1 SPECIFICATION OF SUPPLY

Water-ammonia absorption heat pump with brushless lownoise fan, fed with natural gas or LPG, air-water version, modulating and condensing, for hot water production up to a delivery temperature of 65 °C (70 °C at 50% of maximum thermal input), for installation in a technical room.

Heat output for each unit (A7W35): 41,3 kW

2 FEATURES AND TECHNICAL DATA

2.1 FEATURES

2.1.1 Mechanical and thermo-hydraulic components

- ► Steel sealed circuit, externally treated with epoxy paint.
- Sealed combustion chamber (type C).
- 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.
- ► Low-noise fan (reduction of electrical consumption and

Electrical power absorption nominal: 0,87 kW

Power supply: 230 V - 50 Hz single-phase

GUE efficiency (A7W35): 164 %

Heat input: 25,2 kW

Weight: 405 kg

reduction of sound emission).
Flange for connection to the fan's air outlet duct, complete with air pressure intake.

Dimensions: width 917 mm, depth 1287 mm, height 1580 mm

2.1.2 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



2.2 DIMENSIONS

Figure 2.1 Dimensions



Figure 2.2 Service plate - Hydraulic/gas connections detail



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. CCI control
- 3. external request

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 CCI control

The CCI control can manage up to 3 GAHP appliances in modulating mode (only GAHP A/GAHP GS/WS).

For more details see Section C01.11.

2.3.4 External request

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

2.4 **TECHNICAL DATA**

Table 2.1 GAHP A Indoor technical data

				GAHP A Indoor	
Heating operation					
Seasonal space heating energy efficiency class	medium-temperature application (55 °C)	-	A+		
(ErP)	low-temperature application (35 °C)	-	A+		
		A7W35	kW	41,3	
llast sutrut for as do unit		A7W50	kW	38,3	
Heat output for each unit	Outdoor temperature/ water outlet temperature	A7W65	kW	31,1	
		A-7W50	kW	32,0	
		A7W35	%	164	
	Outdoor tomporature Mater outlet tomporature	A7W50			
doe enciency	Outdoor temperature/ water outlet temperature	%	124		
		%	127		
Heatinput	nominal (1013 mbar - 15 °C)		kW	25,7	
	real		kW	25,2	
Hot water outlet temperature	maximum for heating		°C	65	
not water outlet temperature	maximum for DHW		°C	70	
	maximum for heating		°C	55	
Hot water inlet temperature	maximum for DHW		°C	60	
	minimum temperature in continuous operation		°C	30 (1)	
	nominal		l/h	2500	
Heating water flow	maximum	l/h	4000		
	minimum	l/h	1400		
Pressure drop heating mode	at nominal water flow	0,31 (2)			
Outdoor temperature (dry bulb)	maximum		°C	45	
outdoor temperature (ary bails)	minimum	°C	-15 (3)		
Electrical specifications				1	
	voltage	V	230		
Power supply	type	-	single-phase		
	frequency		Hz	50	
Electrical power absorption	nominal	kW	0,87 (4)		
	minimum		kW	0,50 (4)	
Degree of protection	IP		-	XSD	
Installation data			3.0	0.70	
	G20 natural gas (nominal)		m²/h	2,72	
	G25 (nominal)	m²/h	3,16		
	G25.1 (nominal)	m²/h	3,16		
Gas consumption	G25.3 (nominal)	m²/h	3,09		
-	G27 (nominal)	m /n	3,32		
	G2.350 (norminal)	m/n	3,/8		
	GSU (HOHHHAI)	kg/li	2,05		
NO omission slass		K9/11	5		
round newer L (max)				74.0 (5)	
sound power L (min)	dB(A)	74,0 (5)			
sound prossure L at 5 motros (max)	dB(A)	52.0 (6)			
sound pressure L at 5 metres (min)	dB(A)	49.0 (6)			
minimum storage temperature	۵۵(۲۱) ۲	-30			
maximum water pressure in operation	har	4.0			
maximum defrosting water flow	l/h	40			
maximum flow rate of flue gas condensate			l/h	4.0	
water content inside the annliance				4	
			-	F	
Water fitting	thread			1 1/4	

In transient operation, lower temperatures are allowed. For flows other than nominal see Design Manual, Pressure losses Paragraph. As an option, a version for operation down to -30 °C is available. Value stated without air ducting. ±10% according to the power supply voltage and tolerance on electrical motors consumption. 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. Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in compliance with standard EN ISO 9614. Data referred to 50 °C outlet temperature. (2) (3) (4) (5) (6) (7)

Value stated without air ducting.

3



			GAHP A Indoor
	type	-	F
Gas connection	thread	Ш	3/4
safety valve drain ducting connection		Ш	1 1/4
Elue and exhaust	diameter (Ø)	mm	80
Flue gas exhaust	residual head	Pa	80
type of installation		-	C13, C33, C43, C53, C63, C83
	width	mm	917
Dimensions	depth	mm	1287
	height	mm	1580
Weight	in operation	kg	405
required air flow		m³/h	11000
required air flow at the maximum available head		m³/h	10000
fan residual head		Pa	40 (7)
General information			
Refrigerating fluid	ammonia R717	kg	7,0
	water H ₂ O	kg	10,0
maximum pressure of the refrigerating circuit			32

In transient operation, lower temperatures are allowed.

(1) (2) (3) (4) (5)

In transient operation, lower temperatures are allowed. For flows other than nominal see Design Manual, Pressure losses Paragraph. As an option, a version for operation down to -30 °C is available. Value stated without air ducting. ±10% according to the power supply voltage and tolerance on electrical motors consumption. 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. Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in compliance with standard EN ISO 9614. Data referred to 50 °C outlet temperature. Value stated without air ducting. (6) (7)

2.4.1 Pressure drops

Table 2.2 GAHP A and GAHP A Indoor pressure drops

	Heat transfer fluid temperature at outlet						
Hot water flow	35 °C	50 °C	60 °C				
	bar	bar	bar				
2000 l/h	0,23	0,21	0,19				
2500 l/h	0,33	0,31	0,29				
3000 l/h	0,46	0,43	0,40				
4000 l/h	0,78	0,72	0,67				

2.4.2 Performances

Table 2.3 p. 4 shows the heat output for a single unit at full load and in stable operation, depending on hot water delivery temperature to the system and outdoor temperature.

Table 2.3 Heat output for each GAHP A HT and GAHP A Indoor

	Water delivery temperature							
Outdoor temperature	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C (1)
	kW	kW	kW	kW	kW	kW	kW	kW
-20 °C	33,9	31,5	29,6	27,7	25,7	23,7	22,7	9,3
-15 °C	35,2	32,8	30,9	29,0	27,0	24,9	23,9	10,0
-10 °C	36,4	34,0	32,1	30,2	28,2	26,2	25,2	10,6
-5 °C	40,3	37,7	35,2	32,7	30,6	28,5	26,4	11,1
0 ℃	40,8	39,2	37,1	35,1	32,7	30,3	28,2	11,3
5 °C	41,3	40,0	38,8	37,5	34,8	32,0	30,2	11,8
7 °C	41,3	40,2	39,3	38,3	35,7	33,0	31,1	12,0
10 °C	41,3	40,6	39,8	38,9	36,6	34,4	32,5	12,4
15 °C	41,6	41,3	40,6	39,8	38,3	36,8	34,8	13,1
20 °C	41,6	41,4	40,8	40,2	39,5	38,5	37,1	13,8
25 °C	41,7	41,5	41,0	40,4	39,9	39,2	38,2	14,2
30 °C	41,8	41,6	41,1	40,5	40,1	39,4	38,4	14,4
35 °C	41,9	41,7	41,2	40,6	40,2	39,5	38,5	14,5

(1) Thermal input reduced to 50%

Table 2.4 p. 5 shows the GUE at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

partial load conditions and in non-stationary operation.

Table 2.4 GUE for GAHP A HT and GAHP A Indoor

	Water delivery temperature							
Outdoor temperature	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C (1)
	%	%	%	%	%	%	%	%
-20 °C	134	125	118	110	102	94	90	74
-15 °C	139	130	123	115	107	99	95	79
-10 °C	144	135	128	120	112	104	100	84
-5 °C	160	150	140	130	121	113	105	88
0 °C	162	155	147	139	130	120	112	90
5 ℃	164	159	154	149	138	127	120	93
7 °C	164	160	156	152	141	131	124	95
10 °C	164	161	158	154	145	137	129	98
15 °C	165	164	161	158	152	146	138	104
20 °C	165	164	162	160	157	153	147	110
25 °C	165	165	163	160	158	156	152	113
30 °C	166	165	163	161	159	156	152	114
35 ℃	166	165	163	161	160	157	153	115

(1) Thermal input reduced to 50%



Please consider that, according to the actual heating request, the appliance may often need to operate under

DESIGN 3

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.

APPLIANCE POSITIONING 3.1

Please refer to Section C01.02.

PLUMBING DESIGN 3.2

Please refer to Section C01.03.

WATER PUMP 3.3

The circulation pump (flow and head) must be selected and installed based on pressure drops of plumbing/primary circuit (piping + components + exchange terminals + appliance). For the appliance's pressure drops refer to Table 2.2 p. 4.



Please refer to Section C01.04 for the characteristics of the pumps available as Robur optional.

3.4 SYSTEM WATER QUALITY



Please refer to Section C01.05.

3.5 **ANTIFREEZE PROTECTION**



Please refer to Section C01.06.

FUEL GAS SUPPLY 3.6



Please refer to Section C01.08.

COMBUSTION PRODUCTS EXHAUST 3.7



Compliance with standards

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Table 2.1 *p. 3*.

Flue gas exhaust connection 3.7.1

Ø 80 mm (with gasket), on the left, at the top (detail C, Figure 2.1 *p. 2*).

3.7.2 Combustion air intake fitting

Ø 80 mm (with gasket), on the left, at the top (detail D, Figure 2.1 p. 2).

3.7.3 Flue gas exhaust

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

It is not allowed to connect several appliances to a single flue, but each appliance must have its own separate flue.





For more details see Section C01.09.

3.8 FLUE GAS CONDENSATE DRAIN



Please refer to Section C01.09.

3.9 SAFETY VALVE DRAIN

Ø 1 1/4", on the left, at the top (detail B, Figure 2.1 p. 2).





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Do not install any shut off device on the drain duct between the safety valve and the outside vent.

3.9.1 Safety valve drain ducting

The drain ducting shall be made in steel pipes (do not use copper or its alloys). Table 3.1 *p. 6* provides sufficient criteria of pipe sizing; alternatively, less compelling sizing is accepted, provided it is compliant with specific applicable norms (the manufacturer cannot be held liable).

Table 3.1 Safety valve drain ducting

Diameter	DN	Maximum length (m)
1″ 1/4	32	30
2″	50	60

The drain duct must have an initial straight section of at

least 30 cm.

Place the drain terminal outside the room, away from doors, windows and aeration vents, and at such a height that any refrigerant leaks cannot be inhaled by any people.

3.10 FAN AIR DUCTING

The appliance is fitted with a flange for connecting to a fan outlet air duct.

The air expelled by the fan must be ducted to the outside.

- Arrange removable fitting/bellows between the air duct and the appliance's flange, for fan maintenance operations.
- A pressure socket is provided to measure the pressure differential.

3.11 ELECTRICAL AND CONTROL CONNECTIONS



Please refer to Section C01.10.

3.12 EXAMPLE DIAGRAMS



3.13 ACOUSTIC



Please refer to Section C01.14.

Please refer to Section C01.13.