

# INSTALLATION, OPERATING AND SERVICING INSTRUCTIONS

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## ALFA Gaz G/GP Dual application gas boiler with atmospheric burner



05/11/2002

ACV reserves the right to modify the technical specifications and components of its products without prior notice.



664Y0800

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**1.1 INTENDED USERS OF THESE INSTRUCTIONS**

These instructions are intended for:

- the specifying engineer
- the installation engineer
- the user
- servicing technicians

**1.2 SYMBOLS**

The following symbols are used in these instructions:



**Essential instruction for operating the system correctly.**



**Essential instruction for personal safety and environmental protection.**



**Danger of electrocution.**



**Risk of burns.**

**1.3 APPLICABLE STANDARDS**

The products have received the “EC” certificate in accordance with the standards prevailing in different countries (European Directives 90/42/EEC, “efficiency”, 90/396/EEC “gas appliances”). These products have also received the Belgian “HR+” mark.



**1.4 WARNINGS**

These instructions are an integral part of the equipment to which they refer and must be supplied to the user.

The product must be installed and serviced by qualified engineers, in compliance with the prevailing standards.

ACV accepts no liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by ACV.



**Failure to observe instructions regarding tests and test procedures can result in personal injury or pollution risks.**

*Note:*  
ACV reserves the right to modify the technical specifications and components of its products without prior notice.

## 2 INSTALLATION

### 2.1 BOILER ROOM

#### 2.1.1 ACCESSIBILITY

The boiler room must be large enough to allow good access to boiler. The following minimum distances (mm) are required around the boiler:

- front	500	- sides	100
- rear	150	- above	700

#### 2.1.2 VENTILATION

The boiler room must be fitted with top and bottom vents according to the table below or current regulations.

#### 2.1.3 BASE

The base on which the boiler rests must be made of non-combustible materials.

### 2.2 CONNECTION

#### 2.2.1 CHIMNEY CONNECTION

The boiler can be connected to a suitable flue or to the chimney by a metal pipe rising at an angle from the boiler to the chimney. It must be easy to remove to give access to the flue pipes when servicing the boiler.

- A. Top vent
- B. Bottom vent
- C. Chimney height
- D. Chimney diameter

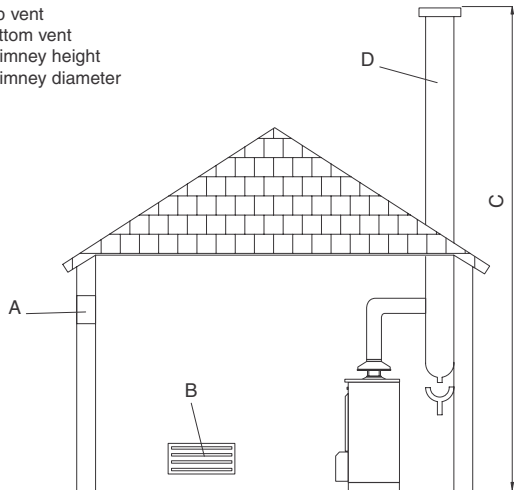


Fig. 1: Boiler room ventilation and chimney connection

		ALFA G	ALFA GP
<b>Ventilation</b>			
Min. fresh air requirement	m <sup>3</sup> /h	82,8	82,8
Top vent (A)	dm <sup>2</sup>	1,5	1,5
Bottom vent (B)	dm <sup>2</sup>	1,5	1,5
<b>Chimney</b>			
C = 5 m Ø min. D	mm	130	130
C = 10 m Ø min. D	mm	130	130
C = 15 m Ø min. D	mm	130	130



#### IMPORTANT

Boilers must be installed by a qualified engineer, in accordance with the prevailing local standards and regulations.

### 2.2.2 CENTRAL HEATING CONNECTION

#### 2.2.2.1 Examples of basic circuit configurations

The drain valve and safety valve must be connected to the waste water system in accordance with current regulations.

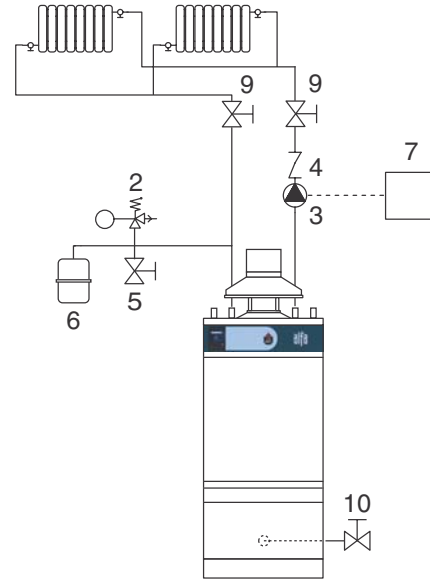


Fig. 2: Configuration with circulator controlled by a room thermostat

1. 3-way manual motorisable mixer valve
2. Safety valve pre-set to 3 bar with pressure gauge
3. Circulator
4. Non-return valve
5. System filling valve
6. Expansion tank
7. Room thermostat
8. ACV 13 controller (see controller kit page 5)
9. Central heating isolating valve
10. Drain valve

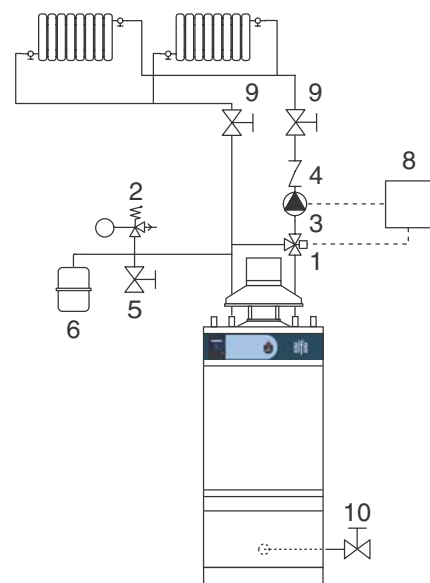


Fig. 3: Configuration with motor driven mixer valve

## 2 INSTALLATION

### 2.2.2.2 ACV circulation kit

ACV offers an optional pre-assembled circulation kit comprising:

- a circulator.
- a 3-way manual motorisable valve.
- connecting pipes including a second optional circuit.
- two isolating valves.
- adapters for mounting expansion tank, safety valve and filling valve to right or left.

### 2.2.2.3 Discharge

The drain valve and safety valve must be connected to the waste water system in accordance with current regulations.



Fig. 4: ACV circulation kit assembly

## 2.2.3 DOMESTIC HOT WATER CONNECTION

### 2.2.3.1 Pressure reducer

If the water mains pressure is greater than 6 bar, a pressure reducer calibrated to 4.5 bar must be fitted.

### 2.2.3.2 Safety unit

The tank safety unit must be ACV approved and calibrated to 7 bar. The valve discharge must be connected to the waste water system in accordance with current regulations.

### 2.2.3.3 Hot water expansion tank

Installing a hot water expansion tank avoids any risk of pressure surges due to water-hammer.

### 2.2.3.4 Hot water circulation

If the tank is situated a long way from the point of use, then installing a closed return circuit can provide a faster supply of hot water always available.

### 2.2.3.5 Description

1. Safety unit
2. Pressure reducer
3. Thermostatic mixing valve
4. Hot water circulator
5. Non-return valve
6. Hot water expansion tank
7. Inlet valve
8. Draw-off valve
9. Bleed valve

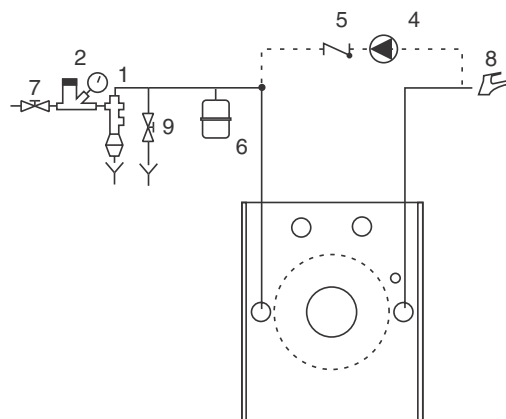


Fig. 5a: Configuration without thermostatic mixing valve



### IMPORTANT

As a safety measure against burns, we strongly advise installing a thermostatic mixing valve (recommended temperature: 60° C).

### Optional fittings available

Safety unit	Ø 3/4"
Pressure reducer	Ø 3/4"
Thermostatic mixer	Ø 3/4"
Hot water expansion tank	5 litres

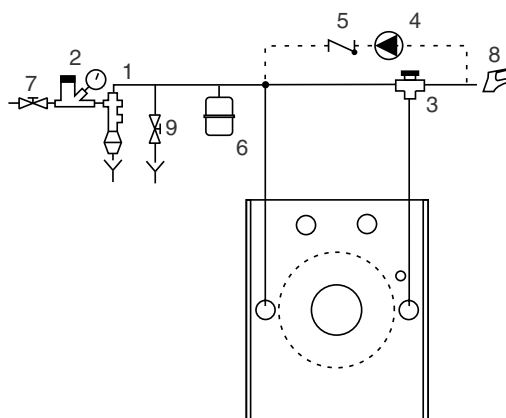


Fig. 5b: Configuration with thermostatic mixing valve

## 2 INSTALLATION

### 2.2.4 CONTROLLER KITS

#### KIT 1: ACV 13.00 / Basic

Basic kit for regulating flow temperature according to weather conditions.

It comprises: temperature regulator with analogue timer, water temperature detector (-30/130° C), outside temperature detector (-30/50° C), 230V - 3 spindle servomotor SQY 31 and intermediate socket.



Fig. 6a: kit 1

#### KIT 1: ACV 13.00 / Standard

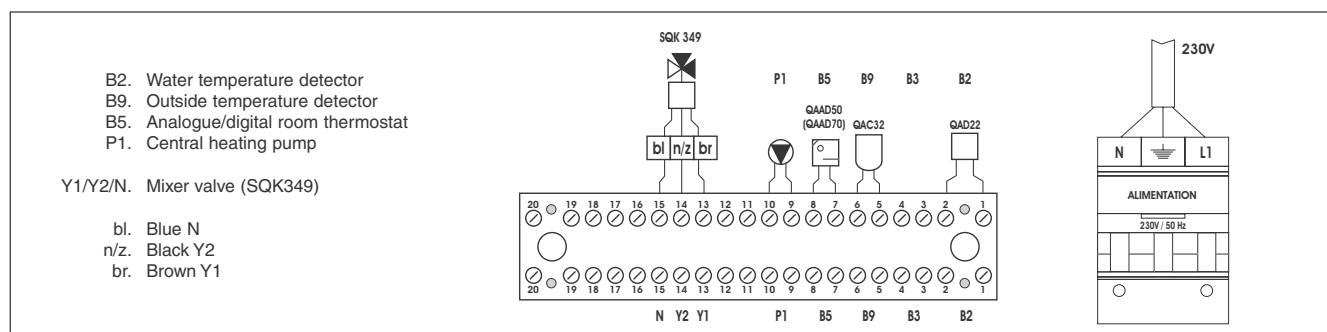
Basic kit for regulating flow temperature according to weather conditions.

It comprises: temperature regulator with analogue timer, water temperature detector (-30/130° C), outside temperature detector (-30/50° C), 230V - 3 spindle servomotor SQY 349 and intermediate socket.



Fig. 6b: kit 2

### Wiring diagram of ACV controller kits (fig. 7)



## 2.3 ELECTRICAL CONNECTION

### 2.3.1 POWER SUPPLY

The boiler operates with a 230 V - 50 Hz single phase supply. An isolator switch with 6 A fuses must be fitted outside the boiler to allow power to be shut off during servicing and before any repairs are carried out on the boiler.

### 2.3.2 COMPLIANCE

Boiler installation must comply with the prevailing local standards and legislation.

### 2.3.3 SAFETY

The stainless steel tank must be earthed separately.

### 2.3.4 BURNER ELECTRICAL CONNECTION

The burner is supplied with power by a 3-core cable.

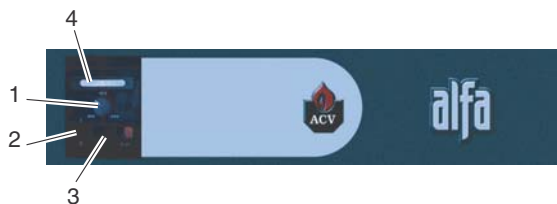


Fig. 8: Control panel



The power to the boiler must be switched off before any work is carried out.

M. Brown  
 O. Orange  
 N. Black  
 B. Blue  
 R. Red  
 T. Green-yellow

- Boiler thermostat (60/90° C)
- On/off switch
- Summer/winter selector
- Thermometer
- Flue spillage thermostat (TTB)
- Safety thermostat (103° C max.)
- Plug (power and control)
- Room thermostat
- Heating pump connection
- To gas valve

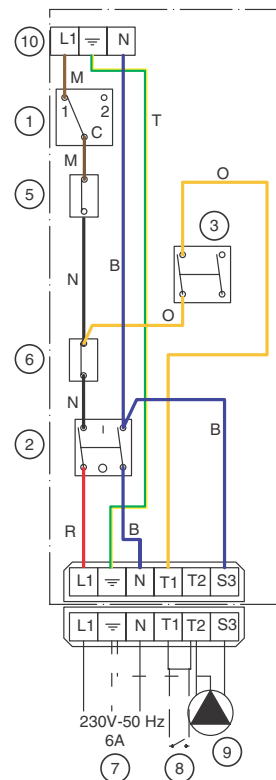


Fig. 9: Boiler wiring diagram

## 3 START-UP

### 3.1 FILLING THE HEATING AND HOT WATER CIRCUITS

1. Fill the domestic hot water circuit and bring it up to pressure.



#### IMPORTANT

The hot water tank must be pressurised before the heating circuit is filled.

2. Fill the heating circuit taking care not to exceed the 2 bar pressure limit.
3. Vent the air from the top of the boiler.
4. After venting the air from the system, bring the pressure up to the static head plus 0.5 bar: 1.5 bar = 10 m – 2 bar = 15 m.
5. Check the power connection, the boiler room ventilation, and ensure that there are no leaks in the flue gas discharge pipes.
6. Set the thermostat (1) to between 60 and 90° C.



Fig. 10: Control panel

7. Set the Summer/Winter selector (3) to the desired position.
8. Switch the on/off switch (2) to the ON position.
9. Check the gas supply pressure on starting up.

### 3.2 BURNER TROUBLESHOOTING

Refer to the servicing and troubleshooting instructions for the burner.



Before servicing or repairs, switch off the power at the mains switch fitted in the boiler room by the electrician.

## 4 SERVICING

### 4.1 RECOMMENDATION

ACV recommends that boilers should be serviced at least once a year. The burner must be serviced and tested by a competent engineer.

### 4.2 SERVICING THE GAS BOILER

- 1 - Switch off the power at the mains switch outside the boiler and close the gas tap.
- 2 - Set the on/off switch on the control panel to the OFF position.
- 3 - Release and remove the chimney flue (1) to free the top of the boiler.
- 4 - Remove the jacket top (2) and lift off the flue reducer (3).
- 5 - Remove the baffles (4) from the flue pipes (5) for cleaning. Replace them if in poor condition.
- 6 - Unscrew the burner chamber plate (6).
- 7 - Brush the flue pipes (5).
- 8 - Clean the burner chamber (7) and the burner (8).
- 9 - Check that the insulation on the burner chamber plate (6) is in good condition.

1. Chimney flue
2. Jacket top
3. Chimney flue reducer
4. Baffles
5. Flue pipes
6. Burner chamber plate
7. Burner chamber
8. Burner

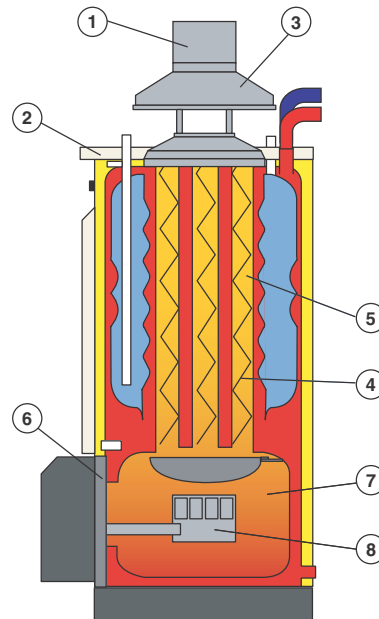


Fig. 11: Main components.

### 4.3 SERVICING THE SAFETY DEVICES

- Check that all thermostats and safety devices are working properly: boiler thermostat, cut-off thermostat and manual reset safety thermostat.
- Test the safety valves on the central heating and hot water circuits.

## 4 SERVICING

### 4.4 SERVICING THE BURNER

- Check and clean the burner and ignition electrode.
- Check that the safety components are working properly.

### 4.5 EMPTYING THE BOILER

#### 4.5.1 EMPTYING THE PRIMARY CIRCUIT (central heating):

1. Switch off the power to the boiler at the mains switch installed by the electrician.
2. Close the isolating valves (1) of the boiler system.
3. Connect a hose to the drain valve (2). Ensure that it is attached properly.
4. Open the drain valve and let the hot water drain out.




5. When the boiler is empty, return the isolating and safety valves to their initial positions.

#### 4.5.2 EMPTYING THE HOT WATER TANK:

1. Switch off the mains power to the boiler at the external switch installed by the electrician.
2. Relieve the pressure in the primary circuit.
3. Close valves (A) and (B).
4. Open valves (C) and (D) (first C then D).
5. Let the water drain away.



6. After emptying, return the valves to their initial positions.

 For the tank to be emptied, valve (C) must be situated at ground level.

### 4.6 SPARE PARTS

Refer to the specific document available from ACV or your distributor.

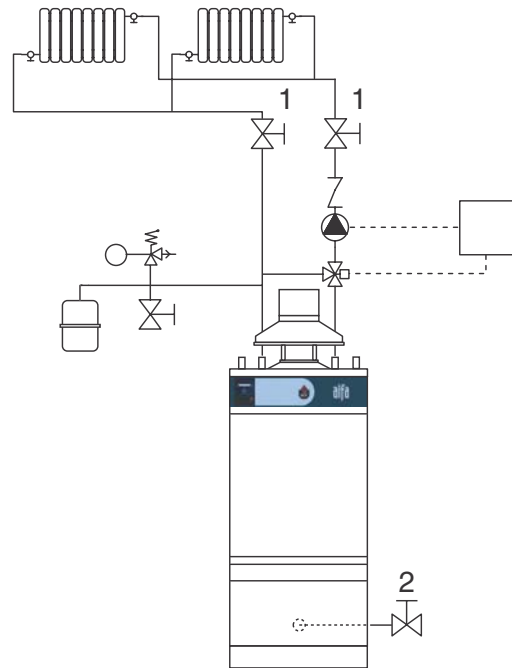


Fig. 12a: Emptying the primary circuit

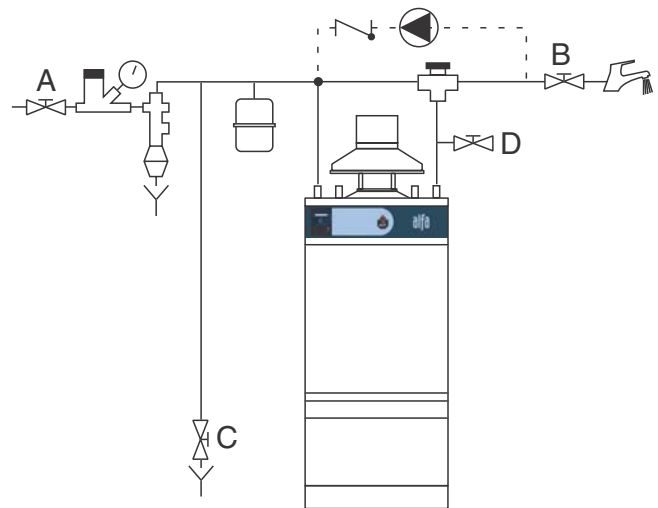


Fig. 12b: Emptying the hot water circuit

## 5 DESCRIPTION

### 5.1 OVERVIEW

- Dual application boiler (central heating and domestic hot water).
- Designed for connection to a chimney or suitable flue.
- TANK-IN-TANK indirect storage type domestic hot water production.
- Fittings for connecting the circulation kit to feed the heating circuit (available as an option).
- Control panel with setting thermostat (60/90 °C), on/off switch, Summer/Winter selector, thermometer, warning lamp and burner reset button.
- Flue gas anti-backdraught safety device.
- Delivered complete with atmospheric type burner.
- ALFA G for natural gas, with rated output of 20.3 kW.
- ALFA GP for propane, with rated output of 23.5 kW.



Fig. 13: Ballon inox sanitaire

### 5.2 DESCRIPTION OF OPERATION

#### 5.2.1 THE TANK-IN-TANK CONCEPT

The ALFA Gas series differs from traditional hot water producers because of its ring-shaped tank immersed in the primary fluid contained in the outer body. When there is a demand for hot water from the central heating system or the domestic hot water system, the thermostat starts the burner. The combustion gases quickly heat up the primary fluid, creating a natural circulation around the tank.

#### 5.2.2 DOMESTIC HOT WATER HEATED INDIRECTLY

This circulation facilitates heat exchange between the primary fluid and the domestic water, which takes place all over the tank surface. The corrugations on the inner and outer shells of the ring-shaped tank further boost the area of heat exchange and speed up the heating process of the domestic water.

#### 5.2.3 EASY SETTING AND SAFETY ASSURED

With a single command, the water temperature of both the primary circuit and the hot water circuit is set by the adjustable thermostat situated on the tank in the primary circuit. A manually reset safety thermostat shuts off the burner if the temperature reaches 103° C.

### 5.3 DESIGN FEATURES

#### 5.3.1 OUTER BODY

The outer body containing the primary fluid is made of STW 22 steel.

#### 5.3.2 TANK-IN-TANK TYPE EXCHANGER ACCUMULATOR

The ring-shaped inner tank with its large heating surface for producing domestic hot water is built of Chrome/Nickel 18/10 stainless steel. It is corrugated over its full height by an exclusive production process and entirely by argon arc welded by the TIG (Tungsten Inert Gas) method.

#### 5.3.3 COMBUSTION GAS CIRCUIT

The combustion gas circuit is protected by cold galvanisation. The combustion gas circuit comprises:

##### 5.3.3.1 Flue pipes

Depending on output, ALFA Gas models contain 4 or 8 steel flue pipes with an internal diameter of 64 mm. Each pipe is fitted with a baffle of special steel designed to improve heat exchange and reduce flue gas temperature.

##### 5.3.3.2 Combustion chamber

The combustion chamber on ALFA Gas models is water cooled.

#### 5.3.4 INSULATION

The boiler body is fully insulated by rigid polyurethane foam with a high thermal insulation coefficient, sprayed on without the use of CFCs.

#### 5.3.5 JACKET

The boiler is covered by a steel jacket which has been scoured and phosphated before being stove enamelled at 220° C.

#### 5.3.6 BURNER

ALFA Gas boilers are fitted with an atmospheric burner with electric ignition.

#### 5.3.7 CONTROL PANEL (Fig. 14)

- 1 - Thermostat adjustable between 60 and 90° C
- 2 - On/off switch
- 3 - Summer/winter selector
- 4 - Thermometer



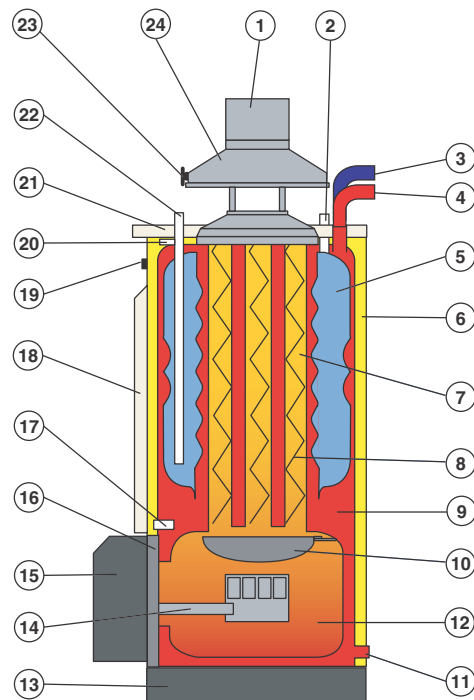
Fig. 14: Control panel



## 5 DESCRIPTION

**Boiler components Fig. 15**

1. Chimney flue
2. Domestic hot water outlet
3. Central heating return
4. Central heating flow pipe
5. Inner ring-shaped domestic hot water tank
6. Sprayed-on polyurethane foam insulation
7. Flue pipes
8. Baffles
9. External body containing central heating circuit
10. Burner chamber disk
11. Boiler drain
12. Combustion chamber
13. Boiler base
14. Burner flame holder
15. Burner chamber cap
16. Burner chamber door
17. Thermometer / boiler thermostat bulb
18. Front
19. Control thermostat 60/90 °C
20. Manual reset safety thermostat 103 °C
21. Casing top
22. Domestic cold water flow pipe
23. Flue spillage thermostat (TTB)
24. Chimney reducing adapter



## 6 TECHNICAL SPECIFICATION

### 6.1 EFFECTIVE DIMENSIONS

The units are delivered fully assembled, tested and packed on a timber base with shockproof edges and protected by heat-shrunk plastic film. On reception and after unpacking, check the equipment for damage. For transport purposes, refer to the weights and dimensions given opposite.

Dimensions	ALFA G	ALFA GP
A	1363	1363
B	130	130
C	685	685
D	390	390
Kg	143	143

### 6.2 MAXIMUM OPERATING CONDITIONS

**Maximum service pressure** (tank full of water)

- Primary circuit: 3 bar
- Secondary circuit: 10 bar

**Test pressure** (tank full of water)

- Primary circuit: 4.5 bar
- Secondary circuit: 13 bar

**Operating temperature**

- Maximum temperature: 90° C

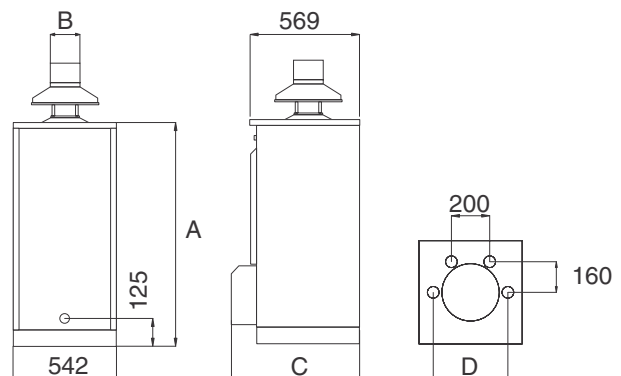


Fig. 16: Effective dimensions

## 6 TECHNICAL SPECIFICATION

### 6.3 DOMESTIC HOT WATER PERFORMANCE

Domestic hot water performances			ALFA G	ALFA GP
<b>Operating at 80° C</b>				
Peak delivery at 40° C	(OT = 30° C)	litres/10'	170	170
Peak delivery at 40° C	(OT = 30° C)	litres/60'	653	665
Continuous delivery 40° C	(OT = 30° C)	litres/h	579	594
<b>Operating at 80° C</b>				
Initial heating time		minutes	24	24
After draw-off of 140 l at 45° C		minutes	17	16,5

*Results obtained without a thermostatic mixing valve and with water supply at 10° C*

### 6.4 BOILER PERFORMANCES

		ALFA G	ALFA GP
Input	kW	23	23,5
Output	kW	20,3	20,7
Combustion efficiency	%	90,7	91,3
Maintenance loss at 60° C as % of rate value	%	1	1
Mass rate of combustion products	g/sec.	18	19
Average CO <sub>2</sub>	%	8,5	9,5
Total capacity	litres	99	99
Primary circuit capacity	litres	56	56
Heating connection	Ø	1"	1"
Hot water connection	Ø	3/4"	3/4"
Hot water tank heat exchange surface	m <sup>2</sup>	1,42	1,42
Weight empty	Kg	143	143
Chimney connection		B11 BS	B11 BS

### 6.5 ATMOSPHERIC BURNER

		ALFA G	ALFA GP
<b>Gas G20 - 20 mbar - I E2+ - I 2E LL</b>			
Burner pressure	mbar	9,8	-
Flow rate	m <sup>3</sup> /h	2,43	-
<b>Gas G31 - 37/50 mbar - I 3P</b>			
Burner pressure	mbar	-	21,2
Flow rate	m <sup>3</sup> /h	-	0,94
Injector Ø	1/100 mm	450	3x160

BE - FR	AT - DK - ES - GB - IT - PT - IE - SE	BE - FR - ES - GB - IE - PT	NL	LU - DE
I E2+	I 2H	I 3P	I 2L	I 2ELL

## 6 TECHNICAL SPECIFICATION

### Description

These atmospheric burners are fitted with a SIT gas valve and an electrically operated relay. This gas valve has been specially developed for atmospheric burners with automatic ignition and ionisation flame detection.

### Advantage

- No pilot flame, therefore no gas consumption when the boiler is off.
- The burner only operates when there is a demand for hot water.
- The electric ignition requires no action.

### Starting

- Flush the gas pipe thoroughly, turn on the room thermostat and switch the control thermostat to heat demand.
- Open the gas tap.
- Turn on the main switch on the control panel.



The burner is preset at the factory.

Check the supply pressure and the pressure in the burner when starting the boiler.

1. Electrically operated gas valves.
2. Upstream gas pressure test point.
3. Pressure regulator
4. Gas burner pressure test point.

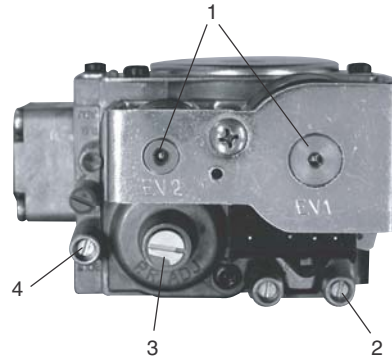
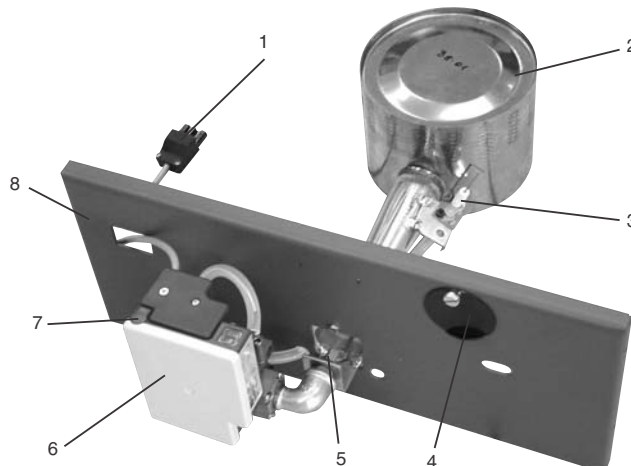


Fig. 17: Burner gas valve

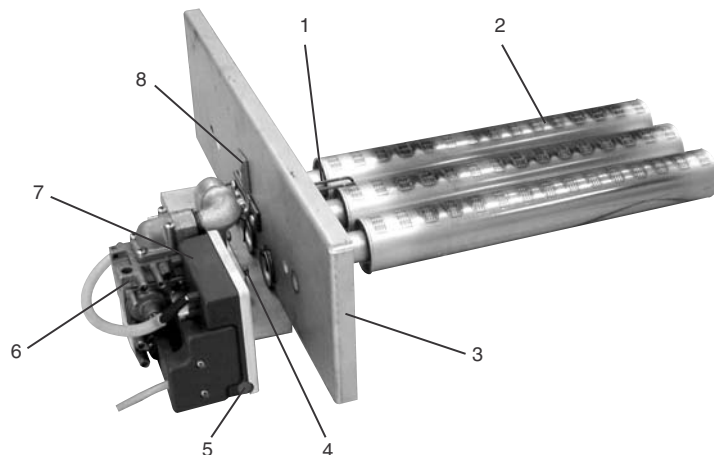
### Natural gas atmospheric burner (fig.18)

1. Burner plug connector
2. Pot type flame holder
3. Ignition and ionisation electrode
4. Observation window
5. Injector
6. Relay
7. Reset button
8. Burner chamber plate



### Propane gas atmospheric burner (fig.19)

1. Ignition and ionisation electrode
2. Flame holder
3. Burner chamber plate
4. Injectors
5. Reset button
6. Gas valve
7. Relay
8. Observation window



## 7 USER GUIDE

### 7.1 USING THE BOILER

#### 7.1.1 GETTING TO KNOW THE CONTROL PANEL (Fig. 20)



**Before doing any work on the boiler, switch off the power at the mains switch installed in the boiler room by the electrician.**

**On the control panel, switch off the ON/OFF switch.**  
(item 2, Fig. 20)

#### 1 - Control thermostat 60° to 90° C (item 1, Fig. 20).

Central heating systems are generally designed to operate at 80° C maximum. If they are operated at a lower temperature, a 3-way mixer valve installed on the heating flow pipe (see Fig. 3, page 3) allows the temperature to be set manually or, if you decide to install a regulator (§ 2.2.4, page 5), automatically.

We recommend you set the thermostat to the maximum values to get the best from the domestic hot water system.



The water stored in the domestic hot water tank in the boiler can be at a very high temperature.

In all cases, install the thermostatic mixer (Fig. 5b, page 4) on the domestic hot water flow pipe which must not exceed 60° C. A blender or mixing valve is recommended at each point of use.

#### 2 - ON/OFF switch (item 2, Fig. 20).

This must be used to switch off the boiler before working on it.

#### 3 - Summer/winter selector (item 3, Fig. 20)

“Winter” position: activates both the hot water and central heating functions. “Summer” position: the room thermostat or regulator (§ 2.2.4, page 5) is switched off. The heating circulator is also switched off. Only the domestic hot water function is provided. You can lower the temperature on the thermostat (1) to save energy.

If there is not enough hot water, we recommend setting the thermostat (1) to its maximum value.

When the next heating season begins, simply select “Winter” to reactivate the heating system.

#### 4 - Thermometer (item 4, Fig. 20)

Reads the temperature of the boiler primary circuit (central heating) directly.

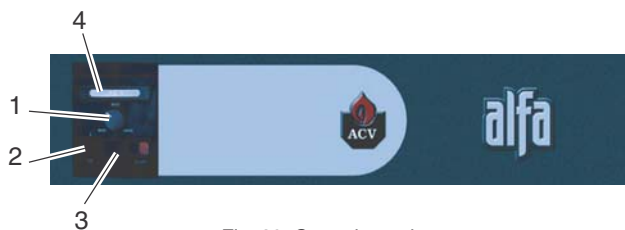


Fig. 20: Control panel

#### 7.1.2 HEATING SYSTEM GAUGE PRESSURE


Your system is fitted with a heating safety valve set to 3 bar, with a pressure gauge.

Ensure that the water in the system is always pressurised. When cold, and after the air in the system has been vented, the pressure gauge must show a pressure between 0.5 and 1.5 bar, depending on the height of the building (1 bar = 5m / 1.5 bar = 10 m and 2 bar = 15 m). To add water, open the filling valve (Fig. 2 and 3 page 3). Close the valve after filling. Vent the air in the system to get an accurate water pressure reading.

#### 7.1.3 SAFETY VALVE (central heating) (item 2, Fig. 3, page 3)



**Water flowing out of the safety valve is extremely hot and can cause serious burns.**  
**The discharge pipe to the drain must be in accordance with current regulations.**  
**Keep people away from discharges of hot water.**


 **In the event of a fault after this short trial, inform the installing engineer.**

#### 7.1.4 SAFETY UNIT (domestic hot water) (item 1, Fig. 5a and 5b, page 4)

A monthly inspection is recommended.  
Lift the lever on the emptying device for a few seconds to ensure that the safety valve is working properly.



**Water flowing out of the safety valve is extremely hot and can cause serious burns.**  
**The discharge pipe to the drain must be in accordance with current regulations.**  
**Keep people away from discharges of hot water.**

 **In the event of a fault after this short trial, inform the installing engineer.**

## 7 USER GUIDE

### 7.1.5 GAS BURNER - RESETTING

If the atmospheric burner is not working:

1. Remove the protective cover.
2. Press the red button to start the burner.

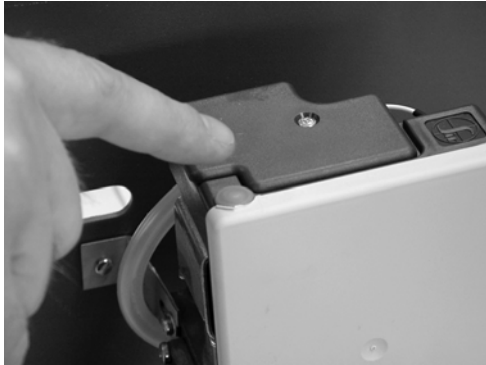


Fig. 21: Burner reset button



**If the burner is not working, isolate the electricity supply before attempting to reset the safety thermostat.**

3. Remove the circular cover on the boiler top and press the red safety thermostat button



**Wait until the boiler temperature is below 60° C then replace the casing front panel.**



Fig. 22: Safety thermostat reset button

4. If the burner lights, replace the cover.
6. If the fault persists, notify the installing engineer.

#### **Starting the burner.**

In normal operation, the gas burner starts automatically whenever the boiler temperature falls below the set temperature.



**To ensure your system operates properly, have it professionally serviced once a year before the central heating season begins.**

### 7.2 BOILER ROOM

- Keep vents free at all times.
- Do not store inflammable products in the boiler room.
- Take care not to store corrosive products near the boiler, such as paints, solvents, chlorine, salt, soap and other cleaning products.
- If you smell gas, do not switch on the light or light a flame. Turn off the mains gas tap at the meter and inform the appropriate services immediately.



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