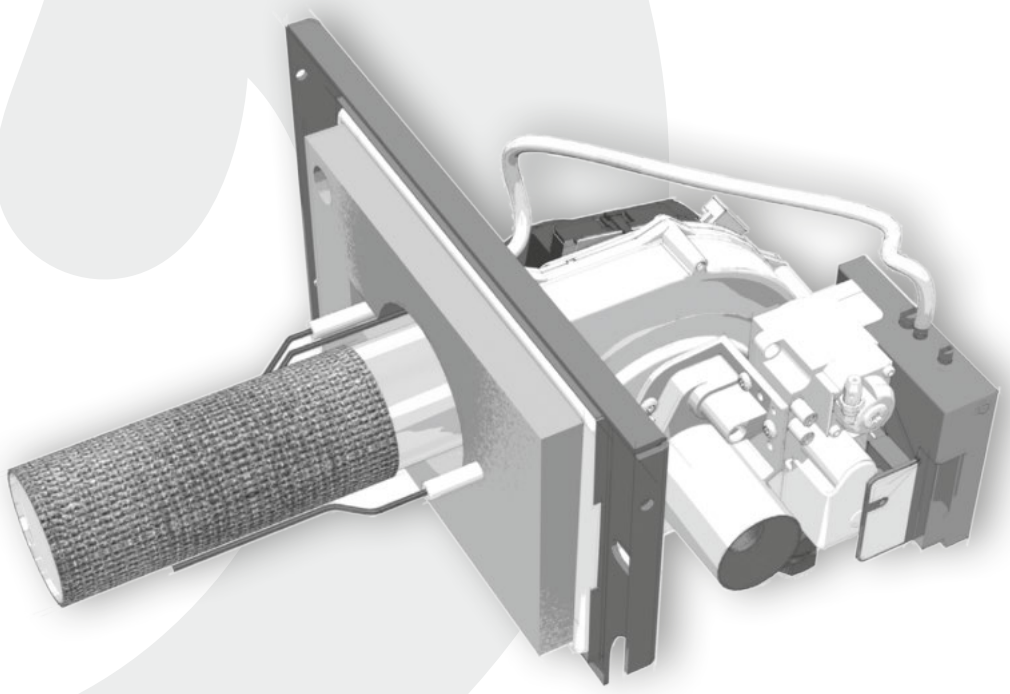
ACV
EXCELLENCE IN HOT WATER

BG 2000-S

25 - 35 - 45 - 55

60 - 70 - 100

INSTALLATION, OPERATION & MAINTENANCE



Instructions for the Installer

A1008858_662Y0600 • C

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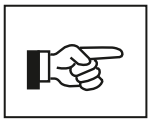
INDEX

WHO SHOULD READ THESE INSTRUCTIONS

These instructions should be read by:
- the design engineer/consultant
- the user
- the installer
- the service engineer

SYMBOLS

The following symbols are used in this manual:



Essential instruction for the correct operation of the installation

Essential instruction for the safety of persons and the environment

Electrocution hazard: use a qualified technician

RECOMMENDATIONS

- **Carefully read this manual before installing and bringing the boiler into service.**
- **It is prohibited to modify the interior of the appliance in any way, without the manufacturer's prior written agreement.**
- **The product must be installed by a qualified engineer, in accordance with the applicable local standards and codes.**
- **Failure to follow the instructions describing test operations and procedures could result in personal injury or a risk of environmental pollution.**
- **In order to ensure the appliance operates safely and correctly, it is important to have it serviced by an approved contractor.**
- **If there is a problem please contact your contractor for advice.**
- **In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please notify your approved contractor immediately of any faults.**
- **Defective parts can only be replaced with original factory parts.**

- **Before carrying out any work on the boiler, it is important to isolate the electrical supply to the unit.**
- **The user must not attempt to gain access to the components inside the boiler or the control panel.**
- **This appliance is not intended for use by persons with reduced physical, sensory or mental capacities , or lack of experience and knowledge (including children) , unless they have been supervised or instructed concerning use of the appliance by a person responsible for their safety.**

CERTIFICATION

The products have received **CE** certification in accordance with the standards in force in various countries (European Directives **92/42/EEC** "efficiency requirements", **2009/142/EC** "gas appliances").

IMPORTANT NOTES

If you smell gas :
- Isolate the gas supply immediately.
- Ventilate the room (Open the windows).
- Do not use electrical appliances and do not operate switches.
- Notify your gas supplier and/or your installer immediately.

These instructions are an integral part of the equipment to which they relate and must be left for the user.

The product is to be installed and serviced by qualified technicians, in accordance with current regulations.

The manufacturer declines all liability for any damage caused as a result of incorrect installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.

The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.

The availability of certain models as well as their accessories may vary according to markets.

The BG 2000-S burner is fitted with a gas valve – venturi assembly, an electronic controller, a fan, a flame holder and lighting and ionisation electrodes.

CONTROLLING THE AIR – GAS MIXTURE

As the fan sucks in air through the venturi, a drop in pressure (**P1**) is produced in the neck of the venturi. The gas valve regulator then reacts to maintain a pressure differential equal to the offset value between the pressure at the gas valve outlet (**P2**) and atmospheric pressure (**P3**): **P2 – P3 = offset**

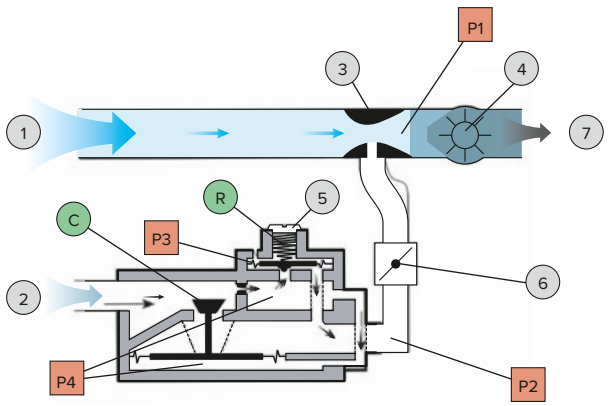
If the air flow decreases, **P1** increases; the same occurs for **P2**; **P2** is then >**P3**; the regulator **R** is moved higher to make **P2 – offset = P3**; pressure **P4** falls and the valve **C** is turned down: the gas flow decreases.

By careful adjustment of the offset, an air – gas pressure ratio of 1 is obtained, regardless of the fan speed.

The pressure differential between the venturi neck and the gas valve outlet then causes gas to be sucked through the venturi.

The gas flow adjustment screw can be used to adjust the quantity of gas injected for a given air flow, which will set the % CO_2 in the flue gas.
A given output can then be set simply by adjusting the speed of rotation of the fan and the % CO_2 to preset values.

Functional diagram



1. Air
2. Gas
3. Venturi
4. Fan
5. Offset adjustment screw
6. Gas flow a adjustement screw (CO_2)
7. Air - gas mixture

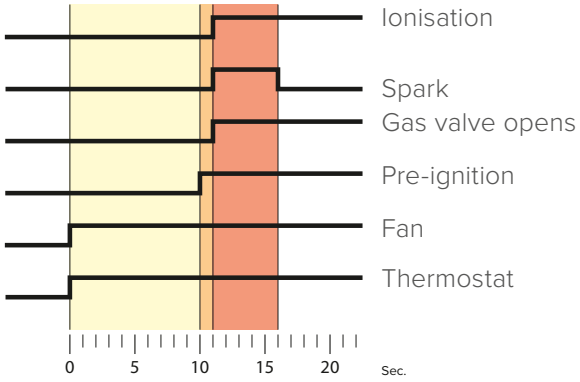
LIGHTING AND FLAME CONTROL

The burner control unit performs the tasks of lighting the burner by producing a spark at the ignition electrode, and maintaining the flame when the gas valve is opened by measuring the ionisation current.

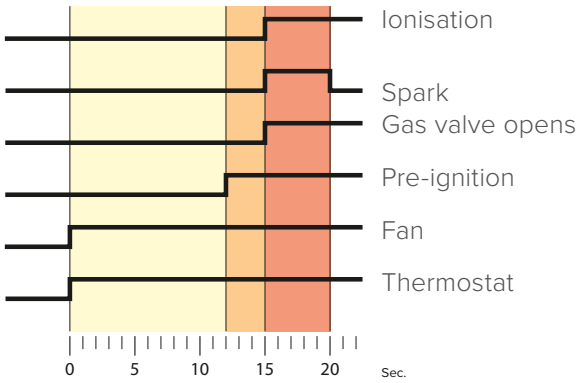
The lighting sequence is shown in the diagram below: When the boiler thermostat detects a demand for heat, the fan starts; after 10 seconds of preliminary flushing, the gas valve is opened and simultaneously a spark is produced. If an ionisation current is detected in the first 5 seconds, combustion occurs normally until the end of the demand. If not, the gas valve is closed and the fan stopped, the burner being in safety mode. It must then be reset manually before lighting is attempted again.

Sequence of starting

BG 2000-S 25 / 35 / 45 / 55 / 60 / 70



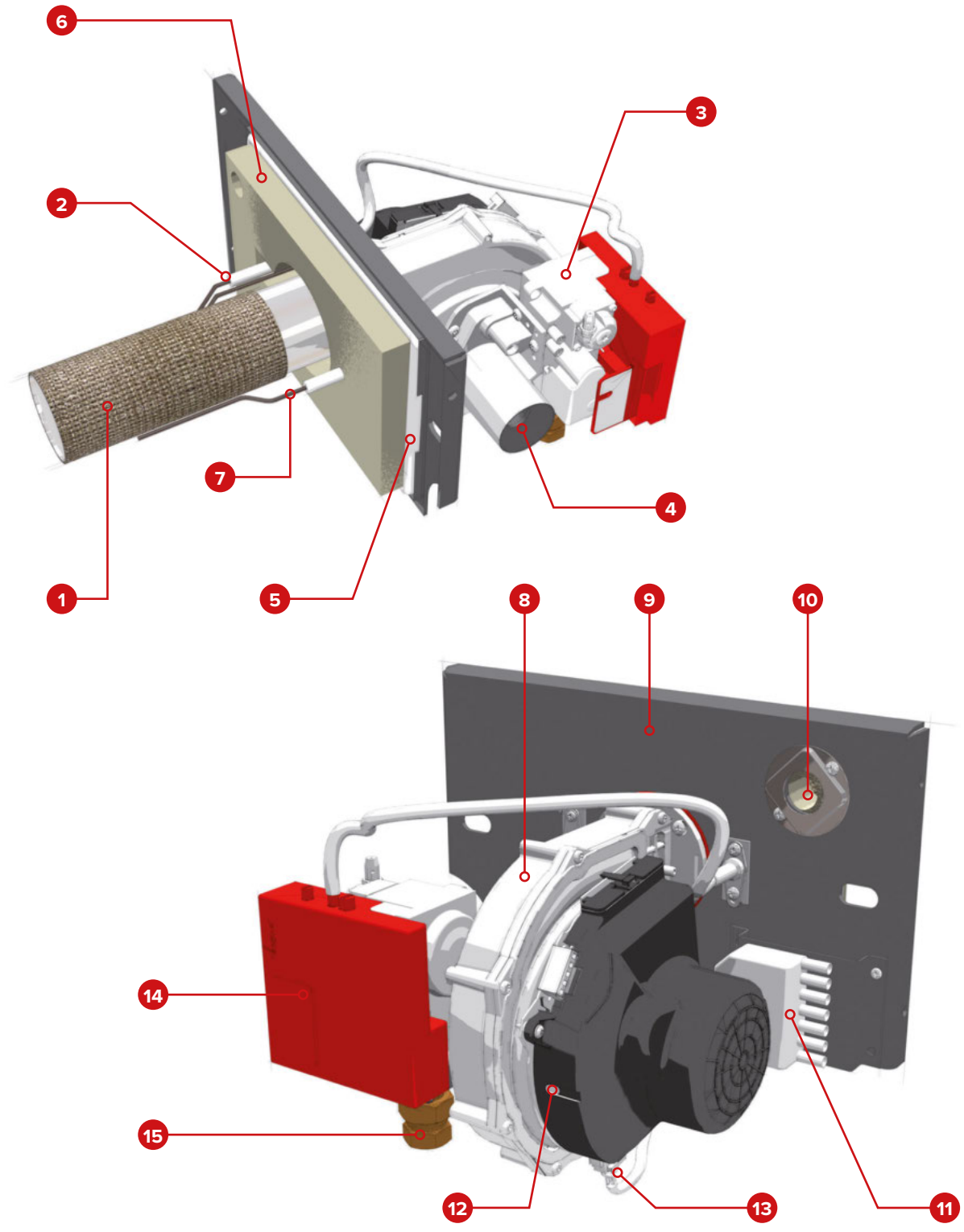
BG 2000-S 100



DESCRIPTION - BG 2000-S 25 / 35 / 45 / 55 / 60 / 70

1. Burner
2. Ignition electrode
3. Gas valve
4. Venturi
5. Burner chamber plate seal
6. Burner chamber plate insulation
7. Ionisation electrode
8. Fan
9. Burner chamber plate
10. Flame inspection window
11. Burner plug
12. Potentiometer setting
13. Fan power plug
14. Burner control
15. Gas supply

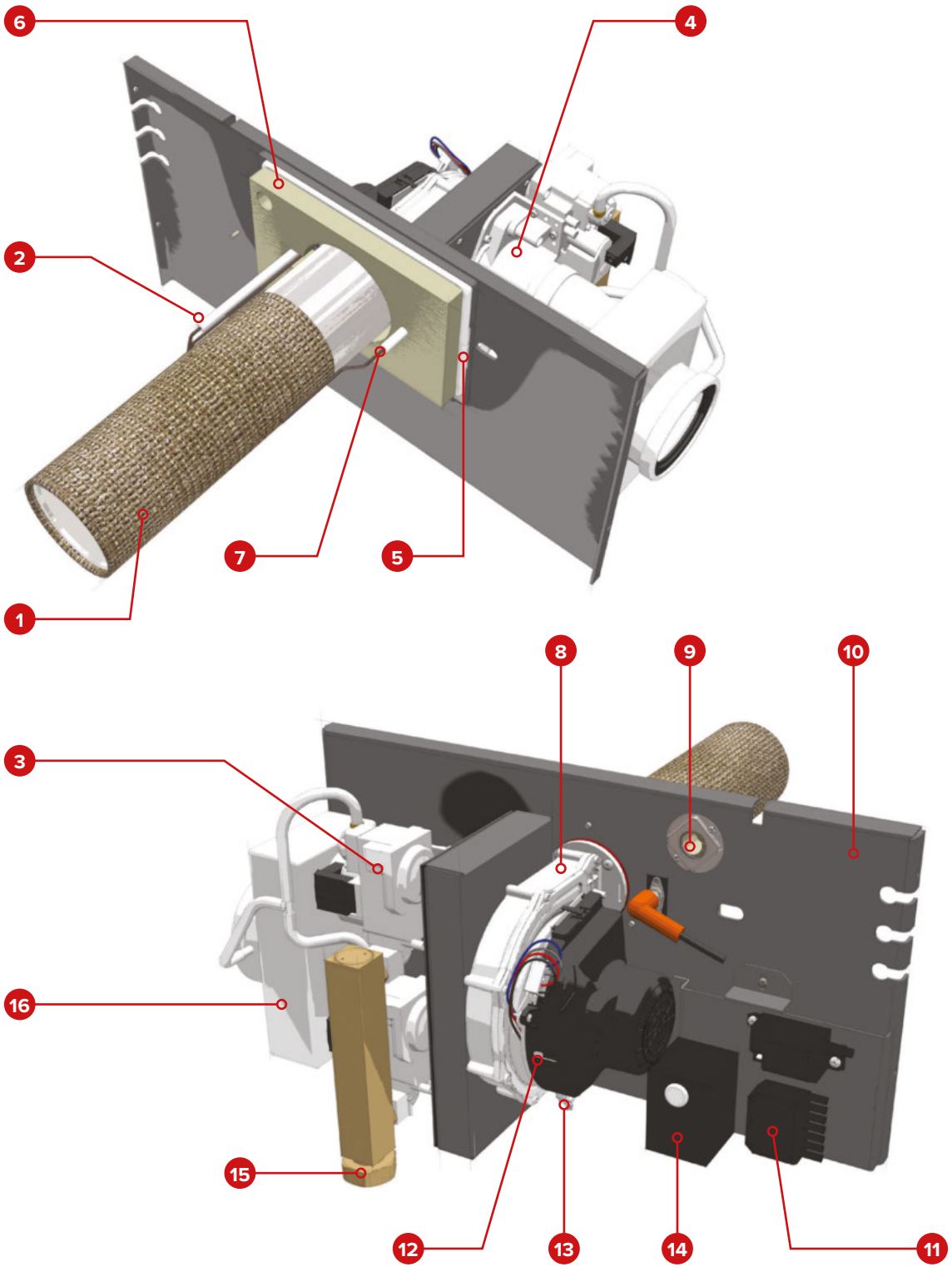
BG 2000-S 25 / 35 / 45 / 55 / 60 / 70



DESCRIPTION - BG 2000-S 100

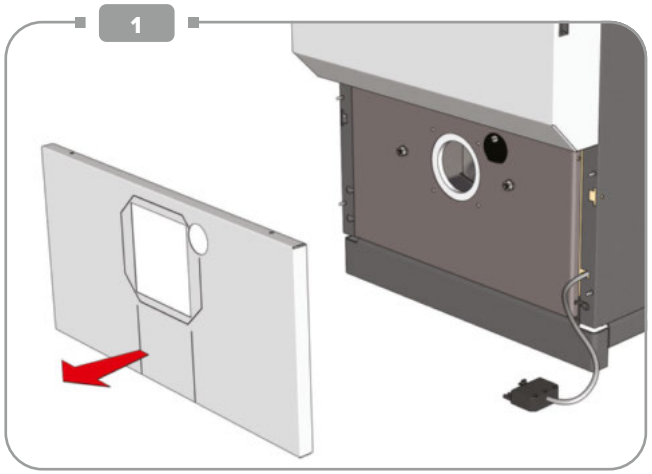
1. Burner
2. Ignition electrode
3. Gas valve (2x)
4. Venturi (2x)
5. Burner chamber plate seal
6. Burner chamber plate insulation
7. Ionisation electrode
8. Fan
9. Flame inspection window
10. Burner chamber plate
11. Burner plug
12. Potentiometer setting
13. Fan power plug
14. Burner control
15. Gas supply
16. Air box

BG 2000-S 100



FITTING THE BURNER

1



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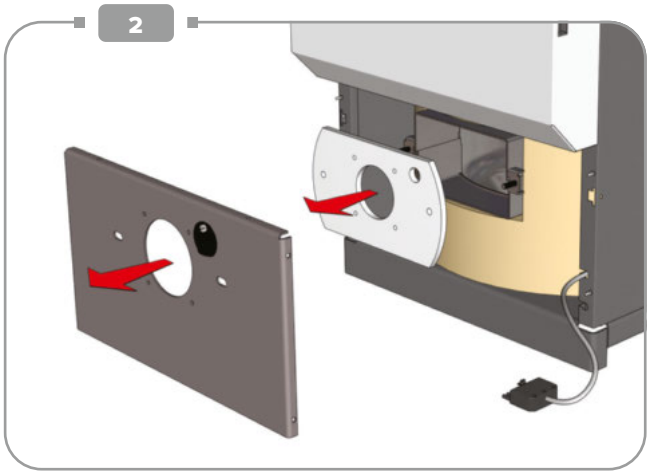

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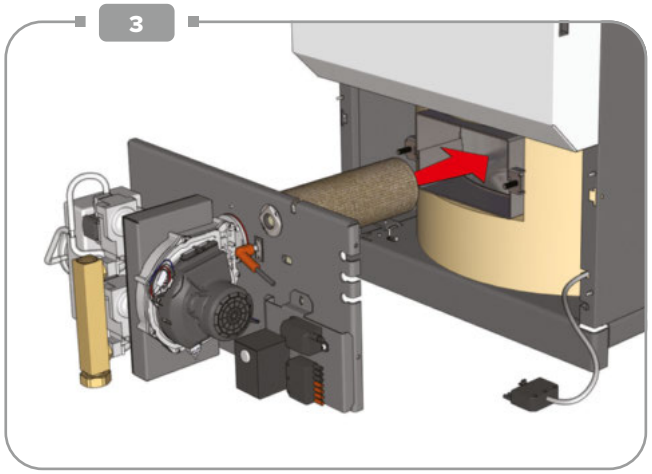

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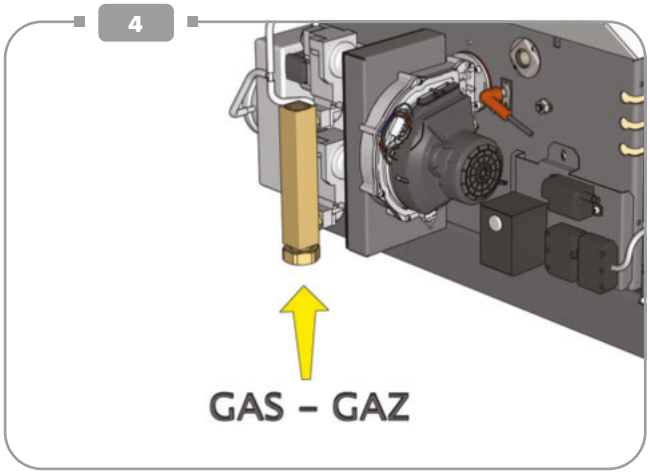

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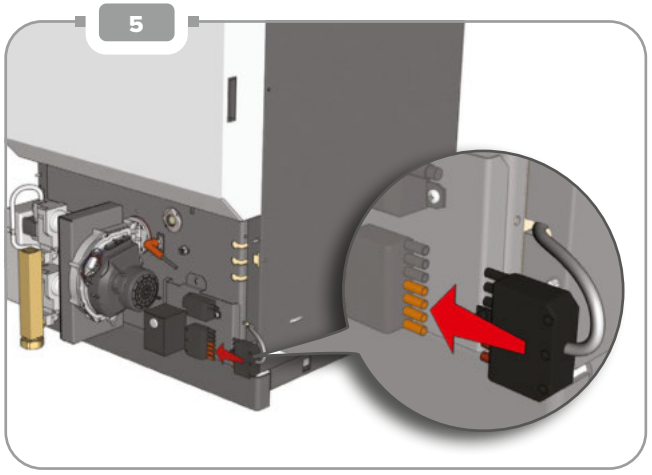
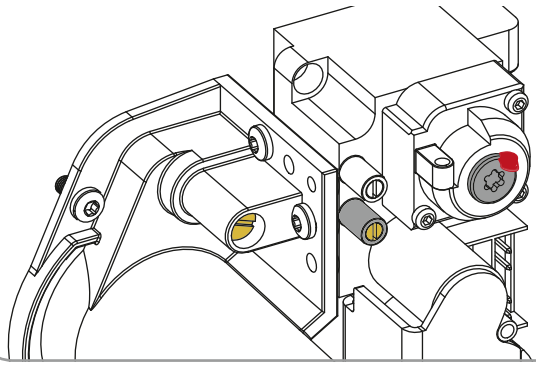


6

Adjust the CO_2 (see page 8)



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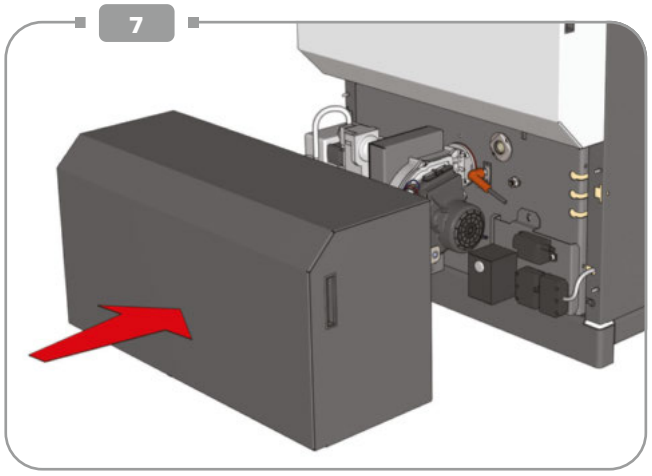

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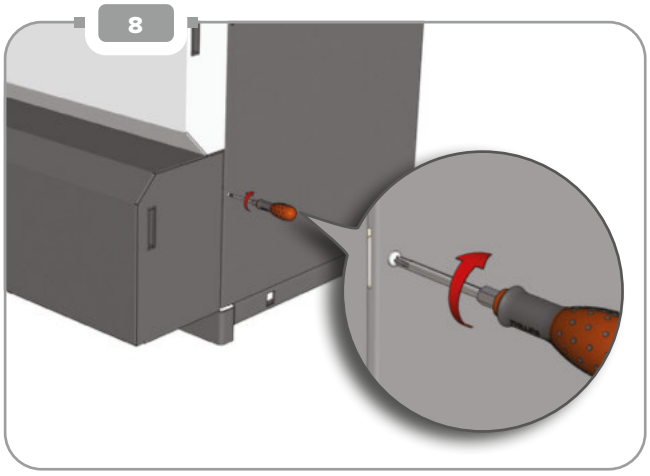


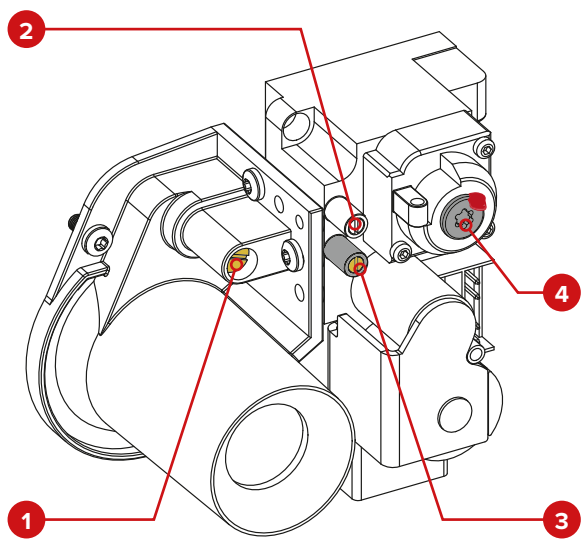
GAS FLOW RATE

- Measure burner combustion using an electronic flue gas analyser.
- Adjust the % CO_2 to the value given in the setting parameter table by turning the gas flow adjustment screw (1, illustration R): anticlockwise for increased flow (rise in %CO_2), clockwise for decreased flow (tall in % CO_2).

1. Gas flow adjustement screw (CO_2).
2. Pressure offset measurement.
3. Upstream gas pressure measurement.
4. Offset adjusting screw cover **(Never touch this screw!)**

Warning!
To respect the parameters of the offset adjustement mentioned again in the table above.

Venturi & gas valve



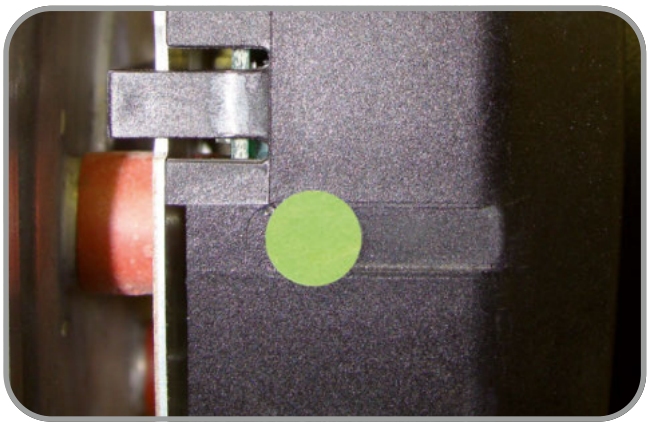
SETTING PARAMETERS

Burners	Boilers	Output kW	G20 - G25		G31	
			% CO_2	Rpm max.	% CO_2	Rpm max.
BG 2000-S / 25	Delta Performance 25 Delta Pro 25	25,0	9,0	3400	11.0 / 11,2	3100
BG 2000-S / 35	Delta Performance 35 Alfa Sprint S / SV HeatMaster 30 N	34,9	9,0	4150	11.0 / 11,2	3760
BG 2000-S / 45	Delta Performance 45 Delta Pro 45	45,0	9,0	4400	11.0 / 11,2	4000
BG 2000-S / 55	Delta Performance 55 Delta Pro 55	55,0	9,0	4100	11.0 / 11,2	3700
BG 2000-S / 60	HeatMaster 60 N	69,9	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 70	HeatMaster 70 N	69,9	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 100 • 85 kW	HeatMaster 100 N	85,0	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 100 • 107 kW	HeatMaster 100 N	107,0	9,5	5900	11.0 / 11,2	5440

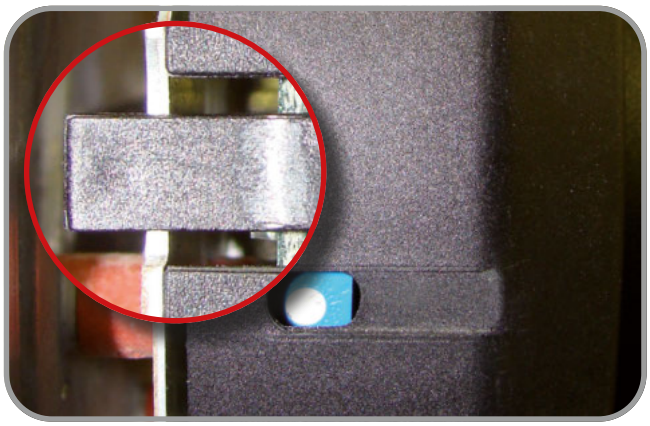
Note:
- The offset value is set at the factory.
- The burner can only be fitted to one of the boilers in the table above.

FAN SETTING PROCEDURE

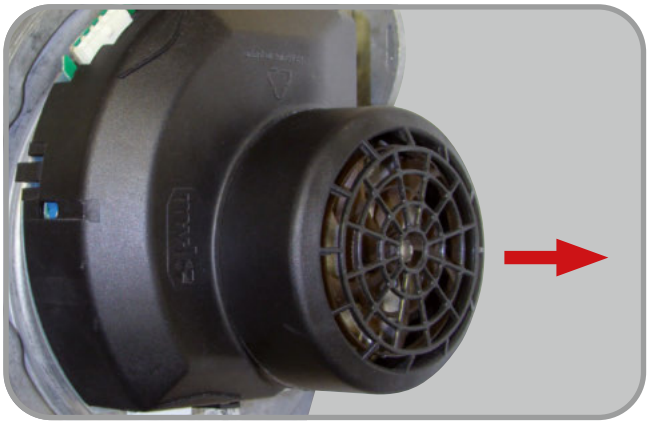
FAN ROTATION SPEED (Rpm)



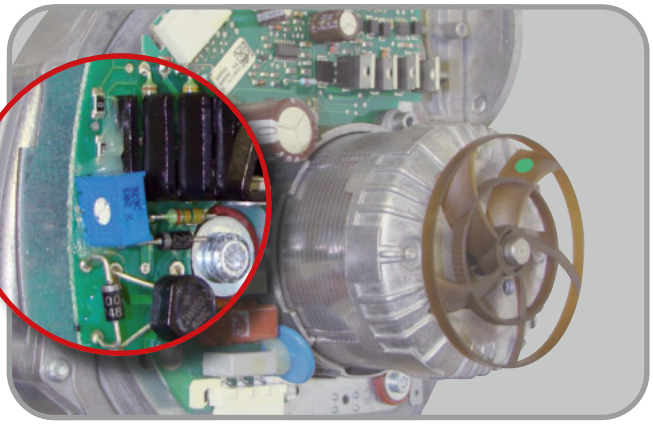
1. Remove the green protective disk



2. Release the clips of the fan motor cover.

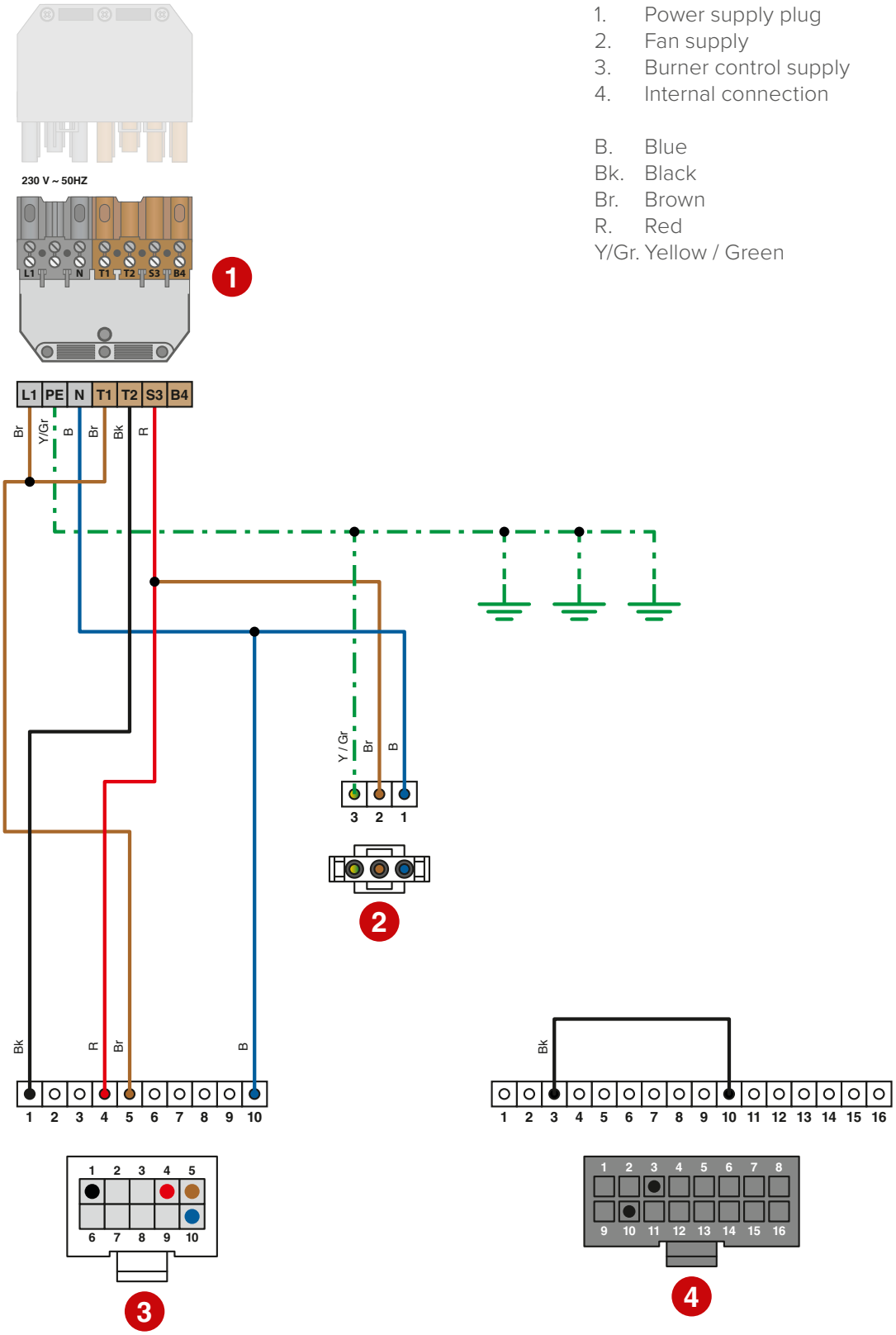


3. Remove the cover protection of the fan.



4. Adjust the speed of the fan using the settings in the table underneath rotate counter clockwise to reduce and clockwise to increase the fan speed once the fan is adjusted please remount the fan motor cover.

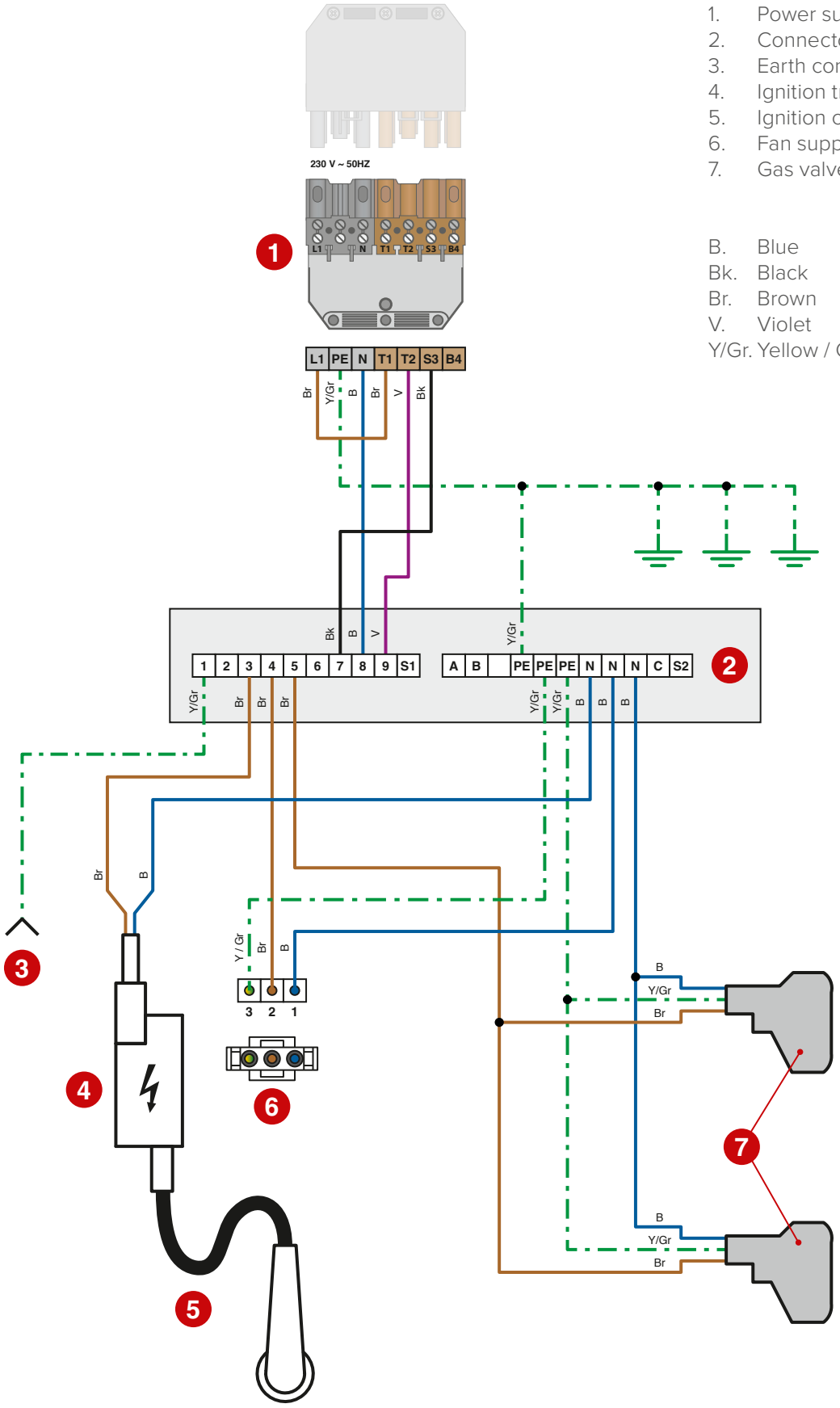
BURNER WIRING • BG 2000-S 25 / 35 / 45 / 55 / 60 / 70



1. Power supply plug
2. Fan supply
3. Burner control supply
4. Internal connection

B. Blue
Bk. Black
Br. Brown
R. Red
Y/Gr. Yellow / Green

If on the control panel the warning-light: “Burner lock-out” continuously lights up as the burner runs, please check if on the boiler-connector the bridge between 12 and 15 (for jet-burners) is replaced by the bridge 15 and 16 (for BG 2000-S) See also installation manual: "**HeatMaster® 30 N / 60 N / 70 N**".

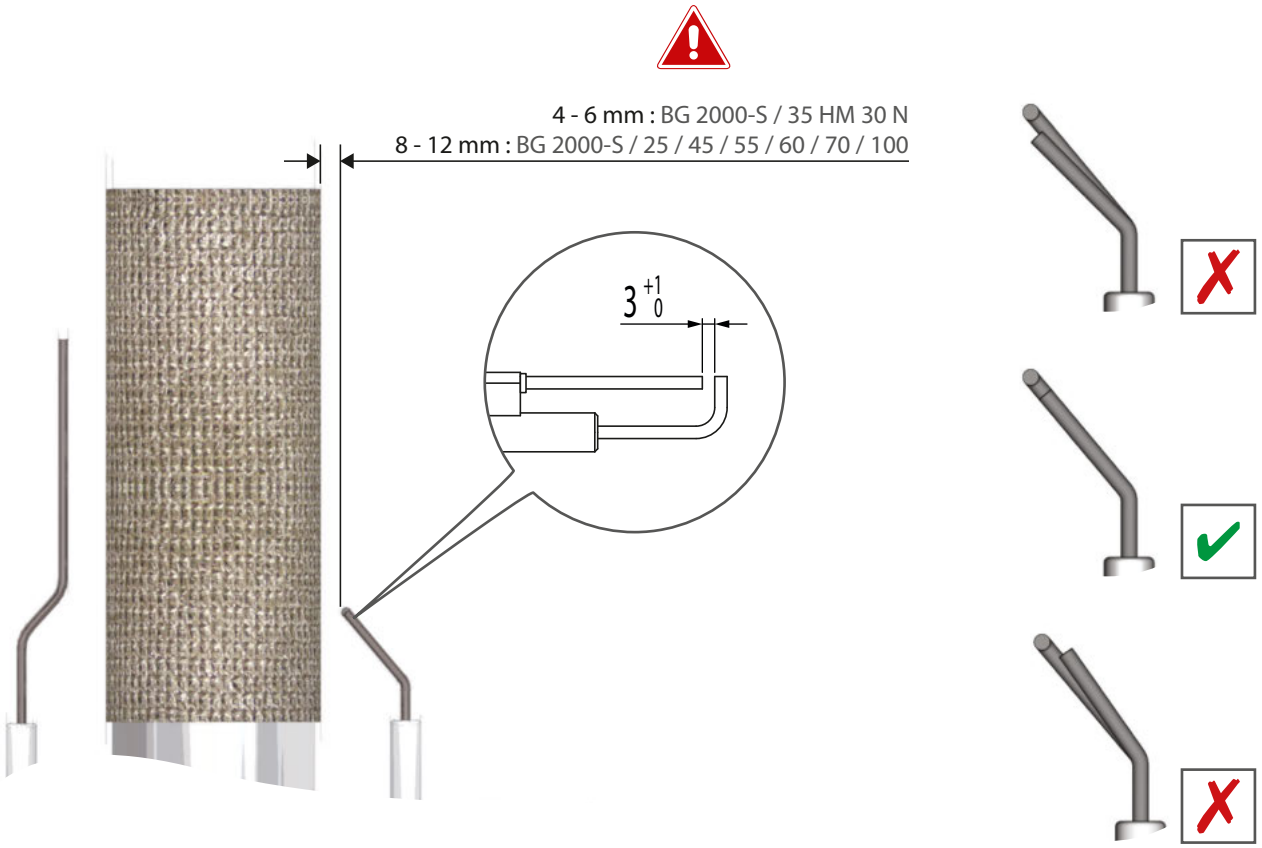


1. Power supply plug
2. Connector box
3. Earth connection
4. Ignition transformer
5. Ignition cable
6. Fan supply
7. Gas valve supply

B. Blue
Bk. Black
Br. Brown
V. Violet
Y/Gr. Yellow / Green

If on the control panel the warning-light: “Burner lock-out” continuously lights up as the burner runs, please check if on the boiler-connector the bridge between 12 and 15 (for jet-burners) is replaced by the bridge 15 and 16 (for BG 2000-S) See also installation manual: "**HeatMaster® 100 N**".

ELECTRODES ADJUSTEMENT

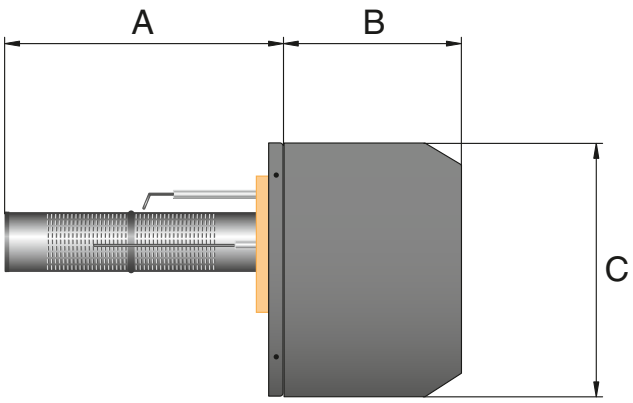


BURNER COMPONENTS

Description		Model reference		Code
Burner control	: Honeywell	S4965 A 2058-B	(BG 2000-S / 25 - 35 - 45 - 55 - 60 - 70)	537D8185
		DKG 972-N-mod28	(BG 2000-S / 100)	537D8189
Fan	: MVL	RG 148 1200 3612	(BG 2000-S / 25 - 35 - 45 - 55 - 60 - 70)	537D3008
		RG 148 1200 3633	(BG 2000-S / 100)	537D3037
Gas valve	: Honeywell	VK4115V2038U	(BG 2000-S / 25 - 35 - 45 - 55 - 60 - 70)	537D4073
		VK4115V1014B	(BG 2000-S / 100)	537D4009
Venturi	: Honeywell	VF-002 45900444-002B	(BG 2000-S / 25 / 35 HM 30 N)	537D4034
		VF-001 45900444-001B	(BG 2000-S / 45)	537D6038
		VF-051 45900446-501B	(BG 2000-S / 55 - 60 - 70 - 100)	537D4028
Burner	: Furigas	Ø 63 mm L. 287 mm	(BG 2000-S / 35 HM 30 N)	537DZ004
		Ø 63 mm L. 224,5 mm	(BG 2000-S / 25 - 35 - 45) + NIT	537DZ017
		Ø 63 mm L. 313,5 mm	(BG 2000-S / 55 - 60 - 70) + NIT	537DZ029
		Ø 98 mm L. 372 mm	(BG 2000-S / 100) + NIT	537DZ019

DIMENSIONS

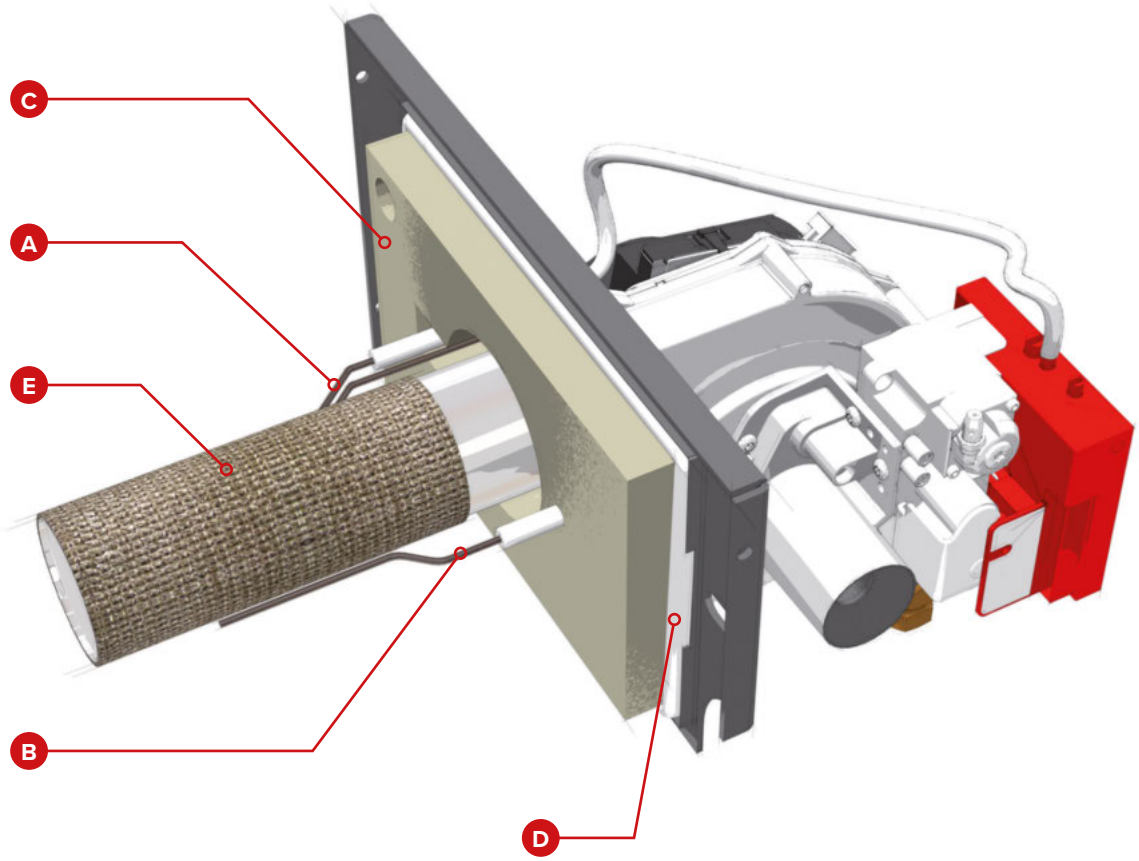
BURNER	A	B	C
BG 2000-S / 25	228	209	307
BG 2000-S / 35 HM 30 N	290	228	248
BG 2000-S / 45	228	209	307
BG 2000-S / 55	317	209	307
BG 2000-S / 60	317	228	248
BG 2000-S / 70	317	248	342
BG 2000-S / 100	376	248	342



SERVICING THE BURNER

1. After removing the burner, check the condition of the ignition **(A)** and ionisation **(B)** electrodes, insulation **(C)** and burner chamber seal **(D)**. Change them if necessary.
2. Check the condition of the flame holder **(E)**.
3. Refit the burner and check that the burner lights.
4. Check the gas connection for leaks.
5. Ensure correct combustion.

BG 2000-S



FAULT-FINDING PROCEDURES

FAULT TABLE

Problems / Corrective measures	Condensation in chimney :	Smell of flue gas :	Insufficient heating :	Burner switches to safety mode after lighting :	Circulator :	Not enough hot water :	Circulator does not turn :	Burner does not light :	Manual reset safety thermostat has actuated :	
Reasons										
Chimney cold and/or not lined									●	1
Boiler T° set too low				●			●		●	2
Chimney blocked								●		3
Back draught in chimney								●		3
Boiler room vents insufficient or nonexistent								●		4
Boiler clogged				●			●	●		5
Burner clogged				●		●	●	●		5
Room thermostat T° set too low							●			6
Circulator blocked or faulty			●				●			7
Boiler switch in Summer position or faulty		●	●				●			8
Not enough water in the system		●	●	●	●		●			9
Radiator valves closed							●			10
Air in the system not vented properly				●	●		●			9
Gas pressure insufficient				●		●	●			11
Gas pipe too small				●		●	●			11
Boiler thermostat is faulty		●		●			●			12
Electrical system not earthed (properly)		●				●				13
The system fuses have blown		●	●				●			14
Air in the system and/or boiler not vented properly		●		●	●		●			9
Interval for large drawoff is too short				●						15
Drawoff flow rate is too high				●						15
Room thermostat not in demand or faulty			●				●			16
Summer/Winter switch faulty	●	●	●				●			17
On/Off switch faulty or not on	●	●	●				●			18
95 °C limit thermostat has activated		●								12
Manual reset safety thermostat has activated		●								19
Burner fan faulty		●								20
Lighting electrode faulty or badly adjusted		●								21
Ionisation electrode faulty or badly adjusted		●								21
Burner connectors not plugged in properly		●								22
Gas valve does not open		●								23
Boiler thermostat faulty	●									12
Air in top of boiler not vented properly	●									9

TABLE OF CORRECTIVE MEASURES

Corrective measures	
Fit lining in chimney	1
Set boiler T° higher	2
Check and clean chimney	3
Comply with local regulations on boiler room ventilation	4
Clean burner and boiler	5
Set room thermostat to desired temperature	6
Clear or replace the circulator	7
Set switch to Winter position or replace switch	8
Fill and vent the system and boiler properly	9
Open radiator valves or adjust thermostatic valves	10
Check that pipes and meter are suitable for the system	11
Replace boiler thermostat	12
Ensure electrical system complies with the regulations	13
Change fuses and find out what caused the problem	14
Keep within the ratings stated by ACV	15
Set the thermostat to the desired temperature or replace	16
Replace Summer/Winter switch	17
Replace On/Off switch	18
This is not normal, find the cause	19
Replace fan	20
Replace electrode or adjust properly	21
Insert connectors properly	22
Replace gas valve ensuring setting parameters are correct	23

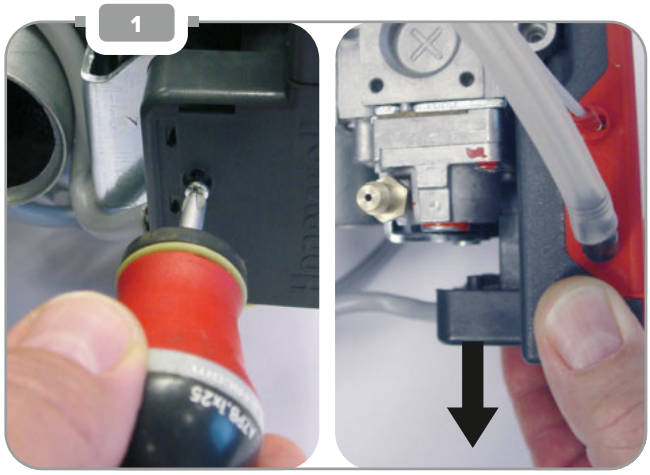
This table may be used after instruction received at ACV

ASSEMBLING AND DISMANTLING THE KIT

1. Switch off the boiler and disconnect it from the mains.
2. Remove the combustion chamber door and the burner from the boiler.
3. Remove the relay (1 screw, fig. 1).
4. Remove the valve - venturi unit from the fan (2 “Torx” screws, see fig. 2).
5. Remove the venturi from the valve (3 “Torx” screws, fig. 3).
6. Fit the right diaphragm (see table on page 3) to the centre of the joint of the valve and the venturi (fig. 4).
7. Refit the burner proceeding in reverse assembly order.
8. Power on and start up the boiler.
9. Adjust the fan speed and the % of CO_2 using the pressure regulator (fig. 5, marked A) referring to the table (page 17).

- Use a “torx” screwdriver ref. TX 25 - 100.
- Adjust the % of CO_2 using a combustion device.

1



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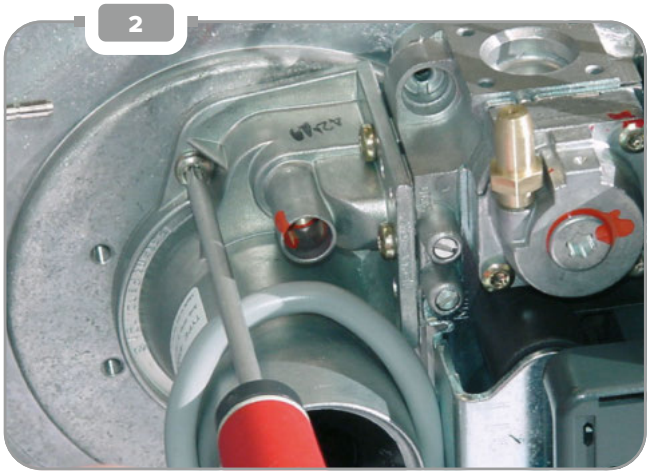

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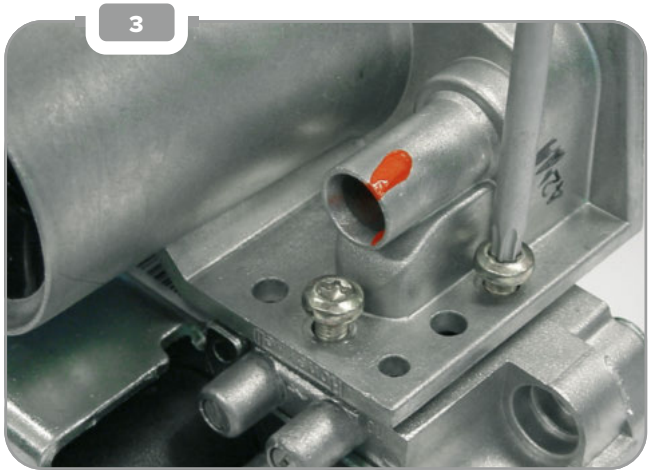
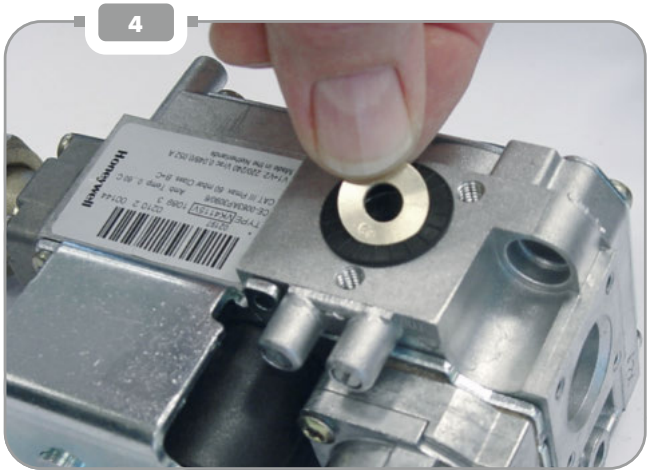
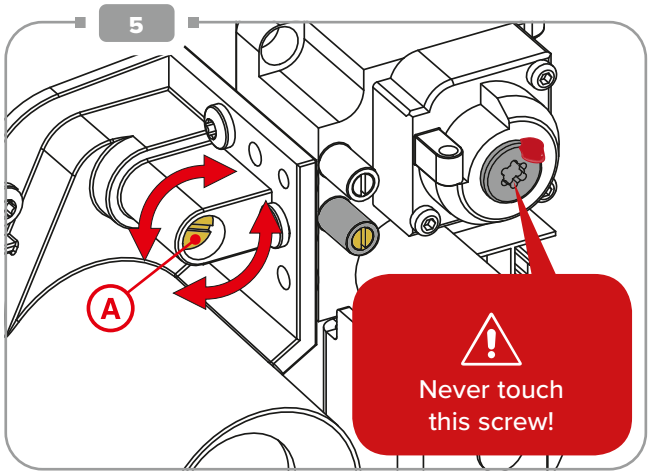


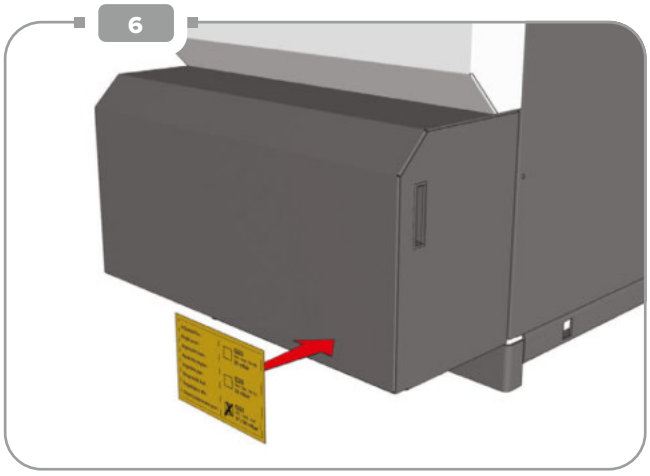
4



5



6



ADJUSTMENT PARAMETERS FOR BURNER CONVERSION

Alfa Sprint S / SV 35 Delta Performance G35 HeatMaster® 30 N	Delta Performance G25 Delta Pro G25	Delta Performance G45 Delta Pro G45	Delta Performance G55 Delta Pro G55	HeatMaster® 60 N / 70 N / 100 N
BG 2000-S 35	BG 2000-S 25	BG 2000-S 45	BG 2000-S 55	BG 2000-S 60 BG 2000-S 70 BG 2000-S 100 • 85 kW BG 2000-S 100 • 107 kW
Ø 52 	Ø 52 	Ø 60 	Ø 68 	Ø 68 

			G20 - G25		G31	
Burners	Boilers	Output kW	% CO_2	Rpm max.	% CO_2	Rpm max.
BG 2000-S / 25	Delta Performance 25 Delta Pro 25	25,0	9,0	3400	11.0 / 11,2	3100
BG 2000-S / 35	Delta Performance 35 Alfa Sprint S / SV HeatMaster 30 N	34,9	9,0	4150	11.0 / 11,2	3760
BG 2000-S / 45	Delta Performance 45 Delta Pro 45	45,0	9,0	4400	11.0 / 11,2	4000
BG 2000-S / 55	Delta Performance 55 Delta Pro 45	55,0	9,0	4100	11.0 / 11,2	3700
BG 2000-S / 60	HeatMaster 60 N	69,9	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 70	HeatMaster 70 N	69,9	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 100 • 85 kW	HeatMaster 100 N	85,0	9,0	4600	11.0 / 11,2	4170
BG 2000-S / 100 • 107 kW	HeatMaster 100 N	107,0	9,5	5900	11.0 / 11,2	5440