Boiler Manual NZ

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

High Efficiency Condensing Boilers

For New Zealand - use with Diesel only ***NZ Burner Approval BUR1511***

Models covered by this manual:

B-Series

Boilerhouse	*B70HE*	*B90HE*	*B120HE*	

U-Series

Utility	*U70HE*	*U90HE*	*U120HE*	*U150HE*
Utility Pumped	*UP70HE*	*UP90HE*	*UP120HE*	*UP150HE*
Utility System	*US70HE*	*US90HE*	*US120HE*	
Utility Combi	*UC70HE*	*UC90HE*	*UC120HE*	

K-Series

Kabin Pak	*K70HE*	*K90HE*	*K120HE*	*K150HE*
Kabin Pak Pumped	*KP70HE*	*KP90HE*	*KP120HE*	*KP150HE*
Kabin Pak System	*KS70HE*	*KS90HE*	*KS120HE*	
Kabin Pak Combi	*KC70HE*	*KC90HE*	*KC120 HE*	

Cert. no. FM29884

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 heat IQ warranty card is completed and returned.

NZ

Refer to appendix a for Diesel Nozzles and pump pressures

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 Heat IQ registered technician.

New Zealand Customers Only

Boiler installation and commissioning

must be carried out by a suitably

qualified technician

Technical support Heat IQ

06 344 7392

For Parts, Service Technical & Warranty Contact

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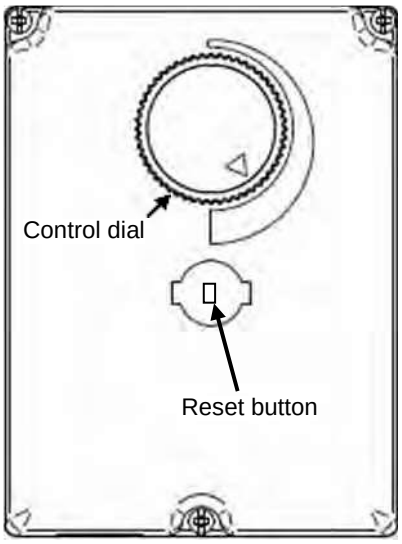
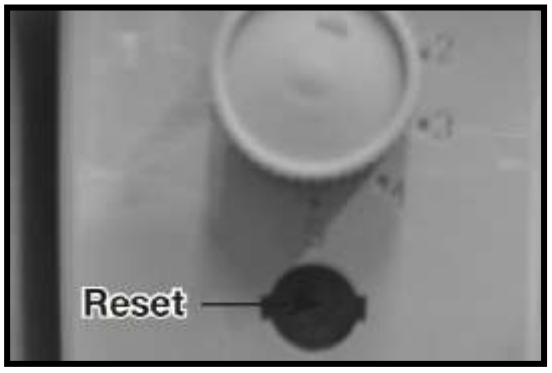
1 USER INSTRUCTIONS

1.1 Dual Thermostat



The radiator temperature is regulated via the boiler control thermostat. The thermostat is user adjustable from 45°C at its minimum setting (dial „0") to 75°C at its maximum setting (dial „5"). In order to provide an additional level of safety there is a high limit thermostat which has a cut off point of 110°C; this is factory set and is not adjustable. If thermostat trips it needs to be reset manually.

1.2 High Limit Thermostat Reset



If the high level thermostat trip has operated, remove the reset cover by using a coin or screwdriver (turning anti clockwise) and press the small red button now exposed. Do not press the reset button while the boiler is still hot as this will cause damage to the thermostat.

1.3 Burner Lockout

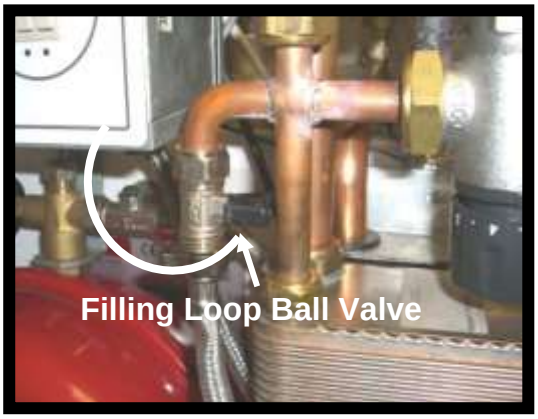
When the pressure jet oil fired burner stops after failing to fire the red reset button will be illuminated. This indicates that there is a fault or there is no fuel getting to the burner. The house holder should only reset the burner twice in succession. If the burner continues to lockout contact Warmflow or your service engineer.

1.4 System Pressure – System & Combi Boilers

When the boiler is connected to a sealed system the system pressure should be periodically checked. The minimum pressure, as indicated by the black needle, is 0.5 bar when the boiler is cold and 2.5 bar when the boiler is at normal operating temperature. If the pressure is outside this range contact Warmflow or your installer.

1.5 Filling Loop

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 valve. After the system has been topped up the pressure gauge should read 1 bar when the system is cold. The valve must be fully closed and the flexible filling loop removed from the valve, expect a small water loss from the pipe.



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.

1.6 Combi Control Panel

The heating control thermostat is user adjustable from 50°C to 80°C. In order to provide an additional level of safety there is a high limit thermostat which has a cut off point of 110°C; this is factory set and is not adjustable. The high limit thermostat is located under the control panel to the left hand side, press button to reset. As standard the panel is fitted with two on/off selector switches to control hot water and central heating. These switches can be replaced by the optional two channel digital programmer, instructions for use are provided in the main boiler handbook.

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

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

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, eg, plastic overflow pipe, directly into the household drain or soak away.

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

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

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

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

3 BEFORE FITTING A COMBI BOILER THE INSTALLER MUST CHECK:

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

2. 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, a pressure reducing valve must be fitted to limit the maximum supply pressure to 3 bar.

3. Where the mains water pressure is supplied via a borehole pump and accumulator the pressure variation must not affect the thermostatic mixer valve. Contact Warmflow for further details.

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 (eg 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 F Northern Ireland and Part L Republic of Ireland.

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

As standard the Combi and System boilers are fitted with a system expansion vessel, circulating pumps, filling loop, pressure gauge and safety valve. An optional 7-day electronic programmer kit is also available for all Utility boiler models.

The Combi 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 UK installs

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

BS5410 : PART 1 Code of practice for oil firing.
BS5449 : PART 1 Forced circulation hot water systems.
BS7593 : Treatment of water in domestic hot water central heating systems.

Current Building Regulations: Part J England and Wales
Section 3 Scotland
Part L Northern Ireland
Part J Republic of Ireland

Current IEE Regulations

BS7074 : PART 1 Application Selection & Installation of Expansion Vessels

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 Combi General Requirements

The boiler will have a DHW priority when both domestic hot water (DHW) and central heating (CH) are selected. So if the flow switch is closed or the heat store has not been satisfied the entire output of the boiler is directed to DHW before the boiler will switch over to CH. When fully cold it can take up to 20 minutes for the heat store of a 90,000 Btu/h combi to be satisfied, and slightly longer for a 70,000 Btu/h combi.

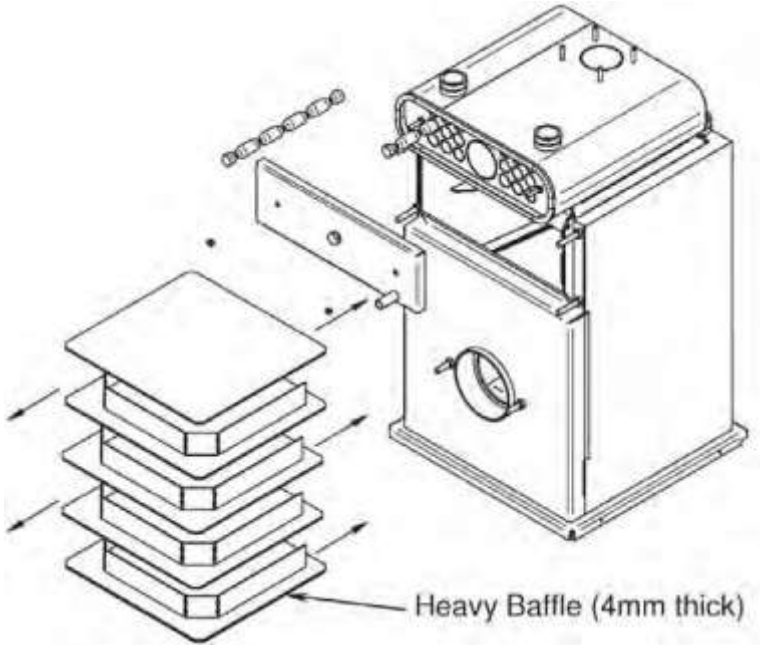
After a draw-off of 120L at 24L/min, with an average temperature rise of 32ºC, the thermal store of a 90,000 Btu/h combi has a recovery time of approximately 7 minutes. A 70,000 Btu/h combi will take slightly longer to recover.

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

4.3.1 Pump Overrun

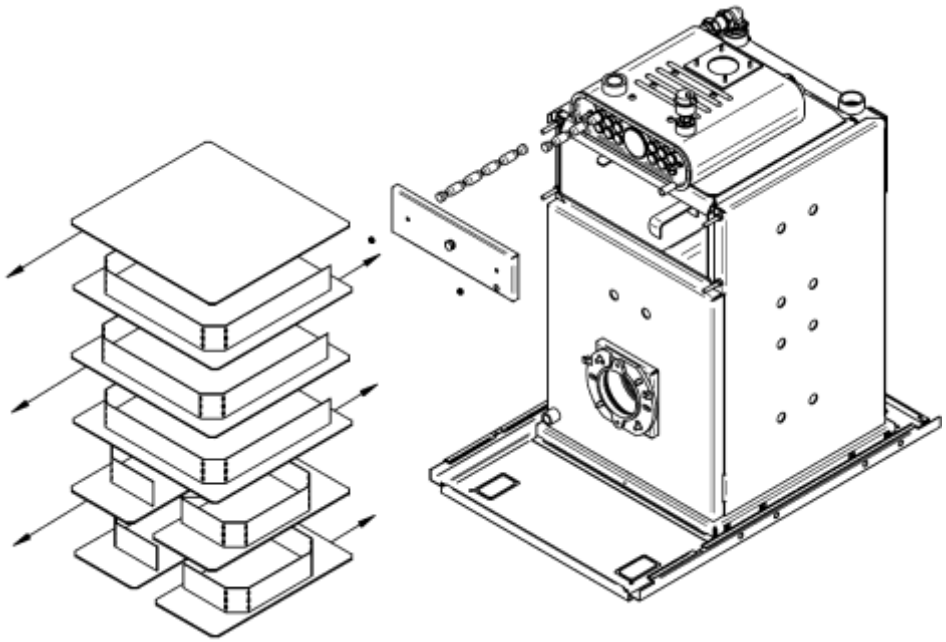
Where there is a build up of excess heat in the boiler primary heat exchanger and the central heating has not been selected then the pump overrun thermostat will operate. The excess heat will then be pumped into the heat store. Once the temperature has fallen in the boiler and the pump overrun stat is satisfied, then the hot water pump will stop.

4.4 Baffle Positioning



Models up to 120 HE

The primary heat exchanger baffles consist of one heavy baffle stack (4mm 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).

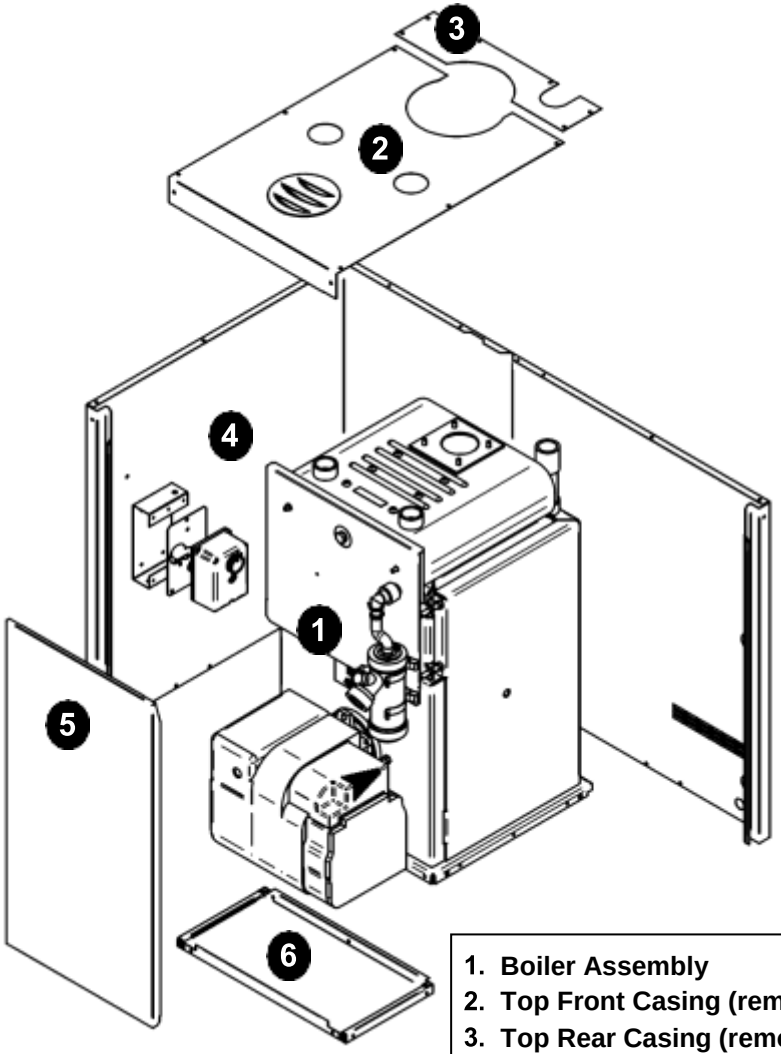


150 HE Models

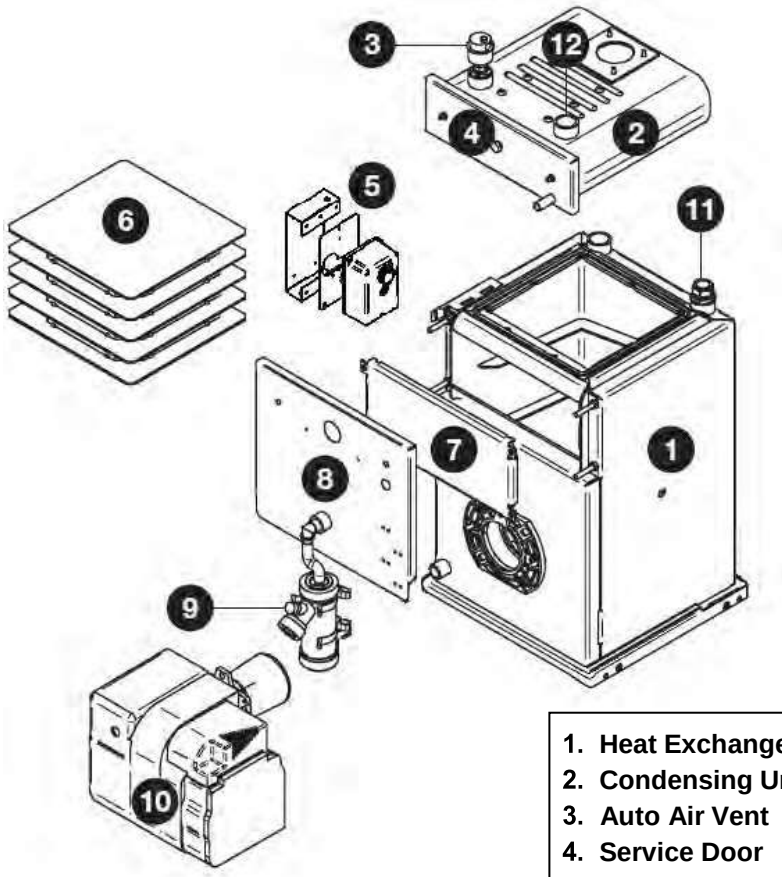
The primary heat exchanger baffles consist of two half-width baffle stacks at the bottom, 3 full-width baffle stacks in the middle and 1 baffle plate at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked.
To achieve maximum efficiency, push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

4.5 Components

4.5.1 B-Series Boilerhouse – Casing Components & Key Components



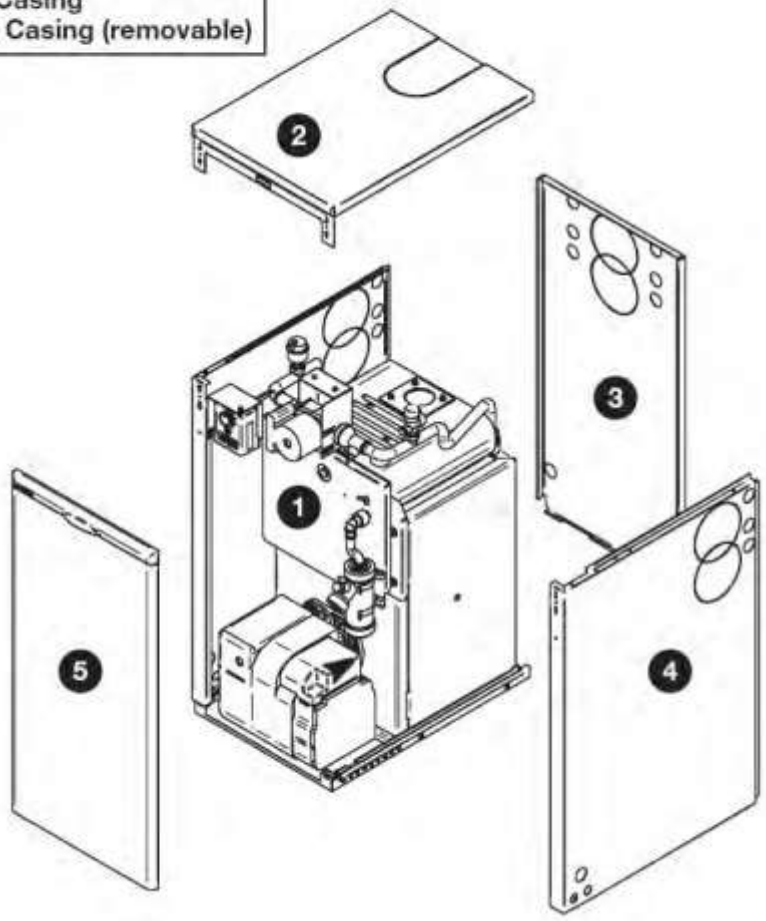
1. Boiler Assembly
2. Top Front Casing (removable)
3. Top Rear Casing (removable)
4. Sides & Rear Casing
5. Front Casing (removable)
6. Bottom Front Casing



1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection

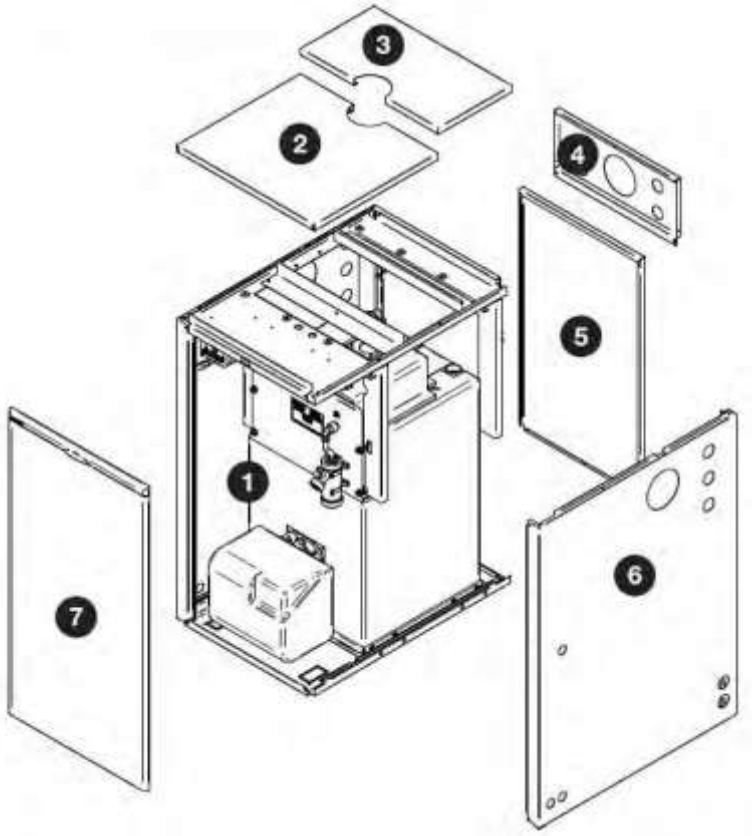
4.5.2 U-Series Utility – Casing Components

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



Models up to 120 HE

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

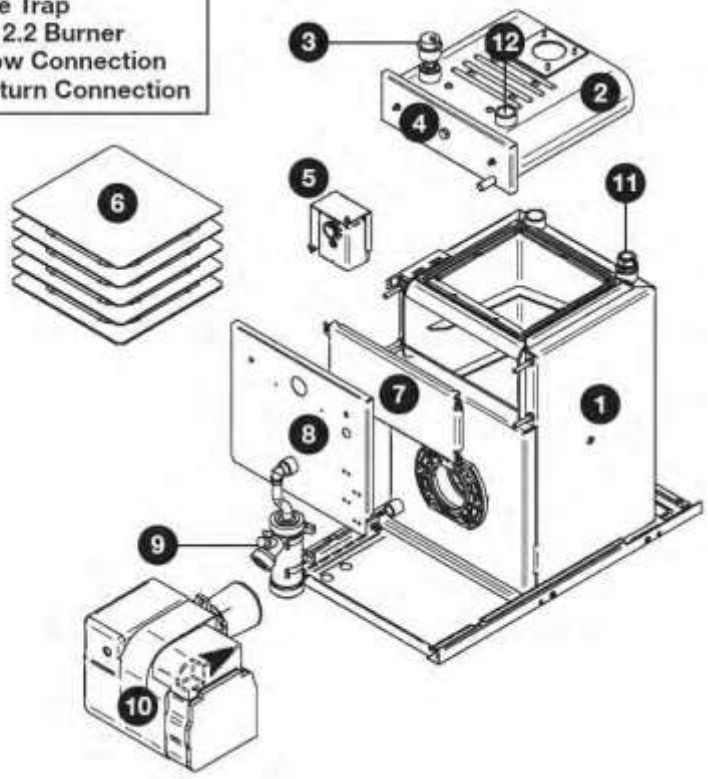


150 HE Models

4.5.3 U-Series Utility – Pre-Wired (UHE)

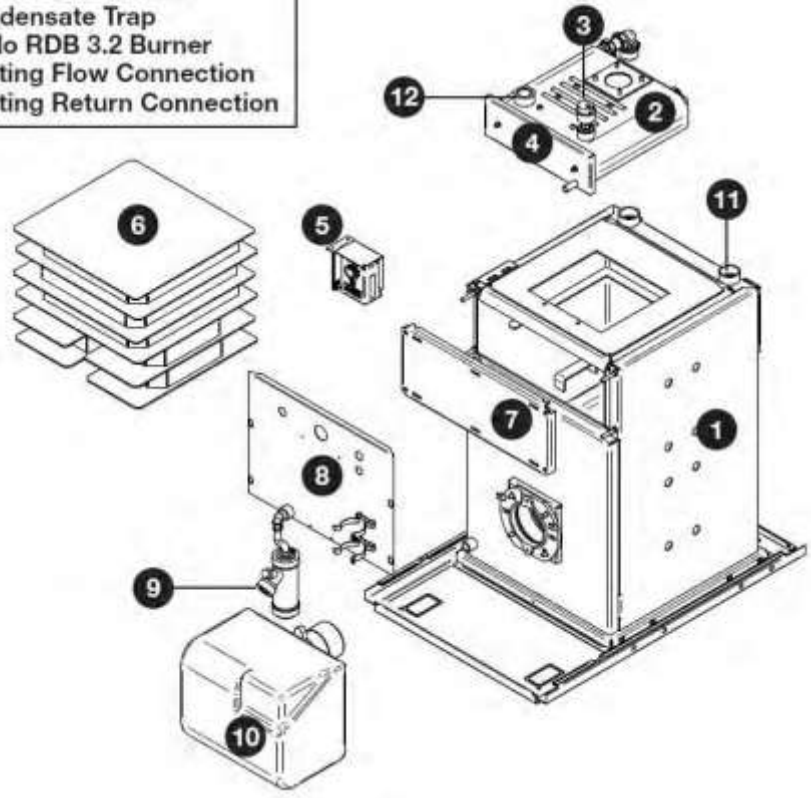
Key Components

1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection



Models up to 120 HE

1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 3.2 Burner
11. Heating Flow Connection
12. Heating Return Connection

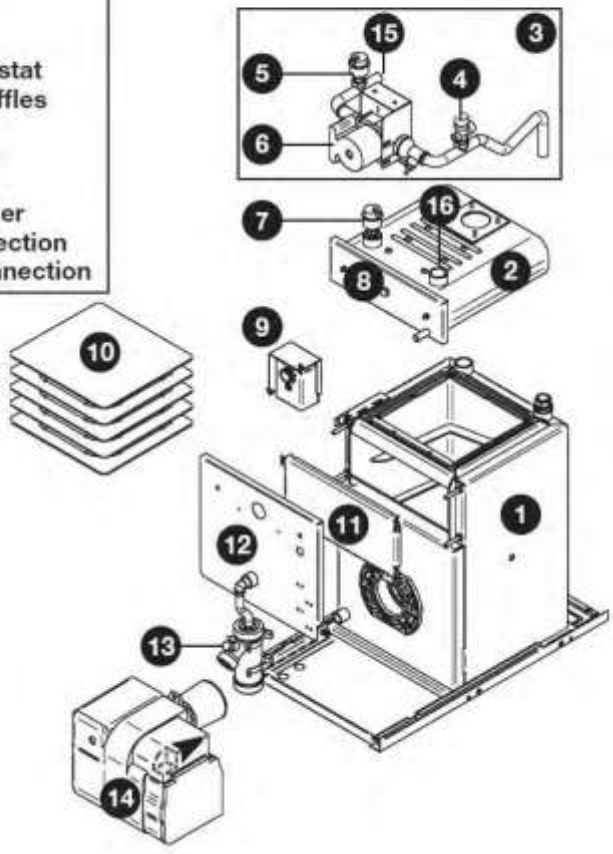


150 HE Models

4.5.4 U-Series Utility – Pumped (UPHE)

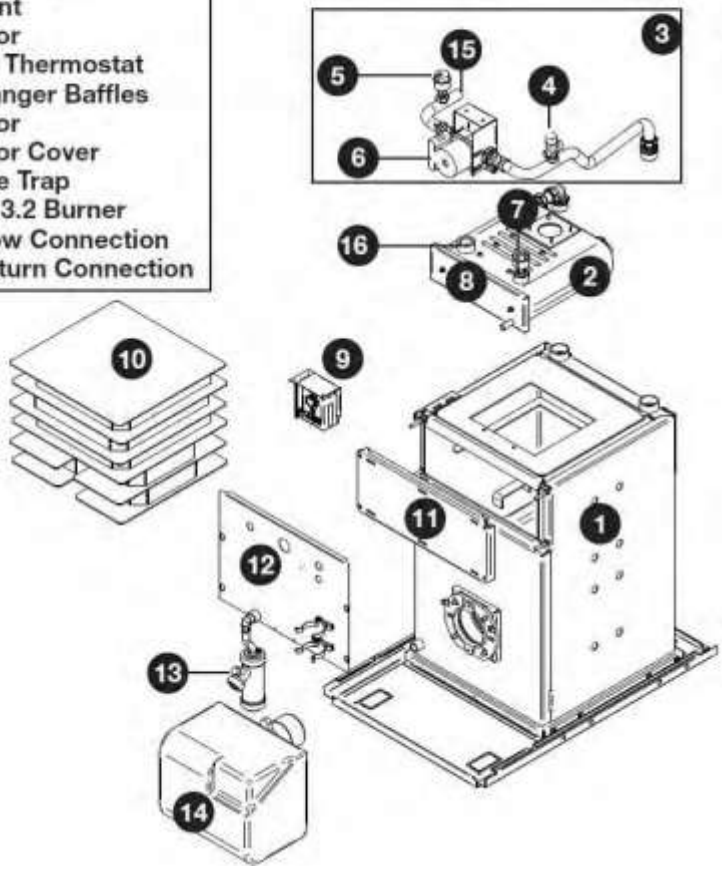
Key Components

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 2.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



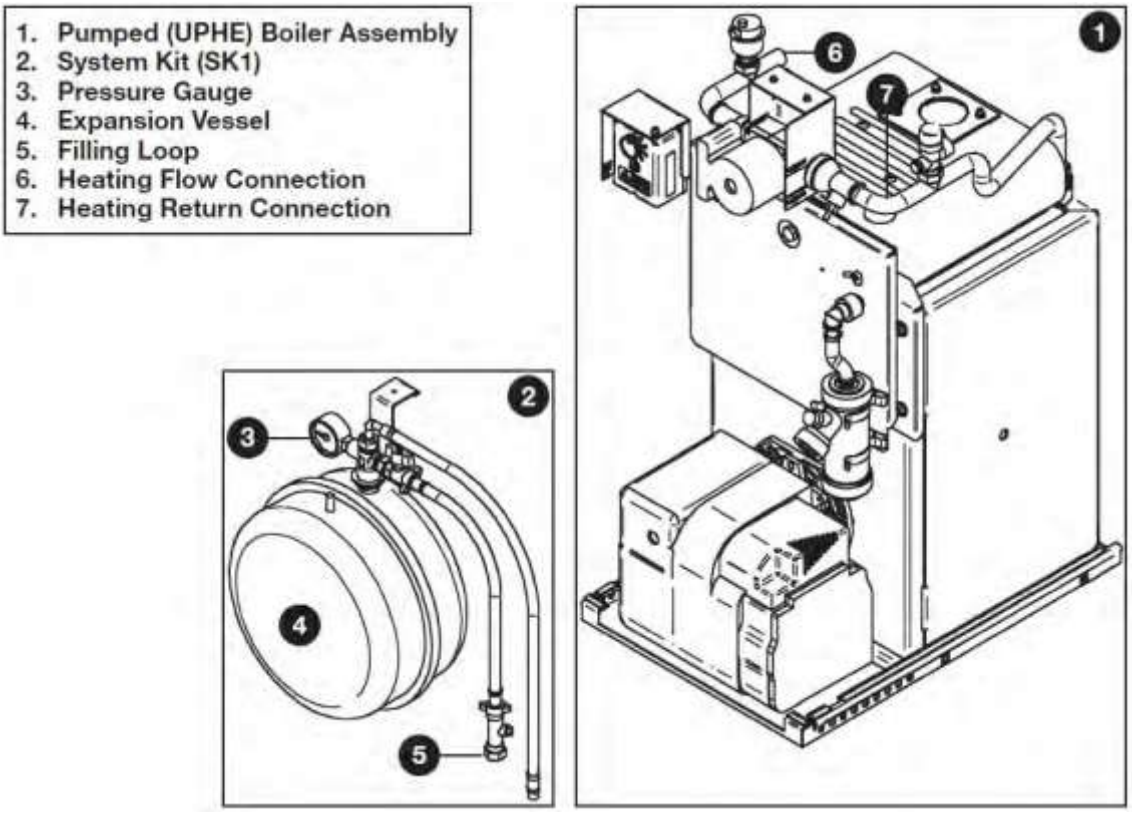
Models up to 120 HE

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 3.2 Burner
15. Heating Flow Connection
16. Heating Return Connection

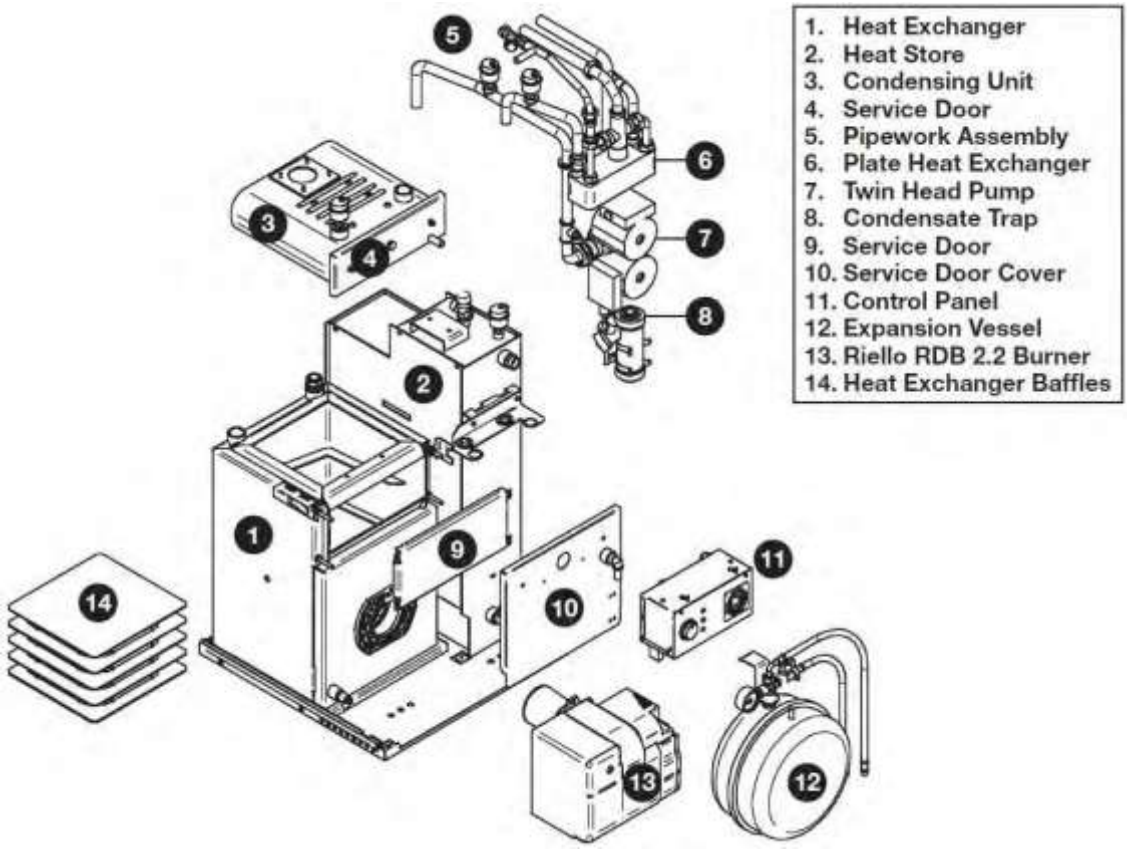


150 HE Models

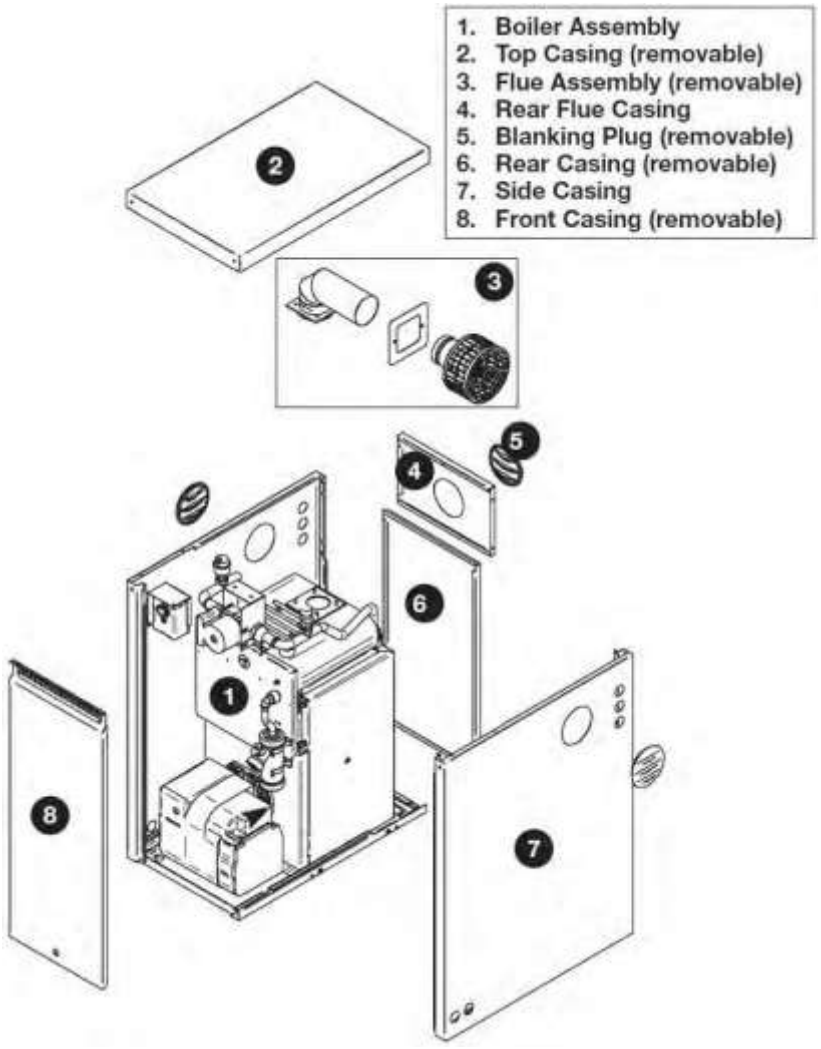
4.5.5 U-Series Utility – System (USHE) - Key Components



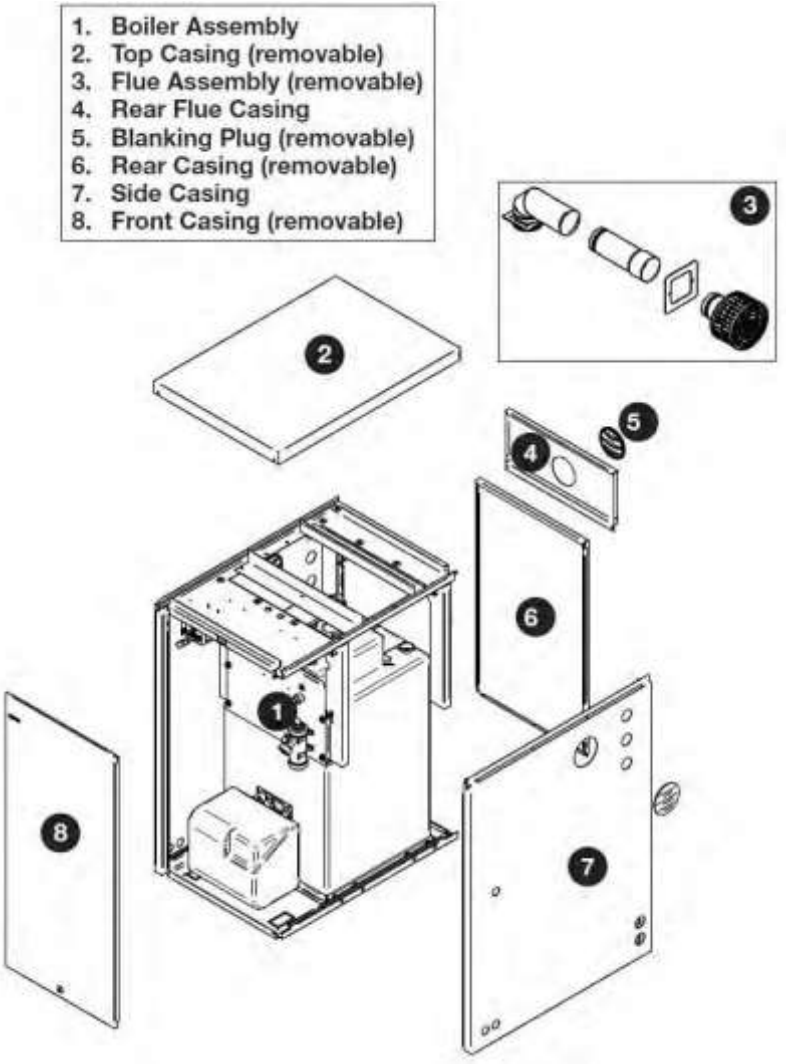
4.5.6 U-Series Utility – Combi (UCHE) - Key Components



4.5.7 K-Series Kabin Pak – Casing Components



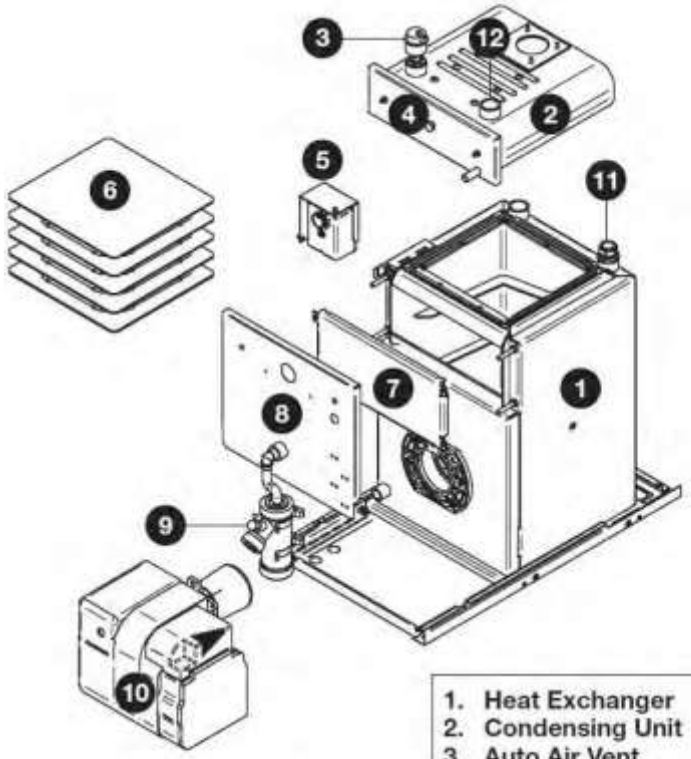
Models up to 120 HE



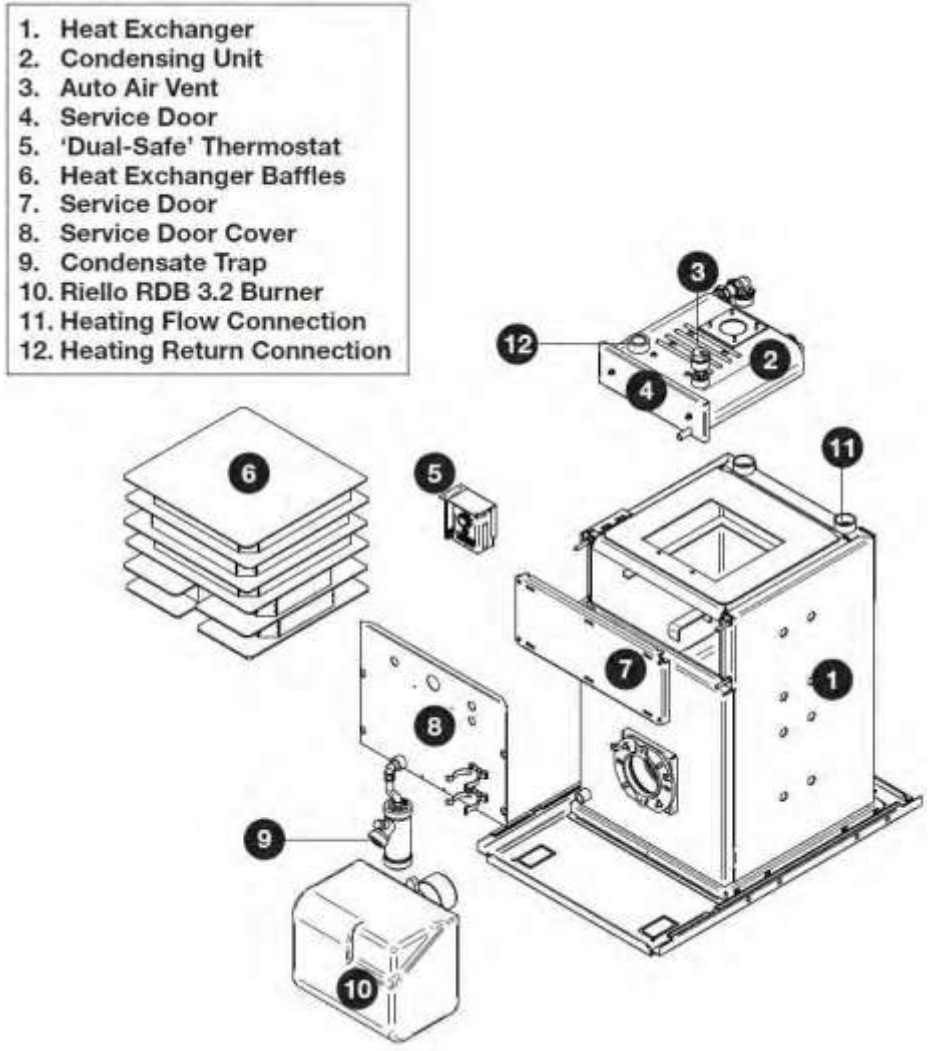
150 HE Models

4.5.8 K-Series Kabin Pak - Pre-Wired (KHE)

Key Components



Models up to 120 HE

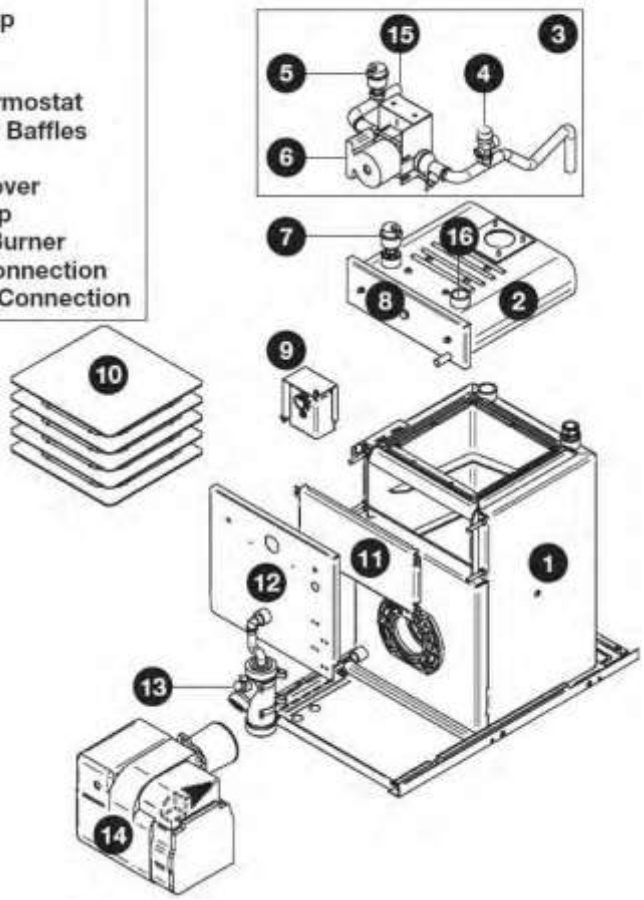


150 HE Models

4.5.9 K-Series Kabin Pak - Pumped (KPHE)

Key Components

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 2.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



Models up to 120 HE

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
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9. 'Dual-Safe' Thermostat
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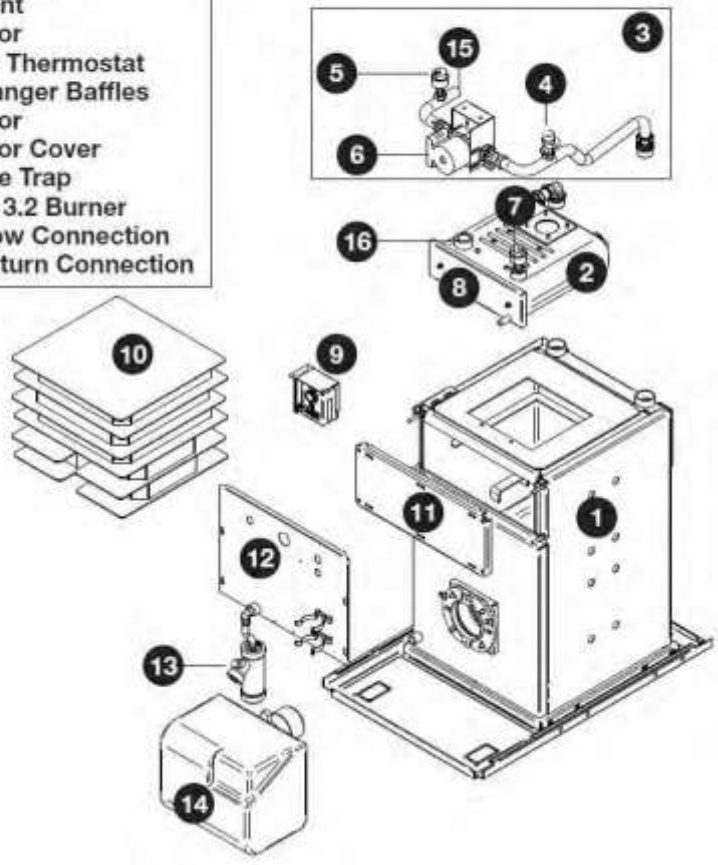
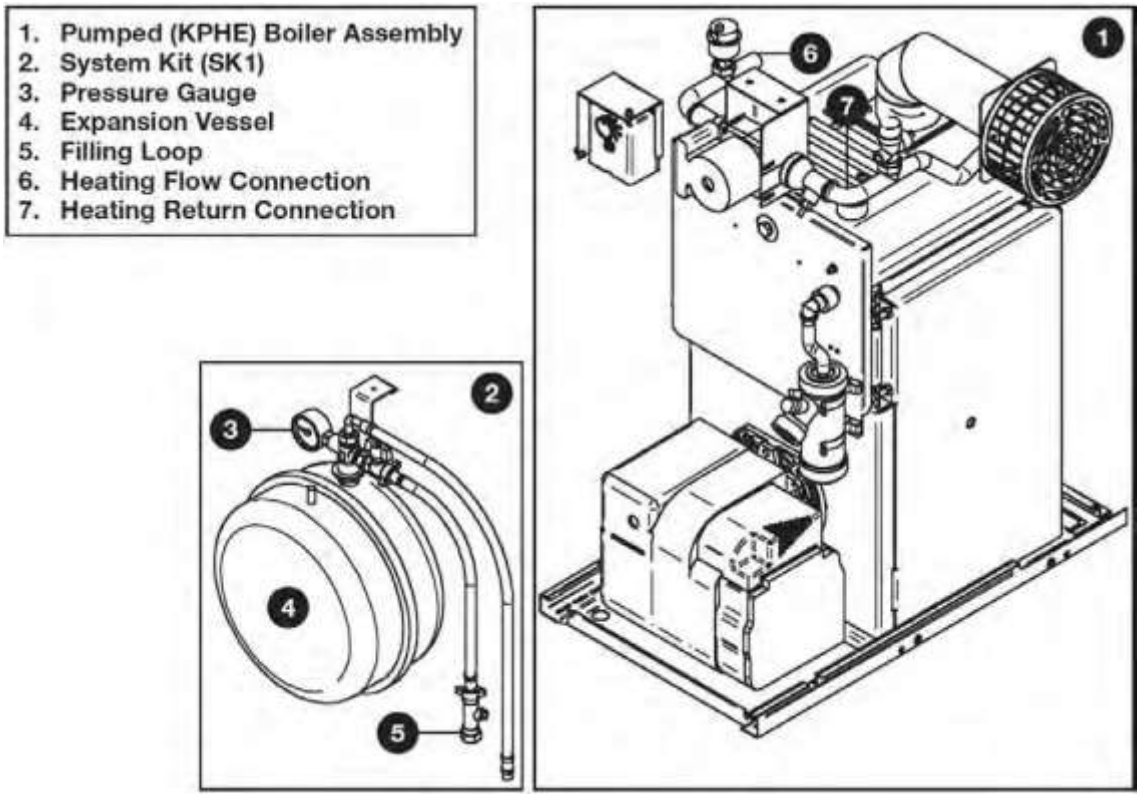
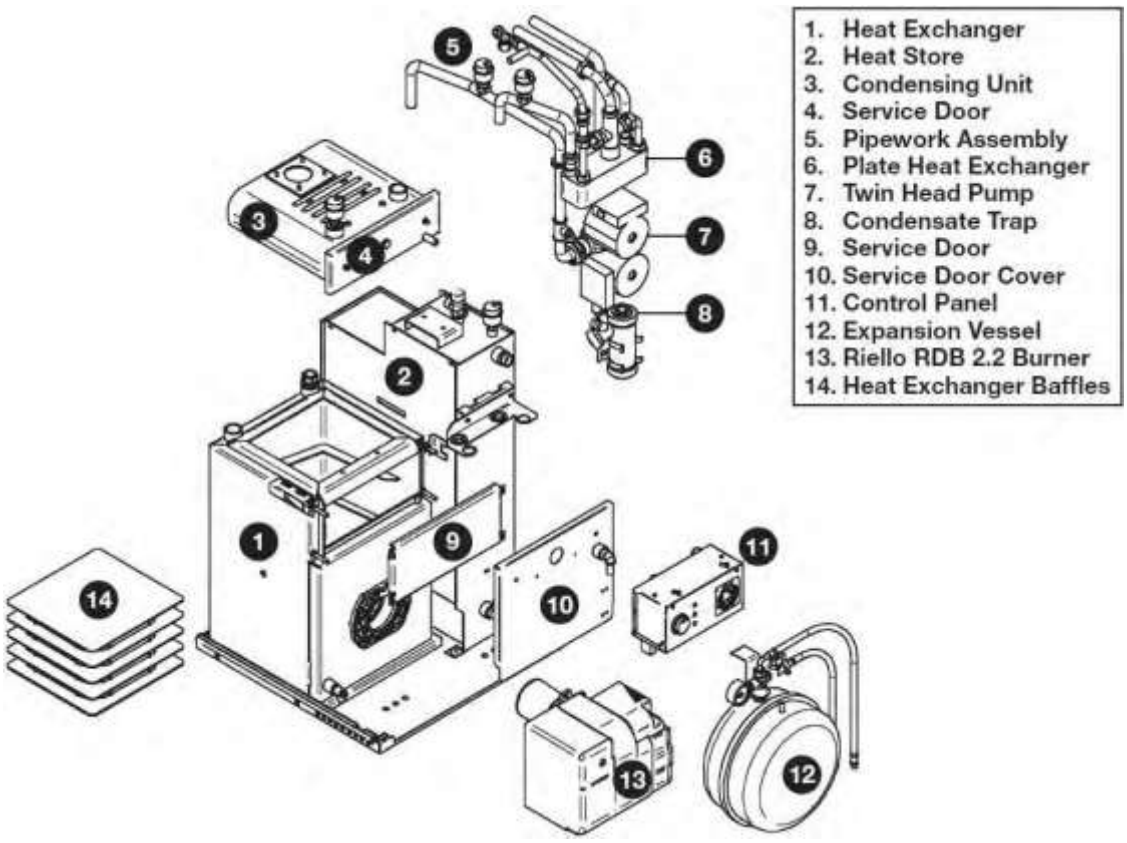


150 HE Models

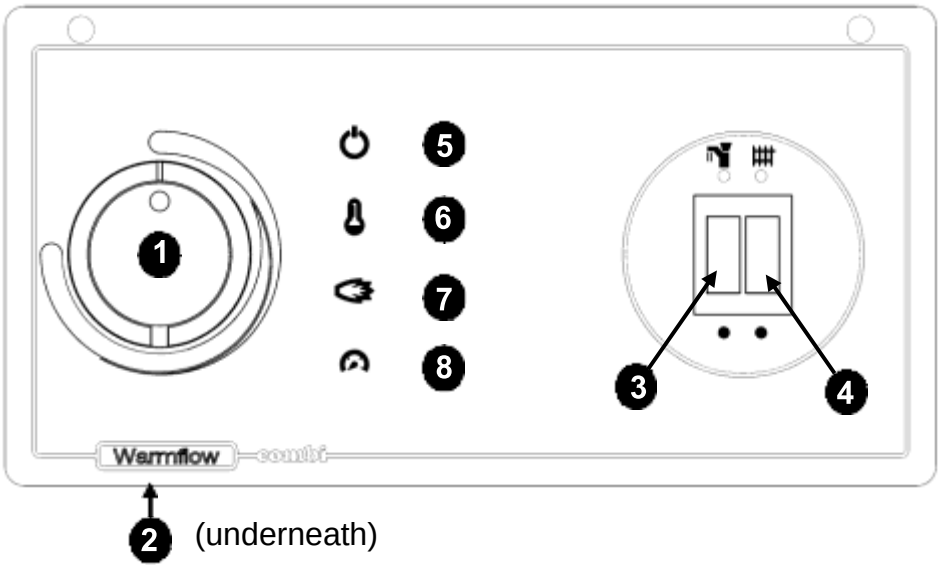
4.5.10 K-Series Kabin Pak – System (KSHE) - Key Components



4.5.11 K-Series Kabin Pak – Combi (KCHE) - Key Components



4.5.12 Combi Control Panel Layout



1) Heating Temperature Control
The heating temperature control adjusts the temperature of the central heating water flowing from the boiler to the radiators. Turn the dial clockwise towards red to increase the temperature and anticlockwise towards blue to reduce.

2) High Limit Reset
The high limit thermostat protects the boiler against overheating and is factory set to 110°C (not adjustable). Should this thermostat ever trip, it must be reset by pressing the small red button underneath the control panel towards the left hand side. Do NOT reset when the boiler is still hot.

3) Hot Water On/Off Switch
4) Heating On/Off Switch
Heating and Hot Water modes are controlled via the on/off switches unless a remote time clock has been fitted. Consult your installer.

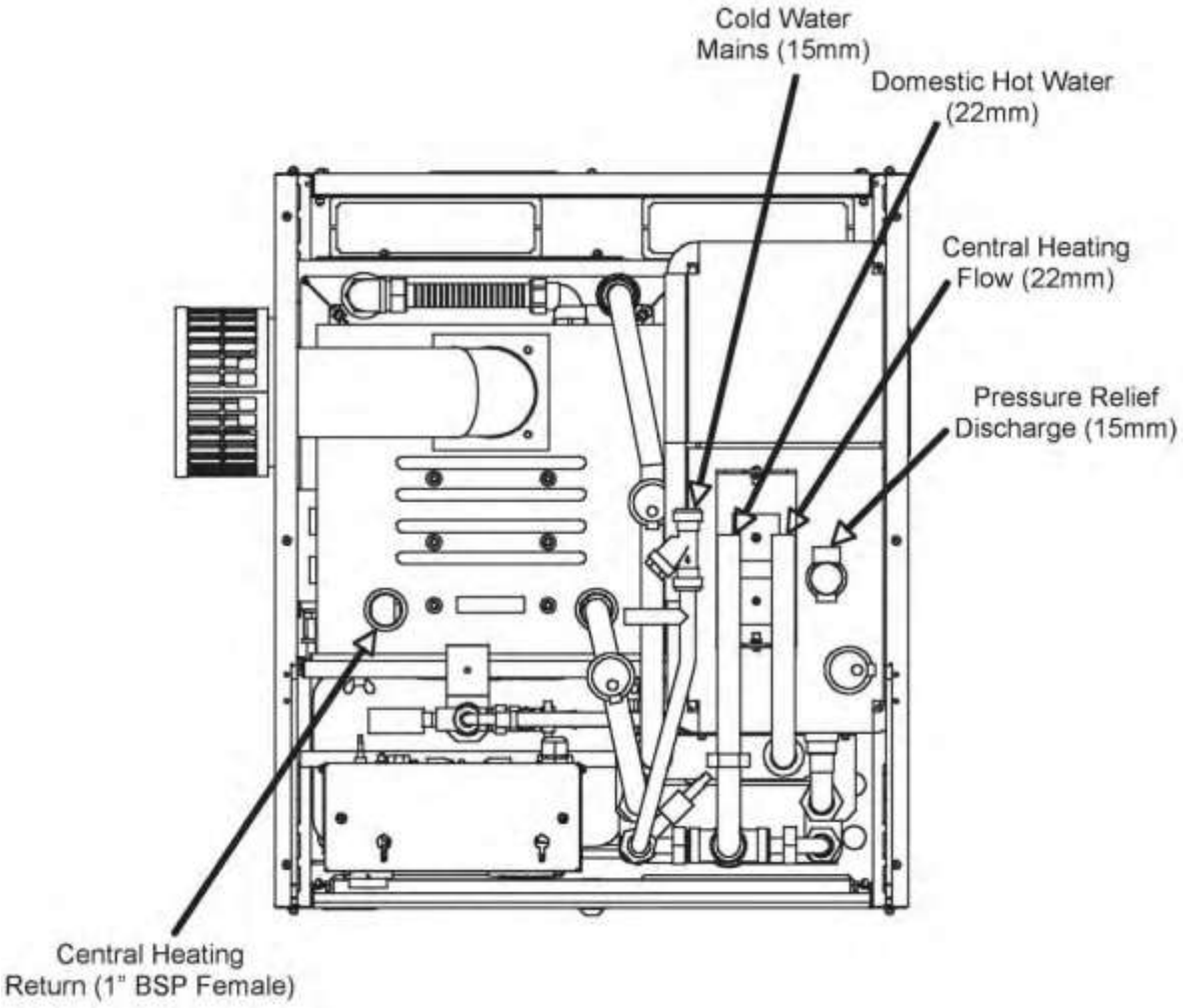
5) Mains On Lamp
If this lamp is not lit there may be no power coming to the appliance. Check fuses and heating controls.

6) High Limit Lamp
If this lamp is lit, the high limit thermostat has tripped. Press the high limit reset (2).

7) Burner Lockout Lamp
If this lamp is lit, the burner has locked out after failing to fire. Press the red reset button on the front of the burner.

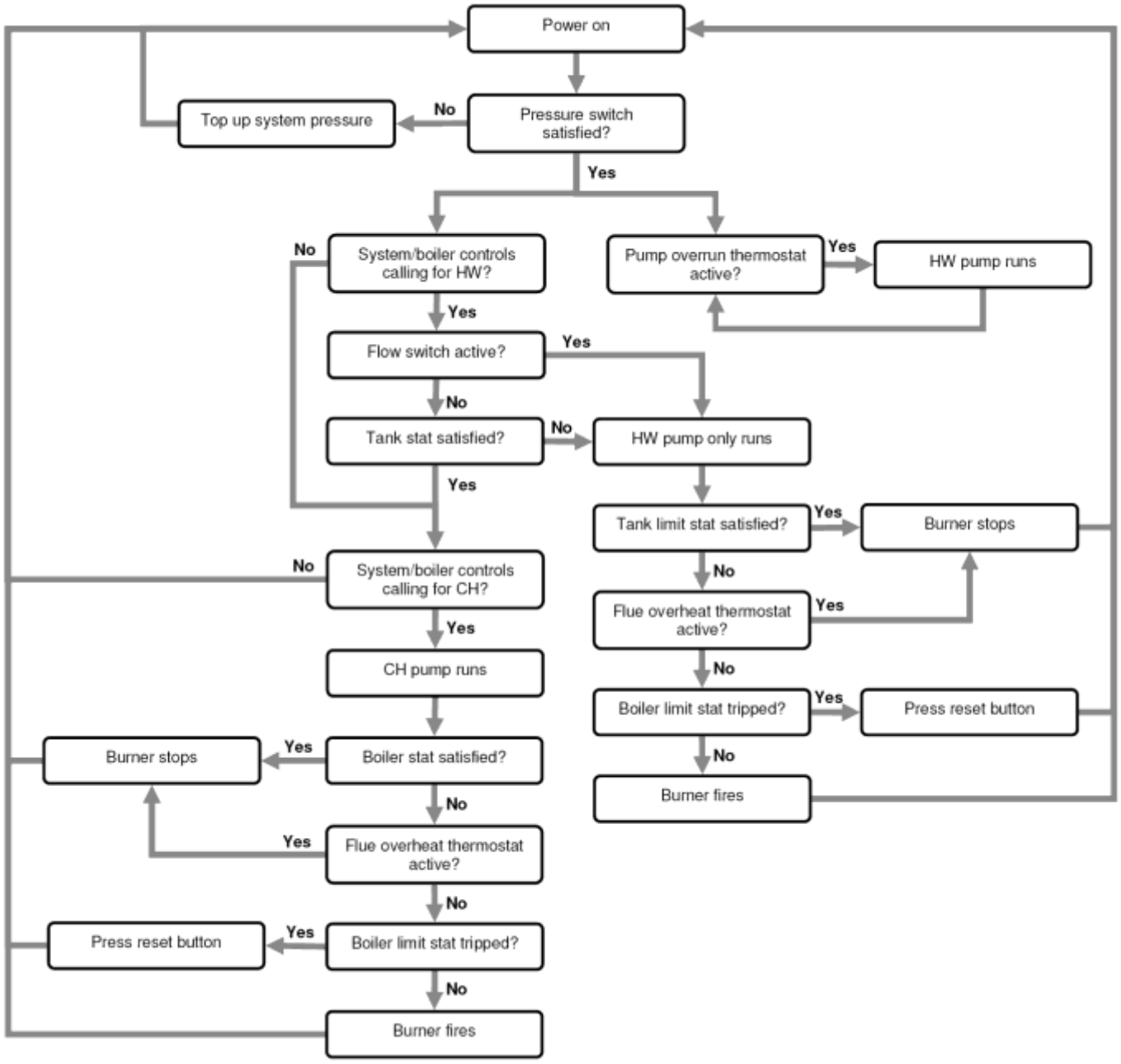
8) Low Pressure Lamp
If this lamp is lit, the system pressure has fallen below 0.3 bar. Refer to the instructions in Sections 1.4 and 1.5. Additionally, top up the pressure until the light goes out then release pressure via the pressure relief valve until system pressure is 1 bar when the boiler is cold.

4.5.13 Combi Pipe Layout (UCHE & KCHE Models)



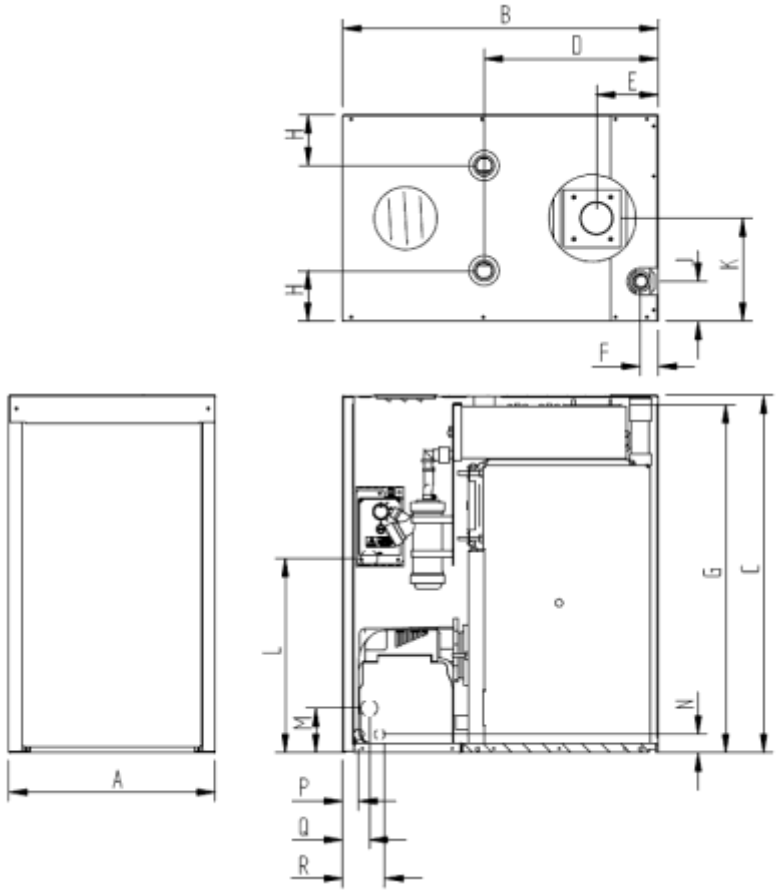
5 TECHNICAL DETAILS

5.1 Combi Sequence of Operation Flow Chart



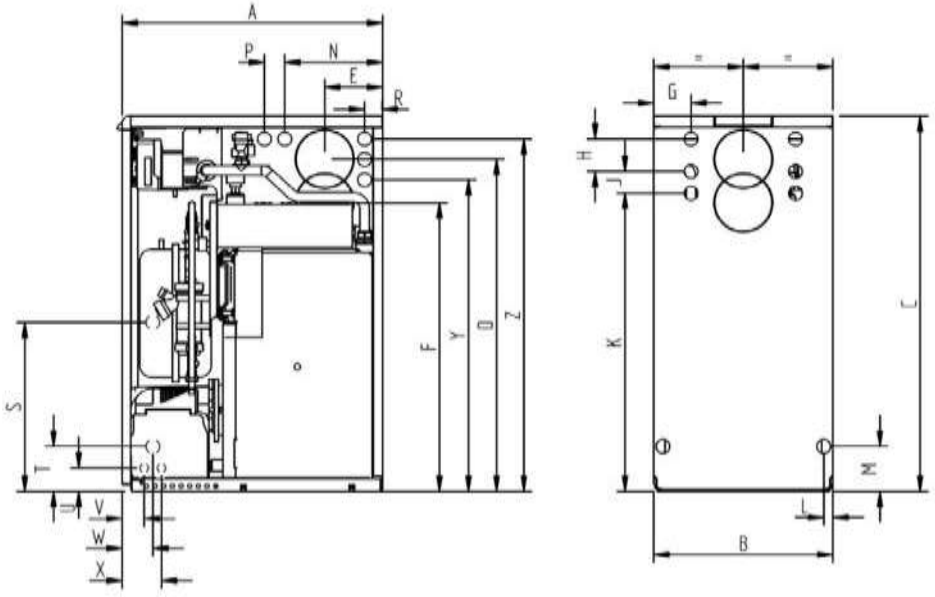
5.2 Dimensions

5.2.1 B-Series Boilerhouse (B70HE, B90HE & B120HE Models)



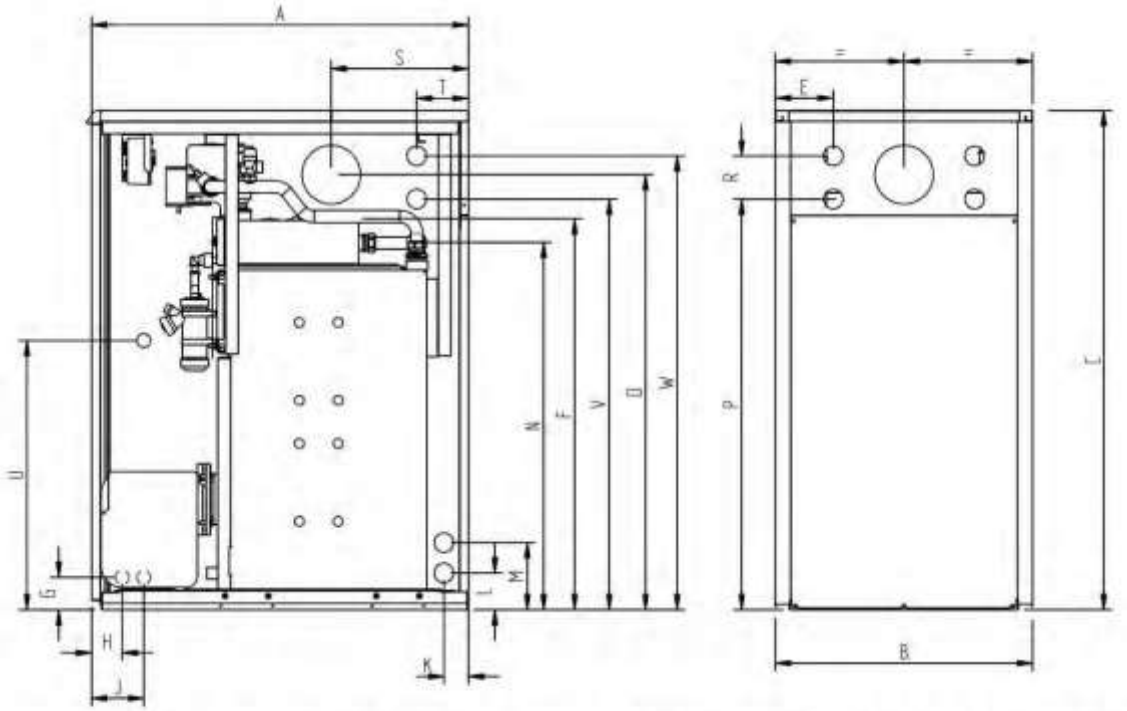
A	395
B	600
C	685
D	332
E	118
F	34
G	664
H	97
J	77
K	197
L	371
M	85
N	35
P	30
Q	50
R	80

5.2.2 U-Series Utility (UHE, UPHE & USHE Models up to 120HE)



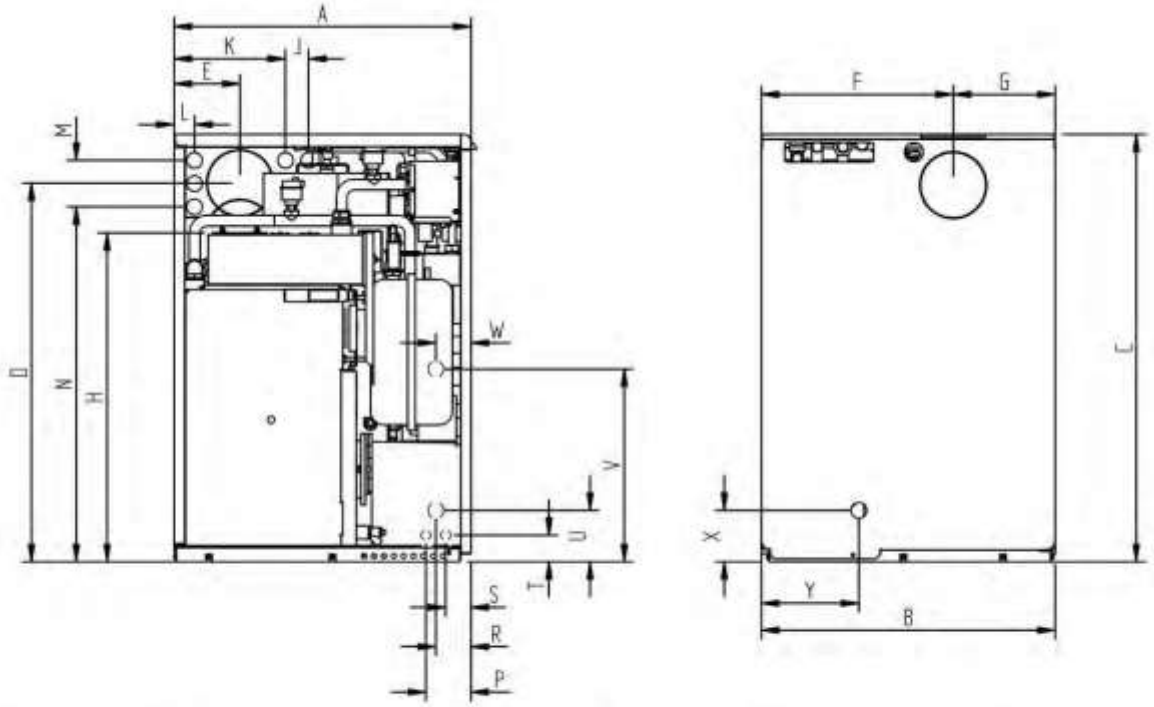
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z
U~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812
UP~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812
US~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812

5.2.3 U-Series Utility (150HE Models)



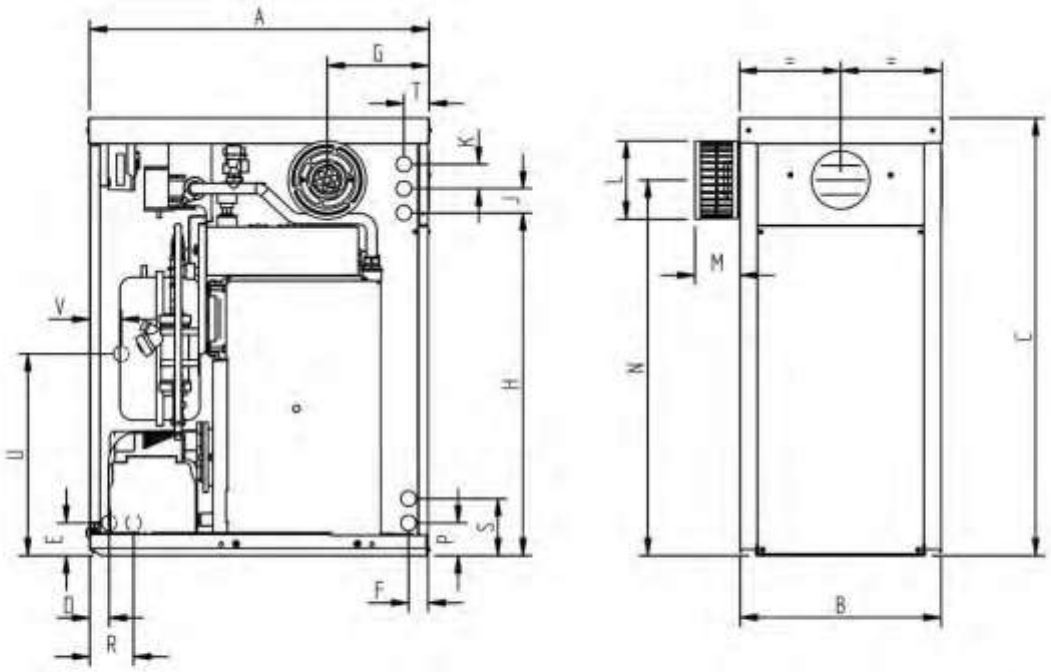
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W
U150HE	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050
UP150HE	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050

5.2.4 U-Series Utility (UCHE Models)



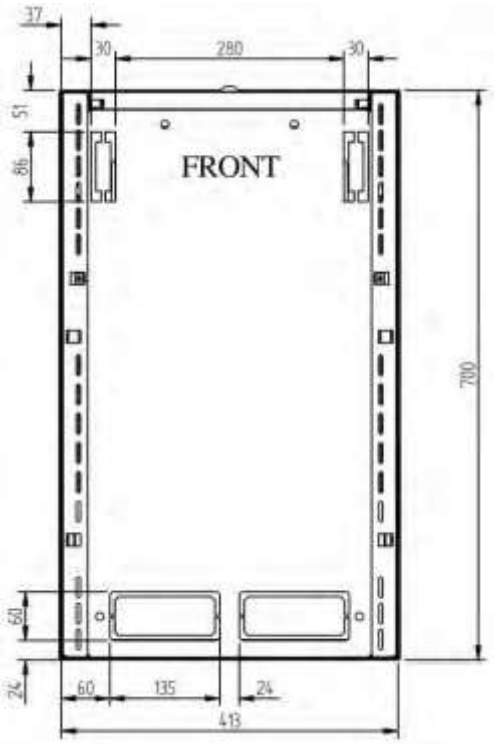
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y
UC~	600	595	865	766	134	388	207	666	47	226	42	94	718	91	71	51	54	104	390	71	104	197

5.2.5 K-Series Kabin Pak (KHE, KPHE & KSHE Models up to 120HE)

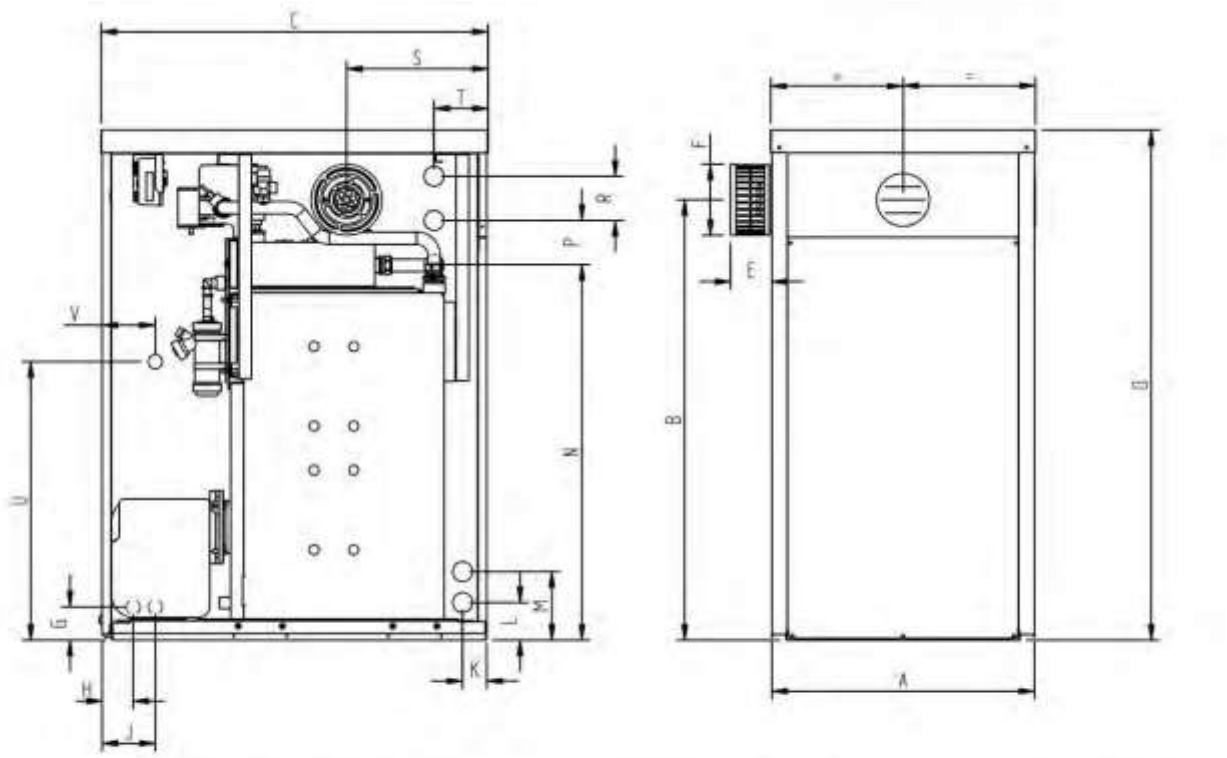


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
K~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
KP~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
KS~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65

5.2.6 K-Series Kabin Pak Base Tray (KHE, KPHE & KSHE Models up to 120HE)

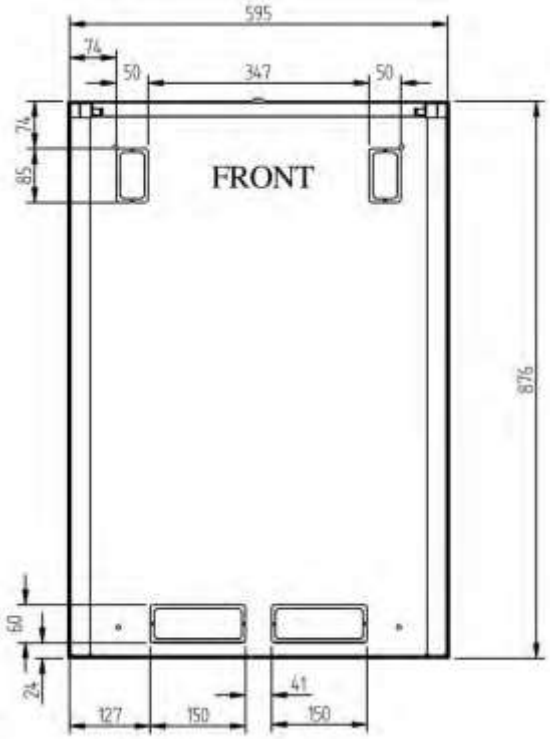


5.2.7 K-Series Kabin Pak (150HE Models)

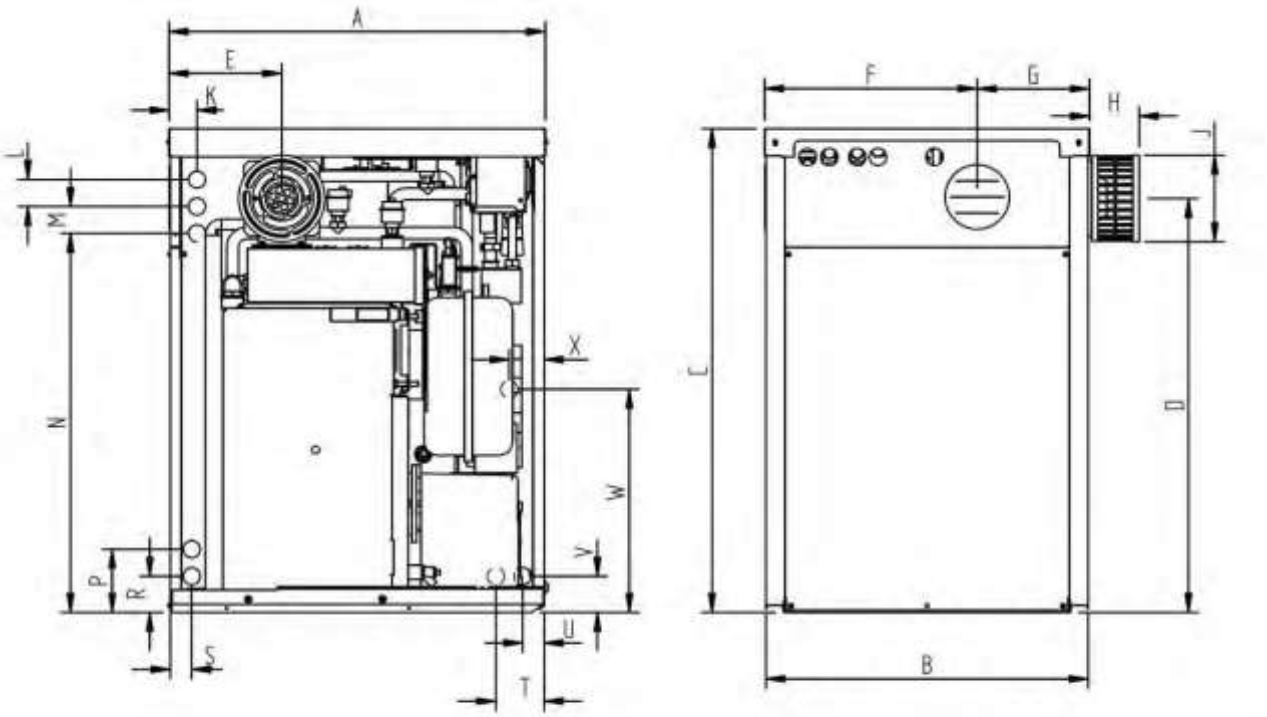


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
K150HE	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120
KP150HE	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120

5.2.8 K-Series Kabin Pak Base Tray (150HE Models)

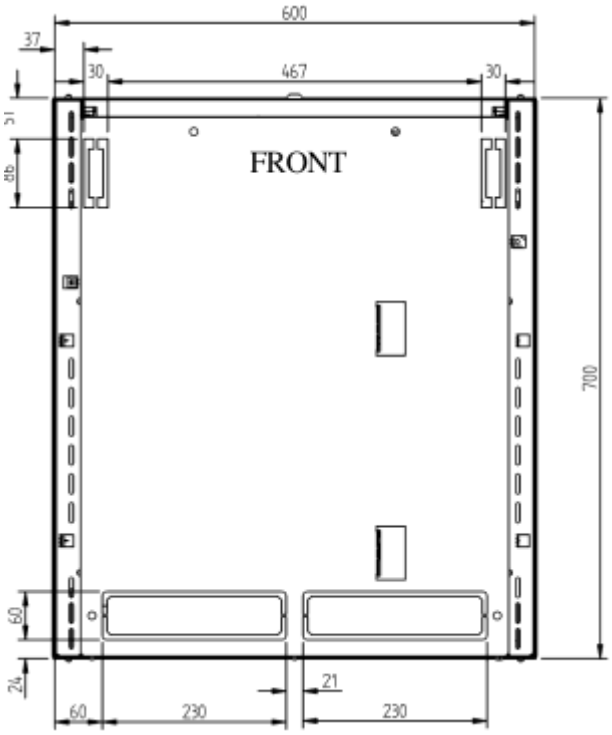


5.2.9 K-Series Kabin Pak (KCHE Models)



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X
KC~	700	600	900	770	210	396	209	92	161	52	50	50	705	117	67	40	90	40	67	415	65

5.2.10 K-Series Kabin Pak Base Tray (KCHE Models)

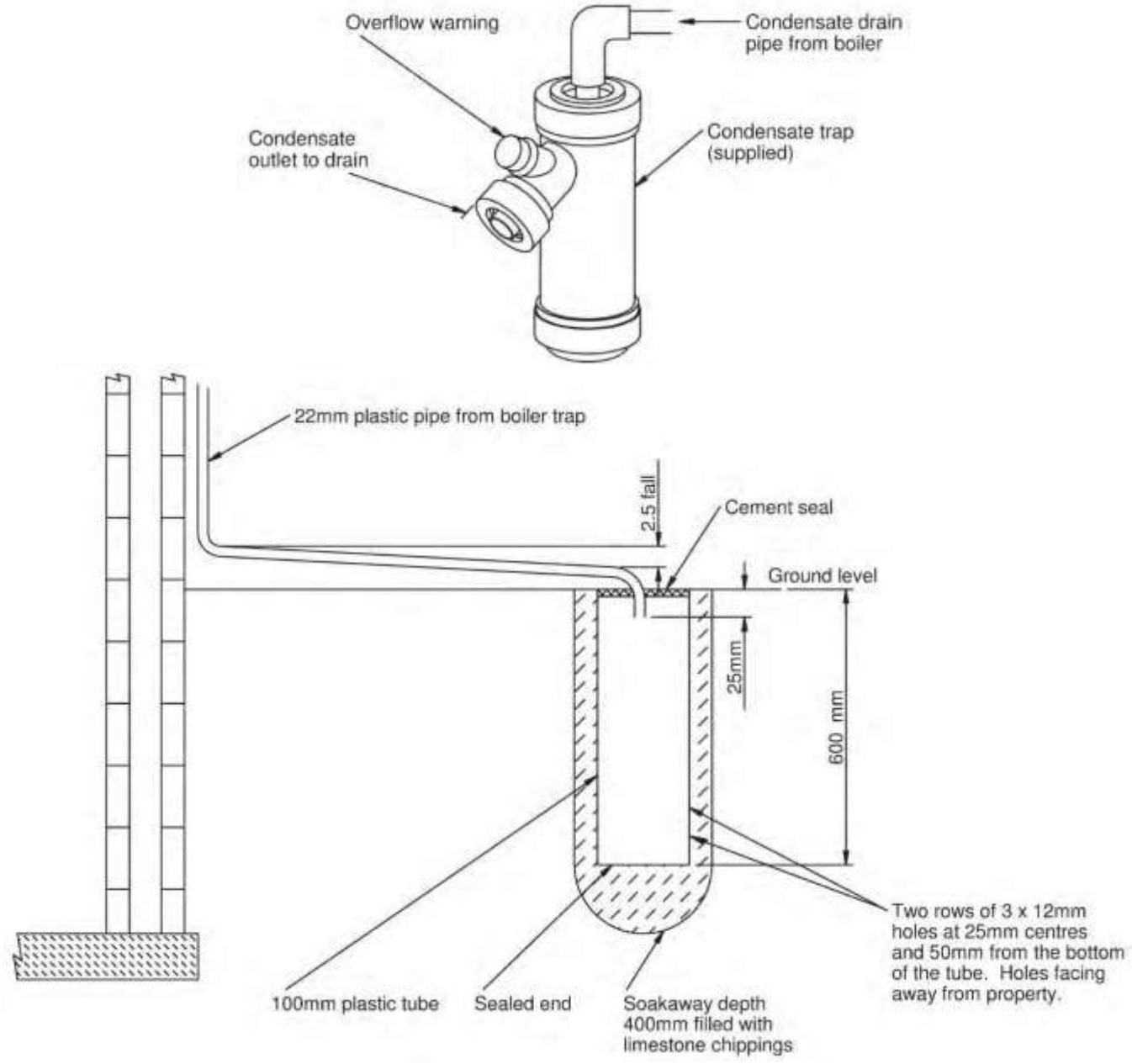


5.3 Condensate Disposal

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

The condensate drainage pipe within the boiler is a flexible plastic hose which can be trimmed to length. 3/4" or 22mm pipe 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.



5.4 Technical Data

5.4.1 B-Series Boilerhouse (BHE)

MODEL		B70HE			B90HE			B120HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings		FOR NZ see specific Diesel Nozzle sizing and pressure data sheet								
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Flow Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Dry	kg	78			78			78		
Boiler Weight Wet	kg	100			100			100		
SEDBUK Efficiency 2009		90.7%			90.7%			90.8%		
Factory Settings		Highlighted in bold								

5.4.2 U-Series Utility – Pre-Wired (UHE)

MODEL		U70HE			U90HE			U120HE			U150HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**											
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry	kg	90			90			90			175		
Boiler Weight Wet	kg	112			112			112			220		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%			90.3%		
Factory Settings		Highlighted in bold											

5.4.3 U-Series Utility – Pumped (UPHE)

MODEL		UP70HE			UP90HE			UP120HE			UP150HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**											
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		22mm Copper			22mm Copper			28mm Compression			28mm Copper		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water	litres	22			22			22			45		
Content	gals	4.8			4.8			4.8			9.9		
Boiler Weight Dry	kg	95			95			95			185		
Boiler Weight Wet	kg	117			117			117			230		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%			90.3%		
Factory Settings		Highlighted in bold											

5.4.4 U-Series Utility – System (USHE)

MODEL		US70HE			US90HE			US120HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**								
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Dry	kg	105			105			105		
Boiler Weight Wet	kg	127			127			127		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%		
Factory Settings		Highlighted in bold								

5.4.5 U-Series Utility – Combi (UCHE)

MODEL		UC70HE			UC90HE			UC120HE		
Nominal Heat Output	kW Btu/hr	14.7 50,000	**17.6** **60,000**	21.0 71,650	21.0 71,560	**23.5** **80,000**	27.1 92,380	27.1 92,380	**29.0** **99,050**	32.7 111,600
Nominal Heat Input	kW Btu/hr	15.3 52,150	**18.4** **62,600**	22.0 75,000	22.0 75,000	**24.4** **83,175**	28.0 95,550	28.0 95,550	**30.0** **102,400**	34.0 116,000
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
Secondary Air Damper		B			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure**								
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	0.85	0.85
Oil Pump Pressure	bar psi	7.0 102	**9.0** **130**	8.0 116	8.0 116	**8.0** **116**	7.0 102	7.0 102	**8.0** **116**	10.0 145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel Flow Rate	litres/h Gals/h	1.65 0.36	**1.98** **0.44**	2.35 0.52	2.35 0.52	**2.65** **0.58**	2.98 0.65	2.98 0.65	**3.40** **0.75**	3.81 0.84
Water Content	litres gals	74 16.3			74 16.3			74 16.3		
Boiler Weight Dry	kg	140			140			140		
Boiler Weight Wet	kg	214			214			214		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi	1.8 26			1.8 26			1.8 26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Factory Set DHW Flow Rate	litres/m gal/m	18 4.0			18 4.0			18 4.0		
Minimum DHW Flow Rate	litres/m gal/m	2.5 0.55			2.5 0.55			2.5 0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar psi	2.5 0.55			2.5 0.55			2.5 0.55		
Cold Water Mains Inlet Connection		Minimum 15mm Unrestricted			Minimum 15mm Unrestricted			Minimum 15mm Unrestricted		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
SEDBUK Efficiency 2009		89.1%			89.1%			89.1%		
Factory Settings		Highlighted in bold								

5.4.6 K-Series Kabin Pak – Pre-Wired (KHE)

MODEL		K70HE			K90HE			K120HE			K150HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**											
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry	kg	90			90			90			175		
Boiler Weight Wet	kg	112			112			112			220		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%			90.3%		
Factory Settings		Highlighted in bold											

5.4.7 K-Series Kabin Pak – Pumped (KPHE)

MODEL		KP70HE			KP90HE			KP120HE			KP150HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Conventional Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**											
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		22mm Copper			22mm Copper			28mm Compression			28mm Copper		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry	kg	95			95			95			185		
Boiler Weight Wet	kg	117			117			117			230		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%			90.3%		
Factory Settings		Highlighted in bold											

5.4.8 K-Series Kabin Pak – System (KSHE)

MODEL		KS70HE			KS90HE			KS120HE		
Nominal	kW	14.7	**17.6**	21.0	21.0	**23.5**	27.1	27.1	**29.0**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,560	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22.0	22.0	**24.4**	28.0	28.0	**30.0**	34.0
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
Secondary Air Damper		B			N/A			N/A		
Conventional	mm	100 or 125			100 or 125			100 or 125		
Flue Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp.	^{0}C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings		**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**								
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	Gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1” BSP Female			1” BSP Female			1” BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Dry	kg	105			105			105		
Boiler Weight Wet	kg	127			127			127		
SEDBUK Efficiency 2009		90.7%			90.8%			90.7%		
Factory Settings		Highlighted in bold								

5.4.9 K-Series Kabin Pak – Combi (KCHE)

MODEL		KC70HE			KC90HE			KC120HE		
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 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
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	**FOR NZ see specific Diesel Nozzle sizing and pressure data sheet**									
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	0.85	0.85
Oil Pump Pressure	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
	psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
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
Water Content	litres	74			74			74		
	gals	16.3			16.3			16.3		
Boiler Weight Dry	kg	140			140			140		
Boiler Weight Wet	kg	214			214			214		
Domestic Hot Water (DHW) Production										
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar	1.8			1.8			1.8		
	psi	26			26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Factory Set DHW Flow Rate	litres/m	18			18			18		
	gal/m	4.0			4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5			2.5		
	gal/m	0.55			0.55			0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar	2.5			2.5			2.5		
	psi	0.55			0.55			0.55		
Cold Water Mains Inlet Connection		Minimum 15mm Unrestricted			Minimum 15mm Unrestricted			Minimum 15mm Unrestricted		
DHW Outlet Connection		22mm Copper			22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
SEDBUK Efficiency 2009		89.1%			89.1%			89.1%		
Factory Settings		Highlighted in bold								

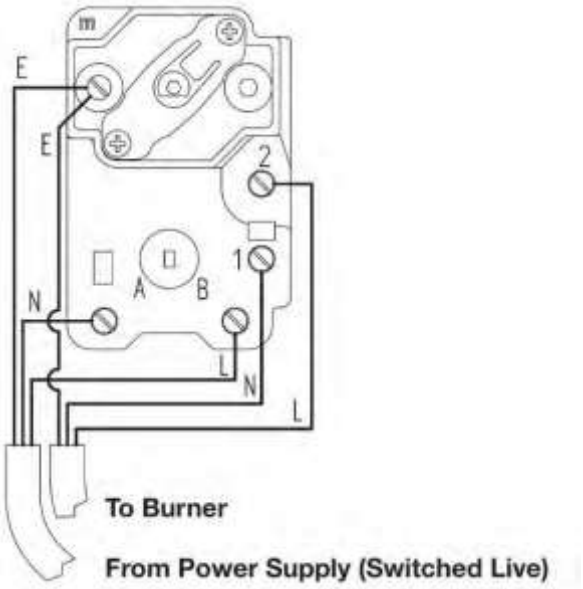
6 ELECTRICITY SUPPLY & WIRING DETAILS

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.

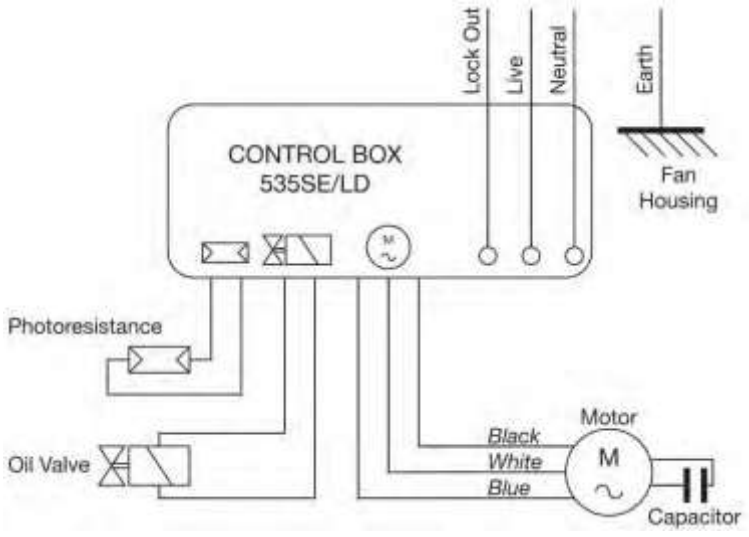
The appliance must be effectively earthed and all external wiring should comply with current New Zealand Regulations.

6.1 Dual-Safe Thermostat (Non-Combi Boilers)



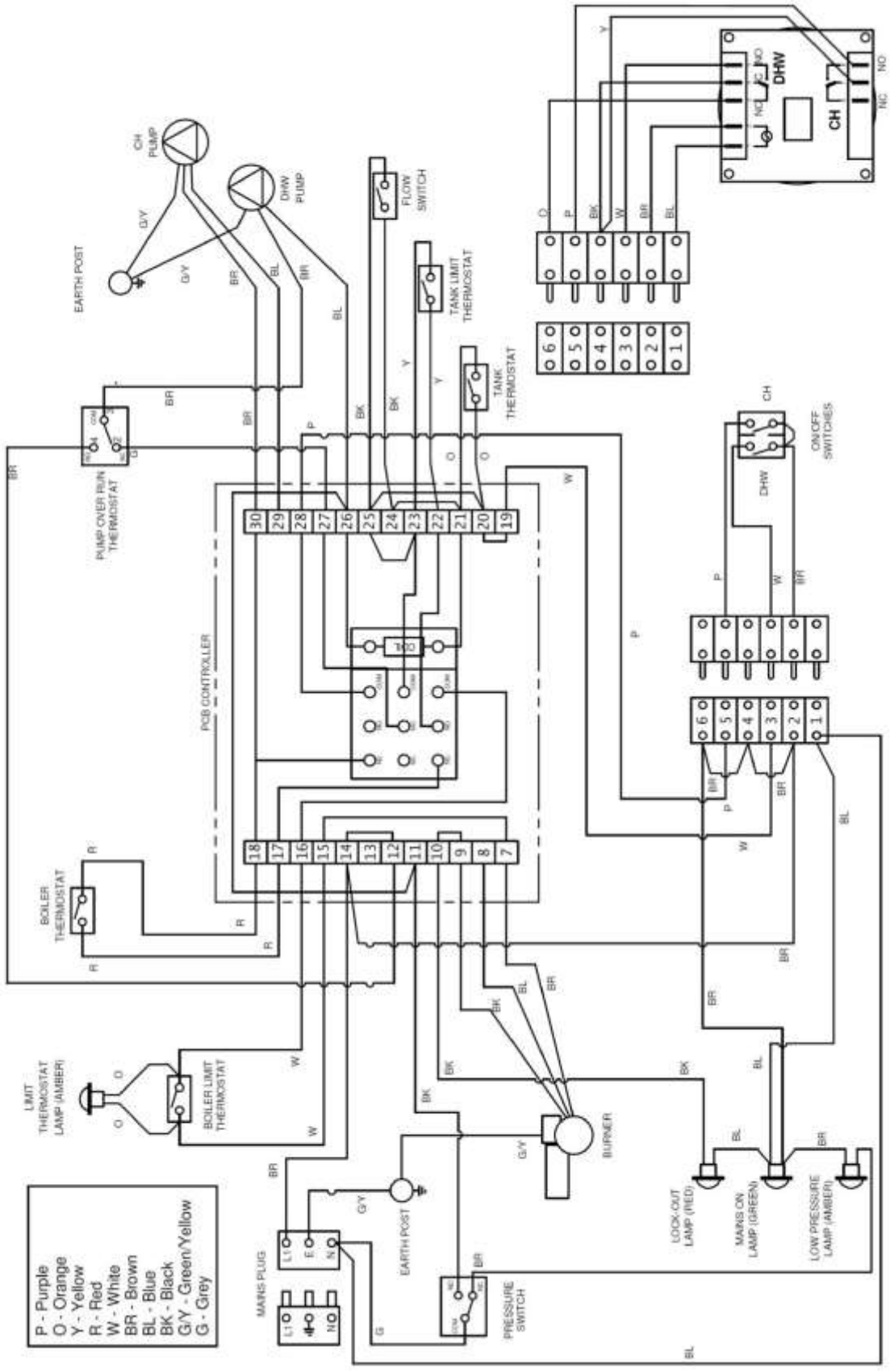
Warning: Do not fit any other wires or loop wires to this stat as this will bypass the thermostats.

6.2 RDB Burner Control Box



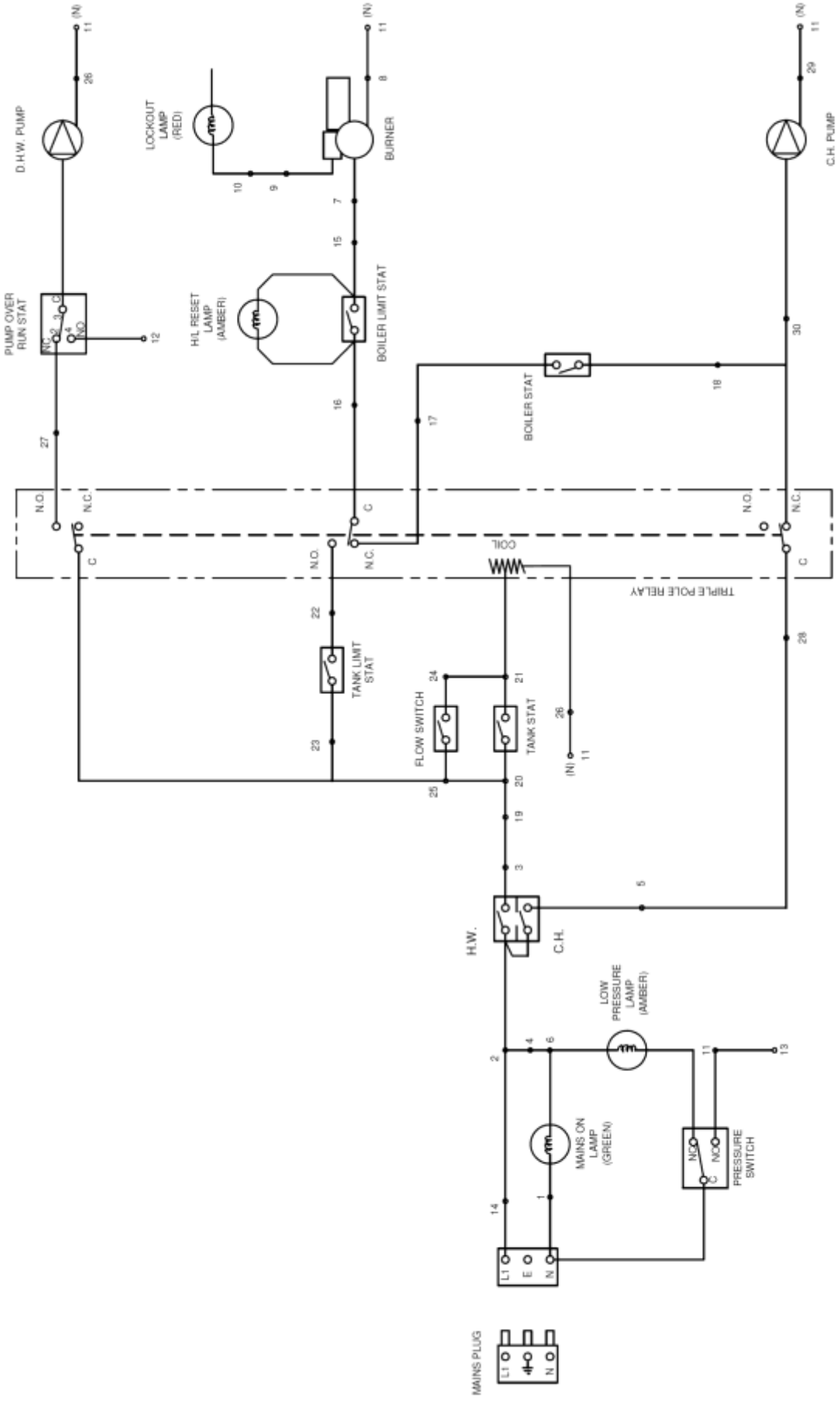
6.3 Combi Wiring Details

6.3.1 Wiring Diagram

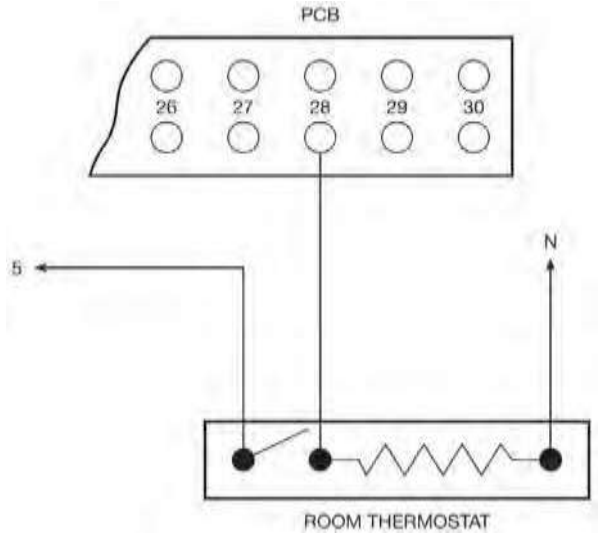


The 3 pin mains plug must be supplied with a permanent live to allow the pump overrun stat and relay to operate.

6.3.2 Wiring Schematic

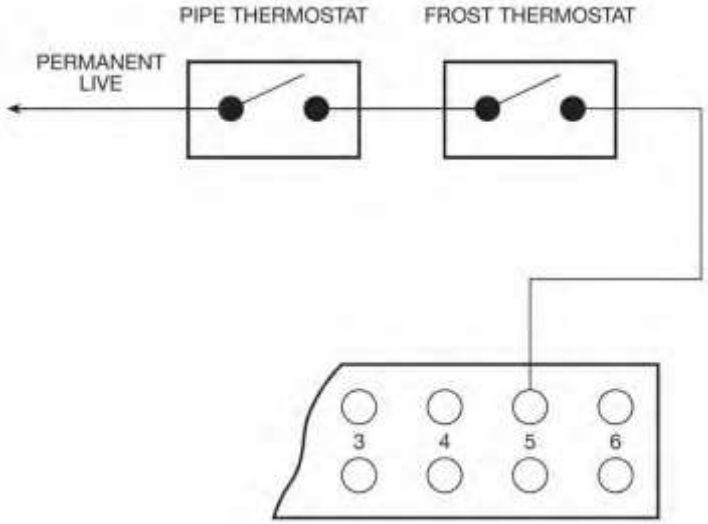


6.3.3 Fitting a Room Thermostat to a Combi



Remove the purple wire from no 5 and no 28 on the PCB and wire the thermostat as shown. The room thermostat should be located where it is not subjected to extraneous heat gains, direct sunlight or draughts.

6.3.4 Fitting Frost Protection to a Combi



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. To prevent over heating of the property a pipe thermostat should be fitted on the return pipe close to the boiler. The Kabin Pak Combi boiler is factory fitted with a frost thermostat as standard.

6.3.5 Combi Pump Overrun Thermostat

The condensing Combi boilers have been fitted with a pump overrun thermostat. In order for the thermostat to work effectively the boiler **must** be supplied with a permanent live via the 3 pin mains plug. Failure to do this will result in nuisance trip outs.

6.4 Installation of a Warmflow Combi Optional Programmer (PC1)

1. Disconnect the electrical supply.

2. Drop down control box front (2 screws).

3. Disconnect the 6 pin plug from the CH/HW on/off switched.

4. With a sharp knife cut out the outline of the panel knockout through the facia label from the front of the panel.

5. With a hacksaw blade or snips remove the knockout piece ensuring that all metal tags or burrs have been removed from the hole.

6. Feed the programmer and harness through the hole from the front of the panel.

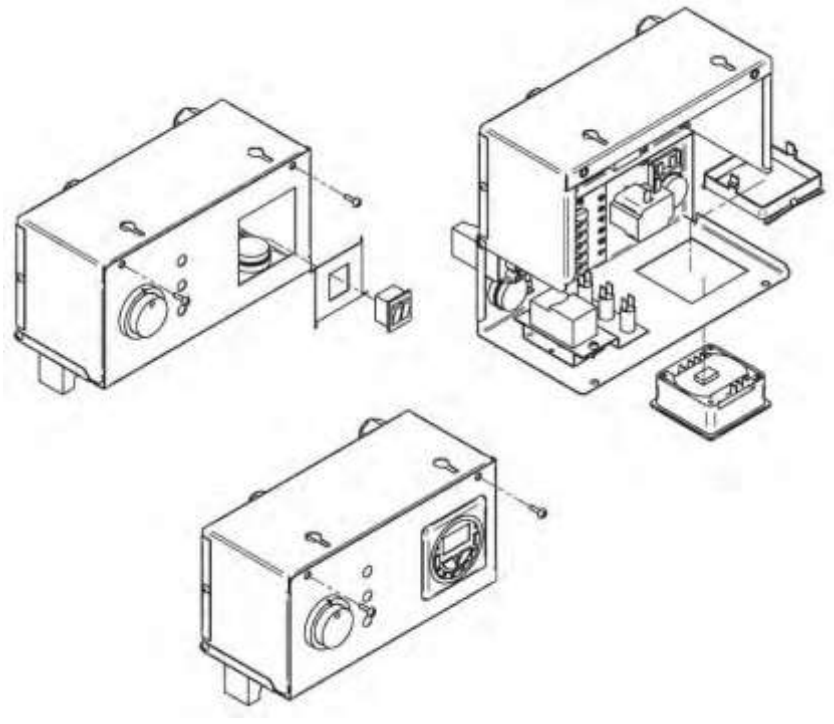
7. Secure in position by attaching the securing bracket to the rear of the programmer.

8. Plug the wiring harness into the 6 way socket.

9. Activate battery back up on the programmer by removing the plastic strip.

10. Close the control panel cover and reconnect the electrical supply.

11. Using the operating instructions located towards to back of this manual or supplied with the programmer, set the switching times.



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6.5 Remote Timers for Combis

6.5.1 Installation of a remote two channel programmer (option 1)

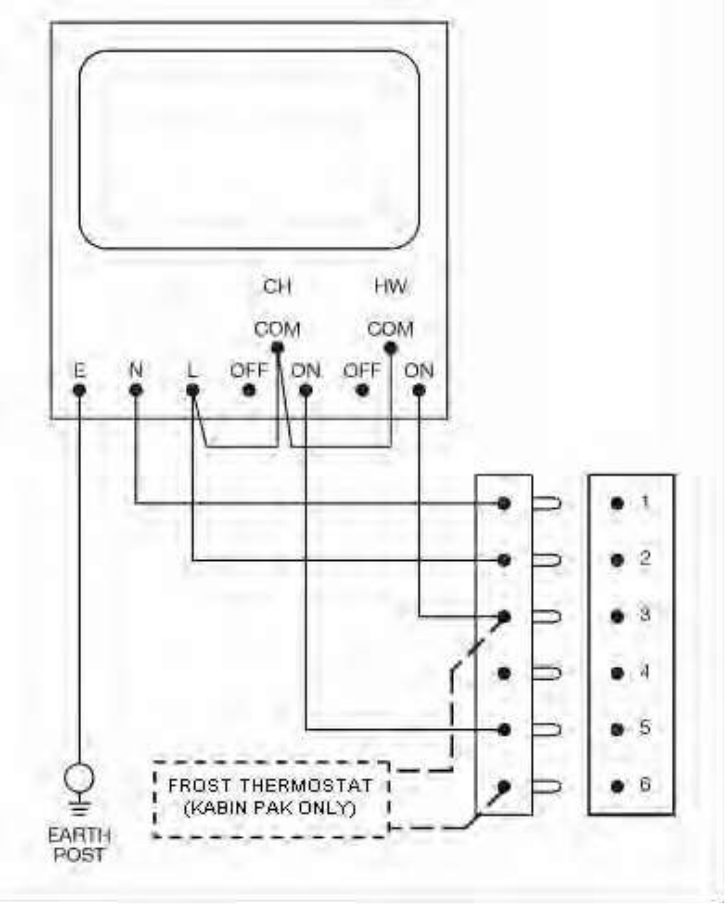
Permanent Live Supply

The boiler **must** be supplied with a permanent live mains supply via a fused isolator connected to the boiler 3 pin mains plug into the control panel.

Failure to connect a permanent live to the boiler will prevent the programmer, boiler mains lamp and pump overrun thermostat from operating. It will also disable the built-in frost protection of a Kabin Pak Combi.

Connecting the Programmer

Inside the boiler control panel, remove the purple, white and brown wires connecting the CH and HW switches to the 6 pin connector of the terminal block.



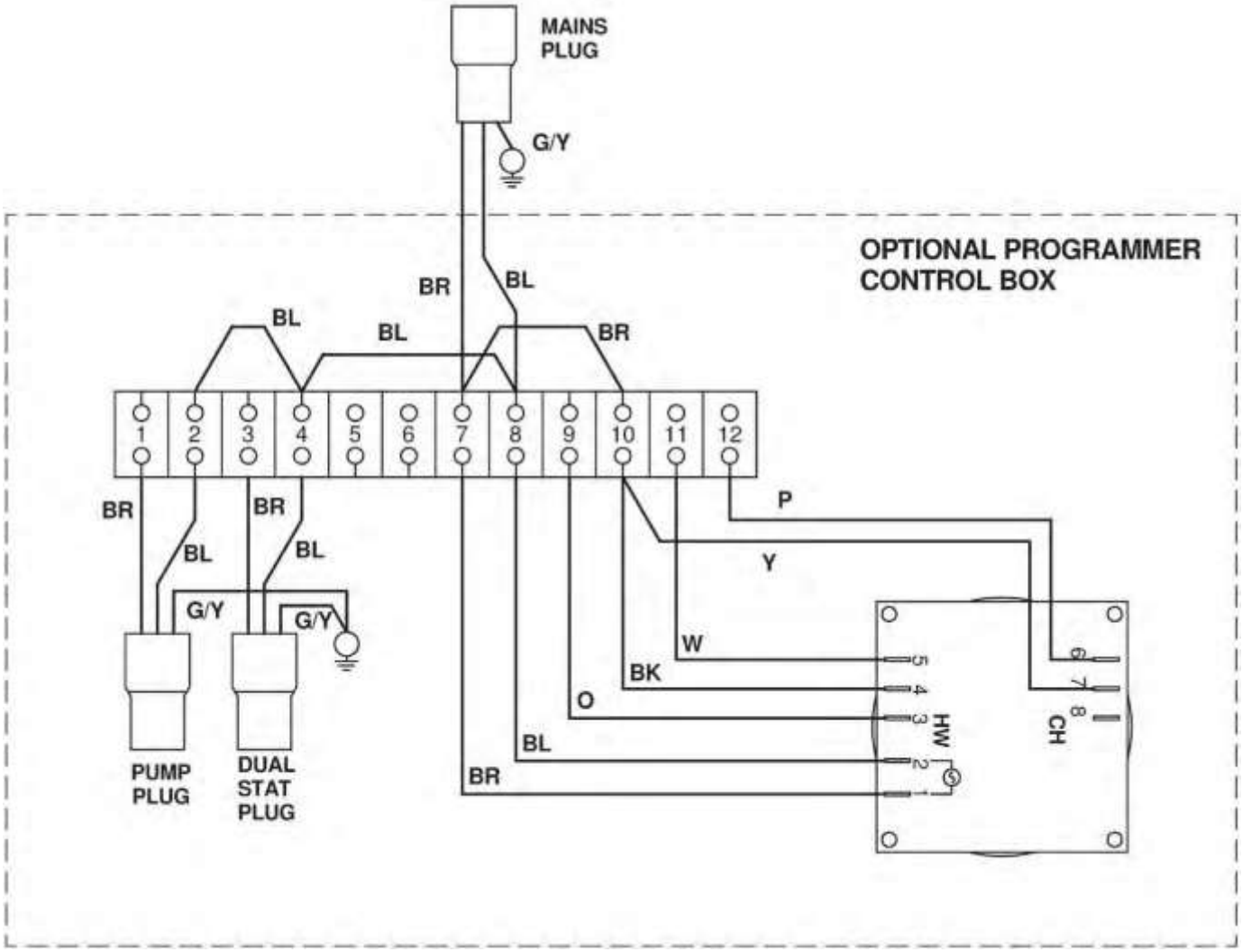
Connect the programmer to the 6 pin connector via a 5 core cable as shown ensuring the earth is connected to one of the earth posts inside the control panel. On Kabin Pak models, ensure the frost thermostat connections to pins 3 and 6 are left in place.

Connecting the programmer in this manner will bypass the CH and HW on/off switches on the boiler control panel. The boiler and programmer will both be powered from the boiler 3 pin mains plug, so only one mains connection is required.

The neutral connection to the 3-pin plug on the control panel must be the sole mains neutral connection to the appliance.

6.6 Optional Programmer (PC1) for Non-Combi Models

6.6.1 Programmer Control Box Wiring Diagram



6.6.2 General Requirements

1. The optional programmer as supplied will supply power to the pump and burner via the central heating channel.

2. When connecting to external controls, eg „Y" plan or „S" plan it will be necessary to remove the loop between 3 and 12 on the programmer terminal block.

3. The programmer is not suitable for gravity hot water systems.

6.6.3 Programmer Installation

1. Disconnect electrical supply.

2. Drop down control box front (2 screws).

3. Secure control box to the horizontal casing bracket (2 screws) and right hand side (1 screw).

4. Connect the thermostat, circulating pump and the mains supply to the leads on the rear of the control box.

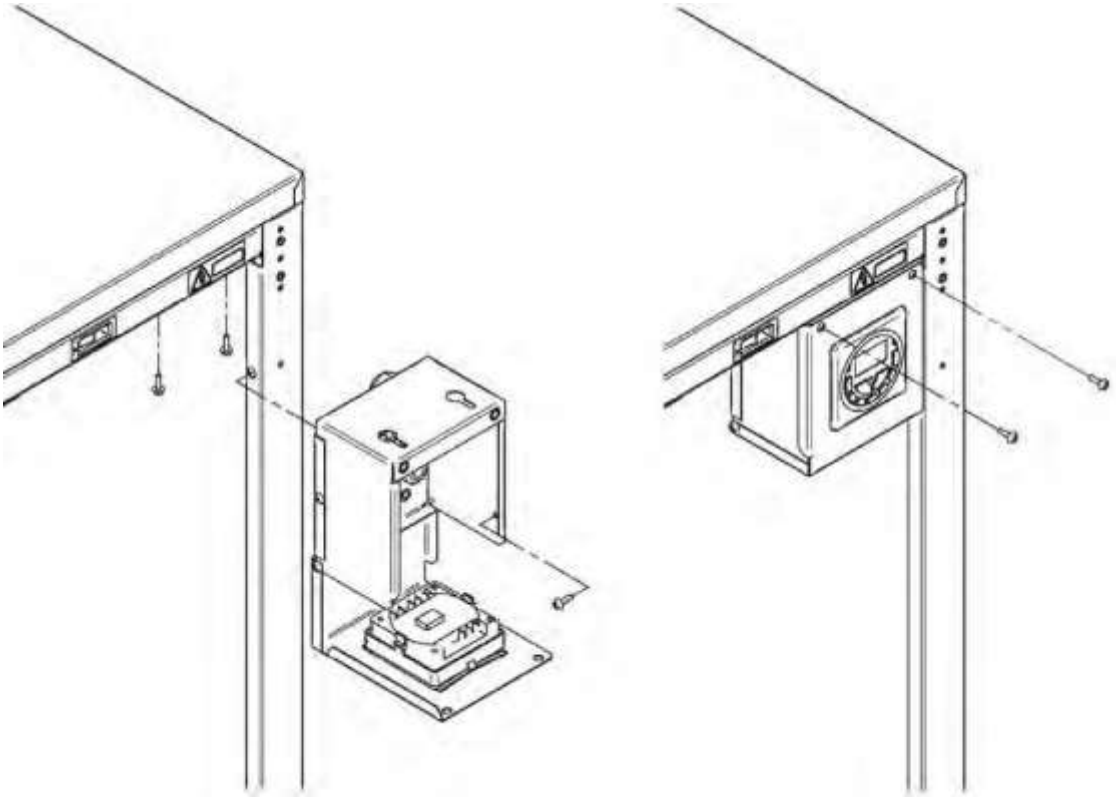
5. Two examples of system wiring are shown in the following sections.

6. If fitting the programmer to a Utility model without an integral pump, disconnect the pump plug from terminals 1 and 2 of the programmer terminal block and from the earth post. Remove the pump plug then wire the external plug into terminals 1 and 2 of the programmer terminal block and the earth post, feeding the wire in through the pump plug cable clamp.

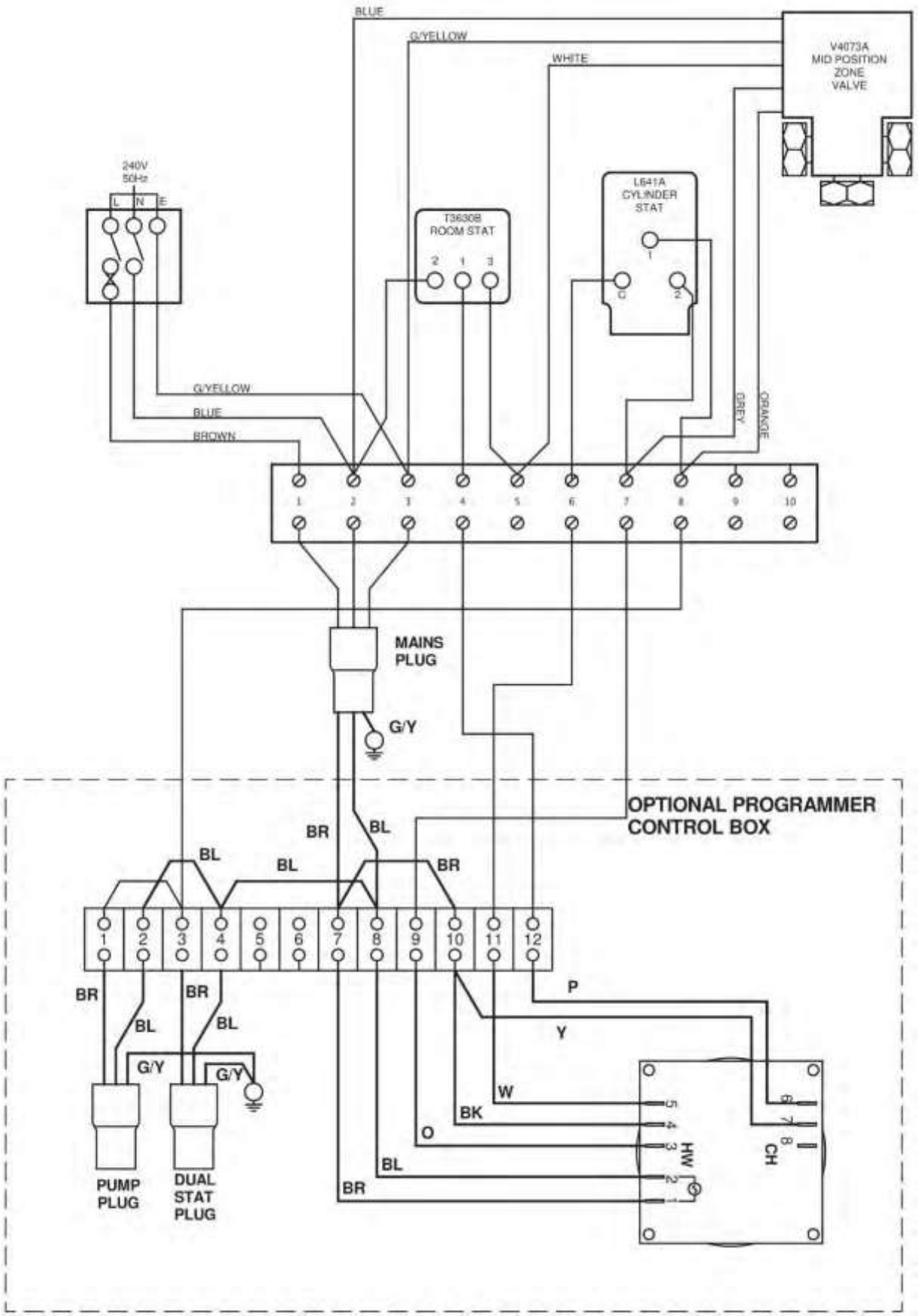
7. Activate battery backup on programmer by removing the plastic strip.

8. Close the control panel cover (2 screws) and reconnect the electrical supply.

9. Using the operating instructions located towards the back of this manual or supplied with the programmer, set the switching times.

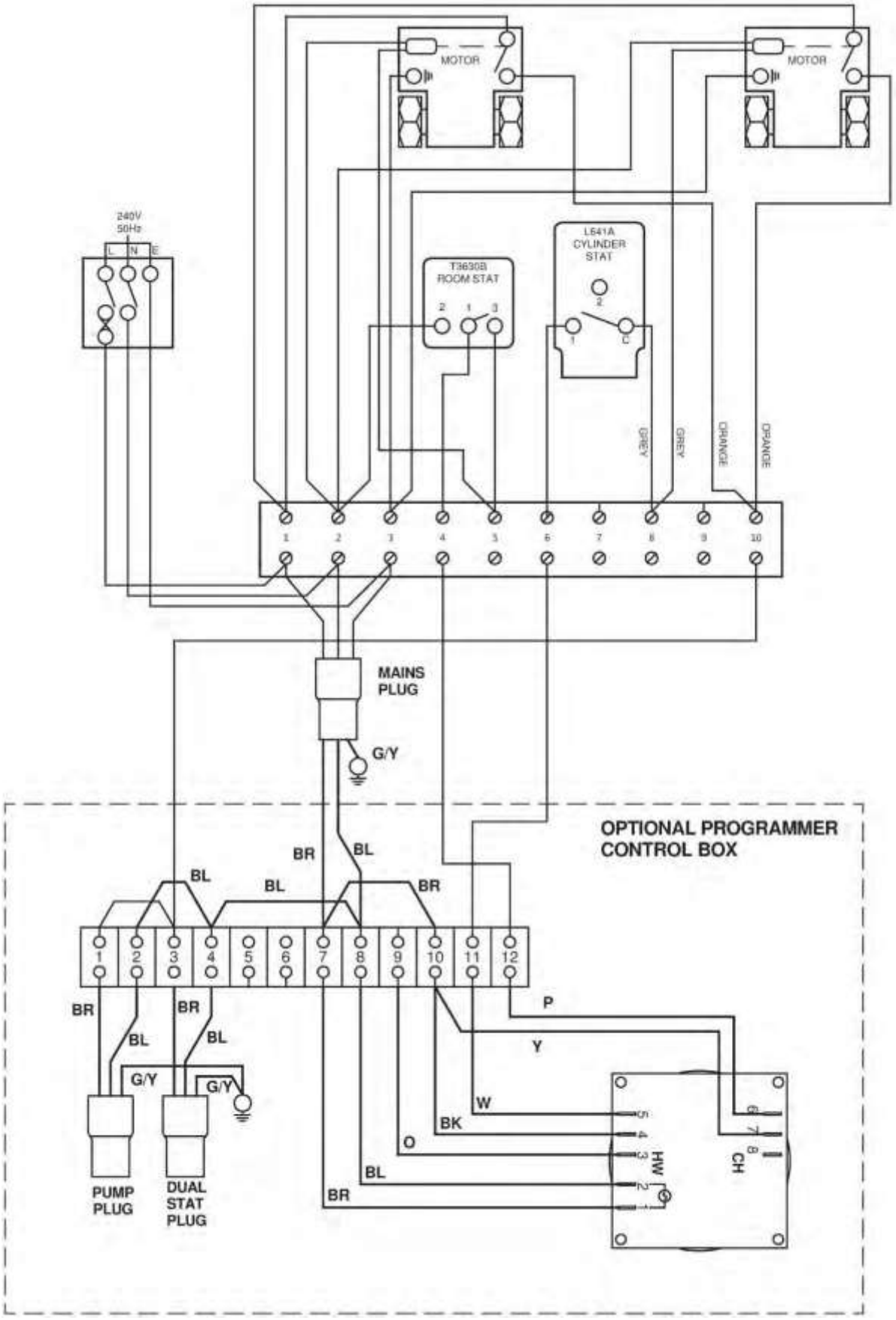


6.6.4 Honeywell 'Y' Plan – Independent CH & DHW (Fully Pumped Only)



Note: Before fitting programmer, remove loop between 3 and 12 on the terminal block.

6.6.5 Honeywell ‘S’ Plan – Independent CH & DHW (Fully Pumped Only)



Note: Before fitting programmer, remove loop between 3 and 12 on the terminal block.

7 OIL SUPPLY

1. Oil Tank

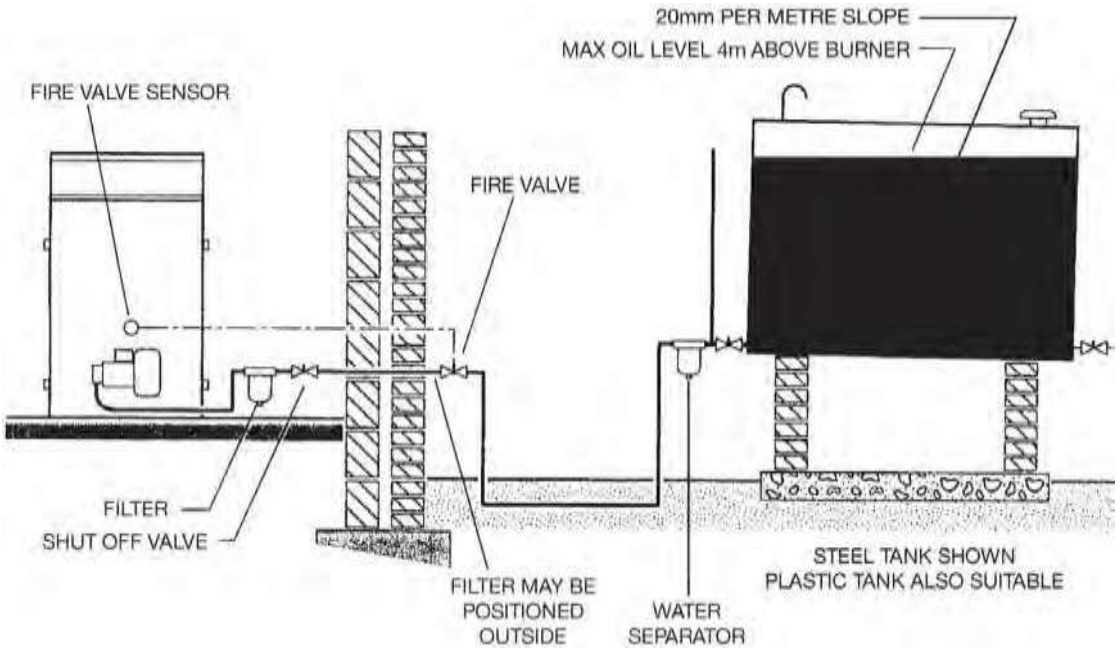
Steel tanks should be painted on the outside only and mounted on piers to prevent corrosion. Plastic oil tanks are also available and can be suitable for installation at ground level. However, oil should never be stored in translucent plastic containers.

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. 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

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

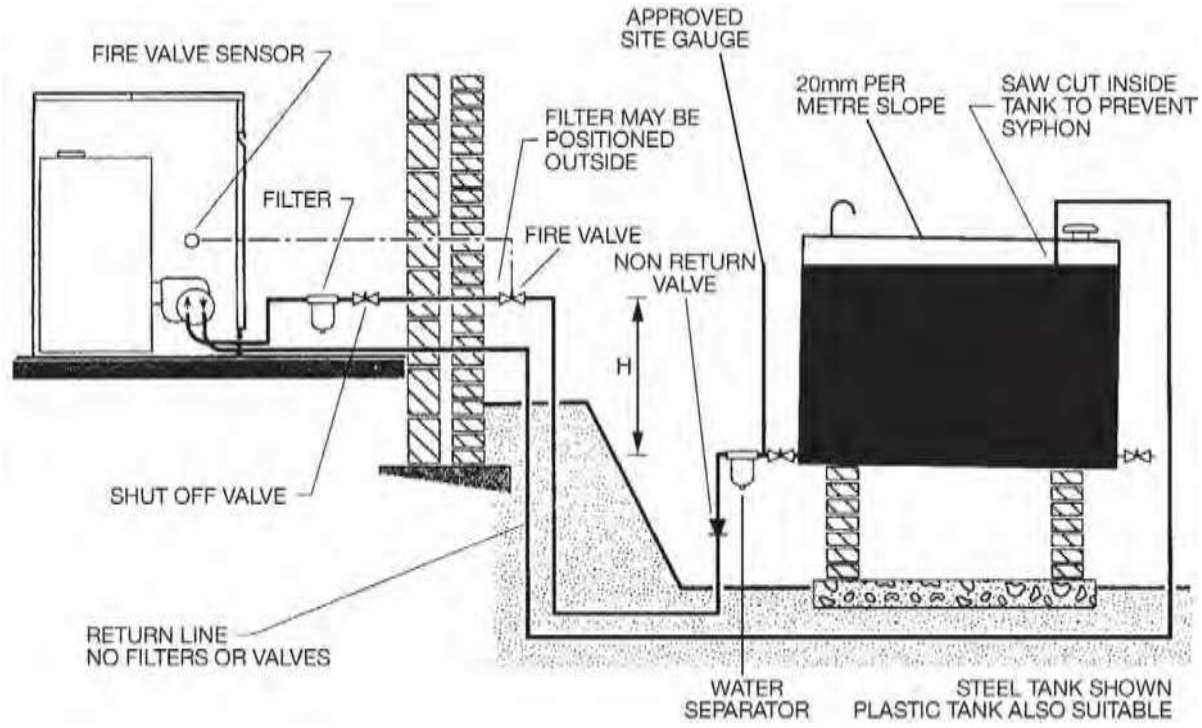


Total Maximum Pipe Length (m)

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.

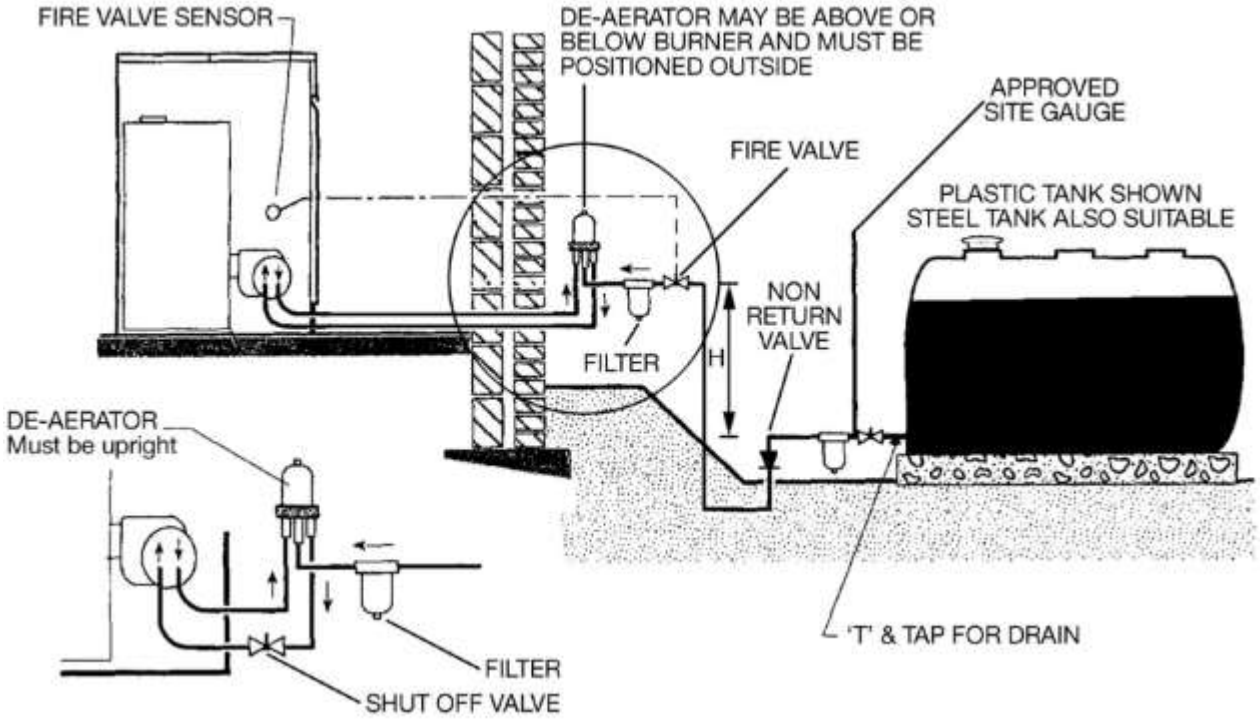
7.2 Two Pipe System



Total Maximum Pipe Length (m)

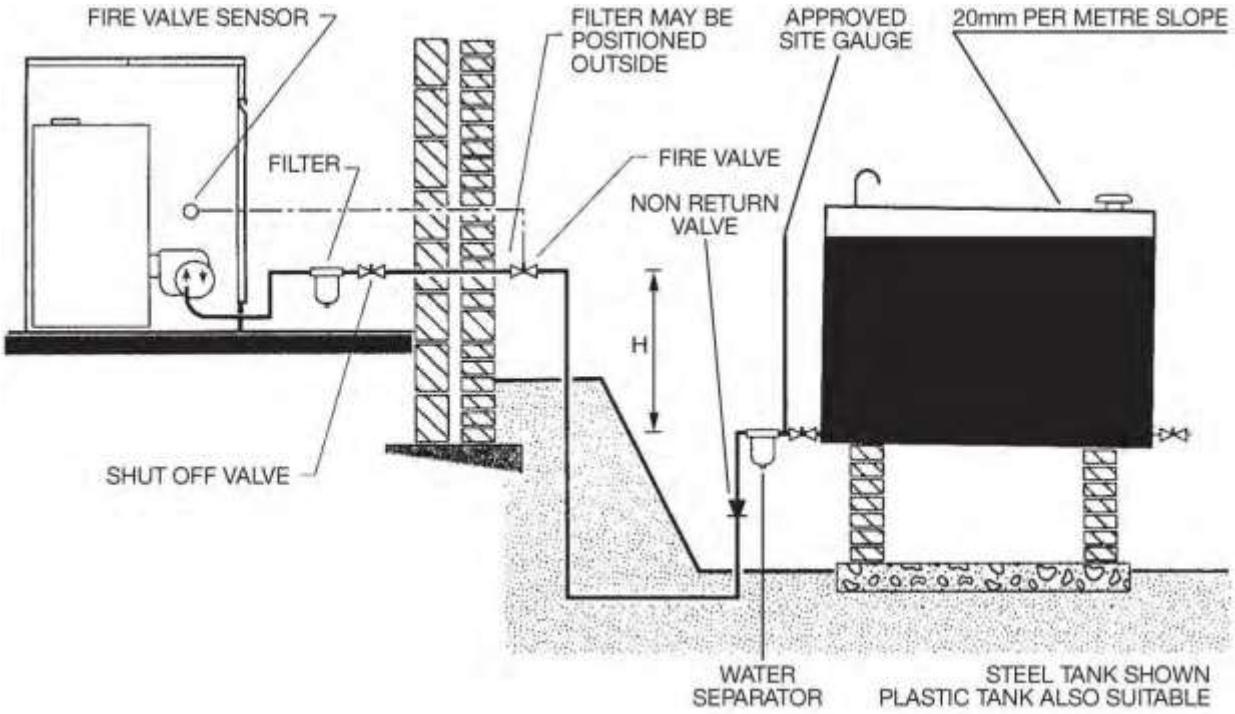
Head H(m)	**0.0**	**0.5**	**1.0**	**1.5**	**2.0**	**3.0**	**3.5**
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

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 Not applicable NZ

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 to BS2869:2010 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 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, 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 inline 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. 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.

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 Plume Management Kit
KPMK	Kabin Pak Plume Management Kit

8.1.1 Flue type Guidelines

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

Type HFL and VFL are not available in NZ

8.1.2 Condensing Boiler Flue Kits

FIRE SAFETY

a dwelling (such as a private household) will not be „compartmentalised" , the use of a plastic flue system is permited
Where the plastic flue system is used within a building which is „compartmentalized care must be taken to ensure that the installation of the flue does not contravene fire regulations and create a safety risk.

In particular, where the flue passes through a „fire break wall or floor" between dwellings it must be suitably enclosed so as to create a protective fire sleave

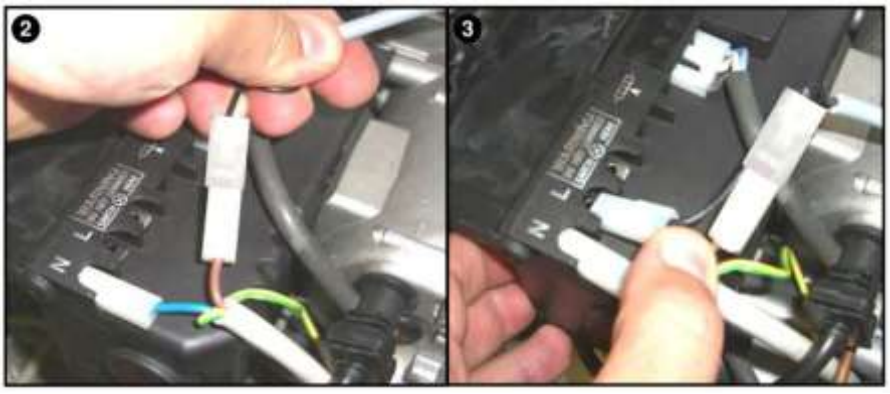
FIT FLUE THERMOSTAT

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

CONNECT THERMOSTAT

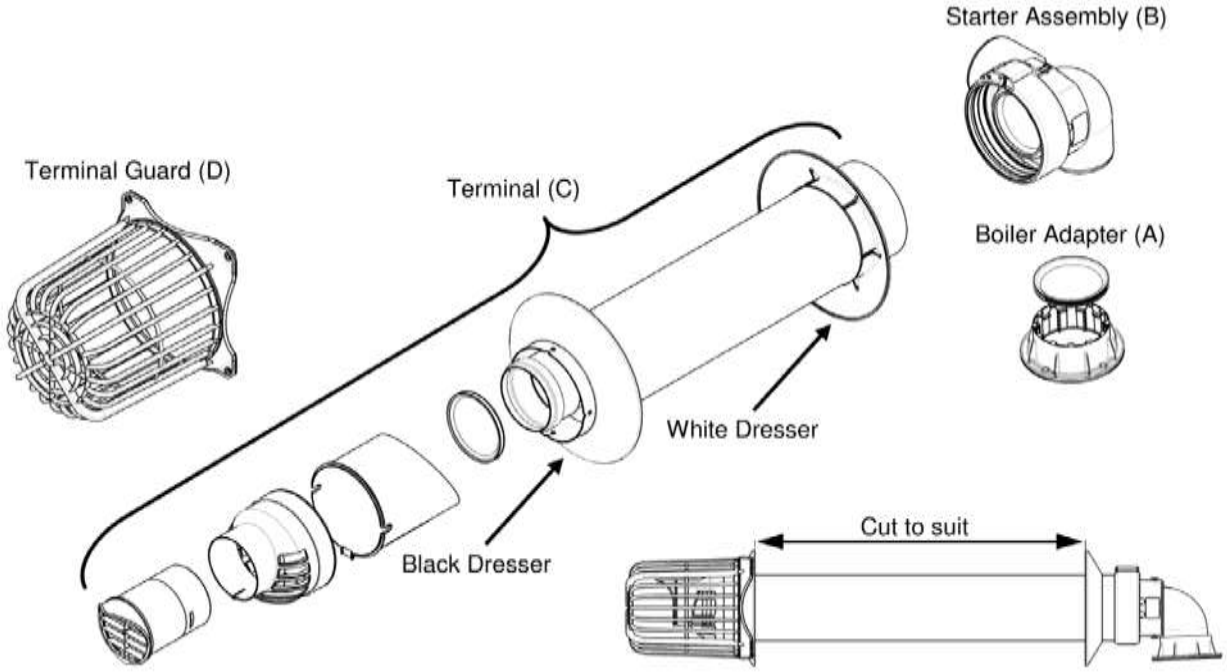
2. Remove the red burner cover. Isolate the electrical supply then open the control box cover. Disconnect the live (brown) wire of the burner power cable and connect it to the corresponding (large) connector of the flue thermostat cable.

3. Connect the other connector of the flue thermostat cable to the live terminal of the control box. Close and secure the cover.



8.1.3 HE Low Level Balanced Flue Kit (FBF)

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. Fit the boiler adapter (A).

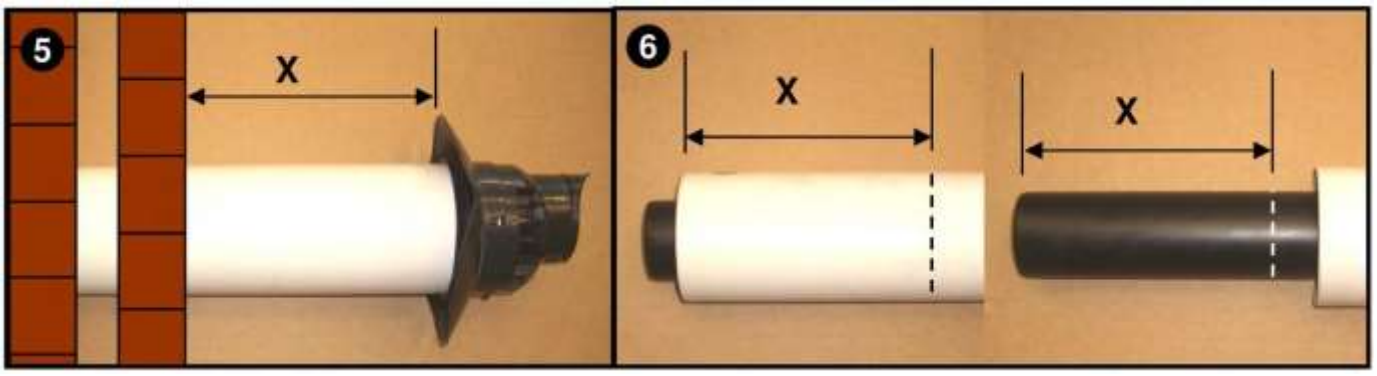
3. Lubricate the seals then insert the starter assembly (B).

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

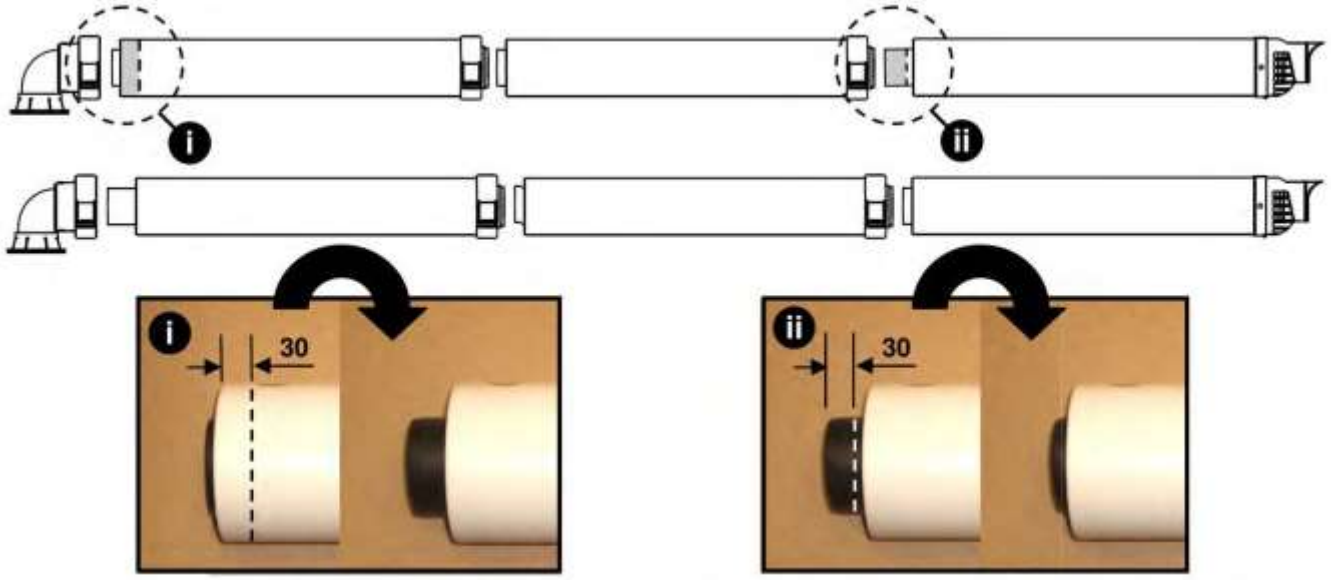
7. Lubricate then refit the terminal then secure with the locking band.

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

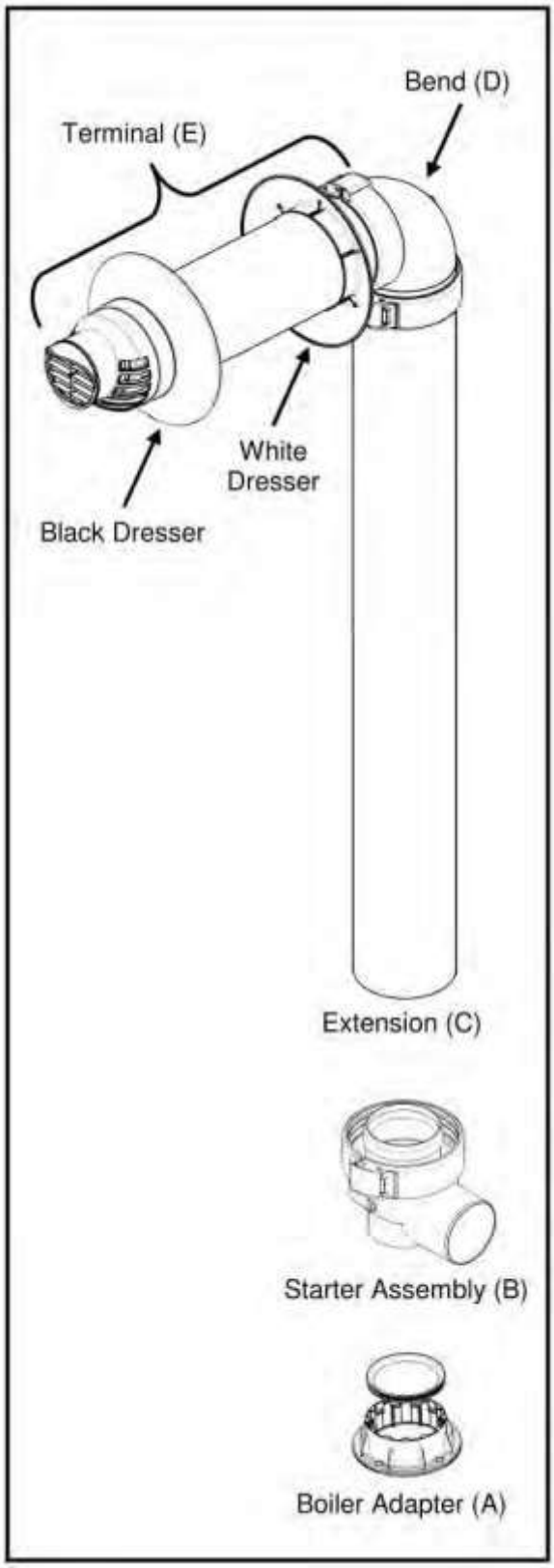
i. Cut 30 mm from the outer pipe of the 1st extension only.

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



8.1.4 HE High Level Balanced Flue Kit (HBF)

The kit comprises:



FIT FLUE THERMOSTAT

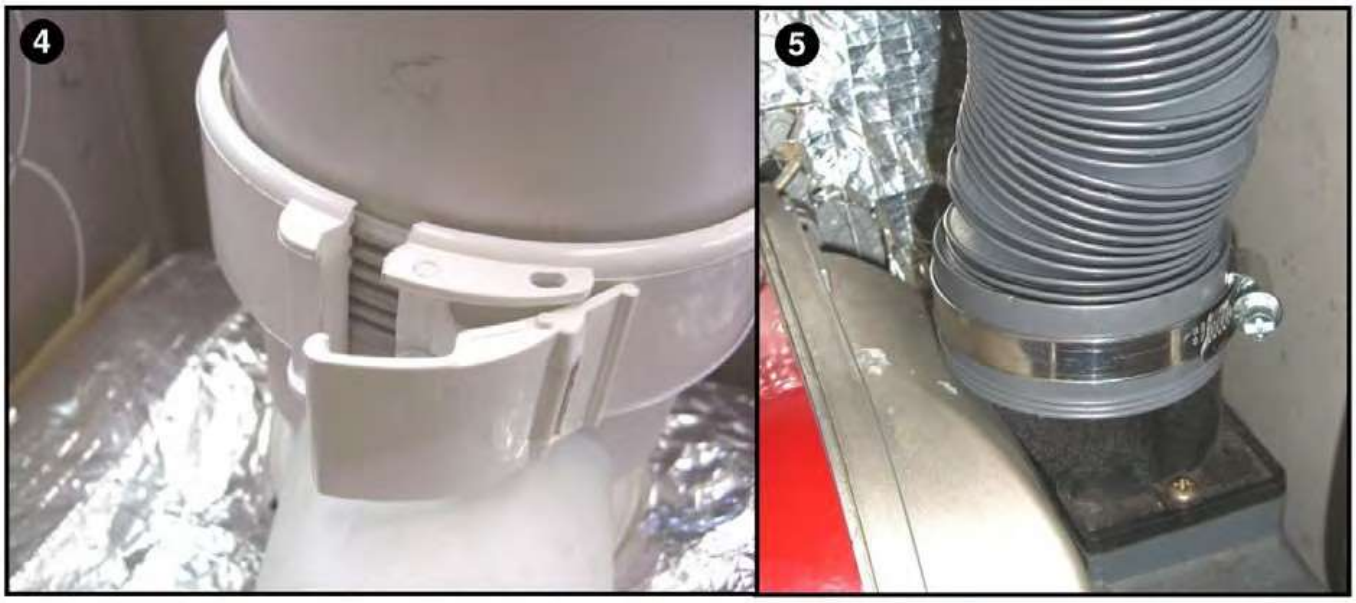
1. Fit the flue thermostat **BEFORE** fitting the flue kit.

FIT STARTER PIECE

2. Remove the top panel casing cut-out using snips. Fit the boiler adapter (A).
3. Lubricate the seals, then insert the starter assembly (B).

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

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.

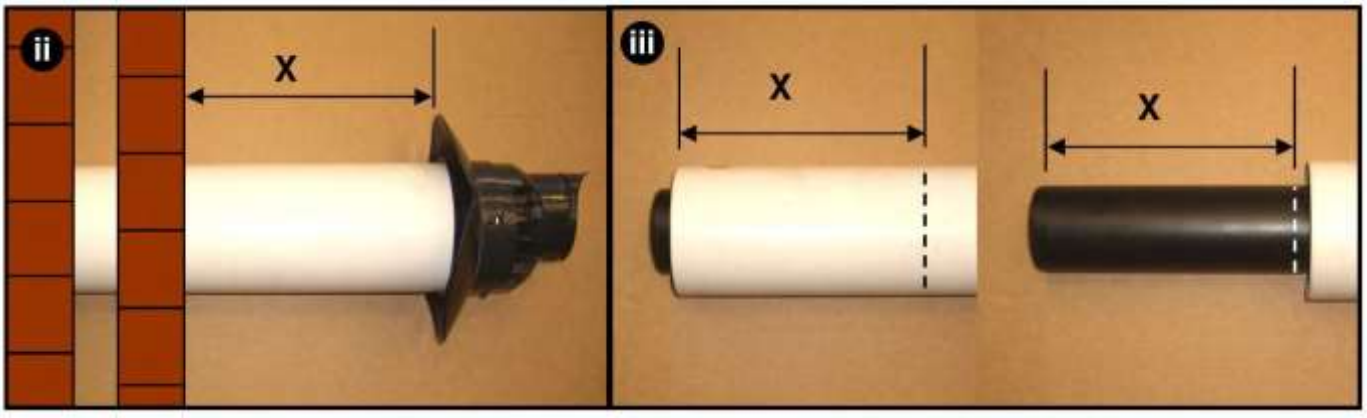


MEASURE AND CUT FLUE TERMINAL

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

ii. Fit the flue terminal (E) and measure the excess length, **X**.

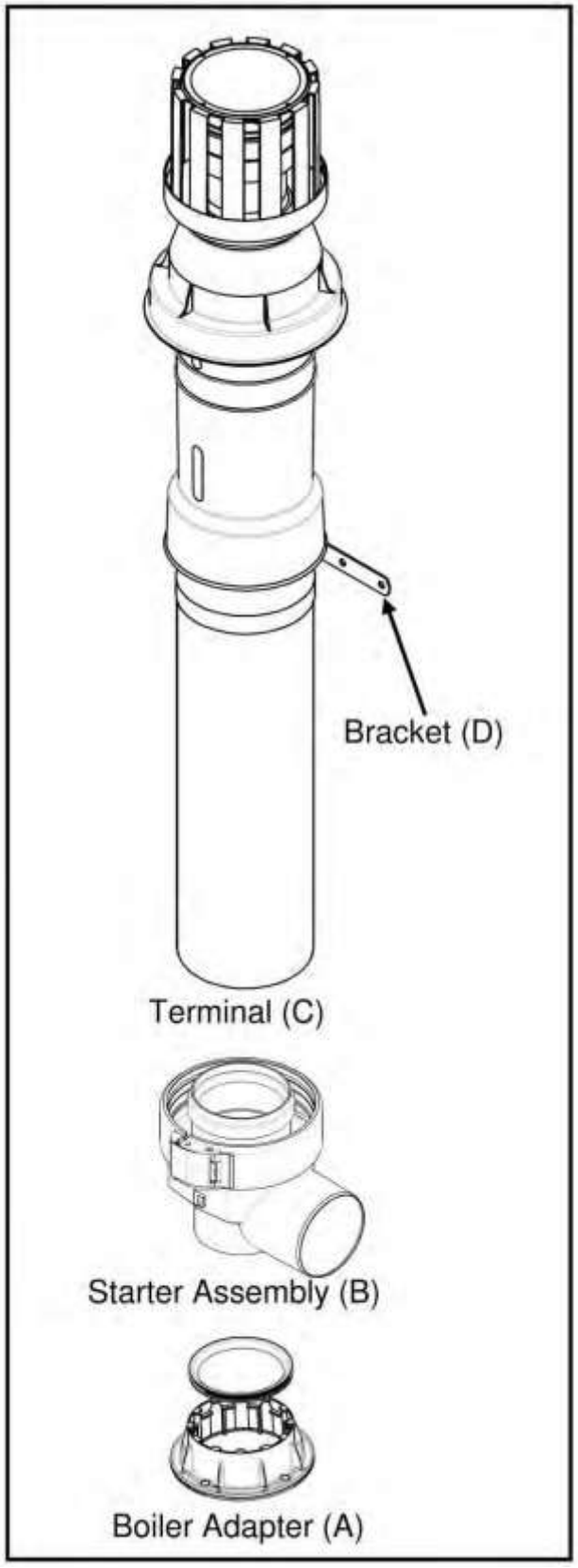
iii. Cut **X** mm from the outer pipe of the terminal then **X** mm from the inner pipe.



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

8.1.5 HE Vertical Balanced Flue Kit (VBF)

The kit comprises:



FIT FLUE THERMOSTAT

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

FIT STARTER PIECE

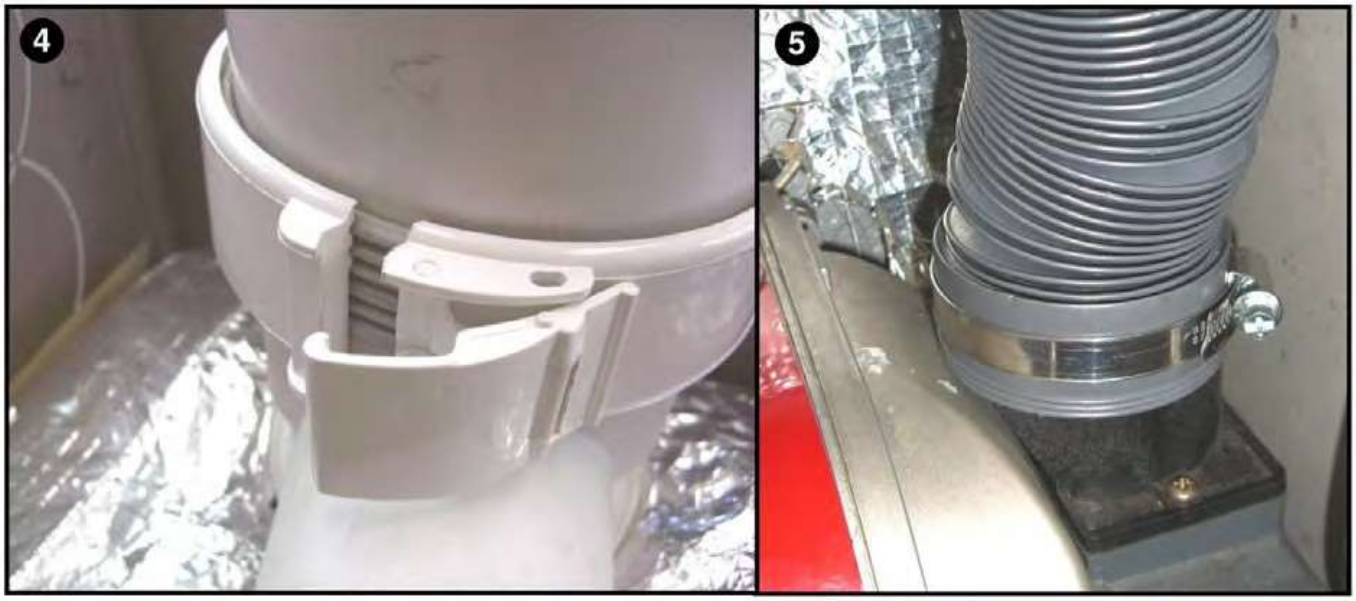
2. Remove the top panel casing cut-out using snips. Fit the boiler adapter (A).

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

CONNECT 1ST EXTENSION AND AIR HOSE

4. Lubricate then fit the 1st extension and secure with the locking band.

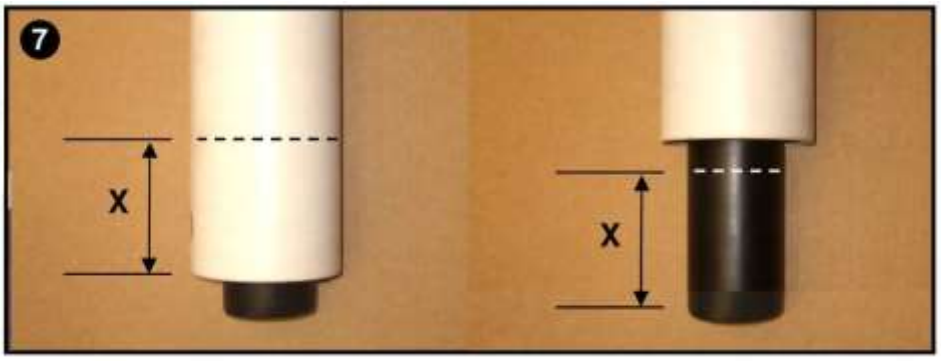
5. Fit the air inlet spigot and gasket to the burner. Attach the flexible air hose to the burner and starter assembly and secure with the jubilee clips.



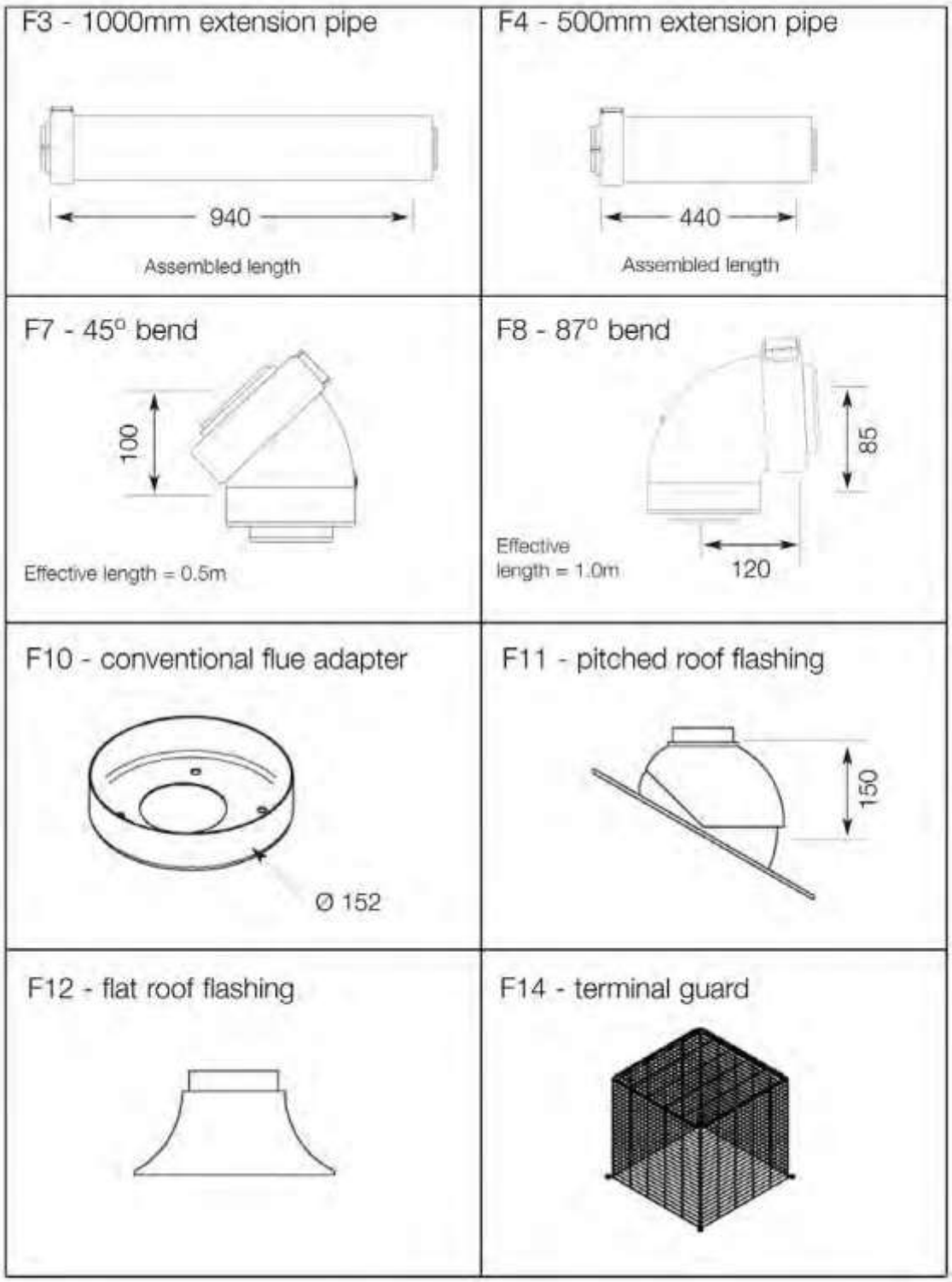
MEASURE AND CUT TERMINAL

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 (C) then X mm from the inner pipe. Refit and secure in place with the bracket (D).



8.1.6 Warmflow HE Boiler Flue Components: 80/125 Ø



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

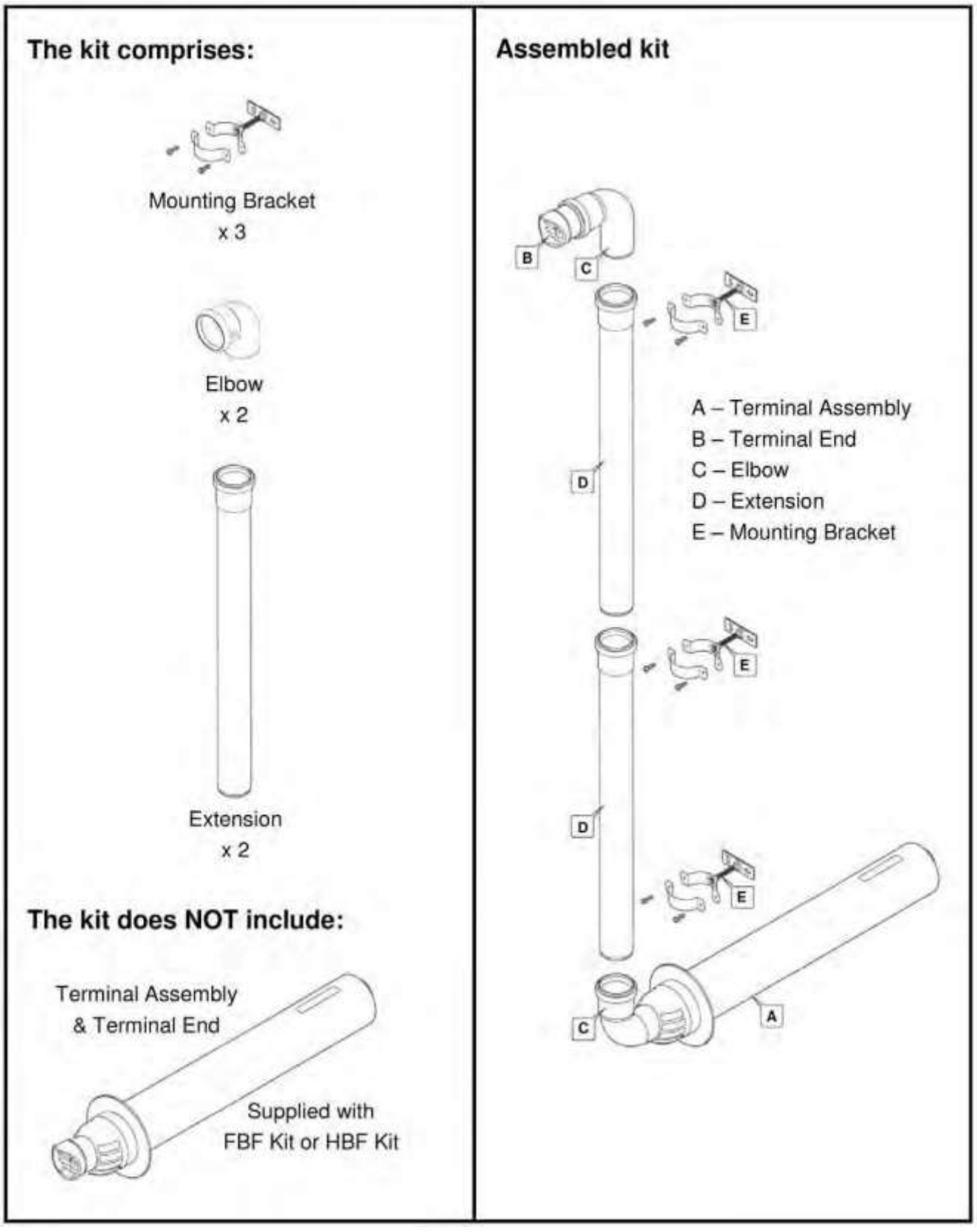
Equivalent length now exceeds the maximum allowable.

INSTALLATION NOT ACCEPTABLE.

8.1.8 Plume Management Kits

Plume Management Kits are available for our range of appliances.

8.1.9 Utility Plume Management Kit (UPMK)

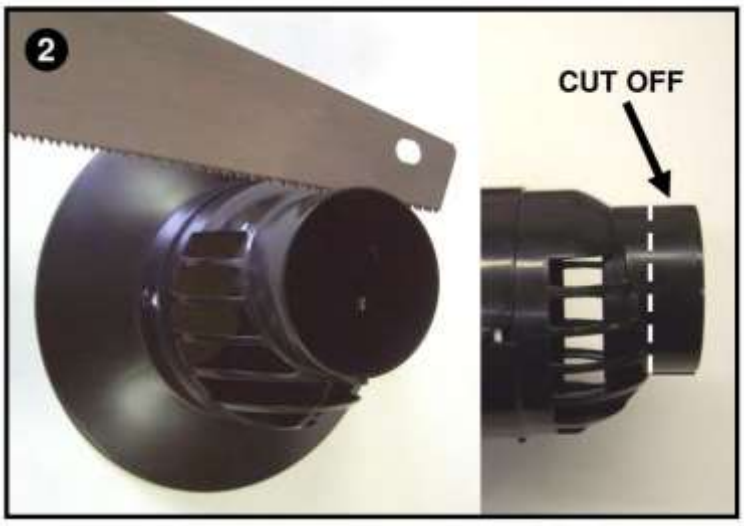


REMOVE TERMINAL END

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

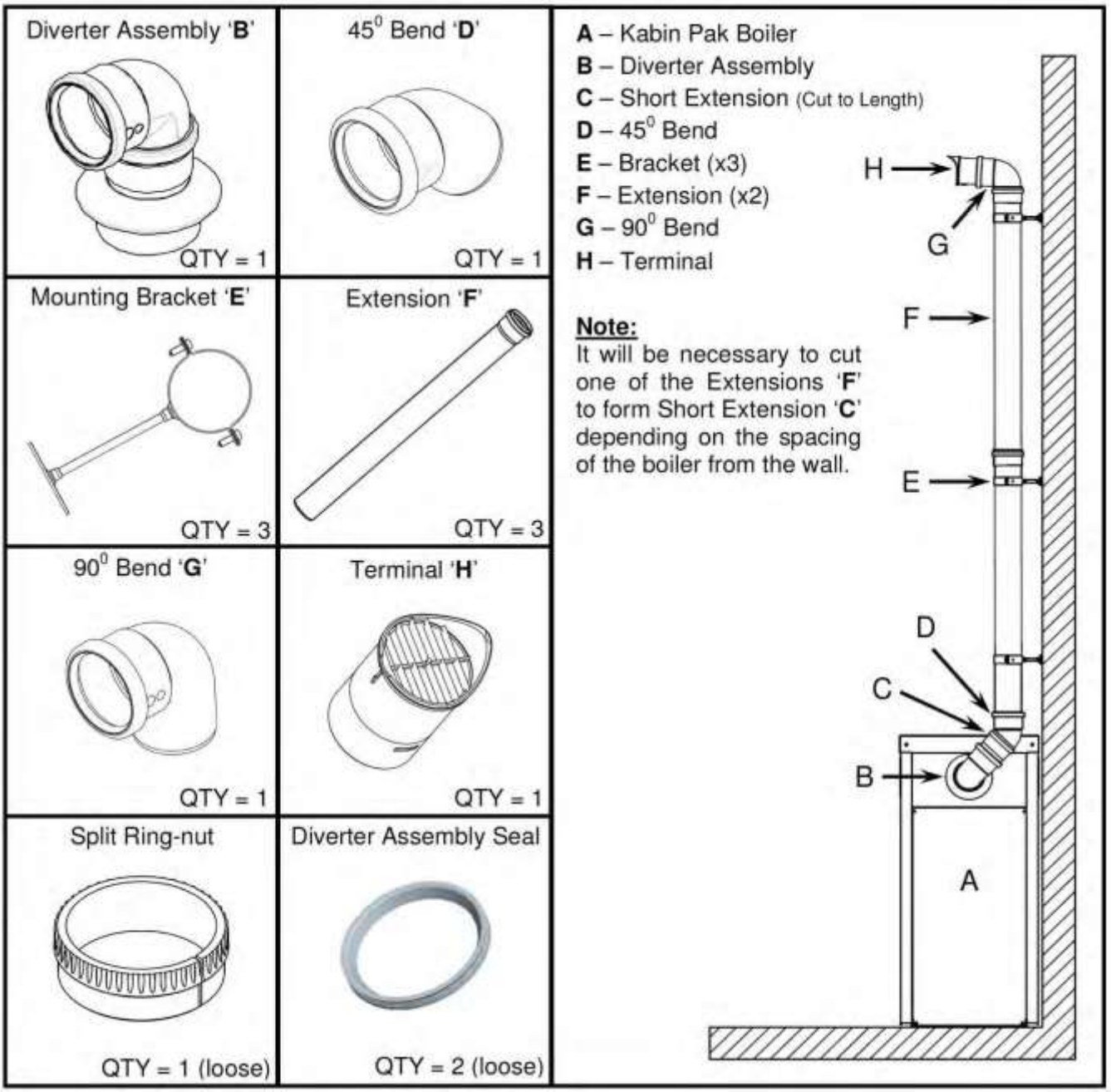
3. Lubricate and insert one of the Elbows (C) into the end of the Terminal Assembly (A). Elbow (C) can be pointed at any angle up to +/- 87° from the vertical. It must not be pointed horizontally or downwards as the effect of the flue gas condensate will reduce the life of the flue seals.

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 overleaf.

8.1.10 Kabin Pak Plume Management Kit (KPMK)

The kit comprises:



1. FIT DIVERTER ASSEMBLY SEALS

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

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

2. FIT SPLIT RING-NUT

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

3. FIT & SECURE DIVERTER ASSEMBLY

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

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

4. ADJUST DIVERTER ASSEMBLY

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

5. ASSEMBLE PLUME MANAGEMENT KIT

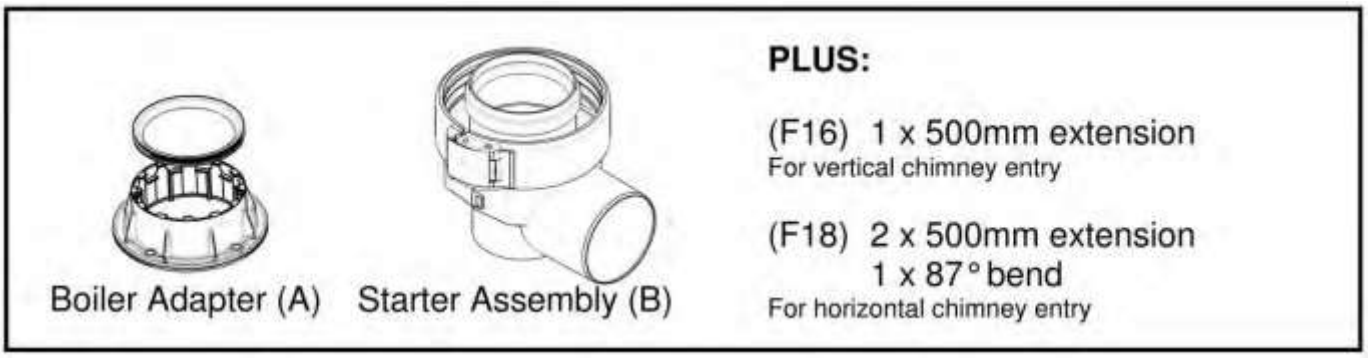
Assemble the remainder of the Plume Management Kit as shown over the page, securing the whole assembly into place using the Mounting Brackets „E".

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

If fitting the flue extension pipe (on a 150HE or Combi model), glue the rubber dresser of the Diverter Assembly „B" to the boiler casing using silicone sealant in order to secure the assembly in place.

8.1.11 Flexible Flue Liner Kit (HFL & VFL) <u>Not applicable In NZ</u>

These boiler connection kits (F16 or F18) contain:



Installation instructions

FIT FLUE THERMOSTAT

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

FIT STARTER PIECE

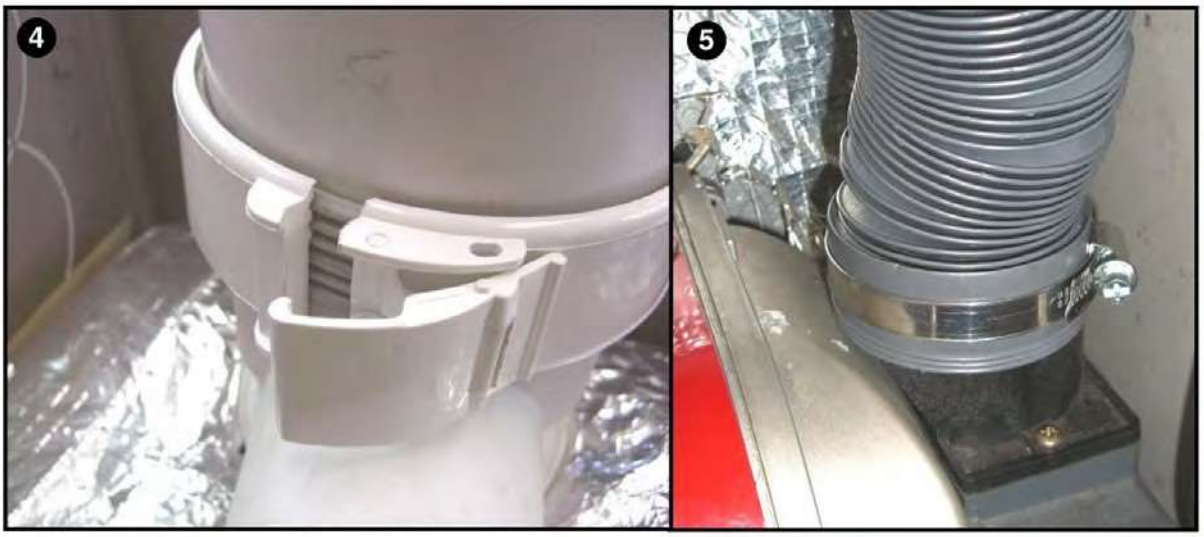
2. Remove the top casing panel cut-out using snips. Fit the boiler adapter (A).

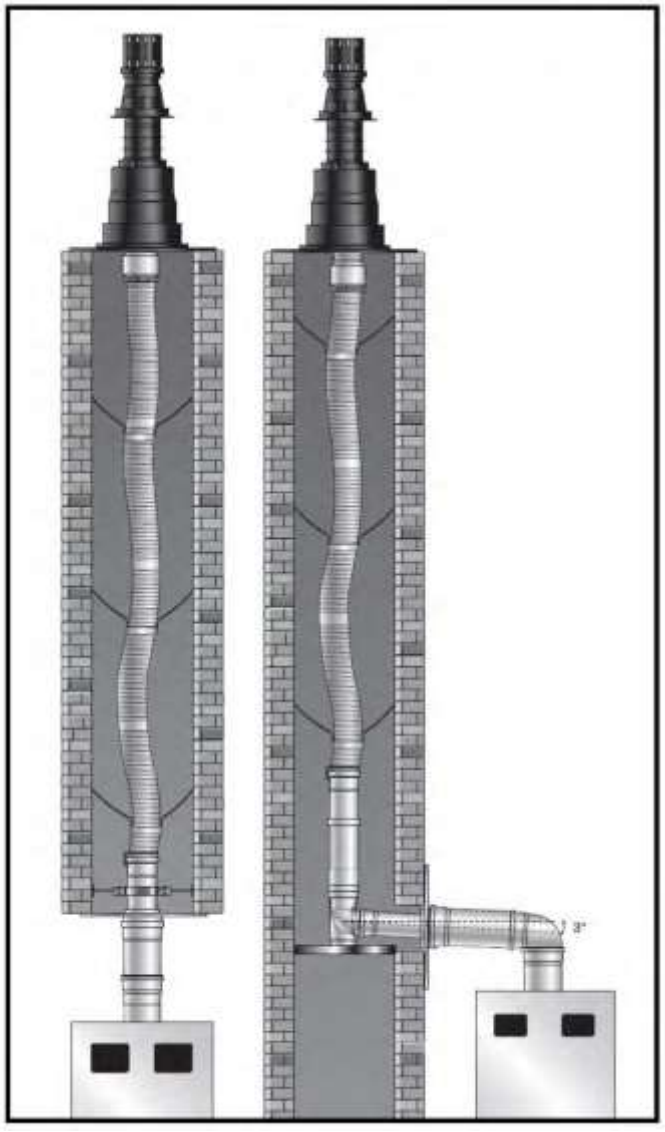
3. Lubricate the seals then insert the starter assembly (B).

CONNECT 1ST EXTENSION AND AIR HOSE

4. Lubricate then fit the 1st extension and secure with the locking band.

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.





CONNECT TO CLOSURE PLATE

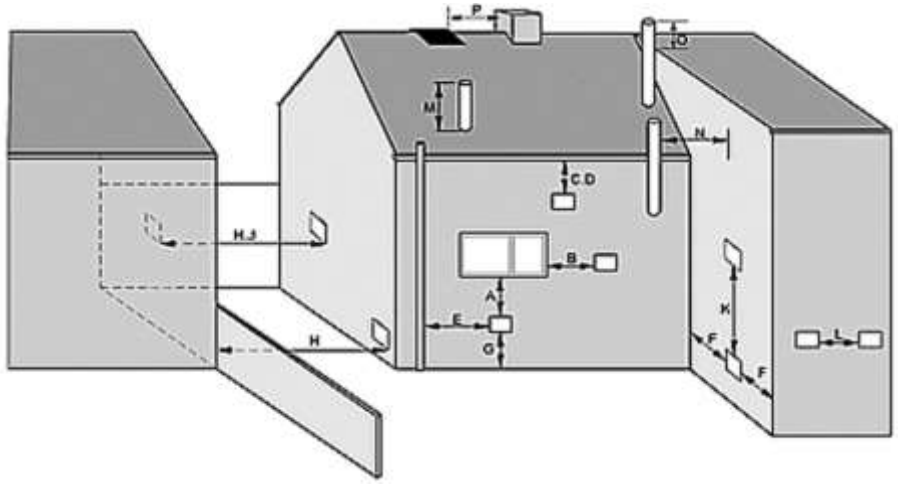
Install the chimney components and closure plate as instructed in the separate instruction leaflet.

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.

Kabin pack boilers have an insulated case and present no heat risk. They require minimum 100mm spacing from any side to construction surface (wall) for service access.

9 AIR SUPPLY FOR COMBUSTION & VENTILATION

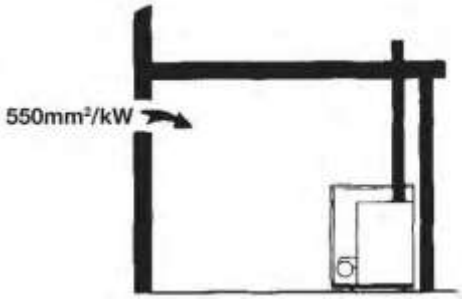
(see BS5410)

9.1 Open Flue Boilers

Open flue type Not applicable in NZ

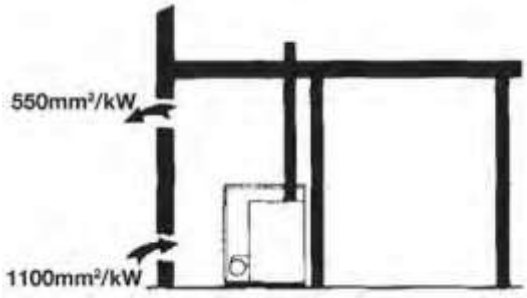
When the boiler is sited in a cellar where the only access for combustion and ventilation air is at high level then the combustion air should be ducted to low level.

Combustion Air Supply
Boiler in Room

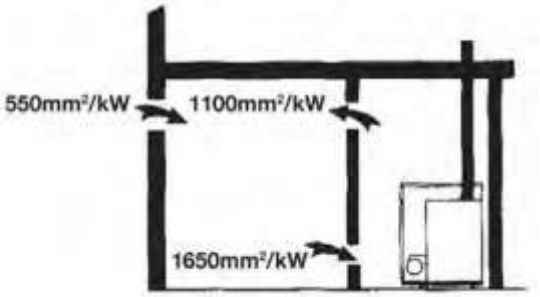


OPEN FLUE

Boiler in Compartment

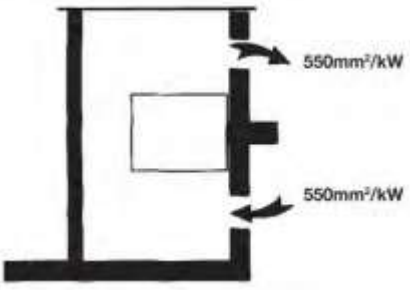


OPEN FLUE
VENTILATED FROM OUTSIDE

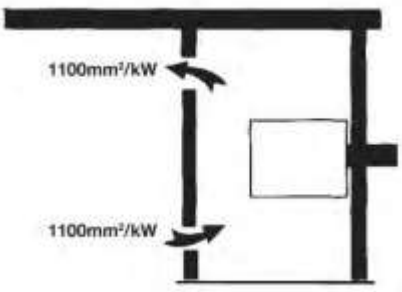


OPEN FLUE
VENTILATED FROM ROOM

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 BS5410 : PART 1 and the Building Regulations.

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. Pumped, System and Combi models may require access to the top.

10.1.3 Heating System

The heating system should be installed to HVCA current 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 BS5449 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, pumps, auto air vents, pressure relief valves, plate heat exchangers and non-return valves due to corrosion product 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. 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 anti freeze agent. The Kabin Pak Combi boiler is factory fitted with a frost thermostat as standard. For all other Kabin Pak models covered by this manual a Frost Thermostat Kit (Code FSK1) is available as an optional extra.

10.1.7 Pipework

We strongly advise that all installation pipework is run in copper. However, if plastic 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 BS7074: PART 1 and BS5449 for details of expansion vessel sizing. The values given in the table below are for total system volumes which include the primary water capacity of the boiler which can be found in the Technical Data section of this manual. System and Combi models up to 120HE 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. Where permitted by the type, size and configuration of heating system the expansion vessel bladder pre-charge pressure can be reduced, prior to filling the system, to 0.5 bar in order to accommodate a total system volume of 145 litres. If these maximum total system volumes are to be exceeded, additional expansion capacity will be required.

INITIAL CHARGE	**VESSEL VOLUMES**											
0.5	2.1	4.2	6.3	8.3	10.5	12.5	14.6	16.7	18.7	20.8	22.9	25.0
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
1.5	2.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1	39.0	42.9	46.8
SYSTEM VOLUME	25	50	75	100	125	150	175	200	225	250	275	300

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.

10.2.2 System Filling

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

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.

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. To prevent this it is recommended that a low pressure cut out switch set at 0.2 bar is fitted to **the system** and wired in series with the boiler limit thermostat.

10.3 Combi Domestic Hot Water

10.3.1 Mains Water Pressure

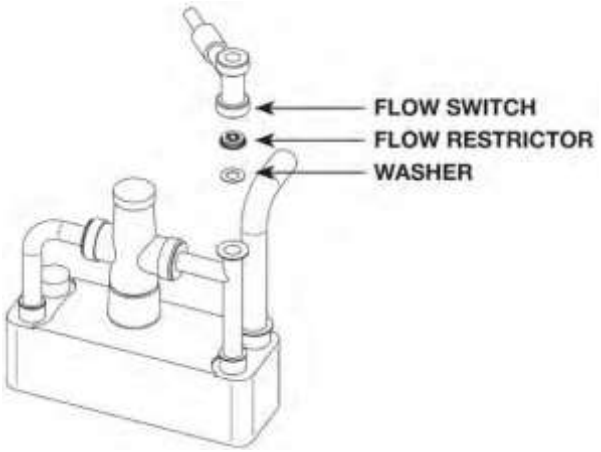
To protect the appliance and to prevent excessive flow rates, a pressure reducing valve must be fitted to limit the maximum supply pressure to 3 bar. We strongly advise that all installation pipework is run in copper. However, if plastic pipe is used, it must be recommended by the pipe manufacturer for use with oil fired appliances and, in any case, the last 1000mm of pipework connected directly to the appliance must be of copper. Whenever a pressure reducing valve or other device containing a non-return valve is fitted to the mains water supply entering the boiler, a mini expansion vessel must be fitted after the device in order to protect the appliance from the expansion due to heating of the water in the domestic hot water pipework. Note that the flow rate from individual taps is dependant 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 Flow Restrictor

An 18L/min flow restrictor has been factory fitted but can be easily removed if required.

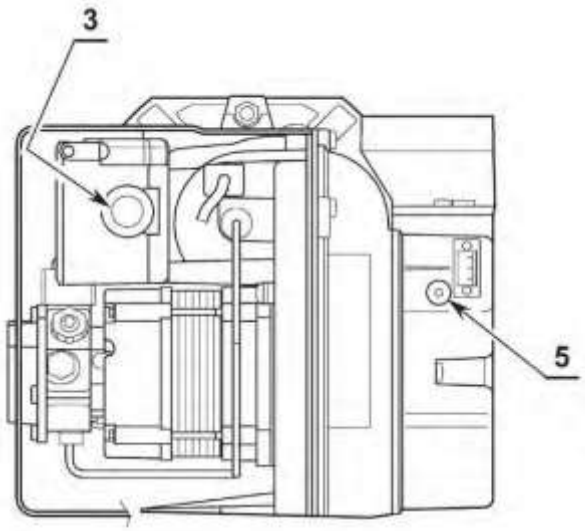


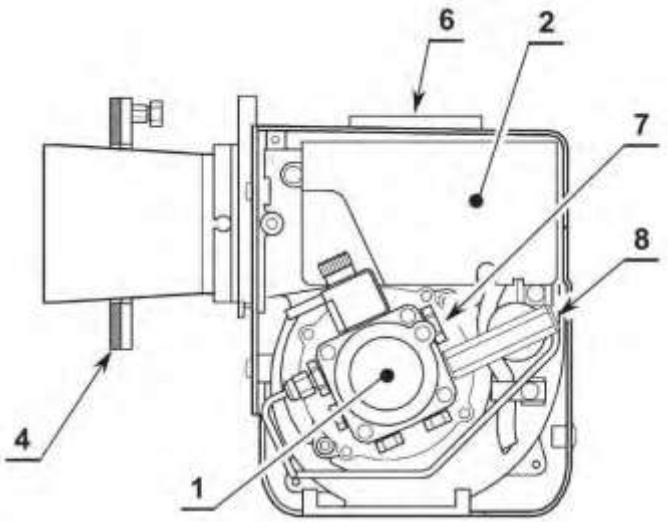
10.3.4 Boreholes

Where the mains water supply to the boiler is fed from a borehole via a pump and accumulator arrangement the variable pressure can cause the mixer valve to go to its fail safe settings thus preventing the outlet water temperature from achieving a suitable level. In order to minimise the pressure variations it is recommended that differential on the borehole pump pressure switch 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.

11 BURNERS

11.1 RDB Burner



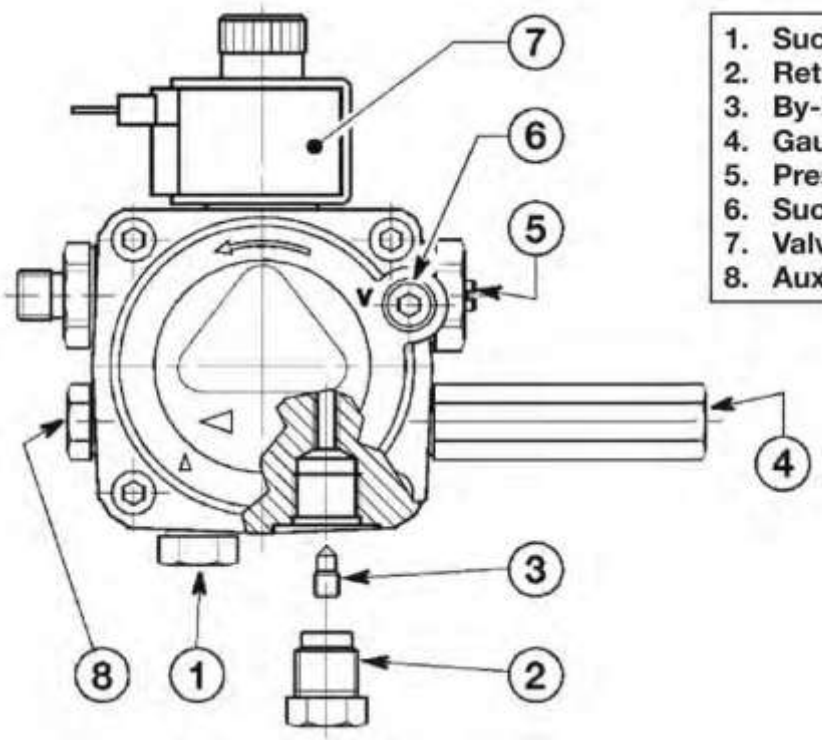


1. Pump
2. Control Box
3. Reset Button with Lock-Out Lamp
4. Flange with Insulating Gasket

5. Air Damper Adjustment Screw
6. Air Tube Connection (Supplied with BF Kit)
7. Pump Pressure Adjustment Screw
8. Pressure Gauge Port

11.2 Oil Pump

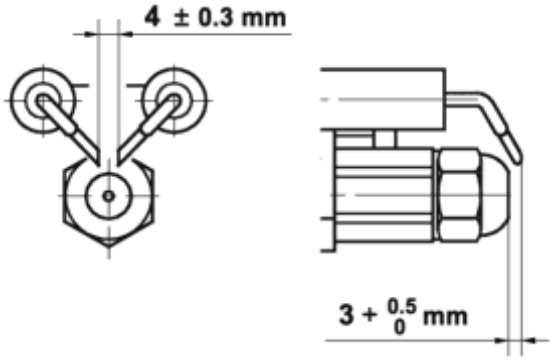
The burner is supplied for use with a one pipe system. For use on a two pipe system, it is necessary to remove the return port plug and fit a small by-pass plug as shown.



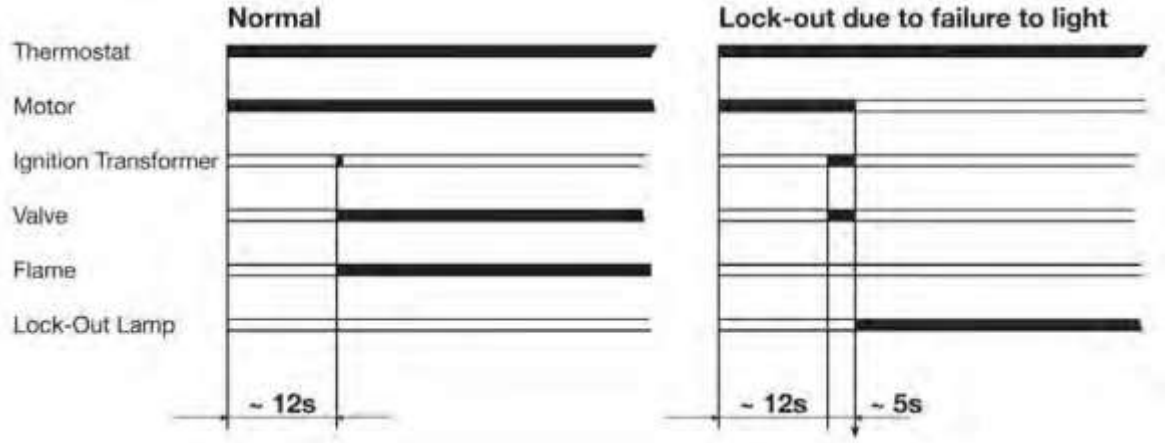
1. Suction Line
2. Return Line
3. By-Pass Screw
4. Gauge Connection
5. Pressure Adjuster
6. Suction Gauge Connection
7. Valve
8. Auxiliary Pressure Test Point

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.



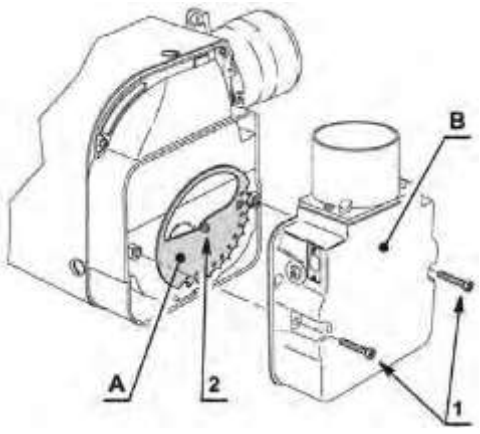
11.4 Burner Start-Up Cycle



11.5 Air Damper Adjustment

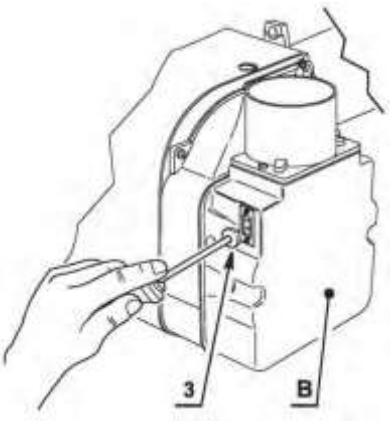
The air damper is set in factory. This regulation is purely indicative. Each installation however, has its own working conditions: actual nozzle output; positive or negative pressure in the combustion chamber, the need of excess air, etc. All these conditions may require a different air damper setting.

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).

12 COMMISSIONING & SERVICING

12.1 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. 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 Heat IQ Approved technician and the commissioning certificate of the Boiler completed and returned to Heat IQ within 30 days from the date of installation

.

12.2 Servicing

12.2.1 General Requirements

The appliance must be serviced annually by a Warmflow or Heat IQ registered service technician

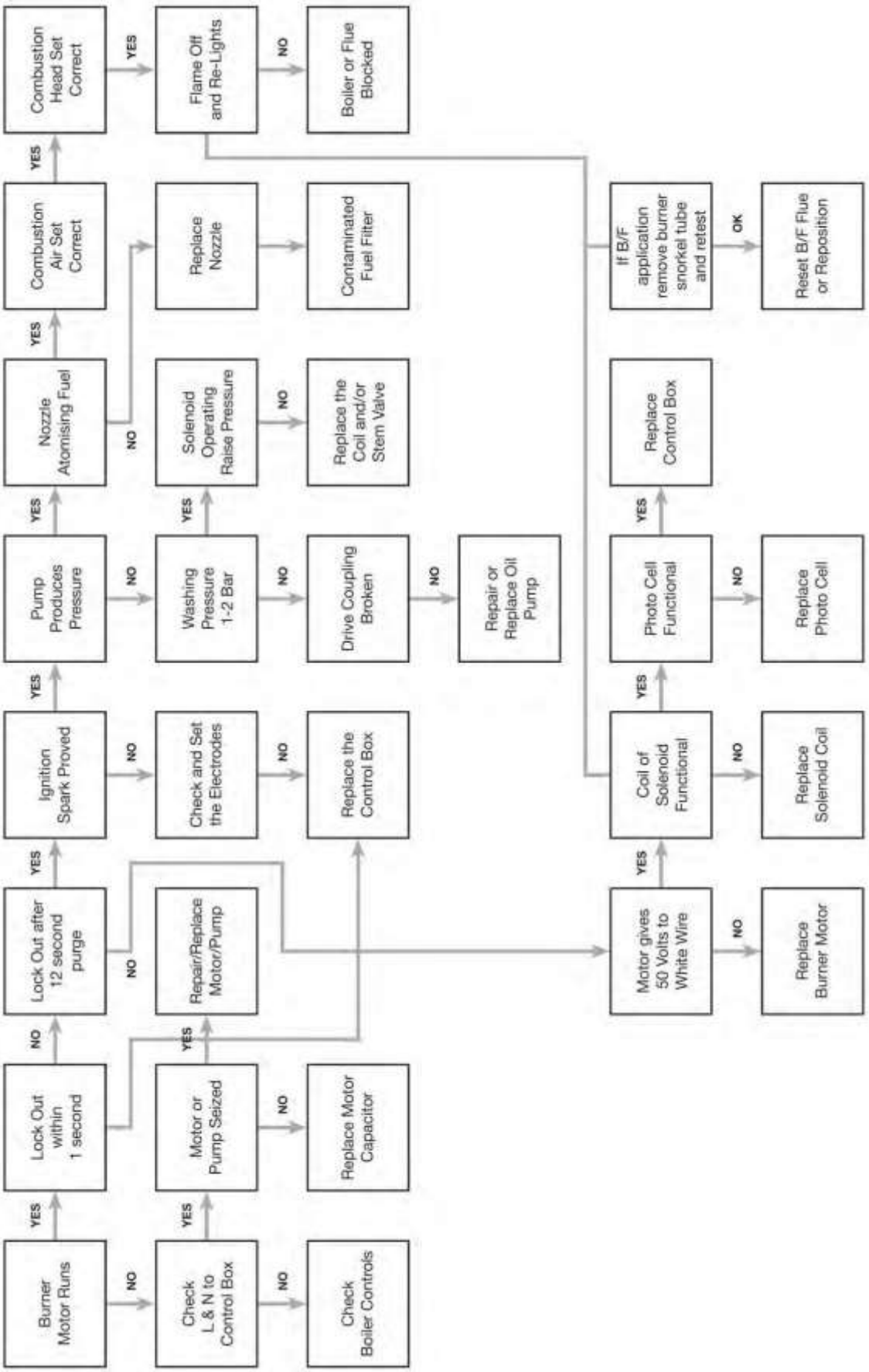
when servicing, special attention should be paid to the condition of the oil nozzle, flexible oil line, fuel filter, door insulation, sealing rope and the secondary heat exchanger door seal. If found to be defective, they must be replaced.

The system corrosion inhibitor level must be checked (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 Heat IQ accredited or suitably qualified technician

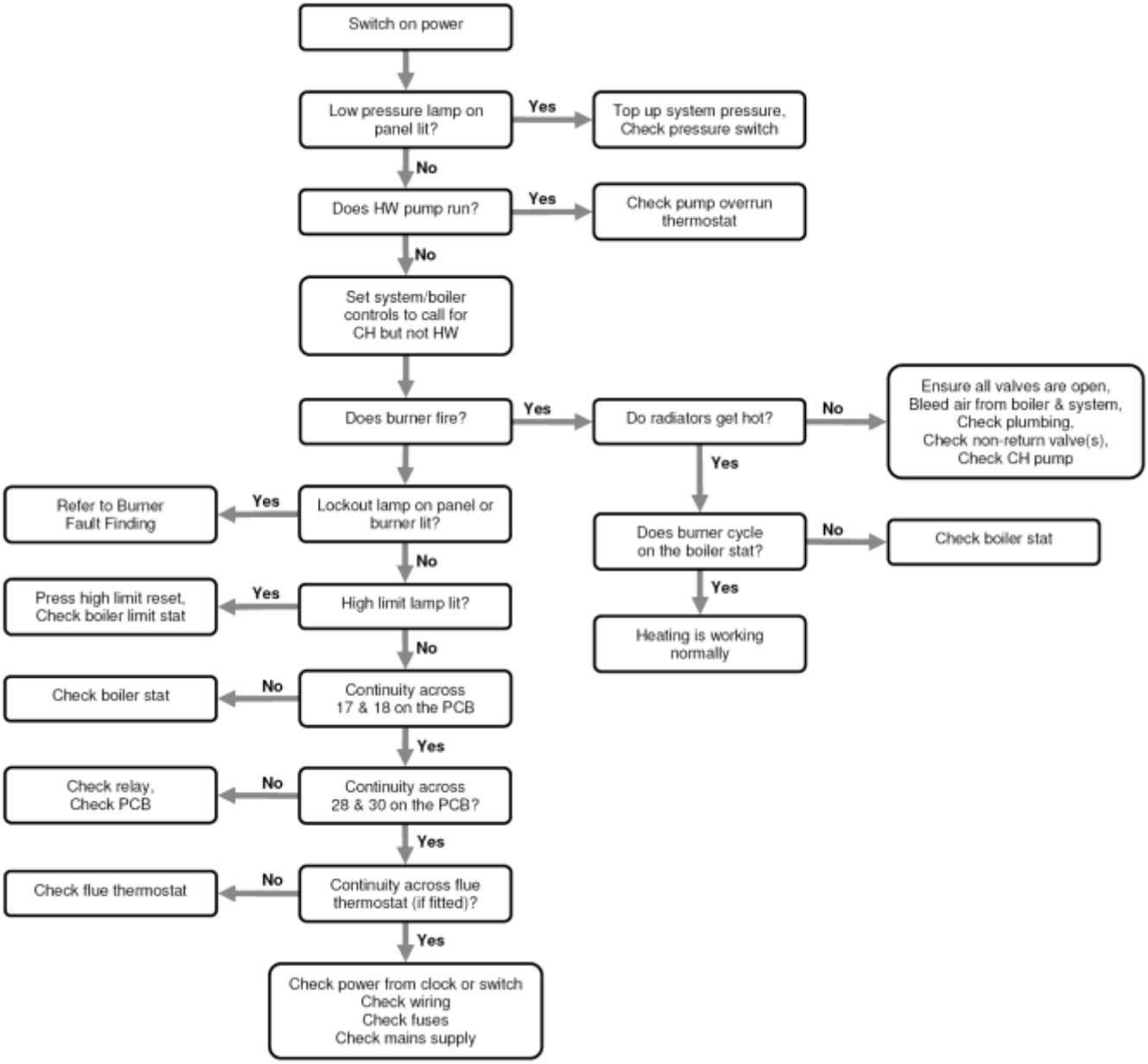
13 BURNER FAULT FINDING

13.1 Riello RDB

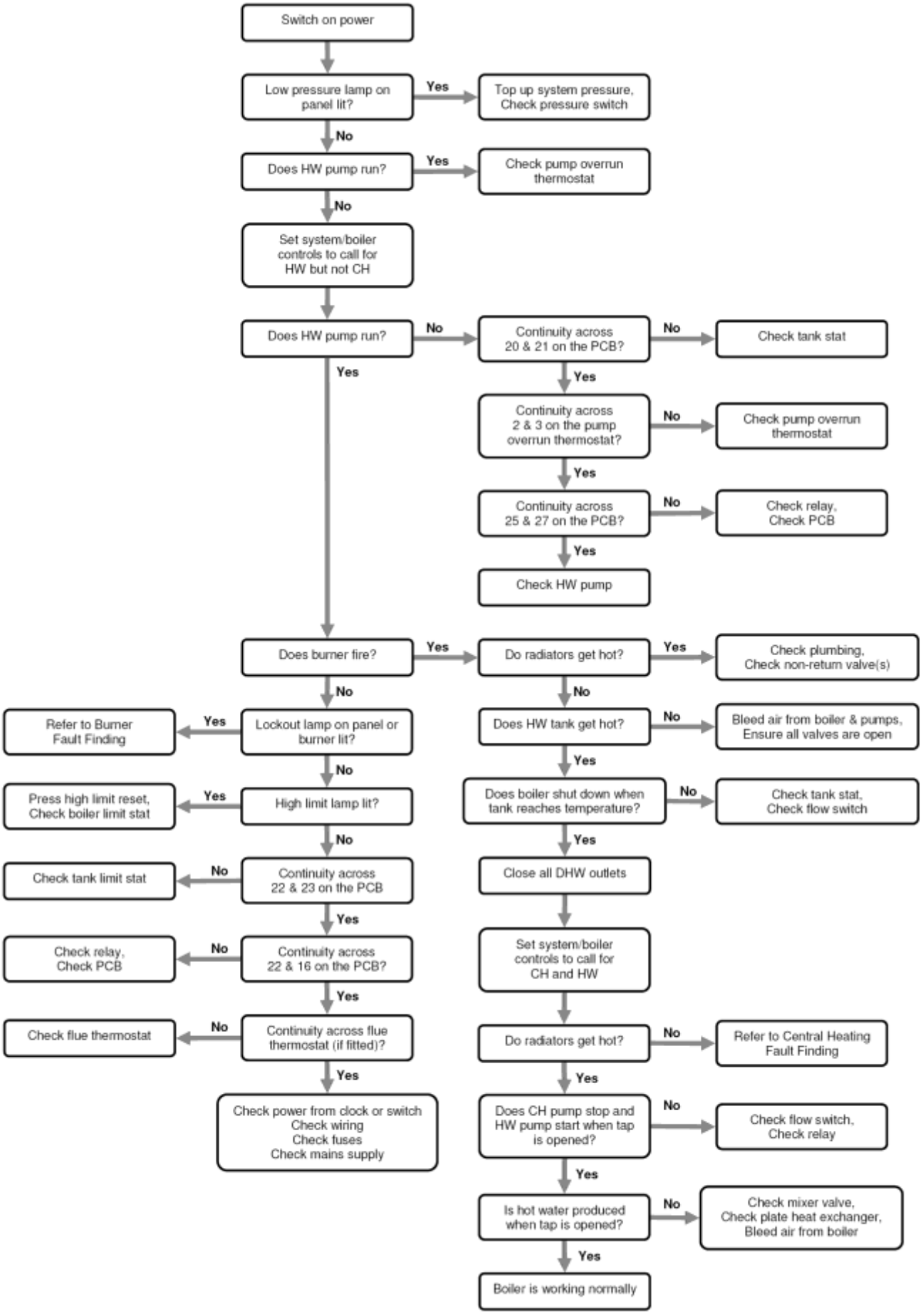


14 COMBI FAULT FINDING

14.1 Central Heating



14.2 Domestic Hot Water



15 OPTIONAL BOILER MOUNTED DIGITAL TIMER

15.1 Operating Instructions

15.1.1 After Installation

When you first install the Cr2032 battery (by removing the clear plastic strip from the rear of the timer) you must press the „RESET" button, the LCD display will display fully for 3 seconds. Then LCD display will change to „5:2d". You can press DAY button to select „7d", „24H" programme mode.

This configures the timer as follows:

5/2d: 5 day/2 day programme option allows different ON/OFF times on weekday and weekend.

7d: 7 day programme option allows different programme setting on each day of weekday and weekend.

24H: 24 hours programme option runs same programme every day.

When you finalise the setting, press the CLOCK button for normal operation.

15.1.2 Built in Programme

For convenience, the timer module has a built in programme, however, it can be easily adjusted (see section 15.1.5 to Change the Programmes).

The timer offers 3 options for both CH and HW programme period.

OFF: Off all the time.

AUTO: To run your time schedule for period one or two or three each day.

ON: Turn on all the time.

Factory Present Time Schedule

Switching	Mon – Fri Time Schedule		Sat – Sun Time Schedule	
	CH/CH1	HW/CH2	CH/CH1	HW/CH2
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	12:00	12:00	12:00	12:00
PERIOD 2 OFF	14:00	14:00	14:00	14:00
PERIOD 3 ON	16:30	16:30	16:30	16:30
PERIOD 3 OFF	22:30	22:30	22:30	22:30

15.1.3 To Set Current Time & Day

1. Press and hold **CLOCK** button then press **DAY** button to select current day of the week.

2. Press and hold **CLOCK** button then press **HOUR** button until the correct hour is displayed.

3. Press and hold **CLOCK** button then press **MINUTE** button until the correct minute is displayed.

15.1.4 Select Operation Mode

Press CH SELECT / HW SELECT button to select operation mode to be **OFF, AUTO, ON.**

15.1.5 To Set Programme Period

Press and hold **DAY** button and press **MIN** until the correct programme period is displayed.

Set Day Programme Period 1 On/Off

Switching	Mon – Fri Time Schedule		Sat – Sun Time Schedule	
	CH/CH1	HW/CH2	CH/CH1	HW/CH2
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	22:30	22:30	22:30	22:30

Set Day Programme Period 2 On/Off

Switching	Mon – Fri Time Schedule		Sat – Sun Time Schedule	
	CH/CH1	HW/CH2	CH/CH1	HW/CH2
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	16:30	16:30	16:30	16:30
PERIOD 2 OFF	22:30	22:30	22:30	22:30

Set Day Programme Period 3 On/Off

Switching	Mon – Fri Time Schedule		Sat – Sun Time Schedule	
	CH/CH1	HW/CH2	CH/CH1	HW/CH2
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	12:00	12:00	12:00	12:00
PERIOD 2 OFF	14:00	14:00	14:00	14:00
PERIOD 3 ON	16:30	16:30	16:30	16:30
PERIOD 3 OFF	22:30	22:30	22:30	22:30

15.1.6 Reviewing the Programmes

Press **TIMER** button each time to toggle through the **ON** and **OFF** settings.

15.1.7 To Change the Programme

1. Press **TIMER** key repeatedly until the particular **ON** or **OFF** time appears.
2. Press **HOUR** button and **MINUTE** button to set new **ON** or **OFF** time.

15.1.8 Mode Select

1. Press **SELECT** to toggle through **ON / AUTO / OFF** modes as indicated by the timer status.

2. **ON** mode turns on the timer.

3. **OFF** mode turns off the timer.

4. **AUTO** mode runs the set programme.

15.1.9 Manual Select

This function is only applicable when your timer is set on **AUTO** mode.

You can temporarily override the normal switching times by pressing the ADV key. The temporarily override won‟t affect the normal programme after execution of the override.

1. Press **CH ADV** or **HW ADV** key the CH icon or HW icon will flash.

2. In approximately 5 seconds the display CH select mode „AUTO‟ or HW select mode „AUTO‟ will flash and go into the manual override function.

3. OFF mode turns off the timer.

4. To cancel override by pressing **CH ADV** or **HW ADV** and the „AUTO‟ will stop flash.

15.1.10 Manual Hour

1. Press **CH ADV** or **HW ADV** key, the CH icon will flash.

2. You now have approx 5 second to enter desired length of time by pressing **CH ADV** or **HW ADV** key once for each hour the new time set should be in affect.

3. The MANUAL HOUR function will bring the unit ON 1 hour to 3 hours in the OFF mode.

4. The MANUAL HOUR function will bring the unit OFF 1 hour to 3 hours in the ON mode.

5. The MANUAL HOUR function is in operation, a count down clock will appear. Then normal display and count down clock will appear on the LCD alternately.

6. The MANUAL HOUR function will bring the unit ON 1 hour to 3 hours in off, clock will count down immediately.

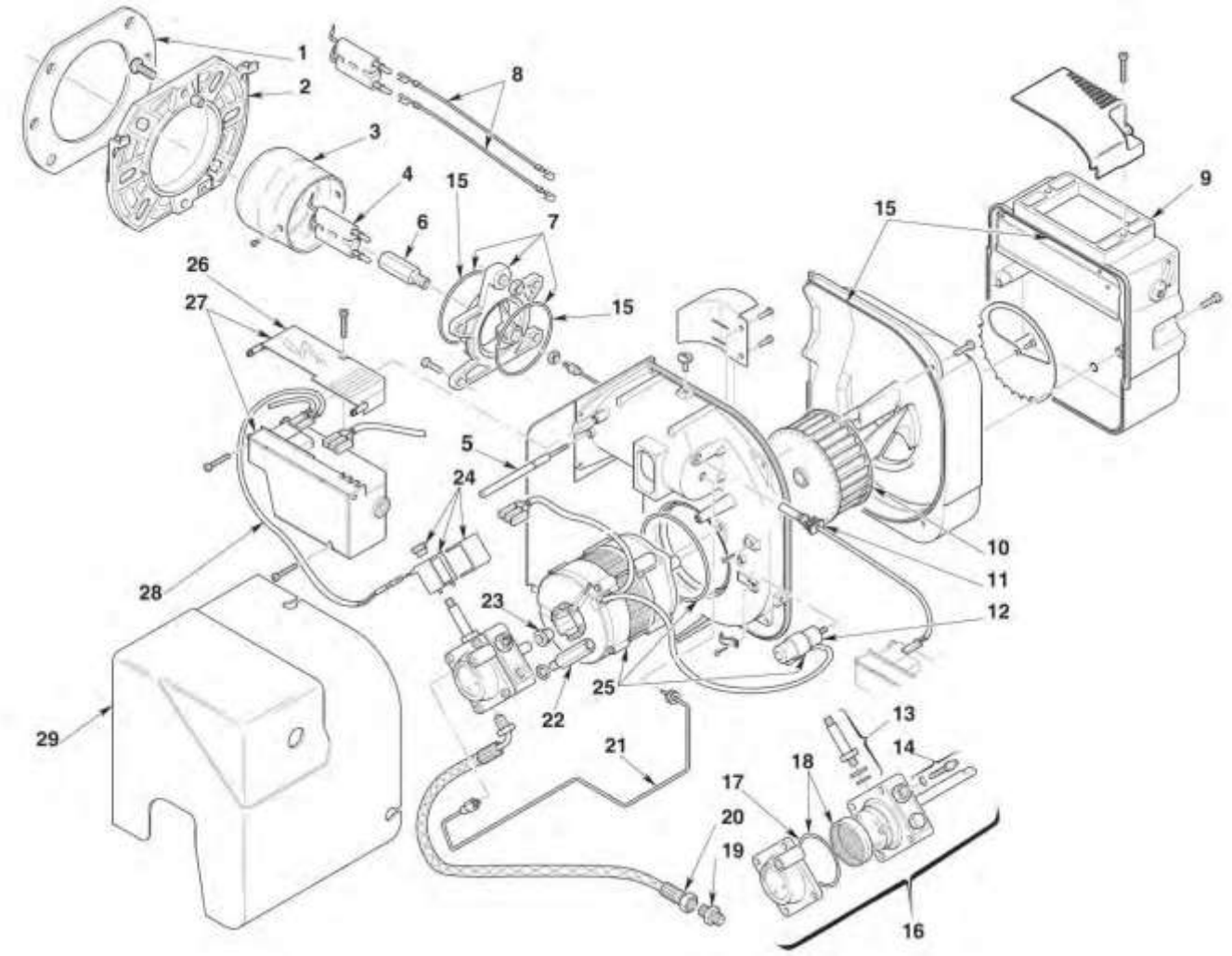
7. When MANUAL HOUR function will extend by 1 hour to 3 hours while ON, clock will count down after the programmed ON is finished.

15.1.11 Cancel Manual Hour Function

Press **CH ADV** or **HW ADV** button again the LCD display and switching status will return to normal.

16 SPARES

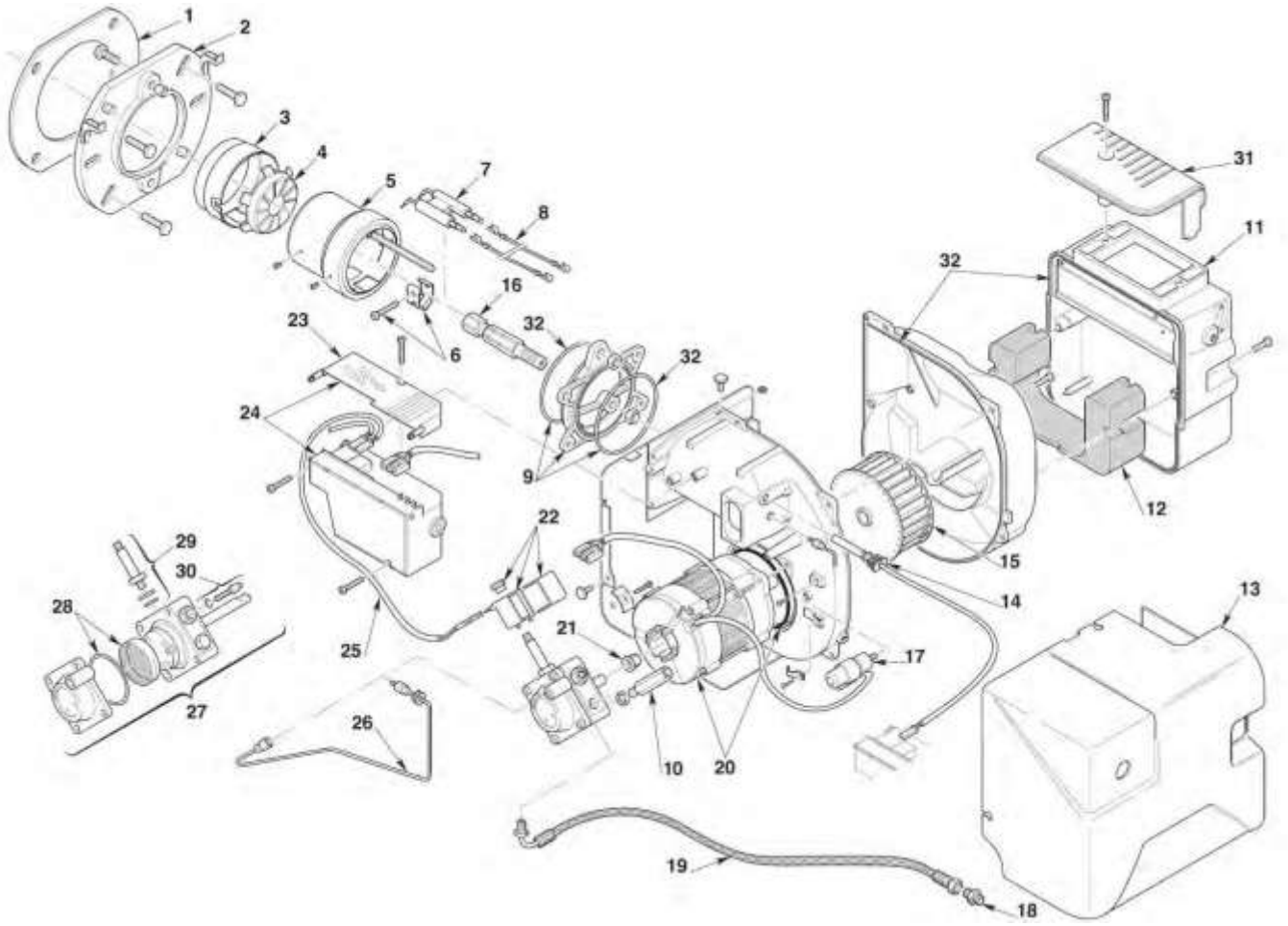
16.1 RDB 2.2 Spares



No	CODE	3514157	3514257	3514557	DESCRIPTION
1	3005787	•	•	•	Gasket
2	3006384	•	•	•	Flange
3	3020494	•			Cup-Shaped Head
3	3020258		•		Cup-Shaped Head
3	3020055			•	Cup-Shaped Head
4	3008860	•	•	•	Electrode Assembly
5	3008875	•	•	•	Screw
6	3008861	•	•	•	Nozzle Holder
7	3008862	•	•	•	Collar
8	3008794	•	•	•	High Voltage Lead
9	3008647			• •	Air Damper Assembly
9	3008839			•	Air Damper Assembly
10	3005788	•	•	•	Fan
11	3008646	•	•	•	PE Cell
12	3002837	•	•	•	Capacitor 4.5µF
13	3007871	•	•	•	Needle Valve
14	20032135	•	•	•	Regulator

No	CODE	3514157	3514257	3514557	DESCRIPTION
15	3008878	•	•	•	Kit Seals
16	20030953	•	•	•	Pump
17	3007175	•	•	•	O-Ring
18	3020436	•	•	•	Filter O-Ring
19	3003602	•	•	•	Connector
20	3005720	•	•	•	Flexible Oil Line
21	3008644	•	•	•	Tube
22	3008876	•	•	•	Pressure Gauge
23	3000443	•	•	•	Joint
24	3008648	•	•	•	Coil-Shell & Knob
25	3002836	•	•	•	Motor & Capacitor
26	3008649	•	•	•	Protection
27	3008652	•	•	•	Control Box 535RSE/LD
28	3008851	•	•	•	Lead Coil
29	3008879	•	•	•	Cover

16.2 RDB 3.2 Spares

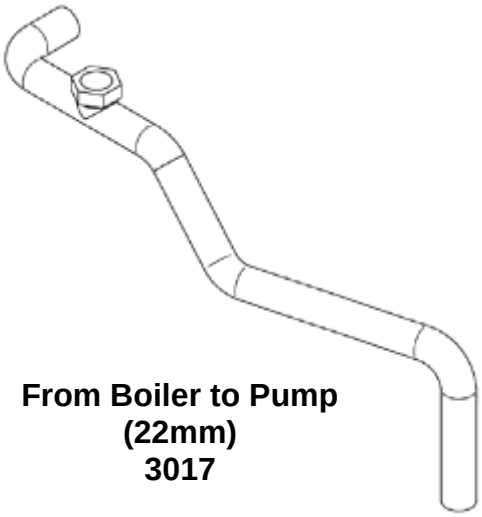


No	CODE	3748941	DESCRIPTION
1	3005795	•	Gasket
2	3008637	•	Flange
3	3005714	•	End Ring
4	3005713	•	Diffuser Disc
5	3007714	•	Blast Tube Assembly
6	3006552	•	Electrode Bracket
7	3007513	•	Electrode Assembly
8	3008794	•	High Voltage Lead
9	3008957	•	Collar
10	3008876	•	Pressure Gauge
11	3008839	•	Air Damper Assembly
12	3008958	•	Deadening
13	3008962	•	Cover
14	3008646	•	PE Cell
15	3005799	•	Fan
16	3008955	•	Nozzle Holder
17	3008960	•	Capacitor 5 µF

No	CODE	3748941	DESCRIPTION
18	3003602	•	Connector
19	3005720	•	Flexible Oil Line
20	3008964	•	Motor
21	3000443	•	Joint
22	3008648	•	Coil-Shell & Knob
23	3008649	•	Protection
24	3008652	•	Control Box 535SE/LD
25	3008851	•	Lead Coil
26	3008961	•	Tube
27	20030953	•	Pump
28	3020436	•	Filter O-Ring
29	3007871	•	Needle Valve
30	20032135	•	Regulator
31	3008959	•	Air Intake
32	3008963	•	Kit Seals

16.3 Pipe Spares

Utility Pumped & System Models –
UP70HE, UP90HE, UP120HE, US70HE, US90HE & US120HE

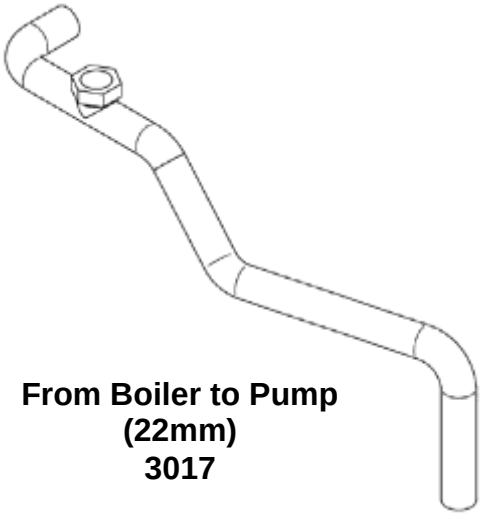


From Boiler to Pump
(22mm)
3017

Pump Flow Pipe
(22mm)
3015

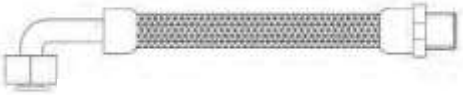
Expansion Vessel
Pressure Hose
3020

Kabin Pak Pumped & System Models –
KP70HE, KP90HE, KP120HE, KS70HE, KS90HE & KS120HE



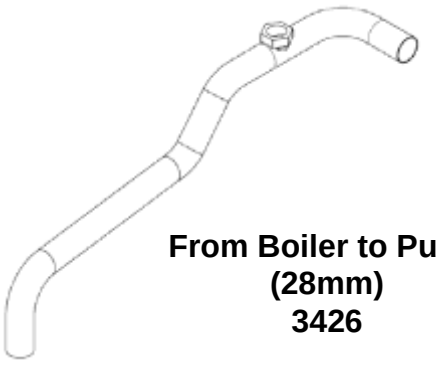
From Boiler to Pump
(22mm)
3017

Pump Flow Pipe
(22mm)
3015

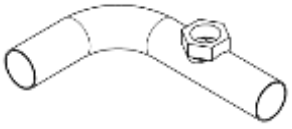


Expansion Vessel
Pressure Hose
3020

150HE Pumped Models – UP150HE & KP150HE



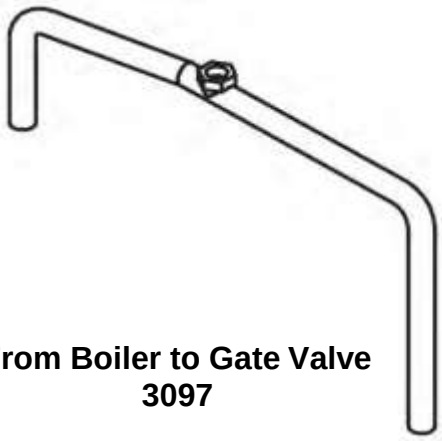
From Boiler to Pump
(28mm)
3426



Pump Flow Pipe
(28mm)
3425

16.3 Pipe Spares cont'd

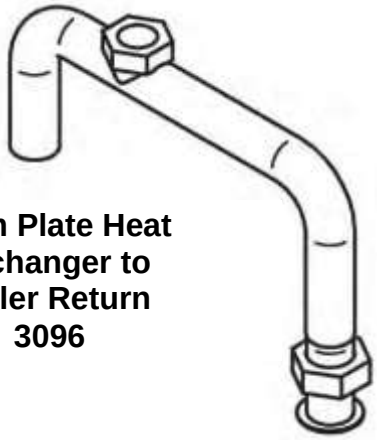
Utility and Kabin Pak Combi Models –
UC70HE, UC90HE, KC70HE & KC90HE



From Boiler to Gate Valve
3097

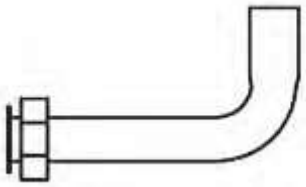
From Gate Valve to Pump
3098

Ch Flow from Pump
3100

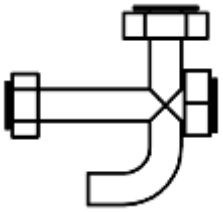


From Plate Heat Exchanger to Boiler Return
3096

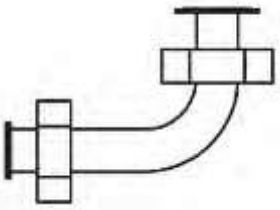
Expansion Vessel Pressure Hose
3020



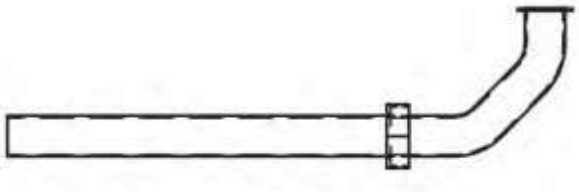
From Heat Store to Plate Heat Exchanger
1997



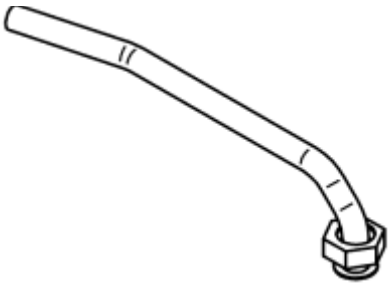
From Flowswitch to Mixing Valve & Plate Heat Exchanger
1992



From Plate Heat Exchanger to Mixing Valve
1994



DHW Flow from Mixing Valve
3101



From Strainer to Flowswitch
3099

16.4 Short Parts List - Boiler

Part Description	Code
Flow Switch	1476
Tank & Boiler Control Thermostat	2131
Boiler Limit Thermostat (Combi Models)	281
Tank Limit Thermostat	2126
Pump Overrun Thermostat	3108
Plate Heat Exchanger	599
Twin Head Pump	2130
15/60 Pump (for replacement head)	602
3 Pole Relay	1827
Auto Air Vent C/W Check Valve	614
Pressure Relief Valve	2132
Filling Loop	2133
Pressure Gauge	3019
Mixer Valve	1621
PCB Controller MK4	2419
12 Litre Pressure Vessel	2128
Single Pole Relay & Base	3074
Dual-Safe Thermostat for Non-Combi Models	WDS2
Optional Programmer for Combi Models	PC1
Optional Programmer for Non-Combi Models	PU1

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

17 YOUR GUARANTEES, TERMS & CONDITIONS New Zealand

1. Heat IQ NZ Guarantees

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

The period of guarantee will be Two years from the date of installation in New Zealand*
The period of guarantee in Great Britain will be 24 months from the date of installation.

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

The primary heat exchanger, secondary heat exchanger and thermal store (in the case of a combination boiler) is guaranteed against defective parts and workmanship for a total of 3 years from the appliance date code, provided the boiler is installed and commissioned in accordance with the instructions supplied with the boiler. This warranty will be a parts only warranty after expiry of the initial parts and labour warranty period,

Heat IQ (NZ) reserves the right to repair or replace components within the guarantee period at a time and location that is most convenient to the company.

2. Conditions of Guarantee

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

Additionally:

- The Boiler warranty registration must be fully completed and the commissioning certificate returned to Heat IQ within 30 days from the date of installation.
- The boiler must be installed and commissioned by an approved Heat IQ accredited Or suitably qualified engineer. Commissioning of the boiler must be completed immediately after the boiler is installed.
- The boiler must be serviced by a Heat IQ accredited or other suitably qualified technician, 12 months after the date of installation and thereafter, at 12 monthly intervals.

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

All repairs must be authorized in writing by Heat IQ prior to any work being carried out. Unauthorized claims are not covered by the guarantee.

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

*If the boiler has not been installed within 2 months of the date of dispatch from Heat IQ, then the warranty will deem to have started.

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

In the event of a breakdown please contact your commissioning engineer Diagnose and liaise with us regarding your fault

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

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

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

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.

CODE 3307
ISSUE 4
FEB 2012