

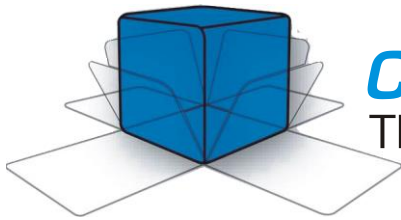
HT-5000P ACDC 200mA TD

Dielectric Withstand Tester

0-5000 Volts AC Output

0-7000 Volts DC 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.

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Section 1

An Introduction to Dielectric Withstand Testing

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-5000P ACDC 200mA TD 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-5000P ACDC 200mA TD 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-5000P ACDC 200mA TD. 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-5000P ACDC 200mA TD 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-5000P ACDC 200mA TD to ensure that excessive leakage does not keep the tester from developing full voltage required for the high voltage test. The HT-5000P ACDC 200mA TD will provide full voltage at any leakage current level up to 200mA.

If full Voltage is reached and test time starts, the leakage current was below the fail setting. If a Excess Leakage fail occurs, the buzzer sounds, and the test is terminated; the leakage current was above the fail setting.

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-5000P ACDC 200mA TD uses a separate high-frequency circuit to detect arc breakdowns.

Set the test duration on the touchscreen display. The test time is counted from the time the Voltage setting is reached to the completion of the test. The Timer defeat must be set to OFF, or the HT-5000P ACDC 200mA TD will test only while the Test Button is pressed. The minimum test time is one second regardless of the setting of the Timer defeat Switch.

Once the test is completed, the screen will display the test results including the max voltage and max current.

High Voltage Discharge

The HT-5000P ACDC 200mA TD has an internal circuit designed to remove the high voltage, after completion of the dielectric withstand test. The HT-5000P ACDC 200mA TD should remain connected to the circuit until the front panel meter shows that the output voltage has dropped to a safe level.

Section 2

Introduction and Specifications

This manual contains complete operating and specifications for the HT-5000P ACDC 200mA TD Dielectric Withstand Tester.

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

The HT-5000P ACDC 200mA TD 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 will automatically check the voltage is to the minimum, in case is not, the tester will automatically move the voltage output to zero.
- 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 display.
- Failure modes are shown by the front panel Display.

Convenience and testing features include:

- Up to 4 testing steps.
- Memories to Save and Recall Testing settings.
- 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-5000P ACDC 200mA TD 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

HT-5000P-ACDC-200mA-TD
FAST
SAFE
RELIABLE

Specifications

Voltage Test Type:	AC & DC
Output	
Voltage:	500-5000VAC & 500-7000VDC
Leakage Current:	AC & DC: 10-200mA from 500-5000V DC: Above 5000V 10-140mA
Input Voltage:	120V/208V three phase
Frequency:	50/60 Hz
Fuse:	6A Slow Blow per phase
Breakdown Detect:	Independent High Frequency Circuit
Transformer Power:	> 500 VA
Leakage Current Detect:	Independent Low Frequency Circuit
Test Time Range:	1-90 Seconds per step, 2min max. when multiple steps
Display:	7" Color Touchscreen
Voltage Accuracy	
Display vs Output:	AC: ±1.0% FSC from 500V to 5000V DC: ±1.0% FSC from 500V to 7000V
Setting vs Display:	AC & DC: ±2.0% 500-1000V and ±1.0% above 1000V
Current Accuracy	
Display vs Output:	AC: ±1mA FSC from 10 to 200mA DC: ±1mA FSC from 10 to 200mA
Leakage Detection:	AC: ±1mA FSC from 10 to 200mA DC: ±3mA below 20mA and ±1mA from 20 to 200mA
Duty Cycle:	100 %
Operation Temperature:	15 - 40 °C
Relative Humidity Range:	0 - 90% Non-Condensing

General


Dimensions:	22" Wide x 26" Deep x 27" High
Weight:	80lbs approx.
Product Package:	HT-5000P ac/dc 200mA HT-5000P ac/dc 200mA Product Manual 18 AWG Test Lead (Black) 18 AWG High Voltage Test Lead (Red) NIST Traceable Calibration Certificate to MIL-STD45662-A

Safety

High Voltage Indicator:	Display Red Background indicates High Voltage Output.
Failure Indicator:	Provided by Front Panel Display and buzzer. Test automatically terminated on failure.

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Table 2-1. HT-5000P ACDC 200mA TD Specifications

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Section 3

Operation

This section describes how to set up and test with the HT-5000P ACDC 200mA TD unit. We recommend that you read the entire section carefully so that you can use all of its features.

Receiving the HT-5000P ACDC 200mA TD

The HT-5000P ACDC 200mA TD is shipped in a special protective crate that should prevent damage during shipping. The container will include the following:

- The HT-5000P ACDC 200mA TD Dielectric Withstand Tester.
- Return Lead.
- High Voltage Test Lead.
- Instruction Manual

Carefully unpack the tester and place it in a clean and safety marked area, the tester is equipped with casters for easy movility.

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-5000P ACDC 200mA TD only to the voltage source indicated on the rear panel.

There is a user-replaceable fuse located on the front panel and also inside the tester via access the rear door. For continued protection against risk of fire, replace only with same type and rating of fuse. The AC Power switch should be turned off and unplugged from source while the fuse is being replaced.

Front Panel Features

Before using the HT-5000P ACDC 200mA TD tester, take a few minutes to become familiar with the use of its controls, indicators, and connectors. The front panel features are shown in Figure 3-1 and described in Table 3-2.

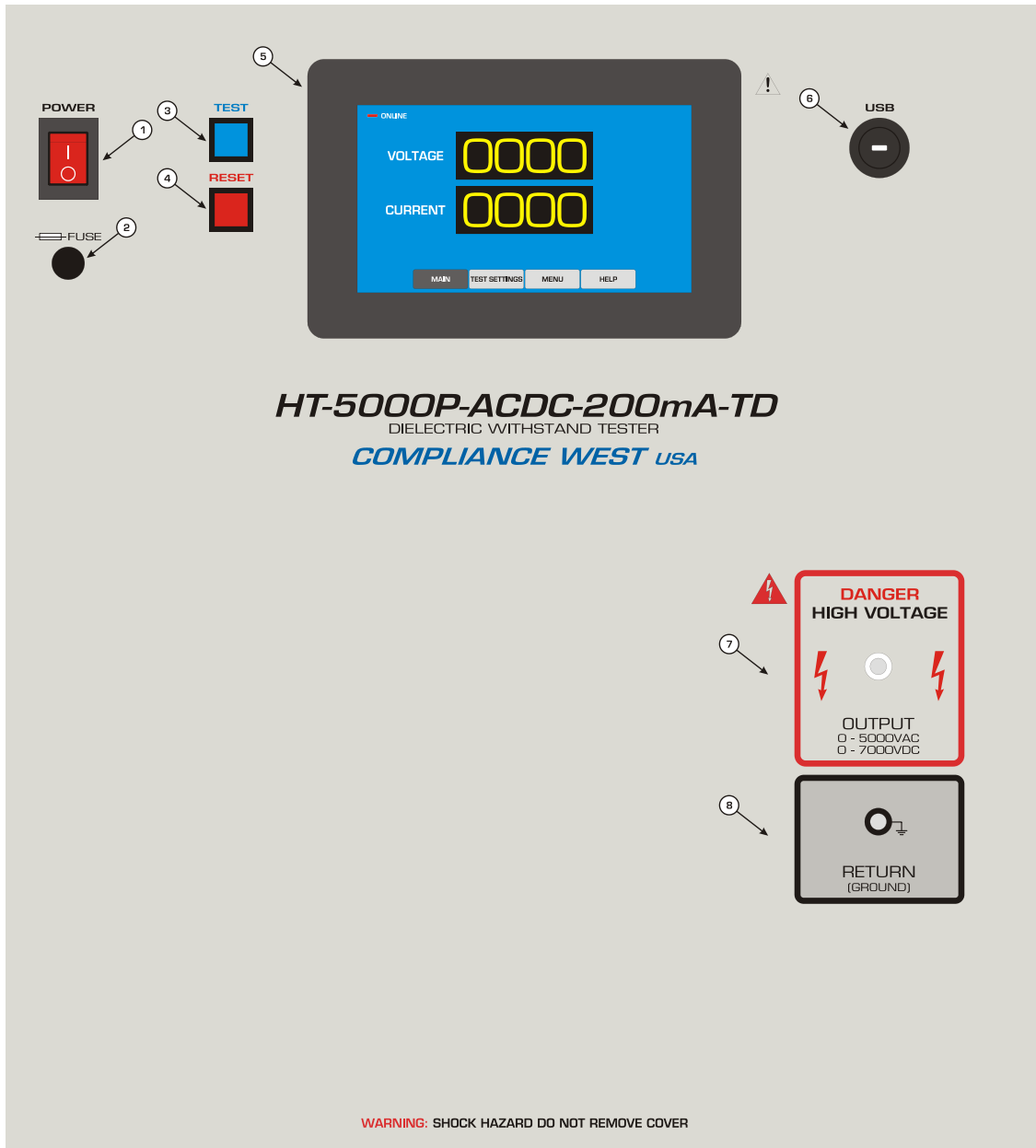


Figure 3-1. Front Panel Controls, Indicators and Connectors

ITEM	NAME	DESCRIPTION
1	Power Switch	Energizes the HT-5000P ACDC 200mA TD.
2	Front Panel Fuse	Fuse Protection for low voltage components.
3	TEST Button	When lit, indicates the HT-5000P ACDC 200mA TD is ready to test; press to begin testing.
4	RESET Button	When lit, indicates that the HT-5000P ACDC 200mA TD is unarmed. When the RESET button is pressed the test is immediately terminated and the TEST switch will lit.
5	Touchscreen Display	Use to set and displays all parameters of the test.
6	USB Port	Communication port to control and request status.
7	HIGH VOLTAGE output	Connect high voltage lead here to conduct an AC & DC test.
8	RETURN Receptacle	At chassis ground reference level. Connect black return lead here.

Table 3-1. Front Panel Control, Indicators and Connectors

Initial Checkout Procedure

Use this procedure to verify that the HT-5000P ACDC 200mA TD tester is ramping up and down correctly.

CAUTION

High voltage, risk of shock, use with care.

1. Plug the tester to a rated source as specified on the ratings label.
2. Turn ON the tester.
3. Set the Test Time Defeat to OFF.
4. Set the Breakdown detect (defeat) to OFF.
5. Disconnect leads from the Output and Return jacks.
6. Set the tester to perform 1 step test
7. Set the Test Time at 30 seconds.
8. Set the leakage limit at 100mA.
9. Set the Voltage to 3000VAC.
10. Press START, the tester should ramp up to 3000VAC and run the test for 30 seconds, pass the test and ramp down.
11. Press RESET.

Leakage Functionality Test

Use this procedure to verify the good functionality of the tester, a function checker box like HTT-1R-001 is required to perform the test.

CAUTION

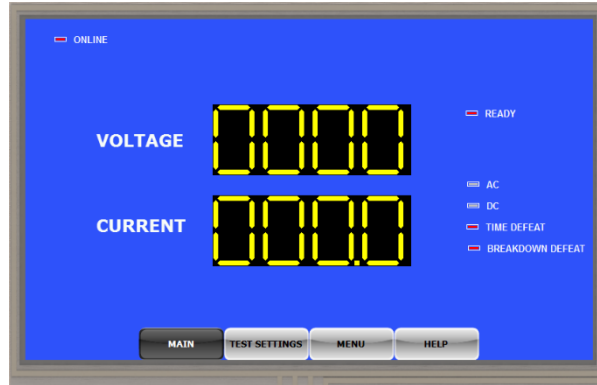
High voltage, risk of shock, use with care.

1. Plug the tester to a rated source as specified on the ratings label.
2. Connect the HTT-1R-001 to the Hipot Tester.
3. Turn ON the tester and the HTT-1R-001.
4. Set the Test Time Defeat to OFF.
5. Set the Breakdown detect (defeat) to OFF.
6. Set the tester to perform 1 step test
7. Set the Test Time at 5 seconds.
8. Set the leakage limit at 160mA.
9. Set the Voltage to 2210VAC.
10. Set the HTT-1R-001 switch to PASS.
11. Press START, the tester should ramp up, run the test for 5s and Pass the test.
12. Press RESET,
13. Set the HTT-1R-001 switch to FAIL.
14. Press START, the tester should fail while ramping up when the leakage reach 160mA.
15. Press RESET.

Setting Testing Parameters

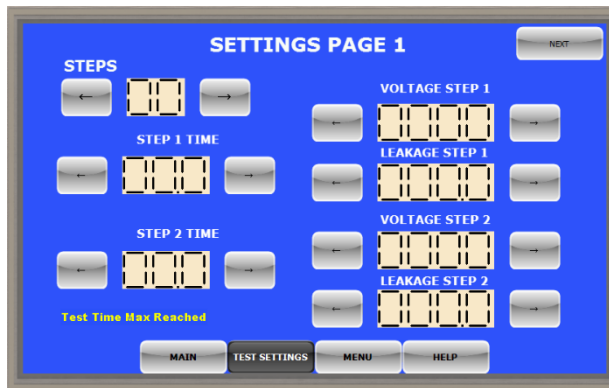
This section describes how to change settings for testing.

Turn Power ON and after a few seconds of initialization the main screen will display.



The main screen will display status of the tester, settings status, Voltage and Current output. When the REDY indicator is green, the operator can press TEST button to star the testing, always make sure the settings are correct to your testing requirements and enforce all safety precautions around the testing area.

Go to test settings by pressing the “TEST SETTINGS” tab.



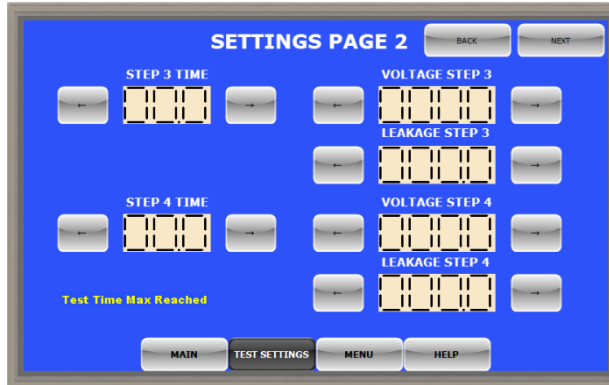
STEPS - Enter the desired number of testing steps with a maximum of 4, each step allows to enter different test time, voltage and leakage settings.

TIME - The Test Time can be up to 90seconds but a max of 2 min. when multiple steps.

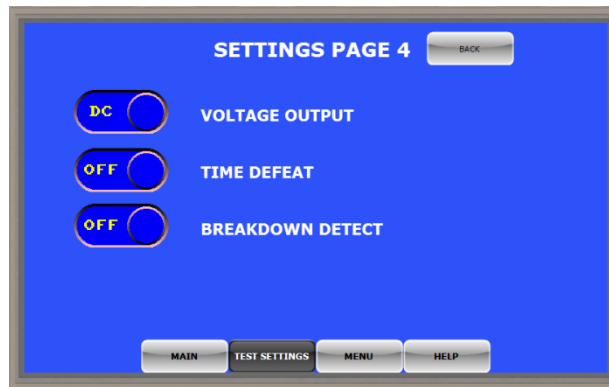
VOLTAGE - The Voltage can be set up to 5000VAC or 7000VDC, Voltage setting must be incremental when testing multiple steps and can't combine AC and DC in the same test sequence.

LEAKAGE - The leakage limit cab be set up to 200mA.

To modify steps 3 and 4 settings press next to move to the “SETTINGS PAGE 2” screen.



Once all settings have been entered press next to move to “SETTINGS PAGE 4” to select AC or DC and to enable the Time and Breakdown Defeat if desired.



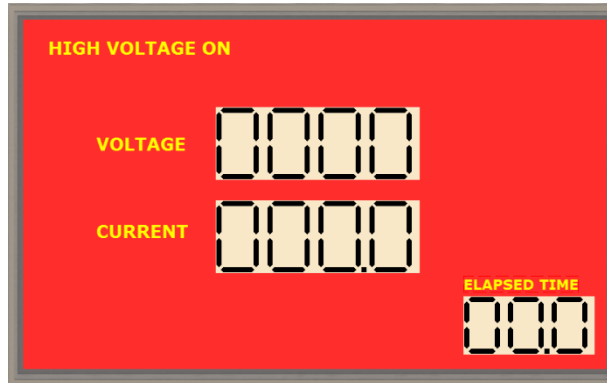
AC/DC - To set AC or DC test.

TIME DEFEAT - Enable this feature to defeat the time setting, when this feature is enable the test time will run for as long as the TEST button is hold pressed by the operator. When Time Defeat is ON, the multi steps is disable and the operator will have to increase or decrease the voltage manually via the Display.

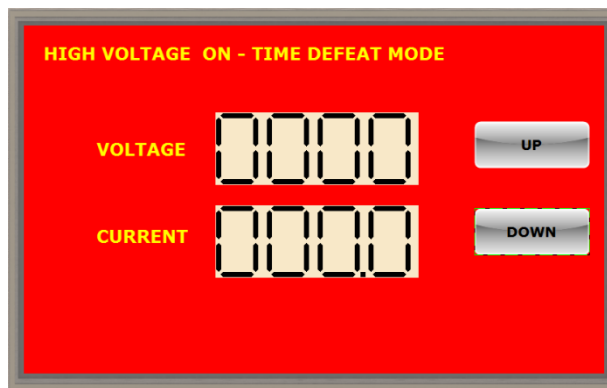
BREAKDOWN DETECT (DEFEAT) – Enable this feature to defeat the breakdown detect, when this feature is enable the tester will not interrupt the test when arcing occurs, this feature is useful for specialized testing when identifying the location of the arc. This feature can only be activated when time defeat is enable.

TIMER DEFEAT	HIPOT DEFEAT	TESTER STATUS
OFF	OFF	Test will stop automatically if the internal test time counter is completed, a leakage failure, or breakdown failure occurs.
ON	OFF	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.
OFF	ON	It will not allow to test until the Test Timer Defeat switch is ON.
ON	ON	Test will continue only as long as the TEST button is held in, minimum one second. The tester will NOT shut down on a dielectric failure. For safety reasons, an excess leakage current will stop the test.

While running a test, the display background changes to red to indicate HV is on, this when testing in “automatic mode”, time defeat OFF.

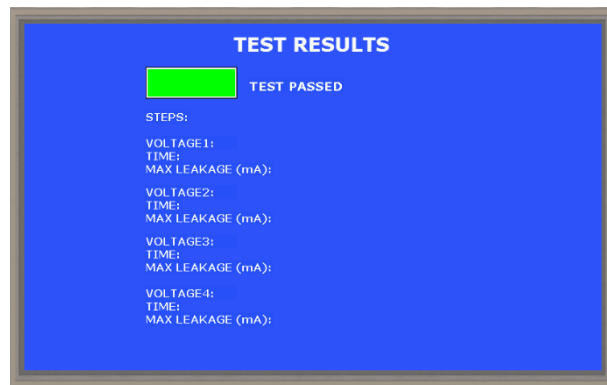


When Time defeat is enable the main testing screen will show as follows, indicating the time defeat is ON, “manual mode”.



To start the test the operator needs to hold press the TEST button with the left hand and increase or decrease the voltage with the “UP” and “DOWN” buttons using his right hand.

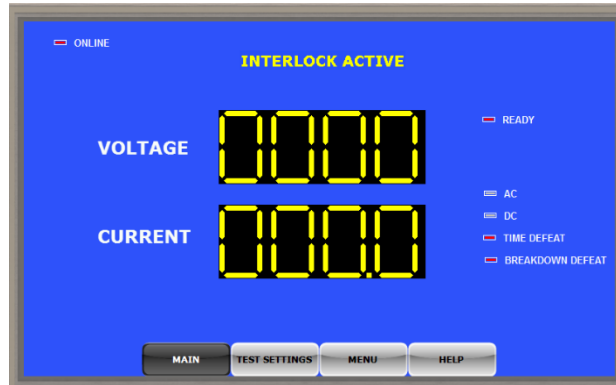
When a test is completed the Screen will display the test results as follows



The test results will indicate if a Failure Passed or Failed, also, the Test Time, maximum Voltage and maximum Leakage for each test step.

Safety Interlock

The tester is equipped with a 2pin terminal block on the back, the interlock is activated when connection between the 2 pins is open. Use this pins to connecto to any safety system like a DUT cage. The tester rear door access is connected to the interlock signal and will activate the interlock if the door is open.



Factory Settings

The HT-5000P ACDC 200mA TD is configured as shown when shipped from Compliance West USA:

FACTORY SETTINGS			
Control	Memory 1 Setting Step 1	Memory 2 Settings Step 1	Memory 3 settings Step 1
Leakage	160mA	160mA	100mA
Voltage	2210V	3500V	4700V
Time Test	5 Seconds	5 Seconds	5 Seconds
Time Defeat	OFF	OFF	OFF
Breakdown Defeat	OFF	OFF	OFF
Voltage Type	AC	AC	DC

Operating Techniques

The following paragraphs describe how to operate the HT-5000P ACDC 200mA TD Dielectric Withstand Tester.

CAUTION:

High voltage is generated by the HT-5000P ACDC 200mA TD tester. Although the chassis of the equipment under test is grounded by the tester, 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. Connect the HT-5000P ACDC 200mA TD to a correctly rated source of supply.
2. Connect the test leads to the tester front panel.
3. Connect the leads alligator clips to the DUT. The black lead is connected to earth ground.
4. Turn tester power switch ON.
5. Set up the required tester parameters, refer to the “Setting Parameters” previously described.
6. Press the RESET button. The TEST button should light, indicating the tester is ready to test.
7. Press the TEST button. The tester will energize the high voltage output.
8. When test is finished, the Display will show the testing results.
9. Do not disconnect the test leads from the equipment being tested until test has ended, and the voltage meter indicates zero volts.

Testing with Breakdown Defeat ON

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 tester is disabled when the Breakdown Detect (Defeat) switch is in the ON position.** The excess leakage limit may stop the test. Also the tests may be terminated at any time by releasing the TEST button.

WARNING:

The HT-5000P ACDC 200mA TD can generate lethal levels of voltage and current. Therefore, care should be taken in examining the DUT to locate areas of failure while the tester is operating.

Test Results

Test Pass: If the Hipot test Pass, the screen will display a TEST PASS message.

Test Fail: If a failure occurs, the tester will terminate the test and the screen will display a TEST FAIL message and the buzzer will sound.

If unanticipated test failures continue, and you suspect that the equipment under test is built correctly, check the Leakage Limit Setting, may be set too low for your application, triggering a Leakage Current Fail, and terminating the test. Consider raising the acceptable leakage current level. If this limit level is at its highest setting, and failures continue, a DC hipot test may be required.

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-5000P ACDC 200mA TD Dielectric Withstand Tester. A 1-year calibration cycle is recommended to maintain the specifications given in Section 2.

Service Information

The HT-5000P ACDC 200mA TD 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 Recommendations

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 dust from the front panel and other sides of the tester with a microfiber towel, a dry low pressure (<20 psi) air can be also used. If deeper cleaning is required, use a mild solution of detergent and a damp microfiber towel, avoid the touchscreen display and dry right after with a dry microfiber towel. All cleaning procedures must be perform with the tester power OFF and unplugged from power source.

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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