

MODEL 870
(SPEC. 76533B)
W/I/R AUTO TESTER
INSTRUCTION MANUAL

KIKUSUI ELECTRONICS CORPORATION

80.4.21 793068A

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1. OUTLINE

This W/I/R AUTO TESTER is an automatic measuring instrument incorporating in combination faculties of a withstanding voltage tester, an insulation resistance tester and a low resistance tester. The TESTER permits automatic inspections on all kinds of electronic devices, apparatuses and the like as regulated by JIS specifications on electrical appliances, while they are on their production lines.

By simply depressing test buttons provided in the TESTER, a device or apparatus to be tested can be automatically tested, while being connected to LINE, for withstanding voltage, insulation resistance and low resistance under and in a test voltage and a test time which have been set to the TESTER, electrical connection of the device or apparatus under test to LINE being automatically cut off. Upon termination of test, the tested device or apparatus will automatically regain its electrical connection to LINE. The TESTER has faculties of various sorts of individual tests and automatic judgments, automatically cuts off a device or apparatus under test electrically from LINE at the time of test, and is provided with a safety and alarm device for protecting operators from inadvertent injury.

2. SPECIFICATIONS

Power supply: 100 V, 50/60 Hz, 45 VA approx., 600 VA max.

Dimensions (Maximum dimensions):

495(500)W x 650(660)H x 440(500)D mm

Attached papers: Instruction Manual, Test data sheets

1. Withstanding Voltage Tester

Test voltage

Applied voltage: AC (50/60 Hz) applied through ZERO CROSS SWITCH.

0 - 2.5/5 kV (2 ranges. Continuously variable)

Output capacity: 500 VA (5 kV, 100 mA max.)

Voltage regulation: 3 % max. for 10 mA at 5 kV

Voltmeter (Interlocked with withstanding voltage range switching)

Scale: 2.5/5 kV. Equally graduated over the whole scale.

Class: Class 1

Indication: Graduated in AC r.m.s. value.

Accuracy: ± 5 % of full scale value.

Test time

Setting: MANUAL/TIMER (1), (2)

TIMER set time: TIMER (1) 0.5 - 10 sec
TIMER (2) 60 sec (fixed)

Leak current detection

Ranges: 1/2/5/10/100 mA (5 ranges)

Accuracy: $\pm 5\%$

Indications of test and judgment

TEST ON: By lamp

NG: By lamp and buzzer

Remote controls: Test, Reset and Operate switchings

2. Insulation Resistance Tester

Measured voltage and measurement range

DC 500 V: 0.05 - 250 M Ω ; 2.5 M Ω at the center of scale

DC 1000 V: 0.1 - 500 M Ω ; 5 M Ω at the center of scale

Measurement accuracy

*1st effective measurement range: $\pm 5\%$ of indicated value

*2nd effective measurement range: $\pm 10\%$ of indicated value

Mark * indicates conformity to JIS C-1302.

Accuracy of measured voltage: $\pm 5\%$, with terminals opened.

Voltage applied to a sample shall be 90 % or more of rated

voltage at the center value.

Measurement time setting: MANUAL/TIMER 0.5 - 10 sec

Conditions and set values for judgment of measured values

Free setting: 0.1 - 250 M Ω (500 V DC)

0.2 - 500 M Ω (1 kV DC)

Accuracy: ± 0.5 % of measurement accuracy

Judgment is made upon 0.1 sec elapse after application of test voltage.

Indications of measurement and judgment

TEST ON: By lamp

NG: By lamp and buzzer

Remote controls: Test, Reset and Operate switchings

3. Low Resistance Tester

DC constant current: 2.5/5/10 A (3 ranges)

Resistance measurement: 0.5/1 Ω (2 ranges)

Measurement error: ± 5 % max.

Reading ranges

Ammeter: 0 - 10 A F.S.

Ohmmeter: 0 - 0.5 Ω (graduated in 10 m)

0 - 1 Ω (graduated in 20 m)

Conditions of judgment

Free setting: 0.05/0.1 Ω , F.S. accuracy $\pm 5\%$

Indications of measurement and judgment

TEST ON: By lamp

NG: By lamp and buzzer

Measurement time setting: MANUAL/TIMER 0.5 - 10 sec

Remote controls: Test, Reset and Operate switchings

4. REMOTE CONTROL BOX

For performing remote controls. About 3 m lead wire attached.

TEST (Double operations)

RESET (H.V. OFF)

OPERATE ON/OFF

5. OUTPUT BOX

For applying LINE output and test voltage output.

About 3 m lead wire attached.

LINE VOLTAGE: 100/120/220/230 V

Indication lamp is attached for indicating
LINE connection.

Output terminals for withstanding voltage and
insulation resistance:

2 sorts of plug sockets

Terminals for LOW OHM TESTER output and detection:

4 binding-post terminals

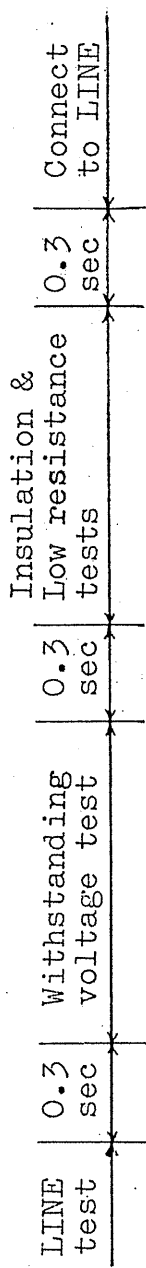
Test method

- (1) Individual tests (for withstanding voltage, insulation
and low resistance)

Each test can be made individually.

- (2) Automatic tests

By depressing TEST button, a sample to be tested,
while being connected to LINE, can be automatically
tested for withstanding voltage, insulation and
low resistance under and in a test voltage and a
test time which have previously been set, electrical
connection of the sample to LINE being automatically
cut off. Upon termination of test, the tested
sample will automatically regain its electrical
connection to LINE.



Mode of
Withstand voltage
& Insulation tests



Mode of
Low resistance
test



Start signal

TEST ON

Test time



-- CONSTRUCTION --

SPEC 76533B W/I/R AUTO TESTER contains the following three portions housed in a casing, each portion being formed into a unit, and is further provided with a remote control box and output boxes connected thereto.

1. SPEC 76537B LOW OHM TESTER

This supplies a constant current to a sample to measure its resistance value by means of a voltage drop caused across the sample through the 4 terminals. It has a function of setting a judgment level for judging measured values.

2. SPEC 76538B WITHSTANDING VOLTAGE/INSULATION TESTER

This incorporates a withstanding voltage/insulation test portion and a control portion for individual and automatic tests on withstanding voltage, insulation and low resistance. Test voltage and test time for withstanding voltage and insulation, and judgment levels for measured values of leak current and insulation resistance can be set by the knobs on the panel. Selection between individual tests and automatic tests, and controls of tests can be made.

3. SPEC 76539B OUTPUT CONTROL

This is an output control portion for switching

between output voltage of individual test/automatic test and line test voltage. A high voltage prevention circuit is provided for preventing high voltage due to the test from being applied to the line side.

4. SPEC 76540B REMOTE CONTROL BOX

TEST and RESET push buttons and OPERATE switch are provided for remote controlling ON/OFF in the respective tests.

5. SPEC 76541B OUTPUT BOX

This is an output terminal portion for the respective tests, and can set a line test voltage.

3. DESCRIPTION ON FRONT PANEL

3.1 Low Resistance Tester (SPEC 76537B)

POWER Power supply switch. Before closing this switch, SEE Paragraph 4.4 on operational procedure.

TEST CURRENT

Changeover knob for setting DC constant current supply used for measurement. (SEE Paragraph 4.6 on operational procedure.)

CURRENT ADJ

Semi-fixed resistor for adjusting constant current supplies of 2.5 A, 5 A and 10 A used for measurement.

RANGE

Changeover knob for switching between 0.5 Ω /1 Ω F.S. of the ohmmeter.

ALARM/MEASURE

Changeover switch for switching between setting of judgment level for measured resistance values and measurement.

ALARM: Judgment level for measured resistance

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values can be set by the semi-fixed resistor located on the upper part.

MEASURE: Resistance can be measured. Change over to MEASURE prior to measurement.

CURRENT CHECK

Terminal for calibrating measurement current. For calibration, remove the short bar, and connect a DC ammeter from outside with polarities in coincidence with respect to each other.

VOLTAGE CHECK

Terminal for calibrating the ohmmeter.

OUTPUT (+ GND)

Output terminal for measurement current. GND is in connection with the casing.

SAMPLING

Terminal for voltage sampling. In case there is an undesirable voltage drop due to the lead wire at the time of measuring a sample, remove the short bar, and connect SAMPLING terminal through another lead wire to the point where voltage is to be measured.

3.2 Withstanding Voltage/Insulation Tester (SPEC 76538B)

- POWER Power supply switch. Prior to closing this switch, SEE Paragraph 4.4 on operational procedure.
- TEST Push buttons for starting tests on withstanding voltage, insulation and low resistance.
- RESET (H.V. OFF) Push button for eliminating NG indication in each test. With this button depressed during test, test voltage/current is cut off.
- TEST VOLTAGE Knob for adjusting test voltage for withstanding voltage. With this knob turned clockwise from "0" position, test voltage increases up to 2.5 kV or 5 kV. For the safety purpose, take care that this knob should be returned to "0" position during the time when test is not made.
- RANGE (2.5 kV/5 kV) Changeover switch for switching between the variable ranges (2.5 kV/5 kV) of test voltage

for withstanding voltage. This switch is interlocked with the voltmeter and the neon lamp indicator. SEE Paragraph 4.6 on operational procedure.

LEAK CURRENT

Knob for setting operating current in the leak current detection circuit.

TIMER/MANUAL/60 sec

Changeover switch for switching the withstanding voltage test time between TIMER and MANUAL.

TIMER: Unless the leak current detection circuit operates, test voltage is generated for a period of time (0.5 - 10 sec) which has been set by TIMER.

MANUAL: Unless the leak current detection circuit operates, test voltage is generated.

60 sec: Internal fixed 1-minute timer.

RANGE (500 V/1 kV)

Changeover switch for setting insulation test voltage. This switch is interlocked with the insulation resistance tester and the neon lamp indicator. (SEE Paragraph 4.6 on operational procedure.)

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ALARM/MEASURE

Changeover switch for switching between setting of judgment level for measured insulation resistance values and measurement.

ALARM: Judgment level for measured resistance values can be set by the semi-fixed resistor located on the upper part.

MEASURE: Measurement of resistance can be made.

FUNCTION

Changeover switch for switching between automatic test and individual test. Switching to the respective modes is made by depressing RESET button.

AUTO

AUTO lamp A (green) is lit, and the output terminals are automatically connected to LINE, LINE ON lamp being lit. Thus, automatic tests on withstanding voltage, insulation and low resistance can be made.

MANUAL

Individual tests on withstanding voltage, insulation and low resistance can be made.

WITHSTANDING VOLTAGE

Withstanding voltage test (individual) can be made. Line connection is cut off.

Withstanding voltage test lamp W (red) is lit to indicate that test voltage is being applied.

INSULATION

Insulation test (individual) can be made. Line connection is cut off. Insulation test lamp I (blue) is lit to indicate that test voltage is being applied.

EARTH TESTER

Low resistance test (individual) can be made. Line connection is cut off. Low resistance test lamp R (blue) is lit to indicate that test voltage is being applied.

OUTPUT (H.V.)

Output H.V. terminals for withstanding voltage and insulation tests.

GND

This GND terminal is electrically connected to the panel face and the chassis. Ground it to the earth without fail, making reference to Paragraph 4.2 on operational procedure.

PANEL/REMOTE

Changeover switch for remote control.

PANEL: Manipulation of TEST and RESET buttons located on the panel is allowed.

REMOTE: Remote control can be made. Manipulation of TEST and RESET buttons located on the panel is impossible.

3.3 Output Control Portion (SPEC 76539B)

POWER Main power supply switch of this TESTER.
When OFF, all the power supplies are cut off.
Prior to closing this switch, SEE Paragraph 4.4 on operational procedure.

LINE VOLTAGE

Connector for connection of line test voltage.
Connection of a test voltage which has been set in OUTPUT BOX can be made.

LOW OHM TESTER OUTPUT

Connector for connection of low resistance test output to OUTPUT BOX.

H.V.

H.V. cable for connection of test voltages for withstanding voltage and insulation. This cable shall be connected to the output terminals for withstanding voltage and insulation tests.

LINE OUTPUT

Output connectors for line test voltage and withstanding voltage/insulation test voltage. These connectors shall be connected to OUTPUT BOX.

GND

This can be electrically connected to the front panel and the chassis by connecting this GND to GND terminal of the withstanding voltage/insulation tester through the short bar. (Sure connection through the short bar shall be made.)

OPERATING INDICATOR

Red neon lamp which indicates that there is some trouble in the H.V. output changeover relay and that the high voltage prevention circuit is in operation for preventing H.V. caused by test from being applied to the line side. Lighting of this lamp indicates that power supply to the low resistance tester and the withstanding voltage/insulation tester is cut off by some trouble. Detect and remedy the trouble.

For supplying power again, turn the power supply switch to OFF and then to ON again.

3.4 Remote Control Box (SPEC 76540B)

TEST Push buttons for starting tests for withstanding voltage, insulation and low resistance. For starting test, depress the right- and left-hand buttons at the same time.

TEST ON Red lamp which indicates that test is going on.

RESET (H.V. OFF)

Push button for eliminating NG indication during test. With this button depressed during test, test voltage/current is cut off.

OPERATE ON/OFF

ON/OFF switch for stopping operation in an emergency or for temporally stopping operation. With this switch being ON, the green lamp is lit, and TEST and RESET operations can be made.

3.5 Output Box (SPEC 76541B)

LINE VOLTAGE

Knob for setting line test voltage.
(100/110/220/240 V)

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LINE ON Red neon lamp which indicates that line test voltage is applied to the output terminals and line test can be made. At the time of withstanding voltage/insulation and low resistance tests, this lamp will be extinguished, and the line voltage is cut off from the output terminals (AC plug socket).

LOW OHM TESTER

Output terminals for low resistance test. When using these terminals, remove the short bar from the sampling terminals on the main body side.

OUTPUT (Plug socket)

Plug socket for connection to the H.V. side of a sample to be tested. Line voltage and test voltage for withstanding voltage/insulation are applied to this socket. Take good care because high voltage is applied to this socket.

GND

Terminal for grounding the GND side of a sample to be tested. This terminal is in connection with the front panel and the casing.

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4. CAUTIONS ON HANDLING

This TESTER generates voltage as high as 5 kV, which may cause a vital accident if handling is incorrect.

In handling, take sufficient care making reference to the following Paragraphs to avoid accidents.

4.1 Grounding of This TESTER

Ground without fail GND terminal located on the panel to a grounding point of the earth. Incomplete grounding may give an electrical shock to a person who touches the panel or casing of the TESTER or a sample under test.

4.2 Connection of GND

Surely connect GND terminal of the withstanding voltage/ insulation test portion (SPEC 76538B) and GND terminal of the output control portion (SPEC 76539B) located in the lower part with respect to each other by the use of the short bar. Also, make sure connection of the short bar located in the interior of the rear face.

4.3 Connection of Connectors

Turn all the power supply switches to OFF during the time of making connections of the connectors and short bars located on the front panel and the rear face.

4.4 ON/OFF Operations of Power Supply Switches

Turning of the power supply switches to ON shall be performed according to the following order of steps. Turning to OFF shall be performed in the inverted order.

- (1) Output control portion (SPEC 76539B)

POWER ON

- (2) Withstanding voltage/insulation test portion
(SPEC 76538B)

POWER ON

- (3) Low resistance test portion (SPEC 76537B)

POWER ON

Do not turn POWER switches to OFF during the time of application of test voltage.

Depress RESET (H.V. OFF) button prior to POWER OFF operation.

4.5 Interruption of Test (TEST OFF)

Unless test is in continuation, return TEST VOLTAGE knob back to "0" position, and turn POWER switch to OFF.

4.6 Operation of Knobs and Switches

Changeover operation of the following knobs and switches shall be performed after depressing RESET button, i.e., under TEST OFF state.

TEST CURRENT knob

RANGE (2.5/5 kV) switch

RANGE (500 V/1 kV) switch

FUNCTION knob

4.7 Connection of Output Terminals

Prior to making connection of the output terminals, make sure of OFF state of output voltage/current (TEST ON lamp is extinguished, and indications of the voltmeter and ammeter are zero). The connection shall be made beginning from GND side to a sample to be tested. Disconnection of GND is dangerous because the whole of the sample will be charged with high voltage.

Take good care at the time of making connection on H.V. side because line test voltage is applied to the output terminals (OUTPUT BOX AC plug socket) in case of automatic test.

4.8 Continuation of Test

Long duration of TEST ON state should be avoided in any test.

5. METHOD OF APPLICATION

Preparation

Interconnect the three portions of this TIMER, i.e., the low resistance test portion, the withstanding voltage/insulation test portion and the output control portion, with respect to one another.

On the panel face, make connection of GND short bar, and connect H.V. lead (red) of the putput control portion to the output terminals for withstanding voltage/insulation test.

On the rear face, make connection of connectors CH1 - CH3 and connection of the short bar.

Then, connect LOW OHM TESTER OUTPUT connectors located on the panel of the output control portion (and LINE OUT connectors) to OUTPUT BOX. In case of operating REMOTE CONTROL BOX, this BOX shall be connected through REMOTE connectors located on the panel.

Connect the power supply plugs of the low resistance tester and the withstanding voltage/insulation tester to the AC plug sockets located on the rear face of the output control portion.

5.1 Low Resistance Test

Upon supplying source power, POWER lamp will be lit. Operation of the power supply shall be performed in accordance with Paragraph 4.4 on operational procedure.

Setting of Measurement Current

Set measurement current by means of TEST CURRENT knob.

Selection of Resistance Range

Select a measurement value of $0.5\Omega/1\Omega$ F.S. by means of RANGE switch.

Setting of Judgment Level

Set ALARM/MEASURE switch to ALARM, and set a judgment level for measured values by means of the semi-fixed resistor while observing the ohmmeter. Thereafter, set the switch to MEASURE.

Connection of Sample

In case of using the measurement terminals on the main body side, the short bar for SAMPLING shall be connected (shall be disconnected on OUTPUT BOX side).

If there is an unnegligible voltage drop due to the lead wire connecting a sample, remove the short bar.

Measurement should be made under the state of the

4-terminal connection.

In case of using the terminals on OUTPUT BOX side, remove the short bar for SAMPLING on the main body side.

Test

With TEST button depressed, measurement current is applied to the sample, the blue R lamp being lit to indicate TEST ON. The ammeter indicates the set current value, and the ohmmeter indicates a measured resistance value.

Reapplication of Test Current

When a measured value exceeds the judgment level set value, the measurement current will be cut off, NG lamp and buzzer indicating NG judgment. Resetting of TEST OFF and NG can be made by means of RESET (H.V. OFF) button. Thereafter, the test current can be reapplied by depressing TEST button.

Depression of TEST button with the output terminals being open, however, causes NG operation.

5.2 Withstanding Voltage Test

Upon application of source power, POWER lamp will be lit. Turn the power supply switch of the output control portion to ON, and then turn the power supply

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switch of the withstanding voltage/insulation test portion to ON, in accordance with the operational procedure.

Set FUNCTION knob to WITHSTANDING VOLTAGE. By this, the line test voltage is cut off from the output terminals (AC plug socket).

Selection of Test Voltage

Select a test voltage of 2.5 kV/5 kV by means of RANGE switch.

Setting of LEAK CURRENT

Set an operating current value in the leak current detection circuit.

Connection of Sample

Make sure that the output voltage is OFF (TEST ON lamp being extinguished) and that the line voltage is cut off (LINE ON lamp being extinguished). Connect a sample to be tested beginning from GND side. On H.V. side, the AC plug of the sample shall be connected to OUTPUT BOX AC plug socket.

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Test

(1) When by MANUAL

Set TIMER/MANUAL changeover switch to MANUAL.

With TEST button depressed, the red W lamp is lit to indicate that application of test voltage is now possible. With TEST VOLTAGE knob turned rightward, the test voltage is applied to the sample.

(2) When by TIMER/60 sec

In the state as set in (1), set the test voltage while observing the voltmeter located on the panel. Then, switch the changeover switch to TIMER (0.5 - 10 sec)/60 sec. Upon this, the timer begins running, and the test voltage is applied to the sample for a period of time which has been set.

Reapplication of Test Voltage

During test, when a larger leak current than the set value flows, NG indication will be given by NG lamp and buzzer, and the applied voltage will be cut off.

- (1) In this case, depress RESET (H.V. OFF) button to reset the detection circuit, and then depress TEST button. By this, the test voltage is reapplied.
- (2) In case the applied voltage is cut off due to termination of running of the timer, depress

RESET (H.V. OFF) button, and then repress TEST button. By this, the test voltage is reapplied.

(3) During test, depression of RESET (H.V. OFF) button will cut off the test voltage. By depressing TEST button, the test voltage can be reapplied.

5.3 Insulation Resistance Test

Upon application of source power, POWER lamp will be lit. Turn the power supply switch on, in accordance with the operational procedure.

Set FUNCTION knob to INSULATION. By this, line test voltage is cut off from the output terminals (AC plug socket).

Selection of Test Voltage

Select a test voltage of 500 V/1 kV by means of RANGE switch.

Setting of Judgment Level

Set ALARM/MEASURE switch to ALARM, and set a judgement level by means of the semi-fixed resistor while observing the insulation resistance tester. Thereafter, set the switch to MEASURE.

Connection of Sample

Make sure that the output voltage is OFF (TEST ON lamp being extinguished) and that the line voltage is cut off (LINE ON lamp being extinguished). Connect a sample to be tested, beginning from GND side. On H.V. side, AC plug of the sample shall be connected to OUTPUT BOX AC plug socket.

Test

With TEST button depressed, the test voltage is applied to the sample, the blue I lamp being lit to indicate TEST ON. The insulation resistance tester will indicate a measured resistance value.

Reapplication of Test Voltage

When a measured value is smaller than the judgment level set value, NG judgment will be indicated by NG lamp and buzzer, and the test voltage will be cut off. Resetting of TEST OFF and NG can be made by means of RESET (H.V. OFF) button. Thereafter, the test voltage can be reapplied by depressing TEST button.

5.4 Automatic Test

Application of source power shall be made in accordance with the operational procedure.

Setting of Test Voltage/Current, Test Time and Judgment Level

Set a test voltage/current, a test time, a judgment level and a line test voltage for each of tests of withstanding voltage, insulation and low resistance in accordance with the operational procedure as specified for each of the tests. Test time for insulation and low resistance tests shall be set by means of the righthand timer on the panel.

Then, set FUNCTION knob to AUTO. The green A lamp will be lit to indicate that automatic test is now possible. By this, the line test voltage is applied to the output terminals (OUTPUT BOX AC plug socket), LINE ON lamp being lit.

Connection of Sample

Make sure that the output voltage/current is OFF.

Connect a sample to be tested to OUTPUT BOX AC plug socket. By this, the line test voltage is applied to the sample for line test.

Make reference to Paragraph 4.7 on operational procedure.

Test

After termination of line test, with the state maintained as it is, depress TEST button. By this, the line test

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voltage is cut off from OUTPUT terminals (LINE ON lamp being extinguished), and withstanding voltage test (indicated by W lamp) and insulation and low resistance tests (simultaneously indicated by I and R lamps) are made under and in the set test voltage/current and test time. Upon termination of the tests, connection of the line test voltage will be made again.

Since the insulation and low resistance tests are made at the same time, if the low resistance test is not required, turn the power supply switch of the low resistance tester to OFF.

Reapplication of Test Voltage/Current

During test, if there occurs a leak current which exceeds the set value and a measured value which exceeds the judgment level, NG indication will be given by NG lamp and buzzer, and the test voltage/current will be cut off.

- (1) In this case, depress RESET (H.V. OFF) button to reset the detection circuit. By this, connection circuit for the line voltage is formed again. Thereafter, the line voltage can be reapplied by depressing TEST button.
- (2) After termination of test, the test voltage can be reapplied by depressing TEST button.

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- (3) When RESET (H.V. OFF) button is depressed during test, the test voltage/current is cut off and the line connection is regained at this point of time. Thereafter, the test voltage/current can be reapplied by depressing TEST button.

5.5 Remote Control

Set PANEL/REMOTE changeover switch of the main body to REMOTE. By this, the remote control box becomes possible of the same functions as those performed by TEST and RESET (H.V. OFF) buttons located on the main body.

During the remote control operation, TEST and RESET buttons located on the main body will be disconnected for the sake of avoiding misoperation and danger, and cannot be operated.

5.6 Output Box

Line test voltage can be set by means of LINE VOLTAGE knob.

5.7 Additional Notes on Operation

- (1) When all the power supply switches on the main body are set at OFF while OUTPUT BOX is in connected state,

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a set LINE voltage is applied to AC plug socket of OUTPUT BOX output terminals, LINE ON lamp being lit. Accordingly, line test can be made in this state.

- (2) At the time of application of supply power, SPEC 76538B (withstanding voltage/insulation control portion) cannot take its reset state until about 2 sec. period elapses after the power has been applied, and accordingly control cannot be performed in this period.

- (3) Changeover of FUNCTION Switch

During test, even if changeover of FUNCTION switch is made, the test will continue until the timer terminates its running or RESET button is depressed. By depressing RESET button and then releasing it, FUNCTION changeover mode can be obtained.

- (4) Insulation Resistance Test

Judgment on a measured value is made when about 0.1 sec. has elapsed after application of test voltage. Accordingly, in case of I/R measurement by automatic measurement, it will be LOW OHM TESTER that gives NG judgment earlier than the other.

6. CALIBRATION

6.1 Low Resistance Tester

Calibration of Measurement Current

Remove the short bar from CURRENT CHECK terminals, and connect a DC ammeter from outside. Then, make calibration by means of CURRENT AJD located on the panel.

Calibration of Ohmmeter

Detect a voltage drop caused across a sample through SAMPLING terminals, leaving the ohmmeter to deflect. Remove the short bar from SAMPLING terminals. Apply, from outside, DC voltages as shown below to check errors in the ohmmeter.

TEST CURRENT	RANGE	
	0.5 Ω	1 Ω
2.5 A	1.25 V	2.5 V
5 A	2.5 V	5.0 V
10 A	5.0 V	10 V

6.2 Withstanding Voltage Tester

Calibration of Test Voltage

Connect to the output terminals a voltmeter or an electrostatic voltmeter having an input impedance of 1000 M or more and a precision of 1 % or better. Make calibration of the voltmeter located on the panel with respect to F.S. by means of METER ADJ 2.5 kV/5 kV of the semi-fixed resistor located on the rear base plate.

Calibration of Leak Current Detection

Connect to the output terminals a load and an ammeter in series, and supply a current of 100 mA. Make adjustment by means of GAIN ADJ semi-fixed resistor located on the rear base plate so that NG operation may be effected with LEAK CURRENT set at 100 mA. Make further adjustments in turn by means of the semi-fixed resistor located on the base plate so that NG operation may be effected with other set values of LEAK CURRENT.

6.3 Insulation Resistance Tester

Calibration of Test Voltage

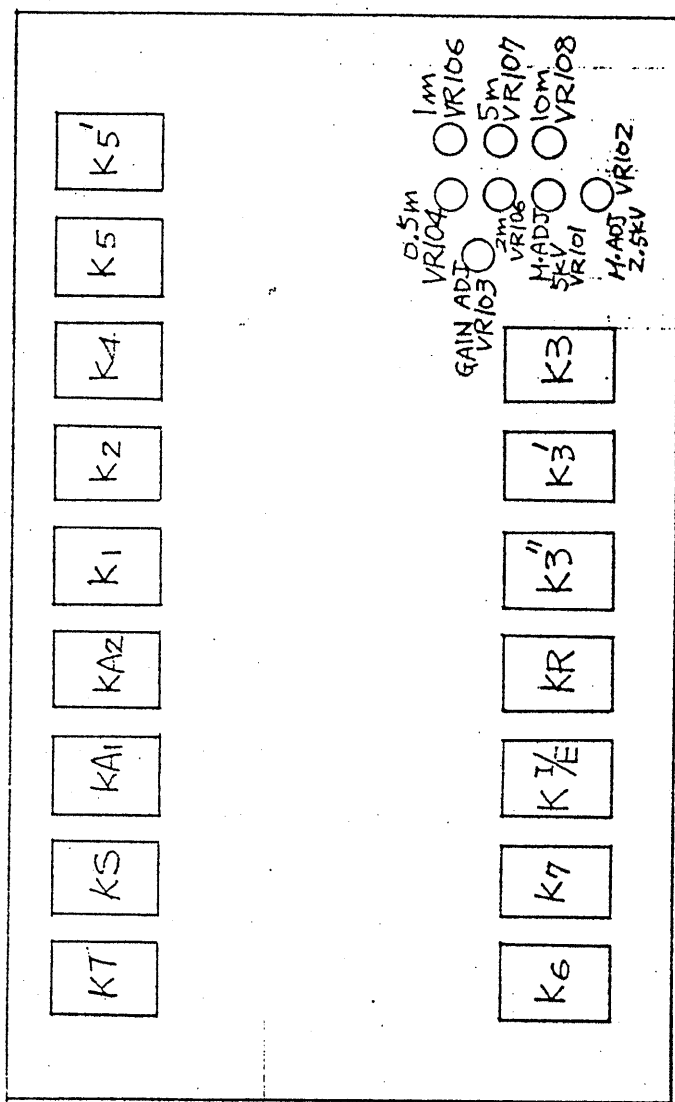
Connect to the output terminals a voltmeter or an

electrostatic voltmeter having an input impedance of 1000 M or more. Make adjustment by means of 500 V ADJ and 1 kV ADJ semi-fixed resistors located on the right-hand side in the interior.

Zero Adjustment of Ohmmeter

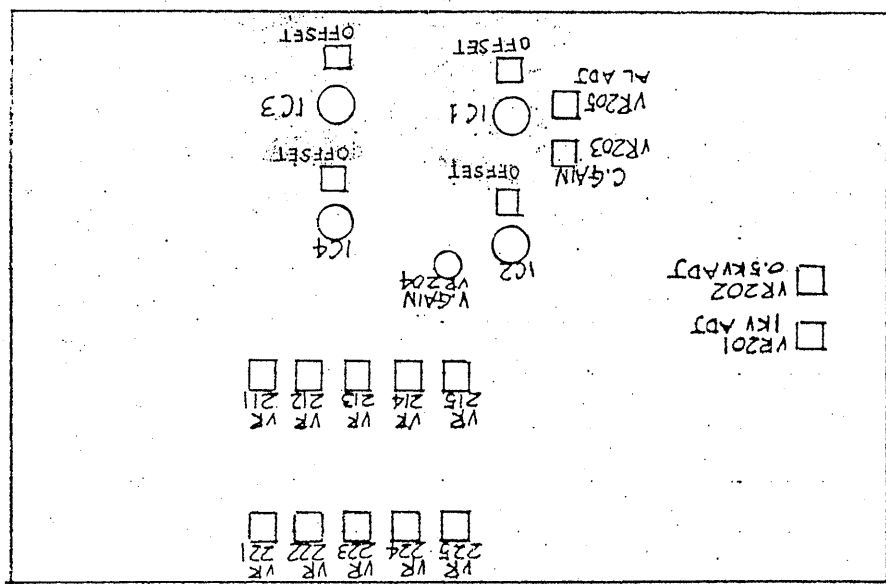
Set ALARM to zero ohm or less, and then change over to MEASURE. Set the ohmmeter to "0" position by means of ZERO ADJ semi-fixed resistor located on the panel, with output being shorted.

Mechanical zero adjustment of the ohmmeter should have been made at the time of POWER OFF.

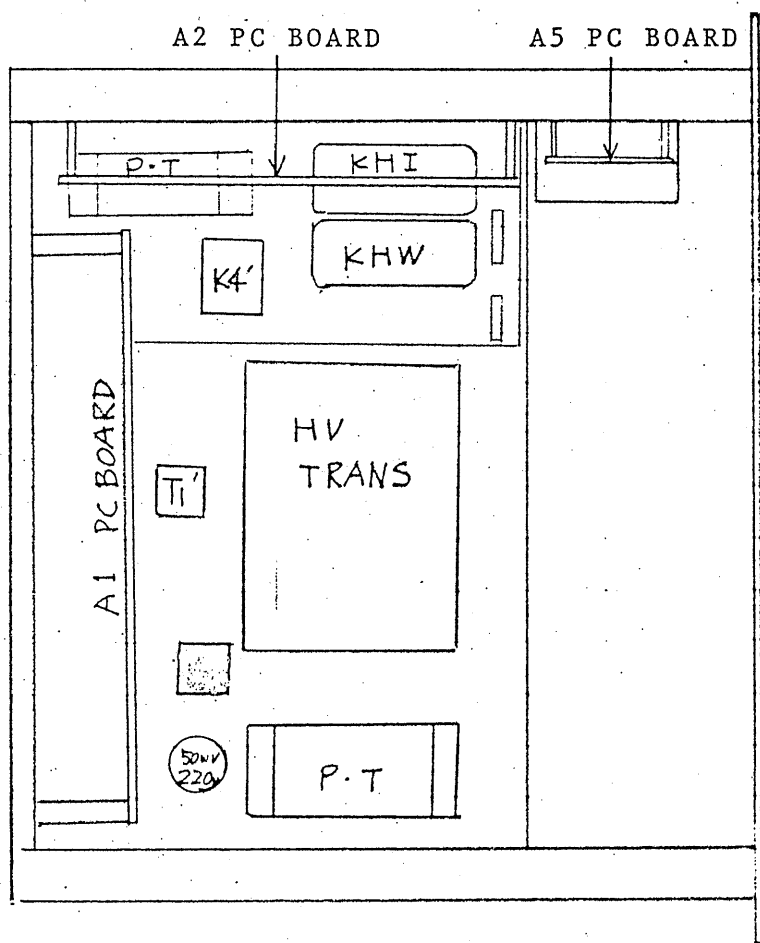


A1 PC BOARD

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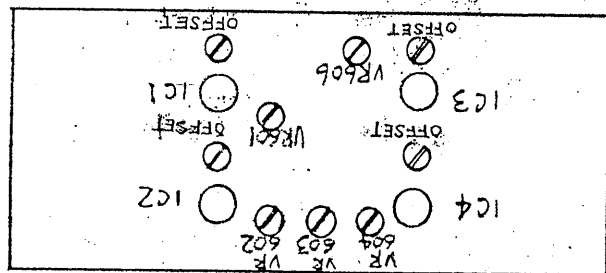


A2 PC BOARD

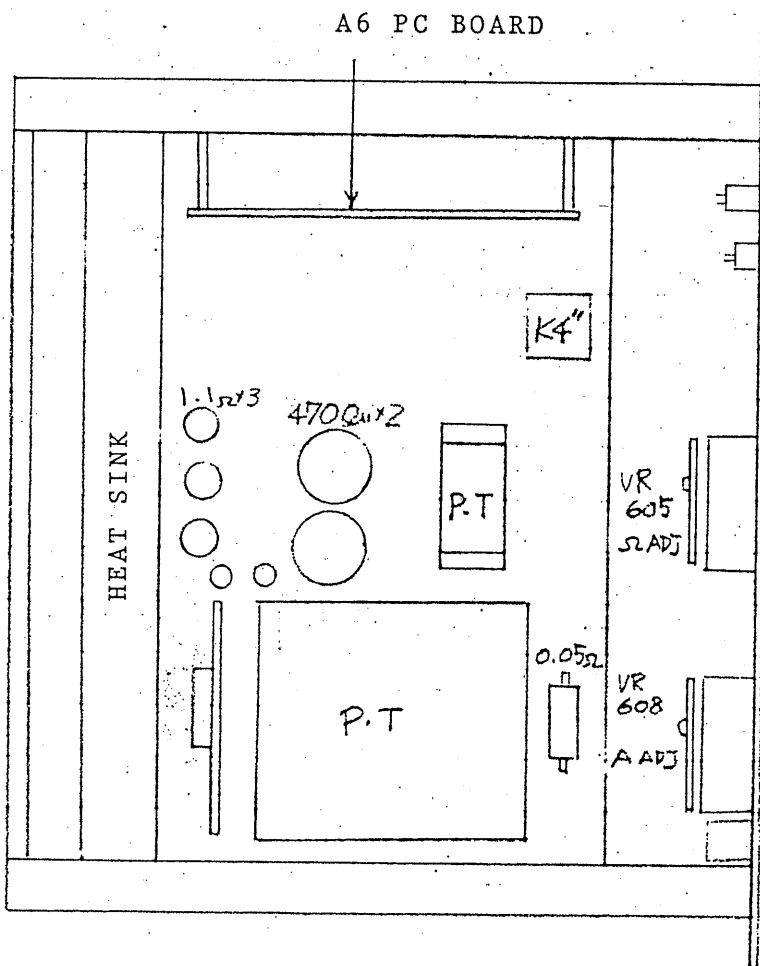


SPEC 76538B COMPONENT LOCATION

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A6 PC BOARD



SPEC 76537B COMPONENT LOCATION

SPEC 76539B COMPONENT LOCATION

