1 SPECIFICATION OF SUPPLY

1.1 VERSIONS

The GA ACF unit is available in the following versions:
- ACF standard, for residential/retail/industrial cooling systems with chilled water up to +3 °C;
- HR with heat recovery exchanger, for residential/retail/industrial cooling systems with chilled water up to +3 °C, plus recovery exchanger hot water up to +75 °C (e.g. DHW production);
- TK for heavy duty use, for process systems and applications with chilled water up to +3 °C, in continuous operation year round;
- HT for very hot climates, for residential/retail/industrial cooling systems with chilled water up to +5 °C, with outside air up to 50 °C;
- LB for negative temperatures, for cooling systems with chilled water up to -10 °C (glycol indispensable).

ACF standard, TK, LB and HT models have 2 water fittings (chilled water inlet/outlet), model HR has 4 water fittings (chilled water and heat recovery exchanger hot water inlet/outlet).
Each version may be supplied with standard (STD) or silenced (S) fan.

1.2 SPECIFICATION OF SUPPLY

1.2.1 ACF standard

Water-ammonia absorption chiller, fed with natural gas or LPG, air-water version, for cold water production up to a delivery temperature of 3°C, for external installation.

1.2.2 HR with heat recovery exchanger

Water-ammonia absorption chiller, fed with natural gas or LPG, air-water version with heat recovery, for cold water production up to a delivery temperature of 3°C and simultaneously hot water production (up to a delivery temperature of 75°C), for external installation.

1.2.3 TK for heavy duty use

Water-ammonia absorption chiller, fed with natural gas or LPG, air-water version for process applications, for cold water production up to a delivery temperature of 3°C, for external installation.

1.2.4 HT for very hot climates

Water-ammonia absorption chiller, fed with natural gas or LPG, air-water version for use in areas with high ambient temperature and humidity, for cold water production up to a delivery temperature of 5°C, for external installation.

1.2.5 LB for negative temperatures

Water-ammonia absorption chiller, fed with natural gas or LPG, air-water version for chilling, for cold water production up to a delivery temperature of -10°C, for external installation.

1.3 COMMON CHARACTERISTICS

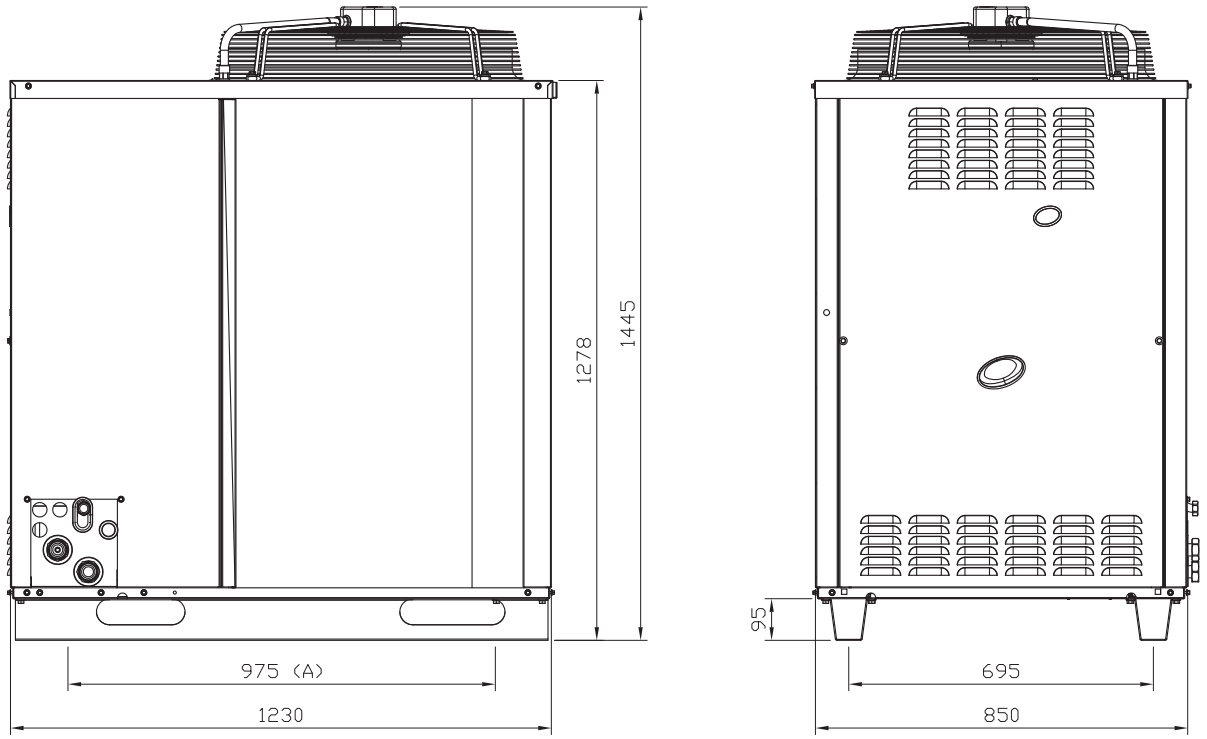
GA ACF units consist of:
- steel sealed circuit, externally treated with epoxy paint;
- sealed combustion chamber (type C) suitable for outdoor installations;
- metal mesh radiant burner equipped with ignition and flame detection device, controlled by an electronic control unit;
- titanium stainless steel shell-and-tube water exchanger (evaporator), externally insulated;
- air exchanger (condenser) with finned coil, with steel pipe and aluminium fins;
- titanium stainless steel shell-and-tube water exchanger (recovery exchanger) (HR version only);
- low power consumption refrigerant fluid oil pump;
- standard fan *or* silenced fan *(specify the desired version)* with variable flow rate.

Control and safety devices:
- electronic board with microprocessor;
- circuit water flow switch;
- generator limit thermostat, with manual reset;
- automatically resettable flue gas thermostat;
- differential air pressure switch on the combustion circuit;
- sealed circuit safety relief valve;
- by-pass valve, between high and low pressure circuits;
- ionisation flame controller;
- gas solenoid valve with double shutter;
- heat recovery exchanger circulating pump relay (HR version only);
- antifreeze function for water circuit.

2 FEATURES AND TECHNICAL DATA

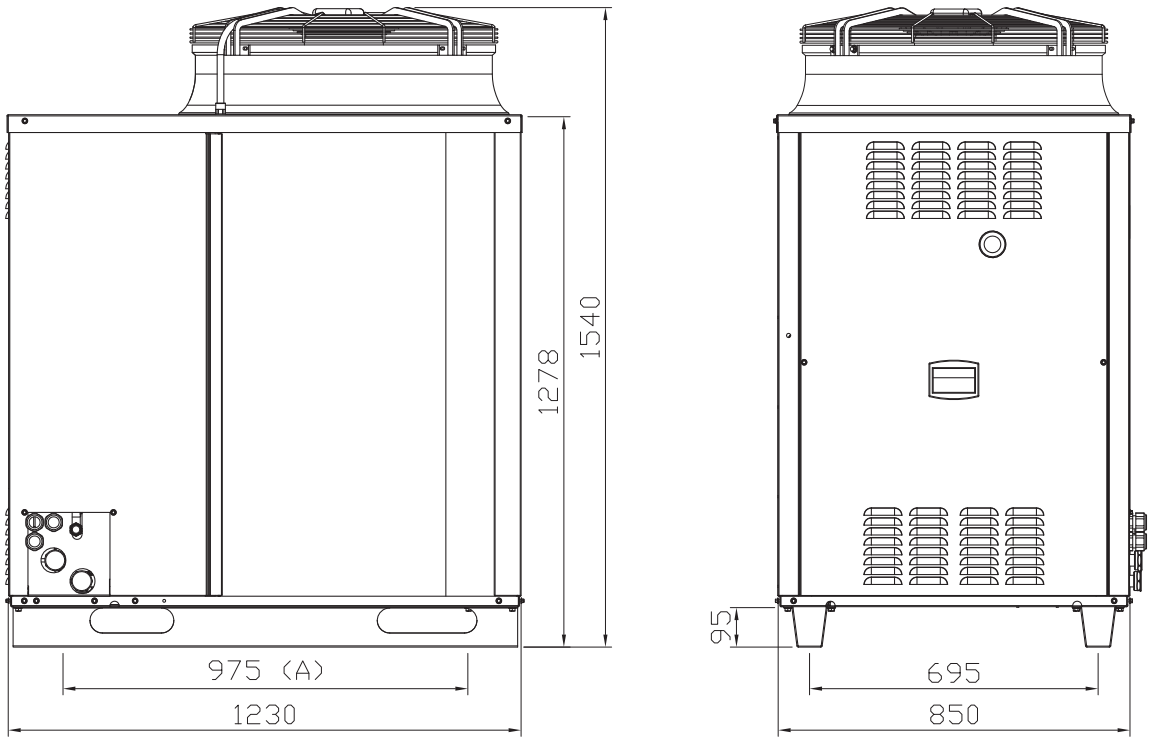
2.1 DIMENSIONS

Figure 2.1 *ACF standard version dimensions*



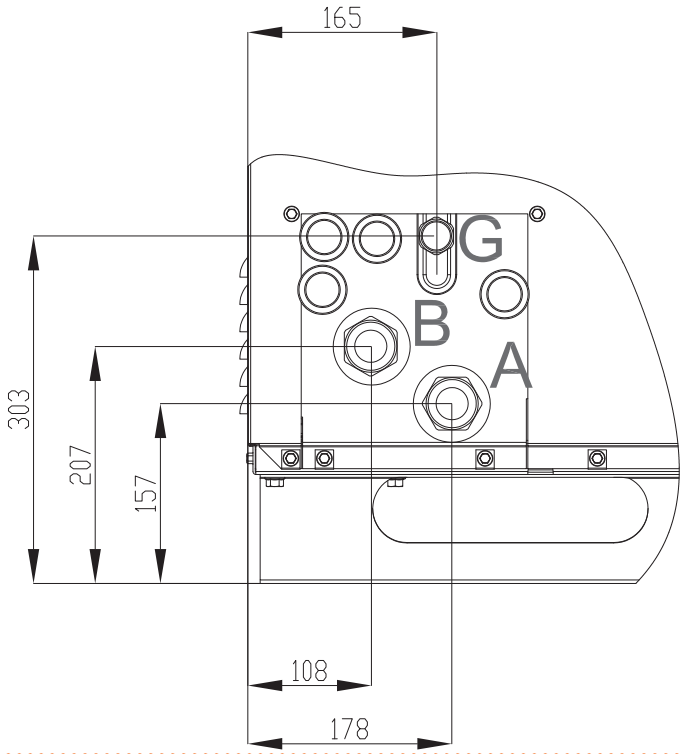
A Position of holes for fixing of anti-vibration joints

Figure 2.2 *ACF silenced version dimensions*



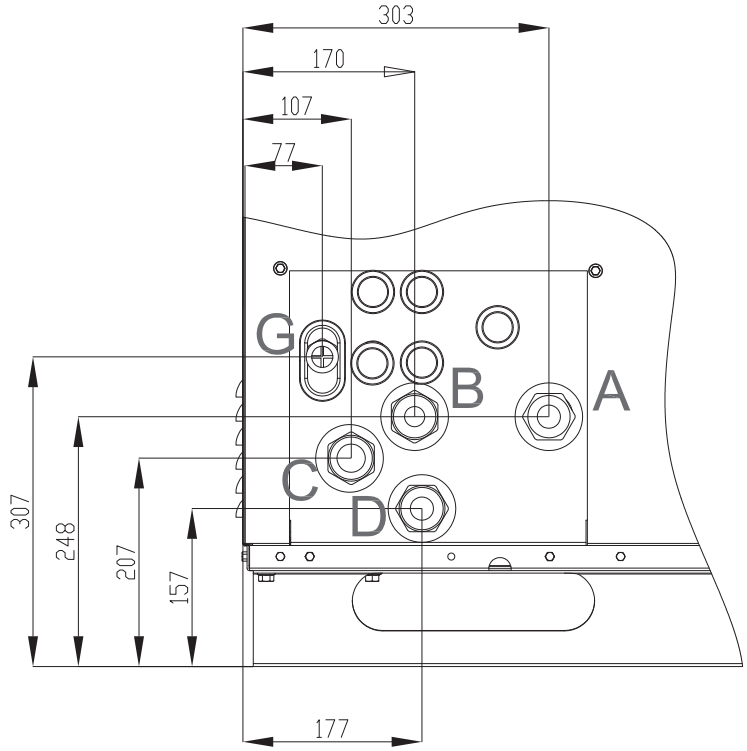
A Position of holes for fixing of anti-vibration joints

Figure 2.3 *ACF Service plate with plumbing and gas connections*



A WATER FLOW TO INSTALLATION 1"1/4 F
B WATER INLET TO UNIT 1"1/4 F
G GAS SUPPLY 3/4" F

Figure 2.4 *ACF-HR Service plate with plumbing and gas connections*



G GAS SUPPLY 3/4" F
Chiller - CHILLED WATER
D WATER FLOW TO INSTALLATION 1"1/4 F
C WATER INLET TO UNIT 1"1/4 F
Recovery exchanger - HOT WATER
A WATER FLOW TO INSTALLATION 1"1/4 F
B WATER INLET TO UNIT 1"1/4 F

2.2 OPERATION MODE

The GA ACF unit may only work in the ON/OFF mode, i.e. ON (at full power) or OFF, with circulating pump at constant flow.

2.3 CONTROLS

Control device

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

- ► (1) **DDC control**
- ► (2) **external request**

2.3.1 Control system (1) with DDC (GAHP unit ON/OFF)

The DDC controller is able to control the appliances, a single GA unit or even several Robur GAHP/GA/AY units in cascade, only in ON/OFF mode (non modulating). For more information see Section C1.12.

2.3.2 Adjustment system (1) with DDC (GAHP unit ON/OFF)

The appliance may also be controlled via generic enable devices (e.g. thermostat, timer, button, contactor...) fitted with voltage-free NO contact. This system only provides elementary control (on/off, with fixed setpoint temperature), thus without the important system functions (1). It is advisable to possibly limit its use to simple applications only and with a single appliance.

2.4 TECHNICAL CHARACTERISTICS

Table 2.1 *GA ACF technical data*

					ACF 60-00	ACF 60-00 HR	ACF 60-00 TK	ACF 60-00 HT	ACF 60-00 LB
Operation in conditioning mode									
Unitary cooling power	Outdoor temperature/Delivery temperature	A35W7	kW		17,7			17,1	-
		A35W-5	kW		-				13,3
Heating capacity	nominal (1013 mbar - 15 °C)		kW		25,3				
	real		kW		25,0				
Cold water temperature (flow)	minimum		°C		3 (1)			5	-10
	nominal		°C		7				-5
Cold water temperature (inlet)	maximum		°C		45				
	minimum		°C		8				-7
Water flow rate	maximum		l/h		3500				2900
	nominal		l/h		2770			2675	2600
	minimum		l/h		2500				2300
Internal pressure drop	at nominal water flow		bar		0,29 (2)				0,42 (2)
External air temperature	nominal		°C		35				
	maximum		°C		45			50	45
	minimum		°C		0		-12	0	
Operating recovery circuit									
Recovery unit thermal capacity	Outdoor temperature/Inlet temperature/1000 l/h water flow	A35W40	kW		-	21,0	-		
Hot water temperature (inlet)	nominal		°C		-	40	-		
Hot water temperature (outlet)	nominal		°C		-	58	-		
Water flow rate	maximum		l/h		-	2500	-		
	minimum		l/h		-	0	-		
	nominal		l/h		-	1000	-		
Total GUE (40°C inlet temperature)	Outdoor temperature/Inlet temperature/1000 l/h water flow	A35W7	%		-	155	-		
Electrical specifications									
Power supply	voltage		V		230				
	type		-		single-phase				
	frequency		50 Hz supply		50				
Electrical power absorption	nominal		kW		0,82 (3)				
	nominal silenced		kW		0,87 (3)				
Degree of protection	IP		-		X5D				
Installation data									
Gas consumption	methane G20 (nominal)		m^3/h		2,68 (4)				
	GPL G30/G31 (nominal)		kg/h		1,97 (5)				1,94 (5)
Sound power L_w (max)			dB(A)		79,6 (6)				
Sound power L_w (max) silenced			dB(A)		75,0 (6)				
Sound pressure L_p at 5 metres (max)			dB(A)		57,6 (7)				
Sound pressure L_p at 5 m (maximum) silenced			dB(A)		53,0 (7)				
Maximum water pressure in operation			bar		4				
Water content inside the apparatus	hot side		l		-	3	-		
	cold side		l		3				
Water fitting	type		-		F				
	thread		" G		1 1/4				
Gas connection	type		-		F				
	thread		" G		3/4				

(1) To be set (on demand) during the first startup. Default Minimum Temperature = 4,5 °C.
(2) For flows other than nominal see Design Manual, Pressure losses Paragraph.
(3) ±10% according to the power supply voltage and tolerance on electrical motors consumption. Measured at outdoor temperature of 30 °C.
(4) PCI (G20) 34,02 MJ/m^3 (15 °C - 1013 mbar).
(5) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).
(6) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.
(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.

			ACF 60-00	ACF 60-00 HR	ACF 60-00 TK	ACF 60-00 HT	ACF 60-00 LB
Dimensions	width	mm	850				
	depth	mm	1230				
	height	mm	1445				
	silenced height	mm	1540				
Weight	in operation	kg	360	390	380		

(1) To be set (on demand) during the first startup. Default Minimum Temperature = 4,5 °C.
(2) For flows other than nominal see Design Manual, Pressure losses Paragraph.
(3) ±10% according to the power supply voltage and tolerance on electrical motors consumption. Measured at outdoor temperature of 30 °C.
(4) PCI (G20) 34,02 MJ/m^3 (15 °C - 1013 mbar).
(5) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).
(6) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.
(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.

Table 2.2 *PED data*

			ACF 60-00	ACF 60-00 HR	ACF 60-00 TK	ACF 60-00 HT	ACF 60-00 LB
PED data							
Components under pression	generator	l	18,6				
	leveling chamber	l	11,5				
	evaporator	l	3,7				
	cooling volume transformer	l	-		4,5		
	cooling absorber solution	l	6,3				
	solution pump	l	3,3				
Test pressure (in air)		bar g	55				
Maximum pressure of the cooling circuit		bar g	32				
Filling ratio		kg of NH_3/l	0,157	0,166	0,165	0,148	0,150
Fluid group		-	1°				

2.4.1 Pressure drops

ACF standard, HR, TK, HT

Table 2.3 *GA ACF ACF standard, HR, TK, HT pressure drop*

Water flow rate	Vector fluid temperature at outlet	
	3 °C	7 °C
	Bar	Bar
2600 l/h	0,27	0,26
2900 l/h	0,33	0,31
3500 l/h	0,48	0,46

The data refer to operation with no glycol in water.

LB

Table 2.4 *GA ACF LB pressure drop*

Water flow rate	Vector fluid temperature at outlet		
	-10 °C	-5 °C	0 °C
	Bar	Bar	Bar
2300 l/h	0,44	0,37	0,30
2600 l/h	0,52	0,42	0,35
2900 l/h	0,55	0,47	0,41

The data refer to operation with 40% glycol water.

HR recovery exchanger

Table 2.5 *GA ACF HR heat recover exchanger pressure drop*

Water flow rate	Heat transfer fluid temperatures on inlet		
	30 °C	40 °C	70 °C
	Bar	Bar	Bar
500 l/h	0,01	0,01	0,01
1000 l/h	0,03	0,03	0,03
1500 l/h	0,06	0,06	0,06
2500 l/h	0,16	0,16	0,14

2.4.2 Performances

ACF standard

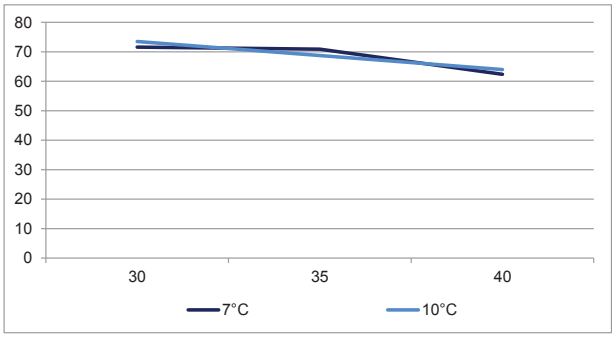
Table 2.6 *p. 5* shows the unitary cooling load at full load and in stable operation, depending on cold water outlet temperature to the system and outdoor temperature, referring to ACF 60-00 unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Table 2.6 *GA ACF standard cooling power for each unit*

External air temperature	Water delivery temperature	
	7 °C	10 °C
	KW	KW
30 °C	17,9	18,4
35 °C	17,7	17,2
40 °C	15,6	16,0
45 °C	11,9	14,8

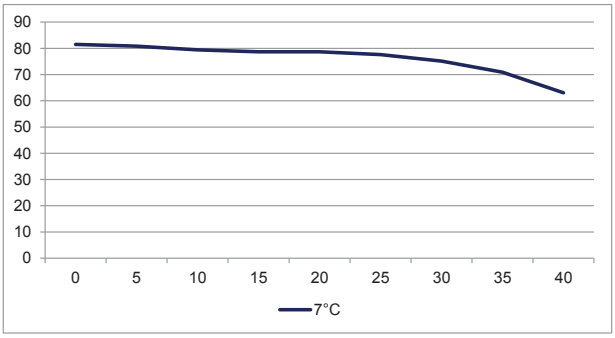
Picture 2.5 *p. 6* shows the GUE trend at full load in conditioning mode and in stable operation for two representative temperatures, referring to ACF 60-00 unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Figure 2.5 *GA ACF standard GUE*



In abscissa the outdoor temperature
In ordinate the full load GUE rate

Figure 2.6 *GA ACF TK GUE*



In abscissa the outdoor temperature
In ordinate the full load GUE rate

TK

Table 2.7 *p. 6* shows the unitary cooling load at full load and in stable operation, depending on cold water outlet temperature to the system and outdoor temperature, referring to ACF 60-00 TK unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Table 2.7 *GA ACF TK cooling power for each unit*

External air temperature	Water delivery temperature	
	4 °C	7 °C
	KW	KW
-10 °C	20,9	20,9
-5 °C	20,6	20,6
0 °C	20,4	20,4
5 °C	20,1	20,2
10 °C	19,9	19,9
15 °C	19,7	19,7
20 °C	19,3	19,7
25 °C	18,6	19,4
30 °C	16,9	18,8
31 °C	16,4	18,6
35 °C	13,8	17,7
40 °C	/	15,8
45 °C	/	/

Picture 2.6 *p. 6* shows the GUE trend at full load in conditioning mode and in stable operation for a representative temperature, referring to ACF 60-00 TK unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

HT

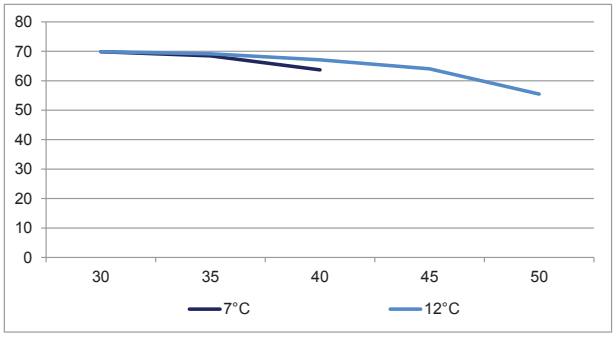
Table 2.8 *p. 6* shows the unitary cooling load at full load and in stable operation, depending on cold water outlet temperature to the system and outdoor temperature, referring to ACF 60-00 HT unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Table 2.8 *GA ACF HT cooling power for each unit*

External air temperature	Water delivery temperature	
	7 °C	10 °C
	KW	KW
30 °C	17,5	17,5
35 °C	17,1	17,1
40 °C	15,9	16,6
45 °C	/	15,2
50 °C	/	/

Picture 2.7 *p. 6* shows the GUE trend at full load in conditioning mode and in stable operation for two representative temperatures, referring to ACF 60-00 HT unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Figure 2.7 *GA ACF HT GUE*



In abscissa the outdoor temperature
In ordinate the full load GUE rate

LB

Table 2.9 *p. 7* shows the unitary cooling load at full load and in stable operation, depending on cold water outlet temperature to the system and outdoor temperature, referring to ACF

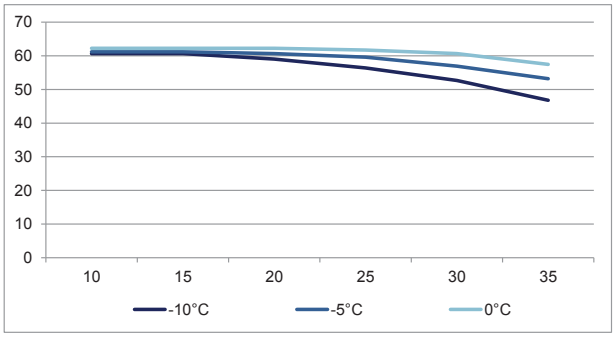
60-00 LB unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Table 2.9 *GA ACF LB cooling power for each unit*

External air temperature	Water delivery temperature		
	-10 °C	-5 °C	0 °C
	KW	KW	KW
10 °C	15,2	15,3	15,6
15 °C	15,2	15,3	15,6
20 °C	14,8	15,2	15,6
25 °C	14,1	14,9	15,4
30 °C	13,2	14,2	15,2
35 °C	11,7	13,3	14,4
40 °C	9,6	11,8	13,3

Picture 2.8 *p. 7* shows the GUE trend at full load in conditioning mode and in stable operation for three representative temperatures, referring to ACF 60-00 LB unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Figure 2.8 *GA ACF LB GUE*



Data for 40% glycol water.
In abscissa the outdoor temperature
In ordinate the full load GUE rate

HR

Table 2.10 *p. 7* shows the unitary cooling load at full load and in stable operation, depending on cold water outlet temperature to the system and outdoor temperature, referring to ACF 60-00 HR unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Table 2.10 *GA ACF HR cooling power for each unit*

External air temperature	Water delivery temperature	
	7 °C	10 °C
	KW	KW
30 °C	17,7	18,2
35 °C	17,7	17,2
40 °C	16,8	16,1
45 °C	14,2	15,4

In the Tables 2.11 *p. 7* and 2.12 *p. 7*, the unitary recoverable thermic power at full load and in stable operating mode, depending on the temperature of the thermal input fluid to the recuperator and the external temperature for two reference water flow to the recuperator, respectively 1000 l/h (Table 2.11 *p. 7*) and 500 l/h (Table 2.12 *p. 7*), referring to the ACF 60-00 HR unit.
Consider that in the absence of a refrigeration request no recoverable thermal power will be available.

Table 2.11 *Recoverable thermal power for each GA ACF HR with 1000 l/h water flow*

External air temperature	Heat transfer fluid temperature on inlet			
	20 °C	30 °C	40 °C	50 °C
	KW	KW	KW	KW
30 °C	31,3	25,1	19,1	13,2
35 °C	32,0	26,2	21,0	15,5
40 °C	/	28,0	23,0	17,5
45 °C	/	30,0	25,1	19,2

The figures refer to temperature on recovery exchanger inlet, with flow rate to recovery exchanger of 1000 l/h.

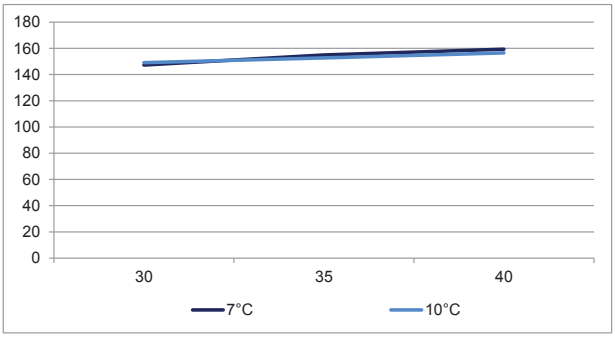
Table 2.12 *Recoverable thermal power for each GA ACF HR with 500 l/h water flow*

External air temperature	Heat transfer fluid temperature on inlet				
	10 °C	20 °C	30 °C	40 °C	50 °C
	KW	KW	KW	KW	KW
30 °C	27,5	23,0	18,1	13,5	9,3
35 °C	27,9	23,5	19,1	14,9	11,0
40 °C	28,2	24,4	20,1	16,3	12,8
45 °C	28,5	25,0	21,2	18,0	14,9

The figures refer to temperature on recovery exchanger inlet, with flow rate to recovery exchanger of 500 l/h.

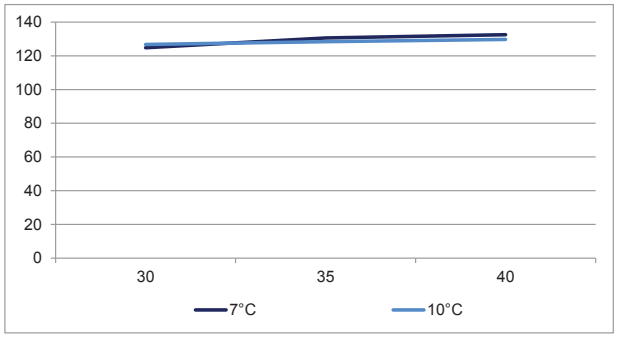
Pictures 2.9 *p. 7* and 2.10 *p. 8* shows the GUE trend at full load in conditioning mode and simultaneous heat recovery in stable operation for two representative temperatures and two water flow rates to the recovery exchanger, referring to ACF 60-00 HR unit.
Please consider that, according to the actual cooling request, the unit may often need to operate under partial load conditions and in non stationary operation.

Figure 2.9 *GA ACF HR GUE with heat recovery 1000 l/h return 40°C*



Data refer to simultaneous operation for conditioning and heat recovery.
Recovery exchanger conditions: flow rate 1000 l/h, inlet temperature 40°C.
In abscissa the outdoor temperature
In ordinate the full load GUE rate

Figure 2.10 *GA ACF HR GUE with heat recovery 500 l/h return 40°C*



Data refer to simultaneous operation for conditioning and heat recovery.
Recovery exchanger conditions: flow rate 500 l/h, inlet temperature 40°C.
In abscissa the outdoor temperature
In ordinate the full load GUE rate

3 DESIGN

Compliance with installation standards

Design and 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;
- cooling systems;
- gas systems;
- flue gas exhaust;
- flue gas condensate discharge.

Design and installation must also comply with the manufacturer's provisions.

3.1 PLUMBING DESIGN

Please refer to Section C1.04.

3.2 FUEL GAS SUPPLY

Please refer to Section C1.09.

3.3 COMBUSTION PRODUCTS EXHAUST

The GA ACF units have no flue gas exhaust.

3.4 ELECTRICAL AND CONTROL CONNECTIONS

3.4.1 Warnings

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 (GS) to turn the appliance on and off, since it may be damaged in the long run (occasional black outs are tolerated).
- To turn the appliance on and off, exclusively use the suitably provided control device (DDC or external enable).

Control of water circulation pump

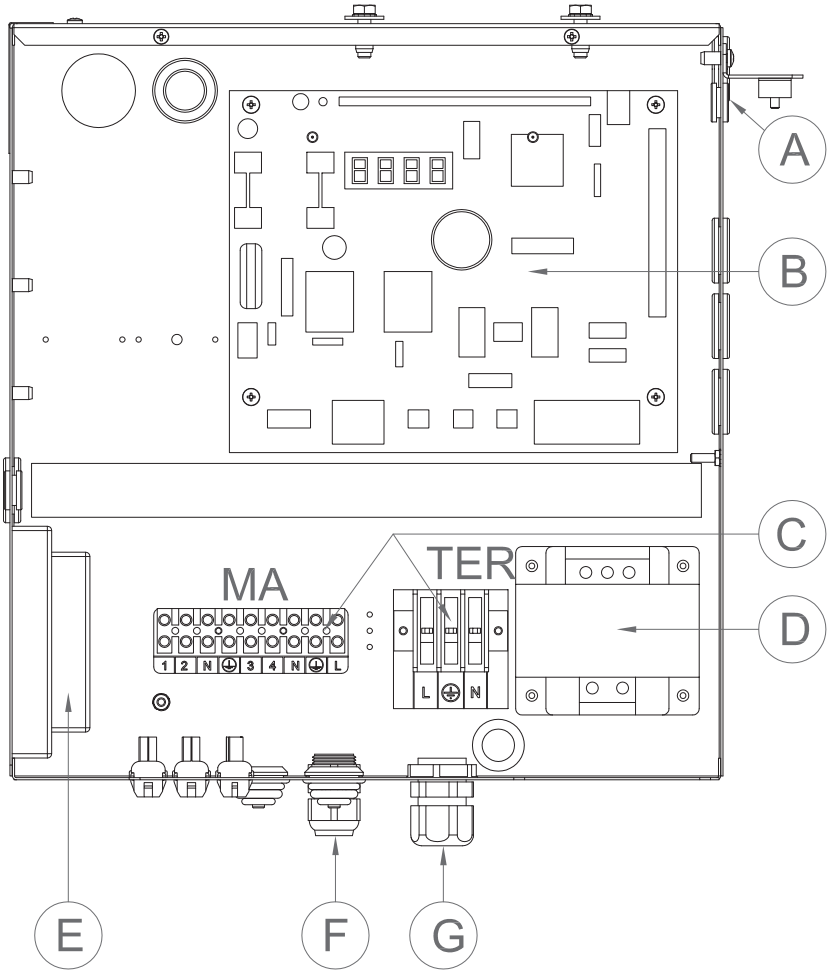
The water circulation pump of the water/primary circuit must mandatorily be controlled by the appliance's electronic boards. It is not admissible to start/stop the circulating pump with no request from the appliance.

3.4.2 Electrical systems

Electrical connections must provide:

► (a) power supply;
► (b) control system.

Figure 3.1 *ACF Electrical Panel*



A CAN-BUS cable gland
B S61 electronic boards
C ME and TER terminal boards
D transformer 230/23 V AC
E flame control box
F circulation pump power supply and control cable gland
G GA power supply cable gland

Terminals:
TER terminal box
L-(PE)-N phase/earth/neutral GA power supply
MA terminal box
N-(PE)-L neutral/earth/phase circulation pump power supply
3-4 circulation pump enable

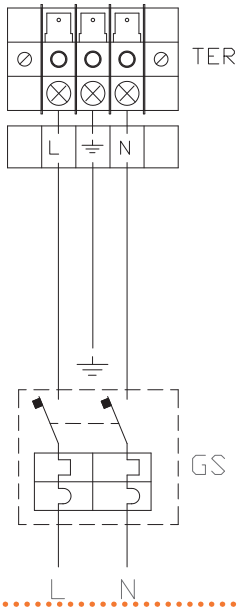
3.4.3 Electrical power supply

Power supply line

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 two 5A type T fuses, (GS) or one 10A magnetothermic breaker.

Figure 3.2 *Electrical wiring diagram - Example of connection of appliance to 230 V 1 N - 50 Hz electricity supply*



TER terminal block
L phase
N neutral

Components NOT SUPPLIED
GS general switch

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

3.4.4 Set-up and control

Control systems, options (1) or (2)

Two separate control systems are provided, each with specific features, components and diagrams (Figures 3.4 *p. 12*, 3.5 *p. 12*):

- ► System (1), with **DDC control** (with CAN-BUS connection).
- ► System (2), with an **external request**.

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 devices.
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).

CAN-BUS signal cable

The DDC controller is connected to the appliance through the CAN-BUS signal cable, shielded, compliant to Table 3.1 *p. 11* (admissible types and maximum distances).
For lengths ≤200 m and max 4 nodes (e.g. 1 DDC + 3 GAHP), a simple 3x0.75 mm shielded cable may even be used.

Table 3.1 *CAN BUS cables type*

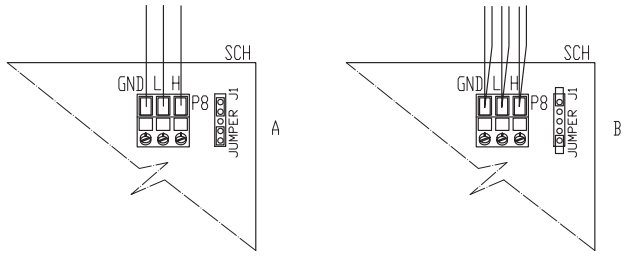
CABLE NAME	SIGNALS / COLOR			MAX LENGTH	Note
Robur					Ordering Code OCVO008
ROBUR NETBUS	H= BLACK	L= WHITE	GND= BROWN	450 m	
Honeywell SDS 1620					In all cases the fourth conductor should not be used
BELDEN 3086A	H= BLACK	L= WHITE	GND= BROWN	450 m	
TURCK type 530					
DeviceNet Mid Cable					
TURCK 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 S61 electronic board, located in the Electrical Panel inside the appliance, Pictures 3.3 *p. 11* and 3.4 *p. 12* Details A and B:

1. Access the Electrical Board of the appliance according to the Procedure 3.4.2 *p. 9*);
2. Connect the CAN-BUS cable to terminals GND, L and H (shielding/earthing + two signal conductors);
3. Place the CLOSED J1 Jumpers (Detail A) if the node is terminal (one connected CAN-BUS cable section only), or OPEN (Detail B) if the node is intermediate (two connected CAN-BUS cable sections);
4. Connect the DDC to the CAN-BUS cable according to the instructions of the following Paragraphs and DDC Manual.

Figure 3.3 *Electrical wiring diagram - Connection cable CAN BUS to electronic board*

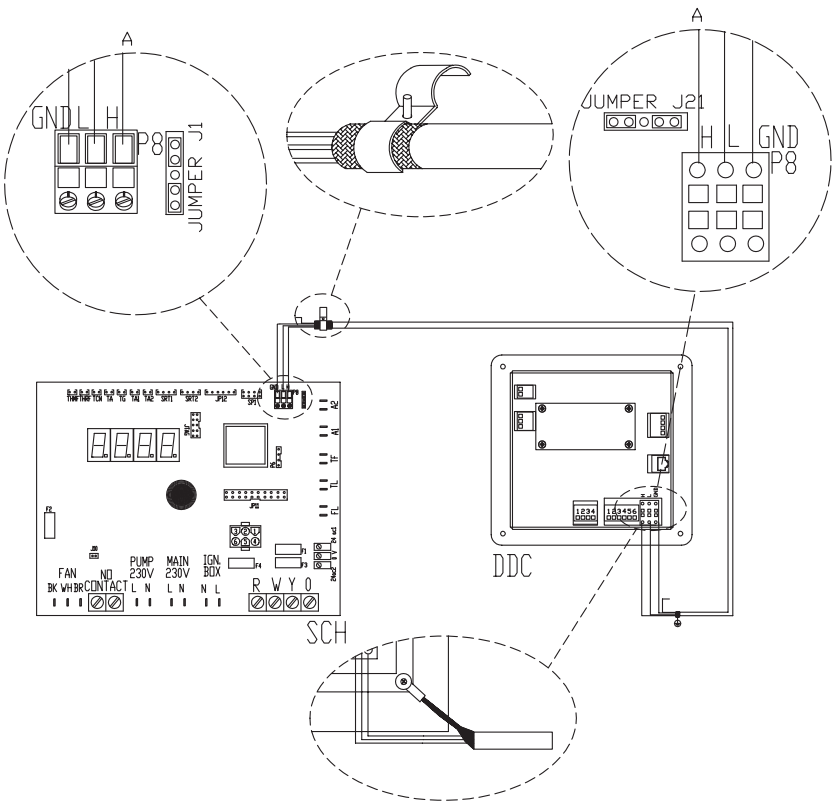


SCH	Electronic board
GND	Common data
L	Data signal LOW
H	Data signal HIGH
J1	Jumper CAN-BUS in board
A	detail of "terminal node" case (3 wires; J1=jumper "closed")
B	Detail of "intermediate node" case (6 wires; J1=jumper "open")
P8	CAN port/connector

GAHP Configuration (S61) + DDC

(System (1) Picture 3.4 *p. 12*, see also Paragraph 2.3 *p. 3*)

Figure 3.4 *CAN-BUS connection for systems with one unit*



DDC Direct Digital Control
SCH electronic board S61
J1 Jumper CAN-BUS in board S61
J21 Jumper CAN-BUS in board DDC
A terminal node connection (3 wires; J1 and J21 = "closed")
H,L,GND data signal wires (ref. cables table)

External request

(System (2), Picture 3.5 *p. 12*, see also Paragraph 2.3 *p. 3*)
It is required to arrange:

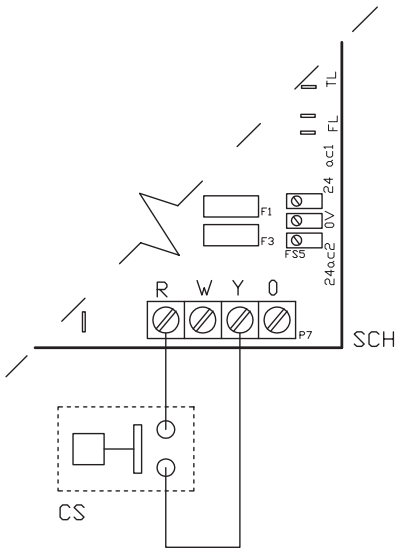
► request device (e.g. thermostat, clock, button, ...) fitted with a voltage-free NO contact.

How to connect the external request

Connection of external request is effected on the S61 board located in the Electrical Panel inside the unit (Figure 3.5 *p. 12*):

1. Access the Electrical Board of the appliance according to the Procedure 3.4.2 *p. 9*.
2. Connect the voltage free contact of the external device (Detail CS), through two wires, to **terminals R and Y** (respectively: common 24 V AC and cooling request) of electronic board S61.

Figure 3.5 *Wiring diagram, external cooling enable connection*



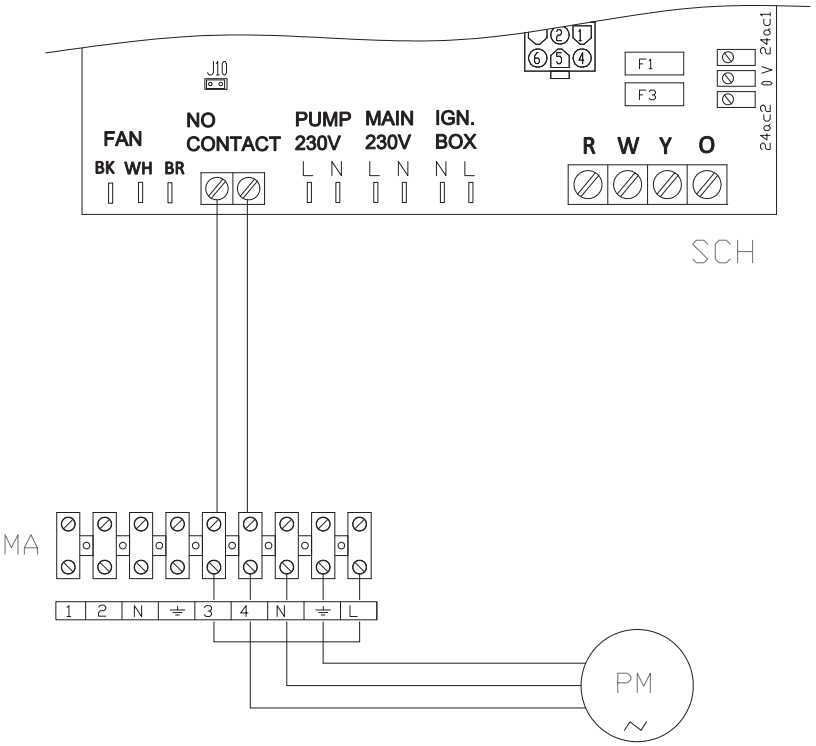
SCH Electronic board
R Common
Y Cooling request terminal
Components NOT SUPPLIED
CS External request

3.4.5 Water circulation pump

CONSTANT FLOW circulating pump

It must be mandatorily controlled from the S61 electronic board. The diagram in Figure 3.6 *p. 13* is for pumps < 700 W. For pumps > 700 W it is required to add a control relay and arrange Jumper J10 OPEN.

Figure 3.6 *Water circulation pump connection - Connection of plant water circulation pumps (power absorption less than 700W), controlled directly by the appliance.*

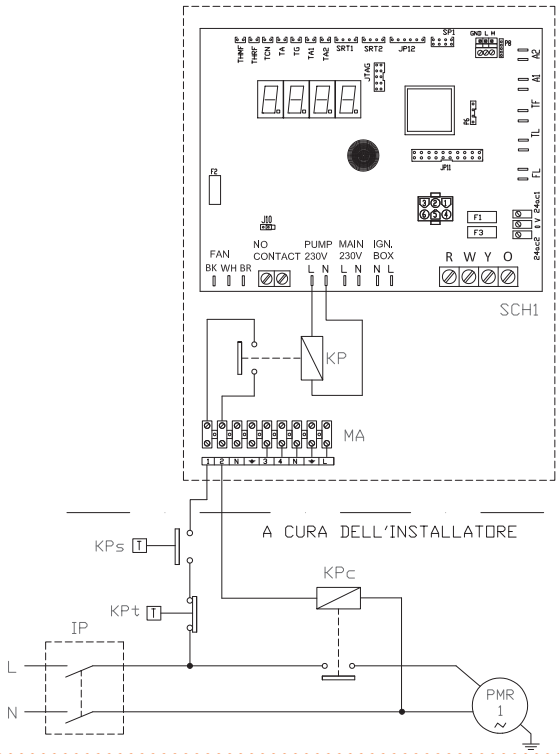


SCH electronic board
J10 closed jumper
N.O. CONTACT N.O voltage free contacts
MA unit terminal block
L phase
N neutral
Components NOT SUPPLIED
PM water pump < 700W

Heat recovery exchanger circulating pump (Figure 3.7 *p. 13*).

To be controlled through contacts 1 - 2 on terminal board MA

Figure 3.7 *Recovery exchanger pump connection wiring diagram*



KP Relay on the unit for recovery exchanger pump request
KPt Thermostat with setpoint calibration of DHW tank (not supplied)
KPs Thermostat calibrated at 35 °C with capillary tube in the lower part of the DHW tank (not supplied) [to be provided in the event the water flow rate on the recovery circuit exceeds the nominal value of 1000 l/h]
KPc Two-pole relay for recovery exchanger pump request (not supplied)
IP Two-pole isolation switch for recovery exchanger pump power supply (not supplied)
PMR Recovery exchanger pump (not supplied)