

MODEL 865  
WITHSTANDING VOLTAGE  
TESTER  
INSTRUCTION MANUAL

KIKUSUI ELECTRONICS CORP.

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## 1. GENERAL

The MODEL 865 is a withstanding voltage tester with voltage rating up to 5 kV AC and output capacity up to 500VA.

Employing various safe guard provisions for operator, timer, overcurrent cut off circuit and various indicators present automatic withstanding voltage testing.

### NOTE

This device is a "Withstanding Voltage Tester" with an output rating of 500VA, designed complying with JIS (Japanese Industrial Standard) and the Ordinances of Electrical Equipment issued by Ministry of International Trade and Industry.

Never use this device as a power supply. Note that, if this device is operated with its maximum load for more than 5 minutes continuously, its internal components may be overheated and badly degraded.

## 2. SPECIFICATIONS

Power requirement	100V 50/60Hz	At no load	approx. 30VA
		At full load	approx. 580VA
Dimensions	300W x 235H x 290D mm		
( maximum )	305W x 260H x 340D mm		
Weight	Approx. 20 kg		
Accessaries	Test lead ( 1.5 m )		1 pair
	Instruction manual		1
Test voltage			
Output voltage	0 ~ 1.5kV / 5kV	50/60 Hz	
	( 2 ranges, continuously variable )		
Output capacity	500VA ( Maximum 5kV, 100mA )		
Voltage regulation	Less than $\pm 2\%$ at 5kV, 10mA output		
Voltmeter	Linked with test voltage range.		
scale	1.5kV/5kV full scale, linear scale		
class	class 1.5		
indication	Root mean square value		
accuracy	within $\pm 5\%$		
Test method and period			
Manual and Automatic	MANUAL/TIMER		
Setting time	2s ~ 72s	at 50Hz	
of timer period	2s ~ 60s	at 60Hz	
Free timer	Possible to set a desired period.		
	( In conjunction with the TEST button )		
Leak current limit			
range	0.5/1/2/5/10/100mA ( 6 ranges ) accuracy $\pm 5\%$		
detection	Pulse and integration of peak value		
	( conversion to rms of sine wave )		
Test result	NG lamp indication on front panel		
	Buzzer operation		
	( sound volume is adjustable with internal adjuster )		

Safety system	* Unless TEST button is pressed, output voltage is never delivered to the output terminal in any position set for knobs and switches on the panel.
	* Connection of lead wires and safe means are surely deliberated for safety of operator.
Withstanding voltage	AC 500V between line and chassis, 1 minute.
Insulation	DC 1000V between line and chassis more than 50MΩ

#### Optional Accessories

##### 1. Remote control box ( MODEL 927 )

The TEST, RESET and the OPERATE ON/OFF ( urgent stop and pause for a time ) are operated from far with this accessory.

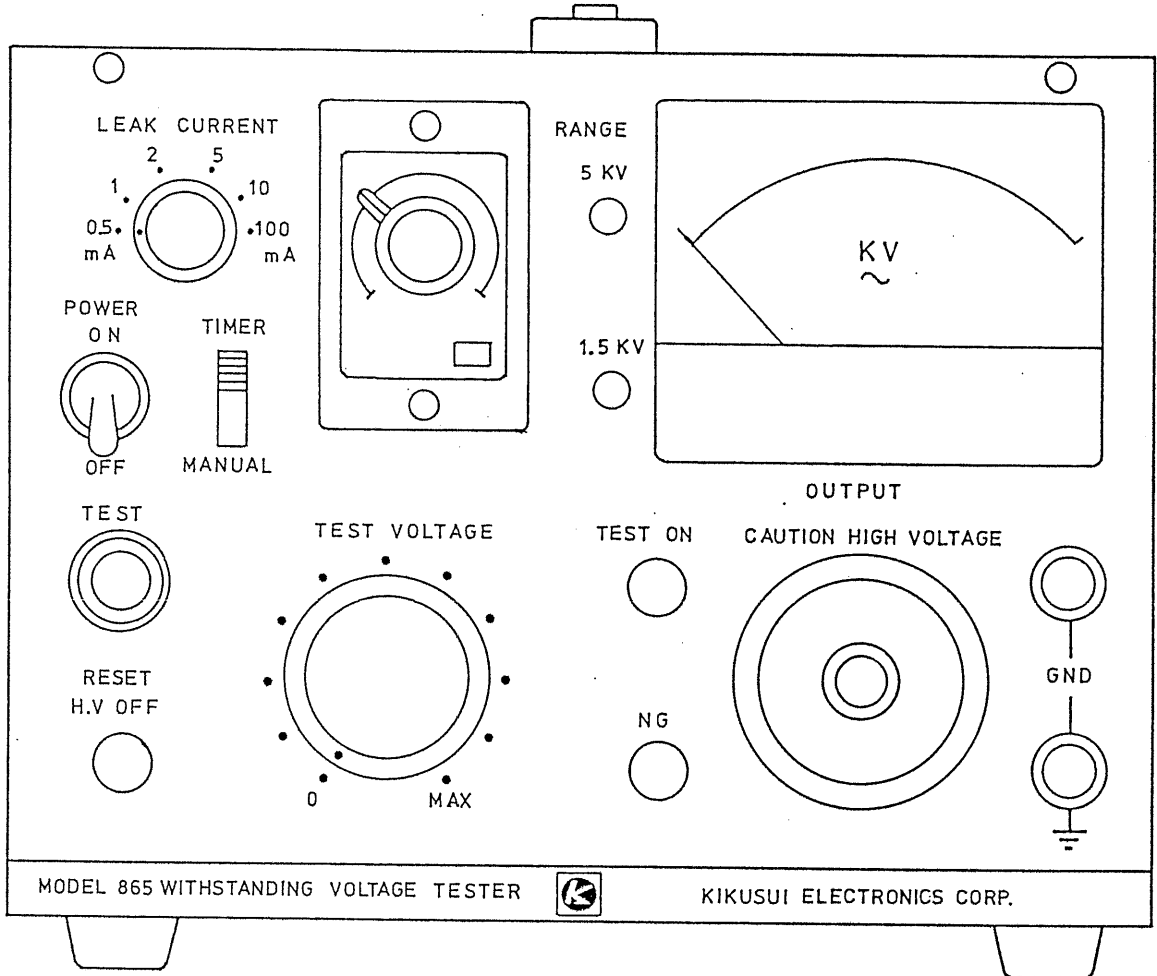
##### 2. Zero Cross Switch

Test voltage is always turned on or off at the moment of zero volts of the test voltage with connecting this zero cross switch.

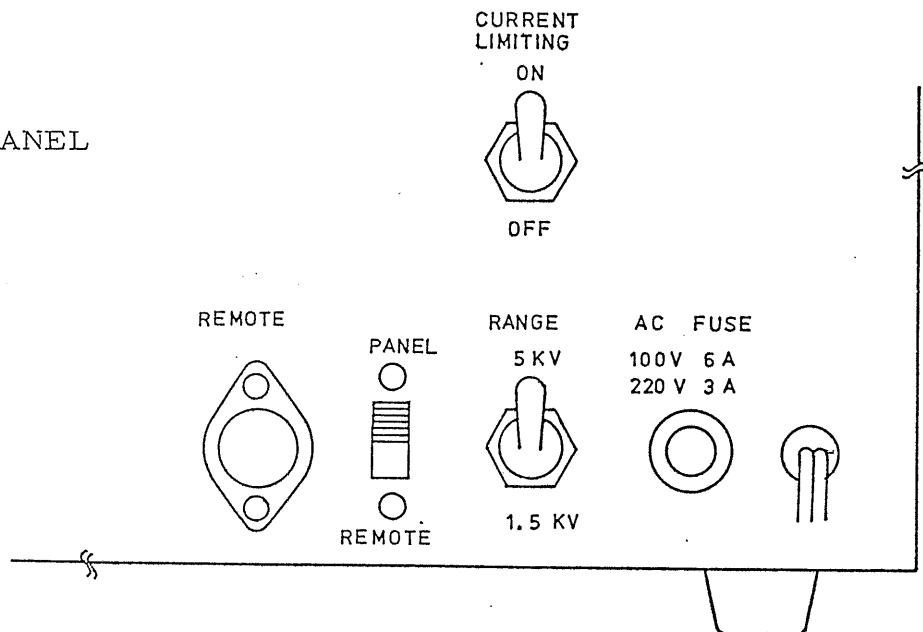
The test sample is protected from the damage by noise caused by on-off operation.

### 3. EXPLANATION OF PANEL

#### FRONT PANEL



#### REAR PANEL



### 3.1 Explanation of Panel

POWER	This is a power switch to turn the power on or off. Before this switch is turned on, the 'Caution on operation' explained on page 10 should be followed.
TEST	The TEST ON red lamp lights on, when this button is pushed. Supply of test voltage becomes possible. Test voltage is turned off when timer is turned off. Test is made again by pushing this button after the reset operation. The free time operation is performed by using this button ( Refer to page 9 ).
RESET ( H.V OFF)	When leakage current detecting circuit is operated on test, test voltage is turned off, and the result is indicated by the NG indicator lamp and buzzer. The test is reset by pushing this button. On test, test voltage is cut off by pushing this button.
LEAK CURRENT	This is the knob to set threshold level ranges of leakage current detecting circuit.
TIMER/MANUAL	This is a switch for setting a test period to the MANUAL or TIMER.
TIMER	Test voltage is supplied for a period set by timer unless leakage current detecting circuit is operated.
MANUAL	Test voltage is supplied unless leakage current detecting circuit is operated.
TEST VOLTAGE	This is a knob for control of test voltage. Test voltage increases up to 1.5kV or 5kV from zero volts with turning this knob clockwise. The TEST VOLTAGE knob should be always turned to the 0 position except when the component is performing the test.
RANGE 5kV / 1.5kV	Variable ranges of test voltage is indicated by this neon lamp. Range switch to set voltage is provided on the rear.

TEST ON                    The lamp indicates that supply of test voltage is possible.

NG                            If current exceeds predetermined level, test voltage  
is immediately cut off.  
The lamp marked NG lights on and buzzer buzzes.

OUTPUT                    Test voltage output terminal.

GND                         GND terminal is electrically connected to the panel  
and chassis.

Timer                      When function switch is set in the TIMER position,  
this timer is used to set the testing period.  
it is set by the center of the timer.  
Do not rotate time setting knob when timer is operating.  
Otherwise, it may be damaged.  
Though time setting knob is hard to rotate, it is normal.  
Always, set time setting knob more than 1/4 of scale.  
When setting to zero, output is not delivered.. Because,  
it is same condition as finished state of test.  
In such a condition, output voltage is delivered for a  
period pushing button.  
( Refer to " free time operation " on page 9.)  
Select an appropriate scale of timer for a frequency  
of supply line.



### 3.2 Explanation of Rear Panel

- REMOTE The MODEL 927 REMOTE CONTROL BOX (optional accessory) is connected to this receptacle, when the PANEL/REMOTE selector is set in the REMOTE position.
- PANEL/REMOTE The control methods of operation ( TEST and RESET ) are selected by this switch. They are the control on panel and control from the MODEL 927.
- RANGE  
1.5KV/ 5KV Variable range of test voltage is selected by this knob. For switching, the POWER switch must be turned off, and the TEST VOLTAGE knob must be set in the 0 position.
- AC FUSE Fuse for line input.  
A 6A fuse is used for a nominal 100V supply, and  
A 3A fuse is used for a nominal 200V supply.
- INTEG/PULSE  
( Internal switching ) Leakage current detecting mode is set to a pulse or integration of peak value ( conversion to rms value ) by this switch.  
This switch is set in the INTEG position at factory.
- The method of leakage current detecting  
By setting in the PULSE mode, creeping discharge, atmospheric discharge and beginning of dielectric breakdown are detected.  
On pulse detecting, the NG indication may be made for some components under test by surge voltage caused with on-off switching of test voltage.  
For avoiding such an effect, use the  
ZERO CROSS SWITCH ( Optional accessory ).
- CURRENT LIMITING This switch normally should be set in the ON position.  
ON↔OFF In the ON position, however, the maximum available power (the product of voltage multiplied by leak current) at the 100mA leak current limiting range is approximately 300VA.  
When a power of more than 300VA is required, throw this switch to the OFF position. Note that, if the equipment to be tested is shorted or presents no withstanding voltage due to insulation breakdown, the fuse of this device may blow out.

## 4. OPERATION

### Setting of Test Voltage

Variable ranges of test voltage is set by a snap switch on rear. Turn the snap switch to the desired position indicated by letters.

On this operation the TEST VOLTAGE knob must be set in the 0 position and the POWER switch must be turned to the OFF position.

### Setting of the LEAK CURRENT

Set the LEAK CURRENT knob so as to be the desired leakage current detection. On test, when leakage current in component exceeds setting threshold level, output voltage is cut off. The NG lamp lights on, and buzzer buzzes. ( Refer to the method of leakage current detecting on page 7 )

Confirm that the TEST VOLTAGE knob is set in the 0 position and the PANEL/REMOTE selector is set in the PANEL position, and make the following operation.

POWER on After following the 'Caution on Operation' explained on page 10, turn the POWER switch to ON.

### Operation

(1) In case of the MANUAL mode.

Set the function switch to the MANUAL mode. A red lamp lights on with pushing the TEST button, It indicates supply of test voltage is possible. Test voltage is supplied to component under test, when the TEST VOLTAGE knob is turned clockwise.

(2) In case of the TIMER mode

Set the function switch in the MANUAL, and push the TEST button. Turn the TEST VOLTAGE knob clockwise until desired voltage is indicated by voltmeter on front panel. Turn the timer knob to the desired period, and set the function switch in the TIMER position. Timer begins to operate, and test voltage is provided to component during a period set by timer.

### Reset of Test Voltage

- (1) If leakage current more than predetermined level flows in test period, test voltage is cut off, and NG lamp lights on.  
Push the RESET (H.V OFF) button. The leakage current detecting circuit is reset. Push the TEST button. Test voltage is supplied again.
- (2) When the supply voltage is cut off by finish of test, push the RESET button. Test voltage is supplied again.
- (3) If the test voltage is cut off by pushing the RESET ( H.V OFF ) button under the test, test voltage is supplied again by pushing the TEST button.

### Free Timer Operation

On free time operation, test voltage is supplied for a period which the TEST button is pushed, and test voltage is immediately cut off, when the button is stopped from pressing.

For the free timer operation, set the test voltage by the same procedure explained above (2), and set the test period of timer to 0.

In such state, test voltage is cut off, when the function switch is set in the TIMER position. Free timer operation is possible by pushing the RESET button.

Test voltage is supplied for a period which the TEST button is pushed. Free timer operation can be repeated with using the TEST and RESET button.

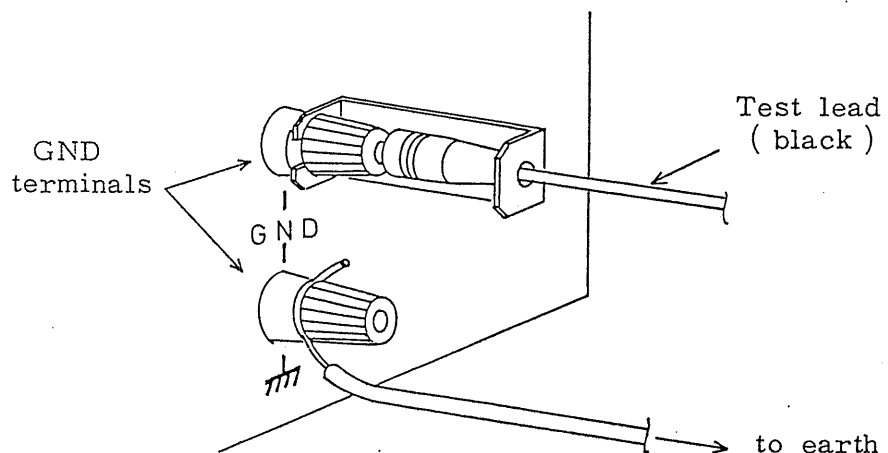
## 5. CAUTION ON OPERATION

When the MODEL 876 is operating, a high voltage of up to 5kV may be exposed to the OUTPUT terminal. Careless operation might injure the operator vitally. The operators are required to read over following advices. Exercise every care to avoid the accident.

- (1) Function switch should be always turned to 0 volts position except when the equipment is performing the test.
- (2) The TEST VOLTAGE knob should be always turned to 0 volts position except when the equipment is performing the test.
- (3) Ground of Panel The GND terminal on front panel must be ground to the earth. When equipment is poorly grounded, the operator is shocked by touching the cabinet or the tested component.
- (4) Connection of Test Leads

Test leads must be connected, after output is turned off (the TEST ON lamp is disappeared.). First connection should be a lead to the GND. Test leads should be checked before using. ( Especially, grounded lead is broken or falsely connected to the terminal.).

When the GND terminal is broken, the equipment may be charged at a high potential. Therefore, the equipment should always be securely grounded as following figure.



- (5) Touching the OUTPUT terminal

Prior to touching the OUTPUT terminal, following two points should be confirmed.

- \* The red lamp indicating test voltage supply does not light.
- \* Meter indication is zero

Touch the OUTPUT terminal by right hand.

## 6. ACCESSARIES BY OPTION

The MODEL 927 REMOTE CONTROL BOX and the ZERO CROSS SWITCH are prepared as optional accessories for the MODEL 865.

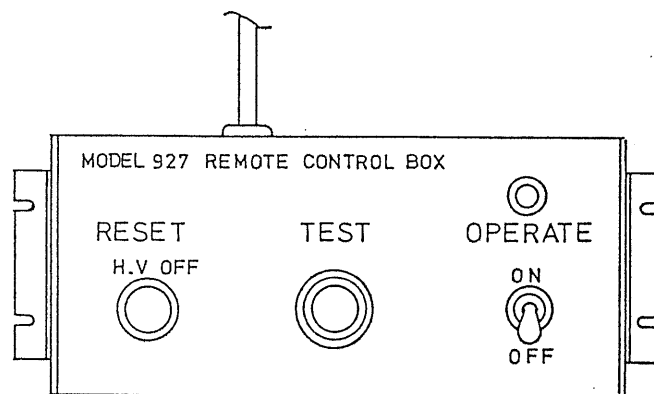
If necessary, please contact Kikusui's agent in your area.

### (1) MODEL 927 REMOTE CONTROL BOX

For operation from the REMOTE CONTROL BOX, connect the MODEL 927 to the REMOTE receptacle of the MODEL 865, and turn the the PANEL/REMOTE switch to the REMOTE. The operation of the TEST and RESET mode can be made from the MODEL 927.

On-off operation of urgent stop, pause and so on are also made by the OPERATE switch.

On remote control operation, the TEST and RESET switch on the MODEL 865 can not be operated for safe operation.

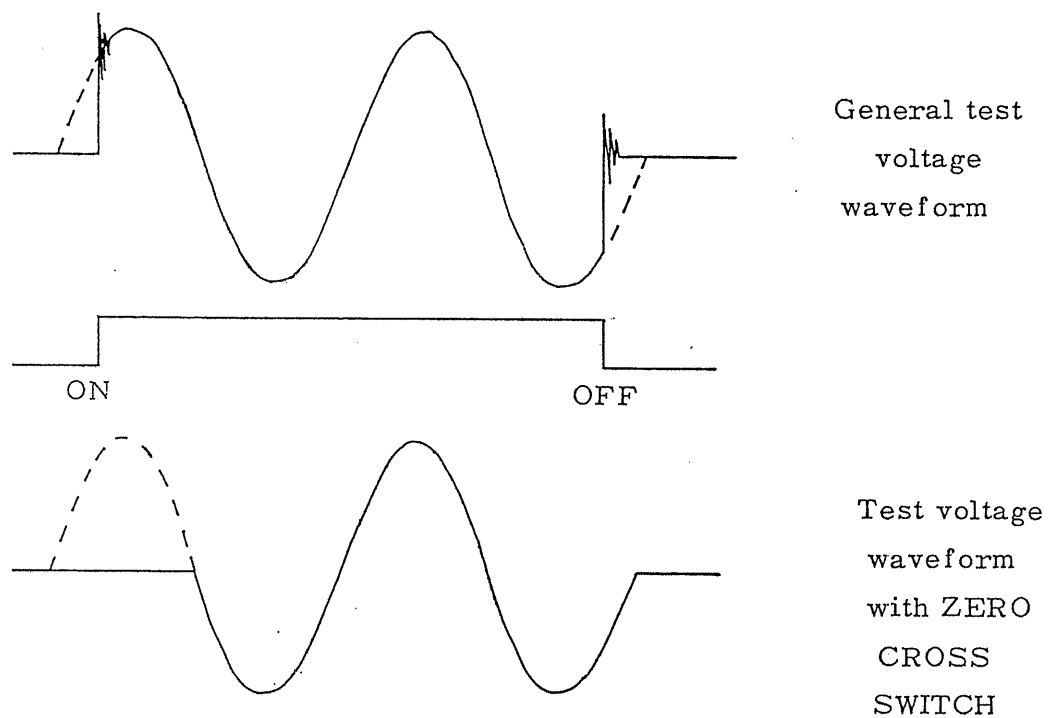


## (2) ZERO CROSS SWITCH

When using the general withstanding voltage tester, surge voltage is caused by on-off operation of test voltage.

Test voltage more than predetermined level is supplied to tested component, and tested component may be damaged or the NG indication may be made.

Those troubles are not caused by using the ZERO CROSS SWITCH (Optional accessory), and highly reliable operation is performed.



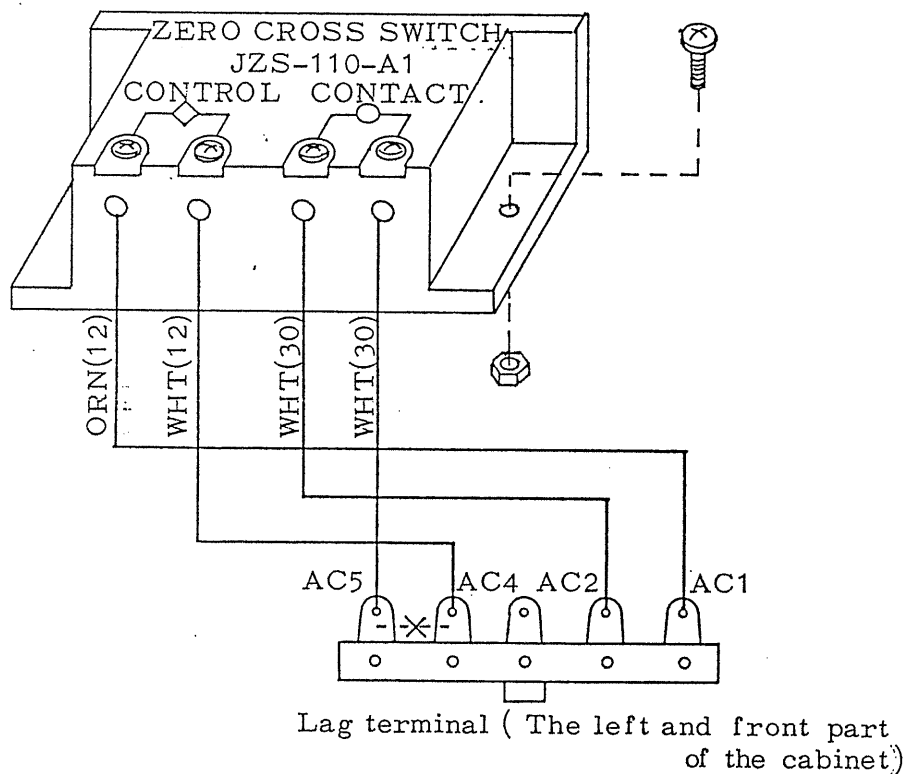
If the output touches a tested component when test voltage is supplied, surge voltage is caused at the moment.

The test voltage should always be turned on or off by the TEST or RESET button, when a tested component is connected to the OUTPUT terminal.

## Method of connection of ZERO CROSS SWITCH

Refer to the CIRCUIT DIAGRAM for connection of the ZERO CROSS SWITCH.

1. Fix the ZERO CROSS SWITCH to the upper part of the H.V transformer located on rear by screws with some heat conductive compound.  
( Always, use the appointed ZERO CROSS SWITCH.):



Connection of the ZERO CROSS SWITCH

2. Connect as the above figure, and remove a tin coated wire connected to AC5 from AC4 ( dotted line )
3. Attach a name plate supplied with : the ZERO CROSS SWITCH to the rear panel.