

MODEL 8527

**Motor Slider Type
Withstanding Voltage & Insulation Resistance Tester**

Instruction Manual

TSURUGA ELECTRIC CORPORATION

I-01881

FOR SAFE USE

For safe use of this product, please observe the following warning and caution. In order to help the users' safe use of the products, the following symbol marks are used in this manual.

⚠ WARNING This is the warning to avoid the danger when it is assumed that such danger as may cause fatal accident or severe injury to a user occurs in case that the product is mishandled.

⚠ CAUTION This is the caution to avoid the danger when it is assumed that such danger as may cause minor injury to a user or generate only physical obstacle occurs in case that the product is mishandled.

⚠ WARNING

This tester outputs high voltage. As there is danger of an electric shock, please strictly follow the directions below:

- **Do not touch high voltage cables or test samples during the test.**
The places marked with ⚠ on the tester are the dangerous parts where the high voltage is generated.
- **Make sure to connect the protective ground terminal to the earth.**
- **Do not short-circuit the output to the ground or commercial power supply line.**
It is dangerous as the housing of tester is charged with high voltage. It also causes the break-down of the tester.
- **When operating the tester, put on the rubber gloves for an electric operation.**
- **For the connection to the sample to be tested, use the attached high voltage cable or an electric cable appropriate to the operating voltage.**
- **Do not repeat ON/OFF of the power supply switch. It is dangerous and causes the break-down of the tester.**
- **Place for installation**
Never install or use this product in the place where such explosive or flammable materials as mentioned below are used or stored (Occupational Safety and Health Laws, Enforcement Regulations Appendix Table 1 Dangerous Materials).
[Explosive material], [Flammable material], [Inflammable material], [Flammable gas], [Oxidizing material]
※Model 8527 internally uses the metallic materials. There is a fear of deterioration due to corrosion or rust and explosion or inflaming by an electric spark.
- **Do not put anything on the 8527 or use it as foot stool.**
※It affects the heat radiation, causing internal heat up and breakdown.
※It may also cause a deformation of the top part of the product.
- **When the voltage is applied to the capacitance load (test sample), the output voltage may rise higher than the case of no load depending upon the capacitance value of the load. Also, in case of the voltage liable load (test sample), wave distortion may occur.**
In case of test voltage 2kV, the influence of capacitance 2000pF or less can be ignored.

⚠ CAUTION

Pay attention to the following cautions about the power supply.

This tester is equipped with a high voltage transformer 500VA, so it can happen in the following cases that the considerably big current (a few 10A) flows to the commercial power supply line which this tester is connected to.

- ▶ **During a few 10ms immediately after the start of withstanding voltage test.**
- ▶ **During a few 10ms while this tester makes a NG (no good) judgement for the test sample.**

Take care for the capacity of supply power line and the other equipment or devices connected to the same line.

Besides, in case that the stabilized AC power supply is used, depending upon the action of its current limiter circuit, the output is turned ON/OFF at high speed. It eventually generates the considerably big surge voltage and is very dangerous.

⚠ CAUTION

- To avoid break-down, malfunction or other troubles, do not use the tester in such places where:
 - ▶ exposed to rain, water drops or direct sunlight.
 - ▶ high temperature or humidity, heavy dust or corrosive gas.
 - ▶ affected by external noise, radio waves or static electricity.
 - ▶ unstable or of much mechanical vibration
 - ▶ high sensitivity measuring instruments or receiver locates nearby
- Do not open the case or modify the tester as it may cause a danger of an electric shock or other troubles.
- In case that abnormal operation occurs, turn off the power supply switch immediately and pull out the power supply cable from the plug socket.
- When doing the maintenance or checking, be sure to stop the use of product and turn off the power supply.
- Do not use the product in the place of vibration or where the shock may occur as it will cause the breakdown of the product.

MAINTENANCE & TRANSPORTATION

⚠ WARNING

- Take care that the water drops like rain do not wet the product.
 - * It may cause the electric shock or malfunction.
- Do not lay along the product. Also take care that the product does not fall down by vibration or else.
 - * It may cause the damage of internal mechanism or malfunction.

⚠ CAUTION

- When the product is transported, hold the chassis (bottom plate).
Do not carry the product holding its red bushing at high voltage output terminal section (refer to ⑨ and ⑫ of the article 3 Name of parts and functions).
 - * The bushing (red) may break, causing serious injury by the fallen 8527.
- Minimize the mechanical shock or vibration when transporting the product.
 - * It may cause the damage of internal mechanism or malfunction.

INTERLOCK

Model 8527 is provided with interlock function.

During the interlock function is in operation, no test is allowed.

The interlock function can be canceled by connecting the attached **REMOTE/OUT** plug into the **REMOTE/OUT** connector ⑪ on the back and then pressing the **STOP** switch ②.

Please refer to the article 15.3 (P53) for the interlock function.

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1. Preface

For proper use of this tester, please carefully read these instructions before initial operation. Please make sure that this instruction manual reaches the responsible person of operation and also keep it near the tester so the operator can read it any time. Model 8527 deals high voltage, so it is designed to provide many protective functions and various concerns to secure the operators' safety.

- As the withstanding voltage tester, this model has the capability of max. output 5kV and output capacity 500VA, which allow for a withstanding voltage test of various electronic equipment or components, in accordance with the various standard.
- The adjustment of test voltage for the withstanding voltage test is automatically done by the motor.
- Referential voltage setting, which prevents the test from being started unless the test voltage comes into the range of either higher value of $\pm 5\%$ of set value or $\pm 50V$, high and low leak current setting, timer function ensures highly accurate measurement.
- As the insulation resistance tester, this model is provided with two ranges of 500V/2000M Ω and 1000V/2000M Ω .
- Large green LED of high visibility is employed for the display of test voltage, current and test time.
- A 9 memory is provided to write in and read out the test conditions regulated by the various standards or regulations.
- A relay contact can be output as the status output during the test.
- By means of REMOTE/OUT connector, an output signal to show "waiting", "in-test" or "judgement" is output in open collector, depending upon the status of the tester.
- This tester is also provided with the remote control connector and terminal blocks which allows remote start/stop of the test. With use of this function jointly with judgement result and output signals, it facilitates the automation and labour-saving.

1.1 ● Initial setting at the time of delivery

The tester has the following initial setting at the time of delivery from factory.

Function	Setting	Remarks
Key lock	OFF	For detail, please refer to the article 12 Key lock.
Double action	OFF	For detail, please refer to the article 13 Special test mode.
GOOD hold	OFF	
Momentary	OFF	
FAIL mode	OFF	
Power on zero volt slider	OFF	For detail, please refer to the article 4.7.1.

Memory (Common for No.1~No.9)

At the delivery from factory, the following data is written in every memory No.1~9.

Keep pressing ENTER key and SHIFT key together, power on the tester, then the settings are reset to the initial ones at the time of delivery.

Test mode	Withstanding voltage test condition	Insulation resistance test condition
W-I	Slider voltage setting OFF (0.00kV)	Test voltage range 0.5kV
	Referential voltage OFF (0.00kV)	High limit resistance value OFF (2000M Ω)
	High limit leak current 10.0mA	Low limit resistance value 10M Ω
	Low limit leak current OFF (0.0mA)	Mask timer 0.3S
	Test time 60.0s	Test time 60.0s
		Discharge function ON

2. Confirmation prior to use

2.1 ●Unpacking

- (1) Unpacking
When the tester is delivered, please check whether it has not been damaged in transit and unpack it carefully. If any damage or inconvenience is found, please consult the dealer whom you purchased the tester from for proper solution.
- (2) Check of contents
Please do not leave in the carton any item of the contents listed below.
List of accessories:

High voltage cable 2m	1 pair
Earth wire 3m	1 piece
Power supply cord 2.5m	1 piece (with 3P→2P, E conversion adaptor)
REMOTE/OUT plug	1 piece (36P)
Fuse 10A	1 piece
Instruction manual	1 copy
RS-232C interface instruction manual	1 copy

CAUTION

RS-232C connector (D-sub 9 pins) Model 5881-11-018 (9 pins – 9 pins / 1.8m) for external communication is available at option. When a customer procures it, please use the inch pitch screw type.

2.2 ●Cautions for handling

Since the Model 8527 deals high voltage, it is designed paying special attention to safety. However, it is still dangerous as it outputs high voltage of max. 5kV. An erroneous handling may cause fatal accident. In order avoid any accident, please strictly observe the following cautions and take utmost care for safety.

- (1) Make sure to connect the protective grounding terminals (back panel) to the earth. If the grounding is insufficient, the tester housing is charged with high voltage when the output is short-circuited to the earth or the power source line, and is very dangerous. Please also check if the grounding cable is disconnected or not.

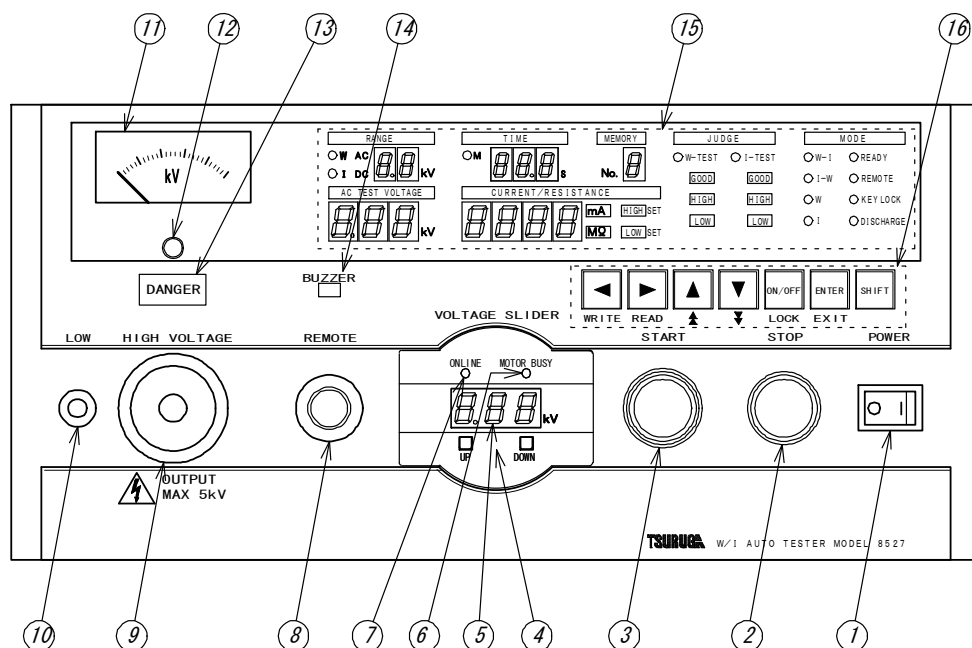
 WARNING
--

Insufficient grounding may cause the electric shock.

- (2) Never touch the output terminals, high voltage cable and test samples during the test.
- (3) When making a connection to the test sample, connect the LOW side prior to the other, with the output OFF.
- (4) When operating the Model 8527, put a rubber glove for prevention of electric shock.

3. Name of parts and functions

3.1 ● Front panel



- ① **POWER** Power supply switch. Press right to turn ON and left to turn OFF.
- ② **STOP** Switch to interrupt the test operation, to reset a judgement and to stop the slider.
- ③ **START** Switch to start the test.
This switch is disabled when the **REMOTE** connector ⑧ is used, or the remote operation is made through the **REMOTE** terminal blocks ⑮ or the **REMOTE/OUT** connector ⑰.

VOLTAGE SLIDER (for withstanding voltage test)

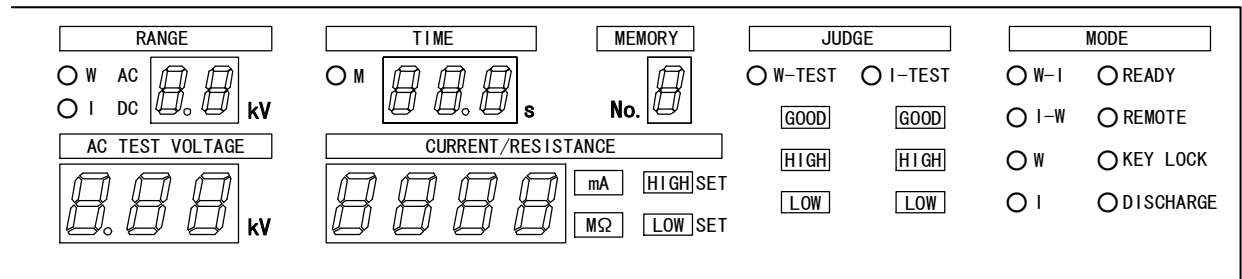
- ④ **UP**, **DOWN** Knob to adjust the test voltage of withstanding voltage test. It is disabled when the key lock function is turned ON.
- ⑤ **Slider display** Displays the slider voltage converting it into the test voltage.
- ⑥ **MOTOR BUSY lamp** Lit up when the slider is in operation.
- ⑦ **ONLINE lamp** Lit up when the remote controlled by RS-232C interface. (For details, refer to the instruction manual of RS-232C interface.)
- ⑧ **REMOTE** Connector for remote control.
- ⑨ **HIGH VOLTAGE** High voltage side terminal of the test voltage output. It outputs high voltage during the test, so never touch it during the **DANGER** lamp ⑬ is lit up. The operator may suffer electric shock. It is common with **HIGH VOLTAGE** on the back panel.
- ⑩ **LOW** Low voltage side terminal of the test voltage output. It is of the same voltage as the case of this tester.
- ⑪ **Output voltmeter** Electrical instrument to indicate the output voltage value.
- ⑫ **Zero adjuster** Knob to adjust the zero position of the voltmeter for withstanding voltage tester. The adjustment is done when no power is applied.

- ⑬ **DANGER** lamp It gives warning during the test voltage is output.
 Never touch the high voltage cable and test sample during the **DANGER** lamp ⑬ is lit up. The operator may suffer electric shock.
- ⑭ Buzzer hole Aperture for the buzzer.

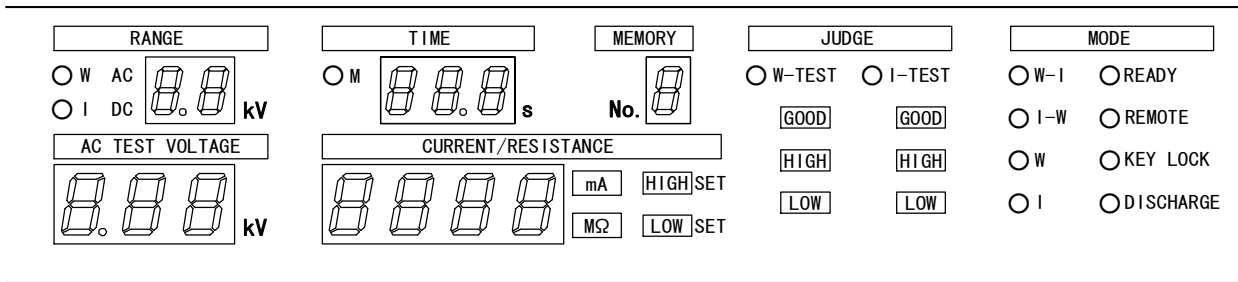
⚠ WARNING

Do not put any thing in the buzzer hole or insert a screwdriver or else.

- It may cause electric shock if touched with metal piece.
- It may also cause trouble of breakdown or mal-function.



- ⑮ Display section Displays the information of test condition, test result and so on.
- READY lamp Lit up in READY status.
- REMOTE lamp Lit up when the remote control is done.
 During this lamp is lit up, the **START** switch ③ is disabled.
- KEY LOCK lamp Lit up when the key lock function is turned ON.
 During this lamp is lit up, the switches other than the **START** switch ③ and the **STOP** switch ② are disabled.
- DISCHARGE lamp Lit up when the status is READY and the discharge function is turned ON.
 During the test it turns OFF, and after the insulation resistance test, it is lit up during the discharging.
- W-I lamp Lit up when the test mode moves W-test → I-test.
- I-W lamp Lit up when the test mode moves I-test → W-test.
- W lamp Lit up when the test mode is withstanding voltage test.
- I lamp Lit up when the test mode is insulation resistance test.
- Range display W AC Displays the voltage range of withstanding voltage test. (5.0kV)
 (RANGE) I DC Displays the voltage range of insulation resistance test. (0.5kV or 1.0kV)
- Voltage display of Withstanding volt. test (AC TEST VOLTAGE) The referential voltage or the voltage value at the output terminal is read out and displayed respectively in READY status or during the test.
- Current/resistance display (CURRENT/RESISTANCE) (1) During the setting of high and low leak current, it displays the set value of leak current, and during the test, it displays the measured value.
 (2) During the setting of high and low resistance, it displays the set value of resistance, and during the test, it displays the measured value.



- mA lamp Lit up during the withstanding voltage test to indicate that the value displayed on the current/resistance display is leak current value.

- MΩ lamp Lit up during the insulation resistance test to indicate that the value displayed on the current/resistance display is insulation resistance value.

- Test time display (TIME) Displays the test time of each test (withstanding voltage and insulation resistance test). During the test it display the time remaining. When the test time is set to OFF, the time lapse is displayed during the test.

- M lamp Lit up during the mask timer time, in the insulation resistance test.

- HIGH SET (1) Lit up at the setting of high limit leak current, during the W-test.
 (2) Lit up at the setting of high limit resistance, during the I-test.

- LOW SET (1) Lit up at the setting of low limit leak current, during the W-test.
 (2) Lit up at the setting of low limit resistance, during the I-test.

- Memory No. display (MEMORY No.) Displays memory number being set in the memory mode.

- W-TEST lamp Lit up during the withstanding voltage test.

- GOOD Lit up after the W-test when the test result is acceptable.

- HIGH Lit up after the W-test when the test result is rejected for its high limit.

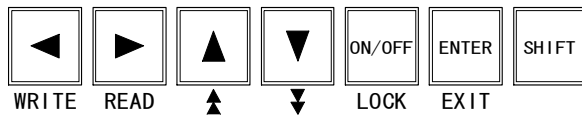
- LOW Lit up after the W-test when the test result is rejected for its low limit.

- I-TEST lamp Lit up during the insulation resistance test.

- GOOD Lit up after the I-test when the test result is acceptable.

- HIGH Lit up after the I-test when the test result is rejected for its high limit.



- LOW Lit up after the I-test when the test result is rejected for its low limit.





⑩ Setting keys



Keys to set the test condition such as referential voltage, leak current, test time etc. and to write in or read out the memory.



 key
WRITE



Key to feed and select each setting item toward left.
(When pressed together with  key, it becomes  key used for writing the memory.)



 key
READ

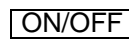
Key to feed and select each setting item toward right.
(When pressed together with  key, it becomes  key used for read-out of the memory.)


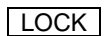
 key


Key to increase the first digit of the set value one by one digit.
(When pressed together with  key, it becomes  key used to increase the second digit of the set value one by one digit.
When kept pressed, the digit continuously increases.



 key


Key to decrease the first digit of the set value one by one digit.
(When pressed together with  key, it becomes  key used to decrease the second digit of the set value one by one digit.
When kept pressed, the digit continuously decreases.

 key
LOCK

Key for selection to set or not to set each setting item.
(When pressed together with  key, it becomes  key and is used to set/reset the key lock.)

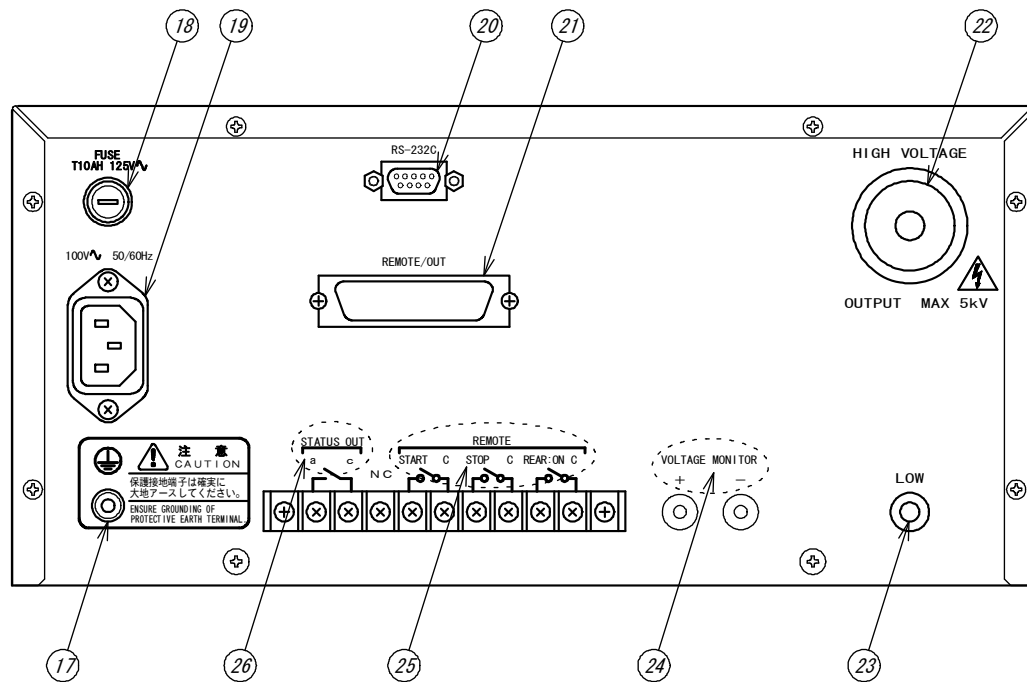
 key
EXIT

Key to finish the setting of test condition or to decide in memory setting.
(When pressed together with  key, it becomes  key used to interrupt the setting or memory mode and return to READY status.)

 key

Shift key to use together with one of other keys.
(The function indicated on each key in blue letters becomes effective.)

3.2 ●Rear panel



⑰ Protecting grounding terminal Terminal for grounding to the earth. Make sure to ground to the earth using the attached earth cable (green). It is the same voltage as the case of the tester.

⑱ **FUSE 10A** Fuse socket. The rate of fuse is as the following table shows.

Type	Power source voltage	Rate of fuse
Standard	100V AC	125V 10A
	115V AC	
Optional	200V AC	250V 5A
	220V AC	
	240V AC	

Please do not use it excluding an attached fuse because it is a rush-resistive type.

⑲ **100V~50/60Hz** Inlet for connection of supply power source. It conforms to the attached power cord (3P).

⑳ **RS-232C** Connector for RS-232C serial communication (D-sub 9 pins). Refer to the instruction manual of interface.

㉑ **REMOTE/OUT** Connector for the setting inputs of interlock and to output the output signals. For detail, refer to the article 15.1 (P52).





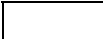

㉒ **HIGH VOLTAGE** High voltage side terminal of test voltage output. It outputs high voltage during the test, so never touch it during the **DANGER** lamp ⑬ is lit up. The operator may suffer electric shock. It is common with **HIGH VOLTAGE** on the front panel.

㉓ **LOW** Low voltage side terminal of the test voltage output. It is of the same voltage as the case of this tester.

㉔ **VOLTAGE MONITOR** Monitor output of withstanding voltage output. Output voltage: 0~5V DC (to 0~5kV AC)

<p>25</p> <p>REMOTE</p> <p>START C</p> <p>STOP C</p> <p>REAR:ON C</p>	<p>Terminal blocks for remote control.</p> <p>When the REAR:ON C terminal is in short-circuit, the test is started by short-circuiting the START C terminal.</p> <p>When the REMOTE connector ⑧ is in use, START C terminal is disabled.</p> <p>By making the short-circuit between the terminals, the test action can be interrupted and the judgement result can be reset.</p> <p>By making the short-circuit between the terminals, the start of the test becomes possible from the rear terminals. The START switch ③ on the front panel becomes ineffective.</p> <p>For detail, refer to the article 14.2 (P48).</p>
<p>26</p> <p>STATUS OUT</p>	<p>Terminal blocks for status output.</p> <p>For detail, refer to the article 16.1 (P55).</p>

3.3 ● Status of display and expression in instruction manual

	Digital display	Flat display	LED lamp
Lit-up mode			● W-TEST
Blinking mode			◎ W-TEST
Turn-off mode			○ W-TEST

4. Preparation prior to use

4.1 ● Zero adjustment of output voltmeter

Before powering ON the power source switch, please confirm that the pointer of the output voltmeter ⑪ indicates “0”.
If it is deviated, make an adjustment turning the zero adjuster ⑫ with the screwdriver.

4.2 ● Connection of protective ground terminal

Make sure to connect the protective grounding terminal ⑰ to the earth. If the grounding is insufficient, the tester housing is charged with high voltage when the output is short-circuited to the earth or the power source line, and is very dangerous.
Please also check if the grounding cable is disconnected or not.

WARNING

Insufficient grounding may cause the electric shock.

4.3 ● Connection with external control device

An external control device can be connected to the **REMOTE** connector ⑧, **REMOTE** terminal ⑮, **REMOTE/OUT** connector ⑲ and **STATUS OUT** terminal ⑳.
For detail of connection, refer to the article 14~15 (P48~54).

4.4 ● Connection of high voltage cable

Choice of output section

Make a choice where to take out the high voltage output, either from the front panel or from the rear panel. During the test, the high voltage output terminal at both front and rear panel are charged with high voltage.

When the front panel is selected

Make a connection of the attached high voltage cable to the **HIGH VOLTAGE** terminal ⑨ and **LOW** terminal ⑩.

When the rear panel is selected

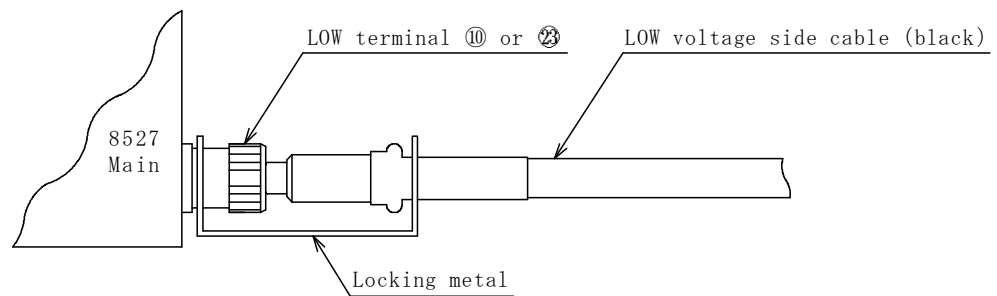
Make a connection of the attached high voltage cable to the **HIGH VOLTAGE** terminal ⑲ and **LOW** terminal ⑳.

Use the attached high voltage cable or the cable appropriate to the voltage to use.

WARNING

- Before making a connection of high voltage cable, ensure that the output is OFF and the output voltmeter ⑪ indicates “0”V.
There is a danger of electric shock.
- A vinyl coating of alligator clip of the attached high voltage cable has no insulation withstandability, so never touch it during the test.
There is a danger of electric shock.
- Take out the high voltage output at either side, front or rear panel.
Never use the both sides together, as it is very dangerous.

After connecting the low voltage side cable to the **LOW** terminal, make sure to fix the locking metal to the terminal.



Fasten the U-shape ditch side to the LOW terminal of the tester main unit.

⚠ WARNING

If the low voltage side cable is disconnected, whole the test sample is charged with high voltage and may cause a danger of an electric shock.

4.5 ● Connection of power supply cable

After confirming that the power supply switch **POWER** ① is OFF, connect the attached power source cord to the inlet for the supply source power on the rear panel. Connect the plug (3P) of power source cord to the socket with the earth connection.

⚠ WARNING

Confirm that the power source voltage is 100V AC, and use the tester within the range of 90V~110V AC. Use of the tester out of this range causes a breakdown or incomplete operation. In case of optional non-standard power source voltage, use the tester within $\pm 10\%$ of the nominal voltage.

4.6 ● Throw in and shut off of power source

The test conditions at the time of power shutdown are retained even if the power is turned OFF and the tester returns with these test conditions when the power is turned ON again. To shutdown the power, turn OFF the power when the READY lamp is in lit up status.

⚠ WARNING

This unit is the mechanical motor slider type tester. Please pay attention that, with the standard setting at the delivery from factory, the set voltage for the withstanding voltage test when the **POWER switch ① is turned ON becomes the same as that before the **POWER** switch ① is shutdown. Before using the tester, check the setting of referential voltage and the display of VOLTAGE SLIDER. Please never start the test without these confirmation.**

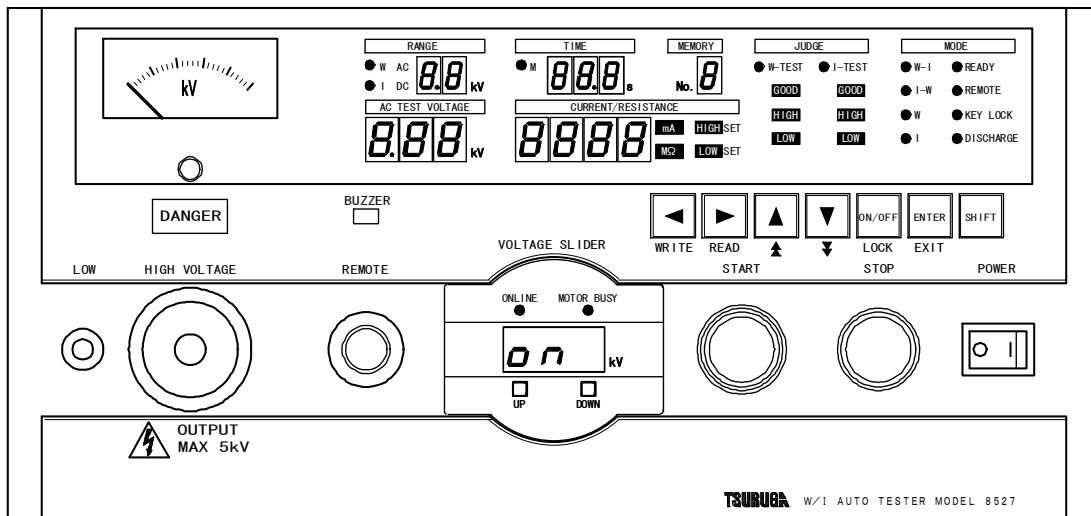
⚠ CAUTION

While the test voltage is output, do not turn OFF the **POWER switch ①, as it will cause the breakdown, excepting such emergency case that the voltage output can not decreased even though the **STOP** switch is pressed.**

4.7 Before the test

- (1) Before starting the operation, carefully read in the article 2.2 **Cautions for handling** and turn ON the **POWER** switch.
- (2) After powering ON of the **POWER** switch, the lamp test of the display is done. The content to be displayed after the lamp test depends upon the test conditions before the tester is shutdown.
 - When the power on zero volt slider is set to ON, the slider display shows 0.00kV.
 - When the power on zero volt slider is set to OFF, the slider display shows the set value of the slider voltage.
 - When the power on zero volt slider is set to OFF and the set value of the slider voltage is also set to OFF, the slider voltage does not move up or down, and it displays the slider voltage converting into the test voltage.

4.7.1 Power on zero volt slider function



Select the status of slider voltage for the withstanding voltage test at powering on.

CAUTION

Prior to the start of test, confirm the slider display value.

Setting procedure **To enter setting mode of power on zero volt slider**

- ① Keep pressing the **DOWN** key, turn ON the power.
- ② The tester enters the lamp test status. The lamp test for the **DANGER** lamp is for about 3 seconds. Then the slider display is lit up with **ON** or **OFF**. The operator may leave the **DOWN** key at this moment.

Change of setting

With this status, **ON** or **OFF** can be selected every time the **DOWN** key is pressed.

Finish

Turn the power OFF.

To validate the changed setting

By re-applying the power, the new setting is validated.

Slider action at powering on after the setting

[at ON]

- The display on the front panel becomes lamp test status.
- The slider display goes down to 0.00kV. The tester enters the lamp test status. The lamp test for the **DANGER** lamp is for about 3 seconds.

Caution: For the control signal and command during the process from powering on to the slider voltage 0.00kV.

- ① The **START**, **STOP** switches or keys are not accepted.
- ② It becomes 0.00kV no matter whether the **REMOTE/OUT** connector is or not, or regardless of set conditions.
- ③ The command of RS-232C is not accepted either.

[at OFF]

- When the slider voltage is set in the test conditions before the power shutdown, the slider goes up when the tester is powered ON and after finishing the lamp test.

5. Setting items in each mode

5.1 ●READY status

When turned ON the **POWER** switch ①, the lamp test is done and then **READY** switch is lit up, entering into READY status.

In READY status of automatic test mode (W-I, I-W), the setting of test condition of the withstanding voltage test and insulation resistance test are alternatively displayed at the cycle of 2 seconds.

The test condition when the power was shutdown last time is displayed.

Pressing the **START** switch ③ starts the test.

In READY mode, the setting of the following 5 items can be done.

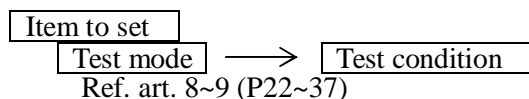
- | | |
|------------------------------|-----------------------------------|
| (1) Test condition | Refer to the article 8~9 (P22~37) |
| (2) Key lock | Refer to the article 12 (P46) |
| (3) Buzzer sounding | Refer to the article 18 (P59) |
| (4) Status output conditions | Refer to the article 16.3 (P56) |
| (5) Special test mode | Refer to the article 13 (P47) |
- ① Double action
 - ② GOOD hold
 - ③ Momentary
 - ④ FAIL mode

5.2 ●Setting mode of test condition

In READY status, by pressing the **▶** (or **◀**) key, **READY** is turned off and the tester enters into the test condition setting mode.

In the test condition setting mode, the test mode and condition can be set or changed.

A press of **ENTER** key finishes the setting and the tester becomes READY status.

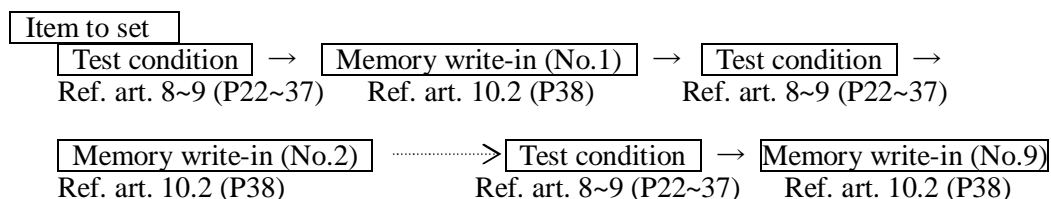


5.3 ●Memory write-in mode

After setting the test condition in the test condition setting mode, press the **WRITE** key (**SHIFT** + **◀** at a time), then the memory number blinks, being ready to write in the memory.

In the memory write-in mode, 9 memory sets can be written. Each memory set consists of 12 items of test conditions which are set in the test condition setting mode.

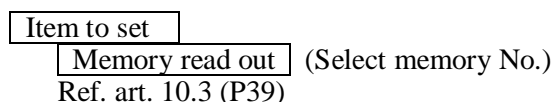
A press of **ENTER** key finishes the setting and the tester becomes READY status.



5.4 ●Memory read-out mode

In READY status, by pressing the **READ** key (**SHIFT** and **▶** at a time), a memory No. blinks and the tester becomes ready to read out the memory. In the memory read out mode, one of the max. 9 memories written in [ref. art. 10.2 (P38)] can be called up and read out.

A press of **ENTER** key finishes the setting and the tester becomes READY status.



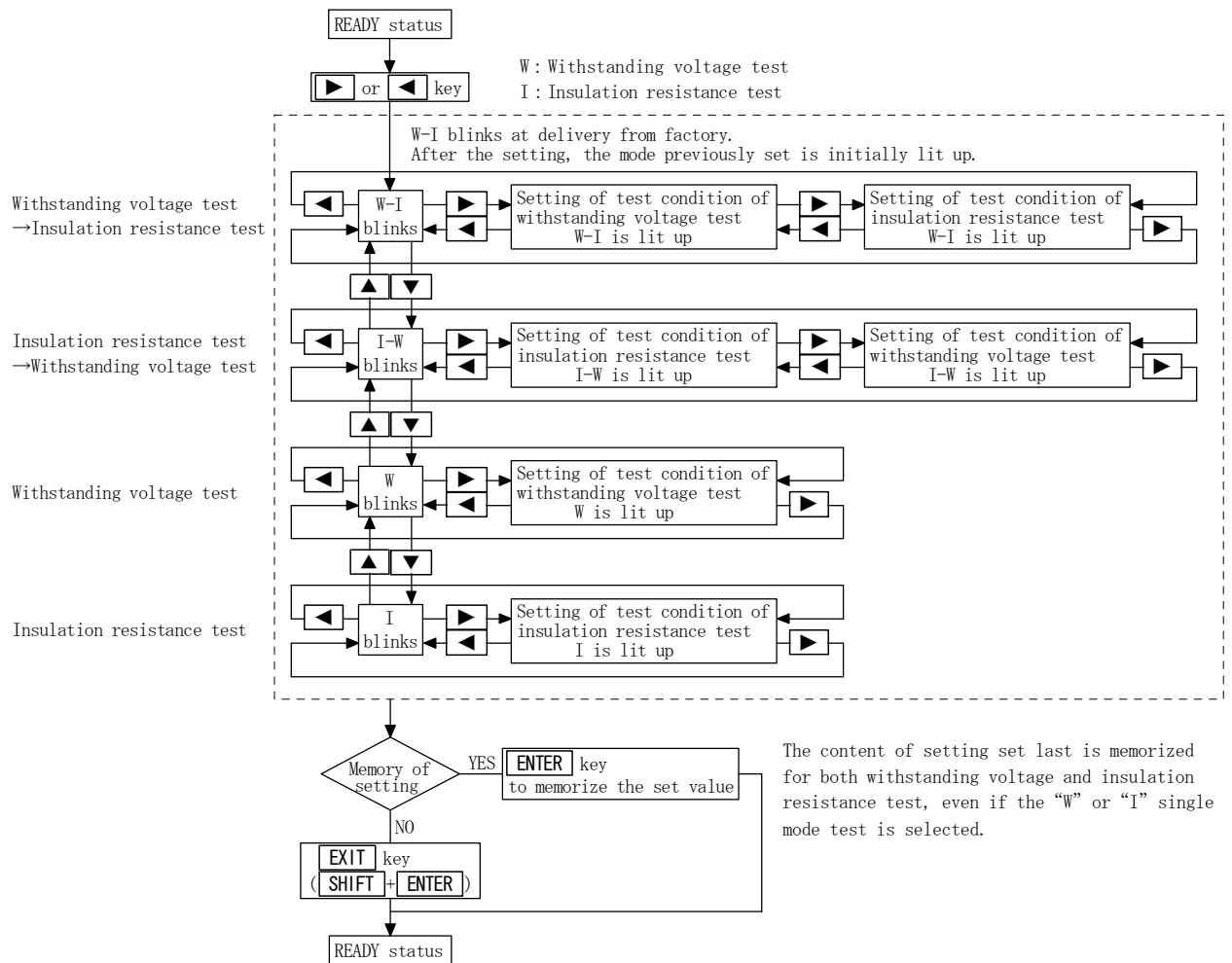
6. Kind of test and flow of setting

6.1 ● Kind of test

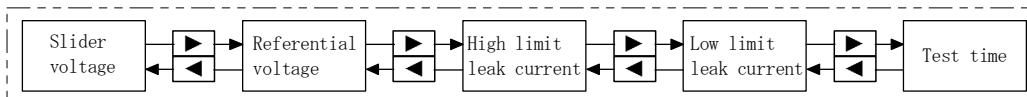
Four types of the test mode can be selected as follows.

- (1) W-I (Withstanding voltage test → Insulation resistance test)
- (2) I-W (Insulation resistance test → Withstanding voltage test)
- (3) W (Withstanding voltage test)
- (4) I (Insulation resistance test)

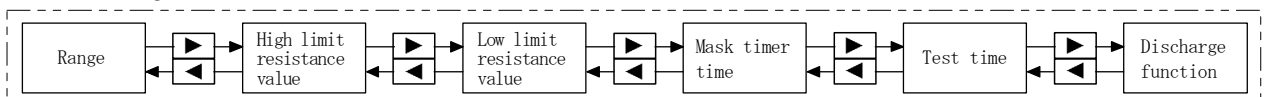
6.2 ● Flow of setting



Flow of setting for withstanding voltage test



Flow of setting for insulation resistance test



7. Operation of motor slider

In order to do the withstanding voltage test according to the specifications of the sample to be tested, it is necessary to set the test voltage.

The motor type slider is built in the model 8527, instead of knob type, so the rotation angle of the voltage adjuster can not be seen. Consequently, in every status of READY, motor in operation, test and judgement, the slider display ⑤ displays the voltage value of the slider, converting it into the test voltage value. However, the voltage drop due to the connection of the sample to be tested is not included.

There are manual setting and the automatic setting with which the designated voltage is automatically set.

7.1 ● Outline of operation of motor slider

7.1.1 Type of motor slider operation

- (1) Manual up and down operation
- (2) Automatic up and down operation

7.1.2 Priority between automatic and manual operation

- The manual operation can not be done during the automatic up and down. The automatic operation has the priority.
- When the automatic up & down is set during the up and down operation with / key, the automatic up and down takes the priority.

7.1.3 Test mode operable with motor slider operation and restriction for test start

- (1) The test mode which is operable with the slider operation.
 - W-I, I-W, W (W=withstanding voltage test, I=insulation resistance test)
 - In the test mode I, the slider display turns off and the slider up and down is no possible.
- (2) Restriction for the start of test
 - The test can not be started during the automatic or manual up and down.

7.1.4 Forced stoppage of motor slider

By the stop operation (switch, STOP terminal, remote connector STOP, RESET command), the slider up and down is stopped.

7.1.5 When the error occurred

- When the error has occurred during the up and down of the slider, it stops the up and down. After recovered from the error, the up and down become possible. Please refer to the article 20 for the recovery from the error.
- The setting by RS-232C is possible but the automatic up and down of the slider by the command WMARK=□. □□kV, MEMORY=□ can not be done. / key, the automatic up and down takes the priority.

CAUTION

The continuous up and down with / key is possible but the adjustment of 0.01kV resolution may be not possible.

7.2 ● Manual operation of motor slider

Conditions to able the operation

- ① While the KEY LOCK lamp is turned off.
- ② In READY status and during test or judgement (except for the error that the interlock generates).
- ③ Limited to the test mode W-I, I-W or W.

Conditions to disable the operation

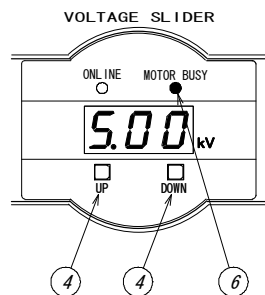
- ① While the KEY LOCK lamp is lit up.
- ② When the test mode is I.

Display content

While the / key ④ is operated, MOTOR BUSY lamp ⑥ is lit up. READY lamp is turned off.

Operable range

0.00~approx. 5.99kV (5.99kV or higher is operable depending upon the fluctuation of power source voltage).



Operation

Press of the key ④ makes the value rise.

Press of the key ④ makes the value fall.

Release from the / key ④ makes the value stop.

Note: Do not press the and key together. If they are pressed together, the key has the priority.

WARNING

Depending upon the fluctuation of power source voltage, the operation with with the setting of 5.99kV or higher is possible. But as it is very dangerous, use the tester within the specified range (within 5kV) as long as possible.

7.3 ● Automatic operation of motor slider

There are three types of automatic operation

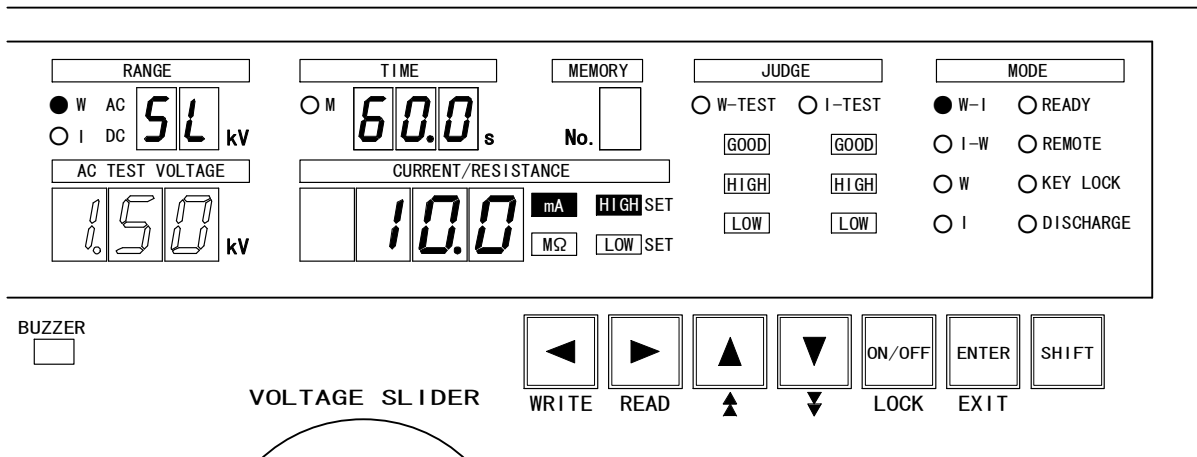
1. By means of key on the front panel.
2. By means of connector.
3. By means of RS-232C interface.

8. Setting of test condition for withstanding voltage test

The test condition can be set when the test mode W-I, I-W or W is selected.

8.1 Voltage of motor slider

Adjustable range: 0.00~5.99kV, OFF



To enter setting mode

- In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- Press key and make the test mode lamp lit.

Setting of slider voltage

- Press or key and select the status that the W AC lamp is lit up, the test voltage range display is lit up with 5L and the test voltage display blinks (refer to the above figure).
- While the test voltage display blinks, press or key and set the slider voltage. The second digit (0.10kV digit) can be set by pressing key (and at a time) or key (and at a time).
- When the slider voltage setting is unnecessary, press key and select the blinking OFF on the display.

To move to the previous setting

Press key and the setting changes as follows depending upon the test mode.

Test mode	Setting item after change
W-I	→ Returns to the blinking of W-I test mode lamp.
W	→ Returns to the blinking of W test mode lamp.
I-W	→ To discharge of insulation resistance.

To the next setting

Press key and it changes to the **setting of referential voltage**.

Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

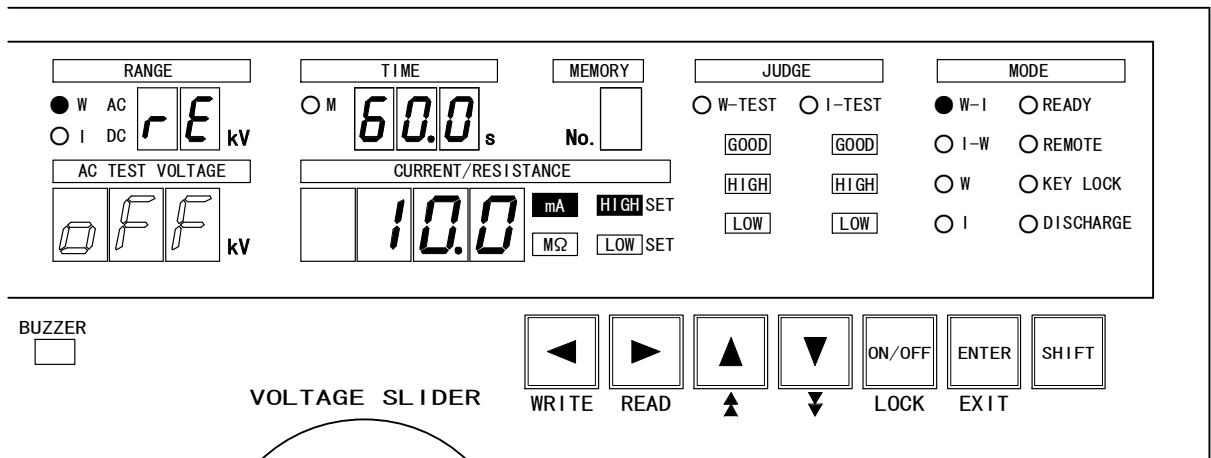
When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

8.2 ●Referential voltage

Adjustable range: 0.00~5.00kV, OFF

[When turning OFF the setting of referential voltage]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press or key and make the test mode lamp lit.

To turn OFF the setting of referential voltage

- ① Press or key and select the status that the W AC lamp is lit up, the test voltage range display is lit up with *rE* and the test voltage display blinks.
- ② Next, press key and select the status that the display blinks with *OFF* (refer to the above figure).

To move to the previous setting

Press key, then the setting changes to the **setting of slider voltage**.

To the next setting

Press key, then changes to the **setting of high limit of leak current**.

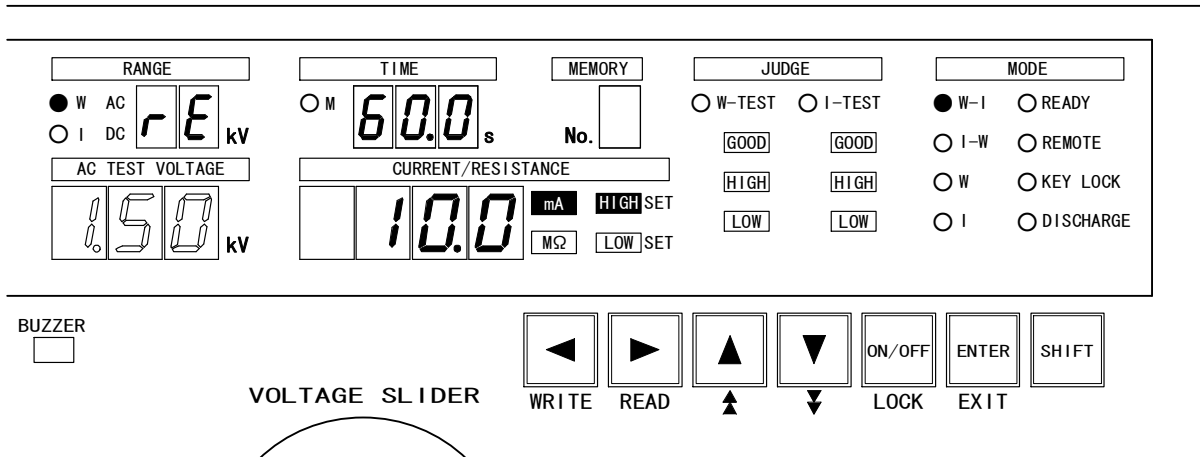
Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

[When setting the referential voltage]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press or key and make the test mode lamp lit.

Setting of referential voltage

- ① Press or key and select the status that the W AC lamp is lit up, the test voltage range display is lit up with rE and the test voltage display blinks.
- ② Next, press key and select the status that the display blinks with the numeral.
- ③ Press or key and set the referential voltage. Pressing of key (and at a time) or key (and at a time) allows the setting of second digit (the digit of 0.10kV) (refer to the above figure).

Note: The referential voltage can be set within the range of 0.00~5.00kV.

To move to the previous setting

Press key, then the setting changes to the **setting of slider voltage**.

To the next setting

Press key, then changes to the **setting of high limit of leak current**.

Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

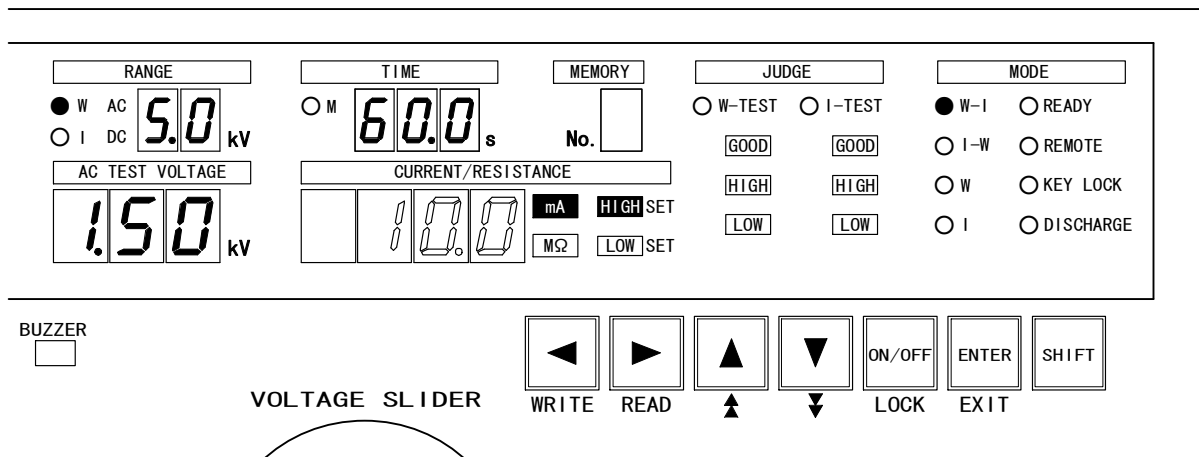
The test conditions in this case are those before entering the setting mode of test condition.

8.3 ● High limit of leak current

Adjustable range: 0.1~110.0mA.

Note: The high limit value of leak current can not be lower than that of low limit, so please apply either corrective solution below:

1. When the low limit value is determined, set the high limit value to exceed the value of low limit.
2. When the high limit value is determined, set the low limit value not to exceed the value of high limit, or turn OFF the low limit.



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press or key and make the test mode lamp lit.

Setting of high limit of leak current

- ① Press or key and select the status that the current/resistance display blinks, the is lit up and the is also lit (refer to the above figure).
- ② Press or key and set the high limit of leak current value.
- ③ Pressing of key (and at a time) or key (and at a time) allows the setting of second digit.

To move to the previous setting

Press key, then the setting changes to the **setting of referential voltage**.

To the next setting

Press key, then changes to the **setting of low limit of leak current**.

Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

8.4 ● Low limit of leak current

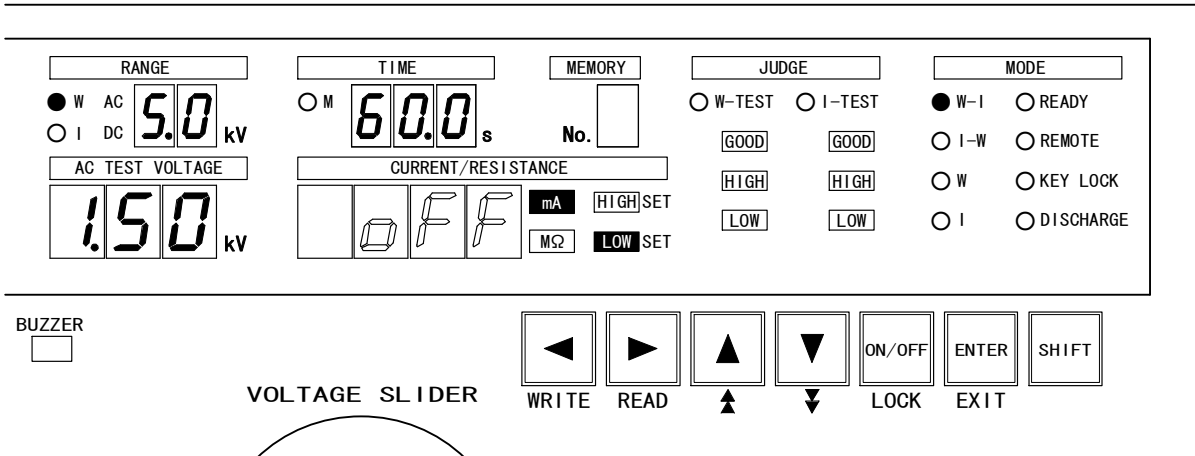
Adjustable range: 0.0~109.0mA, OFF.

Note-1: The low limit value of leak current can not be higher than that of high limit, so please apply either corrective solution below:

1. When the low limit value is determined, set the high limit value to exceed the value of low limit.
2. When the high limit value is determined, set the low limit value not to exceed the value of high limit.

Note-2: When the setting is turned OFF, no judgement for the low limit is made. When the setting is restored (ON) from OFF, and when the low limit value is higher than the high limit value, the low limit value is replaced with 0.0mA.

[When turning OFF the setting of low limit of leak current]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press or key and make the test mode lamp lit.

To turn OFF the setting of low limit of leak current

- ① Press or key and select the status that the current/resistance display blinks, the **mA** is lit up and the **LOW SET** is also lit.
- ② Next, press key and select the status that the display blinks with **OFF** (refer to the above figure).

To move to the previous setting

Press key, then the setting changes to the **setting of high limit of leak current**.

To the next setting

Press key, then changes to the **setting of test time**.

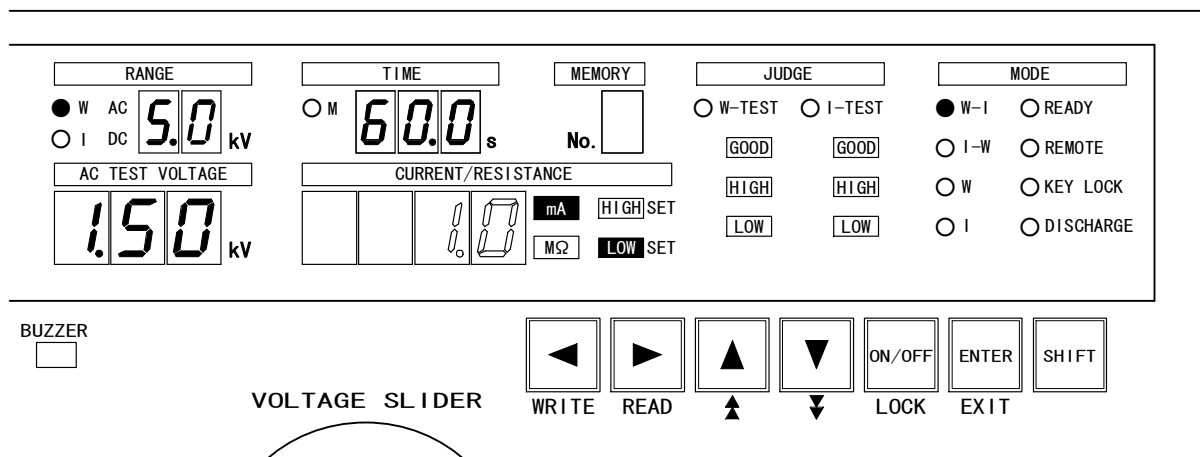
Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

[When setting the low limit of leak current]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press or key and make the test mode lamp lit.

Setting of low limit of leak current

- ① Press or key and select the status that the current/resistance display blinks, the is lit up and the is also lit.
- ② Next, press key and select the status that the display blinks with the numeral (refer to the above figure).
- ③ Press or key and set the low limit of leak current value. Pressing of key (and at a time) or key (and at a time) allows the setting of second digit.

To move to the previous setting

Press key, then the setting changes to the **setting of high limit of leak current**.

To the next setting

Press key, then changes to the **setting of test time**.

Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

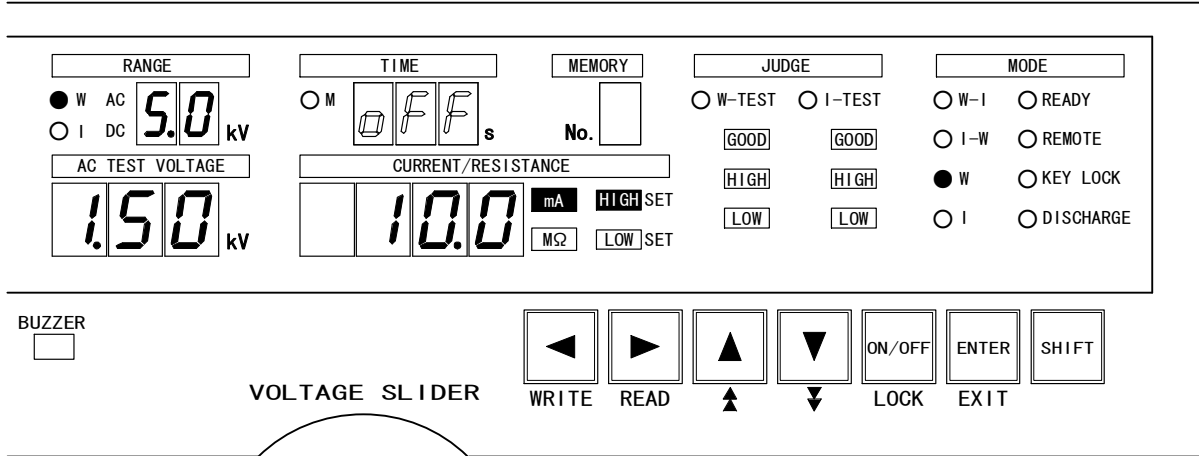
8.5 ● Test time

Adjustable range: 0.5~999 s

When the test mode is W, the test time can be switched OFF.

Note: When the test mode is W-I or I-W, please set the test time.

[When switching OFF the setting of test time]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the W test mode lamp blinking.
- ② Press or key and make the test mode lamp lit.

To turn OFF the setting of test time

- ① Press or key and select the status that the test time display blinks.
- ② Next, press key and select the status that the display blinks with *OFF* (refer to the above figure).

To move to the previous setting

Press key, then the setting changes to the **setting of low limit of leak current**.

To the next setting

Press key and the setting changes as follows depending upon the test mode.

Test mode	Setting item after change
W-I →	Setting of test voltage for insulation resistance test.
W →	Returns to the blinking of W test mode lamp.
I-W →	Returns to the blinking of I-W test mode lamp.

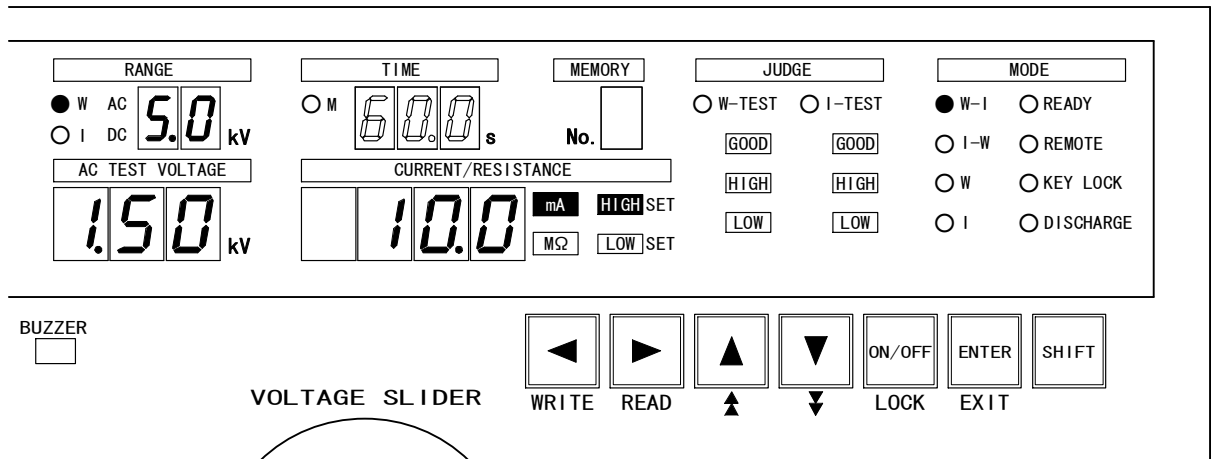
Finish of setting

Press key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

[When setting the test time]



To enter setting mode

- ① In READY status, press [▶] or [◀] key, then the test mode lamp blinks. Test mode lamp moves up and down with [▲] or [▼] key. Make the required test mode lamp blinking (W-I, I-W or W lamp).
- ② Press [▶] or [◀] key and make the test mode lamp lit.

Setting of test time

- ① Press [▶] or [◀] key and select the status that the test time display blinks.
- ② Next, press [ON/OFF] key and select the status that the display blinks with the numeral (refer to the above figure).
- ③ Press [▲] or [▼] key and set the test time. Pressing of [▲] key ([SHIFT] and [▲] at a time) or [▼] key ([SHIFT] and [▼] at a time) allows the setting of second digit. The adjustable range is 0.5~99.9s (resolution 0.1s), 100~999s (resolution 1s).

To move to the previous setting

Press [◀] key, then the setting changes to the **setting of low limit of leak current**.

To the next setting

Press [▶] key and the setting changes as follows depending upon the test mode.

Test mode	Setting item after change
W-I →	Setting of test voltage for insulation resistance test.
W →	Returns to the blinking of W test mode lamp.
I-W →	Returns to the blinking of I-W test mode lamp.

Finish of setting

Press [ENTER] key, then the slider moves up or down and the tester returns to READY status, memorizing the set having been made.

When the [EXIT] key ([SHIFT] and [ENTER] at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

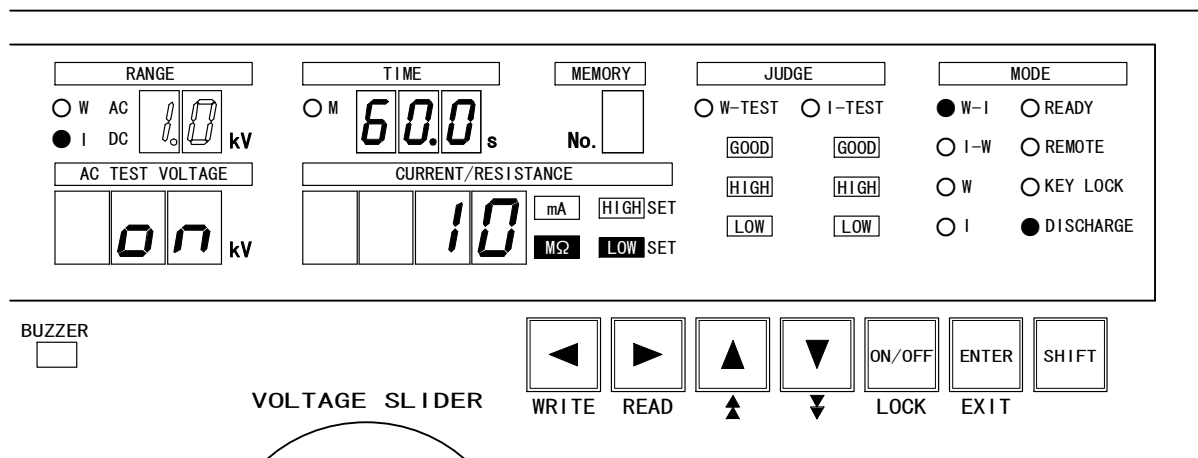
The test conditions in this case are those before entering the setting mode of test condition.

9. Setting of test condition for insulation resistance test

The test condition can be set when the test mode W-I, I-W or I is selected.

9.1 ● Test range of insulation resistance test

Range to set: 1.0kV or 0.5kV



To enter setting mode

- In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- Press or key and make the test mode lamp lit.

Change of test voltage range

- Press or key and select the I DC lamp is lit up and the test voltage range blinks (refer to the above figure).
- Next, change the test voltage to 1.0kV or 0.5kV with or key. When the test voltage is changed, the range display blinks with the selected voltage value.

To move to the previous setting

Press key and the setting changes as follows depending upon the test mode.

Test mode	Setting item after change
W-I →	Setting of test time of withstanding voltage test.
I-W →	Returns to the blinking of I-W test mode lamp.
I →	Returns to the blinking of I test mode lamp.

To the next setting

Press key, then changes to the **setting of high limit of resistance value**.

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

9.2 ● High limit of resistance value

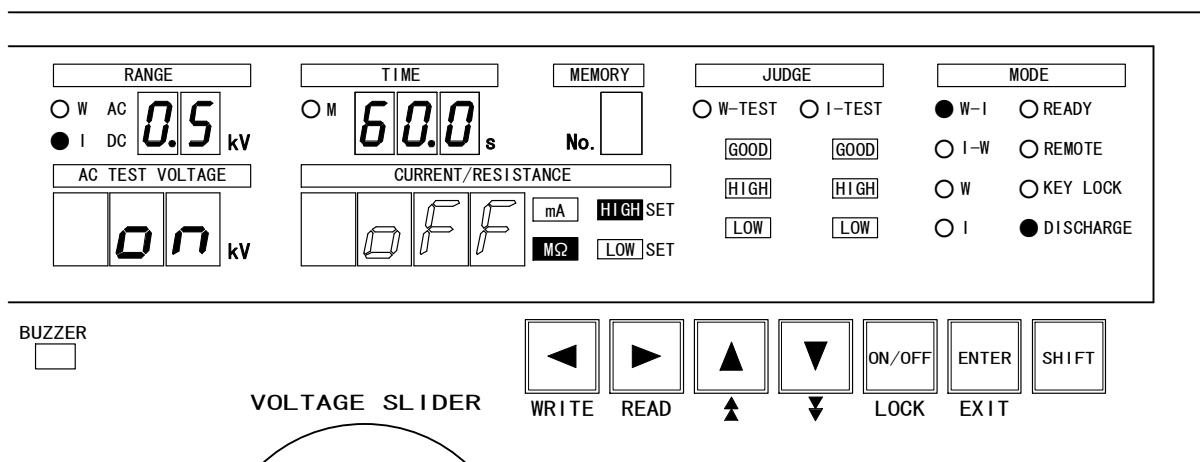
Adjustable range: 0.2MΩ~2000MΩ, OFF

Note-1: The adjustable range is 0.2~9.9MΩ (resolution 0.1MΩ) and 10~2000MΩ (resolution 1MΩ).

Note-2: The high limit of resistance value can not be lower than that of low limit, so please apply either corrective solution below:
 1. When the low limit value is determined, set the high limit value to exceed the value of low limit, or turn OFF the setting.
 2. When the high limit value is determined, set the low limit value not to exceed the value of high limit.

Note-3: When the setting is turned OFF, no judgement for the high limit is made. When the setting is restored from OFF, and when the high limit value is lower than the low limit value, the high limit value of resistance is replaced with 2000MΩ.

[When turning OFF the setting of high limit of resistance value]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- ② Press or key and make the test mode lamp lit.

To turn OFF the setting of high limit of resistance value

- ① Press or key and select the status that the current/resistance display blinks, the is lit up and the is also lit.
- ② Next, press key and select the status that the display blinks with *OFF* (refer to the above figure).

To move to the previous setting

Press key, then changes to the **setting of test range of insulation resistance test**.

To the next setting

Press key, then changes to the **setting of low limit of resistance value**.

Finish of setting

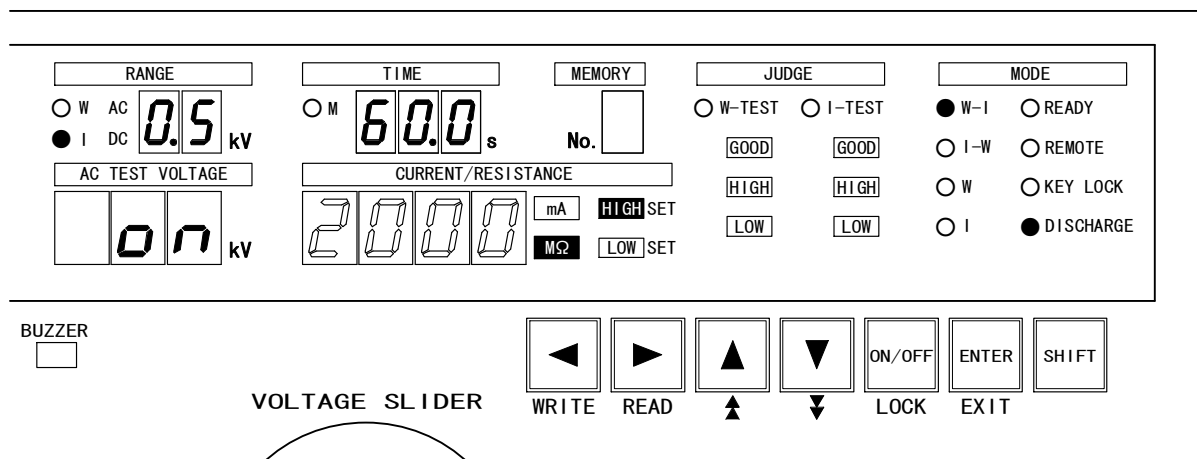
Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

[When setting the high limit of resistance value]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- ② Press or key and make the test mode lamp lit.

Setting of high limit of resistance value

- ① Press or key and select the status that the current/resistance display blinks, the $M\Omega$ is lit up and the HIGH SET is also lit.
- ② Next, press key and select the status that the display blinks with the numeral (refer to the above figure).
- ③ Press or key and set the high limit of resistance value. Pressing of key (and at a time) or key (and at a time) allows the setting of second digit (1MΩ digit).

To move to the previous setting

Press key, then the setting changes to the **setting of test range of insulation resistance test**.

To the next setting

Press key, then changes to the **setting of low limit of resistance value**.

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

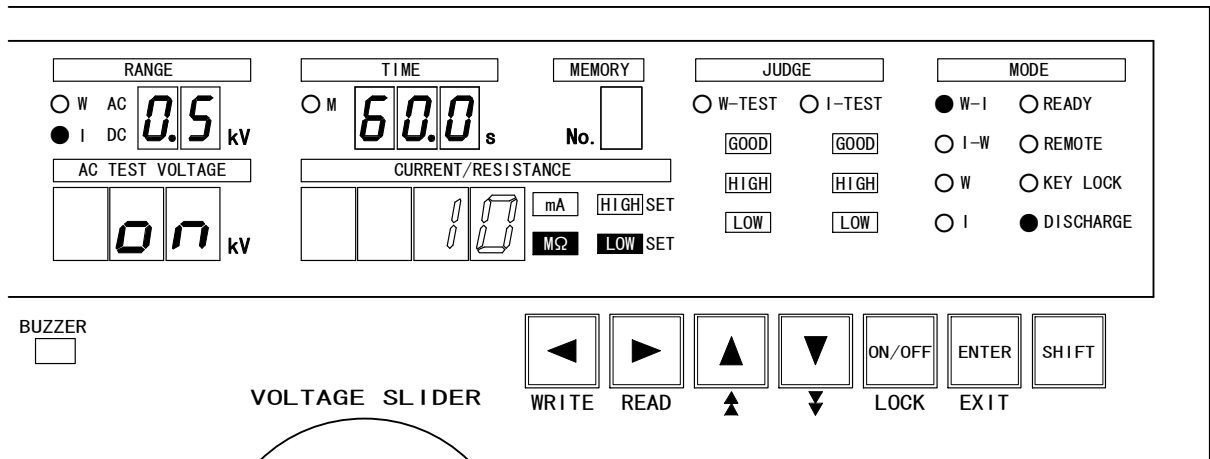
9.3 ● Low limit of resistance value

Adjustable range: 0.1MΩ~1999MΩ.

Note-1: The adjustable range is 0.1~9.9MΩ (resolution 0.1MΩ) and 10~1999MΩ (resolution 1MΩ).

Note-2: The low limit of resistance value can not be higher than that of high limit, so please apply either corrective solution below:

1. When the low limit value is determined, set the high limit value to exceed the value of low limit, or turn OFF the setting.
2. When the high limit value is determined, set the low limit value not to exceed the value of high limit.



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- ② Press or key and make the test mode lamp lit.

Setting of low limit of resistance value

- ① Press or key and select the status that the current/resistance display blinks, the is lit up and the is also lit.
- ② Next, press or key and set the low limit of resistance value.
- ③ Pressing of key (and at a time) or key (and at a time) allows the setting of second digit.

To move to the previous setting

Press key, then the setting changes to the **setting of high limit of resistance value**.

To the next setting

Press key, then changes to the **setting of mask timer time**.

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

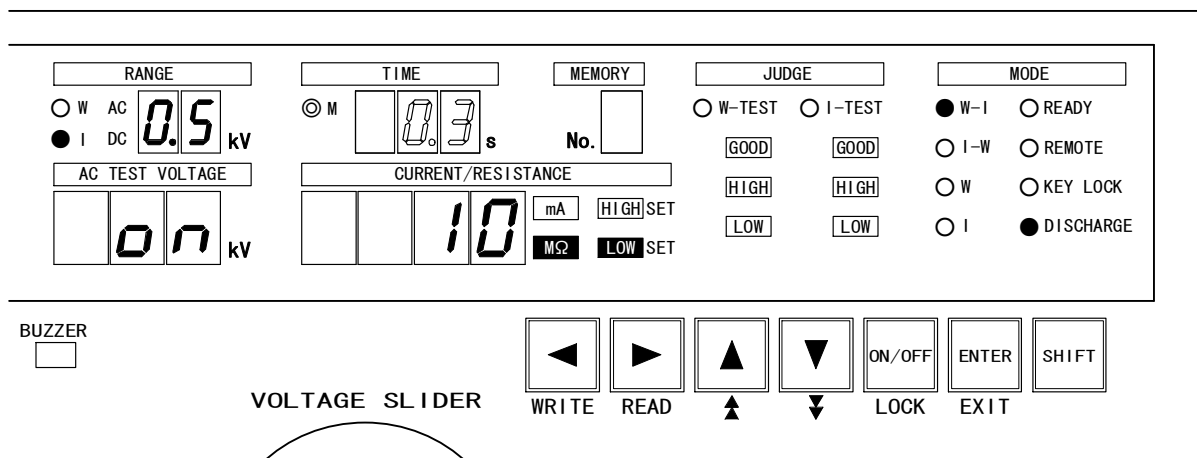
When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

9.4 ● Time of mask timer

Adjustable range: 0.3~50.0s. Mask time can not be turned OFF.

Note: The mask timer can not be set to the time 0.2 s or less than the test time.



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- ② Press or key and make the test mode lamp lit.

To set the mask timer time

- ① Press or key and select the status that the M lamp and the test time display blink.
- ② Next, press key and select the status that the display blinks with the numeral (refer to the above figure).
- ③ Press or key and set the mask timer time. Pressing of key (and at a time) or key (and at a time) allows the setting of second digit (digit of 1s).

To move to the previous setting

Press key, then changes to the **setting of low limit of resistance value.**

To the next setting

Press key, then changes to the **setting of test time.**

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

9.5 ● Test time

Adjustable range: 0.5~999 s

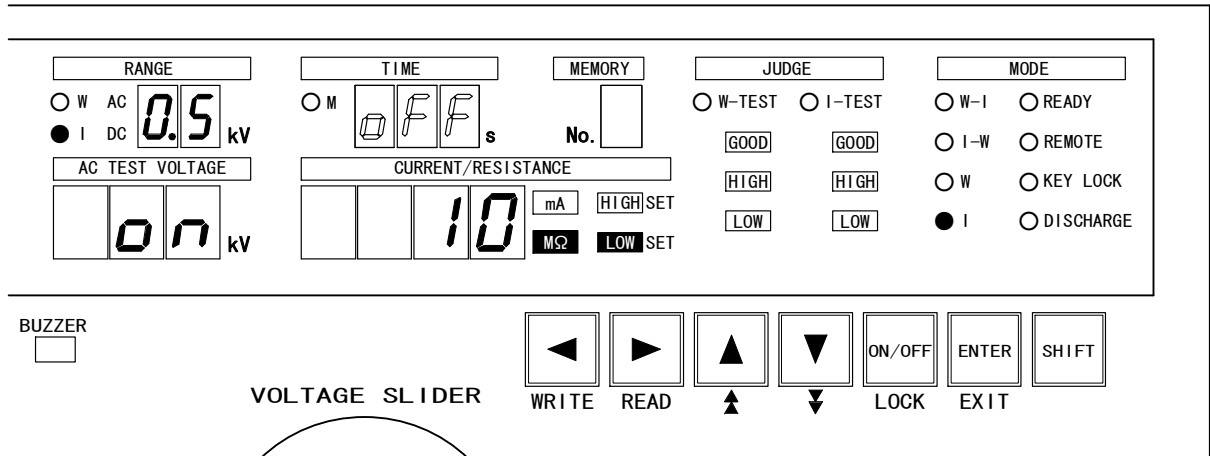
When the test mode is I, the time can be switched OFF.

Note-1: Make an adjustment to the time 0.2s or higher than that of mask timer time.

Note-2: When the setting is restored from OFF, and when the time is less than the mask timer time, the test time is replaced with 60.0s.

Note-3: Set the test time when the test mode is W-I or I-W.

[When switching OFF the setting of test time]



To enter setting mode

- In READY status, press **▶** or **◀** key, then the test mode lamp blinks. Test mode lamp moves up and down with **▲** or **▼** key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- Press **▶** or **◀** key and make the test mode lamp lit.

To switch OFF the setting of test time

- Press **▶** or **◀** key and select the status that the test time display blinks.
- Next, press **ON/OFF** key and select the status that the display blinks with **OFF** (refer to the above figure).

To move to the previous setting

Press **◀** key, then changes to the **setting of mask timer time**.

To the next setting

Press **▶** key, then changes to the **setting of discharging function**.

Finish of setting

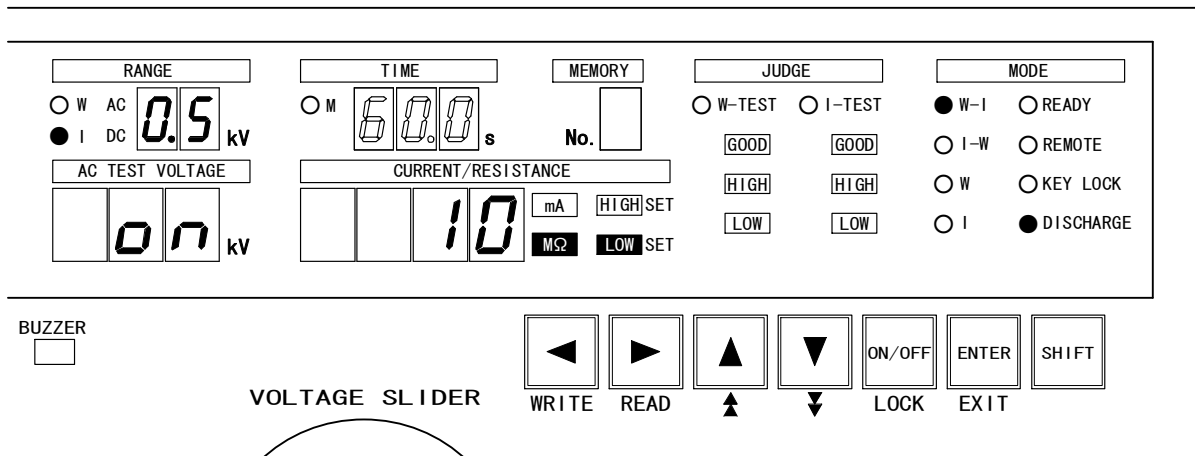
Press **ENTER** key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the **EXIT** key (**SHIFT** and **ENTER** at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

[When setting the test time]



To enter setting mode

- ① In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- ② Press or key and make the test mode lamp lit.

Setting of test time

- ① Press or key and select the status that the test time display blinks.
- ② Next, press key and select the status that the display blinks with the numeral (refer to the above figure).
- ③ Press or key and set the test time. Pressing of key (and at a time) or key (and at a time) allows the setting of second digit (digit of 1s).

To return to the previous setting

Press key, then changes to the **setting of mask timer time**.

To the next setting

Press key, then changes to the **setting of discharging function**.

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

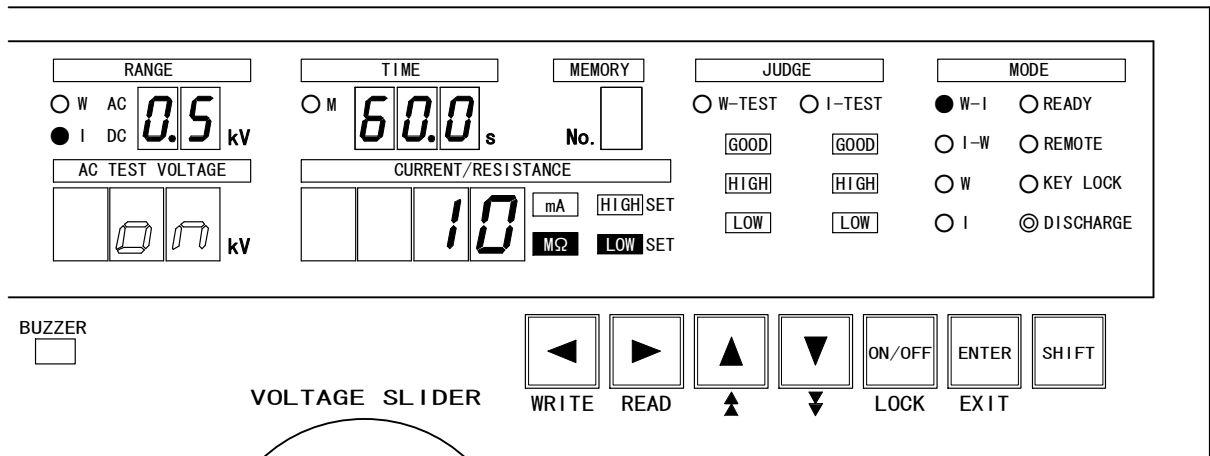
The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

9.6 ● Discharging function

Setting: ON or OFF



To enter setting mode

- In READY status, press or key, then the test mode lamp blinks. Test mode lamp moves up and down with or key. Make the required test mode lamp blinking (W-I, I-W or I lamp).
- Press or key and make the test mode lamp lit.

To set the discharging function

- Press or key and select the status that the test time display blinks with *on* or *off* and DISCHARGE lamp also blinks.
- When the discharging function is necessary, press key and select the status that the display blinks with *on* (refer to the above figure).
- When the discharging function is not necessary, press key and select the status that the display blinks with *off*.

To move to the previous setting

Press key, then changes to the **setting of test time**.

To the next setting

Press key and the setting changes as follows depending upon the test mode.

Test mode	Setting item after change
W-I →	Returns to the blinking of W -I test mode lamp.
I →	Returns to the blinking of I test mode lamp.
I-W →	Setting of referential voltage for the withstanding voltage test.

Finish of setting

Press key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W.

When the key (and at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

The test conditions in this case are those before entering the setting mode of test condition.

10. Memory function

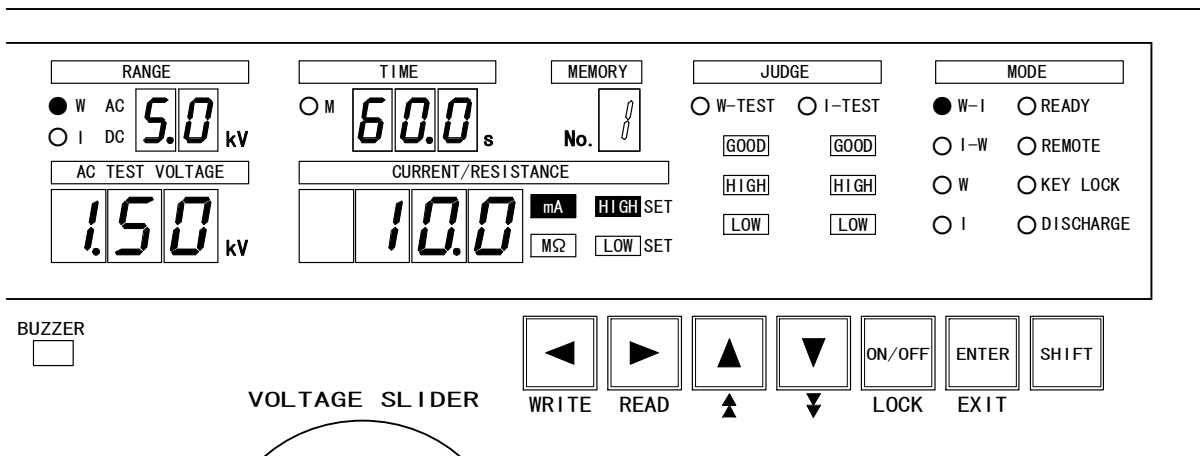
This tester is provided with 9 program memories to memorize the test mode and the setting of test condition of withstanding voltage and insulation resistance test.

10.1 ● Configuration of memory

Each memory can memorize one type of test mode, 5 items of the test conditions of withstanding voltage test and 6 items of the test conditions of insulation resistance test. For the content of the type and items, please refer to the following table.

Type of test mode	Setting of test condition for withstanding voltage test	Setting of test condition for Insulation resistance test
1 items	5 items	6 items
W→I	Slider voltage setting	Range of test voltage
I→W	Referential voltage	High limit of resistance value
W	High limit of leak current	Low limit of resistance value
I	Low limit of leak current	Mask timer time
	Test time	Test time
		Discharging function

10.2 ● Memory write-in



Selection of memory No.

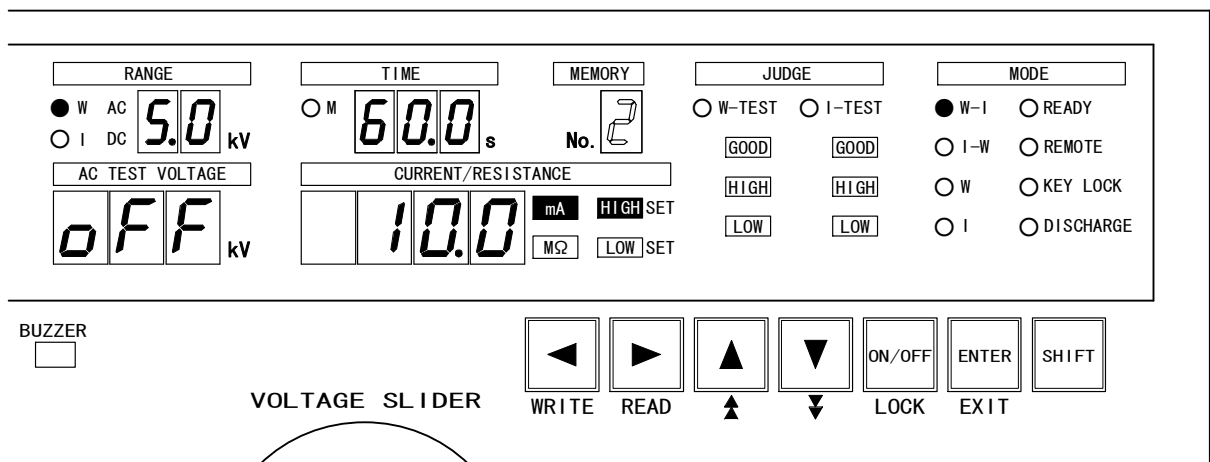
- Make the setting of test mode and test condition required to be written in the memory, and make the tester READY status (refer to the article 8~9).
- Press **WRITE** key (**SHIFT** and **◀** at a time), then the numeral on the memory No. display blinks, entering into the memory write-in mode (refer to the above figure).
- Select the memory No. to write in with **▲** or **▼** key.

Finish of memory write-in

Press **ENTER** key, then the tester returns to READY status, memorizing the set having been made.

The slider moves up or down when the test mode is W-I or I-W (refer to the article 10.4). When the **EXIT** key (**SHIFT** and **ENTER** at a time) is pressed in the setting mode, the memory write-in mode is interrupted and the tester becomes READY status. The memory No. in this case is that before entering the memory write-in mode.

10.3 ● Memory read-out

**Selection of memory No.**

- ① In READY status, press **READ** key (**SHIFT** and **▶** at a time).
- ② The numeral on the memory No. display blinks, entering into the memory read-out mode.
Each display displays the content of the setting of the memory No. in blinking.
- ③ Select the memory No. to read out with **▲** or **▼** key (refer to the above figure).

Finish of memory read-out

Press **ENTER** key, then the tester returns to READY status, memorizing the set having been made.

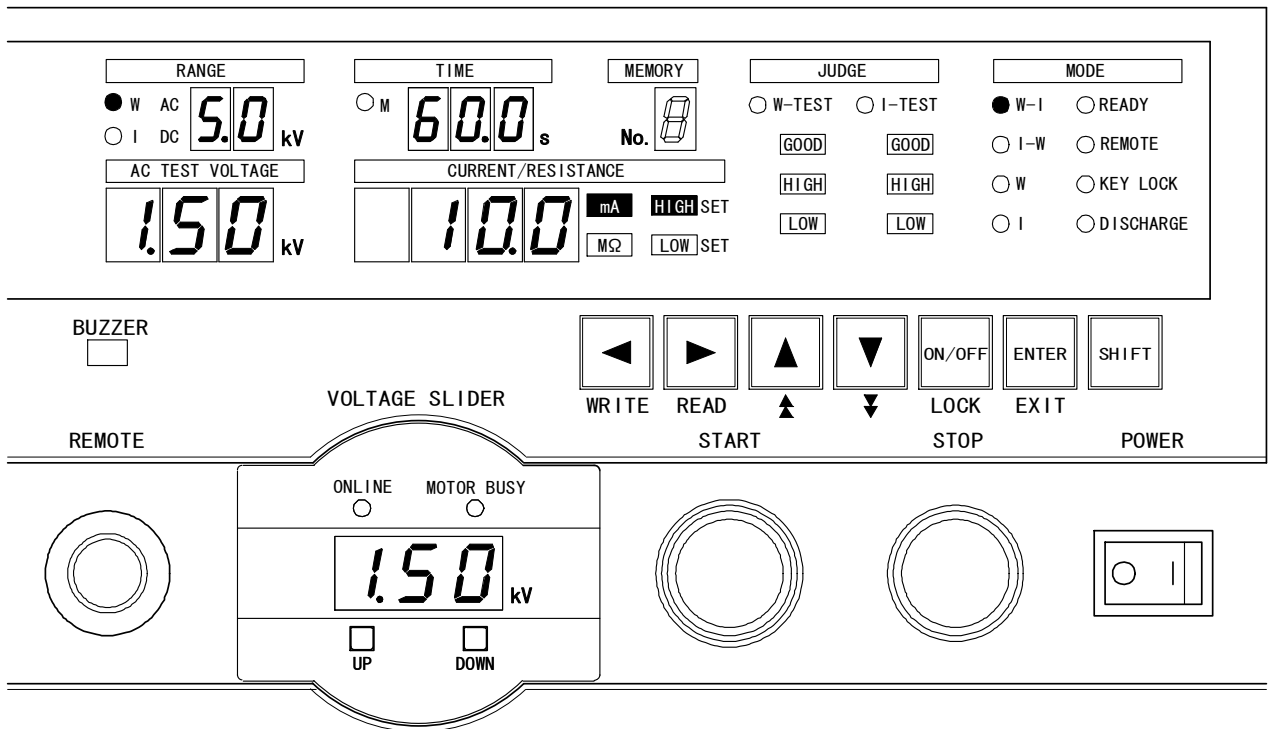
The slider moves up or down when the test mode is W-I or I-W (refer to the article 10.4).

When the **EXIT** key (**SHIFT** and **ENTER** at a time) is pressed in the setting mode, the memory read-out mode is interrupted and the tester becomes READY status.

The memory No. in this case is that before entering the memory read-out mode.

10.4 ● Voltage adjustment of motor slider by memory

By means of the memory No. write-in and read-out, the slider voltage can be adjusted. The figure below shows an example when the memory No.8 is read out.



Provisions to allow setting

- ① The slider voltage (0~5.99kV) is set in the test conditions of each memory No.
- ② The KEY LOCK lamp is turned off.
- ③ When the test mode is W-I, I-W or W.

Setting

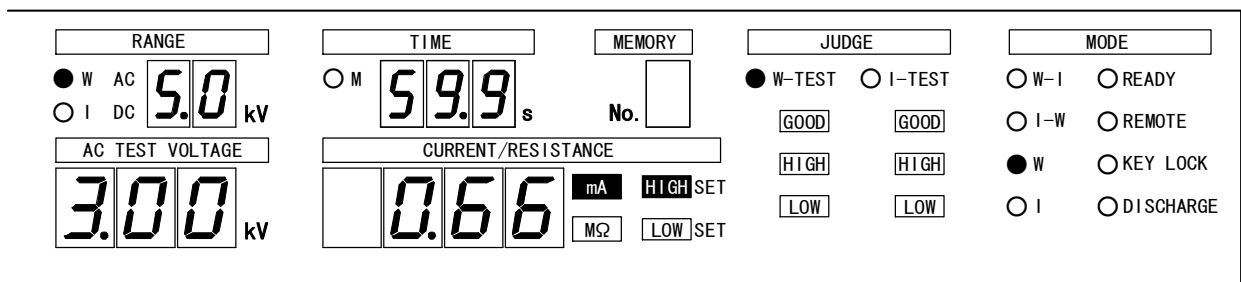
- ① Refer to the article 10.2 for the memory write-in.
- ② Refer to the article 10.3 for the memory read-out.

Start of automatic move up or down

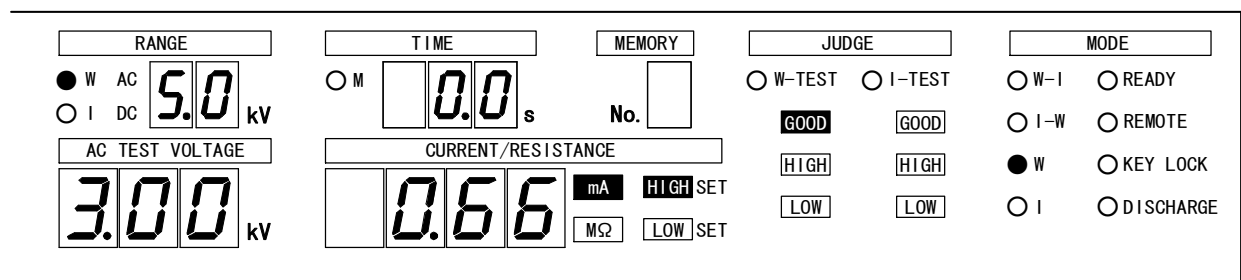
- After the setting of memory No., the slider voltage automatically moves up or down with **ENTER** key.

11. Test procedure (from start to judgement result)

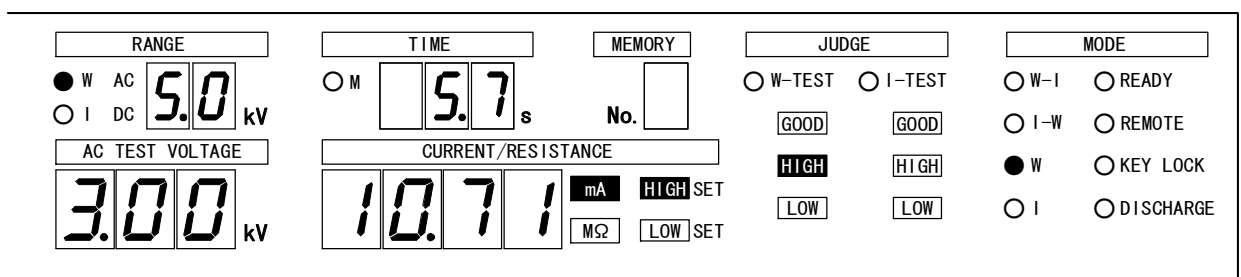
11.1 ● W test (withstanding voltage test)



- In READY status, press or key, then the test mode lamp blinks. Select the W lamp with or key, and the test conditions are also displayed.
- When it is necessary, the test conditions can be changed with , , , , , key. For detail, refer to the article 8.
Note: The test time can be set to OFF. In this case, the elapsed time is displayed during the test, and when exceeded 999s, the display scrolls with , while the test is continued.
- Press switch ③, then W-TEST lamp is lit up and the test starts. While the high voltage is output, the lamp is lit up. During the test, TEST/H.V.OUT, W-TEST, TEST of connector ② are turned ON and READY is OFF. When the test is finished, TEST/H.V.OUT, W-TEST, TEST of connector ② are turned OFF and END is ON.
- Case of good judgement
 When the test time is elapsed, the test finishes and the of withstanding voltage test is lit up.
 - When the good judgement time is for 0.2 seconds, the tester returns to READY status before the start.
 - When the good judgement time is continuous output, re-start is not possible. In this case, press switch ②, then it becomes READY status.
 - For the judgement output, W-GOOD, GOOD of connector ② are turned ON.



- Case of NG judgement
 The output of test voltage is stopped and the test is stopped. When the leak current value is higher than the high limit value, JUDGE is, and when the leak current value is lower than the low limit value, JUDGE is continuously lit up. Press switch ②, then it becomes READY status.
 - For the judgement output, W-HIGH or W-LOW, NG of connector ② are turned ON.



※Caution When the test voltage is out of the range of referential voltage

When the referential voltage is set and the test voltage is not within the range of referential voltage (within $\pm 5\%$), the test is stopped.

[In case of 1000V or less, within $\pm 50V(\pm 5\text{digit})$]

In case that the test voltage is below the range of referential voltage, the tester waits for 5 second and when exceeded the range, the test is immediately stopped.

During this sequence, the timer does not work and the W-TEST lamp blinks.

Also, if the test voltage goes out of the range of referential voltage during the test, the test is stopped.

When the setting of referential voltage is unnecessary, it can be switched OFF.

- (1) Press **START** switch ③, then the W-TEST and the **DANGER** lamp ⑬ are lit up, starting the test with the preset test condition.

[Judgement display and output when the voltage is out of the range of referential voltage]

Judgement display ... **HIGH** **LOW** lamps are lit up (W-TEST side)

Judgement output No judgement is output. PROTECTION (pin No.12) is output at the **REMOTE/OUT** connector ②.

- (2) In case that the test voltage is less than the range of referential voltage, the tester waits for 5 seconds (W-TEST lamp blinks while waiting), and during this period, the required test voltage can be output by **UP** key.

When exceeded the range of referential voltage, the test is immediately stopped.

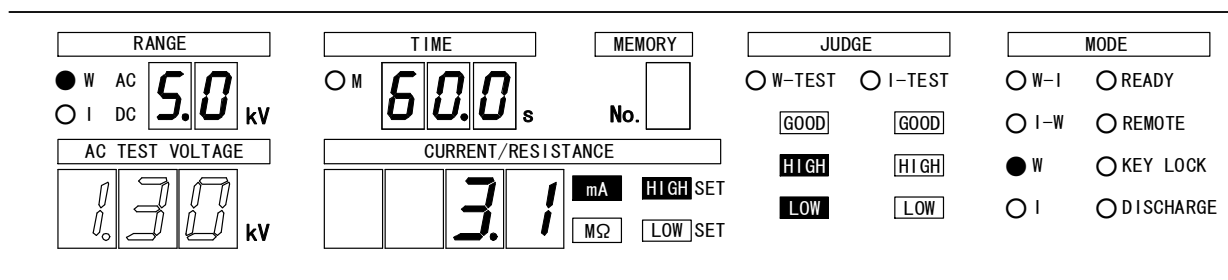
Even if the setting of referential voltage is switched OFF, the test is immediately stopped when the test voltage becomes 6.00kV or higher.

The voltage value is displayed on the output voltmeter and the test voltage display.

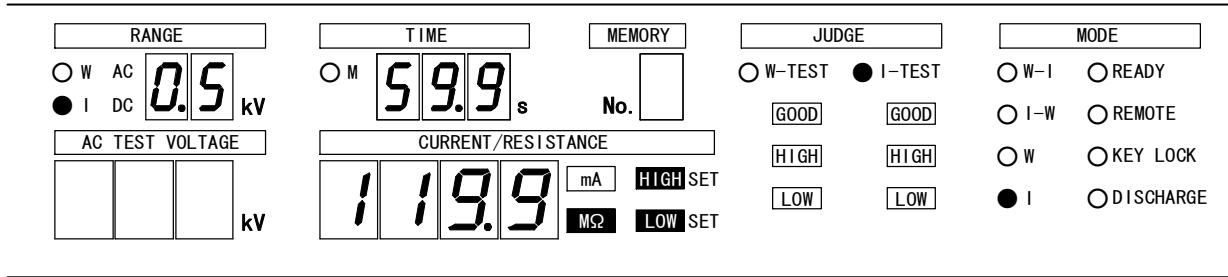
Note: Even in the waiting status, the test voltage is output, so the judgement for the high and low limit of leak current is made.

- (3) If the voltage is still out of the range even after passing 5 seconds, the test voltage display displays, in blinking, the output value of test voltage at that moment, and furthermore, JUDGE **HIGH** **LOW** are lit up and the test is stopped.
Press **STOP** switch ② to make READY status.

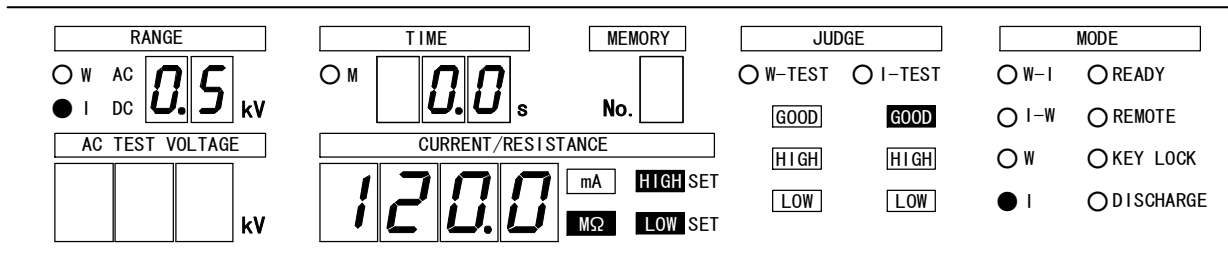
[When the test voltage is out of the range of referential voltage]



11.2 ● I test (insulation resistance test)



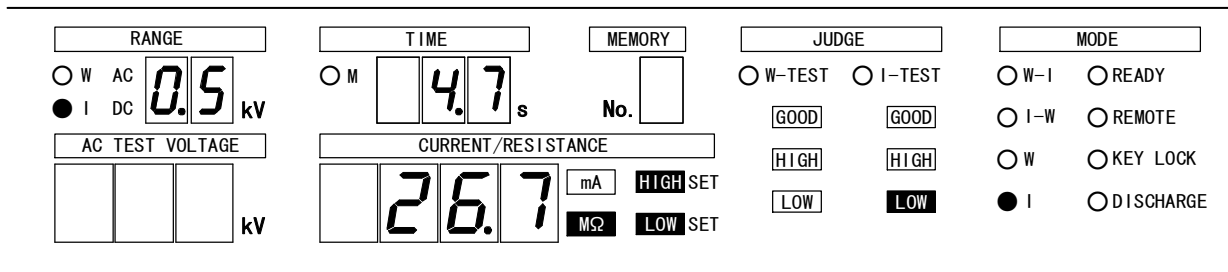
- In READY status, press **▶** or **◀** key, then the test mode lamp blinks. Select the I lamp with **▲** or **▼** key, and the test conditions are also displayed.
- When it is necessary, the test conditions can be changed with **▶**, **◀**, **▲**, **▼**, **ON/OFF**, **SHIFT** key. For detail, refer to the article 9.
Note: The test time can be set to OFF. In this case, the elapsed time is displayed during the test, and when exceeded 999s, the display scrolls with **---**, while the test is continued.
- Press **START** switch ③, then I-TEST lamp is lit up and the test starts. While the high voltage is output, the **DANGER** lamp is lit up. During the test, TEST/H.V.OUT, I-TEST, TEST of **REMOTE/OUT** connector ② are turned ON and READY is OFF. When the test is finished, TEST/H.V.OUT, I-TEST, TEST of **REMOTE/OUT** connector ② are turned OFF and END is ON.
- Case of good judgement



When the test time is elapsed, the test finishes and the **GOOD** of insulation resistance test is lit up.

- When the good judgement time is for 0.2 seconds, the tester returns to READY status before the start.
- When the good judgement time is continuous output, re-start is not possible. In this case, press **STOP** switch ②, then it becomes READY status.
- For the judgement output, I-GOOD, GOOD of **REMOTE/OUT** connector ② are turned ON.

- Case of NG judgement



The output of test voltage is stopped and the test is stopped. When the measured resistance value becomes out of the set range, the output of test voltage is stopped and the test is also stopped. When the measured resistance value is higher than the high limit value, **JUDGE HIGH** is, and when the value is lower than the low limit value, **JUDGE LOW** is lit up.

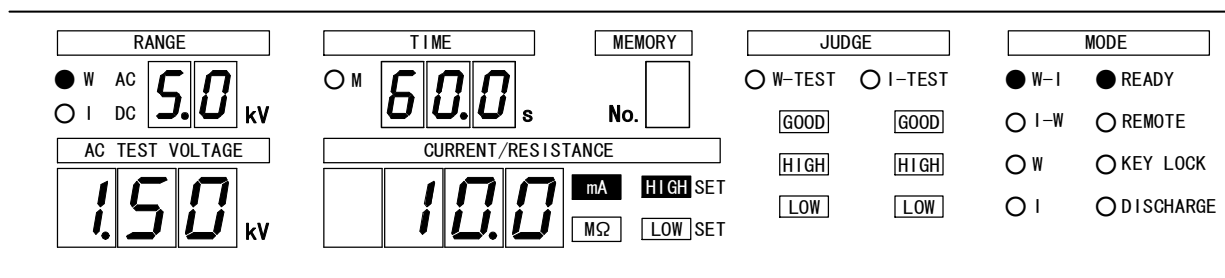
Press **STOP** switch ②, then it becomes READY status.

- For the judgement output, I-HIGH or I-LOW, NG of **REMOTE/OUT** connector ② are turned ON.

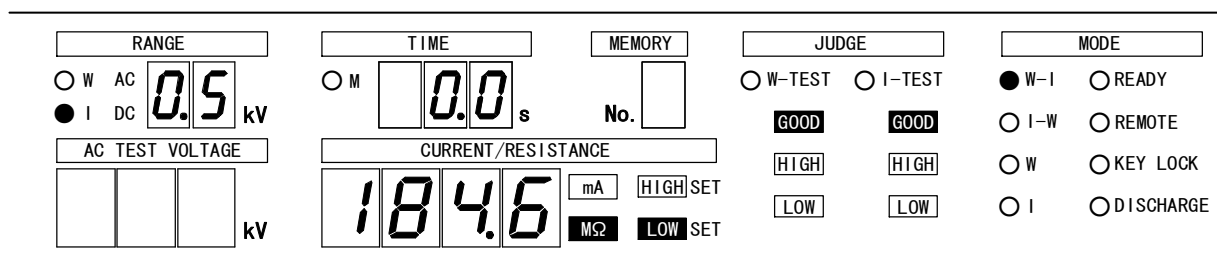
11.3 ● W-I test (withstanding voltage → insulation resistance test)

In READY status, the display of test conditions of withstanding voltage test and insulation resistance test alternates at the cycle of 2 seconds.

Note: About the judgement for the low limit of leak current
No judgement for the low limit of leak current is made by the time when 0.3 seconds have passed from the start of withstanding voltage test. Also, when the referential voltage is set, the judgement for the low limit of leak current is made when 0.3 seconds have passed after reaching the range of referential voltage.



- (1) In READY status, press or key, then the test mode lamp blinks. Select the W-I lamp with or key, and the test conditions are also displayed.
- (2) When it is necessary, the test conditions can be changed with , , , , , key. For detail, refer to the article 8 and 9.
- (3) Press switch ③, then W-TEST lamp is lit up and the test starts. While the high voltage is output, the lamp is lit up. During the test, TEST/H.V.OUT, TEST of connector ② are turned ON and READY is OFF.
(During the withstanding voltage test, W-TEST is, and during the insulation resistance test, I-TEST is turned ON.)
When the test is finished, TEST/H.V.OUT, W-TEST, I-TEST, TEST of connector ② are turned OFF and END is ON. For detail, refer to the article 17 Timing chart.
- (4) Case of good judgement



When the test time of withstanding voltage test or insulation resistance test is elapsed, of withstanding voltage test or insulation resistance test is respectively lit up.

- When the good judgement time is for 0.2 seconds, the tester returns to READY status before the start.
- When the good judgement time is continuous output, re-start is not possible. In this case, press switch ②, then it becomes READY status.
- For the status output, refer to the article 17 Timing chart.

- (5) Case of NG judgement
When the withstanding voltage test is NG - Refer to the article 11.1
When the insulation resistance test is NG - Refer to the article 11.2
Press switch ②, then it becomes READY status.

11.4 ● I-W test (insulation resistance → withstanding voltage test)

In READY status, the display of test conditions of withstanding voltage test and insulation resistance test alternates at the cycle of 2 seconds.

RANGE <input type="radio"/> W AC <input checked="" type="radio"/> I DC 0.5 kV		TIME <input type="radio"/> M 60.0 s		MEMORY No. <input type="text"/>		JUDGE <input type="radio"/> W-TEST <input type="radio"/> I-TEST <input type="button" value="GOOD"/> <input type="button" value="GOOD"/> <input type="button" value="HIGH"/> <input type="button" value="HIGH"/> <input type="button" value="LOW"/> <input type="button" value="LOW"/>		MODE <input type="radio"/> W-I <input checked="" type="radio"/> READY <input checked="" type="radio"/> I-W <input type="radio"/> REMOTE <input type="radio"/> W <input type="radio"/> KEY LOCK <input type="radio"/> I <input checked="" type="radio"/> DISCHARGE	
AC TEST VOLTAGE <input type="text"/> <input type="text"/> <input type="text"/> kV		CURRENT/RESISTANCE <input type="text"/> <input type="text"/> <input type="text"/> mA <input type="button" value="HIGH SET"/> <input type="text"/> <input type="text"/> <input type="text"/> MΩ <input type="button" value="LOW SET"/>							

- In READY status, press or key, then the test mode lamp blinks. Select the I-W lamp with or key, and the test conditions are also displayed.
- When it is necessary, the test conditions can be changed with , , , , , key. For detail, refer to the article 8 and 9.
- Press switch ③, then I-TEST lamp is lit up and the test starts. While the high voltage is output, the lamp is lit up. During the test, TEST/H.V.OUT, TEST of connector ② are turned ON and READY is OFF. (During the insulation resistance test, I-TEST is, and during the withstanding voltage test, W-TEST is turned ON.) When the test is finished, TEST/H.V.OUT, W-TEST, I-TEST, TEST of connector ② are turned OFF and END is ON. For detail, refer to the article 17 Timing chart.
- Case of good judgement

RANGE <input type="radio"/> W AC <input checked="" type="radio"/> I DC 5.0 kV		TIME <input type="radio"/> M 0.0 s		MEMORY No. <input type="text"/>		JUDGE <input type="radio"/> W-TEST <input type="radio"/> I-TEST <input checked="" type="button" value="GOOD"/> <input checked="" type="button" value="GOOD"/> <input type="button" value="HIGH"/> <input type="button" value="HIGH"/> <input type="button" value="LOW"/> <input type="button" value="LOW"/>		MODE <input type="radio"/> W-I <input type="radio"/> READY <input checked="" type="radio"/> I-W <input type="radio"/> REMOTE <input type="radio"/> W <input type="radio"/> KEY LOCK <input type="radio"/> I <input type="radio"/> DISCHARGE	
AC TEST VOLTAGE 1.50 kV		CURRENT/RESISTANCE <input type="text"/> <input type="text"/> <input type="text"/> mA <input type="button" value="HIGH SET"/> <input type="text"/> <input type="text"/> <input type="text"/> MΩ <input type="button" value="LOW SET"/>							

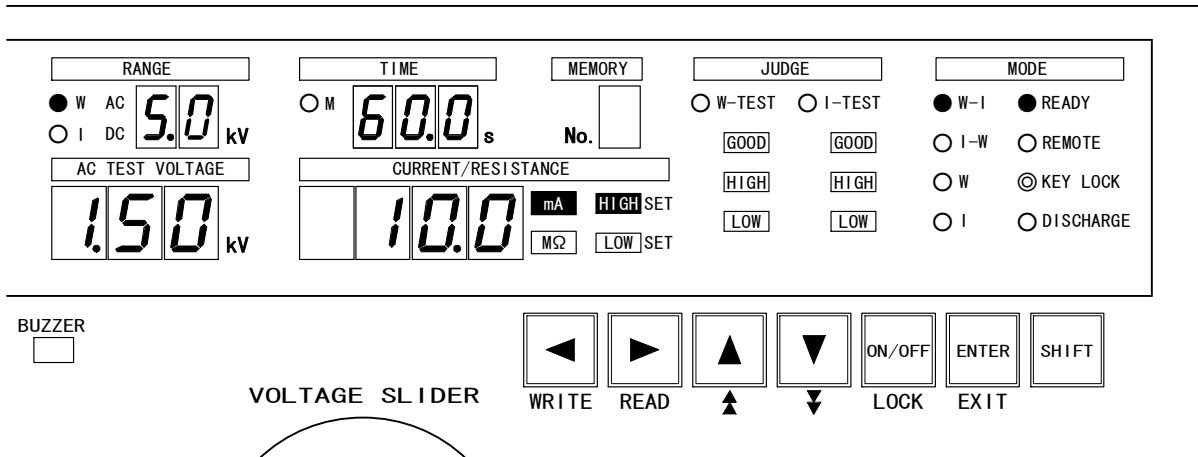
When the test time of insulation resistance test or withstanding voltage test is elapsed, of insulation resistance test or withstanding voltage test is respectively lit up.

- When the good judgement time is for 0.2 seconds, the tester returns to READY status before the start.
- When the good judgement time is continuous output, re-start is not possible. In this case, press switch ②, then it becomes READY status.
- For the status output, refer to the article 17 Timing chart.

- Case of NG judgement
 When the insulation resistance test is NG - Refer to the article 11.2
 When the withstanding voltage test is NG - Refer to the article 11.1
 Press switch ②, then it becomes READY status.

12. Key lock

In READY status, the key lock disables the operation by the switches other than **START** switch ③ and **STOP** switch ②. When remote controlled, the start is made through the remote control.



Setting procedure of key lock

- ① In READY status, keep pressing the **LOCK** key (**SHIFT** and **ON/OFF** at a time) for 3 seconds or more. While pressing, KEY LOCK lamp blinks.
- ② KEY LOCK lamp is then lit up and the key lock function is set up.

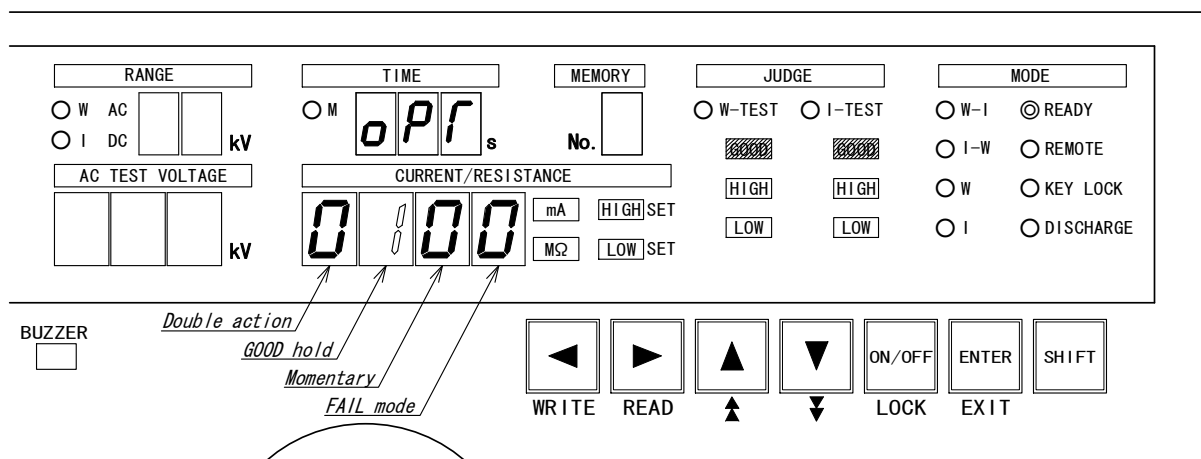
Cancellation of key lock

- ① While KEY LOCK lamp is lit up, press again the **LOCK** key (**SHIFT** and **ON/OFF** at a time) for 3 seconds or more. For 3 seconds being pressed, KEY LOCK lamp blinks.
- ② KEY LOCK lamp is then turned off and the key lock function is cancelled.

13. Special test mode

Model 8527 is able to have the setting of 4 special functions by means of key operation on the front panel.

- (1) Double action start function
Within 0.5 second from the stop signal having been input, the test starts with input of start signal.
Note: When the function is set, READY lamp blinks in READY status.
- (2) GOOD hold function
This is the function to concern the good judgement. The output becomes continuous until the stop signal is input.
- (3) Momentary start function
The test is done only when the start signal is input.
- (4) FAIL mode function
This is the function to disable the resetting of NG judgement and PROTECTION action by the stop signal of remote control, and enables the resetting only by the stop switch on the tester main unit.



Setting procedure of special test mode

- ① In READY status, press **[SHIFT]** and **[STOP]** key at a time for 3 seconds or more. READY lamp blinks and the test time display is lit up with "o P I". The 4th digit of the current/resistance display blinks.
- ② The item to set can be moved with **[▶]** or **[◀]** key.
- ③ Refer to the following table for the items to select.

CURRENT/RESISTANCE					Lamps to synchronously blinks at the setting
0	0	0	0	▲ key: Numeral increases. ▼ key: Numeral decreases.	
0	-	-	-	Cancel of setting	READY lamp
!	-	-	-	Setting of double action start function	
0	-	-	-	Cancel of setting	GOOD of I-TEST, W-TEST
!	-	-	-	Setting of GOOD hold function Note: In order to re-start, once of stop signal input is necessary	
2	-	-	-	Setting of GOOD hold function Note: When the start signal is input, the judgement output is reset and re-starts.	
0	-	-	-	Cancel of setting	I-TEST, W-TEST lamp
!	-	-	-	Setting of momentary start function	
0	-	-	-	Cancel of setting	HIGH LOW of I-TEST, W-TEST
!	-	-	-	Setting of FAIL mode	

Finish of setting

Press **[ENTER]** key, then the tester returns to READY status, memorizing the set having been made.

When the **[EXIT]** key (**[SHIFT]** and **[ENTER]** at a time) is pressed in the setting mode, the special test mode is interrupted and the tester becomes READY status.

The special test mode in this case is that before entering the special test mode.

14. Remote control

On the model 8527, a remote control is possible through **REMOTE** connector ⑧ on the front panel, **REMOTE** terminal ⑮ or **REMOTE/OUT** connector ⑲ on the rear panel.

WARNING

When the tester is remote-controlled, high voltage is switched ON/OFF by the external signal, so utmost care must be taken so that the high voltage can no be erroneously generated and that no one never touches the output terminals, high voltage cable or test sample, putting the first priority to safety.

14.1 ● Operation by **REMOTE** connector

With use of the optional Remote Control Box (Model 5858-07, 07W) connected to the **REMOTE** connector ⑧, the start/stop operation can be remote-controlled.

When the plug of the remote control box is inserted, the **REMOTE** lamp is lit up and the type of operation changes from the switch operation on the front panel to the remote control by the remote control box.

During the remote operation, the **START** switch ③ on the front panel is disabled.

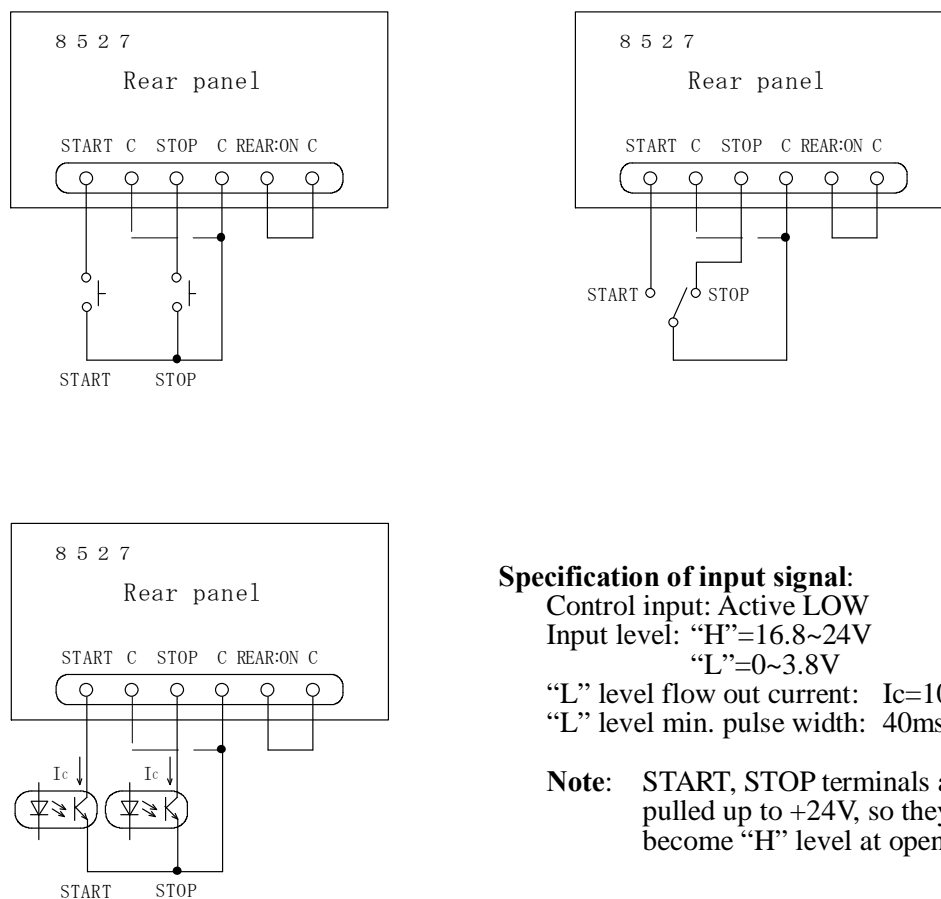
14.2 ● Operation by **REMOTE** terminal

An equivalent operation to that through **REMOTE** connector ⑧ is also possible through the **REMOTE** terminal ⑮ on the rear panel.

By connecting the optional foot switch (model 5858-04) to the **START** terminal, the start operation can be done by foot.

- ① Turn the power supply OFF and confirm that the **DANGER** lamp ⑬ is turned off.
- ② Make a short-circuit between REAR:ON and C terminal of the **REMOTE** terminal ⑮. Or alternatively, make a short-circuit between the pin No.2 of the **REMOTE/OUT** connector ⑲ and the COM (either of pin No.19, 23 or 36) of the same connector.
- ③ Connect a logic element such as switch, relay contact, transistor, photo-coupler etc. between **START** and C, and between **STOP** and C.
- ④ Turn ON the power supply and the **REMOTE** lamp at the display section is lit up, then the remote control is enabled.

Note: When the remote control is in operation, the **START** switch ③ on the front panel is disabled. However, the stop operation is still possible from both of the **STOP** switch ② on the front panel and the **STOP** terminal of the **REMOTE** terminal ⑮.



Specification of input signal:

Control input: Active LOW

Input level: "H"=16.8~24V

"L"=0~3.8V

"L" level flow out current: $I_c=10\text{mA}$

"L" level min. pulse width: 40ms

Note: START, STOP terminals are pulled up to +24V, so they become "H" level at opening.

Fig.14.1 Connection examples of remote control terminal

⚠ CAUTION

In case that the control is made by switch, relay and etc. and when the chattering occurs, it may cause faulty operation.

14.3 ● Operation by REMOTE/OUT connector

Same remote operation as that through [REMOTE] terminal ⑤ can be done through the [REMOTE/OUT] connector ① on the rear panel.

For connection of connector, please refer to the article 15.2 (P52).

The operation is same as that of REMOTE terminal, the article 14.2 (P48).

14.4 ● Operation by REAR:MODE

Features of REAR:MODE

1. The test mode (withstanding voltage or insulation resistance test) can be selected by a relay, sequencer etc. When the test mode is not selected, the test is performed by the test condition before entering the REAR:MODE.
2. The test can be done, reading out the content of memory setting by a sequencer etc.
3. The test mode can be externally controlled but the change of numeral setting is not possible, so make the setting in advance by the memory etc.
4. Since the tester is used by the external control, the tester becomes key lock condition during the setting.
5. The start signal is decided depending upon the setting condition of remote control.
6. An interruption of the test is possible from the **STOP** switch ②, **STOP** terminal ⑤, on the rear panel and Pin No.4 (STOP) of the **REMOTE/OUT** connector.

REAR:MODE from the setting to the start

- (1) Make a short-circuit between the Pin No.20 (REAR:MODE) of the **REMOTE/OUT** connector ① on the rear and COM (either 19, 23 or 36) of the same connector ①. **7** is displayed on the memory number display.
Note: When auto operation is done by the sequencer etc. without using the **START** switch ③ (manual start), make the Pin No.2 (REAR:ON) ON. Or, make a short-circuit between REAR:ON and C of the **REMOTE** terminal ⑤.
- (2) Select a test mode.
 Make a selection of either test mode in advance, withstanding voltage or insulation resistance test, by means of Pin No.21 (W-MODE) or Pin No.22 (I-MODE) on the **REMOTE/OUT** connector ①.
- (3) After confirming the wiring with the test sample, safety and so on, press **START** switch ③. Or, start the test by remote control.

In order to do the withstanding voltage and insulation resistance test in sequence (W-I, I-W), make a re-start switching over the other test mode, after the good judgement at the item (2) above.

[Example] When the withstanding voltage test → insulation resistance test (W-I) is done.

- ① In READY status, turn ON the Pin No.21 (W-MODE) of the **REMOTE/OUT** connector ①. The test is started. The tester becomes in operation of withstanding voltage test and the **DANGER** lamp ⑬ is lit up.
- ② After the good judgement of withstanding voltage test, turn OFF the Pin No.21 (W-MODE). The tester is then in READY status.
- ③ To do the insulation resistance test next, turn ON the Pin No.22 (I-MODE).
- ④ Start the test. The tester becomes in operation of insulation resistance test and the **DANGER** lamp ⑬ is lit up.
- ⑤ Afterwards, the judgement can be made normally.

To start reading out the memory

- (1) Make a short-circuit between the Pin No.20 (REAR:MODE) of the **REMOTE/OUT** connector ① on the rear and COM (either 19, 23 or 36) of the same connector ①. **7** is displayed on the memory number display.
- (2) By the combination of the BCD code of the Pin No.6~9 (MEM SET 1, 2, 4, 8) of the same connector ①, read out the memory No.1~9.
Note: When the A~F code is input, A~F is displayed on the display but no read out is possible.
- (3) After confirming the wiring with the test sample, safety and so on, press **START** switch ③. Or, start the test by remote control.

Remote control which can be jointly used with REAR:MODE

Basically, it is as explained at the **REAR:MODE from the setting to the start**.

During the REAR:MODE setting, the remote control can also be used jointly.

The start from the **REMOTE** connector ⑧ (front panel), **REMOTE** terminal ⑤ (rear panel) and Pin No.3 (START) of the **REMOTE/OUT** connector ① is also possible.

Refer to the article 14.6 for the priority of remote control.

[Likely error at the REAR:MODE]

Blinking display of <i>Err Mode</i>	For a likely cause and solution, refer to the article 20 Error messages.
Blinking display of <i>Err E-40</i>	
Blinking display of <i>Err rNE</i>	

14.5 ● Voltage adjustment of motor slider by REMOTE/OUT connector

When the REAR:MODE is ON status and the memory No. is selected, the slider voltage automatically moves up or down to its set value.

If the memory No. is changed in the course of moving up or down, the slider voltage moves up or down to the newly selected memory No, as long as the selected memory No. and the set value of slider voltage are effective ones. Even if the invalid memory No. (A~F) is erroneously selected while the slider voltage moves up or down, or the REAR:MODE is turned OFF, the slider moves to the set voltage value which is previously selected with the valid memory No.

14.6 ● Priority of each remote control

On the model 8527 there are 4 parts of setting for the remote control. If the plural numbers of the setting are made, they follow the priority specified in the following table.

Item	Setting of remote control	Priority
A	RS-232C connector ⑳ (rear panel)	1
B	REMOTE connector ⑧ (front panel)	2
C	REMOTE / OUT connector ㉑ (rear panel)	3
D	REMOTE terminal ㉒ (rear panel)	

The items C and D (REAR:ON) are internally of parallel connection, so when controlled from the rear panel, it can be done either C or D.

15. External control

15.1 ●Control by REMOTE/OUT connector

By means of the REMOTE/OUT connector ②① on the rear panel, the remote control of start/stop, the setting of interlock to secure the safety, and the output signals corresponding to each condition of the 8527 can be output by open collector.

The input and output signals are isolated from the internal circuit by photo-coupler.

Also, the 8527 is provided with the power source of 24V DC 0.1A, which can be utilized as power supply for the external control.

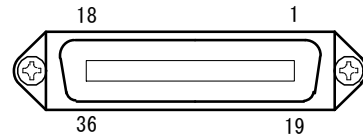
15.2 ●Arrangement and function of connector pins

I/O	Signal name	Pin No.	Function
	+24V	1	Power 24V DC for external control is output. (capacity 0.1A)
I	REAR:ON	2	Change-over signal for remote control. Ref. article 14.2 for detail.
	START	3	Input signal for start.
	STOP	4	Input signal for stop.
	INTERLOCK	5	Signal for interlock.
	MEM SET 1	6	BCD code input for read out of memory. (effective at the setting of REAR:MODE)
	MEM SET 2	7	
	MEM SET 4	8	Effective for No.1~No.9
MEM SET 8	9	A~F code are ineffective, no memory can be read.	
O	TEST/H.V.OUT	10	Output at high voltage terminal during the voltage output.
	READY	11	Output at READY status.
	PROTECTION	12	Output when the protective function works. Ref. article 15.4 for detail.
	GOOD	13	Output at good judgement.
	W HIGH	14	Output at NG judgement for high limit of W test.
	W GOOD	15	Output at good judgement of W test.
	I HIGH	16	Output at NG judgement for high limit of I test.
	I GOOD	17	Output at good judgement of I test.
-	NC	18	Vacant pin (do not use it as relay terminal).
COM	COM	19	Common (common with 23, 26)
I	REAR:MODE	20	Change-over action of test mode (W, I) from the rear panel.
	W-MODE	21	Setting of mode for W test (effective at the setting of REAR:MODE).
	I-MODE	22	Setting of mode for I test (effective at the setting of REAR:MODE).
COM	COM	23	Common (common with 19, 36)
O	W-TEST	24	Output during the W test, not output while W-TEST is blinking.
	I-TEST	25	Output during the I test, not output while I-TEST is blinking.
	TEST	26	Output during the test, not output while W-TEST or I-TEST is blinking.
-	NC	27	Vacant pin (do not use it as relay terminal).
O	END	28	Output at the end of test.
-	NC	29	Vacant pin (do not use it as relay terminal).
	NC	30	Vacant pin (do not use it as relay terminal).
O	NG	31	Output at NG judgement.
	W LOW	32	Output at NG judgement for low limit of W test.
-	NC	33	Vacant pin (do not use it as relay terminal).
O	I LOW	34	Output at NG judgement for low limit of I test.
-	NC	35	Vacant pin (do not use it as relay terminal).
COM	COM	36	Common (common with 19, 23)

Type of input/output:

I: input
 O: Open collector output.
 COM: Common for input/output
 -: Vacant pin

Connector used: 36P Anphenol



Note: When externally remote controlled, REAR:ON and COM are short-circuited. The operation is same as that of REMOTE terminal, the article 14.3 (P49).

15.3 ● Interlock signal

The interlock is the function to shut off the output getting the tester to jointly work with the external device, in order to secure the safety of operator.

By making open the Pin No.5 (INTER-LOCK) of the REMOTE/OUT connector ① on the rear panel, the tester becomes interlock status and the start of the test is disabled. During the interlock function is in operation, *Err LOCK* is displayed, the output of 8527 is shut off and the operation of all the switches are disabled.

To cancel the interlock, short-circuit the Pin No.5 and Pin No.23 (COM) of the REMOTE/OUT connector ① to make it to “L” level, and then press the STOP switch ②. *Err LOCK* is turned off and READY lamp is lit up, enabling the test.

Note: The Pin No.5 and Pin No.23 of the attached REMOTE/OUT plug (36P) are short-circuited.

Considering the safety aspect, please provide a proper interlock solution to jointly work with the external device, for example, as the following connection example shows.

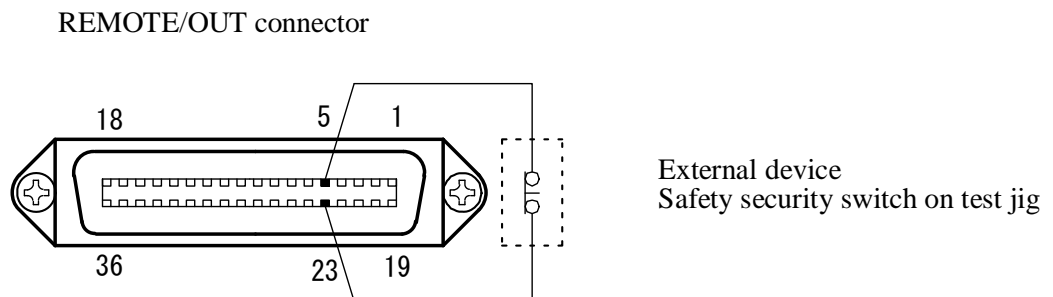


Fig.15.1 Interlock connection example

15.4 ● Protective function (PROTECTION)

The protective function is the action that the PROTECTION is output from the REMOTE/OUT connector ① on the following condition.

- When the discharging of the test sample does not finish even after passing 10 seconds from the finish of test.
- When the voltage output does not fall even after passing 10 seconds from the finish of test.
- When the interlock input is turned OFF.
- When the remote status is changed during the test.
- When the test voltage is out of the range of referential voltage.

15.5 ● Output signals and power supply for control

It is possible to take out each condition of the 8527 as output signal.
The power supply of 24V DC for control is provided, so the relay etc. can be directly driven.

- (1) Specification of output signal (Pin No.10~17, 24~26, 28, 31, 32, 34)
 - Signal type : Open collector output
 - Max. load voltage : 30V DC
 - Max. output current : 30mA DC
 - Isolation system : Isolated from the internal circuit by photo-coupler
 - Output saturation voltage : 1.6V DC or less
- (2) Specification of control power source (Pin No.1)
 - Output voltage : 24V DC
 - Current capacity : 0.1A DC

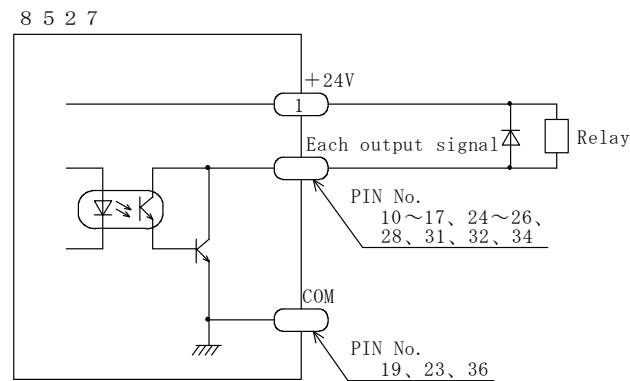


Fig.15.2 Connection example of relay drive

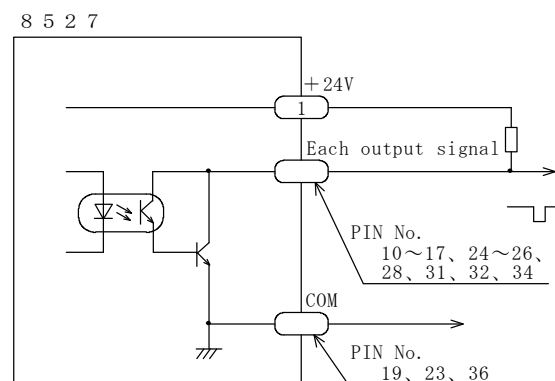


Fig.15.3 Example to obtain a signal level

⚠ CAUTION

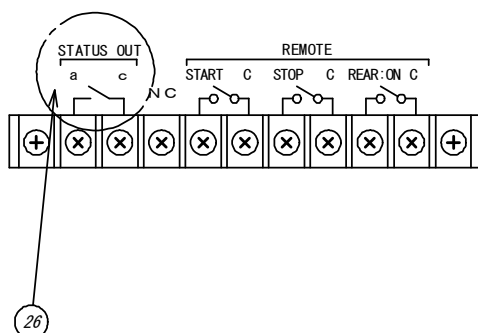
- Use the output signal with 30V and 30mA DC or less.
- In case of controlling an inductive load like relay, connect a diode in parallel with the coil to absorb the reverse electricity.

16. Status output

16.1 ● Name of STATUS OUTPUT and condition for output

When the preset condition for output is met, the relay contact is output from the **STATUS OUT** ②⑥ on the rear panel. In case that the plural numbers of output are selected, the output is given when either condition is met.

Output name	Output condition
TEST/H.V. OUT	Output when the voltage is output to the high voltage terminal (when DANGER is lit up).
TEST	During the test (when TEST lamp is lit up).
GOOD	At GOOD judgement (when GOOD lamp is lit up).
NG	At NG judgement (when JUDGE HIGH , LOW lamp is lit up).
READY	In READY status (when READY lamp is lit up).
REMOTE	When remote controlled (when REMOTE lamp lit up).
POWER ON	When the power supply is ON.



It can be connected to the optional buzzer unit (5858-05) and so on.
Plural numbers of output names for status output can be selected (it is OR selection).

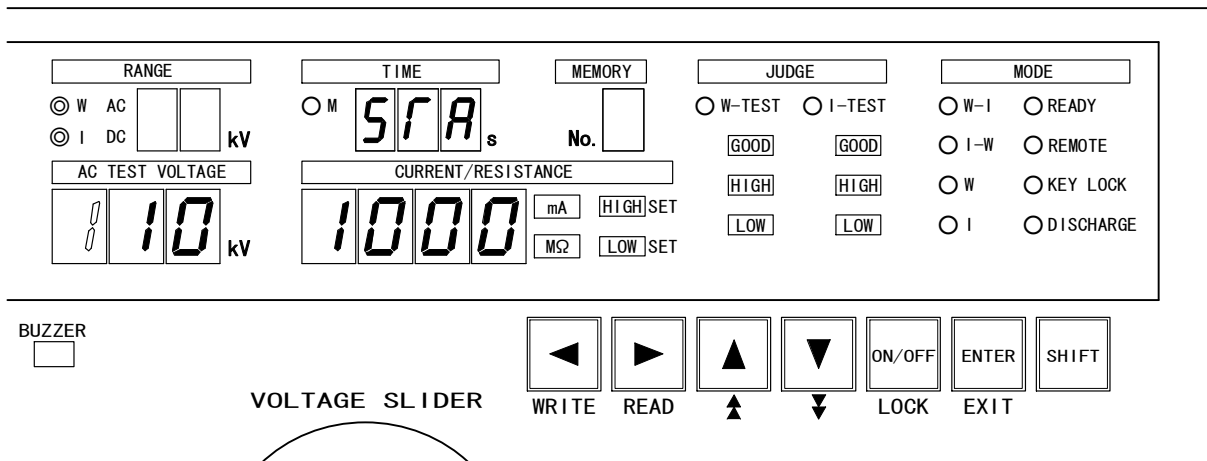
16.2 ● Specifications of status output

Output relay configuration : 1a relay contact
Max. output capacity : 250V AC/1A (30V DC/1A) resistive load
Terminal screw to use : M3

⚠ WARNING

Do not connect the device to consume 250V AC/1A (30V DC/1A) or more to the outlet of the status output. It will cause a break-down of this tester.

16.3 ●Setting of condition for status output



Setting procedure of condition for status output

- ① Press **ON/OFF** key and **▲** key at a time for 3 seconds or more. W AC, I DC lamps blink and the test time display is lit up with "57A". The highest digit of the voltage display blinks.
- ② The item to set can be moved with **▶** or **◀** key.
- ③ Refer to the following table for the items to select.



“/” or “/” blinks at selection of each item.
 /: To select / : Not to select
▶ key: Move to right, but when pressed at the item POWER ON, moves to the TEST/H.V. OUT.
◀ key: Move to left, but when pressed at the item TEST/H.V. OUT, moves to POWER ON.

	Selection item of status output	Lamps to blink at the setting
/	TEST/H.V.OUT	DANGER , W AC, I DC lamp
/	TEST	I-TEST, W-TEST lamp
/	GOOD	GOOD of W-TEST, I-TEST
/	NG	HIGH LOW of W-TEST, I-TEST
/	READY	READY lamp
/	REMOTE	REMOTE lamp
/	POWER ON	-----

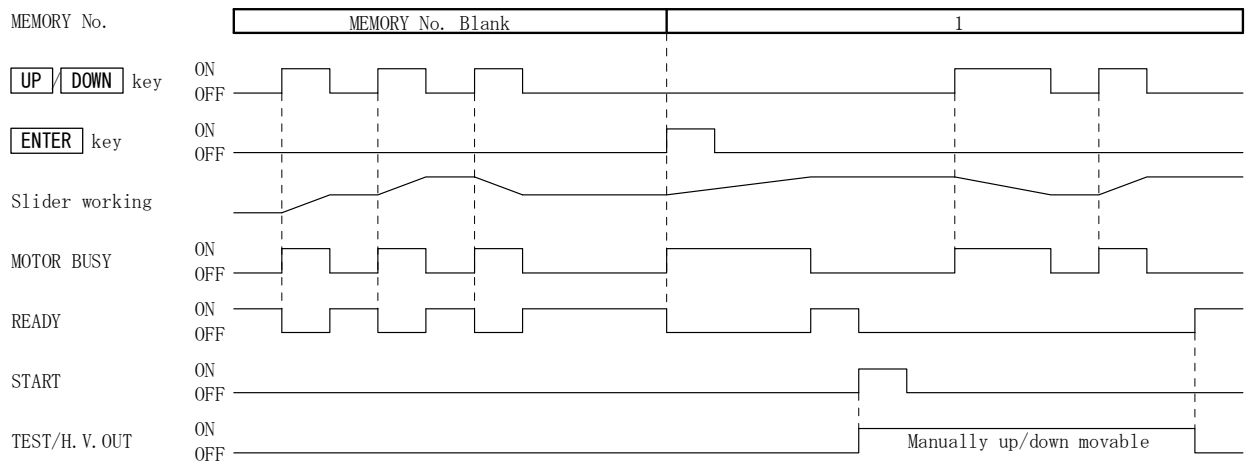
Finish of setting

Press **ENTER** key, then the tester returns to READY status, memorizing the set having been made.
 When the **EXIT** key (**SHIFT** and **ENTER** at a time) is pressed, the setting mode for the condition of status output is interrupted and the tester becomes READY status.
 The setting mode for the condition of status output in this case is that before entering the setting mode for the condition of status output

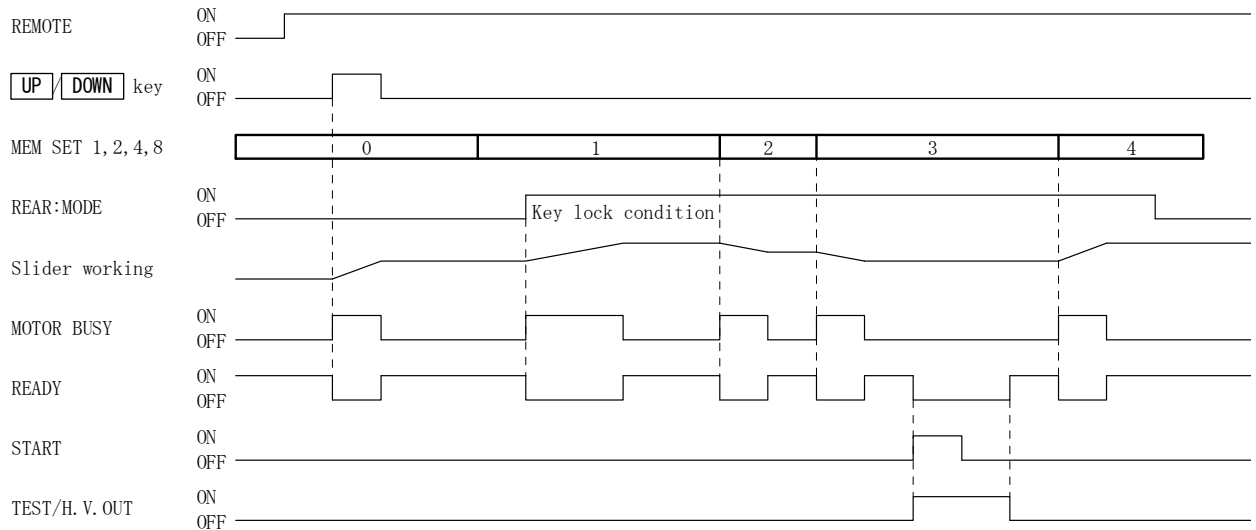
17. Timing chart

17.1 ● Motor slider working

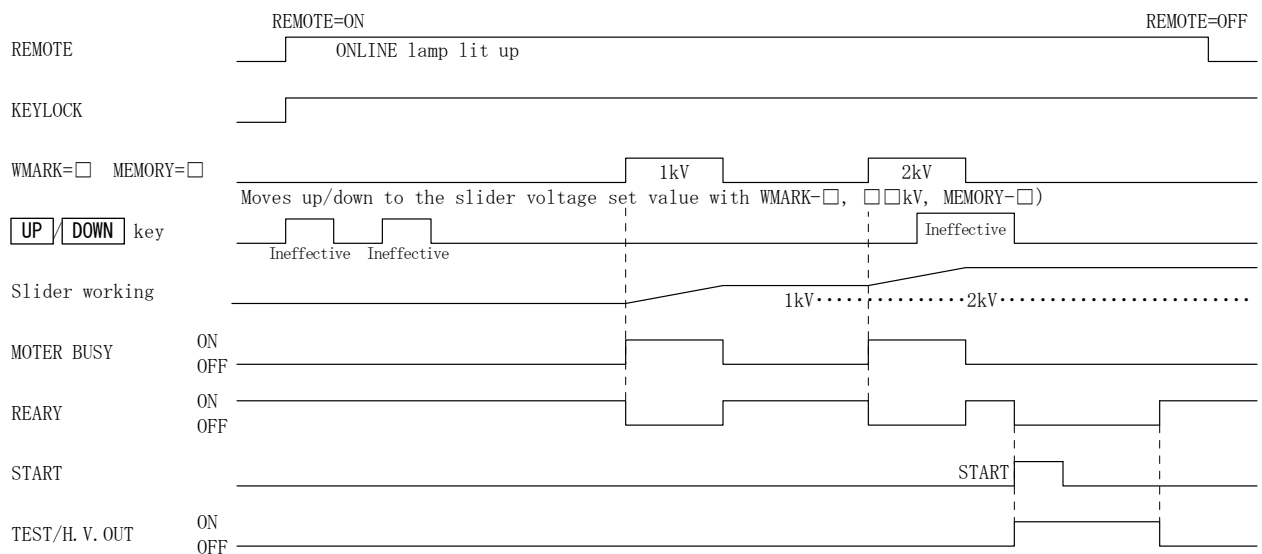
[Setting of slider voltage by front panel operation]



[Setting of slider voltage by rear remote control]

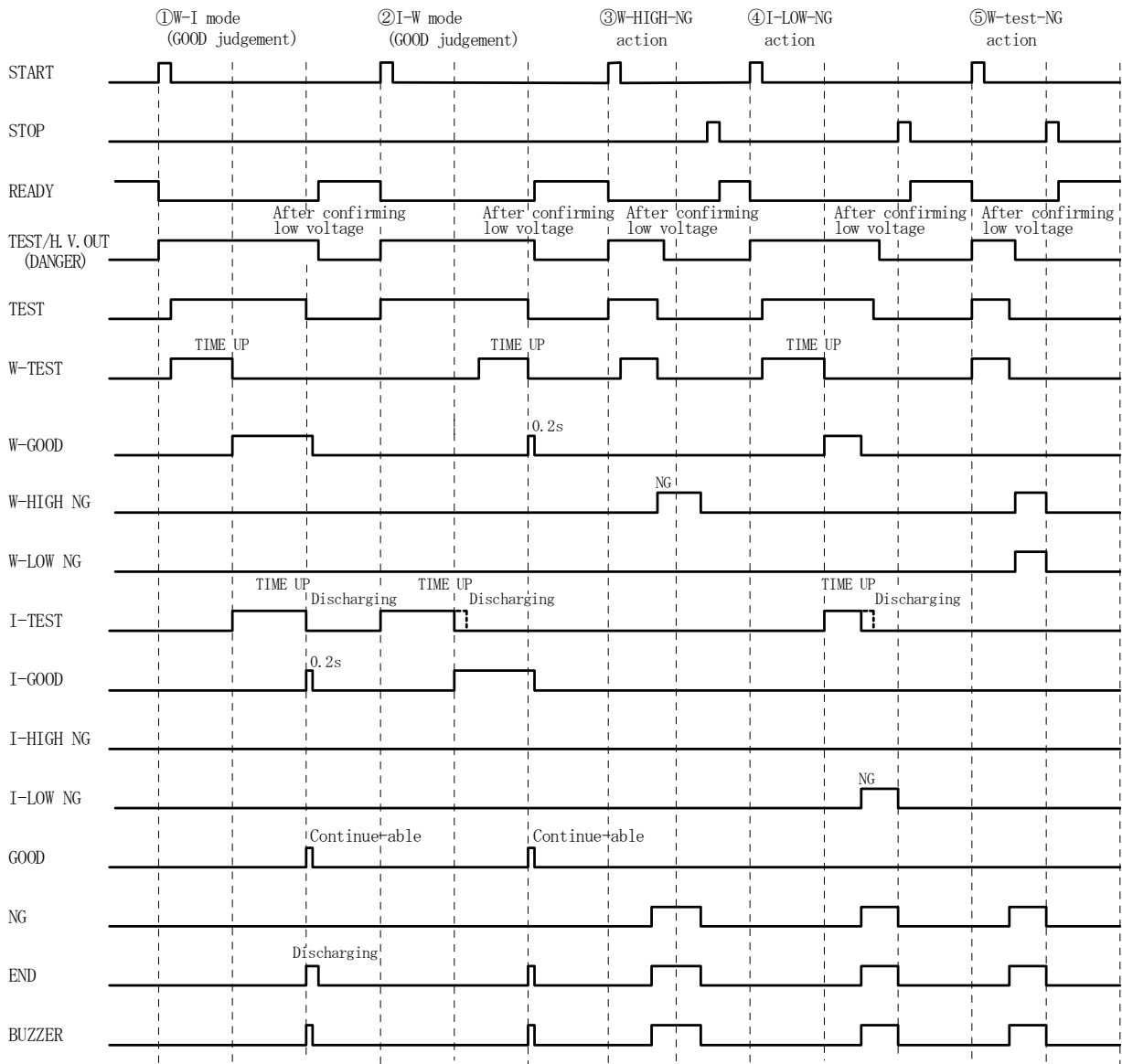


[Setting of slider voltage by RS-232C]



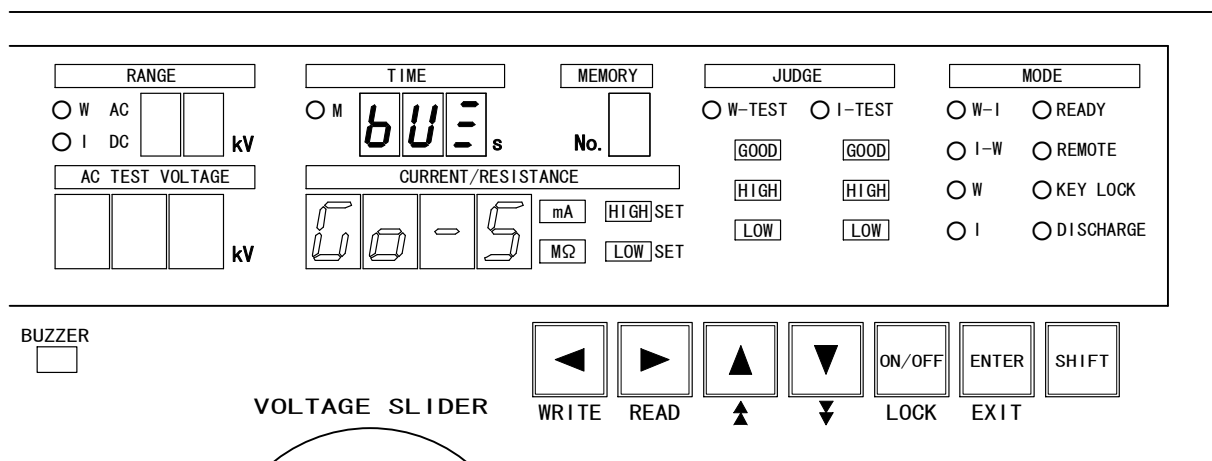
When the key lock is ON, **UP/DOWN** key of VOLTAGE SLIDER is also lock condition.

17.2 ● From motor slider stoppage to finish of test



18. Adjustment of buzzer sound

At the time of GOOD and NG judgement, the buzzer sounds.
Sound volume of the buzzer is adjustable by the setting on the front panel.



To enter the setting of buzzer sound

In READY status, press **[ON/OFF]** key and **[▼]** key at a time for 3 seconds or more.
The test time display is lit up with “**6U3**”.

Adjustment of buzzer sound at the GOOD judgement

- The current/resistance display blinks with “**60-□**”.
The adjustment of buzzer sound at GOOD judgement can be made while “**60-□**” is blinking.
- The sound volume can be set with **[▲]** or **[▼]** key.
For the level of volume, refer to the table below.

Adjustment of buzzer sound at the NG judgement

- The current/resistance display blinks with “**60-□**”.
- With the **[▶]** or **[◀]** key, GOOD judgement “**60-□**” and NG judgement “**NG-□**” can be alternated. Select the blinking of NG judgement.
- The sound volume can be set with **[▲]** or **[▼]** key.
For the level of volume, refer to the table below.

Finish of setting

Press **[ENTER]** key, then the tester returns to READY status, memorizing the set having been made.

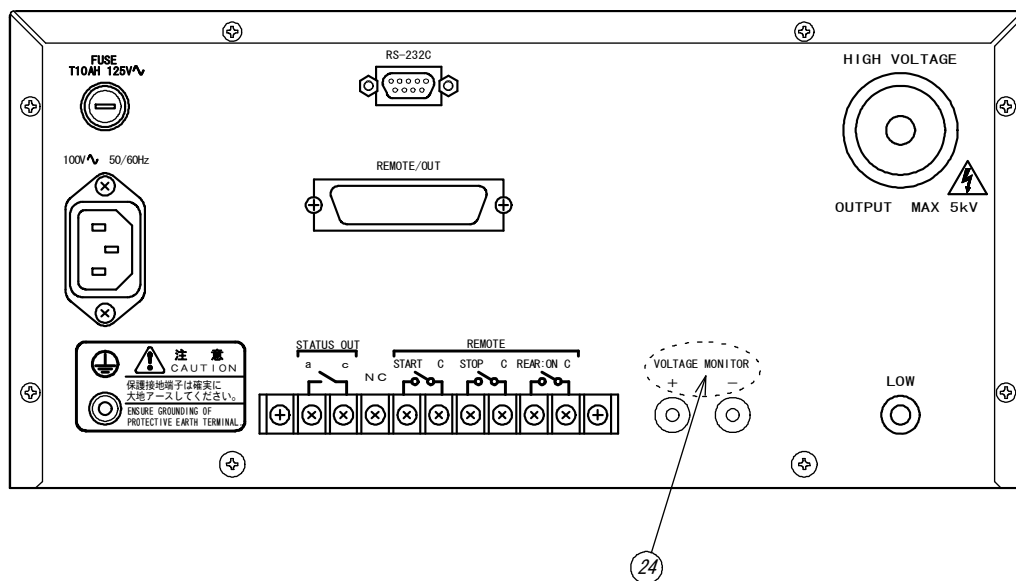
When the **[EXIT]** key (**[SHIFT]** and **[ENTER]** at a time) is pressed while “**6U3**” is lit up on the test time display displays, the adjustment of buzzer sound is interrupted and becomes to READY status. The level of buzzer sound then is the level before entering the setting of buzzer sound.

[Sound volume]	Adjustable range		Volume
	For GOOD judgement	For NG judgement	
	60-5	NG-5	Max ↑
	60-4	NG-4	
	60-3	NG-3	↓ Min
	60-2	NG-2	
	60-1	NG-1	OFF
	60-0	NG-0	

Buzzer sounds by pressing **[STOP]** switch ② for confirmation.

19. Monitor output of voltage

The monitor output for the voltage of withstanding voltage test is provided on 8527. The monitor output is output from ⑭ on the rear panel.



Output range : Output voltage 0~5VDC to the output 0~5kVAC of withstanding voltage test.
 Tolerance : $\pm 1.5\%$ of F.S
 External resistance load : $2k\Omega$ or more.

⚠ WARNING

VOLTAGE MONITOR is not isolated from the high voltage output ⑨, ⑩, ⑫, ⑬ and ⑰.
 Take utmost care for the connection with the monitor equipment.

20. Error message

When the error occurs, the message is displayed as the following table shows depending upon the situation. Take proper action after confirming the error message.



AC TEST VOLTAGE	CURRENT/RESISTANCE	Cause	Solution
<i>Err</i>	<i>CHrG</i>	When discharging of test sample does not finish after passing 10 sec.	A, I
<i>Err</i>	<i>SSr</i>	When voltage output does not drop after passing 10 sec.	A
<i>Err</i>	<i>LoCP</i>	When interlock input turns OFF.	B
<i>Err</i>	<i>rMFE</i>	When remote status is changed during the test.	C
measuring	<i>uuuu</i>	When abnormal current is detected during withstanding voltage test. (Becomes NG for high limit of leak current.)	D
<i>Err</i>	<i>SrFr</i>	When the time to retain start signal is less than 40ms.	E
<i>Err</i>	<i>E-11</i>	When start signal turns OFF in momentary action, during W test.	F
<i>Err</i>	<i>E-21</i>	When start signal turns OFF in momentary action, during I test.	F
<i>Err</i>	<i>Mode</i>	When the test mode is indecisive.	G
<i>Err</i>	<i>E-40</i>	Test mode W and I are simultaneously set in REAR:MODE.	H

※ PROTECTION is output from **REMOTE/OUT** connector ②.

Solutions:

- A: Turn OFF the power supply immediately. The 8527 main unit is may be faulty. Consult us or the dealer.
- B: Interlock input is turned OFF. Review the connection and sequence, and correctly connect the interlock input.
Press **STOP** switch ② and make READY status.
- C: The error is given when the connection is ON/OFF and the memory number is changed during the test. Press **STOP** switch ② and make READY status, and check the connection or sequence.
- D: In case that the test sample is short-circuited or abnormal current flows, the judgement for high leak current becomes NG.
In view of priority on safety, the 8527 is designed to firstly check whether the load (test sample) is short-circuited or not, faster than the measurement. Consequently, the measured voltage at this moment is the value in half-way of response and is not correct value. Pay attention to it.
After checking the connection or sequence, or replacing the load (test sample) with correct one, press **STOP** switch ② and make READY status.
- E: Press **STOP** switch ② and make READY status.
When the ON time is less than 10ms, take care to securely provide the start sequence of 40ms or more.
- F: Press **STOP** switch ② and make READY status. Check the connection or sequence so that the start signal can not be turned OFF during the test.
- G: When the test mode before entering the REAR:MODE setting is W or I, be sure to set the test mode to the same mode before the setting. To solve it, turn OFF the REAR:MODE and set to the single test mode in question.
- H: When the REAR:MODE is operating, make the setting so that the test mode selection is W-MODE or I-MODE. During the setting, it can be avoided by making the setting normal.
If it happens during the test, press **STOP** switch ② and make READY status. Afterwards, make a review of the connection or sequence so that the W-mode and I-mode can not be turned ON together.
- I: In case that the electrical capacity of the sample to be tested is big, the electric discharge may be not completed and the high voltage may remain.
Turn OFF the power and sufficiently discharge the sample to be tested by the proper way.

21. Maintenance and troubles

21.1 ●Cleaning

When the front panel or the case becomes dirty, wipe it with soft cloth.
For heavy dirt, wipe it lightly with the soft cloth wetted with the neutral cleaner thinned by water, and finish the cleaning with dry cloth. Do not use organic solvent like benzene or paint thinner as they may deform or discolor the case.

21.2 ●Failure symptom

When the tester is supposed to be faulty, please check the following points before requesting the repair of it.

Symptom	Check points
Although the power is turned ON, display does not light up.	<ul style="list-style-type: none">● Isn't the power supply plug of socket?● Isn't the fuse burnt out? Replace fuse referring to the art. 21.3 (P62).
<i>Err Lock</i> is displayed.	<ul style="list-style-type: none">● Interlock functions. Cancel the interlock referring to the art. 15.3 (P53).
Key is not operable.	<ul style="list-style-type: none">● Isn't the KEY LOCK lamp lit up? Cancel the key lock referring to the art. 12 (P46)
Test can not be started, though <input type="button" value="START"/> switch is pressed.	<ul style="list-style-type: none">● Isn't the READY lamp lit up?● Isn't the REMOTE lamp lit up? <input type="button" value="START"/> switch is disabled during the remote control. Refer to the article 14.6 (P51) for remote control.

21.3 ●Replacement of fuse

When the fuse is replaced, make sure to use one of the rated fuses listed below.
The fuse is attached as one of the accessories.

Sort	Power source voltage	Rate of fuse
Standard	100V AC	125V 10A
	115V AC	
Option	200V AC	250V 5A
	220V AC	
	240V AC	
	240V AC	

Recommendation:
It is recommended to use the lash-resistive type fuse TWM of Fuji Tanshi Kogyo made.

Do not use the fuse other than those rated above.

21.4 ● For long term troubles-less use

The model 8527 employs the slide regulator of motor driven and consists of motor section and transformer section.

It contains the mechanically consumable part, so if the part is continuously consumed, it may cause burnout trouble. If the use is frequent, the replacement of the motor slider is necessary.

Also, as it is the integral type of construction, any replacement, wiring or installation should be done at our factory. Please contact us for such services.

Time for replacement

[Motor section] The setting of withstanding voltage 0kV-Max-0kV is regarded as a return.
Use the tester with the 8000 times (returns) as an indication of life.

When the speed of VOLTAGE SLIDER appears to have been slow

In READY status, turn OFF the referential voltage setting and, changing the UP/DOWN of VOLTAGE SLIDER from 0 to max. or max. to 0, measure the elapsing time. From the reference below, make it as an indication of the time for replacement if the speed has become slower by 20% or more.

Individually for the motor, it is the time for replacement if the speed becomes slower by 10% or more, however, there is the measurement error of 2 seconds in actual time measurement, so about 20% is considered to be a realistic indication for judging the time for replacement.

Reference 0 ~ Max. continuously changeable (0~100% changeable)
Approx. 30 seconds 50Hz
Approx. 25 seconds 60Hz

[Motor section]
Indication of total time of use (total working time of VOLTAGE SLIDER) 2000 hours

⚠ WARNING

When doing the test, getting the VOLTAGE SLIDER to continuously change, it should be within 30 minutes. In this case, the downtime should be the same as test time or more.

Limit for the continuous test time

Table 21

Ambient temperature t (°C)	High limit set value I (mA)	Downtime	Maximum test time
t ≤ 40°C	50 < I ≤ 110	Same as test time or more	30 minutes or less
	I ≤ 50	Unnecessary	24 hours

22. Specifications

22.1 Withstanding voltage test section

22.1.1 Test voltage

- (1) Applied voltage 0~5kV AC
- (2) Output capacity 500VA (5kV, 100mA) at the power source voltage 100V AC.
For the output current 50mA or higher, 30 min. or less continuously.
- (3) Wave shape Shape of commercial power source.
- (4) Voltage fluctuation rate 15% or less
(with the rated power source voltage and at no load ⇒ max. load)
- (5) Voltage output system Zero-cross throw switch.
- (6) Setting of output voltage Setting by motor slider.
- (7) Setting accuracy of slider ±30V, except for the error due to voltage fluctuation.

22.1.2 Voltage measurement

- (1) Rectification system Effective average rectification value display.
- (2) Analog
 - Scale 0~5kV AC
 - Accuracy ±5% of F.S
- (3) Digital
 - Measuring range 0.00~6.00kV AC, 3 digits green LED, character height 10mm.
 - Accuracy ±1.5% of F.S (F.S 5kV)
 - Voltage display Voltage applied to the high voltage terminal is displayed during the test. Voltage at the judgement is retained at the finish of the test.

22.1.3 Current measurement

- (1) Rectification system Effective average rectification value display.
- (2) Measuring range 0.01~199.9mA (2 ranges, joint change-over with high limit value)
- (3) Display Digital display in 3 1/2 digits, green LED, character height 10mm.
- (4) Resolution 0.01mA (0.1~9.9mA) Note: () shows high limit set value.
0.1mA (10.0~110.0mA)
- (5) Measuring accuracy ±(5%+20 μ A) of high limit set value.
- (6) Current display Leak current value is displayed during the test.
Leak current value at the judgement is retained at the finish of the test (at NG of withstanding voltage or at I-W, W test mode).

22.1.4 Judgement of test result

- (1) Judgement system
 - High limit Analog comparator (for short-circuit detection, with the set value internally fixed)
 - High limit, low limit Digital comparator.
 - (2) Adjustable range
 - High limit 0.1~110.0mA (Low limit +1 digit or more) Resolution 0.1mA.
 - Low limit 0.1~109.0mA (High limit -1 digit or less) Resolution 0.1mA
 - Note:** Low limit setting can be ON/OFF (Judgement function: OFF, [LOW SET] LED is turned off.)
 - (3) Judgement condition
 - High limit value > Leak current > Low limit value ... GOOD
(W-GOOD LED lit up, output ON)
 - High limit value ≤ Leak current NG
(W-HIGH LED lit up, output ON)
 - Low limit value ≥ Leak current NG
(W-LOW LED lit up, output ON)
- Note:** Output time of GOOD judgement can be switched to continuous or 0.2s.
- For the AC withstanding voltage testers, the leak current due to the capacity distribution in the high voltage cable, jig and so on can cause the judgement error.
- Please determine the judgement criterion value, taking this leak current into account.
- The following values are the referential values on condition that the wiring is made, keeping the distance between HIGH voltage side cable (red) and LOW voltage side cable (black) of the attached high voltage cable (5880-25-020).

Output voltage	1kV	2kV	3kV	4kV	5kV
Leak current	10 μ A	20 μ A	30 μ A	37 μ A	47 μ A

22.1.5 Test time

- (1) Adjustable range 0.5~999s, with time off function.
- (2) Setting resolution 0.1s (0.5~99.9s) / 1s (100~999s)
- (3) Time display 0.0~999, 3 digits green LED, character height 8mm
During the test With timer ON Remaining time is displayed.
With timer OFF Time lapse is displayed.
- (4) Accuracy ±20ms (0.5~99.9s) / ±200ms (100~999s)

22.4 Input/output signal

(1) Judgement system	High and low limit digital comparator.
(2) Connector	36P Anphenol connector on the rear panel.
(3) Output signal	Open collector 30V DC, 30mA MAX
(4) Name of output signal	TEST : In test.
	END : Finish.
	TEST/H.V. ON : High voltage is output.
	READY : In waiting.
	W-TEST : In operation of withstanding voltage test.
	I-TEST : In operation of insulation resistance test.
	GOOD : At good judgement (0.2s / continuous changeable).
	NG : At NG judgement (continuous).
	W HIGH : At NG judgement of withstanding voltage test for high limit (continuous).
	W LOW : At NG judgement of withstanding voltage test for low limit (continuous).
	W GOOD : At GOOD judgement for withstanding voltage test.
	I HIGH : At NG judgement of insulation resistance test for high limit (continuous).
	I LOW : At NG judgement of insulation resistance test for low limit (continuous).
	I GOOD : At GOOD judgement for insulation resistance test.
PROTECTION : When the protective function is activated.	
(5) Power source for output/input signal	24V DC, 0.1A
(6) Input signal	H=16.8~24V, L0~3.8V Ic=10mA, L level minimum pulse width=40ms
(7) Name of input signal	START : Start signal
	STOP : Stop signal
	REAR:ON : Remote control signal
	INTER LOCK : Interlock signal
	W-MODE : Withstanding voltage test mode
	I-MODE : Insulation resistance test mode
	REAR:MODE : Changeover signal of remote control
	MEM SET1 : Memory read-out BCD code 1 signal
	MEM SET2 : Memory read-out BCD code 2 signal
	MEM SET4 : Memory read-out BCD code 4 signal
MEM SET8 : Memory read-out BCD code 8 signal	

22.5 Status output

The relay contact is output when the output condition set from the front panel.

Contact configuration	: 1a contact.
Contact capacity	: 250V AC / 1A (30V DC / 1A) Resistive load
Setting condition	: 1) TEST/H.V. OUT 5) READY
(Plural numbers of the condition selectable)	2) TEST 6) REMOTE
	3) GOOD 7) POWER ON
	4) NG

22.6 Voltage monitor output

Monitor output for output voltage of withstanding voltage test.

Output terminal	: One piece each of red and black Johnson terminal on the rear panel.
Output voltage	: 0~5V DC (to 0~5kV AC)
Tolerance	: ±1.5% of F.S

22.7 RS-232C interface

Setting of the test condition and take in of the test result data can be done by P/C and so on.

Connector	: D-sub 9P
Transmission system	: Start-stop synchronous duplex transmission
Transmission speed	: 9600bps
Data length	: 8bit
Parity	: Nil

22.8 Remote control

The remote control listed below is possible by and through REMOTE connector (DIN5P) on the front panel, REMOTE terminal or REMOTE/OUT connector on the rear panel.

- (1) START Start of test.
- (2) STOP Interruption of the test and the reset of judgement.
In case that the remote control is done from the REMOTE connector on the front panel, it is necessary to connect the optional remote control box (5858-07).
It is also possible to remote control with no-voltage contact or logic element from the REMOTE terminal or REMOTE/OUT connector on the rear panel.
When the remote control is done, REAR:ON is to be short-circuited. REMOTE is displayed when remote controlled. Start switch on the front panel is not operable.
- (3) W-MODE Withstanding voltage test mode (REMOTE/OUT connector pin 21)
- (4) I-MODE Insulation resistance test mode (REMOTE/OUT connector pin 22)
When the remote control is done from the connector on the rear panel, make a short-circuit between REAR:MODE and COM.
The test mode set on the front panel becomes ineffective and the mode selected on the rear panel becomes effective.
- (5) Memory read-out The test is performed by the condition memorized in the memory.
It is possible to do the test by the condition of the memory selected by REMOTE/OUT connector (MEM SET).
When this function is actuated, no change of the setting is allowed (unable to enter the setting mode).

22.9 Other functions

- (1) Interlock Locking condition when the pin5 (INTER LOCK) on the rear connector is open.
When locked, *ERR LOCK* is displayed.
- (2) Memory function 12 kinds of setting content (test mode, setting of slider voltage, setting of referential voltage, high and low limit of leak current and test time of the withstanding voltage test, and voltage range, high and low limit of resistance value, test time, mask timer time and to activate or not discharging function of the insulation resistance test) are memorized. When the memory is written in or read out, the memory No.1~9 is displayed.
- (3) Referential voltage Test is started when the voltage set by the slider is within $\pm 5\%$ of the set value.
Note: When the set voltage is 1000V or less, it is within $\pm 50V$.
In case that the voltage comes out of the set value, the test is stopped and [W-HIGH], [W-LOW](NG) LED are lit up.
(The function can be turned ON/OFF. When turned OFF, *OFF* is displayed on the voltage display at the time of setting and in [READY].)
- (4) Key lock When locked, operation of the switches other than start and stop is disabled.
(KEY LOCK lamp is displayed at locking)
- (5) Buzzer adjustment Sound volume is individually adjustable (mute-able) for GOOD, NG. Setting is made on the front panel.
- (6) DANGER display It is lit up when the test voltage is output.
In case that the voltage remains at the output terminal, it is continuously lit up.
Low voltage detection level : 100V AC
30V DC
- (7) Special mode
 - ① Double action start function
Within 0.5 second after the stop signal having been input, the test starts by input of start signal.
 - ② GOOD hold function
 - a) "GOOD" judgement is continuously output until the stop signal is input. In this case, re-start is not possible until the stop signal is input.
 - b) In the above a) condition, by inputting the start signal, the judgement is reset and the re-start is possible.
 - ③ Momentary start function
The test is done only when the start signal is input.
 - ④ FAIL mode function
NG judgement and PROTECTION action by the stop signal of remote control are disabled, and only the resetting by the stop switch on the tester main unit is enabled.

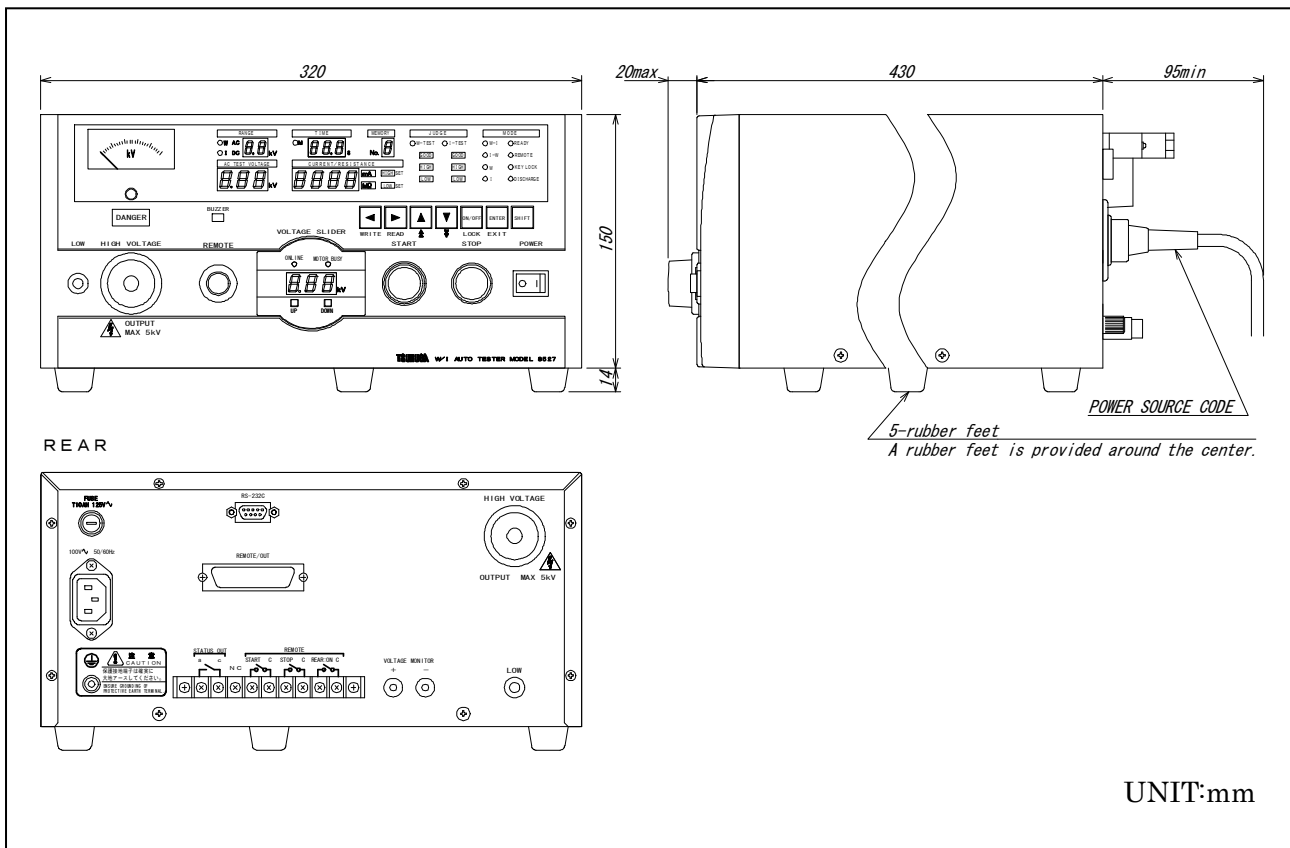
22.10. General specifications

- (1) Power supply 100V AC 50/60Hz
- (2) Range of source power supply 90~110V AC
- (3) Power consumption Approx. 650VA at rated load of withstanding voltage test, approx. 17VA with no load (READY)
- (4) Operating ambient temp. 0~40°C
- (5) Operating ambient hum. 20~80%RH
- (6) Storage temp. and hum. -20~70°C, 90%RH or less (no dew)
- (7) Withstanding voltage Power source – Outer housing 1000V AC for 1 minute
- (8) External dimensions 320(W) × 150(H) × 430(D)mm
- (9) Weight Approx. 19 kg.
(Increased by about 5.5 kg. for non-standard power source voltage.)
- (10) Optional accessories
 - Remote control box Model 5858-07
 - Both-hands remote control box Model 5858-07W
 - Foot switch Model 5858-04
 - Communication cable Model 5881-11-018 (RS-232C cable, 9 pins – 9 pins / 1.8m)
 - Rack mount bracket Model 5871-03-015
 - Relay unit Model 5858-08

22.11. Optional specification (factory option, to be designated at ordering)

- Non-standard power
 - 115V AC / Suffix: -P115
 - 200V AC / Suffix: -P200
 - 220V AC / Suffix: -P220
 - 240V AC / Suffix: -P240
- are available on request.

22.12. External dimensions



Contact Information	
Name	: Tsuruga Electric Corporation
Address	: 1-3-23 Minami-Sumiyoshi, Sumiyoshi-ku, Osaka-shi 558-0041 Japan

RS-232C Interface for Model 8527

Instruction Manual

TSURUGA ELECTRIC CORPORATION

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1. Specifications

The model 8527 is provided standard with the RS-232C interface for communication, which allows to the remote control and the output of various data by a personal computer.

[Note] There are many types of equipment on “host” side such as personal computer, sequencer and so on. In this manual, all these equipment are represented by the word “host”.

○Content operable with RS-232C interface.

Table 1.1

Function	Content
Setting / Operation	<ul style="list-style-type: none"> ●Test action mode ●Each test condition ●Memory No. ●Buzzer sound
Output	<ul style="list-style-type: none"> ●Test action mode ●Each test condition ●Each test result ●Status ●Memory No. ●Buzzer sound

[Note] ON/OFF of supply power source, setting of special test mode and status output condition are not possible to do.

○Specifications

Table 1.2 Specifications

Transmission system	Start-stop synchronous duplex transmission
Transmission speed	9600bps
Data bit length	8 bit
Stop bit	1 bit
Parity bit	Nil
Delimiter	CR+LF
Xon/Xoff	Nil
Receiver buffer length	256 bites
Connector	D-sub 9 pin (male)

○Priority of remote control

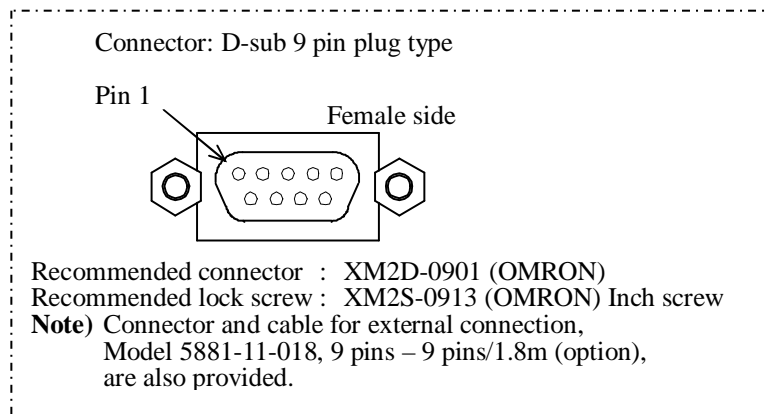
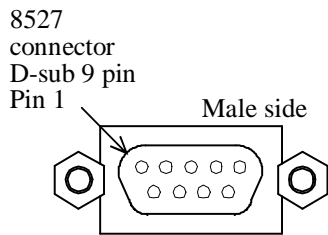
Item	Setting of remote control	Priority
A	RS-232C connector (rear panel)	1
B	REMOTE connector (front panel)	2
C	REMOTE / OUT connector (rear panel)	3
D	REMOTE terminal (rear panel)	3

○Cautions when the power source is thrown in again after use of RS-232C.

When the power is turned OFF, the content other than those set by the memory, such as the memory number display, keylock, remote etc., return to the condition before being set by the RS-232C.

2. Connection

2.1 ● Connectors and signals



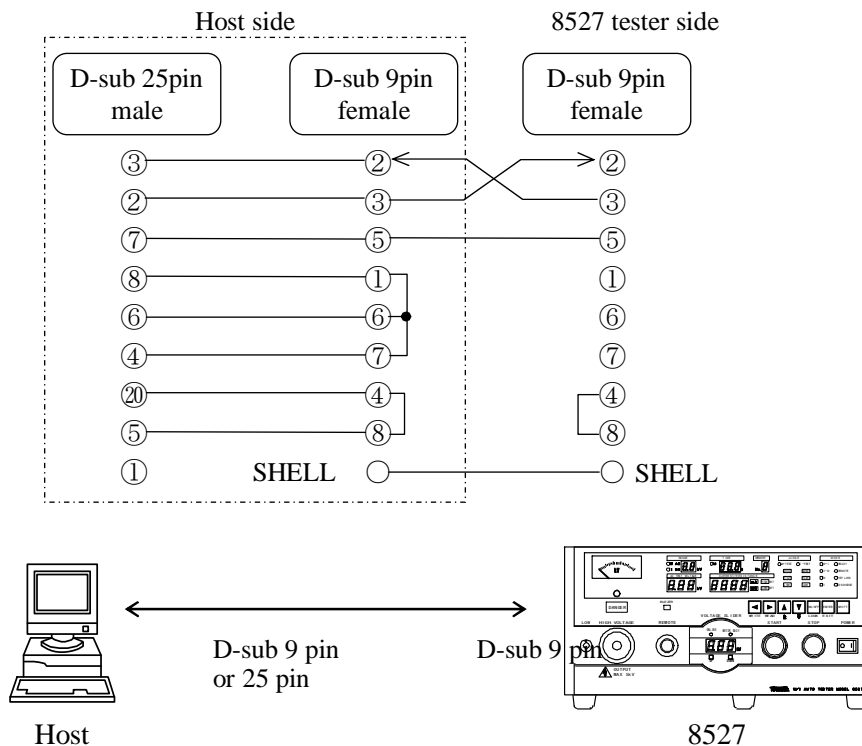
Pin No.	8527 JIS (RS-232C)	Direction	Name
①	NC		Not in use
②	RD (RXD)	←Host	Receiving data
③	SD (TXD)	→Host	Transmission data
④	ER (DTR)	←Host	Data terminal ready
⑤	SG (GND)		Ground for signal
⑥	NC		Not in use ※1
⑦	RS (RTS)	←Host	Request for transmission
⑧	CS (CTS)	→Host	Transmittable
⑨	NC		Not in use ※2

※1 Host side is DR (DSR) data set ready.

※2 Host side is RI

2.2 ● Connection with host (reference)

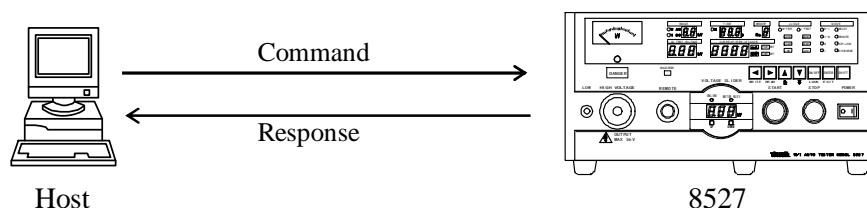
No hardware handshake.



Make a connection of 8527 and host by cable.

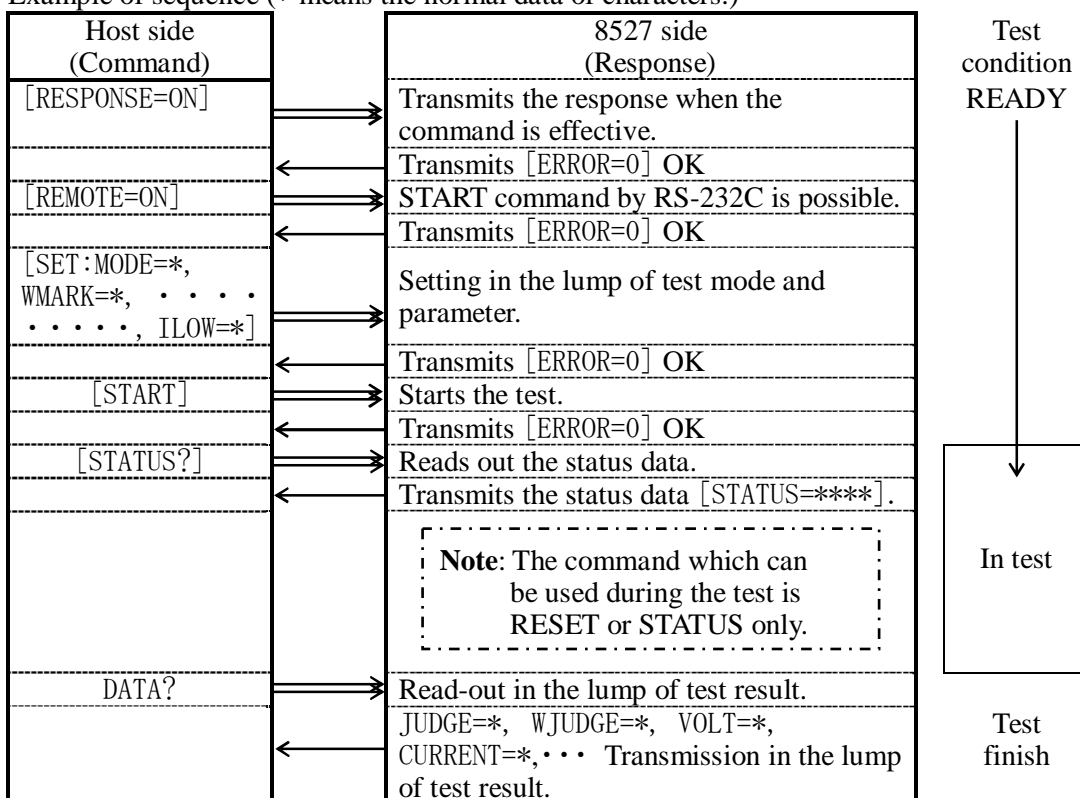
3. Explanation of communication method

3.1 ● Communication method for command

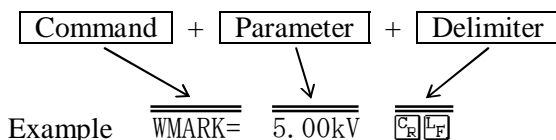


Command is sent from the host.
 When the 8527 received an effective command, it makes the corresponding transaction.
 After completion of transaction, a response is transmitted to the host.
 The host transmits the next command after confirming the response.

Example of sequence (* means the normal data of characters.)



A Configuration of command



1. Command The command to control 8527.
 It does not a matter whether the command is in capital or small letter.
2. Delimiter It means the division of transmission data.
3. JIS 8 bit code is used for the command, parameter and delimiter.
4. Command and parameter is divided by “=”.
5. In case that there is no parameter, transmit the delimiter following the command.
 Example: RESET CRF
6. 8527 responses even if a unit is not included in the parameter.

Caution at the transmission of command

Transmit the set command (○○○○=) when the 8527 is in READY status.
 When the set command is transmitted from the host during the test, 8527 transmits an error to the host.

B Configuration of response

When the host transmits the command to 8527, 8527 analyzes and transact the command, and transmits the response to the host.

In case that the command transmission is unconformable, 8527 transmits an error code to the host.

Also provided on 8527 is the **Response Setting** to set whether or not to transmit the normal response from 8527 when the received transmission of command is normal.

[Refer to the article 4.2.7 (P12) RESPONSE.]

[When the Response Setting is turned ON]

- For the effective setting and operation command, 8527 certainly transmits ERROR=0 to the host .

Example 3.1 In case of effective command START $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$,
Response is: ERROR=0 $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$

Example 3.2 In case of effective command WTIMER=60. 0s $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$,
Response is: ERROR=0 $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$

The test time of withstanding voltage test is set to 60.0s.

- For the ineffective setting and operation command, 8527 certainly transmits ERROR=code to the host.

Example 3.3 In case of ineffective command RST $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$ (incorrect spell of the
test stop command)

Response is: ERROR=Error No $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$

[When the Response Setting is turned OFF]

- 8527 does not transmit ERROR=0 to the effective setting and operation command.

Example 3.4 In case of effective command START $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$,
No response is transmitted.

Example 3.5 In case of effective command WTIMER=60. 0s $\begin{matrix} \text{C}_R \\ \text{L}_F \end{matrix}$,
No response is transmitted.

- For the ineffective setting and operation command, 8527 certainly transmits ERROR=code to the host, regardless of ON/OFF of Response Setting.
Same as Example 3.3.

3.2 ●Basic format of read-out command

When the “?” is added to the command letters sent from the host, 8527 transacts it as read-out command. To the read-out command, 8527 adds “=parameter” to the command letters and transmits it to the host.

Command from the host side : Command letters?
 Response from 8527 to the host : Command letters=parameter
 In case of error, 8527 transmits the error code to the host.
 Refer to the **article 6 (P34) Error**.

Example 3.6 Command : ILOW?

C _R	L _F
----------------	----------------

 Reads out the low limit value of resistance of insulation resistance test.
 Response is : ILOW=10.0MOHM

C _R	L _F
----------------	----------------

3.3 ●Basic format of setting and operation

- When the “=” is added to the letters of setting command from the host side, 8527 transacts it as setting command.
- “=” is not necessary for the operation command START and RESET.

Setting command from the host side : Command letters=
 Operating command from the host side : Command letters

Example 3.7 In case of setting command
 Effective command : MODE=WI

C _R	L _F
----------------	----------------

 Test mode is set to W-I
 Response : ERROR=0

C _R	L _F
----------------	----------------

 When Response Setting is ON.
 Response : No response When Response Setting is OFF.
 In case of error, the error code is transmitted to the host.

Example 3.8 In case of operation command
 Effective command : In case of START

C _R	L _F
----------------	----------------

 Starts the test.
 Response : ERROR=0

C _R	L _F
----------------	----------------

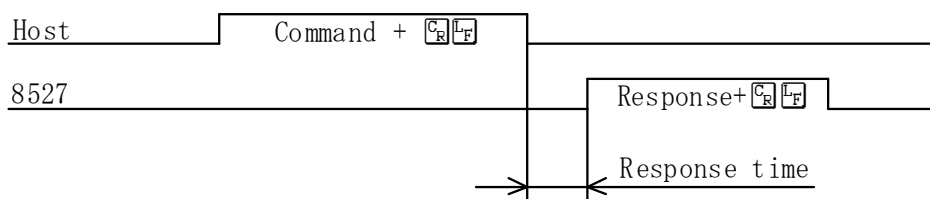
 When Response Setting is ON.
 Response : No response When Response Setting is OFF.
 In case of error, the error code is transmitted to the host.

4. Explanation of command

4.1 Table of command

Function		Setting / read-out	Approx. response time (ms) (Note-1)	Explanation page
ON/OFF selection of remote control		REMOTE=/REMOTE?	23/19	9
Keylock		KEYLOCK=/KEYLOCK?	27/23	10
ON/OFF selection to suffix command name and unit to the transmission to the host		FORMAT=/FORMAT?	27/23	11
ON/OFF selection of response		RESPONSE=/RESPONSE?	32/24	12
Test mode		MODE=/MODE?	17/15	13
Start of test		START	10~15	14
Stop of test and judgement reset		RESET	10~15	14
Read-out of status		STATUS?	5~13	15
Read-out of tester identification		IDNT?	12	16
Withstand- ing voltage test	Slider voltage Note-2	WMARK=/ WMARK?	400/20	16
	Referential voltage	WLEVEL=/WLEVEL?	28/16	17
	High limit of leak current	WHIGH=/WHIGH?	25/16	18
	Low limit of leak current	WLOW=/WLOW?	32/15	19
	Test time	WTIMER=/WTIMER?	29/26	20
Insulation resistance test	Test voltage range	IVOLT=/IVOLT?	19/16	21
	High limit of resistance value	IHIGH=/IHIGH?	32/14	22
	Low limit of resistance value	ILOW=/ILOW?	29/12	23
	Mask time	IMASK=/IMASK?	30/18	24
	Test time	ITIMER=/ITIMER?	25/18	25
	Discharge function	DISCHARGE=/DISCHARGE?	32/27	26
Read-out of judgement result		JUDGE?	20	27
Read-out in the lump of test result and data		DATA?	16	28
Parameter of test condition Note-2		SET:/SET:?	400/30	29
Change-over of memory No. Note-2		MEMORY=/MEMORY?	400/14	30
Parameter of test condition including memory No. □:1~9		MEM□:/MEM□:?	420/20	31
Buzzer sound volume		BUZZ=/BUZZ?	23/15	32

Note-1: The response time mentioned in the table is the referential value and may vary depending upon the condition of use. It is not to warrant the performance of 8527.



Note-2: The setting command automatically moves the slider up or down.
 Example : WMARK=1.50kV [C] [F]
 MEMORY=1 (When the effective WMARK=□.□□kV are in the memory content.)

4.2 ● Explanation of each command

4.2.1 REMOTE= (setting of remote control)

Function By setting the remote control, ONLINE lamp and REMOTE lamp are lit up and the tester enters in the keylock status (KEYLOCK lamp lit up).

Structure REMOTE=[ON/OFF]

ON/OFF : Becomes the status of remote control by the host with “ON”.
 Keylock setting is also turned “ON” without condition.
 START command becomes effective.
 Cancels the remote control status with “OFF”.
 Setting for the keylock at that time is retained.

Transmission

REMOTE=ON Makes the remote control setting ON.

REMOTE=OFF Makes the remote control setting OFF.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF

⚠ WARNING

The keylock function can be cancelled by KEYLOCK=OFF command of RS-232C. Do not use the RS-232C remote control by KEYLOCK=OFF.

4.2.2 REMOTE? (read-out of setting of remote control)

Function Reads out whether the setting of remote control is ON or OFF.

Structure REMOTE?

Transmission

REMOTE?

Response

REMOTE=ON When the remote control setting is ON.

REMOTE=OFF When the remote control setting is OFF.

4.2.3 KEYLOCK= (setting of keylock)

Function Lock or cancel the operation other than those made on the front panel and by START and STOP of REMOTE / OUT connector ② (KEYLOCK lamp lit up).

Structure KEYLOCK=ON/OFF

ON/OFF: Becomes keylock status with “ON”.
Cancels the keylock status with “OFF”.

Transmission

KEYLOCK=ON Makes the keylock setting ON.

KEYLOCK=OFF Makes the keylock setting OFF.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

Note: When the KEYLOCK=ON is set, the keylock can not be cancelled by key operation. In order to turn it OFF, make the KEYLOCK=OFF command or turn OFF the power supply.

4.2.4 KEYLOCK? (read-out of keylock status)

Function Reads out ON or OFF of the keylock setting.

Structure KEYLOCK?

Transmission

KEYLOCK?

Response

KEYLOCK=ON When the keylock setting is ON.

KEYLOCK=OFF When the keylock setting is OFF.

Note: The keylock status set by the key on the tester main unit can not be read out. When the KEYLOCK lamp is lit up with KEYLOCK=OFF , cancel it by the key on the tester main unit.

4.2.5 FORMAT= (setting of response format)

- Function** Command name and unit can be added to the response sent to the host.
- Structure** FORMAT=[ON/OFF]
 - ON/OFF** : Adds command name and unit to the data sent to the host with "ON".
Does not add command name and unit to the data sent to the host with "OFF".
- Transmission**
 - FORMAT=ON $\text{C}_R \text{L}_F$ Adds command name and unit to the response.
 - FORMAT=OFF $\text{C}_R \text{L}_F$ Does not add command name and unit to the response.
- Response** When 8527 received the effective command setting.
 - ERROR=0 $\text{C}_R \text{L}_F$ When the Response Setting is ON.
 - No response When the Response Setting is OFF.

4.2.6 FORMAT? (read-out of response format)

- Function** Reads out whether the setting of response format is ON or OFF.
- Structure** FORMAT?
- Transmission**
 - FORMAT? $\text{C}_R \text{L}_F$
- Response**
 - FORMAT=ON $\text{C}_R \text{L}_F$ When the response format to the host is ON.
 - FORMAT=OFF $\text{C}_R \text{L}_F$ When the response format to the host is OFF.

⚠ CAUTION

In this instruction manual, the explanations are made provided that FORMAT=ON for comprehension.

4.2.7 RESPONSE= (setting of response)

Function When 8527 received the effective command, it informs the host that the command is normally received. This communication function can be set to ON or OFF.

Structure RESEPNSE=**ON/OFF**

ON/OFF : Always transmits the response with “ON”.
 When 8527 receives the effective command, it transmits ERROR=0 to the host.
 For the ineffective command, it transmits ERROR=**No**.
 When 8527 receives the effective command with “OFF”, no response is transmitted to the host.
 When the command is ineffective, ERROR=**No** is transmitted regardless of ON/OFF of the Response Setting.

Note: For ERROR=**No**, refer to the article 6 Error.

Transmission

RESEPNSE=ON **C_RL_F** Makes the response setting ON.

RESEPNSE=OFF **C_RL_F** Makes the response setting OFF.

Response When 8527 received the effective command setting.

ERROR=0 **C_RL_F** When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.8 RESEPNSE? (read-out of setting of response)

Function Reads out whether the setting of response is ON or OFF.

Structure RESEPNSE?

Transmission

RESEPNSE?**C_RL_F**

Response

RESEPNSE=ON **C_RL_F** When the Response Setting is ON.

RESEPNSE=OFF **C_RL_F** When the Response Setting is OFF.

4.2.9 MODE= (setting of test mode)

Function Makes the setting of test mode.

Structure MODE=**Parameter**

Parameter

- WI : Automatic sequential test mode, withstanding voltage test → insulation resistance test.
- IW : Automatic sequential test mode, insulation resistance test → withstanding voltage test.
- W : Single test mode of withstanding voltage test
- I : Single test mode of insulation resistance test

Transmission

MODE=WI

Test mode is set to automatic sequential test mode of WI (withstanding voltage test → insulation resistance test).

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.10 MODE? (read-out of test mode)

Function Reads out the test mode being set.

Structure MODE?

Transmission

MODE?

Response

MODE=I When the test mode setting is I, insulation resistance test.

4.2.11 START (start of test)

- Function Starts the test.
Note: When the setting on 8527 main unit side of the special test mode - GOOD hold function is \bar{L} , re-start with START command is also possible.
- Structure START
- Transmission
START $\bar{C}_R \bar{L}_F$
- Response When 8527 received the effective command setting.
ERROR=0 $\bar{C}_R \bar{L}_F$ When the Response Setting is ON.
No response When the Response Setting is OFF.

4.2.12 RESET (stop of test, judgement reset)

- Function Stops the test.
When the command is transmitted in the condition that the judgement is being out, the judgement is reset.
- Structure RESET
- Transmission
RESET $\bar{C}_R \bar{L}_F$
- Response When 8527 received the effective command setting.
ERROR=0 $\bar{C}_R \bar{L}_F$ When the Response Setting is ON.
No response When the Response Setting is OFF.

4.2.13 STATUS? (read-out of status)

Function Reads out the status of 8527.

Note: It has no relation with the relay output of **STATUS OUT** terminal on the rear of 8527 under **Setting of condition for status output** (refer to P55 of instruction manual of the tester main unit).

Structure STATUS?

Transmission

STATUS?**C_R****L_F**

Response

STATUS=**C_R****L_F**
: Numeral in 4 digits (Hexadecimal notation)

[Example]

STATUS=0015 **C_R****L_F** In test.
 W-TEST, TEST/HVOUT, TEST are being output.
 STATUS=2442 **C_R****L_F** At the finish of test.
 I-GOOD, W-GOOD, GOOD, END are being output.

●Kinds of parameter

Name of output	Condition of output	Weight of data (Hexadecimal digit)
TEST	In the course of test.	0001
END	Finish of test.	0002
TEST/H. V. OUT	High voltage being output.	0004
READY	In waiting.	0008
W-TEST	In the course of withstanding voltage test.	0010
I-TEST	In the course of insulation resistance test.	0020
GOOD	Total judgement passed.	0040
NG	Total judgement failed.	0080
W-HIGH	Withstanding voltage test failed for high limit of leak current.	0100
W-LOW	Withstanding voltage test failed for low limit of leak current.	0200
W-GOOD	Withstanding voltage test passed.	0400
I-HIGH	Insulation resistance test failed for high limit of resistance.	0800
I-LOW	Withstanding voltage test failed for low limit of resistance.	1000
I-GOOD	Insulation resistance test passed.	2000
PROTECTION	Protective circuit is activated. Note-1	4000
MOTOR BUSY	Motor slider in operation.	8000

Note-1: “Protective circuit is activated” means that the tester is in the status of interlock, error display and etc.

4.2.17 WLEVEL= (setting of referential voltage of withstanding voltage test)

- Function Makes the setting of referential voltage of withstanding voltage test.
- Structure WLEVEL=Referential voltage
- Referential voltage OFF or 0.00~5.00kV is to be set.
- Transmission
- WLEVEL=1.50kV CRLF Sets the referential voltage of withstanding voltage test at 1.50kV.
- Response When 8527 received the effective command setting.
- ERROR=0 CRLF When the Response Setting is ON.
- No response When the Response Setting is OFF.

4.2.18 WLEVEL? (read-out of referential voltage of withstanding voltage test)

- Function Reads out the referential voltage of withstanding voltage test.
- Structure WLEVEL?
- Transmission
- WLEVEL?CRLF
- Response
- WLEVEL=1.50kV CRLF Indicates the referential voltage of withstanding voltage test 1.50kV.

4.2.19 WHIGH= (setting of high limit of leak current of withstanding voltage test)

Function Makes the setting of high limit of leak current of withstanding voltage test.

Structure WHIGH=**High leak current**

High leak current 0.1~110.0mA is to be set.

Note: Set value of high leak current can not be lower than low limit value of leak current.

Transmission

WHIGH=10.0mA Sets the high limit of leak current of withstanding voltage test at 10.0mA.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.20 WHIGH? (read-out of high limit value of leak current of withstanding voltage test)

Function Reads out the high limit value of leak current of withstanding voltage test.

Structure WHIGH?

Transmission

WHIGH?

Response

WHIGH=10.0mA Indicates the high limit of leak current of withstanding voltage test 10.0mA.

4.2.21 WLOW= (setting of low limit of leak current of withstanding voltage test)

Function Makes the setting of low limit of leak current of withstanding voltage test.

Structure WLOW=**Low leak current**

Low leak current OFF or 0.0~109.0mA is to be set.

Note: Set value of low leak current can not be higher than high limit value of leak current.

Transmission

WLOW=2.0mA Sets the low limit of leak current of withstanding voltage test at 2.0mA.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.22 WLOW? (read-out of low limit value of leak current of withstanding voltage test)

Function Reads out the low limit value of leak current of withstanding voltage test.

Structure WLOW?

Transmission

WLOW?

Response

WLOW=2.0mA Indicates the low limit of leak current of withstanding voltage test 2.0mA.

4.2.23 WTIMER= (setting of test time of withstanding voltage test)

Function Makes the setting of test time of withstanding voltage test.

Structure WTIMER=**Test time**

Test time OFF or 0.5~999sec. is to be set.

Transmission

WTIMER=60.0s Sets the test time of withstanding voltage test at 60.0sec.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.24 WTIMER? (read-out of test time of withstanding voltage test)

Function Reads out the test time of withstanding voltage test.

Structure WTIMER?

Transmission

WTIMER?

Response

WTIMER=10.0s Indicates the test time of withstanding voltage test 10.0sec..

4.2.25 IVOLT= (setting of test voltage range of insulation resistance test)

Function Makes the setting of test voltage range of insulation resistance test.

Structure IVOLT=**Test voltage range**
 Test voltage range 0.5kV or 1.0kV is to be set.

Transmission

IVOLT=1.0kV **C_RL_F** Sets the range of insulation resistance test at 1.0kV.

Response When 8527 received the effective command setting.

ERROR=0 **C_RL_F** When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.26 IVOLT? (read-out of test voltage range of insulation resistance test)

Function Reads out the test voltage range of insulation resistance test.

Structure IVOLT?

Transmission

IVOLT?**C_RL_F**

Response

IVOLT=0.5kV **C_RL_F** Indicates the test voltage range of insulation resistance test 0.5kV.

4.2.27 IHIGH= (setting of high limit of resistance value of insulation resistance test)

Function Makes the setting of high limit of resistance value of insulation resistance test.

Structure IHIGH=**High limit of resistance value**

High limit of resistance value OFF or 0.2MOHM~2000MOHM is to be set.

Note: High limit value of resistance can not be lower than the low limit value of resistance.

Transmission

IHIGH=100.0MOHM Sets the high limit value of resistance of insulation resistance test at 100.0MΩ.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.28 IHIGH? (read-out of high limit of resistance value of insulation resistance test)

Function Reads out the high limit of resistance value of insulation resistance test.

Structure IHIGH?

Transmission

IHIGH?

Response

IHIGH=100.0MOHM Indicates the high limit value of resistance of insulation resistance test 100.0MΩ.

4.2.29 ILOW= (setting of low limit of resistance value of insulation resistance test)

Function Makes the setting of low limit of resistance value of insulation resistance test.

Structure ILOW=**Low limit of resistance value**

Low limit of resistance value 0.1MOHM~1999MOHM is to be set. It can not be set to OFF.

Note: Low limit value of resistance can not be higher than the high limit value of resistance.

Transmission

ILOW=0.2MOHM Sets the low limit value of resistance of insulation resistance test at 0.2MΩ.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.30 ILOW? (read-out of low limit of resistance value of insulation resistance test)

Function Reads out the low limit of resistance value of insulation resistance test.

Structure ILOW?

Transmission

ILOW?

Response

ILOW=2.0MOHM Indicates the low limit value of resistance of insulation resistance test 2.0MΩ.

4.2.31 IMASK= (setting of mask time of insulation resistance test)

Function Makes the setting of mask time (mask timer) of insulation resistance test.

Structure IMASK=**Mask time**

Mask time 0.3~50.0 sec. is to be set. It can not be set to OFF.

Note: Set the mask time shorter than test time (ITIMER) by 0.2 sec. or more.

Transmission

IMASK=5.0s Sets the mask time of insulation resistance test at 5.0 sec..

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.32 IMASK? (read-out of mask time of insulation resistance test)

Function Reads out the mask time of insulation resistance test.

Structure IMASK?

Transmission

IMASK?

Response

IMASK=0.5s Indicates the mask time of insulation resistance test 0.5 sec..

4.2.33 ITIMER= (setting of test time of insulation resistance test)

Function Makes the setting of test time of insulation resistance test.

Structure ITIMER=**Test time**

Test time OFF or 0.5~999 sec. is to be set.

Note: Set the test time longer than mask time (IMASK) by 0.2 sec. or more.

Transmission

ITIMER=60.0s **C_R** **L_F** Sets the test time of insulation resistance test at 60.0 sec..

Response When 8527 received the effective command setting.

ERROR=0 **C_R** **L_F** When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.34 ITIMER? (read-out of test time of insulation resistance test)

Function Reads out the test time of insulation resistance test.

Structure ITIMER?

Transmission

ITIMER? **C_R** **L_F**

Response

ITIMER=10.0s **C_R** **L_F** Indicates the test time of insulation resistance test 10.0 sec..

4.2.35 DISCHARGE= (setting of discharge function of insulation resistance test)

Function Makes the setting of discharge function of insulation resistance test.

Structure DISCHARGE=**ON/OFF**

ON/OFF : Discharge function is ON with “ON”.
 Discharge function is OFF with “OFF”.

Transmission

DISCHARGE=ON **C_RL_F** Sets the discharge function of insulation resistance test to ON.

Response When 8527 received the effective command setting.

ERROR=0 **C_RL_F** When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.36 DISCHARGE? (read-out of discharge function of insulation resistance test)

Function Reads out ON or OFF of the discharge function of insulation resistance test.

Structure DISCHARGE?

Transmission

DISCHARGE?**C_RL_F**

Response

DISCHARGE=ON **C_RL_F** When ON of the discharge function of insulation resistance test is read out.

4.2.37 JUDGE? (read-out of judgement result)

Function Reads out the judgement result of each test.
[Command to use after the finish of the test (READY status)]
 Judgement result is retained until the next start even if the RESET command is made or **STOP** switch is pressed.

Structure JUDGE?

Transmission

JUDGE?_R_F

Response

Type of judgement	Parameter	Content
Total judgement JUDGE= _R _F _R : Parameter	GOOD	Passed.
	NG	Failed.
	NULL	When the test is stopped by RESET command (STOP switch).
	PROTECT	When the protective function (PROTECTION) is activated during the test.
Test mode WJUDGE= _R _F IJUDGE= _R _F _R : Parameter	GOOD	Passed.
	HIGH	Failed for high limit judgement.
	LOW	Failed for low limit judgement.
	NULL	When the test is stopped by RESET command (STOP switch).
	HIGH LOW	When the protective function (PROTECTION) is activated during the test.

Example of responses:

Test mode	Judgement result and action during the test	Response
WI or IW	Passed W and I test.	JUDGE=GOOD, WJUDGE=GOOD, IJUDGE=GOOD _R _F
WI	W test failed for HIGH	JUDGE=NG, WJUDGE=HIGH, IJUDGE=NULL _R _F
	W test failed for LOW	JUDGE=NG, WJUDGE=LOW, IJUDGE=NULL _R _F
	I test failed for HIGH	JUDGE=NG, WJUDGE=GOOD, IJUDGE=HIGH _R _F
	I test failed for LOW	JUDGE=NG, WJUDGE=GOOD, IJUDGE=LOW _R _F
	When protective function activated in W test	JUDGE=PROTECT, WJUDGE=HIGH LOW, IJUDGE=NULL _R _F
	When protective function activated in I test	JUDGE=PROTECT, WJUDGE=GOOD, IJUDGE=HIGH LOW _R _F
IW	W test failed for HIGH	JUDGE=NG, WJUDGE=HIGH, IJUDGE=GOOD _R _F
	W test failed for LOW	JUDGE=NG, WJUDGE=LOW, IJUDGE=GOOD _R _F
	I test failed for HIGH	JUDGE=NG, WJUDGE=NULL, IJUDGE=HIGH _R _F
	I test failed for LOW	JUDGE=NG, WJUDGE=NULL, IJUDGE=LOW _R _F
	When protective function activated in W test	JUDGE=PROTECT, WJUDGE=HIGH LOW, IJUDGE=GOOD _R _F
	When protective function activated in I test	JUDGE=PROTECT, WJUDGE=NULL, IJUDGE=HIGH LOW _R _F
WI or IW	At RESET (stop)	JUDGE=NULL, WJUDGE=NULL, IJUDGE=NULL _R _F
W	At judgement result GOOD	JUDGE=GOOD, WJUDGE=GOOD _R _F
	At judgement result HIGH	JUDGE=NG, WJUDGE=HIGH _R _F
	At judgement result LOW	JUDGE=NG, WJUDGE=LOW _R _F
	At STOP	JUDGE=NULL, WJUDGE=NULL _R _F
	When protective function activated	JUDGE=PROTECT, WJUDGE=HIGH LOW _R _F
I	At judgement result GOOD	JUDGE=GOOD, IJUDGE=GOOD _R _F
	At judgement result HIGH	JUDGE=NG, IJUDGE=HIGH _R _F
	At judgement result LOW	JUDGE=NG, IJUDGE=LOW _R _F
	At STOP	JUDGE=NULL, IJUDGE=NULL _R _F
	When protective function activated	JUDGE=PROTECT, IJUDGE=HIGH LOW _R _F

4.2.38 DATA? (lump read-out of test result)

Function	Reads out the detail data of test result. [Command to use after the finish of the test (READY status)] Judgement result and data are retained until the next start even if the RESET command is made or STOP switch is pressed.
Structure	DATA?
Transmission	
	DATA? C_R L_F
Response	

[Example of responses after the finish of automatic test]

Test mode	Judgement result and action during the test	Response
WI or IW	Passed W and I test.	JUDGE=GOOD, WJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA, IJUDGE=GOOD, RESISTANCE=123MOHM C_R L_F
WI	W test failed for HIGH	JUDGE=NG, WJUDGE=HIGH, VOLT=1.51kV, CURRENT=32.1mA, IJUDGE=NULL, RESISTANCE=0.00MOHM C_R L_F
	W test failed for LOW	JUDGE=NG, WJUDGE=LOW, VOLT=1.51kV, CURRENT=0.15mA, IJUDGE=NULL, RESISTANCE=0.00MOHM C_R L_F
	I test failed for HIGH	JUDGE=NG, WJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA, IJUDGE=HIGH, RESISTANCE=1234MOHM C_R L_F
	I test failed for LOW	JUDGE=NG, WJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA, IJUDGE=LOW, RESISTANCE=10.20MOHM C_R L_F
IW	W test failed for HIGH	JUDGE=NG, WJUDGE=HIGH, VOLT=1.51kV, CURRENT=32.1mA, IJUDGE=GOOD, RESISTANCE=12.34MOHM C_R L_F
	W test failed for LOW	JUDGE=NG, WJUDGE=LOW, VOLT=1.51kV, CURRENT=0.6mA, IJUDGE=GOOD, RESISTANCE=1234MOHM C_R L_F
	I test failed for HIGH	JUDGE=NG, WJUDGE=NULL, VOLT=0.00kV, CURRENT=0.00mA, IJUDGE=HIGH, RESISTANCE=1234MOHM C_R L_F
	I test failed for LOW	JUDGE=NG, WJUDGE=NULL, VOLT=0.00kV, CURRENT=0.00mA, IJUDGE=LOW, RESISTANCE=9.99MOHM C_R L_F
WI or IW	At RESET (stop) Note-1	JUDGE=NULL, WJUDGE=NULL, VOLT=0.00kV, CURRENT=0.00mA, IJUDGE=NULL, RESISTANCE=0.00MOHM C_R L_F
	When protective function activated Occurred in W of WI mode Note-2	JUDGE=PROTECT, WJUDGE=HIGH LOW, VOLT=1.50kV, CURRENT=1.23mA, IJUDGE=NULL, RESISTANCE=0.00MOHM C_R L_F
W	W test passed	JUDGE=GOOD, WJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA C_R L_F
	W test failed for HIGH	JUDGE=NG, WJUDGE=HIGH, VOLT=1.51kV, CURRENT=32.1mA C_R L_F
	W test failed for HIGH When the leak current exceeds 199.9mA	JUDGE=NG, WJUDGE=HIGH, VOLT=0.00kV, CURRENT=OVER C_R L_F
	W test failed for LOW	JUDGE=NG, WJUDGE=LOW, VOLT=1.51kV, CURRENT=0.15mA C_R L_F
	At RESET (stop) Note-1	JUDGE=NULL, WJUDGE=NULL, VOLT=0.00kV, CURRENT=0.0mA C_R L_F
	When protective function activated Note-2	JUDGE=PROTECT, WJUDGE=HIGH LOW, VOLT=1.50kV, CURRENT=1.23mA C_R L_F
I	I test passed	JUDGE=GOOD, IJUDGE=GOOD, RESISTANCE=1234MOHM C_R L_F
	I test passed When it exceeds 2000MΩ	JUDGE=GOOD, IJUDGE=GOOD, RESISTANCE=OVER C_R L_F
	I test failed for HIGH	JUDGE=NG, IJUDGE=HIGH, RESISTANCE=1234MOHM C_R L_F
	I test failed for LOW	JUDGE=NG, IJUDGE=LOW, RESISTANCE=1.2MOHM C_R L_F
	At RESET (stop) Note-1	JUDGE=NULL, IJUDGE=NULL, RESISTANCE=0.00MOHM C_R L_F
	When protective function activated Note-2	JUDGE=PROTECT, IJUDGE=HIGH LOW, RESISTANCE=1234MOHM C_R L_F

Note-1: Data is 0.

Note-2: Responses with the data when the protective function is activated.
For the test which could not be performed, the data is 0.

4.2.39 SET: (setting of parameters of test condition)

Function Makes the setting of test mode and parameters in the lump.

Structure SET: **Parameter of test**

Parameter of test

MODE=**Test mode** W-I, I-W, W, I
 WMARK=
 WLEVEL=
 WHIGH=
 WLOW=
 WTIMER=
 IVOLT=
 IHIGH=
 ILOW=
 IMASK=
 ITIMER=
 DISCHARGE=

Setting is made for the test mode which includes the withstanding voltage test. W-I, I-W, W
 For detail, refer to the articles 4.2.15 (P16), 4.2.17 (P17), 4.2.19 (P18), 4.2.21 (P19) and 4.2.23 (P20).
 Setting is made for the test mode which includes the insulation resistance test. W-I, I-W, I
 For detail, refer to the articles 4.2.25 (P21), 4.2.27 (P22), 4.2.29 (P23), 4.2.31 (P24), 4.2.33 (P25) and 4.2.35 (P26).

Note: In the test mode W or I, omit the items which are not tested.

Transmission

When the test mode is W-I,

SET:MODE=WI, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON

When the test mode is I,

SET:MODE=I, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.40 SET:? (lump read-out of parameters of test condition)

Function Reads out the test mode and each parameter in the lump.

Structure SET:?

Transmission

SET:?

Response

When the test mode is I-W. (MODE=WI when the mode is W-I)

When FORMAT=ON

SET:MODE=IW, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON

When FORMAT=OFF

SET:IW, 2.50, 1.50, 20.0, OFF, 60.0, 0.5, OFF, 10, 1.0, 60.0, ON

When the test mode is W,

When FORMAT=ON

SET:MODE=W, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s

When FORMAT=OFF

SET:W, 2.50, 1.50, 20.0, OFF, 60.0

4.2.41 MEMORY= (setting of memory number)

Function	Changes over to the test condition of designated memory No.
Structure	MEMORY=□ □ : 1~9
Transmission	
MEMORY=5 <input type="checkbox"/> <input type="checkbox"/> Changes the current test condition over to memory No.5. Motor slider automatically moves up/down when the effective WMARK=□. □□kV are in the memory content.
Response	When 8527 received the effective command setting.
ERROR=0 <input type="checkbox"/> <input type="checkbox"/> When the Response Setting is ON.
No response When the Response Setting is OFF.

4.2.42 MEMORY? (read-out of memory number)

Function	Reads out the memory number currently selected.
Structure	MEMORY?
Transmission	
MEMORY? <input type="checkbox"/> <input type="checkbox"/>	
Response	
MEMORY=8 <input type="checkbox"/> <input type="checkbox"/> When the memory No.8 is read out.
MEMORY=OFF <input type="checkbox"/> <input type="checkbox"/> When the condition that no memory is selected is read out.

4.2.43 MEM[No]: (setting of test condition to memory)

Function Makes the setting of test mode and parameters in the designated memory number.

Structure MEM[No] : [Parameter of test]

[No] : 1~9

[Parameter of test]

Same as those at the **article 4.2.39 (P29) SET: (setting of parameters of test condition)**

Transmission

When the test mode is W-I,

MEM3:MODE=WI, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON [C][F]

When the test mode is I,

MEM5:MODE=I, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON [C][F]

Response When 8527 received the effective command setting.

ERROR=0 [C][F] When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.44 MEM[No]:? (read-out memorized test condition)

Function Reads out the designated memory number, test mode and each parameter in the lump.

Structure MEM[No]:?

[No] : 1~9

Transmission

MEM3:?[C][F]

Response

When the test mode is I-W, (MODE=WI when the mode is W-I)

○When FORMAT=ON

MEM3:MODE=IW, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s, IVOLT=0.5kV, IHIGH=OFF, ILOW=10MOHM, IMASK=1.0s, ITIMER=60.0s, DISCHARGE=ON [C][F]

○When FORMAT=OFF

MEM3:IW, 2.50, 1.50, 20.0, OFF, 60.0, 0.5, OFF, 10, 1.0, 60.0, ON [C][F]

When the test mode is W,

○When FORMAT=ON

MEM3:MODE=W, WMARK=2.50kV, WLEVEL=1.50kV, WHIGH=20.0mA, WLOW=OFF, WTIMER=60.0s [C][F]

○When FORMAT=OFF

MEM3:W, 2.50, 1.50, 20.0, OFF, 60.0 [C][F]

4.2.45 BUZZ= (setting of buzzer sound)

Function Makes the setting of sound volume of GOOD and NG buzzer.

Structure BUZZ=OFF/1~5,OFF/1~5
 ① ②

- ① Buzzer sound volume parameter at passed (GOOD) judgement
 OFF, 1, 2, 3, 4, 5
 Sound volume: Small ↔ Big
- ② Buzzer sound volume parameter at failed (NG) judgement
 OFF, 1, 2, 3, 4, 5
 Sound volume: Small ↔ Big

Transmission

BUZZ=3, 5

Buzzer sound volume at GOOD (judgement passed) is set to 3 among 5 levels and the sound level at NG (judgement failed) is set to maximum sound volume.

Response When 8527 received the effective command setting.

ERROR=0 When the Response Setting is ON.

No response When the Response Setting is OFF.

4.2.46 BUZZ? (read-out of set value of buzzer sound)

Function Reads out the set value of buzzer sound for GOOD and NG.

Structure BUZZ?

Transmission

BUZZ?

Response

BUZZ=OFF, 3
 ① ②

- ① Buzzer sound volume at passed (GOOD) judgement Shows the sound is muted.
- ② Buzzer sound volume at failed (NG) judgement Shows level 3 among 5.

5. Command which can perform a setup of slider voltage

On 8527, the setting of test voltage for the withstanding voltage test is possible by the RS-232C interface.

Conditions to allow the setting

- ① Test mode is to be either W-I, I-W or W.
- ② In case that the setting is made by the designated memory No., the slider voltage setting (0~5.99kV) is to be set in the test conditions of the memory No.

Conditions not to allow the setting

When the test mode is MODE-I.

Kinds of command

- Automatically moves up/down with WMARK= \square . \square \square kV command.
For detail, refer to the article 4.2.16.
- Automatically moves up/down to the slider voltage set value with MEMORY= \square \square \square \square command.
For detail, refer to the article 4.2.41.
- Automatically moves up/down with SET: \square \square \square command.
For detail, refer to the article 4.2.39.

6. Error

Error code	Content of error and solution
ERROR=1	Command format is not recognizable. Erroneous letter. Example: RESSET, RST Correct the letters to RESET.
ERROR=2	Parameter is out of effective range. Example: ITIMER=9999 Set it to OFF or within 0.5~999s.
ERROR=3	When the parameter is tried to be set in the condition that the setting is not allowed. Example: The command WMARK=5.00kV etc. related to withstanding voltage test is transmitted in the test mode I. Transmit the command to suit to the test mode.
ERROR=4	Operation is made in the course of initialization of 8527. When the test is in initialization such as powering on and does not become READY status, the command setting is not allowed.
ERROR=5	Operation other than RESET, STATUS is made during the test or judgement output. Transmitted START command while MOTOR BUSY. Example: Before making the setting, read out such information TEST, PROTECTION, READY etc. of STATUS?. Transmit the setting command after confirming the READY status.
ERROR=6	Ineffective operation is made when REMOTE=OFF. START command becomes ineffective when REMOTE=OFF. Do the operation after setting REMOTE=ON.
ERROR=7	Structural error has occurred in the lump setting at SET: and MEM□:. Example: When the transmission of command not defined by SET:, MEM□:, such as buzzer sound volume (BUZZ=3, 3), is made.
ERROR=8	Transmission of command is made during the setting of test condition. Example: Transmission of command is not allowed while the setting is made on the front panel. Finish the setting and make READY lamp lit status.

For the errors in the following table, please refer to the Article 20 Error message of the tester main unit.

Error message		Solution
<i>Err</i>	<i>CHrG</i>	ERROR=3 is always transmitted to the host when the command is transmitted. It is the hardware problem. Inform us or the dealer whom you purchased.
<i>Err</i>	<i>SSr</i>	
<i>Err</i>	<i>LoCK</i>	If the No.5 pin of <input type="checkbox"/> REMOTE / OUT connector (INTER LOCK) is open, ERROR=3 is transmitted to the host even if the command is transmitted. Making a short-circuit between the No.5 pin and COM, transmit RESET command or press <input type="checkbox"/> STOP switch.
<i>Err</i>	<i>rNFE</i>	Transmit RESET command or press <input type="checkbox"/> STOP switch.
<i>Err</i>	<i>STrT</i>	
<i>Err</i>	<i>E-11</i>	
<i>Err</i>	<i>E-21</i>	
<i>Err</i>	<i>E-40</i>	
<i>Err</i>	<i>Node</i>	Refer to the Article 20 Error message of the tester main unit.

7. Cautions

About the case when the setting is operated by REMOTE=OFF, KEYLOCK=OFF in the condition of setting which is previously made by the RS-232C communication:

[When the EXIT key is pressed in the course of setting with key operation]
The value set by RS-232C does not remain. It returns to the set value of no memory number before entering the RS-232C communication mode.

[When the ENTER key is pressed in the course of setting with key operation]
Setting condition is memorized by key operation and the set value is retained even if the power source is re-thrown in.

8. Sample program

```
' ○Here is the sample program source for Microsoft Visual Basic of 8527 control.
'
' 1. When the form is loaded, setting of the communication of 8527 and the operational check
'    are done.
' 2. Click of the command1[SETTING] button makes a change of test condition, set value.
'
'    Content of the setting is as follows:
'
'          MODE          = WI
'          WMARK         = 2.50kV
'          WLEVEL        = OFF
'          WHIGH         = 10.0mA
'          WLOW          = OFF
'          WTIMER        = 5.0s
'          IVOLT         = 0.5kV
'          IHIGH         = OFF
'          ILOW          = 100MOHM
'          IMASK         = 0.3s
'          ITIMER        = 5.0s
'          DISCHARGE     = ON
'
' 3. Click of command2[START] button starts the automatic test with the above set values.
' 4. The test can be stopped by the command3[STOP] button.
' 5. Sample program finishes with the command4[QUIT] button.
' 6. Data of communication content, test result and so on are occasionally displayed to
'    the text box (Text1).
'
' ○About the object to arrange on the form
' MSComm1 :Microsoft Comm Control Arrange the component (OCX) on the form.
' Text1   :TextBox ※. Set MultiLine property to True
' Command1 :CommandButton
' Command2 :CommandButton
' Command3 :CommandButton
' Command4 :CommandButton
```

```

'----- Definition -----
Option Explicit

Private StopFlag As Boolean 'Flag to stop the test

'Wait, time out detection, for msec time, Windows API
Private Declare Function GetTickCount Lib "kernel32" () As Long

'Definition of enumeration form of 8527 status
Private Enum STB8527_ID
    sTEST = &H1           'Test in operation
    sTEST_END = &H2       'Test ends
    sH_V_OUT = &H4        'High voltage being output
    sREADY = &H8          'In waiting
    sW_TEST = &H10        'Withstanding voltage test in operation
    sI_TEST = &H20        'Insulation resistance test in operation
    sGOOD = &H40          'Total judgement passed
    sNG = &H80            'Total judgement failed
    sW_HIGH = &H100       'Withstanding voltage test failed for high limit
    sW_LOW = &H200        'Withstanding voltage test failed for low limit
    sW_GOOD = &H400       'Withstanding voltage test passed
    sI_HIGH = &H800       'Insulation resistance test failed for high limit
    sI_LOW = &H1000       'Insulation resistance test failed for low limit
    sI_GOOD = &H2000      'Insulation resistance test passed
    sPROTECTION = &H4000 'Protective circuit activated
End Enum

'Definition of enumeration form of error code
Private Enum EER8527_ID
    eNo_Error = 0         'Normal
    eSyntax_Error = 1     'Command writing error
    eOut_Of_Range = 2     'Out of effective range
    eCondition = 3        'Setting condition error
    eInitializing = 4     '8527 in initialization
    eTesting = 5          'Test in operation
    eRemote_Off = 6       'REMOTE= is OFF status
    eSet_Construction = 7 'SET structural error
    eKey_Operating = 8    'Being set by key operation
End Enum

```



```

' ----- Procedures -----
'MSCOMM1      Defines the port and open it.

Private Function OpenComm(Optional PortNumber As Integer) As Boolean
Dim nPort As Integer

    On Error GoTo Err_OpenComm

    nPort = 1

    If PortNumber <> 0 Then nPort = PortNumber

    With MSCOMM1

        If .PortOpen = True Then .PortOpen = False

        .CommPort = nPort           'Port number
        .Settings = "9600,n,8,1"    'Communication setting
        .InBufferSize = 256        'Receiving buffer size
        .OutBufferSize = 256       'Transmission buffer size

        Call FlashBuffer           'Flash of receiving and transmission buffer

        .Hnadshaking = comNone     'Hand shake
        .DTREnable = True          'DTR
        .NullDiscard = True        'Discard of NULL letter
        .RThreshold = 0            'No receiving event
        .ParityReplace = "?"       'Parity error replacement letter
        .RTSEnable = True          'RTS
        .SThreshold = 0            'No transmission event
        .EOFEnable = False         'EOF
        .InputMode = comInputModeText 'ASCII communication

        .PortOpen = True          'Port open

    End with

Exit_OpenComm:
    OpenComm = True
    ShowLog "OpenComm", "No." & nPort & " 9600,n,8,1 OK"
    Exit Function

Err_OpenComm:
    OpenComm = False
    ShowLog "OpenComm", "NG"
    MsgBox "An error occurred in OpenComm.", vbCritical
    Exit Function
End Function

```

```
'MSCOMM1      Close the port.
Private Sub CloseComm ( )
    On Error GoTo Exit_CloseComm
    With MSComm1
        If .PortOpen = True Then
            .PortOpen = False      'port close
            Call FlashBuffer      'flash of buffer
            .RTSEnable = False
            .DTREnable = False
        End if
    End With
    ShowLog "CloseComm", "OK"
Exit_CloseComm:
    Exit Sub
End Sub
'MSCOMM1      Flash of receiving buffer
Private Sub FlashBuffer()
    With MSComm1
        .InBufferCount = 0
        .OutBufferCount = 0
    End With
End Sub
'Text1 Log display letters
Private Sub ShowLog(Optional ByVal dat1 As Variant, Optional ByVal dat2 As Variant)
    With Text1
        If Len(.Text) >= .MaxLength Then .Text = Right(.Text, 256)
        .SelStart = Len(.Text)
        .SelText = dat1 & ":" & dat2 & vbCrLf
    End With
End Sub
```

```

'MSCOMM1      Transmission of command and receiving of response

Private Function SendComm(ByVal sSendCommand As String, Optional ByRef sRecvBuffer As
String) As Boolean
Dim sSend As String          'Transmission letters
Dim sRecv As String         'Receiving letters buffer
Dim nTMO As Long           'Time out

    On Error GoTo Err_SendComm

    'Receiving time out is set to 1sec.
    nTMO = GetTickCount + 1000

    'Transmission letter is half pitch + CRLF
    sSend = StrConv(sSendCommand, vbNarrow)
    ShowLog "Send", sSend
    sSend = sSend & vbCrLf

    With MSCOMM1
        FlashBuffer
        .Output = sSend          ' transmission of letters
    End With

    Do

    DoEvents

        sWait 0.1 'Weight of 100ms

        With MSCOMM1
            If .InBufferCount > 0 Then          'Receiving buffer (port) includes letters
                sRecv = sRecv & .Input        'Receiving letters stored in buffer
                'Debug.Print sRecv
            End If
        End with

        If InStr(sRecv, vbCr) > 0 then          'Receiving letters buffer includes delimiter
            sRecv = Left(sRecv, InStr(sRecv, vbCr) - 1) 'delimiter and after is left
            ShowLog "Recv", sRecv
            Exit Do
        End If

        If GetTickCount >= nTMO Then          'time out condition
            ShowLog "SendComm", "TMO Error"
            GoTo Err_SendComm:
        End If

    Loop

Exit_SendComm: 'Normal end
    sRecvBuffer = sRecv
    SendComm = True
    Exit Function

Err_SendComm: 'Abnormal end
    sRecvBuffer = ""
    SendComm = False
    MsgBox "An error occurred in SendComm.", vbCritical
    Exit Function
End Function

```

```

'Display message depending upon content of response
'At error message : False
Private Functin ErrorHandler(ByVal sResponse As String) As Boolean
Dim nError As EER8527_ID

'Error response
If sResponse Like "ERROR=*" Then

    If sResponse <> "ERROR=0" Then 'Error

        nError = CLng(Right(sResponse, 1))

        Select Case nError
        Case eNo_Error                ' 0
            ShowLog "ERROR", "No Error."
        Case esyntax_Error            ' 1
            Showlog "ERROR", "Syntax error"
        Case eOut_Of_Range            ' 2
            ShowLog "ERROR", "Out of range."
        Case eCondition                ' 3
            ShowLog "ERROR", "Condition error of the parameter."
        Case eInitializing            ' 4
            ShowLog "ERROR", "Being initialized."
        Case eTesting                ' 5
            ShowLog "ERROR", "Testing."
        Case eRemote_Off                ' 6
            ShowLog "ERROR", "Remote Off."
        Case eSet_Construction        ' 7
            ShowLog "ERROR", "Construction error of an order for a SET or MEM."
        Case eKey_Operating            ' 8
            ShowLog "ERROR", "Being set up by the key operation."
        Case Else
            ShowLog "ERROR", "Undefined Error"
        End Select

        GoTo Err_ErrorHandler:

    End If

End if

Exit_ErrorHandler:
    ErrorHandler = True
    Exit Function

Err_ErrorHandler:
    ErrorHandler = False
    Exit Function
End Function

'sec weight procedure
Private Sub sWait(ByVal sngSec As Single)
Dim lngStart As Long, lngEnd As Long
    If sngSec = 0 Then Exit Sub
    lngStart = GetTickCount()
    lngEnd = lngStart + (sngSec * 1000)
    Do While GetTickCount() < lngEnd
        DoEvents
    Loop
End Sub

```

```

' Read in form
Private Sub Form_Load()

    With Text1
        .MultiLine = True
        .MaxLength = 4096
        .Text = ""
    End With

    Command1.Caption = "&SETTING"
    Command2.Caption = "&START"
    Command3.Caption = "&STOP"
    Command4.Caption = "&QUIT"

End Sub

' Perform when form is active
Private Sub Form_Active()
Static MeActive As Boolean

    If MeActive Then Exit Sub

    MeActive = True

Dim szBuf As String

' No.1 port open
If OpenComm(1) = False Then GoTo Err_Form_Activate:

' 8527 Response ON
If SendComm("RESPONSE=ON", szBuf) = False Then GoTo Err_Form_Activate:
If ErrorHandler(szBuf) = False Then GoTo Err_Form_Activate:

' 8527 Remote control ON
If SendComm("REMOTE=ON", szBuf) = False Then GoTo Err_Form_Activate:
If ErrorHandler(szBuf) = False Then GoTo Err_Form_Activate:

' 8527 Response format OFF
If SendComm("FORMAT=3", szBuf) = False Then GoTo Err_Form_Activate:
If ErrorHandler(szBuf) = False Then GoTo Err_Form_Activate:

' 8527 Obtaining tester identification
If SendComm("IDNT?", szBuf) = False Then GoTo Err_Form_Activate:
If ErrorHandler(szBuf) = False Then GoTo Err_Form_Activate:

    Command1.Enabled = True
    Command2.Enabled = False
    Command3.Enabled = False
Exit_Form_Activate:
    Exit Sub

Err_Form_Activate:
    Command1.Enabled = False
    Command2.Enabled = False
    Command3.Enabled = False
    Exit Sub
End Sub

```

```
Private Sub Form_QueryUnload(Cancel As Integer, UnloadMode As Integer)

    If Not Command4.Enabled Then
        Cancel = True
        Exit Sub
    End If

    'Reset 8527 to local at finish of form
    If Command1.Enabled Then
        Call SendComm("RESET")
        Call SendComm("KEYLOCK=OFF")
        Call SendComm("REMOTE=OFF")
    End If

    Call CloseComm 'Close port

End

End Sub

' Start of test
Private Sub Command2_Click()
    Dim szBuf As String, nSTB As STB8527_ID

    StopFlag = Flase
    Command1.Enabled = False
    Command2.Enabled = False
    Command3.Enabled = True
    Command4.Enabled = False

    ' Confirm status before start
    If SendComm("STATUS?", szBuf) = False Then GoTo Exit_Command2_Click:
    If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:

    szBuf = "&H" & szBuf
    If IsNumeric(szBuf) = False Then GoTo Exit_Command2_Click:
    nSTB = CLng(szBuf)
    If (nSTB And sREADY) = 0 Then
        MsgBox "Can not START.", vbCritical
        GoTo Exit_Command2_Click:
    End If

    ' RESET command
    If SendComm("RESET", szBuf) = False Then GoTo Exit_Command2_Click:
    If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:

    ' START command
    If SendComm("START", szBuf) = False Then GoTo Exit_Command2_Click:
    If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:

Do

    DoEvents

    sWait 0.5 'weight of 500ms
```

```

' STOP button is pressed
If StopFlag Then
    If SendComm("RESET", szBuf) = False Then GoTo Exit_Command2_Click:
    If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:
    GoTo Exit_Command2_Click:
End If

' Status confirmation during test
If SendComm("STATUS?", szBuf) = False Then GoTo Exit_Command2_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:

nSTB = CLng("&H" & szBuf)

' Protective action exists
If nSTB And sPROTECTION Then
    ShowLog "STATUS", "PROTECTION"
    GoTo Exit_Command2_Click:
End If

If nSTB And sI_TEST Then Debug.Print "I_TESTING"
If nSTB And sW_TEST Then Debug.Print "W_TESTING"

' At completion of test action
If (nSTB And sH_V_OUT) = 0 Then Exit Do 'Voltage is shut down / test stops

Loop

' Obtain judgement at completion of test action
If SendComm("JUDGE?", szBuf) = False Then GoTo Exit_Command2_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:
' ✖Received letters are log displayed to text box.

' Obtain judgement and measured data at completion of test action
If SendComm("DATA?", szBuf) = False Then GoTo Exit_Command2_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:
' ✖Received letters are log displayed to text box.

' Do reset
If SendComm("RESET", szBuf) = False Then GoTo Exit_Command2_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command2_Click:

Exit_Command2_Click:
    StopFlag = False
    Command1.Enabled = True
    Command2.Enabled = True
    Command3.Enabled = False
    Command4.Enabled = True
    Exit Sub
End Sub

Private Sub Command3_Click()
    StopFlag = True
End Sub

```

```

' Initial setting of 8527
Private Sub Command1_Click()
Dim szBuf As String, nSTB As STB8527_ID
Dim Sets As String

    Command1.Enabled = False
    Command2.Enabled = False
    Command3.Enabled = False

' SET: Command transmission
If SendComm("STATUS?", szBuf) = False Then GoTo Exit_Command1_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command1_Click:

szBuf = "&H" & szBuf
If IsNumeric(szBuf) = False Then GoTo Exit_Command1_Click:
nSTB = CLng(szBuf)
If (nSTB And sREADY) = 0 Then
    MsgBox "It is not the condition which can be setup.", vbCritical
    GoTo Exit_Command1_Click:
End If

' Construction of SET: command
Sets = "SET:" & "MODE=WI"
Sets = Sets & "," & "WMARK=2.50kV"
Sets = Sets & "," & "WLEVEL=OFF"
Sets = Sets & "," & "WHIGH=10.0mA"
Sets = Sets & "," & "WLOW=OFF"
Sets = Sets & "," & "WTIMER=5.0s"
Sets = Sets & "," & "IVOLT=0.5kV"
Sets = Sets & "," & "IHIGH=OFF"
Sets = Sets & "," & "ILOW=100MOHM"
Sets = Sets & "," & "IMASK=0.3s"
Sets = Sets & "," & "ITIMER=5.0s"
Sets = Sets & "," & "DISCHARGE=ON"

' SET: command transmission
If SendComm(Sets, szBuf) = False Then GoTo Exit_Command1_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command1_Click:

' RESET command transmission
If SendComm("RESET", szBuf) = False Then GoTo Exit_Command1_Click:
If ErrorHandler(szBuf) = False Then GoTo Exit_Command1_Click:

    Command2.Enabled = True
    Command3.Enabled = True

Exit_Command1_Click:
    Command1.Enabled = True
    Exit Sub

End Sub

' Finish button
Private Sub Command4_Click()
    Unload Me
End Sub

```

Contact Information
Name : Tsuruga Electric Corporation
Address : 1-3-23 Minami-Sumiyoshi, Sumiyoshi-ku, Osaka-shi 558-0041 Japan