

**Factory set for Natural Gas.  
Can be Converted to Propane  
with parts provided.**

**Serial No:**

**WARNING:** If the information in these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

- Do not store or use gasoline or other flammable vapours and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any electrical switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions.
- Installation and service must be performed by a Corgi registered installer.



**Genie**

**Operating, Installation and  
Servicing Instructions for**

**Certikin**

**Condensing  
Pool & Spa Heaters**

**CE 0087**

**Models:  
MB35C  
MB50C**

# TECHNICAL DATA

GENERAL SPECIFICATIONS					
WATER CONTENT	MB35C	3.75	Litres	0.83	gallons
	MB50C	4.45	Litres	1.0	gallons
MAXIMUM WATER PRESSURE		5 bar (70 psi)			
MAXIMUM WATER FLOW TEMP		Pool 32°C (90°F)		Spa 41°C (106°F)	
ELECTRICAL SUPPLY		230V 50Hz, FUSED AT 3A, 130W			
PROTECTION LEVEL		IP44			
FLUE SYSTEM		80/125 PP, to a maximum Flue Equivelant Length of 20m			

PERFORMANCE SPECIFICATIONS						
GAS CATEGORY, TYPE AND SUPPLY PRESSURE			II <sub>2H3+</sub> G20 @ 20 mbar G31 @ 37 mbar			
MODEL Corgi Work Code			NATURAL GAS		PROPANE	
			MB35C	MBC50C	MB35C	MB50C
HEAT INPUT	GROSS	kW	35.5	51.0	35.5	51.0
		Btu/h	121,100	174,000	121,100	174,000
	NET	kW	31.95	45.9	31.95	45.9
		Btu/h	109,000	156,000	109,000	156,600
TYPICAL EFFICIENCY		% gross	97	97	97	97
		% net	108	108	108	108
HEAT OUTPUT		kW	34.43	49.47	34.43	49.47
		Btu/h	117,500	168,000	117,500	168,800
GAS RATE (NG)		m <sup>3</sup> /h	3.37	4.88	1.28	1.9
MAXIMUM RATE, OUTDOOR TOP, CO			120	80	99	130
COMBUSTION SETTINGS, NG, CO <sub>2</sub>			8.4	9.3	9.4	10.2
OFFSET SETTING		pA	-3.0	-3.0	-3.0	-3.0
ORIFICE		mm			4.3	5.2

# Contents

Section	Page	List of Figures	Page
<b>TECHNICAL DATA</b>	<b>Inside cover</b>		
User Instructions	1	<i>Fig 1.0 Terminal Positions</i>	4
		<i>Fig 2.0 Hydraulic Resistance Graph</i>	5
		<i>Fig 3.0 Service Access &amp; Pipe Connections</i>	7
		<i>Fig 3.1 Wall Terminal Dimensions</i>	7
		<i>Fig 3.2 Outdoor Terminal Dimensions</i>	8
		<i>Fig 3.3 Roof Terminal Dimensions</i>	8
		<i>Fig 4.0 Wall Terminal Installation</i>	9
		<i>Fig 4.1 Extended Wall Terminal Installation</i>	9
		<i>Fig 4.2 Extended Vertical Roof Installation</i>	9
		<i>Fig 4.3 Outdoor Terminal Installation</i>	9
		<i>Fig 5.0 Outdoor Terminal Fixing</i>	11
		<i>Fig 5.1 Pressure Switch</i>	12
		<i>Fig 6.0 Venturi Fixing</i>	13
		<i>Fig 6.1 Orifice Position</i>	13
		<i>Fig 6.2 Gas Valve Tappings</i>	13
		<i>Fig 7.0 Condensate Disposal</i>	14
		<i>Fig 7.1 Condensate Syphon</i>	14
		<i>Fig 8.0 Heat Exchanger Sight Glass</i>	15
		<i>Fig 9.0 Controls</i>	16
		<i>Fig 10.0 Multiple Heater Install</i>	17
		<i>Fig 11.0 Schematic Wiring</i>	19
		<i>Fig 12.0 Electrical Components</i>	26
		<i>Fig 13.0 Boiler Components</i>	27
<b>INTRODUCTION</b>	<b>3</b>		
<i>Heater Location</i>	3		
<i>Gas Supply</i>	4		
<i>Conversion</i>	4		
<i>Flueing</i>	4		
<i>Air Supply</i>	4		
<i>Outdoor Heaters</i>	4		
<i>Condensate Drain</i>	5		
<i>Pool Pump &amp; Pipework</i>	5		
<i>Winterisation</i>	5		
<i>Electricity Supply</i>	5		
<b>INSTALLATION OF HEATER</b>	<b>6</b>		
<i>Procedure</i>	6		
<i>Outdoor Terminal</i>	6		
<i>Flue Systems</i>	6		
<i>Wall Terminal</i>	6		
<i>Roof Terminal</i>	6		
<i>Flue Examples</i>	9		
<i>Plumbing</i>	12		
<i>Pressure Switch</i>	12		
<i>Gas Conversion</i>	12		
<i>Gas Connection</i>	12		
<i>Condensate Connection</i>	13		
<i>Electrical Connection</i>	15		
<i>Commissioning</i>	15		
<i>Control Setup</i>	16		
<i>Multiple Heater Kit</i>	17		
<b>FAULT FINDING</b>	<b>20</b>		
<i>Operation</i>	20		
<i>Safety Controls &amp; Lockouts</i>	20		
<i>Engineering Mode</i>	20		
<i>Test Temperature Disp.Mode</i>	20		
<i>Display Fault Codes</i>	21/22		
<i>Routine Service</i>	23		
<i>Changing Components</i>	23		
<i>Spares</i>	26		
<i>Heater Components</i>	27		

# Genie USER'S OPERATING INSTRUCTIONS

## FOR YOUR SAFETY - READ BEFORE OPERATING

**WARNING: IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT, CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.**

This appliance is equipped with an ignition device which automatically lights the burner.

**BEFORE OPERATING** after a prolonged time off, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

### WHAT TO DO IF YOU SMELL GAS

- \* Do not try to light any appliance
- \* Do not touch any electric switch
- \* Do not use any phone in your building.
- \* Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions.
- \* If you cannot reach your gas supplier, call the fire service.

- \* Isolate the appliance with the Service Cock inside. If this is not accessible, isolate at the gas meter.
- \* Do not use this appliance if any part has been under water. Immediately call a qualified service engineer to inspect the appliance and to replace any part of the control system and any gas control which has been damaged.

**CAUTION:** Propane gas is heavier than air and will settle on the ground. Since it can accumulate in confined areas, extra care should be exercised when lighting Propane heaters.



### Before Start Up

Keep heater area clear and free from combustibles, flammable liquids and chemicals.

Water must be flowing through the heater during operation. Ensure that system is filled with water and the pump is operating.

### Quick Start

Check that the Electricity and Gas Supplies are on. Turn on the Pool Pump. Turn on the Heater with the switch on the Front Panel and set the desired temperature with the Pool Temperature Knob. In a few seconds the Heater will fire.

### Summary of Controls (Left to Right)

**ON/OFF Switch** - Turns the Heater On and Off and resets the Ignition Control if locked out.

**Lock/Reset Button** - If it is pressed for 2 seconds it locks the Set Temperature so the Pool Temperature Knob is inoperative. To unlock, press again for 2 seconds.

With a short press the Set temperature is displayed. It will flash if the Lock is ON.

**Pool Temperature Display** - This normally shows the Pool Temperature but also show the Setting Temperature when the Pool Temperature Control Knob is moved. A Setting Dot is displayed whilst it is adjusted. The Display is also used for commissioning and diagnostic purposes.

(Page 16)

### Pool Demand LED - Green

**Off** - There is no Pool Heating demand, pool heating is off.

**On** - There is Pool Heating Demand and the Pool is not up to temperature.

**Flashing** - The Pool Heating Demand is met, the pool is up to temperature.

### **Pool Temperature Control Knob**

16°C to 32°C or 41°C (60°F to 90°F or 106°F)

(Maximum is changed in Setup Mode, see Page 11)

Rotate clockwise to increase the Pool Temperature. The Setting Temperature is shown whilst rotating and for 3 seconds after.

To lock the required Temperature Setting see Lock/Reset Button Page 1

### **Pump Pressure**

#### **- Yellow LED, Display, Pool Temperature**

On - If the pump is running and there is insufficient pressure, possibly due to a blocked Pool Filter. The Heater will not run.

#### **Overheat - Red LED, Display "OH1"**

On - This indicates the water in the Heater has overheated and it has shutdown. Wait for the Heater to cool then press the Lock/Reset Button to start the Heater again. If this problem persists this should be investigated by a Service Engineer.

#### **Overheat - Flashing Red LED, Display "OH2"**

Flashing - This indicates the Heater has overheated and it has shutdown. Wait for the Heater to cool then press the Lock/Reset Button to start the Heater again. If this problem persists this should be investigated by a Service Engineer.

#### **Overheat - Red & Yellow LED, Display "GAS"**

On - This indicates the Heater Gas Ignition Control has locked out. Press the Lock/Reset Button to start the Heater again. If this problem persists this should be investigated by a Service Engineer.

#### **Condensate - Display "HI"**

This indicates that the Condensate drain is blocked and the Heater has shutdown. When the blockage is cleared for the Heater will operate again.

### **Water Pressure Switch**

A water pressure switch is provided in the heater to shut off the burners in the event that water supply to the heater is interrupted. The water pressure switch should be checked and adjusted for proper operation by a qualified service person at the time of installation, and thereafter checked at each service.

**WARNING:** Operation of the heater without water circulation will cause rapid and severe damage to the heater.

### **Water Temperature Settings**

The Heater is designed to provide the maximum amount of heat to the pool up to one degree below the set temperature. For that last degree it reduces the power to maximise control. For certain installation designs, if the pool is used before it is up to set temperature, the water entering the pool from the Heater could be noticeably warmer than the pool. This is not a fault but part of the design. It will reduce for the final degree up to set temperature.

### **CAUTION**

Elevated water temperature can be hazardous, and the U.S. Consumer Product Safety Commission recommends the following guidelines:

1. Spa or hot tub water temperatures should never exceed 40°C (104°F). A temperature of 38°C (100°F) is considered safe for a healthy adult. Special caution is suggested for young children.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant Women Beware! Soaking in water over 39°C (102°F) can cause fetal damage during the first three months of pregnancy resulting in the birth of a brain-damaged or deformed child. Pregnant women should stick to the 38°C (100°F) maximum rule.
4. Before entering the spa or hot tub, users should check the water temperature with an accurate thermometer; spa or hot tub thermostats may err in regulating water temperatures by as much as 2°C (4°F).
5. Persons with a medical history of heart disease, circulatory problems, diabetes, or blood pressure problems should obtain a doctor's advice before using pools or hot tubs.
6. Persons taking medications which induce drowsiness, such as tranquilizers, antihistamines, or anticoagulant, should not use spas or hot tubs.

### **Cleaning**

It is recommended that periodically the casing is cleaned and sprayed with WD40 or similar liquid, and any exposed threads are lightly coated in grease.

### **Service & Maintenance**

It is a mandatory requirement that any gas work carried out must be by a Corgi registered engineer with an appropriate accreditation.

It is recommended that the Heater is serviced after every 2000 hours of operation.

### **Winterisation**

If the Pool and Heater are not going to be used for the cold winter months it is recommended that the equipment is winterised. Contact your pool installer for help with this.

Failure to winterise the Heater during a period of freezing could cause damage to the Heater which will not be covered by your warranty.



# INTRODUCTION

These Instructions cover a range of direct, floor mounted, gas fired, condensing pool heaters which are room sealed and fan assisted. The flue system available is concentric, left, right, rear, and vertical, all up to 20 metres 'FEL'. There is also an Outdoor Top terminal for use where the Heater is installed out of doors. The ignition system is fully automatic.

There are two models with different outputs - see the **Technical Data on Inside Cover** for details. Both can be installed in multiples to obtain a larger, combined output.

The casing is of green and black polyester powder coated mild steel. The Heaters use a high performance stainless steel heat exchanger and are suitable for connection to pools using chlorinated and salt chlorinated water provided the following levels of chemicals are maintained.

pH	7.2 to 7.8
Total Alkalinity	80 to 140 ppm
Calcium Hardness	200 to 400 ppm
Salt maximum	6000 ppm
Free Chlorine	1 to 4 ppm

All chemicals must be introduced and completely diluted into the pool water before being circulated through the heater. Do not place chlorine tablets or bromine sticks in the skimmer, high chemical concentrations will result when the pump is not running.

Chlorinators must feed downstream of the heater and have an anti-siphoning device to prevent chemical back-up into the heater when the pump is shut off.

**NOTE:** *High chemical concentrates from feeders and chlorinators that are out of adjustment will cause corrosion to the heat exchanger in the heaters. Such damage is not covered under the warranty.*

## Gas Safety (Installation and Use) Regulations, (as amended).

It is the law that all gas appliances are installed by a competent person (e.g. a CORGI registered operative) in accordance with the above Regulations. Failure to install appliances correctly could lead to prosecution.

It is in your own interest, and that of safety, to ensure that the law is complied with. The installation of the Heater MUST also be in accordance with the current I.E.E. Wiring Regulations, the Local Building Regulations, Building Standards (Scotland), the Bye Laws of the Local Water Undertaking, any relevant requirements of the Local Authority, and

Health and Safety document No 635, "Electricity at Work Regulations".

Detailed recommendations are contained in the following British Standard Codes of Practice.

## Codes of Practice.

BS.6798 Installation of gas fired hot water boilers of rated input not exceeding 70kW.

BS.5440: Part1 and Part 2. Flues (for gas appliances of rated input not exceeding 60kW).

BS 6891 Specification for installation of low pressure gas pipework.

BS5482:1 Code of practice for domestic butane & propane gas burning installations.

Building Regulations Part L1.

**IMPORTANT.** It is important that no external control devices are directly connected to this appliance - unless covered by these 'Installation and Servicing Instructions' or otherwise recommended by the manufacturer. If in doubt, please enquire. Any direct connection of a control device not recommended by the manufacturer could infringe the Gas Safety (Installation & Use) Regulations, the above regulations and the normal appliance warranty.

Manufacturer's notes must NOT be taken, in any way, as overriding statutory obligations.

## Location of Heater

The Heater MUST be installed on a flat and level floor, capable of adequately supporting the weight of the Heater and any ancillary equipment.

Provision is provided for the heater to be fixed to the floor.

It is IP 44 Rated and can be installed out of doors in a suitable position. In all cases the choice of position should take into account the flue, the plume and the condensate drainage.

## IMPORTANT NOTICE.

If the Heater is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations in Timber Frame Housing', reference DM2. If in doubt, advice must be sought from the Local Gas Region of British Gas.

The Heater may be installed in any room or internal space. Particular attention is drawn to the requirements of the current I.E.E Wiring regulations and, in Scotland, the electrical provisions of the Building Regulations applicable to Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower.

Where a room sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control, utilising mains electricity should be so situated that it

cannot be touched by a person using the bath or shower.

Where installation will be in an unusual location then special procedures may be necessary and BS.6798 gives detailed guidance on this aspect.

A compartment used to enclose the Heater **MUST** be designed and constructed specially for this purpose. An existing cupboard, or compartment, may be used provided it is modified for the purpose. Details of essential features of cupboard compartment design, including airing cupboard installations are given in BS.6798.

In siting the Heater, the following limitations **MUST** be observed:

1. The position selected for installation **MUST** allow adequate space for servicing in front of the boiler and for air circulation around the boiler.
2. This position **MUST** also permit the provision of a satisfactory balanced flue termination.
3. This position **MUST** also permit the provision of a satisfactory connection to the condensate drain.

## Gas Supply

An existing meter (NG) and pipework should be checked, preferably by the Gas Supplier, to ensure that they are adequate to deal with the rate of gas supply required.

Supply pipes should be sized to suit installation and obtain a working pressure of 20 mbar (NG), 37 mbar (Propane). Installation pipes should be fitted in accordance with BS.6891.

A Natural Gas Heater must be connected to a governed meter.

## Conversion

The appliance is supplied for NG and can be converted to LPG by the addition of an Propane Orifice which is supplied with the heater. See page 12 for conversion instructions.

## Flueing

Only flue components specified by the Manufacturer should be used with these appliances. Detailed recommendations for flueing are given in BS.5440: The following notes are intended for general guidance.

1. Be aware of the plume from the flue and the wetting effect it can have to adjacent property.
2. The flue can be taken upwards, left, right or to the rear of the appliance, but **never** downwards.
3. The Heater is supplied separate to the chosen flue set. It can be fitted with up to 20 metres equivalent length of Concentric flue, see the Flue Section on page 9 & 10 for examples and parts selection.

Terminal Position	Minimum
Below window or vent	300 mm
Below gutter or pipes	75 mm
Below eaves	200 mm
Below balcony or roof	200 mm
From a window	200 mm
From vertical pipe	75 mm
From corners	300 mm
Above ground, roof or balcony	300 mm
From facing surface	600 mm
From facing terminal	1200 mm
From opening under a car port	1200 mm
Vertically from a terminal	1500 mm
Horizontally from a terminal	300 mm

**Fig. 1.0**

## IMPORTANT.

It is absolutely **ESSENTIAL** to ensure in practice, that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, other sources of natural air infiltration or forced ventilation/air conditioning.

*If this should occur, the appliance **MUST** be turned OFF IMMEDIATELY and the Local Supplier consulted.*

## Air Supply

It is **NOT** necessary to have a purpose provided air vent in the room or internal space in which the boiler is installed.

Where the boiler is installed in a cupboard or compartment **no** air vents are required.

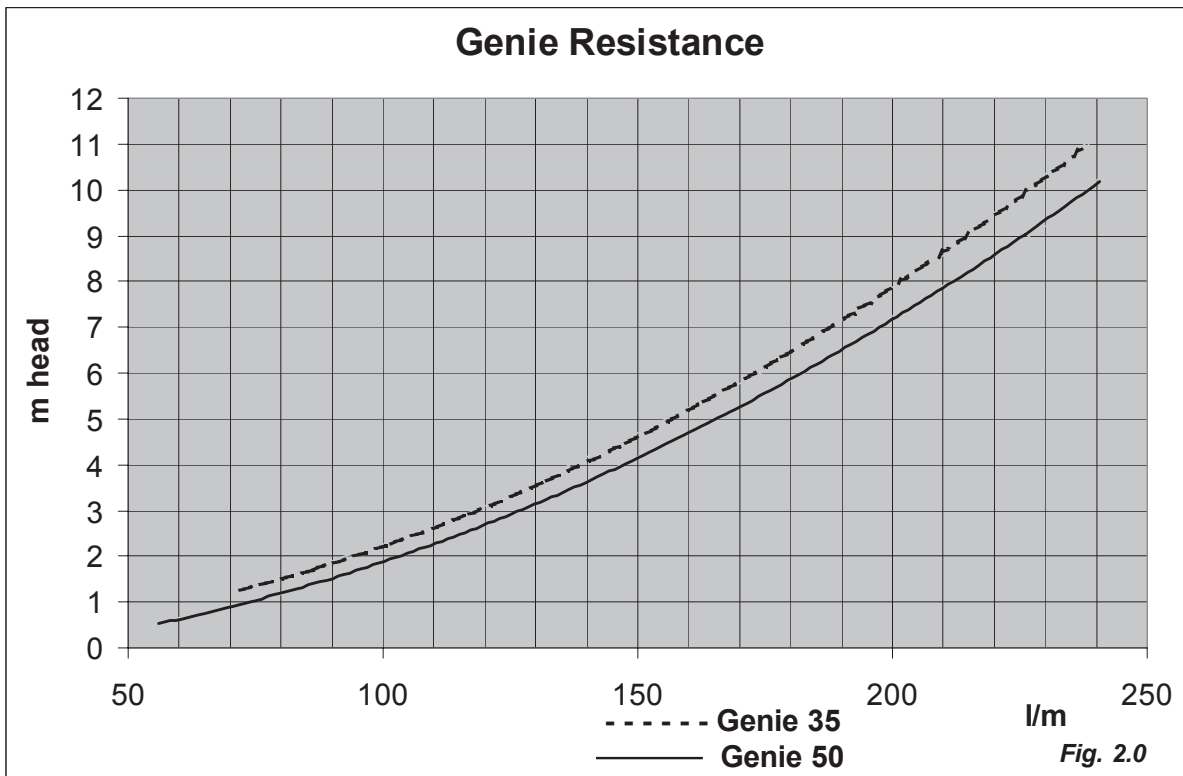
However the user may wish to ensure that it is ventilated to provide air circulation.

## Outdoor Heaters

These Heaters are certified for outdoor installation, when equipped with the approved terminal.

**WARNING:** The heater shall not be located in an area where water sprinklers, or other devices, may cause water to spray through the cabinet openings and into the heater. This could cause heavy internal rusting or damage some electrical components, and this would void the warranty.

It is recommended that periodically the casing is cleaned and sprayed with WD40 or similar liquid, and any exposed threads are lightly coated in grease.



## Condensate Drain

See Fig. 7.0, and 7.1

A 75mm condensate trap is provided on the Heater and is satisfactory when connected to Soakaways, Gullies, Rainwater Pipework and Internal Drainage systems. All pipework and fittings in the condensate drainage system **MUST** be made of plastic, unless they carry other liquid waste. **No other materials may be used.** The pipework should be insulated if run out of doors.

The drain outlet on the boiler is :

**Osma, 40 mm waste pipe.**

## Pool Pump & Pipework

The Heaters are designed using very high performance heat exchangers that have a high hydraulic resistance. However a bypass is incorporated in the product and furthermore its controls modulate the input when approaching the set temperature, if flow conditions are insufficient.

If a new pump is being fitted consult the Pressure Loss graph (**Fig 2.0**) to determine its size.

The Heater is provided with 1½" plastic pool connections to both the left and the right.

With the exception of automatic dosing equipment, the Heater should be plumbed as the last piece of equipment before the pool.

It is permissible to fit an isolating valve on the pipework on the supply side of the Heater.

It is **NOT** permissible to fit an isolating valve on the outlet of the Heater **UNLESS**, an additional flow switch has been connected on the Heaters Mains supply.

Condensing Pool Heater

## Winterisation

Turn off the Mains electricity and Gas Supply.

Draining the Heater can be achieved by the opening of an unused pool connection.

If the Heater is below the pool an isolating valve can be fitted **ONLY IF** an additional flow switch has been wired into the Heaters Mains supply.

## Electricity Supply

Wiring external to the appliance **MUST** be in accordance with the current I.E.E. Wiring Regulations and any Local Regulations that apply.

The Heater is supplied with a plug and lead for 230V ~ 50Hz. Single phase. Fuse rating is 3A.

The method of connection to the mains electricity supply **MUST** facilitate complete electrical isolation of the Heater, preferably by the use of a fused double pole switch having a 3mm (1/8in.) contact separation in both poles and servicing only the Heater and its controls.

The point of connection to the mains should be readily accessible and adjacent to the Heater.

**Note.** Where a Heater is installed in a room containing a pool or shower, the appliance, any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched



# INSTALLATION OF HEATER

## Space Required for Installation and Service.

Left, Right or Above	300 mm	12 in.
In Front	800 mm	40 in.

## Suggested procedure:

Site to suit the pool, terminal, plume and condensate drain limitations.

- For an indoor installation only** : Mark & Drill Flue hole. (See Fig. 3.1 for dimensions)
- If required, fix the Heater to the floor using the holes provided in the front channel.
- The Heater is provided with an Electrical Plug and lead. This can be connected to a suitable supply as detailed on the previous page. If it is required to separately time the running of the Heater this can be achieved as follows:
  - Remove the Front Door for access to the fixings that retain the Front Top Panel. Remove Front Top Panel
  - Remove the Electrical Cover to access the Mains connector.
  - Pull out the Mains connector and replace the Mains lead and link wire with a Permanent and Switched live supply. See Fig 11.0
- Pipe to the 22mm gas connection. A gas isolating valve is provided on the Heater Gas Valve.
- Plumb to the Pool Pump and Filter.
- Test for leaks.
- Replace the Electrical Cover and Panels.

## Assembly of the Outdoor Terminal

A specific Outdoor Top Terminal must be used for an outdoor installation.

The Outdoor Top Terminal is a push fit into the Flue Adapter and locked in position with a clamping ring. If lubrication is required only Centra Cerin or silicone grease should be used.

## All Other Flue Systems

The maximum Flue Equivalent Length (FEL) permitted is 20 metres, horizontal or vertical. The component parts have the following FELs:

1 metre of concentric flue	1.0
2 metres of concentric flue	2.0
A 45 degree concentric bend	1.1
A 90 degree concentric bend	1.5
A concentric Roof Terminal	3.3
A concentric Wall Terminal	3.9

Sum the Flue Equivalent Lengths used in the design this must not exceed 20 metres.

## Assembly

All items assemble by a push fit/clamp system. If it is required to lubricate the seals only Centra Cerin supplied by the manufacturer or Silicone Grease should be used.

The pipes should be assembled so the socket end is always furthest from the Heater.

Flues should be supported by brackets every metre of run.

Horizontal flues should incline back to the Heater by 3 degrees (52mm in 1000mm)

## Wall Terminal

The Horizontal Wall Terminal is supplied with two rubber wallplates, one for inside and one for the outside. The core drill diameter required will be determined by the incline and the wall thickness.

Wall Thickness	Core Drill diameter
150- 240 mm	175 mm
240- 330 mm	185 mm
330 - 420 mm	195 mm
420 - 500 mm	205 mm

## Roof Terminal

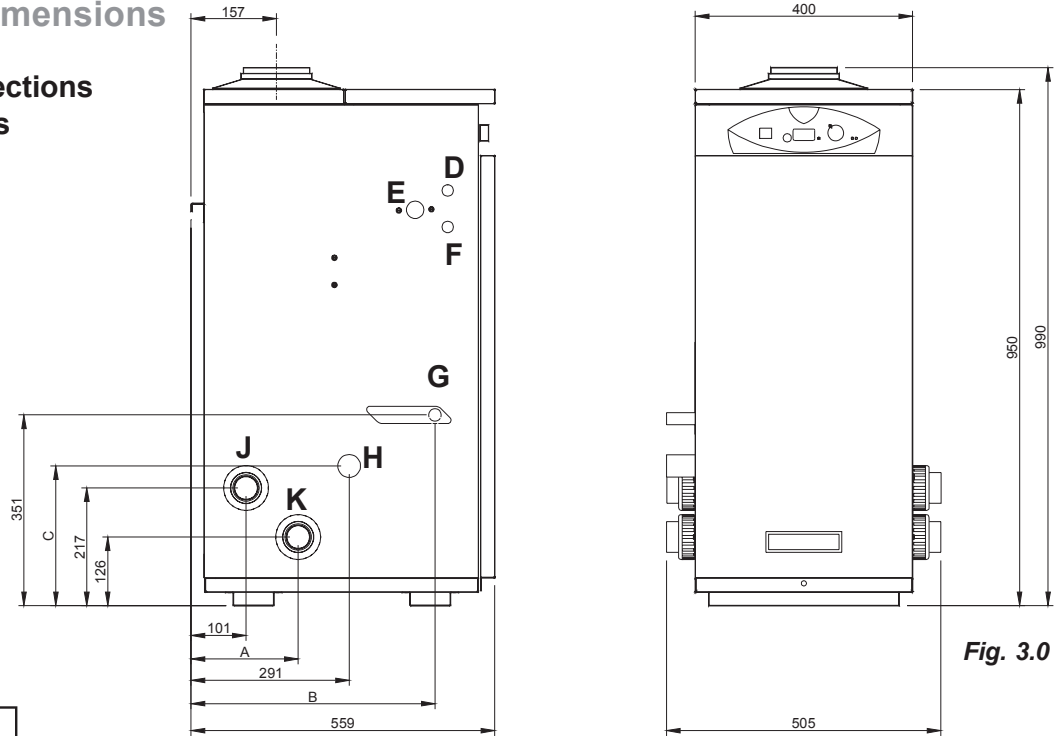
The Vertical Roof Terminal should be fitted in a minimum of 300mm clear unobstructed space. It is not permitted to alter the construction of the Terminal, above the roof line, however the concentric section below the roof line can be altered to suit the installation.

## It is recommended that:

- The Installation of the flues are completed before their connection to the Heater. This will ensure that any debris that gets into the flues can be cleared.
- That bends in vertical flues are always 45 degrees.
- Flues may be reduced in length by cutting. The inner Flue pipe should be cut so it is 5 to 10mm longer than the outer Air duct. It will ease assembly if the cut edges are cleaned, chamfered and greased before assembly.

# Heater Dimensions

## Pipe Connections & Locations



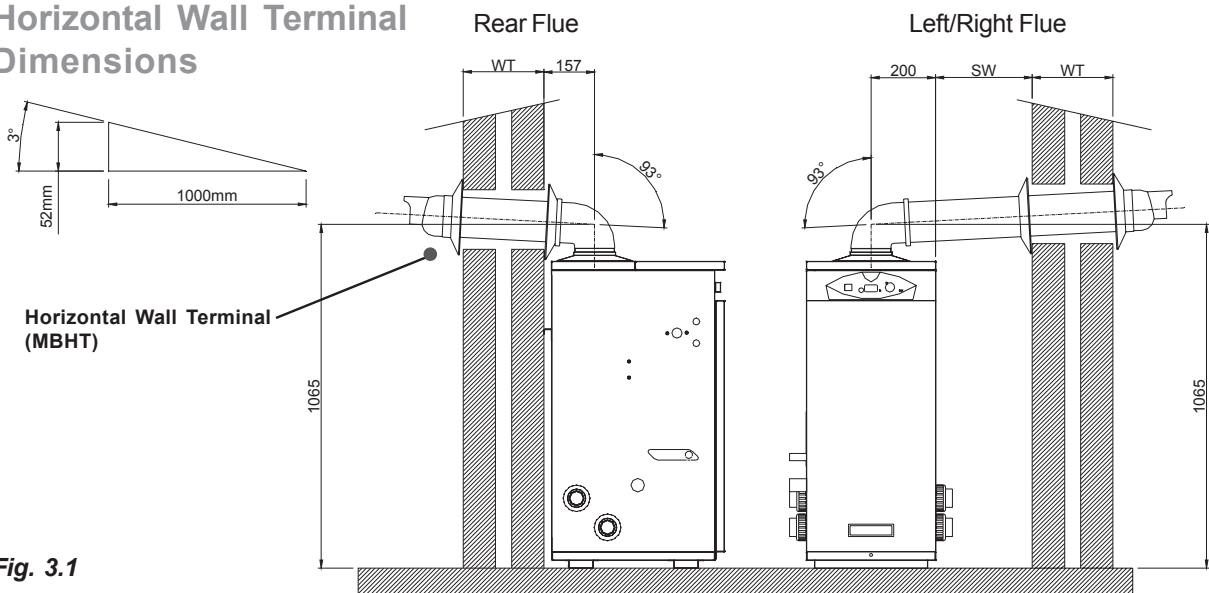
**Fig. 3.0**

Dimensions				
Model	A	B	C lh side	C rh side
<i>Genie 35</i>	165mm	385mm	252mm	270mm
<i>Genie 50</i>	197mm	449mm		

Connections	
<b>D</b>	Multi Heater Connection
<b>E</b>	External Control (CCP01)
<b>F</b>	Electric In
<b>G</b>	Gas Supply - 22mm Copper
<b>H</b>	Condensate Drain - 40.1mm Hunter Plastic
<b>J</b>	From Pool - 1½" Plastic Demountable Fittings
<b>K</b>	To Pool - 1½" Plastic Demountable Fittings

Service Access	
<b>Left, Right or Above</b>	300mm
<b>In Front</b>	800mm

## Horizontal Wall Terminal Dimensions



**Fig. 3.1**

## Outdoor Terminal Dimensions

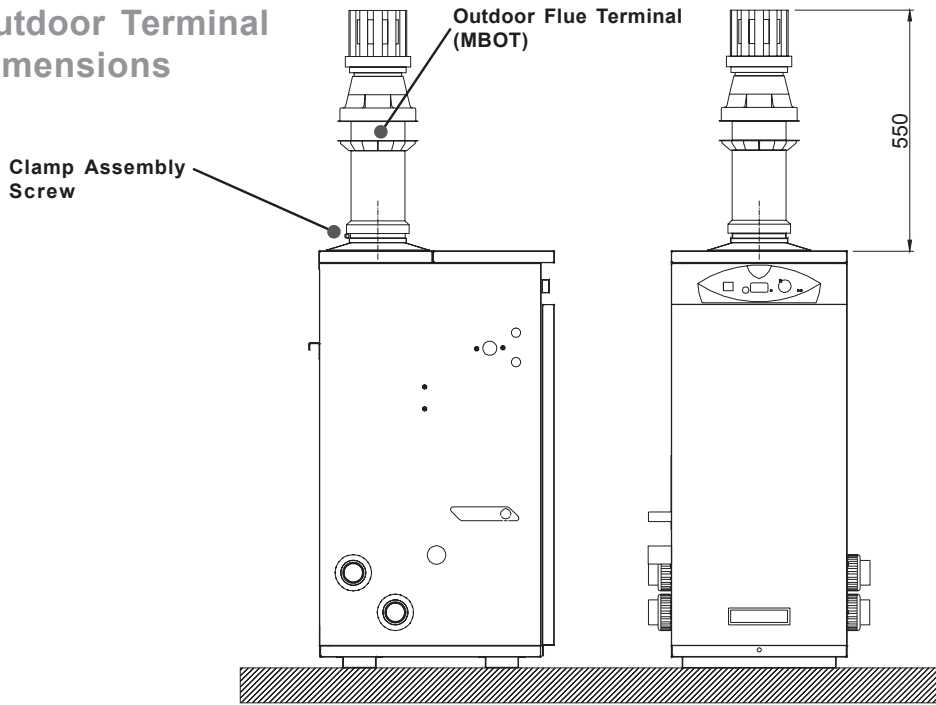


Fig. 3.2

## Vertical Roof Terminal Dimensions

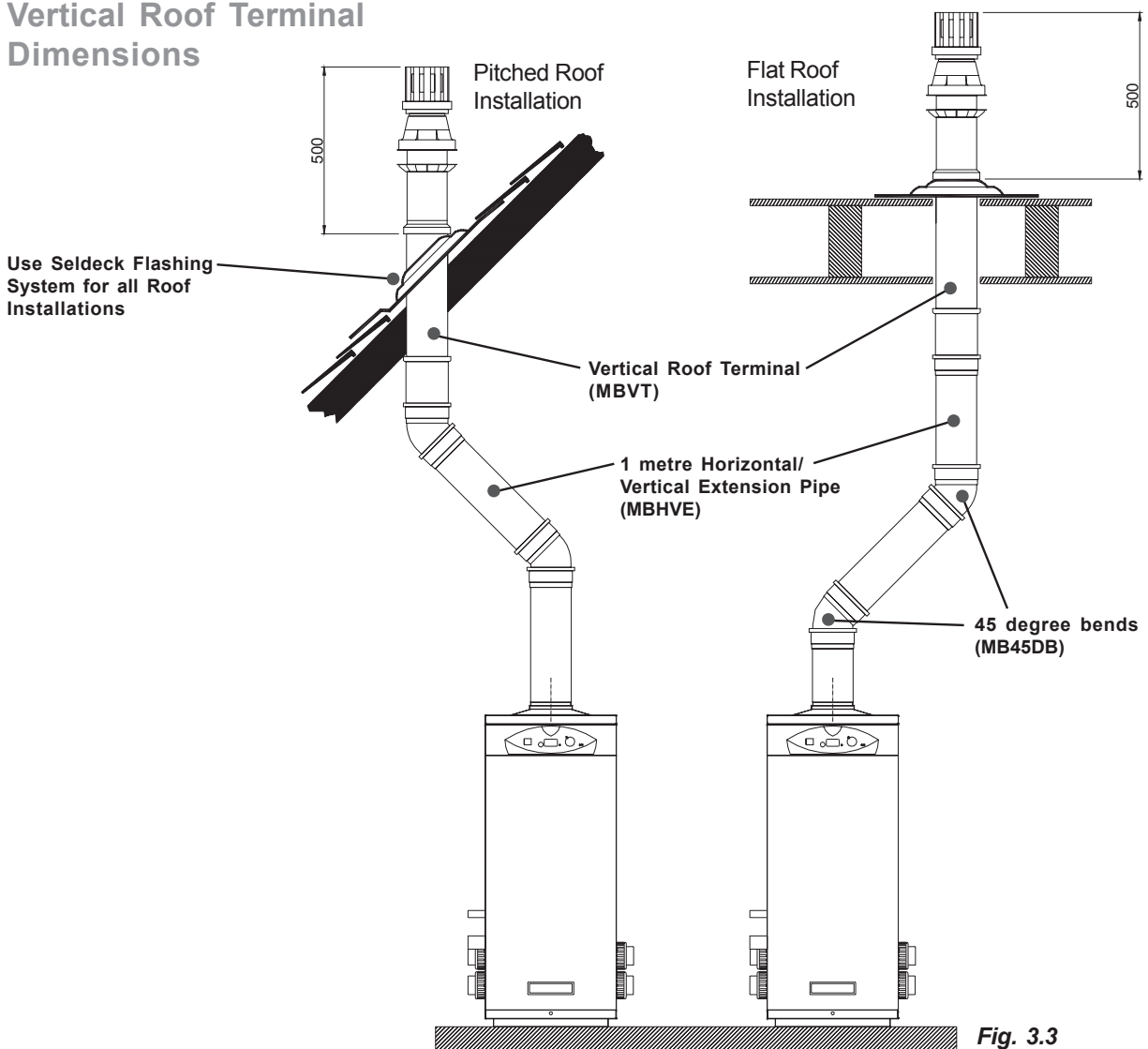


Fig. 3.3

# Flue Examples

## Outdoor Terminal



## Extended Horizontal Wall Terminal



## Extended Vertical Roof Terminal



## Horizontal Wall Terminal



## Flue Kit Part Codes

Determine the type of Flue system you require and choose from the list of kits available below:

Kit Code	Description	Type of Flue System		
		Outdoor Kit	Horizontal Terminal	Vertical Terminal
MBHT	Horizontal Wall Terminal	n/a	Yes	n/a
MBHVE	1 metre Horizontal/Vertical Extension Pipe	n/a	Optional	Optional
MBVT	Vertical Roof Terminal	n/a	n/a	Yes
MBOT	Outdoor Terminal	Yes	n/a	n/a
MB45DB	45 degree bend	n/a	Optional	Optional
MB90DB	90 degree bend	n/a	Optional	n/a

## Flue Kit Part Codes (cont.)

The Maximum Flue Equivalent Length (FEL) permitted is 20 metres, horizontal or vertical. The Flue Kits available below list the FEL for each component. Add up all the FEL's used in your design and check that this does not exceed 20 metres. (see page 6)

Kit Code	Description	FEL Flue Equivalent Length (m)	Photo of Kit
<b>MBHT</b>	Horizontal Wall Terminal	3.9m	
<b>MBHVE</b>	1 metre Horiz./Vertical Extension Pipe	1.0m	
<b>MBVT</b>	Vertical Roof Terminal	3.3m	
<b>MBOT</b>	Outdoor Terminal	n/a	
<b>MB45DB</b>	45 degree bends (pair)	1.1m (per bend)	
<b>MB90DB</b>	90 degree bend	1.5m	



## Flue Parts Assembly

All items assemble by a push fit/clamp system. If it is required to lubricate the seals only Centra Cerin supplied by the manufacturer or Silicone Grease should be used.

The pipes should be assembled so the socket end is always furthest from the Heater.

Flues should be supported by brackets every metre of run.

Horizontal flues should incline back to the Heater by 3 degrees (52mm in 1000mm)

### It is recommended that:

1. The Installation of the flues are completed before their connection to the Heater. This will ensure that any debris that gets into the flues can be cleared.
2. That bends in vertical flues are always 45 degrees.
3. Flues may be reduced in length by cutting. The inner Flue pipe should be cut so it is 5 to 10mm longer than the outer Air duct.
4. It will ease assembly if the cut edges are cleaned, chamfered and greased before assembly.

## Wall Terminal

The Horizontal Wall Terminal is supplied with two rubber wallplates, one for inside and one for the outside. (See Fig 3.1)

If drilled at 3 degrees the core drill diameter required is 175 mm. If a level hole is being drilled its size will be determined by the wall thickness.

Wall Thickness	Core Drill diameter
150- 240 mm	175 mm
240- 330 mm	185 mm
330 - 420 mm	195 mm
420 - 500 mm	205 mm

Because of the incline of the flue the height of the centre of the flue hole on the inside will be determined by the distance the heater is from the wall.

1. Ensure the required service clearance is available.
2. Fit the 90 degree elbow to the heater and measure from its outlet face to the wall.
3. Add 52 mm for every 1000 mm distance to 1065 mm.

Example:

Distance measured = 480 mm

$(52 \times 480) / 1000 = 25 \text{ mm}$

Flue centre  $1065 + 25 = 1090\text{mm}$

## Roof Terminal

The Vertical Roof Terminal should be fitted in a minimum of 300mm clear unobstructed space. It is not permitted to alter the construction of the Terminal, above the roof line, however the concentric section below the roof line can be altered to suit the installation.

## Outdoor Terminal

**A specific Outdoor Top Terminal must be used for an outdoor installation.**

The Outdoor Top Terminal is a push fit into the Flue Adapter and locked in position with a clamping ring (See Fig 3.2 and 5.0) with the fastener at the back. If lubrication is required only Centra Cerin or silicone grease should be used.



Fig. 5.0

## Plumbing

The heater requires water flow and pressure to operate properly. It must therefore be installed downstream of the filter and pump. A typical installation is plumbed as follows:

1. The Pump outlet is plumbed to the inlet of the Filter.
2. The outlet side of the Filter is then plumbed to the inlet of the Heater.
3. The outlet of the Heater is plumbed to the return line to the pool or spa. The Pump, Filter and Heater are plumbed in series.

Plumbing from the heater back to the pool must not have any valves or restriction that could prevent flow when the pump is operating. If it is necessary to install a valve on the return to the pool then it is essential that a flow switch is installed and interlocked with the Heater supply.

The Heater must be located so that any water leaks will not damage the structure of adjacent area. There is no requirement for heat shunt connections to the Heater, plumbing can be made in standard plastic 1½" pipe from the supplied demountables

Use the pressure loss chart on page 5 to specify a suitable pump.

Connection to the Heater can be made from either the left or the right, it is supplied to be connected on the left. To change, undo the demount connection on the **right**, complete with blanking plates, and swap with the connections on the **left**.

### Flow Rate

The Heaters are built with an internal fixed bypass that ensures the correct flow through the heat exchanger for a wide range of conditions.

**The minimum permitted flow is: 80 litres/min**

### Pressure Switch

The Heater is protected by an adjustable water pressure switch that has to close before the Heater will operate. It is very important to verify that it turns off when the water flow is interrupted.

It has an adjustment range equivalent to  $\pm 1.5$  metres. The switch is factory set for most conditions but can be altered if required:

1. With the pump on turn the knurled nut clockwise until a click is heard.
2. Turn the nut anti-clockwise a quarter of a turn.
3. Turn the pump on and off to check the switch operates correctly.



Fig. 5.1

## NG to LPG Conversion

The Heater can be converted to LPG on site. It should be done before the Heater is piped to its supply.

1. With the Gas and Electrical supply off, undo the three screws that hold the Venturi to the Gas Valve. (**See Fig.6.0**)
2. Allow the Gas valve to drop and gently hang on its cables.
3. Fit the Conversion Orifice into the Rubber Seal that sits in the Gas Valve. (**See Fig.6.1**)
4. Re-assemble the Gas Valve and Venturi.
5. Affix the new Propane Serial Number Data Label supplied over the existing.

## LPG to NG Conversion

The method is as detailed above except the Orifice is removed and the Venturi and Gas Valve reassembled with just the Rubber Seal between them. A new Serial Number Data Label should be obtained from the manufacturer and affixed over the existing.

## Gas Connection

The 22mm copper gas connection provided can be positioned to exit the Heater from either the left or the right. A minimum of 20mb. (NG), 37mb (LPG) must be available at the Heater inlet, with the Heater and other connected appliances firing. Check for gas tightness (B.S. 6891: 1988) in pipework to boiler using a manometer. (**See Fig. 6.2**) Gas soundness within the Heater should be checked using sense of smell and leak detection fluid. Check the maximum rate and combustion are to specification, (See Datatable Inside Cover.)

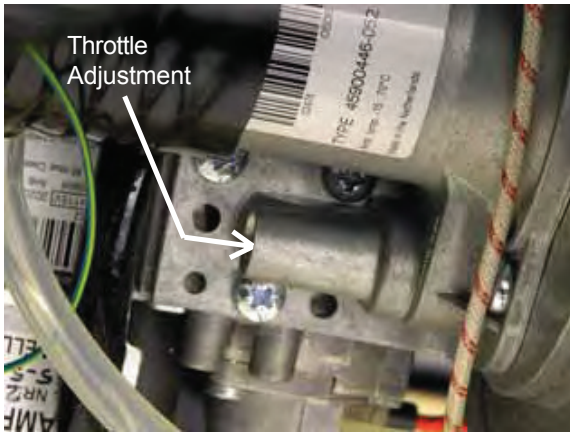
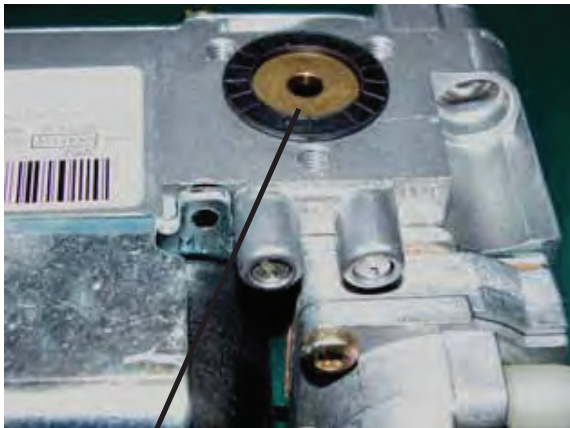
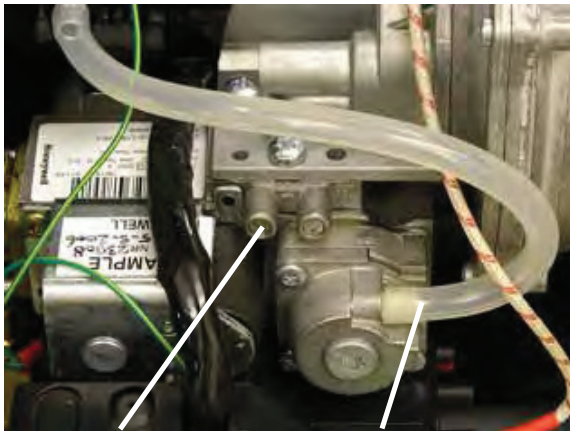


Fig. 6.0



Orifice in position

Fig. 6.1



Inlet pressure tapping

Offset connection

Fig. 6.2

Rating Table (1040 Btu/ft<sup>3</sup>) (38.8 MJ/m<sup>3</sup>)

kW gross	Btu/h	sec/ft <sup>3</sup>	m <sup>3</sup> /2 mins
7.5	25590	145	0.023
12.5	42650	87	0.039
20	68240	55	0.062
34.6	108055	31.5	0.107
52	177420	21	0.161

## Condensate Connection

The direction of the plastic condensate drain pipe connection can be altered from the factory position on the left, to the right.

- Remove the blanking plate from the left hand side (*See Fig. 3.1*)
- Loosen the two screws holding the Trap bracket and swivel the trap through 90 degrees.
- Secure the bracket and fit the supplied 40 mm pipe.
- Example installations are shown in *Fig 7.1*.
- Fit blanking plate to the right hand side. (*See Fig 7.1*)

Where possible an internal termination of the condensate discharge pipework should be used.

If this is not possible external pipes should be kept as short as possible and insulated.

Where fitted in pipework that includes another trap an Air Break should be fitted between the Heater and that trap.

Avoid connecting to a kitchen sink trap as the solids and fats in the drain will cause a blockage.

It is permissible to connect to an external gully or rain water hopper provided they connect to a combined system.

The condensate should not be run into a 'grey water' system.

If the condensate pipe is connected to a stack it should join not less than 450 mm above the foot of the stack. In addition it should be positioned so there no chance of cross-flow to another connection.

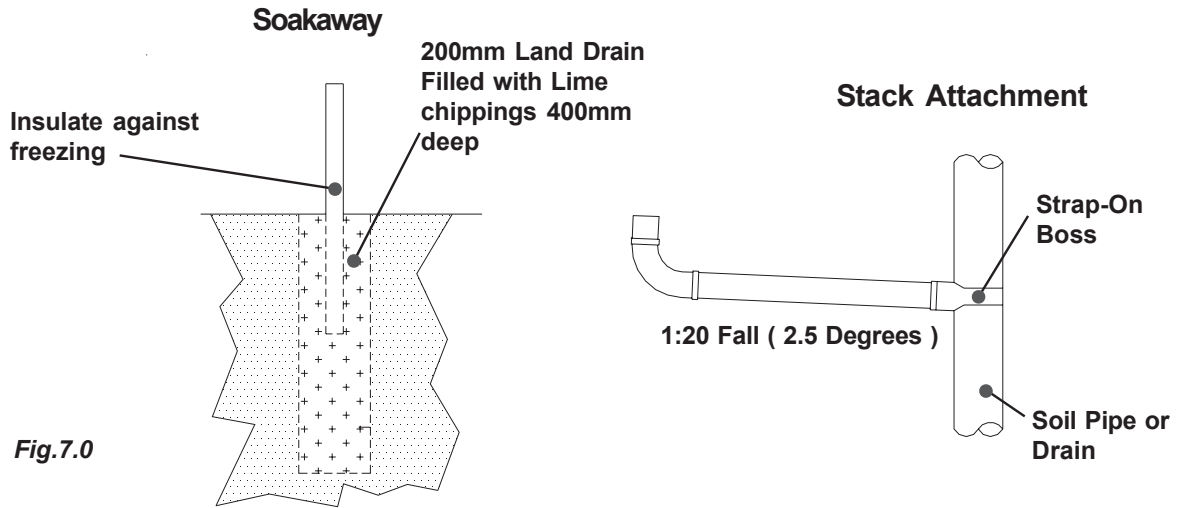
Installation pipework must be in Osma 40 mm plastic pipe to a suitable drain location with a gradient of 2.5° (45mm/ metre run) minimum. If connected to another drainage trap, an air break is required between the Heater drain and that trap. (*See Fig.7.0 & 7.1*). External runs, should, if possible, be insulated to defer problems from freezing.

Check during commissioning to prove there is a leakfree working connection from the Heater to the drain. The simplest way to do this is to carefully pour some water into the boiler flue and check it emerges at the drain.

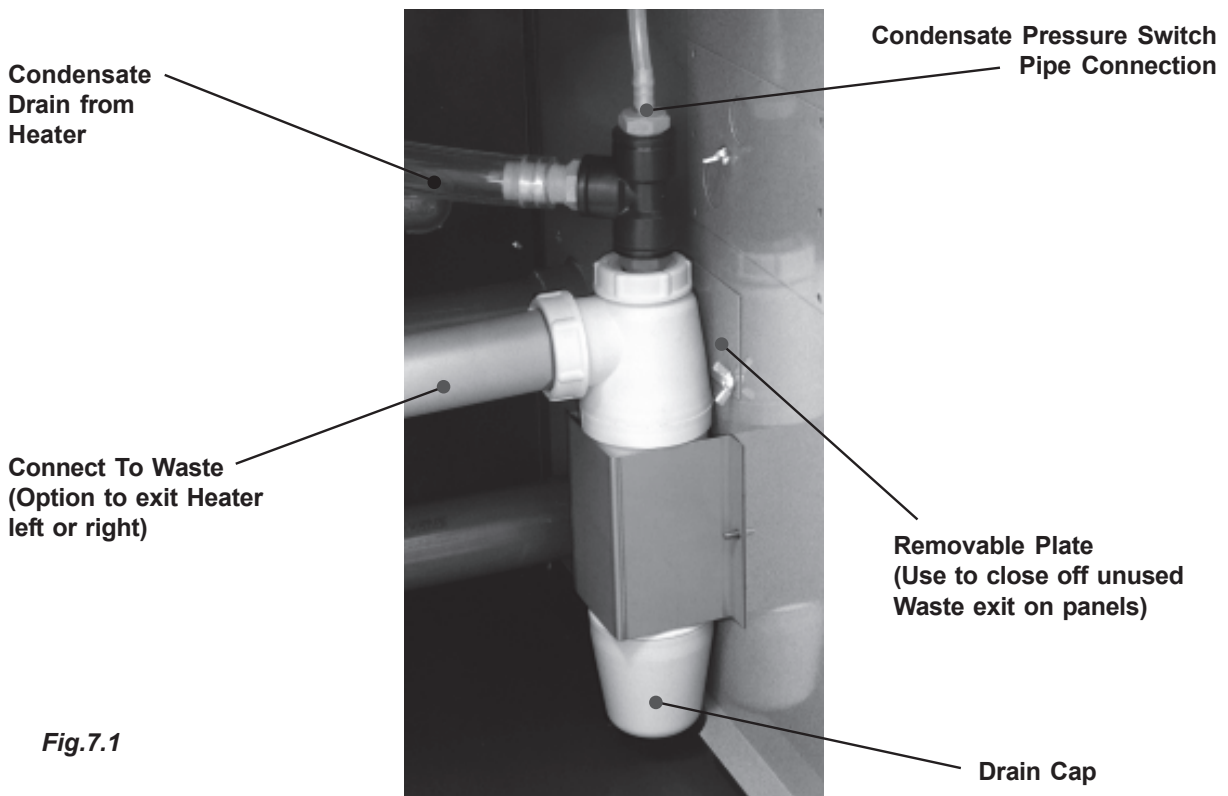
The "Guide to the Condensing Boiler Assessment Procedure for Dwellings" can be referred to, see <http://www.planningportal.gov.uk/england/professionals/en/1115314255842.html>

## Example Condensate Disposal Methods

Note: Do not reduce the pipe size below the 40mm provided.



## Condensate Syphon (75 mm)





## Electrical Connections

### **WARNING: The appliance MUST be earthed.**

All wiring for the Heater and system controls MUST conform to I.E.E. Wiring Regulations, and work should be tested using a suitable meter, for Earth Continuity, Polarity, Short Circuit and Resistance to Earth.

The Heater supply must be through a common isolator, a double pole 3A fused isolating switch with a contact separation of 3mm minimum on both poles.

The cable used should be no less than 0.75mm<sup>2</sup> to BS.6500 PVC, 3 core, and fixed ensuring the earth connection is longer than the Live and Neutral.

Access to the Heater connections is made by the removal of the Front Top Panel and the Electrical Chassis cover, two screws.

The Heater's internal wiring is shown in **Fig.11.0**.

Connections are as follows :-

#### 4 Way Terminal

⏏  
N  
SL  
L

#### Supply Connection

Earth  
Mains Neutral  
Switched Live  
Permanent Live

A factory installed link has been fitted between SL and L which should be removed if the Heater is to have its own switched supply.

For systems using an external programmer, the electrical wiring should follow the relevant control manufacturer's recommendations, with the switched live from the controls returning to SL in the 4 way push-fit connector.

It is possible to connect several Heaters together using the Multiple Heater Kit. Details for the parts and installation of this kit are given on Page 17.

## Commissioning

### General

The elimination of air from the heat exchanger is essential to maximise the life of the Heater. It is strongly recommended that the Heater is first run with the **GAS OFF** until the air has been purged. If air has not been released then there is a possibility of the Heater overheating and triggering one of its safety thermostats.

### Commissioning Procedure

The Heater Control is factory set to display in Fahrenheit and work to a maximum temperature of 90°F (32°C). If a Centigrade display or higher, Spa temperature 106°F (41°C) maximum is required, enter Setup Mode. (See Page 16)

The boiler is fitted with automatic ignition and will start when the gas cock is open, mains is connected and the Pressure Switch is activated by the pool Pump. (for greater detail about the internal controls see the Maintenance section, Fault Diagnosis) If the Heater fails to light the gas it will shutdown and try again. It will repeat this a total of 5 times and then lock out. This will show as the **Red LED** lit and '**GAS**' on the display.

Press the Lock/Reset button to start another 5 attempts.



**Fig. 8.0**

It is possible with the front door off to see when the burner is lit through the sight glass. (See Fig. 8.0)

After the burner has been lit for a few minutes the gas rate and combustion should be checked, see the **Technical Data on Inside Cover** for details.

The Heater is factory set and should not require adjustment. When the Heater has been running for at least 10 minutes check all joints, gas and water, for leaks, and correct where necessary.

**Note:** The boiler is fitted with a syphon trap that includes a blocked drain detection device. This is to safeguard the boiler and help defer the effects from the possible freezing of the condensate pipework in extreme weather.

Should this happen the control will lockout and the display will show '**HI**', as in "condensate level is high". See the Fault Finding section for more details.

This will have to be corrected before the Heater will run.

The user should be made aware of this feature and, that in the event of blocked or frozen condensate pipework, the boiler will automatically stop functioning.

It will start again as soon as the blockage has cleared.

Finally, instruct the user on Heaters operation and controls.



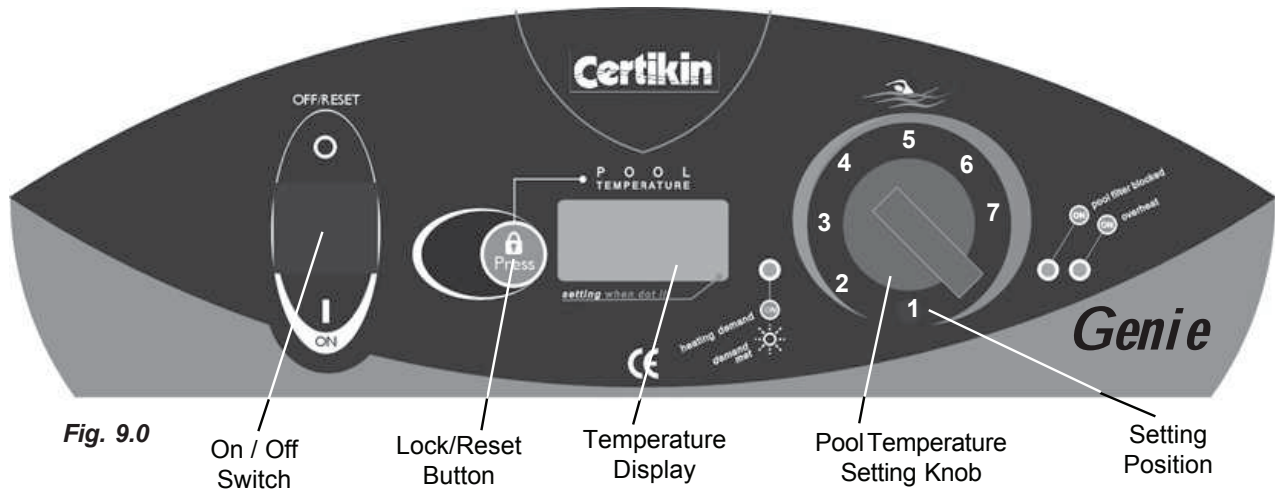




Fig. 9.0

Setup Mode Setting	Factory Setting	Alternative	Display Indicator
1 Display units	° F = Fahrenheit	° C = Centigrade	° F or ° C
2 Maximum temperature	32 °C (90 °F)	41 °C ( 106 °F)	PL or SPA
3 Pressure Log	Number of Operations	Resets to zero	Yellow LED ON
4 Overheat Log	Number of Operations	Resets to zero	Red LED ON
5 Combustion Gas Log	Number of Operations	Resets to zero	Red LED flashing
6 Gas Lockout Log	Number of Operations	Resets to zero	Red & Yellow LED ON
7 Hi-Limit Log	Number of Operations	Resets to zero	Red PCB LED ON
8 Unused	Number of Operations	Resets to zero	Red PCB LED ON
9 Version number	-	-	e.g. 008


## Setup Mode

Switch on with the panel switch whilst pressing the Lock/Reset button.  then release. The control is now in Setup Mode.

The control can now be altered by rotating the Pool Thermostat Knob to a certain position and then pressing the Lock/Reset button,  then switching off. (See Fig. 9.0)

Example:

To change from Fahrenheit to Centigrade:

Turn Panel Switch OFF then back ON whilst pressing the Lock/Reset  button.

Turn the Pool Thermostat Knob until the display shows 'F'.

Press the Lock/Reset button  once and the display will show 'C'.

Switch the Panel Switch OFF then back ON again.

The Control will now display in Centigrade.

## Multiple Heater Kit

### Overview

It is possible to connect together several Heaters and by doing so obtain a larger output with an economical and a fail-safe design. The Multiple Heater Kit enables 2 or more Heaters to be connected to obtain the necessary Load Sharing, automatically. This works by one Heater being a Master and the others being Slaves. The Master is set for the required pool temperature and it then controls as many of the Heaters as necessary to obtain the temperature. It also equalises the running time of every Heater so they all do the same amount of work.

#### Kit Part Codes:

- 2 Heaters: MBMIK2
- 3 Heaters: MBMIK3
- 4 Heaters: MBMIK4
- 5 Heaters: MBMIK5
- 6 Heaters: MBMIK6
- 7 Heaters: MBMIK7
- 8 Heaters: MBMIK8

### Individual Part Numbers

- |                         |                                 |
|-------------------------|---------------------------------|
| 1 per Heater,           | M5160 Adapter PCB.              |
| 1 off per Installation  | M5161, Terminator Plug, Red.    |
| 1 off per Installation, | M5162, Terminator Plug, Yellow  |
| 1 less than Heaters,    | M5163, 4m Interconnection Cable |

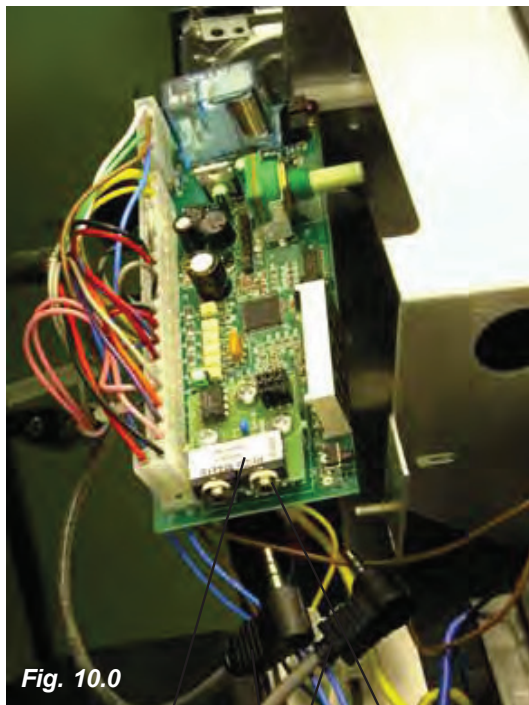


Fig. 10.0

Adapter PCB  
Connectors  
Interconnection Cables

### Installation Instructions

- Disconnect the Heater from the Mains then remove the Top Panel and the Electrical Chassis Cover.
- Remove Pool Thermostat Control Knob
- Remove Pool Thermostat Board by removing retaining plate and carefully slide out until fully accessible. (Fig. 10.0)
- Carefully fit the Adapter PCB in the space behind the Pool Temp. Display on the Board (Fig. 10.0) ensuring that the six pins on the Board pass through the underside of the Adapter PCB and, that the plastic locking pillars snap into place. Refit Pool Thermostat Board and Knob.
- Repeat steps 1) and 2) for all the Heaters.
- Using the supplied cables, pass them through the upper side panel grommet and daisy chain the Heater Adapter PCBs together. (Fig. 10.1) The first and last Heater in the 'chain' will use the Terminator Plugs to fill their 2 unused sockets. There are 2 different coloured Terminators, they can go in either the first or last Heater. NB. Ensure the connectors are fully home (Fig. 10.2)
- Choose which Heater is to be the Master and then make the rest Slaves by disconnecting their Pool Temp Sensors. Remove the orange connection to the Pool Temp Sensor located on the rear heat exchanger connection (Fig. 10.3)
- Any external electrical control should only be connected to the Master, Pool Demand. Remove any Pool Demand links from the Slaves.
- Turn on the Mains, then switch on all the Heaters. After a short self-test the Master should show the actual temperature, and the Slaves three dashes "---". If a Slave continues to show a moving display of dashes this indicates it not correctly connected to the Master, check the Interconnection cable plugs are fully home.
- Replace the panels.



Fig. 10.1



Fig. 10.2

Side Panel Grommet

Disconnected Orange Wire on Pool Temp Sensor (Slaves Only)

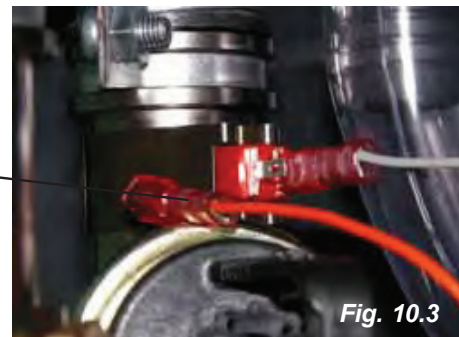


Fig. 10.3

## Operation

- Turn on all the Heaters with their Pool Temperature Controls.
- The Master will show temperatures and the Slaves “---”.
- Set the required temperature on the Master and provided there is an electrical demand at the Master’s Pool Demand connection, the Heaters will run.

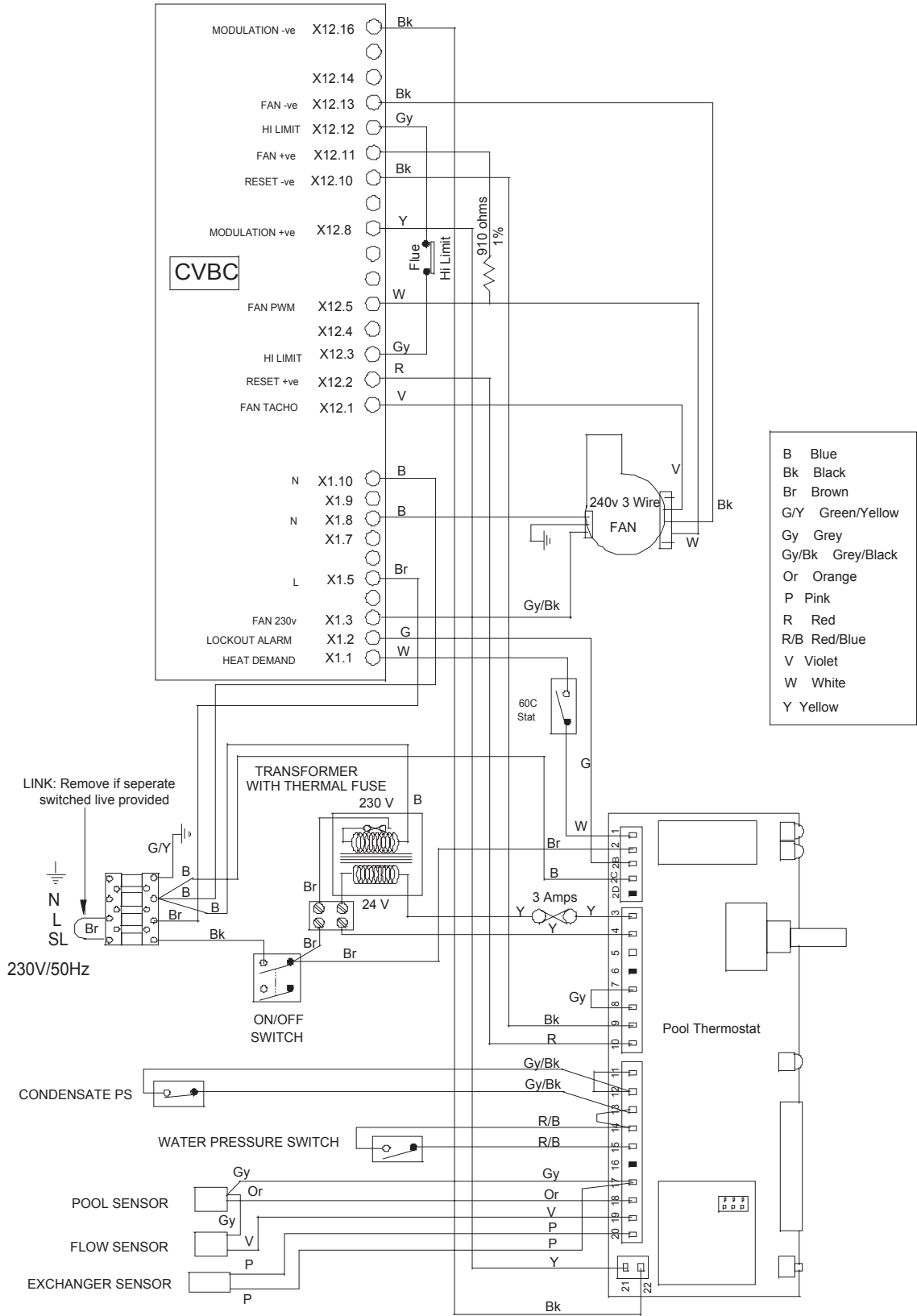
## Features

- A Master is the only Heater with a Pool Sensor connected, move the sensor and the Master changes.
- If the Master Pool Temperature Control is turned off, none of the Heaters will run.
- If a Slave’s Pool Temperature Control is turned off it will not operate. The Master will know and alter its control accordingly.
- If a safety device on the Master operates it will not run but will continue to control the Slaves.
- If a safety device on any of the Slaves operates that Slave will not operate.
- If a Slave has Flow fault which its Pressure Switch detects the burner will stop immediately and the Filter LED will light. It will no longer be available to the group. It will then check every 3 minutes or so to see if the problem has been corrected, the Filter LED will flash. It will put itself back in the group if flow is satisfactory.
- The Master display can be altered in Setup Mode like a single Heater. (see Page 16)
- Unlike a single Heater, there is no modulation of individual burners.

## Displays

- The Master display is just like a single Heater.
- A Slave will display “---” when working as part of the group. It will show all the fault conditions of a single Heater except “P/oc”, the Pool Sensor Open Circuit fault. If this is displayed it indicates a interconnection problem, check the cables and connectors.
- The Pool Demand LEDs work as a Single Heater. On when running, Off when off, and Flashing if not needed by the Master.
- The warning LEDs work for all in a group, as per a single Heater.

# Schematic Wiring



30/11/06

**Fig.11.0**

# FAULT FINDING

**WARNING:** BEFORE COMMENCING OR COMPLETING ANY ELECTRICAL WORK ON THE APPLIANCE, IT IS RECOMMENDED THAT THE BASIC SAFETY CHECKS FOR EARTH CONTINUITY, SHORT CIRCUIT, POLARITY AND RESISTANCE TO EARTH ARE MADE. ALL WORK CARRIED OUT SHOULD FOLLOW GUIDELINES LAID DOWN BY THE I.E.E.

## Operation

The Heater requires Mains on both the Live (L) and Switched Live (SL) connection to be able to run. It is delivered with a link between them which can be removed if a separate Heater switched live is going to be used.

To run, the Heater must have a Mains supply, Gas, Pool Pump pressure sufficient to activate the Pressure Switch, all safety switches closed and a pool temperature below the set point.

If all the above are correct then the Gas Ignition Control starts the Ignition sequence:

1. The Fan runs as a pre-purge of the Heat Exchanger
2. After a few seconds a spark is created at the electrode and the burner is lit.
3. The burner flame is sensed and the spark is removed.
4. The Fan speed is then changed to the required speed according to the modulation curve.
5. If it fails to light the burner the spark will stop and the Fan will run on as a post-purge of the Heat Exchanger.
6. The ignition sequence will be repeated up to five times, then the control will lockout and will require a reset to start again.

## Safety Controls & Lockouts

The Pool Thermostat Control indicates the actual and set temperature of the pool and also displays all the lockouts. The next pages detail the fault conditions, the indicators, the display and the actions required.

## Setup Mode

Turn off on the Panel Switch. Turn on with the Panel Switch whilst pressing the Lock/Reset Button.  The Control is now in Setup Mode. See Page 16 for details.

## Engineering Mode


This is a special mode used to set the operation of the Control and to investigate fault conditions, it requires a Special Connector available from your supplier. It is recommended that none of the settings are altered without consultation with the manufacturer.

Turn the Heater OFF with Panel Switch

Remove the Front Top Panel and the Electrical Chassis Cover.

Pull off the PCB connector for the Sensors and replace with the Special Connector.

Turn the Heater back ON.

It is now possible to change some of the Control's parameters. Press the Lock/Reset button  to display them. To show the alternative, rotate the Pool Thermostat Potentiometer

1. **bt1** or **bt3**. The Control Heater personality. bt1 are traditional non-condensing Pool Heaters, bt3 is the Condensing Pool Heater. Default is bt3.
2. **td0** and **td1**. The Test Temperature Display Mode. Default is td0. td1 is a special diagnostic mode which shows all the sensor temperatures to one decimal place, for each press of the Lock/Reset button.
3. **0.0** to **7.9**. Proportional band. Default 1.0.
4. **0** to **50**. DeltaT modulation point. Default 12.

After making the selections required, power off, replace sensor connector and power back on.

## Test Temperature Display Mode 1 (td1).

Temperatures are displayed to 0.1 degree resolution, not the normal 1 degree.

The display will now show each sensor temperature and cycle around them for each press of the Lock/Reset button.

1. Pool Temperature as normally displayed.. The Green LED will be alight.
2. Pool Temperature is displayed to 0.1 degrees. The Green LED will be alight.
3. Heat Exchanger Flow Temperature. The Yellow LED will flash rapidly.
4. Heat Exchanger Combustion Temperature. The Red LED will flash rapidly.

Rotating the potentiometer will change the set temperature. Pressing and holding the button whilst one of the temperatures is displayed will 'lock/unlock' it on the display for continuous observation.



# Fault Codes

FRONT PANEL		ON PCB		EXPLANATION
LOCK / RESET DISPLAY	GREEN YELLOW RED	RED LED1 RED LED2		
	  	 	 	OFF, no mains supply or failed power supply
	  	 	 	Running, raising pool temperature to 28°C
	  	 	 	Up to temperature, 28°C
	  	 	 	Insufficient water pressure. Filter?, Blockage?
	  	 	 	'OH1' Water Over temperature. Allow to cool then investigate in Engineering Mode. Reset with Button
	  	 	 	'OH2' Flue gas over temperature. Allow to cool then investigate in Engineering Mode. Reset with Button
	  	 	 	'GAS' Gas Control Lockout. Unable to light burner, reset with Button. <b>OR</b> Flue Stat tripped. Investigate cause. Reset on Flue Stat
	  	 	 	'HI' Condensate level high. Blocked? Clear obstruction and allow control to auto reset.

# Fault Codes

FRONT PANEL		ON PCB		EXPLANATION			
LOCK / RESET	DISPLAY	GREEN	YELLOW	RED	RED LED1	RED LED2	
							'P' alternating with 'oc' = Pool sensor open circuit <b>OR</b> No network detected if a Master in a multiple heater installation 'P' alternating with 'cc' = Pool sensor short circuit
							'F' alternating with 'oc' = Heat Exchanger Flow sensor open circuit 'F' alternating with 'cc' = Heat Exchanger Flow sensor short circuit
							'H' alternating with 'oc' = Heat Exchanger Combustion sensor open circuit 'H' alternating with 'cc' = Heat Exchanger Combustion sensor short circuit
							'Err' alternating with '4' = Pool potentiometer open circuit 'Err' alternating with '5' = Pool potentiometer short circuit

For all of the above. Turn off, correct problem and turn back on again and the display and operation will be normal.

# SERVICING

## Health and Safety Statement :

This Heater contains no asbestos.

## Routine Service

To ensure continued efficient operation of the appliance it is recommended that it is checked and serviced at regular intervals.

The frequency of servicing will depend upon the particular installation and usage but in general every 2000 hours of operation should be the maximum. It is law that any service work should be carried out by Corgi registered personnel.

1. Clean burner and combustion chamber.
2. Check condition of ignition spark and sensing probe.
3. Check boiler pipework joints for leaks.
4. Check the Air duct and Flue seals.
5. Check condensate syphon and pipework for leaks.
6. Check the Gas Rate.
7. Check the combustion CO and CO<sub>2</sub>.

Follow the procedures given in Changing Components for parts removal in addition to the following notes. In all cases, before work commences turn off the Mains Electricity and Gas Supply.

## Burner & Combustion Chamber

To view the burner and the inside of the Heat Exchanger it is suggested you remove the front of the Heat Exchanger complete with the Fan and Gas Valve:

- Remove Door and Front Top Panel
- Disconnect Gascock flange form Valve.
- Unplug Fan electrical connectors.
- Remove Air tube from Flue Adapter.
- Undo cover over Ignition Control connections and remove the two connectors.
- Pull off the Earth Lead connection on the Valve and Heat Exchanger.
- Undo the four nuts holding the Heat Exchanger front and withdraw.
- Assembly is the reverse.

## Spark & Sense Electrode

- Turn off the Heater.
- Pull off the HT Lead.
- Undo the two screws retaining the electrode assembly and withdraw.
- Assembly is the reverse.

## Pipework

**IMPORTANT.** The Heat Exchanger connections are made using O rings and retaining clamps and should not be strained in any direction. Any strain will result in damage to the Heat Exchanger and will not be covered by the warranty.

All plastic pipework joints are solvent welded and cannot be remade but have to be replaced.

## Condensate Syphon

The lower bowl of the Syphon can be unscrewed, examined and cleaned.

## Air Duct & Flue Seals

A visual inspection should establish there are no leaks around any of the seals, including the flexible Air Duct to the Venturi.

## Gas Rate & Combustion

See the Datatable on Page 1 for the correct values. A Combustion sample point is provided on the front of the Flue Adapter. (**See Fig.13.1**)

## Changing Components

**THERE IS ONE FUSE, THE REMAINDER OF THE CONTROLS ARE NOT REPAIRABLE AND IF NOT WORKING MUST BE REPLACED.**

In all cases, before work commences turn off the Mains Electricity and Gas Supply.

The following items can be replaced:

- Fuse, 24V supply.
- Transformer.
- Pool Thermostat.
- Condensate Pressure Switch.
- Pool Temperature Sensor.
- Heat Exchanger Flow Sensor.
- Water Pressure Switch.
- Control Thermostat.
- Overheat Thermostat.
- Heat Exchanger Combustion Temperature Sensor.
- Flue Thermostat
- Ignition Control.
- Gas Valve.
- Fan.
- Heat Exchanger.

## On the Electrical Chassis

To access these items first remove the Front Top Panel and then the Chassis Cover.

## Fuse (See Fig. 12.0)

There is one inline 3A 1¼" fuse on the 24V supply between the Transformer and the Pool Thermostat. The Fuse Holder bayonets apart to allow its replacement.

### Transformer (See Fig. 12.0)

The Transformer includes its own, internal thermal fuse on the primary. If this has gone open circuit the cause should be established before replacing the Transformer.

- Disconnect from the terminal strip and fuse holder.
- Undo the two screws holding it to the chassis and replace.

### Pool Thermostat (See Fig. 12.0)

- Pull off the Pool Thermostat Knob.
- Release the Rear Retainer by undoing the Wing Nut.
- Pull off all the PCB connectors.
- Slide out the Thermostat.
- Replacement is the reverse.

### Condensate Pressure Switch

(See Fig. 12.0)

- Undo the single fixing screw.
- Pull off the two electrical connectors and transfer to the new Switch. They connect to the 'C' and 'NO' connections.
- Replacement is the reverse

## Heater Components

The remainder of the parts can be accessed through the front.

### Pool Temperature Sensor & Heat Exchanger Flow Sensor

These are located on the connections to the Heat Exchanger and are the same items. (See Fig.13.4)

- Unclip the sensor from the connections.
- Transfer the push on electrical connectors to the replacement and clip back on.

### Water Pressure Switch

This is located on the Inlet connection to the Heat Exchanger and its removal will require the draining of the Heater. (See Fig.13.4)

- Pull off the Electrical Connectors
- Unscrew from the Heat Exchanger connections.
- Replacement is the reverse.

If the Water Pressure Switch needs adjustment See Page 12 for details.

**IMPORTANT. It is essential that all the air is removed from the Heat Exchanger before the Heater is fired. Running the Heater with air still in it will damage the Heat Exchanger and invalidate the warranty.**

### Control Thermostat

This is located on the Outlet connection of the Heat Exchanger. (See Fig.13.4)

- Unclip the sensor from the connection.
- Transfer the push on electrical connectors to the replacement and clip back on.

## Heat Exchanger Combustion Temperature Sensor

This is located on the top of the Heat Exchanger, on the right hand side. (See Fig.13.1)

- Release the electrical connector by pressing the latch and pulling up.
- Twist the Sensor a quarter turn clockwise and withdraw.

**IMPORTANT** Ensure the O ring seal is fitted correctly to the replacement before fitting.

- Replacement is the reverse.

### Flue Thermostat

This is located on the Flue Adapter. (See Fig.13.1).

- Pull off the electrical connectors.
- Slide out from under the clip.
- Replacement is the reverse.

### Ignition Control (See Fig.13.3)

- Undo the single screw holding the Ignition Control.
- Release the two electrical connectors by pressing the latch and pulling apart.
- Pull the Ignition Control away from the Gas Valve.
- Replacement is the reverse.

### Gas Valve (See Fig.13.3)

- Remove the Ignition Control, see above.
- Release the Gascock by undoing the four shoulder bolts holding it to the Gas Valve.
- Remove the Offset tube from the Gas Valve and unscrew the Offset Connector and transfer to the new Gas Valve.
- Release the Gas Valve from the Venturi by undoing three screws. (See Fig.13.3)

**IMPORTANT** Ensure the rubber seal (and orifice if Propane) is transferred from the old Valve and placed between the Venturi and Gas Valve before assembly.

- Replacement is the reverse.
- Fire the Heater and check for gas leaks.
- After five minutes check the rate and combustion is correct to the Datatable. (inside cover). Adjust using the throttle on the Gas Valve, (See Fig. 13.3).

### Fan (See Fig.13.2)

- Remove the two electrical connectors on the Fan. See (See Fig.13.2)
- Remove the two screws holding the Venturi to the Fan.
- Undo the four nuts holding the Fan to the Heat Exchanger and withdraw. (See Fig.13.2)
- Transfer the Venturi gasket to the new fan.
- Replacement is the reverse.

### **Venturi (See Fig.13.2)**

- Remove the Ignition Control and Gas Valve, see above.
- Pull off the Air Tube (See Fig.13.3)
- Undo the two screws holding the Venturi to the Fan and remove.
- Ensure the gasket is transferred to the new venturi or positioned on the Fan before positioning the replacement.
- Replacement is the reverse.
- Fire the Heater and check for gas leaks.
- After five minutes check the rate and combustion is correct to the Datatable. (inside cover). Adjust using the throttle on the Gas Valve, (See Fig. 13.3).

### **Heat Exchanger (See Fig.13.0)**

The removal of the Heat Exchanger will require the draining of the Heater.

- Undo both the Demountable connections to the Pool pipework. (See Fig.13.5)
- Undo the screws holding the panels around the Demountable connections. (See Fig.13.5)
- Release Heat Exchanger from the pipework by removing the screw holding the retaining clips. (See Fig.13.4)
- Lower the pipework away from the Heat Exchanger.
- Remove the Front Top Panel and disconnect the Flue Thermostat connections.
- Pull the Air Duct and Flue up and away from the Heater Flue Adapter.
- Disconnect the Heat Exchanger Combustion Sensor by pressing the latch and pulling off.
- Remove the four screws holding the Rear Top Panel.
- Remove the Rear Top Panel with the Flue Adapter.
- Remove the Fan, Gas Valve and Ignition Controller.
- The Heat Exchanger is now only retained by the two side brackets and releasing the four front screws will enable it to be lifted away. Before releasing ensure there is support available.
- Replacement is the reverse.



## Spares

### 1st Line Spares:

Item	Part Number	SPMBG
Primary Heat Exchanger (35 kW)	M2136	SPMBG001
Primary Heat Exchanger (50 kW)	M2139	SPMBG002
Propane Orifice 35kW	M2150	SPMBG014
Propane Orifice 50kW	M2151	SPMBG015
Fan	M2138	SPMBG003
Gas Valve	M2140	SPMBG004
Ignition Control	M2141	SPMBG005
Pool Thermostat PCB	M2155	SPMBG016
Water Pressure Switch	650634	SPMB506
HT Lead	M2142	SPMBG006
Condensate Syphon	M2143	SPMBG007
Condensate Pressure Switch	M2144	SPMBG008
Ht Exchanger Combustion Sensor	M2145	SPMBG009
Spark & Sense Electrode	M2146	SPMBG010
Flue Thermostat	M2147	SPMBG011
Control Thermostat	M2148	SPMBG012
Pool Temperature Sensor	M2149	SPMBG013
Ht Exchanger Flow Sensor	M2149	SPMBG013

## Electrical Components

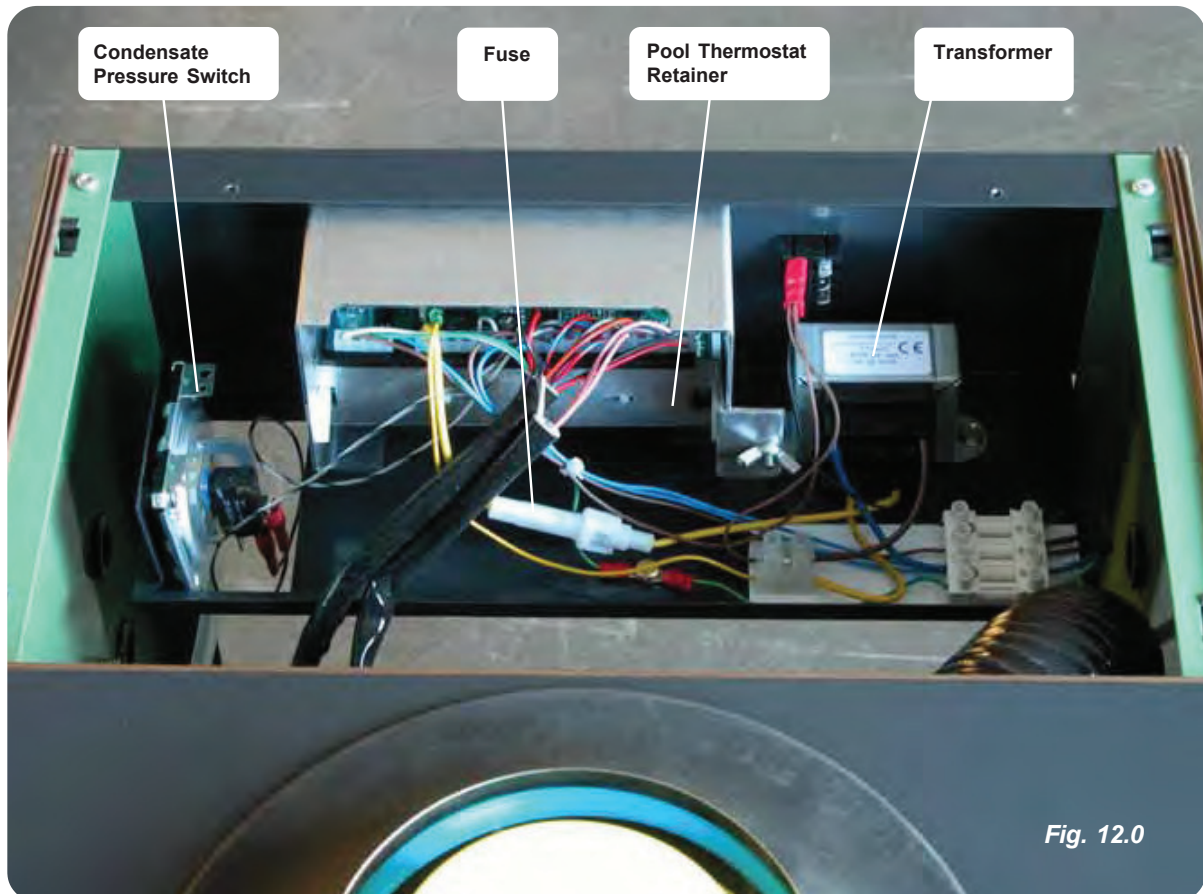
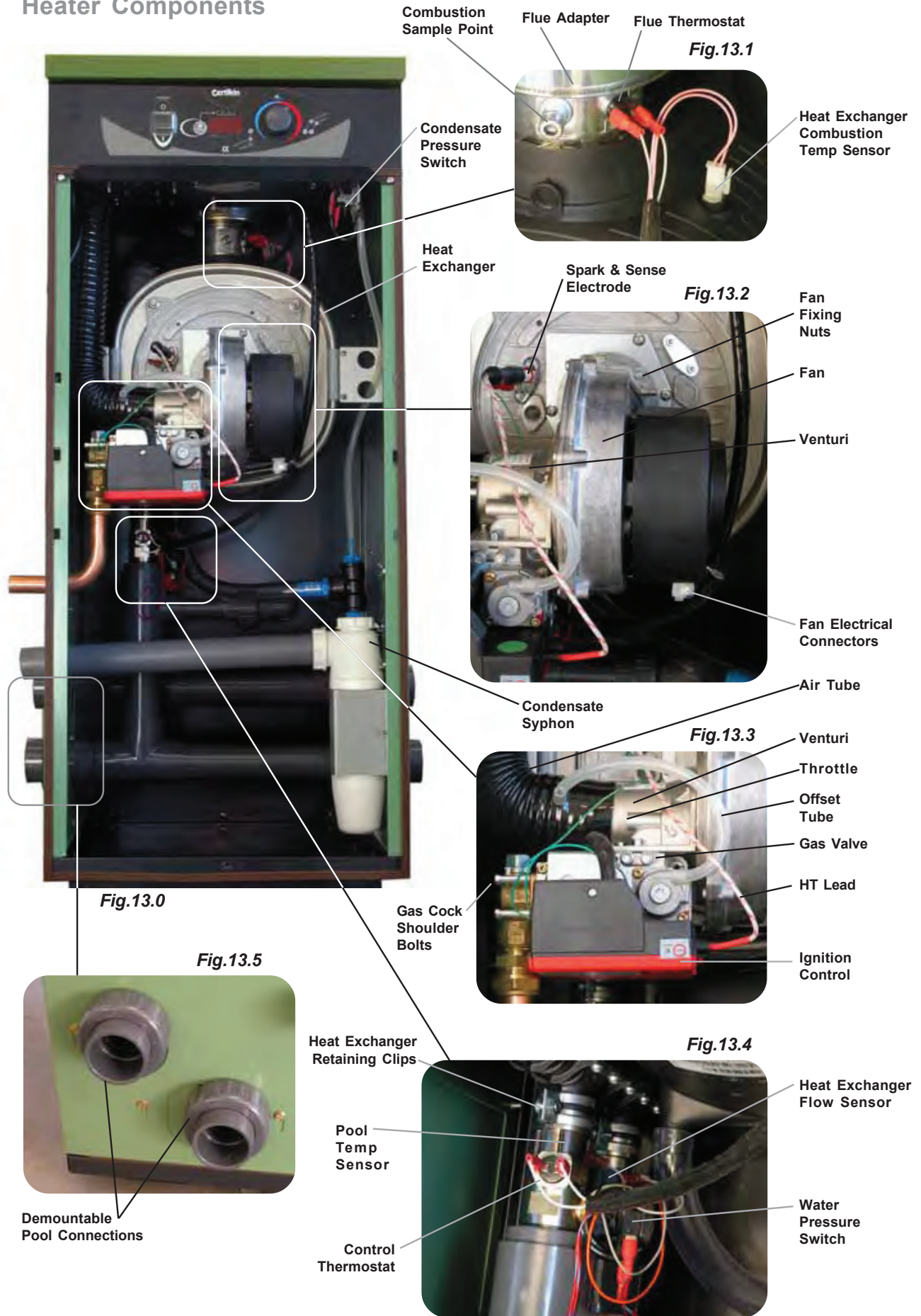


Fig. 12.0

# Heater Components



Combustion Sample Point  
Flue Adapter  
Flue Thermostat  
**Fig.13.1**

Heat Exchanger Combustion Temp Sensor  
Heat Exchanger  
Condensate Pressure Switch

Spark & Sense Electrode  
**Fig.13.2**  
Fan Fixing Nuts  
Fan  
Venturi  
Fan Electrical Connectors

Air Tube  
Condensate Syphon  
**Fig.13.3**  
Venturi  
Throttle  
Offset Tube  
Gas Valve  
HT Lead  
Ignition Control

**Fig.13.0**

**Fig.13.5**

Heat Exchanger Retaining Clips  
Pool Temp Sensor  
Control Thermostat  
**Fig.13.4**  
Heat Exchanger Flow Sensor  
Water Pressure Switch

Demountable Pool Connections