1 SPECIFICATION OF SUPPLY

1.1 GAHP A PLUS

Water-ammonia absorption heat pump, gas-fired with natural gas, LPG or natural gas and hydrogen mixtures up to 20%, air-water version, modulating down to 28% of the nominal heat input, condensing, for hot water production up to an outlet temperature of 65 °C (70 °C at 50% of maximum thermal input), for outdoor installation.
Nominal heat output (A7W35): 44,6 kW
GUE efficiency (A7W35): 172 %
Heat input: 26,0 kW
Electrical power absorption nominal: 0,84 kW
Power supply: 230 V - 50 Hz single-phase
Sound power Lw (max): 79,6 dB(A)
Weight: 356 kg
Dimensions: width 904 mm, depth 1264 mm, height 1446 mm

1.2 GAHP A PLUS S1

Water-ammonia absorption heat pump with low-noise brushless modulating fan, gas-fired with natural gas, LPG or natural gas and hydrogen mixtures up to 20%, air-water version, modulating down to 28% of the nominal heat input, condensing, for hot water production up to an outlet temperature of 65 °C (70 °C at 50% of maximum thermal input), for outdoor installation.
Nominal heat output (A7W35): 44,6 kW
GUE efficiency (A7W35): 172 %
Heat input: 26,0 kW
Electrical power absorption nominal: 0,77 kW
Power supply: 230 V - 50 Hz single-phase
Sound power Lw (max): 74,0 dB(A)
Sound power Lw (min): 71,0 dB(A)
Weight: 367 kg
Dimensions: width 904 mm, depth 1264 mm, height 1523 mm

2 FEATURES AND TECHNICAL DATA

2.1 FEATURES

2.1.1 Mechanical and thermo-hydraulic components

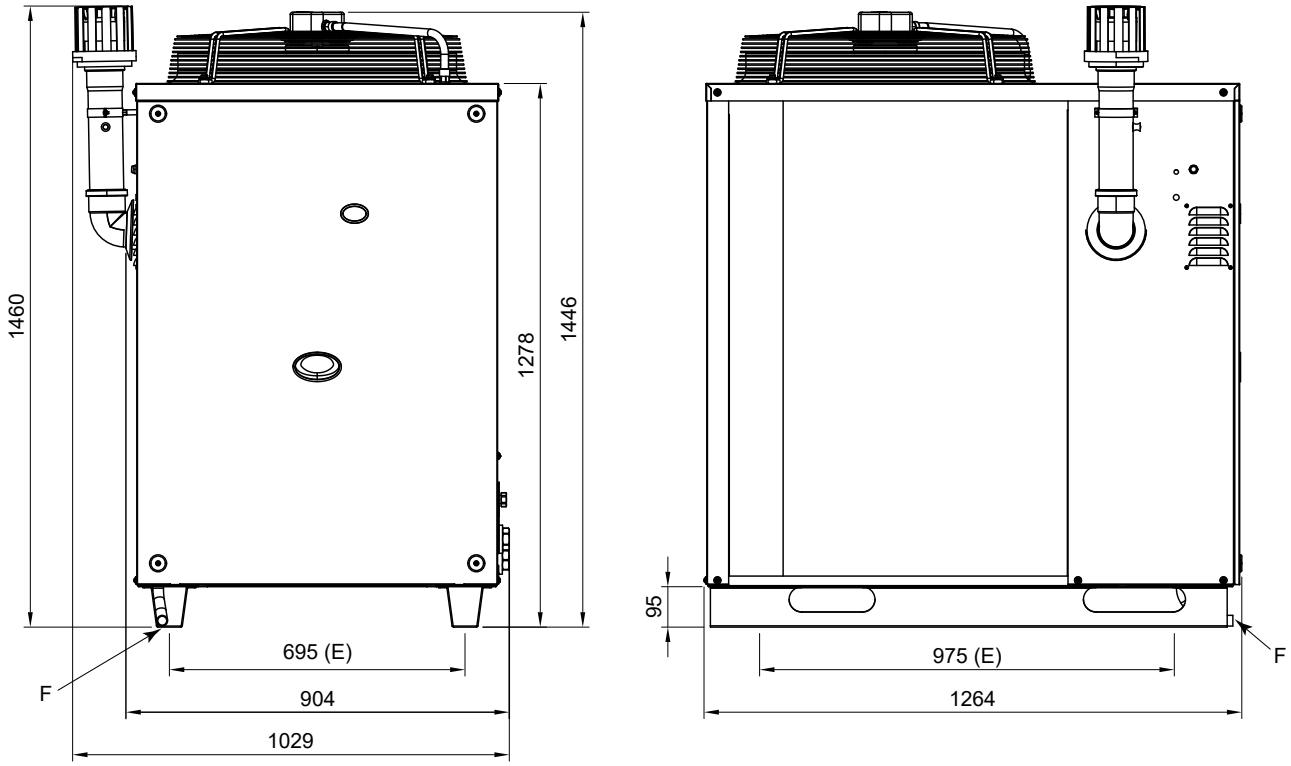
- Steel sealed circuit, externally treated with epoxy paint.
- Sealed combustion chamber (type C) suitable for outdoor installations.
- Metal mesh radiant burner, equipped with ignition electrodes and flame detection, managed by an electronic flame control box.
- Titanium stainless steel shell-and-tube 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.
- Modulating premix burner group from 100% to 28% of the nominal heat input.
- Standard or S1 low-noise fan (low power consumption and low noise emission).

2.1.2 Control and safety devices

- Electronic board featuring a microprocessor, LCD, and knob.
- 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.

2.2 DIMENSIONS

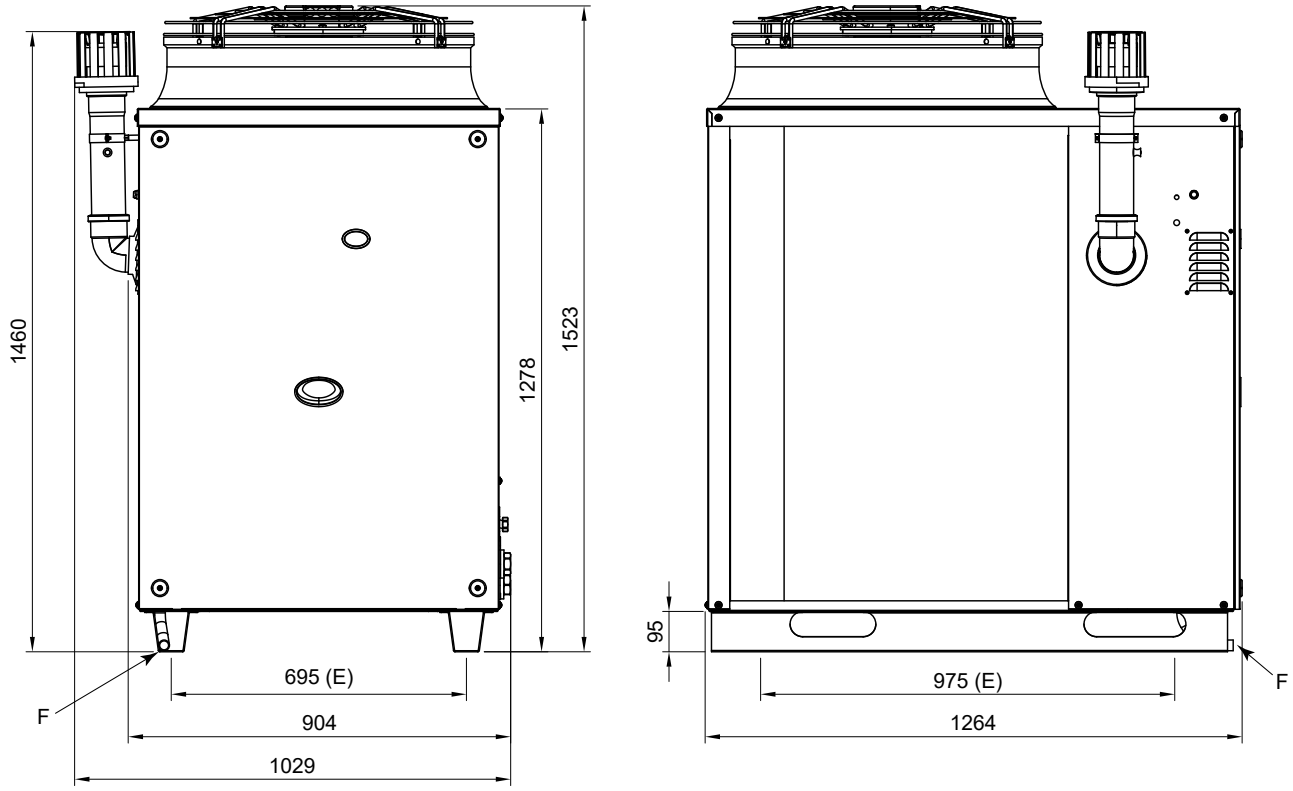
Figure 2.1 *Dimensions (standard fan)*



E Centre distance of holes for vibration damper supports

F Condensate drain connection

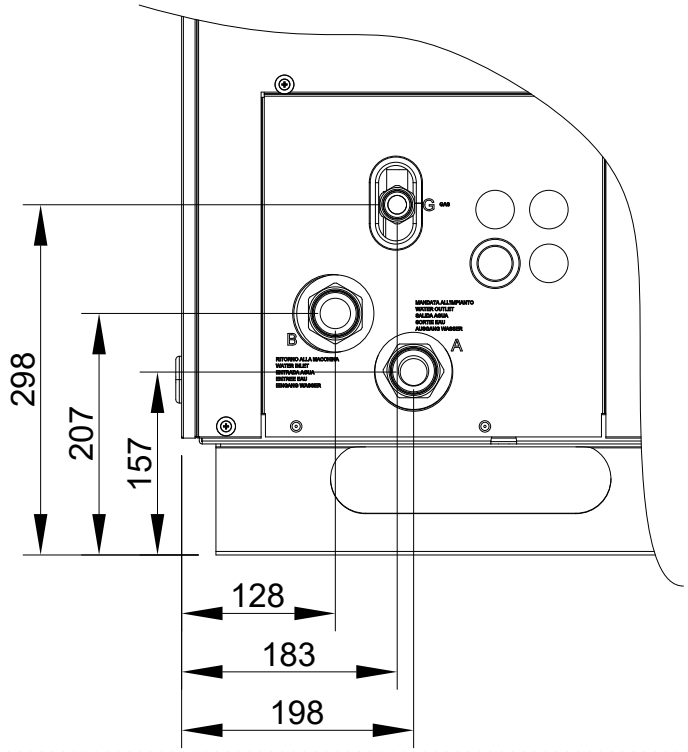
Figure 2.2 *Dimensions (low-noise fan)*



E Centre distance of holes for vibration damper supports

F Condensate drain connection

Figure 2.3 *Service plate - Hydraulic/gas connections detail*



G Gas connection Ø 3/4" F

B Water inlet connection Ø 1 1/4" F

A Water outlet connection Ø 1 1/4" F

2.3 CONTROLS

2.3.1 Control device

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

- ► DDC panel
- ► CCI panel
- ► External request

2.3.2 DDC panel

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

For more details see Section C01.11.

2.3.3 CCI panel

The CCI control panel can manage up to 3 GAHP appliances in modulating mode (i.e. only GAHP A Plus/GAHP GS/WS Plus for heating only).

For more details see Section C01.11.

2.3.4 External request

The appliance can also be controlled by a generic request device (e.g. thermostat, timer, switch, contactor...) fitted with a voltage-free NO contact. This system only allows basic control (on/off, with a fixed setpoint temperature), thus lacking essential system functions of the DDC/CCI control panel. We recommend using it only for simple applications and with a single appliance.

2.4 TECHNICAL DATA

Table 2.1 *GAHP A Plus technical data*

				GAHP A Plus	GAHP A Plus S1
Heating mode					
Seasonal space heating energy efficiency class (ErP)	medium-temperature application (55 °C)		-	A+	A++
	low-temperature application (35 °C)		-	A+	
Nominal heat output	Outdoor temperature/Water outlet temperature	A7W35	kW	44,6	
GUE efficiency	Outdoor temperature/Water outlet temperature	A7W35	%	172	
Heat input	nominal (1013 mbar - 15 °C)		kW	26,4	
	real		kW	26,0	
Hot water outlet temperature	maximum for heating		°C	65	
	maximum for DHW		°C	70	
Hot water inlet temperature	maximum for heating		°C	55	
	maximum for DHW		°C	60	
	minimum temperature in continuous operation		°C	30 (1)	
Heating water flow	nominal		l/h	2500	
	maximum		l/h	4000	
	minimum		l/h	2000	
Water pressure drop in heating mode	at nominal water flow		bar	0,31 (2)	
Outdoor temperature (dry bulb)	maximum		°C	45	
	minimum		°C	-15 (3)	
Electrical specifications					
Power supply	voltage		V	230	
	type		-	single-phase	
	frequency		Hz	50	
Electrical power absorption	nominal		kW	0,84 (4)	0,77 (4)
	minimum		kW	-	0,45 (4)
Degree of protection	IP		-	25	
Installation data					
Gas consumption	G20 natural gas (nominal)		m^3/h	2,79	
	G25 (nominal)		m^3/h	3,25	
	G25.1 (nominal)		m^3/h	3,25	
	G25.3 (nominal)		m^3/h	3,13	
	G27 (nominal)		m^3/h	3,41	
	G2.350 (nominal)		m^3/h	3,92	
	G30 (nominal)		kg/h	2,09	
	G31 (nominal)		kg/h	2,05	
NO_x emission class			-	6	
Sound power L_w (max)			dB(A)	79,6 (5)	74,0 (5)
Sound power L_w (min)			dB(A)	-	71,0 (5)

(1) In transient operation, lower temperatures are allowed.
(2) For flows other than nominal see Design Manual, Pressure losses Paragraph.
(3) As an option, a version for operation down to -30 °C is available.
(4) ±10% depending on power voltage and absorption tolerance of electric motors.
(5) 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.
(6) 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.
(7) Overall dimensions excluding flue gas exhaust.
(8) Tolerance ±5%.

				GAHP A Plus	GAHP A Plus S1
sound pressure L_p at 5 metres (max)			dB(A)	57,6 (6)	52,0 (6)
sound pressure L_p at 5 metres (min)			dB(A)	-	49,0 (6)
minimum storage temperature			°C	-30	
maximum water pressure in operation			bar	4,0	
maximum condensate flow			l/h	4,2	
water content inside the appliance			l	4	
Water fitting	type		-	F	
	thread		"	1 1/4	
Gas connection	type		-	F	
	thread		"	3/4	
Flue gas exhaust	diameter (Ø)		mm	80	
	residual head		Pa	90	
type of installation			-	B23P, B33, B53P	
Dimensions	width		mm	904 (7)	
	depth		mm	1264	
	height		mm	1446 (7)	1523
	Packing	width	mm	930	
		height	mm	1489	1523
		depth	mm	1300	
Weight	in operation		kg	356	367
	gross (including packaging)		kg	353	364
Maximum air flow of the fan			m^3/h	11000	
fan residual head			Pa	-	40
General information					
Refrigerating fluid (8)	ammonia R717		kg	7,5	
	water H_2O		kg	10,0	
maximum pressure of the refrigerating circuit			bar	32	

(1) In transient operation, lower temperatures are allowed.
(2) For flows other than nominal see Design Manual, Pressure losses Paragraph.
(3) As an option, a version for operation down to -30 °C is available.
(4) ±10% depending on power voltage and absorption tolerance of electric motors.
(5) 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.
(6) 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.
(7) Overall dimensions excluding flue gas exhaust.
(8) Tolerance ±5%.

2.4.1 Pressure drops

Table 2.2 *GAHP A Plus pressure drops*

Hot water flow	Heat transfer fluid temperature at outlet		
	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. 5* shows the heat output at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.3 *GAHP A Plus heat output*

Outdoor temperature	Water delivery 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
-22 °C	34,8	32,8	30,7	28,7	26,8	25,4	23,9	-
-20 °C	35,2	33,2	31,1	29,1	27,2	25,7	24,2	-
-15 °C	36,1	34,1	32,0	30,1	28,2	26,5	24,7	-
-14 °C	36,3	34,3	32,2	30,3	28,4	26,6	24,9	-
-13 °C	36,6	34,5	32,4	30,5	28,7	26,8	25,0	-
-12 °C	36,8	34,7	32,6	30,7	28,9	27,0	25,1	-
-11 °C	37,1	35,0	32,9	31,0	29,1	27,2	25,3	-
-10 °C	37,6	35,4	33,3	31,3	29,4	27,4	25,5	-
-9 °C	38,1	36,0	33,9	31,8	29,8	27,8	25,8	-
-8 °C	40,3	38,3	36,3	33,5	30,8	28,7	26,7	-
-7 °C	41,3	39,2	37,1	34,3	31,5	29,4	27,3	11,8
-6 °C	41,9	39,7	37,6	34,8	32,0	29,8	27,6	11,9
-5 °C	42,2	40,2	38,1	35,2	32,4	30,1	27,9	12,0
-4 °C	42,5	40,5	38,5	35,7	32,9	30,5	28,2	12,0
-3 °C	42,9	40,9	38,9	36,2	33,4	30,9	28,5	12,1
-2 °C	43,2	41,2	39,3	36,5	33,7	31,2	28,7	12,2

(1) Thermal input reduced to 50%

Outdoor temperature	Water delivery 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
-1 °C	43,4	41,6	39,7	37,0	34,2	31,6	29,0	12,3
0 °C	43,7	41,9	40,1	37,4	34,7	32,0	29,3	12,3
1 °C	41,6	41,0	40,4	37,8	35,2	32,4	29,6	12,4
2 °C	44,2	42,5	40,8	38,2	35,6	32,8	29,9	12,5
3 °C	44,4	42,8	41,2	38,7	36,1	33,2	30,3	12,6
4 °C	44,5	43,0	41,5	39,1	36,7	33,7	30,8	12,7
5 °C	44,6	43,2	41,8	39,5	37,3	34,3	31,4	12,8
6 °C	44,6	43,3	42,0	39,9	37,8	34,9	32,0	13,0
7 °C	44,6	43,4	42,3	40,3	38,4	35,4	32,5	13,1
8 °C	44,6	43,5	42,4	40,6	38,8	35,9	33,0	13,3
9 °C	44,6	43,6	42,5	40,9	39,3	36,4	33,5	13,5
10 °C	44,7	43,6	42,5	41,1	39,7	36,8	34,0	13,6
11 °C	44,7	43,6	42,6	41,3	40,0	37,2	34,4	13,8
12 °C	44,7	43,7	42,6	41,5	40,3	37,6	34,8	13,9
13 °C	44,7	43,7	42,7	41,6	40,5	37,9	35,2	14,0
14 °C	44,7	43,7	42,7	41,7	40,6	38,1	35,6	14,1
15 °C	44,7	43,8	42,8	41,8	40,8	38,4	36,0	14,2
20 °C	44,7	43,9	43,0	42,2	41,3	39,5	37,7	14,6
25 °C	44,7	43,9	43,2	42,4	41,6	40,3	39,0	15,0
30 °C	44,7	43,9	43,2	42,5	41,9	40,8	39,8	15,1
35 °C	44,7	43,9	43,2	42,5	41,9	41,1	40,3	15,2

(1) Thermal input reduced to 50%

Table 2.4 *p. 6* shows the GUE at full load and stable operation, depending on the hot water delivery temperature to the system and outdoor temperature.

Table 2.4 *GUE GAHP A Plus*

Outdoor temperature	Water delivery temperature							
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C (1)
-22 °C	134	126	118	111	103	98	92	-
-20 °C	136	128	120	112	105	99	93	-
-15 °C	139	131	123	116	108	102	95	-
-14 °C	140	132	124	117	109	102	96	-
-13 °C	141	133	125	117	110	103	96	-
-12 °C	142	134	126	118	111	104	97	-
-11 °C	143	135	127	119	112	105	97	-
-10 °C	145	136	128	121	113	106	98	-
-9 °C	147	138	130	122	115	107	99	-
-8 °C	155	147	140	129	118	111	103	-
-7 °C	159	151	143	132	121	113	105	91
-6 °C	161	153	145	134	123	115	106	92
-5 °C	162	154	147	136	125	116	107	92
-4 °C	164	156	148	137	126	117	108	93
-3 °C	165	157	150	139	128	119	110	93
-2 °C	166	159	151	141	130	120	111	94
-1 °C	167	160	153	142	132	122	112	94
0 °C	168	161	154	144	134	123	113	95
1 °C	160	158	156	145	135	124	114	95
2 °C	170	164	157	147	137	126	115	96
3 °C	171	165	159	149	139	128	117	97
4 °C	171	166	160	150	141	130	119	98
5 °C	171	166	161	152	143	132	121	99
6 °C	172	167	162	154	146	134	123	100
7 °C	172	167	163	155	148	136	125	101
8 °C	172	167	163	156	149	138	127	102
9 °C	172	168	163	157	151	140	129	104
10 °C	172	168	164	158	153	142	131	105
11 °C	172	168	164	159	154	143	132	106
12 °C	172	168	164	160	155	145	134	107
13 °C	172	168	164	160	156	146	136	108
14 °C	172	168	164	160	156	147	137	109
15 °C	172	168	165	161	157	148	138	109
20 °C	172	169	166	162	159	152	145	112

(1) Thermal input reduced to 50%

Outdoor temperature	Water delivery temperature							
	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C (1)
25 °C	172	169	166	163	160	155	150	115
30 °C	172	169	166	164	161	157	153	116
35 °C	172	169	166	164	161	158	155	117

(1) Thermal input reduced to 50%

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

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 drain

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

3.1 APPLIANCE POSITIONING

Please refer to Section C01.02.

3.2 PLUMBING DESIGN

Please refer to Section C01.03.

3.3 WATER PUMP

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. 5*.

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.

3.6 FUEL GAS SUPPLY

Please refer to Section C01.08.

3.7 FLUE GAS EXHAUST

Compliance with standards

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Table 2.1 *p. 4*.

3.7.1 Flue gas exhaust connection

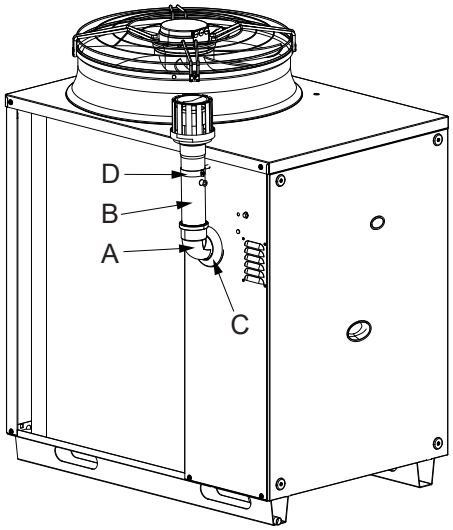
Ø 80 mm (with gasket), on the left, at the top (Figure 3.1 *p. 7*).

3.7.2 Flue gas exhaust kit

The appliance is supplied with flue gas exhaust kit, to be fitted by the installer, including (Figure 3.1 *p. 7*):

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 3.1 *Flue gas exhaust*



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

3.7.3 Possible flue

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

For more details see Section C01.09.

3.8 FLUE GAS CONDENSATE DRAIN

Please refer to Section C01.09.

3.9 ELECTRICAL AND CONTROL CONNECTIONS

Please refer to Section C01.10.

3.10 EXAMPLE DIAGRAMS

Please refer to Section C01.13.

3.11 ACOUSTIC

Please refer to Section C01.14.