ELECTRONIC TEMPERATURE MONITORS

(INCLUDING CALIBRATOR)

SERVICE INFORMATION

TYPES: ET 100 SINGLE CHANNEL
ET 200 TWIN CHANNEL
TC 100 CALIBRATOR

CONTENTS:

LIBRA MEDICAL

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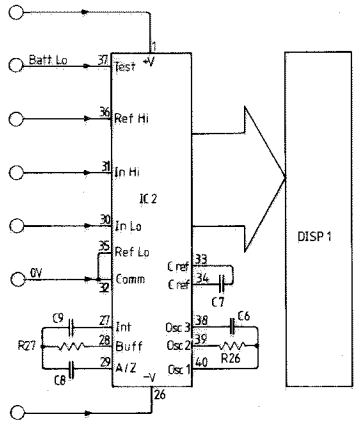
INTRODUCTION

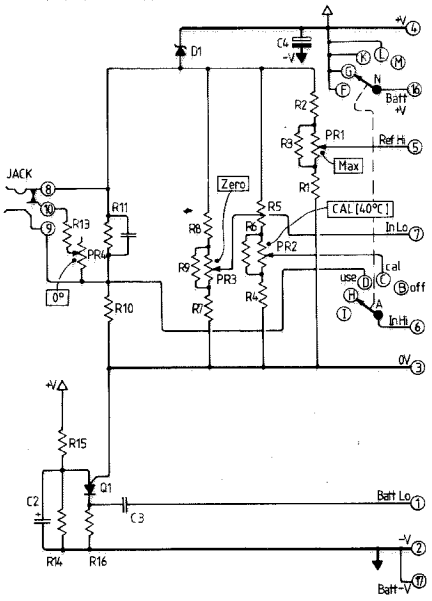
These instruments, in single and twin channel versions, have been designed to provide accurate and reliable long term temperature monitoring and display in any clinical situation. They have been designed to accept thermistor temperature probes with a specification similar to the Yellow Springs 400 series. The information contained in this brochure should enable any technical service department to carry out repairs or recalibration if required. Calibration can be checked with the in built calibration facility, at 40°C, and an external calibrator covering 22 – 50°C in six steps, is available for routine checks, Part No. TC 100.

CIRCUIT DIAGRAMS AND COMPONENT LAYOUT

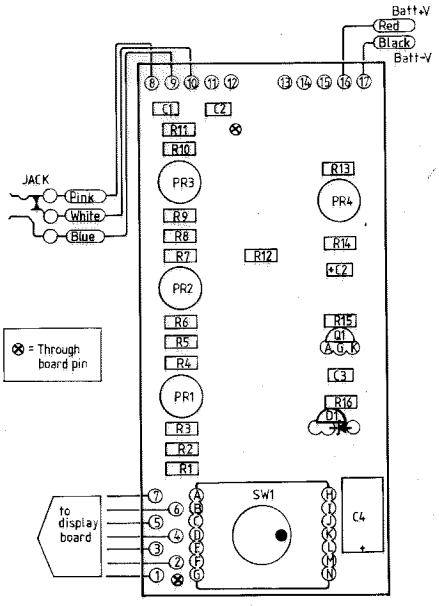
1 & 2 CHANNEL : DISPLAY BOARD



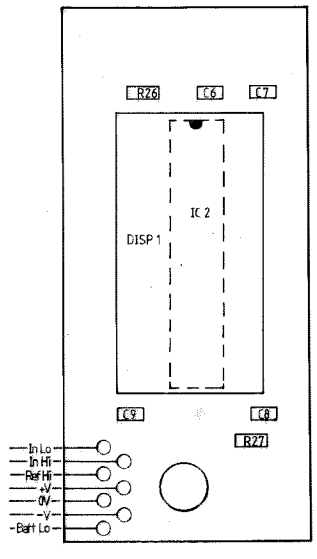
1 CHANNEL : ANALOGUE BOARD



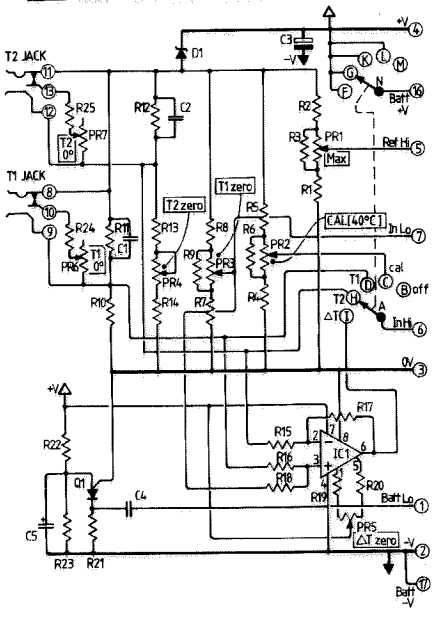
1 CHANNEL : ANALOGUE BOARD LAYOUT



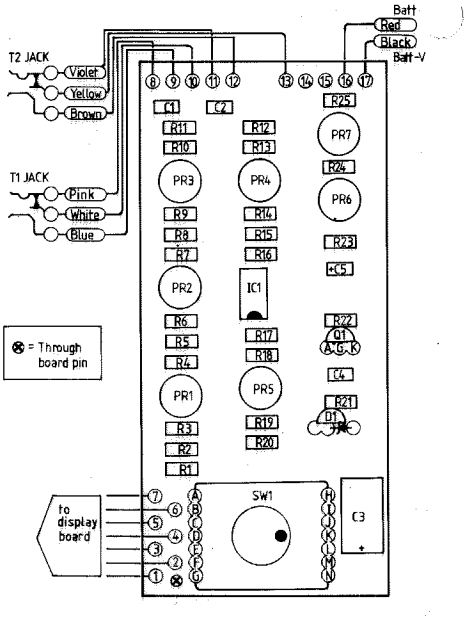
1 & 2 CHANNEL : DISPLAY BOARD LAYOUT



2 CHANNEL : ANALOGUE BOARD



2 CHANNEL : ANALOGUE BOARD LAYOUT



COMPONENT LIST

DISPLAY BOARD

R26	390K	1%	.25W
R27	47K	1%	.25W
C6	47pF	ceramic	
C7, 8	.47µF	met.poly.	
C9	.22µF	met.poly.	
IC2	ICL 7126 CPL		

DISP 1	LCD 3½ digit .5in high.
19993	Knob
19994	Case – white
19995	ET100 front panel
19996	ET200 front panel

SINGLE CHANNEL ANALOGUE BOARD

R1	6K34	.5%	.25W
R2, 4, 7	100K	1%	.25W
R3	1K	1%	.25W
R5	3K3	1%	.25W
R6	470R	1%	.25W
R8	5K9	1%	.25W
R9	330R	1%	.25W
R10	18K	1%	.25W
R11	1K2	1%	.25W
R12	1M	1%	.25W
R13	11K3	1%	.25W
R15	270K	1%	.25W
R16	4K7	1%	.25W
R14	470K	1%	.25W

PR1, 2, 3, 4	1K	preset
C1	.47µF met.poly.	
C2	2.2µF tant.	
C3	.1µF met.poly.	
C4	100µF 16v al. elect.	
D1	ICL 8069 DCZR	
Q1	2N6027	
SW1	switch: 6way 2pole	

TWIN CHANNEL ANALOGUE BOARD

R1	6K34	.5%	.25W
R2, 4, 7	100K	1%	.25W
R3	1K	1%	.25W
R5	3K3	1%	.25W
R6	470R	1%	.25W
R8	5K9	.5%	.25W
R9	330R	1%	.25W
R10	18K	1%	.25W
R11, 12	1K2	1%	.25W
R13	15K	1%	.25W
R14	2K7	1%	.25W
R15, 16, 17, 18	1M	1%	.25W
R19, 20, 21	4K7	1%	.25W
R22	270K	1%	.25W
R24,25	11K3	.5%	.25W
R23	470K	1%	.25W

PR1, 2, 3, 4, 6, 7	1K	preset
PR5	22K	preset
C1, 2	.47µF met.poly.	
C3	100µF 16V al.elect.	
C4	.1µF met.poly.	
C5	2.2µF tant.	
IC1	ICL 7611 DCPA	
D1	ICL 8069 DCZR	
Q1	2N6027	
SW1	switch: 6way 2pole	

CALIBRATION PROCEDURE

CALIBRATION VALUES (°C)						
Calibration	22	26	32	38	44	50
Thermometer display	22.0	25.9	31.9	38.0	43.9	49.8
Critical values				●		

SINGLE CHANNEL

1. Plug calibration box into probe input. Set all pots (PR1 – 4) halfway. Switch thermometer to USE and set box to 22.0
2. Adjust Zero (PR3) so display reads 22.0
3. Set box to 50° and adjust Max (PR1) so display reads 49.8
4. Repeat 2. & 3. until satisfactory.
5. Set box to each position and check display against table above. Make final adjustments if necessary.
6. Disconnect calibration box. Switch thermometer to CAL.
7. Adjust Cal (PR2) so display reads 40.0
8. Switch thermometer to USE. Adjust 0° (PR4) so display reads 0.0

TWIN CHANNEL

1. Plug calibration boxes into T1 & T2 inputs. Set all pots halfway. Switch thermometer to T1 and set T1 calibration box to 22.0
2. Adjust T1 zero (PR3) so display reads 22.0
3. Set box to 50° and adjust Max (PR1) so display reads 49.8
4. Repeat 2 & 3 until satisfactory.
5. Set box to each position and check display against table above. Make final adjustments if necessary.
6. Switch thermometer to T2 and set T2 calibration box to 22.0
7. Adjust T2 zero (PR4) so display reads 22.0
8. Repeat 5 but only adjust PR4.
9. Disconnect calibration boxes. Switch thermometer to CAL.
10. Adjust CAL (PR2) so display reads 40.0
11. Switch thermometer to T1. Adjust T1 0° (PR6) so display reads 0.0
12. Switch thermometer to T2. Adjust T2 0° (PR7) so display reads 0.0
13. Plug in calibration boxes, set to 38°. Switch thermometer to ΔT. Adjust ΔT zero (PR5) until display reads 0.0
14. Leave T2 box at 38°. Set T1 box to each position and check that display error is less than 0.2°. Set T1 box to 38° and repeat for T2.

BATTERY LOW VOLTAGE: BOTH MODELS

1. Remove PP3 battery from thermometer and replace with bench type DC power supply. Also connect digital voltmeter across supply for more accurate reading. Set supply to 9V and switch on. Switch thermometer to CAL.
2. Slowly reduce supply voltage until display flashes. This should occur in the range 7.2 – 6.6V.