

Camray



Supplement for

SEALED SYSTEM BOILERS

This supplement must be used in conjunction with the Camray 5 Manual supplied with the Boiler.

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CONTENTS

SECTION 1 - INTRODUCTION

- 1:1 Introduction
- 1:2 Regulations
- 1:3 Boiler Arrangement
- 1:4 Sealed System Components

SECTION 2 - INSTALLATION

- 2:1 Wiring Diagrams
- 2:2 Service Connection Dimensions
- 2:3 Tundish Position
- 2:4 Pipe Connection Details
- 2:5 Control Panel

- 2:6 Filling the System
- 2:7 Pressure Relief Valve
- 2:8 Expansion Vessel Pressure

SECTION 3 - SERVICING

- 3:1 Access
- 3:2 Water System
- 3:3 Additional Servicing

SECTION 4 - SPARE PARTS

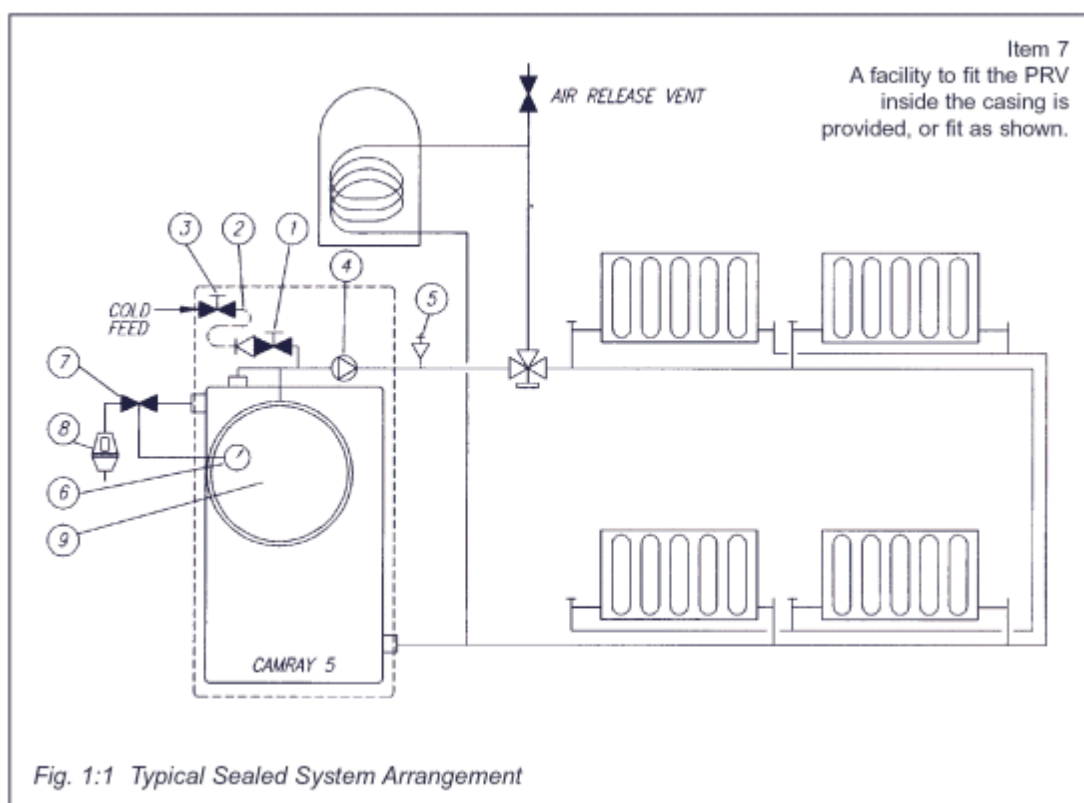
See Spare Parts

SECTION 5 - PUMP PERFORMANCE

1:1 INTRODUCTION

Boulter Camray 5 Sealed System Boilers are designed for use in sealed water systems. The Boilers are supplied with an expansion vessel and associated components arranged to minimise installation time.

Sealed System Boilers can be used for Conventional Flue or with any of the Boulter Balanced Flue options available for the Camray 5, *except* side low level.



Components Supplied with Boiler - Fig 1:1

Item	Description
1	Double Check Valve/Isolating Valve
2	Filling Loop - Flexible Hose
3	Mains Water Shut Off Valve

4	Circulating Pump - 3 Speed
5	Automatic Air Vent (Not supplied by Boulter)
6	Pressure Gauge - 0-6 bar range
7	Pressure Relief Valve - 3 bar
8	Tundish
9	Expansion Vessel Charged to 0.5 bar

1:2 REGULATIONS

The installation must comply with the requirements of the latest editions of:

BS5449 Part 1 Forced Circulation Hot Water System;

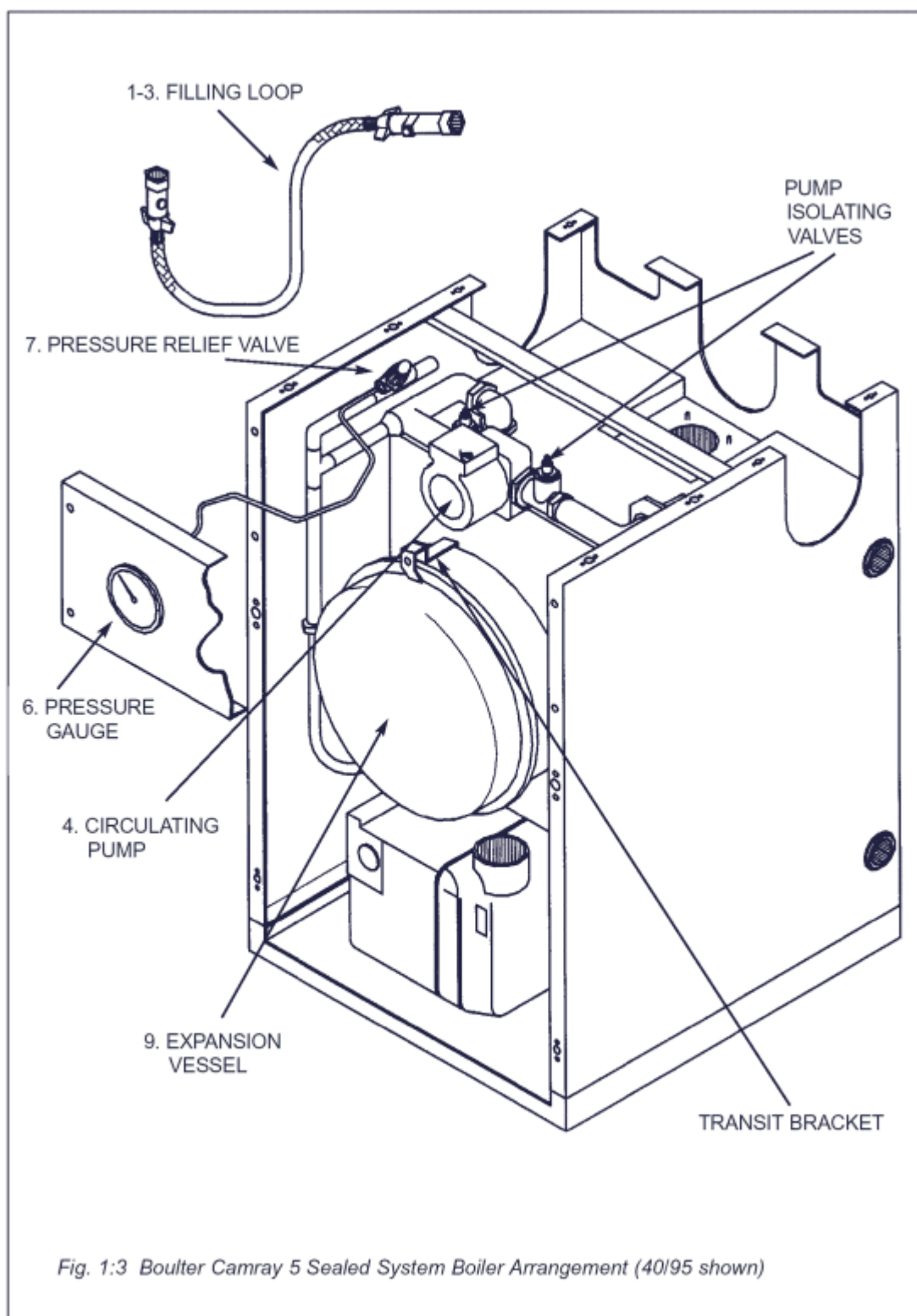
BS7074 Part 1 Codes of Practice for Sealed Systems;

The Building Regulations Part G3:

I.E.E. Wiring Regulations In addition to the standards and regulations listed in the Camray 5 Manual.

CAMRAY 5 SB PAGE 1

1:3 BOILER ARRANGEMENT



CAMRAY 5 SB PAGE 2

1:4 SEALED SYSTEM COMPONENTS

1. Double Check Valve

Fitted to Cold Fill to prevent 'back feed' when Filling Loop is connected.

2. Filling Loop

A flexible hose which should ONLY be connected when filling or topping up the system.

THE FILLING LOOP HOSE MUST BE DISCONNECTED AND MAY BE LEFT HANGING FROM ONE OF THE FITTINGS WHEN NOT IN USE.

3. Mains Water Shut Off Valve

Supplied to isolate mains supply.

4. Circulating Pump

The pump is fitted to the Flow Pipe as a circulating pump for the Heating System.

5. Automatic Air Vent

The Vent automatically vents air from the system.

The bleed screw should be loosened one turn.

Routine venting of radiators is still advised.

6. Pressure Gauge

The Gauge (mounted behind the front door) is provided as a visual indication of the water pressure within the system.

When the system is initially filled (cold) and all radiators full and vented, the Pressure Gauge will show the Cold Fill Pressure. Set the Red pointer to this setting.

Cold Fill Pressure

A pressure below the set Cold Fill Pressure indicates the system requires "topping up".

7. Pressure Relief Valve

(fitted inside casing)

This can be fitted to one of the top sockets of the Boiler. The remaining top socket must be plugged.

8. Tundish

Supplied to provide a visual indication of water flowing from the Relief Pressure Valve (7). Refer to [2:3](#).

It is a requirement of G3 of the Building Regulations that the Tundish is fitted in a safe position visible to the householder.

9. Expansion Vessel

The Expansion Vessel is suitable for systems with a static head of up to 5 metres (16.5ft) i.e. the vertical distance between expansion vessel and highest point of system, usually the top of bedroom radiators. If the static head is greater than 5 metres, then the charge in the vessel must be increased to equal this higher static pressure. The pressure can be increased if required by simply pumping up the vessel with a standard type pump and checking the pressure with a tyre gauge with the system at zero pressure. A schraider type valve is provided on the vessel for this purpose (see note below). During air charge, leave the PRV open.

NOTE: The air charge should not exceed a pressure of 1.5 bar (22 p.s.i.)

Vessel Charge and Initial System Pressure		bar	0.5	1.0	1.5
		psi	7.3	14.5	21.8
Boiler	Expansion Vessel size supplied	Total water content of system using expansion vessel supplied.			
40/65	10 litres	litres	125	90	62
		gallons	27	19.7	13.6
65/95	12 litres	litres	150	109	75
		gallons	32.7	23.8	16.5
100/140	18 litres	litres	224	162	112
		gallons	49	35	24.6
For systems having a larger capacity multiply the total system capacity by the factor to obtain the total minimum expansion vessel capacity					
		0.08	0.11	0.16	

CAMRAY 5 SB PAGE 3

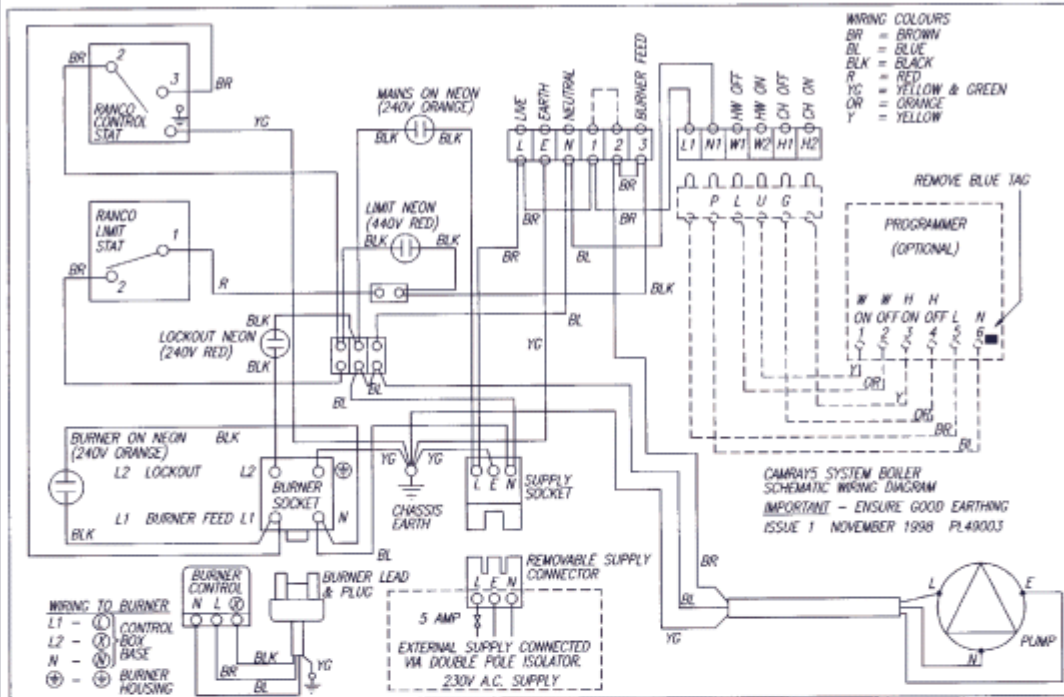
2:1 WIRING DIAGRAMS

IMPORTANT ENSURE GOOD EARTH

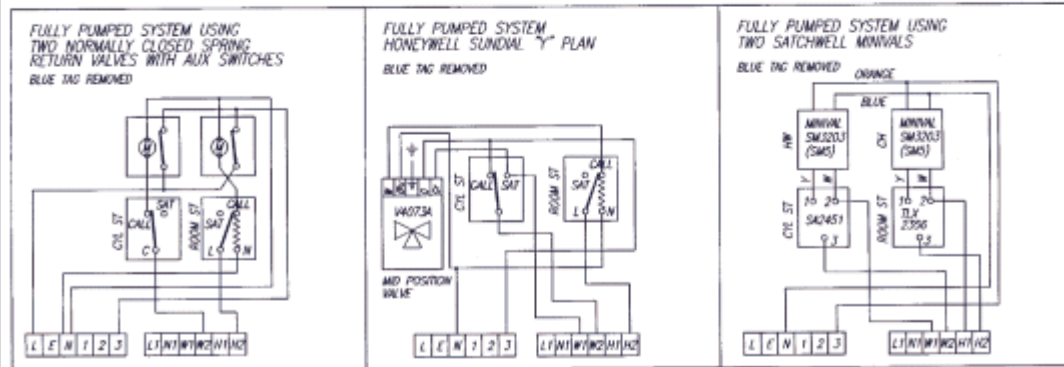
CAMRAY 5 SEALED SYSTEM - CONTROL PANEL

SCHEMATIC WIRING DIAGRAM

**CAMRAY 5 SEALED SYSTEM - CONTROL PANEL
SCHEMATIC WIRING DIAGRAM**

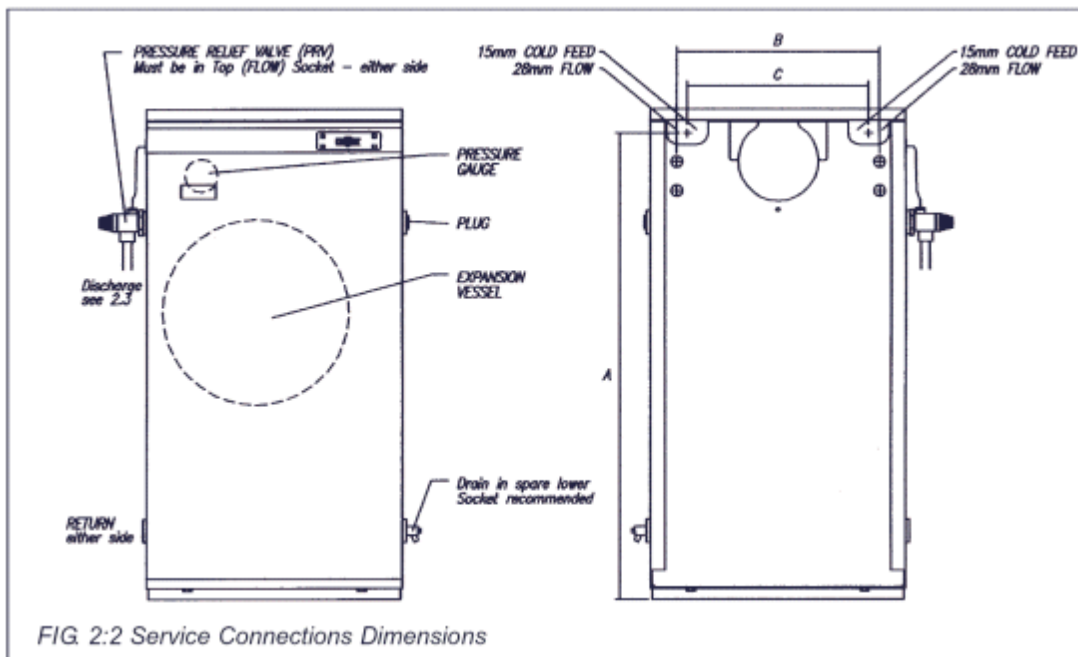


IF OPTIONAL PROGRAMMER IS NOT FITTED USE TERMINAL 3 FOR THE SWITCHED LIVE FROM EXTERNAL CONTROL CIRCUIT.
 IF OPTIONAL PROGRAMMER IS FITTED, REMOVE LINK 1-2 AND CONNECT EXTERNAL CONTROL CIRCUIT IN ONE OF THE THREE EXTERNAL CONTROL SYSTEMS SHOW BELOW.
 TYPICAL EXTERNAL WIRING OPTIONS



CAMRAY 5 SB PAGE 4

2:2 SERVICE CONNECTIONS DIMENSIONS



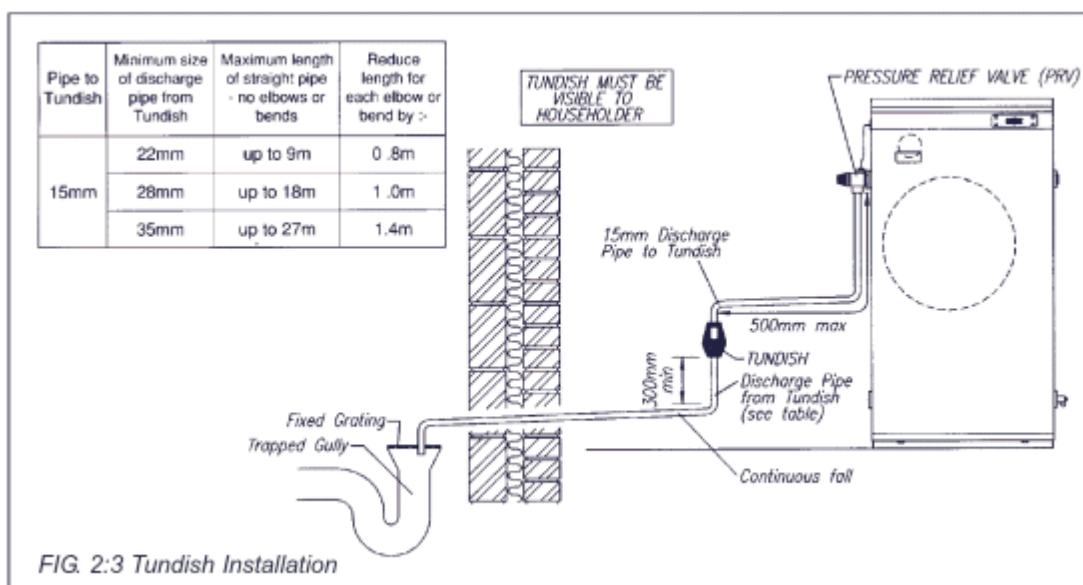
2:3 TUNDISH POSITION

A Tundish is supplied to provide a visual indication of water flowing from the Pressure Relief Valve of the Boiler.

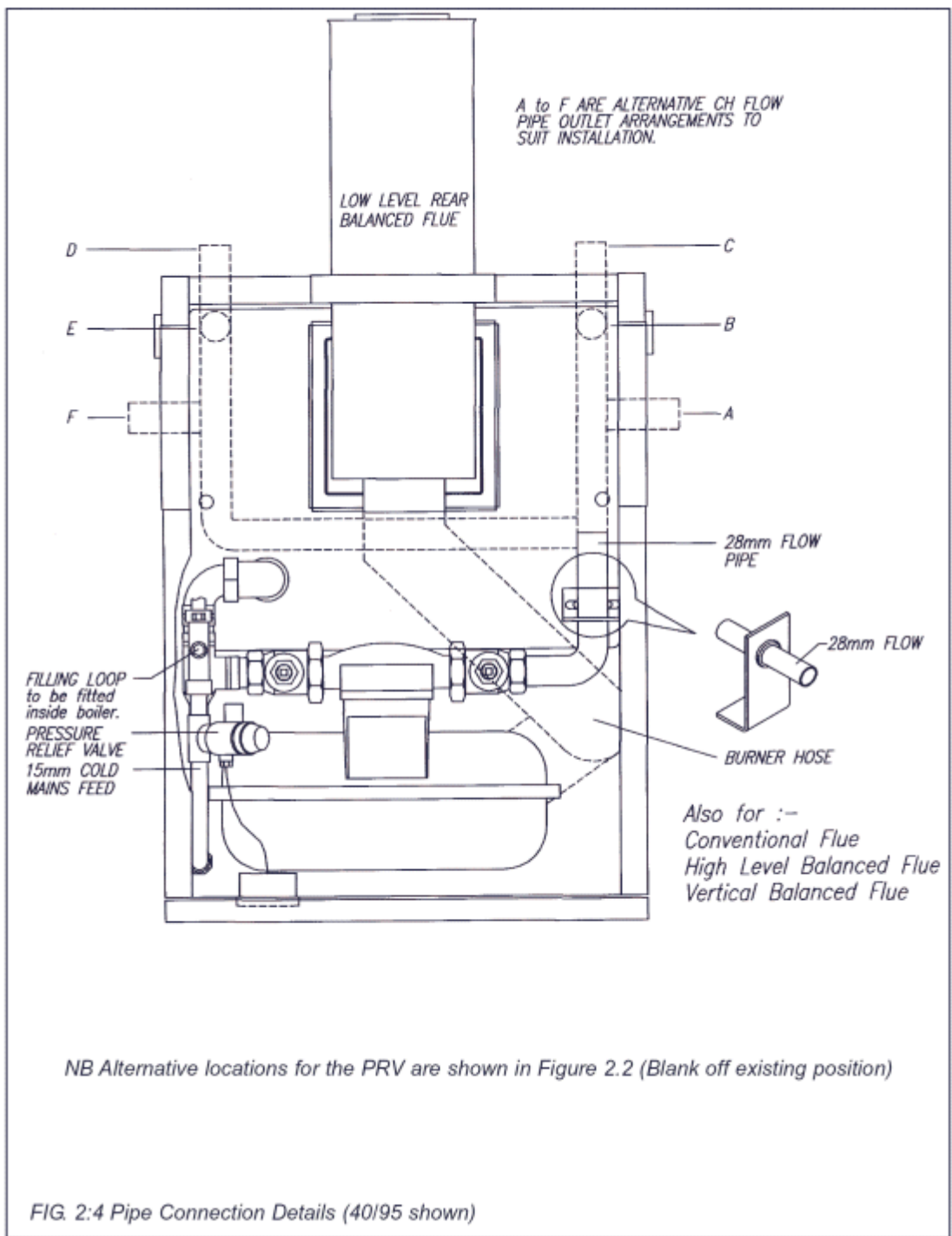
The Tundish must be located in a position clearly visible to the Householder.

Installation of the Tundish must comply with Part G3 of The Building Regulations typically as [fig. 2:3](#)

Model	A	B	C
40/65 65/95	815	354	317
100/140	937	416	379



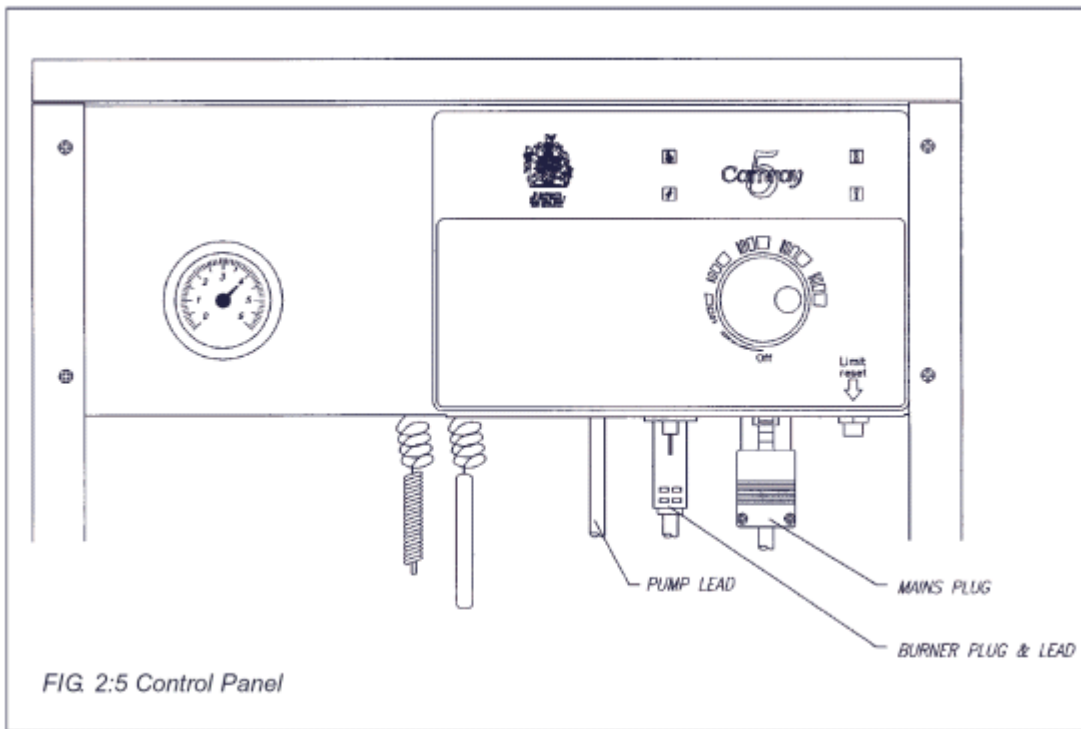
2:4 PIPE CONNECTION DETAILS



2:5 CONTROL PANEL

The Control Panel is fitted as described on page 18 of the Camray 5 manual.

system which may have operated on a lower pressure.



2:6 FILLING THE SYSTEM

1. Check that the black screw on the Automatic Air Vent is loosened 1 turn.
2. Check spare sockets in Boiler have been plugged.
3. Check drain cock/s are off.
4. Connect the Filling Loop Hose from the incoming mains supply to the Double Check Valve and open the Double Check Valve fully.
5. Open the Mains Isolating Valve partway to fill the system SLOWLY.
6. Flush system thoroughly and refill.
7. Vent radiator and any other manual Air Release Vents.
8. Check for leaks particularly on an older
9. When the system is completely full and vented close both Mains Isolating Valve and Double Check Valve and disconnect flexible Filling Loop Hose, catching water.

THE FILLING LOOP MUST BE DISCONNECTED WHEN NOT IN USE.

IMPORTANT

Do not allow water in Filling Loop to spill over the Burner.

10. Set the red pointer of the Pressure Gauge to the Cold Fill pressure. Refer to [1:4.6](#).

CAMRAY 5 SB PAGE 7

2:7 CHECK PRESSURE RELIEF VALVE OPERATION

This is checked by allowing the water pressure to increase until the valve operates - this should be between 2.7 and 3.3 bar.

Reduce the system pressure to achieve the initial cold fill pressure.

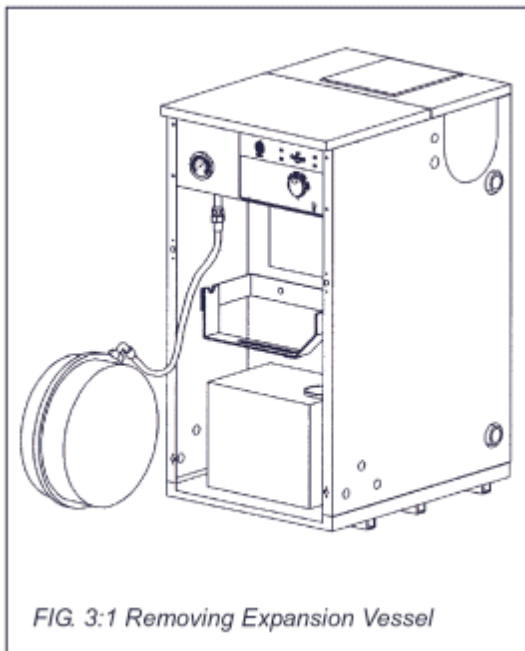
2:8 EXPANSION VESSEL PRESSURE

When the system water is heated, the pressure will rise above the Cold Fill setting. If the pressure reaches 2.5 bar when the Boiler is operated at its highest temperature with all radiators in circulation, then an additional expansion vessel must be fitted in the system. Refer to [Section 1 :4.9](#) and BS 7074 Part 1 for information on sizing of the additional expansion vessel.

3:1 ACCESS

The design of the Sealed System Boiler enables the Pressure Vessel to be lifted and laid on the floor whilst still connected to the Boiler, enabling full access to the Burner and Heat Exchanger (on 40/65 and 65/95 Boilers only).

Any work top must be removable for service access to system components beneath the top casing lid.



3:2 WATER SYSTEM

During routine servicing, the water should be "topped up" if necessary using the Filling Loop when the system is cold. Refer to [2:6 Filling the System](#).

3:3 ADDITIONAL SERVICING

In addition to the General Boiler Maintenance covered in the main Camray 5 Manual, the following items should be checked on an annual basis at the very least.

1. System Pressure

The System Pressure should be checked periodically and increased as necessary using the Filling Loop or

other approved method.

Filling should be carried out on a cold system so that the pressure can be increased to the original cold fill design pressure (indicated by the red pointer on the system Pressure Gauge).

The Pressure Gauge should be watched carefully during filling and the Mains Isolating Valve opened slowly.

2. System Draining

The Boiler as well as the system, is under pressure and before disconnecting any components, the system pressure must be reduced. It is recommended that a suitable drain be situated in one of the Boilers' lower sockets to facilitate this.

After replacing the relevant parts refill the system as described in [Section 2:6](#).

3. Pressure Relief Valve

This should be checked for operation during annual servicing by increasing the system pressure outlined in Section 2:7.

4. Expansion Vessel Pressure

Should be checked to be in accordance with the cold design pressure of the system.

CAMRAY 5 SB PAGE 8

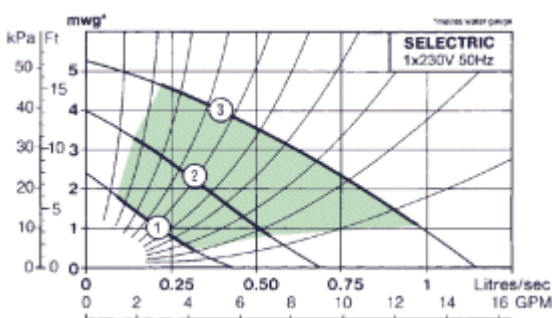
5:1 PUMP PERFORMANCE

Pump Performance on Camray 5 Sealed System Boilers

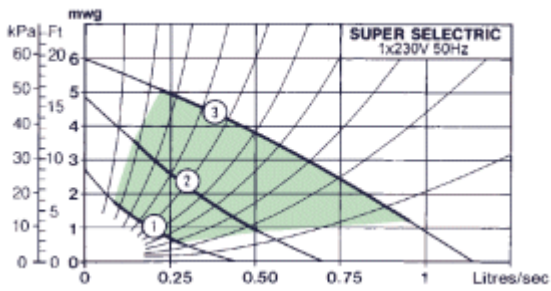
Two types of pumps are used in the Camray 5 System Boilers.

The graphs below show the pump performance curves as defined by the pump manufacturer.

Used in models 40/65 & 65/95



Used in models 100/140



1. Set the speed selector switch to maximum (Speed 11) and switch on the electricity supply and start the heating system.
2. Turn the switch to minimum (Speed 1) and if after a suitable time all the radiators are not hot, increase the speed of the pump by switching to Speed 11. Repeat this process until adequate circulation is achieved.

Remember, if the speed setting is too high, noise may be caused in the system and the power consumption will be unnecessarily high.

CAMRAY 5 SB PAGE 12