Boiler Manual

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

Insta Boilers

For use with Gasoil only

Models covered by this manual:

Insta I-Series

Internal System Insta *I21SI* *I26SI* *I33SI*

Insta Boiler models Patent GB1613466.0, GB2552701, IE86968

bsi. ISO 9001 Quality Management

CE

WARMFLOW

LEAVE THIS MANUAL WITH THE END USER

COMMISSIONING

This appliance must be commissioned. Failure to commission the boiler will invalidate the warranty. After commissioning, ensure that the Boiler Passport is completed and returned.

SERVICING

To ensure continued reliable operation, fuel economy and to validate the guarantee, it is recommended that the boiler is serviced annually by a Warmflow or an OFTEC registered technician.

NI Customers Only

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

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CONTENTS

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 should contact our service department whilst at your home, to report the fault.

1.1 Burner Lockout

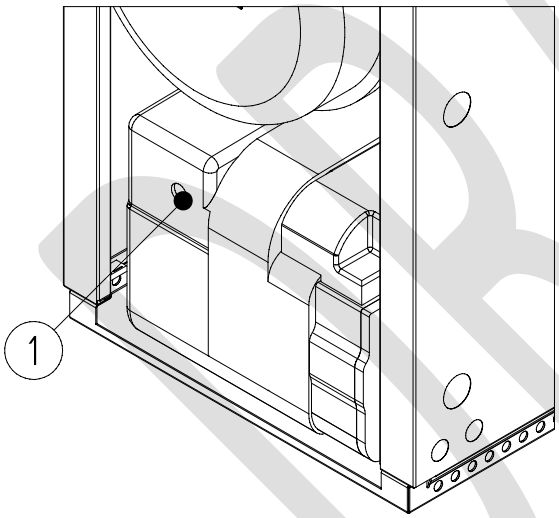
When the pressure jet oil fired burner stops after failing to fire the red reset button (1) will be illuminated. The position of the button will vary depending on the type of burner fitted.

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

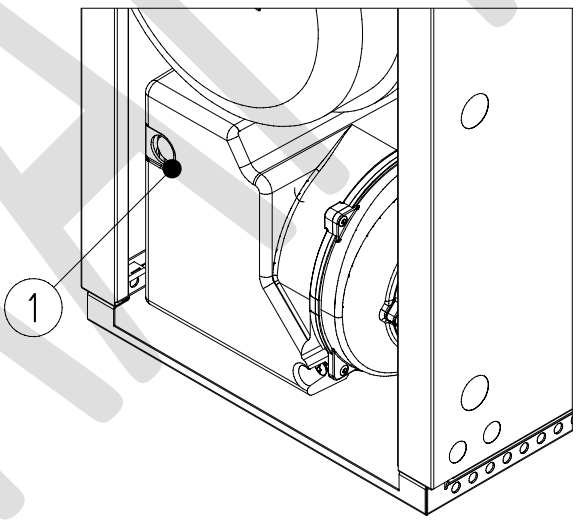
The house holder should only reset the burner twice in succession.

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

RIELLO RDB

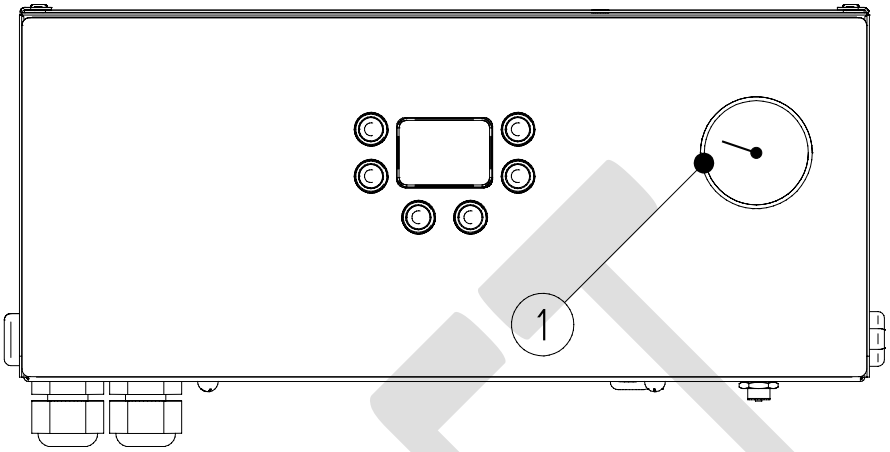


ECOFLAM MAX4



1.2 System Pressure

The boiler is connected to a sealed system. The system pressure should be periodically checked using the pressure gauge (1), located on the right side of the control panel.



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. See Section 1.3.

Frequent or routine topping up of the system should not be necessary 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.

Special attention must be given to corrosion inhibitor concentrations where there is a need to top up the system. See Section 1.4.

A pressure switch is included as standard on all Insta models which prevents the operation of the boiler if the system pressure drops below 0.4 bar, this will be indicated by code E04 on the LCD.

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.

1.3 Filling Loop

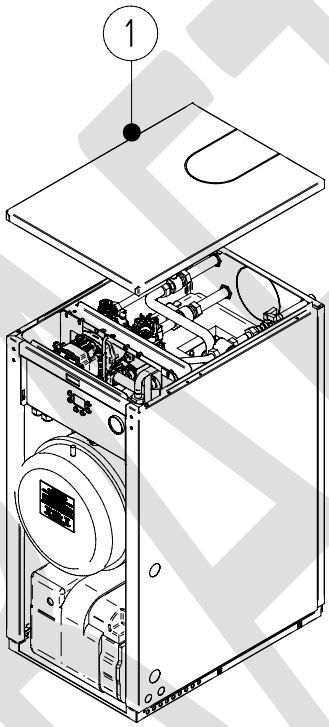
On all models, set the pressure to 1.0 bar when cold.

Special attention must be given to corrosion inhibitor concentrations where there is a need to top up the system. See Section 1.4.

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

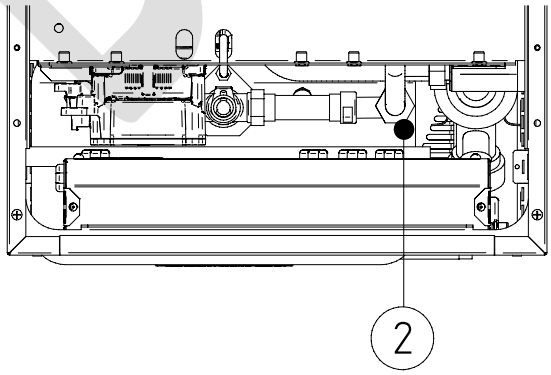
The filling loop is located above the expansion vessel.

The filling valve is located behind the control panel, and can be accessed once the top casing (1) is removed.



Ensure the flexible hose is correctly fitted at both ends, then open the valve (2) to increase system pressure (viewed from top).

After topping up the system the valve must be fully closed.



1.4 Corrosion Inhibitor

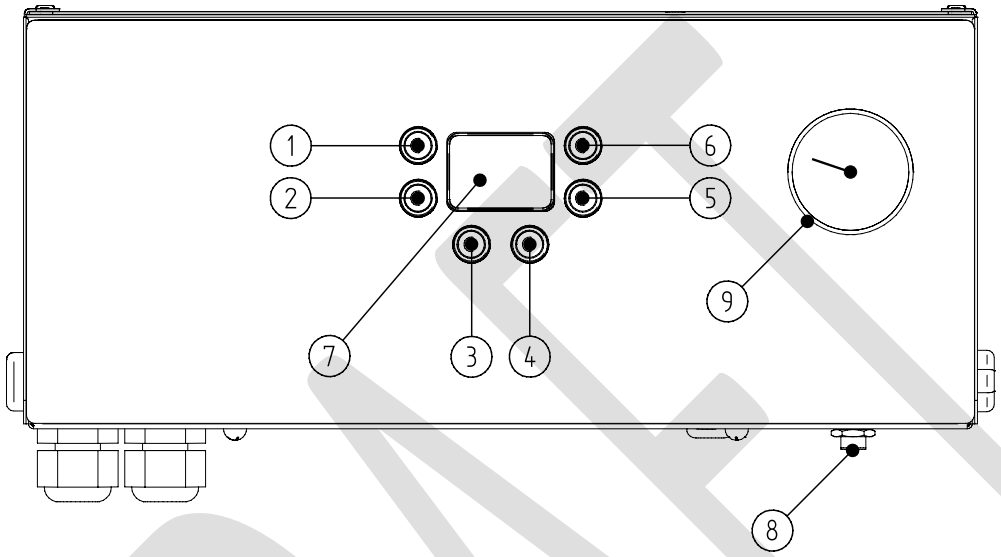
Special attention must be given to the concentration of corrosion inhibitors in the system water where there is a need for topping up. Concentrations must be restored to inhibitor manufacturers' recommendations and monitored going forward.

Frequent or routine topping up of the system should not be necessary 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.

1.5 Control Panel

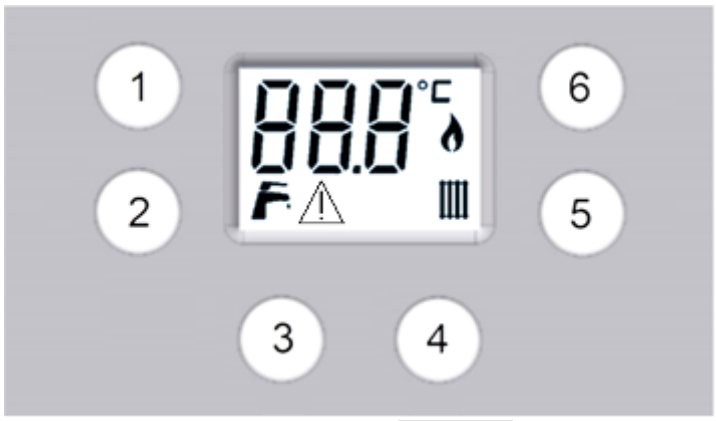
Insta Boilers are fitted with a Liquid Crystal Display (LCD), and 6 pushbuttons as identified below.

The High Limit Thermostat reset button (8) is located under the RH side of the control panel. This must only be pressed when the appliance has cooled.



1) DHW+ button
2) DHW- button
3) Mode button
4) Information button
5) CH- button
6) CH+ button
7) Liquid Crystal Display (LCD)
8) High Limit Thermostat reset
9) System Pressure Gauge

1.6 LCD Icon Descriptions

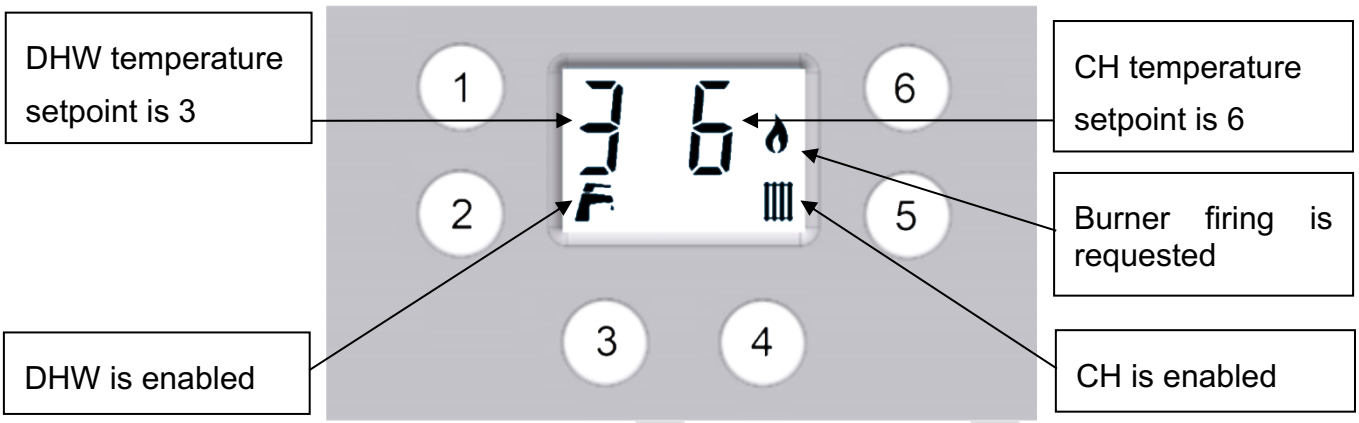


Icon	Description
	DHW Status
	CH Status
°C	Temperature Unit
	Burner Status
	Alert

1.7 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.

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

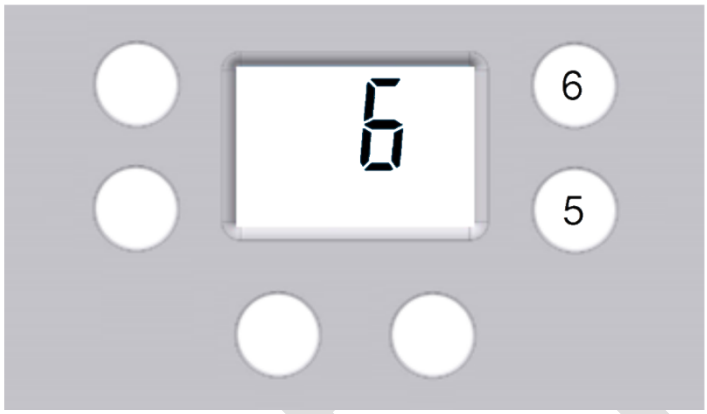
During preheating of the boiler for DHW, the Burner Status icon will flash on and off.

During burner firing with DHW or CH requests, the Burner Status icon will be displayed continuously.

1.8 Setting CH flow temperature

The CH Setpoint Menu is displayed when the CH+ button (6) or CH- button (5) are pressed when the LCD is displaying the Home Screen.

Example below shows the CH setpoint at setting ‘6’.



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.

1.9 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.

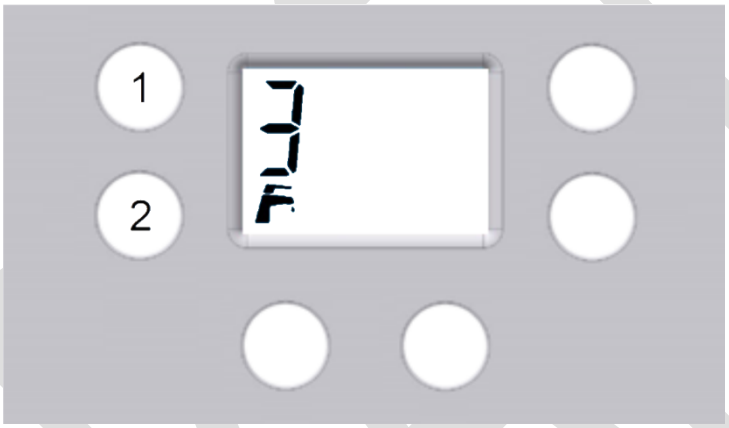
The actual DHW delivery temperature is dependent on site conditions, incoming water temperature and flow rate.

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 should 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 '3'.

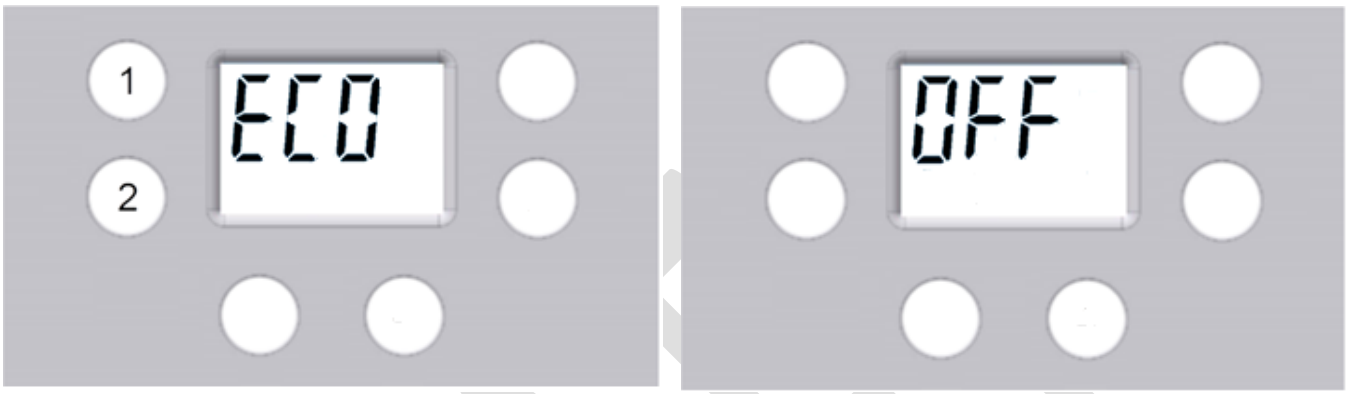


1.10 Eco Mode

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 in the appliance by default and must be disabled if not required.

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



It is possible to enable the Eco mode function again by pressing DHW- button (2) and DHW+ button (1) simultaneously for 3 seconds, the LCD displays ‘ECO On’ when the function is enabled.

It is possible to view the status of Eco Mode using the Info Menu. See Section 1.14.

1.11 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 ‘ICE’ is displayed on the LCD.

1.12 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.

1.13 Speed adjustment of the circulating pump

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).

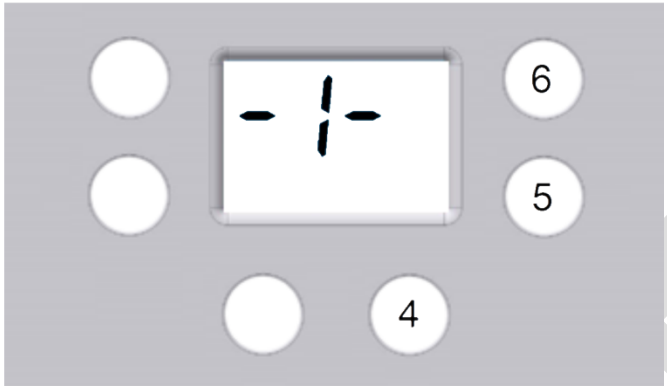
1.14 Information Menu

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 (4).

The LCD alternates between the variable number, and actual value.

For example Variable 1 = 60 °C



If a value is unavailable '- -' will be displayed.

The variables can be scrolled through using the CH+ button (6) and CH- button (5).

To return to the Home Screen, press the Information button (4) again, or if no button is pressed for 60 seconds, the Home Screen is displayed automatically.

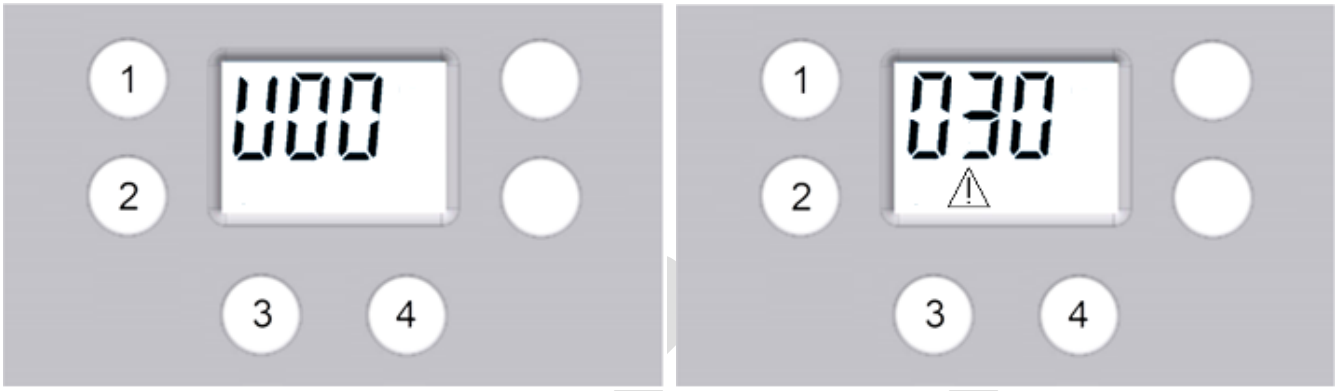
Variable number	Description
0	Eco Mode Status
1	CH Flow Temperature (°C)
2	CH Return Temperature (°C)
3	DHW Flow Temperature (°C)
4	DHW Flow rate (l/minute)
5	Circulating pump speed (%)
6	External Temperature (°C)
7	DHW Setpoint (°C)
8	CH Setpoint (°C) (see note)
9	Control PCB Firmware version

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

1.15 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 (4) for 3 seconds.



The LCD alternates between the variable number, and actual value.

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

The Alert 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 Alert icon ⚠ will stop flashing.

To return to the Home Screen, press the Information button (4) again, or if no button is pressed for 1 minute, 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.

1.16 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 should 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.

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 AN INSTA 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 an Insta 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 & pressure, the appliance must be fitted with a 3-bar pressure reducing valve to limit the maximum water supply pressure to 3 bar.

A domestic water expansion vessel should 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 then the total flow from all the outlets should 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 only and to be used on a fully pumped system, and are suitable for connection to sealed heating systems.

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

The Insta 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 should be installed by a competent installer in accordance with the recommendations laid down by the building services compliance guide, OFTEC and sound engineering practice.

In order to comply with building regulations, the boiler passport and/or OFTEC forms CD10 for installations and CD11 for commissioning should be left with the customer. Alternatively the installation can be inspected and approved by a building control officer.

4.3 Insta 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 preheating cycle has not been completed, 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 5 minutes for the pre heat cycle to complete, 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 boiler is up to temperature.

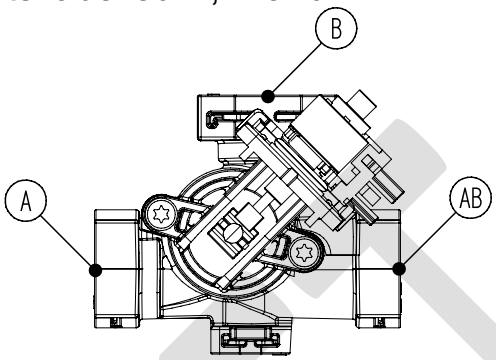
4.3.1 Pump Overrun

There are timed pump overrun functions, these are controlled by P01 & P02 in the Engineer Parameters, see section 11.7.1.

4.3.2 Diverting Valve Operation

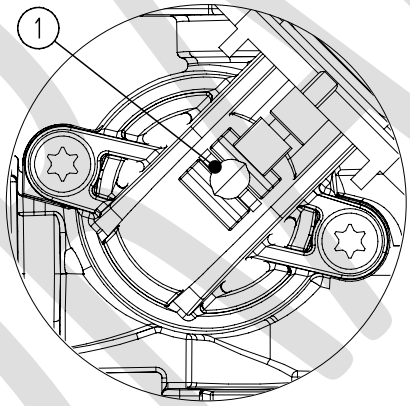
The function of the diverting valve is to direct return system water from either the central heating circuit or Plate Heat Exchanger to the circulating pump, depending on mode selection and thermostat requirements.

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

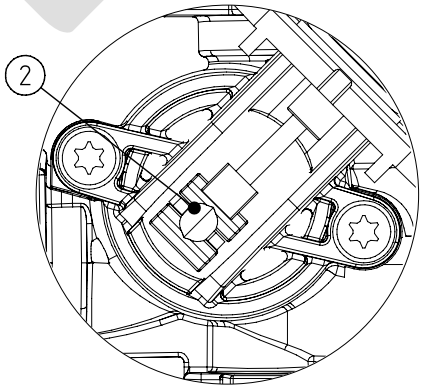


The valve actuator has two positions, DHW and CH.

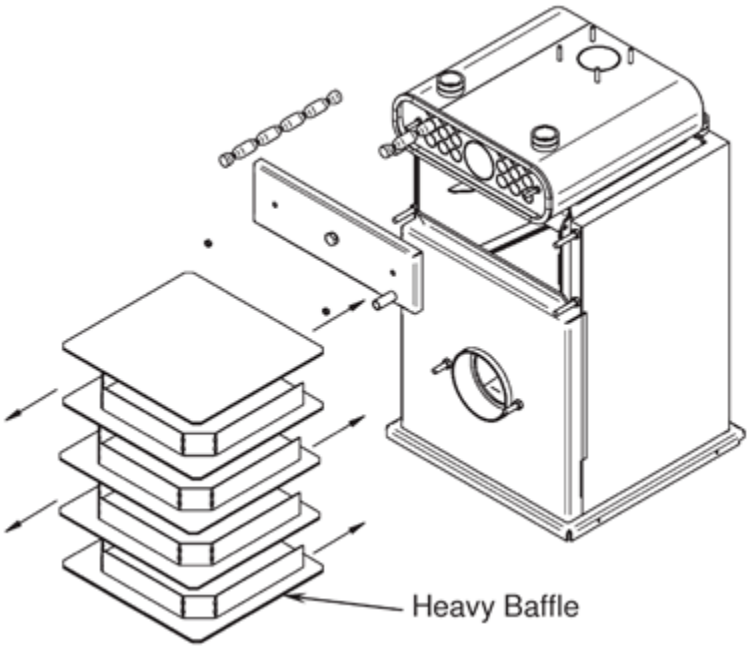
The DHW position retracts the actuator (1), directing system water from the Plate Heat Exchanger to the circulating pump.
Water flows from port B to port AB:



The CH position extends the actuator (2), directing system water from the central heating circuit return to the circulating pump.
Water flows from port A to port AB:



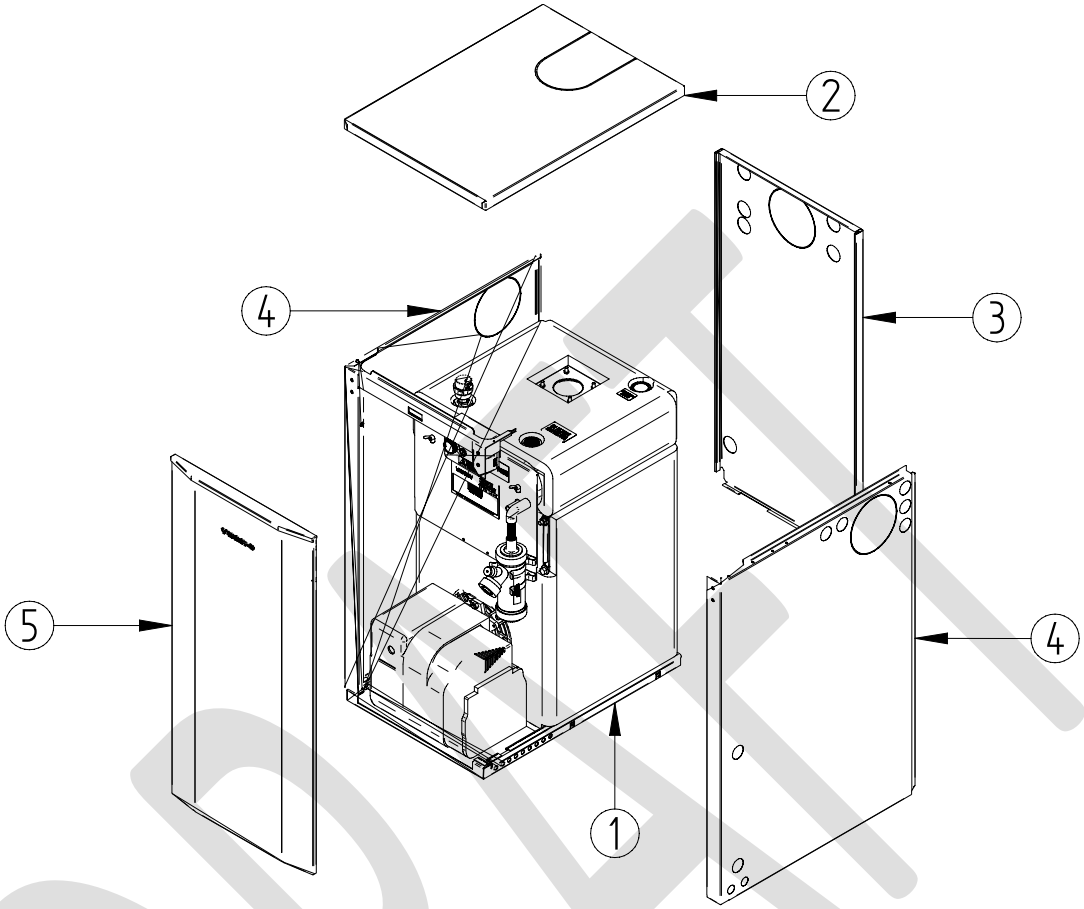
4.4 Baffle Positioning



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).

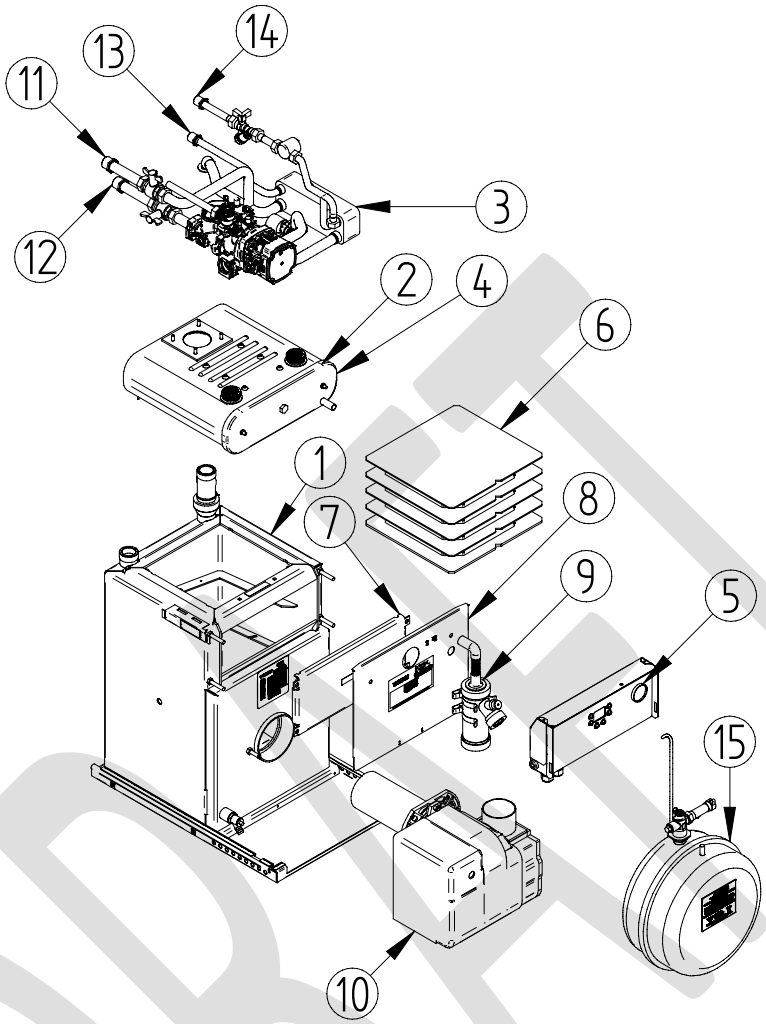
4.5 Components

4.5.1 Insta Casing



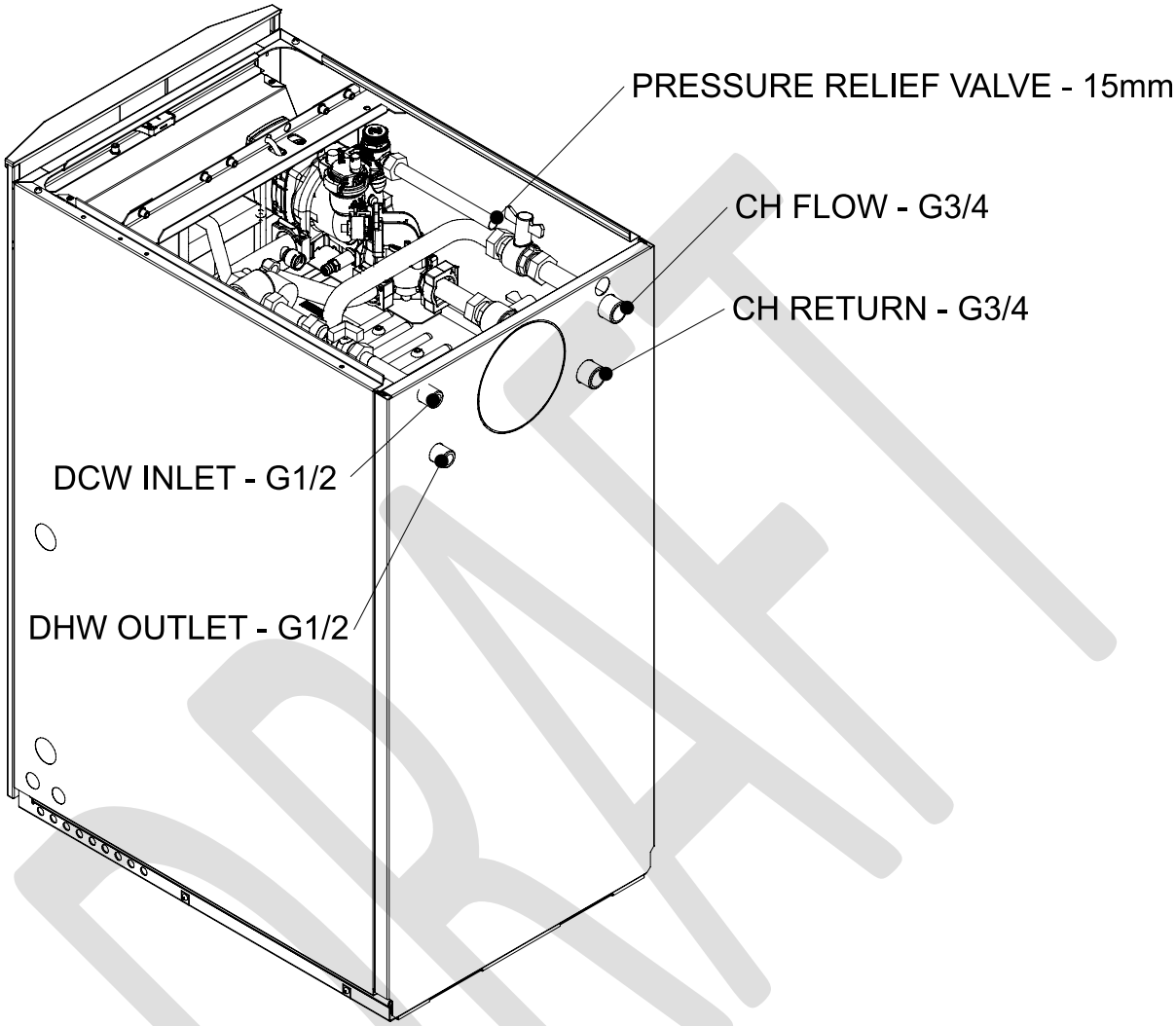
1. Boiler Assembly
2. Top Casing (removable)
3. Rear Casing
4. Side Casing
5. Front Casing (removable)

4.5.2 Insta 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. Burner
11. Heating Flow Connection
12. Heating Return Connection
13. Domestic Hot Water Connection
14. Domestic Cold Water Connection
15. System Expansion Vessel

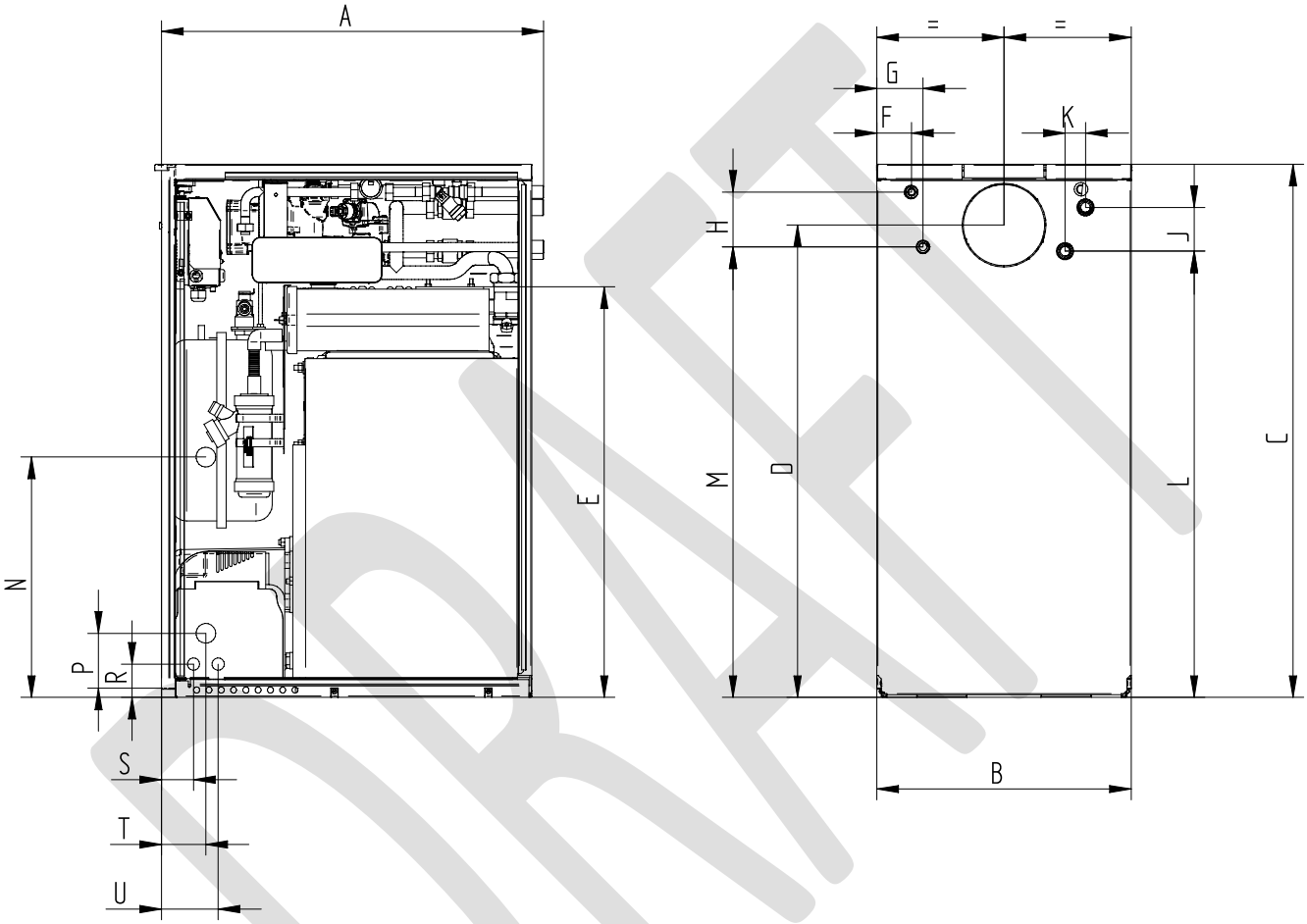
4.5.3 Insta Pipe Layout



5 TECHNICAL DETAILS

5.1 Dimensions

5.1.1 I-Series Insta I26 & I33



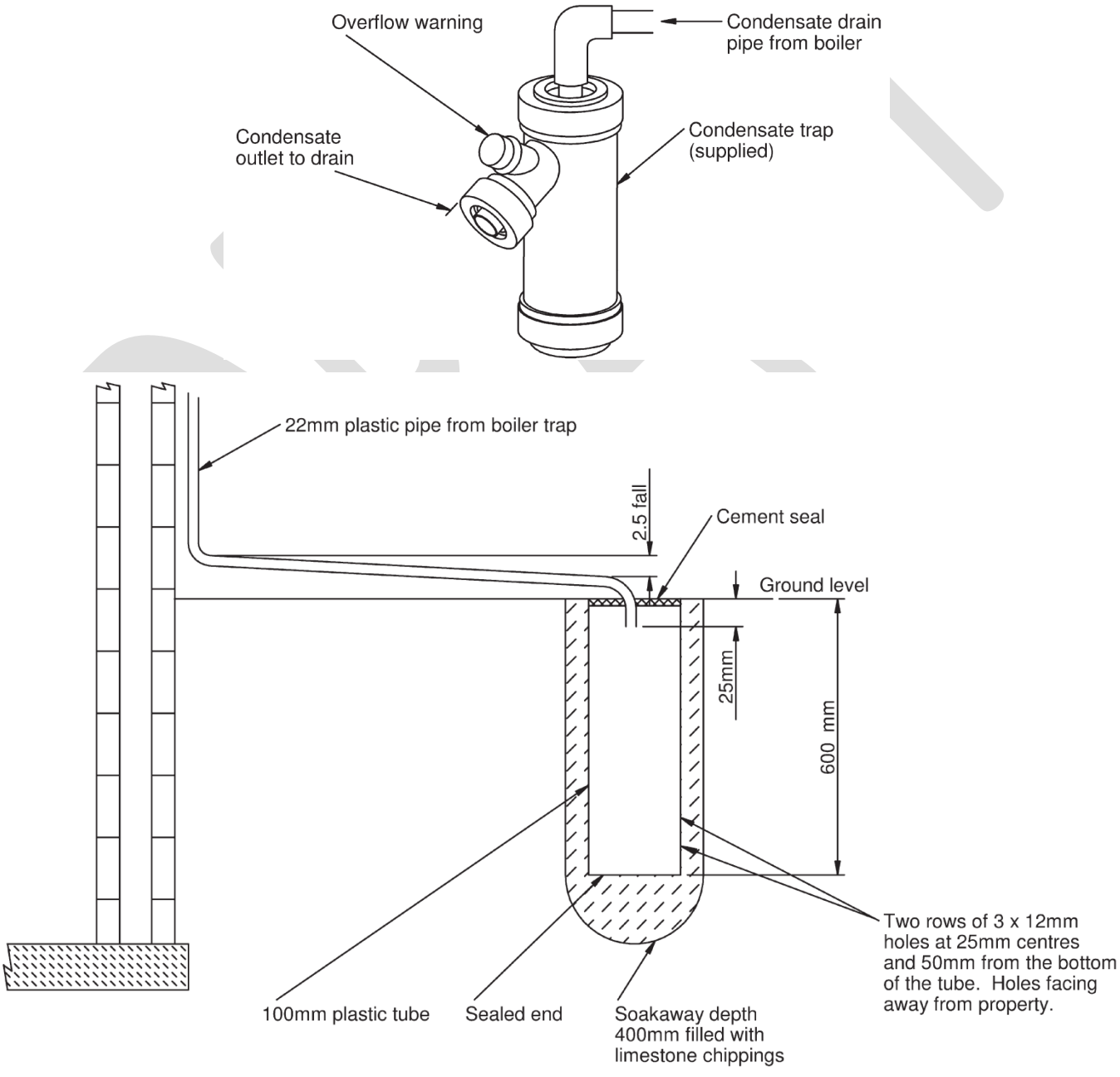
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U
I~SI	621	413	865	766	666	56	75	89	71	33	724	731	390	89	54	52	72	92

5.2 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 should be connected to the flexible hose. The pipe should 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 should 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.



5.3 Technical Data

5.3.1 I-Series (Internal) Insta Boilers – Riello BX Kerosene Fuel

MODEL		I21SI			I26SI			I33SI		
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 80°EH			Danfoss 80°ES			Danfoss 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**	45.0	9.0	**8.0**	10.0
	psi	99	**116**	116	145	**126**	102	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	TBC			TBC			TBC		
	gals									
Boiler Weight Wet	kg	TBC			TBC			TBC		
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	TBC			TBC			TBC		
	gal/m									
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)		TBC			TBC			TBC		
Pressure Relief	bar	TBC			TBC			TBC		
	psi									
Cold Water Mains Inlet Connection		G1/2			G1/2			G1/2		
DHW Outlet Connection		G1/2			G1/2			G1/2		
Flow Connection		G3/4			G3/4			G3/4		
Return Connection		G3/4			G3/4			G3/4		
Factory Settings		Highlighted in bold								

5.3.2 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

5.3.3 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

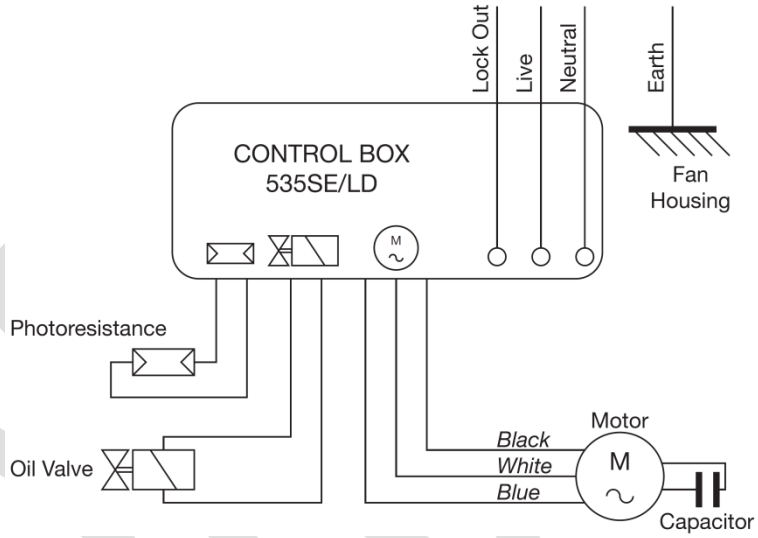
Note: All wiring activities described in the following sections should only be undertaken by trained persons having an appropriate level of competency/qualification.

220 – 240V. 1PH, 50Hz

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

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

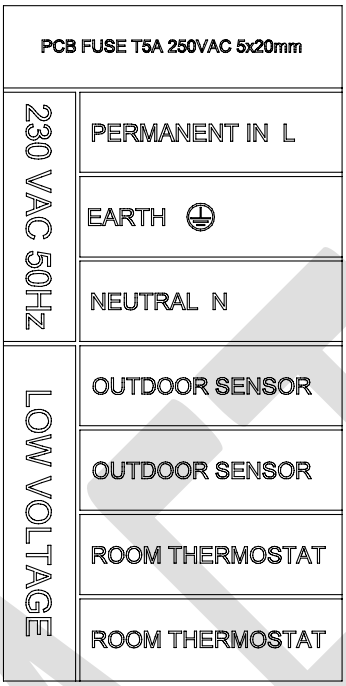
6.1 Riello RDB Burner Control Box



6.2 Ecoflam MAX 4 Burner Control Box

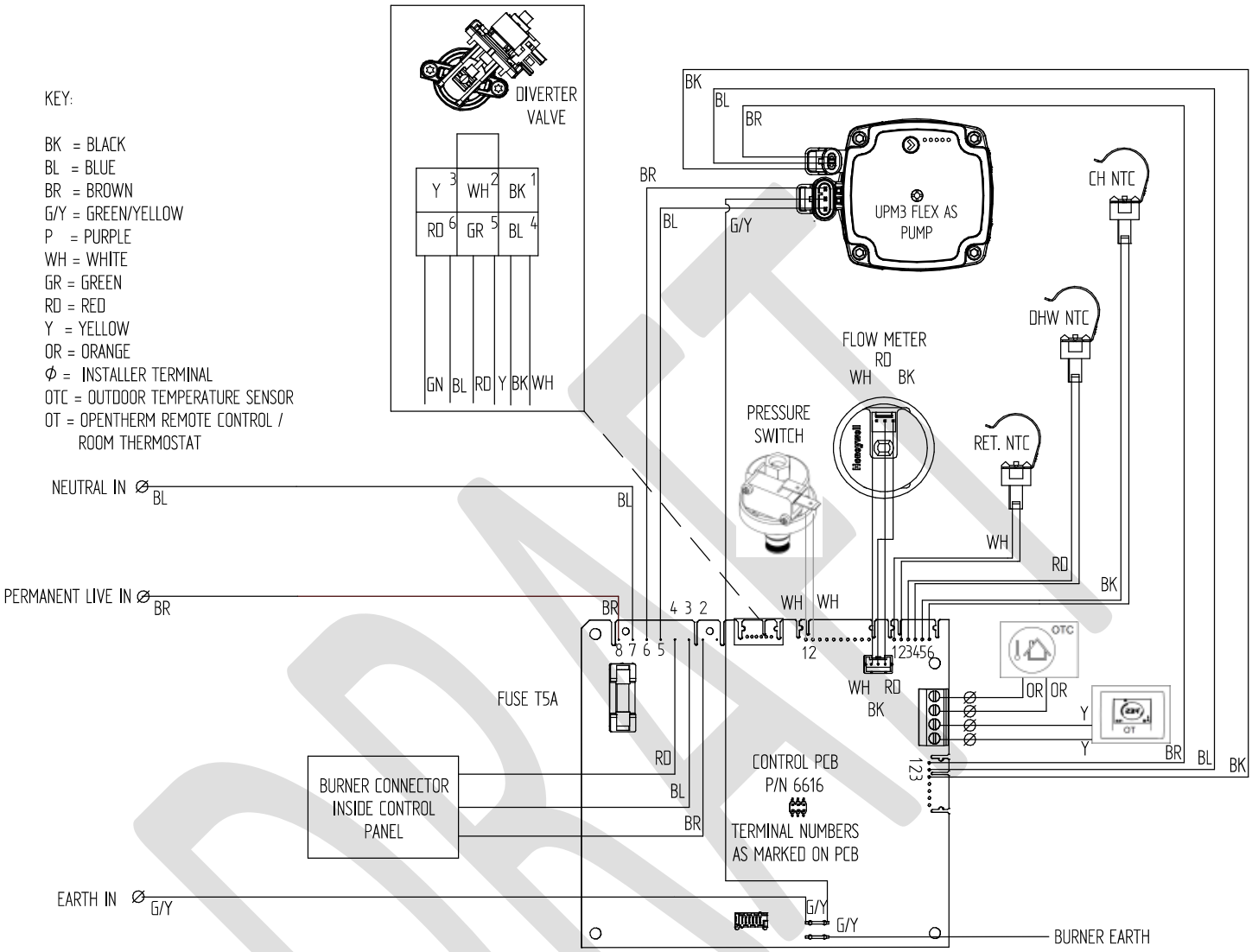
6.3 Insta Boiler Wiring Details

6.3.1 Installer Terminals

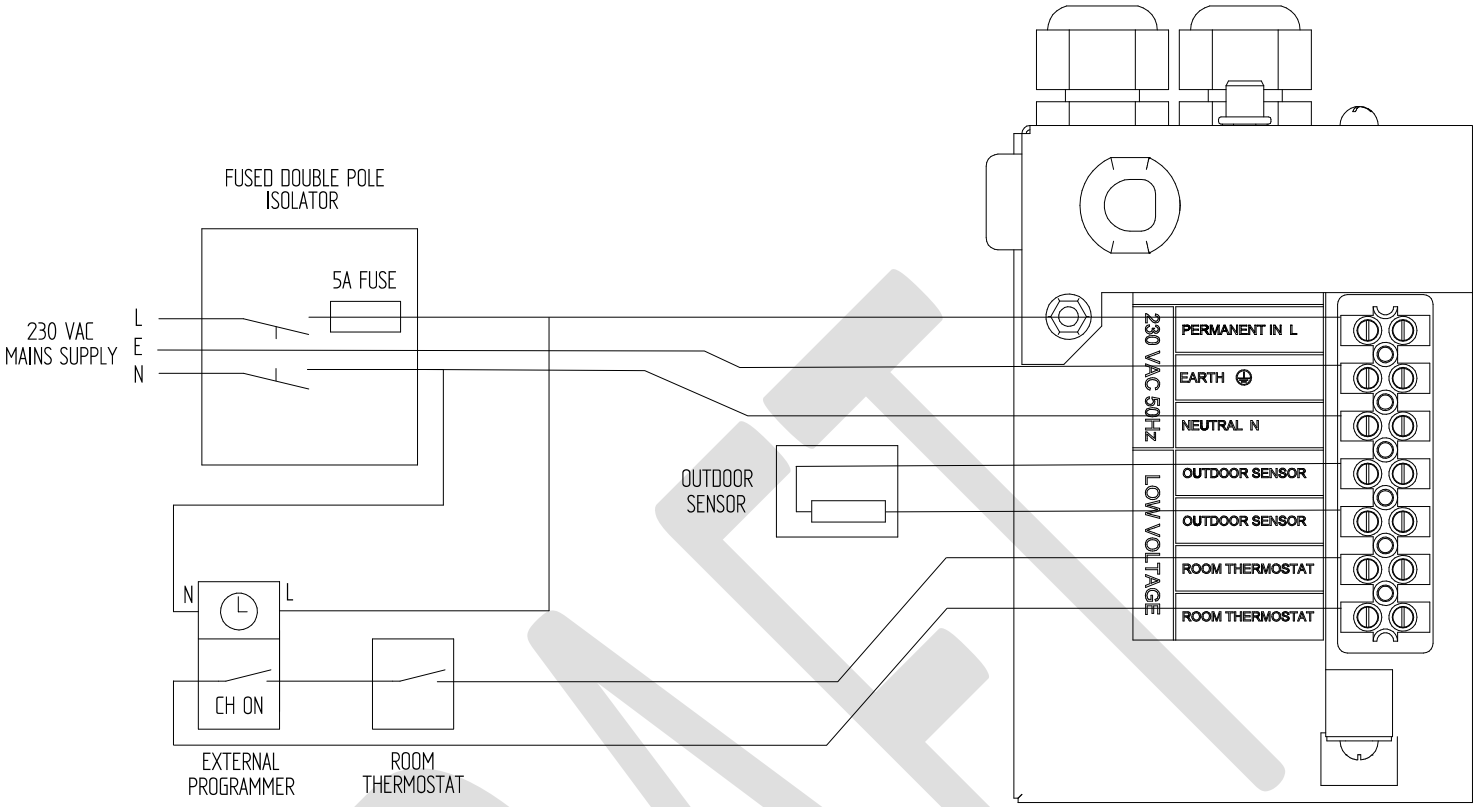


Terminal	Description
PERMANENT IN L	AC Live Supply to the appliance
EARTH	Protective Earth Supply to the appliance
NEUTRAL N	AC Neutral Supply to the appliance
OUTDOOR SENSOR	Connection for optional Outdoor Sensor
OUTDOOR SENSOR	
ROOM THERMOSTAT	Volt free connection for Room Thermostat or optional Remote Control
ROOM THERMOSTAT	

6.3.2 Wiring Diagram & Fuses

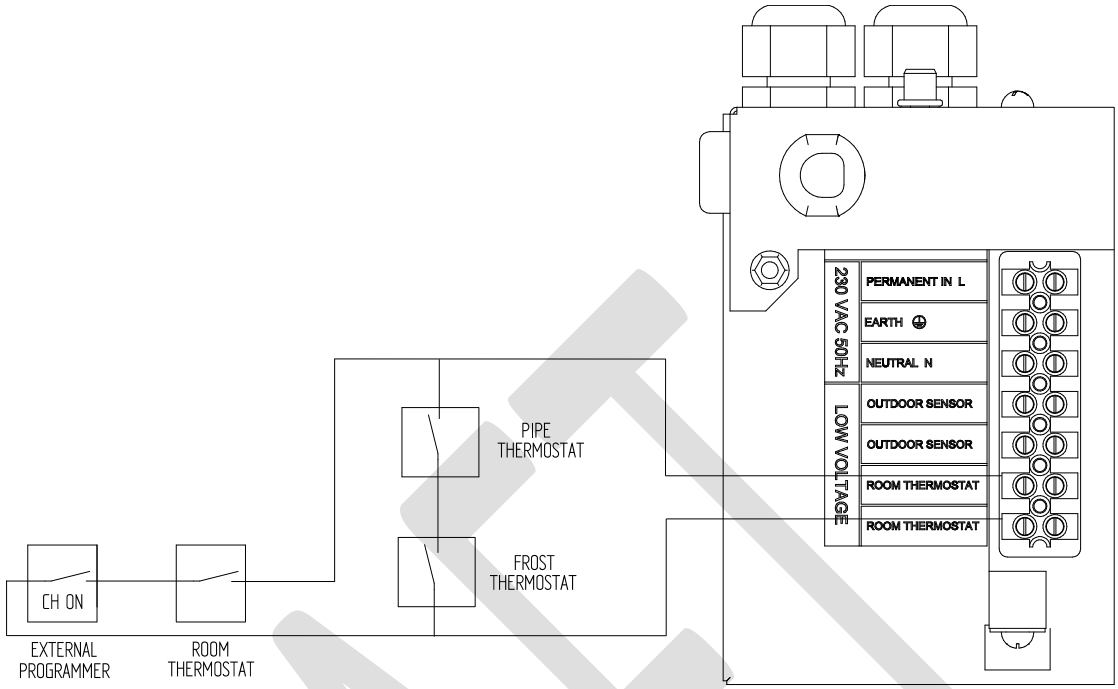


6.3.3 External Programmer, Room Thermostat & Optional Outdoor sensor



The programmer and room thermostat switching contacts must be volt free.

6.4 Building Frost Protection



In order to provide frost protection for the fabric of the building a frost thermostat should:
- 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

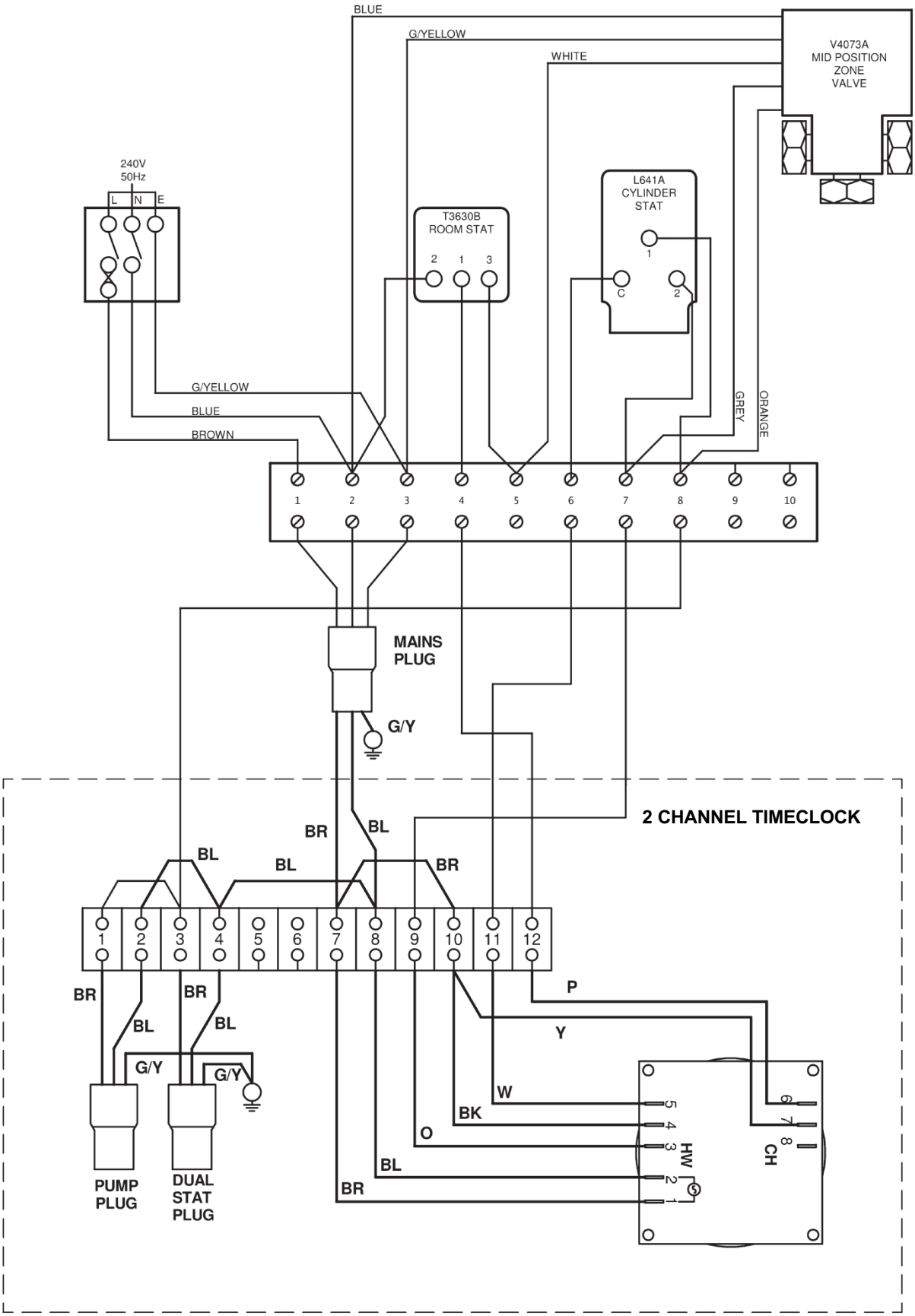
To prevent over heating of the property a pipe thermostat should be fitted on the return pipe close to the boiler.

To protect the fabric of the appliance only, Insta Boilers are fitted with frost protection, see section 1.11.

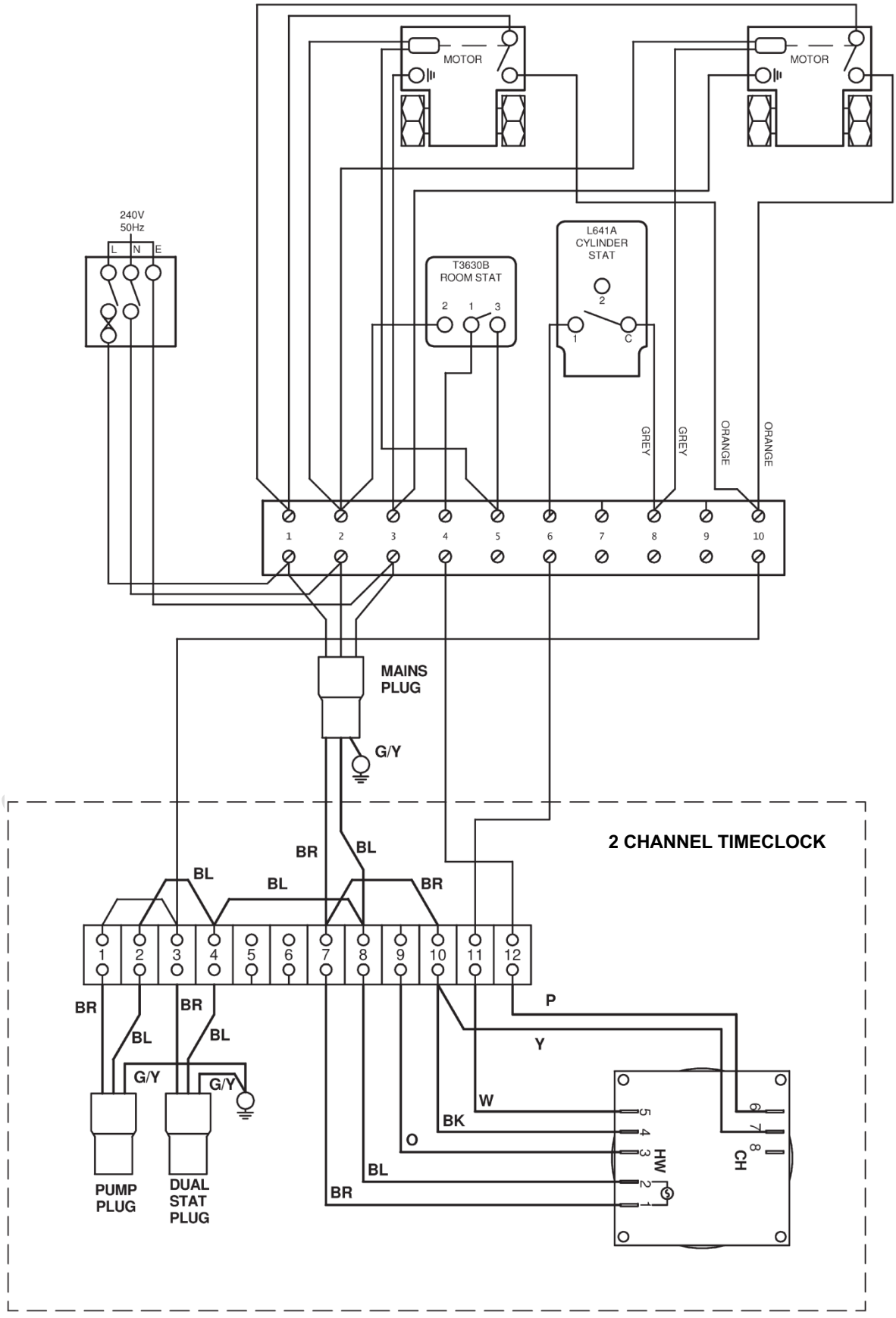
6.5 Insta Boiler Pump Overrun Function

The Insta 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.

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



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



7 OIL SUPPLY

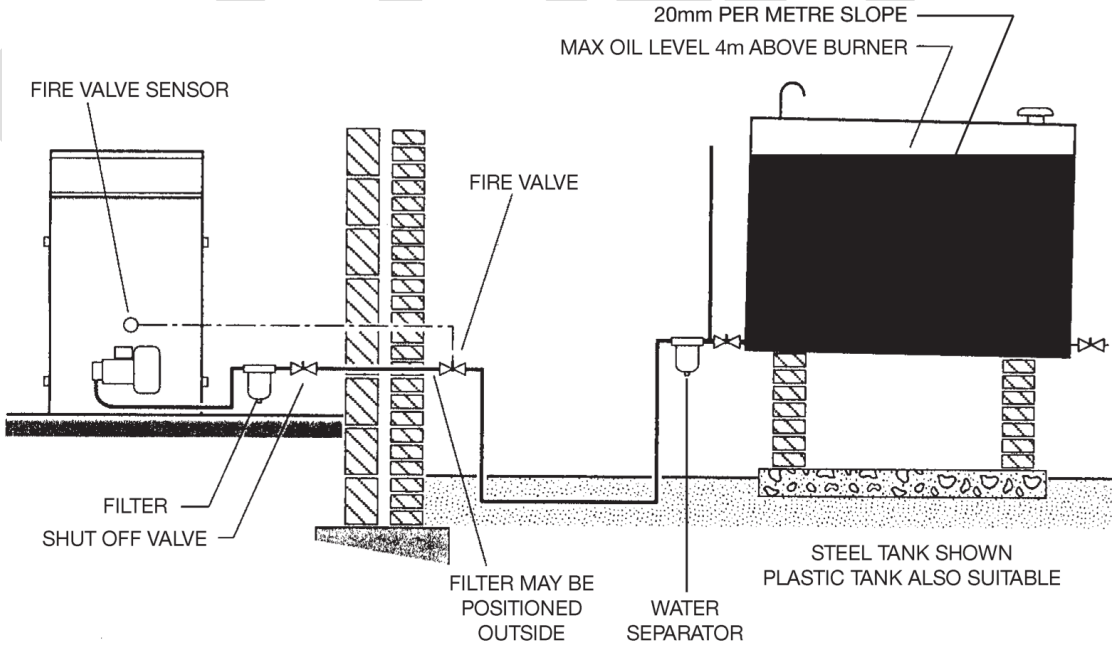
1. Oil Tank
Steel tanks constructed to BS799: PART 5 should be painted on the outside only and mounted on piers to prevent corrosion. Plastic oil tanks are also available and can be suitable for installation at ground level. However, oil should never be stored in translucent plastic containers.

The tank outlet should be at a height to provide sufficient clearance to allow for proper maintenance of any isolation valve, oil filter or water separator fitted.

2. Pipework
The pipe from the oil tank to the burner should be run in copper, steel or aluminium. Galvanised pipe and fittings should not be used. The pipework should terminate close to the boiler and be fitted with an isolating valve and filter. A remote sensing fire valve must be fitted to the oil line preferably before the oil line enters the building (BS5410: PART 1).

Depending on the position of the tank a two pipe system may be required. One and two pipe oil systems are shown below. As an alternative to a two pipe system, a Tigerloop or other approved de-aerator may be used.

7.1 One Pipe Gravity System

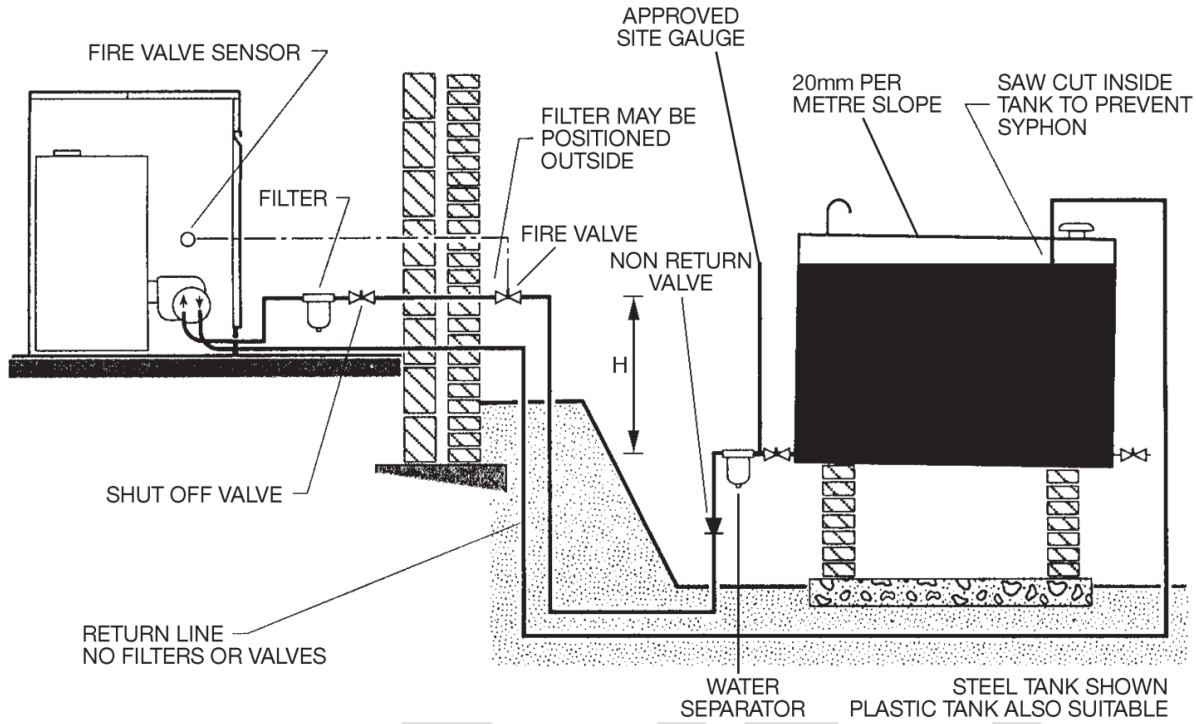


Total Maximum Pipe Length (m)

Head H(m)	0.5	1.0	1.5	2.0
ID 8mm	10	20	40	60
ID 10mm	20	40	80	100

Note: Plastic oil level gauges may shrink when exposed to kerosene thus allowing the ingress of water. Pump failures due to water contamination are not covered under warranty.

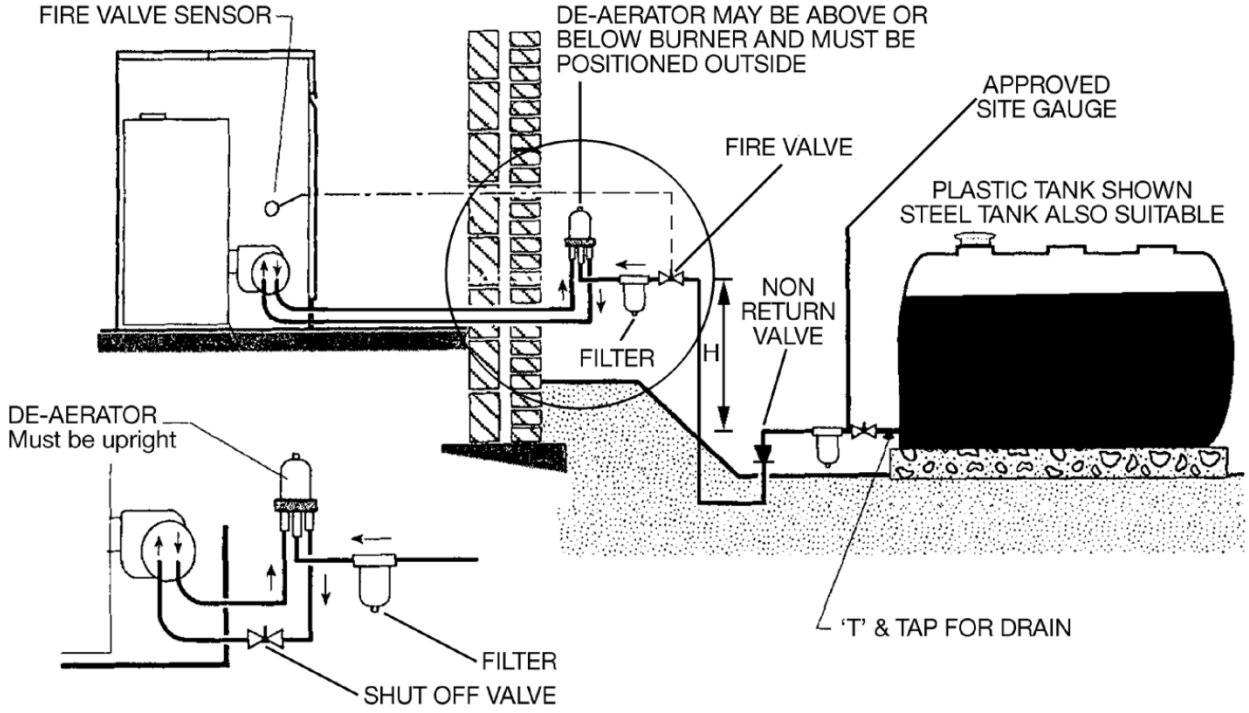
7.2 Two Pipe System



Total Maximum Pipe Length (m)

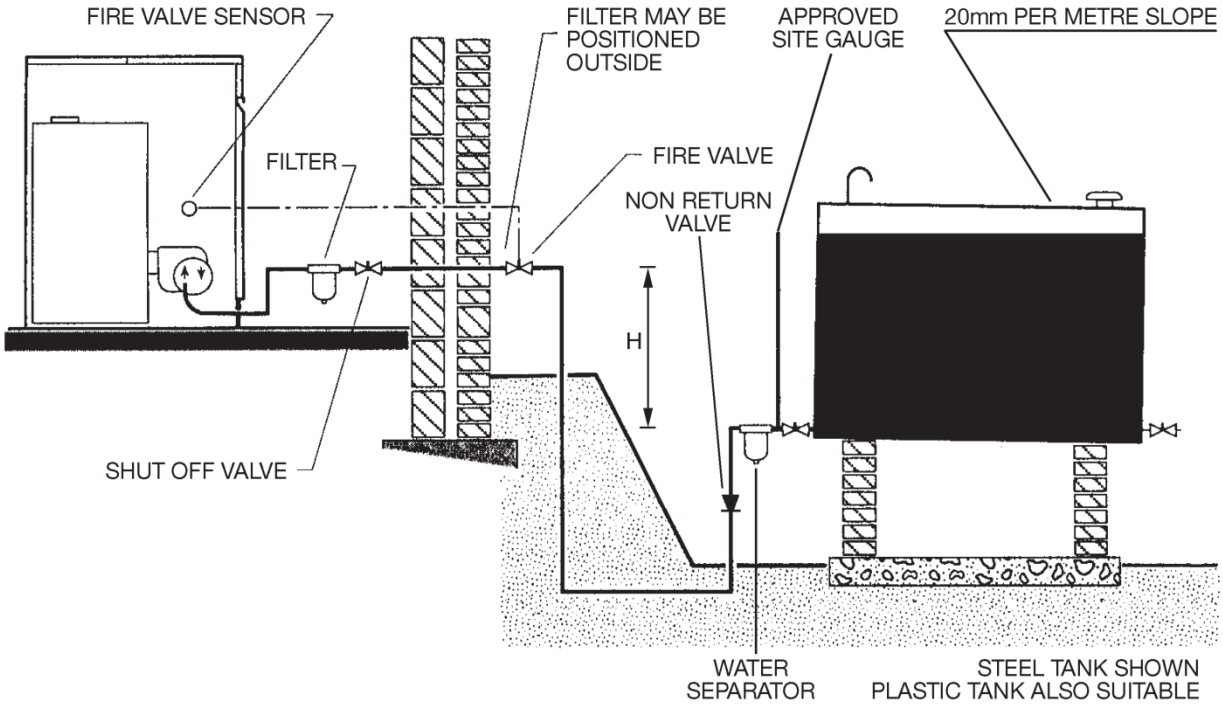
Head H(m)	0.0	0.5	1.0	1.5	2.0	3.0	3.5
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

7.3 De-aerator System



For maximum pipe length and lift contact de-aerator manufacturer.

7.4 One Pipe Lift System



Total Maximum Pipe Length (m)

Head H(m)	**0.0**	**0.5**	**1.0**	**1.5**	**2.0**	**3.0**	**3.5**
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

Note: The pump vacuum should not exceed a maximum of 0.4 bar. Above this, gas is released from the oil thus leading to burner lockout.

7.5 Instructions for the use of Bio Fuel

To ensure consistency, the fuel supplier must be able to demonstrate compliance with a recognised Quality Control and management system to ensure high standards are maintained within the storage, blending and delivery processes. The installation oil storage tank and its ancillaries must also be prepared BEFORE liquid Bio fuel is introduced. Checks and preparation should include;

1. For new installations, make sure that all materials and seals in the oil storage and supply line to the burner are compatible with Bio fuels. For all installations, there must be a good quality bio compatible oil filter at the tank and then a secondary filter for protecting the burner from contamination. The filtration must be to the specification detailed in the technical manual supplied with the burner

2. If an existing oil storage tank is to be used then in addition to the materials checks as detailed above, it will be essential that the tank is first inspected for condition and checked for water or other contamination. Warmflow strongly recommend that the tank is cleaned and oil filters replaced prior to Bio fuel delivery. If this is not completed then due to the hydroscopic nature of Bio fuel, it will effectively clean the tank, absorb any water present which in turn will result in equipment failure that is not covered by the manufacturer's warranty.

3. Depending on the capacity of the oil storage tank and oil usage, fuels may remain static within the tank for some considerable time and so Warmflow recommends that the oil distributor is consulted regarding the appropriate use of additional Biocides within the fuel to prevent microbial growth from occurring within the tank.

The Department of Transport suggest when using fuels with a bio fuel content within “Stationary Equipment” that the content of tanks is turned every six months or in any event no less than every twelve months to help prevent blockages to filters. Warmflow suggests that fuel suppliers and or service companies are contacted for guidance on fuel storage. The extract detailed above referencing Section 4 – Composition, note 8 of BS2869 should also be considered, and special attention should be applied to dual fuel applications where oil may be stored for long periods of time.

4. The burner must be set according to the appliance application and commissioned checking that all combustion parameters are as recommended in the appliance technical manual.

5. Warmflow recommends that the in line and burner oil pump filters are inspected and if required replaced frequently during burner use, before the burner start up following a long period of discontinued operation and even more frequently where contamination has occurred. Particular attention is needed when inspecting and checking for fuel leakages from seals, gaskets and hoses.

INSTALLER/SERVICER NOTES

1. During the burner installation, check that the gasoil and bio fuel blends are in accordance with Riello recommendations (please refer to the chapters “Technical Data” and “Guidance for the use of bio fuel blends within the burner technical manual).

2. If a Bio blend is in use the installer must seek information from the end user that their fuel supplier can evidence that the blends of fuel conform to the relevant EN standards.

3. Check that the materials used within the oil tank and ancillary equipment are suitable for bio fuels. If in doubt contact the relevant supplier or manufacturer.

4. Particular attention should be given to the oil storage tank and supply to the burner. Warmflow recommends that existing oil storage tanks are cleaned and inspected and any traces of water are removed BEFORE bio fuel is introduced (Contact the tank manufacturer or oil supplier for further advice). If these recommendations are not respected this will increase the risk of contamination and possible equipment failure.

5. Warmflow recommends a good quality bio compatible oil filter at the tank and a secondary filter are used to protect the burner pump and nozzle from contamination. The filter sizes must be in line with the technical manual supplied with the burners.

6. The burner hydraulic components and flexible oil lines must be suitable for bio fuel use (check with Riello if in doubt).

7. Regularly check visually for any signs of oil leakage from seals, gaskets and hoses.

8. It is strongly recommended that with Bio fuel use, oil filters are inspected and replaced every 4 months and more regularly where contamination is experienced.

9. During extended periods of non-operation and/or where burners are using oil as a standby fuel, it is strongly recommended that the burner is put into operation for short periods at least every three months.

7.6 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

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

8.1.1 Conventional Flue Guidelines

The flue system should 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 should be avoided and the flue should terminate 2 feet (600mm) above the ridge of the dwelling. Terminals which restrict the discharge or allow ingress of water should 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. The annular space must be filled with non-combustible insulation and sealed top and bottom.

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

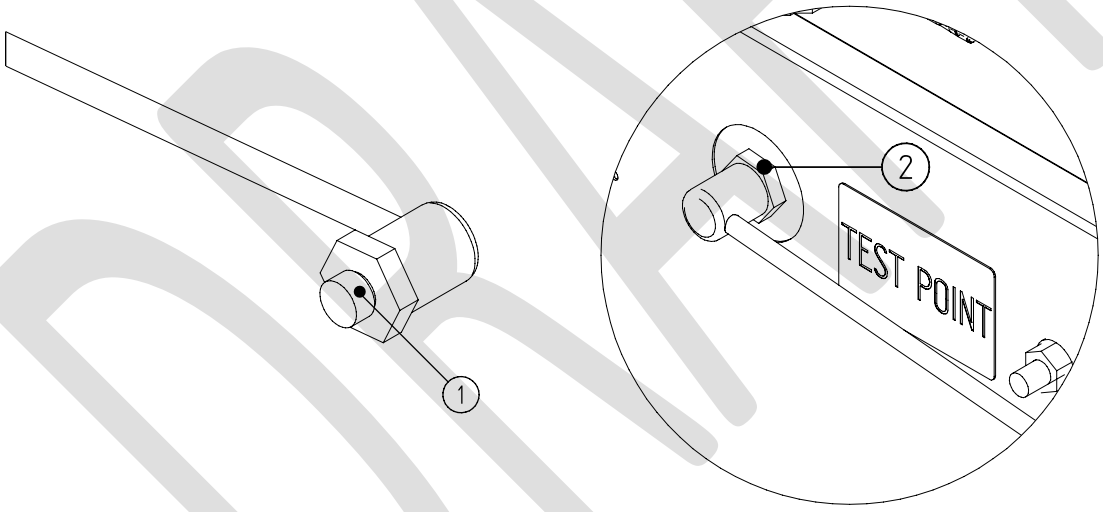
As with a metal flue system, where a plastic flue system is used within a building which is ‘compartmentalised’ as defined by the Building Regulations, care must be taken to ensure that the installation of the flue does not contravene the Regulations and create a safety risk.

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**.

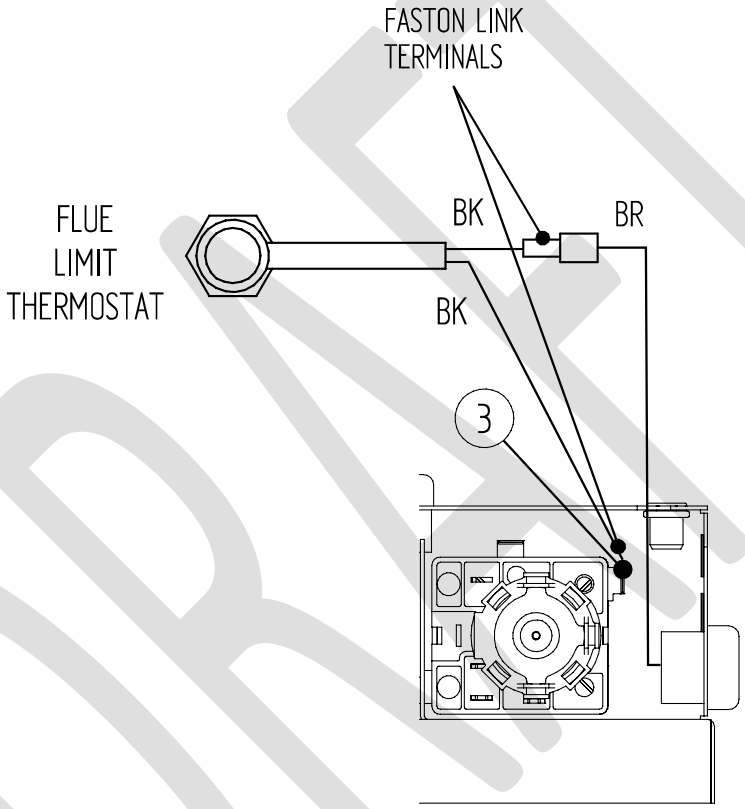


CONNECT FLUE THERMOSTAT

2. Isolate the electrical supply then remove the control panel installer cover. Disconnect the brown cable with the Faston connector from the burner to the right hand side of the boiler limit thermostat (3).

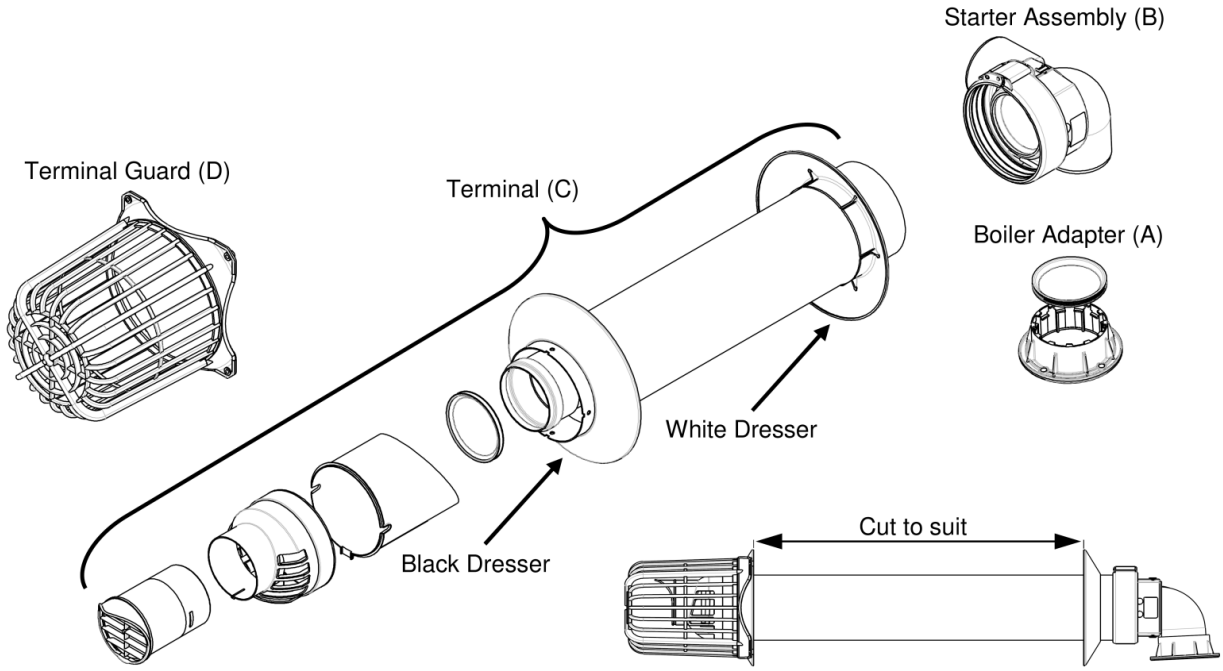
3. Pass the flue thermostat cable through the gland in the control panel, then connect the link terminals to the right hand side of the boiler limit thermostat and the disconnected burner cable.

4. Replace the installer cover, and reconnect the electrical supply.



Low Level Balanced Flue Kit (FBF)

The kit comprises:



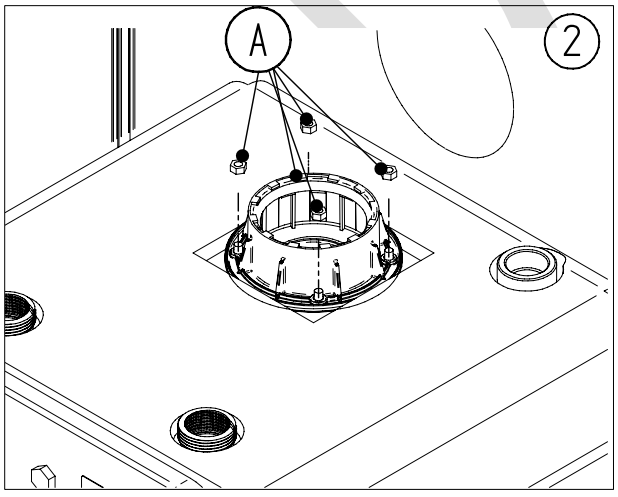
FIT FLUE THERMOSTAT

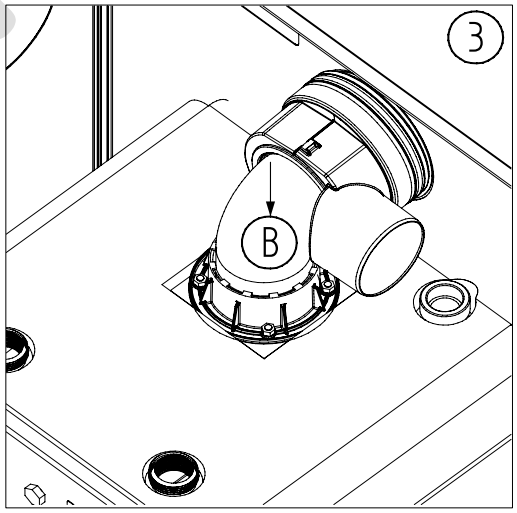
1. Fit the flue thermostat **BEFORE** fitting the flue kit. Refer to section **¡Error! No se encuentra el origen de la referencia.**.

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, and secure with 4x M6 nuts (A).

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



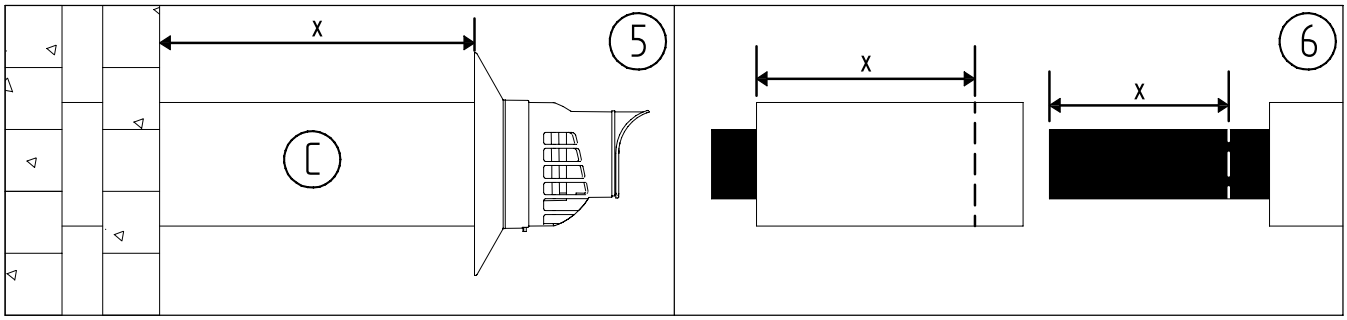


MEASURE AND CUT FLUE TERMINAL

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

5. Lubricate then fit the flue terminal (C) and measure the excess length, **X**.

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



CONNECT TERMINAL AND AIR HOSE

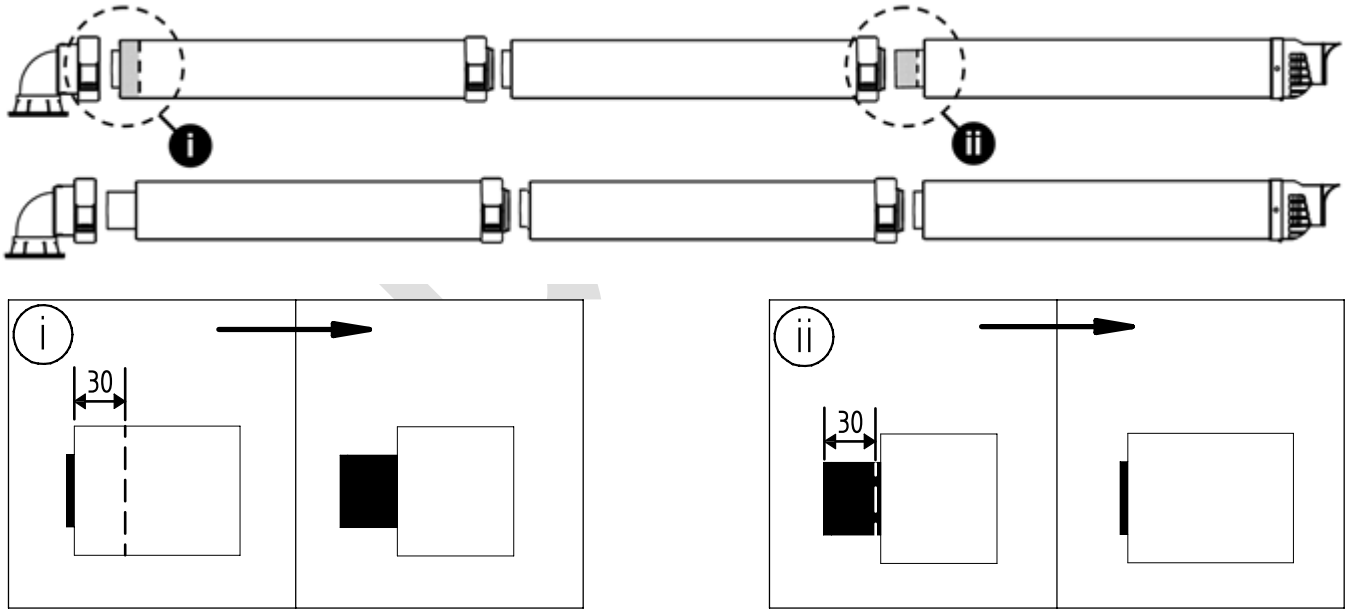
7. Lubricate then refit the terminal then secure with the locking band.

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.

ONLY IF EXTENDING HORIZONTALLY

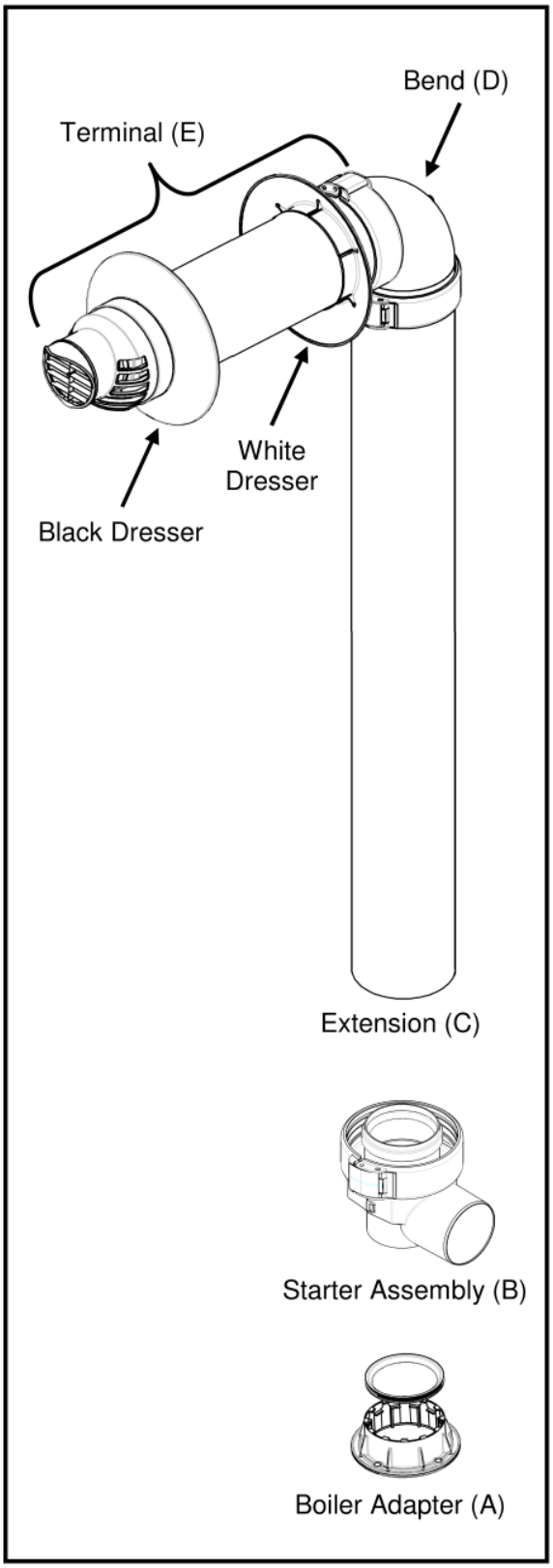
i. Cut 30 mm from the outer pipe of the 1st extension only.

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



8.1.4 High Level Balanced Flue Kit (HBF)

The kit comprises:



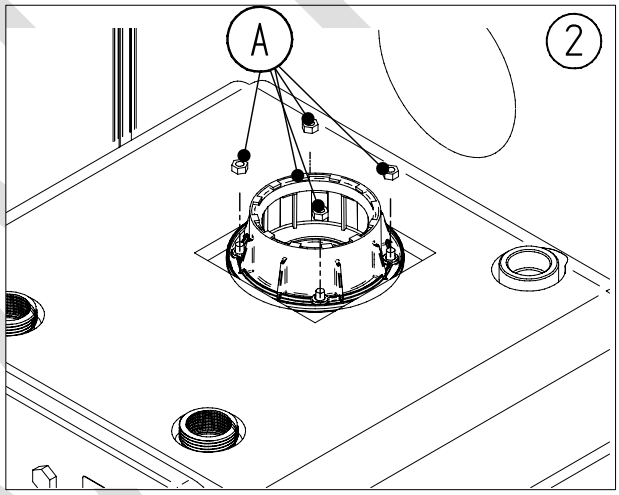
FIT FLUE THERMOSTAT

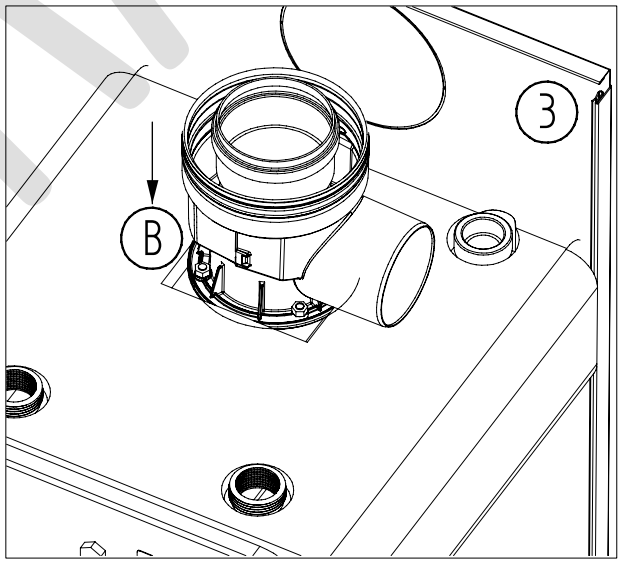
1. Fit the flue thermostat **BEFORE** fitting the flue kit.

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, and secure with 4x M6 nuts (A).

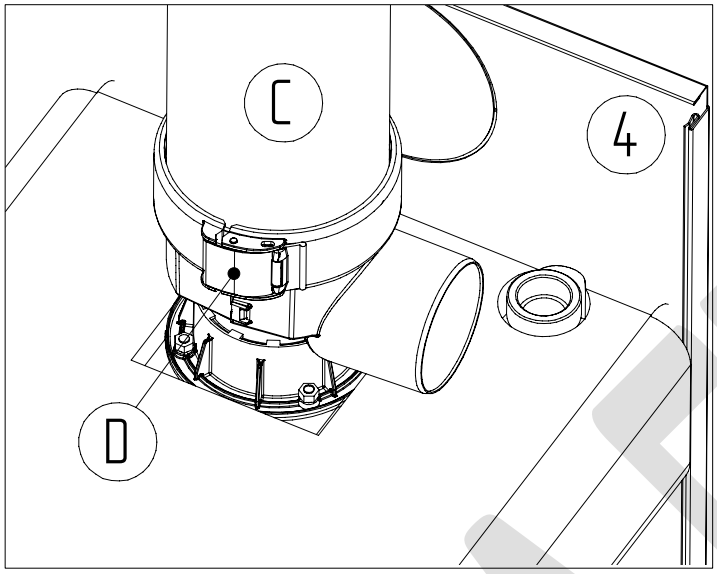
3. Lubricate the seals, then insert the starter assembly (B).

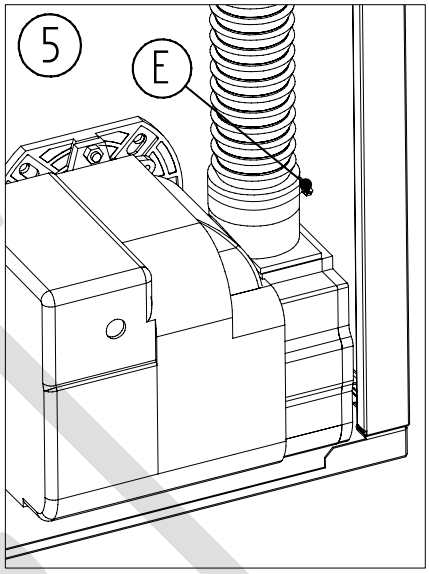




4. Lubricate and fit the extension (C) and bend, then secure with the locking band (D).

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.



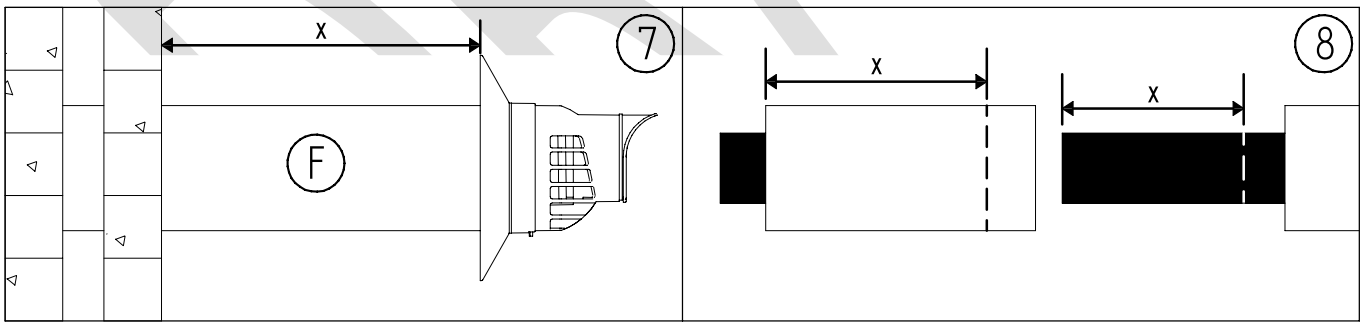


MEASURE AND CUT FLUE TERMINAL

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.

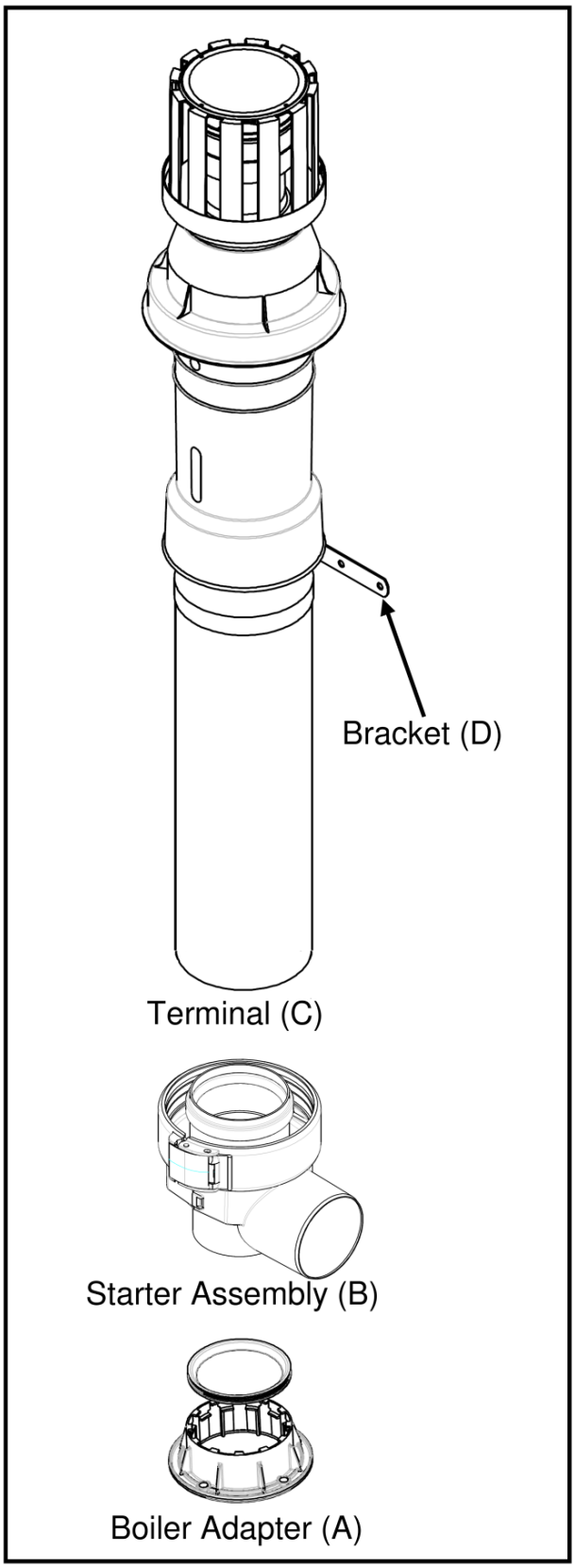


9. Lubricate the seals, then fit the flue terminal.

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:



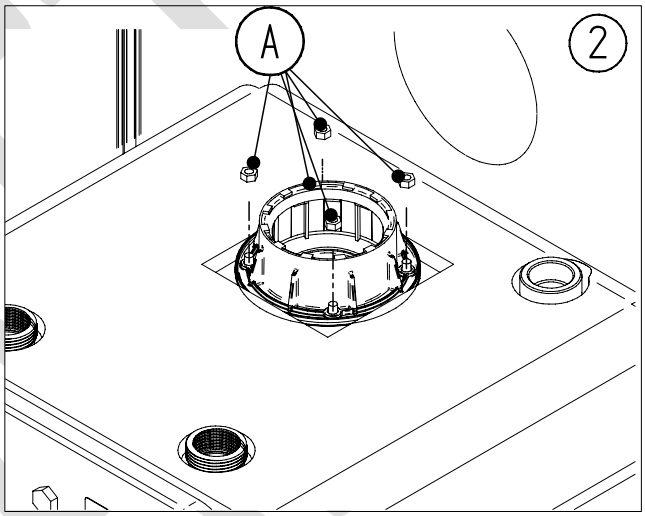
FIT FLUE THERMOSTAT

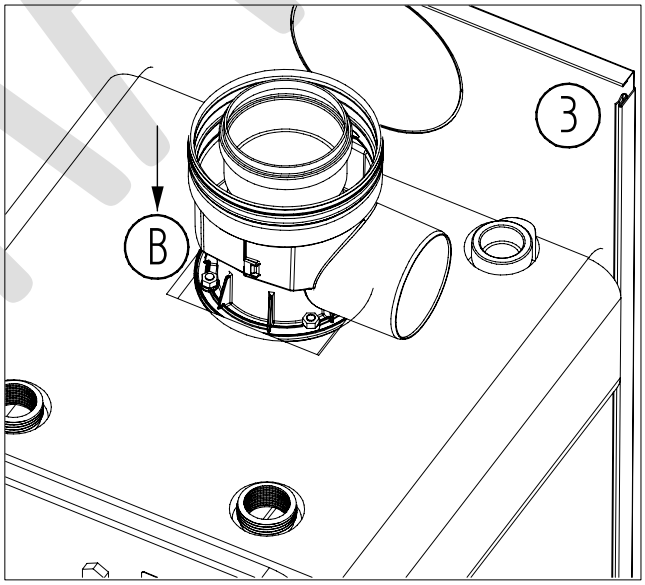
1. Fit the flue thermostat **BEFORE** fitting the flue kit.

FIT STARTER PIECE

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

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

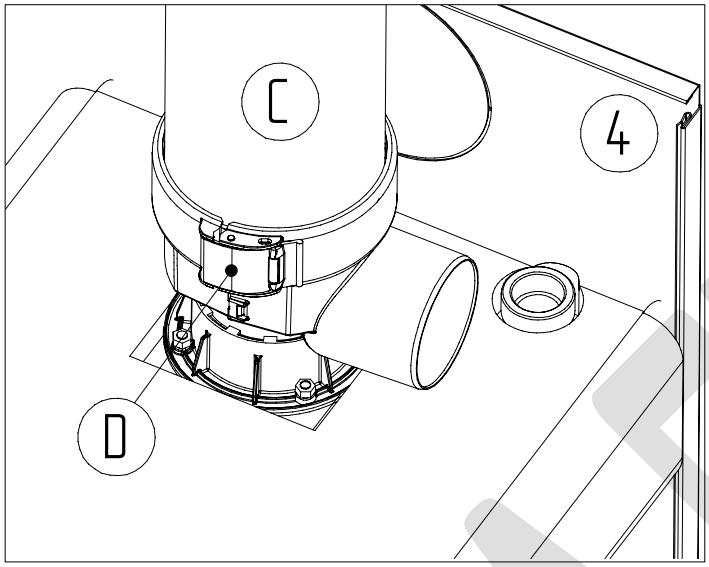


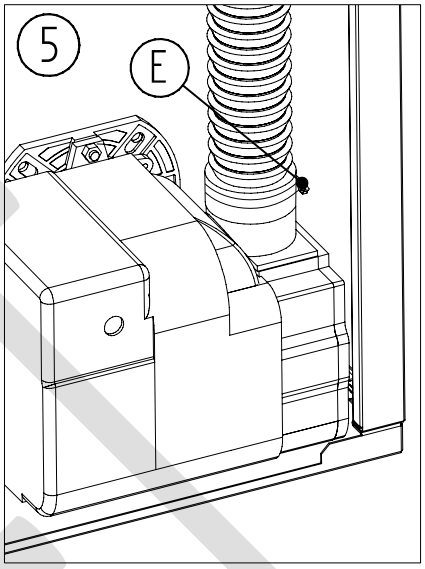


CONNECT 1ST EXTENSION AND AIR HOSE

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.

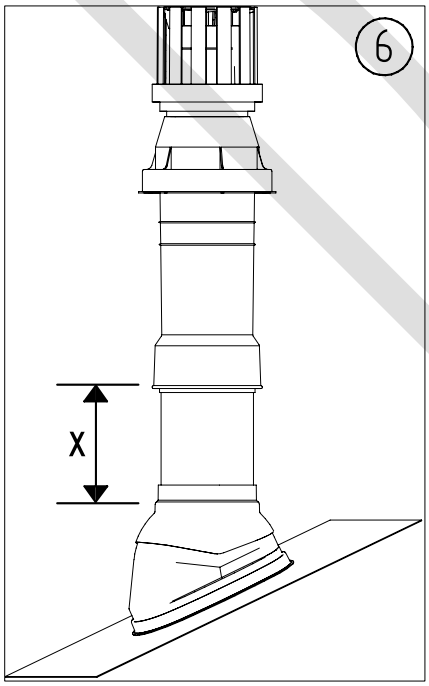


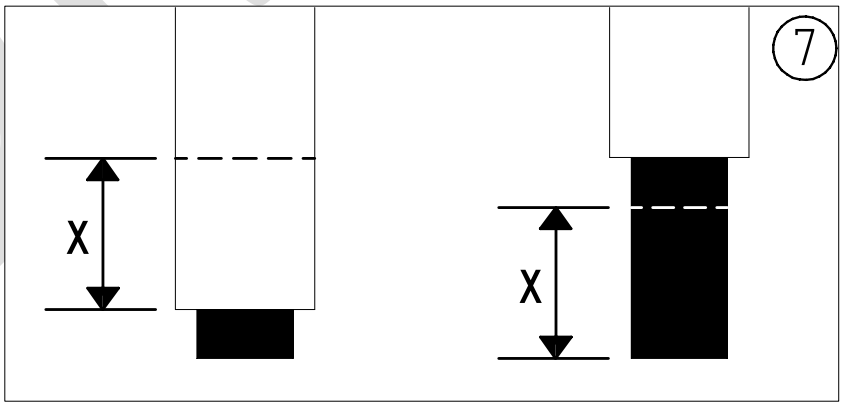


MEASURE AND CUT TERMINAL

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

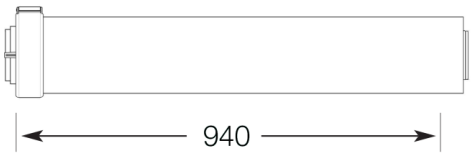
7. Cut X mm from the outer pipe of the terminal then X mm from the inner pipe. Refit and secure in place with the bracket.





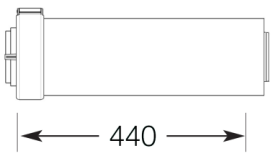
8.1.6 Warmflow Boiler Flue Components: 80/125 Ø

F3 - 1000mm extension pipe



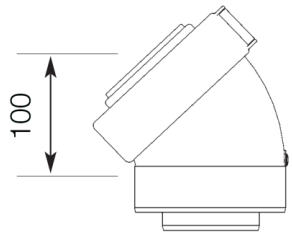
Assembled length

F4 - 500mm extension pipe



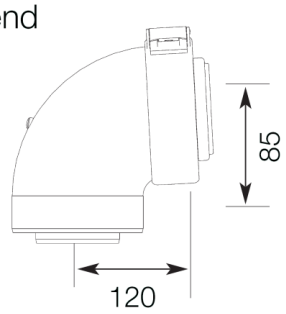
Assembled length

F7 - 45° bend



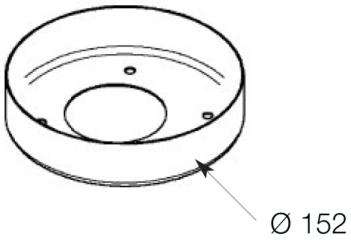
Effective length = 0.5m

F8 - 87° bend

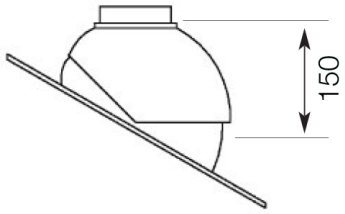


Effective length = 1.0m

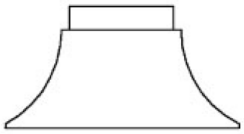
F10 - conventional flue adapter



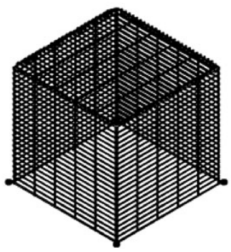
F11 - pitched roof flashing



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:

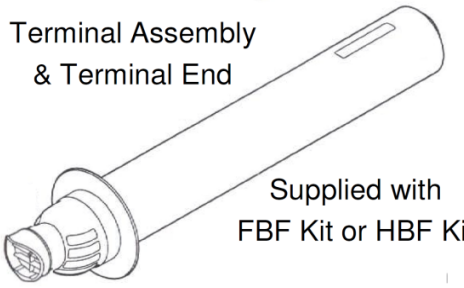
Mounting Bracket
x 3

Elbow
x 2

Extension
x 2

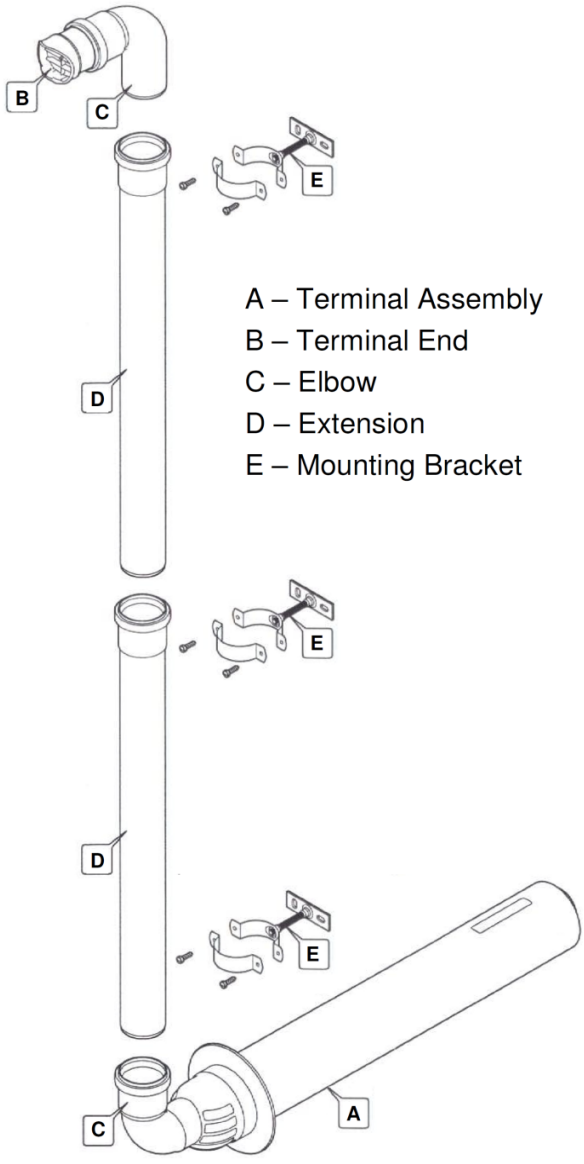
The kit does NOT include:

Terminal Assembly
& Terminal End



Supplied with
FBF Kit or HBF Kit

Assembled kit

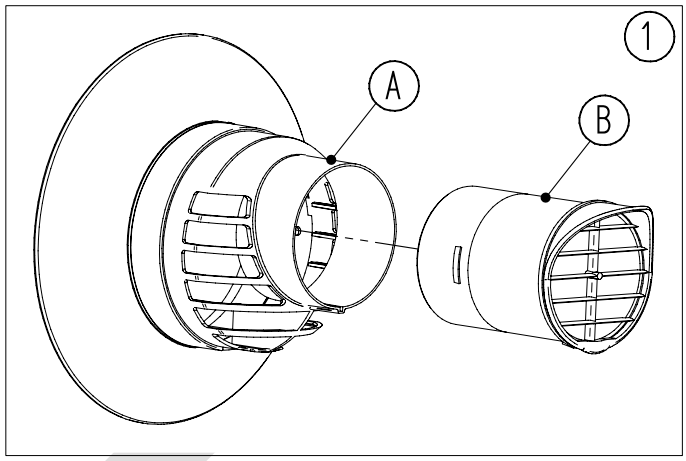


A – Terminal Assembly
B – Terminal End
C – Elbow
D – Extension
E – Mounting Bracket

REMOVE TERMINAL END

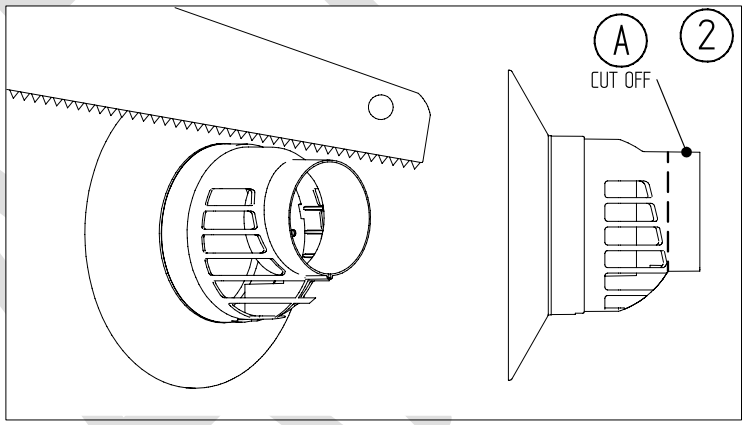
REMOVE TERMINAL END

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



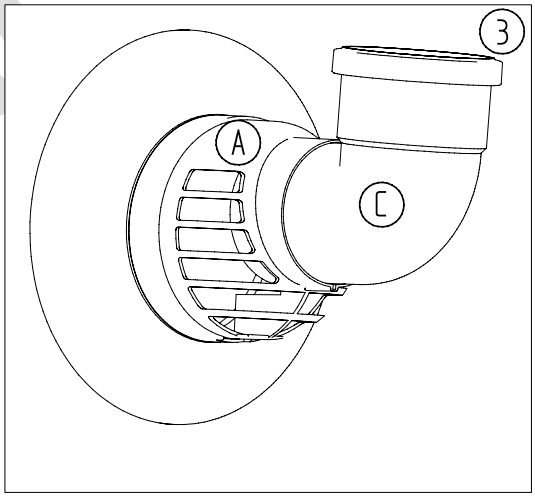
CUT OFF EXCESS MATERIAL

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.



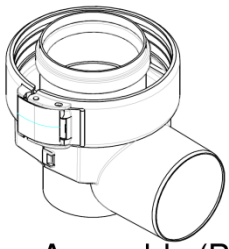
ASSEMBLE THE KIT

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.

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

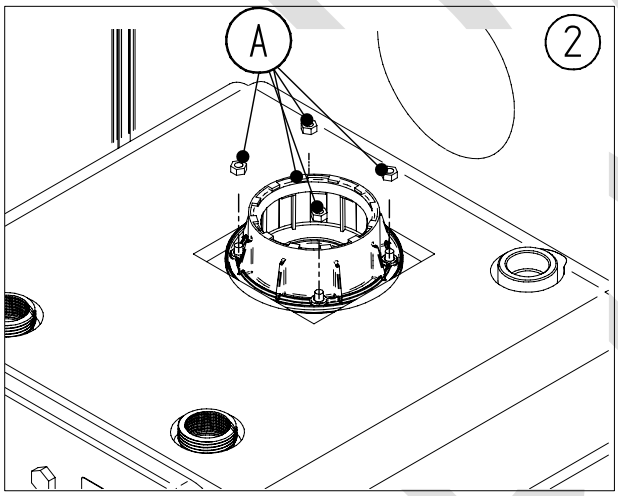
FIT FLUE THERMOSTAT

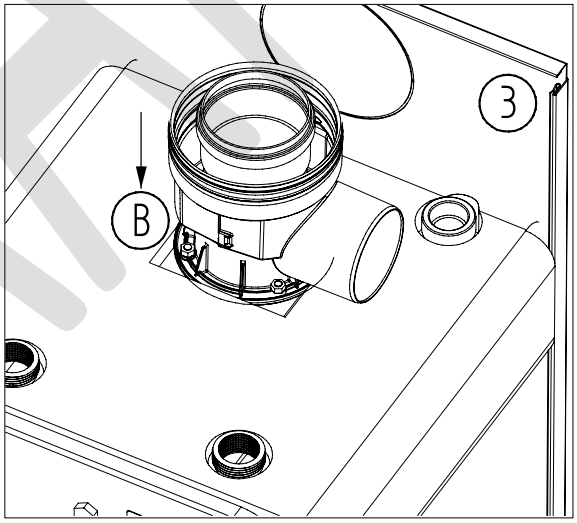
1. Fit the flue thermostat **BEFORE** fitting the flue.

FIT STARTER PIECE

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

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

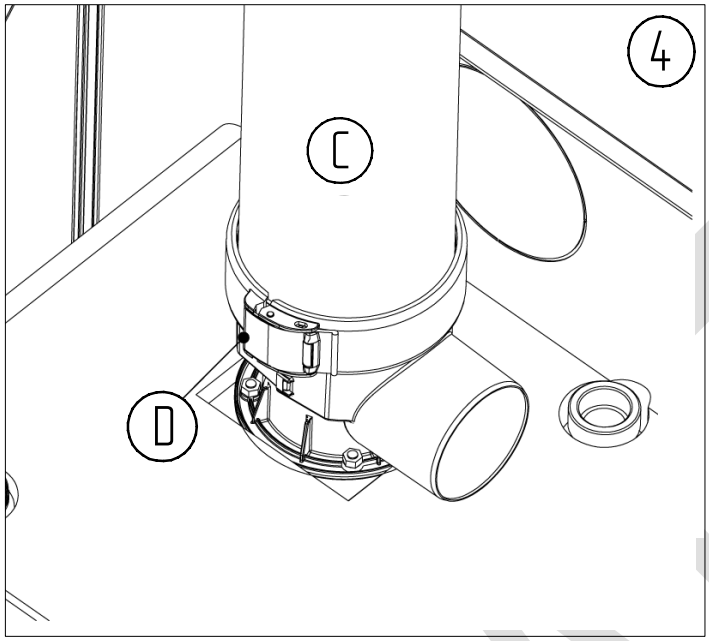


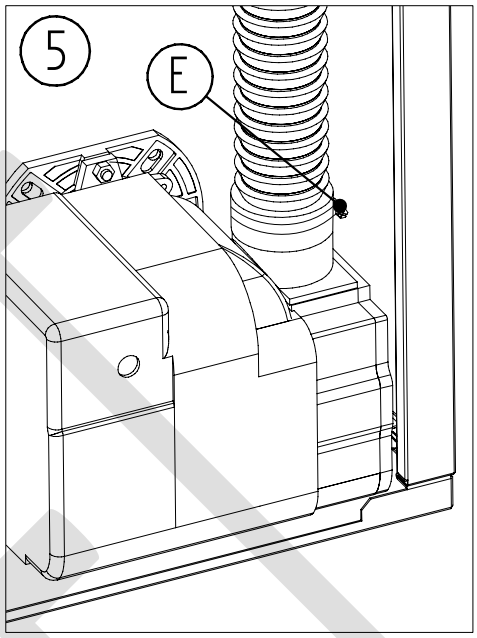


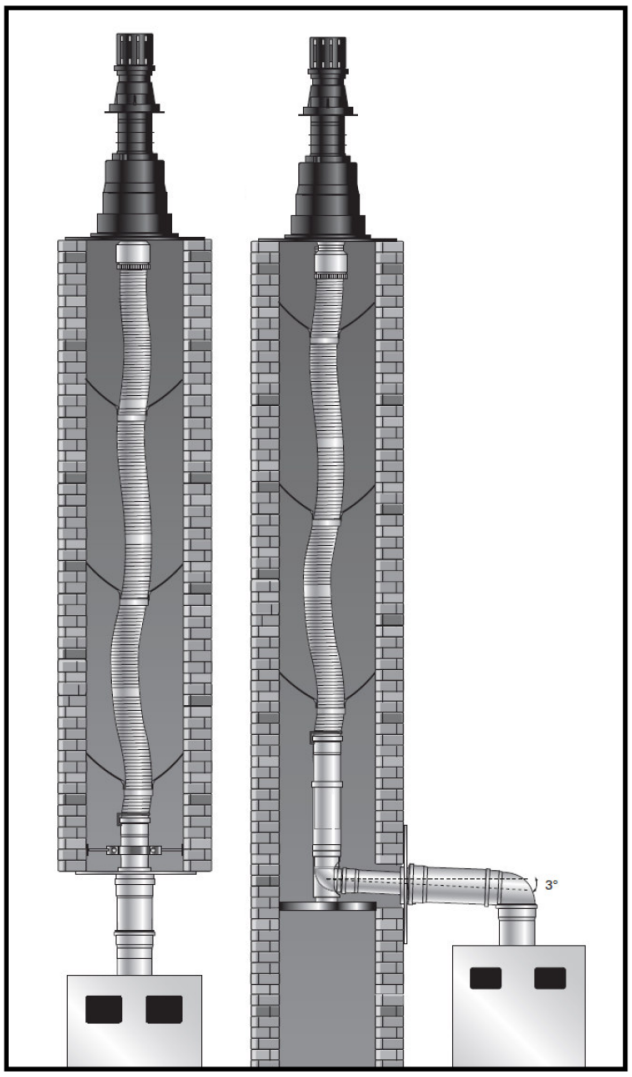
CONNECT 1ST EXTENSION AND AIR HOSE

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

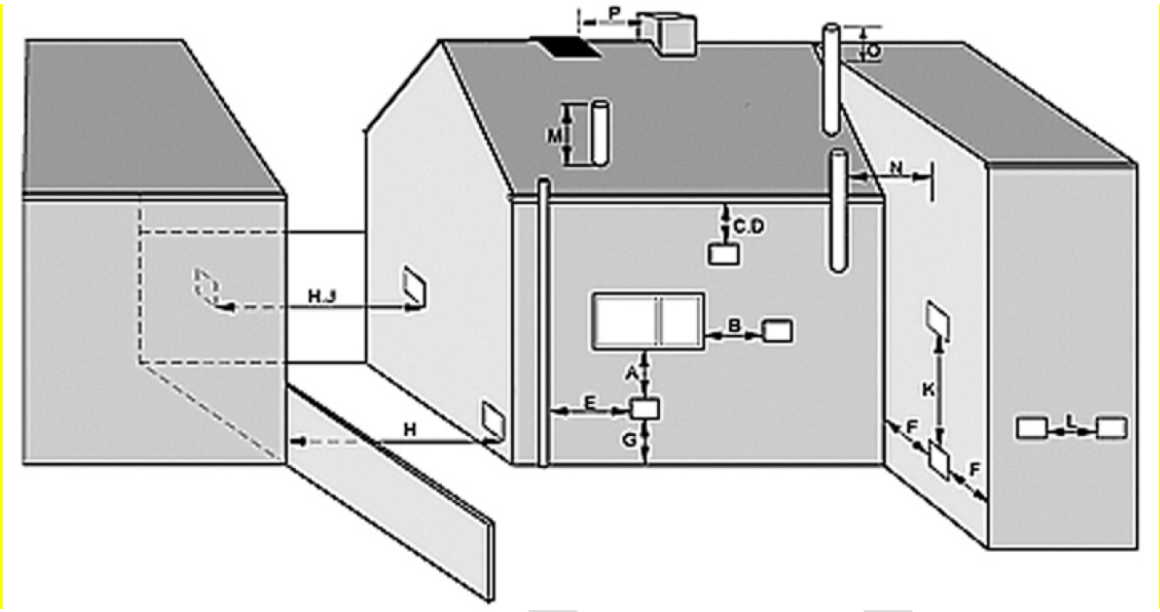
Install the chimney components and closure plate as instructed in the separate instruction leaflet.

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 pluming from the flue. If it is likely to be a nuisance to the householder 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.

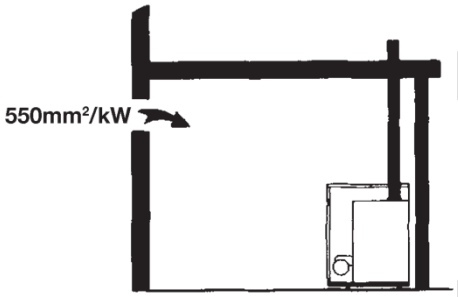
9 AIR SUPPLY FOR COMBUSTION & VENTILATION

(see BS5410)

9.1 Open Flue Boilers

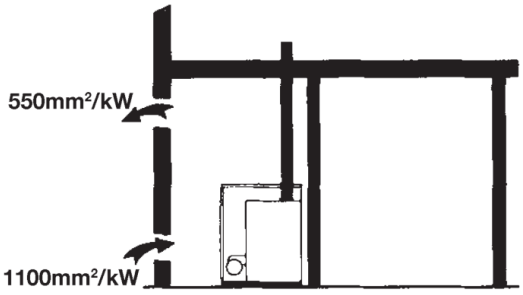
When the boiler is sited in a cellar where the only access for combustion and ventilation air is at high level then the combustion air should be ducted to low level.

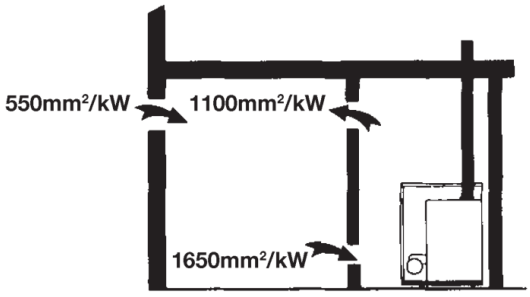
Combustion Air Supply
Boiler in Room



OPEN FLUE

Boiler in Compartment

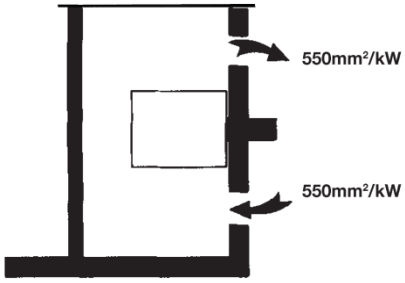


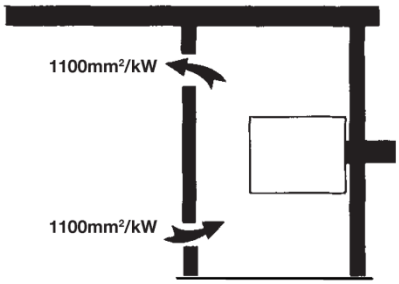


OPEN FLUE
VENTILATED FROM OUTSIDE

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 should be stood on a rigid, non-porous, non-combustible base, which is not softened by warmth, to comply with the Building Regulations.

10.1.2 Service Access

24” (600mm) Clearance should be provided above and in front of the boiler to allow for routine servicing. Insta boilers require access to the top. This is of particular relevance to appliances located beneath work surfaces. Such work surfaces should be easily removable for service access.

10.1.3 Heating System

The heating system should 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. The plugs should 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.

10.1.5 Drain Cock

For all appliances not factory-fitted with drain cocks, one should be fitted to the boiler drain boss located to the left hand side of the burner. Drain cocks should 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 should be fitted. Alternatively the system could be dosed with an antifreeze agent. Insta Boilers are fitted with frost protection as standard to protect 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, in any case, the last 1000mm of pipework connected directly to the appliance must be of copper. All connections to the appliance must be made with compression 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 5.3 of this manual. Insta models are supplied with a 12 litre expansion vessel charged to 1.0 bar.

This can accommodate a maximum combined boiler and system volume of 110 litres. Expansion vessel pre-charge pressures should 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 should be cold and the system pressure should 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 Insta Boiler Filling

Insta Boilers are fitted with a filling loop is supplied fitted to the expansion vessel.

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 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.

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

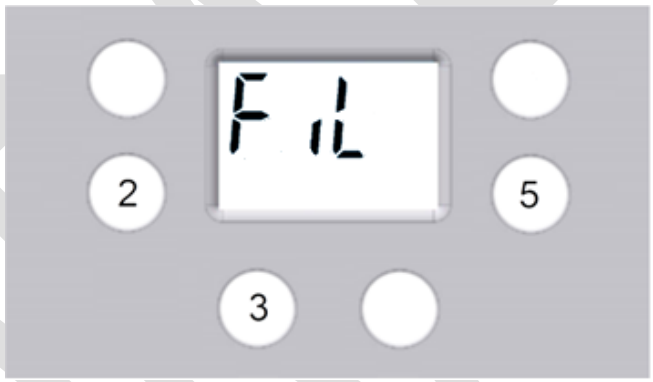
The Filling mode is activated by simultaneously pressing the DHW- (2) and CH- button (5) for 10 seconds. The appliance must not be in 'OFF' mode.

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 operation of Test mode, the LCD displays the following information in a cycle:

1. "FiL" to indicate Test Mode is operational.
2. Countdown timer in seconds
3. Current CH flow temperature



The function can be disabled by pressing the Mode button (3) for 1 seconds.

Alternatively the function is automatically stopped after a timeout period of 15 minutes (900 seconds). A countdown timer in seconds is shown on the LCD.

10.2.3 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.

10.2.4 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. No other valves should be positioned between the relief valve and discharge termination. The pressure relief valve should be manually activated periodically in order to assess valve opening, normally as part of servicing.

10.2.5 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. Insta Boiler models are factory-fitted with a low system pressure shutdown as standard.

10.3 Insta Boiler Domestic Hot Water

10.3.1 Mains Water Pressure

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

A mini expansion vessel should be 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.

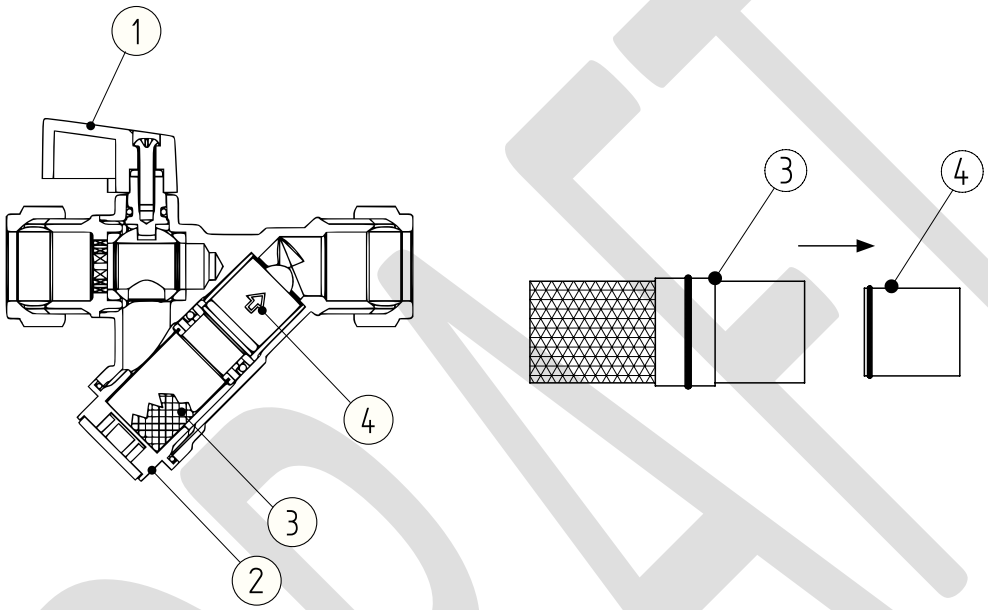
10.3.3 Boreholes

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

10.3.6 Balanced flue

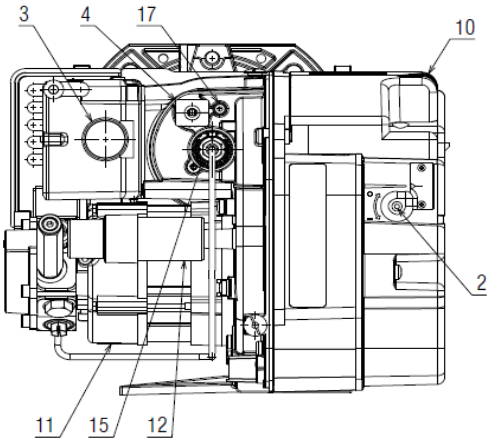
Due to the relatively high ambient temperature within the Insta Boiler casing, a balanced flue should be fitted in order to draw in cooler outside air.

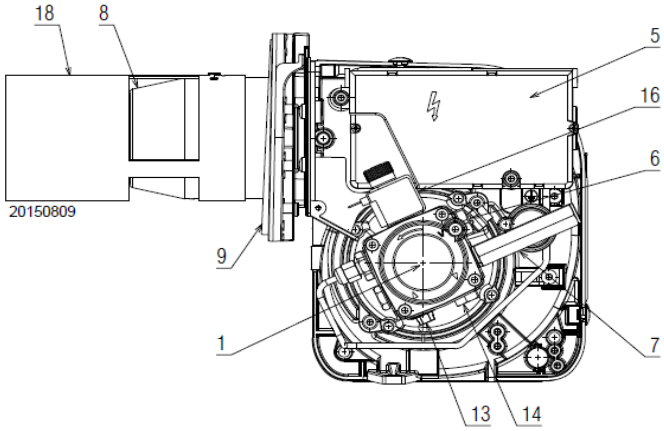
10.3.7 Plinth / Base

The boiler should be installed on a plinth or base with a thermal break such as non-combustible solid insulation. This is to minimise heat transfer to the ground and maximise the overall efficiency of the boiler.

11 BURNERS, COMMISSIONING AND SERVICING

11.1 RDB BX Burner

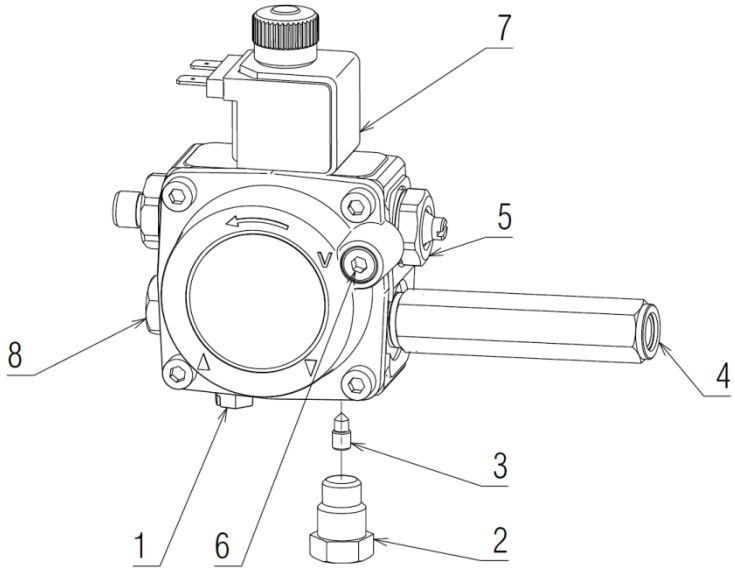




1.	Oil Pump	10.	Air Inlet
2.	Air Damper Adjustment Screw	11.	Motor
3.	Reset Button with Lockout Lamp	12.	Motor Ignition Capacitor
4.	Flame Sensor	13.	Fuel Suction Line
5.	Control Box	14.	Return Line
6.	Pump Pressure Adjustment Screw	15.	Combustion Head Adjustment Handle
7.	Extension for Gauge Connection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

11.2 Oil Pump

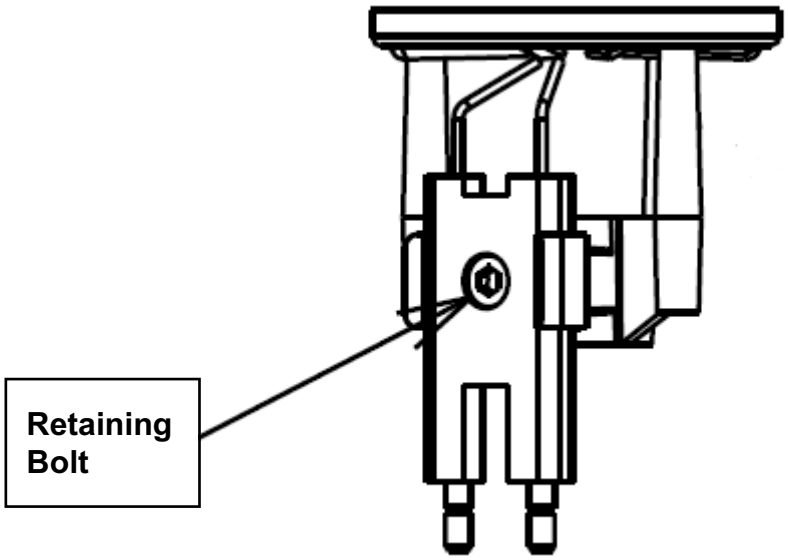
The burner is supplied for use with a one pipe system. For use on a two pipe system, it is necessary to remove the return port plug and fit a small by-pass screw as shown:



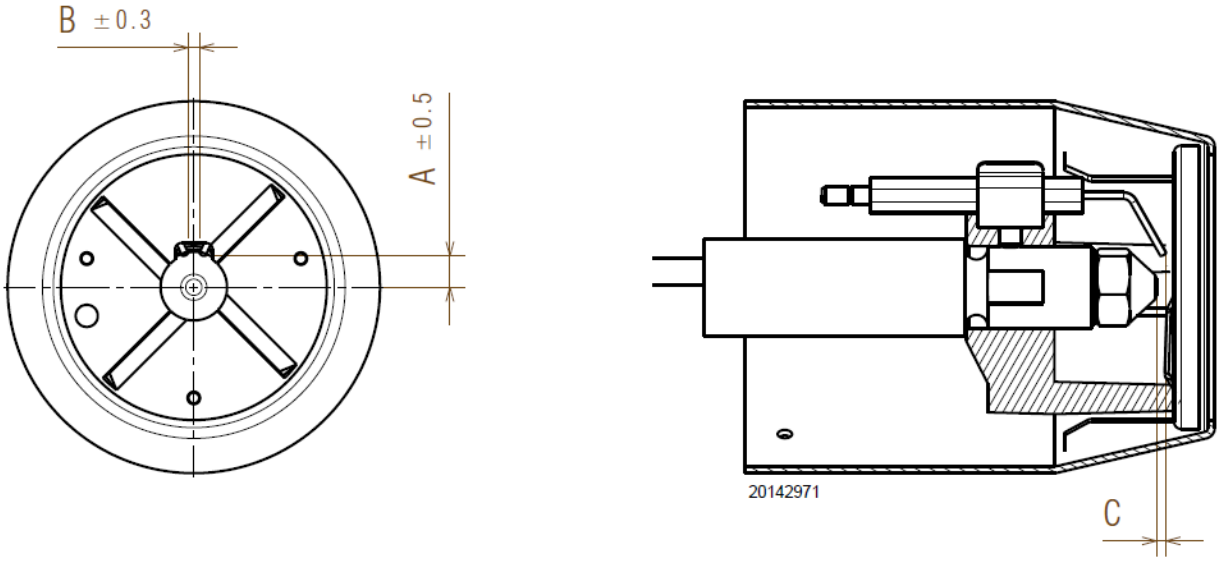
1. Suction Line
2. Return Port Plug
3. By-pass Screw
4. Pressure Gauge Connection
5. Pressure Adjuster
6. Suction Gauge Connection
7. Fuel Solenoid and Valve
8. Auxiliary Pressure Test Point

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.



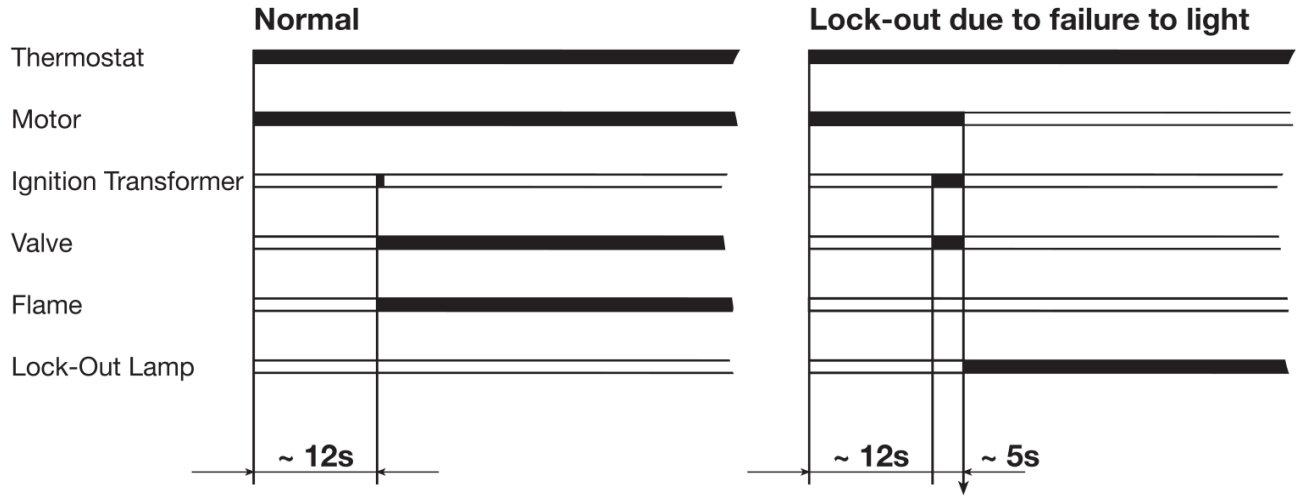
The positioning of the electrodes should then be checked. The correct position for each burner is shown below.



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

11.4 Burner Start-Up Cycle

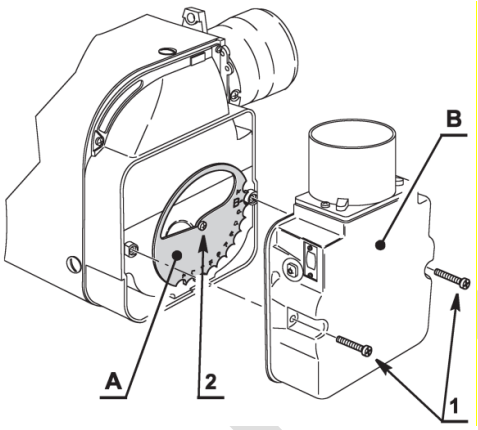
Lock out is indicated by a lamp on the control box.



11.5 Air Damper Adjustment

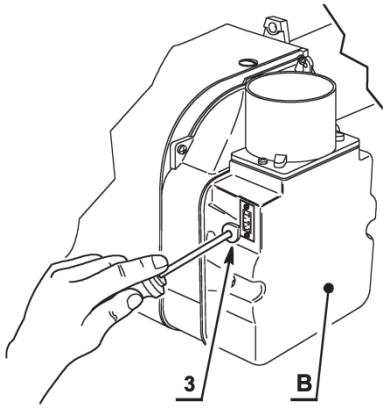
The air damper is set in factory. This regulation is purely indicative. Each installation however, has its own working conditions: actual nozzle output; positive or negative pressure in the combustion chamber, the need of excess air, etc. All these conditions may require a different air damper setting.

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)

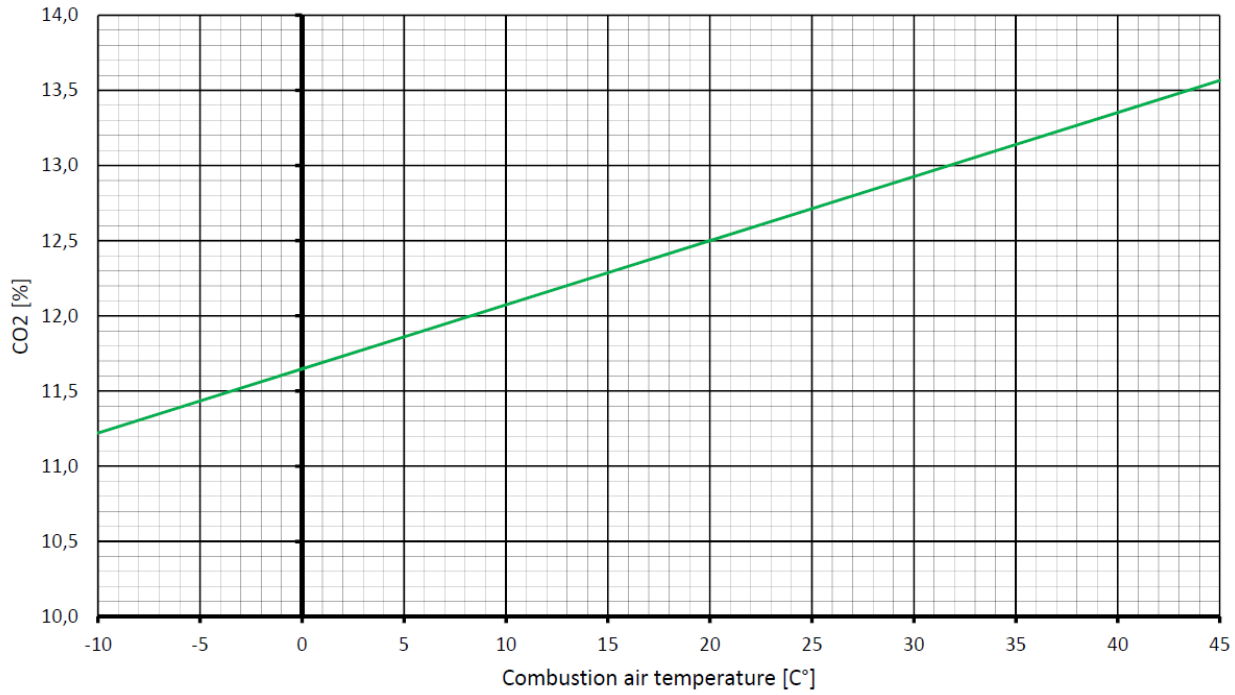


Air Damper (B) – The purpose of this damper is to perform a fine tuning of the inlet air. Tuning of this device is possible by turning the screw (3).

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:



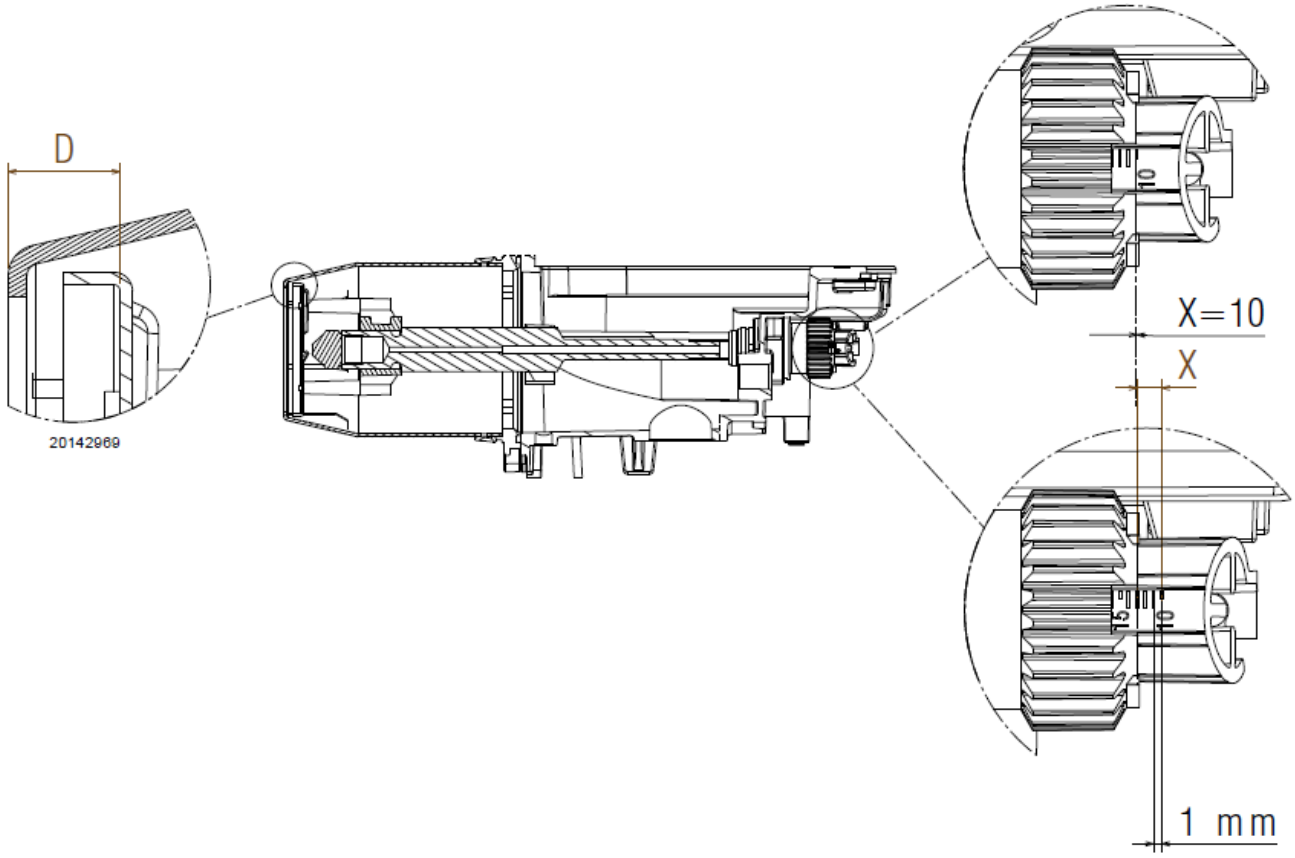
For example, with an external air temperature of 20°C, adjust the CO_2 to 12.5% (± 0.2%).

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 on Kerosene Fuel 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

11.7 Commissioning

Note: It is the responsibility of the installer to ensure that the boiler is properly commissioned by an OFTEC trained and registered technician. Failure to do so WILL invalidate ALL warranties.

Before firing ensure that all the baffles are in place, as they may have been displaced during transit; Refer to the General Information section. Switch the boiler on, ensuring all controls are calling for heat.

The oil pump pressure must be checked by fitting a pressure gauge to the pump pressure port. If necessary the pressure should be adjusted until it corresponds with the value in the Technical Data section for the required output. Using a smoke pump, check the smoke number. It should be zero.

Using a flue gas analyser, 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 guidance. Testing while the boiler is still relatively cold gives inaccurate results and leads 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 or OFTEC trained and registered technician and the commissioning certificate of the OFTEC Boiler Passport completed and returned to Warmflow within 30 days from the date of installation and 90 days from the date code stamped on the appliance.

Additionally, to comply with the building regulations, the boiler passport or OFTEC form CD11 should be completed and a copy left with the householder.

11.7.1 Programming Engineer Parameters – Insta Boilers

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

Insta Boilers are fitted with parameters that may need to be adjusted upon commissioning, depending 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 (4) and DHW- button (2) for 3 seconds.

The Main digit indicates 'PAS'.

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

The password is 138.

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 Alert 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 Alert icon ⚠ will stop flashing.

To return to the Home Screen, press the Information button (4) again, or if no button is pressed for 1 minute, 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	CH Mode	N/A	1-2	2
P 07	CH Temp Differential	°C	2-10	5
P 08	DHW + Boiler Max Temp	°C	0-20	15

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	Reserved
P06	CH Mode. 1 = Circulating only pump on when boiler is over 60°C. 2 = Circulating pump on continuously during CH demand.
P07	Temperature differential on CH cycle below CH setpoint.
P08	Maximum boiler temperature above DHW setpoint during DHW cycle.

11.8 Servicing

11.8.1 General Requirements

The appliance must be serviced annually by a Warmflow or OFTEC registered service technician in accordance with the recommendations laid out in OFTEC's Technical Book 2: 'Domestic & Light Commercial Servicing and Commissioning – Requirements for Oil Fired Systems – Pressure Jet Appliances'.

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) and the secondary heat exchanger door seal. If found to be 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 safety controls and devices such as high limit thermostats, pressure relief valves and fire valves **MUST** be assessed. If found to be defective, they **MUST** be replaced.
N.B.: 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 or OFTEC trained and registered technician. Details of the servicing conducted must be recorded in the OFTEC Boiler Passport.

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 (6) for 5 seconds.

When activated, CH demand is forced, and a maximum CH temperature of 90°C is allowed.

During operation of Test mode, the LCD displays the following information in a cycle:

4. “tES” to indicate Test Mode is operational.
5. Countdown timer in seconds
6. Current CH flow temperature

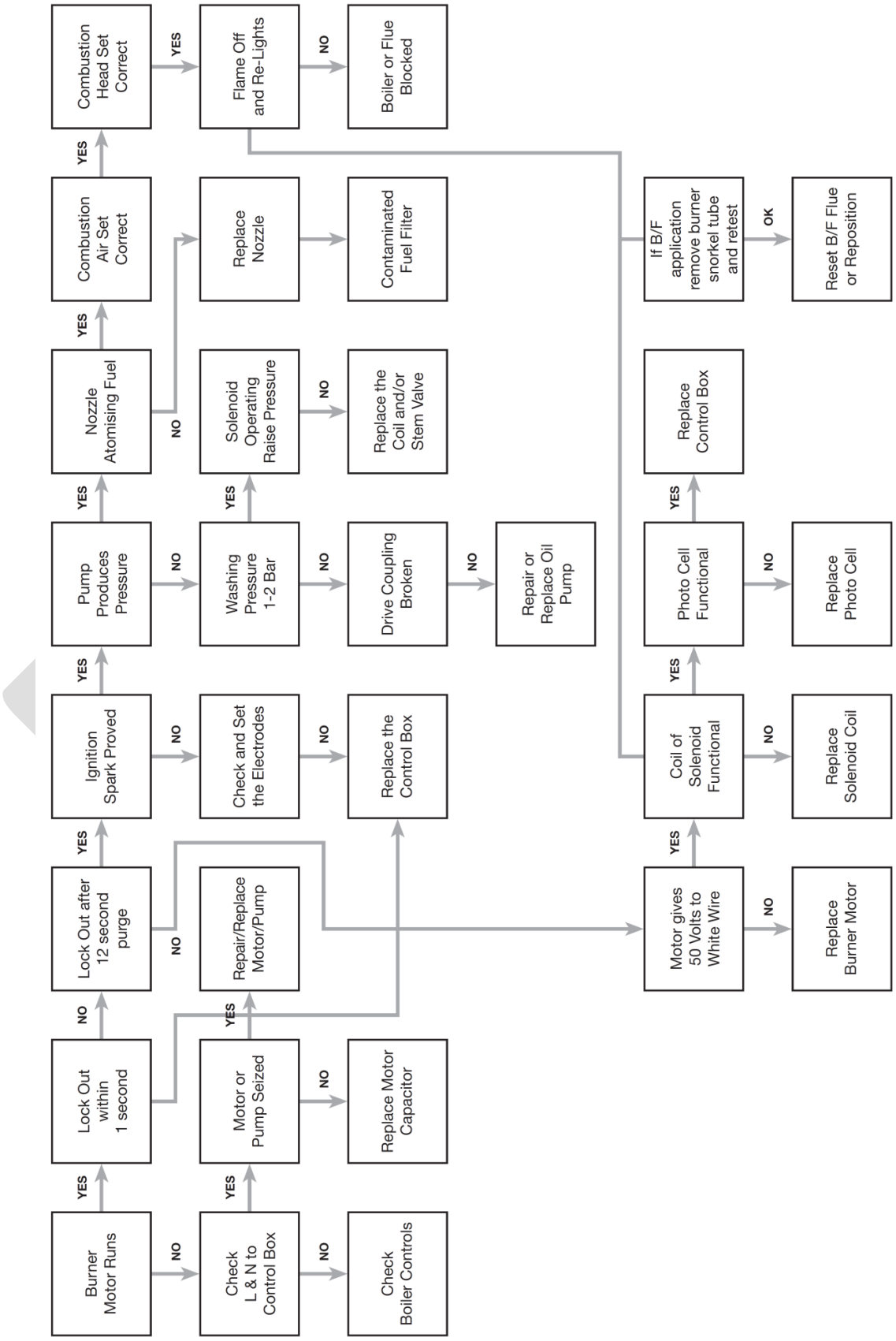
The function can be disabled by pressing the Mode button (3) for 1 seconds.

Alternatively the function is automatically stopped after a timeout period of 15 minutes (900 seconds). A countdown timer in seconds is shown on the LCD.

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 should be taken when doing so.

12.1 Riello RDB BX



13 INSTA BOILER FAULT FINDING

WARNING: The Insta 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 should be taken when doing so.

13.1 Error codes displayed on the LCD.

Insta 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)
E04	Low System Pressure	System not topped up after pressure loss after bleeding radiators etc. Leak in heating system	Check system pressure, see Section 1.3, 1.4 & 1.5 then, check corrosion inhibitor concentration.
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
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

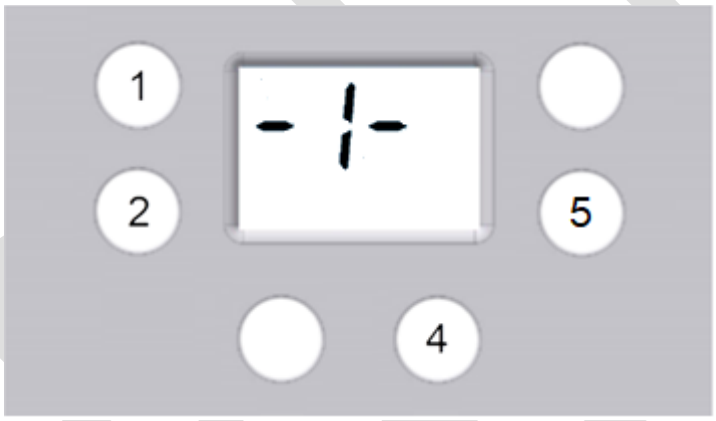
13.2 Error codes stored in the Error Logger

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 (4) and CH- button (5) simultaneously for 5 seconds, then the Error Logger is shown.



2. Scroll through the errors using the DHW+ button (1) and DHW- button (2).
3. If no errors are recorded in the logger, ‘E00’ is displayed on the main digit.
4. The home screen will be displayed if no buttons are pressed for 30 seconds.

13.3 Central Heating Fault Finding Table

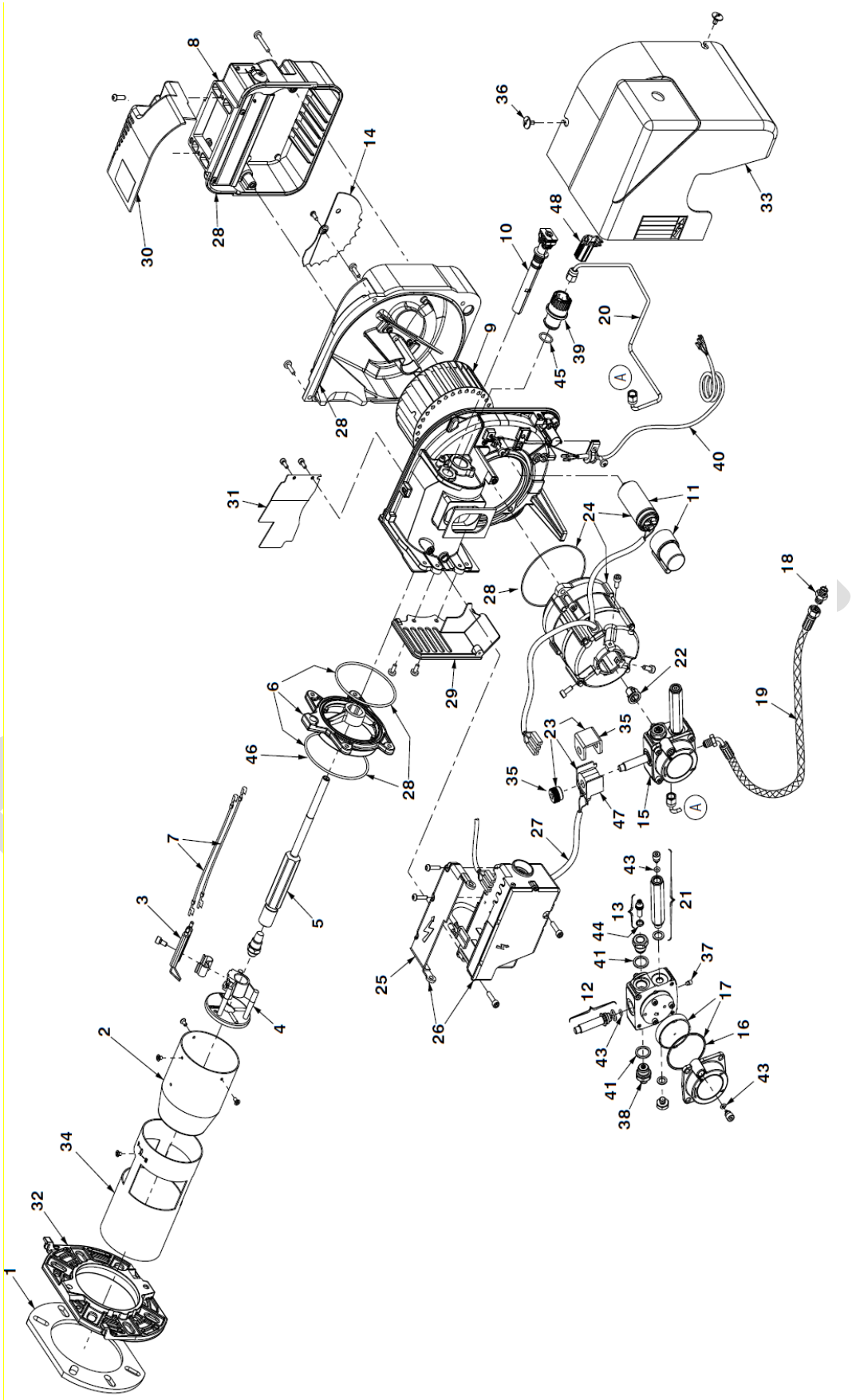
Check No.	Item to check	Answer	Corrective Action (s)
1	Is AC Power Supply healthy to the appliance and LCD operational?	No	Rectify AC Power supply problem
		Yes	Go to Check 2
2	Are Error Codes displayed on LCD?	Yes	Rectify Error Code problems, see Section 13.1
		No	Go to Check 3
3	Is the CH Radiator 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
5	Is external timeclock in 'ON' time?	No	Adjust 'ON' time period to call for Central Heating
		Yes	Go to Check 6
6	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 7
7	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 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 CH flow Temperature set to call for heat?	No	Adjust with CH + button to call for heat
		Yes	Go to Check 10
10	Is the Diverter Valve Actuator in the CH (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 zone valves open?	No	Rectify the zone valve operation
		Yes	Go to check 13
13	Is all air vented from the system?	No	Vent air from the system at all locations
		Yes	Go to Check 14
14	Is burner operating, lockout is indicated by red lamp on burner, see section 1.1	No	Reset lockout, see section 1.1
			Reset high limit, see section 1.5
		Yes	Check CH system in property

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 the Flame Symbol displayed flashing on the boiler LCD with all DHW outlets closed?	Yes	The Boiler is performing preheat wait until complete
		No	Go to Check 5
5	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 6
6	Is the circulating pump running with 1x green and at least 1x amber LED?	No	Check Circulating Pump connections
		Yes	Go to Check 7
7	Is the DHW Flow temperature set correctly for the installation?	No	Adjust with DHW +/- buttons to set temperature as required
		Yes	Go to Check 8
8	Is the Diverter Valve Actuator in the DHW (Retracted) position? Section 4.3.2	No	Check Diverter Valve Actuator Connections
		Yes	Go to Check 9
9	Are the isolating valves within the boiler open?	No	Open the valves to allow water flow
		Yes	Go to Check 10
10	Are the property DHW isolation valves open?	No	Rectify the isolation valve positions
		Yes	Go to check 11
11	Is all air vented from the boiler?	No	Vent air from the boiler at all locations
		Yes	Go to Check 12
12	Is burner operating, lockout is indicated by red lamp on burner, see section 1.1	No	Reset lockout, see section 1.1 Reset high limit, see section 1.5
		Yes	Check DHW system in property

14 SPARES

14.1 RDB 2.2 BX Spares

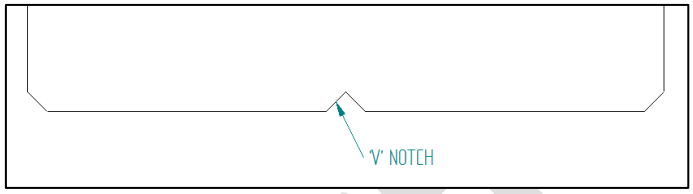


No	CODE	20112459	20112460	20112464	DESCRIPTION
1	3005787	•	•	•	Gasket
2	20147320	•	•	•	Head Assembly
3	20018545	•			Electrode Assembly
3	20018693		•	•	Electrode Assembly
4	20139837	•			Diffuser Disc
4	20133586		•	•	Diffuser Disc
5	20133588	•	•	•	Nozzle Holder
6	20141540	•	•	•	Collar
7	20019415	•	•	•	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
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 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.



14.3 Short Parts List

Insta Models	
Part Description	Code
Flow Sensor	5317
Pressure Switch	6727
22mm NTC Sensor	5656
15mm NTC Sensor	5655
6mm Probe NTC Sensor with cable	5320
Insta Boiler High Limit Thermostat	6614
Plate Heat Exchanger 24 Plate (Insta)	6644
Grundfos UPM3 FLEX-AS Circulating Pump Head & Body only	6225
Composite Auto Air Vent	6212
Composite Pressure Relief Valve	6211
Filling Loop	2133
Pressure Gauge (Insta)	6607
Control PCB with LCD (Insta)	6616
12 litre Round Expansion Vessel	2128
Flue Thermostat	3535
Diverting Valve Stepper Motor	6227

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

Warranty information can be found online at:

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

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 should be electrically isolated and disconnected.

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

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

Glass fibre insulation – suitable PPE should 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:

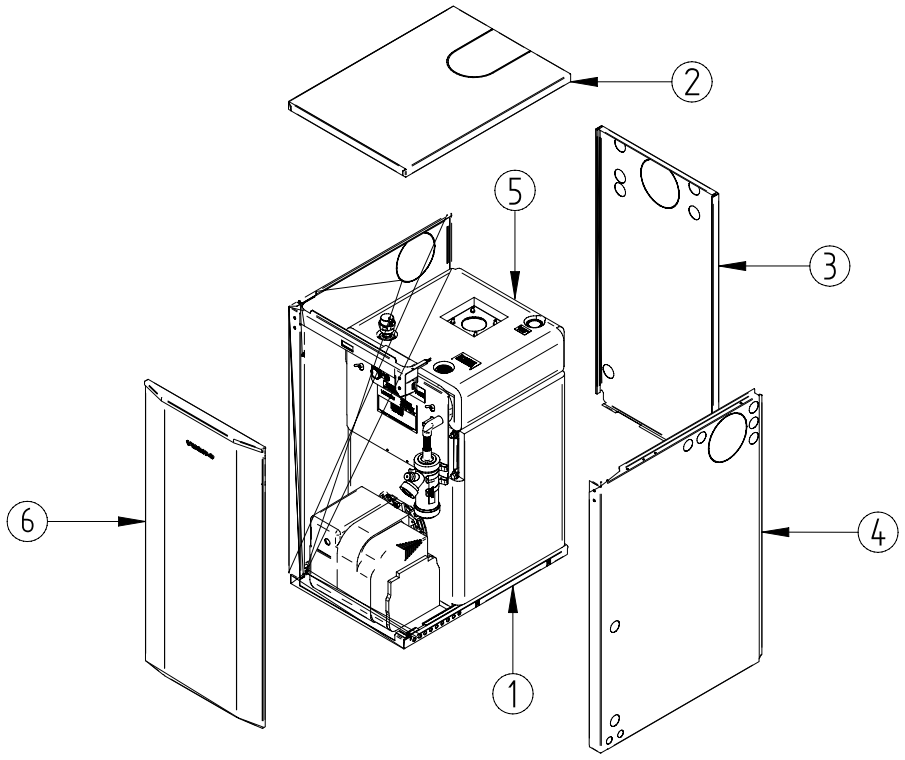
- Mild Steel
- Stainless Steel
- Copper
- Brass
- Ceramic Fibre
- Plastic components
- Electronic components

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.

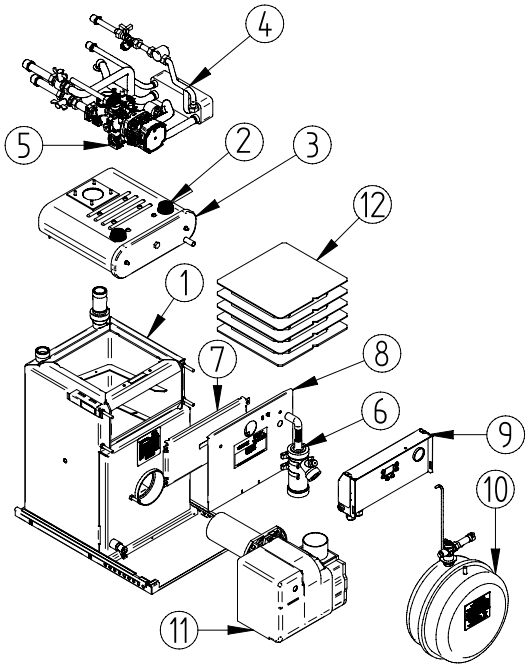
The components of a typical appliance including heat generator are shown (not all components may be fitted, depending on appliance specification).

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 Insta Boiler



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

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

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This manual is accurate at the date of printing (E&OE) but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued product improvement.

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