

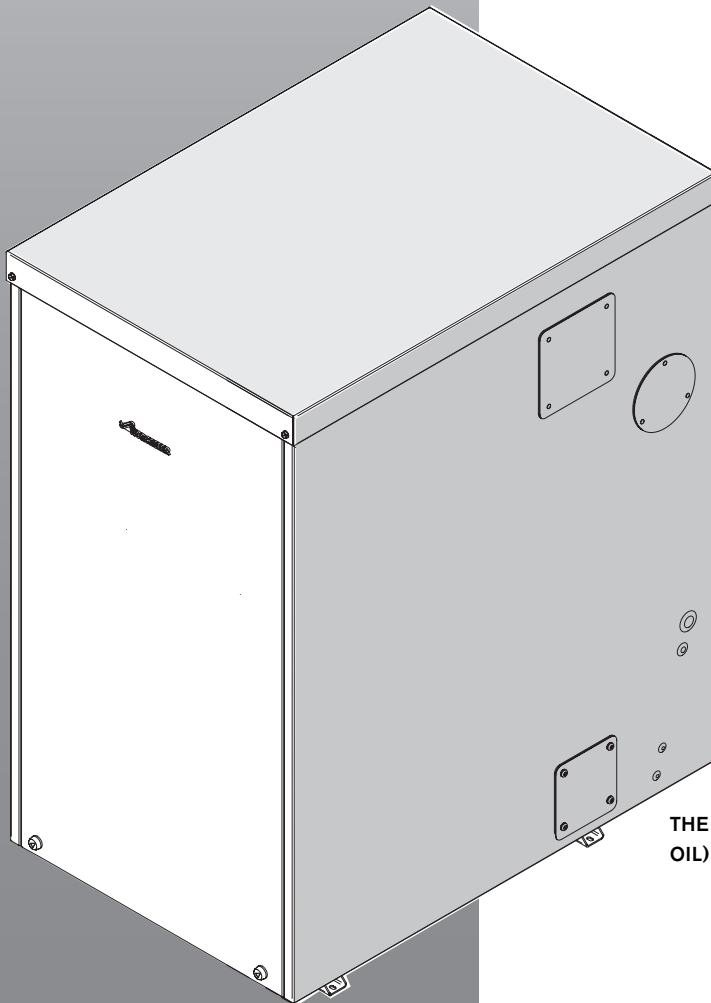
INSTRUCTION MANUAL

INSTALLATION, COMMISSIONING & SERVICING

FLOOR STANDING EXTERNAL OIL FIRED CONDENSING BOILER USING
BALANCED FLUE SYSTEM

GREENSTAR CAMRAY EXTERNAL & EXTERNAL SYSTEM 12/18, 18/25, 25/32

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



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

GB


WORCESTER
Bosch Group

INSTALLATION & SERVICING INSTRUCTIONS

SYMBOLS USED IN THIS MANUAL:



Domestic hot water



Central heating



Room thermostat



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

STORE THE APPLIANCE IN A DRY AREA PRIOR TO INSTALLATION.

Check List Hardware/Literature pack

Item	Qty
Greenstar Camray External/External System Installation/Servicing Instructions.....	1
Users Instructions	1
Hardware Pack.....	1
100mm Ø Services Duct.....	1
Condensate Trap Kit.....	1
Warranty Return Envelope	1
Cabinet Key.....	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.

SAFETY & REGULATIONS

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SAFETY PRECAUTIONS

OIL SMELLS, LEAKS OR FUMES FROM THE APPLIANCE:

- ▶ Extinguish any naked flames.
- ▶ 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.

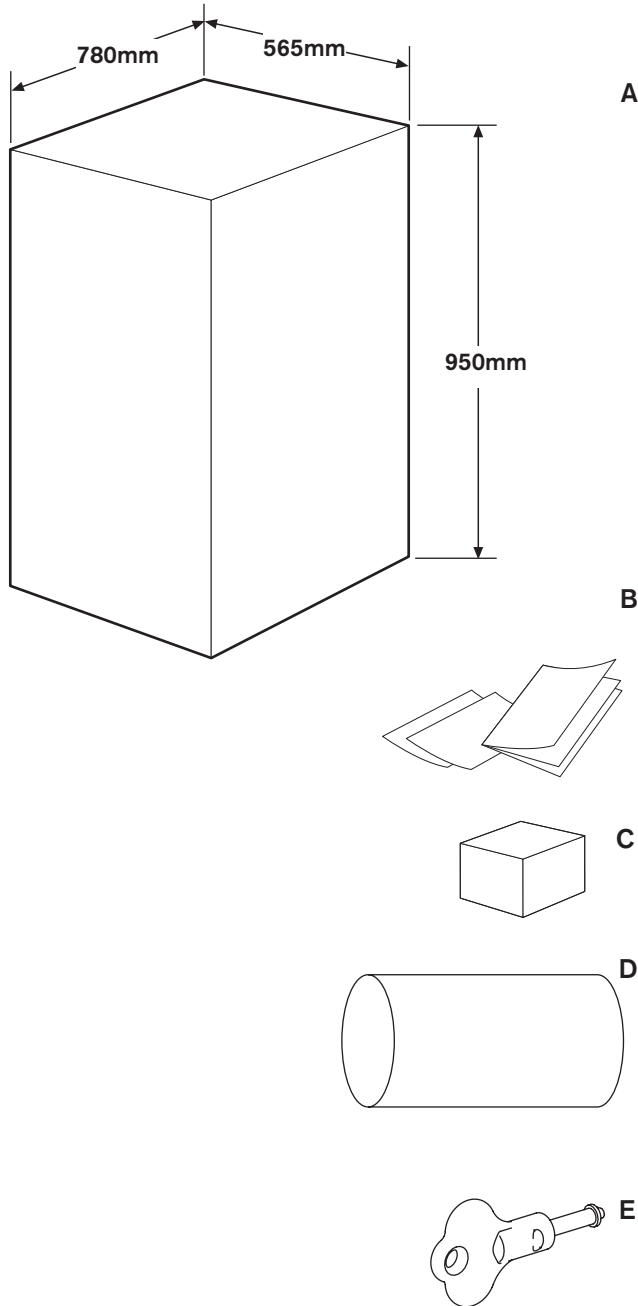
OFTEC Standards.

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

GENERAL INFORMATION

STANDARD PACKAGE:

- A - Floor standing oil fired condensing boiler for open vent and sealed domestic central heating and domestic hot water cylinders.
- B - Literature pack.
- C - Condensate trap kit.
- D - 100mmØ services duct.
- E - Cabinet key



APPLIANCE INFORMATION

Check List

Item	Qty
Greenstar Camray External/External System Installation/Serviceing Instructions.....	1
Users Instructions	1
Hardware Pack.....	1
100mm Ø Services Duct.....	1
Condensate Trap Kit.....	1
Warranty Return Envelope	1
Cabinet Key.....	1

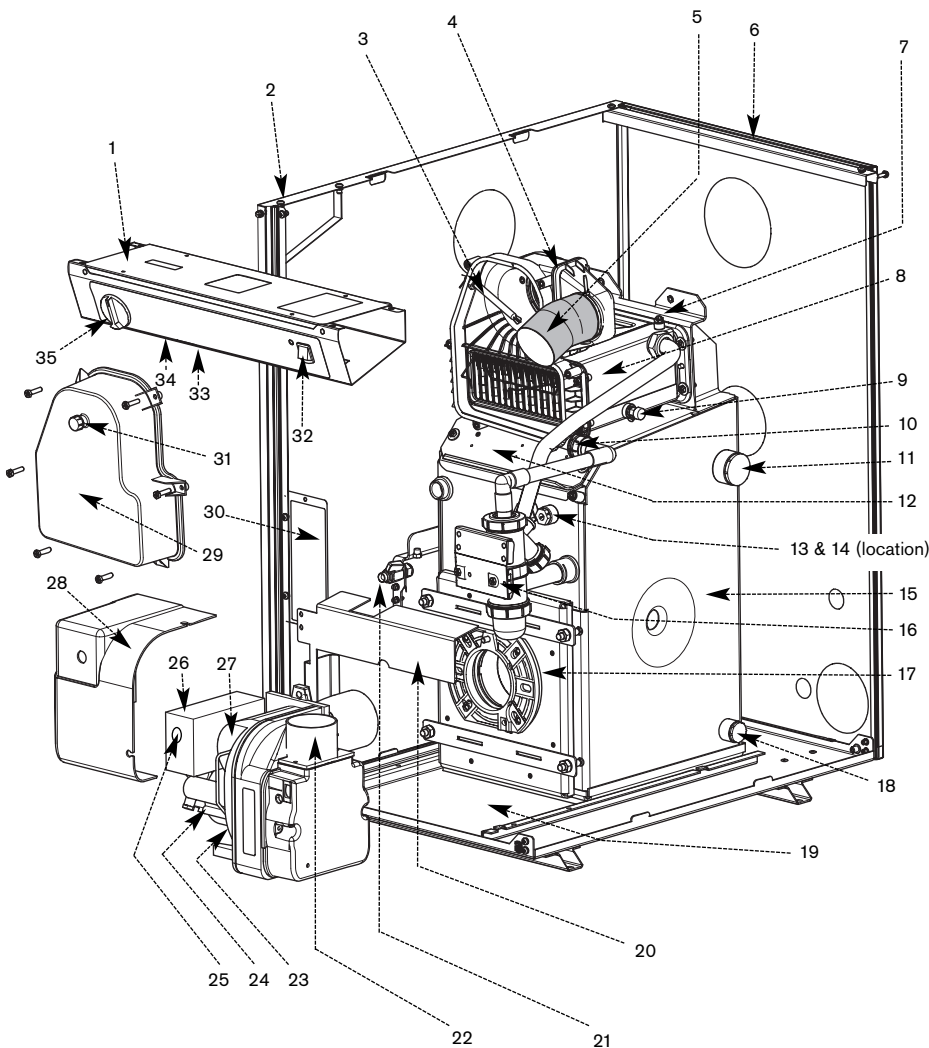
TECHNICAL DATA

DESCRIPTION	UNITS	12/18	18/25	25/32
Central Heating				
Primary water capacity (total) External	litres	23	23	21
Primary water capacity (total) External System	litres	30	30	28
Maximum static head	metres	30	30	30
Minimum static head	metres	1	1	1
Water side resistance (20°C difference) External	mbar	26	52	69
Max. available pumphead (20° difference) External System	mH ₂ O	5.7	4.9	4.1
Max. permissible sealed system operating pressure in accordance with WRAS guidelines	bar	2.5	2.5	2.5
Flue				
Exit flue gas mass flow	kg/hr	29	40	51
Pipework connections				
Fuel line (compression)	mm	10	10	10
External System flow	mm	22	22	28
External flow and optional vent/air vent	BSP	1	1	1 ¹ / ₄
Primary drain	BSP	3 ³ / ₄	3 ³ / ₄	3 ³ / ₄
Condensate (polypropylene)	mm	21.5	21.5	21.5
Pressure relief valve outlet - External System	mm	15	15	15
Electrical				
Electrical power supply voltage	AC...V	230	230	230
Frequency	Hz	50	50	50
Max. power consumption External	W	150	160	160
Max. power consumption External System	W	255	265	265
Thermostats				
Boiler flow temperature range (cut in/cut out)	°C	55/81	55/81	55/81
Control thermostat differential	°C	5	5	5
Boiler high limit thermostat set point	°C	95	95	95
Boiler manual reset overheat thermostat set point	°C	105	105	105
Flue manual reset overheat thermostat set point	°C	110	110	110
General Data				
Maximum hearth temperature	°C	<100	<100	<100
SEDBUK (Band A)	%	93.1	93.2	94.2
Appliance protection rating	IP	45	45	45
Weight (excluding packaging) External	kg	114	115	122
Weight (excluding packaging) External System	kg	133	134	152
Expansion vessel (External System only)	litres	12	12	12
Emissions class for NO _x and CO	class	3	3	3
Typical NO _x emission figures	mg/kWhr	209	198	156

CAMRAY EXTERNAL

The diagram opposite excludes the top, front and RH side casing panels.

- 1 CONTROL BOX ASSEMBLY
- 2 CASING SIDE PANEL
- 3 FLUE OVERHEAT THERMOSTAT PHIAL
- 4 AIR INLET CASING
- 5 FLEXIBLE AIR DUCT (CONNECTING TO AIR INTAKE ON BURNER)
- 6 CASING SUPPORT PANEL
- 7 SECONDARY HEAT EXCHANGER BLEED POINT (ONE ON EITHER SIDE)
- 8 SECONDARY HEAT EXCHANGER
- 9 SECONDARY HEAT EXCHANGER DRAIN
- 10 CONDENSATE OUTLET
- 11 FLOW/OPTIONAL OPEN VENT CONNECTION
- 12 BAFFLE RETAINER ACCESS DOOR
- 13 CONTROL & MANUAL RESET OVERHEAT THERMOSTAT PHIAL & AUTO-RESET HIGH LIMIT THERMOSTAT PHIAL (LOCATION)
- 14
- 15 PRIMARY HEAT EXCHANGER
- 16 CONDENSATE TRAP & BRACKET (supplied)
- 17 COMBUSTION CHAMBER ACCESS DOOR
- 18 DRAIN/OPTIONAL FEED & EXPANSION CONNECTION
- 19 BASE PLATE AND OIL DRIP TRAY
- 20 DEFLECTOR PLATE
- 21 OIL SUPPLY ISOLATING VALVE
- 22 BURNER AIR INTAKE (CONNECTED BY FLEXIBLE DUCT (5) TO AIR INLET CASING (4))
- 23 BURNER MOTOR
- 24 OIL PUMP (BEHIND PLASTIC COVER)
- 25 LOCKOUT RESET BUTTON (ON FRONT OF BURNER CONTROL BOX)
- 26 BURNER CONTROL BOX
- 27 RIELLO RDB BURNER
- 28 RIELLO RDB BURNER COVER
- 29 FLUE MANIFOLD ACCESS COVER
- 30 DATA LABEL
- 31 FLUE GAS SAMPLING POINT
- 32 MODE SWITCH
- 33 BOILER OVERHEAT RESET BUTTON
- 34 FLUE OVERHEAT RESET BUTTON
- 35 TEMPERATURE CONTROL KNOB

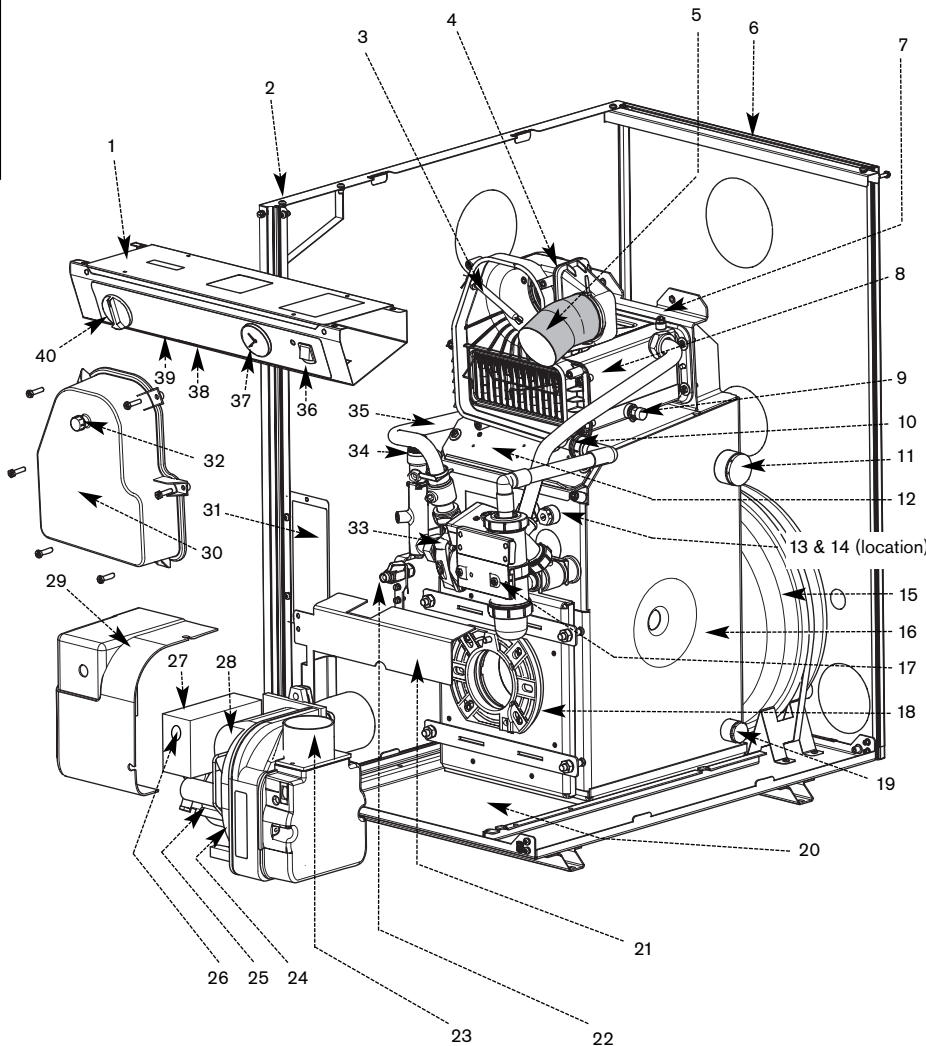


LAYOUT & COMPONENTS

CAMRAY EXTERNAL SYSTEM

The diagram opposite excludes the top, front and RH side casing panels.

- 1 CONTROL BOX ASSEMBLY
- 2 CASING SIDE PANEL
- 3 FLUE OVERHEAT THERMOSTAT PHIAL
- 4 AIR INLET CASING
- 5 FLEXIBLE AIR DUCT (CONNECTING TO AIR INTAKE ON BURNER)
- 6 CASING SUPPORT PANEL
- 7 SECONDARY HEAT EXCHANGER BLEED POINT (ONE ON EITHER SIDE)
- 8 SECONDARY HEAT EXCHANGER
- 9 SECONDARY HEAT EXCHANGER DRAIN
- 10 CONDENSATE OUTLET
- 11 FLOW/OPTIONAL OPEN VENT CONNECTION (NOT USED ON SYSTEM)
- 12 BAFFLE RETAINER ACCESS DOOR
- 13 CONTROL & MANUAL RESET OVERHEAT THERMOSTAT PHIAL & THERMOSTAT PHIAL (LOCATION)
- 14 AUTO-RESET HIGH LIMIT THERMOSTAT PHIAL (LOCATION)
- 15 SYSTEM EXPANSION VESSEL
- 16 PRIMARY HEAT EXCHANGER
- 17 CONDENSATE TRAP & BRACKET (supplied)
- 18 COMBUSTION CHAMBER ACCESS DOOR
- 19 DRAIN/OPTIONAL FEED & EXPANSION CONNECTION
- 20 BASE PLATE AND OIL DRIP TRAY
- 21 DEFLECTOR PLATE
- 22 OIL SUPPLY ISOLATING VALVE
- 23 BURNER AIR INTAKE (CONNECTED BY FLEXIBLE DUCT (5) TO AIR INLET CASING (4))
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- 27 BURNER CONTROL BOX
- 28 RIELLO RDB BURNER
- 29 RIELLO RDB BURNER COVER
- 30 FLUE MANIFOLD ACCESS COVER
- 31 DATA LABEL
- 32 FLUE GAS SAMPLING POINT
- 33 SYSTEM PUMP ASSEMBLY
- 34 SYSTEM PRESSURE RELIEF VALVE
- 35 SYSTEM FLOW PIPE
- 36 MODE SWITCH
- 37 SYSTEM PRESSURE GAUGE
- 38 BOILER OVERHEAT RESET BUTTON
- 39 FLUE OVERHEAT RESET BUTTON
- 40 TEMPERATURE CONTROL KNOB



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.
- ▶ Refill with clean water and inhibitor to manufacturers instructions.

IMPORTANT: The appliance provides a permanent external electrical supply for servicing and must therefore be fed via a circuit breaker incorporating earth leakage protection.

MAINS SUPPLY



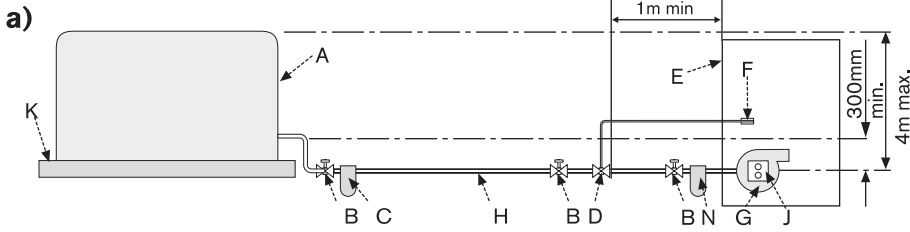
ELECTRICAL SUPPLY:

- Supply: 230V - 50Hz.
- Cable: PVC insulated 0.75mm² (24 x 0.2mm) temperature rated to 90°C.
- Protection IP45.
- External 5A fuse to BS 1362.
- 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.
- B - Isolating valve.
- C - Oil strainer & water separator.
- D - Fire valve to BS 5410.
- E - External casing.
- F - Fire valve sensor.
- G - Oil burner.
- H - Oil supply pipe.
- J - Oil pump.
- K - Full base (plastic tanks).
- L - Non-return valve.
- M - De-aerator.
- N - Oil filter (16µm max filtration size)

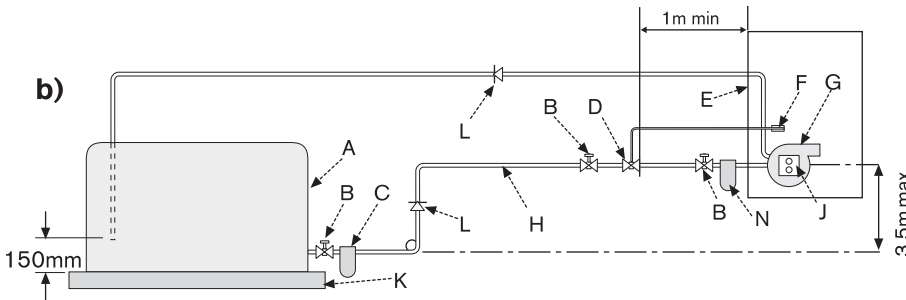
NOTE: All dimensions are in metres unless stated otherwise.

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



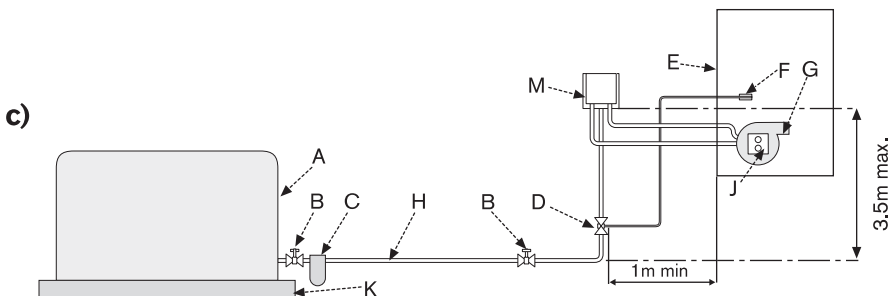
MAXIMUM PIPE RUN FOR SINGLE PIPE GRAVITY FEED SYSTEM (IN METRES)

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 (IN METRES)

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 (IN METRES)

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 28 second kerosene 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) may 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.

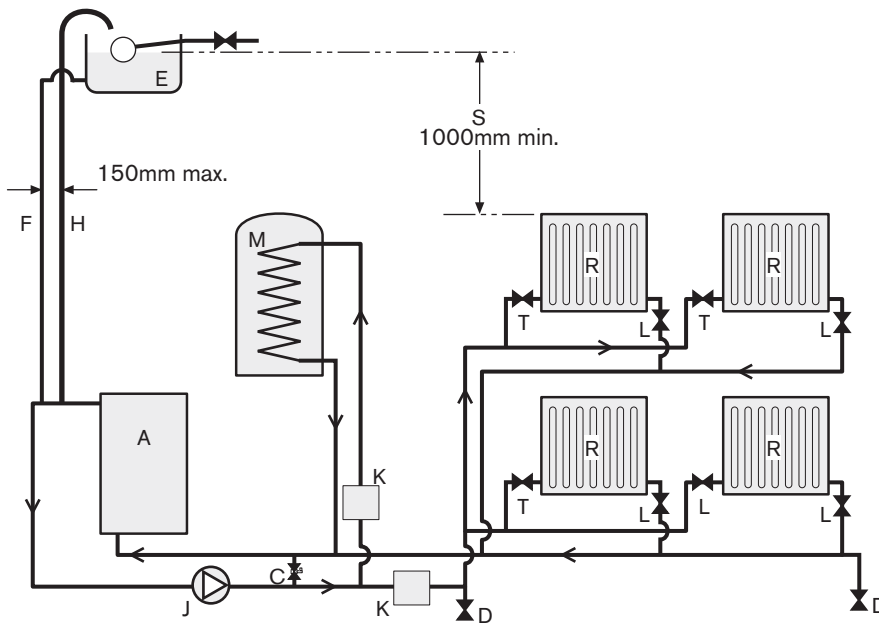
Pipework

- ▶ 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.

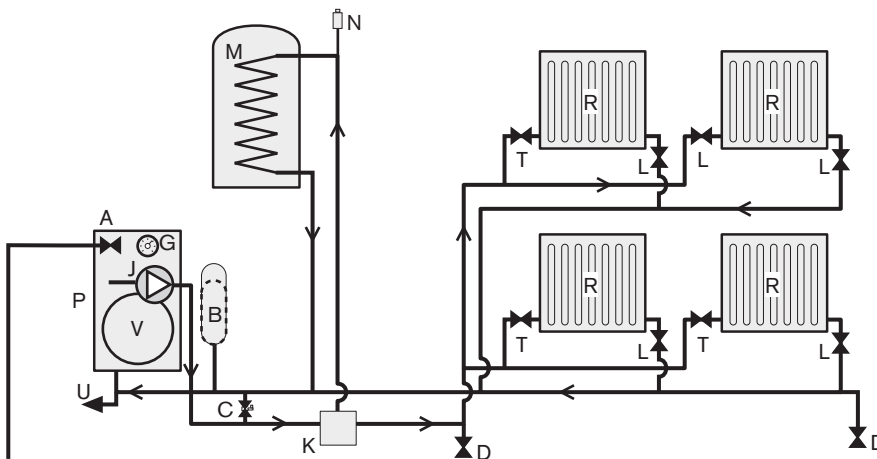
Under no circumstances should a combination isolating/fire valve be used as the sole fire protection device.

GREENSTAR CAMRAY EXTERNAL BOILER LAYOUT:



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

GREENSTAR CAMRAY EXTERNAL SYSTEM BOILER LAYOUT:



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.

PRIMARY SYSTEM PLASTIC PIPEWORK:

- Any plastic pipework used must have a polymeric barrier, comply with BS 7921 and be installed to BS 5955 with 1000mm (minimum) length of copper or steel pipe connected to the boiler.
- Plastic pipework used for underfloor heating must be correctly controlled with a thermostatic blending valve limiting the temperature of the circuits to approx. 50°C with 1000mm (minimum) length of copper or steel pipe connected to the boiler.

PRIMARY SYSTEM/CONNECTIONS/VALVES:

- Do not use galvanised pipes or radiators.**
- All system connections, taps and mixing valves must be capable of sustaining a pressure of 3 bar.
- Radiator valves should conform to BS 2767:10.
- All other valves should conform to BS1010.
- On new installations TRVs must be used on all radiators except the radiator where the room thermostat is sited, this must be fitted with lockshield valves and left open. All installations should have TRVs fitted to radiators within the sleeping accommodation.
- An automatic bypass valve must be connected between the heating flow and return where TRVs are used on all radiators, fitted to give at least a 3 metre circuit when activated.
- Drain cocks are required at all the lowest points on the system.
- Air vents are required at all high points on the system.

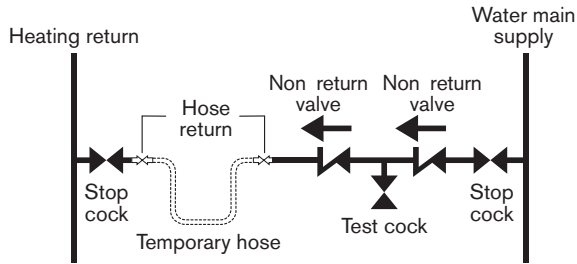
OPEN VENT PRIMARY SYSTEM:

- 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).
- 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), set to operate at 3bar, is fitted to the heating flow pipe.
- Where the system volume is more than 100 litres at 0.5 bar or exceeds 2.65 bar at maximum heating temperature an extra expansion vessel (B) must be fitted to the heating return pipe as close as possible to the boiler.
- Pressurise the extra expansion vessel (B) to the same figure as the expansion vessel (V) built into the appliance (0.5 bar factory setting).
- A pressure gauge (G), 3 bar minimum is fitted to the appliance
- An automatic air vent (N) must be fitted.

PRE-
INSTALLATION



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:

- 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.

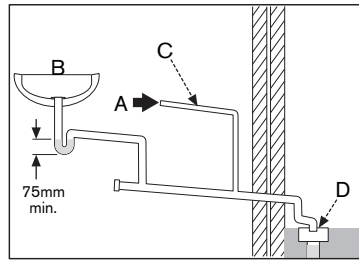
Making it safe:

- 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.

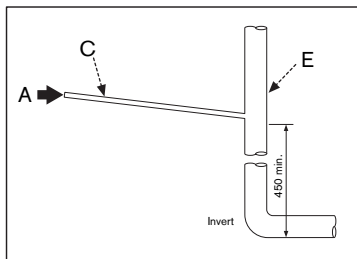
Condensate can be discharged into a rainwater hopper which is part of a sewer system carrying both rainwater and foul water.

- 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.

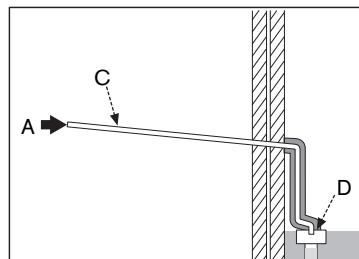
a - Internal waste drainage system



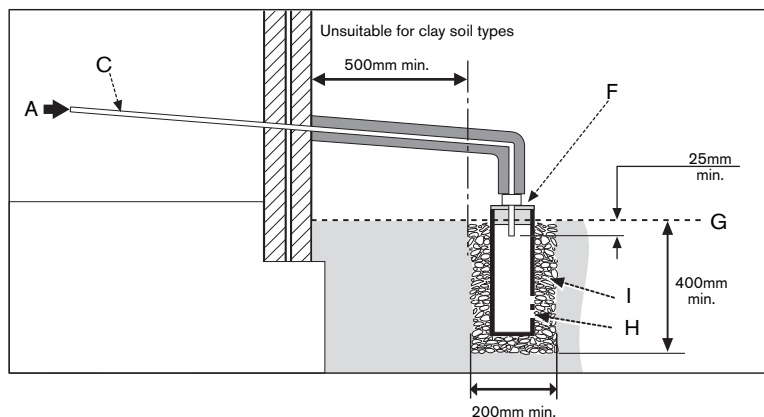
b - Soil/vent stack



c - External drainage system

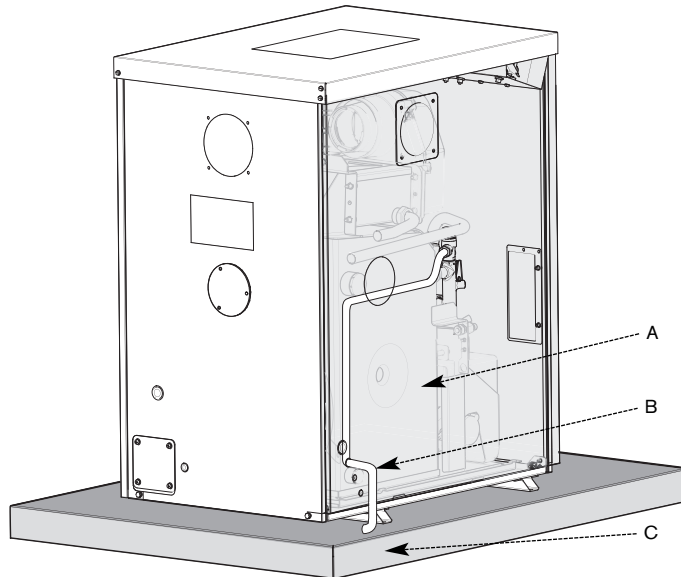


d - External condensate absorption point



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.



Typical pressure relief drain pipe routing.

- The pressure relief drain pipe (B) 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 (B) should be finished with a partial bend, near the outlet to face an external wall or appliance casing (as shown) to help prevent freezing.

A - External boiler casing.

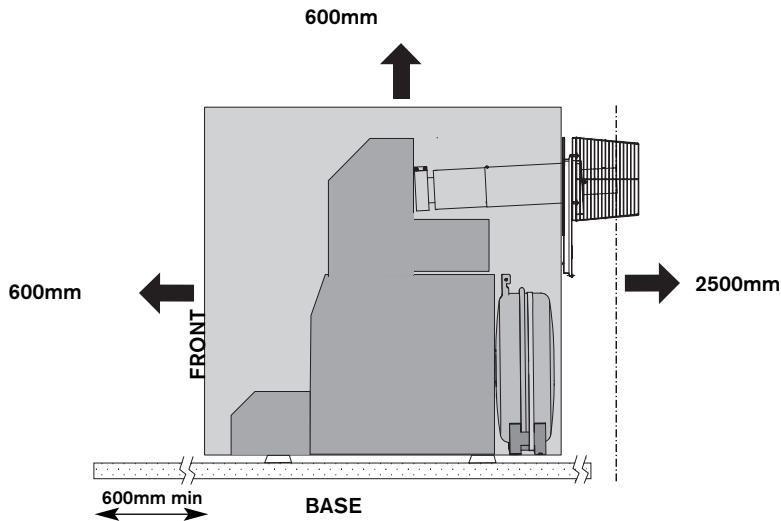
B - Drain pipe.

C - Hard standing.

BOILER LOCATION &

CLEARANCES

PRE -
INSTALLATION



WARNING:

This appliance should not be installed where there is a potential for excessive ground water coverage.

This boiler is only suitable for installing externally at a suitable location onto a fixed permanent rigid surface capable of supporting the boiler weight.

There must be a sufficient hard standing around the appliance to allow for servicing.

The boiler must be installed on a flat level surface to ensure that condensate does not enter the primary heat exchanger.

Tarmac and wood hardstandings are not recommended.

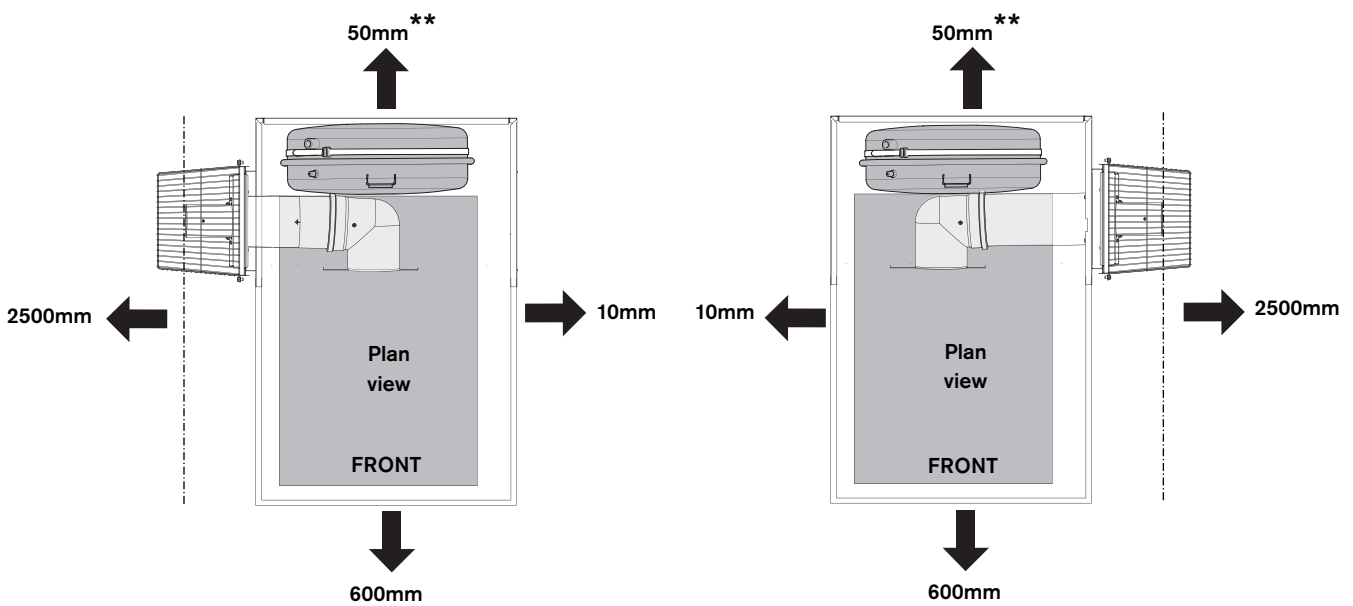
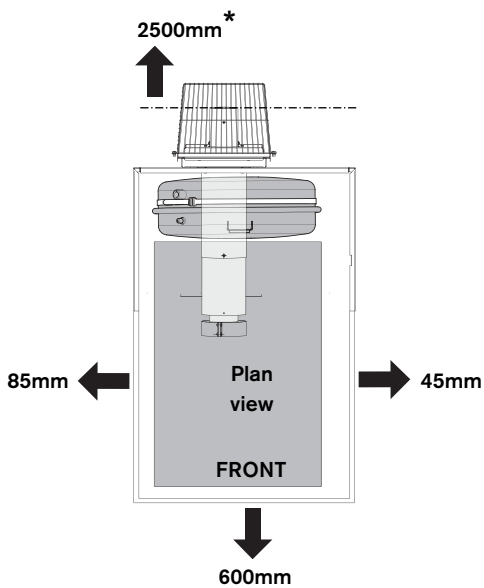
CLEARANCES: Min service & flue clearances

Above	600m
Front	600m

RH/LH clearance flue outlet on opposite side:	10mm
RH clearance flue outlet on rear:	45mm
LH clearance flue outlet on rear:	85mm

Rear clearance flue outlet on side:	50mm**
Rear clearance flue outlet on rear:	2500mm*

It is strongly recommended that the flue terminal faces away from walls to reduce the possibility of wetting occurring.



FLUE TERMINAL POSITIONS

PRE -
INSTALLATION

Minimum dimensions of flue terminal positions for oil fired appliances:

TERMINAL POSITION	B(H)
A ¹ Directly below an opening, air brick, opening windows, etc	600mm
B ¹ Horizontally to an opening, air brick, opening window, etc	600mm
C Below a plastic/painted gutter, drainage pipe or eaves if combustible material protected	75mm
D ² Below a plastic/painted gutter, drainage pipe or eaves without protection to combustible material	600mm
E From vertical sanitary pipework	300mm
F From an external or internal corner or from a surface or boundary alongside the terminal	300mm
G Above ground or balcony level	300mm*
H ¹ From a surface or boundary facing the terminal with 2500mm clearance to both sides of the terminal	1200mm
H ² From a surface or boundary facing the terminal with less than 2500mm clearance to either side of the terminal	2500mm
I ¹ From a terminal facing the terminal with 2500mm clearance to clearance to both sides of the terminal	1200mm
I ² From a terminal facing the terminal with less than 2500mm clearance to either side of the terminal	2500mm
K Horizontally from a terminal on the same wall	750mm

- Flue terminals must be positioned to avoid combustion products entering into buildings.
- The flue must be fitted and terminated in accordance with the recommendations of BS5410.
- 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 terminal guard must be fitted if the terminal is 2m or less above a surface where people have access.

*Stainless steel terminal guard.
Part No: 7 716 190 050*

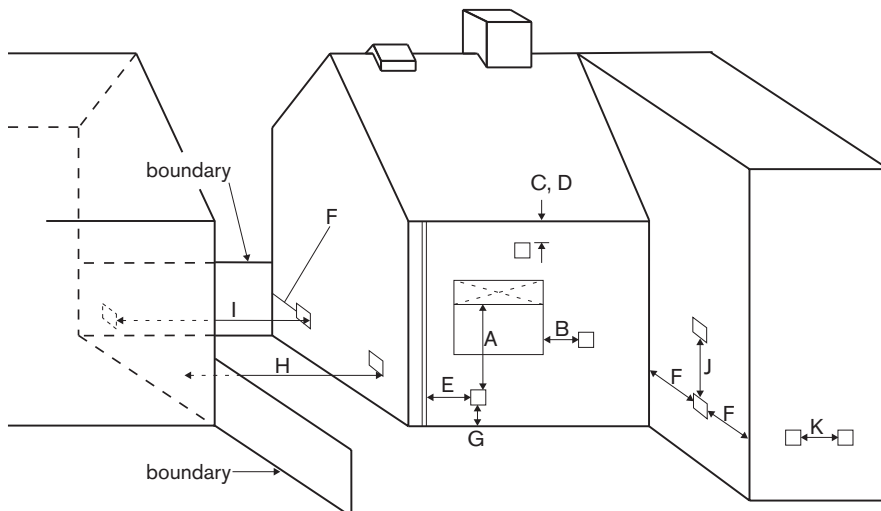
- The following additional guidelines (from part L Exceptions Guidance Document) are recommended when determining the flue outlet position:
- Avoid discharging flue gases into car ports or narrow passageways.
- *Minimum distance of the flue terminal from above ground is 2100mm where directed to a public footpath, private access route or a frequently used area and 2500mm from a car parking area.

B(H) Balanced Horizontal flue

- 1 An opening means an openable element, such as an openable window, or a permanent opening such as a permanently open air vent.

Notwithstanding the dimensions above, a terminal should be at least 300mm from combustible material, e.g. a window frame.

- 2 A way of providing protection of combustible material would be to fit a heat shield at least 750mm wide.



Minimum dimensions of flue terminal positions for oil fired appliances:

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

Key: — Not applicable, N/A Not allowed, B(H) Balanced Horizontal flue, B(V) Balanced 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.

HIGH LEVEL FLUE TERMINAL

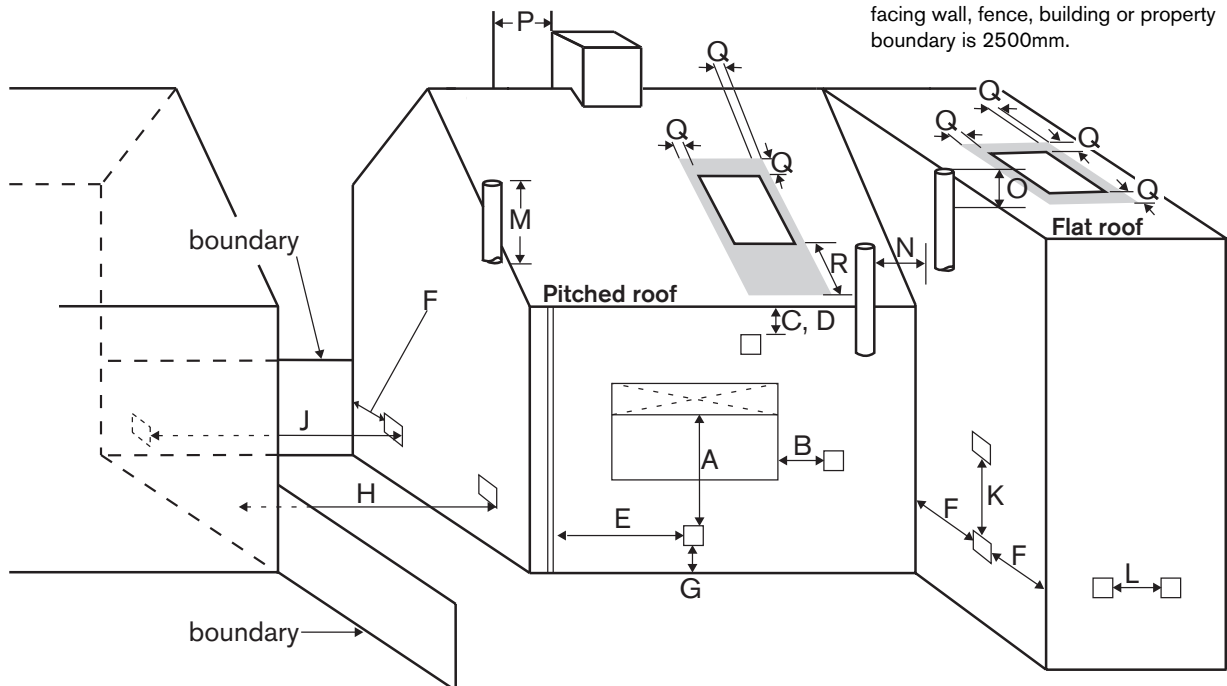
POSITIONS

- Flue terminals must be positioned to avoid combustion products entering into buildings.
- The flue must be fitted and terminated in accordance with the recommendations of BS 5410.
- 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 terminal guard must be fitted if the terminal is 2m or less above a surface where people have access. The guard must be spaced equally (minimum 50mm) around the flue and fixed to the wall with plated screws.

Stainless steel terminal guard.
Part No: 7 716 190 050

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.



FLUE OPTIONS

IMPORTANT: The weather seal (supplied) must be fitted to every flue joint to give the required level of weather protection.

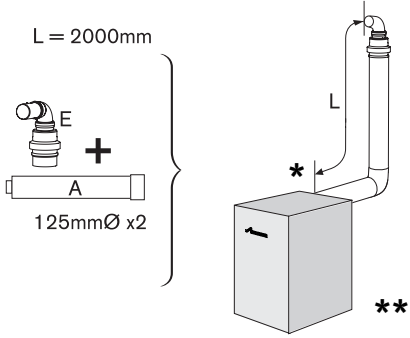
The diagrams (opposite) show the components used and the maximum flue length (L) for each flue configuration.

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

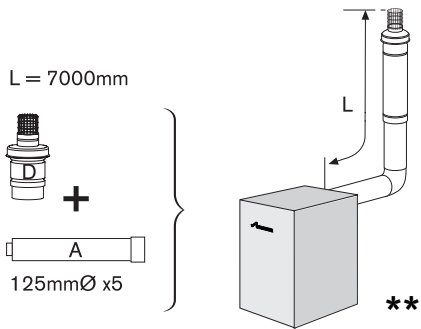
- To achieve the maximum flue length (L), a flue section will have to be reduced in length.
- Only the straight flue extensions can be reduced in length by cutting.

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.

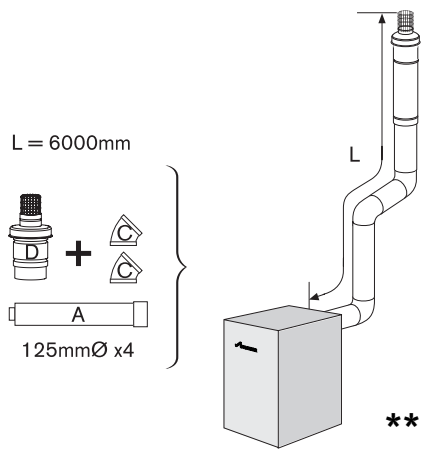
PRE-INSTALLATION



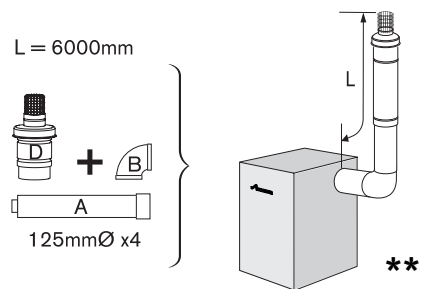
High level horizontal terminal (rear outlet)



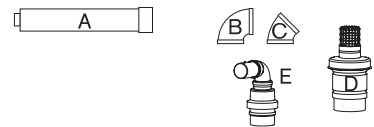
Vertical terminal (rear outlet)



Vertical terminal (rear outlet)



Vertical terminal (side outlet)



- A - Straight flue extension
- B - Flue bend 90°
- C - Flue bend 45°
- D - Vertical Terminal Kit (incl. 90° elbow)
- E - Horizontal terminal kit (incl. 90° elbow)

Calculating the flue length:

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

2000mm.
Vertical 80/125mmØ / 100/150mmØ (25/32 only): 7000mm.

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: 1000mm overall length.
Effective length when engaged into sockets within the flue run is 950mm.

Flue Terminal lengths:

Horizontal Oilfit External = 305mm
Vertical Oilfit External: 80/125 = 185mm + cage
Vertical Oilfit External: 100/150 (for 25/32 only) = 270mm + cage

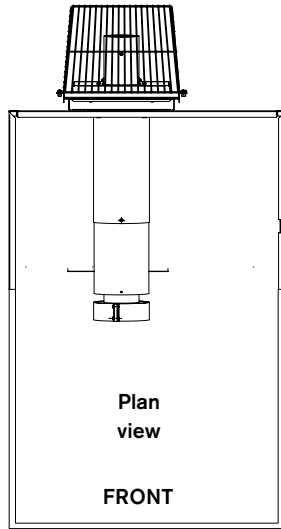
For satisfactory flue performance it is recommended that no more than 2m of the vertical flue is run horizontally.

- * Rear exit only.
- ** Horizontal flue runs should be kept as short as possible.

CABINET MOUNTED BALANCED HORIZONTAL FLUE OPTIONS

REAR FLUE OUTLET

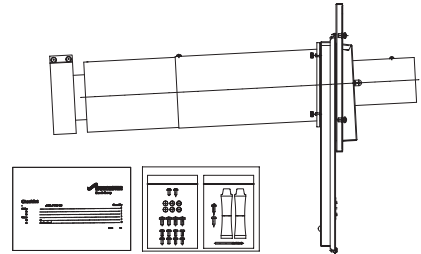
A + C



- The horizontal flue is fitted to the rear or either side of the cabinet.

IMPORTANT:

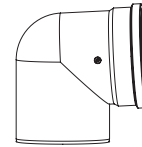
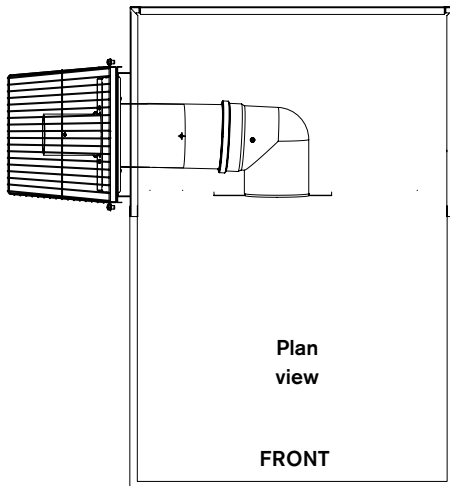
It is strongly recommended that the flue terminal faces away from walls to minimise the occurrence of wetting.



A - External horizontal flue kit

LEFT HAND FLUE OUTLET

A + B + C



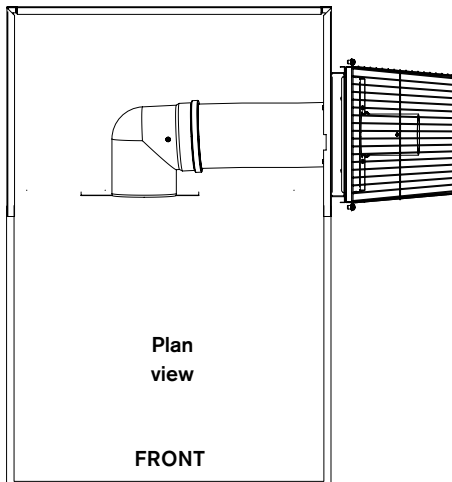
B - 90° in-line elbow 80/125mm
Part No. 7 716 190 034



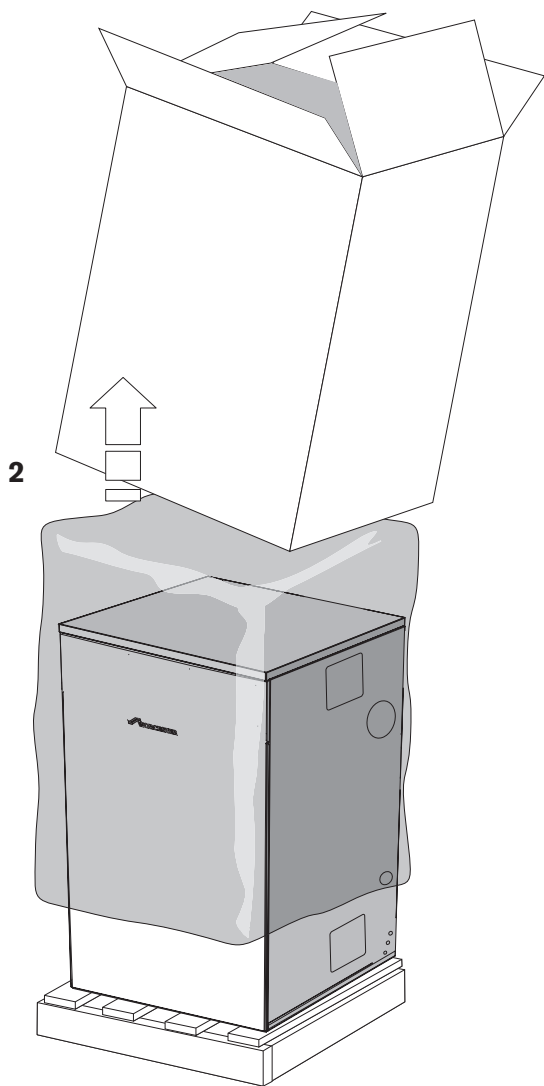
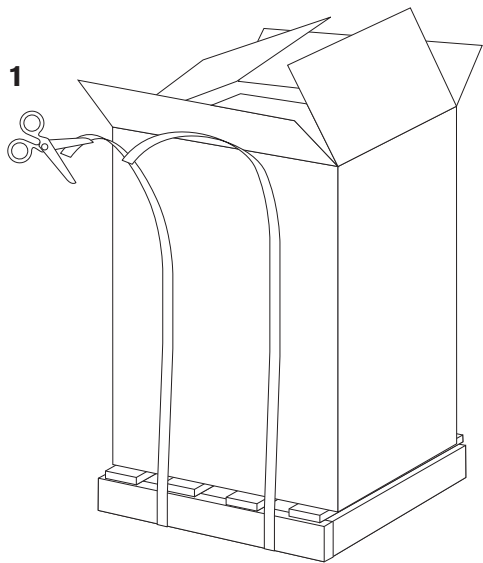
C - Stainless steel terminal guard
Part No. 7 716 190 050

RIGHT HAND FLUE OUTLET

A + B + C



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:

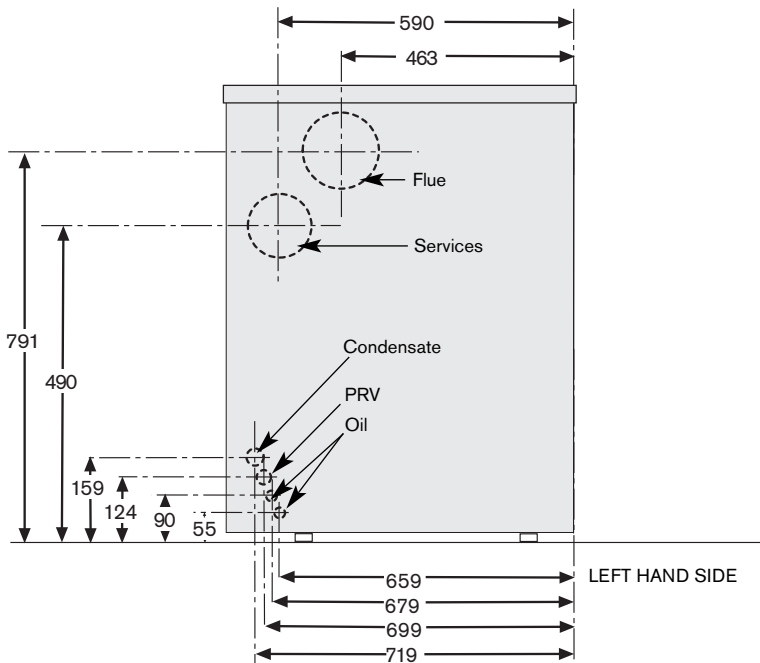
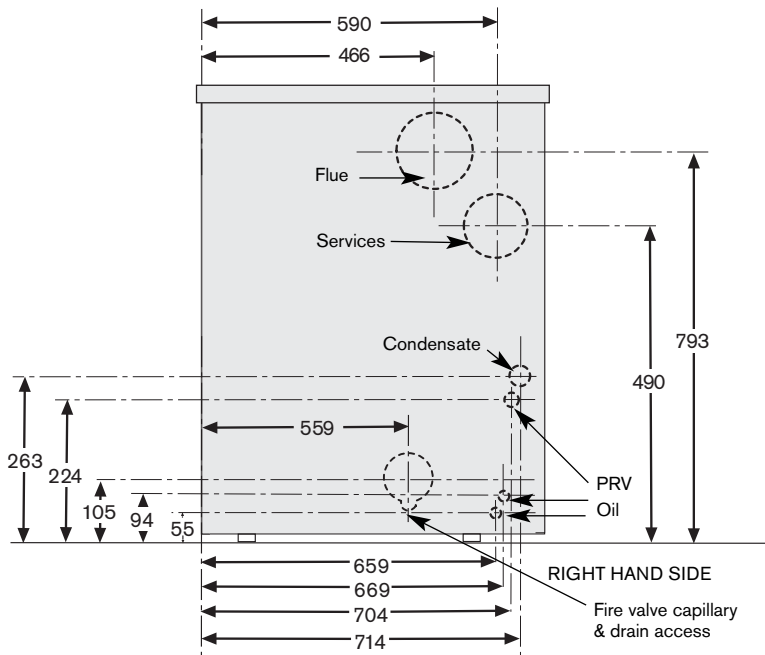
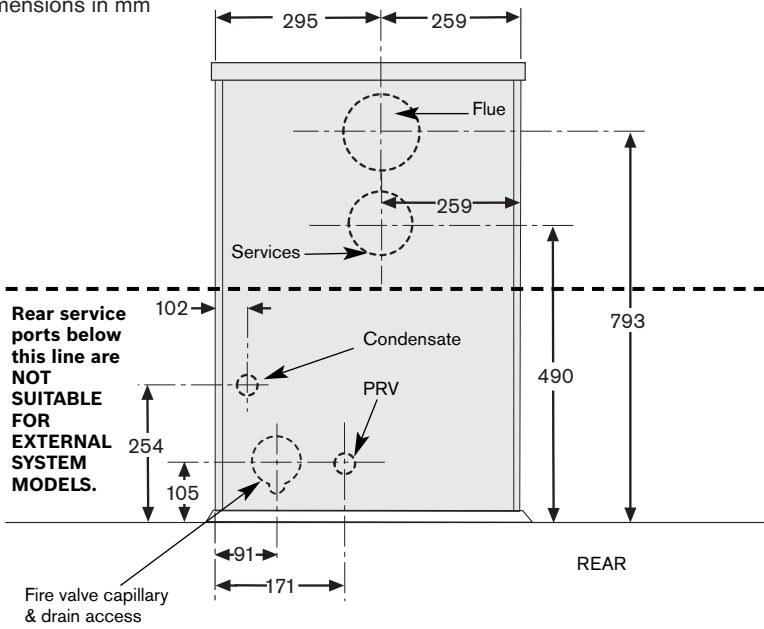
- Lift only a manageable weight, or ask for help.
- When lifting or putting things down, bend the knees, and keep the back straight and feet apart.
- Do not lift and twist at the same time.
- Lift and carry objects close to the body.
- Wear protective clothing and gloves to protect from any sharp edges.

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 removed 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.
- 2 ▶ Lift carton up and away from the boiler.
 - ▶ Remove the plastic bag from the boiler and place safely aside.

All dimensions in mm



PIPEWORK & FLUE POSITIONS

CAUTION: Ensure there are no pipes, electric 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 CONNECTIONS:

Flow (External System models)
22mm Ø copper 12/18, 18/25.
28mm Ø copper on 25/32 model.

Flow (External models) & optional open vent/air vent
1" BSP 12/18, 18/25.
1 1/4" BSP 25/32.

Primary drain & optional feed & expansion/feed
3/4" BSP.

Return 22mm Ø copper 12/18, 18/25.
28mm Ø copper on 25/32 model.

Services duct 100mm Ø.

Condensate outlet 21.5mm Ø.

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

WARNING: THIS APPLIANCE IS SERVICED AND REPAIRED EXTERNALLY. EXTERNAL EQUIPMENT OPERATED AT 230V SHOULD NOT BE INSTALLED, SERVICED OR REPAIRED UNDER ADVERSE WEATHER CONDITIONS.

THIS APPLIANCE IS INSTALLED AND SERVICED EXTERNALLY TO THE PROPERTY, BUT THE ENGINEER MUST HAVE ACCESS TO THE INSIDE OF THE PROPERTY WHEN INSTALLING OR SERVICING THE APPLIANCE.

BOILER INSTALLATION

Note: The cabinet is not load bearing it only provides weather protection for the boiler inside.

- 1 ▶ Mark position of the 100mm services duct on the exterior wall and make a hole through.
- 2 ▶ Remove the screws securing the base panel to the transit pallet and lift the boiler off the pallet and into its installation position taking care not to scrape the base panel across the hard standing. **Do not attempt to lift and position the boiler on your own. Do not use the copper pipes to move the boiler.**

▶ Fasten the base to the hard standing using the holes provided. Care should be taken to ensure that the base is level.

- 3 ▶ Remove the key for the door fasteners from the literature pack. Undo the screws at the bottom of the front panel (using the key provided) and remove the screws from the rear panel pulling both panels down and out to remove. Store safely away from the installation point.

- 4 ▶ Remove the screws from the top panel and lift up to remove, store safely away from the installation point. Remove the screw tool from the installation pack.

- 5a ▶ Loosen the flexible air duct clamp (A) and remove the air duct from the burner.

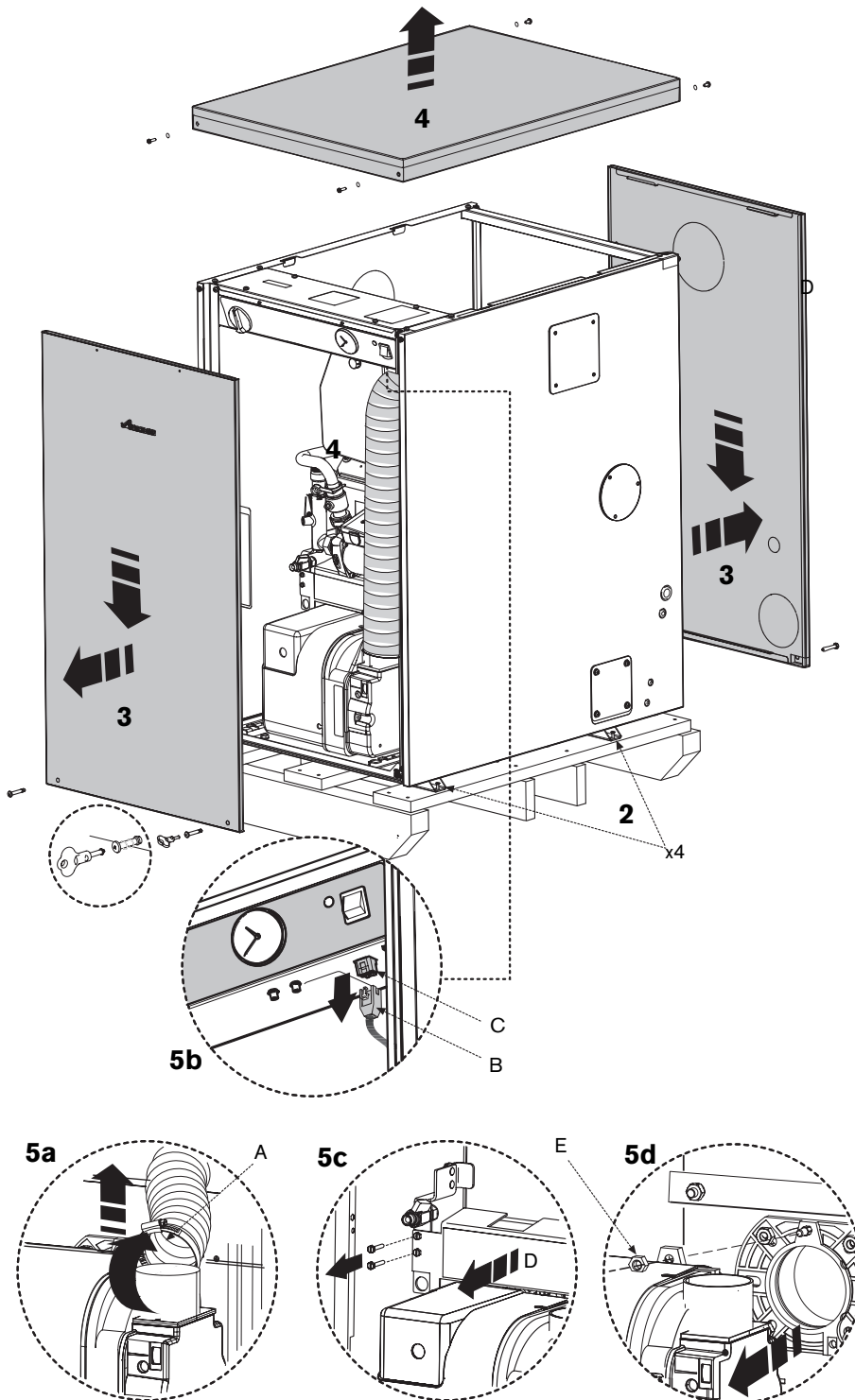
- 5b ▶ Depress the locking ears to unplug the burner lead (B) from the control box (C).

- 5c ▶ Undo the two screws securing the deflector plate (D) and remove the plate.

- 5d ▶ Undo and remove the retainer (E) on top of the burner. The burner can now be removed from the heat exchanger. Store the burner and retainer nut safely away from the boiler.

▶ Measure the 100mm Ø services duct to give at least 10mm inside the casing and to finish flush with the interior wall surface, cut to size and fit the duct. Fit the 100mm sealing ring where the duct enters the casing and seal the joint to the exterior wall and inside the cabinet with a suitable sealant.

CAMRAY EXTERNAL SYSTEM SHOWN



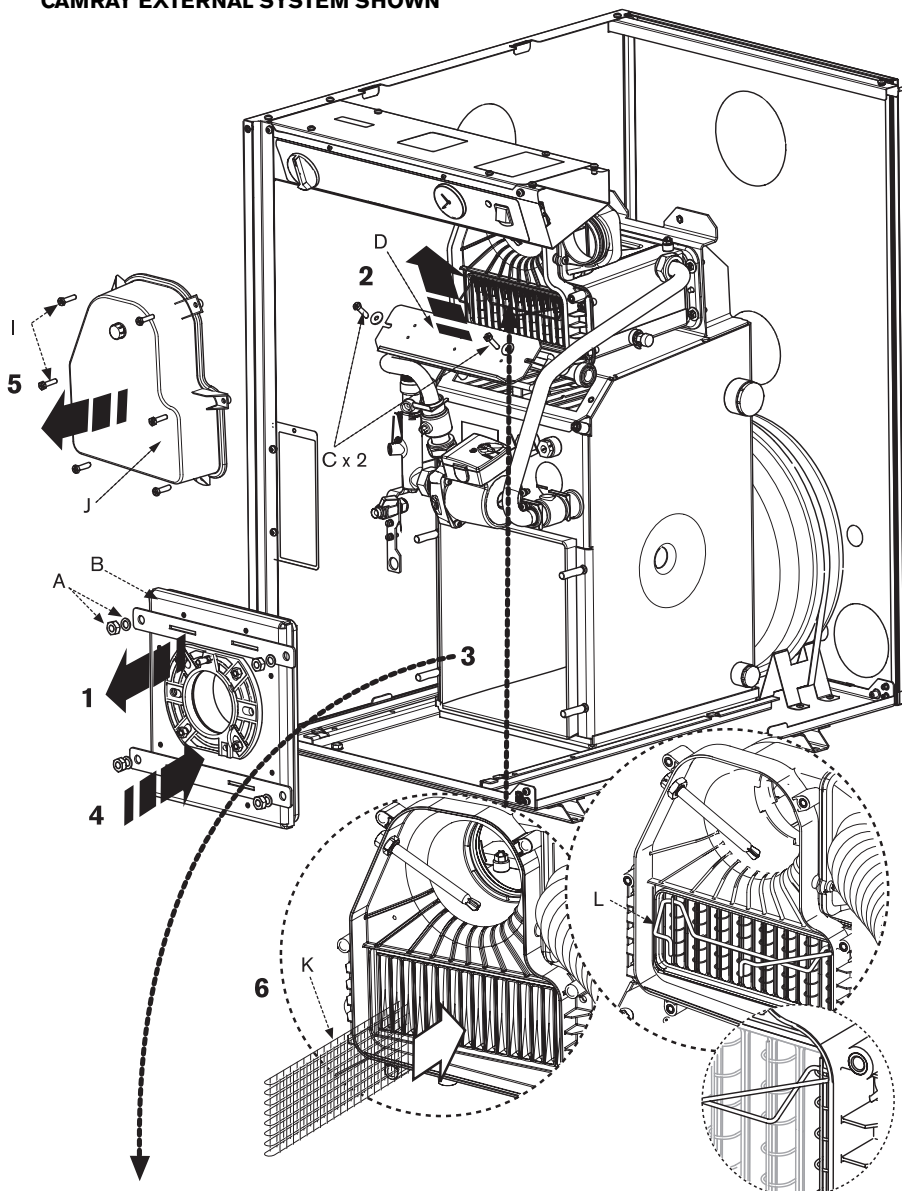
INSTALLATION NOTES:

- ▶ Ensure all the seals are in good condition and seated properly.
- ▶ To ease assembly of flue components, grease seals lightly with the solvent free grease supplied.
- ▶ A terminal guard must be fitted if the terminal is 2m or less above a surface where people have access.

All flue options:

- 1 ▶ Lightly grease the flue cowl seal with the solvent free grease supplied.
- 2 ▶ Carefully remove the blanking plate from the appropriate flue aperture (if necessary) and refit the blanking plate in the unused aperture.
- 3 ▶ Carefully remove the insulation from the flue aperture in the cabinet that the flue is to pass through, and fit to the unused aperture (if necessary).
- 4 ▶ Refer to the flue manual supplied with the flue kit for flue installation.

COMBUSTION CHAMBER



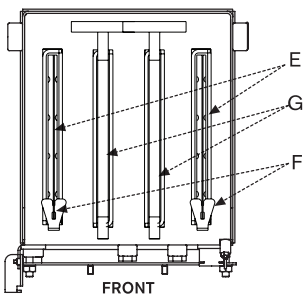
Combustion chamber:

- 1 ▶ Release retaining nuts and washers (A).
 - ▶ Remove combustion chamber access door (B).
- 2 ▶ Release screws (C) on either side and remove upper access door (D).
- 3 ▶ Ensure baffles (E) and baffle retainers (F), restrictor plates (G) and acoustic insulation insert (H - 25/32 model only) are correctly fitted for the boiler model as shown in the plan view opposite.

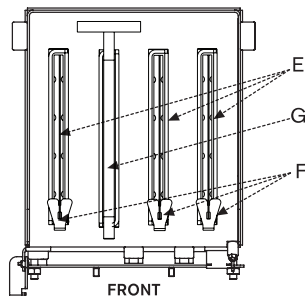
For further information refer to the Baffle Arrangement Diagrams in the Servicing Section of this manual.

 - ▶ Refit the upper access door (D) and secure with screws (C).
- 4 ▶ Secure combustion chamber access door with nuts and washers (A). Tighten until door is firmly secured using the sequence below. Do not overtighten the nuts.
- 5 ▶ Unscrew screws (I) and remove flue manifold access cover (J).
- 6 ▶ Check that all the baffles (K) and baffle retainer (L) are correctly fitted to the secondary heat exchanger.

12/18
Plan sectional view

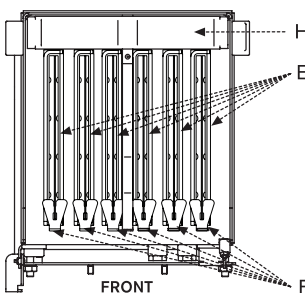


18/25
Plan sectional view

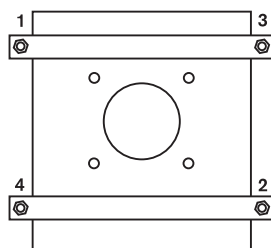


Hook the retainer (L) over the end two baffles

25/32
Plan sectional view



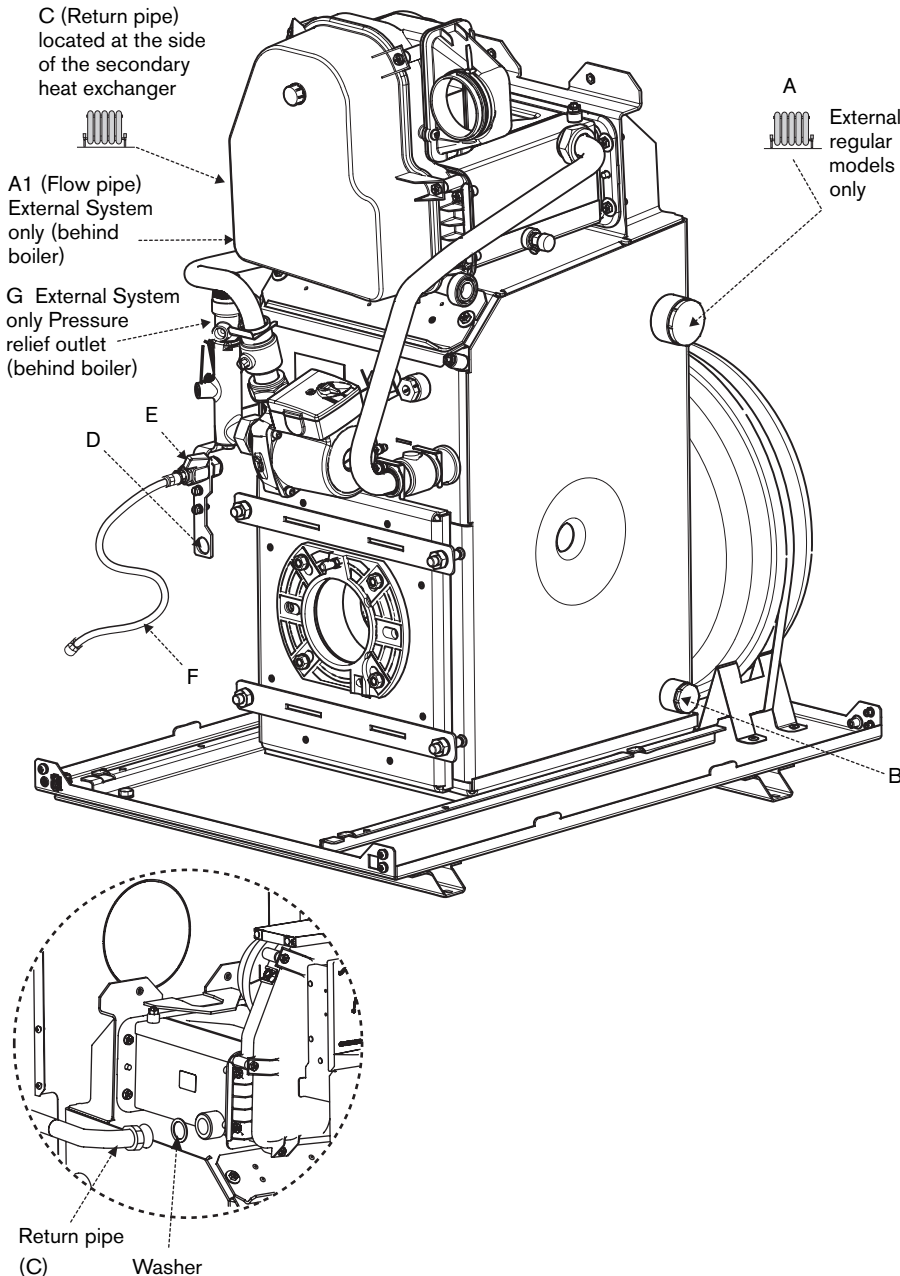
IMPORTANT when refitting the combustion chamber access door (4)



Combustion chamber access door tightening sequence.

CAUTION: ISOLATE THE OIL & WATER MAINS SUPPLY BEFORE STARTING ANY WORK AND OBSERVE ALL RELEVANT SAFETY PRECAUTIONS.

PIPEWORK CONNECTIONS



- A - Flow (External regular models only) optional open vent/air vent 1" BSP on 12/18, 18/25 and (1 1/4" BSP on 25/32 models).
- A1 - Flow (External System models only) 22mm Ø copper (28mm Ø on 25/32 models)
- B - Primary drain & optional feed and expansion/feed 3/4" BSP
- C - Return 22mm Ø copper (28mm Ø on 25/32 models)
- D - Fixing point for optional return oil line
- E - Oil isolating valve (10mmØ)
- F - Flexible oil hose
- G - Pressure relief discharge pipe 15mm Ø copper (External System models only)

WATER CONNECTIONS:

- ▶ All service pipes into the property must pass through the services duct.
- ▶ Insulate all the system/supply pipes and where the pipes pass through the duct use at least 22mm insulation around the pipes.
- ▶ Remove the transit bungs from the pipework connections on the boiler.

NOTE: that surplus water may be present due to factory testing.

- ▶ Ensure all pipework is clean.
- ▶ Fit the return pipe (C) to the secondary heat exchanger using the sealing washer supplied.
- ▶ Align water pipework through the 100mm Ø duct and connect, ensuring that the control box fits correctly before permanently connecting the pipework.
- ▶ Check that all unused sockets have been capped.

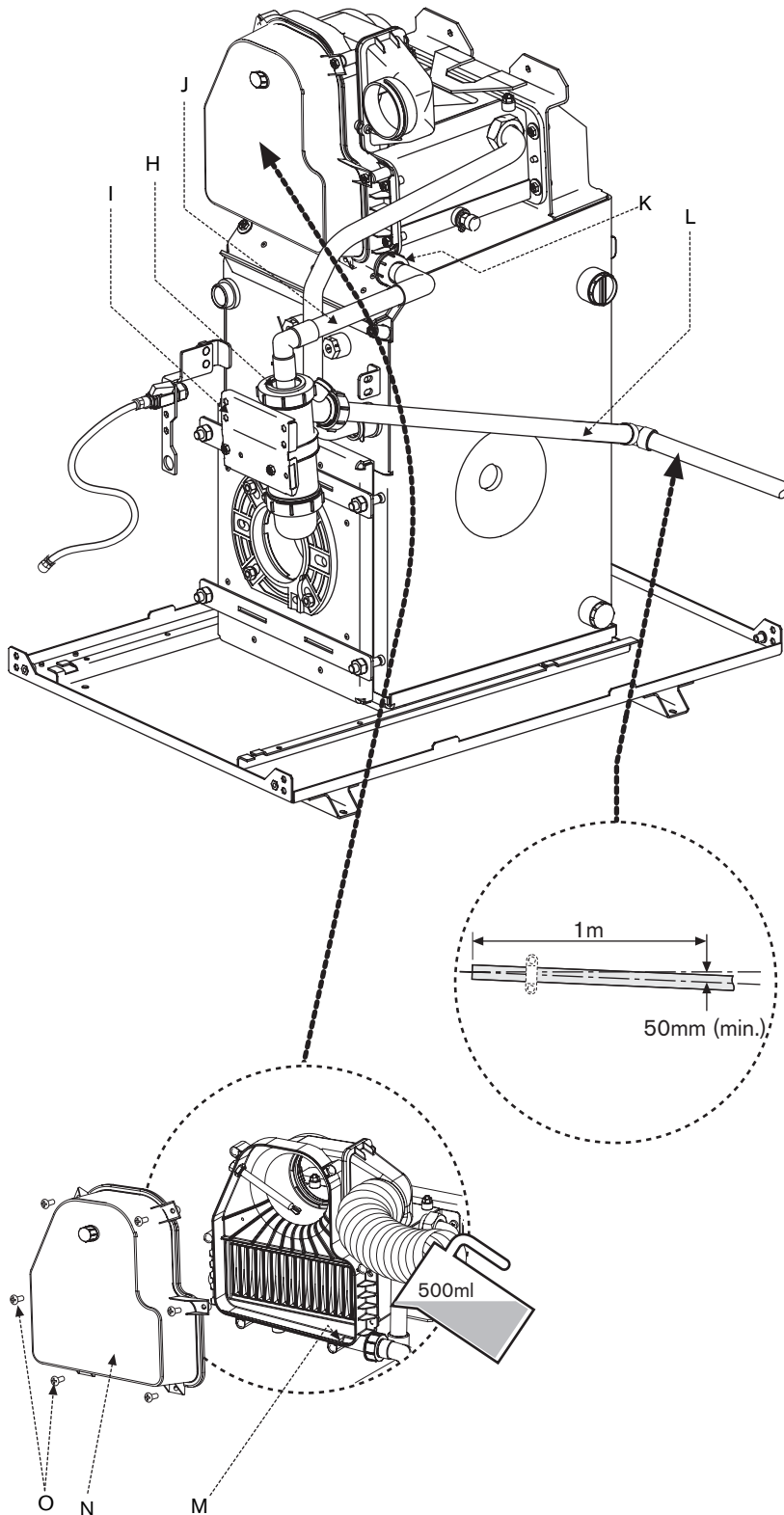
OIL SUPPLY CONNECTIONS:

NOTE: Oil filters and de-aeration devices are not to be fitted within the casing and the fire valve body must be at least 1 metre from the external casing.

- ▶ Route the oil supply pipe through the appropriate casing hole as required and connect to the isolating valve (E) and ensure the valve is closed.
- ▶ Connect the flexible oil hose (F) to the isolating valve (E).
- ▶ Pass the fire valve sensor through the most appropriate casing hole and locate the capillary in the cut out at the bottom of the hole.
- ▶ Clip the sensor into the clip provided at the rear of the control box.
- ▶ Rotate the cover plate and seal so it does not cover the capillary, then secure with the screws provided.

CAMRAY EXTERNAL SYSTEM SHOWN

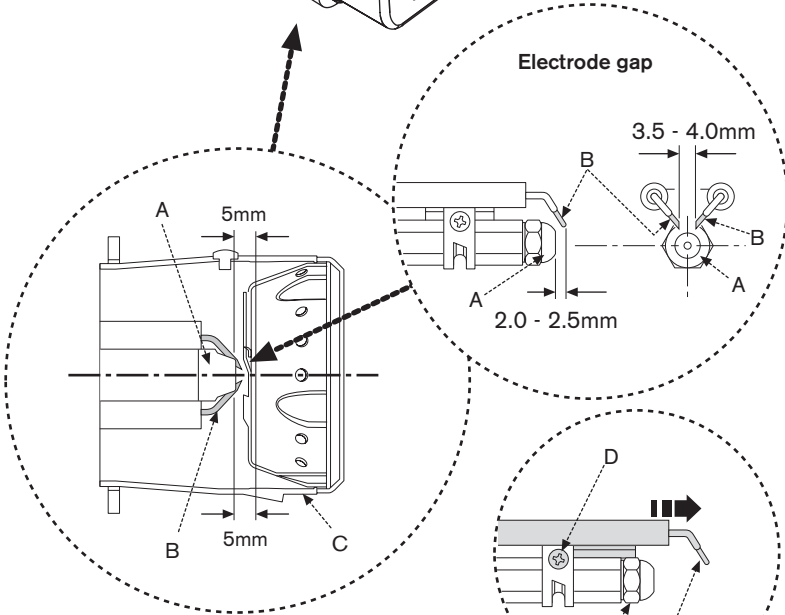
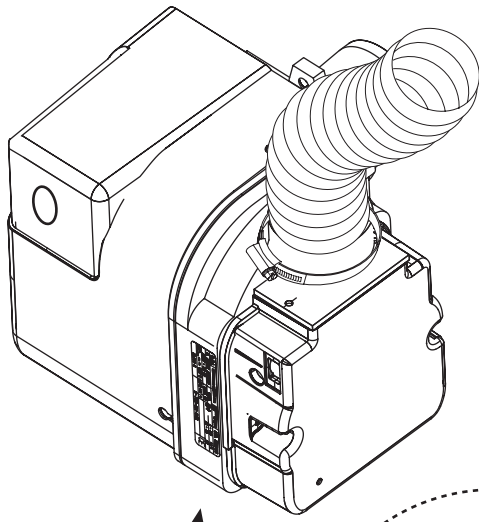
- H - Condensate trap
- I - Condensate trap fixing bracket - supplied
- J - Condensate outlet (21.5mmØ) - supplied
- K - Flue manifold condensate outlet
- L - Condensate pipe - not supplied
- M - Condensate collector
- N - Flue manifold cover (includes seal)
- O - Flue manifold cover fixing screws

**CONDENSATE CONNECTION:**

- ▶ The condensate trap (H) must be installed onto the bracket (I) supplied.
- ▶ Measure condensate pipe (J) mark and cut square to length required.
- ▶ Fit sealing washer inside condensate pipe nut and connect to the flue manifold outlet (K).
- ▶ Connect 21.5mm polypropylene pipe (L) (not supplied) to condensate trap (J) before terminating to waste.
- ▶ Ensure that the condensate pipe runs away from the boiler at a constant fall of 50mm (min.) for every metre.
- ▶ Carefully pour 500ml of water into the condensate collector (M) to fill condensate trap.
- ▶ Check the water is running away and the condensate pipework joints are water tight.
- ▶ Check the flue manifold seal (fitting in the flue manifold cover) is undamaged and seated correctly.
- ▶ Refit flue manifold access cover (N) and secure with screws (O).

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

IMPORTANT: Insulate all external condensate pipework or run in 32mm pipework to prevent freezing.



OIL BURNER & PUMP

CAUTION: ISOLATE THE OIL & WATER MAINS SUPPLY 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.

NOTE: Burners are supplied with Mid-Range output nozzle.

- ▶ Ensure nozzle (A) is aligned centrally within the combustion head (C).
- ▶ Inspect for any visible defects.

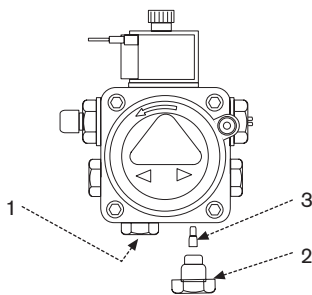
2 IMPORTANT: Before removing or fitting a nozzle (A), loosen screw (D) and move the electrodes (B) forward.

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

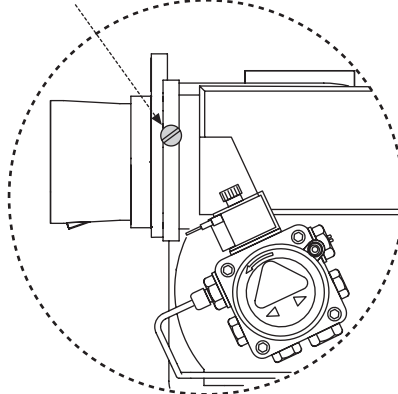
NOTE: the 12/18 model has a brass deflection washer and locating circlip behind the nozzle. These must be in place for the correct operation of the burner.

IMPORTANT: Whenever replacing the combustion head, ensure that the photocell is lined up with the sight hole.

RIELLO RDB OIL

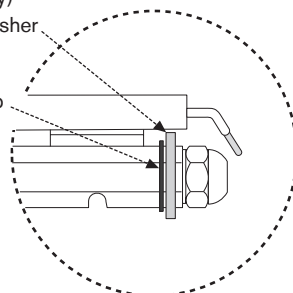


D (on 12/18 and 18/25 models only)



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

Locating circlip



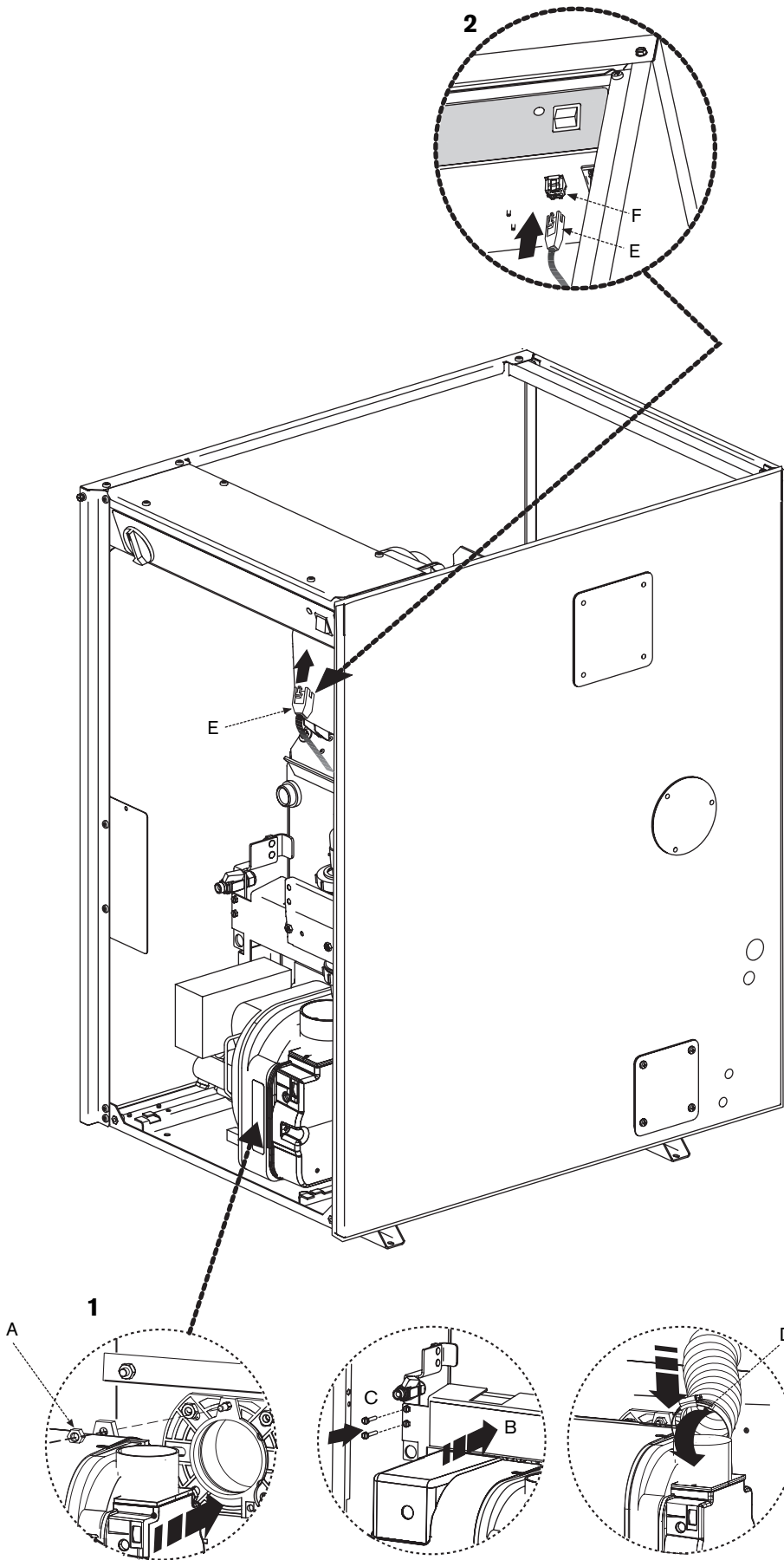
OIL PUMP:

Connecting the oil pump for a single hose system:

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

Converting the oil pump for a double pipe system:

- 1 ▶ Check the inlet hose connection (1).
 - ▶ Unscrew return plug (2).
 - ▶ Screw in by-pass screw (3).
- 2 ▶ Connect the flexible oil pipe return hose (not supplied) to the oil pump and the return line connection and tighten to secure.



- 1 ▶ Align burner combustion head into boiler collar.
- ▶ Locate the combustion head into the combustion chamber door, push the burner firmly onto the door and secure with retainer (A).
- ▶ Check that the burner is seated correctly on its mounting flange and that the oil hose/s are not trapped in front of or underneath the burner.
- ▶ Refit the deflector plate (B) and secure with screws (C). Ensure that the flexible oil hose/s are not positioned between the deflector plate and the combustion chamber door.
- ▶ Attach air duct and tighten clip (D) to secure to the burner air intake.
- 2 ▶ Plug burner lead (E) into control box (F).

INSTALLATION

ELECTRICS

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

IMPORTANT: THIS APPLIANCE PROVIDES A PERMANENT EXTERNAL ELECTRICAL SUPPLY FOR SERVICING AND MUST THEREFORE BE FED VIA A CIRCUIT BREAKER INCORPORATING EARTH LEAKAGE PROTECTION.

WARNING: EXTERNAL EQUIPMENT OPERATED AT 230 VOLTS SHOULD NOT BE SERVICED OR REPAIRED UNDER ADVERSE WEATHER CONDITIONS.

Access to 230V connections:

- 1 ▶ Release screws (A) and remove cover panel (B) from control box (C).
- 2 ▶ Release screws (D) from cable clamp (E).
▶ Pull inner clamp part (F) outwards.
▶ Feed sufficient power cable (G) through the cable clamp (E) and secure grip with screws (D).
▶ Separate wires from cable end and strip to 6mm.

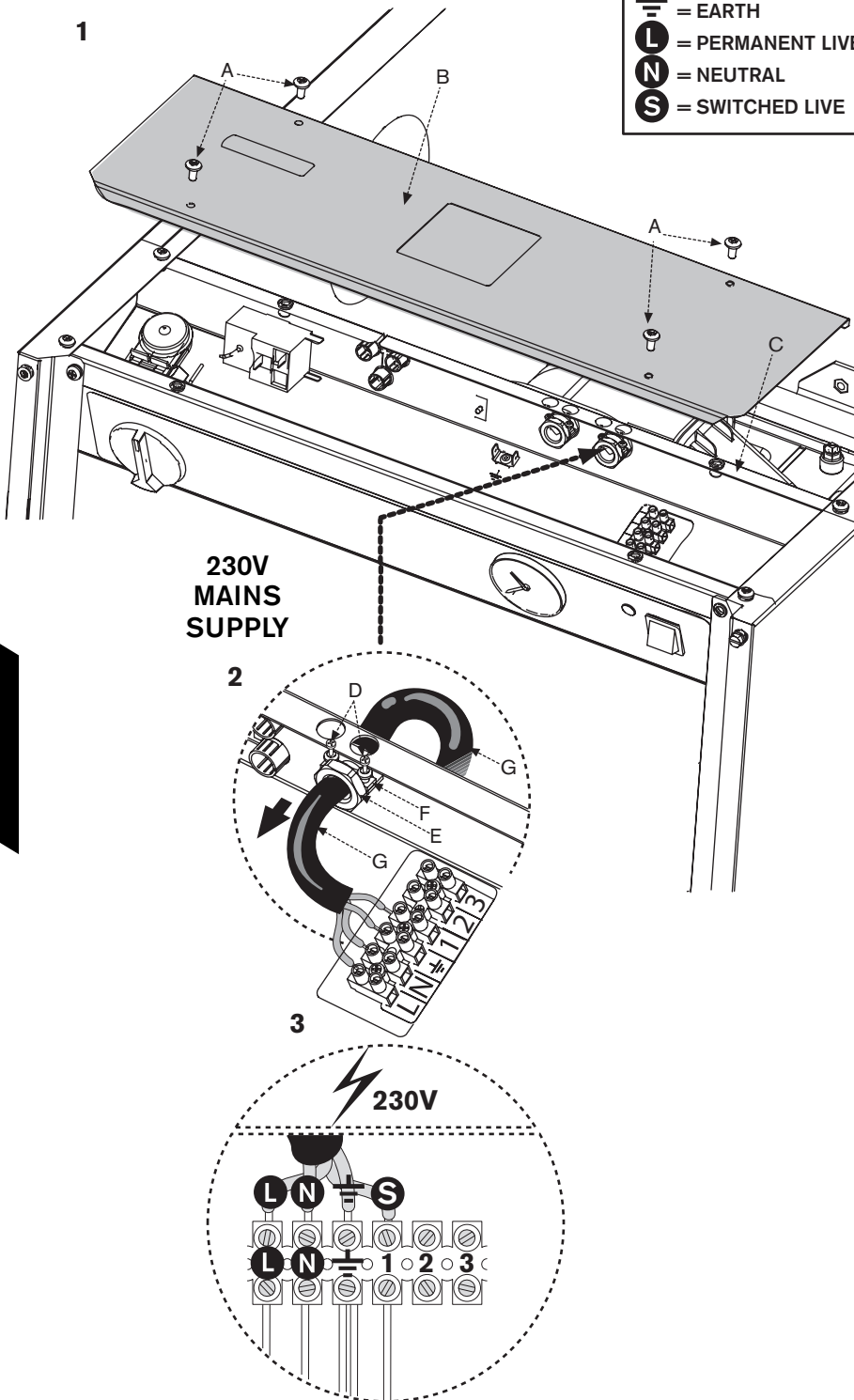
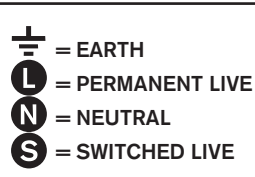
230V connections (terminal block X1):

- 3 ▶ Connect the permanent LIVE wire (Brown) to terminal L.
▶ Connect the switched LIVE wire (demand or boiler feed) to terminal 1.
▶ Connect NEUTRAL wire (Blue) to terminal N.
▶ Connect EARTH wire (Green/Yellow) to the connector \perp .

Route the power cable down the side panel through the service duct to the internal property connection point avoiding any potentially hot surfaces.

Any external device connected to the boiler must take its power supply from the boiler supply only and must NOT have a separate supply.

NOTE: A frost thermostat is fitted as standard to the external appliance to provide frost protection.

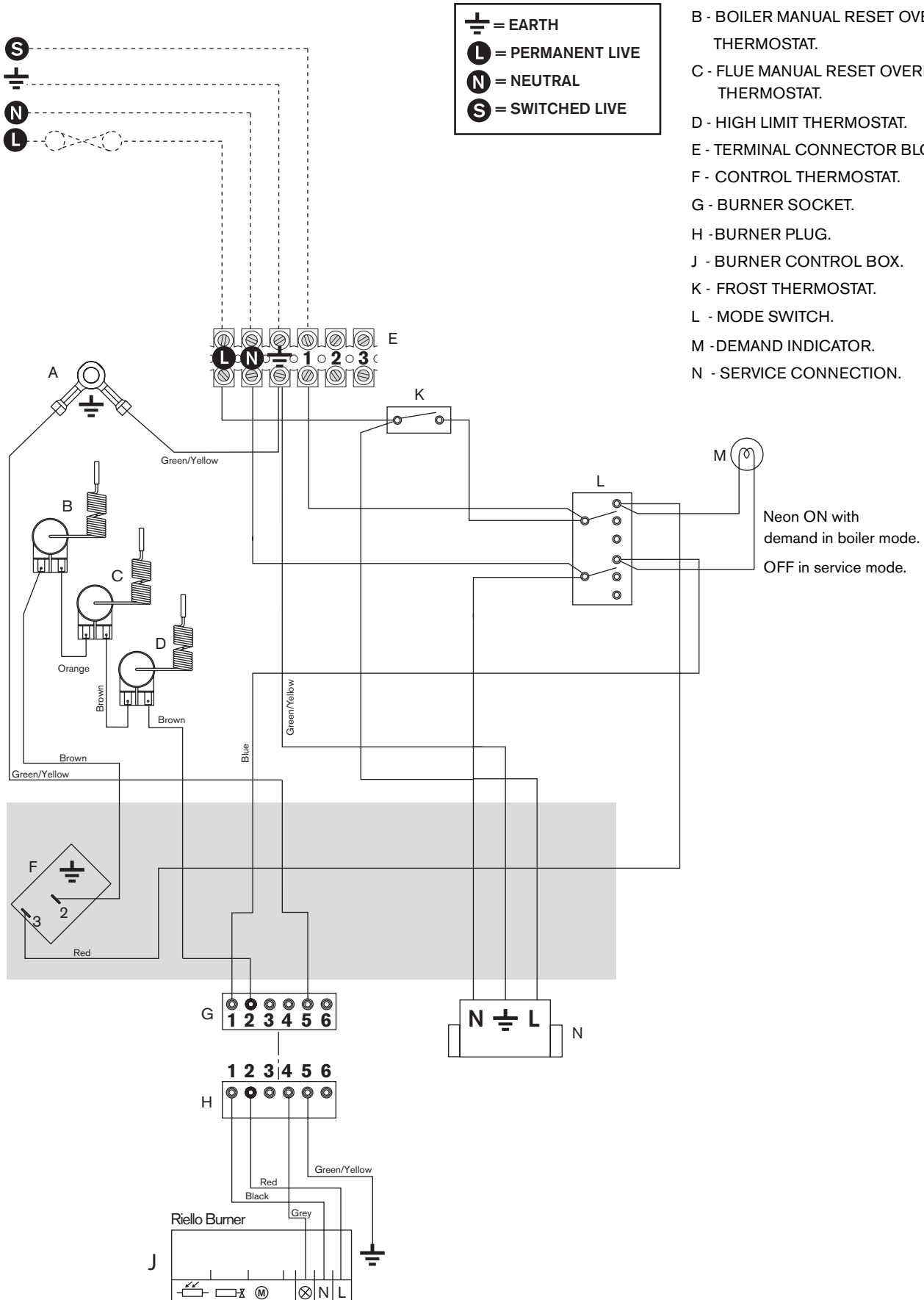


CAMRAY EXTERNAL SYSTEM SHOWN

230V STANDARD WIRING DIAGRAM:

Key to components:

- A - EARTH STUD.
- B - BOILER MANUAL RESET OVERHEAT THERMOSTAT.
- C - FLUE MANUAL RESET OVERHEAT THERMOSTAT.
- D - HIGH LIMIT THERMOSTAT.
- E - TERMINAL CONNECTOR BLOCK.
- F - CONTROL THERMOSTAT.
- G - BURNER SOCKET.
- H - BURNER PLUG.
- J - BURNER CONTROL BOX.
- K - FROST THERMOSTAT.
- L - MODE SWITCH.
- M - DEMAND INDICATOR.
- N - SERVICE CONNECTION.

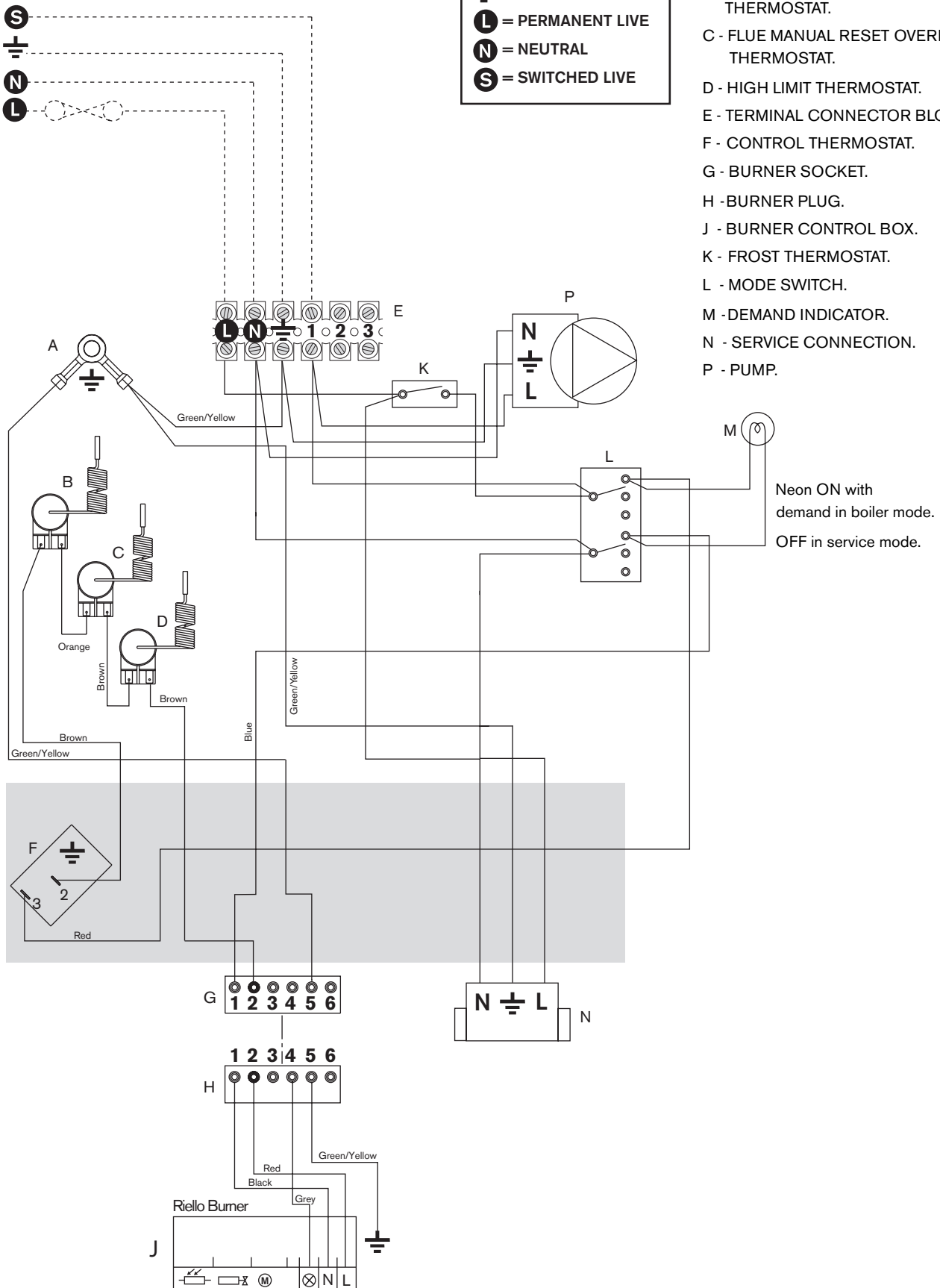
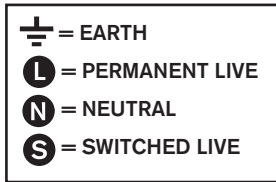


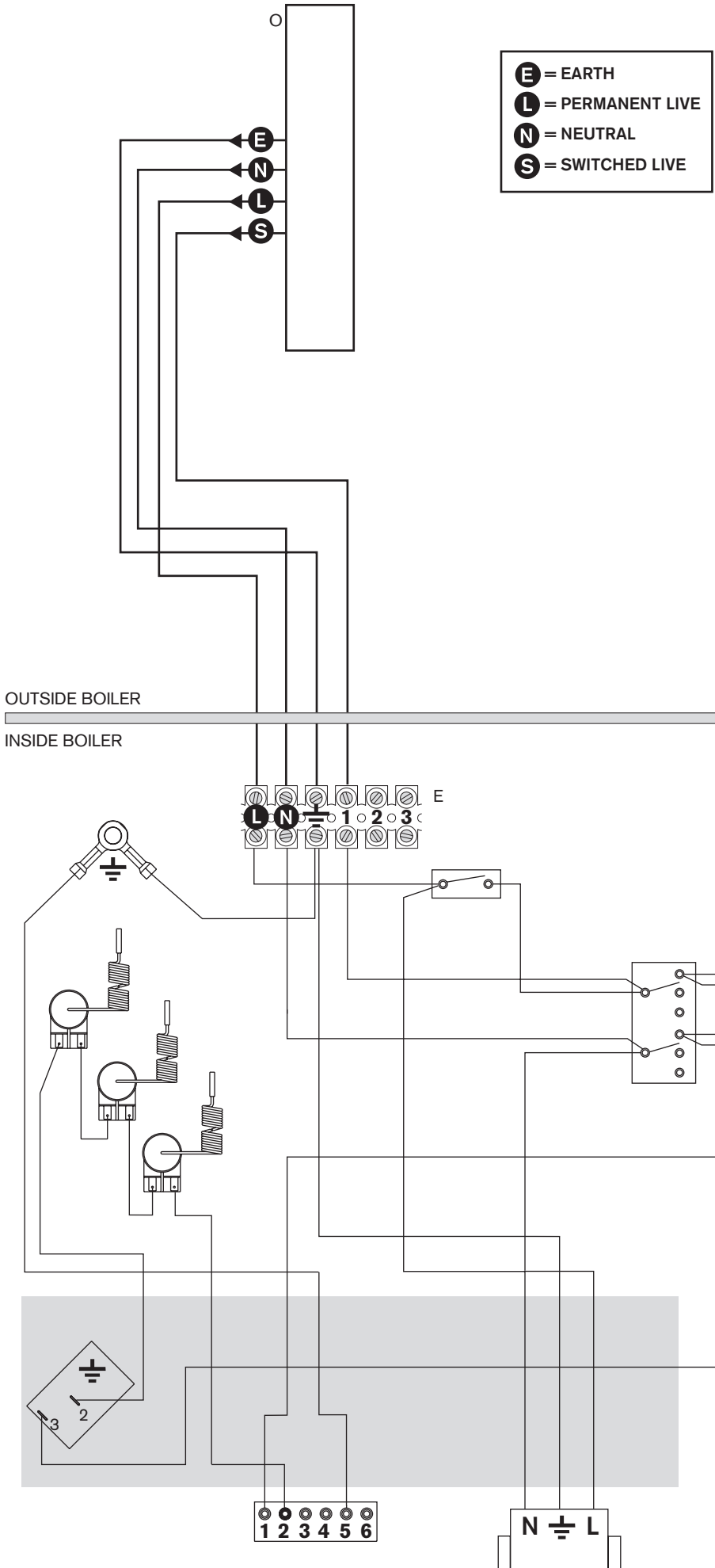
INSTALLATION

230V STANDARD WIRING DIAGRAM:

Key to components:

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- K - FROST THERMOSTAT.
- L - MODE SWITCH.
- M - DEMAND INDICATOR.
- N - SERVICE CONNECTION.
- P - PUMP.





REMOTE 2 OR 3 PORT VALVE CONTROL SET USING REMOTE PROGRAMMER:

Key to components:

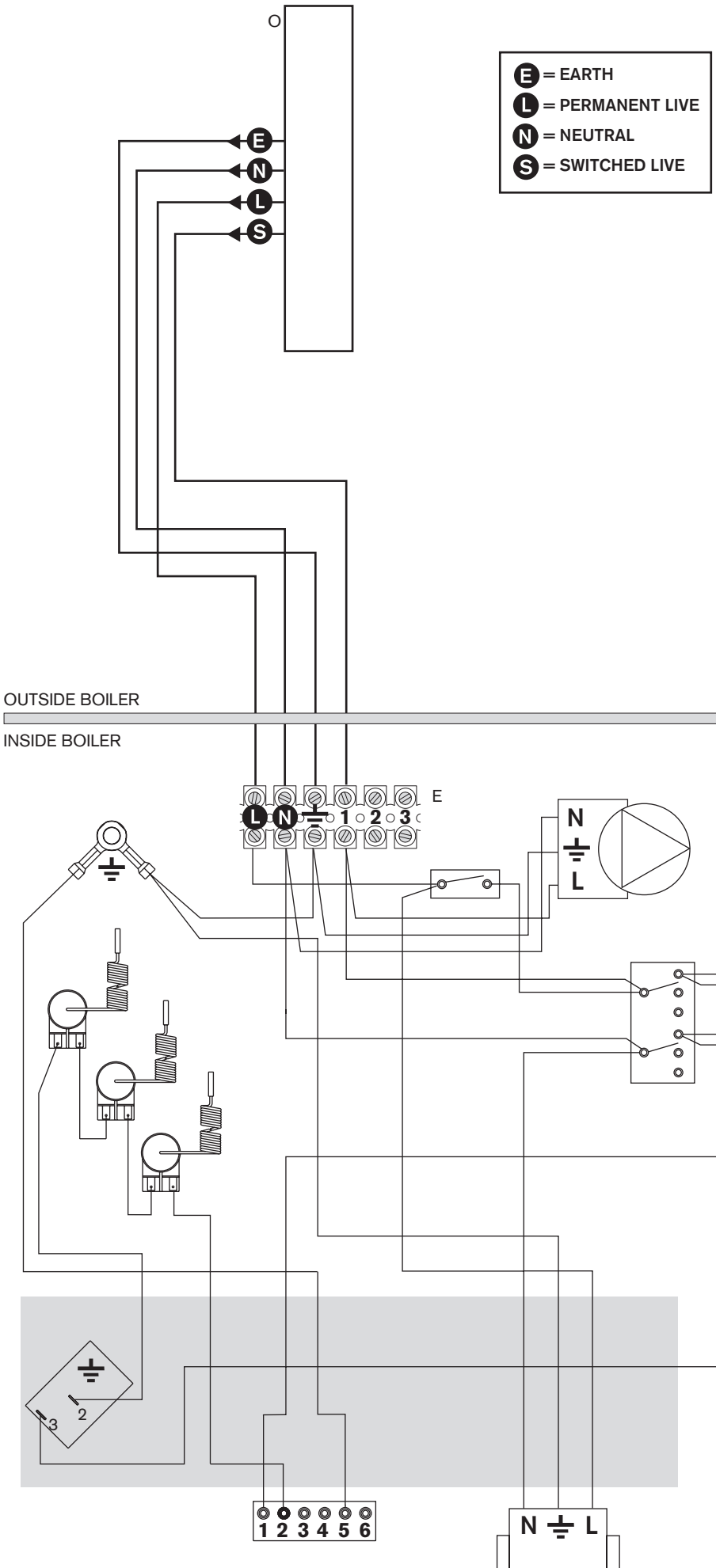
- O - REMOTE JUNCTION BOX (10-way) to connect the following (refer to manufacturers instructions):
 - ▶ Mains wiring 230V 50Hz, fed via a circuit breaker incorporating earth leakage protection.
 - ▶ Hot water tank thermostat.
 - ▶ Room thermostat.
 - ▶ System water valves.
 - ▶ Circulating pump.
 - ▶ External programmer.
- E - TERMINAL CONNECTOR BLOCK.

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.

If an additional frost thermostat is required, it should be connected to the remote junction bo.

INSTALLATION



E = EARTH
L = PERMANENT LIVE
N = NEUTRAL
S = SWITCHED LIVE

REMOTE 2 OR 3 PORT VALVE CONTROL SET USING REMOTE PROGRAMMER:

Key to components:

- O - REMOTE JUNCTION BOX (10-way) to connect the following (refer to manufacturers instructions):
 - ▶ Mains wiring 230V 50Hz, fed via a circuit breaker incorporating earth leakage protection.
 - ▶ Hot water tank thermostat.
 - ▶ Room thermostat.
 - ▶ System water valves.
 - ▶ Circulating pump.
 - ▶ External programmer.
- E - TERMINAL CONNECTOR BLOCK.

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

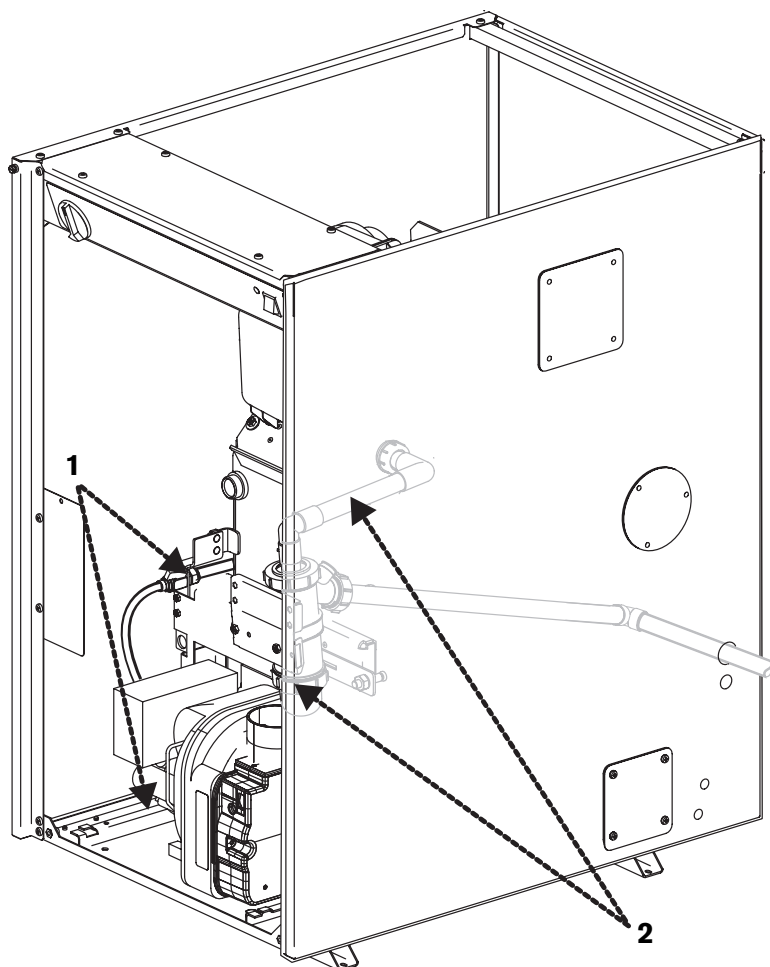
- ▶ The junction box (O) must be a terminal block type, current rated to at least 5 amps.
- ▶ A 5 amp fuse must be fitted to the mains supply.
- ▶ The junction box (O) must be fitted externally to the boiler.

If an additional frost thermostat is required, it should be connected to the remote junction box.

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

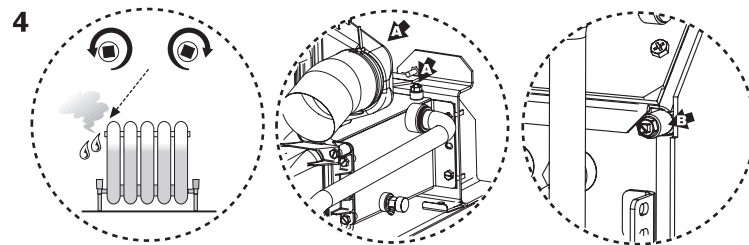
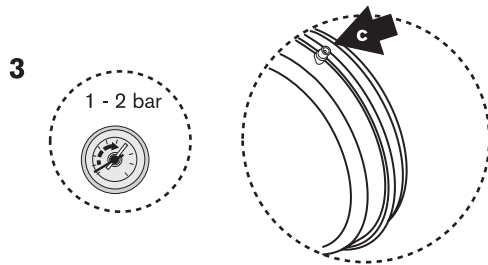
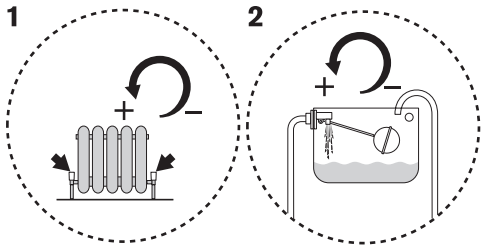
- ▶ Check that the service and water pipes are connected correctly.
- ▶ Check that all unused sockets are plugged.
- 1 ▶ Check that the oil supply is kerosene and that the pipework is connected correctly to the oil pump, via the supplied flexible hose.
- ▶ Check that the burner is seated correctly on its mounting flange and that the oil hose/s are not trapped in front of or underneath the burner.
- ▶ Turn on the main oil supply valve at the tank, check the oil supply pipework and connections. Rectify any leaks.
- ▶ Check the flue is correctly fitted and the connections are secure.
- 2 ▶ Check the condensate pipework is correctly fitted and connected.
- ▶ Check the condensate trap is filled with water.

NOTE: The cabinet is not load bearing, it only provides weather protection for the boiler inside.



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 CD10 or its equivalent, to inform the LABC of the installation.

FILLING THE SYSTEM



- 1 ▶ Open all system and radiator valves.
 - ▶ Turn on the water main stop cock.
- 2 ▶ Open vented systems only:
 - ▶ Turn on the water to the system feed and expansion cistern and allow the system to fill.
- 3 ▶ Sealed systems only:
 - ▶ Check and if required, adjust the expansion vessel pressure using the Schraeder type valve (C) before filling the system.

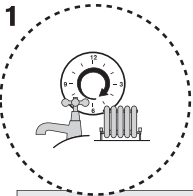
The charge pressure of the built-in 12 Litre expansion vessel is 0.5 bar as dispatched, which is equivalent to a static head of 5m.

Total system volume (litres)	Initial system pressure (bar)	Initial charge pressure (bar)
180	0.5	0.5
107	1.0	0.5
138	1.0	1.0

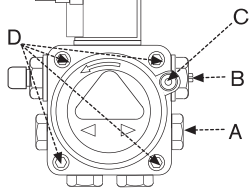
If an extra expansion vessel is fitted to the central heating return, adjust this to the same pressure as the appliance internal expansion vessel, refer to separate instructions supplied with the extra expansion vessel.

- ▶ Fill the system to between 1 and 1.5 bar pressure via a WRAS approved filling link.
 - ▶ Monitor the pressure gauge during venting and repressurise if required.
- 4 ▶ Vent all radiators, retighten when completed.
 - ▶ Check the system and correct any leaks.
 - ▶ Bleed air from the central heating pump bleed screw.
 - ▶ 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).

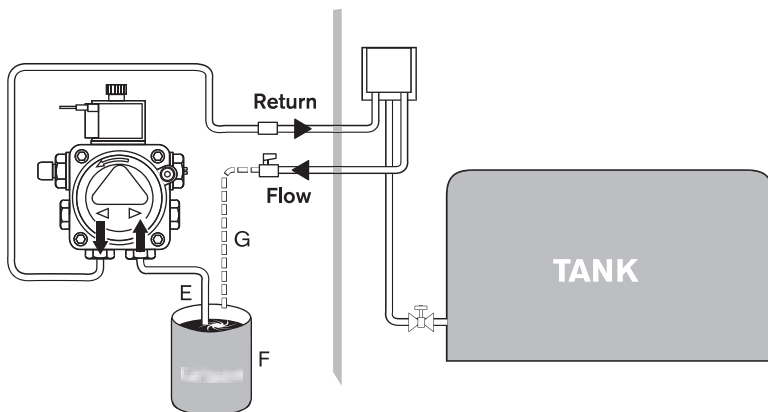
STARTING THE APPLIANCE



RIELLO RDB OIL PUMP

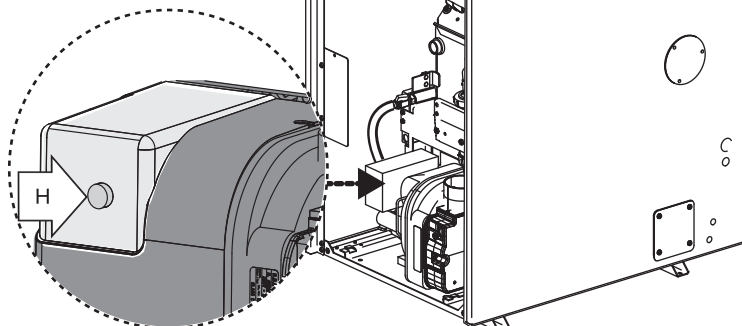


- A - Bleed & pressure gauge port
- B - Pressure adjustment
- C - Vacuum gauge port
- D - Retaining screws - cover



BURNER LOCKOUT INDICATOR/ RESET BUTTON

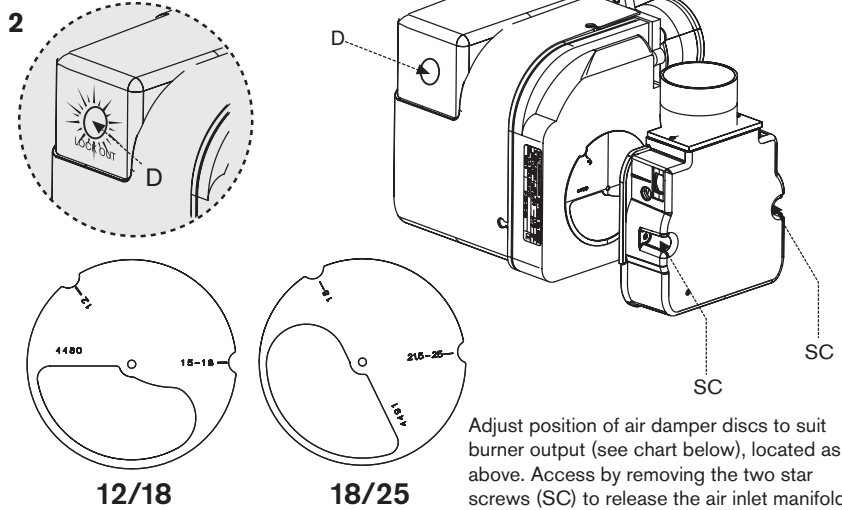
(On the burner control box)



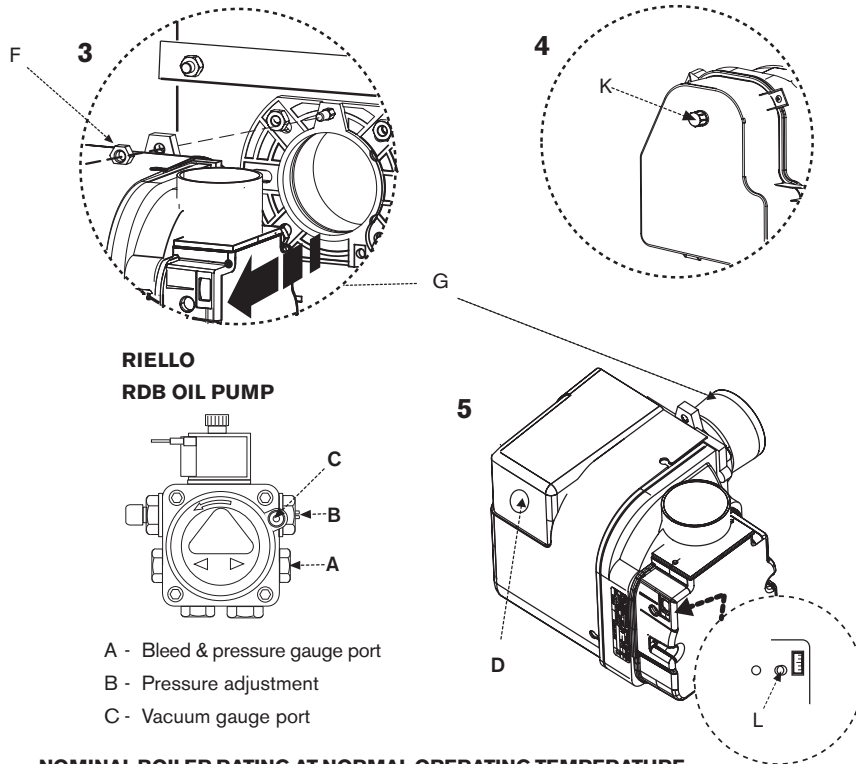
IMPORTANT: Never run the appliance when the appliance/system is unpressurised (sealed systems) or empty.

- 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 at least 2½ litres of 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:**
 - ▶ To prime a de-aerator, disconnect the flexible oil inlet hose (E) from the isolation valve and place in a container of kerosene (F). Connect a spare flexible oil hose (G), to discharge into container (F). 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 (F). Turn off the boiler then reconnect the flexible oil inlet hose (E).
 - ▶ 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 electricity supply to the boiler.
 - ▶ Set the programmer to ON.
 - ▶ Set the boiler mode switch to ON.
 - ▶ Turn on the thermostat control to MAX.
 - ▶ Allow the burner to run through to 'lock-out' indicated by the illumination of the lockout indicator on the lockout reset button (H).
 - ▶ Wait 2 minutes then press the lockout reset button (H).
 - ▶ 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 (A).
 - ▶ Switch off the boiler.
 - ▶ 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.

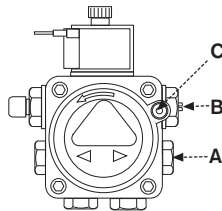
STARTING THE APPLIANCE



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.



RIELLO RDB OIL PUMP



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

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 ₂	APPROX. AIR SETTING	INPUT (APPLIANCE) kW	OUTPUT (APPLIANCE) kW	AIR DAMPER DISC SETTING	BURNER HEAD
		Kg/h	l/h							

Boiler 12/18 RDB 1

0.40 60°ES	100	1.04	1.32	64	11.5	3.0	12.3	12.0	12	LD 2X SH 12/18
0.45 60°ES	120	1.28	1.63	73	11.5	3.5	15.4	15.0	15-18	LD 2X SH 12/18
0.55 80°EH	105	1.54	1.96	76	11.5	5.5	18.5	18.0	15-18	LD 2X SH 12/18

Boiler 18/25 RDB 2.2

0.55 80°EH	115	1.58	1.96	75	11.0	4.5	18.5	18.0	18	T2 SH 18/25
0.60 60°ES	115	1.84	2.33	77	12.0	2.5	22.1	21.5	21.5-25	T2 SH 18/25
0.75 80°ES	110	2.15	2.72	82	12.5	3.75	25.7	25.0	21.5-25	T2 SH 18/25

Boiler 25/32 RDB 2.2

*0.65 80°EH	140	2.15	2.72	80	11.0	4.5	25.7	25.0	N/A	T2 L/H 25/32
0.75 80°EH	125	2.37	3.0	81	12.0	4.0	28.3	27.5	N/A	T2 L/H 25/32
0.85 80°EH	125	2.58	3.27	83	12.5	4.5	30.8	30.0	N/A	T2 L/H 25/32

* 25/32 model for 25kW remove the plastic air guide (see following page).

- 2 ▶ Remove plastic cover from the burner casing.
 - ▶ 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.
- NOTE: For 25/32 appliance see following page.**

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 (D).

- ▶ 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 cap (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 CO₂ 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.

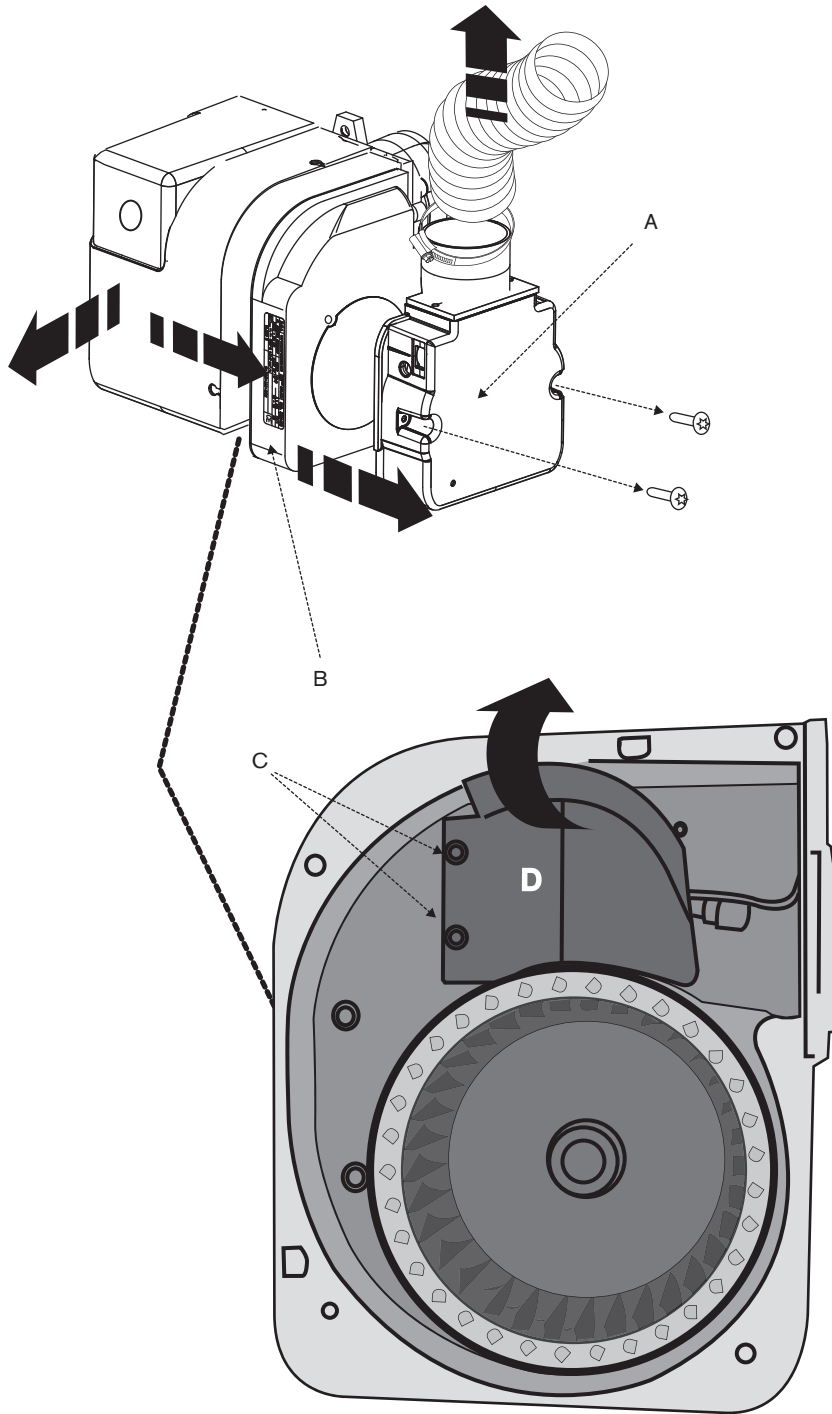
- ▶ Turn off the electrical supply.
- ▶ Isolate the oil supply to the burner.
- ▶ Remove the oil pressure gauge.
- ▶ Refit the blanking plug (A).
- ▶ Check and rectify any oil leaks.
- 5 ▶ Switch on the oil supply.
- ▶ Switch on the electrical supply.
- ▶ Restart the boiler and run for 5 minutes.
- ▶ Recheck the CO₂ levels and if required, adjust the air shutter setting (L) to obtain the correct CO₂ level.
- ▶ Refit the sample point cap (hand tighten only, do not over tighten) and refit the burner cover.

STARTING THE APPLIANCE

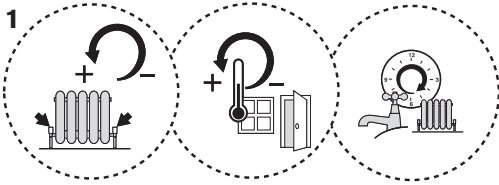
On 25/32 Appliances:

To achieve the minimum output of 25kW from the 25/32 RDB 2.2 it is necessary to remove the air guide (D) from the burner. For any other required output the air guide must remain in place.

- ▶ Disassemble the burner, removing the red plastic cover, flexible air hose and air intake manifold (A).
- ▶ Remove the fan housing (B) by undoing the four securing screws.
- ▶ Remove the two screws (C) securing the plastic air guide.
- ▶ Remove air guide (D) and reassemble the burner in reverse order.



STARTING THE APPLIANCE

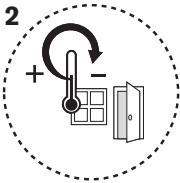


Central heating:

- 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 (B) to max.

The demand indicator (A) should illuminate and the burner should be ON with the circulating pump. On External System models only, the system pressure gauge (C) should read between 1 and 1.5 bar.

- ▶ 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.

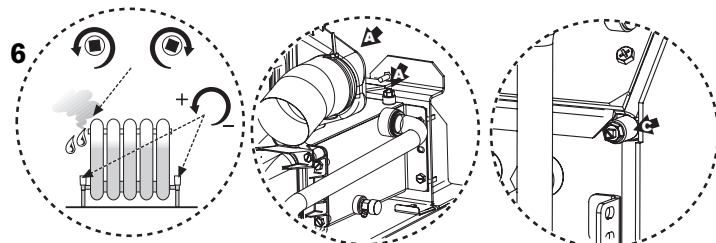
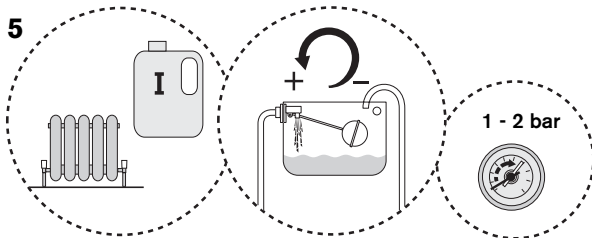
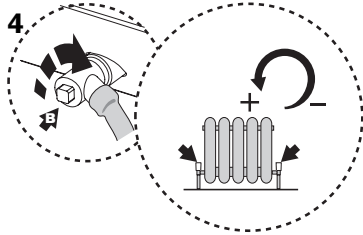
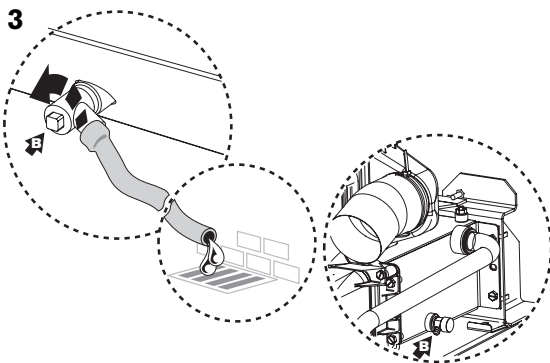
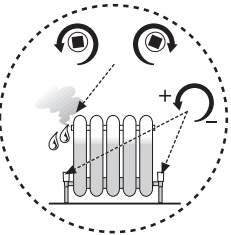
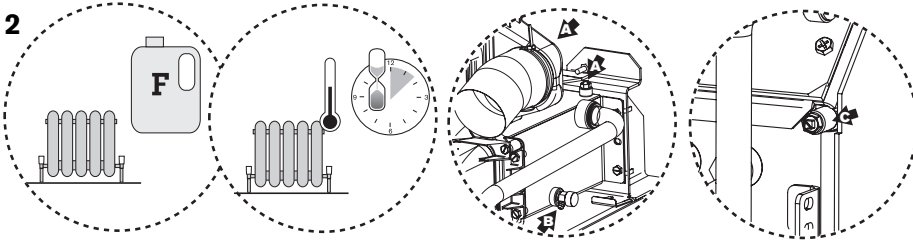
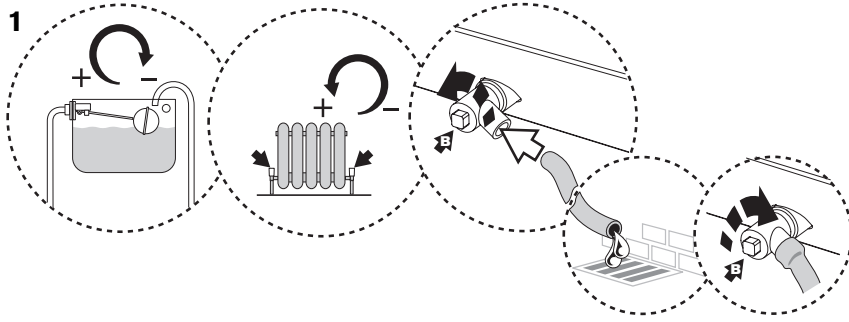


- 2 ▶ Set the room thermostat to minimum. *The demand indicator light (A), burner and circulating pump should be off.*

- 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 and thoroughly flush the system to remove the flushing agent and debris (B).

INHIBITOR (Central Heating):

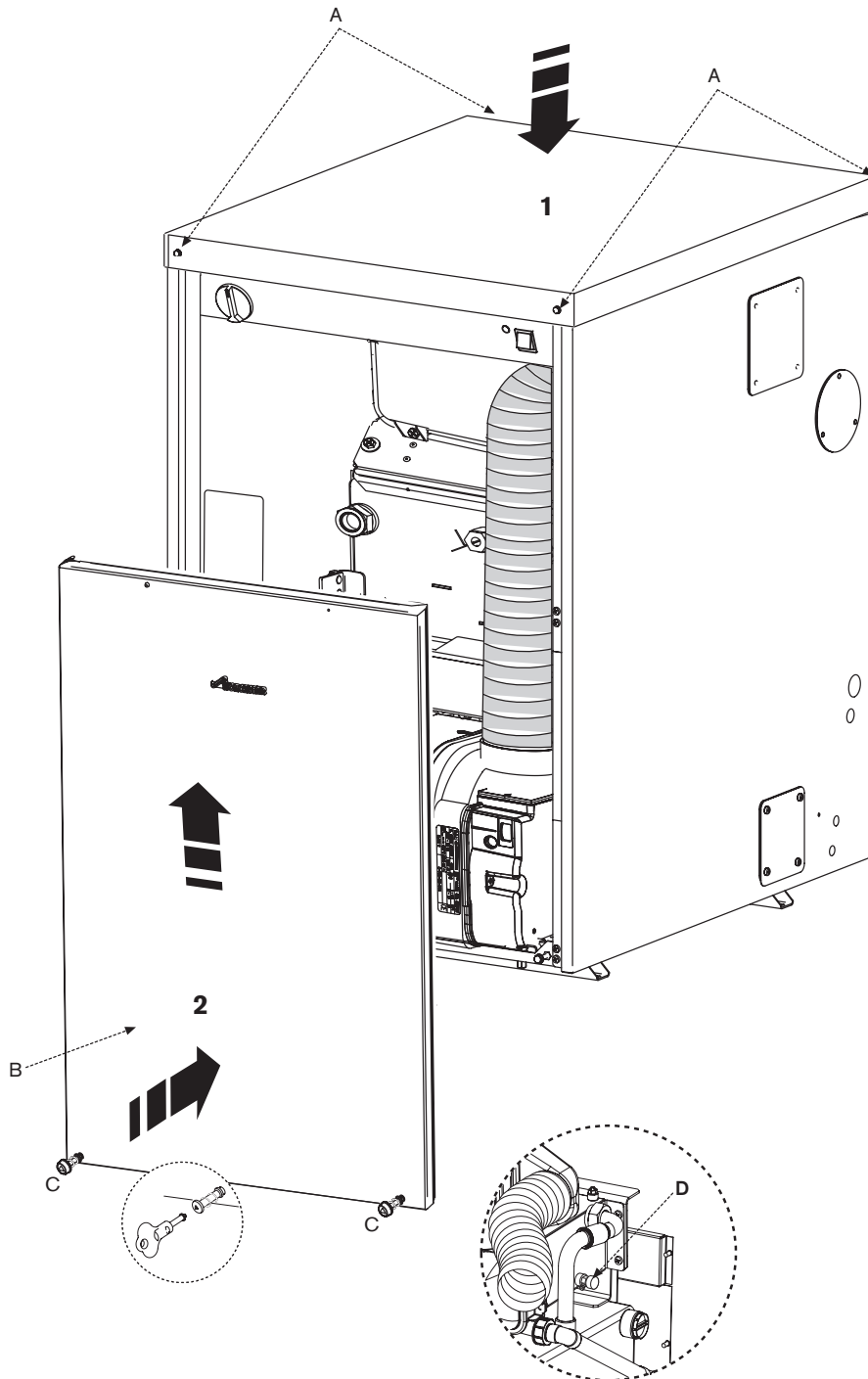
- 4 ▶ Check drain cocks (B) and manual air vents are closed and all radiator valves are open.
- 5 ▶ Add a suitable inhibitor (I), (or combined inhibitor/anti-freeze if the system is exposed to freezing conditions) to the heating system in accordance with the manufacturers instructions.

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 1.5 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 .



- 1 ▶ Refit the top panel and press down to compress the seal when fitting the securing screws (A).
- 2 ▶ Push the front panel (B) up behind the top panel and push in at the base to secure with the screws (C) using the tool provided. Always apply pressure at the edges of the boiler panels when securing to avoid accidental damage

COMMISSIONING

Handover:

- ▶ Complete the Guarantee Registration Card, Combustion Record (page 47) and a 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.
- ▶ The drain points are normally on the lowest points of the system.

NOTE: Release drain point (D) to drain the secondary heat exchanger.

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

DO NOT USE PRESSURE WASHERS OR STEAM CLEANERS ON THIS APPLIANCE OR ITS CABINET.

WARNING: EXTERNAL EQUIPMENT OPERATED AT 230 VOLTS SHOULD NOT BE SERVICED OR REPAIRED UNDER ADVERSE WEATHER CONDITIONS

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 at the base of the front panel using the tool provided and pull the panel out and down to remove. Store safely away from the working area.

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

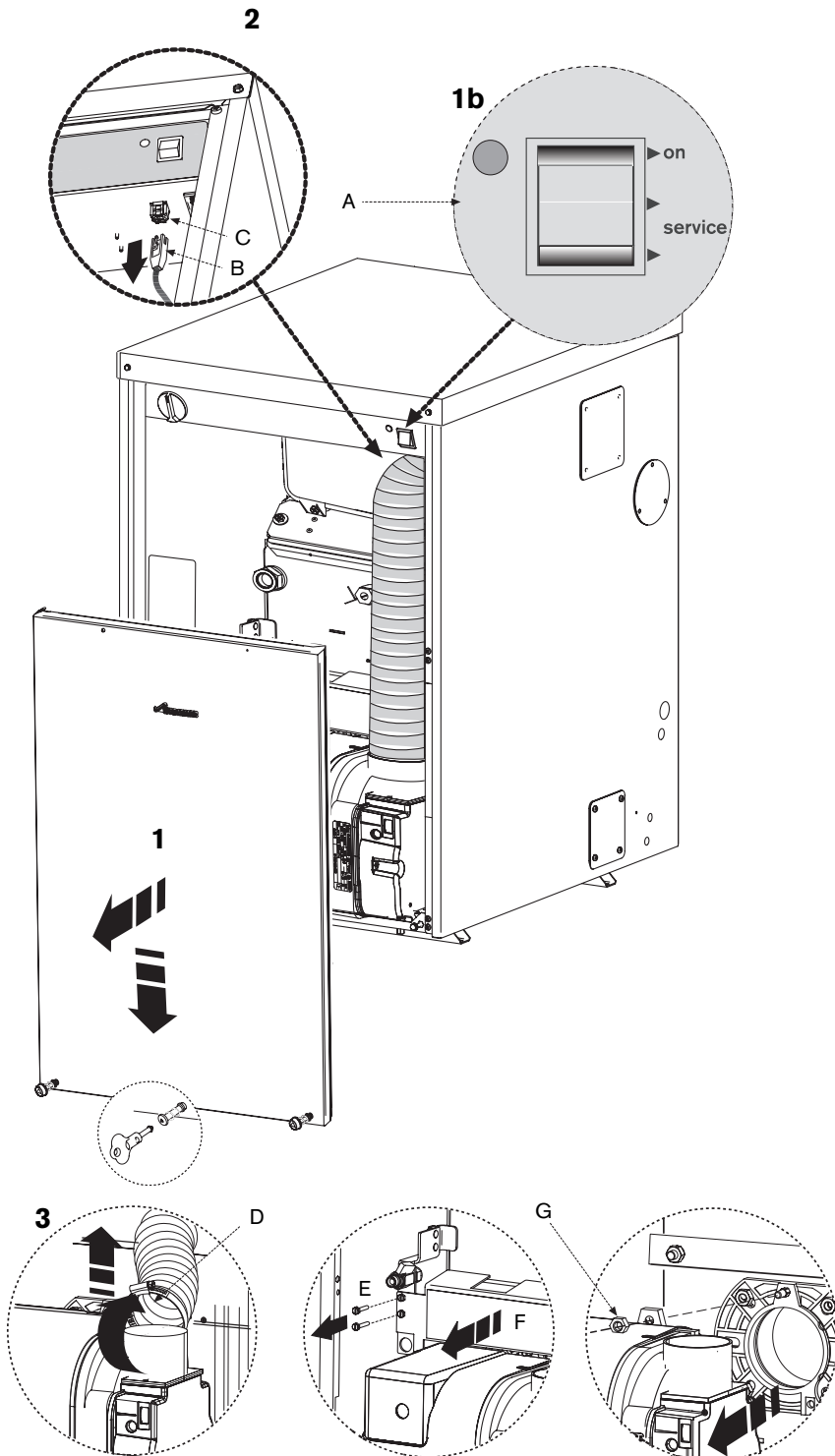
- 1b ▶ Switch into service mode at switch (A).
- 2 ▶ Depress locking ears and unplug burner lead (B) from control box (C).

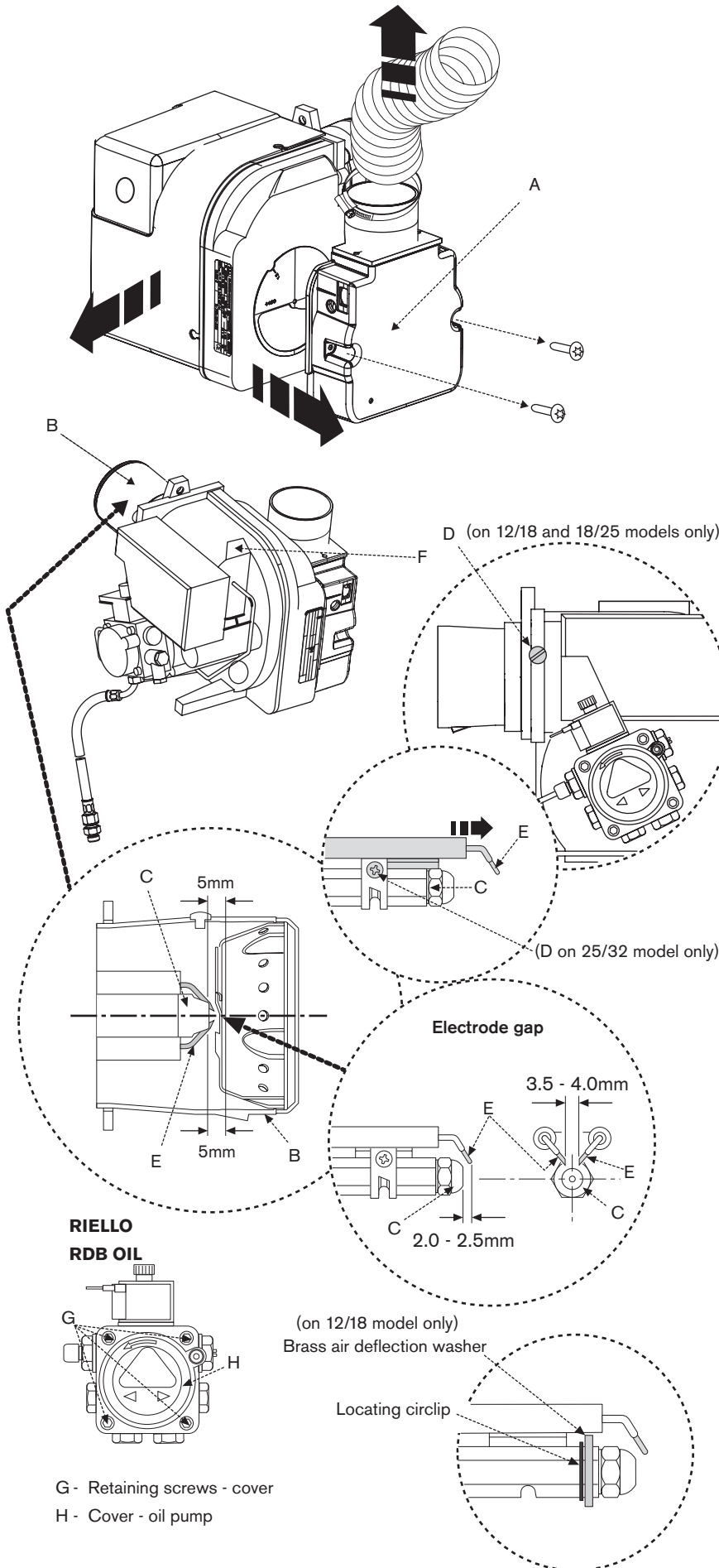
 - An adapter lead is available to allow mains voltage service aids to be operated from the service connection. (Service lead Part No. 8 716 113 483 0).

- 3 ▶ Loosen clip (D) to detach air duct.
 - ▶ Undo the two screws securing the deflector plate (E) and remove the plate (F).
 - ▶ Unscrew burner retainer nut (G) and gently pull burner forward to remove from combustion chamber door.

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

- ▶ Check and clean the burner.
- ▶ Replace burner nozzle and flexible oil hose/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 and Camray External System boilers:** The PRV is a safety device and must be checked for correct operation. The expansion vessel pressure must be checked and adjusted if necessary.





1 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) to match boiler output.**

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

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

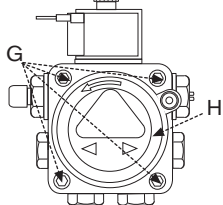
NOTE: The 12/18 model has a brass air deflection washer and locating circlip behind the nozzle. These must be in place for the correct operation of the burner.

- ▶ Refit the combustion head (B). Check that the nozzle (C) lies centrally 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 hose 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 cabinet.**

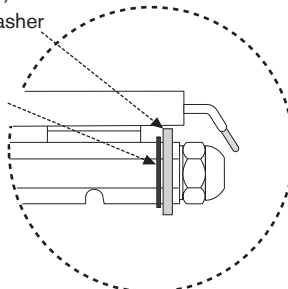
**RIELLO
RDB OIL**



G - Retaining screws - cover
H - Cover - oil pump

(on 12/18 model only)
Brass air deflection washer

Locating circlip



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:

- ▶ Remove top cover by releasing the screws (A) at each corner and lift free.
- ▶ Release screws (B) to remove the flue manifold access cover (C) and clear any debris.
- ▶ Check the condensate route (D) is clear and clean the condensate trap and pipework.
- ▶ Check the flue system and clean if necessary.
- ▶ 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).
- ▶ Check the seal on the manifold access cover (C) and replace if necessary.
- ▶ Refit the flue manifold access cover (C) and secure with screws (B).

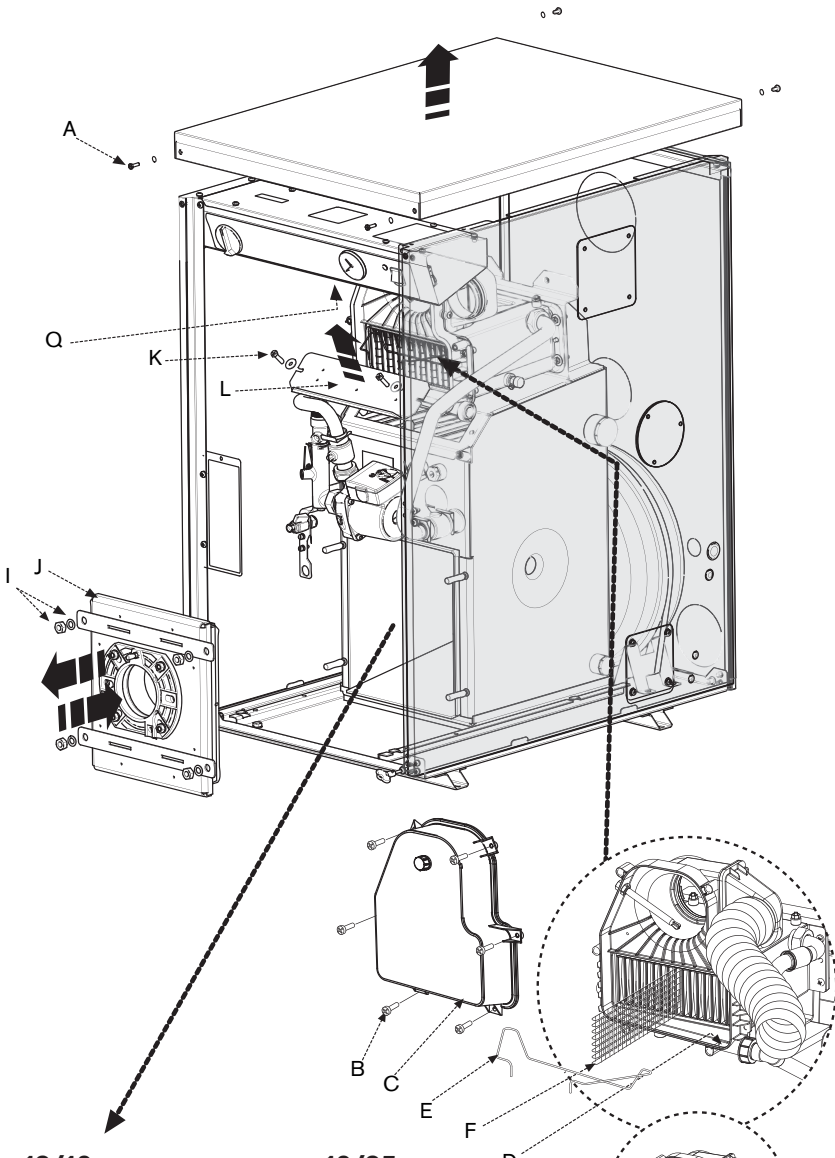
Combustion chamber:

- ▶ Release the M10 retaining nuts and washers (1) and remove combustion chamber access door (J).
- ▶ Check the fibreglass rope seal on the combustion chamber access door (J) and replace if necessary.
- ▶ Remove the 2 screws (K) and baffle access panel (L) located at the top of the primary heat exchanger and remove the baffle retainers (M).
- ▶ Remove the baffles (N) and restrictor plate/s (O, not on 25/32 model), clean and check the condition of the baffles and the restrictor plate/s. Replace any parts considered to be badly corroded/degraded.
- ▶ Remove the acoustic insulation insert (P) on 25/32 models only.
- ▶ 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.
- ▶ Check the condition of the baffle access panel seal.
- ▶ Refit the acoustic insulation insert (P) on 25/32 models only.
- ▶ Refit the items in reverse order ensure the baffles (N), baffle retainers (M) and restrictor plate/s (O, not on 25/32 model) are correctly fitted for the boiler output as shown in the plan view opposite.
- ▶ Refit baffle access panel (L).
- ▶ Refit combustion chamber access door (J).
- ▶ Secure with nuts and washers (1) and tighten until the door is firmly secured using the sequence shown opposite. Do not over tighten the nuts.

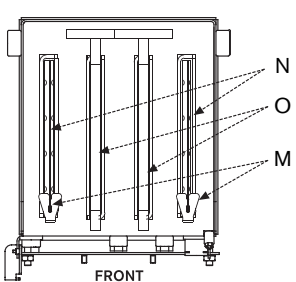
Fire valve:

- ▶ Check that the oil supply pipe has a fire valve fitted at least 1m from the appliance with the fire valve sensor located within the appliance case. A fire valve sensor clip (Q) is provided for this purpose.

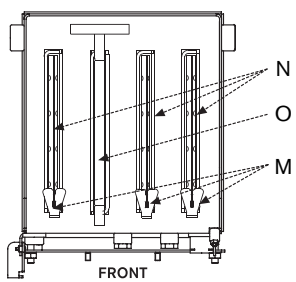
SERVICING & SPARES



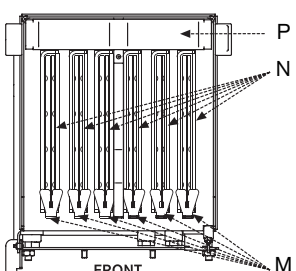
12/18
Plan sectional view



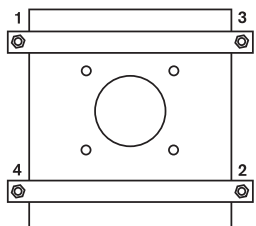
18/25
Plan sectional view



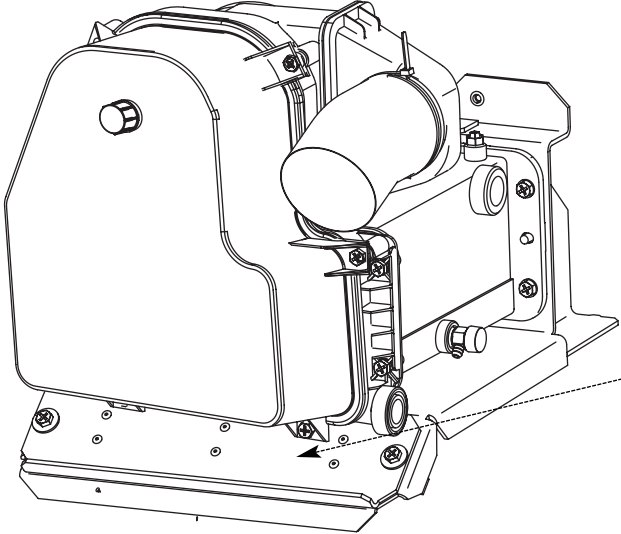
25/32
Plan sectional view



IMPORTANT when refitting the combustion chamber access door (4)

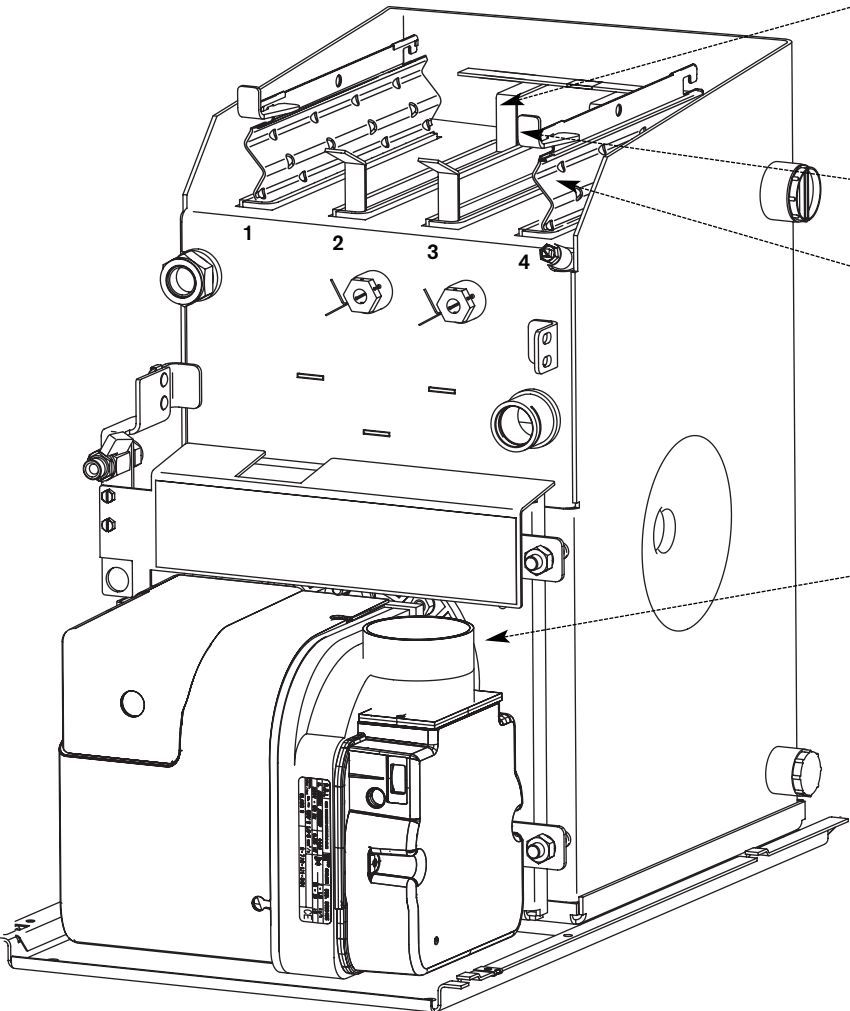


Combustion chamber access door tightening sequence.



12/18 MODEL SHOWN

BAFFLE ACCESS DOOR



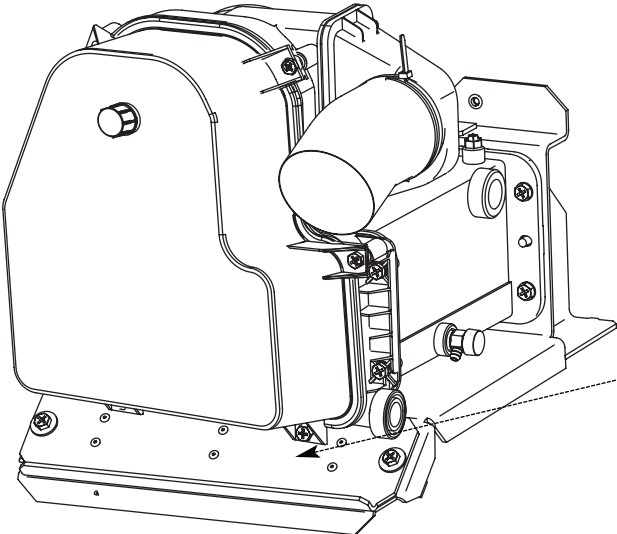
RESTRICTOR PLATE
2 for 12/18 models, fitted into tubes 2 & 3.
Remove and fit through baffle access door.

BAFFLE RETAINER
Remove and fit through baffle access door.

BAFFLE
2 for 12/18 models, fitted in tubes 1 & 4.
Lift baffle to remove the baffle retainer then pull down to remove the baffle through the combustion chamber.

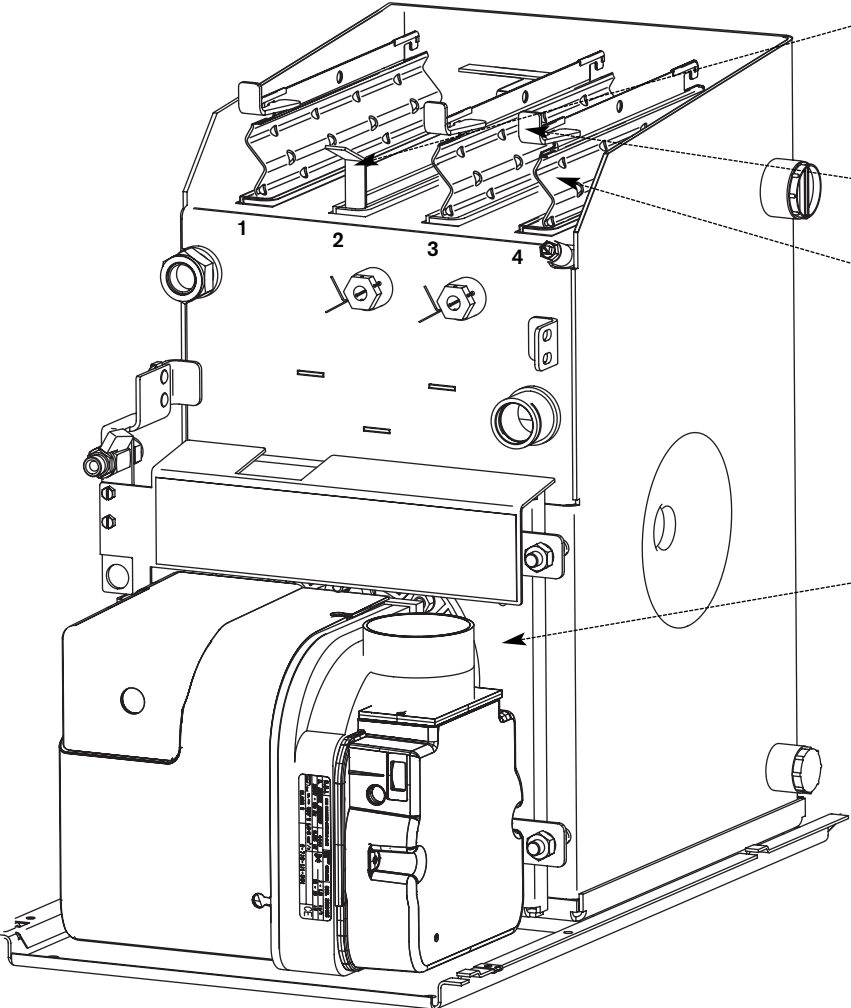
COMBUSTION CHAMBER ACCESS DOOR

SERVICING & SPARES



18/25 MODEL SHOWN

BAFFLE ACCESS DOOR



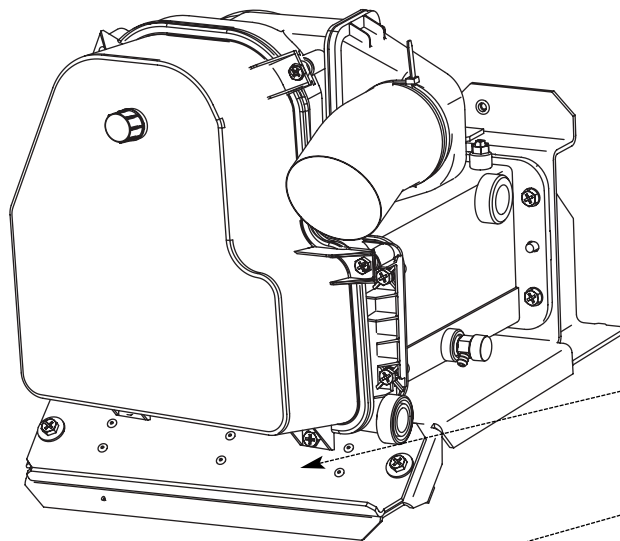
RESTRICTOR PLATE
1 for 18/25 models, fitted into tube 2.
Remove and fit through baffle access door.

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.

COMBUSTION CHAMBER ACCESS DOOR

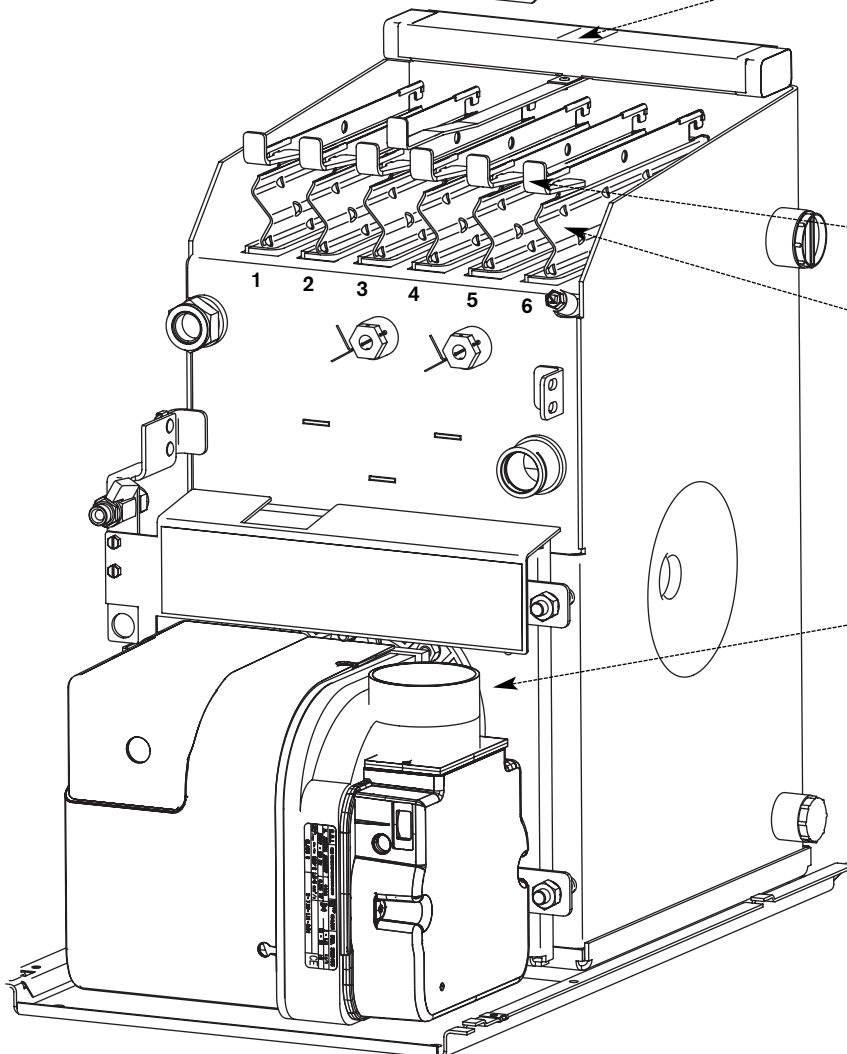
SERVICING & SPARES



25/32 MODEL SHOWN

BAFFLE ACCESS DOOR

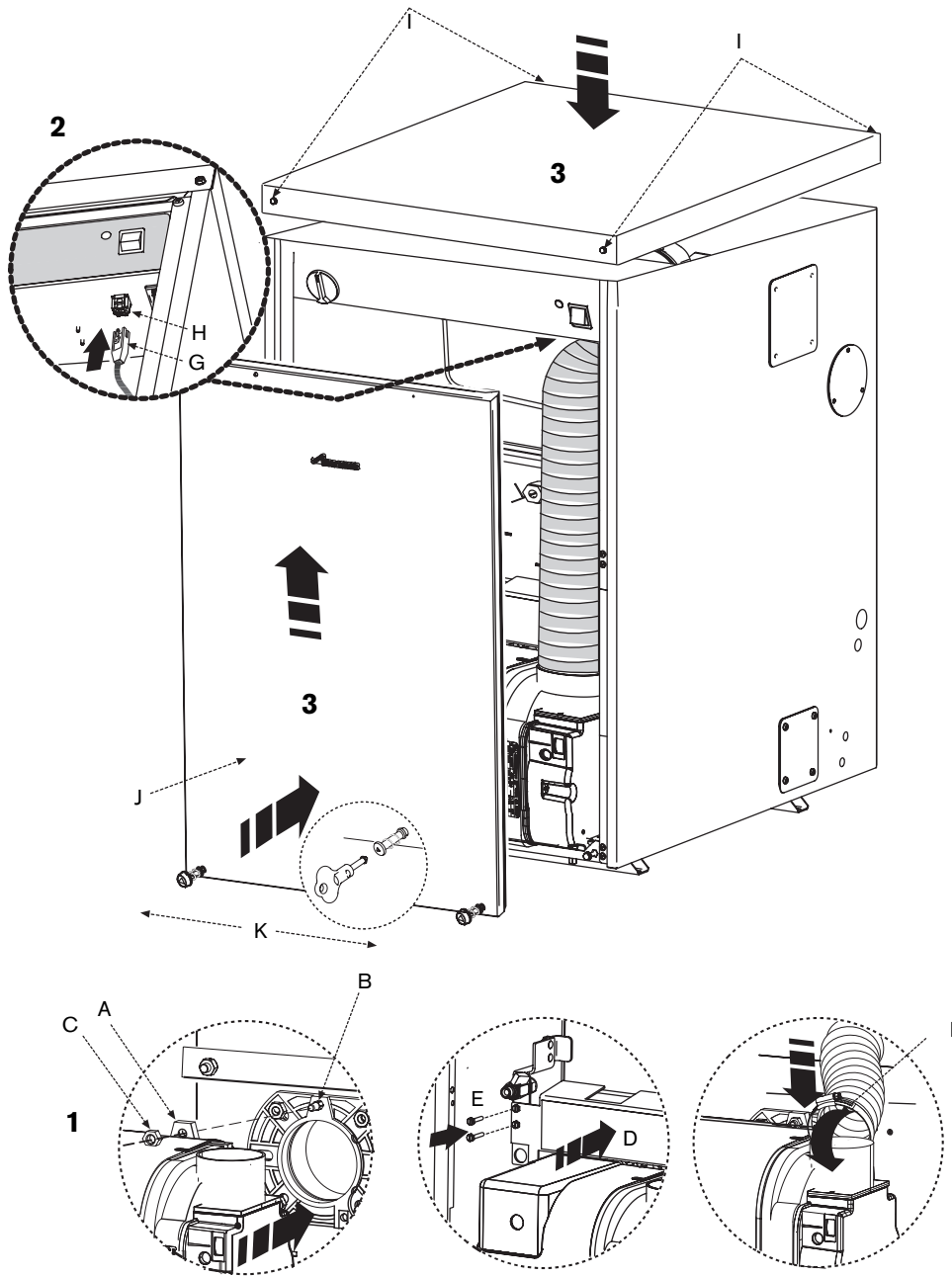
**ACOUSTIC INSULATION INSERT
(25/32 models only)
Remove last. Refit first.**



BAFFLE RETAINER
Remove and fit through baffle access door.

BAFFLE
6 for 25/32 models, fitted in all 6 tubes
Lift baffle to remove the baffle retainer then pull down to remove the baffle through the combustion chamber.

COMBUSTION CHAMBER ACCESS DOOR



Re-commission the burner:

- 1 ▶ Align burner combustion head into boiler collar.
 - ▶ 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 do not overtighten.
 - ▶ Check that the burner is seated correctly on its mounting flange and that the oil hose/s are not trapped in front of or underneath the burner.
 - ▶ Refit the deflector plate (D) and secure with screws (E). Ensure that the flexible oil pipe/s are not positioned between the deflector plate and the combustion chamber door.
 - ▶ Attach air duct pipe and tighten clip (F) to secure to the burner air intake.

IMPORTANT:
 Ensure the gasket is a good seal between the burner combustion head and the boiler housing to prevent flue gases escaping.

- 2 ▶ Plug burner lead (G) into control box (H).
 - ▶ 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 the smoke reading is 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 below, adjust the CO₂ if necessary using the air shutter. When the combustion is correct turn off the boiler, remove the pressure gauge and refit the sample point cap, (hand tighten only, do not over tighten) and refit the plastic cover.

Refit panels:

- 3 ▶ Refit the top panel and press down to compress the seal when fitting the securing screws (I).
 - ▶ Push the front panel (J) up behind the top panel and push in at the base to secure with the twist lock screws (K) using the tool provided.

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.

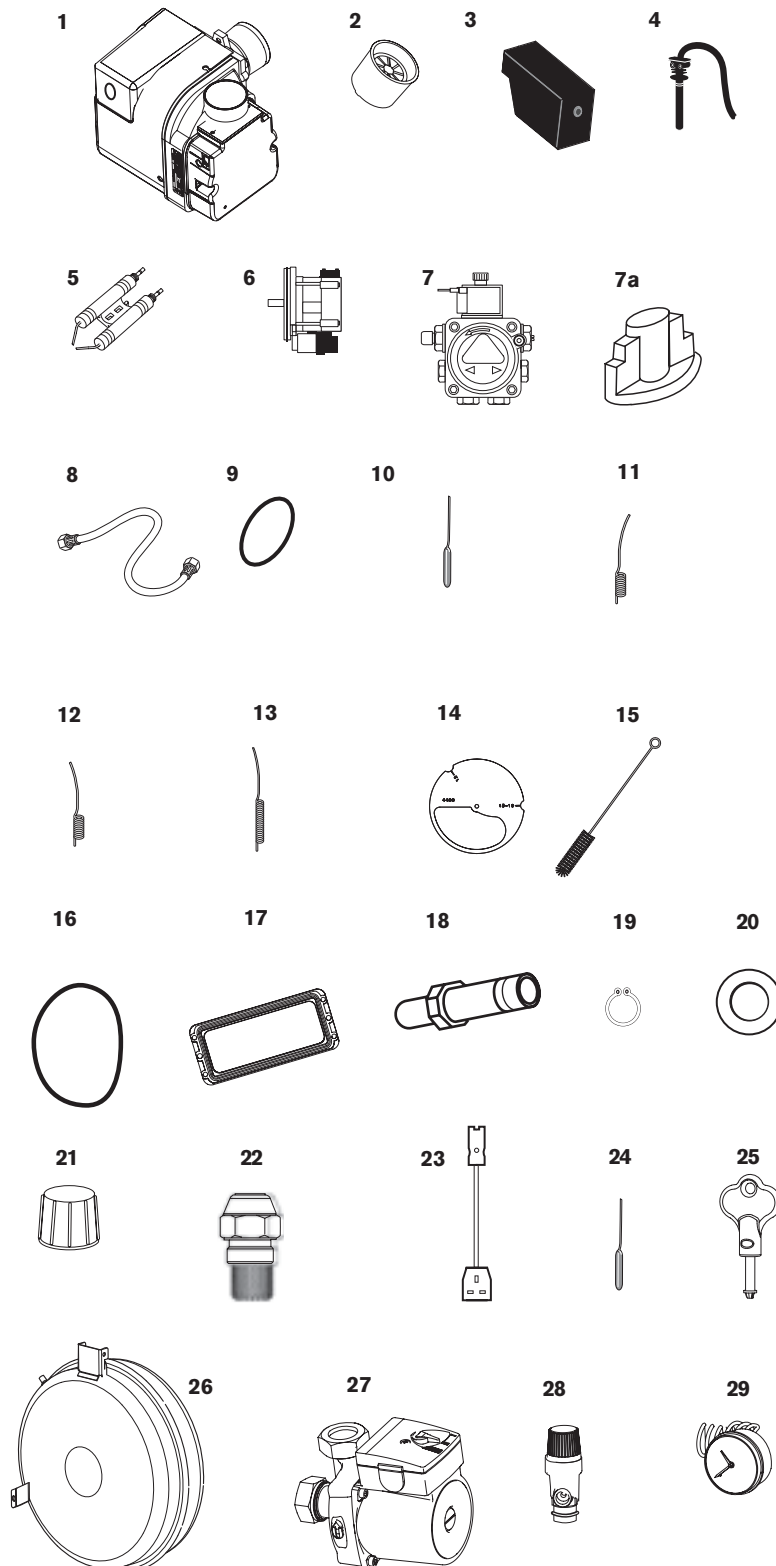
* 25/32 model for 25kW remove the plastic air guide (see page 38).

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

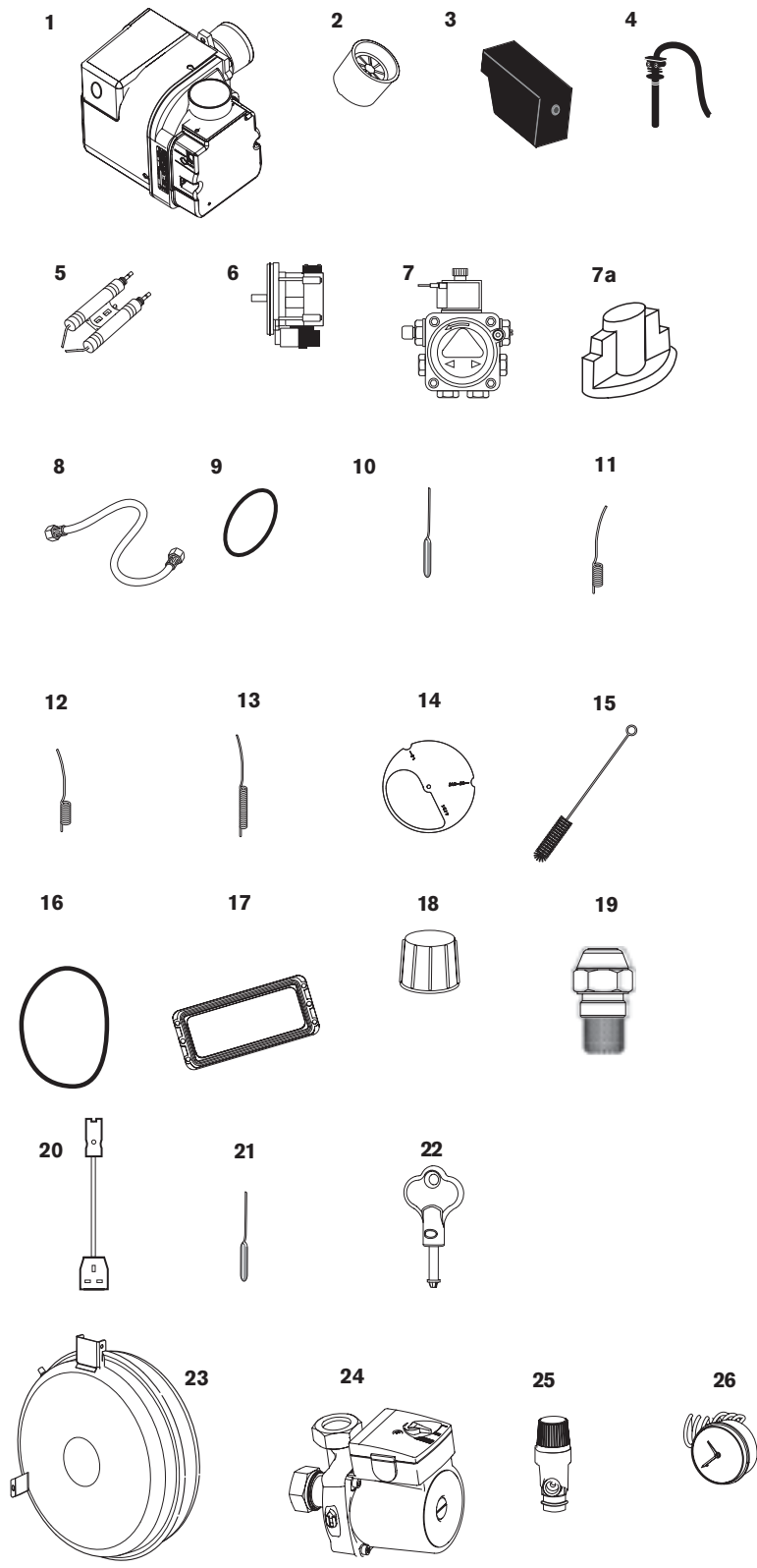
NOZZLE	OIL PUMP PRESSURE (p.s.i.)	FUEL FLOW RATE		APPROX. FLUE GAS TEMP °C	%CO ₂	APPROX. AIR SETTING	INPUT (APPLIANCE)	OUTPUT (APPLIANCE)	AIR DAMPER DISC SETTING	BURNER HEAD
		Kg/h	l/h				kW	kW		
Boiler 12/18 RDB 1										
0.40 60°ES	100	1.04	1.32	64	11.5	3.0	12.3	12.0	12	LD 2X SH 12/18
0.45 60°ES	120	1.28	1.63	73	11.5	3.5	15.4	15.0	15-18	LD 2X SH 12/18
0.55 80°EH	105	1.54	1.96	76	11.5	5.5	18.5	18.0	15-18	LD 2X SH 12/18
Boiler 18/25 RDB 2.2										
0.55 80°EH	115	1.58	1.96	75	11.0	4.5	18.5	18.0	18	T2 SH 18/25
0.60 60°ES	115	1.84	2.33	77	12.0	2.5	22.1	21.5	21.5-25	T2 SH 18/25
0.75 80°ES	110	2.15	2.72	82	12.5	3.75	25.7	25.0	21.5-25	T2 SH 18/25
Boiler 25/32 RDB 2.2										
*0.65 80°EH	140	2.15	2.72	80	11.0	4.5	25.7	25.0	N/A	T2 L/H 25/32
0.75 80°EH	125	2.37	3.0	81	12.0	4.0	28.3	27.5	N/A	T2 L/H 25/32
0.85 80°EH	125	2.58	3.27	83	12.5	4.5	30.8	30.0	N/A	T2 L/H 25/32

SERVICING & SPARES

SHORT PARTS LIST 12/18



- 1 Burner - Riello RDB 1 12/18 HE**
Part Number: 8 716 111 951 0
- 2 Combustion head - LD2X SH12/18**
Part Number: 8 716 112 731 0
- 3 Control box 535 RSE/LD**
Part Number: 8 716 109 203 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: 8 716 112 730 0
- 9 Burner 'O' ring**
Part Number: 8 716 109 328 0
- 10 Control thermostat**
Part Number: 8 716 142 390 0
- 11 Auto reset overheated thermostat**
Part Number: 8 716 142 391 0
- 12 Manual reset overheated thermostat**
Part Number: 8 716 142 392 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 Manifold access cover seal**
Part Number: 8 716 107 536 0
- 17 Secondary Heat Exchanger gasket**
Part Number: 8 716 112 954 0
- 18 Nozzle holder**
Part Number: 8 716 112 777 0
- 19 Circlip**
Part Number: 8 716 112 773 0
- 20 Brass air restrictor washer**
Part Number: 8 716 112 729 0
- 21 Flue sample point cap**
Part Number: 8 716 113 177 0
- 22 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
0.55 80° EH (18kW output)
Part Number: 8 716 156 671 0
- 23 Service lead**
Part Number: 8 716 113 483 0
- 24 Frost stat**
Part Number: 8 716 142 393 0
- 25 Spare 1/4 turn cabinet key**
Part Number: 8 716 114 013 0
- EXTERNAL SYSTEM ONLY**
- 26 Expansion vessel**
Part Number: 8 716 142 507 0
- 27 Pump**
Part Number: 8 716 112 293 0
- 28 Pressure relief valve**
Part Number: 8 716 142 422 0
- 29 System pressure gauge**
Part Number: 8 716 107 638 0



1 Burner - Riello RDB 2.2 18/25 HE

Part Number: 8 716 112 346 0

2 Combustion head - T2 SH18/25

Part Number: 8 716 112 780 0

3 Control box 535 RSE/LD

Part Number: 8 716 109 203 0

4 Photocell

Part Number: 8 716 109 193 0

5 Ignition electrode

Part Number: 8 716 109 183 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: 8 716 112 730 0

9 Burner 'O' ring

Part Number: 8 716 109 328 0

10 Control thermostat

Part Number: 8 716 142 390 0

11 Auto reset overhear thermostat

Part Number: 8 716 142 391 0

12 Manual reset overhear thermostat

Part Number: 8 716 142 392 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 Manifold access cover seal

Part Number: 8 716 107 536 0

17 Secondary Heat Exchanger gasket

Part Number: 8 716 112 954 0

18 Flue sample point cap

Part Number: 8 716 113 177 0

19 Oil nozzle

0.55 80° EH (18kW output)

Part Number: 8 716 156 671 0

0.60 60° ES (21.5kW output)

Part Number: 8 716 156 680 0

0.75 80° ES (25kW output)

Part Number: 8 716 109 387 0

20 Service lead

Part Number: 7 716 113 483 0

21 Frost stat

Part Number: 8 716 142 393 0

22 Spare 1/4 turn cabinet key

Part Number: 8 716 114 013 0

EXTERNAL SYSTEM ONLY

23 Expansion vessel

Part Number: 8 716 142 507 0

24 Pump

Part Number: 8 716 112 293 0

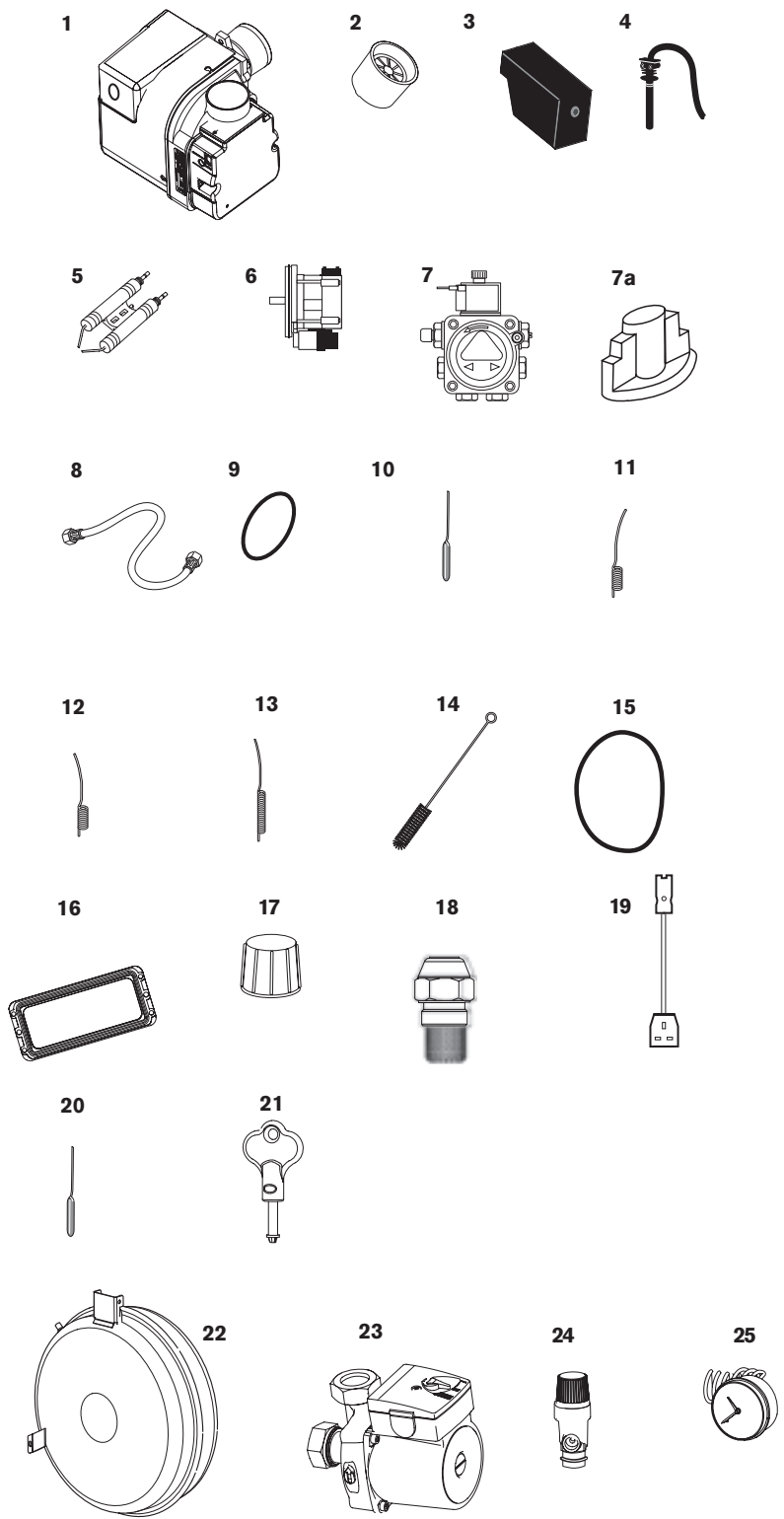
25 Pressure relief valve

Part Number: 8 716 142 422 0

26 System pressure gauge

Part Number: 8 716 107 638 0

SERVICING & SPARES



- 1 Burner - Riello RDB 2.2 25/32 HE**
Part Number: 8 716 112 347 0
- 2 Combustion head - T2 LH25/32**
Part Number: 8 716 112 769 0
- 3 Control box 535 RSE/LD**
Part Number: 8 716 109 203 0
- 4 Photocell**
Part Number: 8 716 109 193 0
- 5 Ignition electrode**
Part Number: 8 716 109 183 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: 8 716 112 730 0
- 9 Burner 'O' ring**
Part Number: 8 716 109 328 0
- 10 Control thermostat**
Part Number: 8 716 142 390 0
- 11 Auto reset overhear thermostat**
Part Number: 8 716 142 391 0
- 12 Manual reset overhear thermostat**
Part Number: 8 716 142 392 0
- 13 Manual reset flue thermostat**
Part Number: 8 716 107 624 0
- 14 Cleaning brush**
Part Number: 8 716 109 428 0
- 15 Manifold access cover seal**
Part Number: 8 716 107 536 0
- 16 Secondary Heat Exchanger gasket**
Part Number: 8 716 112 954 0
- 17 Flue sample point cap**
Part Number: 8 716 113 177 0
- 18 Oil nozzle**
0.65 80° EH (25kW output)
Part Number: 8 716 110 362 0

0.75 80° EH (27.5kW output)
Part Number: 8 716 109 387 0

0.85 80° EH (30kW output)
Part Number: 8 716 156 644 0
- 19 Service lead**
Part Number: 7 716 113 483 0
- 20 Frost stat**
Part Number: 8 716 142 393 0
- 21 Spare 1/4 turn cabinet key**
Part Number: 8 716 114 013 0
- EXTERNAL SYSTEM ONLY**
- 22 Expansion vessel**
Part Number: 8 716 142 507 0
- 23 Pump**
Part Number: 8 716 112 293 0
- 24 Pressure relief valve**
Part Number: 8 716 142 422 0
- 25 System pressure gauge**
Part Number: 8 716 107 638 0

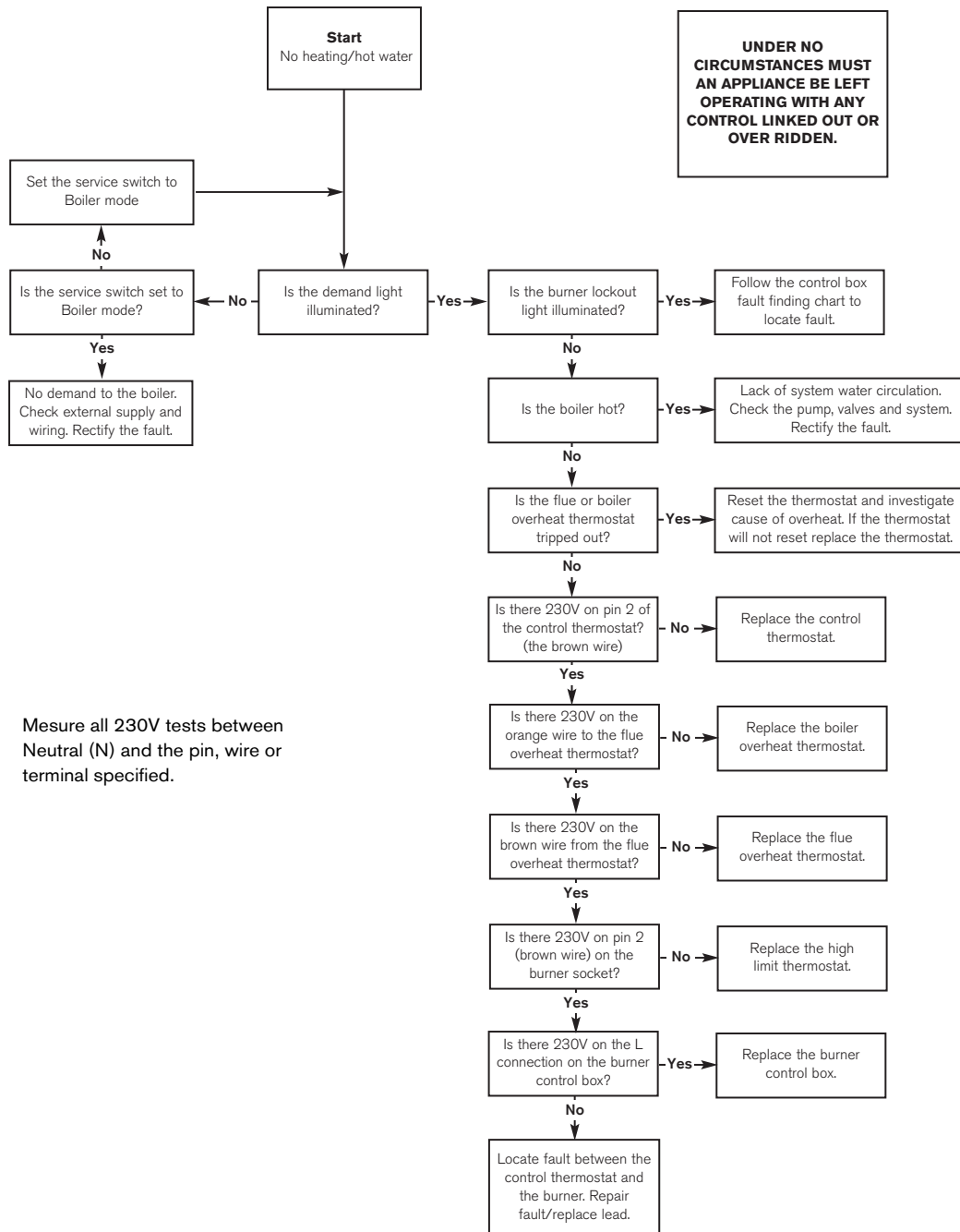
SERVICING & SPARES

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 eventuality has been covered. Worcester, Bosch Group cannot be held responsible for costs incurred by persons not deemed to be competent.



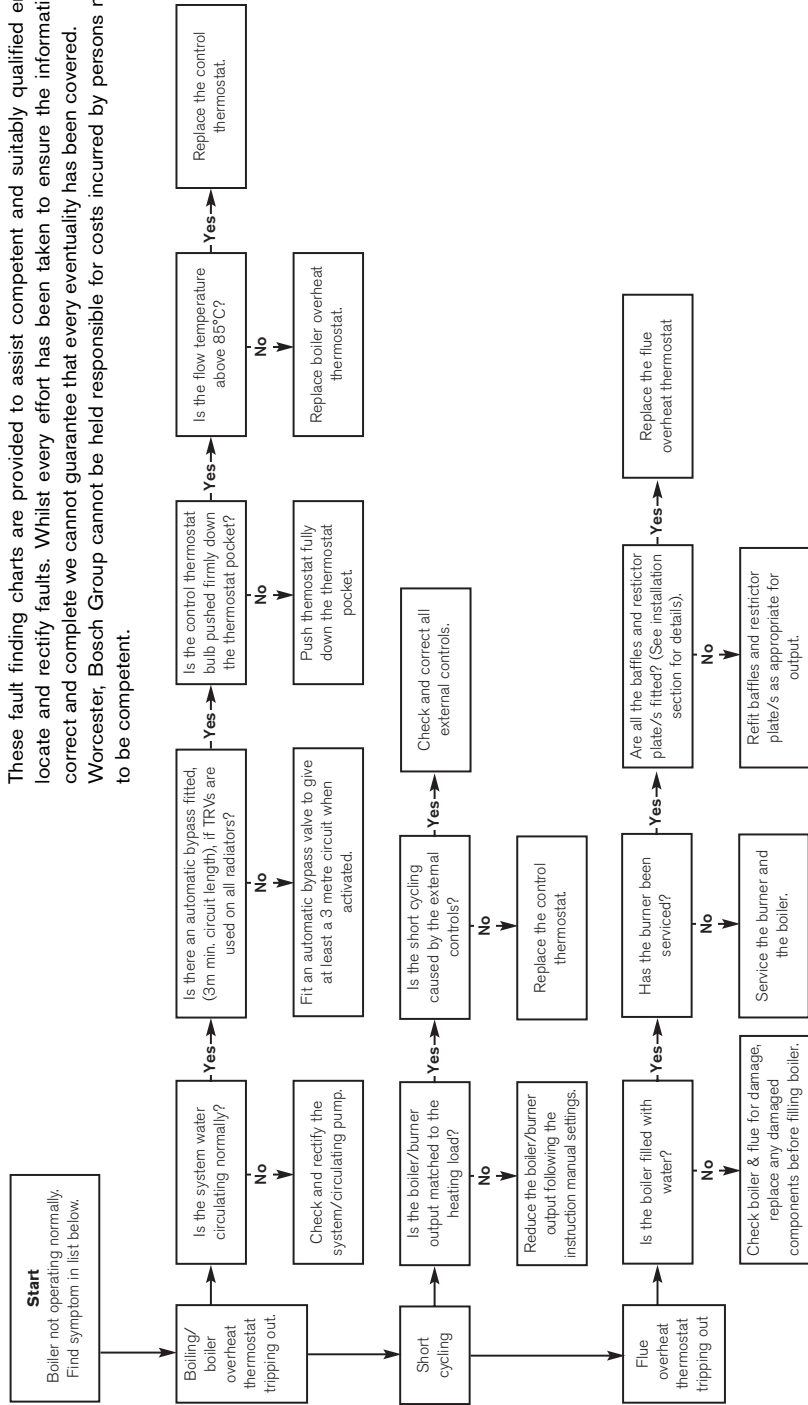
FAULT FINDING & DIAGRAMS

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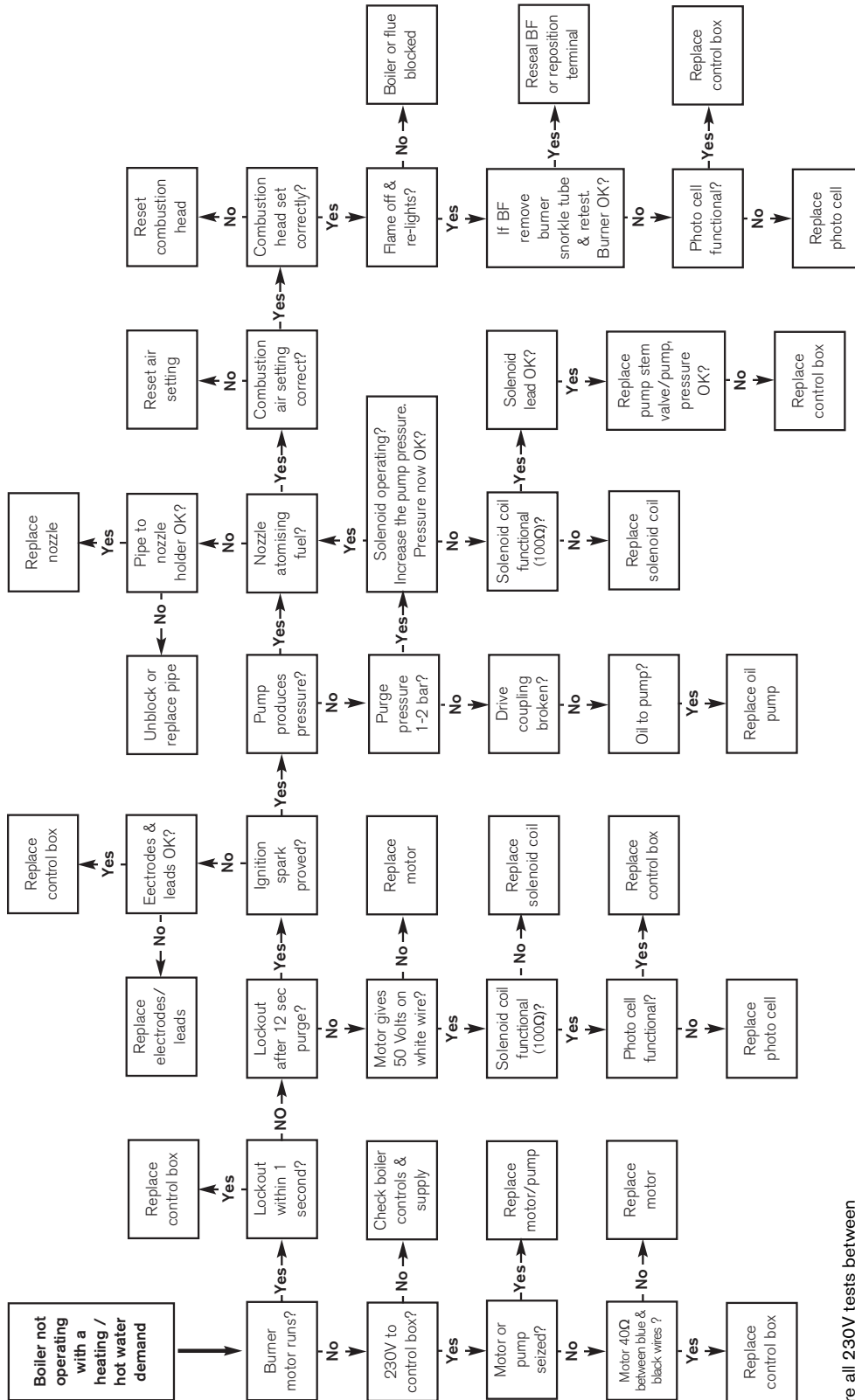


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UNDER NO CIRCUMSTANCES MUST AN APPLIANCE BE LEFT OPERATING WITH ANY CONTROL LINKED OUT OR OVER RIDDEN.



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 eventuality has been covered. Worcester, Bosch Group cannot be held responsible for costs incurred by persons not deemed to be competent.



Measure all 230V tests between Neutral (N) and the pin, wire or terminal specified.

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.

OIL BOILER COMBUSTION RECORD

BOILER MODEL _____ **SERIAL No.** _____

COMMISSIONING ENGINEER

COMBUSTION CHECKS

COMPANY NAME:	PUMP PRESSURE (PSI):
ADDRESS:	CO ₂ %:
ENGINEERS NAME:	SMOKE READING:
SIGNATURE:	F.G.T.°C:
DATE:	FLUE PRESSURE:
	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 28 SECOND 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 CO₂%: _____
 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 the mode switch in boiler/ON mode ?
2. Is there 230V across the boiler live and neutral terminals?
3. Is there 230V across the terminals 1 and N? If not there is no demand to the boiler from the controls or the control wiring is not correct.
4. Is the polarity correct? (230V across live and earth, 0V across neutral and earth)
5. Is the air bled from the primary system?
6. Is the air bled from the oil supply?
7. 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 1 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 1 and N? If not there is no demand to the boiler from the controls or the controls wiring is not correct.

CONTACT INFORMATION

WORCESTER, BOSCH GROUP:

TECHNICAL:	08705 266241
SERVICE:	08457 256206
SPARES:	01905 752571
LITERATURE:	01905 752556
TRAINING:	01905 752526
SALES:	01905 752640
WEBSITE:	www.worcester-bosch.co.uk

WATER TREATMENT:

FERNOX	01799 550811
www.fernox.com	
SENTINEL	0800 389 4670
www.sentinel-solutions.net	

FLUE TERMINAL GUARD:

PART No. 7 716 190 050

EXCELLENCE COMES AS STANDARD

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Worcester, Bosch Group is a brand name of
Bosch Thermotechnology Ltd.
www.worcester-bosch.co.uk

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