

GLEDHILL GULFSTREAM II CFI SPECIFICATION

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IMPORTANT NOTICE

Any installation must be in accordance with the relevant requirements of the current issue of Gas Safety (Installation and Use) Regulations, Local Building Regulations, the Building Standards (Scotland) Consolidation, I.E.E. Wiring Regulations, Local Water Company Byelaws and Health & Safety Document No. 635 - The Electricity at Work Regulations 1989. Detailed recommendations are contained in the current issue of the following British Standards and codes of practice :-

BS 7593: 1992; BS 5440 Pts. 1 & 2; BS 5449;
BS 5546; BS 6700; BS 6798; BS 6891 and BG DM2.

Gas Consumer Council

The Gas Consumer Council (GCC) is an independent organisation which protects the interest of gas users. If you need advice, you will find the telephone number in your local telephone directory under Gas.

GENERAL

Details of essential features of cupboard design are given in BS 6798.

This information is provided to assist generally in the selection of equipment. Responsibility for selection and specification of our equipment must, however, remain that of our customers and any experts or consultants concerned with the installation(s).

**PLEASE NOTE THAT WE DO NOT
THEREFORE ACCEPT ANY
RESPONSIBILITY FOR MATTERS OF
DESIGN SELECTION OR SPECIFICATION,
FOR THE EFFECTIVENESS OF AN
INSTALLATION OR UNIT CONTAINING
ONE OF OUR PRODUCTS.**

All goods are sold subject to our Conditions of Sale which are set out in the Appendix to this Specification.

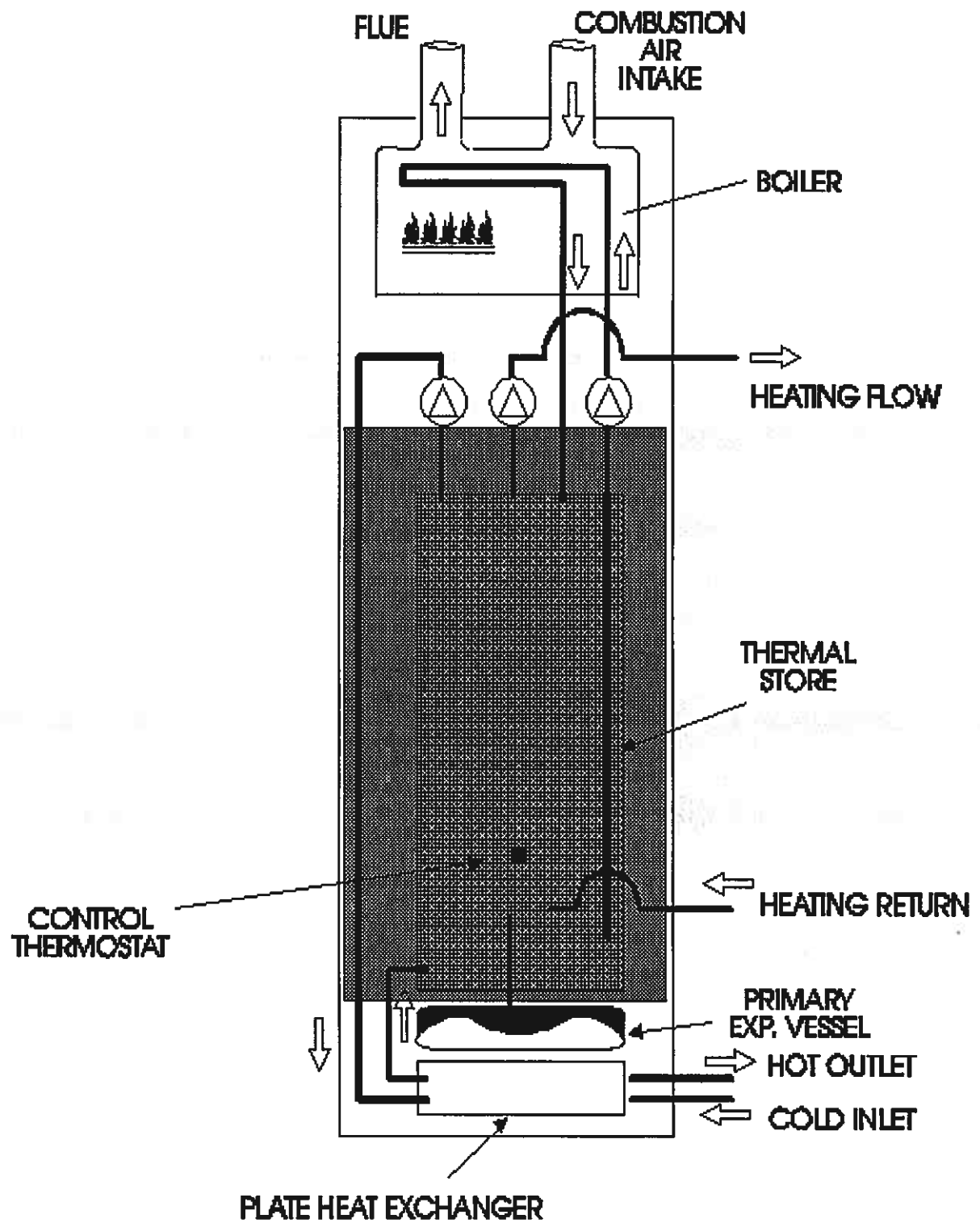
WARNING

The GulfStream is for use on natural gas only and must not be used on any other gas.

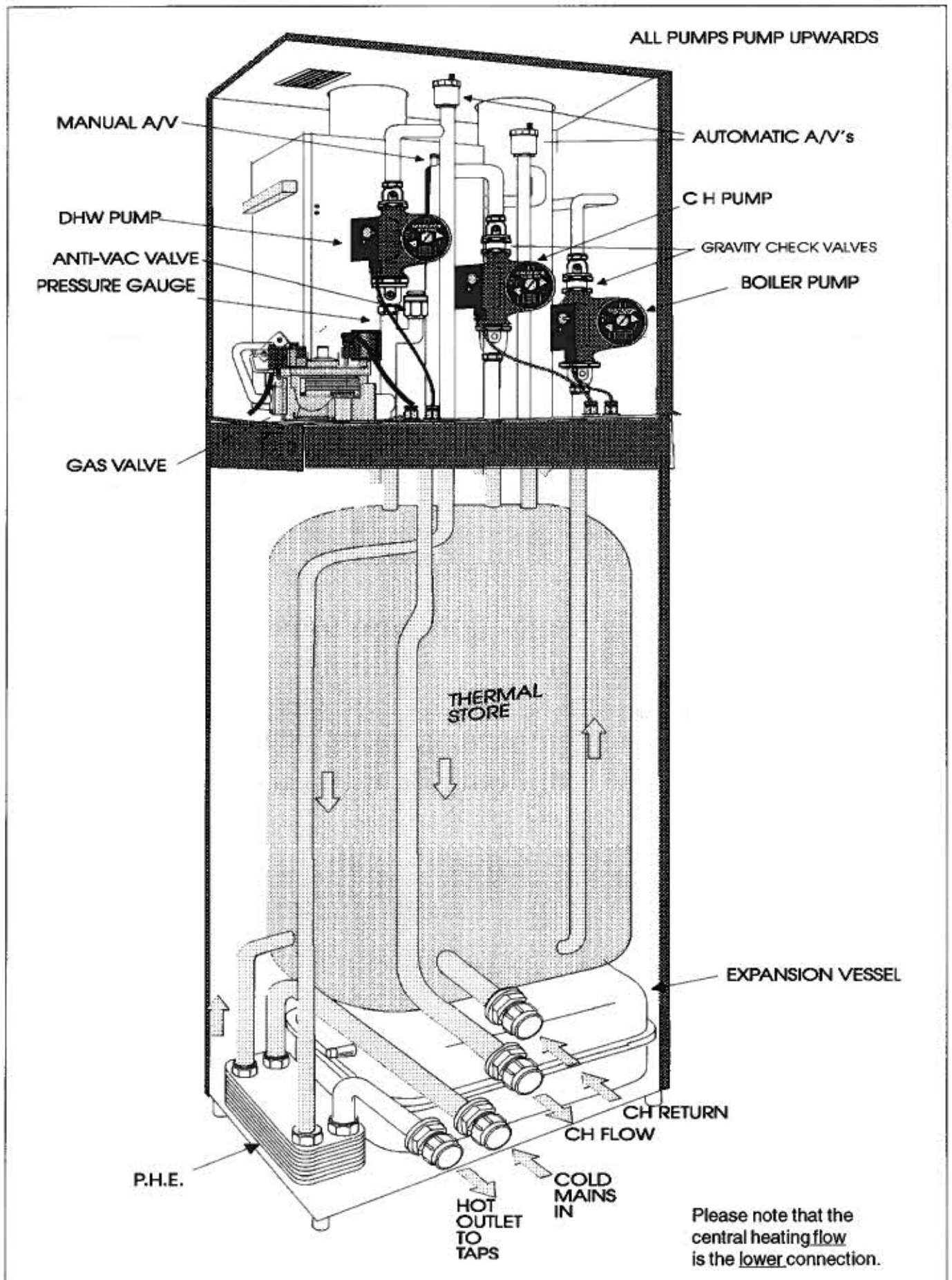
**A WBS APPROVED PRODUCT
DEVELOPED IN CONJUNCTION WITH
BRITISH GAS PLC**

BRITISH PATENT NOS.
BRITISH PATENT APPLICATIONS
PUBLISHED UNDER NOS: 9418928.9
9508872.0
2272105A

DESCRIPTION



DESCRIPTION



DESCRIPTION

INTRODUCTION

GulfStream is a fully automatic gas fired, open flued heated thermal store appliance for supplying sealed system wet central heating and mains pressure hot water for dwellings with a design heat loss of up to 8kW or 15kW depending on the model. The principle is to separate the heat generator (i.e. the boiler) from the heat emitters (i.e. the radiators and the domestic hot water generator) by a thermal store. This evens out the fluctuating demands for heating and hot water and significantly improves the system efficiency.

An important feature of this design is that domestic hot water can be supplied directly from the mains without the need for additional safety controls in the DHW supply. This is achieved by passing the mains water through a high performance plate heat exchanger. The outlet temperature of the domestic hot water is maintained by a printed circuit board which controls the speed of the pump which circulates primary hot water from the thermal store through the primary side of the plate heat exchanger.

All models feature a fully automatic ignition system incorporating an intermittent pilot.

TECHNICAL DATA

8 CFI/100 8 CFI/100L

Nominal heat input	13.5kW (46,060 Btu/h)
Nominal heat output	10.6kW (36,070 Btu/h)
Maximum Central Heating Load	8.0kW (27,300 Btu/h)
Inlet Pressure	20mbar (8in.wg)
Burner Pressure	11.8mbar (4.7in.wg)
Burner Injector	Bray CAT 23/1050
Burner	Aeromatic 10 x 12
Gas Control	SIT Nova 0822117
Pilot Assembly	SIT OP 9013
Ignition PCB	Pektron AFF/0342G132
Gas Rate after 10	21.4l/m (45.4ft ³ /hr)
Overall Height	1960mm (77.2in) 100 model 1500mm (59 in) 100L model
Overall Width	385mm (15.2in) 100 model 600mm (23.6 in) 100L model
Overall Depth	585mm (21.6in) 100 model
Weight empty	90 kg (198 lb)
Weight full	190 kg (419 lb)
Flue socket diameter	125mm (5 in)
Thermal store volume	100 l (22 gal)
Flue prods.m ³ /sec(ft ³ /min)	0.013 (28.2) 3.5% CO ₂ 75°C

15 CFI/100 15 CFI/135

22.5kW (76770 Btu/h)
18.0kW (61416 Btu/h)
15.0kW (51180 Btu/h)
20 mbar (8in. wg).
14.5 mbar (5.8in. wg).
Bray CAT 23/1600.
Aeromatic 10 x 12.
SIT Nova 0822117
SIT OP 9013
Pektron AFF/0342G132
35.73 l/m (75.03ft ³ /hr)
1960mm
385mm (100 l model)
465mm (135 l model)
585mm
90 kg (100 l model)
100 kg (135 l model)
190 kg (100 l model)
235 kg (135 l model)
125mm
135 l
or 100 l
0.019 (40.3)
4.4% CO ₂ 91°C

Another important feature of the system is that because the thermal store acts as a buffer between the boiler and the heating system, any variety of space heating control systems can be used, although the primary water circulating pump is an integral part of the appliance.

Clearances required for installation and servicing:

Top 300mm (12in) (except lowline model 100mm 4 in)

Base Nil floor standing

Rear Nil

Left Hand Side 13mm (1/2in) from door jamb

Right Hand Side 200mm (8in)

Front 15mm (1/2in) Installed (600mm) (24in) for servicing.

MINIMUM INTERNAL CUPBOARD DIMENSIONS

Appliance Type	Width mm	Depth mm	Height mm
8 CFI/100	600	600	2286
8 CFI/100L	815	600	1600
15 CFI/100	600	600	2286
15 CFI/135	680	600	2286

Domestic Hot Water Pressure/Flow

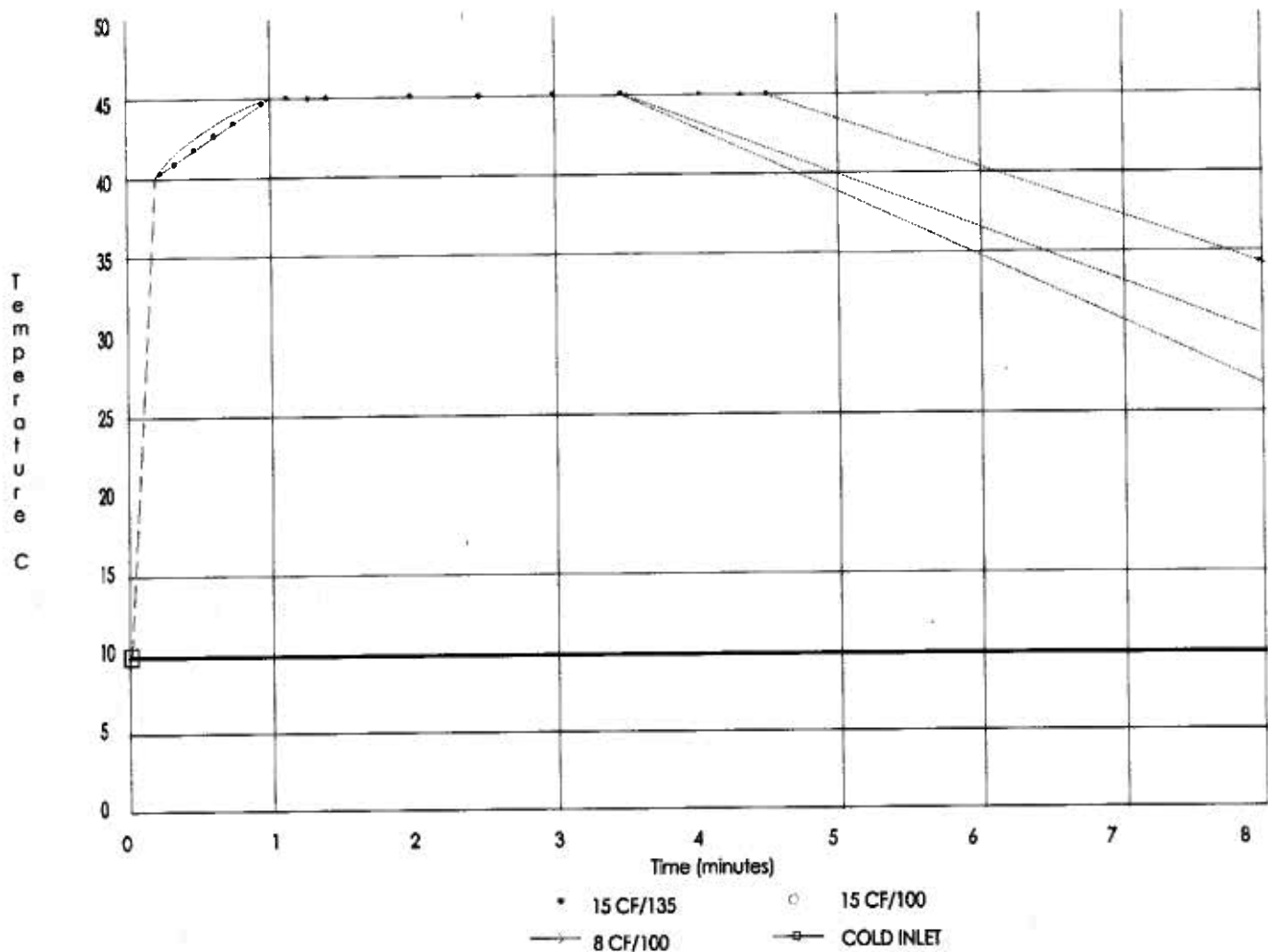
Characteristics:

Minimum flow to operate 2.5 l/min.

Minimum inlet pressure to obtain nominal flow rate 2 bar dynamic.

GULFSTREAM II DHW PERFORMANCE

Outlet temperature v time @ 27 l/min.



GAS SUPPLY

1. The Local Gas Region should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas.
2. An existing service pipe **MUST NOT** be used without prior consultation with the Gas Supplier.
3. A gas meter can only be connected by the Gas Supplier or by a Gas Supplier Contractor.
4. An existing meter should be of sufficient size to carry the maximum boiler input plus the demand of any other installed appliance, (BS 6891 : 1988). See section Technical Data for the gas required for each specific model.
5. A minimum of 22mm diameter pipework to within 1 metre of the appliance gas cock should be fitted.
6. The governor at the meter must give a constant outlet pressure of 20mbar (8in wg) when the appliance is running.
7. The gas supply line should be purged. **WARNING:** before purging open all doors and windows, also extinguish any cigarettes, pipes, and any other naked lights.

8. The complete installation must be tested for gas soundness.

ELECTRICAL SUPPLY

1. The mains supply required is 230V 50 Hz fused at 3A, via a fused double pole isolator with a contact separation of at least 3mm in both poles.
2. This should be a permanent connection to the fixed wiring of the system.
3. There must be only one common isolator for the boiler and its control system, and it must provide complete electrical isolation.
4. The power supply cable to the appliance should be at least 0.75mm² (24 x 0.2mm²) PVC heat resistant, as specified in table 16 of BS 6500.
5. All external wiring to the boiler must be in accordance with the latest I.E.E. Wiring Regulations, and any local regulations which apply.
6. The appliance must be earthed.

DESCRIPTION

7. In the event of an electrical fault after installation of the appliance, preliminary electrical systems checks must be carried out i.e. Earth Continuity, Short Circuit, Polarity, and Resistance to Earth.

8. All fuses must be ASTA approved to BS 1362.

APPLIANCE LOCATION

The following limitations **MUST** be observed when siting the boiler:

1. This appliance **MUST NOT** be installed in a room containing a bath or shower. Only the 8kW unit may be installed in a bedroom, and it must be in a compartment, in accordance with Gas Safety in Use Regulations (1995).
2. The boiler is not suitable for external installation. The position selected for installation should be within the building, unless otherwise protected by a suitable enclosure, and **MUST** allow adequate space for installation, servicing, and operation of the appliance, and for air circulation around it.
3. This position **MUST** allow for the flue and air inlet system to be fitted in its correct position, ensuring that any ceiling joists directly above the appliance in a position which would prevent either duct from exiting vertically upwards can be trimmed.
4. The boiler must be installed on a flat surface which is capable of supporting the weight of the appliance and any ancillary equipment.
5. If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations Timber Frame Housing', Reference DM2. If in doubt, advice must be sought from the Local Gas Region.
6. A compartment used to enclose the appliance **MUST** be designed and constructed specifically for this purpose. An existing cupboard, or compartment, may be used provided it is modified accordingly. BS 6798 gives details of the essential features of cupboard/compartment design, including airing cupboards.

FLUE

The appliance is classed as a Type B_{11BS} boiler intended to be connected to a flue evacuating the combustion products to outside from the compartment. The combustion air is drawn into the appliance from the roofspace.

8 & 15kW appliances: the roofspace.
(see page 8 for ventilation requirements).

1. The primary flue system, the air intake and the draught diverter are all supplied with the appliance. The protective shield (disc) must always be fitted on the primary flue 100mm below the draught diverter.
2. The secondary flue system is to be supplied by the installation engineer.
3. The flue outlet is suitable for connection 125mm bore flue pipe conforming to BS 715.
4. The flue installations and termination must comply with the requirements of BS 5440 : 1.
5. Although the draught diverter makes the combustion performance independent of conditions in the secondary flue an efficient flue is necessary to ensure trouble free operation.
6. No additional add-on devices (e.g. flue dampers) must be fitted to the appliance.
7. If a previously used chimney or flue is used then it must be swept. The chimney should be lined. Check the flue system efficiency before installing GulfStream.
8. The flue should rise vertically towards its terminal; horizontal runs of flue pipe and right angle bends must be avoided. A minimum equivalent vertical length of flue above top of GulfStream draught diverter is 1 metre (39 in).

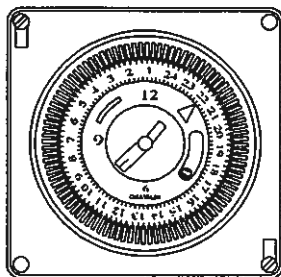
When installing the flue pipes adequate safeguards must be taken to protect combustible materials (i.e. roof felt, electrical cables, wooden joists and loft insulation).

GULFSTREAM II CF. MODEL SELECTION DATA

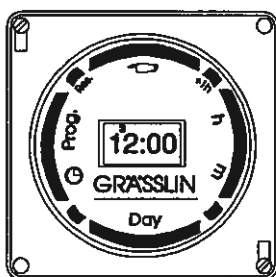
MODEL	MAX HEAT LOSS	PROPERTY SIZE OF UNIT W D H	MIN CUPBOARD SIZE W D H	HOT WATER FLOW RATE L/MIN	WEIGHT FULL KG	PROPERTY TYPE GUIDE UP TO	TAPPINGS
8 CF/100	8kW	385X585X1960	600X600X2286	35	190	3 bedroom, one bathroom plus en-suite shower	1/2" BSPF expansion relief. BS21 gas cock. Htg flow and return cold mains and hold draw off all 22mm compression
8 CF 100L	8kW	600X600X1500	815X600X1580	35	190	3 bedroom, one bathroom plus en-suite shower	
15 CF/100	15kW	385X585X1960	600X600X2286	35	190	4-5 bedroom, one bathroom plus en-suite shower	
15 CF/135	15kW	465X585X1960	680X600X2286	35	230	4-5 bedroom, two bathrooms plus en-suite shower or one bathroom plus two en-suite showers	
The flow rates quoted in the chart above assume normal dynamic water pressures and adequate flow to property and are the mixed flow temperature to give a 35° C rise.							

ORIGINAL SPECIFICATION OPTIONS

View of the two clocks



ELECTRO-MECHANICAL
CLOCK



DIGITAL
CLOCK

TO PROGRAMME THE CENTRAL HEATING AND LIGHTING INSTRUCTIONS.

SEE THE INSTRUCTIONS ON THE INSIDE OF THE
TOP SIDE PANEL.

1. If specified the appliance may be supplied with two single on/off switches. These will be the water on/off switch and a heating on/off in place of the timer. This option allows the installation engineer to fit an external (remote) timer of either single or double channel. Single channel will control the heating only. Double channel will control the appliance and the heating. This could then be set to prevent the thermal store being topped up over night or when the property is un-occupied. It should be noted that for the heating to work the water switch must be switched on.

* If an external clock is fitted it **MUST** include an override.

DESCRIPTION

VENTILATION 8 & 15kW

The appliance is designed to be installed in a cupboard with both the air inlet and the draught diverter situated in the roof space above the cupboard. The appliance draws air from the roof space for combustion, therefore it is necessary to ensure the roof space is adequately ventilated with a plentiful supply of air. In new properties the ventilation of the roof space must meet the requirements stated in the Building Regulations. In the case of existing properties the minimum free area to be provided shall be $9\text{cm}^2/\text{kW}$ of the appliances maximum rated gas input as required by Table 2 of BS5440 Part 2. Two vents each of this area shall be provided at low level in the gable walls or through the eaves at opposite ends of the building in line with the flue/air inlet location to ensure adequate cross ventilation is provided. The following notes are for general guidance.

The compartment must meet the following requirements:

1. The compartment must be large enough to allow it and the appliance to be inspected and serviced. A minimum width between the door jambs of 595mm for the 100 litre store.
2. All surfaces within 75mm of appliance shall be non-combustible or lined with non combustible material.
3. Be fitted with permanent air vents in the cupboard or compartment, at high level and at low level, direct to the room. Both high and low level air vents must communicate with the same room. Each vent must have a minimum free area of 65cm^2 . Air vents must not communicate with a garage or bathroom.
4. As an alternative to the above the space between the primary flue and the flue sleeve can be used to provide the high ventilation as long as a duct is also provided from the roof space to provide the low level ventilation requirements. The duct must have a minimum free area of 65cm^2 and be constructed from a suitable non-flammable material
5. The door of an understairs cupboard must have a BS 476:Part 8 fire resistance of not less than 0.5h and air vents must be direct to outside air.

These minimum areas must be provided to ensure safe operation of the appliance.

Note : Both air vents must communicate with the same room or internal space which must not be a bathroom. The 15 model may not communicate with a bedroom or bed sitting room. Air vents must not incorporate fly screens or any material which may restrict the free passage of air.

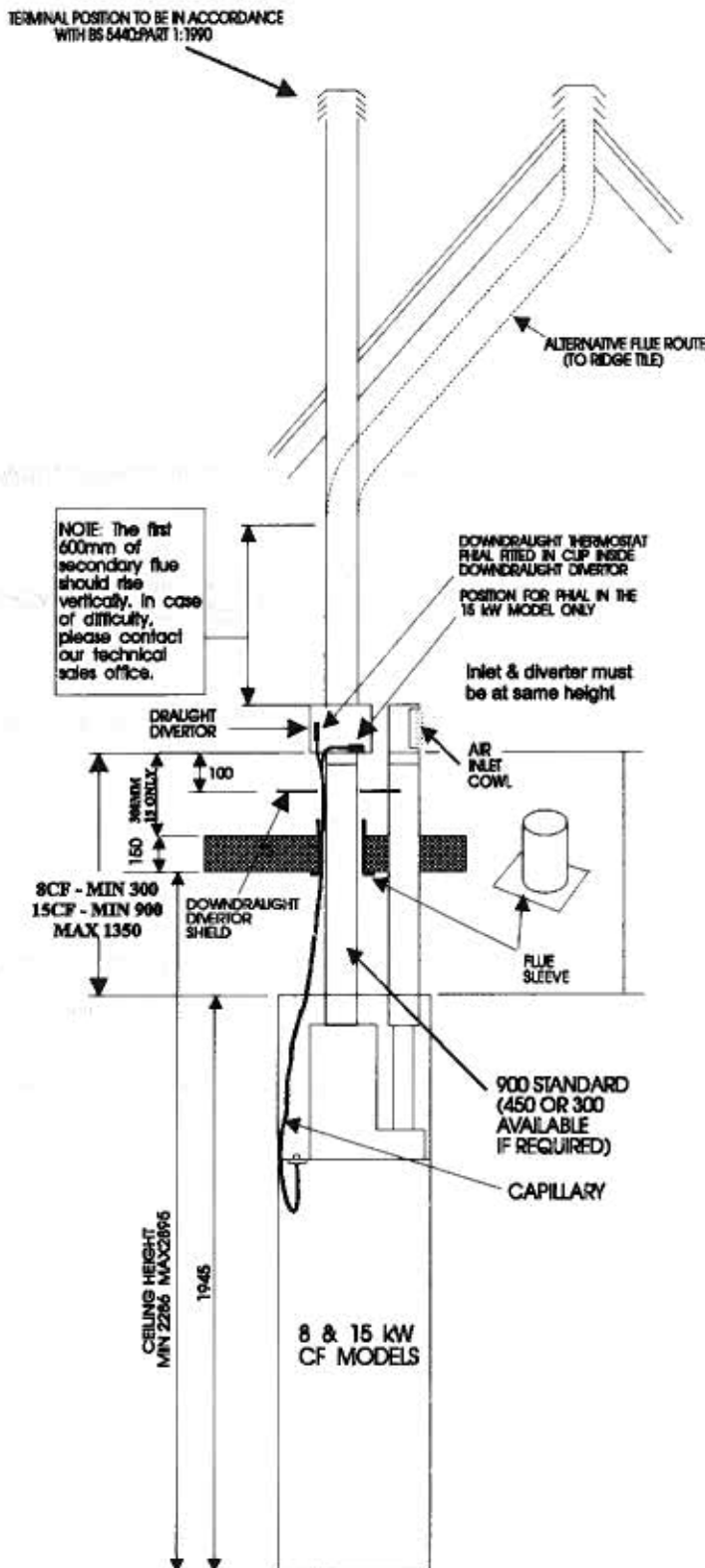
Further guidance is given in BS 6798 and BS 5540: Part 2 and Gas Safety in Use Regulations (1995).

LOWLINE MODEL

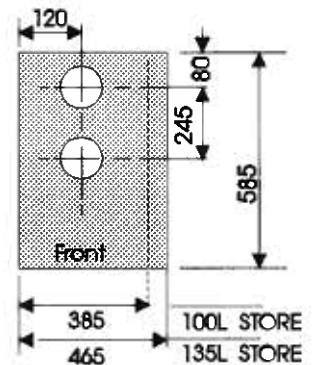
For cases where height is limited the 8CF/100L Lowline unit has been developed. In general the Design, Installation and Servicing Instructions for the standard models apply to the Lowline model.

If necessary a plinth must be constructed on which the appliance can be mounted in order to meet the flue and air duct dimensional requirements. This plinth **MUST** be of sufficient strength to support the weight of the appliance full of water and **MUST** be located so as not to restrict the low level grills in the door of any cupboard enclosing the appliance

Fig 3 Side view showing flue system - primary & secondary flues.



Plan view of flue positions

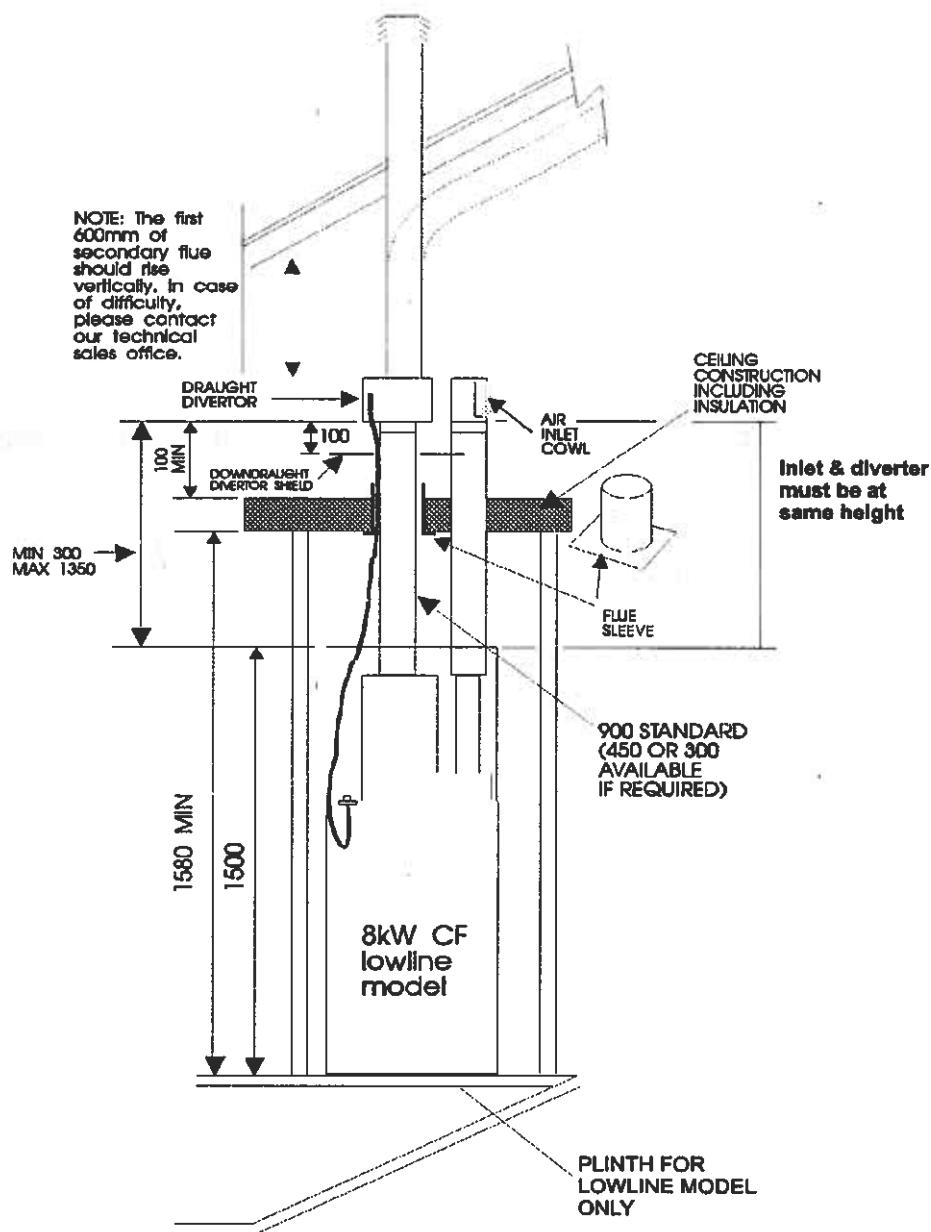


CEILING HEIGHT MIN 2286 MAX 2895	FLUE KIT FOR 8 & 15 STD STD + EXT. KITS
1 METRE (MIN) SECONDARY FLUE IS REQUIRED IN ALL INSTALLATIONS ON ALL APPLIANCES	
NOTE: 13mm clearance is required on the left hand side of the appliance	

Please note particularly the dimensions of the primary flue which require the draught diverter/air inlet cowl to be located a minimum of 300mm above the ceiling construction/insulation and a minimum primary flue length of 900mm.

SYSTEM DESIGN

Fig 3a Side view showing flue system-primary & secondary flues.



Please note particularly the dimensions of the primary flue which require the draught diverter/air inlet cowl to be located a minimum of 100mm above the ceiling construction/insulation and a minimum primary flue length of 300mm.

DOMESTIC HOT WATER SYSTEM MAINS WATER SUPPLY

1. GulfStream models are designed to be fed directly from mains. They fulfil the requirements of Water Byelaw 91, and therefore **do not require a check valve** to be fitted to the supply pipe. The performance of the GulfStream is directly related to the adequacy of the cold supply to the dwelling. This must be capable of providing for those services which could be required simultaneously and the maximum demand should be calculated. GulfStream will operate at pressures as low as 1 bar which must be available when local demand is at its maximum, but the preferred range is upwards of 2 bar. As a general guideline, although a 15mm service may be sufficient for the smaller dwelling with one bathroom, a 22mm service is preferred (25mm MDPE) and should be the minimum for larger dwellings, and properties above two storeys.

If a water meter is fitted in the service pipe, it should have a nominal rating to match the anticipated maximum simultaneous hot and cold water demand, calculated in accordance with BS 6700. This could be 50 litres per minute in some properties.

If the incoming static mains water pressure exceeds 8 bar at any point in the 24 hour cycle then a pressure limiting valve set at 5 bar should be fitted downstream of the stop tap where the cold supply enters the property. Units must be fitted strictly in accordance with the requirements of the Local Water Undertaking who should be consulted prior to installation. In the event of any difficulty please contact us as the manufacturer. Equipment used in the system should be suitable for a working pressure of 8 bar.

A non return valve is not required. Should ancillary equipment, requiring a non-return valve, be fitted to the same mains supply as the GulfStream, then this valve must not be fitted between the inlet of this mains supply to the house and the GulfStream.

2. No safety fittings are required on the secondary system.

USE IN HARD WATER AREAS

A patented control system prevents domestic water from exceeding 55°C for most of the operational time of the appliance.

IT IS NOT NECESSARY TO FIT ANY FORM OF SCALE INHIBITING EQUIPMENT IN THE DOMESTIC COLD SUPPLY TO THE APPLIANCE.

If it ever becomes necessary the plate heat exchanger is easily isolated and replaced with a service exchange unit.

COLD & HOT WATER DISTRIBUTION SYSTEM

1. Although a 15mm copper supply may be adequate for the smaller 1 bathroom dwelling, a 22mm (25mm MDPE) supply is preferred where possible to make best use of this appliance.

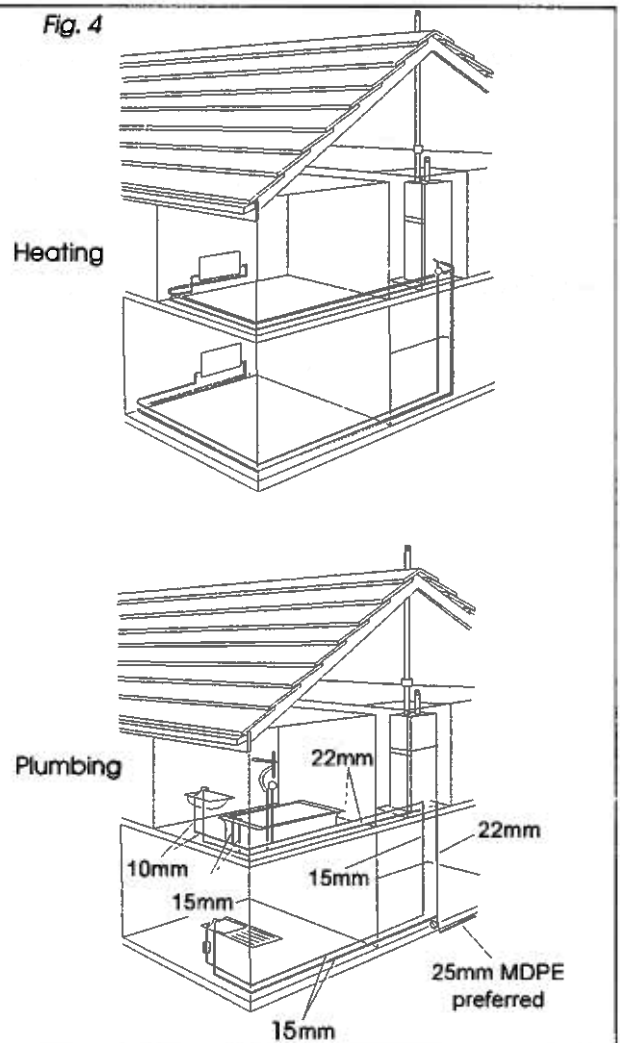
2. Internally run in 22mm copper to the GulfStream and from the GulfStream in 22mm past the hot draw-off to the bath.

3. All the tee-offs to the outlets should be in 10mm except for the bath, showers and sinks. See fig. 4.

4. Alternatively, tee-offs to terminal fittings in existing property can easily be fitted with flow restrictors to balance the simultaneous demand (see page 38 for details).

5. The hot water supply to a shower mixing valve should be an independant branch fed directly from the GulfStream and preferably should be the first draw-off point on the circuit. The cold water supply to a shower mixing valve should be fed directly from the rising main and should be the first draw-off point on the cold circuit.

Fig. 4



SYSTEM DESIGN

TERMINAL FITTINGS

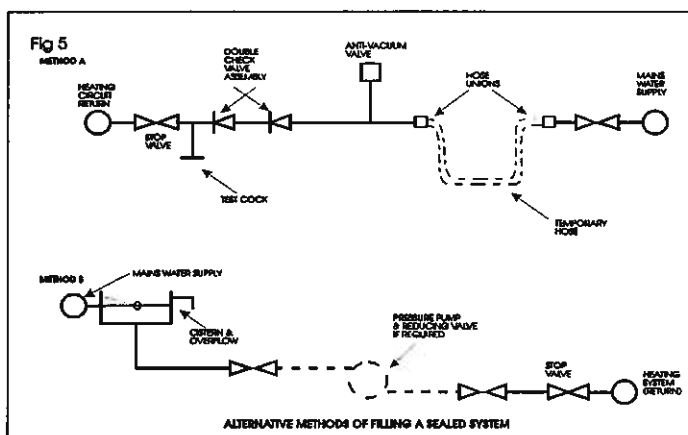
1. Hot and cold taps and mixing valves used with this appliance must be suitable for operating at 10 bar.
2. Any type of shower mixing valve can be used as long as both the hot and cold supplies are mains fed. However, **PRESSURE COMPENSATING** shower mixing valves are proven to give better control when more than one fitting are open simultaneously and are therefore **STRONGLY RECOMMENDED**. Thermostatic versions are preferable.
3. No back syphonage arrangements are necessary with fixed head showers.
4. If a loose head shower with flexible hose is to be used over a bath then the hose must be fixed so that the head cannot fall closer than 25mm above the top edge of the bath. Alternatively, the shower must incorporate or be fitted with an back-syphon device at the point of flexible hose connection.
5. Balancing is best achieved by fitting appropriate flow regulators to each hot and cold outlet.
6. The supply of hot and cold mains water direct to a bidet is permitted, provided that this is of the **over-rim flushing type** and that a type 'A' air gap is incorporated.

SPACE HEATING SYSTEM

The design heat losses for the property will need to be calculated. We would recommend that the method for heat loss calculations, radiator and boiler sizing contained in BS 5449: 1990 is used and compared to the maximum central heating load listed in Technical Data on page 4. Allowances for domestic hot water requirements have been built into the difference between the nominal heat output and maximum central heating load figures on the following basis:

- 8 CF/100 - 1 bathroom plus one en-suite shower
- 15 CF/100 - 1 bathroom plus one en-suite shower
- 15 CF/135 - 2 bathrooms plus one en-suite shower or 1 bathroom and two en-suite showers.

If large baths or extra bathrooms are required please seek guidance from Technical Sales Department.



In the interests of fuel economy and maximising the domestic hot water supply, the total output of the radiators installed must not exceed the maximum central heating load (under design conditions) for the appliance as stated in the Technical Data section.

HEATING SYSTEM

The installation must comply with the requirement of BS 6798 and BS 5449. Maximum water temperature is 82°C +/- 3°C.

The appliance is supplied with the flow and return connections terminating in compression fittings (22mm).

The appliance also incorporates the following components:-

Heating Pump- on the flow from the store.

Expansion Vessel - 20 litres, pre-charged to 1.0 bar

Pressure Gauge- 0 to 4 bar

Expansion Relief Valve - set to operate at 3 bar.

At least one flushing valve should be fitted at the lowest point in the system to enable the water system to be drained.

If the appliance is the highest point on the heating system a manual air vent is provided above the heating pump. However, if any point of the heating system is higher than the appliance we would recommend that an automatic air vent is fitted at the highest point in the system.

The appliance is designed for connection to sealed central heating water systems. Fig. 4. shows a typical system design.

To prevent gravity circulation in the heating system a gravity check valve is provided in the vertical heating flow pipe above the pump.

If all the radiators are provided with thermostatic valves a suitable by-pass should be fitted as normal on the heating circuit.

A sealed system must only be filled by a competent person using one of the approved methods shown in Fig. 5. The system should incorporate the connections appropriate to one of these methods.

METHOD OF MAKEUP: Water loss from the system should be replaced from a makeup vessel connected to the system through a non return valve on the return side of the heating circuit. This vessel should be higher than the top of the system (Method B).

Alternatively provision for makeup can be made by pre-pressurisation of the system via a temporary hose connection and through a double check valve and stop valve (Method A).

FILLING: There shall be no permanent connection to the mains water supply, even through a non return valve, without the approval of the Local Water Authority.

EXPANSION VESSEL REQUIREMENTS

Vessel Charge	bar	1	1.5
	psi	14.5	21.8
Total water content of system, including the store (100 or 135 l), using 20 litre (4.4 gal) capacity expansion vessel supplied with appliance	litre	183	128
	gal	40	28
For systems having a larger capacity multiply the total system capacity in litres (gallons) by the factor to obtain the total minimum expansion vessel capacity required litres (gallons)		0.11	0.16

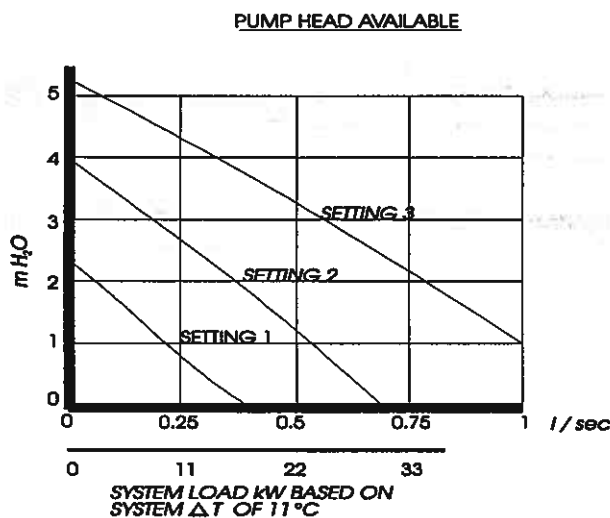
In normal circumstances a pressure of 1.2 bar is suitable for most domestic properties.

The minimum system pressure should be not less than the static head, (the height of the highest point in the system above the expansion vessel plus a margin of 0.5 bar).

The expansion vessel has to be suitable to accommodate the change in volume of the water in the system when heated between 10°C to 110°C. See BS 5449: 1990 clause 16.2 for further information.

NOTE: If the appliance pressure gauge indicates 2.6 bar or higher with the appliance at maximum temperature and all radiators in circulation, an additional expansion vessel is required in the system.

FIG 6



CONTROL

This GulfStream is supplied with a water on/off switch which, when in the ON position, allows the boiler to heat up and maintain the thermal store at the required temperature. This will then allow the appliance to provide domestic hot water on demand. The thermal store will automatically be replenished with heat as required. The GulfStream is also supplied with a timing device (analogue or digital) which controls the central heating supply pump.

The thermostat control on the front of the appliance allows the user to adjust the thermal store temperature. This will usually be reduced during the summer months when central heating is not required. Reducing this control during the winter will control the central heating radiators at a lower temperature. Reducing this temperature control will not reduce the maximum temperature of the domestic hot water exiting the taps. Although not usually noticeable the domestic hot water temperature flowing from the tap will start to reduce at a slightly earlier stage.

Extra controls may be added to the heating system to provide a more efficient system, i.e. room thermostat (230V) and / or thermostatic radiator valves.

A feature of the GulfStream system is that, because of the thermal store, the radiators become warm within minutes of switching on the central heating pump. This rapid response means that the time clock can be set to switch on the heating approximately 10 minutes prior to requiring heat.

If the appliance has been supplied with two single on/off switches, the installation engineer will need to fit an external (remote) timer of either single or double channel. Single channel will control the heating only. Double channel will control the water and heating. This could then be set to prevent the thermal store being topped up over night or when the property is un-occupied. It should be noted that for the heating to work the water switch must be switched on. A room thermostat may also be fitted to control the central heating requirements.

INSTALLATION

UNPACKING THE APPLIANCE

The appliance will be supplied with a separate package flue kit.

8 AND 15CF APPLIANCE

1. Appliance
2. Standard Flue Kit for installations of ceiling heights Up to 2350mm
Containing: Draught diverter fitted with clip for down draught protection device.
Air inlet cowl.
Flue Sleeve.
2 x 900mm twin wall ducts (one each for flue and air).
3. Plumbing Kit
Containing: Angled union gas cock
1/2 inch drain cock
4. Additional Flue Kit for installations with a ceiling height of up to 2700mm 2 x 450mm twin wall adjustable ducts (one each for flue and air).
Additional Flue Kit for installations with a ceiling height of up to 3000mm 2 x 300mm twin wall ducts (one each for flue and air).

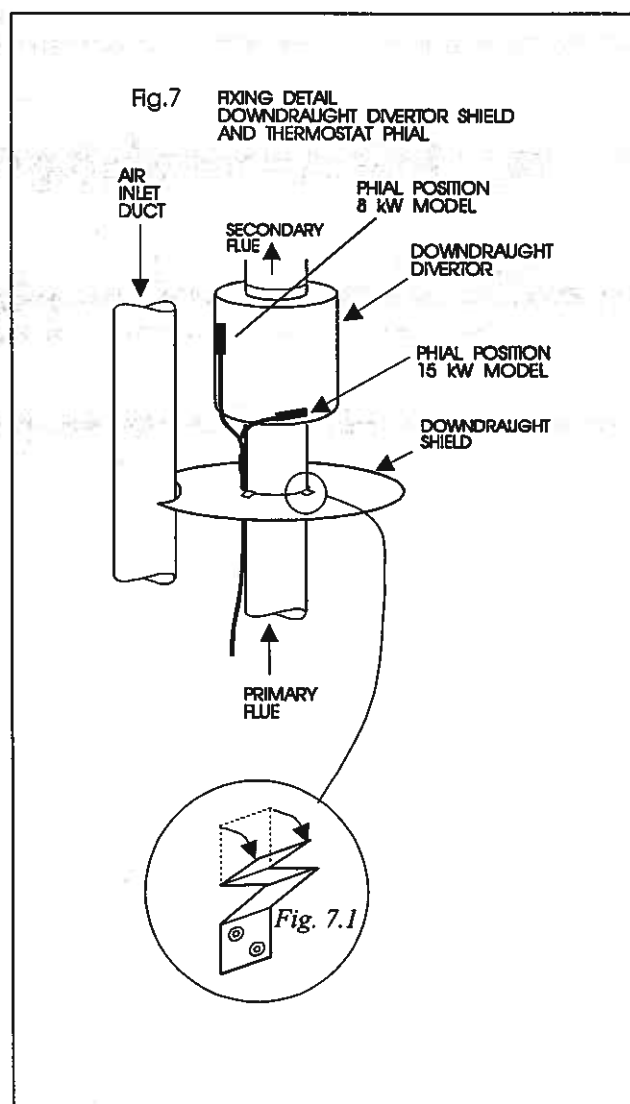
FLUE CONNECTION 8 & 15CF

Once the appliance has been positioned correctly the supplied air inlet duct, air inlet cowl, flue and draught diverter can be fitted as detailed below:

- i. Mark the position and diameter of both the flue and air ducts on the ceiling. It is important that the flue sleeve supplied with the appliance is used. It should be fitted around the flue. The annular gap connects the cupboard and the roof space making the two into one compartment as defined in the The Building Regulations Part B.
- ii. Cut the two holes in the ceiling.
- iii. Position the appliance.
- iv. The thermostat phial and the primary flue should now be passed through the hole in the draught shield. (see Fig.7). This should be carried out in the roof space. The shield should be secured to the primary flue brackets by bending the top tabs of the brackets over the shield. (See Fig. 7.1). The primary flue can now be offered into position through the hole in the ceiling into the front socket of the appliance.
- v. Fit the draught thermostat in the clip provided in the draught diverter. (see Fig 7)
- vi. The secondary flue can now be fitted. This should be correctly aligned and connected to the collar on the top of the draught diverter (See Fig 3). The flue terminal position must comply with BS 5440 part 1.

vii.) Fit the air inlet duct to the rear socket of the appliance, ensuring that it engages in the cut out in the shield, and the air inlet hole at the top of it faces away from the flue.

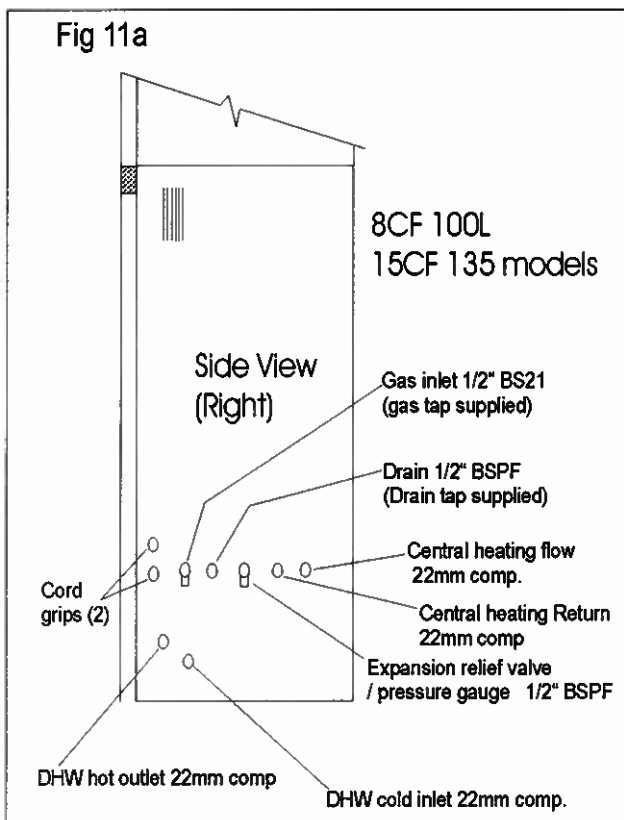
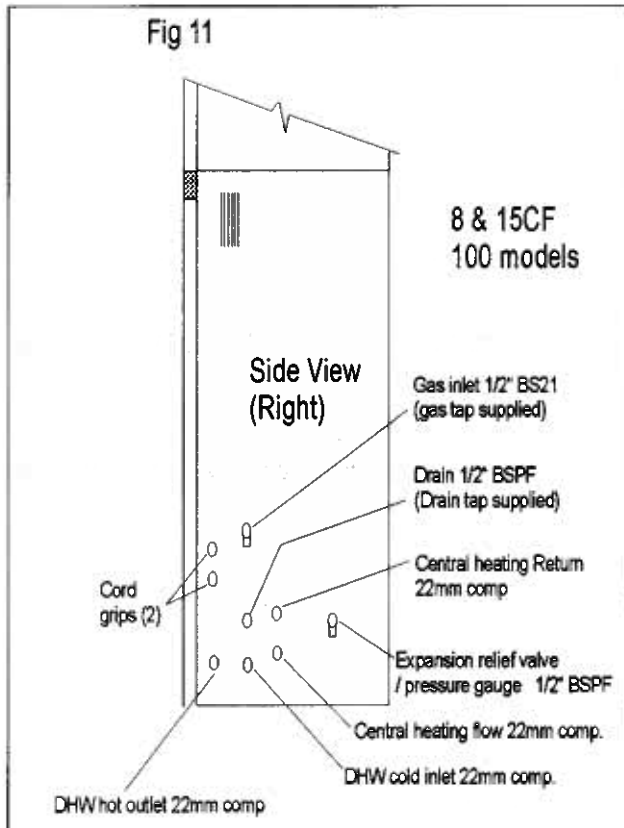
This appliance is fitted with a draught thermostat for added protection. If this thermostat should operate, and switch off the appliance, it is because the flue is under draught conditions, probably due to adverse wind conditions. It will only be possible to reset the thermostat once conditions have returned to normal. To reset the thermostat pull off the top front panel and push the small button mounted on the left hand side (see control diagram). It will be necessary to wait at least ten minutes before attempting to reset the thermostat. The draught thermostat is an **important safety device** and **must not** be put out of action or interfered with in any way. In cases of repeated or continuous shutdown a competent person should be called to investigate and rectify the condition causing this. Only manufacturers original parts should be used for replacement.



INSTALLATION

PLUMBING

All the water and gas connections are located on the right hand side of the appliance.



CENTRAL HEATING

Using 22mm copper pipework connect the appliance to the central heating system (copper compression fittings 22mm). Two stop valves should be fitted as close to the appliance connections as possible. The **flow** and **return** connections are labelled.

DOMESTIC HOT WATER

Connect the cold water supply to the appliance (copper compression fitting 22 mm). A stop valve should be fitted as close to the appliance connection as possible. Connect the DHW flow to the hot water system (copper compression fitting 22mm).

EXPANSION RELIEF VALVE

The valve should be connected to a discharge pipe which permits the safe discharge of steam and hot water such that no hazard to persons or damage to electrical components is caused. The discharge pipe must be a minimum of 15mm diameter and must not include any upward pipe runs. **NOTE.** The valve incorporates plastic components which will be adversely affected by heat. For this reason we recommend the use of compression fittings for joints adjacent to the valve.

GAS

The union gas cock is supplied as a loose item in the fitting kit. The male liner, with union nut, should be fitted to the Rc 1/2" gas inlet using an approved jointing compound. The gas cock can then be fitted and the gas supply completed. The whole gas installation including the meter should be inspected and tested for soundness and purged in accordance with the recommendations of the current issue of BS 6891.

DRAIN COCK

The 1/2" drain cock, which is supplied as a loose item in the fitting kit, should be fitted to the drain connection on the appliance using an approved jointing compound.

INSTALLATION

ELECTRICAL WIRING

**NOTE: THIS APPLIANCE MUST BE EARTHED.
A PERMANENT LIVE MUST BE CONNECTED TO
THE BOILER.**

Remove the casing upper front and side panels. These panels are removed by pulling them away at the top (off two spring pins) then lifting them up and away from the appliance.

Remove the lower front cover by first unscrewing the two screws located at the front base of the appliance. Pull the bottom outwards and allow the case to slide downwards.

Open the control box by removing the retaining screw and pulling the cover forwards.

Thread the power supply cable through one of the cable restraining glands in the lower right hand case, pass the cable up into the control box through one of the grommets and make the required connection to the terminal strip. Clamp the wire in the cable gland at the entry to the appliance. When making these connections ensure that the earth wire is made longer than the live and neutral wires (Fig. 10.)

Any external controls wiring should be passed through the other cable restraining gland in the lower right hand case, up into the control box through one of the grommets and the required connection made to the terminal strip. Clamp the wire in the cable gland at the entry to the appliance.

All electrical wiring to the appliance should be secured to prevent the wire touching any hot surfaces on the boiler.

The electrical installation must comply with the latest I.E.E. Wiring Regulations.

After installation of the appliance, preliminary electrical systems checks must be carried out, i.e. earth continuity polarity and resistance to earth short circuit.

On completion of the electrical installation the control box cover should be re-fitted and the casing lower panel re-assembled.

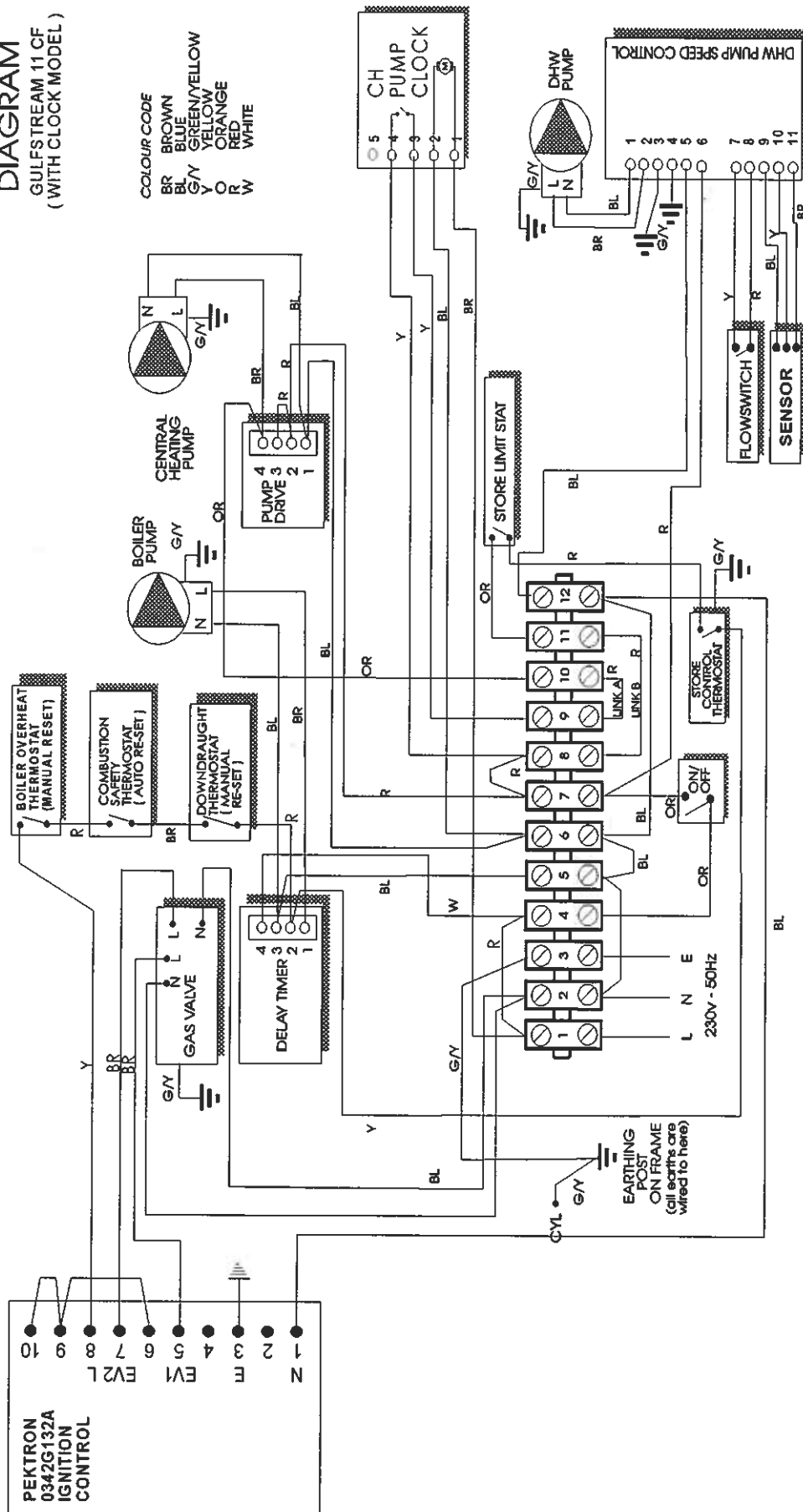
**DO NOT SWITCH ON THE ELECTRICITY
SUPPLY AT THIS STAGE.**

INSTALLATION

WIRING DIAGRAM

GULFSTREAM T1 CF
(WITH CLOCK MODEL)

COLOUR CODE
BR BROWN
BL BLUE
G/Y GREEN/YELLOW
Y YELLOW
O ORANGE
R RED
W WHITE

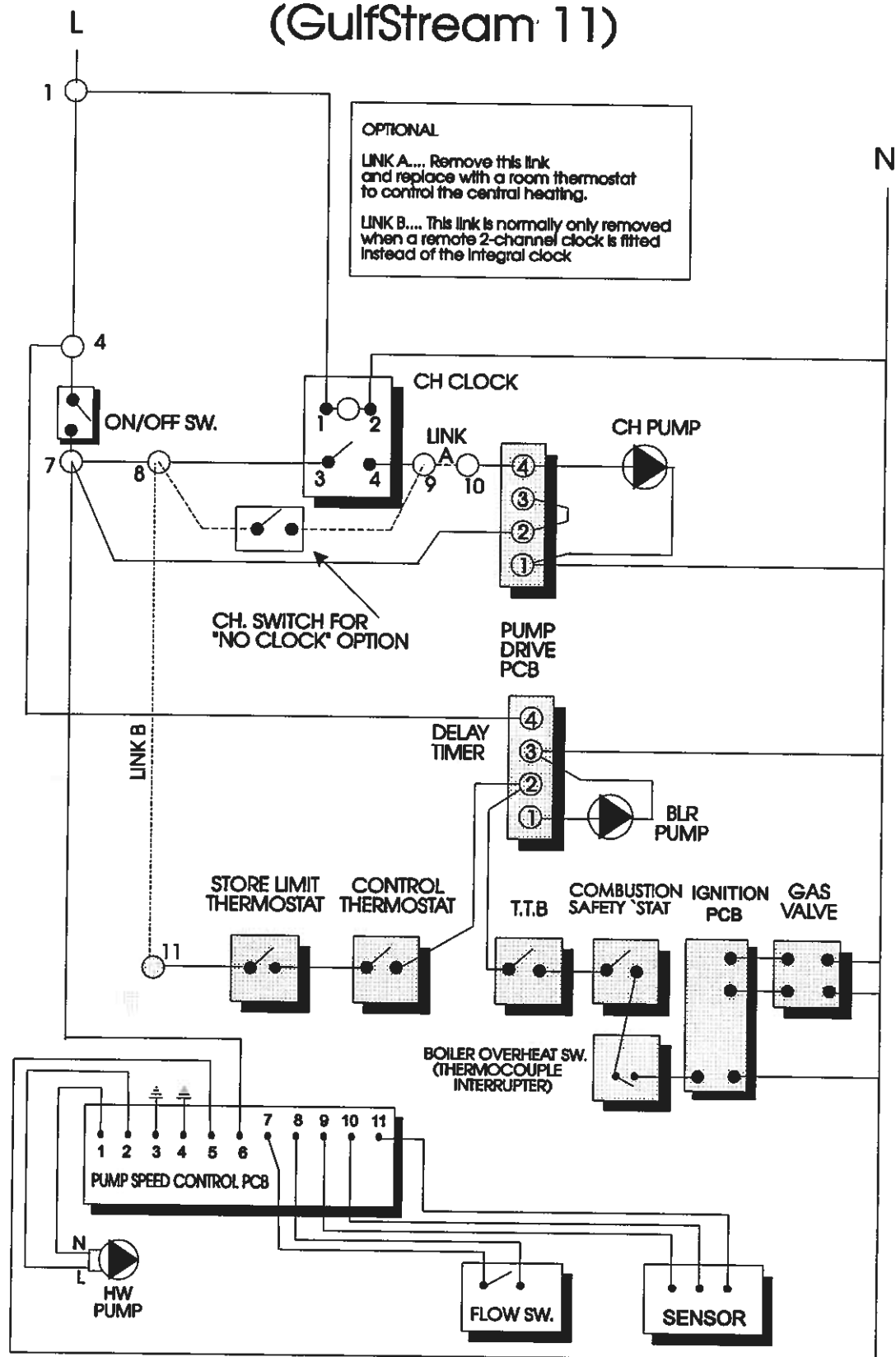


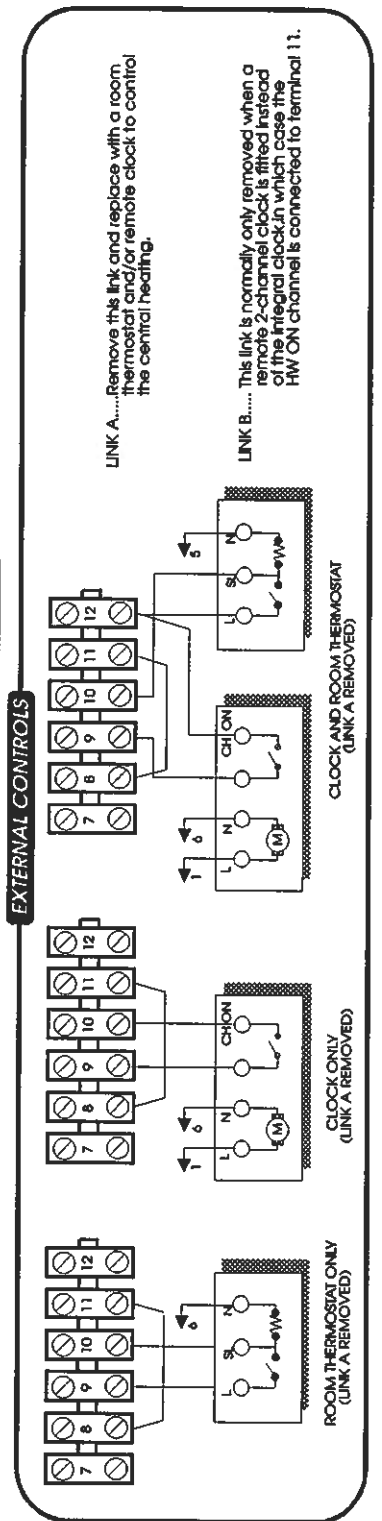
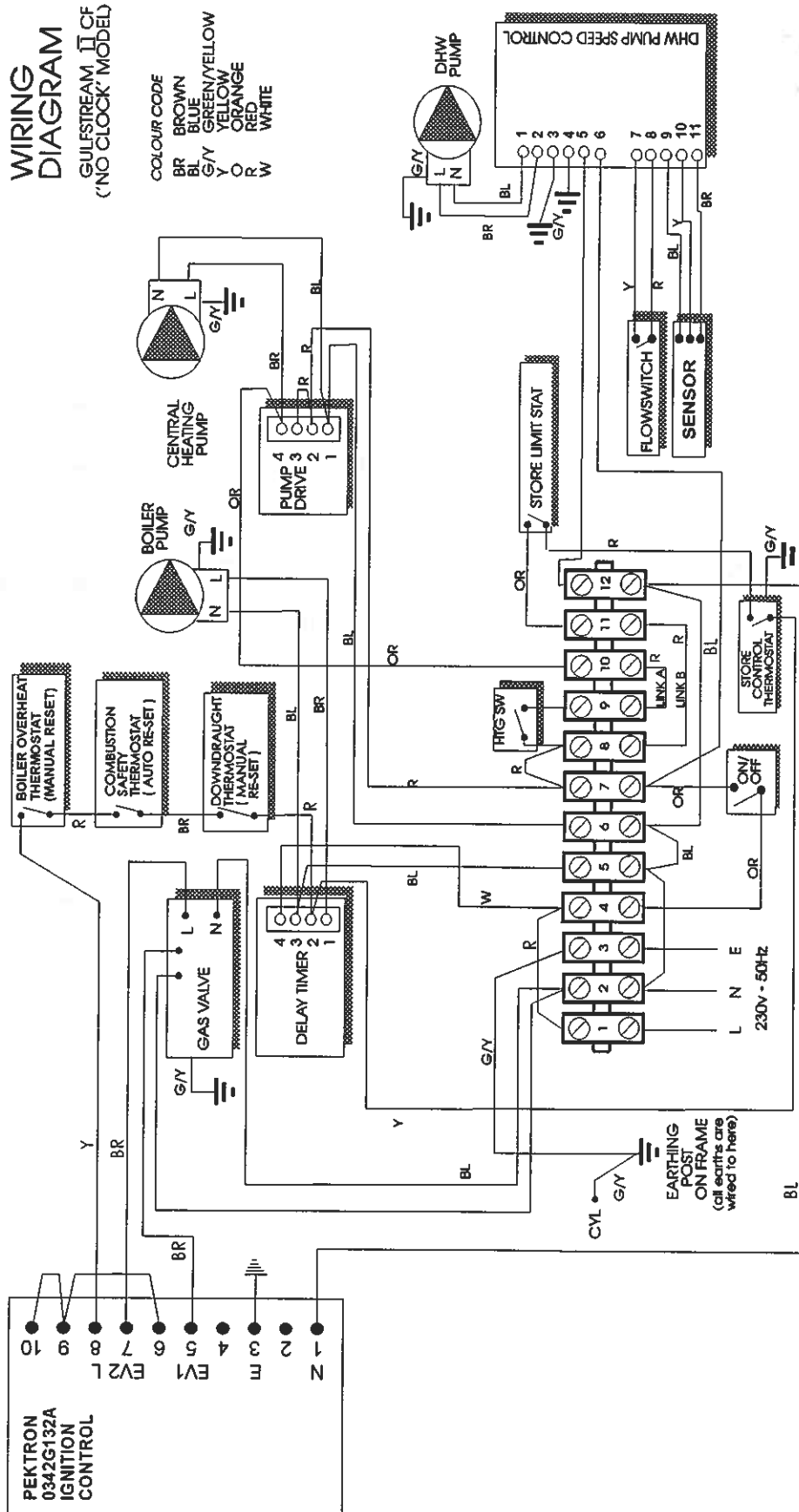
LINK A..... Remove this link and replace with a room thermostat and/or remote clock to control the central heating.

LINK B..... This link is normally only removed when a remote 2 channel clock is fitted instead of the integral clock in which case the HW ON channel is connected to terminal 11.

INSTALLATION

Functional Flow Diagram (GulfStream 11)





COMMISSIONING

INITIAL SYSTEM FILLING

Experience with sealed systems shows that make up may be needed during the first six weeks of operation. However filling loops are now available which allow the system to remain connected during the commissioning period (see page 39/40 for details).

Open the CH flow and CH return valves.

Check and adjust the expansion vessel air pressure if necessary to the initial charge pressure (1.0 bar).

Fill the system with water using one of the approved methods described in Section 'Heating System' to system pressure (1.2 bar). **Vent the system via the three appliance vents (two automatic and one manual)** the radiator valves and system air vents in accordance with normal practice. The water system must be thoroughly flushed out, initially with cold water. Ensuring that all valves are open. Refill the system. If the system is new add a cleanser such as Sentinal X300 to ensure that flux residues and installation debris are removed from the system. **When determining the quantity of cleanser required, be sure to allow for the increased volume of water in the primary circuit due to the thermal store. Vent all air from the system and boiler to ensure removal of all air locks (including pumps).**

NOTE: Special care is required where the boiler is used on an old system, which should be drained and flushed out, ensuring that all radiators are drained. The use of a corrosion inhibitor suitable for copper based boilers is recommended. Examine the system for water leaks, after re-pressurising to system pressure (1.2 bar) - rectify where necessary. At this stage the operation of the safety valve should be checked by allowing the water pressure to increase until the valve operates - this should be approximately 3 bar. Release the cold water to achieve the initial (cold fill) system design pressure. The marker on the pressure gauge should be set to the initial system pressure. Check and adjust the expansion pressure it should be carefully checked for leaks.

Once the system is up to pressure it should be carefully checked for leaks.

Open the cold water inlet cock and allow water to flow through the appliance to the domestic hot water taps. Ensure all air is vented and there are no leaks.

INITIAL LIGHTING ENSURE BOILER IS FULL OF WATER

i) Check that the electricity supply is ISOLATED and the boiler switch is set to OFF position.

ii) Turn on the gas supply and open the gas service cock to purge air from the gas line in accordance with the current issue of BS 6891.

iii) Loosen the burner pressure test point on the gas valve (Fig. 12) and connect a suitable pressure gauge.

iv) Ensure central heating system controls are NOT calling for heat.

v) Switch ON the electricity supply.

vi) Switch ON the appliance and check that the appliance circulation pump is circulating water through the boiler and store. The appliance incorporates an intermittent pilot ignition system. After a few seconds, the controls will automatically attempt to light the pilot, and as soon as the pilot flame is detected the main burner will light. If the pilot fails to ignite during the ignition period (approximately 10 seconds) (or is extinguished at any other time) the appliance will go to ignition lock-out. To re-set the appliance turn the mains switch off and back on again. The ignition procedure will then be repeated. Pilot and main burner flames may be seen through the viewing port in the front of the combustion chamber.

vii) **NOTE:** On first lighting, establishment of the pilot flame may be slightly delayed due to the presence of air in the pipework. In this case, it may be necessary to interrupt the power supply to re-set the appliance a few times before all the air is purged from the pilot pipe.

viii) Set the boiler thermostat to maximum (Winter). The boiler will continue to fire and heat the appliance thermal store to the temperature set by the appliance thermostat.

ix) Check soundness of all appliance gas carrying components and joints using leak detection fluid.

x) When the heat demand has been satisfied and every time the main burner is extinguished the pilot flame also goes out.

FINAL ADJUSTMENT

i) Allow the boiler to fire for approximately 10 minutes then check that the burner gas pressure is in accordance with the values stated under TECHNICAL DATA. The burner pressure is factory set.

ii) If burner pressure adjustment is necessary, remove the screwed cap from the gas control valve, see Fig 12, and turn the screw beneath clockwise to increase pressure and anticlockwise to reduce pressure.

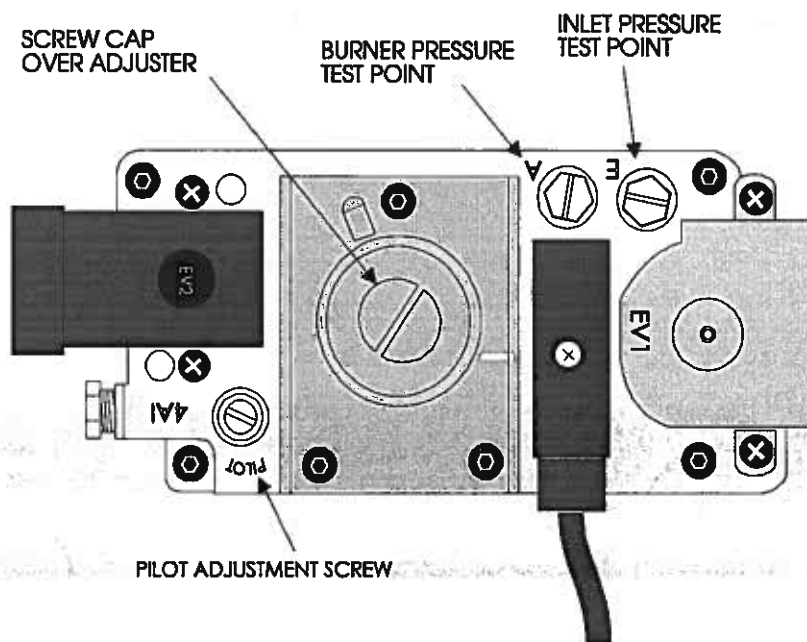
iii) With the burner set to its correct pressure the gas rate given in the TECHNICAL DATA should be checked by using the gas meter.

iv) Switch off the boiler, using the water switch. The pump will run as required by its control thermostat to extract residual heat from the boiler into the thermal store.

v) Remove the pressure gauge. Replace the screwed cap and refit the screw in the test nipple. Relight and test for gas soundness at the test nipple screw.

Fig 12

GAS VALVE. - VIEWED FROM ABOVE



vi) Re-light the appliance and allow the thermal store to heat to maximum. After checking for water leaks, turn the boiler off, and drain the system whilst hot once the pump over-run has finished. **NOTE:** To ensure full cleansing, it is important that the cleanser is circulated to all parts of the system for a total period of not less than 1 hour from the time the product is first introduced. Refill the system. Although the GulfStream has no special water treatment requirements, the radiators and other parts of the circuit will benefit from the application of a corrosion and scale inhibitor, such as Sentinel X100, a multi-metal corrosion and scale inhibitor manufactured by BetzDearborn. **When determining the quantity of inhibitor required, be sure to allow for the increased volume of water in the primary circuit due to the thermal store.**

vii) The in line water strainers should now be checked and cleaned if necessary. The strainer is situated in the inlet of the cold feed (see fig 16).

viii) Refill the system and adjust to the system fill pressure (1.2 bar). Check the pressure gauge pointer is set to the system design pressure. Check all air is vented from the system.

ix) Re-light the appliance and allow the thermal store to heat to maximum.

x) To check the operation of the domestic hot water supply, open a domestic hot water tap and ensure that hot water is satisfactory, i.e. the flow and temperature are in accordance with TECHNICAL DATA. Turn off the tap.

xi) To check the operation of the central heating, ensure all the external controls (should they be fitted) are calling for heat, switch the timer over-ride switch to the ON position. The central heating pump will come on and distribute the stored water around the central heating system. The thermal store temperature control may fire the boiler to replenish the store. Balance the heating circuits as normal practice. Switch the timer over-ride to OFF.

xii) Set the clock over-ride switch to the timed position and check that the time clock is set at the desired time periods. Set the room thermostat (if fitted) to the required setting.

COMMISSIONING

APPLIANCE THERMOSTAT

At its maximum (Winter) setting, the thermostat will control the store temperature at approximately 82°C. This Winter setting should be used to provide both central heating and domestic hot water during the winter months. The minimum setting (Summer) should be used to provide domestic hot water during the summer months. The thermostat has been calibrated by the makers and no attempt should be made to re-calibrate it on site.

This thermostat does not reduce the maximum temperature of the domestic hot water exiting the taps.

PUMP OVERRUN PCB

The overrun pcb will keep the appliance pump running when the boiler has shut down for a period of approximately 5 minutes.

OVERHEAT CUT-OFF DEVICE

The overheat thermostat is preset and no adjustment is possible. It will require re-setting if an overheat condition occurs. A Service Engineer should be called if this situation continues. The re-set button is located inside the top front cover just above the control panel.

GAS CONTROL VALVE

Check the operation of the valve by turning off the appliance switch. The main burner must shut down immediately.

COMBUSTION SAFETY THERMOSTAT

The combustion safety thermostat is pre-set and no adjustment is possible. It will switch off the burner in the event of combustion products failing to clear the combustion chamber. (Blocked primary flue or heat exchanger).

DOWN DRAUGHT THERMOSTAT

The down draught thermostat is preset and no adjustment is possible. It will require re-setting if a down draught condition occurs. The re-set button is located inside the top front cover on the LHS just above the control panel. A Service Engineer should be called if this situation continues.

EXTERNAL CONTROLS

Check that any other external controls connected in the system such as time clocks and thermostats, control the boiler as required.

USER'S INSTRUCTIONS

A User's Instructions leaflet is provided with this boiler but the householder must have the operation of the boiler and system explained by the Installer. The householder must also be advised of the importance of regular servicing and of the precautions necessary to prevent damage to the system and building, in the event of the system remaining out of commission in frost conditions. The paragraph headed 'Safety Devices' must also be explained to the user.

ROUTINE SERVICING

To ensure continued efficient operation of the appliance, it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage but in general once a year should be adequate. It is the law that any service work must be carried out by a competent person such as British Gas or other CORGI registered personnel.

The boiler incorporates a flue sampling point located inside the front case panel on the front of the boiler collector hood. If the service engineer has suitable equipment to analyse the flue gas, the screw may be removed and a 6mm inside diameter sample tube fitted. The front case panel must be removed to gain access. Do not forget to replace the screw after use.

	8	15
Nominal CO ₂ at sampling point. with clean heat exchanger.	8.0%	8.0%

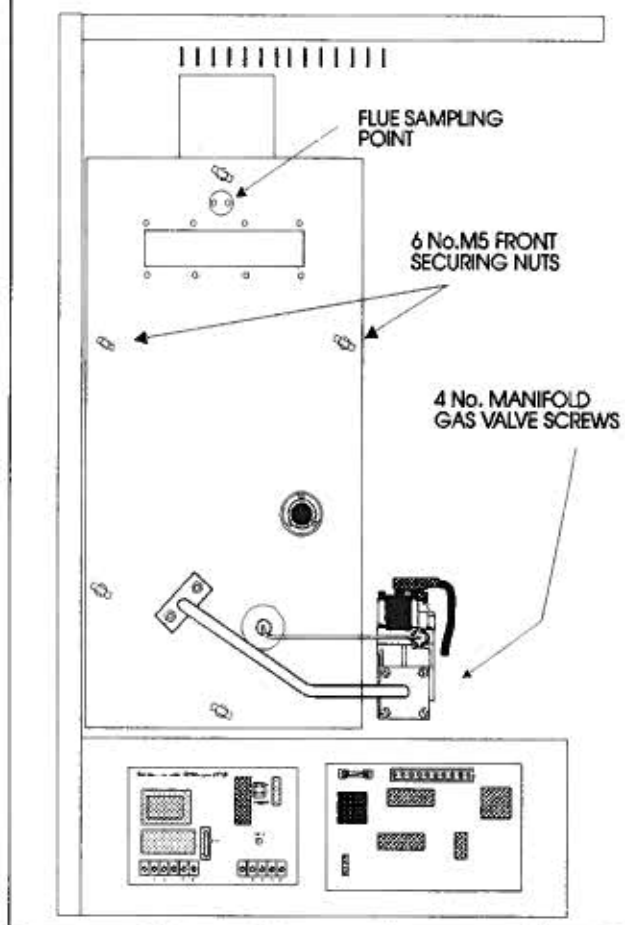
Before commencing any service operation, ISOLATE the mains electrical supply, TURN OFF the gas supply at the main service cock and remove the upper front and right hand case panels.

These panels are removed by pulling them away at the top (off two spring pins) then lifting them up and away from the appliance. Service the appliance by following the full procedure detailed below.

MAIN BURNER

1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Disconnect the pilot tube at the gas valve.
3. Disconnect the electrode lead from the ignition PCB.
4. Remove the four screws securing the burner manifold to the front of the gas valve.
5. Remove the six M5 nuts securing the boiler front in position.
6. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
7. Clean all deposits from the surface of the burner flame strip with soft brush or vacuum cleaner and ensure there is no fluff in the entry of the burner venturi.

FIG 13



SERVICING

8. Ensure main burner injector orifice is clean.
9. **PILOT BURNER.** The following operations are only necessary if the pilot flame is distorted or the wrong size, i.e. too small. Disconnect the electrode lead from the electrode, uncouple the pilot gas tube nuts at the base of the pilot assembly and lift out the pilot. **Note:** the pilot injector sits loosely on top of the pilot tube, or may be retained in pilot head itself. Remove and inspect the pilot injector for dirt deposits and clean if necessary. Likewise inspect and clean the electrode and earth post using a soft brush.

BOILER HEAT EXCHANGER

Working from above and below the heat exchanger use a suitable brush and remove any deposits from between the fins. Remove all the deposits from the combustion chamber base.

COMBUSTION CHAMBER INSULATION

Check the combustion chamber insulation for damage. If damaged replace as described under replacement.

IMPORTANT - The fibre insulation panels must be dampened to avoid inhalation of loose fibres.

EXPANSION VESSEL

Release water pressure at pressure relief valve. Check and repressurize if necessary the expansion vessel air pressure to the initial charge pressure (1.0 bar).

RE-ASSEMBLE & RE-COMMISSION

1. Re-assemble all components in reverse order except the right hand case and front door which should not be refitted until the burner pressure has been checked. Ensure that all joints, seals, and the HT connection are correctly fitted.
2. Unscrew and connect a pressure gauge to the burner pressure test point on the gas control valve (Fig. 12). Turn on the gas and electricity supply and light the appliance as described in section COMMISSIONING.
3. Check the operation of the appliance and ensure that the burner pressure after at least 10 minutes running is as stated on the data plate or in section TECHNICAL DATA. Adjust if necessary as described in section COMMISSIONING.
4. Check soundness of all appliance gas carrying components and joints using leak detection fluid.
5. Turn off the boiler and remove the pressure gauge and tighten the sealing screw. Relight the appliance and test for gas soundness.
6. Refit the front and right hand upper case panels.
7. Return all appliance controls to their original settings.

REPLACEMENT OF PARTS

The cylinder storage vessel is not a replacement part, in the event of failure Gledhill Water Storage should be notified. Before commencing any replacement operation, ISOLATE the mains electrical supply, TURN OFF the gas supply at the main service cock.

Remove the upper front and right hand case panels. These panels are removed by pulling them away at the top (off two spring pins) then lifting them up and away from the appliance.

Remove the lower front cover by first unscrewing the two screws located at the front base of the appliance. Allow the case to slide downwards then remove it forwards. Open the control box by removing the two screws and rotating the cover forwards.

After any replacement operation, follow the full commissioning procedure as detailed in the COMMISSIONING - INITIAL LIGHTING & FINAL ADJUSTMENT section of these instructions. If any gas carrying joints have been disturbed check for gas soundness using leak detection fluid.

BOILER PUMP (REAR)

1. Isolate the pump with the two pump isolation valves.
2. Disconnect the wiring at the pump.
3. Slacken fully the pump unions and remove the pump.
4. Replace and refit in reverse order taking care to observe the direction of flow.
5. Refill and vent the appliance and system as described in section COMMISSIONING.
6. Check that the pump speed is set to maximum.

CH PUMP (CENTRE)

1. Isolate the pump with the two pump isolation valves.
2. Disconnect the wiring at the pump.
3. Slacken fully the pump unions and remove the pump.
4. Replace and refit in reverse order taking care to observe the direction of flow.
5. Refill and vent the appliance and system as described in section COMMISSIONING.
6. Check that the pump speed is set to maximum.

DHW PUMP (FRONT)

1. Isolate the pump with the two pump isolation valves.
2. Disconnect the wiring at the pump.

3. Slacken fully the pump unions and remove the pump.
4. Replace and refit in reverse order taking care to observe the direction of flow.
5. Refill and vent the appliance and system as described in section COMMISSIONING.
6. Check that the pump speed is set to maximum.

ANTI-VACUUM VALVE

1. Drain the appliance to a point just below the anti-vacuum valve.
2. Unscrew the faulty valve.
3. Replace and refit in reverse order using an approved jointing sealant.
4. Refill and vent the appliance and system as described in section COMMISSIONING.

PRESSURE GAUGE

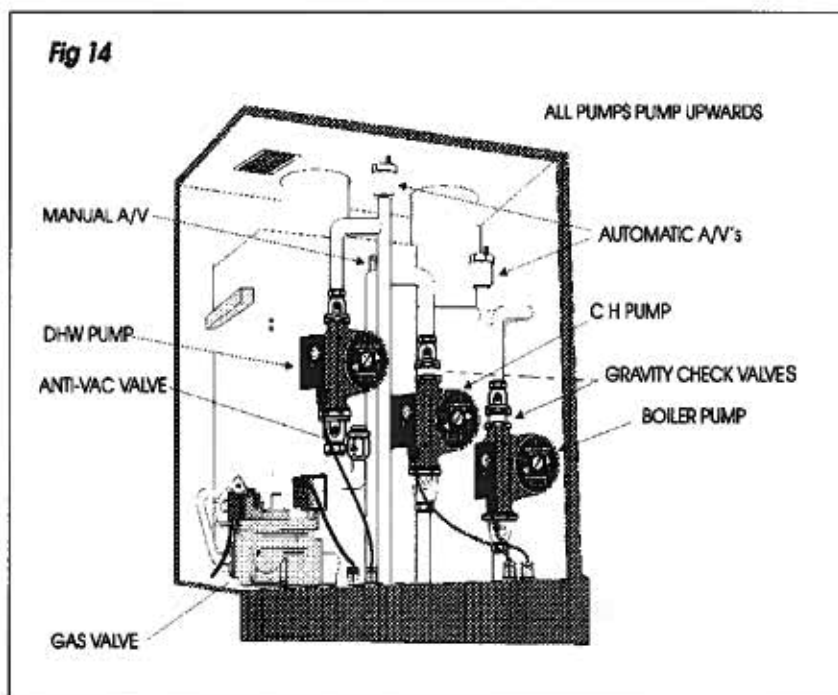
1. Drain the appliance to a point just below the pressure gauge.
2. Unscrew the faulty gauge.
3. Replace and refit in reverse order using an approved jointing sealant.
4. Refill and vent the appliance and system as described in section COMMISSIONING.

DRAINING THE GULFSTREAM

For operations involving a drain down, first release the pressure by opening the pressure relief valve, then ensure that all air vents are open before opening the drain cock.

REPLACEMENT OF PARTS

Fig 14



GRAVITY CHECK VALVE (ABOVE PLATE HEAT EXCHANGER)

1. Drain the whole appliance.
2. Undo the two nuts, one above and one below the valve, and also the nut securing the short pipe to the plate heat exchanger and remove the pipe, then the check valve. Note, the two lower nuts have sealing washers between faces, the upper one is an olive type joint.
3. Replace and refit in reverse order using two new sealing washers.
4. Refill and vent the appliance and system as described in section COMMISSIONING.

GRAVITY CHECK VALVE (ABOVE BOILER PUMP)

1. Isolate boiler pump.
2. Remove pump with GCV.
3. Replace GCV.
4. Refit in reverse order using new washers.
5. Refill and vent the appliance and system as described in section COMMISSIONING.

EXPANSION RELIEF VALVE

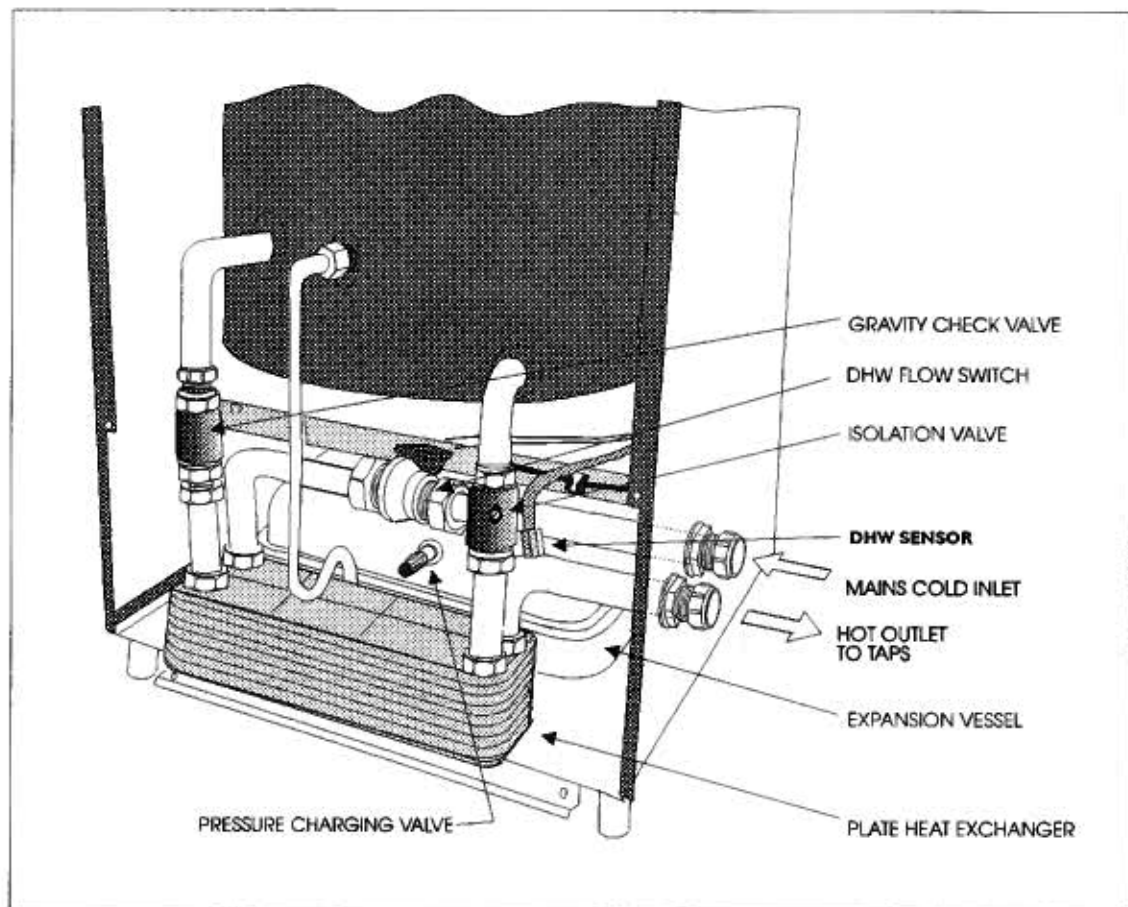
1. Drain the appliance to a point just below the pressure relief safety valve.
2. Remove the outlet pipe and fitting from the faulty valve.

3. Unscrew the faulty valve from the appliance.
4. Replace and refit in reverse order using a suitable thread sealant.
5. Refill and vent the appliance and system as described in section COMMISSIONING.

PLATE HEAT EXCHANGER

1. Isolate the plate heat exchanger using the isolation valve just above the plate heat exchanger, the check valve will isolate the other side primary connection.
2. Shut off the cold supply to the appliance and open the domestic hot water tap which is the lowest in the system.
3. Undo the four nuts at the front of the plate heat exchanger and remove the two short 22mm copper pipes from between the heat exchanger and the valves. Note, a small amount of water will escape at this point which was in the two short copper pipes.
4. Undo the two nuts at the rear of the plate heat exchanger, again a small amount of water will escape.
5. Loosen the locking nut and the compression joint on the cold feed in order to rotate the bend by 90° to clear the PHE.
6. Withdraw the plate heat exchanger forwards.
7. Replace and refit in reverse order using six new sealing washers.
8. Refill and vent the appliance and system as described in section COMMISSIONING.

REPLACEMENT OF PARTS



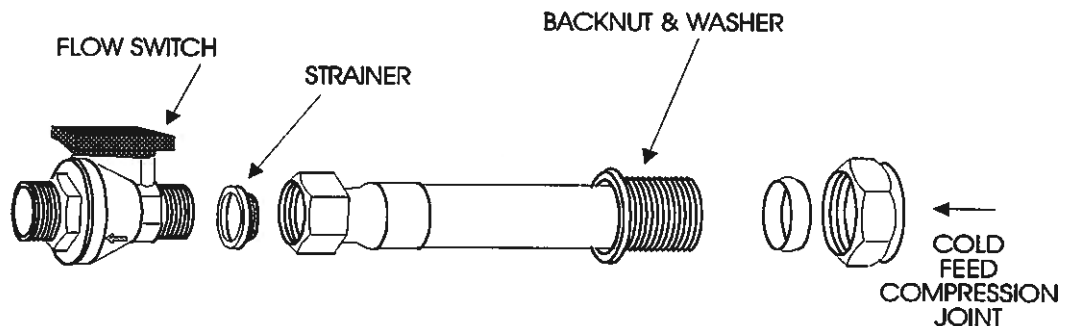
DHW FLOW SWITCH

1. Isolate the plate heat exchanger using the isolation valve just above the plate heat exchanger, the check valve will isolate the other side primary connection.
2. Shut off the cold supply to the appliance and open the domestic hot water tap which is the lowest in the system.
3. Undo the four nuts at the front of the plate heat exchanger and remove the two short 22mm copper pipes from between the heat exchanger and the valves. Note, a small amount of water will escape at this point which was in the two short copper pipes.
4. Undo the two nuts at the rear of the plate heat exchanger, again a small amount of water will escape. **NOTE:** If the lowest hot tap is higher than the plate heat exchanger, then this distribution pipe should be first drained from a convenient point.
5. Withdraw the plate heat exchanger forwards.
6. Pull off the two wires taking note of their correct position.
7. Undo the two nuts, one each side of the flow switch, and remove the faulty flow switch.
8. Replace and refit in reverse order using six new sealing washers.
9. Refill and vent the appliance and system as described in section COMMISSIONING.

REPLACEMENT OF PARTS

Figure 16

Flow switch showing strainer



DHW STRAINER

1. Remove the flow switch as detailed above and replace the strainer. See figure 16
2. Refit in reverse order.
3. Refill and vent the appliance and system as described in section COMMISSIONING.

CH EXPANSION VESSEL

1. Drain the whole appliance.
2. Shut off the cold supply to the appliance and open the domestic hot water tap which is the lowest in the system.
3. Undo the four nuts at the front of the plate heat exchanger and remove the two short 22mm copper pipes from between the heat exchanger and the valves. Note, a small amount of water will escape at this point which was in the two short copper pipes.
4. Undo the two nuts at the rear of the plate heat exchanger, again a small amount of water will escape.
5. Withdraw the plate heat exchanger forwards.
6. Omit 7 if the flow switch and pipe assembly can be set aside without straining the electrical wires.
7. Pull the two wires off the flow switch.
8. Undo the compression nut on the outside of the cold inlet bulkhead fitting.

9. Undo the locking nut on the outside of the cold inlet bulkhead fitting and remove the two pipes and the flow switch assembly.
10. Undo the nut securing the expansion vessel pipe to the tank and remove the assembly.
11. Fit the pipe to a new expansion vessel using a new seal, check the vessel is pre-charged to the required pressure and refit in reverse order using new sealing washers.
12. Refill and vent the appliance and system as described in section COMMISSIONING.

DHW PUMP SPEED CONTROL PCB

1. Remove the wires from the DHW pump speed control pcb taking note of their positions.
2. Remove the faulty pcb by pulling it off the mounting posts.
3. Replace and refit in reverse order taking care to connect the wires in accordance with the wiring diagram.

REPLACEMENT OF PARTS

BOILER PUMP DELAYTIMER

1. Remove the wires from the appliance pump delay timer PCB taking note of their positions.
2. Remove the faulty PCB by pulling it off the mounting post.
3. Replace and refit in reverse order taking care to connect the wires in accordance with the wiring diagram.

PUMP DRIVE PCB

1. Remove the wires from CH pump PCB taking note of their positions.
2. Remove the faulty PCB by pulling it off the mounting posts.
3. Replace and refit in reverse order taking care to connect the wires in accordance with the wiring diagram.

CHTIMING DEVICE

1. Pull off the electrical wires from the timing device connectors, taking note of their positions.

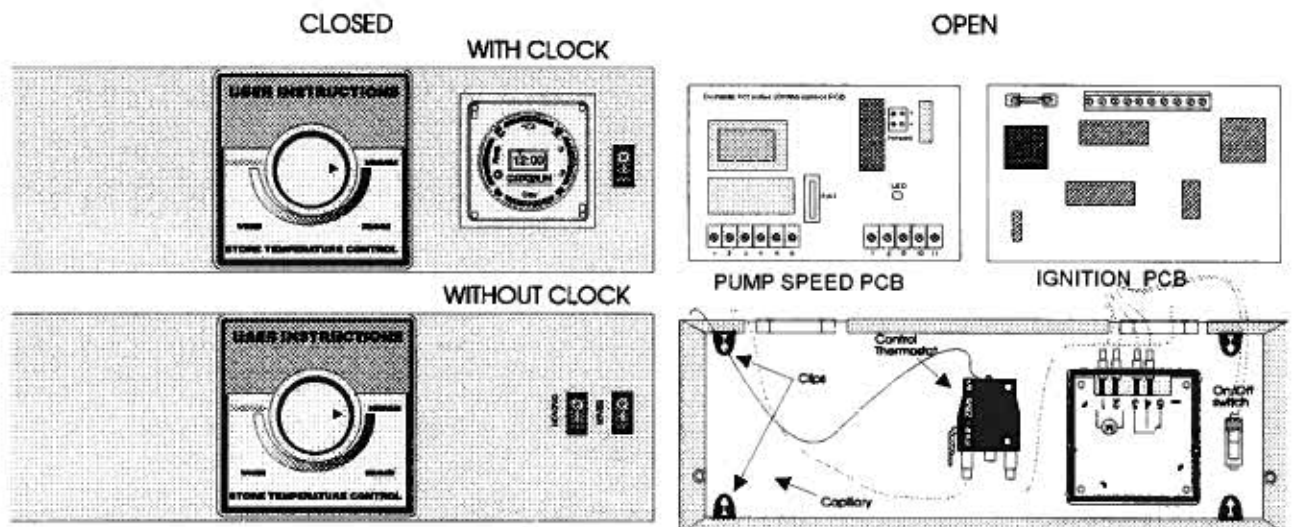
2. Pull the front, clear plastic cover off the timing device.
3. Remove the timing device by rotating the two plastic screw heads through 90° and slide it forwards out of the panel.
4. Replace and refit in reverse order making sure the electrical connections are in accordance with the wiring diagram.

STORE CONTROL THERMOSTAT

1. Remove the sensing bulb from its pocket by first taking out the retaining pin and spacer then sliding the bulb out.
2. Pull off the control thermostat knob.
3. Pull off the electrical wires from the rear of the control thermostat, taking note of their positions.
4. Undo the two screws securing the control thermostat body to the fascia and remove the complete control thermostat, taking care when withdrawing the capillary and bulb.
5. Replace and refit in reverse order making sure the route of the capillary is the same and the electrical connections are in accordance with the wiring diagrams.

Fig 17

CONTROL PANEL



REPLACEMENT OF PARTS

IGNITION PCB

1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Remove the molex connector block and HT lead from the PCB.
3. Release the PCB from its four mounting studs.
4. Replace the ignition PCB and re-assemble in reverse order.

MULTIFUNCTIONAL GAS CONTROL VALVE

1. Unplug the electrical leads from the gas valve.
2. Disconnect the pilot tube at the gas valve.
3. Separate the gas control valve from the flange (burner manifold) at the outlet port by removing the four screws and 'O' ring.
4. Separate the gas control valve from the flange at the inlet port by removing the four securing screws (two are extended hexagonal) and 'O' ring.
5. Replace and refit in reverse order making sure the electrical connections are in accordance with the wiring diagram.

PILOT FILTER

The pilot burner is protected from blockage by a pilot filter situated within the gas control valve. The filter is large and designed to last the life of the gas control valve under normal operating conditions. It is therefore unlikely to need replacing. However in the event of pilot filter blockage being suspected the complete valve will need replacing.

BOILER OVER-HEAT THERMOSTAT

1. Remove the split pin which is retaining the sensing bulb in its pocket situated in the boiler flow pipe at the rear of the appliance and pull out the bulb.
2. Remove the two electrical connections on the over-heat cut-off device.
3. Remove the locking nut holding the over-heat cut-off device in position and remove the faulty device.
4. Replace and refit in reverse order making sure the route of the capillary is the same i.e. not touching the combustion chamber sides.

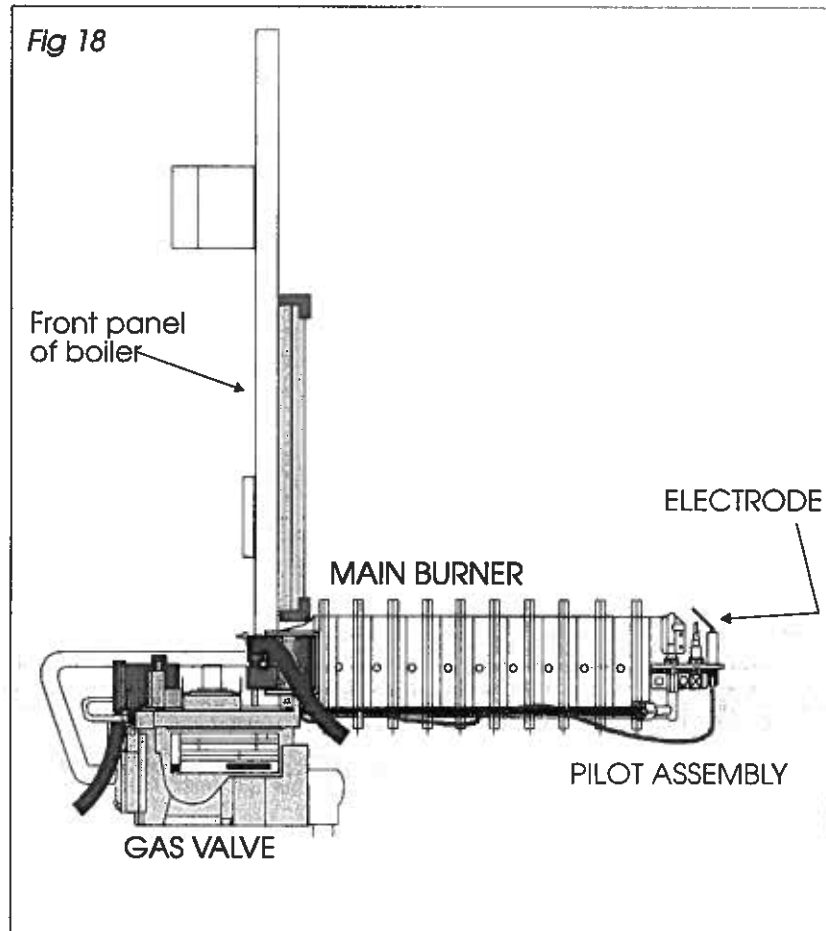
MAIN BURNER

1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Disconnect the pilot tube at the gas valve.
3. Disconnect the electrode lead from the ignition PCB.
4. Remove the four screws securing the burner manifold to the front of the gas valve and 'O' ring.
5. Remove the six M5 nuts securing the boiler front in position.
6. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
7. Undo the two screws retaining the pilot assembly to the burner.
8. Undo the two nuts securing the burner, front plate and manifold and remove the burner. Replace and refit in reverse order.

MAIN BURNER INJECTOR

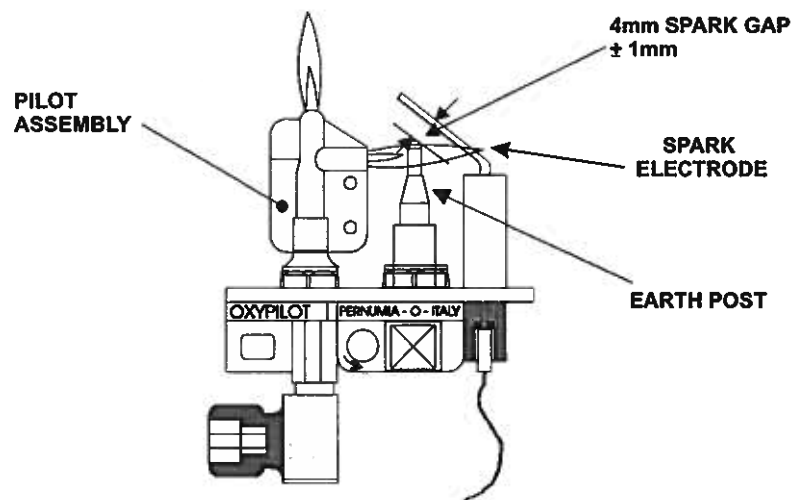
1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Disconnect the pilot tube at the gas valve.
3. Disconnect the electrode lead from the ignition PCB.
4. Remove the four screws securing the burner manifold to the front of the gas valve and 'O' ring.
5. Remove the six M5 nuts securing the boiler front in position.
6. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
7. Undo the two screws retaining the pilot assembly to the burner.
8. Undo the two nuts securing the burner, front plate and manifold and remove the burner.
9. Unscrew and remove the main burner injector.
10. Replace and refit using a new copper sealing washer, in reverse order.

REPLACEMENT OF PARTS



REPLACEMENT OF PARTS

FIGURE 19



PILOT ASSEMBLY

1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Disconnect the pilot tube at the gas valve.
3. Disconnect the electrode lead from the ignition PCB.
4. Remove the four screws securing the burner manifold to the front of the gas valve.
5. Remove the six M5 nuts securing the boiler front in position.
6. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
7. Remove the electrode lead from the electrode.
8. Unscrew the pilot pipe from the pilot assembly and withdraw the injector. **Note**, the pilot injector sits loosely on top of the pilot tube, or may be retained in pilot head itself. Undo the two screws retaining the pilot assembly to the burner and remove the assembly.
9. Replace and refit in reverse order.

BOILER HEAT EXCHANGER

1. Drain the appliance to a point just below the heat exchanger.
2. Unscrew the two screws securing the control box cover and pivot the cover downwards.
3. Disconnect the pilot tube at the gas valve.
4. Disconnect the electrode lead from the ignition PCB.
5. Remove the four screws securing the burner manifold to the front of the gas valve.
6. Remove the six M5 nuts securing the boiler front in position.
7. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
8. Undo the two unions at the rear of the heat exchanger.
9. Lift the heat exchanger up and over the front support and out of the appliance.
10. Replace and refit in reverse order using new seals.
11. Refill and vent the appliance and system as described in section COMMISSIONING.

REPLACEMENT OF PARTS

DOWN DRAUGHT THERMOSTAT

This is situated on the appliance draught diverter in the roof space. (see fig 7)

1. On the appliance remove the two electrical connections to the thermostat body.
2. Unfasten the thermostat from its mounting position.
3. Fit the new thermostat into the appliance and re-connect the electrical wires.
4. Feed the sensing bulb up into the roof space along the same route as the existing one.
5. On the draught diverter in the roof space, remove the split pin securing the existing thermostat in place.
6. Fit the new thermostat bulb into position securing with the split pin.
7. Remove old thermostat.

STORE OVERHEAT THERMOSTAT

1. Remove the sensing bulb from its pocket by first taking out the retaining pin and then sliding out the bulb and spacer.
2. Remove the two electrical connections on the over-heat cut-off device.
3. Remove the locking nut holding the over-heat cut-off device in position and remove the faulty device.
4. Replace and refit in reverse order making sure the route of the capillary is the same and the electrical connections are in accordance with the wiring diagram.

COMBUSTION SAFETY THERMOSTAT

1. Unscrew the two screws securing the control box cover and pivot the cover downwards.
2. Disconnect the pilot tube at the gas valve.
3. Disconnect the electrode lead from the ignition PCB.
4. Remove the four screws securing the burner manifold to the front of the gas valve.
5. Remove the six M5 nuts securing the boiler front in position.
6. Slide the burner assembly (including boiler front and burner manifold) forwards and away from the appliance.
7. Remove the two screws securing the top cover plate of the controls compartment.
8. Disconnect the two spade connections from the thermostat and the nut holding the thermostat.
9. Remove the screw retaining the pigtail capillary bracket.
10. Remove the grommet from it's hole.
11. The whole thermostat assembly can now be moved forward and the two split pins removed.

12. Remove the thermostat and capillary and replace in reverse order.

COMBUSTION CHAMBER INSULATION

1. Remove heat exchanger as previously described.
2. Carefully replace insulation panels with reference to Fig 20.

IMPORTANT - The panels should be dampened to avoid the insulation of loose fibres.

FIG 20

BOILER INSULATION PANELS

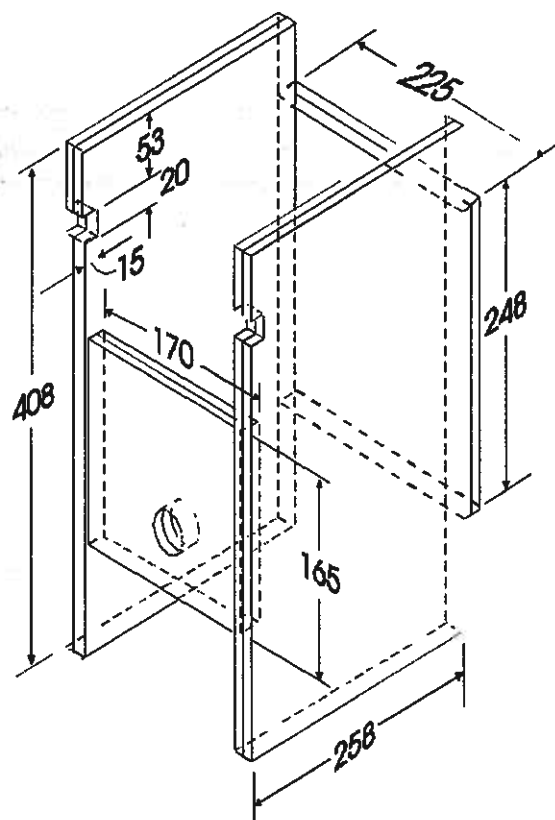
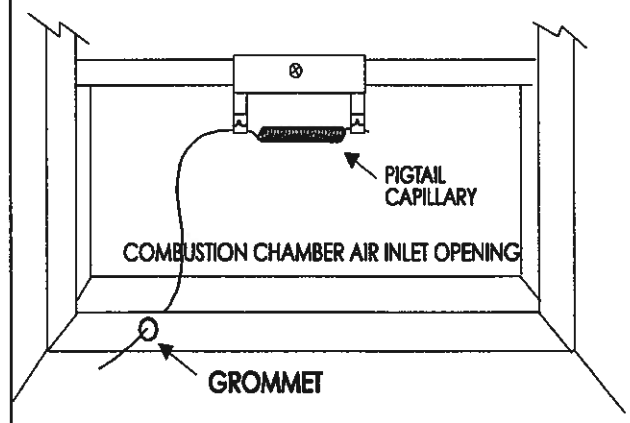


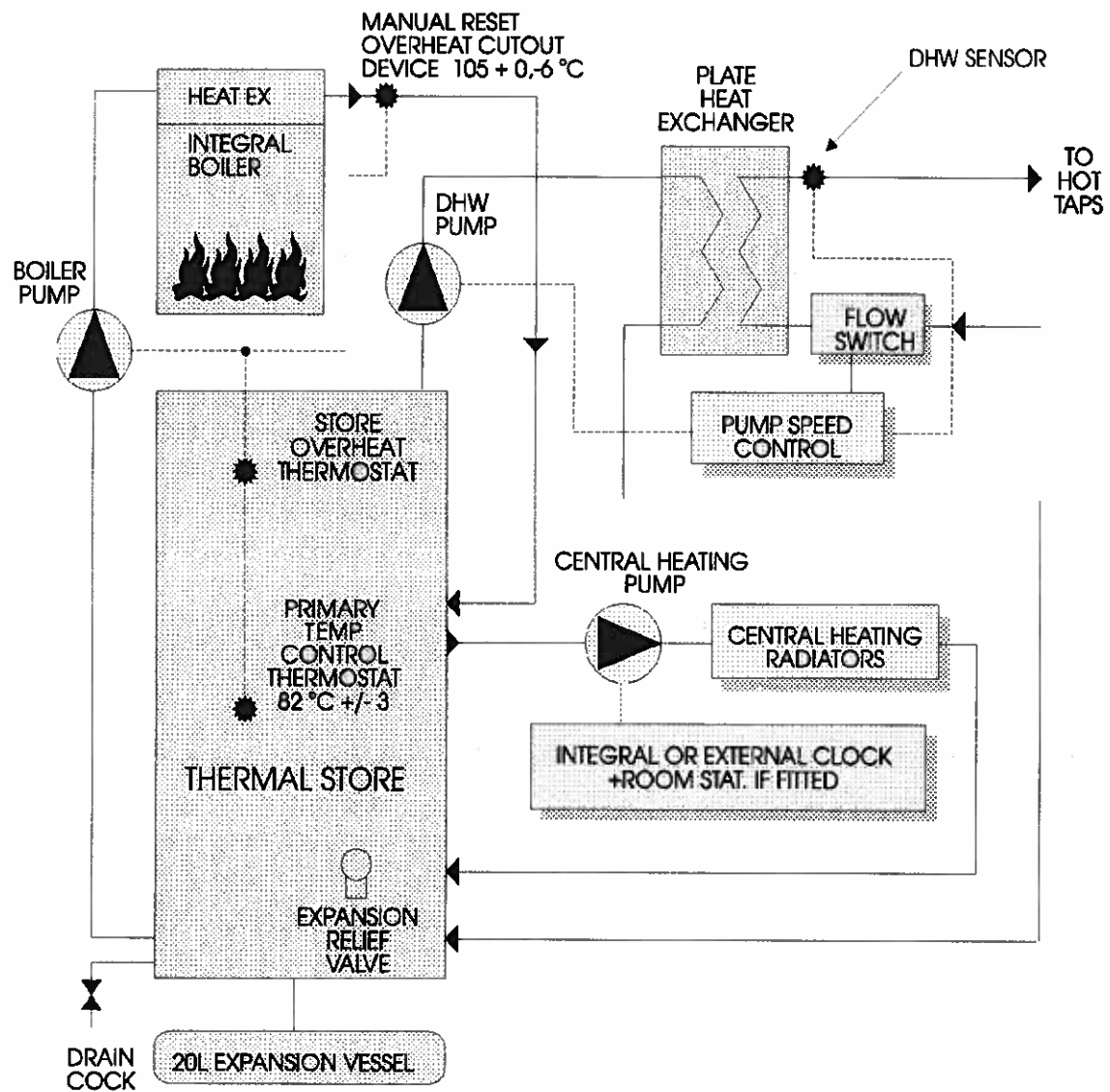
Fig 20.1

POSITION OF COMBUSTION SAFETY THERMOSTAT



HYDRAULIC DIAGRAM

Fig 21



FAULT FINDING

PILOT	
SYMPTON	POSSIBLE CAUSES
Pilot will not light	Main gas tap off - pilot feed not purged of air - pilot feed blocked - pilot injector blocked - electrode, electrode lead or ignitor faulty - sparking in the wrong position.
Pilot established but goes out within 10 seconds	Incorrect or faulty pilot injector fitted - pilot injector partially blocked. Faulty detection circuit - PCB fault - polarity incorrect.

MAIN BURNER AND THERMAL STORE	
SYMPTON	POSSIBLE CAUSES
Pilot does not attempt to light store temperature is not maintained.	External controls (LINK 'B') if fitted, control thermostat, low limit thermostat, down draught device or combustion safety stat not calling for heat - blown fuse - defective power supply or external controls - governor stuck in closed position - solenoid open circuited (test for continuity at solenoid terminals) - main injector blocked - gas valve not in correct position - low primary water pressure.
Pilot and main burner will ignite but system liable to nuisance shutdown.	Dirty or loose connections - flue fault, (down draught) inadequate air supply, combustion safety thermostat faulty.
Main burner will not shut down in response external controls.	Short circuit in external controls or wiring defective solenoid, faulty boiler thermostat.
Main burner pressure incorrect.	Governor screw requires adjustment (after adjustment recheck pressure)

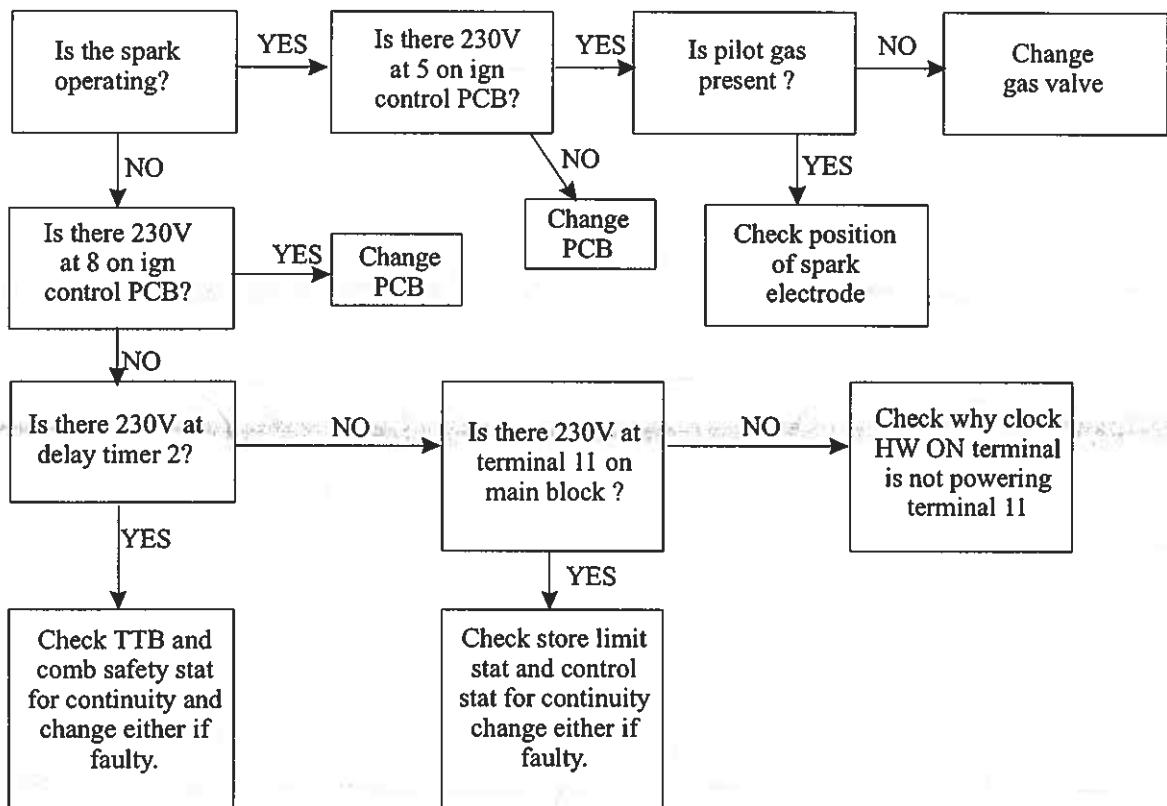
FAULT FINDING

SPACE HEATING	
SYMPTON	POSSIBLE CAUSES
Radiators will not heat up but thermal store is being maintained hot.	Faulty or incorrectly set internal timing device - external controls (room thermostat) if fitted either faulty or not calling for heat - central heating pump stuck.
Radiators only warm (all at the same temperature).	Thermal store is not being maintained because of faulty boiler controls or radiator heating load is in excess of that allowed.

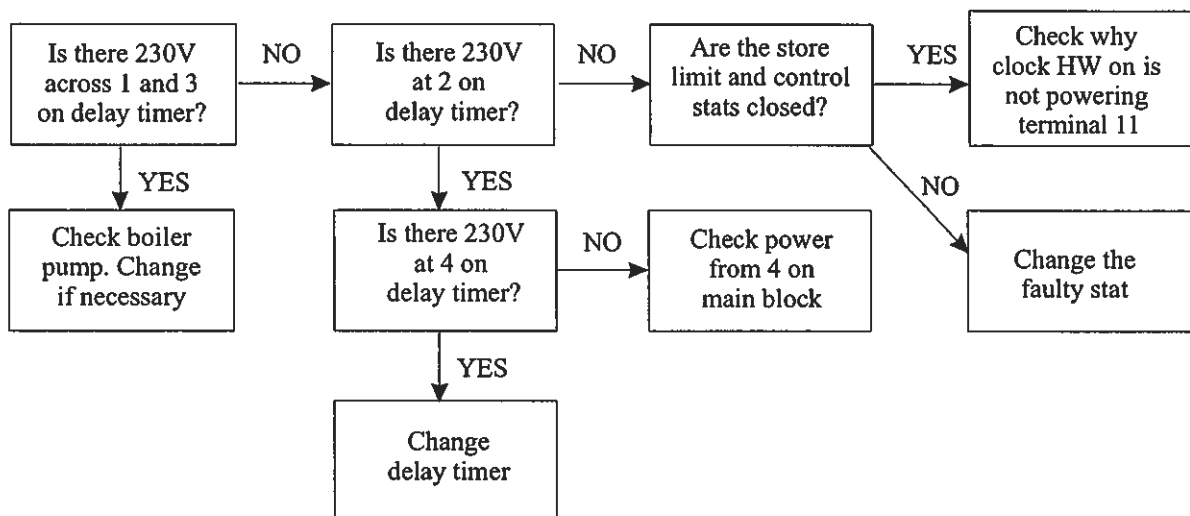
DOMESTIC HOT WATER	
SYMPTON	POSSIBLE CAUSES
DHW temperature remains cold exiting the taps.	Thermal store is cold - DHW pump is stuck - DHW thermistor sensor or pump speed control pcb is faulty - Flow switch is faulty - too little or too much flow from the taps.
DHW temperature fluctuates wildly when flow is steady.	DHW pump keeps sticking when voltage is reduced and not starting until voltage is too high.
DHW temperature exceeds and remains well above 60°C when the flow rate is low.	DHW pump speed control and/or thermistor sensor is/are faulty causing the DHW pump to run at full 230V continuously.

FAULT FINDING

Boiler will not light (Ensure gas supply is on and purged)
(Ensure power is on and clock is calling for DHW)



Boiler will not light (Boiler pump not working)



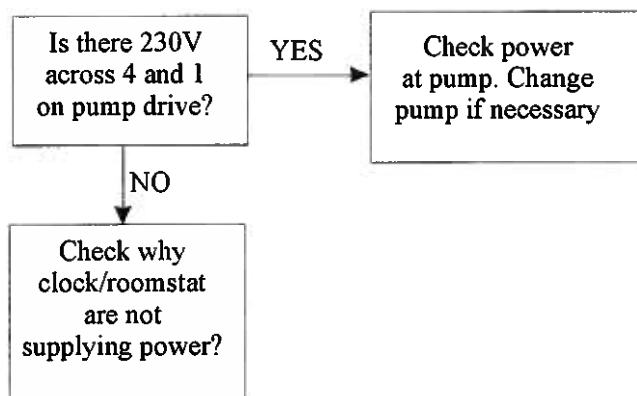
FAULT FINDING

FAULT FINDING

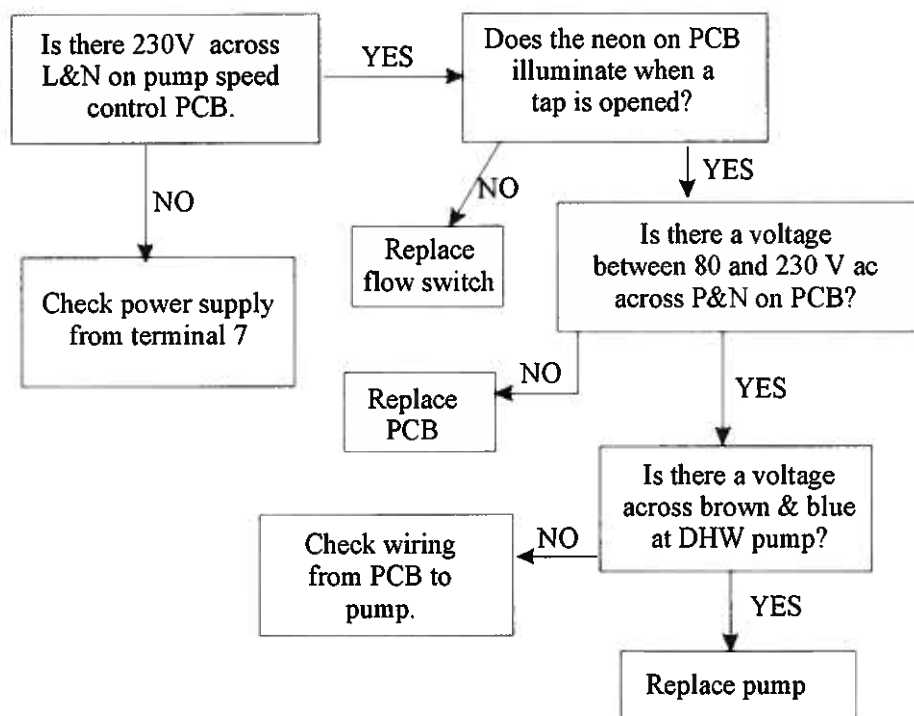
No central heating

(CH pump not working)

(Ensure clock and room stat are calling for CH)



No domestic hot water



SHORT PARTS LIST

Key No.	Description	Manufacturer	Stock Code No.	Gas Council Part No.
1	Pressure relief valve/gauge	Reliance	XG154	
2	Plate heat exchanger	SWEP	GT017	
4	DHW pump speed control pcb	ELOK	GT152	
5	DHW sensor	ELOK	GT153	
6	Delay timer PCB	Gledhill	XB041	
7	Pump drive pcb	Gledhill	XB104	
8	CH timing device (digital)	Grasslin	XB216	
9	CH timing device (electro-mechanical)	Grasslin	XB215	
10	Ignition PCB	Pektron	GF037	
11	Multi-functional gas control valve	S.I.T.	GF009	
12	Main burner injector 8appliance	Bray	GT074	
13	Main burner injector 15 appliance	Bray	GT018	
14	Main burner	Aeromatic	GT035	
15	Electrode lead	S.I.T.	GS086	
16	Boiler over-heat cut-off device	Ranco	GF010	
17	Pilot assembly	S.I.T.	GF013	
18	Down draught stat 8, & 15 appliance	Ranco	GT058	
19	Low limit thermostat	Ranco	GT064	
20	Control thermostat	Hawco	GT032	
21	Combustion chamber insulation	Gledhill	GT028/Mal	
22	Flow switch	Albion	GT106	
23	On/off switch	Arcoelectric	GT034	
24	Anti-vacuum valve	Gledhill	GT056	
	Pumps	Grundfos	XB001	
25	Combustion safety thermostat	Ranco	GT057	
26	Automatic air vent	Altechnic	GT015	
27	GCV above PHE	Altechnic	GT041	
28	P/Vessel	Altechnic	GT004	

PARTS

Fig 22

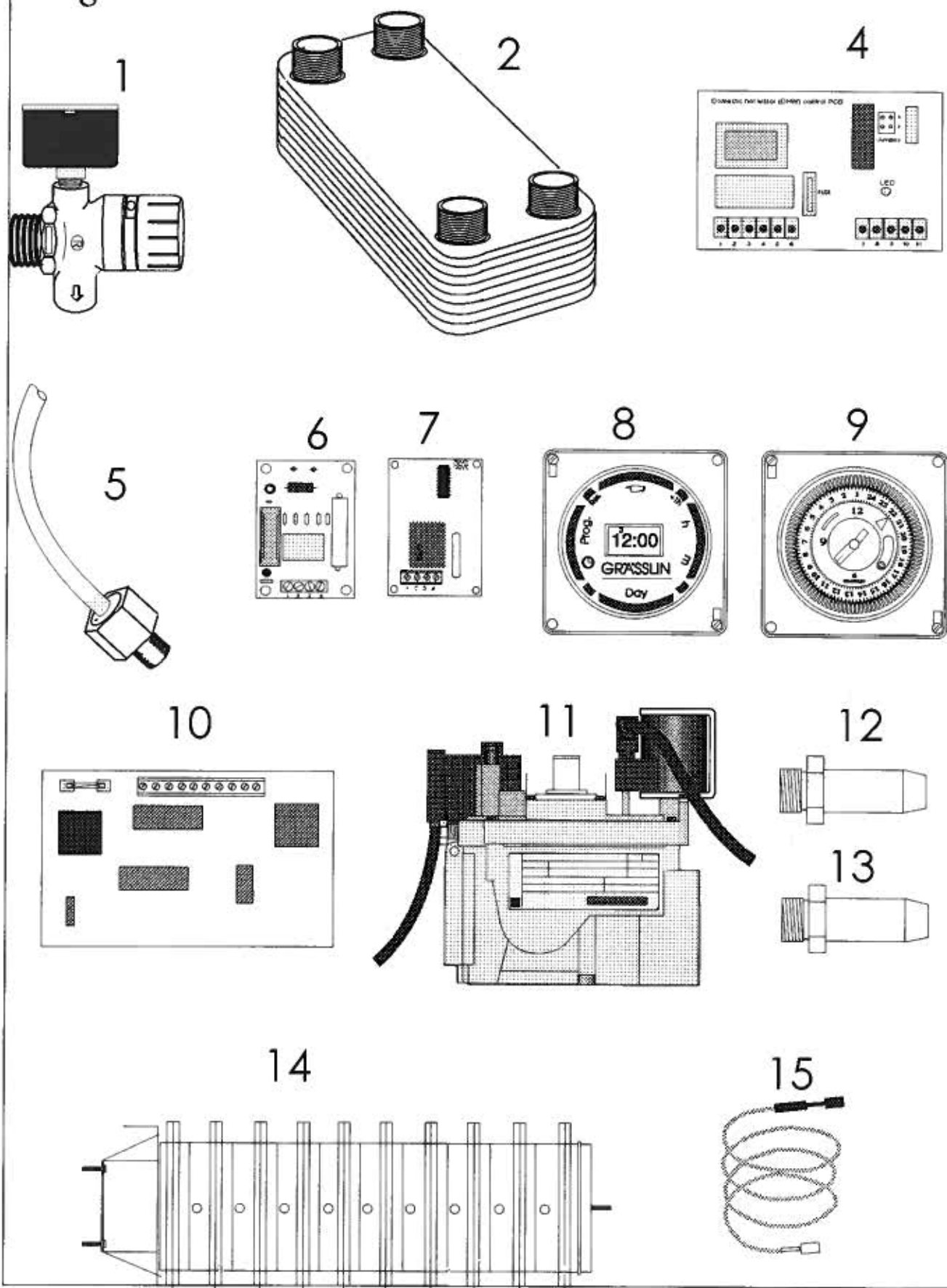
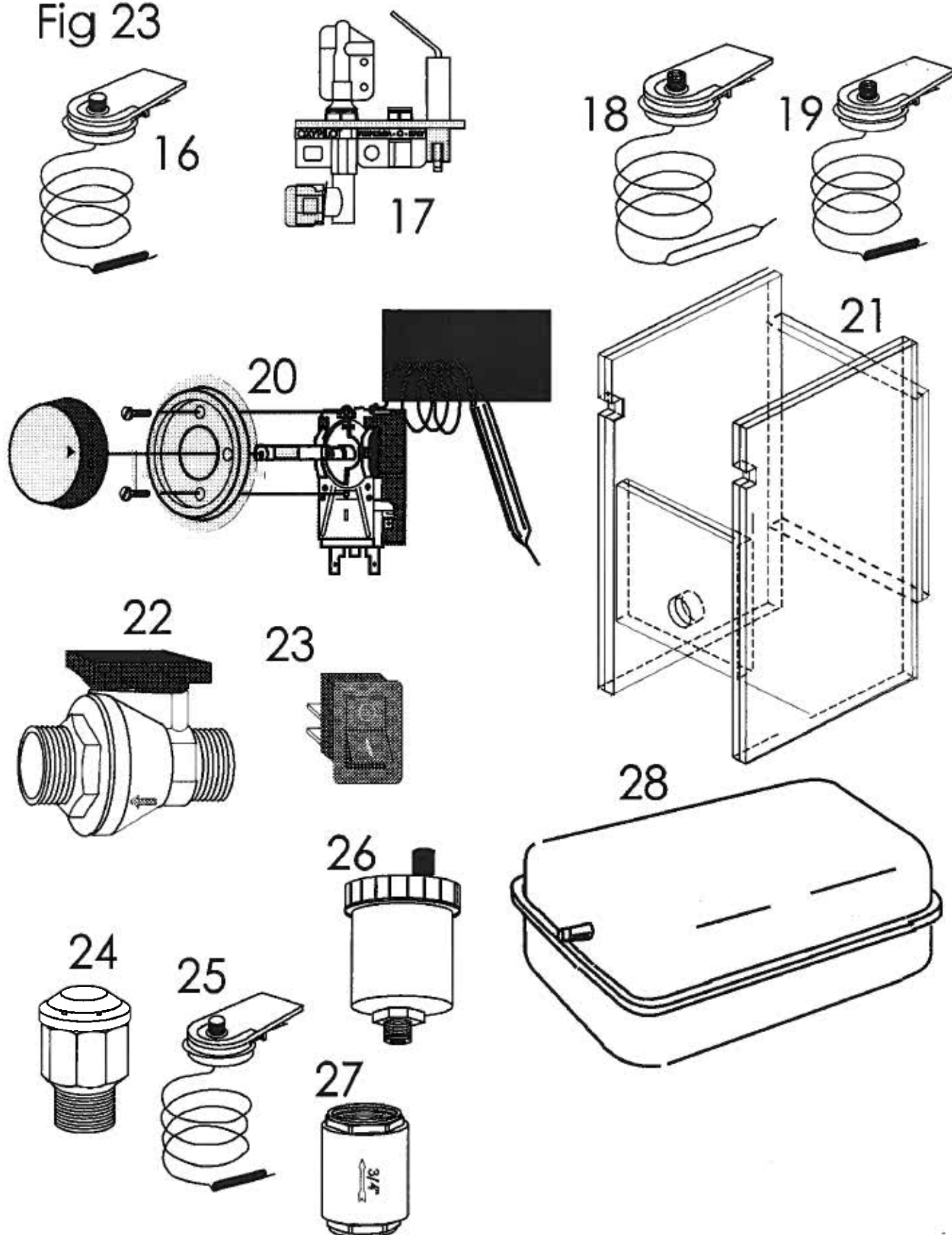


Fig 23

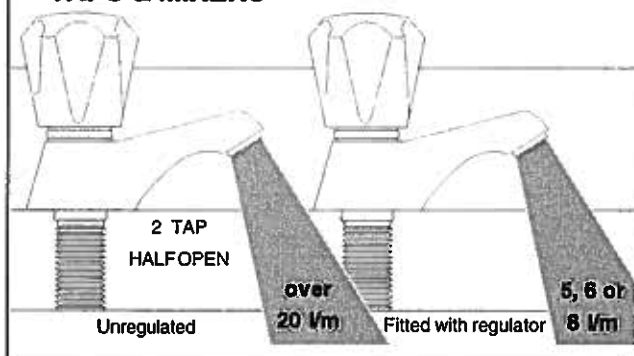


APPENDIX

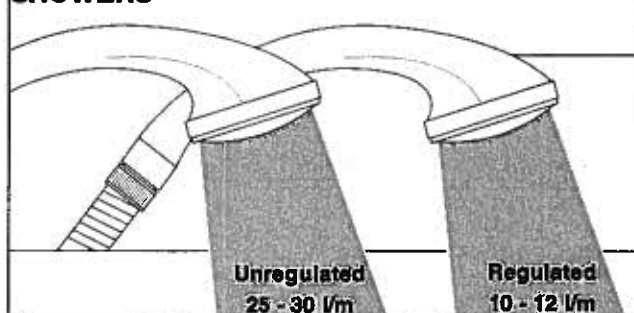
WATER SAVINGS

WATER RELATED COSTS CAN BE REDUCED BY GOOD PLUMBING PRACTICE.

TAPS & MIXERS



SHOWERS



Vast quantities of water are needlessly run off to waste due to Taps, Mixers and Showers discharging flow rates far in excess of the rates required for them to perform their duties.

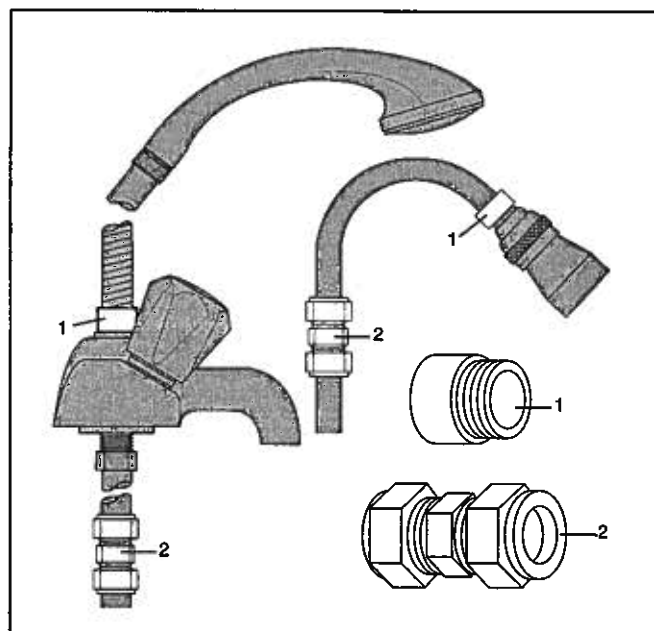
The contrasting flow rates shown on this leaflet clearly illustrate the savings that can be made whilst still providing a good performance.

British made AQUAFLOW REGULATORS provide constant flow rates by automatically compensating for supply pressure changes between 1 bar & 10 bars.

To facilitate installation into the wide range of plumbing equipment which is encountered in the U.K, FOUR FIXING OPTIONS are available:-

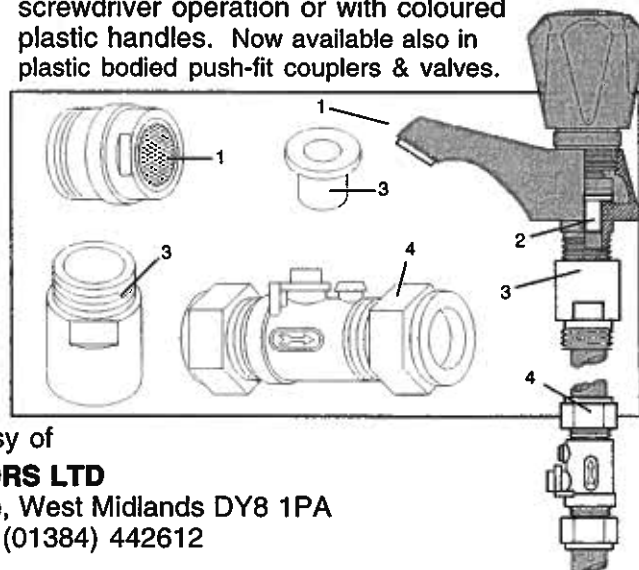
OPTIONS FOR SHOWERS

1. MXF "DW" RANGE - For fitting behind Fixed Shower Heads or onto Flexible Hoses for Handshowers (preferably onto the inlet end when lightweight hoses are used).
2. COMPRESSION FITTING RANGE. "In Line" regulators as in Option 4 for Taps & Mixers.



4 FIXING OPTIONS FOR TAPS & MIXERS

1. MK RANGE - Combined Regulators & Aerator for screwing onto Taps & Mixers with internal or external threads on their noses. Anti Vandal models also available.
2. MR05-T RANGE - Internal Regulators. Push fit into Tap or Mixer seats. Produced in three sizes - 12.5mm (BS1010), 12mm & 10mm, Flangeless models also available for Taps with Low Lift washers.
3. MXF STANDARD RANGE - Screw on tail models for Taps & Mixers. Fix onto the tails before fitting the tap connectors. Available in 3/8", 1/2", 3/4" and 1" BSP.
4. COMPRESSION FITTING RANGE - "In Line" regulators housed in 15mm & 22mm CXC COUPLERS & ISOLATING VALVES. "UK WFBS LISTED BY THE WATER RESEARCH CENTRE. Isolation valves available for slotted screwdriver operation or with coloured plastic handles. Now available also in plastic bodied push-fit couplers & valves.



Information by courtesy of

AQUAFLOW REGULATORS LTD

Haywood House, 40 New Road, Stourbridge, West Midlands DY8 1PA

Telephone (01384) 442611 Fax: (01384) 442612



ROBOFIL AUTO

GENERAL

The Altecnic Robofil range has been developed in conjunction with installers and specifiers to meet the requirements laid down by the industry as far as sealed heating systems and combination boilers are required.

The full range of the Robofil family are suitable for heating systems and for combination boiler systems, and can also be used as top up units in the traditional open vented systems.

FEATURES

The Robofil Auto incorporates all parts necessary to meet the relevant laws. These include the following:

full flow manual isolation ball valve with compression fittings, DZR brass WRC listed. Stainless steel braided flexible hose with butterfly fittings and quick release connections WRC listed.

Pressure reducing valve, chrome plated incorporating filter.

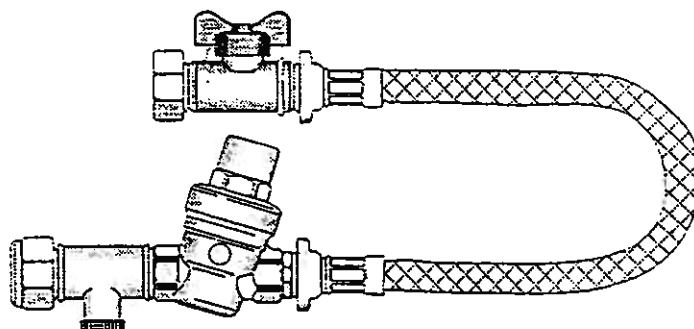
1/2" x 1/2" brass nipple, machined to accept 15mm olives

Robocheck II Double Check valve, with bleed point WRC listed to BS6282

Technical Specification

Max. working pressure 15 bar

Max. working temperature 95°C



TECHNICAL DATA

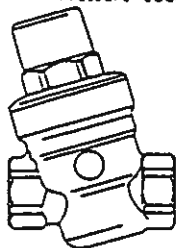
Due to the adjustable range of the pressure reducing valve, automatic pressures can be set between 0.5 and 3 bar to cover all potential applications of the unit.

The adjustment allows the installer to take account of individual house pressures to ensure a smooth running of a sealed system.

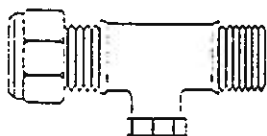
Due to the ease of installation, it allows the householders to top up the pressures on both combination and sealed system applications, avoiding the need for expensive service calls. Due to the unique cartridges design of the PRV an in built filter is in line, which avoids harmful swarf entering the heating system, or depositing on the safety relief valve.



Pressure reducing valve



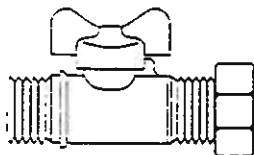
Robocheck II with double check valve 15mm with test point.



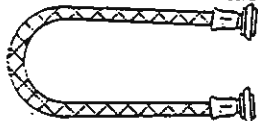
Chrome plated nipple adaptor



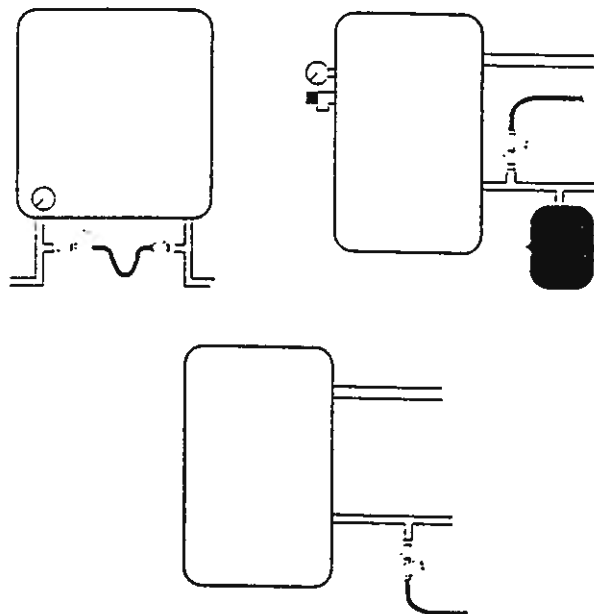
Isolation valve 15mm Ball Valve TYPE



Aiflex - Flexible connection



INSTALLATION



The Robofil auto should be fitted on the mains supply with the isolating valve on the mains side connected to the flexible hose and the double check valve should be on the downstream side of the pressure reducing valve. Due to the flexible layout of the Robofil auto any convenient position within the system can be chosen.

It is also suitable for use on open vented systems, for domestic top up if this is required.

Gledhill (Water Storage) Ltd

AMD. MAY 2007

CONDITIONS OF SALE & WARRANTY TERMS

1. We only do business upon the Conditions which appear below and no other. Unless we so agree in writing these Conditions shall apply in full to any supply of goods by us to the exclusion of any Conditions or terms sought to be imposed by any purchaser. These Conditions of Sale and Warranty Terms override those which are contained on the Invoice Forms and all Sales are now subject to these Conditions of Sale and Warranty terms only.

2. PRICE

Once an order or call off has been accepted the price will be held for three months but if delivery is extended beyond that period at the customer's request, then we reserve the right to amend the price when necessary. The company reviews its pricing annually to adjust for changes in our cost base. We reserve the right to alter prices at any time for severe movements in raw materials (mainly copper and steel). If there is to be a change we will give customers at least four weeks notice but anything delivered after that date will be at the revised price. An order may not be cancelled or varied after acceptance without the written consent of the company. Such cancellation or variation shall be subject to such reasonable charges as may be appropriate.

3. SPECIFICATION

The goods are supplied in accordance with the Specifications (if any) submitted to the Purchaser and any additions and alterations shall be the subject of an extra charge. Any goods not so specified shall be in accordance with our printed literature or the literature of any of our component suppliers (subject to any modifications made since publication). If we adopt any changes in construction or design of the goods, or in the specification printed in our literature, the Purchaser shall accept the goods so changed in fulfilment of the order.

4. PAYMENT

The invoice price of goods shall be payable within 30 days of despatch by us of our invoice for the goods or such longer time as may be stated by our quotation or invoice. If we receive payment in full on or before the due date we will allow an appropriate settlement discount except where we have quoted a special net price. If payment is not received in full on or before the due date we shall be entitled in addition to the invoice price to:

- (i) payment of a sum equal to any increase in the copper price supplement applicable to the particular goods sold between the date of receipt of order and the date of receipt of payment in full; and
- (ii) interest on any part of the invoice price unpaid after the due date at the rate of 3% per annum over the base rate for the time being of HSBC Bank plc.

5. TIME

We give estimates of delivery dates in good faith and time of delivery is not nor shall be made of the essence of any contract nor shall we be liable for any loss or damage occasioned by delay in delivery.

6. DELIVERY

We deliver free normally by our own vehicles within 25 miles of any of our manufacturing depots. Delivery to any place more than 25 miles from one of our manufacturing depots may be subject to our quoted delivery charges. We reserve the right to make delivery of goods contained in one order by more than one consignment and at different times. Where a period is agreed for delivery and such period is not extended by our Agreement, the Purchaser shall take delivery within that period. If the Purchaser fails to take delivery, we shall be entitled at the Purchaser's risk and expense to store the goods at the Purchaser's premises or elsewhere and to demand payment as if they had been despatched. Off loading at point of delivery shall be the responsibility of and be undertaken by the Purchaser.

7. SHORTAGES OR DAMAGE

Goods must be inspected before signature of delivery note and any damage, shortage or discrepancy noted on the delivery note and the goods returned on the same vehicle. The buyer must also give us immediate written notice of the damage, shortage or discrepancy so that we may prompt investigation.

8. RETURN OF GOODS

Goods may not be returned to the Company except by prior written permission of an authorised officer of the Company and such return shall be subject to payment by the Purchaser of handling and re-stocking charges, transport and all other costs incurred by the Company.

9. COMPANY LIABILITY

All our goods are made of the best materials from reputable manufacturers and where stated are manufactured to the appropriate British or European Standard. Complaints must be given to us immediately, before any action is taken, as responsibility cannot be accepted if repairs or renewals are attempted on site without our written authority.

Defects caused by corrosion or scale deposits are not covered by this guarantee save as expressly provided in paragraph (f) of this Condition 9.

Where we agree to rectify any defect, we reserve the right to undertake the work on our own premises.

The following guarantee covers faulty materials and manufacture for the stated period, provided that:-

- The unit has been installed in accordance with our installation and service instructions and all relevant codes of practice and regulations in force at the time of installation.
- That all necessary inlet controls and safety valves have been fitted correctly.
- It has only been used for the storage of potable water supplied from the public mains.
- Where appropriate the unit has been regularly maintained as detailed in the installation and service instructions.

(a) Domestic and Commercial Open Vented Cylinders and Tanks.

The copper storage vessel is guaranteed for ten years and if it proves to be defective either in materials or workmanship, we will either repair or supply replacement at our option with the closest substitute in the case of any obsolete product to any address in Great Britain.

- (i) free of all charge during the first year after delivery by us.
- (ii) thereafter at a charge of one-tenth of the then current list price and any copper price supplement and delivery charge during the second year after delivery by us and increasing by a further one-tenth on the second and subsequent anniversary of delivery by us.

(b) Domestic Mains Fed Products (Primary Stores)

The copper storage vessel is guaranteed for five years and if it or any integral pipework as part of the storage vessel assembly proves to be defective either in materials or workmanship, we reserve the right to either repair or supply replacements or the closest possible substitute in the case of any obsolete product and will collect and deliver to any address in England, Wales and Scotland (excluding all Scottish Islands).

- (i) free of all charge during the first year after delivery by us.
- (ii) thereafter at a charge of one-fifth of the then current list price or any copper price supplement and delivery charge during the second year after delivery by us increasing by a further one-fifth on the second and subsequent anniversary of delivery by us.

(c) Integrated Boiler and Storage Vessel Products and Stand Alone Boilers

In the case of the GulfStream range of products and the Gledhill boiler range of products, Gledhill guarantees the heat exchanger (boiler) for material and construction faults for two years and FURTHER we will meet the installer/contractors reasonable costs in removing and replacing any DEFECTIVE heat exchanger up to a MAXIMUM of one third of the extent of our liability in regard to the replacement product.

THE RESPONSIBILITY FOR THE EXECUTION OF THIS GUARANTEE LIES WITH THE INSTALLER.

The guarantee becomes null and void if the appliance is used incorrectly, or in the event of proven negligence or incorrectly implemented repairs OR FAILURE TO CARRY OUT THE RECOMMENDED INSPECTION/MAINTENANCE. The guarantee also becomes null and void if changes are made to the appliance without our knowledge, or if the serial number on the appliance is removed or made illegible.

The annual service must be carried out by a competent installer in accordance with the advice given by Gledhill and using Gledhill approved parts.

(d) Stainless Steel Unvented Cylinders

Gledhill guarantee the components including controls, valves and electrical parts for two years from the date of purchase. IT SHOULD BE NOTED THAT THE FACTORY FITTED TEMPERATURE AND PRESSURE RELIEF VALVE MUST NOT BE REMOVED OR ALTERED IN ANY WAY OR THE GUARANTEE WILL NOT BE VALID. GLEDHILL WILL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL LOSS OR DAMAGE HOWEVER IT IS CAUSED.

The guarantee for the stainless steel vessel is for twenty five years if the original unit is returned to us AND PROVIDED THAT:

- (i) It has been installed as per the Design, Installation & Servicing Instructions, relevant standards, regulations and codes of practice.
- (ii) It has not been modified, other than by Gledhill.
- (iii) It has not been subjected to wrong or improper use or left uncared for.
- (iv) It has only been used for the storage of potable water.
- (v) It has not been subjected to frost damage.
- (vi) The benchmark log book is completed after each annual service.
- (vii) The unit has been serviced annually.

It should be noted that the guarantee does not cover:

- the effects of scale build up
 - any labour charges associated with replacing the unit or parts.
- If the stainless steel vessel proves to be defective either in materials or workmanship we reserve the right to either repair or supply replacements or the closest possible substitute in the case of any obsolete product and will collect and deliver to any address in England, Scotland and Wales (excluding all islands):

- (i) free of charge during the first year after delivery by us.
- (ii) thereafter at a charge of one twenty fifth of the then current list price during the second year after delivery by us and increasing by a further one twenty fifth on the second and subsequent anniversary of delivery by us.

ACTION IN THE EVENT OF FAILURE

If the Stainless Lite develops a leak we will ask for a deposit against the supply of a new one. This will be refunded if the failure is within the terms of the warranty when it has been examined by us.

(e) Solar Panels and ancillary equipment

Gledhill provides a five year warranty for defects in the collectors (except broken glass and collector accessories eg metal edgings). If the collector demonstrably fails to meet one of the requirements of the standard DIN 4757 part 3 we will replace it free of charge based on the date of invoice. We can not be responsible for damage caused by mechanical stress and/or changes caused by weather related influences. The warranty excludes minor surface damage that does not affect performance or malfunction due to improper assembly or installation.

Please note:

- Installation must have been carried out by a licensed special-ized company (heating contractor or plumber) following the version of installation instructions in force.
- Gledhill or its representative was given the opportunity to check complaints on site immediately after any defect occurred.
- Confirmation exists that the system was commissioned properly and that the system was checked and maintenance was performed annually by a specialised company licensed for this purpose.

(f) Components of our products other than Storage Vessels and Integral Pipework.

We will either extend to the purchaser the same terms of warranty as we are given by the manufacturer of the component or if the manufacturer does not give any warranty, replace free of charge any component which becomes defective within two years after the date of the delivery by us and is returned to us at the purchaser's expense but we shall not meet the cost of removal or shipping or return of the component or any other cost charges or damages incurred by the purchaser.

If the appliance manufactured by Gledhill incorporates a factory fitted scale inhibitor then during the period of three years from the date of delivery Gledhill will replace, free of charge, any plate heat exchanger fitted in the appliance as original equipment in which scale formation occurs that materially reduces the effectiveness of the plate heat exchanger. This guarantee does not extend to any other component installed within the Gledhill appliance or elsewhere in the Purchaser's domestic water system.

(g) General

In the case of goods manufactured solely in accordance with our specification and designs and in respect of any installation work carried out by or on our behalf, our entire liability and the purchaser's sole remedies (subject to (a) - (f) above) and shall be as follows:

- (a) we accept liability for death or personal injury to the extent that it results from our negligence that of our employees agents or subcontractors.
- (b) subject to paragraph (d) below, we accept liability for direct physical damage to tangible property to the extent that such damage is caused by our negligence that of our employees agents or subcontractors.
- (c) our total liability to the purchaser over and above any liability to replace under (1 - 4) above (whether in contract or in tort including negligence) in respect of any one cause of loss or damage claimed to result from any breach of our obligations hereunder, shall be limited to actual money damages which shall not exceed £20,000 provided that such monetary limit shall not apply to any liability on the part of ourselves referred to in paragraph (a) above.
- (d) except as provided in paragraph (a) above but otherwise notwithstanding any provision herein contained in no event shall we be liable for the following loss or damage howsoever caused and even if foreseeable by us or in our contemplation :-
 - (i) economic loss which shall include loss of profits, business revenue, goodwill or anticipated savings.
 - (ii) damages in respect of special indirect or consequential loss or damage (other than death, personal injury and damage to tangible property).
 - (iii) any claim made against the purchaser by any other party (save as expressly provided in paragraph (b) above).
- (e) except in respect of our liability referred to in paragraph (a) above no claim may be made or action brought (whether in contract or in tort including negligence) by the purchaser in respect of any goods supplied by us more than one year after the date of the invoice for the relevant goods.
- (f) nothing in these Conditions shall confer on the purchaser any rights or remedies to which the purchaser would not otherwise be legally entitled.

10. LOSS OR INJURY

Notwithstanding any other provision contained herein the Purchaser's hereby agree to fully indemnify us against any damages losses costs claims or expenses incurred by us in respect of any claim brought against us by any third party for :-

- (a) any loss injury or damage wholly or partly caused by any goods supplied by us or their use.
- (b) any loss injury or damage wholly or partly caused by the defective installation or sub-standard workmanship or materials used in the installation of any goods supplied by us.
- (c) any loss injury or damage in any way connected with the performance of this contract.

PROVIDED that this paragraph (6) will not require the Purchaser to indemnify us against any liability for our own acts of negligence or those of our employees agents or sub-contractors.

FURTHER in the case of goods supplied by us which are re-sold to and installed by a third party by the Purchaser it will be the sole responsibility of the Purchaser to test the goods immediately after their installation to ensure that inter alia they are correctly installed and are in proper working order, and are not likely to cause any loss injury or damage to any person or property.

11. VARIATION OF WARRANTY AND EXCLUSION

Should our warranty and exclusion be unacceptable we are prepared to negotiate for variation in their terms but only on the basis of an increase in the price to allow for any additional liability or risk which may result from the variation.

Purchasers are advised to insure against any risk or liability which they may incur and which is not covered by our warranty.

12. RISK AND RETENTION OF TITLE

(a) goods supplied by us shall be at the Purchaser's risk immediately upon delivery to the Purchaser or into custody on the Purchaser's behalf or to the Purchaser's Order. The Purchaser shall effect adequate insurance of the goods against all risks to the full invoice value of the goods, such insurance to be effective from the time of delivery until property in the goods shall pass to the Purchaser as hereinafter provided.

(b) property in the goods supplied hereunder will pass to the Purchaser when full payment has been made by the Purchaser to us for :-

- (i) the goods of the subject of this contract.
- (ii) all other goods the subject to of any other contract between the Purchaser and us which, at the time of payment of the full price of the goods sold under this contract, have been delivered to the Purchaser but not paid for in full.
- (c) until property in the goods supplied hereunder passes to the Purchaser in accordance with paragraph (2) above.

(i) the Purchaser shall hold the goods in a fiduciary capacity for us and shall store the same separately from any other goods in the Purchaser's possession and in a manner which enables them to be identified as our goods.

(ii) the Purchaser shall immediately return the goods to us should our authorised representative so request. All the necessary incidents associated with a fiduciary relationship shall apply.

(d) the Purchaser's right to possess the goods shall cease forthwith upon the happening of any of the following events, namely :-

- (i) if the Purchaser fails to make payment in full for the goods within the time stipulated in clause 4 hereof.
- (ii) if the Purchaser, not being a company, commits any act of bankruptcy, makes a proposal to his or her creditors for a compromise or does anything which would entitle a petition for a Bankruptcy Order to be presented.
- (iii) if the Purchaser, being a company, does anything or fails to do anything which would entitle an administrator or an administrative receiver or a receiver to take possession of any assets or which would entitle any person to present a petition for winding up or to apply for an administration order.

(e) the Purchaser hereby grants to us an irrevocable licence to enter at any time any vehicle or premises owned or occupied by the Purchaser or in the possession of the Purchaser for the purposes of repossessing and recovering any such goods the property in which has remained in us under paragraph (2) above. We shall not be responsible for and the Purchaser will indemnify us against liability in respect of damage caused to any vehicle or premises in such repossession and removal being damaged which it was not reasonably practicable to avoid.

(f) notwithstanding paragraph (3) hereof and subject to paragraph (7) hereof, the Purchaser shall be permitted to sell the goods to third parties in the normal course of business. In this respect the Purchaser shall act in the capacity of our commission agent and the proceeds of such sale :-

- (i) shall be held in trust for us in a manner which enables such proceeds to be identified as such, and ;
- (ii) shall not be mixed with other monies nor paid into an overdrawn bank account.

We, as principal, shall remunerate the Purchaser as commission agent a commission depending upon the surplus which the Purchaser can obtain over and above the sum, stipulated in this contract of supply which will satisfy us.

(g) in the event that the Purchaser shall sell any of the goods pursuant to clause (6) hereof, the Purchaser shall forthwith inform us in writing of such sale and of the identity and address of the third party to whom the goods have been sold.

(h) if, before property in the goods passes to the Purchaser under paragraph (2) above the goods are or become affixed to any land or building owned by the Purchaser it is hereby agreed and declared that such affixation shall not have the effect of passing property in the goods to the Purchaser. Furthermore if, before property in the goods shall pass to the Purchaser under paragraph (2) hereof, the goods are or become affixed to any land or building (whether or not owned by the Purchaser), the Purchaser shall:-

- (i) ensure that the goods are capable of being removed without material injury to such land or building.
- (ii) take all necessary steps to prevent title to the goods from passing to the landlord of such land or building.
- (iii) forthwith inform us in writing of such affixation and of the address of the land or building concerned.

The Purchaser warrants to repair and make good any damage caused by the affixation of the goods to or their removal from any land or building and to indemnify us against all loss damage or liability we may incur or sustain as a result of affixation or removal.

(i) in the event that, before property in the goods has passed to the Purchaser under paragraph (2) hereof, the goods or any of them are lost, stolen, damaged or destroyed :-

- (i) the Purchaser shall forthwith inform us in writing of the fact and circumstances of such loss, theft, damage or destruction.
- (ii) the Purchaser shall assign to us the benefit of any insurance claim in respect of the goods so lost, stolen, damaged or destroyed.

13. NON-PAYMENT

If the Purchaser shall fail to make full payment for the goods supplied hereunder within the time stipulated in clause 4 hereof or be in default of payment for any other reason then, without prejudice to any of our other rights hereunder, we shall be entitled to stop all deliveries of goods and materials to the Purchaser, including deliveries or further deliveries of goods under this contract. In addition we shall be entitled to terminate all outstanding orders.

14. RISK

All goods sold by us shall be at the sole risk of the Purchaser from the date of despatch by us of the invoice for their price.

15. VALUE ADDED TAX

All prices quoted are exclusive of Value Added Tax which will be charged at the rate ruling at the date of despatch of invoice.

16. TRADE SALES ONLY

We are only prepared to deal with those who are not consumers within the terms of the Unfair Contract Terms Act 1977, the Sale of Goods Act 1979 and the Supply of Goods and Services Act 1982. Accordingly any person who purchases from us shall be deemed to have represented that he is not a consumer by so purchasing.

17. JURISDICTION

The agreement is subject to English/Scottish law and any dispute arising hereunder shall be settled in accordance therewith dependent upon the location.

