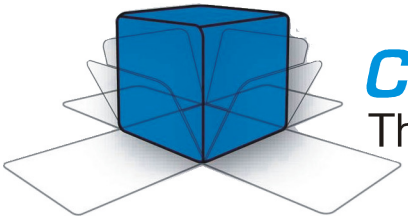
HT-10KVP ac 100mA

Dielectric Withstand Tester

0-10,000 Volts AC Output

Instruction Manual



COMPLIANCE WEST USA

The blue box that tests. And tests.

Dear Customer:

Congratulations! Compliance West USA is proud to present you with your Dielectric Withstand Tester. Your instrument features a groundbreaking microcontroller circuit design and ergonomic front panel, and represents the latest in high voltage laboratory testing.

To fully appreciate all the features of your new meter, we suggest that you take a few moments to review this manual. Compliance West USA stands by your instrument with a full one-year warranty. If the need arises, please don't hesitate to call on us.

Thank you for your trust and confidence.

Rev 1.0, August, 2013.

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Section 1

An Introduction to Dielectric Withstand Testing with the HT-10KVP ac 100mA

The dielectric withstand test is a test which is recognized by safety agencies worldwide as a valid criterion of safe assembly of end-use equipment. The HT-10KVP ac 100mA is designed as a research instrument to determine the dielectric properties of component assemblies of end-use equipment. It applies a high-voltage potential between Output and Return test leads and monitors Leakage Current, and watches for Dielectric Breakdown during the test. To aid in testing, the HT-10KVP ac 100mA can be configured with or without a test duration timer, and can be set to deliver high voltage after an arc has been detected to pinpoint an area of arcing.

The dielectric withstand test involves high voltage, and caution should be exercised when using the HT-10KVP ac 100mA. The Return Receptacle on the front panel is connected to ground potential, and setups should be designed with this in mind, to guard against the operator contacting high voltage. Always make sure the return lead is firmly connected.

Leakage Test

The HT-10KVP ac 100mA leakage test uses a separate low-frequency circuit to detect excessive current between the Output and Return receptacles on the front panel. There is not a specific leakage current level pass/fail requirement at this time for most equipment. However, higher than normal leakage current on a particular sample may indicate an assembly, and or a component problem in the circuit.

The leakage current is also monitored by the HT-10KVP ac 100mA to ensure that excessive leakage does not keep the tester from developing full voltage required for the high voltage test. The HT-10KVP ac 100mA will provide full voltage at any leakage current level up to 100mA. Set the acceptable leakage current limit using the Shutdown Limit Potentiometer on the front panel.

If the green Full Voltage indicator lights and the test continue, the leakage current was below the acceptable limit. If the red Excess Leakage indicator lights, the buzzer sounds, and the test is terminated; the leakage current was above the acceptable limit.

High Voltage Dielectric Withstand Test

This test checks for insulation system breakdown's by applying a high voltage between the Output and Return receptacles on the front panel. The HT-10KVP ac 100mA uses a separate high-frequency circuit to detect arc breakdowns.

Set the test duration with the Timer Control Potentiometer on the front panel. The test time is counted from the time the Full Voltage indicator is lit to the completion of the test. The Timer Control Switch must be set to ON, or the HT-10KVP ac 100mA will test only while the Test Button is pressed. The minimum test time is one second regardless of the setting of the Timer Control Switch.

If the green Hipot Pass indicator lights, the test cycle has been successfully completed, meaning there was no dielectric breakdown. If the red Hipot Fail indicator lights, a breakdown arc has been detected.

High Voltage Discharge

The HT-10KVP ac 100mA has an internal circuit designed to remove the high voltage, after completion of the dielectric withstand test. The HT-10KVP ac 100mA should remain connected to the circuit until the front panel meter shows that the output voltage has dropped to a safe level.

Voltage Safety Stop

As a safety feature the HT-10KVP ac 100mA will stop testing if the output voltage reaches 10.5kV.

Section 2

Introduction and Specifications

This manual contains complete operating and specifications for the HT-10KVP ac 100mA Dielectric Withstand Tester.

The instrument is a bench-type Dielectric Withstand Tester with AC Output, designed for laboratory testing of components, and insulation systems.

The HT-10KVP ac 100mA features automatic two buttons operation, with numerous safety features designed to protect the operator:

- The test return lead is directly connected to ground potential for operator safety.
- The test can be immediately terminated at any time by pressing the red **RESET** button.
- Before the test can commence, the Zero Voltage Start safety feature most be disarmed by turning the voltage knob to the minimum, also the unit must be armed by pressing the red **RESET** button. The test will not begin until the blue **TEST** Button is pushed.
- If a failure is encountered, the high voltage is immediately shut down, a buzzer sounds and the voltage discharge progress is shown by the front panel meter.
- Failure modes are shown by the front panel LED's.

Convenience and testing features include:

- Test time, and leakage limit are settable.
- Test duration timer is defeatable for specialized testing.
- Testing may be terminated or continued when a dielectric breakdown is detected.
- Test results are determined quickly, without operator intervention.
- The HT-10KVP ac 100mA allows custom setups for test time and leakage limit.

Your Tester has a warranty for a period of one year upon shipment of the instrument to the original purchaser.

Specifications

ELECTRICAL	
Voltage Output	0 - 10,000 Vac
Leakage Current	Adjustable from 5 to 100mA in 1mA steps
Pass/Fail Criteria:	
Leakage Current:	Pass/Fail point user adjustable.
Dielectric Breakdown:	Separate high frequency detection circuit for breakdown spike detection
Test Time:	User adjustable 1 to 90 sec. 1 sec steps, defeatable
Voltage Meter Accuracy	± 0.1KV from 0.50KV to 10.00KV
Leakage Meter Accuracy	± 1mA full scale
Duty cycle	100 %
Test adjustments	Front Panel: Test Time Leakage Limit Voltage Adjustment Timer ON/DEFEAT Hipot ON/DEFEAT
ENVIRONMENTAL	
Operating Temperature	15-40°C
Relative Humidity Range	0-90% non-condensing
GENERAL	
Input power requirements	120 volts, 50/60 Hz, 10A max
Weight	80 lbs.
SAFETY AGENCY TOPICS	
Transformer Output	> 500VA
Visual Indication of Voltage Output	Provided by front panel meter, directly connected to high voltage output
Failure Indication	Audible, provided by internal buzzer Visual, provided by red LEDs, on front panel Test can be automatically terminated on failure
Leakage Test	Provided; 5 mA AC factory set pass/fail point, user adjustable.
Zero Voltage Start	It will NOT let to start the test until the voltage adjustment knob is at the minimum position.
Voltage Safety Stop	Test will automatically stop if voltage reaches 10.5KVac.

Table 2-1. HT-10KVP ac 100mA Specifications

Section 3

Operation

This section describes how to set up and make measurements with the HT-10KVP ac 100mA unit. We recommend that you read the entire section carefully so that you can use all of its features.

Setting up the HT-10KVP ac 100mA

The HT-10KVP ac 100mA is shipped in a special protective container that should prevent damage during shipping. The container will include the following:

- The HT-10KVP ac 100mA Dielectric Withstand Tester
- A black 18 AWG Test Return Lead (Alligator Clip/Banana Plug ends)
- A red High Voltage Heavy Duty Test Lead (Alligator Clip/High Voltage Plug ends)
- A Power Cord.
- This Instruction Manual

18 AWG Line Power Cord	GL Return Test Lead	Red 18 AWG High Voltage Test Lead
		

Table 3-1. Shipment Cables & Connectors

Use the original shipping container for subsequent shipping. If the original shipping container is not available, be sure that adequate protection is provided to prevent damage during shipment.

AC Line Voltage Requirements and Fuse Replacement

Connect the HT-10KVP ac 100mA only to the voltage source indicated on the rear panel.

There is a user-replaceable fuse located on the front panel. The fuse rating is printed on the front panel. For continued protection against risk of fire, replace only with same type and rating of fuse. The AC Power switch should be turned off while the fuse is being replaced.

Front and Rear Panel Features

Before using the HT-10KVP ac 100mA tester, take a few minutes to become familiar with the use of its controls, indicators, and connectors. The front panel features of the HT-10KVP ac 100mA are shown in Figure 3-1 and described in Table 3-2.

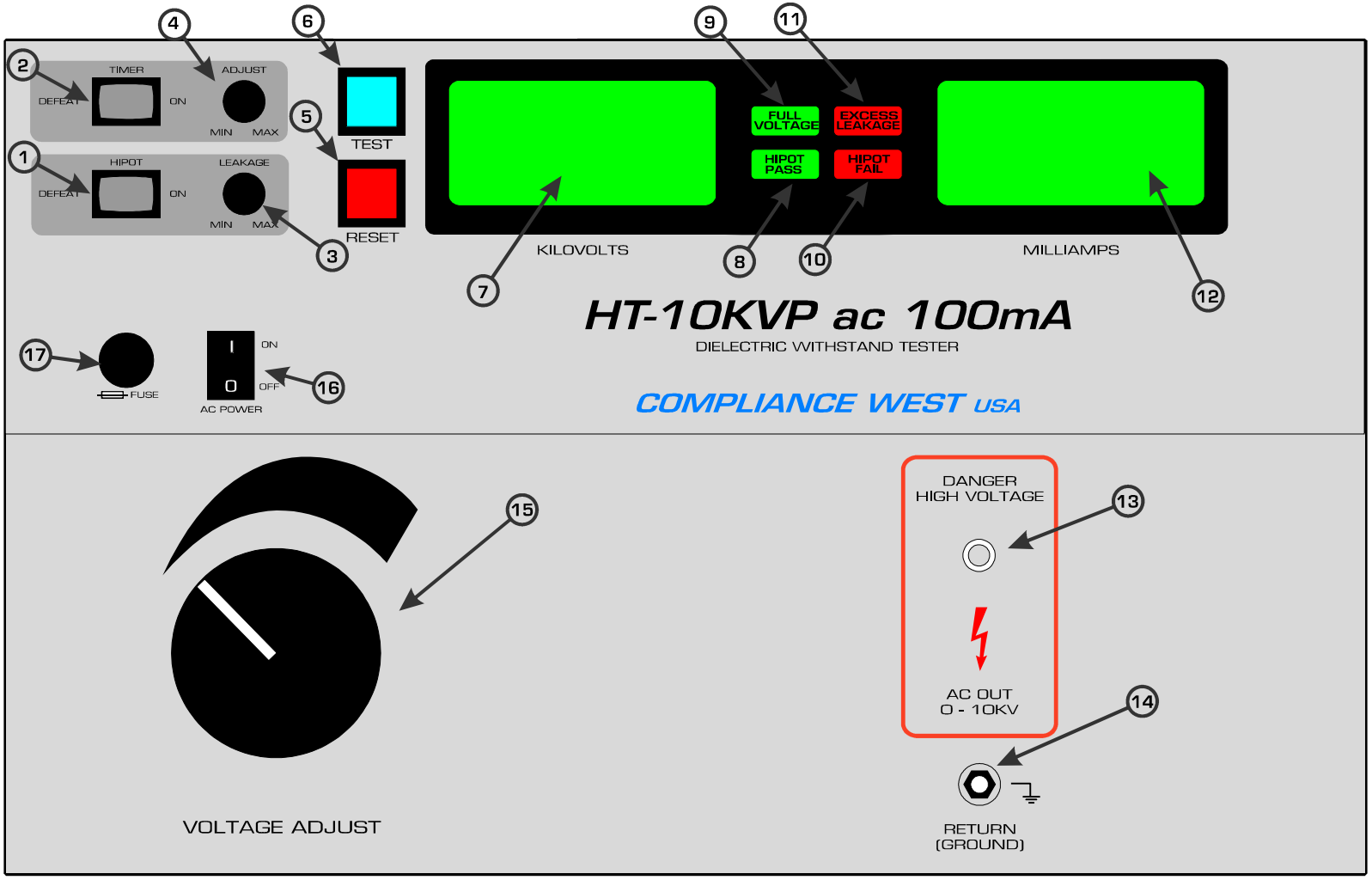

Figure 3-1. Front Panel Controls, Indicators and Connectors

ITEM NO.	NAME	FUNCTION
1	HIPOT	When ON, Dielectric breakdown detect will be activated. When in DEFEAT position, test will continue regardless of a dielectric breakdown, but it can be stopped by the excess leakage limit. NOTE: The TIMER switch must also be in the DEFEAT position, otherwise the buzzer will sound. The test will continue only as long as the TEST button is pressed. Minimum test time is approximately one second.
2	TIMER	When ON, test duration is set by TIMER ADJUST, Item 4. When in DEFEAT position, testing continues only as long at TEST button is pressed. Minimum test time is one second. NOTE: TIMER Switch position must be DEFEAT when HIPOT Switch is in the DEFEAT position.
3	LEAKAGE ADJUST	Adjusts the shutdown point for the Leakage Current Test. For details see "Leakage Current Adjust."
4	TIMER ADJUST	Adjusts the test duration. For details see "Test Time Adjust".
5	RESET Button	When lit, indicates that the HT-10KVP ac 100mA is unarmed. When the RESET button is pressed, the TEST switch is lit. PRESSING THE RESET BUTTON AT ANY TIME IMMEDIATELY STOPS TESTING.
6	TEST Button	When lit, indicates the HT-10KVP ac 100mA is ready to test; press to begin testing. NOTE: The Voltage Adjust knob must be at the minimum position in order to disarm the Zero Voltage Start safety feature, Item 15.
7	VOLTAGE METER	Connected to the output. Reads actual output voltage. Adjust meter range with VOLTAGE ADJUST Knob, Item 15.
8	HIPOT PASS LED	Indicates test conclusion with satisfactory results.
9	FULL VOLTAGE LED	Lights when output voltage has ramped up. Test time starts when this indicator lights.
10	HIPOT FAIL LED	Lights when arcing or insulation flashover has occurred.
11	EXCESS LEAKAGE LED	Actual leakage current has exceeded the shutdown point set with Shutdown Limit Potentiometer, Item 3.
12	CURRENT METER	Connected to the output. Read the current flowing through the return lead of the HT-10KVP ac 100mA during the test.
13	AC OUTPUT Receptacle	Connect high voltage lead here to conduct an AC test.
14	RETURN Receptacle	At chassis ground reference level. Connect black return lead here.
15	VOLTAGE ADJUST Knob	Voltage is continuously adjustable before or during testing with this knob. NOTE: Before the test can commence, the Zero Voltage Start safety feature most be disarmed by turning the voltage knob to the minimum.
16	AC POWER Switch	Energizes the HT-10KVP ac 100mA.
17	FUSE	Main fuse. Replace only with type, and rating of fuse specified on the front panel label. Turn off power switch, Item 16, before servicing fuse.

Table 3-2. Front Panel Control, Indicators and Connectors

Initial Checkout Procedure

Use this procedure to verify that the HT-10KVP ac 100mA tester is working correctly. Refer to table 3-1, figure 3-1 and table 3-2 for location of items.

CAUTION
High voltage, risk of shock, use with care.

1. Turn the Tester on using the AC Power switch.
2. Set the Test Timer switch, and Failure Shutdown switch to ON position.
3. Disconnect leads from the Output and Return jacks.
4. Set the Test Time to around 30 seconds.
5. Push the RESET button. The TEST button should light.
6. Disarm the Zero Voltage Start safety feature by turning the voltage knob to the minimum.
7. Push the TEST button.
8. After the FULL VOLTAGE indicator lights, use the Voltage Adjust knob to set the desired output voltage. At the end of the test, the Full Voltage, Hipot Pass, and RESET switch indicators should be lit.
9. Push the RESET button. The TEST button should light.
10. Disarm the Zero Voltage Start safety feature by turning the voltage knob to the minimum.
11. Connect the red lead to the Output receptacle, and connect the black lead to the Return receptacle, then, connect the two leads together to simulate a high leakage current condition.
12. Push the TEST button.
13. Use the Voltage Adjust knob to increase the voltage output, but the test should terminate immediately and the buzzer should sound. The Excess Leakage Indicator and RESET button indicators should be lit.
14. Disconnect the red lead (banana connector) from the HV output of the HT-10KVP ac 100mA, but keep the red alligator clip connected with the black lead which is already connected to the Return receptacle.
15. Push the RESET button. The TEST button should light.
16. Disarm the Zero Voltage Start safety feature by turning the voltage knob to the minimum.
17. Push the TEST button.
18. After the FULL VOLTAGE indicator lights, use the Voltage Adjust knob to set the output voltage to approx. 1500 volts.
19. (This test simulates a dielectric breakdown. High voltage could exist on the alligator clips. Exercise caution to avoid shock.) Pick up the red lead and insert it into the HV Output during the machine is performing the test. The test will immediately terminate with a buzzer. The Full Voltage, Hipot Fail, and RESET button indicators should be lit.
20. Push the RESET button. The TEST button should light.

If any of these tests give unexpected results, service may be required. Please check the test setup and if further information is needed, contact our Service hotline for assistance.

Setting up the HT-10KVP ac 100mA for Laboratory Testing

This section describes procedures for setting the HT-10KVP ac 100mA tester.

a. Leakage current level
b. High voltage level
c. High voltage test time
d. Test timer switch
e. Breakdown detect switch.

This will allow you to change settings from the factory settings below. Refer to table 3-1, figure 3-1 and table 3-2 for location of items.

Factory Settings

The HT-10KVP ac 100mA is configured as shown when shipped from Compliance West USA:

Voltage Display:	Vrms
Leakage Current Level:	10mA
High Voltage Level:	Minimum
High Voltage Test Time:	1 second
Test Timer switch:	ON
Breakdown Detect switch:	ON

Display of Leakage Limit and Duration Settings

To view the Test Duration, and Leakage Limit current settings, hold down the **RESET** button for 2 seconds. The meter will display "L" with the Leakage Limit value in mA. Hold down the **RESET** button again for 2 seconds, and the meter will display "d" with the Test Duration set time in seconds.

Leakage Current Level Adjust

1. Connect the HT-10KVP ac 100mA to a correctly rated source of supply and turn ON the tester.
2. Push the **RESET** button. The **TEST** indicator should light, indicating that the HT-10KVP ac 100mA is ready.
3. Turn the **Leakage Limit Adjust**. As soon as the potentiometer starts turning, the voltage meter will start blinking and displaying "L" with the new value. Leakage Level can be set in 1 mA increments.

Voltage Adjust

This procedure controls the high voltage level used in the dielectric withstand test. Testing can be terminated at any time by pressing the RESET button. Use the procedure below to set it.

1. Set the Test Timer switch, and Failure Shutdown switch to ON position
2. Disarm the Zero Voltage Start safety feature by turning the voltage knob to the minimum.
3. Push the RESET button. The TEST button should light.
4. Push the TEST button.
5. After the FULL VOLTAGE indicator lights, use the Voltage Adjust knob to set the desired output voltage.
6. Push the RESET button to terminate the test.

High Voltage Test Time Adjust

This procedure sets the length of time the HT-10KVP ac 100mA will conduct the high voltage test. The test time is specified by the safety agencies, and is tied to the test voltage. Most safety agencies will allow a much shorter test (usually 1 second vs. 1 minute) if the voltage is increased by 20%. The factory set is for 1 second. Consult the safety agencies on the test time for the type of equipment being tested. If a different test time is required, use this procedure to set it.

1. Connect the tester to a correctly rated source of supply and turn ON the power switch.
2. Push the **RESET** button. The **TEST** indicator should light, indicating that the HT-10KVP ac 100mA is ready.
3. Adjust the **Test Time** potentiometer. As soon as the potentiometer starts turning, the voltage meter will display "d" with the new value. Test Time can be set in 1 second increments from 1 to 90 seconds.

Setting the Test Timer Switch

The Timer Control switch allows test time to be controlled by the HT-10KVP ac 100mA internal timer or to continue until terminated by the operator.

When this switch is in the DEFEAT position, the test will continue only while the TEST button is held down. The minimum test time is approx. 1 second.

When this switch is in the ON position, the test time will be controlled by the HT-10KVP ac 100mA internal timer. For information on how to set this time, see instructions above.

The Test Timer must be defeated if Breakdown Detect Defeat is desired. See Table 3-3 for details.

Setting the Failure Shutdown Switch

Use extreme caution when using this feature

The Breakdown Detect switch allows the operator to continue testing after a failure is encountered. This allows the operator to find the breakdown point, but **all arc shutdown circuitry in the HT-10KVP ac 100mA is disabled when the Breakdown Detect switch is in the DEFEAT position**. The excess leakage limit may stop the test. Also the tests may be terminated at any time by releasing the TEST button.

WARNING: Testing with the Shutdown Limit switch in the DEFEAT position is extremely hazardous. The HT-10KVP ac 100mA can generate lethal levels of voltage and current. Therefore, care should be taken in examining the equipment being tested, to locate areas of failure while the HT-10KVP ac 100mA is operating.

Operating Techniques

The following paragraphs describe how to operate the HT-10KVP ac 100mA Dielectric Withstand Tester.

CAUTION:

High voltage is generated by the HT-10KVP ac 100mA. Although the chassis of the equipment under test is grounded by the HT-10KVP ac 100mA, a risk of shock exists.

Testing Products

This section describes how to conduct a test. Testing can be terminated at any time by pressing the RESET button.

1. Set up tester to correct parameters for unit to be tested using the previously described procedures.
2. Connect the HT-10KVP ac 100mA to a correctly rated source of supply and turn it on.
3. Plug the black lead into the Return receptacle. Plug the red lead into the Output receptacle.
4. Connect the alligator clips of the leads across the circuit or part being tested. Keep in mind that the black lead is connected to earth ground.
5. Press the RESET button. The TEST button should light, indicating that the HT-10KVP ac 100mA is ready to test.
6. Set the VOLTAGE ADJUST Knob to minimum in order to disarm the Zero Voltage Start safety feature.
7. Push the TEST button. The HT-10KVP ac 100mA will energize the high voltage output.
8. After the FULL VOLTAGE indicator lights, use the Voltage Adjust knob to set the desired output.
9. If the Shutdown Limit switch is set to ON, and if the leakage current of the circuit under test exceeds the alarm value, the Excess Leakage indicator will light and the test will terminate.
   If the Shutdown Limit switch is set to DEFEAT, and the requirements of Table 3-3 are met, the HT-10KVP ac 100mA will continue to test. Voltage output may sag if the power required by the circuit is beyond the capabilities of the HT-10KVP ac 100mA.
10. If the Timer Control switch is set to ON, the HT-10KVP ac 100mA will conduct the high voltage test for the amount of time set in the Test Duration procedure.
    If the Timer Control switch is set to DEFEAT, the high voltage test will continue only while the TEST button is pressed.
11. If an insulation system breakdown is detected, and
    - The Shutdown Limit switch is ON, the Hipot Fail indicator will light, the buzzer will sound, and the voltage will be removed.

- The Shutdown Limit switch is set to DEFEAT, and the requirements of Table 3-3 are met, the Hipot Fail indicator will light, and the test will continue as long as the TEST button is pressed.

12. If no breakdown is detected, the high voltage will be removed at the end of the test, the Hipot Pass indicator will light, and the RESET button will light.
13. Do not disconnect the leads from the equipment being tested until test has ended, and the voltage meter indicates zero volts.

Test Results

Hipot Pass: If the Hipot Pass light is lit, the equipment being tested passed all test parameters.

Red Indicator/Buzzer: Any red indicator/buzzer test result means the equipment being tested failed a test phase. If unanticipated test failures continue, and you suspect that the equipment under test is built correctly, check the following items:

1. Shutdown Limit Setting: May be set too low. This would cause normal input capacitor charging to draw more that the preset leakage current limit, triggering a Leakage Current Fail light, and terminating the test. Consider raising the acceptable leakage current level; see **Leakage Current Level Adjust**. If this limit level is at its highest setting, and failures continue, a DC hipot tester may be required

		Result
TIMER	**HIPOT**	
ON	ON	Test Timer and the breakdown detect are On. Test will stop automatically if the internal test time counter is completed, or a leakage failure, or breakdown failure.
DEFEAT	ON	Test Timer is defeated. After full voltage is reached, the test will continue only as long as the Test button is held in, minimum one second. Test will stop automatically on all leakage or breakdown failures.
ON	DEFEAT	Buzzer will turn sound, It will not allow to test until the Test Timer switch is in defeat.
DEFEAT	DEFEAT	Test will continue only as long as the TEST button is held in, minimum one second. The HT-10KVP ac 100mA will NOT shut down on a dielectric failure, but the front panel Hipot Fail light will flash to indicate a dielectric breakdown. The Hipot Pass light will not light at the completion of a successful test. For safety reasons, excessive leakage current, as set by the Leakage knob, will cause the HT-10KVP ac 100mA to shut down.

Table 3-3: Front Panel Switch Truth Table

Section 4

Maintenance and Calibration

WARNING

THESE SERVICE INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

This section contains maintenance information for the HT-10KVP ac 100mA Dielectric Withstand Tester. A 1-year calibration cycle is recommended to maintain the specifications given in Section 2.

Service Information

The HT-10KVP ac 100mA is warranted to the original purchaser for a period of 1 year. This warranty does not cover problems due to misuse or neglect.

Malfunctions which occur within the limits of the warranty will be corrected at no charge. Mail the instrument post paid to the manufacturer. Dated proof of purchase is required for all in-warranty repairs.

The manufacturer is also available for calibration and/or repair of instruments that are beyond their warranty period. Contact the manufacturer for a cost quotation. Ship the instrument and your remittance according to the instructions given by the manufacturer.

Cleaning

CAUTION

Do not use aromatic hydrocarbons or chlorinated solvents for cleaning. These solutions will react with the plastic materials used in the instrument.

Clean the front panel and case with a mild solution of detergent and a damp sponge. Clean dust from the PWB with clean, dry, low pressure (<20 psi).

Calibration Procedure

The Calibration Procedure should be performed annually and any time your instrument has been repaired. The calibration procedure consists of the next sections:

1) Entering Calibration Mode.
2) Calibration and Software Version Information.
3) Voltage Meter Verification.
4) Voltage Meter Re-calibration.
5) Leakage Meter Verification.
6) Leakage Current Re-Calibration.

NOTE

Allow the instrument to stabilize for approximately five minutes. Perform all calibration adjustments at an ambient temperature of 23°C ±5°C (73°F ±9°F).

WARNING

CALIBRATION ADJUSTMENTS ARE PERFORMED ON ENERGIZED CIRCUITS. EXERCISE CAUTION AT ALL TIMES, AND USE A NON-CONDUCTIVE TOOL FOR ALL ADJUSTMENTS.

Entering Calibration Mode

NOTE

Only enter into this mode if the HT-10KVP ac 100mA unit needs a re-calibration on any of the parameters of Voltage Meter or Leakage. Zero voltage start option will be deactivated during this mode.

1. Turn Off the HT-10KVP ac 100mA unit.
2. Hold in both the **Test** and **Reset** buttons.
3. Turn On the HT-10KVP ac 100mA unit.
4. Release the **Test** button, release the **Reset** button, press and hold the **Reset** button, press and hold the **Test** button, release the **Test** button, and then release the **Reset** button.
5. If the correct sequence was entered, the display will read "Sure", if not, start over at step 1.
6. While "Sure" is displayed on the screen you can:
   6.1 Press **Reset** to exit out of the **Calibration Mode** and keep all of the currently programmed calibration settings, or.
   6.2 Press **Test** to enter the **Calibration Mode** and create new calibration settings. (Be sure you want to enter the **Calibration Mode** as this will change the laboratory number so it will show the calibration was not performed by Compliance West USA).
7. Once the **Calibration Mode** has been entered, the **Reset** button toggles between the calibration menus: Volt, V1, V2, L1, L2, and bars.

Calibration and Software Version Information

This will allow the user to see the version of the software as well as who performed the last calibration.

1. Turn off the HT-10KVP ac 100mA tester.
2. Hold in the **Reset** button while turning on the tester.
3. The meter will display 3 items:
   A) The model number of the tester.
   B) The version of the software
   C) Laboratory number to designate who performed the last calibration:
   (1= Compliance West USA, 2= another company)

Voltage Meter Verification

1. Turn Off the HT-10KVP ac 100mA unit.
2. Turn the Voltage Adjust to minimum.
3. Set up a 1000:1 probe with and external volt meter has is shown on Figure 4-1.
4. Turn On the HT-10KVP ac 100mA unit.
5. Press the Test button and turn up the Voltage Adjust to compare the front meter of the HT-10KVP ac 100mA unit vs. the external volt meter, tolerance most be +/- 100V full scale (From 05.00 KV to 10.00KV).
6. If one value is out of the specified tolerances, the HT-10KVP ac 100mA unit needs a voltage meter re-calibration. Follow the Voltage Meter Re-Calibration procedure.

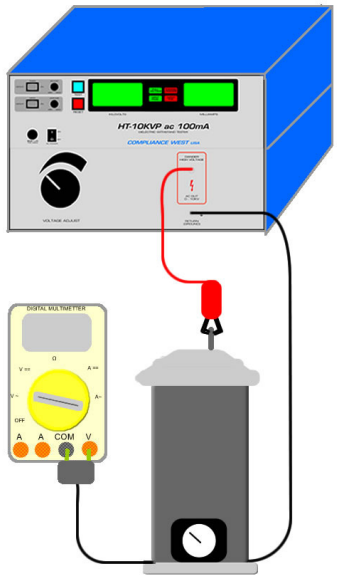

Figure 4-1. Voltage Measurement with 1000:1 High Voltage Probe

Voltage Meter Re-Calibration

1. Turn Off the HT-10KVP ac 100mA unit.
2. Set up a 1000:1 probe with the volt meter has is shown on Figure 4-1.
3. Enter to **Calibration Mode**. See Entering Calibration Mode procedure.
4. Select the top calibration voltage point by pressing the **Reset** button until V1 is shown on the front display of the HT-10KVP ac 100mA unit.
5. Turn the Voltage Adjust on the front panel to minimum (counterclockwise). Press the **Test** button and a voltage number will be displayed on the front panel meter (08.00). Be careful as the HT-10KVP ac 100mA will be putting out voltage at this point.
6. Turn the Voltage Adjust on the front panel clockwise until the output on the external voltage meter equals the number showed on the front meter of the HT-10KVP ac 100mA unit, then, press the Test button to record the new top calibration voltage point in the internal memory. The front display on the HT-10KVP ac 100mA unit will show "V1" again.
7. Select the bottom calibration voltage point by pressing the **Reset** button until V2 is shown on the front display of the HT-10KVP ac 100mA unit.

8. Turn the Voltage Adjust on the front panel to minimum (counterclockwise). Press the **Test** button and a voltage number will be displayed on the front panel meter (00.50). Be careful as the HT-10KVP ac 100mA unit will be putting out voltage at this point.
9. Turn the Voltage Adjust on the front panel clockwise until the output on the external voltage meter equals the number showed on the front meter of the HT-10KVP ac 100mA unit, then, press the Test button to record the new bottom calibration voltage point in the internal memory. The front display on the HT-10KVP ac 100mA unit will show "V2" again.
10. Turn Off the HT-10KVP ac 100mA tester.
11. Confirm the new voltage meter calibration performing again the Voltage Meter Verification procedure, mentioned before.

Leakage Meter Verification

1. Turn Off the HT-10KVP ac 100mA unit.
2. Connect the output of the HT-10KVP ac 100mA through a 1000 watt high voltage load resistor (100kΩ) in series with an external current meter returning to the Return jack on the front panel of the HT-10KVP ac 100mA as is shown on figure 4-2.
3. Turn the Voltage Adjust to minimum.
4. Turn On the HT-10KVP ac 100mA unit.
5. Turn the Leakage Limit potentiometer to the maximum.
6. Press the Test button and slowly turn up the voltage comparing the leakage current on front meter with the external meter. Reading on the external meter should be +/- 1mA (From 10 mA to 100mA).
7. If one value is out of the specified tolerances, the HT-10KVP ac 100mA unit needs a leakage current re-calibration. Follow the Leakage Current Re-Calibration procedure.

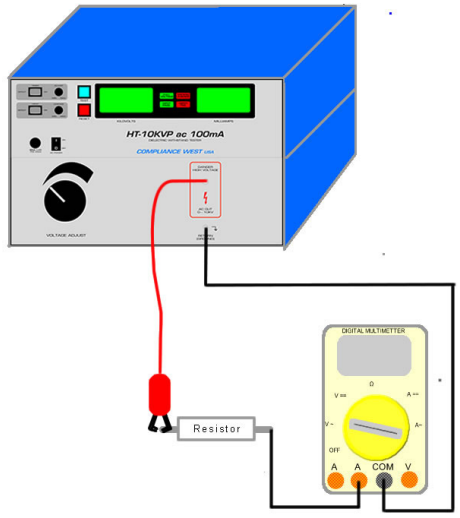

Figure 4-2. Current Measurement with 1000 W High Voltage Resistor.

Leakage Current Re-Calibration

1. Turn Off the HT-10KVP ac 100mA unit.
2. Connect the output of the HT-10KVP ac 100mA unit through a 1000 watt high voltage load resistor (100kΩ) in series with an external current meter returning to the Return jack on the front panel of the HT-10KVP ac 100mA as is shown on figure 4-2.
3. Enter to **Calibration Mode**. See Entering Calibration Mode procedure.
4. Select the top calibration leakage point by pressing the **Reset** button until L1 is shown on the front display of the HT-10KVP ac 100mA unit.
5. Turn the Voltage Adjust on the front panel to minimum. Press the **Test** button and a leakage number will be displayed on the front panel meter (80). Be careful as the HT-10KVP ac 100mA will be putting out voltage at this point.
6. Slowly turn the Voltage Adjust on the front panel clockwise until the current flowing on the external current meter (mA scale) equals the number showed on the front meter of the HT-10KVP ac 100mA unit, then, press the Test button and the front display will show “hold” for a few seconds, wait until the front display show again "L1" again.
7. Select the bottom calibration leakage point by pressing the **Reset** button until L2 is shown on the front display of the HT-10KVP ac 100mA unit.
8. Turn the Voltage Adjust on the front panel to minimum. Press the **Test** button and a leakage number displayed on the front volt panel meter (10). Be careful as the HT-10KVP ac 100mA will be putting out voltage at this point.
9. Slowly turn the Voltage Adjust on the front panel clockwise until the current flowing on the external current meter (mA scale) equals the number showed on the front meter of the HT-10KVP ac 100mA unit, then, press the Test button and the front display will show “hold” for a few seconds, wait until the front display show again "L2" again.
10. Turn Off the HT-10KP ac 100mA tester.
11. Confirm the new leakage current calibration performing again the Leakage Current Verification procedure, mentioned before.

Section 5

Technical Assistance

Technical Assistance from Compliance West USA is available:

Phone: (800) 748-6224
Hours: 8:30 AM - 4:30 PM Pacific Time.
Also available on our web site at: **www.compwest.com**

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