# MODEL 8526

# AC/DC Withstanding Voltage Tester

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## Instruction Manual

**TSURUGA ELECTRIC CORPORATION**

I-01990-1

# 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 injure 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 injure 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.**
- **<u>Place for installation</u>**
  **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 8526 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 8526 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 ⑥ and ⑲ of the article 3 Name of parts and functions).**
  **＊The bushing (red) may break, causing serious injury by the fallen 8526.**
- **Minimize the mechanical shock or vibration when transporting the product.**
  **＊It may cause the damage of internal mechanism or malfunction.**

# INTERLOCK

Model 8526 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 ⑱ on the back and then pressing the STOP switch ②.
Please refer to the article 14.3 (P32) 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 8526 deals high voltage, so it is designed to provide many protective functions and various concerns to secure the operators' safety.

- As the AC 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.
- As a DC withstanding voltage tester, this model has the capability of maximum output 5kV and output capacity 50W, which enables a safe DC withstanding voltage test, leaving no residual electric charge in the test sample thanks to its automatic discharging function.
- Referential voltage setting, which prevents the test from being started unless the test voltage comes into the range of either higher value of ±5% of set value or ±50V, high and low leak current setting, timer function ensures highly accurate measurement.
- Large green LED of high visibility is employed for the display of test voltage, current and test time.
- 9 memory is provided to write in and read out the test conditions regulated by the various standards or regulations.
- 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" can be 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 11.Key lock. |
| Double action | OFF | For detail, please refer to the article 12. Special test mode. |
| GOOD hold | OFF | |
| Momentary | OFF | |
| FAIL mode | OFF | |

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 | AC Withstanding voltage test condition | DC Withstanding voltage test condition |
|---|---|---|
| AC Withstanding voltage test | Test voltage range 2.5kV | Test voltage range 2.5kV |
| | Referential voltage 0.00kV (OFF) | Referential voltage 0.00kV (OFF) |
| | High limit leak current 10.0mA | High limit leak current 1.0mA |
| | Low limit leak current 0.0mA (OFF) | Low limit leak current 0.0mA (OFF) |
| | Test time 60.0s | Test time 60.0s |

# 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 |
| REMOTE/OUT plug | 1 piece (36P) |
| Fuse 7A | 1 piece |
| Instruction manual | 1 copy |
| RS-232C interface instruction manual | 1 copy |

**⚠ CAUTION** RS-232C connector (D-sub 9 pins) Model 5881-11-020 (9 pins – 9 pins / 2.0m) 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 8526 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.

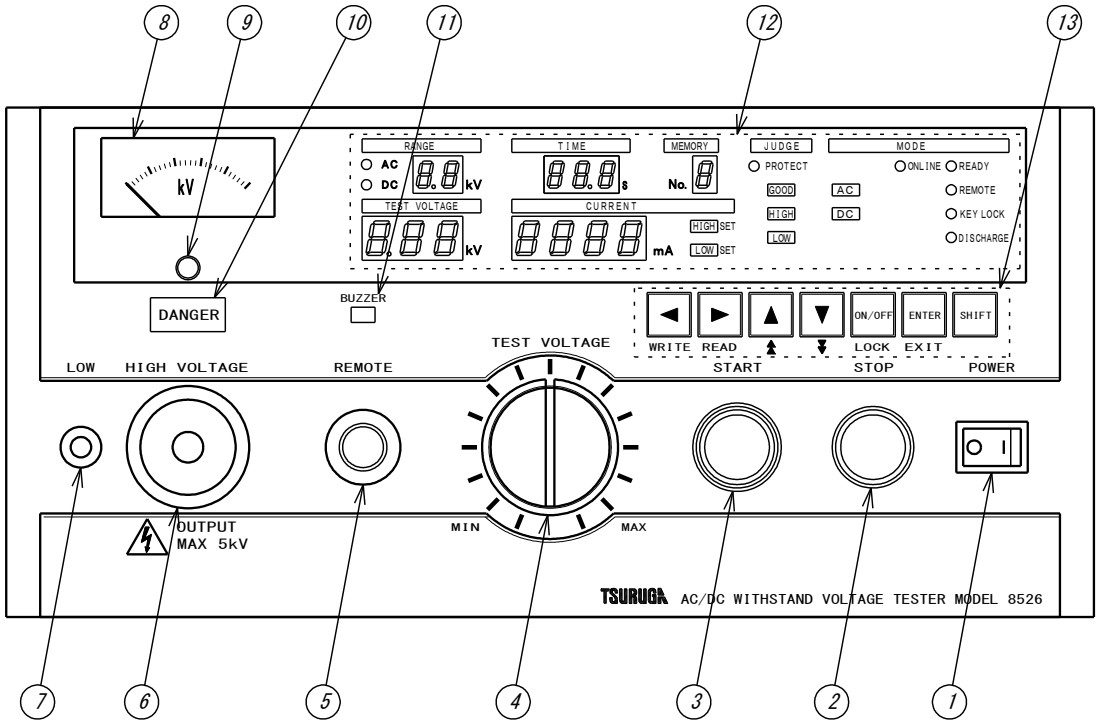
(1) Make sure to connect the protective grounding terminals (back panel) to the earth. If the grounding is insufficient, the tester housing is charged with high voltage when the output is short-circuited to the earth or the power source line, and is very dangerous. Please also check if the grounding 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 8526, 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 and to reset a judgement.

③ START — Switch to start the test.
This switch is disabled when the REMOTE connector ⑤ is used, or the remote operation is made through the REMOTE terminal blocks ㉑ or the REMOTE/OUT connector ⑱.

④ TEST VOLTAGE — Knob to adjust the voltage of withstanding voltage test.

⑤ REMOTE — Connector for remote control.

⑥ 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 ⑩ is lit up. The operator may suffer electric shock.
It is common with HIGH VOLTAGE on the back panel.

⑦ LOW — Low voltage side terminal of the test voltage output. It is of the same voltage as the case of this tester.

⑧ Output voltmeter — Electrical instrument to indicate the output voltage value.

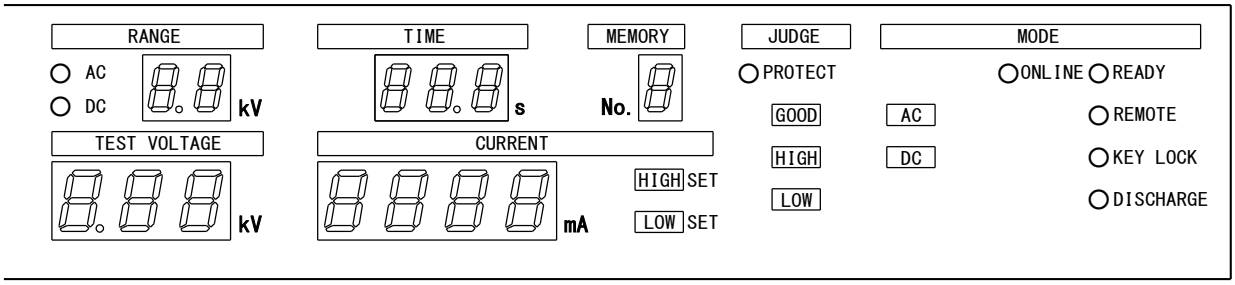
⑨ Zero adjuster — Knob to adjust the zero position of the voltmeter for voltage tester.
The adjustment is done when no power is applied.

⑩ DANGER lamp — It gives warning during the test voltage is output.
Never touch the high voltage cable and test sample during the DANGER lamp ⑩ is lit up. The operator may suffer electric shock.

⑪ 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.**




⑫ 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 during the discharging of DC withstanding voltage test.

ONLINE lamp　　Lit up while the tester is remote controlled via RS-232C.

AC lamp　　Lit up during the setting for the AC withstanding voltage test.

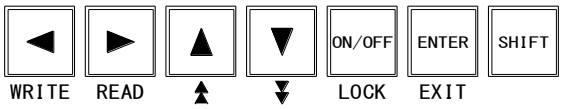
DC lamp　　Lit up during the setting for the DC withstanding voltage test.

Range display (RANGE)　　Displays the voltage range of AC/DC withstanding voltage test. (2.5kV or 5.0kV)

Voltage display of Withstanding volt test (TEST VOLTAGE)　　During the setting of referential voltage, it displays the set value, and during the test, it displays the output voltage value.

Current/resistance display (CURRENT)　　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.

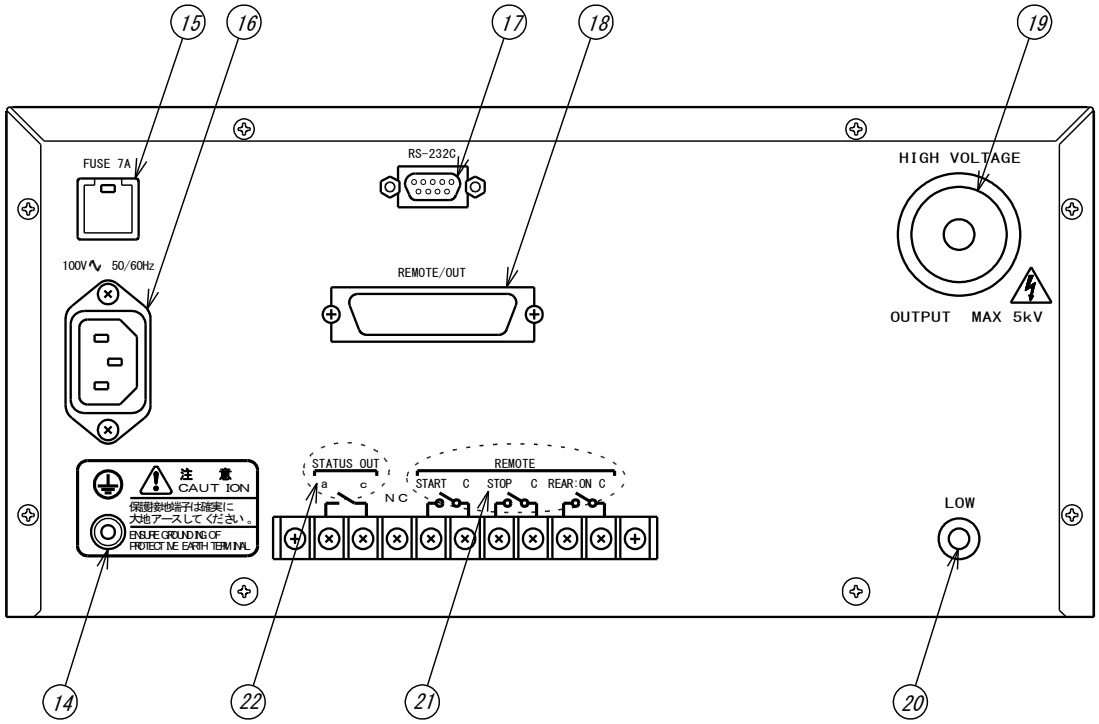
| | |
|---|---|
| Test time display (TIME) | Displays the test time of each test (AC or DC withstanding voltage test). During the test it display the time remaining. When the test time is set to OFF, the time lapse is displayed during the test. |
| HIGH SET | Lit up at the setting of high limit leak current. |
| LOW SET | Lit up at the setting of low limit leak current. |
| GOOD | Lit up after the test, when the test judgement result is acceptable. |
| HIGH | Lit up after the test, when the test judgement result is rejected for its high limit. |
| LOW | Lit up after the test, when the test judgement result is rejected for its low limit. |
| Memory No. display (MEMORY No.) | Displays memory number being set in the memory mode. |
| PROTECT lamp | Lit up when the PROTECTION is output. |




⑬ 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 SHIFT key, it becomes WRITE key used for writing the memory.) |
| ▶ key READ | Key to feed and select each setting item toward right. (When pressed together with SHIFT key, it becomes READ 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 SHIFT 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 SHIFT 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. |
| ON/OFF key LOCK | Key for selection to set or not to set each setting item. (When pressed together with SHIFT key, it becomes LOCK key and is used to set/reset the key lock.) |
| ENTER key EXIT | Key to finish the setting of test condition or to decide in memory setting. (When pressed together with SHIFT key, it becomes EXIT key used to interrupt the setting or memory mode and return to READY status.) |
| SHIFT 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




⑭ 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.

⑮ FUSE 7A — Fuse socket. The rate of fuse is as the following table shows.

| Type | Power source voltage | Rate of fuse |
|---|---|---|
| Standard | 100V AC | 125V 7A |
| Optional | 115V AC | |
| | 200V AC | 250V 4A |
| | 220V AC | |
| | 240V AC | |

Do not use the fuse other than rated one.

⑯ 100V～50/60Hz — Inlet for connection of supply power source.
It conforms to the attached power cord (3P).

⑰ RS-232C — Connector for RS-232C serial communication (D-sub 9 pins).
Refer to the instruction manual of interface.

⑱ REMOTE/OUT — Connector for the setting inputs of interlock and to output the output signals.
For detail, refer to the article 14.1 (P31).

⑲ 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 ⑩ is lit up. The operator may suffer electric shock.
It is common with HIGH VOLTAGE on the front panel.

⑳ LOW — Low voltage side terminal of the test voltage output. It is of the same voltage as the case of this tester.

㉑ REMOTE — Terminal blocks for remote control.

START C — When the REAR:ON C terminal is in short-circuit, the test is started by short-circuiting the START C terminal.
When the REMOTE connector ⑤ is in use, START C terminal is disabled.

STOP C — By making the short-circuit between the terminals, the test action can be interrupted and the judgement result can be reset.

REAR:ON C — 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.
For detail, refer to the article 13 (P28).

㉒ STATUS OUT — Terminal blocks for status output.
For detail, refer to the article 15 (P34).

# 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 indicates "0".
If it is deviated, make an adjustment turning the zero adjuster ⑨ with the screwdriver.

## 4.2 ●Connection of protective ground terminal

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.**

## 4.3 ●Connection with external control device

An external control device can be connected to the REMOTE connector ⑤, REMOTE terminal ㉑, REMOTE/OUT connector ⑱ and STATUS OUT terminal ㉒.
For detail of connection, refer to the article 13~15 (P28~35).

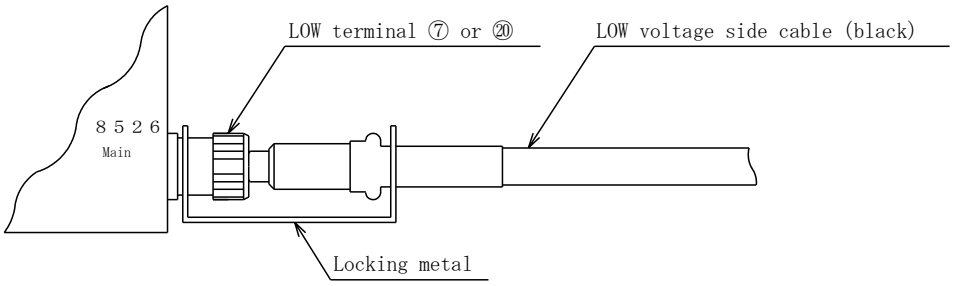
## 4.4 ●Connection of high voltage cable

**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 ⑥ and LOW terminal ⑦.
**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 appropriates to the voltage to use.

**⚠ WARNING**

- **Before making a connection of high voltage cable, ensure that the output is OFF and the output voltmeter ⑧ 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 withstandibility, 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 ±10% of the nominal voltage.**

## 4.6 ●Throw in and shut off of power source

Before turning ON the POWER switch ① and throw in the power, confirm that the TEST VOLTAGE knob ④ is completely turned anti-clockwise to the end.
For shut off of the power supply, turn the TEST VOLTAGE knob ④ clockwise completely to the end, and after confirming the DANGER lamp ⑩ is turned off and the output voltmeter ⑧ indicates 0V, turn OFF the POWER switch ①.

**⚠ WARNING**

**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.**

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.

## 4.7 ●Before the test

(1) Before powering on the tester, carefully read the article 2.2 **Cautions for handling**.
(2) For after the power source switch is turned ON, whole the display segments are lit up (lamp test), and after the while lighting is finished, the tester enters into the test mode the last time when the power is turned OFF.

# 5. Setting items in each mode

## 5.1 ●READY status

When the [POWER] switch ① is turned ON, the lamp test is done and then [READY] is lit up showing that the tester enters in READY status.
The test condition at the previous power shutdown is displayed.
Pressing the [START] switch ③ starts the test.
In READY mode, the setting of the following items can be done.

| Items to set | |
|---|---|
| (1) Test condition | Refer to the article 7~8 (P12~20) |
| (2) Key lock | Refer to the article 11 (P26) |
| (3) Buzzer sounding | Refer to the article 17 (P37) |
| (4) Status output condition | Refer to the article 15.3 (P35) |
| (5) Special test mode | Refer to the article 12 (P27) |
| 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.

Item to set

[Test mode] ⟶ [Test condition]
Ref. art. 7.2 (P12) Ref. art. 8 (P13~20)

## 5.3 ●Memory write-in mode

After setting the test condition in the test condition setting mode, press the [WRITE] key ([SHIFT] + [◀]), 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 6 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.

Item to set

[Test condition] → [Memory write-in (No.1)] → [Test condition] →
Ref. art. 7.2 (P12) Ref. art. 9.2 (P21) Ref. art. 7.2 (P12)

[Memory write-in (No.2)] ⋯⋯> [Test condition] → [Memory write-in (No.9)]
Ref. art. 9.2 (P21) Ref. art. 7.2 (P12) Ref. art. 9.2 (P21)

## 5.4 ●Memory read-out mode

In READY status, by pressing the [READ] key ([SHIFT] + [▶]), a memory No. blinks and the tester becomes ready to read out the memory. In the memory read out mode, one of the 9 memories written in [ref. art. 9.2 (P21)] can be called up and read out.
A press of [ENTER] key finishes the setting and the tester becomes READY status.

Item to set

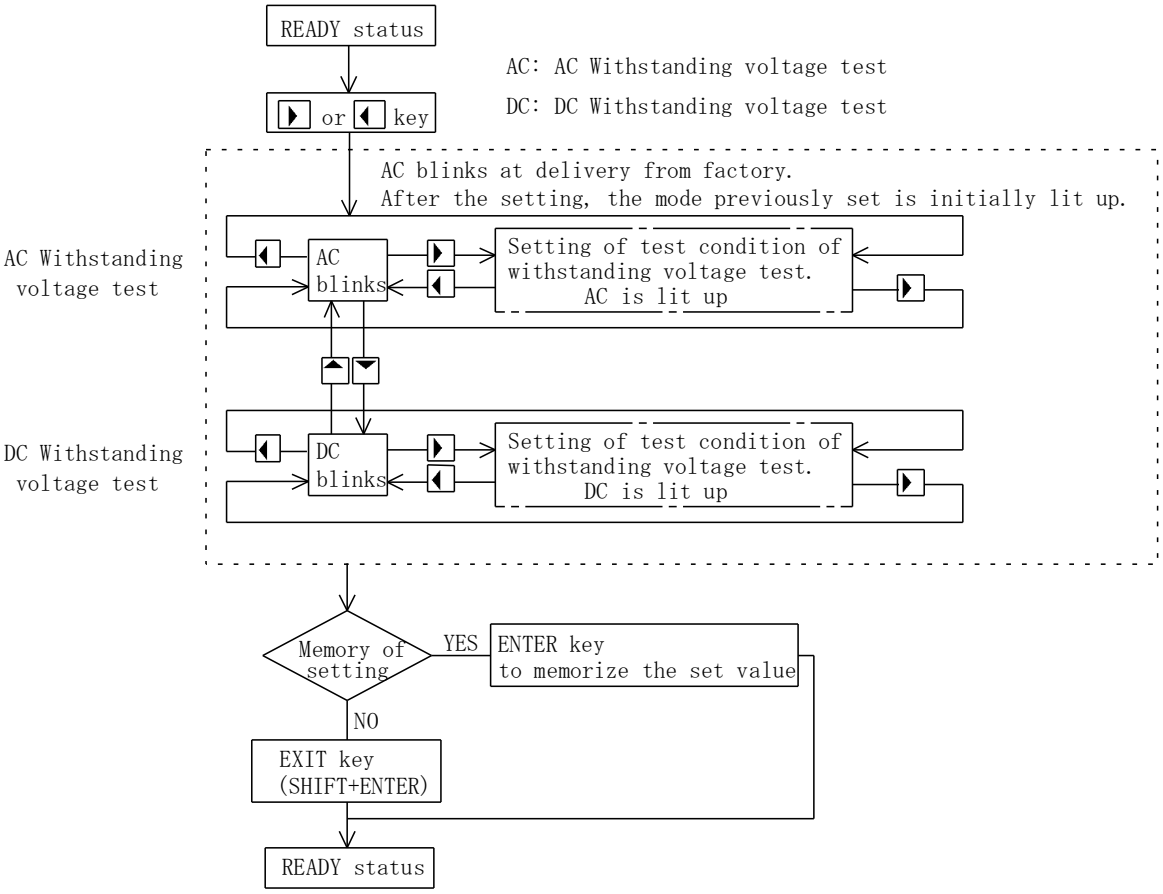
[Memory read out] (Select memory No.) Ref. art. 9.3 (P22)

# 6. Kind of test mode and flow of setting

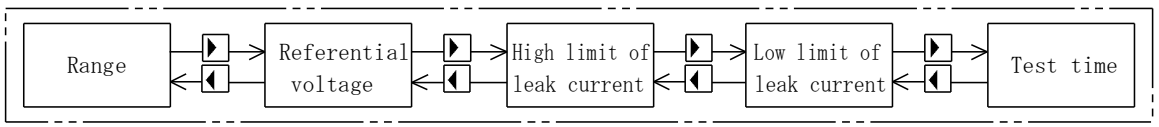
## 6.1 ●Kind of test mode

- AC Withstanding voltage test
- DC Withstanding voltage test

## 6.2 ●Flow of setting




Flow of setting for withstanding voltage test



# 7. Setting of test mode

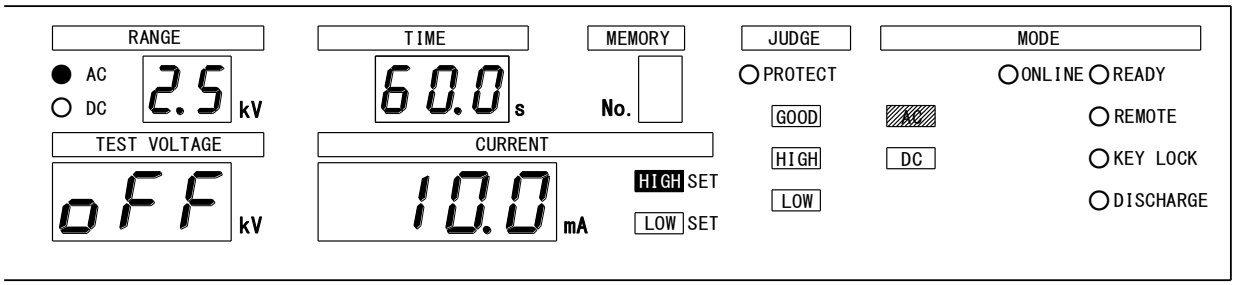
## 7.1 ●Status of display and expression in instruction manual

| | Digital display | Flat display | LED lamp |
|---|---|---|---|
| Lit-up mode | 8.8.8. | GOOD | ● KEY LOCK |
| Blinking mode | 8.8.8. | GOOD | ◎ KEY LOCK |
| Turn-off mode | | GOOD | ○ KEY LOCK |

## 7.2 ●Selection of each test mode

The following 2 test modes can be set.

- AC (AC Withstanding voltage test)
- DC (DC Withstanding voltage test)




① **To enter the setting for selection of test mode,**
In READY status, press [▶] or [◀] key, then the test mode lamp blinks. The test mode lamp moves up and down with [▲] or [▼] key. Set to the required test mode lamp (blinking status). A press of [ENTER] key determines the selected mode and the tester returns to READY status

② **To enter the setting of AC withstanding voltage test,**
In the condition ①, while [AC] (AC withstanding voltage test) is in blinking, press [▶] or [◀] key, then you can enter the setting of test condition for the AC withstanding voltage test.

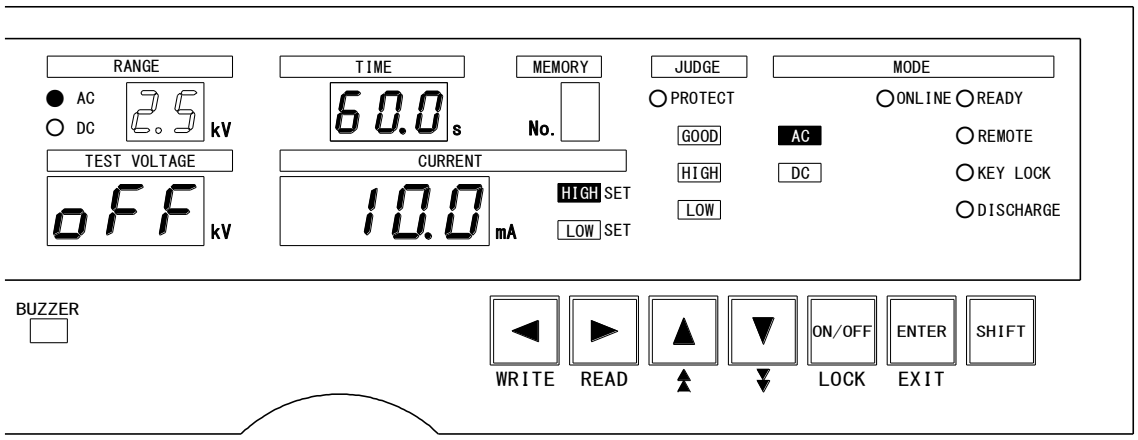
③ **To enter the setting of DC withstanding voltage test,**
In the condition ①, while [DC] (DC withstanding voltage test) is in blinking, press [◀] or [◀] key, then you can enter the setting of test condition for the DC withstanding voltage test.

# 8. Setting of test condition for withstanding voltage test

The setting of test condition has to be made independently for the AC withstanding voltage test and DC withstanding voltage test. The condition set in the AC withstanding voltage test mode and in the DC withstanding voltage test mode is respectively valid for the AC, DC.

## 8.1 ●Test range of withstanding voltage test

Range to set: 2.5kV or 5kV




To enter setting mode

① In READY status, press ▶ or ◀ key, then the test mode lamp blinks. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).

② Press ▶ or ◀ key and make the test mode lamp lit up.

Setting of test voltage range

① Press ▶ or ◀ key and select the status that the AC or DC lamp is lit up, and the test voltage range is blinking (refer to the above figure).

② Switch the test voltage to 2.5kV or 5kV with ▲ or ▼ key.
When the test voltage range is switched, the range display displays the selected voltage value in blinking. A press of ▶ or ◀ key changes the display of voltage value from blinking to lit up, then, move to the next item of condition setting.

To return to the previous setting

Press ◀ key, then the setting changes to that of test mode selection.

To the next setting

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

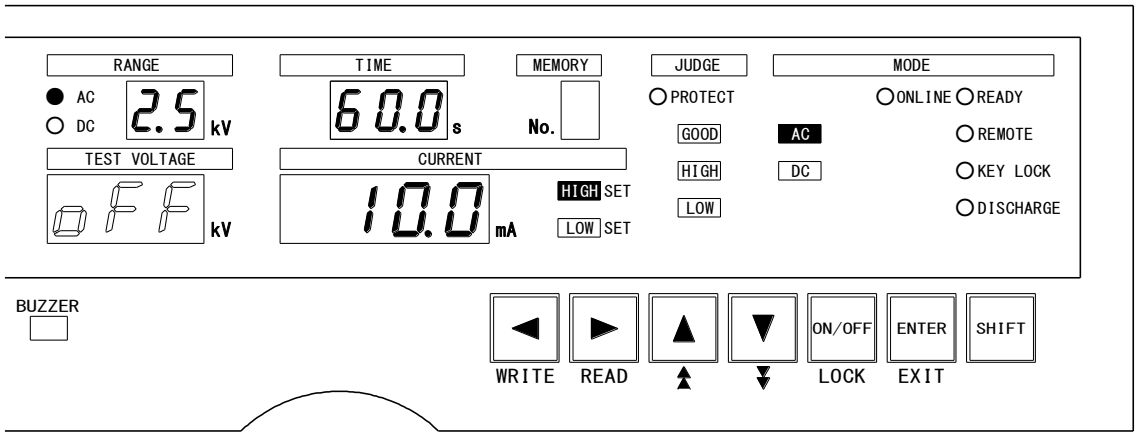
Finish of setting

Press ENTER key, then the tester returns to READY status, memorizing the settings having been made.
When the EXIT key (SHIFT and ENTER key 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. The test mode lamp moves up and down with [▲] or [▼] key. Make the required test mode lamp blinking ([AC] or [DC]).
② Press [▶] or [◀] key and make the test mode lamp lit up.

To turn OFF the setting of referential voltage

① Press [▶] or [◀] key and select the status that the test voltage display blinks.
② Next, press [ON/OFF] key and select the status that the display blinks with oFF (refer to the above figure).

To return to the previous setting

Press [◀] key, then the setting changes to the **setting of test range of withstanding voltage test**.

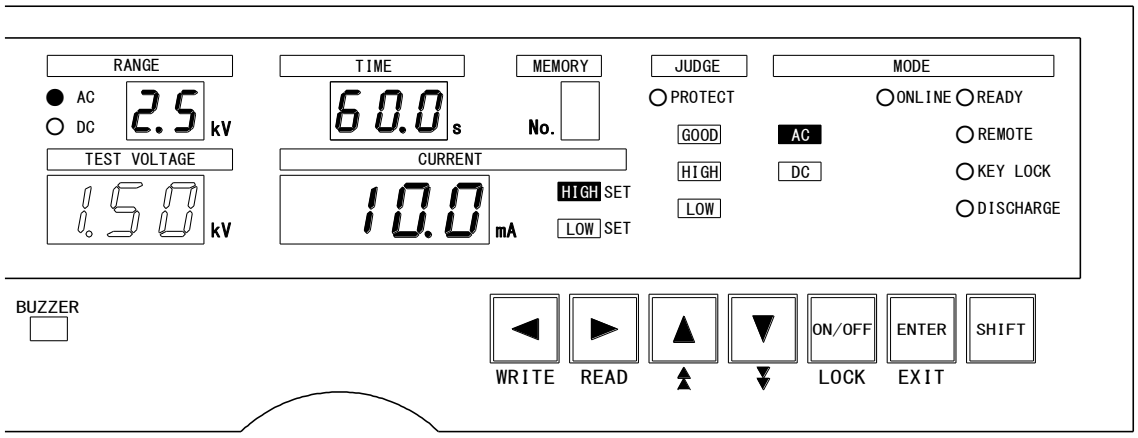
To the next setting

Press [▶] key, then the setting moves to the **setting of high limit of leak current**.

Finish of setting

Press [ENTER] key, then the tester returns to READY status, memorizing the settings having been made.
When the [EXIT] key ([SHIFT] and [ENTER] key 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. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).
② Press ▶ or ◀ key and make the test mode lamp lit up.

Setting of referential voltage

① Press ▶ or ◀ key and select the status that the test voltage display blinks.
② Next, press ON/OFF key and select the status that the display blinks with the numeral.
③ Press ▲ or ▼ key and set the referential voltage.
A press of ⏫ key (SHIFT and ▲ keys at a time) or ⏬ key (SHIFT and ▼ keys 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 return to the previous setting

Press ◀ key, then the setting changes to the **setting of test range of withstanding voltage test**.

To the next setting

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

Finish of setting

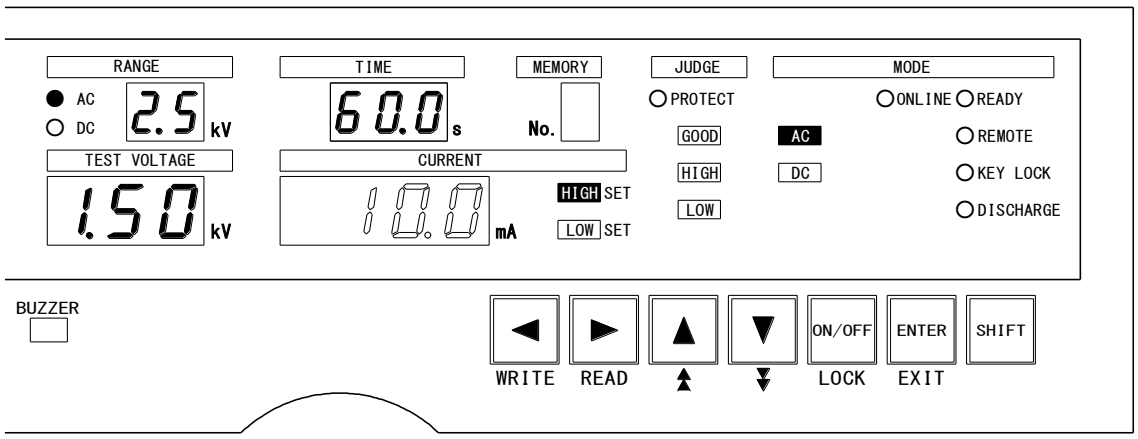
Press ENTER key, then the tester returns to READY status, memorizing the settings having been made.
When the EXIT key (SHIFT and ENTER key at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.
The test conditions in this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

## 8.3 ●High limit of leak current

Adjustable range: For AC withstanding voltage test, 0.1~110.0mA.
For DC withstanding voltage test, 0.1~11.0mA.

**Note:** The high limit value of leak current can not be set lower than that of low limit, so please set to comply with the following conditions.

1. When the low limit value of leak current is determined, set the high limit value to exceed the value of low limit.
2. When the high limit value of leak current 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. The test mode lamp moves up and down with [▲] or [▼] key. Make the required test mode lamp blinking ([AC] or [DC]).
② Press [▶] or [◀] key and make the test mode lamp lit up.

Setting of high limit of leak current

① Press [▶] or [◀] key and select the status that the current display blinks and [HIGH] SET is lit up (refer to the above figure).
② Next, press [▲] or [▼] key and set the high limit of leak current value.
A press of [↟] key ([SHIFT] and [▲] keys at a time) or [↡] key ([SHIFT] and [▼] keys at a time) allows the setting of second digit.

To return to the previous setting

Press [◀] key, then the setting changes to the **setting of referential voltage**

To the next setting

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

Finish of setting

Press [ENTER] key, then the tester returns to READY status, memorizing the settings having been made.
When the [EXIT] key ([SHIFT] and [ENTER] key 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.

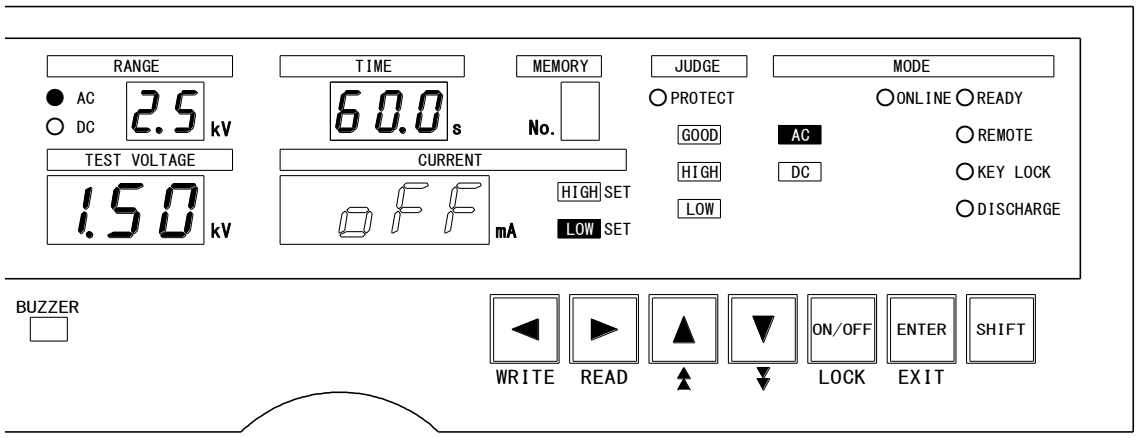
## 8.4 ●Low limit of leak current

Adjustable range: For AC withstanding voltage test, 0.0~109.0mA, OFF.
For DC withstanding voltage test, 0.0~10.9mA, OFF.

Note 1: The high limit value of leak current can not be set lower than that of low limit, so please set to comply with the following conditions.
1. When the low limit value of leak current is determined, set the high limit value to exceed the value of low limit.
2. When the high limit value of leak current is determined, set the low limit value not to exceed the value of high limit, or turn "OFF" the low limit.

Note 2: When set to "OFF", no judgement is made for low limit. When restored (to 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. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).
② Press ▶ or ◀ key and make the test mode lamp lit up.

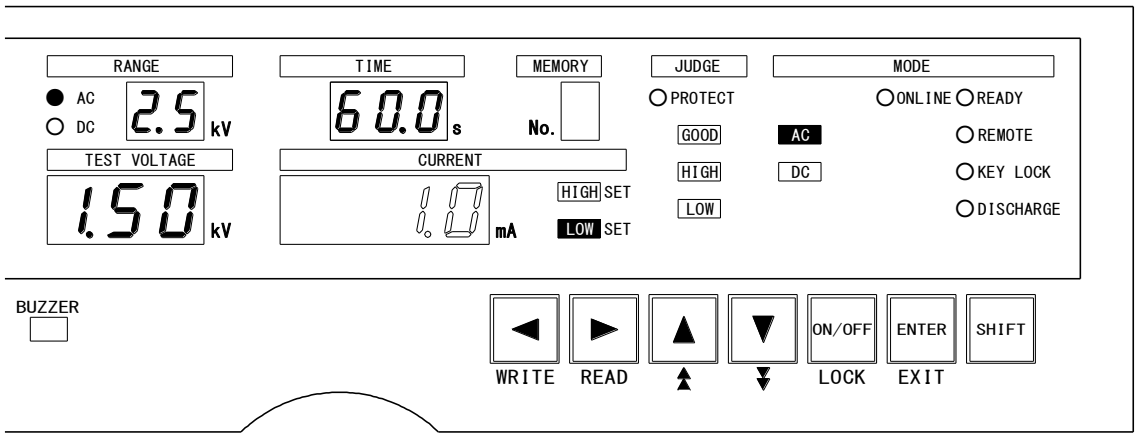
To turn OFF the setting of low limit of leak current
① Press ▶ or ◀ key and select the status that the current display blinks and LOW SET is lit up.
② Next, press ON/OFF key and select the status that the display blinks with oFF (refer to the above figure).

To move to the previous setting
Press ◀ key, then changes to the **setting of high limit of leak current**.

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

Finish of setting
Press ENTER key, then the tester returns to READY status, memorizing the settings having been made.
When the EXIT key (SHIFT and ENTER key 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. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).

② Press ▶ or ◀ key and make the test mode lamp lit up.

Setting of low limit of leak current

① Press ▶ or ◀ key and select the status that the current display blinks and LOW SET is lit up.

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 low limit of leak current value.
A press of ⏫ key (SHIFT and ▲ keys at a time) or ⏬ key (SHIFT and ▼ keys at a time) allows the setting of second digit.

To move to the previous setting

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

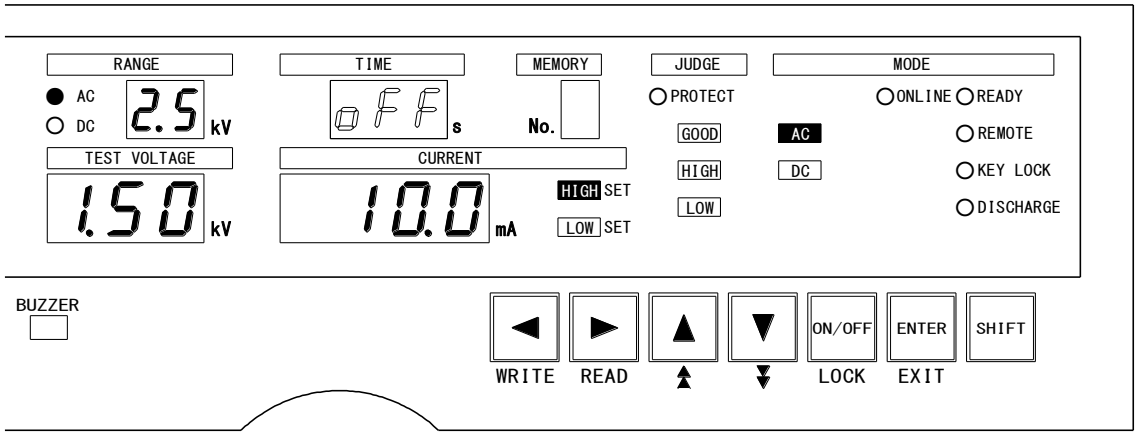
When the EXIT key (SHIFT and ENTER key at a time) is pressed in the setting mode, the setting mode for the test condition is interrupted and the tester becomes READY status.

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, OFF

**[When turning OFF the setting of test time]**




To enter setting mode

① In READY status, press ▶ or ◀ key, then the test mode lamp blinks. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).

② Press ▶ or ◀ key and make the test mode lamp lit up.

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 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 low limit of leak current**.

To the next setting

Press ▶ key, then changes to the selective state of test mode.

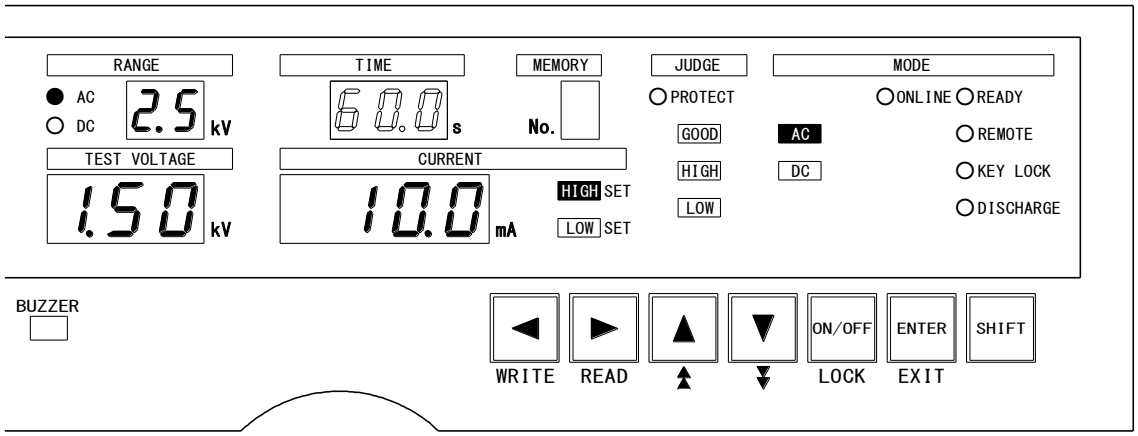
Finish of setting

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

When the EXIT key (SHIFT and ENTER key 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. The test mode lamp moves up and down with ▲ or ▼ key. Make the required test mode lamp blinking (AC or DC).

② Press ▶ or ◀ key and make the test mode lamp lit up.

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.
A press of ⏫ key (SHIFT and ▲ keys at a time) or ⏬ key (SHIFT and ▼ keys 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 changes to the **setting of low limit of leak current**.

To the next setting

Press ▶ key, then changes to the selective state of test mode**.**

Finish of setting

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

When the EXIT key (SHIFT and ENTER key 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. Memory function

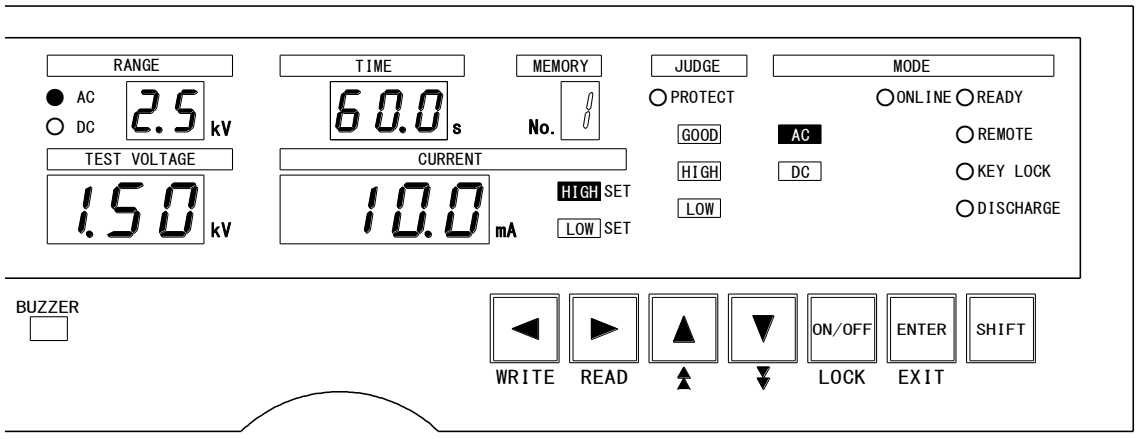
This tester is provided with 9 program memories to memorize the test mode and the setting of test conditions.

## 9.1 ●Configuration of memory

Each memory can memorize one type of test mode, 5 items of the test conditions of AC withstanding voltage test and 5 items of the test conditions of DC withstanding voltage test. For the content of each type and item, please refer to the following table.

| Type of test mode | Setting of test condition for AC withstanding voltage test | Setting of test condition for DC withstanding voltage test |
|---|---|---|
| ↓ | ↓ | ↓ |
| 1 type | 5 items | 5 items |
| AC (AC withstanding voltage test)<br>DC (DC withstanding voltage test)<br>Either one | Range of test voltage<br>Referential voltage<br>High limit of leak current<br>Low limit of leak current<br>Test time | Range of test voltage<br>Referential voltage<br>High limit of leak current<br>Low limit of leak current<br>Test time |

## 9.2 ●Memory write-in




Selection of memory No.

① 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 7~8).

② 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).

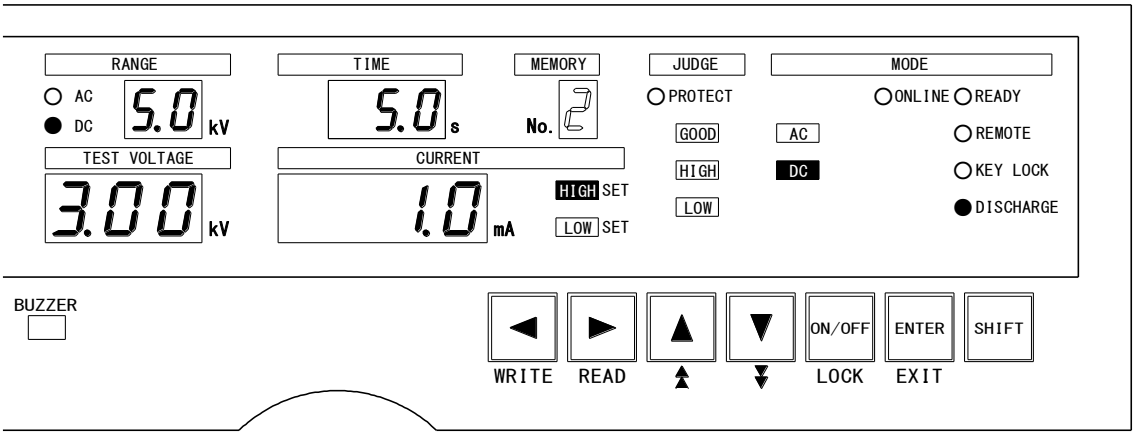
③ Select the memory No. to write in with [▲] or [▼] key.

Finish of memory write-in

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

When the [EXIT] key ([SHIFT] and [ENTER] key 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.

## 9.3 ●Memory read-out




Procedure of memory read-out

① In READY status, press [READ] key ([SHIFT] and [▶] key at a time).
② The numeral of 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 write-in

Press [ENTER] key, then the tester returns to READY status, memorizing the settings having been made.
When the [EXIT] key ([SHIFT] and [ENTER] key 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. Test procedure (from start to judgement result)

## 10.1 ●Setting of test voltage (before starting test)

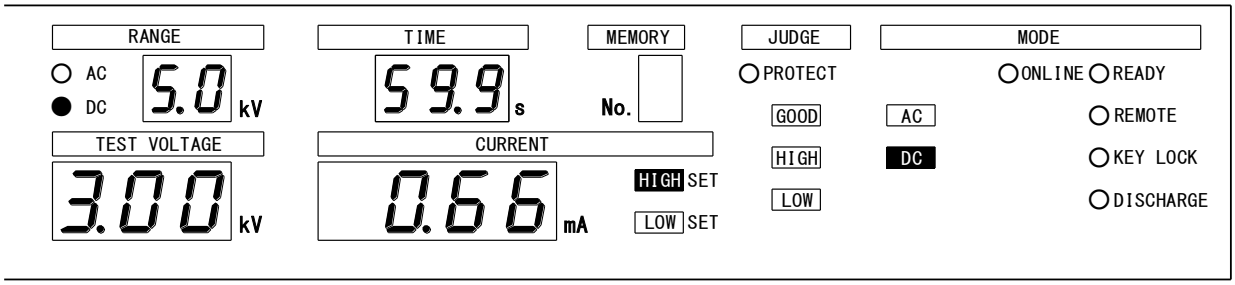
① In READY status, press the [▶] key for 3 times and make the status that the test voltage display blinks.
② Press the [ON/OFF] key and select the status that the display blinks with oFF.
③ Press the [▶] key twice and make the status that the current display blinks and [LOW SET] is lit up.
④ Press the [ON/OFF] key and select the status that the display blinks with oFF.
⑤ Press the [▶] key once and make the status that the test time display blinks.
⑥ Press the [ON/OFF] key and select the status that the display blinks with oFF.
⑦ Press the [ENTER] key and set the above three kinds of condition to OFF.
⑧ Press the [START] switch ③ and generate the test voltage.
⑨ Gradually turn the [TEST VOLTAGE] knob ④ clock-wise and set the test voltage.
⑩ Press the [STOP] switch ② and shut down the output voltage.
⑪ Press the [▶] key and enter into the setting mode of test condition, and restore the conditions previously set to OFF, by pressing the [ON/OFF] key.

**⚠ WARNING**

**If the test range of withstanding voltage test is switched from 2.5kV to 5kV, leaving the test voltage knob at the position set at the range 2.5kV, the test voltage is doubled when output.**
**When making a change of test range of withstanding voltage test, or reading out a memory, please always do it turning the knob anti-clock-wise to the end.**

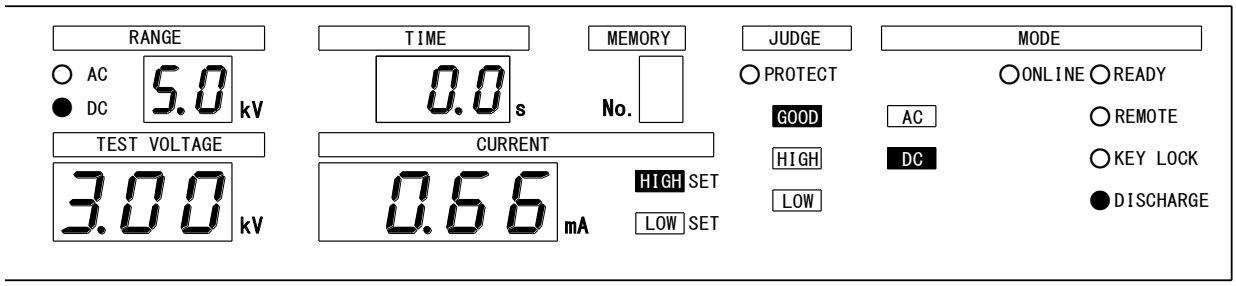
## 10.2 ●Test operation

(1) Start




① Carry out the **Setting of test condition for withstanding voltage test** at article 8 and the **Setting of test voltage** at article 10.1
② Press the [START] switch ③, then the [DANGER] lamp ⑩ is lit up and the test starts.
③ During the test, respectively displayed are the measured output voltage on the test voltage display, the measured leak current value on the current display, the remaining test time on the test time display.
**Note:** When the test time is set to oFF, the elapsed time is displayed during the test, and when exceeded 999s, the scroll of "- - -" is displayed and the test is continued.
④ During the test, TEST/H.V. OUT, TEST and AC-TEST or DC-TEST are ON at the [REMOTE/OUT] connector ⑱.

(2) Good judgement



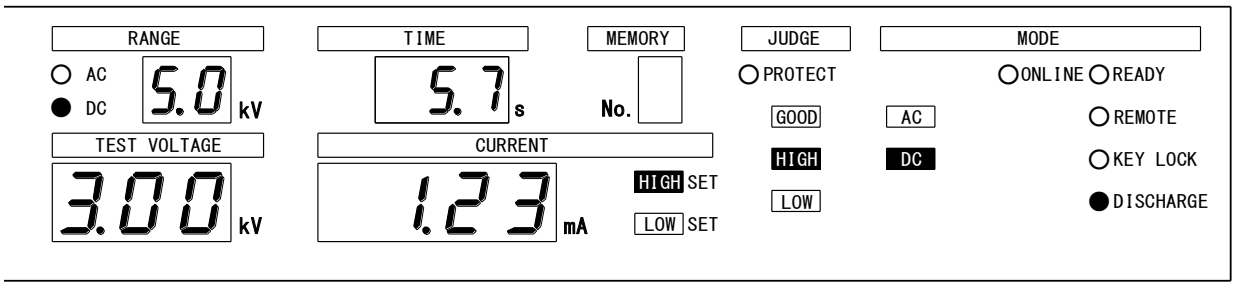

① When the leak current value of the test sample is within the set range until the time reaches the set time, the good judgement is given.
**Note:** If the test time is set to oFF, no judgement is made.

② At the judgement, the test voltage display and the current display respectively displays the value at that time, while the test time display displays 0.0 s.

③ At the judgement, GOOD and END are ON at the REMOTE/OUT connector ⑱. Buzzer is also ON.
The sound level of the buzzer is adjustable or the buzzer can be turned OFF. Make a setting referring to the article 17 Adjustment of buzzer sound.

④ After about 0.2 second, the above judgement result is resent and returns to READY status.
The good judgement can be continuously output. Make a setting referring to the article 12 Special test mode.

(3) NG judgement




① When the measured leak current value becomes out of the set range, the NG judgement is given.

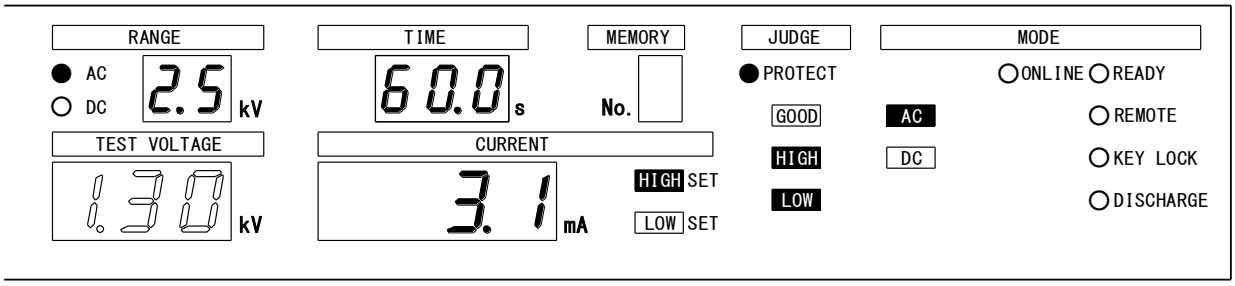
② At the judgement, the test voltage display and the current display respectively displays the value at that time, while the test time display displays the remaining time when the time is set, or the elapsed time when the time is set OFF.

③ At the judgement, when the measured leak current is higher than the high limit value, JUDGE HIGH is, and when it is lower than the low limit value, JUDGE LOW is lit up. And at the REMOTE/OUT connector ⑱, END and HIGH or LOW are ON, and the buzzer is also turned ON.
The sound level of the buzzer is adjustable or the buzzer can be turned OFF. Make a setting referring to the article 17 Adjustment of buzzer sound.

④ Press STOP switch ②, then the above judgement result is reset and the tester becomes READY status.

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

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




① In case that the referential voltage is set and when the test voltage is not within the range of referential voltage (within 5% of the set value), the test is stopped. (For the voltage less than 1000V, within +/-50V (+/-5 digit).)
When the test voltage is less than the range of referential voltage, the tester waits for 5 seconds, and when exceeded, the tester immediately stops the test.
Also, when the test voltage went out of the range of referential voltage, the test is immediately stopped.

② Press [START] switch ③, then the [DANGER] lamp ⑩ is lit up, and if the test voltage is our of the range of referential voltage, MODE [AC] or [DC] blinks.

③ During this sequence, the test voltage display displays the measured output voltage value and the current display displays the measured leak current value. Also, if the test time is set, the test time display displays the set value, and when the test time is set to OFF, the test time display displays 0.0 s.

④ At the [REMOTE/OUT] connector ⑱, TEST/H.V.OUT is ON.

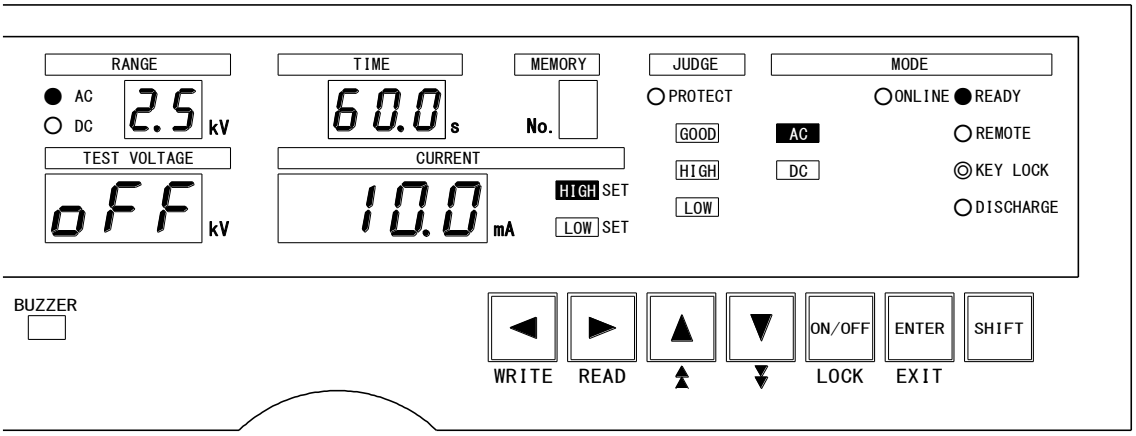
⑤ When judged to be out of the referential voltage range and the test is stopped, the current display displays the value at that moment, and the test voltage display displays the value at that moment in blinking. Also, JUDGE [HIGH] [LOW] and PROTECT lamp are lit up.

⑥ At this time, PROTECTION is ON at the [REMOTE/OUT] connector ⑱.

⑦ Press [STOP] switch ②, then the tester resets and returns to READY status.

# 11. Key lock

In READY status, 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 for 3 seconds or more the LOCK key (SHIFT and ON/OFF at a time). 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.

# 12. Special test mode

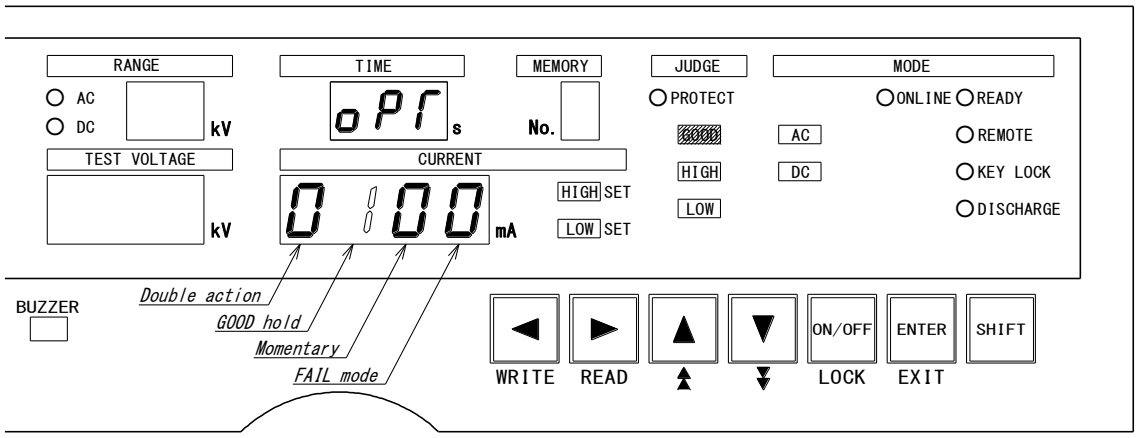
Model 8526 is able to have the setting of 4 special functions by means of key operation on the front panel.

(1) Double action start function
Within 0.5 second from the stop signal having been ON/OFF, 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] key and [STOP] key at a time for 3 seconds or more.
READY lamp blinks and the test time display is lit up with "oPr".
The highest digit of the current 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

0 0 0 0

[▲] key: Numeral increases.
[▼] key: Numeral decreases.

| | | | | | Lamps to synchronously blinks at the setting |
|---|---|---|---|---|---|
| 0 | - | - | - | Cancel of setting | READY lamp |
| 1 | - | - | - | Setting of double action start function | |
| | 0 | - | - | Cancel of setting | GOOD |
| | 1 | - | - | Setting of GOOD hold function<br>**Note**: In order to re-start, once of stop signal input is necessary | |
| | 2 | - | - | Setting of GOOD hold function<br>**Note**: When the start signal is input, the judgement output is reset and re-starts. | |
| | | 0 | - | Cancel of setting | AC DC |
| | | 1 | - | Setting of momentary start function | |
| | | | 0 | Cancel of setting | HIGH LOW |
| | | | 1 | Setting of FAIL mode | |

Finish of setting

Press [ENTER] key, then the setting is memorized and returns to READY status.
When the [EXIT] key ([SHIFT] and [ENTER] key 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 that case is the condition before entering the special test mode.

# 13. Remote control

On the model 8526, a remote control is possible through [REMOTE] connector ⑤ on the front panel, [REMOTE] terminal ㉑ or [REMOTE/OUT] connector ⑱ 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.**

## 13.1 ●Operation by REMOTE connector

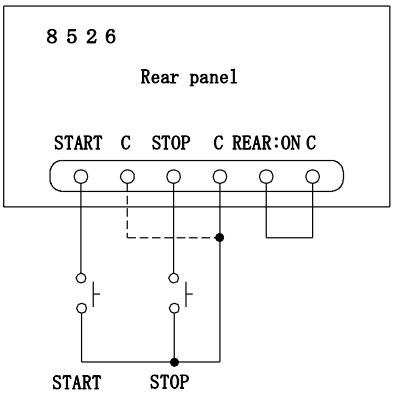
With use of the optional Remote Control Box (Model 5858-07, 07W) connected to the [REMOTE] connector ⑤, the start/stop operation can be remote-controlled.
When the plug of the remote control box is inserted, the REMOTE lamp is lit up and the type of operation changes from the switch operation on the 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.

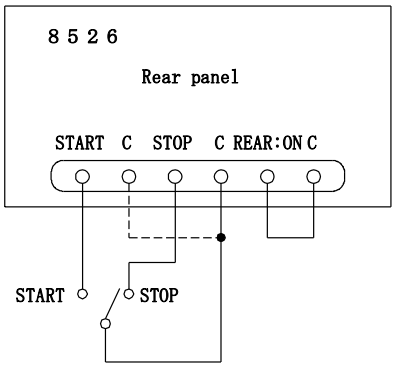
## 13.2 ●Operation by REMOTE terminal

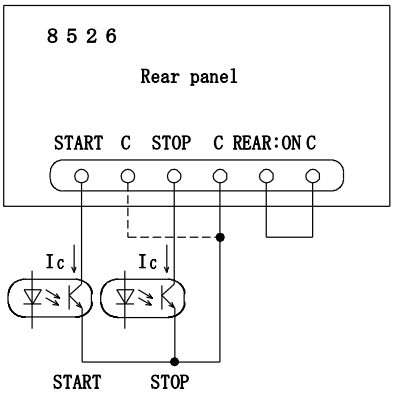
An equivalent operation to that through [REMOTE] connector ⑤ is also possible through the [REMOTE] terminal ㉑ on the rear panel.
By connecting the optional foot switch (model 5858-04) to the START terminal, the start operation can be done by foot.

① Turn the power supply OFF and confirm that the [DANGER] lamp ⑩ is turned off.
② Make a short-circuit between REAR:ON and C terminal of the [REMOTE] terminal ㉑. Or alternatively, make a short-circuit between the pin No.2 of the [REMOTE/OUT] connector ⑱ and the COM (either one of pin No.19, 23 or 36) of the same connector ⑱.
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 ㉑.




**Specification of input signal**:
Control input: Active LOW
Input level: "H"=16.8~24V
"L"=0~3.8V
"L" level flow out current: $I_C$ =10mA
"L" level min. pulse width: 40ms

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

**Fig.13.1** 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.** |

## 13.3 ●Operation by REMOTE/OUT connector

Same remote operation as that through REMOTE terminal ㉑ can be done through the REMOTE/OUT connector ⑱ on the rear panel.
For connection of connector, please refer to the article 14.2 (P31).
The operation is same as that of REMOTE terminal, the article 13.2 (P28).

## 13.4 ●Operation by REAR:MEM

Features of REAR:MEM

1. The test can be performed, reading out the content of memory setting by a relay, sequencer etc.
2. Since the tester is used by the external control, it becomes key lock condition during the setting.
3. The start signal is decided depending upon the setting condition of the remote control.
4. An interruption of the test is possible from the STOP switch ②, STOP terminal ㉑, on the rear panel and STOP Pin No.4 of the REMOTE/OUT connector.

To start, reading out the memory

(1) Make a short-circuit between the Pin No.20 (REAR:MEM) of the REMOTE/OUT connector ⑱ on the rear and COM (either 19, 23 or 36) of the same connector ⑱. Then 0 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 ⑱, read out the memory No.1~9.

**Note:** When the A~F code is input, A~F is displayed on the display but the read out is not 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.

(4) If the pin No.20 of the connector ⑱ is opened, the tester returns to the test condition before entering the operation by REAR:MEM.

Remote control which can be jointly used with REAR:MEM

During the REAR:MEM setting, the remote control can also be used jointly. The start from the REMOTE connector ⑤ (front panel), REMOTE terminal ㉑ (rear panel) and Pin No.3 (STOP) of the REMOTE/OUT connector ⑱ is also possible.

Refer to the article 13.5 for the priority of remote control.

[Likely error at the REAR:MEM]

| | |
|---|---|
| Blinking display of Err rMtE | For a likely cause and solution, refer to the article 18 Error messages. |

## 13.5 ●Priority of each remote control

On the model 8526 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 ⑰ (rear panel) | 1 |
| B | REMOTE connector ⑤ (front panel) | 2 |
| C | REMOTE / OUT connector ⑱ (rear panel) | 3 |
| D | REMOTE terminal ㉑ (rear panel) | 3 |

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.

# 14. External control

## 14.1 ●Control by REMOTE/OUT connector

By means of the REMOTE/OUT connector ⑱ 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 8526 can be output by open collector.
The input and output signals are isolated from the internal circuit by photo-coupler.
Also, the 8526 is provided with the power source of 24V DC 0.1A, which can be utilized as power supply for the external control.

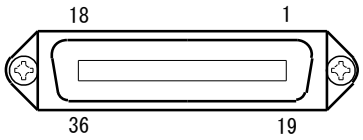
## 14.2 ●Arrangement and function of connector pins

| 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 13.3 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:MEM) Effective for No.1~No.9 A~F code are ineffective, no memory can be read. |
| | MEM SET 2 | 7 | |
| | MEM SET 4 | 8 | |
| | MEM SET 8 | 9 | |
| 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 14.4 for detail. |
| | GOOD | 13 | Output at good judgement. |
| | HIGH | 14 | Output at NG judgement for high limit. |
| — | NC | 15 | Vacant pin (do not use it as relay terminal). |
| | NC | 16 | Vacant pin (do not use it as relay terminal). |
| | NC | 17 | Vacant pin (do not use it as relay terminal). |
| | NC | 18 | Vacant pin (do not use it as relay terminal). |
| COM | COM | 19 | Common (common with 23, 36) |
| I | REAR:MEM | 20 | Change-over signal for memory read out from the rear panel. |
| — | NC | 21 | Vacant pin (do not use it as relay terminal). |
| | NC | 22 | Vacant pin (do not use it as relay terminal). |
| COM | COM | 23 | Common (common with 19, 36) |
| O | AC-TEST | 24 | Output during the AC withstanding voltage test. Not output while AC is blinking. |
| | DC-TEST | 25 | Output during the DC withstanding voltage test. Not output while DC is blinking. |
| | TEST | 26 | Output during the test. Not output while AC or DC 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. |
| | LOW | 32 | Output at NG judgement for low limit. |
| — | NC | 33 | Vacant pin (do not use it as relay terminal). |
| | NC | 34 | Vacant pin (do not use it as relay terminal). |
| | 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



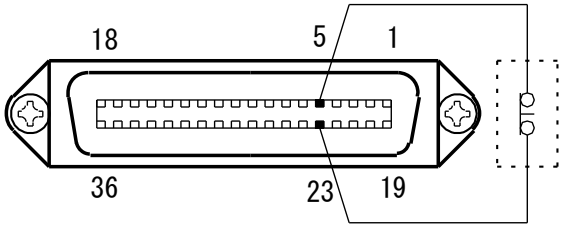

**Note**: When externally remote controlled, REAR:ON and COM are short-circuited. The operation is same as that of REMOTE terminal, the article 13.2 (P28).

## 14.3 ●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 5 (INTER-LOCK) of the REMOTE/OUT connector ⑱ 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 LoCH is displayed, the output of 8526 is shut off and the operation of all the switches are disabled.
To cancel the interlock, short-circuit the pin 5 and pin 23 (COM) of the REMOTE/OUT connector ⑱ to make it to "L" level, and then press the STOP switch ②.
Err LoCH is turned off and READY lamp is lit up, enabling the test.
**Note**: The pin 5 and 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.

REMOTE/OUT connector




External device
Safety security switch on test jig

**Fig.14.1** Interlock connection example

## 14.4 ●Protective function (PROTECTION)

The protective function is the action that the PROTECTION is output from the REMOTE/OUT connector ⑱ 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 becomes out of the range of referential voltage and the test is stopped.
- When there is an abnormality in the DC high voltage power source circuit.

## 14.5 ●Output signals and power supply for control

It is possible to take out each condition of the 8526 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.10~14, 24~26, 28, 31, 32)
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

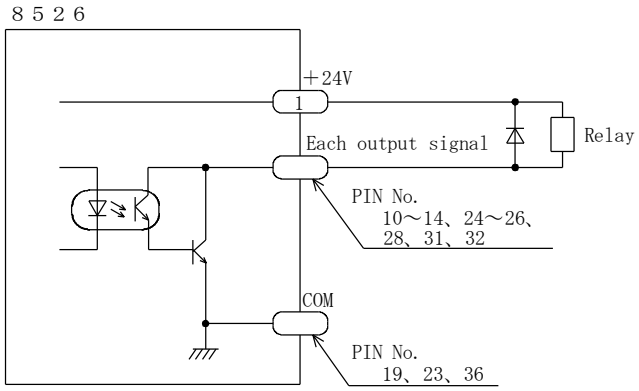



**Fig.14.2** Connection example of relay drive

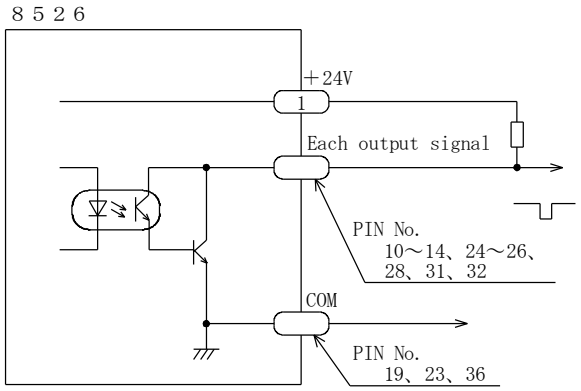



**Fig.14.3** Example to obtain a signal level

### ⚠ CAUTION

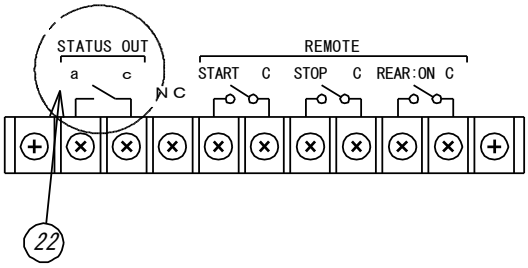
- **Use the output signal with 30V and 30mA DC or less.**
- **In case of controlling an inductive load like relay, connect a diode in parallel with the coil to absorb the reverse electricity.**

# 15. Status output

## 15.1 ●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 ㉒ 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. |
| 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).

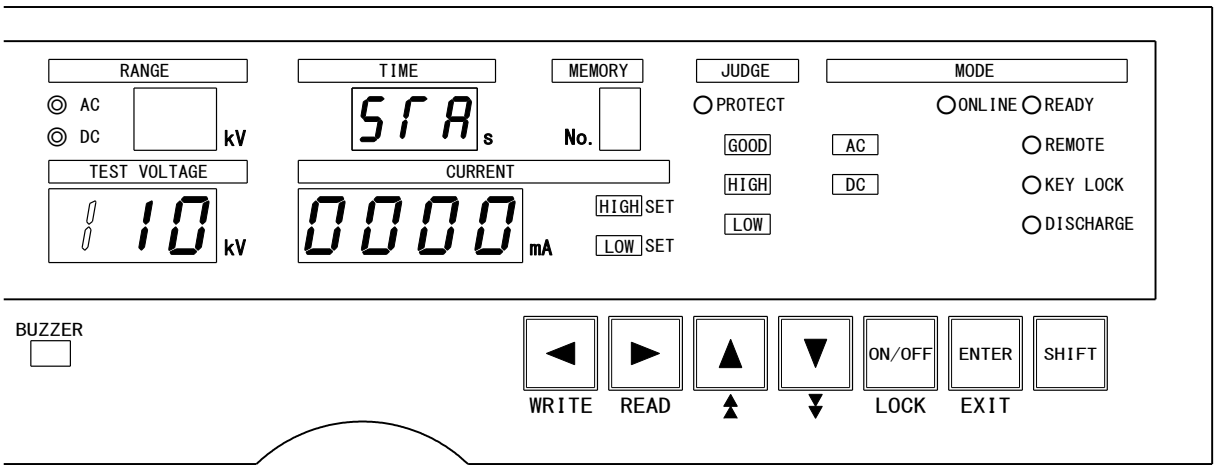
## 15.2 ●Specifications of status output

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

**⚠ WARNING**

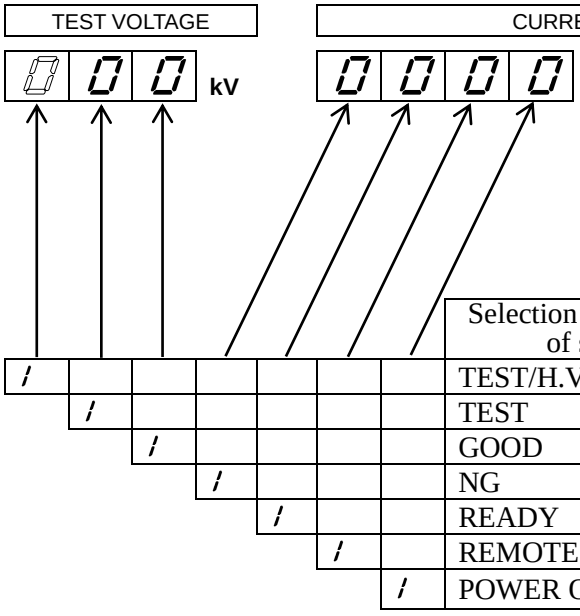
**Do not connect the device to consume 250V AC/1A (30V DC/1A) or more to the outlet of the status output. It will cause a break-down of this tester.**

## 15.3 ●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.
[DENGER], AC, DC lamps blink and the test time display is lit up with "SrA".
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.



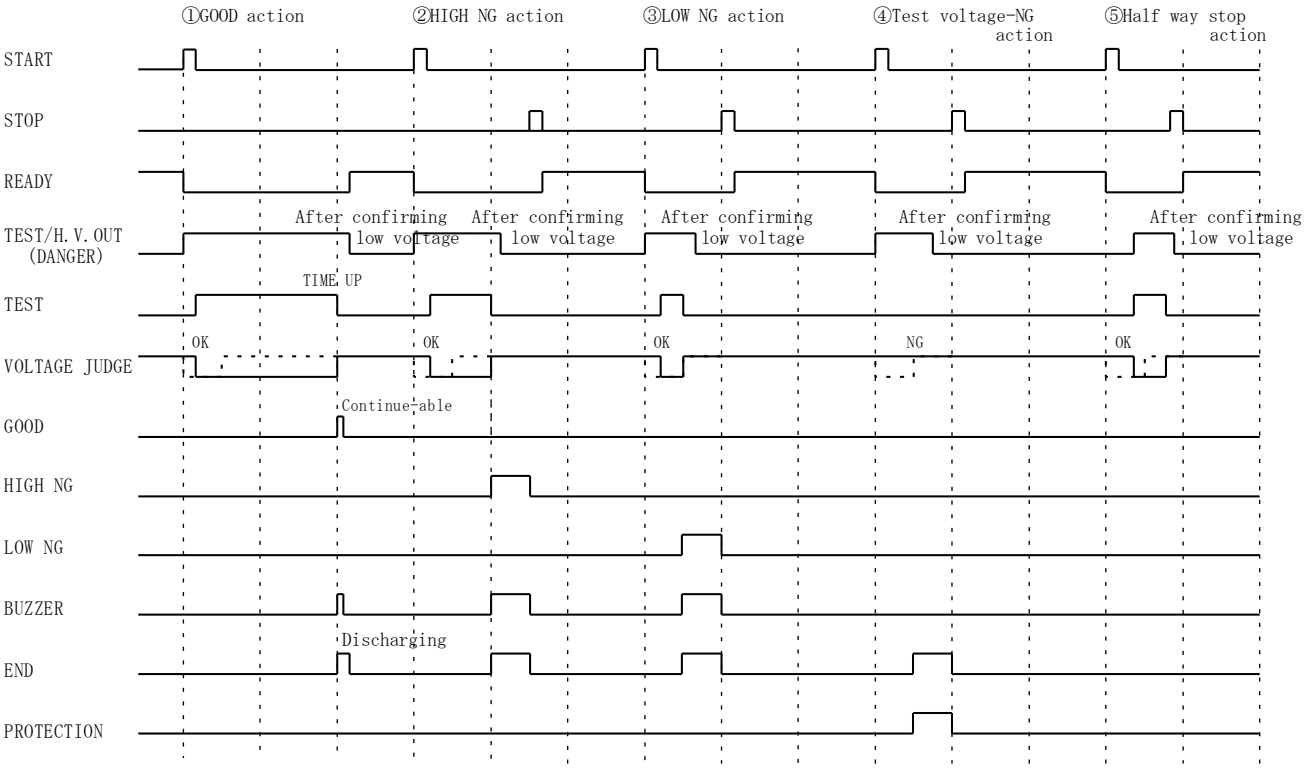

"0" or "1" blinks at selection of each item.
1 : To select 0 : Not to select
[▶] key: Move to right, but when pressed at the item POWER ON, moves to the TEST/H.V. OUT.
[◀] key: Move to left, but when pressed at the item TEST/H.V. OUT, moves to POWER ON.

| Selection item of status output | Lamps to synchronously blinks at the setting |
|---|---|
| TEST/H.V. OUT | [DANGER], AC, DC lamp |
| TEST | [AC] [DC] |
| GOOD | [GOOD] |
| NG | [HIGH] [LOW] |
| READY | READY lamp |
| REMOTE | REMOTE lamp |
| POWER ON | ———— |

Finish of setting

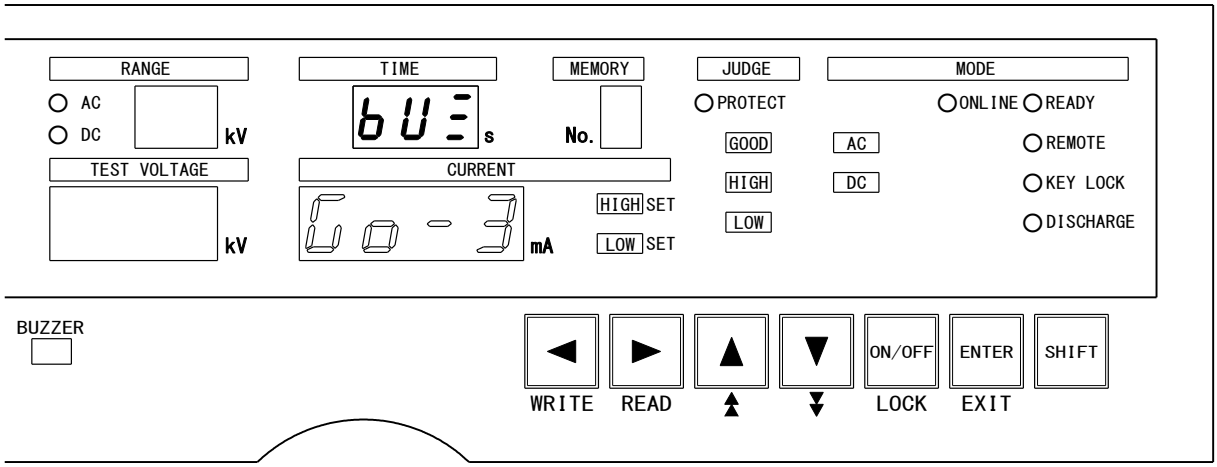
Press [ENTER] key, then the setting is memorized and returns to READY status.
When the [EXIT] key ([SHIFT] and [ENTER] key at a time) is pressed, the setting mode of the status output condition is interrupted and the tester becomes READY status.
The setting mode of the status output condition at that time is the condition before entering the setting mode of the status output condition.
When the [EXIT] key ([SHIFT] and [ENTER] key at a time) is pressed while "SrA" is lit up, the setting mode of the status output condition is interrupted and the tester becomes READY status.
The setting mode of the status output condition at that time is the condition before entering the setting mode of the status output condition.

# 16. Timing chart



# 17. 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 displays "bUZ ".

Adjustment of buzzer sound at the GOOD judgement

① The current display blinks with "Go -□".
The adjustment of buzzer sound at GOOD judgement can be made while "Go -□" is blinking.
② 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

① The current display blinks with "Go -□".
② Pressing alternatively the [▶] or [◀] key, GOOD judgement "Go -□" and NG judgement "nG -□" can be switched over.
Be sure to make a setting while "nG -□" is blinking
③ 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 setting is memorized and returns to READY status.
When the [EXIT] key ([SHIFT] and [ENTER] at a time) is pressed while "bUZ " 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.

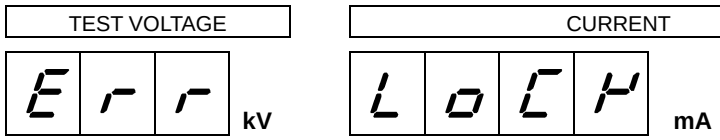
[Sound volume]

| Adjustable range | | Volume |
|---|---|---|
| For GOOD judgement | For NG judgement | |
| Go-5 | nG-5 | Max ↑ |
| Go-4 | nG-4 | |
| Go-3 | nG-3 | |
| Go-2 | nG-2 | |
| Go-1 | nG-1 | ↓ Min |
| Go-0 | nG-0 | OFF |

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

# 18. 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.




| TEST VOLTAGE | CURRENT | Cause | Solution | |
|---|---|---|---|---|
| Err | CHrG | When discharging of test sample does not finish after passing 10 sec. | A, G | ※ |
| Err | SSr | When voltage output does not drop after passing 10 sec. | A | ※ |
| Err | LoCH | When interlock input turns OFF. | B | ※ |
| Err | rMtE | When remote status is changed during the test. | C | ※ |
| Measuring | 0000 | When abnormal current is detected during withstanding voltage test.(Becomes NG for high limit of leak current.) | D | |
| Err | StrT | When the time to retain start signal is less than 40ms. | E | |
| Err | E-11 | When start signal turns OFF in momentary action, during W test. | F | |
| Err | HEAt | When the overload condition is detected during the DC withstanding voltage test. | H | ※ |
| Err | dAnG | When the abnormality is detected in the DC high voltage power source circuit during the DC withstanding voltage test. | I | ※ |

※ PROTECTION is output from REMOTE/OUT connector ⑱.

**Solutions**:

A : Turn OFF the power supply immediately. The 8526 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 or the test mode 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 8526 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 40ms, the error is displayed.
Make an arrangement to secure the start sequence 40ms or more.

F : Press STOP switch ② and make READY status. Make a connection so that the start signal can not be OFF during the test, or review the sequence.

G : In case that the capacity of the test sample is big, un-discharged high voltage may remain in it. Turn the power supply OFF and sufficiently discharge the test sample in a proper way.

H : Press STOP switch ② and make READY status.
In case that the 8526 main unit is heated up, cool it down, leaving it as it is for 10 minutes or more.
If the 8526 is not heated up, another possibility is that the supply voltage abnormality drops. Check the power source.

I : Press STOP switch ② and make READY status, and turn OFF the power supply.
The 8526 might have been broken down. Consult us or our distributor.

# 19. Maintenance

## 19.1 ●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.

## 19.2 ●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. | • Isn't the power supply plug of socket?<br>• Isn't the fuse burnt out?<br>Replace fuse referring to the art. 19.3 (P39). |
| Err LoCH is displayed. | • Interlock functions.<br>Cancel the interlock referring to the art. 14.3 (P32). |
| Key is not operable. | • Isn't the KEY LOCK lamp lit up?<br>Cancel the key lock referring to the art. 11 (P26) |
| Test can not be started, though START switch is pressed. | • Isn't the READY lamp lit up?<br>• Isn't the REMOTE lamp lit up?<br>START switch is disabled during the remote control.<br>Refer to the article 13 (P28) for remote control. |

## 19.3 ●Replacement of fuse

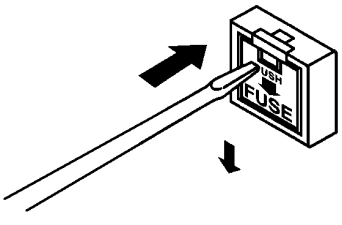
When the fuse is replaced, make sure to use one of the rated fuses listed below.
The fuse rated at 7A is attached as one of accessories.

| Sort | Power source voltage | Rate of fuse |
|---|---|---|
| Standard | 100V AC | 125V 7A |
| Option | 115V AC | |
| | 200V AC | 250V 4A |
| | 220V AC | |
| | 240V AC | |

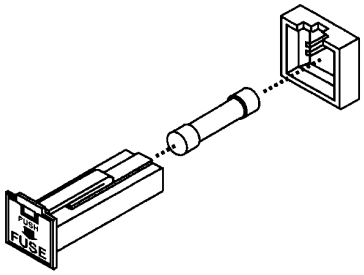
Do not use the fuse other than those rated above.

Procedure to replace fuse

① Turn OFF the POWER switch ① and pull out the power supply cable.
② Insert the screwdriver into the square hole of the fuse socket ⑮ on the rear panel and, pushing it downward, remove the fuse box.
③ Replace the fuse with the rated one.
④ Insert the fuse box.




(**Fig.1**)




(**Fig.2**)

# 20. Specifications

**1. Withstanding voltage test section**

1.1 AC withstanding voltage output

| | |
|---|---|
| (1) Output voltage | 0~2.5kV / 0~5kV AC |
| (2) Output capacity | 500VA (5kV, 100mA). with the rated power source voltage.<br>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<br>(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 | Manual setting by volt slider. |

1.2 DC withstanding voltage output

| | |
|---|---|
| (1) Output voltage | 0~2.5kV / 0~5kV DC |
| (2) Output capacity | 50W (5kV, 10mA) at the rated power source voltage.<br>For the output current 6mA or higher, continuously for 1 minute or less. (The pause time needs to be 10 times of test time.)<br>For the output current 1mA to less than 6mA, continuously for 2 minutes or less. (The pause time needs to be 4 times of test time.) |
| (3) Output ripple | At 5kV no load : 50Vp-p, typical<br>At the maximum rated output : 100Vp-p, typical. |
| (4) Voltage fluctuation rate | 3% or less<br>(with the rated power source voltage and at no load ⇒ max. load) |
| (5) Setting of output voltage | Manual setting. |
| (6) Discharging function | Discharges the electric charge which is charged in the test sample. |

**2. Voltage measurement**

2.1 Analog

| | |
|---|---|
| (1) Scale | AC and DC sharing. 0~5kV |
| (2) Accuracy | ±5% of F.S |
| (3) AC indication | Effective average rectification value indication. |
| (4) Unit | "kV" |

2.2 Digital

| | |
|---|---|
| (1) Measuring range | AC and DC sharing. 0.00~6.00kV |
| (2) Display | Digital display in 3 digits, green LED, character height 10mm. |
| (3) Accuracy | ±1.5% of F.S (F.S 2.5kV/5kV) |
| (4) Voltage display | During the test, the voltage applied to the high voltage terminal is displayed.<br>At the finish of the test, the voltage value at judgement is retained.<br>At READY, the referential voltage value is displayed. |
| (5) AC indication | Effective average rectification value indication |

**3. Current measurement**

| | |
|---|---|
| (1) Display range | AC:0.01~199.9mA (2 ranges, joint change-over with high limit value)<br>DC:0.01~19.99mA |
| (2) Display | Digital display in 3 1/2 digits, green LED, character height 10mm. |
| (3) Resolution | AC:0.01mA (0.1~9.9mA)<br>0.1mA (10.0~110.0mA)<br>DC:0.01mA (0.1~11.0mA)<br>**Note**: ( ) shows high limit set value. |
| (4) Accuracy | ±(5%+20μA) of high limit set value. |
| (5) Current display | During the test, the leak current value is displayed.<br>At the finish of the test, the leak current value at judgement is retained.<br>At READY, the high limit value is displayed. |
| (6) AC indication | Effective average rectification value indication. |

**4. Judgement of test result**

(1) Judgement system
- High limit: Analog comparator.( For short-circuit detection, set value internally fixed. )
- High and low limit: Digital comparator.

(2) Adjustable range
- High limit: AC:0.1~110.0mA (low limit + 1 digit or more)
  DC:0.1~11.0mA (low limit + 1 digit or more)
  Resolution 0.1mA (0.1~110.0mA, for DC up to 11.0mA)
- Low limit: AC:0.0~109.0mA (high limit – 1 digit or less)
  DC:0.0~10.9mA (high limit – 1 digit or less)
  Resolution 0.1mA (0.0~109.0mA, for DC up to 10.9mA)

**Note1**: Low limit setting can be ON/OFF

**Note2**: High and low limit value for the AC withstanding voltage test and the same for the DC withstanding voltage test are memorized as independent item with each other.

(3) Judgement condition

High limit value ＞ Leak current ＞ Low limit value … GOOD
High limit value ≦ Leak current ……. HIGH NG
Low limit value ≧ Leak current ……. LOW NG

**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 |

**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.
- At READY, set value is displayed.

(4) Accuracy: ±20ms (0.5~99.9s) / ±200ms (100~999s)

**6. Input/output signal**

(1) Connector: 36P Anphenol connector on the rear panel.
(2) Output signal: Open collector 30V DC, 400mA MAX (TOTAL)
(3) Name of output signal

| | | |
|---|---|---|
| TEST | : | In test. |
| AC-TEST | : | In AC withstanding voltage test. |
| DC-TEST | : | In DC withstanding voltage test. |
| END | : | Finish. |
| TEST/H.V. OUT | : | While high voltage is output at output terminal. |
| READY | : | In waiting. |
| GOOD | : | At good judgement (0.2s/continuous changeable). |
| NG | : | At NG judgement (continuous). |
| HIGH NG | : | At NG judgement for high limit (continuous). |
| LOW NG | : | At NG judgement for low limit (continuous). |
| PROTECTION | : | While protective function is activated. |

(4) Power source for output/input signal: 24V DC, 0.1A
(5) Input signal: H=16.8~24V, L=0~3.8V
1c=10mA, L level minimum pulse width=40ms

(6) Name of input signal

| | |
|---|---|
| START | Start signal |
| STOP | Stop signal |
| REAR:ON | Change-over signal for remote control |
| INTER LOCK | Interlock signal |
| REAR:MEM | Memory read-out signal |
| MEM SET1 | Memory read-out signal, BCD code 1 |
| MEM SET2 | Memory read-out signal, BCD code 2 |
| MEM SET4 | Memory read-out signal, BCD code 4 |
| MEM SET8 | Memory read-out signal, BCD code 8 |

REMOTE / OUT connector

| Signal name | Pin No. | | Signal name |
|---|---|---|---|
| +24V | 1 | 19 | COM |
| REAR:ON | 2 | 20 | REAR:MEM |
| START | 3 | 21 | - |
| STOP | 4 | 22 | - |
| INTER LOCK | 5 | 23 | COM |
| MEM SET1 | 6 | 24 | AC-TEST |
| MEM SET2 | 7 | 25 | DC-TEST |
| MEM SET4 | 8 | 26 | TEST |
| MEM SET8 | 9 | 27 | - |
| TEST/H.V. OUT | 10 | 28 | END |
| READY | 11 | 29 | - |
| PROTECTION | 12 | 30 | - |
| GOOD | 13 | 31 | NG |
| HIGH | 14 | 32 | LOW |
| - | 15 | 33 | - |
| - | 16 | 34 | - |
| - | 17 | 35 | - |
| - | 18 | 36 | COM |

**7. 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 (Plural numbers of the condition selectable)
: 1) TEST/H.V. OUT 5) READY
2) TEST 6) REMOTE
3) GOOD 7) POWER ON
4) NG

**8. 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 |

**9. 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.
The priority of start signal at remote control is;
The signal via RS-232C communication has the highest priority.
Secondary, the remote control connected to the front panel remote connector (DIN5P).
Lastly, the rear panel REMOTE/OUT connector and REMOTE terminal block.

(3) 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 (Key lock condition ).

**10. Other functions**

(1) Interlock — Locking condition when the INTER LOCK pin ⑤ on the rear connector is open.
When locked, Err LocH is displayed.

(2) Memory function — 9 kinds of setting content (AC/DC voltage range, referential voltage, high and low limit of leak current, test time) 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 ±5% of the set value.
Note: When the set voltage is 1000V or less, it is within ±50V (±5digit). In case that the voltage comes out of the set value during the test, the test is stopped and HIGH LOW NG is displayed.
(The function can be turned ON/OFF. When turned OFF, oFF is displayed on the voltage display at the time of setting.)

(4) Key lock — When locked, operation of the switches other than stop is disabled.
(KEY LOCK is displayed while locked.)

(5) Buzzer adjustment — Sound volume is individually adjustable (mute-able) for GOOD, NG.
Setting is made on the front panel.

(6) DANGER display — Lit up when the test voltage is output.
When the voltage remains at the output terminal after the finish of test, it is continuously lit up.
Low voltage detection level: AC 100V
DC 30V

(7) Special mode

① Double action start function
Within 0.5 second from the stop signal having been ON/OFF, the test starts with 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 allowed until the stop signal is input.
b) In the above condition a), if the start signal is input, the judgement is cancelled 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.

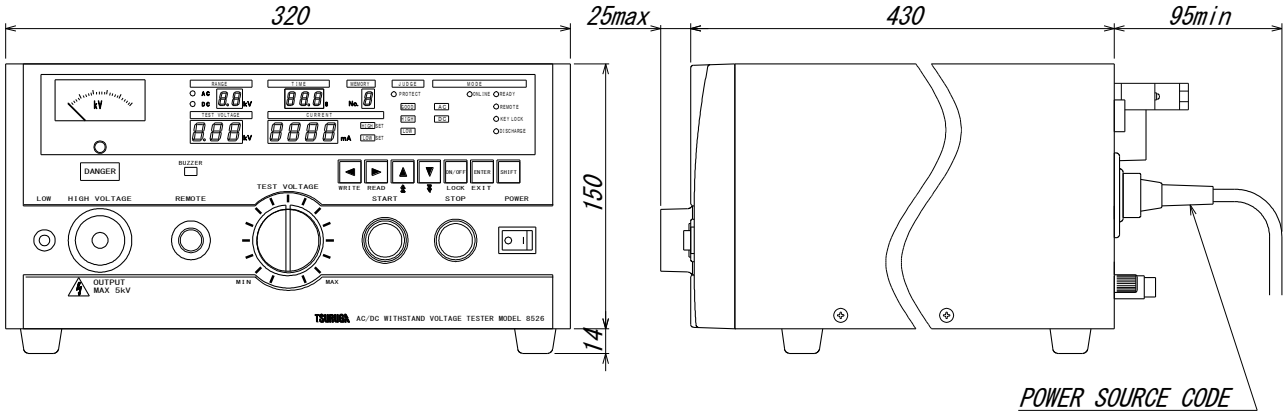
## 11. General specifications

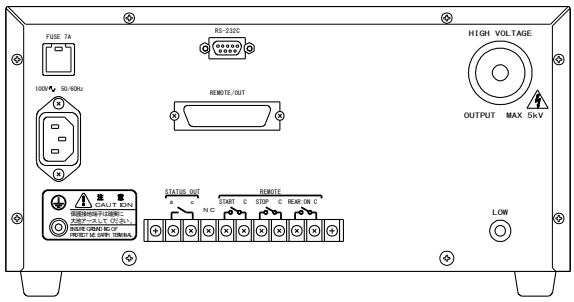
| | | |
|---|---|---|
| (1) Power supply | 100V AC 50/60Hz | |
| (2) Power supply voltage tolerance range | 90~110V AC supply | |
| (3) Power consumption | Approx. 650VA at rated load, approx. 25VA with no load (READY) | |
| (4) Operating ambient temp. | 0~40℃ | |
| (5) Operating ambient hum. | 20~80%RH (no dew) | |
| (6) Storage temp. and hum. | -20~70℃, 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. 17 kg. (Increased by about 5.5 kg. for non-standard power source voltage.) | |
| (10) Accessories | High voltage cable 2m | 1 pair |
| | Earth wire 3m | 1 piece |
| | Power supply cord 2.5m | 1 piece |
| | REMOTE/OUT plug | 1 piece (36P) |
| | Miniature fuse 7A | 1 piece |
| | Instruction manual | 1 copy |
| | Interface manual | 1 copy |
| (11) Optional accessories | Remote control box | Model 5858-07 |
| | Both-hands remote control box | Model 5858-07W |
| | Foot switch | Model 5858-04 |
| | Communication cable (RS-232C cable, 9 pins – 9 pins / 2.0m) | Model 5881-11-020 |
| | Rack mount bracket | Model 5871-03-015 |
| | Relay unit | Model 5858-08 |

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

| | | |
|---|---|---|
| Non-standard power | AC115V ・・・・Suffix: -P115 | |
| | AC200V ・・・・Suffix: -P200 | |
| | AC220V ・・・・Suffix: -P220 | |
| | AC240V ・・・・Suffix: -P240 | It is possible to produce it. |

## 13. External dimensions




Unit: mm

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# RS-232C Interface for Model 8526

## Instruction Manual

TSURUGA ELECTRIC CORPORATION

I-01991

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# 1. Specifications

The model 8526 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 | ●Test action mode<br>●Each test condition<br>●Memory No.<br>●Buzzer sound |
| Output | ●Test action mode<br>●Each test condition<br>●Each test result<br>●Status<br>●Memory No.<br>●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) |

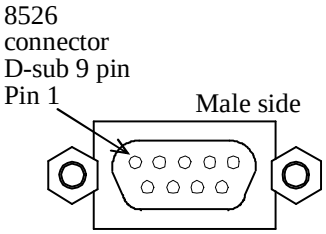
○Priority of remote control

| 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 |

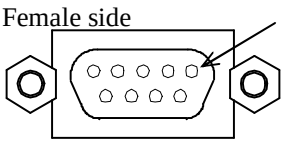
○Cautions when the power source is thrown in again after use of RS-232C.
When the power is turned OFF, the content other than those set by the memory, such as the memory number display, keylock, remote etc., return to the condition before being set by the RS-232C.

# 2. Connection

## 2.1 ●Connectors and signals




Connector: D-sub 9 pin plug type



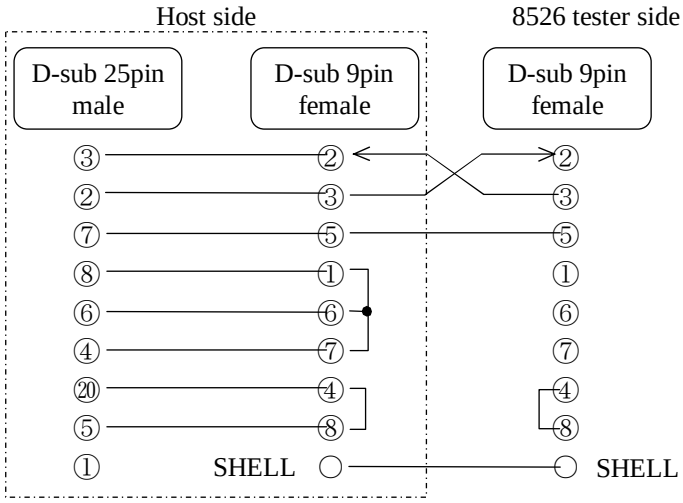

Recommended connector : XM2D-0901 (OMRON)
Recommended lock screw : XM2S-0913 (OMRON) Inch screw
**Note)** Connector and cable for external connection,
Model 5881-11-018, 9 pins – 9 pins/1.8m (option),
are also provided.

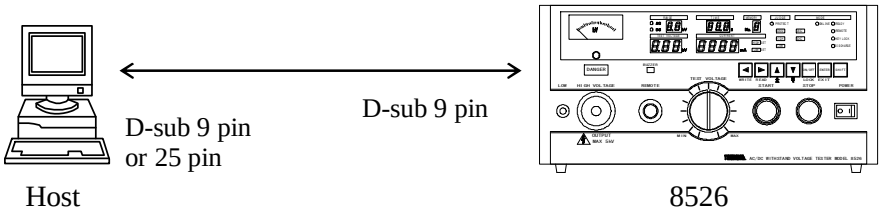
| Pin No. | Tester signal JIS (RS-232C) | Direction | Name |
|---|---|---|---|
| ① | NC | | Not in use |
| ② | RD (RXD) | ←Host | Receiving data |
| ③ | SD (TXD) | →Host | Transmission data |
| ④ | ER (DTR) | ←Host | Data terminal ready |
| ⑤ | SG (GND) | | Ground for signal |
| ⑥ | NC | | Not in use ※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.

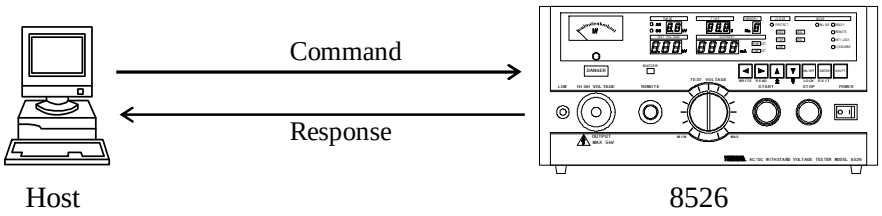



Make a connection of 8526 and host by cable.

# 3. Explanation of communication method

## 3.1 ●Communication method for command




Command is sent from the host.
When the 8526 received the 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.)

| Host side (Command) | 8526 side (Response) | Test condition |
|---|---|---|
| [RESPONSE=ON] | Transmits the response when the command is effective. | READY |
| | Transmits [ERROR=0] OK | |
| [REMOTE=ON] | START command by RS-232C is possible. | |
| | Transmits [ERROR=0] OK | |
| [SET:MODE=AC, AVOLT=*, ・・・・・・・・・・, ATIMER=*] | Setting in the lump of test mode and parameter. | |
| | Transmits [ERROR=0] OK | |
| [START] | Starts the test. | |
| | Transmits [ERROR=0] OK | |
| [STATUS?] | Reads out the status data. | |
| | Transmits the status data [STATUS=****]. | |
| | **Note**: The command which can be used during the test is RESET or STATUS only. | In test |
| DATA? | Read-out in the lump of test result. | |
| | JUDGE=*, AJUDGE=*, VOLT=*, CURRENT=*] Transmission in the lump of test result. | Test finish |

A Configuration of command

Command + Parameter + Delimiter

Example AVOLT= 5.0kV $C_R$ $L_F$

1. Command The command to control 8526.
   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 $C_R$ $L_F$
6. 8526 responses even if a unit is not included in the parameter.

Caution at the transmission of command

Transmit the set command (○○○○=) when the 8526 is in READY status.
When the set command is transmitted from the host during the test, 8526 transmits an error to the host.

B Configuration of response

When the host transmits the command to 8526, 8526 analyzes and transact the command, and transmits the response to the host.
In case that the command transmission is unconformable, 8526 transmits an error code to the host.
Also provided on 8526 is the **Response Setting** to set whether or not to transmit the normal response from 8526 when the received transmission of command is normal.
[Refer to the article 4.2.7 (P10) RESPONSE.]

[When the Response Setting is turned ON]

○ For the effective setting and operation command, 8526 certainly transmits ERROR=0 to the host.
  Example 3.1 In case of effective command START [CR][LF],
  Response is: ERROR=0 [CR][LF]
  Example 3.2 In case of effective command ATIMER=60.0s [CR][LF],
  Response is: ERROR=0 [CR][LF]
  The test time of AC withstanding voltage test is set to 60.0s.
○ For the ineffective setting and operation command, 8526 certainly transmits ERROR=code to the host.
  Example 3.3 In case of ineffective command RST [CR][LF] (incorrect spell of the test stop command)
  Response is: ERROR=[Error No][CR][LF]

[When the Response Setting is turned OFF]

○ 8526 does not transmit ERROR=0 to the effective setting and operation command.
  Example 3.4 In case of effective command START [CR][LF],
  No response is transmitted.
  Example 3.5 In case of effective command ATIMER=60.0s [CR][LF],
  No response is transmitted.
○ For the ineffective setting and operation command, 8526 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, 8526 transacts it as read-out command. To the read-out command, 8526 adds "=parameter" to the command letters and transmits it to the host.

Command from the host side : Command letters?
Response from 8526 to the host : Command letters=parameter
In case of error, 8526 transmits the error code to the host.
Refer to the **article 5 (P30) Error** .

Example 3.6 Command : DLOW?[LF] …… Reads out the low limit of leak current of DC withstanding voltage test.
Response is : DLOW=5.0mA [CR][LF]

## 3.3 ●Basic format of setting and operation

○ When the "=" is added to the letters of setting command from the host side, 8526 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

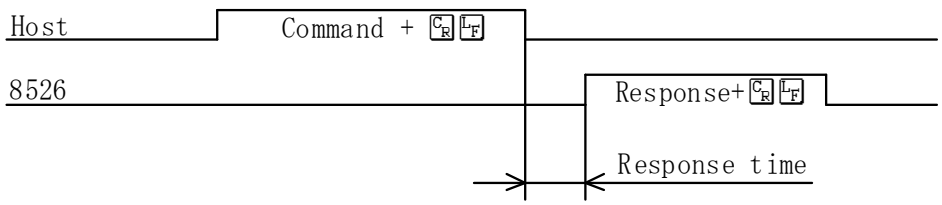
Example 3.7 In case of setting command
Effective command : MODE=AC [CR][LF] …… Test mode is set to AC withstanding voltage mode.
Response : ERROR=0 [CR][LF] …… When Response Setting is ON.
Response : No response …… When Response Setting is OFF.
In case of error, the error code is transmitted to the host.

Example 3.8 In case of operation command
Effective command : START [CR][LF] …… Starts the test.
Response : ERROR=0 [CR][LF] …… 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) | Explanation page |
|---|---|---|---|---|
| ON/OFF selection of remote control | | REMOTE=/REMOTE? | 23/19 | 7 |
| Keylock | | KEYLOCK=/KEYLOCK? | 27/23 | 8 |
| ON/OFF selection to suffix command name and unit to the transmission to the host | | FORMAT=/FORMAT? | 27/23 | 9 |
| ON/OFF selection of response | | RESPONSE=/RESPONSE? | 32/24 | 10 |
| Test mode | | MODE=/MODE? | 17/15 | 11 |
| Start of test | | START | 10～15 | 12 |
| Stop of test and judgement reset | | RESET | 10～15 | 12 |
| Read-out of status | | STATUS? | 5～13 | 13 |
| Read-out of tester identification | | IDNT? | 12 | 14 |
| AC Withstanding voltage test | Test voltage range | AVOLT=/AVOLT? | 19/15 | 14 |
| | Referential voltage | ALEVEL=/ALEVEL? | 28/16 | 15 |
| | High limit of leak current | AHIGH=/AHIGH? | 25/16 | 16 |
| | Low limit of leak current | ALOW=/ALOW? | 32/15 | 17 |
| | Test time | ATIMER=/ATIMER? | 29/26 | 18 |
| DC Withstanding voltage test | Test voltage range | DVOLT=/DVOLT? | 19/15 | 19 |
| | Referential voltage | DLEVEL=/DLEVEL? | 28/16 | 20 |
| | High limit of leak current | DHIGH=/DHIGH? | 25/16 | 21 |
| | Low limit of leak current | DLOW=/DLOW? | 32/15 | 22 |
| | Test time | DTIMER=/DTIMER? | 29/26 | 23 |
| Read-out of judgement result | | JUDGE? | 20 | 24 |
| Read-out in the lump of test result and data | | DATA? | 16 | 25 |
| Parameter of test condition | | SET:/SET:? | 340/30 | 26 |
| Change-over of memory No. | | MEMORY=/MEMORY? | 32/14 | 27 |
| Parameter of test condition including memory No. □:1~9 | | MEM□:/MEM□:? | 420/20 | 28 |
| Buzzer sound volume | | BUZZ=/BUZZ? | 23/15 | 29 |




**Note**: 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 8526.

## 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 CR LF ……... Makes the remote control setting ON.

REMOTE=OFF CR LF ……. Makes the remote control setting OFF.

Response — When 8526 received the effective command setting.

ERROR=0 CR LF ……. 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? CR LF

Response

REMOTE=ON CR LF ..……... When the remote control setting ON is read out.

REMOTE=OFF CR LF ..…….. When the remote control setting OFF is read out.

### 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 ⑱ (KEYLOCK lamp lit up).

Structure — KEYLOCK=ON/OFF

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

Transmission

KEYLOCK=ON [CR][LF] ..... Makes the keylock setting ON.

KEYLOCK=OFF [CR][LF] ..... Makes the keylock setting OFF.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. 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?[CR][LF]

Response

KEYLOCK=ON [CR][LF] ……... When the keylock setting ON is read out.

KEYLOCK=OFF [CR][LF] …….. When the keylock setting OFF is read out.

**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 [CR][LF], 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 [CR][LF] …….. Adds command name and unit to the response.

FORMAT=OFF [CR][LF] ..…… Does not adds command name and unit to the response.

Response　When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. 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?[CR][LF]

Response

FORMAT=ON [CR][LF] ..……... Setting of response format is ON.

FORMAT=OFF [CR][LF] ..…….. Setting of response format 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 8526 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 — RESPONSE=[ON/OFF]

[ON/OFF] : Always transmits the response with "ON".
When 8526 receives the effective command, it transmits ERROR=0 to the host.
For the ineffective command, it transmits ERROR=[No].
When 8526 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 5 Error.

Transmission

RESPONSE=ON [CR][LF] …….. Makes the response setting ON.

RESPONSE=OFF [CR][LF] ……. Makes the response setting OFF.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response ……..... When the Response Setting is OFF.

### 4.2.8 RESPONSE? (read-out of setting of response)

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

Structure — RESPONSE?

Transmission

RESPONSE?[CR][LF]

Response

RESPONSE=ON [CR][LF] …….. Setting of response is ON.

RESPONSE=OFF [CR][LF] ..…. Setting of response is OFF.

### 4.2.9 MODE= (setting of test mode)

Function　Makes the setting of test mode.

Structure　MODE=Parameter

Parameter
AC : AC withstanding voltage test mode.
DC : DC withstanding voltage test mode.

Transmission

MODE=AC CR LF …… Test mode is set to AC withstanding voltage test mode.

MODE=DC CR LF …… Test mode is set to DC withstanding voltage test mode.

Response　When 8526 received the effective command setting.

ERROR=0 CR LF …… 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? CR LF

Response

MODE=AC CR LF …… When the test mode setting is AC withstanding voltage test.

MODE=DC CR LF …… When the test mode setting is DC withstanding voltage test.

### 4.2.11 START (start of test)

Function — Starts the test.

**Note**: When the setting on 8526 main unit side of the special test mode - GOOD hold function is 2, re-start with START command is also possible.

Structure — START

Transmission

START [CR][LF]

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. 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 reset.

Structure — RESET

Transmission

RESET [CR][LF]

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. 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 8526.
It corresponds to the open collector output of REMOTE/OUT connector ⑱ (refer to the instruction manual of 8526 main unit).
**Note**: It has no relation with the relay output of STATUS OUT terminal on the rear of 8526 under **Setting of condition for status output** (refer to P34 of instruction manual of the tester main unit).

Structure

STATUS?

Transmission

STATUS?CR LF

Response

STATUS=□□□□CR LF

□: Numeral in 4 digits (Hexadecimal notation)

[Example]

STATUS=0015 CR LF ……... In test.
TEST/HVOUT, TEST, AC-TEST are being output.
STATUS=0042 CR LF ……... At the finish of test.
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 |
| AC-TEST | In the course of AC withstanding voltage test. | 0010 |
| DC-TEST | In the course of DC withstanding voltage test. | 0020 |
| GOOD | Total judgement passed. | 0040 |
| NG | Total judgement failed. | 0080 |
| HIGH | Withstanding voltage test failed for high limit of leak current. | 0100 |
| LOW | Withstanding voltage test failed for low limit of leak current. | 0200 |
| PROTECTION | Protective circuit is activated. **Note-1** | 4000 |

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

### 4.2.14 IDNT? (read-out of tester identification)

Function　Reads out the model name, software version of the tester.

Structure　IDNT?

Transmission

IDNT?CR LF

Response　When 8526 received the effective command setting.

IDNT=TSURUGA_8526_ROM-NO.456_Ver.1.00.00 CR LF
①　②

①Model name
②Software version
(For improvement of quality, the software version might have been updated.)

### 4.2.15 AVOLT= (setting of test voltage range of AC withstanding voltage test)

Function　Makes the setting of test voltage range of AC withstanding voltage test.

Structure　AVOLT=Test voltage range

Test voltage range　2.5kV or 5.0kV is to be set

Transmission

AVOLT=5.0kV CR LF …….. Sets the range of AC withstanding voltage test at 5.0kV.

Response　When 8526 received the effective command setting.

ERROR=0 CR LF ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.16 AVOLT? (read-out of test voltage range of AC withstanding voltage test)

Function　Reads out the test voltage range of AC withstanding voltage test.

Structure　AVOLT?

Transmission

AVOLT?CR LF

Response

AVOLT=2.5kV CR LF …….. Indicates the test voltage range of AC withstanding voltage test 2.5kV.

### 4.2.17 ALEVEL= (setting of referential voltage of AC withstanding voltage test)

Function — Makes the setting of referential voltage of ACwithstanding voltage test.

Structure — ALEVEL=[Referential voltage]

[Referential voltage] OFF or 0.00~5.00kV is to be set.

Transmission

ALEVEL=1.50kV [CR][LF] ….. Sets the referential voltage of AC withstanding voltage test at 1.50kV.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.18 ALEVEL? (read-out of referential voltage of AC withstanding voltage test)

Function — Reads out the referential voltage of AC withstanding voltage test.

Structure — ALEVEL?

Transmission

ALEVEL?[CR][LF]

Response

ALEVEL=1.50kV [CR][LF] ….. Indicates the referential voltage of AC withstanding voltage test 1.50kV.

### 4.2.19 AHIGH= (setting of high limit of leak current of AC withstanding voltage test )

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

Structure — AHIGH=[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

AHIGH=10.0mA CR LF ..... Sets the high limit of leak current of AC withstanding voltage test at 10.0mA.

Response — When 8526 received the effective command setting.

ERROR=0 CR LF ..... When the Response Setting is ON.

No response ..... When the Response Setting is OFF.

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

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

Structure — AHIGH?

Transmission

AHIGH? CR LF

Response

AHIGH=10.0mA CR LF ..... Indicates the high limit of leak current of ACwithstanding voltage test 10.0mA.

### 4.2.21 ALOW= (setting of low limit of leak current of AC withstanding voltage test)

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

Structure — ALOW=[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

ALOW=2.0mA [CR][LF] …….. Sets the low limit of leak current of AC withstanding voltage test at 2.0mA.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response ……..….. When the Response Setting is OFF.

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

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

Structure — ALOW?

Transmission

ALOW?[CR][LF]

Response

ALOW=2.0mA [CR][LF] …….. Indicates the low limit of leak current of AC withstanding voltage test 2.0mA.

### 4.2.23 ATIMER= (setting of test time of AC withstanding voltage test)

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

Structure — ATIMER=[Test time]

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

Transmission

ATIMER=60.0s CR LF …….. Sets the test time of AC withstanding voltage test at 60.0sec.

Response — When 8526 received the effective command setting.

ERROR=0 CR LF ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.24 ATIMER? (read-out of test time of AC withstanding voltage test)

Function — Reads out the test time of AC withstanding voltage test.

Structure — ATIMER?

Transmission

ATIMER? CR LF

Response

ATIMER=10.0s CR LF …….. Indicates the test time of AC withstanding voltage test 10.0sec.

### 4.2.25 DVOLT= (setting of test voltage range of DC withstanding voltage test)

Function — Makes the setting of test voltage range of DC withstanding voltage test.

Structure — DVOLT=[Test voltage range]

[Test voltage range] 2.5kV or 5.0kV is to be set.

Transmission

DVOLT=5.0kV [CR][LF] …….. Sets the range of DC withstanding voltage test at 5.0kV.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.26 DVOLT? (read-out of test voltage range of DC withstanding voltage test)

Function — Reads out the test voltage range of DC withstanding voltage test.

Structure — DVOLT?

Transmission

DVOLT?[CR][LF]

Response

DVOLT=2.5kV [CR][LF] …….. Indicates the test voltage range of DC withstanding voltage test 2.5kV.

### 4.2.27 DLEVEL= (setting of referential voltage of DC withstanding voltage test)

Function — Makes the setting of referential voltage of DCwithstanding voltage test.

Structure — DLEVEL=[Referential voltage]

[Referential voltage] OFF or 0.00~5.00kV is to be set.

Transmission

DLEVEL=1.50kV [CR][LF] ….. Sets the referential voltage of DC withstanding voltage test at 1.50kV.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.28 DLEVEL? (read-out of referential voltage of DC withstanding voltage test)

Function — Reads out the referential voltage of DC withstanding voltage test.

Structure — DLEVEL?

Transmission

DLEVEL?[CR][LF]

Response

DLEVEL=1.50kV [CR][LF] ….. Indicates the referential voltage of DC withstanding voltage test 1.50kV.

### 4.2.29 DHIGH= (setting of high limit of leak current of DC withstanding voltage test )

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

Structure — DHIGH=[High leak current]

[High leak current] 0.1~11.0mA is to be set.

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

Transmission

DHIGH=10.0mA CR LF ….. Sets the high limit of leak current of DC withstanding voltage test at 10.0mA.

Response — When 8526 received the effective command setting.

ERROR=0 CR LF ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.30 DHIGH? (read-out of high limit value of leak current of DC withstanding voltage test)

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

Structure — DHIGH?

Transmission

DHIGH? CR LF

Response

DHIGH=10.0mA CR LF …… Indicates the high limit of leak current of DCwithstanding voltage test 10.0mA.

### 4.2.31 DLOW= (setting of low limit of leak current of DC withstanding voltage test)

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

Structure — DLOW=[Low leak current]

[Low leak current] OFF or 0.0~10.9mA is to be set.

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

Transmission

DLOW=2.0mA [CR][LF] …….. Sets the low limit of leak current of DC withstanding voltage test at 2.0mA.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.32 DLOW? (read-out of low limit value of leak current of DC withstanding voltage test)

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

Structure — DLOW?

Transmission

DLOW?[CR][LF]

Response

DLOW=2.0mA [CR][LF] …….. Indicates the low limit of leak current of DC withstanding voltage test 2.0mA.

### 4.2.33 DTIMER= (setting of test time of DC withstanding voltage test)

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

Structure — DTIMER=[Test time]

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

Transmission

DTIMER=60.0s [CR][LF] …….. Sets the test time of DC withstanding voltage test at 60.0sec.

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.34 DTIMER? (read-out of test time of DC withstanding voltage test)

Function — Reads out the test time of DC withstanding voltage test.

Structure — DTIMER?

Transmission

DTIMER?[CR][LF]

Response

DTIMER=10.0s [CR][LF] …….. Indicates the test time of DC withstanding voltage test 10.0sec.

### 4.2.35 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?CR LF

Response

| Type of judgement | Parameter | Content |
|---|---|---|
| Total judgement<br>JUDGE=□<br>□: Parameter | GOOD | Passed. |
| | NG | Failed. |
| | NULL | When the test is stopped by RESET command (STOP switch). |
| | PROTECT | Protective circuit is activated (PROTECTION) during the test. |
| Test mode<br>AJUDGE=□<br>DJUDGE=□<br>□: 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 | Protective circuit is activated (PROTECTION) during the test. |

Response exampl

At the signal AC withstanding voltage test

| | |
|---|---|
| When the judgement result is GOOD | JUDGE=GOOD, AJUDGE=GOOD CR LF |
| When the judgement result is HIGH | JUDGE=NG, AJUDGE=HIGH CR LF |
| When the judgement result if LOW | JUDGE=NG, AJUDGE=LOW CR LF |
| At stop | JUDGE=NULL, AJUDGE=NULL CR LF |
| When the protection occurred | JUDGE=PROTECT, AJUDGE=HIGH LOW CR LF |

At the signal DC withstanding voltage test

| | |
|---|---|
| When the judgement result is GOOD | JUDGE=GOOD, DJUDGE=GOOD CR LF |
| When the judgement result is HIGH | JUDGE=NG, DJUDGE=HIGH CR LF |
| When the judgement result if LOW | JUDGE=NG, DJUDGE=LOW CR LF |
| At stop | JUDGE=NULL, DJUDGE=NULL CR LF |
| When the protection occurred | JUDGE=PROTECT, DJUDGE=HIGH LOW CR LF |

### 4.2.36 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?CR LF

Response

[Example of response after the finish of single AC withstanding voltage test]

| Judgement result and action during the test | Response |
|---|---|
| AC W test passed | JUDGE=GOOD, AJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA CR LF |
| AC W test failed for HIGH | JUDGE=NG, AJUDGE=HIGH, VOLT=1.51kV, CURRENT=32.1mA CR LF |
| AC W test failed for LOW | JUDGE=NG, AJUDGE=LOW, VOLT=1.51kV, CURRENT=0.15mA CR LF |
| At RESET (Stop) **Note-1** | JUDGE=NULL, AJUDGE=NULL, VOLT=0.00kV, CURRENT=0.0mA CR LF |
| At occurrence of PROTECT **Note-2** | JUDGE=PROTECT, AJUDGE=HIGH LOW, VOLT=1.50kV, CURRENT=1.23mA CR LF |

[Example of response after the finish of single DC withstanding voltage test]

| Judgement result and action during the test | Response |
|---|---|
| DC W test passed | JUDGE=GOOD, DJUDGE=GOOD, VOLT=1.51kV, CURRENT=1.23mA CR LF |
| DC W test failed for HIGH | JUDGE=NG, DJUDGE=HIGH, VOLT=1.51kV, CURRENT=10.0mA CR LF |
| DC W test failed for LOW | JUDGE=NG, DJUDGE=LOW, VOLT=1.51kV, CURRENT=0.15mA CR LF |
| At RESET (Stop) **Note-1** | JUDGE=NULL, DJUDGE=NULL, VOLT=0.00kV, CURRENT=0.0mA CR LF |
| At occurrence of PROTECT **Note-2** | JUDGE=PROTECT, DJUDGE=HIGH LOW, VOLT=1.50kV, CURRENT=1.23mA CR LF |

**Note-1**: Data is 0.
**Note-2**: Responses with the data at the occurrence of PROTECT.
For the test which could not be performed, the data is 0.

### 4.2.37 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]

●In the AC withstanding voltage test.

MODE=AC
AVOLT=
ALEVEL=
AHIGH=
ALOW=
ATIMER=

For detail, refer to the articles 4.2.15 (P14), 4.2.17 (P15), 4.2.19 (P16), 4.2.21 (P17) and 4.2.23 (P18).

●In the DC withstanding voltage test.

MODE=DC
DVOLT=
DLEVEL=
DHIGH=
DLOW=
DTIMER=

For detail, refer to the articles 4.2.25 (P19), 4.2.27 (P20), 4.2.29 (P21), 4.2.31 (P22) and 4.2.33 (P23).

Transmission

In the AC withstanding voltage test mode.

SET:MODE=AC, AVOLT=2.5kV, ALEVEL=2.00kV, AHIGH=10.0mA, ALOW=5.0mA, ATIMER=60.0s [CR][LF]

In the DC withstanding voltage test mode.

SET:MODE=DC, DVOLT=2.5kV, DLEVEL=2.00kV, DHIGH=10.0mA, DLOW=5.0mA, DTIMER=60.0s [CR][LF]

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] …….…… When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.38 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:?[CR][LF]

Response

In the AC withstanding voltage test mode.

○When FORMAT=ON
SET:MODE=AC, AVOLT=2.5kV, ALEVEL=1.50kV, AHIGH=20.0mA, ALOW=OFF, ATIMER=60.0s [CR][LF]

○When FORMAT=OFF
SET:AC, 2.5, 1.50, 20.0, OFF, 60.0 [CR][LF]

In the DC withstanding voltage test mode.

○When FORMAT=ON
SET:MODE=DC, DVOLT=2.5kV, DLEVEL=1.50kV, DHIGH=10.0mA, DLOW=OFF, DTIMER=60.0s [CR][LF]

○When FORMAT=OFF
SET:DC, 2.5, 1.50, 10.0, OFF, 60.0 [CR][LF]

### 4.2.39 MEMORY= (setting of memory number)

Function　Changes over to the test condition of designated memory No.

Structure　MEMORY=□

□ : 1~9

Transmission

MEMORY=5 [CR][LF] ……..... Changes the current test condition over to memory No.5.

Response　When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……..…… When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.40 MEMORY? (read-out of memory number)

Function　Reads out the memory number currently selected.

Structure　MEMORY?

Transmission

MEMORY?[CR][LF]

Response

MEMORY=8 [CR][LF] ..……..... When the memory No.8 is read out.

MEMORY=OFF [CR][LF] ……..... When the condition that no memory is selected is read out.

### 4.2.41 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 4.2.37 (P26) SET: (setting of parameters of test condition)**

Transmission

In the AC withstanding voltage test mode.

MEM5:MODE=AC,AVOLT=5.0kV,ALEVEL=1.00kV,AHIGH=100.0mA,ALOW=OFF,
ATIMER=60.0s [CR][LF]

In the DC withstanding voltage test mode.

MEM5:MODE=DC,DVOLT=5.0kV,DLEVEL=1.00kV,DHIGH=10.0mA,DLOW=OFF,
DTIMER=60.0s [CR][LF]

Response — When 8526 received the effective command setting.

ERROR=0 [CR][LF] ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

### 4.2.42 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:?

Transmission — No : 1~9

MEM3:?[CR][LF]

Response

In the AC withstanding voltage test mode.

○When FORMAT=ON

MEM3:MODE=AC,AVOLT=2.5kV,ALEVEL=1.50kV,AHIGH=20.0mA,ALOW=OFF,
ATIMER=60.0s [CR][LF]

○When FORMAT=OFF

MEM3:AC,2.5,1.50,20.0,OFF,60.0 [CR][LF]

In the DC withstanding voltage test mode.

○When FORMAT=ON

MEM3:MODE=DC,DVOLT=2.5kV,DLEVEL=1.50kV,DHIGH=10.0mA,DLOW=OFF,
DTIMER=60.0s [CR][LF]

○When FORMAT=OFF

MEM3:DC,2.5,1.50,10.0,OFF,60.0 [CR][LF]

### 4.2.43 BUZZ= (setting of buzzer sound)

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

Structure — BUZZ=[OFF/1～5]①,[OFF/1～5]②

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

Transmission

BUZZ=3, 5 CR LF — Buzzer sound volume at GOOD (judegment passed) is set to 3 among 5 levels and the sound level at NG (judgement failed) is set to maximum sound volume.

Response — When 8526 received the effective command setting.

ERROR=0 CR LF ……. When the Response Setting is ON.

No response …….. When the Response Setting is OFF.

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

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

Structure — BUZZ?

Transmission

BUZZ? CR LF

Response

BUZZ=OFF, 3 CR LF
① ②

①Buzzer sound volume at passed (GOOD) judgement
…….. Shows the sound is muted.

②Buzzer sound volume at failed (NG) judgement
…….. Shows level 3 among 5.

# 5. Error

| Error code | Content of error and solution |
|---|---|
| ERROR=1 | Command format is not recognizable. Erroneous letter.<br>Example: RESSET, RST<br>Correct the letters to RESET. |
| ERROR=2 | Parameter is out of effective range.<br>Example: ATIMER=9999<br>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.<br>Example: The command AVOLT=5.0kV etc. related to AC withstanding voltage test is transmitted in the DC withstanding voltage test mode.<br>Transmit the command suit to the test mode. |
| ERROR=4 | Operation is made in the course of initialization of 8526.<br>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.<br>Example: Before making the setting, read out such information TEST, PROTECTION, READY etc. of STATUS?<br>Transmit the setting command after confirming the READY status. |
| ERROR=6 | Ineffective operation is made when REMOTE=OFF.<br>START command becomes ineffective when REMOTE=OFF.<br>Do the operation after setting REMOTE=ON. |
| ERROR=7 | Structural error has occurred in the lump setting at SET: and MEM□:<br>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.<br>Example: Transmission of command is not allowed while the setting is made on the front panel.<br>Finish the setting and make READY lamp lit status. |

For the errors in the following table, please refer to the Article 18 Error message of the tester main unit.

| PROTECTION **status** | **Solution** |
|---|---|
| Err CHrG<br>Err SSr | ERROR=3 is always transmitted to the host when the command is transmitted.<br>It is the hardware problem. Inform us or the dealer whom you purchased. |
| Err LoCH | If the No.5 pin of REMOTE / OUT connector (INTER LOCK) is open, ERROR=3 is transmitted when the command is transmitted.<br>Making a short-circuit between the No.5 pin and COM, transmit RESET command or press STOP key. |
| Err rNrE<br>Err SrrI<br>Err E-11<br>Err HEAI<br>Err dANG | Transmit RESET command or press STOP key. |

# 6. 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.

# 7. Sample program

```
' ○Here is the sample program source for Microsoft Visual Basic of 8526 control.
'
'   1. When the form is loaded, setting of the communication of 8526 and the operational check
'      are done.
'   2. Click of the command1[AC SETTING] button makes a change of AC withstanding voltage
'      test condition, set value.
'
'      Content of the setting is as follows:
'
'            MODE    = AC
'            AVOLT   = 2.5kV
'            ALEVEL  = OFF
'            AHIGH   = 10.0mA
'            ALOW    = OFF
'            ATIMER  = 5.0s
'
'   3. Click of the command2[DC SETTING] button makes a change of DC withstanding voltage
'      test condition, set value.
'
'      Content of the setting is as follows:
'
'            MODE    = DC
'            DVOLT   = 5.0kV
'            DLEVEL  = OFF
'            DHIGH   = 5.0mA
'            DLOW    = OFF
'            DTIMER  = 2.0s
'
'   4. Click of command3[START] button starts the automatic test with the above set values.
'   5. The test can be stopped by the command4[STOP] button.
'   6. Sample program finishes with the command5[QUIT] button.
'   7. 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
'   Command5    :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 "kerne132" ( ) As Long

' Definition of enumeration form of 8526 status
Private Enum STB8526_ID
    sTEST = &H1             'Test in operation
    sTEST_END = &H2         'Test ends
    sH_V_OUT = &H4          'High voltage being output
    sREADY = &H8            'In waiting
    sA_TEST = &H10          'AC Withstanding voltage test in operation
    sD_TEST = &H20          'DC Withstanding voltage 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
    sPROTECTION = &H4000    'Protective circuit activated
End Enum


' Definition of enumeration form of error code
Private Enum EER8526_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       '8526 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

      . Handshaking = 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  'ASCI 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 sending and 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 EER8526_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 = "&AC SETTING"
    Command2. Caption = "&DC SETTING"
    Command3. Caption = "&START"
    Command4. Caption = "&STOP"
    Command5. Caption = "&QUIT"

End Sub
```

```
'Perform when form is active
Private Sub Form_Activate ( )
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:

   '8526 Response ON
   If SendComm ("RESPONSE=ON", szBuf) = False Then GoTo Err_Form_Activate:
   If ErrorHandler (szBuf) = False Then GoTo Err_Form_Activate:

   '8526 Remote control ON
   If SendComm ("REMOTE=ON", szBuf) = False Then GoTo Err_Form_Activate:
   If ErrorHandler (szBuf) = False Then GoTo Err_Form_Activate:

   '8526 Response format OFF
   If SendComm ("FORMAT=OFF", szBuf) = False Then GoTo Err_Form_Activate:
   If ErrorHandler (szBuf) = False Then GoTo Err_Form_Activate:

   '8526 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 = True
   Command3. Enabled = False
   Command4. Enabled = False
Exit_Form_Activate:
   Exit Sub

Err_Form_Activate:
   Command1. Enabled = False
   Command2. Enabled = False
   Command3. Enabled = False
   Command4. Enabled = False
   Exit Sub
End Sub
```

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

    If Not Command5. Enabled Then
       Cancel = True
       Exit Sub
    End If

    'Reset 8526 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 Command3_Click ( )
Dim szBuf As String, nSTB As STB8526_ID

    StopFlag = False
    Command1. Enabled = False
    Command2. Enabled = False
    Command3. Enabled = False
    Command4. Enabled = True
    Command5. Enabled = False

    'Confirm status before start
    If SendComm ("STATUS?", szBuf) = False Then GoTo Exit_Command3_Click:
    If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:

    szBuf = "&H" & szBuf
    If IsNumeric (szBuf) = False Then GoTo Exit_Command3_Click:
    nSTB = CLng (szBuf)
    If (nSTB And sREADY) = 0 Then
       MsgBox "Can not START.", vbCritical
       GoTo Exit_Command3_Click:
    End If

    'RESET command
    If SendComm ("RESET", szBuf) = False Then GoTo Exit_Command3_Click:
    If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:

    'START command
    If SendComm ("START", szBuf) = False Then GoTo Exit_Command3_Click:
    If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:

    Do

       DoEvents

       sWait 0.5                            'weight of 500msec.
```

```
        'STOP button is pressed
        If StopFlag Then
                If SendComm ("RESET", szBuf) = False Then GoTo Exit_Command3_Click:
                If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:
                GoTo Exit_Command3_Click:
        End If

        'Status confirmation during test
        If SendComm ("STATUS?", szBuf) = False Then GoTo Exit_Command3_Click:
        If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:

        nSTB = CLng ("&H" & szBuf)

        'Protective action exists
        If nSTB And sPROTECTION Then
                ShowLog "STATUS", "PROTECTION"
                GoTo Exit_Command3_Click:

        End If

        If nSTB And sD_TEST Then Debug. Print "D_TESTING"
        If nSTB And sA_TEST Then Debug. Print "A_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_Command3_Click:
    If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_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_Command3_Click:
    If ErrorHandler(szBuf) = False Then GoTo Exit_Command3_Click:
    '※Received letters are log displayed to text box.

    'Do reset
    If SendComm ("RESET", szBuf) = False Then GoTo Exit_Command3_Click:
    If ErrorHandler (szBuf) = False Then GoTo Exit_Command3_Click:

Exit_Command3_Click:
    StopFlag = False
    Command1. Enabled = True
    Command2. Enabled = True
    Command3. Enabled = True
    Command4. Enabled = False
    Command5. Enabled = True
    Exit Sub
End Sub

Private Sub Command4_Click ( )
    StopFlag = True
End Sub
```

```
'Initial setting of 8526  [AC withstanding voltage test]
Private Sub Command1_Click ( )
Dim szBuf As String, nSTB As STB8526_ID
Dim Sets As String

   Command1. Enabled = False
   Command2. Enabled = False
   Command3. Enabled = False
   Command4. Enabled = False

   'STATUS? 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=AC"
   Sets = Sets & "," & "AVOLT=2.5kV"
   Sets = Sets & "," & "ALEVEL=OFF"
   Sets = Sets & "," & "AHIGH=10.0mA"
   Sets = Sets & "," & "ALOW=OFF"
   Sets = Sets & "," & "ATIMER=5.0s"

   '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:

   Command3. Enabled = True
   Command4. Enabled = True

Exit_Command1_Click:
   Command1. Enabled = True
   Command2. Enabled = True
   Exit Sub

End Sub
```

```
'Initial setting of 8526  [DC withstanding voltage test]
Private Sub Command2_Click ( )
Dim szBuf As String, nSTB As STB8526_ID
Dim Sets As String

   Command1. Enabled = False
   Command2. Enabled = False
   Command3. Enabled = False
   Command4. Enabled = False

   'STATUS? command transmission
   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 "It is not the condition which can be setup.", vbCritical
      GoTo Exit_Command2_Click:
   End If

   'Construction of SET: command
   Sets = "SET:" & "MODE=AC"
   Sets = Sets & "," & "DVOLT=5.0kV"
   Sets = Sets & "," & "DLEVEL=OFF"
   Sets = Sets & "," & "DHIGH=5.0mA"
   Sets = Sets & "," & "DLOW=OFF"
   Sets = Sets & "," & "DTIMER=2.0s"

   'SET: command transmission
   If SendComm (Sets, szBuf) = False Then GoTo Exit_Command2_Click:
   If ErrorHandler (szBuf) = False Then GoTo Exit_Command2_Click:

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

   Command3. Enabled = True
   Command4. Enabled = True

Exit_Command2_Click:
   Command1. Enabled = True
   Command2. Enabled = True
   Exit Sub

End Sub

'Finish button
Private Sub Command5_Click ( )
   Unload Me
End Sub
```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