Boiler Manual

Incorporating: **User Instructions**
Installation Instructions
Service Instructions
Guarantee Terms & Conditions

Agentis Boilers

For use with Kerosene, HVO & Gas Oil

Models covered by this manual:

Agentis B-Series

Boilerhouse	*B21*	*B26*	*B33*	

Agentis I-Series

Internal	*I21*	*I26*	*I33*	*I44*
Internal Professional	*I21PRO*	*I26PRO*	*I33PRO*	*I44PRO*
Internal Pumped & Pumped Professional	*I21P/PRO*	*I26P/PRO*	*I33P/PRO*	*I44P*
Internal System & System Professional	*I21S/PRO*	*I26S/PRO*	*I33S/PRO*	
Internal Combi & Combi Professional	*I21C/PRO*	*I26C/PRO*	*I33C/PRO*	

Agentis E-Series

External	*E21*	*E26*	*E33*	*E44*
External Professional	*E21PRO*	*E26PRO*	*E33PRO*	*E44PRO*
External Pumped & Pumped Professional	*E21P/PRO*	*E26P/PRO*	*E33P/PRO*	*E44P*
External System & System Professional	*E21S/PRO*	*E26S/PRO*	*E33S/PRO*	
External Combi & Combi Professional	*E21C/PRO*	*E26C/PRO*	*E33C/PRO*	

Internal Combi and External Combi models Patent GB1613466.0, GB2552701, IE86968

SCS ISO 9001 CERTIFIED

CE

WARMFLOW

LEAVE THIS MANUAL WITH THE END USER

COMMISSIONING

This appliance must be commissioned by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation.

After commissioning, the Installer must ensure that the appliance is registered with the manufacturer. Registration of the appliance may be completed online, or by completing and returning the OFTEC boiler passport installation/commissioning certificate, or by completing and returning any equivalent installation/commissioning certificate applicable within the territory of installation. A copy of the installation/commissioning records must also be provided by the Installer to the Owner of the appliance. The Owner of the appliance must retain a copy of the installation/commissioning records provided.

Failure to commission and register the appliance will invalidate all appliance warranties.

SERVICING

To ensure continued reliable operation, fuel economy and to validate the appliance warranty, the appliance must be serviced annually by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation. Failure to annually service the appliance will invalidate all appliance warranties. Annual service records must be retained by the Owner of the appliance.

NI Customers Only

Warmflow Engineering Service division (NI) provides an excellent back-up service, operating a team of OFTEC trained and registered engineers who can meet all the servicing, commissioning and breakdown requirements for your appliance.

Tel: 028 9262 1515

Fax: 028 9262 2827

E-mail: service@warmflow.co.uk

Web: www.warmflow.co.uk

For Parts, Service Technical & Warranty Contact

Great Britain & N. Ireland, Tel: 028 9262 1515

Republic of Ireland, Tel: 048 9262 1515

HEAD OFFICE

Lissue Industrial Estate, Moira Road,
Lisburn, Co. Antrim, N. Ireland, BT28 2RF
Tel: (028) 9262 1515
Fax: (028) 9262 0869
E-mail: sales@warmflow.co.uk
technical@warmflow.co.uk
service@warmflow.co.uk

GB OFFICE

Unit 16, Stadium Point Business Park,
Shrewsbury, England, SY2 6NE
Tel: (01952) 607 750
Fax: (01952) 603 983
E-mail: salesgb@warmflow.co.uk
technical@warmflow.co.uk
service@warmflow.co.uk

CONTENTS

1 USER INSTRUCTIONS

This boiler must be serviced annually. Contact Warmflow for further details.

In the event of a breakdown please contact your commissioning engineer who must contact our service department whilst at your home, to report the fault.

1.1 Dual Thermostat – Non-Combination Boilers

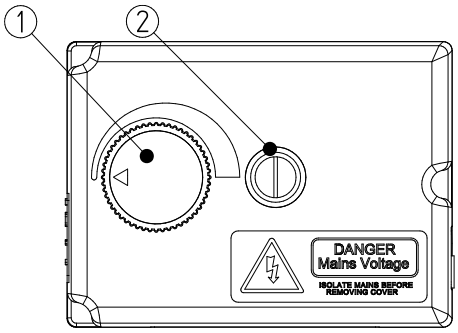
The radiator temperature is regulated via the boiler control thermostat. The thermostat is user adjustable from ***nominally*** 45°C to 80°C. Turn the control knob (1) clockwise to increase temperature, and anticlockwise to decrease.

The thermostat has a built-in manually reset safety cut off which will 'lock out' in the event of the boiler overheating and which will need to be reset in order to restore operation. Overheating lockout occurs at a temperature of 110°C.

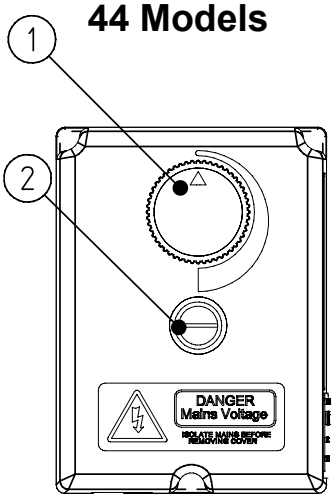
Remove the lock-out cover (2) using a coin or screwdriver (turning anti-clockwise) and depress the red button to reset.

Do not press the reset button while the boiler is still hot as this will cause damage to the thermostat.

21, 26 & 33 Models



44 Models



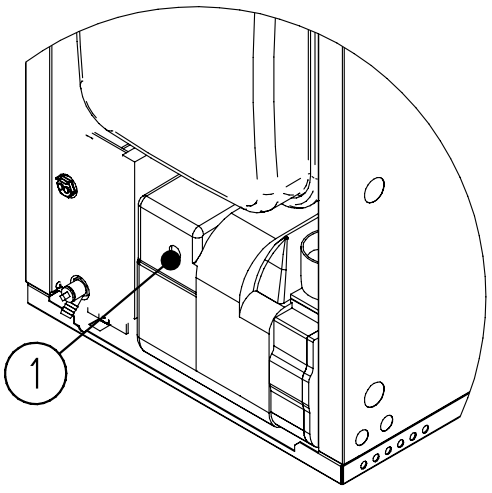
1.2 Burner Lockout

When the pressure jet oil fired burner stops after failing to fire the red reset button (1) will be illuminated.

This indicates that there is a fault or there is no fuel getting to the burner.

The burner must not be reset more than twice in succession.

If the burner continues to lockout contact Warmflow or your service engineer.



1.3 Sealed Systems & System Pressure

When the appliance is connected to a sealed, pressurised (unvented) heating system, the system pressure must be set to 1.0bar when cold. Never set system pressure whilst the system is in the hot condition. Ensure that all heating system zones are in the open condition during topping up.

It is recommended to isolate all electricity supplies to the appliance before topping up system pressure.

System maximum pressure must be limited to 3.0bar via the fitment of a pressure relief valve adjacent to the appliance which is rated to this value if one is not supplied factory-fitted to the appliance. Ensure that the pressure relief valve cannot become isolated from the appliance by any means.

A pressure gauge with a suitable operating range must also be fitted if not factory-fitted to the appliance.

Where the appliance is without a factory-fitted expansion vessel, one of capacity which is appropriate to the total volume of the system must be fitted to the return pipework. See Section 10.2.1 of this manual for guidance on expansion vessel capacities.

System pressure must be periodically checked using the system pressure gauge.

Where there is a need to top-up the system to 1.0bar (cold), special attention must be given to corrosion inhibitor concentrations. Corrosion inhibitor concentrations must be maintained in line with the inhibitor manufacturer's requirements at all times.

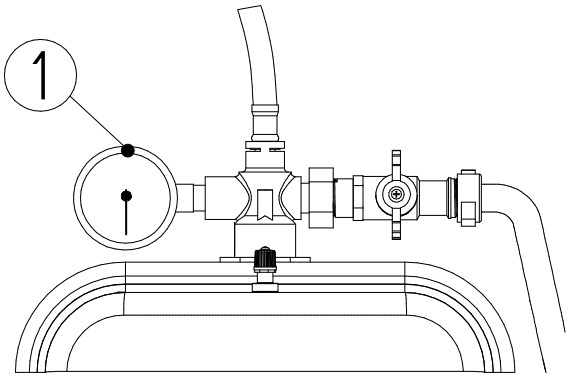
Frequent or routine topping up of the heating system should not be necessary and may prove harmful to the appliance. For this reason, the use of automatic filling loops is strictly forbidden and to prevent inadvertent topping of the system, all filling loops must be isolated and disconnected after filling or topping-up of the system is complete.

Should topping up prove necessary on a frequent or routine basis you must contact Warmflow or your installer to seek advice.

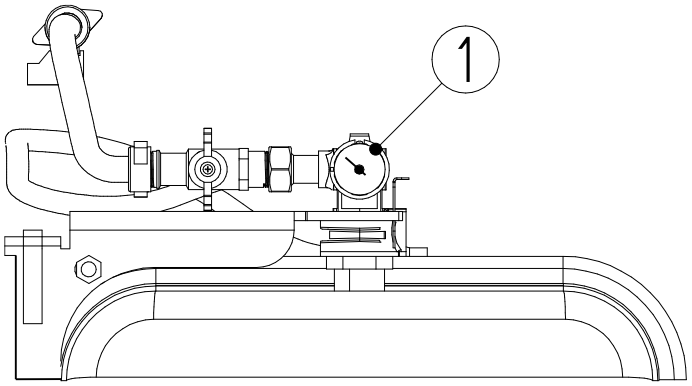
1.4 Sealed Systems & System Pressure - System & Combination Boilers

In addition to the requirements of Section 1.3, when a system or combination boiler is connected to a sealed system, the system pressure must be periodically checked using the pressure gauge (1), located above the factory-fitted expansion vessel.

System Boilers



Combination Boilers



The system pressure as indicated by the black needle, is minimum 1.0 bar when the boiler is cold and up to 2.5 bar when the boiler is at normal operating temperature.

If the system pressure falls below the minimum (e.g. due to the removal of a radiator for decorating purposes) then the system should be topped up using the filling loop supplied. See Section 1.5.

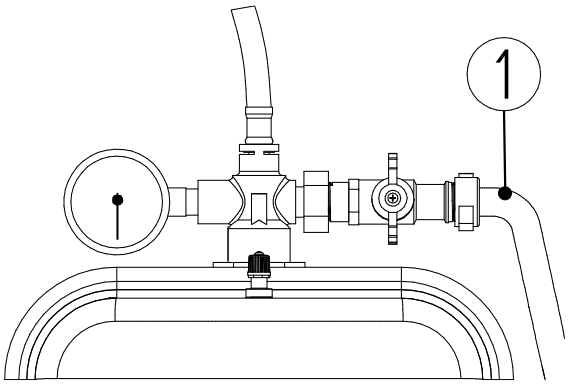
The indication of the system pressure on the gauge has a tolerance of +/-0.2 bar at idle state.

Do not allow the flexible hoses connected to the expansion vessel to become twisted, kinked or flattened. This may cause collapse of hose bore compromising the function of the expansion vessel.

1.5 Filling Loop

System Boilers – The filling loop is located above the expansion vessel.

Remove the dust caps, then fit the flexible hose (1) at both ends, open the valves to increase system pressure.

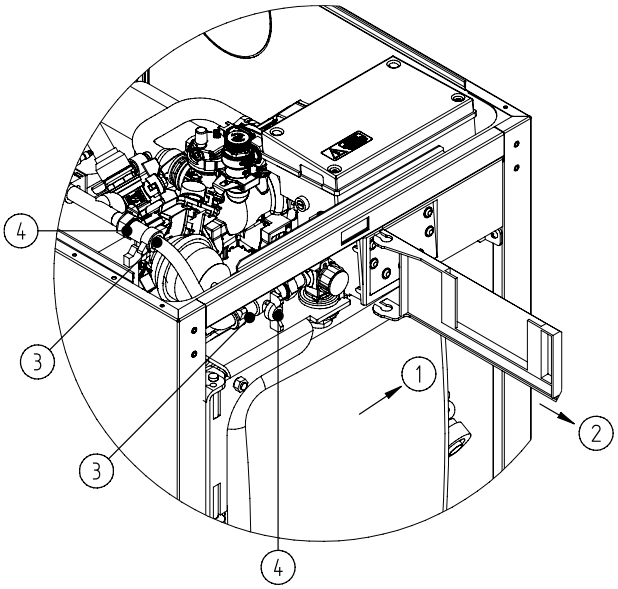


Your installer will be able to advise the position of the filling valve.

After topping up the system the valve(s) must be fully closed and the flexible hose disconnected from the valve(s), and dust caps refitted.

Expect a small water loss from the hose.

Combination Boilers – The filling loop is accessed by opening (1) and removing (2) the access cover.



Remove the dust caps, then fit the flexible hose (3) at both ends, open the valves (4) to increase system pressure.

After topping up the system the valve(s) must be fully closed and the flexible hose disconnected from the valve(s), and dust caps refitted.

Expect a small water loss from the hose.

1.6 Corrosion Inhibitor

Where there is a need to top-up the system to 1.0bar (cold), special attention must be given to corrosion inhibitor concentrations. Corrosion inhibitor concentrations must be maintained in line with the inhibitor manufacturer's requirements at all times.

Frequent or routine topping up of the heating system should not be necessary and may prove harmful to the appliance. For this reason, the use of automatic filling loops is strictly forbidden and to prevent inadvertent topping of the system, all filling loops must be isolated and disconnected after filling or topping-up of the system is complete.

Should topping up prove necessary on a frequent or routine basis you must contact Warmflow or your installer to seek advice.

1.7 Circulating Pump Exercise

For non-combination boiler appliances with an integral circulating pump, during periods when the appliance is not being regularly used, the circulating pump must be exercised for at least 5 minutes once per week in order to prevent locking.

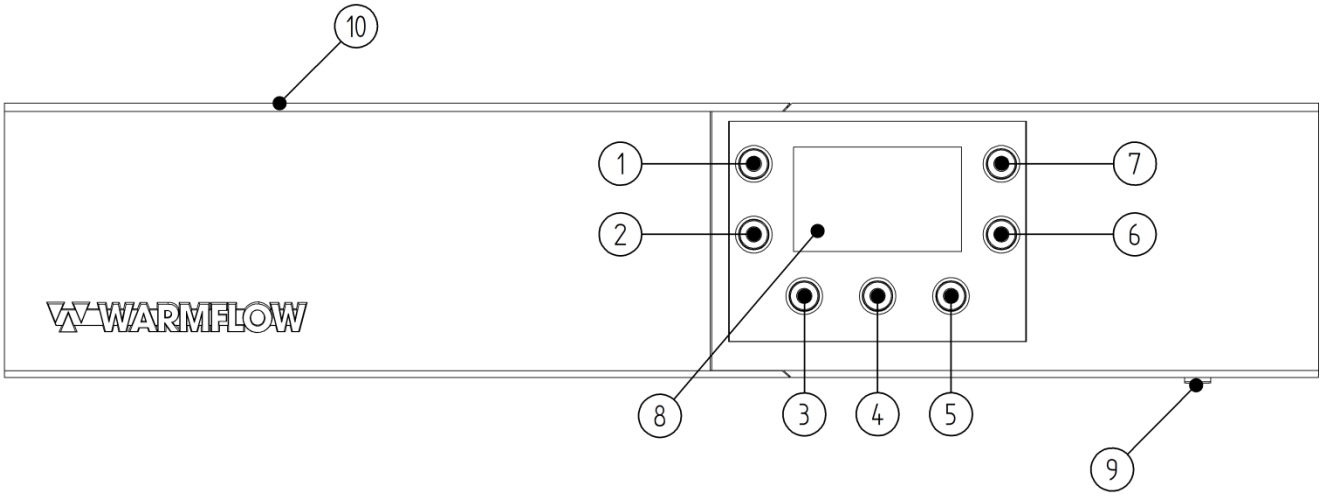
For combination boilers, circulating pump exercise routines which prevent pump locking are automatic and for this reason the boiler must have a permanent live AC supply for this function to operate. See section 1.16.

1.8 Control Panel – Combination Boilers

(Please see page 152 for 'How to' Combination Boiler Control Panel Video)

Internal and External Combination Boilers are fitted with a Liquid Crystal Display (LCD), and 7 pushbuttons as identified below.

The High Limit Thermostat reset button is located under the RH side of the control panel.



1) DHW+ button
2) DHW- button
3) Mode button
4) Time programming button
5) Information button
6) CH- button
7) CH+ button
8) Liquid Crystal Display (LCD)
9) High Limit Thermostat reset
10) Filling loop access panel

The appliance has 4x operating modes:

1. Central Heating and Domestic Hot Water
2. Domestic Hot Water Only
3. Central Heating Only
4. Off

The mode can be changed by pressing the mode button.

The current operating mode is represented by icons displayed on the LCD screen, refer to section 1.10 for details.

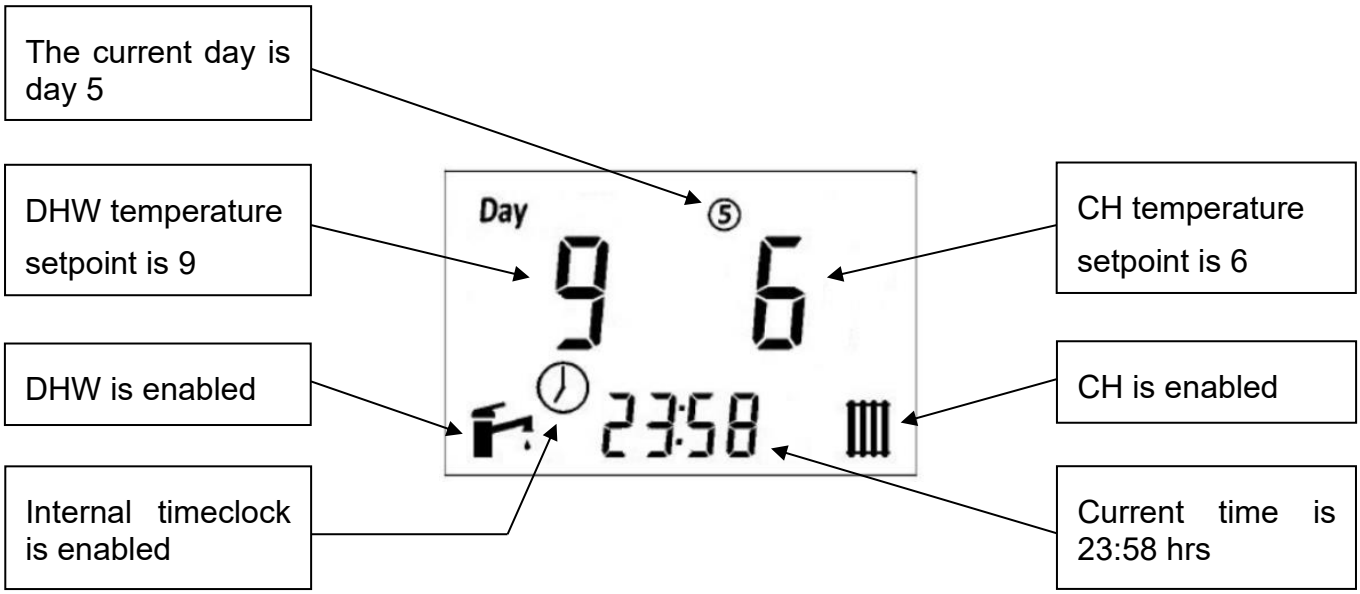
1.9 LCD Icon Descriptions

Icon	Description
	DHW Status
	CH Status
	Engineer
RESET	Reset
°C	Temperature Unit
	Internal Timeclock Control
	Manual Override
Day ① ② ③ ④ ⑤ ⑥ ⑦	Current Day
	Timeslot Identifier (1-4)
ON OFF	Timeslot Programming Type
	DHW Setpoint 1 (Upper Bar)
	DHW Setpoint 1 (Lower Bar)

1.10 Home Screen

When the appliance is powered on, or after reset the Home Screen is displayed by default.

As an example, depending on user settings:



In case of an error or fault, the error code number is displayed on the LCD along with the Engineer icon.

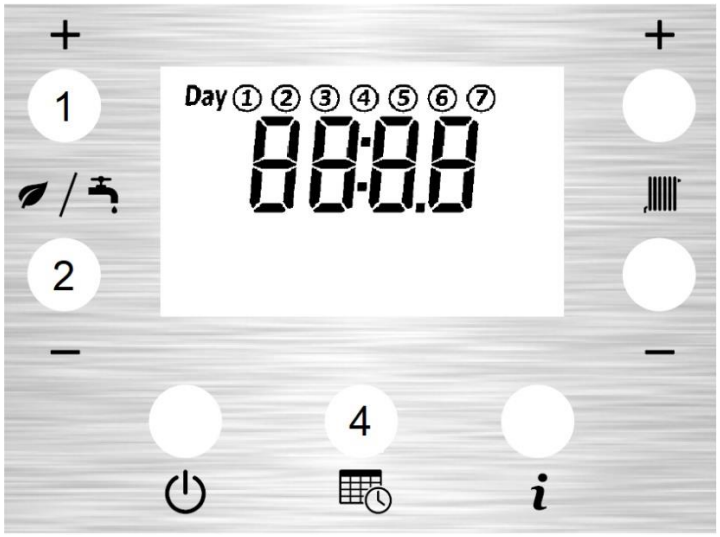
During CH or DHW cycles the corresponding DHW or CH icons will flash on and off to indicate activity.

There are two lines of text as shown below which are used for displaying, selecting and adjusting settings.

1.11 Setting the date and time

In order for the appliance to operate with maximum DHW efficiency, and if the built in timeclock is to be used, it is necessary to correctly set the date and time upon first start-up of the appliance. If the date is correctly set, daylight saving changes will be applied automatically.

From the Home Screen, the date and time can be set by simultaneously pressing the Time Programming button (4) and DHW- button (2) for 3 seconds.



Step 1 – Set the current hour (24 hr format) using the DHW+ button (1) and DHW- button (2), then press the Time Programming button to confirm.

Step 2 – Set the current minute using the DHW+ button (1) and DHW- button (2), then press the Time Programming button (4) to confirm.

Step 3 – Set the current week day (1-7) using the DHW+ button (1) and DHW- button (2), then press the Time Programming button (4) to confirm.

Step 4 – Set the current year using the DHW+ button (1) and DHW- button (2), then press the Time Programming button (4) to confirm.

Step 5 – Set the current month (1-12) using the DHW+ button (1) and DHW- button (2), then press the Time Programming button (4) to confirm.

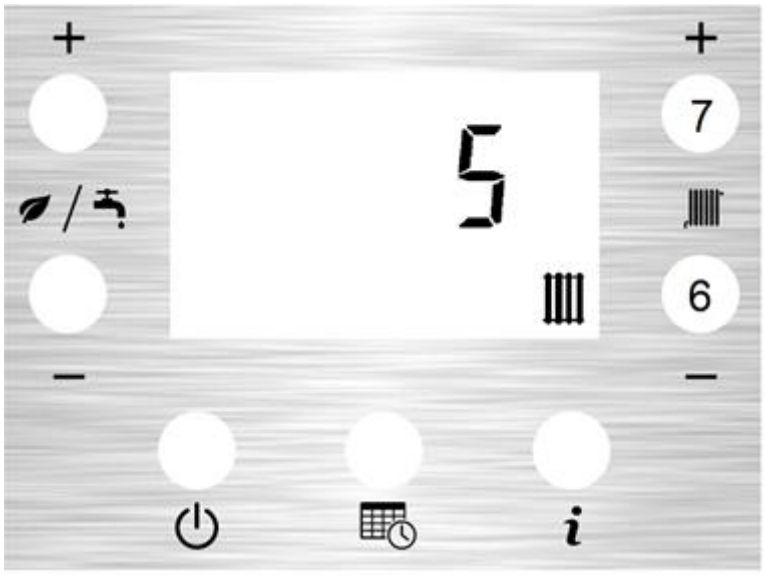
Step 6 – Set the current date using the DHW+ button (1) and DHW- button (2), then press the Time Programming button (4) to confirm.

The LCD will show the time, and display the text ‘done’ when the programming is completed.

After the appliance has been in operation for a number of days, it will be able to maintain a memory of the date and time settings during short power interruptions. If power is interrupted for an extended period it may be necessary to re-set the time and date again using the above routine.

1.12 Setting CH flow temperature

The CH Setpoint Menu is displayed when the CH+ button (7) or CH- button (6) are pressed when the LCD is displaying the Home Screen.



The setpoint is adjustable from 1 (lowest) to 9 (highest). Nominally the central heating flow temperature (at the boiler) will be 50°C at the lowest setting and 82°C at the highest setting.

The setting is saved 5 seconds after the last button press.

1.13 Setting DHW flow temperature

The DHW Setpoint Menu is displayed when the DHW+ button (1) or DHW- button (2) are pressed when the LCD is displaying the Home Screen.

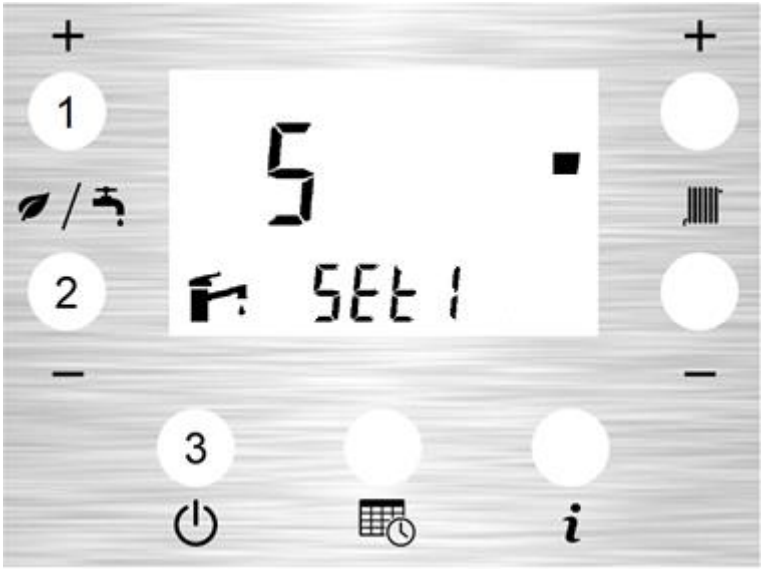
The actual DHW delivery temperature is dependent on site conditions, incoming water temperature and flow rate.

The setpoints are adjustable from 1 (lowest) to 9 (highest). Nominally the DHW flow temperature (at the boiler) will be 40°C at the lowest setting and 70°C at the highest setting.

A risk assessment must be conducted to determine the most appropriate anti-scald device to be installed at all outlets, to limit the temperature of hot water outlets. These may include, but are not limited to bidets, taps and showers.

Consult local building control regulations which apply to the installation for further reference.

Example below shows the DHW setpoint at setting ‘5’.



1.13.1 Multiple DHW Setpoints

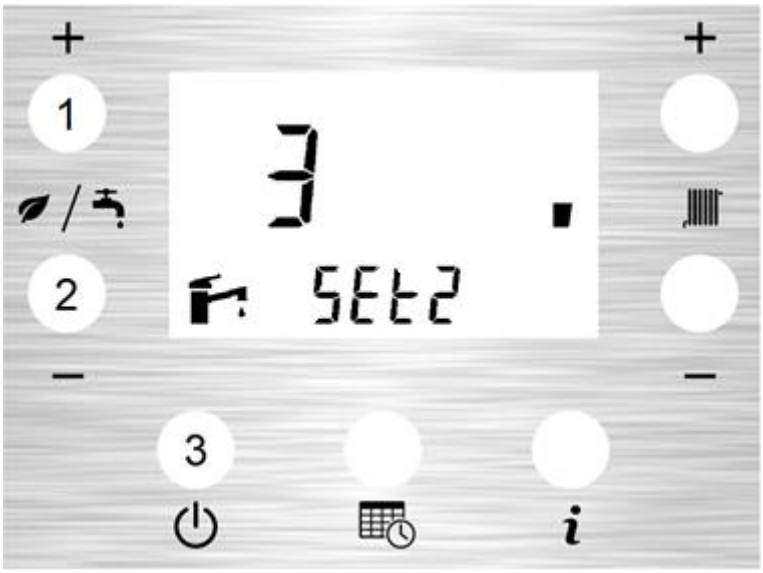
The appliance has the ability to use two DHW setpoints, setpoint 1 displayed as ‘SEt 1’ (Normal) and setpoint 2, displayed as ‘SEt 2’ (Lower).

Setpoint 2, (‘SEt 2’) can only be enabled with the built-in DHW programmer. See section 6.6.2 for setting the DHW programmer. The advantage of the additional setpoint allows the DHW temperature to be lowered at different times of the day. This can be a useful safety function, lowering temperatures when users such as children may be using outlets. The function can also increase the efficiency of the appliance by lowering the DHW flow temperature during certain times of the day when a higher temperature is not required.

The Mode button (3) is used to toggle between ‘SEt 1’ and ‘SEt 2’ when setting the DHW temperature.

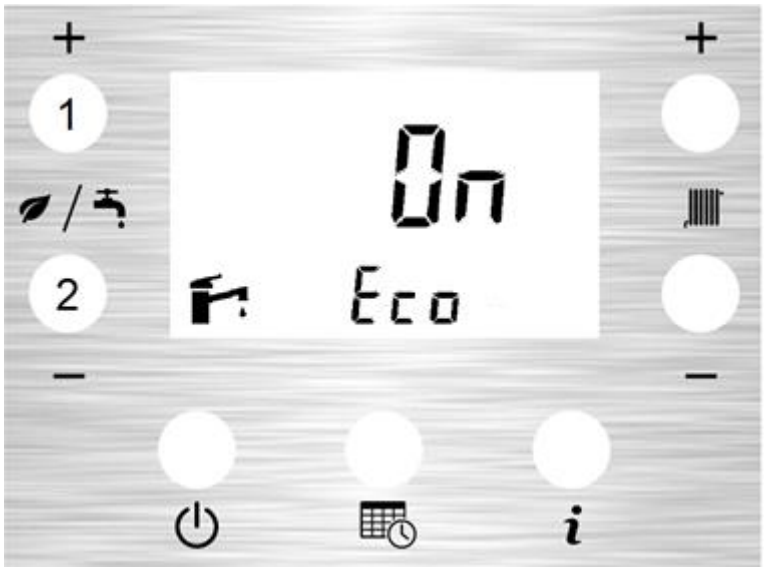
During operation with the DHW programmer enabled, the appliance will revert to ‘SEt 2’ unless a ‘SEt1’ time slot is active.

Example below shows setpoint 2, displayed as ‘SEt 2’ at a setting of ‘3’:



1.14 Eco Mode

Eco mode works to control burner firing based on the inputs into the control system during DHW cycles only, i.e. Eco mode has no effect on CH operation.



The Eco mode function is enabled by pressing the DHW- button (2) and DHW+ button (1) simultaneously for 3 seconds, the LCD displays ‘Eco On’ when the function is enabled. The Eco mode function is enabled in the appliance by default and must be disabled if not required.

It is possible to disable the Eco mode function by pressing DHW- button (2) and DHW+ button (1) simultaneously for 3 seconds, the LCD displays ‘Eco OFF’ when the function is disabled.

When Eco mode is enabled in conjunction with the internal programmer, the lower section of the LCD will alternate between showing the time of day and ‘Eco’ to remind the user that Eco mode is enabled.

When Eco mode is enabled without the use of the internal programmer, ‘Eco’ will display continuously in this same location.

1.15 Frost Protection (Ice Protection function)

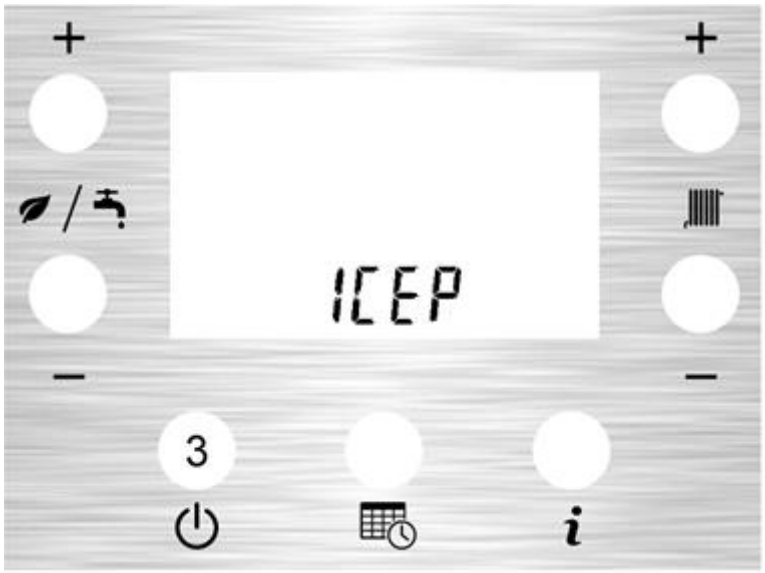
Ice Protection function works to reduce the risk of freezing and thereby protect the fabric of the boiler if either the CH Flow or CH Return temperature falls below 5°C. The ice protection function will force the appliance to operate until the CH Flow temperature rises above 30°C.

This mode operates even when all timeclocks are set to 'OFF', and also if the control panel is set to the 'OFF' mode using the Mode button (3).

Be aware of unexpected firing in these conditions.

The boiler must have a permanent live AC supply and an adequate fuel supply for the function to operate.

When the function is operating 'ICEP' is displayed on the LCD.



1.16 Circulating Pump and Diverter Valve Exercise Functions

If the boiler has not operated the circulating pump or the diverting valve for a period of 24 hours, it will operate these components for 10 seconds to prevent locking.

The boiler must have a permanent live AC supply for this function to operate.

1.17 Speed adjustment of the circulating pump

1.17.1 Combination Boilers

The speed of the circulating pump is controlled in both CH and DH modes by a signal from the control panel. If the maximum speeds need to be adjusted to suit site conditions, refer to Engineer Parameters in Section 11.7.1. The settings on the circulating pump must not be adjusted from the factory default of PWM Profile A (heating).

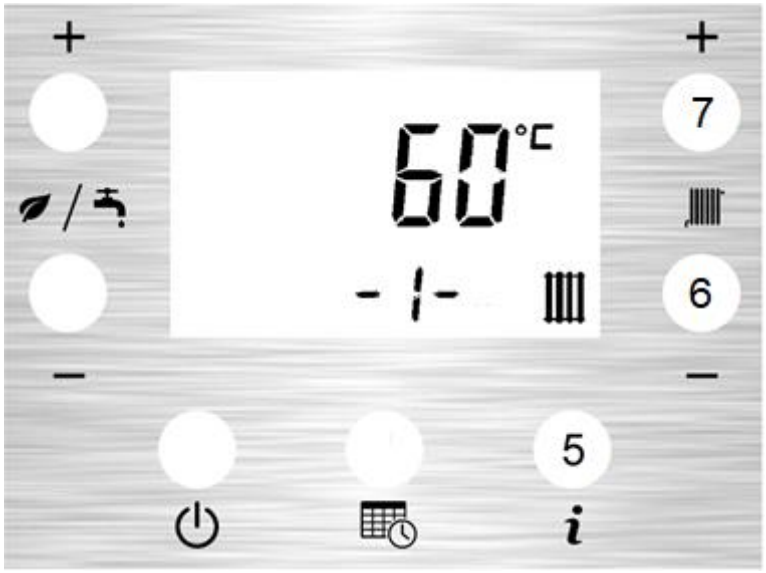
1.17.2 Pumped and System Boilers

The speed of the circulating pump can be adjusted using the pushbutton and LED indications on the pump. Please refer to the manufacturer's documentation which is available via www.warmflow.co.uk/support/downloads.

1.18 Information Menu

The Information Menu is used to display selected appliance parameters in real time, it can be used during the commissioning stage, or to assist fault diagnosis.

The Information Menu is displayed from the Home Screen by pressing the Information button (5).



The auxiliary digits then indicate the displayed variable number, and the main digits display the value of the variable.

If a value is unavailable '- -' will be displayed on the main digits.

The variables can be scrolled through using the CH+ button (7) and CH- button (6).

To return to the Home Screen, press the Information button (5) again, or if no button is pressed for 60 seconds, the Home Screen is displayed automatically.

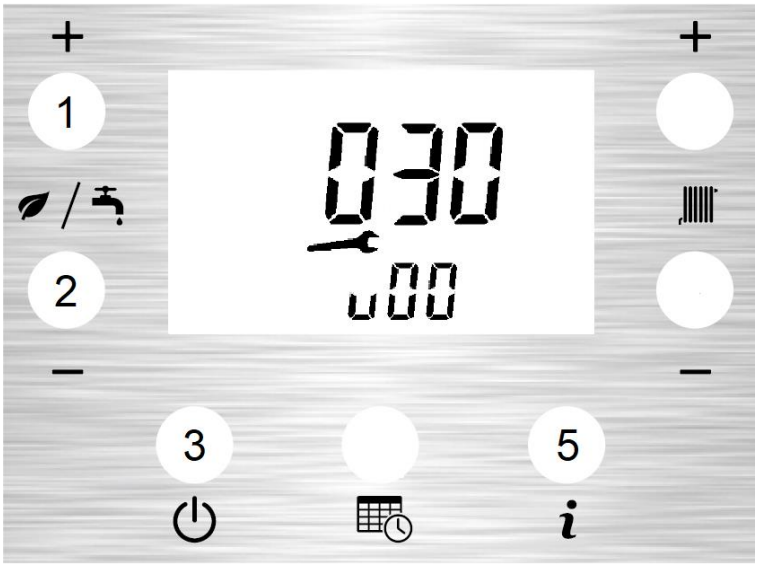
Variable number	Description
1	CH Flow Temperature (°C)
2	CH Return Temperature (°C)
3	DHW Flow Temperature (°C)
4	Heat Store Temperature (°C)
5	DHW Flow rate (l/minute)
6	Circulating pump speed (%)
7	External Temperature (°C)
8	DHW Setpoint (°C)
9	CH Setpoint (°C) (see note)
10	Control PCB Firmware version
11	MMI PCB Firmware version

Note: If the External Temperature sensor is used, the displayed value will be the Weather Compensated CH setpoint.

1.19 User Parameters

The User Parameters Menu is used to allow selected parameters to be modified by the user, without password protection.

The User Parameters Menu is displayed from the Home Screen by pressing the Information button (5) for 3 seconds.



The auxiliary digits then indicate the displayed variable number, and the main digits display the value.

To modify a value, press the Mode button (3) for 1 second.

The service icon will begin to flash.

Adjust the variable setting to the desired value using the DHW+ button (1) and DHW- button (2).

To save the new value, press the Mode button again for 1 second.

The Service icon will stop flashing.

To return to the Home Screen, press the Information button (5) again, or if no button is pressed for 3 minutes, the LCD will return to the Home Screen automatically.

Parameter number	Description	Units	Range	Default Value
u 00	Weather Compensation Coefficient (see note)	N/A	0-30	30

Note: If the remote control is also used, the remote control setting will override the parameter u00 value.

1.20 Weather Compensation Operation

The Weather Compensation operates on the central heating system when the Outdoor Sensor has been connected by the installer.

Depending on the outdoor temperature, the CH flow temperature is automatically reduced below the user CH setpoint.

The amount of reduction depends on the Weather Compensation Coefficient (Parameter ‘u 00’).

A lower value of Parameter ‘u 00’ results in a greater reduction of the CH flow temperature at a given outdoor temperature.
A higher value of Parameter ‘u 00’ results in a smaller reduction of the CH flow temperature at a given outdoor temperature.
Parameter ‘u 00’ is adjustable from 0 to 30.

The maximum setting value of 30 means that weather compensation is not active when the outdoor temperature is less than 5°C, however the CH setpoint will be reduced the higher the outdoor temperature rises above 5°C.

A value of 20 means that weather compensation is not active when the outdoor temperature is less than -6°C, however the CH setpoint will be reduced the higher the outdoor temperature rises above -6°C.

Care must be taken if using a value below 20 as these values produce very aggressive reductions in the CH setpoint.

2 CONDENSING BOILER INSTALLATION REQUIREMENTS

The Warmflow condensing boiler can be fitted to most installations using standard practices and techniques. There are however a number of considerations that must be taken into account.

1. All existing systems must be properly flushed to remove any sediment/ sludge in order to prevent any blockage or reduction in efficiency of the boiler. **N.B:** Systems must be flushed prior to the installation of the boiler appliance.

2. The system must be fully pumped.

3. The primary difference between an ordinary boiler and a condensing boiler is the condensate drain. The drain can be plumbed from the condensate trap in any ordinary plastic pipe, e.g. plastic overflow pipe, directly into the household drain or soak away.

   Any blockage in the drain could lead to an alteration in the combustion settings because of partially blocked flueways.

   Where the boiler is fitted into a basement, a condensate pump may be required.

4. As an indicator of the increased efficiency of a condensing boiler there may be a visible plume of ‘steam’ from the flue. Care needs to be exercised when positioning the appliance and selecting the type of flue to ensure that the plume does not cause a nuisance to the householder or to surrounding properties.

   As the water temperature in the system rises the pluming effect will diminish. Even where pluming is not visible the boiler is still operating more efficiently than a standard boiler.

3 BEFORE FITTING A COMBINATION BOILER THE INSTALLER MUST CHECK:

1. That a risk assessment has been completed to determine the most appropriate anti-scald device to be used for the various applications, to limit the temperature of hot water outlets including bidets, taps and showers. DHW setpoint 9 has a nominal flow temperature of 70°C at the boiler.

Consult local building control regulations which apply to the installation for further reference.

2. What the maximum hot water demand placed on the boiler is likely to be. Not every installation is suitable for a Combination boiler. Systems requiring very high hot water flow rates may be better suited with a Warmflow unvented cylinder.

3. That the mains are capable of supplying up to 24 litre/min with a minimum dynamic pressure of 1.8 bar at the boiler. This is to ensure that the boiler can achieve its maximum output. To protect the appliance and to prevent excessive flow rates, the appliance is equipped with a 3-bar pressure reducing valve to limit the maximum water supply pressure to 3 bar. A 0.16 litre expansion vessel is also fitted to the domestic circuit to accommodate DHW expansion when outlets are closed. It may be necessary to supplement this expansion vessel in larger DHW systems.

4. The hardness of the mains water supply. Systems with hard water must be fitted with a suitable chemical scale preventer (e.g. Fernox Quantomat or Combimate).

5. That the flow from any one hot water outlet does not exceed the maximum recommended. This applies particularly to baths which are usually fitted with larger taps and larger bore supply pipes. It may be necessary to restrict the flow to these taps by reducing the bore of the supply pipework (e.g. 15mm) or by fitting a restrictor into the pipework.

6. That any outlet, when opened, does not starve all the other outlets of hot water. If more than one outlet is open at the same time, the total flow from all the outlets must not exceed the maximum flow rate of the boiler.

7. That any showers being supplied with hot water by the boiler are compatible with this type of appliance.

It should be noted that the boiler has been factory fitted with an 18 litre/min flow restrictor.

The manufacturer’s guarantees are void if the appliance is not installed and commissioned in accordance with the recommendations made herein.

4 GENERAL INFORMATION

4.1 Introduction

Note: All our domestic appliances have been independently tested and accredited as exceeding the minimum SEDBUK efficiency levels required for their type, in compliance with the Building Regulations Approved Document L1A, L1B for England and Wales, the Building Standards (Scotland) Regulations Section 6, Part F1 Northern Ireland and Part L Republic of Ireland.

Warmflow oil fired condensing boilers are designed to burn Class C2 (28 sec redwood) kerosene, liquid biofuels and to be used on a fully pumped system, and are suitable for connection to sealed heating systems.

As standard the Combination and System boilers are fitted with a system expansion vessel, circulating pump, filling loop, pressure gauge and pressure relief valve.

The Combination boiler can provide, at mains pressure, domestic hot water without the need for a storage cylinder.

The manufacturer's guarantees are void if the appliance is not installed and commissioned in accordance with the recommendations made herein.

4.2 General Requirements

The installation of the boiler must be in accordance with the following regulations.

BS 5410-1: Code of practice for oil firing. Installations up to 45 kW output capacity for space heating and hot water supply purposes.

BS EN 12828+A1: Heating systems in buildings. Design for water-based heating systems.

BS EN 12831: Heating systems in buildings. Method for calculation of the design heat load.

BS EN 14336: Heating systems in buildings. Installation and commissioning of water based heating systems.

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

Current applicable Building Regulations and IET Wiring regulations.

BS 7074-1: Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Code of practice for domestic heating and hot water supply

The heating system must be installed by a competent installer in accordance with the building regulations laid down by the regional or local government or authority presiding within the territory of installation, in accordance with OFTEC requirements or with those of an equivalent competent persons scheme applicable within the territory of installation, and in accordance with sound engineering practices.

A copy of the appliance installation/commissioning records must provided by the Installer to the Owner of the appliance. Installation/commissioning records must be retained by the Owner of the appliance.

4.3 Combination Boiler General Requirements

The boiler will have a DHW priority when both domestic hot water (DHW) and central heating (CH) are selected. So if DHW flow is detected or the heat store has not been satisfied the entire output of the boiler is directed to DHW before the boiler will switch over to CH. When fully cold it can take approximately 15 minutes for the heat store to be satisfied, depending on appliance output.

After a draw-off of 120L at 24L/min, with an average temperature rise of 32ºC, the thermal store has a recovery time of approximately 5 minutes depending on appliance output.

Note: If DHW has not been selected no hot water can be produced even if the heat store is up to temperature.

4.3.1 Pump Overrun

Where there is a build-up of excess heat in the boiler primary heat exchanger with domestic hot water mode selected, the pump overrun function will operate. This function is controlled by the CH Flow NTC sensor.

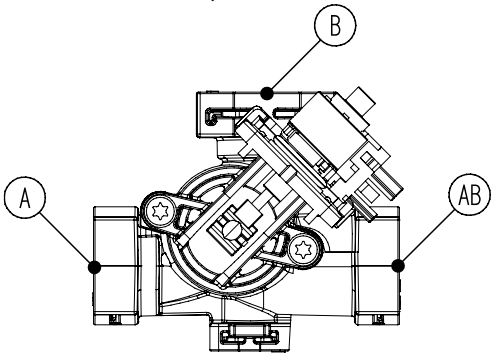
The excess heat will then be pumped into the heat store. Once the temperature has fallen in the boiler and the pump overrun function is satisfied, then the circulating water pump will stop.

There are also timed pump overrun functions, these are controlled by P01 & P02 in the Engineer Parameters.

4.3.2 Diverting Valve Operation

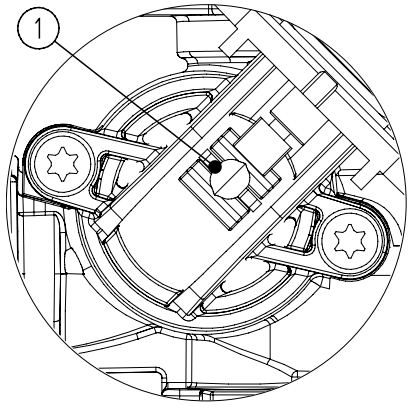
The function of the diverting valve is to direct return system water from either the central heating circuit or domestic hot water heat store to the circulating pump, depending on mode selection and thermostat requirements.

The valve body has 3x ports labelled A, B and AB:

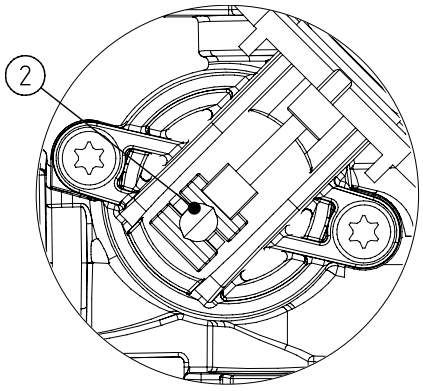


The valve actuator has two positions, CH and DHW.

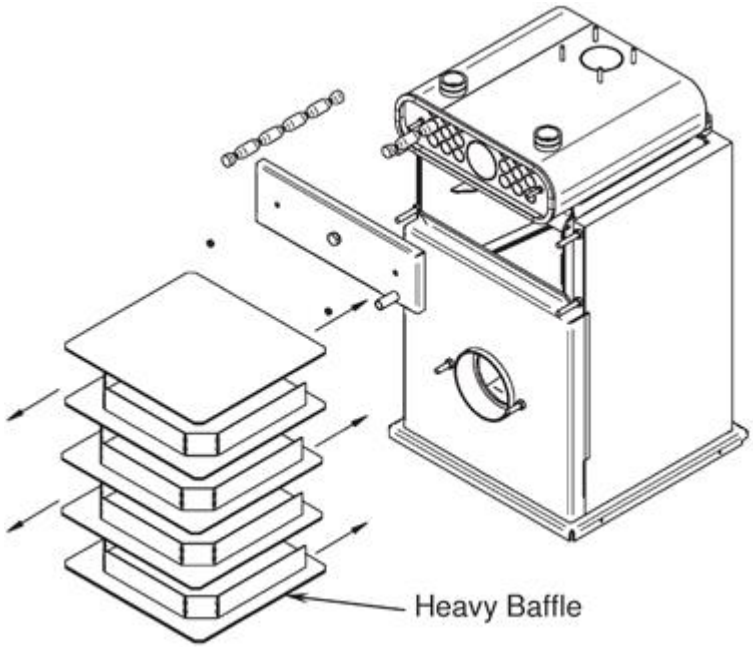
The CH position retracts the actuator (1), directing system water from the central heating circuit return to the circulating pump.
Water flows from port B to port AB:



The DHW position extends the actuator (2), directing system water from the Plate Heat Exchanger to the circulating pump.
Water flows from port A to port AB:

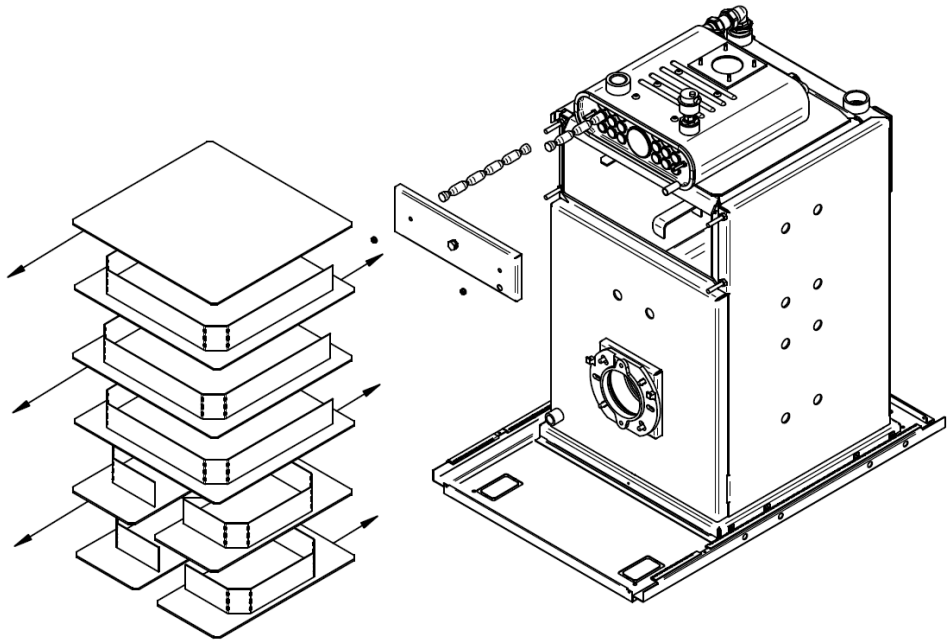


4.4 Baffle Positioning



21, 26 & 33 Models

The primary heat exchanger baffles consist of one heavy baffle stack (5mm thick) at the bottom, 3 lighter baffle stacks (3mm thick) in the middle and 1 baffle plate (3mm thick) at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked. To achieve maximum efficiency push the primary heat exchanger baffles in the direction of the arrows as shown. The secondary heat exchanger spring baffles must be fully inserted into the heat exchanger tubes (narrow end first).

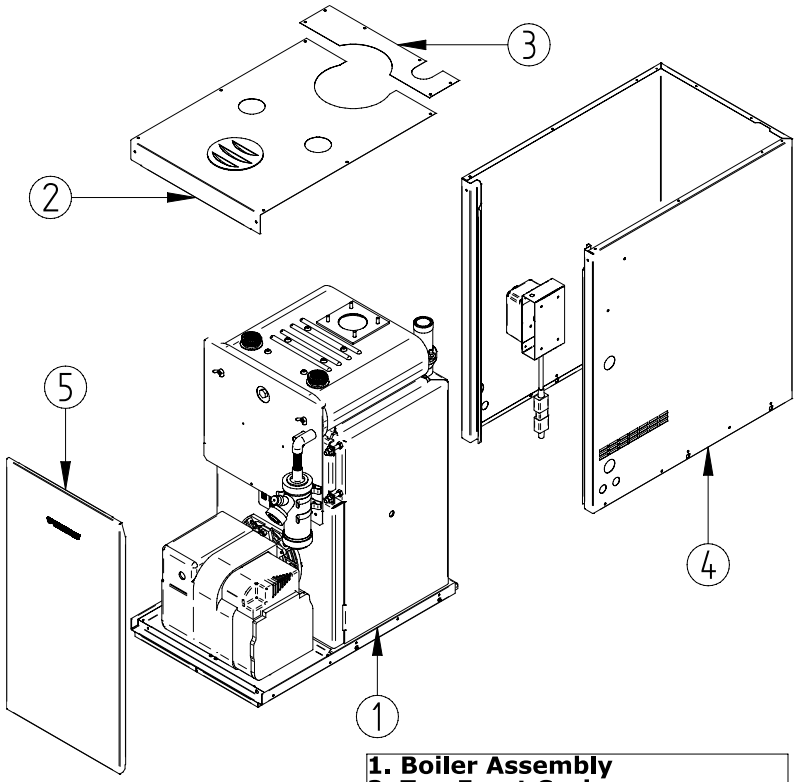


44 Models

The primary heat exchanger baffles consist of two half-width baffle stacks at the bottom, 3 full-width baffle stacks in the middle and 1 baffle plate at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked.
To achieve maximum efficiency, push the primary heat exchanger baffles in the direction of the arrows as shown. The secondary heat exchanger spring baffles must be fully inserted into the heat exchanger tubes (narrow end first).

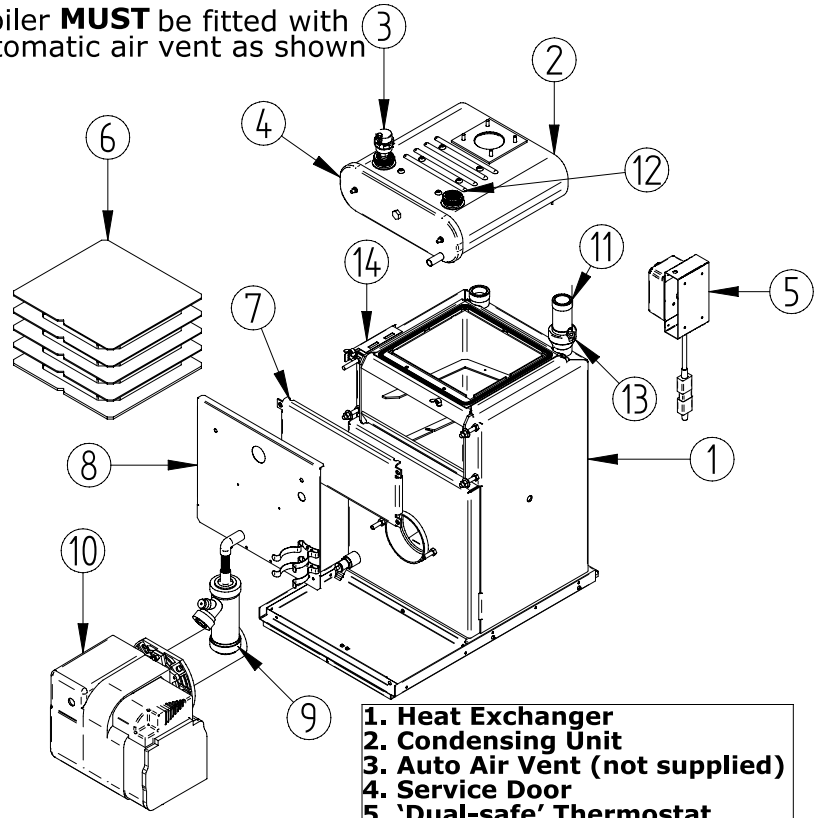
4.5 Components

4.5.1 B-Series Boilerhouse – Casing & Key Components



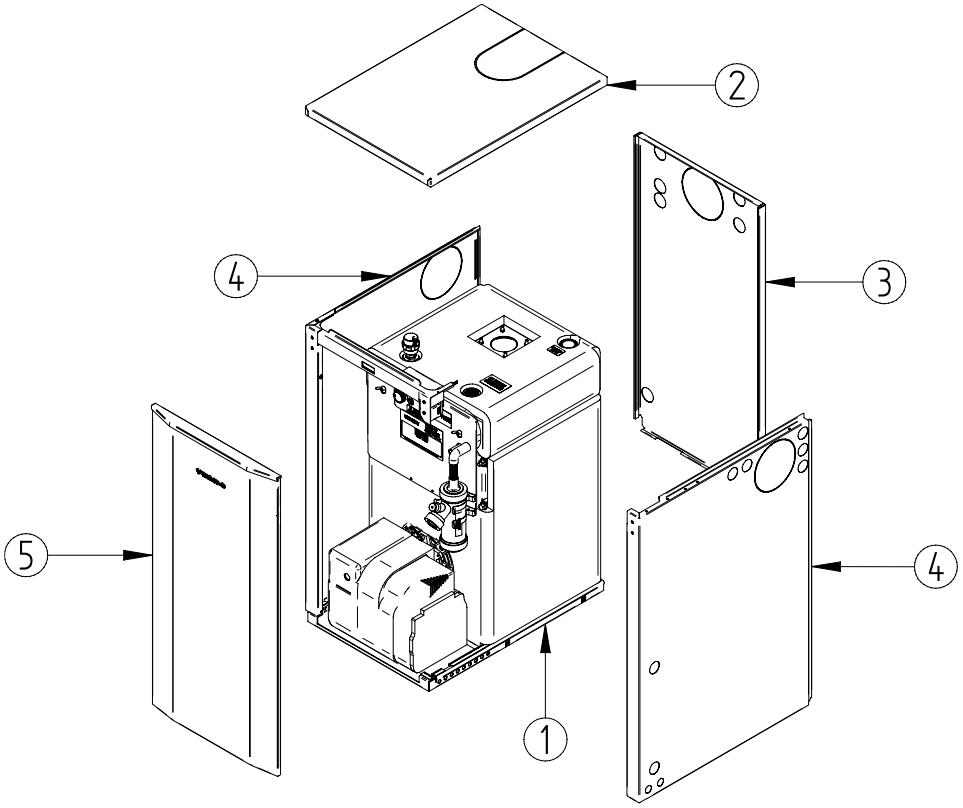
1. Boiler Assembly
2. Top Front Casing
3. Top Rear Casing (removable)
4. Sides & Rear Casing
5. Front Casing (removable)

The boiler **MUST** be fitted with an automatic air vent as shown



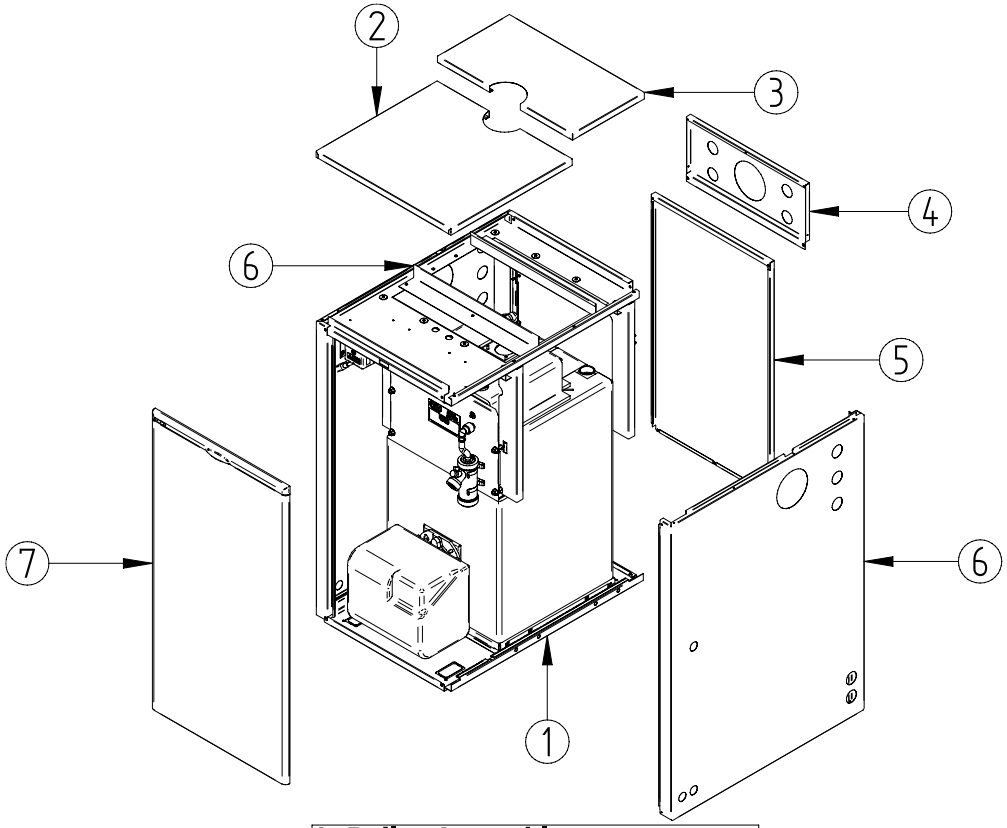
1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent (not supplied)
4. Service Door
5. 'Dual-safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Control Thermostat Pocket (bulb capillary)
14. Limit Thermostat Pocket (coiled capillary)

4.5.2 I-Series (Internal) Casing



1. Boiler Assembly
2. Top Casing (removable)
3. Rear Casing
4. Side Casing
5. Front Casing (removable)

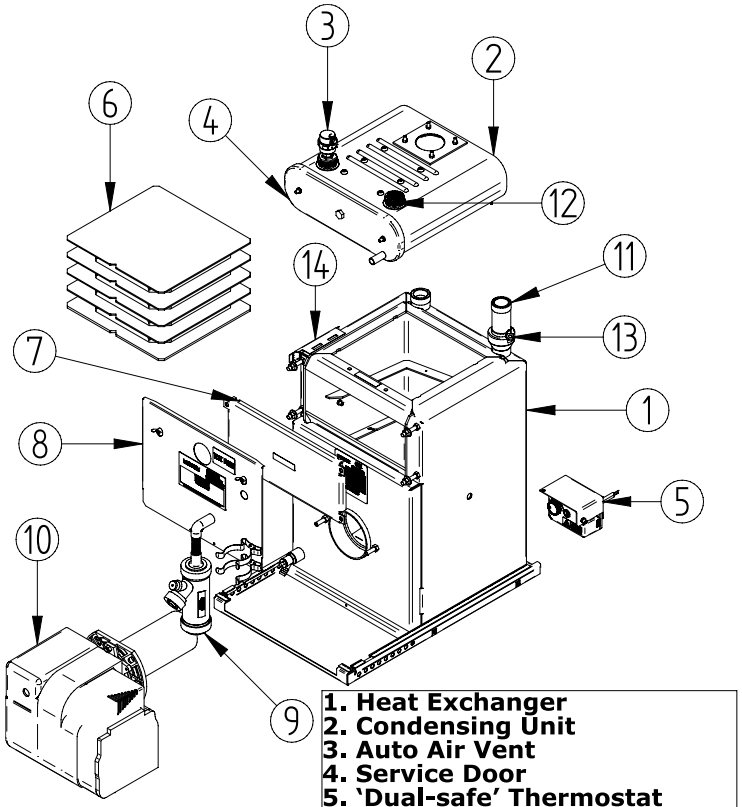
21, 26 & 33 Models



1. Boiler Assembly
2. Top Front Casing (removable)
3. Top Rear Casing (removable)
4. Rear Flue Casing
5. Rear Casing (removable)
6. Side Casing
7. Front Casing (removable)

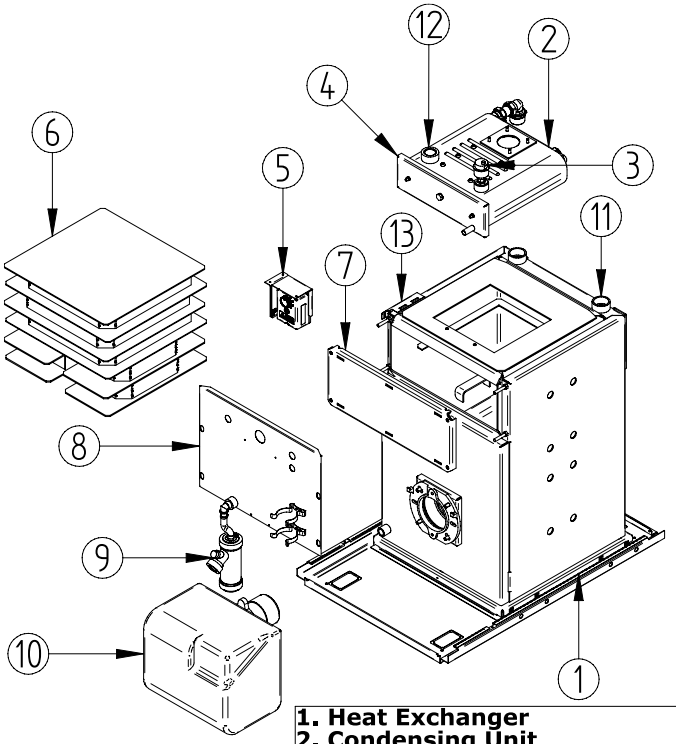
44 Models

4.5.3 I-Series (Internal) Key Components



1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Control Thermostat Pocket (bulb capillary)
14. Limit Thermostat Pocket (coiled capillary)

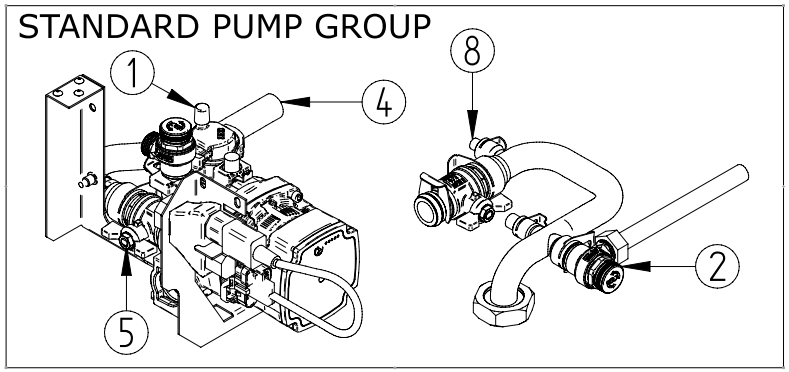
21, 26 & 33 Models

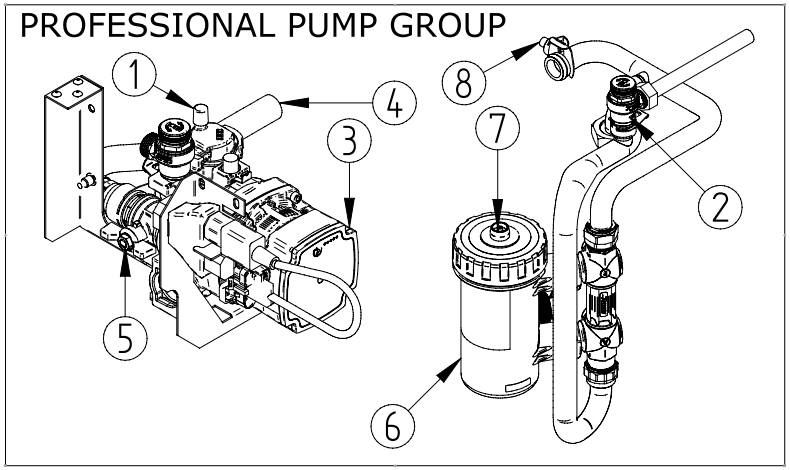


1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. RDB 3.2 Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Thermostat Pocket (control and limit)

44 Models

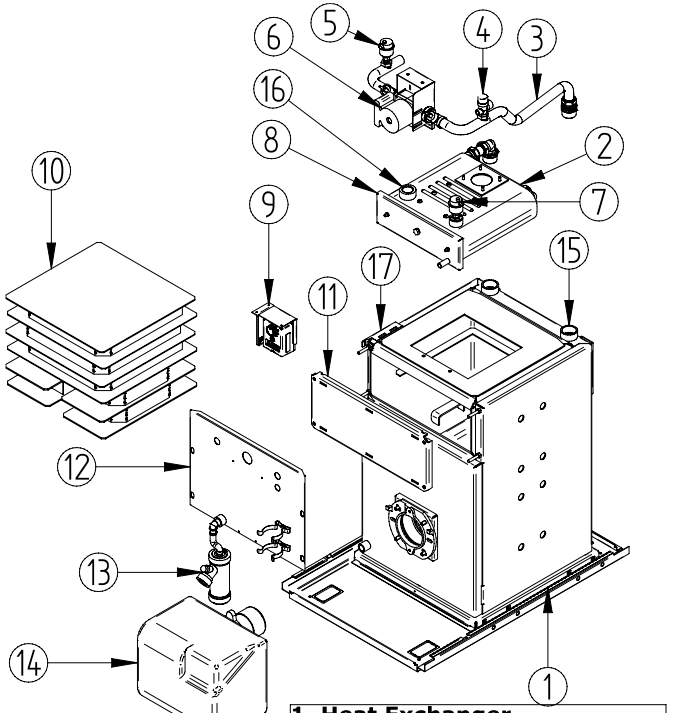
4.5.4 I-Series (Internal) Pump Group





1. Automatic Air Vent
2. Pressure Relief Valve
3. Circulating Pump
4. CH Return Connection
5. Service Valve
6. Magnetic Filter
7. Manual Air Vent
8. System Kit Connection

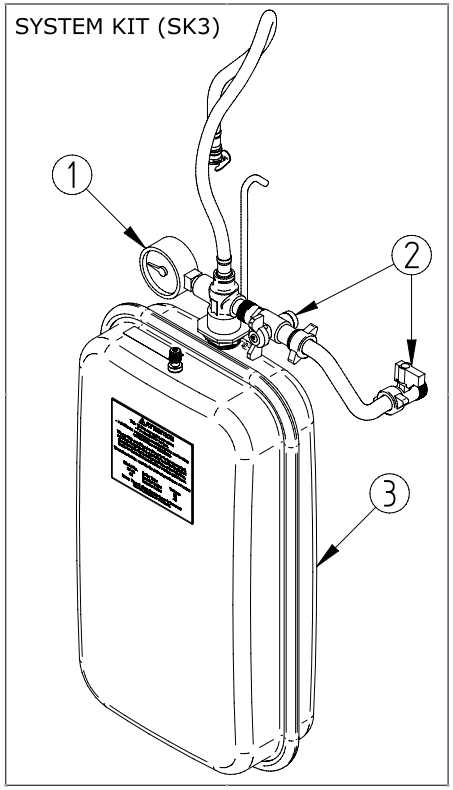
21, 26 & 33 Models



1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. RDB 3.2 Burner
15. Heating Flow Connection
16. Heating Return Connection
17. Thermostat Pocket (control and limit)

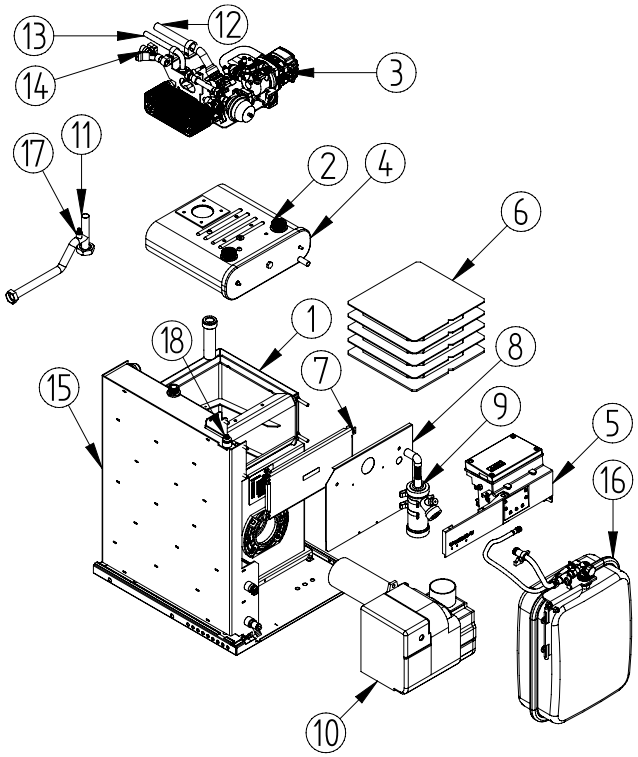
44 Models

4.5.5 I-Series (Internal) System Components (SK3)



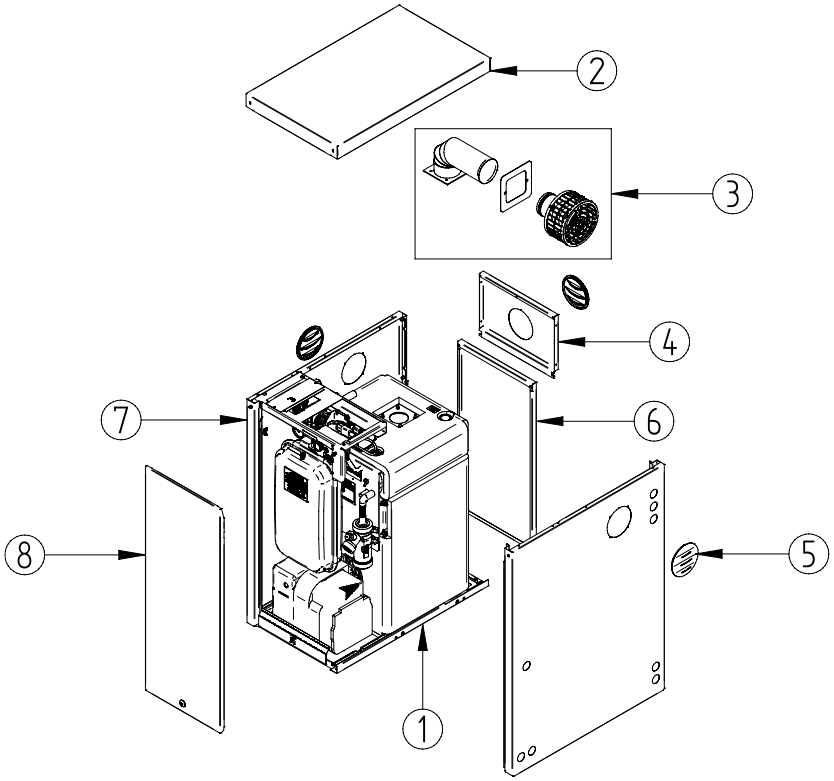
1. System Pressure Gauge
2. Filling Loop Valves
3. 12 Litre Expansion Vessel

4.5.6 I-Series (Internal) Combination Boiler - Key Components



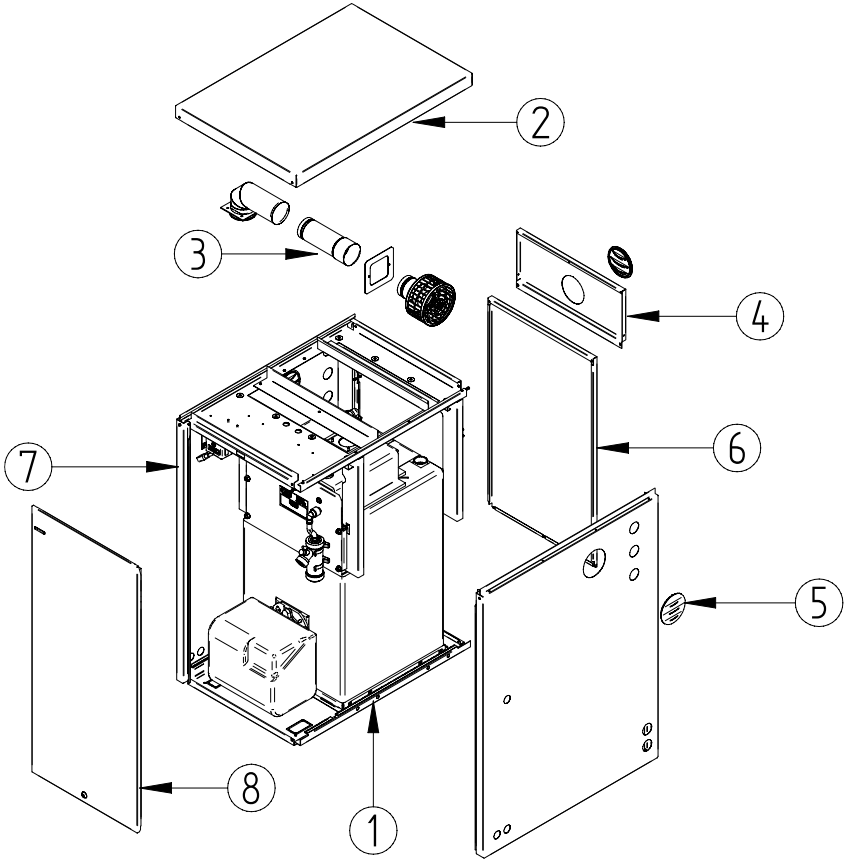
1. Heat Exchanger
2. Condensing Unit
3. Hydraulic Group
4. Service Door
5. Control Panel Assembly
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Domestic Hot Water Connection
14. Domestic Cold Water Connection
15. Heat Store Tank
16. System Expansion Vessel
17. Manual Air Vent
18. Manual Air Vent

4.5.7 E-Series (External) Casing



1. Boiler Assembly
2. Top Casing (removable)
3. Flue Assembly (removable)
4. Rear Flue Casing
5. Blanking Plug (removable)
6. Rear Casing (removable)
7. Side Casing
8. Front Casing (removable)

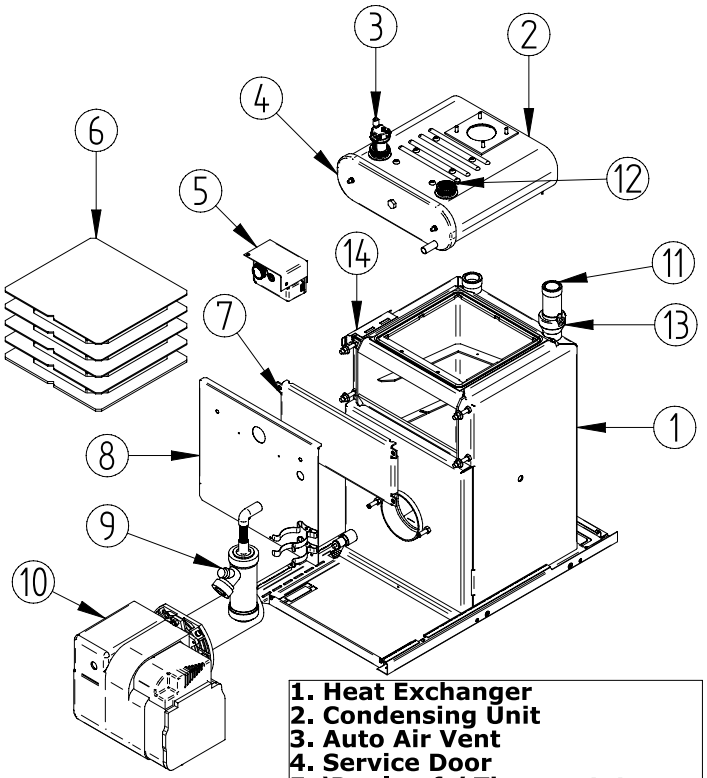
21, 26 & 33 Models



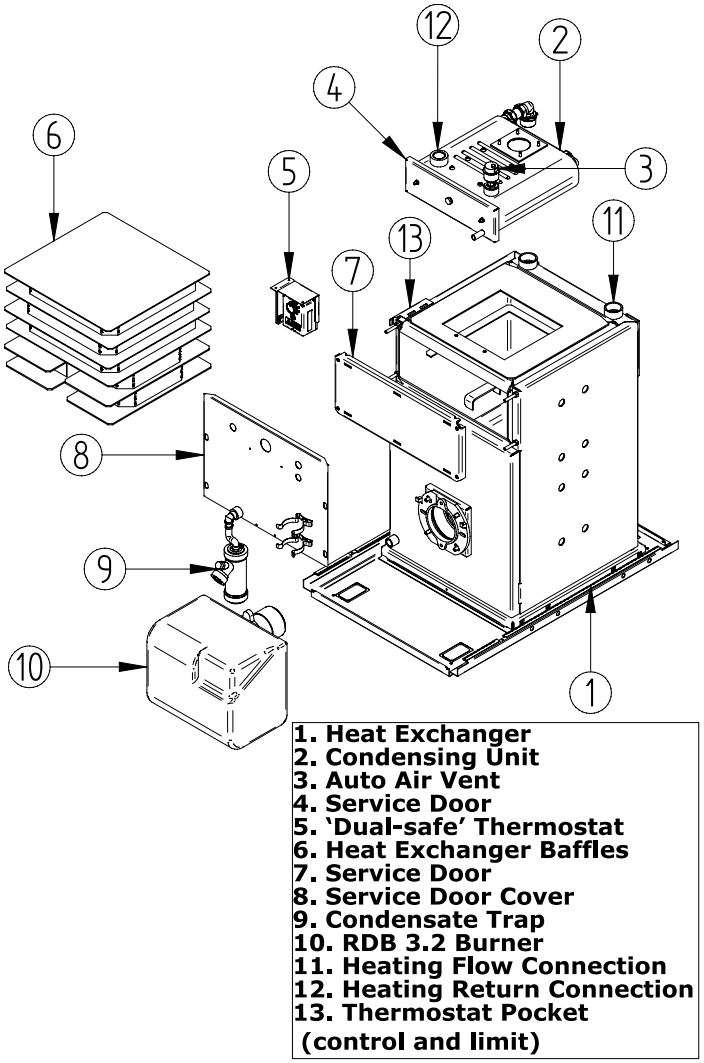
1. Boiler Assembly
2. Top Casing (removable)
3. Flue Assembly (removable)
4. Rear Flue Casing
5. Blanking Plug (removable)
6. Rear Casing (removable)
7. Side Casing
8. Front Casing (removable)

44 Models

4.5.8 E-Series (External) Key Components

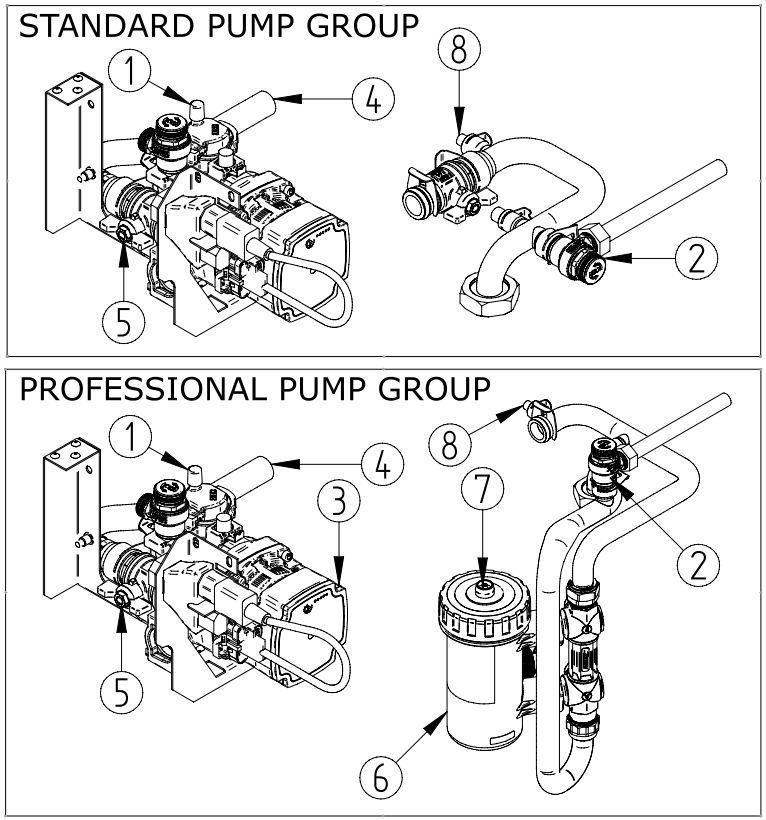


21, 26 & 33 Models



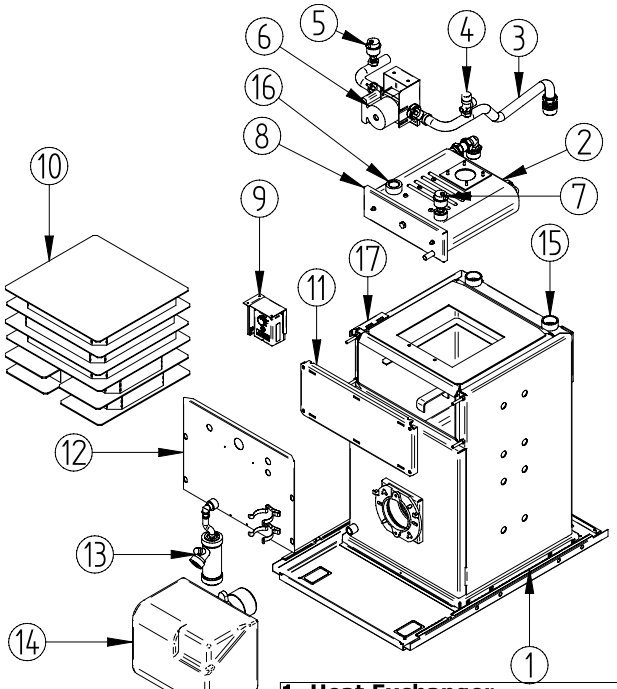
44 Models

4.5.9 E-Series (External) Pump Group



1. Automatic Air Vent
2. Pressure Relief Valve
3. Circulating Pump
4. CH Return Connection
5. Service Valve
6. Magnetic Filter
7. Manual Air Vent
8. System Kit Connection

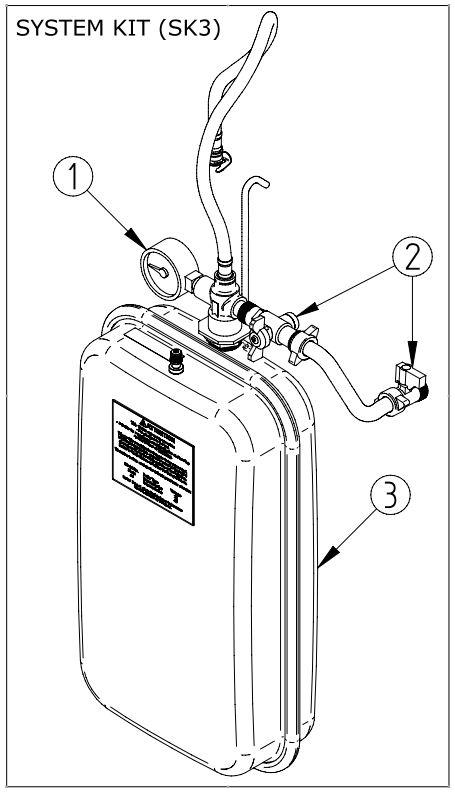
21, 26 & 33 Models



1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. RDB 3.2 Burner
15. Heating Flow Connection
16. Heating Return Connection
17. Thermostat Pocket (control and limit)

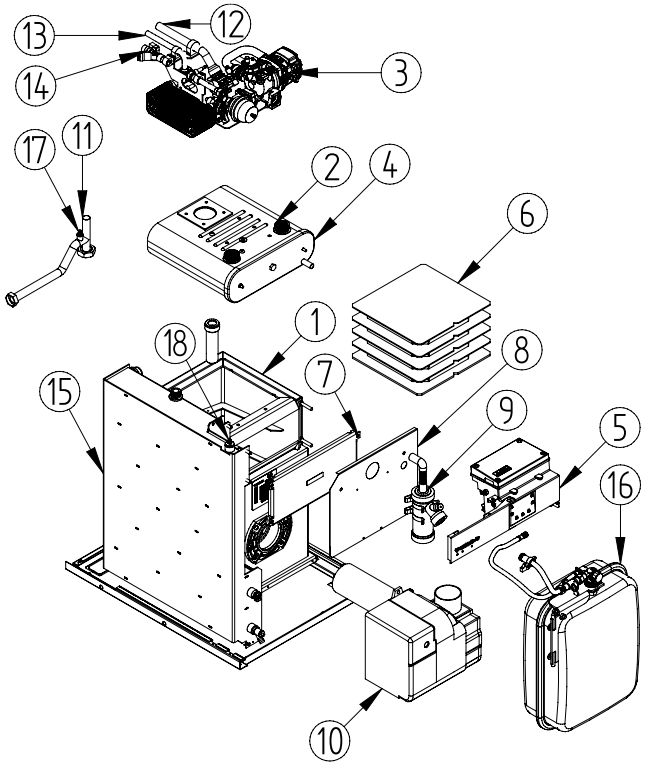
44 Models

4.5.10 E-Series (External) System Components (SK3)



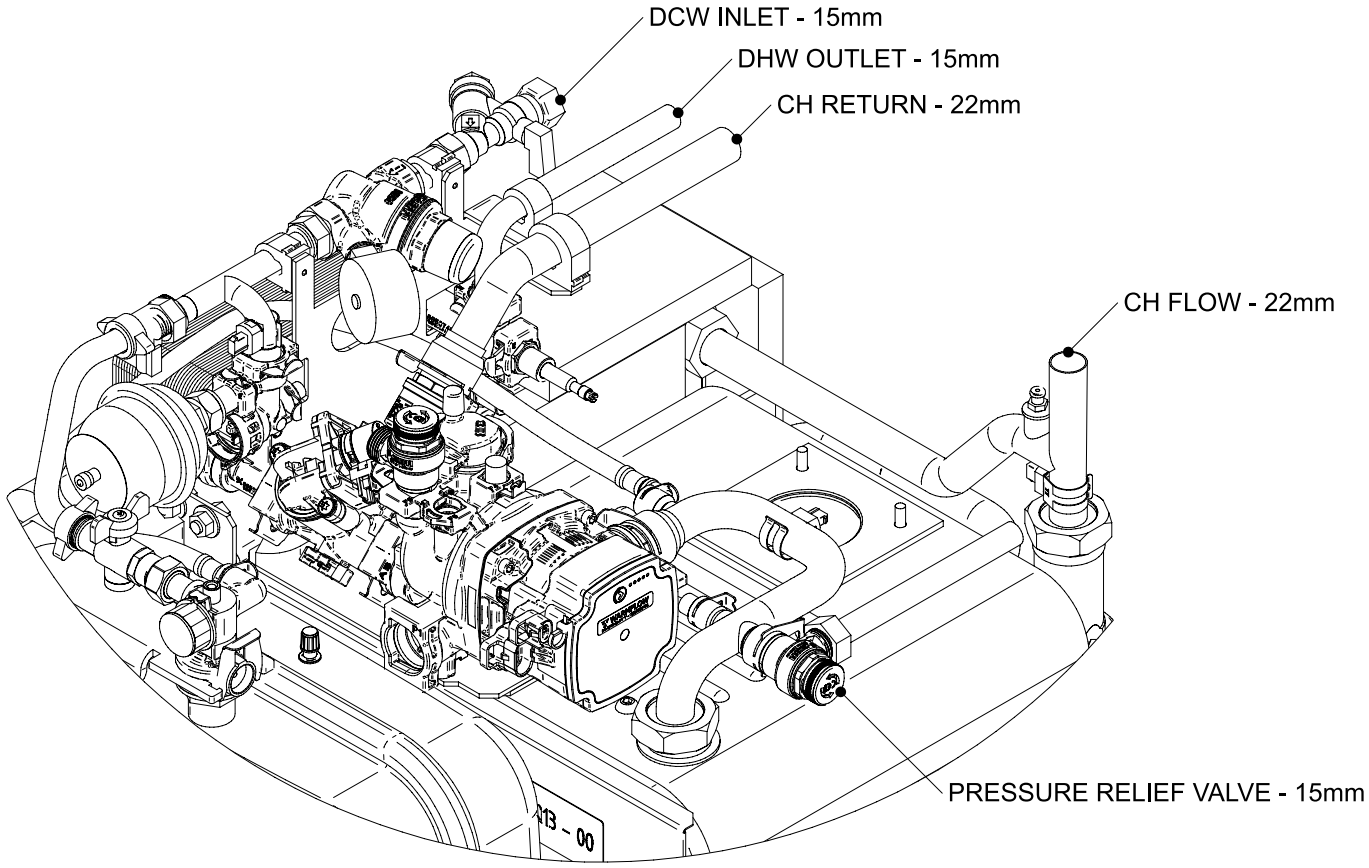
1. System Pressure Gauge
2. Filling Loop Valves
3. 12 Litre Expansion Vessel

4.5.11 E-Series (External) Combination Boiler - Key Components



1. Heat Exchanger
2. Condensing Unit
3. Hydraulic Group
4. Service Door
5. Control Panel Assembly
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Domestic Hot Water Connection
14. Domestic Cold Water Connection
15. Heat Store Tank
16. System Expansion Vessel
17. Manual Air Vent
18. Manual Air Vent

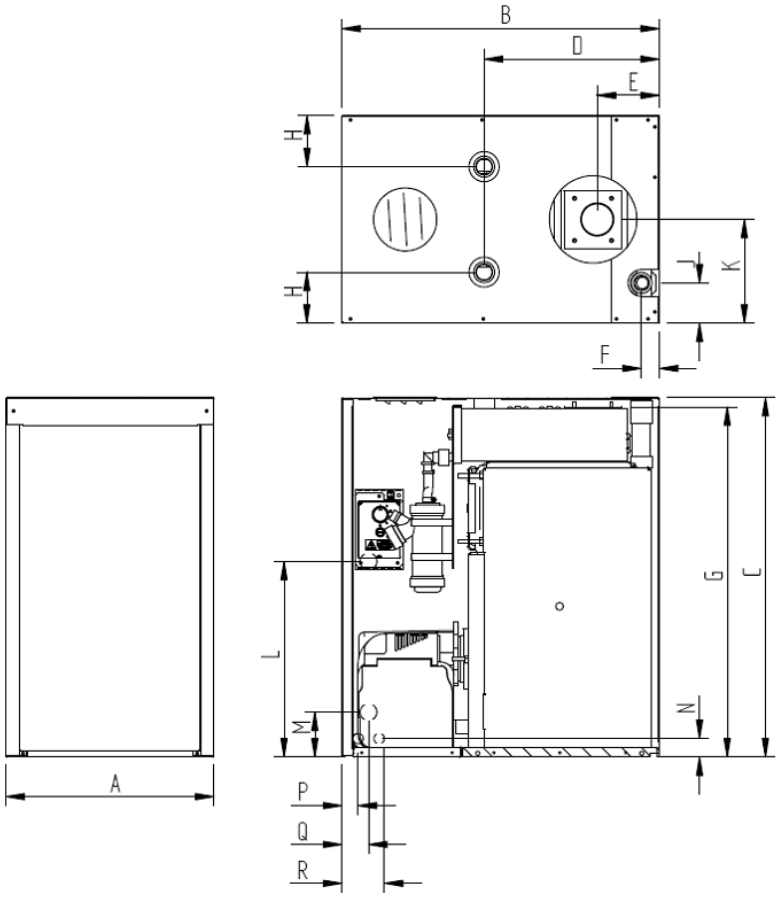
4.5.12 Combination Boiler Pipe Layout



5 TECHNICAL DETAILS

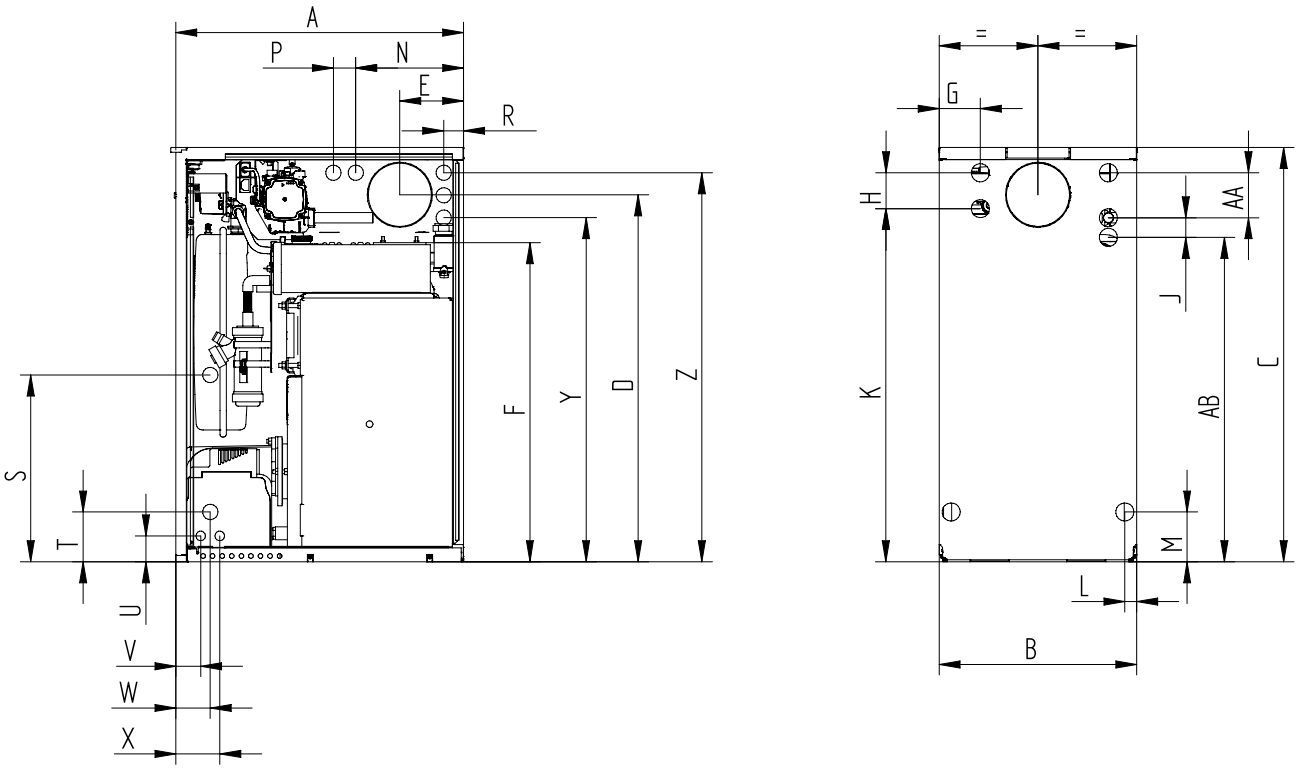
5.1 Dimensions

5.1.1 B-Series (Boilerhouse) B21, B26 & B33



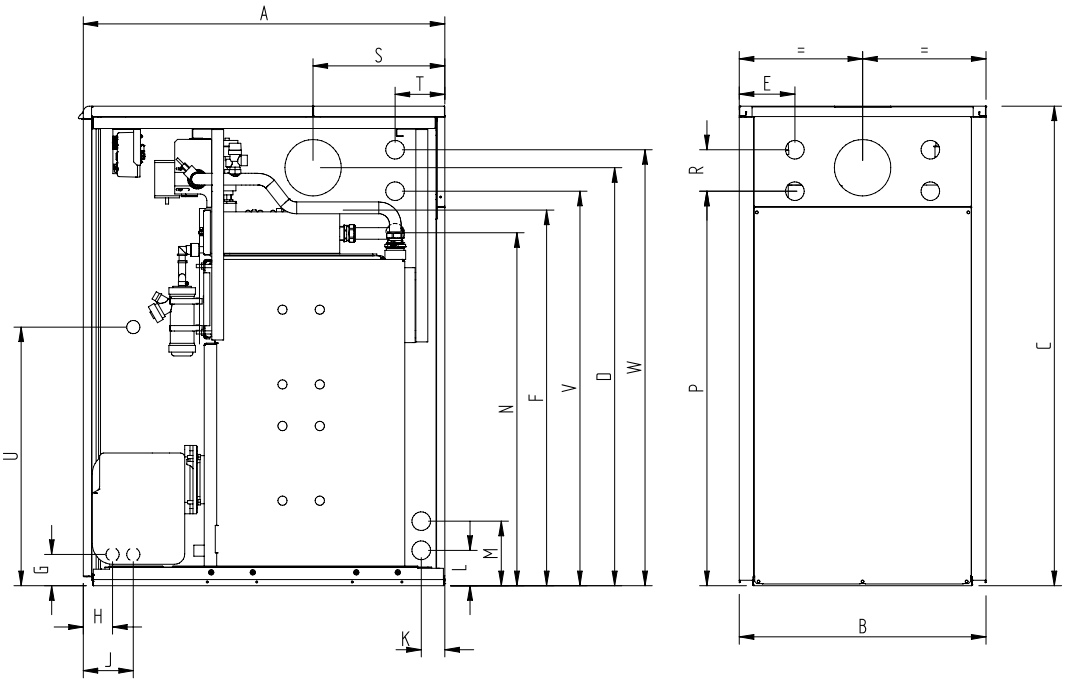
A	395
B	600
C	697
D	332
E	118
F	34
G	676
H	97
J	77
K	197
L	383
M	97
N	47
P	30
Q	50
R	80

5.1.2 I-Series (Internal) I21, I26 & I33



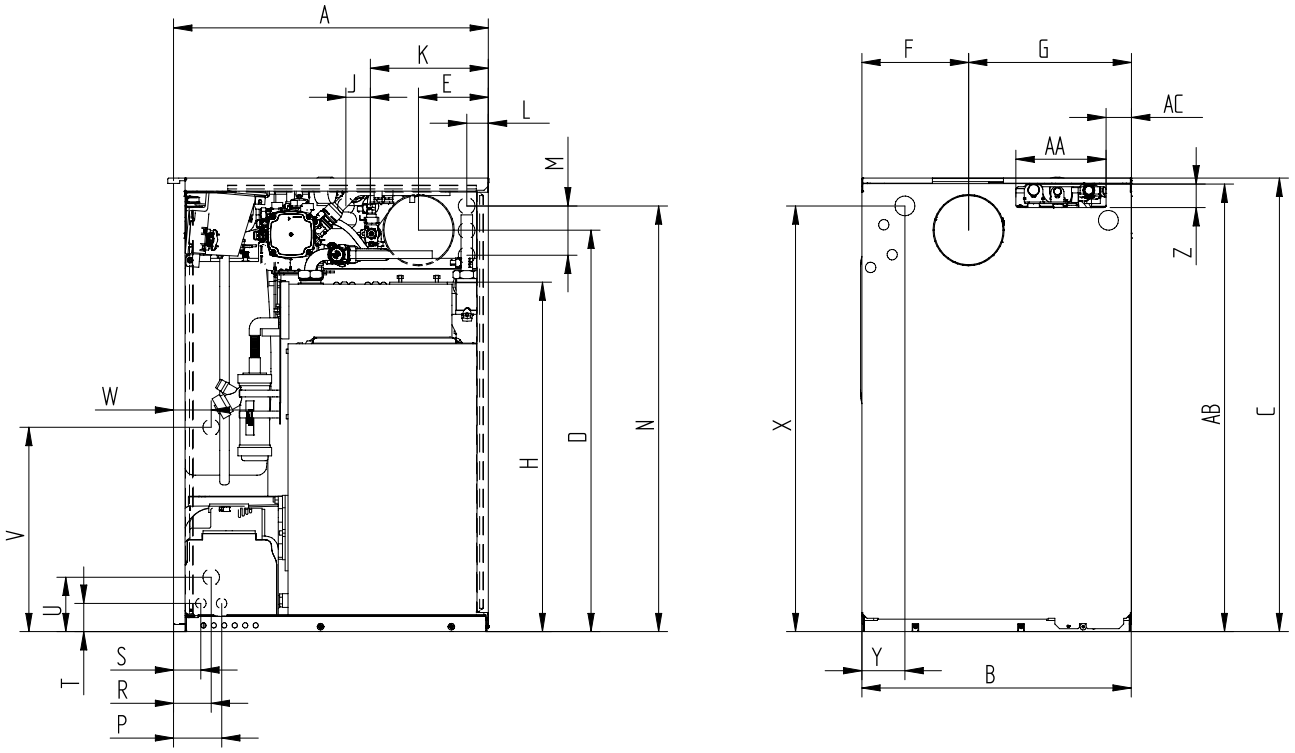
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA	AB
I~	602	413	865	766	134	666	86	75	42	737	25	104	226	47	41	390	104	54	52	72	92	718	812	94	677
I~P	602	413	865	766	134	666	86	75	42	737	25	104	226	47	41	390	104	54	52	72	92	718	812	94	677
I~S	602	413	865	766	134	666	86	75	42	737	25	104	226	47	41	390	104	54	52	72	92	718	812	94	677

5.1.3 I-Series (Internal) I44



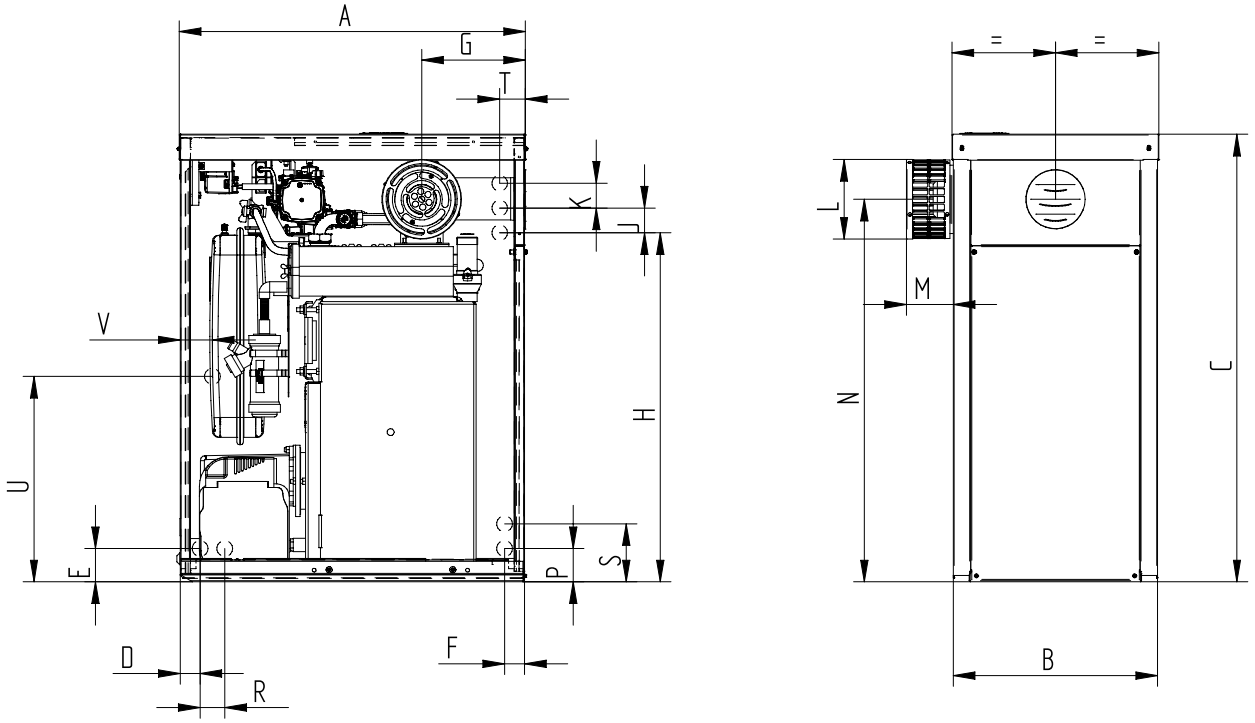
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W
I44	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050
I44P	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050

5.1.4 I-Series (Internal) Combination Boilers I21C, I26C& I33C



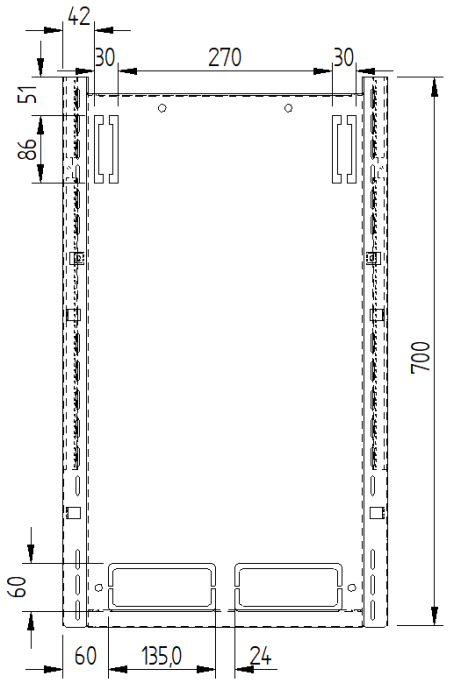
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
I~C	602	515	865	766	133	204	311	667	47	225	41	94	812	92	72	52	54	104	390	72	812	82	45	172	854	49

5.1.5 E-Series (External) E21, E26 & E33

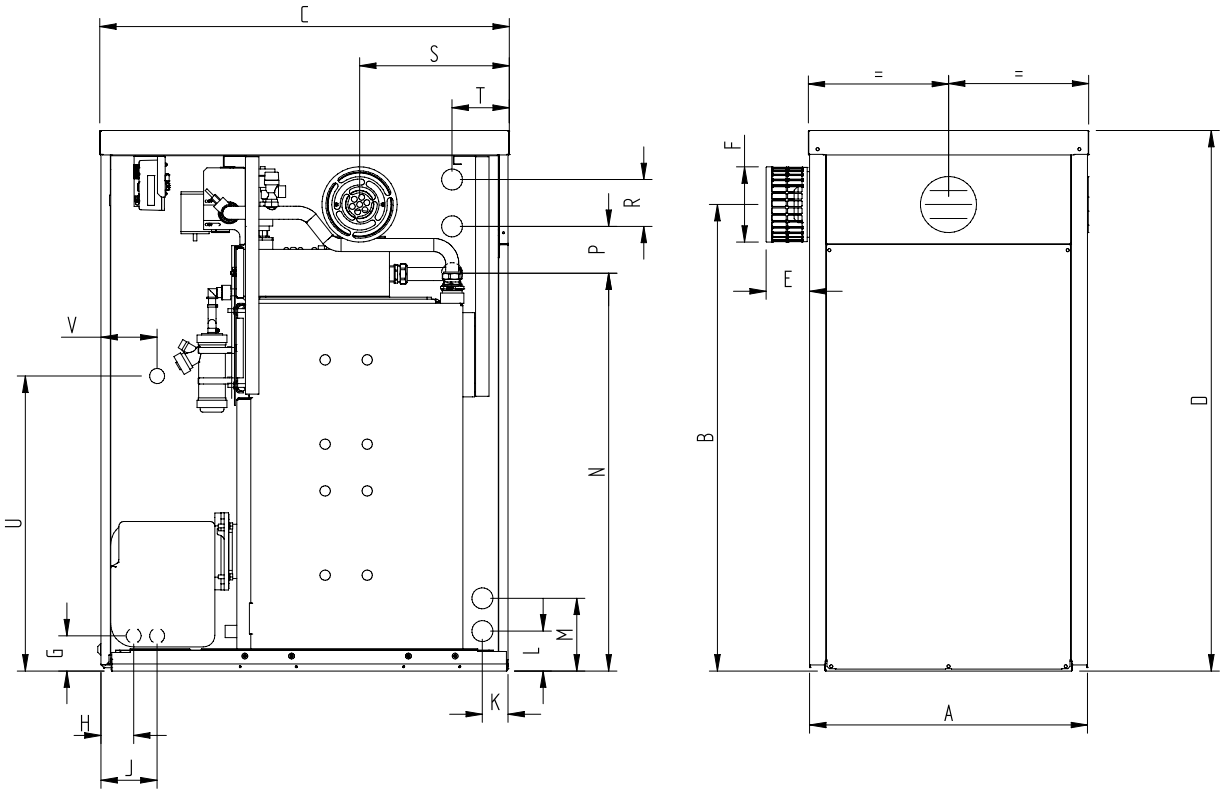


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
E~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
E~P	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
E~S	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65

5.1.6 E-Series (External) Base Tray E21, E26 & E33

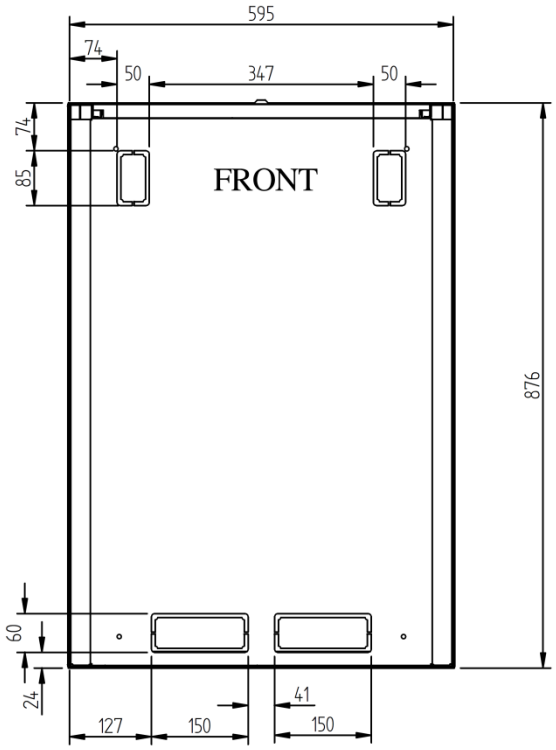


5.1.7 E-Series (External) E44

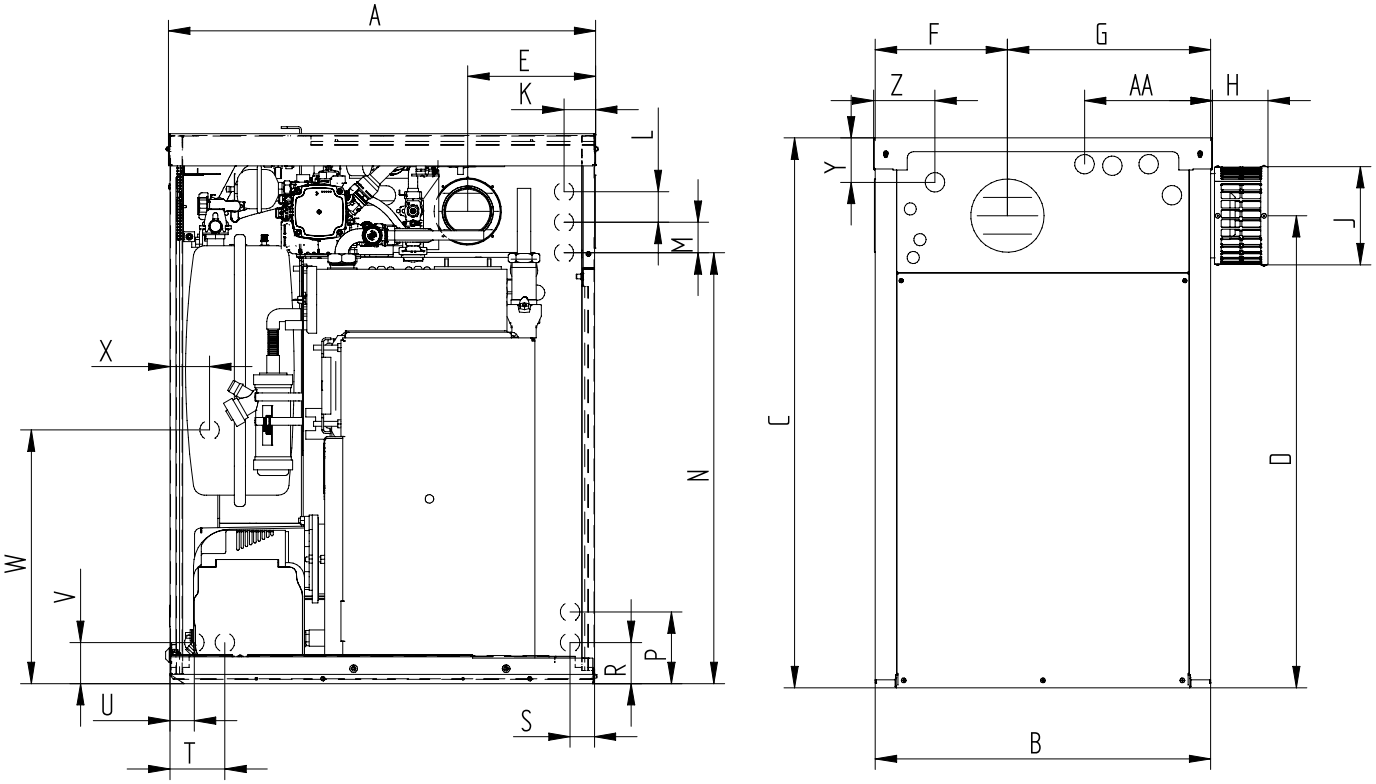


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
E44	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120
E44P	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120

5.1.8 E-Series (External) E44 Base Tray

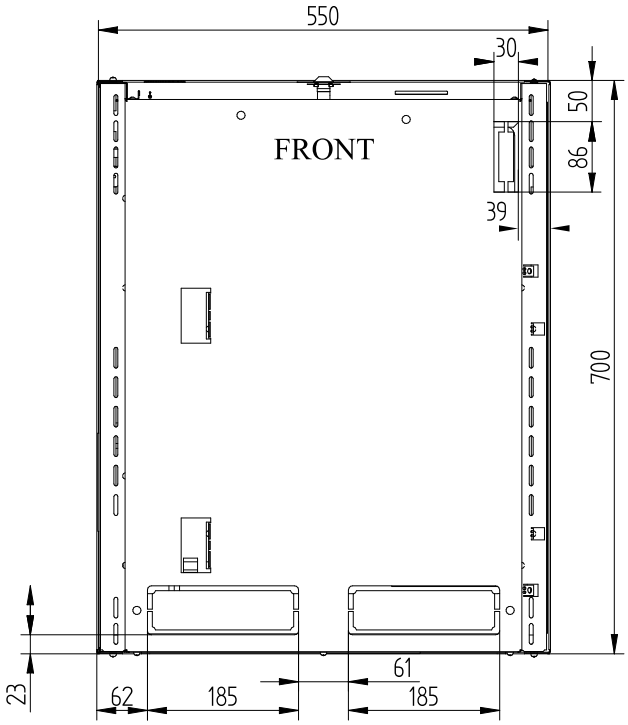


5.1.9 E-Series (External) Combination Boilers E21C, E26C& E33C



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
E~C	700	550	900	770	210	217	333	93	161	52	50	50	705	117	67	40	90	40	67	415	65	73	100	209

5.1.10 E-Series (External) Combination Boiler Base Tray E21C, E26C & E33C

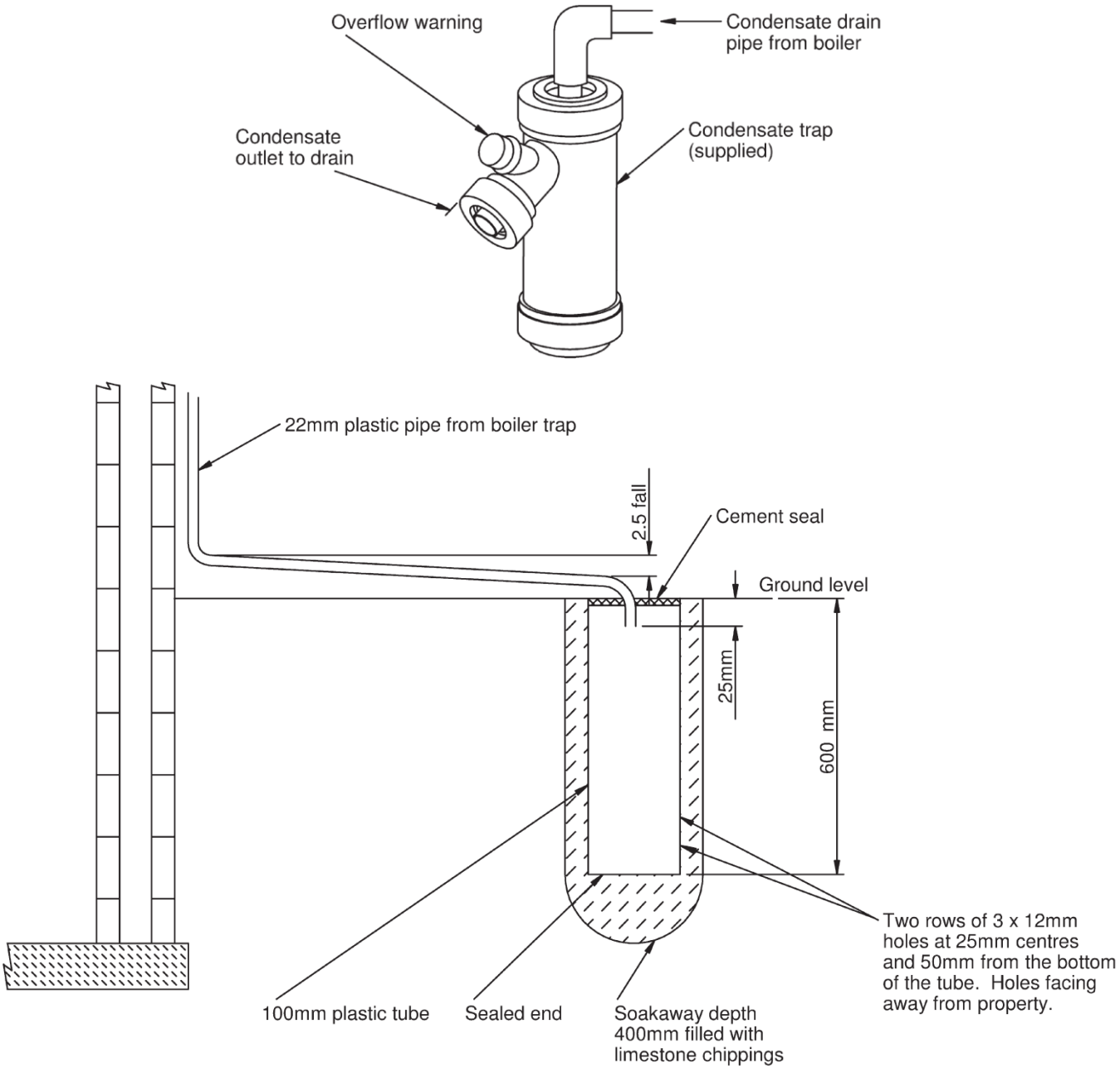


5.3 Condensate Disposal

The Warmflow high efficiency condensing boiler is supplied with a factory fitted, self-sealing condensate trap. The trap has been fitted inside the boiler casing to the right hand side.

The condensate drainage pipe within the boiler is a flexible plastic hose which can be trimmed to length. 3/4” or 22mm pipe must be connected to the flexible hose. The pipe connected must not be made from steel or copper. The drainage pipe may run into an internal soil stack or waste pipe, an external gulley, hopper or soakaway as shown below.

The boiler, when fully condensing, will produce a maximum of 1.5 litres per hour of condensate. It is recommended that the drainage pipe must have a minimum fall of 1:20. This pipe must be protected from freezing either by insulating or using large diameter pipework in exposed locations.



5.4 Technical Data - Kerosene

5.4.1 B-Series (Boilerhouse) - Kerosene

MODEL		**B21**			**B26**			**B33**		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0
Flow Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Wet	kg	114			114			114		
Factory Settings		Highlighted in bold								

5.4.2 I-Series (Internal) Heat Only/Heat Only Professional - Kerosene

MODEL		I21 / I21PRO			I26 / I26 PRO			I33 / I33 PRO			I44 / I44 PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°H
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.10**	1.25
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0	10.0	**9.0**	9.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145	145	**131**	131
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0	19.0	**19.0**	22.5
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Wet	kg	123			123			123			230		
Factory Settings		Highlighted in bold											

5.4.3 I-Series (Internal) Pumped, Pumped Professional - Kerosene

MODEL		I21P / I21P PRO			I26P / I26P PRO			I33P / I33P PRO			I44P		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°H
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.10**	1.25
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0	10.0	**9.0**	9.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145	145	**131**	131
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0	19.0	**19.0**	22.5
Flow Connection		28mm Compression			28mm Compression			28mm Compression			28mm Copper		
Return Connection		22mm Copper			22mm Copper			28mm Compression			1¼" BSP Female		
Water Content	litres gals	24 5.3			24 5.3			24 5.3			45 9.9		
Boiler Weight Wet	kg	127			127			127			242		
Factory Settings		Highlighted in bold											

5.4.4 I-Series (Internal) System & System Professional - Kerosene

MODEL		I21S / I21S PRO			I26S / I26S PRO			I33S / I33S PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water	litres	30			30			30		
Content	gals	6.6			6.6			6.6		
Boiler Weight Wet	kg	138			138			138		
Factory Settings		Highlighted in bold								

5.4.5I-Series (Internal) Combination & Combination Professional Boilers - Kerosene

MODEL		I21C / I21C PRO			I26C / I26C PRO			I33C / I33C PRO		
Nominal Heat Output	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal Heat Input	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump Pressure	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0
	psi	99	**116**	116	145	**126**	145	131	**116**	145
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel Flow Rate	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0
Water Content	litres	64			64			64		
	gals	14.1			14.1			14.1		
Boiler Weight Wet	kg	221			221			221		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar	1.8			1.8			1.8		
	psi	26			26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Factory Set DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5			2.5		
	gal/m	0.55			0.55			0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar	2.5			2.5			2.5		
	psi	0.55			0.55			0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.4.6 E-Series (External) Heat Only/Heat Only Professional - Kerosene

MODEL		E21 / E21 PRO			E26 / E26 PRO			E33 / E33 PRO			E44 / E44 PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°H
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.10**	1.25
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0	10.0	**9.0**	9.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145	145	**131**	131
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0	19.0	**19.0**	22.5
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Wet	kg	128			128			128			232		
Factory Settings		Highlighted in bold											

5.4.7 E-Series (External) Pumped, Pumped Professional - Kerosene

MODEL		E21P / E21P PRO			E26P / E26P PRO			E33P / E33P PRO			E44P		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°H
	size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.10**	1.25
Oil Pump	bar	6.5	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0	10.0	**9.0**	9.0
Pressure	psi	99	**116**	116	145	**126**	145	131	**116**	145	145	**131**	131
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0	19.0	**19.0**	22.5
Flow Connection		28mm Compression			28mm Compression			28mm Compression			28mm Copper		
Return Connection		22mm Copper			22mm Copper			28mm Compression			1¼" BSP Female		
Water	litres	24			24			24			45		
Content	gals	5.3			5.3			5.3			9.9		
Boiler Weight Wet	kg	132			132			132			244		
Factory Settings		Highlighted in bold											

5.4.8 E-Series (External) System & System Professional - Kerosene

MODEL		E21S / E21S PRO			E26S / E26S PRO			E33S / E33S PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB BX 2.2 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	6.8	**8.0**	8.0	10.0	**8.7**	10.0	9.0	**8.0**	10.0
Pressure	psi	99	**116**	116	146	**126**	145	131	**116**	145
% CO_2	Recommended	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
	Maximum	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water	litres	30			30			30		
Content	gals	6.6			6.6			6.6		
Boiler Weight Wet	kg	140			140			140		
Factory Settings		Highlighted in bold								

5.4.9 E-Series (External) Combination & Combination Professional Boilers - Kerosene

MODEL		E21C / E21C PRO			E26C / E26C PRO			E33C / E33C PRO		
Nominal Heat Output	kW Btu/hr	14.7 50,000	**17.6** **60,000**	21.0 71,650	21.0 71,560	**23.5** **80,000**	27.1 92,380	27.1 92,380	**29.0** **99,050**	32.7 111,600
Nominal Heat Input	kW Btu/hr	15.3 52,150	**18.4** **62,600**	22.0 75,000	22.0 75,000	**24.4** **83,175**	28.0 95,550	28.0 95,550	**30.0** **102,400**	34.0 116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°EH	**80°EH**	80°EH	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.45	**0.55**	0.60	0.55	**0.65**	0.75	0.75	0.85	0.85
Oil Pump Pressure	bar psi	6.8 99	**8.0** **116**	8.0 116	10.0 145	**8.7** **126**	10.0 145	9.0 131	**8.0** **116**	10.0 145
% CO_2	Recommended Maximum	11.5 12.5	**11.5** **12.5**	11.5 12.5	11.5 12.5	**11.5** **12.5**	11.5 12.5	11.5 12.5	**11.5** **12.5**	11.5 12.5
Approx Fuel Flow Rate	litres/h Gals/h	1.65 0.36	**1.98** **0.44**	2.35 0.52	2.35 0.52	**2.65** **0.58**	2.98 0.65	2.98 0.65	**3.40** **0.75**	3.81 0.84
Combustion Head Position	mm	11.0	**11.5**	12.5	12.5	**14.5**	15.0	15.5	**18.0**	18.0
Water Content	litres gals	64 14.1			64 14.1			64 14.1		
Boiler Weight Wet	kg	226			226			226		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi	1.8 26			1.8 26			1.8 26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Factory Set DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Minimum DHW Flow Rate	litres/m gal/m	2.5 0.55			2.5 0.55			2.5 0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar psi	2.5 0.55			2.5 0.55			2.5 0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.5 Technical Data – HVO (100%)

5.5.1 B-Series (Boilerhouse) - HVO

MODEL		B21			B26			B33		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
HVO Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0
Flow Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Wet	kg	114			114			114		
Factory Settings		Highlighted in bold								

5.5.2 I-Series (Internal) Heat Only/Heat Only Professional - HVO

MODEL		I21 / I21 PRO			I26 / I26 PRO			I33 / I33 PRO			I44 / I44 PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33.0	**38.5**	44.0
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0	34.3	**40.0**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
HVO Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	60°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85	0.85	**1.00**	1.00
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0	11.0	**10.5**	12.5
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160	160	**152**	181
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71	3.74	**4.36**	5.11
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98	0.99	**1.15**	1.35
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0	21.0	**21.0**	23.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Wet	kg	123			123			123			230		
Factory Settings		Highlighted in bold											

5.5.3 I-Series (Internal) Pumped, Pumped Professional - HVO

MODEL		I21P / I21P PRO			I26P / I26P PRO			I33P / I33P PRO			I44P		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33.0	**38.5**	44.0
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0	34.3	**40.0**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
HVO Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	60°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85	0.85	**1.00**	1.00
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0	11.0	**10.5**	12.5
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160	160	**152**	181
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71	3.74	**4.36**	5.11
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98	0.99	**1.15**	1.35
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0	21.0	**21.0**	23.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression			28mm Copper		
Return Connection		22mm Copper			22mm Copper			28mm Compression			1¼" BSP Female		
Water Content	litres gals	24 5.3			24 5.3			24 5.3			45 9.9		
Boiler Weight Wet	kg	127			127			127			242		
Factory Settings		Highlighted in bold											

5.5.4 I-Series (Internal) System & System Professional - HVO

MODEL		I21S / I21S PRO			I26S / I26S PRO			I33S / I33S PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
HVO Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85
Oil Pump Pressure	bar psi	10.5 152	**10.5** **152**	12.5 181	12.5 181	**10.7** **155**	13.0 189	12.0 174	**11.5** **167**	11.0 160
% CO_2	Recommended Maximum	12.5 13.5	**12.5** **13.5**	12.5 13.5	12.5 13.5	**12.5** **13.5**	12.5 13.5	12.5 13.5	**12.5** **13.5**	12.5 13.5
Approx Fuel Flow Rate	litres/h Gals/h	1.75 0.46	**2.02** **0.53**	2.37 0.63	2.40 0.63	**2.67** **0.70**	3.05 0.81	3.05 0.81	**3.28** **0.87**	3.71 0.98
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water Content	litres gals	30 6.6			30 6.6			30 6.6		
Boiler Weight Wet	kg	138			138			138		
Factory Settings		Highlighted in bold								

5.5.5I-Series (Internal) Combination & Combination Professional Boilers - HVO

MODEL		I21C / I21C PRO			I26C / I26C PRO			I33C / I33C PRO		
Nominal Heat Output	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600
Nominal Heat Input	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0
	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
HVO Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85
Oil Pump Pressure	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0
	psi	152	**152**	181	181	**155**	189	174	**167**	160
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel Flow Rate	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71
	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0
Water Content	litres	64			64			64		
	gals	14.1			14.1			14.1		
Boiler Weight Wet	kg	221			221			221		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar	1.8			1.8			1.8		
	psi	26			26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Factory Set DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5			2.5		
	gal/m	0.55			0.55			0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar	2.5			2.5			2.5		
	psi	0.55			0.55			0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.5.6 E-Series (External) Heat Only/Heat Only Professional – HVO

MODEL		E21 / E21 PRO			E26 / E26 PRO			E33 / E33 PRO			E44 / E44 PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33.0	**38.5**	44.0
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0	34.3	**40.0**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
HVO Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	60°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85	0.85	**1.00**	1.00
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0	11.0	**10.5**	12.5
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160	160	**152**	181
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71	3.74	**4.36**	5.11
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98	0.99	**1.15**	1.35
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0	21.0	**21.0**	23.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Wet	kg	128			128			128			232		
Factory Settings		Highlighted in bold											

5.5.7 E-Series (External) Pumped, Pumped Professional – HVO

MODEL		E21P / E21P PRO			E26P / E26P PRO			E33P / E33P PRO			E44P		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33.0	**38.5**	44.0
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0	34.3	**40.0**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33			RDB 3.2 BX 33-44		
Head		BX500			BX700			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
HVO Settings													
Nozzle	Make	Danfoss			Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	60°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85	0.85	**1.00**	1.00
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0	11.0	**10.5**	12.5
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160	160	**152**	181
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71	3.74	**4.36**	5.11
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98	0.99	**1.15**	1.35
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0	21.0	**21.0**	23.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression			28mm Copper		
Return Connection		22mm Copper			22mm Copper			28mm Compression			1¼" BSP Female		
Water Content	litres	24			24			24			45		
	gals	5.3			5.3			5.3			9.9		
Boiler Weight Wet	kg	132			132			132			244		
Factory Settings		Highlighted in bold											

5.5.8 E-Series (External) System & System Professional - HVO

MODEL		E21S / E21S PRO			E26S / E26S PRO			E33S / E33S PRO		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600
Nominal	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB BX 2.2 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
HVO Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85
Oil Pump	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0
Pressure	psi	152	**152**	181	181	**155**	189	174	**167**	160
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71
Flow Rate	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water	litres	30			30			30		
Content	gals	6.6			6.6			6.6		
Boiler Weight Wet	kg	140			140			140		
Factory Settings		Highlighted in bold								

5.5.9 E-Series (External) Combination & Combination Professional Boilers - HVO

MODEL		E21C / E21C PRO			E26C / E26C PRO			E33C / E33C PRO		
Nominal Heat Output	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,128	**99,050**	111,600
Nominal Heat Input	kW	15.3	**18.5**	21.8	22.0	**24.4**	28.0	28.0	**30.0**	34.0
	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B	B	C	N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
HVO Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES	80°ES	**80°ES**	80°ES
	Size	0.40	**0.45**	0.50	0.50	**0.60**	0.60	0.65	**0.75**	0.85
Oil Pump Pressure	bar	10.5	**10.5**	12.5	12.5	**10.7**	13.0	12.0	**11.5**	11.0
	psi	152	**152**	181	181	**155**	189	174	**167**	160
% CO_2	Recommended	12.5	**12.5**	12.5	12.5	**12.5**	12.5	12.5	**12.5**	12.5
	Maximum	13.5	**13.5**	13.5	13.5	**13.5**	13.5	13.5	**13.5**	13.5
Approx Fuel Flow Rate	litres/h	1.75	**2.02**	2.37	2.40	**2.67**	3.05	3.05	**3.28**	3.71
	Gals/h	0.46	**0.53**	0.63	0.63	**0.70**	0.81	0.81	**0.87**	0.98
Combustion Head Position	mm	11.5	**12.0**	13.0	13.5	**14.5**	15.0	16.0	**20.0**	20.0
Water Content	litres	64			64			64		
	gals	14.1			14.1			14.1		
Boiler Weight Wet	kg	226			226			226		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar	1.8			1.8			1.8		
	psi	26			26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Factory Set DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5			2.5		
	gal/m	0.55			0.55			0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar	2.5			2.5			2.5		
	psi	0.55			0.55			0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.6 Technical Data - Gasoil

5.6.1 B-Series (Boilerhouse) - Gasoil

MODEL		B21			B26			B33		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.40	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8		
Boiler Weight Wet	kg	114			114			114		
Factory Settings		Highlighted in bold								

5.6.2 I-Series (Internal) Heat Only/Heat Only Professional - Gasoil

MODEL		I21 / I21 PRO			I26 / I26 PRO			I33 / I33 PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8		
Boiler Weight Wet	kg	123			123			123		
Factory Settings		Highlighted in bold								

5.6.3 I-Series (Internal) Pumped, Pumped Professional - Gasoil

MODEL		I21P / I21P PRO			I26P / I26P PRO			I33P / I33P PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water Content	litres gals	24 5.3			24 5.3			24 5.3		
Boiler Weight Wet	kg	127			127			127		
Factory Settings		Highlighted in bold								

5.6.4 I-Series (Internal) System & System Professional - Gasoil

MODEL		I21S / I21S PRO			I26S / I26S PRO			I33S / I33S PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water Content	litres gals	30 6.6			30 6.6			30 6.6		
Boiler Weight Wet	kg	138			138			138		
Factory Settings		Highlighted in bold								

5.6.5 I-Series (Internal) Combination & Combination Professional Boilers - Gasoil

MODEL		I21C / I21C PRO			I26C / I26C PRO			I33C / I33C PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended Maximum	- -	**11.50** **13.50**	12.50 13.50	11.0 12.5	**12.5** **12.5**	14.0 14.0	11.0 12.5	**12.5** **12.5**	13.5 13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Water Content	litres gals	64 14.1			64 14.1			64 14.1		
Boiler Weight Wet	kg	221			221			221		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi	1.8 26			1.8 26			1.8 26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Factory Set DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Minimum DHW Flow Rate	litres/m gal/m	2.5 0.55			2.5 0.55			2.5 0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar psi	2.5 0.55			2.5 0.55			2.5 0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.6.6 E-Series (External) Heat Only/Heat Only Professional - Gasoil

MODEL		E21 / E21 PRO			E26 / E26 PRO			E33 / E33 PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8		
Boiler Weight Wet	kg	128			128			128		
Factory Settings		Highlighted in bold								

5.6.7 E-Series (External) Pumped, Pumped Professional - Gasoil

MODEL		E21P / E21P PRO			E26P / E26P PRO			E33P / E33P PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss			Danfoss			Danfoss		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water Content	litres gals	24 5.3			24 5.3			24 5.3		
Boiler Weight Wet	kg	132			132			132		
Factory Settings		Highlighted in bold								

5.6.8 E-Series (External) System & System Professional - Gasoil

MODEL		E21S / E21S PRO			E26S / E26S PRO			E33S / E33S PRO		
Nominal	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB BX 2.2 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	-	88.00	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss 80°H			Danfoss 80°H			Danfoss 80°H		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Flow Connection		28mm Compression			28mm Compression			28mm Compression		
Return Connection		22mm Copper			22mm Copper			28mm Compression		
Water Content	litres gals	30 6.6			30 6.6			30 6.6		
Boiler Weight Wet	kg	140			140			140		
Factory Settings		Highlighted in bold								

5.6.9 E-Series (External) Combination & Combination Professional Boilers - Gasoil

MODEL		E21C / E21C PRO			E26C / E26C PRO			E33C / E33C PRO		
Nominal Heat Output	kW	-	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
	Btu/hr	-	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal Heat Input	kW	-	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
	Btu/hr	-	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 BX 15-21			RDB 2.2 BX 21-27			RDB 2.2 BX 27-33		
Head		BX500			BX700			BX700		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm	100 or 125			100 or 125			100 or 125		
	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	-	88.0	89.0	89.0	**87.6**	83.6	101.0	**94.0**	93.0
Smoke	Bacarach	0			0			0		
Gas Oil Settings										
Nozzle	Make	Danfoss 80°H			Danfoss 80°H			Danfoss 80°H		
	Angle & Pattern	-	**80°H**	80°H	80°H	**80°H**	80°H	80°H	**80°H**	80°H
	Size	-	**0.40**	0.40	0.50	**0.50**	0.50	0.60	**0.60**	0.60
Oil Pump Pressure	bar	-	**13.0**	13.0	12.5	**12.5**	12.5	12.5	**12.5**	12.5
% CO_2	Recommended	-	**11.50**	12.50	11.0	**12.5**	14.0	11.0	**12.5**	13.5
	Maximum	-	**13.50**	13.50	12.5	**12.5**	14.0	12.5	**12.5**	13.5
Approx Fuel Flow Rate	litres/h	-	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
	Gals/h	-	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Combustion Head Position	mm	-	**11.50**	13,00	13.0	**13.0**	13.0	16.0	**16.0**	16.0
Water Content	litres	64			64			64		
	gals	14.1			14.1			14.1		
Boiler Weight Wet	kg	226			226			226		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar	1.8			1.8			1.8		
	psi	26			26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Factory Set DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5			2.5		
	gal/m	0.55			0.55			0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 22 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar	2.5			2.5			2.5		
	psi	0.55			0.55			0.55		
Cold Water Mains Inlet Connection		Minimum 15mm			Minimum 15mm			Minimum 15mm		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Return Connection		22mm Copper			22mm Copper			22mm Copper / 28mm Compression		
Factory Settings		Highlighted in bold								

5.7 Fiche Data

Data according to EU Regulation 811/2013, supplementing Directive 2010/30/EU can be found online at:

https://www.warmflow.co.uk/support/erp

5.8 Technical Parameters

Data according to EU Regulation 811/2013, supplementing Directive 2010/30/EU can be found online at:

https://www.warmflow.co.uk/support/erp

6 ELECTRICITY SUPPLY & WIRING DETAILS

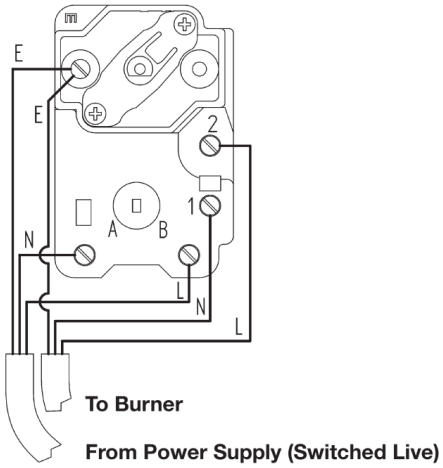
Note: All wiring activities described in the following sections must only be undertaken by trained persons having an appropriate level of competency/qualification.

220 – 240V. 1PH, 50Hz

The boiler/burner and other external electrical equipment must be wired with heat resistant cable via a fused double pole isolating switch which must be fitted with a 5 amp fuse.

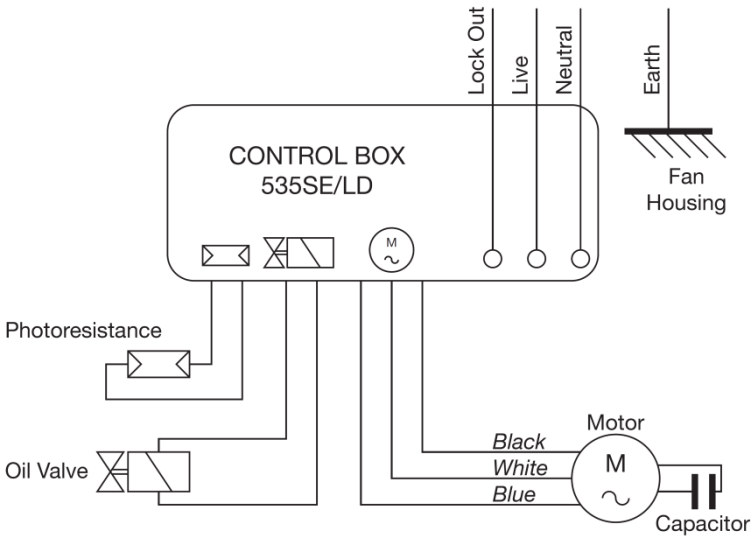
The appliance must be effectively earthed and all external wiring must comply with current IEE Regulations.

6.1 Dual-Safe Thermostat (Non-Combi Boilers)



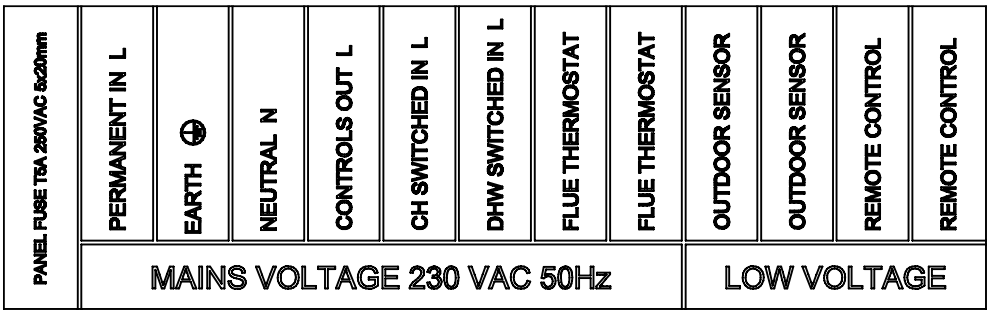
Warning: Do not fit any other wires or loop wires to this thermostat as this will bypass this control and safety device.

6.2 RDB Burner Control Box



6.3 Internal / External Combination Boiler Wiring Details

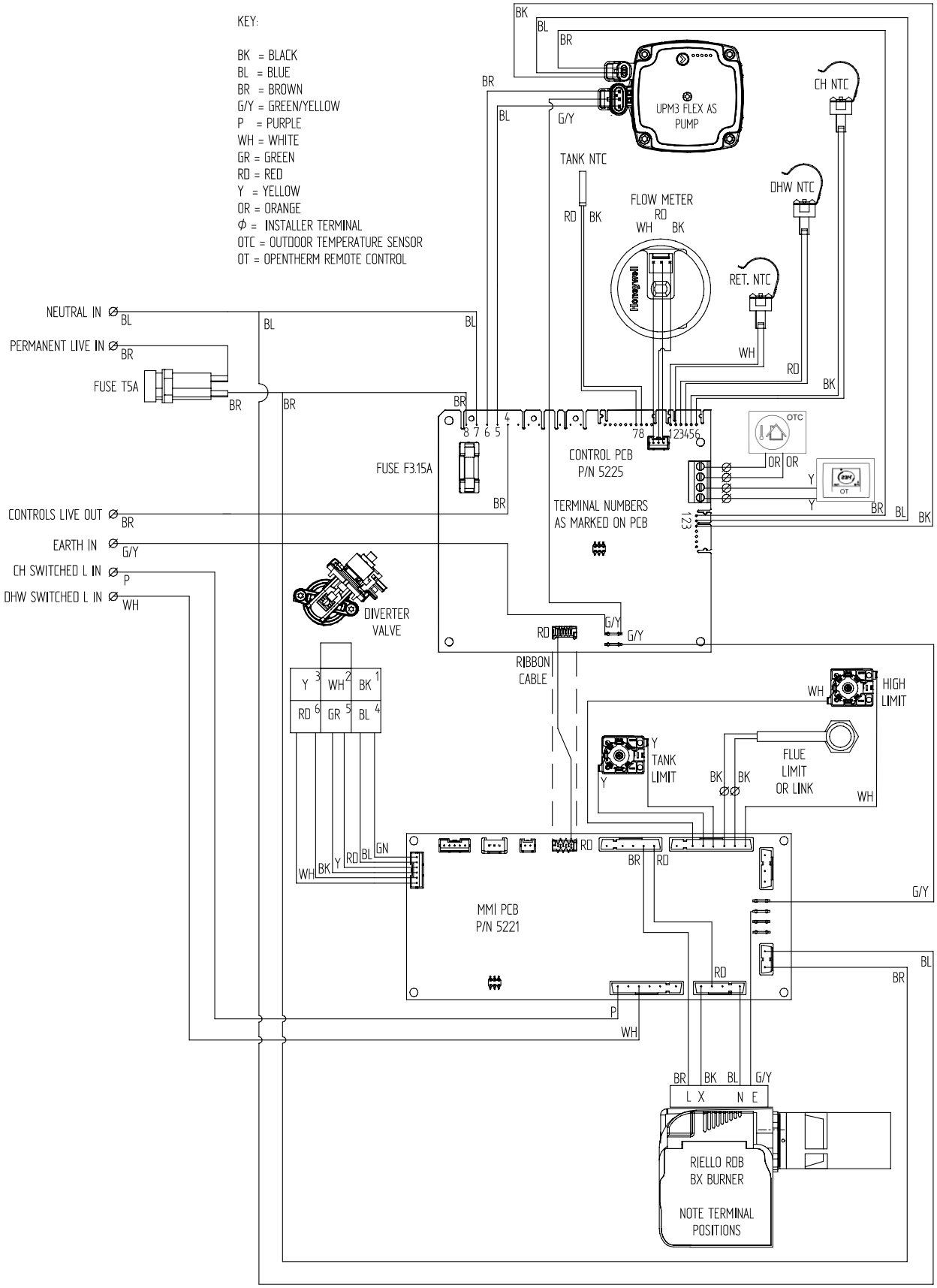
6.3.1 Installer Terminals



Terminal	Description
PERMANENT IN L	AC Live Supply to the appliance
EARTH	Protective Earth Supply to the appliance
NEUTRAL N	AC Neutral Supply to the appliance
CONTROLS OUT L	Fused output to AC Voltage Room Thermostat
CH SWITCHED IN L	Switched Live from AC Voltage Room Thermostat
DHW SWITCHED IN L	Switched Live from DHW Programmer (see note)
FLUE THERMOSTAT	AC Voltage connection for Flue thermostat
FLUE THERMOSTAT	
OUTDOOR SENSOR	Low Voltage connection for optional Outdoor Sensor
OUTDOOR SENSOR	
REMOTE CONTROL	Low Voltage connection for optional Remote Control
REMOTE CONTROL	

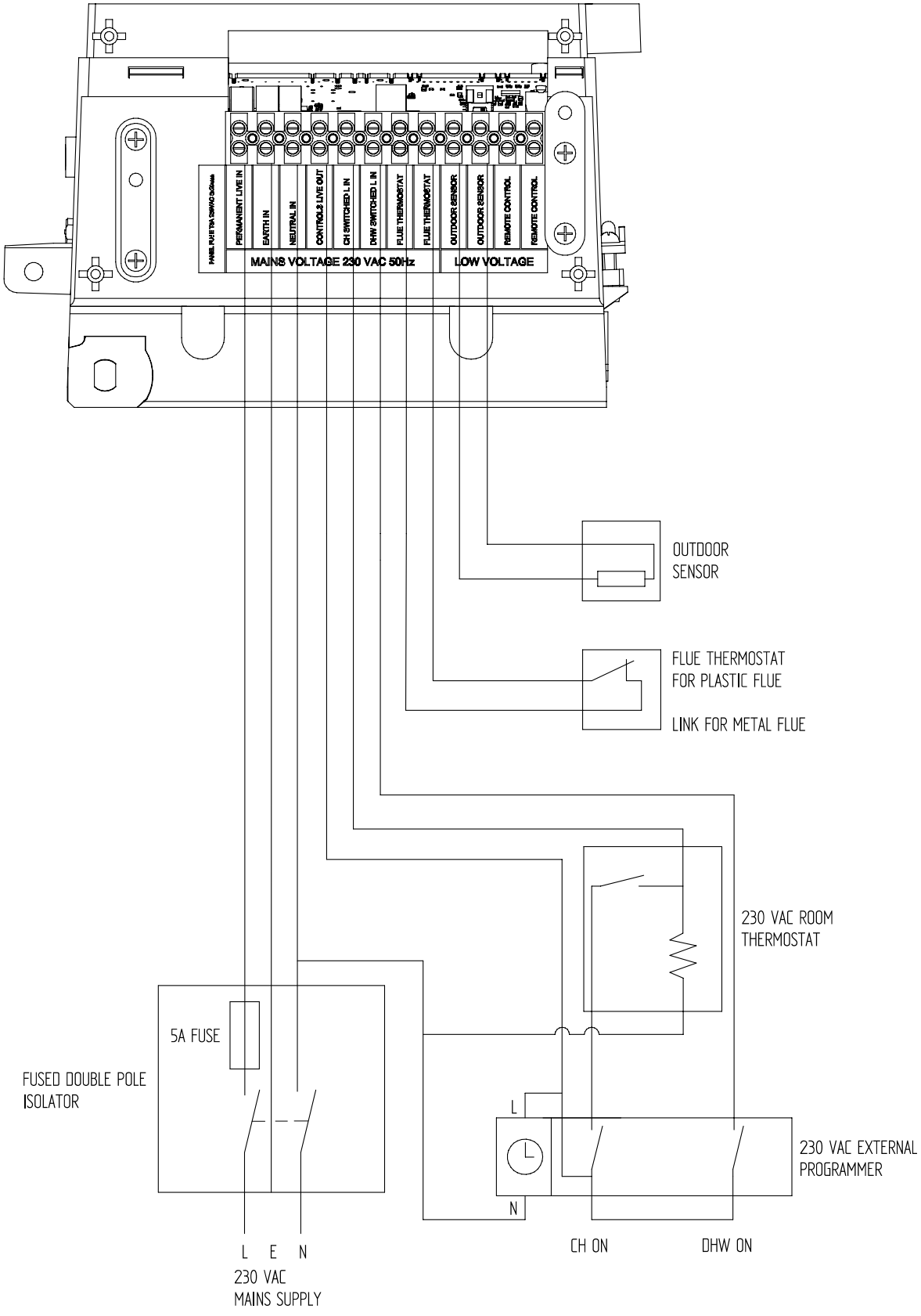
Note: If Internal DHW programmer is used, leave white link connected between CONTROLS OUT L & DHW SWITCHED IN L

6.3.2 Wiring Diagram & Fuses

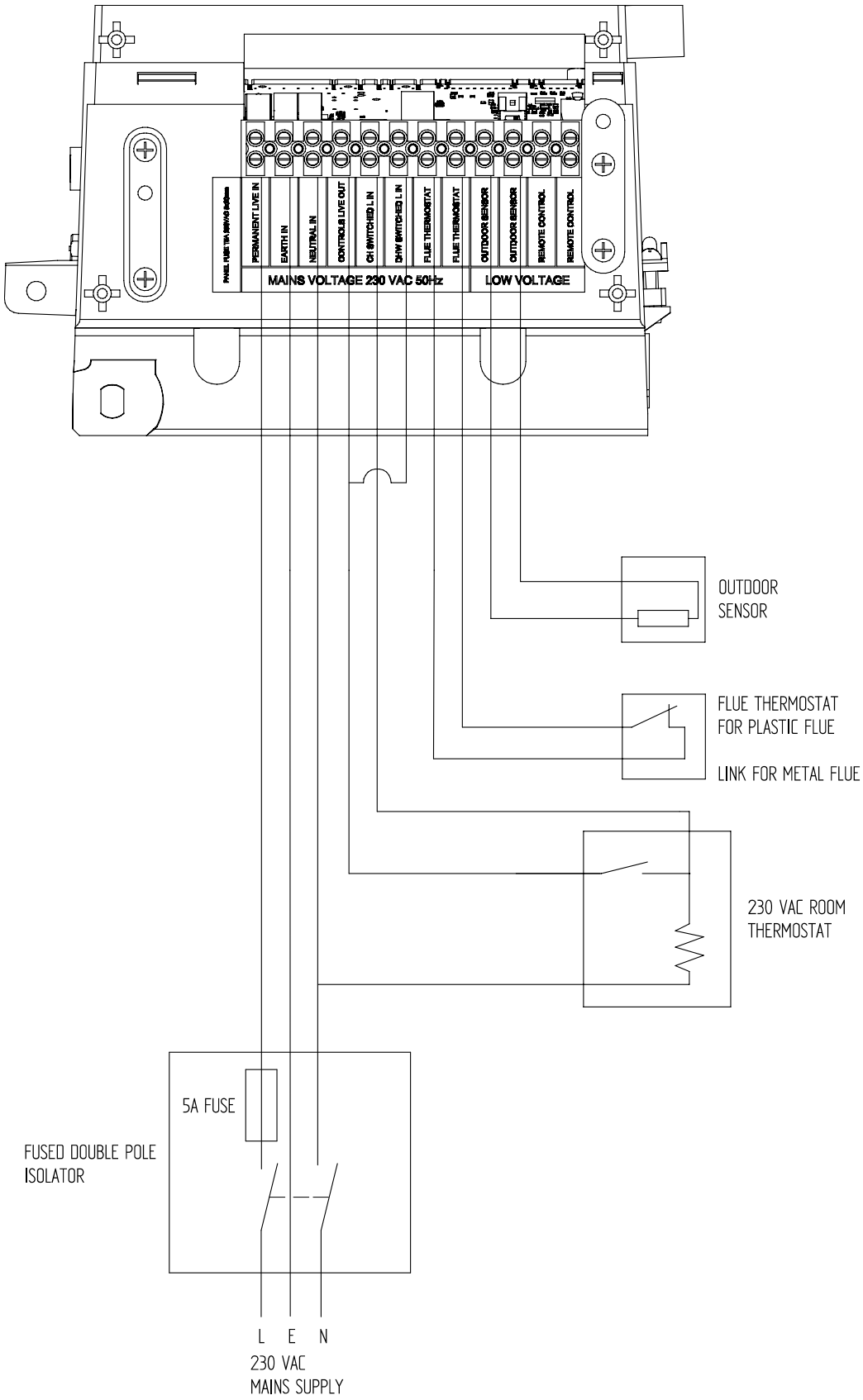


The appliance must have a permanent live supply connected to operate.

6.3.3 External 230V Two Channel Programmer, Room Thermostat & Optional Outdoor sensor

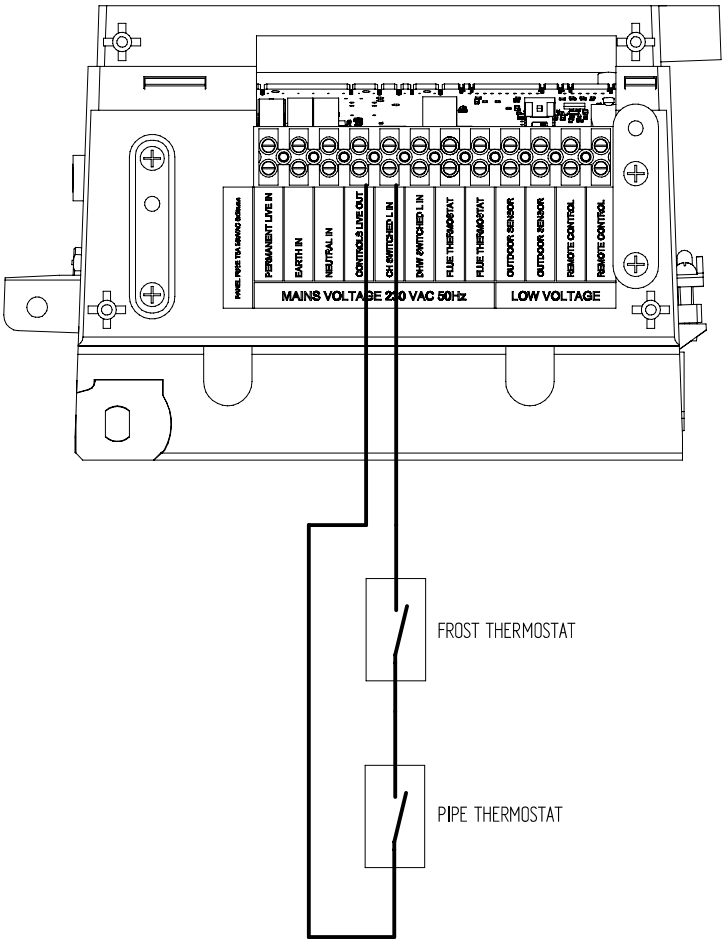


6.3.4 Internal Two Channel Programmer and Room Thermostat, Optional Outdoor Sensor



6.4 Building Frost Protection

6.4.1 Combination Boiler Models



In order to provide frost protection for the fabric of the building a frost thermostat must:
- be fitted in the coldest room in the house
- call for appropriate zone valves to open
- allow the boiler to operate irrespective of time clock condition

If the Internal Programmer is used, CH must be enabled, and Manual Override set to continuous, and the room thermostat set to a low setting.

To prevent over heating of the property a pipe thermostat must be fitted on the return pipe close to the boiler.

To protect the fabric of the appliance only, the Combination Boiler models are fitted with frost protection, see section 1.13.

6.4.2 All Other Boiler models

For all other boiler models building frost protection measures must be based upon a thermostat fitted in the coldest room in the house and a pipe thermostat fitted on the return pipe close to the boiler. These thermostats must call for heat and open appropriate zone valves, irrespective of time clock operation. Consult with your installer as installations will vary.

6.5 Combination Boiler Pump Overrun Function

The Combination Boiler has been fitted with a pump overrun function. In order for the function to operate, the boiler must be installed with a permanent live supply. Failure to do this will result in incorrect operation of the appliance, and nuisance high limit cut outs.

6.6 Using the built in programmer (Combination Boiler models)

The built in programmer can be used if this feature was enabled by the installer, consult with your installer for further information.

It has the following features:

Feature	CH	DHW
Day Programming	7 days	7 days
Time Slots	4 per day	4 per day
Boost	1,2,3 hours	1,2,3 hours
Advance	Yes	Yes
Continuous	Yes	Yes
Temperature Profiles	N/A	DHW Setpoint 1 & Setpoint 2
Day Copy	Yes	Yes

The programmer is supplied with the following factory default settings:

	CH		DHW		
Slot	ON	OFF	ON	OFF	DHW Setpoint
1	06:30	08:30	06:30	08:30	1
2	--:--	--:--	--:--	--:--	1
3	--:--	--:--	--:--	--:--	1
4	16:30	22:30	16:30	22:30	1

For maximum DHW efficiency, use a lower Setpoint for DHW setpoint 2 if possible, and use OFF periods in the DHW programming to suit user requirements.

6.6.1 Programming CH Time Slots

1. From the Home Screen, press the Time Programming button (4) for 3 seconds.

2. The LCD will display 'tinE' representing Time. **Note: This menu can only be accessed if the internal time programmer is enabled for CH. See sections 11.7.1 and 11.7.2 for enabling the programmer.**

3. Press the DHW+ button (1) to select CH Time Programming, the radiator icon will flash when selected.

4. Press the Mode button (3) for 1 second to enter the CH Time Programming Menu.

5. The word Day will flash. Use the DHW+ button (1) or DHW- button (2) to select the day to be modified.

6. Press the Mode button (3) for 1 second to modify the Time Slots for the selected day, the day number ③ (1-7) will flash.

7. Press the DHW+ button (1) or DHW- button (2) to select the Time Slot to be modified, indicated by the Time Slot Identifier on the left side of the LCD . There are 4 time slots represented by the 4 blocks of the Time Slot Identifier.

8. To modify the displayed Time Slot, Press the Time Programming button (4) for 1 second, the time to be modified will flash. The on time is shown in the main digits with 'ON' ON to the left of the time. The off time is shown in the axillary digits with 'OFF' OFF to the left of the time.

9. Change the time as required using the DHW+ button (1) or DHW- button (2).

10. Confirm the setting and move to the next time to be modified by pressing the Time Programming button (4).

11. When finished programming the off time, confirm the setting by pressing the Time Programming button (4) which will return the LCD to step 7 allowing another time slot to be selected. To select a different day for programming, return to step 5 by pressing the Mode button (3) for 1 second.

12. Repeat the steps as required to modify the Time Slot ON and OFF time settings. The settings are saved and the LCD returns to the Home Screen when no button presses are detected for a short period of time.

13. It is possible to copy settings from one day to another, see Section 6.6.3.

To disable a time Slot, set the ON and OFF times to the same value, '----' will be displayed as the time setting once the off time is confirmed with the Time Programming button (4).

6.6.2 Programming DHW Time Slots

1. From the Home Screen, press the Time Programming button (4) for 3 seconds.

2. The LCD will display 'tinE' representing Time. **Note: This menu can only be accessed if the internal time programmer is enabled for DHW. See sections 11.7.1 and 11.7.2 for enabling the programmer.**

3. Press the DHW+ button (1) to select DHW Time Programming, the tap icon will flash when selected.

4. Press the Mode button (3) for 1 second to enter the DHW Time Programming Menu.

5. The word Day will flash. Use the DHW+ button (1) or DHW- button (2) to select the day to be modified.

6. Press the Mode button (3) for 1 second to modify the Time Slots for the selected day, the day number ③ (1-7) will flash.

7. Press the DHW+ button (1) or DHW- button (2) to select the Time Slot to be modified, indicated by the Time Slot Identifier on the left side of the LCD . There are 4 time slots represented by the 4 blocks of the Time Slot Identifier.

8. Press the CH+ button (7) or CH- button (6) to select the required DHW Temperature Setpoint:

   a. DHW Setpoint 1 = Upper Bar
   b. DHW Setpoint 2 = Lower Bar

9. To modify the displayed Time Slot, Press the Time Programming button (4) for 1 second, the time to be modified will flash. The on time is shown in the main digits with 'ON' ON to the left of the time. The off time is shown in the axillary digits with 'OFF' OFF to the left of the time.

10. Change the time as required using the DHW+ button (1) or DHW- button (2).

11. Confirm the setting and move to the next time to be modified by pressing the Time Programming button (4).

12. When finished programming the off time, confirm the setting by pressing the Time Programming button (4) which will return the LCD to step 7 allowing another time slot to be selected. To select a different day for programming, return to step 5 by pressing the Mode button (3) for 1 second.

13. Repeat the steps as required to modify the Time Slot ON and OFF time settings. The settings are saved and the LCD returns to the Home Screen when no button presses are detected for a short period of time.

14. It is possible to copy settings from one day to another, see Section 6.6.3.

To disable a time Slot, set the ON and OFF times to the same value, '----' will be displayed as the time setting once the off time is confirmed with the Time Programming button (4).

6.6.3 Day Copy

It is possible to copy either CH or DHW settings from one specific day to another day.

1. From the Home Screen, Press the Time Programming button (4) for 3 seconds

2. The LCD will display 'tinE' representing Time. **Note: This menu can only be accessed if the internal time programmer is enabled for CH or DHW. See sections 11.7.1 and 11.7.2 for enabling the programmer.**

3. Press the DHW+ button (1) to select either DHW or CH Time Programming, the radiator icon or tap icon will flash when selected.

4. Press the mode button (3) for 1 second to enter the required Time Programming Menu.

5. The word Day will flash. Use the DHW+ button (1) or DHW- button (2) to select the day to be copied.

6. Press the DHW+ button (2) and Mode button (3) simultaneously for 3 seconds, the LCD will display 'COPY SrC', the settings are copied into a temporary buffer.

7. Press the Mode button (3) for 1 second to return to the day selector.

8. Press the DHW+ button (1) or DHW- button (2) to select the required destination day.

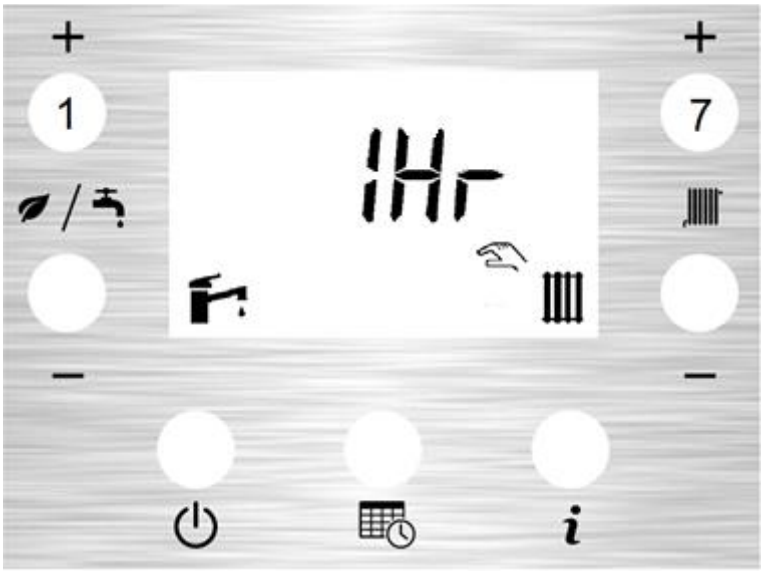
9. Press the DHW- button (1) and Mode button (3) simultaneously for 3 seconds, the LCD shows 'COPY dSt', the settings are copied to the destination day. It is possible to paste the settings to multiple days as required by repeating these steps. The settings are saved and the LCD returns to the Home Screen when no button presses are detected for a short period of time.

6.6.4 Manual Overrides

It is possible to manually override the Time Slots if required. When a manual override is active, the hand symbol icon is displayed on the LCD when either CH manual overrides, DHW overrides or both are enabled.

6.6.5 Boost Mode

Boost is a temporary override of either CH or DHW request for 1,2 or 3 hours, independent of Time Programming slots.



To Boost CH, press the CH+ button (7) for 3 seconds and then repeatedly press the CH+ button (7) to select ‘1Hr, 2Hr, 3Hr’ as required to select the Boost Time.

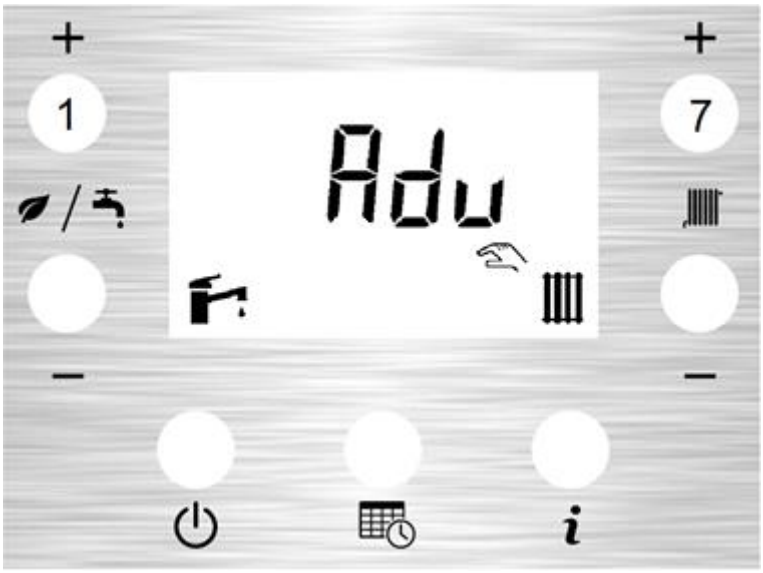
To Boost DHW, press the DHW+ button (1) for 3 seconds and then repeatedly press the DHW+ button (1) to select ‘1Hr, 2Hr, 3Hr’ as required to select the Boost Time.

For DHW Boost, Setpoint 1 is used during this function.

The Function starts when no buttons are pressed for 5 seconds.

6.6.6 Advance Mode

Advance is a temporary override, setting the DHW or CH function OFF if it was ON, and ON if it was OFF until the next Time Slot.



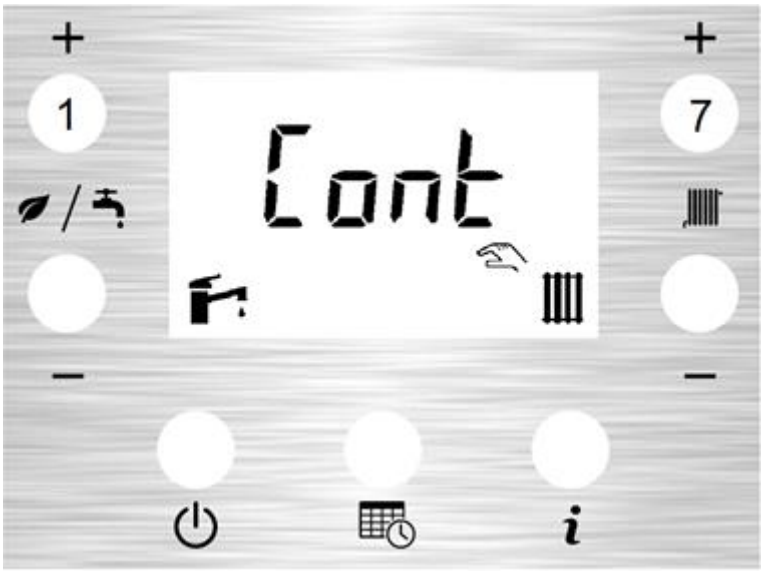
To Advance CH, press the CH+ button (7) for 3 seconds and then repeatedly press the CH+ button (7) to select ‘Adv’.

To Advance DHW, press DHW+ button (1) for 3 seconds and then repeatedly press the DHW+ button (1) to select ‘Adv’.

The Function starts when no buttons are pressed for 5 seconds.

6.6.7 Continuous Mode

Continuous is a permanent override, setting the DHW or CH function ON until the override is switched off by the user.



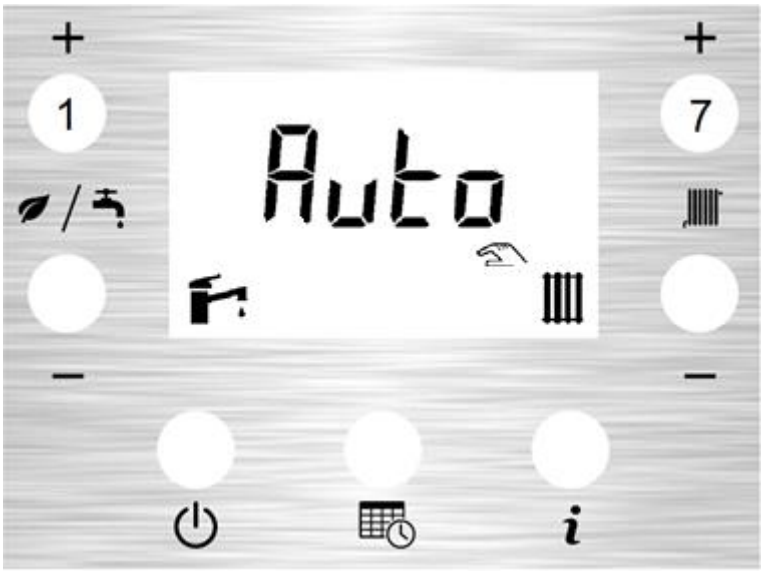
To activate Continuous CH, press CH+ button (7) for 3 seconds and then repeatedly press to select ‘Cont’.

To activate Continuous DHW, press DHW+ button (1) for 3 seconds and then repeatedly press the DHW+ button (1) to select ‘Cont’.

The Function starts when no buttons are pressed for 5 seconds.

6.6.8 Cancelling Manual Overrides

To cancel an active manual override and return to Time Slot automatic mode:



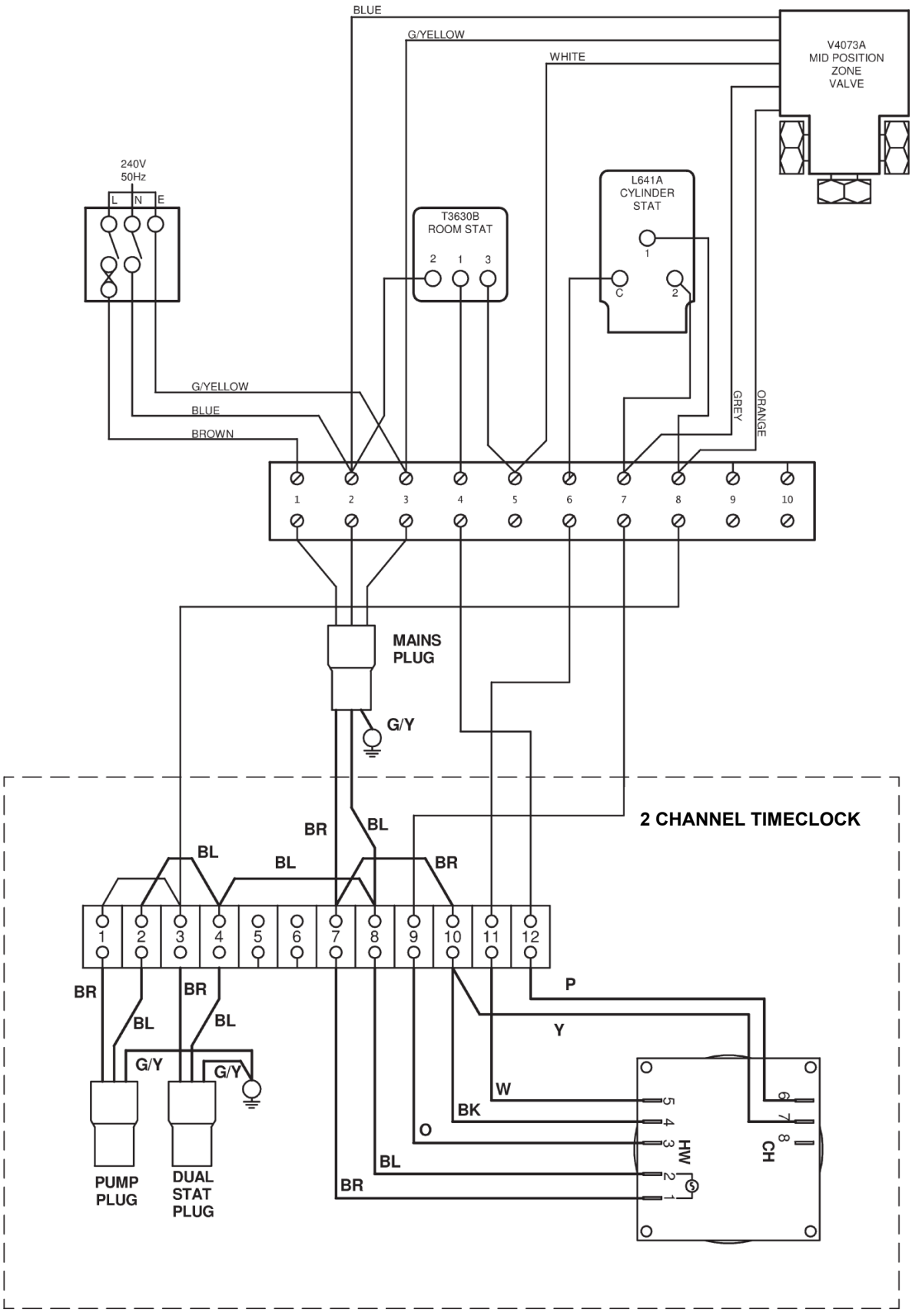
To activate Auto CH, press CH+ button (7) for 3 seconds, then repeatedly press to select ‘Auto’

To activate Auto DHW, press DHW+ button (1) for 3 seconds, then repeatedly press to select ‘Auto’

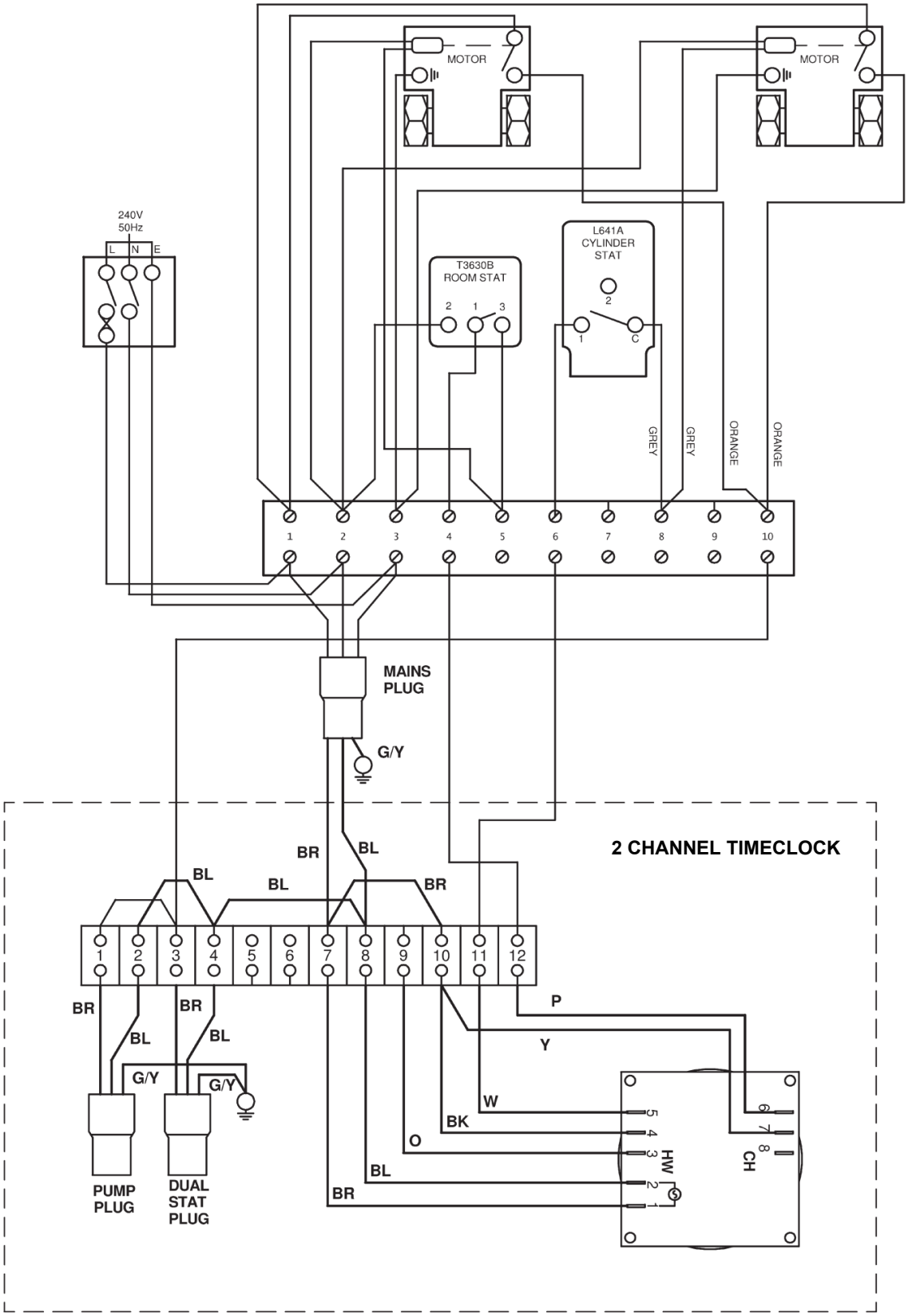
The Function starts when no buttons are pressed for 5 seconds.

When a manual override is active, the hand symbol icon is displayed on the LCD when either CH manual overrides, DHW overrides or both are enabled. When manual overrides are cancelled, the hand symbol icon will disappear from the LCD display.

6.6.9 Honeywell 'Y' Plan – Independent CH & DHW (Fully Pumped Only)



6.6.10 Honeywell 'S' Plan – Independent CH & DHW (Fully Pumped Only)



Note: The foregoing wiring diagrams must be followed to ensure the correct operation of the appliance used in conjunction control panels with motorised vales incorporating a microswitch. This is to ensure that the appliance is only activated once the valve is in the fully opened position to allow unrestricted distribution of heated system water to the appropriate zones. Systems not connected in this way can cause 'dead heading' of the appliance and possible malfunctions. Under no circumstances must dead heading be permitted.

7 FUEL SUPPLY

7.1 General

The fuel supply system to the boiler may be of single pipe, two pipe or a suction oil supply configuration with deaerator as appropriate to the installation situation. Refer to BS5410: Part 1 and OFTEC Technical Manual: Domestic & Commercial Requirements for Oil Storage and Supply Equipment for guidance and representative examples oil supply system types. In all cases the oil supply system must comply fully with the requirements of BS5410 and Technical Manual.

The fuel supply system installed must be constructed to allow the proper service and maintenance of the oil supply system and its components including any isolation valve(s), oil filter or water separator fitted.

The use of plastic fuel storage tanks, with or without top outlet is recommended. Where steel tanks are used these must be constructed in accordance with BS 799: Part 5 and must be protected against corrosion. Fuel must never be stored in translucent plastic containers.

The pipework from the fuel storage tank to the appliance must be run in plastic-coated annealed copper and where exposed be fully supported to avoid accidental damage. Steel and aluminium pipes if used must be protected from corrosion. Galvanised pipe and fittings must not be used.

Pipework with an inferior degree of fire resistance to those constructed of copper or steel, such as braided flexible fuel lines, must be contained within the boiler enclosure and be protected by an appropriate remote acting fire valve; the fire valve itself must be located outside the building or boiler enclosure and in an appropriate position from the appliance in order to retain correct fire protection. Refer to BS5410: Part 1 and the OFTEC Technical Manual for specific guidance on fire valve positioning.

Note too that in externally located boiler appliances, flexible fuel lines may also be subject to accelerated deterioration if permitted to extend outside of the boiler enclosure where they may be exposed to the elements and/or accidental damage, and for this reason also must be completely contained within the boiler enclosure.

The fuel supply system must include at least one appropriate filter with a filtration rate of not greater than that specified by the burner manufacturer. See the related burner manual supplied.

Equipment failures due to water and other sources of fuel contamination are not covered under warranty.

The pump vacuum must not exceed a maximum of 0.4 bar. Above this value, gas is released from the fuel thus leading to burner lockout.

The Warmflow Professional range of Agentis boiler appliances is supplied with a fuel supply kit which provides a number of the principal components and fittings for fuel supply installation. Note that in some installation situations additional components and fittings may be required.

7.2 Instructions for the use of liquid biofuels

Biofuels commonly used as alternatives to kerosene in home heating applications are usually either of two types:

- Hydrotreated Vegetable Oil (HVO) - renewable diesel
- Fatty Acid Methyl Ester (FAME) – biodiesel.

These biofuels are not the same with main differences centring around their chemical compositions, performances and storage qualities. As an alternative to kerosene, HVO is most typically selected as the biofuel of choice due to its lower CO_2 emissions and environmental impacts, as well as its ease of use & storage and higher energy content by comparison with FAME.

HVO fuel comes in all kinds of blends. It can be used in conjunction with Warmflow oil-fired appliances both as pure HVO (100% concentration), as well as blended in various commercially available ratios with fossil fuels (kerosene). The concentration of HVO utilised will influence appliance combustion performance and characteristics as well the considerations to be taken into account when using or transitioning to the selected biofuel type.

When using or transitioning the Warmflow oil-fired heating appliance from kerosene to biofuels the following must be considered:

1. To ensure consistency of delivered biofuels, it is recommended that the fuel supplier can demonstrate compliance with a recognised Quality Management System in order to confirm that the high standards required in relation to the storage, blending and delivery processes associated with biofuels are met and maintained.

2. The fuel storage tank and ancillary equipment of the installation must also be prepared BEFORE liquid biofuel is introduced.

   Ensure that all materials and seals in the fuel storage tank, ancillary equipment and burner are compatible with the type of biofuel being used. Extra caution must be exercised in relation to materials and seals previously subjected to kerosene as these may demonstrate some degree of shrinkage when subsequently subjected to biofuels, thereby potentially permitting some degree of fuel escape to occur. For this reason, Warmflow recommends the replacement of all such materials and seals when transitioning from kerosene to biofuels.

   It is recommended that fuel storage tanks and ancillary equipment exceeding 20 years of age are replaced.

   In all cases fuel storage tanks used must provide a secondary containment (bund) for their liquid contents.

   For all installations, there must be at least one good quality, biofuel-compatible fuel filter at the fuel storage tank. Use of a further secondary filter for the protection of the burner from contamination is also recommended. The filtration used must be to the specification detailed in the technical manual supplied with the burner.

3. If an existing fuel storage tank and ancillary equipment are to be used, then in addition to the foregoing materials and component checks, it is essential that both tank and ancillaries are first inspected for condition and checked for the presence of water and other contaminants. Warmflow strongly recommends that the fuel storage tank and ancillary equipment are cleaned, and fuel filters replaced prior to biofuel delivery. If this is not completed, then due to the hydroscopic nature of biofuel, it may absorb any water present, which in turn will result in heating appliance and related equipment failures that will not be covered by the manufacturer's warranty. Additionally, the presence of water and other contaminants in relation to biofuels within the fuel storage tank and ancillary equipment may also promote the growth of biological matter, and this too will result in heating appliance and related equipment failures that will not be covered by the manufacturer's warranty.

4. Depending on the capacity of the fuel storage tank and the consumption of fuel at the installation, fuels may sometimes remain static within the tank for some considerable time. Warmflow recommends that the fuel distributor is consulted regarding the appropriate use of biocides within the fuel to prevent the growth of biological matter from occurring within the tank.

It is further recommended that where fuel consumption is low, or the contents of the fuel storage tank remains static for extended periods, the contents of the tank must be turned over every six months, or in any event no less than every twelve months, to help prevent blockages to filters, etc. Warmflow suggests that fuel suppliers and or service companies are contacted for guidance on appropriate biofuel storage requirements.

During extended periods of non-operation, it is also strongly recommended that the burner is put into operation for short periods at least every three months. Failure to do so will result in heating appliance and related equipment failures that will not be covered by the manufacturer's warranty.

5. The burner must be set according to the appliance application and fully commissioned, checking that all combustion parameters are as recommended in the appliance technical data. For information concerning burner setting in relation to HVO refer to the technical tables in Section 5.5 of this manual.

   For information concerning burner setting in relation to FAME biofuel please contact Warmflow directly.

   Where 100% HVO is to be utilised, in addition to the adjustment of combustion parameters, it may be also be necessary to replace the burner photo sensor with one which incorporates an amplification lens in order to better detect the flame colour associated with HVO combustion. Contact Warmflow for further guidance.

6. Warmflow recommends that where biofuels are used, as part of annual servicing activities, particular attention must be paid to the inspection and cleanliness of in-line and burner fuel pump filters. These must be cleaned/replaced as necessary. Filters may require inspection/cleaning on a more frequent basis following an episode of fuel contamination.

   It is also recommended that such attention is given to the inspection and cleanliness of filters before re-starting the appliance following an extended period of non-operation.

7.3 Fuel Additives

The use of fuel additives is not permitted without prior approval from Warmflow, use of additives may render the appliance Warranty void.

8 FLUES

(Please see page 152 for 'How to' Internal Boiler Flue Assembly Video)

8.1 Flue Options, Components & Dimensions

The use of any flue system other than that supplied or recommended by the manufacturer will invalidate the warranty.

The following flue options are available from Warmflow:

FBF	Low Level Balanced Flue Kit
HBF	High Level Balanced Flue Kit
VBF	Vertical Balanced Flue Kit
HFL	Horizontal Entry Flue Liner Kit
VFL	Vertical Entry Flue Liner Kit
UPMK	Utility/Internal Plume Management Kit
KPMK	Kabin Pak/External Plume Management Kit

8.1.1 Conventional Flue Guidelines

The flue system must be designed in accordance with local bye-laws and the Building Regulations. Draught stabilisers are not recommended for oil fired boilers. Sharp bends or horizontal runs must be avoided and the flue must terminate 2 feet (600mm) above the ridge of the dwelling. Terminals which restrict the discharge or allow ingress of water must be avoided.

When connecting to an existing masonry chimney, a Warmflow HFL or VFL flexible flue liner suitable for use with oil fired condensing boilers and of an appropriate diameter must be used.

Only Warmflow flue systems designed specifically for use with oil-fired condensing boilers may be used.

8.1.2 Condensing Boiler Flue Kits

FIRE SAFETY

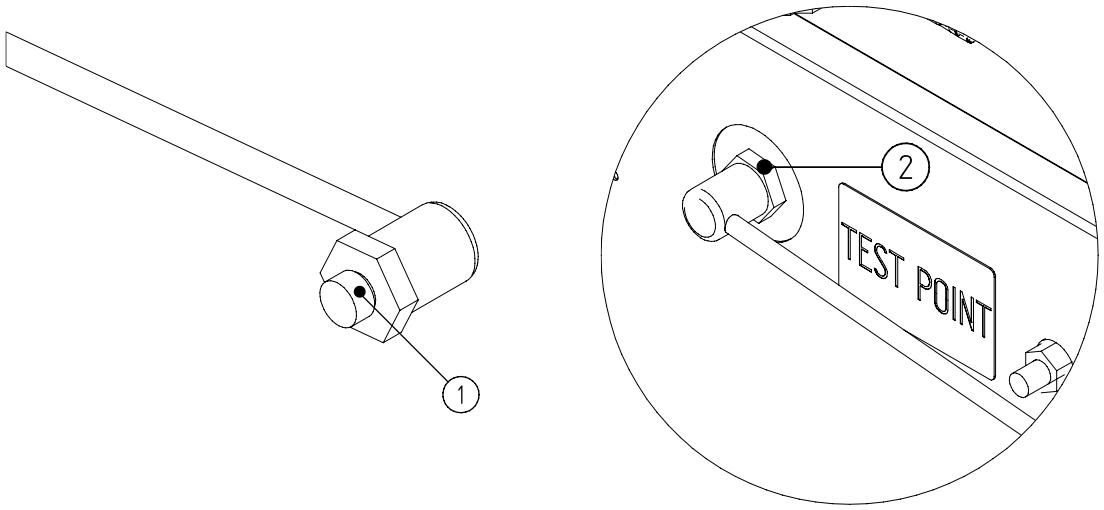
As with a metal flue system, where a plastic flue system is used within a building which is ‘compartmentalised’ as defined by the Building Regulations, care must be taken to ensure that the installation of the flue does not contravene the Regulations and create a safety risk.

In particular, where the flue passes through a ‘compartment floor’ or ‘compartment wall’ as defined by the Building Regulations it must be enclosed so as to create a ‘protected shaft’ as defined by the Regulations. Consult your local Building Control department for detailed guidance.

In regard to the above, the use of a plastic flue system is no different from that of a metal flue system. If in doubt, consult your local Building Control department.

8.1.3 Fit Flue Thermostat

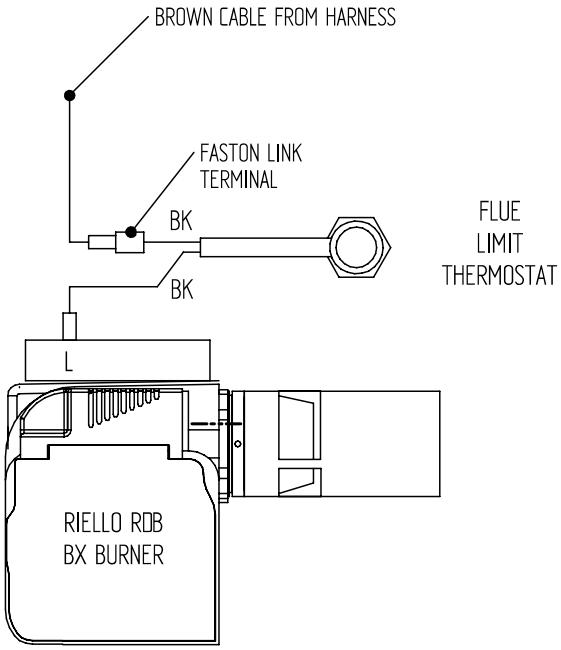
1. Remove the test point bolt from the boiler. Apply PTFE tape to the flue thermostat threads (1) then screw it into the test point (2). Tighten **by hand only**.



CONNECT FLUE THERMOSTAT – NON COMBINATION BOILER MODELS

2. Remove the red burner cover. Isolate the electrical supply then open the burner control box cover. Disconnect the live (brown) wire of the burner power cable and connect it to the Faston link terminal of the flue thermostat cable.

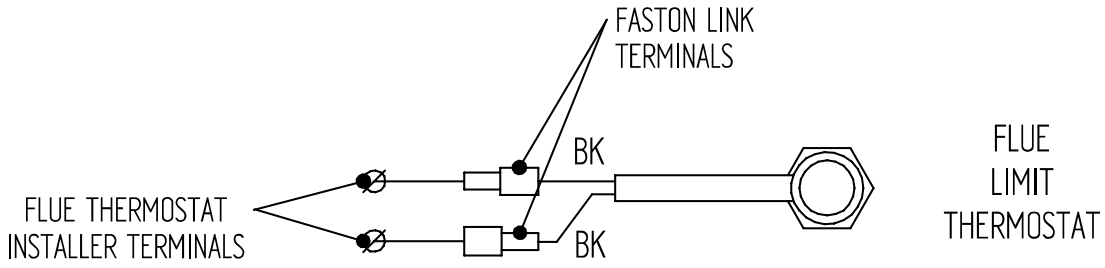
3. Connect the other connector of the flue thermostat cable to the live terminal of the control box. Close and secure the cover, ensuring no cables are trapped and route the cable through an unused location.



CONNECT THERMOSTAT – COMBINATION BOILER MODELS

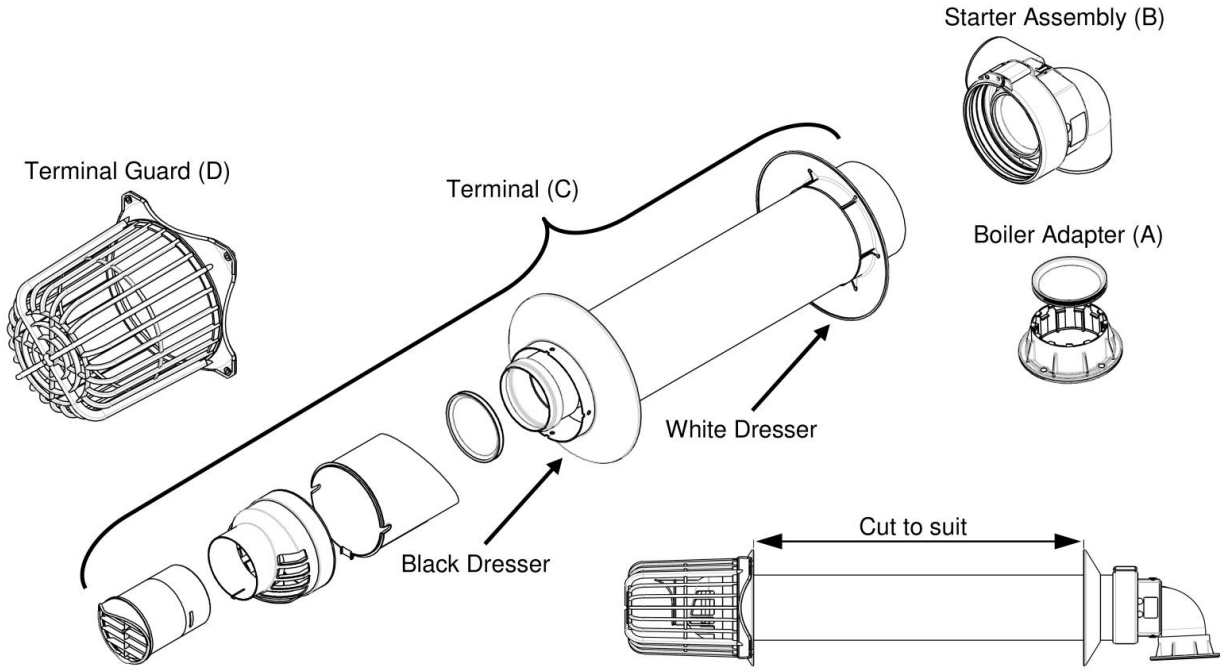
2. Isolate the electrical supply then remove the control panel installer cover. Disconnect the Faston link terminals for the flue thermostat, then connect them to the Faston terminals of the flue thermostat cable.

3. Secure the cable using the supplied cable clamp. Refit and secure the control panel installer cover, ensuring no cables are trapped and route the cable through an unused location.



Low Level Balanced Flue Kit (FBF)

The kit comprises:



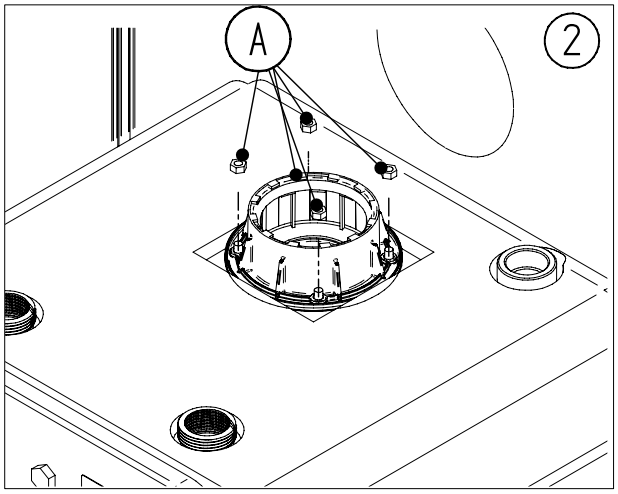
FIT FLUE THERMOSTAT

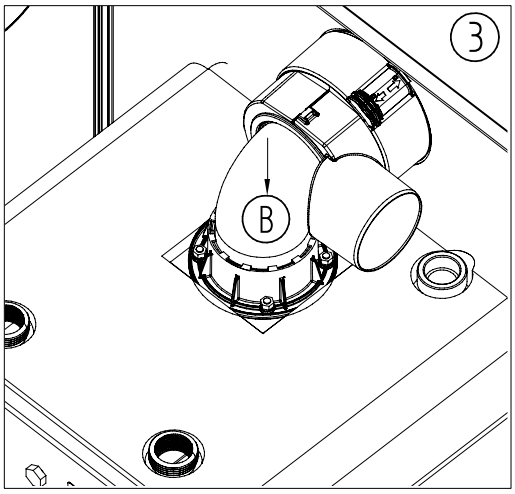
1. Fit the flue thermostat **BEFORE** fitting the flue kit. Refer to section 8.1.3.

FIT STARTER PIECE

2. Remove the appropriate casing panel cut-out using snips, deburr edges. Ensure the gasket is placed correctly, then fit the boiler adapter using nuts (A).

3. Lubricate the seals then insert the starter assembly (B).



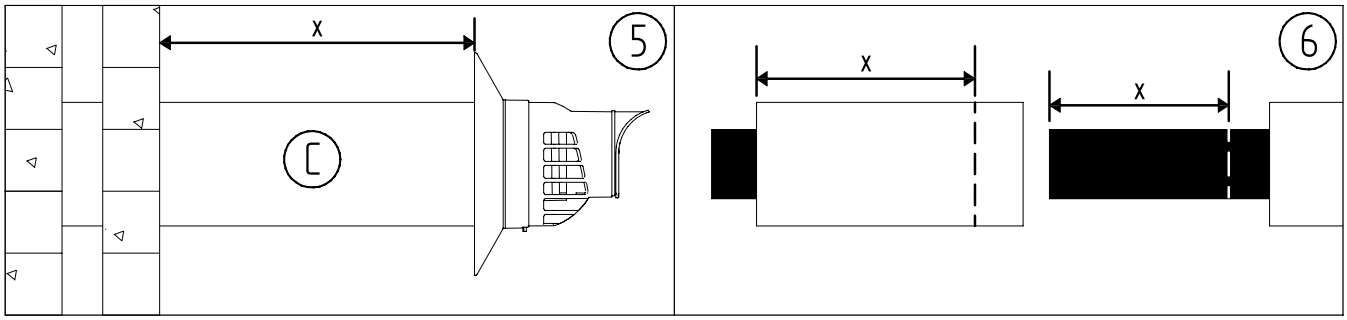


MEASURE AND CUT FLUE TERMINAL

4. Cut a hole through the wall and fit a non-combustible sleeve.

5. Ensure the locking band is open by sliding the clamp to the O (Open) position, lubricate then fit the flue terminal (C) and measure the excess length, X.

6. Remove the terminal, cut X mm from the outer pipe of the terminal then X mm from the inner pipe.

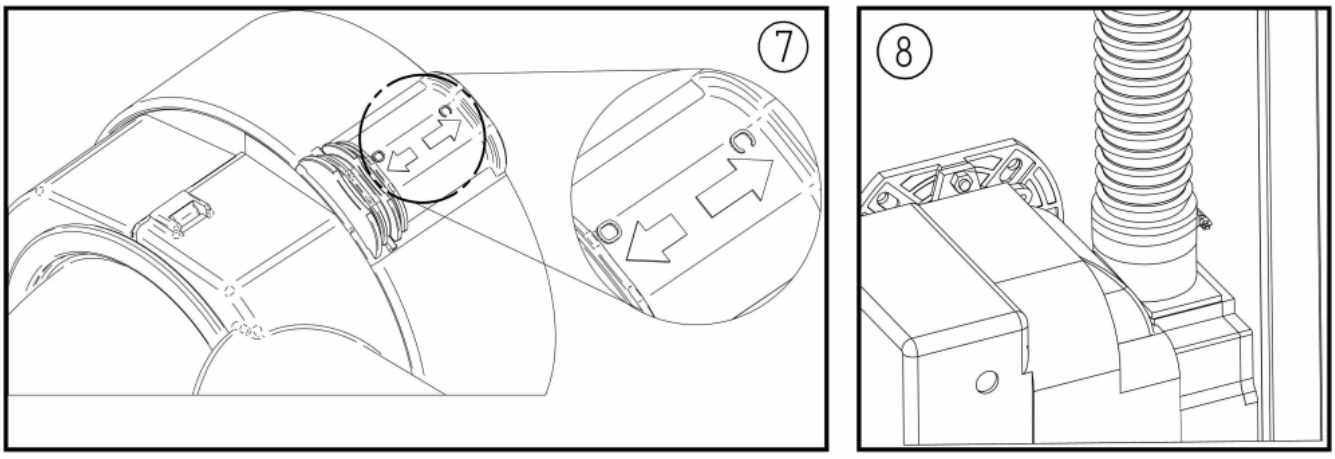


CONNECT TERMINAL AND AIR HOSE

7. Lubricate and refit the terminal ensuring correct orientation, then secure with the locking band. Close the locking band, then slide the clamp to the C (Closed) position, ensuring the flue is secure.

8. Fit the air inlet spigot and gasket to the burner. Attach the flexible air hose to the burner and starter assembly and secure with the jubilee clips.

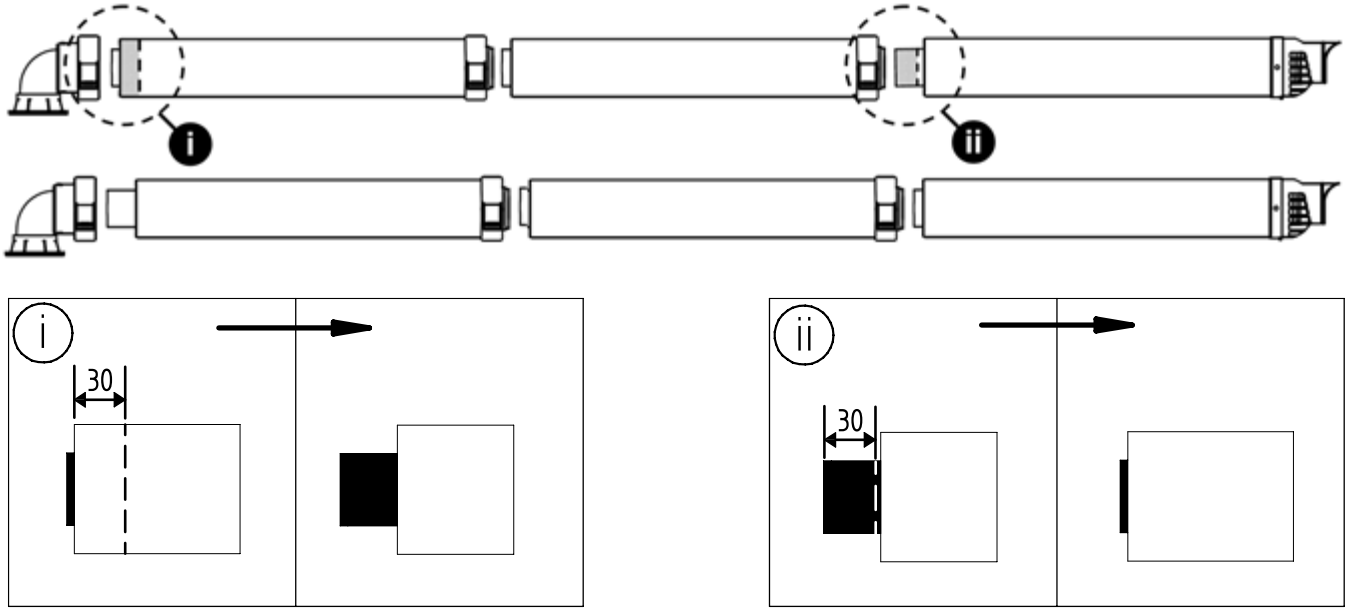
9. Fit the terminal guard (D) securing in place with suitable fasteners (not supplied).



ONLY IF EXTENDING HORIZONTALLY

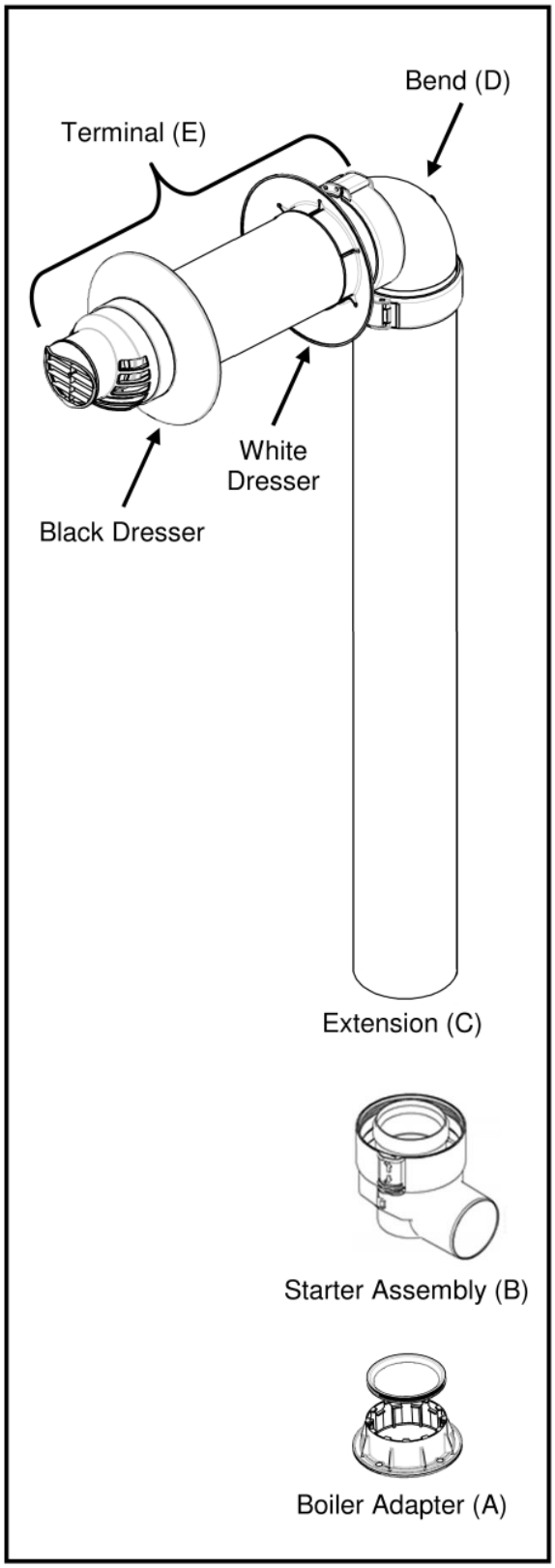
i. Cut 30 mm from the outer pipe of the 1st extension only.

ii. Cut 30 mm from the inner pipe of the flue terminal.



8.1.4 High Level Balanced Flue Kit (HBF)

The kit comprises:



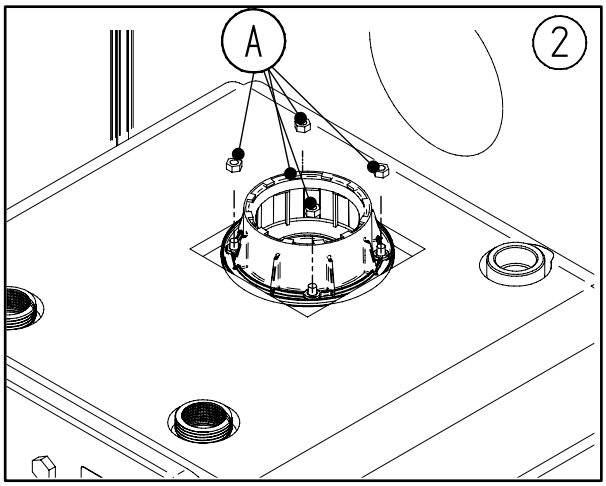
FIT FLUE THERMOSTAT

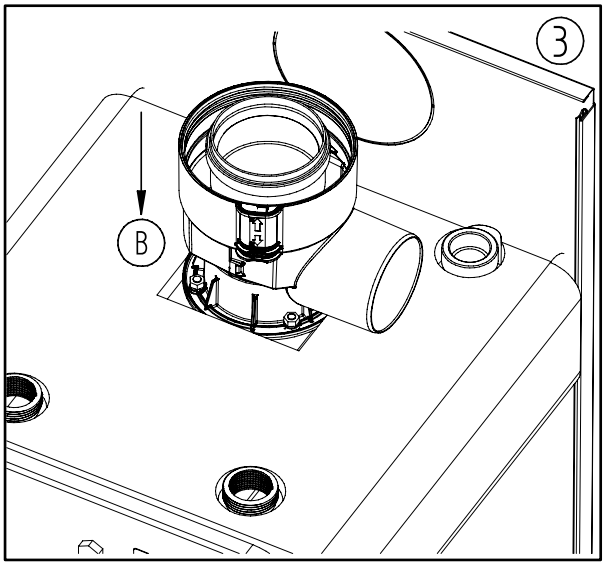
1. Fit the flue thermostat **BEFORE** fitting the flue kit. Refer to section 8.1.3.

FIT STARTER PIECE

2. Remove the appropriate casing panel cut-out using snips, deburr edges. Ensure the gasket is placed correctly, then fit the boiler adapter using nuts (A).

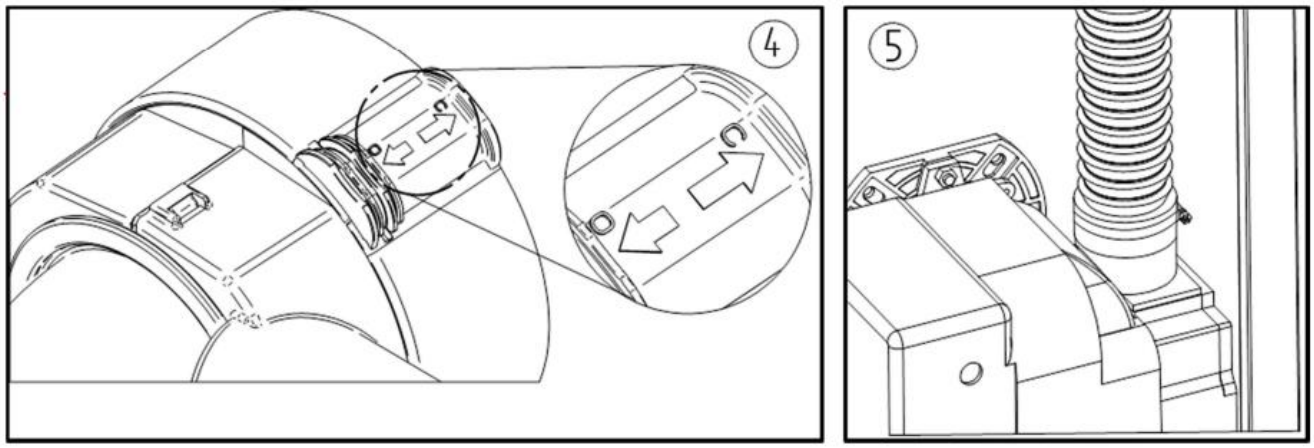
3. Lubricate the seals, then insert the starter assembly (B).





4. Ensure the locking band is open by sliding the clamp to the O (Open) position. Lubricate and fit the first extension (C) and bend (D) as required by the installation. Close the locking bands, then slide the clamps to the C (Closed) position, ensuring the flue is secure.

5. Fit the air inlet spigot and gasket to the burner. Attach the flexible air hose to the burner and starter assembly and secure with the jubilee clips (E) at both ends.

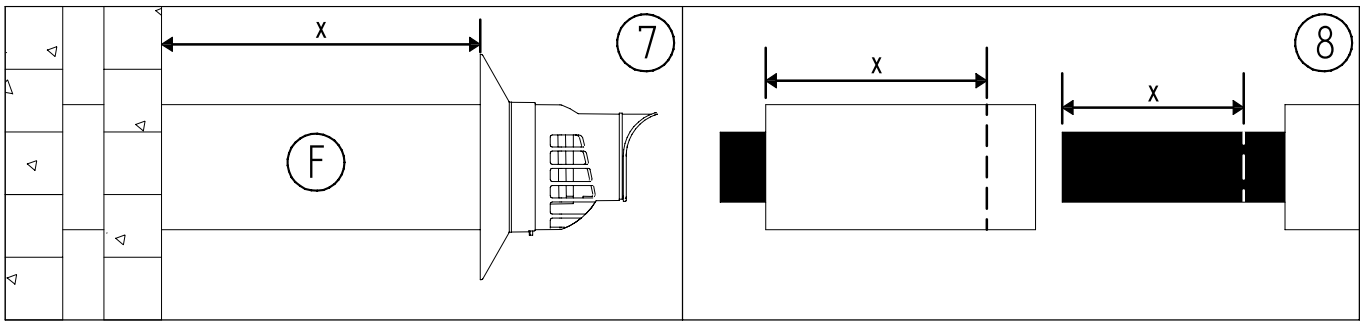


MEASURE AND CUT FLUE TERMINAL

6. Cut a hole through the wall and fit a non-combustible sleeve.

7. Fit the flue terminal (F) and measure the excess length, **X**.

8. Cut **X** mm from the outer pipe of the terminal then **X** mm from the inner pipe.

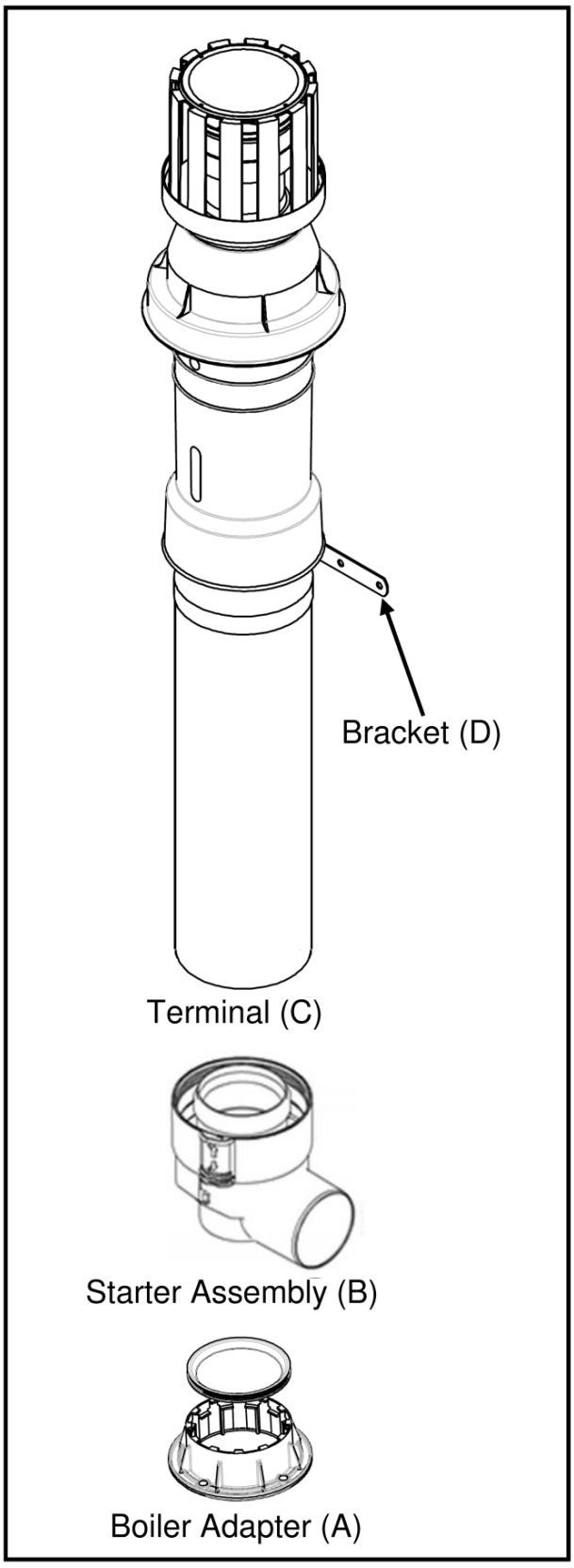


9. Ensure the locking band is open by sliding the clamp to the O (Open) position. Lubricate and refit the terminal. Close the locking band, then slide the clamp to the C (Closed) position, ensuring the flue is secure.

Note: A terminal guard is required if the termination location is less than 2m above external ground level.

8.1.5 Vertical Balanced Flue Kit (VBF)

The kit comprises:



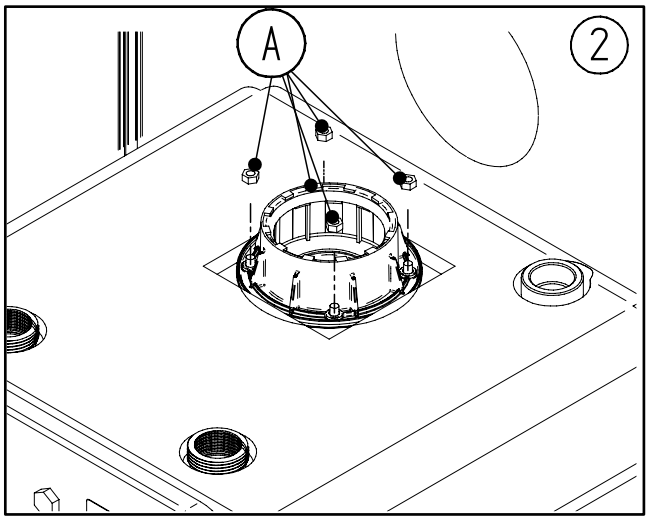
FIT FLUE THERMOSTAT

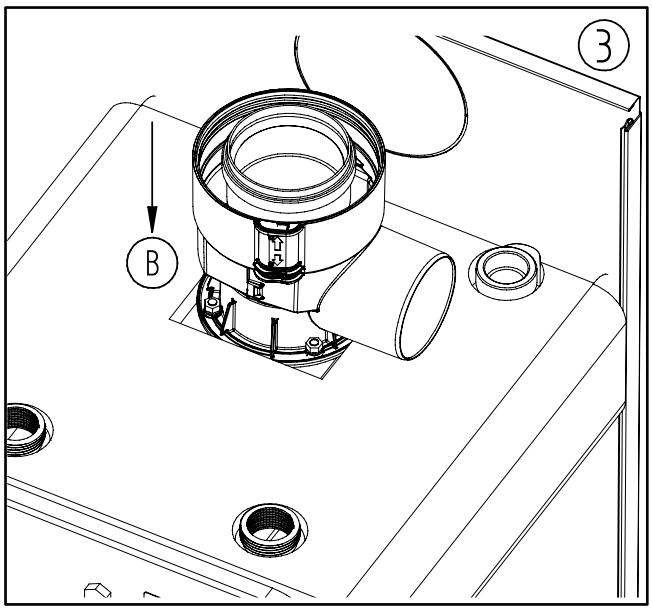
1. Fit the flue thermostat **BEFORE** fitting the flue kit. Refer to section 8.1.3.

FIT STARTER PIECE

2. Remove the top panel casing cut-out using snips. Fit the boiler adapter using nuts (A).

3. Lubricate the seals, then insert the starter assembly (B).

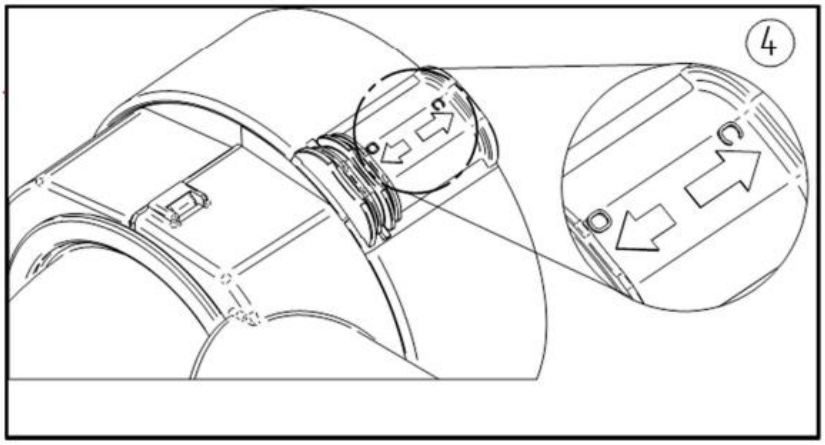


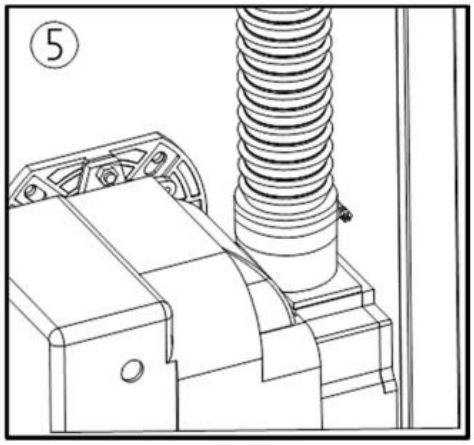


CONNECT 1ST EXTENSION AND AIR HOSE

4. Ensure the locking band is open by sliding the clamp to the O (Open) position. Lubricate and fit the first extension or terminal depending on installation requirements. Close the locking band, then slide the clamp to the C (Closed) position, ensuring the flue is secure.

5. Fit the air inlet spigot and gasket to the burner. Attach the flexible air hose to the burner and starter assembly and secure with the jubilee clips (E) at both ends.

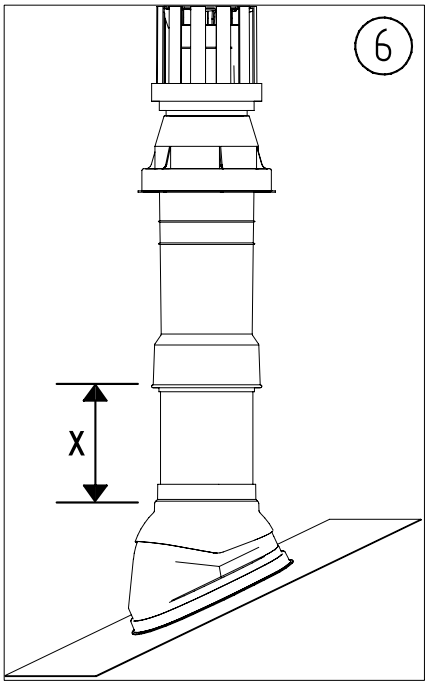


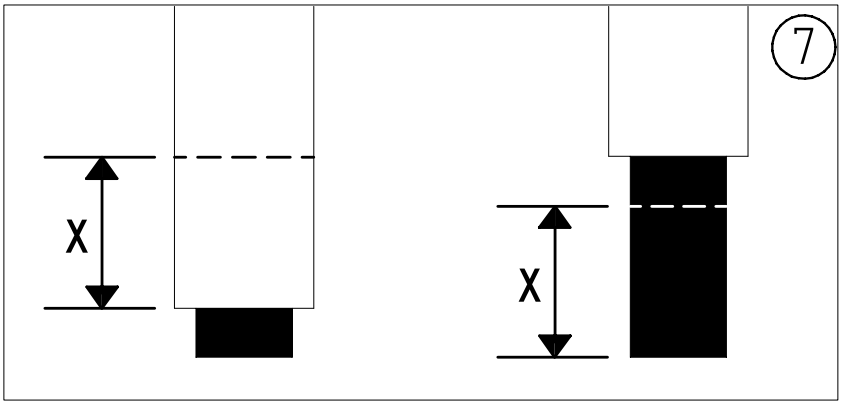


MEASURE AND CUT TERMINAL

6. Fit the flashing and assemble the flue up through the roof, lubricating all seals and securing all locking bands after installation. Measure the excess length, X, noting carefully the correct measurement locations.

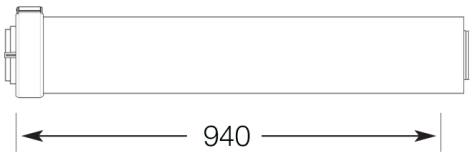
7. Remove the terminal, cut X mm from the outer pipe of the terminal (C) then X mm from the inner pipe. Refit the terminal and secure in place with the bracket (D).





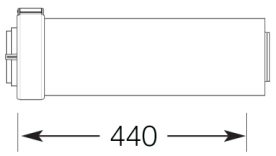
8.1.6 Warmflow Boiler Flue Components: 80/125 Ø

F3 - 1000mm extension pipe



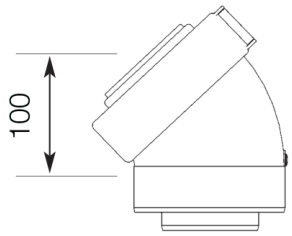
Assembled length

F4 - 500mm extension pipe



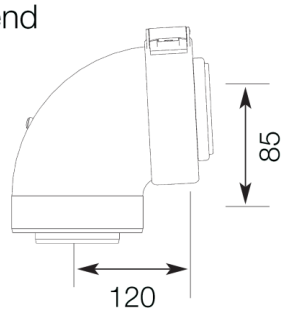
Assembled length

F7 - 45° bend



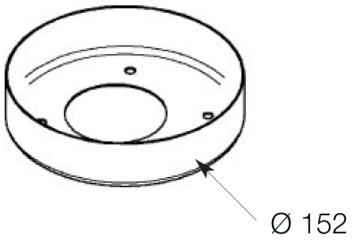
Effective length = 0.5m

F8 - 87° bend

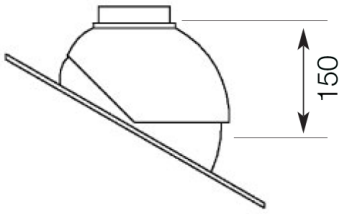


Effective length = 1.0m

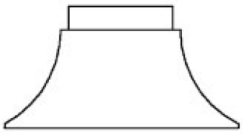
F10 - conventional flue adapter



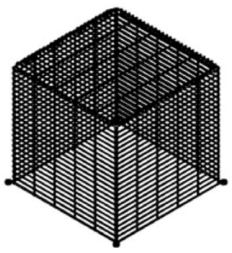
F11 - pitched roof flashing



F12 - flat roof flashing



F14 - terminal guard



Note:

1. **Flue fitting kit required.**
2. **If the terminal is less than 2 metres above ground level, a terminal guard must be fitted.**
3. **Extension pipes and flue adapter lengths quoted are effective lengths and not the actual length of the piece.**
4. **All dimensions in mm unless otherwise stated.**

8.1.7 Flue Length Calculation

BOILER OUTPUT (kW)	TOTAL EQUIVALENT FLUE LENGTH (m)	
	Vertical Balanced Flue	High/Low Level Balanced Flue
15	8.0	5.0
21	8.0	5.0
26	8.0	5.0
30	6.0	3.5
33	4.0	2.5
44	4.0	2.5

Note:

1. All flues can utilise any combination of bends, straights, adapters and terminals.

2. Ensure flue is arranged such that it falls continuously towards the boiler.

3. The Low Level, High Level and Vertical Balanced Flue Systems can use any combination of flue extension pieces up to the maximum equivalent length depending upon boiler output as illustrated in the above table.

Example Calculation:

Boiler Output: 20kW

Length of Flue (distance from boiler to terminal): 8.0m

Example 1: No bends fitted.

Length of vertical flue	8.0m
No bends	0.0m
Equivalent length	8.0m

Equivalent length within the maximum allowable.

INSTALLATION ACCEPTABLE.

Example 2: 2 x 45° bends fitted.

Length of vertical flue	8.0m
2 x 45° bends	1.0m
Equivalent length	9.0m

Equivalent length now exceeds the maximum allowable.

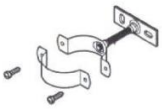
INSTALLATION NOT ACCEPTABLE.

8.1.8 Plume Management Kits

Plume Management Kits are available for our range of appliances.

8.1.9 Utility/Internal Plume Management Kit (UPMK)

The kit comprises:

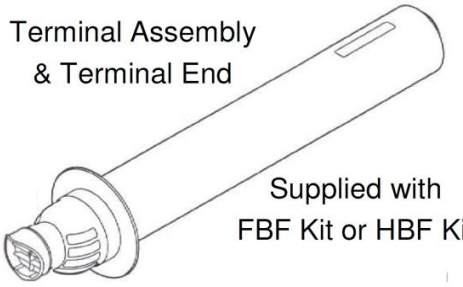


Mounting Bracket
x 3

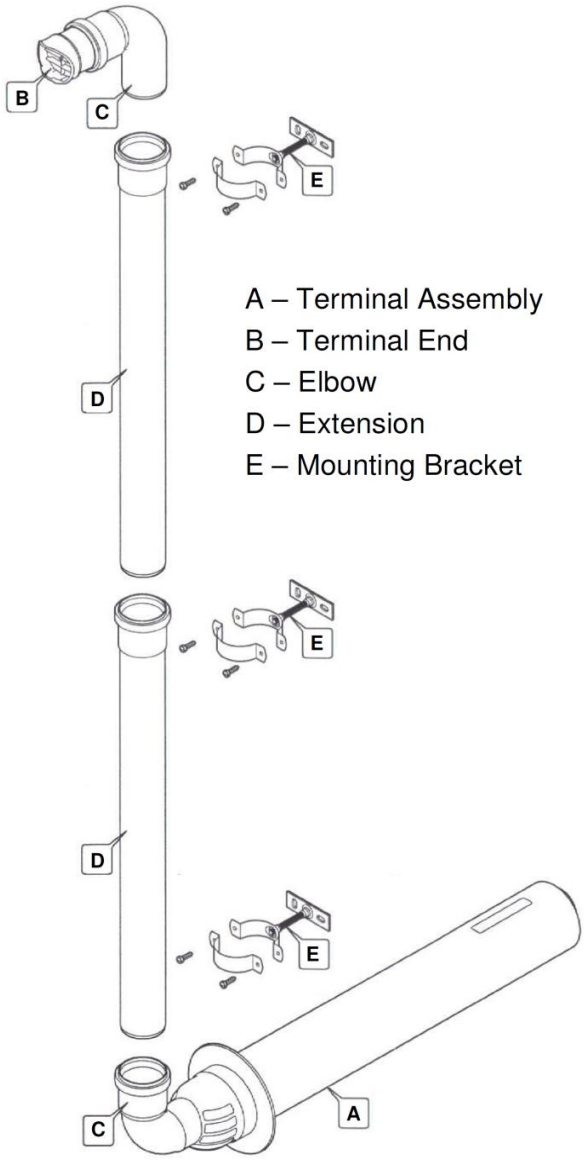
Elbow
x 2

Extension
x 2

The kit does NOT include:



Assembled kit

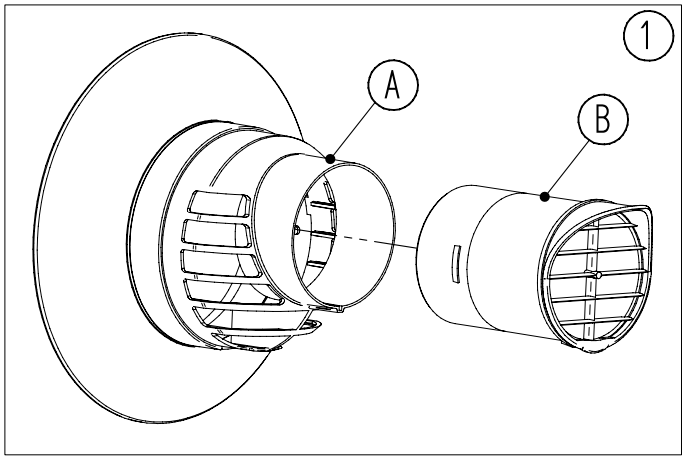


A – Terminal Assembly
B – Terminal End
C – Elbow
D – Extension
E – Mounting Bracket

REMOVE TERMINAL END

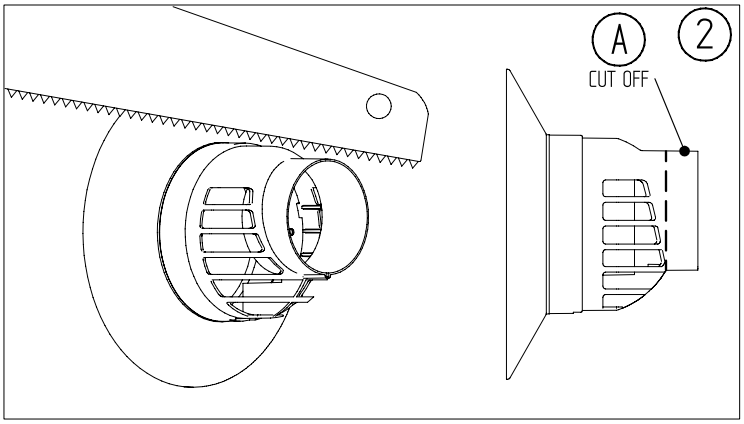
REMOVE TERMINAL END

1. Hold the Terminal Assembly (A) in place and extract the Terminal End (B) by gripping and pulling firmly.



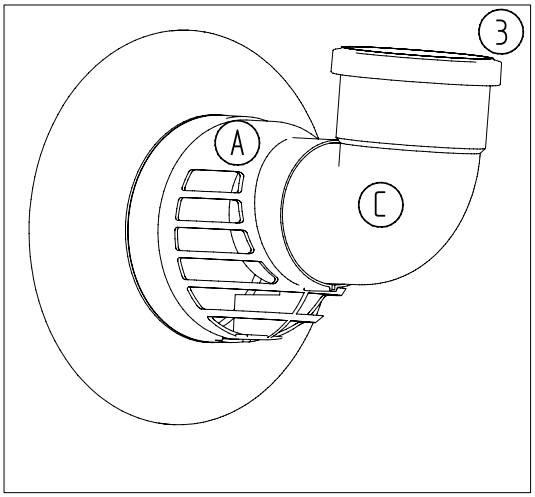
CUT OFF EXCESS MATERIAL

2. Using a suitable saw, cut off the highlighted portion of the end of the Terminal Assembly (A) then de-burr the cut edge.



FIT DIVERTER ELBOW

3. Lubricate and insert one of the Elbows (C) into the end of the Terminal Assembly (A). Elbow (C) can be pointed at any angle up to +/- 87° from the vertical. It must not be pointed horizontally or downwards as the effect of the flue gas condensate will reduce the life of the flue seals.

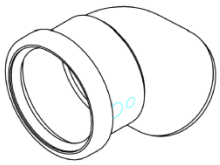
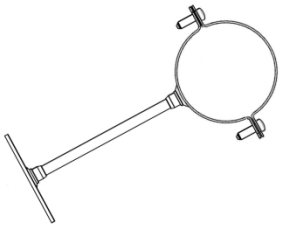
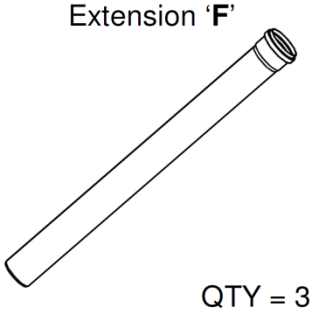
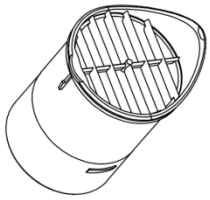
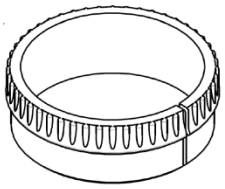


ASSEMBLE THE KIT

Assemble the remainder of the kit inserting the Terminal End (B) into the top Elbow (C) and using the Mounting Brackets (E) to secure the Extensions (D) as shown in the assembled kit diagram.

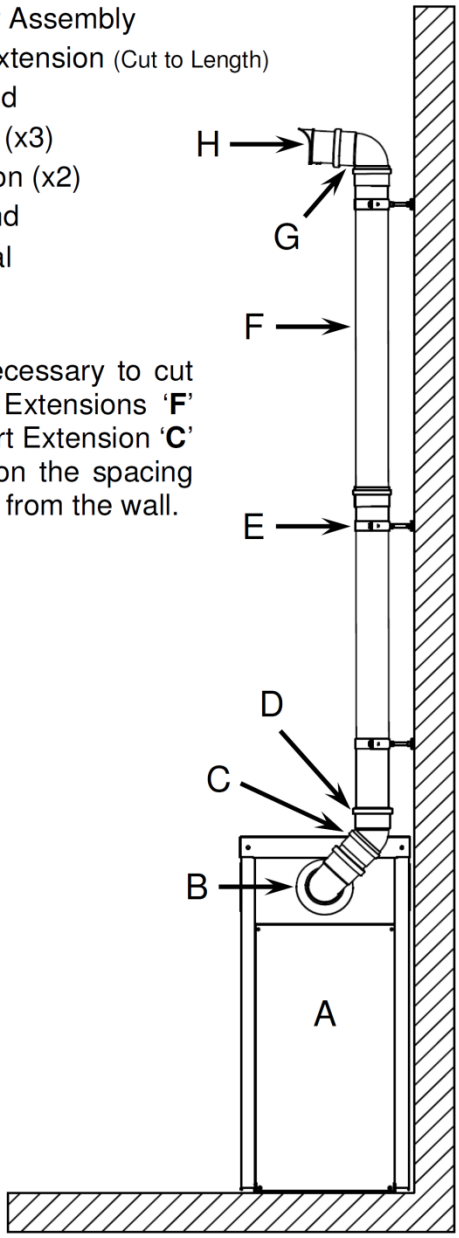
Kabin Pak/External Plume Management Kit (KPMK)

The kit comprises:

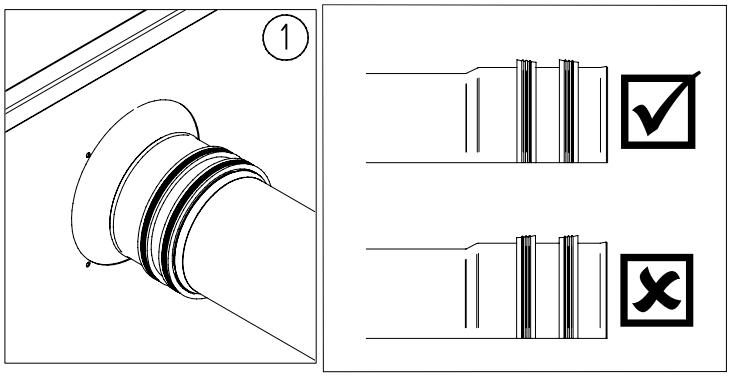
Diverter Assembly '**B**'  QTY = 1	45^0 Bend '**D**'  QTY = 1
Mounting Bracket '**E**'  QTY = 3	Extension '**F**'  QTY = 3
90^0 Bend '**G**'  QTY = 1	Terminal '**H**'  QTY = 1
Split Ring-nut  QTY = 1 (loose)	Diverter Assembly Seal  QTY = 2 (loose)

A – Kabin Pak Boiler
B – Diverter Assembly
C – Short Extension (Cut to Length)
D – 45^0 Bend
E – Bracket (x3)
F – Extension (x2)
G – 90^0 Bend
H – Terminal

Note:
It will be necessary to cut one of the Extensions '**F**' to form Short Extension '**C**' depending on the spacing of the boiler from the wall.



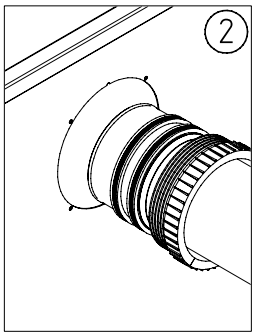
1. FIT DIVERTER ASSEMBLY SEALS



Apply suitable lubricant to the two Diverter Assembly Seals (supplied loose) then fit to the end of the boiler flue pipe noting the correct orientation.

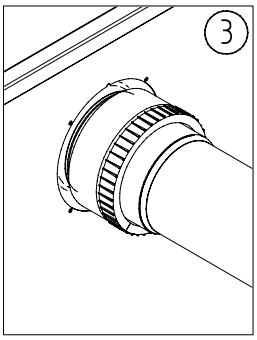
The seals MUST be fitted as shown with the outer surface sloping away from the end of the pipe to allow the Diverter Assembly to push over the seals.

2. FIT SPLIT RING-NUT



Fit the Split Ring-nut by pulling open the split and pushing the nut over the pipe. Ensure the threaded end is facing towards the seals.

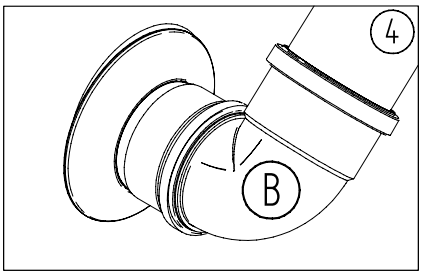
3. FIT & SECURE DIVERTER ASSEMBLY



Lubricate the inside of the Diverter Assembly ‘B’ then push the assembly onto the end of the pipe and over the 2 seals. Use the Split Ring-nut to force the seals into the assembly ensuring that they remain flat on the pipe.

Tighten the Ring-nut into the assembly ensuring the assembly is tight onto the end of the pipe and that the seals are well compressed. The Diverter Assembly must be firmly attached to the pipe when complete.

4. ADJUST DIVERTER ASSEMBLY



Turn the 90° bend on the Diverter Assembly ‘B’ around to 45°, pointing towards the wall. If necessary, adjust the position of the rubber dresser on the Diverter Assembly in order to ensure a good weather seal.

5. ASSEMBLE PLUME MANAGEMENT KIT

Assemble the remainder of the Plume Management Kit as shown in the assembled kit diagram, securing the whole assembly into place using the Mounting Brackets ‘E’.

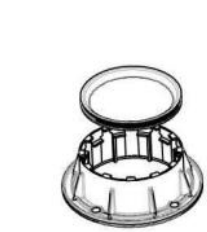
It will be necessary to cut one of the Extensions ‘F’ to form Short Extension ‘C’, depending on the spacing of the boiler from the wall.

If fitting the flue extension pipe (on a 44kW Model or Combination Boiler model), fix the rubber dresser of the Diverter Assembly ‘B’ to the boiler casing using appropriate silicone sealant in order to secure the assembly in place.

Ensure the location of the terminal complies with all local legislative requirements.

8.1.10 Flexible Flue Liner Kit (HFL & VFL)

These boiler connection kits (F16 or F18) contain:



Boiler Adapter (A)

Starter Assembly (B)

PLUS:

(F16) 1 x 500mm extension
For vertical chimney entry

(F18) 2 x 500mm extension
1 x 87° bend
For horizontal chimney entry

Installation instructions

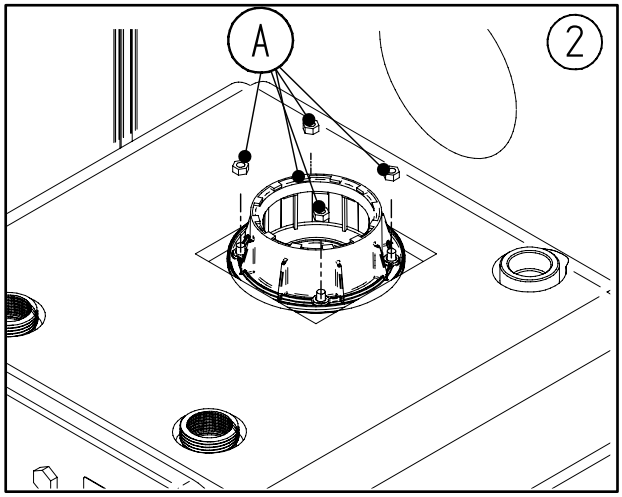
FIT FLUE THERMOSTAT

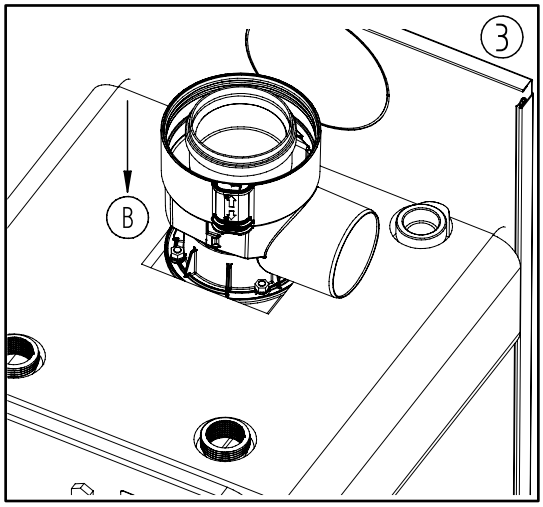
1. Fit the flue thermostat **BEFORE** fitting the flue.

FIT STARTER PIECE

2. Remove the top casing panel cut-out using snips. Fit the boiler adapter using nuts (A).

3. Lubricate the seals then insert the starter assembly (B).

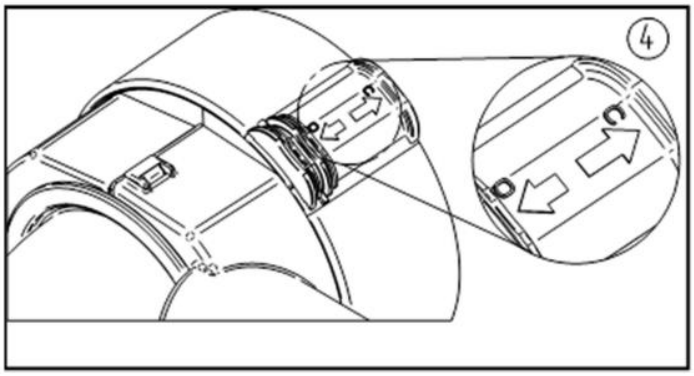


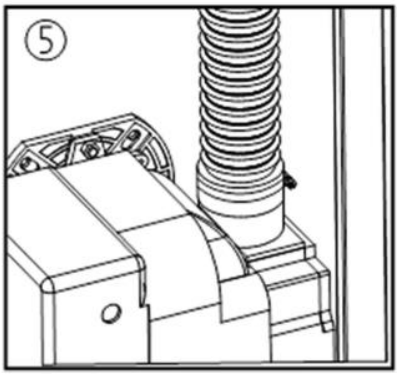


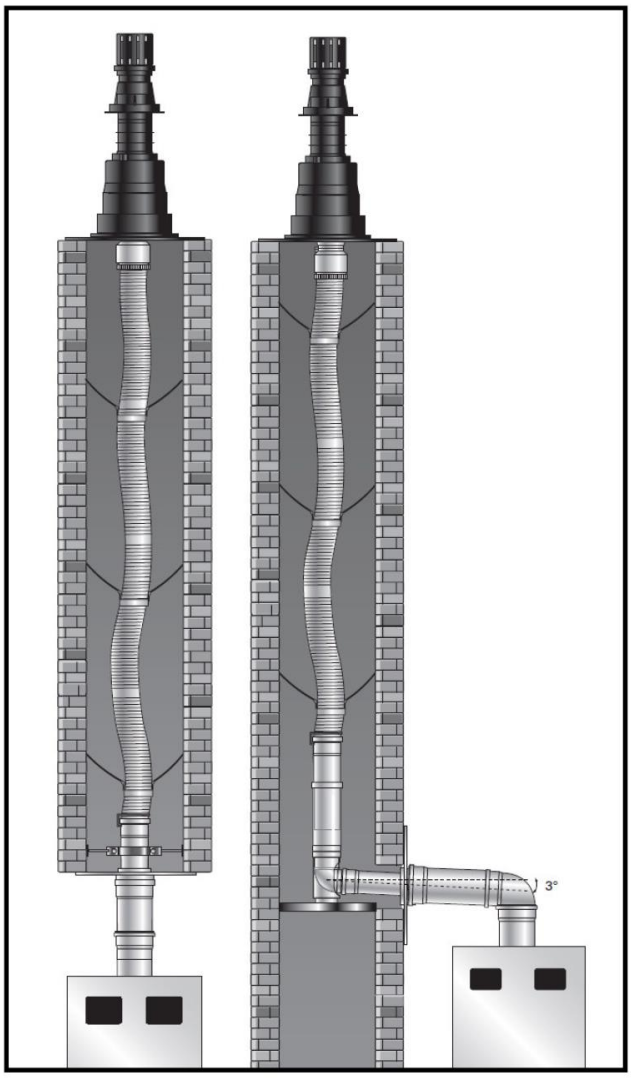
CONNECT 1ST EXTENSION AND AIR HOSE

4. Lubricate then fit the 1st extension (C) and secure with the locking band (D).

5. Fit the air inlet spigot and gasket to the burner. Attach the flexible air hose to the burner and starter assembly and secure with the jubilee clips (E) at both ends.







CONNECT TO CLOSURE PLATE

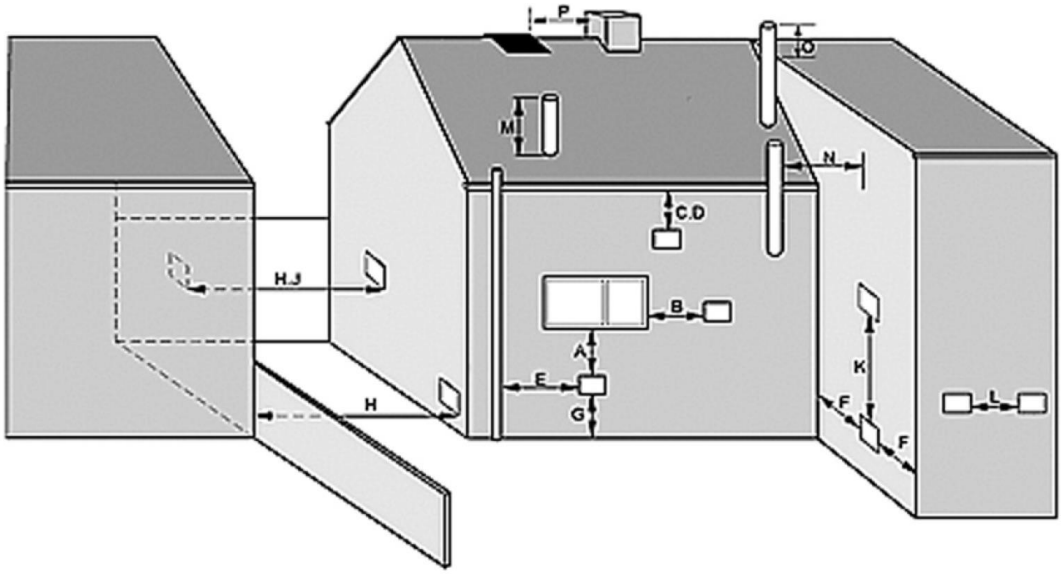
Install the chimney components and closure plate as instructed in the separate instruction leaflet.

Run the flue from the boiler to the chimney closure plate. If necessary, the extension(s) can be cut to length.

Horizontal entry kits only

Ensure that the ‘horizontal’ section into the closure plate is inclined back towards the boiler at a minimum of 3° to the horizontal as shown.

8.2 Flue Terminal Locations



MINIMUM DISTANCES TO TERMINALS IN MILLIMETRES AS MEASURED FROM THE TOP OF THE CHIMNEY OR THE RIM OF A LOW LEVEL DISCHARGE OPENING

A	Directly below an opening, air brick, opening window etc.	600
B	Horizontally to an opening, air brick, opening window etc.	600
C	Below a gutter, eaves or balcony with protection.	75
D	Below a gutter or a balcony without protection.	600
E	From vertical sanitary pipework.	300
F	From an internal or external corner, surface or boundary alongside the terminal.	300
G	Above ground or balcony level.	300
H	From a surface or a boundary facing the terminal.	600
J	From a terminal facing the terminal.	1200
K	Vertically from a terminal on the same wall.	1500
L	Horizontally from a terminal on the same wall.	750
M	Above the highest point of an intersection with the roof.	600
N	From a vertical structure on the side of the terminal.	750
O	Above a vertical structure less than 750mm from the side of the terminal.	600
P	From a ridge terminal to a vertical structure on the roof.	1500

These are minimum dimensions and are only quoted as guidelines.
Installation in exposed positions is not recommended. Account must be made of the plume from the flue. If it is likely to be a nuisance to the householder or neighbouring properties, the use of a vertical balanced flue or conventional flue should be considered.

Terminating positions must be at least 1.8 metres from an oil storage tank unless a wall with at least 30-minute fire resistance and extending 300 mm higher and wider than the tank is provided between the tank and the terminating position.

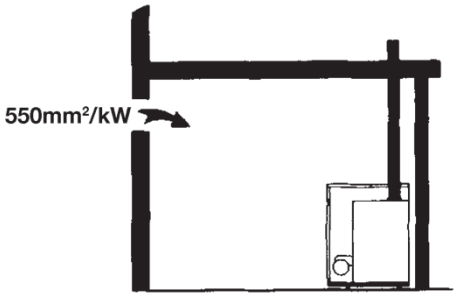
9 AIR SUPPLY FOR COMBUSTION & VENTILATION

(see BS5410)

9.1 Open Flue Boilers

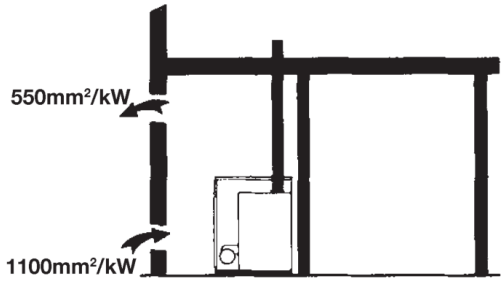
When the boiler is sited in a cellar where the only access for combustion and ventilation air is at high level then the combustion air must be ducted to low level.

Combustion Air Supply Boiler in Room

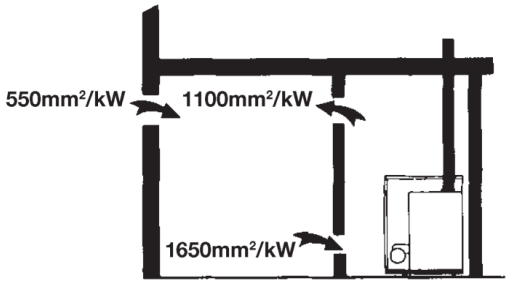


OPEN FLUE

Boiler in Compartment

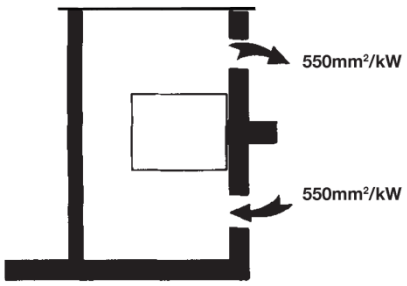


OPEN FLUE
VENTILATED FROM OUTSIDE

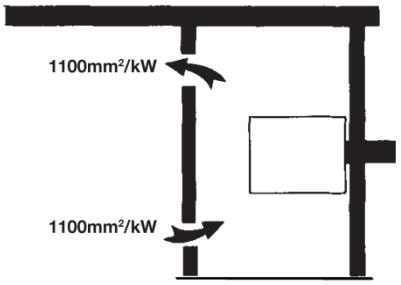


OPEN FLUE
VENTILATED FROM ROOM

9.2 Balanced Flue Boilers – Boilers in a Compartment



VENTILATED FROM OUTSIDE



VENTILATED FROM ROOM

Air Supply for Ventilation

No Combustion Air Inlet Required to Room

10 INSTALLATION REQUIREMENTS

The boiler installation must be in compliance with relevant standards and Building Regulations. See Section 4.2 of this manual.

10.1 General Requirements

10.1.1 Hearth

The boiler has a hearth temperature of between 50°C and 85°C and must be stood on a rigid, non-porous, non-combustible plinth or base, which is not softened by warmth in order to comply with the Building Regulations. The base or plinth material must minimise heat transfer to the ground and maximise the overall efficiency of the boiler. The base must have a slight forward fall (not less than 10mm over the length of the boiler) in order to ensure proper egress of condensate to the condensate trap.

10.1.2 Service Access

24" (600mm) Clearance must be provided above and in front of the boiler to allow for routine servicing. Pumped, System and Combination Boiler models may require access to the top. This is of particular relevance to appliances located beneath work surfaces. Such work surfaces must be easily removable for service access.

10.1.3 Heating System

The heating system must be installed to current HVAC codes of practice. Before installing the boiler, the new or existing system must be thoroughly flushed to clear all sludge or other foreign matter such as solder, steel wool and copper filings. The system must be cleansed, neutralised, and protected from corrosion in accordance with BS12828, BS12831, BS14336 and BS7593 using suitable cleansing agent(s) and inhibitor(s) and carried out in accordance with the cleanser / inhibitor manufacturers' instructions. The system must be dosed to the concentrations specified by the inhibitor manufacturer (refer to the Technical Data section of this manual for the volume of the boiler when calculating the total system volume). Inhibitor concentrations must be monitored and maintained on an ongoing basis. Failure of components such as, but not limited to heat exchangers, condensing units, pumps, auto air vents and pressure relief valves, etc. due to corrosion products in the system will not be covered by warranty.

10.1.4 Air Vents

The plastic plugs of the auto air vent(s) factory-fitted to the boiler must be loosened when filling the system in order to bleed the air from the boiler. Air must also be vented from combination boilers using the manual air vents located in the heat store tank and boiler flow pipe assembly. The plugs must be tightened again once filling is complete. In addition to any factory fitted air vents it is recommended that another air vent is fitted at the highest point in the system. Where the flow pipework drops down from the boiler the installer must ensure that an automatic air vent is fitted to the top of the pipework to prevent air being trapped in the boiler.

On B-Series models, the boiler **MUST** be fitted with an automatic air vent as shown in Section 4.5.1. If an air vent is not fitted, air will accumulate in the secondary heat exchanger and cause the boiler to malfunction. Failure to fit an air vent will invalidate ALL warranties.

10.1.5 Drain Cock

For all appliances not factory-fitted with drain cocks, one must be fitted to the boiler drain boss located to the left-hand side of the burner. Drain cocks must also be fitted to the lowest points in the system to allow the system to be completely drained.

10.1.6 Frost Protection

Where there is a risk to the boiler or installation from frost then a suitable frost thermostat must be fitted. Alternatively, the system could be dosed with an antifreeze agent. Combination Boiler models are fitted with frost protection as standard to protect the fabric of the boiler only. For all other External models covered by this manual, a Frost Thermostat Kit (Code FSK2) is available as an optional extra. This also protects the fabric of the boiler only. Details of frost protection for the fabric of the building can be found in section 6.4 of this manual.

10.1.7 Pipework

We strongly advise that all installation pipework is run in copper. However, if plastic pipe or plastic-coated pipe is used, it must be recommended by the pipe manufacturer for use with oil fired appliances and compatible with the operating parameters of Warmflow oil-fired products specifically. In any case, the first 1000mm of pipework (or as per the pipe manufacturer's instructions) connected directly to the appliance must be of copper. If plastic pipe is to be used, consideration must be given to additional protection measures against the potentially elevated temperatures that may be generated by the boiler appliance, e.g. in a high limit thermostat activation scenario.
All connections to the appliance must be made with compression fittings.
Warmflow does not accept any responsibility for any damage, however caused, to plastic piping or fittings.

10.2 Sealed Systems

10.2.1 Expansion Vessel

Refer to Section 4.2 of this manual for standards referencing details of expansion vessel sizing.
The values given in the table below are for total system volumes which include the water content of the boiler details of which can be found in the Technical Data Section 5.4 of this manual. System models up to 33kW are supplied with a 12-litre expansion vessel charged to 1.0 bar. Combination Boiler models are supplied with a 24-litre expansion vessel charged to 1.0 bar. This can accommodate a maximum combined boiler and system volume of 220 litres.
Expansion vessel pre-charge pressures must be evaluated and adjusted periodically, normally as part of servicing.
When measuring the expansion vessel bladder pre-charge pressure, using a tyre gauge, the system must be cold, and the system pressure must be relieved (by manually operating the system pressure relief valve) in order to obtain an accurate reading.

If the maximum total system volumes stated above are to be exceeded, additional expansion capacity will be required.

INITIAL CHARGE	**VESSEL VOLUMES**											
1.0	2.7	5.4	8.2	10.9	13.6	16.3	19.1	21.8	24.5	27.2	30.0	32.7
SYSTEM VOLUME	**25**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**

Do not allow the flexible hoses connected to the expansion vessel to become twisted, kinked or flattened. This may cause collapse of hose bore compromising the function of the expansion vessel.

10.2.2 System Boiler Filling

For all System and Combination Boilers a filling point complete with a filling loop is supplied fitted to the expansion vessel. The filling loop **MUST** be disconnected from the mains supply after filling. A system pressure when cold of 1 bar is recommended. After filling, vent all air from the system. The plastic plugs of the auto air vent(s) factory fitted to the boiler must be loosened when filling the system in order to bleed the air from the boiler, then re-tightened when filling is complete.

10.2.3 Combination Boiler Filling

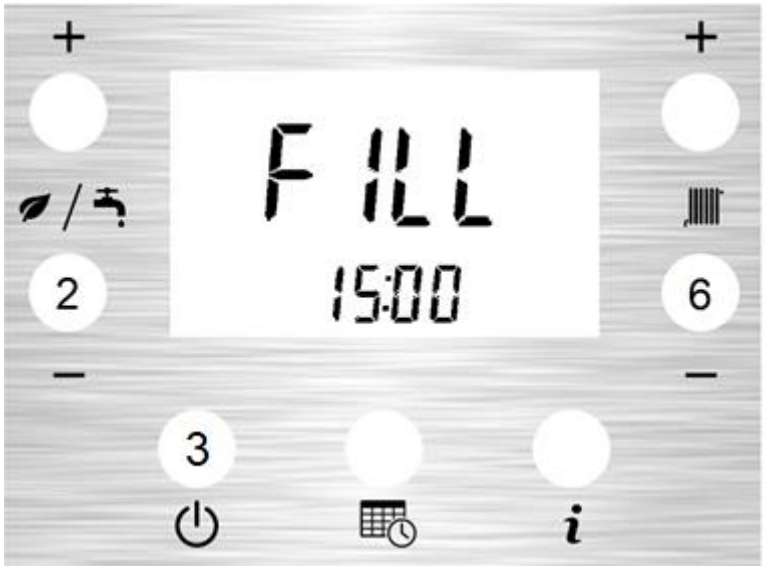
Filling mode provides a facility to assist in removing air from the system during system filling.

The Filling mode is activated by simultaneously pressing the DHW- (2) and CH- button (6) for 10 seconds. The appliance must not be in 'OFF' mode.

During this function:

1. All heat demands are disabled.
2. The circulating pump operates at the maximum speed.
3. The diverter valve is moved to mid position.

During this function, 'FILL' is shown on the LCD:



The function can be disabled by pressing the Mode button (3) for 5 seconds.

Alternatively, the function is automatically stopped after a timeout period of 15 minutes. A countdown timer is shown on the auxiliary digits.

10.2.4 System Pressure

Water loss from the system as indicated by a reduction in pressure on the pressure gauge may be made up through the filling loop. In the first week of operation, it is normal to see a drop in system pressure. After this time the system pressure must be rechecked, and the system refilled. Failure to do so may lead to boiler faults.

Special attention must be given to the concentration of corrosion inhibitors in the system water where there is a need for topping up or refilling. Inhibitor concentrations must be restored to the concentrations specified by the inhibitor manufacturer.

Frequent or routine refilling and topping up of the system should not be necessary on an ongoing basis and may prove harmful to the appliance. Should topping up prove necessary on a frequent or routine basis you must contact Warmflow or your installer.

10.2.5 Pressure Relief Valve

Any pressure relief valve fitted to the boiler or system must be able to discharge externally to a drain where the discharge can be seen but cannot cause any injury or damage. Other valves must not be positioned between the relief valve and discharge termination. The pressure relief valve must be manually activated periodically in order to assess valve opening, normally as part of servicing.

10.2.6 Low Pressure Switch

Where there is a catastrophic loss of water from the system the boiler thermostats may fail to operate which would result in serious damage to the appliance. To prevent this, it is recommended that a low pressure cut out switch set at 0.3 bar is fitted to **the system** and wired in series with the boiler limit thermostat.

10.3 Combination Boiler Domestic Hot Water

10.3.1 Mains Water Pressure

To protect the appliance and to prevent excessive flow rates, a pressure reducing valve is factory-fitted to limit the maximum supply pressure to 3 bar.

A mini expansion vessel is factory-fitted after the pressure reducing valve in order to protect the appliance from the expansion due to heating of the water in the domestic hot water pipework. Depending on DHW system volume, additional expansion may be required.

We strongly advise that all installation pipework is run in copper. However, if plastic pipe or plastic-coated pipe is used, it must be recommended by the pipe manufacturer for use with oil fired appliances and, in any case, the last 1000mm of pipework connected directly to the appliance must be of copper.

Note that the flow rate from individual taps is dependent on the number of outlets being operated together, as well as the length and size of pipework and the mains supply pressure.

10.3.2 Water Hardness

Although many of the DHW components are designed to resist lime scale formation, in areas of hard water it may still be necessary to fit an inline chemical water softener. For further information contact Warmflow and your local water company.

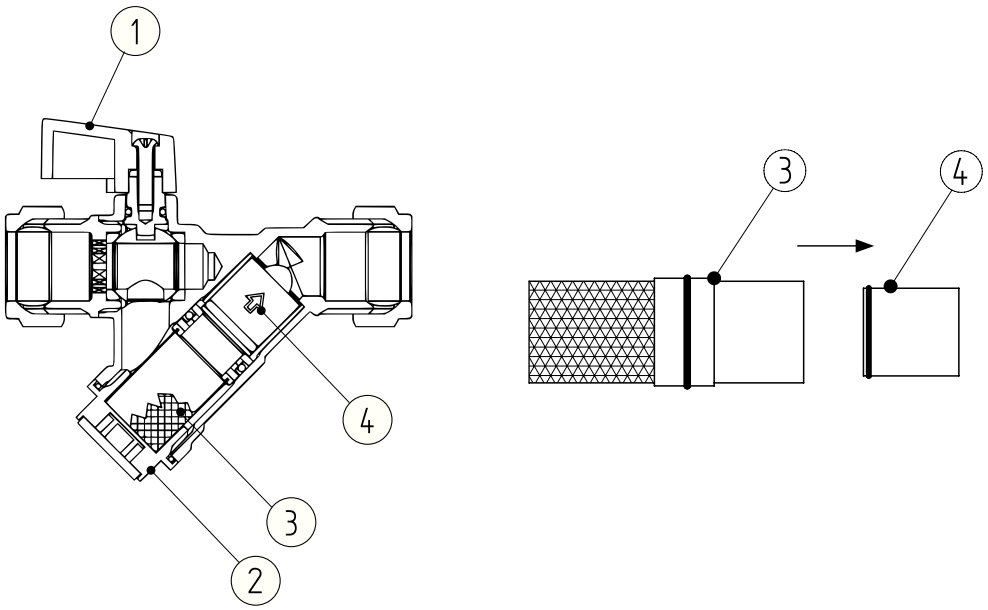
10.3.3 Boreholes

In order to minimise the pressure variations, it is recommended that the differential setting on the borehole pump pressure control is kept as low as possible without adversely affecting the pump motor. The accumulator must be as large as possible in order to reduce the rate of pressure change and a pressure reducing valve (PRV) must be situated between the pump and accumulator and the boiler. The PRV must be set slightly below the minimum setting of the pressure switch on the pump.

10.3.4 Flow Restrictor

An 18l/min flow restrictor has been factory fitted to the incoming DCW isolation valve but can be easily removed if required.

1. Isolate the incoming DCW supply using the ball valve (1).
2. Remove the cap and O ring (2) using a spanner, expect an escape of residual water.
3. Withdraw the combined strainer element (3) and flow restrictor (4) assembly.
4. Remove the flow restrictor cartridge from the strainer element and replace the strainer element back into the valve body.
5. Replace the cap, ensuring the O ring is seated correctly.
6. Turn on the incoming DCW supply.



10.3.5 Pipework

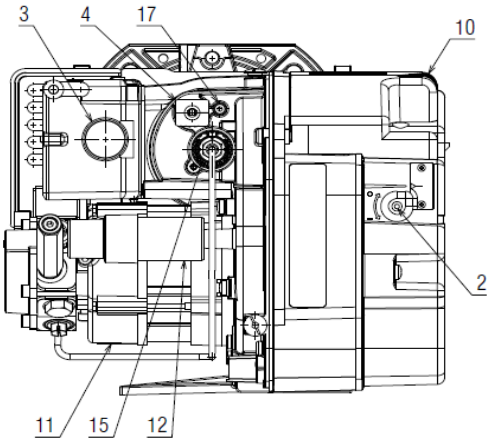
All pipework including pipework within the casing must be insulated after the boiler has been installed. Suitable pipe insulation with a minimum wall thickness of 19mm must be used wherever possible. For exterior pipework insulation, please see the latest local building regulations for details.

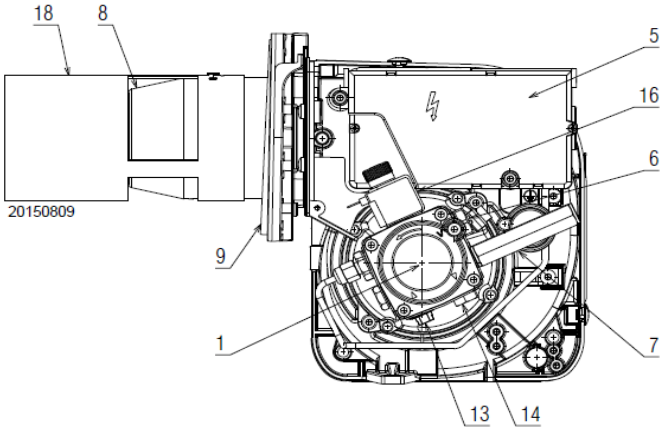
10.3.6 Balanced flue

Due to the relatively high ambient temperature within the Combination Boiler casing, a balanced flue must be fitted in order to draw in cooler outside air. For external models, an air inlet adapter, AID, is available from Warmflow.

11 BURNERS, COMMISSIONING AND SERVICING

11.1 RDB BX Burner

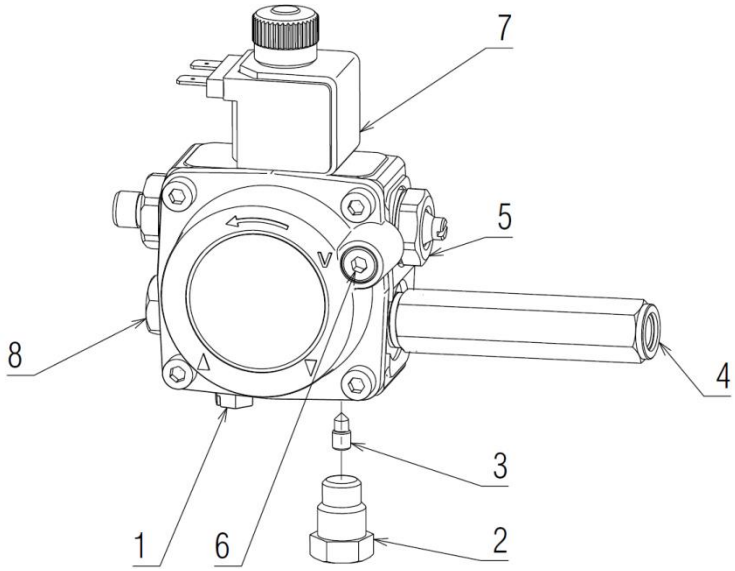




1. Oil Pump
2. Air Damper Adjustment Screw
3. Reset Button with Lockout Lamp
4. Flame Sensor
5. Control Box
6. Pump Pressure Adjustment Screw
7. Extension for Gauge Connection
8. Combustion Head
9. Flange with Insulation Gasket
10. Air Inlet
11. Motor
12. Motor Ignition Capacitor
13. Fuel Suction Line
14. Return Line
15. Combustion Head Adjustment Handle
16. Coil
17. Air Pressure Test Point
18. Recirculating Pipe

11.2 Oil Pump

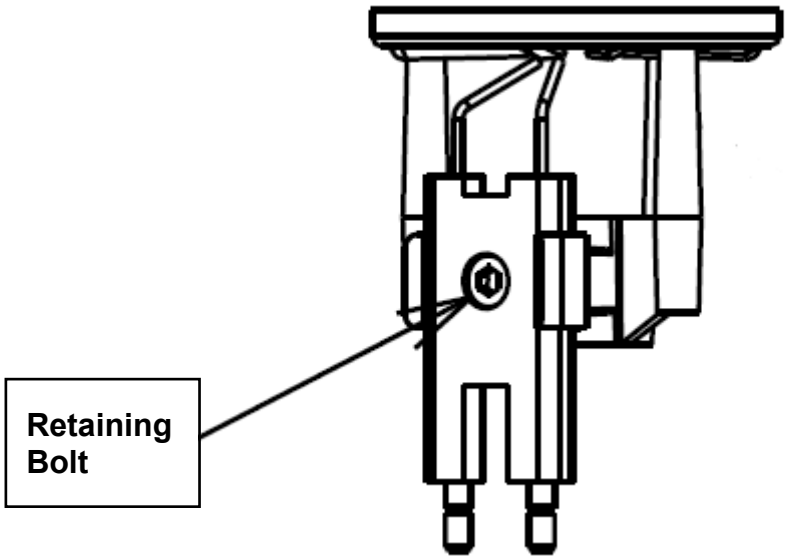
The burner is supplied for use with a one pipe system. For use on a two-pipe system, it is necessary to remove the return port plug and fit a small by-pass screw as shown:



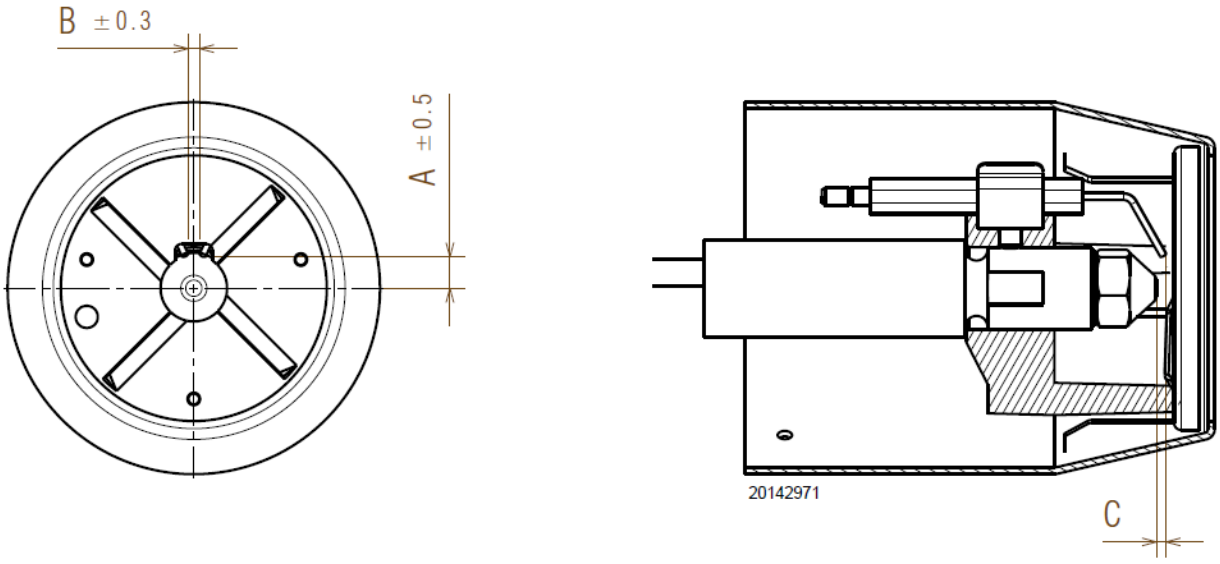
1. Suction Line
2. Return Port Plug
3. By-pass Screw
4. Pressure Gauge Connection
5. Pressure Adjuster
6. Suction Gauge Connection
7. Fuel Solenoid and Valve
8. Auxiliary Pressure Test Point

11.3 Electrode Setting

When removing or replacing the nozzle, move the electrodes forward to avoid the risk of damage. The electrodes are slackened by unscrewing the brass post that passes from the electrode holder out of the side of the burner. When work is complete, ensure the electrodes are reset as shown and secured by tightening the brass post.



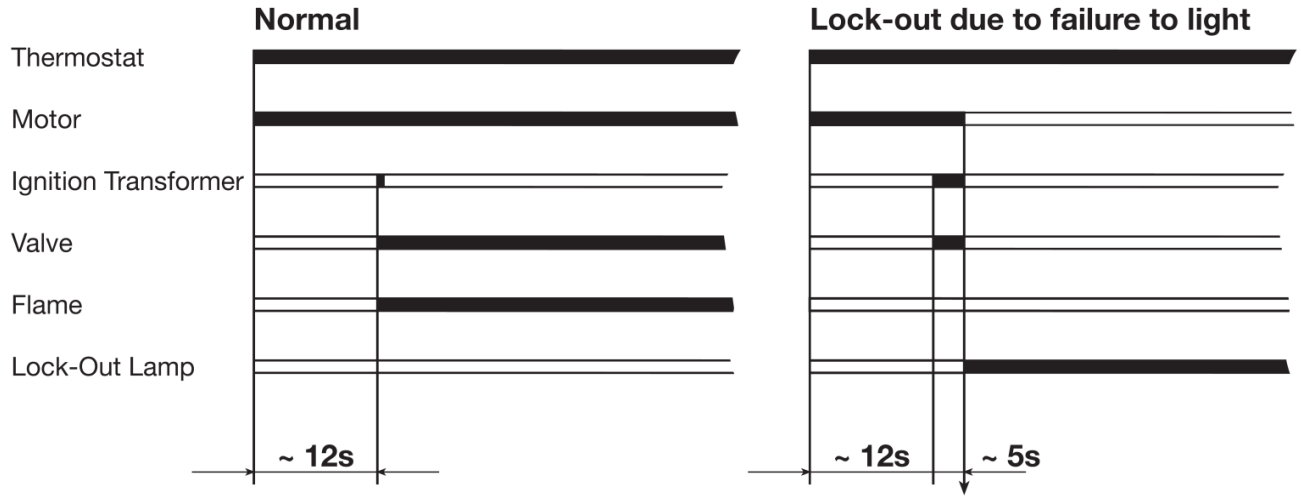
The positioning of the electrodes must then be checked. The correct position for each burner is shown below.



Model	Dimension A	Dimension B	Dimension C
RDB 2.2 BX 15/21	7	2.5	2.5 – 3
RDB 2.2 BX 21/27	4.5	3	2 – 2.5
RDB 2.2 BX 27/33	4.5	3	2 – 2.5
RDB 3.2 BX 33/44	4.6	3	2 – 2.5

11.4 Burner Start-Up Cycle

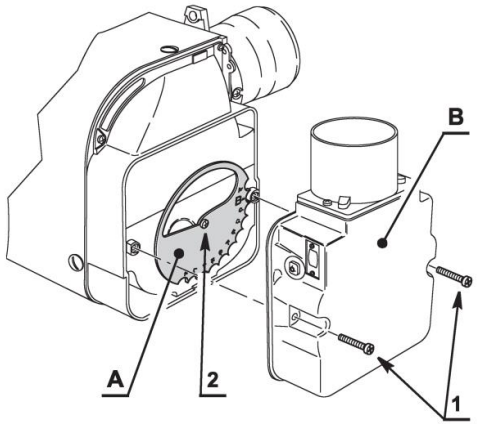
Lock out is indicated by a lamp on the control box.



11.5 Air Damper Adjustment

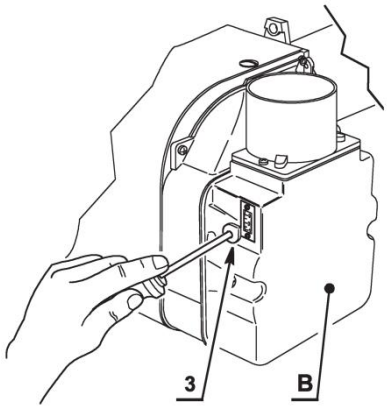
The air damper is set in factory. This regulation is purely indicative. Each installation, however, has its own working conditions: actual nozzle output; positive or negative pressure in the combustion chamber, the need of excess air, etc. All these conditions may require a different air damper setting.

Air Damper (A) – 15/21 Burner Only



Air Damper (A) – The main air damper can be set in either of two positions. To set the positions of the damper, proceed as follows: Remove the secondary air damper (B) loosening the screws (1). Loosen the screw (2) and rotate the main air damper (A) to the required position. Retighten the screw (2) and put back the secondary air damper (B).

Air Damper (B)

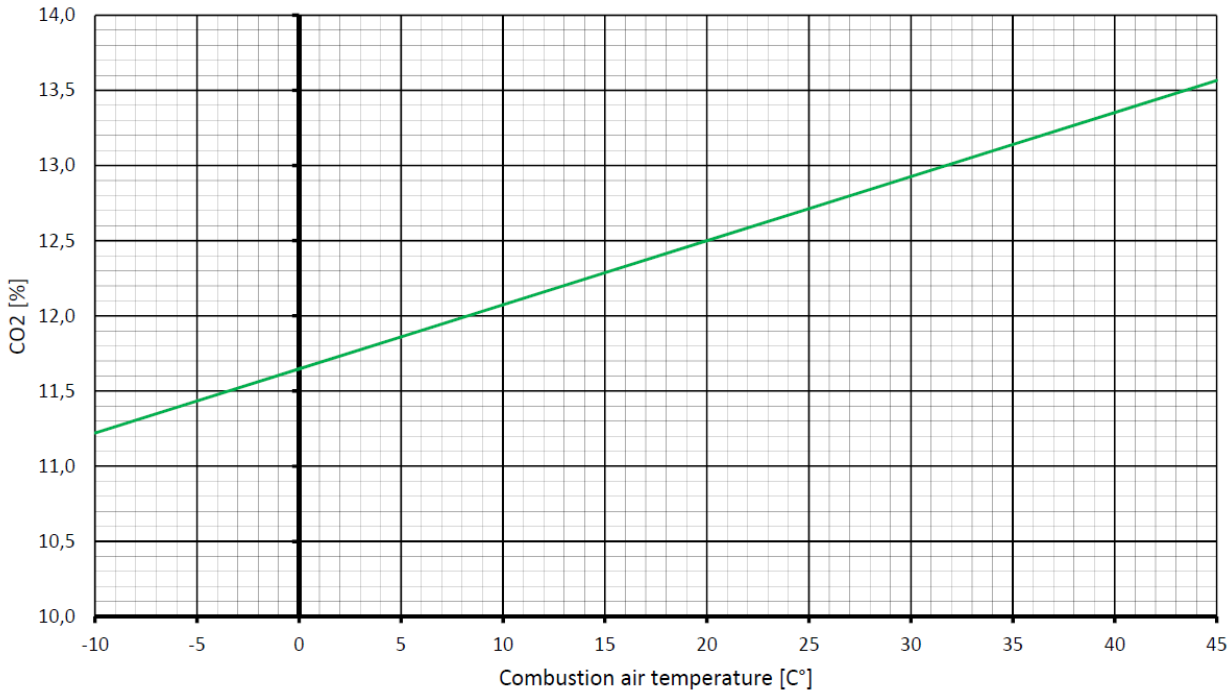


Air Damper (B) – The purpose of this damper is to perform a fine tuning of the inlet air. Tuning of this device is possible by turning the screw (3).

11.5.1 Ambient Air Correction

The combustion air is drawn from outside, therefore ambient temperature changes can influence the percentage of flue gas CO_2.

It is recommended to adjust the CO_2 according to the graph below:



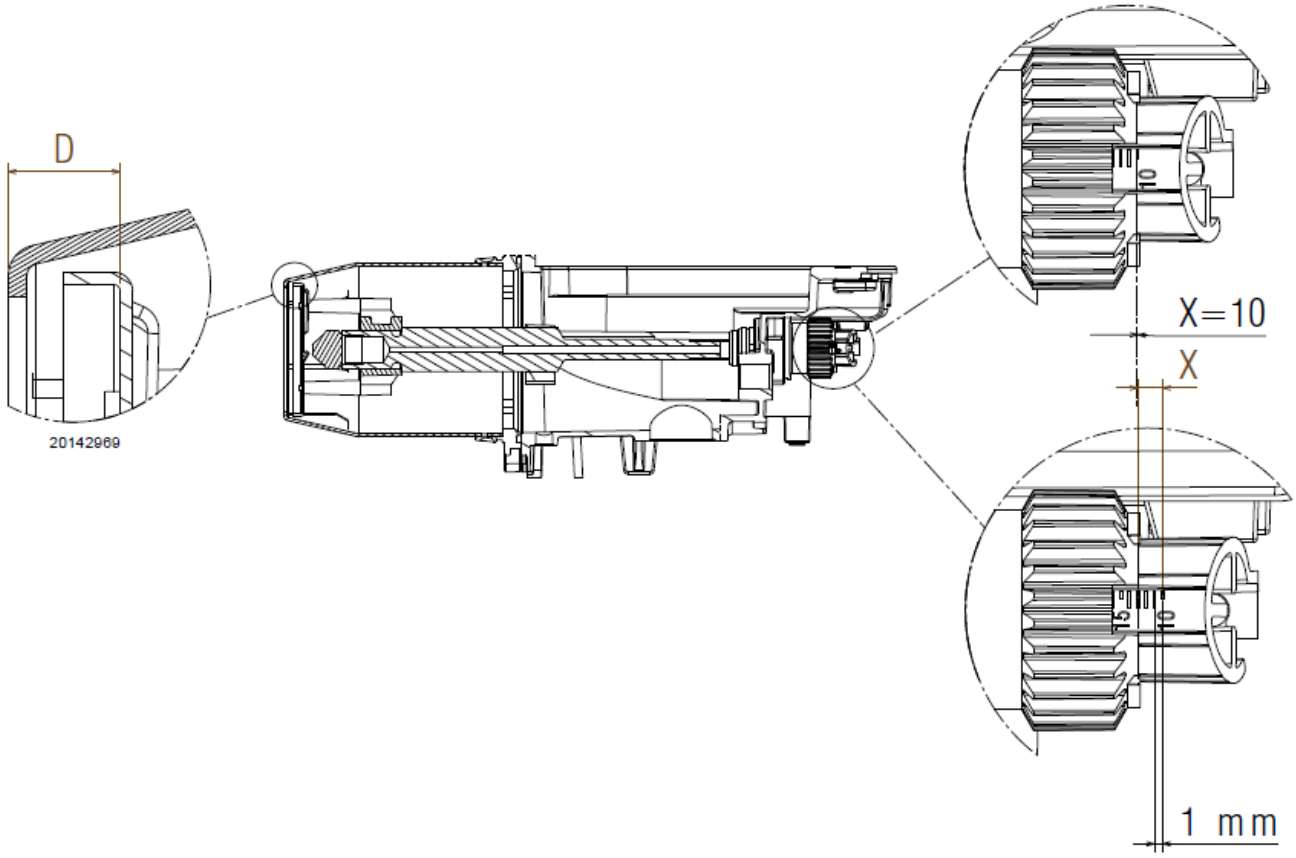
For example, with an external air temperature of 20°C, adjust the CO_2 to 12.5% (± 0.2%).

11.6 Combustion Head Adjustment

If the heat output of the burner is to be changed from the factory default setting, then the combustion head must be repositioned in order to maintain low NOx levels.

11.6.1 RDB 2.2 BX Adjustment

Adjustments on the basis of the required output can be made by rotating the adjustment knob (1 complete revolution = 1 millimetre adjustment).

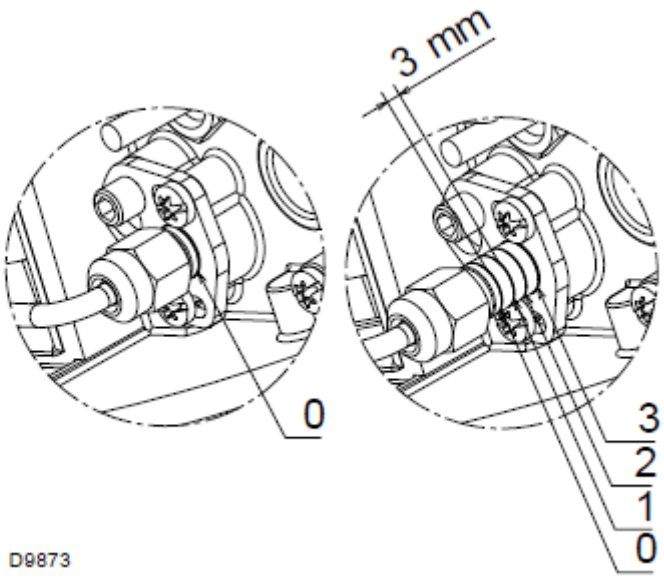


The settings for the mid-range outputs are shown in the table below.

Model	X (mm)	D(mm)
FULLY CLOSED	**10.0**	**10.0**
RDB 2.2 BX 15/21	**11.5**	**11.5**
RDB 2.2 BX 21/27	**14.5**	**14.5**
RDB 2.2 BX 27/33	**18.0**	**18.0**

11.6.2 RDB 3.2 BX Adjustment

The RDB 3.2 BX has a slightly different adjustment mechanism than the RDB 2.2 BX. Adjustments on the basis of the required output can be made by rotating the adjustment screw. Distance between the indentations = 3mm. Each complete rotation of the screw = 1mm. The setting for the mid-range output is shown in the table below.



The setting for the mid-range output is shown in the table below.

Model	X (mm)	D(mm)
FULLY CLOSED	**10.0**	**10.0**
RDB 3.2 BX 33/44	**19.0**	**19.0**

11.7 Commissioning

Note: It is the responsibility of the installer to ensure that the appliance is properly commissioned by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation. Failure to commission the appliance will invalidate all appliance warranties. The appliance must be commissioned in line with the requirements of the OFTEC Technical Manual. When assessing appliance operation as part of commissioning ensure that the appliance is not affected by 'dead-heading' within the hydronic heating system due to any incorrect wiring or component failure.

Before firing ensure that all the baffles are in place, as they may have been displaced during transit; Refer to the General Information section of this manual. Switch the boiler on, ensuring all controls are calling for heat and allow the system and boiler appliance to achieve normal operating temperatures before commencing the commissioning process.

In order to achieve satisfactory combustion performance, as part of commissioning, it may be necessary to adjust any or all parameters which influence appliance combustion. Adjustments necessary may include fuel pump pressure setting, electrode setting, air damper setting, combustion air setting, and combustion head setting. In all cases upon commencing commissioning activities ensure that parameters are set to that of the factory default, see Section 5.4 of this manual. Note that significant deviation from these factory defaults may be necessary in some installation situations.

Use a smoke pump to check the smoke number. It must be zero.

Use a flue gas analyser to check the CO_2 content and the flue gas temperature once the boiler is hot. With the CO_2 correctly set, check the flue gas composition in line with OFTEC or local guidance. Flue gas testing conducted while the boiler is still relatively cold will give inaccurate results and may lead to incorrect adjustments being made.

Where a balanced flue has been fitted, ensure the air duct connecting the flue and burner has been properly connected before commissioning.

Note: All product warranties will be invalidated if the appliance is not commissioned by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation. The appliance must be registered with the manufacturer within 30 days from the date of installation and 90 days from the date code stamped on the appliance. Registration may be completed online, or by completing and returning the OFTEC boiler passport installation/commissioning certificate, or by completing and returning any equivalent installation/commissioning certificate applicable within the territory of installation.

A copy of the installation/commissioning records must also be provided by the Installer to the Owner of the appliance. The Owner of the appliance must retain a copy of the installation/commissioning records provided.

11.7.1 Programming Engineer Parameters – Combination Boilers

NOTE: ENGINEER PARAMETERS MUST ONLY BE ADJUSTED BY A TRAINED AND COMPETENT PERSON

Combination Boilers are fitted with parameters that may need to be adjusted upon commissioning, depending on the specific installation.

The Engineer Parameters Menu is used to allow selected parameters to be modified by the engineer, these items are password protected.

The Engineer Parameters Menu is displayed from the Home Screen by simultaneously pressing the Information button (5) and DHW- button (2) for 3 seconds.

The Main digit indicates ‘PASS’.

The DHW+ button (1) and DHW- button (2) are used to enter the left digits of the password.

The CH+ button (7) and CH- button (6) are used to enter the right digits of the password.

The password is 1380.

To accept the password, press the Mode button (3) for 1 second.

To select a parameter, use the DHW+ button (1) and DHW- button (2).

To modify a value, press the Mode button (3) for 1 second.

The Engineer icon will begin to flash.

Adjust the variable setting to the desired value using the DHW+ button (1) and DHW- button (2).

To save the new value, press the Mode button (3) again for 1 second.

The Engineer icon will stop flashing.

To return to the Home Screen, press the Information button (5) again, or if no button is pressed for 3 minutes, the Home Screen is displayed automatically.

11.7.2 Engineer Parameter List

Parameter number	Description	Units	Range	Default Value
P 00	CH Anti-Cycle time	mins	0-10	0
P 01	CH Pump Overrun time	secs	0-240	60
P 02	DHW Pump Overrun time	secs	0-240	0
P 03	DHW min flowrate	l/min/10	15-40	15
P 04	CH Pump Speed	%	50-100	100
P 05	DHW Tank Pump Speed	%	50-100	100
P 06	DHW Programmer Type	N/A	0-1	0
P 07	CH Programmer Type	N/A	0-1	0
P 08	DHW Tank setpoint offset	°C	0-30	6
P 09	DHW Tank Differential	°C	1-10	6
P 10	CH Temp Differential	°C	2-10	5

Detailed descriptions of the Engineer Parameters can be found below:

Parameter	Description
P00	Used to prevent the burner firing in CH mode for a period after it last stopped, to prevent inefficient short cycling of the burner CH mode.
P01	Keeps the circulating pump running for a period after the last CH cycle, to distribute heat within the primary heat exchanger after a CH cycle.
P02	Keeps the circulating pump running for a period after the last DHW cycle, to distribute heat within the primary heat exchanger after a DHW cycle.
P03	Minimum DHW flow rate for activation of the DHW Instantaneous cycle, measured in litres/minute/10. For example, P03=15, means 1.5 litres/minute.
P04	Circulating pump speed during CH cycle, this can be reduced depending on system requirements.
P05	Circulating pump speed during DHW Tank cycle, this should be kept at 100% for fastest tank re-heat.
P06	DHW Programmer Type. 0 = External Time Programmer Control 1 = Internal Time Programmer Control
P07	CH Programmer Type. 0 = External Time Programmer Control 1 = Internal Time Programmer Control
P08	Temperature above DHW setpoint the Tank Cycle switches off at.
P09	Temperature differential on DHW Tank cycle.
P10	Temperature differential on CH cycle.

11.8 Servicing

11.8.1 General Requirements

The appliance must be serviced annually by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation. Servicing must be conducted in line with the requirements of OFTEC'S Technical Manual.

Additionally, when servicing, special attention **MUST** be paid to the condition of the oil nozzle, flexible oil line, fuel filter, door insulation, sealing rope, expansion vessel (inc. pre-charge), flow meter (combi boilers), and the secondary heat exchanger door seal. If found to be worn or defective, they **MUST** be replaced.

If fitted, the magnetic filter must be serviced per the manufacturer's instructions.

Flexible oil lines must be replaced if out of their guarantee period. If doubt exists as to the guarantee period expiry date of the flexible oil lines, or if their integrity is uncertain, they **MUST** be replaced as part of the service.

The operation of boiler appliance controls and safety devices, items such as control and high limit thermostats, pressure relief valves and fire valves **MUST** be assessed. If found to be defective, they **MUST** be replaced.

N.B.: When assessing appliance operation ensure that the appliance is not affected by 'dead-heading' within the hydronic heating system due to any incorrect wiring or component failure.
During the assessment of fire valve operation, and where they exist, wheel-head fire valves **MUST** be replaced with a remote acting type.

The system corrosion inhibitor concentration must be checked during annual servicing (instant on-site test kits are available from inhibitor manufacturers) and additional inhibitor **MUST** be added if the system is found to be under-dosed. Refer to the inhibitor manufacturer for further guidance.

Note: All product warranties will be invalidated if the appliance is not serviced annually by a Warmflow technician, an OFTEC-registered technician or by an individual who is certified via an equivalent competent persons scheme applicable within the territory of installation. Annual service records must be retained by the Owner of the appliance.

11.8.2 Test Mode

Test mode allows a forced CH demand, this allows for flue gas analysis tests to be performed following a service operation, even if a switched live demand is not present.

Note. The appliance must have CH mode enabled, as indicated by the CH icon shown on the LCD.

Test mode can be activated by pressing the DHW+ button (1) and CH+ button (7) for 10 seconds.

When activated, CH demand is forced, and the maximum CH setpoint is set.

During operation of Test mode, the LCD displays “tESt” with the Engineer icon flashing.

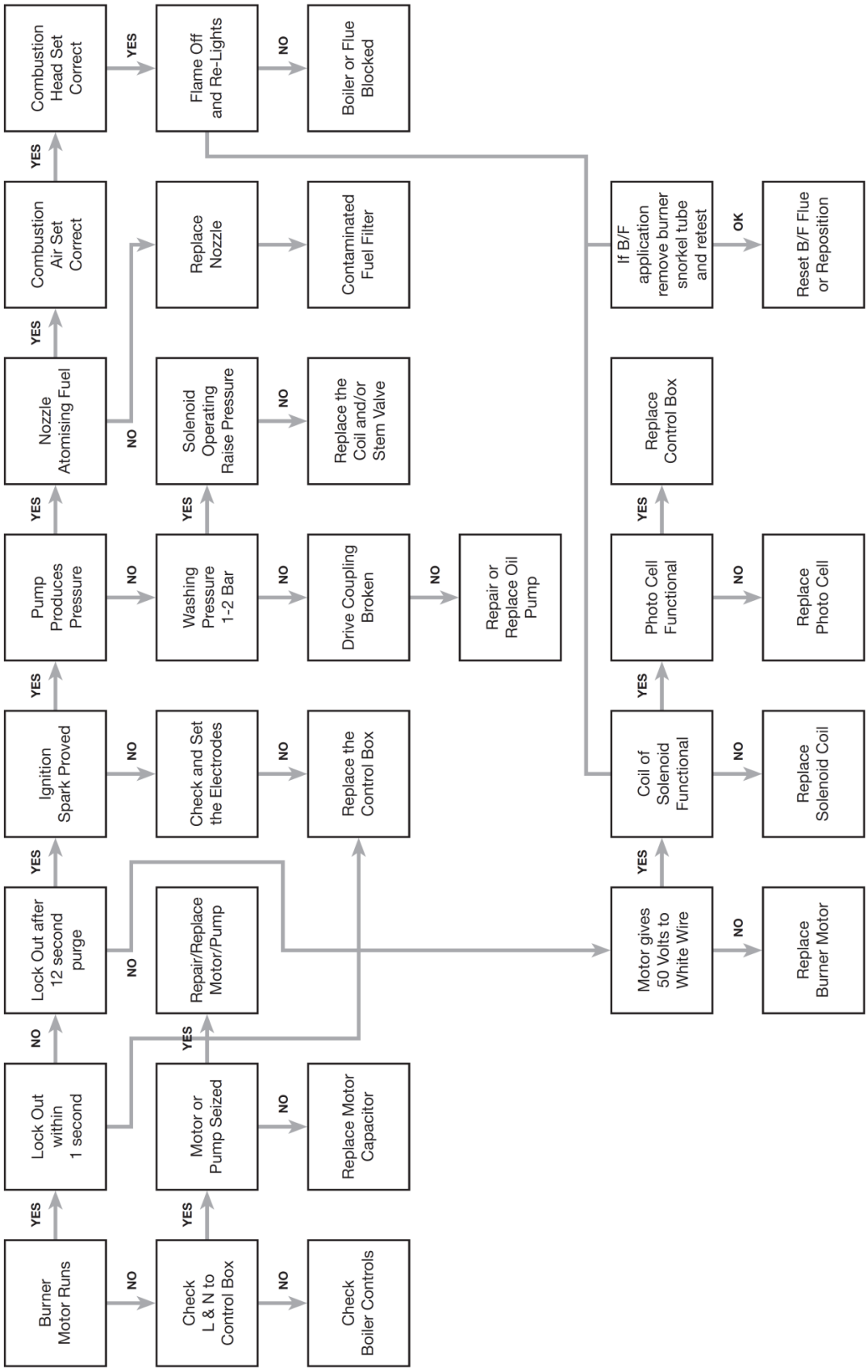
The function can be disabled by pressing the Mode button (3) for 5 seconds.

Alternatively the function is automatically stopped after a timeout period of 15 minutes. A countdown timer is shown on the auxiliary digits.

12 BURNER FAULT FINDING

WARNING: The burner fault finding chart is to only be used by competent and suitably qualified engineers. It may be necessary to check live terminals inside the control panel. Extreme care must be taken when doing so.

12.1 Riello RDB BX



13 COMBINATION BOILER FAULT FINDING

WARNING: The Combination Boiler fault finding tables (Central Heating and Hot Water) are to only be used by competent and suitably qualified engineers. It may be necessary to check live terminals inside the control panel. Extreme care must be taken when doing so.

13.1 Error codes displayed on the LCD.

Combination Boilers are fitted with diagnostic functions that monitor the correct function of certain control systems within the appliance.

Error codes are displayed on the LCD, a list of Error codes, their possible causes and corrective actions are detailed below.

Code	Description	Possible Cause (s)	Corrective Action (s)
E01	Burner Lockout	No fuel supply to burner, air in fuel lines Burner fault	Consult Service Engineer
E02	High Limit	Air Lock in boiler, displaced NTC Temperature Sensor, circulation problem	Consult Service Engineer
E05	Boiler NTC Error	Boiler Flow NTC Temperature Sensor short circuit or disconnected	Consult Service Engineer
E06	DHW Flow NTC Error	DHW Flow NTC Temperature Sensor short circuit or disconnected	Consult Service Engineer
E11*	Tank Limit	Displaced Tank NTC Temperature Sensor Probe	Consult Service Engineer
E12	Tank Control NTC Error	Tank Control NTC Temperature Sensor short circuit or disconnected	Consult Service Engineer
E15*	CH Return NTC Error	CH Return NTC Temperature Sensor short circuit or disconnected	Consult Service Engineer
E22	Flash Data Corrupted	PCB Fault	Consult Service Engineer
E31	Remote Control Communication Error	Damaged Remote-Control cable Remote Control Fault	Consult Service Engineer
E32	MMI - Control PCB Error (On Remote Control)	Damaged cable in control panel PCB Fault	Consult Service Engineer
E62	MMI - Control PCB Error (On Boiler)	Damaged cable in control panel PCB Fault	Consult Service Engineer

*Error Codes E11, E15 are not displayed on the LCD, and are only stored in the Error History for diagnosis.

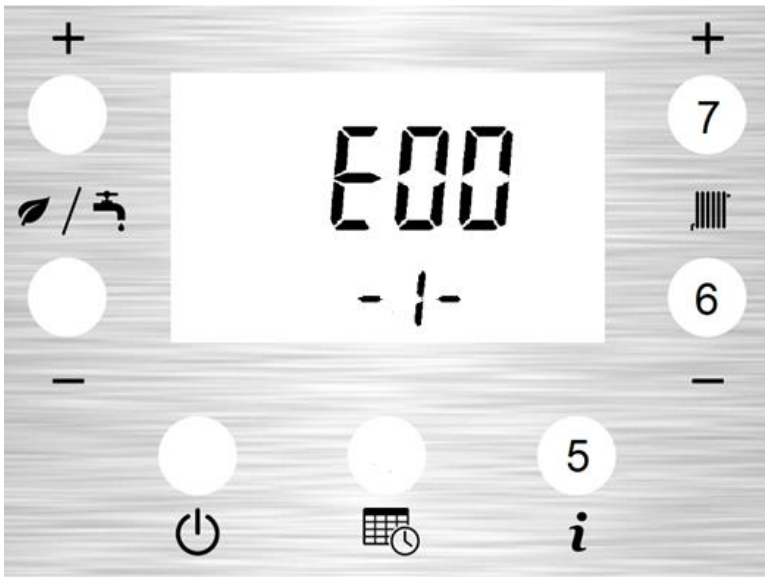
13.2 Error codes stored in the Error Logger

Review the appliance history by accessing the Error Logger from the Home Screen on the control panel.

The last 5 Errors are recorded by the Error Logger, the most recent Error will have the lowest index number, shown in the auxiliary digits of the LCD.

Index	Error Code
1	E XX
2	E XX
3	E XX
4	E XX
5	E XX

1. Press the Info button (5) and CH- button (6) simultaneously for 2 seconds, then the Error Logger is shown.



2. Scroll through the errors using the CH+ button (6) and CH- button (7).
3. If no errors are recorded in the logger, ‘E00’ is displayed on the main digit.

13.3 Central Heating Fault Finding Table

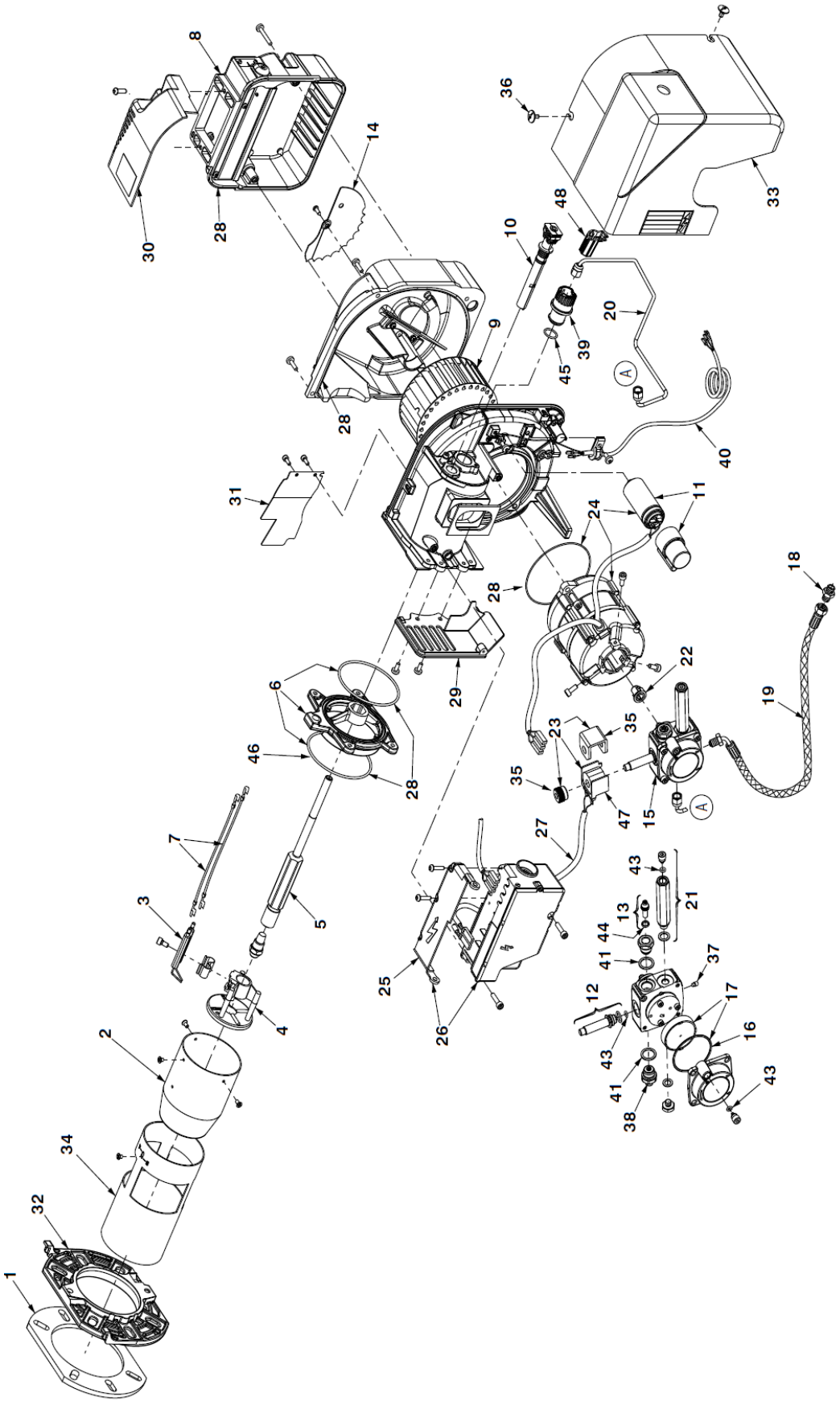
Check No.	Item to check	Answer	Corrective Action (s)
1	Is AC Power Supply healthy to the appliance and LCD operational?	No	Rectify AC Power supply problem
		Yes	Go to Check 2
2	Are Error Codes displayed on LCD?	Yes	Rectify Error Code problems, see Section 13.1
		No	Go to Check 3
3	Is the CH Radiator symbol displayed solid on the boiler LCD?	No	Press Mode Button to select CH mode
		Yes	Go to Check 4
4	Are room thermostats calling for Central Heating?	No	Adjust room thermostats to call for Central Heating
		Yes	If external timeclock is used go to Check 5
			If internal timeclock is used go to Check 6
5	Is external timeclock in 'ON' time?	No	Adjust 'ON' time period to call for Central Heating
		Yes	Go to Check 7
6	Is internal timeclock in 'ON' time?	No	Adjust 'ON' time period to call for Central Heating
		Yes	Go to Check 7
7	Is the DHW Tap Symbol displayed flashing on the boiler LCD?	Yes	The Boiler is performing DHW mode, wait until complete
		No	Go to Check 8
8	Is the CH Radiator symbol displayed flashing on the boiler LCD?	No	Check CH controls, boiler does not have an active call for CH
		Yes	Go to Check 9
9	Is the circulating pump running with 1x green and at least 1x amber LED?	No	Check Circulating Pump connections
		Yes	Go to Check 10
10	Is the CH flow Temperature set to call for heat?	No	Adjust with CH + button to call for heat
		Yes	Go to Check 11
11	Is the Diverter Valve Actuator in the CH (Retracted) position? Section 4.3.2	No	Check Diverter Valve Actuator Connections
		Yes	Go to Check 12
12	Are the isolating valves within the boiler open?	No	Open the valves to allow water flow
		Yes	Go to Check 13
13	Are the property zone valves open?	No	Rectify the zone valve operation
		Yes	Go to check 14
14	Is all air vented from the system?	No	Vent air from the system at all locations
		Yes	Go to Check 15
15	Check burner operation, lockout is indicated by Error Code E01, as part of Check 2		

13.4 Domestic Hot Water Fault Finding Table

Check No.	Item to check	Answer	Corrective Action (s)
1	Is AC Power Supply healthy to the appliance and LCD operational?	No	Rectify AC Power supply problem
		Yes	Go to Check 2
2	Are Error Codes displayed on LCD?	Yes	Rectify Error Code problems, see Section 13.1
		No	Go to Check 3
3	Is the DHW Tap symbol displayed solid on the boiler LCD?	No	Press Mode Button to select DHW mode
		Yes	Go to Check 4
4	Is external timeclock in 'ON' time?	No	Adjust 'ON' time period to call for Domestic Hot Water
		Yes	Go to Check 6
5	Is internal timeclock in 'ON' time?	No	Adjust 'ON' time period to call for Domestic Hot Water
		Yes	Go to Check 6
6	Is the DHW Tap Symbol displayed flashing on the boiler LCD with all DHW outlets closed?	Yes	The Boiler is performing DHW mode, wait until complete
		No	Go to Check 7
7	Is the DHW Tap symbol displayed flashing on the boiler LCD with DHW flow of over 2 litres/minute?	No	Check wiring to, and obstructions in the DHW flowmeter
		Yes	Go to Check 8
8	Is the circulating pump running with 1x green and at least 1x amber LED?	No	Check Circulating Pump connections
		Yes	Go to Check 9
9	Is the DHW Flow temperature set correctly for the installation?	No	Adjust with DHW +/- buttons to set temperature as required
		Yes	Go to Check 10
10	Is the Diverter Valve Actuator in the DHW (Extended) position? Section 4.3.2	No	Check Diverter Valve Actuator Connections
		Yes	Go to Check 11
11	Are the isolating valves within the boiler open?	No	Open the valves to allow water flow
		Yes	Go to Check 12
12	Are the property DHW isolation valves open?	No	Rectify the isolation valve positions
		Yes	Go to check 13
13	Is all air vented from the boiler?	No	Vent air from the boiler at all locations
		Yes	Go to Check 14
14	Check burner operation, lockout is indicated by Error Code E01, as part of Check 2		

14 SPARES

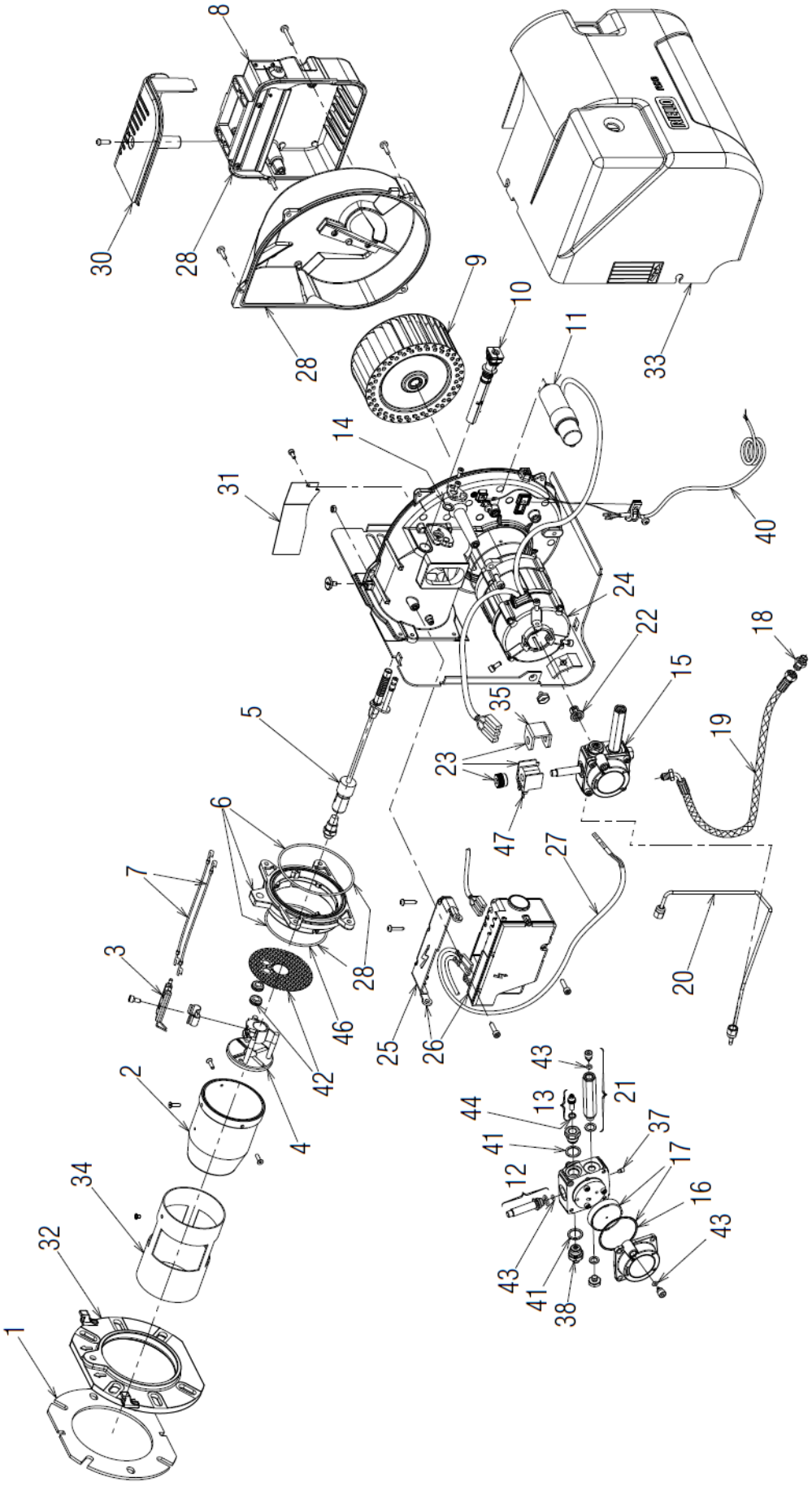
14.1 RDB 2.2 BX Spares



No	CODE	20112459	20112460	20112464	DESCRIPTION
1	3005787	•	•	•	Gasket
2	20147320	•	•	•	Head Assembly
3	20018545	•			Electrode Assembly
3	20018693		•	•	Electrode Assembly
4	20139837	•			Diffuser Disc
4	20133586		•	•	Diffuser Disc
5	20133588	•	•	•	Nozzle Holder
6	20141540	•	•	•	Collar
7	20019415	•	•	•	High Voltage Lead
8	20089768	•	•		Air Damper Assembly
8	3008647			•	Air Damper Assembly
9	3005788	•	•	•	Fan
10	20132526	•	•	•	Flame Sensor
11	20071576	•	•	•	Capacitor 4.5µF
12	3007871	•	•	•	Needle Valve
13	3008651	•	•	•	Regulator
14	20094349	•			Air Damper
15	20030953	•	•	•	Pump
16	3007175	•	•	•	O-Ring
17	3020436	•	•	•	Filter O-Ring
18	3003602	•	•	•	Connector
19	3005720	•	•	•	Flexible Oil Line
20	20018549	•	•	•	Tube
21	3008876	•	•	•	Extension
22	3000443	•	•	•	Coupling
23	3008648	•	•	•	Coil-Shell & Knob
24	20071577	•	•	•	Motor & Capacitor
25	3008649	•	•	•	Protection

No	CODE	20112459	20112460	20112464	DESCRIPTION
26	3008652	•	•	•	Control Box 535RSE/LD
27	3008851	•	•	•	Coil Lead
28	20040600	•	•		Seals Kit
28	20127451			•	Seals Kit
29	3020306	•	•	•	Front Shield
30	20012046	•	•	•	Air Intake
31	3020263	•			Bulkhead
31	20081612		•	•	Bulkhead
32	3006384	•	•	•	Front Piece
33	3008879	•	•	•	Cover
34	20112893	•			Cylinder
34	20139827		•		Cylinder
34	20133598			•	Cylinder
35	3007566	•	•	•	Shell & Knob
36	20119098	•	•	•	Screw
37	20029299	•	•	•	By-Pass Screw
38	3020076	•	•	•	Connector
39	20134372	•	•	•	Knob
40	20139820	•	•	•	Power Connection
41	3007087	•	•	•	Seal
43	3007177	•	•	•	O-Ring
44	3007028	•	•	•	O-Ring Seal
45	3007167	•	•	•	O-Ring Seal
46	3007178	•	•	•	O-Ring
47	3007565	•	•	•	Coil
48	20147023	•	•	•	Index

14.2 RDB 3.2 BX Spares



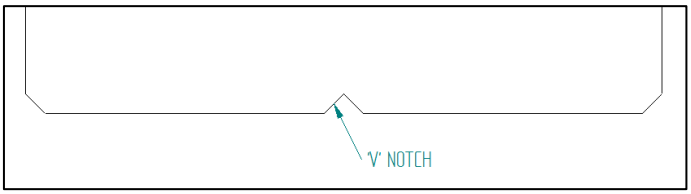
No	CODE	20145385	DESCRIPTION
1	3005795	•	Gasket
2	20149708	•	Head Assembly
3	20018693	•	Electrode
4	20133586	•	Diffuser Disc
5	20149710	•	Nozzle Holder
6	3008957	•	Collar
7	20121451	•	High Voltage Lead
8	3008647	•	Air Damper Assembly
9	3005799	•	Fan
10	20132526	•	Flame Sensor
11	20081251	•	Capacitor
12	3007871	•	Needle Valve
13	3008651	•	Regulator
14	3007029	•	O-Ring
15	20030953	•	Pump
16	3007175	•	O-Ring Seal
17	3020436	•	O-Ring & Filter
18	3003602	•	Connector
19	3005720	•	Flexible Oil Line
20	20018660	•	Tube
21	3008876	•	Extension
22	3000443	•	Coupling
23	3008648	•	Coil-Shell & Knob
24	20083029	•	Motor
25	3008649	•	Protection
26	20040633	•	Control Box
27	3008851	•	Connection
28	3008963R	•	Seals Kit

No	CODE	20145385	DESCRIPTION
30	3008959	•	Air Intake
31	20046903	•	Bulkhead
32	3008637	•	Flange
33	3008962	•	Cover
34	20139827	•	Cylinder
35	3007566	•	Shell & Knob
37	20029299	•	By-Pass Screw
38	3020076	•	Connector
40	20139820	•	Power Connection
41	3007087	•	Seal
42	20151137	•	Diffuser
43	3007177	•	O-Ring
44	3007028	•	O-Ring Seal
46	3007178	•	O-Ring
47	3007565	•	Coil

14.3 Baffles – from September 2016 Manufacture

For appliances with a date manufacture date during or after September 2016, the baffles have a V Notch in the burner facing edge for identification.

Do not attempt to fit baffles without this identification marker to appliances manufactured after this date.



14.4 Short Parts List

21-33 Models	
Part Description	Code
Flow Sensor	5317
22mm NTC Sensor	5656
15mm NTC Sensor	5655
6mm Probe NTC Sensor with cable	5320
Combination Boiler High Limit Thermostat	5223
Combination Boiler Tank Limit Thermostat	5318
Plate Heat Exchanger	5789
Grundfos UPM3 FLEX-AS Circulating Pump Head & Body only	6225
Composite Auto Air Vent	6212
Composite Pressure Relief Valve	6211
Filling Loop	5788
Pressure Gauge (Combination Boiler)	5855
Pressure Gauge (Other models)	3019
Control PCB	5225
MMI PCB with LCD	5221
12 litre Rectangular Expansion Vessel	6319
24 litre Rectangular Expansion Vessel	4319
Flue Thermostat	3535
RV20 Diverting Valve Filled	5466
Dual Safe Thermostat for non-Combination Boilers	WDS2

44 Models	
Part Description	Code
Grundfos UPS2 25-40/60 Circulating Pump	4413
Brass Auto Air Vent c/w Check Valve	614
Brass Pressure Relief Valve	2132
Flue Thermostat	3535
Dual Safe Thermostat for non-Combination Boilers	WDS2

When ordering replacement casing panels it should be noted that due to the painting process, there may be some variation in colour.

15 YOUR GUARANTEES, TERMS & CONDITIONS

1. Warmflow Guarantees (UK & Ireland only).

The boiler, including all controls, plate heat exchangers, pipework and unions, and associated equipment contained within the boiler casing, and the burner and flue system, if supplied by Warmflow, are guaranteed against defective parts and workmanship, providing the boiler is installed and commissioned in accordance with the instructions supplied with the boiler.

The period of guarantee will be 12 months from the date of installation in Northern Ireland and the Republic of Ireland. The period of guarantee in Great Britain will be 24 months from the date of installation.

NOTE: In Northern Ireland and the Republic of Ireland the period of guarantee can only be increased to 24 months through the purchase of an extended warranty.

The primary heat exchanger, secondary heat exchanger and thermal store (in the case of a Combination Boiler) is guaranteed against defective parts and workmanship for a total of 5 years from the appliance date code, provided the boiler is installed and commissioned in accordance with the instructions supplied with the boiler. This warranty will be a parts only warranty after expiry of the initial parts and labour warranty period, i.e. after 12 months in Northern Ireland and in the Republic of Ireland and after 24 months in Great Britain. This warranty is subject to a full service record with details of annual service logged in the OFTEC Boiler Passport.

Warmflow reserves the right to repair or replace components within the guarantee period at a time and location that is most convenient to the company.

2. Conditions of Guarantee

The boiler must be installed, commissioned and serviced in accordance with the installation instructions supplied with the boiler.

Additionally:

- The Boiler Passport must be fully completed and the commissioning certificate returned to Warmflow within 30 days from the date of installation, and 90 days from the date code stamped on the appliance.

- The boiler must be installed and commissioned by a Warmflow or other competent engineer, who is OFTEC registered. Commissioning of the boiler must be completed immediately after the boiler is installed.

- The boiler must be serviced by a Warmflow or other competent engineer, who is OFTEC registered, 12 months after the date of installation and thereafter, at 12 monthly intervals.

Warmflow will accept no liability for the cost of repairs resulting from incorrect installation, inadequate commissioning, lack of regular maintenance, misuse, tampering or repair by unqualified persons.

All repairs must be authorised in writing by Warmflow prior to any work being carried out. Unauthorised claims are not covered by the guarantee.

Faults and any associated costs occurring due to lack of fuel, power, water supply, scale formation or corrosion are not covered by these guarantees.

If the boiler has not been installed within 3 months of the date of despatch from Warmflow, then the warranty will deem to have started.

Claims for consequential loss or damage are not covered by these guarantees.

In the event of a breakdown please contact your commissioning engineer who must then contact our service department whilst at your home, to report the fault.

The statutory rights of the customer are not affected by the guarantee.

NB: The nozzle, fuel lines and refractory items supplied with the boiler are deemed to be consumable items and are therefore excluded from the guarantee.

NOTE: Failure to complete & return the boiler passport at the time of installation will invalidate all guarantees.

3. Warmflow Guarantees (All other territories).

Warranty information can be found online at:

https://www.warmflow.es

16 END OF LIFE INFORMATION

Warmflow High Efficiency Condensing Boilers must be disposed of according to local regulations by using a public or private waste collection service.

16.1 Safety Risks

Prior to disassembly, the appliance must be electrically isolated and disconnected.

Any fluids within must be drained, and disposed of in-line with local regulations.

Care must be taken when handling the appliance due to weight, use appropriate PPE and lifting aids.

Glass fibre insulation – suitable PPE must be used for respiration protection, and to avoid skin or eye contact.

16.2 Disassembly of the Product

The main materials of the components are:

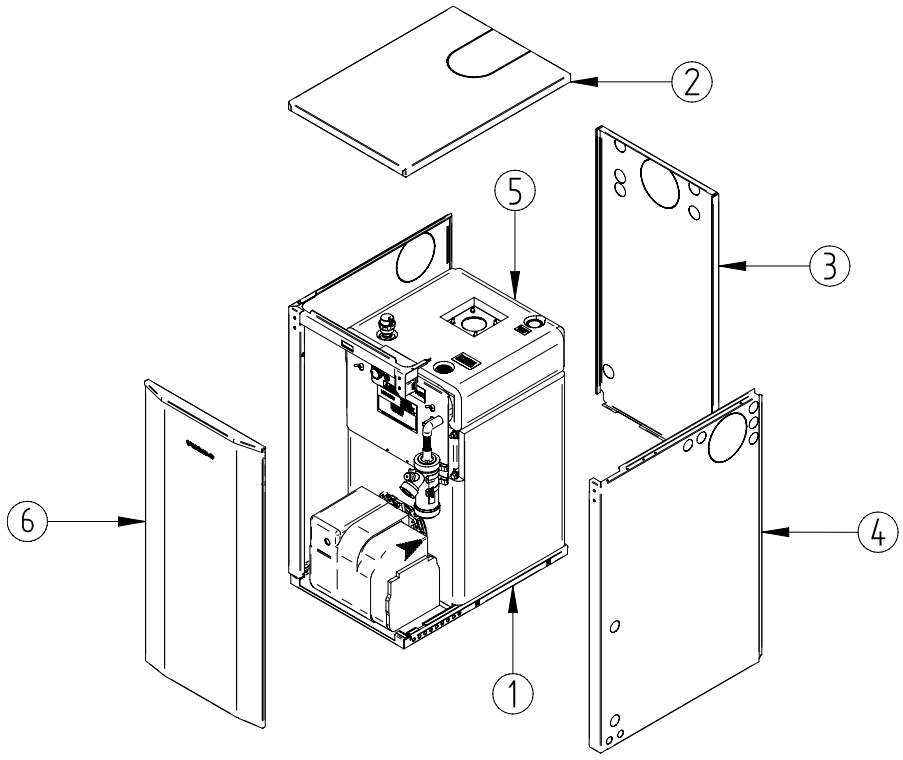
- Mild Steel
- Stainless Steel
- Copper
- Brass
- Ceramic Fibre
- Plastic components
- Electronic components

These may be recycled – depending on the local recycling facilities available.

The appliance assembly includes various mechanical fasteners and can be disassembled with standard tools.

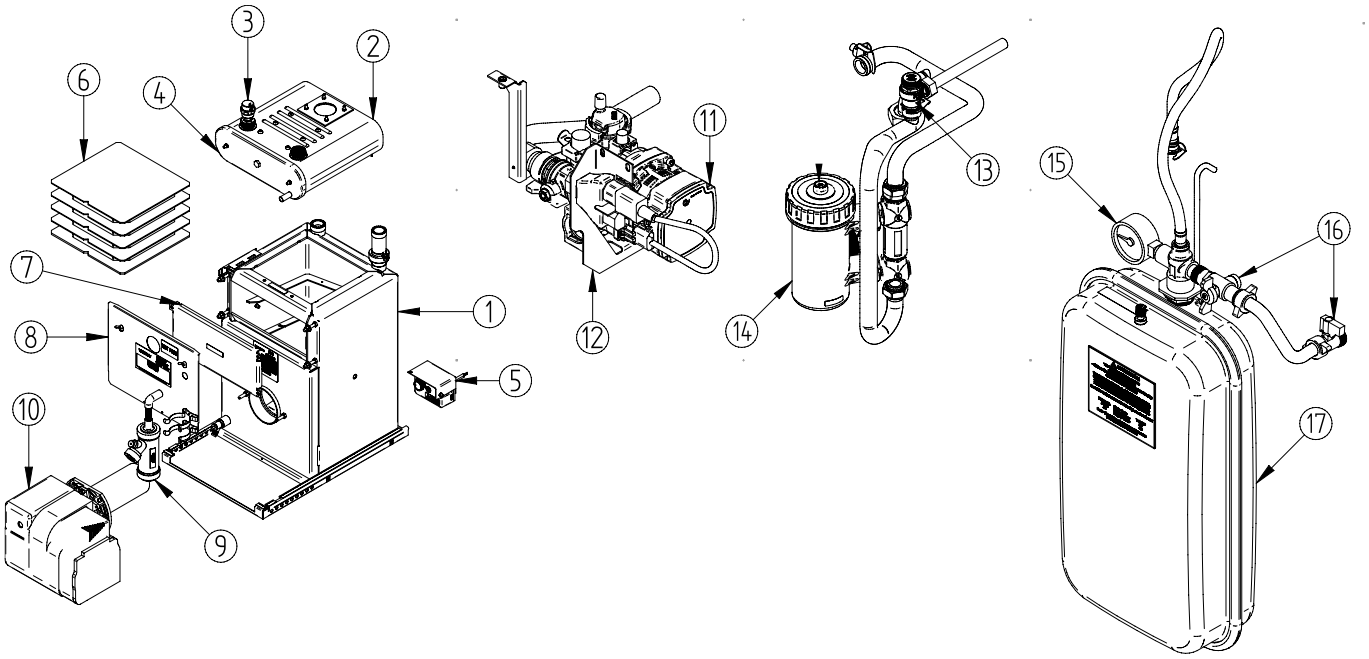
The components of a typical appliance including heat generator are shown (not all components may be fitted, depending on appliance specification).

16.3 Casing and key components



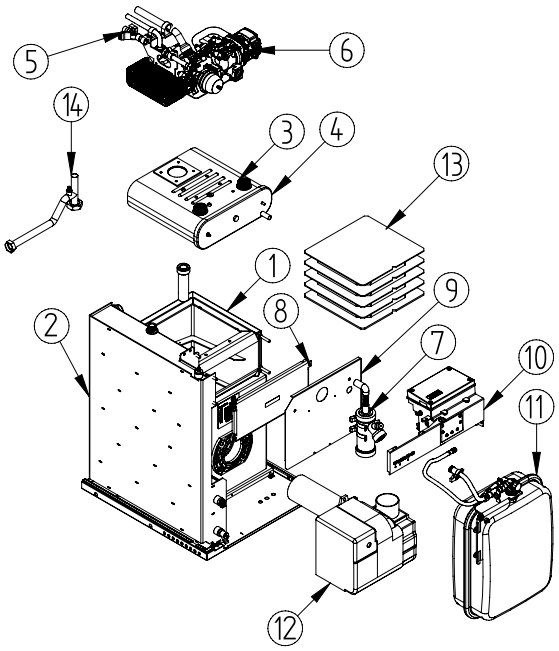
Item	Description	Main Materials	Special Notes
1	Boiler Assembly	Various	See Table Below
2	Top Casing	Galvanised Steel	
3	Rear Casing	Galvanised Steel	
4	Side Casing	Galvanised Steel	
5	Insulation	Foil Backed Glass Fibre	Wear Appropriate PPE
6	Front Casing	Galvanised Steel	

16.4 Boiler Assembly



Item	Description	Main Materials	Special Notes
1	Heat Exchanger	Mild Steel	Welded Construction
2	Condensing Unit	Stainless Steel & Viton Seal	
3	Auto Air Vent	Brass	
4	Service Door	Stainless Steel & Natural Rubber	
5	Thermostat	Plastic, Copper, Electronic Components	
6	Heat Exchanger Baffles	Mild Steel	
7	Service Door	Mild Steel, Ceramic Fibre	Wear Appropriate PPE
8	Service Door Cover	Galvanised Steel	
9	Condensate Trap	Plastic	
10	Heat Generator	Various	Consult Manufacturer
11	Circulating Pump	Various	Consult Manufacturer
12	Circulating Pump Bracket	Galvanised Steel	
13	Relief Valve	Plastic	
14	Magnetic Filter	Various	Consult Manufacturer
15	Pressure Gauge	Brass & Glass	
16	Valves and Flexible Pipework	EPDM, Stainless Steel, Brass	
17	Expansion Vessel	Mild Steel, Rubber	Consult Manufacturer

16.5 Combination Boiler



Item	Description	Main Materials	Special Notes
1	Heat Exchanger	Mild Steel	
2	Heat Store	Mild Steel	
3	Condensing Unit	Stainless Steel & Viton Seal	
4	Service Door	Stainless Steel & Natural Rubber	
5	Pipework Assembly	Copper, Brass, Stainless Steel	
6	Circulating Pump & Valve	Various	Consult Manufacturer
7	Condensate Trap	Plastic	
8	Service Door	Mild Steel & Ceramic Fibre	Wear Appropriate PPE
9	Service Door Cover	Galvanised Steel	
10	Control Panel	Plastic, Copper, Electronic Components	
11	Expansion Vessel	Mild Steel & Rubber	
12	Heat Generator	Various	Consult Manufacturer
13	Heat Exchanger Baffles	Mild Steel	
14	Boiler Flow Pipe	Copper & Brass	

Various other brackets, fasteners and components may be used, with up to 5% of appliance weight

Video links:

Scan QR code for Warmflow Agentis Combination Boiler Control Panel ‘How to’ Video.

COMBI BOILER CONTROL PANEL VIDEO

Scan QR code for Warmflow Agentis Internal Boiler Flue ‘How to’ Video.

INTERNAL BOILER FLUE ASSEMBLY VIDEO

CODE 6572
ISSUE G
OCT 2025