

INSTRUCTION MANUAL

High Voltage Test Probe

Model HP01-TOS

Model HP02-TOS

First Edition

Warnings against High Voltage!

- *This instrument delivers dangerous high voltages.*
- *Any incorrect handling may cause death.*
- *Read Section 3 "WARNINGS" in this manual and W/I Tester to be used in conjunction.*
- *This manual should be placed within the reach of the operator so that he may read it whenever necessary.*

KIKUSUI ELECTRONICS CORPORATION

(KIKUSUI PART No. Z1-000-152)

M-91080

- To supervisor in charge of operation -

- (1) *The probe involves unavoidable danger of electrification.
Provide full protective measures to prevent electric shock hazards. Strictly observe the safety instructions given in Section 3.1 "Safety Requirements of Test Conditions and Environments."*
- (2) *If the operator does not read the language used in this manual, translate the manual into appropriate language.*
- (3) *Help the operator in understanding this manual before operation.*
- (4) *Keep this manual near the tester for easy access of the operator.*

- For your own safety (How to avoid electrification) -

(1) Never touch the following area, or else, you will be electrified, and run the risk of death.

- Never touch the contact pin of the probe.*
- Never touch the device under test.*

(2) To minimize the possibility of death, observe the following instructions:

- Never perform test in such attitude that you are leaning against the test bench with your elbow or other parts.*
- Never fix the probe grip to the slide bar by binding them together to let the contact pin exposed constantly.*
- Keep the probe cables in a state free from entanglement.
Do not let them hung on you.*
- Never generate the test voltage unnecessarily. Generate it only for the required minimum.*

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1. GENERAL

Model HP01-TOS High Voltage Test Probe has been designed as a handy probe to be used in conjunction with a TOS Series W/I Tester (Model TOS****) or with a Model 871 W/I Tester. The probe allows to rapidly accomplish test of devices which require only a shorter test voltage application duration, as the test can be done without requiring to make wiring to each DUT (device under test) and as the probe is designed handy and is convenient for handling.

However, since the probe deals with a hazardously high voltage, it must be handled extremely carefully. Although the probe has been designed so that the high voltage is automatically cut off as you release your finger from the probe, never operate the probe carelessly.

2. SPECIFICATIONS

- Rated Maximum Voltage*:
4 kV AC rms, 50/60 Hz;
5 kV DC
- Cable Length:
HP01-TOS Approx. 1.8 m (70.9 in)
HP02-TOS Approx. 3.5 m (137.8 in)
- Ambient Conditions
- Operable Temperature and Humidity: 0 to 40°C (32 to 104°F), 20 to 80 RH %
- Storage Temperature and Humidity: -20 to 70°C (-4 to 158°F), up to 80% RH

* : The term "Rated Maximum Voltage" means a limit voltage that, up to this voltage, a test operation can be normally done in the ambient conditions mentioned here. It is dangerous to use the probe with a voltage higher than the rated maximum voltage. Never apply any voltage higher than this limit to the probe.

Note: The current which flows through the stray capacitance of the high voltage cable of the probe can cause an inaccuracy of measurement. The higher the test voltage or the higher the measuring sensitivity, the larger is the inaccuracy. Due to this, when a test is done with a high measuring sensitivity, the stray current may become larger than the preset lower limit current for PASS/FAIL decision and the lower-limit PASS/FAIL decisions on the tested objects may become meaningless.

The specifications are subject to change without notice.

3. WARNINGS

The probe handles a dangerously high voltage which can cause electric shock hazards leading to death unless the probe is handled correctly.

Handle the probe extremely carefully.

Be sure to observe the instructions given below.

(For the names and functions of the components of the probe, refer to Section 4 "DESCRIPTION OF COMPONENTS.")

3.1 Safety Requirements of Test Conditions and Environments

The probe is a handy instrument which has been designed for a higher test efficiency. The handy instrument, on the other hand, involves danger of electrification due to the following reasons:

- Wearing of rubber gloves for electrical job is inconvenient for handling of the probe.
- The operator is required to get near the High Voltage Area as DUT, etc.

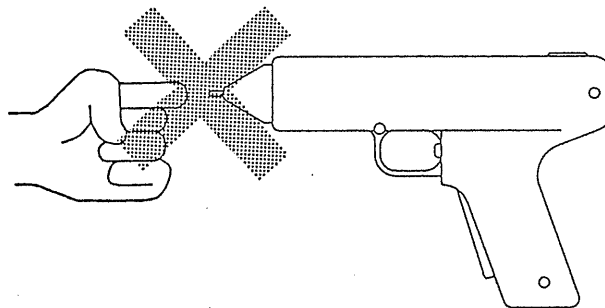
In order to prevent electrification, be sure to provide the following protections:

- Insulate the DUT and High Voltage Area with an electrical insulation rubber plate or sheet. Provide protective means to prevent contacting of the operator with High Voltage Area.
- Provide a protector or other means so that no persons other than the authorized operators can get into the test area.

3.2 Warnings and Cautions

(1) – Never touch the charged parts. –

- The high test voltage is delivered to the contact pin ⑥. Never touch the contact pin ⑥ in any case.
- When in test, the DUT also is charged up to the high test voltage. Never touch the charged parts of the High Voltage Area.



- Do not expose the contact pin except when it is necessary for test.
 - The red area ⑦ of the probe is a dangerous area. Never touch the red area ⑦.
- (2) – Never modify the probe. –
- Never fix the grip ② to the slide bar ③ by binding them together to let the contact pin ⑥ exposed constantly. This modification can cause electrification.
 - Do not jumper or otherwise modify the test switch 1 ④ and/or test switch 2 ⑤ into a state that they are constantly held in the ON state. This modification of the switch circuit can cause electrification.
- (3) – Never operate the probe with a single hand. –
- To operate the probe, use your both hands. [For the test procedure, see Section 6.] Never operate the probe with a single hand.
- (4) – Be sure to correctly connect the connectors. –
- Be sure to connect the remote control plug ⑫ (DIN type). Electrification will occur if you attempt to operate the probe without connecting the plug. Operate the probe after confirmation on connecting the remote control plug ⑫ (DIN type).
 - Connect the high voltage plug ⑩ of the probe to the high voltage output terminal of the W/I Tester simply by insertion — do not connect them by fastening. The connection must be in such state that the former is disconnected from the latter when a certain pull force is applied to the former.
- The reason for this is as follows: The high voltage cable ⑨ is designed shorter than the remote control cable ⑪ (DIN type) in order that the former is disconnected sooner than the latter from the W/I Tester should such accident occur that the cables are caught by any object and pulled.
- (5) – Never use the probe with unapplicable instruments. –
- The probe has been designed specifically for use as an optional accessory of TOS Series W/I Tester (Model TOS****) or Model 871 W/I Tester. Do not attempt to use the probe with other models of instruments of Kikusui or other manufacturers even though the connectors may mate.
- (6) – Never use the probe at a voltage higher than 4 kV AC rms. (5 kV DC) –
- The rated maximum working voltage of the probe is 4 kV AC rms. (5 kV DC). Never use the probe for voltages higher than 4 kV AC rms. (5 kV DC). Electrification may result if the probe is used at a voltage higher than 4 kV AC rms. (5 kV DC).

(7) — Never apply the test voltage in a wrong procedure. —

- The correct procedure of applying the test voltage to the DUT (device under test) is as follows:
 - (a) Apply the contact pin ⑥ of the probe to the DUT.
 - (b) Turn on the test switch 1 ④ of the probe.
 - (c) Turn on the test switch 2 ⑤ of the probe.

Be sure to apply the test voltage in the above procedure.

A wrong procedure involves a danger of electrification.

Application of the contact pin ⑥ in the state that the high test voltage is already delivered to it involves a possibility of damaging the DUT.

(8) — Never cut off the test voltage in a wrong procedure. —

- The correct procedure of cutting off the test voltage from the DUT is as follows:
 - (a) Turn off the test switch 1 ④ of the probe.
 - (b) Wait until the H.V ON lamp ⑧ goes out (indicating that the test voltage has been cut off from the contact pin).
Then, detach the contact pin ⑥ of the test probe from the DUT.
Release the grip ② to retract the pin into the main body ① of the probe.
 - (c) Turn off the test switch 2 ⑤ of the probe.

Be sure to cut off the test voltage in the above procedure.

A wrong procedure involves a danger of electrification.

Detaching of the contact pin ⑥ from the DUT in the state that the test voltage is still delivered to the contact pin involves a possibility of damaging the DUT.

(9) — Never perform test heedlessly or negligently. —

- Handle the probe attentively. Do not swing it around.
- Handle the probe cables cautiously. Do not jerk them.
- Keep the probe cables in a state free from entanglement.
Do not let them hung on you.
- Be sure to read the instruction manual for the W/I Tester, especially carefully the chapters related to “WARNINGS” and “Remote control.”
Do not neglect the instructions given there.

3.3 Routine Maintenance Inspection

For the sake of probe operation safety, inspect and confirm the following items routinely (before starting the day's work).

- Check that the probe cables do not indicate any signs of breakage, loose connectors, or other failures.
- Check that the grip ② and the slide bar ③ move smoothly.
- Check that the test switches 1 ④ and 2 ⑤ act smoothly as they are pressed.
- Check that the contact pin ⑥ does not indicate any signs of damage.
- Check that the warning label posted in the main body of the probe has not become illegible or not been peeled off.
- Check that the W/I Tester used in conjunction operates normally.

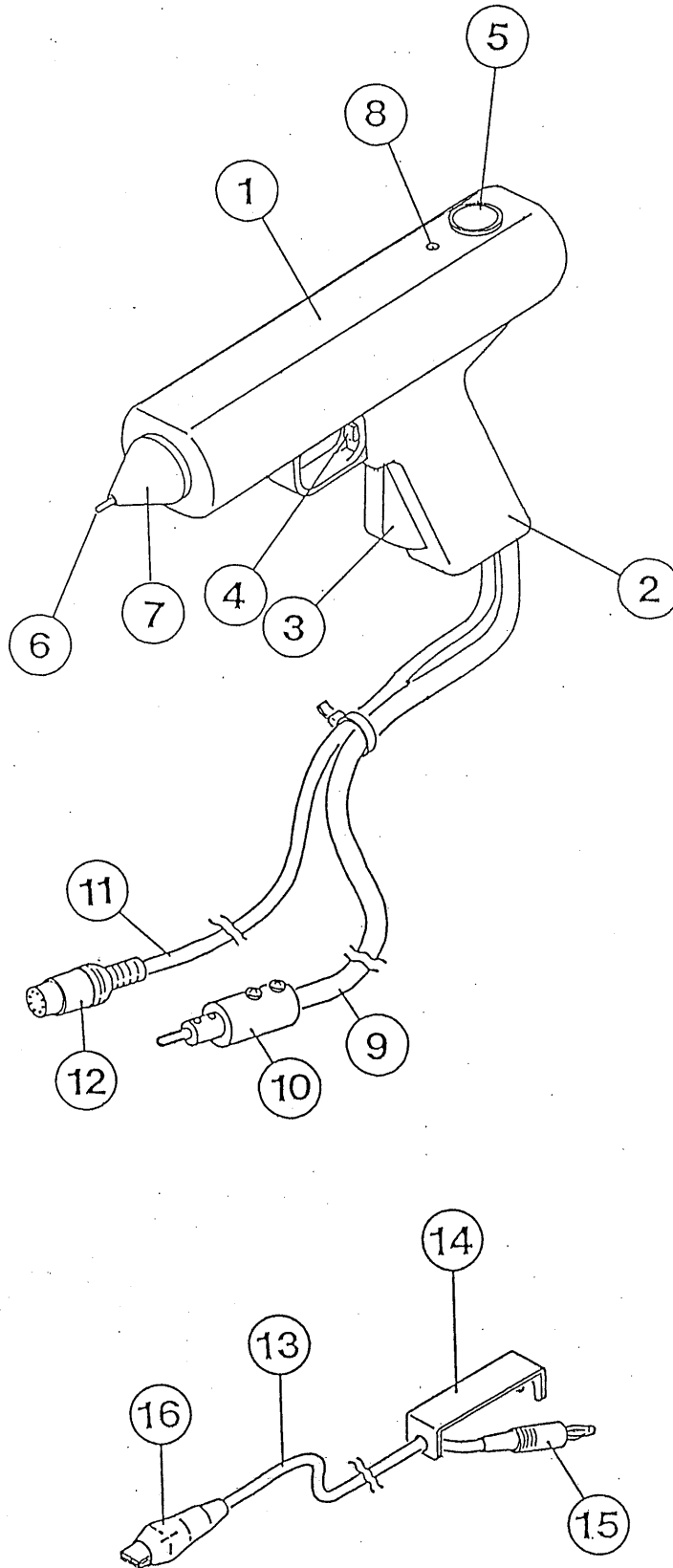
When any abnormality or failure is found, immediately stop using the probe and order your Kikusui agent for repair. Do not attempt to repair the probe for yourself.

3.4 Failures and Repair

When any abnormality or failure is found, immediately stop using the probe and order your Kikusui agent for repair. Do not attempt to repair the probe for yourself.

- The H.V ON lamp ⑧ of the probe does not light at all.
- Lighting of the H.V ON lamp ⑧ of the probe does not conform with that of the TEST ON lamp or H.V ON lamp of the W/I Tester.
- The H.V ON lamp ⑧ remains lighted beyond a certain period after the test switch 1 ④ or 2 ⑤ is turned off.
- The H.V ON lamp ⑧ remains lighted beyond a certain period after the contact pin ⑥ is retracted into the main body ①.

4. DESCRIPTION OF COMPONENTS



① Main Body

The main body of the probe. To carry the probe, hold it by the main body.

② Grip

The grip to hold the probe when operating it. Use your more-skillful hand to hold it.

③ Slide Bar

As you squeeze the grip ② with your hand, the slide bar ③ moves and the contact pin ⑥ emerges from the main body.

④ Test Switch 1

One of the two switches for delivering the test voltage. To deliver the test voltage, squeeze the switch with a finger of your more-skillful hand in which you are holding the grip ②.

⑤ Test Switch 2

One of the two switches for delivering the test voltage. To deliver the test voltage, press the switch with a finger of your less-skillful hand which is free as you are not using it to hold the probe.

[The test voltage is delivered only when both test switches 1 and 2 are turned on, and the slide bar is moved to the end.]

⑥ Contact Pin

The contact pin delivers the high voltage. Apply it to the test point of DUT (device under test). Never touch the contact pin.

Never let it brought into contact with other objects than the test point of DUT.

⑦ Red Area

The red area is an insulative area for the contact pin ⑥.
Never touch the area as it may cause electrification.

⑧ H.V ON lamp

The lamp (red) indicates that the test voltage is delivered to the contact pin ⑥, in the same function as that of the H.V ON or TEST ON lamp of the W/I Tester.

⑨ High Voltage Cable

For connection of the test voltage.

⑩ High Voltage Plug

For connection of the test voltage. To be connected to the OUTPUT terminal of the W/I Tester.

⑪ Remote Control Cable (DIN cable)

For connection of the remote control signals of the probe.

⑫ Remote Control Plug (DIN plug)

For connection of the remote control signals, such as ON/OFF control of the test output voltage for the probe. To be connected to the REMOTE connector (remote control connector) of the W/I Tester.

⑬ GND Test Leadwire

The leadwire is for connecting the GND terminal of the DUT (device under test) to the GND or LOW terminal of the W/I Tester.

⑭ Test Leadwire Fixture

To fix the GND plug ⑮ connected to the W/I Tester against disconnection.

⑮ GND Plug

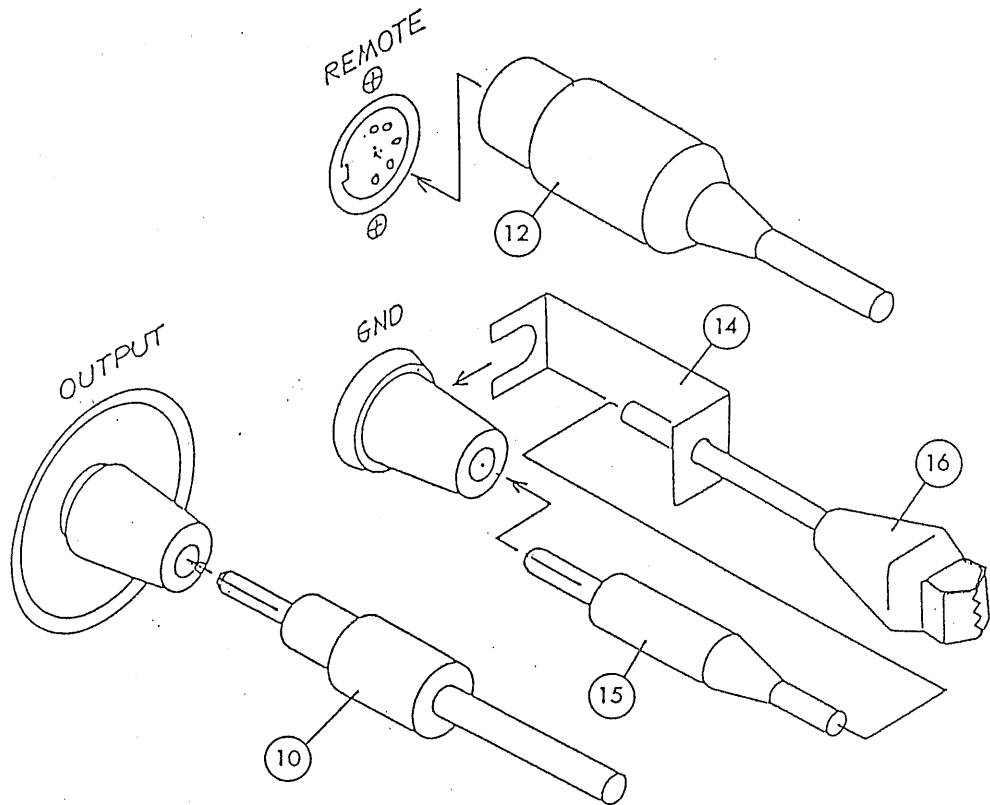
To be connected to the GND or LOW terminal of the W/I Tester.
Put on the test leadwire fixture ⑭ to guard against disconnection of the plug.

⑯ GND Alligator Clip

For connection of the GND leadwire to the DUT.

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5. TEST SETUP



To prepare a test setup with the probe, proceed as follows:

- (1) Be sure that the POWER switch of the W/I Tester is set to OFF and its input power cable is disconnected from the AC mains line.
- (2) Connect the GND test leadwire (13) of the probe to the GND or LOW terminal of the W/I Tester. Protect the connection with the test leadwire fixture (14) against disconnection.
- (3) Connect the GND alligator clip (16) of the GND test leadwire to the ground line of the DUT (device under test).
- (4) Connect the remote control plug (12) (DIN plug) of the probe to the REMOTE connector of the W/I Tester. As this connection is done, the W/I Tester is automatically switched over to the REMOTE mode. When in the REMOTE mode, the test voltage of the tester cannot be locally controlled with the TEST button or START button on the front panel of the tester but can only be remotely controlled from the probe.
- (5) Connect the high voltage plug (10) of the probe to the OUTPUT terminal of the W/I Tester.

6. TEST PROCEDURE

- (1) Set the W/I Tester for the required test conditions by referring to its instruction manual.
- (2) Prepare a test setup by connecting the probe to the W/I tester by referring to Section 5 "TEST SETUP."
- (3) Hold the probe by its grip ② with your more-skillful hand [do not squeeze it yet]. Place your less-skillful hand near the test switch 2 ⑤ in preparation for pressing the switch [do not press the switch yet].
- (4) Apply the front end (red area ⑦) of the probe to the test point of the DUT (device under test). Squeeze the slide bar ③ so that the contact pin ⑥ emerges from the front end (red area ⑦) of the probe [exercising care not to press the test switch 1 ④ at the same time].
- (5) Apply the contact pin ⑥ to the test point of the DUT. Squeeze the test switch 1 ④ with a finger of your more-skillful hand in which you are holding the grip ②. In this state, press the test switch 2 ⑤ with a finger of your less-skillful hand, and the H.V ON lamp ⑧ will light indicating that the test voltage is applied to the DUT. [Do not detach the contact pin ⑥ from the DUT during the test voltage application period.]
- (6) After the test voltage application period is over (or when aborting the test cycle), release your finger from the test switch 1 ④.
[Do not release the grip ② or detach the probe from the DUT yet.]
- (7) Be sure that the H.V lamp ⑧ has gone out.
- (8) Release the grip ② to let the contact pin ⑥ retracted into the main body ① of the probe. Next, release the finger of your less-skillful hand from the test switch 2 ⑤. Then, detach the probe from the DUT.

With the above procedure, one cycle of test is complete and the test setup returns to the state of step (3). Commence the next test cycle by step (4).

Note: Be sure to turn off the POWER switch of the WII Tester when the test is over.

7. GLOSSARY

The meanings of the terms used in this manual are as follows:

Term	Meaning
Voltage, High Voltage	Voltages higher than zero volts
Probe	Model HP01-TOS/HP02-TOS High Voltage Test Probe (including accessories)
W/I Tester	TOS Series W/I, Withstanding voltage (and Insulation resistance), Tester (Model TOS****) or Model 871 W/I Tester
Test Voltage	A voltage applied to DUT (device under test) to test its withstanding voltage or insulation resistance. The voltage may be controlled or programmed for its type (AC/DC), voltage, duration, and other conditions of test.
High Voltage Area (as DUT, etc.)	The contact pin ⑥ of the probe, and the DUT parts which are charged up to high voltage due to contact with the contact pin ⑥, including the parts which are charged up to high voltages due to electrostatic or electromagnetic induction by the test voltage.