

Part No. DOC 01 Rev. 12 March 2003

USER, INSTALLATION
and
SERVICING INSTRUCTIONS

EUROFLAME

**Kitchen/Utility and Boiler House Models
50/70, 70/90, 90/120 and
Kitchen/Utility System Models
50/90, 90/120**

For use with Kerosine or Gas Oil



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**



LIST OF CONTENTS

Section	Subject	Page
1	User instructions	3
2	Technical information	6
3	General boiler information	10
4	Boiler installation	23
5	Commissioning	32
6	Information for the user	34
7	Boiler servicing	34
8	Wiring diagrams	37
9	Fault finding	40
10	Burner spares	42
11	Health and safety information	44
12	EC declaration of conformity	45
13	Space for any special installation notes	46

COMMISSIONING REPORT

Date:

Commissioning engineer: Tel. No:

Boiler model/output: Btu/h Fuel type: Kerosine or Gas oil

Nozzle size: Pump pressure: Air setting:

Flue gas % CO₂: Net flue gas temp: Smoke No:

SERVICE LOG

It is recommended that the appliance is installed, commissioned and serviced by a 'Competent person' such as a suitably qualified Oftec registered technician.

Date	% CO₂	Net flue gas temp.	Smoke No.	Service engineer/Tel. No.



1.1 About your boiler

The boiler will provide domestic hot water and central heating and is fully automatic once switched on. An illuminated On/Off switch, see Fig. A, is fitted to the Euroflame Kitchen/Utility model, which lights when the boiler is switched on, but does not necessarily indicate the burner is firing.

1.2 Boiler controls (see Fig. A or B)

To access the Kitchen/Utility model controls, pull the front panel off (push-on fixings).

1.3 Lighting your boiler (see Fig. A or B)

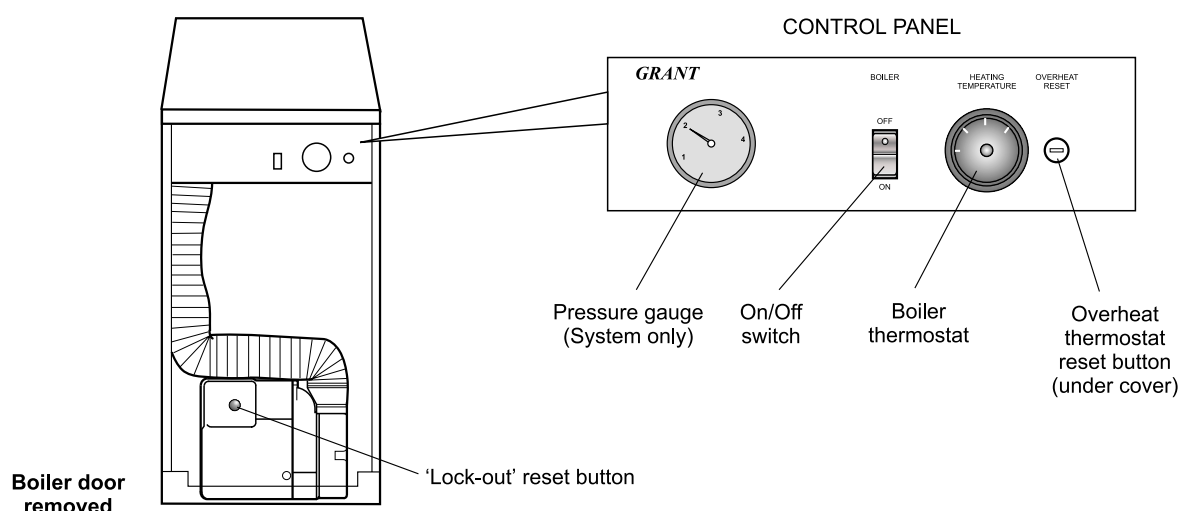
1 Ensure that - There is sufficient fuel, of the correct type, in the supply tank and all fuel supply valves are open. The water supply is on. The electricity supply to the boiler is off. The boiler On/Off switch is set to OFF (Kitchen/Utility models, the neon in the switch is not alight). The room thermostat (if fitted) is at the desired setting. The boiler thermostat is set to the required setting (see section 1.7).

2 Switch on the electricity supply to the boiler.

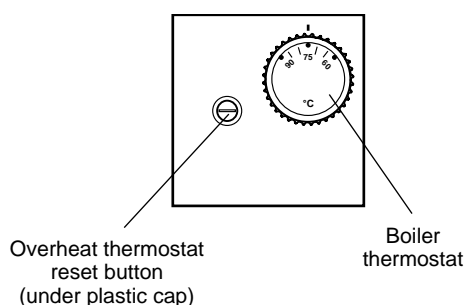
Note: Boiler House models will light at this stage.

3 For Kitchen/Utility models, set the On/Off switch to ON. A neon in the switch lights when it is in the on position.

The boiler will now light automatically.



Controls for Euroflame Kitchen/Utility models - Fig. A



Controls for Boiler House models - Fig. B



1 - USER INSTRUCTIONS

1.4 Turning off your boiler (see Fig. A or B)

Kitchen/Utility models for short periods - Set the On/Off to OFF.

To restart, simply set the switch to ON.

Kitchen/Utility models for long periods: Set the On/Off switch to OFF and switch off the electricity supply to the boiler. If required, the fuel supply valve may be closed and the water and electricity supplies turned off at the mains. To restart, refer to the full lighting instructions above.

Boiler House models for short periods - Switch off the electricity supply to the boiler.

To restart, switch on the electricity supply to the boiler.

Boiler House models for long periods - Switch off the electricity supply to the boiler. If required the fuel supply valve may be closed and the water and electricity supplies turned off at the mains.

To restart, refer to the full lighting instructions given previously.

1.5 Points to check if burner fails to light

- 1 Check that the boiler On/Off switch is ON.
- 2 Check that any remote programmer (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 (see section 1.7).

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.

1.6 About your fuel

Euroflame boilers will operate on either Class C2 Kerosine or Class D Gas Oil. Your Installer will have informed you of the type of fuel your boiler has been set to use and he will have marked this on the boiler data label. You should always quote the type of fuel you require when ordering from your supplier.

Note: Balanced flue models (flue terminal through the wall) must only be used with Kerosine.

Do not wait until the fuel runs out before you order some more. Sludge in the bottom of the tank may be drawn into the fuel lines. If it is possible, switch off the boiler when the new supply is delivered and leave the fuel to settle for an hour before restarting the boiler.

1.7 General notes and care of your system

- 1 **Boiler thermostat** - This control allows the temperature of the water leaving the boiler to heat the radiators and domestic hot water to be adjusted.

Note: If you have a cylinder thermostat on your hot water cylinder, this will control the temperature of your domestic hot water. The boiler thermostat setting must be equal to or above the cylinder thermostat setting to enable the cylinder thermostat to control the domestic hot water system.

The boiler thermostat has an operating range of 65 to 85°C. The following settings are recommended:-

- a Heating and hot water in Winter 85°C
- b Hot water only in Summer 65°C

- 2 **Burner Lock-out reset button** - If there is a burner malfunction, a built-in safety circuit switches the burner off and the Lock-out reset button will light. Usually such malfunctions are short lived and pressing the reset button will restore normal operation.

If the burner continually goes to 'Lock-out' a fault exists **or** the fuel supply is low. If you have sufficient fuel, you will need to call your Service engineer.

- 3 **Safety thermostat** - Your boiler is fitted with a safety overheat thermostat which will automatically switch off the boiler in the case of a control malfunction causing overheating.

If your boiler goes off and you try to light it but nothing happens and the 'Lock-out' reset button on the burner is not lit, the overheat thermostat has probably operated. The boiler will not light until the thermostat is reset. To reset, unscrew the small plastic cap (see Fig. 30a or 30b), press the button then replace the cap.

If this condition continually repeats, contact your Service engineer.



- 4 Ventilation** - Always ensure that the boiler has adequate ventilation. Any ventilation openings provided by the Installer **must not** be obstructed. Periodically check that they are clear.
- Do not** attempt to 'box in' the boiler or build a compartment around it before consulting your Installer.
- Do not** place any combustible material around or on the boiler or flue pipe.
- 5 Flue terminal** - The flue terminal on the outside wall **must not** be obstructed or damaged.
- In severe conditions check that the terminal does not become blocked by snow.
- 6 Frost protection** - Your Installer may have fitted a frost thermostat. If not, and you are likely to be away for a short time, leave the boiler on with the boiler thermostat set at a low setting. For longer periods the boiler and system should be drained. Contact your Service engineer for draining and filling the system.
- 7 Cleaning and servicing** - Lightly wipe over the case with a damp cloth and a little detergent. **Do not** use abrasive pads or cleaners.
- You should have your boiler serviced at least once a year to ensure safe and efficient operation. Contact your Service engineer for further details.
- 8 Failure of electricity supply** - If the electricity supply fails, the boiler will not operate. It should relight automatically when the supply is restored.
- If a programmer is fitted (Multi Pass Kitchen models only) it will retain the time settings for up to 24 hours and will not have to be reset to the correct time of day when the supply is restored (the display remains for up to 1 hour, but will re-appear when the supply is restored).

1.8 Electricity supply

The boiler requires a 230/240 V ~ 50 Hz supply. It must be protected by a 5 Amp fuse.

Warning: This appliance must be earthed.

1.9 Sealed central heating system

If your boiler is operating on a sealed heating system, the installer will have pressurised the system and should have told you (or set it on the pressure gauge) the system pressure when cold (this is normally between 0.8 and 1.0 bar, which will increase slightly when hot). If the pressure (when cold) is below the set pressure mentioned above, you should contact your Installer or Service engineer to re-pressurise the system. If the system requires frequent re-pressuring, ask your Installer or Service engineer to check the heating system for leaks.

The boiler or system will be fitted with an automatic air vent to remove air from the system. Any air trapped in the radiators should be removed by venting the radiators using the vent screw at the top of each radiator. Only vent a radiator if the top is cool and the bottom is hot. Excessive venting will reduce the system pressure, so only vent when necessary and check the system pressure as mentioned above. Re-pressurise the system if necessary.

Note: Your system may incorporate a 'Top-Up' vessel, advice on how to use it should be obtained from your installer.

The boiler or system will be fitted with a safety valve to release excess pressure from the system. If water or steam is emitted from the end of the safety valve discharge pipe, switch off the boiler and contact your Installer or Service engineer.

The expansion vessel air charge must be checked annually. Failure to maintain an adequate air charge in the vessel may invalidate the warranty.



2 - BOILER TECHNICAL INFORMATION

2.1 Boiler technical data

Model		50/70	50/90 System	70/90	90/120	90/120 System
Water content	litre	14	21	21	22	22
	gal	3.1	4.6	4.6	4.8	4.8
* Weight (dry)	kg	55 (bh), 76 (ku)	117	100 (bh), 109 (ku)	112 (bh), 121 (ku)	129
(bh=Boiler House, ku=Kitchen/Utility)	lb	121 (bh), 167 (ku)	258	220 (bh), 240 (ku)	232 (bh), 252 (ku)	284
Max. heat input (Kerosine)	kW	22.8 (bh), 22.0 (ku)	28.3	28.8 (bh), 28.3 (ku)	38.0	38.0
(bh=Boiler House, ku=Kitchen/Utility)	Btu/h	77 794 (bh), 75 067 (Ku)	96 563	98 269 (bh), 96 563 (ku)	129 600	129 600
Flow (F) and return (R) connections		1" BSP	22mm (F) 1" BSP (R)	1" BSP	1 1/4" BSP	28mm (F) 1 1/4" BSP (R)
Flue size (conventional)		100 mm (4 in) diameter			125 mm (5 in) dia.	125mm (5 in) dia.
Waterside resistance						
Flow/Return temp. difference of 10°C		26.5 mbar				
Flow/Return temp. difference of 20°C		9.5 mbar				
Maximum static head		28 m				
Minimum circulating head		1m				
Boiler thermostat range		65 to 85°C (60 to 90°C - Boiler House models)				
Limit (safety) stat switch off temp.		111°C ± 3°C				
Max. hearth temperature		Less than 50°C				
Electricity supply		230/240 V ~ 50 Hz Fused at 5 Amp				
Motor power		90 W max.				
Starting current		2.60 Amp				
Running current		0.85 Amp				
Oil connection		1/4" BSP Male (on end of flexible fuel line)				
Conventional flue		Minimum flue draught - 8.7 N/m ² (0.035 in wg)				
		Maximum flue draught - 37 N/m ² (0.15 in wg)				
Max. operating press. Sealed system		3 bar				
Open system		3 bar	3 bar	3 bar	3 bar	3 bar
Max. heating system volume		N/A	157 litre	N/A	N/A	157 litre
Expansion vessel (pre-charged 1 bar)		N/A	12 litre	N/A	N/A	12 litre

* Weight includes burner but excludes flue



2.2 Euroflame oil boilers using Class C2 kerosine

Note: All boilers are despatched for use with kerosine.

Model	Heat Output		Net efficiency ** (%)		Net Heat Input		Nozzle	Oil press. (bar)	Smoke No.	Burner head	Fuel flow rate (kg/h)	Flue gas temp.*** (°C)	CO ₂ (%)	Top baffle position
	(kW)	(Btu/h)	Utility	B/House	(kW)	(Btu/h)								
50/70 Riello RDB	14.7	50 000	93.0	90.0	16.1	54 900	0.50/60°EH	7.00	0 - 1	LD2SX short	1.33	211	11.5	N/A
	*17.6	60 000	93.0	90.0	19.3	65 900	0.60/60°EH	7.00	0 - 1	LD2SX short	1.60	211	11.5	N/A
	20.5	70 000	93.0	90.0	22.5	76 900	0.60/60°EH	8.50	0 - 1	LD2SX short	1.87	211	11.5	N/A
70/90 Riello RDB	20.5	70 000	93.2	91.8	22.5	76 900	0.60/60°EH	8.50	0 - 1	LD3	1.87	180	11.5	Left
	*23.5	80 000	93.2	91.8	25.8	87 900	0.75/60°EH	7.00	0 - 1	LD3	2.13	180	11.5	Left
	26.4	90 000	93.2	91.8	29.0	98 900	0.75/60°EH	9.50	0 - 1	LD3	2.40	180	11.5	Left
50/90 Riello RDB	14.7	50 000	93.2	N/A	16.1	54 900	0.50/60°EH	7.00	0 - 1	LD2	1.33	180	11.5	Right
	17.6	60 000	93.2	N/A	19.3	65 900	0.60/60°EH	7.00	0 - 1	LD2	1.60	180	11.5	Right
	20.5	70 000	93.2	N/A	22.5	76 900	0.60/60°EH	8.50	0 - 1	LD3	1.87	180	11.5	Left
	*23.5	80 000	93.2	N/A	25.8	87 900	0.75/60°EH	7.00	0 - 1	LD3	2.13	180	11.5	Left
	26.4	90 000	93.2	N/A	29.0	98 900	0.75/60°EH	9.50	0 - 1	LD3	2.40	180	11.5	Left
90/120 Riello RDB2	26.4	90 000	92.0	90.9	28.7	96 700	0.75/80°H	9.50	0 - 1	LD3A	2.38	190	12.0	N/A
	*32.2	110 000	92.0	90.9	35.0	119 400	1.00/80°H	8.00	0 - 1	LD3A	2.62	220	12.0	N/A
	35.2	120 000	92.0	90.9	38.0	129 600	1.00/80°H	8.60	0 - 1	LD3A	3.12	225	12.0	N/A

2.3 Euroflame oil boilers using Class D gas oil

Model	Heat Output		Net efficiency ** (%)		Net Heat Input		Nozzle	Oil press. (bar)	Smoke No.	Burner head	Fuel flow rate (kg/h)	Flue gas temp.*** (°C)	CO ₂ (%)	Top baffle position
	(kW)	(Btu/h)	Utility	B/House	(kW)	(Btu/h)								
50/70 Riello RDB	20.5	70 000	93.0	90.0	22.5	76 900	0.40/60°S	12.00	0 - 1	LD2SX short	1.60	200	11.5	N/A
70/90 Riello RDB	26.4	90 000	93.2	91.8	29.0	98 900	0.60/60°S	12.00	0 - 1	LD3	1.97	200	11.5	Left
50/90 Riello RDB	26.4	90 000	93.2	N/A	29.0	98 900	0.60/60°S	12.00	0 - 1	LD3	1.97	200	11.5	Left
90/120 Riello RDB2	35.2	120 000	92.0	90.9	38.2	130 400	0.75/80°S	12.50	0 - 1	LD3A	3.20	220	12.0	N/A

Notes:

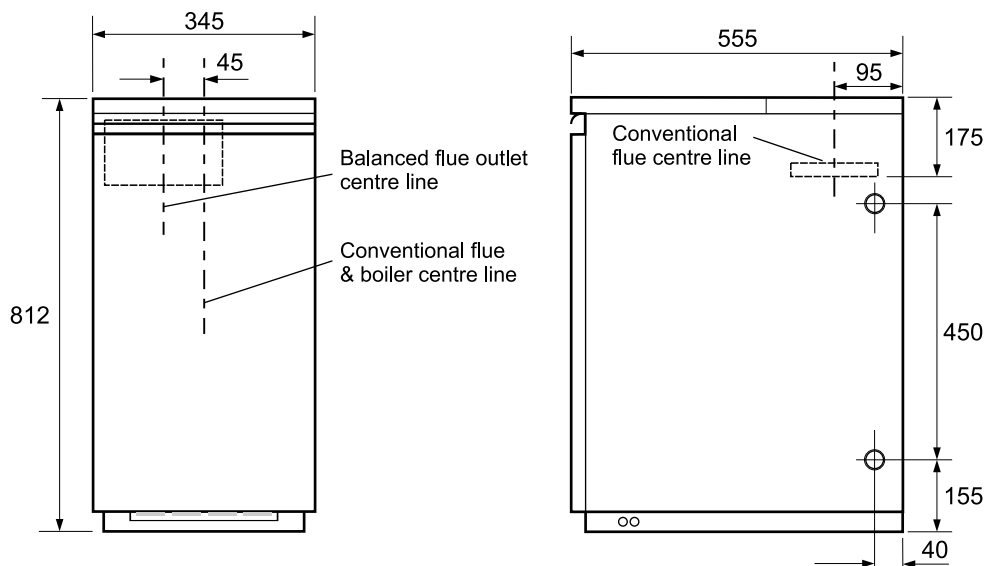
- 1 The data given above is approximate only. The Kerosine table is based on the boiler being used with a low level balanced flue.
- 2 The above settings may have to be adjusted on site for the correct operation of the burner.
- 3 Gas Oil is **not** suitable for use with balanced flue.
- 4 The installer **must** amend the boiler data label if the type of fuel or nozzle used is changed.
- 5 When commissioning, or when the output or fuel is changed, the air damper must be adjusted to obtain the correct CO₂ level.
- 6 Boiler House models: When used with a balanced flue, the air intake grille on the burner **must** be replaced with the air intake spigot supplied with the flue kit. The air intake hose must be attached to the burner spigot using the clip supplied.
- 7 50/90 System boiler: It is necessary to adjust the top baffle plate and exchange the burner head when setting the boiler to 50 000 or 60 000 Btu/h output.
- 8 Net flue gas temperatures given are $\pm 10\%$.
- 9 * Indicates the factory set output.
- 10 ** Net thermal efficiency (BSRIA).
- 11 *** Flue gas temperature at combustion door test point will be approximately 45°C higher.



2.4 Boiler dimensions

See Figs. 1a and 1b

50/70 Utility model



50/70 Boiler House model

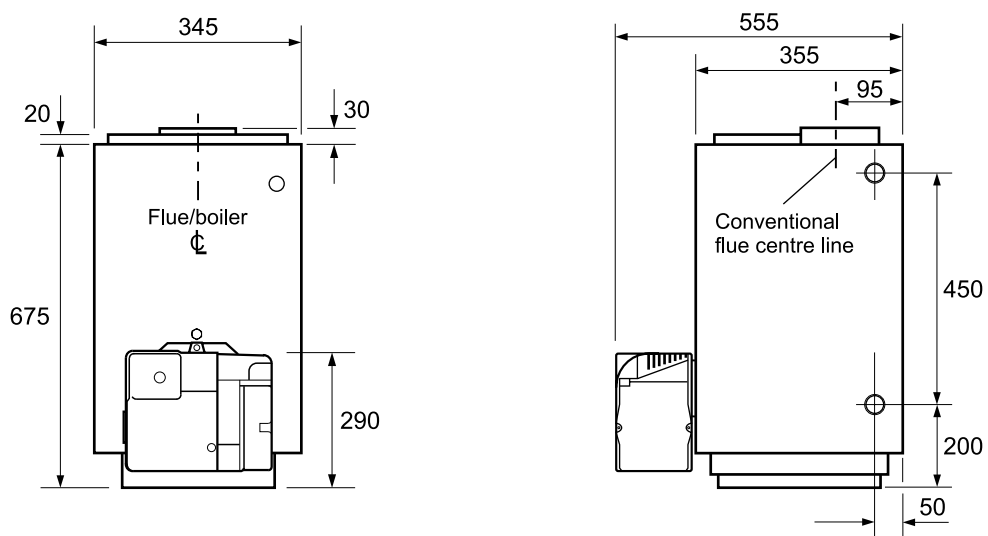
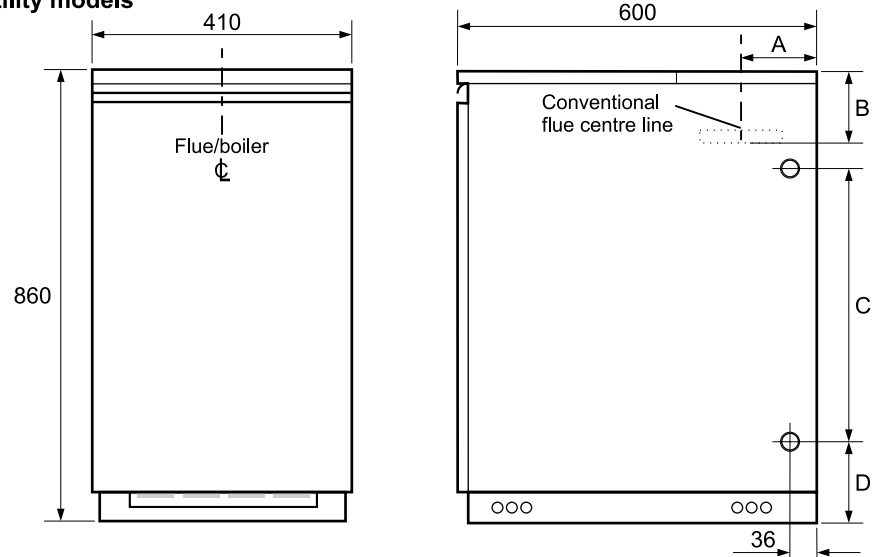


Fig. 1a - 50/70



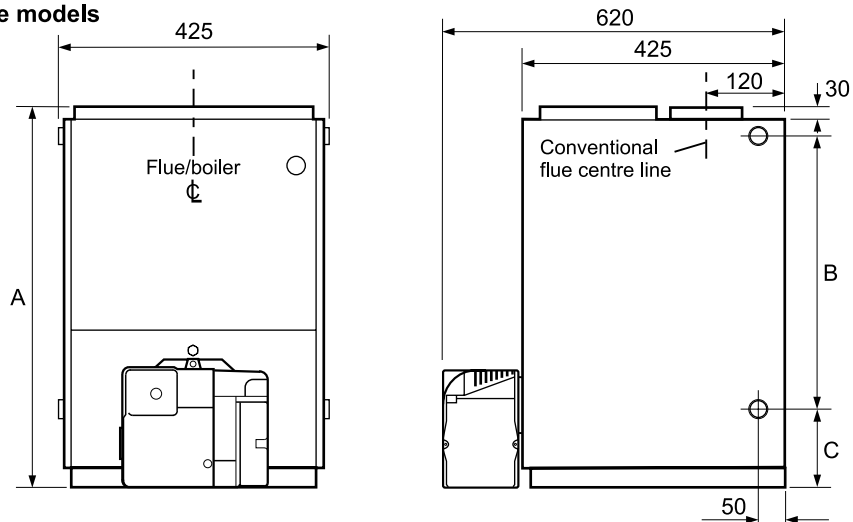
70/90,90/120 Kitchen/Utility models

	70/90	90/120
A	105	100
B	170	195
C	535	425
D	125	175



70/90, 90/120 Boiler House models

	70/90	90/120
A	750	715
B	535	425
C	155	223



50/90, 90/120 System models

	50/90	90/120
A	105	100
B	48	58
C	50	52
D	50	52
E	170	195
F	30	68
G	125	175

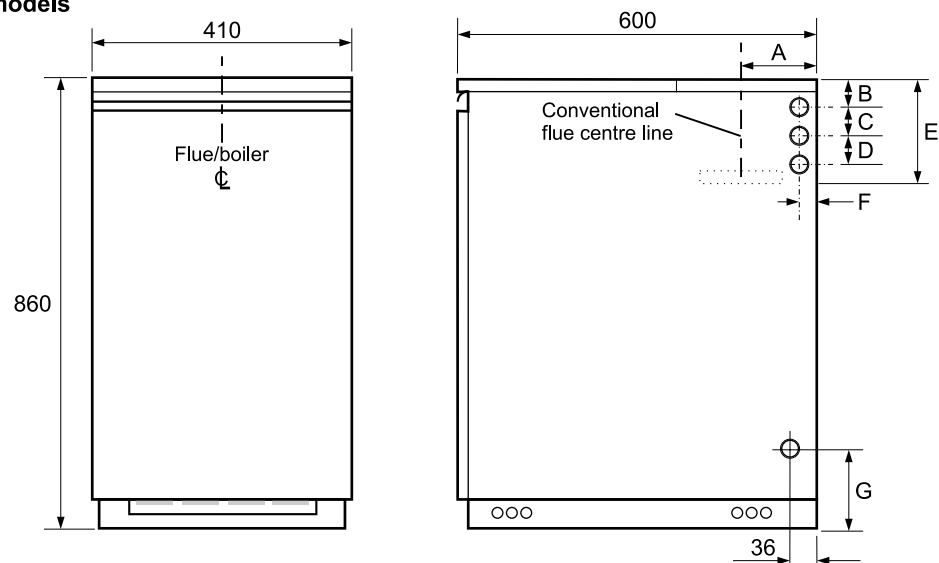


Fig. 1b - 70/90, 50/90, 90/120



3.1 Boiler description

The Euroflame range of automatic pressure jet oil boilers have been designed for use with a central heating system with indirect domestic hot water cylinder. They are not suitable for use with either a direct cylinder or a 'primatic' cylinder.

The boilers are also suitable for use on sealed central heating systems.

There are five versions of the Euroflame available, the 50/70, 50/90 System, 70/90, 90/120 and 90/120 System. The 50/70, 70/90 and 90/120 can be supplied as Kitchen/Utility or uncased Boiler House models. The 50/70 can be adjusted to a maximum output of 20.5 kW (70 000 Btu/h), the 50/90 System 26.4 kW (90 000 Btu/h), the 70/90 26.4 kW (90 000 Btu/h) and the 90/120 35 kW (120 000 Btu/h).

The boilers are supplied as Conventional flue models, if a Balanced flue version is ordered, a Balanced Flue Kit is required. Kits available include:- Low Level Balanced Flue (Short, Standard, Long and Extra Long) and High Level Balanced Flue, both suitable for left, right or rear outlet and a Vertical Concentric Balanced Flue.

Kitchen/Utility models are supplied with the burner factory fitted. The burners for Boiler House models are supplied in a separate carton. A burner supply cable is supplied pre-wired to all burners.

The 50/90 and 90/120 Kitchen/Utility System boilers are sealed system versions of the standard Euroflame Kitchen/Utility boilers. They are supplied factory fitted with a complete sealed system kit incorporating a 12 litre expansion vessel, automatic air vent, pressure relief safety valve assembly, pressure gauge and filling loop. A circulating pump and isolating valves are also fitted. Both the pump and burner are pre-wired for ease of installation.

All burners are pre-set for use with kerosine and are supplied ready to connect to a single pipe fuel supply system with a loose flexible fuel line (900 mm) and $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP male adaptor supplied with the boiler. If required, an additional flexible fuel line (900 mm) and $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP male adaptor are available from Grant Engineering (UK) Limited, for two-pipe oil supply system.

All models are suitable for use with Class C2 kerosine or Class D gas oil. See sections 2.2 and 2.3.

Note: Only Kerosine may be used with Low Level Balanced flues.

If the fuel to be used is Gas Oil or the boiler output is to be changed, it may be necessary to change the burner nozzle, burner head and top baffle plate position (50/90 only). Refer to the Technical Information in sections 2.2 and 2.3.

To change the nozzle on a Kitchen/Utility model, remove the burner from the boiler then remove the burner head/nozzle as described in section 7.4. For a Boiler House model, unpack the burner and remove the burner head/nozzle as described in section 7.4. To remove and adjust the 50/90 top baffle plate refer to section 7.3. The installer **must** amend the boiler data label accordingly.

The temperature of the water leaving the boiler to heat the radiators and hot water cylinder is User adjustable from 65 to 85°C on Kitchen/Utility models and 60 to 90°C on Boiler House models.

The boilers are fitted with an overheat thermostat (allowing them to be used on sealed central heating systems) which will automatically switch off the boiler if the heat exchanger exceeds a pre-set temperature of $111^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

The control panel fitted to the Kitchen/Utility and System models has an On/Off switch (with neon indicator light), boiler thermostat control knob and the manual reset button for the overheat thermostat. The System models also have a system pressure gauge.

Both Boiler House models are supplied with a combined boiler and overheat thermostat with a boiler thermostat control knob and the manual reset button for the overheat thermostat.



3.2 Regulations to comply with

Installation of a Euroflame 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:-
 - OFST 100 Polythene oil storage tanks for distillate fuels.
 - OFST 200 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.

IMPORTANT

Before starting any work on the boiler, or fuel supply please read the health and safety information given in section 11 on page 44.

3.3 Delivery

Kitchen/Utility Conventional flue models are supplied in one pack, containing the cased boiler with the burner and control panel fitted, and literature pack.

Kitchen/Utility Balanced flue models are supplied in two packs, containing the following:-

- Carton 1 The cased boiler with burner and control panel fitted, and literature pack.
- Carton 2 The balanced flue kit - low, high level or vertical, as ordered. A terminal guard is supplied with a low level flue kit.

Boiler House Conventional flue models are supplied in two packs, containing the following:-

- Carton 1 The boiler with literature pack, but without burner.
- Carton 2 The burner with the combined boiler and overheat thermostat.

Boiler House Balanced flue models are supplied in three packs as follows:-

- Carton 1 The boiler with literature pack, but without burner.
- Carton 2 The burner with the combined boiler and overheat thermostat.
- Carton 3 The balanced flue kit - low level, high level or vertical as ordered. A terminal guard is supplied with a low level flue kit.

The following flue kits are available, refer to section 3.8 for further details.

- a High level balanced flue.
- b High level balanced flue extensions.
- c Low level balanced flue.
(Short, Standard, Long or Extra Long)
- d Vertical balanced flue.
- e Vertical balanced flue extensions.
- f 45° elbows for high level and vertical balanced flues.

**Regional statutory requirements may deem this appliance to be a 'controlled service'.
Where this is the case, it is a legal requirement that the appliance is installed and commissioned either under the remit of building control or by a 'Competent person' such as a suitably qualified Oftec registered technician.**



3.4 Fuel supply

3.4.1 Fuel storage

A painted (outside only) storage tank must be constructed to BS 799:5:1987 and should include the following:-

- A fuel level gauge (not a glass type).
- A vent pipe incorporating a weatherproof termination (bend or cap) of a diameter not less than the filling pipe.
- A sludge valve.
- An outlet valve at the opposite end of the tank to the sludge valve.

The tank should be positioned in accordance with the recommendations given in BS 5410:1:1997, which gives details of filling, maintenance and protection from fire.

The tank should be suitably supported so as to obtain a slope of 20 mm per metre towards the sludge valve.

A galvanised tank must not be used.

A plastic tank may be used and must comply with OFS T100.

Note: Plastic tanks should be adequately and uniformly supported on a smooth level surface, across their entire base area.

3.4.2 Fuel pipes

- Fuel supply pipes should be of copper tubing with an internal diameter of at least 8 mm. Soldered joints should not be used. Galvanised pipe must not be used.
- Flexible pipes must not be used outside the boiler case.
- A remote sensing fire valve must be installed in the fuel supply line (outside) where it enters the building, with the sensing head located above the burner. Recommendations are given in BS 5410:1:1997.
- A metal bowl type filter with a replaceable micronic filter must be fitted in the fuel supply line adjacent to the boiler. A shut-off valve should be fitted before the filter, to allow the filter to be serviced.
- A flexible fuel line, adaptor and $\frac{1}{4}$ " BSP isolation valve are supplied loose with the boiler for the final connection to the burner. If a two pipe system or Tiger Loop system is used, an additional flexible fuel line (900 mm) and $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP male adaptor are available from Grant Engineering (UK) Limited.

- Flexible fuel lines should be inspected annually when the boiler is serviced and replaced every two years.
- The use of a 'Tankmaster' and Tiger Loop is an ideal way of delivering an oil supply to the boiler. The Tankmaster unit, fitted to the storage tank, includes a filter, sight tube, shut-off valve and fire valve. A separate fire valve is required in the fuel line (outside) where it enters the building containing the boiler. See Fig. 4.

3.4.3 Single pipe system - (See Fig. 2)

- Where the storage tank outlet is above the burner the single pipe system should be used. The height of the tank above the burner limits the length of pipe run from the tank to the burner.
- As supplied the burner is suitable for a single pipe system.

3.4.4 Two pipe system - (See Fig. 3)

- When the storage tank outlet is below the burner, the two pipe system should be used. The pipe runs should be as shown in Fig. 3. The return pipe should be at the same level in the tank as the supply pipe, both being 75 to 100 mm above the base of the tank. The pipe ends should be a sufficient distance apart so as to prevent any sediment disturbed by the return entering the supply pipe.
 - Avoid the bottom of the tank being more than 3 m below the burner.
 - A non-return valve should be fitted in the supply pipe together with the filter and fire valve. The return pipe must be unrestricted.
- 4 To be used with a two-pipe system, the burner **must** be fitted with an additional flexible fuel line (a flexible fuel line (900 mm) and $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP male adaptor are available from Grant Engineering (UK) Limited). See section 3.4.6.
- The pump vacuum should not exceed 0.4 bar. Beyond this limit gas is released from the oil.

For guidance on installation of top outlet fuel tanks and suction oil supply sizing, see OFTEC booklet T1/139. Available at www.oftec.org.uk

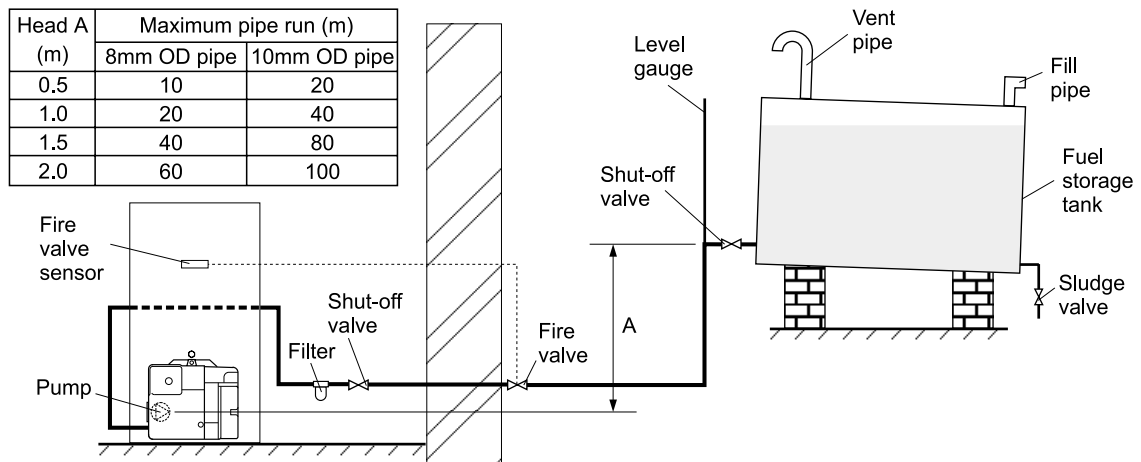


Fig. 2 - Single pipe system

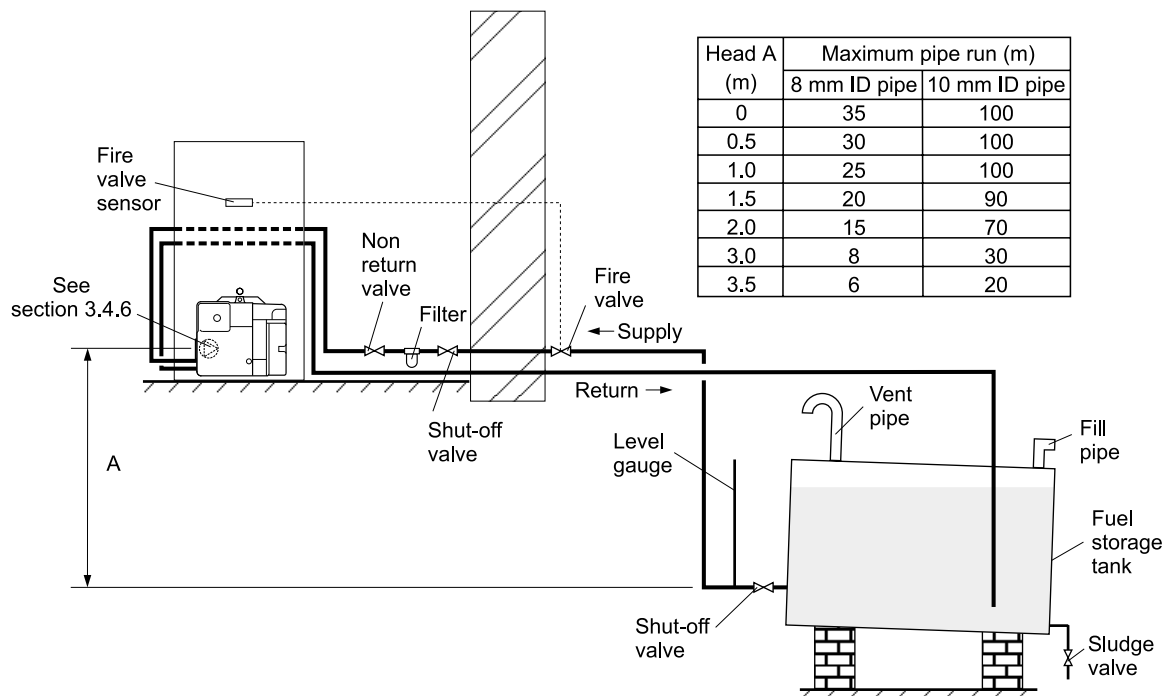


Fig. 3 - Two pipe system



3 - GENERAL BOILER INFORMATION

3.4.5 Tiger Loop system - (See Figs. 4 and 5)

- 1 When The storage tank is below the burner, an alternative to a two pipe system can be achieved using the Tiger Loop oil deaerator. This effectively removes the air from the oil supply on a single pipe lift.
- 2 The Tiger Loop is connected close to the boiler as a two pipe system (omitting the non-return valve) as shown in Fig. 4. Refer to the manufacturers instructions supplied with the Tiger Loop.
The Tiger Loop **must** be mounted vertically.
- 3 To be used with a Tiger Loop system, the burner **must** be fitted with an additional flexible fuel line (a flexible fuel line (900 mm) and $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP male adaptor are available from Grant Engineering (UK) Limited). See section 3.4.6.

Note: To prevent any possibility of fuel fumes entering the building, the Tiger Loop **must** be fitted outside.

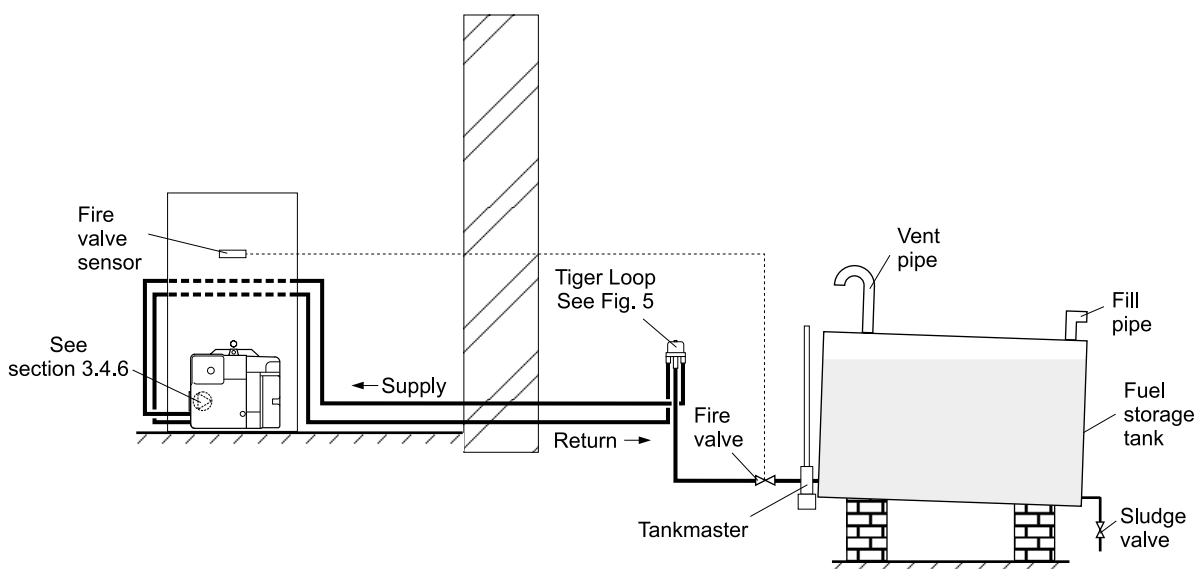


Fig. 4 - Tiger loop system

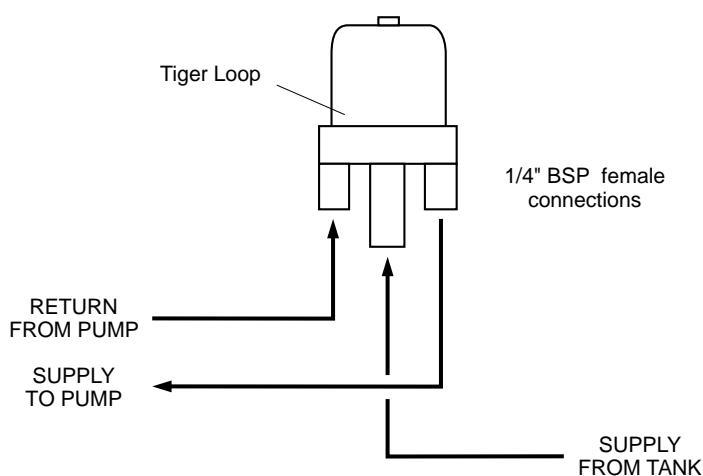


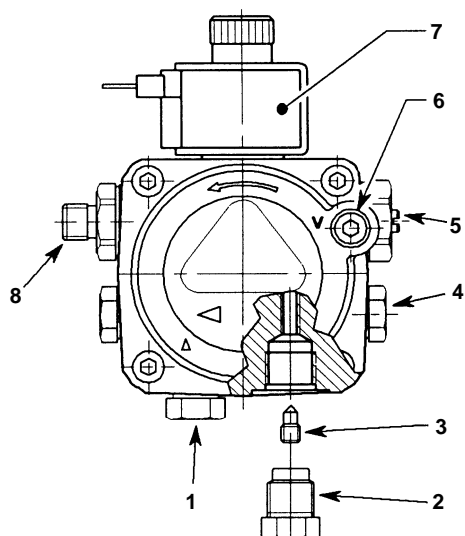
Fig. 5 - Tiger loop



3.4.6 Two pipe oil supplies

Riello RDB burner - See Fig. 6

- 1 The fuel pump is supplied for use with a single pipe fuel supply system. For use on a two pipe system, it is necessary to fit the By-pass screw (see Fig. 6) into the tapping in the return port.
- 2 The By-pass screw is supplied in the boiler accessory pack.
- 3 Remove the plastic burner cover (two screws). To gain access on Kitchen models, it may be necessary to remove the grey plinth - loosen the screw securing the right hand side of the plinth, then withdraw the plinth forward from the right and away from the case.
- 4 Remove and discard the blanking plug from the return connection of the pump and fit the By-pass screw using an hexagonal key.
- 5 Connect the return oil flexible fuel line to the pump.
- 6 Connect the $\frac{3}{8}$ " to $\frac{1}{4}$ " BSP adaptor to the flexible fuel line.
- 7 Flexible fuel lines and adaptors are available from Grant Engineering (UK) Ltd.
- 8 **Boiler House models** - Fit the burner as described in section 4.6.



- | | |
|-----------------------------|---------------------------|
| 1 Oil inlet connection | 5 Pressure adjuster |
| 2 Return connection | 6 Vacuum gauge connection |
| 3 By-pass screw | 7 Solenoid |
| 4 Pressure gauge connection | 8 Supply to nozzle |

Fig. 6 - Riello RDB pump

3.5 Electricity supply

- 1 A 230/240 V ~ 50 Hz mains supply is required.
The boiler must be earthed.
- 2 The supply must be fused at 5 Amp and there must only be one common isolator for the boiler and control system, and it must provide complete electrical isolation.
- 3 A fused double pole switch or a fused three pin plug and shuttered outlet socket should be used for the connection.
- 4 The power supply cable should be at least 0.75 mm² PVC as specified in BS 6500, Table 16.
- 5 All the wiring external to the boiler must be in accordance with the current I.E.E. Wiring Regulations.
- 6 Any room thermostat or frost thermostat used must be suitable for use on mains voltage.
- 7 In the event of an electrical fault after installation of the boiler, the following electrical system checks must be carried out:- Short circuit, Polarity, Earth continuity and Resistance to earth.

3.6 Air supply

See Figs. 7 and 8

A sufficient permanent air supply to the boiler should be provided:

- a For proper combustion of fuel and effective discharge of combustion products to the open air.
- b For the ventilation of any confined space in which the boiler is installed to prevent overheating of the boiler any equipment in and near the boiler.
- c For the satisfactory operation of any draught stabiliser which may be fitted.

It should be both the designer's and installer's concern that the air required for these functions be introduced so as to cause as little discomfort as possible to the building occupants and thus to offer them the least temptation to obstruct the ventilators.

Further details may be obtained from BS 5410:1:1997.

Notes:

For a boiler fitted in a compartment, which is ventilated as shown, no additional allowance is necessary.

Open flue - Extract fans, where needed, should be in accordance with section 4.4.7 in BS 5410 Part 1 1997.



3 - GENERAL BOILER INFORMATION

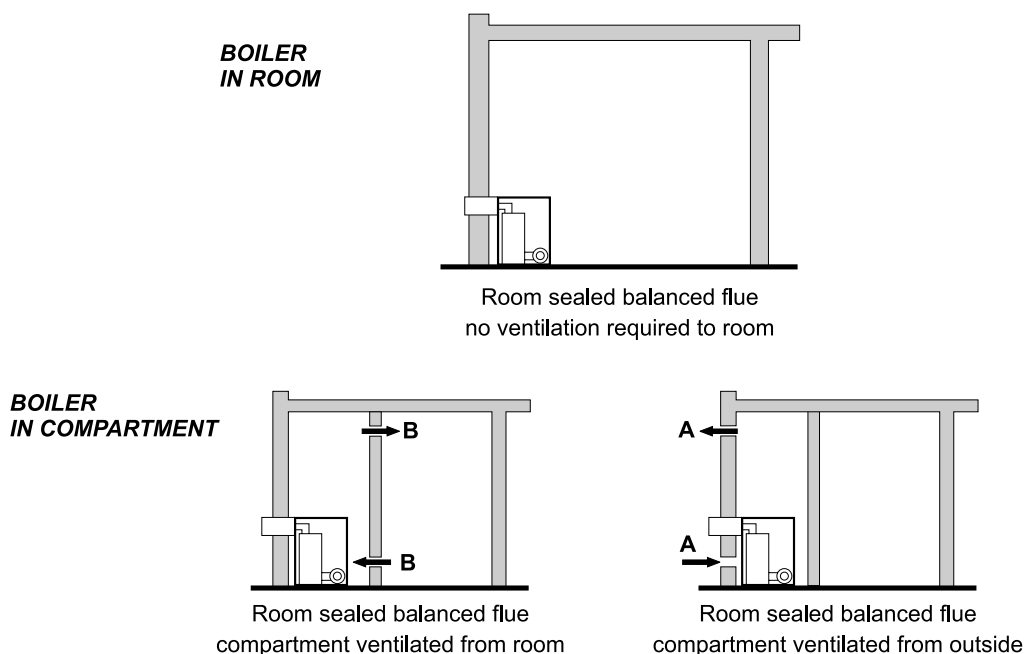


Fig. 7 - Air supply for room sealed balanced flue boilers

Minimum size of air vents required - see Figs. 7 and 8

	50/70	50/90, 70/90	90/120
Vent A	113 cm ² (18 in ²)	145 cm ² (23 in ²)	194 cm ² (30 in ²)
Vent B	226 cm ² (36 in ²)	290 cm ² (46 in ²)	388 cm ² (60 in ²)
Vent C	85 cm ² (13 in ²)	118 cm ² (18 in ²)	166 cm ² (26 in ²)
Vent D	226 cm ² (36 in ²)	290 cm ² (46 in ²)	388 cm ² (60 in ²)
Vent E	338 cm ² (52 in ²)	436 cm ² (68 in ²)	580 cm ² (90 in ²)

Note: If the boiler is in a compartment, this **must** be added to the areas required for ventilation.

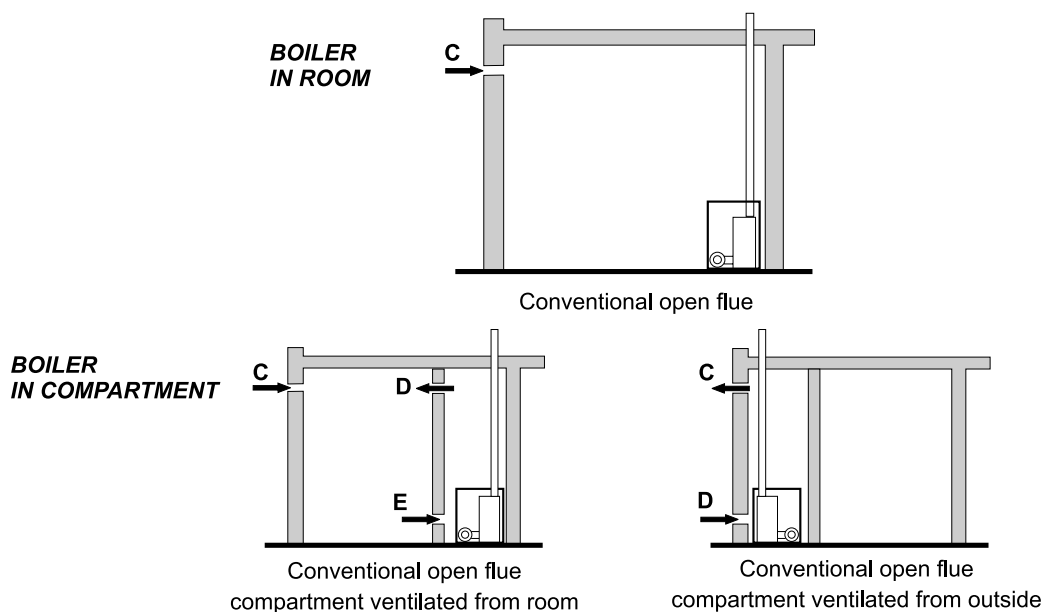


Fig. 8 - Combustion and ventilation air supply for conventional flue boilers



3.7 Conventional flue system

See Figs. 9 and 10

Grant boilers have high operating efficiencies. Care must be taken to ensure the flue system is suitable for the low flue gas temperatures.

- 1 An insulated flue terminating in a down draught free area, i.e. at least 600 mm above the point of exit through the roof or preferably above the ridge level, will normally provide the necessary draught of at least 8.7 N/m^2 (0.035 in wg) as measured close to the boiler connection. If a draught of 37 N/m^2 (0.15 in wg) or more is measured, then a draught stabiliser should be fitted in the flue.
- 2 The flue terminal must be at least 600 mm from any opening into the building, and 600 mm above any vertical structure or wall less than a horizontal distance of 750 mm from the terminal. See Fig. 10.
- 3 If an existing chimney is used, it must be lined with a stainless steel liner for use with fuel oil. The top and bottom of the annular space must be sealed and the void filled with a suitable insulating material to reduce cooling of the flue gases.
- 4 If a rigid flue is used either internally or externally, it must be of the twin wall type with a stainless steel inner skin suitably insulated and weather proofed.
- 5 **The flue diameter must be as specified in section 2.1** for the size of boiler in question.
- 6 The flue must be run upwards following as near a vertical route as possible. Horizontal runs must be avoided and no bends should have an angle of more than 45° from the vertical. There should be at least 600 mm of vertical flue above the boiler before the first bend.
- 7 A sealed cleaning door must be provided near the base of the flue.
- 8 The exposed flue pipe between the boiler and the chimney must not be of an asbestos material and aluminium must not be used in any part of the flue.
- 9 If the draught conditions are satisfactory, the flue should terminate with a standard cowl suitable for pressure jet oil boilers. Where the flue cannot terminate above the ridge of the roof, use an 'OH' or similar type cowl where downdraughting occurs. Ridge vent terminals **must not** be used.
- 10 Refer to the locally applicable Building Regulations, BS 5410:1 and OFTEC Installation Requirements (Books 2 and 3) for further guidance on conventional flue systems.

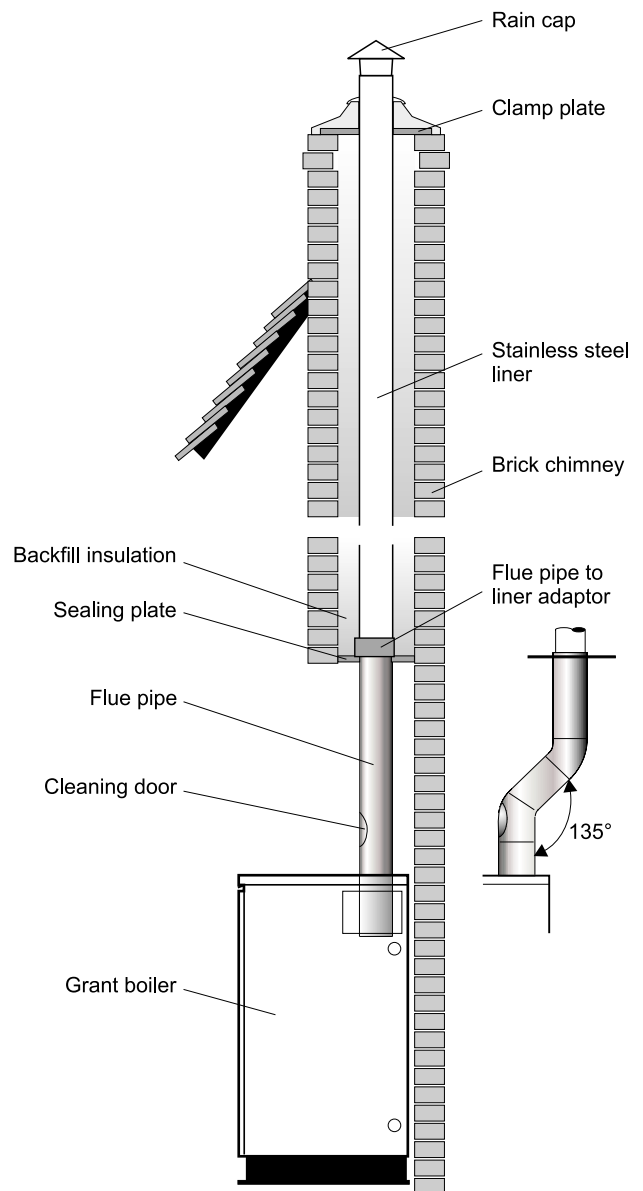


Fig. 9 - Typical conventional flue with brick chimney

11 To allow for flue gas analysis and combustion testing, a test point is provided in the cleaning cover. Alternatively, a test hole can be drilled in the flue pipe.



3 - GENERAL BOILER INFORMATION

3.8 Connect a conventional flue

Kitchen/Utility models

- 1 Lift off the two case top panels.
- 2 Remove the insulation from the smaller panel (do not discard it) and remove knock-out.
- 3 Cut a clearance hole in the insulation.
- 4 Place the first section of the flue pipe through the panel and locate it into the boiler flue socket.
- 5 Make good the connection using a suitable flexible high temperature sealant (e.g. Silastic or similar) and a rope seal and replace the insulation.
- 6 Fit the dress plate supplied, to the top panel.

Boiler House models

- 1 Position the flue pipe into the boiler flue socket.
- 2 Make good the connection using a suitable flexible high temperature sealant (e.g. Silastic or similar) and a rope seal.

3.9 Balanced flue options

- 1 Apart from a conventional flue/chimney, several balanced flue options are available for use with the Kitchen/Utility and Boiler House models.
 - a **High level horizontal balanced flue** - allows the flue to rise between approximately 1.7 to 2.2 m above floor level before exiting through the rear or side wall. It is adjustable to suit the following wall thicknesses:-
 - Rear 215 to 450 mm (approximately)
 - Side 120 to 350 mm (approximately)
 Extension kits are available which extend the flue by 950 mm, 450 mm or 275 to 450 mm telescopic.
 - b **A vertical balanced flue kit** - adjustable to 3 m (maximum 6 m with extensions). Extension kits are available which extend the flue by 950 mm, 450 mm or 275 to 450 mm telescopic. A choice of two waterproof flashings (flat or pitched) and a wall bracket are also available.
 - c **Low level horizontal balanced flue** - available in Short, Standard, Long and Extra Long kits, adjustable to suit the following wall thicknesses:-

Euroflame low level balanced flue kits	To suit wall thickness (mm)			
	Rear exit		Side exit	
Short Kit	Min.	Max.	Min.	Max.
50/70 Boiler House	100	240	0	170
70/90, 90/120 Boiler House	75	230	0	125
50/70 Kitchen/Utility	100	230	30	165
70/90, 90/120 Kitchen/Utility	90	230	0	135
50/90, 90/120 System	90	230	0	135
Standard Kit				
50/70 Boiler House	240	490	145	400
70/90, 90/120 Boiler House	200	465	100	355
50/70 Kitchen/Utility	230	475	150	380
70/90, 90/120 Kitchen/Utility	230	470	110	355
50/90, 90/120 System	230	470	110	355
Long Kit				
50/70 Boiler House	465	955	365	855
70/90, 90/120 Boiler House	435	925	325	820
50/70 Kitchen/Utility	465	940	365	850
70/90, 90/120 Kitchen/Utility	445	940	335	825
50/90, 90/120 System	445	940	335	825
Extra Long Kit				
50/70 Boiler House	955	1815	855	1715
70/90, 90/120 Boiler House	925	1785	820	1680
50/70 Kitchen/Utility	940	1800	850	1710
70/90, 90/120 Kitchen/Utility	940	1800	825	1685
50/90, 90/120 System	940	1800	825	1685

The wall thicknesses quoted above for side flue assumes that the boiler will be spaced off the wall by a nominal 20 mm (to provide clearance for the plugs for the water connections). Water connections may be taken from one side only, if required (see paragraph 2 in section 3.12).



- 2 The minimum clearances for positioning the flue terminal are shown in Fig. 10.
- 3 If the lowest part of the flue terminal is fitted less than 2 m above a surface to which people have access, the terminal must be protected by a guard. A suitable guard is supplied with the Low level flue kit. The guard must be fitted centrally over the flue terminal and securely fixed to the wall.

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

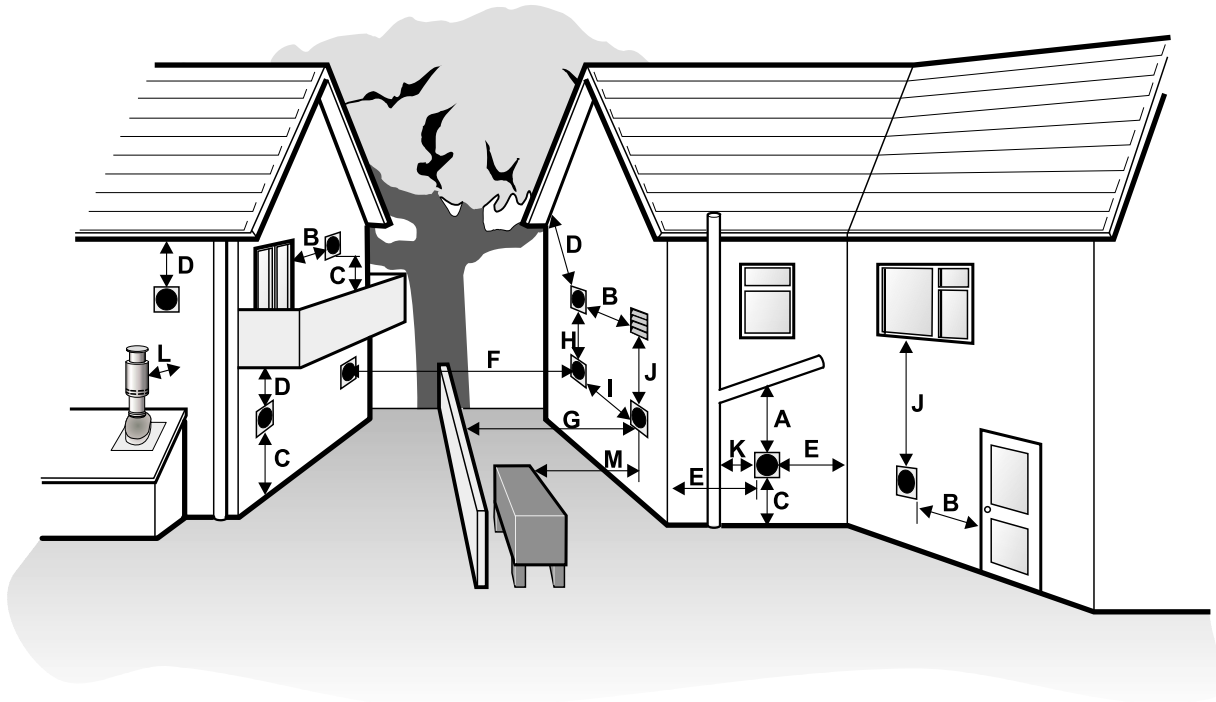


Fig. 10 - Clearances for Balanced flues

Terminal position	Min. distance (mm)
A Below a gutter or sanitary pipework	* 600
B Horizontal from an opening, air brick or window	600
C Above ground or balcony level	**300
D Below eaves or balcony	*600
E From an internal or external corner	**300
F From a terminal facing the terminal	1200
G From a surface facing the terminal	600
H Vertical from terminals on the same wall	1500
I Horizontal from terminals on the same wall	750
J Below an opening, air brick, window etc.	600
K From vertical sanitary pipework	300
L Vertical flue from a wall	600
M From an oil storage tank	1800

Notes: * 75 mm with protection.
 ** 300 mm British Standards
 (600 mm recommended for high level balanced flue)

Distances measured to rim of terminal.

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

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



3 - GENERAL BOILER INFORMATION

3.10 Frost protection

For additional protection of either the entire heating system, or the boiler and localised pipework, it is recommended that a frost thermostat be installed. Refer to section 8 for connection details.

To protect the heating system the frost thermostat should be sited within the house in such a place that it can detect any rise and fall in the ambient air temperature, i.e. in a room with a radiator.

Where the frost thermostat is installed outside the house (to protect a boiler installed in an external boiler room or garage) or in an attic, it is recommended that it be used in conjunction with a pipe thermostat to avoid unnecessary and wasteful overheating of the property. The pipe thermostat should be located on the boiler return pipe, and set to operate at 25°C. Refer to section 8 for connection details.

3.11 Boiler location

- 1 The boiler must stand on a surface that is firm and level. It does not require a special hearth as the temperature of the boiler base is less than 50°C.
- 2 Sufficient clearance **must be** allowed around the boiler for the following:-
Access above the boiler to remove the baffles for servicing.
Access at the front of the boiler to remove the burner.
- 3 If the boiler is to be installed with a side against a wall, allow a nominal clearance of 20 mm for the plugs for the water connections. Water connections may be taken from one side only if required (see section 3.12, paragraph 2).

3.12 Water connections

Kitchen/Utility and Boiler House - See Fig. 11

- 1 A high level flow and low level return connection are provided on each side of the boiler. See Fig. 1. 1" BSP connections are used on 50/70, 70/90 models and 1¼" on 90/120 models.
- 2 Flow and return connections should preferably be diagonally opposed, i.e. to opposite sides of the boiler. If the boiler is to be positioned against a wall, the water connections may be taken from one side only.
- 3 All models have a tapping (½" BSP) on the front for the thermostat pocket, (pocket supplied loose with Boiler House models).

- 4 All water connections have been temporarily sealed with plastic caps to prevent any residual water (from factory testing) leaking from the boiler during transit. **All** the caps must be removed before connecting any fittings.

Plug all unused connections.

- 5 Fit drain taps in the central heating and domestic hot water systems to allow the complete system to be fully drained.
- 6 Thoroughly flush the system before fitting the pump.

3.12a Water connections

System boiler

The system pipework may exit the boiler from either the left hand or right side of the boiler casing. See Fig. 1.

- 1 Fit any elbows, bushes etc. to the heating return tapping at the bottom (1" BSP 50/90 or 1¼" BSP 90/120) before placing the boiler in position if access is restricted. Do not forget to plug the unused connection on the opposite side.
- 2 The heating flow pipe (22 mm 50/90 or 28 mm 90/120) and 15 mm safety valve discharge pipe are provided with pushfit Tectite elbows to enable quick and simple installation. Orientate the elbows for left or right hand connection. Ensure that the installation pipework is pushed fully home into the elbows.

The 90/120 boiler is supplied with a 28mm flow pipe factory fitted for left hand side exit. A 28mm push fit Tectite elbow is provided for easy connection of the heating system pipework.

If required, the flow pipe may exit through the right hand side panel. The 28mm factory fitted flow pipe must be turned 90° and routed across the boiler behind the control panel.

Important: Care must be taken not to obstruct the cleaning cover door on top of the boiler as removal of the door and the boiler baffles will not be possible.

- 3 The safety valve discharge pipe must be routed clear of the boiler to the outside, to discharge in such a manner that the discharge can be seen but cannot cause injury or damage to persons or property.
- 4 The cold fill shut off valve should be fitted in an accessible position close to the boiler to enable connection of the temporary flexible filling loop to the boiler.

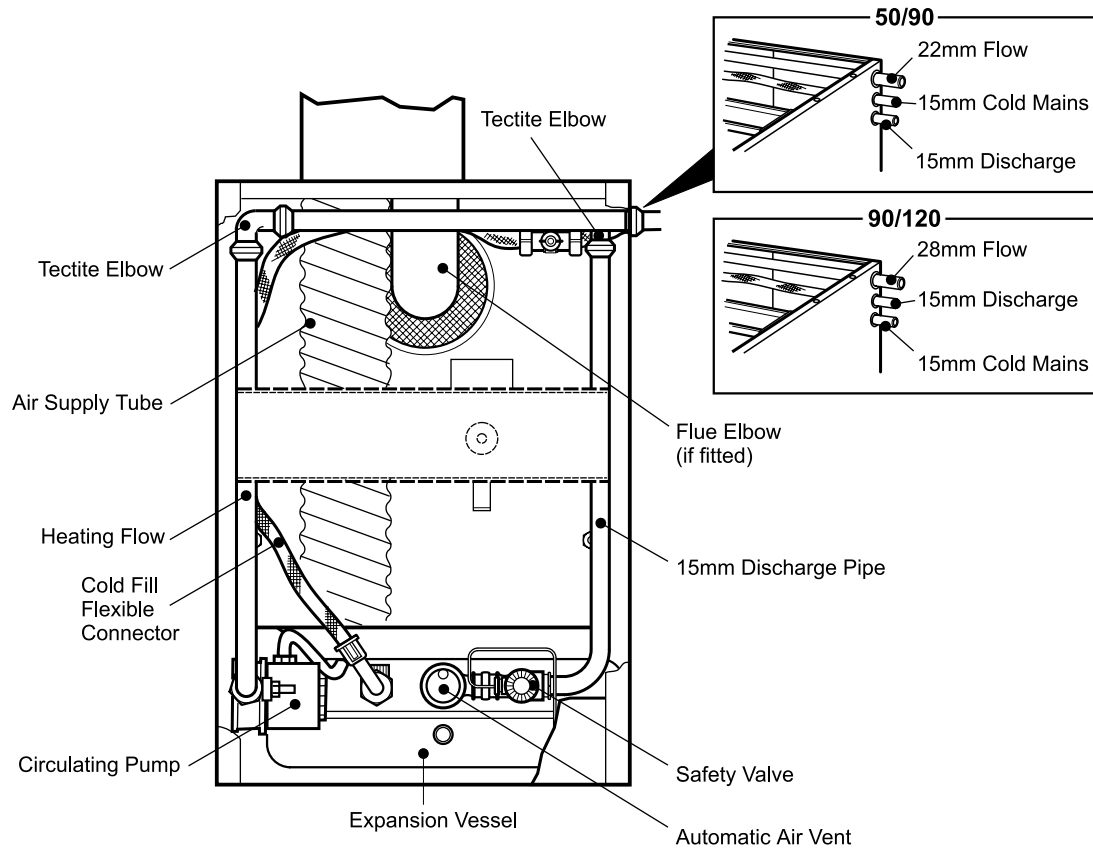


Fig. 11 - Kitchen/Utility system boiler water connections

3.13 Heating system diagrams

See Figs. 12, 13 and 14

3.13.1 Gravity domestic hot water - (See Fig. 12)

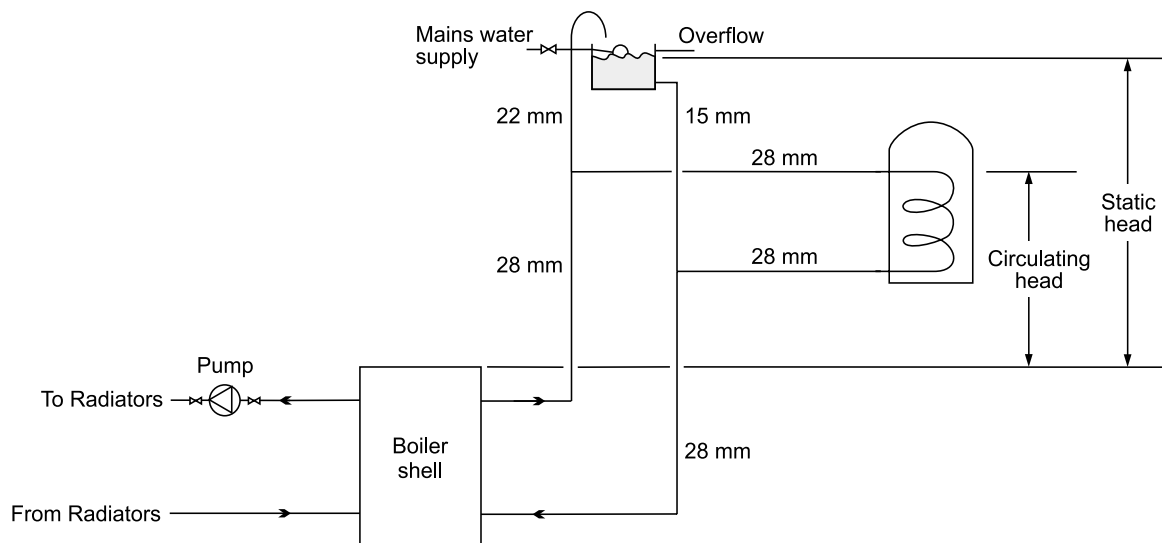


Fig. 12 - Gravity domestic hot water system



3 - GENERAL BOILER INFORMATION

3.13.2 Fully pumped - (See Fig. 13)

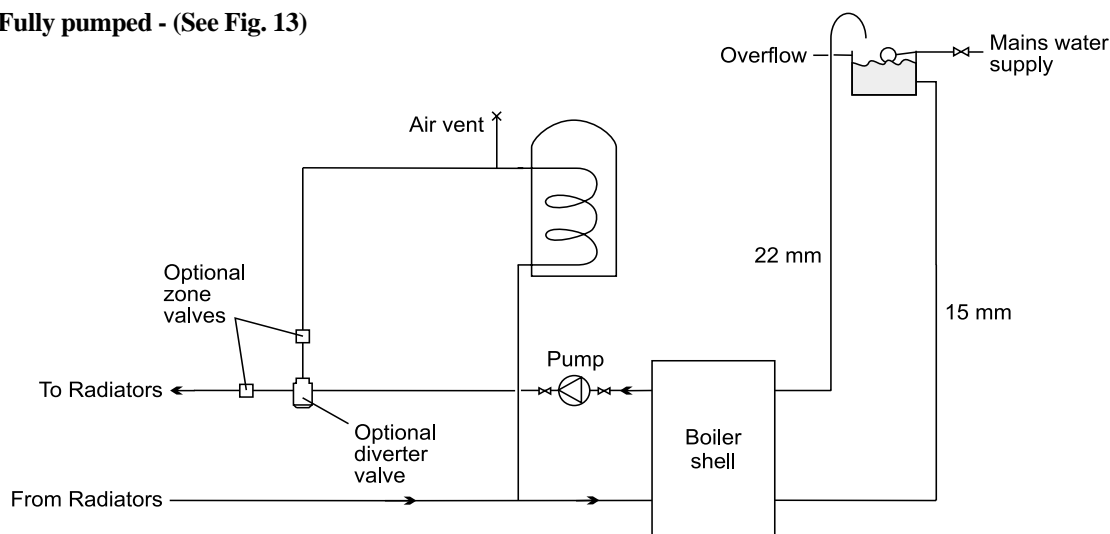


Fig. 13 - Fully pumped system

3.13.3 Kitchen/Utility sealed system - (See Fig. 14)

- 1 The boiler is suitable only for use with a sealed system complying with the requirements of BS 5449.
The maximum temperature of the central heating water is 85°C.
- 2 The boiler is supplied with the following items factory fitted:-
 - a A diaphragm expansion vessel complying with BS 4814, pre-charged at 1.0 bar.
 - b System pressure gauge, with an operating range of 1 to 4 bar.
 - c Pressure relief safety valve complying with BS 6759 and set to operate at 3 bar.
 - d Circulating pump with isolating valves.

- e Automatic air vent.
- f Filling loop. This **must be** isolated and disconnected after filling the system.
- 3 The central heating system volume, using the expansion vessel as supplied, must not exceed the volume shown in section 2.1. For further guidance refer to BS 7074:1.
Refer to section 4.14 for further details of the expansion vessel.
- 4 The system design pressure (cold) should be between 0.5 and 1.0 bar. This pressure is equivalent to the maximum static head (see Fig. 14) in bar + 0.3 (1 bar = 10.2 metres of water).
- 5 If thermostatic radiator valves are fitted to all radiators, a system by-pass must be fitted.

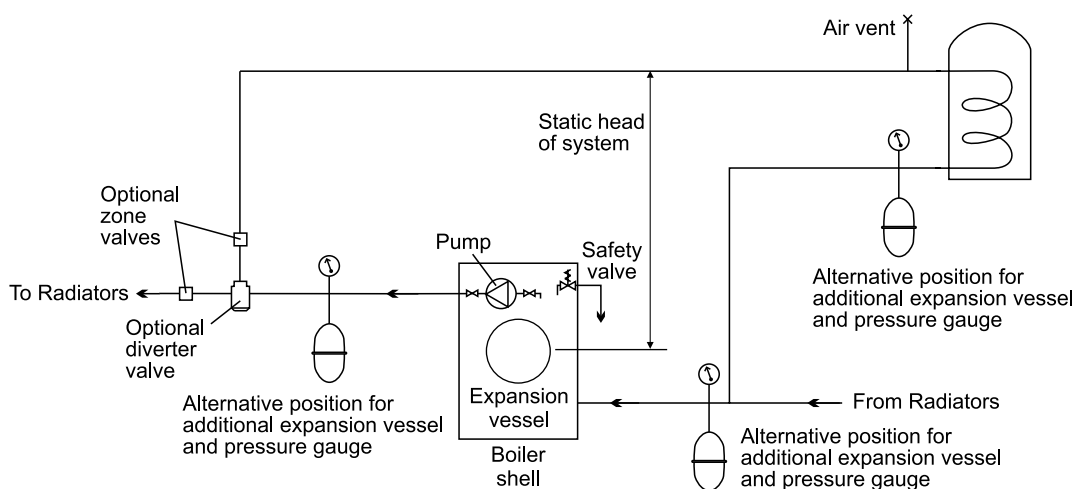


Fig. 14 - Sealed system



- 6 Provision should be made to replace water lost from the system. This may be done manually (where allowed by the local Water Undertaking) using the filling loop arrangement supplied with the boiler.
- 7 Filling of the system must be carried out in a manner approved by the local Water Undertaking. Where allowed, the system may be filled via the filling loop supplied (the loop arrangement includes a double check valve assembly).
- 8 All fittings used in the system must be able to withstand pressures up to 3 bar.
- 9 Radiator valves must comply with the requirements of BS 2767(10):1972.
- 10 One or more drain taps (to BS 2879) must be used to allow the system to be completely drained.

To avoid the danger of dirt and foreign matter entering the boiler the complete heating system should be thoroughly flushed out - before the boiler is connected and then again after the system has been heated and is still hot. This is especially important where the boiler is used on an old system.

For optimum performance after installation, this boiler and its associated central heating system must be flushed in accordance with the guidelines given in BS 7593:1992 'Treatment of water in domestic hot water central heating systems'.

This must involve the use of a proprietary cleaner, such as BetzDearborn's Sentinel X300 or X400, or Fernox Superfloc. Full instructions are supplied with the products, but for immediate information, please contact BetzDearborn on 0151 4209563 or Fernox on 0179 9550811.

For Long term protection against corrosion and scale, after flushing, it is recommended that an inhibitor such as Betzdearborn's Sentinel X100 or Fernox MB01 or Copal is dosed in accordance with the guidelines given in BS 7593:1992.

Failure to implement the guidelines may invalidate the warranty.

4.1 Unpack the boiler

Kitchen/Utility models

- 1 Carefully remove the packaging from the boiler and remove it from the transit pallet.
- 2 Remove the boiler front panel (pulls off - two push-on fixings) and remove the literature pack.

Boiler House models

- 1 Carefully remove the packaging from the boiler. The literature pack is supplied on top of the boiler.
- 2 Unpack the burner. The pack contains the burner and the combined boiler control /overheat thermostat.

Refer to section 3.8 to fit a conventional flue.

4.2 Prepare the wall

See Figs 15 and 16

If the boiler is to be used with a balanced flue, decide upon the position of the boiler and determine exactly where the flue will pass through the wall.

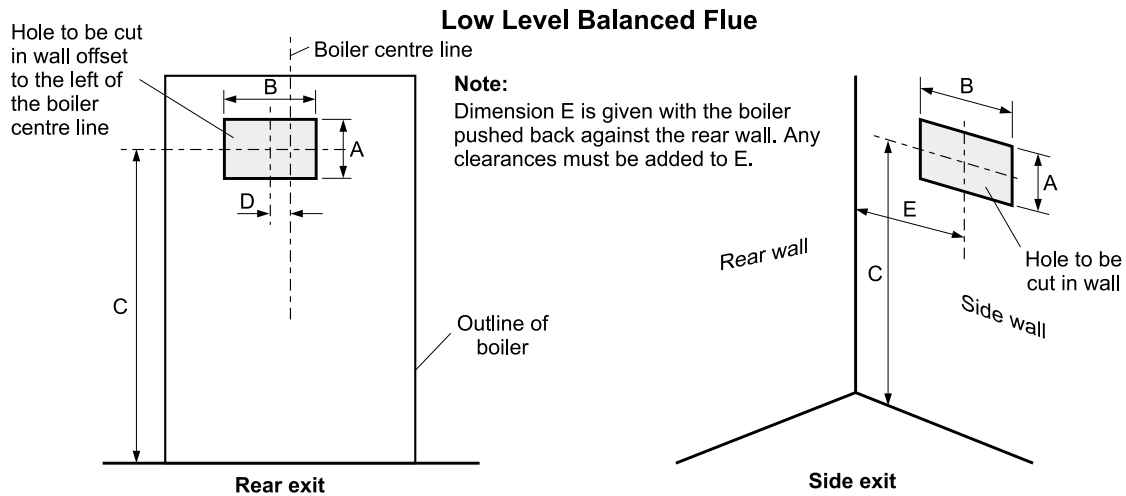
Check that there are no obstructions in the way, that the terminal position complies with the dimensions given in Fig. 10 and then make the hole in the wall for the flue as shown in Fig. 15 (low level flue) or Fig. 16 (high level flue).

Note: The hole dimensions given in Figs. 15 and 16 include an extra 10 mm over the size of the terminal to provide clearance for fitting.

Note: When the boiler is installed with the back panel against the wall and a high level flue, the throat of the flue bend could enter the inner wall opening. Cut away the underside of the hole in the inner wall to accept the throat of the bend.



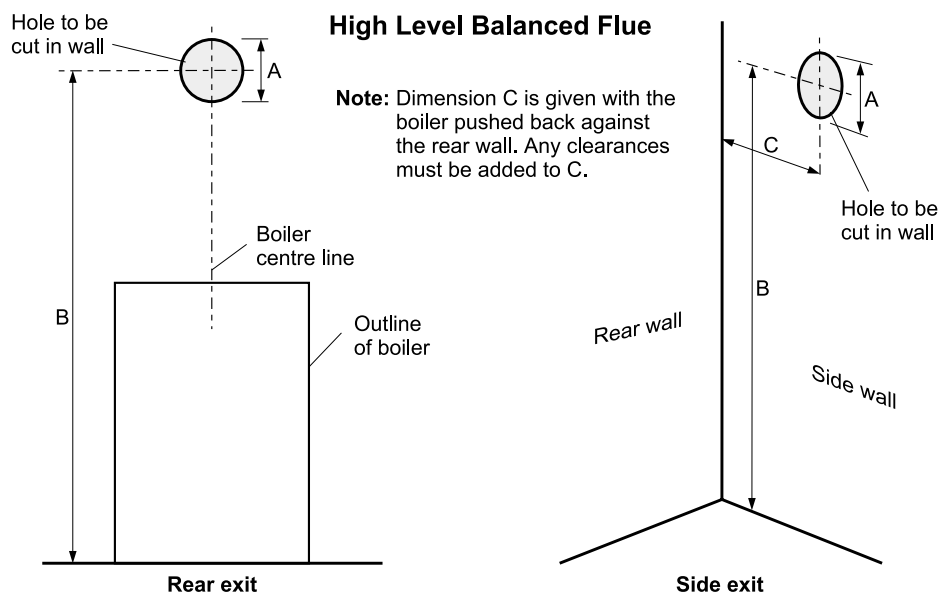
4 - BOILER INSTALLATION



Model	Dimension (mm)				
	A	B	C	D	E
Kitchen/Utility model - 50/70	130	195	715	45	135
Kitchen/Utility models - 50/90, 70/90	130	195	764	45	155
Kitchen/Utility model - 90/200	155	255	753	53	155
Boiler House model - 50/70	130	195	770	45	140
Boiler House model - 70/90	130	195	825	45	165
Boiler House model - 90/200	155	255	815	53	175

Note:
Dimension E is given with the boiler pushed back against the rear wall. Any clearances must be added to E.

Fig. 15



Model	Dimension (mm)			
	A (dia)	B (min)	B (max)	C (side)
Kitchen/Utility model - 50/70	175	1160	2060	80
Kitchen/Utility models - 50/90, 70/90	175	1210	2110	100
Kitchen/Utility model - 90/200	200	1250	2090	100
Boiler House model - 50/70	175	1220	2120	90
Boiler House model - 70/90	175	1275	2175	115
Boiler House model - 90/200	200	1300	2040	120

Fig. 16

4.3 High level and vertical balanced flue

Fitting instructions for the high level balanced flue and vertical balanced flue are supplied with the flue kits.

Adjustable sections: The adjustable extensions are telescopic. The wall terminal section is adjustable and is suitable for a wall thickness of 215 mm to 450 mm. Simply adjust to the required length using a twisting motion. The outer pipes **must** overlap by a minimum of 25 mm.

Extensions: The vertical height and horizontal length of the flue may also be increased using extensions. The extensions are available in fixed lengths of 225 mm, 450 mm and 950 mm. An adjustable extension (275 - 450 mm) is also available.

Bends: 45° bends are available and may be used to create an offset or deviation in the flue system. The distance between the bends should be kept as short as possible with a maximum length of 950 mm.

The equivalent flue length of each elbow is approximately one metre. Only two bends should be used.

Note: The overall assembled flue length should not exceed 4.0 metres from the top of the boiler to the end of the terminal.

Accessories available:

- Extension 225 mm
- Extension 450 mm
- Extension 950 mm
- Adjustable extension 275 - 450 mm
- 45° bend
- Wall bracket

Note: Flue sections cannot be cut.

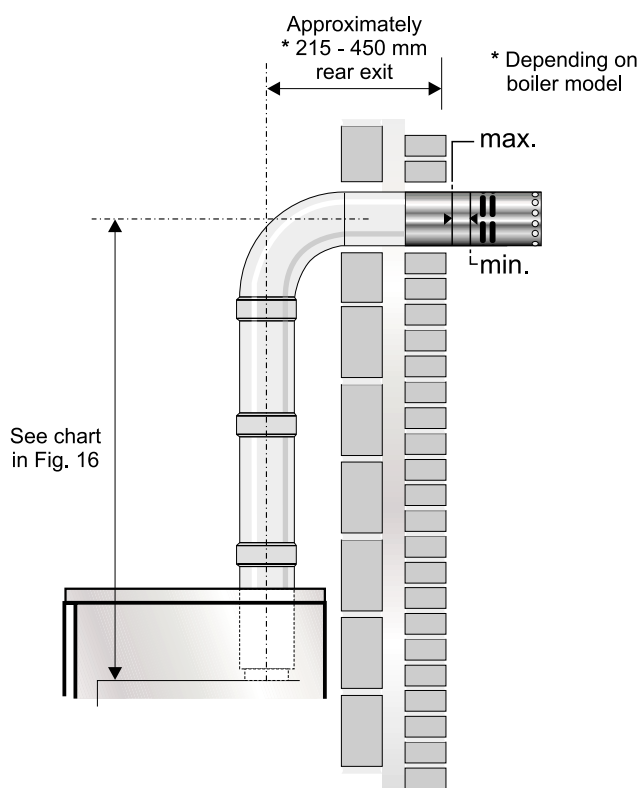


Fig. 17 - High level balanced flue



4 - BOILER INSTALLATION

4.4 Make the water connections

- 1 **Boiler House models** - Fit the thermostat pocket (supplied with the boiler/overheat thermostat assembly) into the ½" BSP tapping on the front of the boiler. Use a small amount of jointing compound on the threads.

Note: Thermostat pocket factory fitted on Kitchen/Utility models.

- 2 **All models** - Fit any elbows, bushes etc. to the water connections before placing the boiler in position if access will be restricted.

Note: If the boiler is to be positioned against a side wall, the water connections may be taken from one side only.

- 3 Ensure that all the plastic caps have been removed from the boiler connections and plug all connections not to be used.
- 4 Plug all connections not to be used and carefully manoeuvre the boiler into position.
- 5 **Balanced flue models** - Do not make any water connections at this stage.
- 6 **Conventional flue models only** - Complete the water connections and fill the water system. Check for leaks, rectifying where necessary.

Refer to section 4.9 to fill the System boiler.

4.5 Fit a low level balanced flue

- 1 **Cased models** - Lift off the boiler case top panels. Remove and discard the appropriate blanking panel from the rear or side of the boiler casing as required.
- 2 Unpack the flue kit.
- 3 Place the circular fibre gasket into the boiler flue spigot. See Fig. 18.

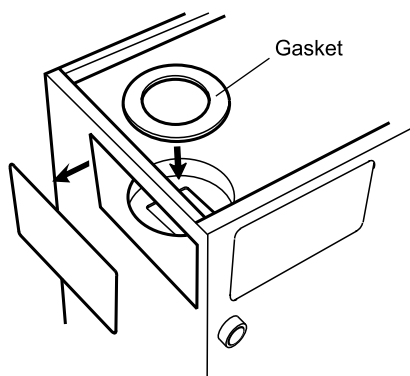


Fig. 18

- 4 Take the flue elbow and pass it through the hole in the boiler casing (cased models). Fit the flue elbow flange onto the boiler flue spigot ensuring that the clamp passes through the hole in the top of the boiler as shown in Figs. 19 and 20.
- 5 Ensure that the elbow is located centrally in the boiler spigot, and is facing in the required direction.

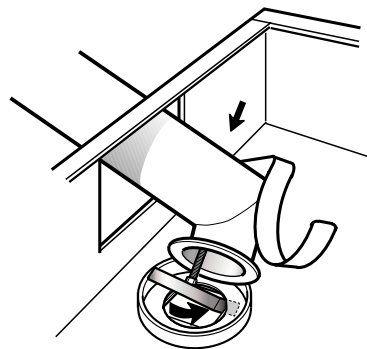


Fig. 19



Fig. 20

- 6 **Cased models** - Ensure that the flexible air tube hanging bracket is positioned correctly. See Fig. 21.
- 7 Turn the domed nut of the flue elbow clamp clockwise until the elbow is clamped to the boiler. Tighten the domed nut using a spanner. See Fig. 21.

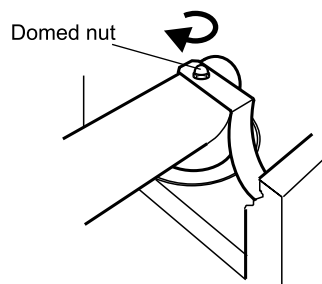


Fig. 21

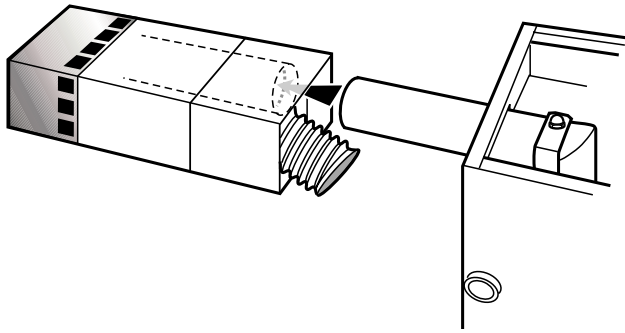


Fig. 22

- 8 Extend the telescopic flue assembly to the approximate required length. Offer the flue assembly up to the flue elbow ensuring that the assembly is in line with the elbow and engage the flue pipe over the elbow. See Fig. 22.

Holding the stainless steel terminal section of the kit, push the flue assembly together until the rectangular wall sleeve is just inside the boiler casing.

Important notes:

- a When engaging the flue assembly over the flue elbow, take care not to dislodge the seal from the recess in the flue pipe.
- b The flue pipe and seal are pre lubricated. Soap solutions must not be used.
- c The elbow must be inserted to a minimum depth of 60 mm past the flue seal.
- d For Boiler House models the wall sleeve should overhang the casing by 20 mm.
- e When using the Short Kit on single leaf walls it may be necessary to discard the inner wall sleeve (painted) to obtain the minimum length available.
- f The telescopic wall sleeves should overlap by a minimum of 20 mm.

Manoeuvre the complete boiler and flue assembly into position, passing the flue through the prepared hole in the wall.

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

- 9 Alternatively, the boiler can be manoeuvred into position with just the flue elbow attached so that the flue elbow is located through the prepared hole in the wall.

Holding the stainless steel section of the flue, pass the flue assembly through the hole in the wall from outside, carefully locating the flue pipe over the flue elbow, until the wall sleeve is just inside the boiler casing.

See Important notes in paragraph 8.

- 10 **Important:** The stainless steel flue terminal must be located correctly to allow access to the terminal fixing screws. Ensure that the marker on the outer wall sleeve is aligned with the face of the outer wall. See Fig. 23.

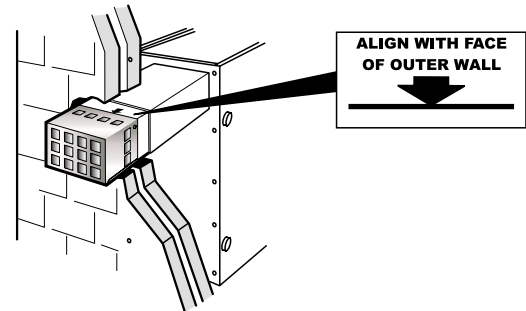


Fig. 23

- 11 Make good the hole in the wall and fit the terminal dress plate using a suitable mastic sealant (not supplied) to provide a weatherproof seal. See Fig. 24.

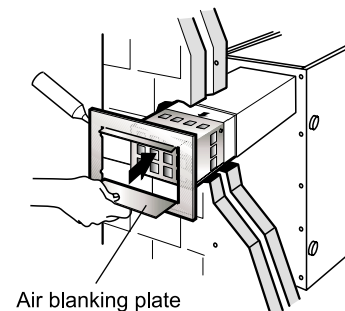


Fig. 24

Ensure that the air blanking plate of the terminal dress plate covers the air intake holes on the underside of the flue terminal as shown in Fig. 24.



4 - BOILER INSTALLATION

- 12 Fit the clip on the deflector plate to the face of the terminal. Locate the lugs on the top edge of the deflector into the upper holes on the front face of the terminal, see Fig. 25. Carefully depress the sides of the deflector and locate the side lugs into the holes in the terminal as shown in Fig. 26.

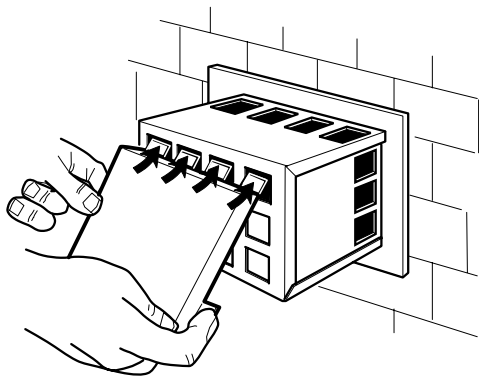


Fig. 25

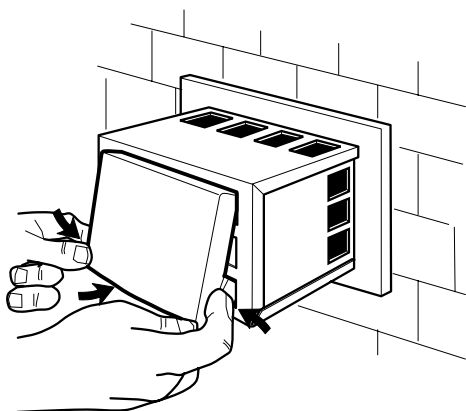


Fig. 26

- 13 **Cased models** - Remove and discard the conventional flue flexible air tube supplied with the boiler from the burner air spigot retaining the clamp. Extend the flexible air tube supplied with the flue kit over the top of the boiler water jacket, passing the tube under the control panel and across the front of the boiler. Locate the end of the tube over the burner air supply spigot and secure using the clamp previously removed. Clip the tube into the hanging bracket on the flue elbow so that it does not touch any hot flue parts.

- 14 **Boiler House models** - Extend the balanced flue flexible air tube over the top of the boiler water jacket. Take the painted flue elbow cover and route the tube through the hole in the front face of the cover.

Fit the flue elbow cover to the inner wall sleeve using the screws supplied. See Fig. 27.

Locate the end of the air tube over the burner air supply spigot and secure using the clamp supplied.

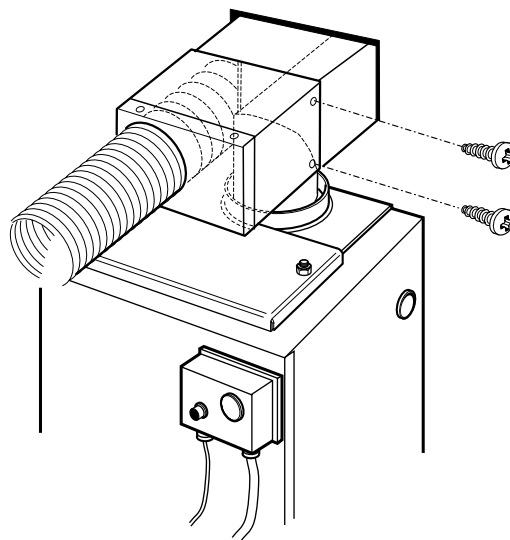


Fig. 27

- 15 Fit the terminal guard over the flue terminal and secure using the screws and plugs supplied. See Fig. 28.

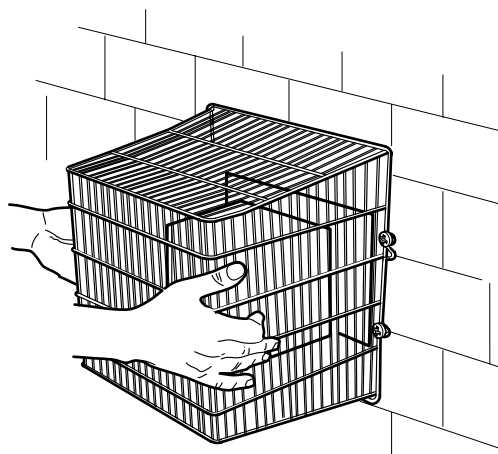


Fig. 28

4.6 Fit the burner

Kitchen/Utility models are supplied with the burner fitted. To fit the burner to a Boiler House model proceed as follows:-

- 1 Remove and retain the burner fixing nut from the stud on the burner fixing flange on the front of the boiler, see Fig. 28. Leave the small nut in position (ensure it is located up against the mounting flange).

Note: Do **not** remove the fixing flange from the boiler.

- 2 Check that the 'O' ring is in position (around the collar of the burner combustion head). Position the burner on the boiler by sliding the combustion head into the mounting flange on the boiler. With the burner level and correctly located over the fixing stud, secure it in position using the nut previously removed.
- 3 **Balanced flue** - Remove the air intake cover from the burner and fit the air tube spigot supplied. See Fig. 31a. Fit the air tube over the air tube spigot and secure it in position using the clamp supplied.

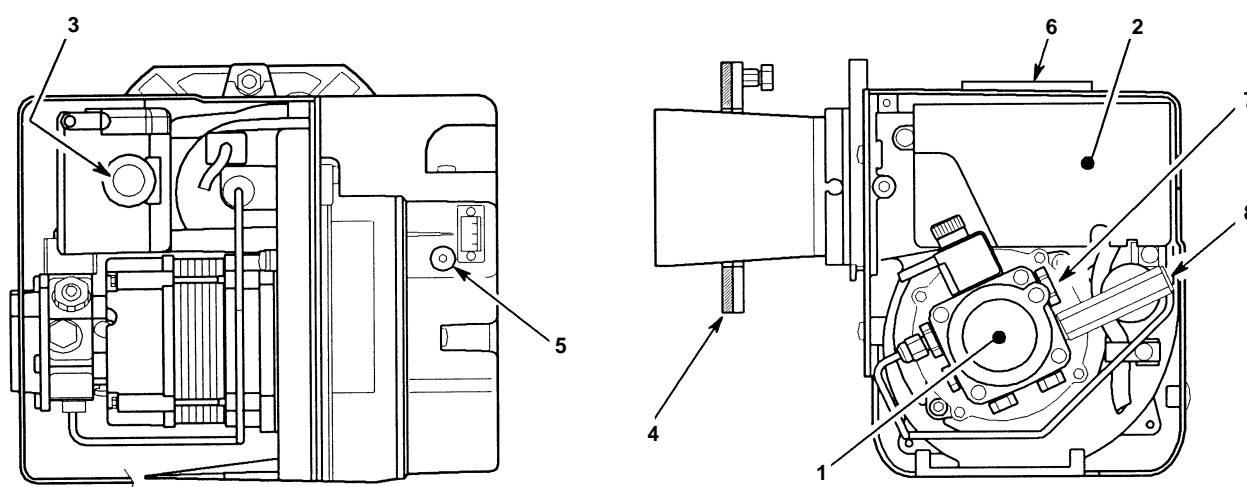


Fig. 29 - Riello RDB burner components

- | | |
|--|--|
| <ol style="list-style-type: none"> 1 Pump 2 Control box 3 Reset button with lock-out lamp 4 Flange with gasket (do not remove from boiler) | <ol style="list-style-type: none"> 5 Air damper adjustment screw 6 Air supply tube connection (balanced flue) 7 Pump pressure adjustment screw 8 Pressure gauge connection |
|--|--|

4.7 Connect the power supply

Kitchen/Utility and Kitchen/Utility System models only

It is recommended that the boiler should be connected to a switched mains power supply from an external timer or control system.

- 1 Lift off the boiler case top panel if it has not already been removed.
- 2 Remove the wiring cover. Fit the grommet supplied into the hole in the rear panel. Route the supply cable through the grommet into the control box, pass it under the cable clamp and connect to the terminal block (refer to Fig. 37) as follows:-
Brown to Mains Live (terminal 1)
Blue to Mains Neutral (terminal 2)
Green/Yellow to Mains Earth (terminal 3)

Boiler House models only

It is recommended that the boiler should be connected to a switched mains power supply from an external timer or control system.

- 1 Position the thermostat phials of the combined boiler/overheat thermostat in the thermostat pocket on the front of the boiler. Push the assembly fully home onto the pocket, with the cable entries to the bottom and secure in position by tightening the two fixing screws.
- 2 Undo the three screws securing the combined boiler/overheat thermostat cover and lift off the cover.



4 - BOILER INSTALLATION

- 3 Withdraw the cable support bushes from the cover. Pass the burner supply cable through one of the bushes and connect it to the boiler (control) thermostat (refer to Fig. 39) as follows:-

Brown to terminal 1 on the control thermostat
Green/Yellow to the earth terminal, marked $\frac{\perp}{\perp}$, on the control thermostat

- 4 Pass a switched mains power supply through the other cable support bush and connect it to the overheat thermostat (refer to Fig. 39) as follows:-

Switched live (brown) to terminal C on the overheat thermostat

Earth (green/yellow) and earth fly lead from casing to the earth terminal, marked $\frac{\perp}{\perp}$, on the overheat thermostat

The Blue (neutral) wire from the burner supply must be linked to the incoming neutral of switched mains supply using a single connector (not supplied).

Refer to section 8.4. For other systems not covered, contact Grant Engineering (UK) Ltd.

DO NOT connect the neutral wires to either of the two thermostats.

- 5 Connect a link between terminal 2 on the overheat thermostat and terminal C on the control thermostat.
- 6 **There are no connections to terminal 1 on the overheat thermostat and terminal 2 on the control thermostat.**
- 7 Position the support bushes so as not to strain the connections when the cover is replaced. Place the cover in position locating the bushes at the same time.

Note: It may be necessary to rotate the thermostat knob to engage it on the operating spindle as the cover is replaced.

- 8 Secure the cover in position by tightening the three screws. Tighten the cable support bush nuts to secure the cables.
- 9 Ensure that all external wiring is adequately supported.
- Do not switch on the electricity supply at this stage.

4.8 *Connect the fuel supply*

See Fig. 6

If a two pipe system is to be used refer to section 3.4.8.

- 1 Remove the plug from the fuel pump oil inlet adaptor and connect the elbow of the flexible fuel line supplied with the boiler.
- 2 Connect the flexible fuel line to the rigid supply using the adaptor supplied. For Kitchen/Utility models the supply enters through one of the holes at the bottom of the case sides or the back panel.

4.9 *Fill and vent a sealed system*

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 (see Fig. 14). 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 107 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 2.3 bar the vessel is adequate. A higher figure indicates that an extra vessel is required.

Fill the system

- 1 An automatic air vent is fitted to the top of the boiler (see Fig. 30). Check that the small cap on the top of the air vent is screwed on fully, then unscrew it one complete turn - the cap remains in this position from now on.
- 2 Ensure that any valves in the heating system pipework are open.



- 3 Ensure that the flexible filling loop is fitted between the shut off valve on the mains water supply and the double check valve on the heating system.
- 4 Open the mains shut off valve and then gradually open the valve on the double check valve until water is heard to flow. The valves are fully open when the operating lever is in line with the valve body and closed when it is at right angles to it.
- 5 Fill the system until the pressure gauge indicates a pressure of approximately 1.5 bar. Close both the filling loop valves and check the system for water soundness, rectifying where necessary.
- 6 Vent each radiator in turn, starting with the lowest in the system, to remove the air.
- 7 It is important that the circulating pump is properly vented to avoid it running dry and damaging its bearings. Undo the cover in the centre of the pump, insert a suitable screwdriver into the end of the pump shaft and rotate it at least one complete turn. Replace the plug.
- 8 Check the operation of the safety valve (see Fig. 29) by turning the head anticlockwise until it clicks. The click is the safety valve lifting off its seat allowing water to escape from the system. Check that this is actually happening, and water flows unobstructed from the relief discharge pipe.
- 9 Continue to fill the system until the pressure gauge indicates 1.0 bar. Close the filling valve and cold water inlet valve and check the boiler and system for water soundness, rectifying where necessary. Water may be released from the system by manually operating the safety valve until the system design pressure is obtained.
- 10 The system design pressure (cold) should be between 0.5 and 1.0 bar. This pressure is equivalent to the maximum static head in bar + 0.3 (1 bar = 10.2 metres of water). See Fig. 14. Set the adjustable pointer on the pressure gauge to the system design pressure.
- 11 On completion of filling, ensure that both filling loop valves are closed and disconnect the flexible hose.

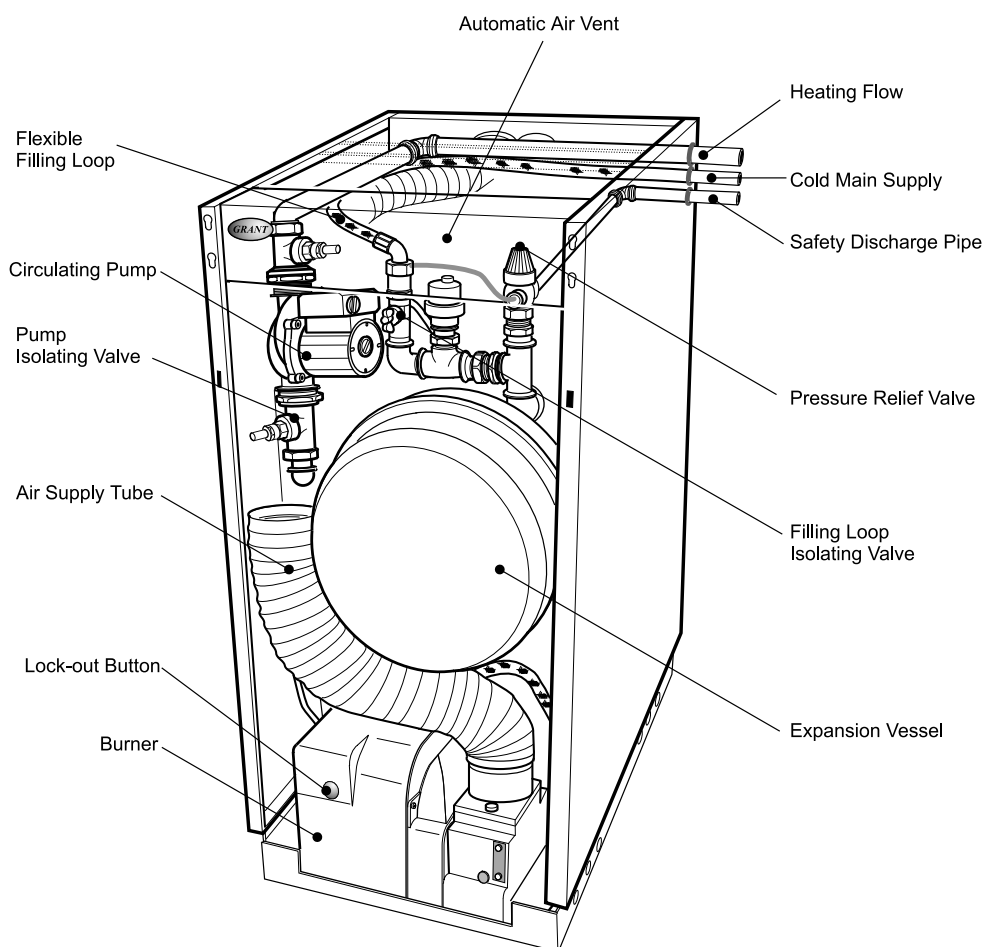


Fig. 30- System boiler components



5 - COMMISSIONING

Refer to Figs. 31a or 31b for boiler controls

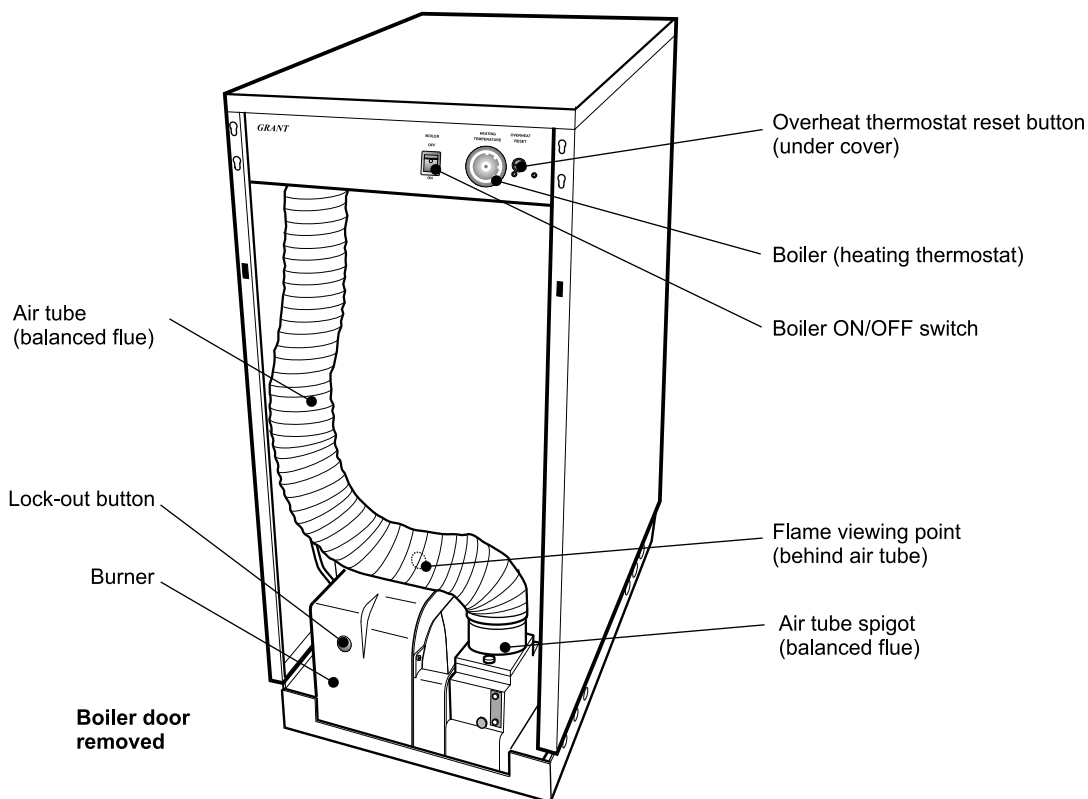


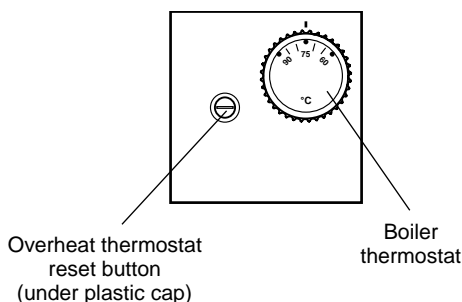
Fig. 31a - Utility models

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

If the boiler output is to be adjusted from that which is factory, set refer to section 1.2 or 1.3 for the required settings, section 7.4 for burner head/nozzle change instructions and Fig. 33 for baffle adjustment as appropriate.

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 if sealed system) and there are no leaks.
- 2 Check that all fuel line valves are open.
- 3 Remove the plastic burner cover (two screws) if it was not previously removed.
- 4 Connect a combined vent manifold and pressure gauge to the pressure gauge connection port on the oil pump. See Fig. 29. Open the vent screw on your vent manifold to vent the supply while the pump is running.



Combined Boiler/Overheat thermostat of the Boiler House models

Fig 31b - Boiler House models

- 5 Set the boiler On/Off switch to Off (Kitchen/Utility models only). Check that all system controls are calling for heat and turn the boiler thermostat to maximum. Switch on the electricity supply.

Note: Boiler House models will start as soon as the electricity supply to the boiler is switched on.



- 6 Set the boiler On/Off switch to On (Kitchen/Utility models only). The burner fan should start and the burner should light within about 20 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 With the burner alight, check the fuel pressure. Refer to the Technical Information, sections 2.2 and 2.3. Adjust the pressure if necessary - see Fig. 29. Note that the On/Off switch (Kitchen/Utility models only, see Fig. 30a) lights when the boiler is switched on, but does not necessarily indicate the burner is firing.
- 8 Operate the boiler until it reaches normal operating temperature. Check oil pipes for leaks, rectifying where necessary.
- 9 With the burner alight, re-check the fuel pressure and re-adjust if necessary. Turn the boiler off, remove the pressure gauge and replace the plug in the pump.
- 10 Having ensured that there are no oil leaks, replace the burner cover. Ensure the flexible air tube is connected to the burner (balanced flue models).
- 11 Relight the boiler and allow it to run for 20 minutes then check the following:-
CO₂ level, Flue gas temperature and Smoke Number. Refer to the Technical Information in sections 2.2 and 2.3.
A flue gas sampling test point is provided in the cleaning cover on top of the boiler.
A flame viewing point is provided, on all models, just above the burner (see Fig. 31a). Use this to view the flame **not** as a test point.
- 12 Check the smoke number, if satisfactory check the CO₂. Use the hexagonal key supplied to adjust the burner air damper (see Fig. 29) as required. Turning the screw clockwise closes the damper and increases CO₂ level, turning the screw anticlockwise opens the damper and reduces CO₂ 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 CO₂ than that which has a smoke number of 1.
- 13 Check the flue gas temperature.
- 14 Check the boiler overheat thermostat by removing the boiler thermostat phial (the shorter one for Kitchen/Utility models) from the pocket in the front of the boiler shell. The boiler should switch off on the overheat thermostat. Replace the phial. Unscrew and remove the reset button cover, press the reset button and replace the cover.
- 15 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.
- 16 Switch off the boiler.
- 17 With the hot water system hot, check again for leaks, rectifying where necessary. Drain the system while it is hot to complete the flushing process. Refill and vent (and pressurise if a sealed system) the system.
- 18 A suitable central heating system inhibitor must be added to protect the system against the effect of corrosion.
- 19 Replace the case top and front panel as appropriate.

Note: After commissioning the boiler you should complete the Commissioning Report on page 2 of these instructions.

If the boiler is to be left in service with the User, set the controls and room thermostat (if fitted) to the User's requirements then refer to section 6.

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.

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



6 - 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 If the boiler is used on a sealed heating system, 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 this Instruction manual with the User.

7 - BOILER SERVICING

To ensure efficient operation of the boiler it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once per year should be adequate. Servicing and replacement of parts must only be carried out by a suitably qualified engineer.

Important: Details of every service should be entered in the Service Log, on page 2 of these instructions. This information may be required to validate the Grant extended warranty.

IMPORTANT

Before starting any work on the boiler, or fuel supply please read the health and safety information given in section 11 on page 44.

7.1 Important notes prior to servicing

- 1 Check the flue terminal and ensure it is not blocked or damaged.
- 2 Run the boiler and check the operation of its controls.
- 3 Ensure that all water/fuel system connections and fittings are sound. Remake any joints and check the tightness of any fittings that may be leaking.

If the boiler is used on a sealed central heating system, check the system pressure. Refill, vent and re-pressurise the system as necessary.
Check the expansion vessel air charge. See section 4.14.

- 4 Check that any ventilation openings are adequate and are clear. See section 3.6.
- 5 Remove any sludge/water from the fuel tank by opening the sludge valve at the lower end of the tank.
- 6 With the fuel supply valve closed, clean/replace the filter element and clean the filter bowl.
- 7 Flexible fuel supply pipes should be inspected annually when the boiler is serviced and replaced every two years. If in doubt replace the pipes.

Warning: Before servicing, set the boiler On/Off switch to Off (Kitchen/Utility models only), isolate the electricity supply and close the fuel supply valve. Allow the boiler to cool.

The data label on the inside of the case side panel for Kitchen/Utility models or on the front panel for Boiler House models, will indicate the fuel used and nozzle fitted.

7.2 Dismantling prior to servicing

- 1 **Kitchen/Utility models** - Remove the boiler front panel (pulls off - push-on fixings). Remove the larger of the case top panels (lifts off - four push-on fixings).
- 2 If necessary, disconnect the flexible air tube from the burner.

- 3 Remove the burner fixing nut (top of the mounting flange) and withdraw the burner. If required, disconnect the flexible oil pipe(s), use a suitable container to prevent any oil spillage.

Note: If two flexible fuel lines are connected to the burner, identify (mark if necessary) which is the inlet and return if they are to be disconnected.

- 4 **Kitchen/Utility models** - Carefully remove the top insulation panel taking care not to damage it.

7.3 Cleaning the boiler

See Fig. 32, 33 or 34

- 1 Remove the two nuts and washers securing the cleaning cover to the top of the boiler and lift off the cover. Take care not to damage the seal.
- 2 Remove the baffles, noting their position (see Fig. 32, 33 or 34).
- 3 Remove all deposits from the baffle plates and all the boiler internal surfaces using a stiff brush and scraper if necessary.
- 4 Check the condition of the flue, clean as necessary.
- 5 Check the condition of the cleaning cover seal, replace if necessary.

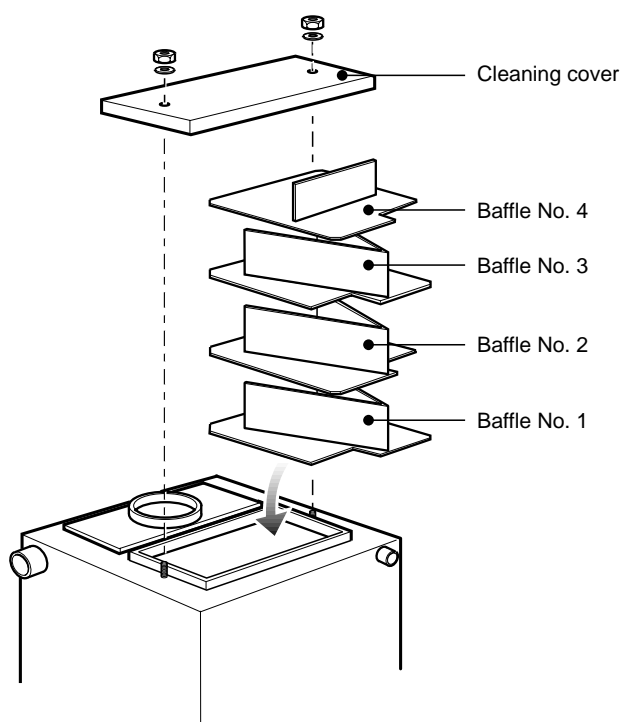


Fig. 32 - 50/70 baffle positions

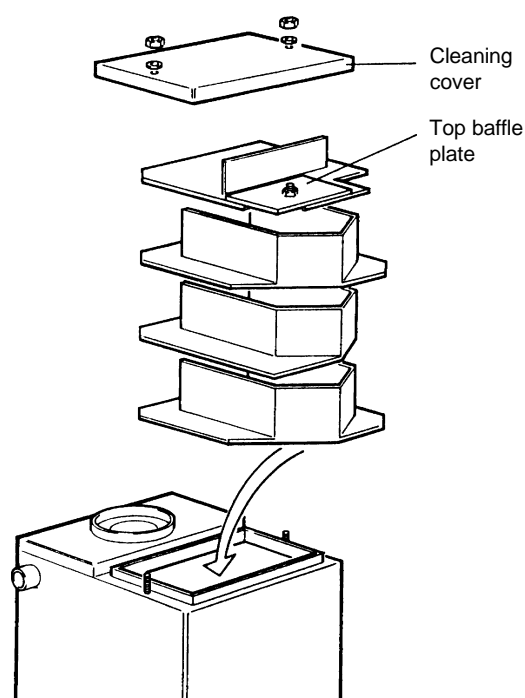


Fig. 33 - 50/90, 70/90 baffle positions

- 6 Replace the baffles, ensuring they are correctly fitted. See Fig. 32, 33 or 34.
50/70 - Baffle plate one is at the bottom, then two, then three and four at the top (see Fig. 32).
50/90 and 70/90 - Ensure that the plate on the top baffle (see Fig. 33) is in the correct position for the boiler output.

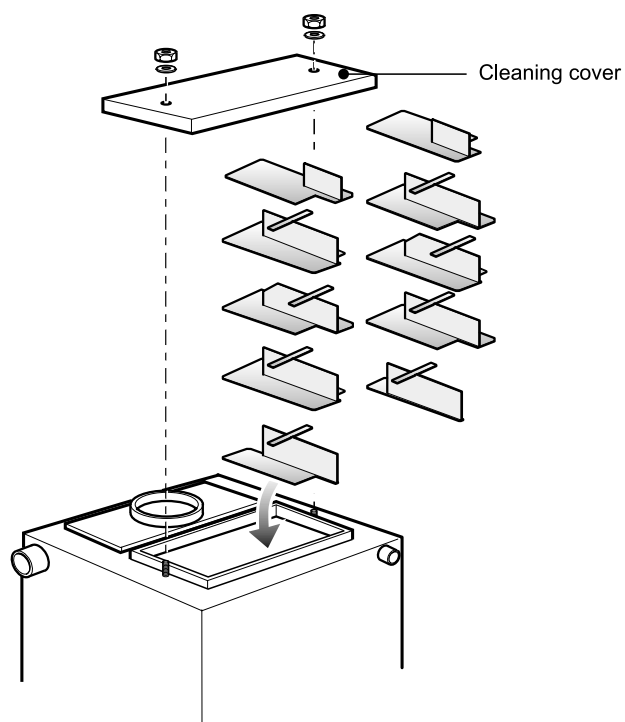


Fig. 34 - 90/120 baffle positions



See table in section 2.2 or 2.3 for the correct position. Fig. 33 shows the top baffle plate fitted on the left hand side when viewed from the front of the boiler. Changing it to right hand side is simply a matter of removing the nut, inverting the plate, and replacing the nut.

- 7 Replace the cleaning cover, ensuring the seal is in good condition and secure it in position with the two nuts and washers previously removed. Tighten to form a seal.

7.4 Cleaning the burner

See section 10.1

- 1 **Combustion head** - Loosen the two screws securing the combustion head to the burner flange and withdraw the head. Clean and replace the combustion head.
- 2 **Inspect the ignition electrodes** - With the combustion head removed, loosen the electrode clamp screw and withdraw the electrode assembly. Wipe clean and check for any cracks in the ceramic insulation. Replace if necessary.

Check the electrode settings - Electrode tips approximately 4 mm apart and 2 to 2.5 mm (50/70) or 3 to 3.5 mm (50/90, 70/90 and 90/120) in front of the nozzle, see Fig 35.

- 3 **Nozzle** - Check that the nozzle size and type are correct, refer to tables in sections 2.2 or 2.3 and boiler data label. Clean the nozzle with kerosine if necessary. Do **not** use a pin or piece of wire to clean the nozzle. Replace the nozzle if a build up of carbon is present.

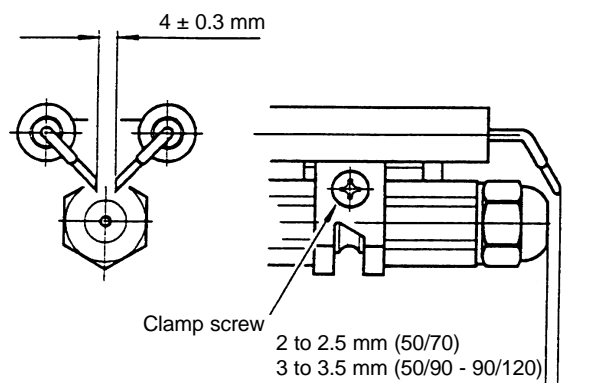


Fig. 35 (70/90 RDB shown)

IMPORTANT: The electrode settings given above MUST be observed

With the combustion head removed, loosen the electrode assembly clamp screw and slide the electrodes away from the nozzle. Remove the nozzle using a good fitting spanner (16 mm). The use of an ill-fitting spanner will damage the nozzle and could lead to an incorrect flame pattern. Always check the electrode settings after replacing the nozzle, see Fig. 35.

- 4 **Photocell** - The photocell is a push-fit in the burner body, see Fig. 36. Carefully pull out the photocell to clean.
- 5 **Fan** - With the air intake grille or spigot removed, remove the screws securing the fan housing cover (R/H side of burner) and remove the cover. Inspect the fan and housing and clean as necessary. Replace the cover.
- 6 **Pump filter** - With the burner cover removed, remove the four screws securing the pump end cover. Remove the filter and wash in kerosine. Replace the filter and end cover, ensure the 'O' ring is in position.
- 7 **Control box (see Fig. 36)** - With the plastic burner cover removed, loosen the screw (1) securing the cover. Open the cover and remove all components. Remove the oil pump solenoid (2) and loosen the two screws (3). Move the control box slightly and disconnect the high voltage leads.

Re-assemble in reverse order.

To ensure safe and efficient operation of the boiler it is important that re-commissioning is carried out, especially combustion checks (CO₂ level, flue gas temperature and smoke number) after the boiler has been serviced.

Refer to the Commissioning instructions starting on page 32.

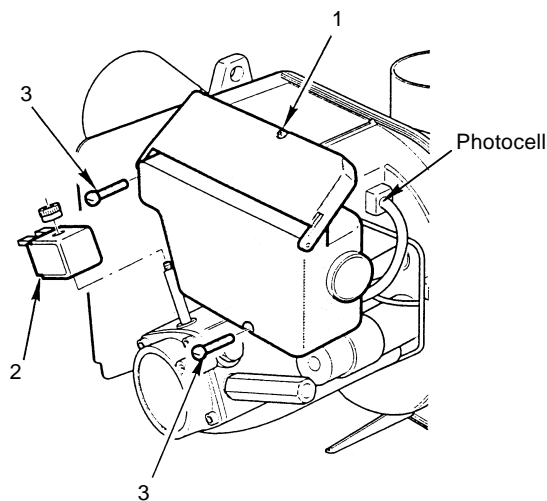


Fig. 36



8.1 Kitchen/Utility boiler control panel wiring diagram

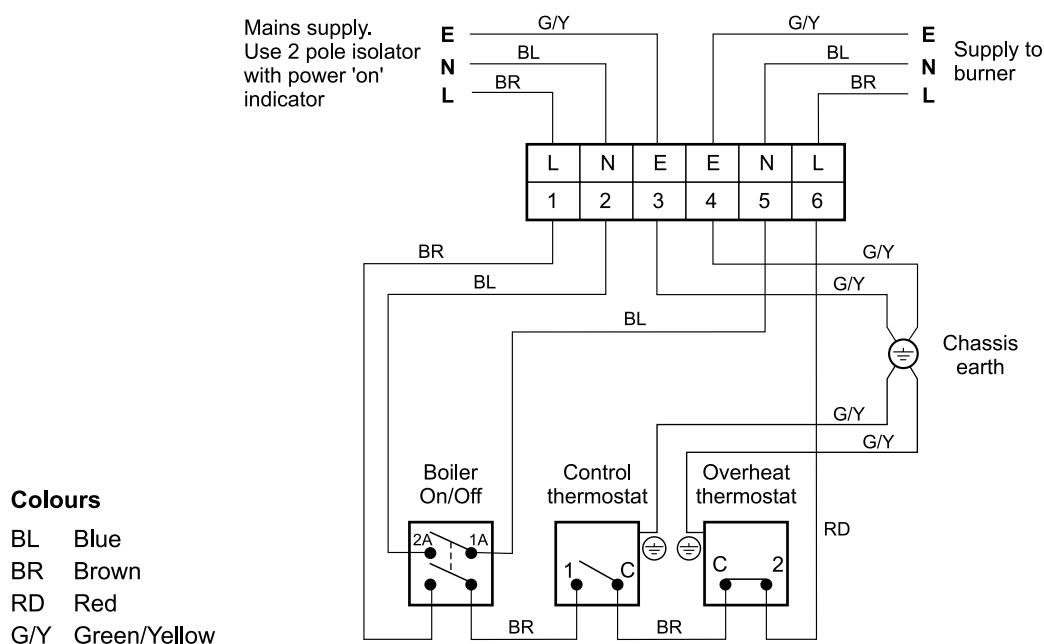


Fig. 37 - Kitchen/Utility boiler

8.2 System boiler control panel wiring diagram

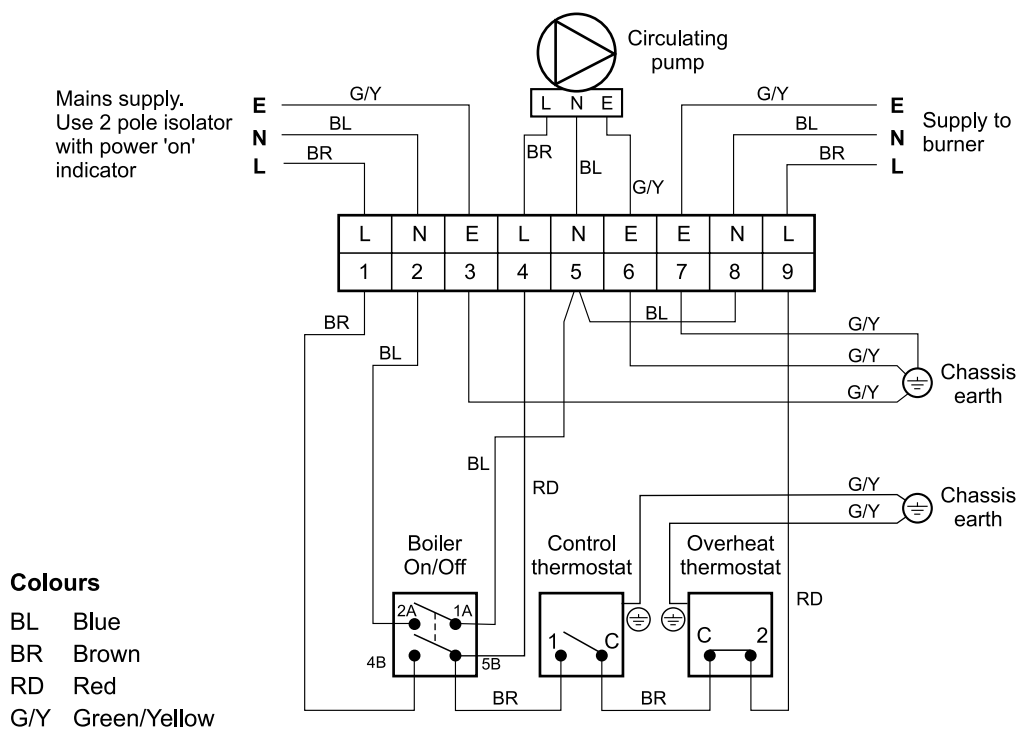


Fig. 38 - System boiler



8 - WIRING DIAGRAMS

8.3 Dual thermostat wiring diagram (boiler house)

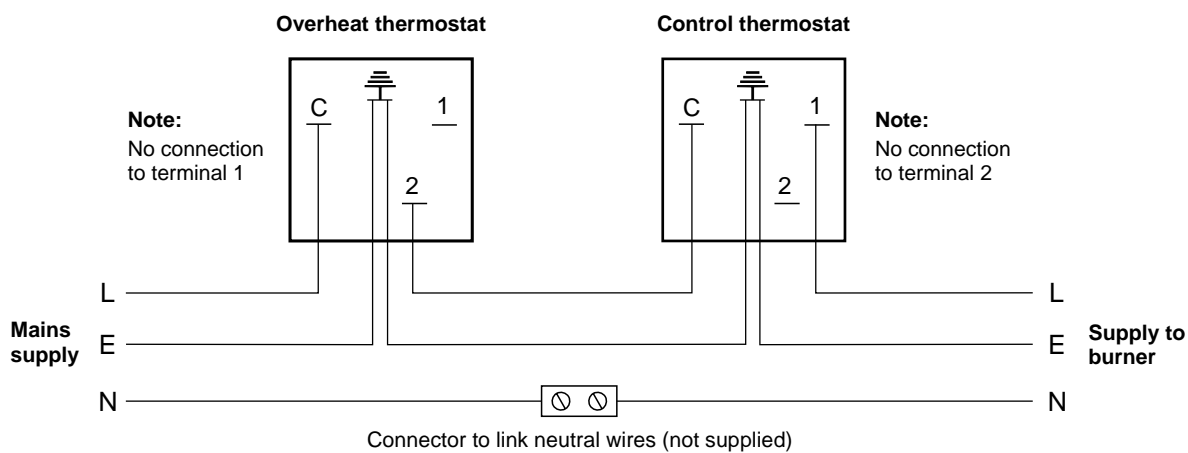


Fig. 39- Boiler House boiler

8.4 Typical control system wiring diagrams

Contact Grant Engineering (UK) Limited for other systems.

a Kitchen/Utility model with Honeywell S Plan (HW & CH controlled by two valves)

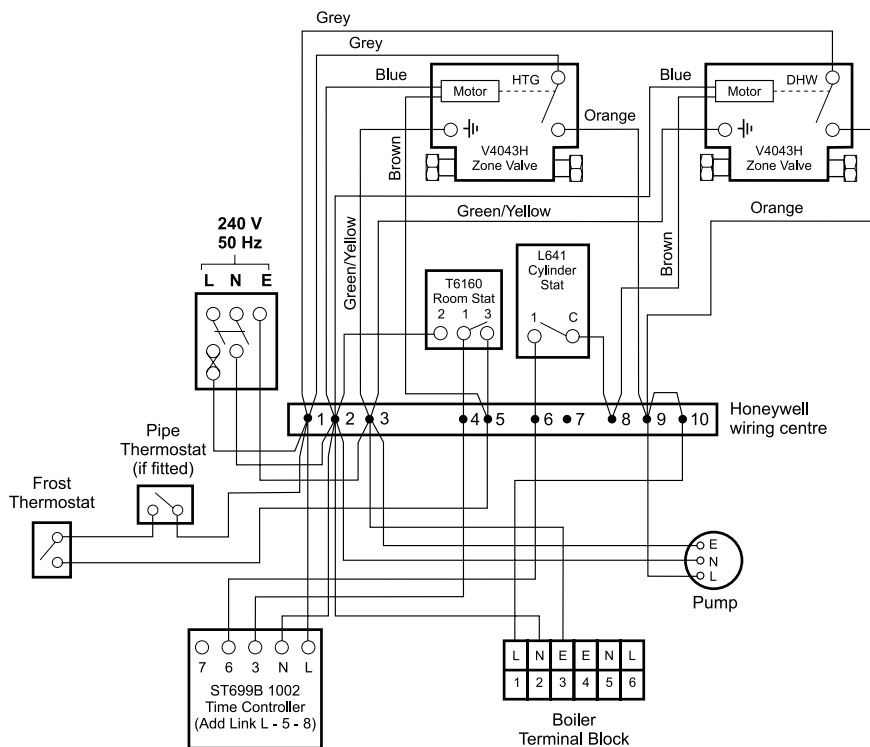


Fig. 40

b Boiler House model with Honeywell Y Plan (HW controlled by mid position valve)

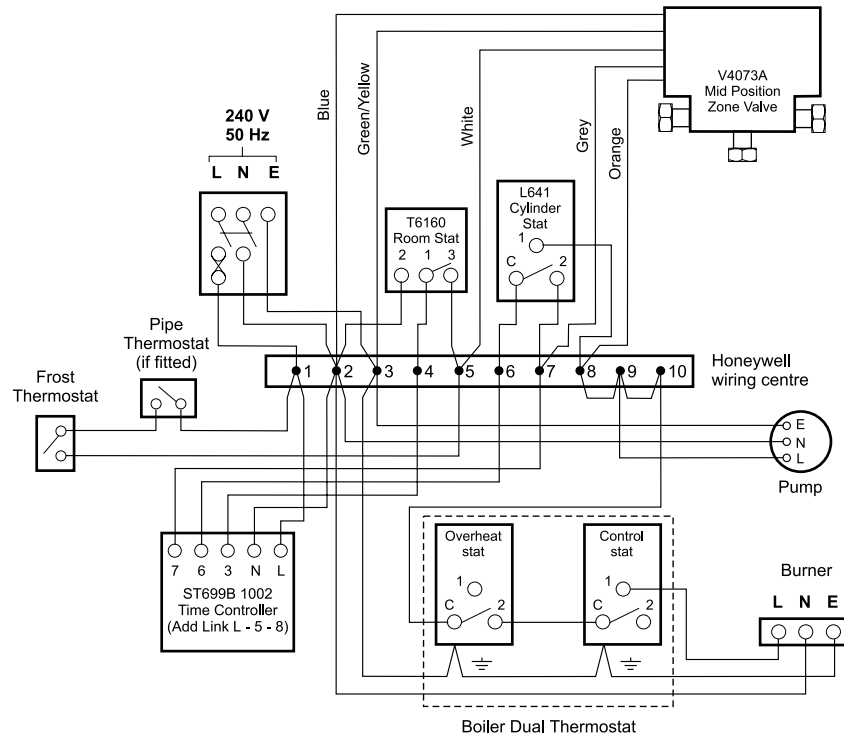


Fig. 41

c System boiler with Honeywell S Plan (HW & CH controlled by two valves)

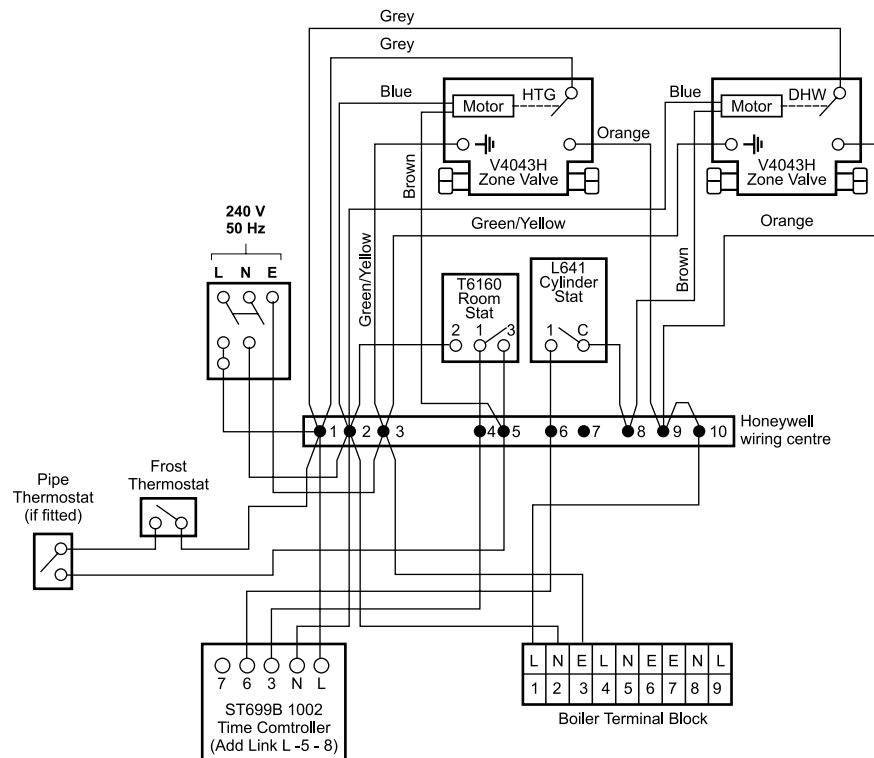


Fig. 42



8 - WIRING DIAGRAMS

d System boiler with Honeywell Y Plan (HW controlled by mid position valve)

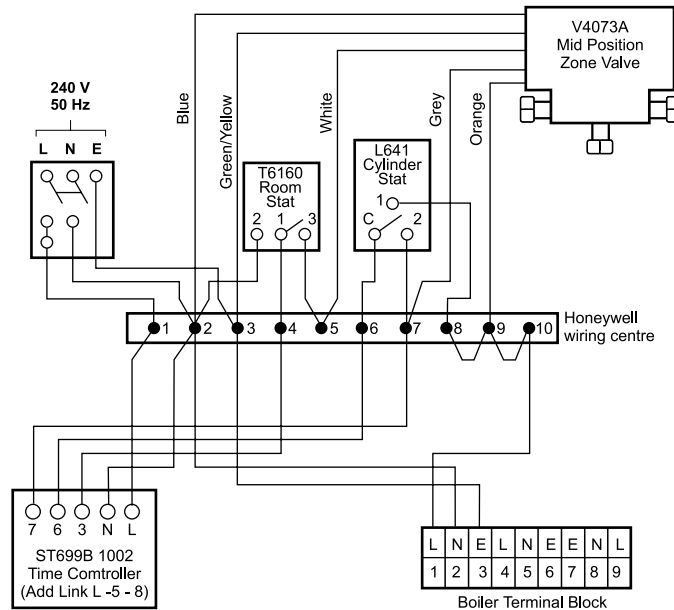
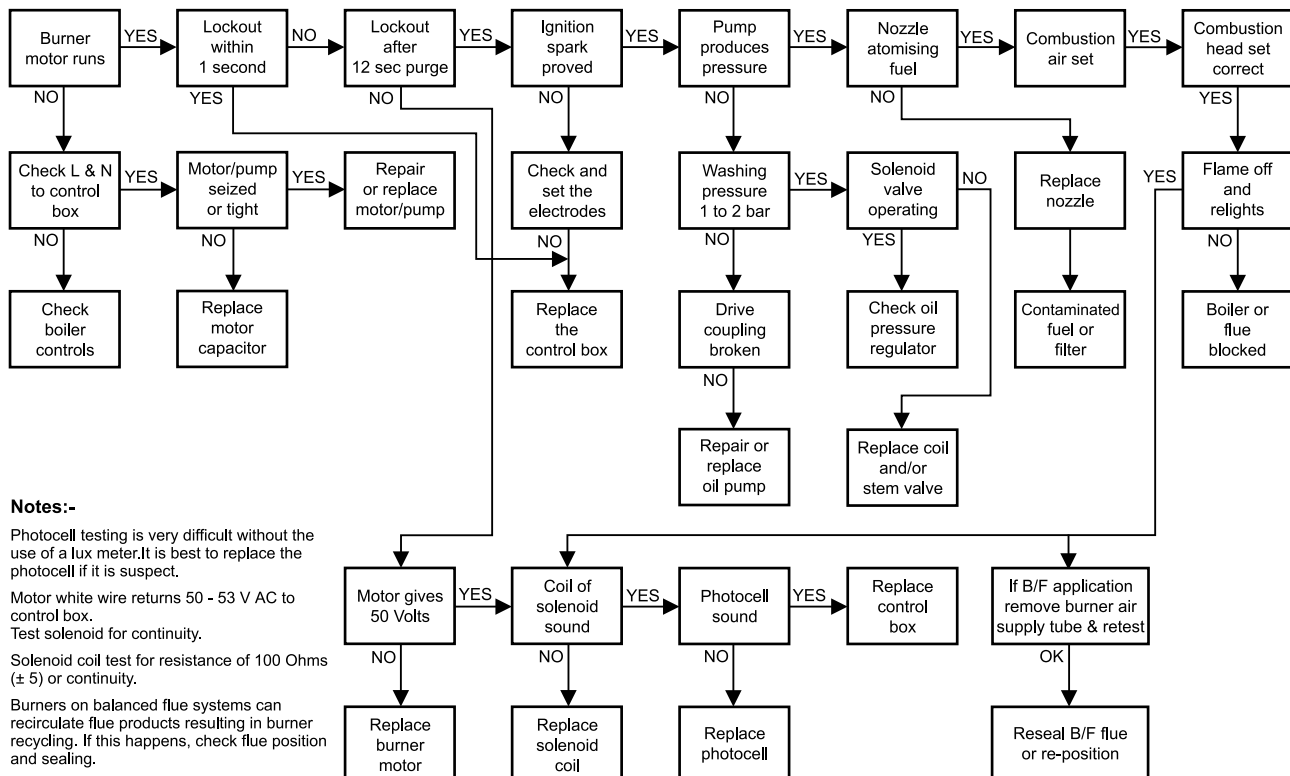


Fig. 43

9 - FAULT FINDING

9.1 Riello RDB burner fault finding





9.2 Boiler fault finding

Warning: Always isolate the electricity supply to the boiler before working on the boiler.

Faults

Remedies

Boiler will not start

- | | |
|--|---|
| 1 No fuel supply. | Ensure that an adequate supply of fuel is available and that the fuel supply valve is open.
Check the condition of the fuel filter, clean if necessary.
Ensure fuel supply is reaching burner and vent pump. |
| 2 No electricity supply. | Ensure electricity supply to the boiler is switched on and that all controls are calling for heat.
Ensure that the overheat thermostat has not tripped, reset if necessary.
Check that a mains supply is present at the burner terminal block. If not, check the boiler and overheat thermostat. |
| 3 Burner not starting - fuel and electricity supplies present. | Press the reset button on the burner control box if it is lit.
Refer to burner fault finding flow diagram. |
| 4 Burner lights but goes to 'lock-out'. | If the flame is unstable, check the combustion settings.
Refer to burner fault finding flow diagram. |

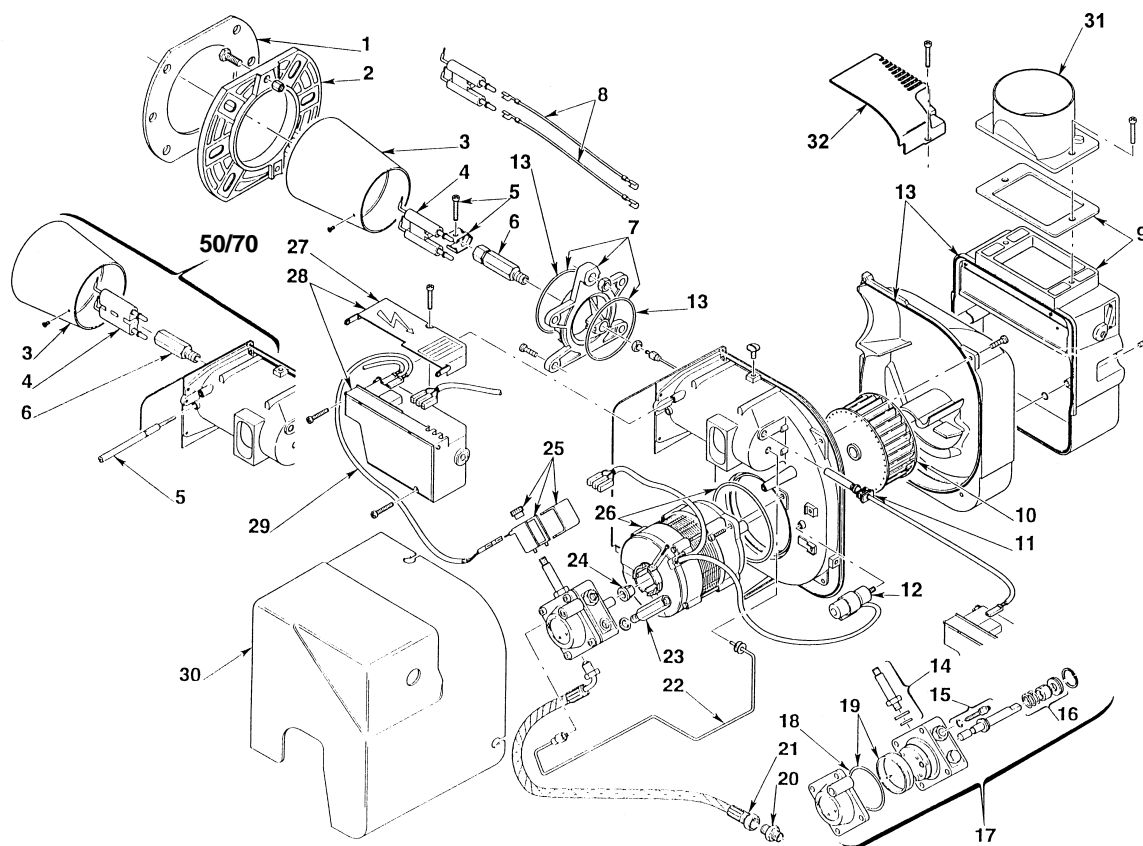
Boiler works but:-

- | | |
|---|--|
| 5 Visible smoke from flue or high smoke number. | Insufficient air supply - check the air damper setting and the condition of the fan.
Check room ventilation is adequate, see section 3.6.
Check the nozzle size and type.
Fuel pressure may be too high - check and adjust. |
| 6 Burner pulsates. | Insufficient air supply - check the air damper setting and the condition of the fan.
Check room ventilation is adequate, see section 3.6.
Check the nozzle size and type. |
| 7 Flame slow to stabilise during start up. | Insufficient air supply - check the air damper setting and the condition of the fan.
Check room ventilation is adequate, see section 3.6.
Check the nozzle size and type.
Fuel pressure may be too low - check and adjust.
Insufficient draught - clean boiler heat exchanger and check condition of flue. |
| 8 Water temperature low. | Undersize nozzle and/or low fuel pressure.
Check condition of boiler heat exchanger and clean if necessary.
Check the boiler thermostat.
Check the combustion settings.
Check the condition of the fuel filter. |
| 9 Boiler operating on overheat thermostat. | Faulty boiler thermostat. |
| 10 Fumes and puffing during starting (conventional flue). | Check the condition of the chimney, ensure it is not blocked and is high enough to produce the required draught.
Check that there is an adequate air supply near the burner and that a kitchen fan is not drawing products out of the burner. |
| 11 Oil odours. | Check all fuel line connections, remake as necessary. |
| 12 Combustion fumes smell. | Check boiler cleaning cover and seal are correctly fitted.
Check burner is correctly fitted onto flange.
Check flue is correctly sealed into flue outlet of boiler. |



10 - BURNER SPARE PARTS

10.1 Riello RDB burner - exploded view

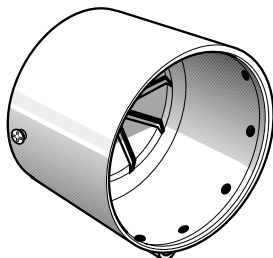


Key No.	Description	Riello Part No.	Grant Part No.	Key No.	Description	Riello Part No.	Grant Part No.
1	Gasket	3005787	RBS105	14	Needle valve	3007582	RBS109
2	Flange	3006384	RBS110	15	Regulator	3008651	RBS120
3	Combustion head LD2SX (50/70)	3008859	RBS132	16	Pump seal	3000439	RBS14
3	Combustion head LD3 (70/90)	3008768	RBS127	17	Pump	3008654	RBS101
3	Combustion head T3 (90/120)	3002447	RBS144	18	'O' ring	3007162	RBS08
3	Combustion head LD2 (50/90)	3008724	RBS126	19	Filter - 'O' ring	3008653	RBS122
4	Electrode assembly (50/70)	3008860	RBS133	20	Connector	3003602	RBS35
4	Electrode assembly (70/90)	3007513	RBS108	21	Flexible pipe	3007672	RBS36
5	Screw (50/70)	3008875	RBS137	22	Tube	3008644	RBS113
5	Electrode bracket (70/90)	3006552	RBS29	23	Pressure gauge connector	3008876	RBS138
6	Nozzle holder (50/70)	3008861	RBS134	24	Drive coupling	3000443	RBS16
6	Nozzle holder (70/90)	3008642	RBS111	25	Solenoid	3008648	RBS117
7	Collar (50/70)	3008862	RBS135	26	Motor	3008650	RBS102
7	Collar (70/90)	3008643	RBS112	27	Cover	3008649	RBS118
8	High voltage lead	3008794	RBS129	28	Control box assembly	3008652	RBS103
9	Air damper assembly	3008647	RBS116	29	Solenoid lead	3008851	RBS139
10	Fan	3005708	RBS39	30	Cover	3008879	RBS141
11	Photocell	3008646	RBS115	31	Air tube spigot	3062774	RBS143
12	Capacitor 4 μ F	3007479	RBS107	32	Air intake cover		RBS142
13	Seal kit	3008878	RBS140				

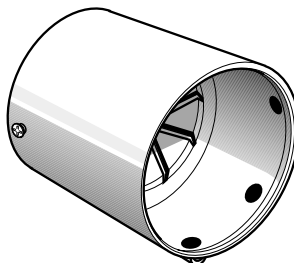


Riello RDB burner heads - see section 10.1

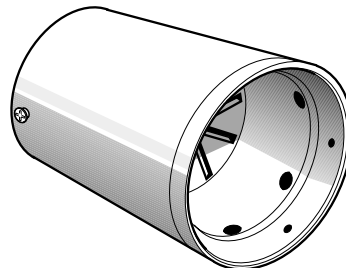
50/70 - LD2SX (short)



50/90 - LD2



50/90, 70/90 - LD3





11 - HEALTH AND SAFETY INFORMATION

Under the Consumer Protection Act 1987 and Section 6 of the Health & Safety at Work Act 1974, we are required to provide information on substances hazardous to health (COSHH Regulations 1988).

Adhesives, sealants and paints used in the manufacture of the product are cured and present no known hazards when used in the manner for which they are intended.

The following other materials are present in the product:

Insulation materials

Material Types: Ceramic fibre board, mineral wool.

Description: Rigid board, slabs, sleeves, gaskets, ropes.

Known Hazards: May cause temporary irritation or rash to skin. High dust levels may irritate eyes and upper respiratory system.

Precautions: Avoid unnecessary or rough handling, or harsh abrasion of boards. Normal handling and use of material should not produce high dust levels.
Avoid inhalation, and contact with skin and eyes.
After handling always follow normal good hygiene practices.

Protection: Use disposable gloves, face mask and eye protection.

First Aid: Eyes - If irritation occurs, wash eyes with copious amounts of water. If symptoms persist, seek immediate medical advice.
Skin - If irritation occurs, wash under running water before washing with soap and water.
Inhalation - Remove to fresh air, drink water to clear throat and blow nose to remove dust/fibres.
Ingestion - Drink plenty of water.

Sealants

Material Types: Silicone elastomer.

Description: Sealant and adhesive.

Known Hazards: Irritation to eyes.

Precautions: Avoid inhalation of vapour, contact with eyes and prolonged or repeated contact with skin.
After handling always follow normal good hygiene practices.

Protection: Use eye protection. Rubber or plastic gloves should be worn where repeated contact occurs and a face mask worn when working in confined spaces.

First Aid: Eyes - Flush eyes with water for 15 minutes. Seek immediate medical attention.
Skin - Wipe off and wash with soap and water.
Inhalation - Remove to fresh air.

Kerosine and Gas oil fuels (Mineral oils)

Known Hazards: The effect of mineral oils on the skin vary according to the duration of exposure and the type of oil. The lighter fractions remove the protective grease naturally present on the skin, leaving it dry, liable to crack and more prone to damage by cuts, abrasions and irritant chemicals.
Skin rashes (Oil acne) most often on arms, but also on any part of the body in contact with oil or oily clothing.
Contact with fuel oils can cause dermatitis.

Precautions: Avoid as far as possible any skin contact with mineral oil or with clothing contaminated with mineral oil. The use of a lanolin-based barrier cream is recommended, in conjunction with regular washing with soap and rinsing with water to ensure all oil is removed from the skin.
Take care to prevent clothing, especially underwear, from becoming contaminated with oil.
Do not put oily rags or tools in pockets, especially trouser pockets.
Have first-aid treatment at once for an injury, however slight.
Do not inhale any vapours from mineral oils.



We declare that the Euroflame range of Oil Boilers equipped with Riello RDB burner approved to EN 267: 1991 satisfy the requirements of the following European Directives:-

1. 89/336/EEC - Electromagnetic Compatibility Directive
Referred to the generic standards EN 55014: 1993, EN 50082: 1: 1992
2. 73/23/EEC - Electrical Equipment Safety Regulations Directive
Referred to the generic standard NO: 3260: The Electrical Equipment (Safety) Regulations: 1994
3. 92/42/EEC - Hot Water Boiler Efficiency Directive
Referred to the generic standard The Boiler (Efficiency) (Amendment) Regulations 1994 (SI 1994/3083)



13 - SPACE FOR ANY SPECIAL INSTALLATION NOTES



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



89/336/EEC

73/23/EEC

92/42/EEC



Grant Engineering (UK) Limited

Hopton House, Hopton Industrial Estate, Devizes, Wiltshire SN10 2EU

Telephone: (0870) 7775553 Fax: (0870) 7775559

email: info@grantuk.com website: www.grantuk.com

This manual is accurate at the date of printing but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued product improvement.

All goods sold are subject to our official Conditions of Sale, a copy of which may be obtained on application.

© Grant Engineering (UK) Limited 2003. No part of this manual may be reproduced by any means without prior written consent.

Manual compiled and designed by Publications 2000 Tel: (01670) 356211