

Bosky Boffin

Multifuel Central Heating Boiler

Installation and operating booklet

CONTENTS

	PAGE
Introduction	A
Specification	B
Installation Specification	1
The Flue	1
Plumbing	4
Wiring	6
Burner	8
Operating Advice - general	10
Fuels	16
Maintenance & Cleaning	17
Some Possible Problems	18
<u>EMERGENCY</u> Procedures	Back Cover

IMPORTANT

BEFORE INSTALLATION, read all sections of the first part of this booklet - 'Installation Specification'. Note that:

1. The boiler must be connected to an effective gravity circuit whose potential heat-leaking capability is equivalent to at least 15% of the output of the unit. It must also be connected to at least a further 40,000 Btu central heating circuit.
2. The importance of an effective flue system cannot be over-stressed. **BOFFIN** boilers are efficient appliances and expel flue gases at comparatively low temperatures. Therefore the flue system must be correctly constructed and well insulated.
3. The positioning and installation of **BOFFIN** boilers must satisfy all national and local building and planning regulations. Do not place the boiler or its flue close to combustible materials. Make sure that there is sufficient fresh air entering the room.

Now read **Installation Specification** for more detailed information.

INTRODUCTION

The **BOFFIN 6** and **7** multi fuel boilers are designed to burn a large variety of solid fuels, including wood, and oil or gas. The single combustion chamber of the **BOFFIN 6** and the dual combustion chamber of the **BOFFIN 7** are surrounded by a double skin water jacket; a multi channel heat exchanger at the top of the chamber(s) maximises the heat transfer to water, making optimum use of the energy available. The efficiency of the water jacket and heat exchangers and the quality of the insulation that surrounds the boiler mean that a high proportion of available heat is transmitted to water and that very little is radiated or passed up the flue.

With the **BOFFIN 6**, manual change over can be carried out whenever the solid fuel fire embers or ashes can be raked out and the burner swung in.

With the **BOFFIN 7**, either the solid fuel chamber or the burner chamber can be used at any time, and the automatic switch-over from solid fuel to burner can be employed whenever necessary.

The range of maximum outputs from **BOFFIN** boilers is as follows:- *

BOFFIN 86 - output Btu/hr 86,000	BOFFIN 87 - output Btu/hr 87,000
BOFFIN 126 - output Btu/hr 126,000	BOFFIN 127 - output Btu/hr 127,000
BOFFIN 156 - output Btu/hr 156,000	BOFFIN 157 - output Btu/hr 157,000

(N.B. Ensure that a gas or oil burner with the appropriate nozzle size is chosen. A variety of oils and either mains gas or L.P.G. can be burned. Consult an expert local burner supplier.)

* Maximum outputs can be achieved with a flue draught of 0.08" w.g. (2mm) burning seasoned wood on a 2 hour loading cycle or with coal/smokeless fuel on a 4 hour loading cycle or with gas/oil.

SPECIFICATION

SPECIFICATION

BOFFIN 6

KEY TO DRAWINGS BELOW (all sizes in mm)

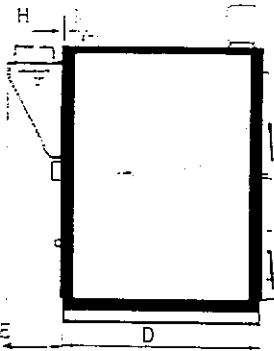
Model No.	86	126	156
Maximum Output Btu/hr	86,000	126,000	156,000
A. Width*	450	450	450
B. Height (excluding module)	1110	1110	1110
C. Height (including module)	1290	1290	1290
D. Depth (excluding flue box)	665	910	910
E. Depth of flue box	230	280	280
F. Burner aperture from l/h side	230	230	230
G. Burner aperture from base	515	515	515
H. Flue centre from rear of unit	115	140	140
I. Height of flue spigot	1110	1110	1110
J. Flue diameter	250	250	250
K. Flow tapping from rear of unit	60	60	60
M. Return tapping from base	500	500	500
N. Drain tapping from base	315	315	315
O. Drain tapping from side	225	225	225
P. Flow and return tappings from side of unit	225	225	225
Firebox depth	530	770	770
width	260	260	310
height	690	690	690
Weight (kgs)	295	250	275

SPECIFICATION

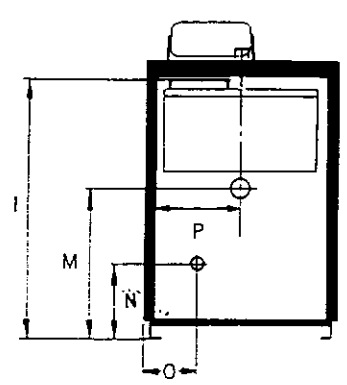
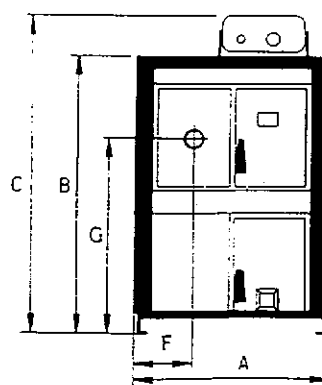
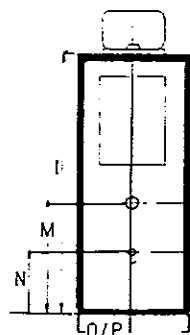
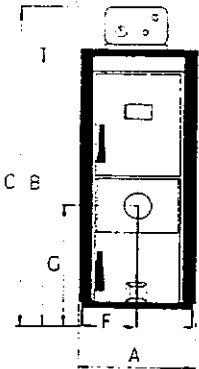
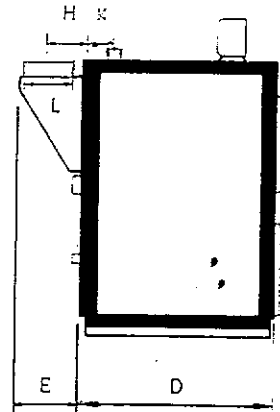
BOFFIN 7

KEY TO DRAWINGS BELOW (all sizes in mm)

Model No.	87	127	157
Maximum Output Btu/hr	87,000	127,000	157,000
A. Width*	740	740	790
B. Height (excluding module)	1110	1110	1110
C. Height (including module)	1290	1290	1290
D. Depth (excluding flue box)	720	960	960
E. Depth of flue box	240	290	290
F. Burner aperture from l/h side	210	210	250
G. Burner aperture from base	660	660	660
H. Flue centre from rear of unit	115	140	140
I. Height of flue spigot	1100	1100	1100
L. Flue diameter	200	250	250
M. Return tapping from base	445	445	445
N. Drain tapping from base	320	320	320
O. Drain tapping from l/h side of unit	205	205	205
P. Flow and return tappings from l/h side of unit	360	360	360
Firebox depth	530	770	770
width	260	260	310
height	690	690	690
Weight (kgs)	335	424	460



*Allow space on either side of the unit for the fan blower and burner to swing away.



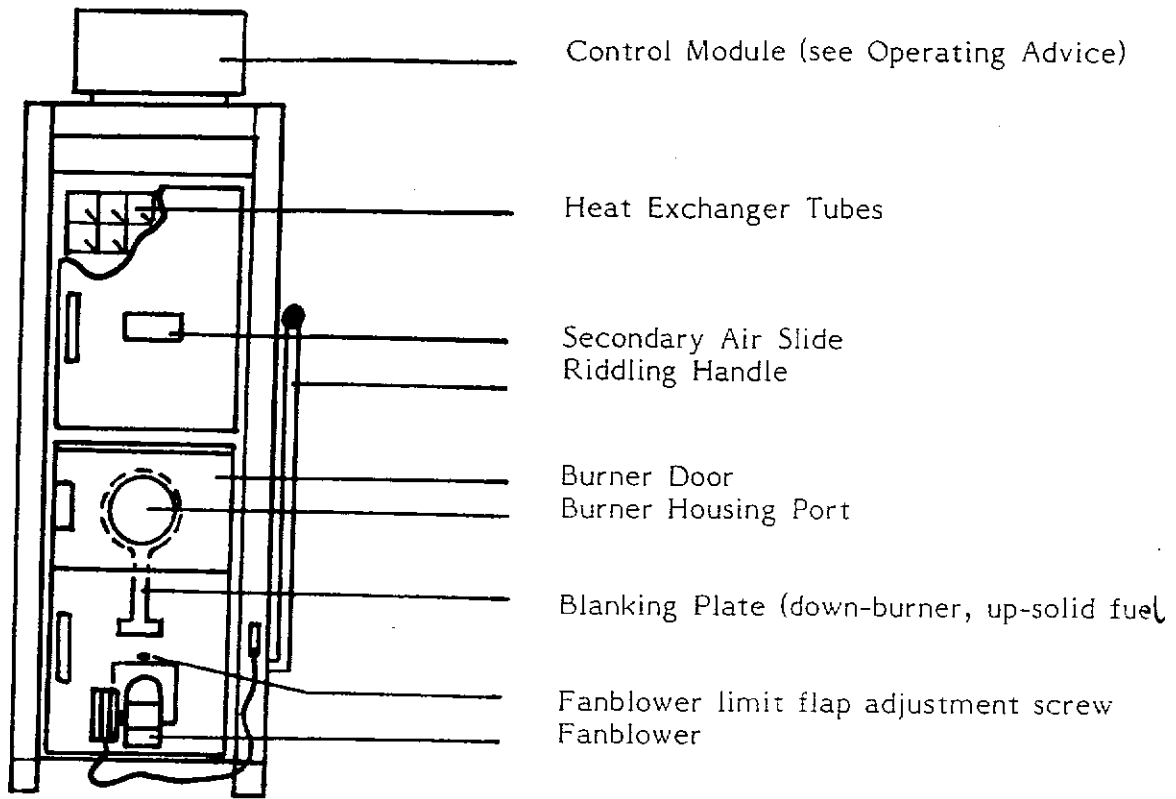
N.B. See table under 'The Flue' below, for flue pipe size

Due to our policy of continuous development, we reserve the right to alter data without notice

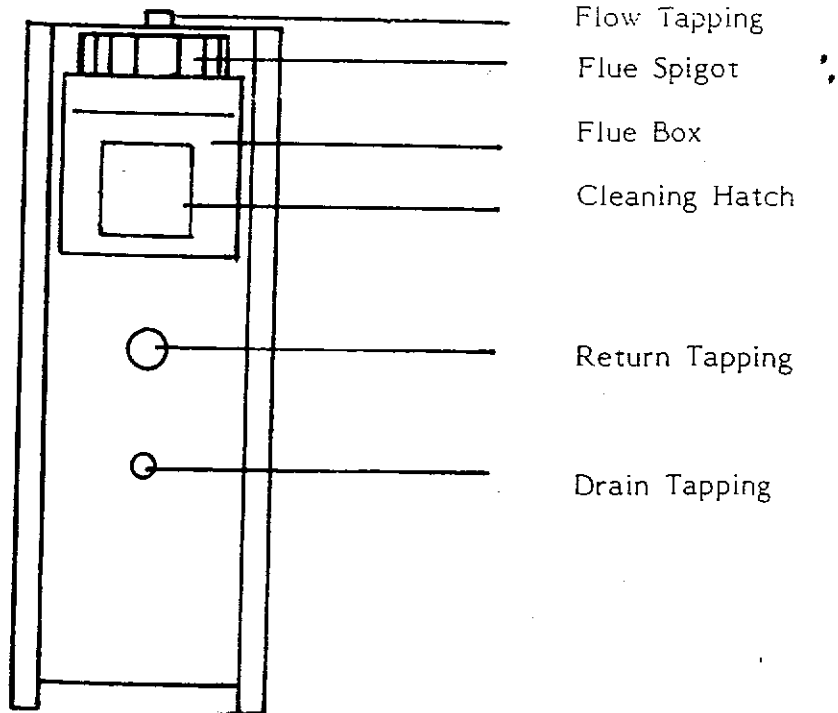
Tapping Sizes - 1 1/2" B.s.p.

BOSKY BOFFIN 6

FRONT

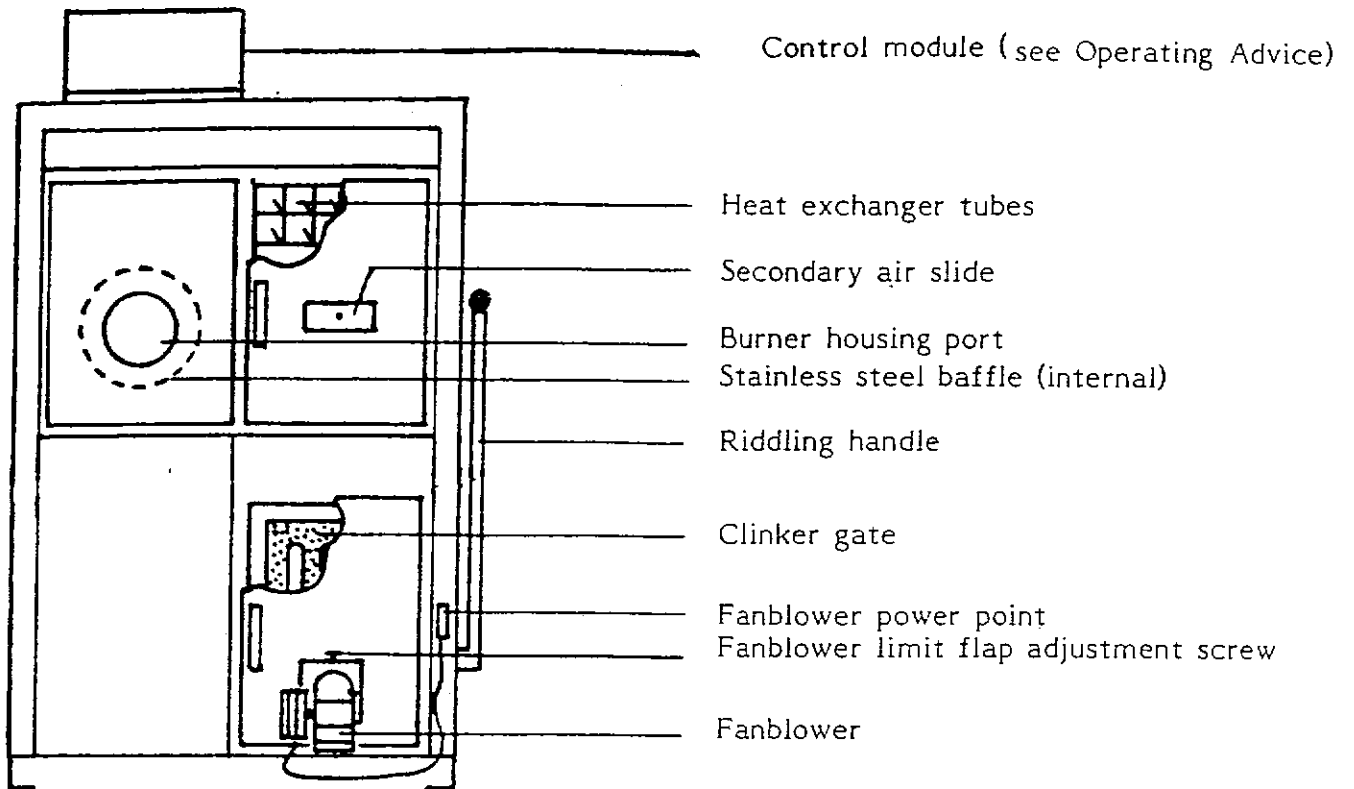


REAR

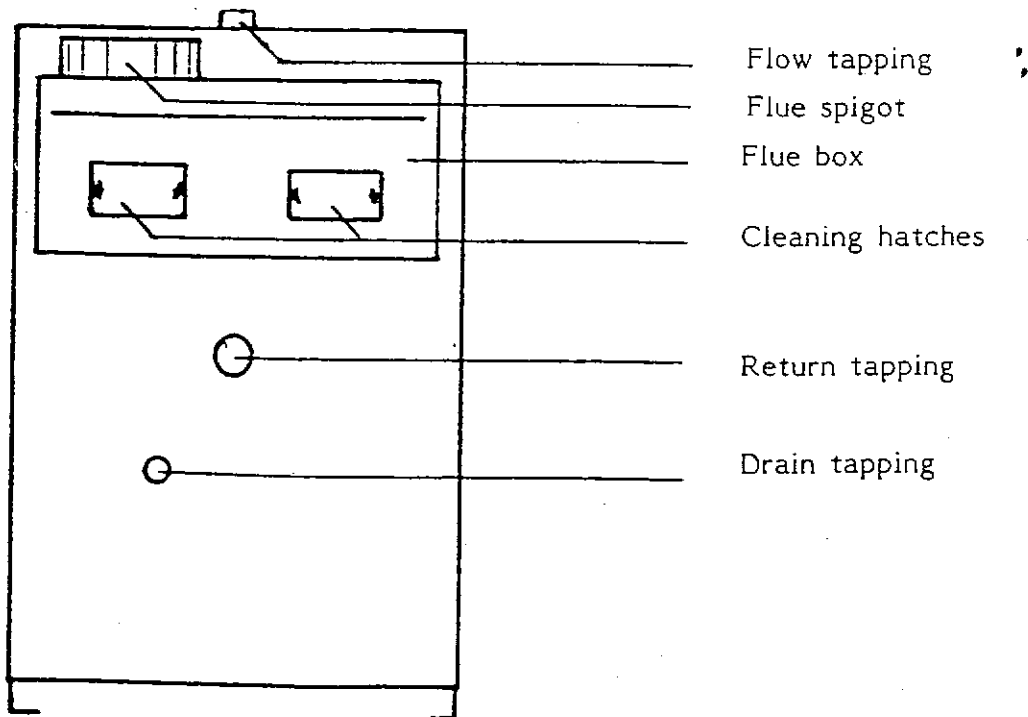


BOSKY BOFFIN 7

FRONT



REAR



INSTALLATION SPECIFICATION

SUMMARY

- ** Check all building regulations
- ** Install clear of combustibles
- ** Ensure that flue is satisfactory
- ** Check plumbing
- ** Have burner commissioned by supplier

Read all the following instructions before installing or lighting

Positioning and Installation The positioning and installation of **BOFFIN** must satisfy all national and local building and planning regulations. In particular, the boiler must be mounted on a flat horizontal and non-combustible surface. Space should be left all round the unit; down the sides so that the doors can be opened without the burner or fan coming up against a wall, across the rear of the unit particularly when a combustible wall surface may be too close to the flue box (and also to allow access for cleaning the flue box), and in front of the unit to allow removal of the ash pan and servicing of the burner.

Fresh Air Inlet An adequate fresh air inlet of at least 70 square inches must be provided in such a way that it cannot be blocked and is not subject to low pressure in adverse wind conditions.

The Flue The flue is the most vital part of any solid fuel installation. **BOFFIN** is a highly efficient device, which means that the amount of heat carried away in the flue gases is reduced to a minimum. In order to provide sufficient flue draught, a high proportion of the flue gas heat leaving **BOFFIN** must pass all the way up to the flue.

THE FLUE MUST THEREFORE BE WELL BUILT,
WELL LINED AND PROVIDE UNDER ALL
CONDITIONS A STEADY DRAUGHT OF BETWEEN
0.08 INCHES AND 0.16 INCHES WATER GAUGE
(2 mm and 4mm). WE THEREFORE SPECIFY THE
FOLLOWING:-

Size of Flue a. The internal diameter of the flue piping (in inches) should be as shown in the following table:-

Height of flue	15/20ft.	21/25ft.	26/30 ft.	31 ft. or over
BOFFIN 86/87	10	8	8	8
BOFFIN 126/127	10	10	10	10
BOFFIN 156/157	10	10	10	10

The flue spigot size on **BOFFIN 86/87** is 8" (200 mm) diameter. That on the **BOFFIN 126/127** and **156/157** is 10" (250 mm) diameter. Only on the low output **BOFFIN 86/87** and with sufficient height of flue will an internal diameter of 8 inches be sufficient. Under all other circumstances, the necessary draught to give a good performance will only be achieved by using a flue of 10 inches internal diameter.

Height of Flue b. The flue must be at least 15 ft. high in any case and will normally need to be higher if the terminal point is not subject to down-draught, turbulence or other adverse wind conditions. In general, the terminal point should be one metre above any obstruction within a 25 ft. radius, but always be prepared to add extra length above this if necessary.

Insulation of Flue The full length of the flue must be sufficiently well insulated to maintain the flue gas temperature. A poorly insulated flue will allow the gases to cool and condense. Smoke will be emitted from the appliance and tar from the flue. The flue gases will be at their hottest as they leave **BOFFIN**. The flue pipe leading immediately from the appliance is therefore most critical. It must be properly insulated and should be vertical or near vertical.

Liners An existing flue must be well sealed or lined so that creosote, tar, smoke or fumes do not leak through the structure of the chimney. Always avoid venting into a large chimney opening, where the gases may cool. It is better to pipe the gases up to a narrow part of the chimney where an air-tight seal should be made. **NEVER** use flexible liners or asbestos, as these readily pick up deposits and will eventually lead to a restricted or blocked flue. Where an existing flue seems to be suitable, a smoke bomb test with a sealed flue should be carried out. This is normal practice where conventional gas or oil boilers are to be installed, and will show up any leaks.

Prefabricated Flue If there is no suitable existing chimney, we recommend either a complete system of twin-walled insulated flue, which is quick to install and has good insulation properties, or a pumice-concrete block and liner system which has good insulation properties (the connection between this latter system and the boiler should be in twin walled insulated flue). Due to the length of the passage from the firebed, through the heat exchanger tubes and through the flue box, there is little chance of flames impinging into the flue. Twin-wall flue can therefore be placed directly onto the flue box.

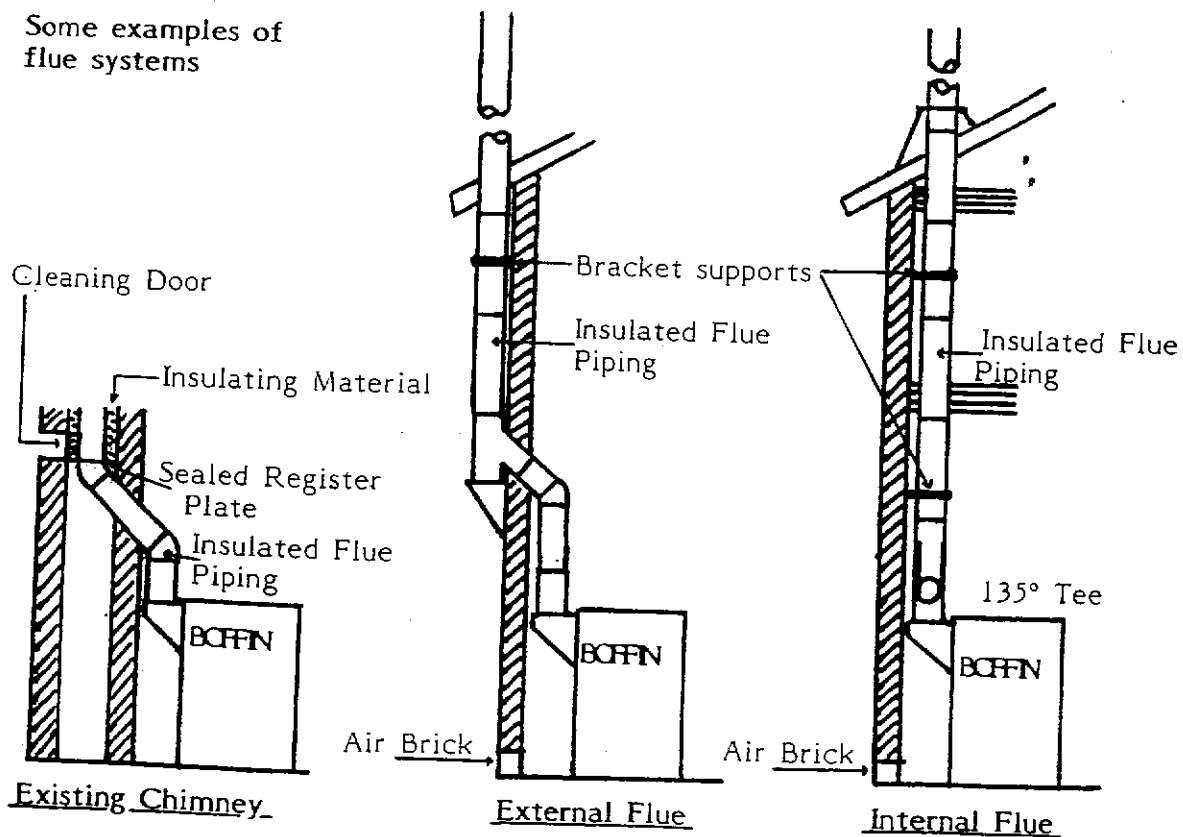
Angles Avoid angles or changes in flue section which will disturb smooth flow of the flue gases. The flue system should be kept as vertical as possible and, in general, if such angles are necessary they should be as mild as possible and low down in the system, where the gases are hot, rather than high up the system, where the gases are cooler and are more easily slowed.

Cleaning Whichever type of flue is chosen, there must be cleaning access to the whole of the flue system. A 135° tee shown in drawing 3 below.

Other Flues Flues that may have been suitable for other types of solid fuel units will not necessarily be adequate for BOFFIN. Because of its efficiency, BOFFIN's flue gas temperatures will be lower than may have been the case with its predecessor. The draw and insulation of the flue system is therefore more critical. Nearly all apparent 'faults' from smoking to excessive fuel consumption and to lack of performance due to flues with either poor or unstable draught, or with bad heat retaining properties. A good flue system may be expensive, and many people are tempted to try an existing chimney just as it is before spending the money. Occasionally this works, but more often than not, the gamble only ends up producing a disappointing performance.

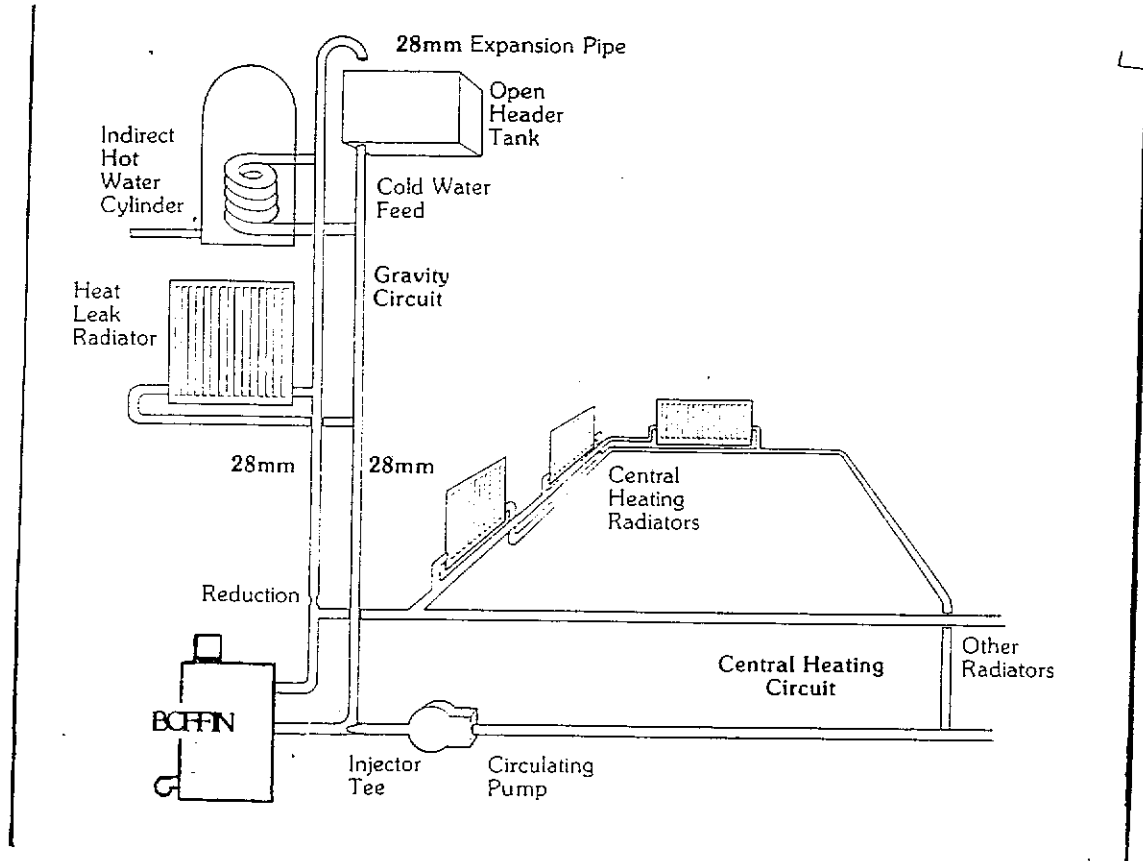
ANY SOLID FUEL APPLIANCE CAN ONLY BE AS GOOD AS ITS FLUE. SHORT CUTS IN FLUE CONSTRUCTION WILL RESULT IN POOR BOILER PERFORMANCE. PLEASE TAKE THE TROUBLE AND TIME TO GET THE FLUE RIGHT FIRST.

Some examples of flue systems



PLUMBING

The plumbing must be in accordance with all relevant regulations and practices, particularly as regards pipe sizes (see also below). It must include a gravity circuit with expansion pipe, open to the atmosphere. The central heating will normally be pump driven as with other types of boiler.



Gravity Circuit

The gravity circuit must have a potential heat leaking capability of at least 15% of the output of the unit. It usually consists of a hot water cylinder and a radiator or two (although it could equally well consist of a number of radiators and no tank). A large cylinder is preferable to a small one, and should ideally be positioned somewhere above the boiler to encourage the natural convection of hot water. The radiator(s) in series or parallel with the cylinder acts as a fail safe in the event of pump failure on the central heating circuit, allowing heat to disperse until such time as the fire has been slowed down by the thermostat. The heat sink radiator(s) may typically be installed in the bathroom or landing. All the piping in the gravity circuit including the expansion pipe should be at least 28 mm for **BOFFIN** (applies to all models), and the short section of common pipe (i.e. when gravity and central heating are running together) should be 35 mm for models 86 and 87, 42 mm for models 126 and 127, or 54 mm for models 156 and 157. For safety's sake only use valves with removable handles on this circuit.

Central Heating Circuit The central heating circuit can be designed to suit the house, and normal control devices such as timers and thermostats may be incorporated in the circuitry controlling the circulating pump. We recommend the use of individual radiator valves, partly because they help heating control and reduce fuel costs, and partly because they help to smooth out heat requirement variations in the central heating circuit.

Ensure that pipe sizes around the central heating circuit are in accordance with normal practice. The piping for the first section of the central heating circuit after the tee off the gravity flow pipe should be in line with common plumbing practice, the bore size depending on the total radiator loading. The piping may then be reduced as the Btu requirement of the balance of the circuit diminishes step by step. Similarly, the return piping should be increased step by step.

Injector Tee Where the gravity and central heating circuits join together to return to **BOFFIN**, we recommend the use of an injector tee connection, situated as close to the unit as possible. This type of tee encourages a stable flow of hot water through both circuits and helps to prevent priority being given to the stronger flow, which is most commonly the pumped central heating circuit. This way, there will not be a shortage of hot water to the taps when the heating is on. This is particularly important with the smaller output models.

Corrosion Inhibitor Always use a corrosion inhibitor when filling the system as this will help to preserve the life of the heat exchanger and the radiators. Follow the manufacturers instructions.

Circuit Temperature and Condensation The return water temperature should be maintained at no less than 40°C so as to avoid condensation on the heat exchanger and return piping. **Failure to maintain this minimum temperature will render the guarantee invalid.**

There is a built-in low temperature thermostat incorporated in the unit and wired in series with the circulating pump terminals to ensure that no cold water will be returned from the central heating circuit before the water from the gravity circuit has warmed up the common return pipe and heat exchanger. If this is not sufficient to keep the heat exchanger temperatures above the required minimum, a three or four way mixing valve and by-pass pipe may be fitted to the flow pipe to divert some hot water straight back into the return. Such a valve can be operated either manually or electrically in conjunction with a return pipe thermostat. The central heating circulating pump connections are wired to terminals Nos. 7 and 8. Additional controls such as time clocks, room thermostats, frost stats can be connected in series with the pump wiring.

Pump Controls There is a chance, as in any solid fuel central heating system, that **BOFFIN** may cause the water to boil. This is possible if the central heating circulating pump is off, no domestic hot water is being used and there is a good fire in the **BOFFIN**. To eliminate this potential problem, an anti-boiling thermostat should be fitted, such as a Danfoss AT 041 E 00 00, or similar.

Wiring The electrical connecting block is located in the box attached to the rear of the control module. Remove the box and run the various feed wires through the grommets to the block. Ensure that none of the wires comes close to the flue box area to the rear of the boiler.

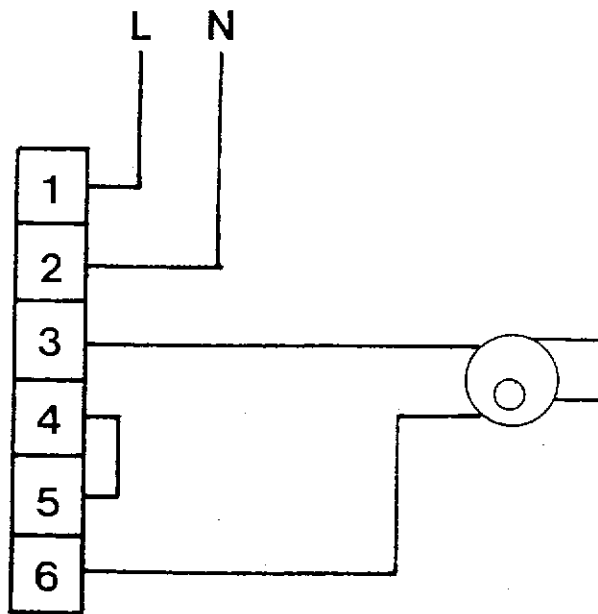
Mains electricity from an ordinary 13 amp socket should be supplied through a fused plug. The live and neutral go to number 1 and 2 of the block respectively.

The central heating pump should be wired into terminals 7 and 8.

An independent room thermostat and/or timing device may be wired into terminals 8 and 9. If no such devices are to be used, 8 and 9 should be looped together. The timing device will need to have its own power supply so that it runs even when certain parts of the BOFFIN's electrical systems are closed down.

Burner Wiring The wires from the oil or gas burner should be wired into terminals 3 and 4 (neutral and live respectively) and 5 and 6 (thermostat wires for those burners fitted with built-in thermostats). The burner supplier will know how to make these connections to the burner.

For burners **without** thermostat connections, connect the main current feed to the burner and arrange the connections to the wiring block within the control module as follows:-

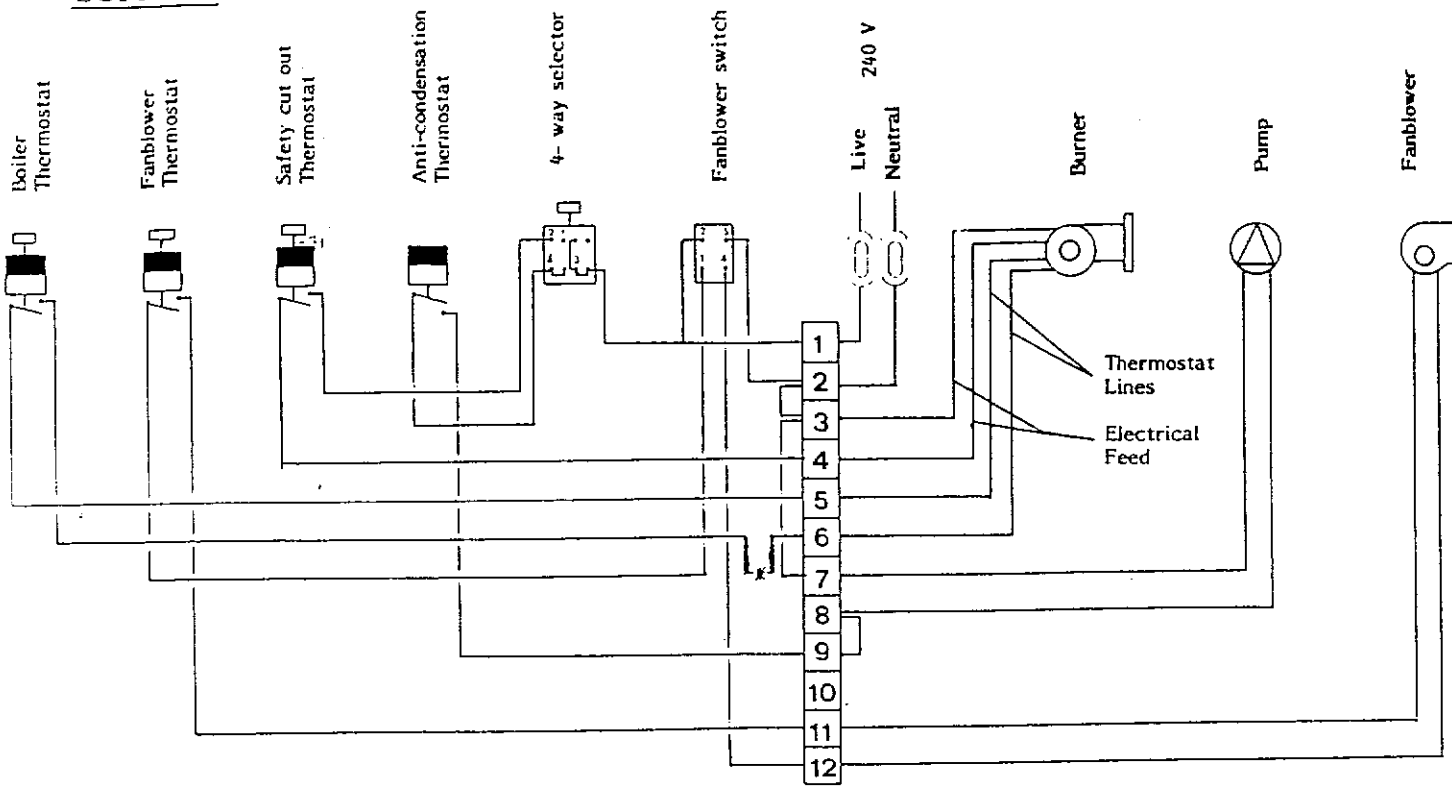


NOTE: That the positive feed wire to the burner must be moved from terminal 4 to terminal 6, having first removed the burner thermostat lines from 5 and 6. A bridge wire must then be put across terminals 4 and 5.

Wiring diagrams - See over

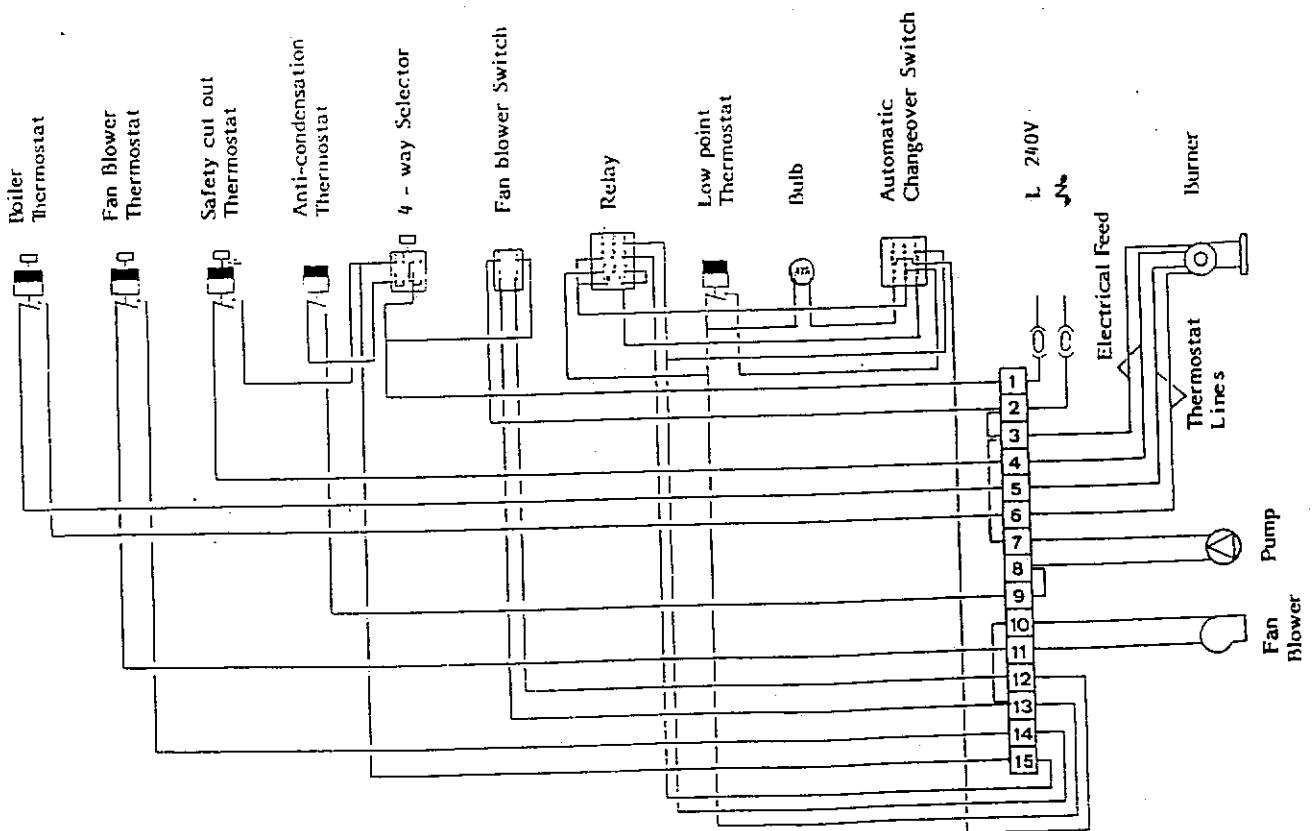
WIRING DIAGRAM

BOFFIN 6



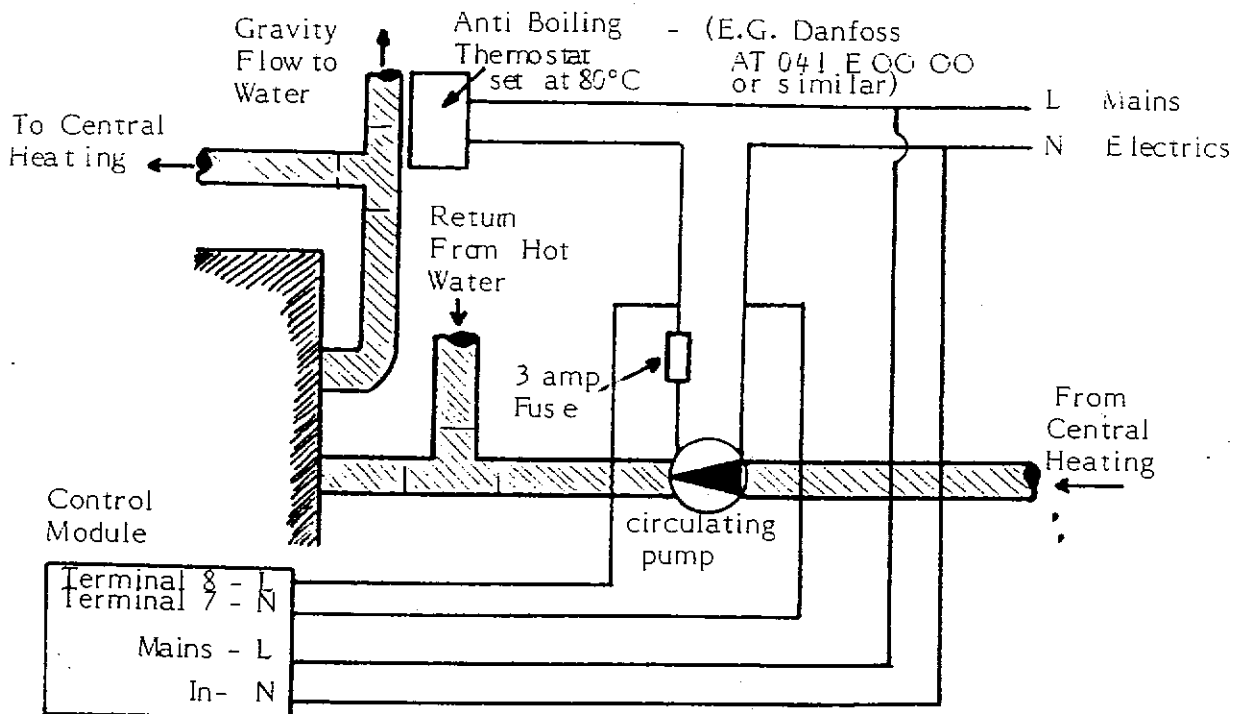
* Door Micro Switch - See Page 9

BOFFIN 7



**Wiring Cont'd
Anti-boiling
thermostat**

In the normal course of events, the overload mechanism in the control module will cut off the burner and fan blower as temperatures within the boiler reach too high a level, and boiling should thus be prevented. However, it is possible to boil the water if, for example, the lower door has not been closed and air is still being allowed into the fire. As a precaution, we strongly recommend the fitting of an anti-boiling pipe thermostat that will by-pass all the BOFFIN control system and link a mains electricity supply to the central heating pump. This thermostat should be set at around 80°C and mounted within a couple of feet of the flow tapping on the gravity circuit. Increasing water temperatures will thus bring on the pump until the flow temperatures return to a more normal level. If you find that the overload switch has to be reset despite the interference of the pipe thermostat, then try setting the pipe thermostat 5°C lower.



Mounting Oil or Gas Burner BOFFIN boilers are supplied without oil or gas burners. Many customers may already have suitable burners available from other installations, but if this is not so, burners can be obtained from local suppliers who should also be asked to commission the burner once it is installed. The appropriate fitments can be made to the burner door once the burner has been chosen; for this reason the door is supplied without pre-drilled bolt holes.

The burner should be wired both in accordance with the wiring diagram shown above and with the instructions supplied with the burner. Oil or gas connections should be made as specified in the burner instructions.

**Which
Burner?**

There are a number of burners suitable for the **BCFFIN**. Consult your installer or local burner suppliers, who will need to know about the intended output of the boiler and various other details of the installation. From this information, they will recommend a model and burner nozzle size suitable for the output required.

**The fan
blower**

The fan blower supplied with the **BOFFIN** should be bolted into position on the lower door, making sure that a good tight fit is made with the housing port. The electric supply socket is next to the lower door, and the fan blower plug can be inserted into this socket either way round. The hinged flap inside the fan housing port is designed to drop when the fan blower cuts off, stopping air being drawn into the firebox. When the fan blower is on, the height to which this flap will rise, and therefore the amount of air entering the firebox area, is controlled by the limiting screw on top of the external part of the housing port. This limiting screw will generally be set so that the flap lifts by no more than finger thickness. If smoke is ever emitted from the secondary air slide on the loading door when the fanblower comes on, the limiting screw should be used to close down the flap, bit by bit, until the smoking no longer occurs.

The motor of the fan blower becomes quite hot during normal operation, so make sure that no combustible materials can come into contact with it.

**Door micro
Switch BOFFIN
6 only.**

The switch fitted to the swing-in burner door of the **BOFFIN 6** is to prevent the burner from firing if the door is opened. Run a twin-core wire through the grommet on the switch housing, and connect to the two terminals. The other end of the wire can then run up the right hand side of the unit and to the wiring block on the back of the control module, taking care not to contact any hot surfaces on the way. Detach a wire from terminal six (see wiring diagram on page 7) and join it to one core of the microswitch wire. Connect the other core into terminal 6. An alternative method is to run a twin core wire from the switch directly to the burner, if it is possible to get at the electrical feed connections on the burner. Detach the live wire from the burner, join it to one of the switch cores, then connect the other core to the connector.

OPERATING ADVICE

- ** Test water circuits, check flue, check electrical connections.
- ** Set controls for mode operation.
- ** Light according to instructions.
- ** Keep appliance clean and chimney well swept

Pre-burn Fill the water circuits and test for leaks, air locks, pump operation, valve operation etc, then drain the system and flush through. Refill, including corrosion inhibitor. The flush is to remove acidic elements that may have lodged in the system during the plumbing installation, and is essential. The guarantee on BOFFIN will be invalidated if an adequate flush is not undertaken and if a corrosion inhibitor is not included in the final fill. NEVER light BOFFIN if there is any chance that the water jacket is not full of water.

Make sure that satisfactory connections have been made to the electrical systems. See that there are wires leading to (a) the burner, (b) the pump, (c) the mains, (d) an external thermostat (if required) and (e) that the fanblower is plugged in.

Complete the flue and seal the connection onto the flue box.

Operate the riddling mechanism and ensure that it feels free. The square hole in the end of the riddling handle fits over the square bar to be found through the circular access hole in the right hand panel. Return the handle to a vertical position after using the mechanism. Make sure that the rope gaskets around the front doors make a good seal. If there are any gaps, ease the rope out of its housing a little with a screwdriver.

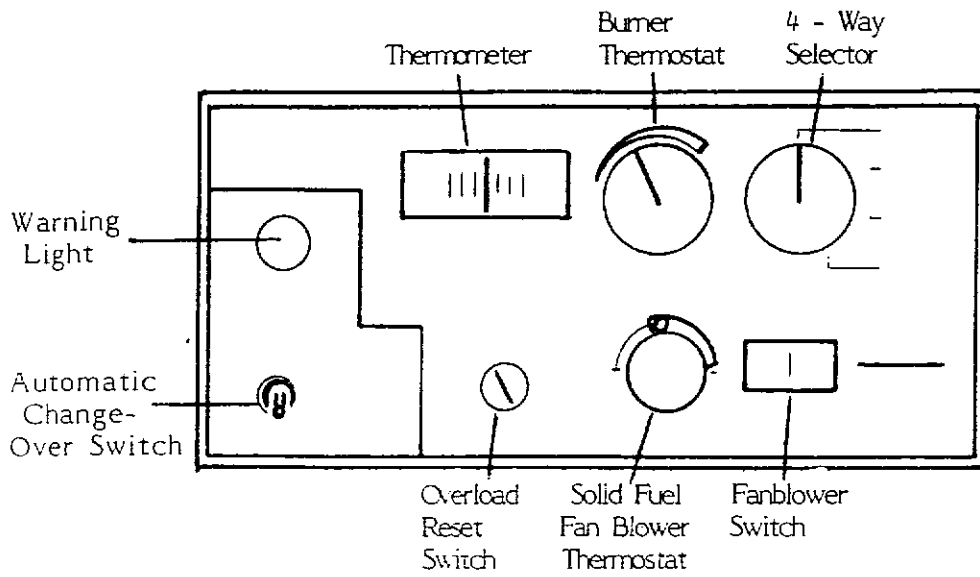
Set Controls When first firing BOFFIN set the 4-way selector to the correct season/fuel combination.

Position 0 and 3 are for solid fuel use and the fan blower should be turned ON when these positions are selected. On the BOFFIN 7, if the automatic switch over is to be used, positions 0 and 3 should be selected. Position 0, on either model 6 or 7, is for domestic hot water only, position 3 for central heating as well. On the BOFFIN 7, if the automatic change over facility is to be used later, do not move its control switch to ON until the water temperature has reached at least 40°C.

Positions 1 and 2 are for the burner only and give domestic hot water or domestic hot water plus central heating respectively.

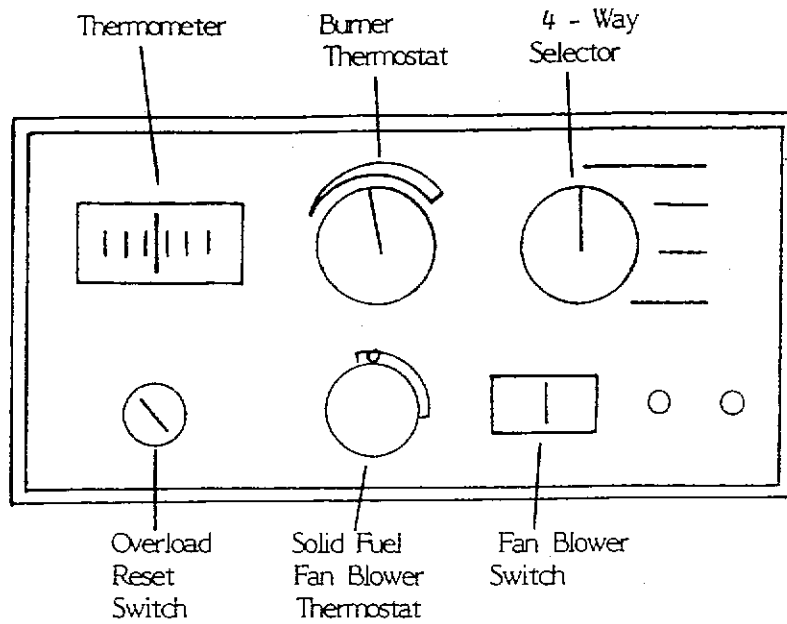
The functions of the various controls are described in more detail below.

Electric Controls - BOFFIN 7



THE 4-WAY SELECTOR SWITCH

Position	Function	Fuel	Other Settings	
			Automatic change-over Switch	Fan blower Switch
0	Summer domestic hot water	Solid fuel only	OFF	ON
		Automatic change over from solid fuel to burner when necessary	ON (Once water temp. has been established)	ON
1	Summer domestic hot water	Burner only	OFF	OFF
2	Winter domestic hot water and central heating	Burner only	OFF	OFF
3	Winter domestic hot water and central heating	Solid fuel only	OFF	ON
		Automatic change over from solid fuel to burner when necessary	ON (Once water temp. has been established.)	ON



THE 4-WAY SELECTOR SWITCH

Position	Function	Fuel	Fan Blower Switch	Thermostat to be set
0	Summer domestic hot water	Solid fuel only	ON	Fan Blower
1	Summer domestic hot water	Burner	OFF	Burner
2	Winter hot hot water and central heating	Burner	OFF	Burner
3	Winter hot water and central heating	Solid fuel	ON	Fan Blower

CONTROLS - ALL MODELS

Fan Blower Switch This switch operates the solid fuel fan blower and should be turned **ON** whenever positions **0** and **3** are used on the 4-way selector. Turn the switch **OFF** when you wish to allow the fire to slow down and die away. See also 'Solid Fuel Fan Blower Thermostat' below.

Solid Fuel Fan Blower Thermostat This thermostat is set to control the water temperature at which the fan blower will come on and go off. Generally, the fan should come on to boost the fire if the boiler thermometer drops below 60°C, and should go off if the boiler thermometer exceeds 75°C or so. It may be adjusted, if necessary, after loosening the locking screw.

Burner Thermostat This thermostat acts in much the same way as the solid fuel fan blower, but controls the oil or gas burner operating temperatures. Try a setting somewhere around the halfway position to start with, then adjust as necessary.

Automatic Changeover Switch 7's only Set this switch to **ON** if you wish the burner to take over from a solid fuel fire once it is exhausted. With the 4-way selector on **0** or **3** and water temperature dropping below 35°C the fan blower will go off and the burner will cut in. When the 4-way selector is on position **1** or **2**, the automatic changeover switch has no function.

Thermometer In Centigrade this shows water temperature in the boiler. Note that the sensor for this thermometer is located at the top of the boiler, and that the temperature of the water at the bottom of the boiler may be cooler for a time after the fire or burner is lit. However, when the system has achieved temperature and particularly when the central heating circulating pump is on, the water temperature in most of the boiler will be that indicated by the thermometer.

Overload Reset Switch This switch will cut the electric current to both the fan blower and burner if the boiler temperature climbs too high. To reset, unscrew the cap and press the button, once the temperature has dropped.

Lighting Solid Fuel Lay a conventional fire of newspaper and kindling through the clinker gate behind the lower door. Leave the fan blower switch off at this time. Light the fire and allow it to establish, adding more kindling until a good size fire has taken hold. Close the clinker gate and lower door and turn on the fan blower switch. Progressively, load up the fire through the top loading door.

Condensation It is not unusual for some condensation to form on the heat exchanger when the unit is first lit and the boiler skins are clean. This may even trickle down into the ash pan areas if there is heavy vapour in the flue gases. As a precaution, protect any flooring that you do not wish to get damp. After a few days, the boiler skins will lose their smooth finish and should not attract vapour quite so readily. **BOFFIN** is fitted with a low temperature thermostat that prevents the pump coming into operation, thus allowing water temperature to rise above the condensation point. Do not over-ride this system and cause the pump to return volumes of cold water to the boiler on a continuous basis.

Condensation Constant low temperatures and subsequent condensation will reduce the life of the water jacket.

If condensation proves to be an on going problem whenever the pump comes on, try turning on the radiators of the central heating system one by one, so that the system is gradually heated up. See also 'Problems' near the back of this booklet.

Adjusting the fan blower Once the system has been raised to a normal working temperature, and the flue has warmed through, it may in some cases be necessary to adjust the fan blower. For example, in the event of the draught from the flue system being on the slow side, the pressure created in the firebox whenever the fan cuts in may cause smoke and fumes to be emitted from the unit. The limiting screw on top of the fan blower housing port can be screwed down a little to eliminate the emission. If the smoke and fume emission continues even after the limiting screw is adjusted, make a close examination of the flue system and its ability to draw away the gases from the firebox.

Firing the burner - BOFFIN 6 The removable baffle plate must first be positioned (holes down) so that it leans against the lower edge of the heat exchanger tubes and rests on the inner edge of the loading port. Check that the burner is securely held in position and properly connected to its electrical and fuel feeds, and that any remnants of a solid fuel fire have been removed from the grate. With the mains electricity supply turned OFF, fasten the burner door to the lower door and close both the main boiler doors. Turn the mains electricity on and select position 1 or 2. Choose a mid-way position for the burner thermostat, then adjust as necessary in due course. As mentioned above, the burner supplier should normally commission the burner when first installed to match the adjustment of the burner to the flue draught.

Firing the burner - BOFFIN 7 Ensure that the stainless steel tubular baffle is in position, and that the burner is held firmly in position. With the mains electricity supply turned OFF, bolt the door firmly shut. Turn the mains on and select position 1 or 2. Choose a mid-way position for the burner thermostat, then adjust as necessary in due course. As mentioned above, the burner supplier should normally commission the burner when first installed to match the adjustment of the burner to the flue draught.

Changeover from solid fuel to oil or gas BOFFIN 6. Allow the solid fuel fire to burn down and remove its ashes through the clinker gate. Then follow the procedure described in 'Firing the burner - BOFFIN 6' above.

BOFFIN 7. For manual rather than automatic change over (when the solid fuel fire is dead), switch the 4-way selector to position 1 or 2. The burner should now fire.

For an automatic change over, turn on the switch to the left of the control module while the boiler is in operation on solid fuel and working temperature is normal. Leave the 4-way selector on position 0 or 3 and the fan blower switched ON. The burner will not fire until the solid fuel fire cannot support water temperature. Note that it is not possible to make normal use of the automatic change over facility by putting the automatic switch in the ON position at the same time as lighting the solid fuel fire from which the burner is supposed to take over; the system would sense that the water was cold and would bring the burner on straight away. The automatic switch should therefore only be turned ON after the boiler temperature has been raised by the fire.

Ash Bed Some attention should be paid to the amount of ash that is allowed to build up in the firebox. Wood has better burning characteristics if a bed of ash is allowed to build up, riddling only being necessary to liven up the fire. Coal or smokeless fuels, on the other hand, burn better if they are well riddled to allow a good air flow to the fire. For slow combustion, it is better to have a thicker ash bed for all fuels. Therefore do not riddle the fire before slowing it down for overnight burning, but riddle if required in the morning.

Riddling Position the riddling handle on the right hand side of the unit and riddle as slowly or as vigorously as necessary for the fuel. Always leave the riddler in the vertical position at all other times. The ash pan may need emptying once a day or so.

Running Rate If the appliance is run for extended periods on a low fire, especially when burning wood, the fire can cool down to such an extent that vapour in the flue gases may condense. This will make the inside of the flue damp so that the soot sticks to the flue, and the tarry mixture formed may drip down into the appliance or may seep through the walls of the flue. To eliminate this, it is always a good idea to run the **BOFFIN** at a high rate wherever possible. Because it is so easy to light, a lot of people, especially in the summer, run the appliance for just a few hours with a roaring fire. This appliance is then allowed to die until the hot water is used up and then **BOFFIN** is relit. From the appliance and the flue point of view, this is a better technique than running a low fire continually.

Secondary Air Slide The solid fuel loading door is fitted with a slide that will allow secondary air into the top of the firebox and ensure that all the useful volatile gases produced by the fire are efficiently burnt. At any time, if opening the loading door causes the fire to brighten, the slide can be left open to allow oxygen in. Opening the slide can also help to reduce the condensation that may form on a cold boiler, by adding dry air to the flue gases.

Fuels

Wood

WOOD must be well-seasoned and dry. Unseasoned and wet wood **MUST NOT** be burned at any cost. The chemicals contained in the flue gases of unseasoned wood will collect on the surfaces of the heat exchanger and flue system, particularly at low temperatures, and will start to attack any metal they touch. There is also a chance that creosote will seep through the flue walls, appearing as a brown stain on the internal and external walls of the building.

WOOD must be well seasoned and dry, the moisture content being 20% or lower. Wood that has been cut, split and stacked for more than a year in a well aerated stack may be just about ready for burning, but two or three year old wood is even better. Radial cracks in the end of a log may be a good sign that the wood is seasoned enough to burn. In any case, the stack should be under cover for three months before burning. Larger logs will burn for longer periods of time and are therefore preferable for overnight burning. Small logs may produce more heat more rapidly but burn away somewhat quicker.

Solid Fuel

Most grades of coal, coke and smokeless fuels will burn on **BCFFIN**, each fuel with its own characteristics.

NOTE: With certain lower grades of coal there may be a tendency for a fresh load to completely blanket the fire, so that volatile gases are produced but travel away unburnt. Once flames and oxygen get through to these gases, the fire will burst into life quite fiercely. It is therefore a good idea to stand a few logs in the corners of the fire before adding a fresh load so that flames have a path up to the top of the fire and can burn off the volatile gases. It is also a good idea to leave open the secondary air slide on the loading door whenever this situation may occur, so that the extra oxygen can encourage efficient burning above the fire. If this phenomenon persists, change to a larger size of coal or mix half-and-half with logs to break up the blanket of fuel. **WITH ANY COAL ALWAYS OPEN THE LOADING DOOR SLOWLY IF THE FIRE HAS BEEN FRESHLY LOADED.**

Clinker

Certain types of fuel burn at a high enough temperature to form clinker. Generally fuels that form heavy clinker should be avoided, as the grate may become jammed and air will find it difficult to get through to the fire. If you do experience clinkering, simply open the clinker gate once the fire has died and scrape the deposits out into the ash pan.

NB A large variety of fuels can be burned in **BOFFIN**, from wood to various coals, to smokeless fuel. Each fuel has a different heat content and a different price and therefore a little experimentation with a variety of fuels will produce one that performs in the right way at the right cost.

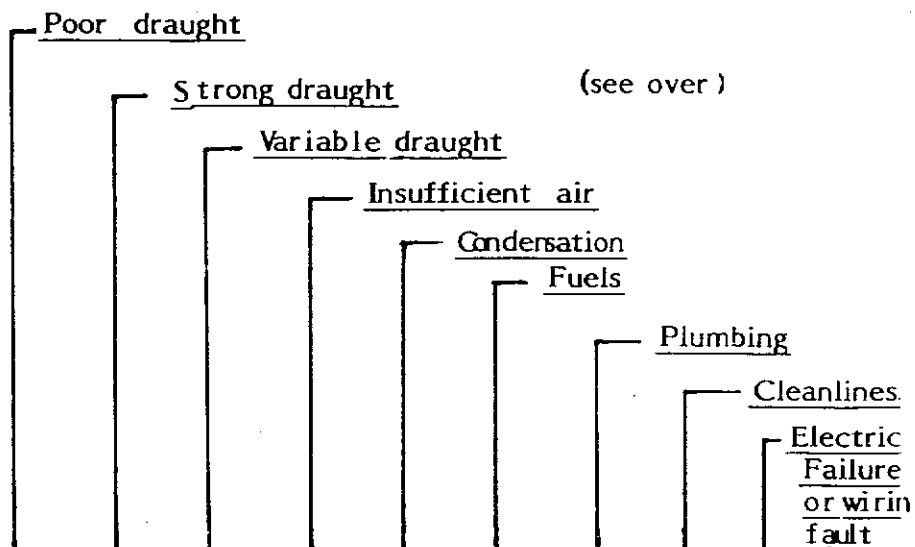
MAINTENANCE AND CLEANING

In the Boiler For most efficient heat transfer through the water jacket, all surfaces that come into contact with the flue gases should be kept clean. Regular cleaning will maintain the efficiency of the unit. Use the scraping tool to remove deposits from the inside surfaces of the firebox and from the square heat exchanger tubes. To keep deposits to a minimum, it is a good idea to have a fast fire for 15 minutes at least once a week. Loose deposits will be scoured off and will make the necessity of cleaning out less frequent.

Chimney Cleaning The flue or chimney will need to be cleaned regularly. How often will depend a lot on how your BOFFIN is run, but, to start with, make a point of inspecting the flue system every three or four weeks. This period may well be extended as time goes by if there is little sign of deposition. Some people find they need to sweep the flue every six to eight weeks, but a longer period is more normal, and in some cases this may be as long as 12 months. **N.B. Check regularly for deposits in the flue box.**

Precautions when not in use If BOFFIN is not to be used for a week or longer, you will need to avoid corrosion and condensation by cleaning the boiler surfaces, heat exchanger tubes and flue box, and by leaving open the ash door to allow the passage of air.

SOME POSSIBLE PROBLEMS



- Difficulty achieving boiler temperature
- Difficulty maintaining fire
- Unresponsive Fire
- Smoke and smell in room
- Smoke emitted when loading
- Rapid sooting up of flueways and chimney
- Overnight dead fire: fuel unburnt fuel exhausted
- Uncontrollable burning
- Performance affected by wind
- Smoke from boiler when door slammed
- Dampness and tar at base of unit
- Pump starves hot water system
- Burner or fan blower inoperative

	A	B	C	D	E	F	G	H	J
Difficulty achieving boiler temperature	X			X		X		X	
Difficulty maintaining fire	X	X				X			
Unresponsive Fire	X			X		X			
Smoke and smell in room	X			X					
Smoke emitted when loading	X		X	X					
Rapid sooting up of flueways and chimney	X					X			
Overnight dead fire: fuel unburnt fuel exhausted	X	X		X		X X			
Uncontrollable burning		X	X						
Performance affected by wind			X	X					
Smoke from boiler when door slammed				X					
Dampness and tar at base of unit	X				X				
Pump starves hot water system							X		
Burner or fan blower inoperative									X

SOLUTIONS

- A. Poor Draught** May be caused by poor insulation, severe angles, insufficient height, air leaks, blockages or voids in the flue system. See **Installation Specification** concerning the flue, near the front of this booklet, or consult your **BOFFIN** installer.
- B. Strong Draught** This is quite often caused by a particularly strong wind from a particular direction. Consult your installer or **BOFFIN** main distributor.
- C. Variable Draught** Is usually caused by wind conditions around the top of the chimney. These conditions may be the result of the relative positions of trees, buildings or the ridge of the roof. Extending the chimney or fitting an anti-draught cowl may be the solution. Consult your **BOFFIN** distributor.
- D. Insufficient Air** Entering the room can be solved by inserting an air brick of at least 70 sq. inches into the wall close to the **BOFFIN**, but not in a negative pressure area, where air may be sucked out of the room rather than allowed into it.
- E. Condensation** This is caused by cold water in the heat exchanger. A low temperature thermostat controlling the pump is fitted to **BOFFIN** to help ensure that cold water is not pumped into the boiler. It allows the heat to build up slowly around the system by turning the pump on intermittently, and it should never allow the boiler temperature to drop below 40°C. When the pump is finally turned on full-time, the temperature difference between flow and return should never be more than 20°C. If the difference is greater, ask your plumber about a mixing valve and by-pass pipe which will ensure that water returning to the boiler is always of a reasonable temperature. Always leave the air slide on the loading door open at such times as condensation may occur, to allow in dry air.
- F. Fuels** May need some experimentation. Large lumps of wood for a long burn; keep a check on deposits with 'dirty' fuels such as coal; running faster means running cleaner; powerful smokeless fuels give a good long run. See also 'Fuels' under **Operating Advice**.
- G. Plumbing** That is incorrectly installed may result in poor flow or even reverse circulation around the gravity system. Look closely at the bore and verticality of the piping, and the type of tee used to join the returns together. See also 'The Plumbing' under **Installation Specifications**.

continued...

H. Cleanliness Is important for good heat transfer from the flue gases to the boiler water. See 'Maintenance and Cleaning' under **Operating Advice**.

J. Electrical Failure If the burner or fan stops during normal operation, check the overload switch on the control module and the fuse on the mains electrical feed. If any of the electrical equipment fails to work from the time of installation, ask the installer to check the wiring of the control module. If the burner refuses to fire but everything else seems alright, contact the burner supplier.