



Installation, use and maintenance manual

Gitié AHAY

Integrated package for outdoor installation

with absorption heat pump and gas condensing boiler



DISPOSAL

The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

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I INTRODUCTION



Installation, use and maintenance manual

This Manual is an integral part of the Gitié AHAY appliance and must be handed to the end user together with the appliance.

I.1 RECIPIENTS

This Manual is intended for:

- ▶ End user, for appropriate and safe use of the appliance.
- ▶ Qualified installer, for correct appliance installation.
- ▶ Planner, for specific information on the appliance.

I.2 CONTROL DEVICE

In order to work, the Gitié AHAY appliance requires a control device to be connected by the installer.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

Gitié AHAY Appliance/Unit = equivalent terms, both used to designate the integrated package consisting of a GAHP A unit and a condensing boiler AY 35 or AY 50.

GAHP appliance/unit = equivalent terms, both used to designate the GAHP gas powered absorption heat pump (Gas Absorption Heat Pump).

AY boiler/unit = equivalent terms, both used to designate the condensing boiler AY 35 or AY 50.

TAC = Technical Assistance Centre authorised by Robur.

External request = generic control device (e.g. thermostat, timer or any other system) equipped with a voltage-free NO contact and used as control to start/stop the GAHP/GA unit and the AY boiler.

DDC Control (Direct Digital Controller) = optional Robur control device to manage one or more Robur appliances in ON/OFF mode (GAHP heat pumps, GA chillers) or in modulating mode (AY boilers).

RB100/RB200 Devices (Robur Box) = optional interface devices complementary to DDC, which may be used to broaden its functions (heating/cooling/DHW production service demands and control of system components such as third party generators, adjustment valves, circulators, probes).

GUE (Gas Utilization Efficiency) = efficiency index of gas heat pumps, equal to the ratio between the thermal energy produced and the energy of the fuel used (relative to LCV, lower calorific value).

First start-up = appliance commissioning operation which may only and exclusively be carried out by a TAC.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS



Installer's qualifications

Installation must exclusively be performed by a qualified firm and by qualified personnel, with specific knowledge on heating, cooling, electrical systems and gas appliances, in compliance with the laws in force in the Country of installation.



Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manu-

facturer's instructions/provisions.



Packing

Packing items (plastic bags, polystyrene foam, nails, etc.) must be kept out of the reach of children, as they are potentially dangerous.



Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.



Use of the appliance by children

The appliance can be used by children over 8 years old, and by people with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, only if they are under surveillance or after they have received instructions regarding safe use of the appliance and understanding the dangers inherent in it. Children should not play with the appliance.



Hazardous situations

- Do not start the appliance in hazardous conditions, such as: gas smell, problems with the plumbing/electrical/gas system, parts of the appliance under water or damaged, malfunctioning, disabling or bypassing control and safety devices.
- In case of danger, request intervention by qualified personnel.
- In case of danger, switch off the electrical power and gas supplies only if this can be done in total safety.



Gas component tightness

- Before performing any operation on gas ducting components, close the gas valve.
- Upon completing any procedure, perform the tightness test according to regulations in force.



Gas smell

If you smell gas:

- Do not use electrical devices such as telephones, multimeters or other equipment that may cause sparks next to the appliance.
- Shut off the gas supply by turning the valve off.
- Switch off the power supply via the external disconnect switch in the power supply electrical panel.
- Use a telephone away from the appliance to ask for intervention from qualified personnel.



Poisoning

- Ensure the flue gas ducts are tight and compliant with the regulations in force.
- Upon completing any procedure, ensure the tightness of the components.



Moving parts

The appliance contains moving parts.

- Do not remove guards during operation, and in any case prior to disconnecting the power supply.



Burn hazard

The appliance contains very hot parts.

- Do not open the appliance and do not touch internal components before the appliance has cooled down.
- Do not touch the flue gas exhaust before it has

cooled down.



Pressure vessels

The appliance has a sealed circuit classified as pressure vessel, the tightness of which is tested by the manufacturer.

- Do not carry out any intervention on the sealed circuit or on the appliance's valves.



Water-ammonia solution

The GAHP/GA unit uses the ammonia-water absorption cycle. The water-ammonia solution is contained in the sealed circuit. The solution is harmful for health if it is ingested, inhaled or comes in contact with the skin.

- In the event of coolant leak keep away and disconnect the power and gas supply (only if it is possible to do so with no danger).
- Ask for TAC intervention.



Electrocution hazard

- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Ensure the appliance cannot be accidentally switched back on.



Earthing

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.



Distance from combustible or flammable materials

Do not deposit flammable materials (paper, diluents, paints, etc.) near the appliance.



Limescale and corrosion

Depending on the chemical/physical properties of the system water, limescale or corrosion may damage the appliance.

- Check system sealing.
- Avoid frequent top-ups.



Chloride concentration

The concentration of chlorides or free chlorine in the system water must not exceed the values in Table 4.3 p. 24.



Aggressive substances in the air

Halogenated hydrocarbons containing chlorine and fluorine compounds cause corrosion. The air

of the installation site must be free from aggressive substances.



Acid flue gas condensate

Discharge the acid condensate of combustion flue gas in compliance with current exhaust regulations.



Switching the appliance off

Disconnecting the power supply while the appliance is running may cause permanent damage to internal components.

- Except in the event of danger, do not disconnect the power supply to switch off the appliance, but always and exclusively act through the provided control device.



In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original spare parts.

- In the event of failure of the appliance and/or breakage of any component, do not attempt to repair and/or restore and immediately contact the TAC.



Routine maintenance

Proper maintenance assures the efficiency and good operation of the appliance over time.

- Maintenance must be performed according to the manufacturer's instructions (see Chapter 8 p. 44) and in compliance with current regulations.
- Appliance maintenance and repairs may only be entrusted to firms legally authorised to work on gas appliances and systems.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.



Decommissioning and disposal

If the appliance is to be disposed of, contact the manufacturer for its disposal.



Keep the Manual

This Installation, use and maintenance manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

III.2 COMPLIANCE

EU directives and standards

The Gitié integrated packages are certified in accordance with EN 12309 and meet the essential requirements of the following Directives:

- ▶ 2016/426/EU "Gas Appliances Regulation" as amended and added.
- ▶ 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.
- ▶ 2014/35/EC "Low Voltage Directive" as amended and added.
- ▶ 2006/42/EC "Machine Directive" as amended and added.
- ▶ 2014/68/EU "Pressure Equipment Directive" as amended and added.
- ▶ 811/2013/EU "Energy-Related Products regulation" as amended and added.
- ▶ 813/2013/EU "Ecodesign requirements regulation" as amended and added.

Furthermore, they comply with the requirements of the following standards:

- ▶ EN 378 Refrigerating systems and heat pumps.
- ▶ EN 15502 Gas-fired central heating boilers.

Other applicable provisions and standards

The design, installation, operation and maintenance of the systems shall be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following shall be complied with:

- ▶ Gas systems and equipment.
- ▶ Electrical systems and equipment.
- ▶ Heating and cooling systems, and heat pumps.
- ▶ Environmental protection and combustion products exhaust.
- ▶ Fire safety and prevention.
- ▶ Any other applicable law, standard and regulation.

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY



Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.



In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Damages caused by external agents such as salts, chlorine, sulphur or other chemical substances contained in the installation water or present in the air of the installation site.

- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 FEATURES

1.1 FEATURES

1.1.1 AHAY Integrated package features

The Gitié AHAY package consists of a GAHP A heat pump and a AY 35 (AHAY35) or AY 50 (AHAY50) condensing boiler.

Each of the units making up the package is equipped with an independent high head water pump.

For each of the versions (Table 1.1 p. 8), the heat pump is available with a standard or low-noise fan.

In all versions, the operation of the units may be simultaneous or independent.

The 2-pipe versions (with a single hydraulic circuit) are equipped with check valves serving each of the units making up the Gitié AHAY package.

Table 1.1 Gitié AHAY package versions

Version	Boiler	Pipes	Hydraulic circuits	Fan
AHAY35/4	AY 35	4	independent	standard
AHAY35/4 S1	AY 35	4	independent	low-noise S1
AHAY35/2	AY 35	2	single	standard
AHAY35/2 S1	AY 35	2	single	low-noise S1
AHAY50/4	AY 50	4	independent	standard
AHAY50/4 S1	AY 50	4	independent	low-noise S1
AHAY50/2	AY 50	2	single	standard
AHAY50/2 S1	AY 50	2	single	low-noise S1

1.1.2 GAHP-A unit features

1.1.2.1 Operation

Based on the thermodynamic water-ammonia absorption cycle (H_2O-NH_3), the appliance produces hot water using outdoor air as a renewable energy source (cold source) and natural gas (or LPG) as primary energy.

The thermodynamic cycle takes place within a hermetically sealed circuit, in welded construction, perfectly tight, factory-tested, which does not require any maintenance or coolant top-ups.

The GAHP A appliance can supply hot water up to 65 °C for heating and/or domestic hot water systems.

1.1.2.2 Mechanical and thermo-hydraulic components

- ▶ Steel sealed circuit, externally treated with epoxy paint.
- ▶ Sealed combustion chamber (type C) suitable for outdoor installations.
- ▶ Metal mesh radiant burner, equipped with ignition electrodes and flame detection, managed by an electronic flame control box.
- ▶ Titanium stainless steel shell-and-tube water heat exchanger, externally insulated.
- ▶ Stainless steel, shell-and-tube recovery exchanger of flue gas latent heat.

- ▶ Air exchanger with finned coil, with steel pipe and aluminium fins.
- ▶ Automatic microprocessor-controlled finned coil defrosting valve.
- ▶ Low power consumption refrigerant fluid oil pump.
- ▶ Standard or low-noise S1 fan.

1.1.2.3 Control and safety devices

- ▶ S61 electronic board with microprocessor, LCD display and knob.
- ▶ Mod10 additional electronic board (integrated in S61).
- ▶ Auxiliary W10 electronic board.
- ▶ System water flowmeter.
- ▶ Generator limit thermostat, with manual reset.
- ▶ Flue gas thermostat, with manual reset.
- ▶ Generator fins temperature probe.
- ▶ Sealed circuit safety relief valve.
- ▶ Bypass valve, between high and low-pressure circuits.
- ▶ Ionization flame control box.
- ▶ Double shutter electric gas valve.
- ▶ Condensate drain obstruction sensor.

1.1.3 AY unit features

1.1.3.1 Operation

The AY appliances are outdoor condensing boilers capable of producing hot water up to 88 °C.

There are two models that can be part of the Gitié AHAY unit: AY 35 and AY 50.

1.1.3.2 Mechanical and thermo-hydraulic components

- ▶ Integrated spiral single tube stainless steel heat exchanger.
- ▶ Premix modulating burner with 1:9 ratio (AY 35), 1:10 (AY 50).
- ▶ Automatic air vent valve.
- ▶ High efficiency water pump.
- ▶ System drain tap.
- ▶ Water temperature probes.
- ▶ Condensate drain siphon.
- ▶ Flue gas exhaust duct with relevant terminal, for type B53P configuration.

1.1.3.3 Control and safety devices

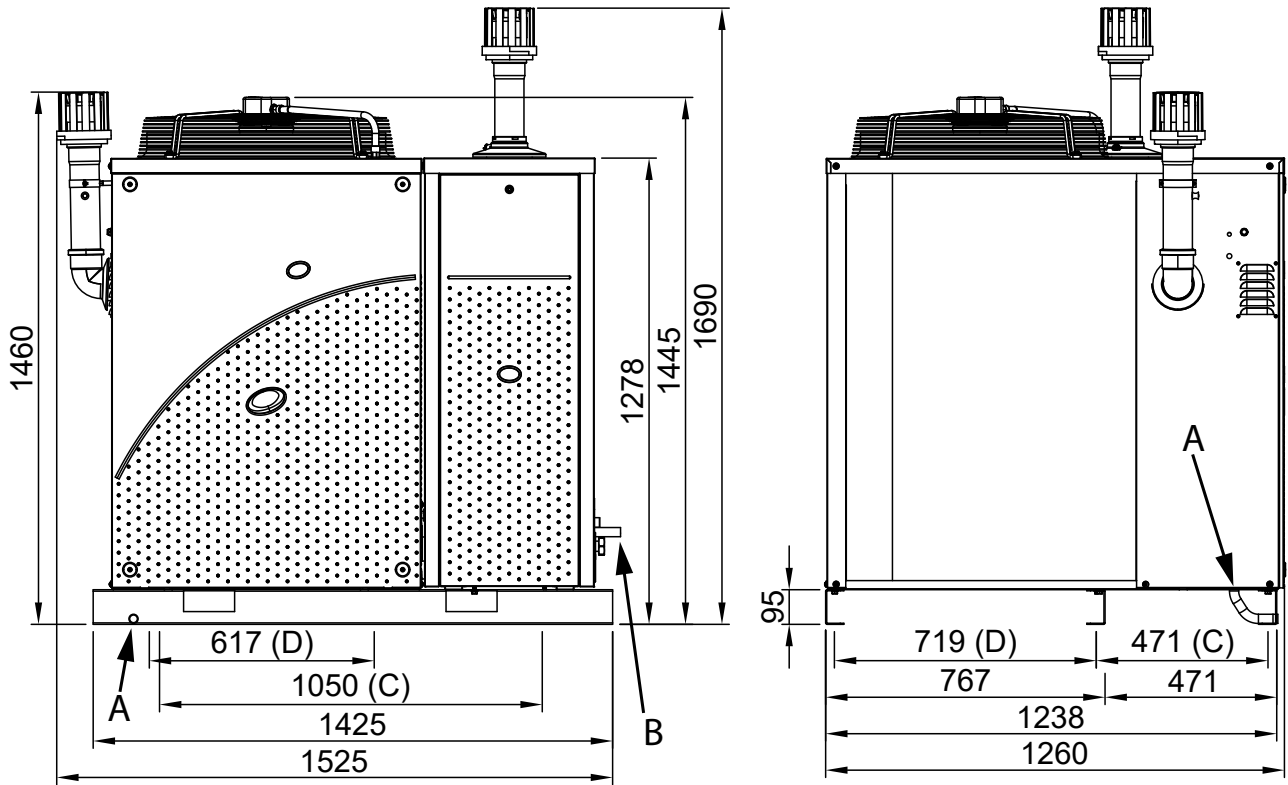
- ▶ Flue safety thermal fuse.
- ▶ Gas solenoid valve.
- ▶ Safety thermostat.
- ▶ Safety valve.
- ▶ Water differential pressure switch.
- ▶ Expansion tank.
- ▶ Outdoor temperature probe.

1.1.3.4 INAIL safety appliances

The kit is only available on appliances intended for the Italian market.

1.2 DIMENSIONS

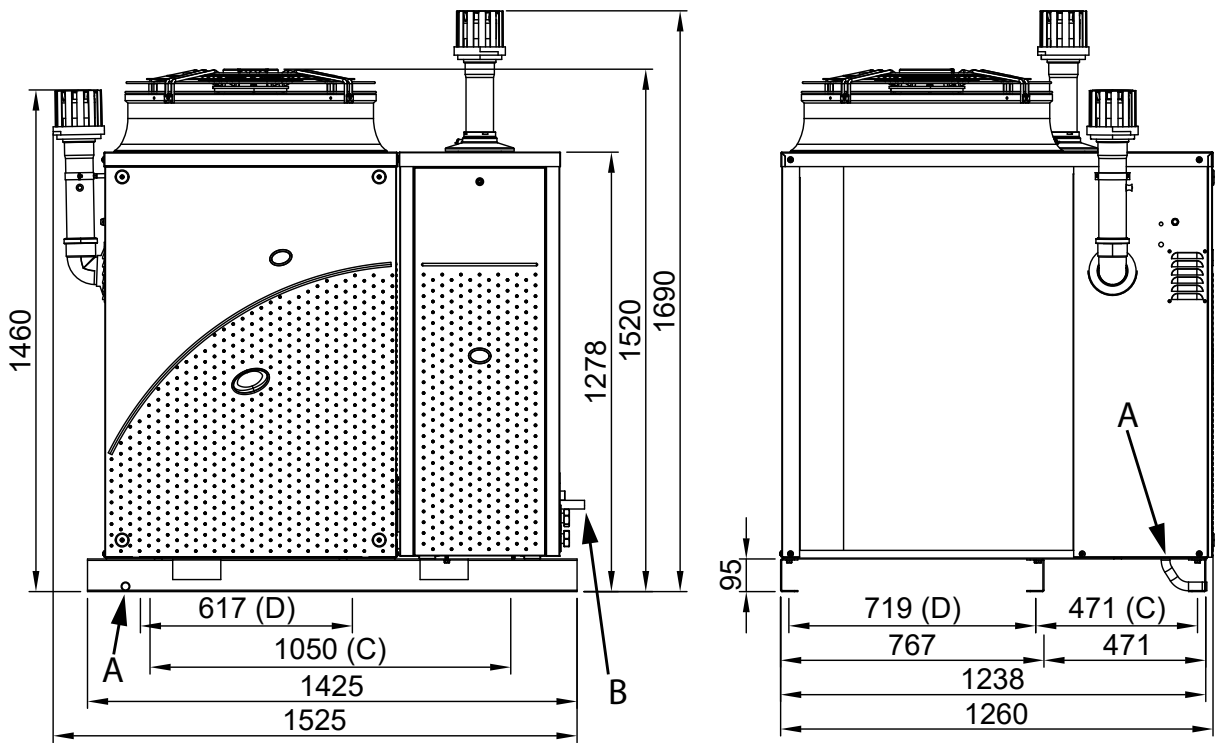
Figure 1.2 Dimensions (standard fan)



- A GAHP A condensate drain
- B AY condensate drain

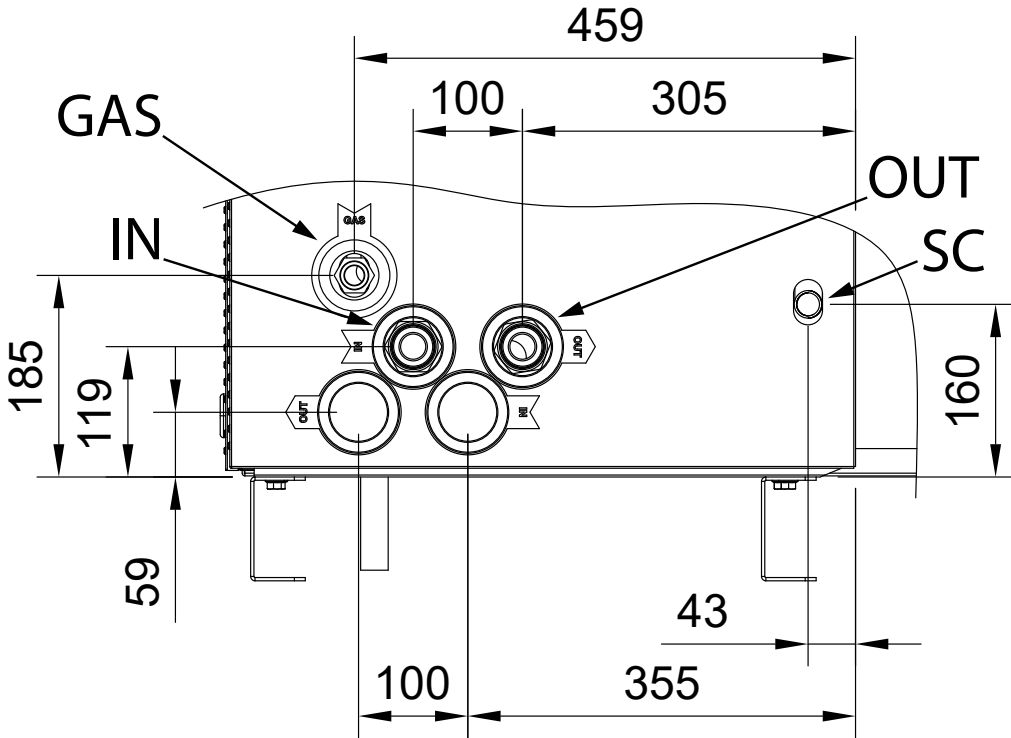
- C Centre distance of holes for front vibration damper supports
- D Centre distance of holes for rear vibration damper supports

Figure 1.3 Dimensions (silenced fan)



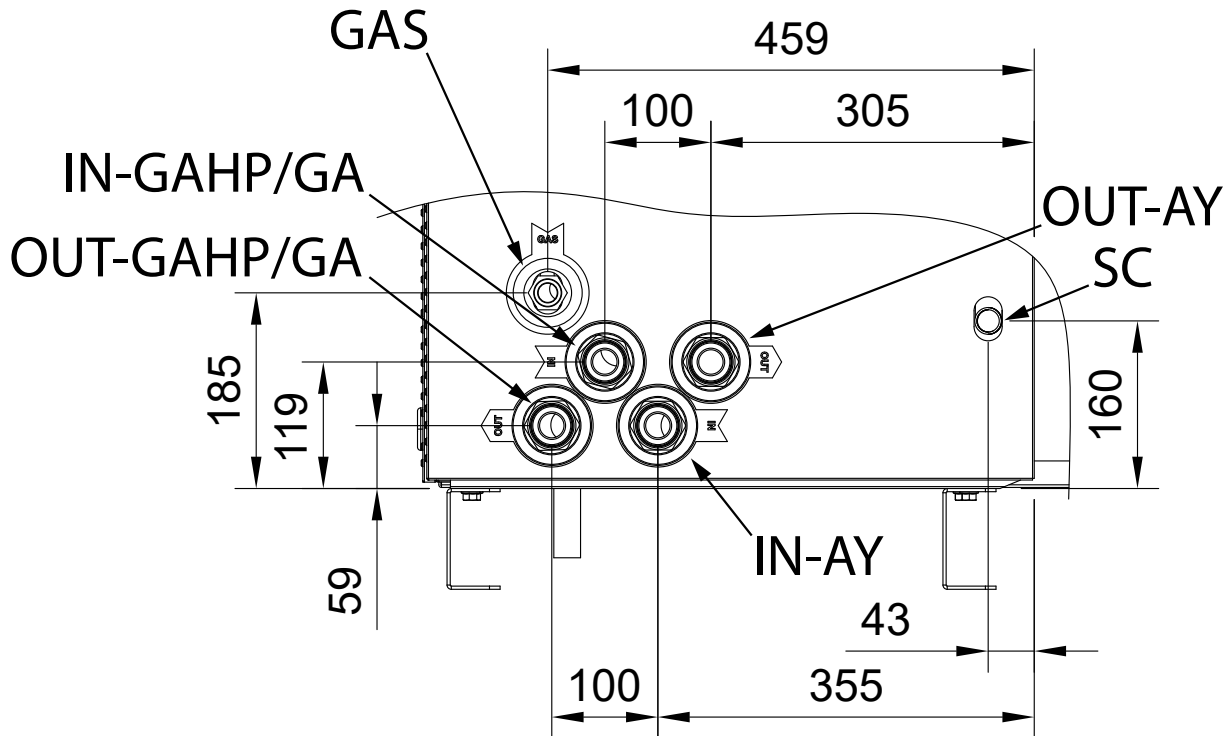
- A GAHP A condensate drain
- B AY condensate drain
- C Centre distance of holes for front vibration damper supports
- D Centre distance of holes for rear vibration damper supports

Figure 1.4 Gitié /2 service plate - Hydraulic/gas connections detail



- OUT Water outlet connection \varnothing 1 1/4" F
- IN Water inlet connection \varnothing 1 1/4" F
- SC AY condensate drain connection (outside diameter 25 mm, inside 21 mm)
- GAS Gas connection \varnothing 3/4" M

Figure 1.5 Gitié /4 service plate - Hydraulic/gas connections detail



OUT-AY AY water outlet connection \varnothing 1 1/4" F

IN-AY AY water inlet connection \varnothing 1 1/4" F

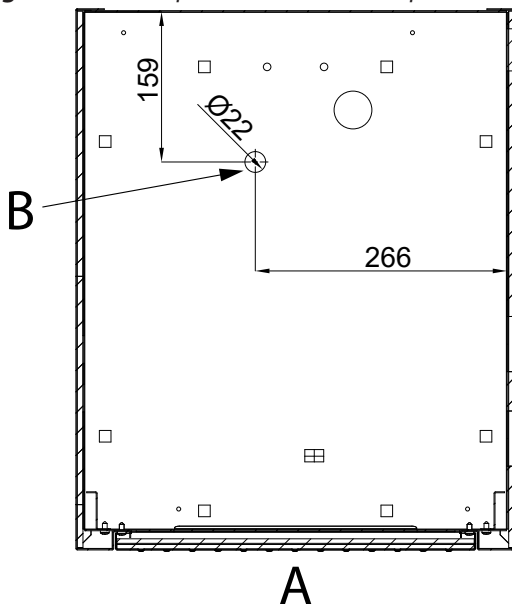
OUT-GAHPGA GAHP/GA water outlet connection \varnothing 1 1/4" F

IN-GAHP/GA GAHP/GA water inlet connection \varnothing 1 1/4" F

SC AY condensate drain connection (outside diameter 25 mm, inside 21 mm)

GAS Gas connection \varnothing 3/4" M

Figure 1.6 Service plate - Detail of bottom plate



A AY front panel

B Boiler safety valve drain external \varnothing 20 mm, internal \varnothing 14 mm

1.3 CONTROLS

1.3.1 Control device

The appliance may only work if it is connected to a control device, selected from:

1. DDC control
2. external requests

1.3.2 DDC Controller

The DDC control is able to manage one or more Robur appliances in ON/OFF mode (GAHP heat pumps, GA chillers) or modulating mode (AY boilers).

The main functions are:

- ▶ Adjustment and control of one (or more) Robur units of the absorption line (GAHP, GA, AY).
- ▶ Data display and parameters setting.
- ▶ Time programming.
- ▶ Climatic curve control.
- ▶ Diagnostics.
- ▶ Errors reset.
- ▶ Possibility to interface with a BMS.

Le funzionalità del DDC possono essere ampliate con i dispositivi ausiliari Robur RB100 e RB200 (es. richieste servizi, produzione ACS, comando generatori di terze parti, controllo sonde, valvole o circolatori impianto, ...).



For further details refer to the DDC, RB100, RB200 manuals and the design manual.

1.3.3 External requests

The appliance may also be controlled via generic request devices (e.g. thermostats, clocks, buttons, contactors...) fitted with **voltage-free NO contacts**. This system only provides elementary control, without some of the important functions of DDC control. Control of the cascade between GAHP/GA and AY is dependent on the opening/closing of

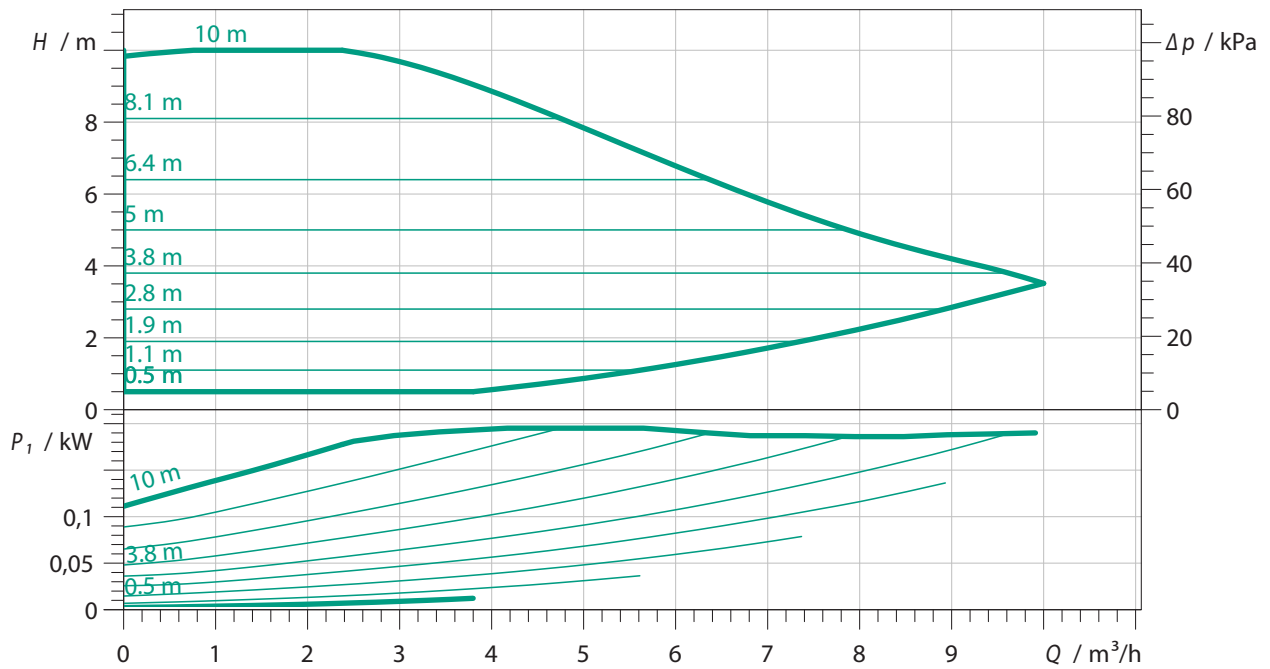
the requests to the units making up the Gitié AHAY (GAHP A and AY boiler). The AY boiler retains the possibility of operating in power modulation.



For connection of the selected device to the appliance's electronic board please refer to Paragraph 5.4 p. 29.

1.4 CIRCULATING PUMP CHARACTERISTIC CURVES

Figure 1.7 Oversized pressure head circulating pump characteristic curves



2 TECHNICAL DATA

2.1 AHAY INTEGRATED PACKAGE TECHNICAL DATA

Table 2.1 Gitié AHAY technical data

Heating mode		AHAY35/2	AHAY35/2 S1	AHAY35/4	AHAY35/4 S1	AHAY50/2	AHAY50/2 S1	AHAY50/4	AHAY50/4 S1
Heat input	real		59,2				75,2		
		A7W35		77,4			94,3		
Heat output for each unit	Outdoor temperature/Water outlet	A7W40		75,8			92,5		
	temperature	A7W50		73,0			89,3		
		A7W65		64,3			79,9		
		A-7W50		66,7			83,0		
		A7W35		131			125		
GUE efficiency	Outdoor temperature/Water outlet	A7W40		128			123		
	temperature	A7W50		123			119		
		A7W65		109			106		
		A-7W50		113			110		
	nominal (AY)			2600			2350		
Water flow rate 4 pipes	minimum (AY)			1200			1500		
	nominal (GAHP)				2500				
	minimum (GAHP)				1400				
	nominal			5100			4850		
Water flow rate 2 pipes	minimum			2600			2900		
	AY				0,57 (1)				
Pressure drop heating mode	GAHP				0,31 (1)				
	version /4 GAHP								0,70
Residual pressure head at nominal flow rate	version /4 AY								0,44
	version /2			0,42			0,42		-
	maximum for heating maximum for DHW				65 (2)		88		

(1) For flows other than nominal see design manual, Paragraph "Pressure losses".

(2) Value in combined operation. 88 °C for boiler-only operation.

(3) In transient operation, lower temperatures are allowed.

(4) As an option, a version for operation down to -25 °C is available.

(5) As an option, a version for operation down to -30 °C is available.

(6) Gas not available for the appliance.

(7) Maximum sound pressure levels in free field, with directionality factor 2, obtained from the sound power level in compliance with standard EN ISO 9614. Data referred to 50 °C outlet temperature.

(8) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614. Data referred to 50 °C outlet temperature.

		AHAY35/2	AHAY35/2 S1	AHAY35/4	AHAY35/4 S1	AHAY50/2	AHAY50/2 S1	AHAY50/4	AHAY50/4 S1
Hot water inlet temperature	maximum for heating				55				
	maximum for DHW				70				
	minimum temperature in continuous operation				30 (3)				
Outdoor temperature (dry bulb)	maximum				45				
	minimum	-15 (4)		-15 (5)					-15
Electrical specifications									
Power supply	voltage	V			230				
	type	-			single-phase				
Electrical power absorption	frequency	Hz			50				
	nominal	kW	1,19	1,12	1,19	1,12	1,22	1,15	1,22
	minimum	kW	-	0,85	-	0,85	-	0,88	-
Degree of protection	IP	-			25				
Installation data									
Gas consumption	G20 natural gas (nominal)	m ³ /h		6,32					8,01
	G25 (nominal)	m ³ /h		7,34					9,31
	G25.1 (nominal)	m ³ /h		-(6)					9,30
	G25.3 (nominal)	m ³ /h		7,18					9,10
	G27 (nominal)	m ³ /h		-(6)					9,77
	G2.350 (nominal)	m ³ /h		-(6)					11,12
	G30 (nominal)	kg/h		4,71					5,97
Dimensions	G31 (nominal)	kg/h		4,64					5,88
	width	mm				1425			
	height	mm	1445	1520	1445	1520	1445	1520	1445
	depth	mm				1260			
	thread	"				3/4			
	type	-				M			
	thread	"				1 1/4			
Water fitting	type	-			F				
	type of installation	-			B23P, B33, B53P				
Type of installation (boiler)	type of installation	-			B23, B23P, B33, B53				
	diameter (Ø)	mm			80				
Heat pump flue gas exhaust	residual head	Pa			80				
	diameter (Ø)	mm			80				
Boiler flue gas exhaust	residual head	Pa			91				
	in operation	kg	477	487	477	487	490	490	500

(1) For flows other than nominal see design manual, Paragraph "Pressure losses".
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 (4) As an option, a version for operation down to -25 °C is available.
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 (6) Gas not available for the appliance.
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 (8) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614. Data referred to 50 °C outlet temperature.

	AHAY35/2	AHAY35/2 S1	AHAY35/4	AHAY35/4 S1	AHAY50/2	AHAY50/2 S1	AHAY50/4	AHAY50/4 S1
minimum storage temperature	°C							
sound pressure L_p at 5 metres (max)	57,6 (7)	52,0 (7)	57,6 (7)	52,0 (7)	57,6 (7)	52,0 (7)	57,6 (7)	52,0 (7)
sound pressure L_p at 5 metres (min)	-	49,0 (7)	-	49,0 (7)	-	49,0 (7)	-	49,0 (7)
sound power L_w (max)	79,6 (8)	74,0 (8)	79,6 (8)	74,0 (8)	79,6 (8)	74,0 (8)	79,6 (8)	74,0 (8)
sound power L_w (min)	-	71,0 (8)	-	71,0 (8)	-	71,0 (8)	-	71,0 (8)
expansion tank volume	l							
maximum flow rate of heat pump flue gas condensate	l/h							
maximum flow rate of boiler flue gas condensate	l/h							
maximum water pressure in operation	bar							
water content inside the appliance	l							
NO _x emission class	GAHP							
	AY							
	5							
	6							

(1) For flows other than nominal see design manual, Paragraph "Pressure losses".

(2) Value in combined operation. 88 °C for boiler-only operation.

(3) In transient operation, lower temperatures are allowed.

(4) As an option, a version for operation down to -25 °C is available.

(5) As an option, a version for operation down to -30 °C is available.

(6) Gas not available for the appliance.

(7) Maximum sound pressure levels in free field, with directionality factor 2, obtained from the sound power level in compliance with standard EN ISO 9614. Data referred to 50 °C outlet temperature.

(8) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614. Data referred to 50 °C outlet temperature.

2.2 GAHP A TECHNICAL DATA

Table 2.2 GAHP A sealed circuit technical data

General information		GAHP A HT	GAHP A HT S1
Refrigerating fluid	ammonia R717	kg	7,0
maximum pressure of the refrigerating circuit	water H ₂ O	kg	10,0
PED data		bar	32
Components under pressure			
	generator	l	18,6
	leveling chamber	l	11,5
	evaporator	l	3,7
	refrigerant volume changer	l	4,5
	solution refrigerant absorber	l	6,3
	solution pump	l	3,3
test pressure (in air)		bar _g	55
maximum pressure of the refrigerating circuit		bar _g	32
filling ratio		kg of NH ₃ /l	0,146
fluid group		-	GROUP 1°

3 TRANSPORT AND POSITIONING

3.1 WARNINGS

Damage from transport or installation

The manufacturer shall not be liable for any damage during appliance transport and installation.

On-site inspection

- Upon arrival at the site, ensure there is no transport damage on packing, metal panels or finned coil.
- After removing the packing materials, ensure the appliance is intact and complete.

Packing

- Only remove the packing after placing the appliance on site.
- Do not leave parts of the packing within the reach of children (plastic, polystyrene, nails...) since they are potentially dangerous.

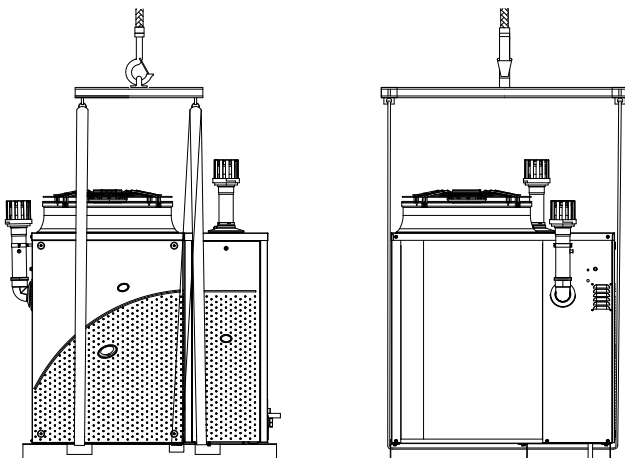
Weight

- The crane and lifting equipment must be suitable for the load.
- Do not stand under suspended loads.

3.2 HANDLING AND LIFTING

- ▶ Always handle the appliance in its packing, as delivered by the factory.
- ▶ Do not remove the protective caps on the flue gas outlets to prevent water and/or foreign bodies from entering the appliance.
- ▶ To lift the appliance use straps or slings inserted in the holes of the base (Figure 3.1 p. 17).
- ▶ Use lifting beams to avoid damaging the outer panels and finned coil (Figure 3.1 p. 17).
- ▶ Comply with safety regulations at the installation site.

Figure 3.1 Instruction for lifting



In the event of handling with forklift or pallet truck, comply with the handling instructions shown on the packing.

3.3 APPLIANCE POSITIONING



Do not install inside a room

The appliance is type-approved for external installation.

- Do not install inside a room, not even if it has openings.
- In no event start the appliance inside a room.



Gitié AHAY unit ventilation

- The arothermic appliance requires a large space, ventilated and free from obstacles, to enable smooth flow of air to the finned coil and free air outlet above the mouth of the fan, with no air recirculation.
- Incorrect ventilation may affect efficiency and cause damage to the appliance.
- The manufacturer shall not be liable for any incorrect choices of the place and setting of installation.

3.3.1 Where to install the appliance

- ▶ The appliance may be installed at ground level, on a terrace or on a roof, compatibly with its dimensions and weight.
- ▶ It must be installed outside buildings, in an area of natural air circulation, outside the dripping path of drain-pipes or similar. It does not require protection from weathering.
- ▶ No obstruction or overhanging structure (e.g. protruding roofs, canopies, balconies, ledges, trees) shall interfere either with the air flowing from the top of the appliance or with the exhaust flue gas.
- ▶ The appliance's flue gas exhaust must not be immediately close to openings or air intakes of buildings, and must comply with safety and environmental regulations.
- ▶ Do not install near the exhaust of flues, chimneys or hot polluted air. In order to work correctly, the appliance needs clean air.

3.3.2 Defrosting water drainage



In winter, it is normal for frost to form on the finned coil and for the appliance to perform defrosting cycles.

To prevent overflowing and damage provide for a drainage system.

3.3.3 Acoustic issues

Pre-emptively assess the appliance's sound effect in connection to the site, taking into account that building corners, enclosed courtyards, restricted spaces may amplify the acoustic impact due to the reverberation phenomenon.

3.4 MINIMUM CLEARANCE DISTANCES

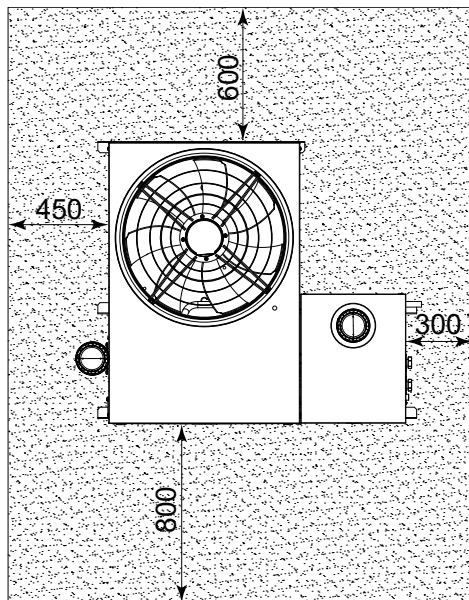
3.4.1 Distances from combustible or flammable materials

Keep the appliance away from combustible or flammable materials or components, in compliance with applicable regulations.

3.4.2 Clearances around the appliance

The minimum clearance distances shown in Figure 3.2 *p. 18* (bar any stricter regulations) are required for safety, operation and maintenance.

Figure 3.2 Clearances



3.5 MOUNTING BASE

3.5.1 Mounting base constructive features

Place the appliance on a level flat surface made of fire-proof material and able to withstand its weight.

3.5.2 Installation at ground level

Failing a horizontal supporting base, make a flat and level concrete base, at least 100-150 mm larger than the appliance size per side.

3.5.3 Installation on terrace or roof

- ▶ The structure of the building must support the total weight of the appliance and the supporting base.
- ▶ If necessary, provide a maintenance walkway around the appliance.

3.5.4 Anti vibration mountings

Although the appliance's vibrations are minimal, resonance phenomena might occur in roof or terrace installations.

- ▶ Use anti-vibration mountings.

4 HEATING ENGINEER

4.1 WARNINGS



Read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of:

- heating systems
- gas systems

- flue gas exhaust
- flue gas condensate discharge



Installation must also comply with the manufacturer's provisions.

4.2 HYDRAULIC SYSTEM

The hydraulic installer must make the hydraulic connection circuit to the system.

The installer must provide for the construction of a suitably sized hydraulic connection circuit, taking into account:

A. of the following indications:

- Use pipes for heating/cooling systems, protected

from weathering and freezing, insulated for thermal dispersion.

- Sizing of the pipes, according to the supplied circulator, must grant the nominal water flow required for the correct operation of the system.
- When using glycol water, take this into account when selecting the pipe material and calculating the additional pressure drop generated by the presence of glycol (Paragraph 4.2.11.2 p. 23).

B. of the residual head data reported in Paragraph 2 p. 13.



Connect the outlet of the boiler safety valve (Figure 1.6 p. 11) to a suitable drain. The manufacturer is not liable for any damage caused by the opening of the safety valve in the event of system overpressure.

4.2.1 Primary and secondary circuit

In many cases it is advisable to divide the hydraulic system into two parts, primary and secondary circuit, uncoupled by a hydraulic separator, or possibly by a tank that also acts as inertial tank/buffer.

See for example the diagrams in Paragraph 4.2.8 p. 22.

4.2.2 Minimum water content

High thermal inertia is conducive to efficient appliance operation. Very short ON/OFF cycles are to be avoided.

- ▶ If necessary, provide for an inertial volume, to be suitably sized (see design manual).

4.2.3 4-pipe version hydraulic connections

on the right, at the bottom, connection plate (Figure 1.5 p. 11).

- ▶ OUT-AY AY water outlet connection Ø 1 1/4" F
- ▶ IN-AY AY water inlet connection Ø 1 1/4" F
- ▶ OUT-GAHPGA GAHP/GA water outlet connection Ø 1 1/4" F
- ▶ IN-GAHP/GA GAHP/GA water inlet connection Ø 1 1/4" F
- ▶ SC Condensate drain connection (outside diameter 25 mm, inside 21 mm)

4.2.4 2-pipe version hydraulic connections

on the right, at the bottom, connection plate (Figure 1.4 p. 10).

- ▶ OUT Water outlet connection Ø 1 1/4" F
- ▶ IN Water inlet connection Ø 1 1/4" F
- ▶ SC Condensate drain connection (outside diameter 25 mm, inside 21 mm)

4.2.5 Pipe cleaning



Pipe cleaning

Before connecting the appliance, accurately wash the water and gas piping and any other system component, removing any residue.

4.2.6 Minimum components of water circuit

Always provide, near the appliance:

- ▶ on water piping, both outlet and inlet
 - 2 antivibration joints on water fittings
 - 2 pressure gauges
 - 2 isolation ball valves
- ▶ on the inlet water piping
 - 1 separator filter
 - 1 Flow regulator valve
- ▶ on the water outlet pipe (only for 4-pipe version and only for the GAHP/GA unit)
 - 1 safety valve (3 bar)
 - 1 expansion tank of the individual unit



The AY unit is equipped with its own 10 l internal expansion tank and a safety valve, which in the 2-pipe version are also effective for the GAHP/GA unit. Depending on the water content of the system, assess the need for additional expansion tanks.

4.2.7 System filling



For the calculation of the total water content to be loaded in the system it is necessary to add the water content of the appliance (Paragraph 2.1 p. 13) and of the distribution terminals to the water content in the pipes and in other elements that make up the system (tanks, hydraulic separators, etc.).



Proceed with the filling of the system as follows.

A filling tap on the system must be provided for filling the system.



At the first power supply of the boiler and each time the power supply is restored, an automatic system venting cycle is activated. The display will show the code F33 for the entire duration of the cycle (5 minutes for the first power supply, 2 minutes for the following ones).



To access the display of the boiler, remove the front panel of the boiler, as shown in Figure 6.2 p. 33.

4.2.7.1 GAHP A



How to fill up the system

After completing all water, electrical and gas connections:

1. Pressurise (at least 1,5 bar) and vent the hydraulic circuit.
2. Let water flow (with burner off) by activating the service request and deactivating it before the burner is ignited.
3. Check and clean the filter on the inlet pipe.
4. Repeat items 1, 2 and 3 until the pressure has stabi-

lised (at least 1,5 bar).

4.2.7.2 AY 35

1. Slightly loosen the cap of the jolly valve placed on the top of the condensing block (Figure 4.1 p. 20) to release the air from the top of the boiler.
2. Open the system filling valve (to be provided on the system) and let out all the air.
3. Check with pressure gauge that system pressure reaches 1,5 bar.
4. Open the automatic air vent valves on the system, if any, and check the air venting process.
5. Make sure that the unit is energized.
6. Send an operating request to the unit for a few seconds. The circulating pump will be immediately activated.
7. Remove the request before the burner is activated. The circulating pump will continue to circulate the water for the post-circulation time.
8. If, after the above operations, a decrease in system water pressure is observed, open again the system filling tap until the system pressure reaches 1,5 bar.
9. Repeat items 6, 7, 8 until the pressure has stabilised (at least 1,5 bar).
10. After the operation, make sure that the system filling tap is tightly closed.



Once the filling operation has been completed, close the cap of the jolly valve on the condensing block, to avoid water leaks.







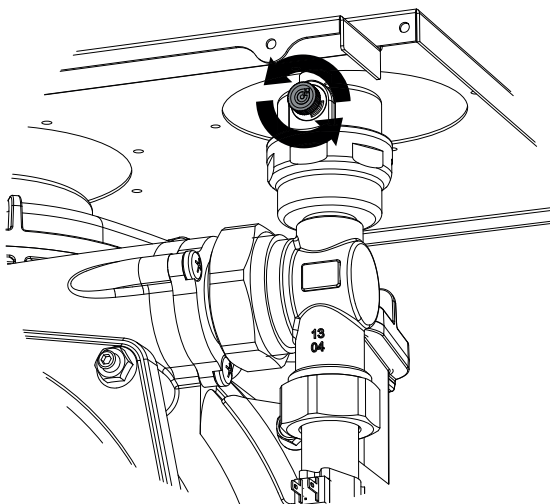
To start the circulation pump only, with the boiler powered, press the  key (Figure 7.1 p. 42): the symbol  will appear on the display; after a few seconds turn off the boiler by pressing the  key again (the symbol  will appear on the display). The circulation pump will remain in operation for a few minutes. Repeat the operation several times until the pressure of the circuit remains unchanged.

Figure 4.1 Cap of the jolly valve on condensing block



4.2.7.3 AY 50

1. Slightly loosen the cap of the jolly valve located at the top of the condensing block (detail 1, Figure 4.2 p. 21) to let the air out from the highest point of the boiler.
2. Check that the air vent valves in the system are not blocked.
3. Connect a rubber hose to the drain tap (detail 2, Figure 4.2 p. 21).
4. Open the drain tap (detail 2, Figure 4.2 p. 21) counterclockwise.
5. Open the system filling tap (to be provided on the system) and let all the air out. Close it when the air is all out, replaced by a constant water flow.
6. Pressurize the hydraulic system, making sure that the water pressure indicated by the pressure gauge is not less than 1,5 bar.
7. Make sure that the unit is energized.
8. Send an operating request to the unit for a few seconds. The circulating pump will be immediately activated.
9. Remove the request before the burner is activated. The circulating pump will continue to circulate the water for the post-circulation time.
10. If, after the above operations, a decrease in system water pressure is observed, open again the system filling valve until the system pressure reaches 1,5 bar.
11. Repeat steps 8, 9 and 10 until the pressure has stabilised (at least 1,5 bar).
12. After the operation, close the filling tap.



Once the filling operation has been completed, close the cap of the jolly valve on the condensing block, to avoid water leaks.







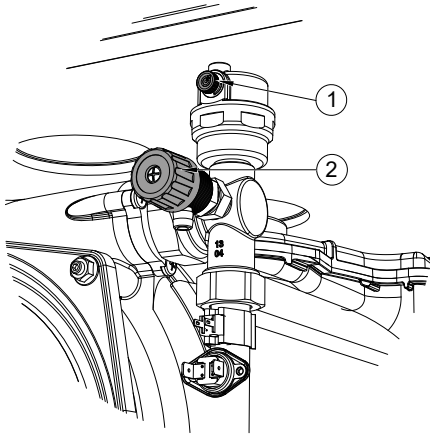
To start the circulation pump only, with the boiler powered, press the  key (Figure 7.1 p. 42): the symbol  will appear on the display; after a few seconds turn off the boiler by pressing the  key again (the symbol  will appear on the display). The circulation pump will remain in operation for a few minutes. Repeat the operation several times until the pressure of the circuit remains unchanged.

Figure 4.2 Air-vent valve

1 Cap of the jolly valve 2 Tap

1. Turn off the system by means of provided control devices and wait for the water pumps to stop.
2. Disassemble the front panel of the boiler.
3. Close the shut-off valve on the outlet and open the upper or left vent valve (Figure 4.3 p. 21, detail B).
4. When the air is all out, replaced by a constant flow of water, close the upper or left vent valve and open the shut-off valve on the outlet.
5. Close the shut-off valve on the inlet and open the lower or right vent valve (Figure 4.3 p. 21, detail C).
6. When the air is all out, replaced by a constant flow of water, close the lower or right vent valve and open the shut-off valve on the inlet.
7. Reactivate the system and let water flow (with burner off).
8. If the air vent has been properly completed, reassemble the front panel of the boiler. If not, repeat the procedure from step 3.

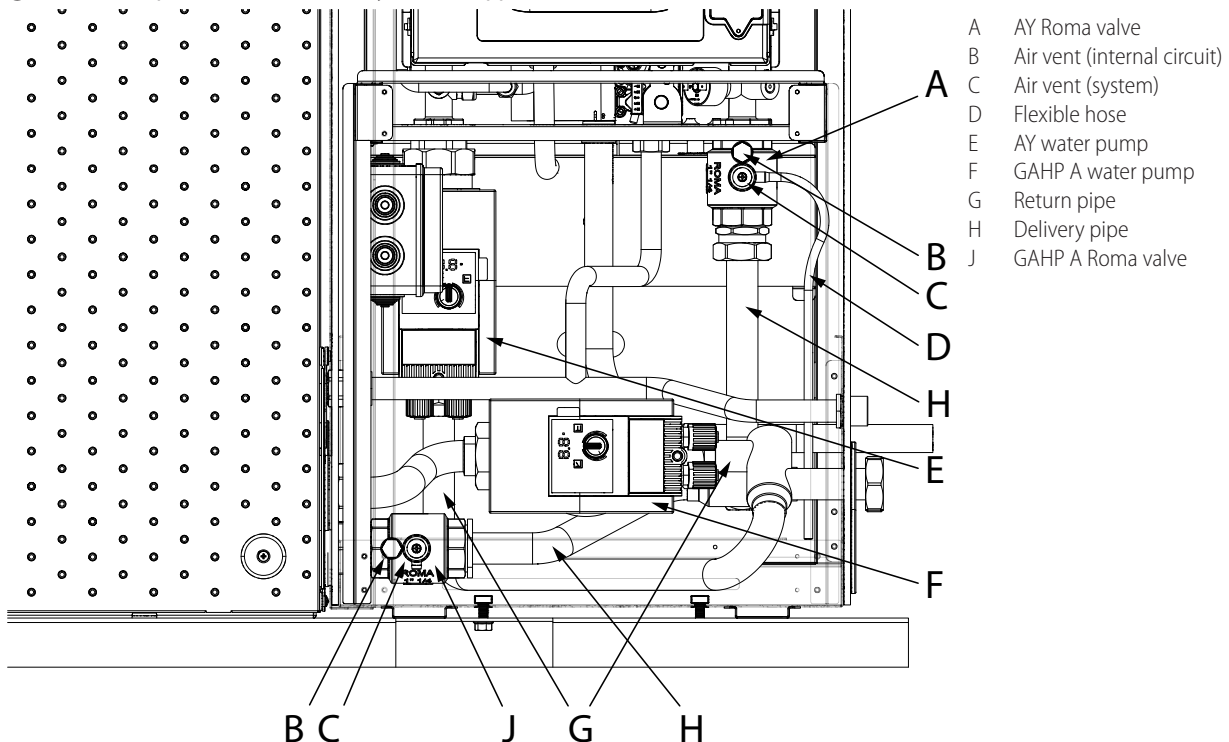
4.2.7.4 Water pump air vent (only for 2 pipe appliances)



How to vent the water pumps of 2 pipe appliances



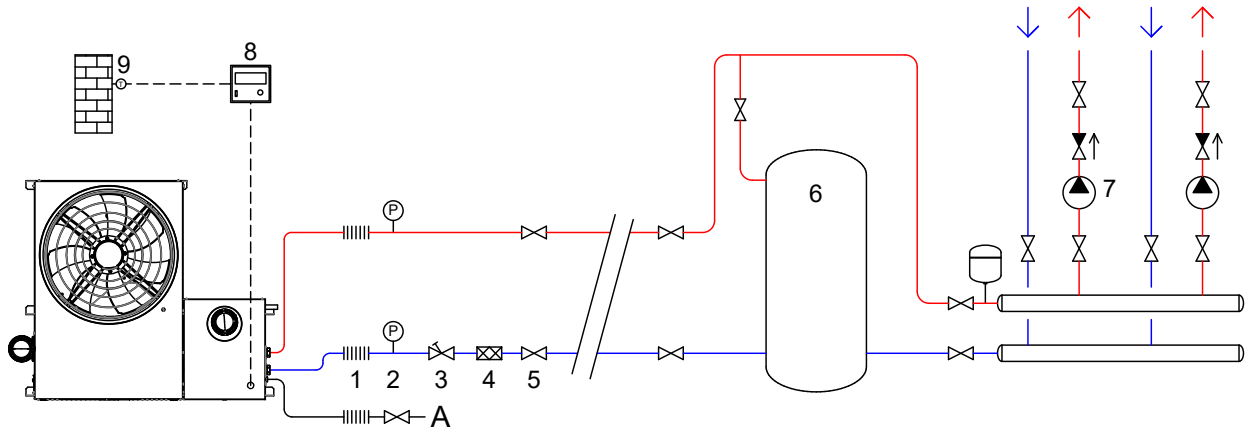
The correct filling and air venting of the hydraulic system are fundamental to ensure reliability over time of the mechanical components, in particular the circulation pumps.

Figure 4.3 Pump/Roma valve assembly on Gitié appliances

- A AY Roma valve
- B Air vent (internal circuit)
- C Air vent (system)
- D Flexible hose
- E AY water pump
- F GAHP A water pump
- G Return pipe
- H Delivery pipe
- J GAHP A Roma valve

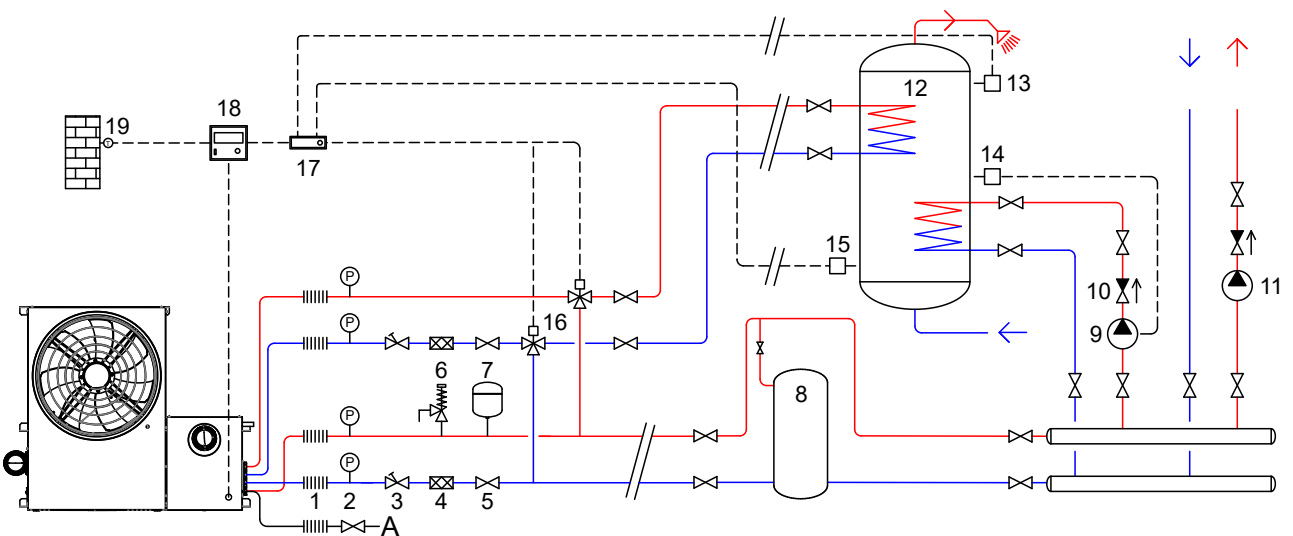
4.2.8 Hydraulic diagrams

Figure 4.4 Hydraulic diagram Gitié AHAY /2



- | | | |
|-----------------------------|---|-----------------------------|
| 1 Anti-vibration connection | 5 Shut-off valve | 9 Outdoor temperature probe |
| 2 Pressure gauge | 6 Buffer tank (and hydraulic separator) | A Gas connection |
| 3 Flow regulator valve | 7 Conditioning circuit water pump | |
| 4 Sludge filter | 8 DDC panel | |

Figure 4.5 Hydraulic diagram Gitié AHAY /4



- | | | |
|---|--|---|
| 1 Anti-vibration connection | 12 DHW accumulation tank | A Gas connection |
| 2 Pressure gauge | 13 Thermostat with adjustable differential for DHW | Notes: |
| 3 Flow regulator valve | 14 Thermostat with adjustable differential for DHW pre-heating | • Pump 9 of DHW pre-heating must only turn on if the temperature difference between manifold and buffer tank is sufficient for correct heat exchange on the pre-heating coil. |
| 4 Sludge filter | 15 Thermostat with adjustable differential for Legionella function | • Pump 9 for DHW pre-heating must be switched off in summer. |
| 5 Shut-off valve | 16 3-way diverter valves for DHW | |
| 6 Safety valve (GAHP/GA circuit) | 17 RB100 device | |
| 7 Expansion tank (GAHP/GA circuit) | 18 DDC panel | |
| 8 Buffer tank (and hydraulic separator) | 19 Outdoor temperature probe | |
| 9 DHW winter pre-heating water pump | | |
| 10 Check valve | | |
| 11 Conditioning circuit water pump | | |

4.2.9 Water circulation pumps

Water circulation pumps are supplied on the appliance. For available water flow and residual head features refer to Paragraph 2.1 p. 13 and to design manual.

4.2.10 Pump antifreeze and anti-lock function



Heating antifreeze function

The appliance is equipped with an active anti-

freeze self-protection system to prevent freezing. The antifreeze function (activated by default) automatically starts the primary water pump and, if required, the burner too, when the outdoor temperature approaches zero.

If the outlet water temperature detected by the water temperature probe inside the boiler falls below the antifreeze activation value (default 12 °C, settable via parameter P81), the control board starts the water pump and the ignition of the burner at minimum power.

When the outlet water temperature reaches 30 °C or the inlet water temperature reaches 20 °C (antifreeze temperature OFF) the control board will turn off the burner.

Electrical and gas continuity

The antifreeze function is only effective if the power and gas supplies are assured. Otherwise, antifreeze fluid in the system water might be required.



Pump anti-lock function

In order to prevent the circulation pump from locking, the boiler is equipped with an anti-lock function which, every 24 hours of inactivity, operates the circulation pump for 30 seconds.

Electrical continuity

The pump anti-lock function is only effective if the power supply is guaranteed.

4.2.11 Antifreeze liquid

Precautions with glycol

Table 4.1 Glycol effects (GAHP/GA)

Glycol %	Water-glycol mixture freezing temperature	Percentage of increase in pressure drops	Loss of efficiency of unit
10	-3 °C	-	-
15	-5 °C	6,0%	0,5%
20	-8 °C	8,0%	1,0%
25	-12 °C	10,0%	2,0%
30	-15 °C	12,0%	2,5%
35	-20 °C	14,0%	3,0%
40	-25 °C	16,0%	4,0%

Table 4.2 Glycol effects (AY)

Glycol %	Water-glycol mixture freezing temperature	Percentage of increase in pressure drops	Loss of efficiency of unit
10	-3 °C	7%	-
15	-5 °C	10%	0,5%
20	-8 °C	13%	1,0%
25	-12 °C	15%	2,0%
30	-15 °C	18%	2,5%
35	-20 °C	21%	3,0%
40	-25 °C	24%	4,0%

The manufacturer disclaims any liability for any damage caused by improper glycol use.

- Always check product suitability and its expiry date with the glycol supplier. Periodically check the product's preservation state.
- Do not use car-grade antifreeze liquid (without inhibitors), nor zinc-coated piping and fittings (incompatible with glycol).
- Glycol modifies the physical properties of water (density, viscosity, specific heat...). Size the piping, circulation pump and thermal generators accordingly.
- With automatic system water filling, a periodic check of the glycol content is required.

In the presence of glycol

In the presence of glycol it is necessary to warn the TAC before the first start-up and to set parameter P52 correctly.



When producing DHW by DHW buffer tank, use propylene glycol only.



The use of toxic antifreeze fluids is forbidden.

4.2.11.1 Type of antifreeze glycol

Inhibited type glycol is recommended to prevent oxidation phenomena.

4.2.11.2 Glycol effects

Tables 4.1 p. 23 (GAHP/GA) and 4.2 p. 23 (AY) show, indicatively, the effects of using a glycol depending on its %.

4.2.12 System water quality



Responsibility of the user/operator/installer

The installer, operator and user must assure system water quality (Table 4.3 p. 24). Failure to comply with the manufacturer's guidelines may affect operation, integrity and life of the appliance, voiding the warranty.

4.2.12.1 System water characteristics



In order to avoid any scale or deposits on the primary exchanger, the water in the system must be treated in accordance with the applicable standards. This treatment is absolutely essential in cases where there are frequent episodes of water supply or partial or total emptying of the system.

The filling and top-up water brings a certain amount of calcium into the system. This is attached to the hot parts including the heat exchanger, thus creating pressure drops and thermal insulation on the active parts. This can lead to damage.

If the filling and top-up water of the system is outside the values indicated below, it must be softened and/or chemically treated. Additives may also be added to keep the calcium in solution. Hardness should be checked regularly and recorded on the system logbook.

The choice of the type of treatment must be made according to the characteristics of the water to be treated, the type of plant and the limits of purity required.

Free chlorine or water hardness may damage the appliance.

Adhere to the chemical-physical parameters in Table 4.3 p. 24 and the regulations on water treatment for residential and industrial heating systems.

Table 4.3 Chemical and physical parameters of water

Chemical and physical parameters of water in heating/cooling systems		
Parameter	Measurement unit	Required value
pH	/	> 7 (1)
Chlorides	mg/l	< 125 (2)
Total hardness (CaCO ₃)	°f	< 15
	°d	< 8,4
Iron	mg/kg	< 0,5 (3)
Copper	mg/kg	< 0,1 (3)
Aluminium	mg/l	< 1
Langelier's index	/	0-0,4
Harmful substances		
Free chlorine	mg/l	< 0,2 (3)
Fluorides	mg/l	< 1
Sulphides		ABSENT

1 With aluminium or light alloys radiators, pH must also be lower than 8 (in compliance with applicable rules)
 2 Value referred to the maximum water temperature of 80 °C
 3 In compliance with applicable rules

4.2.12.2 Water topping up

The chemical-physical properties of the system's water may alter over time, resulting in poor operation or excessive topping up.

- ▶ Ensure there are no leaks in the installation.
- ▶ Periodically check the chemical-physical parameters of the water, particularly in case of automatic topping up.



Chemical conditioning and washing

Water treatment/conditioning or system washing carried out carelessly may result in risks for the appliance, the system, the environment and health.

- Contact specialised firms or professionals for water treatment or system washing.
- Check compatibility of treatment or washing products with operating conditions.
- Do not use aggressive substances for stainless steel or copper.
- Do not leave washing residues.

4.3 FUEL GAS SUPPLY

4.3.1 Gas connection

3/4" M on the right, at the bottom, connection plate (Paragraph 1.2 p. 9).

- ▶ Install an anti-vibration connection between the appliance and the gas piping.

4.3.2 Mandatory shut-off valve

- ▶ Provide a gas shut-off valve (manual) on the gas supply line, next to the appliance, to isolate it when required.
- ▶ Perform connection in compliance with applicable regulations.

4.3.3 Gas pipes sizing

The gas pipes must not cause excessive pressure drops and, consequently, insufficient gas pressure for the appliance.

4.3.4 Supply gas pressure



This appliance is equipped for a maximum gas supply pressure of 50 mbar.

The appliance's gas supply pressure, both static and dynamic, must comply with Table 4.4 p. 25, with tolerance ± 15%.



Non compliant gas pressure (Table 4.4 p. 25) may damage the appliance and be hazardous.

Table 4.4 Network gas pressure

Product category	Country of destination	Gas supply pressure [mbar]							
		G20	G25	G25.1 (1) (2) (3)	G25.3 (1) (2)	G2.350 (2) (3)	G27 (2) (3)	G30	G31
II _{2H3B/P}	AL, BG, CY, CZ, DK, EE, FI, GR, HR, IT, LT, MK, NO, RO, SE, SI, SK, TR	20						30	30
	AT, CH	20						50	50
II _{2H3P}	BG, CH, CZ, ES, GB, GR, HR, IE, IT, LT, MK, PT, SI, SK, TR	20							37
	RO	20							30
	AT	20							50
II _{2ELL3B/P}	DE	20	20					50	
II _{2Esi3P}	FR	20	25						37
II _{2Er3P}		20	25						37
II _{2HS3B/P}	HU	25		25				30	30
II _{2E3P}	LU	20							50
II _{2EK3B/P}	NL	20			25			30	30
II _{2E3B/P}		20						37	37
II _{2ELwLs3B/P}	PL	20				13	20	37	37
II _{2ELwLs3P}		20				13	20		37
I _{2E(R)}	BE	20							
I _{2E(S)}		20							
I _{3P}	BE								37
	IS								30
I _{2H}	LV	20							
I _{3B/P}	MT, CY							30	30
I _{3B}								30	

1 ARAY not approved for G25.1, G25.3 gases.

2 ACAY not approved for G25.1, G25.3, G2.350, G27 gases.

3 Gas not available for AHAY35, ARAY35, ACAY35.

Before proceeding with the construction of the system, the installer must:

- ▶ Check that the gas used corresponds to that for which the appliance has been designed (see nameplate).
- ▶ Check that the flow rate of the gas meter is such as to ensure the simultaneous use of all the devices connected to it.



Although it is normal for the inlet pressure to decrease during the operation of the appliance, it is important to check that there are no excessive fluctuations in the inlet pressure. In order to limit the extent of these variations, it is necessary to appropriately define the diameter of the gas inlet pipe to be adopted based on the length and pressure drop of the pipe itself, from the gas meter to the appliance.



If fluctuations in the gas distribution pressure happen, it is advisable to insert a special pressure stabiliser upstream of the gas inlet to the appliance. In case of LPG supply, all necessary precautions must be taken to avoid freezing of the combustible gas in case of very low external temperatures.



If it is necessary to change the type of gas supply to the appliance, contact the TAC that will make the necessary changes.



Under no circumstances shall the installer be authorised to carry out such operations.

4.3.5 Vertical pipes and condensate

- ▶ If needed, vertical gas pipes must be fitted with siphon and discharge of the condensate that may form inside the pipe.
- ▶ If needed, insulate the piping.

4.3.6 LPG pressure reducers

With LPG the following must be installed:

- ▶ A first stage pressure reducer, close to the liquid gas tank.
- ▶ A second stage pressure reducer, close to the appliance.

4.4 COMBUSTION PRODUCTS EXHAUST



Installation types

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Paragraph 2.1 p. 13.



The flue gas exhaust protective cap prevents water and/or foreign bodies from entering the appliance before the installation of the flue gas kit. The cap should thus be removed only when the kit itself has been fully assembled and installed.

4.4.1 GAHP A

4.4.1.1 Flue gas exhaust connection

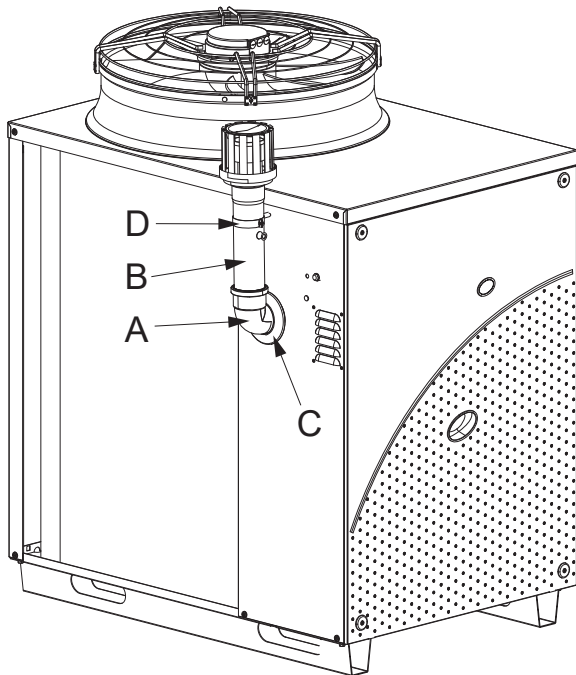
Ø 80 mm (with gasket), on the left, at the top (Figure 4.6 p. 26).

4.4.1.2 Flue gas exhaust kit

The appliance is supplied with flue gas exhaust kit, to be fitted by the installer, including (Figure 4.6 p. 26):

- ▶ 1 pipe Ø 80 mm, length 300 mm, with terminal and socket for flue gas analysis
- ▶ 1 support collar
- ▶ 1 90° elbow Ø 80 mm
- ▶ 1 rain cover

Figure 4.6 Flue gas exhaust



- A 90° elbow Ø 80
- B Pipe Ø 80 300 mm with terminal
- C Rain cover
- D Collar

How to install the flue gas kit

Figure 4.6 p. 26:

1. Remove the front panel.
2. Fasten the collar (D) with its spacer to the left side panel of the appliance.
3. Fit the terminal/pipe assembly (B) to the elbow (A).
4. Fit the rain cover (C) onto the elbow (A).
5. Remove the protective cap of the flue gas exhaust.
6. Insert the elbow/terminal/pipe assembly into the flue gas exhaust.
7. Fit the assembly closing the collar (D) and place the rain cover.
8. Fit the front panel back on.

4.4.2 AY

4.4.2.1 Flue gas exhaust connection

Ø 80 mm (with gasket), at the top (Figure 4.7 p. 26).

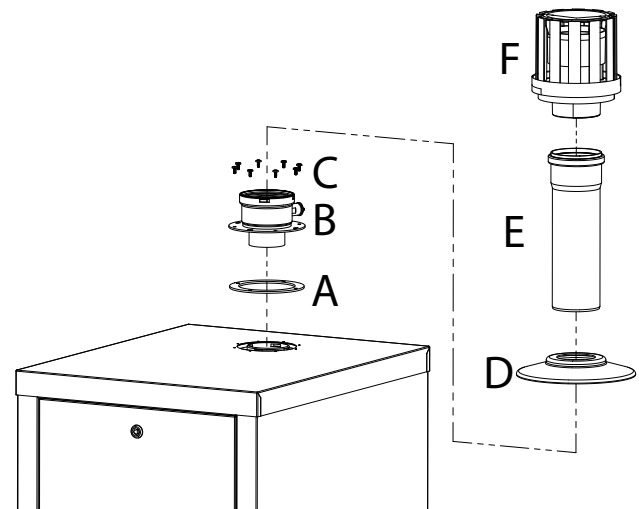
The rain cover, supplied, must be mounted on the flue gas exhaust pipe to protect the internal components of the boiler (detail E, Figure 4.7 p. 26).

The combustion air is drawn from the outside of the casing by means of special louvres.

4.4.2.2 Flue gas exhaust kit

The appliance, supplied in B53P configuration, is standard supplied with a DN80 flue gas kit, to be set up by the installer.

Figure 4.7 Flue gas exhaust kit



- A Gasket of the flanged socket
- B Flanged socket Ø 60/80 mm
- C Fixing screws of the flanged socket
- D Rain cover
- E Flue gas exhaust pipe
- F Roof terminal socket

How to install the flue gas kit

Figure 4.7 p. 26:

1. Remove the protective cap on the top panel of the appliance.
2. Check that the gasket G is correctly positioned on the combustion chamber (Figure 4.8 p. 27).
3. Position the gasket A of the flanged socket B at the appropriate holes for the fixing screws C.
4. Position the flanged socket B over the gasket A and secure the assembly with the appropriate fixing screws C.
5. Position the rain cover D on the flanged socket B, making sure that it fits underneath the flue gas analysis socket.
6. Insert the flue gas exhaust pipe E into the flanged socket B.
7. Fit the terminal F on the extension pipe E inside the dedicated socket.

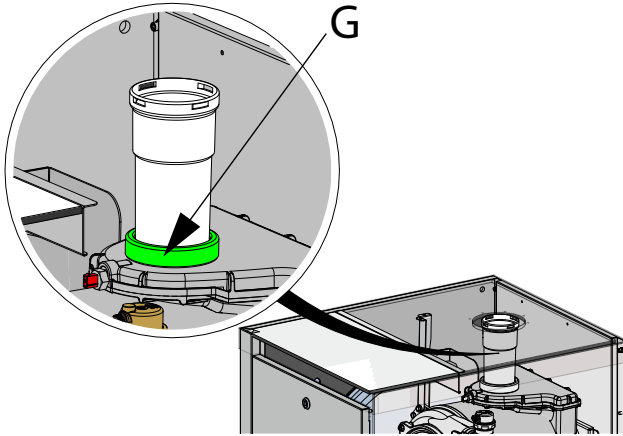
i Take care to fit the rain cover below the flue gas analysis socket on the flanged socket in such a way that it is still accessible.

! It is important to check the correct positioning of the gasket G positioned on the combustion

chamber (Figure 4.8 p. 27).

Incorrect positioning of the gasket G can compromise the correct discharge of the flue gas outside and consequently damage the appliance.

Figure 4.8 Correct gasket positioning



G Gasket

4.4.3 Possible flue

If required, the appliance may be connected to a flue appropriate for condensing appliances.

- ▶ To size the flue refer to Paragraph 2.1 p. 13 and to design manual.
- ▶ Use ducts and terminals suitable for forced draft condensing appliances.
- ▶ If the flue gas exhaust of the GAHP A and that of the AY boiler are connected to a single flue, it is mandatory to install a flap valve on the exhaust of each.
- ▶ The flue must be designed, sized, tested and constructed by a skilled firm, with materials and components complying with the regulations in force in the country of installation.
- ▶ Always provide a socket for flue gas analysis, in an accessible position.
- ▶ The horizontal sections for flue gas exhaust must always be mounted on a slope towards the appliance (3° slope = 5 mm per metre of pipe).
- ▶ For vertical ducts longer than 1,5 m, a curve and a Tee (Figure 4.9 p. 27) for condensate collection and drainage must be provided. The condensate must then be evacuated in accordance with the regulations in force, at the same time as that coming from inside the appliance.



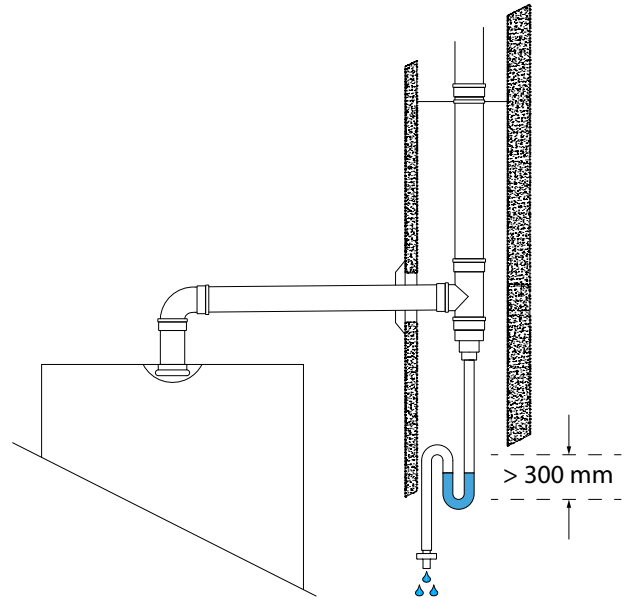
In case the check valves are installed outside, an appropriate UV ray protection must be assured (if the valve is in plastic) as well as protection from potential winter freezing of condensate backflow into the siphon.



The connection of the discharge to the sewerage system must be made at atmospheric pressure, i.e. by dripping into a siphoned container connected

to the sewerage system.

Figure 4.9 Flue gas condensate drain



4.5 FLUE GAS CONDENSATE DRAIN

The GAHP A unit and the AY unit are condensation appliances which therefore produce condensation water from combustion fumes.

The system must be designed in such a way as to prevent condensation from freezing. Before commissioning the appliance, check that the condensate is drained correctly.



Condensate acidity and exhaust regulations

The flue gas condensate contains aggressive acid substances. Refer to applicable regulations in force for condensate exhaust and disposal.

If required, install an acidity neutraliser of adequate capacity.



Do not use gutters to discharge the condensate

Do not discharge the flue condensate in gutters, due to the risk of materials corrosion and ice formation.

4.5.1 Flue gas condensate connection

- ▶ The condensate drain hose must be connected to a suitable discharge manifold.
- ▶ The junction between the pipe and the manifold must remain visible.
- ▶ The connection of the discharge to the sewerage system must be made at atmospheric pressure, i.e. by dripping into a siphoned container connected to the sewerage system.

4.5.1.1 GAHP A

The connection for flue gas condensate drain is located on the left side of the appliance (Paragraph 1.2 p. 9).

4.5.1.2 AY

The connection for flue gas condensate drain is located on the right side of the appliance at the connection plate (Paragraph 1.2 p. 9).

4.5.2 Flue gas condensate drain manifold

If necessary the condensate drain manifold may be in common between the 2 units the Gitié package consists of.

To make the condensate drain manifold:

- ▶ Size the ducts for maximum condensation flow rate (Paragraph 2.1 p. 13).
- ▶ Use plastic materials resistant to acidity pH 3-5.
- ▶ Provide for min. 1% slope, i.e. 1 cm for each m of the length (otherwise a booster pump is required).
- ▶ Prevent freezing.
- ▶ Dilute, if possible, with domestic waste water (e.g. bathrooms, washing machines, dish washers...), basic and neutralising.

4.5.3 Condensate drain siphon filling

During the first start-up, the condensate siphon of the AY modules must be filled to prevent the combustion gases from backflowing through the siphon.

It is advisable, after the first few months of operation of the appliance, to clean the siphon, which collects also any deposits resulting from the first passage of the condensate inside the components of the appliance. These deposits could cause the siphon itself to malfunction.

4.6 DEFROSTING WATER DRAINAGE**i Defrosting**

In winter, frost may form on the finned coil and the appliance performs defrosting cycles.

4.6.1 Collection basin and drainage system

Provide for a collection basin or containment rim and a discharge system of the defrosting water, to avoid overflowing, freezing and damage.

5 ELECTRICAL INSTALLER

Do not power and/or start the appliance before filling the hydraulic system, as this may damage the internal hydraulic components.

5.1 WARNINGS**General warnings**

Read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.

**Compliance with installation standards**

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of electrical systems.



Installation must also comply with the manufacturer's provisions.

**Live components**

After placing the appliance in the final position, and prior to making electrical connections, ensure not to work on live components.

**Earthing**

- The appliance must be connected to an effective earthing system, installed in compliance with regulations in force.

- It is forbidden to use gas pipes as earthing.

**Cable segregation**

Keep power cables physically separate from signal ones.

**Do not use the power supply switch to turn the appliance on/off**

- Never use the external isolation switch to turn the appliance on and off, since it may be damaged in the long run (occasional blackouts are tolerated).
- To turn the appliance on and off, exclusively use the suitably provided control device.

5.2 ELECTRICAL SYSTEMS

Electrical connections must provide:

- ▶ power supply (Paragraph 5.3 p. 29)
- ▶ control system (Paragraph 5.4 p. 29)

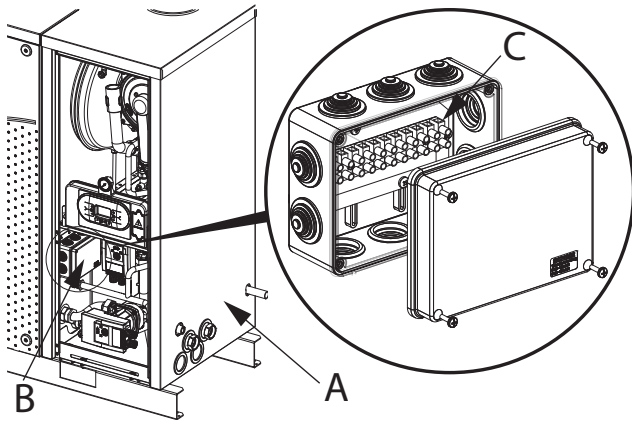
**How to make connections**

All electrical connections must be made in the appliance's electrical panel (Figure 5.1 p. 29):

1. Ensure the appliance's electrical panel is not live.
2. Remove the front panel of the boiler module and the cover of the electrical panel.
3. Run the cables through the appropriate holes at the rear of the boiler (Figure 5.2 p. 29).
4. Run the cables through the suitable cable glands in the electrical panel.
5. Identify the appropriate connection terminals.
6. Make the connections.

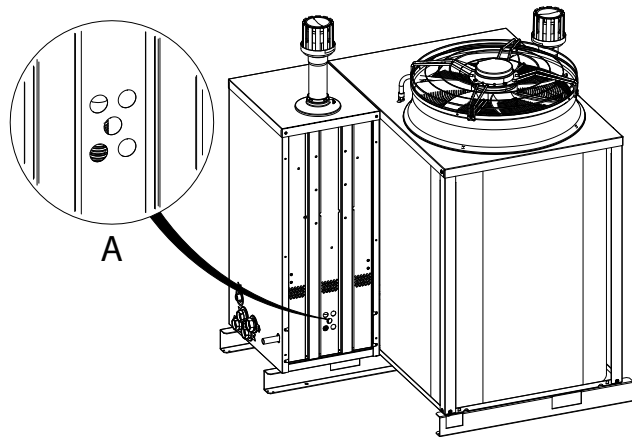
- Close the electrical panel and fit the front panel back on.

Figure 5.1 Gitié electrical panel position and terminal block access



- A AY boiler
B Gitié electrical panel
C Gitié terminal block

Figure 5.2 Cable glands position



- A Detail of cable glands position

5.3 ELECTRICAL POWER SUPPLY

Provide (by the installer) a protected single phase line (230 V 1-N 50 Hz) with:

- ▶ 1 three-pole cable type FG7(O)R 3Gx1,5
- ▶ 1 two-pole switch with 2 8 A type T fuses (GS), or 1 10 A magnetothermic breaker.



The switches must also provide disconnecter capability, with min contact opening 4 mm.



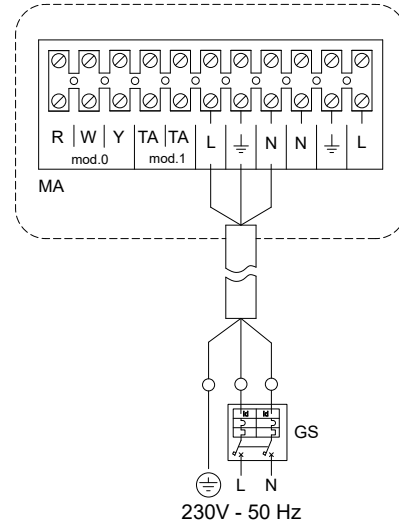
How to connect the power supply

To connect the three-pole power supply cable (Figure 5.3 p. 29):

- Access the electrical board of the appliance according to the Procedure 5.2 p. 28.

- Connect the three wires to the terminal block in the electrical panel on the appliance.
- Provide the earth lead-in wire longer than live ones (last to be torn in the event of accidental pulling).

Figure 5.3 Power supply connection



- L Phase
N Neutral
MA Gitié terminal block

Components NOT SUPPLIED

- GS Main switch

5.4 ADJUSTMENT AND CONTROL

5.4.1 Control systems

Two separate adjustment systems are provided, each with specific features, components and diagrams (see Paragraph 1.3 p. 11):

- DDC control (with CAN bus connection).
- External request.

5.4.2 CAN bus communication network

The CAN bus communication network, implemented with the cable of the same name, makes it possible to connect and remotely control one or more Robur appliances with the DDC control device.

It entails a certain number of serial nodes, distinguished in:

- ▶ intermediate nodes, in variable number
- ▶ terminal nodes, always and only two (beginning and end)

Each component of the Robur system, appliance (GAHP, GA, AY, ...) or control device (DDC, RB100, RB200, ...), corresponds to a node, connected to two more elements (if it is an intermediate node) or to just one other element (if it is a terminal node) through two/one CAN bus cable section/s, forming an open linear communication network (never star- or loop-shaped).

5.4.3 CAN bus signal cable

The DDC controller is connected to the appliance through

the CAN bus signal cable, shielded, compliant to Table 5.1 p. 30 (admissible types and maximum distances). For lengths ≤200 m and up to 4 nodes (e.g. 1 DDC + 1

RB100 + 1 Gitié), a simple 3x0,75 mm² shielded cable may be used.

Table 5.1 CAN bus cables type

Cable name	Signals / Color			Maximum length	Note	
Robur						
ROBUR NETBUS	H = BLACK	L = WHITE	GND = BROWN	450 m	Optional code OCVO008	
Honeywell SDS 1620						
BELDEN 3086A	H = BLACK	L = WHITE	GND = BROWN	450 m	In all cases the fourth conductor should not be used	
TURCK type 530						
DeviceNet Mid Cable						
TURCK type 5711	H = BLUE	L = WHITE	GND = BLACK	450 m		
Honeywell SDS 2022						
TURCK type 531	H = BLACK	L = WHITE	GND = BROWN	200 m		



How to connect the CAN bus cable to the appliance

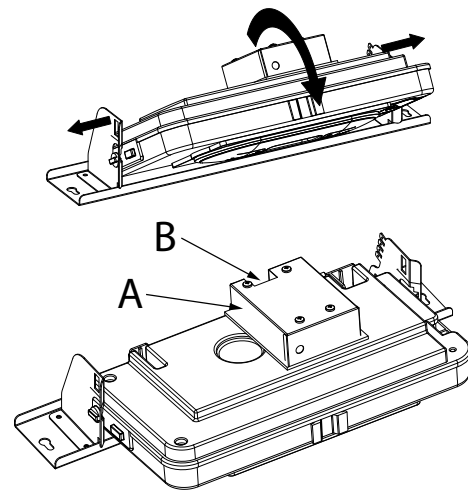
To connect the CAN bus cable to the CAN-NDG electronic board, located at the rear of the AY boiler electrical panel:

1. Access the AY boiler electrical panel after removing the boiler front panel (Paragraph 6.3 p. 33).
2. Turn the control panel 90° outwards, using the side latches, to access the CAN-NDG board (Figure 5.4 p. 30).
3. Connect the CAN bus cable to terminals 0, L and H, taking care not to disconnect the wires already on the terminals.
4. Connect the CAN bus cable to the DDC (Figure 5.6 p. 31). Please also refer to the DDC manual for clarification.



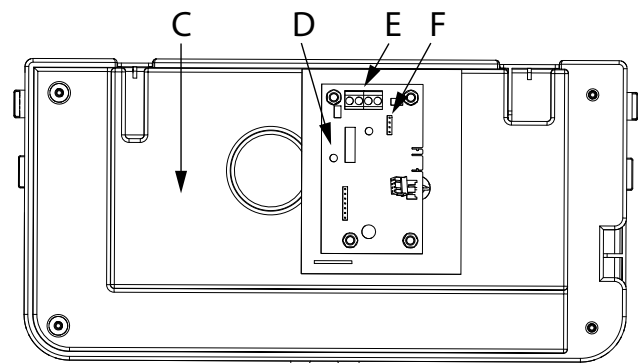
The CAN bus connection between the AY module and the GAHP/GA module is factory wired.

Figure 5.4 Access to CAN-NDG board



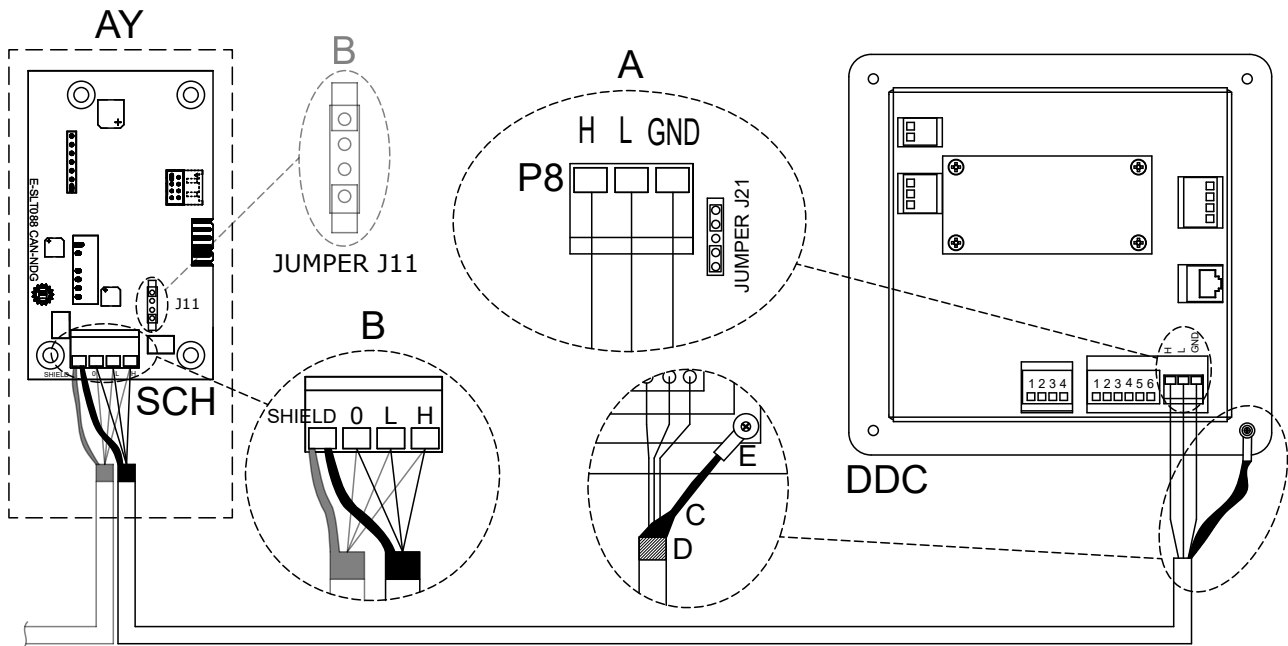
A CAN-NDG board B CAN bus port

Figure 5.5 Connection of the CAN bus cable to the electronic board



C Back of the electrical panel E CAN bus port
D CAN-NDG board F Jumper J11

Figure 5.6 CAN bus connection between Gitié and DDC



- | | | |
|-------------------------------------|--|--|
| DDC Direct Digital Controller | H Data signal HIGH | C CAN bus cable shield |
| SCH CAN-NDG board of the AY module | L Data signal LOW | D Insulating tape to protect the shield of the CAN bus cable |
| J11 CAN bus jumper on CAN-NDG board | A Terminal node connection - (3 wires; J21 = "closed") | E Eyelet terminal and fixing screw |
| J21 CAN bus jumper on DDC panel | B Intermediate node connection - (6 wires; J11 = "open") | P8 CAN port/connector |
| GND Common data | | |
| 0 Common data | | |

Place jumper J21 CLOSED (detail A, only one section of CAN bus cable connected).

In the case of other devices connected to the CAN bus cable, please refer to the device manual.

5.4.4 External request

It is required to arrange:

- Request devices (e.g. thermostats, timers, buttons, ...) fitted with voltage-free NO contacts.

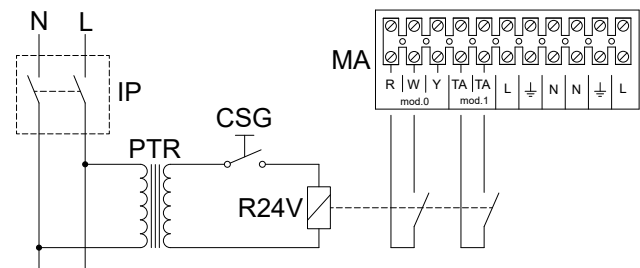
How to connect external requests

Connection of external request is effected on the terminal block located in the electrical panel inside the appliance (Figure 5.1 p. 29).

If you wish the heating requests of the two units to be simultaneous, follow the connection diagram shown in Figure 5.7 p. 31.

If you wish the heating requests of the two units to be independent, follow the connection diagram shown in Figure 5.8 p. 32.

Figure 5.7 Connection of simultaneous external requests

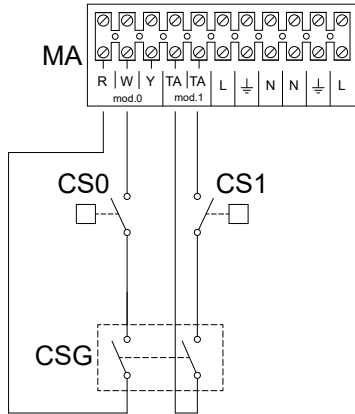


MA Gitié terminal block

Components NOT SUPPLIED

- | | |
|-----------------------------|---------------------|
| IP Two-pole switch | CSG General request |
| PTR SELV safety transformer | R24V 24V relay |

Figure 5.8 Connection of separate external requests



MA Gitié terminal block

Components NOT SUPPLIED

- CSG General request
- CS0 GAHP A heating request
- CS1 AY heating request

6 FIRST START-UP



First start-up entails checking/setting up the combustion parameters and may exclusively be carried out by a Robur TAC. NEITHER the user NOR the installation technician is authorised to perform such operations, under penalty of voiding the warranty.

6.1 PRELIMINARY CHECKS

6.1.1 Preliminary checks for first start-up

Upon completing installation, before contacting the TAC the installer must check:

- ▶ Water, electrical and gas systems suitable for the required capacities and equipped with all safety and control devices required by the regulations in force.
- ▶ Absence of leaks in the water and gas systems.
- ▶ Type of gas for which the appliance is designed (natural gas or LPG).
- ▶ Supply gas pressure complying with the values of Table 4.4 p. 25.
- ▶ Correct operation of the flue exhaust duct.
- ▶ Power supply mains complying with the appliance's rating plate data.
- ▶ Appliance correctly installed, according to the manufacturer's provisions.
- ▶ System installed in a workmanlike manner, according to national and local regulations.

6.1.2 Abnormal or hazardous installation situations

Should any abnormal or hazardous installation situations be found, the TAC shall not perform first start-up and the appliance shall not be commissioned.

These situations may be:

- ▶ Appliance installed inside a room.
- ▶ Failed compliance with minimum clearances.
- ▶ Insufficient distance from combustible or flammable materials.
- ▶ Conditions that do not warrant access and maintenance in safety.
- ▶ Appliance switched on/off with the main switch, instead of the provided control device.
- ▶ Appliance defects or faults caused during transport or installation.
- ▶ Gas smell.
- ▶ Non-compliant mains gas pressure.
- ▶ Non-compliant flue gas exhaust.
- ▶ All situations that may involve operation abnormalities or are potentially hazardous.

6.1.3 Non-compliant system and corrective actions

Should the TAC find any non conformities, the user/installer is bound to perform any corrective procedures required by the TAC.

After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

6.2 HOW TO ACCESS THE GAHP A MODULE

For all control and maintenance operations, the front panel of the GAHP A module must be removed as described below.

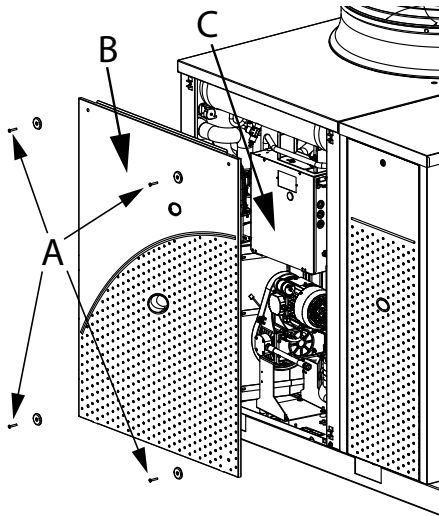


How to remove the front panel of the GAHP A module (Figure 6.1 p. 33):

1. Unscrew the four screws A on the front panel.

- Remove front panel B by tilting it outwards from below and pulling it off the top.

Figure 6.1 Accessing the GAHP A module



- A Front panel screws
- B Front panel
- C GAHP A module electrical panel

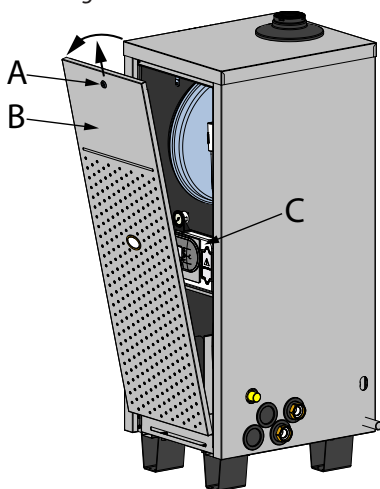
6.3 HOW TO ACCESS THE BOILER

For all control and maintenance operations, it is necessary to remove the front panel of the boiler as described below. The other panels cannot be removed as they are structural.

How to remove the boiler front panel (Figure 6.2 p. 33):


- Open lock A with the triangle key supplied with the appliance.
- Remove front panel B by tilting it outwards and pulling it upwards.

Figure 6.2 Accessing the boiler



- A Front panel lock
- B Front panel
- C AY boiler electrical panel

6.4 ELECTRONIC BOARD PARAMETERS SETTING


















 Before commissioning the operation of the device to the user, the operating parameters must be set or simply checked.

Modify settings via the DDC

If the device is connected to the DDC control, refer to the relevant manual to modify settings.

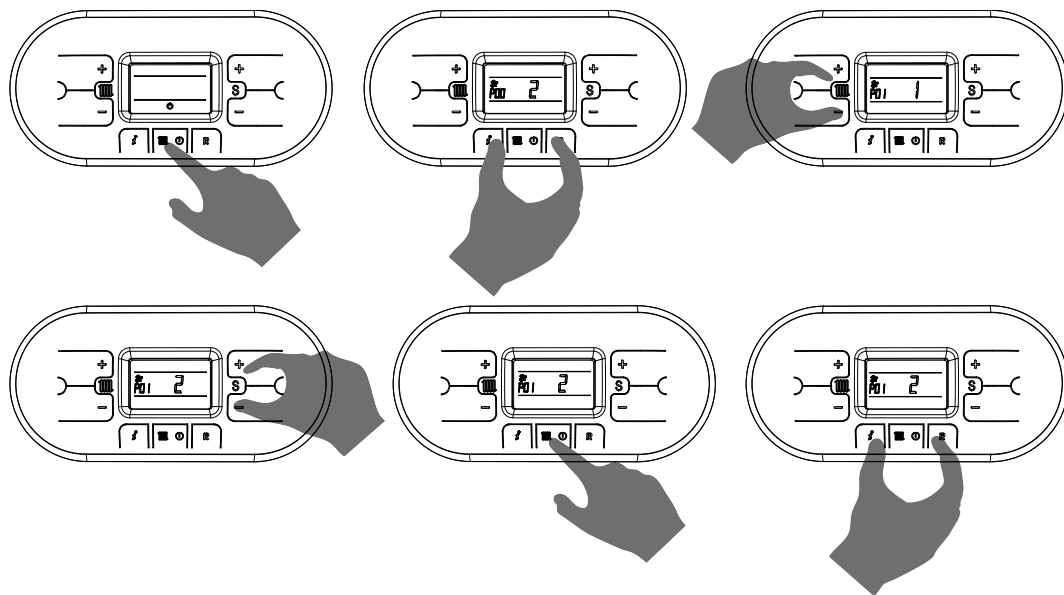
6.4.1 AY

To access the parameters menu and adjust the value of the desired parameter, follow the procedure described below (refer to Figure 6.3 p. 34):

- Press  key to select the OFF mode, displayed with the  symbol.
- Hold at the same time the  and  keys and wait until on the display appears the  symbol with the message 'P10', and release the  and  keys.
- Use the  and  keys of the heating circuit  to select the parameter to be edited.
- Use the keys  and  of the DHW circuit  to change the value of the parameter.
- Press the  key to confirm and wait for the display to stop flashing, to make the adjustment effective.
- To exit the parameter menu, hold down the  and  keys simultaneously and wait for the  symbol to appear on the display.

The operating parameters are shown in the following Tables and are visible on the internal display of the boiler.

Figure 6.3 Access and setting of boiler parameters



6.4.1.1 AY 35



The parameters and their values refer to the firm-

ware 1.001 for the CAN-NDG board and to the firm-ware A.10 for the MIAH410 board.

Table 6.1 AY 35 electronic board parameters

Parameter	Description	Range	Default	Setting
P10	Boiler model selection	17 ÷ 18	17	17.AY 35
P20	Mod0 type Not used	--	--	Do not change
P22	Serial number Mod0 - 3 most significant digits Not used	000 ÷ 999	--	Do not change
P23	Serial number Mod0 - 3 intermediate digits Not used	000 ÷ 999	--	Do not change
P24	Serial number Mod0 - 3 least significant digits Not used	000 ÷ 999	--	Do not change
P30	Mod1 type	31 ÷ 32	31	31.AY 35
P32	Serial number Mod1 - 3 least significant digits	000 ÷ 999	--	Do not change
P33	Serial number Mod1 - 3 intermediate digits	000 ÷ 999	--	Do not change
P34	Serial number Mod1 - 3 least significant digits	000 ÷ 999	--	Do not change
P40	Board CAN address It is possible to set the CAN bus address of the CAN-NDG board for connecting the boiler to the DDC panel.	0 ÷ 478	0	The address must be unique for each appliance on the same CAN bus network.
P45	Gas type selection WARNING: before changing the parameter value, read the instructions in Paragraph 6.7 p. 42.	0 ÷ 1	0	0. G20, G25, G25.1 (1), G25.3, G2.350 (1), G27 (1) 1. LPG, G30, G31
P46	Special function	0 ÷ 5	0	Do not change
P50	Mod1: hydraulic system ID It is possible to set the system ID to which the DDC panel considers the boiler to be connected.	0 ÷ 15	0	The code must be the same for all the appliances on the same hydraulic system
P51	Mod1: group of belonging (DHW) It is possible to set the group of belonging to which the DDC panel considers the boiler to be connected.	0 ÷ 1	0	0. base group 1. separable group
P52	Glycol percentage It is possible to set the percentage of glycol in the system water.	0 ÷ 60	0	Value in percentage
P54	Heating run-up It is possible to set the time, during the start-up phase, that the boiler takes to reach the maximum set power (for the space heating service).	0 ÷ 4	1	0. disabled 1. 50 s 2. 100 s 3. 200 s 4. 300 s

P58	Post-circulation heating timing It is possible to set the operating time of the pump, in heating mode, after the main burner has been switched off due to the intervention of the room thermostat.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P62	Minimum blower speed adjustment for heating It is possible to set the minimum speed of the blower for the heating service, which corresponds to the minimum power of the burner during a heating request (see Figure 6.5 p. 38). The value is preset according to the boiler model (P10) and the Mod1 type (P30).	33 ÷ min between 133 and P63	53	Value in hertz (1 Hz = 30 RPM)
P63	Maximum blower speed adjustment for heating It is possible to set the maximum speed of the blower for the heating service, which corresponds to the maximum power of the burner during a heating request (see Figure 6.5 p. 38). The value is preset according to the boiler model (P10) and the Mod1 type (P30).	maximum between 40 and P62 ÷ 290	203	Value in hertz (1 Hz = 30 RPM)
P64	Starting step adjustment It is possible to set the blower speed during the start-up phases. The value is preset according to the boiler model (P10) and the Mod1 type (P30).	33 ÷ 255	110	Value in hertz (1 Hz = 30 RPM)
P66 (2) (3)	Setting the climatic curve The appliance is equipped with an outdoor temperature probe (located onboard the appliance) that acts by automatically changing the outlet temperature according to the measured outdoor temperature. The extent of the correction depends on the set heating control value Kd (Figure 6.4 p. 37). The choice of the curve is determined by the maximum outlet temperature Tm and the minimum outdoor temperature Te, taking into account the degree of insulation of the building. The values of the outlet temperatures Tm refer to standard systems 30÷80 °C.	0 1 ÷ 30	0	0. disabled The numbering of the value corresponds to the 'Kd' curves of the graph (Figure 6.4 p. 37)
P68 (2) (4)	0-10 V industrial bus drive enable The 0-10 V industrial bus input can be enabled or disabled to set burner power or delivery temperature via the external bus.	0 ÷ 2	0	0. disabled 1. temperature control mode 2. power control mode
P69	Min heating setpoint It is possible to set the minimum user-adjustable heating temperature.	20 ÷ 40	30	Value in °C
P70	Max heating setpoint It is possible to set the maximum user-adjustable heating temperature.	40 ÷ 88	80	Value in °C
P72	Δt delivery-return setpoint It is possible to set the temperature difference between delivery and return.	0 5 ÷ 40	20	0. disabled Value in °C
P73	Modulating pump minimum speed	50 ÷ 70	60	Do not change
P74	Modulating pump maximum speed	70 ÷ 100	100	Do not change
P78	Control mode It is possible to set the control mode of the boiler.	0 ÷ 2	0	0. CAN bus 1. do not use 2. external request
P81	Heating antifreeze temperature setting It is possible to set the temperature of the water in the heating system at which the antifreeze protection is activated.	5 ÷ 12	12	Value in °C
P82	Flowmeter type	0 ÷ 2	2	Do not change
P83	Minimum water flow setting	20 ÷ 68	30	Do not change

1. Gas not available for AY 35.
2. The climatic curve and the use of the 0-10 V input are alternative functions. If both functions are configured as active, the climatic curve is used. These functions are only used in the case of control via external request (P78 = 2).
3. With the climatic curve active, the outlet water setpoint temperature is set to a value between that of parameters P69 and P70 based on the outdoor temperature measured by the probe inside the appliance and on the Kd value set in parameter P66 (Figure 6.4 p. 37).
4. With 0-10 V input active in temperature control mode, the outlet water setpoint is set to a value between that of parameters P69 and P70 based on the line passing

through the points (3 V, P69) and (10 V, P70). A voltage lower than 3 V corresponds to no service request. With 0-10 V input active in power control mode, the thermal output is set to a value between the minimum and maximum power according to the line passing through the points (3 V, minimum power) and (10 V, maximum power). A voltage lower than 3 V corresponds to no service request.

6.4.1.2 AY 50



The parameters and their values refer to the firmware 1.001 for the CAN-NDG board and to the firmware A.10 for the MIAH410 board.

Table 6.2 AY 50 and AY 100 electronic board parameters

Parameter	Description	Range	Default	Setting
-----------	-------------	-------	---------	---------

P10	Boiler model selection	17 ÷ 18	18	18.AY 50 (and each of the two modules of AY 100)
P20	Mod0 type Not used	--	--	Do not change
P22	Serial number Mod0 - 3 most significant digits Not used	000 ÷ 999	--	Do not change
P23	Serial number Mod0 - 3 intermediate digits Not used	000 ÷ 999	--	Do not change
P24	Serial number Mod0 - 3 least significant digits Not used	000 ÷ 999	--	Do not change
P30	Mod1 type	31 ÷ 32	32	32.AY 50 (and each of the two modules of AY 100)
P32	Serial number Mod1 - 3 least significant digits	000 ÷ 999	--	Do not change
P33	Serial number Mod1 - 3 intermediate digits	000 ÷ 999	--	Do not change
P34	Serial number Mod1 - 3 least significant digits	000 ÷ 999	--	Do not change
P40	Board CAN address It is possible to set the CAN bus address of the CAN-NDG board for connecting the boiler to the DDC panel.	0 ÷ 478	0	The address must be unique for each appliance on the same CAN bus network.
P45	Gas type selection WARNING: before changing the parameter value, read the instructions in Paragraph 6.7 p. 42.	0 ÷ 1	0	0. G20, G25, G25.1, G25.3, G2.350, G27 1. LPG, G30, G31
P46	Special function	0 ÷ 5	0	Do not change
P50	Mod1: hydraulic system ID It is possible to set the system ID to which the DDC panel considers the boiler to be connected.	0 ÷ 15	0	The code must be the same for all the appliances on the same hydraulic system
P51	Mod1: group of belonging (DHW) It is possible to set the group of belonging to which the DDC panel considers the boiler to be connected.	0 ÷ 1	0	0. base group 1. separable group
P52	Glycol percentage It is possible to set the percentage of glycol in the system water.	0 ÷ 60	0	Value in percentage
P54	Heating run-up It is possible to set the time, during the start-up phase, that the boiler takes to reach the maximum set power (for the space heating service).	0 ÷ 4	1	0. disabled 1. 50 s 2. 100 s 3. 200 s 4. 300 s
P58	Post-circulation heating timing It is possible to set the operating time of the pump, in heating mode, after the main burner has been switched off due to the intervention of the room thermostat.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P62	Minimum blower speed adjustment for heating It is possible to set the minimum speed of the blower for the heating service, which corresponds to the minimum power of the burner during a heating request (see Figure 6.6 p. 39). The value is preset according to the boiler model (P10) and the Mod1 type (P30).	33 ÷ min between 133 and P63	53	Value in hertz (1 Hz = 30 RPM)
P63	Maximum blower speed adjustment for heating It is possible to set the maximum speed of the blower for the heating service, which corresponds to the maximum power of the burner during a heating request (see Figure 6.6 p. 39). The value is preset according to the boiler model (P10) and the Mod1 type (P30).	maximum between 40 and P62 ÷ 290	247	Value in hertz (1 Hz = 30 RPM)
P64	Starting step adjustment It is possible to set the blower speed during the start-up phases. The value is preset according to the boiler model (P10) and the Mod1 type (P30).	33 ÷ 255	130	Value in hertz (1 Hz = 30 RPM)
P66 (1) (2)	Setting the climatic curve The appliance is equipped with an outdoor temperature probe (located onboard the appliance) that acts by automatically changing the outlet temperature according to the measured outdoor temperature. The extent of the correction depends on the set heating control value Kd (Figure 6.4 p. 37). The choice of the curve is determined by the maximum outlet temperature Tm and the minimum outdoor temperature Te, taking into account the degree of insulation of the building. The values of the outlet temperatures Tm refer to standard systems 30÷80 °C.	0 1 ÷ 30	0	0. disabled The numbering of the value corresponds to the 'Kd' curves of the graph (Figure 6.4 p. 37)
P68 (1) (3)	0-10 V industrial bus drive enable The 0-10 V industrial bus input can be enabled or disabled to set burner power or delivery temperature via the external bus.	0 ÷ 2	0	0. disabled 1. temperature control mode 2. power control mode

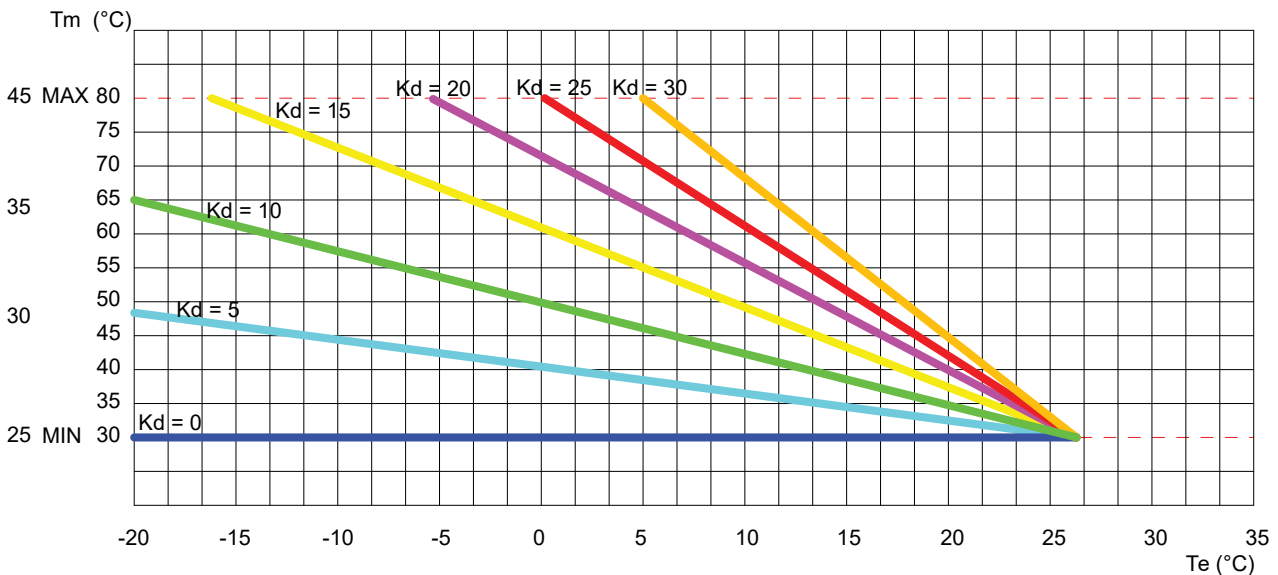
P69	Min heating setpoint It is possible to set the minimum user-adjustable heating temperature.	20 ÷ 40	30	Value in °C
P70	Max heating setpoint It is possible to set the maximum user-adjustable heating temperature.	40 ÷ 88	80	Value in °C
P72	Δt delivery-return setpoint It is possible to set the temperature difference between delivery and return.	0 5 ÷ 40	20	0. disabled Value in °C
P73	Modulating pump minimum speed	50 ÷ 70	60	Do not change
P74	Modulating pump maximum speed	70 ÷ 100	100	Do not change
P78	Control mode It is possible to set the control mode of the boiler.	0 ÷ 2	0	0. CAN bus 1. do not use 2. external request
P81	Heating antifreeze temperature setting It is possible to set the temperature of the water in the heating system at which the antifreeze protection is activated.	5 ÷ 12	12	Value in °C
P82	Flowmeter type	0 ÷ 2	2	Do not change
P83	Minimum water flow setting	20 ÷ 68	30	Do not change

1. The climatic curve and the use of the 0-10 V input are alternative functions. If both functions are configured as active, the climatic curve is used. These functions are only used in the case of control via external request (P78 = 2).
2. With the climatic curve active, the outlet water setpoint temperature is set to a value between that of parameters P69 and P70 based on the outdoor temperature measured by the probe inside the appliance and on the Kd value set in parameter P66 (Figure 6.4 p. 37).
3. With 0-10 V input active in temperature control mode,

the outlet water setpoint is set to a value between that of parameters P69 and P70 based on the line passing through the points (3 V, P69) and (10 V, P70). A voltage lower than 3 V corresponds to no service request. With 0-10 V input active in power control mode, the thermal output is set to a value between the minimum and maximum power according to the line passing through the points (3 V, minimum power) and (10 V, maximum power). A voltage lower than 3 V corresponds to no service request.

6.4.1.3 Climatic curves

Figure 6.4 Climatic curves



Tm Delivery temperature
Te Outdoor temperature

Kd Heating control value

6.4.1.4 Blower frequencies

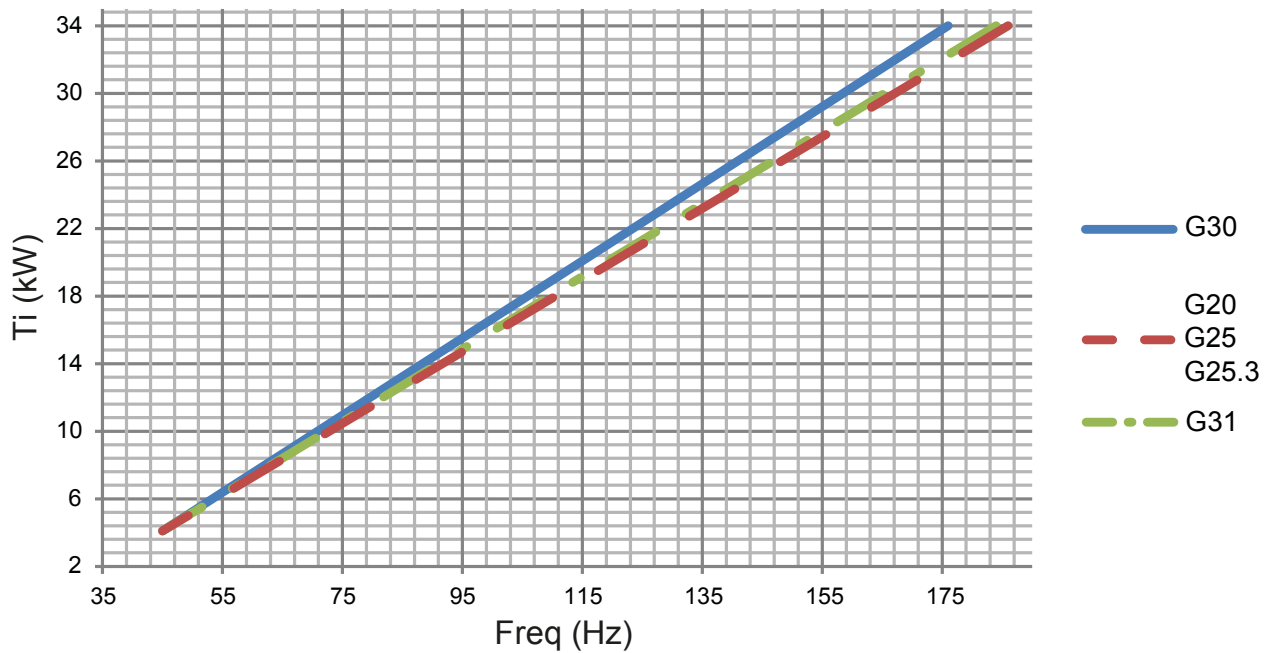
Table 6.3 Minimum and maximum blower frequencies

Boiler	Gas type	Measurement unit	Frequency (heating/DHW) (1)	
			minimum	maximum
Caldaria 35 AY 35	G20	Hz	53	203
	G25	Hz	53	203
	G25.3	Hz	53	203
	G30	Hz	55	195
	G31	Hz	55	203
Caldaria 55.1 Caldaria 100.2 AY 50 AY 100	G20	Hz	53	247
	G25	Hz	53	247
	G25.1	Hz	53	247
	G25.3	Hz	53	247
	G2.350	Hz	53	247
	G27	Hz	53	247
	G30	Hz	55	230
	G31	Hz	53	240

1 Caldaria 35, Caldaria 55.1, Caldaria 100.2: check parameters P10 and P11 for DHW, P12 and P13 for heating. AY 35, AY 50, AY 100: check parameters P62 and P63 for heating.

6.4.1.4.1 AY 35

Figure 6.5 Heat input/blower frequency diagram

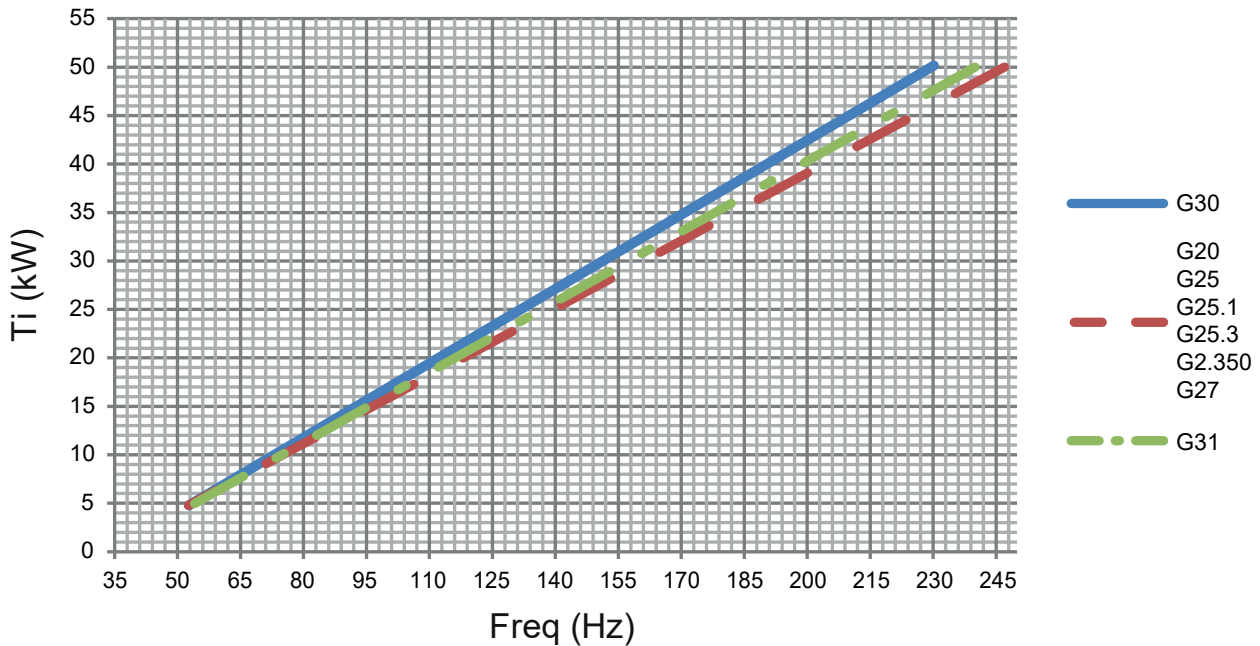


Ti Thermal input

Freq Frequency

6.4.1.4.2AY 50

Figure 6.6 Heat input/blower frequency diagram



Ti Thermal input

Freq Frequency

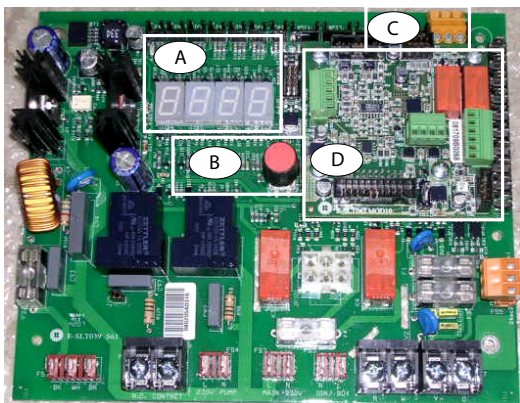
6.5 GAHP/GA

 Firmware

The instructions on the use of the S61 electronic board concern the **firmware version 3.036**.

6.5.1 The GAHP/GA electronic board

Figure 6.7 GAHP unit electronic board (S61+Mod10)



- A 4 digit display
- B Knob
- C CAN port
- D Mod10 controller

6.5.2 Display

The 4-digit display (Detail A Figure 6.7 p. 39) is as follows:

- ▶ The **first digit** (on the left, green) indicates the menu

number (e.g. "0.", "1.", "2.", ... "8.").

- ▶ The **last three digits** (on the right, red) indicate a **code** or a **value** for a parameter, among those included in the selected menu (e.g. "_6" "_20", "161"). (e.g. menu+parameter "1._6", "2._20", "3.161").

6.5.3 Knob

One of the following actions can be performed with the board knob (Detail B Figure 6.7 p. 39):

- ▶ Enter the menu list (by pressing the first time).
- ▶ Scroll the menu list, or a series of parameters in a menu (by turning).
- ▶ Select a menu or a parameter (by pressing).
- ▶ Modify and confirm the setting of a parameter (turning and pressing).
- ▶ Execute a command (by pressing).
- ▶ Exit a menu and go back to the higher level by selecting the letter "E" which is displayed at the end of the menu list or of a series of parameters in a menu.

The letter "E" is displayed at the end of the menu list or of a series of parameters in a menu, and indicates the exit to go back to the higher level by pressing the knob.

6.5.4 Menus and Parameters

The menus may be display only (functional data or parameters), display and setting (parameters) or control (reset).

Menu for the user (but for the installer and TAC as well)

- ▶ The menu "0.", display only, for functional data detected in real time.
- ▶ The menu "1.", display only, for current values of appliance parameters.
- ▶ Menu "2.", control, to execute flame control unit reset

operations, reset errors (Paragraph 9.2 p. 46).

- ▶ Menu "3.", display and setting, to set the value of some system parameters (e.g. water setpoint temperature); the values are initialised by the TAC at first start-up.

It is accessed without password.

Menu for the installer or TAC (not accessible to the user)

- ▶ Menu "4.", "5.", "6." and "9." are password-protected. These are specific sections, exclusively intended for qualified personnel (installer or TAC). For information see the Service manual.
- ▶ Menu "7." is display only and intended for the manufacturer.
- ▶ Menu "8." is empty, it may be selected but not used.



Special key for the knob

- To access the menus and parameters of the board, use the special supplied key, attached to the gas pipe above the electrical panel. The key allows the knob to be operated through the suitable hole in the electrical panel cover, operating safely away from live components.
- Always keep the key for future uses.



How to access the menus and parameters

Before Starting:

1. Power supply switch on.
2. Display of the board showing in sequence the detected water temperature data (if the appliance is in normal operation), or the flashing malfunction and failure codes (if the appliance is in failure).
To access the menus and parameters of the board, proceed as follows (see also Figure 6.7 p. 39).
1. Remove the front panel by removing the fixing screws.
2. Remove the cover of the electrical panel to access the board knob.
3. Act on the knob by means of the special key through the suitable hole.
4. Press the knob once to display the menus: the first menu is displayed, "0." (= menu 0).
5. Turn the knob clockwise to scroll down and display the other/subsequent menus; the menu numbers will be displayed in order, "1.", "2.", ... , "6." ... or "E" (= exit).
6. Select the menu of interest (e.g. display "2.____" = menu 2) by pressing the knob; the first parameter code will be displayed, in menu order (e.g. display "2._20" = parameter 20 in menu 2).
7. Turn the knob clockwise to scroll down the other parameters in the menu; the codes will be displayed in order (e.g. display "2._20", "2._21", ... "2._25" = parameters 20, 21, ... 25 in menu 2), or letter "E" (= exit) at the end of the list.
8. Select the parameter of interest (e.g. with code 161 in menu 3) by pressing the knob; the figure previously assigned to the parameter will be displayed, read-only or to be set (e.g. the figure "45" for parameter 161 in menu 3 = water temperature setpoint at 45 °C); if instead of a figure/setting it is a

command, a flashing code is displayed (e.g. "reS1" for the flame lock-out reset command).

9. Press the knob to reconfirm the figure; or rotate the knob to modify the figure, and press at the end to confirm or set the new figure; if however, it is a matter of controlling an appliance operation, press the knob to execute it.
10. To exit a parameter menu or the menu list and go back to the higher level, turn the knob to display the letter "E" for exit, then press the knob again.
11. Place the cover back on the electrical panel opening and fit the appliance's front panel back on.

6.5.5 How to raise/lower the water temperature setpoint

The water temperature set-point establishes the outlet temperature to the system (water output from the appliance), or inlet from the system (water input in the appliance). The temperature is pre-set by the TAC upon first start-up.



If the appliance is not connected to a DDC control, to raise/lower the water temperature setpoint with the S61 board, proceed as follows:

1. Access menu 3 under parameter 161 (= water temperature set-point) by rotating and pressing the knob; "3.161" must be displayed (procedure Paragraph 6.5.4 p. 39);
2. Display the parameter value by pressing the knob; the previously set value is displayed (from 10 to 65 °C); to reconfirm the pre-existing value press the knob again, otherwise go to step 3.
3. Turn the knob to modify the value, increasing or decreasing it, and press it to set the new value.
4. Exit menu 3, and from the menu list, by selecting and pressing letter "E" twice, and go back to the normal display of detected temperature data.



Do not modify complex settings

Specific technical and system knowledge is required for complex settings. Contact a TAC.

6.6 AY COMBUSTION PARAMETERS CHECK



The ignition system will automatically activate the system venting cycle function shown in the display with code F33, lasting 2 minutes (except for the first start-up, where the duration is 5 minutes), during which the pump will be started and switched off in alternate cycles. When the function is active, the pump is activated and the burner ignition request is disabled. The regular operation of the boiler is allowed only when the operation is completed.

To check and calibrate the CO₂ value at maximum and minimum power, proceed as follows, referring to Figure 6.8 p. 41.

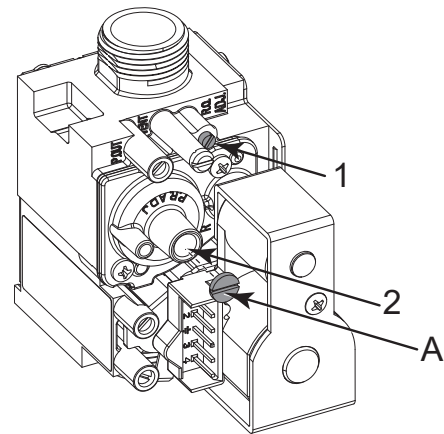
The CO₂ values and other parameters useful to verify combustion are summarized in Table 6.4 p. 41.

- ▶ Power the boiler.
- ▶ Open the gas valve on the boiler and check that the valves connecting to the system are open.
- ▶ Activate the heating request to the boiler, through the control devices provided, and provide an adequate thermal load for carrying out the verification operations.
- ▶ Insert the flue gas analyser into the flue gas analyser socket and turn it on.



The flue gas analysis socket is positioned on the flanged socket (detail PF, Figure 6.9 p. 41).

Figure 6.8 Gas valve



- A Protection screw 2 Offset adjustment screw
1 Gas flow adjustment screw

Figure 6.9 Socket for AY flue gas analysis

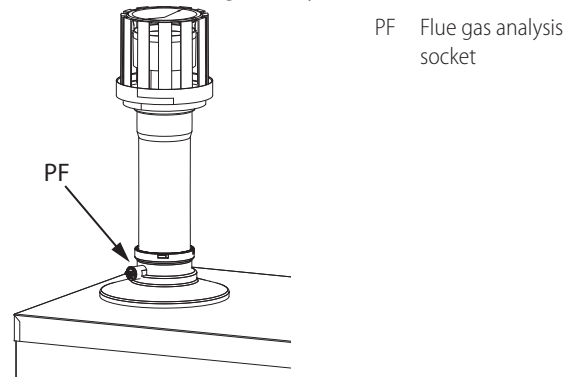



Table 6.4 AY combustion parameters



				AY 35	AY 50
Installation data					
CO₂ percentage in fumes	Nominal heat input	G20	%	9,45 ÷ 9,25	9,3 ÷ 9,1
		G25	%	9,35 ÷ 9,15	9,3 ÷ 9,1
		G25.1	%	- (1)	10,5 ÷ 10,3
		G25.3	%	9,3 ÷ 9,1	
		G2.350	%	- (1)	9,3 ÷ 9,1
		G27	%	- (1)	9,3 ÷ 9,1
		G30	%	11,4 ÷ 11,2	11,3 ÷ 11,1
	Minimal heat input	G31	%	10,55 ÷ 10,35	10,3 ÷ 10,1
		G20	%	9,05 ÷ 8,85	9,0 ÷ 8,8
		G25	%	9,0 ÷ 8,8	
		G25.1	%	- (1)	9,9 ÷ 9,7
		G25.3	%	9,0 ÷ 8,8	
		G2.350	%	- (1)	9,0 ÷ 8,8
		G27	%	- (1)	9,0 ÷ 8,8
Flue temperature	Nominal heat input	G20	°C	69,4	66,4
	Minimal heat input	G20	°C	61,3	56,8
Fumes flow rate	Nominal heat input	G20	kg/h	54	80
	Minimal heat input	G20	kg/h	7	8
CO emission			ppm	75,0	68,0

(1) Gas not available for the appliance.





6.6.1 Minimum heating power

1. Activate the chimney sweep function (F32) by pressing for 7 seconds the  key (Figure 7.1 p. 42). The maximum time before being forced out of the function is 15 minutes.
2. Check that the CO₂ value conforms to that reported in Table 6.4 p. 41.
3. If this is not the case, unscrew the protection screw A and adjust with a 4 hex key the screw 2 of the offset adjuster (Figure 6.8 p. 41). To increase the value of CO₂ turn the screw clockwise and vice-versa if you want to decrease it.
4. Once completed the adjustment, tighten the protection screw A on the offset adjuster.

6.6.2 Maximum heating power

1. Press the  key of the heating side  for the calibration of the maximum heating power.
2. Check that the CO₂ value complies to the value shown in Table 6.4 p. 41.
3. If this is not the case, adjust the gas flow adjuster using

the screw 1 (Figure 6.8 p. 41). To increase the CO₂ value turn the screw counterclockwise and vice versa if you want to decrease it.

4. After each adjustment on screw 1 of the gas flow adjuster, you have to wait about 30 seconds for the boiler to stabilize itself to the set value.
5. Press the  key of the heating side  and check that CO₂ value at minimum power has not changed. If so, repeat the calibration described in previous Paragraph 6.6.1 p. 42.
6. Deactivate the chimney sweep function by switching the boiler to OFF mode using the  button ( symbol appears on the display).
7. Disconnect the flue gas analyzer and screw the cap of the flue gas analysis socket back on.
8. Replace the boiler front panel.

6.7 GAS CHANGEOVER



Contact a TAC for the gas change operation.

7 NORMAL OPERATION

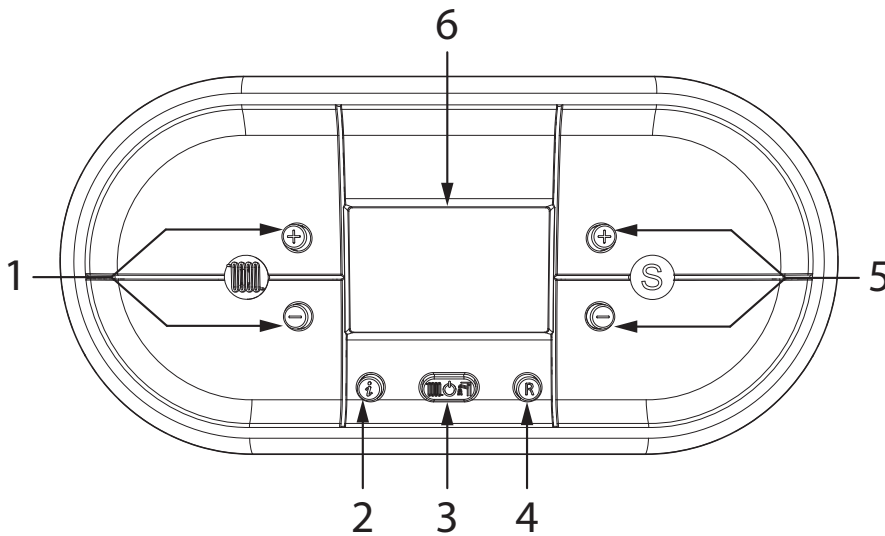


This section is for the end user.



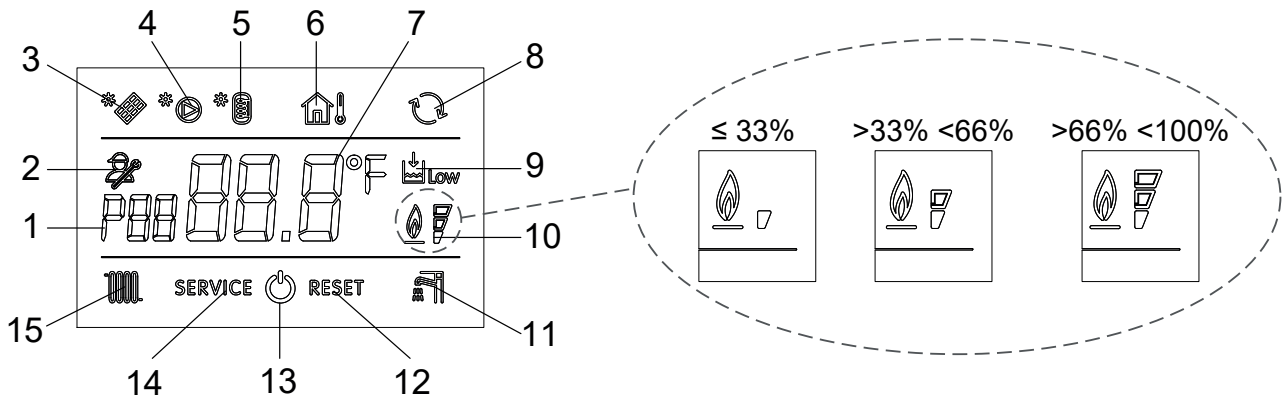
The use of the device by the end user is only permitted after the Robur authorised TAC has completed the first start-up.

Figure 7.1 Boiler control panel



- 1 Heating temperature adjustment keys
- 2 INFO key: press once to view the temperatures and other informations - hold for 5 seconds, in off operating mode, to view the last 5 faults
- 3 Operating mode selection key: winter / space heating / summer / OFF
- 4 RESET key: faults reset - chimney sweep function activation (hold for 7 seconds)
- 5 Keys for setting DHW temperature / parameter values / by pressing the keys simultaneously for 5 seconds, the display backlighting can be activated for a continuous period of 10 minutes
- 6 Display

Figure 7.2 Boiler display icons



- | | |
|--|--|
| <p>1 Parameter number indication or displayed info code</p> <p>2 Parameter programming function active</p> <p>3 Not used</p> <p>4 Not used</p> <p>5 Not used</p> <p>6 Installed outdoor probe / Outdoor temperature display</p> <p>7 Temperature display / setpoint / parameter value</p> <p>8 OpenTherm communication present (remote control)</p> <p>9 Insufficient system water pressure signal</p> | <p>10 Flame presence signal / it also indicates, on 3 percentage levels, the modulating power level of the boiler</p> <p>11 Operation in DHW mode enabled (only for boilers having this function)</p> <p>12 Resettable error signal</p> <p>13 Off operating mode</p> <p>14 Non resettable error signal</p> <p>15 Operation in heating mode enabled</p> |
|--|--|

7.1 WARNINGS

General warnings

Prior to using the appliance carefully read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.

First startup by TAC

First start-up may exclusively be carried out by a Robur TAC (Chapter 6 p. 32).

Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 p. 4), since the appliance or system might be damaged.

Routine switching on/off

The appliance may exclusively be switched on/off by means of the suitably provided control device.

Do not switch on/off with the power supply switch

Do not switch the appliance on/off with the power supply switch. This may be harmful and dangerous for the appliance and for the system.

7.2 PRELIMINARY CHECKS

Checks before switching on

Before switching on the appliance, ensure that:

- Gas valve open.
- Appliance electrical power supply (main switch ON).
- DDC power supply (if any).
- The fumes exhaust duct is free and correctly connected to the fumes exhaust system.
- The hydraulic circuit has been filled. If this is not the case, fill the system according to the instructions in Paragraph 4.2.7 p. 19 and 4.5.3 p. 28.
- System pressure 1,5 bar.

7.3 SWITCH ON AND OFF

- ▶ If the appliance is controlled by a DDC, refer to the relevant manual.
- ▶ If the appliance is controlled by external requests (e.g. thermostat, timer, switch, ... with voltage-free NO contact), the appliance is switched on/off by the ON/OFF positions of the external control devices.

After switching on with the control, in normal operating conditions, the appliance starts/stops automatically according to the user's thermal needs, supplying hot water at the programmed temperature.







Although the external request is in the "ON" position, this does not mean the appliance will start immediately, but it will only start when there are actual service demands.


7.3.1 Operation with external request

7.3.1.1 Turning the boiler on and off

7.3.1.1.1 Switching on



1. Press the  key on the control panel of the boiler (Figure 7.1 p. 42). The fixed  symbol will appear on the display, indicating that the function has been activated.
2. Whenever there is a request for space heating, the automatic ignition system will ignite the burner; the operation is represented by the ignition of the  symbol with an intermittent signal on the display.

 **The burner is only ignited when there is a heating service request from the provided control device (e.g. thermostat, timer, switch, contactor ...).**

 After a long period of unit inactivity or at the first start-up, it may be necessary to repeat the ignition operation a few times due to the presence of air in the gas piping.

7.3.1.1.2 Switching off


The burner switches off automatically when the heating service request from the provided control device (e.g. thermostat, timer, switch, contactor ...) is switched off or when the setpoint is achieved.

To switch off the boiler, press the  button on the boiler (Figure 7.1 p. 42) until the  symbol appears on

the display.

In this operating mode the boiler no longer provides heating and DHW, but the antifreeze and pump anti-lock systems remain active (Paragraph 4.2.10 p. 22).

7.3.2 Operation with DDC control

 If the appliance is connected to the DDC control, please refer to the relevant manual to switch on/off via the DDC.

7.4 MODIFYING SETTINGS

Modify settings via the DDC

If the device is connected to the DDC control, refer to the relevant manual to modify settings.

Do not modify complex settings

Specific technical and system knowledge is required for complex settings. Contact a TAC.


7.5 EFFICIENCY


For increased appliance efficiency:

- ▶ Keep the finned coil clean.
- ▶ Set water temperature to the actual system requirement.
- ▶ Reduce repeated switch-ons to the minimum (low loads).
- ▶ Program appliance activation for actual periods of use.
- ▶ Keep water and air filters on plumbing and ventilation systems clean.


8 MAINTENANCE


8.1 WARNINGS


 Correct maintenance prevents problems, assures efficiency and keeps running costs low.

 Maintenance operations described herein may exclusively be performed by the TAC or skilled maintenance technician.

 Any operation on internal components may exclusively be performed by the TAC.

 Before performing any operation, switch off the appliance by means of the control device and wait for the end of the shutdown cycle, then disconnect power and gas supply, by acting on the electrical disconnecter and gas valve.

 The efficiency checks and every other "check and maintenance operation" (see Tables 8.1 p. 45 and 8.2 p. 45) must be performed with a frequency according to current regulations or, if more restrictive, according to the provisions set forth by the manufacturer, installer or TAC.

 Responsibility for efficiency checks, to be carried out for the aims of restricting energy consumption, lies with the system manager.

Environmental or operational heavy conditions

In environmental or operational conditions particularly heavy (for example: heavy-duty use of the appliance, salty environment, etc.), maintenance and cleaning operations must be more frequent.

8.2 GAHP/GA PREVENTIVE MAINTENANCE

For preventive maintenance, comply with the recommendations in Table 8.1 p. 45, column GAHP A.

Table 8.1 Guidelines for the GAHP/GA preventive maintenance operations

		GAHP A	GAHP GS/WS	GA ACF	GAHP-AR
Guidelines for the preventive maintenance operations					
Check of the unit	visually check of the general condition of the unit and of its finned coil	√ (1)	-	√ (1)	√ (1)
	check the correct operation of the device used for monitoring the water flow	√	√	√	√
	check the % value of CO ₂	√	√	-	-
	check gas pressure to the burners	-	-	√	√
	check that the condensate discharge is clean (If necessary, frequency of the maintenance operation must be increased)	√	√	-	-
	replace the belts after 6 years or 12000 hours of operation	√	√	√	√
	check/restore the pressure of the primary hydronic circuit	-	-	-	-
	check/restore the air pressure inside of the expansion vessel of the primary hydronic circuit	-	-	-	-
	replace the oil pump motor condenser every 3 years or every 10000 operating hours or whenever the condenser capacity is less than 95% of the nominal value	√	√	√	√
Check for every DDC or CCI	check that the plant is able to achieve the setpoint temperature	√	√	√	√
	download the event history	√	√	√	√

(1) It is suggested to clean the finned coil once every 4 years (optimal frequency of the cleaning operation is in any case strongly affected by the installation site). Avoid excessively aggressive cleaning of the finned coil (e.g. high-pressure washer).

8.3 SCHEDULED ROUTINE MAINTENANCE

8.3.1 GAHP/GA

For scheduled routine maintenance, perform the operations in Table 8.2 p. 45, column GAHP A, at least once every 2 years.

Table 8.2 GAHP/GA scheduled routine maintenance

		GAHP A	GAHP GS/WS	GA ACF	GAHP-AR
Ordinary scheduled maintenance					
Check of the unit	clean the combustion chamber	√ (1)	√ (1)	√	√ (1)
	clean the burner	√ (1)	√ (1)	√	√ (1)
	clean the ignition and flame sensor electrodes	√	√	√	√
	check that the condensate discharge is clean	√	√	-	-

(1) Only in case the analysis of combustion products is non-compliant.

8.3.2 AY

It is recommended that the following operations and checks be carried out each year:

- ▶ Combustion circuit functionality and heat exchange control:
 - Burner and flue exhaust duct inspection
 - Cleaning of burner and water/flue exchanger (if applicable)
 - Flame ignition/detection system control
- ▶ Hydraulic circuit and internal components functionality check:
 - Hydraulic circuit control (pipes, gaskets)
 - Expansion tank
 - Control and safety devices
 - Water temperature probes
- ▶ Periodic analysis of combustion, in accordance with regulations in force

8.4 PERIODS OF INACTIVITY

Avoid emptying the installation

Emptying the system may cause damage due to corrosion of the water pipes.

Deactivate the system in winter

Should you intend to stop the appliance in the winter season, ensure at least one of the following conditions:

1. antifreeze function active (Paragraph 4.2.10 p. 22)
2. sufficient antifreeze glycol (Paragraph 4.2.11 p. 23)

8.4.1 Prolonged periods of inactivity

Should you foresee to leave the appliance inactive for a

long period of time, disconnect it from the electrical and gas mains. These operations must be performed by qualified personnel.



How to deactivate the appliance for long periods of time

1. Switch the appliance off (Paragraph 7.3 p. 43).
2. Only when the appliance is completely off, power it off with the main switch/disconnector switch (Detail GS in Figure 5.3 p. 29).
3. Close the gas valve.
4. If necessary, add water with glycol (if the appliance is disconnected from the power and gas mains, the active antifreeze protection is missing, Paragraph 4.2.10 p. 22).



How to reactivate the appliance after long periods of inactivity

Before reactivating the appliance, the operator/maintenance technician of the system must first of all:

- Check whether any maintenance operations are required (contact the TAC; see Paragraphs 8.2 p. 45 and 8.3 p. 45).
 - Check content and quality of the water in the system, and if necessary top it up (Paragraphs 4.2.7 p. 19, 4.2.12 p. 24 and 4.2.11 p. 23).
 - Ensure the flue gas exhaust duct is not obstructed, and that the condensate drain is clean.
- After completing the above checks:
1. Open the gas valve and ensure there are no leaks; should gas smell be noticed, close the gas valve again, do not switch any electrical devices on and request intervention by qualified personnel.
 2. Power on with the main power supply switch (GS, Figure 5.3 p. 29).
 3. Switch on the appliance by means of the provided control device (Paragraph 7.3 p. 43).

9 DIAGNOSTICS

In the event of a malfunction of the appliance, before contacting the TAC, make sure that:

- ▶ There is a full electricity supply.
- ▶ The gas is supplied.
- ▶ The gas pressure is within the indicated limits.
- ▶ The DDC control (if any) is set so that the appliance is switched on and the appliance does not display a fault.

9.1 MESSAGES ON THE DISPLAY

9.1.1 Display on GAHP/GA modules

The electronic boards on board the GAHP/GA/AY modules that make up the Gitié are equipped with a display, visible through the sight glass on the front panel of the relevant appliance.

9.1.2 Signals in the event of fault

In case of fault to one (or more) module(s), the relevant display(s) flashes indicating an operating code. Simultaneously, the display of the DDC control (if present) flashes. If it is a permanent error or warning the appliance stops.



For diagnostics, please refer to Paragraph 9.3 p. 47.

9.2 RESTARTING A LOCKED-OUT UNIT

- ▶ To restart the appliance you must know and perform the procedure concerning the issue reported and identified by the code.
- ▶ Only act if you are familiar with the issue and with the procedure (technical expertise and professional qualifications might be required).
- ▶ If you do not know the code, the problem, or the procedure, or you do not have sufficient skills, and in any case of doubt, contact the TAC.



For diagnostics, please refer to Paragraph 9.3 p. 47.

9.2.1 Locked-out appliance

An external intervention (reset or repair) is required due to an appliance fault or problem with the system.

- ▶ A reset may be enough for a temporary and provisional fault.
- ▶ For a fault or breakdown, alert the maintenance technician or TAC.

9.2.2 Reset

There are two options for resetting a fault:

1. If the appliance is connected to a DDC you may act through the control device, as described in the relevant manual.
2. You may act directly from the board as described below (if the appliance is controlled with an external request, this is the only option).



How to reset the GAHP/GA module directly from the board:


1. Access the GAHP/GA module electronic board by removing the front panel (procedure Paragraph 6.2 p. 32).
2. Access Menu 2 under Parameter "_20", to reset flame block (Error E412), or Parameter "_21", for any other generic reset, turning and pressing the knob; "_20"/"_21" must be displayed (procedure Paragraph 6.5.4 p. 39).
3. Press the knob to display the flashing reset request (e.g. "reS1" to reset flame block).
4. Press the knob again (the second time) to perform the reset; the reset request stops flashing, then "_2_XX" is displayed again (e.g. "_2_20"). The reset operation has been performed.

5. Exit menu 2 and the menu list, by selecting and pressing letter "E" twice, and go back to the normal display of detected temperature data.
6. Replace the front panel.



How to reset the AY module directly from the

boiler:

1. Access the boiler's internal display by removing the front panel (procedure Paragraph 6.3 p. 33).
2. Press the reset key .
3. Replace the front panel.

9.3 OPERATIVE CODES

9.3.1 GAHP A

Table 9.1 Operative codes GAHP A

Code	Description	Warning (u)	Error (E)
400	Flame controller reset circuit fault	NA	Power cycle the appliance. If the code persists, shows up again or in case of doubt, contact the TAC.
401	Limit thermostat trip	Contact the TAC.	
402	Flue gas thermostat trip	Contact the TAC.	
405	Outdoor temperature exceeding operational limits	NA	Reset is automatic when the triggering condition ceases.
406	Outdoor temperature below operational limits	Non-blocking Warning (informative code). Reset is automatic when the triggering condition ceases.	NA
407	High generator temperature	Reset is automatic when the triggering condition ceases.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
408	Flame controller error	NA	Contact authorised Technical Assistance
410	Low hot water flow	Reset is automatic when the triggering condition ceases.	Check and clean water filters on the system. Check for air in the system. Check water flow pump. Power cycle the appliance. Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
411	Insufficient rotation of oil pump	Reset occurs automatically 20 minutes after the code is generated.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
412	Flame controller lockout	Reset is automatic up to 4 attempts (in about 5 minutes).	Check gas supply. Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 20). If the code persists or in case of doubt, contact the TAC.
416	Hot water delivery temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
417	Hot water inlet temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
420	Generator temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
422	Water flowmeter fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
423	Air-gas mix temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.


Code	Description	Warning (u)	Error (E)
424	Flue gas temperature probe fault	Reset is automatic when the triggering condition ceases.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
425	Clogged condensate drain	NA	Check and clean condensate drain. Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
426	Generator fins temperature probe fault	Reset is automatic when the triggering condition ceases.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
428	Flame controller error	NA	Power off the appliance. Contact the TAC.
429	Gas solenoid valve without electrical power	Reset occurs automatically if the gas solenoid valve switches on again within 10 minutes (with central flame control unit on).	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
430	High flue gas or generator fins temperature	Reset is automatic when the triggering condition ceases.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
431	Hot water temperature exceeding operational limits	Check configuration of other heat generators on the system. Check water flow. Check system thermal load. Reset is automatic when the triggering condition ceases.	NA
434	-	Contact the TAC.	NA
436	Blower fault	Reset occurs automatically 20 minutes after the code is generated.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
437	Low air-gas mix temperature	Non-blocking Warning (informative code). The code is reset automatically when the triggering condition ceases.	NA
444	Evaporator temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
446	High hot water inlet temperature	Check configuration of other heat generators on the system. Reset is automatic and occurs if the generating condition ceases with circulating pump on or 20 minutes after the code is generated with circulating pump off.	NA
447	Hot water inlet temperature below operational limits	Reset occurs automatically when the generating cause resolves or 430 seconds after the code is generated.	Reset occurs automatically when the condition that generated the code ceases. If the code shows up again or in case of doubt contact the TAC.
448	High hot water differential temperature	Check water flow. Reset occurs automatically 20 minutes after the code is generated.	Reset occurs automatically when the condition that generated the code ceases. If the code shows up again or in case of doubt contact the TAC.
449	Missing auxiliary board	NA	Contact the TAC.
452	Defrosting cycle activated	Non-blocking Warning (informative code). The code clears automatically when execution of defrosting ends.	NA
453	Water flow while system in cooling mode	Reset is automatic when the triggering condition ceases.	NA
460	Defrosting valve has failed to open	Non-blocking Warning (informative code). Reset is automatic, however, it is advisable to contact the TAC.	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.

Code	Description	Warning (u)	Error (E)
461	Oil pump priming cycle activated	The priming cycle lasts 30' if activated manually or 10 minutes if activated automatically. Reset is automatic when the triggering condition ceases.	NA
478	High hot water delivery temperature	Reset is automatic when the triggering condition ceases.	NA
479	Heating antifreeze function activated	Non-blocking Warning (informative code). The code clears automatically when antifreeze function execution ends.	NA
80/480	Incomplete functional parameters	Contact the TAC.	
481	Invalid bank 1 parameters	Reset is automatic when the triggering condition ceases.	Contact the TAC.
482	Invalid bank 2 parameters	Reset is automatic when the triggering condition ceases.	Contact the TAC.
484	Transformer or 24 Vac fuse fault	NA	Contact the TAC.
485	Invalid module type configuration parameters	NA	Contact the TAC.
486	ROM board fault	NA	Contact the TAC.
487	pRAM board fault	NA	Contact the TAC.
488	xRAM board fault	NA	Contact the TAC.
489	Registers board fault	NA	Contact the TAC.
490	Outdoor temperature probe fault	NA	Reset may be performed from the DDC/CCI or from the S61 board (menu 2, parameter 21). If the code persists, shows up again or in case of doubt, contact the TAC.
491	Electronic board fault	NA	Contact the TAC.

NA: Not Applicable

9.3.2 AY

Most faults are generated directly by the MIAH410 boiler electronic board and are consequently shown on the boiler display (and sent to the DDC control, if any), while faults generated by the CAN-NDG board are sent to the DDC only (if any).

The faults generated by the boiler board are exclusively errors (and consequently on the DDC panel, if any, they will always be displayed as E), either temporary (i.e. with automatic reset) or permanent (i.e. with manual reset). For faults requiring manual reset, this can be done by pressing the reset button  on the boiler or, alternative-

ly, through the appropriate functions of the DDC control, if any.

Specifically, codes 01, 02, 12 and 41 are reset by the DDC control via the reset button of the flame controller.



Errors can be blocking (i.e. implying burner shutdown) or non-blocking. Even with a non-blocking error, it is not guaranteed that the burner can be switched on in the event of a service request.

The fault codes listed below are also shown on the DDC control, if any, by adding the hundreds digit "1" to the code. The code 01 will then be displayed as 101 on the DDC control.



Table 9.2 Error codes

Error codes generated by the MIAH410 boiler electronic board (displayed

both on the boiler display and on the DDC control, if any)

Code	Description	Temporary error	Permanent error
01	Limit thermostat trip	Contact authorised Technical Assistance	
02	Flue gas thermostat trip	Contact authorised Technical Assistance	
09	Ignition failure	Reset is automatic up to 3 attempts.	NA
12	Flame controller lockout	NA	Check gas supply. The reset can be carried out from DDC or from the boiler panel by pressing the  key. If the code persists or in case of doubt, contact the TAC.
31	No CAN bus communication	Contact authorised Technical Assistance	NA
36	Blower fault	Reset occurs automatically 20 minutes after the code is generated.	The reset can be carried out from DDC or from the boiler panel by pressing the  key. If the code persists, shows up again or in case of doubt, contact the TAC.

NA: Not Applicable

41	Flame controller error	NA	The reset can be carried out from DDC or from the boiler panel by pressing the  key. If the code persists, shows up again or in case of doubt, contact the TAC.
73	Insufficient water pressure	Reset is automatic when the triggering condition ceases.	NA
74	AUX temperature probe fault	Reset is automatic when the triggering condition ceases.	NA
75	Low hot water flow	Reset is automatic when the triggering condition ceases.	Check and clean water filters on the system. Check for air in the system. Check water flow pump. Power cycle the appliance. The reset can be carried out from DDC or from the boiler panel by pressing the  key. If the code persists, shows up again or in case of doubt, contact the TAC.
76	Hot water delivery temperature probe fault	Reset is automatic when the triggering condition ceases.	NA
77	Hot water inlet temperature probe fault	Reset is automatic when the triggering condition ceases.	NA
83	Invalid functional parameters	NA	Power off the appliance. Contact the TAC.
84	Incorrect supply voltage	Reset is automatic when the triggering condition ceases.	NA
86	Internal boiler board error	NA	Power off the appliance. Contact the TAC.
87	No communication with CAN-NDG board	Reset is automatic if communication is restored within 60 seconds. Otherwise, a reset of the CAN-NDG board is forced and W182 is raised.	Contact the TAC.
90	Outdoor temperature probe fault	Reset is automatic when the triggering condition ceases.	NA

NA: Not Applicable


Error codes generated by the CAN-NDG board (displayed only on the DDC control, if any)

Code	Description	Warning (u)	Error (E)
180	Incomplete functional parameters	Contact the TAC.	
181	Error in storing configuration parameters on CAN-NDG board	Reset is automatic when the triggering condition ceases.	Contact the TAC.
182	CAN-NDG board reset	Reset is automatic when the triggering condition ceases.	NA
185	Invalid module type configuration parameters	NA	Contact the TAC.
188	Boiler parameters reading error	Reset is automatic the next time the parameters are read correctly.	NA
189	Boiler parameters writing error	NA	Run parameter writing again.
192	Incompatibility of boiler board FW version	NA	Contact the TAC.

NA: Not Applicable

The special functions listed below are also shown on the DDC control, if any, as warnings, always adding the hundreds digit "1" to the code.

Table 9.3 Function codes

Code	Function	Description
F32	Chimney sweep function active	It is activated by pressing the reset  key for 7 seconds and it is deactivated by turning off the boiler. Brings the boiler to the minimum and maximum power for 15 minutes by deactivating the modulation function. Generally used for combustion and calibration tests.
F33	System air purge cycle in progress	It automatically starts when the boiler is powered up, running for 5 minutes a series of cycles in which the pump is turned on for a period of 40 seconds and then turned off for a period of 20 seconds. Regular operation is only permitted at the end of the function. It can also be activated during normal operation of the boiler, in the event that the enable of the water pressure switch is lacking, when the contact is closed, a 2-minute venting cycle is performed.
F79	Heating antifreeze function	It is automatically activated when the heating probe detects an outlet temperature lower than the value of P81. The boiler operates at minimum power and is deactivated when a water temperature of 30 °C is detected on the outlet or 20 °C on the inlet.

10 APPENDICES

10.1 PRODUCT FICHE

Table 8
COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):	Gitié AHAY35						
Air-to-water heat pump:	yes						
Water-to-water heat pump:	no						
Brine-to-water heat pump:	no						
Low-temperature heat pump:	no						
Equipped with a supplementary heater:	yes						
Heat pump combination heater:	no						
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	63,8	kW	Seasonal space heating energy efficiency	η_s	126	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7$ °C	<i>Pdh</i>	56,1	kW	$T_j = -7$ °C	<i>PERd</i>	109	%
$T_j = +2$ °C	<i>Pdh</i>	34,5	kW	$T_j = +2$ °C	<i>PERd</i>	136	%
$T_j = +7$ °C	<i>Pdh</i>	22,3	kW	$T_j = +7$ °C	<i>PERd</i>	134	%
$T_j = +12$ °C	<i>Pdh</i>	9,6	kW	$T_j = +12$ °C	<i>PERd</i>	126	%
$T_j =$ bivalent temperature	<i>Pdh</i>	37,0	kW	$T_j =$ bivalent temperature	<i>PERd</i>	134	%
Bivalent temperature	<i>T_{bv}</i>	1,0	°C				
Annual energy consumption	<i>Q_{HE}</i>	377	GJ				
COLDER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	62,9	kW	Seasonal space heating energy efficiency	η_s	121	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7$ °C	<i>Pdh</i>	38,4	kW	$T_j = -7$ °C	<i>PERd</i>	124	%
$T_j = +2$ °C	<i>Pdh</i>	23,3	kW	$T_j = +2$ °C	<i>PERd</i>	130	%
$T_j = +7$ °C	<i>Pdh</i>	15,1	kW	$T_j = +7$ °C	<i>PERd</i>	126	%
$T_j = +12$ °C	<i>Pdh</i>	6,9	kW	$T_j = +12$ °C	<i>PERd</i>	125	%
$T_j =$ bivalent temperature	<i>Pdh</i>	36,5	kW	$T_j =$ bivalent temperature	<i>PERd</i>	128	%
$T_j =$ operation limit temperature	<i>Pdh</i>	62,9	kW	$T_j =$ operation limit temperature	<i>PERd</i>	95	%
For air-to-water heat pumps: $T_j = -15$ °C (if TOL < -20 °C)	<i>Pdh</i>	51,6	kW	For air-to-water heat pumps: $T_j = -15$ °C (if TOL < -20 °C)	<i>PERd</i>	98	%
Bivalent temperature	<i>T_{bv}</i>	-6,0	°C				
Annual energy consumption	<i>Q_{HE}</i>	461	GJ				
WARMER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	70,6	kW	Seasonal space heating energy efficiency	η_s	123	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = +2$ °C	<i>Pdh</i>	70,6	kW	$T_j = +2$ °C	<i>PERd</i>	104	%
$T_j = +7$ °C	<i>Pdh</i>	45,2	kW	$T_j = +7$ °C	<i>PERd</i>	126	%
$T_j = +12$ °C	<i>Pdh</i>	20,5	kW	$T_j = +12$ °C	<i>PERd</i>	128	%
$T_j =$ bivalent temperature	<i>Pdh</i>	35,3	kW	$T_j =$ bivalent temperature	<i>PERd</i>	131	%
Annual energy consumption	<i>Q_{HE}</i>	276	GJ				
Bivalent temperature	<i>T_{bv}</i>	9,0	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	-22	°C
				Heating water operating limit temperature	<i>WTOL</i>	65	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P_{OFF}</i>	0,000	kW	Rated heat output	<i>P_{sup}</i>	33,4	kW
Thermostat-off mode	<i>P_{TO}</i>	0,041	kW	Type of energy input	monovalent		
Standby mode	<i>P_{SB}</i>	0,009	kW				
Crankcase heater mode	<i>P_{CK}</i>	-	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	—	10000	m ³ /h
Sound power level, indoors/outdoors	<i>L_{WA}</i>	- / 80	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	-	m ³ /h
Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 2:

Emissions of nitrogen oxides: NO_x 45 mg/kWh

Table 8
COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):	Gitié AHAY35 S1						
Air-to-water heat pump:	yes						
Water-to-water heat pump:	no						
Brine-to-water heat pump:	no						
Low-temperature heat pump:	no						
Equipped with a supplementary heater:	yes						
Heat pump combination heater:	no						
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	63,8	kW	Seasonal space heating energy efficiency	η_s	127	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7\text{ °C}$	<i>Pdh</i>	56,1	kW	$T_j = -7\text{ °C}$	<i>PERd</i>	109	%
$T_j = +2\text{ °C}$	<i>Pdh</i>	34,5	kW	$T_j = +2\text{ °C}$	<i>PERd</i>	137	%
$T_j = +7\text{ °C}$	<i>Pdh</i>	22,3	kW	$T_j = +7\text{ °C}$	<i>PERd</i>	135	%
$T_j = +12\text{ °C}$	<i>Pdh</i>	9,6	kW	$T_j = +12\text{ °C}$	<i>PERd</i>	127	%
$T_j =$ bivalent temperature	<i>Pdh</i>	37,0	kW	$T_j =$ bivalent temperature	<i>PERd</i>	135	%
Bivalent temperature	T_{bv}	1,0	°C				
Annual energy consumption	Q_{HE}	374	GJ				
COLDER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	62,9	kW	Seasonal space heating energy efficiency	η_s	122	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7\text{ °C}$	<i>Pdh</i>	38,4	kW	$T_j = -7\text{ °C}$	<i>PERd</i>	125	%
$T_j = +2\text{ °C}$	<i>Pdh</i>	23,3	kW	$T_j = +2\text{ °C}$	<i>PERd</i>	132	%
$T_j = +7\text{ °C}$	<i>Pdh</i>	15,1	kW	$T_j = +7\text{ °C}$	<i>PERd</i>	127	%
$T_j = +12\text{ °C}$	<i>Pdh</i>	6,9	kW	$T_j = +12\text{ °C}$	<i>PERd</i>	127	%
$T_j =$ bivalent temperature	<i>Pdh</i>	36,5	kW	$T_j =$ bivalent temperature	<i>PERd</i>	129	%
$T_j =$ operation limit temperature	<i>Pdh</i>	62,9	kW	$T_j =$ operation limit temperature	<i>PERd</i>	95	%
For air-to-water heat pumps: $T_j = -15\text{ °C}$ (if TOL < -20 °C)	<i>Pdh</i>	51,6	kW	For air-to-water heat pumps: $T_j = -15\text{ °C}$ (if TOL < -20 °C)	<i>PERd</i>	99	%
Bivalent temperature	T_{bv}	-6,0	°C				
Annual energy consumption	Q_{HE}	457	GJ				
WARMER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	70,6	kW	Seasonal space heating energy efficiency	η_s	124	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = +2\text{ °C}$	<i>Pdh</i>	70,6	kW	$T_j = +2\text{ °C}$	<i>PERd</i>	105	%
$T_j = +7\text{ °C}$	<i>Pdh</i>	45,2	kW	$T_j = +7\text{ °C}$	<i>PERd</i>	127	%
$T_j = +12\text{ °C}$	<i>Pdh</i>	20,5	kW	$T_j = +12\text{ °C}$	<i>PERd</i>	129	%
$T_j =$ bivalent temperature	<i>Pdh</i>	35,3	kW	$T_j =$ bivalent temperature	<i>PERd</i>	132	%
Annual energy consumption	Q_{HE}	274	GJ				
Bivalent temperature	T_{bv}	9,0	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	-22	°C
				Heating water operating limit temperature	<i>WTOL</i>	65	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P_{OFF}	0,000	kW	Rated heat output	P_{sup}	33,4	kW
Thermostat-off mode	P_{TO}	0,041	kW	Type of energy input	monovalent		
Standby mode	P_{SB}	0,009	kW				
Crankcase heater mode	P_{CX}	-	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	—	10000	m ³ /h
Sound power level, indoors/outdoors	L_{WA}	- / 74	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	-	m ³ /h
Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 2:

Emissions of nitrogen oxides: NO_x 45 mg/kWh

Table 8
COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):	Gitié AHAY50						
Air-to-water heat pump:	yes						
Water-to-water heat pump:	no						
Brine-to-water heat pump:	no						
Low-temperature heat pump:	no						
Equipped with a supplementary heater:	yes						
Heat pump combination heater:	no						
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	79,9	kW	Seasonal space heating energy efficiency	η_s	125	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7$ °C	<i>Pdh</i>	70,3	kW	$T_j = -7$ °C	<i>PERd</i>	105	%
$T_j = +2$ °C	<i>Pdh</i>	43,2	kW	$T_j = +2$ °C	<i>PERd</i>	135	%
$T_j = +7$ °C	<i>Pdh</i>	28,0	kW	$T_j = +7$ °C	<i>PERd</i>	138	%
$T_j = +12$ °C	<i>Pdh</i>	12,0	kW	$T_j = +12$ °C	<i>PERd</i>	130	%
T_j = bivalent temperature	<i>Pdh</i>	36,8	kW	T_j = bivalent temperature	<i>PERd</i>	139	%
Bivalent temperature	T_{bv}	4,0	°C				
Annual energy consumption	Q_{HE}	475	GJ				
COLDER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	79,0	kW	Seasonal space heating energy efficiency	η_s	119	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = -7$ °C	<i>Pdh</i>	48,2	kW	$T_j = -7$ °C	<i>PERd</i>	116	%
$T_j = +2$ °C	<i>Pdh</i>	29,2	kW	$T_j = +2$ °C	<i>PERd</i>	130	%
$T_j = +7$ °C	<i>Pdh</i>	19,0	kW	$T_j = +7$ °C	<i>PERd</i>	126	%
$T_j = +12$ °C	<i>Pdh</i>	8,7	kW	$T_j = +12$ °C	<i>PERd</i>	125	%
T_j = bivalent temperature	<i>Pdh</i>	37,1	kW	T_j = bivalent temperature	<i>PERd</i>	129	%
T_j = operation limit temperature	<i>Pdh</i>	79,0	kW	T_j = operation limit temperature	<i>PERd</i>	95	%
For air-to-water heat pumps: $T_j = -15$ °C (if TOL < -20 °C)	<i>Pdh</i>	64,8	kW	For air-to-water heat pumps: $T_j = -15$ °C (if TOL < -20 °C)	<i>PERd</i>	97	%
Bivalent temperature	T_{bv}	-2,0	°C				
Annual energy consumption	Q_{HE}	589	GJ				
WARMER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	86,7	kW	Seasonal space heating energy efficiency	η_s	121	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
$T_j = +2$ °C	<i>Pdh</i>	86,7	kW	$T_j = +2$ °C	<i>PERd</i>	102	%
$T_j = +7$ °C	<i>Pdh</i>	55,5	kW	$T_j = +7$ °C	<i>PERd</i>	119	%
$T_j = +12$ °C	<i>Pdh</i>	25,1	kW	$T_j = +12$ °C	<i>PERd</i>	130	%
T_j = bivalent temperature	<i>Pdh</i>	37,3	kW	T_j = bivalent temperature	<i>PERd</i>	132	%
Annual energy consumption	Q_{HE}	344	GJ				
Bivalent temperature	T_{bv}	10,0	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	-22	°C
				Heating water operating limit temperature	<i>WTOL</i>	65	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P_{OFF}	0,000	kW	Rated heat output	P_{sup}	49,2	kW
Thermostat-off mode	P_{TO}	0,041	kW	Type of energy input	monovalent		
Standby mode	P_{SB}	0,009	kW				
Crankcase heater mode	P_{CK}	-	kW				
Other items							
Capacity control		variable		For air-to-water heat pumps: Rated air flow rate, outdoors	—	10000	m ³ /h
Sound power level, indoors/outdoors	L_{WA}	- / 80	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	-	m ³ /h
Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 2:

Emissions of nitrogen oxides: NO_x 44 mg/kWh

Table 8
COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):	Gitié AHAY50 S1						
Air-to-water heat pump:	yes						
Water-to-water heat pump:	no						
Brine-to-water heat pump:	no						
Low-temperature heat pump:	no						
Equipped with a supplementary heater:	yes						
Heat pump combination heater:	no						
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	79,9	kW	Seasonal space heating energy efficiency	η_s	126	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	<i>Pdh</i>	70,3	kW	Tj = -7 °C	<i>PERd</i>	106	%
Tj = +2 °C	<i>Pdh</i>	43,2	kW	Tj = +2 °C	<i>PERd</i>	136	%
Tj = +7 °C	<i>Pdh</i>	28,0	kW	Tj = +7 °C	<i>PERd</i>	139	%
Tj = +12 °C	<i>Pdh</i>	12,0	kW	Tj = +12 °C	<i>PERd</i>	130	%
Tj = bivalent temperature	<i>Pdh</i>	36,8	kW	Tj = bivalent temperature	<i>PERd</i>	140	%
Bivalent temperature	<i>T_{bv}</i>	4,0	°C				
Annual energy consumption	<i>Q_{HE}</i>	472	GJ				
COLDER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	79,0	kW	Seasonal space heating energy efficiency	η_s	120	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	<i>Pdh</i>	48,2	kW	Tj = -7 °C	<i>PERd</i>	117	%
Tj = +2 °C	<i>Pdh</i>	29,2	kW	Tj = +2 °C	<i>PERd</i>	132	%
Tj = +7 °C	<i>Pdh</i>	19,0	kW	Tj = +7 °C	<i>PERd</i>	127	%
Tj = +12 °C	<i>Pdh</i>	8,7	kW	Tj = +12 °C	<i>PERd</i>	127	%
Tj = bivalent temperature	<i>Pdh</i>	37,1	kW	Tj = bivalent temperature	<i>PERd</i>	130	%
Tj = operation limit temperature	<i>Pdh</i>	79,0	kW	Tj = operation limit temperature	<i>PERd</i>	95	%
For air-to-water heat pumps: Tj = -15 °C (if TOL < -20 °C)	<i>Pdh</i>	64,8	kW	For air-to-water heat pumps: Tj = -15 °C (if TOL < -20 °C)	<i>PERd</i>	97	%
Bivalent temperature	<i>T_{bv}</i>	-2,0	°C				
Annual energy consumption	<i>Q_{HE}</i>	584	GJ				
WARMER CLIMATE CONDITIONS							
Rated heat output (*)	<i>Prated</i>	86,7	kW	Seasonal space heating energy efficiency	η_s	121	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = +2 °C	<i>Pdh</i>	86,7	kW	Tj = +2 °C	<i>PERd</i>	102	%
Tj = +7 °C	<i>Pdh</i>	55,5	kW	Tj = +7 °C	<i>PERd</i>	119	%
Tj = +12 °C	<i>Pdh</i>	25,1	kW	Tj = +12 °C	<i>PERd</i>	130	%
Tj = bivalent temperature	<i>Pdh</i>	37,3	kW	Tj = bivalent temperature	<i>PERd</i>	132	%
Annual energy consumption	<i>Q_{HE}</i>	344	GJ				
Bivalent temperature	<i>T_{bv}</i>	10,0	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	-22	°C
				Heating water operating limit temperature	<i>WTOL</i>	65	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P_{OFF}</i>	0,000	kW	Rated heat output	<i>P_{sup}</i>	49,2	kW
Thermostat-off mode	<i>P_{TO}</i>	0,041	kW	Type of energy input	monovalent		
Standby mode	<i>P_{SB}</i>	0,009	kW				
Crankcase heater mode	<i>P_{CK}</i>	-	kW				
Other items							
Capacity control		variable		For air-to-water heat pumps: Rated air flow rate, outdoors	—	10000	m ³ /h
Sound power level, indoors/outdoors	<i>L_{WA}</i>	- / 74	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	-	m ³ /h
Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 2:

Emissions of nitrogen oxides: *NO_x* 44 mg/kWh

Robur mission

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



caring for the environment

Robur S.p.A.
advanced technologies
for air conditioning
via Parigi 4/6
24040 Verdellino/Zingonia (BG) Italy
+39 035 888111 - F +39 035 884165
www.robur.it robur@robur.it

