TEST CODE SHEET

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1. TYPE OF TEST(S)

Performance test of air bubble unvented hot water storage systems.

2. WATER REGULATIONS REQUIREMENTS FOR FITTINGS

Schedule 2

17 - (1) Every unvented water heater, not being an instantaneous water heater with a capacity not greater than 15 litres, and every secondary coil contained in a primary system shall -
(a) be fitted with a temperature control device, and either a temperature relief device or a combined pressure and temperature relief valve; or
(b) be capable of accommodating expansion within the secondary hot water system.

3. BRITISH STANDARDS OR WATER SPECIFICATION, DEEMED TO SATISFY WATER REGULATIONS REQUIREMENTS

3.1 Fittings with 'kitemarks' which are deemed to satisfy the requirements of regulations are listed in the directory.

4. TEST PROCEDURE

4.1 Tests applicable to the following fittings:-

UNVENTED HOT WATER STORAGE SYSTEMS

(A) UNVENTED HOT WATER STORAGE SYSTEMS

PURPOSE

To establish whether the integral expansion system used, with the unvented hot water storage system will prevent operation of the expansion / pressure relief valves for 380 cycles, equivalent to a minimum period of one years service.

SCOPE

A typical care of daily use of a 2001 unvented hot water storage system is assumed as follows;

(1) 1801 assumed to be drawn off in batches as follows:

(a) 40 litres 7.30am, 5 litres / minute.
(b) 40 litres 11.30am, 10 litres / minute.
(c) 40 litres 5.00pm, 10 litres / minute.
(b) 40 litres 10.00pm, 25 litres / minute.

(2) The lower immersion is on for a period between midnight and 6.00am, set at 65°C.

(3) The upper immersion will operate for a period between 6.00pm and 7.00pm, if thermostat calls for heat.

(4) This daily cycle is assumed to occur every day of the year and, therefore, 380 cycles should equate to at least1 years service.

(5) Consider it reasonable to condense this simplified draw-off pattern, to that shown in Table 1, Figures 2 and 3.

TEST METHOD

Assemble the system under test in accordance with the manufacturer's instructions ensuring that the system is correctly commissioned and in accordance with Figure 1 (except FV1, FV2 or FV3 - see (1) below).

Directly Heated or Indirectly Heated

If *Directly Heated*, set up as follows: -

(1) Install the flow meters as in Figure 1 or use one flow meter to give readings of all three solenoid valves. Install directly on the hot water take-off from the top of the cylinder.

(2) Wire the immersion heater to the control panel.

(3) Wire the thermostat on the cylinder to the control panel.

(4) Connect control panel up to power supply.

(5) By-pass the solenoid valves and set flow rates as follows;

(a) V1 5 litres / minute.
(b) V2 10 litres / minute.
(c) V3 25 litres / minute.

(6) Reset control panel. Press black button and hold for 5 seconds.

(7) Start test. Press blue button on control panel, either option A (95 days) or (63.3 days).

If *Indirectly Heated*, set up as follows: -

(1) Install the flow meter as in Figure 1 or use one flow meter to give readings of all three solenoid valves. Installing directly on the hot water take-off from the top of the cylinder.

(2) Wire the pump on the primary side up to the control panel.

(3) If the primary circuit cannot reach the temperature within the domestic side of the cylinder within the time stated in Option A or Option B, then connect the immersion heater either up to the control panel or directly to the power supply to compensate for this.

(4) Wire the thermostat on the cylinder to the panel.

(5) Connect control panel to power supply.

(6) By-pass the solenoid valves and set flow rates as follows;

(a) V1 5 litres / minute.
(b) V2 10 litres / minute.
(c) V3 25 litres / minute.

(7) Reset control panel. Press black button and hold for 5 seconds.

(8) Start test. Press blue button on control panel, either option A (95 days) or (63.3 days).

Test equipment to be used (See Figure 1).

(1) Pressure gauges, accuracy (optional), for indication purposes only.

(2) Solenoid valves.

(3) Valves to control the draw-off flow rate.

(4) A programming device to achieve the heater cycle and draw-off profile in Table 1.

(5) A temperature controller to ensure the water is 65°C ± 2°C.

(6) The test specimen complete with all cold water controls.

(7) A cold water supply with a minimum supply available of 30 litres / minute at a static pressure of 1 bar above the system pressure.

5. ACCEPTANCE CRITERIA

The expansion / pressure relief valve shall not operate before 380 cycles have been completed.

OPTION A

CYCLE	LOWER HEATER TIMER 1	5 1/MIN TIMER 3	10 1/MIN TIMER 4	UPPER HEATER TIMER 2	25 1/MIN TIMER 6
1	ON 0.00 OFF 3.00	3.30 3.38	ON 4.00 OFF 4.04 ON 4.30 OFF 4.34	4.45 5.45	5.55 5.58
2	ON 6.00 OFF 9.00	9.30 9.38	ON 10.00 OFF 10.04 ON 10.30 OFF 10.34	10.45 11.45	11.55 11.58
3	ON 12.00 OFF 15.00	15.30 15.38	ON 16.00 OFF 16.04 ON 16.30 OFF 16.34	16.45 17.45	17.55 17.58
4	ON 18.00 OFF 21.00	21.30 21.38	ON 22.00 OFF 22.04 ON 22.30 OFF 22.34	22.45 23.45	23.55 23.58

OPTION B

CYCLE	LOWER HEATER TIMER 1	5 1/MIN TIMER 3	10 1/MIN TIMER 4	10 1/MIN TIMER 5	UPPER HEATER TIMER2	25 1/MIN TIMER 6
1	ON 0.00 OFF 1.30	2.00 2.08	2.14 2.18	2.42 2.46	2.57 3.39	3.56 3.58
2	ON 4.00 OFF 5.30	6.00 6.08	6.14 6.18	6.42 6.46	6.57 7.39	7.56 7.58
3	ON 8.00 OFF 9.30	10.00 10.08	10.14 10.18	10.42 10.46	10.57 11.39	11.56 11.58
4	ON 12.00 OFF 13.30	14.00 14.08	14.14 14.18	14.42 14.46	14.57 15.39	15.56 15.58
5	ON 16.00 OFF 17.30	18.00 18.08	18.14 18.18	18.42 18.46	18.57 19.39	19.56 19.58
6	ON 20.00 OFF 21.30	22.00 22.08	22.14 22.18	22.42 22.46	22.57 23.39	23.56 23.58

Table 1 – Heater cycle and draw-off schedule

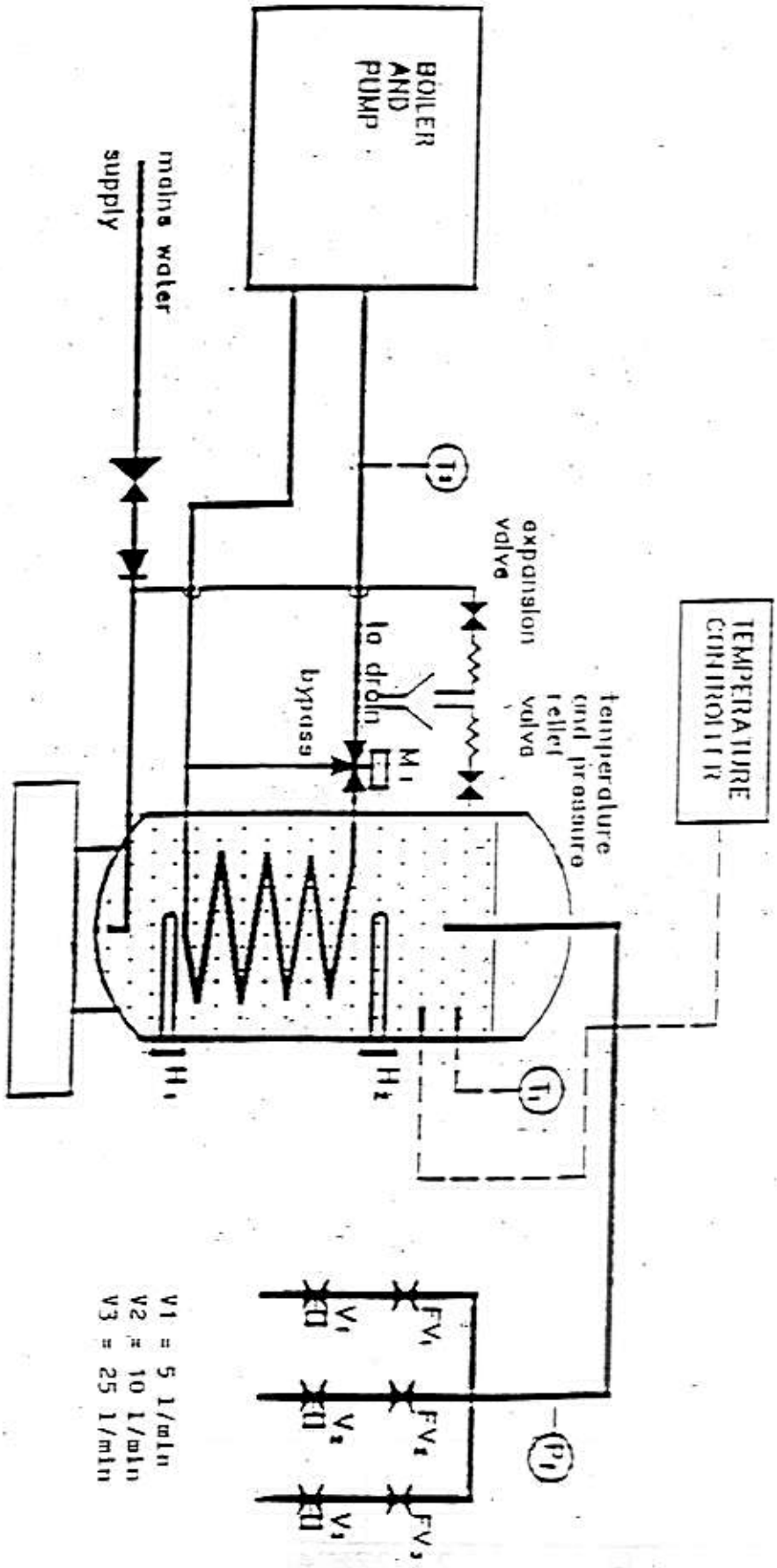

FIGURE 1

SCHEMATIC LAYOUT OF TEST ASSEMBLY

Figure 1 – Schematic layout of test assembly

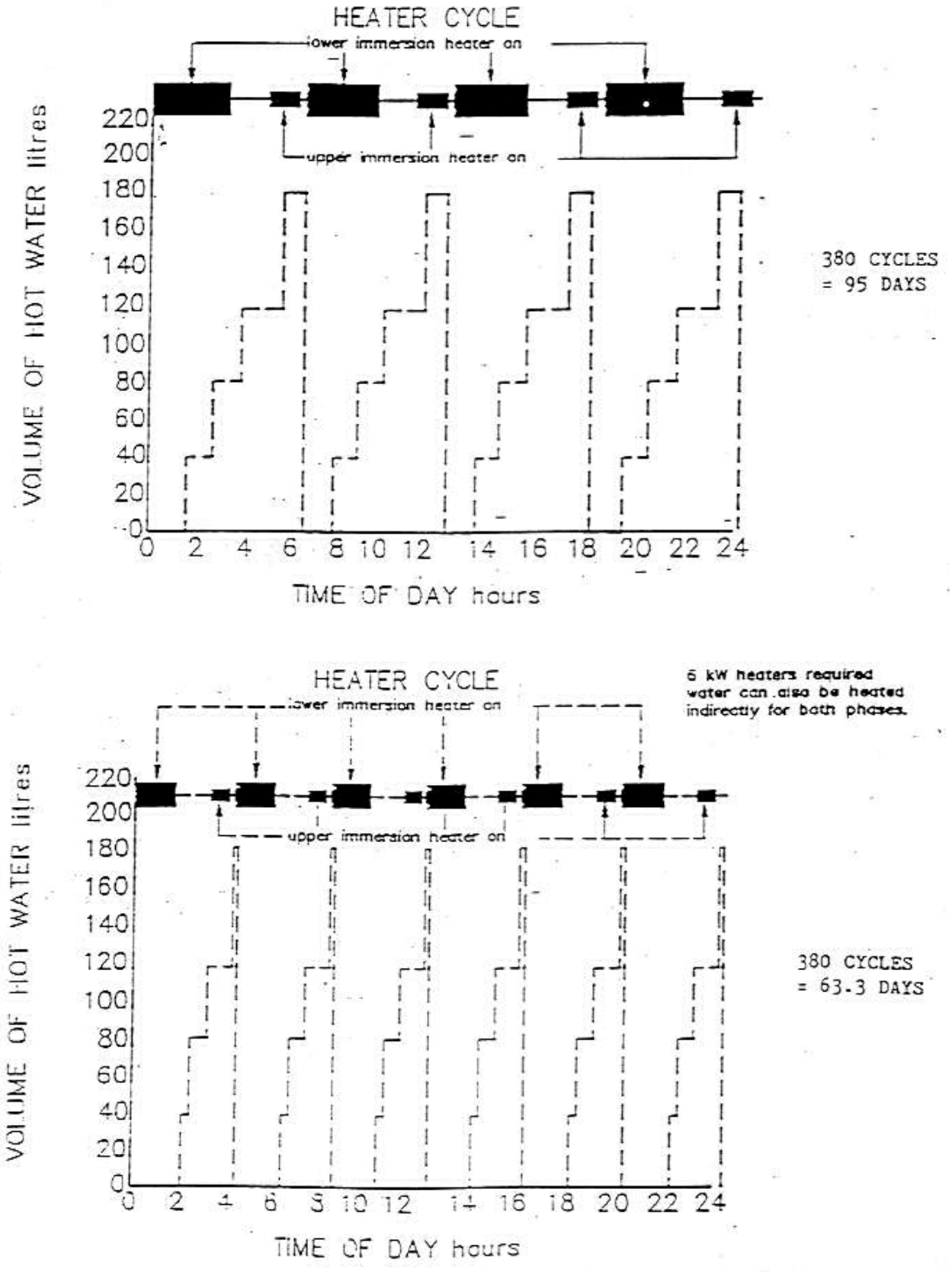

Figure 2 – Heater cycle and draw-off profile

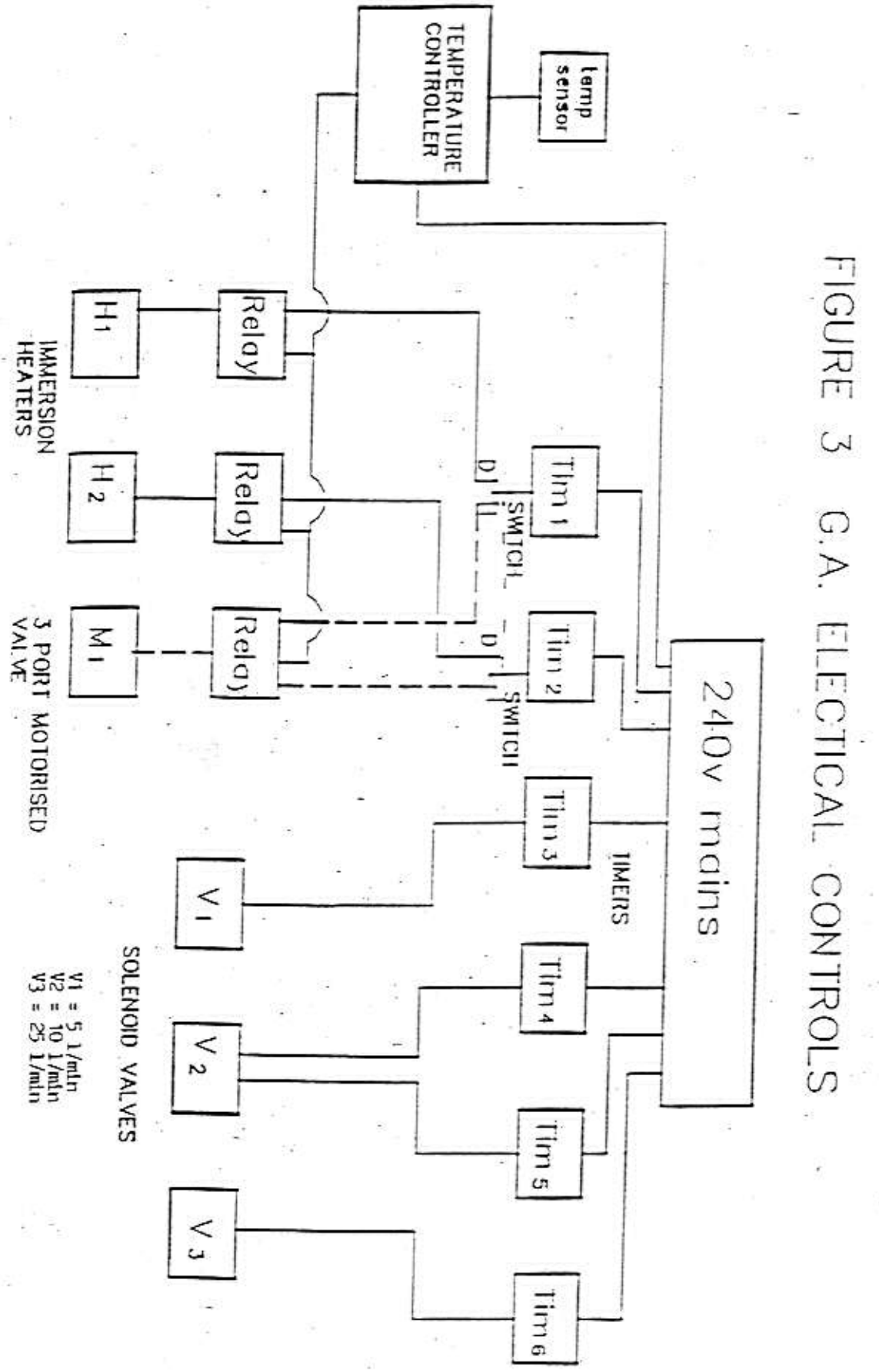

Figure 3 – G.A. electrical controls