



**FIREBIRD**

# **ENVIROMAX**

## **CONDENSING RANGE**

### **TECHNICAL MANUAL**

**For use with Diesel 35 Sec. Gas Oil**

**TECHNICAL MANUAL INCLUDES**

**>> HOUSEHOLDER INSTRUCTIONS**

**>> INSTALLER GUIDE**

**>> COMMISSIONING**

**>> SERVICING**

**>> SPARE PARTS**



*Working towards a greener planet*

This manual must remain with the householder on completion of installation

REVISION 6. © 01-03-2010



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We would like to thank you for purchasing a high efficiency Firebird C Range Condensing domestic central heating oil fired boiler. This instruction manual is produced for the reference and guidance of qualified installation engineers such as those who are OFTEC registered. EU legislation governs the manufacture, operation and efficiency of all domestic central heating oil boilers. Our boilers and burners will be supplied as matched units tested and approved to OFTEC Standard OFS A100.

FIREBIRD Boilers are full manufacturing members of OFTEC (Oil Firing Technical Association) and are participating in its Boiler testing and approvals programme to comply with OFS A100 and EC Efficiency Directive.

***You should ensure that all installation, servicing and commissioning works are carried out by a competent person, such as one registered by OFTEC. It should be noted that it is the responsibility of the Installer/Householder to ensure that the boiler is properly commissioned. Failure to do so may invalidate the boiler guarantee and any extended warranty.***

### **SERVICING**

***The boiler requires servicing on an annual basis to ensure it maintains its efficiency, continues to perform reliably and as a regular check on its built-in safety features. It is important that servicing should be conducted by a competent engineer, such as one who is OFTEC trained and registered.***

***All appropriate OFTEC manuals and BS Standards should be studied and their requirements adhered to and used in conjunction with these instructions. This manual includes a list of some BS Standards and Building Regulations.***

OFTEC is conducting training and registration of engineers and this is to be commended, as reading of this manual alone for installation and servicing procedures cannot replace the critical advantage provided by training and years of experience.

### **INTRODUCTION**

Firebird domestic oil fired condensing boilers are highly efficient and are all independently certified to Sedbuk Band A. They use less fuel and have lower running costs than non-condensing boilers. Because of their increased efficiency they emit less carbon dioxide than non-condensing boilers, which will contribute to efforts to reduce global warming. The incredible efficiency of the Firebird C Range Condensing Boiler is due to the development of a single boiler unit with two unique heat exchanger units. This gives an exchange surface greater than non-condensing boilers.

This additional surface area increases the amount of heat extracted from the combustion process and thus reduces the heat wasted to atmosphere. So much heat is extracted from the combustion gases that their water vapor element condenses into liquid form, releasing the latent heat that was used to create the vapor in the first place. It is this heat gain that gives the condensing boiler its significant advantage over a non-condensing model. In order to enable this high level of heat extraction to take place, the water in the boiler's heat exchanger must be cooled down to about 55°C or less, this means that the boiler is working at its maximum efficiency

The condensate produced is often mistakenly considered to be highly acidic. In fact the acidity of condensate from a Firebird C Range Condensing Boiler will be found to be as low, if not lower, than that of vinegar.

The Firebird C Range Condensing Boiler is suitable for under floor heating provided the return temperature is above 40°C. at all times.

The Firebird C Range Condensing Boiler even when not working in condensing mode will still operate at extremely high efficiencies making it suitable for fitting to an existing heating system without alteration to the radiator sizes.

**The burner is factory set for use with kerosene 35 second Gas Oil.**

- **Firebird boilers are designed and manufactured to give many years of trouble-free service. We provide a comprehensive conditional warranty of 5 years on the boiler shell and 2 years on burner and associated controls.**
- **This will only apply if the boiler is commissioned by an approved engineer and is serviced annually thereafter.**
- **Please ensure that the Commissioning Card (the tear-off section on the Guarantee Card) is returned, fully completed within 28 days of complete installation & commissioning. Correct commissioning will ensure that your boiler is set to operate at its maximum fuel efficiency.**
- **Consumable components, the nozzles and the oil hose are excluded.**
- **The terms laid down on the Guarantee must be adhered to.**

## TERMS OF THIS GUARANTEE

1. **Firebird hereby guarantees the following**  
(The Guarantees)
  - a. The Boiler Shell will be free from defective parts or workmanship for a period of 5 years from the date of installation.
  - b. Burner, controls and flue kits (supplied by Firebird) will be free from defective parts or workmanship for a period of 2 years from the date of installation. (With the exception of burner nozzles, which should be replaced at the recommended service intervals.)
2. Guarantees are subject to the following conditions:
  - a. All claims under the guarantees must be within the above stated time limits.
  - b. The boiler must be commissioned by qualified persons and as set out in the Installation Manual, using correct test equipment.
  - c. Maintenance should be carried out at the intervals stated in the Installation Manual.
  - d. Installation of the boiler must be in accordance with (a) Installation Manual, (b) all relevant standards and codes of practice.
  - e. Firebird can accept no liability in respect of any defect arising from incorrect installation, negligence, fair wear and tear, misuse, alteration or repair by unqualified persons.
  - f. Firebird will not accept any liability in respect of any defect occurring in the heat exchanger due to limescale build-up and or low return water temperature.
  - g. The guarantees extend to reasonable labour costs EXCEPT under clause 1a where any valid claim made after 3 years will not include labour costs.
  - h. Firebird's prior authorisation must be obtained before examination or repair of the boiler takes place.
  - i. Firebird will examine all claims made under the guarantee and for any claims that are deemed invalid, the costs incurred will be borne by the owner.
  - j. That the appliance was used only for normal domestic central heating purposes.
3. Any defective part removed under any or all of the guarantees **MUST** be returned to Firebird.

STATUTORY RIGHTS OF THE OWNER ARE NOT AFFECTED BY THIS GUARANTEE

**POPULAR BOILERHOUSE**

**Enviromax Popular Boilerhouse Operating Procedure**

(All outputs)



**TO START THE BOILER FOLLOW THIS SEQUENCE:**

- Turn on fuel supply.
- Switch on power supply to boiler.
- Turn timer control (If Fitted) to 'ON'.
- Set the boiler thermostat to the required temperature (figure 1 pg. 5). The boiler thermostat controls the boiler operation by automatically maintaining the required boiler water temperature output. Safe operation is also maintained by the burner control system which provides the required ignition and shut off sequence. If a time control is fitted this will automatically switch the boiler off and on when heat is required.

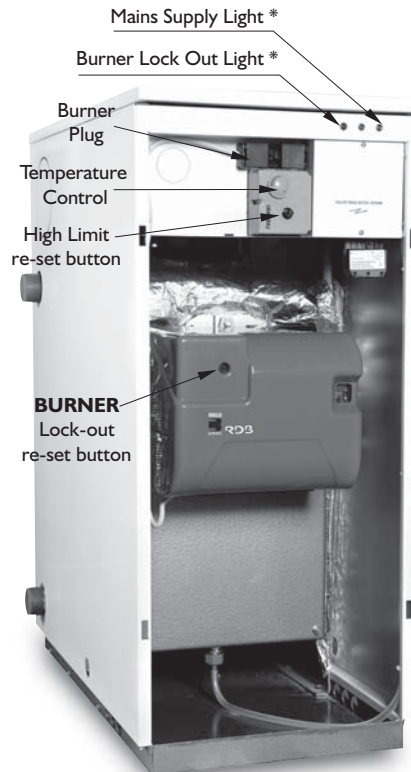
**THE BOILER CAN BE TURNED OFF BY ANY OF THE FOLLOWING MEANS:**

- Turn the timer control (if fitted) to OFF.
- Turn OFF the mains electrical supply to the boiler.

**SYSTEM**

**Enviromax System Operating Procedure**

(All outputs)



**TO START THE BOILER FOLLOW THIS SEQUENCE:**

- Turn on fuel supply.
- Switch on power supply to boiler.
- Turn timer control (If Fitted) to 'ON'.
- Set the boiler thermostat to the required temperature (figure 1 pg. 5). The boiler thermostat controls the boiler operation by automatically maintaining the required boiler water temperature output. Safe operation is also maintained by the burner control system which provides the required ignition and shut off sequence. If a time control is fitted this will automatically switch the boiler off and on when heat is required.

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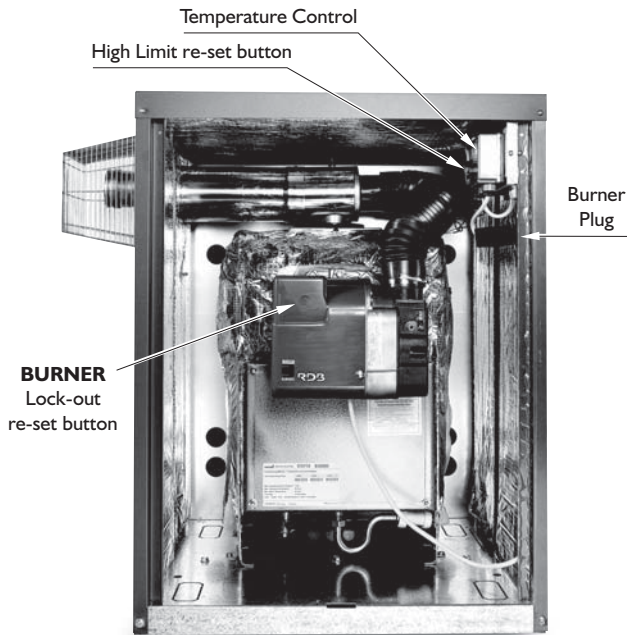
- Turn the timer control (if fitted) to OFF.
- Turn OFF the mains electrical supply to the boiler.

\* Lights not included in Utility models.

# SYSTEMPAC

## Enviromax Systempac Operating Procedure

(All outputs)



### TO START THE BOILER FOLLOW THIS SEQUENCE:

- Turn on fuel supply.
- Switch on power supply to boiler.
- Turn timer control (If Fitted) to 'ON'.
- Set the boiler thermostat to the required temperature (figure 1 pg. 5). The boiler thermostat controls the boiler operation by automatically maintaining the required boiler water temperature output. Safe operation is also maintained by the burner control system which provides the required ignition and shut off sequence. If a time control is fitted this will automatically switch the boiler off and on when heat is required.

### THE BOILER CAN BE TURNED OFF BY ANY OF THE FOLLOWING MEANS:

- Turn the timer control (if fitted) to OFF.
- Turn OFF the mains electrical supply to the boiler.

## Thermostat Control

figure 1



Set at Max 80°C

Set at Mid 70°C

Set at Min 60°C

## Burner Lockout

(ALL MODELS)

The boiler is factory fitted with a burner control box lockout safety feature which operates automatically if a fault occurs in the burners operation. Should this occur, the light on the front of the burner - **See Burner Section Pg. 40 or Boiler Photo** - will illuminate and its cause must be investigated. This could be caused by:

- A. An interruption in the fuel supply. (Eg. empty oil supply tank)
- B. An electrical supply fault.
- C. A fault with the burner or its safety control system.
- D. The failure of a component. (Eg. photo cell)
- E. Worn or dirty oil nozzle.

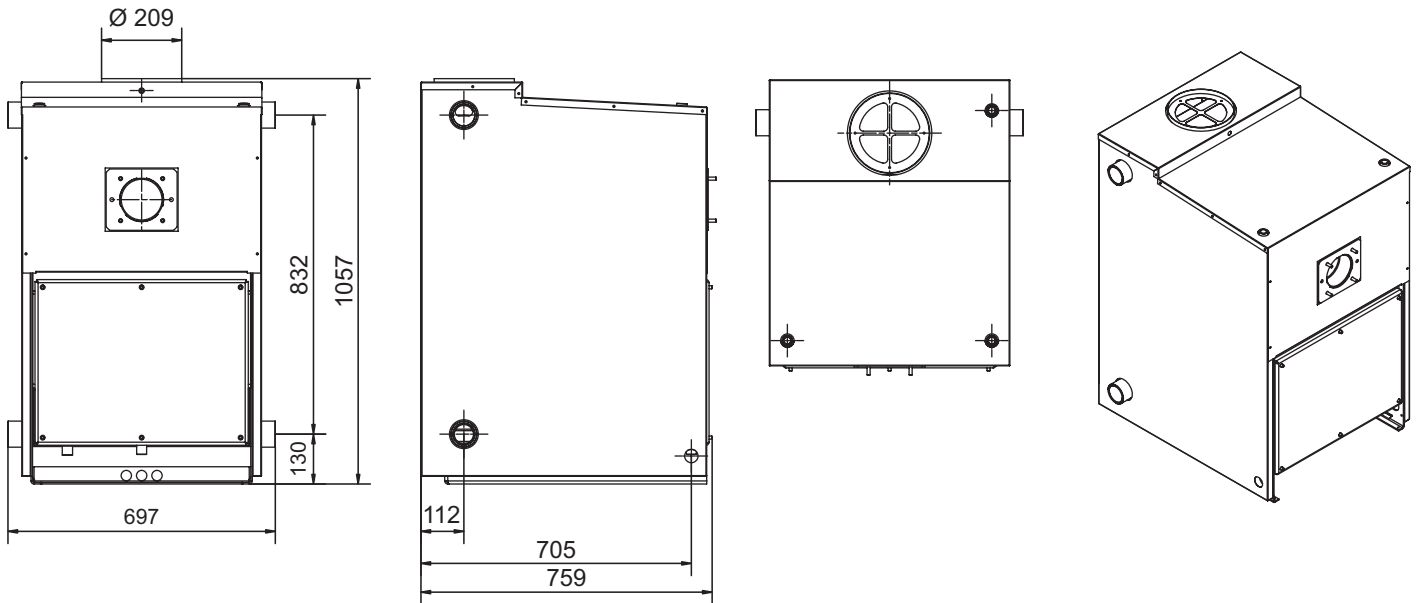
Before attempting to restart the boiler the front panel and the burner cover should be removed and a visual check made for any obvious problems such as oil leaks, loose connections etc.

**ENSURE OIL TANK CONTAINS CORRECT GRADE FUEL.  
35 SECOND GAS OIL**

### TO RESTART THE BOILER

1. Press reset button **See Burner Section Pg. 40 or Boiler Photo**
2. Ensure that the boiler thermostat, time switch (if fitted) and any external controls connected to the boiler are set to call for heat.
3. Check that the oil supply valves and remote sensor fire valve are open and that there is sufficient oil in the tank.
4. Check that the burner lockout light is unlit and with the 'mains ON' the boiler will be ready to commence its start sequence.

## Firebird Enviromax Popular Boilerhouse C Range Dimensions (mm)



**Copper Pipe Not Plastic to be used for a minimum of 1 metre off the boiler**

Boiler Model		<b>C80 / 100</b>
Max Heat Output	Kw	80 / 100
	Btu/h ('000)	341

### CONNECTIONS

Heating Flow	2" Bsp.
Heating Return	2" Bsp.
Drain Off Cock	2" Bsp.
Condense Drain Off Connection.	22 mm PLASTIC

### WATER CONTENT

Water Content Boiler	75
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### FLUE (Indoor Boilers) Concentric Flue

Balanced Flue Assembly (mm)	207 (8")
Conventional flue Socket. (mm)	207 id.
Flue Draught Reqd. (Min WG.)	0.040"
Conventional Flue (Max WG.)	0.15"

### MAINS WATER SUPPLY

Pressure	Max	<b>Limescale excess:</b> When over 150/200 ppm. Fit appropriate scale reducer.
	Min	<b>10 bar max</b> (Fit pressure reducing valve as necessary)
		<b>1 bar min.</b> For user Comfort reduce pressure at tap to between 1 and 5 Bar.

### TEMPERATURE CONTROL

Boiler Central Heating Control	60°C - 80°C +- 3°C
Boiler Safety Limit	110°C +- 3°C

### HEATING SYSTEM (SEALED)

Fit in accordance with BS 7074 Part 1, BS 5449, OFTEC Standards, etc	
Boiler Test Pressure	4.5 Bar
Safety Valve Operating Pressure Gauge	0 to 4 Bar

### WATER SIDE RESISTANCE

<b>Flow Rate To Give A Nominal Output At 10k Differential</b>	<b>Flow Rate To Give A Nominal Output At 20k Differential</b>
Flow Rate Measured (Kg h <sup>-1</sup> ) 2874.24	Flow Rate Measured (Kg h <sup>-1</sup> ) 1522.92
Waterside Resistance (mbar) 0.18	Waterside Resistance (mbar) 0.19

Pressure Jet Oil Burners	RIELLO RDB 4.2
Fuel	35 second Gas Oil
Electrical Supply	230v. AC 50Hz To be fused at 5amp.



**ELECTRICAL SUPPLY**

The boiler and controls require 230V 1 phase 50Hz mains electric supply protected with a 5amp fuse.

The guarantee on this product will be rendered void if damaged by power from a stand by electricity supply. i.e. (Generator.)

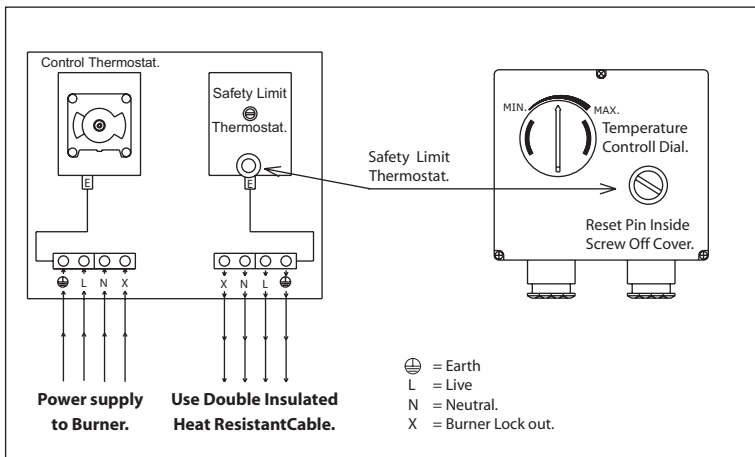
**THIS APPLIANCE MUST BE EARTHED.**

A qualified electrician must carry out all electric wiring in accordance with current I.E.E Regulations and any local regulations which may apply.

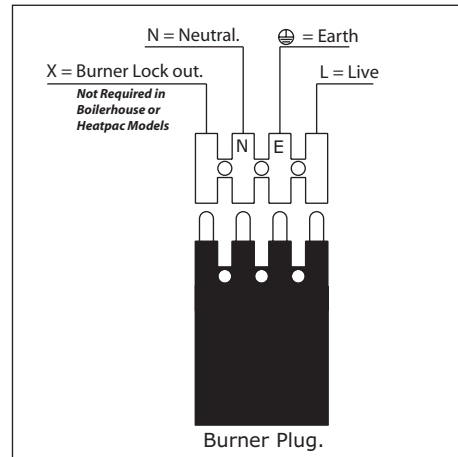
The mains electrical supply must be taken from a double pole isolating switch with a 5amp fuse, positioned somewhere close to the boiler. Heat resisting cable must be used which can be routed into the boiler through the access provided on either side of the base. Ancillary controls may be provided for with terminal connections in the control panel.

**POPULAR / BOILERHOUSE WIRING**

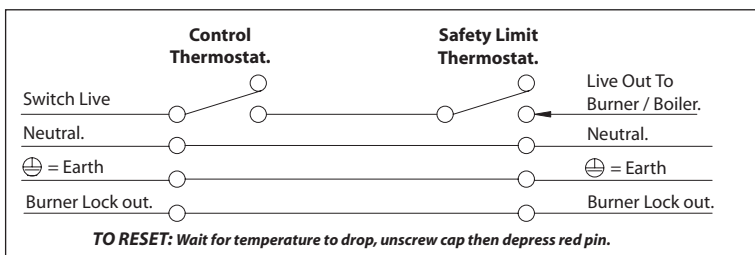
**I. Stat Dual Thermostat**



**Burner Plug.**



**SCHEMATIC DIAGRAM.**

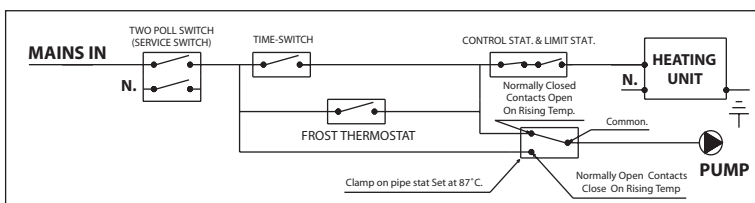


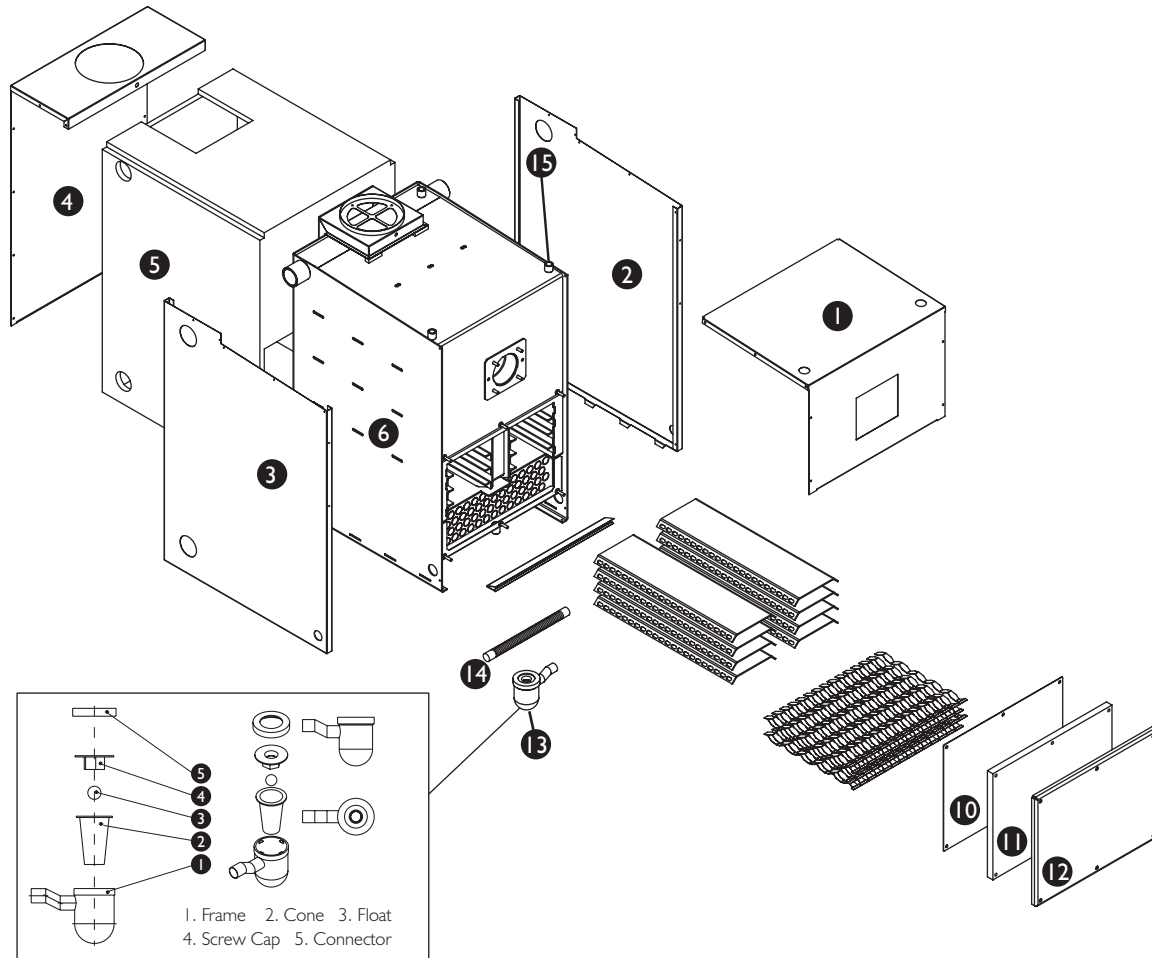
**IMPORTANT**

**When connecting the mains supply to this unit ensure that:**

- 1 Double insulated heat resistant cable is used.
- 2 No single insulated cable is exposed at connection points on the (Thermostat, Burner, plug and socket)
- 3 All relevant lids and covers are properly replaced and secured correctly.
- 4 A permanent power supply (not timed) be available at location of boiler. This can be used for a frost thermostat and or an over heat thermostat, should either or both be needed.

**OVER RUN DIAGRAM FOR CIRCULATING PUMP.**





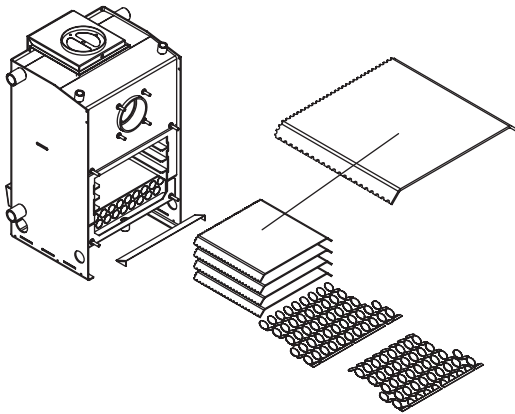
**ENVIROMAX POPULAR - Boilerhouse Model C100**

No.	Description	C100
1	Burner panel	212416
2	Right Side Panel	212415
3	Left Side Panel	212418
4	Back Panel	212417
5	Jacket	112421
6	Shell	-
7	Burner	410210
10	Graphite Door Seal	112414
11	Door Gasket	112362
12	Boiler Door	212423
13	Condense Trap	112184
14	Condensate Hose	111537
15	Boiler Dual Thermostat	112018

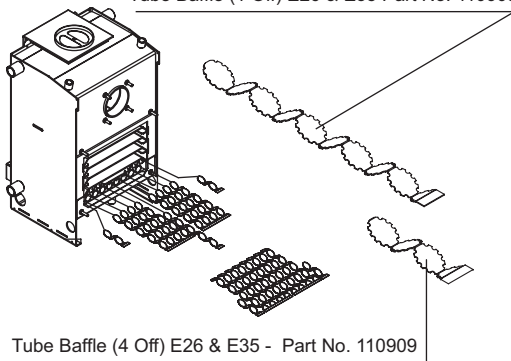
**ENVIROMAX C26 & C35**

**ENVIROMAX (E) RANGE BAFFLES.**

E26 Smoke Baffle R4 ..... - Part No. 212028  
 E35 Smoke Baffle oblong ..... - Part No. 212122

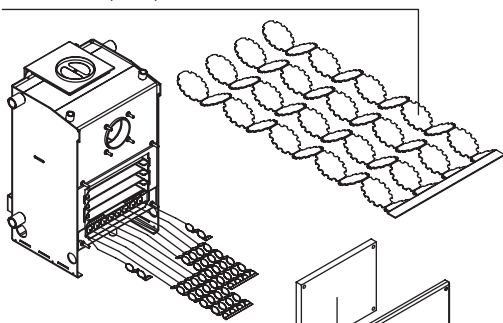


Tube Baffle (1 Off) E26 & E35 Part No. 110908



Tube Baffle (4 Off) E26 & E35 - Part No. 110909

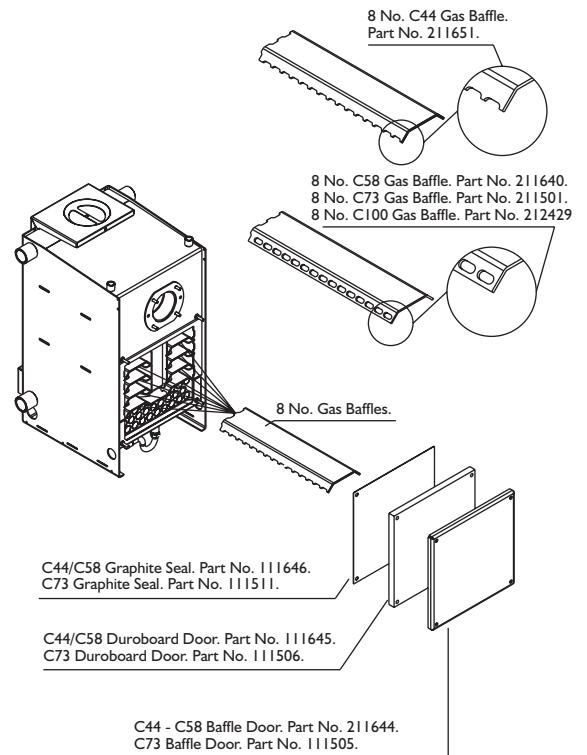
Tube Baffle (4 Off) E26 & E35 - Part No. 110907



E26 & E35 Door Gasket. - Part No. 110918

E26 & E35 Door. - Part No. 210910

**ENVIROMAX C44, C58, C73 & C100**



8 No. C44 Gas Baffle. Part No. 211651.

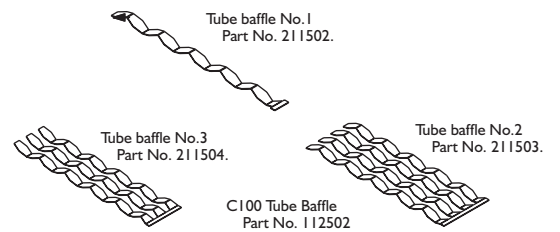
8 No. C58 Gas Baffle. Part No. 211640.  
 8 No. C73 Gas Baffle. Part No. 211501.  
 8 No. C100 Gas Baffle. Part No. 212429

8 No. Gas Baffles.

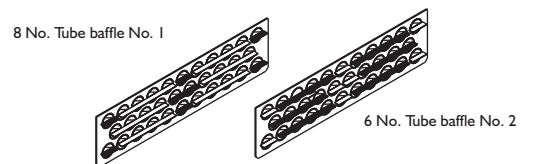
C44/C58 Graphite Seal. Part No. 111646.  
 C73 Graphite Seal. Part No. 111511.

C44/C58 Duroboard Door. Part No. 111645.  
 C73 Duroboard Door. Part No. 111506.

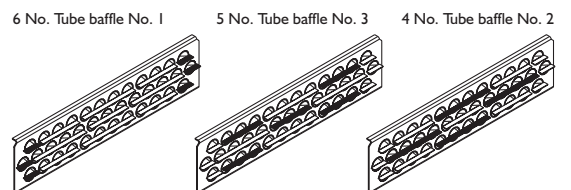
C44 - C58 Baffle Door. Part No. 211644.  
 C73 Baffle Door. Part No. 111505.



**C44 & C58**



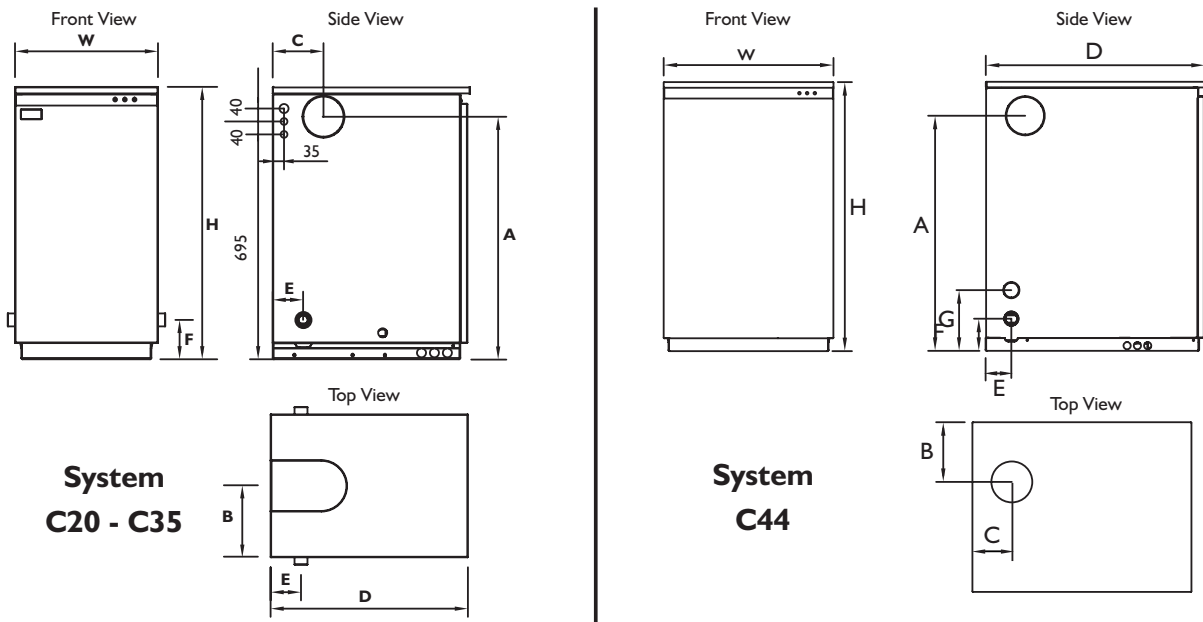
**C73**



C100 - 10 x Tube baffle No. 1 • 9 x Tube baffle No. 2

• • • • PATENTED BOILER DESIGN • • • •

**Firebird Enviromax System C Model Dimensions (mm)**



Model	Output	Weight	Dimensions(mm)								
			H	W	D	A	B	C	E	F	G
Enviromax System	C20	143	845	442	610	753	221	157	94	124	-
System	C26	146	845	442	610	753	221	157	94	124	-
System	C35	149	845	442	610	753	221	157	94	124	-
System	C44	235	1046	660	852	914	232	157	100	125	236

**Copper Pipe Not Plastic to be used for a minimum of 1 metre off the boiler**

Boiler Model		<b>C20/26</b>	<b>C35</b>	<b>C44</b>
Max Heat Output	Kw	20/26	35	44
	Btu/h ('000)	68/89	119	150
<b>CONNECTIONS</b>				
Heating Flow		1" Bsp	1" Bsp	1 1/2" Bsp
Heating Return		1" Bsp	1" Bsp	1 1/2" Bsp
Drain Off Cock		1/2" Bsp.	1/2" Bsp.	1/2" Bsp.
Safety Pressure Relief valve outlet (Copper)		1/2" Bsp.	1/2" Bsp.	1/2" Bsp.
Condense Drain Off Connection.			3/4" Bsp. Female	
<b>Circulating Pump (Grundfos)</b>				
		25/60	25/60	25/80
Boiler integral Expansion Vessel Normal Capacity		12 litres	12 litres	18 litres
pre-charged to 1 bar.				
<b>WATER CONTENT</b>				
Water Content Boiler		24	24	45
<b>FLUE (Indoor Boilers)</b>				
Balanced Flue Assembly (mm)		125 (5")	125 (5")	155 (6")
Conventional flue Socket. (mm)		130 id.	130 id.	155 id.
Flue Draught Reqd. (Min WG.)		0.040"	0.040"	0.040"
Conventional Flue (Max WG.)		0.15"	0.15"	0.15"
Pressure Jet Oil Burners		RIELLO RDB 2.2 up to C35 & RIELLO RDB 4.2 up to C58 - C73		
Fuel		35 second Gas Oil		
Electrical Supply		230v. AC 50Hz To be fused at 5amp.		
<b>TEMPERATURE CONTROL</b>				
Boiler Central Heating Control		60°C - 80°C +- 3°C		
Boiler Safety Limit		110°C +- 3°C		
Tank (DHW)- Fixed		78°C +- 3°C		
Early Alert - Fixed		87°C +- 3°C		
Over-run - Fixed		93°C +- 3°C		
<b>HEATING SYSTEM (SEALED)</b>				
Fit in accordance with BS 7074				
Part 1, BS 5449, OFTEC Standards, etc				
Max. Operating Pressure		2.5 Bar		
Max. System Pressure cold		1.5 Bar		
Min. System Pressure cold		0.5 Bar + 0.3 Bar		
Boiler Test Pressure		4.5 Bar		
Safety Valve Operating Pressure		3 Bar		
<b>WATER SIDE RESISTANCE</b>				
<b>Flow Rate To Give A Nominal Output At 10k Differential</b>				
Flow Rate Measured (Kg h <sup>-1</sup> ) 2874.24				
Waterside Resistance (mbar) 0.18				
<b>Flow Rate To Give A Nominal Output At 20k Differential</b>				
Flow Rate Measured (Kg h <sup>-1</sup> ) 1522.92				
Waterside Resistance (mbar) 0.19				

**Guidelines for Sealed System Installation - See section 3.2, 4, 5 & 6**

**ELECTRICAL SUPPLY**

The boiler and controls require 230V 1 phase 50Hz mains electric supply protected with a 5amp fuse.

The guarantee on this product will be rendered void if damaged by power from a stand by electricity supply. i.e. (Generator.)

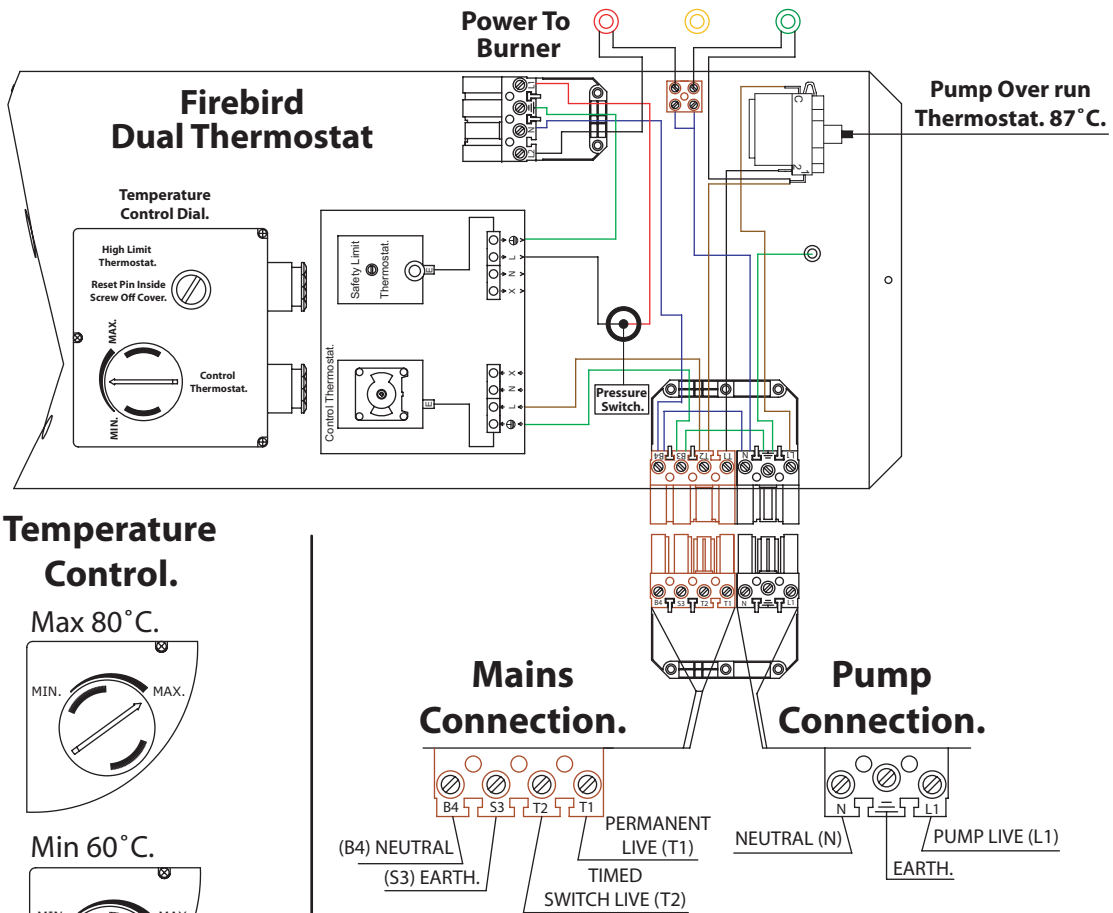
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A qualified electrician must carry out all electric wiring in accordance with current I.E.E Regulations and any local regulations which may apply.

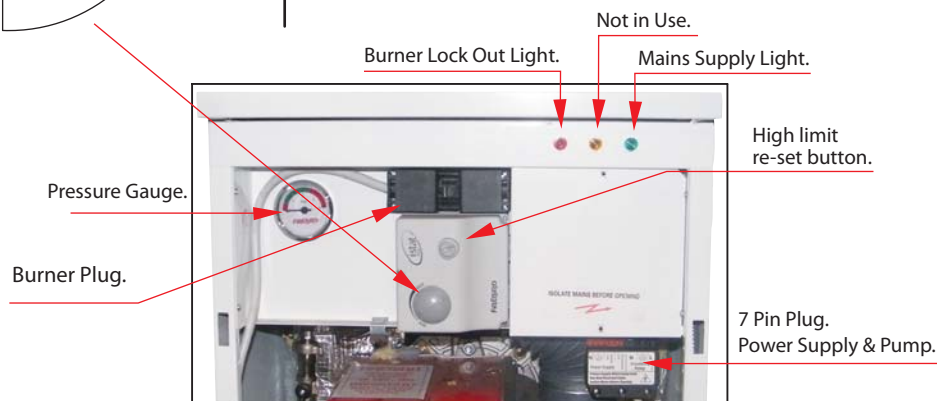
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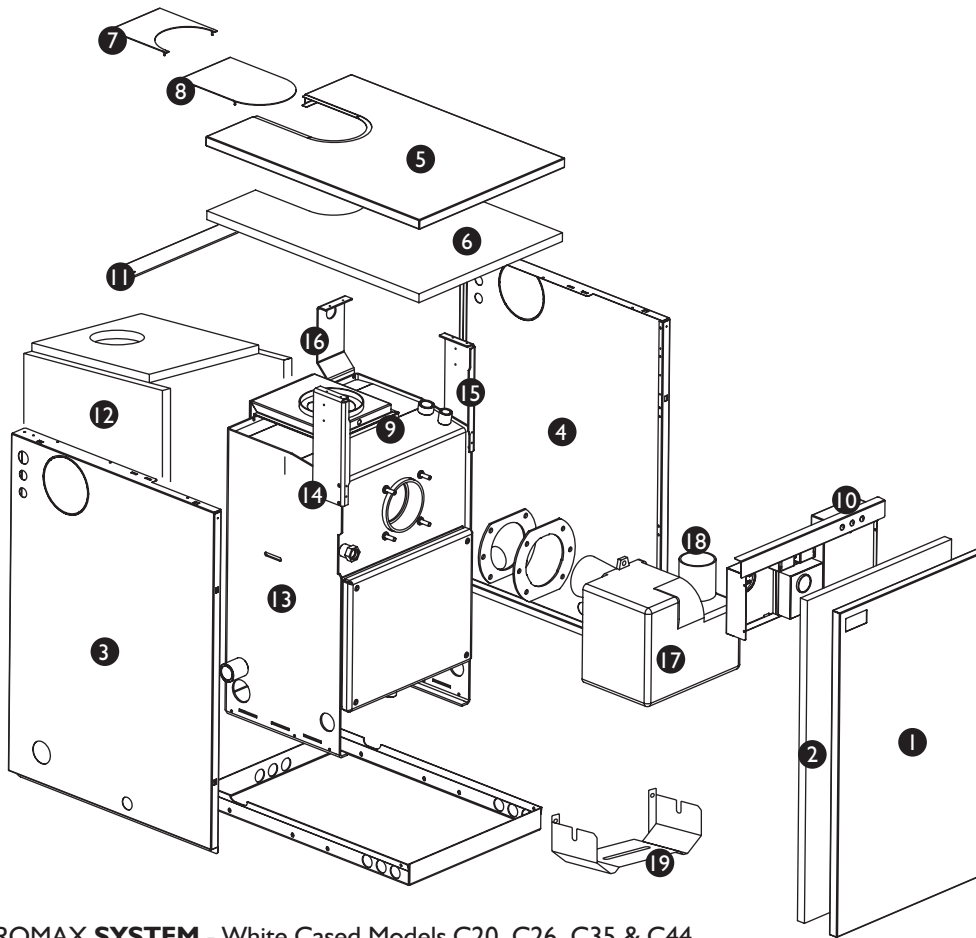
**Firebird Enviromax System Wiring Diagram**

*Enviromax 7 Pin Plug Wiring White Panel with Lights & Pressure Switch*



**Use Heat Resistant Cable. Protect Supply with 5 Amp. Fuse.**



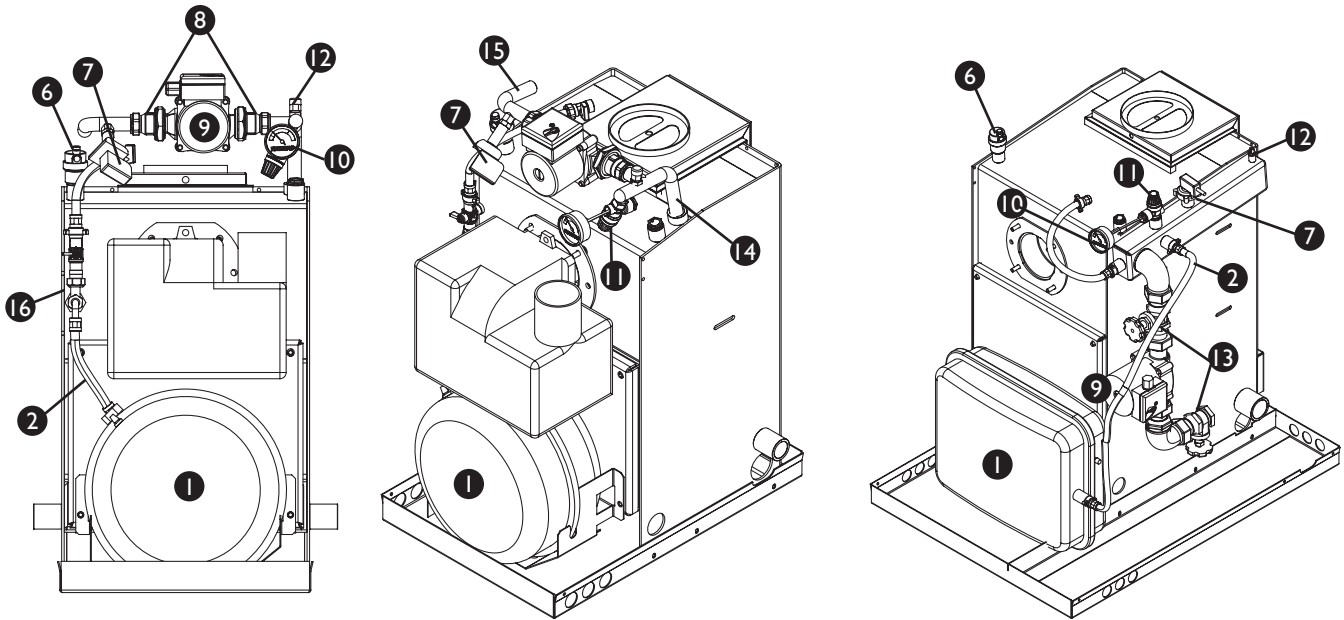


**ENVIROMAX SYSTEM** - White Cased Models C20, C26, C35 & C44

No.	Description	C20 / C26 / C35	C44
1	Front Panel	111376	111787
2	Front Panel Insulation	110937	111788
3	Left Side Panel	111374	111786
4	Right Side Panel	111374	111792
5	Top Panel	111375	111793
6	Top Panel Insulation	111794	111789
7	Flue Trim (Half Moon)	111397	111587
8	Flue Blank	111388	111586
9	Flue Gas Analysis Blank	110923	110923
10	Control Panel	311671	311706
11	Back Support	111596	111790
12	Insulation Jacket	110917	111653
13	Boiler Shell	310960	311783
14	Left Support Bracket	210915	211805
15	Right Support Bracket	210915	211797
16	Back Support Bracket	210916	211770
17	Burner	<b>C20</b> 410205 <b>C26</b> 410206 <b>C35</b> 410208	<b>C44</b> 410208 <b>C58</b> 410209
18	Air Hose	111902	111902
19	Pressure Vessel Bracket	210962	210962

### C20 / C26 / C35 Sealed System

### C44 Sealed System



#### ENVIROMAX SYSTEM PLUMBING PARTS

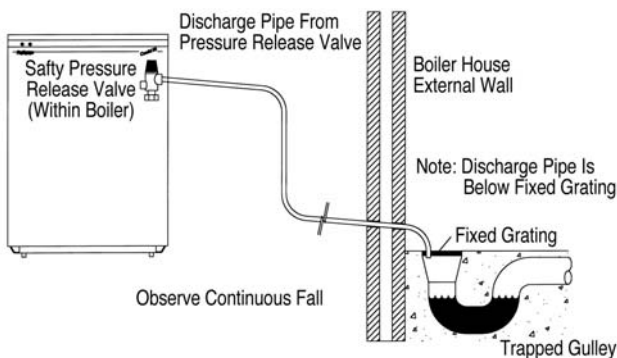
No.	Description	C20 / C26 / C35	C44 / C58
1	12ltr. Pressure Vessel	ACC012PVL	ACC018PVL
2	Expansion Vessel Hose	ACCCOMHOS	ACCCOMHOS
6	Auto Air Vent	ACCCOMAAV	ACCCOMAAV
7	Pressure Switch	ACC000PSW	ACC000PSW
8	22mm Pump Valve	ACC022PIV	ACC022PIV
9	Circulating Pump	ACCCOMPMP	ACC150PMP
10	Pressure Gauge	ACCCOMPRG	ACCCOMPRG
11	3 Bar Safety Valve	ACCCOMSRV	ACCCOMSRV
12	Manual Air Vent	ACCCOMMAC	ACCCOMMAC
13	1 1/4" Gate Valve	-	110758
14	System Pipe 1	110969	-
15	System Pipe 2	110970	-
16	System Pipe 3	110971	-
17	22mm Butterfly Valve	-	-

## SEALED HEATING CIRCUIT

*(also applies to System Boilers)*

The system must comply with BS 7074 Part 1 and BS 5449 Part 1 with a maximum water temperature of 80°C.

- \* A manual reset overheat limit thermostat is located at the rear of the electrical control panel. If a boiler overheat condition arises the burner will stop and remain inoperative until this thermostat reset button is depressed.



- \* A pressure relief valve to BS 6759 operating at 3 bar (45 lb/in<sup>2</sup>) is fitted. A discharge pipe of 15 mm diameter is also fitted to the discharge connection on the pressure relief valve. During installation an extension pipe should be fitted to this, leading, to outside the building. The pipe should be as short as possible and may need a tundish fitted in a protected position within the building.

**Note:- Water must not discharge above an entrance, window or where public have access. The installer must be aware that the discharge may be boiling water.**

- \* A drain cock must be fitted at the lowest points in the system to enable draining as necessary. A drain cock is already fitted at the bottom of the boiler heat store to enable draining of boiler and tank unit only. All pipes connected to boiler should have shut off valves fitted to facilitate this.
- \* A Pressure gauge, having range 0 to 4 bar is fitted to boiler control panel. This indicates water pressure in boiler and system at time of reading. **Pressure when cold should** be 1/2 bar minimum to 1.5 bar maximum. This is known as Initial System Design Pressure (P<sub>i</sub>).

**N.B. Initial System Design Pressure (measured in bar) equals static head of system (measured in bar) plus 0.3.**



When the system is cold and filled to initial fill pressure P<sub>i</sub> the pointer on the pressure gauge should point at **1 bar**.

The pressure gauge shown has **two red zones** marked on it. The first is between 0 and 1/2 a Bar. If the pointer falls into this zone when system and boiler are cold this is indicating that initial System Fill Pressure has dropped and this will activate the pressure switch cutting off power supply to the Combi C. Refill system manually until indicated pressure rises to 1 bar.

**N.B. Insufficient pressure in the boiler will cause power supply to switch off.**

- \* A 12 litre expansion vessel is fitted to boiler, precharged with air or nitrogen to **1 bar** which allows a system static head of 5 metres. If the static head is greater than this then the air charge in the vessel must be increased to balance the higher static head. **The air charge should not exceed a pressure of 1.5 bar.**

**The Firebird Combi C Boiler's with built in Expansion Vessels having an initial air charge pressure of 1 bar. If total water content of system is greater than the capabilities of the vessel supplied then an additional vessel will be required to be fitted to the return pipe as close as is practical to the boiler. There should be no valves or restrictions between vessel and boiler. See page 17 for vessel sizes.**

If static head is altered then it is also necessary to alter air charge pressure to equal static head (+ 0.3 Bar). This is necessary in order to keep system water from entering expansion vessel until system is being heated and thus allow its maximum acceptance volume (V) to be used **only to accommodate the expansion of system water during boiler operation.**

Remember that air charge pressure **must** be **equal** in both vessels (attached to the same system). In the above example this is 1 bar. **Air charge pressure** is the air pressure in expansion vessel **before** system is filled. It is measured with a tyre gauge attached to Schrader valve on the vessel.



N.B. The second **red zone** is between 2<sup>1</sup>/<sub>2</sub> and 4 bar pressure. When the heating system is up to full working temperature, if the pointer on the pressure gauge should enter this **red zone** showing a final system design pressure of more than **2<sup>1</sup>/<sub>2</sub> bar**, it is likely that:

- (a) **Total** system water content is greater than that calculated and if additional expansion vessel has been fitted it should be replaced with a larger unit  
**OR** if integral boiler expansion vessel only is used then an additional expansion vessel is required.
- (b) Static head may be higher than calculated. In this case it is necessary to re-measure static head and revise expansion vessel air charge pressure.
- (c) Expansion vessel incorrect size or air charge pressure incorrect.

**Refer to BS 7074  
Part 1 and BS 5449 for further information.**

### EXPANSION VESSEL AND SYSTEM REQUIREMENTS

Safety Valve Setting	3 bar		
Initial System Pressure	0.5 bar	1.0 bar	1.5 bar
Total Water Content of System	TOTAL VESSEL VOLUME **		
Litres	Litres	Litres	Litres
25	2.1	2.7	3.9
50	4.2	5.4	7.8
75	6.3	8.2	11.7
100	8.3	10.9	15.6
125	10.4	13.6	19.5
150	12.5	-> <b>[16.3]</b> <-	23.4
175	14.7	19.1	27.2
200	16.7	21.8	31.2
225	18.7	24.5	35.1
250	20.8	27.2	39.0

**FOR FURTHER INFORMATION CONSULT APPROPRIATE TRAINING MANUALS AND BS 7074 PART 1, BS 5449, ETC**

\*\* When calculating size of any additional expansion vessel required, remember to deduct the boiler expansion vessel volume of 12 litres from the calculated total system vessel volume required, as given in above table.

#### EXAMPLE: using above table

- If total water content of system is** - 150 litres
- and initial system pressure required is** - 1.0 bar
- then vessel volume required is** - 16.3 litres  
[from above table]
- The vessel supplied with boiler is** - 12.0 litres
- therefore an additional vessel of is required** - 4.3 litres  
(minimum)

*(For this system of 150 litres - total water volume)*

..Nearest available stock size for additional vessel required, at 1 bar initial system pressure (taken from above table) is 5 Litres.

It is emphasised that the installer should be fully acquainted with sealed system installation and operation, calculation of total system water volume, determining of initial system pressure required and calculation of any additional expansion vessel volume required. **Warranty is void when the boiler is installed in a system with insufficient expansions.**

NB .. Ensure that all expansion vessels in the same system are set at EQUAL air charge pressures.

### DOMESTIC HOT WATER CIRCUITS

The final 600 mm mains water supply should be of copper tube to BS 2871 Part 1. Ensure that any capillary fittings used are of lead free solder variety.

**For user comfort the mains pressure at taps should be between 1 and 5 bar. If it exceeds this it is advisable to fit a pressure reducing valve adjusted to reduce pressure to an acceptable level within above range.**

To ensure user comfort and satisfaction it may be advisable to discuss foregoing with householder. Where long hot water supply-pipe runs are used these should be insulated to prevent rapid cooling of residual hot water after draw off is completed.

If the boiler is fitted in a hard water area check that hardness does not exceed 150 p.p.m. by testing with a standard test strip. Immerse test strip in flowing tap water for one second. Shake off excess water. Check strip after approximately fifteen seconds. If three or more zones have changed colour the water hardness is over 150 p.p.m. **(Read instructions on test strip package)**. Fitting of an in line scale inhibitor is then necessary.

**Failure to check water hardness and fit appropriate water softening equipment will result in scale build up and consequent reduction in water heating performance. Check with local Water Authority if in doubt.**

Hot and Cold taps, mixing valves and fittings must be suitable for operating at mains pressure up to 10 bar Bidets with the supply of hot and cold mains water are permitted if they are of the over-rim flushing type and have shrouded outlets which enable them to have temporary hand held spray attached. Showers of loose headed or flexible type must be fixed so that the head cannot fall closer than 25mm above the top edge of the bath to prevent it immersing into the bath water. Alternatively the shower should have a double check valve incorporated at the point of the flexible connections.

## WATER FLOW REGULATION

The flow rate of water from individual taps may be affected by any of the following:-

1. **Number of taps in use at one time**
2. **Cold mains pressure**
3. **Diameter and length of pipework in the domestic water circuits within the dwelling.**
4. **Excessive flow from 3/4" bath taps in a house system converted to mains water supply.**

It is recommended:-

- A. To ensure that the mains water connection to the appliance is the first connection from the mains on entering the dwelling.
- B. Where flow starvation is encountered that flow restrictors or balancing valves are fitted at supply outlets.

\* The boiler has circulating pumps fitted therefore no other is normally required. They are factory set at maximum output. This setting should not be altered on the domestic hot water pump as production of domestic hot water may be adversely affected.

## SYSTEM FILLING, TESTING AND MAKE-UP

### Introduction

Mains cold water is supplied through the boiler pipework to two separate circuits operating at different pressures.

### Circuit One

This is the Radiator Heating System including boiler and primary tank which is filled from mains supply via flex filling loop (**see - Method A**) within boiler to a pressure determined from system static head, expansion vessel size and system water volume. This flexible filling loop should be disconnected when boiler and system are filled and checked, See diagrams - **Method A & Method B**).

### Circuit Two

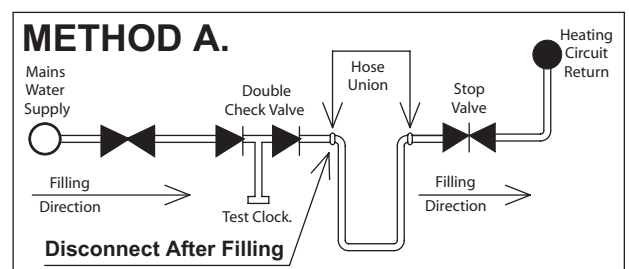
This is the domestic **cold** water supply through the boiler plate heat exchanger via domestic hot water pipework direct to hot taps. This works at full mains pressure or if this is excessive at a reduced pressure controlled by a mains pressure reducing valve to a pressure acceptable to householder and satisfactory for the correct operation of Combi C Boiler System. This mains pressure reducing valve is **not supplied with boiler**, but will be available from a local supply merchant.

**System filling should take place slowly and can be done by either of the following methods:-**

### Manual Filling

The Firebird Combi C comes with this system built into the appliance. It consists of a flexible hose connection with a butterfly shut off valve at each end and a double check valve assembly at boiler end. To conform to requirements of BS 7074 Part I and local water Authority Bye Laws, the flexible hose should be disconnected at one end when filling has been completed and checked. Two end caps are supplied and should be fitted to disconnected ends as a safety precaution against inadvertent opening of ball valves.

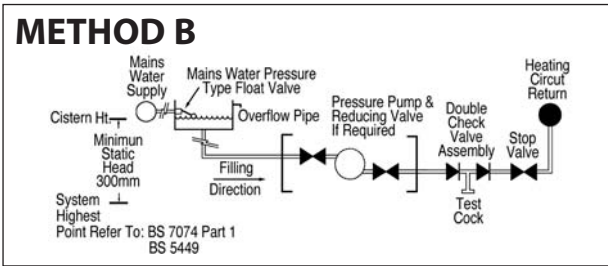
Pressure gauge on Control Panel should be checked occasionally when system is cold. Refill to initial fill pressure if necessary. Should this be a frequent occurrence, complete system should be checked for leaks.



### Automatic Filling

Automatic System filling may be made with a feed and make-up cistern connected through a double check valve and stop valve assembly to the return side of the heating system as close to the boiler as is practical. This cistern should be located above the heating systems highest point to give a minimum static head of 300 mm between it (highest point) and cistern. The manual filling system fitted to boiler should then be disconnected and connection points blanked off.

This system has the advantage of automatic water make-up in the event of system pressure loss due to air elimination and minor leaks. In any case control panel pressure gauge should be occasionally checked.



**N.B. Remember also to check air fill pressure of Expansion Vessel when system is cold using standard tyre gauge connected to Schrader air valve on vessel.**

**NOTE: There shall be no direct connection to the mains, even with the use of a non-return valve without the permission of Local Water Authority.**

\* It is recommended that an inhibitor be added at the time of final fill to protect the System from corrosion. Ensure that this is carried out in accordance with inhibitor manufacturers instructions. Installer should ensure that inhibitor used is suitable and that it will have no adverse effect on Expansion Vessels diaphragms or any other part or component of the system.

## COMMISSIONING

\* **Before proceeding to filling, ensure that electricity supply is switched off at mains to avoid any possibility of time switch operating and passing power to appliance prior to filling.**

### Filling and Testing

Check that all connections, especially compression joints, are fully tightened. Re-check and ensure that pressure vessel air charge is correct, then fill system with water via filling system used. **Turn off water supply before system pressure reaches safety valve operation point of 3 bar.** (Say 2 to 2.5 bar). Vent system via all manual air vents **including circulating pumps, boiler, radiators, system high points.** etc. Check that dust caps are loosened on auto air vents, keep constant check on system pressure gauge (fitted to control panel). If pressure has dropped re-admit water to above pressure. Ensure all appropriate boiler and system valves are open.

-With water supply turned off, **thoroughly** flush out boiler and system to remove **all** foreign matter before allowing boiler and pumps to operate. If in doubt drain system and repeat above procedure. At this stage flushing-out water should be clean and clear of all foreign matter.

Refill the system and again vent at all points as described above. Examine the complete system for water leaks having pressurised it to 1 - 2.5 bar. Correct any leaks, then check operation of safety valve by admitting further water until this valve operates. This should occur when system pressure rises to between 2.7 and 3.3 bar. When satisfied with valve operation, and with mains water still turned off, draw off sufficient water until initial system design fill pressure ( $P_i$ ). (cold fill) is established (0.5 - 1 bar - as calculated for system).

Remember that initial cold fill pressure can only be checked when system water has properly cooled down. Check that **final operating pressure** ( $P_f$ ) is under 2.5 bar with all radiators turned on and up to highest working temperature. Should system operating pressure exceed this, check:

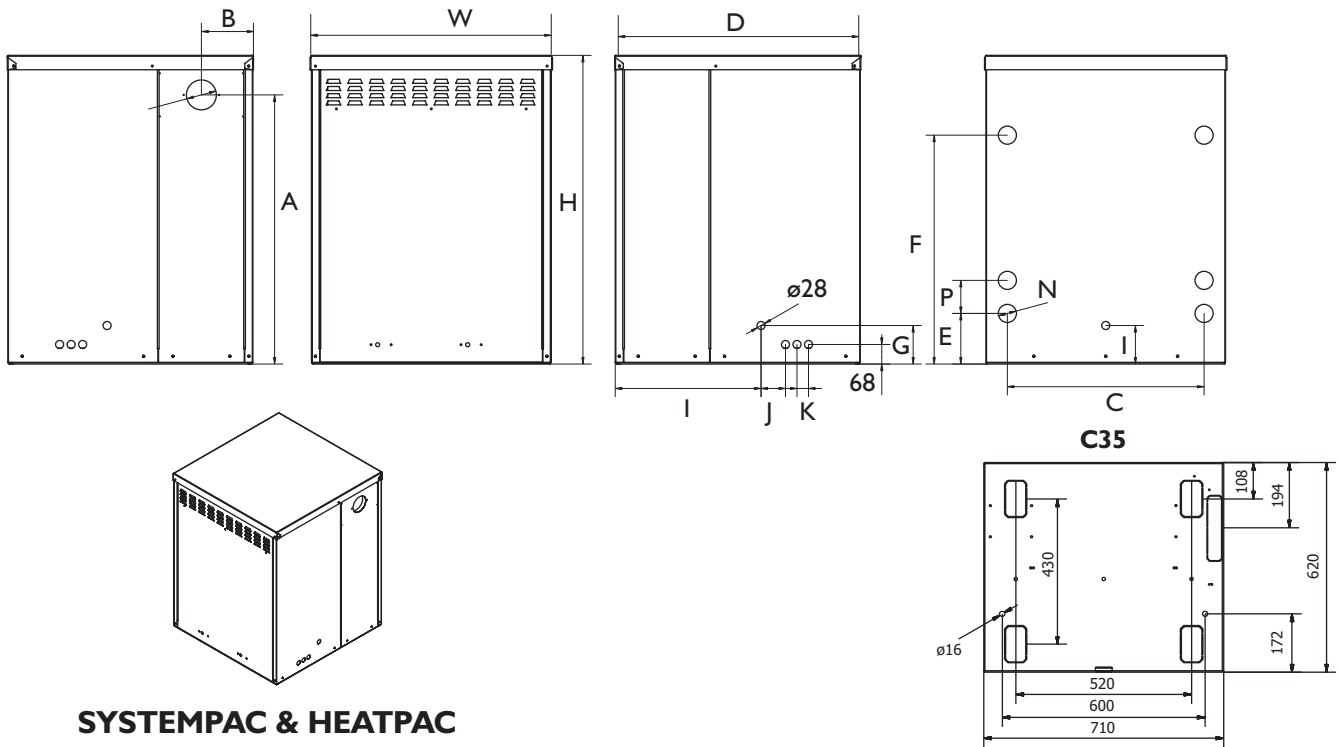


1. That initial cold fill pressure is correct and, if additional expansion vessel is fitted, that pressure is equal in each vessel.
2. That expansion vessels are sized correctly.

**Special attention should be given to existing heating systems where Firebird Combi C boiler has replaced an existing unit. Extra effort should be made to ensure that all original pipe work and radiators are repeatedly flushed. If possible use a proprietary cleansing agent suitable for system as loosened scale and foreign matter can seriously reduce domestic hot water performance and pump efficiency.**

**Use corrosion inhibitor of suitable type.**

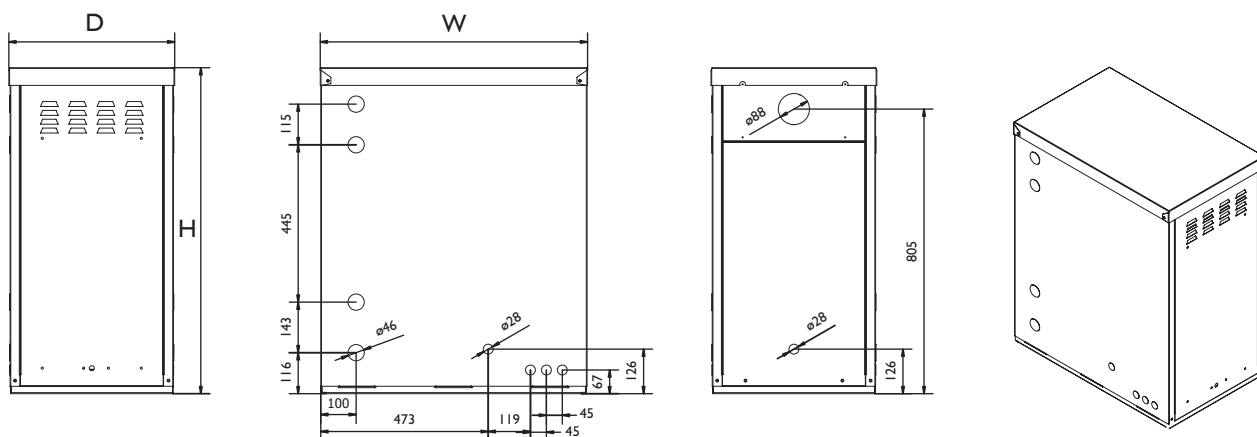
**Firebird Enviromax Heatpac C Range Dimensions (mm)**



**SYSTEMPAC & HEATPAC**

Model	Output Kw/hr	Weight kg	Dimensions(mm)													
			H	W	D	A	B	C	E	F	G	I	J	K	N	P
Heatpac	C26	158	946	713	622	808	179	540	176	432	134	271	79	45	ø46	70
Heatpac	C35	158	946	713	622	808	179	540	176	432	134	271	79	45	ø46	70
Heatpac	C44	244	1074	840	856	936	181	684	176	796	134	507	85	40	ø63	115

**Firebird Enviromax Slimline C Range Dimensions (mm)**



**SLIMLINE HEATPAC**

Model	Output Kw/hr	Weight kg	Dimensions(mm)		
			H	W	D
Enviromax	C26	150	922	756	469
Slimline	C35	153	922	756	469

**Copper Pipe Not Plastic to be used for a minimum of 1 metre off the boiler**

ENVIROMAX		Systempac			Heatpac / Slimline Heatpac			
Boiler Model		<b>C26</b>	<b>C35</b>	<b>C44</b>	<b>C26</b>	<b>C35</b>	<b>C44/58</b>	<b>C73</b>
Max Heat Output	Kw	26	35	44	26	35	44 / 58	73
	Btu/h ('000)	89	119	150	89	119	150 / 198	249
<b>CONNECTIONS</b>								
Heating Flow		1" Bsp.	1" Bsp.	1 1/2" Bsp.	1" Bsp.	1" Bsp.	1 1/2" Bsp.	1 1/2" Bsp.
Heating Return		1" Bsp.	1" Bsp.	1 1/2" Bsp.	1" Bsp.	1" Bsp.	1 1/2" Bsp.	1 1/2" Bsp.
Mains Cold Feed (Copper)		1/2" Bsp.	1/2" Bsp.	1/2" Bsp.				
Drain Off Cock		1/2" Bsp.	1/2" Bsp.	1/2" Bsp.	1/2" Bsp.	1/2" Bsp.	1/2" Bsp.	1/2" Bsp.
Safety Pressure Relief valve outlet (Copper)		1/2" Bsp.	1/2" Bsp.	1/2" Bsp.				
Condense Drain Off Connection.								
White Cased Heat Pac & Popular B.H.		3/4" Bsp. Female 22 mm PLASTIC			3/4" Bsp. Female 22 mm PLASTIC			
Circulating Pump ( <b>Grundfos</b> )		25/60	25/60	25/80				
Boiler integral Expansion Vessel Normal Capacity		12 litres	12 litres	18 litres				
		pre-charged to 1 bar.						
<b>WATER CONTENT</b>								
Water Content Boiler		24	24	45	24	24	43.5	54
<b>TEMPERATURE CONTROL</b>								
Boiler Central Heating Control		60°C - 80°C +- 3°C			60°C - 80°C +- 3°C			
Boiler Safety Limit		110°C +- 3°C			110°C +- 3°C			
Over-run - Fixed		87°C +- 3°C			87°C +- 3°C (Heatpac & Kitchen only)			
<b>FROST THERMOSTAT FITTED TO ALL HEAT PAC MODELS</b>		<b>BOILER SAFETY LIMIT, FROST AND OVER-RUN THERMOSTATS FITTED ON ALL HEAT PAC MODELS</b>						
<b>HEATING SYSTEM (SEALED)</b>								
Fit in accordance with BS 7074 Part 1, BS 5449, OFTEC Standards, etc								
Max. Operating Pressure		2.5 Bar						
Max. System Pressure cold		1.5 Bar						
Min. System Pressure cold		0.5 Bar + 0.3 Bar						
Boiler Test Pressure		4.5 Bar			4.5 Bar			
Safety Valve Operating Pressure		3 Bar			3 Bar			
<b>MAINS WATER SUPPLY</b>								
Pressure	Max	<b>Limescale excess:</b> When over 150/200 ppm. Fit appropriate scale reducer.						
	Min	<b>5 bar Maximum Operating Pressure</b> (Tested to 10 bar) (Fit pressure reducing valve as necessary)						
		<b>1 bar min.</b> For user Comfort reduce pressure at tap to between 1 and 5 Bar.						
<b>WATER SIDE RESISTANCE</b>								
Flow Rate Measured (Kg h <sup>-1</sup> )					<b>Flow Rate To Give A Nominal Output At 10k Differential</b>			
Waterside Resistance (mbar)					2874.24			
					0.18			
Flow Rate Measured (Kg h <sup>-1</sup> )					<b>Flow Rate To Give A Nominal Output At 20k Differential</b>			
Waterside Resistance (mbar)					1522.92			
					0.19			
Pressure Jet Oil Burners		RIELLO RDB 2.2 up to C35 & RIELLO RDB 4.2 up to C58 - C100						
Fuel		C2 Kerosene						
Electrical Supply		230v. AC 50Hz To be fused at 5amp.						

**ELECTRICAL SUPPLY**

The boiler and controls require 230V 1 phase 50Hz mains electric supply protected with a 5amp fuse.

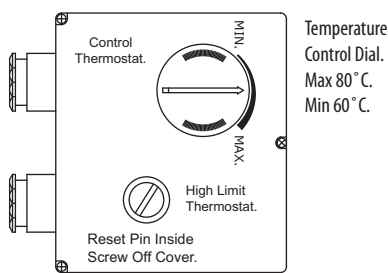
The guarantee on this product will be rendered void if damaged by power from a stand by electricity supply. i.e. (Generator.)

A qualified electrician must carry out all electric wiring in accordance with current I.E.E Regulations and any local regulations which may apply.

The mains electrical supply must be taken from a double pole isolating switch with a 5amp fuse, positioned somewhere close to the boiler. Heat resisting cable must be used which can be routed into the boiler through the access provided on either side of the base. Ancillary controls may be provided for with terminal connections in the control panel.

**Firebird Systempac C Wiring Diagram**

**Firebird I. Dual Thermostat**

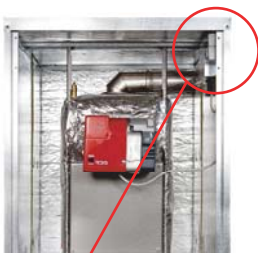
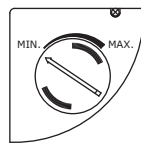
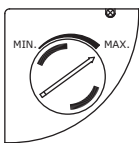


Temperature Control Dial.  
Max 80°C.  
Min 60°C.

**Temperature Control.**

Max 80°C.

Min 60°C.



**A Pump Over Run Thermostat 87°C.**

**B Bi. Metal Frost Thermostat. 5°C. / 14°C.**

Temperature Control High Limit re-set button

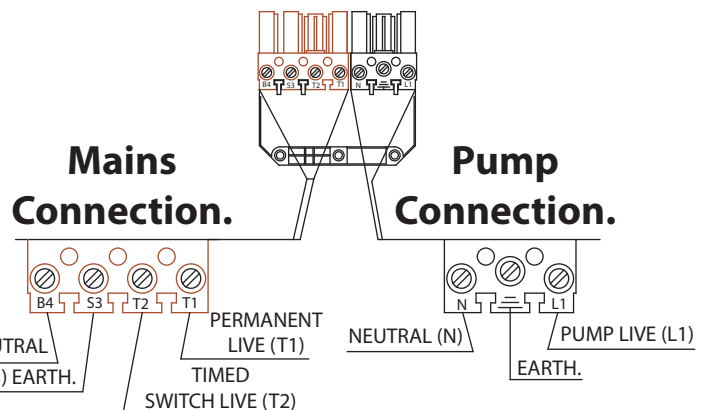
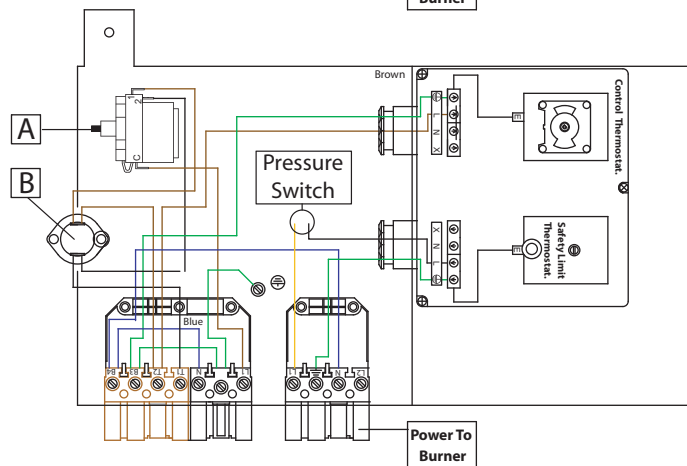
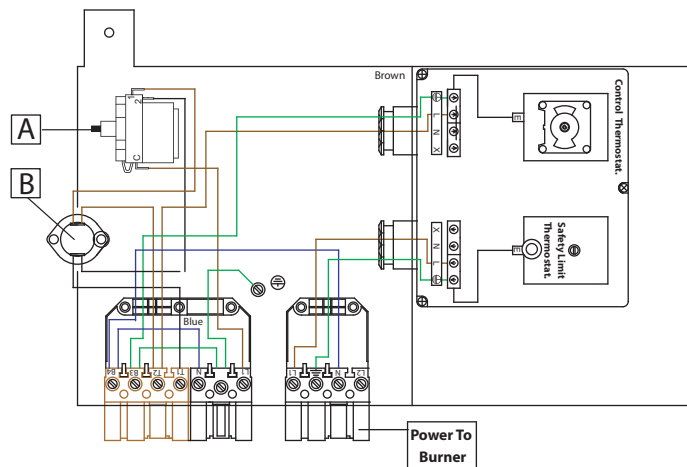


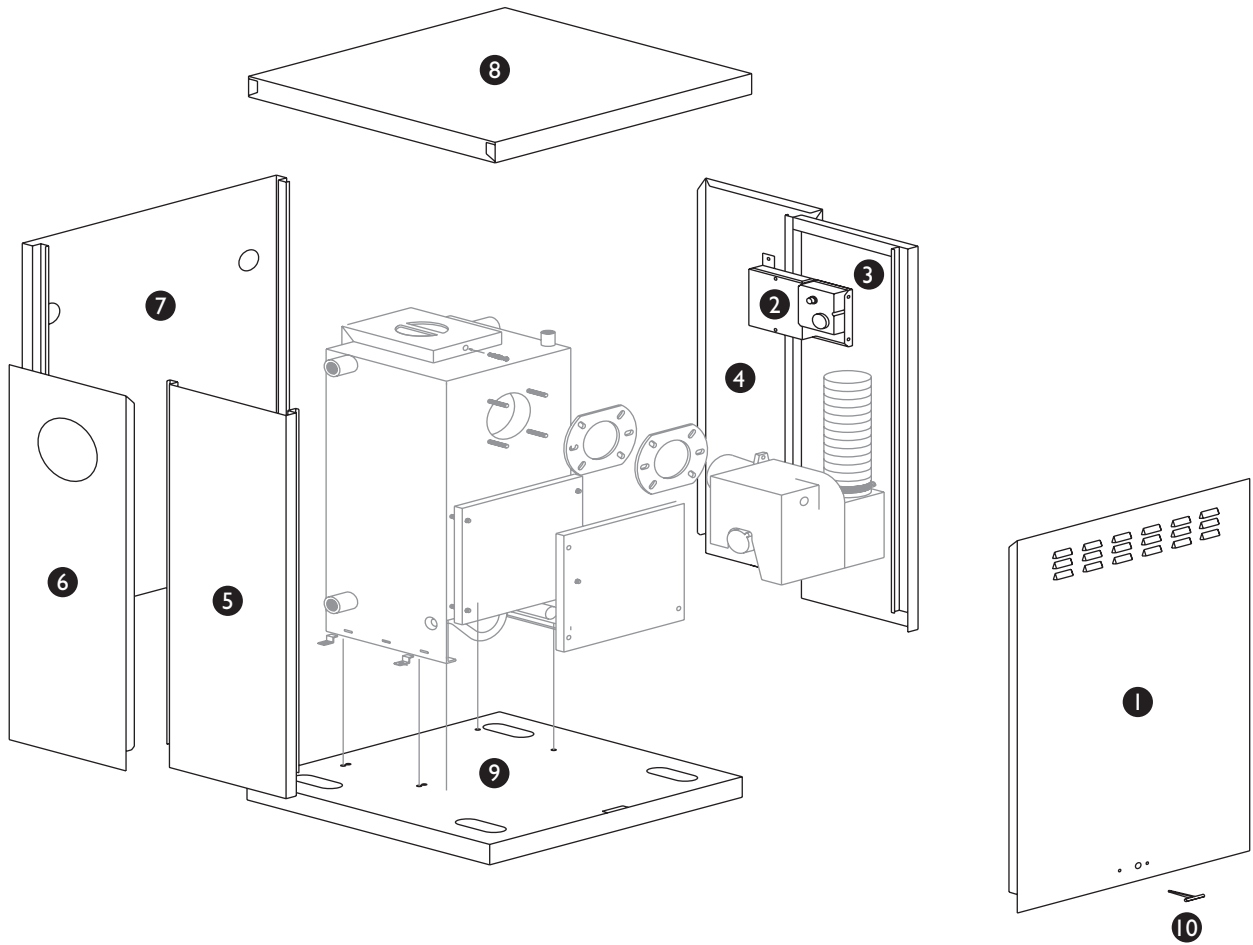
7 Pin Plug  
Power Supply & Pump

Burner Plug

**Use Heat Resistant Cable.  
Protect Supply with 5 Amp. Fuse.**

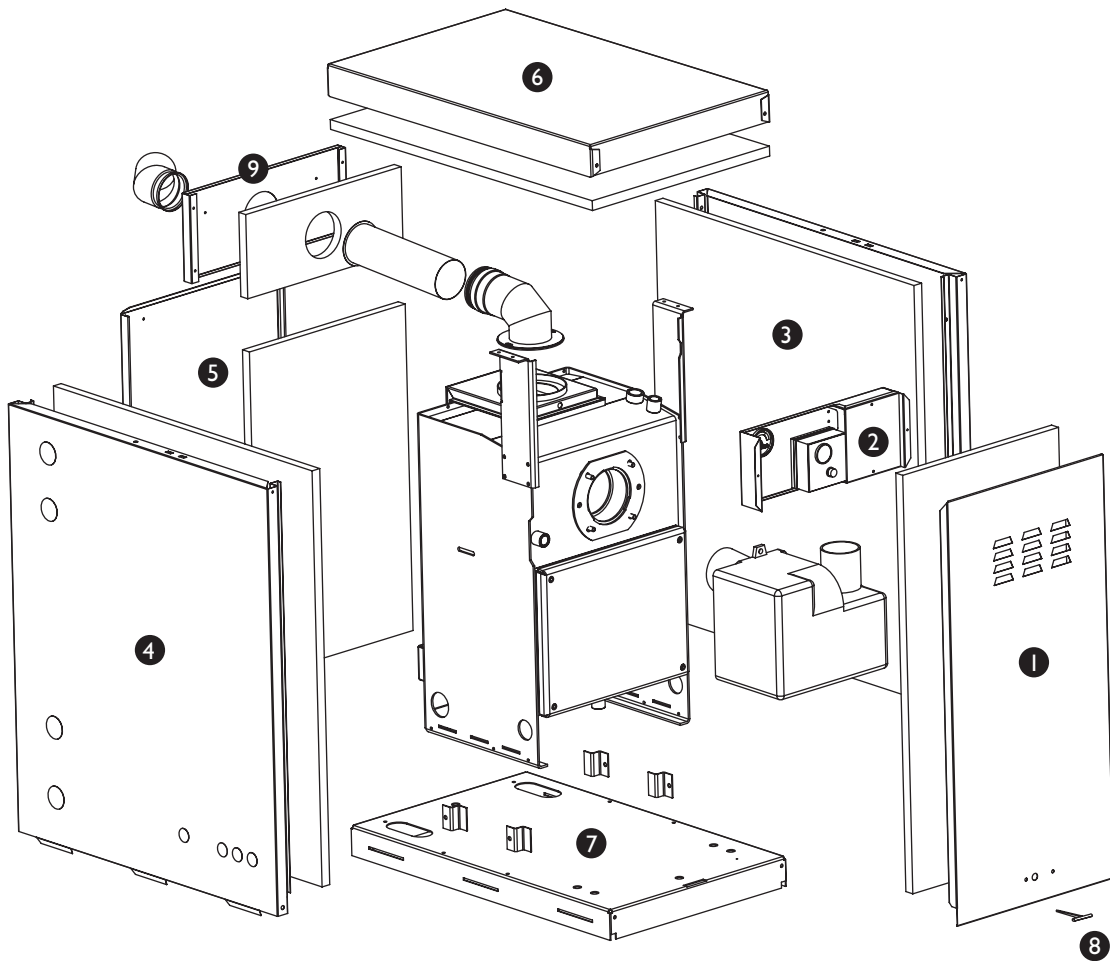
**Enviromax 7 Pin Plug Systempac Wiring**





**ENVIROMAX HEATPAC - Outdoor Models C26, C35 & C44**

No.	Description	C26/35	C44
1	Front Panel	211527	211754
2	Control Panel	310453	311804
3	Fixed Right Side	211518	211758
4	Removeable Right Side	211521	211751
5	Fixed Left Side	211517	211752
6	Removeable Left Side	211520	211750
7	Back Panel	211547	211748
8	Top Panel	211519	211753
9	Base	211528	211746
10	Key	110267	110267



ENVIROMAX **SLIMLINE HEATPAC** - Outdoor Models C26 & C35

No.	Description	C26	C35
1	Front Panel	211604	211604
2	Control Panel	311146	311146
3	Fixed Right Side	211608	211608
4	Fixed Left Side	211607	211607
5	Back Panel	211605	211605
6	Top Panel	211609	211609
7	Base	211594	211594
8	Key	110267	110267
9	Flue Panel	211606	211606



## STANDARDS & REGULATIONS

To ensure the highest standards of installation & safety, it is important that the boiler be installed in compliance with the following regulations where applicable. It is the responsibility of installer and everyone concerned with any aspect of installation to ensure that all applicable standards and regulations are fully adhered to.

All **CURRENT** editions of the appropriate Building Regulations:-

<b>Part L &amp; J</b>	<b>England &amp; Wales</b>
<b>Part F</b>	<b>Section III Scotland - Conservation of Fuel Power</b>
<b>Part L</b>	<b>Northern Ireland - Conservation of Fuel Power</b>
<b>Part J</b>	<b>Republic of Ireland - Conservation of Fuel Power</b>
BS 5410	Part 1 1997. Code of practice for Oil Firing Installations.
BS 799	Part 5 1987. Specification for Oil Storage Tanks.
BS 4876 1984.	Performance requirements for oil burning appliances.
BSEN 12828:2003	(UK National Annex). Heating Systems in Buildings - Designed for water based heating systems.
BS 7074	Part 1 1989. Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems.
BS 5446 1990.	Installation of hot water supplies for domestic purposes.
BS 7593 1992.	Code of Practice for treatment of water in heating systems.
BS 715 1989.	Metal flue pipes, fittings, terminals and accessories.
BS 1189 1989.	Clay flue linings and flue terminals.
<b>BS 4543 part 3 1990.</b>	<b>Factory made insulated chimneys for oil fired appliances.</b>
BS 6700.	Design, installation, testing and maintenance of services supplying water.
BS 7671.	Current IEE Regulations. Local Water Undertaking Bylaws. Water supply (water fittings) Regulations 1999. The Control of Pollution (Oil) Regulations.

**In addition, the work must comply with OFTEC Installation Requirements for oil fired boilers and oil storage tanks.**

**OFTEC also publish excellent guides including:** Safe working practices for Oil Fired Technicians' - OFTEC Technical Book Three (Installation requirements for Oil Fired Boilers and Oil Storage Tanks) - OFTEC Technical Book Four (Domestic Heating Systems) and it is recommended that these should adhere to Domestic Heating Design Guide.

COPIES OF BRITISH STANDARDS MAY BE PURCHASED DIRECT FROM:

**BSI (Customer Services),  
389 Chiswick High Rd., London W4 4AL.  
Tel.: 0181-9967002 Fax: 0181-9967001**

International and EC Standards are also available from above.

OFTEC PUBLICATIONS ARE AVAILABLE FROM:-

**OFTEC, Oil Firing Technical Association,  
Foxwood House, Dobbs Lane,  
Kesgrave, Ipswich. IP5 2QQ  
[www.oftec.org](http://www.oftec.org)**

### PRE- INSTALLATION CHECKS

The installer should also be aware of his/her responsibilities under The Health and Safety at Work Act. The interests of safety are best served if the boiler is installed and commissioned by a competent engineer, OFTEC trained and Registered. If not a Building Notice is required in England & Wales. Other parts of the British Isles including the Channel Islands also require notification to building control.

### **BOILER INSTALLATION:**

Other than special considerations for condensate removal and plume dispersal, the installation of oil firing condensing boilers is the same as for non-condensing boilers.

BS 5410 : Part 1 1997 gives the requirements for domestic boiler and oil storage installations.

For condensing boilers the same requirements apply for installation with regard to cleaning and flushing and providing inhibitors as are followed for any other boiler. Manufacturers instructions must always be followed together with the requirements of BSEN 12828, 2003 & BS EN 12831, 2003, which supersede BS 5449 1990, and the statutory requirements of the Building Regulations.

## HEALTH & SAFETY INFORMATION

Under the Consumer Protection Act 1987 and Section 6 of the Health and Safety Act 1974, we are required to provide information on substances hazardous to health.

### INSULATION AND SEALS

Ceramic Fibre, Alumino - Silicone Fibre material are used for boards, ropes and gaskets. Known hazards are that people may suffer reddening and itching of the skin. Fibre entering the eye will cause foreign body irritation. It may also cause irritation to the respiratory tract.

Precautions should be taken by people with a history of skin complaints or who may be particularly susceptible to irritation. High dust levels are only likely to arise following harsh abrasion. Suitable personal protective equipment should be worn where appropriate.

Generally, normal handling and use will not give discomfort. Follow good hygiene practices, wash hands before consuming food, drink or using the toilet.

First Aid - Medical attention should be sought following eye contact or prolonged reddening of the skin.

The small quantities of adhesives and sealants used in the product are cured. They present no known hazards when used in the manner for which they are intended.

### THIS PRODUCT HAS BEEN DESIGNED TO THE FOLLOWING STANDARDS:

#### EMC Directive (Electromagnetic compatibility) 89/336/EC

Standards:

EN 61000-6-1: Electromagnetic Compatibility Generic Standard - Immunity for residential, commercial and light industrial environments. (Feb.2001)

EN 61000-6-3: Electromagnetic Compatibility Generic Standard - Emission standard for residential, commercial and light industrial environments. (Feb.2001)

#### LV Directive (Low voltage) 73/23/EEC

Standard:

IEC 60335-1: Household and similar electrical appliances - Safety (May 2001)

#### Boiler Efficiency Directive 92/42/EEC

Standard:

BSEN 304: Oil boilers with forced draft burners.

## FUEL SPILLAGE

1. Switch off all electrical and other ignition sources.
2. Remove all contaminated clothing to safeguard against fire risk and skin damage. Wash affected skin thoroughly with soap and water and remove clothing to a safe well ventilated area and allow to air before cleaning.
3. Contain and smother the spill using sand or other suitable oil absorbent media or non-combustible material.
4. Do not allow fuel to escape into drains or water courses. If this happens, contact the relevant authorities in your area. (Ireland Only)  
Contact The Environment Agency on 0800 807060 (UK Only)
5. Consult local Authority about disposal of contaminated soil.

## SAFETY

Safe use of Kerosene.

These fuels give off a flammable vapour when heated moderately. Vapour ignites easily, burns intensely and may cause explosion. The vapour can follow along at ground level for considerable distances from open containers and spillages collecting as an explosive mixture in drains, cellars, etc.

Fuels remove natural oils and fats from the skin and this may cause irritation and cracking of skin. Barrier cream containing lanolin is highly recommended together with good personal hygiene and where necessary appropriate personal protection equipment. (P.P.E.)

Gas oil may also cause irreversible damage to health on prolonged or repeated skin contact.

Always store fuels in a properly constructed and labelled tank. Always handle fuel in open air or well ventilated space away from sources of ignition and refrain from smoking.

Always drain fuel using a proper fuel retriever, funnel or mechanical siphon. Never apply heat to a fuel tank, container or pipework. Never siphon fuel through tube by mouth. If accidentally swallowed contact doctor immediately and do **NOT** induce vomiting. Avoid inhaling fuel vapour as this can cause light headedness and seriously impair judgement.

## FIRST AID

If fuel is accidentally swallowed:-

- \* Seek medical attention immediately. Do **NOT** induce vomiting.

If fuel is splashed into eyes:-

- \* Wash out with running water for at least ten minutes and seek medical attention.

***Please not following important points before commencing installation. Failure to do so will invalidate warranty***

### **INSTALLATION & COMMISSIONING:**

Boilers must be installed, commissioned and serviced by qualified and experienced persons and as set out in the installation manual, using correct test equipment.

### **EXPANSION VESSEL:**

Total water content of system and boiler must be calculated to determine if an additional pressure vessel is required.

### **HARD WATER - LIMESCALE:**

Failure to check water hardness and fit appropriate water softening equipment will result in scale build up and consequent reduction in water heating performance. Check with local Water Authority if in doubt.

### **PLASTIC PIPING - WARNING**

The boiler thermostat control and safety system is not designed, and must not be relied on, to protect plastic pipe from overheating. Plastic pipe must never be connected directly to the boiler. If you choose to use plastic pipe anywhere on your heating circuits, then please consult the plastic pipe manufacturer for their instructions on how to ensure their product never overheats. Our boiler control and safety high limit thermostats are not designed to fulfil this function. (They may suggest the fitting of independent pipe thermostats, or thermostatic mixing valves linking flow and return).

**• Firebird accepts no responsibility for failure of plastic piping and fittings for what ever reason.**

### **WARNING:**

The manufacturer cannot accept responsibility for any damage to persons, animals or property due to error in installation or in the burner adjustment or due to improper or unreasonable use or non observance of the technical instruction enclosed with the burner, or due to the intervention of unqualified personnel.

### **BOILER THERMOSTAT / THERMISTOR FUNCTION**

The CONTROL THERMOSTAT [1] on the boiler allows the householder to vary the water flow temperature from a low of 60°C to a high of 80°C to 82°C, depending on the model.

In accordance with EU boiler standards, your boiler is also fitted with a SAFETY HIGH LIMIT THERMOSTAT [2], fixed at 114°C. This system protects the boiler in the event of the control thermostat failing and keeps the boiler safe.

The safety high limit thermostat [2] will shut off the boiler and will require the limit button to be pushed to restart the boiler. If the problem re-occurs, you should call your service engineer.

In cases where the flow from the boiler is down to the heating system, fitting a PUMP OVER RUN THERMOSTAT [3] (A Pipe Stat) is recommended. This is to prevent the residual heat build up in the boiler from unnecessarily activating the high limit thermostat and thus causing nuisance. See Heat Pac Wiring Diagram on **page 38**.

We have factory fitted pump overrun thermostats on Kitchen, System, Combi and Heatpac range of boilers.

### **TIME AND TEMPERATURE CONTROLS**

The Building Regulations state that central heating systems must have time and temperature control on the pipe circuits (eg thermostatic radiator valves / TRVs, room thermostats, cylinder thermostats etc.).

### **BURNER**

**The burner is factory set for use with kerosene 28 second class C fuel.**

### **ROOM SEALED BALANCED FLUES.**

(a) BS5410 – 1997 Code of practice for oil firing. Installations up to 45 kW output capacity for space heating and hot water supply purposes

Paragraph 11.2 Mounting

“The flue terminal should be mounted so that it is separated from any combustible material forming a part of the building.

Such combustible material may take the form of cladding on the surface of a non-combustible wall through which the flue outlet passes. In such a case, the cladding adjacent to the flue outlet should be replaced by non-combustible material extending not less than 50mm beyond the outside dimensions of the flue outlet.

The wall through which the flue outlet passes may itself be of combustible material, and if so the flue outlet, where it passes through the wall, should be surrounded by non-combustible insulating material not less than 50mm thick (see **Fig. 1, Page 44**). The insulating material itself should be contained in a steel liner to provide the necessary structural rigidity and to prevent moisture reaching the insulating material.”

## Installation in New Zealand and Australia

This appliance has been manufactured in compliance with ASI690 Domestic Oil Fired appliances Safe Design Code.

This appliance has a current Occupational Safety and Health (OSH) and Environmental Risk Management Association (ERMA) Clean Air Approval number of 1079/03

This appliance and flue system has been tested by CRL Laboratories in New Zealand ( **Certificate number 07-41180** ) and can be installed to meet the requirements of ASI691-1985 Domestic Oil Fired Appliances Installation.

This includes suitability for zero clearance installation to combustible surfaces.

Please ensure that this appliance and flue system is installed to comply with manufacturers instructions and ASI691-1985 Domestic Oil fired Appliances Installation.

Please ensure that the appliance is bolted to the floor for seismic restraint.

Firebird recommend the use of Firebird coaxial flue systems to achieve room sealed operation. However, conventional flue systems are also suitable.

The installation of this appliance and fuel source will require a building consent from your local council.

### **THIS APPLIANCE IS TUNED TO RUN ON DIESEL FUEL.**

This appliance must be installed by experienced personnel.  
Failure to install correctly will invalidate the warranty.  
The warranty does not cover consequential damages.

If you have any queries with this product,  
please consult the distributor in New Zealand

**Central Heating New Zealand Ltd**  
**11 Parkhouse Road**  
**Christchurch**  
**0064 3357 1233**  
**[www.centralheating.co.nz](http://www.centralheating.co.nz)**

Ensure that adequate clearance is available for making the water and flue connections.

As the boiler is serviced from the front, no headroom clearance is necessary but a clearance of 750mm must be available at the front of the boiler.

No special hearth is required as the boiler is fully insulated, but the floor must be level and capable of supporting the weight of the boiler and its water content.

Sound levels must also be a consideration. Whilst Firebird Enviromax boilers are one of the quietest boilers on the market, some householders are particularly sensitive and the following points should be considered:

1. Tiled surfaces in a small room will amplify noise - particularly if the wall construction is hollow.
2. If a conventional flue passes through a bedroom it is capable of transmitting noise.
3. Low level balanced flue terminals can produce exhaust noise on the outside terminal and this should be considered when siting near adjacent property.
4. The Firebird Balanced Flue Kit has been specifically designed for Firebird's indoor boilers. The use of third party low level flue kits is not recommended and will affect its warranty.
5. The Siting of the boiler should take into account the disposal of condensate products.

- It is recommended that a suitable corrosion inhibitor is added to the heating system.
- New and existing systems should be treated with chemical cleaner and properly flushed before the boiler is fitted and corrosion inhibitor added.
- In areas of hard water a suitable descaler would also be required.

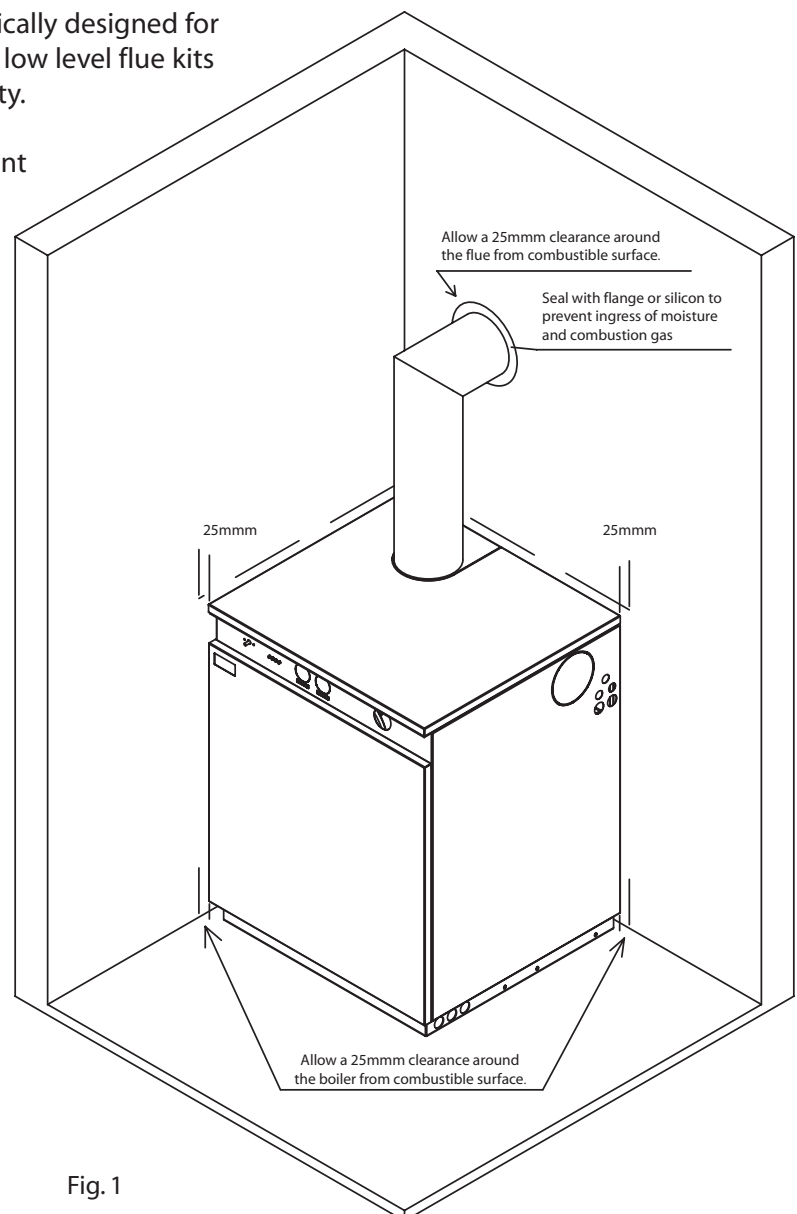
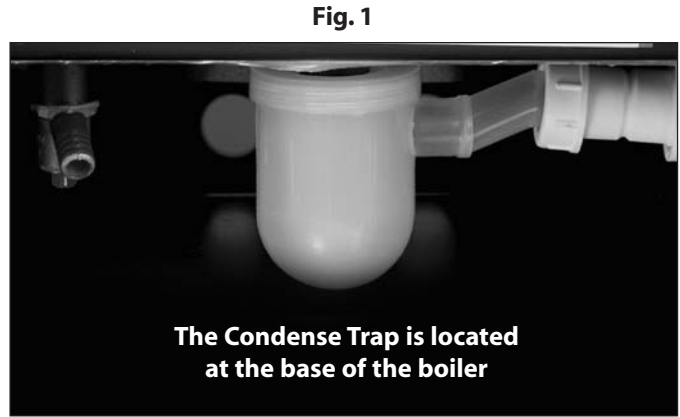


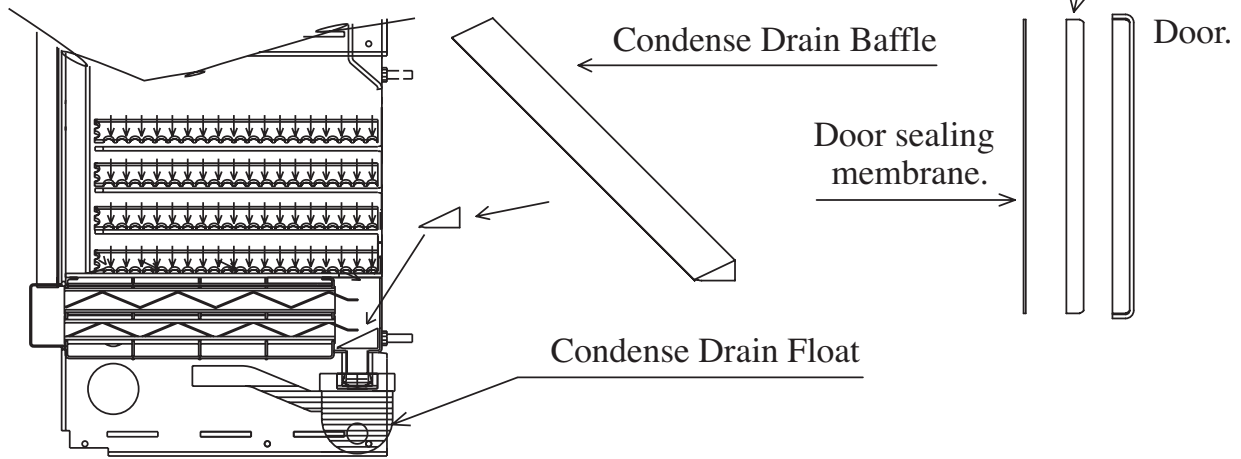
Fig. 1

**CONDENSATE DISPOSAL  
SYSTEM NO. 1  
CONDENSATE TRAP**

**IMPORTANT  
Always prime condense trap.**

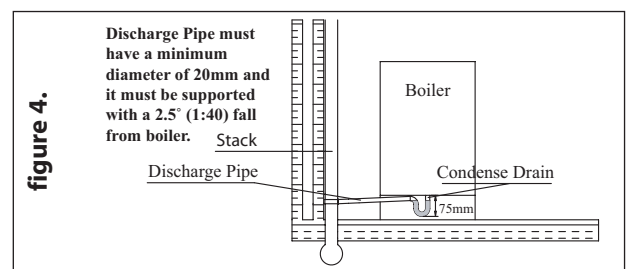
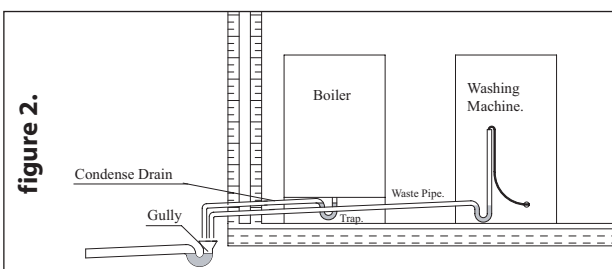
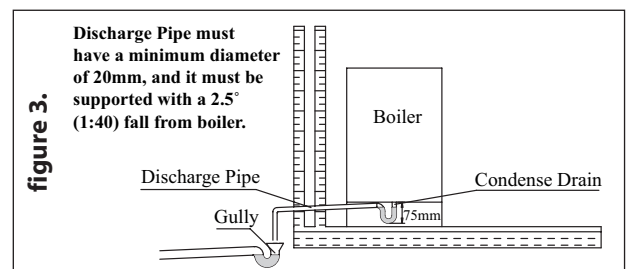
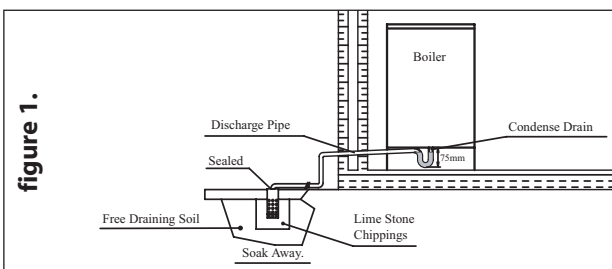


**Condense Baffle and Condense Trap**



**Before switching on your Firebird condensing oil boiler check that:**

- (1) The float & condense drain baffle are in place.
- (2) That the condense trap is primed.
- (3) The condense discharge pipe is a corrosion resistant pipe.



## CONDENSATE DISPOSAL SYSTEM NO. 2 - CONDENSATE PUMP IMPORTANT

Firebird condensing boilers when in condensing mode extract more heat from the flue products and the resulting condensate which is mildly acidic needs to be drained from the boiler via a condensate pipe to the drainage system.

**Provision must be made for the removal of condensate from the boiler to a internal soil stack, waste pipe, external soil stack, gully or soak-away as per BS6798.**

The 75mm trap is provided with the boiler and situated on the front of the boiler (under the cleaning door) as per **figure 1, page 45**. This should be checked at regular intervals and cleaned at annual service.

The condensate line should be plastic and minimum diameter of 22mm.

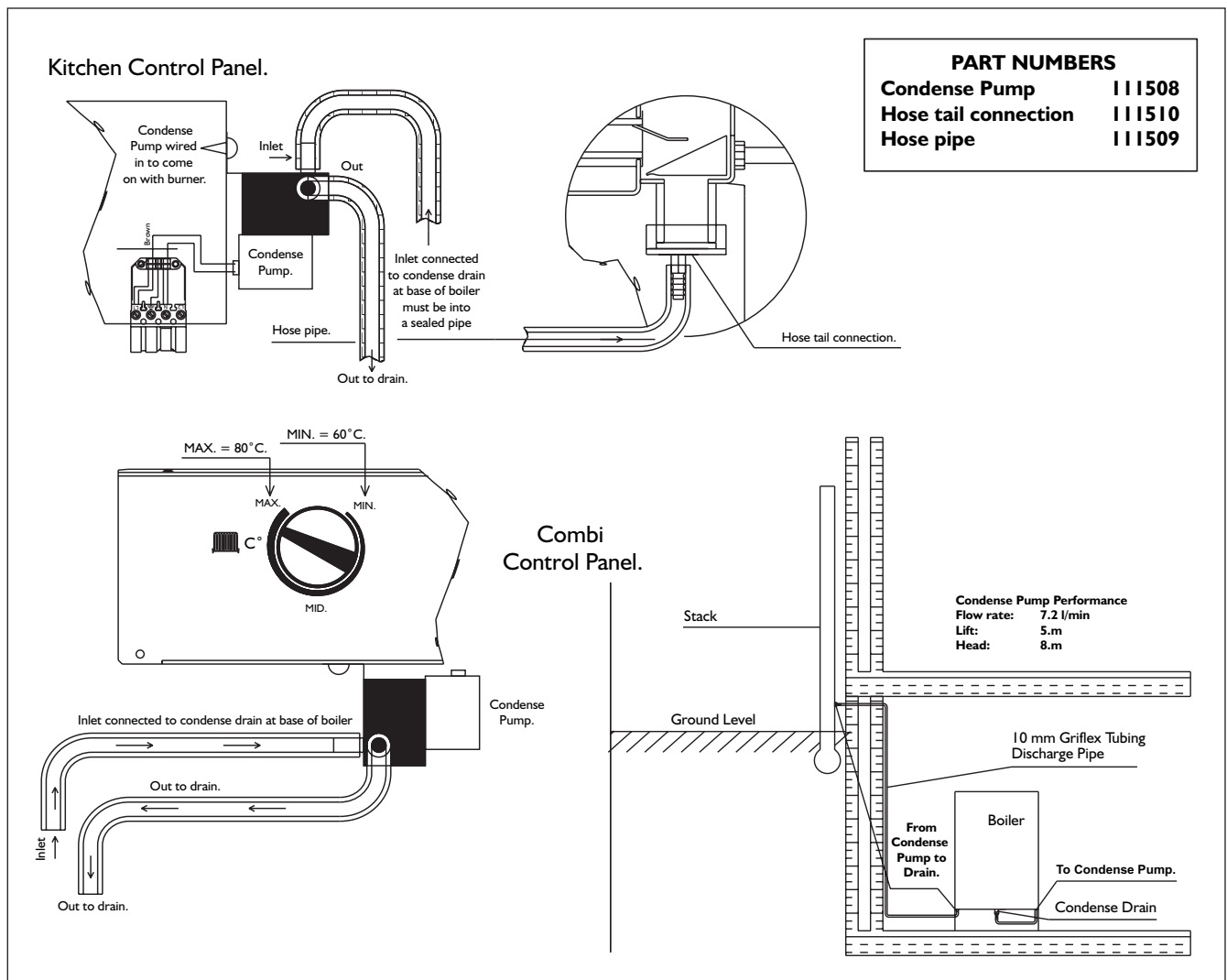
**Copper or steel cannot be used.**

A fall from the boiler of 1:40 minimum.

As few bends as possible to reduce the risk of trapping condensate.

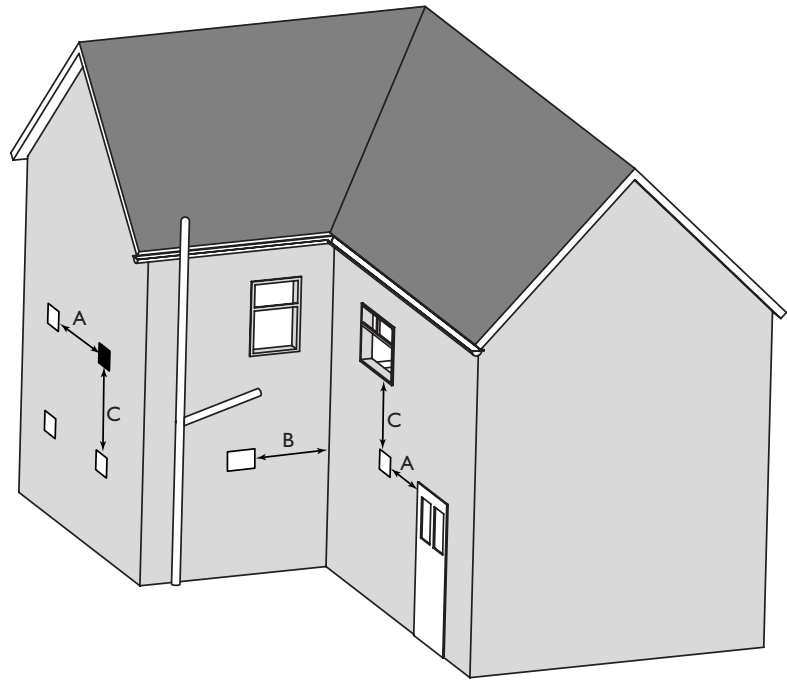
**CONDENSATE PIPEWORK THAT IS EXTERNAL OR IN AN UNHEATED GARAGE SHOULD NOT EXCEED 3 METERS AND LAGGED WITH WATER PROOF INSULATION TO PREVENT FREEZING.**


### CONDENSE PUMP (KIT IS AVAILABLE AS AN OPTIONAL EXTRA)



**BALANCED FLUE SITING**

- A.** Horizontal from opening, airbrick, opening window etc.
- B.** From an internal or external corner.
- C.** Below an opening, airbrick, opening window etc.



Information supplied by   
 Book three Aug. 2002  
**See note at foot of page**

- Notes:
- 1.** The terminal should be positioned to avoid combustion products entering the building or accumulating in stagnant pockets around buildings.
  - 2.** The terminal must be protected by a guard if it is less than 2 metres above ground level or in a position where any person has access to it (i.e. a balcony).
  - 3.** A heat protection shield should be fitted if the terminal is less than 850mm from a plastic or painted gutter or less than 450mm from painted eaves.

\* **FIREBIRD RECOMMENDS AS PER OFTEC RECOMMENDATIONS THAT THE FLUE SHOULD BE A MINIMUM DISTANCE OF 1 METRE FROM OPENINGS SO THAT IT DOES NOT CAUSE A NUISANCE AND PERMITS THE DISPERSAL OF COMBUSTION PRODUCTS. (SEE PAGE 51)**

**Building Regulations**

<b>BUILDING REGULATIONS</b>	<b>A</b>	<b>B</b>	<b>C</b>
Northern Ireland 1990	600	600	600
Republic of Ireland 1997	600	600	600

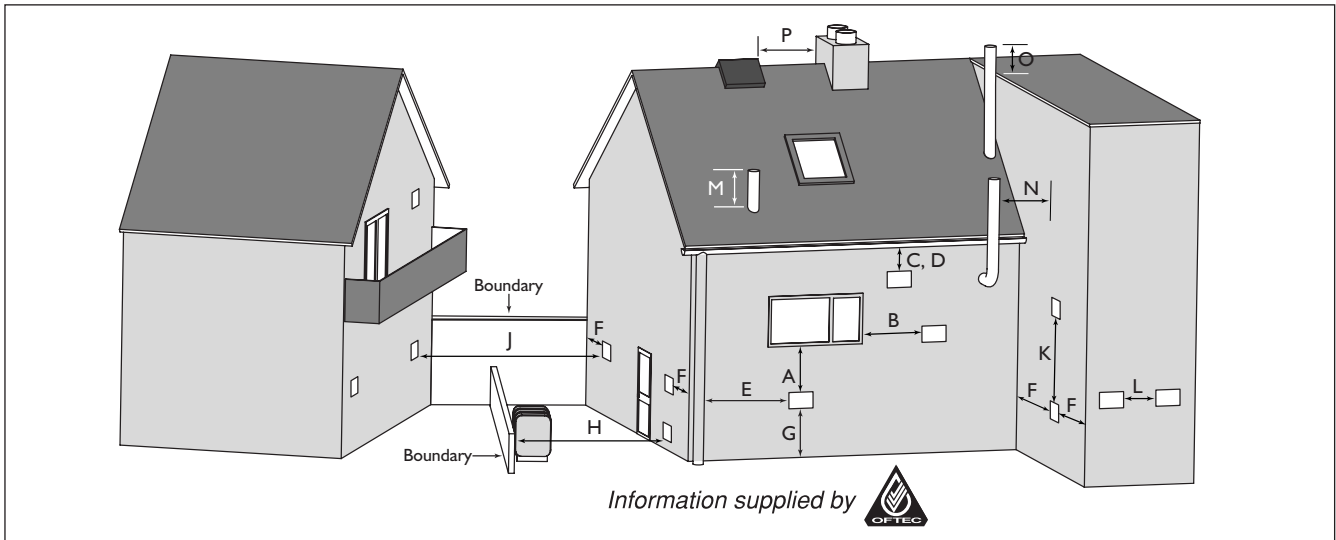
\*Where the terminal is within 1 metre of any plastic material, such material should be protected from the effects of combustion products of fuel. There are additional general requirements in most Regulations and Standards that the flue must be positioned so that it does not cause a nuisance and permits the dispersal of combustion products.

**NOTE:** The Buildings Regulations clearances shown above are minimum allowed. To take account of prevailing site conditions it is advisable wherever necessary to follow the manufacturers preferred recommendation. If in doubt contact manufacturer for advice.

**ALWAYS CHECK FOR ANY BUILDING REGULATIONS AMENDMENTS WHICH MAY HAVE BEEN ISSUED AFTER THE PUBLICATION OF THIS MANUAL**



**Clearances advised by the BRITISH STANDARDS for Open Flues,  
Low Level Balanced Flues and Balanced Flues fitted to Oil Fired Boilers.  
THESE ARE ALSO THE BUILDING REGULATIONS FOR ENGLAND, WALES & SCOTLAND**



**Minimum distances to terminals in millimetres as measured from top of the chimney  
or the rim of a low level discharge opening.**

APPLIANCE BURNER TYPE	PRESSURE JET	VAPOURISING
A Directly below an opening, air brick, opening window etc *	600	Not allowed
B Horizontally to an opening, air brick, opening window etc *	600	Not allowed
C Below a gutter, eaves or balcony with protection *	75	Not allowed
D Below a gutter or a balcony without protection	600	Not allowed
E From vertical sanitary pipework	300	Not allowed
F From an internal or external corner or surface or boundary alongside the terminal	300	Not allowed
G Above ground or balcony level	300	Not allowed
H From a surface or boundary facing the terminal	600	Not allowed
J From a terminal facing the terminal	1200	Not allowed
K Vertically from a terminal on the same wall	1500	Not allowed
L Horizontally from a terminal on the same wall	750	Not allowed
M Above the highest point of an intersection with the roof	600	1000
N From a vertical structure on the side of the terminal	750	2300
O Above a vertical structure less than 750mm from the side of the terminal	600	1000
P From a ridge terminal to a vertical structure on the roof	1500	Not allowed

**These notes form an integral part of the information shown above.**

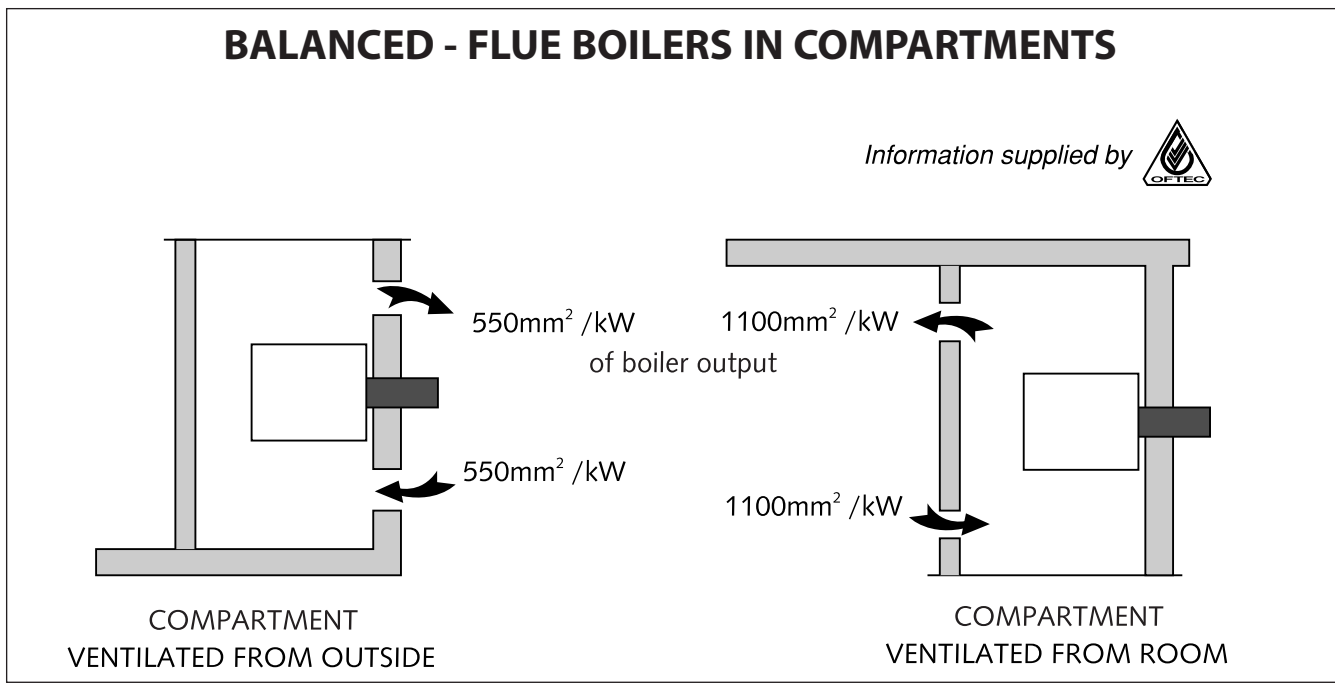
1. Terminals should be positioned so as to avoid products of combustion accumulating in stagnant pockets around the building or entering into buildings.
2. Appliances burning Class D oil have additional restrictions.(See 1.7.3 in Oftec Book 3 - Aug. 2002)
3. Vertical structure in N, O and P include tank or lift rooms, parapets, dormers etc.
4. Terminating positions A to L are only permitted for appliances that have been approved for low level flue discharge when tested to OFS A100 or A101.
5. Terminating positions must be at least 1.8 metres distant from an oil storage tank unless a wall with at least 30 mins fire resistance and extending 300mm higher and wider than the tank is provided between the tank and the terminating position.
6. Where a flue is terminated less than 600mm away from a projection above it and the projection consists of plastic or has a combustible or painted surface, then a heat shield of at least 750mm wide should be fitted to protect these surfaces.
7. For terminals used with vapourising burners, a horizontal distance of at least 2300mm is required between the terminal and the roof line.
8. If the lowest part of the terminal is less than 2 metres above the ground, balcony, flat roof or other place to which any person has access, the terminal must be protected by a guard.
9. Notwithstanding the dimensions given in the drawing and table, a terminal should not be sited closer than 300mm to combustible material.

**BALANCED FLUE BOILERS**

The Firebird boiler may be set for Room-sealed balanced flue operation using a Firebird condensing balanced flue kit. This kit does **not** draw **combustion air** from inside the room. **It is drawn from outside direct to burner by airpipe supplied with boiler.** Flue gases are expelled through the same kit. However, if the boiler is installed in a **compartment** or **small room**, some **ventilation air** is necessary to maintain acceptable temperature in boiler area.



**Balanced flue boiler in room (eg. kitchen) does not require individual ventilation.**



**Use of any equipment other than the matching Firebird low level roomsealed concentric flue kit is not guaranteed for low level discharge and will probably invalidate the warranty.**

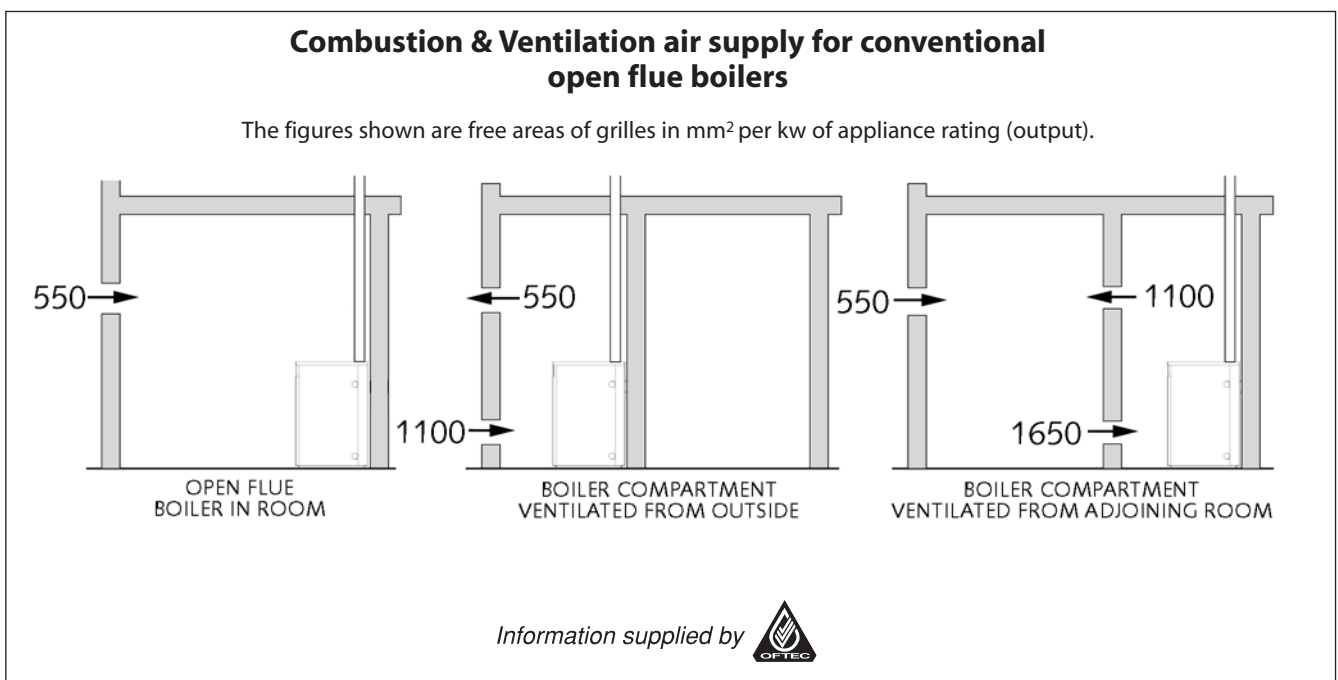
**Ventilation and Combustion Air**

**Conventional Flue Boilers**

An adequate supply of **combustion and ventilation air** is essential for efficient and safe boiler operation and the openings for this should be positioned to cause least possible draught, **with no possibility of being accidentally blocked**.

Please note: The British Standard Code of Practice for Oil Firing BS5410: Part 1, requires a permanent air inlet opening of **550mm<sup>2</sup> per kW (above 5 kW)** of boiler rated output. (Note: 1kW = 3412 Btu/h).

Also, when the boiler is installed in a compartment or confined space, **ventilation** openings are required to ventilate and to avoid overheating in the boiler area.



FULL TEXT of both BS 5410 Part 1: 1997 and appropriate Building Regulations for each country should be obtained and fully applied

**N.B. Please Carefully Note:**

- A.** For boiler installations in domestic garages in Scotland, Part F of Building Regulations permits **only** Room Sealed appliances to be used (Ref. OFTEC Bk. Three May 1999 page 1 (18)).
- B.** Technical annex T1/127 to OFTEC Book Three, May 1999 page 2 (19) Para. 1, 2 states "In Scotland and the Republic of Ireland **only** Room Sealed Balanced Flue Appliances can be used in that location" (i.e. domestic garages).

**Definitions**

- Combustion Air :** Air required directly by boiler oil burner for combustion process.
- Ventilation Air :** Air required in room for ventilation, cooling, etc. and to promote a healthy living environment.

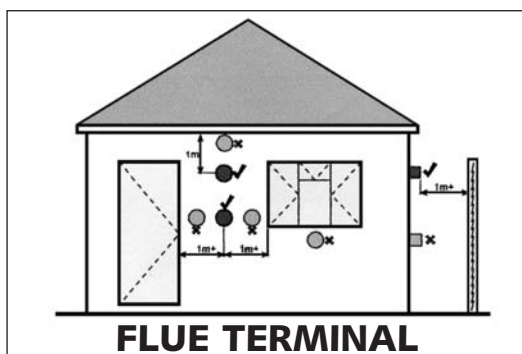


## CONDENSATE PLUME DISPERSAL

When choosing the location for a condensing boiler, special consideration must be given to the positioning of the flue terminal. Care should be taken to locate it so as to prevent either the end user or their neighbours perceiving the plume to be a nuisance.

It should be noted that the normal statutory clearances required around low level flue terminals (ref. T45 T1/135) may not be sufficient to cope with plume dispersal from a condensing boiler. The following points should be considered:-

1. Plumes can extend out horizontally and can also drift out to the sides and above the terminal. Care needs to be taken, therefore, to avoid the plume reaching adjacent surfaces, particularly windows and neighbours dwellings.
2. Flue terminals need to be located where air can pass freely across them to disperse vapours.
3. The effect of the moisture generated must be considered in relation to the possible corrosion of metal parts it might reach and to the possible formation of ice on pathways in freezing conditions.
4. Keep flue terminals a minimum of 1 m (horizontally) from openings in the building.
5. Do not install flue terminals directly below a window.
6. Do not install flue terminals next to a door.
7. Do not install flue terminals within 1 m of ventilated soffits or eaves.
8. Keep flue terminals at least 1 m away from a surface or boundary facing the terminal.
9. Follow the appliance manufactures instructions.



## CONVENTIONAL FLUE SYSTEMS

### IMPORTANT

The Firebird condensing boiler **must not** be installed with existing flue systems. A flue system suitable for wet flues must be used. If a flue system which is unsuitable is used it **will invalidate the warranty**.

Because of the high operating efficiencies of the Firebird condensing boilers and low flue gas temperatures, it is necessary to pay extra special attention to the flues and chimneys.

Existing chimneys must be lined with a liner certified as suitable for condensing oil boilers by flue manufacturer.

Twin wall insulation must be used for external applications, with **seals** and stainless steel inner skin.

Only vitreous enamel or high grade stainless steel can be used between boiler and chimney in an internal installation, aluminium or asbestos type material **must not be used (Vitreous enamel must not be cut)**.

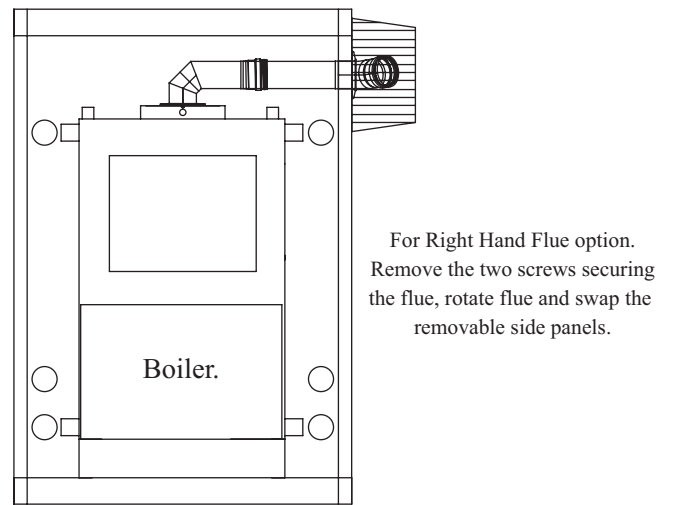
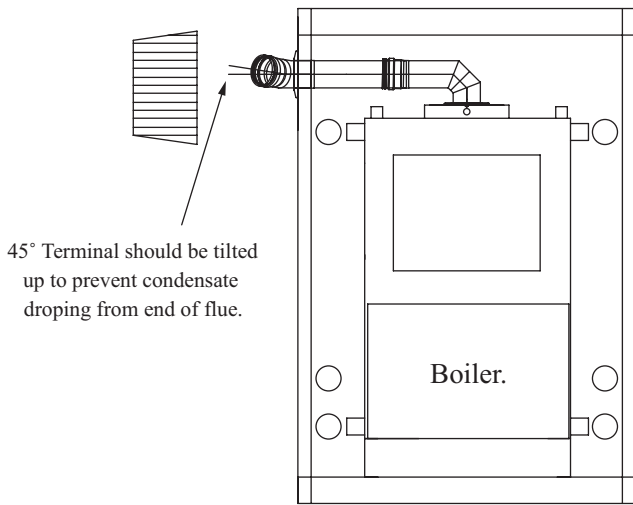
Condensate must be able to run back into the flue chamber of the boiler and not escape, as up to 1.5 ltr. of condensate can be produced in a conventional flue. No trap is required in the flue system.

The terminal must be positioned to avoid combustion products entering the building and as per Building Regulations. **Refer to BS5410:1 OFTEC installation requirements books one and two.**

**Every individual concerned with any aspect of installation should be deemed as competent, and be aware of all current National and Local Government Standards and Building & Installation Regulations.**

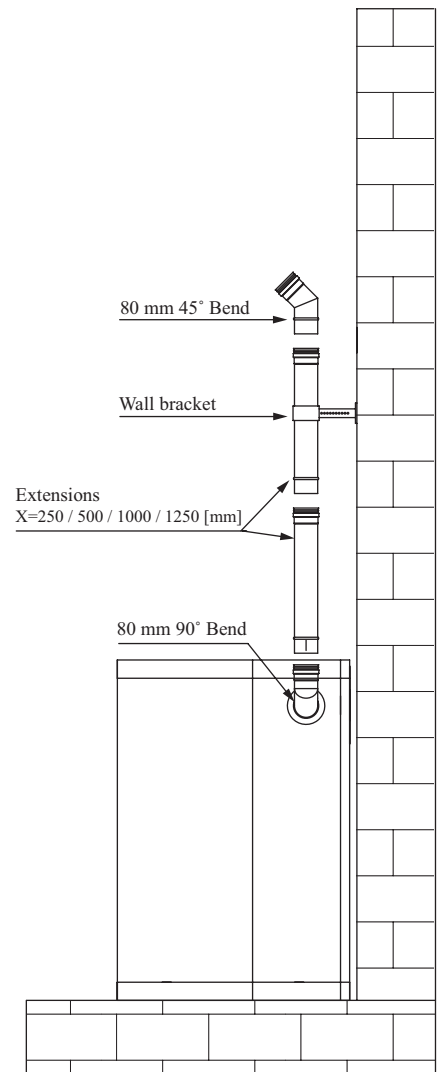
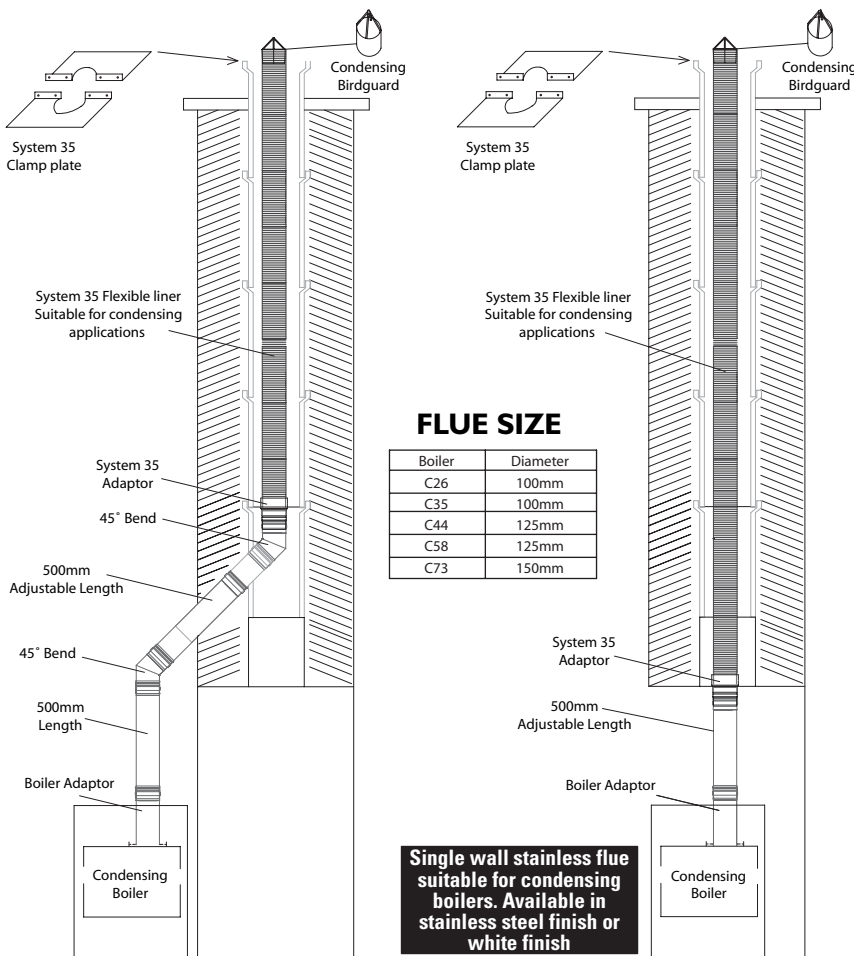
INSTALLATION INSTRUCTIONS SUPPLIED WITH ALL FLUE KITS

SYSTEMPAC FLUE



CONDENSING BOILER CHIMNEY INSTALLATION

PLUME KIT.



**NOTE:**  
 All brick chimney constructions must comply with current building regulations and BS 5410: Part 1. Insulated factory made chimneys should comply with BS 4543.

# MULTI DIRECTIONAL BALANCED FLUE SYSTEMS

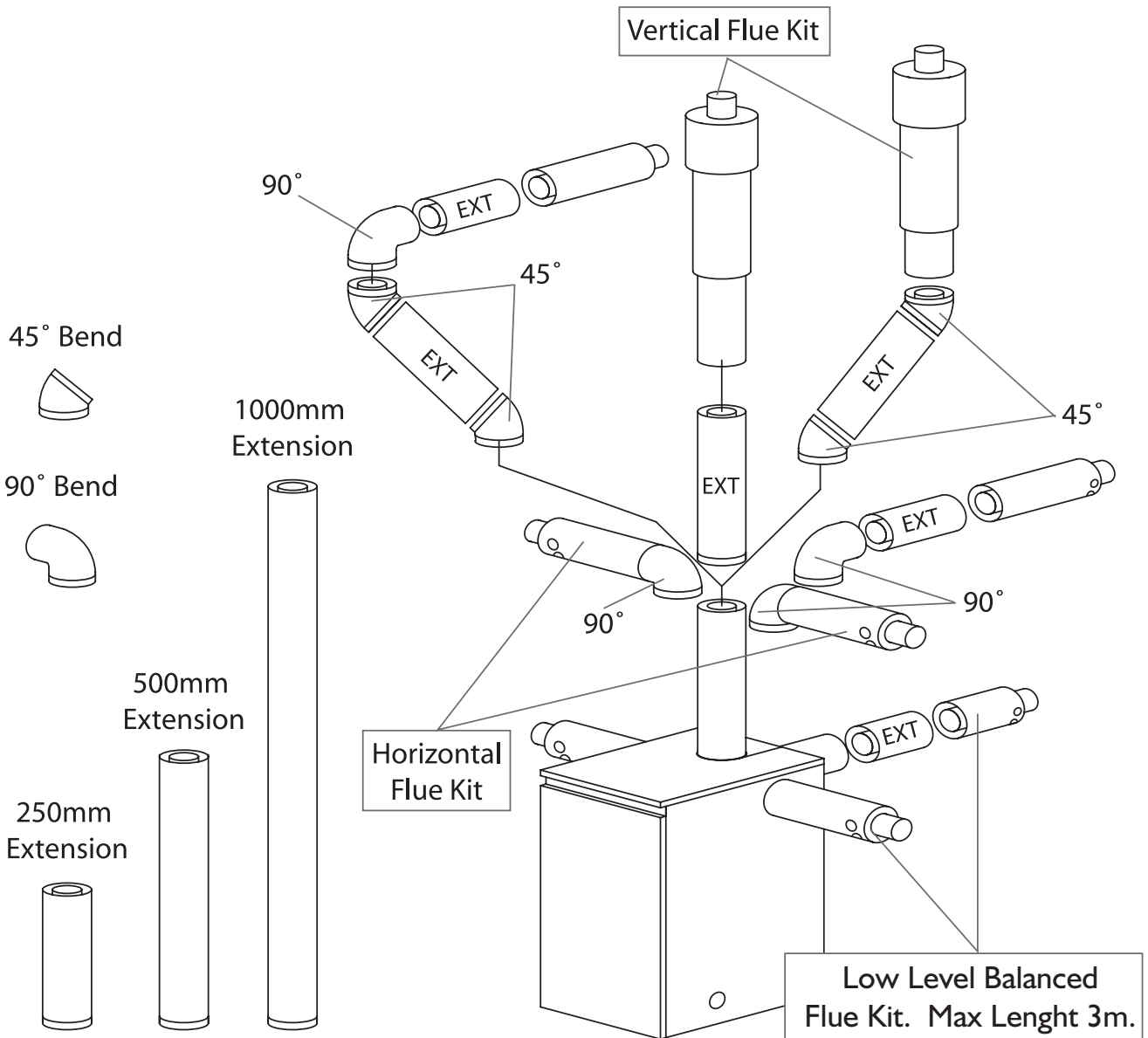
## FIREBIRD ENVIROMAX BALANCED FLUE SYSTEMS

Vertical Balanced Flue Kit - Maximum flue length  
6 metres C20 • 6 metres C26 • 6 metres C35

Overall length must take into account 45° bend = 500mm length

High Level Balanced Flue Kit - Maximum flue length 6 metres

90° bend equivalent to 1 metre length



**INSTALLATION INSTRUCTIONS SUPPLIED WITH ALL FLUE KITS**

**OIL STORAGE TANK SITING**

Consult OFTEC Manuals

It is very unlikely that a fire should start from a domestic oil tank, however it does need to be protected from a fire which may originate in a building nearby. For this reason, the tank should be located at least 1.8 metres from any building and no closer than 760mm from any boundary. If it must be closer than 1.8 metres, the building wall should not have any openings other than ventilation openings. In addition, the wall should have at least 30 minutes fire resistance and extending 300mm higher and extends 300mm beyond both ends of the tank is provided between the tank and the terminating position and the wall should have a half hour resistance to an internal fire and extend 1.8 metres from any part of the tank.

A non-combustible radiation barrier is an alternative but this must meet the requirements of BS 5410 Part 1: 1997, "clause 28" Section 6.4.

Steel tanks must be mounted on brick or block piers with a waterproof membrane between the piers and tank.

See Oftec Technical Information T19

**Oil storage tanks should not be sited within 1.8m of boiler flue outlets.**

Do not allow household waste or hot ashes container in vicinity of oil storage tank or boiler flue outlet.

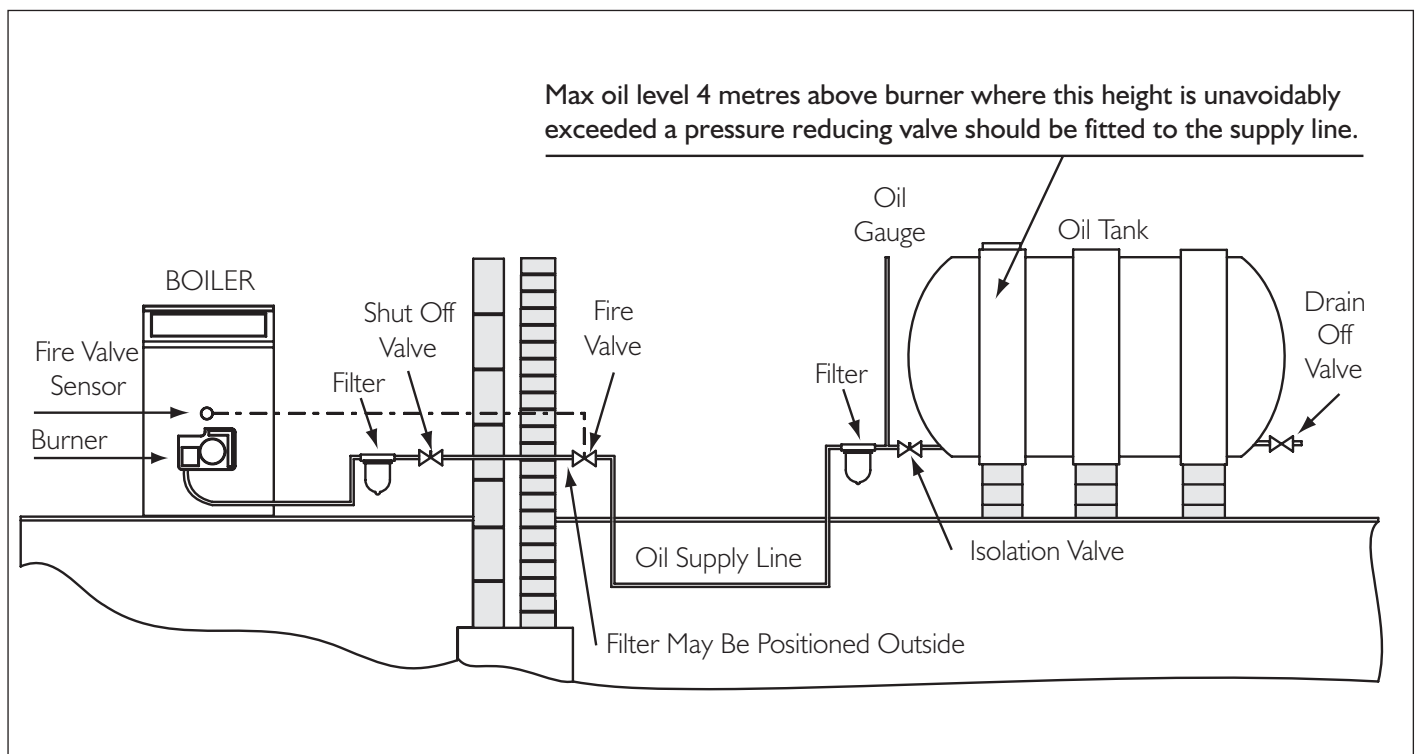
**FLEXIBLE OIL PIPE(S)**

A flexible burner oil hose is supplied with the boiler which must be wholly contained within the appliance case.

**Please note: A filter must not be fitted inside the boiler and all joints in the oil line MUST BE OIL-TIGHT. Soldered joints are not permissible. Before connecting to the boiler always flush the complete oil supply line and ensure that oil supply is completely clean and free of any dirt or foreign matter.**

**SINGLE PIPE SYSTEM**

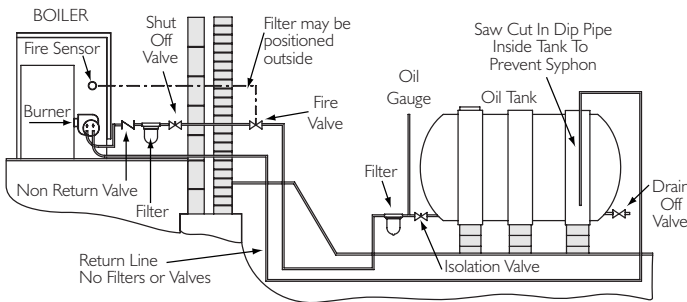
Where installations have the bottom of the tank above the oil burner, a single pipe system may be used. The oil burner should then be set for single pipe operation - **See also manufacturers oil burner manual**



**TWO PIPE SYSTEMS**

Where installations have the bottom of the tank below the oil burner pump a two pipe system is required. Ensure that valves and filters are not fitted in the return line as this must be unobstructed at all times.

The oil burner pump should be set for two pipe operation as detailed in accompanying oil burner -manual.



**TIGERLOOP SINGLE PIPE SYSTEMS**

**IMPORTANT:**

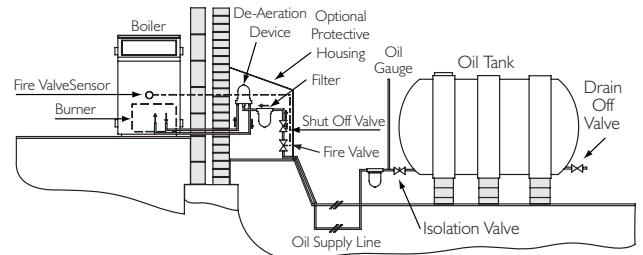
The Tigerloop should not be fitted inside the dwelling - See TI/139 drawing below and OFTEC manual book 3 page 2(8:1)

Where installations normally require a two pipe system but have long or impractical return line runs, a 'Tigerloop' De-aerator can be used which removes air from a single - pipe - lift oil feed. Higher lift heights can be achieved than are possible with conventional two pipe systems.

The oil burner pump should be set for two pipe operation.

**INDIVIDUAL TIGERLOOP INSTRUCTIONS**

**MUST BE IMPLICITLY FOLLOWED.**



**SCHEMATIC DRAWING**  
SINGLE PIPE OIL SUPPLY WITH DE-AERATION DEVICE (eg. TIGERLOOP)  
BOTTOM OF OIL TANK BELOW OR LEVEL WITH BURNER.  
(ADAPTED FROM OFTEC DRAWING)

**FIRE VALVES**

A fire valve is an essential part of the oil supply system. It should be capable of cutting off the flow of oil outside the building in the event of a fire starting up within the boiler. The valve should be located just outside the building at the point where the oil supply line enters. It must be activated by a remote sensor located over the burner, but in a position clear of any direct radiation or excessive heat.

**IMPORTANT:**

Fire Valves should comply with **OFTEC Standards OFS E101**  
Fitting of Fire Valves should comply with **BS : 5410 Part 1**

**REGULATIONS & STANDARDS**

In **England and Wales**, installation in single family dwellings have to comply with the building Regulations Part J. This requires compliance with BS 5410 : Part 1 : 1997. All tanks either deemed to be at risk or with a capacity of more than 2,500 litres will require to be banded.

For installation in **Scotland**, Building Standard Part F applies. This requires compliance with BS 5410 : Parts 1 and 2. All tanks either deemed to be at risk or with a capacity of more than 2,500 litres will require to be banded.

Those externally installed tanks with a capacity of less than 2,500 litres will require a bund if located not more than 50 metres from a spring or bore hole, 10 metres from controlled waters and additionally where it may constitute a hazard.

The above risks and hazards are described in OFTEC Technical Information Note TI/133.

In **Northern Ireland**, the Building Regulations do not currently cover the installation of oil storage tanks.

In the **Republic of Ireland** the requirements of BS 5410: Parts 1 and 2 are required to be complied with be Building Regulations Part J.



**The burner nozzle, pump pressure and air setting may have to be changed from the factory setting to suite sight conditions.**

## Riello RDB 2.2 Range Burner Settings (D).

Variations in nozzle throughput, flue type & draught, oil viscosity etc. may give results differing from these laboratory performance figures. These settings were carried out using a conventional flue.

### DIESEL SETTINGS FOR FIREBIRD C BOILER RANGE USING RDB 2.2 & 4.2 BURNERS

Model	Burner	Output		Blast Tube	Nozzel			Pump Pressure	Air Shutter	Comb Head	Air Box	Avg. Fg. °C	CO <sub>2</sub>	Smoke No
		kW.	BTU		Size	Angle	Type							
C 26	RDB 2.2	20	70,000	T1	.5	80°	S	12 bar	2.2	-	1	70	11.5-12%	0-1
		23	80,000	T3	.55	80°	S	10.5 bar	3.5	-	1	70	11.5%	0-1
		26	90,000	T3	.55	80°	S	12 bar	4.5	-	1	75	11.5-12%	0-1
C 35	RDB 2.2	36	90,000	T3	.6	80°	S	11 bar	4	-	1	85	11.5%	0-1
		30.5	105,000	T3	.65	80°	S	11 bar	5	-	1	90	11.5-12%	0-1
		35	120,000	T5	.65	80°	S	14 bar	6	-	1	95	11.5-12%	0-1
C 44	RDB 2.2	35	120,000	T5	.65	80°	S	14 bar	4	-	2	80	11.5%	0-1
		39.5	135,000	T5	.75	80°	S	13 bar	5	-	2	85	11.5%	0-1
		44	150,000	T5	.85	80°	S	13 bar	6	-	2	90	11.5%	0-1
C 100	RDB 4.2	80	272,000	Adj.	1.75	80°	S	12 bar	6	5	-	80	12%	0-1
		100	340,000	Adj.	2.00	80°	S	12 bar	8.4	6	-	80	12%	0-1

THE SHADED IN LINE REPRESENT FACTORY SETTING.

The above settings were carried out on a Firebird Condensing Boiler with 2 metres of vertical balanced flue. The ambient air was averaging around 20°C. Allowances should also be allowed for the viscosity of the oil and the tolerance of the nozzles. These settings are a guide and should only be used as such. A flue gas analyser must be used when fine tuning a burner to a boiler. When using this chart on a burner fitted to a standard efficient boiler air setting may vary.

#### Steps in Commissioning a Burner in a Firebird Boiler.

1. Check Nozzle to required output.
2. Is the correct Burner Head fitted to the burner for the required output?
3. Set air damper from the guide above for the desired output.
4. Check the pump pressure.
5. Set Boiler thermostat to minimum and allow boiler to heat up before carrying out a Flue gas analysis.
6. Check Flue gasses with a smoke gun before taking using Flue gas analyser.
7. Proceed with Flue gas analysis, adjust air damper to get desired CO<sub>2</sub>%.
8. Print a record of analysis result.

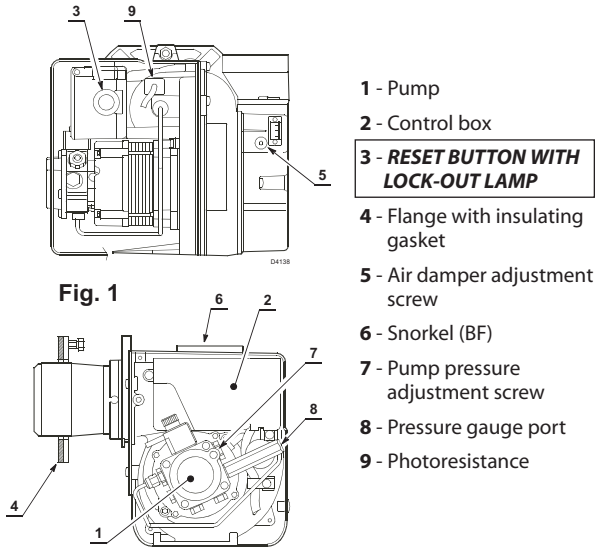


**RIELLO BURNER SPECIFICATION**

**Burner Description**

One stage kerosene burner.

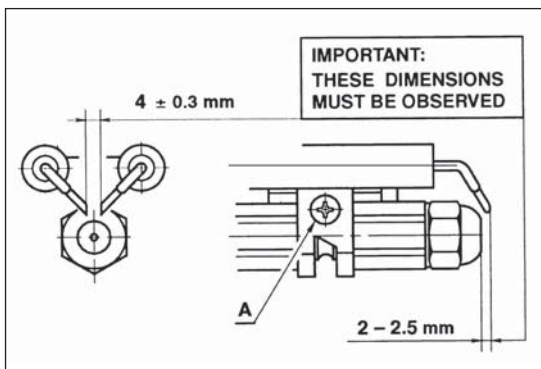
The intake air temperature must not be over 70 °C.  
 Burner with CE marking in conformity with EEC directives:  
 EMC 89/336/CEE and Efficiency 92/42/EEC.  
 CE Certification No.: **0036 0316/01** as 92/42/CEE.



**1.1 BURNER EQUIPMENT**

- Flange with insulating gasket . . . . . N.º 1
- Screw and nuts for flange . . . . . N.º 1
- Hexagonal key . . . . . N.º 1
- Plastic air cover . . . . . N.º 1
- Screws for flange to be fixed to boiler . . N.º 4
- Flexible oil pipes with nipples . . . . . N.º 2
- By-pass screw for 2 pipe system . . . . . N.º 1

**ELECTRODE SETTING  
 Riello RDB 2.2**



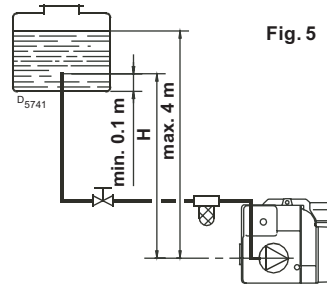
**ATTENTION**

Before assembling or removing the nozzle loosen screw (A) and move electrodes forward.

**HYDRAULIC SYSTEM**

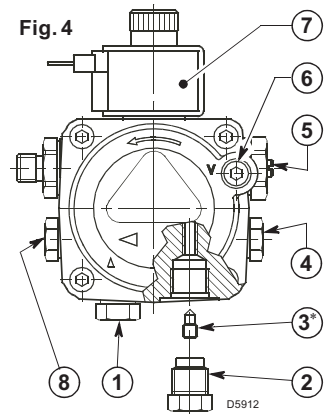
**WARNING**

- **SINGLE PIPE**  
 The pump is designed to allow working with one pipe.
- **TWO PIPE**  
 In order to obtain two pipe working it is necessary to unscrew the return plug (2), screw in the by-pass screw (3) and then screw in return oil line (2). (See fig. 4).  
 In the two pipe systems, before starting the burner make sure that the return pipe-line is not clogged. An excessive back pressure would cause the damage of the pump seal.



H meters	L meters	
	I. D. 8 mm	I. D. 10 mm
0.5	10	20
1	20	40
1.5	40	80
2	60	100

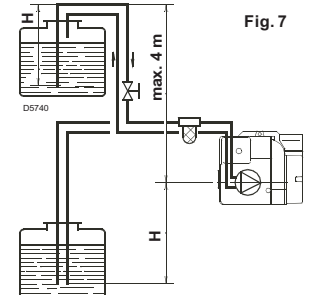
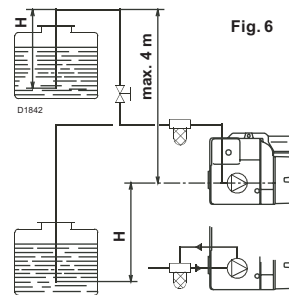
- 1 - Suction pipe
- 2 - Return line
- 3 - By-pass screw  
 (\* is supplied loose in burner pack)
- 4 - Pressure gauge connection & Bleed screw
- 5 - Pressure adjuster
- 6 - Vacuum gauge connection
- 7 - Valve
- 8 - Auxiliary pressure test point



H meters	L meters	
	I. D. 8 mm	I. D. 10 mm
0	35	100
0.5	30	100
1	25	100
1.5	20	90
2	15	70
3	8	30
3.5	6	20

**PRIMING PUMP:**

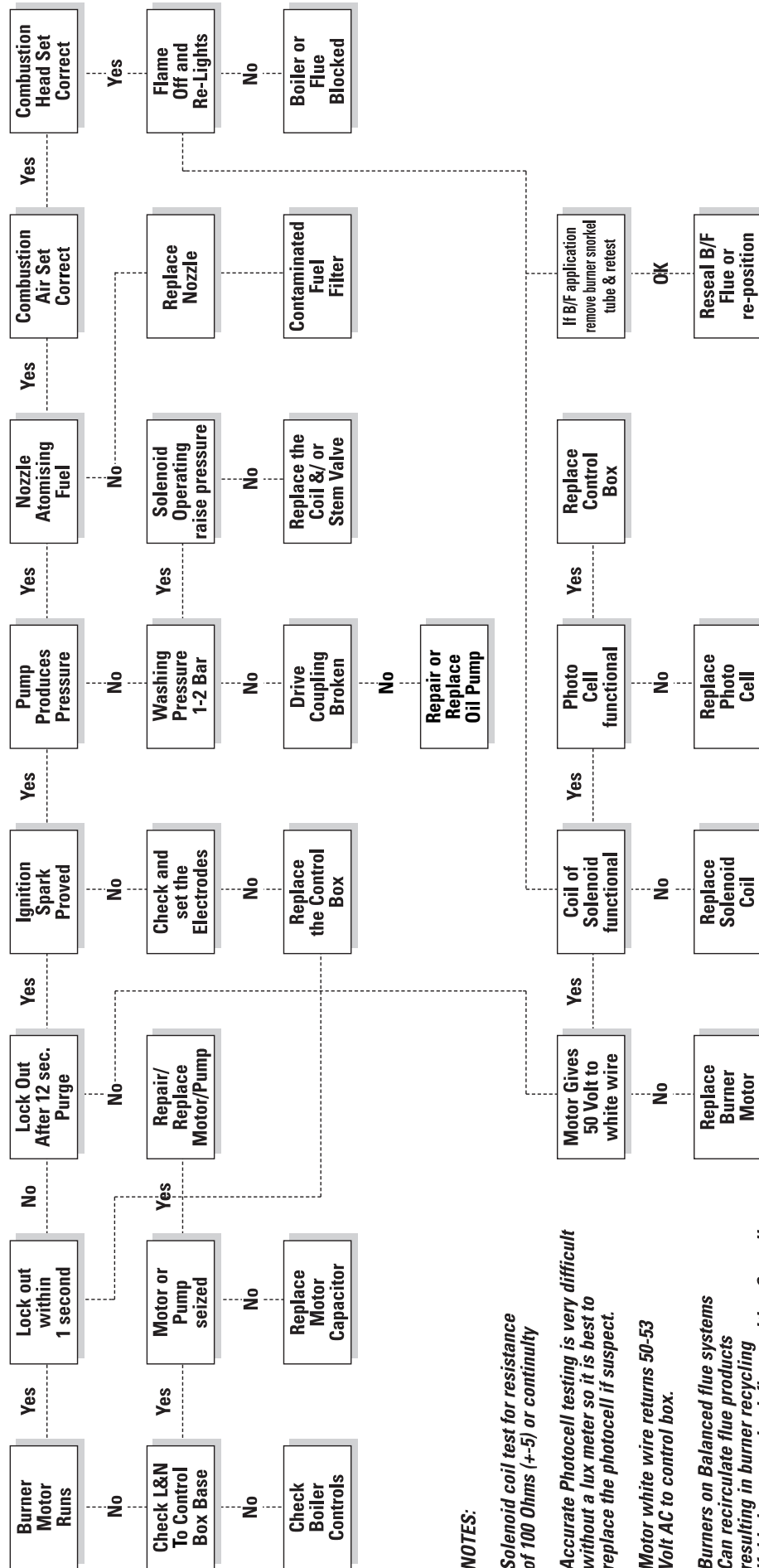
On the system in fig. 5 it is sufficient to loosen the suction gauge connection (6, fig. 4) and wait until oil flows out.  
 On the systems in fig. 6 and 7 start the burner and wait for the priming. Should lock-out occur prior to the arrival of the fuel, await at least 20 seconds before repeating the operation. The pump suction should not exceed a maximum of 0,4 bar (30 cm Hg). Beyond this limit gas is released from the oil. Oil pipes must be completely tight.  
 In the vacuum systems (fig. 7) the return line should terminate within the oil tank at the same level as the suction line. In this case a non-return valve is not required. Should however the return line arrive over the fuel level, a non-return valve is required. This solution however is less safe than previous one, due to the possibility of leakage of the valve.



H = difference of level L = Max. length of the suction line  
 I.D. = Internal diameter of the oil pipes

For Full details on suction line systems please refer to OFTEC Technical Information Sheet T1/139 (T32)

# Troubleshooting Guide for Riello RDB Burner Fault Finding Logic For Control Box Type 5352 SE/LD RDB Series Oil Burners



**NOTES:**

Solenoid coil test for resistance of 100 Ohms (+-5) or continuity

Accurate Photocell testing is very difficult without a lux meter so it is best to replace the photocell if suspect.

Motor white wire returns 50-53 Volt AC to control box.

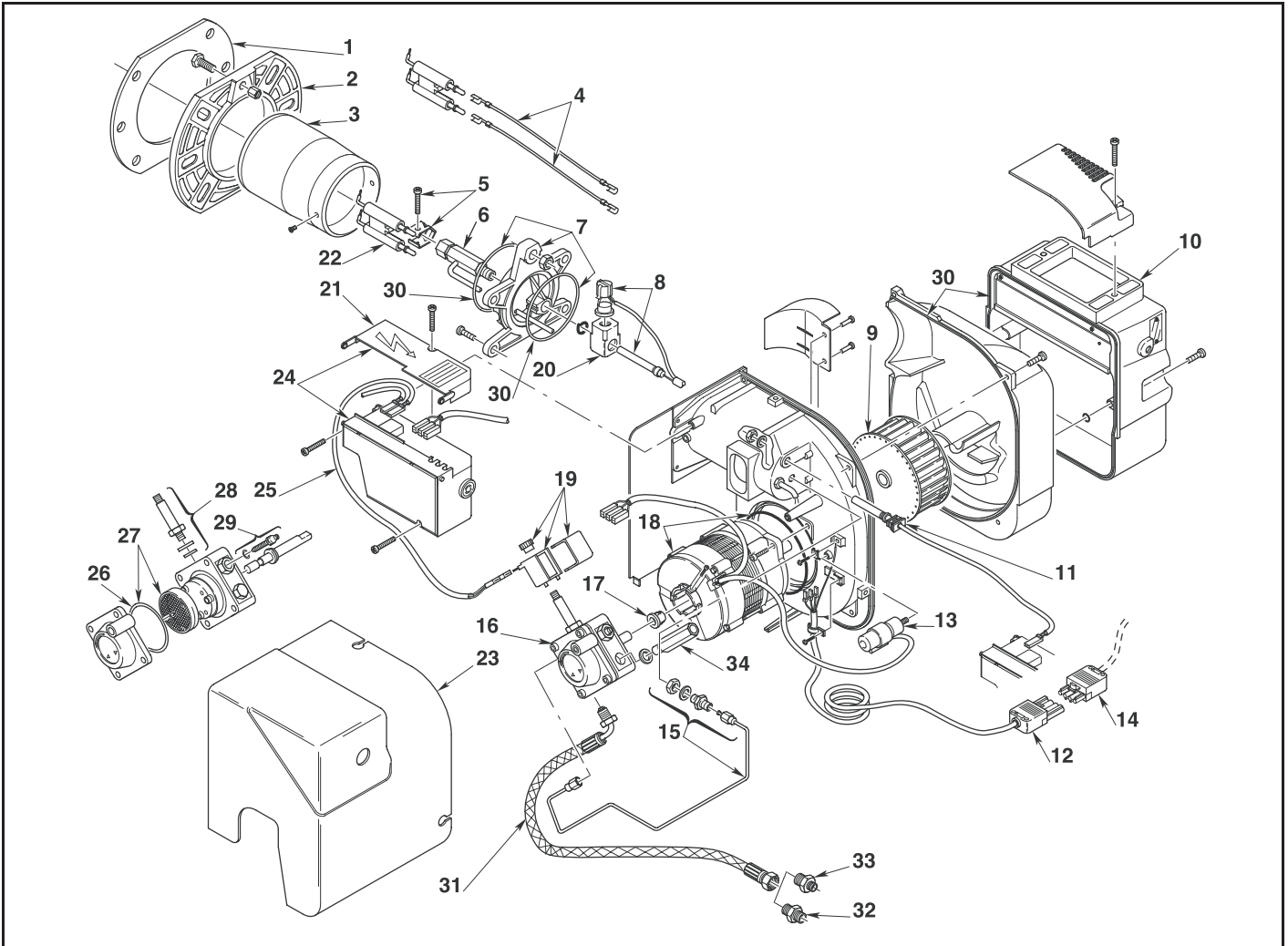
Burners on Balanced flue systems Can recirculate flue products resulting in burner recycling if this happens check flue position & sealing.

**DIESEL - LIGHT OIL BURNERS**

**RDB2.2R FIREBIRD 70D**  
**RDB2.2R FIREBIRD 90D**  
**RDB2.2R FIREBIRD 120D**  
**RDB2.2R FIREBIRD 150D**

**COD. 3515105**  
**COD. 3515305**  
**COD. 3515505**  
**COD. 3515506**

**TIPO/TYP/TYP 744T1R**  
**TIPO/TYP/TYP 744T3R**  
**TIPO/TYP/TYP 744T5R**  
**TIPO/TYP/TYP 744T5R**



N.	COD.	COD.				DESCRIPTION
		3515105	3515305	3515505	3515506	
1	3005787	•	•	•	•	GASKET
2	3006384	•	•	•	•	FLANGE
3	3002507	•				CUP - SHAPED HEAD
3	3002447	•				CUP - SHAPED HEAD
3	3002533		•	•	•	CUP - SHAPED HEAD
4	3008794	•	•	•	•	HIGH VOLTAGE LEAD
5	3006552	•	•	•	•	ELECTRODE BRACKET
6	3008855	•	•	•	•	NOZZLE HOLDER
7	3008845	•	•	•	•	COLLAR
8	3002437	•	•	•	•	HEALTER ASSEMBLY
9	3005788	•	•	•	•	FAN
10	3008647	•	•			AIR DAMPER ASSEMBLY
10	3008839		•	•	•	AIR DAMPER ASSEMBLY
11	3008646	•	•	•	•	P.E. CELL
12	3002657	•	•	•	•	4 POLE SOCKET
13	3002837	•	•	•	•	CAPACITOR 4,5 µF
14	3007418	•	•	•	•	4 PIN PLUG
15	3008842	•	•	•	•	TUBE AND CONNECTOR
16	3020475	•	•	•	•	PUMP

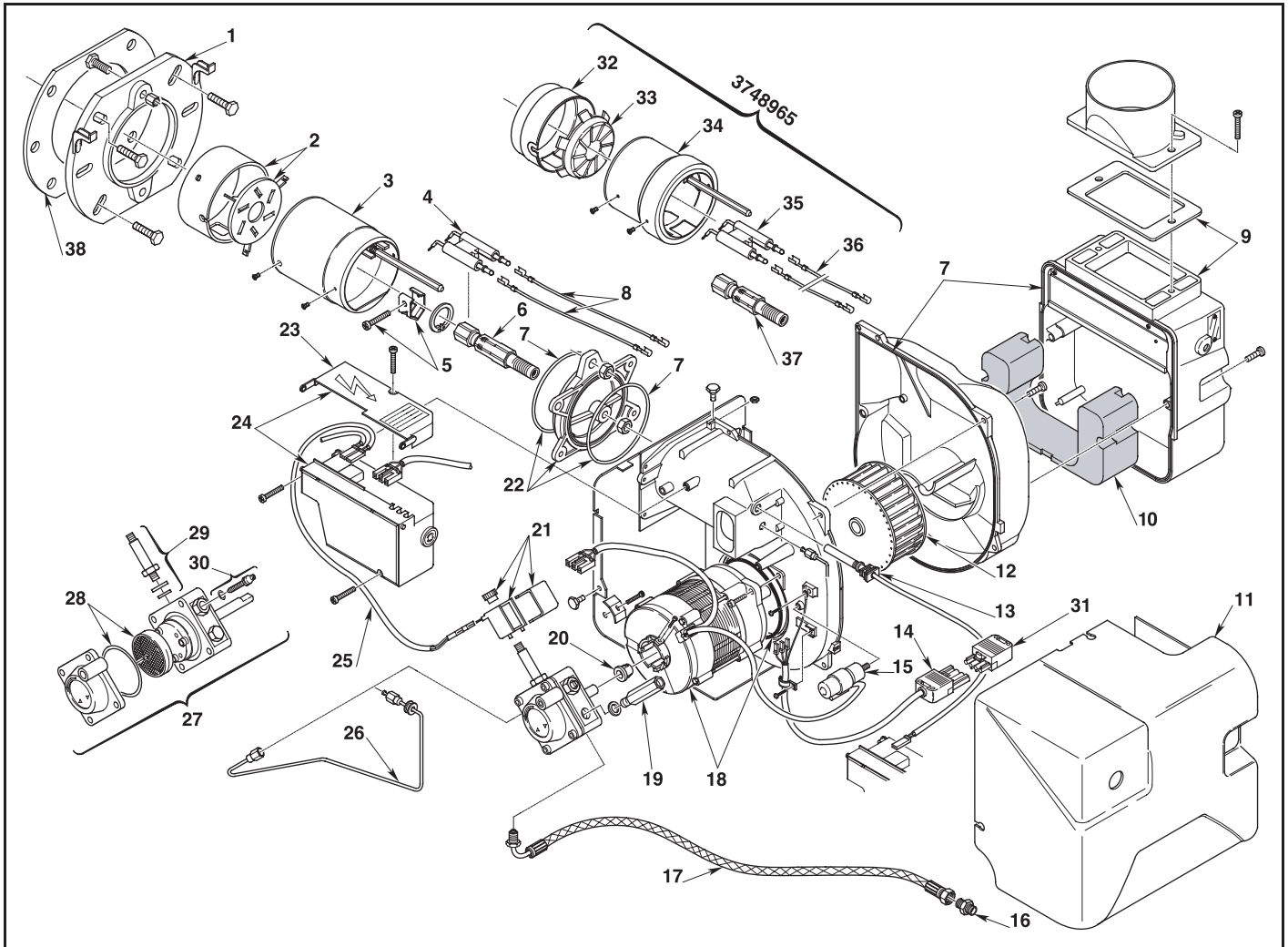
N.	COD.	COD.				DESCRIPTION
		3515105	3515305	3515505	3515506	
17	3000443	•	•	•	•	JOINT
18	3002836	•	•	•	•	MOTOR + CAPACITOR
19	3008648	•	•	•	•	COIL
20	3008856	•	•	•	•	CONNECTOR
21	3008649	•	•	•	•	PROTECTION
22	3007513	•	•	•	•	ELECTRODE ASSEMBLY
23	3008879	•	•	•	•	COVER
24	3008652	•	•	•	•	CONTROL BOX
25	3008851	•	•	•	•	LEAD COIL
26	3007162	•	•	•	•	O-RING
27	3008653	•	•	•	•	FILTER - O-RING
28	3007582	•	•	•	•	NEEDLE VALVE
29	3008651	•	•	•	•	REGULATOR
30	3008878	•	•	•	•	KIT SEALS
31	3007621	•	•	•	•	FLEXIBLE
32	3003602	•	•	•	•	CONNECTOR 3/8 - 1/4
33	3009068	•	•	•	•	CONNECTOR 3/8 - 3/8
34	3008876	•	•	•	•	PRESSURE GAUGE

# KEROSENE - LIGHT OIL BURNERS

**RDB3 FIREBIRD 150K**  
**RDB4 FIREBIRD 200K**  
**RDB4.2 FIREBIRD C58/200K**

**COD. 3748965**  
**COD. 3748965**  
**COD. 3748965**

**TYPE489 T50**  
**TYPE488 T50**  
**TYPE490 T61**



N.	COD.	3748965	3748860	3748861	DESCRIPTION
1	3008637	•	•	•	FLANGE
2	3006392		•	•	END RING AND DIFFUSER DISC
3	3006151	•	•	•	BLAST TUBE ASSEMBLY
4	3008538		•	•	ELECTRODE ASSEMBLY
5	3006552	•	•	•	ELECTRODE BRACKET
6	3008954		•	•	NOZZLE HOLDER
7	3008963	•	•	•	KIT SEALS
8	3008956		•	•	HIGH VOLTAGE LEAD
9	3008839	•	•	•	AIR DAMPER ASSEMBLY
10	3008958	•	•	•	DEADENING
11	3008962	•	•	•	COVER
12	3005799	•	•	•	FAN
13	3008646	•	•	•	P.E. CELL
14	3002657	•	•	•	4 POLE SOCKET
15	3008960	•	•	•	CAPACITOR 5 µF
16	3003602	•	•	•	CONNECTOR
17	3005720	•	•	•	FLEXIBLE OIL LINE
18	3008964	•	•	•	MOTOR
19	3008876	•	•	•	PRESSURE GAUGE
20	3000443	•	•	•	JOINT

N.	COD.	3748965	3748860	3748861	DESCRIPTION
21	3008648	•	•	•	COIL + SHELL AND KNOB
22	3008957	•	•	•	COLLAR
23	3008649	•	•	•	PROTECTION
24	3008652	•	•	•	CONTROL BOX 535SE/LD
25	3008851	•	•	•	LEAD COIL
26	3008961	•	•	•	TUBE
27	3020475	•	•	•	PUMP
28	3008653	•	•	•	FILTER - O-RING
29	3007582	•	•	•	NEEDLE VALVE
30	3008651	•	•	•	REGULATOR
31	3007418	•	•	•	4 PIN PLUG
32	3005714	•			END RING
33	3005713	•			DIFFUSER DISC
34	3007714	•			BLAST TUBE ASSEMBLY
35	3007513	•			ELECTRODE ASSEMBLY
36	3008794	•			HIGH VOLTAGE LEAD
37	3008955	•			NOZZLE HOLDER
38	3005795	•	•	•	GASKET

**NOTE: SERVICING MUST BE CARRIED OUT BY A COMPETENTLY QUALIFIED ENGINEER ANNUALLY.**

**A)** Before carrying out a service it is recommended that the following is checked:

- 1). Smoke
- 2). CO2
- 3). The flue gas temperature
- 4). Oil pressure
- 5). Ensure flue is unrestricted & operating properly

At the same time check for oil and combustion leaks. Advance to service **ONLY** after ensuring that both electric and oil supply to boiler is safely isolated

## B) THE OIL TANK

Draw off any accumulated water and sludge from the tank by opening the drain cock. Turn off the oil supply and remove the filter bowl, then wash the element clean with kerosene.

## C) THE BOILER

Remove combustion access door for access to baffles and to clean heat exchanger.

Check insulation sealing and its silver foil lining in combustion access door - replacing when necessary. Check graphite seal and replace if necessary. When refitting this door be careful not to damage the foil and insulation by over tightening.

Check condensate trap is clean and free of combustion debris and make sure that the condense drain is free and not blocked.

Expansion Vessel pre-charge pressure should be checked annually.

## D) THE BURNER

Check performance of oil-nozzle and replace.

 **Ensure correct specification replacement nozzle is used.**

Check all oil filters and replace as necessary.

Remove burner and clean blast tube and ensure that airways are clear.


Ensure electrodes are clean, dry, not broken and are set as per burner specifications.

Clean fan and photocell.

**Once again check flexible oil lines and connections for damage or leaks, replace as necessary. Replace flexible oil lines every 2 years.**

### Combustion Check

Carry out combustion analysis and ensure that boiler is performing to specification outlined in manual. Flue conditions may cause deviation from these figures. Firebird recommend that the flue gas analyser is set to light oils and that a smoke test is always carried out before using the analyser

 **Always keep careful record of flue gas analysis results including any verbal and written advice to customer (householder). Always check carefully for restricted or blocked flue. If possible record CO levels and advise customer of need to keep boiler room well ventilated. Always make sure that ventilation is kept clear.**

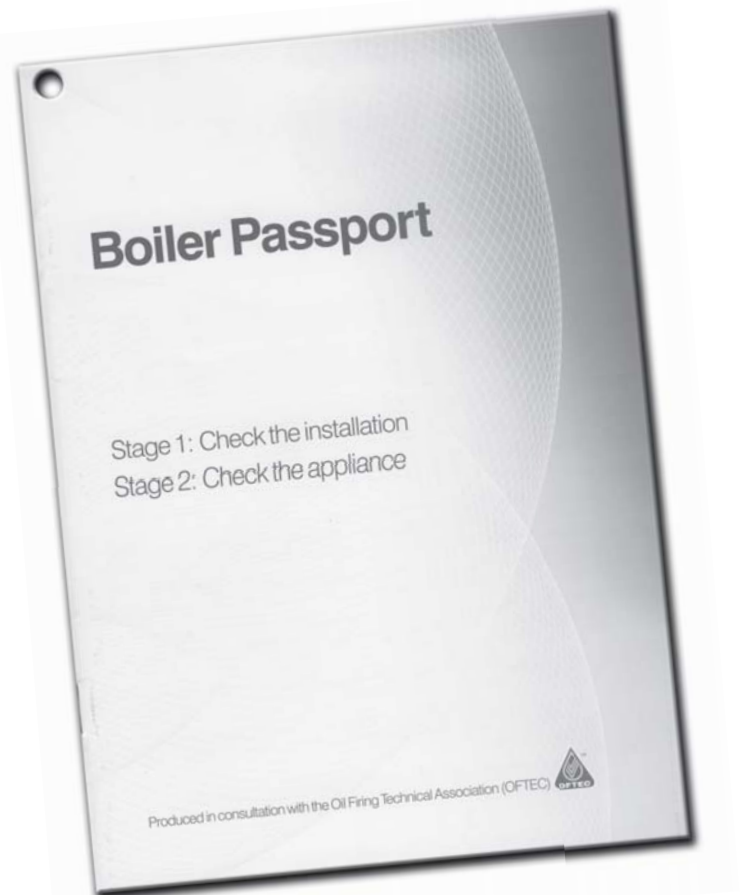
## SERVICING RECORD - PAGE 46

# Service Checklist

**NB** All Information recorded hereunder should also be included in Engineers own filed service reports. It is recommended that the boiler be serviced, **at least once a year**, and the details recorded below. Combi Boilers may need more frequent service. Engineer should advise householder.

	1 <sup>ST</sup> SERVICE	2 <sup>ND</sup> SERVICE	3 <sup>RD</sup> SERVICE	4 <sup>TH</sup> SERVICE
<b>Burner Model</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nozzle Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nozzle Size	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nozzle Angle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pump Pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoke Reading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CO <sub>2</sub> %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F.G.T. °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Valve Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Condense Trap (where Fitted)</b>				
Is condense trap piped to drain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is condense trap primed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Float and condense trap in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CHECK</b>				
Flue seals OK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flexible Oil Line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baffle Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deflector plate and baffles in position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graphite door seal and door gasket fitted and in good order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CHECK</b>				
All Connections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D.M. Hot Water Operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combi Hot Water Operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Central Heating Operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boiler Thermostat Operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Date:</b>	.....	.....	.....	.....
<b>Service Engineer:</b>	.....	.....	.....	.....
<b>Tel. No:</b>	.....	.....	.....	.....
<b>Signature:</b>	.....	.....	.....	.....
<b>Comments:</b>	.....	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....
	.....	.....	.....	.....

# Boiler Passport Golden Rules



**Failure to comply with the below requirements may invalidate all warranties**

## **TO THE HOUSEHOLDER:**

- 1) This appliance must be serviced annually in accordance with the appliance manufacturer's instructions and the service records within this document completed.
- 2) To ensure your continued Boiler Warranty, the annual service must be carried out by an OFTEC Registered Technician or an otherwise competent person.
- 3) Use of non-competent persons may invalidate this warranty. A list of OFTEC Registered Technicians is available at [www.oftec.org](http://www.oftec.org) or alternatively telephone OFTEC on 0845 658 5080 (UK) or 01 864 5771 (RoI)

*If there is any doubt as to the suitability of your technician, please check with the manufacturer prior to the work being carried out.*

## **TO THE INSTALLER:**

- 1) The installer is responsible for completing this passport and returning the paperwork to the manufacturer.
- 2) The appliance must be correctly commissioned in accordance with the appliance manufacturer's instructions and registered with the manufacturer.
- 3) The Central Heating System must be cleansed with a proprietary cleanser and treated with a proprietary corrosion inhibitor, the concentration of which must be checked at each annual service.
- 4) The incoming cold water mains supply to a combi boiler must be fitted with a suitable and effective hard water treatment.
- 5) A fuel filter with a filter rating of 70 microns or better must be fitted to the fuel supply to the appliance, in accordance with the burner manufacturer's recommendations.

*Remember, the future warranty of the appliance is conditional upon correct installation, completion of the passport document and returning the commissioning certificate to the appliance manufacturer – if you don't do this the warranty could be invalid.*

**Boiler Passport must be returned within 28 days of installation to validate warranty (see T&C page 3)**



**ATTENTION****ALL OIL FIRED BOILERS  
INSTALLERS**

It is the responsibility of **INSTALLER / HOUSEHOLDER** to ensure that the boiler is **PROPERLY COMMISSIONED** and that the **BOILER PASSPORT** is filled out by a competent or OFTEC registered engineer and returned to Firebird within **28 DAYS** of installation

Failure to have the appliance commissioned and warranty card completed and returned will invalidate the warranty.

It is not the responsibility of the Manufacturer or the Supplier if a boiler will not operate properly due to non commissioning of the appliance.

**PLEASE NOTE:**  
Should a site inspection be required from the manufacturers engineer, a call-out fee **will be charged** if the fault is a result of incomplete or incorrect commissioning.

It is recommended that commissioning is carried out by a competent and qualified service engineer.

**It should be noted that it is the responsibility of the installer to ensure that the boiler is properly commissioned. Failure to do so may invalidate the boiler guarantee and any extended warranty.**

**PROCEDURES****1. OIL TANK**

The installation of the oil tank and supply line should comply with all the instructions shown earlier in this manual. Consult OFTEC Manual - Book No. 3, Section 2.

If a single supply line is used ensure that the bottom of the tank is above the burner. A suction line system via a de-aerator should be used where the level of the oil in the tank may fall below the level of the oil burner pump.

**CHECK AND ENSURE CORRECT GRADE FUEL OIL HAS BEEN SUPPLIED.**

**2. THE BURNER**

A two single pipe system may also be used in low-level tank installations. **See page 39.** Please flush out oil pipe by drawing off some oil before connecting fuel pipe to burner - otherwise there is a danger of grit and dirt being forced into the burner pump, resulting in pump blockage, damage and 'lock-out'

**3. THE BOILER**

- A.** Switch off the power supply, ensure that the boiler and system is full of water, all valves are open and that installation conforms with all Standards, Regulations and Instructions.
- B.** **Depending on condensate disposal system check that the condensate trap is primed or pump is operational.**
- C.** **Check that boiler baffles are correctly positioned.**
- D.** Check the oil supply by disconnecting the oil supply hose at the burner and running off a quantity to ensure it is free from air. Then bleed air from burner pump. **See page 46.**

- E.** If fitted, check that the time switch is 'ON' and that both room and boiler thermostats are calling for heat.
- F.** Reconnect electrical supply and the boiler should start. If the burner lock-out activates, this suggests air in the pump. Wait a minute or so and try again. If lock-out occurs again, air must be bled from the pump pressure gauge connection point once more.
- G.** View the burner flame through the sight glass - it should be bright cream/yellow without any sign of smoke. Use a smoke gun to check that the burner is burning clean.
- H.** Run the boiler for about fifteen minutes then take a CO2 reading and adjust as necessary.

### HANDING OVER

**A thorough check of the system should be made, then the householder should receive a clear and concise demonstration of the boiler operation and any system controls and OFTEC forms:- OFTEC CD10 and OFTEC CD11**

**This manual and burner manufacturers manual plus any other instructions should be handed over to the user, the guarantee card should be completed and posted, and the user advised about the importance of annual servicing.**



### COMMISSIONING RECORD

**Should be completed and a copy kept in engineers file.**

## NOTES

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**FIREBIRD**  
**BOILERS**

For further information on Firebird Products please contact

New Zealand Distributor

**Central Heating New Zealand Ltd**

11 Parkhouse Road,

Sockburn,

Christchurch,

+ 64 3357 1233

[www.centralheating.co.nz](http://www.centralheating.co.nz)

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