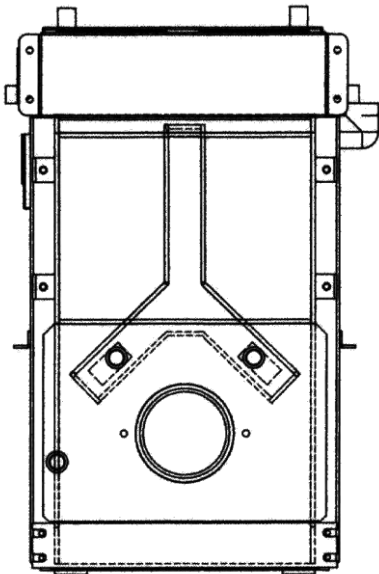


Mistral Boilers

NON CONDENSING RANGE

Oil Fired Boilers You'll Warm To

Customer Information. Installation And Servicing Manual



Oil Fired Floor standing Boilers.

Models covered by this manual:

Internal Combination	15-41 kw
Internal Mega Combination	41-68 kw
Internal Sealed System	15-41 kw
Kitchen/Utility	15-68 kw
Outdoor Combination	15-41 kw
Outdoor Mega Combination	41-68 kw
Outdoor Sealed System	15-41 kw
Outdoor Standard	15-68 kw
Boiler House	15-68 kw

Please Leave These Instructions with the User

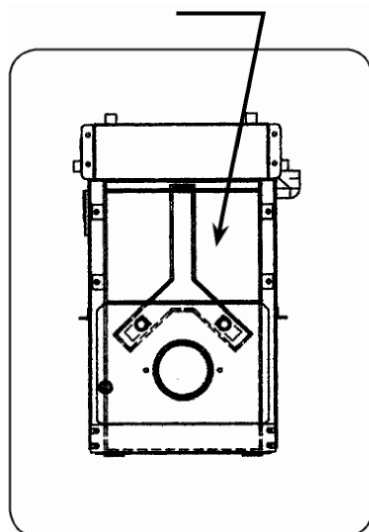


Mistral manufacture a comprehensive range of high efficiency oil boilers for domestic and industrial heating applications. Culminating from years of experience, ongoing development and our wealth of technical knowledge the specially developed Mistral 'Y' section heat exchangers are fitted to all Mistral boilers providing much improved performance and operating efficiency.

The unique 'Y' section centrally located waterway design allows excellent heat transfer to take place, particularly in the lower combustion chamber. This greatly reduces the pressure build up normally associated with conventionally manufactured boiler types. The 'Y' section design allows baffles to be a more open tolerance, providing for better overall running performance, smoother start ups and cleaner combustion. Baffles fitted to non central waterway heat exchangers, normally have to be extremely tight to attain required efficiencies, which can cause pressure build up and increase soot deposit in the boiler.

The additional surface heat transfer area created within the boiler by the 'Y' section heat exchanger also allows Mistral to manufacture high KW output boilers within typical domestic appliance size enclosures. Mistral Boilers Limited is committed to offering the most technically advanced and extensive range of domestic oil fired boilers available.

INNER Y SECTION



WARRANTY

Heat Exchanger – 5 Years
Burner & Controls – 2 Years
(Terms & Conditions apply)

SAFETY

Please note that the products are extremely heavy and great care should be taken when moving the appliance around. Specialist equipment should be used where possible, a full risk assessment and a plan of action should be undertaken, prior to purchase to avoid any injury.

INDEX / PAGE CONTENTS

	Page
1.0 Health And Safety	
1.1 COSH.....	4
1.2 In The Event Of A Spillage.....	4
1.3 Operation.....	4
2.0 User Information	
2.1 Introduction.....	5
2.2 Product Description.....	5
2.3 Pre Install Information.....	5
2.4 Connections And Fit Up.....	6
2.5 Specifications And Sizes.....	7
2.6 Oil Supply.....	10
2.7 Electrical.....	10
2.8 Air Supply And Ventilation.....	10
2.9 Control Panel.....	10
2.10 Burner Lockout.....	11
2.11 Starting And Switching Off.....	12
2.12 Immersion Heater (Combi Plus Models Only).....	12
2.13 Frost Protection.....	12
2.14 Maintenance And Service.....	13
3.0 Introduction	
3.1 Suitability.....	14
3.2 Health And Safety.....	14
3.3 Location.....	14
4.0 Installation	
4.1 Standards And Regulations.....	15
4.2 Heating System.....	15
4.3 Domestic Hot Water (Combi And System Models).....	15
4.4 Electrical Connection.....	16
4.5 Air For Combustion And Ventilation.....	16
4.6 Immersion Heater (Combi Plus Models Only).....	17
5.0 Sealed Systems	
5.1 System Regulations.....	18
5.2 Boiler Models.....	18
5.3 Heating And Hot Water System.....	18
5.4 Sealed Primary System.....	18
5.5 Expansion Vessel.....	18
5.6 Discharge Pipe.....	19
5.7 System Filling And Commissioning.....	19
5.8 Pressure Vessel Sizing.....	19
6.0 Oil Storage And Supply	
6.1 Regulations.....	20
6.2 Fuels.....	20
6.3 Oil Supply.....	20
6.4 Tanks And Pipes.....	21
6.5 Oil Supply Diagrams.....	22
7.0 Flues	
7.1 Conventional Flue.....	23
7.2 Balanced Flues.....	24
7.3 Balanced Flue Installation.....	24
8.0 Quick- Lok Flue System	26
9.0 Commissioning Service And Maintenance	28
10.0 Fault Finding	30
11.0 Boiler Spares	34
12.0 Boiler And Burner Set Up Technical Specifications	36
13.0 Wiring Schematics	37
14.0 Warranty / Guarantee Registration And Conditions	42

1.1 COSHH Regulations 1988

This information is for installers and service engineers, as required by the consumer protection Act 1987 and the Health and Safety at work Act 1974.

Every reasonable care has been taken to see that this product has been developed and built to meet these safety requirements, when installed in the manner intended.

It is the responsibility of those working on this appliance to ensure that all necessary personal protection is used to safeguard against parts and substances that may be considered hazardous to Health and Safety, some of which may be listed below.

Kerosene and Gas Oil (Mineral Oils) Skin Care

- Avoid as far as possible any skin contact with mineral oils.
- The lighter fractions of these oils remove the protective grease normally present in the surface of the skin. This can make the skin liable to crack, and prone to damage.
- Prolonged exposure may lead to the development of warty swellings or sores. Skin rashes (Oil acne) may occur on any part of the body where there is mineral oil contact with the skin. Always wash your hands before going to the toilet.
- **Do not delay in seeking medical attention if you suspect any problem.**
- Before working on appliance: use suitable lanolin based creams that may give some protection against the affects of mineral oil and assist cleaning of skin. Re-apply before work is resumed after each break.

Ingestion

- Under no circumstances should mineral oils be taken internally.
- **Never** ingest any mineral oils.
- **Never** siphon by mouth.
- **Never** breathe any mineral oil vapours and do not fire the burner in a manner where un-burnt vapours can be discharged into any work area or kitchen.

First Aid

- If mineral oil is accidentally swallowed, **seek immediate medical attention and do not induce vomiting.**
- If mineral oil is splashed into eyes, wash out with running water for at least 10 minutes and **seek immediate medical attention.**

Insulation and Rope Seals

Glass Rope, Mineral Wool, Glass Fibre and Ceramic Insulation.

- The dust and fibres of these materials may be harmful if inhaled. Suppress any dust observed when removing fired parts by spraying with water. Safety wrap in a sealed plastic bag. Remove from the site and dispose of, in a permitted way.
- New parts should only be used as supplied and not be cut or machined. If it's necessary to cut or drill, a facemask should be worn and the cutting carefully disposed of as above.

Glue, Paint and Sealant

- These materials present no known hazard, when appliance is used for purposed intended.

1.2 In The Event Of A Fuel Spillage

- Stop/switch off all electrical and other ignition risks.
- Isolate the leak.
- Ventilate the area.
- Smother the spillage using sand, soil or other suitable absorbing material, but not cement.
- Avoid oil contact with combustible materials. Prevent spilt fuel from entering drains or watercourses. If it does, warn the Environment Agency, Water suppliers and Fire Service.

Handling

- The products are extremely heavy, and a risk assessment, and plan of action, should be made at each site, prior to the appliance arriving.

1.3 Operation

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

2.1 **Introduction**

We are confident that our company produce the largest range of domestic oil fired boilers manufactured in the U.K. Mistral have been manufacturing boilers for more than a quarter of a century. Our extensive experience has enabled us to produce a new generation of high efficiency boilers. Our unique Y shaped inner waterway allows us to achieve much greater heat transfer and therefore efficiency, whilst at the same time reducing the resistance in the boiler most commonly found with traditional boilers. This provides for a cleaner start up, and therefore reduces the potential for the appliance to soot up.

The main heat exchanger is made from mild steel, 5 mm inner, 3 mm outer.

This high specification has been achieved through extensive research and testing to ensure our products achieve the highest quality.

2.2 **Product Descriptions**

Models:

Standard KUT/BH/ Models 1-7 50/232,000btu (15-68kw)

These appliances are suitable for open vent and sealed system application.

Sealed System S Models 1-4 50/140,000btu (15-41kw)

Incorporates expansion vessel, pressure relief valve, filling loop & circulating pump as standard.

Combination CC Models 1-4 50/140,000btu (15-41kw)

Provides for heating and hot water within one unit, priority hot water system. Includes expansion vessel, pressure relief valve and circulating pump as standard, flow rates 17.5 –20 litres @ 35 °C rise and a draw off between 130 – 500 litres.

Mega Combination MC Models 5-7 140/232,000btu (41-68kw)

Our unique Mega Combi is used when requirement is for higher flow rates and better draw off. Flow rates from 27-35 litres @ 40 °C rise and a draw off up to 600 litres. Draw off is affected by output and flow rates.

Combination Plus (7 day, two channel programmer supplied)

The unique product on this model is the inclusion of an immersion heater, which can either be used as a backup for hot water, or indeed used to achieve hot water if there is any issue with the burner, or lack of fuel to the appliance. Please note the immersion only heats the domestic hot water. Hot water performance will not be the same as when boiler is operated utilising burner.

Outdoors

All boilers are available as external models, particularly useful when internal space is at a premium, or you simply do not want the unit indoors.

2.3 **Pre Install Procedures And Reference Tips**

Thank you for buying a Mistral product.

Please note the following points of added information for your attention.

- a. Please read the manual fully before installing the appliance.
- b. The products are extremely heavy, and a risk assessment, and plan of action, should be made at each site, prior to the appliance arriving.
- c. The appliance is likely to be fixed to the pallet for extra security when shipping. Normally, one screw each side of the burner, through the base.
- d. Boiler should be placed on a flat level surface.
- e. Prior to filling system, please check all joints are tight as they may vibrate in transit.
- f. Before firing the burner, remove main boiler inspection door and ensure the baffles have not moved in transit. They should be pushed back level and flush to each other. Failure to do so may affect efficiency, combustion and performance. Failure to do this may affect efficiency and combustion. When replacing the door, please tighten the bolts to ensure good seal. Only a suitably qualified person should fire / set-up burner.
- g. A programmer must be installed or the link wires fitted before the Combi models will operate.

2.4 **Connections & Fit Up**

- a. Flow and return sockets are as follows;
KUT / BH / S Internal And External Models: 50-140,000btu (15/41kw). = 1' BSP
140-232,000btu (41 / 68kw). = 1'1/4 BSP

C / C Plus / MC Internal And External Models: 50-90,000btu (15-26kw). = 22mm
90-232,000btu (26-68kw). = 28mm
- b. A 4 port heat exchanger is available (2 off Flow & Return) as a special order for the KUT, BH and S internal and external models. Blanking plugs are supplied free issue. This option is not available for Combi models.
- c. A spacer is needed to take up the distance between the top of the exchanger and the panel exit when a low level balanced flue is fitted. For a conventional flue, a flue adapter will be required.
- d. An isolating valve must be fitted to the oil line inside the boiler casing. Isolating ball valves should also be fitted to the flow and return water pipes to provide for future service and maintenance.
- e. Ensure the correct amount of inhibitor is used when filling the system, and checked annually.
- f. Note all stats relevant to the boiler, and ensure they are in the correct pocket.

KUT, BH, & S Boilers Internal And External Models = 1 off Heating Stat, 1 off High Limit Stat
See Fig. 3 (Page 8).

C, C Plus & MC Boilers Internal And External Models = 1 off Heating Stat, 1 off Hot Water Stat, 1 off Limit, 1 off Pump Over Run Stat. See Fig.3 (Page 8)
- g. Check the pipe work position, and direction of flow. Ensure that when making up the flow pipe from the diverter valve (if fitted), that it avoids blocking any parts of the boiler from being removed at a later stage. See Fig. 5 (Page 8)
- h. Check flow direction of circulating pump (if fitted) Ensure arrow is pointing in the correct flow direction. See Fig. 8 (Page 9)
- i. Frost stats should be fitted to all boilers, where there is a risk of low temperatures.

Combi Boilers

- a. Ensure the flow switch is fitted in an aligned position to the pipe and that the arrow is pointing in the direction of the flow. See Fig.6 (Page 8)
- b. Important – Hot water – the dial indicator for this should be set for position 1, unless required for the water to be hotter. The boiler produces water at a high temperature to help protect against bacteria in the pipes, overcome extended pipe runs to the tap and to give the best overall performance achievable for the heat store, in terms of flow rate at a given rise of temperature.
- c. The incoming water temperature difference between summer and winter will have an effect on tap water temperature. This hot water dial may need to be adjusted to suit the seasonal condition.
- d. If the tap water temperature is higher than required, we recommend fitting either a mixer valve which can be manually operated or for a more consistent result a thermostatic valve. These can be fitted at individual taps, or anywhere from the boiler onwards to achieve the required temperatures.
- e. If a mixer or thermostatic valve is fitted it may be necessary to fit a pipe thermostat to the boiler.

Mega Combi Boilers

- a. The information above for the Combi boiler is also applicable to the Mega Combi models.
- b. For ease of transit, and on site mobility, the Mega Combi models are shipped in 2 separate cased parts. The Mega Combi will require final assembly on site. Instructions, all pipe work, pump, diverter valve and fittings required for the final assembly are supplied.
- c. When assembling, the base fixings, See Fig. 7 (Page 9)) should be loosened. The pipe work and parts should then be assembled as a mock up to ensure correct position. The heat store and exchanger may need to be adjusted to ensure everything fits correctly. When you are satisfied that everything is aligned tighten all fixings and pipe work as required. See Fig 7 – 8 (Page 9) .

Note: On all Combi models we recommend a 2 channel programmer is fitted. For testing links can be installed to allow the boiler heating and water to run continuously however to ensure maximum efficiency this should not be considered to be a permanent method of operation. Mistral offer either a 24 hour or 7 day programmer for full heating and hot water control.

Combi & System Boilers

- a. The expansion vessel supplied with the boilers is specifically to protect the boiler, and additional vessels may be required depending on the size of the system being fitted.
Water content = 15 / 41 kw Combi = exch = store = 20 + 30 = app. 50 litres
Water content = 41 / 68 kw Combi = exch = store = 25 + 95 = app. 120 litres

Outdoor External Boilers

- a. All pipe work and cables should be resealed to ensure no water ingress.

We trust that this list has been of help, if you need further assistance or information contact Mistral Boilers and our Technical Department will be pleased help resolve any problems you may encounter.

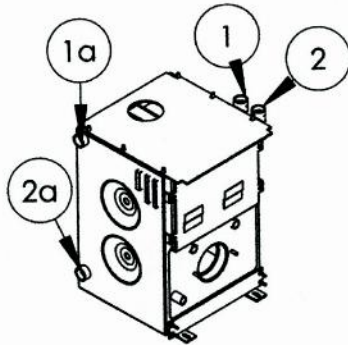
Mistral Boiler SPECIFICATIONS

SE NON CONDENSING BOILERS			BOILER SIZE & MODEL NUMBER			
BOILER TYPE	PREFIX CODE	SEDBUK RATING	15-20kw	20-26kw	26-35kw	35-41kw
			1	2	3	4
Kitchen Utility	KUT	C	WGT 125kg			
Boiler House	BH	C	H 865mm W 495mm D 600mm WGT 125kg			
System	S	C	WGT 130kg			
Combi Standard	C-STD	C	H 865mm W 600mm D 600mm WGT 175kg			
Combi Plus	C-PLUS	C	WGT 180kg			
Outdoor Utility	OD	C	WGT 130kg			
Outdoor System	OD-SS	C	H 895mm W 770mm D 680mm WGT 135kg			
Outdoor Combi Standard	OD-C-STD	C	WGT 180kg			
Outdoor Combi Plus	OD-C-PLUS	C	WGT 185kg			

SE NON CONDENSING BOILERS			BOILER SIZE & MODEL NUMBER		
BOILER TYPE	PREFIX CODE	SEDBUK RATING	41-50kw	50-58kw	58-68kw
			5	6	7
Kitchen Utility	KUT	C	H 1230mm W 500mm D 755mm WGT 235kg		
Boiler House	BH	C	WGT 235kg		
Outdoor Utility	OD	C	H 1245mm W 650mm D 775mm WGT 235kg		
Mega Combi Standard	MC-STD	C	H 1230mm W 1000mm D 755mm WGT 375kg		
Mega Combi Plus	MC-PLUS	C	WGT 380kg		
Outdoor Mega Combi Std	OD-MC-STD	C	H 1245mm W 1300mm D 425mm WGT 405kg		
Outdoor Mega Combi Plus	OD-MC-PLUS	C	WGT 410kg		

- NOTES:**
1. E.G.=KUT1=Kitchen/Utility 15/20kw (50-70,000btu). Sedbuk C Rated. H865mm x W495mm x D600mm. Weight 125kg.
 2. E.G.=OD6=Outdoor Utility 50/58kw (170-200,000btu). Sedbuk C Rated. H1245mm x W650mm x D775mm. Weight 235kg.
 3. For ease of handling Mega Combi's are shipped in 2 parts. Outdoor Mega Combi's are shipped in 3 parts.
 4. All units are approx dry weights of boilers. Dimensions may vary.
 5. Safety – Due to the excessive weight, a risk assessment is advised before purchase.
 6. Boiler outputs are factory pre-set at mid range max to provide optimum operating performance. If the required kw output rating is at the higher end, it is recommended that the next size boiler model is selected.

Fig :- 1

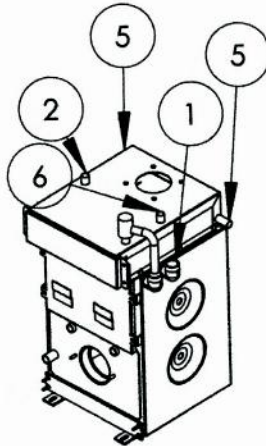


**NON-CONDENSING
PIPE POSITIONS**

STANDARD
1, FLOW
2, RETURN

4 PORT OUTLET
1a, FLOW
2a, RETURN

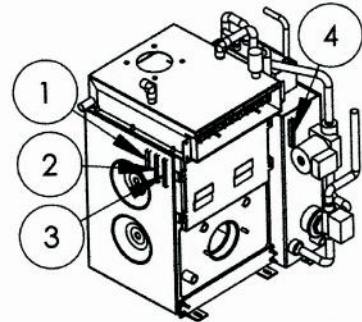
Fig :- 2



PIPE POSITIONS

1, FLOW
2, RETURN
5, CONDENSING DRAINS
6, CAPPED OFF RETURN

Fig :- 3



STAT POSITIONS

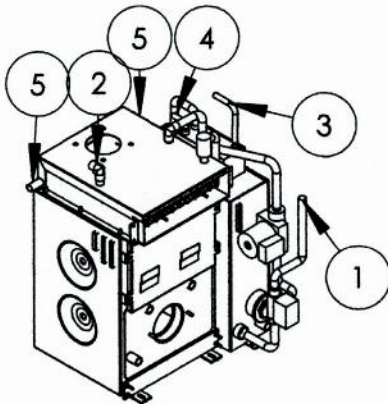
HEAT EXCHANGER

1, HEATING
2, HI LIMIT
3, PUMP OVER RUN

HEAT STORE

4, HOT WATER

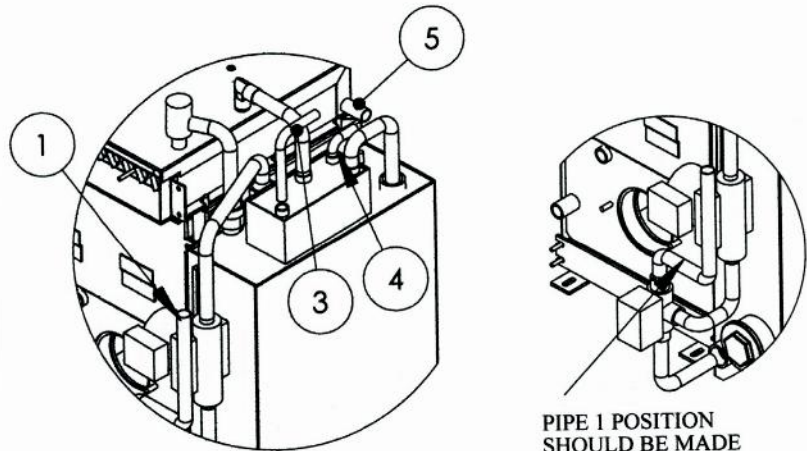
Fig :- 4



PIPE POSITIONS

1, FLOW
2, RETURN
3, COLD FEED IN
4, HOT WATER OUT
5 CONDENSING DRAINS

Fig :- 5



PIPE 1 POSITION
SHOULD BE MADE
TO FIT ON THE
RIGHT SIDE OF PUMP.
TO GIVE FULL ACCESS
TO FRONT DOOR

Fig :- 6

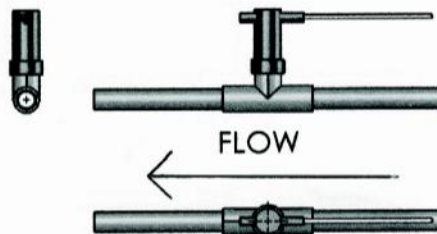


Fig :- 7

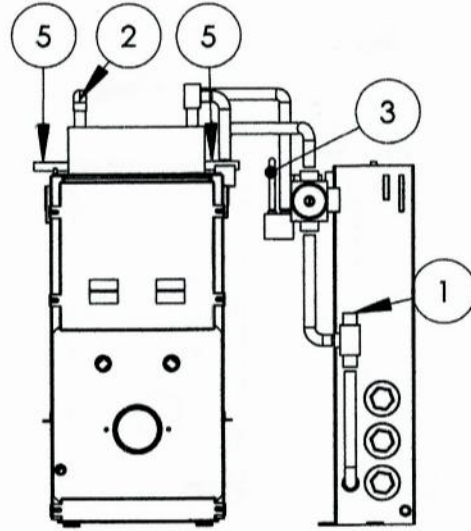
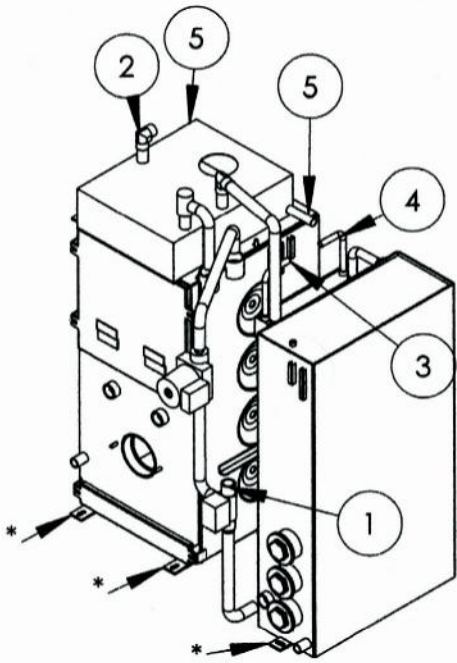
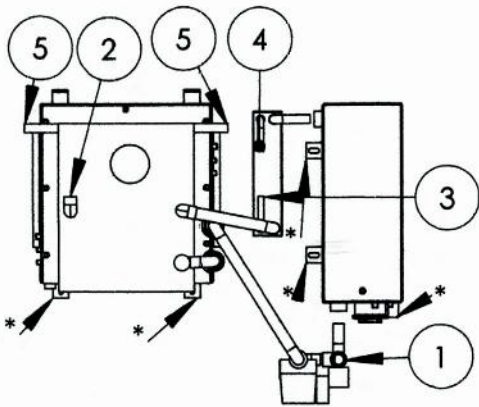


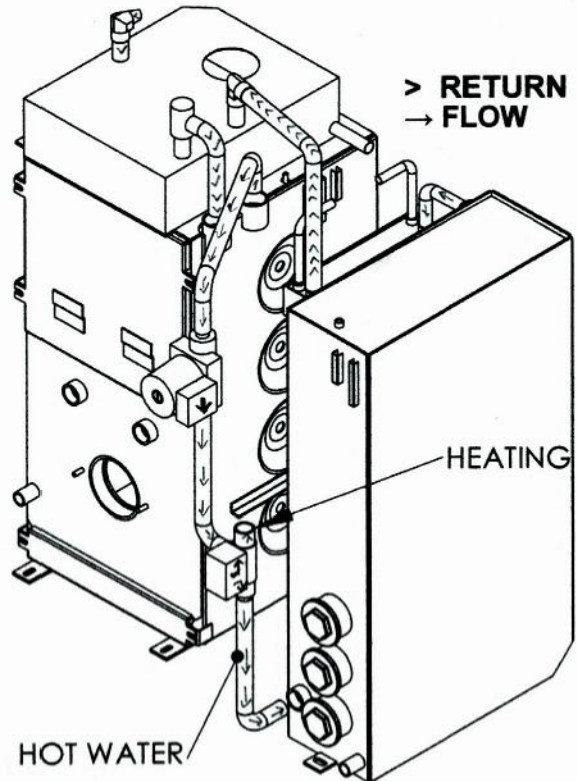
Fig :- 8



PIPE POSITIONS

- 1, FLOW
- 2, RETURN
- 3, COLD FEED IN
- 4, HOT WATER OUT
- 5 CONDENSING DRAINS

* FIXING LUGS
 EXCHANGER =2 OFF
 STORE =3 OFF



2.6 Oil Supply

- **Fuels.** Mistral Boilers are designed to burn BS 2869 Part 2, Class C2 28sec Kerosene.

2.7 Electrical Connection

- Boilers must be connected to a 230v 50hz 1ph power supply. Standard models must be connected via a fused (5 amp) isolator, located on an adjacent wall. The Combi Plus models with the integral immersion heater should be connected directly to the consumer (20 amp ELCB circuit) unit via a double pole isolator located on an adjacent wall.

Note: Always Isolate The Electrical Supply Before Completing Any Work On The Boiler.

2.8 Air Supply And Ventilation

The boiler is designed to operate with the following flue types:

Conventional Flue

This type requires a permanently open air vent; to supply air for combustion and to allow the flue system to work. A Conventional flue system must be suitable for use with an oil fired boiler. Please contact flue supplier or manufacturer for advice.

Balanced Flue

This type does not require a permanently open air vent, however ventilation will be required if the boiler is enclosed within a cupboard or small enclosed area to prevent the boiler from over heating.

Regulations

It is the installers responsibility to check all relevant regulations before installing any flue type.

WARNING: Ensure all Air Vents and Flue Ways are Not Obstructed OR CLOSED

2.9 Control Panel KUT / BH / S / OD / ODSS Models

- The control is provided with 1 to 6 dial on the face of the control thermostat. Should you wish to turn the boiler off, turn the control thermostat to the off position.
- Summer/Winter Settings.** You are advised not to operate your appliance below a setting of 55°C which relates to number 1 on your control thermostat.
- High Limit Thermostat** Under the small black finger tight cap located to the side of the thermostat is housed the reset button for the high limit thermostat. Should it be necessary to reset, wait until the appliance has sufficiently cooled down to allow for the thermostat to reset. Should this persist, contact your installer or service engineer.

Control Thermostat

High Limit Reset



Control Panel C / C Plus / MC / MC Plus / ODC / ODC Plus / ODMC models

The above models are equipped with the following features:

- Central Heating Control Thermostat. Dial settings 1 – 6.
- Domestic Hot Water Control Thermostat. Dial Settings 1 – 6.
- Selector Switch. Boiler On/Off & Immersion Heater On/Off (If Applicable)
- Boiler High Limit Thermostat Reset Button
- Green Neon Lamp. Power On Indicator
- White Neon Lamp. Boiler Run Indicator
- Amber Neon Lamp. Immersion Indicator (If Fitted)
- Red Neon Lamp. High Limit Indicator
- Fuse Holder (5 amp)
- System Pressure Gauge

Central Heating Thermostat

Control dial knob for boiler temperature range 55 - 82°C. This is indicated on the dial as 1 – 6. Should the heating need to be switched off for short periods, turn the knob to the off position.

You our advised not to operate your boiler below 55°C which relates to setting number 1 on your control knob.

For normal heating, select between number 4 and 5 (70/76°C) on your control knob. In severe weather conditions it may be necessary to select number 6 (82°C) on your control knob.

Domestic Hot Water Thermostat

Control dial knob for domestic hot water range 55 - 82°C. This is indicated on the dial as 1 – 6. The control allow you to adjust the stored water temperature. 1 = Hot, 6 = Very Hot.

Note: Water temperature will be less in colder periods due to much colder mains water passing through the heat exchanger. It may be necessary to adjust/decrease the flow at source (tap) to increase water temperature.

The hot water production from the Combi boiler is highly efficient however if you find under certain circumstances of low flow rate, that the water temperature at the point of use may be for a short period too high your installer, will be able to advise the uses of an appropriate temperature mixer valve.

Boiler Selector Switch

Controls either the boiler On or immersion heater On, (immersion heater only applicable to plus models) with an intermediate off position and is indicated on the switch as: I/ O /II. The neon indicators show the selection. Switching the selector to O also turns the power to the programmer off.

High Limit Thermostat

Under the small black finger tight cap located to the side of the thermostat is housed the reset button for the high limit thermostat. Should it be necessary to reset, wait until the appliance has sufficiently cooled down to allow for the thermostat to reset. Should this persist, contact your installer or service engineer

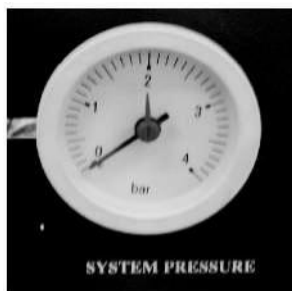
Dual Channel Programmer

Stand alone 7 Day 2 Channel programmer supplied with Combi Plus models. Provides full control of Heating and Domestic Hot Water On & Off Times.

Available as an optional extra on Standard Combi and other boiler models.

Pressure Gauge (System & Combi Models)

For sealed systems, the panel incorporates a pressure gauge. On the front face is a red arrow pointer, that should be set to minimum system pressure. The indicated gauge pressure should not exceed 2.0 bar when the boiler is hot, nor less than 0.5 bar. It is important to refer pressures outside these ranges to your installer.



Pressure

2.10 Burner Lockout

The Burner has an independent control system (Burner Control Box) This incorporates a flame detector (Photocell) which senses the presence of the burner flame. In the event of a flame failure, the control box activates a re-ignition sequence. Should the photocell not detect a flame presence within 15 seconds the burner will go to lock out and a illuminates the red button on the control box.

Burner Lockout
Reset Button →



Burner Lockout Continued>

A lock out is the result of a fault in the operation of the boiler and can be attributed to the following problems:

- a. An interruption of fuel supply.
- b. Electrical supply fault e.g. Extreme low voltage.
- c. Failure of a burner component.
- d. Flue obstruction.
- e. Obstruction of combustion air ventilation.
- f. Burner combustion not being correct.

WARNING! Only attempt to restart the burner twice, if the burner fails to start contact your installer or service engineer

2.11 Starting And Switching Off The Boiler

Following the points outlined in figure 2.10 & 2.11 and 2.12 (Burner Lockout).

Combi Models. The Combi models may be used for heating the domestic hot water only. This mode is made using the programmer as required.

To switch on:

- a. Switch on the power supply.
- b. Switch the selector to I (BR).
- c. Set thermostat to desired setting and see that other controls such as room thermostat and programmer are calling for heat as required.
- d. Start-up is fully automatic once the desired settings are made.

To switch off, **Short Term**

- e. Set the programmer, heating controls or thermostats to off.

To switch off, **Long Term**

- f. Turn the Boiler/Immersion selector switch to the off position.
- g. Switch off the appliance power supply.
- h. Shut off oil supply to the appliances.
- i. If the dwelling is being left un-attended for an extended period and there is a risk of freezing consider either draining down system or adding a heating system anti freeze to the system.

Non Combi Models

To switch on, set the control thermostat to the desired setting and check other controls are calling for heat.

To switch off, **Short Term**

- a. Turn the appliance thermostat to off, or switch internal / external controls to off position.

To switch off, **Long Term**

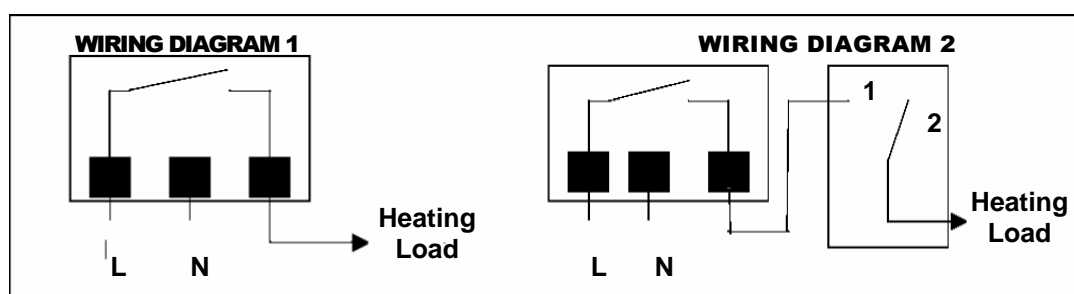
- b. Switch off the appliance power supply.
- c. Shut off oil supply to the appliances.
- d. If the dwelling is being left un-attended for an extended period and there is a risk of freezing consider either draining down system or adding a heating system anti freeze to the system.

2.12 Immersion Heater (Combi Plus Models).

The immersion heater is switched on at the selector position II. This removes the power to the burner but leaves the internal circulating pump and diverter valve junction in the hot water mode. The immersion heater provides for sufficient hot water in the event of loss of oil supply. You are advised not to wait for the oil to run dry as it can cause a break down. The immersion heater also contains a thermostat which operates in the range 40-80°C

2.13 Frost Protection

During winter absences away from home, you may lower the room thermostat and boiler control thermostat to 1 and also reduce the programmer time settings. If available set the room thermostat to frost setting. If the boiler is located in an outhouse or is an external model it is recommended that a frost thermostat is fitted.



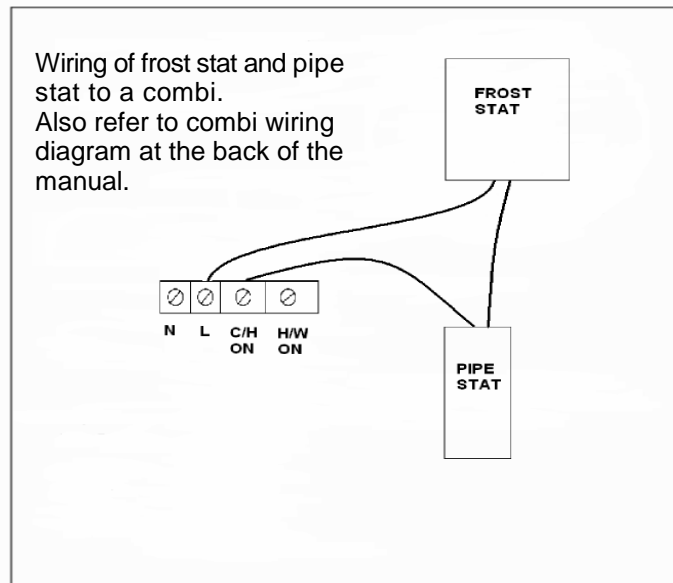
Frost Protection Continued>

It is strongly recommended that a pipe thermostat be wired in series to ensure that overheating of the property does not occur. The pipe thermostat should be sited on the heating return pipe, wired as shown in wiring diagram 2, below and set to 5°C (depending on system and location).

The frost thermostat must be wired to override all other time and temperature controls, and preferably to switch on the heating circuit, rather than the hot water circuit.

When a frost thermostat is installed on a central heating system, the fused spur should only be switched off for servicing and maintenance. If the appliance is to be switched off for any reason e.g. holiday, then switching must only be carried out at the programmer or time clock.

Note: For wiring of frost stat on Combi models refer to the Combi wiring diagram Page 39.



2.14 Maintenance and Servicing

To ensure reliable and efficient operation of the boiler, it is essential, that once the boiler is installed, it is commissioned and subsequently serviced on an annual basis by an OFTEC registered or suitably qualified engineer. Failure to do so will invalidate the warranty (Statutory Rights Will Not Be Affected). It is the responsibility of the installer to ensure that the boiler is commissioned.

To clean the boiler casings on a day to day basis, wipe with a damp cloth. Care should be taken to avoid using any abrasive cleaning materials and caution should be used to avoid touching any hot surfaces.

3.1 Suitability

Mistral oil fired boilers are fully automatic, horizontally fired pressure jet boilers, complying with European directives for boiler efficiency, low voltage and EMC and are designed for use as follows:

- a. Indirect, open-vented central heating and hot water systems.
- b. Indirect, un-vented sealed central heating and hot water system.
- c. For maximum system operating pressure up to 3 bar.
- d. For connection to approved conventional or factory made chimney.
- e. For use with Mistral own balanced flue system
- f. As a replacement for existing boilers or as part of a new installation.

3.2 Health and Safety

Please refer also to the COSHH information printed on the inside cover of the manual.

- a. In the interest of safety reliability and efficiency the appliance should be installed and commissioned by an OFTEC or suitably qualified engineer.
- b. The equipment supplied by Mistral Boilers in the way of boiler or flue, should not be modified or used outside the scope of its suitability, unless described within this manual or through direct discussion with Mistral.
- c. Electrical wiring to the boiler and heating system should be undertaken by a suitably qualified electrician and comply with the last wiring regulations BS7671. No attempt should be made to modify or change the internal wiring of the boiler.

3.3 Location

a. The Hearth

The boiler must stand on a firm level hearth which complies with current building regulation. The base temperature of the appliance does not exceed 85°C. If the boiler is to be positioned on a hearth of combustible material, suitable protection should be placed underneath which is non combustible and impervious to oil.

b. Siting.

The noise level of the appliance is low and so makes them ideally suitable for siting within the kitchen, the utility room or garage. As some people are more sensitive to noise than others, it is good practice to discuss the intended location beforehand.

When choosing the location for a condensing boiler special consideration must be given to the positioning of the flue terminal. Care should be taken to locate it so as to prevent either the end user or their neighbours perceiving the plume to be a nuisance. It should be noted that the normal statutory clearances required around low level flue terminals may not be sufficient to cope with plume dispersal from a condensing boiler. The following points should be considered:

- c. Plumes can extend out horizontally and can also drift out to the sides and above the terminal. Care needs to be taken therefore to avoid the plume reaching adjacent surfaces, particularly windows and neighbours dwellings.
- d. Flue terminals need to be located where air can pass freely across them to disperse vapour.
- e. The effect of the moisture generated must be considered in relation to possible corrosion of metal parts it might reach and to the possible formation of ice on pathways in freezing conditions.
- f. Keep flue terminals a minimum of 1 m (horizontally) from openings in the building.
- g. Do not install flue terminals directly below a window. (see diagram page 27/28)
- h. Do not install flue terminals next to a door. (see diagram page 27/28)
- i. Do not install flue terminals within 1 m of ventilated soffits or eaves. (see diagram page 27/28)
- j. Keep flue terminals at least 1 m away from a surface or boundary facing a terminal. (see diagram page 27/28)

Avoidance of any potential nuisance can normally be achieved by utilising one of the many differing flue options available.

4.1 Standards And Regulations

The installation of this boiler must comply with the latest edition of the following standards:

BS 799:5	Specification for Oil Storage Tanks.
BS 4543	Pt 1 & 3 Factory made Chimneys.
BS 5410	Pt 1 Oil Installations under 44kW.
BS-EN – 12828 12831 2003	Forced Circulation Hot Water Central Heating Systems for Domestic Premises.
BS 7074	Pt 1 & 7 Sealed System Components and Codes of Practice.
BS 7593	Code of Practice for Treatment of Central Heating Water in DHWS.
BS 7671	Electrical Wiring Regulations.

THE BUILDING REGULATIONS

Part J & L	England and Wales.
Part F	Section 111 Scotland.
Part L	Northern Ireland.

THE CONTROL OF POLLUTION (OIL) REGULATIONS

BS 5955:8	Installation, Plastic Pipes and Fittings
BS 799:5	Specification for Oil Storage Tanks.
BS 4543	Pt 1 & 3 Factory made Chimneys.
BS 5410	Pt 1 Oil Installations under 44kW.
BS-EN – 12828 12831 2003	Forced Circulation Hot Water Central Heating Systems for Domestic Premises.
BS 7074	Pt 1 & 7 Sealed System Components and Codes of Practice.
BS 7593	Code of Practice for Treatment of Central Heating Water in DHWS.

Special consideration should be given for condensate removal and plume dispersal.

BS 5410: Part 11997 Gives the requirements for domestic boiler and oil storage installations.

4.2 Heating System

This boiler can be used for a new installation or as a replacement fitted to an existing installation.

Ensure that the system is thoroughly cleaned and flushed through prior to filling and for long term protection a suitable corrosion and scale inhibitor should be added to the primary water.

Kettling and system noises can best be avoided with the removal of swarf and residues prior to filling with clean water and the addition of a proprietary system inhibitor, before first firing, is strongly recommended.

To avoid **nuisance over temperature tripping out** of the boiler limit thermostat, due to reduced or no water flow through the boiler whilst the burner is firing, it is strongly advised that the control system should be wired so that the burner is switched off at the same moment as the circulating pump.

Where thermostatic radiator valves are employed, these may well cause reduced return flow to the boiler as they close down. To avoid affecting the boiler flow, it is preferable to include in the system, a by-pass loop between the flow and return, which incorporates a proprietary by-pass valve that is sensitive to the change in pressure.

Before filling the system, ensure that any unused sockets have been plugged and the boiler drain down point is closed.

Garage Installations are dealt with in the OFTEC Technical advice publication TI/1 27.

4.3 Domestic Hot Water System (Combi Models)

The cold mains inlet fittings provides a 15 mm compression joint on the C1, C2, C3 and C4 (15-41kw) models and 22 mm on mega combi range MC5, MC6, MC7 (41-68).

The water supply pressure to the boiler should be within the range of 1.0 to 3.0 bar. If pressure exceeds 3.0 bar fit a pressure reducing valve.

Cold Water Supply and Treatment. To minimise scale formation in the plate heat exchanger it is important to know how hard the water supply is. This hardness information is available from the local water company. Where water hardness of over 150ppm is expected, it is recommended that water treatment is fitted. This would preferably be a water softener. There are also signal type water conditioners that are connected to electrical supply external to the boiler. Without treatment it is to be expected that the natural scale build up will with time, reduce the heat transfer efficiency of the plate heat exchanger.

4.4 Electrical Connection (Excluding COMBI PLUS)

The electrical supply required to power the boiler is: 230V AC, 1 ph, 50Hz.

The supply must be fused at 5 Amps and be fitted with a double pole isolation switch, with a contact separation for each pole of 3mm fitted with shuttered sockets mounted adjacent to the boiler. It must isolate the complete boiler control system.

The supply connection to the control panel is through a removable three way plug located in the base of the boiler control panel. There is no need to enter the control panel for supply connection.

Room or frost thermostats used should be able to switch mains supply voltage and have a contact rating of at least 10 amps.

Electrical Connection COMBI PLUS Models

The electrical supply required to power the boiler is: 230V AC, 1 ph, 50Hz.

The supply to the boiler must be from a direct spur from the consumer unit via a ELCB rated at 20 amps.

This provides for the immersion heater facility, the boiler control is protected by a 5 amp fuse (Holder) located on the underside of the control panel.

A double pole isolation switch, with a contact separation for each pole of 3mm fitted with shuttered sockets must be mounted adjacent to the boiler to isolate the complete boiler control system.

Room or frost thermostats used should be able to switch mains supply voltage and have a contact rating of at least 10 amps.

Wiring Connection:

The supply connection to the control panel is through a removable three way plug located in the base of the boiler control panel. There is no need to enter the control panel for supply connection. The power supply cable required to power the Combi Plus models should be a minimum of 2.5mm².

Note: All Combi Models. Terminals are provided within the control panel for a 2 channel programmer/clock and external wired room thermostat connection. If radio control devices are used, the switch control wires from the device should only be connected in the termination block provided for the programmer control. See Combi wiring diagram Page. 39.

4.5 Air For Combustion And Ventilation

The provision of a permanent and adequate air supply is essential for the safe and efficient operation of the boiler, and must cater as follows:

- Air for combustion and to allow the flue to evacuate all the flue products.
- Air for ventilation to prevent overheating, if the boiler is installed in a confined space or compartment.

Air For Combustion (Conventional Flue)

British Standard Code of Practice BS5410: pt1. Requires a permanent opening from outside, into the room containing the boiler of 550mm² for each kW of boiler maximum output.

Where a **stabiliser** is fitted 1 100mm²/kW is required, but not if the boiler is in a ventilated compartment.

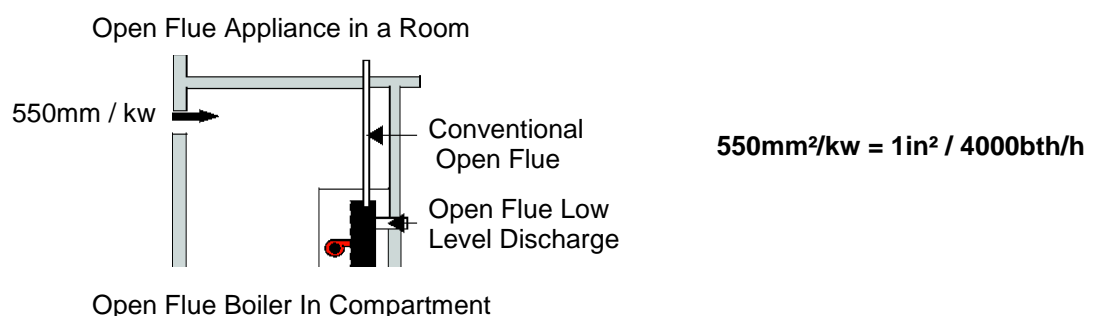
Preferably located at high level, to avoid discomfort to the occupants and any possibility of being blocked off to prevent draughts.

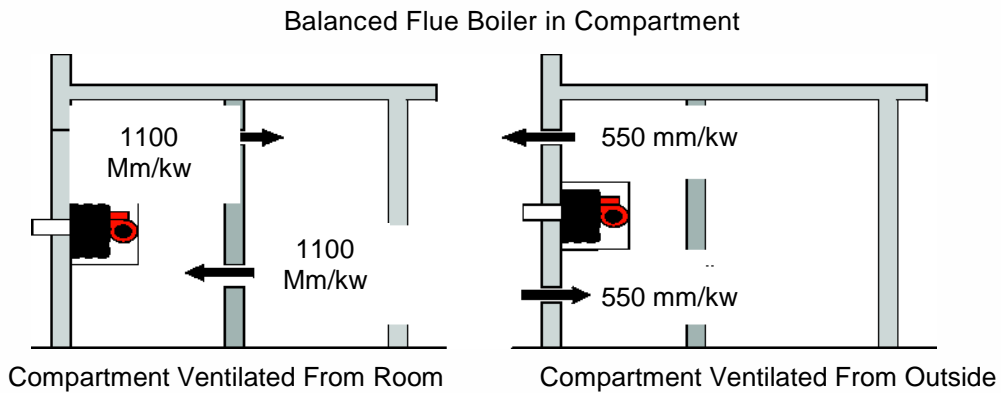
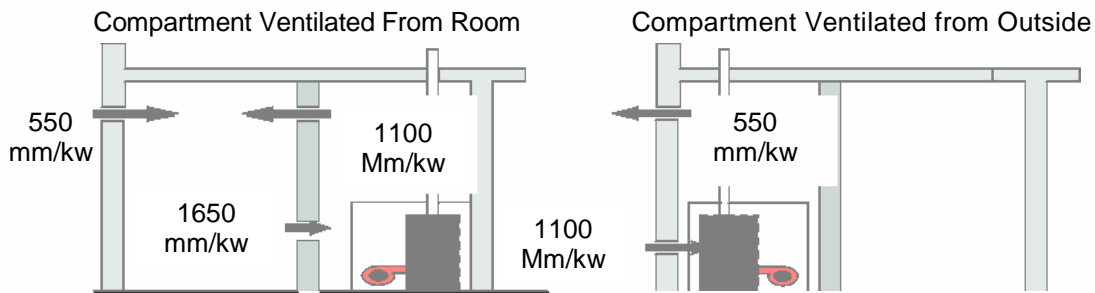
Air For Ventilation (Conventional Flue)

In addition to air for combustion, British Standard requires high and low level permanently open vents, where the boiler is located in a compartment or confined space.

- Where air is taken from outside the building, high and low level vents each of 550mm² for each kW of boiler maximum output are required.
- Where air is taken from an adjoining heated space, high vent of 1100mm² and low vent of 1650mm² for each kW of boiler maximum output are required and from the same room.
- Basement installations** require air for combustion to be ducted to low level.
- Restrictions** Oil fired boilers must not draw air from a bedroom.
- Extract Fans** With all doors windows and adjustable vents closed and the extractor on maximum setting, there must be no adverse effect on the combustion performance. Tests should be made of CO₂ and smoke with the fan on and off.

The maximum permissible rate of fan extract for a pressure jet burner is 40 litres per second. With extraction from an adjoining room, the intervening door should be left open.





The above information supplied by OFTEC

4.6 The Immersion Heater Combi Plus Models

The Immersion Heater is pre-wired to the boiler control panel and requires no further attention. It's internal thermostat operates independently to all other boiler thermostats and is set at 65°C. When the immersion heater is selected on the front of the control panel selector switch: position II, the integral circulating pump is energised. It remains in operation throughout this selection, to provide heat transfer at the plate heat exchanger.

Warning! Do not operate the immersion heater without the heating system being first, filled with water and bled of air.

5.1 System Regulations

In addition to the installation standards and regulations outlined earlier in 4.1. Sealed System installations must comply with the latest edition of:

- a. BS 7074 pt 1. Application, selection and installation of expansion vessels and ancillary equipment for sealed systems.
- b. BS 7074 pt 7. Code of practice for sealed systems.

5.2 Boiler Models

KUT, BH, OD Models are suitable for incorporation in a sealed un-vented heating or hot water system as they are equipped with a manual reset limit thermostat. They do not however contain within their construction any of the components required for filling or water pressure safety.

C, S, ODC, ODS, MC Models. These boilers are supplied with all the necessary components for connection to a sealed un-vented heating or hot water system as follows:

- a. **Expansion Vessel.** Pre charged at 1.0 bar (14.5 psi) Is suitable for a static head of up to 10.2m, measured from the highest point of the system; usually the top of the bedroom radiators, to the mid point of the vessel.
For other static heads the pre-charge must be adjusted, either by lowering to 0.5 bar for 5.1 m, or increasing to 1.5 bar for 15.3m. For this purpose a standard tyre valve is provided on the expansion vessel. Measurement is achieved using a tyre gauge, with the vessel disconnected from the system or the system empty of water. Higher pressures are made by pumping up with a conventional foot pump.
The pre-charge must not exceed 1.5 bar.
- b. **Pressure Relief Valve.** Factory set at 3.0 bar (43.5 psi.), and located on the front left hand side of the heat exchanger.
- c. **Circulating Pump.** Grundfos three speed variable head with heavy duty ball isolating valves. Mounted on the internal boiler flow pipe work. Direct installer connection to 22mm compression.
- d. **Automatic Air Vent.**
- e. **Pressure Gauge 0-4 bar.** Control panel mounted and connected to the pressure relief valve tapping.
- f. **Filling and Make-up Loop.** For site installation on the heating system pipe work.
- g. **Limit Thermostat – Manual Reset.** Setting at 11 0 C \pm 6 C. Reset button located on the front face of the control panel under the black finger tight knob. Should the boiler overheat and the limit thermostat trips it can not be reset until the boiler has cooled sufficiently.

5.3 Heating And Hot Water System

The C, S, ODC, ODS Models are specifically designed for use on sealed un-vented systems. They can however be used on an open vented system in accordance with the normal requirements applicable to this type of installation. The boilers incorporate an in-built circulating pump. Thermostatic radiator valves and lock shield valves must be suitable for the higher system operating pressures.

System Filling Point and Make-up.

The connection point on the boiler may be capped off and an alternative location provided elsewhere on a low point of the system, if preferred. This must however be in accordance with local water undertaking regulations.

The make-up provision on the system boilers for replacement of lost water is through the filling loop. However, other means can be provided via a make-up vessel or tank. This would be mounted in a higher position than the top point of the system and connected through a non-return valve into the system. On the return side of either: the hot water cylinder or all of the radiators.

Loop must be disconnected from one of its connections when not in use.

- a. **Mains water Connection.** There must be no connection to the mains water supply other than through the temporary filling loop connection at the time of filling or recharging.
- b. **Hot Water Storage Vessel.** This should be of the indirect coil type or a direct cylinder fitted with immersion clarifier which are suitable for the intended system pressure of 0.35 bar above the safety relief valve setting.

5.4 Sealed Primary System

The pressure gauge mounted on the control panel indicates the system pressure once cold charged and during the heating cycle. It also has a red arrow pointer that is positioned to indicate the cold charge point of the system and serves as a warning to indicate loss of system water. When the boiler is fired the system pressure rises and should not rise above 2.3 bar. If it does it indicates insufficient expansion vessel capacity. The expansion vessels initial charge must not be less than the static head pressure of the system.

5.5 Expansion Vessel Selection

Refer to the sizing table at the end of this section for the explanation on vessel sizes and system water volumes. It is important that an additional vessel is connected to the system should the hot cycle pressure exceed 2.3 bar.

5.6 Discharge Pipe

Discharge from a safety relief valve must be to a safe location, one where it:

- Is visible.
- Cannot discharge over people i.e. above an entrance window, or any type of public access.
- Cannot cause damage to property, and is preferably at low level.

The discharge pipe must be at least the same size as the connection to the valve (15mm). The fall of the discharge route must be sufficient to prevent blockage through freezing.

Warning! The discharge pipe could emit boiling water!

5.7 System Filling And Commissioning

The flexible hose on the filling loop kit provides the means of initial system filling from the mains water supply and for subsequent topping up of the system.

There is, provided on the hose, a double check valve with a shut-off ball valve located on the mains side. Both the check valve and shut-off valve are made to accept the "O-ring" sealed end connections of the flexible hose. The wing nuts do not require more than finger tightening. Disconnect one end of the hose after filling.

To Fill The System

- Connect and see that the filling hose is secure between the mains and the double check valve.
- Ensure that all valves except the valve on the double check valve, are open and that the automatic air vent's plastic cap is open to release air.
- Open the mains shut-off valve and gradually open the ball valve on the double check valve, until the system pressure reaches 1 - 1.5 bar.
- Close the filling loop valves and inspect the system for leaks, repairing as necessary.
- Vent the system at the radiators boiler and circulating pump, beginning at the lowest level.
- Check the operation of the safety relief valve by releasing the red plastic knob until a click is heard. Allowing water to vent through the discharge pipe check that the discharge is free of obstruction and allows it to flow to the drain point.

Expansion Vessel Sizing Table

- The volume of the expansion vessel chosen must not be less than given in the table.
- Additional expansion vessels, if needed, should be fitted as close as practicable to either the inlet or outlet of the boiler.
- Generally with an initial system pressure of 0.5 bar (metres), a system capacity of about 145 litres (31.5 gallons) can be accommodated with the 12 litre vessel supplied on the system models.
- The air charge in the expansion vessel should not exceed 1.5 bar.
- Fill as necessary to the system design pressure. Close filling loop valves.
- Remove one end of the filling loop hose from its connection.
- Finally, check the operation of the manual reset thermostat by allowing the boiler to run with the control thermostat phial temporarily removed from its pocket.

Safety Valve Setting 3.0 Bar

Vessel Charge & Initial System Pressure	Bar	0.5	1.0	1.5
Total Water Content In System	Litres	Expansion Vessel Volume		
25	2.1	2.7	3.9	2.1
50	4.2	5.4	7.8	4.2
75	6.3	8.2	11.7	6.3
100	8.3	10.9	15.6	8.3
125	10.4	13.6	19.5	10.4
150	12.5	16.3	23.4	12.5
175	14.6	19.1	27.3	14.6
200	16.7	21.8	31.2	16.7
225	18.8	24.5	35.1	18.8
250	20.8	27.2	39.0	20.8
For system volumes other than those shown, multiply the total water content by the appropriate factor.	Factor	0.0833	0.109	0.156

For system models, deduct from the expansion volume, given or calculated the boiler vessel supplied.

To select the correct vessel for the expansion vessel volume requirement, select the next rounded size up.

6.1 Regulations

BS 5410: Part 1.
BS 799: Part 5. Steel Tanks. OFST200.
OFS T100: Plastic Tanks.
BS 2871: Part 1. Table Y. Copper Tube.
BS 864: Part 2. Flared Fittings.
Building Regulations – Part L & J

Useful Technical Publications Available From OFTEC.
 T1/130: Remote Tank Fill: Terraced Housing.
 T1/131: Sitting Of Domestic Tanks.
 T1/133: Environmental Spillage Risk Assessment.
 T1/134: Underground Oil Supply Pipes

6.2 Fuels

The burner is supplied set with the appropriate nozzle and pump pressure for the mid range of the boiler to fire **Class C2 Kerosene to BS2869 pt 2**,
 The burner must not be modified to burn other fuels, unless Mistral Boilers is consulted with regard to suitability.

6.3 Oil Supply

Oil enters the boiler side casing low down, either side to suit the installation. In the interests of safety, avoid passing the flexible burner oil line through the holes in the casing panels, the joint to the copper supply is made inside the casing.

The oil feed can be a single gravity feed, two pipe suction lift, or single pipe suction lift with DEAERATOR. Pipe work under the ground should be joint free and where appropriate use plastic covered copper tube. Exposed pipe work must be protected against accidental damage and fire.

Do not use solder fittings in the oil line.

Always flush out the oil line before connecting to the burner pump.

Components

Oil Filters should always be fitted to the oil line. One incorporated in the sight of the gauge assembly at the tank and another (of the paper element type) close by; but not inside, the boiler casing, especially if this is a replacement boiler installation using existing pipe work and tank.

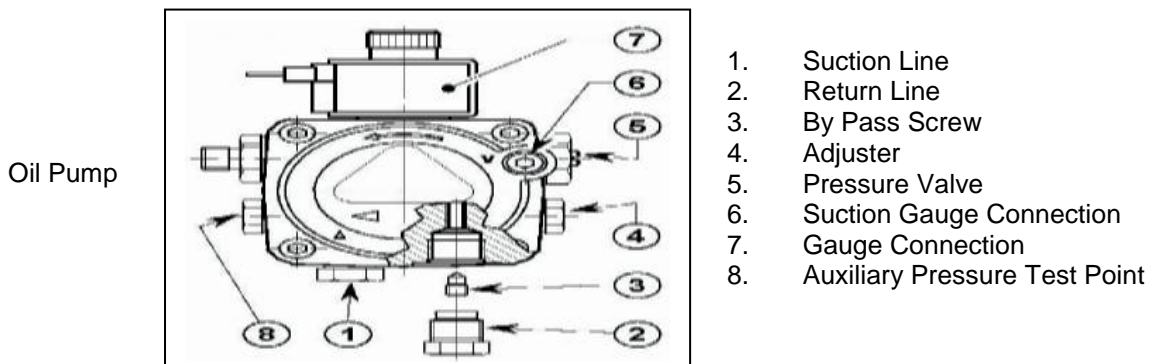
Shut off cock, close to the boiler to allow burner and filter servicing, without draining down.

Fire valve, is an essential part of the installation. The valve should be located just outside the building at the point of entry. It is activated by a remote sensor phial which is positioned within the boiler casing and over the burner. The safe routing of the capillary tube to avoid accidental damage is important. Various lengths of capillary are available. The use of solder head shut-off valves is not recommended.

Overfill alarms and remote contents gauges. Overfill alarms are essential when the delivery point and vent pipe are remote from each other. Remote contents gauges transmit the oil level to a display unit inside the house.

Single pipe gravity feed (See 6.5.) If the oil outlet of the supply tank is above the burner, a single 10mm copper supply pipe line should be installed. This should include: an essential oil filter and remote sensor fire valve. At the burner the copper line is connected to oil pump via a flexible oil line to the suction port.

The burner is supplied from the factory set for single pipe gravity feed and does not have a bypass screw fitted.



6.4 Tanks And Pipes

If the oil outlet of the supply tank is below the burner, a twin pipe 10mm copper supply system is suitable. This should include on the suction line: the essential oil filter, remote fire sensor and a spring loaded non- return oil valve.

Connections are to the suction and return ports of the burner pump via two flexible oil lines. The non-return valve prevents drain back to the supply tank which can occur during maintenance or after a long period of shut down.

The oil pump must have its internal bypass screw fitted. This is supplied loose with the burner.

The return line should terminate at the same level as the suction line and enter from the top of the tank; also within the tank the return line should have a small cut or hole to prevent siphoning.

No valves or restrictive fittings are to be fitted to the return line as they could blow the pump seals.

Pipe Runs (Metres) And Essential Fittings

Fire Valve	Yes
Filter	Yes
Non Return Valve	Yes
Bypass Screw	Yes (Fitted)

Oil Lift (Metres)	8mm I/D Pipe Run (Metres)
0	35
0.5	30
1	25
1.5	20
2	15
2.5	10
3	8
3.5	6
Maximum Lift	4 Metres

Single Pipe Suction Lift With DEAERATOR

Where the oil line run for a two pipe system is long, or it is more convenient, a single suction line feed may be employed which includes an oil DEAERATOR with two pipe loop at the burner pump.

This device is located outside the building adjacent to the boiler. It may be higher or lower than the burner pump. No non-return valve is required.

Connections are a single pipe feed to the DEAERATOR and from here a flow and return connection to the boiler pump. The bypass screw is fitted. Pipe sizes may vary to suit the application.

The pump vacuum should not exceed 4 metres (0.4 bar) measured at the pump connection V. The pipe run table shows the TOTAL pipe length.

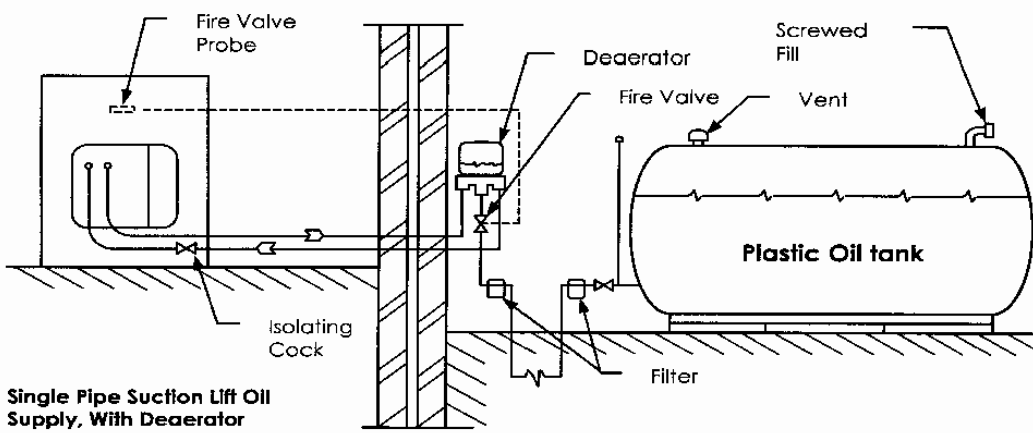
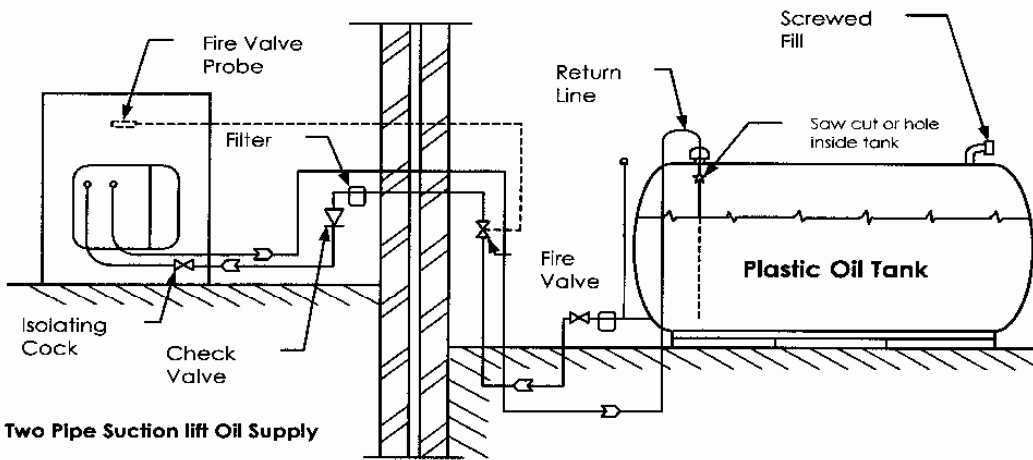
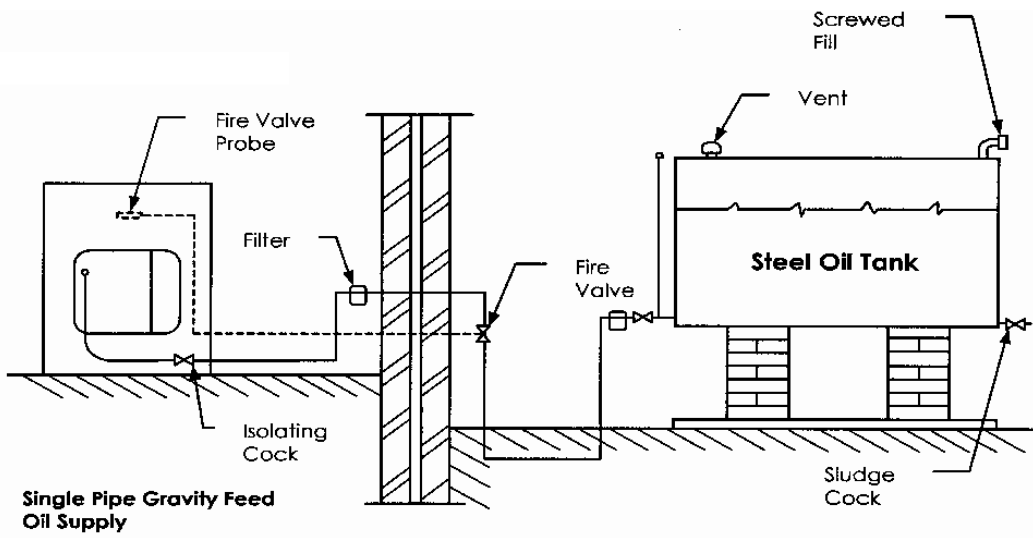
Deaerator Pipe Runs (Metres) - Kerosene

Oil Lift (Metres)	6mm I/D Pipe	8mm I/D Pipe	10mm I/D Pipe
0	24	100	100
0.5	21	100	100
1	19	93	100
1.5	16	84	100
2	13	71	100
2.5	11	59	100
3	8	46	100
3.5	6	33	100
4 (Maximum)	-	20	100

Bypass Screw

The Bypass screw, return port location (Riello burner pump). The pump is supplied for use with a one pipe gravity feed oil supply line and the bypass screw is not fitted in the return port which is plugged. For use on a 2 pipe suction lift system or where a DEAERATOR is used the bypass screw must be fitted.

6.5 Oil Supply Diagrams.



7.1 Conventional Flue Options

Also See Section 4.4. (Air For Combustion And Ventilation)

- a. Connected to an existing chimney, should be suitably lined using a liner intended for oil condensing boilers. It is advisable to back-fill with insulation such as vermiculite.
- b. Factory made double skinned and insulated flue systems, suitable for oil boilers.

For further information on conventional flue, refer to flue manufacturers guide lines.

Draught

A conventional flue works because the air pressure at the top is less than at the bottom and the air surrounding the chimney pushes the air in the flue upwards to the top, causing the gasses to rise.

This flow is also assisted by lighter heated flue gasses from the boiler.

If the flue terminates in a region of positive pressure, as would be found below the ridge of a roof or below the eaves etc. then the gasses will be held back and spillage from the flue may occur at the bottom.

Compliance

The flue must comply with the requirements of Building Regulations Part J & L and BS5410. As down draught (inversion of the flue gasses) must be avoided, strict adherence to the regulations regarding termination does not guarantee satisfactory performance.

Design

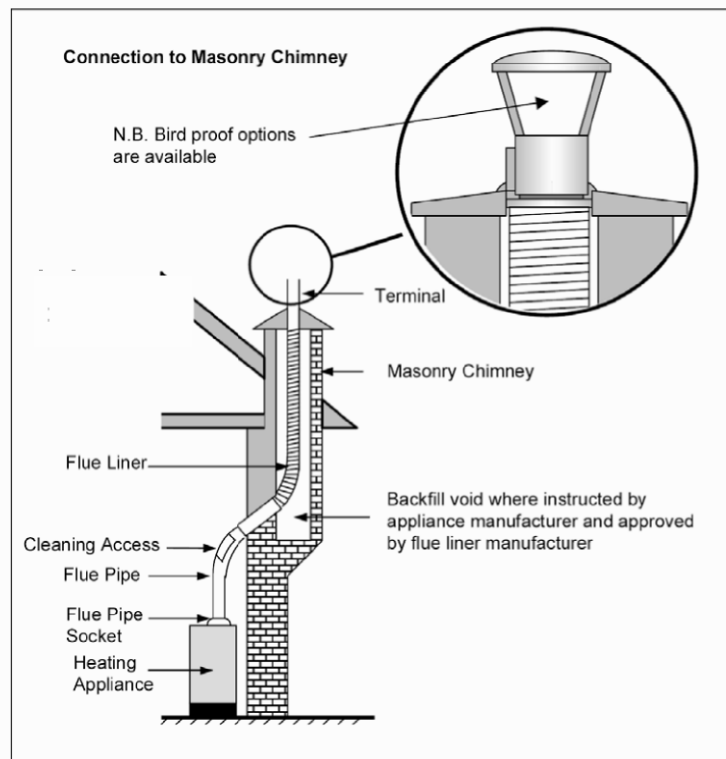
The flue should terminate beyond the ridge or flat roof parapet. If terminating from within a brick chimney, the flue should extend to at least the height of a normal clay pot.

The use of a rain cap is recommended. Other types of pots and cowls that might restrict the efficient flow of combustion products should not be fitted and where found should be removed.

Special anti-down draught pots serve only to increase the effective height of the flue when installed in a positive pressure zone and should be avoided.

The connecting flue from the boiler to the main stack should not reduce the boiler take off size. Do not immediately exit the boiler with a flue bend, a straight run of at least 600mm is advised.

Bends should be kept to a minimum angle of 135° and where required should be inspection types.



Never run the flue horizontally and always join into the main stack either vertically or at 45°.

To make the adaptor joint: The flue should be sealed to the boiler adaptor using the appropriate high temperature sealant.

7.2 Balanced Flues

Mistral offer a full range of balanced flue kits and parts. See Page ? & ?

On all balanced flues in certain conditions, the wind can blow flue products into the air intake, resulting in burner recycling, then soot. If this happens check flue position and sealing of flue. If flue position or design cannot be changed, by using extensions or plume kits(see page 29-30.), sufficient air must be provided from another source. The air supply to the burner can be from the room, if enough air is available, or fit the flexible hose to a 75mm tube to take the air from outside. Burner must have clean air to work.

The requirements of the building regulations and BS 5410: pt 1 must be observed. However, if there is any doubt as to the suitability of a proposed flue location, please feel free to discuss this with our technical service department.

If any part of the balanced flue terminal after installation is lower than 2m from the ground, or can be touched, or is liable to damage, then a stainless steel **terminal guard** is required.

Terminal positions which are likely to be in close proximity to an **oil tank** must comply with the requirements for oil storage tanks in BS 5410, which is a clear distance of 1.8m and overrides the minimum dimensions for terminal positions shown in the table unless a fire-break is built.

The dimensions shown in the table are the minimum distances advised by BS 5410. However, where experience shows that a greater distance would be appropriate to give a more reliable installation, we have also given the greater dimension.

Terminal Positions – Best Practice

Avoid Discharging:

- a. Into a recreational area, such as a patio or play area.
- b. Onto adjoining property, unless with permission.
- c. Into a narrow passage way, particularly if it has a closed end.
- d. Into a carport.
- e. Directly into a public walkway.
- f. Directly into a below ground level space (old coal shoot)
Into an area where plants and shrubs will obviously grow and hinder the dispersal of the flue gas.

Timber framed buildings are suitable for the installation of a horizontal balanced flue oil boiler. If the terminal passing through the frame is metal sleeved and at least 50mm greater than the flue and packed with heat resisting insulation, each end should be capped with a metal plate for the flue to pass through and the outside sealed to prevent ingress of moisture.

Ceilings And Roof Timbers.

- a. There must be no joints within the ceiling joist area.
- b. Joints must be at least 150mm below the ceiling.
- c. Where the flue passes through the ceiling, a means of securing a fire break must be retained.
- d. Flues that pass through habitable areas must be suitably boxed in to avoid a fire hazard. Please refer to your Local Building Control Officer for further advice.
- e. Section J & L of the Building Regulations must be adhered to.

7.3 Balanced Flue Installation

All balanced flue options require the removal of the conventional flue terminal adaptor, where fitted, and the retention of the sealing gasket.

The balanced flue kits fit to the same four studs with the M8 nuts and washers. Where tubes slide into each other it is important to lubricate the tube in order to protect the rubber seal from damage during assembly.

The flue tubes are telescopic and generally do not require cutting.

Low level terminals have a connection that allows the flexible air tube to connect between the flue and air entry on the burner.

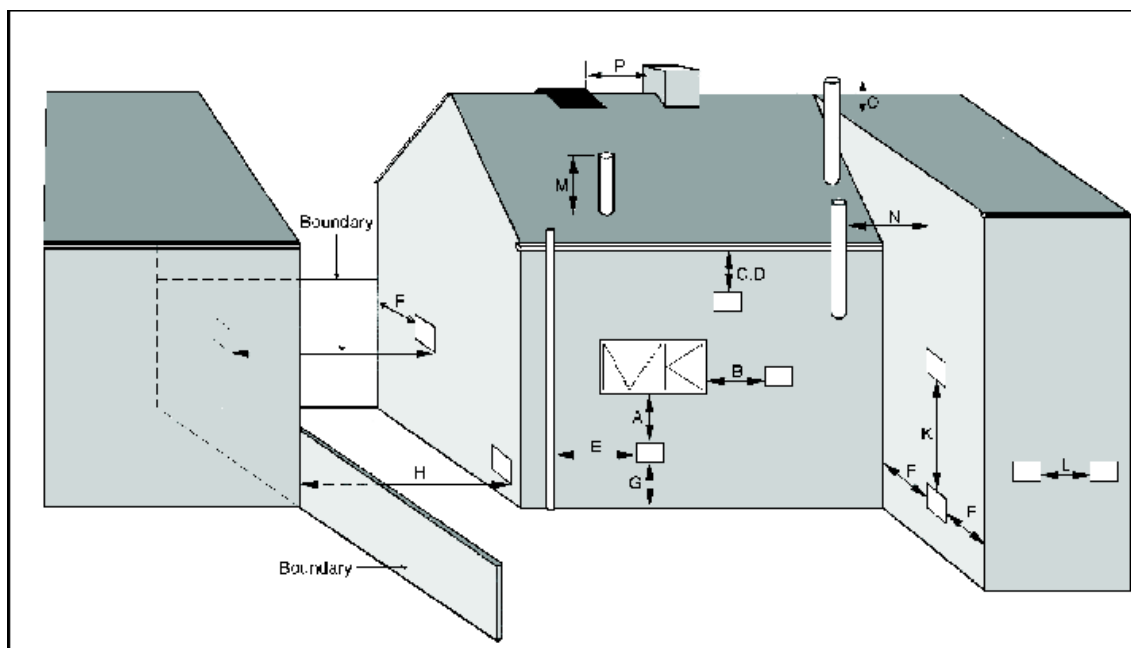
High level and vertical flues mount onto a stainless steel flue adapter that also allows the flexible air tube to connect to the burner.

The air tube is an essential component and must be secured with the clips provided. Take care not to puncture the skin of the tube.

Due to the fact that all flue sections are fully adjustable please use the clamps provided to finish off or hold vertical sections in position prior to fitting the next vertical section.

Take care to ensure that the rubber internal flue seals do not snag when assembling as this will allow combustion gases to leak and will or could effect the burner operation.

Recommended Minimum Balanced Flue Distances For Non Condensing Boilers



Recommended Minimum Balanced Flue Distances

(mm)

A	Directly below an opening, air brick, opening windows etc.	600
B	Horizontally to an opening, air brick, opening windows etc.	600
C	Below a gutter or a balcony without protection.	600
D	Below a gutter or a balcony with protection.	75
E	From a vertically sanitary pipe work.	300
F	From an internal or external corner or surface or boundary alongside terminal.	300
G	Above ground or balcony level.	300
H	From a surface or a boundary facing the terminal.	600
J	From a terminal facing the terminal.	1200
K	Vertically from a terminal on the same wall.	1500
L	Horizontally from a terminal on the same wall.	750
M	Above the highest point of an intersection with the roof.	600
N	From a vertical structure on the side of the terminal.	750
O	Above a vertical structure less than 750mm from the side of the terminal.	600
P	From a ridge terminal to vertical structure on the roof.	1500

Note: For outdoor models ensure that the flue outlet is a minimum of 600mm (Preferably 1000mm) away from any opening door, window, airbrick or fro an overhanging structure or gutter.

Mistral Balanced Flue Kit Descriptions

BFK LOW LEVEL HORIZONTAL FLUE KIT. Telescopic 355 – 575mm 2 part Flue Kit.

Kit Includes: Boiler Adapter, Telescopic Terminal, Terminal Guard, Seals, Lubricant, Seals and Burner Air Hose & Clips.

HHK HIGH LEVEL HORIZONTAL FLUE KIT. 1100mm Vertical / 450mm Horizontal Flue Kit.

Kit Includes: Boiler Adapter, 950mm Extension, 90° Elbow, 220-440mm Adjustable Extension, Wall Terminal, Lubricant, Seals and Burner Air Hose & Clips.

VK 3000 VERTICAL FLUE KIT. 3 Metre Vertical Flue Kit.

Kit Includes: Boiler Adapter, 2 x 950mm Extension, 450mm extension, 220-440mm Adjustable Extension, Roof Terminal, Lubricant, Seals and Burner Air Hose & Clips.

NOTE: It is not recommended that elbows totalling more than 90° are used in the complete flue system.

MISTRAL KWIC-LOC FLUE SYSTEMS

The Mistral KWIC-LOC balanced flue systems have been developed to provide for both fixed and individual flue design options. Utilizing the 'O' ring seal and clip fixing system, allows all parts to be quickly assembled. Manufactured from high grade stainless steel the KWIC-LOC system and accessories are for balanced or conventional flue applications.

- ⊗ **Suitable for condensing and non condensing boilers**
- ⊗ **All flue are multi directional. Low level flues are concealed within the boiler casing, improving cosmetic appearance and helping to retain efficiency**
- ⊗ **Vertical, high & low level flue kit options, available with a full range of accessories, elbows, Flashings and adapters**
- ⊗ **Fixed and adjustable extensions provide for variable flue length requirements**

KWIC – LOC flue is available in 2 sizes to suit boilers 15 – 41 kw and 41 – 68 kw

Part Numbers 1541 = Boilers 15 - 41 kw (50 – 140,000 btu) Flue OD Diameter 120mm
 Part Numbers 4168 = Boilers 41 - 68 kw (140 – 232,000 btu) Flue OD Diameter 150mm

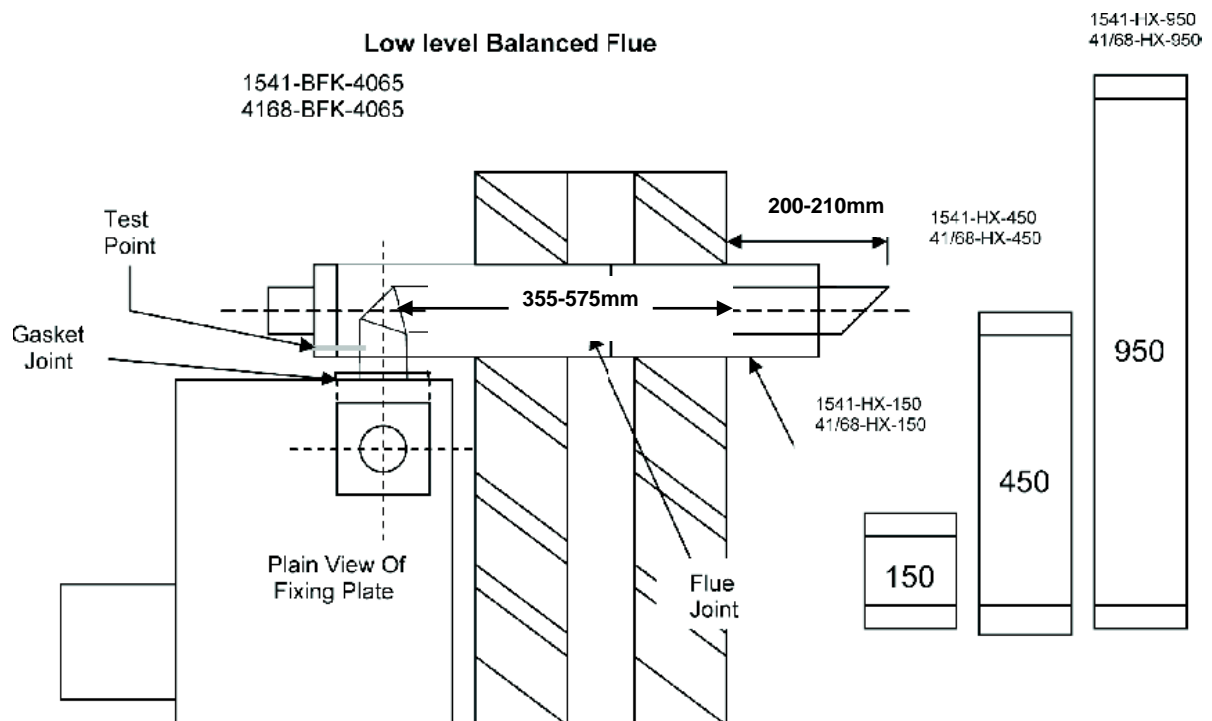
Low Level, Vertical and High Level Kit options are supplied with the flue parts as illustrated, complete with the burner air hose & clips, seals, lubricant, boiler flue gasket, terminal guard, fixings and screws as applicable for the kit.

Plume elbow options are available that permit low level and outdoor boiler flues to be converted into the vertical position. This allows nuisance plumbing to be diverted away from windows or other obstructions. When a plume elbow is fitted, accessories from the vertical/high level flue range are used to complete the system.

Low level extensions (i.e. 1541 – HX – parts) can only be used with the low level flue system kits and these parts are not compatible for use with vertical and high level flue systems (i.e. 1541 – X – parts).

Local conditions, flue position and the overall flue length can have an adverse and a varying effect on the boiler performance. The boiler may require further adjustment to suit the site conditions.

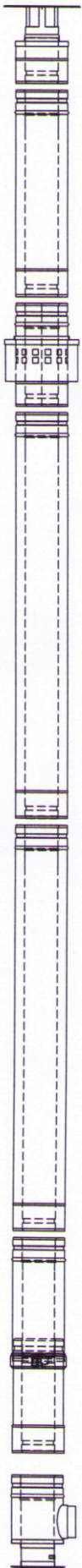
For further information and advice on the Mistral KWIC – LOC flue system, please contact our technical sales office.



KWIC – LOC FLUE KITS AND PARTS

3000mm VERTICAL FLUE KIT

1541 – VK – 3000
4168 – VK – 3000



TERMINAL RAIN CAP
1541 – BFRT (Part 1)
4168 – BFRT (Part 1)

450mm EXT
1541 – X – 450
4168 – X – 450

TERMINAL AIR INTAKE
1541 – BFRT (Part 2)
4168 – BFRT (Part 2)

PITCHED FLASHING
1541 – PRF

FLAT FLASHING
1541 – FRF

950mm EXT
1541 – X – 950
4168 – X – 950

450mm EXT
1541 – X – 450
4168 – X – 450

950mm EXT
1541 – X – 950
4168 – X – 950

315mm - 470mm
ADJUSTABLE EXT
1541 – AX – 2442
4168 – AX – 2442

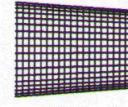
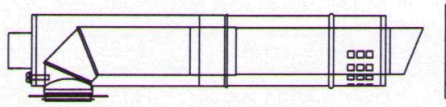
BOILER ADAPTER
1541 – BFBA
4168 – BFBA

315mm - 470mm
ADJUSTABLE EXT
1541 – AX – 2442
4168 – AX – 2442

BOILER ADAPTER
1541 – BFBA
4168 – BFBA

LOW LEVEL FLUE KIT

1541 – BFK – 4065
4168 – BFK – 4065

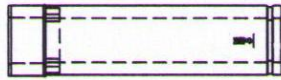


TERMINAL
GUARD
1541 – TG

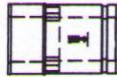
LOW LEVEL KIT ACCESSORIES



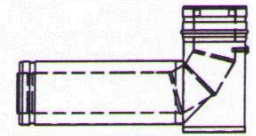
950mm EXT
1541 – HX – 950
4168 – HX – 950



450mm EXT
1541 – HX – 450
4168 – HX – 450



150mm EXT
1541 – HX – 150
4168 – HX – 150

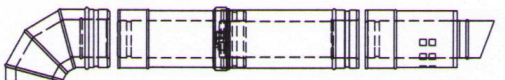


**PLUME ELBOW
1541 – HX – 90
4168 – HX – 90

****Note:** Use High Level accessories
For Vertical Plume Extensions

HIGH LEVEL HORIZONTAL FLUE KIT

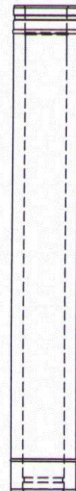
1541 – HHK – 1100
4168 – HHK – 1100



WALL TERMINAL
1541 – HLHT
4168 – HLHT

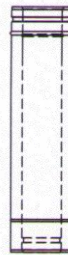
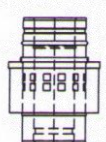
240mm - 440mm
ADJUSTABLE EXT
1541 – AX – 2442
4168 – AX – 2442

**HIGH LEVEL & VERTICAL
FLUE ACCESSORIES**



950mm EXT
1541 – X – 950
4168 – X – 950

VERTICAL TERMINAL
1541 – X – 150
4168 – X – 150
(2 Part Kit)



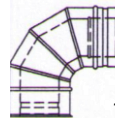
450mm EXT
1541 – X – 450
4168 – X – 450



45° ELBOW
1541 – ELB – 45
4168 – ELB – 45



150mm EXT
1541 – X – 150
4168 – X – 150



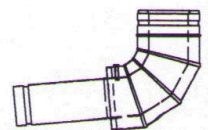
90° ELBOW
1541 – ELB – 90
4168 – ELB – 90



CF ADAPTER
CF - ADPT



SPACER
B - ADPT



OUTDOOR MODEL
PLUME ELBOW
1541 – OD – ELB – 90
4168 – OD – ELB – 90

References BS5410: pt 1. OFTEC BOOK 2.
OFTEC TI/133 Domestic oil tank, environmental risk assessment.
See also Sealed Systems SECTION 5.7. System Filling and commissioning.

The Boiler

The boiler has been supplied and tested for mid range of the boiler. As site conditions will influence the operation of the boiler, these factory settings require final adjustment.

- a. Correctly installed and set up for first firing, Mistral boilers will provide long, efficient and reliable service. It is required that the appliance should be serviced minimum every 12 months.
- b. Whilst every effort has been made to give the correct installation advice within this manual, the commissioning of these boilers requires some expert knowledge.
- c. To comply with the building regulations this boiler must be commissioned by an OFTEC or suitably approved engineer.
- d. Once the boiler has been tested and your report has been compiled, it is recommended that you highlight to the person requesting the work, any deviations and errors that may require attention. If it is safety related, please advise an appropriate course of action.
- e. The following check list should be undertaken before the commissioning tests are undertaken. The sequence is as outlined in the OFTEC book 2.
- f. OFTEC form CD11 should be completed and a copy left with house holder. Please also fill in the information at the back of this book.

Commissioning Of The Appliance

- a. Ensure there is no air in the heating system, and system has been flushed and treated with inhibitor.
- b. Remove inspection door on main heat exchanger, and condensing unit, and check baffles.
- c. Remove burner and check settings / nozzle. Please refer to burner manual for correct settings.
- d. Turn electrical supply, to the boiler ON.
- e. Set the central heating controls so they are calling for heat.
- f. Purge air from oil line supply.
- g. Check oil pump pressure adjust if required.
- h. Check smoke reading.
- i. Measure the Co' and adjust air on burner accordingly.
- j. Ensure appliance is up to working temperature. Failure to do so may incur incorrect combustion settings.
- k. The flue gas temperature should exceed 150 °c. If this is not the case, this can cause condensation to enter the boiler, in order to overcome this, it is possible to remove the top 2 baffles to obtain optimum flue gas temp.

General

There are certain parts which will require inspection and possible replacement at the time of service.

- a. Oil burner nozzle, must be replaced with the same specification.
Never attempt to strip and clean the nozzle, this will lead to further difficulties and expense.
- b. The oil lines must be inspected for hardening of the liner and possible leaks through the braiding. If either condition exists, replace the hose. You are advised to replace the hose every two years.
- c. Fuel oil filter cartridge - rinse clean, or replace with the paper element type. Clean the bowl, inspect the bowl seal for swelling or cracks, and replace if necessary. Re-assemble taking care not to misplace the seal.
- d. Access door seals. The seal must be complete and provide a sound gas tight seal.

Serviceing Procedure

These tasks should be undertaken by an OFTEC registered or suitably qualified engineer who is equipped with the necessary tools and combustion testing equipment.

Before switching off the boiler and starting the service, it is advisable to observe the boiler running, to get a general idea of its condition.

Oil Storage

Examine the oil supply tank and associated pipe work for signs of leakage or corrosion.

Check the support piers and the fill and vent connections. Inspect the sight gauge operation for any damage or water ingress. For metal tanks check the drain valve for water or sludge, pump out or drain as necessary but avoid any spillage to surrounding soil.

Oil Supply

Check exposed pipe work for damage or deterioration. Examine the function of any non-return valve, fire valve (hot water test) and deaerator etc. Clean oil filters. Inspect the flexible oil lines.

Air Supply

Check the combustion air and ventilation openings are clear of lint or debris.

For balanced terminals see that no obstructions have been placed near the terminal and no shrubbery has grown up, which would hinder its operation. See that no additional air extraction has been added to the dwelling which could affect the operation of the appliance.

Flues And Chimneys

Inspect and clean as necessary conventional flues to the first bend. Ensure the flue has no build-up of soot or debris.

Boiler

Servicing is from the front. For Sealed System boilers, remove the expansion vessel and lay to one side. Before removing the burner, carefully disconnect the flexible air duct, by undoing the clip at the burner air entry, turn off the oil supply cock and remove the flexible oil lines. Unplug the burner lead at the control panel and remove the burner. Undo the access covers, remove and clean all baffles, noting the order in which they were positioned. Clean the heat transfer surfaces in the boiler and vacuum out all loose debris. Inspect the burner gasket and access cover seals and replace if necessary.

The Burner

Remove the blast tube and clean internally and externally. Remove the electrode assembly and inspect for grazing or cracks in the ceramic. Clean and replace. Remove old nozzle and discard. Refit new nozzle of the same make, pattern and capacity as specified in the technical data. Brush clean the fan blades of any dust build-up. Inspect and clean the oil pumps filter. Check the condition of the photoelectric cell for signs of discolouration, clean and replace as necessary.

Boiler Security And Combustion

Refit burner, re-connect the flexible oil line, burner lead and air hose. Attach a pressure gauge (0-20bar) air bleed manifold to correct the pump connection. After bleeding the pump of air, check the oil pressure and adjust as required. Test the combustion readings for; CO₂, smoke number and flue gas temperature. Adjust the air shutter as required. Check the burner for lock-out function either by removing and covering the photoelectric cell or removing the solenoid coil. Check the operation of the limit stat, by temporarily removing the control stat phial from its pocket. Reinstatate all controls and run the boiler to confirm the operation of the control stat.

Sealed System

Check the system pressure and water level. Refer to section 5.7 Page 19 (System Filling and Commissioning). Check the operation of the pressure relief valve.

Finally

Advise the user of any problems or faults found whilst undertaking the service.

FAULT FINDING

Initial user checks, before calling out a service engineer.		Action
Do you have enough fuel?		Check the sight gauge.
Are all the fuel supply valves to the boiler open?		See they are all open.
Has the external fire valve tripped?		Press the trip button.
Is the boilers electrical power supply switched on?		Check.
Has the boilers power supply fuse blown?		Replace only once!
Are the heating system controls calling for heat?		Set them for heating on.
Is the boiler control thermostat set between 1 and 6?		Set for desired temperature.
Has the control panel high limit thermostat tripped?		* Check and reset if required.
Has the burner control box gone to Lock-out?		* Check and press lens.
Problem	Probable causes	Actions / checks
1. Burner will not start, or run	No power supply to the boiler. No power supply to the burner. Burner control box locked-out Burner motor / pump seized.	Switch the supply on. Isolator fuse may have blown. External heating system controls must call for heat: <ul style="list-style-type: none"> • Room thermostat. • Cylinder thermostat. • Programmer / time switch. Boiler control thermostat set between 1 and 6. Boiler limit thermostat tripped. Reset, press illuminated lens. Faulty photo-cell, replace. Faulty control box, replace. Look for oil leakage from pump shaft seal, replace if locked or tight spot.
2. No fuel supply or restriction suspected	No fuel in tank. Supply lines restricted or blocked tank vent Air locks.	Replenish. Try to turn off oil at the burner, from the flexible oil line (gravity supply). Are all valves open, or has the fire valve tripped. Has the tank outlet valve tripped? Is there water in the tank or supply line? Are all the filters clean in supply oil pump. Has there a blockage in the supply line, at the inlet to a valve or deaerator? Rubber valve seats swollen with Kerosene contact. Air being drawn into suction supply line from valve heads or fittings, consider fitting deaerator. Bleed pump.
3. Burner starts but locks-out after 15 secs	Dirty photo-cell. Control box photo-cell circuit faulty. Control box base connections loose. Restricted oil supply. Nozzle dirty. Combustion settings out of specification.	Clean cell and inside of blast tube. Replace control box. Tighten Check as above. Replace. Reset.

Problem	Probable causes	Actions / checks
4. Burner starts but no flame establishes	Oil restriction. Blocked oil nozzle. No pump pressure. Motor / pump drive coupling broken. Ignition failure. Burner settings.	Check as above. Replace. Faulty pump solenoid coil replace. Dirt in pump, clean or replace. Replace. Check: electrode gap (3-4mm), arcing to the blast tube, condition of leads. Cracked ceramic insulator, replace electrode assembly. Low oil pressure or too much air adjustment.
5. Burner runs but continually pulsates	Condense trap blocked. Flue system blocked. Air supply restricted. Flue terminating into pressure zone. Nozzle worn, with poor spray pattern and high capacity. Nozzle dribble or letting by on shut-down. Boiler baffles wrongly positioned.	Check free flow of water from trap to outside. Check for debris or soot build-up, clean. Clear obstruction. Check flue height, if wrong consider increasing flue termination height. Replace. Check oil solenoid seat on pump, clean or replace pump valve assembly. See that the chamber is dry of oil. Relocate in correct order.
6. Morning lock-outs	Two pipe supply suction line loosing oil. Oil level in tank below minimum level. Burner excess air too high. Burner stalling. Supply voltage low in mornings. Boiler output too large for system.	Check the non-return valve functions OK. Raise minimum tank height or fit deaerator. Set air setting for higher CO ₂ , (check smoke number). Check for tight or seized motor bearing. Is the pump shaft seal leaking oil? Seek advice from local electricity supplier. Check pump setting for correct temperature drop across boiler. Consider de-rating burner.
7. Burner runs but smokes	Tank topped up with wrong grade of fuel. Air supply restricted. Dust build-up on burner fan blades. Boiler flue-ways or flue restricted. Combustion dirty.	Check with fuel supplier. Clear obstruction. Brush blades clean. Check for debris and soot build-up, clean. Check and reset: Nozzle, CO ₂ , smoke number and pump pressure, reset as necessary.

Problem	Probable causes	Actions / checks
8. Burner runs OK, but flame shuts down slowly	Air entrapment in nozzle or pump. Solenoid valve faulty. Pump shut-off piston sticking.	Bleed pump, check for air ingress in suction line while running (two pipe system). Replace coil or stem assembly. Replace pump.
9. Burner runs but goes to lock-out before reaching temperature	Balanced flue system leaking combustion products into air supply. Combustion leaks at flue joints, covers or burner mounting. Suction line drawing air into fuel.	Use analyser to check for CO ₂ in burner air supply. If found to be leaking, resealing is essential. Check condition of gaskets, (typically open flued system). Check for air ingress at valves and fittings, consider fitting deaerator.
10. Burner runs but does not reach working temperature	Boiler undersized ^{for} system. Burner output restricted. Low efficiency (high flue gas temperature) Faulty control thermostat.	Re-rate output if possible. Consider upgrade. Check nozzle output. If exchanger surfaces are sooty, clean. Check combustion settings. Replace.
11. Fumes from boiler	Combustion leaks at flue joints, covers or burner mounting. Flue system not evacuating products of combustion.	Check condition of gaskets, reseal. Inspect flue for debris or soot build-up, check for flue spillage.
12. Oil smells	Oil leakage at connections or fittings, or through braiding of hose.	Check for leaks or weeping at joints, inspect flexible hose and replace as required.
13. Other problems	<ul style="list-style-type: none"> • Boiler cycling on limit thermostat. • Boiler blows fuses. <ul style="list-style-type: none"> • White pluming at flue terminal. • Noise from burner. 	<p>Replace control thermostat.</p> <p>Motor / pump seized, replace. Wiring short. Motor winding failed, replace.</p> <p>Not a boiler problem. This is associated with water vapour condensing into cold air. Fan rubbing on scroll, reposition. Motor bearings dry, due to oil leaking from pump shaft seal, replace.</p>

Fault finding – Hot Water System.

Problem	Probable causes	Actions/checks
1. No Hot water	<p>Circulating pump seized. Programmer HW channel off. Hot water temperature stat switched off. Flow switch blocked or faulty. Inlet ball valve partially blocked, by debris build-up reducing flow rate to below flow switch trigger rate of 2.5l/m. Spring-return valve, seized or jammed 11 pin relay coil faulty. Programmer faulty. High limit thermostat tripped.</p>	<p>Free off rotor or replace. Advance or re-programme. Re-set or replace.</p> <p>Clear blockage or replace paddle head. open bleed screw, to blow-out dirt, or strip and clean.</p> <p>Check lever position, when powered Free valve or replace head. Replace relay. Replace. Reset. Check heating water circulating and possible air entrapment in thermal store or boiler. Check flow switch is stuck open or faulty. Circulating pump faulty, replace. CH or DHW thermostat faulty, replace.</p>
2. low water temperature and flow	<p>Plate heat exchanger partially scaled up. Debris build-up behind flow control filter. Low water supply pressure.</p>	<p>De-scale or replace. Check function of water treatment. open bleed screw, to blow-out dirt, or strip and clean. Check pressure, if low report to water company.</p>

1.No CH and or DHW	<p>Programmer channels for either CH or DHW are off. DHW and or CH thermostats set to off position or fault.</p>	<p>Advance or re-programme. Re-set or replace.</p>
2. High limit thermostat trips off	<p>Circulating pump faulty.</p>	<p>Free off or replace.</p>
3. No CH (DHW OK)	<p>Faulty spring return valve, not moving to operating mode. Room stat set low or faulty.</p>	<p>Check if lever is moving over, indicated by operating light, or replace head. Re-set or replace.</p>
4. No DHW (CH OK)	<p>Faulty spring return valve, jammed in HW mode. Flow switch blocked or faulty. 11 pin relay faulty.</p>	<p>Check lever position, when powered SRV head shows operating light. Free valve or replace head. Clear blockage or replace paddle head. Replace relay.</p>
5. Pressure relief valve discharges. (HW and CH OK)	<p>Pressure vessel has lost charge, or insufficient expansion volume. PRV faulty or dirty seating.</p>	<p>Check vessel charge, re-pressurise or replace if diaphragm damaged. Or add extra volume (see section 5.5). Clear dirt, or replace PRV.</p>

BOILER SPARES

Control Panel Components

Item	Description	15-41 KW	41-68 KW
1	Control Knob and Bezel	CK1568 001	CK1568 001
2	Control Thermostat / DHW Thermostat	CK1568 002	CK1568 002
3	Manual Reset Button Cover	CK1568 003	CK1568 003
4	Manual Reset Limit thermostat	CK1568 004	CK1568 004
5	Dual Channel programmer (Combi)	CPRG 2	CPRG 2
6	11 pin relay (combi)	CC1568 001	CC1568 001
7	11 pin relay base (combi)	CC1568 002	CC1568 002
8	Pump over run thermostat (combi)	CK1568 017	CK1568 017
9	6 pin immersion relay (combi Plus)	CC1568 004	CC1568 004

Combi / Utility and Sealed System Boiler Components

5	Circulating Pump	CC1541 005	CC4168 005
6	12 Litre Expansion Vessel	CC1541 006	CC4168 006
7	Pressure Gauge (0-4 bar)	CC1568 007	CC1568 007
8	Pressure Relief Valve (0-3 Bar)	CC1568 008	CC1568 008
9	Auto Air Vent	CC1568 019	CC1568 019
10	Expansion Vessel Hose	CY1568 030	CY1568 030
11	Filling loop Kit	CC1568 999	CC1568 999
12	Pump Valve	CC1541 006	CC4168 006
13	Diverter valve	CC1541 002	CC4168 002
15	Flow switch	CC1568 003	CC1568 003

Boiler Heat Exchanger Short Spares

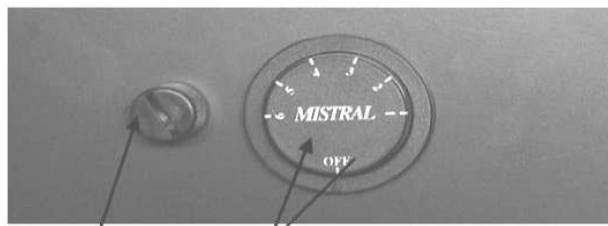
13	Condensing Unit Baffles	CY1568 013	CY1568 013
14	Top Left Hand Side Baffle	CY1541 014	CY4168 014
15	Top Right Hand Side Baffle	CY1541 015	CY4168 015
16	Middle Left Hand Side Baffle	CY1541 016	CY4168 016
17	Middle Right Hand Side Baffle	CY1541 017	CY4168 017
18	Bottom Left Hand Side Baffle	CY1541 018	CY4168 018
19	Bottom Right Hand Side Baffle	CY1541 019	CY4168 019
20	Condense Trap	CTR 005	CTR 005
21	Front Access Cover Assembly Main Heat Exchanger	CY1541 018	CY4168 018
22	Front Access Cover Assembly Condensing Heat Exchanger	CY1541 700	CY4168 700
23	Condensing unit door seal	CY1541 020	CY4168 020
24	Base Pad	CY1541 021	CY4168 021

Boiler Casing Set

24	Casing Set	On Application
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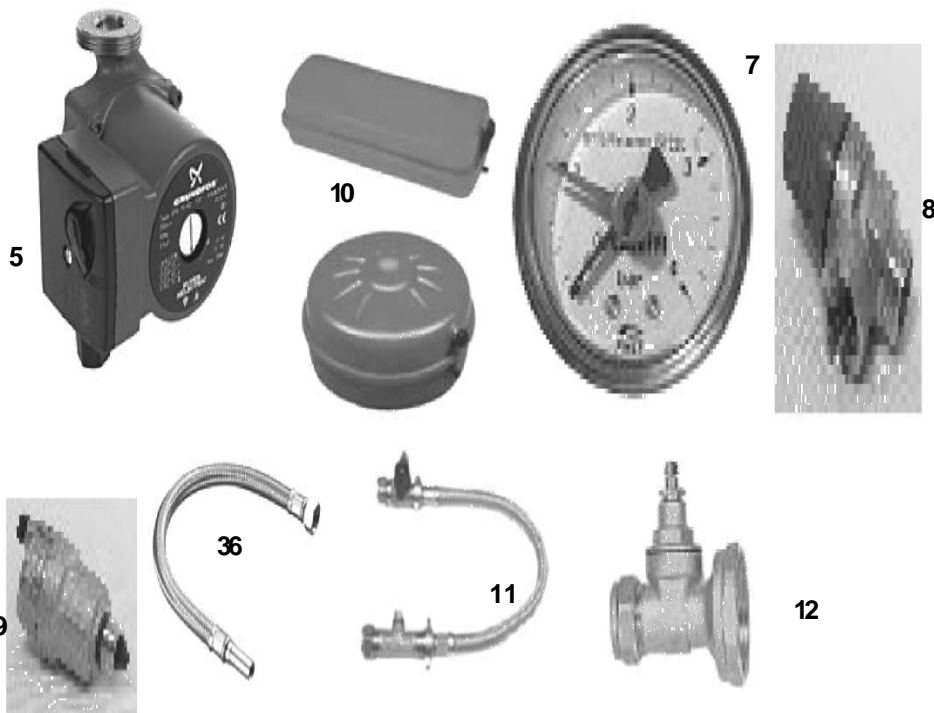
Short Burner Spares List. Riello RDB1 / 2 / 3

		Riello
25	Flexible Air Hose (BF)	CK4001 022
26	Air Hose Clips (BF)	CK4001 023
27	Control Box	MBR 102
28	Photo Electric Cell	MBR 105
29	Motor	MBR 100
30	Capacitor	MBR 104
31	Pump	MBR 101
32	Solenoid Coil	MBR 103
33	Mounting Flange	MBR 129 (Sate Burner)
34	Flange Gasket	MBR 130
35	Blast Tube	MBR (State Burner)
36	Flexible Oil Line	MBR 132



3&4

1&2



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10

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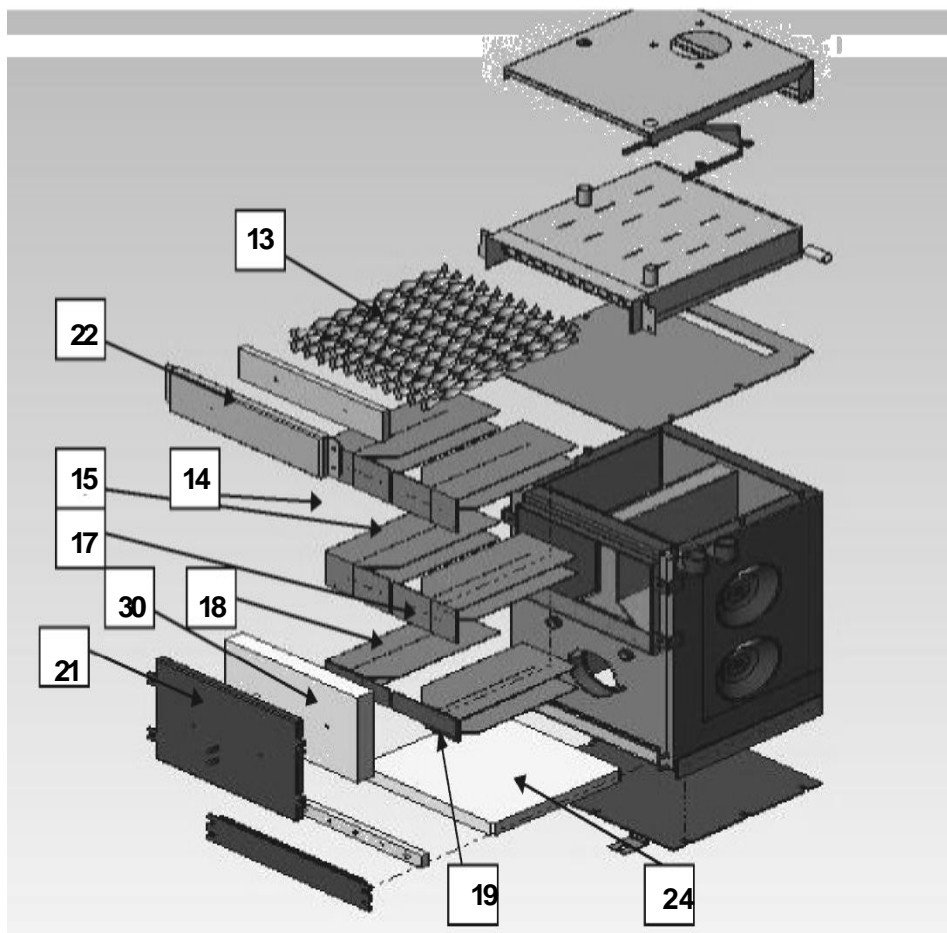
8

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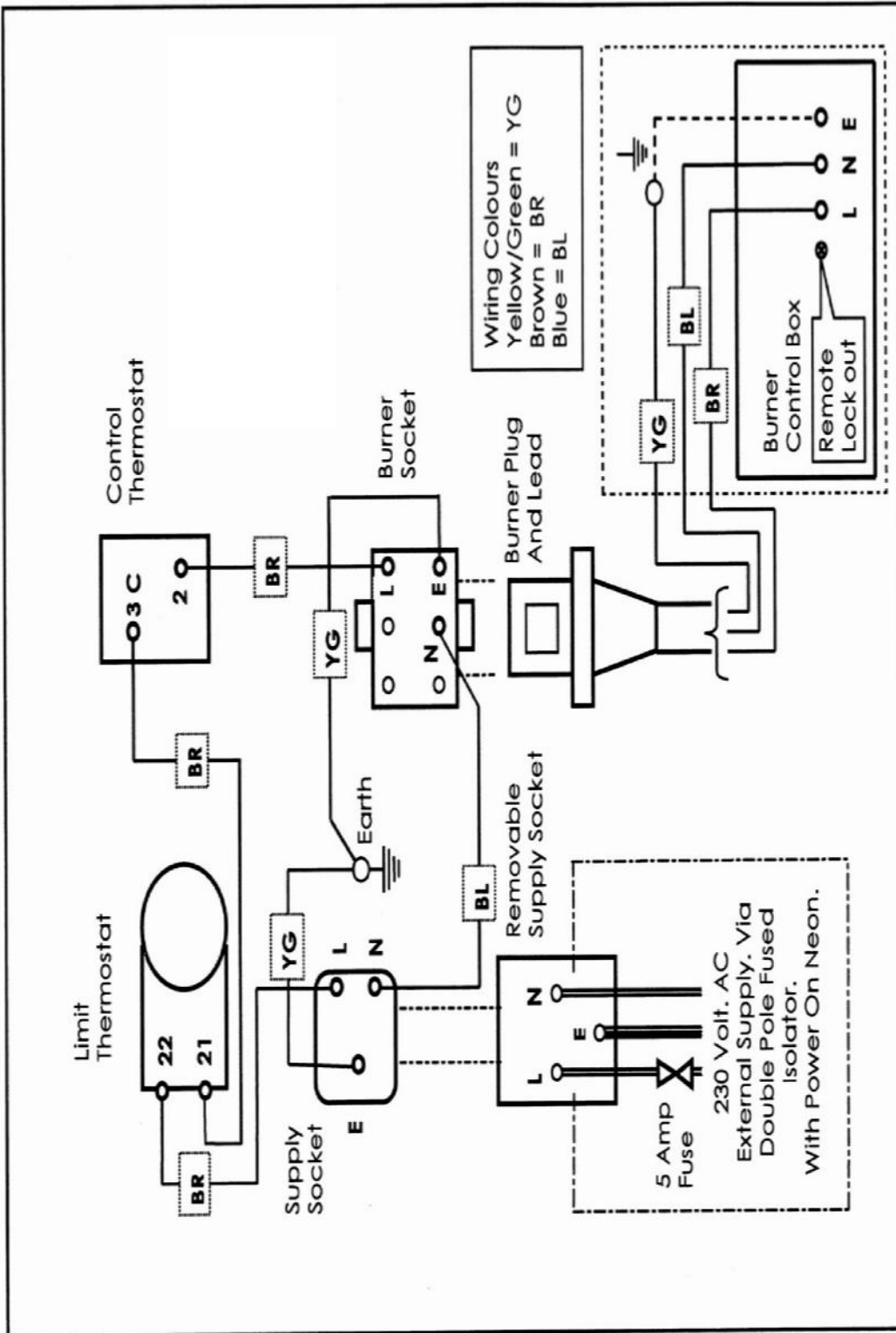
TECHNICAL SPECIFICATION

BOILER SPECIFICATION

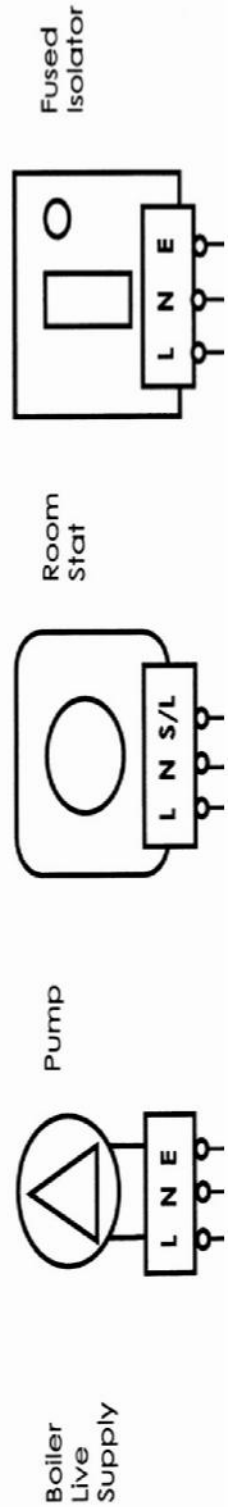
Function	Key	Boiler Model Size							
Model Size/Type		1	2	3	4	5	6	7	
Model/Output	Kw	15/20	20/26	26/35	35/41	41/50	50/58	58/68	
Model/Output	Btu/1000	50/70	70/90	90/120	120/140	140/170	170/200	200/232	
Fuel	Kerosene	28 sec							
Nozzle Size	Delavan	.55/80°w	.65/80°w	.85/80°w	1.10/80°w	1.35/60°w	1.50/60°w	1.75/60°w	
Pump Pressure	PSI	120	120	140	120	130	140	140	
Co2	%	11-11.5							
CO	PPM	<43							
Smoke Number	< >	0-1							
Max Operating Pressure	Bar	3							
Test Pressure	Bar	4.5							
Min Static Head	Metres	1							
Burner Type	Riello	RDB 1	RDB 1	RDB 2.2	RDB 2.2	RDB 2.2	RDB 3.2	RDB 3.2	
Blast Tube	Pattern	Std Cup	Std Cup	T5 Cup	Std Drilled	T5 Cup	Adj Head	Adj Head	
Blast Tube Setting	Position	Fixed	Fixed	Fixed	Fixed	Fixed	0.5	1.5	
Balanced Flue Diameter	OD mm	125				150			
Flue Gas Temperature	°C	150							
Minimum Draught	Ins/WG	0.10							
	Ins/WG	0.04							
Maximum Draught	Mbar	0.37							
	Ins/WG	0.15							
Min Return Temp	°C	50							
Max Operating Temp	°C	82							
Min Operating Temp	°C	55							
Hearth Temp	°C	Less Than 80							
Limit Thermostat Temp	°C	110 Manual Reset							
Flow & Return Difference	°C	10 - 20							
Water Resistance 10°C	mm/WG	<300							

Notes:

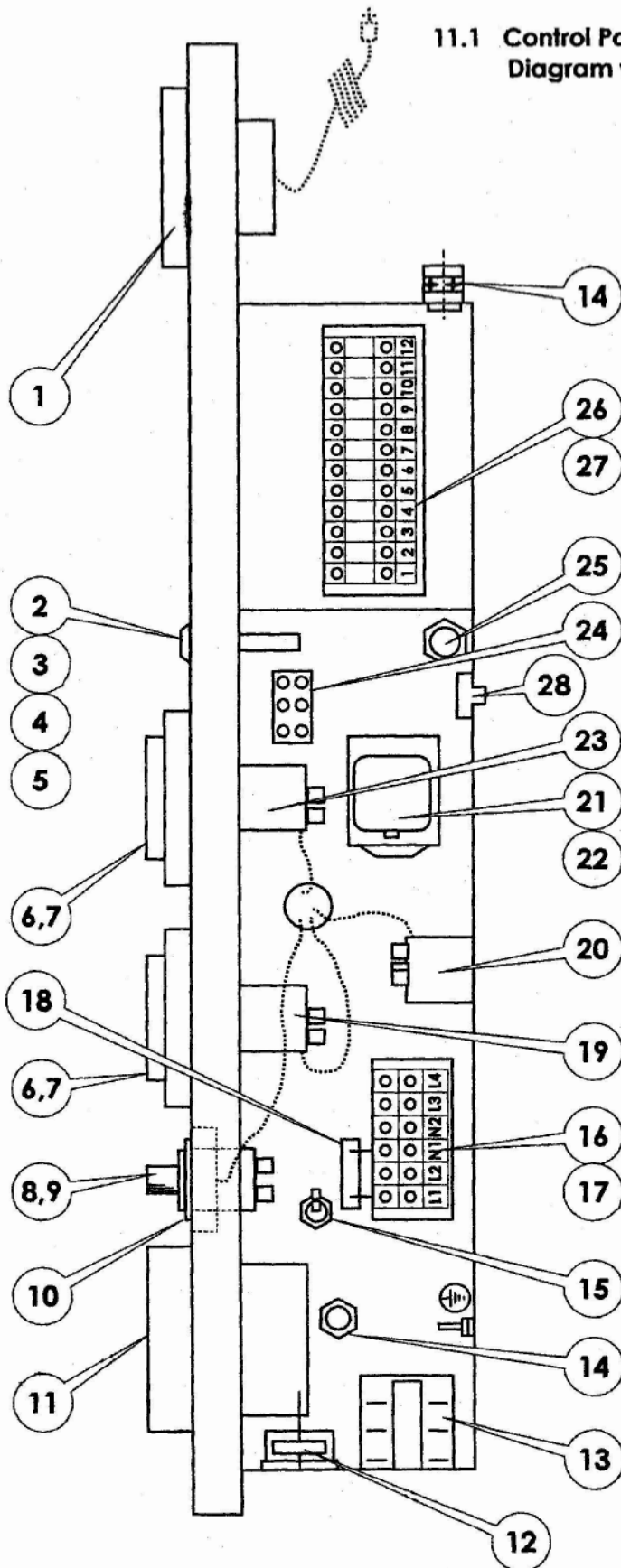
- 1 For safety and to ensure correct function before the boiler is put into use, the boiler, burner and system must be commissioned by a suitably qualified engineer.
- 2 These figures are for guide purpose only and are based on what we consider to be the boilers optimum range setting to maintain a clean running system.
- 3 Site conditions, the flue and the overall installation can have an effect on the boiler set up, requiring further adjustment to achieve the most efficient combustion.
- 4 Flue type and lengths, especially elbows and horizontal runs, add resistance to the boiler through draft, which can occasionally cause over pressurisation in the chamber. Wind direction and the flue terminal position can also have an influence on this. If this is found to be the case, it may be necessary to downsize the nozzle to restore and correct the balance of air flowing through the boiler.
- 5 The above data is collated from tests completed on Mistral SE Non Condensing boilers.



TYPICAL SYSTEM BOILER – PUMP WIRING via 10amp room thermostat.



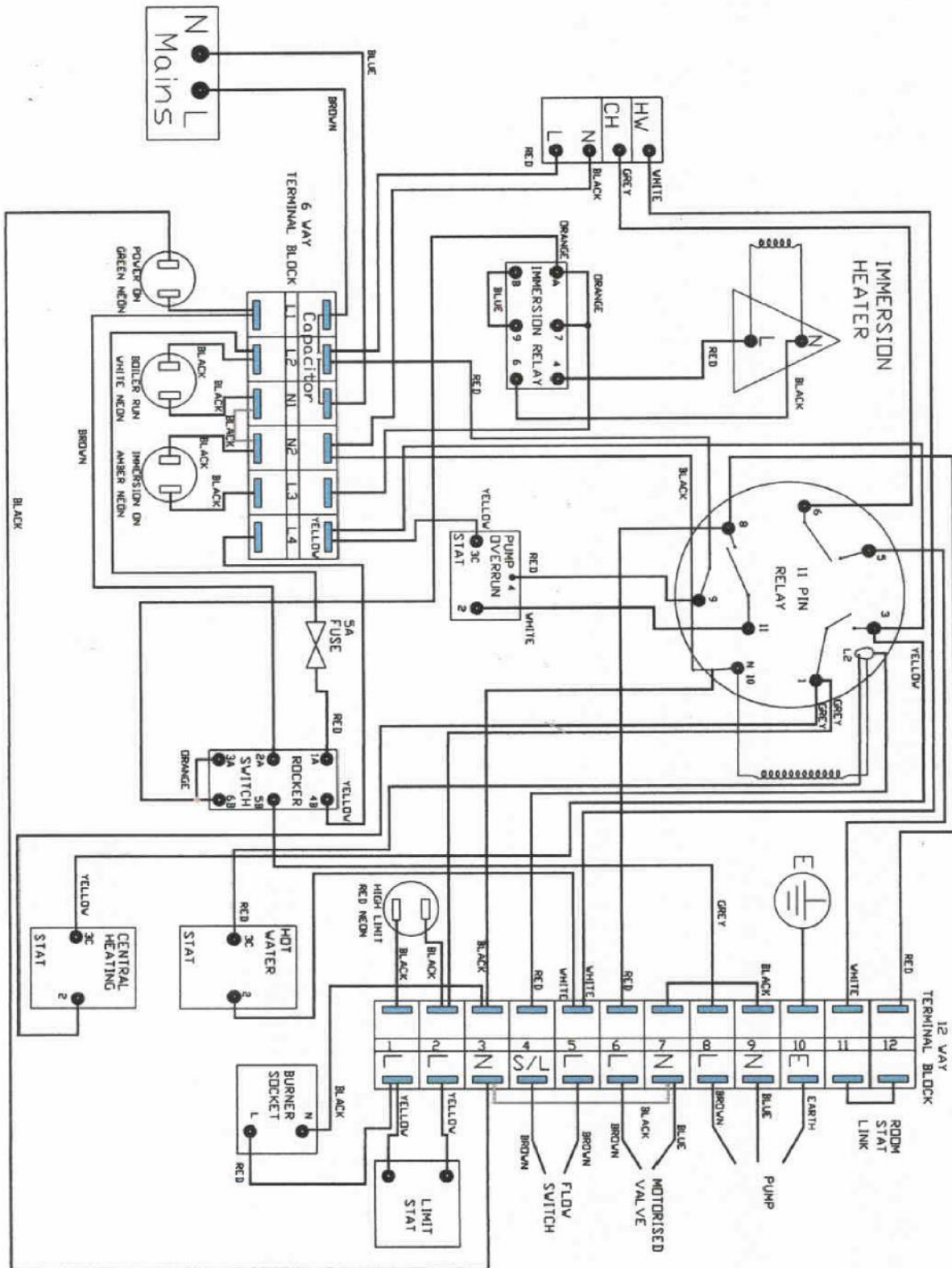
13.1 Combi Standard and Plus Control Panel Components Diagram with wiring removed.



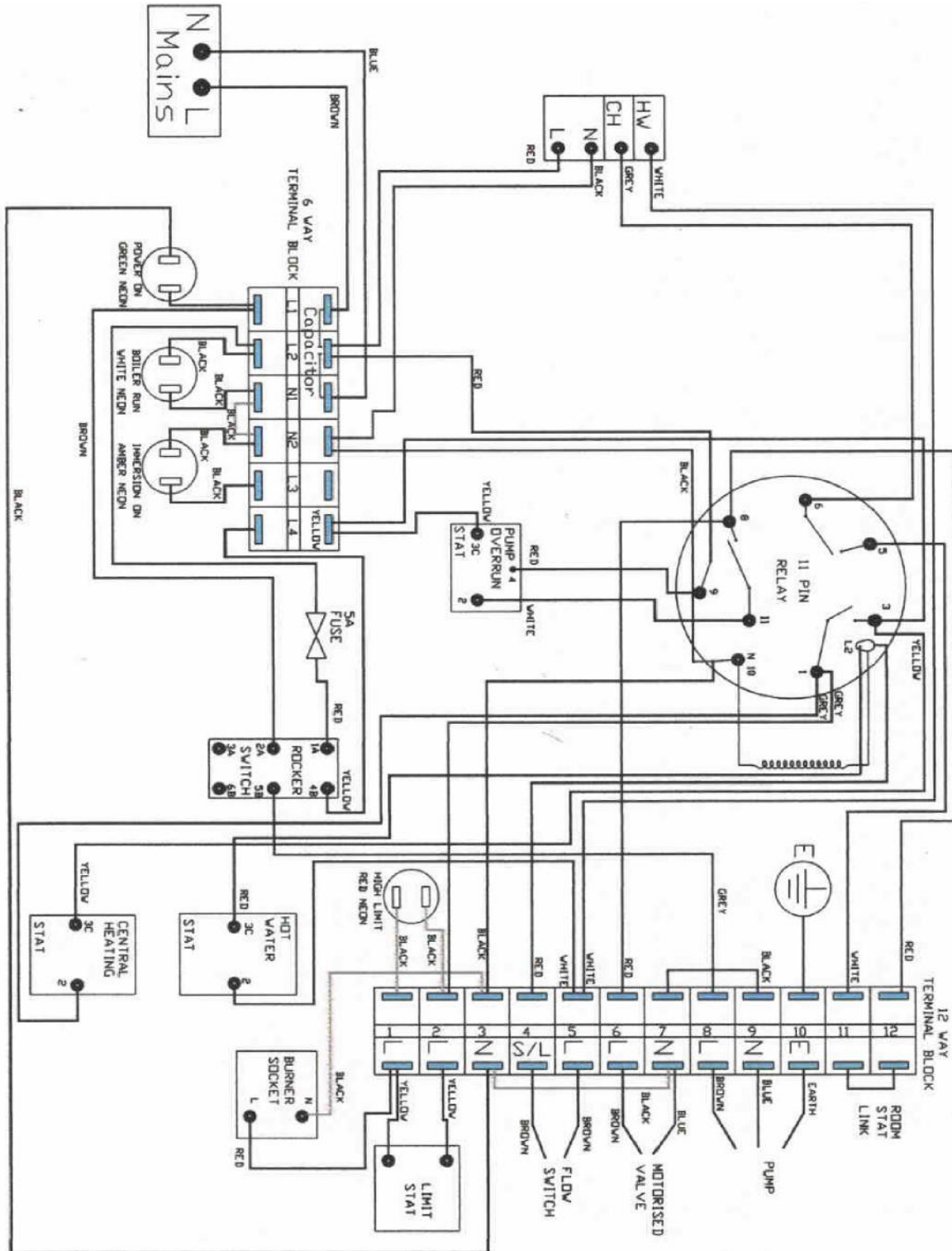
11.1 Control Panel Components Diagram with wiring removed

Item	Description
1	Pressure gauge 0 – 4bar
2	Green neon 230v
3	Clear neon 230v
4	Amber neon 230v
5	Red neon 380v
6	Mistral thermostat knob
7	Bezel
8	Limit thermostat reset button cover
9	Limit thermostat 110°C
10	Selector switch
11	Programmer 2 channel
12	Supply socket male & female
13	Relay 20amp (Immersion heater)
14	Cable grip 16mm
15	Fuse holder (5amp fuse)
16	6 way terminal strip
17	6 way ident shield
18	Capacitor 0.47µF
19	Heating control thermostat
20	Pump overrun thermostat
21	11 pin relay
22	Relay base
23	Hot water control thermostat
24	Burner socket
25	Cable grip 20mm
26	12 way terminal strip
27	12 way ident shield
28	Limiting Stat

Combi Plus Wiring Diagram

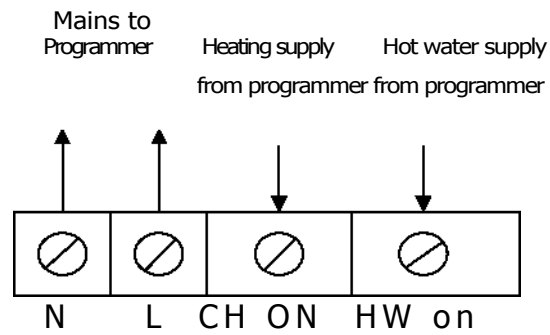


Combi Standard Wiring Diagram

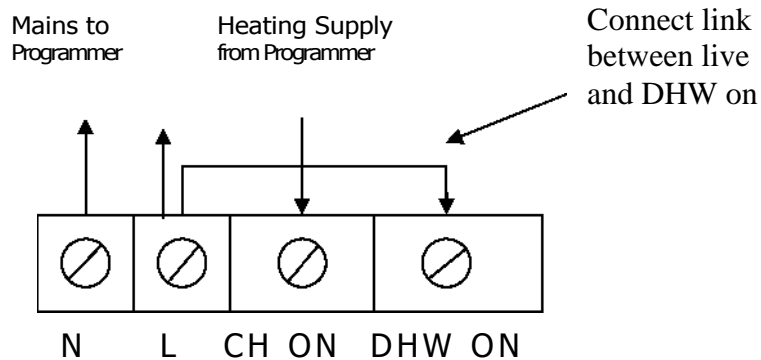


WIRING OF EXTERNAL PROGRAMMER ON COMBI BOILER

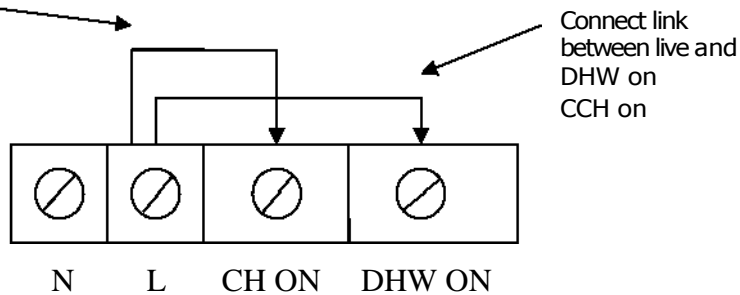
Fitting of two Channel programmer



Fitting of Single Channel programmer
NOT RECOMMENDED



Connect links For test only



Wiring of external room stat

11 = L to stat

12= S/L from stat to boiler

Do not use an externally powered room stat

A room stat can be connected to all combi models
Connections are No 11 & 12 on the 12 way strip

INSTALLATION/COMMISSIONING/ SERVICE & WARRANTY DETAIL

Installation, Commissioning & Service Record

Installer Contact Details

Engineers Name: CD 10 Number:
 Company Name: Installation Date:
 Address:
 Postcode: Tel: Mob Tel:

Commissioning Engineer Details

Engineers Name: CD 11 Number:
 Company Name: Reg. Number:
 Address: Commissioning Date:
 Postcode: Tel: Mob Tel:

Boiler Model: Output: Serial Number:
 Burner Model: Pump Pressure: **Checked**
 Oil Type: Air: Flue Seal Checked: Yes/No
 Nozzle Type: Smoke Reading: Gaskets Checked: Yes/No
 Nozzle Size: CO2%: Inhibitor In System: Yes/No
 Nozzle Pattern: F.G.T.*C: All Connections: Yes/No

Service Record

The information as recorded here should also be included in the engineers own report. To comply with the boilers Conditions of Guarantee the boiler must be serviced by a certified oil engineer at least once a year.

	Service 1	Service 2	Service 3	Service 4
Engineers Name:				
Company Name:				
Certificate Number:				
Company Name:				
Telephone Number:				
Nozzle Type:				
Nozzle Size:				
Nozzle Pattern:				
Pump Pressure:				
Air:				
Smoke Reading ppm:				
CO2%:				
F.G.T.*C:				
	Checked	Checked	Checked	Checked
Flue Seal:				
Gaskets:				
Condense Trap:				
Water:				
Inhibitor Present:				
All Connections:				
Baffles:				
Correct Baffle Position:				
D.M. Hot Water:				
Central Heating:				
Flow Switch:				
Power Supply:				
Date Of Service:				
Signature:				

Guarantee Registration

Please detach here and forward to Mistral Boilers Ltd.

Office Use Only	
Serial No:	
Registration No:	

Mistral Boiler Guarantee Registration

To endorse the guarantee this form must be completed by the Installation Engineer, the Commissioning Engineer and the Householder. The completed document must be forwarded to Mistral Boilers Ltd. Unit C3, Halesfield 23, Telford, Shropshire TF7 4NY within 28 days following the commissioning date. On receipt Mistral will endorse the guarantee and issue the boiler with a Guarantee Registration Number. The householder will be advised of the Guarantee Registration Number upon receipt of this form. The Guarantee Registration Number should be recorded in the Installation Manual as this will be required if it is necessary to make a claim during the warranty period.

Please complete all information fields using **BLOCK CAPITALS**

Householder Details

Customer Name:
 Customer Address:
 Address:
 Postcode: Tel: Purchase Date:

Installer Contact Details

Engineers Name:
 Company Name:
 Address:
 Postcode: Tel: Installation Date:
 Mob: CD 10 Number:

Commissioning Engineer Details

Engineers Name:
 Company Name:
 Address:
 Postcode: Tel: Commissioning Date:
 Mob: Reg Number:

Boiler Model: Output: Serial Number:

Burner Model:	Pump Pressure:	Checked
Oil Type:	Air:	Flue Seal Checked: Yes/No
Nozzle Type:	Smoke Reading:	Gaskets Checked: Yes/No
Nozzle Size:	CO2%:	Inhibitor In System: Yes/No
Nozzle Pattern:	F.G.T.*C:	All Connections: Yes/No

I certify that the above boiler has been installed and commissioned in accordance with the manufacturer's installation/instruction manual, the CD10 & CD11 documents are present and that all required checks have been completed ready for the safe operation of the boiler.

Commissioning Engineers Signature:

Mistral Boiler Guarantee

1. The Mistral Terms Of Guarantee

Mistral boilers are Guaranteed (Subject to Conditions) to be free from defective parts and workmanship from the date of purchase for the following time periods.

- a: **Mistral Guarantee for the period of 2 Years.** (Excluding Consumable Items) The Burner, controls, valves, pumps and all other parts used in the original manufacture of the boiler.
- b: **Mistral Guarantee for the period of 5 Years.** Boiler steel heat exchanger (excluding baffles).
- c: **Warranty Extension.** Additional and extended boiler warranty schemes are available, details are available upon request.

2. Conditions Of Guarantee

- a: The boiler must be installed by a suitably qualified person and the CD10 installation documentation completed. Prior to operation, the boiler must be commissioned by a certified oil engineer and the CD11 commissioning documentation completed. All work must be completed in accordance with the boiler installation manual and comply with all relevant Standards and Codes of Practice.
- b: Following the boiler commissioning, to endorse the guarantee period, the commissioning engineer must complete the installation check list in the manual and the householder must forward it to Mistral Boilers Ltd within 28 days. On receipt, Mistral Boilers Ltd will endorse the guarantee and advise the householder of the guarantee registration number. If the householder is not in receipt of the guarantee registration number within 28 days of the submission, Mistral Boilers Ltd must be notified of this fact immediately.

- c: The boiler must be maintained during the term of the guarantee. The boiler must be serviced at least once every 12 months by a certified oil engineer. Proof of servicing will be required when making a warranty claim.
- d: Mistral will accept no liability in respect of any defect arising from incorrect installation, misuse, negligence, fair wear & tear, repair by unqualified persons or unauthorised modification.
- e: Mistral will not accept any liability for a defect occurring in the steel heat exchanger or any other part caused by the build up of lime scale, lack of a suitable inhibitor, air build up, low water level or low water return temperature.
- f: The guarantee extends to cover reasonable labour costs specific to a repair during the 2 year period. Any additional costs incurred will be the responsibility of the householder. In the event of a defect with the boiler steel heat exchanger outside the two year period, the unit must be returned at the householders cost to Mistral Boilers Ltd for inspection. A repair or replacement unit will then be supplied as applicable.
- g: Prior to any warranty repair or inspection work taking place a warranty authorisation number must be obtained from Mistral Boilers Ltd.
- h: Any parts removed (that are subject to a warranty claim), must be returned to Mistral Boilers Ltd within 28 days for testing and inspection.
- i: Mistral Boilers Ltd. accepts no responsibility for any consequential repair, loss or damage however caused. Any additional work required such as unit removals, drain downs, filling or any other work that is consequential to the repair will be the sole responsibility of the householder.

THE STATUTORY RIGHTS OF THE OWNER ARE NOT AFFECTED BY THIS GUARANTEE

WARRANTY BREAKDOWN PROCEDURE

In the first instance if a fault is suspected, the householder must at their cost employ an engineer to inspect the complete heating system and fuel supply.

In the unlikely event of a boiler fault, the boiler should be made safe in all aspects. If a leak is suspected, all oil/water flow and return pipes to the boiler must be isolated. It is the responsibility of the householder/engineer to take all necessary action to make the boiler safe and ensure consequential damage limitation.

If a boiler problem is diagnosed the householder should contact Mistral Boilers Ltd preferably whilst the engineer is attending.

If the problem reported is subject to a potential warranty claim it will be necessary to provide details of the following:

- 1. Boiler Model Type & Serial Number
- 2. Date Of Purchase (Copy Of Sales Invoice)
- 3. CD10 Installation Number
- 4. CD11 Commissioning Number
- 5. Mistral Guarantee Number
- 6. Service History Log

If the claim is accepted by Mistral Boilers Ltd as a potential warranty issue, a works authorisation number will be issued for a specific repair to be completed either by the attending engineer or an appointed Mistral Technician in the area.

Prior to the commencement of any work, Mistral Boilers Ltd will require the authority and acceptance from the householder/engineer that all or any work completed will be chargeable in full if a fault is found not to be acceptable as a warranty claim.

Parts removed that are the subject of a warranty claim must be returned with the warranty claim invoice.

Mistral will not accept any invoice or charge for unauthorised or non acceptable warranty work. Any other costs will be the sole responsibility of the householder/engineer.

BOILER INFORMATION

Please record the following information.

Model Type

Serial Number.....

Date Of Purchase.....

CD10 Number.....

CD11 Number.....

Mistral Guarantee Number.....

NOTE: Mistral Boilers Limited will accept no claims for a warranty repair unless a full payment for the product or any prior work completed on the product has been received in full and in accordance to Mistral Boilers Limited Terms & Conditions of sale.



Complies with the EC low voltage and electromagnetic compatibility and efficiency directives.



With high efficiency and low emissions the Mistral range of oil fired boilers are environmentally friendly and as a result economical to run.



Registered equipment group member of the oil firing technical association for the petroleum industry.



All our manufacturing is carried out under a stringent quality control system to BS5750 ISO9002 and monitored by the British Standards Institute.

Mistral Boilers have been a privately owned company since the early 1960's and are one of the longest standing British Manufacturers of Oil Fired Boilers & associated components.

All of our products are manufactured at our Telford facility which covers in excess of 25,000 sq ft. We utilise some of the most advanced computer controlled machinery including point to point penetration robotic welding cells to manufacture our products to exacting standards.

We are proud of our products and should you require any advice or guidance please feel free to contact us on the number below.

Tel: 01952 270082

Fax: 01952 270086

Web: - mistralboilers.com

email: - mistralboilers@aol.com

Mistral Boilers Ltd, Unit D4, Halesfield 23,
Telford, Shropshire, TF7 4NY

Mistral Boilers maintain a policy of continuous improvement and in order to stay at the forefront of boiler technology reserves the right to alter specifications without notice. The statutory rights of the customer are not affected. All information correct at time of going to press.