

## 1 SPECIFICATION OF SUPPLY

### 1.1 AY 35

Modulating condensing boiler with sealed chamber, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, for indoor or outdoor installation, equipped with a high head water pump.

Operating point 80/60: effective power 33,4 kW

Heat input: 34,0 kW

Electrical power absorption nominal: 0,22 kW

Power supply: 230 V - 50 Hz single-phase

Weight: 77 kg

Dimensions: width 465 mm, depth 575 mm, height 1284 mm

### 1.2 AY 50

Modulating condensing boiler with sealed chamber, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, for indoor or outdoor installation, equipped with a high head water pump.

Operating point 80/60: effective power 49,2 kW

Heat input: 50,0 kW

Electrical power absorption nominal: 0,25 kW

Power supply: 230 V - 50 Hz single-phase

Weight: 87 kg

Dimensions: width 465 mm, depth 575 mm, height 1284 mm

### 1.3 AY 100

Modulating condensing boiler with sealed chamber, consisting of two independent thermal modules, each with effective power 49,2 kW, fed with natural gas or LPG, for hot water production up to a delivery temperature of 88 °C, for indoor or outdoor installation, equipped with independent high head water pumps (one for each thermal module).

Operating point 80/60: effective power 98,4 kW

Heat input: 99,8 kW

Electrical power absorption nominal: 0,49 kW

Power supply: 230 V - 50 Hz single-phase

Weight: 131 kg

Dimensions: width 720 mm, depth 575 mm, height 1284 mm

## 2 FEATURES AND TECHNICAL DATA

### 2.1 FEATURES

The AY appliances are condensing boilers suitable for both outdoor and indoor installation, capable of producing hot water up to 88 °C.

The range includes three models: AY 35, AY 50, AY 100.

The boiler casing is approved to resist weathering with particular regard to the action of UV rays.

#### 2.1.1 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), 1:20 (AY 100).
- ▶ Automatic air vent valve.
- ▶ Check valve.
- ▶ High efficiency water pump.
- ▶ System drain tap.
- ▶ Water temperature probes.
- ▶ Condensate drain siphon.
- ▶ Check valve on flue gas exhaust (only for AY 100).
- ▶ Flue gas exhaust duct with relevant terminal, for type B53P configuration.

In the AY 100 the above components are double.

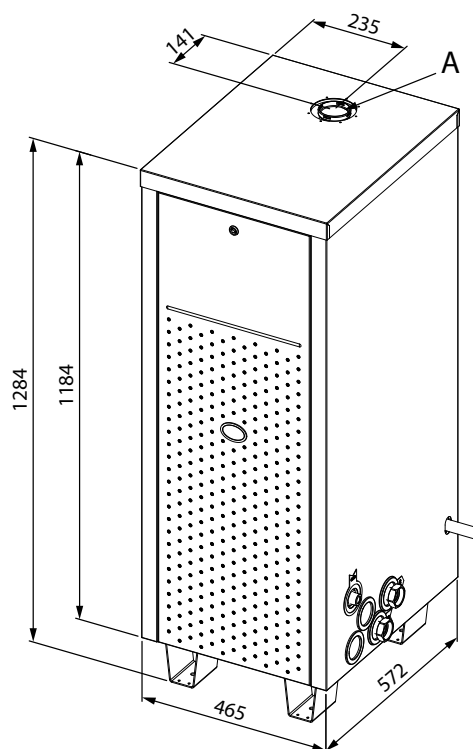
#### 2.1.2 Control and safety devices

- ▶ Flue safety thermal fuse.
  - ▶ Gas solenoid valve.
  - ▶ Safety thermostat.
- In the AY 100 the above components are double.
- ▶ Safety valve.
  - ▶ Water differential pressure switch.
  - ▶ Expansion tank.
  - ▶ Outdoor temperature probe.

### 2.2 DIMENSIONS

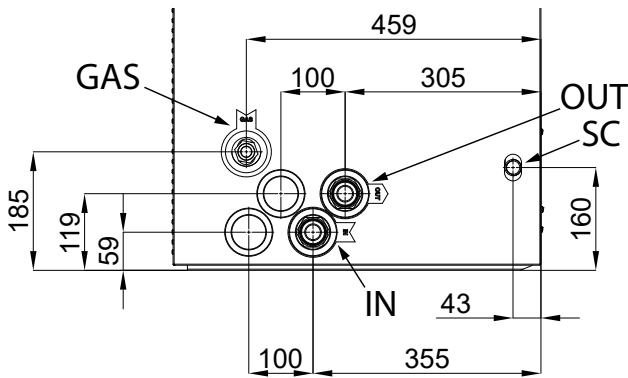
#### 2.2.1 AY 35 and AY 50

Figure 2.1 Unit dimensions



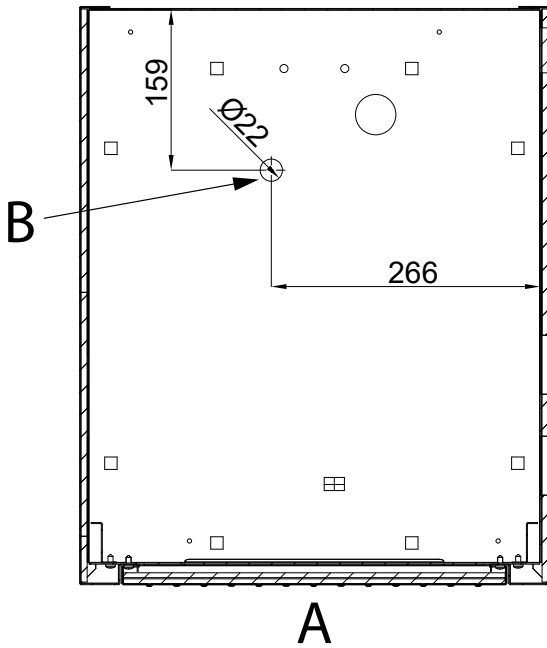
A Flue gas outlet Ø 80 mm

**Figure 2.2** 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 Condensate drain connection (outside diameter 25 mm, inside 21 mm)  
 GAS Gas connection Ø 3/4" M

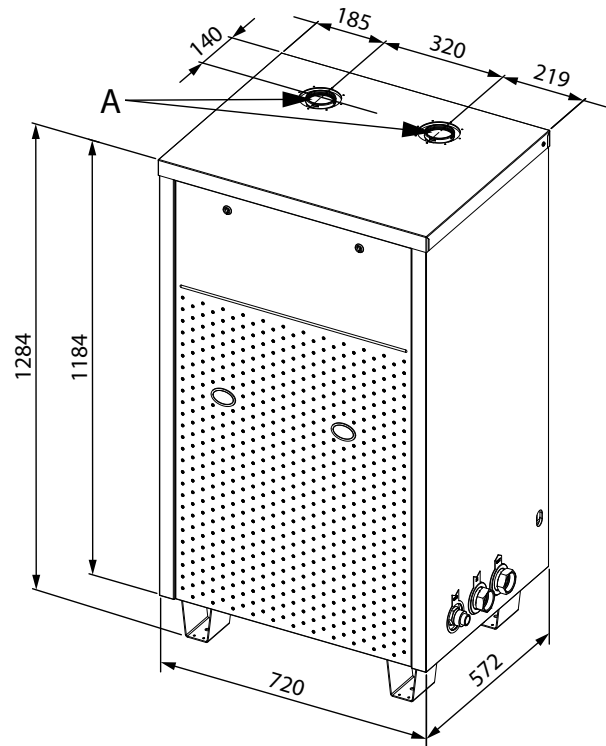
**Figure 2.3** Service plate - Detail of bottom plate



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

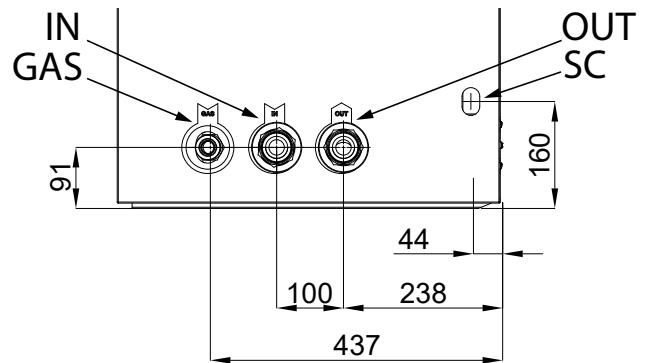
**2.2.2 AY 100**

**Figure 2.4** Unit dimensions



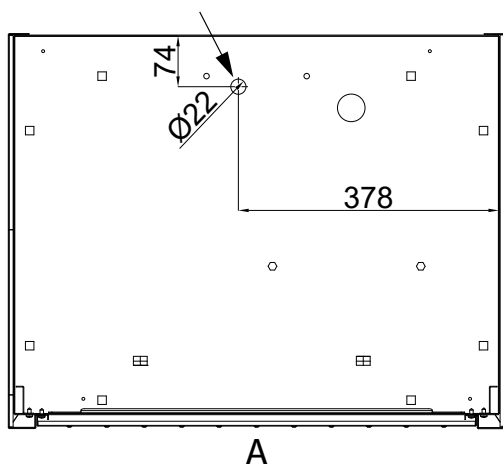
A Flue gas outlet Ø 80 mm

**Figure 2.5** Service plate - Hydraulic/gas connections detail



OUT Water outlet connection Ø 1 1/2" F  
 IN Water inlet connection Ø 1 1/2" F  
 SC Condensate drain connection (outside diameter 25 mm, inside 21 mm)  
 GAS Gas connection Ø 1" M

Figure 2.6 Service plate - Detail of bottom plate



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

device, selected from:

- ▶ DDC control
- ▶ 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 External request

The appliance may also be controlled via generic request devices (e.g. thermostat, timer, switch, contactor...) fitted with voltage-free NO contact. This system only provides simplified control, hence without the important functions of the DDC control. It is advisable to limit its use to simple applications only and with a single appliance.

In the case of the AY 100 appliance, two separate requests must be provided for the two thermal modules that make up the appliance.

## 2.3 CONTROLS

### 2.3.1 Control device

The appliance may only work if it is connected to a control

## 2.4 TECHNICAL DATA

Table 2.1 Technical data

			AY 35	AY 50	AY 100	
<b>Heating operation</b>						
<b>Heat input</b>	nominal (1013 mbar - 15 °C)	kW	34,0	50,0	99,8	
	minimum	kW	4,1	5,0		
<b>Operating point 80/60</b>	Nominal heat input	effective power	kW	33,4	49,2	98,4
		efficiency	%	98,2	98,4	98,5
<b>Operating point 50/30</b>	Nominal heat input	efficiency	%	106,4	106,8	
<b>Operating point Tr = 30 °C</b>	Heat input 30%	efficiency	%	108,6	108,8	
<b>Operating point Tr = 47 °C</b>	Heat input 30%	efficiency	%	102,1	102,8	
<b>Heat losses</b>	to casing in operation	%	0,25	0,10	0,47	
	to flue in operation	%	2,40	2,10		
	with burner off	%	0,03	0,05	0,03	
<b>Heating water flow</b>	nominal	l/h	2600	2350	4700	
	minimum	l/h	1200	1500		
<b>Pressure drop heating mode</b>	at nominal water flow	bar		0,57 (1)		
<b>Hot water outlet temperature</b>	maximum	°C		88		
<b>Outdoor temperature (dry bulb)</b>	maximum	°C		45		
	minimum	°C		-25		
<b>Electrical specifications</b>						
<b>Power supply</b>	voltage	V		230		
	type	-		single-phase		
	frequency	Hz		50		
<b>Electrical power absorption</b>	nominal	kW	0,22	0,25	0,49	
<b>Degree of protection</b>	IP	-		X5D		
<b>Installation data</b>						

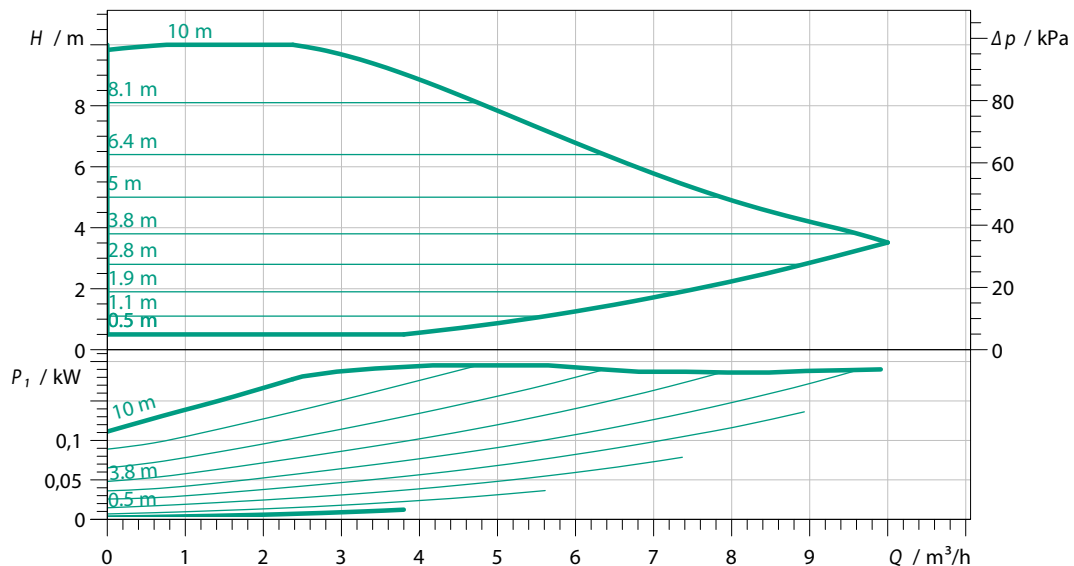
(1) For flows other than nominal see design manual, Paragraph "Pressure losses".  
 (2) Gas not available for AY 35.  
 (3) 2 independent flue gas exhausts.  
 (4) For each of the independent flue gas exhausts.

			AY 35	AY 50	AY 100
<b>Gas consumption</b>	G20 natural gas (nominal)	m <sup>3</sup> /h	3,60	5,29	10,58
	G25 (nominal)	m <sup>3</sup> /h	4,18	6,15	12,30
	G25.1 (nominal)	m <sup>3</sup> /h	- (2)	6,14	12,26
	G25.3 (nominal)	m <sup>3</sup> /h	4,09	6,01	12,03
	G27 (nominal)	m <sup>3</sup> /h	- (2)	6,45	12,88
	G2.350 (nominal)	m <sup>3</sup> /h	- (2)	7,35	14,67
	G30 (nominal)	kg/h	2,68	3,94	7,88
	G31 (nominal)	kg/h	2,64	3,88	7,77
<b>Water fitting</b>	type	-	F		
	thread	"	1 1/4	1 1/2	
<b>Gas connection</b>	type	-	M		
	thread	"	3/4	1	
<b>Flue gas exhaust</b>	diameter (Ø)	mm	80		
	residual head	Pa	91	100	100 (4)
<b>NO<sub>x</sub> emission class</b>			6		
<b>Circulating pump data</b>	Residual pressure head at nominal flow rate	boiler only	bar		
	nominal flow at the maximum available head		2600	2350	4700
<b>type of installation</b>			B23, B23P, B33, B53		
<b>maximum equivalent length of exhaust duct</b>			15	14	14 (4)
<b>maximum water pressure in operation</b>			bar		
<b>maximum flow rate of flue gas condensate</b>			3,4	5,0	10,0
<b>water content inside the appliance</b>			8	11	22
<b>expansion tank volume</b>			l		
<b>minimum storage temperature</b>			°C		
<b>Dimensions</b>	width	mm	465		720
	depth	mm	575		
	height	mm	1284		
<b>Weight</b>	in operation	kg	77	87	131

- (1) For flows other than nominal see design manual, Paragraph "Pressure losses".
- (2) Gas not available for AY 35.
- (3) 2 independent flue gas exhausts.
- (4) For each of the independent flue gas exhausts.

### 2.4.1 Circulating pump characteristic curves

**Figure 2.7** Oversized pressure head circulating pump characteristic curves



There are two water pumps in the AY 100 appliance.

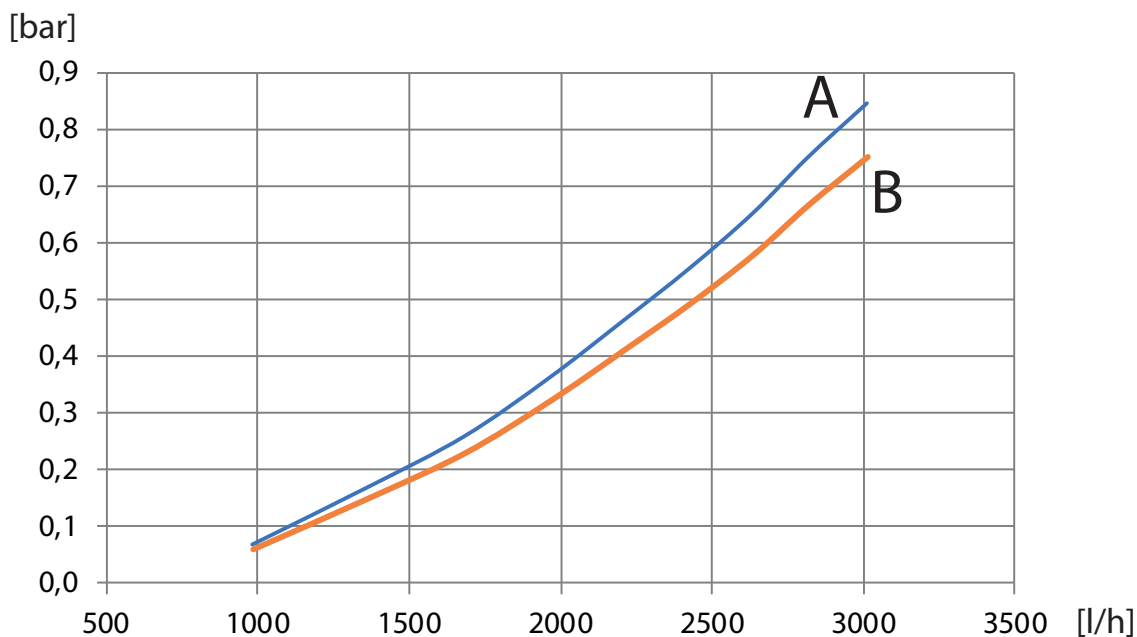
2.4.2 Pressure drops and residual head

Table 2.2 Nominal flow rate and residual head

				AY 35	AY 50	AY 100	
<b>Installation data</b>							
<b>Circulating pump data</b>	nominal flow at the maximum available head			l/h	2600	2350	4700
	Residual pressure head at nominal flow rate			boiler only	bar		
					0,44		

2.4.2.1 AY 35

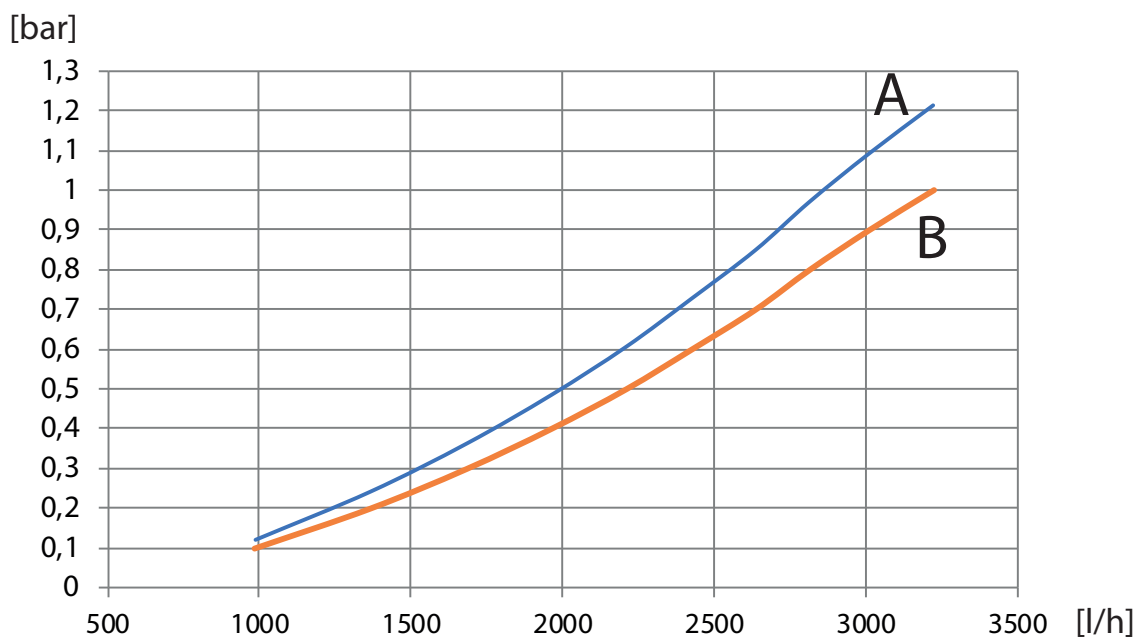
Figure 2.8 Available head and pressure drop of the boiler



A Boiler pressure drop with 20% glycol water      B Boiler pressure drop with no glycol in water

2.4.2.2 AY 50 and AY 100

Figure 2.9 Pressure drop AY 50 and AY 100



A Boiler pressure drop with 35% glycol water      B Boiler pressure drop with no glycol in water

For AY 100 the curve is the same, as the boiler consists of two

thermal modules in parallel, each with its own water pump.

### 2.5 INAIL SAFETY APPLIANCES

The kit is only available on appliances intended for the Italian

market.

## 3 DESIGN

### **i** 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
- gas systems
- flue gas exhaust
- flue gas condensate drain

### **i** 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

Appliances in the AY range are equipped with high head water pumps, already mounted and wired, the characteristic curve of which is shown in Figure 2.7 p. 4. Pressure drops within the appliance are given in Paragraph 2.4.2 p. 5.

### 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 COMBUSTION PRODUCTS EXHAUST

### **i** 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.

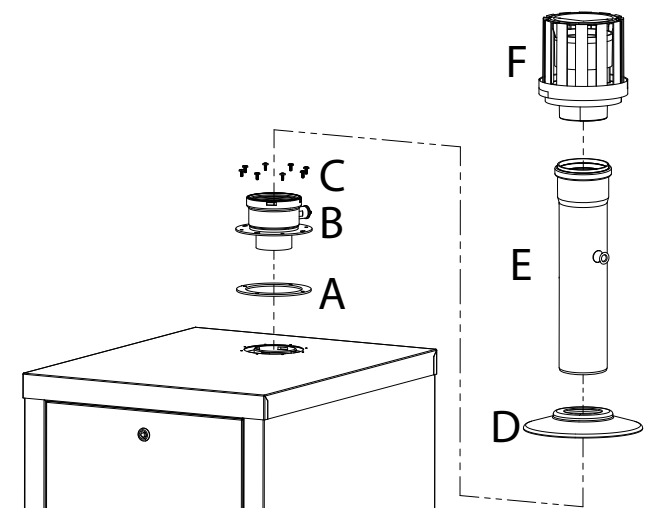
### 3.7.1 Flue gas exhaust connection

- ▶ AY 35: Ø 80 mm
- ▶ AY 50: Ø 80 mm
- ▶ AY 100: Ø 80 mm (2 independent flue gas exhausts) on the upper side of the boiler (Paragraph 2.2 p. 7). The combustion air is drawn from the outside of the casing by means of special louvres.

### 3.7.2 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. For the AY 100 appliance, the flue gas exhaust kit is double and the kit must be installed on both thermal modules.

**Figure 3.1** 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              |

### 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

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Please refer to Section C01.13.

### 3.11 ACOUSTIC

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Please refer to Section C01.14.