

Avo BM400 SERIES

SPECIFICATION

INSULATION RANGES

Nominal Test Voltage (d.c.)	BM400 500 V	BM401 500 V	BM402 250 V, 500 V	BM403 1000 V
Measuring Range	0.01 — 999 M Ω on all ranges (0 — 10 G Ω on analogue scale)			
Terminal Voltage on Open Circuit (d.c.)	+15% maximum			
Short Circuit Current	1 mA nominal			
Test Current on Load	1 mA at min. pass values of insulation specified in BS7671, HD384 and IEC 364.			
Accuracy (at 20 °C)	$\pm 2\%$, ± 2 digits			

CONTINUITY RANGES

Measuring Range	0.01 — 99.9 Ω (0 — 50 Ω on analogue scale)
Open Circuit Voltage	5 V, ± 1 V
Short Circuit Current	205 mA, ± 5 mA
Accuracy (at 20 °C)	1 — 9.99 Ω : $\pm 2\%$, ± 2 digits 10 — 99.9 Ω : $\pm 5\%$
Zero Offset Adjust	0 — 9.99 Ω
Continuity Buzzer	Operates at less than 5 Ω

RESISTANCE RANGE

Measuring Range	(can be used for diode testing) 0.1 — 100 k Ω (0 — 10 M Ω on analogue scale)
Open Circuit Voltage	5 V, ± 1 V
Short Circuit Current	20 μ A, ± 5 μ A
Accuracy (at 20 °C)	$\pm 5\%$ ± 2 digits

VOLTAGE RANGE

Measuring Range	(not BM402 and BM404) (i) 0 — 600 V d.c. (ii) 0 — 600 V a.c. (50/60 Hz) (iii) 0 — 450 V a.c. (400 Hz) (0 — 500 V on analogue scale)
Accuracy (at 20 °C)	<450 V d.c. or a.c. (50/60 Hz): $\pm 1\%$, ± 2 digits >450 V d.c. or a.c. (50/60 Hz): $\pm 2\%$, ± 2 digits a.c. at 400 Hz: $\pm 5\%$, ± 2 digits

TEMPERATURE COEFFICIENT

All Ranges <0.1% per °C

DEFAULT VOLTMETER

The default voltmeter operates when an external voltage >25 V a.c. or d.c. is detected on any range except OFF and $\frac{1}{1}$. When this occurs, all instruments, except the BM402 and BM404, will revert to the voltage range display. Reverse polarity d.c. will cause '-dc' to appear on the voltage measuring instruments. The BM402 and BM404 will beep and flash 'V' on the display as a warning. If external volts are present, testing will be inhibited.

BATTERY CONDITION TEST

The battery condition test position measures the voltage on a simulated load. The result is displayed in volts, and as a bar graph indicating the remaining battery power. As the battery becomes exhausted the bar will reduce. If the batteries are low during a test, the symbol $\frac{1}{1}$ will appear. If an external voltage ± 1 V is present, the display will flash and the buzzer will sound.

AUTO SHUT-OFF

The auto shut off operates 5 minutes after the start of a test, on all ranges. To change the shut off time to 60 minutes, first perform a battery test (as above) then press the 'Test' button twice. If an insulation test, or 'Off' is selected, the shut-off time will revert to 5 minutes. It is therefore not possible to generate dangerous voltages for more than 5 minutes, even with a locking test button.

GENERAL SPECIFICATION

ENVIRONMENTAL CONDITIONS	
Altitude up to 2000 m	
Pollution degree 2	
Operating Range	-20 — +40 °C
Operating Humidity	90% R.H. at 40 °C max.
Storage Range	-25 — +65 °C
FUSE	
Type	500 mA (F) 440 V, 32 x 6 mm Ceramic HBC 10 kA minimum.

The fuse, and spare fuse, are accessible by removing the battery compartment cover. Disconnect from external circuits before removing the cover. To check for a ruptured fuse switch to an insulation range and press the test button. Indication of a ruptured fuse is provided by the symbol $\frac{1}{1}$.

SAFETY

The BM400 series is protected against connection to a 440 V Category III supply. The BM400 series will, in general, meet the requirements of IEC1010-1 (1990), BS4743 (1979) and VDE 0411 (1973). The BM402 and BM404, which do not incorporate a voltage range should not be connected to live circuits intentionally.

INSTALLATION CATEGORIES

Category III: Fixed wiring and installations within a building.

AUTOMATIC DISCHARGE

When the test button is released, after an insulation test, a 250 k Ω resistor is automatically switched across the terminals to discharge the item under test. Any voltage present will be indicated on the display so that the discharge can be monitored (except on the BM402 and BM404, which will display 'V').

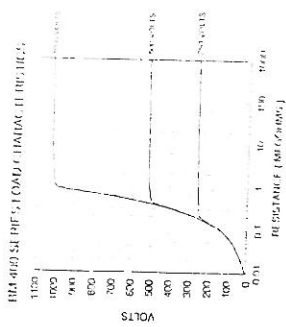
POWER SUPPLY

Battery Type 6 x 1.5 V cells IEC LR6 type only.
Battery Life 3000, 5 second operations, at 1 kV worst case.
The batteries should be removed if the instrument is not to be used for a long period of time. If the batteries leak, the instrument must be cleaned thoroughly.

BATTERY REPLACEMENT

For safety reasons, the battery compartment must not be opened if the test leads are connected. Undo the two screws in the battery compartment cover to access the batteries.

TERMINAL CHARACTERISTICS



WEIGHT
625g

DIMENSIONS
220 x 92 x 55mm

CLEANING
The exterior can be cleaned with soap and water.

ACCESSORIES

Supplied:	Test lead set Zip-up carrying case	part no. 6220 437 part no. 6420 099
Optional:	Fixed prod Fused lead set, FPK4 Test-&-carry case	part no. 5210 350 part no. 6110 920 part no. 6420 092

OPERATION

Please note: insulation tests operate only when the test button is pressed. Grey labelling denotes where it is necessary to press the test button.

Insulation Testing

1. Set the selector switch to the test voltage required.
2. Connect the test leads, first to the instrument, and then to the isolated item under test.
3. Press the test button to activate the test voltage.
4. Release the test button at the end of the test. The reading will hold for about 3 seconds.
5. Any capacitive circuits charged during a test will automatically discharge. If significant voltage remains the voltage warning will occur.
6. Remove the test leads only when no voltage is indicated

NB. There is a safety delay on the first operation of the 1000 V range each time the range is selected.

Continuity Testing

1. Set the selector switch to $\frac{1}{1}$.
2. Connect the test leads. The pointer will appear when connection to <10 M Ω is made.
3. The test will activate automatically
4. After the test probes are disconnected, the reading will be held for a few seconds.

PART NO. 6171-734 EDS. 2

Disassembly

Important

1. Removal of the printed circuit board must be done carefully to avoid scratching the inside of the display window.
2. Do not lose the 'O' ring on the rotary switch shaft.
3. If the terminal leads need to be unsoldered, plug in the test leads (to act as a heat sink) and perform the operation as quickly as possible to avoid distorting the plastic moldings.

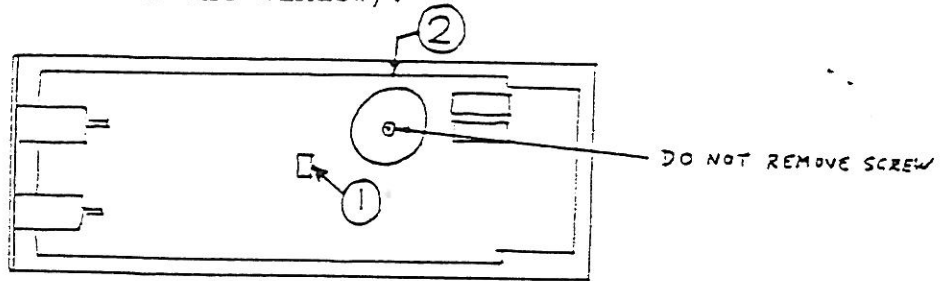
Procedure

Remove all four screws.

Remove battery compartment cover, batteries and gasket.

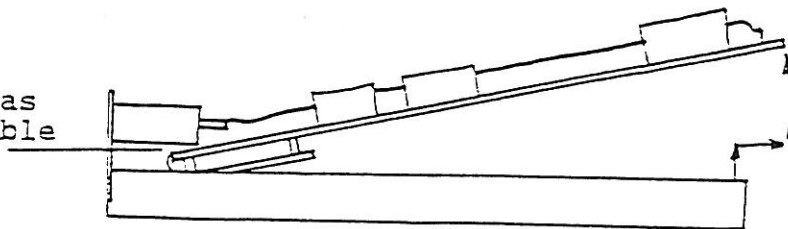
Remove back cover.

In the centre of the board there is a yellow plastic tab (1). Remove the securing wedge behind the tab. Push the tab sideways and using a screwdriver, lever the board away from the case at (2) until the range selector knob falls off. (Don't worry about damaging the switch, just remember not to scratch the window).



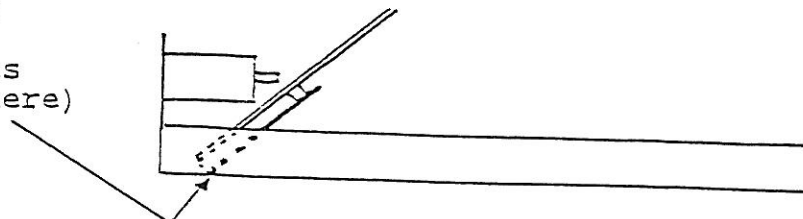
Arrange the terminal wires to make the most of their length (or unsolder them at board end) and remove the board as shown below:

Keep this gap as small as possible

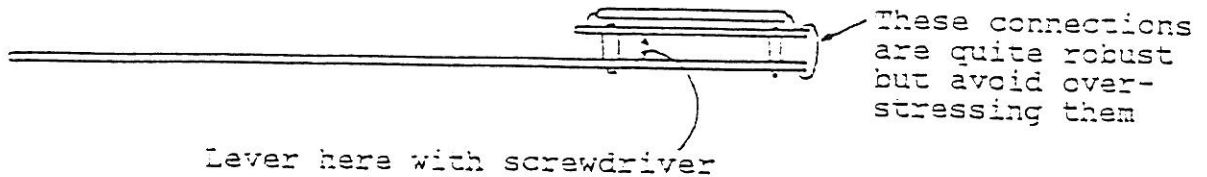


AVOID THIS:

(window gets scratched here)



To separate the display board from the main board:



Removal of the display is difficult because of the large number of pins that need to be unsoldered. If a fault on the display board is suspected, make the elementary checks first as on page [13].

The display is most easily removed using either a hot air gun with a specially shaped nozzle or a 'wide' soldering iron to heat up at least one row of pins simultaneously. The pcb holes then need to be cleared of solder. It only takes two minutes to solder the display in again but it is worth checking that everything works first. Fit the display into its holes and apply water to the joints with a small paint brush. This will make adequate connection to the display for a few minutes. When all appears satisfactory, remove the display and check for electrolytic corrosion which may have occurred if water got to the wrong places. Do not get water on the main board, some parts are very sensitive to leakage.

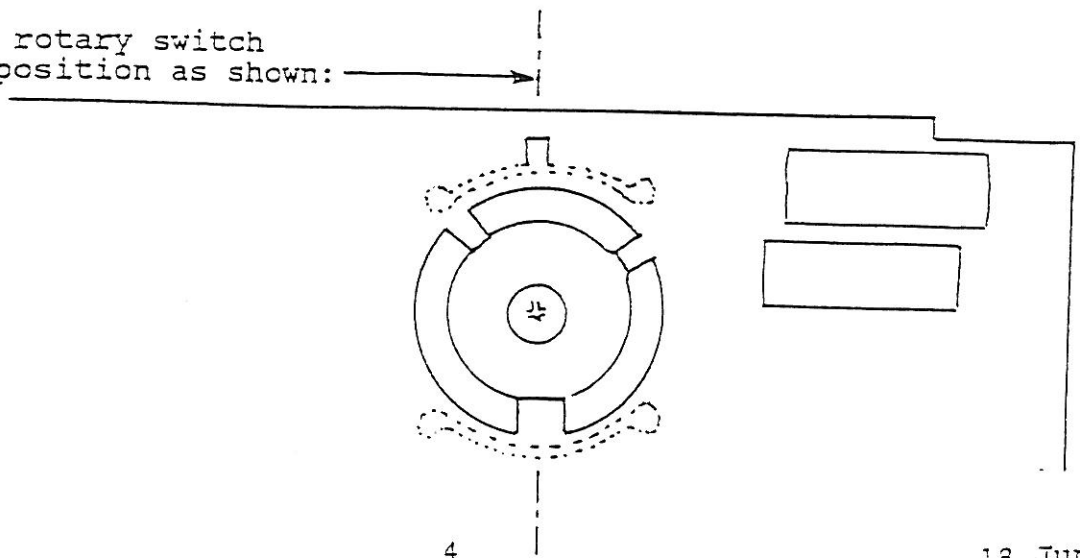
When soldering the display in, do not let it rest on the components underneath or the reflector will get marked. The gap between display and pcb should be 3.5 to 4.0 mm.

One last point. Do solder the display in the right way up!

Re-assembly

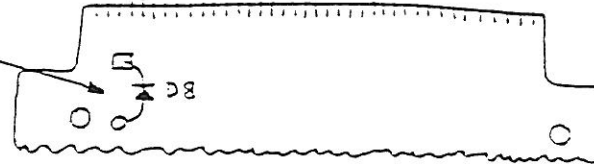
Be careful not to scratch the window (see above).

Line up the rotary switch in the OFF position as shown:



Diagnostic Mode

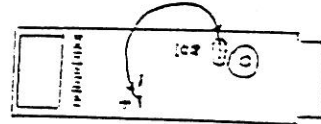
To enable diagnostic mode, connect a diode in D8 position. (Diode only needs to be connected during switch on).



On entry to diagnostic mode, buzzer beeps and display shows 'ddd'. System is set to low power mode. Step through test sequence by pressing 'test' button. Buzzer beeps and display briefly indicates diagnostic test number. (eg. Display shows 'd01') If a test fails, further help is contained on page shown as: < >

Note:

If the rotary switch is not fitted connect a wire link from BAT+ to the pin of IC8 nearest to the edge of the board.

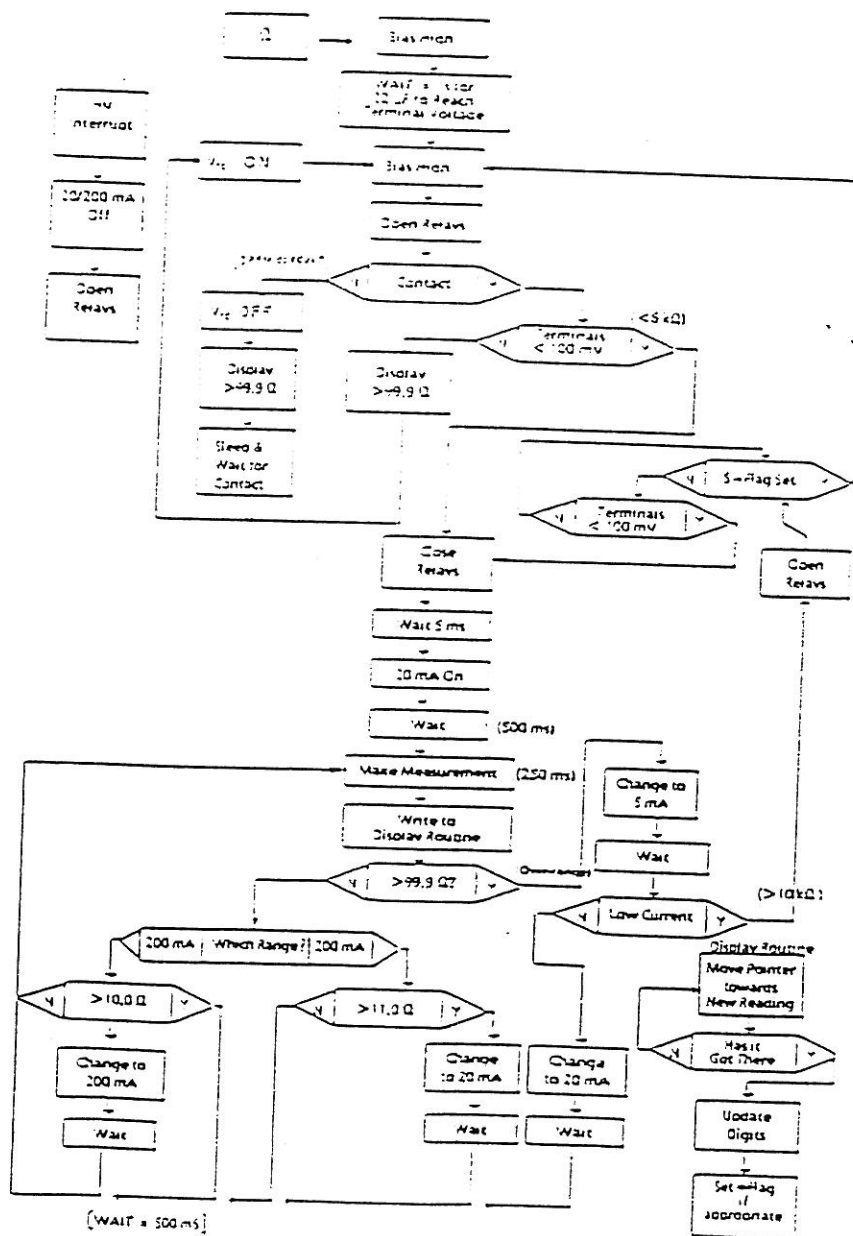


Test number	Conditions	[Observations for quick check]
Test 0 <15>	Test display. Vcc 'off' Relays de-energized Turns 'on' all display segments	[Check all segments are on]
Test 1 <17>	Display programme version number Set driven ground to 'connect' status Vcc 'on' -ve terminal 'connect' Relays de-energized 'P' denotes programme version '-' denotes pre-production	
Test 2	Read and display input ports status Vcc 'on' Relays de-energized	[Suggest skip this test]
Left hand digit	= port 5 (bit 0 = SW1, bit 1 = SW2) (bit 2 = SW4, bit 3 = SW8)	
Middle digit	= port 1 (bit 0 = BATTOK, bit1 = CONTACT) (bit 2 = MEAS RESULT bit3 =NOTLOWCURRENT)	
Right hand digit	= port 0 (bit 0 = VOLTS RESULT, bit1 = test) (bit 2 = LINKDET, bit 3 = HVBAR)	
Test 3 <17> <18>	Basic 50v voltage range [TP 0 = 50mV] Vcc 'on' Relays de-energized Displays input voltage: 0 - 50V positive dc only	[+5V to +Term: Read 5V±0.1V] [0V to +Term: Read 0V±0.1V] [o/c +Term; Read 0.3V±0.2V]

Continuity testing is initiated by the CONTACT signal from the VOLTAGE DETECTOR. This signal appears when a resistance of less than 10 MΩ is connected across the terminals.
 (See section: Voltage and Contact Detector for further details.)

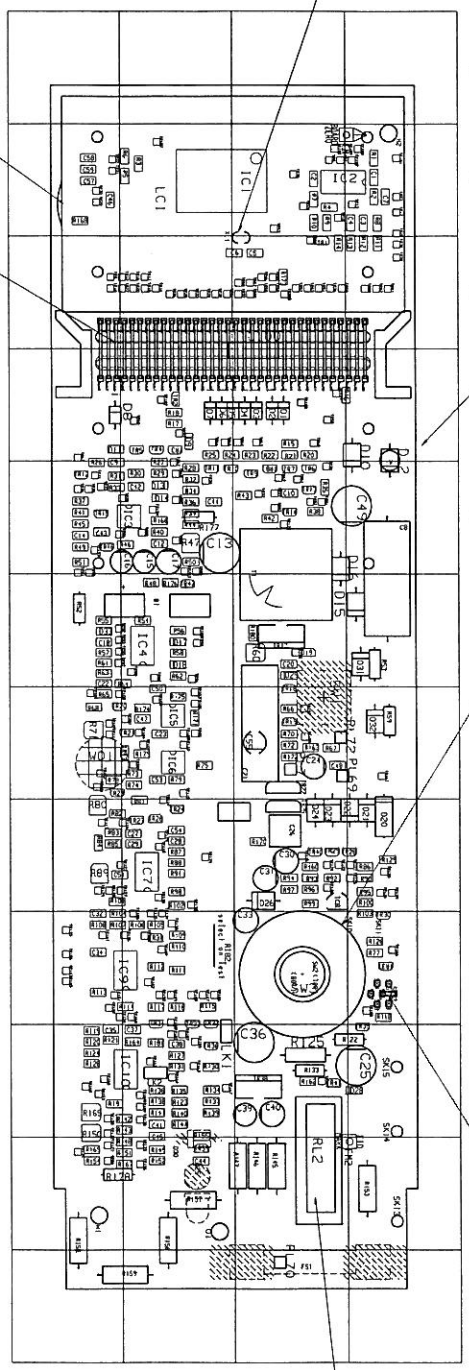
The CURRENT SOURCE provides a constant current of either 205 mA (for resistances up to 11Ω) or 20.5 mA (for 10Ω to 100Ω). The negative terminal voltage is buffered to become driven ground and the positive terminal voltage is measured with respect to this. Resistance is calculated from the voltage measured, assuming the forced current to be correct.
 If the current is too low and the measured voltage is also low the blown fuse symbol will come on after about 3 seconds.
 (For further details see: 'Voltmeter' and 'Current source'.)

Ohms flow chart

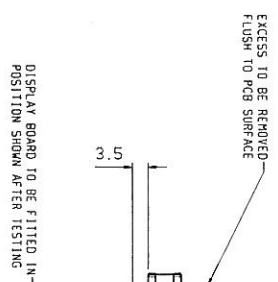


AVO AVO INTERNATIONAL LTD.
 TITLE: BMB0-400 PCB ASSY
 PART No. 6430-717
 FINISH USED ON: BMB0-400 MK2

AREAS MARKED  TO BE SPOT MASKED USING ITEM 9.



REF	ITEM	QTY	REF	ITEM	QTY	REF	ITEM	QTY	REF	ITEM	QTY
01	3670-001	13	08	3670-001	13	50	3670-001	13	57	3670-001	13
02	3670-002	13	09	3670-002	13	51	3670-002	13	58	3670-002	13
03	3670-003	13	10	3670-003	13	52	3670-003	13	59	3670-003	13
04	3670-004	13	11	3670-004	13	53	3670-004	13	60	3670-004	13
05	3670-005	13	12	3670-005	13	54	3670-005	13	61	3670-005	13
06	3670-006	13	13	3670-006	13	55	3670-006	13	62	3670-006	13
07	3670-007	13	14	3670-007	13	56	3670-007	13	63	3670-007	13
08	3670-008	13	15	3670-008	13	58	3670-008	13	64	3670-008	13
09	3670-009	13	16	3670-009	13	59	3670-009	13	65	3670-009	13
10	3670-010	13	17	3670-010	13	60	3670-010	13	66	3670-010	13
11	3670-011	13	18	3670-011	13	61	3670-011	13	67	3670-011	13
12	3670-012	13	19	3670-012	13	62	3670-012	13	68	3670-012	13
13	3670-013	13	20	3670-013	13	63	3670-013	13	69	3670-013	13
14	3670-014	13	21	3670-014	13	64	3670-014	13	70	3670-014	13
15	3670-015	13	22	3670-015	13	65	3670-015	13	71	3670-015	13
16	3670-016	13	23	3670-016	13	66	3670-016	13	72	3670-016	13
17	3670-017	13	24	3670-017	13	67	3670-017	13	73	3670-017	13
18	3670-018	13	25	3670-018	13	68	3670-018	13	74	3670-018	13
19	3670-019	13	26	3670-019	13	69	3670-019	13	75	3670-019	13
20	3670-020	13	27	3670-020	13	70	3670-020	13	76	3670-020	13
21	3670-021	13	28	3670-021	13	71	3670-021	13	77	3670-021	13
22	3670-022	13	29	3670-022	13	72	3670-022	13	78	3670-022	13
23	3670-023	13	30	3670-023	13	73	3670-023	13	79	3670-023	13
24	3670-024	13	31	3670-024	13	74	3670-024	13	80	3670-024	13
25	3670-025	13	32	3670-025	13	75	3670-025	13	81	3670-025	13
26	3670-026	13	33	3670-026	13	76	3670-026	13	82	3670-026	13
27	3670-027	13	34	3670-027	13	77	3670-027	13	83	3670-027	13
28	3670-028	13	35	3670-028	13	78	3670-028	13	84	3670-028	13
29	3670-029	13	36	3670-029	13	79	3670-029	13	85	3670-029	13
30	3670-030	13	37	3670-030	13	80	3670-030	13	86	3670-030	13
31	3670-031	13	38	3670-031	13	81	3670-031	13	87	3670-031	13
32	3670-032	13	39	3670-032	13	82	3670-032	13	88	3670-032	13
33	3670-033	13	40	3670-033	13	83	3670-033	13	89	3670-033	13
34	3670-034	13	41	3670-034	13	84	3670-034	13	90	3670-034	13
35	3670-035	13	42	3670-035	13	85	3670-035	13	91	3670-035	13
36	3670-036	13	43	3670-036	13	86	3670-036	13	92	3670-036	13
37	3670-037	13	44	3670-037	13	87	3670-037	13	93	3670-037	13
38	3670-038	13	45	3670-038	13	88	3670-038	13	94	3670-038	13
39	3670-039	13	46	3670-039	13	89	3670-039	13	95	3670-039	13
40	3670-040	13	47	3670-040	13	90	3670-040	13	96	3670-040	13
41	3670-041	13	48	3670-041	13	91	3670-041	13	97	3670-041	13
42	3670-042	13	49	3670-042	13	92	3670-042	13	98	3670-042	13
43	3670-043	13	50	3670-043	13	93	3670-043	13	99	3670-043	13
44	3670-044	13	51	3670-044	13	94	3670-044	13	100	3670-044	13
45	3670-045	13	52	3670-045	13	95	3670-045	13			
46	3670-046	13	53	3670-046	13	96	3670-046	13			
47	3670-047	13	54	3670-047	13	97	3670-047	13			
48	3670-048	13	55	3670-048	13	98	3670-048	13			
49	3670-049	13	56	3670-049	13	99	3670-049	13			
50	3670-050	13	57	3670-050	13	100	3670-050	13			



NOTE: ITEMS OTHER THAN NOS. 1 & 5 TO BE FOUND ON BOM 6132-022 PCB ASSY BULK SET OF PARTS.

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ISSUED: 2-05-03 21597
 DATE: 2-05-03 21597
 BY: [Signature]

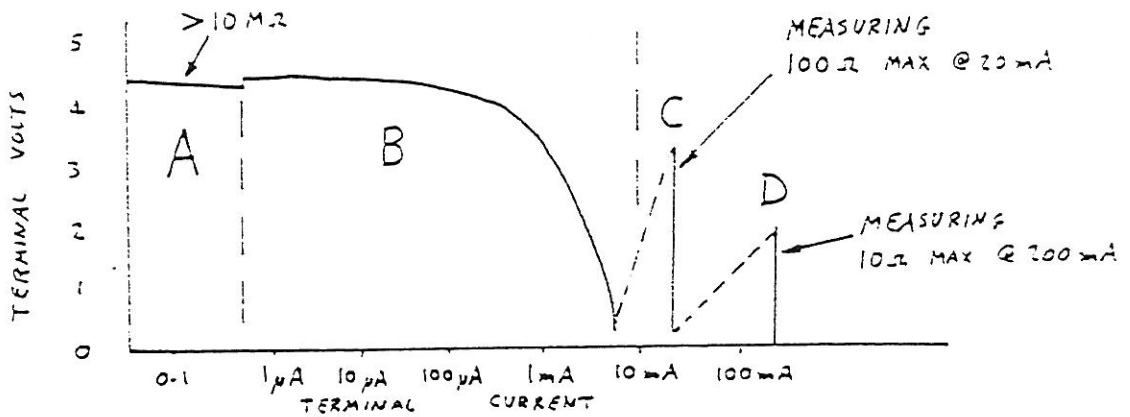
SCALE: A3: 1:1
 DATE: 2-05-96

INDUSTRIAL CALIBRATION LIMITED
 REPAIR AND CALIBRATION OF TEST EQUIPMENT

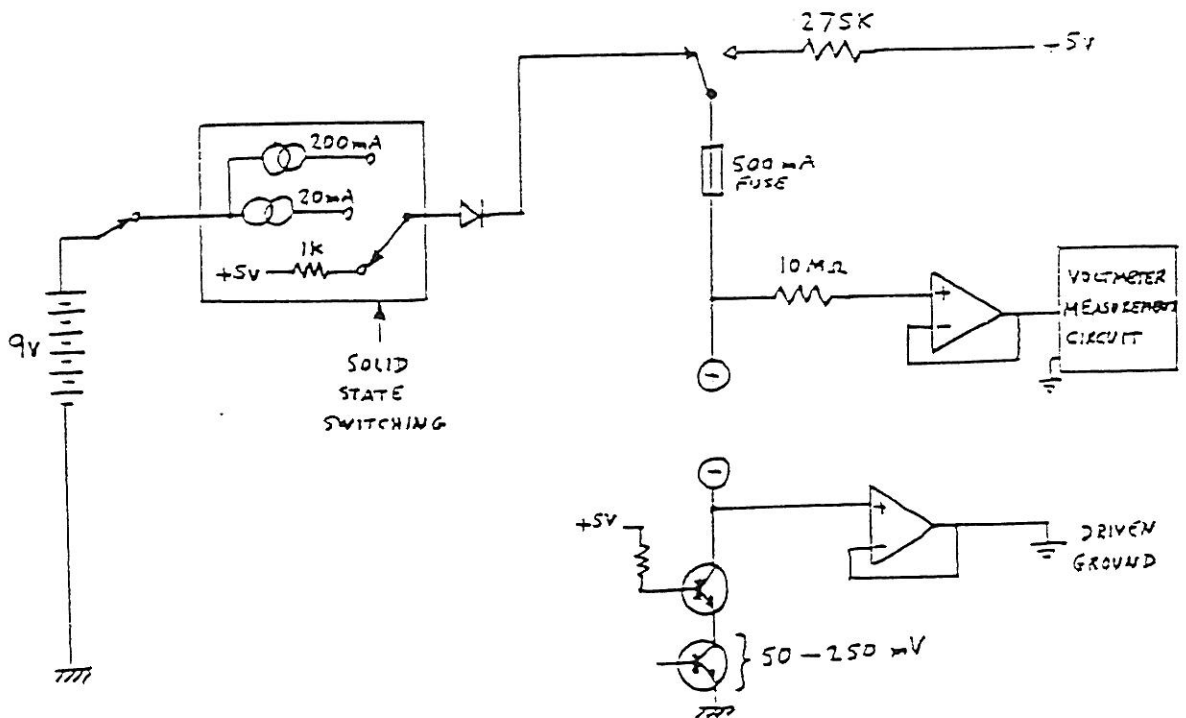


Continuity (Ohms)

There are four modes of operation, depending on the resistance across the terminals:

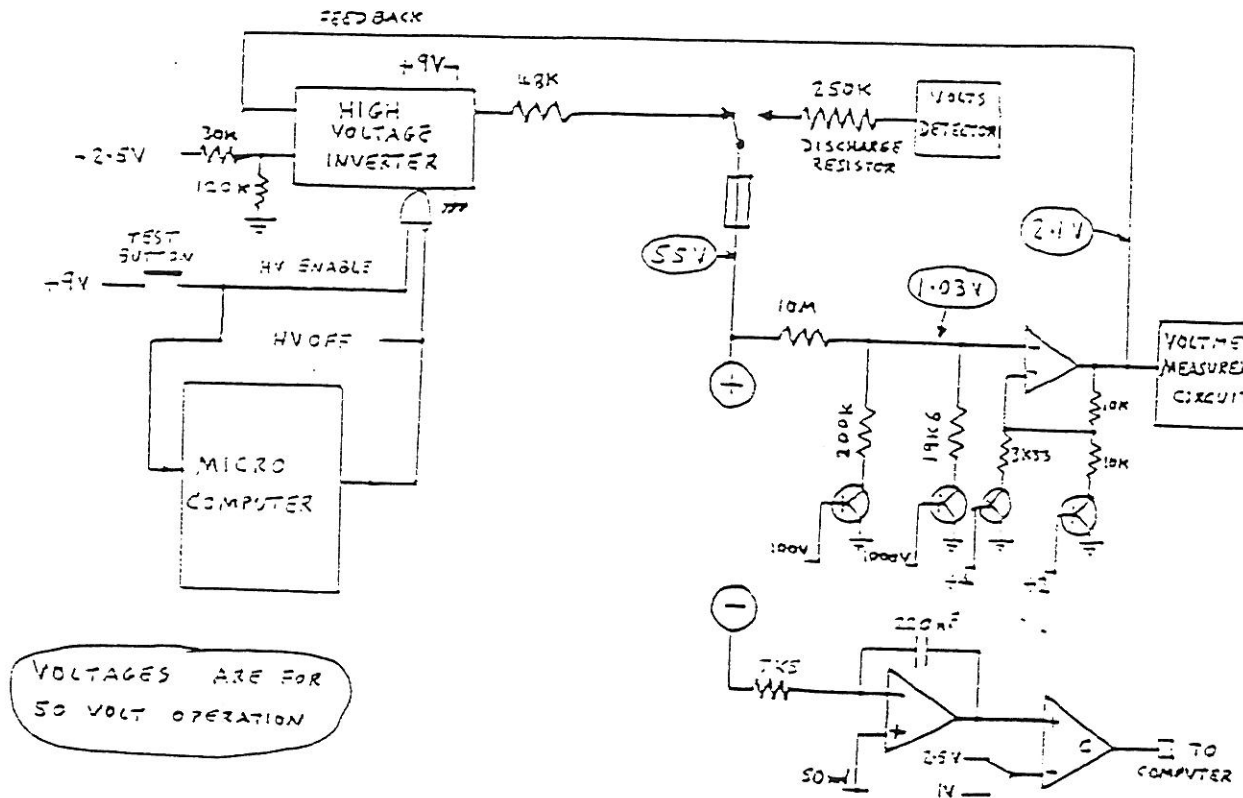


- A. Terminals open-circuit, internal power consumption is reduced to a minimum with 275 k Ω in series with terminals for instrument protection. In this mode it can be connected to 600 volts without damage.
- B. Continuity detected, relay energised, terminals held at 4.5 volts with a 1 k Ω resistor in series.
- C. Load is less than 100 Ω , turn on 20 mA current source and make measurement.
- D. Load is less than 10 Ω , turn on 200 mA current source and make measurement.



Operating modes

Insulation tests



Pressing the 'TEST' button applies battery voltage to HV ENABLE. (This ensures that high voltage cannot be generated accidentally even if the computer crashes). HV ENABLE is also applied to computer pin 40, this turns on VCC, connects the relays and takes HV OFF low. The voltmeter circuit feeds back the 'FB' signal to regulate the terminal voltage correctly and also measures the actual terminal voltage for the purposes of insulation resistance calculations.

Voltage will only be generated by the inverter if:

- (1) TEST button is pressed.
- (2) HV OFF is low.

The computer controls HV OFF. It will only go low if the terminals are at less than 50 volts before the test starts.

The current flowing into the negative terminal is measured by the CURRENT MEASUREMENT circuit which generates pulse widths in proportion to the reciprocal of the current.

Test 10
<13>

Test battery load and low battery circuits

Vcc 'on'
Battery load 'on' [Battery current =95 ±10mA
Relays de-energized
Current integrator in reset mode

Displays logic level of 'BATTOX' line
Supply voltage >6.3V, displays 'HHH' [Observe]
Supply voltage <5.3V, displays 'LLL' [Observe]
Threshold approximately 5.8V

Test 11
<23>

Test current integrator [Terminals o/c]

Vcc 'on'
Relays de-energized
Integrator is put into a continuous measurement loop

Displays pulse time in seconds
Terminals open circuit: 1.65 ±0.1 seconds [Observe]
Terminals short circuit: 0.03 ±0.1 seconds [Observe]
Displays 'rrr' if stuck in resetting mode
Displays 'ppp' if stuck in precharging mode
Displays 'ttt' if stuck in timing mode
If stuck, attempts to reset after 16 seconds
Outputs pulse timing on port 7.3 (connector pin 1)
Logic 1 denotes 'pulse timing in progress'

Test 12
<20>

Test high voltage inverter on 50V setting [Press button
[c/p = 55 ±3V]

Vcc 'on'
Relays energized

While test button is pressed, the instrument generates 5
and the display shows the '1000V' flag as a warning.

Battery current <150 mA

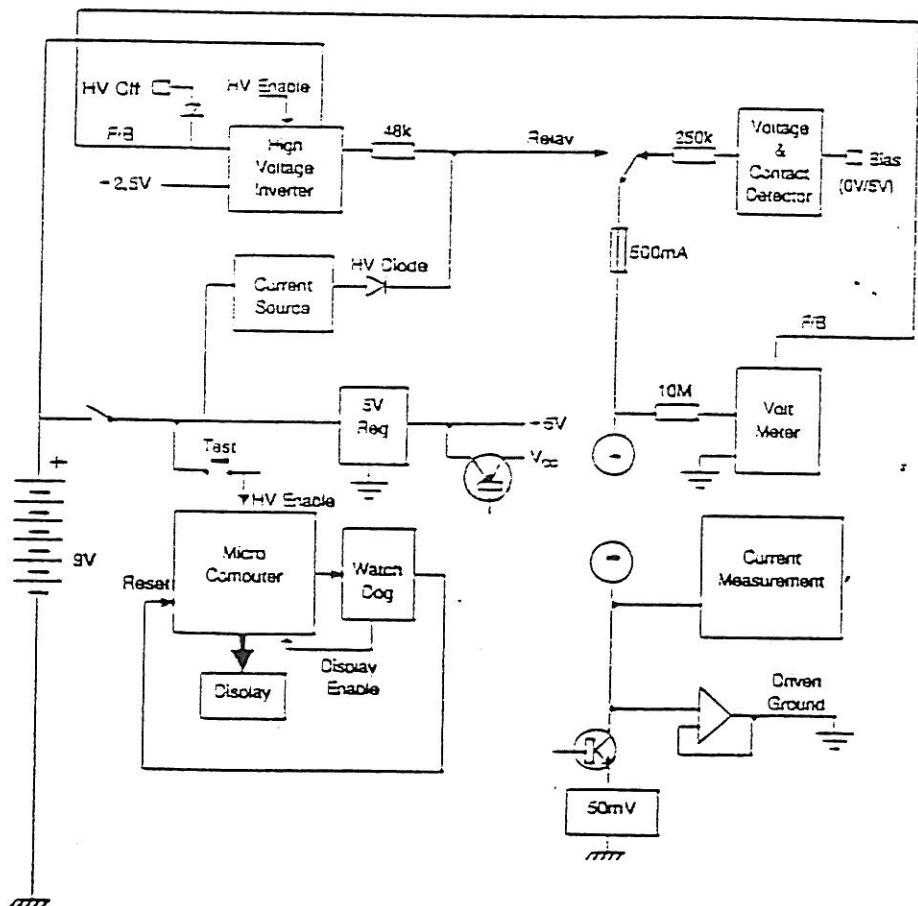
Introduction

The BM80 and the BM400 series of insulation testers all use the same basic design, and use the same parts. Different instruments are defined by the position of the switch stops and the software.

The BM80 offers considerably improved performance, providing insulation measurements up to 200GΩ, whereas the BM400 stops at 10GΩ (the digits stop at 1 GΩ). The BM80 setup procedure is therefore more demanding than for the BM400. This manual is written for the BM80 but contains notes where relevant about the BM400 series instruments.

These instruments are designed for maximum user convenience with due regard to safety and power consumption. Continuity tests are initiated automatically when the test leads sense contact and the voltmeter circuit is powered up only when the terminal voltage is greater than one volt. Insulation tests only operate if the 'TEST' button is being pressed. Internal discharge resistors render safe any external capacitance that was charged during the test.

Block diagram



Note that the driven ground [$\frac{+}{-}$] is the reference level for all measurements. It is 50mV to 300mV above battery ground [---]. The +5V supply sits on driven ground so that battery ground appears as a negative rail for supplying the operational amplifiers.

SPECIFICATION**INSULATION RANGES**

	BM400	BM401	BM403
	BM402	BM404	
Nominal Test			
Voltage (d.c.)	500 V	500 V	250 V,
	1000 V		500 V
			1000 V

MEASURING RANGE0,01 - 999 M Ω on all ranges**Terminal Voltage on****Open Circuit (d.c.)**

+15% maximum

Short Circuit Current1,5 mA, $\pm 0,5$ mA**Test Current on Load**

1 mA at min. pass values of insulation specified in BS 7671, HD 384 and IEC 364.

Accuracy (at 20 °C) $\pm 2\%$, ± 2 digits**CONTINUITY RANGES****Measuring Range:** 0,01 - 99,9 Ω **Open Circuit Voltage:** 5 V, ± 1 V**Short Circuit Current:** 205 mA, ± 5 mA**Accuracy (at 20 °C)**1 - 9,99 Ω : $\pm 2\%$, ± 2 digits; 10 - 99,9 Ω : $\pm 5\%$ **Zero Offset Adjust:** 0 - 9,99 Ω **Continuity Buzzer**Operates at less than 5 Ω **RESISTANCE RANGE**

(can be used for diode testing)

Measuring Range: 0,1 - 100 k Ω (0 - 10 M Ω on analogue scale)**Open Circuit Voltage:** 5 V, ± 1 V**Short Circuit Current:** 20 μ A, ± 5 μ A**Accuracy (at 20 °C):** $\pm 5\%$ ± 2 digits**VOLTAGE RANGE**

(not BM402 and BM404)

Measuring Range

(i) 0 - 600 V d.c.

(ii) 0 - 600 V a.c. (50/60 Hz)

(iii) 0 - 450 V a.c. (400 Hz)

Accuracy (at 20 °C)<450 V d.c. or a.c. (50/60 Hz): $\pm 1\%$, ± 2 digits>450 V d.c. or a.c. (50/60 Hz): $\pm 2\%$, ± 2 digits
a.c. at 400 Hz: $\pm 5\%$ ± 2 digits**TEMPERATURE COEFFICIENT**

<0,1% per °C on all ranges.

DEFAULT VOLTMETER

The default voltmeter operates when an external voltage >25 V a.c. or d.c. is detected on any range except OFF and \square . When this occurs, all instruments, except the BM402 and BM404, will revert to the voltage range display. Reverse polarity d.c. will cause '-dc' to appear on the voltage measuring instruments. The BM402 and BM404 will beep and flash 'V' on the display as a warning. If external volts are present, testing will be inhibited.

BATTERY CONDITION TEST

The battery condition test position measures the voltage on a simulated load. The result is displayed in volts, and as a bar graph indicating the remaining battery power. As the battery becomes exhausted the bar will reduce. If the batteries are low during a test, the symbol \square will appear. If an external voltage >1 V is present, the display will flash and the buzzer will sound.

AUTO SHUT-OFF

The auto shut off operates 5 minutes after the start of a test, on all ranges. To change the shut off time to 60 minutes, first perform a battery test (as above) then press the 'Test' button twice. If an insulation test, or 'Off' is selected, the shut off time will revert to 5 minutes. It is therefore not possible to generate dangerous voltages for more than 5 minutes, even with a locking test button.

GENERAL SPECIFICATION**Operating Range**

-20 - +40°C

Operating Humidity

90% R.H. at 40 °C max.

Storage Range

-25 - +65°C

FUSE**Type**

500 mA (F) 440 V, 32 x 6 mm Ceramic HBC 10 kA minimum.

The fuse, and spare fuse, are accessible by removing the battery compartment cover. Disconnect from external circuits before removing the cover. To check for a ruptured fuse switch to an insulation range and press the test button. Indication of a ruptured fuse is provided by the symbol \square .

SAFETY

The BM400 series is protected against connection to a 440 V Category III supply, or 600 V Category II. The BM400 series will, in general, meet the requirements of IEC 1010-1 (1990), BS 4743 (1979) and VDE 0411 (1973). The BM402 and BM404, which do not incorporate a voltage range should not be connected to live circuits intentionally.

INSTALLATION CATEGORIES

Category III: Fixed wiring and installations within a building.

Category II: After the socket outlet, i.e. appliances etc.

AUTOMATIC DISCHARGE

When the test button is released after an insulation test, a 250 k Ω resistor is automatically switched across the terminals to discharge the item under test. Any voltage present will be indicated on the display so that the discharge can be monitored (except on the BM402 and BM404, which will display 'V').

POWER SUPPLY**Battery Type**

6 x 1,5 V cells IEC LR6 type only.

Battery life

3000, 5 second operations, at 1 kV worst case.

The batteries should be removed if the instrument is not to be used for a long period of time. If the batteries leak, the instrument must be cleaned thoroughly.

BATTERY REPLACEMENT

For safety reasons, the battery compartment must not be opened if the test leads are connected. Undo the two screws in the battery compartment cover to access the batteries.

WEIGHT

625g

DIMENSIONS

220 x 92 x 55mm

This instrument is manufactured in the United Kingdom. The Company reserves the right to change the specification or design without prior notice. AVO and MEGGER are Registered Trade Marks of AVO MEGGER INSTRUMENTS LIMITED. This data uses the comma as the decimal marker to align with general European usage.

ORDERING INFORMATION**Item (Qty)**

Analogue/Digital Insultion and Contiuity Testers

Order CodeBM400, BM401, BM402
BM403, BM404

Zip-up carrying case part no.6420-090

Included Accessories

Test lead set part no.6220-437

Optional Accessories

Fixed prod part no.5210-350

Fused lead set,

FPK4 part no.6110-920

Test-&-carry case part no.6420-092

BM80/BM400 Service Manual

Written by H R Marsh
Date 29 June 1994
Issue 3

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