

Part No. DOC 25 Rev. 09 November 2004

SUPPLEMENTARY INSTALLATION  
and  
USER INSTRUCTIONS

## **COMBI 90 OUTDOOR MODULE MkII**

For use with Kerosene or Gas Oil

**TO BE READ IN CONJUNCTION WITH THE INSTRUCTION MANUAL SUPPLIED  
WITH THE BOILER**

This supplementary manual **MUST** be used for the installation of the boiler, pipework, electrical wiring and associated controls.

For information on servicing the boiler, including burner fault finding, repair and servicing, please refer to the Combi 70 and Combi 90 instruction manual supplied with the appliance.

Please refer to the users instructions in this supplement.

After installing the boiler leave these instructions with the User

**This appliance is deemed a controlled service and specific regional statutory requirements may be applicable**



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## 1 - USER INSTRUCTIONS

### 1.1 Boiler controls (see Fig. A)

To access the Outdoor module controls, remove the front panel by turning the handle and withdrawing it forwards at the bottom.

### 1.2 Lighting your boiler (see Fig. A)

- 1 Ensure that** - There is sufficient fuel, of the correct type, in the supply tank and all fuel supply valves are open. The water supply is on. The electricity supply to the boiler is off. The boiler On/Off switch is set to OFF, the pump and burner switches are set to off (the neons in the switches are not alight). The room thermostat (if fitted) is at the desired setting. The boiler thermostat is set to the required setting.
- 2 Switch on the electricity supply to the boiler.
- 3 Set the On/Off switch to ON and the heating timer (if fitted) to ON. Set the burner and pump switches to ON. A neon in the switch lights when it is in the on position. The boiler will now light automatically.

### 1.3 Turning off your boiler (see Fig. A)

**For short periods** - Set both the burner and pump switches to OFF.

To restart, simply set both switches to ON.

**For long periods:** Set both the burner and pump switches to OFF. If required, the fuel supply valve may be closed and the water and electricity supplies turned off at the mains.

**Note:** The built in frost thermostat will not operate if the electricity supply to the boiler is switched off.

### 1.4 Points to check if burner fails to light

- 1 Check that the boiler On/Off, burner and pump switches are set to ON.
- 2 Check that the timer (if fitted) is working and is in an 'on' period.
- 3 Check that all thermostats are set to the desired setting and are calling for heat.
- 4 Check if the burner 'Lock-out' reset button is lit. If it is, press it to start the burner. If the burner fails to light and goes to 'Lock-out' again, check that you have sufficient fuel in the storage tank and that the fuel supply valve is open.
- 5 Ensure that a fuse has not blown or that the electricity supply has not failed.
- 6 Check to see if the safety thermostat has operated.

If the burner still fails to light after carrying out these checks then a fault exists. Switch off the electricity supply to the boiler and contact your Service engineer.

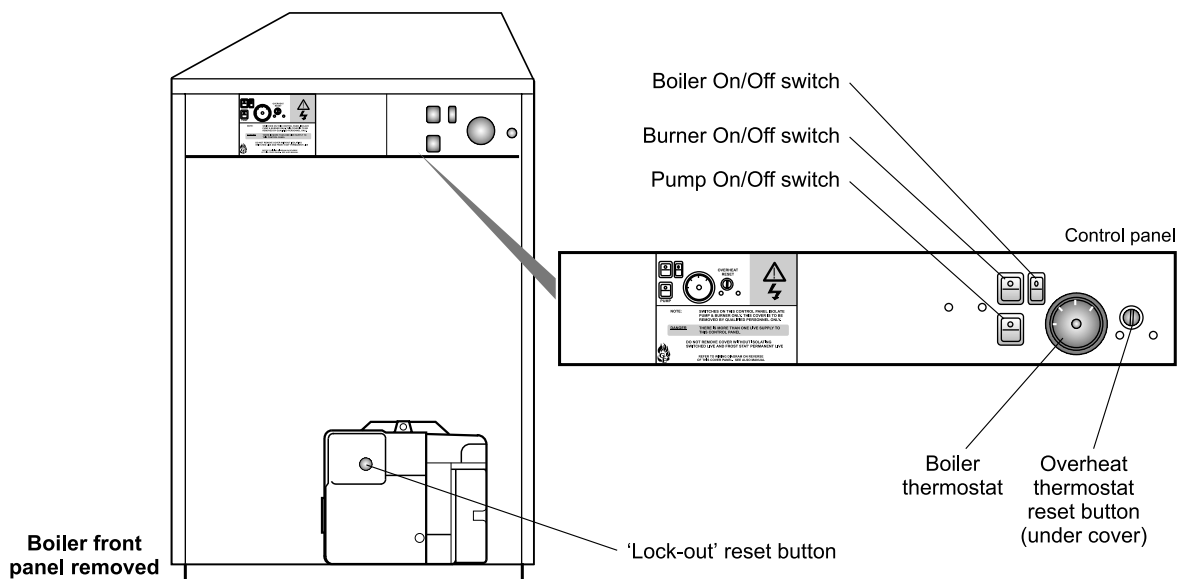


Fig. A

2 - BOILER TECHNICAL INFORMATION

2.1 Boiler dimensions

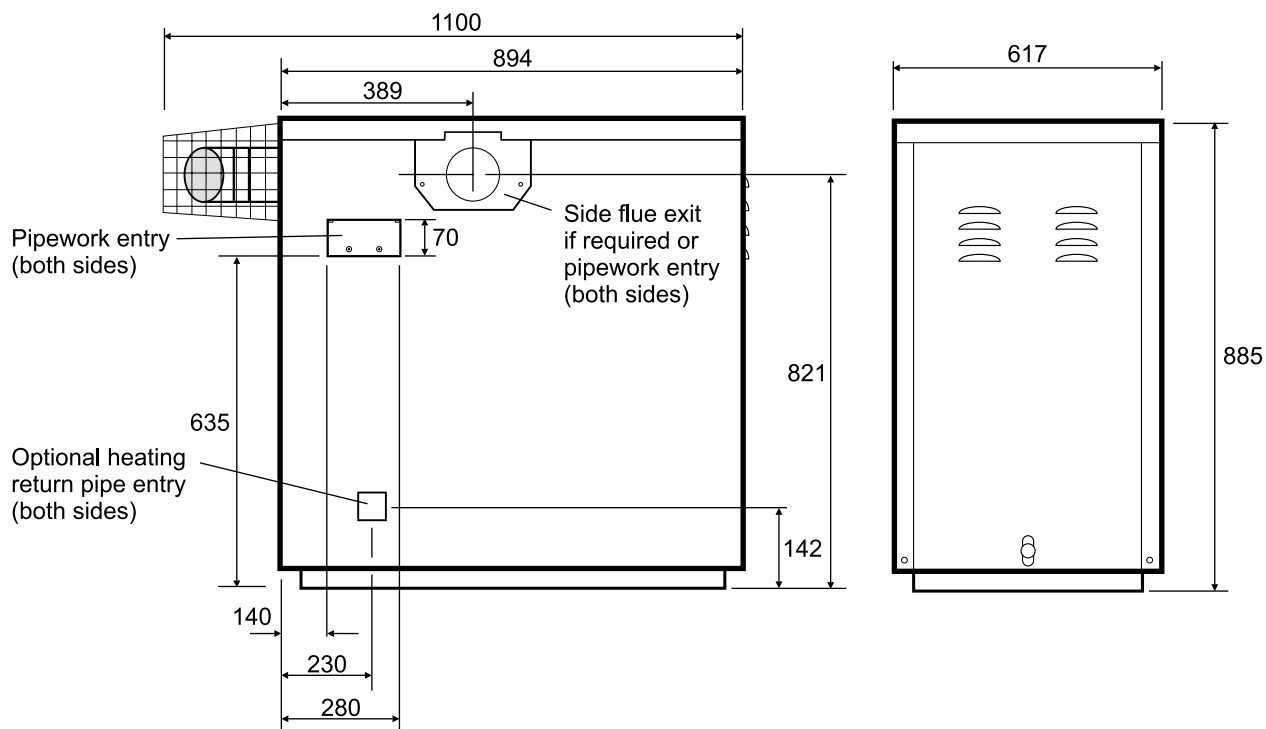


Fig. 1



## 2 - BOILER TECHNICAL INFORMATION

### 2.2 Boiler technical data

Model		Combi 90
Boiler water content	litre	40
	gal	8.8
* Weight (dry)	kg	202
	lb	445
Max. heat input (Kerosene)	kW	27.6
	Btu/h	94 200
Connections:	Heating flow and return	Flow - 22 mm copper pipe, Return - 1" BSP
	Cold water mains inlet	15 mm copper pipe
	Domestic hot water outlet	15 mm copper pipe
	Pressure relief valve discharge	15 mm copper pipe
Boiler thermostat range		75 to 85°C
Limit (safety) thermostat switch off temp.		111°C ± 3°C
Maximum heating system pressure (cold)		1.0 bar
Minimum heating system pressure (cold)		0.5 bar
Pressure relief valve		2.5 bar
Expansion vessel		12 litres (pre-charged at 1.0 bar)
Maximum heating system volume		90 litres (approximately)
Maximum operating pressure		2.5 bar
Minimum domestic hot water flow rate		3.0 litres/min (0.66 gal/min)
Maximum domestic hot water temperature		65°C
Maximum mains water inlet pressure		8.0 bar
Minimum recommended mains water inlet pressure		2.5 bar

### 2.3 Combi 90 Outdoor Module using Class C2 kerosene

**Note:** Boilers are despatched for use with kerosene.

Heat Output		Net Heat Input		Net eff. ** (%)	Head type	Nozzle size	Oil press. (bar)	Smoke No.	Fuel flow rate (kg/h)	Net flue gas temp. (°C)	Flue gas mass flow rate (kg/h)	CO <sub>2</sub> (%)
(kW)	(Btu/h)	(kW)	(Btu/h)									
26.4	90 000	27.6	94 200	95.8	LD3	0.75/60°EH	9.5	0 - 1	2.40	180	38.7	12.0

### 2.4 Combi 90 Outdoor Module using Class D gas oil - Conventional flue only

Heat Output		Net Heat Input		Net eff. ** (%)	Head type	Nozzle size	Oil press. (bar)	Smoke No.	Fuel flow rate (kg/h)	Net flue gas temp. (°C)	Flue gas mass flow rate (kg/h)	CO <sub>2</sub> (%)
(kW)	(Btu/h)	(kW)	(Btu/h)									
26.4	90 000	27.9	95 250	94.6	LD3	0.60/60°S	12.0	0 - 1	1.97	200	38.7	12.0



**Notes:**

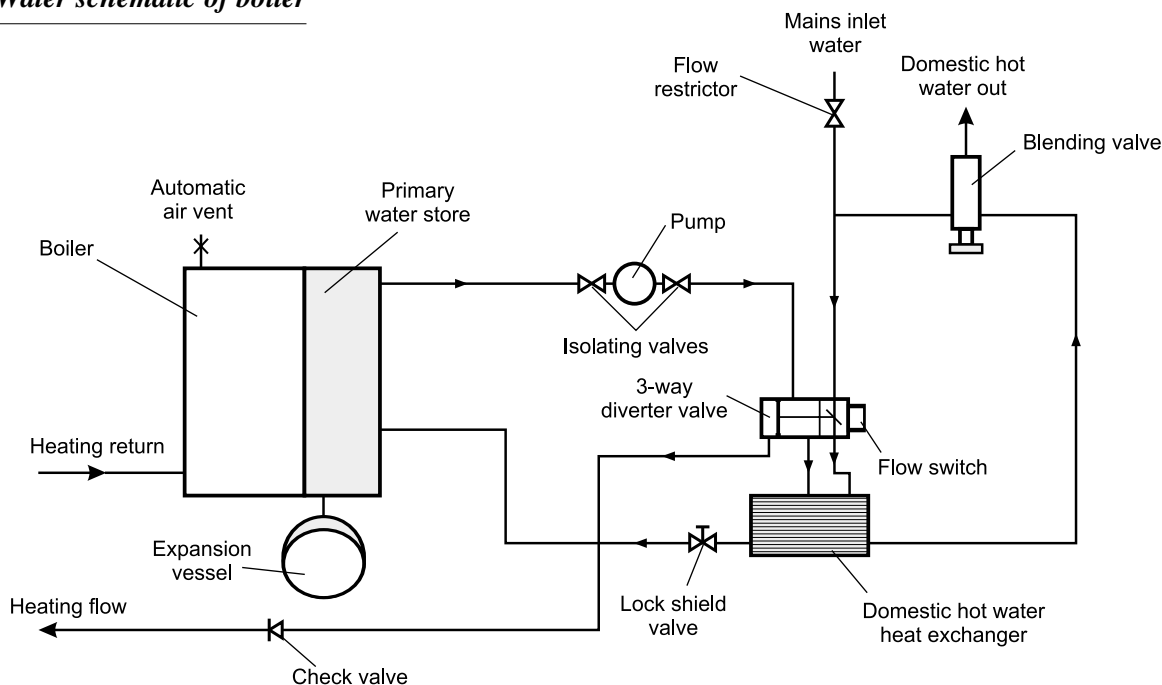
- 1 The data given above is approximate only.
- 2 The above settings may have to be adjusted on site for the correct operation of the burner.
- 3 Gas Oil is **not** suitable for use with the low level discharge of the Outdoor modules.
- 4 Net flue gas temperatures given are  $\pm 10\%$ .
- 5 \*\* Net thermal efficiency (BSRIA).

To obtain the correct CO<sub>2</sub> level, the final flue gas reading must be taken with all casing and door panels fitted.

### 2.5 Air damper settings

**Note:** The burner is supplied factory set at the output given in Section 2.3. When commissioning, the air damper **must** be adjusted to obtain the correct CO<sub>2</sub>.

### 2.6 Water schematic of boiler



**Fig. 2**

## 3 - GENERAL BOILER INFORMATION

### 3.1 Boiler description

The Grant Outdoor Combination boiler has been designed for use with a sealed central heating system and will provide domestic hot water at mains pressure. The boiler is supplied with the burner fitted and is suitable for use with kerosene only when used with the factory fitted low level discharge flue system. The flue can be adjusted on site for either rear, left hand or right hand flue outlet position, as required. A Conventional external stainless steel flue system is available for use with kerosene or gas oil.

The temperature of the water leaving the boiler to heat the radiators may be adjusted using the control thermostat. It is recommended however, that the thermostat is set to maximum to achieve optimum hot water performance. The temperature of the domestic hot water is controlled by a thermostatic mixing valve located in the insulated rear compartment of the boiler casing. Please also refer to Sections 3.5 and 3.6.



## 3 - GENERAL BOILER INFORMATION

### 3.2 Delivery

The Outdoor Module is supplied in one pack, with the burner and control panel factory fitted. The flue terminal and wire guard are supplied loose (inside the carton) for fitting on site.

### 3.3 Regulations to comply with

Installation of a Combi boiler must be in accordance with the following recommendations:-

- a Building Regulations for England and Wales, and the Building Standards for Scotland issued by the Department of the Environment and any local Byelaws etc.
- b Model and local Water Undertaking Byelaws.
- c Applicable Control of Pollution Regulations.
- d The following OFTEC requirements:-
  - OFS T100 Polythene oil storage tanks for distillate fuels.
  - OFS T200 Fuel oil storage tanks and tank bunds for use with distillate fuels, lubrication oils and waste oils.

Further information may be obtained from the OFTEC Technical Information Book 3 (Installation requirements for oil fired boilers and oil storage tanks).

The installation should also be in accordance with the latest edition of the following British Standard Codes of Practice:-

- |           |  |
|-----------|--|
| BS 715    | Metal flue pipes, fittings, terminals and accessories.             |
| BS 799:5  | Oil storage tanks.   |
| BS 1181   | Clay flue linings and flue terminals.                              |
| BS 4543:3 | Factory made insulated chimneys for oil fired appliances.          |
| BS 4876   | Performance requirements for oil burning appliances.               |
| BS 5410:1 | Code of Practice for oil firing appliances.                        |
| BS 5449   | Forced circulation hot water systems.                              |
| BS 7593   | Code of Practice for treatment of water in heating systems.        |
| BS 7671   | Requirements for electrical installations, IEE Wiring Regulations. |

**Failure to install and commission appliances correctly may invalidate the boiler warranty.**

### 3.4 Fuel supply

For details of the fuel supply, refer to Section 3.4 in the main Installation and Servicing instructions supplied with the boiler.

### 3.5 Method of operation

Once the boiler is switched on it will always provide domestic hot water upon demand. The timer only controls the operating times of the central heating. When central heating is not required, the timer switch should be set to OFF.

Domestic hot water supply always takes priority over central heating. If a demand for hot water occurs during a period of central heating, the boiler mode will automatically change to provide hot water until the demand ceases. This interruption in the central heating only lasts for as long as hot water is required and should not be noticed by the User.

**Central Heating Mode** - If there is a call for heat, i.e. the timer and room thermostat (if fitted) are calling for heat, the pump will start to circulate the central heating water and the burner will light. When the temperature in the boiler reaches that set on the boiler thermostat, the burner is turned off. The pump continues to run, circulating water around the system, for as long as both the timer and room thermostat (if fitted) are calling for heat. As the heating system water cools, the temperature drop is detected by the boiler thermostat and the burner is automatically restarted for the cycle to continue until either the timer or room thermostat stops calling for heat. The burner and pump are then turned off.

**Domestic Hot Water Mode** - When a demand for hot water (by opening a hot tap, etc.) is sensed by the diverter valve flow switches, the pump starts and the water in the boiler is diverted through the domestic hot water heat exchanger, heating the incoming mains water. The hot water produced is mixed in the thermostatic blending valve with incoming mains water to automatically ensure that the temperature does not exceed 65°C.

**Note:** For optimum performance it is recommended that the thermostatic blending valve is set to provide a hot water temperature at the outlets between 45 and 50°C.

**Note:** If the water in the boiler is already up to temperature, there will be a delay before the burner starts to maintain the water temperature in the boiler.



When the hot tap is closed and the diverter valve flow switches sense that hot water is no longer required, if the remote timer is set to either TIMED or CONSTANT, the boiler will return to the central heating mode, with the pump and burner running. If the timer is not calling for central heating, the pump is turned off but the burner will continue to run for a short period until the water in the boiler reaches the required temperature ready for another hot water operation.

#### 3.6 Domestic hot water system

1 A hot water flow rate of up to 17 litres/min is available, dependant on mains water pressure. To maintain a longer and more consistent hot water temperature, a flow restrictor is factory fitted to limit the flow rate to approximately 15 litres/min. The flow restrictor is located in the outlet side of the cold water inlet isolating valve.

2 The incoming mains water pressure should be between 1 and 8 bar to ensure efficient operation. If the pressure is above 8 bar a pressure reducing valve must be fitted.

The boiler may still operate down to a pressure of 1.0 bar but with a reduced flow rate. Below 1.0 bar the hot water flow switch will turn the boiler off. The minimum flow rate needed for the flowswitch to operate is 3 litres/min.

3 To ensure economic use, the pipe runs between the boiler and hot taps should be in 15 mm copper pipe and be as short as possible. Where possible the pipework should be insulated to reduce heat loss.

4 All taps and mixing valves used in the domestic hot water system must be suitable for operating at a mains pressure of up to 8 bar.

5 If required, a shower may be fitted in the domestic hot water system. It is recommended that thermostatically controlled shower valves are used to protect against a flow of water at too high a temperature. If a fixed head type shower is used, no anti-syphonage devices are required. If a loose or flexible head type shower is used, it must be arranged so that the head cannot fall closer than 25 mm above the top of the bath, thereby preventing immersion in the bath water. If this is not practicable, an anti-syphonage device must be fitted at the point of the flexible hose connection.

6 The supply of hot and cold mains water direct to a bidet is allowed (subject to local Water Undertaking requirements) provided that the bidet is of the over-rim flushing type. The outlets should be shrouded and unable to have a temporary hand held spray attached. Arrangements for anti-syphonage are not necessary.

7 Before the mains water supply pipe is connected to the boiler, it should be thoroughly flushed out to avoid the danger of dirt or foreign matter entering the boiler.

8 The mains water connection to the boiler must be the first connection from the mains supply.

**Note: Hard Water - A water hardness test kit is supplied with the boiler. Should the total hardness of the water supply exceed 125 ppm, an in-line scale inhibitor or water softener (both available from Grant UK) should be fitted in the cold water supply to the boiler. Consult the local Water Undertaking if in doubt.**

#### 3.7 To use the water hardness kit

**Important:** Do not immerse the test strip in running water and avoid contact.

Fill a clean container with a sample of water from the mains cold water supply to the boiler.

Immerse the test strip in the water for approximately one second, ensuring that all the test zones are fully wetted.

Shake off the surplus water and wait for one minute.

Assess the colouration of the test zones using the following chart.

Green areas	Violet areas	Hardness	Total hardness mg/l (ppm)
4	0	very soft	<50 mg/l calcium carbonate
3	1	soft	>70 mg/l calcium carbonate
2	2	medium	>125 mg/l calcium carbonate
1	3	hard	>250 mg/l calcium carbonate
0	4	very hard	>370 mg/l calcium carbonate

Note: (1 mg/l = 1 ppm (part per million))

If the hardness reading is found to be in the medium to very hard range (the shaded area), it is essential that some form of water conditioner or softener is fitted to reduce scale formation within the combination boiler. Failure to do so may invalidate both the manufacturers warranty and any extended warranty covering the appliance.

The water conditioner or softener should be fitted to the cold water supply serving the appliance and in accordance with the manufacturers instructions. Grant Engineering (UK) Ltd. cannot be held responsible for any damage or misuse caused by the fitting of any water conditioning device.

**Please protect the domestic hot water system from the harmful effects of scale.**



**3.8 Frost protection**

- Outdoor Modules are supplied with a factory fitted frost protection thermostat, located inside the boiler control panel. This is pre-wired to the boiler electrical system and is factory set to 5°C.
- For total system protection against freezing, particularly during extended periods without electrical power, Grant recommend the use of a combined heating system anti-freeze and corrosion inhibitor, used in accordance with the manufacturers instructions.

**3.9 Boiler location**

- The boiler must stand on a solid, level surface capable of supporting the weight of the boiler when full of water, e.g. a prepared concrete standing, paving slabs bedded down on sand/cement, or similar.
- The Module can be installed either against the building or free standing some distance away from the building.

- The Module must be positioned such that the required clearances from the low level flue outlet, as shown in Fig. 3, are achieved.

**Note:** The flue outlet can be fitted to either the left, right or rear of the Module, as required.

- Adequate clearance must be left around the Module for servicing. In particular, a minimum clearance of 600 mm above the Module for removal of the top panel, 600 mm at the opposite end to the flue outlet for access to the burner and 600 mm at the flue outlet end for access to the circulating pump and Combi boiler components.

- The flue terminal must be a minimum distance of 1.8 m from an oil storage tank.

The flue terminal should be positioned so as to avoid products of combustion accumulating in stagnant pockets around the building or entering into buildings.

Distances measured to rim of terminal.

Clearances recommended by Grant Engineering (UK) Limited in accordance with British Standards and Building Regulations.

- Notes:**
- An opening means an openable element, such as an openable window, or a permanent opening such as a permanently open air vent.
  - Notwithstanding the dimensions given, a terminal should be at least 300 mm from combustible material, e.g. a window frame.
  - A way of providing protection of combustible material would be to fit a heat shield at least 750 mm wide.

- Notes:** \* 75 mm with protection.  
\*\* 300 mm British Standards.

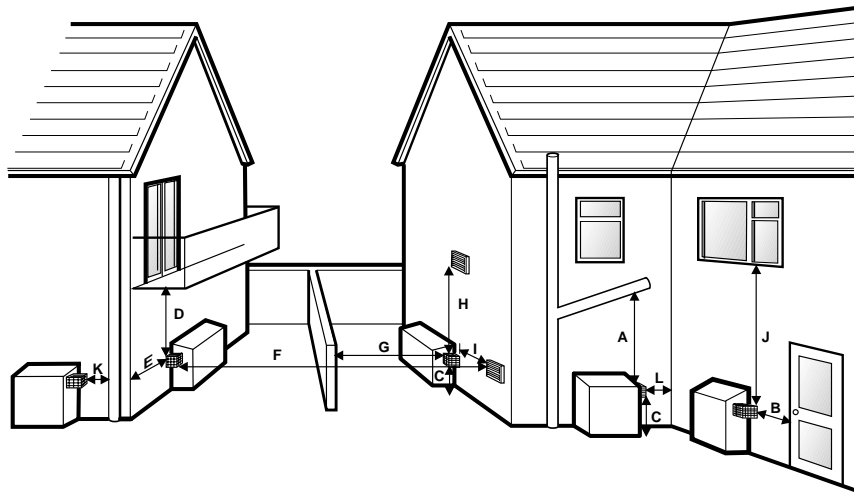


Fig. 3 - Flue terminal positions

Terminal position	Min. distance
A Below gutters, eaves or balconies (with protection)	*600
B Horizontally from a door, window or air vent	600
C Above ground, flat roof or balcony level	**300
D Below gutters, eaves or balconies (without protection)	*600
E From an external corner	300
F From a terminal facing the terminal	1200
G From a surface facing the terminal	600
H Vertically from a terminal on the same wall	1500
I Horizontally from a terminal on the same wall	750
J Directly below an opening, air brick, window, etc.	600
K From a vertical drain pipe or soil pipe	300
L From an internal corner	300





#### 3.10 Pipework materials

**General** - Grant boilers are compatible with both copper and plastic pipe. Where plastic pipe is used it must be of an oxygen barrier type. The first metre of pipe connected to the boiler must be made in copper.

**Sealed systems** - Where a sealed heating system is fitted to the boiler only copper tube may be used.

**Underfloor systems** - Plastic pipe may be used on underfloor systems where the plastic pipe is fitted after the thermostatic mixing valve. Copper tube must be used for the primary pipework between the boiler and the underfloor mixing/blending valves.

## 4 - BOILER INSTALLATION

#### 4.1 Unpack the boiler

- 1 Carefully remove the packaging from the boiler and lift it off the pallet.
- 2 The flue terminal guard is supplied loose inside the packaging.
- 3 Remove the case top panel (four screws).
- 4 The flue may exit the casing from the left, right or rear of the casing. The casing has two removable blanking panels and a flue exit panel. Fit the panel with the flue exit hole and seal in the required position.
- 5 Slacken the wing nuts holding the flue elbow and rotate the elbow to the required direction for the flue to exit the casing.
- 6 Push the end of the flue terminal section with the red seal through the seal in the casing. The terminal has been factory lubricated. Take care not to dislodge or damage the red seals.
- 7 Carefully insert the terminal into the flue elbow until the bend of the terminal contacts the outer casing, then, pull the terminal forward approximately 25 mm and rotate the bend so that the outlet is **horizontal**.

**Rear Exit** - The flue must discharge away from the building.

**Side Exit** - The flue should discharge towards the rear of the casing to prevent flue gases re-entering the boiler casing through the air inlet vents on the casing front door. The flue terminal must be fitted horizontally to prevent dripping from the end of the terminal.

- 8 Tighten the wing nuts holding the flue elbow and fit the stainless steel flue guard using the two screws provided.
- 9 The top panel of the casing has been designed so that it may be fitted to create a slight slope away from the side positioned against the wall. To tilt the top panel, loosen the four top panel casing screws, one at each corner and push down on the side furthest from the wall. Tighten the screws. See Fig. 4.

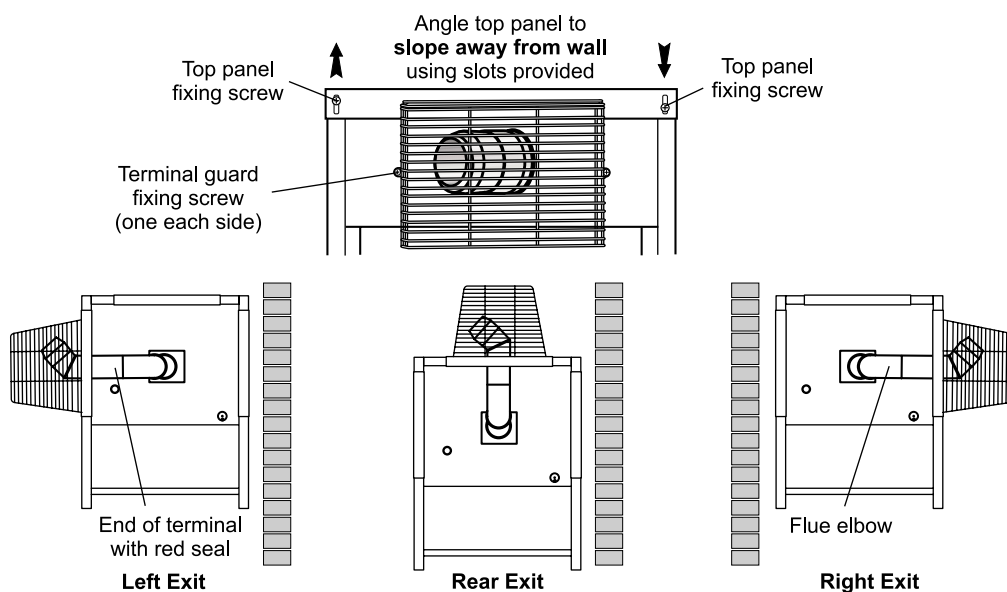


Fig. 4



## 4 - BOILER INSTALLATION

### 4.2 Preparations for installation

- 1 If the boiler is to be fitted against the wall, prepare the wall to accept the heating system pipework. To mark the wall for drilling, refer to Fig. 1 for the positions of the pipework openings in the enclosure sides.

**Note:** Pipework should be insulated where it passes through the wall into the boiler enclosure.

- 2 The electrical supply to the boiler should be routed through the wall in a suitable conduit, such that it enters the boiler enclosure via one of the pipework openings. The cable can be routed to the front of the boiler, for connection to the boiler control panel, either over the top or beneath the boiler heat exchanger. Heat resistant PVC cable, of at least 1.0 mm<sup>2</sup> cross section should be used within the boiler enclosure.
- 3 The oil supply line should be installed up to the position of the boiler. Refer to the main installation and servicing manual for details. The final connection into the boiler enclosure can be made with 10 mm soft copper, routed along the base of the enclosure (either between the enclosure and wall or in front of the enclosure) to enter through one of the holes located in the bottom edge of either side panel, at the front (burner) end.
- 4 A remote sensing fire valve must be installed in the fuel supply line a minimum of 1 metre from the point of entry to the boiler, with the sensing head located above the burner using the clip mounted on the underside of the control panel.

### 4.3 Conventional flue

Where it is not practical to use the factory supplied low level flue, the Grant range of Outdoor Modules may be fitted with a conventional flue system.

A twin wall stainless steel insulated flue system is available from Grant UK.

An insulated boiler connector elbow, complete with test point, replaces the low level terminal and flue guard supplied with the boiler.

The Grant External flue system connects to the elbow and may terminate at high level or vertically as required. See Fig. 5.

The flue system is suitable for use with class C2 kerosene and class D gas oil.

**When using gas oil the flue must terminate a minimum of 2 metres above outside ground level.**

The following components are available from Grant UK.

Item	Part No.
Starter elbow	GKM90
150 mm extension	GX150/90
250 mm extension	GX250/90
450 mm extension	GX450/90
950 mm extension	GX950/90
195-270 mm adjustable extension	GXA250/90
45° elbow	GE45/90
High level terminal	GTH90
Vertical terminal	GTV90
wall bracket	GWB90
Extended wall bracket kit	GEB90

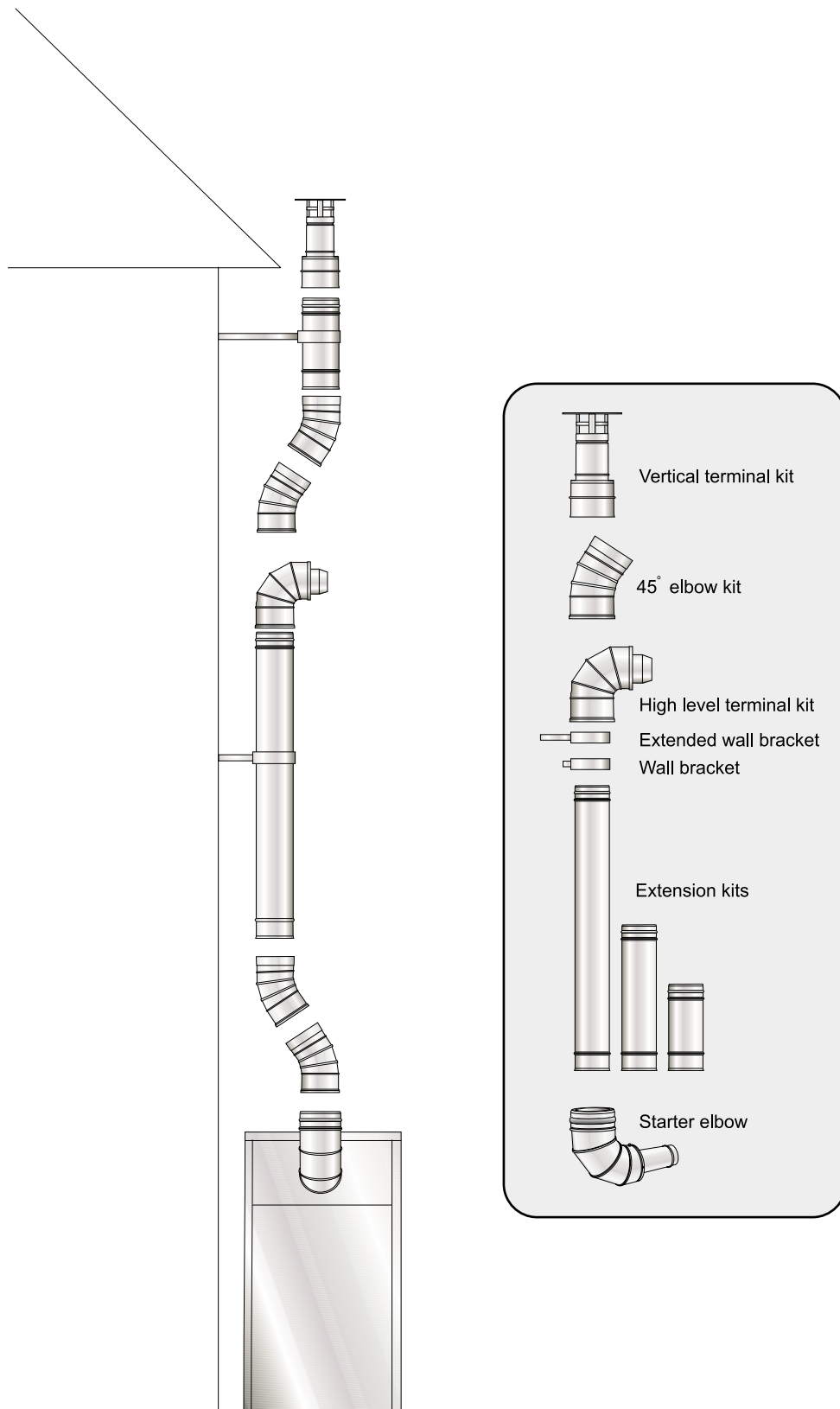


Fig. 5



## 4 - BOILER INSTALLATION

### 4.4 Water connections

- 1 The pipework connections are housed within an insulated compartment inside the rear end of the boiler casing (opposite end from the burner). These connections are accessed by removing the back panel of the enclosure.
- 2 The boiler side panels are fitted with movable plates to allow the pipework to exit the boiler enclosure. The side flue exit holes in the side panels may also be used to route the pipework and cables into the building. Where the boiler is sited remotely from the building, the pipework can be routed through the holes in the base of the rear compartment.
- 3 The cold mains and domestic hot water connections are supplied with 15 mm Tectite elbows which can be turned to allow either left or right hand pipe entry. It is recommended that an isolating valve be fitted on the cold mains supply pipe at a point where the supply leaves the building and before it enters the Module casing.
- 4 The heating flow should be fitted with the 22 mm Tectite elbow supplied to allow either left or right hand pipe entry.
- 5 The boiler is fitted with a 1" BSP heating return tapping mounted centrally at low level on the rear of the water jacket. A 1" BSP x 22 mm bent coupling is supplied.

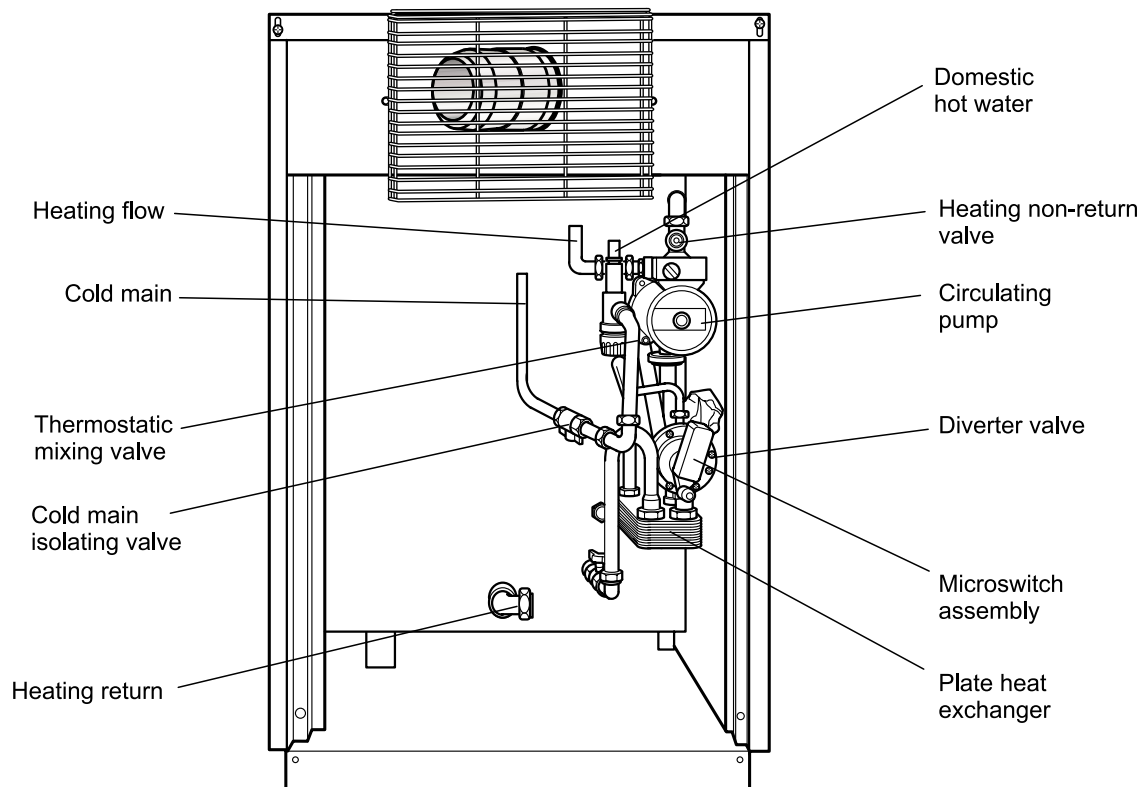


Fig. 6

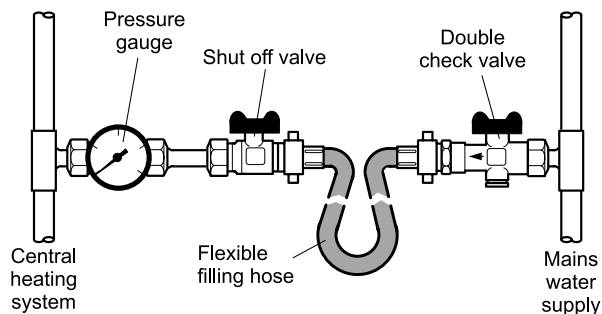


Fig. 7

6 The filling loop kit and pressure gauge supplied, should be located in a convenient and easily accessible position inside the house, where the gauge will be visible to the User (see Fig. 7).

Fit the double check valve to the mains water supply, ensuring correct flow direction as indicated by the arrow on the valve. Fit the pressure gauge and shut-off valve to the central heating system. Fit the flexible filling hose between the two valves.



#### 4.5 Expansion vessel pressure

The expansion vessel fitted is supplied with a charge pressure of 1.0 bar (equivalent to a max. static head of 10.2 metres). The charge pressure must not be less than the actual static head at the point of connection. Do not pressurise the vessel above 1.5 bar.

The air pressure in the vessel must be checked annually.

The central heating system volume, using the expansion vessel as supplied, must not exceed 90 litres. If the system volume is greater, an extra expansion vessel (complying with BS 4841) must be fitted as close as possible to the central heating return connection on the boiler. The charge pressure of the extra vessel must be the same as the vessel fitted in the boiler.

Refer to BS 7074:1 for further guidance.

The air charge pressure may be checked using a tyre pressure gauge on the expansion vessel Schraeder valve. The vessel may be re-pressurised using a suitable pump. When checking the air pressure the water in the heating system must be cold and the system pressure reduced to zero.

A simple test to check if the expansion vessel size is adequate, is to fully heat the system and if the pressure rises no more than 2.0 bar the vessel is adequate. A higher figure indicates that an extra vessel is required.

#### 4.6 Connect the power supply

- Undo the two screws from the left hand cover on the control panel to gain access to the boiler wiring terminal block.
- Pass the mains power supply cable through the cable grommet into the control panel, through the cable clamp and connect to the 12-way terminal block as follows:-  
Permanent Live (brown) to terminal 3 - marked L3  
Neutral (blue) to terminal 4 - marked N4  
Earth (green/yellow) to terminal 5 - marked E5
- To control the central heating On/Off periods, it is recommended that the boiler be wired to a **single channel timer** or (programmable) room thermostat sited at a convenient location within the property. The switched live from the central heating control system must be connected to terminal 1 on the 12-way terminal block - marked S/L.

**Note:** When connected in this way, a link must be added between terminals 2 and 3 - marked S/L2 and L3 to enable the burner to fire.

- Alternatively, a two channel programmer may be fitted to the boiler as follows:-

Switched Live Heating to terminal 1 - marked S/L1  
Switched Live Hot Water to terminal 2 - marked S/L2  
Permanent Live Frost stat to terminal 3 - marked L3  
Mains Neutral to terminal 4 - marked N4  
Mains Earth to terminal 5 - marked E5

**The programmer should be of an internally linked type.**

**Note:** If connected in this way, the User must be made aware that if the hot water channel is left in the off position, hot water may not be available upon demand and that the primary store may need to recover before any hot water is available.

#### 4.7 Connection of Grant Mini-Programmer

- Select the desired fixing position for the heating controller.
- When fixing the wallplate remember the connections are at the top and the vertical centre line of the unit is at the position shown (C/L) - in line with the terminal E. See Fig. 8.
- Fix the wallplate to the wall or flush mounted box as required.
- Surface cables can only enter from below the unit. If mounted on a flush mounted box, cables can enter from the rear through the aperture in the wallplate.
- Important:** Links must be fitted between terminal L and 5 and between 2 and 4. See wiring diagram in Section 5.3.
- Whilst the unit does not require an Earth connection, a terminal is provided on the wallplate for Earth continuity purposes.
- Ensure that all dust and debris are cleared from the area.
- Locate the module on the latches at the bottom of the wallplate and hinge upwards to fully engage the unit connectors into the wallplate. Tighten the two fixing screws to secure the unit to the wallplate.
- Before setting the programme, the unit and circuit should be checked. Switch ON the mains electricity supply and set the left hand rocker switch to 'CONSTANT' and the right hand rocker switch to 'ON'. Adjust any remote thermostats to check that the services operate correctly.



## 4 - BOILER INSTALLATION

- 10 Set the left hand rocker switch to 'OFF', check that the heating goes off and that the hot water operation stays on.
- 11 Set the right hand rocker switch to 'OFF' and check that both services do not operate.
- 12 Finally, return the left rocker switch to 'TIMED' and the right hand rocker switch to the 'ON' position.

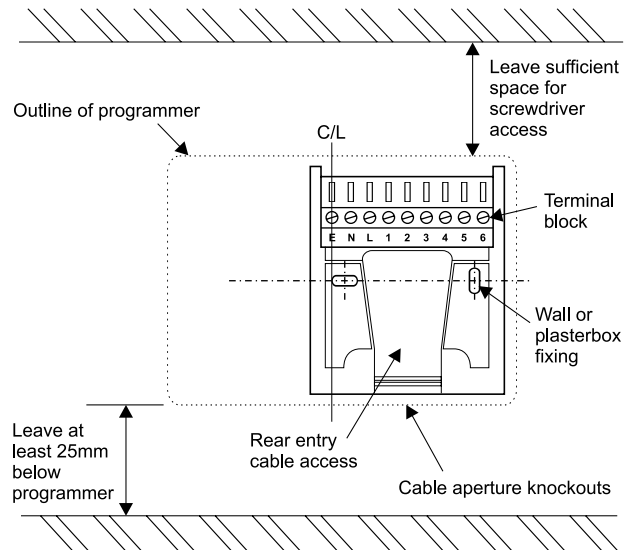


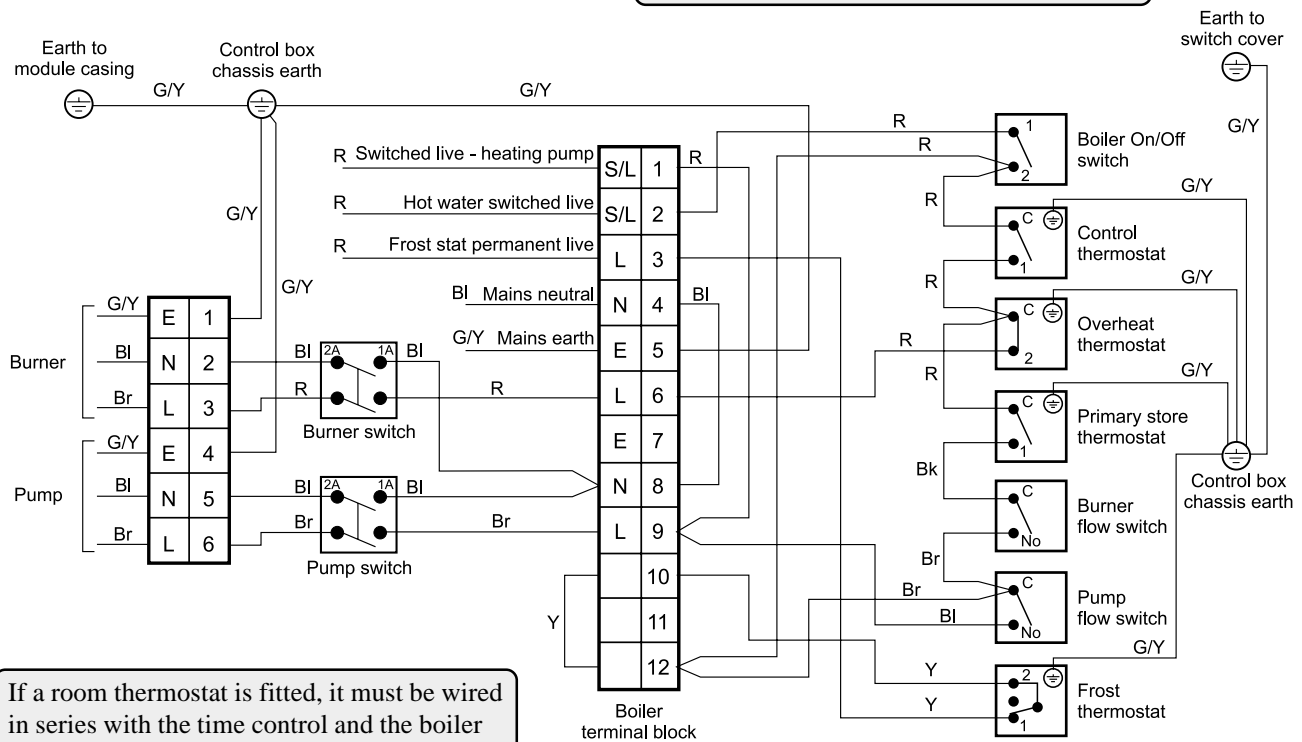
Fig. 8

## 5 - WIRING DIAGRAMS

### 5.1 Control panel wiring diagram

Refer to Notes in Section 4.6.

**Note:** If a single channel timer is used, a link must be fitted between terminals 2 and 3.

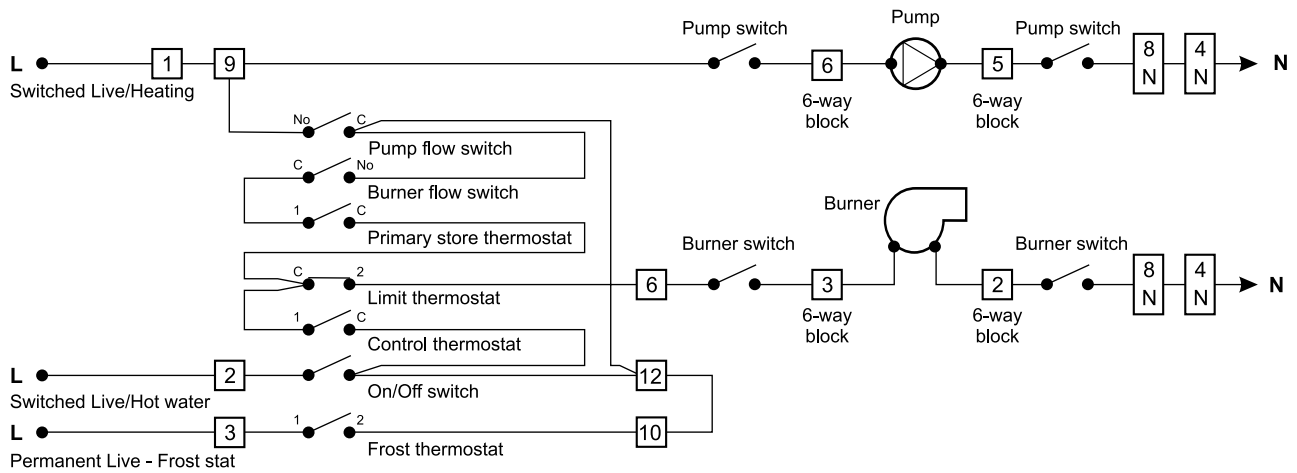


If a room thermostat is fitted, it must be wired in series with the time control and the boiler terminal S/L 1.

**Colour code:** Bk Black, BI Blue, Br Brown, R Red, Y Yellow, G/Y Green/Yellow

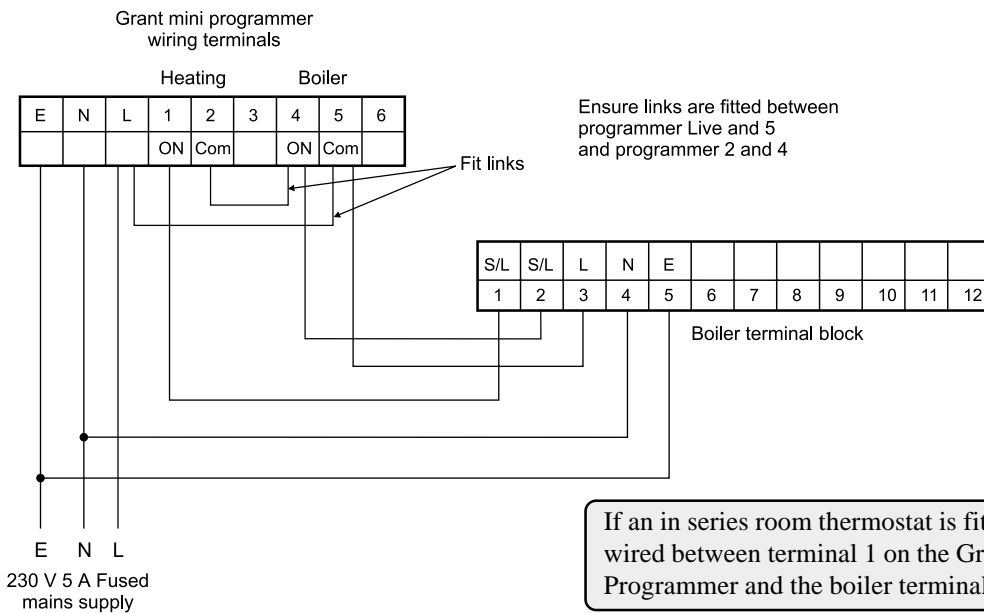


5.2 Functional flow wiring diagram



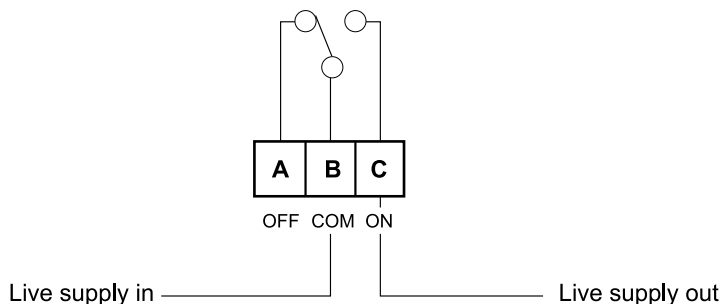
5.3 Connection of Grant remote wall mounted mini programmer

Refer to Notes in Section 4.7.



5.4 Grant programmable room thermostat

A programmable room thermostat - Part No. RSKIT is available from Grant UK. The thermostat has a 5/2 day operation and enables six time and temperature changes each day. The thermostat incorporates frost protection and an On/Off facility.





Refer to Fig. A, page 3, for boiler controls

**It is important that the following commissioning procedure is carried out to ensure safe and efficient operation of the boiler.**

**Note: Check that the baffles are in position and that the cleaning cover is correctly fitted and a good seal made.**

- 1 Check that the water system has been vented and pressurised, and there are no leaks.
- 2 Check that all fuel line valves are open.
- 3 Remove the boiler casing front panel and the plastic burner cover (two screws) if they were not previously removed.
- 4 Connect a combined vent manifold and pressure gauge to the pressure gauge connection port on the oil pump. Open the vent screw on your vent manifold to vent the supply while the pump is running.
- 5 Set the boiler On/Off switch to 'OFF'. Check that all system controls are calling for heat and turn the boiler thermostat to maximum. Switch on the electricity supply.
- 6 Fully open a hot tap and allow it to run to vent the internal primary circuit. Set the boiler, burner and pump On/Off switches to 'ON'. The boiler will operate and the burner should light within about 10 seconds. If the burner does not light and the 'Lock-out' reset button lights, wait for about 45 seconds then press the reset button to restart the ignition process. This procedure may have to be repeated several times during first lighting.
- 7 Set the timer switch to 'CONSTANT' and close the hot tap, the boiler will now be operating in the central heating mode.
- 8 With the burner alight, check the fuel pressure. Refer to the Technical Information, see section 2.3 or 2.4. Adjust the pressure if necessary.
- 9 Operate the boiler until it reaches normal operating temperature. Check oil supply/return pipe for leaks, rectifying where necessary.
- 10 With the burner alight, re-check the fuel pressure and re-adjust if necessary. Switch the boiler off, remove the pressure gauge and replace the plug in the pump.
- 11 Having ensured that there are no oil leaks, replace the burner cover.
- 12 Relight the boiler and allow it to run for 20 minutes then check the following:-  
CO<sub>2</sub> level, Flue gas temperature and Smoke Number. Refer to the Technical Information in Section 2.3 or 2.4. A test point is provided in the flue deflector.
- 13 Check the smoke number, if satisfactory check the CO<sub>2</sub>. Adjust the burner air regulator. Turning the screw anticlockwise closes the damper and increases CO<sub>2</sub> level, turning the screw clockwise opens the damper and reduces CO<sub>2</sub> level. Re-check the smoke number if the air damper has been moved.  
Under no circumstances must the smoke number be above 1.  
A suitable position for the air damper is one which gives 1% less CO<sub>2</sub> than that which has a smoke number of 1.

**Note: To obtain the correct CO<sub>2</sub> level, the final flue gas reading must be taken with all casing and door panels fitted.**

**Note: It is important that the air damper is correctly set.**

- 14 Check the flue gas temperature.
- 15 Check the boiler overheat thermostat by removing the boiler thermostat phial (the shorter one) from the pocket in the back of the boiler, just to the left above the pump. The boiler should switch off on the overheat thermostat. Replace the phial. Unscrew and remove the plastic cap covering the reset button, press the reset button and replace the cap.
- 16 When the boiler has been adjusted and is running satisfactorily, balance the central heating system by adjusting the radiator lock shield valves. Start with the radiator nearest the boiler and adjust the valves to achieve the required temperature drop across each radiator. If thermostatic radiator valves have been installed, check the system by-pass.
- 17 Switch off the boiler.
- 18 With the system hot, check again for leaks, rectifying where necessary. Drain the heating system while it is hot to complete the flushing process.
- 19 Refill, vent and pressurise the system as described in main installation and servicing instructions, adding a suitable inhibitor. For further information concerning inhibitors contact Grant Engineering (UK) Limited.



## 6 - COMMISSIONING



20 Replace the casing panels, if not already fitted.

**Note: After commissioning the boiler you should complete the Commissioning Report on page 2 of main instructions supplied with the boiler.**

If the boiler is to be left in service with the User, set the controls, timer (see User's Operating manual) and room thermostat (if fitted) to the User's requirements.

If the boiler is not to be handed over immediately, close the boiler fuel supply valve and switch off the electricity supply.

If there is any possibility of the boiler being left during frost conditions, then the boiler and system should be drained.

For details of servicing and Replacement of components, Fault finding refer to the main instruction manual.

## 7 - INFORMATION FOR THE USER

The User must be advised (and demonstrated if necessary) of the following important points:-

- 1 How to light and turn off the boiler and how to operate the system controls.
- 2 The precautions necessary to prevent damage to the central heating system and to the building, in the event of the boiler not being in operation during frost conditions.
- 3 The importance of servicing the boiler to ensure safe and efficient operation. This should normally only be required once a year.
- 4 The type of fuel used.
- 5 That any servicing or replacement of parts must only be carried out by a suitably qualified engineer.
- 6 Ensure that the boiler controls and room thermostat (if fitted) are set to the User's requirements.
- 7 Tell the user the system pressure and show them the position of the safety valve discharge pipe.
- 8 Show the User how to reset the overheat thermostat and how to restart the boiler if it goes to 'Lock-out'.

**Leave these instructions and the main instruction manual with the User.**





# SUPPLEMENT

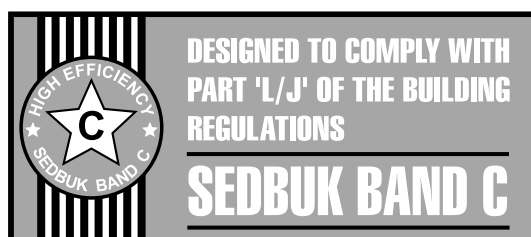
Complies with the EC Low voltage,  
Electromagnetic compatibility and  
Boiler efficiency Directives



89/336/EEC  
73/23/EEC  
92/42/EEC

## SEDBUK Rating:-

Combi 90 Outdoor Module ..... 82.9%



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