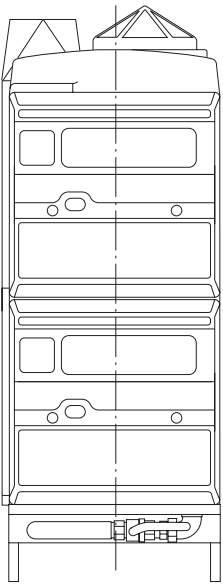


**DORCHESTER
DR-SE 18 & DR-SE 20 P/P
HOT WATER
STORAGE HEATERS**

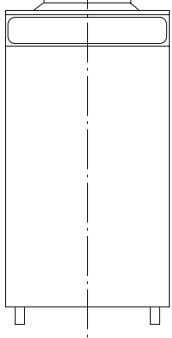
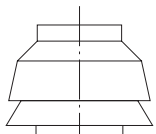
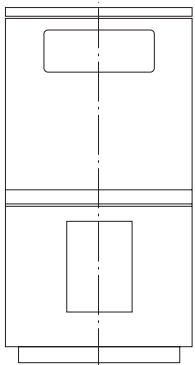
**Installation, Commissioning
and Maintenance Instructions**

(Minisit 710 gas control valve)
Heaters with serial numbers from 8000000



IMPORTANT NOTE

**THESE INSTRUCTIONS MUST BE READ
AND UNDERSTOOD BEFORE INSTALLING,
COMMISSIONING, OPERATING OR
SERVICING EQUIPMENT**



Customer Services

Technical Enquiries



01202 662527/662528

To supplement the detailed technical brochures, technical advice on the application and use of products in the Hamworthy Heating range is available from our technical team in Poole and our accredited agents.

Site Assembly



01202 662555

Hamworthy offer a service of site assembly for many of our products in instances where plant room area is restricted. Using our trained staff we offer a higher quality of build and assurance of a boiler built and tested by the manufacturer.

Commissioning



01202 662555

Commissioning of equipment by our own engineers, accredited agents or specialist sub – contractors will ensure the equipment is operating safely and efficiently.

Maintenance Agreements



01202 662555

Regular routine servicing of equipment by Hamworthy service engineers inspects the safety and integrity of the plant, reducing the risk of failure and improving performance and efficiency. Maintenance agreements enable our customers to plan and budget more efficiently.

Breakdown service, repair, replacement



01202 662555

Hamworthy provide a rapid response breakdown, repair or replacement service through head office at Poole and accredited agents throughout the UK.

Spare Parts



01202 662525

A comprehensive spare parts service is operated from our factory in Poole, providing replacement parts for both current and discontinued products. Delivery of parts and components is normally from stock within seven days. However, a next day delivery service is available for breakdowns and emergencies.

**DORCHESTER
DR-SE 18 & DR-SE 20 P/P
HOT WATER
STORAGE HEATERS**

**Installation, Commissioning
and Maintenance Instructions**

(Minisit 710 gas control valve)
Heaters with serial numbers from 80000000

**NOTE: THESE INSTRUCTIONS MUST BE READ AND UNDERSTOOD BEFORE
INSTALLING, COMMISSIONING, OPERATING OR SERVICING EQUIPMENT.**

THIS HEATER IS FOR USE ON 2nd AND 3rd FAMILY GASES ONLY. RELEVANT DETAILS
MUST BE FOUND WITHIN THIS DOCUMENT AND CHECKED AGAINST THE GAS TO BE
FIRED AND FOR WHICH GAS THE HEATER IS ADJUSTED, PRIOR TO FIRST FIRING.

THIS HEATER IS INTENDED TO BE INSTALLED IN A ROOM SEPARATED FROM LIVING
ROOMS AND PROVIDED WITH APPROPRIATE VENTILATION DIRECTLY TO THE OUTSIDE.

IF IT IS TO BE INSTALLED IN A LIVING ROOM, THE HEATER MUST BE FITTED WITH AN
ADDITIONAL COMBUSTION PRODUCTS DISCHARGE SAFETY DEVICE TOGETHER WITH
THE APPROPRIATE VENTILATION.

**THIS HEATER HAS BEEN TESTED FOR COMPLIANCE TO EUROPEAN DIRECTIVES
90/396/EEC AND 89/336/EEC AMENDED BY 92/31/EEC AND 93/68/EEC CERTIFICATE
NUMBER 0085 AQ.**

**PUBLICATION NO. 500001062
ISSUE 'D'
February 2005**

CONTENTS

PAGE

1.0 INTRODUCTION AND DELIVERY	1
2.0 DESCRIPTION	1
2.1 Heater	
2.2 Options	
3.0 GENERAL REQUIREMENTS	2
3.1 Related Documents	
3.2 British Standards	
3.3 British Gas Publications	
4.0 TECHNICAL DATA	2
5.0 LOCATION	3
6.0 GAS SUPPLY	3
6.1 Service Pipes	
6.2 Meters	
6.3 Gas Supply Pipes	
6.4 Boosted Supplies	
7.0 FLUE SYSTEM	4
7.1 Flue Construction	
7.2 Waste Gas Volume	
8.0 AIR FOR COMBUSTION AND VENTILATION	4
9.0 WATER PIPEWORK INSTALLATION	5
10.0 GAS PIPEWORK INSTALLATION	6
11.0 CONTROL SYSTEM	6
12.0 COMMISSIONING	6
12.1 System Checks	
12.2 Heater Checks	
12.3 Procedure for Initial Lighting and Adjustment	
12.4 Combustion Check	
12.5 Normal Operation	

PAGE**13.0 SERVICING**

8

- 13.1 Removal of Burner Assembly
- 13.2 Servicing Burner Assembly
- 13.3 Cleaning of Exhaust Gas Passageway
- 13.4 Inspection of Waterside Surfaces and Anode
- 13.5 Assembly Following Servicing

14.0 RECOMMENDED SPARES

10

15.0 OPTIONS

10

- 15.1 Time Clock Control
- 15.2 Flame Failure Alarm
- 15.3 Top to Bottom Circulation
- 15.4 Living Space Installation

FIGURES**PAGE**

Figure No. 1	Dimensioned Views	14
Figure No. 2	Typical Schematic Pipework Arrangement - Single Heater	15
Figure No. 3	Typical Schematic Pipework Arrangement - Multi Heaters	15
Figure No. 4	Typical Schematic Pipework Arrangement - Heater with Storage Tank	16
Figure No. 5	Burner Assembly	16
Figure No. 6	Pilot Burner Assembly	17

TABLES

Table 1	Technical Data	3
Table 2	Exhaust Gas Data	4
Table 3	General Air Requirements	5
Table 4	Air Supply Openings per Heater	5
Table 5	Control Valve Temperature Settings	8

APPENDIX 1 - LPG MODELS	18
-------------------------	----

APPENDIX 2 - UNVENTED SYSTEMS	20
-------------------------------	----

1.0 INTRODUCTION AND DELIVERY

1.1 This heater must be installed by a competent person holding 'CORGI' registration or equivalent.

All installations must conform to the relevant Gas Safety and Building Regulations. H.S.E. requirements must also be taken into account when installing, operating and maintaining any equipment.

1.2 This heater can be adjusted to fire either Natural Gas (2nd Family) or LPG (3rd Family). This manual refers to models suitable for Natural Gas. For details of LPG models, refer to Appendix 1 at rear of manual. Consult the heater data plate to ascertain which gas group the heater has been manufactured to use. Heaters **MUST NOT** use gas other than that for which the heater has been adjusted.

1.3 All heaters are factory assembled and delivered individually packed and shrouded in polythene on a wooden pallet. Within the packaging, wrapped separately are the draught diverter and the two piece burner/controls cover. A separate package contains the installers kit comprising a manual gas shut off valve with integral union, a drain valve, reducing bush, lighting up instructions and users instructions.

The exterior casing of the heater is coated with a protective plastic coating which should be peeled off following installation.

To check the size of the heater, refer to the rating label which is attached to the heater casing and mounted above the burner controls.

2.0 DESCRIPTION

2.1 Heater

The **Hamworthy DR-SE** series of automatic gas fired hot water storage heaters comprises two models designated DR-SE 18 P/P and DR-SE 20 P/P. Each unit is fired by an atmospheric gas burner incorporating a permanent pilot and controlled by a multi-functional gas valve of the self energising type (no electrical supply required). This valve is fitted with an integral control thermostat for automatic temperature control and Piezo unit for ignition of the permanent pilot. A manual reset overheat safety device (high limit thermostat) is fitted on the thermocouple circuit to extinguish the pilot flame in the event of an overheat trip occurring.

Flue gases from the combustion chamber pass through the heater via three central fire tubes which are fitted with stainless steel retarders to ensure maximum heat transfer to water. The draught diverter supplied must be fitted in an unmodified condition to the spigot around the top of the fire tubes where it provides a connection to a vertical flue.

The internal surfaces of the vessel, coated with a high quality glass lining together with a removable sacrificial magnesium anode, provides the best possible protection against waterside corrosion. The vessel is fully insulated and covered in a pre-coated sheet steel casing.

The connections provided on each heater are:-
Cold water inlet, hot water outlet, secondary recirculation and drain. Additionally, both models include an inspection/clean out door.

The heaters are floor mounted units designed to provide hot water for domestic, commercial and industrial premises. They can be installed in single or multiple units and can be used in conjunction with suitably sized additional storage tanks (not HHL supply).

All screw threads used on the heaters conform to the following:-

ISO 7/1 or **ISO 228/1** for pipe threads where applicable.

ISO 262 for all general screw threads.

2.2 Options

The heaters can be supplied with the following additional variations, either ready fitted or for site fitting.

2.2.1 LPG - The heaters can be supplied adjusted for use on propane or butane - see Appendix 1 at rear of manual. It is important that the heater is correctly adjusted for the gas to be fired.

2.2.2 Unvented supply - The heaters can be supplied with a purpose designed and sized unvented kit comprising pressure reducing valve, non-return valve, expansion vessel, expansion relief valve and pressure/temperature relief valve, to enable the heater to be coupled directly to the mains water. For details see Appendix 2 (publication No. 500001005)

2.2.3 Time Clock Control - A conversion kit can be supplied which provides a 230 volt single phase solenoid valve between the gas control valve and the burner enabling the heater to be controlled from a time clock or interlock (i.e. fan dilution flow switch). For details see Section 15.1 of this manual. Note: If any form of time clock control is fitted due regard should be given to the HSE and DHSS guidance on the maintenance of water temperatures to avoid Legionella.

2.2.4 Flame Failure Alarm - A pressure switch can be supplied fitting on the gas pilot supply tube between the gas control valve and the pilot burner which will detect the absence of a pilot flame either due to pilot failure or an overheat condition. The pressure switch

contains a volt free micro switch with changeover contacts which can be wired to a warning lamp or alarm circuit, For details see Section 15.2 of the manual.

2.2.5 Top to Bottom Circulation - In order to give enhanced temperature control to aid compliance with the HSE guidance and the DHSS Code of Practice for 'The Control of Legionellae in Health Care Premises', a pump circulation kit can be supplied comprising 230 volt single phase pump, pipework and sufficient fittings to connect between the hot water flow and the bottom drain connection. For details see Section 15.3 of this manual.

2.2.6 Living Space Installation - The standard heaters are supplied only for installation in a room separated from living rooms and provided with appropriate ventilation directly to the outside. If installation is being considered in a living room, the ventilation must remain appropriate and the unit must be fitted with a combustion products discharge safety device which is available as an additional kit. For details see Section 15.4 of this manual.

3.0 GENERAL REQUIREMENTS

3.1 Related Documents.

Gas Safety Installations and Use Regulations 1998, (as amended).

It is Law that all gas appliances are installed by competent persons in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure that this law is complied with.

The installation of the heater **MUST** be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, IEE Regulations and the byelaws of the local water undertaking.

The installation should also be in accordance with

4.0 TECHNICAL DATA

Technical data is shown in Table 1

Heater Connections:

Cold feed	:	R1½	1½ in BSP external taper
Hot flow	:	R1½	1½ in BSP external taper
Recirculation	:	Rc1	1 in BSP internal
Drain	:	Rc1	1 in BSP internal
(¾ in BSP (t) drain valve supplied complete with 1 in / ¾ in reducing bush and hose connection)			
Gas inlet pipe	:	R½	½ in BSP external taper
Manual gas valve	:	2 x Rc½	2 x ½ in BSP internal c/w union
Draught diverter spigot ID	:	131 mm	
Nominal bore of flue outlet	:	127 mm	

the relevant requirements of the HSE, the local gas region and local authority and the relevant recommendations of the following documents:-

3.2 British Standards

BS 6891 - Specification for installation of low pressure gas pipework of up to 28 mm (R1) in domestic premises (2nd family gas). For larger installations see **IGE/UP/2** below.

BS 6798 - Specification for installation of gas-fired boilers of rated input not exceeding 70 kW net.

BS 6644 - Specification for installation of gas-fired hot water boilers of rated inputs between 60 kW and 2 MW (2nd and 3rd Family gases).

BS 6700 - Specification for Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

CP 342 - COP for Centralised hot water supply, Part 2 - buildings other than individual dwellings.

BS 5546 - Specification for installation of hot water supplies for domestic purposes, using gas-fired appliances of rated input not exceeding 70 kW.

BS 5440 - Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) - Part 1: Flues. Part 2: Ventilation.

3.3 Institution of Gas Engineers and Managers Publications

IGE/UP/1 - Soundness testing and purging of industrial and commercial gas installations.

IGE/UP/1A - Soundness testing and direct purging of small low pressure industrial and commercial Natural Gas installations.

IGE/UP/1B - Tightness testing and purging of domestic sized Natural Gas installations.

IGE/UP/2 - Gas installation pipework, boosters and compressors on industrial and commercial premises.

IGE/UP/10 - Installation of gas appliances in industrial and commercial premises. Part 1 - Flued appliances

Table 1. Technical Data

MODEL	DR-SE 18	DR-SE 20
Input (Gross)	22.2 kW	25.5 kW
Input (Net)	20.0 kW	23.0 kW
Output	18.0 kW	20.0 kW
Weight (filled)	470 kg	600 kg
Maximum water pressure	6 bar	6 bar
Nominal gas inlet pressure (G20)	20 mbar	20 mbar
Maximum gas inlet pressure (G20)	25 mbar	25 mbar
Gas burner setting pressure	13.6 mbar	13.0 mbar
Injector diameter	3.5 mm	3.8 mm
Injector marking	350	380
Gas flow rate	2.1 m ³ /h	2.4 m ³ /h
Capacity	300 litres	400 litres
Continuous output with Δt of 44°C	350 l/h	390 l/h
Time to recover storage with Δt of 44°C	52 min	62 min

Detailed dimensions of the heaters are shown in Fig. 1

5.0 LOCATION

The heater location should be such that a satisfactory flue system can be connected. An adequate air supply for both combustion and ventilation must be provided (see table 3) and sufficient space allowed around the heater for servicing (see figure 1). The heater must normally be installed in a room separate from a living room. If the heater is to be installed in a living room, it must be fitted with a combustion products discharge safety device, which is available as an additional kit—see Section 15.4 of this manual.

The heater must be installed on a level concrete floor or plinth or equivalent non-combustible surface which is sufficient to support its weight when filled with water (see Table 1).

Any combustible material adjacent to the heater and flue system must be so placed or shielded so as to ensure that its temperature does not exceed 65°C

6.0 GAS SUPPLY

6.1 Service Pipes

The responsible gas conveyor must be consulted at the installation planning stage in order to establish the availability of an adequate supply of the appropriate gas.

An existing service pipe must not be used without prior consultation with the responsible gas conveyor.

6.2 Meters

If necessary a new gas meter will be connected to the

service pipe by the responsible gas conveyor, or his contractor.

6.3 Gas Supply Pipes

Supply pipes must be fitted in accordance with BS 6891. Pipework from the meter to the heater must be of adequate size and not smaller than the heater gas connection (½" BSP).

6.4 Boosted Supplies

Where it is necessary to employ a gas pressure booster, the controls must include a low pressure cut-off switch at the booster inlet. The responsible gas conveyor must be consulted before a gas pressure booster is fitted.

7.0 FLUE SYSTEM

7.1 The Hamworthy DR-SE series of water heaters are designed to be used with natural draught flues. Flue systems must be designed in accordance with the current regulations and with reference to BS 5440 Part 1, BS 6644 and IGE/UP/10. The following points should be noted:

7.1.1 The correct draught diverter is packed with each heater. It must be fitted in an unmodified condition to the spigot on the top of the heater. The draught diverter should be pushed fully home into the spigot and the close fit should ensure no further sealing of this joint is required.

7.1.2 Any flue system connected to the draught diverter must be self-supporting and fitted inside the diverter top spigot. **Allowance must be made in the**

flue system for removal of a section close to the heater to enable the diverter and retarders to be removed for cleaning.

7.1.3 The heaters must be located as near to the chimney as possible, the nearest heater being not more than 2 m away.

7.1.4 The flue system must be designed to achieve a suction condition at the draught diverter at all times the heater is firing. The vertical height of the flue should never be less than 1 m. Any bends or additional resistances within the flue system must be compensated for by increasing the vertical height above the minimum.

7.1.5 The flue connection spigot on the draught diverter is intended for sheet metal flues. The materials used for the flue system must be non-combustible, mechanically robust and resistant to internal and external corrosion.

7.1.6 In some instances, mechanical assistance may be necessary. The heaters are suitable for connection to a fan diluted flue system. Refer to BS 5440 Part 1, BS 6644 and IGE/UP/10.

7.1.7 Hamworthy Heating Limited offers a comprehensive range of flue products from stock, or alternatively provides a full design and installation service incorporating sizing, site survey and drawings for approval prior to manufacture. For further information contact Hamworthy Heating (Flue Products) at Birmingham. The number is located on the back of this manual.

7.2 Exhaust Gas Volume and Temperatures

It is recommended that the volume and temperature of the exhaust gases used for the design of the flue system are as shown in Table 2:-

TABLE 2. Exhaust Gas Data

Heater Model	Approximate Exhaust Gas Volume at N.P.T	Approximate Exhaust Gas before Draught Diverter
	m ³ /h	°C
DR-SE 18	31.4	153
DR-SE 20	36.1	167

8.0 AIR FOR COMBUSTION AND VENTILATION

Adequate air for combustion and ventilation must be provided by means of openings at high and low level within the space housing of the heater and directly communicating with the outside air. The air supply requirements specified in BS 5440 Part 2 for inputs up to 60 kW and BS 6644 for inputs above 60 kW should be followed and are summarised in Tables 3 and 4.

Note 1: High level is considered to be as close to the ceiling as possible. Low level is considered to be 150 mm above floor level.

Note 2: Aerosols as used in hair dressing salons can give off vapours, as do some industrial processes, which can cause rapid corrosion of heater components. It is therefore essential that in these instances, the vapours do not contaminate the air supply to, or the air within, the space housing the heaters.

Note 3: Particular attention must be paid to any other equipment housed within the space as the heater, which may use extract equipment. In this instance, air supply must be by mechanical means at a greater rate than the total extract in order to ensure correct combustion and operation of the flue or additional air vents must be provided.

Note 4: Heaters installed in a living space must be fitted with a combustion products discharge safety device which is available as an additional kit - see Section 15.4 of this manual and the space must be appropriately ventilated in accordance with BS 5440 Part 2.

Note 5: If the compartment containing the heater is vented indirectly, the free areas must be increased in accordance with BS 5440 Part 2.

Table 3 - General Air Requirements

Total Input Rating of Appliance	Position of Opening	Free Area of Opening (Air Direct from Outside)
Up to 60 kW (Gross)	Low level	9cm ² per kW of total maximum rated input
	High Level	4.5cm ² per kW of total maximum rated input
Above 60 kW (Gross)	Low Level	540cm ² plus 4.5cm ² per kW in excess of 60 kW total rated input
	High Level	270cm ² plus 2.25cm ² per kW in excess of 60 kW total rated input.

Table 4 - Air Supply Openings per Heater

Model	Position of Opening	Free Area cm ²
DR-SE 18	Low Level	200
	High Level	100
DR-SE 20	Low Level	230
	High Level	115

9.0 WATER PIPEWORK INSTALLATION

9.1 For details of a typical installation scheme of a DR-SE water heater refer to Fig. 2. For details of a typical installation scheme of multi-DR-SE water heaters refer to Fig. 3.

The heaters can also be installed in conjunction with a storage tank, typically as shown in Fig. 4. To ensure the tank is brought up to temperature, a suitable pump should be installed between the heater and tank controlled by a thermostat in the tank. This enable hot water from the heater to circulate to the tank, thus keeping all the storage up to temperature and ready for use.

9.2 For sizes of water connections, refer to Section 4.0. All the water pipework connections are located on the top cover of the heater, the hot water supply is identified by a red spot and the cold feed by a blue spot. The cold feed connection contains a plastic tube which feeds the water towards the bottom of the heater. The cold supply must always be fed into this connection. The heater is supplied with a recirculation connection, located behind the draught diverter, plugged. If the recirculation connection is not to be used, it can be utilised for the fitting of the relief valve or open vent. The drain valve supplied in the installers kit should be fitted to the connection at the bottom of the heater. All jointing compound used should be suitable for potable water systems.

9.3 The feed tank and the water supply pipe from the feed tank must be sized to ensure that make-up water is equivalent or exceeds the maximum draw off rate of the heater system and any other system

requirements.

The hot water flow pipe from each heater must be fitted with a 25 mm diameter vent pipe and a 19 mm relief valve. The vent should rise to discharge over the feed cistern. No isolating valves must be fitted between the heater and the relief valve/open vent. For unvented systems refer to Appendix 2 (publication No. 500001005).

For maximum pressure, refer to Table 1.

9.4 It is recommended that the heater should operate with not less than a 2 m (6 ft) working head but due consideration must be given to the highest position of any draw-off points on the system when determining this height.

Dead legs to water draw-off points should be as short as possible and in no case should they exceed the lengths laid down in the Water Byelaws. The Water Byelaws state that the maximum lengths of pipe supplying a hot water draw-off tap measured along the axis of the pipe from the heater, cylinder or tank or from a secondary circuit are as listed below:-

Pipes not greater than 19 mm ID - max dead leg length 12 m.

Pipes in range 19-24 mm ID - max dead leg length 7.6 m.

Pipes greater than 25 mm ID - max dead leg length 3 m.

9.5 After installation of the water system has been

completed, open the main water supply valve, flush the system and fill the heater. Open the hot water taps and allow air to escape from the system. When the system is free of air close the hot water taps and check for leaks on all the water heater connections including the drain valve, anode connections and the inspection port flange. Before being taken into use, the system should be cleaned and disinfected. Refer to BS 6700.

10.0 GAS PIPE INSTALLATION

An Rc½ manual union gas shut-off valve is supplied in the installers kit. The valve can either be fitted direct to the gas inlet pipe or remote from the heater but in close proximity to it. In either case ensure that the valve is fitted with the union on the downstream (gas control valve) leg of the pipework.

Connect the incoming gas supply to the manual gas valve on each heater, observing the notes detailed under Section 'Gas Supply', and conforming to the requirements of BS6891. Before commissioning the complete gas installation must be purged, inspected and pressure tested for soundness.

NOTE: Do not run the gas pipework across the front of the heater at low level since this may prevent removal of the burner assembly for maintenance and avoid running the gas supply pipework across the inspection door cover plate.

11.0 CONTROL SYSTEM

Automatic control of the heater centres around the 710 Minisit multi-functional gas control valve which incorporates an integral thermostat with a range of 40 to 75°C. The thermostat action is purely mechanical, requiring no power supply and operating on the principle of fluid filled bellows, capillary and temperature sensing phial, the latter being located in a pocket projecting into the heater. The functions of the valve, including the temperature setting, are controlled by a single knob with an interlocked Piezo unit, which only operates when the control knob is in the pilot gas position, to ignite the permanent pilot. Pilot flame failure is detected by a two piece thermocouple with a drop out time of 35 to 45 seconds. The two sections of a thermocouple are joined by a connection to each side of an overheat safety device (limit thermostat) located on a bracket attached to the heater casing above the control valve.

The overheat safety device is of the manual reset type, the reset button being positioned beneath the black covering knob. The sensing element for this device is located in the same pocket as the control valve sensor and is inserted second behind the larger phial. The overheat safety device is non-adjustable and preset to operate at a temperature of 80°C. Should the device operate, the heater is immediately shut down, gas to both pilot and main

burner being shut off. Manual re-ignition of the pilot flame is required to re-instate the heater into service, once the temperature has dropped. Before resetting, however, the installation should be inspected to trace and isolate the cause of the problem before any further firing takes place.

12.0 COMMISSIONING

12.1 System Checks

Before attempting to commission any heater ensure that any personnel involved are aware of what action is to be taken and begin by making the following checks:-

- a) Flueway passages to the chimney are clear.
- b) Adequate ventilation exists in the boilerhouse - refer to Tables 3 and 4.
- c) If the heater is installed in a living space, a combustion products discharge safety device is fitted.
- d) The water system is vented, fully charged with water and ready to receive heat.
- e) The gas supply pipework is clear of any loose matter, tested for soundness and purged.

12.2 Heater Checks

On each heater, before attempting to light, check:-

- a) Draught diverter is currently installed on top of the heater in an unmodified condition and the flue retarders are correctly positioned within each of the three fire tubes. The flue has a removable section above the draught diverter for maintenance.
- b) Heater is adjusted for the type of gas being supplied. Gas supply is connected but turned off at manual valve, unions are tightened, test points are tight, burner is correctly positioned, the injector is tight and the pilot burner is connected from the control valve. Ensure lighting-up instruction sheet from installers kit is mounted on heater casing. Note that protective plastic cover on casing should be removed first.
- c) The thermostat sensing phial and overheat safety device sensor are correctly and securely positioned in the pocket. Remove black cover knob from overheat safety device and press reset button fully to ensure device is reset. Check thermocouple is connected and undamaged between the pilot burner, overheat safety device and control valve.
- d) Piezo unit is fitted securely on the control valve, the lead is undamaged, pushed fully onto the spade connection and the spark electrode is fitted correctly and undamaged.
- e) If heater is controlled by a time clock or additional electrical interlock, an electrically operated solenoid valve will be positioned in the

main gas supply pipe between the control valve and the burner. Ensure electrical supply to this valve is switched off.

Note: A standard DR-SE heater does not require a mains electricity supply.

12.3 Procedure for Initial Lighting and Adjustment.

WARNING: IF THE PILOT LIGHT IS EXTINGUISHED EITHER INTENTIONALLY OR UNINTENTIONALLY, NO ATTEMPT SHOULD BE MADE TO RE-LIGHT THE GAS UNTIL AT LEAST 5 MINUTES HAVE ELAPSED.

Remove the two piece burner cover to gain access to the control valve.

Ensure the “★” position on the valve control knob is aligned with the setting indicator. (refer to Fig 5)

Ensure that the manual gas shut-off valve has been turned off for at least 5 minutes before attempting to light heater - then open valve.

Light the pilot flame by depressing fully the pilot button marked “★” while repeatedly pressing the large Piezo igniter button “↗” (refer to Fig. 5). Hold pilot button fully pushed in for a further 20 seconds after the pilot has lit before releasing. The pilot flame should remain alight, but if it is extinguished, depress the stop button “●” once and wait 5 minutes before repeating procedure.

If the pilot flame does not light after several seconds repeatedly operating the Piezo igniter, revert the gas line to the outside of the building and check whether both spark and gas are present at the pilot.

Having established the pilot flame, switch on power supply to electrically operated solenoid valve (if fitted) and turn control knob on gas valve to position “3”. The main valve will open and the burner will ignite.

After the heater has operated for approximately 10 minutes, turn valve control knob to “★” position (pilot only).

Locate the pressure test point on the left hand side of the gas control valve adjacent to the gas outlet connection to the burner (refer to Fig. 5). Remove the screw and fit a manometer to the test point. Return the control knob to position “3” and measure gas pressure. Check reading against pressure required in Table 1 or on heater data label. Adjust control valve regulator, located adjacent to the test point, as necessary by removing plastic cap and, using a screwdriver, turning the metal adjusting screw beneath, clockwise to increase, anticlockwise to decrease the pressure.

Turn control knob back to “pilot only ★”, remove manometer and tighten test point screw. Return

control knob to position “3” and allow system to warm up.

Note: Condensation can occur whenever firing the heater from cold but will cease as the temperature increases. It should not prove detrimental to the pilot/ burner but prolonged or frequent operation under condensing conditions should be avoided.

Turn the valve control knob to pilot position “★” and visually check pilot flame. It should be a stable flame without yellow tipping and of sufficient size to adequately heat the thermocouple and light the main flame efficiently. Should adjustment be necessary, pull off control knob and locate pilot adjustment screw beneath (refer to Fig. 5a). To reduce pilot gas flow - turn screw clockwise, to increase—turn screw anticlockwise. Replace control knob.

Check all joints for gas tightness.

Check that no exhaust gas spillage occurs from the draught diverter: refer to procedure detailed in BS 5440. Check operation of any controls including the control thermostat by adjusting temperature setting thus lighting and extinguishing the main flame.

Finally, adjust the valve control knob to the correct temperature setting for the system. The numbers around the gas valve control knob are equivalent to the temperatures shown in Table 5. Replace the two piece burner cover.

TABLE 5 - Control Valve Temperature Settings

Control Knob Setting	1	2	3	4	5	6	7
Temperature °C	40	54	60	64	68	72	75

12.4 Combustion Check

It is advisable to make a combustion check at the time of initial commissioning. An exhaust gas sampling point is not provided but access to the main gas stream is available via the draught diverter. Utilise a right angled probe to enter the flue gas collector hood below the diverter.

For natural gas only:-

Normal CO₂ = 8% - 9% by volume.

Normal CO level should not exceed 200 ppm by volume.

All for dry gas sample.

12.5 Upon satisfactory completion of the initial lighting and adjustment, explain to the user the operation of the system. Ensure that the user is fully conversant with the lighting, shutting down and general operating procedure.

To shut down heater for short periods only: turn the gas control knob to “★” position (pilot only - pilot remains alight).

To shut down heater for long periods only: turn the gas control knob to “★” position and depress the stop button “●”: close manual shut-off valve on gas supply: turn off electricity supply to solenoid valve etc. (if fitted).

13.0 SERVICING

IMPORTANT: Due to the variable chemical nature of distributed water supplies, it is recommended that in addition to the annual internal inspection and cleaning, this appliance is inspected for calcium deposition anode loss within a maximum of three months following initial commissioning and the frequency of subsequent inspections adjusted accordingly.

Failure to install in accordance with the relevant **Hamworthy Heating Installers Guides** and to carry out the above recommendations may compromise appliance warranties.

Regular annual servicing is recommended. Although cleaning of the flueways may not be necessary every year, it is important that all controls and safety features are checked for correct operation.

WARNING: Before proceeding with any maintenance, turn off the manual gas shut-off valve to the heater being serviced and isolate the electrical supply to any electrical control (if fitted).

13.1 Removal of Burner Assembly

Remove the two piece burner cover to allow access to the control valve and thermostats by lifting lugs in the casing slots and withdrawing. Unscrew and disconnect the union on the downstream side of the manual gas shut-off valve.

Locate and unscrew the two self-tapping screws which hold the control valve bracket to the heater casing.

Locate and unscrew the two self-tapping screws which hold the pressure switch bracket (if fitted) to the heater casing (Flame Failure Alarm option only) Locate the thermostat pocket, remove securing clip and carefully withdraw the overheat safety device sensor together with its positioning spring, followed by the control thermostat sensor.

Locate the overheat safety device and remove from bracket by unscrewing black cover knob and loosening the securing nut.

Locate the two studs at either edge of the burner mounting bracket within the burner aperture at the bottom of the heater. Loosen and remove the nuts and washers and then carefully withdraw the complete burner assembly. Full withdrawal may be dependant on disconnection of cabling to solenoid valve and/or pressure switch (if fitted) (Time Clock and Flame Failure Alarm options only).

13.2 Servicing Burner Assembly

Check the main stainless steel burner for cleanliness. If necessary, clean with a brush to remove any accumulation of dust and debris from around flame ports and venturi entry.

Check main injector for cleanliness. This must be removed for inspection. Use soft lint free material for cleaning - never use a metal scraper.

Ensure any disturbed screw thread is re-tightened correctly.

Examine the thermocouple for cleanliness and flame erosion, or damage to the lead - clean or replace as necessary.

Examine the spark electrode for cracks in the ceramic, flame erosion at the ignition tip or damage to the lead - clean or replace as necessary.

Examine the pilot burner for cleanliness - if pilot is contaminated with dust, clean the flame ports and the slotted air inlet. If necessary, release the nut securing the gas connection to the burner, and withdraw the tube with captive oil. This frees the pilot injector which can be tapped out and cleaned. Ensure pilot injector is in correct position when re-assembling (see Fig. 6).

When the assembly has been cleaned check operation of Piezo system by repeatedly pressing Piezo button “⚡” - a spark should appear between the electrode and the flame port of the pilot burner. If not check and replace Piezo unit or electrode and cable as necessary.

Note: If the exhaust gas passage is to be cleaned, proceed to the following paragraph before replacing the burner assembly.

13.3 Cleaning of Exhaust Gas Passageway

To gain access to the heater’s fire tubes, the draught diverter must first be removed. Ensure that the flue system is self supporting before removing section of flue above the diverter (a maintenance joint should have been provided for this purpose). Lift off the draught diverter and withdraw the three retarders vertically from the fire tubes. Depending on the height available above the heater, the retarders may require flexing as they are withdrawn.

Examine the internal surfaces of the fire tubes and if any deposits are apparent, clean the tubes with a stiff brush, collecting the debris on the base plate of the heater. Use a brush to clean around the combustion chamber through the burner opening and clean out the base plate, replace the retarders, draught diverter and flue.

13.4 Inspection of the Waterside Surfaces and Magnesium Anode.

Note: On no account remove the magnesium anode without checking to ensure that the heater is fully isolated and pressure removed.

Isolate the cold feed, hot flow and circulation connections and 3 way vent valve if fitted. Connect a hose to the drain valve at the bottom left hand side of the heater. Run the hose to a convenient drain and open drain valve.

Ensure heater is fully drained.

The heater is fitted with a single magnesium anode which hangs vertically within the vessel and is located in front of the draught diverter. Release and unscrew the top M8 nut and remove the green/yellow earth bonding connection between the anode and the tank. Release and unscrew the 1 in BSP cap nut which secures the anode (35 mm across flats) and withdraw. Examine the anode for corrosion and replace if the diameter has been reduced to less than 18 mm. When replacing the anode use an approved sealant for potable water systems and ensure the earth bonding connection is remade on top of the anode to ensure good electrical contact to the tank. Also check cleanliness of bonding connection at the tank.

Note: Where access above the heater is limited, it may be possible to replace the solid anode with a more flexible segmented anode.

Remove the four self-tapping screws from the circular casing inspection port located to the right of the gas control valve.

Remove the panel and the disc of insulation beneath to expose the inspection port cover. Release and remove the eight M10 bolts and take off the inspection cover complete with its sealing gasket. Inspect the interior surfaces of the heater for deposits. If deposits are apparent, they can be flushed through the drain by a water jet applied through the inspection port, or the vessel can be chemically cleaned and flushed. After cleaning, replace the inspection cover with new sealing gasket.

Note: On no account should a metal scraper be used to remove deposits since this may result in damage to the glass lining.

13.5 Assembly Following Servicing

Close drain valve and remove hose.

Open the isolation valves on the heater cold feed, hot flow, circulation and common vent connections.

Allow the system to fill with water.

Check to ensure that there are no leaks from the anode connection and the drain valve. Check for

leaks at the inspection port and then replace the insulation disc and the exterior casing panel with the four self-tapping screws.

Slide the gas burner assembly into position beneath the heater and refit in the reverse order to that detailed in Section 13.1.

Relight burner in accordance with Section 12.3 and check operation of controls.

Note: The maintenance of the water side of the system may require additional cleaning and disinfecting before being placed into service Refer to BS 6700.

14.0 RECOMMENDED SPARES

Description	Part No.
Gas Control Valve (710 Minisit)	533903039
Overheat Safety Device (Limit Stat)	747433982
Thermocouple	747439880
Pilot Burner (Natural Gas)	361150066
Pilot Injector (Natural Gas)	331101686
Spark Electrode c/w Lead	333805318
Main Injector 3.5mm (DR-SE 18 - Nat. Gas)	330513691
Main Injector 3.8mm (DR-SE - Nat. Gas)	532902033
Inspection Port Gasket	339008966
Magnesium Anode (DR-SE 18)	363202253
Magnesium Anode (DR-SE 20)	363202246

15.0 OPTIONS

15.1 Time Clock Control

15.1.1 General

A solenoid valve kit can be supplied either factory fitted to the heater or for site fitting which enables the heater to be controlled by an external source. HHL Part No. 563605008

15.1.2 Assembly

Ensure the gas supply to the heater (if connected) is turned off.

Remove burner assembly as detailed in Section 13.1.

Disconnect thermocouple, pilot bundy tube and Piezo lead from gas control valve.

Unscrew compression fitting at gas valve outlet and remove valve.

Unscrew burner injector and lock nut, remove gas supply pipe and discard.

Assemble the two sections of pipework supplied into the solenoid valve: straight pipe in valve outlet, curved section in valve inlet using suitable gas pipe

sealant. Adjust positions of pipes to mirror the discarded pipe, with solenoid enclosure to the left. Refit new assembly to burner with lock nut and fit injector. Using new nut and olive, refit curved pipe plain end fully into valve and tighten. Reassemble burner assembly to heater using reverse procedure to 13.1.

The solenoid valve will require connection to a 230V ac 50 Hz 1ph electrical supply via a fused isolator using heat resisting 3 core cable of adequate rating (not HHL supply). Refer to valve label or manufacturer's instructions for details of fuse sizing etc.

WARNING: This valve must be earthed.

Reconnect the gas supply to heater and re-commission as detailed in Section 12.0. Check for gas soundness, particularly at new and disturbed joints.

NOTE: In order to light the main burner, the newly fitted solenoid valve must have the electrical supply turned on.

15.1.3 Control

The electrical supply to the solenoid valve should be controlled via a time clock, interlock etc. (not HHL supply) thus enabling the heater to be shut down when required or necessary. The permanent pilot remains unaffected by the operation of the solenoid valve and will continue to remain alight.

15.2 Flame Failure Alarm

15.2.1 General

A pressure switch kit can be supplied either factory fitted to the heater or for site fitting which enables a switch to operate on failure of the pilot flame allowing a signal to be sent to an indicator or alarm. HHL Part No. 363607840

15.2.2 Assembly

Ensure gas supply to the heater (if connected) is turned off.

Select the pressure switch, support bracket, brass tee, coned lock nut and sealing ring. Place the threaded portion of the tee through the hole in the bracket (bend away from tee), screw on lock nut (cone away from tee), push on seal and seal tee into pressure switch until tight.

Screw down lock nut and seal onto end of pressure switch thread and tighten.

Hold pressure switch beneath the gas control valve on the heater with tee vertical and to the left. Mark mid-point of tee on 4 mm pilot supply tube and cut tube. Using the nuts and olives provided insert cut ends of tube into either side of tee and tighten. Locate support bracket against right hand edge of the

heater casing at the burner aperture, drill holes and secure bracket with the two self-tapping screws provided.

15.2.3 Electrical Installation (not HHL supply)

WARNING: This pressure switch must be earthed.

The installation must be made in accordance with IEE regulations using heat resistant PVC insulated cable of adequate rating. Remove the pressure switch cover to expose the four terminals within: common, normally open, normally closed and earth. The electrical circuit and terminals used depend upon the type of alarm system to be connected (not HHL supply).

All wiring to the pressure switch must pass through the cable gland supplied.

15.2.4 Commissioning

Commission heater as detailed in Section 12. When pilot is lit, ensure all new joints are checked for leakage.

Shut down the heater by turning manual gas valve off and ensure electrical supply to heater and pressure switch (if fitted) is off. Loosen the pressure test point screw located on pressure switch and fit a manometer.

Re-light pilot flame (after waiting 5 minutes from previous shutdown).

Check initial reading on manometer, then slowly close the manual gas shut-off valve until the pressure reading at the manometer is approximately 10-12 mbar.

Adjust pressure setting nut on the pressure switch (clockwise to increase, anti-clockwise to decrease) until the switch operates (determined either by an audible click or use of a test meter across the micro-switch contacts).

Fully open manual gas shut-off valve - check pressure switch is made.

Turn gas control knob to "★" position and depress stop button "●". Pilot flame should extinguish and as pilot gas pressure decays, the pressure switch should operate. Remove manometer, tighten pressure test point screw and replace pressure switch cover.

Wait 5 minutes from extinguishing the pilot before re-lighting in accordance with the lighting up instructions.

15.2.5 Fault Finding

Should the alarm operate - check for possible faults as follows:

SYMPTOM	REMEDY
Alarm on - pilot remains alight	Re-commission pressure switch as detailed above. If switch does not operate - replace.
Alarm on - pilot out	
a) Pilot blown out or gas control stop button depressed inadvertently	Wait 5 minutes then attempt to re-light in accordance with lighting up instructions
b) Overheat safety device has operated.	Allow heater to cool down, remove overheat safety device cover knob and depress button. If the button resets with an audible click. Check: 1) Temperature setting of gas control valve. Adjust or replace as necessary. 2) Calibration of overheat safety device - if out of calibration or will not reset - replace. Note: Before re-lighting pilot, ensure reason for overheat safety device operation has been investigated fully.
c) Thermocouple circuit is broken or contains a high resistance.	Check thermocouple connections particularly at overheat safety device for tightness and continuity. If high resistance across safety device - replace.
d) Thermocouple is faulty	Replace
e) Gas control valve is faulty.	Replace
Alarm off - pilot out.	1) if within 45 secs from loss of pilot flame - thermocouple cooling down - wait. 2) If over 45 secs from loss of pilot flame - incorrectly set or faulty pressure switch or pilot supply pipe blocked.

15.3 Top to Bottom Circulation

15.3.1

A top to bottom circulation kit can be supplied for both heaters - DR-SE 18 HHL Part No. 563605053, DR-SE 20 HHL Part No. 563605054. The kit is normally supplied partially assembled for fitting to the heater when located in its final position.

NOTE 1: The 1½" Tee assembly must be fitted to the hot water flow connection prior to any connection to system pipework.

NOTE 2: All jointing compound used should be suitable for potable water systems.

15.3.2 Assembly

Locate the non-return valve / ¾" Tee sub-assembly and screw the 1 in thread into the drain connection at the bottom of the heater. The sub-assembly may need to be split at a middle joint in order to fit. Line up the assembly horizontally directing away from the burner aperture and fit the small copper pipe bend vertically at the end. The ¾" drain valve supplied in the installers kit should be fitted to the open end of the ¾" Tee.

Select the bronze pump supplied, fit the inlet and outlet valves and mount the pump vertically, outlet

downwards, onto the pipe bend and tighten the compression joint. Follow the pump manufacturer's instructions for any particular requirements. Select the 1½" Tee assembly and fit to hot water flow connection on top of the heater with the compression fitting directly away from the heater.

Select the long copper pipe and fit between pump inlet and hot flow connection. Before tightening compression fittings, minor adjustments may be required to the positioning and the copper pipe may need trimming to allow for assembly tolerances in order to fit squarely.

Tighten all joints fill heater and check for leaks.

The pump will require connection to a 230V ac 50Hz 1ph electrical supply via a fused isolator using heat resisting 3 core cable of adequate rating (not HHL supply). Refer to pump manufacturer's instructions for details of fuse sizing etc.

WARNING: This pump must be earthed.

15.3.3 Control

If the kit is to be fitted to a standard heater which does not require an electrical supply for operation, the pump can be wired to operate continuously or through its own time clock and set to operate during periods of minimal draw-off and set to "off" during

peak demand.

If the kit is to be fitted to a heater which has also been fitted with a gas solenoid valve (see 15.1) to enable time clock control of the heater, the pump can be wired to the same time clock so that during "off" periods both pump and heater are shut down.

15.3.4 Maintenance

The pump manufacturer's instructions should be followed with regard to maintenance and servicing.

15.4 Living Space Installation

15.4.1 General

For heaters which are to be installed in a living space, a combustion products discharge safety device must be fitted. The device can be supplied in the form of a kit for either size of heater - HHL Part No. 563605150 - for site fitting during installation. It is incumbent upon the installer / purchaser / specifier of the heater for this use, that a kit is ordered and installed before the heater is put into service. The kit comprises a thermal reset thermostat fixed at 79°C with long capillary and sensor mounting bracket, protective sleeving for the capillary and a bridging cable for the thermocouple circuit.

15.4.2 Assembly

Ensure the gas supply to the heater (if connected) is turned off and electrical supply to other optional equipment (if fitted) is isolated.

Remove top half of burner cover by lifting upwards and pulling outwards. Locate the overheat safety device and its mounting bracket. Unscrew the black cover knob together with the mounting nut and remove overheat device. Trace back the two piece thermocouple and ensure the lead to the pilot burner is connected to terminal 1 of the overheat device. Disconnect the second thermocouple lead to the gas control valve at the overheat device, select the bridging cable from the kit and attach one end to spade terminal 2 of the overheat device. Remount the overheat device to the underside of the bracket using the right hand hole and with the body of the overheat device to the right of the hole.

Tighten securing nut and replace cover knob.

Select the combustion products discharge thermostat from the kit, remove the cover knob and securing nut and mount the thermostat adjacent to the overheat device using the left hand hole in the bracket and with the terminal connections facing forward.

Tighten securing nut and replace cover knob.

Connect the loose end of the bridging cable to termi-

nal 1 of the thermostat and the thermocouple lead from the gas control valve to terminal 2.

Carefully unwind sufficient capillary of the combustion products discharge thermostat to reach the draught diverter at the top of the heater.

Remove the bracket attached to the sensing bulb (if fitted) and slide protective sleeving over sensing bulb and capillary.

Locate the two holes drilled one above the other on the sloping face of the draught diverter and rotate diverter to reposition them approximately in line with the gas control valve.

Remove the two screws from the sensing bulb bracket, centrally position the bracket on the bulb and with the smaller bracket holes to the rear, position the bracket inside the draught diverter and secure with the two set screws through the diverter. The sensing bulb's final position should be horizontal, just under the lip of the diverter.

Position the capillary and sleeving down the casing and coil excess capillary at the thermostat end. Refit top burner cover and allow capillary to pass through the slot on the left hand side.

Commission heater as detailed in Section 12.0.

15.4.3 Control

The combustion products discharge thermostat is wired in series with the overheat safety device (limit thermostat) on the thermocouple circuit. Should a blockage or a severe draught occur in the flue, whilst the heater is operating, the products of combustion will spill from the draught diverter and pass over the temperature sensor.

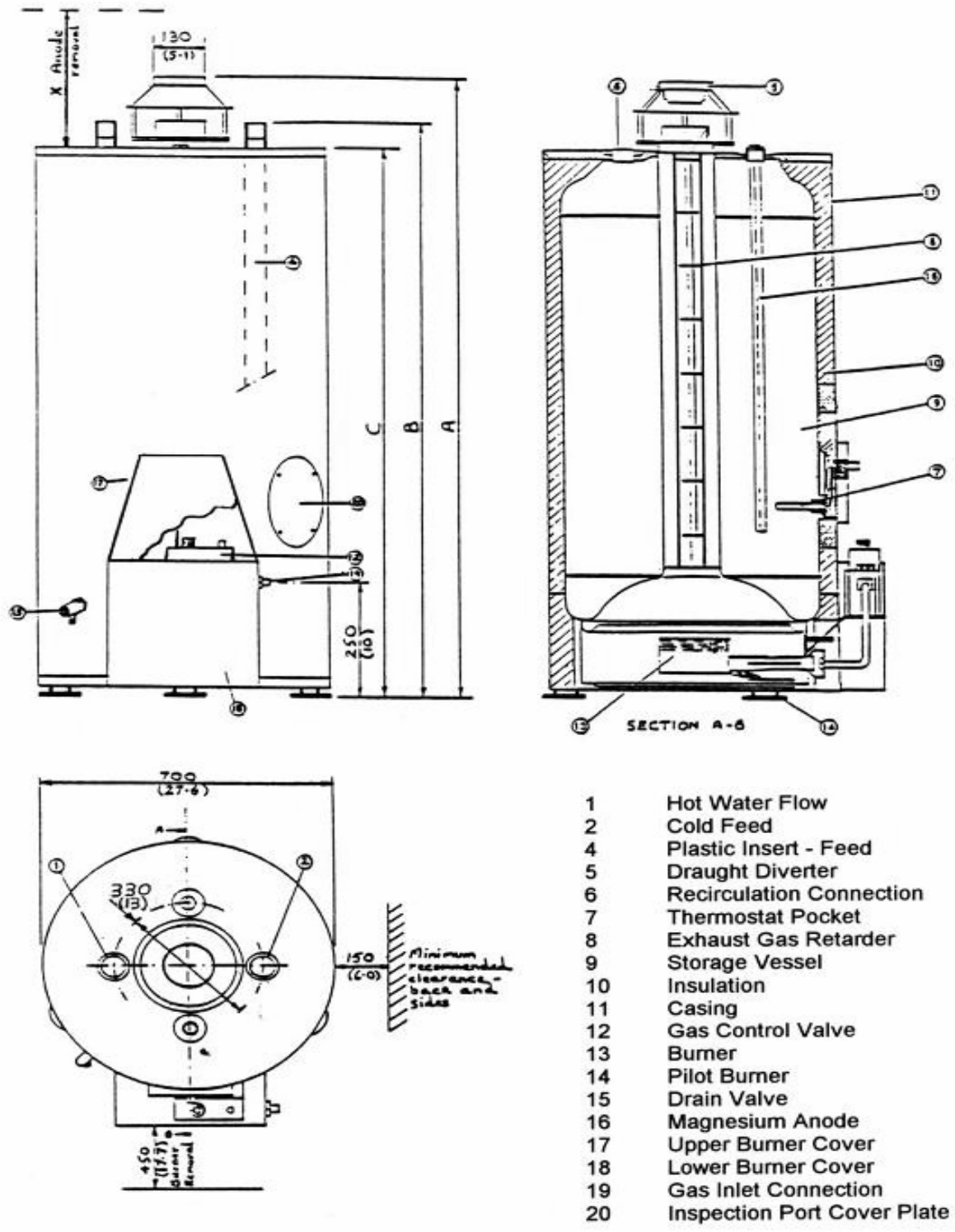
Once a temperature of 79°C is detected, the thermostat will activate, breaking the thermocouple circuit and shutting down the heater, both main flame and pilot. The thermostat will reset automatically as the temperature of the flue sensor reduces but the heater requires manual intervention to relight the pilot (see Section 12.0 of this manual for lighting up instructions).

On relight, check for spillage with a smoke trace (see BS 5440 Part 1). If the blockage persists, the heater will again shut down. The flue system should be thoroughly examined and the root cause of the problem corrected.

No additional electrical supply is required for the operation of the combustion discharge safety device since it is connected to the millivolt thermocouple circuit and no alarm signal can be added

In an alarm is required, it is suggested that a flame failure alarm kit is added (see Section 2.2.4 and

15.2). An alarm raised by either the combustion products discharge safety device or the overheat safety device can be differentiated since the former is a thermal reset device and the latter has a manual reset button to indicate if it has operated.



Model	DR-SE 18	DR-SE 20
A	1620 (63.8)	1930 (76.0)
B	1520 (59.8)	1830 (72.0)
C	1485 (58.5)	1795 (70.7)
X	950 (37.4)	1150 (45.3)

Dimensions in mm (in)

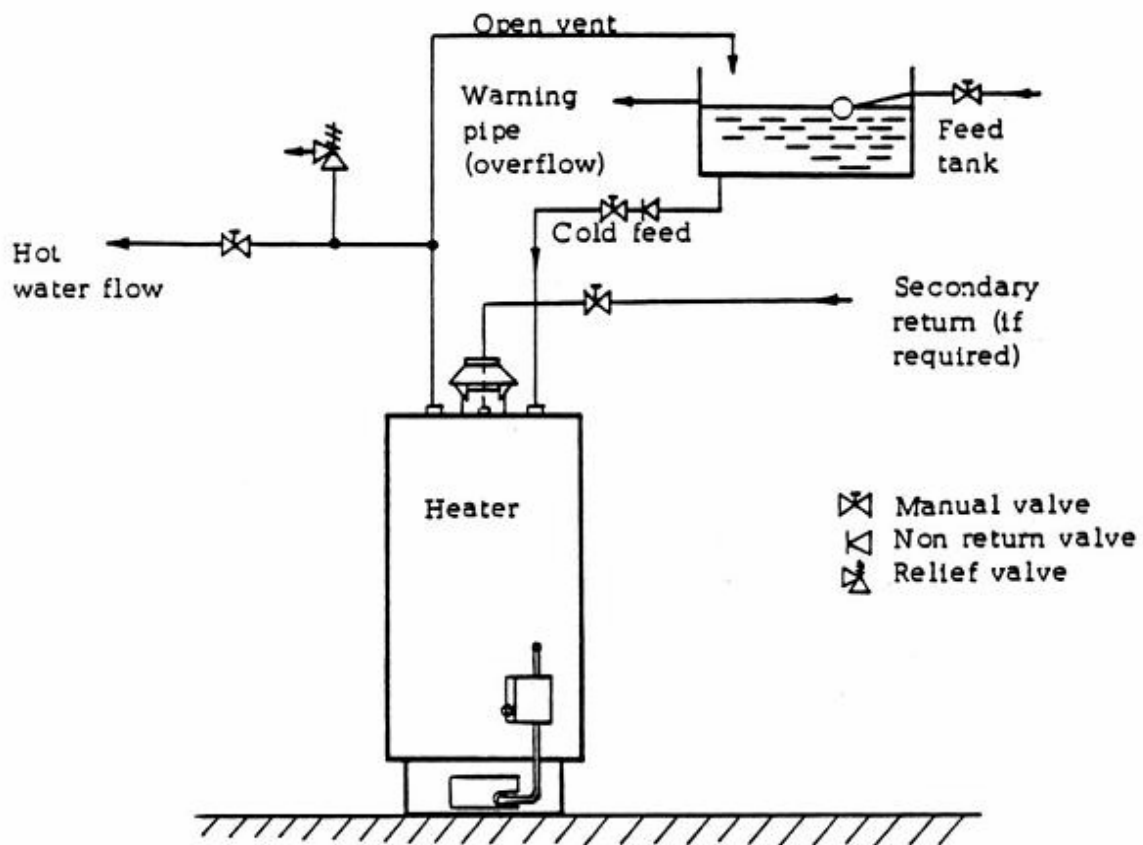


Fig 2 Typical Schematic Pipework Arrangement - Single Heater

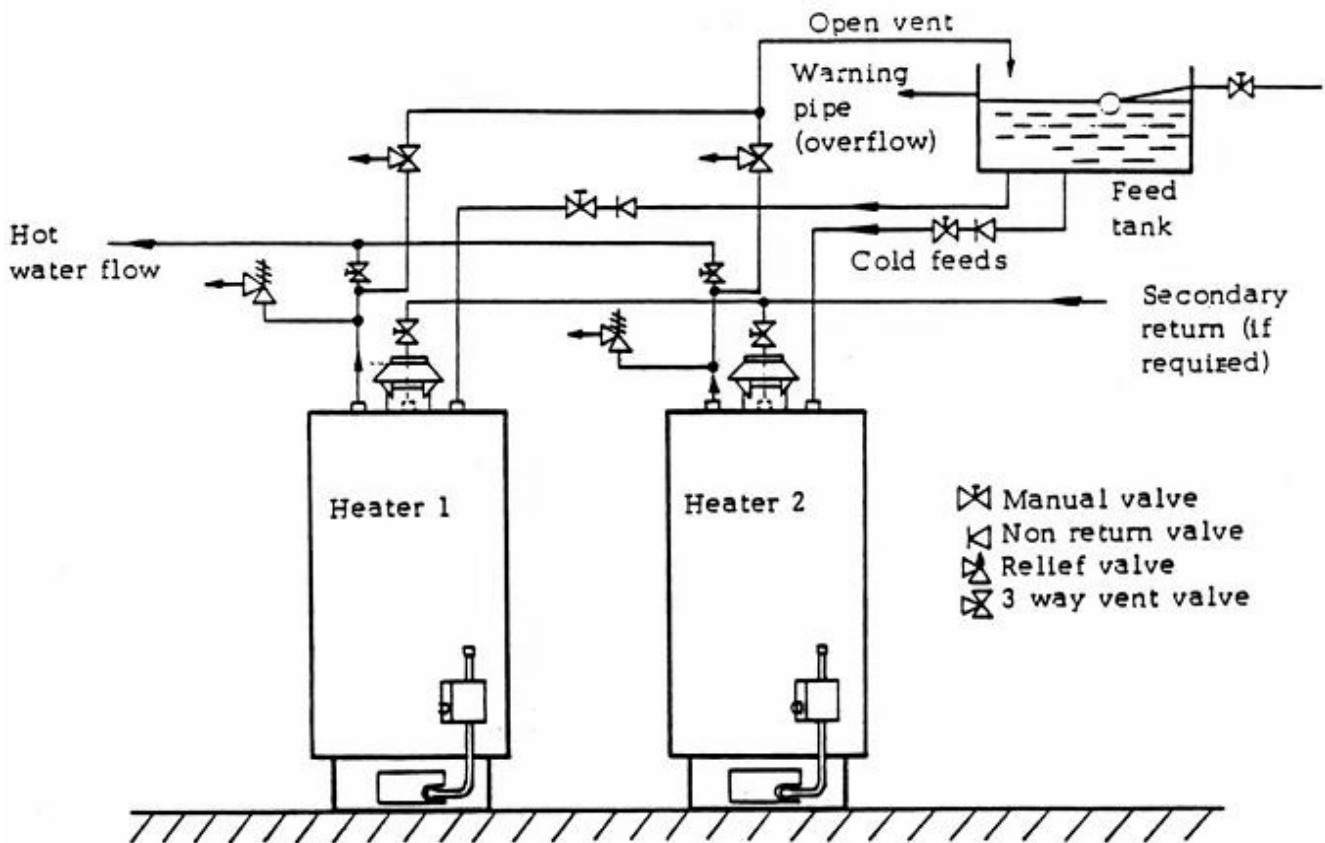


Fig 3 Typical Schematic Pipework Arrangement - Multi Heaters

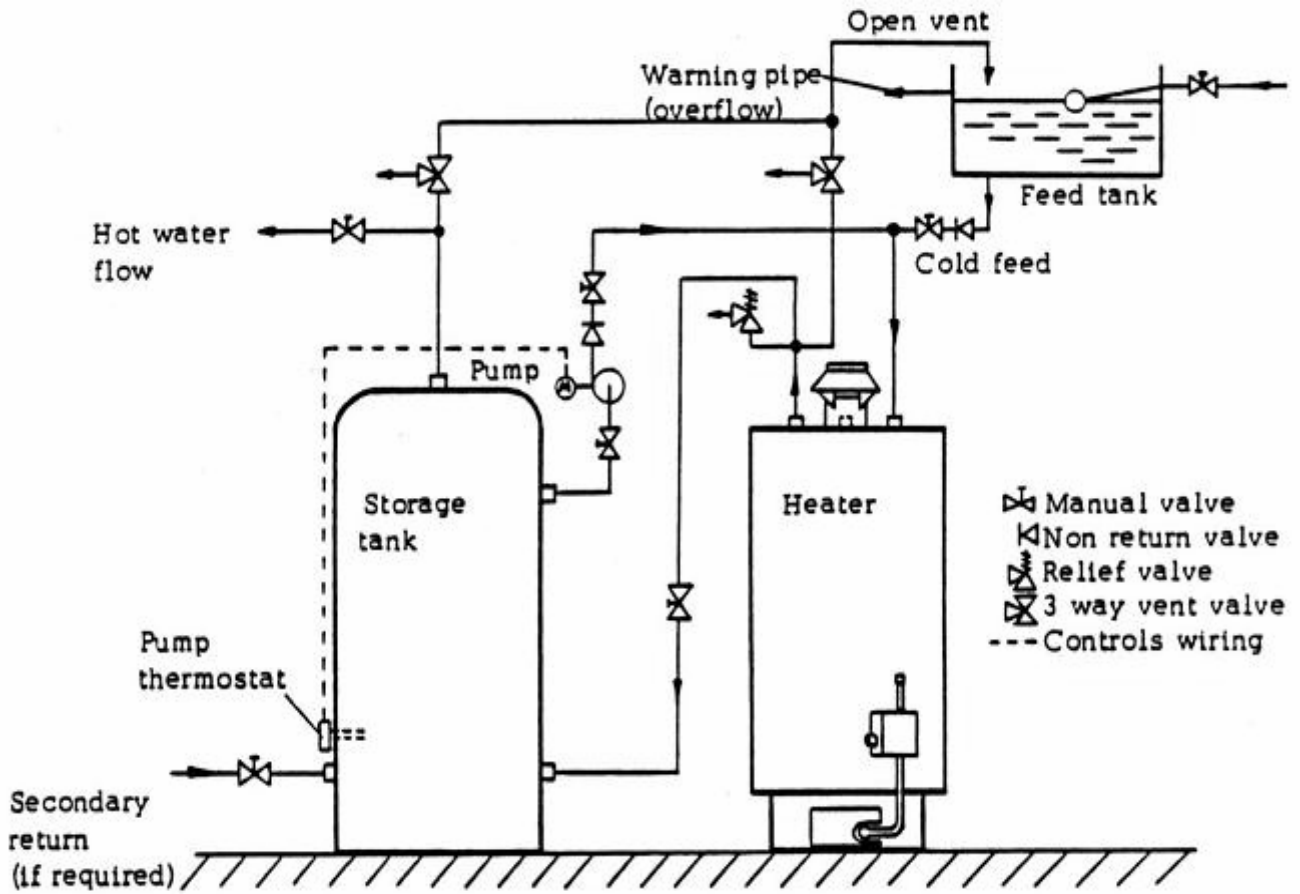
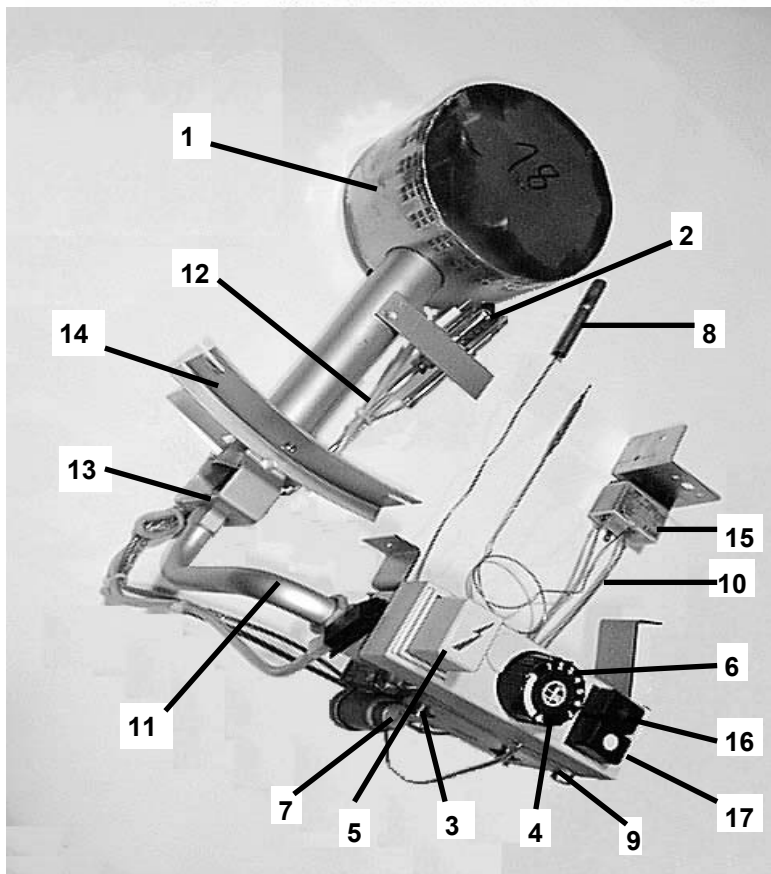


Fig 4 Typical Schematic Pipework Arrangement - Heater with Storage Tank



- 1 Burner
- 2 Pilot burner
- 3 Setting pressure test point
- 4 Gas valve control knob
- 5 Piezo unit button
- 6 Gas valve setting scale
- 7 Pressure regulator cover screw
- 8 Temperature sensing phial
- 9 Input pressure test point
- 10 Thermocouple
- 11 Burner feed pipe
- 12 Pilot burner feed pipe
- 13 Injector
- 14 Burner mounting bracket
- 15 Overheat safety device (limit 'stat)
- 16 Pilot button
- 17 Stop button

Fig 5 Burner Assembly

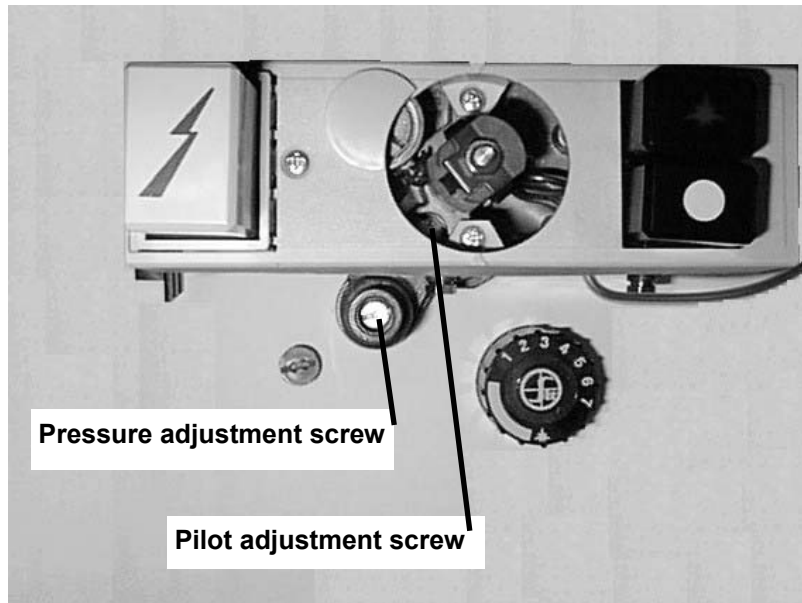


Fig 5a Gas Control Valve Adjustments

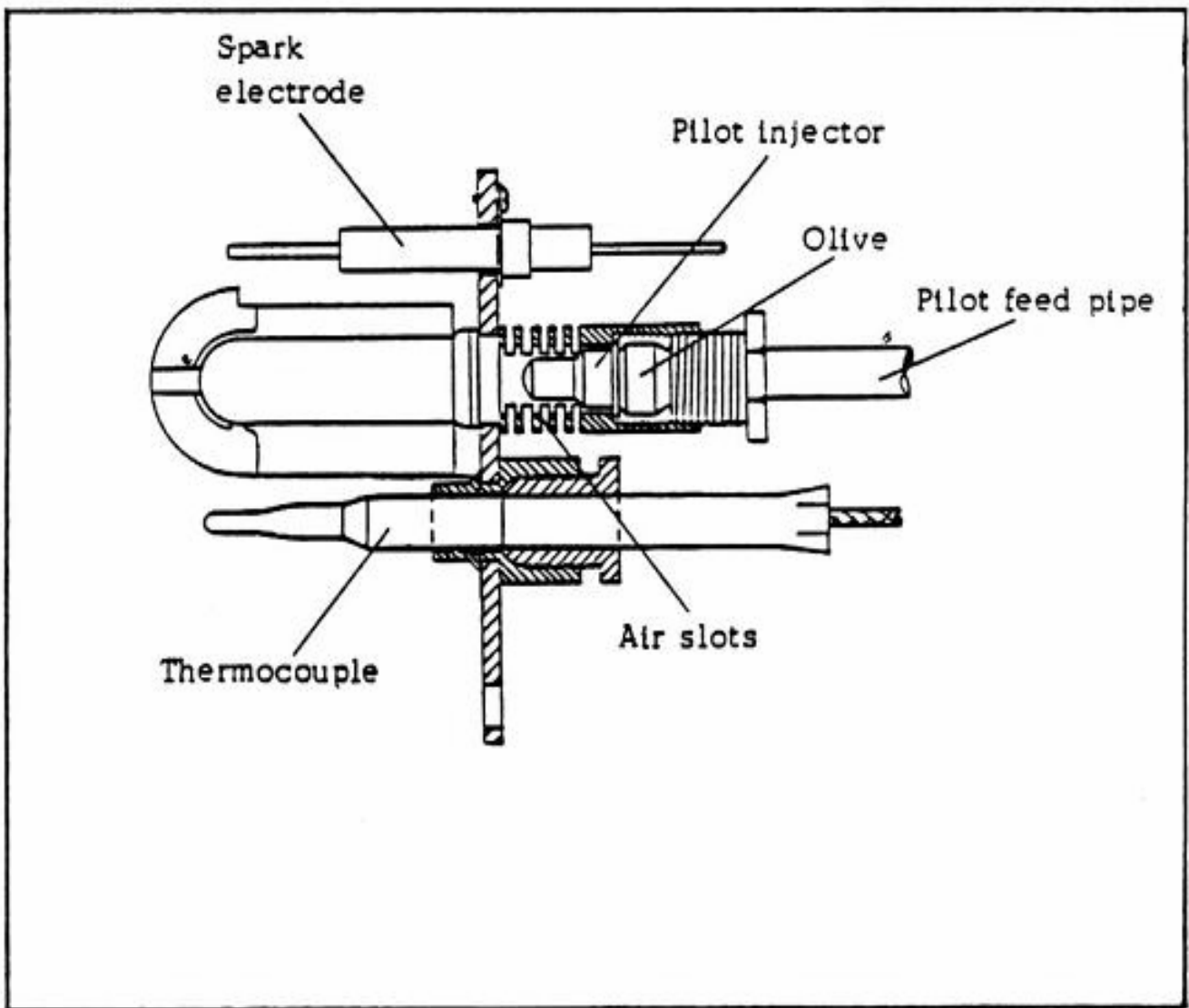


Fig 6 Pilot Burner Assembly

APPENDIX 1

INSTALLATION, COMMISSIONING AND MAINTENANCE MANUAL

DR-SE 18 P/P & DR-SE 20 P/P

DORCHESTER RANGE OF

HOT WATER STORAGE HEATERS

FOR DOMESTIC HOT WATER

(PERMANENT PILOT IGNITION)

FIRING LPG (PROPANE OR BUTANE)

TO BE USED IN CONJUNCTION WITH THE MAIN INSTALLERS GUIDE PUBLICATION NO. 500001062

NOTE: LPG FUELS

IT IS STRONGLY RECOMMENDED THAT, ON LPG INSTALLATIONS, GAS DETECTION EQUIPMENT IS FITTED. THIS EQUIPMENT SHOULD BE POSITIONED NEAR THE HEATER AND AT LOW LEVEL. IT IS ALSO IMPERATIVE THAT THE SPACE HOUSING THE HEATER IS VENTILATED AT HIGH AND LOW LEVEL TO THE REQUIREMENTS OF BS5440 PART 2 AND BS6644. REFER TO MAIN INSTALLERS GUIDE.

1.0 DESCRIPTION

The Hamworthy DR-SE series of automatic gas fired hot water storage heaters can be supplied as standard to fire commercial Propane or Butane. The heaters are very similar to the natural gas models, the difference being as follows.

1.1 The 710 Minisit multi-functional control valve is a modified version which has the gas pressure regulator adjusting screw wound fully in clockwise until there is an audible click. This effectively removes the pressure regulating facility, the regulator being locked fully open. In addition, the pilot adjusting screw is screwed fully anticlockwise. (refer to Fig 5a)

1.2 The injectors, both main and pilot, are sized for Propane/Butane instead of Natural gas. The burner remains the same for both families of gas.

1.3 As the heaters do not have appliance regulators (see 1.1), the gas pressure to the burner is entirely dependant upon the incoming gas supply pressure. It is therefore **VERY IMPORTANT** that the incoming gas supply pressure is accurately set up to 37 mbar for propane or 28 mbar for butane by means of adjustment to the main lock-up regulator in the gas supply line.

2.0 GENERAL REQUIREMENTS

The installation of the heater **MUST** be in accordance with the relevant requirements of the Gas Safety Regulations (1994), Building Regulations, IEE Regulation and the byelaws of the local water undertaking. It should also be in accordance with relevant recommendations of the publications referred to in the main installers guide, together with the following additional document:

BS 5482 Part 1 - Domestic Butane and Propane gas burning installations (permanent dwellings).

3.0 TECHNICAL DATA

Technical data is shown in Table 1 overleaf.

All other data is as shown for natural gas models in the main installers guide.

Heater connections and dimensions are as shown in the main installers guide.

Gas rates are based on the following calorific values:

Propane	-	95.65 Mj/m ³ (gross)
Butane	-	125.81 Mj/m ³ (gross)

Table 1 - Technical Data

MODEL	DR-SE 18	DR-SE 20
Gas Inlet Pressure Propane (G31)	37 mbar	37 mbar
Gas Inlet Pressure Butane (G30)	28 mbar	28 mbar
Injector Diameter	2.30 mm	2.45 mm
Injector Marking	230	245
Gas Flow Rate Propane (G31)	0.85 m ³ /h	0.98 m ³ /h
Gas Flow Rate Butane (G30)	0.65 m ³ /h	0.74 m ³ /h

4.0 INSTALLATION

The heater should be installed in the same manner as described in the main installers guide.

5.0 COMMISSIONING

The heater should be commissioned in exactly the same manner as described in the main installers guide, but the following additional points should be closely observed.

- a) Before attempting to light the heater, ensure that it is adjusted for the gas to be fired and check that the injector size agrees with that in the literature and on the data plate. The size of the injector can be found stamped on the brass injector itself.
- b) Ensure that adequate ventilation is provided, particularly at low level. LPG is heavier than air so any spillage or leakage will result in a build-up of gas on the floor.
- c) Ensure that the incoming gas pressure is regulated to the correct figure, 37 mbar for propane, 28 mbar for butane.
- d) Ensure that the LPG reaches the heater in a fully gaseous state since liquid gas is detrimental to the control valve and results in poor combustion.
- e) Check all joints on the gas pipework including the burner assembly and pilot line for leaks.
- f) It is not necessary to fit a manometer to the burner test point to check gas pressure since the correct gas inlet pressure should already have been set (see c) above. At this inlet pressure, the burner input will be correct.

6.0 SERVICING

Follow the same procedures indicated in the main installers guide.

7.0 ADDITIONAL RECOMMENDED SPARES

Description	Part No.
Gas Control Valve (can be modified for use on LPG from Nat. Gas version)	533903039
Main Injectors 2.3 mm (DR-SE 18 LPG)	532902034
Main Injector 2.45 mm (DR-SE 20 LPG)	330513733
Pilot Injector (LPG)	330512479

APPENDIX 2

UNVENTED SYSTEMS -DRSE HEATERS

With the exception of the relief valve position and the size of the Nabic relief valve (see Table 1 DRSE (UV) Water Heaters) the Unvented Kit and its application on DRSE heaters is identical to the DRL (UV) models. See Installation, Commissioning and Maintenance Manual Appendix 3.

On DRSE (UV) heaters the 3/4" BSP Nabic temperature and pressure relief valve is fitted in the 1" BSP socket (6), ref Figure 1,

this normally being the recirculation connection for the heater .

If recirculation is required on the hot water distribution system, the circulation return should be teed into the appliance cold feed generally as shown in Figure 1.

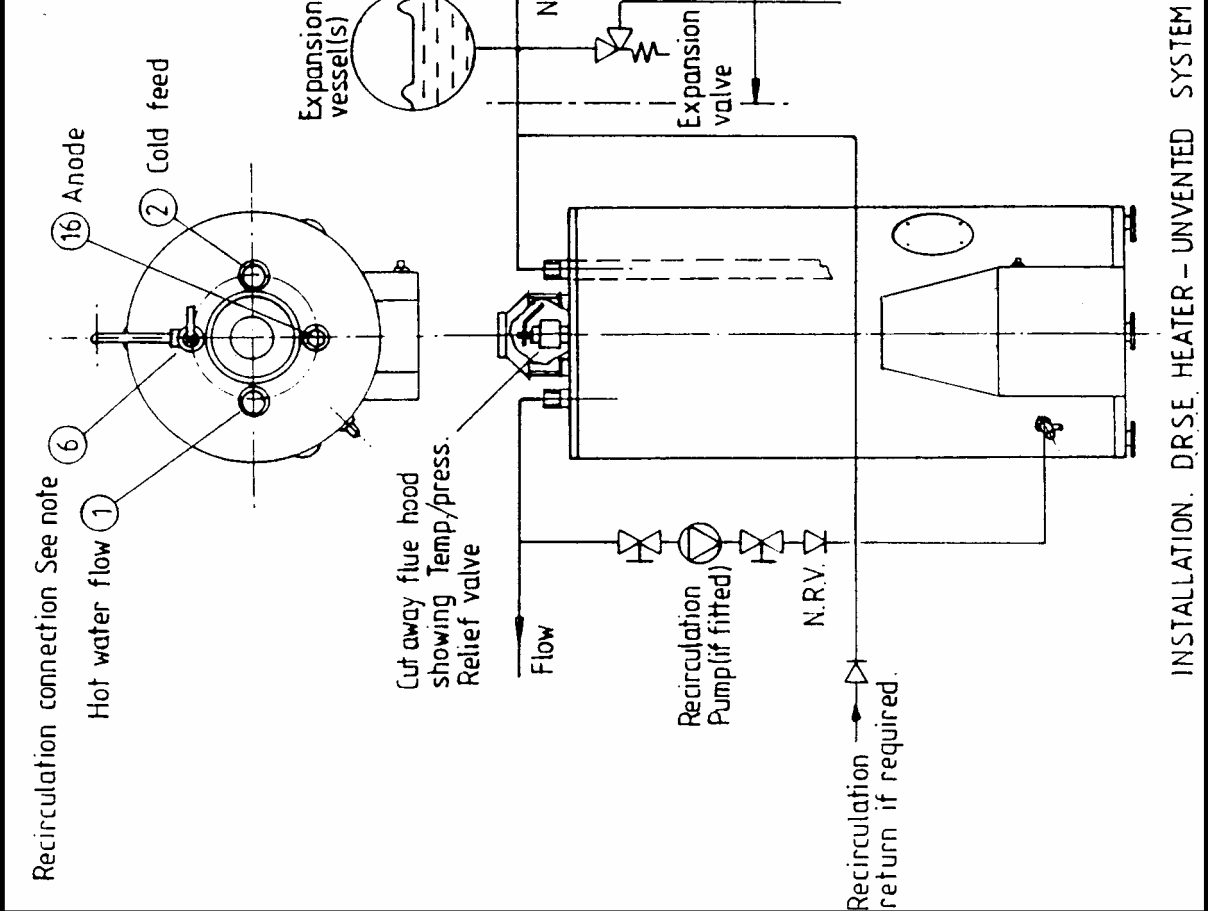
FOR ALL OTHER INFORMATION SEE APPENDIX 3 FOR DR35-90L (UV) Part No 500001004-

DRSE (UV) WATER HEATERS

WATER SUPPLY AND SAFETY KITS FOR UNVENTED SYSTEMS

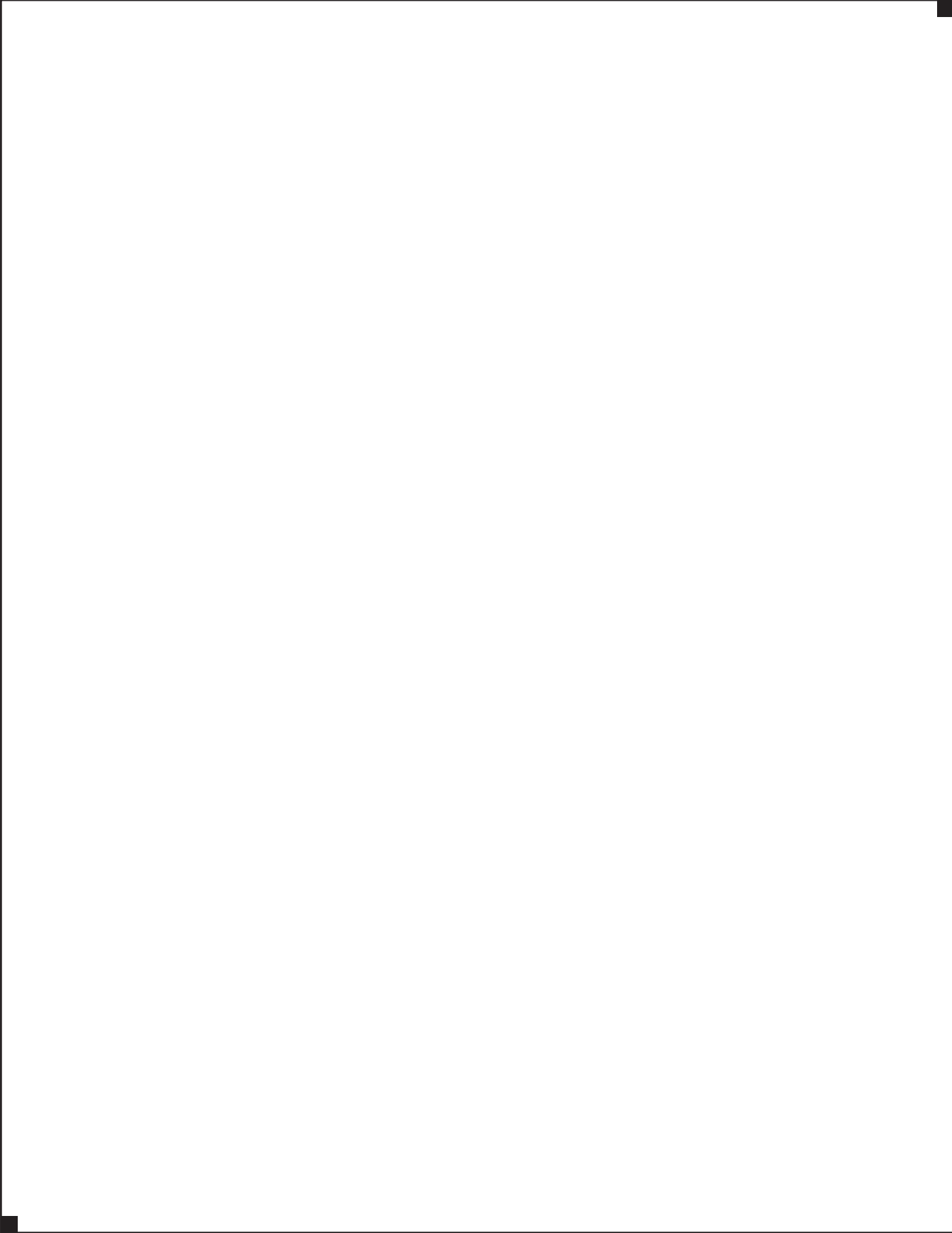
HEATER MODEL	DRSE 300 (UV) DRSE 18 (UV)	DRSE 380 (UV) DRSE 20 (UV)
UNVENTED KIT NUMBER	363607501	363607501
ASSEMBLY COMPRISING PRESSURE LIMITING VALVE (SET TO 350 kPa) WITH INTEGRAL STRAINER. CORE MANIFOLD WITH INTEGRAL NON RETURN VALVE. EXPANSION RELIEF VALVE (SET TO 500 kPa)	562403076	562403076
1 X 40 LITRE EXPANSION VESSEL	532712070	532712070
PRESSURE/TEMPERATURE RELIEF VALVE NABIC FIG 500T (SET TO 600 kPa) - SIZE HEL PART NUMBER	3/4" BSP 331905177	3/4" BSP 331905177
REDUCING BUSH TO SUIT RELIEF VALVE - SIZE HEL PART NUMBER	1"-3/4" BSP 741627498	1"-3/4" BSP 741627498

NOTE !
 ON UNVENTED HEATERS FIT THE 3/4" NABIC
 TEMPERATURE/PRESSURE RELIEF VALVE INTO
 SOCKET ITEM 6 USING HEX. REDUCING BUSH
 AND PIPE RELIEF TO TUN DISH.



INSTALLATION. DR.SE HEATER - UNVENTED SYSTEM APPLICATION Fig.1

Notes



Connect direct






Direct Dial Telephone and Fax Numbers



- boilers
- controllers
- water heaters
- pressurisation sets

Poole Office

Hamworthy Heating Limited
Fleets Corner, Poole, Dorset BH17 0HH England
Main switchboard tel: **01202 662500**


Technical enquiries	 01202 662527/662528	 01202 665111
Spare parts	 01202 662525	 01202 665111
Service department	 01202 662555	 01202 662522



- flue components
- packaged fan dilution systems
- bespoke flue components
- bespoke flue systems
- design and installation

Birmingham Office

Hamworthy Heating Limited
Shady Lane, Great Barr, Birmingham B44 9ER
Main switchboard tel: **0121 360 7000** fax: **0121 325 2309**

General enquiries  **0121 360 7000**

Direct Email Addresses

Customer Services spares@hamworthy-heating.com
service@hamworthy-heating.com
technical@hamworthy-heating.com
sales.flues@hamworthy-heating.com

Hamworthy Heating Accredited Agents

North West England

Gillies Modular Services
210-218 New Chester Road, Birkenhead, Merseyside L41 9BG
tel: **0151 666 1030** fax: **0151 647 8101**

Southern Ireland

HEVAC Limited
Naas Road, Dublin 12, Ireland
tel: **00 3531 141 91919** fax: **00 3531 145 84806**

Northern Ireland

HVAC Supplies Limited
Unit 2, Antrim Line Business Park, Sentry Lane, Newtownabbey BT36 8XX
tel: **02890 849826** fax: **02890 847443**

Scotland

McDowall Modular Services
14-46 Lomond Street, Glasgow, Scotland G22 6JD
tel: **0141 336 8795** fax: **0141 336 8954**

North East England

Allison Heating Products
17 Beech Road, South Shields, Tyne & Wear NE33 2QH
tel: **0191 455 7898** fax: **0191 455 7899**

Website

www.hamworthy-heating.com

Associate Companies, Offices and Agents throughout the World.

Hamworthy reserves the right to make changes and improvements which may necessitate alteration to the specification without prior notice.