1 SPECIFICATION OF SUPPLY

1.1 ARAY35/4

Integrated package consisting of a water-ammonia absorption heat pump, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 33,4 kW, fed with natural gas or LPG, for the hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 4-pipe plumbing configuration (separate water circuits for heat pump and boiler).
Heat output for each unit (A7W35): 73,8 kW
GUE efficiency (A7W35): 125 %
Heat input (heating): 59,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,19 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 467 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1445 mm

1.2 ARAY35/4 S

Integrated package consisting of a water-ammonia absorption heat pump with low-noise fan, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 33,4 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 4-pipe plumbing configuration (separate water circuits for heat pump and boiler).
Heat output for each unit (A7W35): 73,8 kW
GUE efficiency (A7W35): 125 %
Heat input (heating): 59,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,22 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 477 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1513 mm

1.3 ARAY35/2

Integrated package consisting of a water-ammonia absorption heat pump, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 33,4 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 2-pipe plumbing configuration (single water circuit for heat pump and boiler).
Heat output for each unit (A7W35): 73,8 kW
GUE efficiency (A7W35): 125 %
Heat input (heating): 59,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,19 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 467 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1445 mm

1.4 ARAY35/2 S

Integrated package consisting of a water-ammonia absorption heat pump with low-noise fan, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 33,4 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 2-pipe plumbing configuration (single water circuit for heat pump and boiler).
Heat output for each unit (A7W35): 73,8 kW
GUE efficiency (A7W35): 125 %
Heat input (heating): 59,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,22 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 477 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1513 mm

1.5 ARAY50/4

Integrated package consisting of a water-ammonia absorption heat pump, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 49,2 kW, fed with natural gas or LPG, for the hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 4-pipe plumbing configuration (separate water circuits for heat pump and boiler).
Heat output for each unit (A7W35): 90,8 kW
GUE efficiency (A7W35): 121 %
Heat input (heating): 75,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,22 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 477 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1445 mm

1.6 ARAY50/4 S

Integrated package consisting of a water-ammonia absorption heat pump with low-noise fan, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 49,2 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of

the appliances comprising it, in a 4-pipe plumbing configuration (separate water circuits for heat pump and boiler).
Heat output for each unit (A7W35): 90,8 kW
GUE efficiency (A7W35): 121 %
Heat input (heating): 75,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,25 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 487 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1513 mm

1.7 ARAY50/2

Integrated package consisting of a water-ammonia absorption heat pump, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 49,2 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 2-pipe plumbing configuration (single water circuit for heat pump and boiler).
Heat output for each unit (A7W35): 90,8 kW
GUE efficiency (A7W35): 121 %
Heat input (heating): 75,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,22 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 477 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1445 mm

1.8 ARAY50/2 S

Integrated package consisting of a water-ammonia absorption heat pump, fed with natural gas or LPG, air-water version, reversible, for hot water production up to a delivery temperature of 60 °C and alternatively cold water down to a delivery temperature of 3 °C, and a modulating condensing boiler with sealed chamber, effective power 49,2 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, suitable for outdoor installation and equipped with independent high head water pumps for each of the appliances comprising it, in a 2-pipe plumbing configuration (single water circuit for heat pump and boiler).
Heat output for each unit (A7W35): 90,8 kW
GUE efficiency (A7W35): 121 %
Heat input (heating): 75,2 kW
Cooling output for each unit (A35W7): 16,9 kW
Heat input (cooling): 25,2 kW
Electrical power absorption nominal: 1,25 kW
Power supply: 230 V - 50 Hz single-phase
Weight: 487 kg
Dimensions: width 1425 mm, depth 1238 mm, height 1513 mm

2 FEATURES

2.1 FEATURES

The Gitié 2.0 ARAY package consists of a GAHP-AR reversible heat pump and a AY 35 (ARAY35) or AY 50 (ARAY50) 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 2.1 *p. 2*), the heat pump is available with a standard or low-noise fan.
In all 4-pipe versions, the operation of the units can always be simultaneous or alternating. In all 2-pipe versions, the operation of the units can only be simultaneous when the heat pump is active in heating mode.
The 2-pipe versions (with a single hydraulic circuit) are equipped with check valves serving each of the units making up the Gitié 2.0 ARAY package.

Table 2.1 *Gitié ARAY package versions*

Version	Boiler	Pipes	Hydraulic circuits	Simultaneous operation	Fan
ARAY35/4	AY 35	4	independent	Yes	standard
ARAY35/4 S	AY 35	4	independent	Yes	low-noise S
ARAY35/2	AY 35	2	single	(1)	standard
ARAY35/2 S	AY 35	2	single	(1)	low-noise S
ARAY50/4	AY 50	4	independent	Yes	standard
ARAY50/4 S	AY 50	4	independent	Yes	low-noise S
ARAY50/2	AY 50	2	single	(1)	standard
ARAY50/2 S	AY 50	2	single	(1)	low-noise S

1 In 2 pipe versions operation may only be simultaneous when the GAHP-AR unit operates in heating mode.

2.1.1 GAHP-AR Unit features

2.1.1.1 Operation

Based on the thermodynamic water-ammonia absorption cycle (H_20–NH_3), the appliance alternatively produces hot water or chilled water with (seasonal) switching of the hot/cold cycle, using outdoor air as a renewable energy 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-AR unit, for heating and/or cooling systems, is able to alternatively (not simultaneously) provide:
- ► Hot water up to 60 °C.
- ► Chilled water down to 3 °C.

2.1.1.2 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.
- Air exchanger with finned coil, with steel pipe and aluminium fins.
- Inversion valve on the cooling circuit, for use of the appliance in heating or cooling mode.
- Automatic microprocessor-controlled finned coil defrosting valve.
- Low power consumption refrigerant fluid oil pump.
- Variable-flow (for summer operation) microprocessor-controlled helicoidal motor-fan.
- Standard or low noise S fan.

2.1.1.3 Control and safety devices

- S61 electronic board with microprocessor, LCD display and knob.
- Auxiliary AR11 electronic board.
- Circuit water flow switch.
- Generator limit thermostat, with manual reset.
- PT1000 flue gas temperature probe.
- Differential flue gas pressure switch on the combustion circuit.
- Sealed circuit safety relief valve.
- Bypass valve, between high and low-pressure circuits.
- Ionization flame control box.
- Double shutter electric gas valve.

2.1.2 AY unit features

2.1.2.1 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 ARAY unit: AY 35 and AY 50.

2.1.2.2 Mechanical and thermo-hydraulic components

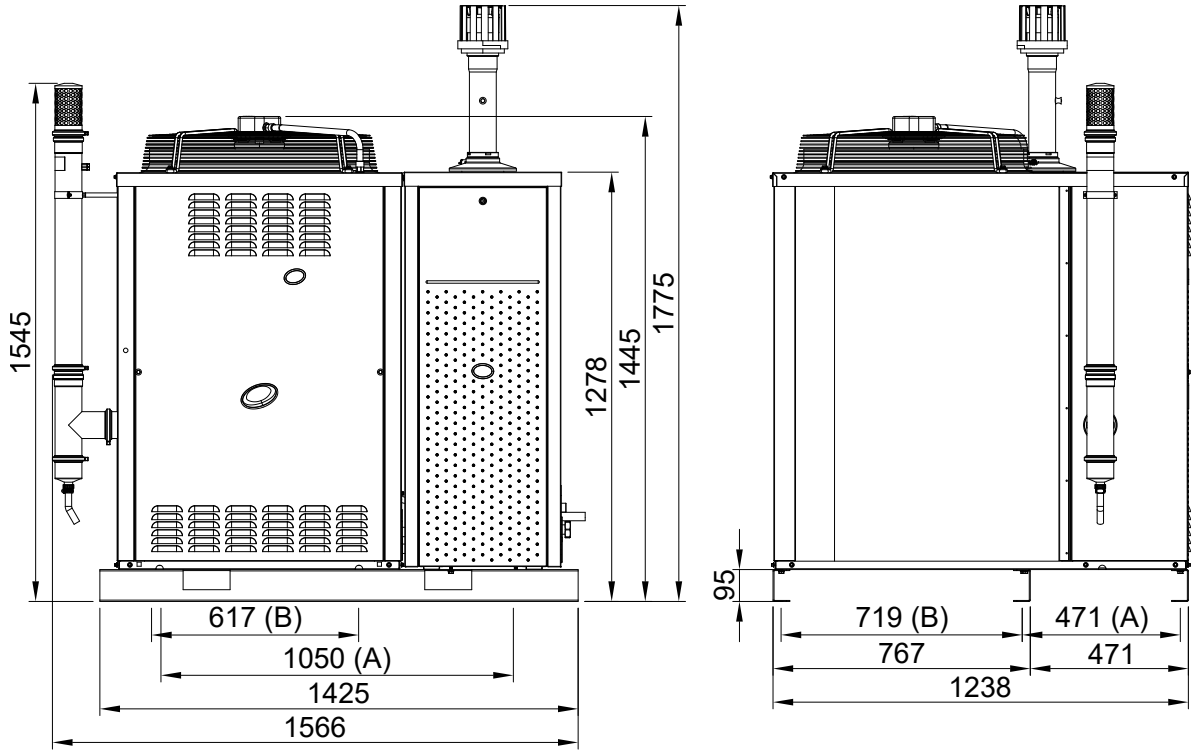
- Integrated spiral single tube stainless steel heat exchanger.
- Premix modulating burner with 1:9 ratio (AY 35), 1:10 (AY 50).
- Automatic air vent valve.
- High efficiency water pump.
- System drain tap.
- Water temperature probes.
- Condensate drain siphon.
- Flue gas exhaust duct with relevant terminal,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

2.1.2.3 Control and safety devices

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

2.2 DIMENSIONS

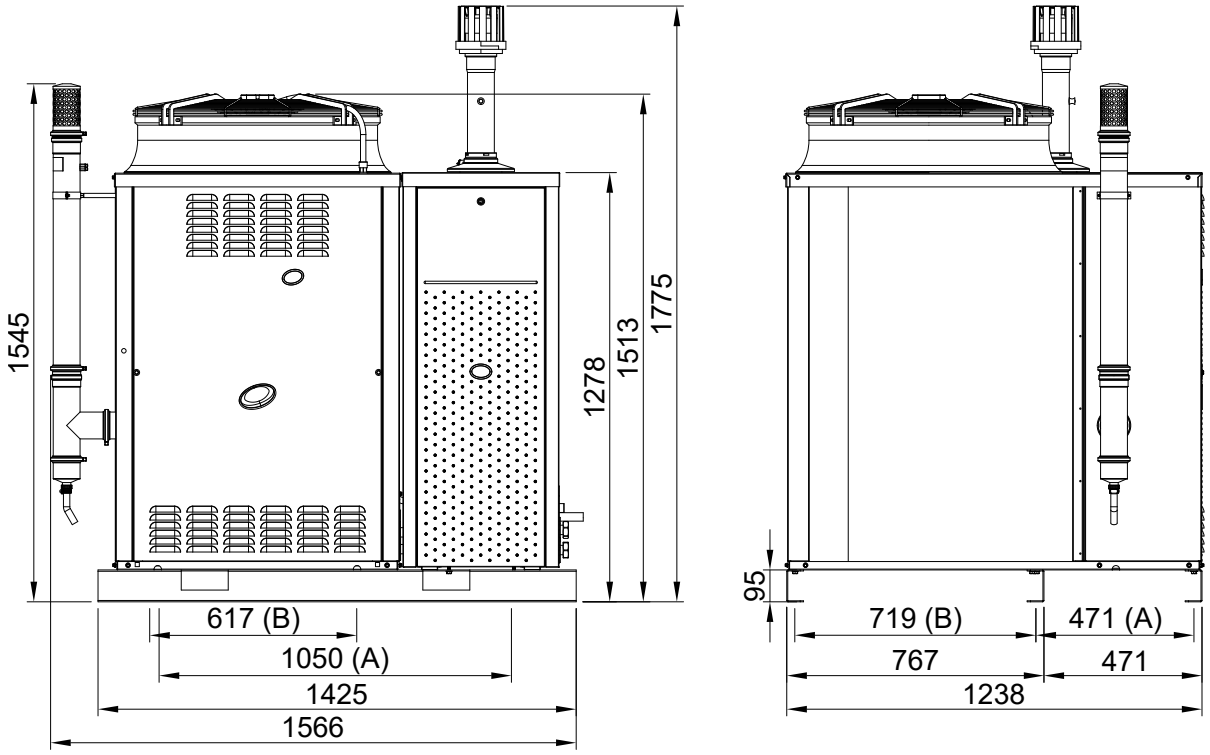
Figure 2.1 *Dimensions (standard fan)*



A Centre distance of holes for front vibration damper supports

B Centre distance of holes for rear vibration damper supports

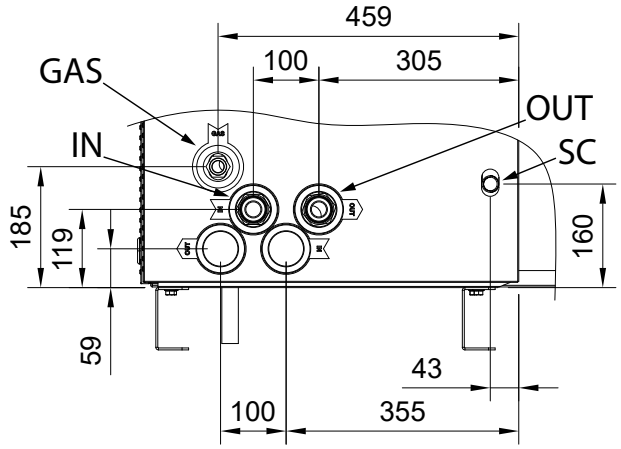
Figure 2.2 *Dimensions (low-noise fan)*



A Centre distance of holes for front vibration damper supports

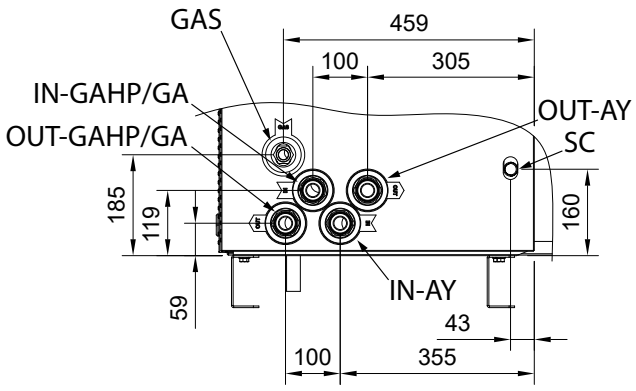
B Centre distance of holes for rear vibration damper supports

Figure 2.3 *Gitié /2 service plate - Hydraulic/gas connections detail*



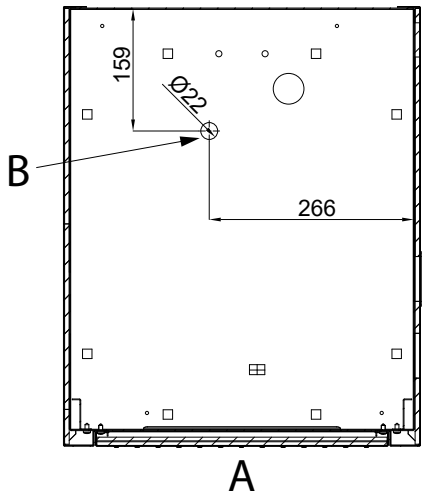
OUT Water outlet connection Ø 1 1/4" F
IN Water inlet connection Ø 1 1/4" F
SC AY condensate drain connection (outside diameter 25 mm, inside 21 mm)
GAS Gas connection Ø 3/4" M

Figure 2.4 *Gitié /4 service plate - Hydraulic/gas connections detail*



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 AY condensate drain connection (outside diameter 25 mm, inside 21 mm)
GAS Gas connection Ø 3/4" M

Figure 2.5 *Service plate - Detail of bottom plate*



A AY front panel
B Boiler safety valve drain outside Ø 20 mm, inside Ø 14 mm

2.3 CONTROLS

2.3.1 Control device

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

1. DDC control
2. external requests

2.3.2 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).
DDC functionality may be extended with auxiliary Robur devices RB100 and RB200 (e.g. service requests, DHW production, third party generator control, probe control, system valves or circulating pumps, ...).

For more details see Section C01.11.

2.3.3 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 2.0 ARAY (GAHP-AR and AY boiler). The AY boiler retains the possibility of operating in power modulation.

2.4 PRESSURE DROPS

2.4.1 GAHP-AR

2.4.1.1 Heating

Table 2.2 *Pressure drop GAHP-AR heating mode*

Hot water flow	Heat transfer fluid temperature at outlet		
	35 °C	50 °C	60 °C
	bar	bar	bar
2500 l/h	0,22	0,21	0,20
3000 l/h	0,30	0,29	0,28
3500 l/h	0,40	0,38	/

2.4.1.2 Cooling

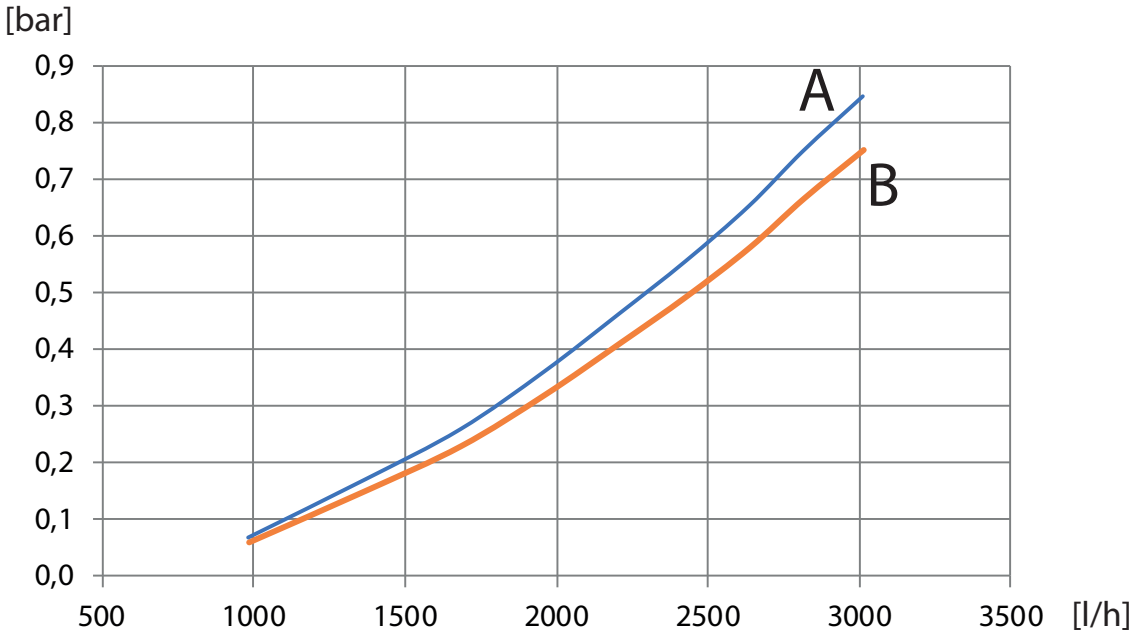
Table 2.3 *Pressure drop GAHP-AR cooling mode*

Cold water flow	Heat transfer fluid temperature at outlet		
	3 °C	7 °C	10 °C
	bar	bar	bar
2500 l/h	0,26	0,24	0,23
3000 l/h	0,35	0,33	0,32
3500 l/h	0,48	0,46	0,45

The data refer to operation with no glycol in water.

2.4.2 AY 35

Figure 2.6 *Available head and pressure drop of the boiler*

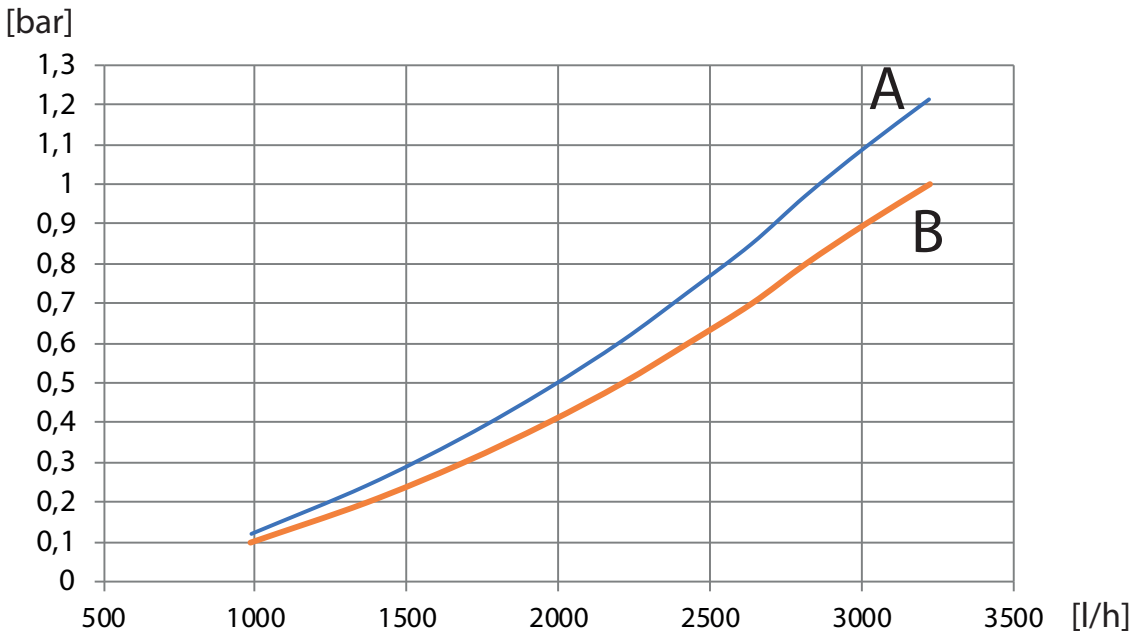


A Boiler pressure drop with 20% glycol water

B Boiler pressure drop with no glycol in water

2.4.3 AY 50

Figure 2.7 *Pressure drop AY 50 and AY 100*

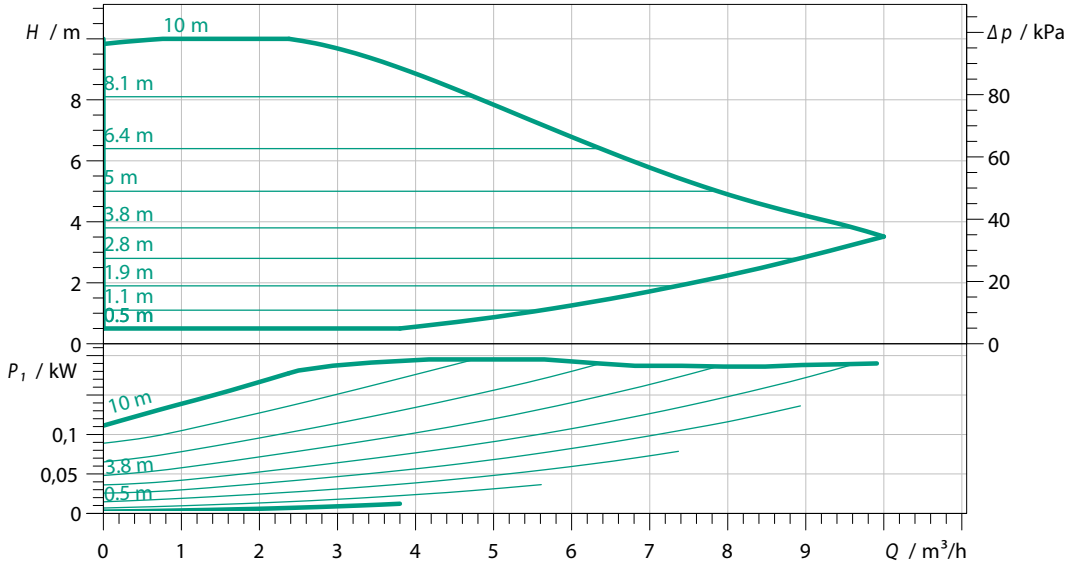


A Boiler pressure drop with 35% glycol water

B Boiler pressure drop with no glycol in water

2.5 CIRCULATING PUMP CHARACTERISTIC CURVES

Figure 2.8 *Oversized pressure head circulating pump characteristic curves*



2.6 PERFORMANCES

2.6.1 ARAY35

2.6.1.1 Heating

Table 2.4 *p. 7* shows the heat output at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.4 *Gitié ARAY35 heating output*

Outdoor temperature	Water delivery temperature					
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
	kW	kW	kW	kW	kW	kW
-20 °C	62,5	61,2	60,1	59,6	58,8	57,7
-15 °C	63,8	62,5	61,4	60,5	59,6	58,5
-10 °C	65,9	64,3	62,9	61,7	60,9	59,8
-5 °C	68,6	67,1	65,8	63,9	63,0	61,8
0 °C	70,9	69,8	68,8	66,0	64,6	62,9
5 °C	73,0	72,2	71,6	68,7	67,1	65,2
7 °C	73,8	73,2	72,7	70,0	68,3	66,4
10 °C	74,6	74,0	73,6	71,1	69,6	67,9
15 °C	75,3	74,7	74,3	72,3	70,9	69,2

Table 2.5 *p. 7* shows the GUE at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.5 *Gitié ARAY35 heating efficiency*

Outdoor temperature	Water delivery temperature					
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
	%	%	%	%	%	%
-20 °C	106	103	102	101	99	97
-15 °C	108	106	104	102	101	99
-10 °C	111	109	106	104	103	101
-5 °C	116	113	111	108	106	104
0 °C	120	118	116	112	109	106
5 °C	123	122	121	116	113	110
7 °C	125	124	123	118	115	112
10 °C	126	125	124	120	118	115
15 °C	127	126	125	122	120	117

Please consider that, according to the actual heating request, the appliance may often need to operate under partial load conditions and in non-stationary operation.

2.6.1.2 Cooling

Table 2.6 *p. 8* shows the cooling output at full load and in stable operation, depending on the cold water delivery temperature to the system and outdoor temperature.

Table 2.6 *Gitié ARAY cooling output*

Outdoor temperature	Water delivery temperature	
	7 °C	10 °C
	kW	kW
30 °C	17,8	18,1
35 °C	16,9	17,4
40 °C	15,0	16,0
45 °C	\	13,5

Table 2.7 *p. 8* shows the GUE at full load and stable operation in cooling mode, depending on the cold water delivery temperature to the system and outdoor temperature.

Table 2.7 *Gitié ARAY cooling efficiency*

Outdoor temperature	Water delivery temperature	
	7 °C	10 °C
	%	%
30 °C	71	72
35 °C	67	69
40 °C	60	63
45 °C	/	54

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.

2.6.2 ARAY50

2.6.2.1 Heating

Table 2.8 *p. 8* shows the heat output at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.8 *Gitié ARAY50 heating output*

Outdoor temperature	Water delivery temperature					
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
	kW	kW	kW	kW	kW	kW
-20 °C	79,5	78,0	76,6	75,9	74,9	73,4
-15 °C	80,7	79,2	77,9	76,8	75,7	74,2
-10 °C	82,8	81,0	79,4	78,0	76,9	75,5
-5 °C	85,6	83,8	82,4	80,2	79,1	77,5
0 °C	87,9	86,5	85,4	82,4	80,7	78,7
5 °C	90,0	89,0	88,2	85,1	83,2	80,9
7 °C	90,8	89,9	89,3	86,3	84,4	82,1
10 °C	91,5	90,7	90,1	87,4	85,7	83,6
15 °C	92,2	91,4	90,9	88,6	86,9	84,9

Table 2.9 *p. 8* shows the GUE at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.9 *Gitié ARAY50 heating efficiency*

Outdoor temperature	Water delivery temperature					
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
	%	%	%	%	%	%
-20 °C	106	104	102	101	100	98
-15 °C	107	105	104	102	101	99
-10 °C	110	108	106	104	102	100
-5 °C	114	111	110	107	105	103
0 °C	117	115	113	110	107	105
5 °C	120	118	117	113	111	108
7 °C	121	120	119	115	112	109
10 °C	122	121	120	116	114	111
15 °C	123	122	121	118	116	113

Please consider that, according to the actual heating request, the appliance may often need to operate under partial load conditions and in non-stationary operation.

2.6.2.2 Cooling

See Paragraph 2.6.1.2 *p. 8*.

2.7 INAIL SAFETY APPLIANCES

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

3 TECHNICAL DATA

3.1 ARAY INTEGRATED PACKAGE TECHNICAL DATA

Table 3.1 *Technical data Gitié ARAY*

				ARAY35/2	ARAY35/2 S	ARAY35/4	ARAY35/4 S	ARAY50/2	ARAY50/2 S	ARAY50/4	ARAY50/4 S
Heating operation											
Heat input	real		kW	59,2				75,2			
Heat output for each unit	Outdoor temperature/ Water outlet temperature	A7W35	kW	73,8				90,8			
		A7W40	kW	73,2				89,9			
		A7W50	kW	70,0				86,3			
		A-7W50	kW	63,1				79,4			
GUE efficiency	Outdoor temperature/ Water outlet temperature	A7W35	%	125				121			
		A7W40	%	124				120			
		A7W50	%	118				115			
		A-7W50	%	107				106			
Water flow rate 4 pipes	nominal (AY)		l/h	2600				2350			
	minimum (AY)		l/h	1200				1500			
	nominal (GAHP)		l/h	3040							
	minimum (GAHP)		l/h	2500							
Water flow rate 2 pipes	nominal		l/h	5640				5390			
	minimum		l/h	3700				4000			
Pressure drop heating mode	GAHP	at nominal water flow (A7W50)	bar	0,29 (1)							
	AY	at nominal water flow	bar	0,57 (1)							
Residual pressure head at nominal flow rate	version /4 GAHP		bar	-		0,72		-		0,72	
	version /4 AY		bar	-		0,44		-		0,44	
	version /2		bar	0,42		-		0,42		-	
Hot water outlet temperature	maximum for heating		°C	60 (2)							
	maximum for DHW		°C	88							
Hot water inlet temperature	maximum for heating		°C	50							
	maximum for DHW		°C	70							
	minimum temperature in continuous operation		°C	30 (3)							
Outdoor temperature (dry bulb)	maximum		°C	35							
	minimum		°C	-20							
Cooling mode											
Heat input	real		kW	25,2							

(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) Gas not available for the appliance.
(5) Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in compliance with standard EN ISO 9614.
(6) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

				ARAY35/2	ARAY35/2 S	ARAY35/4	ARAY35/4 S	ARAY50/2	ARAY50/2 S	ARAY50/4	ARAY50/4 S
Cooling output for each unit	Outdoor temperature/ Water outlet temperature	A35W7	kW	16,9							
GUE efficiency	Outdoor temperature/ Water outlet temperature	A35W7	%	67							
Cold water temperature (outlet)	minimum		°C	3							
Cold water temperature (inlet)	maximum		°C	45							
	minimum		°C	8							
Cold water flow	nominal		l/h	2900							
	minimum		l/h	2500							
Pressure drop cooling mode	GAHP/GA	at nominal water flow	bar	0,31 (1)							
Residual pressure head at nominal flow rate	version /4 GAHP		bar	-		0,70		-		0,70	
	version /2		bar	0,68		-		0,68		-	
Outdoor temperature	maximum		°C	45							
	minimum		°C	0							
Electrical specifications											
Power supply	voltage		V	230							
	type		-	single-phase							
	frequency		Hz	50							
Electrical power absorption	nominal		kW	1,19	1,22	1,19	1,22	1,25	1,22	1,25	
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			
	G27 (nominal)		m^3/h	- (4)				9,77			
	G2.350 (nominal)		m^3/h	- (4)				11,12			
	G30 (nominal)		kg/h	4,71				5,97			
	G31 (nominal)		kg/h	4,64				5,88			
Dimensions	width		mm	1425							
	height		mm	1445	1513	1445	1513	1445	1513	1445	1513
	depth		mm	1238							
Gas connection	thread		"	3/4							
	type		-	M							
Water fitting	thread		"	1 1/4							
	type		-	F							
Type of installation (heat pump)	type of installation		-	B23, B53							
Type of installation (boiler)	type of installation		-	B23, B23P, B33, B53							
Heat pump flue gas exhaust	diameter (Ø)		mm	80							
	residual head		Pa	12							

(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) Gas not available for the appliance.
(5) Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in compliance with standard EN ISO 9614.
(6) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

			ARAY35/2	ARAY35/2 S	ARAY35/4	ARAY35/4 S	ARAY50/2	ARAY50/2 S	ARAY50/4	ARAY50/4 S
Boiler flue gas exhaust	diameter (Ø)	mm	80							
	residual head	Pa	91				100			
Weight	in operation	kg	467	477	467	477		487	477	487
minimum storage temperature		°C	-30							
sound pressure L_p at 5 metres (max)		dB(A)	57,6 (5)	53,0 (5)	57,6 (5)	53,0 (5)	57,6 (5)	53,0 (5)	57,6 (5)	53,0 (5)
sound power L_w (max)		dB(A)	79,6 (6)	75,0 (6)	79,6 (6)	75,0 (6)	79,6 (6)	75,0 (6)	79,6 (6)	75,0 (6)
expansion tank volume		l	10							
maximum flow rate of boiler flue gas condensate		l/h	3,4				5,0			
maximum water pressure in operation		bar	3,0							
water content inside the appliance		l	11				14			
NO_x emission class	GAHP	-	5							
	AY	-	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) Gas not available for the appliance.
(5) Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in compliance with standard EN ISO 9614.
(6) Sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

4 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 drain

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

4.1 APPLIANCE POSITIONING

Please refer to Section C01.02.

4.2 PLUMBING DESIGN

Please refer to Section C01.03.

4.3 WATER PUMP

Appliances in the Gitié 2.0 range are equipped with high head water pumps, already mounted and wired, the characteristic curve of which is shown in Figure 2.8 *p. 7*.
Pressure drops within the appliance are given in Paragraph 2.4 *p. 5*.

4.4 SYSTEM WATER QUALITY

Please refer to Section C01.05.

4.5 ANTIFREEZE PROTECTION

Please refer to Section C01.06.

4.6 FUEL GAS SUPPLY

Please refer to Section C01.08.

4.7 COMBUSTION PRODUCTS EXHAUST

Installation types

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Paragraph 3.1 *p. 9*.

4.7.1 GAHP-AR

4.7.1.1 Flue gas exhaust connection

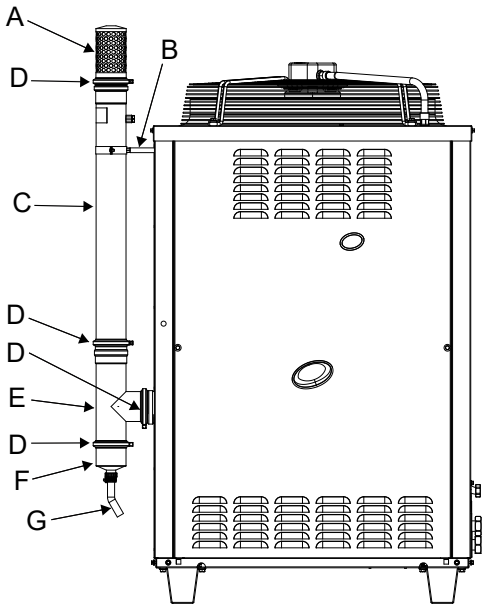
Ø 80 mm (with gasket), on the left, at the bottom (Figure 4.1 *p. 12*).

4.7.1.2 Flue gas exhaust kit

The appliance is supplied with flue gas exhaust kit, to be fitted by the installer, including (Figure 4.1 *p. 12*):

- ► 1 Ø 80 mm flue gas exhaust pipe, length 750 mm (C)
- ► 1 T connector (E)
- ► 1 condensate trap (F)
- ► 1 terminal (A)
- ► 1 clamp for fixing pipe (B) to left side panel
- ► 4 pipe clamps (D)
- ► 1 condensate drain hose fitting and silicone hose (G)

Figure 4.1 *Components of flue gas exhaust kit*



A Terminal
B Pipe clamp
C Exhaust pipe L = 750 mm
D Pipe clamp
E T connector
F Condensate drain
G Hose adaptor + condensate drain pipe

4.7.2 AY

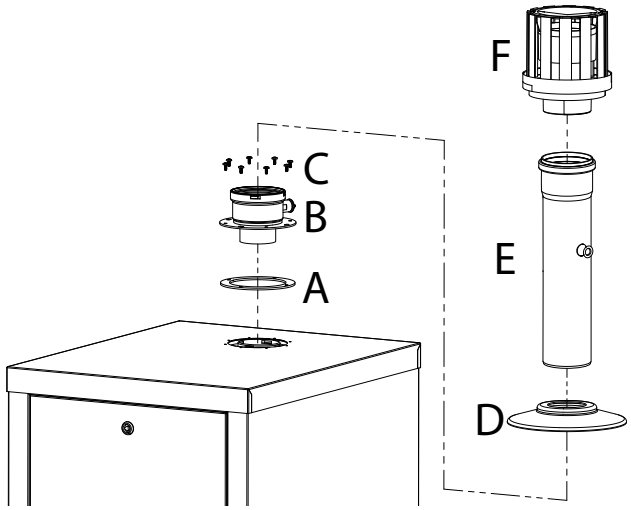
4.7.2.1 Flue gas exhaust connection

Ø 80 mm (with gasket), at the top (Figure 4.2 *p. 13*).
The combustion air is drawn from the outside of the casing by means of special louvres.

4.7.2.2 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 4.2 *Flue gas exhaust kit*



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

4.7.3 Possible flue

If necessary, the appliance may be connected to a flue.

► Modules GAHP-AR and AY have different flue gas exhaust characteristics and cannot therefore be connected to the same flue, but must be connected to different and separate flues.

For more details see Section C01.09.

4.8 FLUE GAS CONDENSATE DRAIN

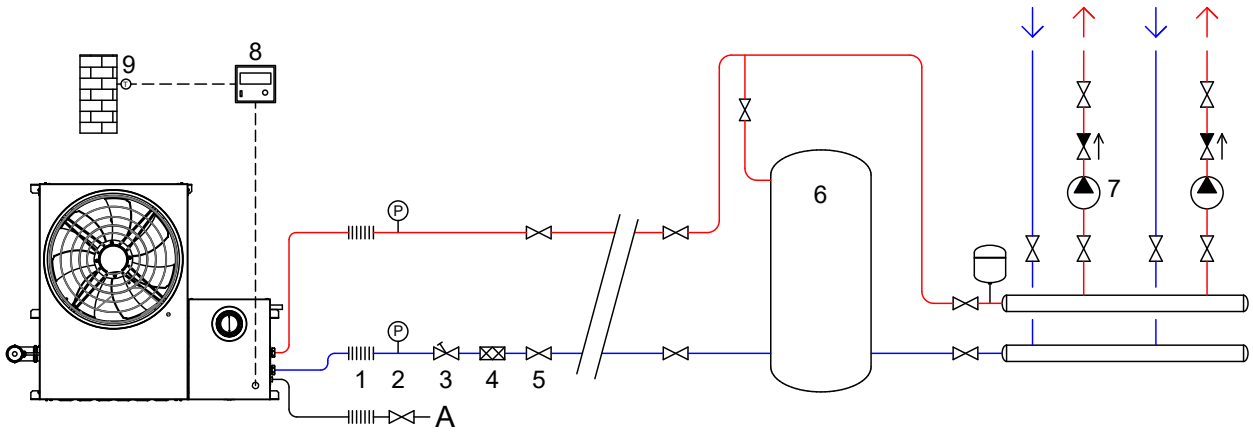
Please refer to Section C01.09.

4.9 ELECTRICAL AND CONTROL CONNECTIONS

Please refer to Section C01.10.

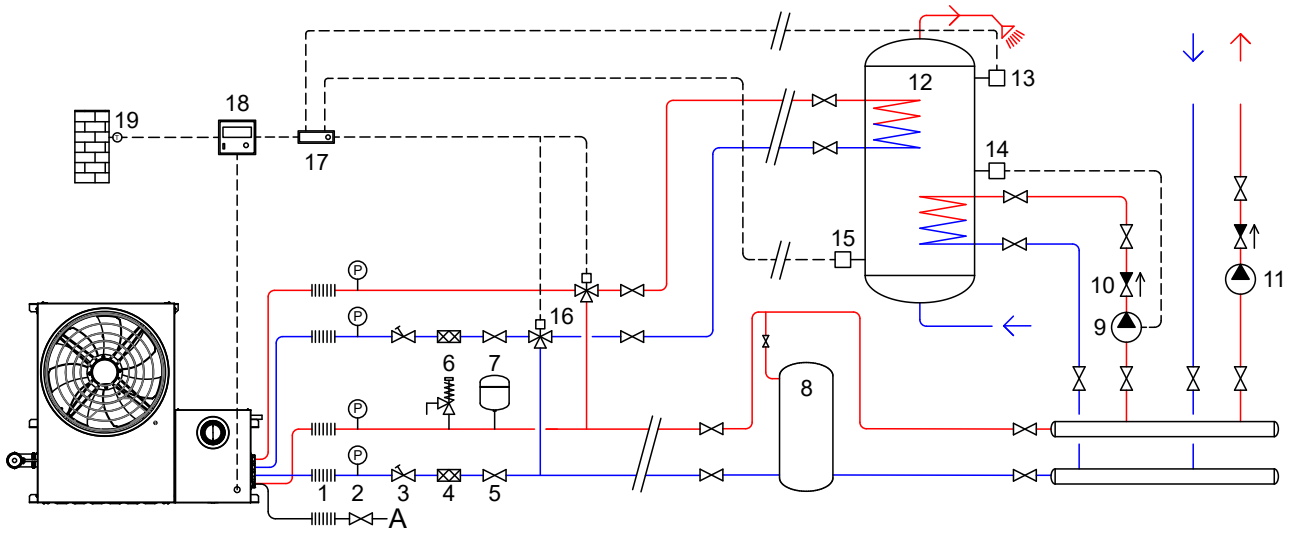
4.10 EXAMPLE DIAGRAMS

Figure 4.3 *Hydraulic diagram Gitié ARAY /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 regulation valve	7	Heating/Cooling circuit water pump		
4	Sludge filter	8	DDC panel		

Figure 4.4 *Hydraulic diagram Gitié ARAY /4*



1 Anti-vibration connection
2 Pressure gauge
3 Flow regulation valve
4 Sludge filter
5 Shut-off valve
6 Safety valve (GAHP/GA circuit)
7 Expansion tank (GAHP/GA circuit)
8 Buffer tank (and hydraulic separator)
9 DHW winter preheating water pump
10 Check valve
11 Heating/Cooling circuit water pump
12 DHW buffer tank
13 Thermostat with adjustable differential for DHW
14 Thermostat with adjustable differential for DHW preheating
15 Thermostat with adjustable differential for Legionella function
16 3-way diverter valves for DHW
17 RB100 device
18 DDC panel
19 Outdoor temperature probe
A Gas connection

Notes:
- Pump 9 of DHW preheating must only turn on if the temperature difference between manifold and buffer tank is sufficient for correct heat exchange on the preheating coil.
- Pump 9 for DHW preheating must be switched off in summer.

4.11 ACOUSTIC

Please refer to Section C01.14.