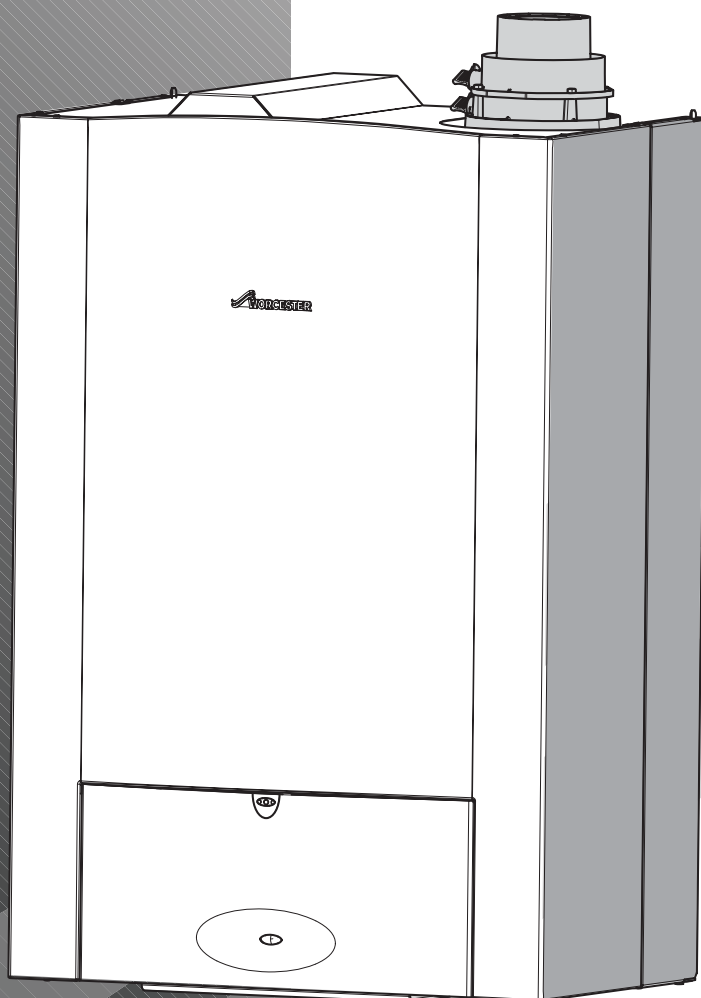


# GREENSTAR DANESMOOR WALL MOUNTED 12/18 & 18/25

**WALL MOUNTED OIL FIRED CONDENSING BOILER  
CONVENTIONAL FLUE & ROOM SEALED FLUE**

**FOR FULLY PUMPED OPEN VENT OR SEALED CENTRAL HEATING SYSTEMS AND DOMESTIC  
HOT WATER CYLINDERS**



THE APPLIANCE IS FOR USE WITH KEROSENE (28 SECOND  
OIL) ONLY

GB

**INSTRUCTION MANUAL  
INSTALLATION COMMISSIONING  
& SERVICING**

## INSTALLATION & SERVICING INSTRUCTIONS

### SYMBOLS USED IN THIS MANUAL:



Domestic hot water



Central heating



Room thermostat



Frost thermostat



Wait time period



Programmer/timer OFF



Cold water main supply



Electricity supply

### PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.

THESE INSTRUCTIONS ARE APPLICABLE TO THE WORCESTER APPLIANCE MODEL(S) STATED ON THE FRONT COVER OF THIS MANUAL ONLY AND MUST NOT BE USED WITH ANY OTHER MAKE OR MODEL OF APPLIANCE.

THE INSTRUCTIONS APPLY IN THE UK ONLY AND MUST BE FOLLOWED EXCEPT FOR ANY STATUTORY OBLIGATION.

THIS APPLIANCE MUST BE INSTALLED BY A COMPETENT PERSON. FAILURE TO INSTALL CORRECTLY COULD LEAD TO PROSECUTION.

#### COMPLYING WITH THE BUILDING REGULATIONS:

This heating appliance forms part of the controlled services for the building. It is law that all controlled services for buildings must comply with building regulations. You must be able to satisfy your Local Authority Building Control Body (LABC) that the work carried out concerning the installation and commissioning of this heating appliance has been carried out to a satisfactory standard.

OFTEC operate a competent persons scheme and registered installers are able to certify that their work complies with building regulations. Under the scheme;

- OFTEC must be informed about every installation.
- OFTEC will issue a building regulations compliance certificate to the householder and will notify the LABC.

OFTEC provide controlled document forms CD10 and CD11 for use during installation and commissioning respectively.

Other organisations operate self-certification schemes e.g. NAPIT and BESCA Ltd. and it may be possible for installers who are members of these organisations to self certify their work.

Alternatively you must submit a building control notice to the LABC before installing any boiler. The LABC will then arrange regular inspection visits during the work to ensure that the installation complies with the regulations.

IF YOU ARE IN **ANY DOUBT** CONTACT THE WORCESTER TECHNICAL HELPLINE.

DISTANCE LEARNING AND TRAINING COURSES ARE AVAILABLE FROM WORCESTER.

**PLEASE LEAVE THESE INSTRUCTIONS, THE COMPLETED COMMISSIONING FORM AND THE USER MANUAL WITH THE OWNER OR WITH THE APPLIANCE AFTER INSTALLATION OR SERVICING. THE SERVICE INTERVAL RECORD CAN BE FOUND ON THE BACK PAGE OF THIS MANUAL.**

#### ABBREVIATIONS USED IN THIS MANUAL:

Ø	Diameter	N/A	Not allowed
CH	Central Heating	SEDBUK	Seasonal Efficiency of Domestic Boilers in the United Kingdom
DHW	Domestic Hot Water		
TRV	Thermostatic Radiator Valve	OFTEC	Oil Firing Technical Association for the Petroleum Industry
IP	Ingress Protection	IEE	Institute of Electrical Engineers
CF	Conventional flue	LABC	Local Authority Building Control Body
BF	Balanced flue		

STORE THE APPLIANCE IN A DRY AREA PRIOR TO INSTALLATION.

## Check List

Item	Qty
Appliance.....	1
Accessories Box (below appliance) Contents:	
Flue Adaptor Kit.....	1
Accessories Tray (top of appliance) Contents:	
Base Panel.....	1
Condensate Pipe.....	1
Fixings Pack:	
Wall bolts.....	6
Burner Service Hook.....	1
Cable Ties.....	2
Oil Valve Fittings Pack.....	1
Fibre Washer Pack.....	1
Casing Bolts.....	6
Literature Pack:	
Greenstar Danesmoor Wall Mounted Installation/Servicing Instructions.....	1
Users Instructions.....	1
Warranty Return Envelope.....	1
Guarantee Registration Card.....	1

#### IMPORTANT HANDLING INSTRUCTIONS:

It is advised that more than one person is involved in the transfer of the packaged appliance from the van to the point of installation. It is advised that no attempt should be made to move the packaged appliance without the use of a suitable truck.

At all times the correct method for handling heavy objects should be strictly observed.

#### GENERAL HANDLING GUIDELINES:

- Lift only a manageable weight, or ask for help.
- When lifting, bend the knees, and keep the back straight and feet apart.
- Do not lift and twist at the same time.
- Lift and carry items close to the body.
- Wear protective clothing and gloves to protect from any sharp edges.

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SAFETY &  
REGULATIONS

APPLIANCE  
INFORMATION

PRE -  
INSTALLATION

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& SPARES

FAULT FINDING  
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NOTES

## SAFETY PRECAUTIONS

### OIL SMELLS, LEAKS OR FUMES FROM THE APPLIANCE:

- ▶ Extinguish any naked flames.
- ▶ Open windows and doors.
- ▶ Isolate the electrical supply.
- ▶ Isolate the fuel supply to the boiler.
- ▶ Rectify fault.

### HEALTH & SAFETY:

The appliance contains no asbestos and no substances have been used in the construction process that contravene the COSHH Regulations (Control of Substances Hazardous to Health Regulations 1988). Where applicable, the CE mark indicates compliance with relative EU Directives.

### COMBUSTIBLE AND CORROSIVE MATERIALS:

**Do not** store or use any combustible materials (paper, thinners, paints etc.) inside or within the vicinity of the appliance.

The combustion air must be kept clear of chemically aggressive substances which can corrode the appliance and invalidate any warranty.

### FITTING & MODIFICATIONS:

Fitting the appliance and any controls to the appliance may only be carried out by a competent engineer in accordance with these instructions and the relevant Installation Regulations. Flue systems must not be modified in any way other than as described in the fitting instructions. Any misuse or unauthorised modifications to the appliance, flue or associated components and systems could invalidate the warranty. The manufacturer accepts no liability arising from any such actions, excluding statutory rights.

### SERVICING:

Advise the user to have the system regularly serviced by a competent, qualified engineer (such as OFTEC registered personnel) using approved spares, to help maintain the economy, safety and reliability of the appliance.

## INSTALLATION REGULATIONS

Failure to install appliances correctly could lead to prosecution.

The appliance should be installed by a competent person. The person installing the appliance should be aware of the Health and Safety at Work Act and take appropriate action to ensure that the regulations are adhered to. In order to give optimum efficiency and trouble free operation the appliance must be commissioned by a qualified OFTEC engineer.

The compliance with a British Standard does not, in itself, confer immunity from legal obligations. In particular the installation of this appliance must be in accordance with the relevant requirements of the following British Standards and regulations in respect of the safe installation of equipment:

BS 5410: part 1: Code of practice for Oil Fired Boilers.

BS 799: part 5: Specification for Oil Storage Tanks.

BS 7593: Code of Practice for treatment of water in domestic hot water central heating systems.

BS 5449: part 1: Specification for forced circulation hot water central heating for domestic premises.

BS 5955: part 8: Specification for the installation of thermoplastic pipes and associated fittings for use in domestic hot and cold water services and heating systems.

BS 7291: Thermoplastic pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings.

BS 7074: part 1: Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems.

BS 7671: IEE Wiring Regulations, current edition.

BS 1362: Specification for general purpose fuse links for domestic and similar purposes.

The Building Regulations Part J and L1 England and Wales; Part F and Part J Section III Scotland; Part L and Part F Northern Ireland.

Local water company bye-laws.

The Control of Pollution (Oil) Regulations.

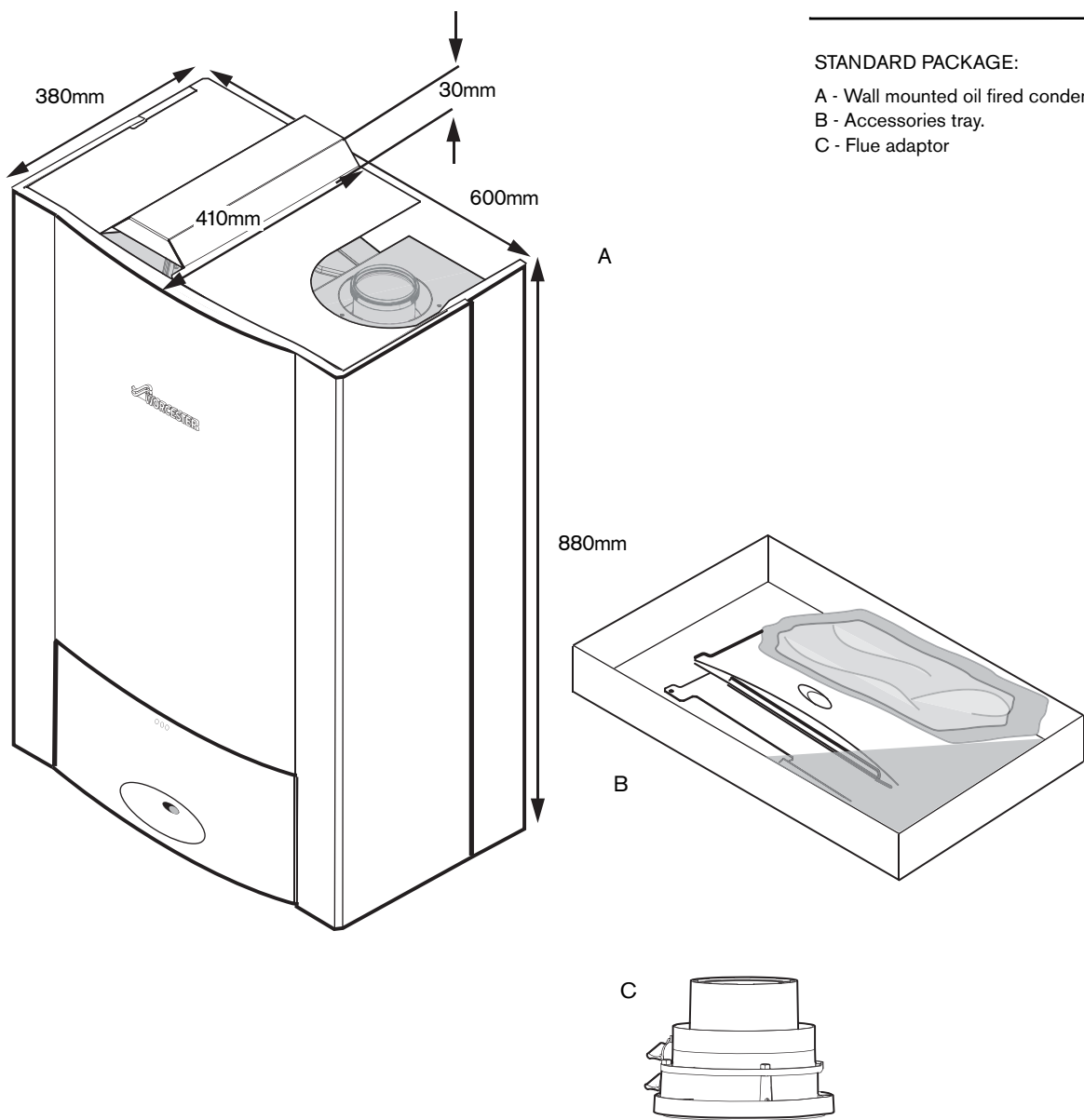
OFTEC Standards.

Where no specific instruction is given, reference should be made to the relevant codes of practice.

## GENERAL INFORMATION

### STANDARD PACKAGE:

- A - Wall mounted oil fired condensing boiler.  
B - Accessories tray.  
C - Flue adaptor



APPLIANCE  
INFORMATION

## Check List

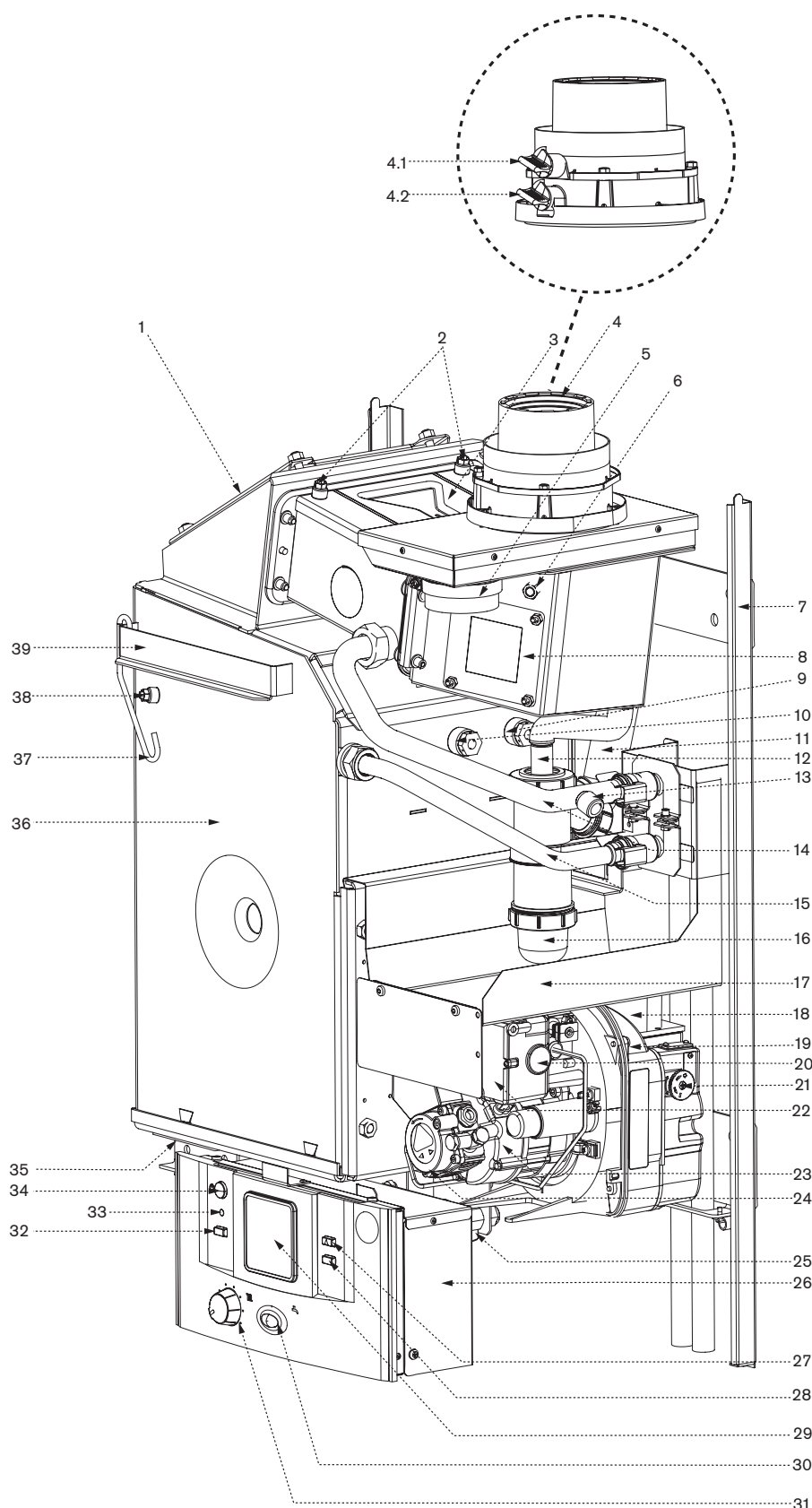
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Wall bolts.....	6
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Casing Bolts.....	6
Literature Pack:	
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Users Instructions.....	1
Warranty Return Envelope.....	1
Guarantee Registration Card.....	1

## TECHNICAL DATA

DESCRIPTION	UNITS	12/18	18/25
<b>Central Heating</b>			
Primary water capacity (total)	litres	23	23
Maximum static head	metres	30	30
Minimum static head	metres	1	1
Water side resistance (20°C difference)	mbar	30	69
Max. permissible sealed system operating pressure in accordance with WRAS guidelines	bar	2.5	2.5
<b>Flue</b>			
Exit flue gas mass flow	kg/hr	29	40
<b>Pipework connections</b>			
Fuel line (compression)	mm	10	10
Flow	mm	22	22
Return	mm	22	22
Primary drain		12mm hose connection	
Condensate (polypropylene)	mm	21.5	21.5
<b>Electrical</b>			
Electrical power supply voltage	AC...V	230	230
Frequency	Hz	50	50
Max. power consumption	W	150	160
<b>Thermostats</b>			
Boiler flow temperature range (cut in/cut out)	°C	55/81	55/81
Control thermostat differential	°C	5	5
Boiler high limit thermostat set point	°C	95	95
Boiler manual reset overheat thermostat set point	°C	105	105
Flue manual reset overheat thermostat set point	°C	110	110
<b>General Data</b>			
SEDBUK (Band A)	%	92.6	92.8
Appliance protection rating (with fascia programmer)	IP	20	20
Appliance protection rating (with programmer blanking plate)	IP	20	20
Appliance weight (dry)	kg	108.5	108.5
Lift weight	kg	72	72
Emissions class for NOx and CO	class	1	1
Typical NOx emission figures	mg/kWhr	160	160

## LAYOUT & COMPONENTS

The diagram opposite excludes the front casing panel, bottom panel and air hose.



1. BAFFLE RETAINER ACCESS DOOR
2. SECONDARY HEAT EXCHANGER BLEED POINTS
3. SECONDARY HEAT EXCHANGER
4. FLUE ADAPTOR
- 4.1 FLUE GAS SAMPLING POINT
- 4.2 COMBUSTION AIR SAMPLE POINT
5. AIR INLET CASING (FLEXIBLE AIR DUCT CONNECTING TO AIR INTAKE ON BURNER (18))
6. FLUE OVERHEAT THERMOSTAT PHIAL
7. WALL MOUNTING FRAME
8. FLUE MANIFOLD ACCESS COVER
9. CONTROL AND MANUAL RESET OVERHEAT THERMOSTAT PHIAL
10. AUTO-RESET HIGH LIMIT
11. HEAT EXCHANGER PIPE
12. CONDENSATE OUTLET
13. SECONDARY HEAT EXCHANGER DRAIN POINT
14. RETURN PIPE
15. FLOW PIPE
16. CONDENSATE TRAP
17. DRIP TRAY
18. BURNER AIR INTAKE (CONNECTED BY FLEXIBLE DUCT TO AIR INLET CASING (6))
19. RIELLO RDB BURNER
20. LOCKOUT RESET BUTTON/INDICATOR (ON FRONT OF BURNER CONTROL BOX)
21. BURNER AIR SETTING ADJUSTER
22. BURNER CONTROL BOX
23. BURNER MOTOR
24. BURNER OIL PUMP
25. OIL SUPPLY ISOLATING VALVE (UNDER HEAT EXCHANGER)
26. CONTROL BOX ASSEMBLY
27. BOILER OVERHEAT RESET BUTTON
28. FLUE OVERHEAT RESET BUTTON
29. OPTIONAL FASCIA MOUNTED PROGRAMMER POSITION
30. POWER INDICATOR
31. TEMPERATURE CONTROL KNOB
32. LOCKOUT RESET BUTTON
33. LOCKOUT INDICATOR
34. POWER SWITCH
35. PRIMARY HEAT EXCHANGER DRAIN (LOCATED UNDER HEAT EXCHANGER)
35. PRIMARY HEAT EXCHANGER
37. BURNER SERVICE SUPPORT
38. PRIMARY HEAT EXCHANGER BLEED POINT
39. BOILER LIFTING HANDLE

APPLIANCE  
INFORMATION

**IMPORTANT: All the following Pre-Installation sections must be read and requirements met before starting boiler or flue installation.**

**CAUTION: ISOLATE THE MAINS SUPPLIES BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.**

## CLEANING PRIMARY SYSTEMS

**IMPORTANT: Debris from the system can damage the boiler and reduce efficiency. Failure to comply with the guidelines for the use of water treatment with the appliance will invalidate the appliance warranty.**

### BEFORE CLEANING THE SYSTEM:

ENSURE THE SYSTEM AND PIPEWORK IS IN GOOD WORKING ORDER.

FLUSH THE EXISTING SYSTEM WITH A POWER FLUSHING MACHINE OR WITH A CHEMICAL CLEANER BEFORE INSTALLING NEW COMPONENTS.

### CLEANING THE PRIMARY SYSTEM:

- ▶ Cleanse the system in accordance with BS 7593.
- ▶ Fill the system with cold mains water to the recommended pressure and check for leaks.
- ▶ Open all drain cocks and drain the system.
- ▶ Close drain cocks and add a suitable flushing agent at the correct strength for the system condition in accordance with the manufacturer's instructions.
- ▶ Circulate the flushing agent before the boiler is fired up.
- ▶ Run the boiler and system at normal operating temperature in accordance with the manufacturer's instructions.
- ▶ Drain and thoroughly flush the system to remove the flushing agent and any debris.





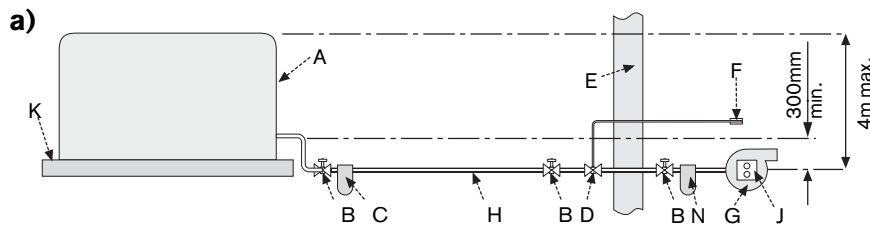
### ELECTRIC SUPPLY:

- Supply: 230V - 50Hz.
- Cable: PVC insulated 0.75mm<sup>2</sup> (24 x 0.2mm) temperature rated to 90°C.
- Protection IP20.
- External 5A fuse to BS1362.
- The appliance must be earthed.
- Please refer to IEE regulations for cross bonding requirements.
- It must be possible to isolate the appliance from the electric supply with at least a 3mm contact separation in both poles supplying the appliance.
- Wiring between the appliance and the electrical supply must comply with IEE wiring regulations and any local regulations which may apply for fixed wiring to a stationary appliance.
- Any system connected to the boiler must not have a separate electrical supply.

- |                                     |   |
|-------------------------------------|---|
| A - Oil storage tank.               | H - Oil supply pipe.                      |
| B - Isolating valve.                | J - Oil pump.                             |
| C - Oil strainer & water separator. | K - Full base (plastic tanks).            |
| D - Fire valve to BS 5410.          | L - Non-return valve.                     |
| E - External wall.                  | M - De-aerator.                           |
| F - Fire valve sensor.              | N - Oil filter (16µm max filtration size) |
| G - Oil burner.                     |   |

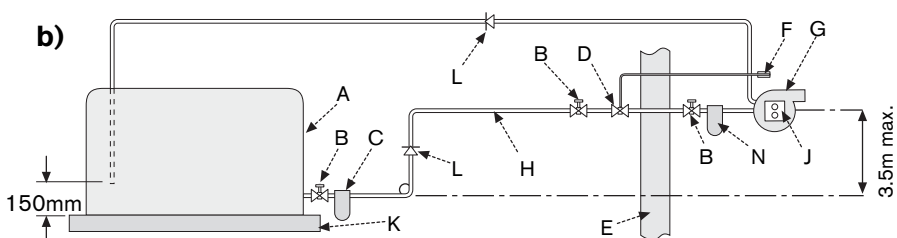
NOTE: All dimensions are in metres unless stated otherwise.

The maximum pipe run figures are based on using copper pipe with an inside diameter of 2mm less than the Ø.



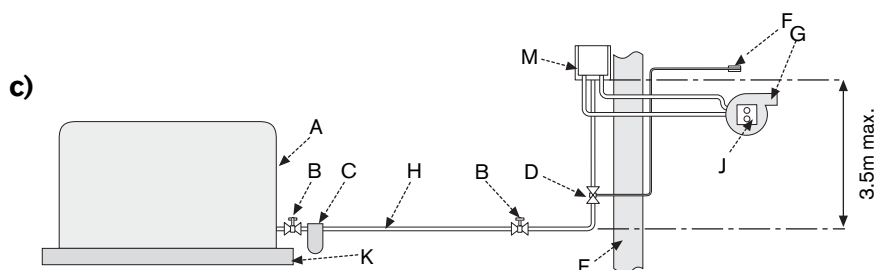
MAXIMUM PIPE RUN FOR SINGLE PIPE GRAVITY FEED SYSTEM

HEAD	10mmØ	12mmØ	HEAD	10mmØ	12mmØ
0.5	12	30	2.5	62	100
1.0	25	69	3.0	74	100
1.5	37	91	3.5	87	100
2.0	49	100	4.0	99	100



MAXIMUM PIPE RUN FOR DOUBLE PIPE SUB-GRAVITY FEED SYSTEM

HEAD	10mmØ	12mmØ	HEAD	10mmØ	12mmØ
0	50	100	2.0	26	66
0.5	44	100	2.5	20	50
1.0	38	95	3.0	14	37
1.5	32	80	3.5	8	22



MAXIMUM PIPE RUN FOR SINGLE PIPE SUCTION LIFT WITH DE-AERATOR

HEAD	FUEL FLOW RATE				HEAD	FUEL FLOW RATE			
	2.5kg/h 8mmØ	5kg/h 8mmØ	10kg/h 8mmØ	10kg/h 10mmØ		2.5kg/h 8mmØ	5kg/h 8mmØ	10kg/h 8mmØ	10kg/h 10mmØ
0	100	55	26	100	2.0	60	30	14	65
0.5	95	45	23	100	2.5	45	25	11	50
1.0	80	40	20	90	3.0	35	15	8	35
1.5	70	35	17	75	3.5	25	10	5	20

The table and illustration above is a guide only and does not in any way override the de-aerator manufacturers instructions.

## OIL SUPPLY

### OIL SUPPLY :

- This appliance is suitable for kerosene (28 second oil) only, no other fuel must be used.
- Plastic or steel tanks should be installed to BS 5410. A steel tank should conform to BS 799: part 5 and have a slope of 1 in 24 away from the outlet valve with a sludge cock at its lower end.
- Do not use galvanised steel tanks or pipework for the oil supply system.
- Do not use soldered joints on the oil supply pipework.

#### a) Single pipe gravity feed system:

The oil storage tank (A) must be positioned so that the oil level does not exceed 4 metres above the level of the burner oil pump (J) and in addition the oil level must be at least 300mm above the oil pump (J). Where the maximum oil level in the oil storage tank exceeds 4 metres, a head breaking device must be installed between the tank (A) and the burner oil pump (J).

#### b) Double pipe sub-gravity feed system:

Maximum suction height 3.5 metres. Non-return valves must be fitted to the inlet and return oil line between the oil pump (J) and oil storage tank (A).

#### c) Single pipe suction lift with de-aerator

Maximum suction height 3.5 metres. The oil tank (A) must be positioned below the oil pump (J). Create an inlet and return loop between the de-aerator (M) and oil pump (J).

A non-return valve must be incorporated within the de-aerator or fitted to the oil line between the oil storage tank (A) and the de-aerator (M).

A top feed oil tank fitted with a de-aerator using an internal non-return valve should have any non-return valves fitted in the base of the tank to the suction line removed to assist purging air from the oil line.

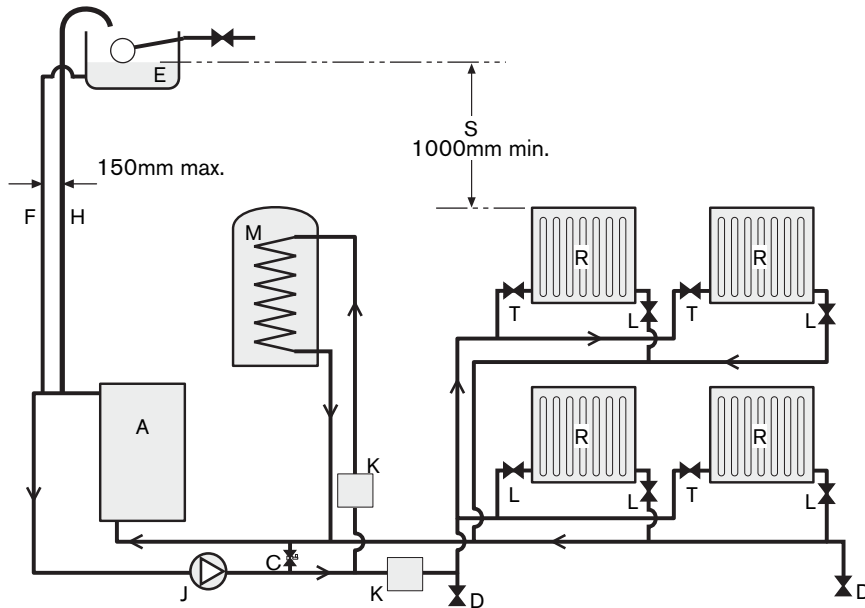
#### Pipework

- ▶ Use copper pipe of the correct diameter according to the information shown opposite. Use flexible hoses to connect to the oil pump (J).
- ▶ Lay the oil supply pipe (H) as straight and level as possible to avoid air pockets and unnecessary friction losses. Route away from the boiler access door or other hot surfaces.
- ▶ Install a manual isolating valve (B) to the oil supply pipe (H), as close to the oil storage tank (A) as possible.
- ▶ Fit an oil strainer and water separator (C) to the oil supply pipe, near the oil storage tank. Fit an additional oil filter (N, 16µm max filtration size) close to the boiler, but not inside the boiler casing.
- ▶ Fit a fire valve in accordance with BS 5410. The fire valve (D) should be fitted externally to the building with the fire valve sensor (F) located within the appliance case. A fire valve with a shut off temperature of 85°C or higher is recommended to avoid the possibility of nuisance shut offs. A capillary type valve provides a neat and simple installation. Alternatively, a fusible link or electrical system may be used.

Under no circumstances should a combination isolating/fire valve be used as the sole fire protection device.

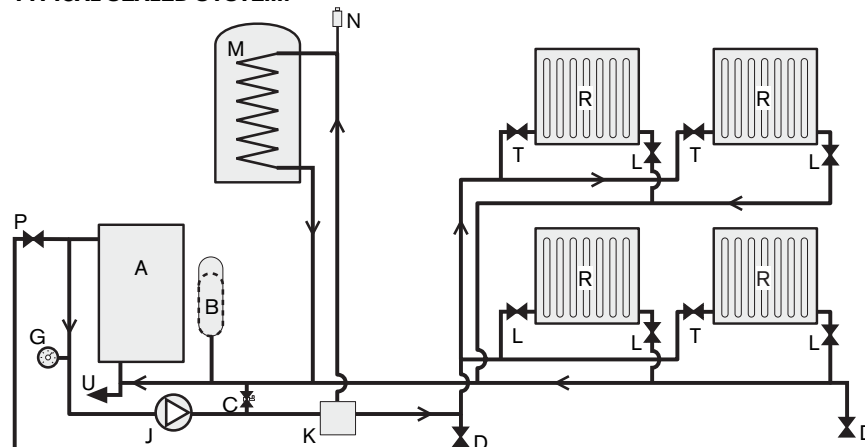
**IMPORTANT:** The boiler should not be allowed to operate with a return temperature of less than 40°C when the system is up to operating temperature.

**TYPICAL OPEN VENT SYSTEM:**

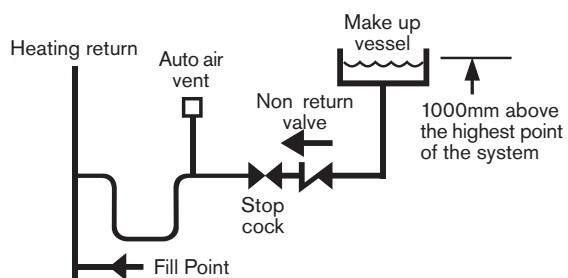
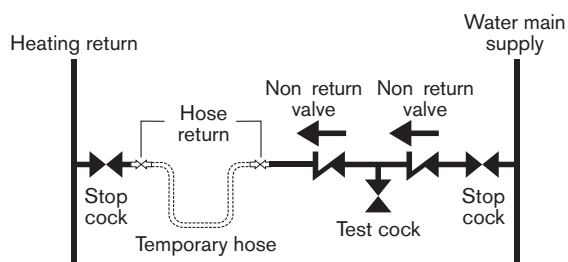


- |                                   |                          |  |
|-----------------------------------|--------------------------|--|
| A - Appliance.                    | G - Pressure gauge.      | P - Pressure relief discharge.         |
| B - Expansion vessel.             | H - Open vent 22mmØ min. | R - Radiators.                         |
| C - Automatic bypass valve.       | J - Circulating pump.    | S - Static head.                       |
| D - Drain cock.                   | K - Zone valve.          | T - Thermostatic radiator valve (TRV). |
| E - Feed and expansion cistern.   | L - Lockshield valve.    | U - To filling system.                 |
| F - Feed and expansion 15mmØ min. | M - Hot water cylinder.  |  |
|                                   | N - Automatic air vent.  |  |

**TYPICAL SEALED SYSTEM:**



- OPEN VENT PRIMARY SYSTEM:**
- The open vent pipe (H) and feed and expansion pipe (F) must rise continuously from the appliance.
  - The feed and expansion cistern (E) must be positioned to provide a static head (S) of at least 1 metre above the highest point in the heating system to the water level in the feed and expansion cistern (E). If the appliance is the highest point of the system 1 metre should be above the highest point of the appliance.
  - Ensure adequate space is left in the expansion cistern for expansion of the system water.
  - No valve shall be fitted in the open vent pipe (H) or the feed and expansion pipe (F).
  - The open vent pipe (H) must be at least 22mmØ.
- FULLY PUMPED SEALED PRIMARY SYSTEM:**
- A pressure relief valve (P), spring loaded safety valve set to operate at 3bar, must be fitted to the heating flow pipe as close as possible to the boiler.
  - An expansion vessel (B) must be fitted to the heating return pipe as close as possible to the boiler and pressurised for the system volume according to the instructions supplied with the vessel.
  - A pressure gauge (G), 3 bar minimum, must be fitted to the heating flow pipe.
  - An automatic air vent (N) must be fitted.



## WATER SYSTEMS & PIPEWORK

### FILLING PRIMARY SEALED SYSTEMS:

- Filling the system must comply with one of the methods shown opposite.
- The filling point must be at low level and must never be a permanent direct fixing to the mains water supply.
- Filling loops must be WRAS approved.

## CONDENSATE PIPEWORK

### CONDENSATE PIPEWORK:

- All national and, where appropriate, local regulations for the discharge and neutralisation of condensate should be followed.
- The condensate pipe must be a minimum of 21.5mmØ polypropylene pipe.

### Routing the pipework:

**Wherever possible, the condensate pipework should be routed internally to prevent freezing.**

- The condensate pipework must fall at least 50mm per metre towards the outlet.
- Take the shortest practicable route.
- Support the pipe at least every 0.5m for near horizontal sections and 1m for vertical sections.

*When a boiler is to be installed in an unheated location, such as a garage, all condensate drainage pipes should be considered as external.*

### External pipework:

- The pipework length should be kept to a minimum and the route as vertical as possible.
- Do not exceed 3 metres outside the dwelling.
- Terminate as close to the ground or drain as possible (below the grating and above the water level) while still allowing for safe dispersal of the condensate. This helps to reduce wind blowing up the pipe and freezing.

*Connection of a condensate drainage pipe to a drain may be subject to local building controls.*

- Pipework subject to extreme cold or wind chill conditions should be 32mm Ø pipe.
- Protect ALL external pipework with weather resistant insulation and box-in, if necessary, to reduce the risk of freezing.

### Making it safe:

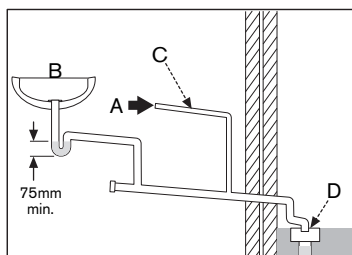
- Condensate pipework must not leak, freeze or block up.
- Condensate traps must be filled before firing up the boiler to prevent the possibility of potentially harmful flue products evacuating via the condensate route.
- Do not dispose of condensate into a water recovery system where it is retained for reuse.

*Condensate can be discharged into a rainwater hopper which is part of a sewer system carrying both rainwater and foul water.*

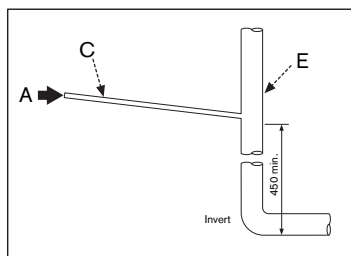
- The pipework must follow one of the options shown opposite:

- A - Condensate from the boiler condensate trap (supplied) which has a 75mm minimum water seal.
- B - Sink.
- C - 21.5mm Ø polypropylene condensate pipe.
- D - Gully.
- E - Internal soil and vent stack.
- F - 300mm x 100mm Ø sealed plastic tube.
- G - Ground level.
- H - Drainage holes 50mm from base of tube (12mm Ø at 25mm centres) facing away from building.
- I - Limestone chippings.

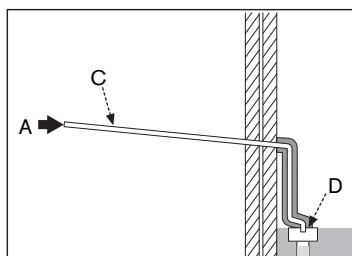
### a - Internal waste drainage system



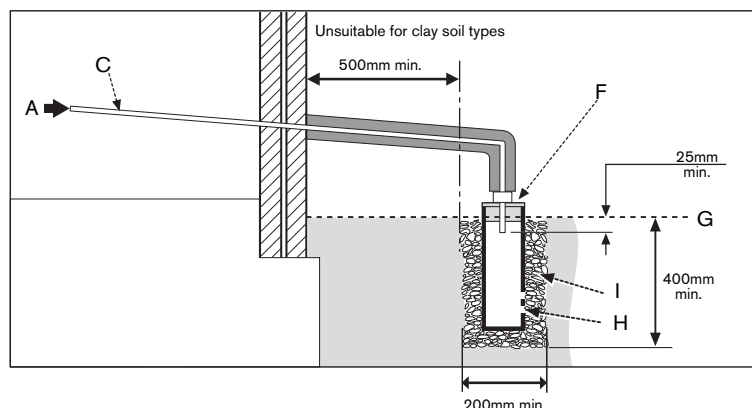
### b - Soil/vent stack

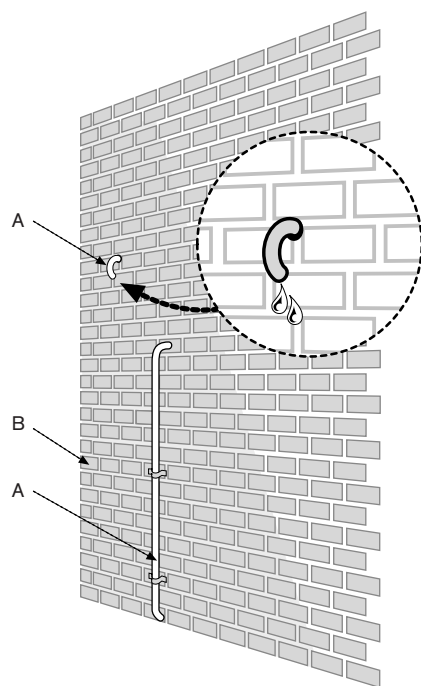


### c - External drainage system



### d - External condensate absorption point





## PRESSURE RELIEF PIPEWORK

**IMPORTANT:** The pressure relief valve is a safety device for the boiler and if activated may discharge boiling water or steam through the relief valve drain pipe.

Care should be taken when siting the outlet pipe so that it does not cause an obstruction or discharge above a window, entrance or other public access where it could cause a hazard.

- The pressure relief drain pipe (A) should be at least 15mm diameter copper pipe and run downwards away from the boiler and discharge away from any electrics or other hazard, preferably to an external drain or soakaway.
- Pipe (A) should be finished with a partial bend, near the outlet to face the external wall (as shown) to help prevent freezing.

A - Drain pipe.

B - Outside wall.

## BOILER LOCATION &

### CLEARANCES

- This boiler is only suitable for installing internally within a property at a suitable location onto a fixed rigid vertical non combustible surface of the same size as the boiler and capable of supporting the boiler weight.
- The boiler is not suitable for external installation unless a suitable enclosure is provided.
- Roof space installations must fully conform to BS 5410 part 1 section 4.6.9.

#### Open flue model (CF):

- In order to ensure clean and efficient combustion an adequate supply of air must be delivered to the combustion chamber.
- To provide sufficient air a suitable inlet must be provided into the room or space in which the boiler is situated.

CF minimum air inlet sizes\*

Output	12/18	18/25
Size cm <sup>2</sup>	99	138

*An air brick or other form of continuous air supply may have to be built into the installation in order to ensure an adequate supply of air.*

- If the appliance is to be installed in a confined space or compartment two air vents will be required, one at high level and one at low level.
- The minimum area of each vent is given in the chart opposite and the size depends on whether the air is taken from another room or outside the building.
- Where air is taken from another room that room **must** contain an air inlet as described above.

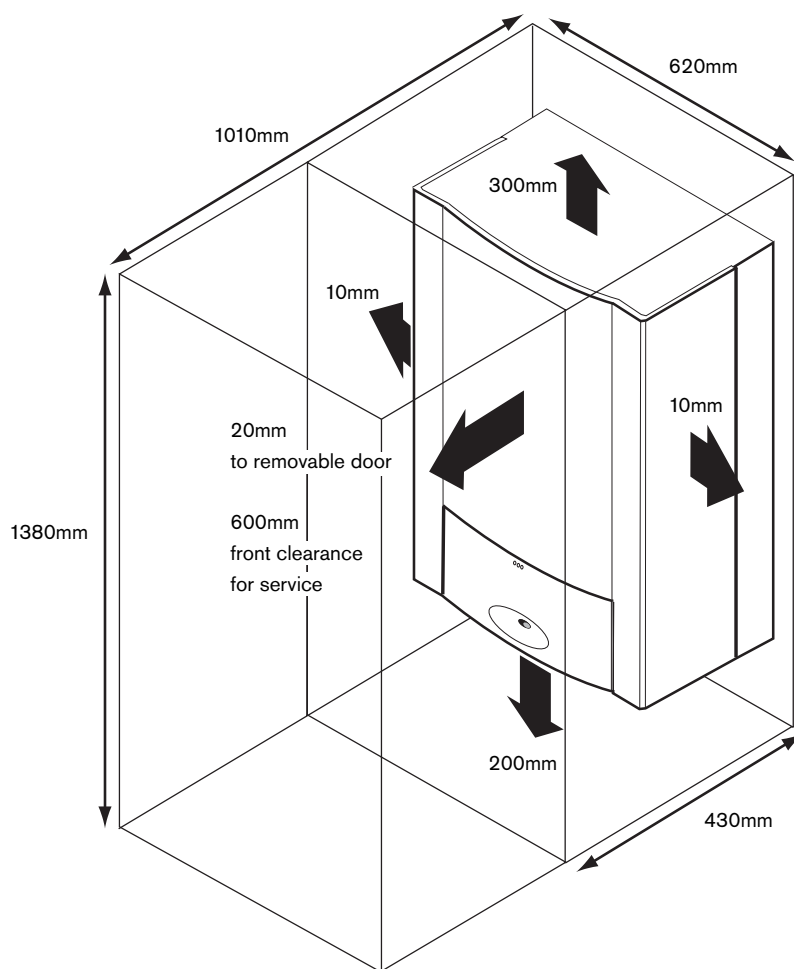
#### Room sealed balanced flue option (RS):

- This option does not require a separate vent for combustion air.
- Installations in cupboards or compartments require permanent vents for cooling purposes, one at high level and one at low level, either to outside air or to a room. Both vents must pass to the same room or be on the same wall to the outside air.
- The minimum air vent free area is given in the chart opposite and the size depends on whether the air is taken from another room or outside the building.

#### Clearances:

- The diagram shows the minimum clearances required around the boiler for servicing.
- At least 1300mm will be required in front of the wall to install the boiler.

\* Due to changes in BS 5410 and modern building design, these figures no longer incorporate the adventitious ventilation allowance.



### MINIMUM AIR VENT AREA (cm<sup>2</sup>) FOR APPLIANCES INSTALLED IN A COMPARTMENT:

<sup>1</sup>Internal air to and from a space/room inside the building.

<sup>2</sup>External air to and from directly outside the building.

#### Conventional flue:\*

Model	Internal <sup>1</sup> ventilation		External <sup>2</sup> ventilation	
	High Level	Low Level	High Level	Low Level
12/18	198	297	99	198
18/25	275	413	138	275

#### Room Sealed flue:\*

Model	Internal <sup>1</sup> ventilation		External <sup>2</sup> ventilation	
	High Level	Low Level	High Level	Low Level
12/18	198	198	99	99
18/25	275	275	138	138

## BOILER LOCATION &

### CLEARANCES

#### COMPARTMENTS:

Follow the requirements of BS 5410 and note:

- Minimum clearances must be maintained.
- An access door is required to install, service and maintain the boiler and any ancillary equipment.
- If fitting the boiler into an airing cupboard use a non-combustible material (if perforated, maximum hole sizes of 13mm) to separate the boiler from the airing space.

#### Venting compartments:

*There must be sufficient clearance around the appliance to allow proper circulation of ventilation air. The clearances required for installation and servicing will normally be adequate for ventilation.*

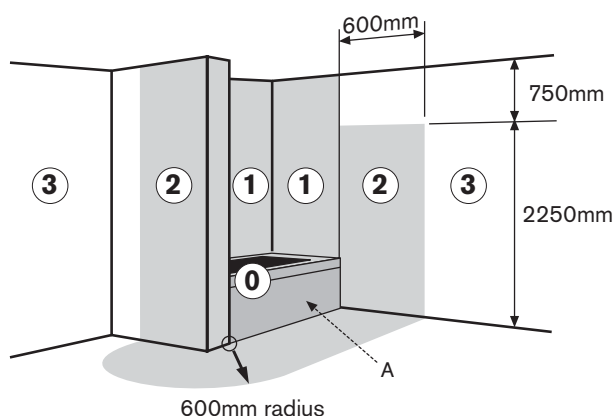
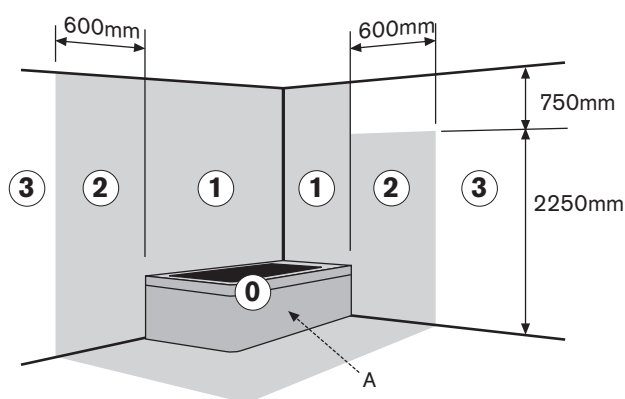
- Ventilation must be provided for boilers fitted into compartments as described in BS 5410.
- Combustion air must not be taken from a room or internal space containing a bath or shower and must not communicate with a protected area such as a hall, stairway, landing, corridor, lobby, shaft etc.
- Air vents must allow access for clean free air and must be sited to comply with the flue terminal position requirements.
- Air ducting runs must not exceed 3m.
- Low level air vents must be less than 450mm from the floor.
- A warning label must be added to the vents with a statement to the effect: "Do not block this vent. Do not use for storage."

#### SHOWER / BATHROOMS:

The boiler **must not** be installed in zones 0, 1 or 2 (the shaded areas shown on the diagrams opposite).

**IMPORTANT:** conventional flued boilers must not be fitted in a bathroom.

**IMPORTANT:** any appliance control using mains electricity must not be able to be touched by a person using the bath or shower. Electrical switches, fused spur and socket outlets must not be fitted in the bathroom. In all cases the IEE wiring regulations must be consulted. Please refer to IEE regulations for cross bonding requirements.



A - Bath or shower cubicle (zone 0)



## Minimum dimensions of flue terminal positions for oil fired appliances:

TERMINAL POSITION	CF	RS(H)	RS(V)
A <sup>1,2</sup> Directly below an opening, air brick, opening window, etc	N/A	600mm	N/A
B <sup>1,2</sup> Horizontally to an opening, air brick, opening window, etc	N/A	600mm	N/A
C Below a plastic/painted gutter, drainage pipe or eaves if combustible material protected	N/A	75mm	N/A
D <sup>3</sup> Below a plastic/painted gutter, drainage pipe or eaves without protection to combustible material	N/A	600mm	N/A
E From vertical sanitary pipework	N/A	300mm	N/A
F From an external or internal corner or from a surface or boundary alongside the terminal	N/A	300mm	N/A
G Above ground or balcony level	N/A	300mm*	N/A
H From a surface or boundary facing the terminal	N/A	600mm**	N/A
J From a terminal facing the terminal	—	1200*mm	—
K Vertically from a terminal on the same wall	N/A	1500mm	N/A
L Horizontally from a terminal on the same wall	—	750mm	—
M Above the point of highest intersection with the roof	600mm	—	600mm
N From a vertical structure on the side of the terminal	750mm	—	750mm
O Above a vertical structure less than 750mm from the side of the terminal	600mm	—	600mm
P From a ridge terminal to a vertical structure on the roof	1500mm	—	N/A
Q Above or to the side of any opening on a flat or sloping roof	300mm	—	300mm
R Below any opening on a sloping roof	1000mm	—	1000mm

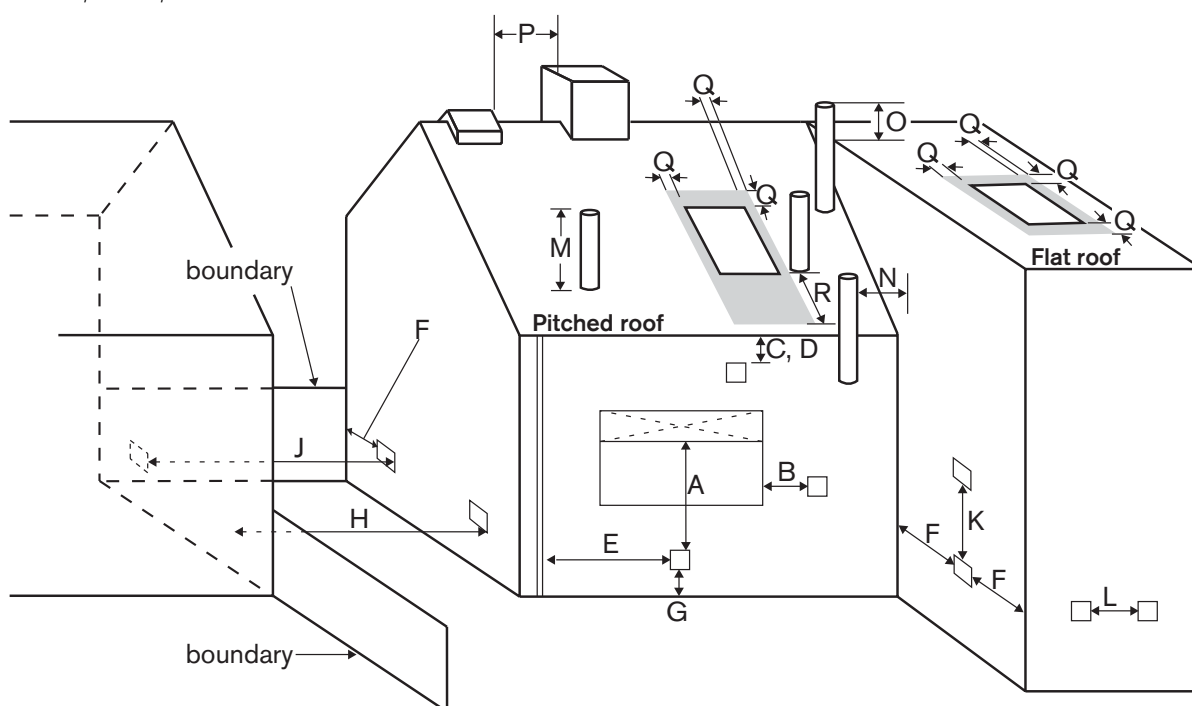
Key: — Not applicable, N/A Not allowed, CF Conventional flue, RS(H) Room Sealed Horizontal flue, RS(V) Room Sealed Vertical flue.

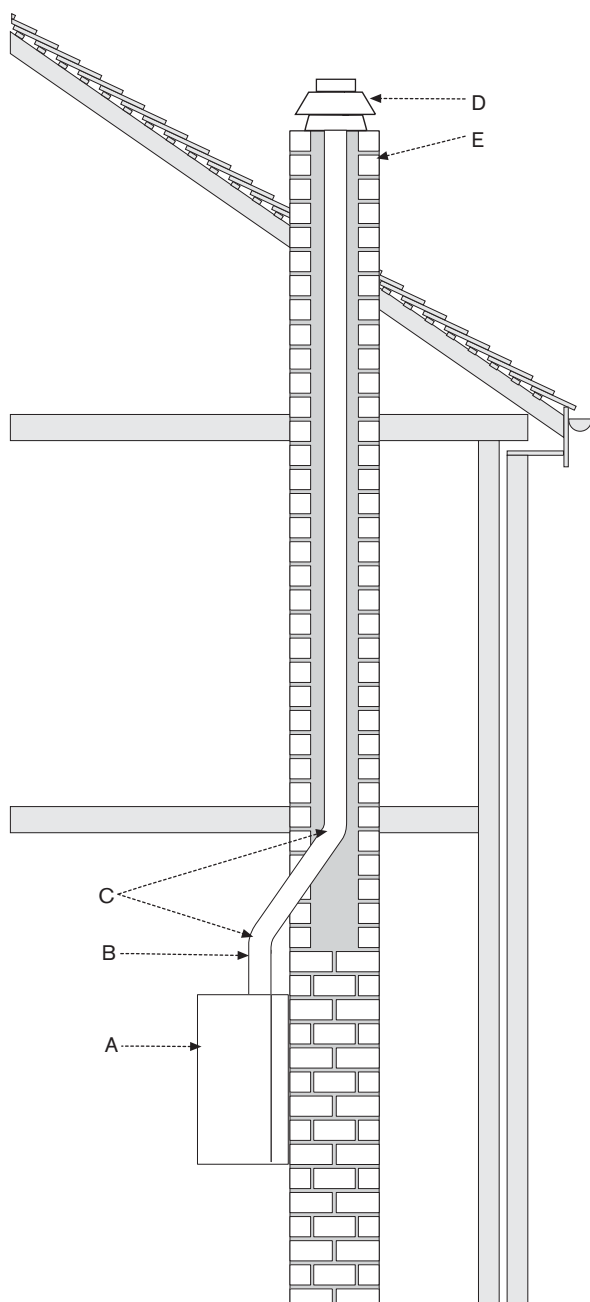
### Notes:

1. Terminals should be positioned so as to avoid products of combustion accumulating in stagnant pockets around the building or entering into buildings.
2. Vertical structure in N, O and P includes tank or lift rooms, parapets, dormers etc.
3. Terminating positions should be at least 1.8m from an oil storage tank unless a wall with at least 30 min fire resistance and extending 300mm higher and wider than the tank is provided between the tank and the terminating position.
4. Where a flue is terminated less than 600mm away from a projection above it and the projection consists of plastics or has a combustible or painted surface, then a heat shield of at least 750mm wide should be fitted.
5. If the lowest part of the terminal is less than 2m above the ground, balcony, flat roof or other place to which any person has access, the terminal should be protected by a guard.
6. Notwithstanding the dimensions given above, a terminal should not be sited closer than 300mm to combustible material. In the case of a thatched roof, double this separation distance should be provided. It is also advisable to treat the thatch with a fire retardant material and close wire in the vicinity of the flue.
7. It is essential that a flue or chimney does not pass through the roof within the shaded area delineated by dimensions Q and R.
8. Where protection is provided for plastic components, such as guttering, it is essential that this is to the standard specified by the manufacturer of the plastic components.

## FLUE TERMINAL POSITIONS

- The flue must be fitted and terminated in accordance with the recommendations of BS5410.
- Flue terminals must be positioned to avoid combustion products entering into buildings.
- The flue must not cause an obstruction.
- Discharge from the flue outlet must not be a nuisance.
- Flue gases have a tendency to plume and in certain weather conditions a white plume of condensation will be discharged from the flue outlet which could be regarded as a nuisance, for example, near security lighting.
- There should be no restriction preventing the clearance of combustion products from the terminal.
- The air inlet/outlet duct and the terminal of the boiler must not be closer than 25mm to any combustible material. Detailed recommendations on protection of combustible materials are given in BS 5410:1
- A protective stainless steel terminal guard, Part No: 7 716 190 050, must be fitted if the terminal is 2m or less above a surface where people have access.
- The following additional guidelines (from part L Exceptions Guidance Document) are recommended when determining the flue outlet position:
  - Avoid discharging flue gases into car ports or narrow passageways.
  - \*Minimum distance of the flue terminal from above ground is 2100mm where directed to a public footpath, private access route or a frequently used area and 2500mm from a car parking area.
  - \*\*Minimum distance of the flue terminal to a facing wall, fence, building or property boundary is 2500mm.





- A - Boiler  
B - Flue  
C - Max. 2 bends at 135°  
D - Anti down-draught terminal  
E - Chimney

- Open (conventional) flued appliances must not be installed in a bedroom, bathroom or bedsitting room.
- The flue system must be in accordance with BS 5410 : Part 1 and the current Building Regulations.
- The flue must be constructed of materials suitable for use with condensing combustion products.
- External flue systems must be of the insulated type.
- Brick and masonry chimneys must be lined with a suitable non-combustible material and properly jointed to withstand the effects of the working temperature (minimum rating of material 120°C) of the appliance and any condensate which may form.
- All flue joints must be sealed to prevent the leakage of condensate and combustion products.
- Ensure that joints are made so that the condensate runs away and is not collected within the joint.

*NOTE: The flue can be increased in size from the boiler take off point providing the joint is correctly sealed. Never reduce the flue diameter from the boiler take off point.*

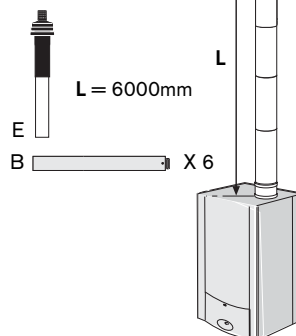
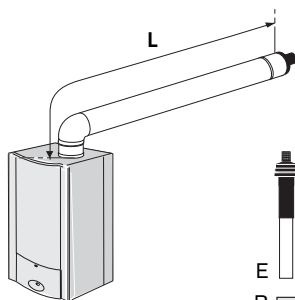
### CF Sizing:

- 12/18 and 18/25 = 100/103mmØ
- Because the flue operates at a lower temperature on a condensing boiler compared to that of a conventional appliance, the flue draught will be lower. Typically the draught will be between 0.5mmwg and 4.4mmwg, measured with the flue warm but the burner not firing. The actual figure will vary depending on weather conditions, flue height and position.
- The flue should be vertical and contain as few bends as possible, a maximum of two 135° bends should be used.
- The flue outlet must be extended beyond the eaves of the building and where possible, above the apex.
- Fit a suitable anti down-draught terminal where down draughts are experienced.
- This appliance is suitable for the Worcester 'Oilfit' conventional flexible flue liner.

## ROOM SEALED FLUE OPTIONS

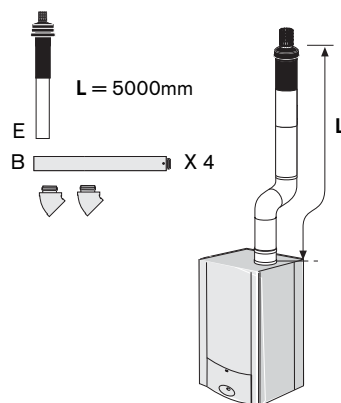
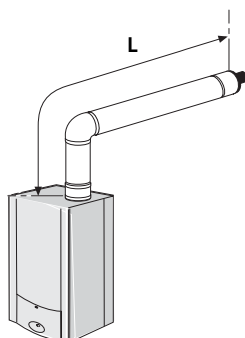
L = 4000mm

A  
B X 4  
C



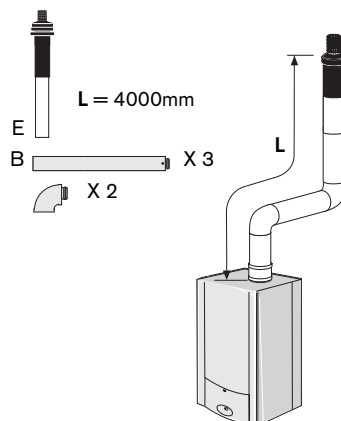
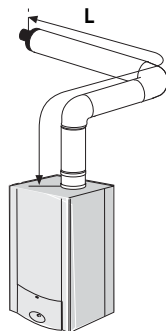
L = 4000mm

A  
B X 4  
C



L = 3000mm

A  
B X 4  
C X 2



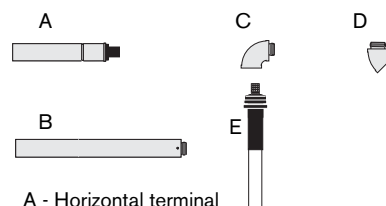
The diagrams (opposite) show the components used and the maximum flue length (L) for each flue configuration.

In all cases L is measured from the outside of the boiler casing.

- To achieve the maximum flue length (L), a flue section will have to be reduced in length.
- Only the flue terminal or straight flue extensions can be reduced in length by cutting.
- The horizontal flue terminal end can be fitted from the inside or outside of the building.

### IMPORTANT:

All horizontal sections must rise away from the boiler by 52mm per metre (3°) to allow the condensate to drain back to the boiler.



A - Horizontal terminal  
B - Straight flue extension  
C - Flue bend 90°  
D - Flue bend 45° X 2  
E - Vertical terminal

### Calculating the flue length:

Measure the total flue length required, noting that the maximum straight flue length including the terminal is:

Horizontal 80/125mm Ø: 4000mm (excluding 120mm of terminal extending outside the building)

Vertical 80/125mm Ø: 6000mm.

Then reduce the total straight flue length for each extra flue bend (excluding the vertical flue kit 90° elbow) by:

1000mm for 90°

500mm for 45°

### Flue Extension lengths:

Horizontal & Vertical 80/125mm Ø: 1000mm overall length.

Effective length when engaged into sockets within the flue run is 950mm.

### Flue Terminal lengths:

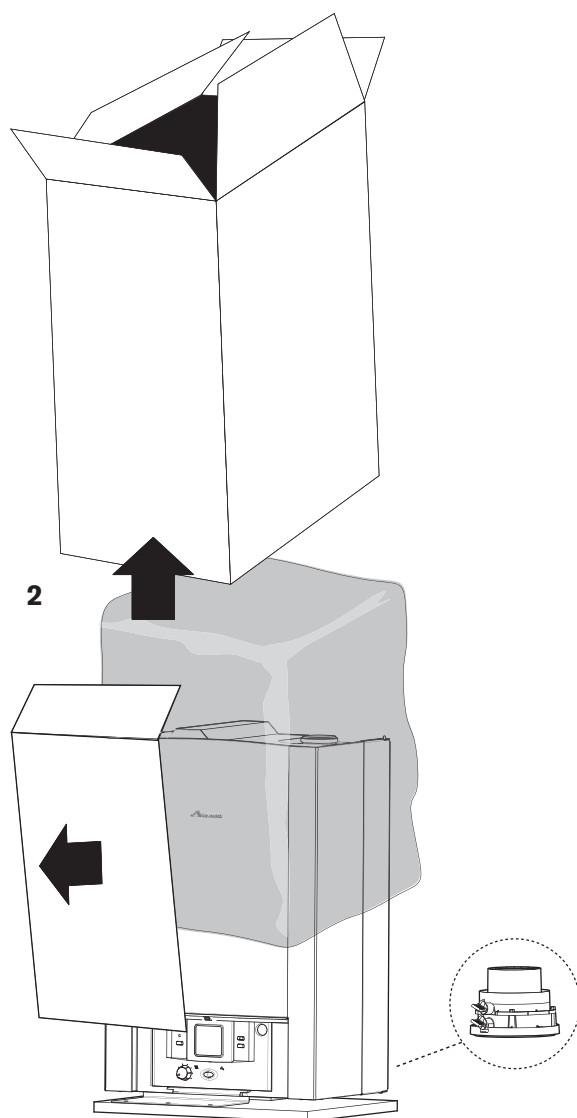
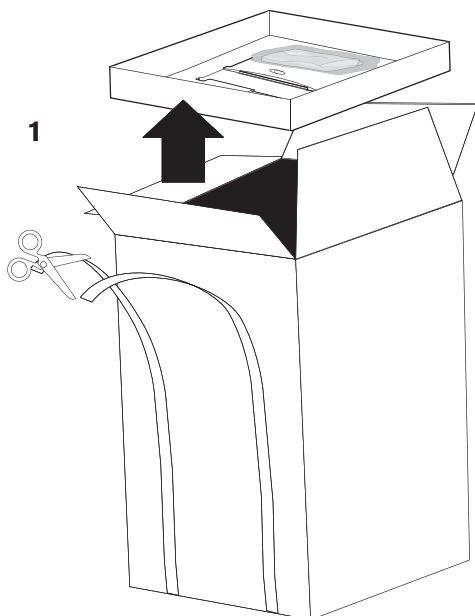
Horizontal 80/125mm Ø: 720mm

Vertical 80/125mm Ø: 1080mm + cage

\* to outside wall.

**IMPORTANT: All the previous Pre-Installation sections must be read and requirements met before starting boiler or flue installation.**

## UNPACKING THE BOILER



### LIFTING AND CARRYING PRECAUTIONS:

- Lift only a manageable weight, or ask for help.
- When lifting or putting things down, bend the knees, and keep the back straight and feet apart.
- Do not lift and twist at the same time.
- Lift and carry objects close to the body.
- Wear protective clothing and gloves to protect from any sharp edges.

### Unpacking:

It is advised that two or more persons are involved in the transfer of the packaged boiler from the van to the point of delivery.

- 1 ▶ Once the packaged boiler has been delivered, the outer carton is opened first. Care should be taken when releasing the straps. If a sharp implement is used make sure the outer carton is not pierced and that the implement is used in such a way so that it may not cause personal injury. All sharp objects must be covered or the blade retracted after use and put away in a safe place.
  - ▶ Lift the accessories tray out of the top of the boiler carton and place in a safe place away from the installation area. Installation and user instructions are in this tray.
- 2 ▶ Lift carton up and away from the boiler.
  - ▶ Remove protective packaging from the front of the boiler.
  - ▶ Remove protective bag from the appliance.
  - ▶ The flue adaptor is packaged at the base of the boiler.

**All packaging must be moved away from the installation area to avoid a potential tripping or slipping hazard.**

**At all times the correct method for handling heavy objects should be strictly observed.**

**The unpacking of the appliance requires the removal of the board support at the base of the boiler. Instructions for this are on the following pages.**

## UNPACKING THE BOILER

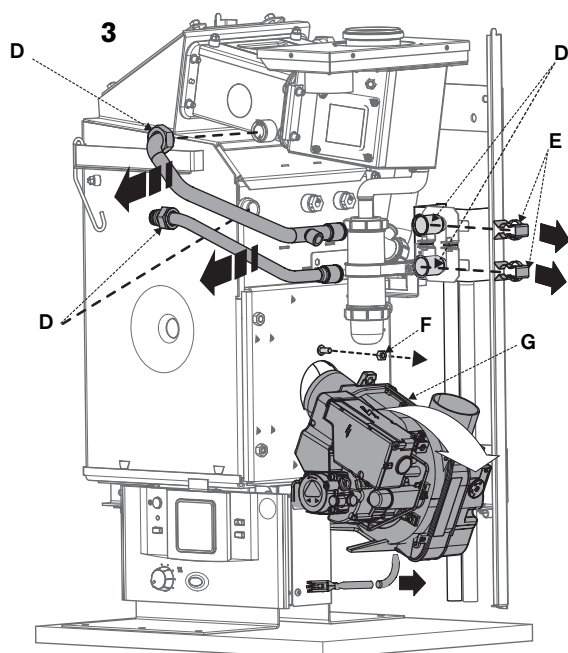
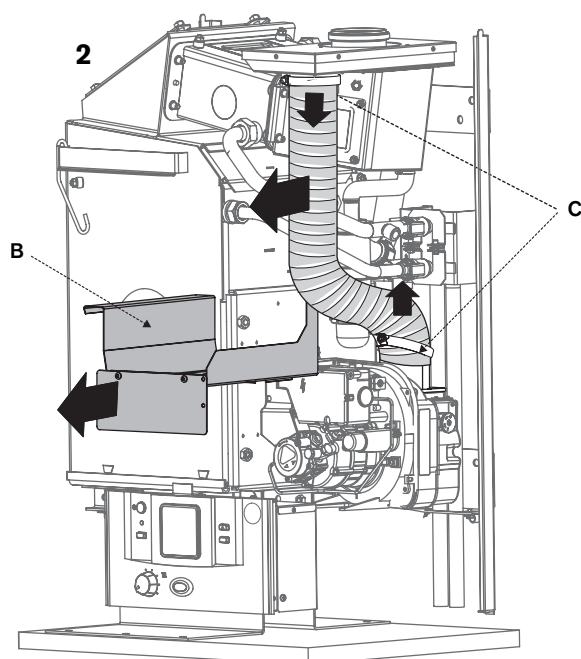
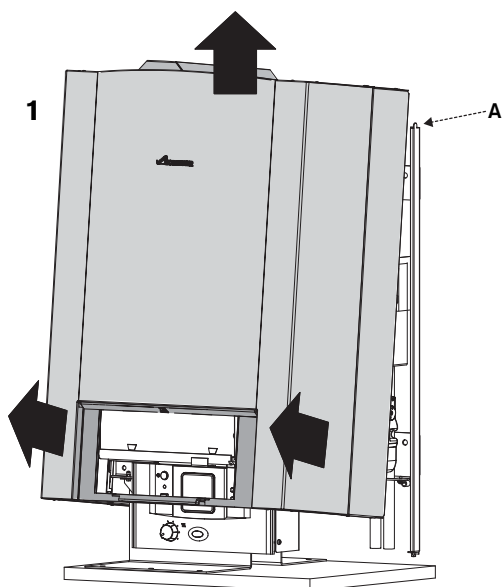
All removed parts must be placed safely away from the working area until required in order to avoid a potential tripping or slipping hazard.

At all times the correct method for handling heavy objects should be strictly observed.

### Removing the base support board:

It is advised that two or more persons are involved in the handling of the appliance during the following procedure.

- 1 ▶ Carefully pull the front panel away from the bottom of the wall mounting frame and lift clear of the two upright tabs (A) at the top of the frame. Remove from the appliance and store safely away from the working area until required.
- 2 ▶ Remove the drip tray (B) by sliding forwards and away from the appliance.
  - ▶ Undo the hose clip connection (C) at the top of the flue outlet assembly and the one at the burner securing the flexible air supply hose and remove.
- 3 ▶ Undo the connections (D) on the flow and return pipes (nuts one end and spring clips (E) the other) and remove the pipes. Store safely away from the boiler.
  - ▶ Undo the nut (F) securing the burner and remove the burner (G) from the appliance. **Make sure the burner lead is unplugged from the boiler control box.**



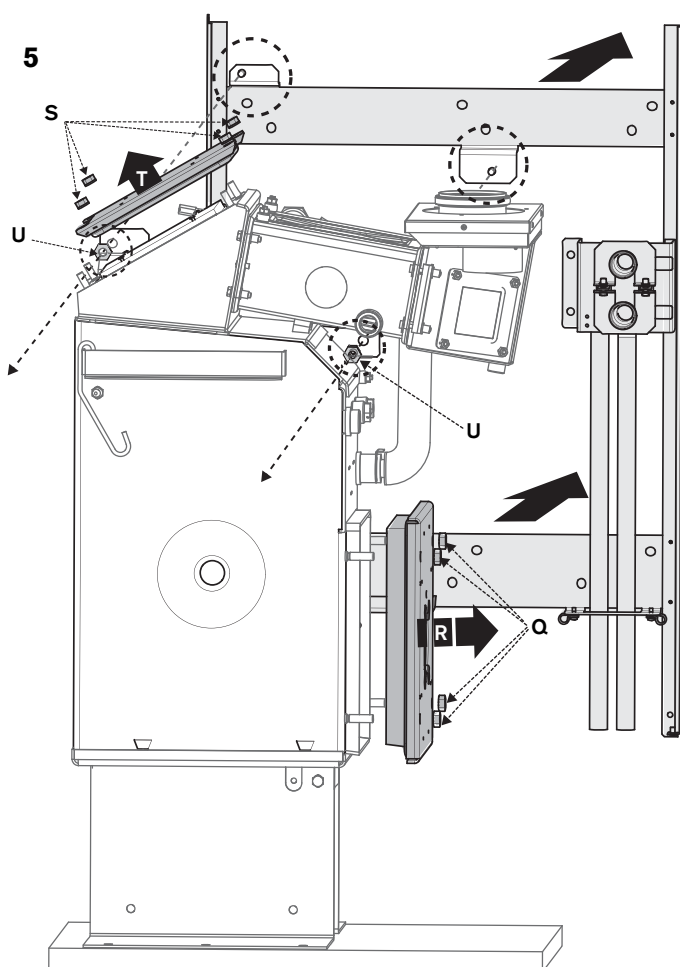
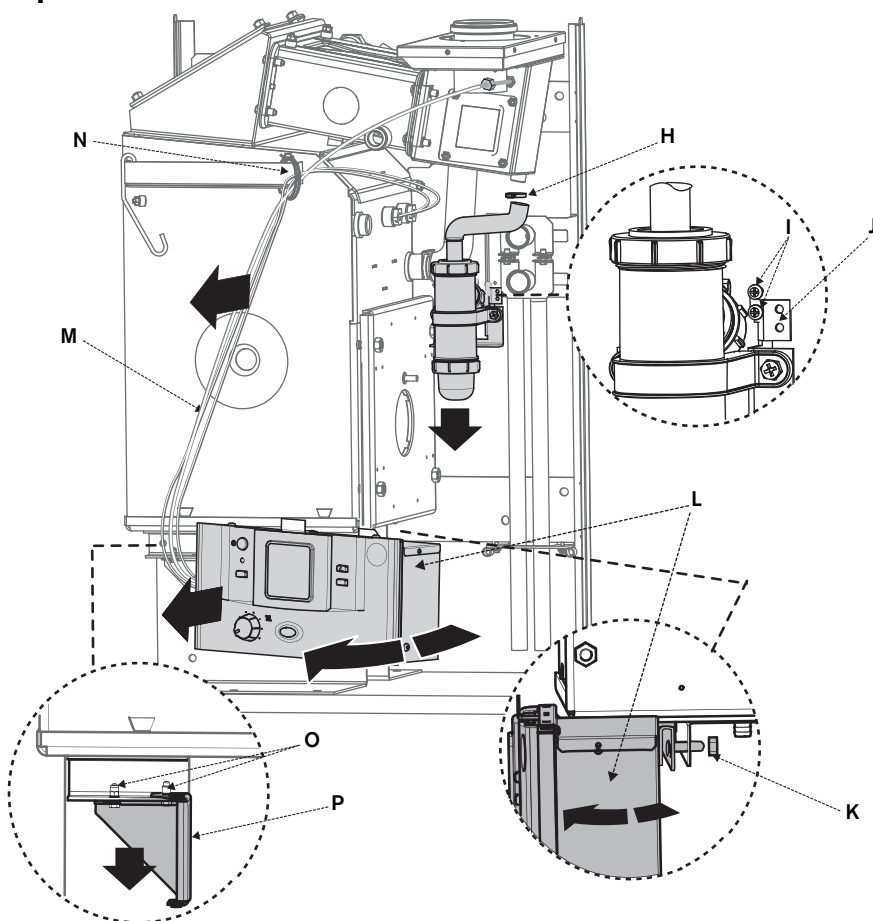
All removed parts must be placed safely away from the working area until required in order to avoid a potential tripping or slipping hazard.

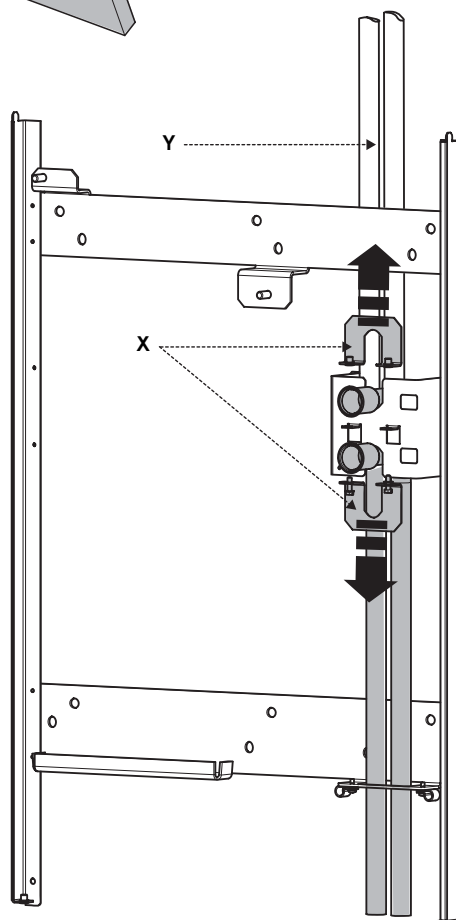
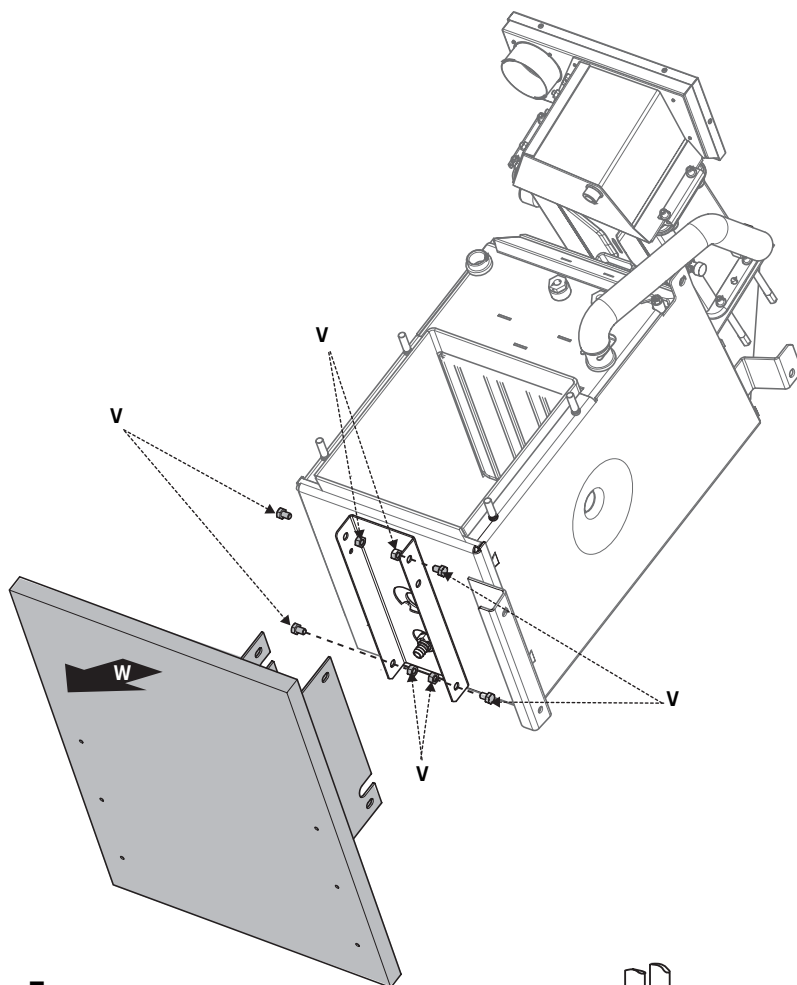
At all times the correct method for handling heavy objects should be strictly observed.

#### Removing the base support board:

It is advised that two or more persons are involved in the handling of the appliance during the procedure.

- 4 ▶ Undo the hose clip connection (H) securing the condensate outlet to the flue manifold.
- ▶ Undo the two screws (I) on the wall frame securing the trap bracket (J) and remove the complete condensate trap and outlet, by gently pulling downwards to free the assembly from the flue manifold. Keep all parts of the trap assembly in a safe place until required.
- ▶ Undo the nut/bolt (K) securing the rear of the electrical control box (L) and swing out to the left. Remove the thermostat phials from their pockets noting the position of each. To remove the phials it is necessary to first remove the split pins holding them in situ, and then gently remove them from their locations on the heat exchanger feeding the capillaries (M) through the plastic tie (N) on the front of the heat exchanger. In some instances this plastic tie may have to be cut free and replaced with a new one. The control box and capillaries can now be lifted and removed from the left hand bracket and stored safely away from the boiler.
- ▶ Undo the two screws (O) securing the control box bracket (P) to the heat exchanger and remove.
- 5 ▶ Undo the four nuts (Q) securing the combustion chamber door and remove the chamber door (R). Be careful not to damage the front insulation panel.
- ▶ Undo the four nuts (S) securing the baffle access door and remove the door (T). Be careful not to damage the insulation panel and seals.
- ▶ The wall mounting frame can now be removed by undoing the two nuts (U) on the wall mounting frame indicated in the circled areas on the diagram. **It is important to keep these nuts as they will be required to re-mount the boiler onto the frame.**





## UNPACKING THE BOILER

All packaging must be placed safely away from the working area in order to avoid a potential tripping or slipping hazard.

At all times the correct method for handling heavy objects should be strictly observed.

### Removing the base support board:

It is advised that two or more persons are involved in the handling of the appliance during the following procedure.

- 6 ▶ Carefully lay the boiler on its left hand side. This is where the support board is least proud of the appliance and there is less risk of accidental damage to components. At least two persons will be required to do this and the correct method for handling heavy objects should be strictly adhered to.
- ▶ Undo the base support board nuts and bolts (V) removing the bottom two first. The boiler will drop slightly to the floor so keep fingers away from the heat exchanger body when it drops. Then remove the top two bolts and pull the base support board (W) and its brackets away from the appliance.

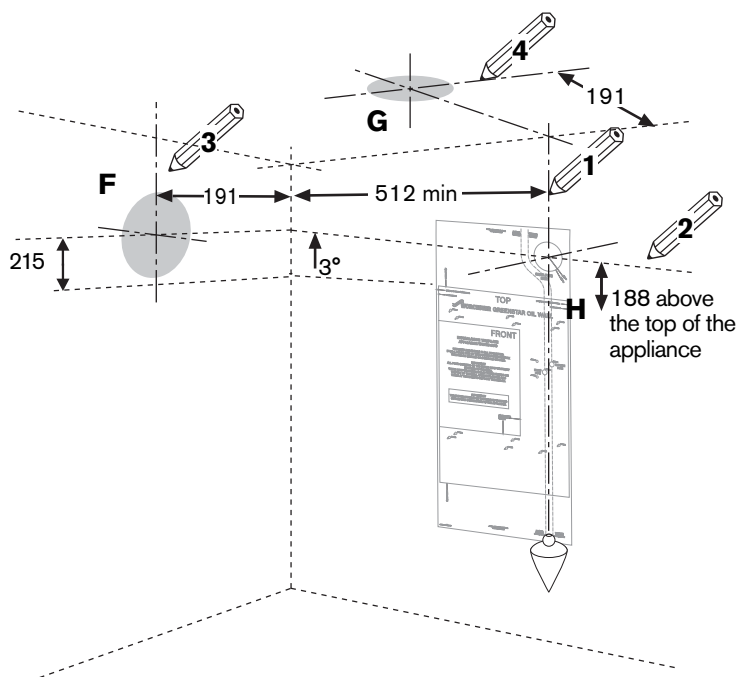
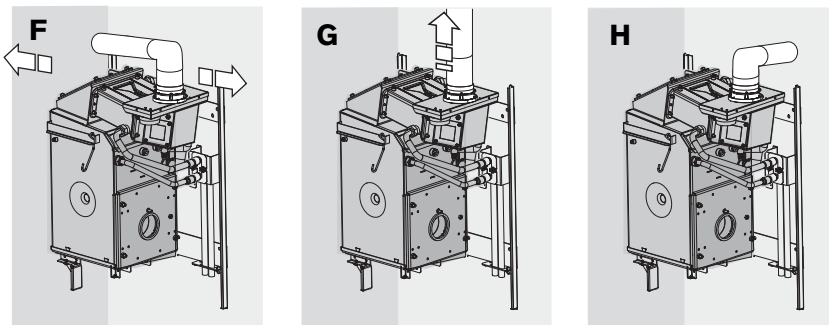
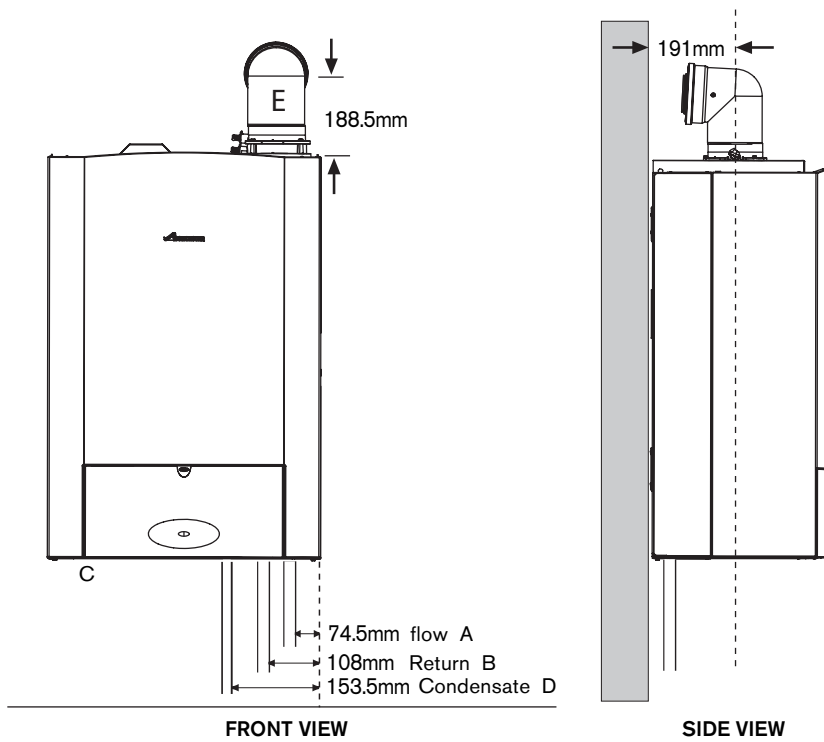
The base support (W) and the brackets attached to it are no longer required. Please dispose of them in a responsible way..

### Optional orientation of flow and return pipes:

- 7 ▶ At this point, before mounting the frame on the wall the orientation of the flow and return pipes can be changed to accommodate supply from above the appliance.
- ▶ To do this release both clamps (X) by undoing the two bolts. The pipes are now free to be removed and replaced in the upright direction (Y).
- ▶ Replace the clamps and re-tighten the bolts. Do not tighten fully so that alignment can be made when preplumbing before mounting the appliance.

**Note:** If a rear exit flue is also used the pipes whilst in the upright position will have to be shortened to miss the flue.





## PIPEWORK POSITIONS &

## FLUE OPENING

**CAUTION:** Ensure there are no pipes, electrical cables, damp proof courses or other hazards before drilling.

**SAFETY:**

All relevant safety precautions must be undertaken. Protective clothing, footwear, gloves and safety goggles must be worn as appropriate.

**PIPEWORK POSITIONS:**

- A - Flow 22mm Ø copper.
- B - Return 22mm Ø copper.
- C - Primary drain hose connection.
- D - Condensate outlet 21.5mm Ø.
- E - Flue outlet.

**NOTE:** For servicing purposes, keep condensate and pressure relief discharge pipes away from components and pipework connections.

**IMPORTANT:** The flue and pipework openings are covered with tabbed blanks.

**Remove carefully as necessary.**

**FLUE OPENING:**

- ▶ Follow the diagram opposite to mark the centre of the flue (1, & 2) for rear opening, (2 & 3) for side opening or (1 & 4) for top opening.

**\*\* IMPORTANT:** for horizontal flues, increase this height by 52mm for every 1000mm of horizontal length that the flue opening is away from the boiler.

**NOTE:** all horizontal flue sections must rise away from the boiler by 52mm per metre to ensure that condensate flows back into the boiler for safe discharge via the condensate waste pipe.

- ▶ Make an opening (F, G or H) through the wall using a core drill or similar at a size relative to the wall thickness as shown below:

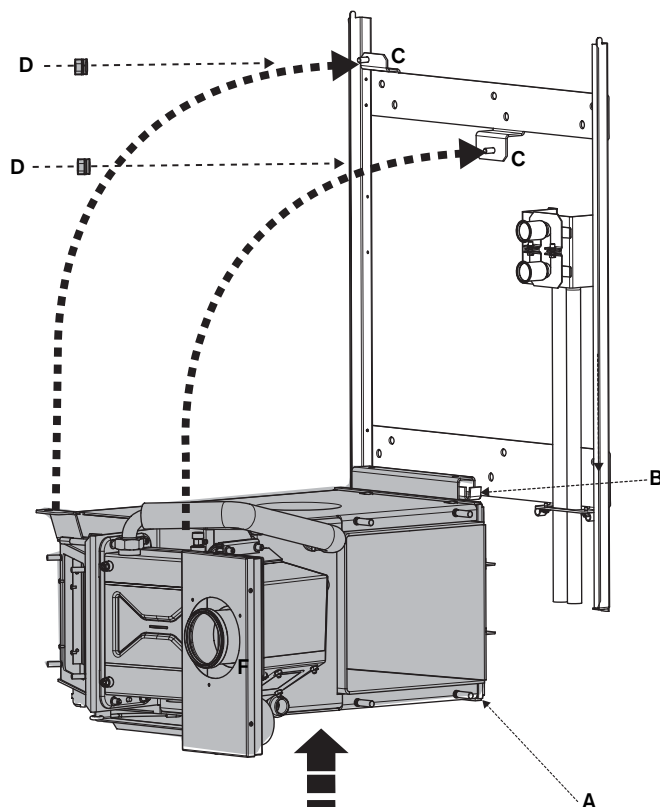
125mm Ø flue:	
Wall thickness	Flue hole size
150 - 240mm	Ø155mm
240 - 330mm	Ø160mm
330 - 420mm	Ø165mm
420 - 500mm	Ø170mm

- ▶ Use the wall mounting template (supplied in the accessories box), to check that the required clearances are available around the proposed boiler location. If the clearances are available then secure the template to the wall, making sure that the template is level, and then mark the fixing points and flue exit point onto the wall.
- ▶ If the flue is exiting to the left or right of the boiler then the centre line of the flue will need to be raised by 52mm per horizontal metre distance from the boiler (a 3° rise from the boiler).

**CAUTION:** Ensure there are no pipes, electrical cables, damp proof courses or other hazards before drilling.



1



- ▶ Drill the 6 mounting holes (the wall bolts require 10mmØ x 90mm hole depth), the pipe fitting bracket fixing hole (wall plug and 5mmØ screw not supplied) and flue exit (using the size chart on the previous page).

**CAUTION:** the bolts supplied are designed to be used on a standard plastered wall, site conditions may require a different fixing method to be used.

NB. There is a spare set of mounting holes in the wall mounting frame to allow for different fixing points if any of the original mounting holes cannot be used (due to mortar joints, voids etc).

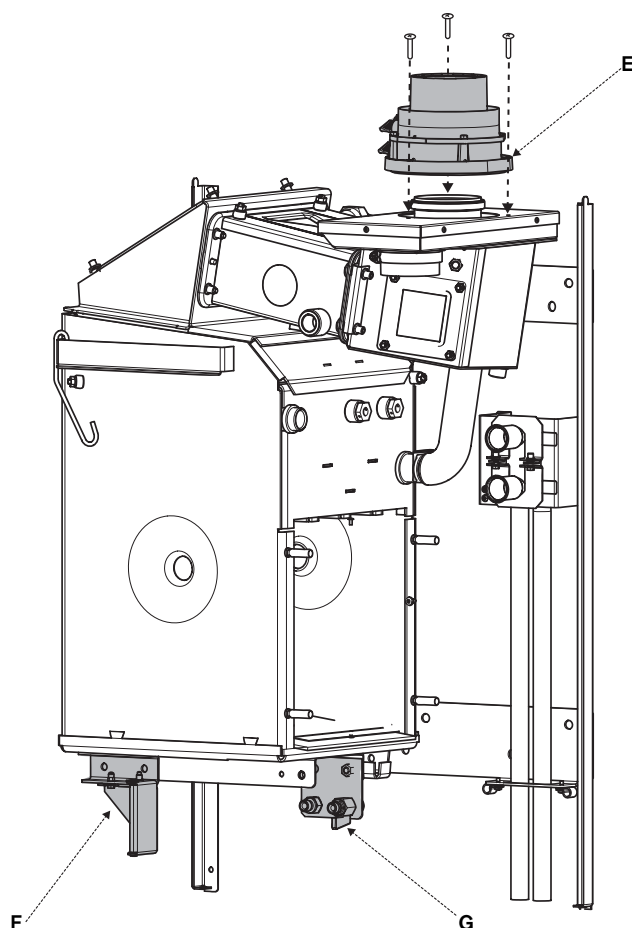
- ▶ Mount the wall mounting frame onto the wall using the wall bolts supplied, checking that the frame is level before finally tightening the bolts.

**At least two people will be required to mount the boiler onto the frame.**

Check the frame is securely fastened to the wall before fitting the boiler.

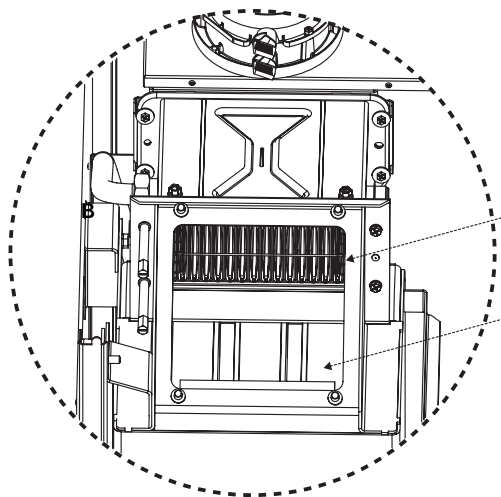
- ▶ Move the boiler to a position near the wall mounting frame with the rear of the boiler facing the frame. Have the two M8 boiler securing nuts (D) from the ready for securing the boiler when lifted into position.
  - ▶ Carefully rest the boiler (A) on its front face and then lift the boiler up and engage the rear support (B) into the slot on the wall mounting frame, pivot the boiler up until the support brackets engage on the studs (C) on the frame then fit and tighten the M8 nuts (D) on to the studs to secure the boiler in place.

2



- ▶ Grease the flue outlet seal with the solvent free grease supplied. Fit the flue adaptor (E) onto the flue cowl with the analysis test points on the left hand side using the 3 screws supplied.
  - ▶ Refit the electrical control box support bracket (F) at the base of the primary heat exchanger.
  - ▶ Fit the oil isolation valve bracket (G) (included in the accessories tray) to the mounting on the bottom of the primary heat exchanger.
  - ▶ Fit the oil isolation valve (supplied in the accessories box), and return bulkhead fitting to the bracket.

3



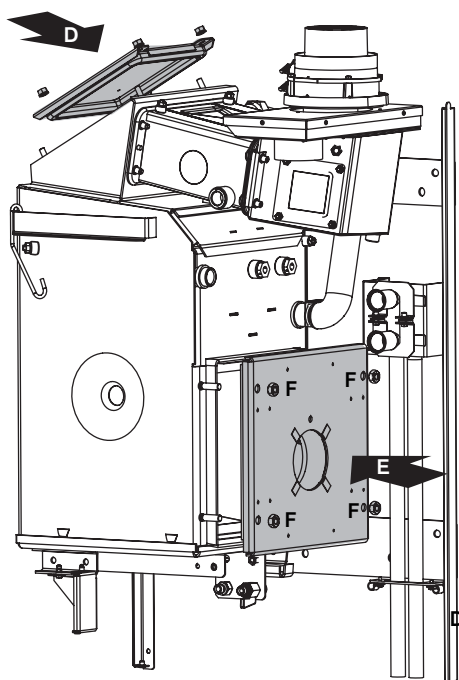
Secondary  
heat exchanger  
baffles and  
retainer

Primary  
heat exchanger  
baffles and  
restrictor  
plates

## COMBUSTION CHAMBER

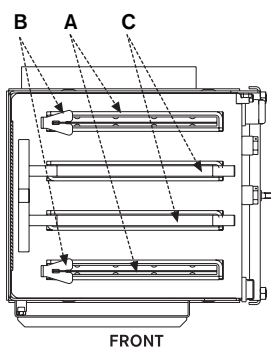
### Combustion chamber:

- 3 ▶ Check all the baffles (A), baffle retainers (B) and restrictor plates (C) are correctly fitted, (they may have moved during transport or installation), then refit the baffle access door (D).
- ▶ Refit the combustion chamber door (E) using the nuts and washers (F), tighten until the door is firmly secured using the sequence opposite to a torque of 6 Nm. Do not overtighten the nuts.



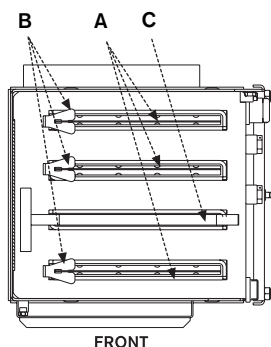
**12/18**

Plan sectional view

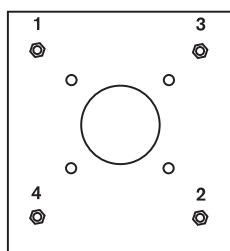


**18/25**

Plan sectional view



**IMPORTANT** when refitting  
the combustion chamber  
access door



Combustion chamber  
access door tightening  
sequence.

## INSTALLATION



Grease the vertical adaptor seal with the solvent free grease supplied. Install the flue following the instructions supplied with the flue.

- 1 ▶ Refit the condensate trap (A) to the flue manifold using the hose clip (B) . Then re-fit the bracket (C) to the wall mounting frame using the two screws provided (D).
- ▶ Fit 21.5mmØ polypropylene pipework (E) to the condensate trap flexible pipe (F) using the fitting provided then terminate the trap outlet to waste.
- ▶ Ensure that the condensate pipework runs away from the boiler at a constant fall of 50mm (min.) per metre.
- ▶ Remove the flue cowl access door (G) by undoing the 4 securing nuts (H). Carefully pour 500ml of water into the flue cowl to fill the condensate trap.
- ▶ Check the water is draining away and the condensate pipework joints are water tight.
- ▶ Refit the flue cowl access door.

**IMPORTANT:** The condensate trap must be correctly filled to prevent the possibility of potentially harmful flue products escaping via the condensate pipework.

- 2 ▶ Re-fit the flow and return pipes at the boiler.
- ▶ Connect the system pipework ( I ) to the flow ( J ) and return ( K ) pipes on the wall bracket. These are push fit connections secured with spring clips ( L ).



## OIL BURNER & PUMP

**CAUTION: ISOLATE THE OIL, WATER & ELECTRICAL MAINS SUPPLIES BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.**

### OIL BURNER:

- 1 ▶ Check the nozzle (A) and electrode (B) settings are correct as shown opposite.
- ▶ Ensure nozzle (A) is aligned centrally within the combustion head (C).
- ▶ Inspect for any visible defects.

**IMPORTANT:** Before removing or fitting a nozzle (A), loosen screw (D) and move the electrodes (B) forward.

After refitting check that the electrode gaps are correct, as shown opposite.

*\* NOTE: the 12/18 model has a brass deflection washer and locating circlip behind the nozzle. These must be in place for the correct operation of the burner.*

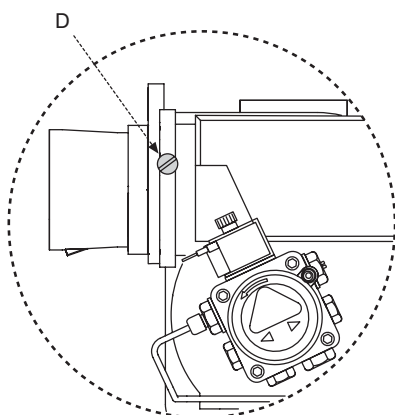
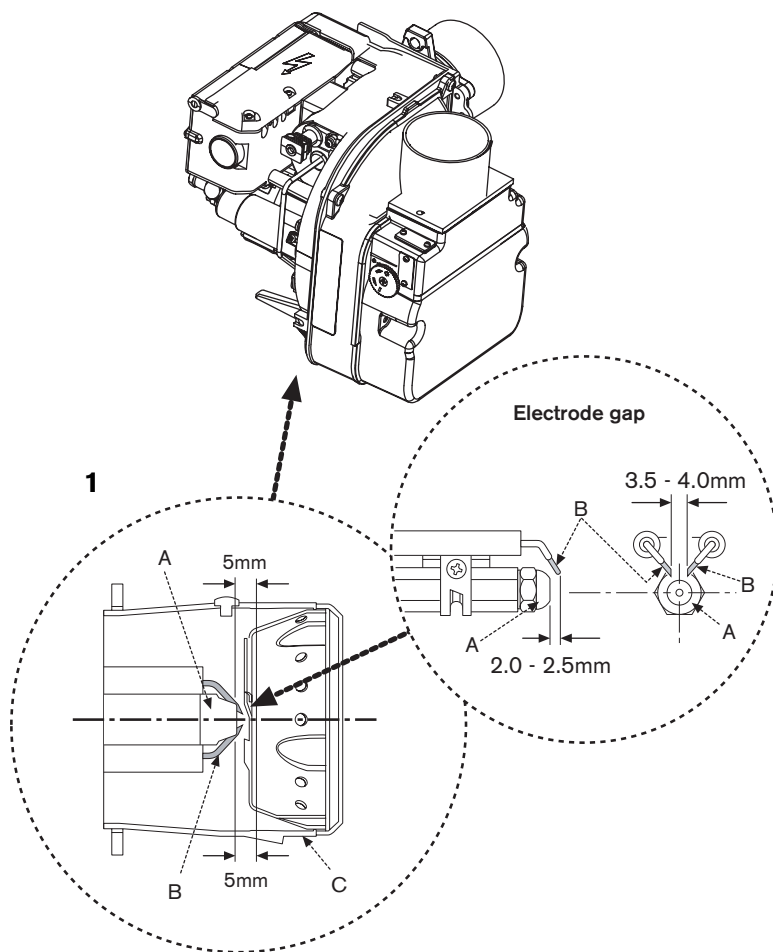
### OIL PUMP:

**Connecting the oil pump for a double pipe system:**

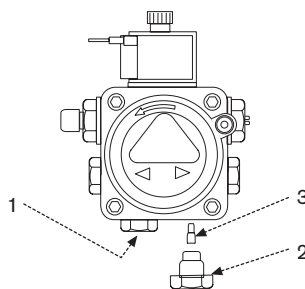
- ▶ The pump is factory set for double pipe operation with the flexible oil pipes fitted.
- ▶ Check connections before use.

**Converting the oil pump for a single pipe system:**

- ▶ Check the inlet pipe connection (1).
- ▶ Unscrew return oil line (2).
- ▶ Remove the by-pass screw (3).
- ▶ Fit a return plug (4) (not supplied) to the oil pump and tighten to secure.

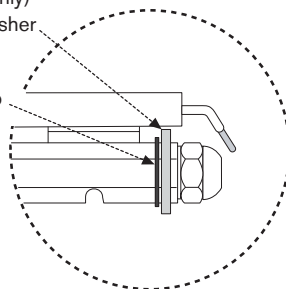


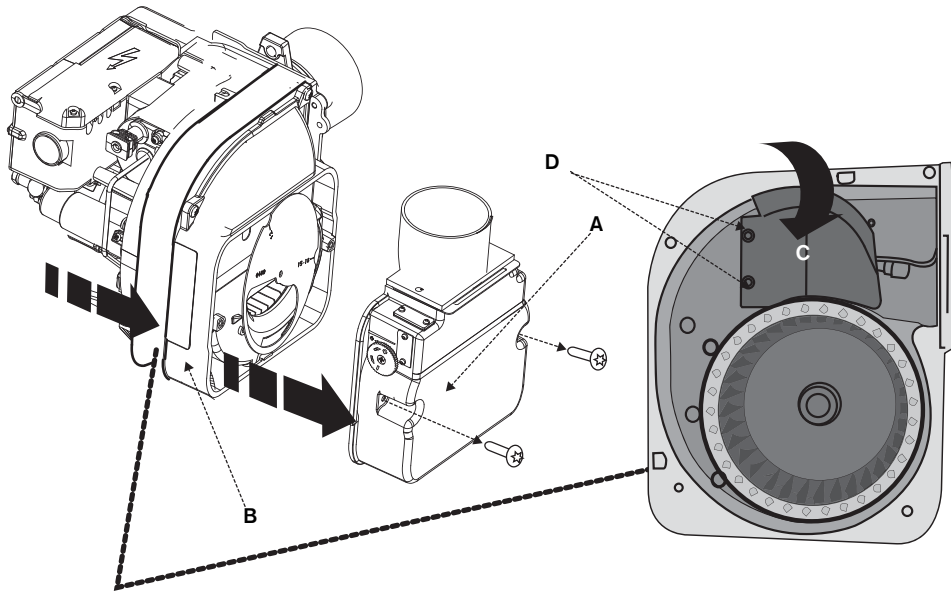
### RIELLO RDB OIL PUMP



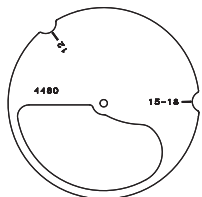
\* (on 12/18 model only)  
Brass air deflector washer

Locating circlip

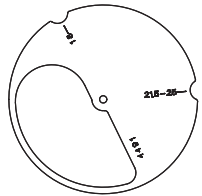




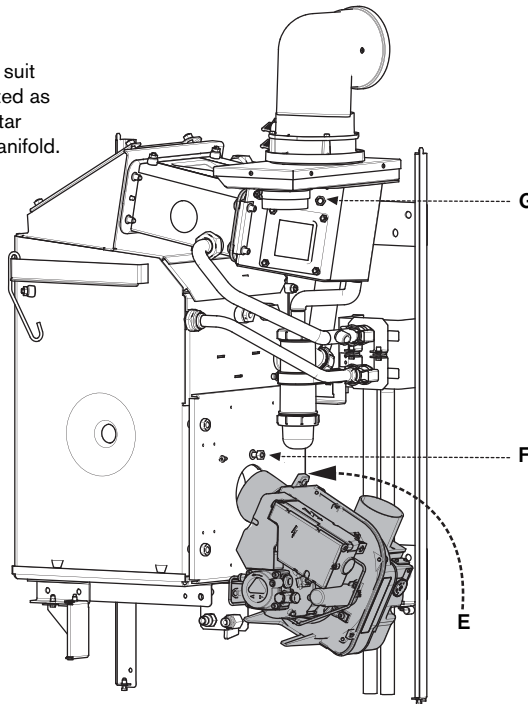
Adjust position of air damper discs to suit burner output (see chart below), located as above. Access by removing the two star screws (SC) to release the air inlet manifold.



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#### NOMINAL BOILER RATING AT NORMAL OPERATING TEMPERATURE USING 28sec KEROSENE:

NOZZLE	OIL PUMP PRESSURE (p.s.i.)	FUEL FLOW RATE Kg/h l/h	APPROX. FLUE GAS TEMP °C	%CO <sub>2</sub>	APPROX. AIR SETTING	INPUT (APPLIANCE) kW	OUTPUT (APPLIANCE) kW	AIR DAMPER DISC SETTING	BURNER HEAD
<b>Boiler 12/18 RDB 1</b>									
0.40 60°ES	100	1.06 1.34	63	12.0	2.25	12.7	12.4	12	LD 2X SH 12/18
0.45 60°ES	110	1.30 1.65	69	12.0	2.5	15.6	15.2	15-18	LD 2X SH 12/18
0.50 60°ES	120	1.55 1.96	71	12.5	4.25	18.6	18.1	15-18	LD 2X SH 12/18
<b>Boiler 18/25 RDB 2.2</b>									
0.50 80°ES	135	1.55 1.95	74	11.0	1.5	18.5	18.0	21.5-25	LD 25X 4HBP
0.60 80°ES	125	1.86 2.35	78	11.5	2.25	22.4	21.7	21.5-25	LD 25X 4HBP
*0.75 80°ES	105	2.16 2.73	85	11.5	4.0	26.0	25.2	21.5-25	LD 25X 4HBP

- ▶ The burner is supplied set to the mid range output, if a different output is required then the burner setup will need to be changed.
- ▶ Remove the air intake manifold (A) by undoing the two SC securing screws. For the lowest burner output the air damper disc setting will need to be changed as shown opposite.

#### For CF flues at 25kW output

- ▶ Remove the fan housing (B) by undoing the four securing screws.
- ▶ Fit the plastic air guide (C) using the screws supplied (D).
- ▶ Reassemble the burner in reverse order.

For any output change the nozzle will need to be changed as given in the chart below.

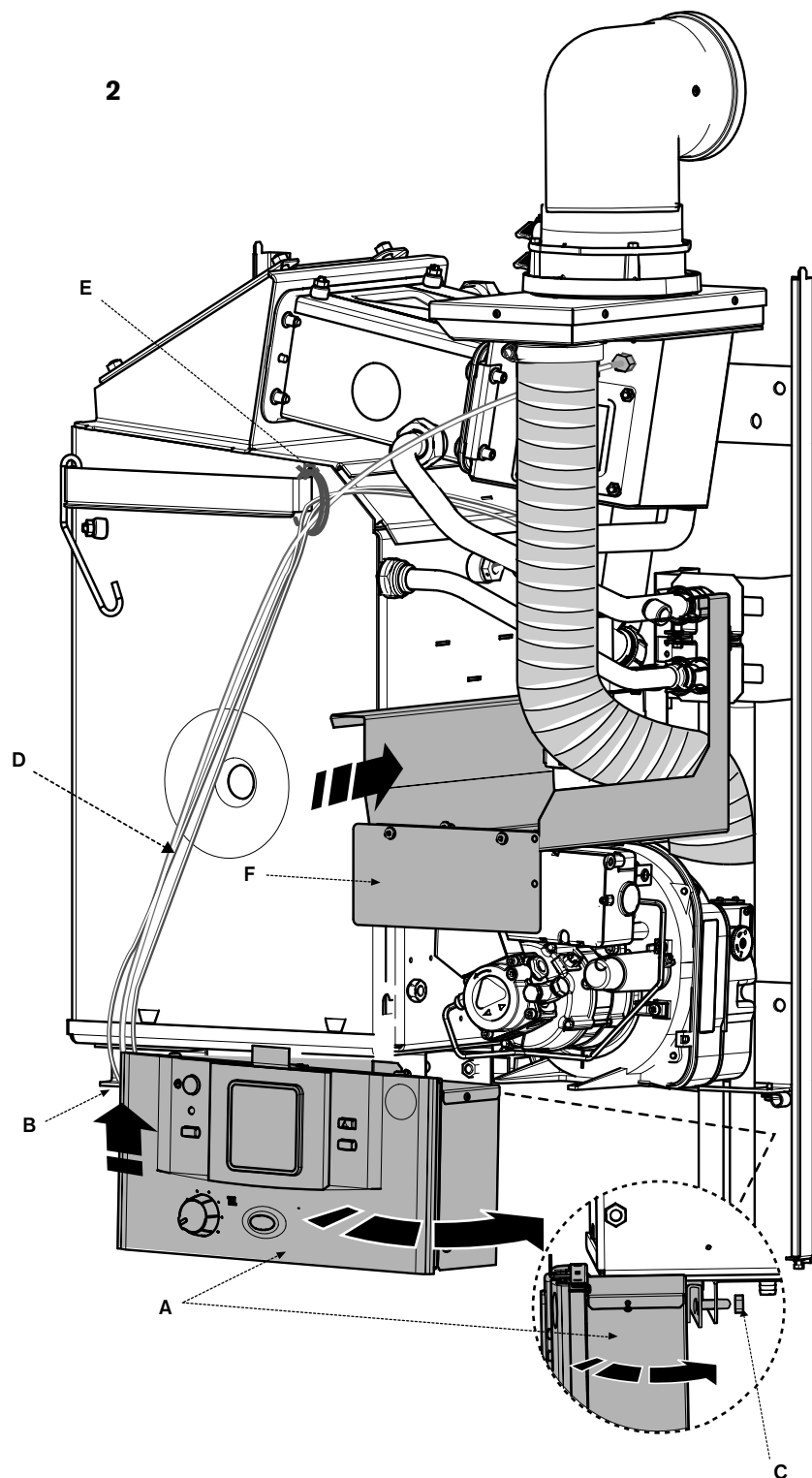
- ▶ Connect the flexible oil hoses onto the fittings on the boiler.

**WARNING: Ensure the oil pipe flow/return connections are correct or serious pump/deaerator damage could occur.**

- ▶ Check that the blast tube gasket is in good condition then fit the burner onto the combustion chamber door. If there is a wall or cupboard directly to the right hand side of the boiler then the burner has to be rotated into the mounting from underneath the boiler (E). Push the burner firmly onto the door and secure in place with the retaining nut (F). Tighten sufficiently to seal but do not overtighten the nut.
- ▶ Reconnect the flexible air hose to the air inlet casing (C).
- ▶ Plug the burner lead into the control box.

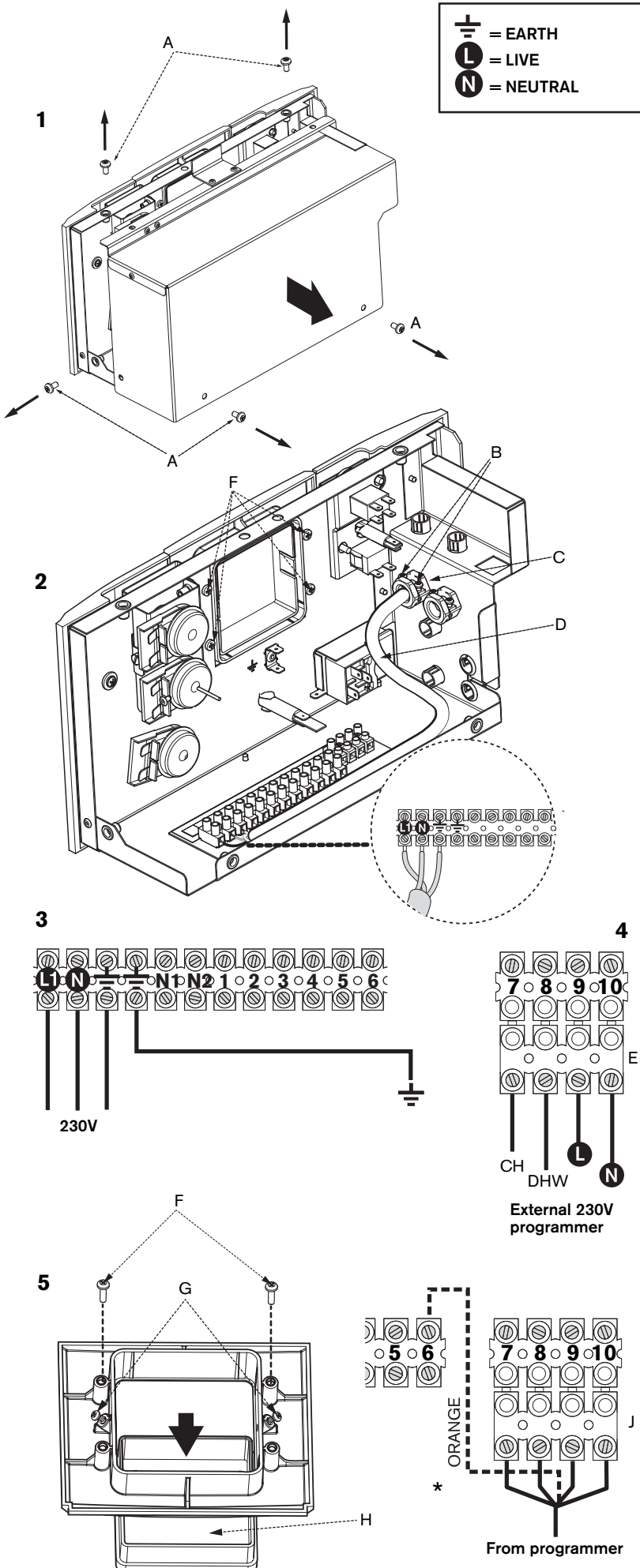
\*For CF flues at 25kW a plastic air guide must be fitted.

2



- 2 ▶ Lift electrical control box (A) back onto the supporting bracket (B).
- ▶ Locate the control box bracket at the rear of the boiler and secure at the base of the primary heat exchanger with the securing nut (C).
- ▶ Carefully feed the capillaries (D) back over the front of the boiler and through the plastic tie (E) and locate in the correct pockets.
- ▶ Slide the drip tray (F) back into position.





## ELECTRICS

**DANGER - 230V:**  
 ISOLATE THE MAINS ELECTRICITY SUPPLY BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.

### Access to 230V connections:

- 1 ▶ Remove the five electrical box rear cover screws (A) and remove the cover.
- 2 ▶ Release screws (B) from cable clamp (C).  
 ▶ Feed sufficient power cable (D) through the cable clamp (C) and secure grip with screws (B).  
 ▶ Separate the wires from the outer insulation and strip the insulation to 6mm.

### 230V connections:

- 3 ▶ Connect LIVE wire (Brown) to terminal L1.  
 ▶ Connect NEUTRAL wire (Blue) to terminal N.  
 ▶ Connect EARTH wire (Green/Yellow) to the terminal ⊞.

Any external device connected to the boiler must NOT have a separate supply.  
 See the following pages of electrical diagrams for details of different systems.

### External 230V programmer:

- 4 ▶ Remove the link from link block (E).  
 ▶ Connect wires as shown.

### Optional Worcester 230V programmer:

- 5 ▶ Remove the four fascia mounting plate screws (F) and remove the mounting plate from the fascia.  
 ▶ Loosen the two retaining screws (G) and remove the blanking plate (H).  
 ▶ Fit the programmer then retighten the retaining screws (G).  
 ▶ Refit the mounting plate into the fascia and refit the four screws (F).  
 ▶ Remove the link block (E).  
 ▶ Plug the programmer block (J) into the terminal block as shown.

\*Move the orange wire from terminal 9 to terminal 6 for a 3 port valve system.

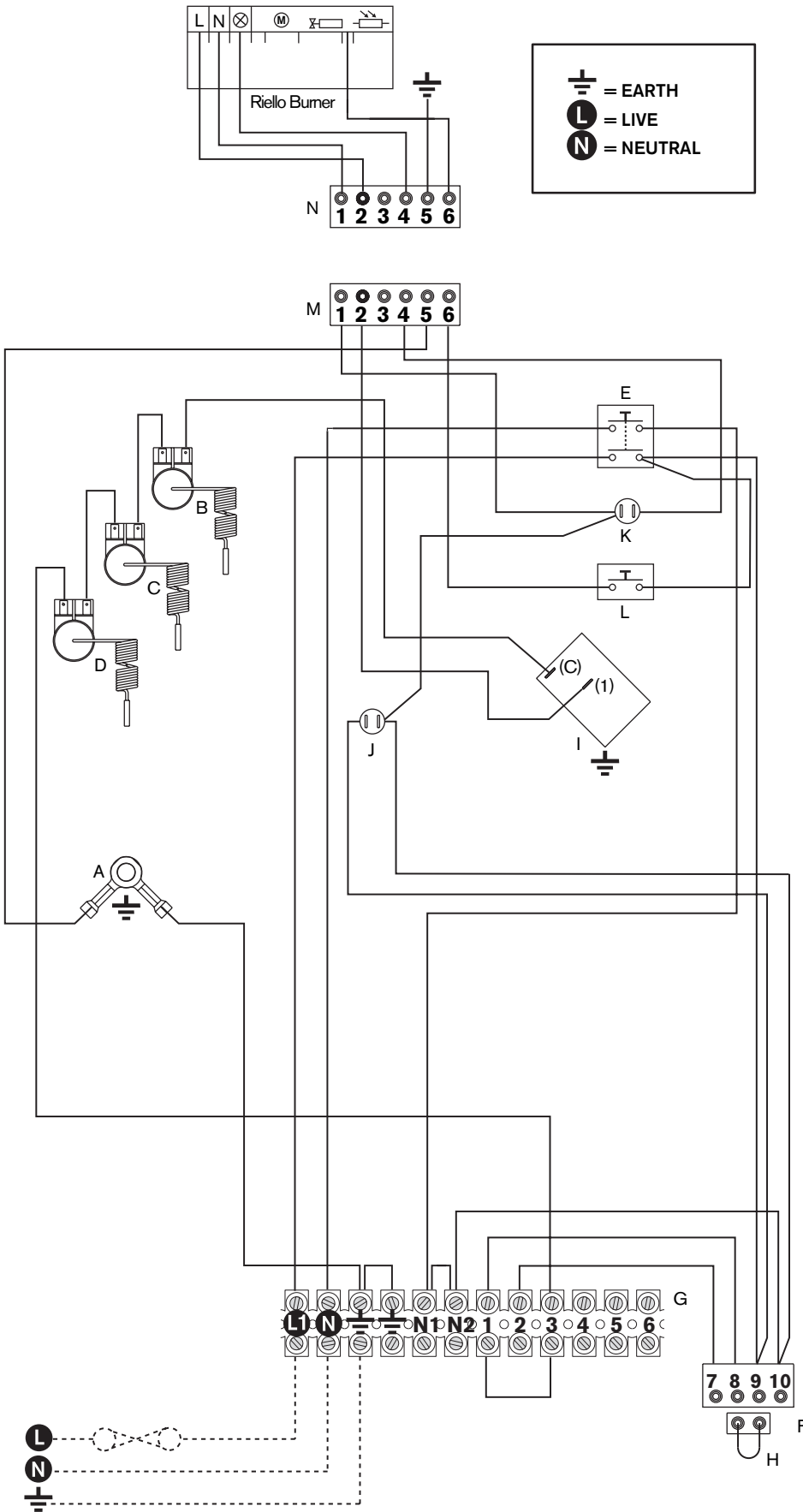
### Refit rear cover:

- ▶ Refit the rear cover to the electrical box and secure with screws (A).

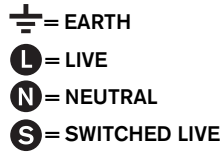
## 230V STANDARD WIRING DIAGRAM:

### Key to components:

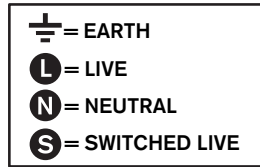
- A - EARTH TAG.
- B - HIGH LIMIT THERMOSTAT.
- C - FLUE MANUAL RESET OVERHEAT THERMOSTAT.
- D - BOILER MANUAL RESET OVERHEAT THERMOSTAT.
- E - POWER SWITCH
- F - INTERNAL PROGRAMMER CONNECTOR.
- G-TERMINAL CONNECTOR BLOCK.
- H - LINK CONNECTOR.
- I - CONTROL THERMOSTAT.
- J - POWER NEON.
- K - LOCKOUT NEON.
- L - LOCKOUT RESET SWITCH.
- M- BURNER SOCKET.
- N - BURNER PLUG.







## 32



## PRE-WIRED REMOTE 2 OR 3 PORT VALVE CONTROL SET USING EXTERNAL PROGRAMMER:

### Key to components:

O - REMOTE JUNCTION BOX (10-way) to connect the following:

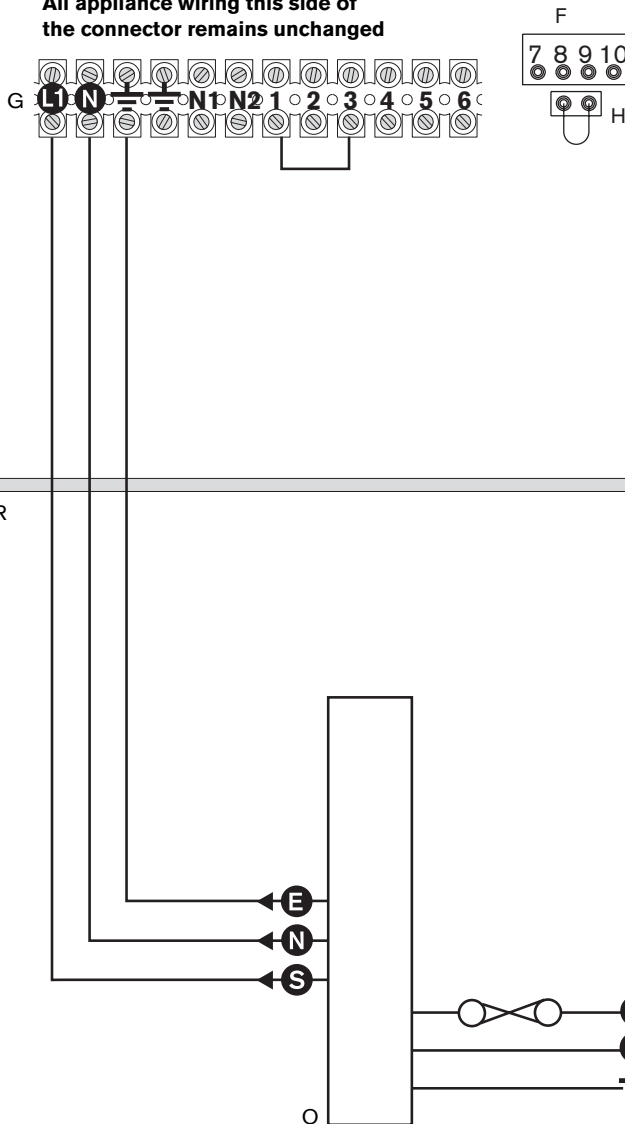
- ▶ Mains wiring 230V 50Hz.
- ▶ Hot water tank thermostat.
- ▶ Room thermostat.
- ▶ System water valves.
- ▶ Circulating pump.
- ▶ External programmer.

F - INTERNAL PROGRAMMER CONNECTOR.

G - TERMINAL CONNECTOR BLOCK.

H - LINK CONNECTOR.

All appliance wiring this side of the connector remains unchanged

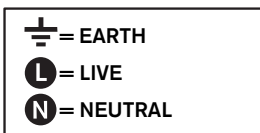


### Remote (10 way) junction box (O) requirements:

- ▶ The junction box (O) must be a terminal block type, current rated to at least 5 amps.
- ▶ A 5 amp fuse must be fitted to the mains supply.
- ▶ The junction box (O) must be fitted externally to the boiler.

*A frost thermostat can also be connected to the remote junction box if required.*

**Note:** The power indicator on the boiler will function as a demand indicator when the programmer is wired into the remote wiring centre.



## 2 PORT VALVE CONTROL SET:

Key to components:

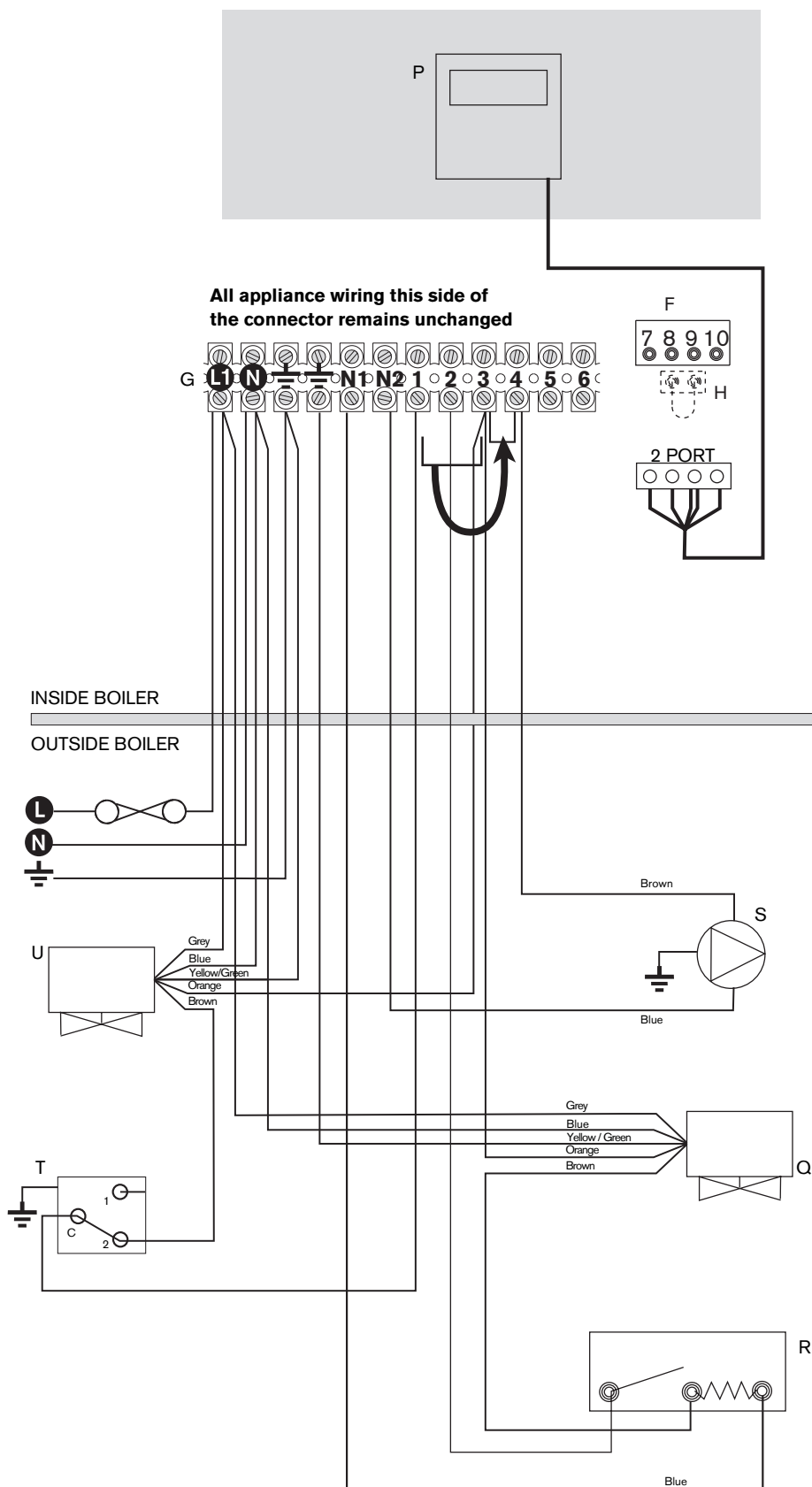
- Q - CH ZONE VALVE.
- R - ROOM THERMOSTAT.
- S - CIRCULATING PUMP.
- F - INTERNAL PROGRAMMER CONNECTOR.
- G-TERMINAL CONNECTOR BLOCK.
- H - LINK CONNECTOR.
- T - HOT WATER CYLINDER THERMOSTAT.
- U - HOT WATER VALVE.
- P - OPTIONAL 230V WORCESTER PROGRAMMER (fitted into fascia panel).

## Terminal connector block (G):




- Remove link 1 to 3.
- Make link 3 to 4.

## Optional 230V Worcester programmer (P):

- Set the pin on the rear of the programmer to 'pumped'.
- Remove the link plug (H).
- Connect the plug from programmer (P) into connector (F).



## ELECTRICS

 = EARTH  
 = LIVE  
 = NEUTRAL

### 3 PORT VALVE CONTROL SET:

#### Key to components:

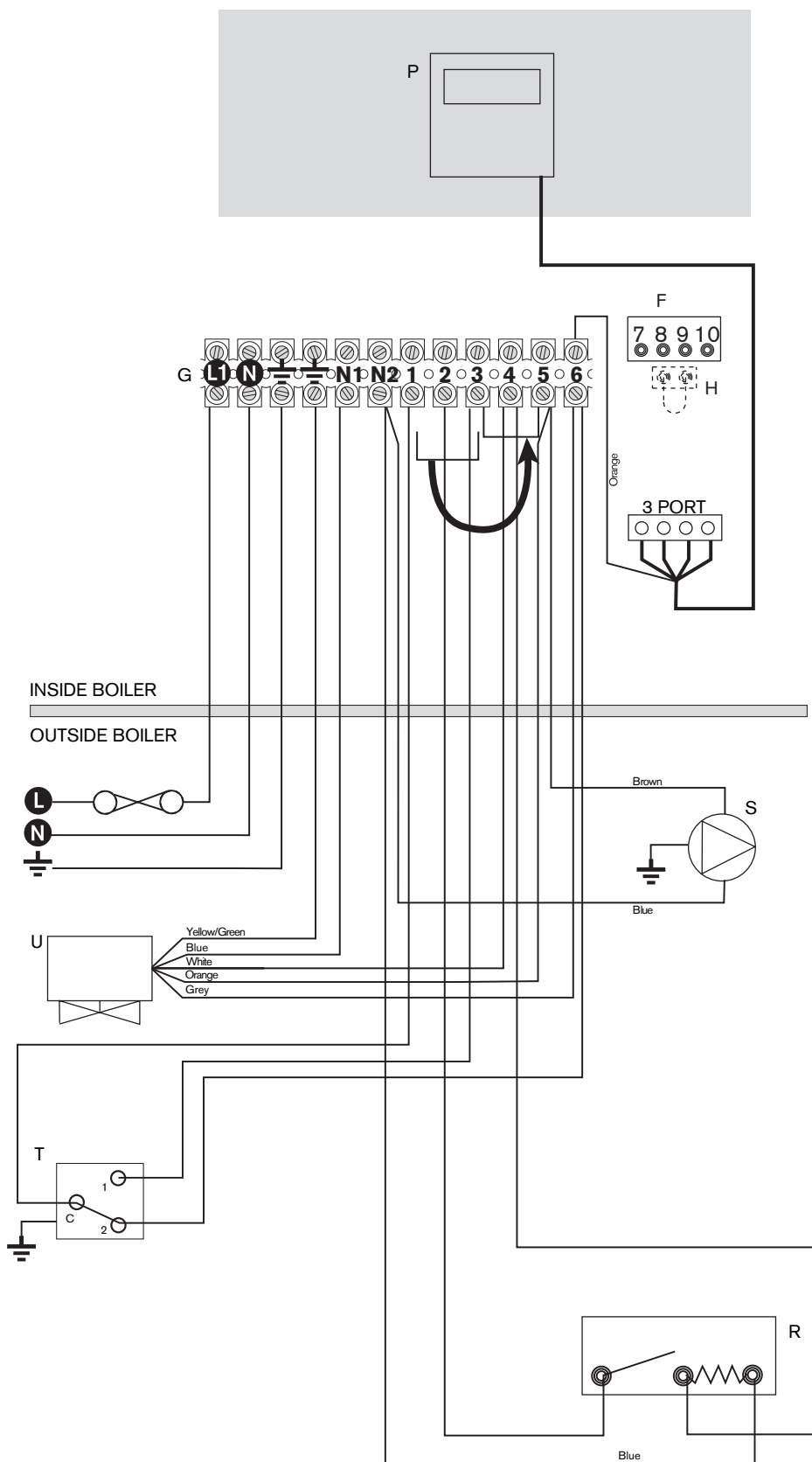
- R - ROOM THERMOSTAT.
- S - CIRCULATING PUMP.
- F - INTERNAL PROGRAMMER CONNECTOR.
- G- TERMINAL CONNECTOR BLOCK.
- H - LINK CONNECTOR.
- T - HOT WATER CYLINDER THERMOSTAT.
- U - MID-POSITION VALVE.
- P - OPTIONAL 230V WORCESTER PROGRAMMER (fitted into fascia panel).

#### Terminal connector block (G):

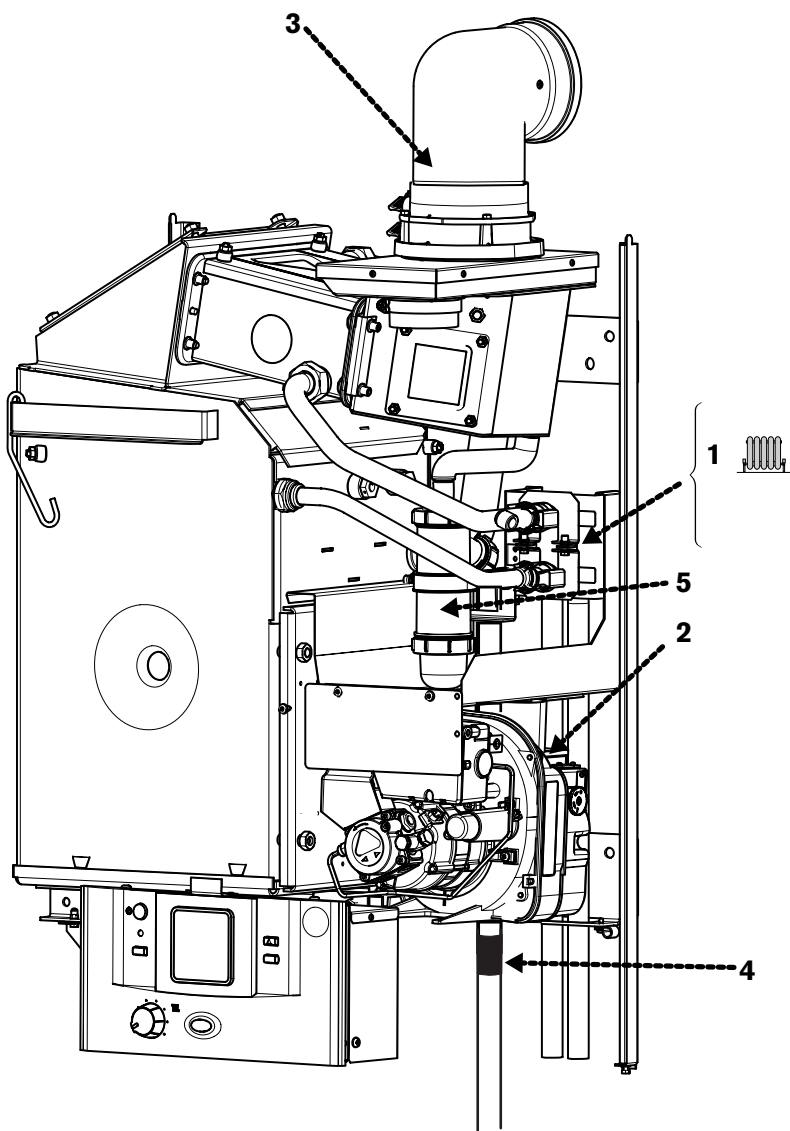
- ▶ Remove link 1 to 3.
- ▶ Make link 3 to 5.

#### Optional 230V Worcester programmer (P):

- ▶ Set the pin on the rear of the programmer to 'pumped'.
- ▶ Remove the link plug (H).
- ▶ Connect the plug from programmer (P) into connector (F).
- ▶ Move the orange wire from terminal 9 to terminal 6.



**CAUTION: ISOLATE THE MAINS ELECTRICAL SUPPLIES BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.**



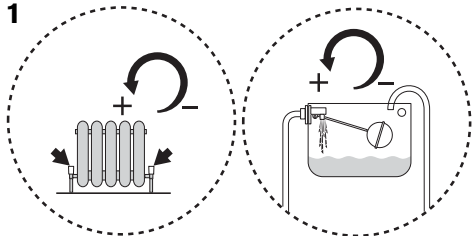
- 1 ▶ Check that the service and water pipes are connected correctly.
- 2 ▶ Check that the oil supply is kerosene and that the pipework is connected correctly to the oil pump.
  - ▶ Check that the burner is seated correctly on its mounting.
  - ▶ Turn on the main oil supply valve at the tank, check the oil supply pipework and connections. Rectify any leaks.
- 3 ▶ Check the flue is correctly fitted and the connections are secure.
- 4 ▶ Check the condensate pipework is correctly fitted and connected.
- 5 ▶ Check the condensate trap is filled with water.

**IMPORTANT: If the boiler is not to be commissioned immediately then:**

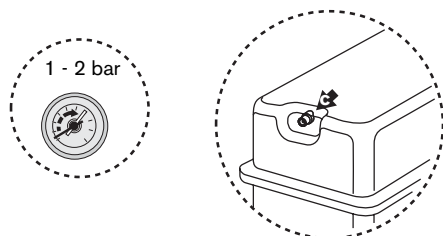
After successfully completing all of the checks and any rectification work, close the water valves, shut off the oil supply and electrically isolate the boiler.

Complete the installation part of the Guarantee Registration Card, and complete a CD10 or equivalent to inform the LABC of the installation.

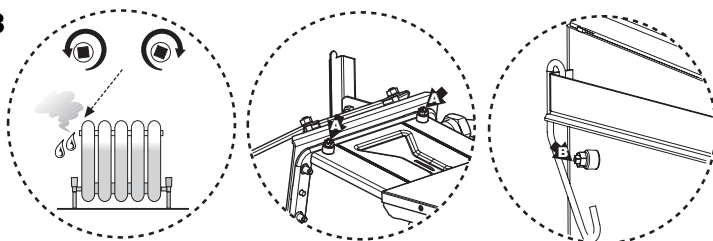
1



2



3

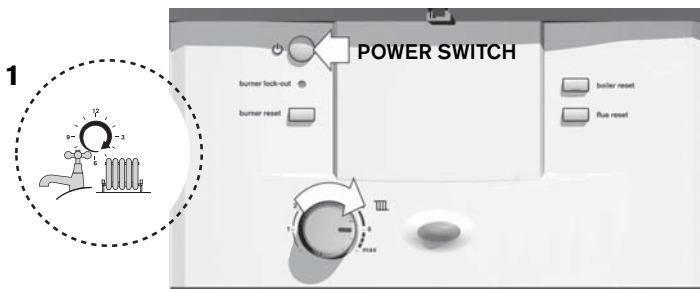


## FILLING THE SYSTEM

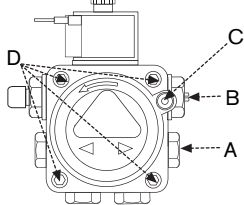
- 1 ▶ Open all system and radiator valves.
  - ▶ Turn on the water main stop cock.
  - ▶ Open vented systems only:
  - ▶ Turn on the water to the system feed and expansion cistern and allow the system to fill.
- 2 ▶ Sealed systems only:
  - ▶ Check and if required, adjust the expansion vessel pressure using the Schraeder type valve (C).
  - ▶ Fill the system to between 1 and 2 bar pressure via a WRAS approved filling link.
  - ▶ Monitor the pressure gauge during venting and repressurise if required.
- 3 ▶ Vent all radiators, retighten when completed.
  - ▶ Check the system and correct any leaks.
  - ▶ Bleed air from at least one of the secondary heat exchanger air vents (a radiator key is ideal for this). There are two venting bosses (A) on the top of the secondary heat exchanger. Only one is used if fluing to the side. The (A) in use and (B) must be bled.
  - ▶ Bleed air from the primary heat exchanger air vent (B).

## STARTING THE APPLIANCE

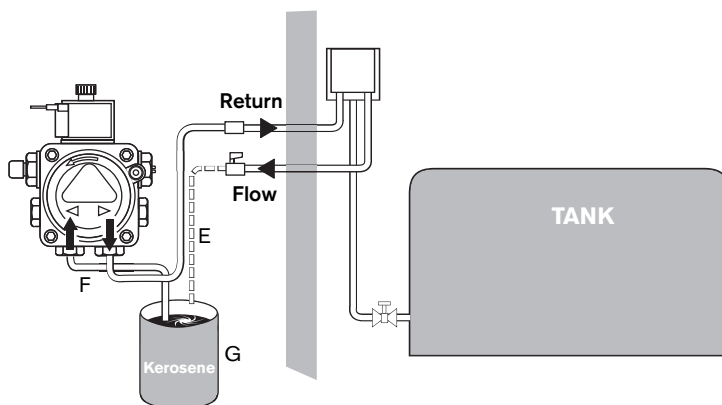
**IMPORTANT:** Never run the appliance when the appliance/system is unpressurised (sealed systems) or empty.



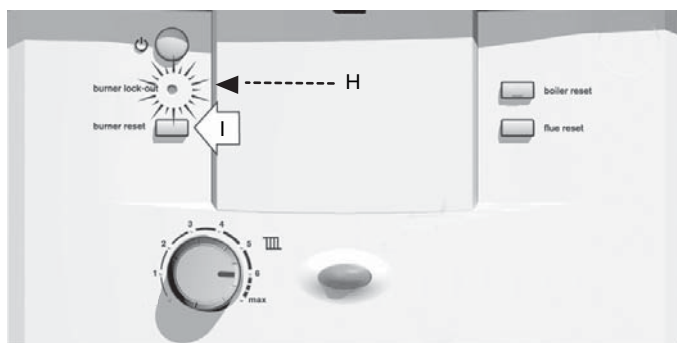
### RIELLO RDB OIL PUMP



- A - Bleed & pressure gauge port
- B - Pressure adjustment
- C - Vacuum gauge port
- D - Retaining screws - cover



### BURNER LOCKOUT



### BURNER LOCKOUT RESET BUTTON ( I )

- 1 ▶ Check the oil supply is correctly fitted and in good working order before turning on the oil supply valves to the boiler.
- ▶ Turn on the main oil supply valve at the tank and draw off oil until a steady flow of clear uncontaminated oil can be seen as follows:
  - The oil supply to the boiler should be primed before the burner is operated to avoid unnecessary pump wear.
  - The use of an oil suction pump will prime and flush through any oil supply set up simply and easily. Alternatively the following procedures can be used:
    - ▶ **Single pipe gravity feed systems:**
      - ▶ Disconnect the flexible oil pipe and open the isolating valve to discharge the oil into a suitable container.
      - ▶ If a top entry tank has been used the pipework will need to be primed before the oil will discharge under gravity.
      - ▶ When completed, close the isolating valve, reconnect the flexible oil pipe.
    - ▶ **Double pipe sub-gravity feed systems and single pipe suction lift with de-aerator:**
      - ▶ Prime the oil supply pipework to prevent oil pump damage .
      - ▶ To prime a de-aerator, disconnect the flexible oil inlet hose (F) from the isolation valve and place in a container of kerosene (G). Connect a spare flexible oil hose (E), to discharge into container (G). Open the isolating valve, turn on the power to the boiler and set the programmer to ON. Prime the de-aerator until there is a steady flow of oil into container (G). Turn off the boiler then reconnect the flexible oil inlet hose (F).
      - ▶ Turn on the boiler, the oil level in the de-aerator will drop as the oil is used until the oil is drawn from the tank. If the de-aerator empties and the burner locks out before the oil is drawn from the tank prime the de-aerator again.
      - ▶ Open the isolating valve and the oil pump bleed valve (A) to discharge into a suitable container once the boiler is started up.
      - ▶ Switch on the electrical supply to the boiler.
      - ▶ Switch on the boiler at the power switch.

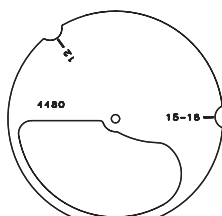
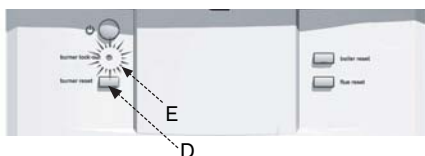
**IMPORTANT:** The burner has an 11 second delay before the motor is activated.

- ▶ Set the programmer to ON.
- ▶ Turn on the boiler control thermostat.
- ▶ Allow the burner to run through to 'lock-out' indicated by the illumination of the lockout indicator (H), (note: some systems will not lock out).
- ▶ If lockout occurs wait 2 minutes then press the lockout reset button ( I ).
- ▶ Repeat the procedure at least 3 times or until a steady stream of oil, without air, runs from the bleed port, then relock the bleed port.
- ▶ Switch off the boiler at the power switch.
- ▶ Remove the oil pump filter, clean with kerosene and refit.

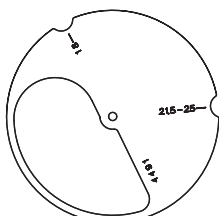
The internal filter is accessed by removing the oil pump cover.

- ▶ Safely dispose of the container/discharge.

2

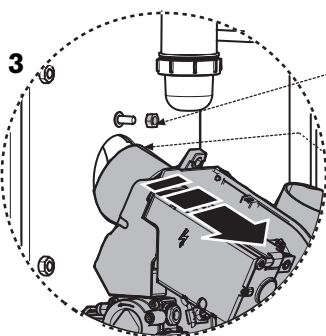
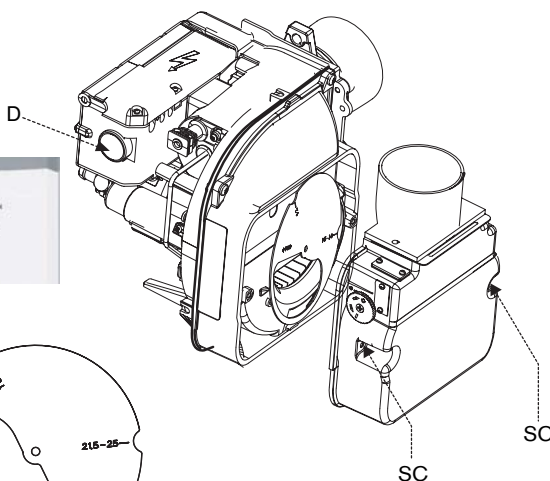


12/18



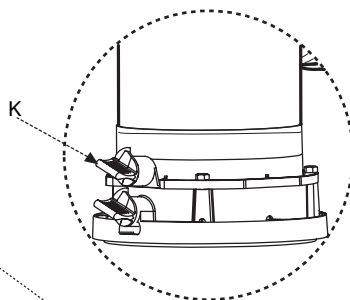
18/25

Adjust position of air damper discs to suit burner output (see chart below), located as above. Access by removing the two star screws (SC) to release the air inlet manifold.

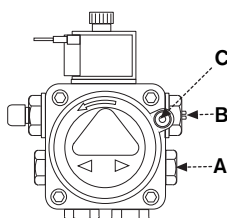


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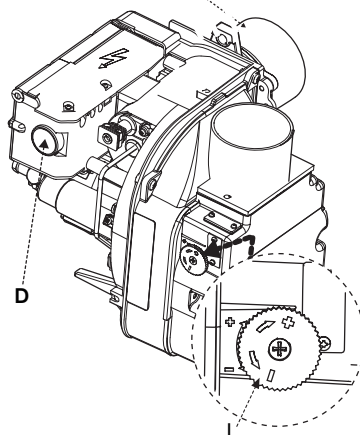


### RIELLO RDB OIL PUMP



- A - Bleed & pressure gauge port  
B - Pressure adjustment  
C - Vacuum gauge port

5



## STARTING THE APPLIANCE

- 2 ▶ Fit a suitable pressure gauge to port (A) on the oil pump.
- ▶ Adjust the air shutter (L) and pump pressure (B) as shown in the table opposite. The burner should ignite following a pre-ignition period of approx. 15 seconds.
- ▶ If changing the burner output, check the position of the air damper disc is correct to the output as shown in the table below.

### Boiler lockout indicator on:

If the burner fails to establish a normal firing pattern or flame failure occurs the flame monitoring photocell mounted in the burner body will alert the burner control box to shut the burner down and provide a safe lockout state indicated by the illumination of the lockout indicator (E).

- ▶ Wait 2 minutes then press the lockout reset button (D) to initiate another start sequence.
- ▶ Repeat procedure until a flame is established.

- 3 ▶ Start and run for 3 minutes then switch off.
- ▶ Check for after-spurting from the nozzle, indicated by oil saturation on the combustion head (G).

If after-spurting occurs:

- ▶ Release the burner retainer (F).
  - ▶ Remove the burner, combustion head (G), and electrodes, hold the burner vertical to unscrew the nozzle and fill the nozzle holder with kerosene.
  - ▶ Refit nozzle, electrodes, combustion head (G) and the burner.
  - ▶ Restart and run for 3 minute intervals until after-spurting stops.
- 4 ▶ Start and run for 20 minutes.
  - ▶ Remove sampling point plug (K) to check the smoke reading is between 0-1. If the smoke level is above 1, check the combustion settings are correct and the oil nozzle is in good condition.

Note: smoke readings may be inaccurate until the smoke from burning organic binder in the access door insulation has ceased.

- ▶ Check the CO<sub>2</sub> levels and adjust the air shutter (L) setting according to the table opposite.
- ▶ Check the flue gas temperature is close to the values shown in the table.

If the flue gas temperature is too high and the baffles are correctly fitted, then reduce the oil pump pressure (B) 5-10p.s.i. to compensate for nozzle variations.

- ▶ Turn off the electrical supply.
- ▶ Isolate the oil supply to the burner.
- ▶ Remove the oil pressure gauge.
- ▶ Refit the blanking plug (A).
- ▶ Check and rectify any oil leaks.

- 5 ▶ Switch on the oil supply.
- ▶ Switch on the electrical supply.
- ▶ Restart the boiler and run for 5 minutes.
- ▶ Recheck the CO<sub>2</sub> levels and if required, adjust the air shutter setting (L) to obtain the correct CO<sub>2</sub> level.
- ▶ Refit the sample point cap.

### NOMINAL BOILER RATING AT NORMAL OPERATING TEMPERATURE USING 28sec KEROSENE:

NOZZLE	OIL PUMP PRESSURE (p.s.i.)	FUEL FLOW RATE		APPROX. FLUE GAS TEMP °C	%CO <sub>2</sub>	APPROX. AIR SETTING	INPUT (APPLIANCE) kW	OUTPUT (APPLIANCE) kW	AIR DAMPER DISC SETTING	BURNER HEAD
		Kg/h	l/h							
<b>Boiler 12/18 RDB 1</b>										
0.40 60°ES	100	1.06	1.34	63	12.0	2.25	12.7	12.4	12	LD 2X SH 12/18
0.45 60°ES	110	1.30	1.65	69	12.0	2.5	15.6	15.2	15-18	LD 2X SH 12/18
0.50 60°ES	120	1.55	1.96	71	12.5	4.25	18.6	18.1	15-18	LD 2X SH 12/18
<b>Boiler 18/25 RDB 2.2</b>										
0.50 80°ES	135	1.55	1.95	74	11.0	1.5	18.5	18.0	21.5-25	LD 25X 4HBP
0.60 80°ES	125	1.86	2.35	78	11.5	2.25	22.4	21.7	21.5-25	LD 25X 4HBP
*0.75 80°ES	105	2.16	2.73	85	11.5	4.0	26.0	25.2	21.5-25	LD 25X 4HBP



## STARTING THE APPLIANCE

### Central heating:

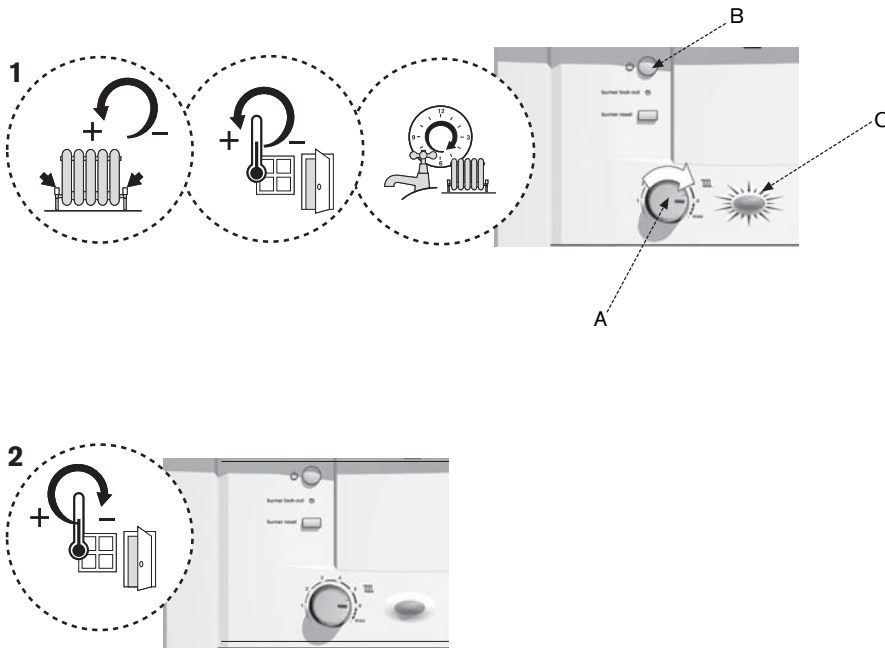
- 1 ▶ Open all radiator valves.
  - ▶ Set room thermostat to maximum.
  - ▶ Set programmer to ON for CH, OFF for DHW (if applicable).
  - ▶ Turn the thermostat control (A) to max.
  - ▶ The power on indicator (C) will always be on except for when wired as a 'pre-wired remote 2 or 3 port valve using external programmer'. In this configuration the indicator will only be on for demand.
  - ▶ Switch on the boiler by pressing the power button (B).

**IMPORTANT: The burner has an 11 second delay before the motor is activated.**

- ▶ Ensure all radiators are heating up evenly and balance the system to the temperature difference required for the heating flow and return according to the heating load.

- 2 ▶ Set the room thermostat to minimum.  
*The burner and circulating pump should be off.*

- 3 ▶ Check that any other controls that are fitted to the system are operating properly.



## WATER TREATMENT

**IMPORTANT:** Debris from the system can damage the boiler and reduce efficiency. Failure to comply with the guidelines for the use of water treatment with the appliance will invalidate the appliance warranty.

**FLUSHING (Central Heating):**

- 1 ▶ Switch off the boiler.
  - ▶ Open vented systems only: turn off the water to the system header tank.
  - ▶ Open all radiator valves/drain cocks (B) and drain the system while the appliance is hot.
  - ▶ Close drain cocks (B).
- 2 ▶ Add a suitable flushing agent (F) and refill the system at the correct strength for the system condition in accordance with the manufacturer's instructions.
  - ▶ Vent the boiler using a radiator key or suitable screwdriver (there are two vent points (A) at the top of the secondary heat exchanger. Only one may be in use, the other may be obscured by side fluing. Always vent (A) and the vent point on the primary heat exchanger (C) and all radiators.
  - ▶ Run the boiler/system at normal operating temperature for the time stated by the flushing agent manufacturer.
- 3 ▶ Drain (B) and thoroughly flush the system to remove the flushing agent and debris.

**INHIBITOR (Central Heating):**

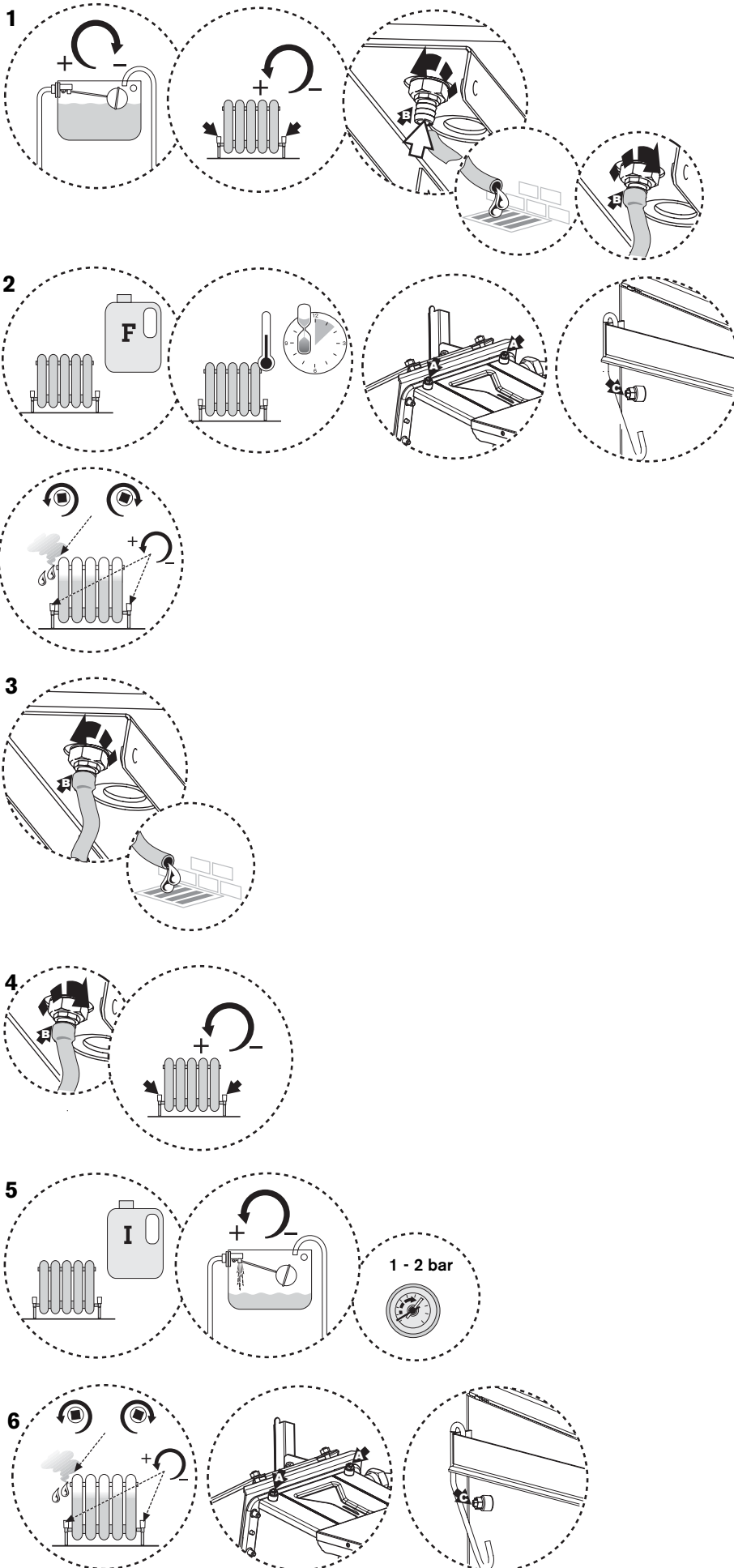
- 4 ▶ Check drain cocks (B) and manual air vents are closed and all radiator valves are open.
- 5 ▶ Add a suitable inhibitor (I), (or combined inhibitor/anti-freeze if the system is exposed to freezing conditions) to the heating system in accordance with the manufacturers instructions.

*The inhibitor or combined inhibitor/anti-freeze must not cause damage to the materials within the boiler (mild steel, stainless steel, copper and brass) and any other materials/components within the system.*

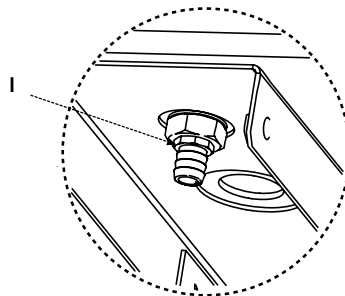
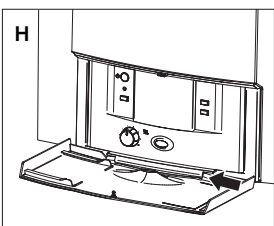
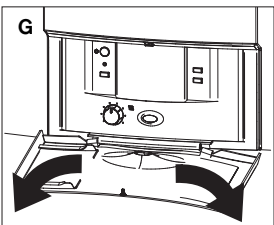
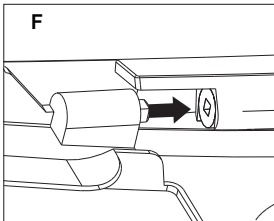
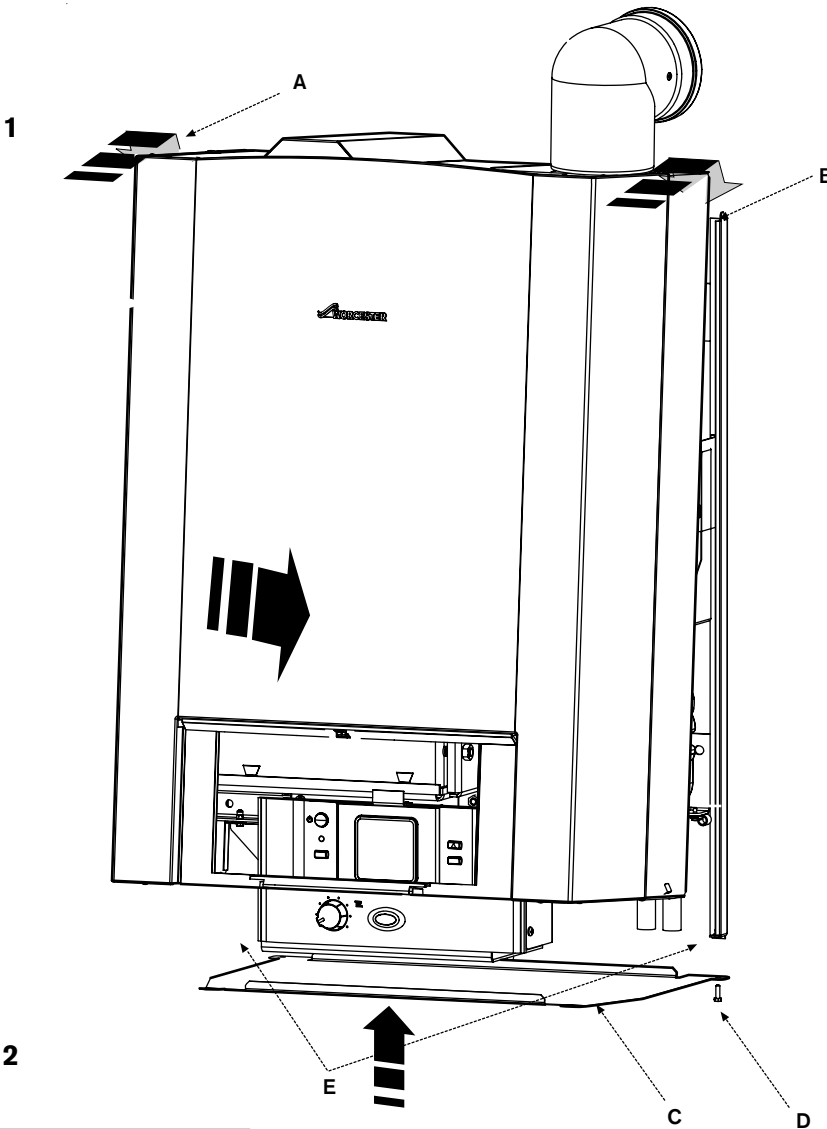
- ▶ Open vented systems only: turn on the water to the system header tank and allow the system to fill.
  - ▶ Sealed systems only: fill the system to between 1 and 2 bar via a WRAS approved filling loop.
- 6 ▶ Vent the boiler, (there are two vent points (A) at the top of the secondary heat exchanger. Only one may be in use, the other may be obscured by side fluing. Always vent (A) and the vent point on the primary heat exchanger (C) and all radiators; retighten vents when complete.
  - 7 ▶ Record the date when the inhibitor was added to the system on the guarantee card.

*NOTE: The concentration level of inhibitor in the system should be checked every 12 months or sooner if system content is lost.*

*The addition of sealing agents to the system water is not permitted as this can cause problems with deposits left in the heat exchanger and invalidate the appliance and heat exchanger warranty.*



## FINISHING COMMISSIONING - APPLIANCE



- 1 ▶ Locate the top rear edges of panel (A) onto the supporting tabs (B) and drop the front panel carefully into position over the appliance. Push gently into place taking care to apply any pressure at the edges of the panel to avoid accidental damage
  - ▶ Lift the bottom panel (C) into place beneath the boiler and engage the front lip with the bottom of the front casing.
  - ▶ Secure both panels to the wall mounting frame by replacing the screws (D) located at the bottom of the wall mounting frame (E).
- 2 ▶ To fit the front flap follow the instructions on the label attached to the component.
  - ▶ Engage the flap in one pivot as indicated in diagram (F).
  - ▶ Carefully bend the flap as shown in diagram (G).
  - ▶ Engage second pivot to complete fitting as shown in diagram (H).

### Handover:

- ▶ Complete the Guarantee Registration Card, Combustion Record (page 50) and CD11 or an equivalent commissioning form.
- ▶ Set up the controls and show the user how to operate all the controls shown in the User Guide and all system controls.
- ▶ Where applicable, instruct the customer how to repressurise the system.
- ▶ If the appliance is unused and exposed to freezing conditions, shut off all the mains supplies and drain the system and boiler.

*NOTE: Release drain point ( I ) to drain the primary heat exchanger.*

## INSPECTION AND SERVICE

**CAUTION: ISOLATE THE WATER, ELECTRICAL AND OIL MAINS SUPPLIES BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.**

### Routine servicing:

To maintain efficient boiler operation, the following should be carried out at least once a year:

- ▶ Carry out a pre-service check and note any operational faults:

#### ▶ Pre-Service Check:

- 1 ▶ Undo the screws (A) located at the bottom of the wall mounting frame, remove the base panel, hold the casing and pull slightly away from the appliance from the bottom, before lifting free of the supporting tabs (B) on the top of the wall mounting frame.
- ▶ Be sure to place the front cover and base panel in a safe place away from the working area.

Operate the appliance and system and note any faults which may need to be corrected during the service.

- 2 ▶ Switch off and electrically isolate the boiler.
  - ▶ Depress locking ears and unplug burner lead from control box (C).
- 3 ▶ Loosen clip (D) to detach air duct pipe from the burner.
  - ▶ Remove the drip tray (E) by pulling forward and free of the appliance.
  - ▶ Unscrew burner retainer nut (F) and gently ease the burner forward and downwards until clear of primary heat exchanger. The burner may be hung on the hook (G) provided.

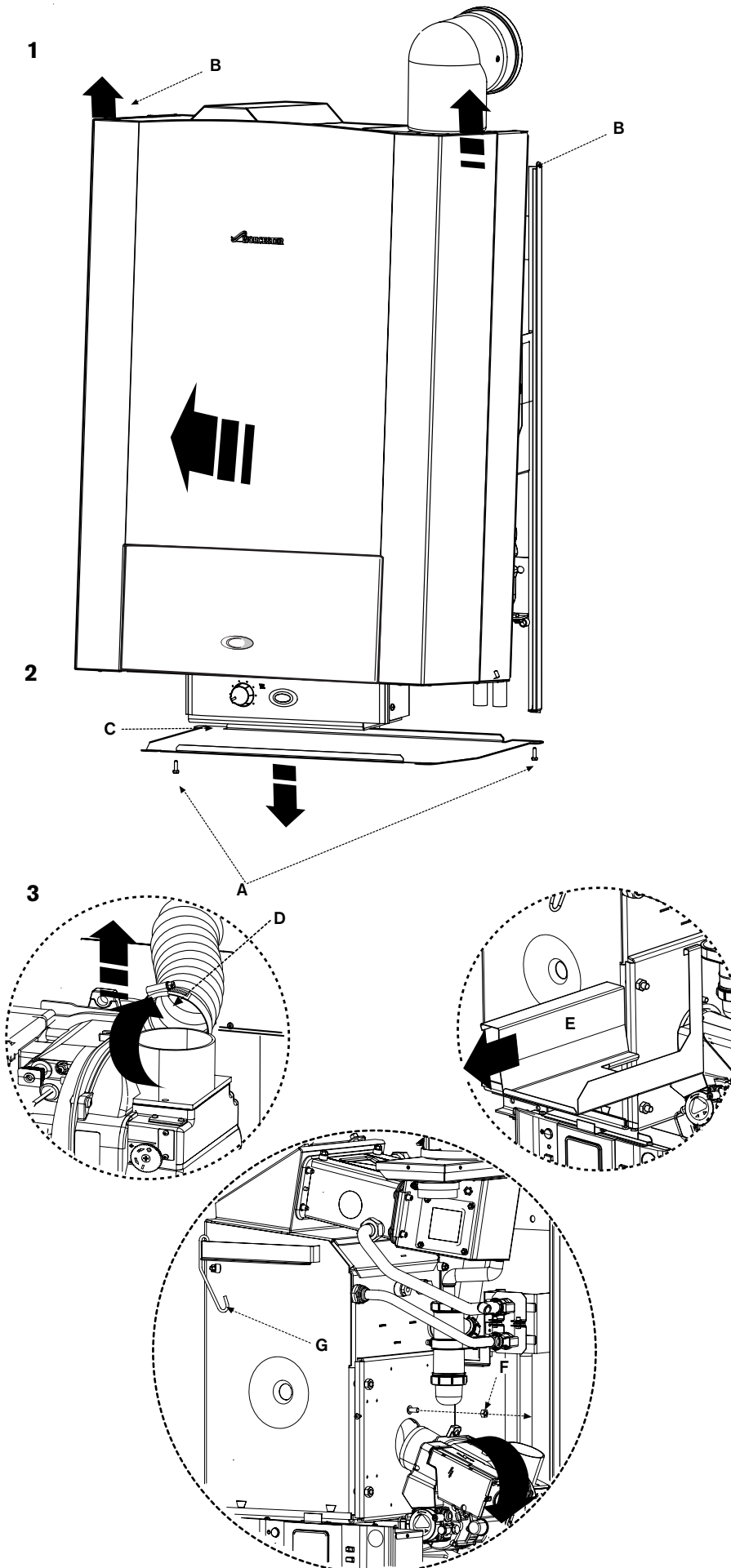
### Service requirements:

See the following instructions for detail of some of the service requirements listed below:

- ▶ Check and clean the burner.
- ▶ Replace the burner nozzle and flexible oil pipe/s.
- ▶ Check and clean the baffle retainers.
- ▶ Check and clean the baffles.
- ▶ Check and clean the heat exchangers surfaces.
- ▶ Check the combustion chamber access door insulation board.
- ▶ Check that the flue system is unobstructed and clean as necessary.
- ▶ Clean or replace all oil filters.
- ▶ Check that the condensate system is not obstructed, clean and refill the condensate trap as necessary.

### Sealed systems only. Important:

The PRV is a safety device and must be checked for correct operation. The expansion vessel pressure must also be checked and adjusted if required.



### Clean the Burner:

- ▶ Remove the air intake cover (A) and clear any debris from the air intake and air damper.
- ▶ Disassemble the burner to allow access to the fan impeller.
- ▶ Check the condition of the gaskets between these parts and replace if necessary.
- ▶ Note the position of the air damper adjustment and check the air damper moves freely.
- ▶ Clean both sides of the fan impeller and remove any debris from the burner housing.
- ▶ Check that the impeller rotates freely.
- ▶ Reassemble the components.
- ▶ Remove the combustion head (B) and thoroughly clean any deposits.

**IMPORTANT:** Before removing or fitting a nozzle (C), loosen screw (D) and move the electrodes (E) forward.

After refitting check that the electrode gaps are correct, as shown opposite.

- ▶ Remove the nozzle (C).
- ▶ Check the nozzle holder is clear of any debris and clean if necessary.
- ▶ Fit a new oil atomising nozzle (C).

**DO NOT** dismantle the nozzle and **DO NOT** clean the nozzle tip.

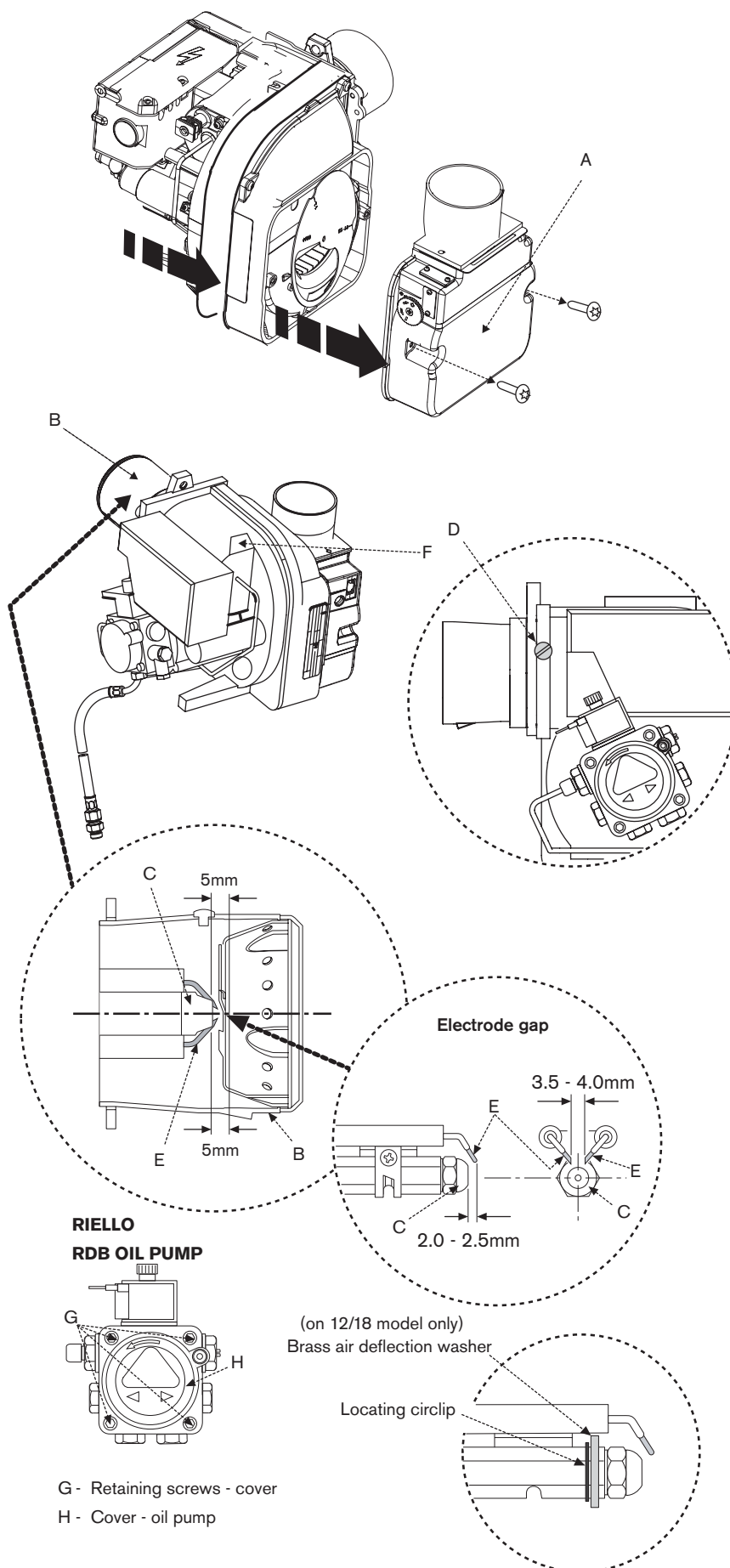
- ▶ Check the electrodes (E) and reset if necessary as shown opposite.

*NOTE: The 12/18 model has a brass air deflection washer behind the nozzle. These must be in place for the correct operation of the burner.*

- ▶ Refit the combustion head (B). Check that the nozzle (C) is central in the combustion head (B) and the head settings are as shown. Ensure that the photocell is lined up with the sight hole.
- ▶ Withdraw the photocell (F) from its housing and wipe clean.
- ▶ Remove the oil pump internal filter, clean in kerosene and reassemble.

*The internal filter is accessed by removing screws (G) and the oil pump cover (H).*

- ▶ Replace the standard flexible oil line/s at every annual service to prevent the possibility of leakage due to ageing.
- ▶ Reassemble the burner components.
- ▶ Check the O-ring seal located around the combustion head and replace if necessary. **This seal must be in good condition, seal failure will cause flue gases to escape into the room.**





### External oil filter:

- ▶ Remove the paper element from the external oil filter and replace it. If the filter contains a washable element, thoroughly clean in kerosene and reassemble into the filter.

### Clean the boiler:

#### Manifold access:

- ▶ Release the 4 nuts (A) to remove the flue manifold access cover (B) and remove any debris.
- ▶ Check the condensate route is clear and clean the condensate trap and pipework.
- ▶ Check the flue system and clean if necessary.
- ▶ Remove the baffle access cover (C) by removing the 4 retaining nuts (D).
- ▶ Remove the baffle retainer (E) and baffles (F) from the secondary heat exchanger.
- ▶ Check and clean the secondary heat exchanger surfaces.

**NOTE:** Do not use wire brushes and cleaning agents to clean the stainless steel secondary heat exchanger components.

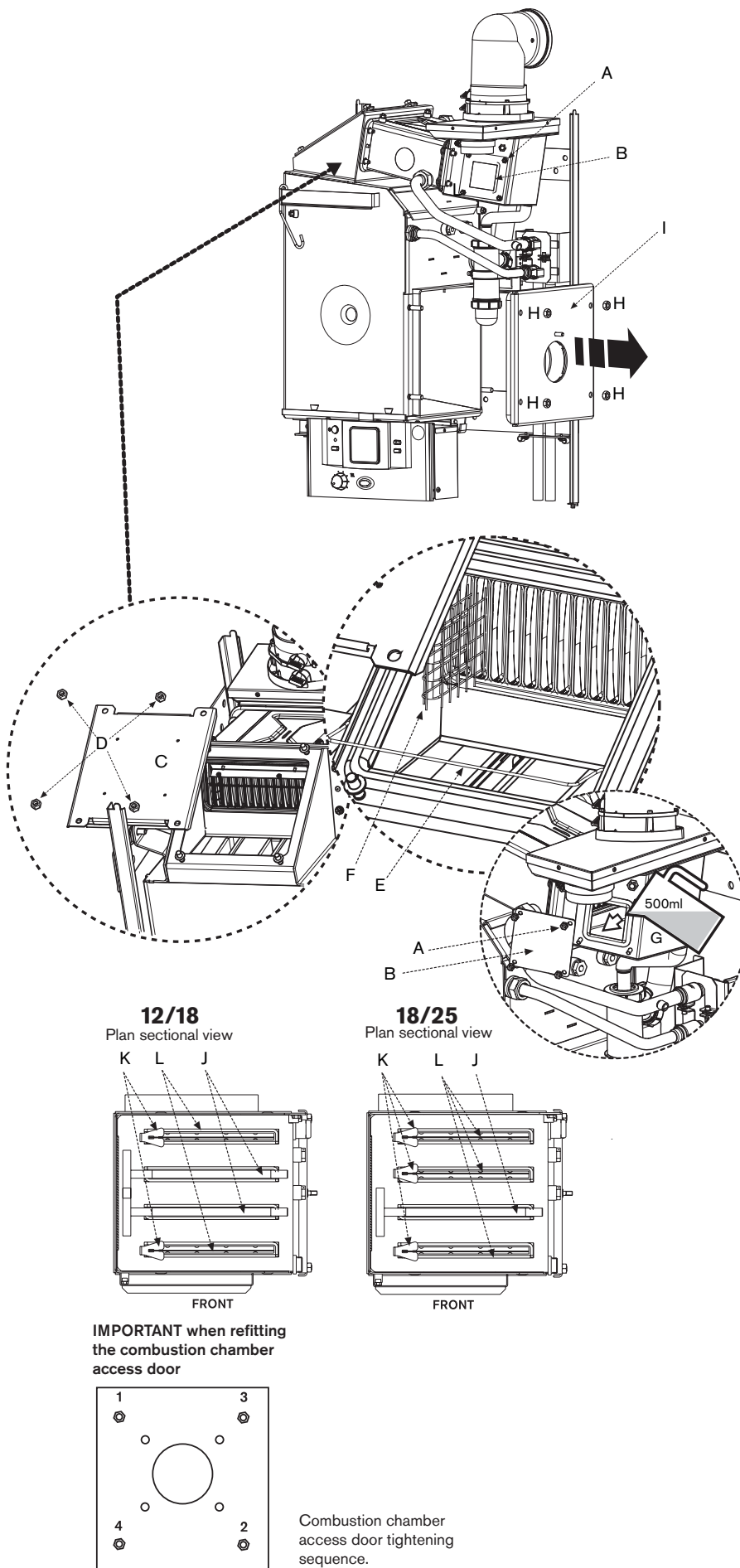
- ▶ Pour 500ml of water into drain (G) to refill the condensate trap.
- ▶ Clean the secondary heat exchanger baffles (F) if necessary and refit correctly.
- ▶ Refit the baffle retainer (E).
- ▶ Refit the flue manifold access cover (B) and secure with nuts (A).

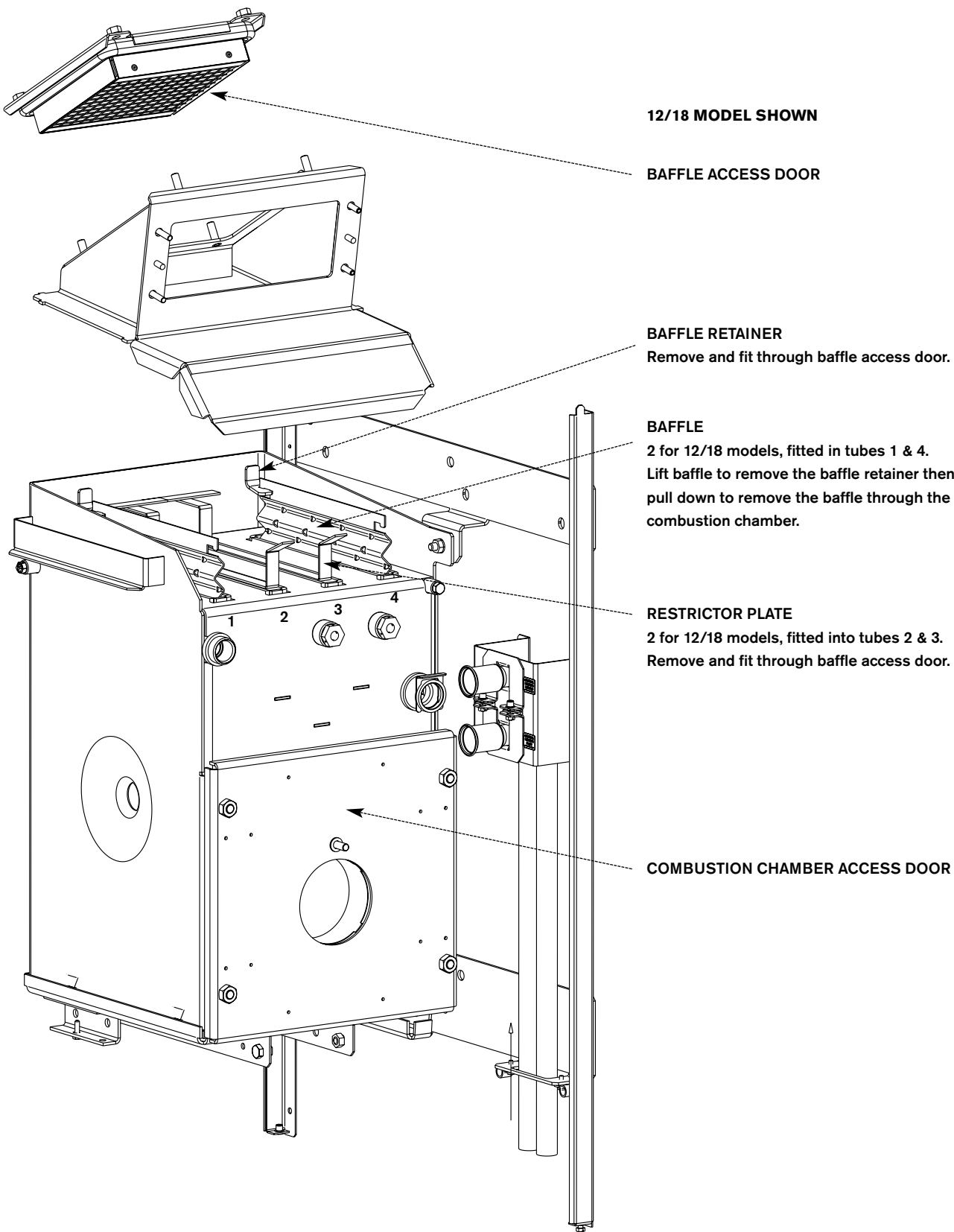
#### Combustion chamber:

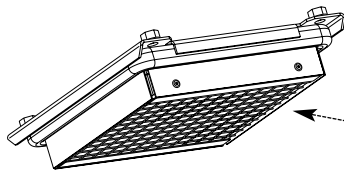
- ▶ Release the M10 retaining nuts and washers (H) and remove combustion chamber access door (I).
- ▶ Check the fibreglass rope seal on the combustion chamber access door (I) and replace if necessary.
- ▶ Remove the baffle retainers (J) through the baffle access at the top of the boiler while at the same time holding the primary baffles (K) through the primary heat exchanger. Remove the baffles through the primary heat exchanger.
- ▶ Clean and check the condition of the baffles and the restrictor plate/s (L). Replace any part considered to be badly corroded/degraded.
- ▶ Thoroughly clean all of the heat exchanger surfaces using a suitable brush and clear all loose debris from the combustion chamber and upper chamber.
- ▶ Check the condition of the combustion chamber access door insulation. If the insulation is damaged the door assembly must be replaced.
- ▶ Refit the items in reverse order ensure the baffles, baffle retainers and restrictor plate/s are correctly fitted for the boiler output as shown in the plan view opposite.
- ▶ Check the seal on the baffle access cover (C) and replace if necessary.
- ▶ Refit combustion chamber access door (I).
- ▶ Secure with nuts and washers (H) and tighten to 6 Nm until the door is firmly secured using the sequence shown opposite. Do not over tighten the nuts.

#### Fire valve:

- ▶ Check that the oil supply pipe has a fire valve fitted externally to the building with the fire valve sensor located within the appliance case. A fire valve sensor clip is provided for this purpose.

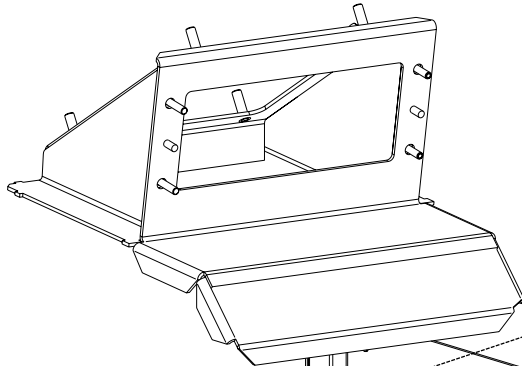






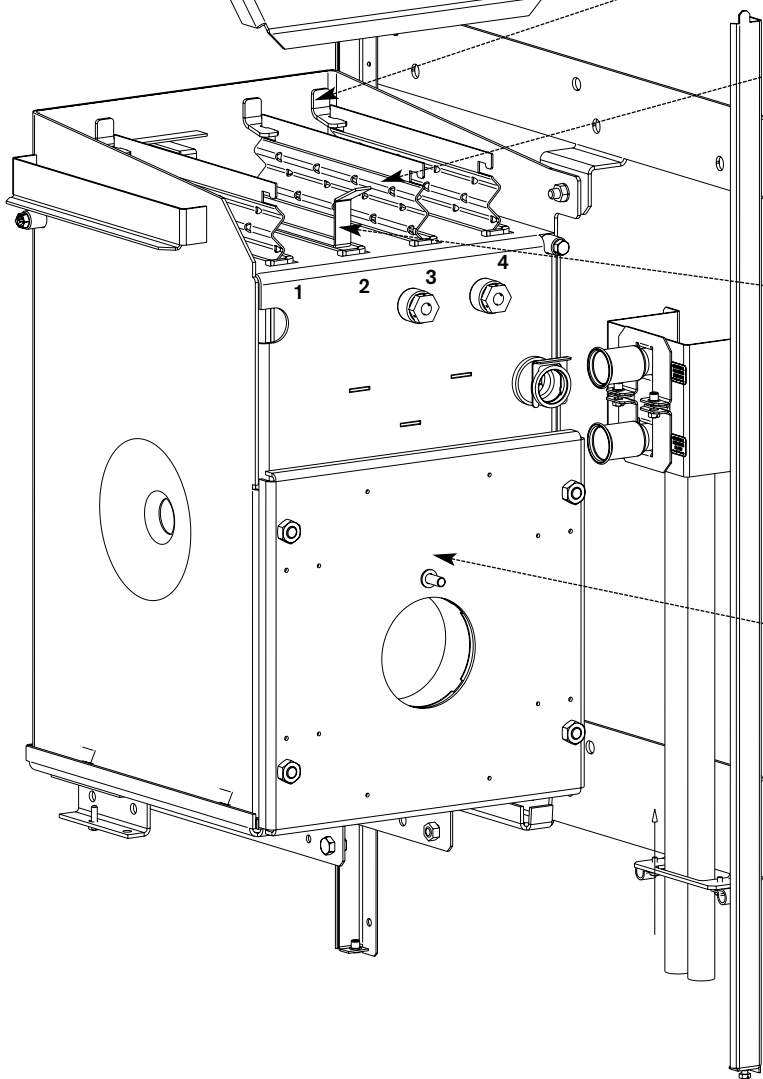
**18/25 MODEL SHOWN**

**BAFFLE ACCESS DOOR**



**BAFFLE RETAINER**

Remove and fit through baffle access door.



**BAFFLE**

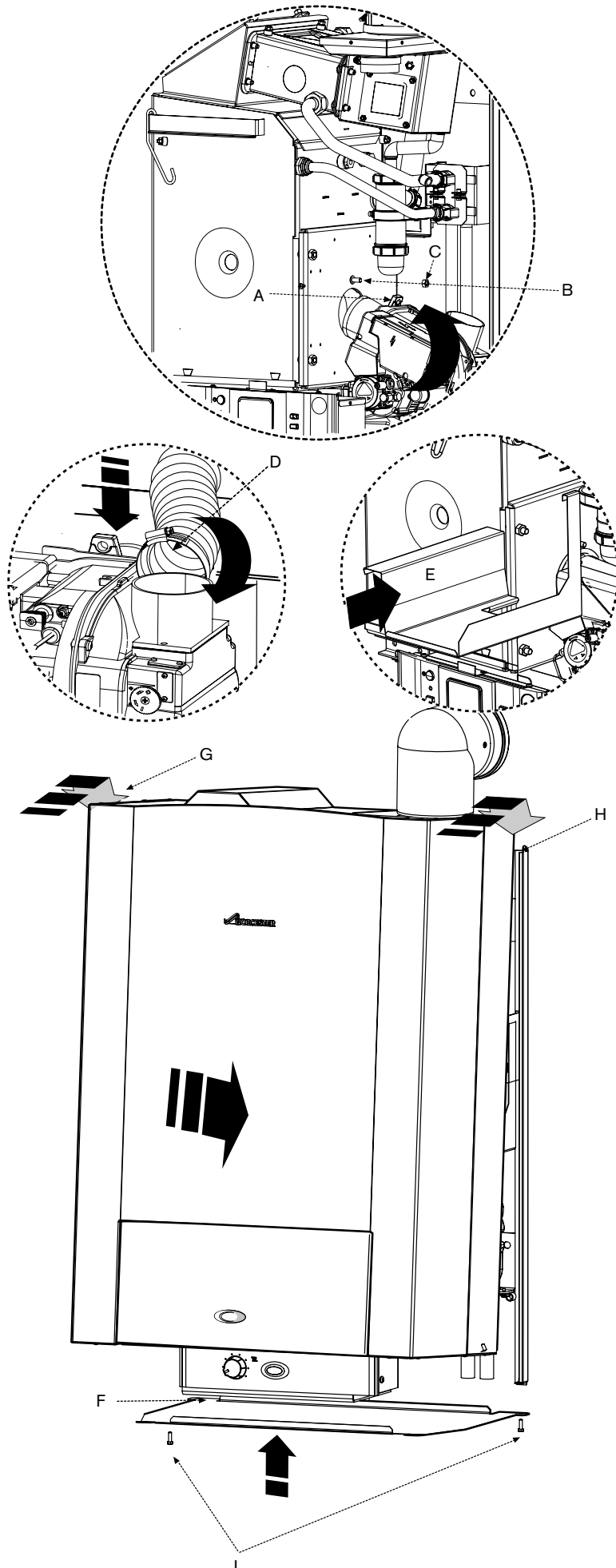
3 for 18/25 models, fitted in tubes 1, 3 & 4. Lift baffle to remove the baffle retainer then pull down to remove the baffle through the combustion chamber.

**RESTRICTOR PLATE**

1 for 18/25 models, fitted into tube 2. Remove and fit through baffle access door.

**COMBUSTION CHAMBER ACCESS DOOR**





## Re-commission the burner:

- 1 ▶ Align burner combustion head into the combustion chamber door.
  - ▶ Locate the burner retainer (A) over the threaded lug on the collar (B). Push the burner firmly onto the flange and secure in place with the retaining nut (C). Tighten sufficiently but refrain from overtightening.
  - ▶ Check that the burner is seated correctly on the door and that the oil pipe/s are not trapped in front of or underneath the burner.
- 2 ▶ Attach air duct pipe and tighten clip (D) to secure to the burner air intake.
  - ▶ Replace the drip tray (E).
  - ▶ Plug burner lead (F) into control box.

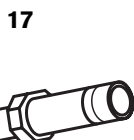
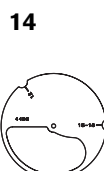
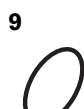
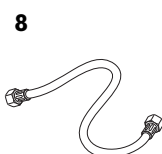
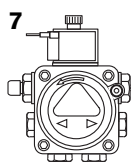
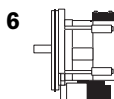
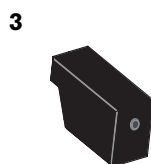
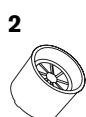
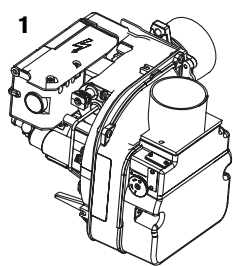
- ▶ Connect an oil pressure gauge to the oil pump, run the burner and check the oil pressure is correct for the required boiler output. Check that the smoke reading is between 0 - 1. If above 1 check the air setting. If the air setting is correct check that the burner has been reassembled correctly.

Allow the boiler to warm up then check the combustion settings are correct as indicated in the table on page 39, adjust the CO<sub>2</sub> if necessary using the air shutter. When the combustion is correct turn off the boiler, remove the pressure gauge and refit the blanking plug and plastic cover.

- ▶ Locate the top rear edges of panel (G) onto the supporting tabs (H) and drop the front panel carefully into position over the appliance. Push gently into place taking care to apply any pressure at the edges of the panel to avoid accidental damage
- ▶ Lift the bottom panel into place beneath the boiler and engage the front lip with the bottom of the front casing.
- ▶ Secure both panels to the wall mounting frame by replacing the screws (I) located at the bottom of the wall mounting frame.

## After service handover:

- ▶ Make a note of the date of any water treatment.
- ▶ Set the controls back to the users requirements.
- ▶ Complete the service interval record at the back of this manual and a CD11 or an equivalent form.
- ▶ If the appliance is unused and exposed to freezing conditions; shut off all the mains supplies, isolate the boiler and drain the system and boiler, including the secondary heat exchanger.



**1 Burner - Riello RDB 12/18 HE**

Part Number: 8 718 681 015 0

**2 Combustion head - LD2X SH12/18**

Part Number: 8 716 112 731 0

**3 Control box MO535**

Part Number: 8 718 682 250 0

**4 Photocell**

Part Number: 8 716 109 193 0

**5 Ignition electrode**

Part Number: 8 716 109 211 0

**6 Motor**

Part Number: 8 716 109 186 0

**7 Oil pump - Riello RDB**

Part Number: 8 716 115 297 0

**7a Pump coupling**

Part Number: 8 716 109 245 0

**8 Flexible oil hose kit**

Part Number: 8 716 108 052 0

**9 Burner 'O' ring**

Part Number: 8 718 682 439 0

**10 Control thermostat**

Part Number: 7 718 680 902 0

**11 Auto reset overhear thermostat**

Part Number: 8 716 107 623 0

**12 Manual reset overhear thermostat**

Part Number: 8 716 107 625 0

**13 Manual reset flue thermostat**

Part Number: 8 716 107 624 0

**14 Air damper disc 12 15-18**

Part Number: 8 716 112 778 0

**15 Cleaning brush**

Part Number: 8 716 109 428 0

**16 Secondary Heat Exchanger gasket**

Part Number: 8 716 112 954 0

**17 Nozzle holder**

Part Number: 8 716 109 337 0

**18 Circlip**

Part Number: 8 716 112 773 0

**19 Brass air restrictor washer**

Part Number: 8 716 112 729 0

**20 Oil nozzle**

0.40 60° ES (12kW output)

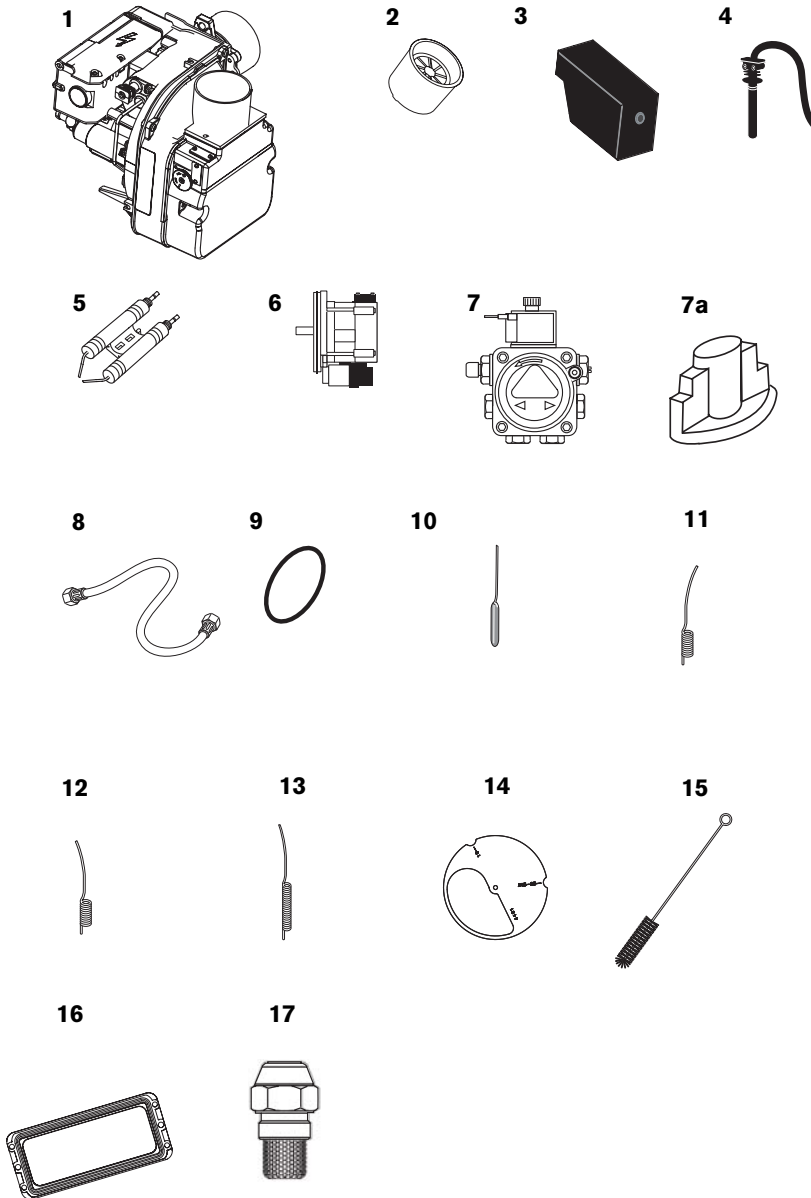
Part Number: 8 716 156 679 0

0.45 60° ES (15kW output)

Part Number: 8 716 114 545 0

0.50 60° ES (18kW output)

Part Number: 8 716 156 671 0



**1 Burner - Riello RDB 2.2 18/25 HE**

Part Number: 8 718 681 016 0

**2 Combustion head - T2 SH18/25**

Part Number: 8 718 682 170 0

**3 Control box MO535**

Part Number: 8 718 682 250 0

**4 Photocell**

Part Number: 8 716 109 193 0

**5 Ignition electrode**

Part Number: 8 716 109 211 0

**6 Motor**

Part Number: 8 716 109 186 0

**7 Oil pump - Riello RDB**

Part Number: 8 716 115 297 0

**7a Pump coupling**

Part Number: 8 716 109 245 0

**8 Flexible oil hose kit**

Part Number: 8 716 108 052 0

**9 Burner gasket**

Part Number: 8 718 682 439 0

**10 Control thermostat**

Part Number: 8 718 680 902 0

**11 Auto reset overhear thermostat**

Part Number: 8 716 107 623 0

**12 Manual reset overhear thermostat**

Part Number: 8 716 107 625 0

**13 Manual reset flue thermostat**

Part Number: 8 716 107 624 0

**14 Air damper disc 18 21.5-25**

Part Number: 8 716 112 783 0

**15 Cleaning brush**

Part Number: 8 716 109 428 0

**16 Secondary Heat Exchanger gasket**

Part Number: 8 747 009 725 0

**17 Oil nozzle**

0.50 80° ES (18kW output)

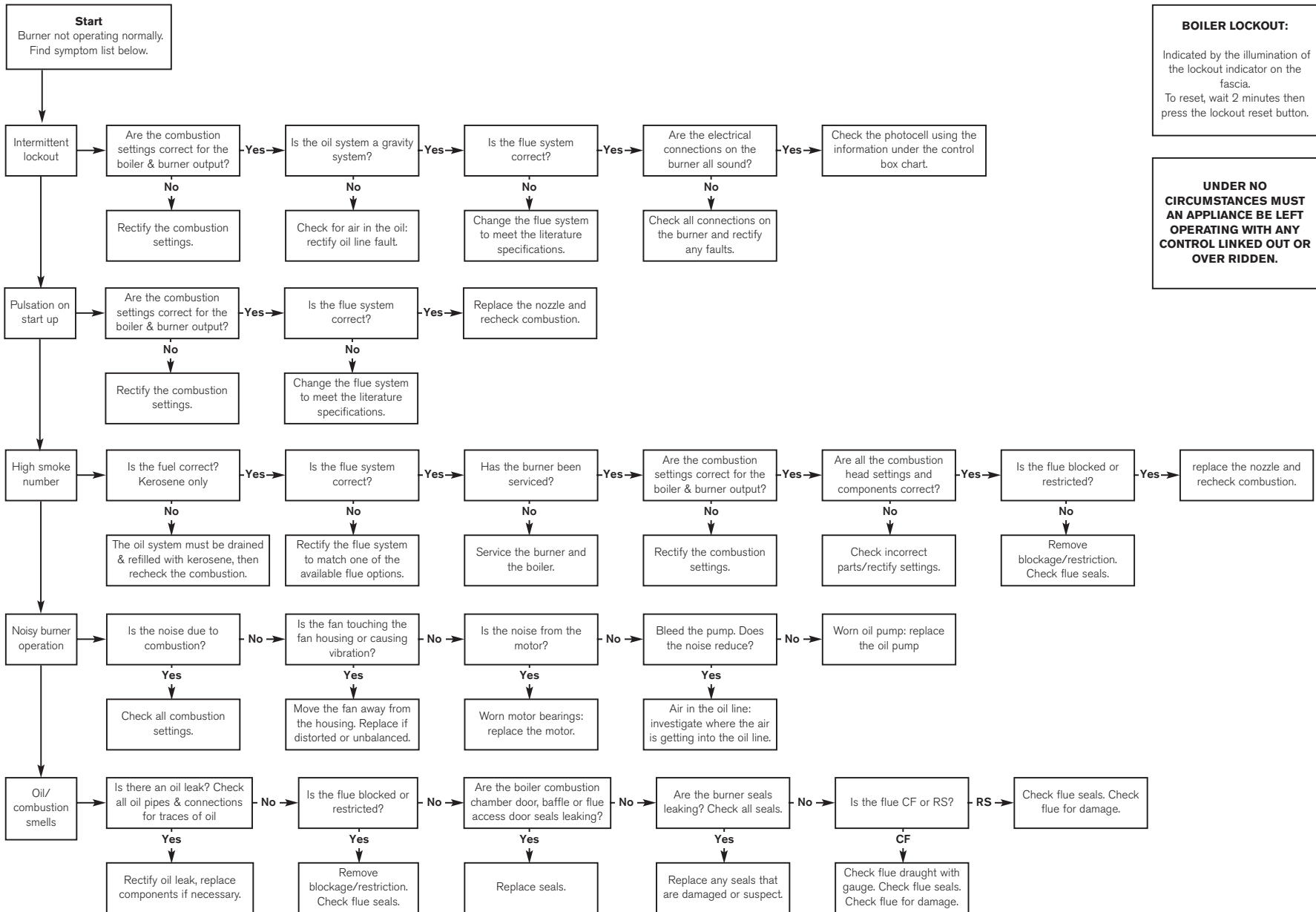
Part Number: 8 716 156 671 0

0.60 80° ES (21.5kW output)

Part Number: 8 716 156 670 0

0.75 80° ES (25kW output)

Part Number: 8 716 109 387 0


**BOILER LOCKOUT:**

Indicated by the illumination of the lockout indicator on the fascia.  
To reset, wait 2 minutes then press the lockout reset button.

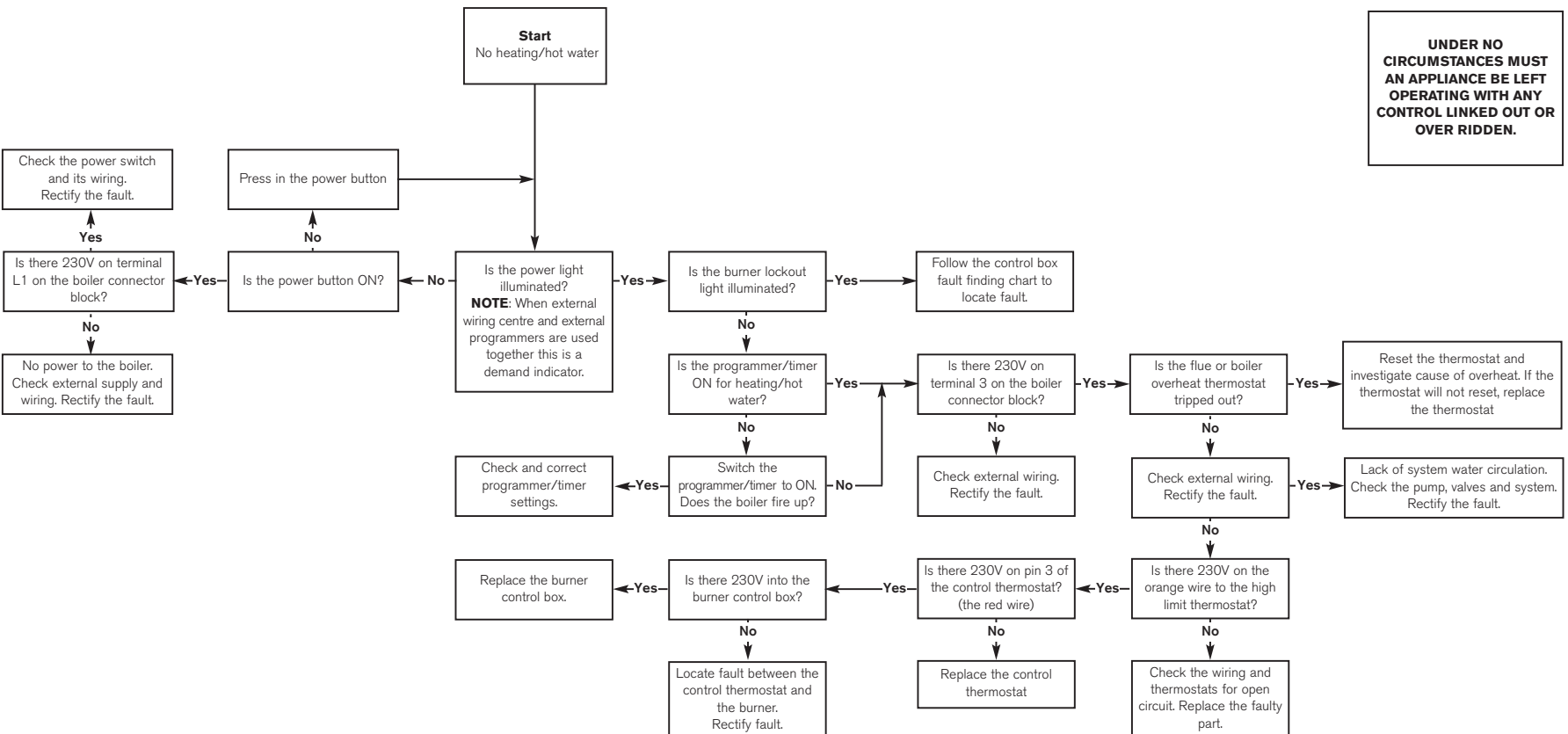
**UNDER NO CIRCUMSTANCES MUST AN APPLIANCE BE LEFT OPERATING WITH ANY CONTROL LINKED OUT OR OVER RIDDEN.**

These fault finding charts are provided to assist competent and suitably qualified engineers to locate and rectify faults. Whilst every effort has been taken to ensure the information given is correct and complete we cannot guarantee that every eventually has been covered.  
Worcester, Bosch Group cannot be held responsible for costs incurred by persons not deemed to be competent.

**FAULT FINDING**
**BURNER FUNCTION**

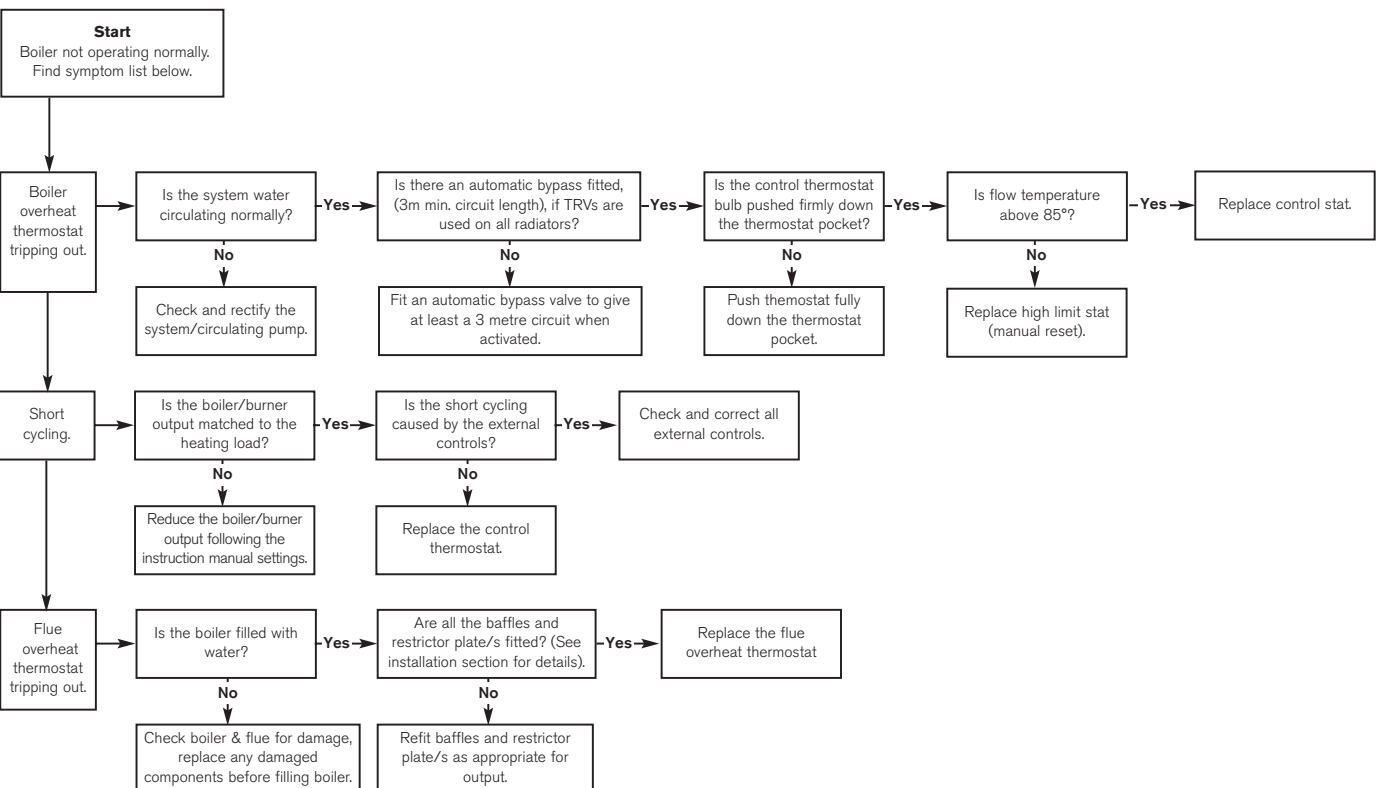
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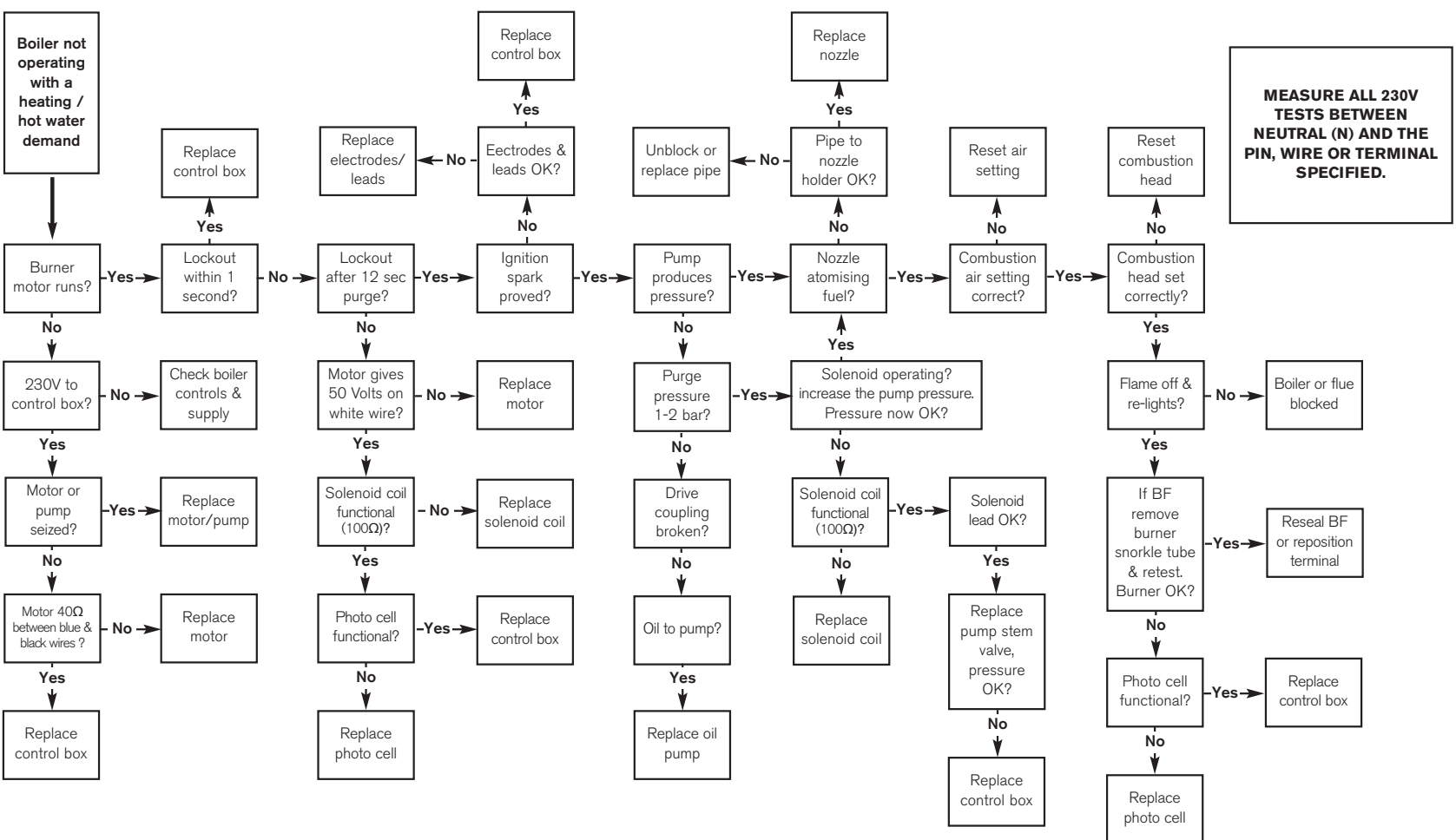


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## DIAGNOSTICS FOR

### MO535 RDB CONTROL BOX

**IMPORTANT:** The burner has an 11 second delay before the motor is activated.



All resistance measurements are actual measured values and some variation is to be expected, therefore measured values should be similar to but not necessarily identical to the given values.

The operation of the photo cell can be tested by measuring the resistance across the photo cell, it should be a high resistance (greater than 10MΩ or open circuit) in the dark and low resistance (3kΩ or less) in light.

Burners on balanced flue systems can recirculate flue products resulting in the burner cycling, if this happens check the flue system integrity and the terminal position.



This operation instruction is provided to assist competent and suitably qualified engineers to locate and rectify faults. Whilst every effort has been taken to ensure the information given is correct and complete we cannot guarantee that every eventuality has been covered. Worcester, Bosch Group cannot be held responsible for costs incurred by persons not deemed to be competent.

STATUS	CODE	ADDITIONAL INFORMATION
<b>Operational Codes</b>		
OFF	OFF	
Initial check time (11 seconds) before pre-purge	OFF	
Pre-purge (15 seconds)	ORANGE Flashing	
Safety time (maximum 5 seconds)	GREEN Flashing	Only when the solenoid valve is energized with no flame signal.
Running	GREEN	
<b>Lock-out/Error Codes</b>		
False light before ignition	GREEN, RED	
Under voltage or over voltage	RED, ORANGE	
lock-out for no flame during safety time	RED	
Lock-out for false flame signal / Lock-out for burner control error	RED Flashing	
Lock-out for maximum number of restarts	RED Fast flashing	
<b>Pump Priming Cycle</b>		
Pump priming cycle	GREEN, ORANGE, RED	In the lock-out condition, the oil pump can be primed for 30 seconds: 1. Press the remote reset button for more than 6 seconds and then release. The control box lock-out reset will blink quickly green, orange and red. 2. Re-press the burner reset button and release within 3 seconds and pump priming starts.

#### Lock-out and Reset

The control box can be reset consequently a maximum of 5 times after which the power supply has to be reset; then the control box can be reset a further 5 times.

#### Limit of Restarts

If the flame is lost during operation; the burner will restart 3 times. On the 4th restart the burner will go to lock-out. By resetting the power supply the control box is reset and allows 3 restarts.

#### Flame Detection

Flame detection minimum current:	30 $\mu$ A
Flame loss maximum current:	25 $\mu$ A
False flame maximum current (without false light):	19 $\mu$ A

# OIL BOILER COMBUSTION RECORD

**BOILER MODEL** \_\_\_\_\_ **SERIAL No.** \_\_\_\_\_

## COMMISSIONING ENGINEER

## COMBUSTION CHECKS

COMPANY NAME:	PUMP PRESSURE (PSI):
ADDRESS:	CO <sub>2</sub> %:
	SMOKE READING:
ENGINEERS NAME:	F.G.T.°C:
SIGNATURE:	FLUE PRESSURE:
DATE:	BURNER MODEL:

## FOR ALL BOILERS CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	YES <input type="checkbox"/>
OIL TYPE USED IS KEROSENE	YES <input type="checkbox"/>
THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE INSTRUCTIONS?	YES <input type="checkbox"/>
THE SYSTEM CLEANER USED:	
THE INHIBITOR USED:	

**SERVICE INTERVAL RECORD** It is recommended that the heating system is serviced regularly and that you complete the appropriate Service Interval Record overleaf.

**Service Provider.** Before completing the appropriate Service Interval Record overleaf, please ensure you have carried out the service as described in this manual. Always use Worcester, Bosch Group specified spare parts when replacing all controls.

**SERVICE 1** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 2** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 3** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 4** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 5** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 6** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 7** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 8** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 9** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_

**SERVICE 10** DATE \_\_\_\_\_

ENGINEER NAME \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

TEL No. \_\_\_\_\_

OFTEC REG No. \_\_\_\_\_

PUMP PRESSURE: \_\_\_\_\_ psi CO<sub>2</sub>%: \_\_\_\_\_NOZZLE CHANGED? YES ☐ NO ☐

F.G.T. °C \_\_\_\_\_ FLUE PRESSURE: \_\_\_\_\_

COMMENTS \_\_\_\_\_

SIGNATURE \_\_\_\_\_



**In the unlikely event the boiler does not give complete satisfaction, before calling for a service engineer, the installer should check the following:-**

### **General checks**

1. Is there 230V across the boiler live and neutral terminals?
2. Is the polarity correct? (230V across live and earth, 0V across neutral and earth)
2. Is the air bled from the primary system?
3. Is the air bled from the oil supply?
4. Is the flue sized and routed correctly?

### **Boiler runs straight to lockout**

1. Has the oil line been purged of air?
2. Where an air eliminator is used in conjunction with a top feed oil tank the non-return valve, (if fitted), should be removed from the oil dip pipe.

### **Boiler locks out at the start of a demand (Heating off overnight for example)**

1. If an air eliminator is being used, check that there are no leaks that allow air to be pulled into the oil supply.
2. If a two pipe oil supply is being used, has a non-return valve been fitted to the inlet pipe? Refer to the instructions for guidelines.

### **No domestic hot water**

1. Is there a domestic hot water demand from the programmer and has the tank reached temperature?
2. Is the circulating pump operating?
3. Are the programmer, tank thermostat, circulating pump and diverter valve/zone valves wired correctly?
4. Is there 230V across L and N? If not there is no demand to the boiler from the controls or the controls wiring is not correct.

### **No central heating**

1. Are both programmer and room thermostat on demand for central heating?
2. Are the room thermostat, programmer, circulating pump and diverter valve/zone valves (if CH and DHW system) wired correctly?
3. Is the circulating pump operating?
4. Is there 230V across L and N? If not there is no demand to the boiler from the controls or the controls wiring is not correct.

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#### **EXCELLENCE COMES AS STANDARD**

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Worcester, Bosch Group is a trading name of

Bosch Thermotechnology Ltd.

**[www.worcester-bosch.co.uk](http://www.worcester-bosch.co.uk)**

8 718 681 134a (08.08)

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SALES:	01905 752640
WEBSITE:	<a href="http://www.worcester-bosch.co.uk">www.worcester-bosch.co.uk</a>

##### **WATER TREATMENT:**

FERNOX	01799 550811
<a href="http://www.fernox.com">www.fernox.com</a>	
SENTINEL	0151 420 9595
<a href="http://www.betzdearborn.com/sentinel">www.betzdearborn.com/sentinel</a>	

##### **FLUE TERMINAL GUARD:**

PART No. 7 716 190 050



**WORCESTER**  
Bosch Group