OPERATION MANUAL

WITHSTANDING VOLTAGE TESTER

MODEL 875AZ

KIKUSUI ELECTRONICS CORPORATION

Power Requirements of this Product

Power requirements of this product have been changed and the relevant sections of the Operation Manual should be revised accordingly.
(Revision should be applied to items indicated by a check mark ☑.)

☐ Input voltage

The input voltage of this product is _____ VAC,
and the voltage range is _____ to _____ VAC. Use the product within this range only.

☐ Input fuse

The rating of this product's input fuse is _____A, _____VAC, and _____.

WARNING

- To avoid electrical shock, always disconnect the AC power cable or turn off the switch on the switchboard before attempting to check or replace the fuse.
- Use a fuse element having a shape, rating, and characteristics suitable for this product. The use of a fuse with a different rating or one that short circuits the fuse holder may result in fire, electric shock, or irreparable damage.

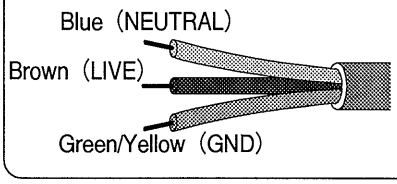
☐ AC power cable

The product is porvided with AC power cables described below. If the cable has no power plug, attach a power plug or crimp-style terminals to the cable in accordance with the wire colors specified in the drawing.

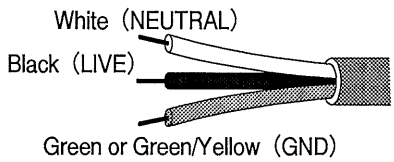
WARNING

- The attachment of a power plug or crimp-style terminals must be carried out by qualified personnel.

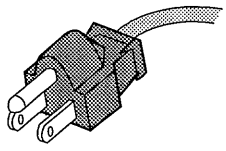
☐ Without a power plug



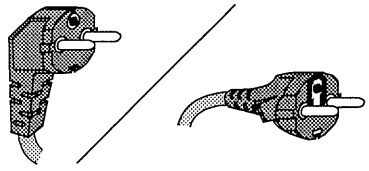
☐ Without a power plug



☐ Plugs for USA



☐ Plugs for Europe



☐ Provided by Kikusui agents

Kikusui agents can provide you with suitable AC power cable.
For further information, contact your Kikusui agent.

☐ Another Cable _____

 Kikusui Part No. Z9-000-027 IB001681

KIKUSUI

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1. GENERAL

This instrument is an AC/DC withstanding voltage tester with maximum output voltage 5 kV and output rating 500 VA (for DC only, 5 kV and 25 mA). The instrument can be used for withstanding voltage test (dielectric strength test) of electronic equipment and components complying with the requirements of JIS (Japanese Industrial Standards) and the Electric Appliance Control Ordinance. The instrument has a GO-NOGO judgement function, a remote control function and other auxiliary functions, which facilitate efficient withstanding voltage test, realizing labor economization.

The instrument, which deals with a high voltage, has been designed with full attention to the safety of the operator.

2. SPECIFICATIONS

Power requirements: 100 V ±10%, 50/60 Hz AC

Power consumption

No load (reset state): Approx. 3 VA

Full load (5 kV, 100 mA): Approx. 600 VA

Insulation resistance: 30 MΩ or over (500 V DC)

Withstanding voltage: 1000 V AC, 1 minute

Dimensions: 548 W × 290 H × 350 D mm
(21.6 W × 11.4 H × 13.8 D in.)

(Maximum dimensions): (550 W × 310 H × 415 D mm)
(21.7 W × 12.2 H × 16.4 D in.)

Weight: Approx. 33 kg (73 lb.)

Accessories: High voltage test leads (HTL-1.5W, approx. 1.5 m (4.9 ft.)) ..... 1 set
Operation manual ..... 1 copy

Test voltage: AC and DC .... 0 - 1.5 kV/0 - 5 kV (2 ranges)

AC Output: 5 kV, 100 mA 500 VA (continuous operation up to 30 minutes), (at line voltage 100 V)

Waveform: Commercial line power waveform

Voltage regulation: 20% or less at 5 kV (at line voltage 100 V, maximum rated load → no load)

Zero-turn-on switch used

DC Output: 5 kV, 25 mA

Ripple: Not greater than 25 Vp-p, at 5 kV output, no load

Voltage regulation: 25% or less at 5 kV output (at line voltage 100 V, maximum rated load → no load)

AC/DC switching: Done inside of instrument.

Output voltmeter

Meter:	JIS Class 1.5
Scales:	1.5 kV/5 kV FS (2 ranges), even scale, used in common for AC/DC
Accuracy:	±3% FS
Type of indication:	Average-value response, rms-value graduation

Output cutoff by leak current detection

Ranges:	0.5/1/2/5/10/100 mA (6 ranges)
Multiplier:	Current set by range selector can be varied up to 2.5 times (at 0.5 - 1 mA ranges)
Setting accuracy:	±5% (at CAL'D position of multiplier)
Detecting method:	Current is integrated, compared with reference value, and calibrated with rms value of sinusoidal wave.

Test method and test time

Manual and with timer

Timer set time 2 - 60 sec

Judgement of test result

If no abnormal state is detected during the period set by the timer, GOOD signal is generated.

GOOD signal: o Lamp

o Make contact signal 100 V AC, 1 A
30 V DC, 1 A

If a leak current larger than the set value is detected, the output is instantaneously cut off and NG alarm is generated.

NG alarm: o Lamp

o Buzzer

o Make contact signal 100 V AC, 1 A
30 V DC, 1 A

Leak current monitor terminals:

Used to monitor the current flowing in the tested object, using an appropriate milliammeter.

Remote control

The test and reset operations can be remote controlled in the following cases:

- o When the remote control box (option) is used.
- o When the high voltage test probe (option) is used.
- o When controlled with the make contact signal of an external relay, etc.
- o When low active control is done with logical elements, etc. The input conditions of this instrument are as follows:

  High level input voltage: 11 - 15 V
  Low level input voltage: 0 - 5 V
  Low level sweep out current: 1 mA

  Note: As the internal gate is subjected to level-up with a resistor, it becomes the high level input state when the input terminal is made open.

Ambient temperature and humidity

Specification range: 5 to 35°C (41 to 95°F), 20 to 80% RH

Operable range: 0 to 40°C (32 to 104°F), 20 to 80% RH

Options:

- Model 913 Remote Control Box

  Used being connected to the instrument rear connector, for remote control of test and reset operations.

- Model 914 Remote Control Box

  The test is turned on only when test buttons are pressed with both hands. Used when extra high operation safety is required.

- HTL-3W High Voltage Test Lead

  Test lead wire, approx. 3 m (9.8 ft) long

- HTP-1.5 High Voltage Test Probe

  High voltage test probe designed for high operating safety and operability. Cable length approx. 1.5 m (4.9 ft).

3. PRECAUTIONS BEFORE USE

3.1 Unpacking and Inspection

The instrument is shipped after being fully adjusted and inspected at the factory. Upon receiving the instrument, immediately unpack it and check for any sign of damage caused while in transportation. If any damage is found, immediately notify the bearer or, if malfunctioning is found, notify the dealer.

3.2 Precautions for Operation

Model 875AZ Withstanding Voltage Tester has been designed with full attention to safety because this instrument handles a high voltage. Yet, as the instrument provides as high voltage as 5 kV to the external circuit, serious hazards are unavoidable unless the instrument is handled correctly. Be sure to observe the following when operating the instrument.

(1) Be sure to connect securely the GND terminal to a good grounding earth line. If grounding is imperfect, the instrument casing can be charged to the high voltage of the instrument when the output is shorted to the ground line or power line and hazards can be caused to the operator when he touches the instrument.

(2) The connection method of the test leadwire of the GND side is shown in Figure 3.1. Be sure to check for that this leadwire is not open, each time the instrument is used. Also be sure to connect the GND terminal to the ground line of the measured object. If it is not securely connected, the measured object becomes a floated state and a dangerously high voltage may be built up in the measured object.

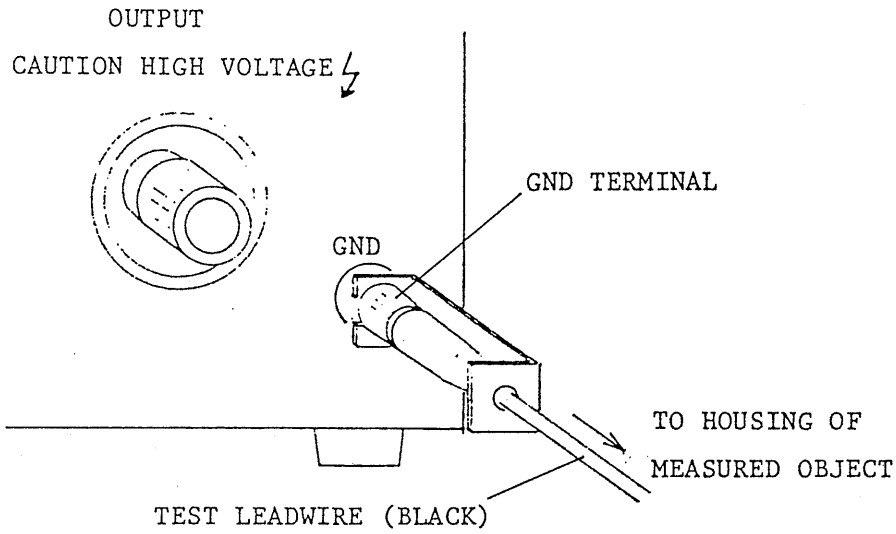


Figure 3.1

(3) Be sure to wear gloves whenever operating this instrument, in order to guard against electric shock hazards.

(4) Before turning-on the power switch, make sure that the TEST VOLTAGE dial is in the extremely counterclockwise position ("0" position).

(5) Except when test is being done, turn the TEST VOLTAGE dial to the extremely counterclockwise position ("0" position). Also, press the RESET (HV OFF) button for the sake of safety. Be sure to turn-off the power switch each time the instrument is not used even for a short period of time or when the operator leaves the instrument.

(6) Before changing the voltage RANGE switch, make sure that the instrument is in the reset state and the TEST VOLTAGE dial is turned to the extremely counterclockwise position ("0" position). Before changing the AC/DC selector switch, make sure that the power switch is off and the output voltmeter reads zero.

(7) Never touch the tested object, leadwires or the output terminals when in the TEST ON state and the test voltage is delivered.

(8) Before touching the test leadwires or output terminal, be sure to check the following:

(a) The output voltmeter indication is zero.

(b) The TEST ON lamp has gone off.

Also short the high voltage OUTPUT terminal to the GND terminal with the test leadwire of the GND terminal.

Note that, after the DC voltage test is done, a substantial time is required before the electric charges stored in the filter capacitors and tested object are discharged.

(9) Do not short the output to the ground line or AC power line, lest the instrument housing should be charged up to a hazardously high voltage. It is permissible, however, to short the high voltage OUTPUT terminal to the GND terminal when the instrument housing is grounded to an earth line.

(10) In case of an emergency, immediately turn-off the POWER switch and disconnect the AC power cord from the AC line receptacle.

(11) When the TEST ON lamp has failed and does not turn on, immediately replace it or contact Kikusui's agent in your area.

(12) When the instrument is remote controlled, the high voltage output is turned on and off with an external signal. When operated in this mode, be extremely careful so that the high voltage output is not turned on inadvertently.

To operate the instrument in good conditions for a long time, pay attention to the following:

(1) When in the no-load state, the maximum output voltage of the instrument becomes higher than 5 kV. An output voltage higher than 5 kV may be produced also when the AC line voltage has surged up. Operate the instrument with an output voltage not higher than 5 kV, whenever possible.

(2) The heat dissipation capacity of the transformer of this instrument is for one-half of the rated output, from the viewpoints of size, weight and cost. Therefore, continuous operation when set at the 100-mA leak current range must not exceed 30 minutes (at ambient temperature 40°C (104°F)). If more test time is required, pause the instrument for the same period that it has been used and, then, resume operation. This requirement does not apply when the leak current range is 10 mA or smaller.

(3) This instrument operates normally with an AC power line voltage range of 100 V ±10%. If the AC line voltage is not within this range, the instrument operation becomes unstable and damage may be caused to the instrument. When the AC line voltage is not within this range, step it up or down into this range using an appropriate device.

(4) Do not use or store the instrument in direct sunlight, in high temperature or humidity, or in dusty atmosphere.

This instrument employs a high voltage output transformer of 500 VA. Therefore, a large input power current (several tens amperes) may flow for several tens milliseconds before the NG signal is detected and the output current is cut off

when an overcurrent has flowed in the load being tested. Pay attention to the AC line capacity and to that this large transiential current might affect other instruments connected on the same AC power line.

4. OPERATION INSTRUCTIONS

4.1 Description of Front Panel

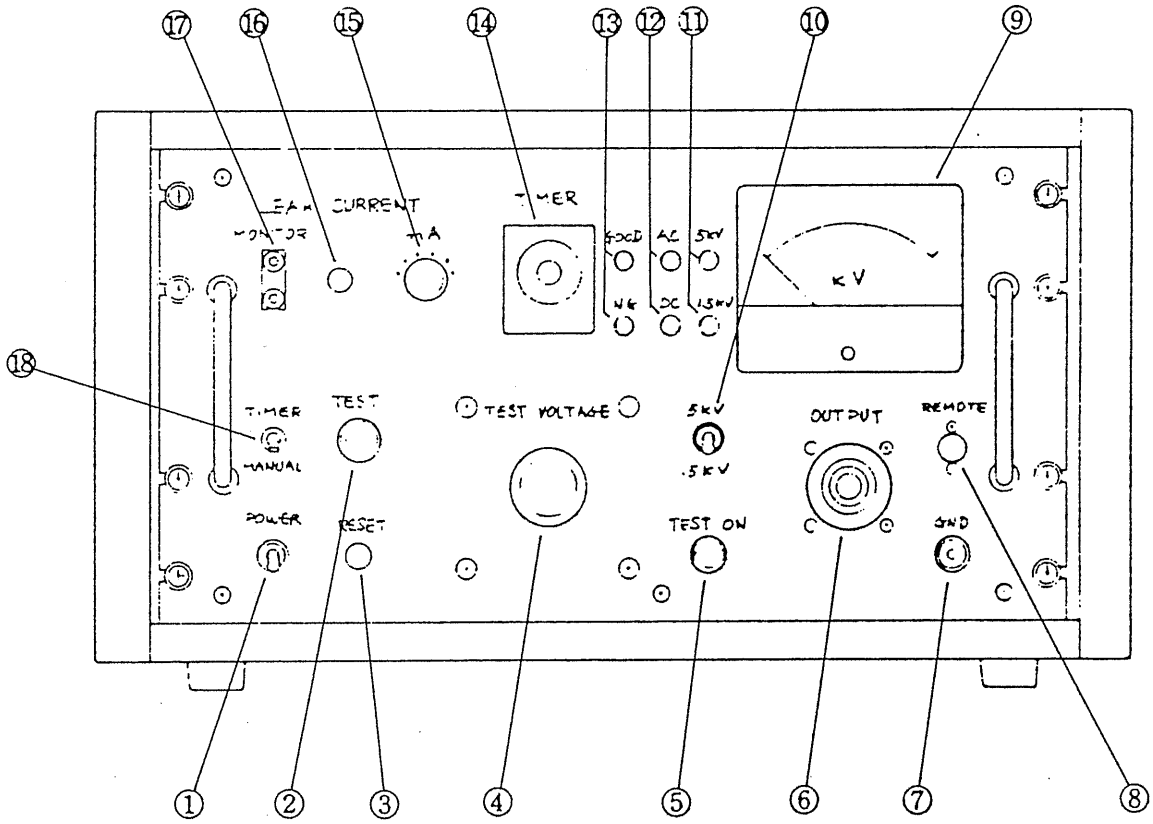


Figure 4.1

(1) POWER (ON/OFF) switch:

Main power switch of instrument. Before turning-ON this switch, be sure to read Section 3.2 "Precautions for Operation."

② TEST button:

As you press this button when the instrument is in the reset state, ⑤ TEST ON lamp lights and the voltage set by ④ TEST VOLTAGE dial is delivered to ⑥ OUTPUT terminal.

③ RESET button (HV OFF):

To be pressed to reset the output voltage when test is over, or to reset the NG alarm or the GOOD signal.

④ TEST VOLTAGE dial:

For setting the test voltage. The "0" position is for the minimum output and the output increases as this dial is turned clockwise.

⑤ TEST ON lamp:

This red lamp indicates that the test voltage is being delivered to the OUTPUT terminal or the test voltage is being applied.

⑥ OUTPUT terminal:

The hot line of the test voltage.

⑦ GND terminal:

The ground line of the test voltage. Electrically connected to the instrument chassis.

⑧ REMOTE CONTROL connector:

When the instrument is remote controlled, the cable of the remote control box is connected to this connector.

⑨ Indicating meter (output voltmeter):

Indicates the output voltage of the instrument.

⑩ RANGE switch:

Selects the test voltage range (5 kV range or 1.5 kV range).

⑪ 5kV/1.5kV lamp

Indicates the range selected by the above switch.

⑫ AC/DC lamps:

Indicates whether the test voltage is AC or DC. Switching is done inside of the instrument.

⑬ GOOD/NG lamps:

If the current exceeds the value set by ⑮ LEAK CURRENT knob and ⑯ MULTIPLIER knob, NG alarm signal is generated and NG lamp turns on. If the current does not exceed the set value during the test, GOOD lamp turns on.

⑭ TIMER:

Sets the test time, with the center knob.

⑮ LEAK CURRENT dial:

Sets the reference value for leak current detection. The value can be set at 0.5, 1, 2, 5, 10 or 100 mA. If a leak current larger than the set value flows in the tested object, judgement is done to be NG and the output is instantaneously cut off. The dial should be set at a value corresponding to the requirement of the tested object.

⑯ MULTIPLIER knob:

The current value set by the above dial can be continuously varied by up to approximately 2.5 times with this knob. The CAL'D position is calibrated to the value set by the above dial. The scale of this knob is not calibrated.

⑰ CURRENT MONITOR terminals:

The leak current can be directly monitored by disconnecting the shorting bar from these terminals and connecting a milliammeter between them. The milliammeter should be capable of measuring the current set by ⑭ LEAK CURRENT dial. The upper terminal is connected to the instrument chassis. Be sure to connect the shorting bar when the current is not measured.

⑱ TIMER/MANUAL switch:

Selects the test mode (TIMER or MANUAL). When thrown to the TIMER position, the test is performed for the period set by ⑭ TIMER. When thrown to the MANUAL position, the output is applied continuously.

4.2 Description of Rear Panel

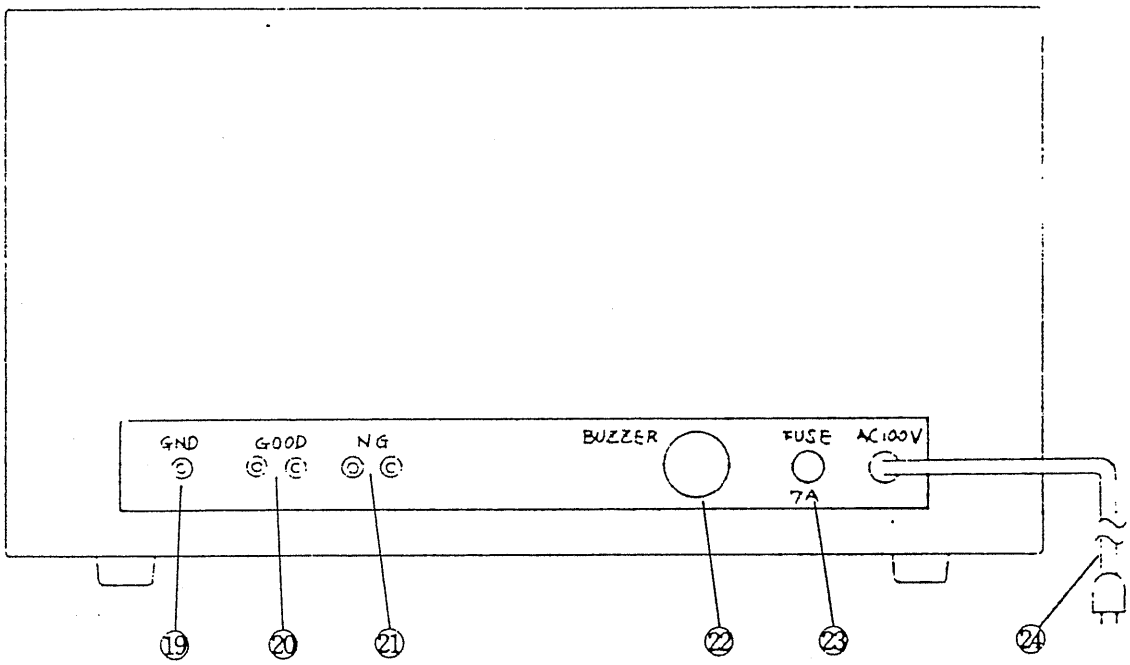


Figure 4.2

⑲ GND terminal:

Terminal for connecting the instrument chassis (housing) to the earth ground.

⑳ GOOD signal terminals:

Provide the GOOD signal, which is a contact signal (made when the signal is generated and broken when the signal is reset). The contact rating is 100 V AC 1A or 30V DC 1A.

㉑ NG signal terminals:

Provide the NG signal, which is contact signal (made when the signal is generated ant broken when the signal is reset). The contact rating is 100 V AC 1A or 30 V DC 1A.

㉒ NG buzzer:

Sounds when NG state is detected. Loudness is adjustable by opening/closing its window.

㉓ FUSE:

Fuse of the AC power line (7 amperes)

㉔ AC power cord

4.3 Operating Procedures

Observing the instructions of 3.2 "Precautions for Operation," operate the instrument as follows:

(1) Selecting the test voltage between AC and DC:

Switching between AC and DC of the test voltage can be done with an internal switch which is accessible when the casing top cover is opened. Be sure, to guard against electric shocks, to turn off the power switch before opening the cover. After the instrument has been used in the DC mode, a certain time is required before the charge stored in the filter capacitors is discharged. Before opening the cover, make it sure that the voltmeter on the front panel indicates zero.

For AC/DC switching, remove the switching board and throw the toggle switch (located at right-hand side of the switching board) to the AC or DC position. Next, so insert the switching board that the selected AC or DC mark is positioned between the arrowhead marks. After the switching operation is over, securely close the cover.

(2) Turning-on the power:

After making sure that (4) TEST VOLTAGE dial is set in the extremely counterclockwise position ("0" position), turn-on (1) POWER switch.

(3) Setting the test voltage range:

Select the required test voltage range with (10) RANGE switch.

(4) Setting the leak current reference value:

With (15) LEAK CURRENT dial, set the leak current reference value as required by the tested object.

(5) Connecting the tested object:

After making sure that the output voltmeter and the TEST ON lamp are in the following states, short the high voltage OUTPUT terminal to the GND terminal with the test leadwire of the GND terminal. Next, connect the test leadwire of the GND terminal to the tested object. Then, connect the test leadwire of the high voltage side to the tested object.

- o The output voltmeter indication is "0".
- o (5) TEST ON lamp has gone off.

(6) MANUAL test

(a) Set (18) TIMER/MANUAL switch in the MANUAL state. Press (2) TEST button. (5) TEST ON lamp will light, indicating that the test voltage is ready to be applied. Then, turn clockwise (4) TEST VOLTAGE dial so that the test voltage is applied to the tested object.

(b) When the test is over, press (3) RESET button to cut off the output voltage.

(c) If a current larger than that set in step (4) flows in the tested object, the instrument judges that the tested object is NG, cuts off its output voltage, and generates an NG alarm. Alarm signals are with a lamp, a buzzer and a contact signal. Alarm signals can be reset by pressing (3) RESET button.

(7) TIMER test

(a) Before connecting the tested object, press (2) TEST button and set the test voltage with (4) TEST VOLTAGE dial. Then, press (3) RESET button to cut off the output voltage.

(b) Set (18) TIMER/MANUAL switch in the TIMER state. Set the required test time with (14) TIMER knob.

(c) Connect the tested object as step (4) above.

(d) Press again (2) TEST button to start the test. When the period set by the timer has elapsed, the test voltage is cut off and the tested object passes the test. In this case, the instrument generates the GOOD signal, the GOOD lamp turns on and the GOOD signal is delivered.

(e) If the NG signal is generated when in the test, the operations and procedures are the same with those explained in Item (5) "MANUAL test."

(8) Re-application of test voltage:

Note that the test voltage is delivered through the OUTPUT terminal only by pressing (2) TEST button regardless of either in the MANUAL or TIMER test mode except when the NG alarm is being generated.

When in the TIMER test mode, the GOOD signal remains generated even after the test is over. Reset the signal by pressing (3) RESET button. To apply again the test voltage, press (2) TEST button.

(9) To apply the test voltage only during the period the TEST button is depressed:

Set (18) TIMER/MANUAL switch in the TIMER state. Turn (12) TIMER knob to the extremely counterclockwise position ("0" position). Depress (2) TEST button and keep depressed the button for the period the test voltage is required to be applied. As you release (2) TEST button, the test voltage is cut off and the GOOD signal is generated. The voltage setting method is the same as that of (7) TIMER test. Re-application of the test voltage is the same as that of Item (8).

(10) LEAK CURRENT MULTIPLIER knob:

When this knob is set in the CAL'D position, the reference value of the leak current detector circuit is at one of 0.5/1/2/5/10/100 mA as selected by the RANGE knob. By turning clockwise the MULTIPLIER knob, the value selected by the RANGE knob can be varied up to approximately 2.5 times continuously variably. This, however, does not apply to the 100 mA range. With this function, the reference current can be set at any value

within the total range of 0.5 to 25 mA. The scale of this knob is not calibrated. Calibration should be done by connecting a milliammeter to (17) CURRENT MONITOR terminals.

For an AC test voltage, use an AC milliammeter; for a DC test voltage, use a DC milliammeter. The full scale of the milliammeter must well cover the reference current to be used. For a DC test voltage, observe the polarity (upper terminal is "+" and lower terminal "-"). For an AC test voltage, no attention is required regarding the polarity.

Whenever no milliammeter is connected to these terminals, short them with the shorting bar.

(11) Remote control:

This instrument can be remote-controlled with the remote control box (option). As the plug of the remote control cable is connected to (8) REMOTE CONTROL connector on the instrument front panel, the internal circuit is automatically switched to the remote operation mode. In this case, (2) TEST button on the instrument front panel becomes idle, although the reset operation can be done either at the instrument front panel or at the remote control box.

It also is possible to remote-control the instrument without using the remote control box. This method is explained below. Be extremely careful when using this method because the high voltage is on-off controlled with an external signal. Pay attention so that the high test voltage is not generated inadvertently. Also,

provide full measures to ensure that the operator's body is not contacted with the output terminal or the test leadwire when the test voltage is being delivered. When these measures are unavailable, do not use the following remote control method.

(a) By controlling the TEST and RESET contacts shown in Figure 4.3, the test voltage can be on-off controlled in the same manner as done at the instrument front panel.

(b) In the case of the setup shown in Figure 4.4, the test voltage is turned on when the switch is thrown to the NO position and it is forcefully turned off when the switch is returned to the NC position.

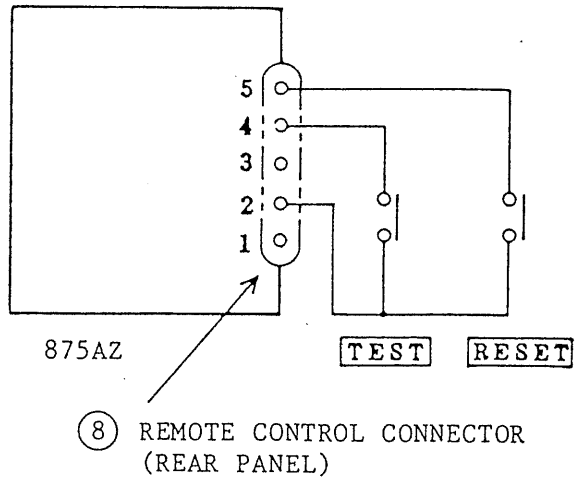


Figure 4.3

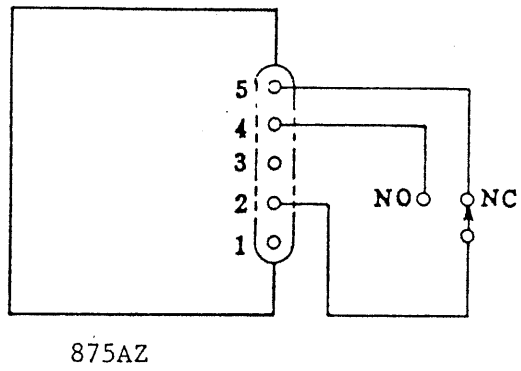


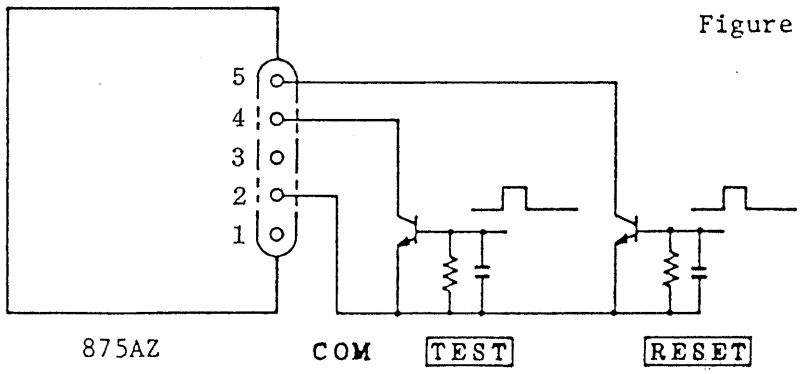
Figure 4.4

(c) Logical elements or transistors may be used instead of the switches in Figure 4.3. The signal status for such operation is shown in Figure 4.5. The input conditions of this instrument for such operation are as follows:

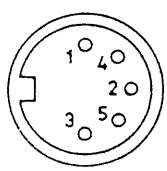
- o High level input voltage: 11 - 15 V
- o Low level input voltage: 0 - 5 V
- o Low level sweep out current: 1 mA

The internal gate is pulled up to +15 V with resistors. Pay attention to the withstanding voltage rating of the transistors used. The impedance between the common line of the controlling circuit and the power line or ground must be greater than 5 MΩ.

Figure 4.5



(d) Note that the layout of pins of the REMOTE CONTROL connector is as per DIN standard and is not in the due order of number progression, as shown in Figure 4.6.

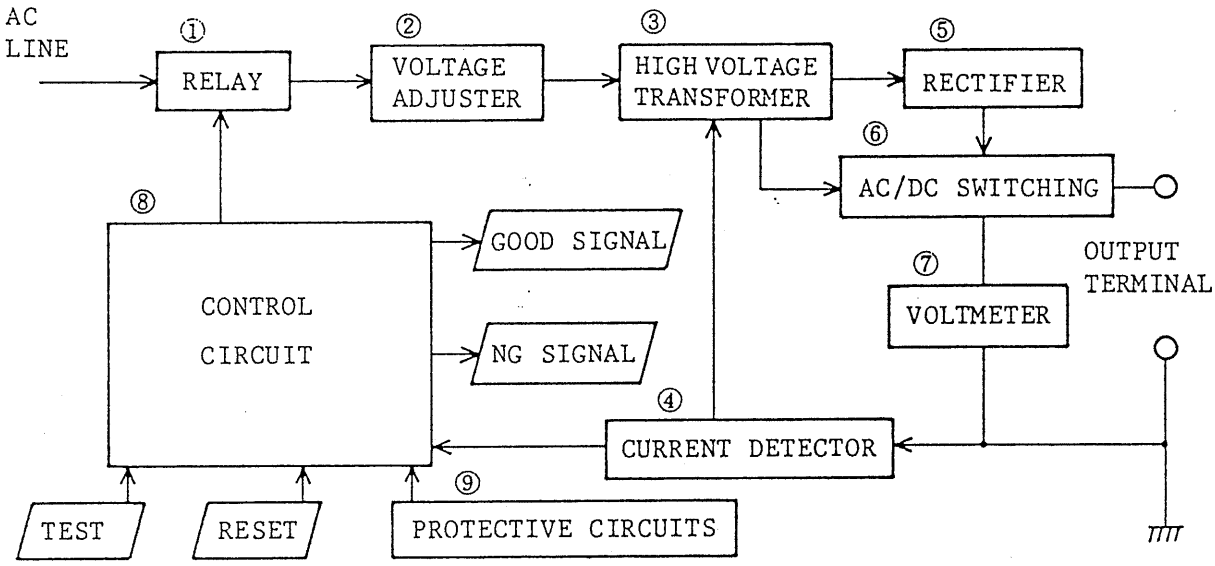


Layout of connector pins as viewed from panel surface

Figure 4.6

5. OPERATING PRINCIPLE

5.1 Block Diagram



5.2 Descriptions of Individual Circuits

(1) Relay:

The 875AZ employs a semi-conductor zero-turn-on switch.

(2) Voltage adjuster:

A slide-transformer is used.

(3) High voltage transformer:

Boosts up the output voltage of the voltage adjuster with a ratio of approximately 1:50 to obtain an output voltage of 0 - 1.5/0 - 5 kV. The rating is 500 VA (5 kV, 100mA).

④ Current detector circuit:

Consists of a current detecting resistor, reference voltage generator and comparator.

⑤ Rectifier circuit:

Full-wave rectifier circuit with two diodes.

⑥ AC/DC switching circuit:

Employs a board insertion method. Although the switching procedure is not very simple, the switching reliability is extremely high.

⑦ Voltmeter:

Directly indicates the output voltage (of the output terminals).

⑧ Control circuit:

Logic circuits consisting of CMOS IC, ensuring a high operation reliability.

⑨ Protective circuits:

Provide various protective features for high voltage test operation safety.

5.3 Zero-turn-on Switch

The 875AZ employs a zero-turn-on switch. The features of the zero-turn-on switch are as follows: When a regular mechanical contact type relay is used for on-off operation of the primary circuit of the high voltage transformer, transiential spike voltages are produced, thereby applying

unjustified high voltages to the tested object and causing a possibility of rejecting an acceptable tested object. The zero-turn-on switch, which employ a semiconductor switching circuit, turns on and off the power line at approximately 0 level, thereby reducing transiential overshoots.

However, if the tested object is connected under the state that the test voltage is being delivered, spikes are produced at the instant of contacting and the effect of the use of the zero-turn-on switch is lost. It also is dangerous. Be sure to turn on or off the test voltage using the TEST and RESET buttons after the tested object is securely connected.

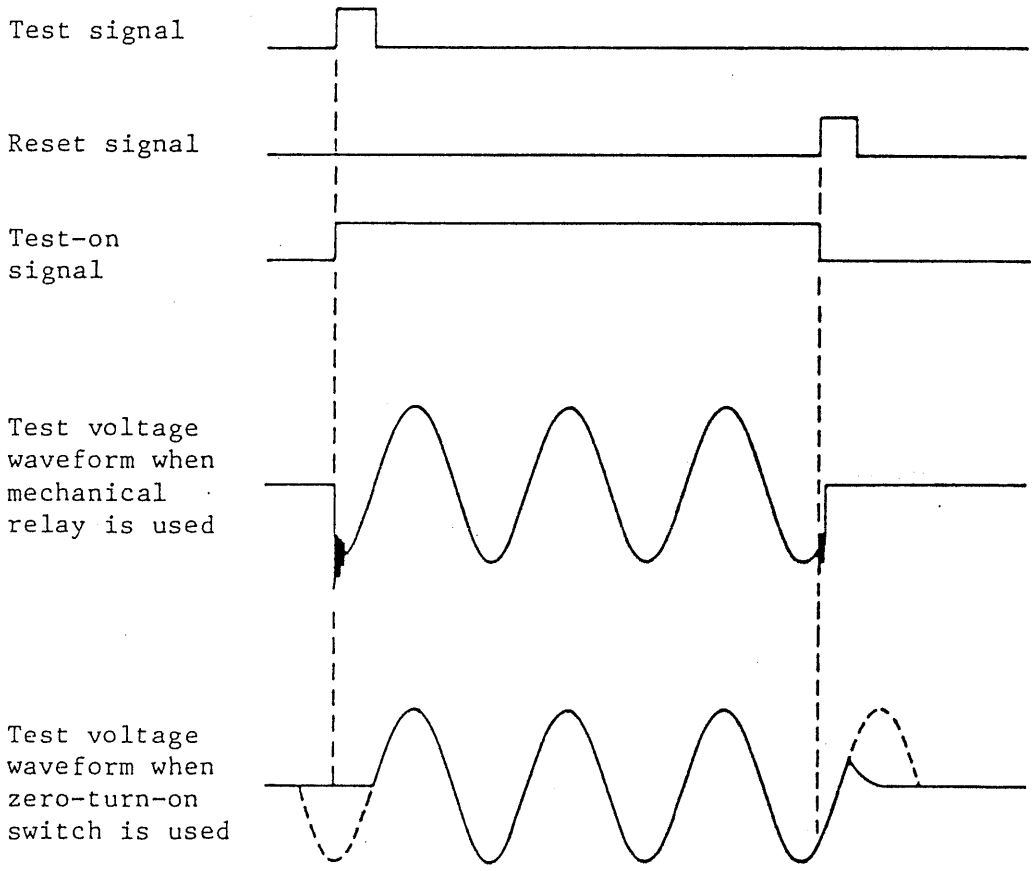


Figure 5.2

6. MAINTENANCE

6.1 Calibration

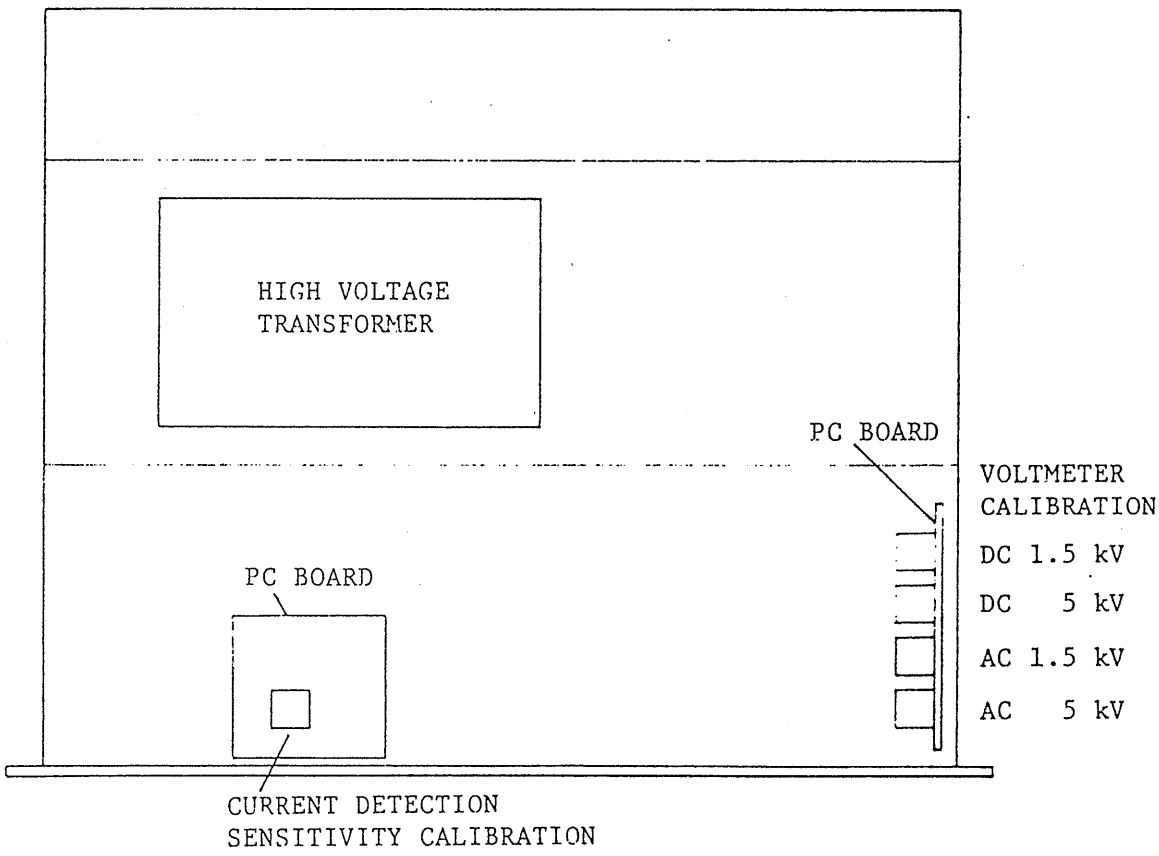
(1) Devices required for calibration

(a) Voltmeter which is capable of measuring 1.5 kV/5 kV AC/DC with an accuracy of approximately 1%. (e.g. Kikusui 149-10A Voltmeter)

(b) Ammeter which is capable of measuring 0.5/1/2/5/10/100 mA AC/DC with an accuracy of approximately 1%.

(c) Load resistors 5k/50k/100k/250k/500k/1MΩ, with voltage rating of 500 V.

(2) Locations of semi-fixed resistors for calibration.



(3) Procedures before calibration

Before turning on the instrument power, check that (9) VOLTMETER pointer is indicating the "0" scale position. If not at this position, adjust to this position with the mechanical adjuster.

Pull out the chassis from the casing after removing the eight clamping-screws of the front panel. Loosen the clamping-screw of the microswitch bracket, rotate the bracket 180°, and fix the bracket in the state that the switch is depressed. Then, turn on (1) POWER switch by throwing it to the upper position.

(4) Voltmeter calibration

(a) With the AC/DC selector switch located at an upper position, set the output in the DC state.

(b) Throw (10) RANGE switch on the panel to the 1.5 kV position.

(c) Connect a calibrating AC voltmeter to the OUTPUT terminal of the instrument and press (2) TEST button. So adjust (4) TEST VOLTAGE dial that the calibrating AC voltmeter reads 1.5 kV.

(d) So adjust the VOLTMETER 1.5 kV RANGE CALIBRATION semi-fixed resistor that the voltmeter of the instrument front panel reads 1.5 kV.

(e) Press (3) RESET button, turn (4) TEST VOLTAGE dial to the extremely counterclockwise position ("0" position), and throw (10) RANGE switch to the 5 kV position.

(f) Press (2) TEST button and so adjust (4) TEST VOLTAGE dial that the calibrating voltmeter reads 5 kV.

(g) So adjust VOLTMETER 5 kV RANGE CALIBRATION semi-fixed resistor that the instrument voltmeter reads 5 kV.

(h) Press (3) RESET button to cut off the output.

(i) Change the output to DC by changing the AC/DC selector board.

(j) Replace the AC voltmeter with a DC voltmeter. Calibrate the instrument voltmeter in a similar manner as calibration of the AC voltmeter.

(5) Leak current detection value calibration

(a) Set the output in the DC state.

(b) Remove the shorting bar from (17) CURRENT MONITOR terminals on the instrument front panel and connect a 10-mA DC milliammeter in its place. Connect a 50-kΩ load resistor between the output terminals.

(c) Throw (10) RANGE switch to the 1.5 kV position and set (15) LEAK CURRENT dial at 10 mA.

(d) Press (2) TEST button. Gradually raise the output voltage by turning (4) TEST VOLTAGE dial, observing the milliammeter reading. The NG signal will be generated at approximately 10 mA. Read the milliammeter at this point.

(e) Repeating once or twice the procedure of (d) above, so adjust CURRENT SENSITIVITY CALIBRATION semi-fixed resistor that the NG alarm is generated exactly at 10 mA.

(6) Leak current detection value check

The leak current detection circuit is so designed that when it is calibrated at one point of AC or DC, all other points (ranges) of AC and DC, except the 100 mA DC range, are automatically calibrated to the specification values.

At each of the AC/DC ranges, measure the current at which the NG alarm is generated, at 500 V. The milliammeter range and load registors for respective ranges are as shown in Table 6.1.

For current measurement, use either an AC or DC milliammeter depending on the type of the output voltage. Of the DC output, the upper terminal is "+" and the lower terminal "-". For AC current measurement, no attention is required to be paid regarding the polarity.

Table 6.1

Range [mA]	Milliammeter full scale [mA]	Load resistor [Ω]
0.1	0.5	1 M
1	1	500 k
2	2	250 k
5	5	100 k
10	10	50 k
100	100	5 k

7. OPTIONS

The following options are available for this instrument.

7.1 Model 913 Remote Control Box

For remote control of test and reset operations.

Specifications

Functions

OPERATE switch:

The TEST button is effective only when this switch is ON. By turning OFF this switch, the output voltage is forcefully reset.

TEST button:

The test voltage is delivered as this button is pressed when the OPERATE switch is ON and the instrument is in the reset state.

RESET button:

This button is used to cut off the test voltage or to reset the NG alarm.

Dimensions: 150 (W) × 70 (H) × 40 (D) mm
(5.90 (W) × 2.56 (H) × 1.58 (D) in.)

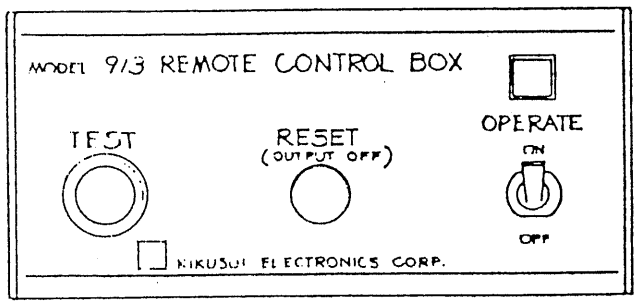


Figure 7.1

7.2 Model 914 Remote Control Box

With this control box, the test voltage is delivered only when the two test buttons are pressed simultaneously.

Specifications

Functions:

Has two TEST buttons and the output voltage is delivered only when the two buttons are pressed concurrently. Other functions are the same as those of Model 913.

Dimensions: 280 (W) × 70 (H) × 40 (D) mm
(11.0 (W) × 2.6 (H) × 1.6 (D) in.)

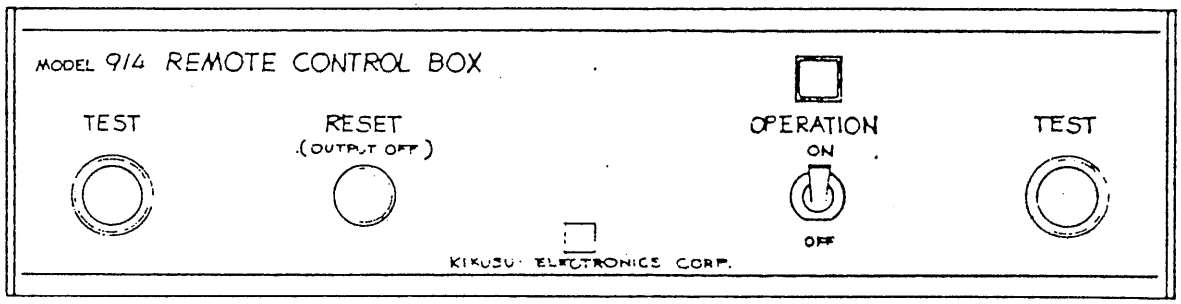


Figure 7.2

7.3 HTL-3W High Voltage Test Leadwire

A high voltage test leadwire approximately 3 m (4.9 ft.) long

7.4 HTP-1.5 High Voltage Test Probe

The HTP-1.5 is designed for high operation safety, yet maintaining good operability. The test switch can be pressed only after holding the grip, thereby preventing inadvertent turning on of the test voltage. When the test switch is released, the test voltage is reset forcefully.

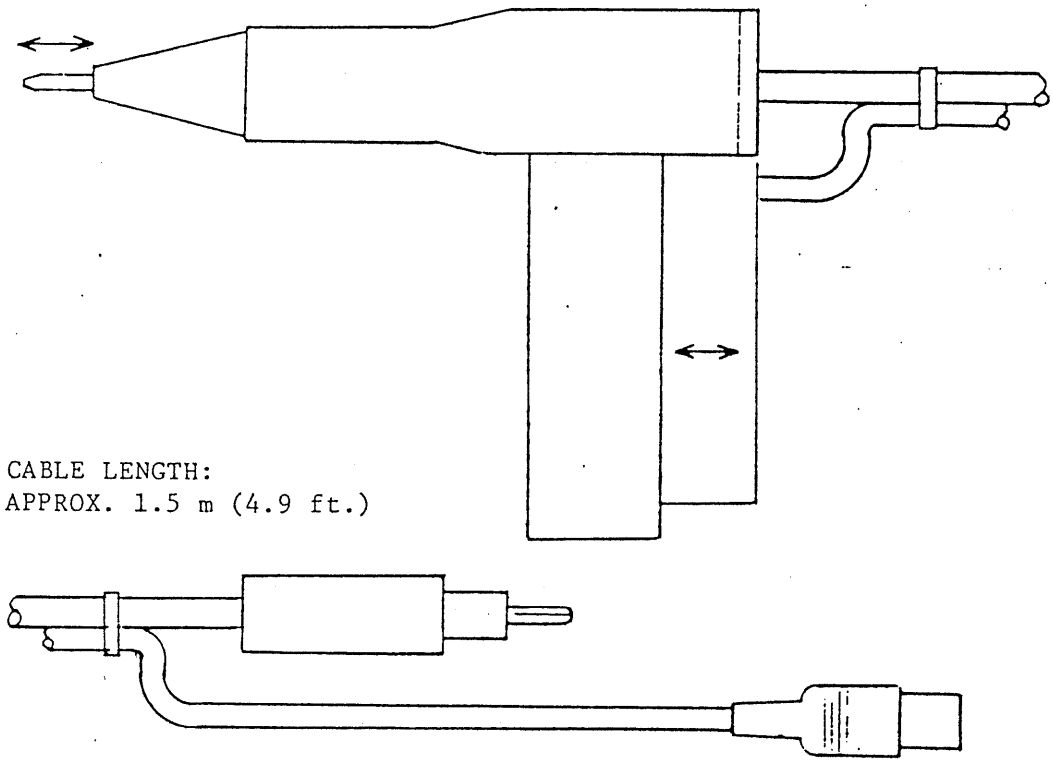


Figure 7.3