

Boiler Manual

Incorporating:

- Guarantee Registration
- User Instructions
- Installation Instructions
- Service Instructions
- Service Record

Standard Efficiency Boilers

Models covered by this manual:

B-Series

Boilerhouse	<i>B70</i>	<i>B90</i>	<i>B120</i>
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U-Series

Utility	<i>U70</i>	<i>U90</i>	<i>U120</i>
Utility Pumped	<i>UP70</i>	<i>UP90</i>	<i>UP120</i>
Utility System	<i>US70</i>	<i>US90</i>	
Utility Combi	<i>UC70</i>	<i>UC90</i>	

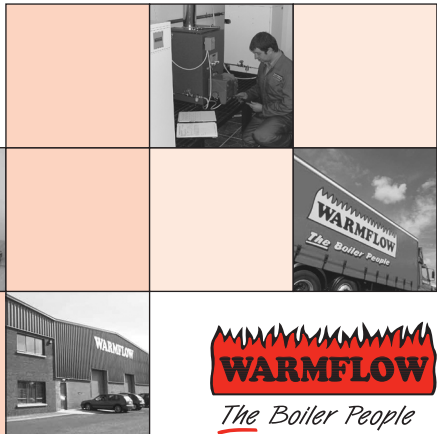
K-Series

Kabin Pak	<i>K70</i>	<i>K90</i>	<i>K120</i>
Kabin Pak Pumped	<i>KP70</i>	<i>KP90</i>	<i>KP120</i>
Kabin Pak System	<i>KS70</i>	<i>KS90</i>	
Kabin Pak Combi	<i>KC70</i>	<i>KC90</i>	

ISO 9001/2002



CERT No. FM 29884



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 attached guarantee registration card is completed and returned. Alternatively, you can register your guarantee online at www.warmflow.co.uk

Servicing

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

NI Customers Only

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

Telephone: 0870 240 6532

Fax: 028 9262 2827

Email: service@warmflow.co.uk

Web: www.warmflow.co.uk

For Parts, Service Technical & Warranty Contact

Great Britain & N Ireland, Tel: 0870 240 6532

Republic of Ireland, Tel: 048 9262 1515

LISBURN

Lissue Industrial Estate, Moira Road,
Lisburn, Co Antrim, N Ireland, BT28 2RF
Tel: (028) 9262 1515
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service@warmflow.co.uk

MANCHESTER

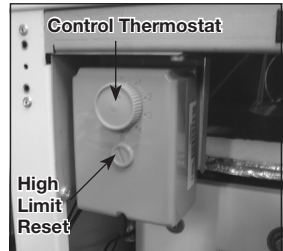
144 Bradford Road,
Manchester, M40 7AS
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Fax: (0161) 205 4818
Email: sales@warmflowgb.co.uk
technical@warmflowgb.co.uk
service@warmflowgb.co.uk

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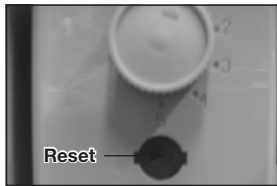
USER INSTRUCTIONS

Dual Thermostat

The radiator temperature is regulated via the boiler control thermostat. The thermostat is user adjustable from 55°C at its minimum setting (dial '0') to 85°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.



High Limit Thermostat Reset



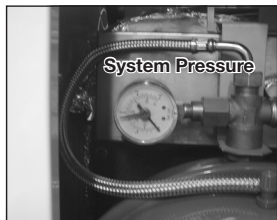
If the high level thermostat trip has operated, remove the reset cover by using a coin or screwdriver (turning anti clockwise) and press the small red button now exposed. Do not press the reset button while the boiler is still hot as this will cause damage to the thermostat.

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.



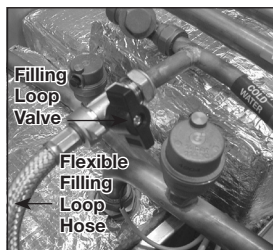
System Pressure – System & Combi Boilers



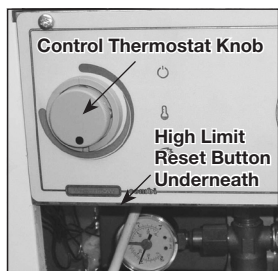
When the boiler is connected to a sealed system the system pressure should be periodically checked. The minimum pressure, as indicated by the black needle, is 0.5 bar when the boiler is cold and 2.5 bar when the boiler is at normal operating temperature. If the pressure is outside this range contact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

Filling Loop

If the system pressure falls below the minimum (eg, removal of 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 filling loop flexible removed from the valve, expect a small water loss from the pipe.



Combi Control Panel



The heating control thermostat is user adjustable from 55°C to 85°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.

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 an 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 (eg 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.

1.0 General Information

1.1 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 standard efficiency boilers are designed for use only on fully pumped (sealed or open-vented) heating systems and to burn Class C2 kerosene and Class D gas oil. Note that with class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

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.

1.2 General Requirements

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 HVCA, OFTEC and sound engineering practice.

In order to comply with the building regulations 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. CD10 and CD11 forms are available from OFTEC on Tel: 0845 658 5080, Fax: 0845 658 5181.

1.3 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.

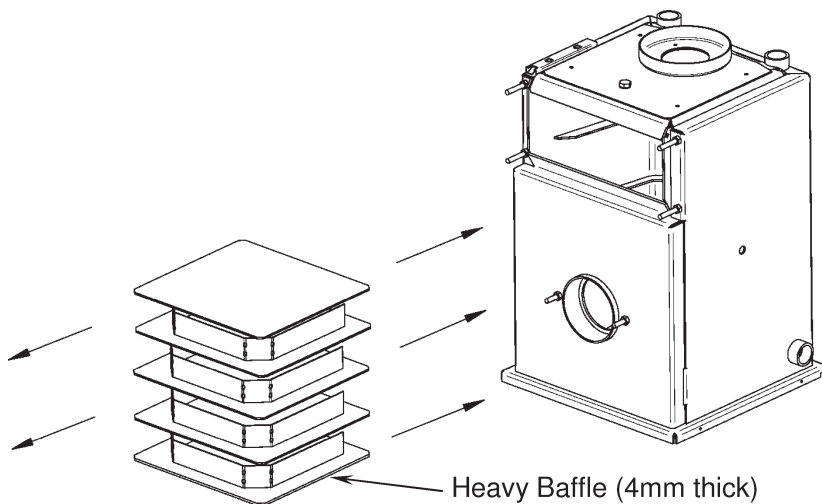
After a draw-off of 120L at 24L/min, with an average temperature rise of 32°C, the thermal store of a 90,000 Btu/h Combi has a recovery time of approximately 7 mins. A 70,000 Btu/h Combi will take slightly longer to recover.

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

1.3.1 Pump Overrun

Where there is a build up of excess heat in the boiler 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 or the central heating pump starts to operate, then the hot water pump will stop.

1.4 Baffle Positioning

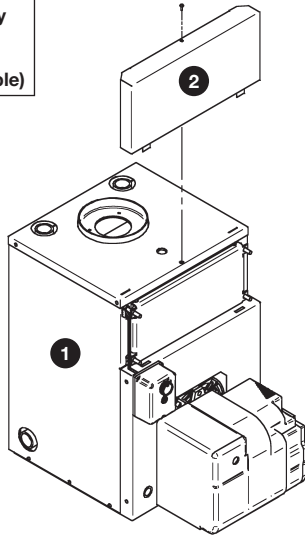


The heat exchanger baffles consist of one heavy baffle stack (4mm thick) at the bottom, 3 lighter baffle stacks (3mm thick) in the middle and 1 baffle plate (3mm thick) at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked.

1.5 Components

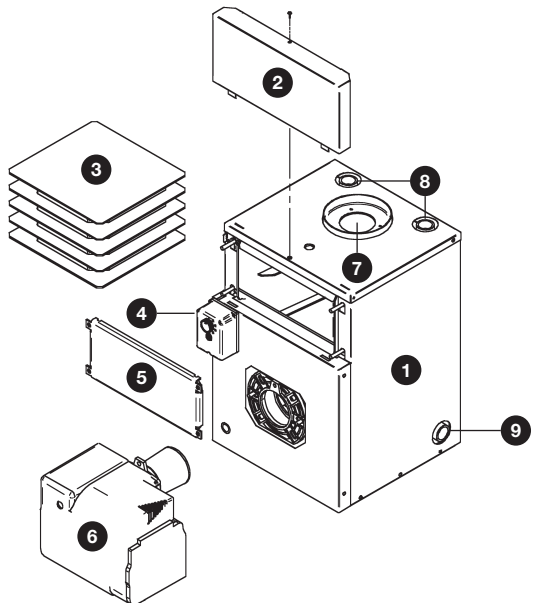
1.5.1 B-Series Boilerhouse – Casing Components

1. Boiler Assembly with Casing
2. Service Door Cover (removable)



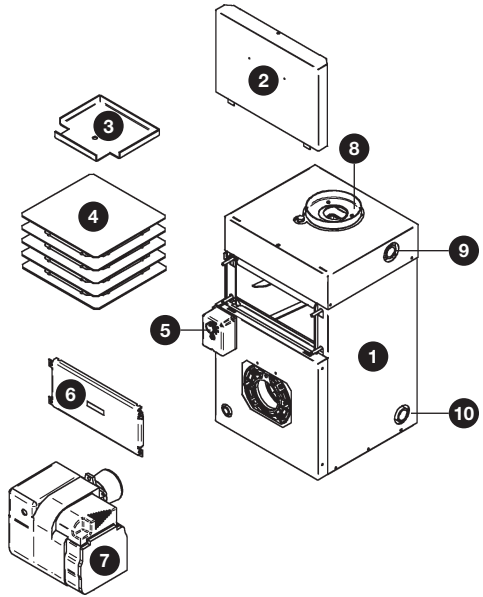
1.5.2 B-Series Boilerhouse (B70, B90 & B1) – Key Components

1. Heat Exchanger with Casing
2. Service Door Cover
3. Heat Exchanger Baffles
4. 'Dual-Safe' Thermostat
5. Service Door
6. Riello RDB 2.2 Burner
7. Flue Ring
8. Heating Flow Connection x 2
9. Heating Return Connection x 2



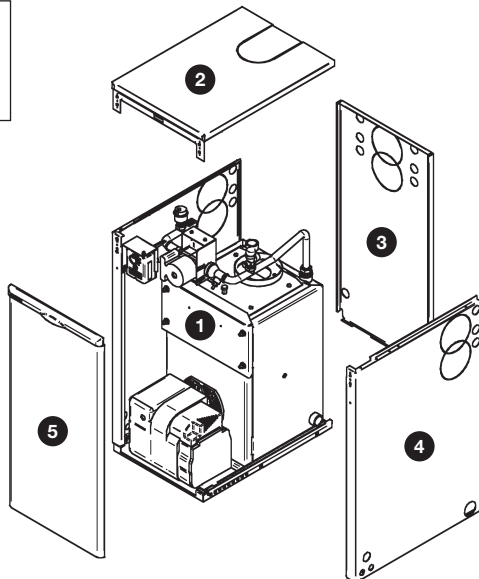
1.5.3 B-Series Boilerhouse (B120) – Key Components

1. Heat Exchanger Assembly with Casing
2. Service Door Cover
3. Secondary Exchanger Inspection Lid
4. Primary Exchanger Baffles
5. 'Dual-Safe' Thermostat
6. Service Door
7. Riello RDB 2.2 Burner
8. Flue Opening
9. Heating Flow Connection x 2
10. Heating Return Connection x 2



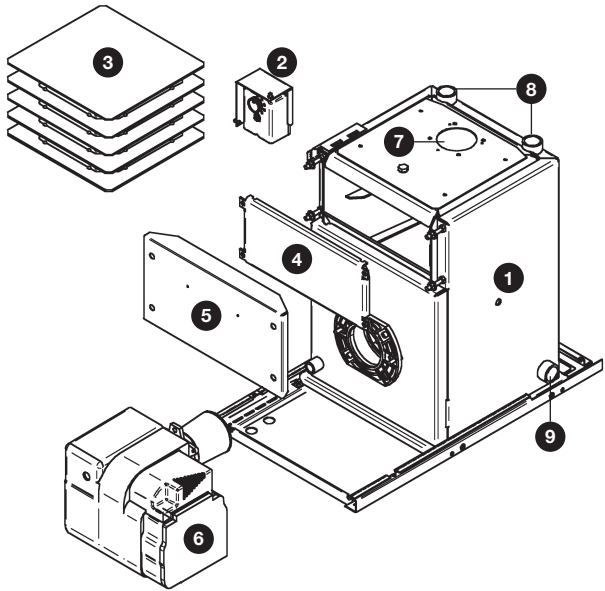
1.5.4 U-Series Utility – Casing Components

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



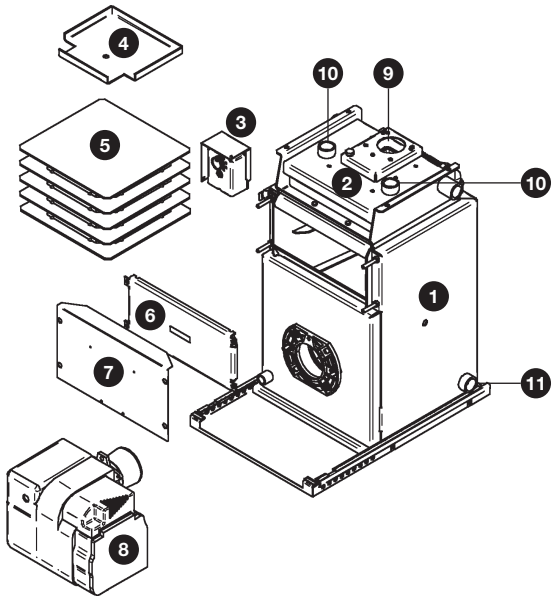
1.5.5 U-Series Utility – Pre-Wired (U70 & U90) – Key Components

1. Heat Exchanger
2. 'Dual-Safe' Thermostat
3. Heat Exchanger Baffles
4. Service Door
5. Service Door Cover
6. Riello RDB 2.2 Burner
7. Flue Opening
8. Heating Flow Connection x 2
9. Heating Return Connection x 2



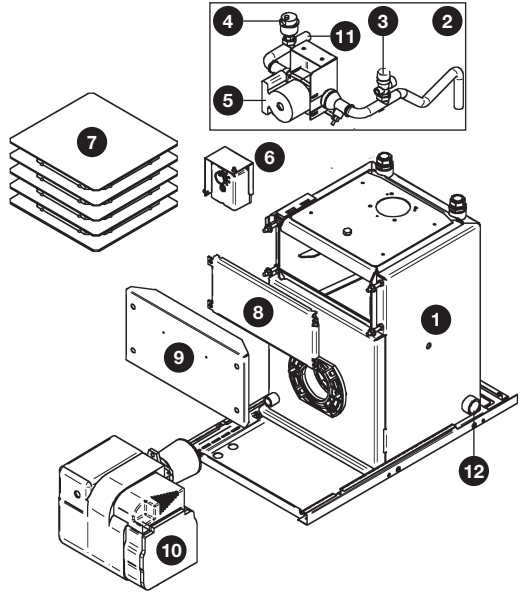
1.5.6 U-Series Utility – Pre-Wired (U120) – Key Components

1. Primary Heat Exchanger
2. Secondary Heat Exchanger
3. 'Dual-Safe' Thermostat
4. Secondary Exchanger Inspection Lid
5. Primary Exchanger Baffles
6. Service Door
7. Service Door Cover
8. Riello RDB 2.2 Burner
9. Flue Opening
10. Heating Flow Connection x 2
11. Heating Return Connection x 2



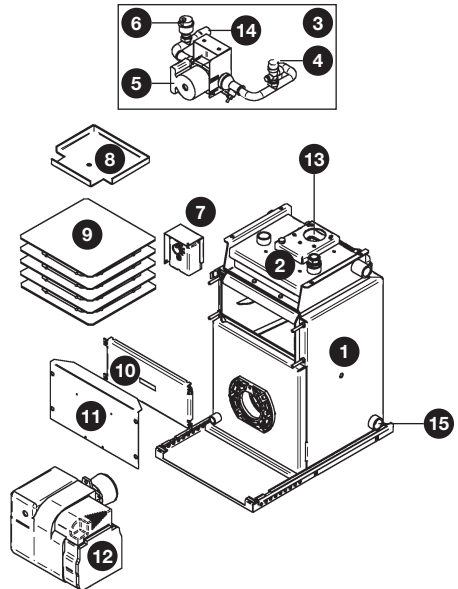
1.5.7 U-Series Utility – Pumped (UP70 & UP90) – Key Components

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



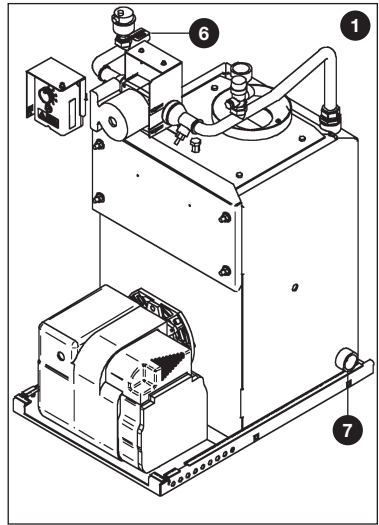
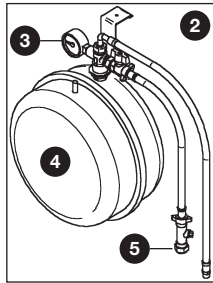
1.5.8 U-Series Utility – Pumped (UP120) – Key Components

1. Primary Heat Exchanger
2. Secondary Heat Exchanger
3. Pipework Assembly
4. Pressure Relief Valve
5. Circulating Pump
6. Auto Air Vent
7. 'Dual-Safe' Thermostat
8. Secondary Exchanger Inspection Lid
9. Primary Exchanger Baffles
10. Service Door
11. Service Door Cover
12. Riello RDB 2.2 Burner
13. Flue Opening
14. Heating Flow Connection
15. Heating Return Connection x 2

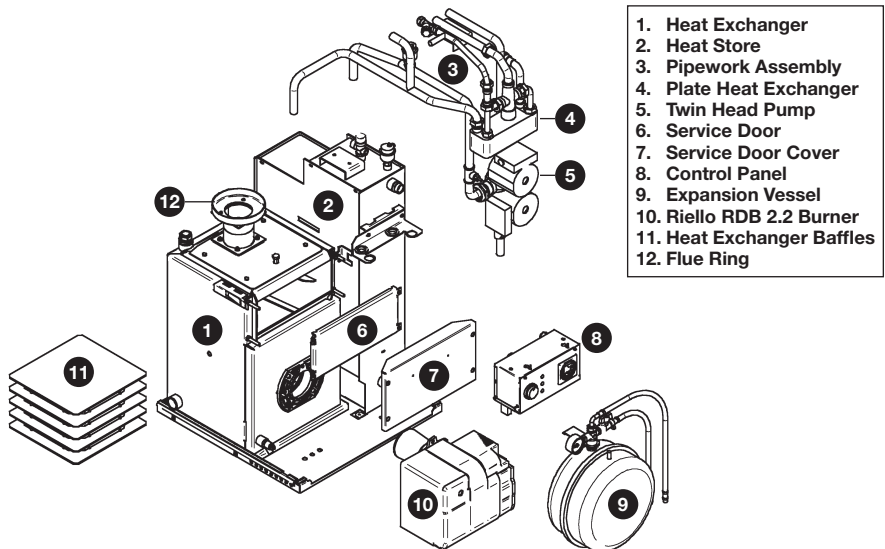


1.5.9 U-Series Utility – System (US70 & US90) – Key Components

1. Pumped (UP) Boiler Assembly
2. System Kit (SK1)
3. Pressure Gauge
4. Expansion Vessel
5. Filling Loop
6. Heating Flow Connection
7. Heating Return Connection x 2

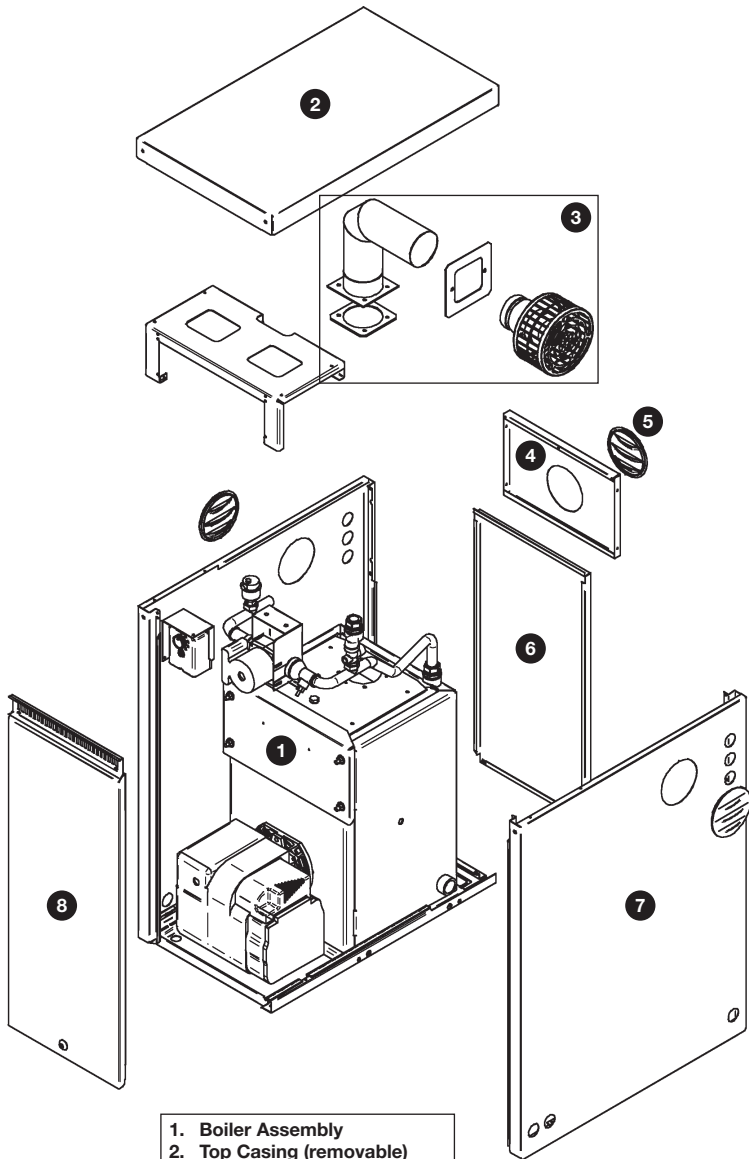


1.5.10 U-Series Utility – Combi (UC70 & UC90) – Key Components



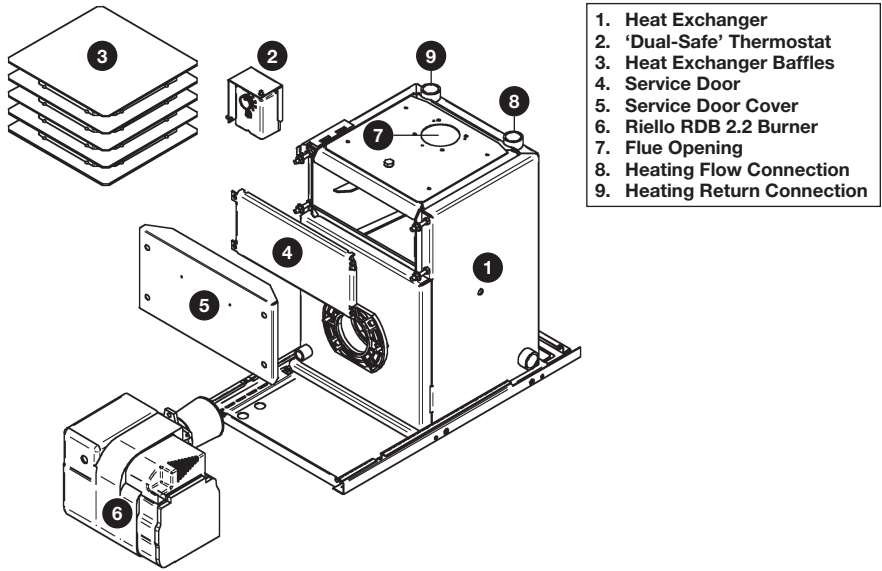
1. Heat Exchanger
2. Heat Store
3. Pipework Assembly
4. Plate Heat Exchanger
5. Twin Head Pump
6. Service Door
7. Service Door Cover
8. Control Panel
9. Expansion Vessel
10. Riello RDB 2.2 Burner
11. Heat Exchanger Baffles
12. Flue Ring

1.5.11 K-Series Kabin Pak – Casing Components

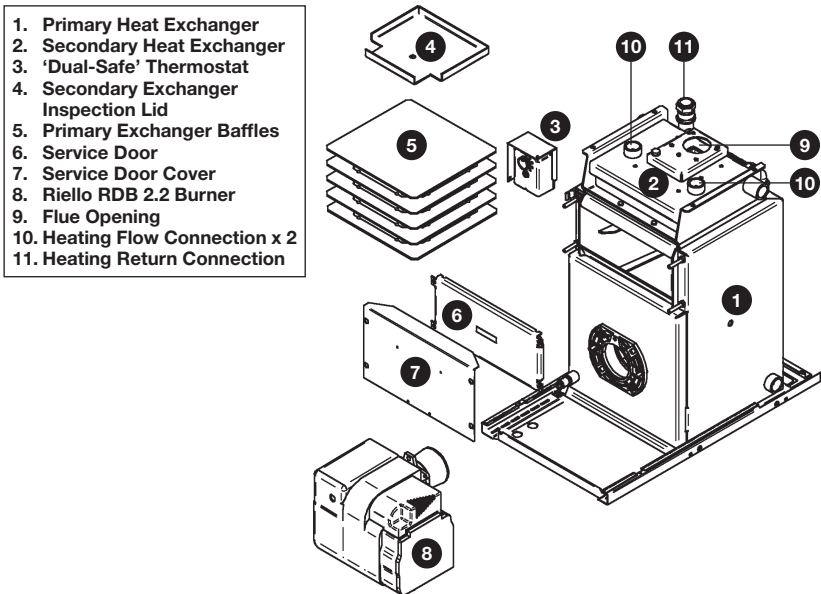


- 1. Boiler Assembly
- 2. Top Casing (removable)
- 3. Flue Assembly (removable)
- 4. Rear Flue Casing
- 5. Blanking Plug (removable)
- 6. Rear Casing (removable)
- 7. Side Casing
- 8. Front Casing (removable)

1.5.12 K-Series Kabin Pak – Pre-Wired (K70 & K90) – Key Components

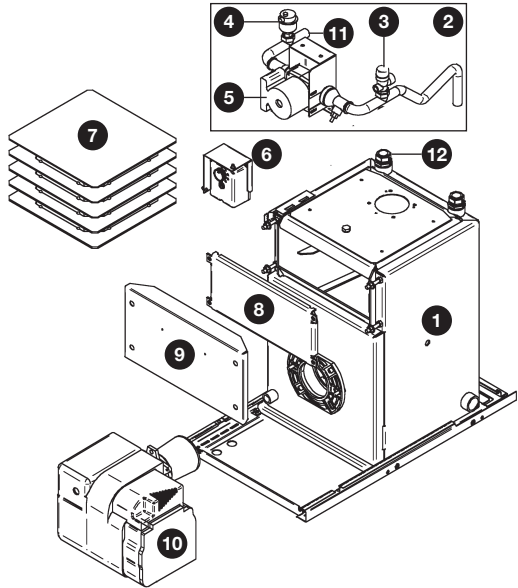


1.5.13 K-Series Kabin Pak – Pre-wired (K120) – Key Components



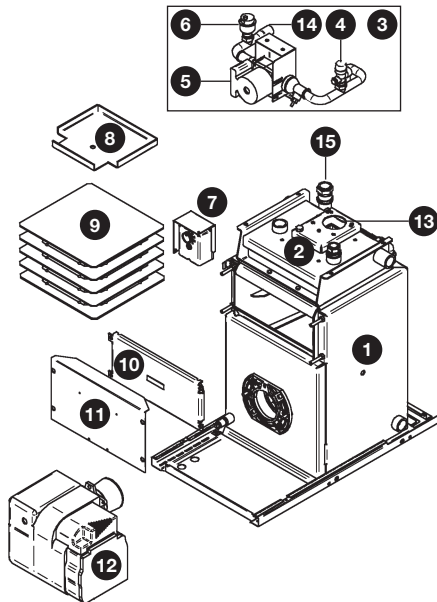
1.5.14 K-Series Kabin Pak – Pumped (KP70 & KP90) – Key Components

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



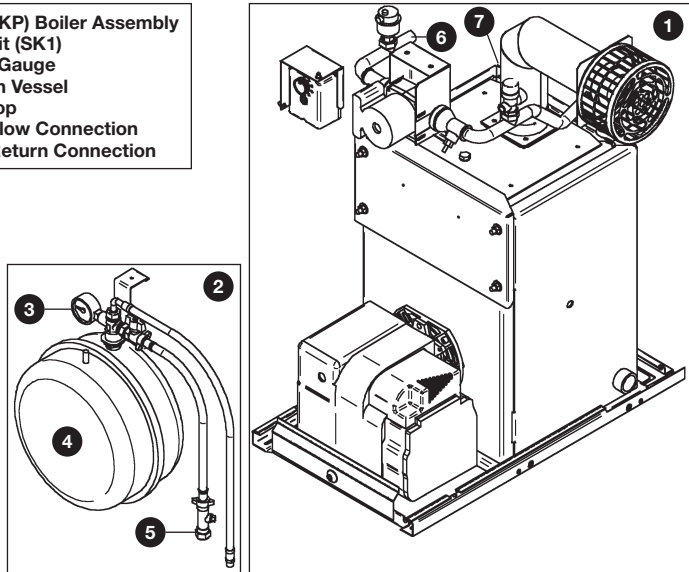
1.5.15 K-Series Kabin Pak – Pumped (KP120) – Key Components

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



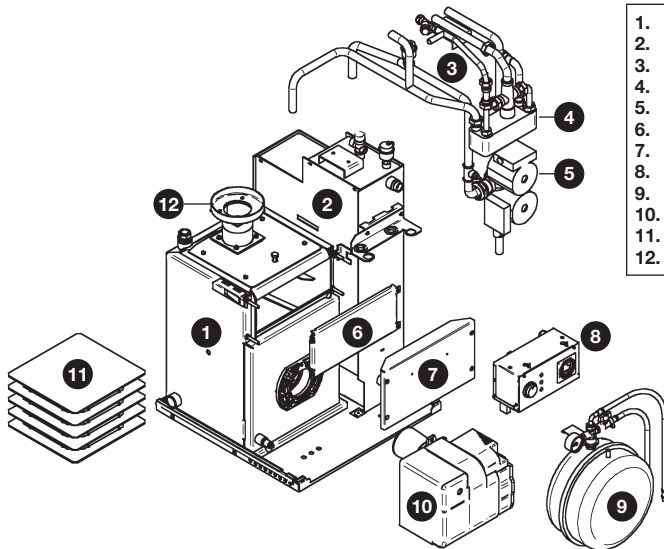
1.5.16 K-Series Kabin Pak – System (KS70 & KS90) – Key Components

1. Pumped (KP) Boiler Assembly
2. System Kit (SK1)
3. Pressure Gauge
4. Expansion Vessel
5. Filling Loop
6. Heating Flow Connection
7. Heating Return Connection

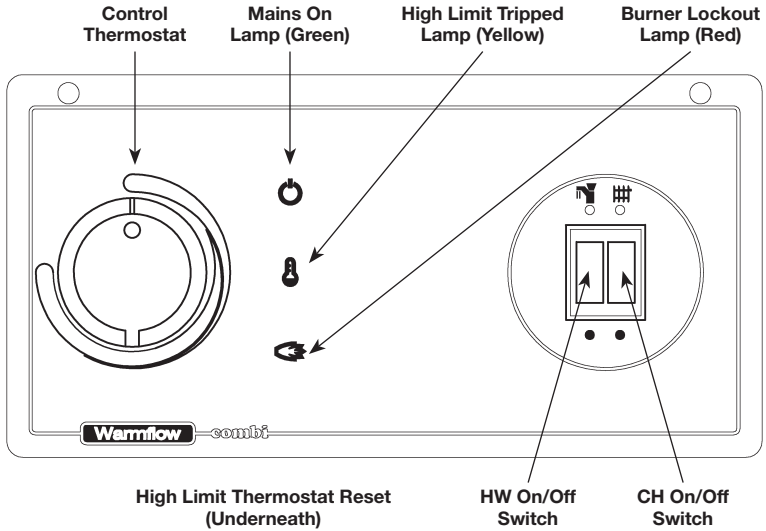


1.5.17 K-Series Kabin Pak – Combi (KC70 & KC90) – Key Components

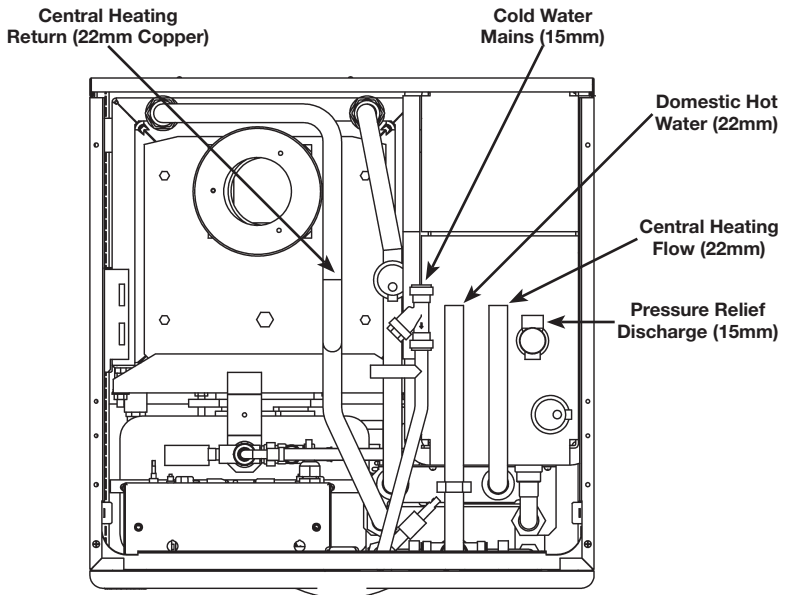
1. Heat Exchanger
2. Heat Store
3. Pipework Assembly
4. Plate Heat Exchanger
5. Twin Head Pump
6. Service Door
7. Service Door Cover
8. Control Panel
9. Expansion Vessel
10. Riello RDB 2.2 Burner
12. Flue Ring



1.5.18 Combi Control Panel Layout

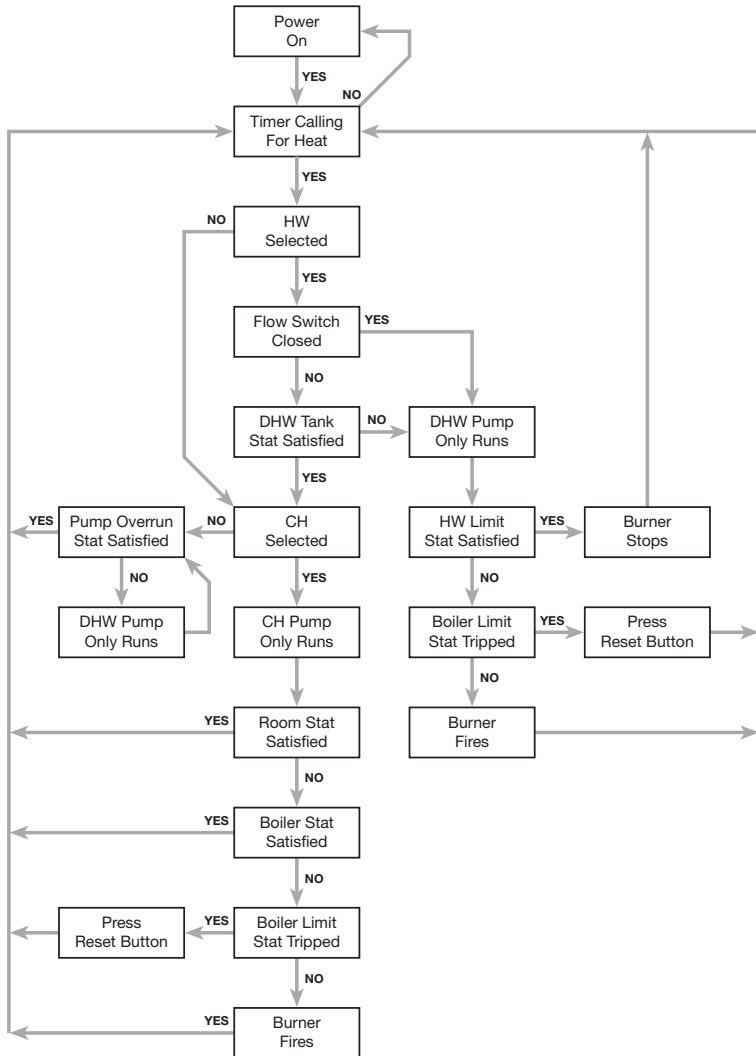


1.5.19 Combi Pipe Layout (UC & KC Models)



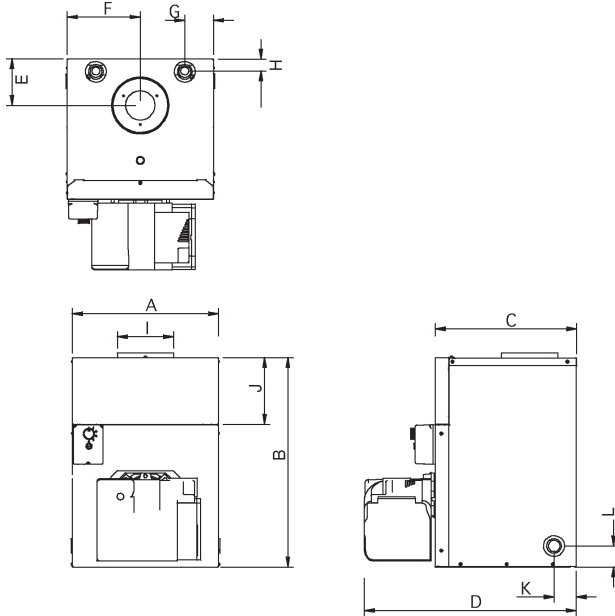
2.0 Technical Details

2.1 Combi Sequence of Operation Flow Chart



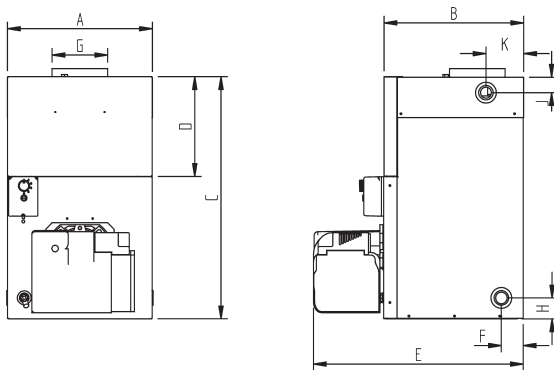
2.2 Dimensions

2.2.1 B-Series Boilerhouse (70 & 90 Output Models)



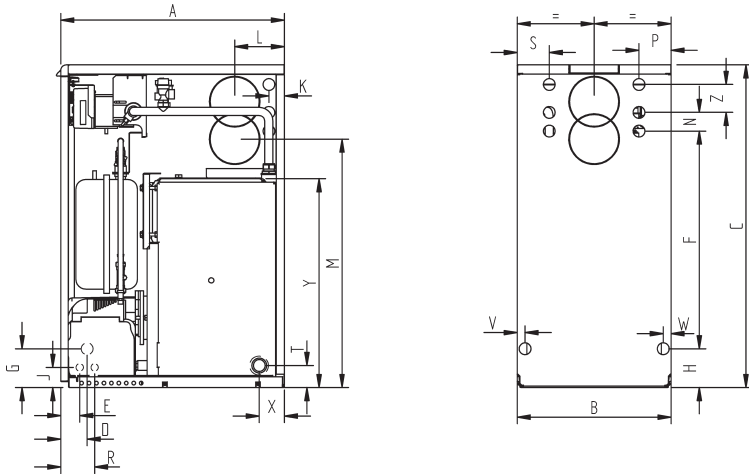
MODEL	A	B	C	D	E	F	G	H	I	J	K	L
B70 / B90 / B1	396	573	383	574	127	198	78	32	152	183	60	58

2.2.2 B-Series Boilerhouse (120 Output Model)



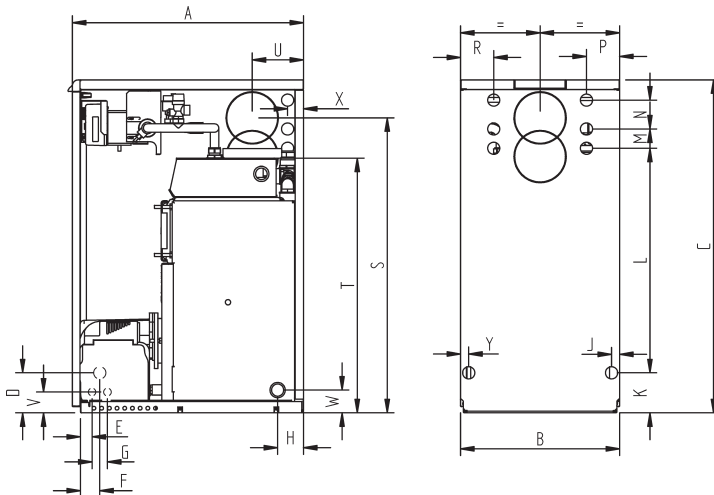
MODEL	A	B	C	D	E	F	G	H	J	K
B120	397	383	662	273	575	60	152	58	42	103

2.2.3 U-Series Utility (70 & 90 Output Non-Combi Models)



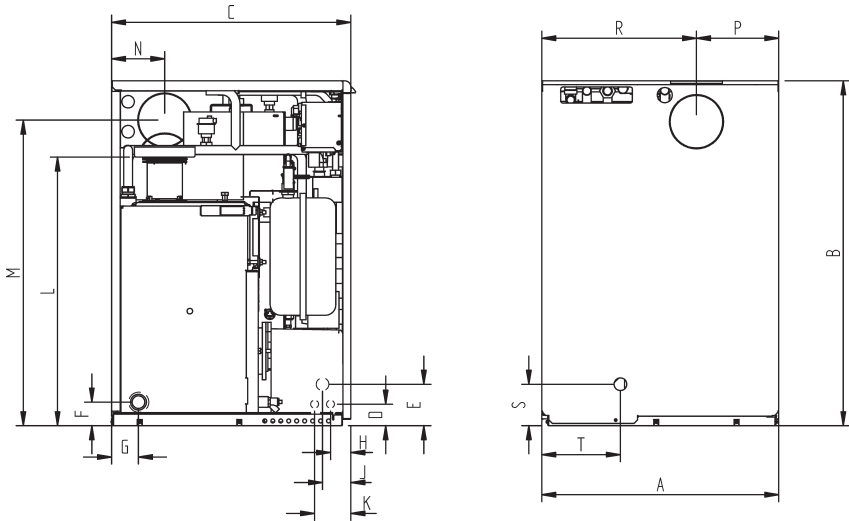
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y	Z
U70 & U90	600	413	865	71	51	583	104	104	54	42	134	666	50	86	91	86	59	21	21	68	560	75
UP70 & UP90	600	413	865	71	51	583	104	104	54	42	134	666	50	86	91	86	59	21	21	68	560	75
US70 & US90	600	413	865	71	51	583	104	104	54	42	134	666	50	86	91	86	59	21	21	68	560	75

2.2.4 U-Series Utility (120 Output Models)



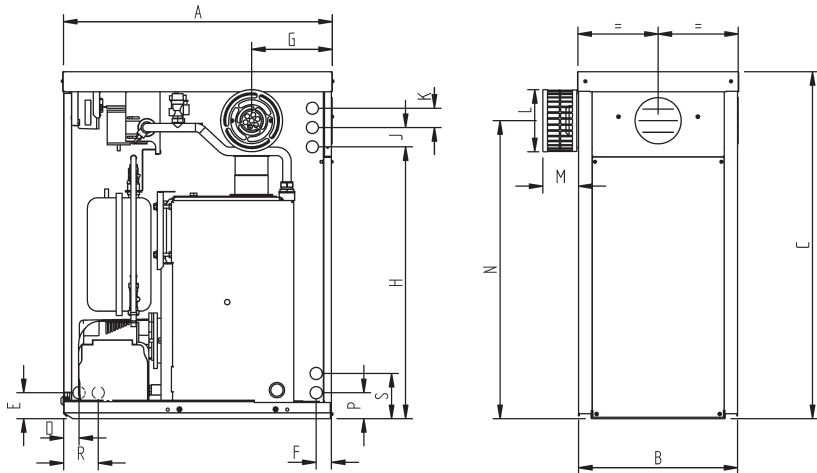
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y
U120	600	413	865	104	30	50	40	68	21	104	583	50	75	86	86	766	662	134	54	59	42	21
UP120	600	413	865	104	30	50	40	68	21	104	583	50	75	86	86	766	662	134	54	59	42	21

2.2.5 U-Series Utility (UC Models)



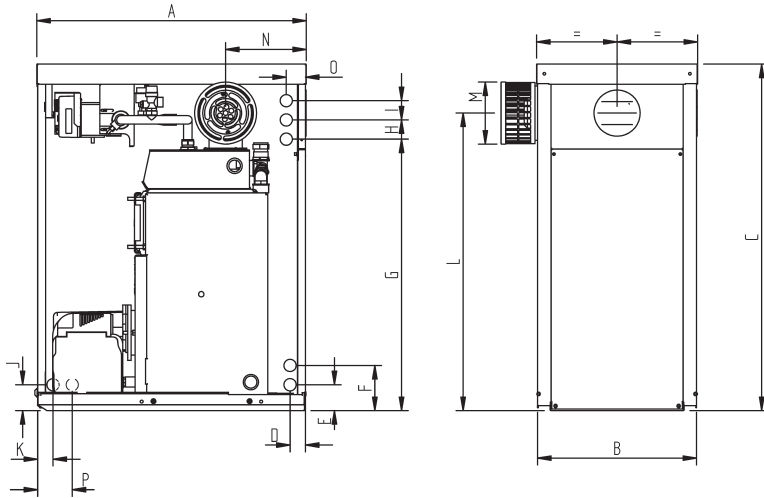
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
UC70 & UC90	595	865	600	54	104	59	68	51	71	91	674	766	134	207	388	104	197

2.2.6 K-Series Kabin Pak (K, KP & KS Models)



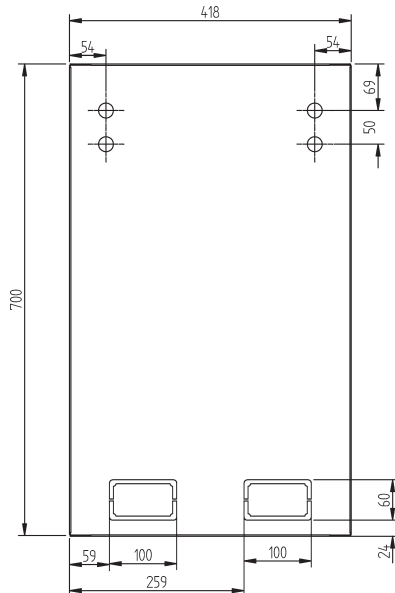
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
K70 & K90	700	413	900	40	67	40	210	705	50	50	160	93	773	67	90	117
KP70 & KP90	700	413	900	40	67	40	210	705	50	50	160	93	773	67	90	117
KS70 & KS90	700	413	900	40	67	40	210	705	50	50	160	93	773	67	90	117

2.2.7 K-Series Kabin Pak (120 Output Models)

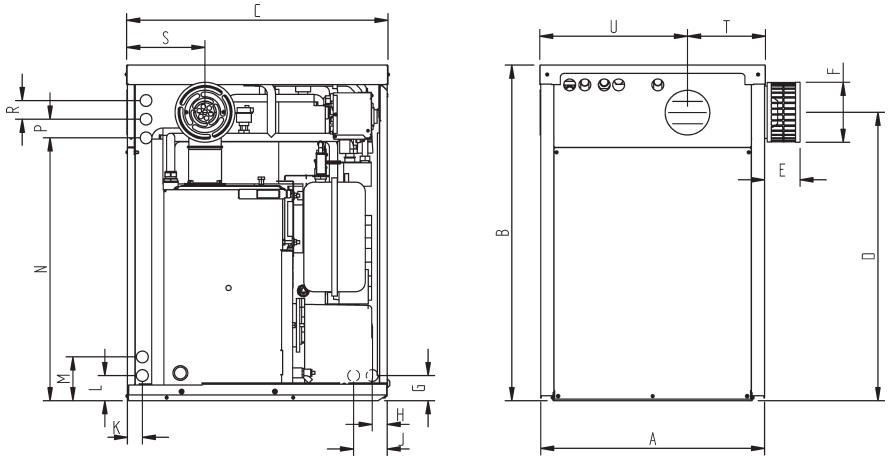


MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
K120	700	413	900	40	67	117	705	50	50	67	40	773	160	210	50	90
KP120	700	413	900	40	67	117	705	50	50	67	40	773	160	210	50	90

2.2.8 K-Series Kabin Pak Base Tray (K, KP & KS Models)

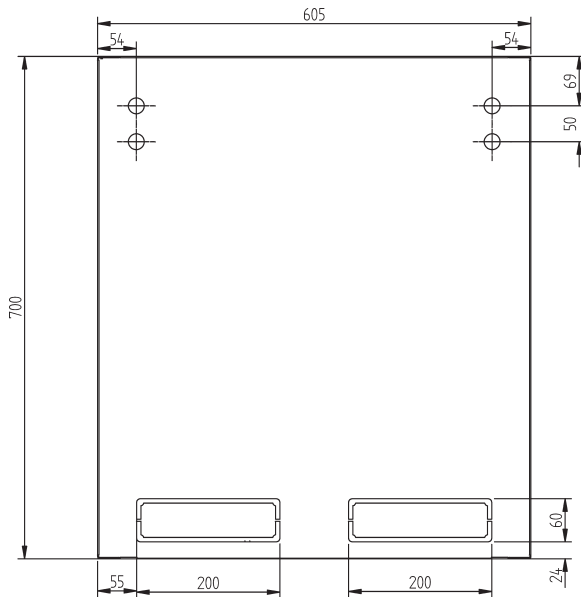


2.2.9 K-Series Kabin Pak (KC Models)



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U
KC70 & KC90	600	900	700	773	95	160	67	40	90	40	67	117	705	50	50	210	209	396

2.2.10 K-Series Kabin Pak Base Tray (KC Models)



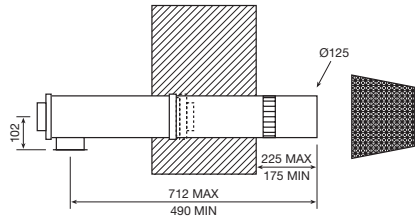
2.3 Flue Options & Dimensions

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

Note that with Class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

2.3.1 'Easy Fit' Low Level Balanced Flue

The horizontal dimension can be increased up to an additional 1200mm using a combination of long extension pieces (600mm) and short extension pieces (300mm).



2.3.2 'Easy Fit' High Level Balanced Flue

The HLBF is available in 4 fixed horizontal lengths which are:

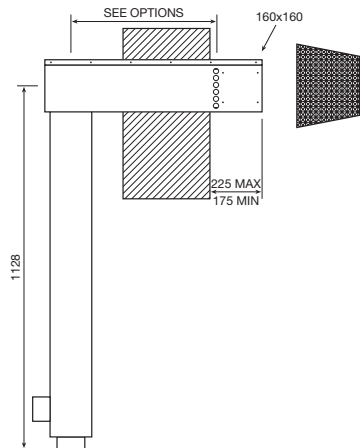
Option 1 – 455mm

Option 2 – 655mm

Option 3 – 585mm

Option 4 – 785mm

Note: The 'Easy Fit' High Level Balanced Flue (HLBF) can only be used with the 120 Output Models (B120, U120 & UP120) when fired at the factory setting (0.85 gal nozzle). It CANNOT be used when fired with a 1.00 gal nozzle or with the 0.85 gal nozzle at increased pump pressure.



2.4 Technical Data

2.4.1 B-Series Boilerhouse – (B)

MODEL		B70			B90			B120		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4	26.4	28.0	33.0
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000	90,000	95,200	112,600
Nominal	kW	15.3	18.4	22	22	24.4	28	28.0	30.0	35.5
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550	95,550	102,400	121,200
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1 SHORT			T2 SHORT			T5 SHORT		
Secondary Air Damper		B			N/A			N/A		
Flue	mm	100 or 125			100 or 125			100 or 125		
Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp	°C	180	190	200	200	210	215	150	160	170
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75	0.75	0.85	1.00
Pump	bar	7.0	8.0	8.0	8.0	8.0	7.0	7.0	8.0	8.5
Pressure	psi	100	116	116	116	116	100	100	116	124
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	3.70
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65	0.65	0.75	0.82
Gas Oil Settings										
Nozzle	make	Danfoss 60°S			Danfoss 60°S			Contact Warmflow for diesel settings		
	size	—	0.4	0.5	0.5	0.55	0.6			
Pump	bar	—	12.0	11.0	11.0	11.0	11.0			
Pressure	psi	—	174	159	159	159	159			
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0			
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.53	2.76			
Flow Rate	gals/h	—	0.38	0.51	0.51	0.56	0.61			
Flow Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Water	litres	14			14			16		
Content	gals	3.1			3.1			3.5		
Boiler Weight Dry	kg	65			65			79		
Boiler Weight Wet	kg	79			79			95		
SEDBUK Efficiency	%	85.6			85.6			85.6		
Factory Settings		Highlighted in Bold								

Note: The 'Easy Fit' High Level Balanced Flue (HLBF) can only be used with the B120 Model when fired at the factory setting (0.85 gal nozzle). It CANNOT be used when fired with a 1.00 gal nozzle or with the 0.85 gal nozzle at increased pump pressure.

2.4.2 U-Series Utility – Pre-Wired (U)

MODEL		U70			U90			U120		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4	26.4	28.0	33.0
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000	90,000	95,200	112,600
Nominal	kW	15.3	18.4	22	22	24.4	28	28.0	30.0	35.5
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550	95,550	102,400	121,200
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1 SHORT			T2 SHORT			T5 SHORT		
Secondary Air Damper		B			N/A			N/A		
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	°C	180	190	200	200	210	215	150	160	170
Smoke Bacarach		0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75	0.75	0.85	1.00
Pump Pressure	bar psi	7.0 100	8.0 116	8.0 116	8.0 116	8.0 116	7.0 100	7.0 100	8.0 116	8.5 124
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	3.70
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65	0.65	0.75	0.82
Gas Oil Settings										
Nozzle	make	Danfoss 60°S			Danfoss 60°S			Contact Warmflow for diesel settings		
	size	—	0.4	0.5	0.5	0.55	0.6			
Pump Pressure	bar psi	—	12.0 174	11.0 159	11.0 159	11.0 159	11.0 159			
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0			
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.53	2.76			
Flow Rate	gals/h	—	0.38	0.51	0.51	0.56	0.61			
Flow Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Water Content	litres gals	14 3.1			14 3.1			16 3.5		
Boiler Weight Dry	kg	78			78			92		
Boiler Weight Wet	kg	92			92			108		
SEDBUK Efficiency	%	85.6			85.6			85.6		
Factory Settings		Highlighted in Bold								

Note: The 'Easy Fit' High Level Balanced Flue (HLBF) can only be used with the U120 Model when fired at the factory setting (0.85 gal nozzle). It CANNOT be used when fired with a 1.00 gal nozzle or with the 0.85 gal nozzle at increased pump pressure.

2.4.3 U-Series Utility – Pumped (UP)

MODEL		UP70			UP90			UP120		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4	26.4	28.0	33.0
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000	90,000	95,200	112,600
Nominal	kW	15.3	18.4	22	22	24.4	28	28.0	30.0	35.5
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550	95,550	102,400	121,200
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1 SHORT			T2 SHORT			T5 SHORT		
Secondary Air Damper		B			N/A			N/A		
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	°C	180	190	200	200	210	215	150	160	170
Smoke Bacarach		0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75	0.75	0.85	1.00
Pump Pressure	bar psi	7.0 100	8.0 116	8.0 116	8.0 116	8.0 116	7.0 100	7.0 100	8.0 116	8.5 124
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	3.70
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65	0.65	0.75	0.82
Gas Oil Settings										
Nozzle	make	Danfoss 60°S			Danfoss 60°S			Contact Warmflow for diesel settings		
	size	—	0.4	0.5	0.5	0.55	0.6			
Pump Pressure	bar psi	—	12.0 174	11.0 159	11.0 159	11.0 159	11.0 159			
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0			
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.53	2.76			
Flow Rate	gals/h	—	0.38	0.51	0.51	0.56	0.61			
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Water Content	litres gals	14 3.1			14 3.1			16 3.5		
Boiler Weight Dry	kg	78			78			92		
Boiler Weight Wet	kg	92			92			108		
SEDBUK Efficiency	%	85.6			85.6			85.6		
Factory Settings		Highlighted in Bold								

Note: The 'Easy Fit' High Level Balanced Flue (HLBF) can only be used with the UP120 Model when fired at the factory setting (0.85 gal nozzle). It CANNOT be used when fired with a 1.00 gal nozzle or with the 0.85 gal nozzle at increased pump pressure.

2.4.4 U-Series Utility – System (US)

MODEL		US70			US90		
Nominal kW		14.0	17.0	20.5	20.5	22.8	26.4
Heat Output Btu/hr		48,000	58,000	70,000	70,000	78,000	90,000
Nominal kW		15.3	18.4	22	22	24.4	28
Heat Input Btu/hr		52,150	62,600	75,000	75,000	83,175	95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1 SHORT			T2 SHORT		
Secondary Air Damper		B			N/A		
Flue Diameter mm		100 or 125			100 or 125		
Flue Diameter in		4 or 5			4 or 5		
Flue Gas Temp °C		180	190	200	200	210	215
Smoke Bacarach		0			0		
Kerosene Settings							
Nozzle make		Danfoss 60°ES			Danfoss 60°ES		
size		0.5	0.55	0.6	0.6	0.65	0.75
Pump Pressure bar		7.0	8.0	8.0	8.0	8.0	7.0
Pump Pressure psi		100	116	116	116	116	100
Max CO ₂ %		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
Flow Rate gals/h		0.36	0.44	0.52	0.52	0.58	0.65
Gas Oil Settings							
Nozzle make		Danfoss 60°S			Danfoss 60°S		
size		—	0.4	0.5	0.5	0.55	0.6
Pump Pressure bar		—	12.0	11.0	11.0	11.0	11.0
Pump Pressure psi		—	174	159	159	159	159
Max CO ₂ %		—	12.0	12.0	12.0	12.0	12.0
Approx Fuel litres/h		—	1.72	2.30	2.30	2.53	2.76
Flow Rate gals/h		—	0.38	0.51	0.51	0.56	0.61
Flow Connection		22mm Copper			22mm Copper		
Return Connection		1" BSP Female			1" BSP Female		
Water Content litres		14			14		
Water Content gals		3.1			3.1		
Boiler Weight Dry kg		78			78		
Boiler Weight Wet kg		92			92		
SEDBUK Efficiency %		85.6			85.6		
Factory Settings		Highlighted in Bold					

2.4.5 U-Series Utility – Combi (UC)

MODEL		UC70			UC90		
Nominal Heat Output	kW Btu/hr	14.0 48,000	17.0 58,000	20.5 70,000	20.5 70,000	22.8 78,000	26.4 90,000
Nominal Heat Input	kW Btu/hr	15.3 52,150	18.4 62,600	22 75,000	22 75,000	24.4 83,175	28 95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1 SHORT			T2 SHORT		
Secondary Air Damper		B			N/A		
Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp	°C	180	190	200	200	210	215
Smoke	Bacarach	0			0		
Kerosene Settings							
Nozzle	make size	Danfoss 60°ES			Danfoss 60°ES		
		0.5	0.55	0.6	0.6	0.65	0.75
Oil Pump Pressure	bar psi	7.0 100	8.0 116	8.0 116	8.0 116	8.0 116	7.0 100
Max CO ₂	%	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
Gas Oil Settings							
Nozzle	make size	Danfoss 60°S			Danfoss 60°S		
		—	0.4	0.5	0.5	0.65	0.6
Oil Pump Pressure	bar psi	— —	12.0 174	11.0 159	11.0 159	8.0 116	11.0 159
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0
Approx Fuel Flow Rate	litres/h gals/h	— —	1.72 0.38	2.30 0.51	2.30 0.51	2.65 0.58	2.76 0.61
Water Content	litres gals		70 15.4			70 15.4	
Boiler Weight Dry	kg		128			128	
Boiler Weight Wet	kg		198			198	
Domestic Hot Water (DHW) Production							
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi		1.8 26			1.8 26	
Maximum Achievable DHW Flow Rate			Unrestricted			Unrestricted	
Maximum Recommended DHW Flow Rate	litres/m gals/m		18 4.0			24 5.3	
Factory Set DHW Flow Rate	litres/m gals/m		18 4.0			18 4.0	
Minimum DHW Flow Rate	litres/m gals/m		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	
Pressure Relief	bar psi		3 43.5			3 43.5	
Cold Water Mains Inlet Connection			Minimum 15mm Unrestricted			Minimum 15mm Unrestricted	
DHW Outlet Connection			22mm Copper			22mm Copper	
Flow Connection			22mm Copper			22mm Copper	
Return Connection			22mm Copper			22mm Copper	
SEDBUK Efficiency	%		82.8			82.8	
Factory Settings			Highlighted in Bold				

2.4.6 K-Series Kabin Pak – Pre-Wired (K)

MODEL		K70			K90			K120		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4	26.4	28.0	33.0
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000	90,000	95,200	112,600
Nominal	kW	15.3	18.4	22	22	24.4	28	28.0	30.0	35.5
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550	95,550	102,400	121,200
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1 SHORT			T2 SHORT			T5 SHORT		
Secondary Air Damper		B			N/A			N/A		
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	°C	180	190	200	200	210	215	150	160	170
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75	0.75	0.85	1.00
Pump Pressure	bar psi	7.0 100	8.0 116	8.0 116	8.0 116	8.0 116	7.0 100	7.0 100	8.0 116	8.5 124
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	3.70
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65	0.65	0.75	0.82
Gas Oil Settings (see note below)										
Nozzle	make	Danfoss 60°S			Danfoss 60°S			Contact Warmflow for diesel settings. Also, see note below.		
	size	—	0.4	0.5	0.5	0.55	0.6			
Pump Pressure	bar psi	—	12.0 174	11.0 159	11.0 159	11.0 159	11.0 159			
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0			
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.53	2.76			
Flow Rate	gals/h	—	0.38	0.51	0.51	0.56	0.61			
Flow Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			28mm Compression		
Water Content	litres gals	14 3.1			14 3.1			16 3.5		
Boiler Weight Dry	kg	78			78			92		
Boiler Weight Wet	kg	92			92			108		
SEDBUK Efficiency	%	85.6			85.6			85.6		
Factory Settings		Highlighted in Bold								

Note: With Class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

2.4.7 K-Series Kabin Pak – Pumped (KP)

MODEL		KP70			KP90			KP120		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4	26.4	28.0	33.0
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000	90,000	95,200	112,600
Nominal	kW	15.3	18.4	22	22	24.4	28	28.0	30.0	35.5
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550	95,550	102,400	121,200
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1 SHORT			T2 SHORT			T5 SHORT		
Secondary Air Damper		B			N/A			N/A		
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	°C	180	190	200	200	210	215	150	160	170
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75	0.75	0.85	1.00
Pump Pressure	bar psi	7.0 100	8.0 116	8.0 116	8.0 116	8.0 116	7.0 100	7.0 100	8.0 116	8.5 124
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	3.70
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65	0.65	0.75	0.82
Gas Oil Settings (see note below)										
Nozzle	make	Danfoss 60°S			Danfoss 60°S			Contact Warmflow for diesel settings. Also, see note below.		
	size	—	0.4	0.5	0.5	0.55	0.6			
Pump Pressure	bar psi	—	12.0 174	11.0 159	11.0 159	11.0 159	11.0 159			
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0			
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.53	2.76			
Flow Rate	gals/h	—	0.38	0.51	0.51	0.56	0.61			
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		22mm Compression			22mm Compression			28mm Compression		
Water Content	litres gals	14 3.1			14 3.1			16 3.5		
Boiler Weight Dry	kg	78			78			92		
Boiler Weight Wet	kg	92			92			108		
SEDBUK Efficiency	%	85.6			85.6			85.6		
Factory Settings		Highlighted in Bold								

Note: With Class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

2.4.8 K-Series Kabin Pak – System (KS)

MODEL		KS70			KS90		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000
Nominal	kW	15.3	18.4	22	22	24.4	28
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1 SHORT			T2 SHORT		
Secondary Air Damper		B			N/A		
Flue	mm	100 or 125			100 or 125		
Diameter	in	4 or 5			4 or 5		
Flue Gas Temp	°C	180	190	200	200	210	215
Smoke	Bacarach	0			0		
Kerosene Settings							
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75
Pump	bar	7.0	8.0	8.0	8.0	8.0	7.0
Pressure	psi	100	116	116	116	116	100
Max CO ₂	%	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
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65
Gas Oil Settings (see note below)							
Nozzle	make	Danfoss 60°S			Danfoss 60°S		
	size	—	0.4	0.5	0.5	0.65	0.6
Pump	bar	—	12.0	11.0	11.0	8.0	11.0
Pressure	psi	—	174	159	159	116	159
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.65	2.76
Flow Rate	gals/h	—	0.38	0.51	0.51	0.58	0.61
Flow Connection		22mm Copper			22mm Copper		
Return Connection		22mm Compression			22mm Compression		
Water	litres	14			14		
Content	gals	3.1			3.1		
Boiler Weight Dry	kg	78			78		
Boiler Weight Wet	kg	92			92		
SEDBUK Efficiency	%	85.6			85.6		
Factory Settings		Highlighted in Bold					

Note: With Class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

2.4.9 K-Series Kabin Pak – Combi (KC)

MODEL		KC70			KC90		
Nominal	kW	14.0	17.0	20.5	20.5	22.8	26.4
Heat Output	Btu/hr	48,000	58,000	70,000	70,000	78,000	90,000
Nominal	kW	15.3	18.4	22	22	24.4	28
Heat Input	Btu/hr	52,150	62,600	75,000	75,000	83,175	95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1 SHORT			T2 SHORT		
Secondary Air Damper		B			N/A		
Flue	mm	100 or 125			100 or 125		
Diameter	in	4 or 5			4 or 5		
Flue Gas Temp	°C	180	190	200	200	210	215
Smoke	Bacarach	0			0		
Kerosene Settings							
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	0.55	0.6	0.6	0.65	0.75
Oil Pump	bar	7.0	8.0	8.0	8.0	8.0	7.0
Pressure	psi	100	116	116	116	116	100
Max CO ₂	%	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
Flow Rate	gals/h	0.36	0.44	0.52	0.52	0.58	0.65
Gas Oil Settings (see note below)							
Nozzle	make	Danfoss 60°S			Danfoss 60°S		
	size	—	0.4	0.5	0.5	0.65	0.6
Oil Pump	bar	—	12.0	11.0	11.0	8.0	11.0
Pressure	psi	—	174	159	159	116	159
Max CO ₂	%	—	12.0	12.0	12.0	12.0	12.0
Approx Fuel	litres/h	—	1.72	2.30	2.30	2.65	2.76
Flow Rate	gals/h	—	0.38	0.51	0.51	0.58	0.61
Water	litres	70			70		
Content	gals	15.4			15.4		
Boiler Weight Dry	kg	128			128		
Boiler Weight Wet	kg	198			198		
Domestic Hot Water (DHW) Production							
Minimum Inlet Dynamic Pressure	bar	1.8			1.8		
for Maximum DHW Flow Rate	psi	26			26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m	18			24		
	gals/m	4.0			5.3		
Factory Set DHW Flow Rate	litres/m	18			18		
	gals/m	4.0			4.0		
Minimum DHW Flow Rate	litres/m	2.5			2.5		
	gals/m	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		
Pressure Relief	bar	3			3		
	psi	43.5			43.5		
Cold Water Mains Inlet Connection		Minimum 15mm Unrestricted			Minimum 15mm Unrestricted		
DHW Outlet Connection		22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper		
Return Connection		22mm Copper			22mm Copper		
SEDBUK Efficiency	%	82.8			82.8		
Factory Settings		Highlighted in Bold					

Note: With Class D gas oil the flue MUST exhaust at more than 2m above the surrounding ground level. The low-level flue supplied as standard with all Kabin Pak models is NOT suitable for Class D gas oil. Alternative options are available – please contact Warmflow.

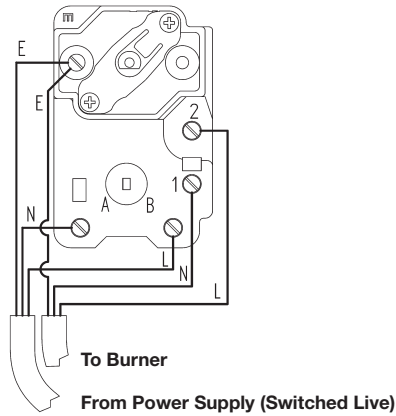
3.0 Electricity Supply & Wiring Details

220 – 240V. 1PH, 50 Hz

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

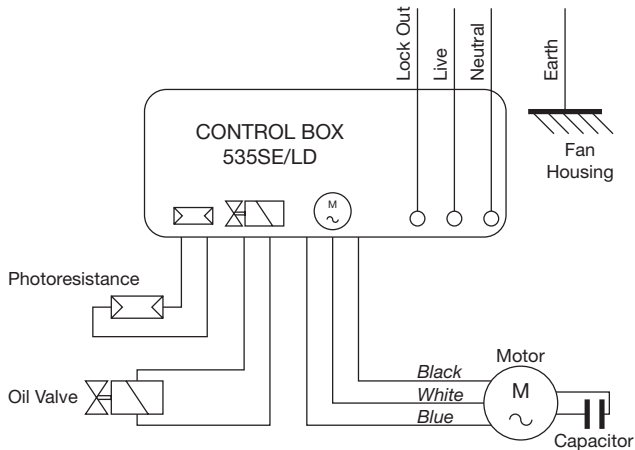
The appliance must be effectively earthed and all external wiring should comply with current IEE Regulations.

3.1 Dual-Safe Thermostat (Non-Combi Boilers)



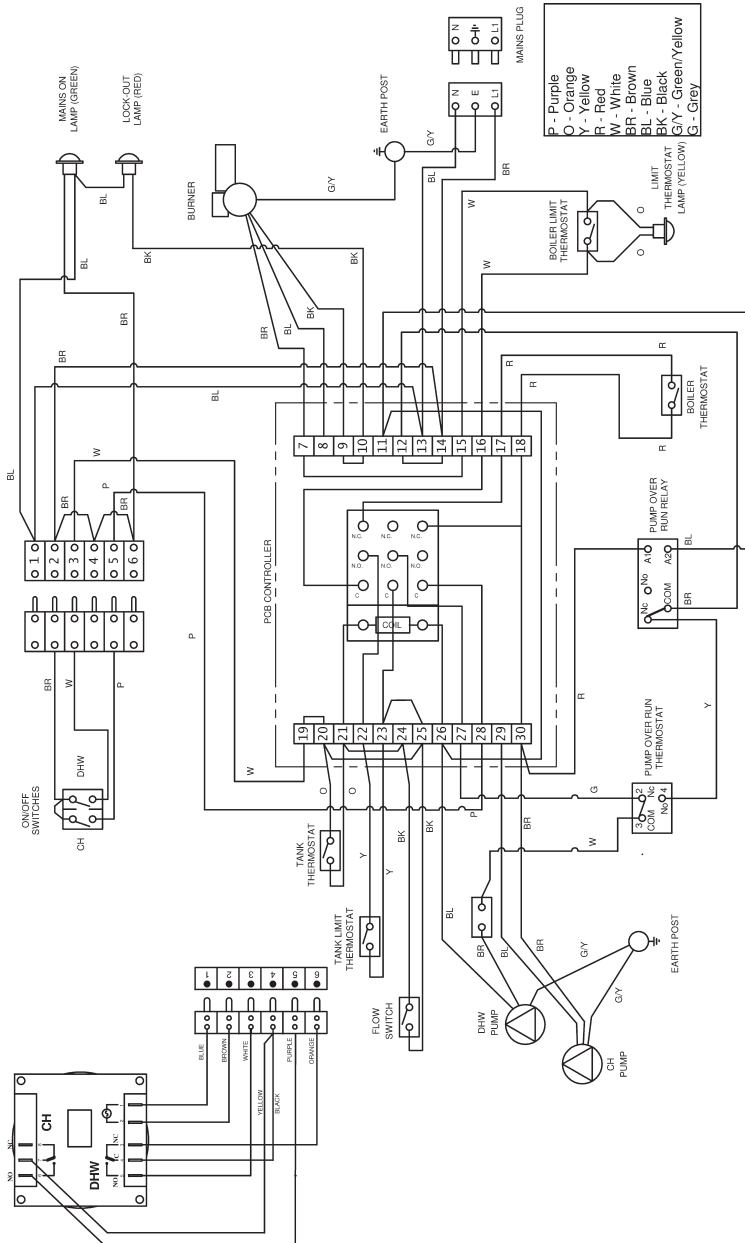
Warning: Do not fit any other wires or loop wires to this stat as this will bypass the thermostats.

3.2 RDB Burner Control Box



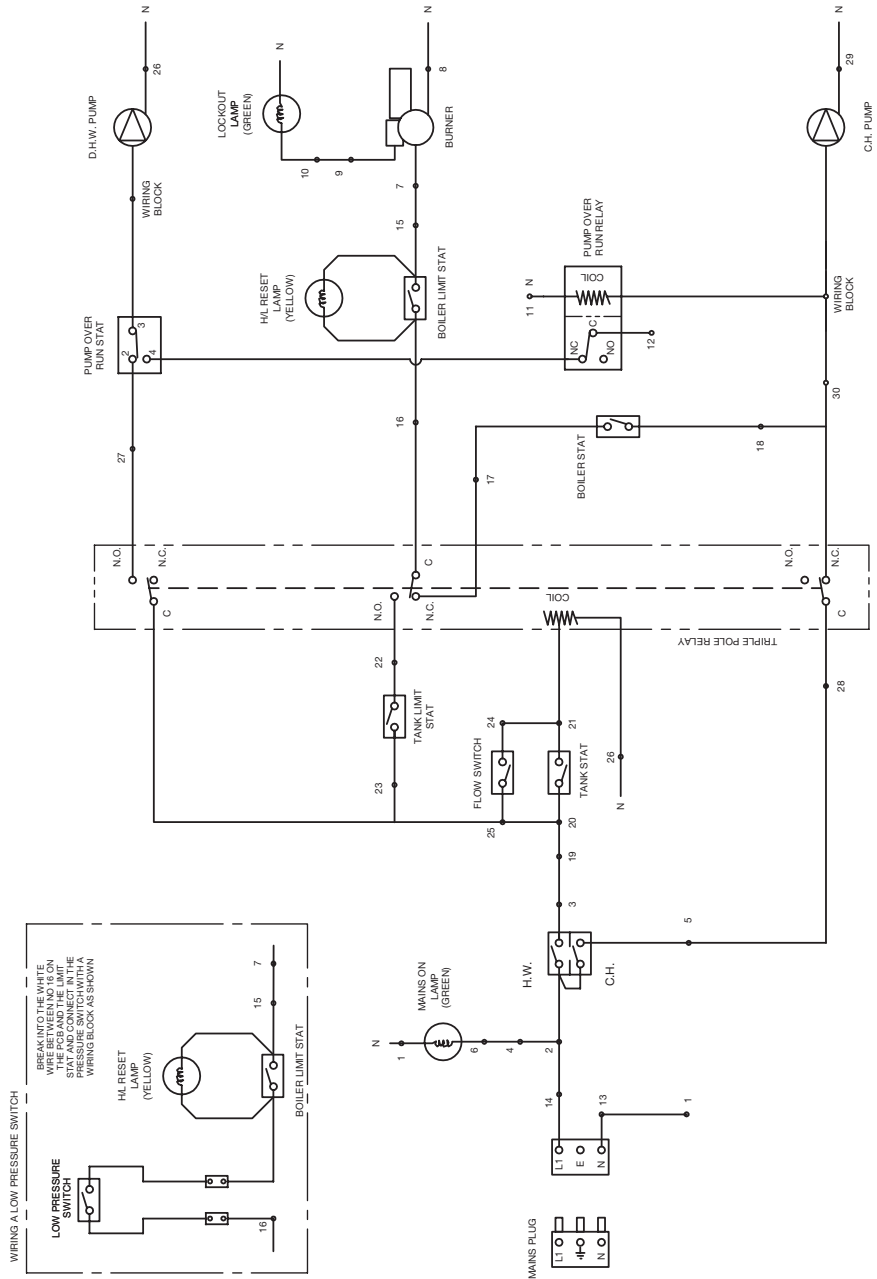
3.3 Combi Wiring Details

3.3.1 Wiring Diagram

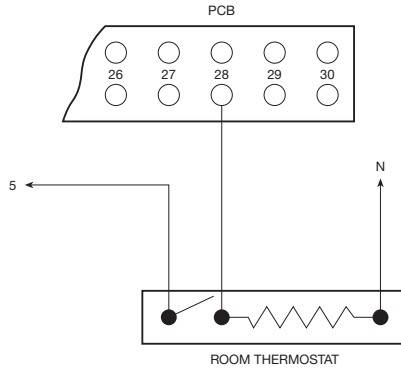


The 3 pin mains plug must be supplied with a permanent live to allow the pump overrun stat and relay to operate correctly.

3.3.2 Wiring Schematic

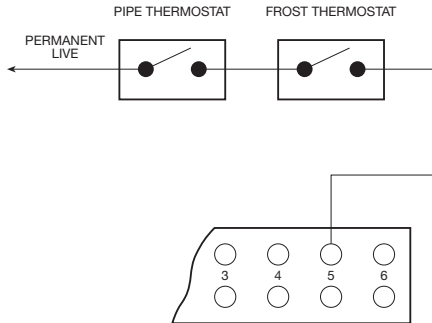


3.3.3 Fitting a Room Thermostat to a Combi



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.

3.3.4 Fitting Frost Protection to a Combi



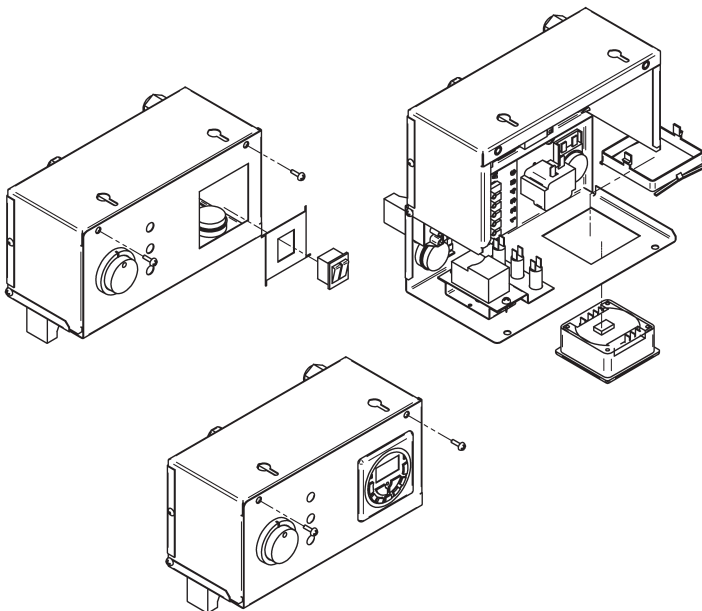
In order to provide frost protection for the fabric of the building a frost thermostat should be fitted in the coldest room in the house. To prevent over heating of the property a pipe thermostat should be fitted on the return pipe close to the boiler. The Kabin Pak Combi boiler is factory fitted with a frost thermostat as standard.

3.3.5 Combi Pump Overrun Thermostat

The 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. Failure to do this will result in nuisance trip outs.

3.4 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 fascia 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 the back of this manual or supplied with the programmer, set the switching times.



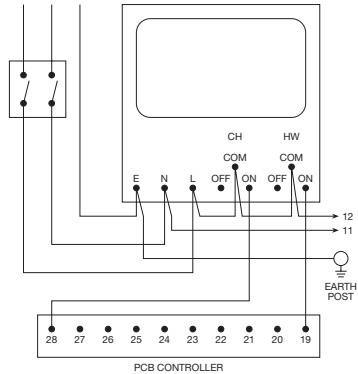
3.5 Remote Timers for Combis

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

Connecting the programmer in this manner will bypass the CH and HW on/off switches on the boiler control panel. A separate connection to the boiler 3 pin mains plug is NOT required.

Inside the boiler control panel, remove the purple and white wires connecting terminals 5 and 3 on the terminal block with terminals 19 and 28 on the PCB.

Connect the programmer to the permanent live mains supply via a fused isolator as shown.



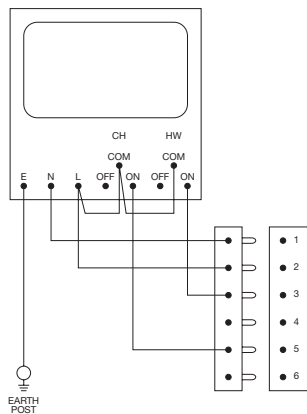
Connect the boiler to the programmer via a 5 core cable as shown with the permanent live connecting to terminal 12 on the PCB. Failure to connect the permanent live to the boiler in this way will prevent the mains lamp and pump overrun thermostats from operating. It will also prevent the built-in frost protection of a Kabin Pak Combi from operating.

3.5.2 Installation of a remote two channel programmer (option 2)

When 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.

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.

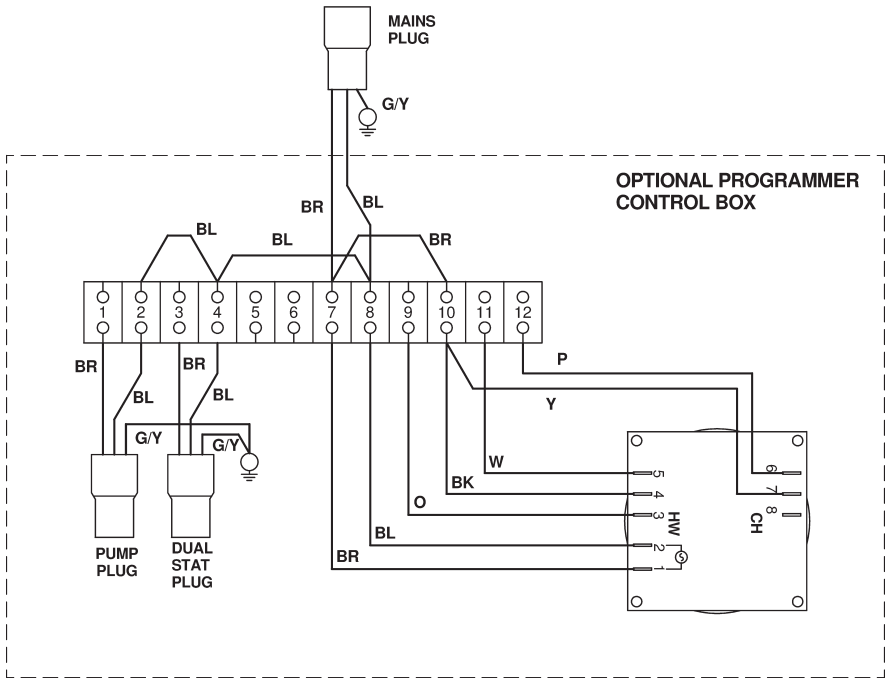
Connect the programmer to the 6 pin connector via a 5 core cable as shown ensuring the earth is connected to one of the earth posts inside the control panel.



Connect the boiler 3 pin mains plug to a permanent live mains supply via a fused isolator. Failure to connect a permanent live to the boiler will prevent the programmer, boiler mains lamp and pump overrun thermostats from operating. It will also prevent the built-in frost protection of a Kabin Pak Combi from operating.

3.6 Optional Programmer (PU1) for Non-Combi Models

3.6.1 Programmer Control Box Wiring Diagram

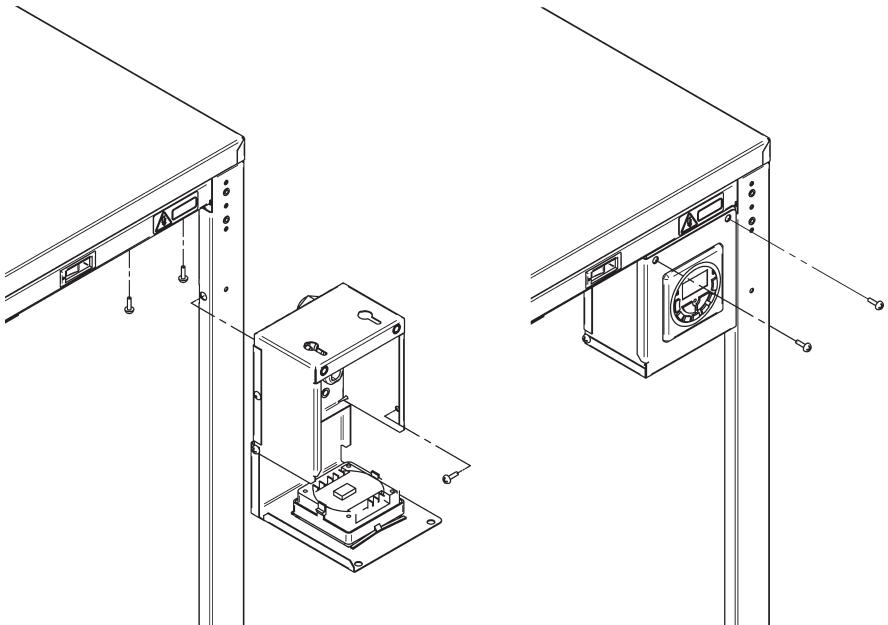


3.6.2 General Requirements

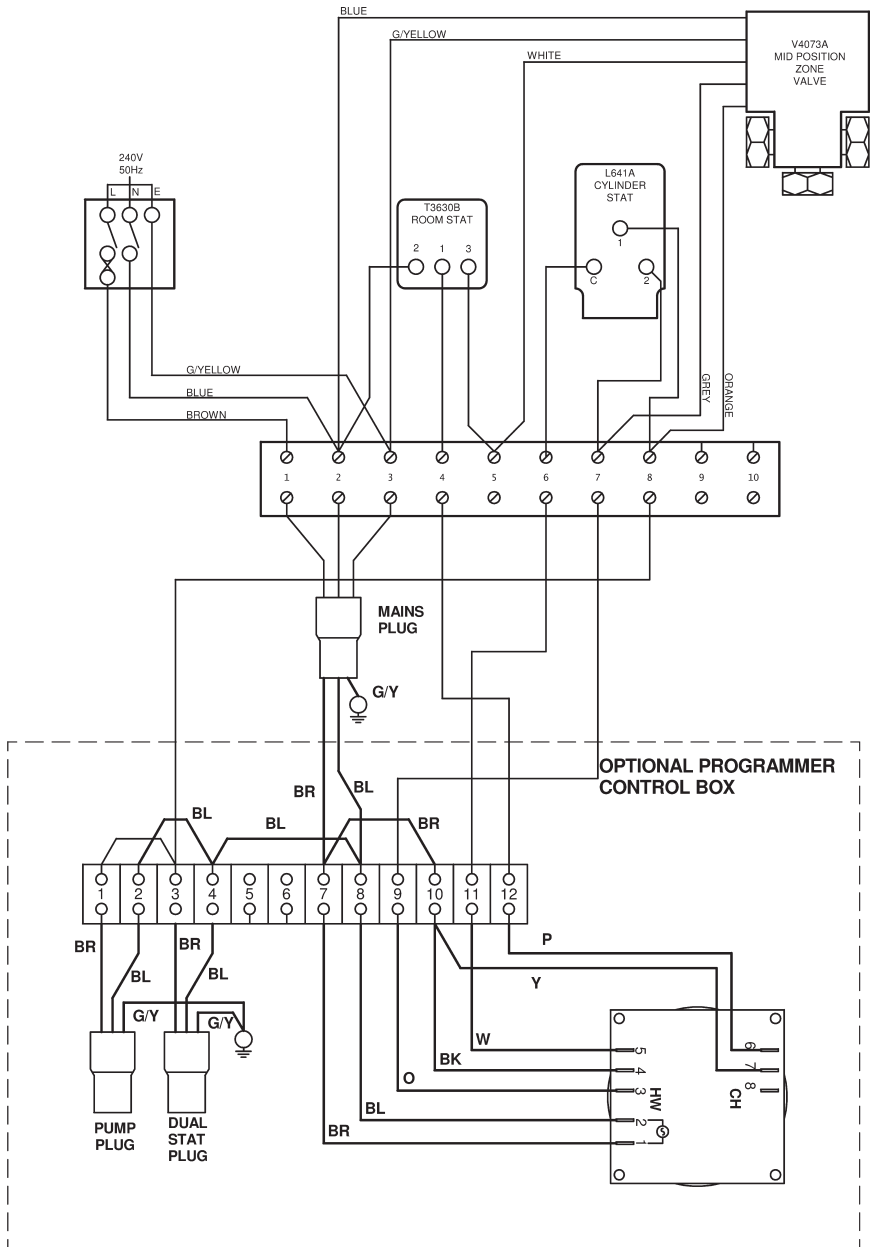
1. The optional programmer as supplied will supply power to the pump and burner via the central heating channel.
2. When connecting to external controls, eg 'Y' plan or 'S' plan it will be necessary to remove the loop between 3 and 12 on the programmer terminal block.
3. The programmer is not suitable for gravity hot water systems.

3.6.3 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 pump 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.

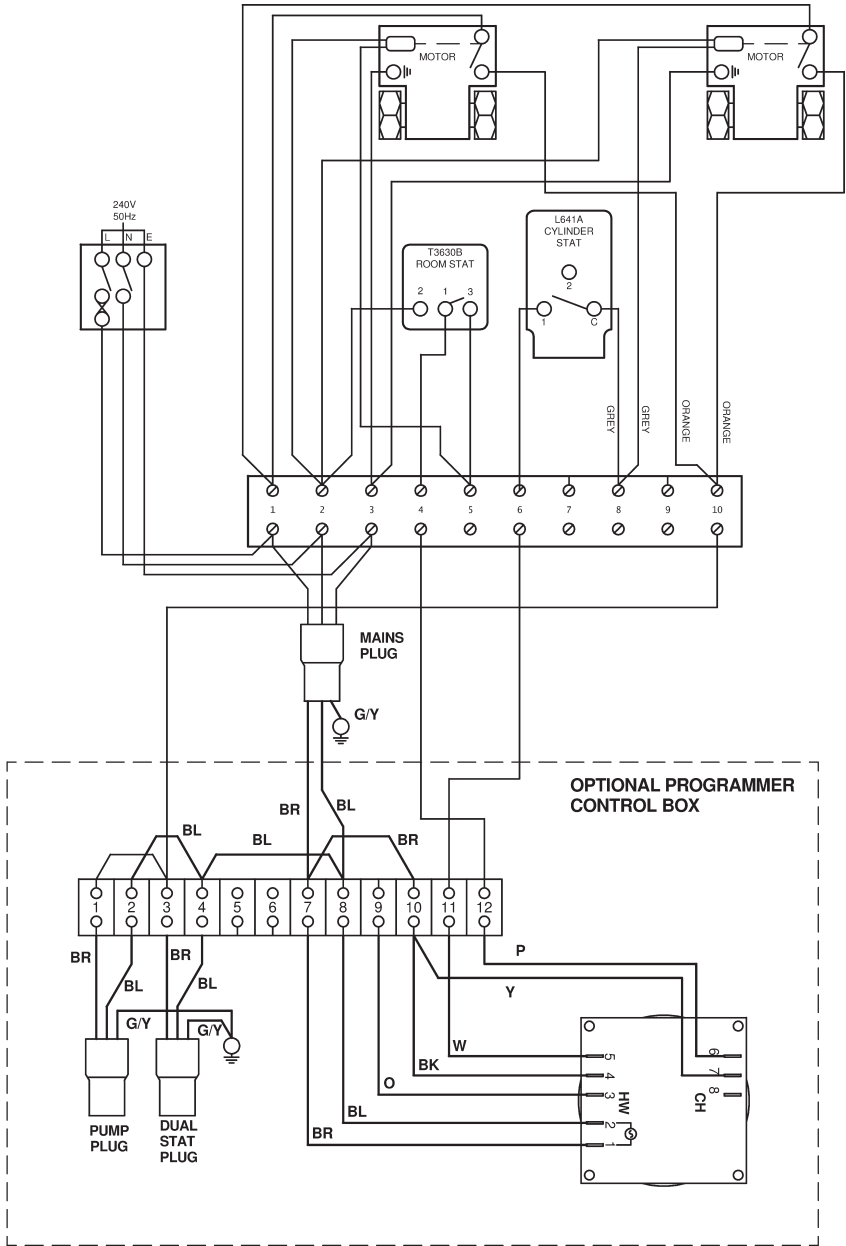


3.6.4 Honeywell 'Y' Plan – Independent CH & DHW (Fully Pumped Only)



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

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



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

4.0 Oil Supply

1. Oil Tank

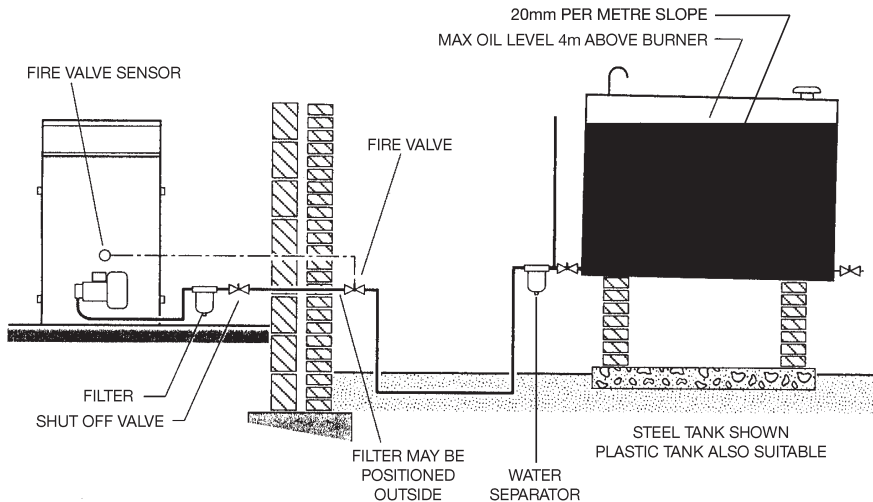
Steel tanks constructed to BS799 : PART 5 should be painted on the outside only and mounted on piers to prevent corrosion. Plastic oil tanks are also available and can be suitable for installation at ground level. However, oil should never be stored in translucent plastic containers.

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

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

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

4.1 One Pipe Gravity System

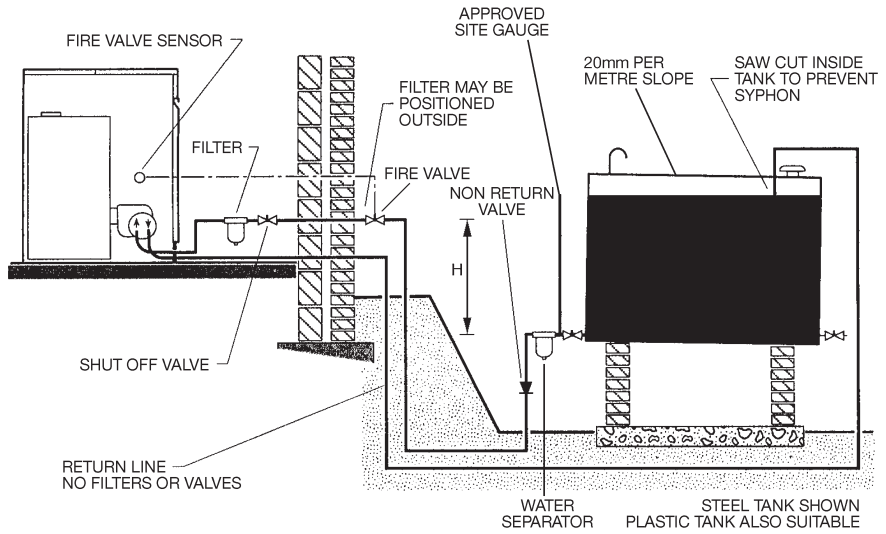


Total Maximum Pipe Length (m)

Head H(m)	0.5	1	1.5	2
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 the warranty.

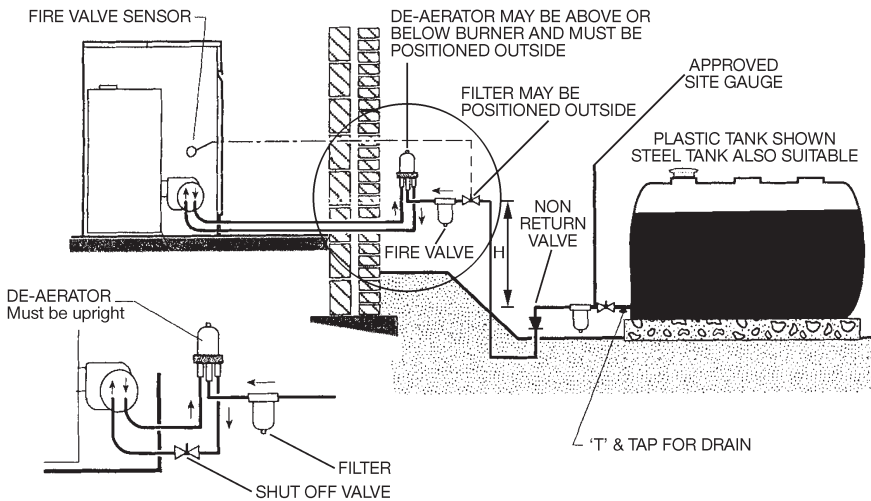
4.2 Two Pipe System



Total Maximum Pipe Length (m)

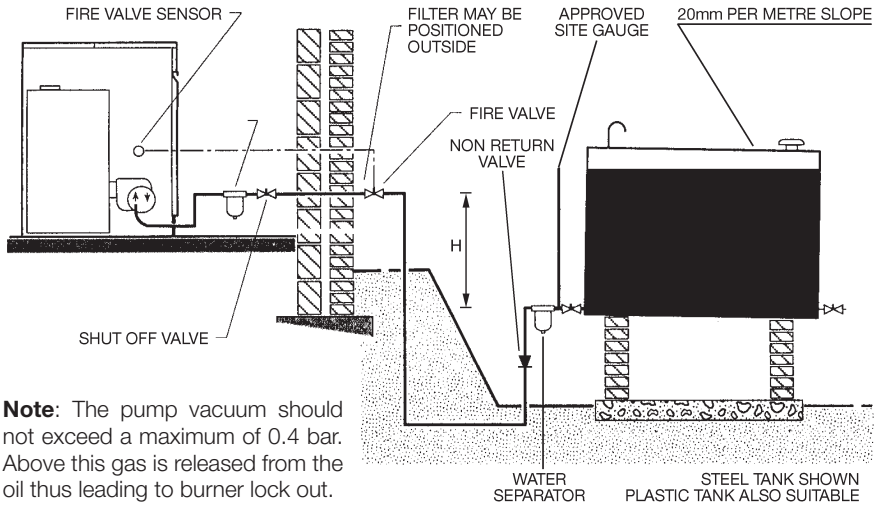
Head H(m)	0.5	0.5	1	1.5	2	3	3.5
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

4.3 De-aerator System



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

4.4 One Pipe Lift System

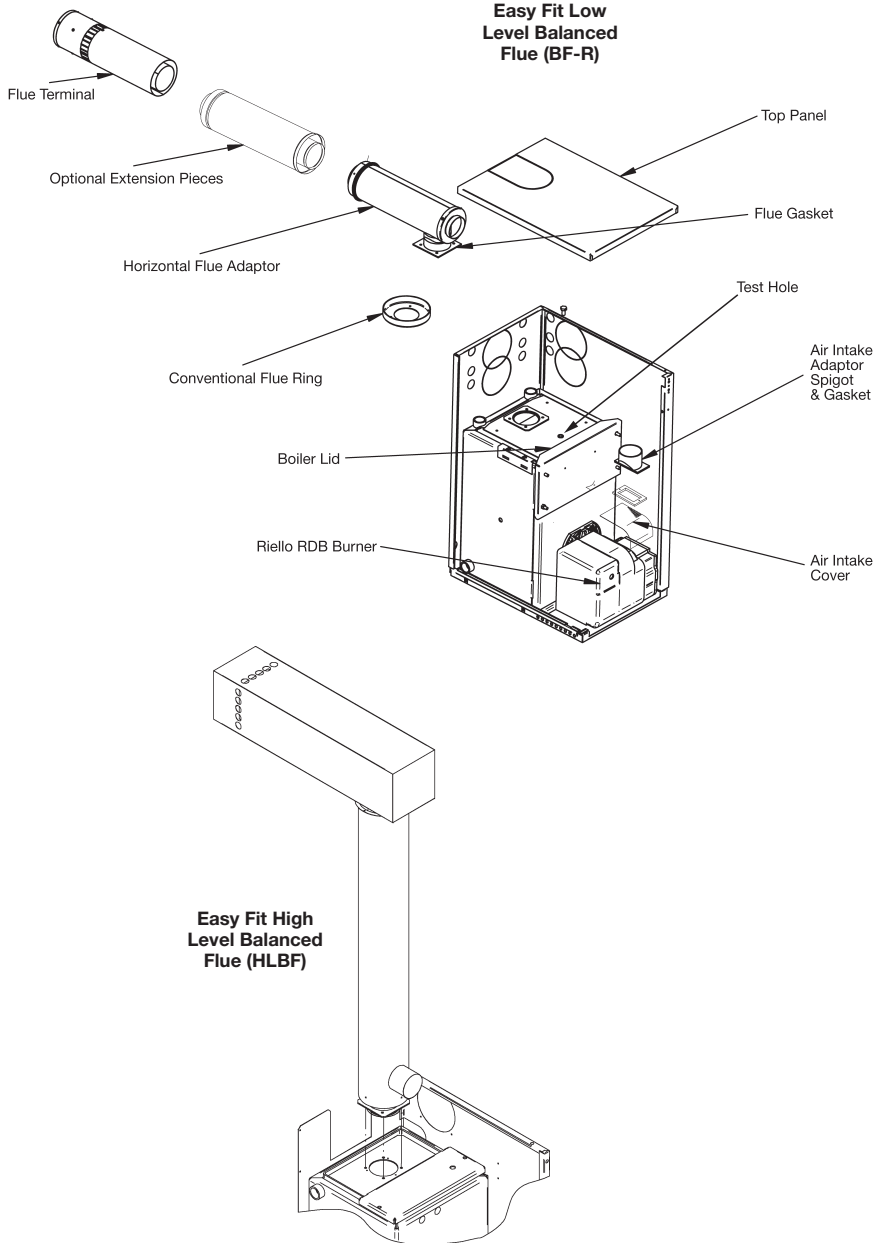


Total Maximum Pipe Length (m)

Head H(m)	0.5	0.5	1	1.5	2	3	3.5
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

5.0 Flues

5.1 Installation of Flues



5.1.1 Installation of a Low Level Balanced Flue (BF-R)

1. Make a suitable sized hole in the wall for the flue. For the dimensions of the boiler, see the Dimensions Section of this manual. For the dimensions of the flue system, see the Flue Kits & Dimensions Section of this manual.

Note: The cavities around the opening must be sealed and protected by a non-combustible sleeve.

2. Remove the conventional flue ring, ensuring all the silicone sealant is removed from the top of the boiler. If installing a 70 or 90 output non-combi model, also remove the service access door.
3. Carefully fit the inner and outer seals to the flue starter piece and smear them with soap or an appropriate lubricant (suitable for use with silicone flue seals).
4. If installing a U70, UP70, U90 or UP90 model, remove the lower casing panel knockout from the appropriate side or rear panel. This is best done with a pair of tin snips. If installing a U120 or UP120 model, remove the upper knockout.

Push the boiler into position against the wall, correctly locate the gasket on the boiler then install the flue starter piece, securing it in position using the fasteners provided.

5. If installing extension pieces, ensure the seals are correctly fitted and lubricated before pushing through the wall and into the starter piece.

Note: Any combination of short (300mm) or long (600mm) extension pieces for the BF-R can be used up to a maximum total length of 1200mm.

6. Slide the flue terminal into position with a twisting movement ensuring that it protrudes through the wall by a minimum of 175mm and a maximum of 225mm.
7. Seal the gap between the flue and the wall both inside and outside, then fit the terminal guard (basket) over the flue terminal. Use the cardboard mounting template supplied with the flue kit to locate and drill the necessary screw holes in the wall.
8. Remove the air inlet cover from the burner then fit the intake adaptor spigot and gasket. Connect one end of the air duct / hose to the flue and the other end to the adaptor spigot and secure.

5.1.2 Installation of a High Level Balanced Flue (HLBF)

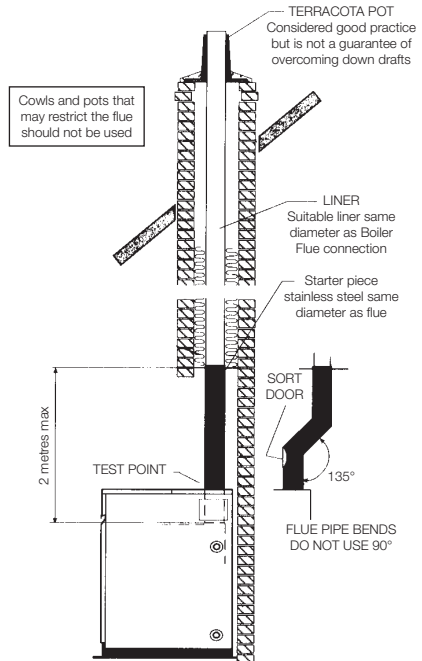
The 'Easy Fit' High Level Balanced Flue (HLBF) can only be used with the 120 Output Models (B120, U120 & UP120) when fired at the factory setting (0.85 gal nozzle). It CANNOT be used when fired with a 1.00 gal nozzle.

Install as per the above instructions noting that there are no flue seals to fit, the flue is not telescopic and there are no extension pieces available for this flue type.

5.2 Conventional Flues

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

When connecting to an existing masonry chimney a flexible stainless steel liner of the correct diameter must be used. The annular space must be filled with insulation and sealed top and bottom. The starter piece should be sealed into the conventional flue adaptor using a high temperature silicone sealant or fire cement.



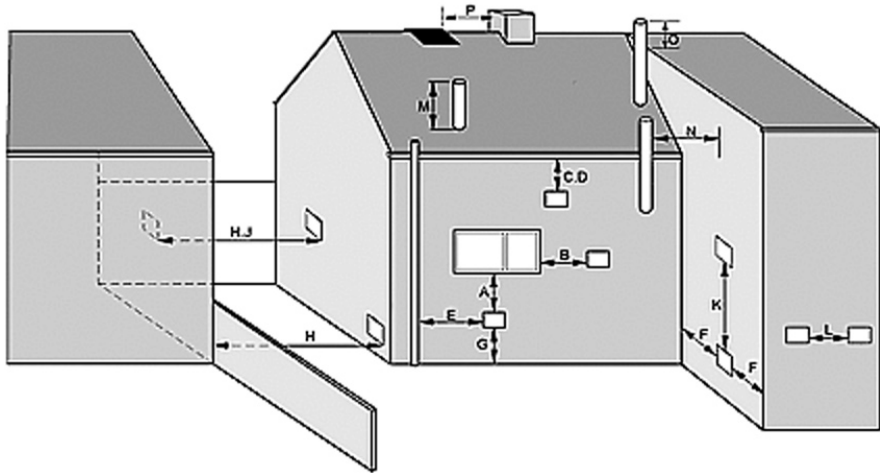
Typical Conventional Flue with Brick Chimney

5.3 Low Level Balanced Flue Terminal Positions

Attention should be given to the position of the flue discharge; we recommend the following guidelines be adopted.

1. The flue should not discharge beneath opening windows or near other accesses to the building.
2. The flue should not discharge near internal/external corners of the building where turbulent wind conditions could occur.
3. A terminal guard must be fitted at all times.
4. The terminal should not discharge over property boundaries.
5. Discharge into narrow passageways should be avoided.
6. The location of the terminal and routing of the flue should be determined by the installer after consultation with the householder.
7. In positioning the flue the wind direction should be considered.

Installation in exposed positions is not recommended.



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 or 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.	1,200
K	Vertically from a terminal on the same wall.	1,500
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.	1,500

These are minimum dimensions and are only quoted as a guidelines.

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

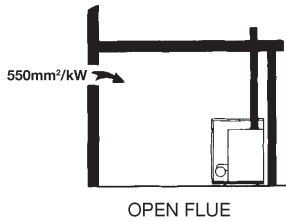
6.0 Air Supply for Combustion & Ventilation
(see BS5410)

6.1 Open Flue Boilers

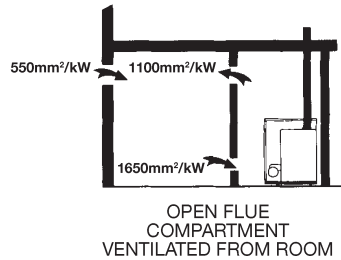
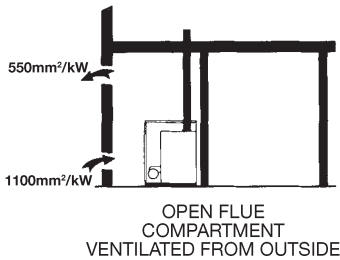
When the boiler is sited in a cellar where the only access for combustion and ventilation air is at high level then the combustion air should be ducted to low level.

Combustion Air Supply

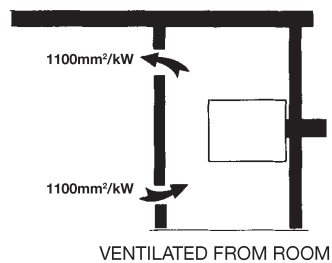
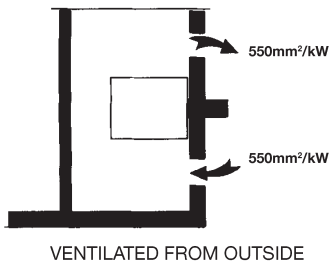
Boiler in Room



Boiler in Compartment



6.2 Balanced Flue Boilers – Boilers in a Compartment



Air Supply for Ventilation
No Combustion Air Inlet required to Room

7.0 Installation Requirements

The boiler installation must be in compliance with BS5410 : PART 1 and the Building Regulations.

7.1 General Requirements

7.1.1 Hearth

The boiler hearth temperature is 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.

7.1.2 Service Access

24" (600mm) Clearance should be provided above and in front of the boiler to allow for routine servicing. Additionally, Pumped, System and Combi models may require access to the top.

7.1.3 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. We recommend that the system is cleaned out in accordance with BS5449 and BS7593 using a suitable non-corrosive commission cleanser. It is further recommended that a suitable corrosion inhibitor is added to the heating system, which will not damage the synthetic rubber parts within the boiler.

7.1.4 Air Vents

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.

7.1.5 Drain Cock

Drain cock(s) should be fitted to a bottom connection on the boiler and to the lowest points in the system to enable the system to be fully drained.

7.1.6 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.

7.1.7 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.

7.2 Sealed Systems

7.2.1 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. A 12 litre expansion vessel charged to 1.0 bar is supplied with both the System and Combi boilers. 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 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 this volume is exceeded, additional expansion capacity will be required.

VESSEL VOLUMES													
INITIAL CHARGE	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
TOTAL SYSTEM VOLUME	25	50	75	100	125	150	175	200	225	250	275	300	

In order to obtain an accurate reading the system should be cold and the system pressure should be relieved by manually operating the pressure relief valve.

7.2.2 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. Ensure the caps on the automatic air vents are loose or removed and bleed both circulating pumps.

7.2.3 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.

7.2.4 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.

7.2.5 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.

7.3 Combi Domestic Hot Water

7.3.1 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.

7.3.2 Water Hardness

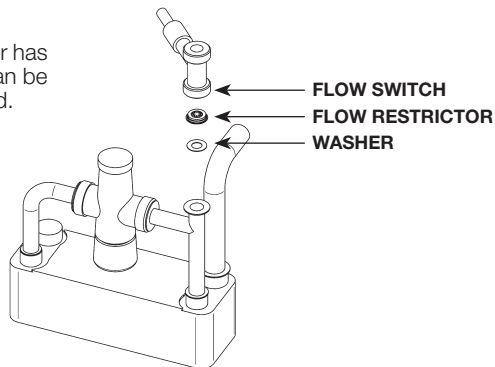
Although many of the DHW components are designed to resist lime scale formation, in areas of hard water it may still be necessary to fit an inline chemical water softener. For further information contact Warmflow and your local water company.

7.3.3 Hot Water Pipework

To ensure economic use, the pipe runs between the boiler and the taps should be as short as possible and insulated to reduce heat loss. Very long pipe runs can lead to excessive water usage and poor efficiency.

7.3.4 Flow Restrictor

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

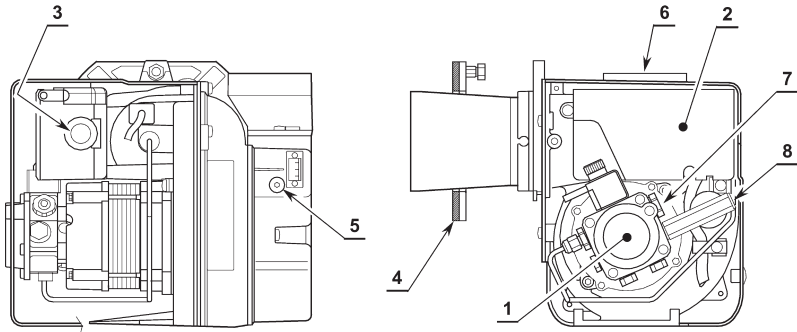


7.3.5 Boreholes

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.

8.0 Burners

8.1 RDB Burner

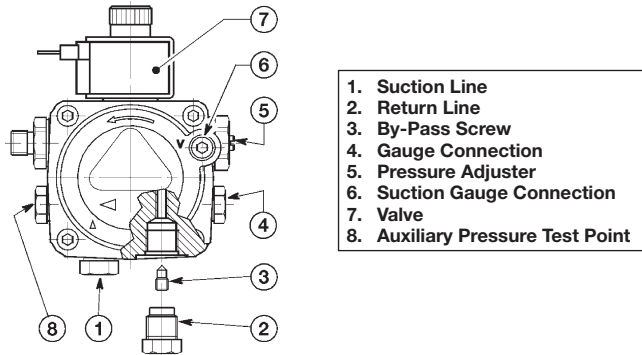


1. Pump
2. Control Box
3. Reset Button with Lock-Out Lamp
4. Flange with Insulating Gasket

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

8.2 Oil Pump

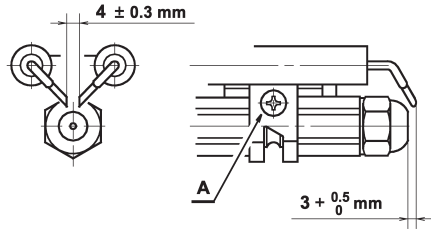
The burner is supplied for use with a one pipe system. For use on a two pipe system, it is necessary to remove the return port plug and fit a small by-pass plug as shown.



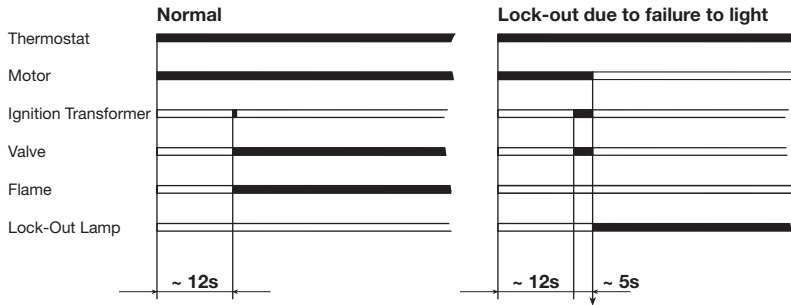
1. Suction Line
2. Return Line
3. By-Pass Screw
4. Gauge Connection
5. Pressure Adjuster
6. Suction Gauge Connection
7. Valve
8. Auxiliary Pressure Test Point

8.3 Electrode Setting

Before assembling or removing the nozzle, loosen the screw (A) and move the electrodes away from the nozzle.



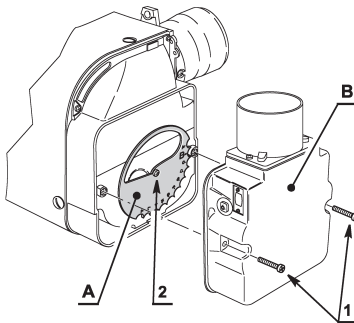
8.4 Burner Start-Up Cycle



8.5 Air Damper Adjustment

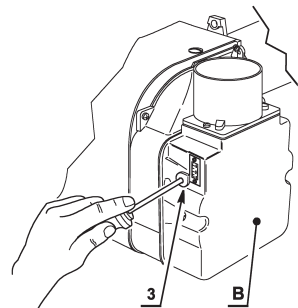
The air damper is set in factory. This regulation is purely indicative. Each installation however, has its own working conditions: actual nozzle output; positive or negative pressure in the combustion chamber, the need of excess air, etc. All these conditions may require a different air damper setting.

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).

9.0 Commissioning & Servicing

9.1 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.

Combustion tests must be carried out using a Combustion Analyser. The pump pressure can be checked by fitting a manifold and a pressure gauge to the oil pump.

Before firing the boiler ensure that all the baffles are in place, as they may have been displaced during transit, as shown in the General Information section. Switch the boiler on, ensuring all controls are calling for heat. Typical burner settings and test data are shown in the Technical Data section.

Check the smoke reading, CO₂ content and flue gas temperature with the boiler up to temperature. 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.

To comply with building regulations OFTEC form CD11 should be completed and a copy left with the householder.

9.2 Servicing

9.2.1 General Requirements

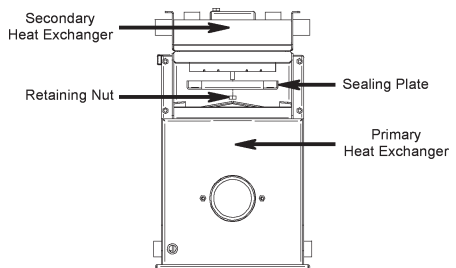
It is recommended that the appliance is serviced annually by a Warmflow or an OFTEC registered service technician in accordance with the recommendations laid out in OFTEC's technical information book 2 – 'Pressure Jet Appliances – Commissioning Requirements for Technicians'.

Additionally when servicing special attention should be paid to the condition of the oil nozzle, flexible oil line, fuel filter, door insulation and sealing rope.

Note: All product warranties will be invalidated if the appliance is not serviced annually by a Warmflow or OFTEC trained and registered technician.

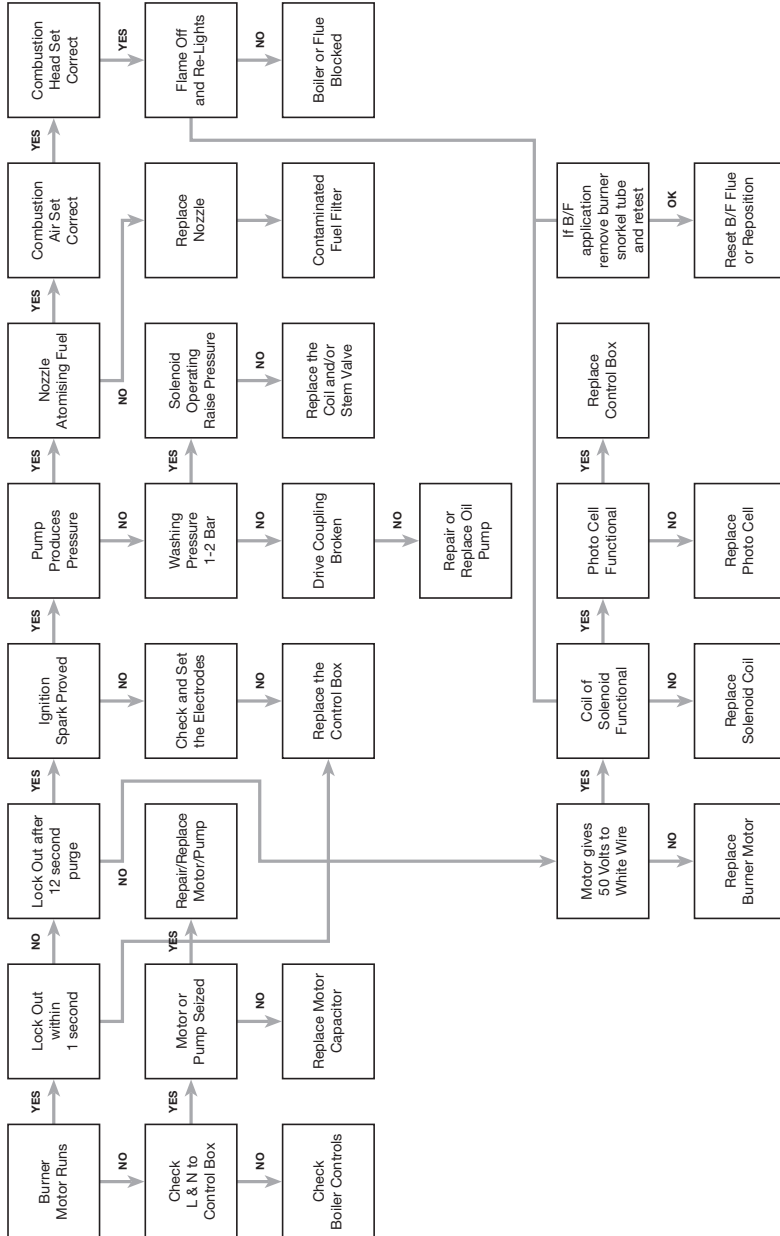
9.2.2 Specific Requirements

To access the secondary heat exchanger of the 120 output models for servicing, remove the sealing plate (see diagram) by unscrewing the retaining nut. Lower the sealing plate and remove. The inner underside of the secondary heat exchanger should be scrubbed clean using a wire brush or similar.



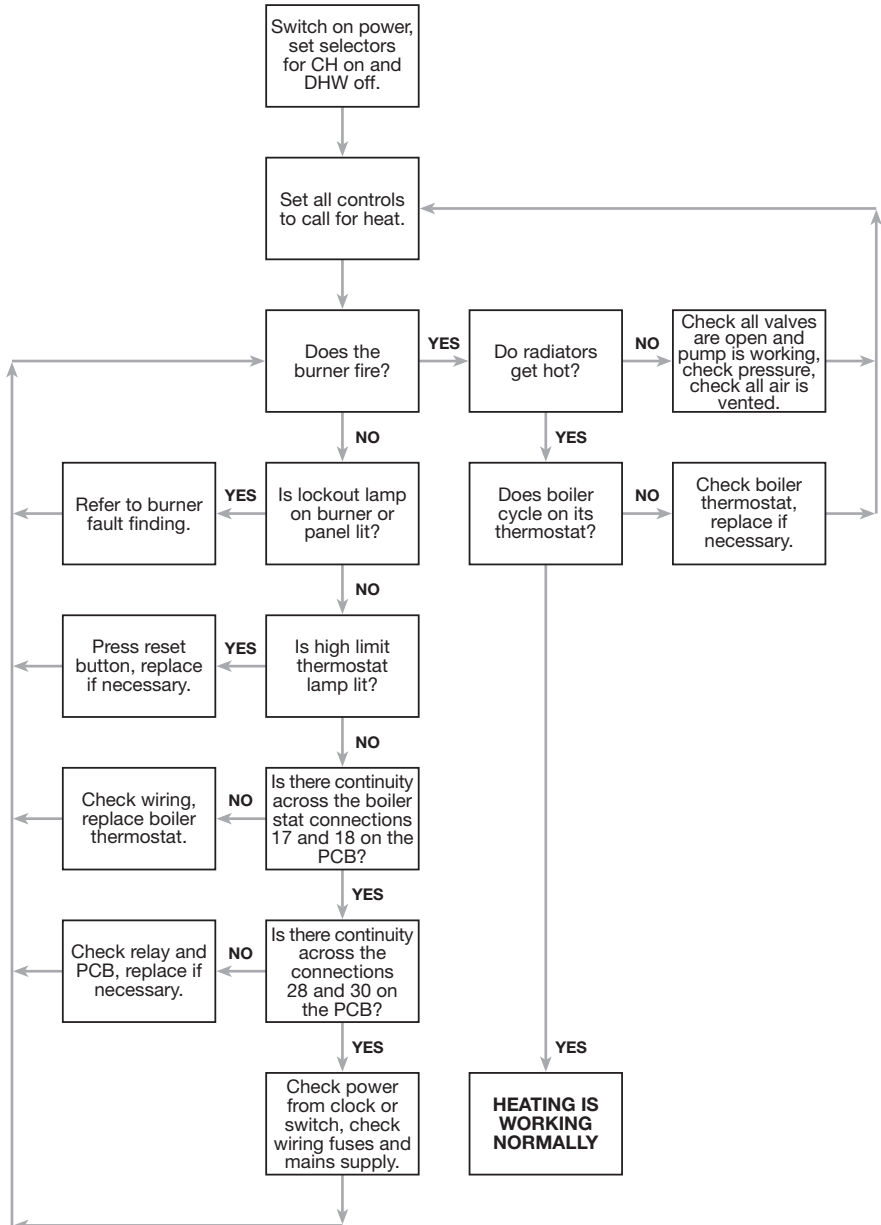
10.0 Burner Fault Finding

10.1 Riello RDB

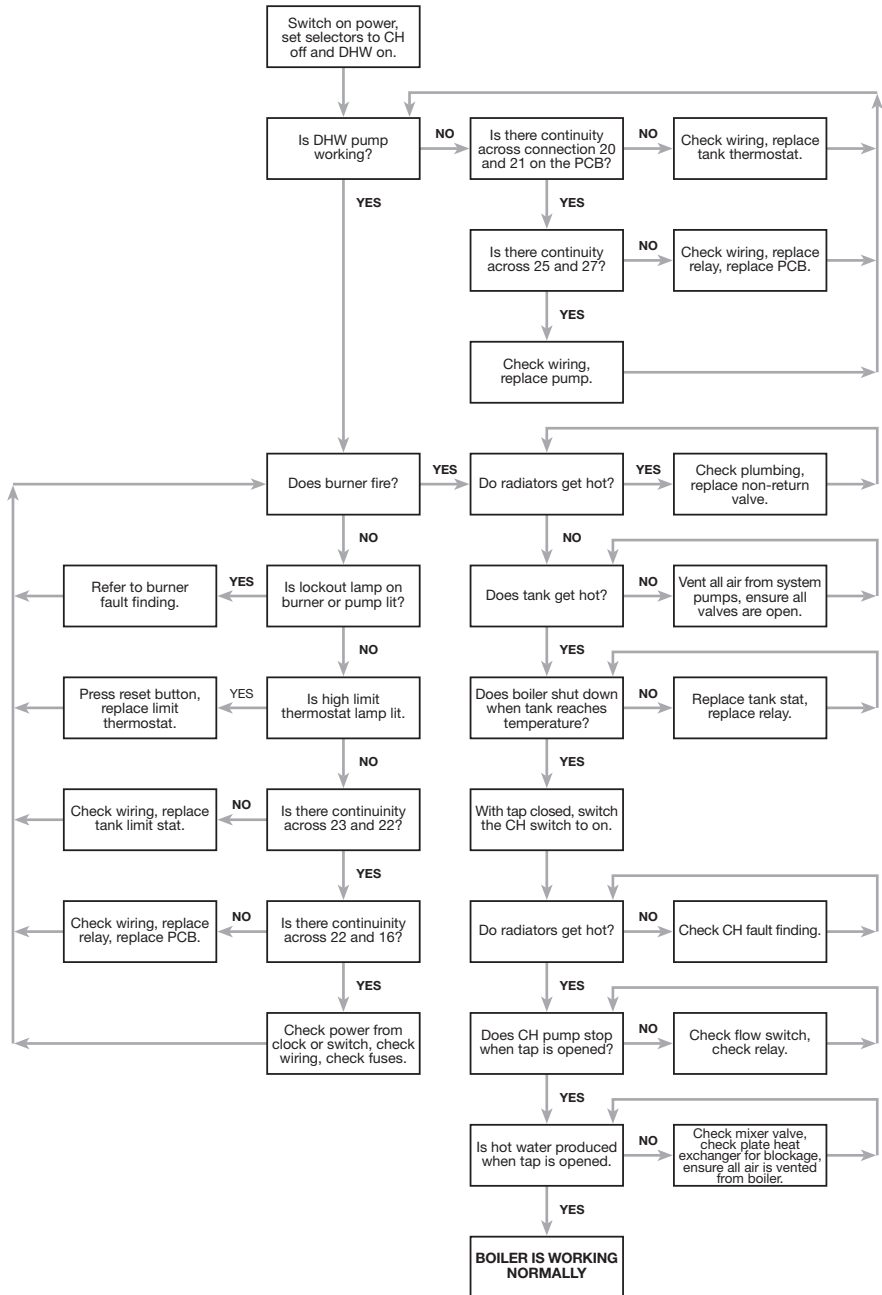


11.0 Combi Fault Finding

11.1 Central Heating



11.2 Domestic Hot Water



12.0 Optional Boiler Mounted Digital Timer



12.1 Operating Instructions

12.1.1 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.

12.1.2 Built in Programme

For convenience, the timer module has a built in programme, however, it can be easily adjusted (see section 12.5 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		Mon – Fri 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

12.1.3 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.

12.1.4 Select Operation Mode

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

12.1.5 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		Mon – Fri 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		Mon – Fri 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		Mon – Fri 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

12.1.6 Reviewing the Programmes

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

12.1.7 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.

12.1.8 Manual 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.

12.1.9 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.

12.1.10 Manual Hour

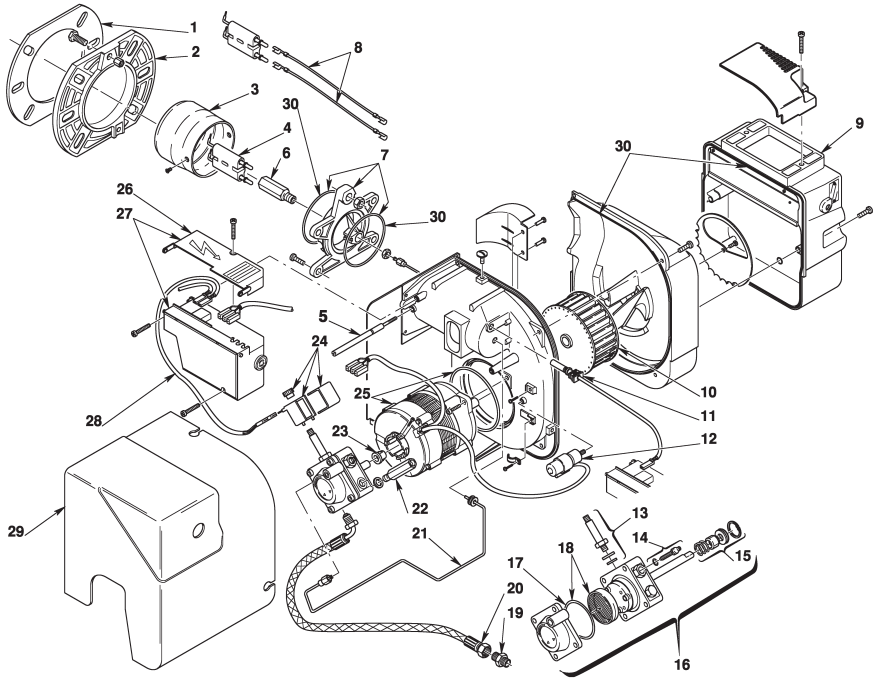
1. Press **CH ADV** or **HW ADV** key, the CH icon will flash.
2. You now have approx 5 second to enter desired length of time by pressing **CH ADV** or **HW ADV** key once for each hour the new time set should be in affect.
3. The MANUAL HOUR function will bring the unit ON 1 hour to 3 hours in the 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.

12.1.11 Cancel Manual Hour Function

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

13.0 Spares

13.1 RDB 2.2 Spares

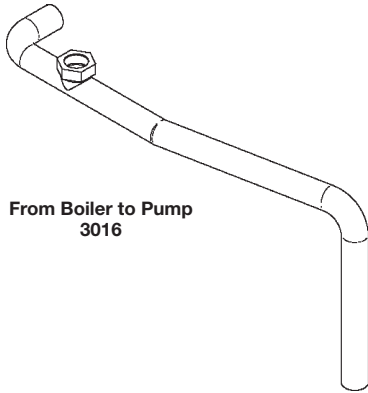


No	CODE	3514157	3514257	3514557	DESCRIPTION
1	3008512	•	•	•	Gasket
2	3006384	•	•	•	Flange
3	3002551	•			Cup-Shaped Head
3	3001079		•		Cup-Shaped Head
3	3020055			•	Cup-Shaped Head
4	3008860	•	•	•	Electrode Assembly
5	3008875	•	•	•	Screw
6	3008861	•	•	•	Nozzle Holder
7	3008862	•	•	•	Collar
8	3008794	•	•	•	High Voltage Lead
9	3008647	•	•		Air Damper Assembly
9	3008839			•	Air Damper Assembly
10	3005788	•	•	•	Fan
11	3007541	•	•	•	PE Cell
12	3002837	•	•	•	Capacitor 4.5µF
13	3007582	•	•	•	Needle Valve
14	3008651	•	•	•	Regulator

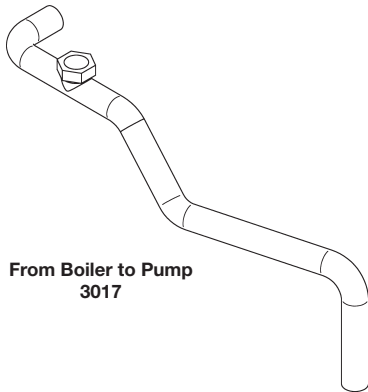
No	CODE	3514157	3514257	3514557	DESCRIPTION
15	3000439	•	•	•	Pump Seal
16	3008654	•	•	•	Pump
17	3007162	•	•	•	O-Ring
18	3008653	•	•	•	Filter O-Ring
19	3003602	•	•	•	Connector
20	3005720	•	•	•	Flexible Oil Line
21	3008644	•	•	•	Tube
22	3008876	•	•	•	Pressure Gauge
23	3000443	•	•	•	Joint
24	3008648	•	•	•	Coil-Shell & Knob
25	3008650	•	•	•	Motor
25	3002836	•	•	•	Motor & Capacitor
26	3008649	•	•	•	Protection
27	3008652	•	•	•	Control Box 535RSE/LD
28	3008851	•	•	•	Lead Coil
29	3008879	•	•	•	Cover
30	3008878	•	•	•	Kit Seals

13.2 Pipe Spares

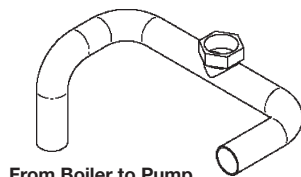
UP70, UP90, US70 & US90 Models



KP70, KP90, KS70 & KS90 Models



UP120 & KP120 Models



13.2 Pipe Spares cont'd

UC70, UC90, KC70 & KC90 Models

From Boiler to Gate Valve
3097

From Gate Valve to Pump
3098

CH Flow from Pump
3100

Return from both CH & Plate Heat Exchanger
3219

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 & Filling Loop
3099

13.3 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.

14.0 Your Guarantee, Terms & Conditions

1. Warmflow Guarantees

The boiler, including all controls, plate heat exchangers and associated equipment contained within the boiler casing, the burner and flue system if supplied by Warmflow against defective parts and faulty workmanship, for period of 12 months from the date of installation, providing the boiler is installed and commissioned in accordance with the installation instructions supplied with the boiler. The period of guarantee will be increased to 24 months in Great Britain providing:

- The guarantee registration form is fully completed and returned to Warmflow within 30 days from the date of installation, or 90 days from the date code stamped on the appliance.
- The boiler must be installed and commissioned by a Warmflow or other competent engineer, who is OFTEC registered. Commissioning of the boiler must be completed immediately after the boiler is installed.
- The boiler must be serviced by a Warmflow or other competent engineer, who is OFTEC registered, 12 months after the date of installation and thereafter, at 12 monthly intervals.

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 water jacket and thermal store (in the case of a combination boiler) for a total of 5 years from the appliance date code, subject to the above conditions being complied with.

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

2. Conditions of Guarantee

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

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

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

Labour charges associated with the replacement of heat exchangers or thermal heat stores will be calculated on a sliding scale depending on the boiler output up to a set maximum. Contact Warmflow for current prices.

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

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

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.

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

NB: The nozzle supplied with the boiler is deemed to be an expendable item and is therefore excluded from the guarantee.

Commission/Service Record

Boiler Serial No | _ _ _ _ _ |

In order that your boiler gives you many years of economical trouble free use and to validate the warranty, this boiler must be commissioned upon installation and serviced annually. Contact Warmflow for an approved engineer within your area.

Date of Commission	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 1st Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 2nd Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 3rd Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 4th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 5th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 6th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 7th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 8th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Date of 9th Service	_____
Company Name	_____
Engineer Name	_____
Engineer Signature	_____
Telephone No	_____

Notes

Notes

Notes

BUSINESS REPLY SERVICE
Licence No BEL 1609

2

CUSTOMERS FROM ROI
PLEASE AFFIX STAMP

Warmflow Engineering Ltd
Appliance Registration Dept
Lissue Industrial Estate
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