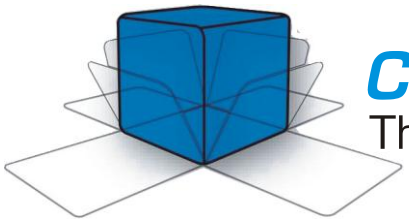
HT-10000P ac/dc
HT-10000P ac
HT-10000P dc

Dielectric Withstand Tester

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.

Table of Contents

Section 0

Quick Start

For a quick look at the abilities of the HT-10000P, we are providing this quick start page, designed to get you up and running quickly. We recommend that you read the entire manual before using the HT-10000P to conduct actual testing.

Initial Setup

1. Remove the HT-10000P from its shipping carton and set it up on a bench.
2. Plug it in to a correctly rated source of supply, using the supplied cordset.
3. Unplug the Test and Return Leads from the tester.
4. Turn on te tester using the AC Power Switch.
5. Switch the Test Timer Switch to DEFEAT.
6. Turn the Voltage Adjust knob fully counterclockwise to set output voltage to zero.
7. Select AC or DC on the AC/DC switch on the front panel (only for HT-10000P ac/dc).
8. Push the RESET Button.
9. Push and hold the TEST Button. (The output voltage is present only while the TEST Button is pressed when the Test Timer Switch is set to the DEFEAT position)
10. Set the desired voltage level using the Voltage Adjust knob.
11. Release the TEST button; output voltage will drop to zero.
12. Plug the High Voltage Output Lead into the AC or DC output.
13. Plug the black lead into the Return jack.
14. Connect the Test Leads across the part to be tested.
15. Push and hold the TEST Button and observe the front panel meters and lights for test results.
16. Release the TEST button to finish the Test.

Section 1

An Introduction to Dielectric Withstand Testing with the HT-10000P

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-10000P 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-10000P can be configured with or without voltage ramp time, 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-10000P. 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-10000P 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 or component problem in the circuit.

The leakage current is also monitored by the HT-10000P to ensure that excessive leakage does not keep the Tester from developing full voltage required for the high voltage test. The HT-10000P will provide full voltage at any leakage current level up to 5mA in DC and 10mA in AC. Set the acceptable leakage current limit using the Shutdown Limit Potentiometer on the front panel. The Shutdown Limit Switch must be set to ON or the HT-10000P keep testing regardless of Leakage Current. Voltage output may sag under these conditions.

If the green Full Voltage indicator lights and the test continues, 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 breakdowns by applying a high voltage between the Output and Return receptacles on the front panel. The HT-10000P uses a separate high-frequency circuit to detect arc breakdowns of greater than 100 nsec duration.

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-10000P 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-10000P has an internal ramp down circuit designed to discharge the high voltage after completion of the dielectric withstand test. The HT-10000P should remain connected to the circuit until the front panel meter shows that the output voltage has dropped to a safe level. On very high voltages, this time may be up to eight seconds.

Section 2

Introduction and Specifications

Introduction

This manual contains complete operating and specifications for the Compliance West USA Model HT-10000P Dielectric Withstand Tester.

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

The HT-10000P features automatic one button 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 unit must be armed by pressing the red **RESET** Button. The test will not begin until the yellow **TEST** Button is pushed.
- If a failure is encountered, the high voltage is immediately shut down, a buzzer sounds, and any voltage stored in the equipment being tested is bled off by a resistor bank in the HT-10000P. 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:

- Voltage ramp, test time and leakage limit are settable.
- Voltage ramp and test duration timer are defeatable for specialized testing.
- Testing may terminated or continued when a dielectric breakdown is detected.
- Test results are determined quickly, without operator intervention.
- Operator instructions are printed on the rear panel for quick reference.
- The HT-10000P allows custom setups for voltage ramp, test time and leakage limit.
- Voltage is discharged by a resistor bank within the HT-10000P upon test completion. Discharge progress is shown on the front panel meter.

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

HT-10000P ac/dc Specifications

ELECTRICAL		
Output	0-10000Vac or 0-14000Vdc .	
Leakage Current	AC: 7500V=10mA, 10000V=8mA DC:10000V=5mA, 14000V=4mA	
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->60 sec., defeatable	
Voltage Ramp-up Time:	User adjustable 1-5 sec., defeatable	
Voltage Ramp-down Time:	Factory set 8 seconds maximum (open circuit)	
Pass/Fail Repeatability	± 2%	
Duty cycle	100 %	
Test adjustments	Front Panel:	Ramp Time Test Time Leakage Limit Voltage Adjust Ramp ON/DEFEAT Timer ON/DEFEAT Hipot ON/DEFEAT
ENVIRONMENTAL		
Operating Temperature	15-40°C	
Relative Humidity Range	0-90% non-condensing	
GENERAL		
Input power requirements	108-132 volts, 50/60 Hz, 2A max	
Weight	27 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.	

Table 2-1. HT-10000P ac/dc Specifications

Section 3

Operation

This section describes how to set up and make measurements with the HT-10000P We recommend that you read the entire section carefully so that you can use all of its features.

Setting up the HT-10000P

The HT-10000P is shipped in a special protective container that should prevent damage during shipping. The container should include the following:

- The HT-10000P Dielectric Withstand Tester
- A black 18 AWG Test Return Lead (Alligator Clip/Banana Plug ends)
- A red 18 AWG High Voltage Test Lead (Alligator Clip/High Voltage Plug ends)
- A Power Cord.
- This Instruction Manual

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.

Remove the Tester from its container and place it on a test bench.

AC Line Voltage Requirements

Connect the HT-10000P only to a voltage source per the rating on the rear panel.

Fuse Replacement

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 replaced.

HT-10000P ac/dc Front Panel Features.

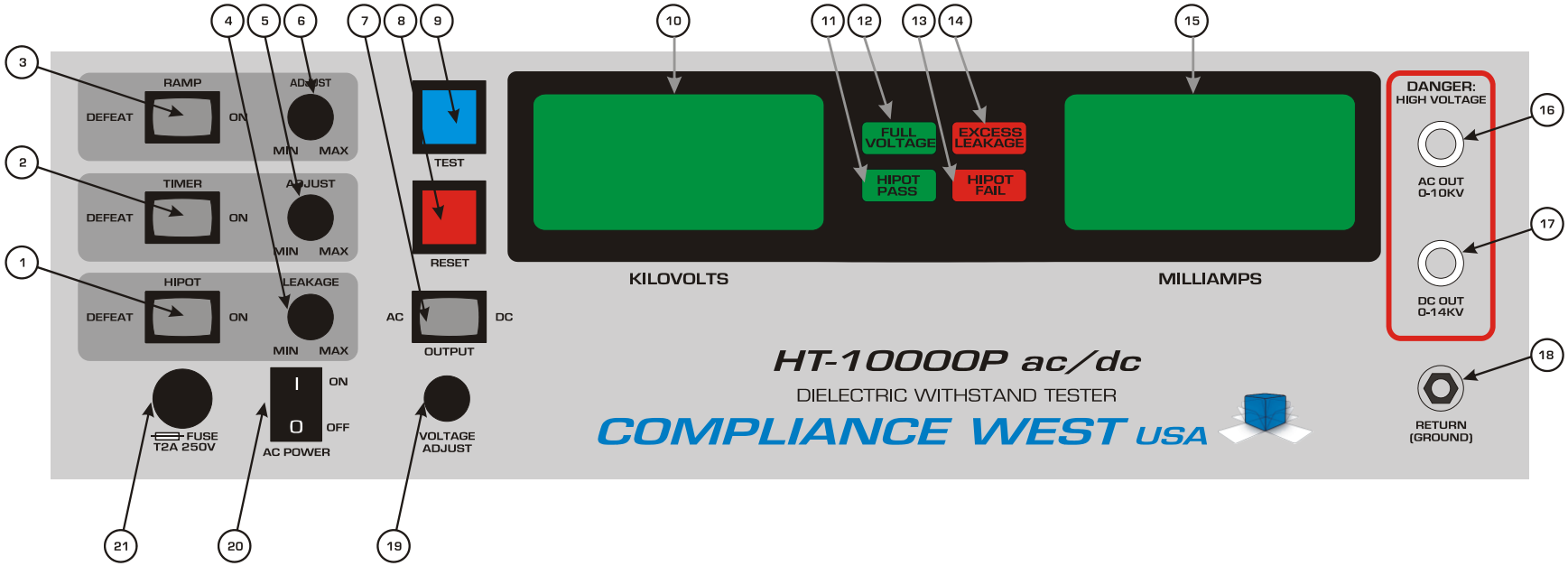


Figure 3-1. Controls, Indicators, Connectors - Model HT-10000P ac/dc Front Panel

ITEM NO.	NAME	FUNCTION
1	HIPOT	When ON, Leakage Limit is as set by the Leakage Adjust, Item 4. When in DEFEAT position, test will continue regardless of leakage current or dielectric breakdown. The RAMP Switch and TIMER Switch must also be in the DEFEAT position. The test will continue only as long as the TEST Button is pressed. Minimum test time is approximately one second. NOTE: Continued testing into a short circuit condition may damage the HT-10000P ac/dc. Make sure there is a voltage indication on the meter. If there is no voltage present, you are testing a short circuit and the HT-10000P ac/dc may be damaged or the fuse may blow.
2	TIMER	When ON, test duration is set by TIMER ADJUST, Item 5. 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	RAMP	When ON, Voltage ramp up time is controlled by RAMP ADJUST, Item 6. When in DEFEAT position, high voltage is applied immediately when TEST button is pressed. NOTE: RAMP Switch position must be DEFEAT when HIPOT Switch is in the DEFEAT position.
4	LEAKAGE ADJUST	Adjusts the shutdown point for the Leakage Current Test. For details see "Leakage Current Adjust."
5	TIMER ADJUST	Adjusts the test duration. For details see "Test Time Adjust".
6	RAMP ADJUST	Adjusts the delay between time TEST button is pushed and time desired output voltage is attained. For details see "Ramp Time Adjust". For no delay, DEFEAT Ramp Time Switch, Item 3.
7	AC/DC Switch	Selects AC or DC output. Operates only when RESET or TEST switch is lit – does not function during a test.
8	RESET Button	When lit, indicates that the HT-10000P ac/d is unarmed. When the RESET Button is pressed, the TEST switch is lit. PRESSING THE RESET BUTTON AT ANY TIME IMMEDIATELY STOPS TESTING.
9	TEST Button	When lit, indicates the HT-10000P ac/dc is ready to test; press to begin testing.
10	VOLTAGE METER	Connected to the output. Reads actual output voltage. Adjust meter range with VOLTAGE ADJUST Knob, Item 19.
11	HIPOT PASS LED	Indicates test conclusion with satisfactory results.
12	FULL VOLTAGE LED	Lights when output voltage has ramped up. Test time starts when this indicator lights.
13	HIPOT FAIL LED	Lights when arcing or insulation flashover has occurred.
14	EXCESS LEAKAGE LED	Actual leakage current has exceeded the shutdown point set with Shutdown Limit Potentiometer, Item 4. Depending on setting of Shutdown Limit Switch, Item 1, test may terminate immediately or continue.
15	CURRENT METER	Connected to the output. Reads the current flowing through the return lead of the HT-10000P ac/dc during the test.
16	AC OUTPUT Receptacle	Connect high voltage lead here to conduct an AC test.
17	DC OUTPUT Receptacle	Connect high voltage lead here to conduct a DC test.
18	RETURN Receptacle	At chassis ground reference level. Connect black return lead here.
19	VOLTAGE ADJUST Knob	Voltage is continuously adjustable during testing with this knob.
20	AC POWER Switch	Energize the HT-10000P ac/dc with this double pole, double throw switch. I = power on, O = indicates power off.
21	FUSE	Mains fuse. Replace only with type and rating of fuse specified on the front panel label. Turn off power switch, Item 22, before servicing fuse.

Table 3-1. Controls, Indicators, Connectors - Model HT-10000P ac/dc Front Panel

HT-10000P ac or dc Front Panel Features.

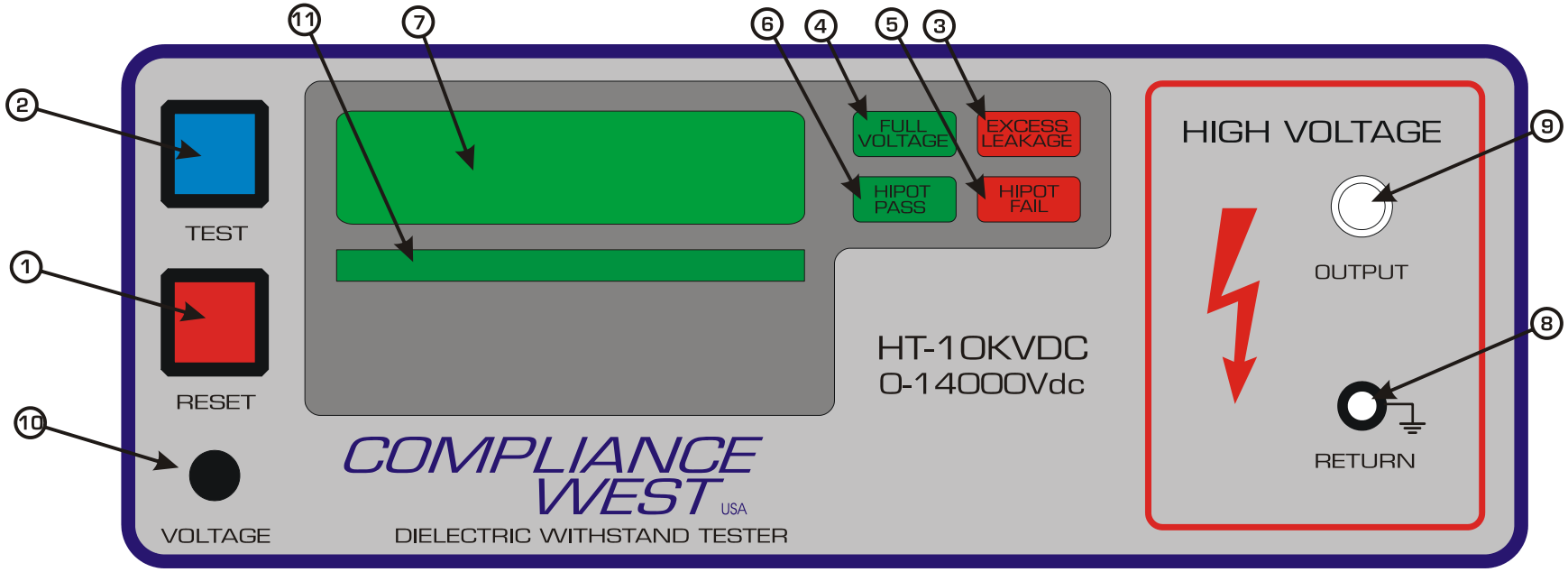


Figure 3-2. Front Panel Controls, Indicators, Connectors - HT-10000P dc & HT-10000P ac.

ITEM NO.	NAME	FUNCTION
1	RESET Button	When lit, indicates that the HT-10000P (AC and DC only) is unarmed. This button must be pushed before the TEST Button is functional. When the RESET Button is pressed, the red lamp goes out and the blue TEST lamp is lit. **PRESSING THE RESET BUTTON AT ANY TIME STOPS THE TEST.** Replace lamp with type 73 T1¾ 14V lamp.
2	TEST Button	When lit, indicates that the HT-10000P is ready to test. The blue lamp goes out when the TEST Button is pressed. Replace lamp with type 73 T1¾ 14V lamp.
3	EXCESS LEAKAGE LED	Indicates failure of leakage current test. If leakage current is too high, the red LED will light and the internal buzzer will sound. The test may be terminated, depending on the setting of the Failure Shutdown Switch.
4	FULL VOLTAGE LED	The full voltage LED will light and if not defeated, the high voltage duration time starts when the voltage output reaches the preset level.
5	HIPOT FAIL LED	Indicates failure of high voltage test. If arcing or a flashover of the insulation system is detected, the red breakdown LED will light, the internal buzzer will sound. The test may be terminated depending on the setting of the Failure Shutdown Switch.
6	HIPOT PASS LED	At the preset test duration time, if no insulation breakdowns are encountered, the green light will light and the test will terminate. If the Test Timer Switch is defeated, testing continues only while the Test Button is pressed (minimum test time one second).
7	VOLTAGE Display	Visual indication of the actual output voltage.
8	RETURN Receptacle	Grounded banana plug jack. For Return Lead connection.
9	OUTPUT Receptacle	Red High Voltage jack. For connection of high voltage test lead.
10	Voltage Adjust Knob	Voltage is continuously adjustable during test.

Table 3-2. Controls, Indicators, Connectors - HT-10000P dc & HT-10000P ac Front Panel

HT-10000P ac or dc Rear Panel Features.

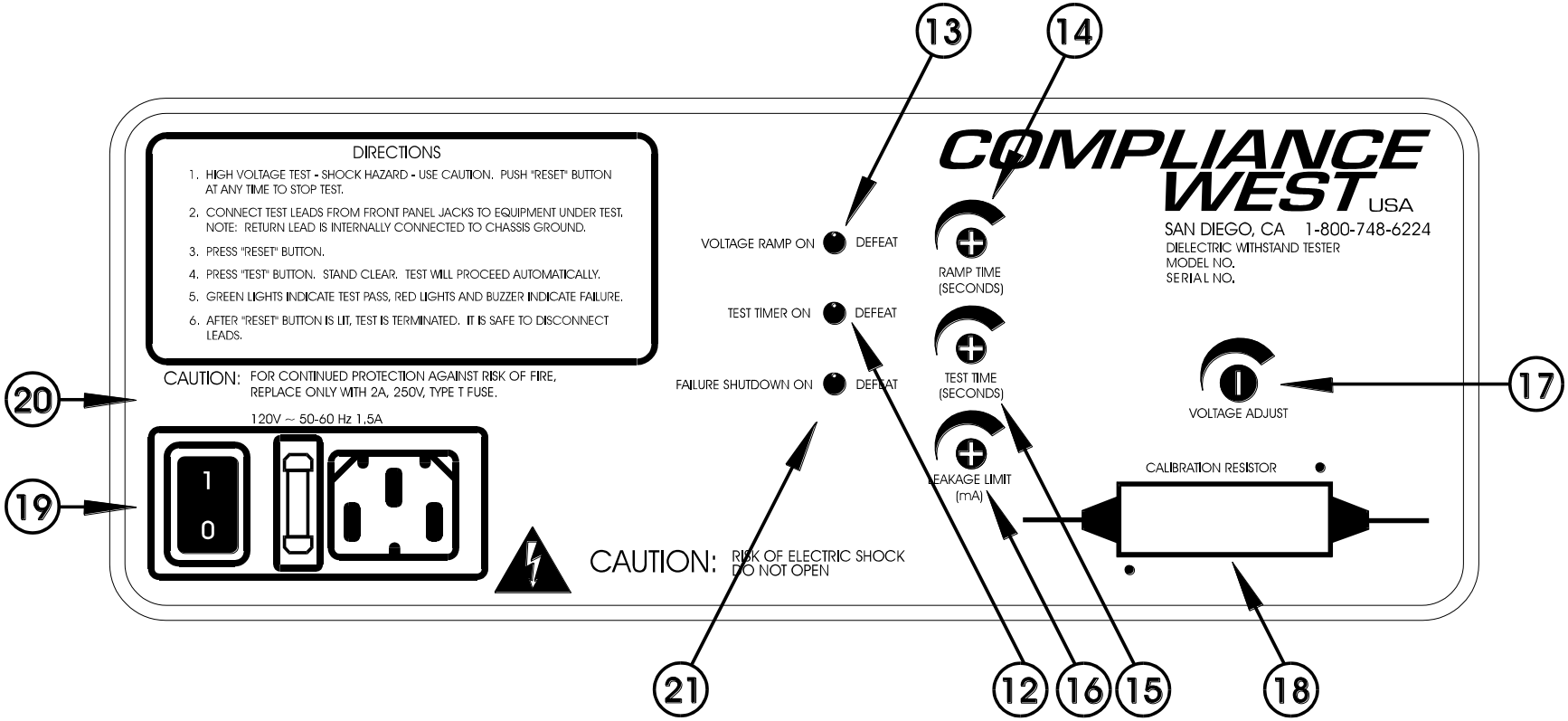


Figure 3-3. Controls, Indicators, Connectors - HT-10000P dc & HT-10000P ac Rear Panel

ITEM NO.	NAME	FUNCTION
12	TEST TIMER Switch	When in ON position, test duration is as set by Test Time Adjustment, Item 15. When in DEFEAT position, test continues as long as TEST Button on front panel is pressed. Minimum test time is approximately one second.
13	VOLTAGE RAMP Switch	When in ON position, high voltage rampup time is as set by Ramp Time Adjustment, Item 14. When in DEFEAT position, high voltage is applied immediately.
14	RAMP TIME	Adjusts the amount of time used to reach the correct high voltage output level. See "High Voltage Ramp Time Adjust" section.
15	TEST TIME	Adjusts the test duration. See "High Voltage Test Time Adjust" section.
16	LEAKAGE LIMIT	Adjusts the alarm level for the excessive leakage current test. See "Leakage Current Level Adjust" section.
17	VOLTAGE ADJUST	Adjusts the High Voltage output. See "High Voltage Level Adjust" section.
18	CALIBRATION RESISTOR	Used in the Leakage Limit Adjustment procedure. See "Leakage Current Level Adjust" section.
19	Appliance Inlet / Fuseholder / Power Switch	AC Input. Replace line fuse. Turn Tester ON/OFF.
20	Fuse replacement warning / Rating of supply	Specifies replacement fuse and supply voltage used.
21	FAILURE SHUTDOWN Switch	When in ON position, a leakage or dielectric failure will terminate the test. When in DEFEAT position, test will continue.

Table 3-3. Control, Indicators, Connectors - HT-10000P dc & HT-10000P ac Rear Panel

Initial Checkout Procedure

Use this procedure to verify that the HT-10000P is working correctly. This procedure should be conducted daily. Refer to Figures 3-1, 3-2 and 3-3 for location of items.

CAUTION
High voltage. Risk of shock. Use care.

1. Turn the Tester on using the AC Power switch.
2. Set the AC/DC Switch to the AC position (HT-10000P ac/dc only).
3. Set the Voltage Ramp Switch, Test Timer Switch, and Failure Shutdown Switche to ON.
4. Disconnect leads from the Output and Return jack.
5. Set the Test Time to mid-travel.
6. Push the RESET button. The TEST button should light.
7. Push the TEST button.
8. The HT-10000P will conduct a test. The meter will read a voltage, hold, and return to zero. During the test, the voltage can be adjusted using the Voltage Adjust knob. At the end of the test, the Full Voltage, Hipot Pass, and RESET switch indicators should be lit.
9. Connect the red lead to the Output receptacle, and the black lead to the Return receptacle, in the HT-10000P ac/dc connect to the AC output receptable..
10. Connect the two leads together to simulate a high leakage current condition. Push the RESET button and then push the TEST button.
11. Test should terminate immediately and the buzzer should sound. The Excess Leakage Indicator and RESET button indicators should be lit. If a spark occurred, the Hipot Fail indicator will also be lit.
12. Leaving the red and black leads connected together, disconnect the black lead from the HT-10000P.
13. Enable the voltage output by pressing the RESET button, then the TEST button. When the full voltage indicator lights, adjust the Voltage knob so the output is approx. 2500 volts. Press the RESET button to disable high voltage output.
14. Verify that the red and black leads are connected together, the black lead is connected to the Return receptacle, and the black lead is disconnected from the HT-10000P.
15. (This test simulates a dielectric breakdown. High voltage could exist on the alligator clips. Exercise caution to avoid shock.) Push the RESET button, then the TEST button. After the full voltage indicator lights, pick up the black lead and insert it into the return Receptacle. The test will immediately terminate with a buzzer. The Full Voltage, Hipot Fail, and RESET button indicators should be lit.
16. Set the AC/DC switch on DC and repeat steps 4-16. Use the DC Output receptacle for these test (For HT-10000P ac/dc only)

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-10000P for Laboratory Testing

This section describes procedures for setting the HT-10000P

a. Voltage type
b. Leakage current level
b. High voltage ramp time
c. High voltage level
d. High voltage test time
e. Voltage ramp switch
f. Test timer switch
g. Breakdown detect switch.

This will allow you to change settings from the factory settings below. Refer to Figures 3-1, 3-2 and 3.3 for location of items.

Factory Settings

The HT-10000P is configured as shown when shipped from Compliance West USA:

Voltage Type (HT-10000P ac/dc):	AC
Voltage Type (HT-10000P ac):	AC
Voltage Type (HT-10000P dc):	DC
Leakage Current Level:	minimum
High Voltage Ramp Time:	minimum
High Voltage Level:	0 Volts
High Voltage Test Time:	minimum
Voltage Ramp Switch:	ON
Test Timer Switch:	ON
Breakdown Detect Switch:	ON

Voltage Type Selection (HT-10000P ac/dc)

Use the AC/DC Voltage Switch, item 7. This switch is functional only when the RESET or TEST button is lit. The Leakage Current level must be reset when switching between AC and DC output.

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-3000P 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-3000P is ready.
3. Use the AC/DC button to select the type of output voltage.
4. Turn the **Leakage Limit Adjust**. As soon as the potentiometer starts turning, the meter will start blinking, display "L", and the value can be set in 0.1 mA increments.

Ramp Time Adjust

This procedure sets the high voltage ramp time between 0.5 and 5 sec. The factory setting of one second is adequate for most situations. However, DC testing into a larger capacitive loads may cause a shutdown due to excessive leakage current. In this case, increasing the ramp time may solve the problem.

1. Make sure there are no test leads connected to the Tester.
2. Set the Voltage Ramp Switch to ON.
3. Set the Test Timer Switch to ON.
4. Set the Failure Shutdown Switch to ON.
5. Push the RESET button, then the TEST button.
6. The FULL VOLTAGE indicator will light. The time from when the TEST button is pushed to when the FULL VOLTAGE indicator lights is the Ramp Time. Set the Ramp Time Potentiometer to change the ramp time. Repeat until the desired Ramp Time is set.

Voltage Adjust

This procedure controls the high voltage level used in the dielectric withstand test. The HT-10000P is factory set for 0 Volts as shipped from the factory. Use the procedure below to set it.

1. Make sure there are no leads connected to the tester.
2. Set the Voltage Ramp Switch to ON.
3. Set the Test Timer Switch to DEFEAT.
4. Set the Failure Shutdown Switch to ON.
5. Turn the Voltage Adjust knob to Zero(counterclock wise)
6. Set the Voltage Range Switch to the appropriate range for the voltage desired.
7. For HT-10000P ac/dc use the AC/DC Switch for the desired output voltage.
8. Push the RESET button.
9. Push and hold the TEST button. Voltage will be supplied while the TEST button is pressed.
10. After the FULL VOLTAGE indicator lights, use the Voltage Adjust knob to set the desired output.
11. Release the TEST button to terminate the test.

High Voltage Test Time Adjust

This procedure sets the length of time the HT-3000P 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 for 1 seconds. Consult the safety agencies for the test time for the type of equipment being tested. If a different test time is required, use this procedure to set it.

1. Defeat the **Ground Check**.
2. Connect the tester to a correctly rated source of supply and turn ON the power switch.
3. Push the **RESET** button. The **TEST** indicator should light, indicating that the HT-3000P is ready.
4. On the rear panel turn the **Test Time** potentiometer. As soon as the potentiometer starts turning, the meter will display "d" and the value can be set in 1 second increments from 1 to 60 seconds.
5. Check the position of the **Ground Check** switch before conducting testing.

Setting the Voltage Ramp Switch

When this switch is in the DEFEAT position, the voltage will immediately rise to the level set by the Voltage Adjust knob. The Timer Control setting is ignored.

When this switch is in the ON position, the voltage ramps according to the setting of the Timer Control. See adjustment instructions above. The Voltage Ramp Switch must be defeated if Shutdown Limit Defeat is desired. See Table 3-4 for details.

Setting the Test Timer Switch

The Timer Control switch allows test time to be controlled by the HT-10000P's 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-10000P's 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 3-4 for details.

Setting the Failure Shutdown Switch

Use Extreme Caution when using this function!

The Breakdown Detect switch allows the operator to continue testing after a failure is encountered. This allows the operator to find a breakdown point, but **all arc shutdown circuitry in the HT-10000P is disabled when the Breakdown Detect switch is in the DEFEAT position**. Tests may be terminated at any time by releasing the TEST button.

When the Breakdown Detect switch is in the DEFEAT position, the test continues while the TEST button is held down (minimum duration 1 second). This allows the operator to find insulation breakdowns easily.

When the Breakdown Detect switch is in the ON position, the HT-10000P will stop the test when excessive leakage or a high voltage arc is detected. Leave the Shutdown Limit switch in the ON position for normal testing.

WARNING: Testing with the Shutdown Limit switch in the DEFEAT position is extremely hazardous. The HT-10000P 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-10000P is operating. Do not operate the HT-10000P for extended periods under conditions of dielectric failure, as overheating and/or damage to the equipment being tested may result.

Operating Techniques

The following paragraphs describe how to operate the HT-10000P Dielectric Withstand Tester.

CAUTION:

High voltage is generated by the HT-10000P. Although the chassis of the equipment under test is grounded by the HT-10000P, a risk of shock exists. Exercise care when using the HT-10000P.

Daily Operation Test

The operation of the HT-10000P should be checked daily by conducting the tests described in the **Initial Checkout Procedure** section of this Manual.

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-10000P 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. For HT-10000P ac/dc plug the red lead into the AC or DC Output receptacle and set the AC/DC switch accordingly.
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; item 1. The TEST button should light, indicating that the HT-10000P is ready to test.
6. Push the TEST button. The HT-10000P will either:
   - Ramp the voltage at the rate set by the Ramp Time Procedure, if the Ramp Control switch is set to ON.
   - Immediately energize the high voltage output if the Ramp Control Switch is set to DEFEAT.
7. 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 3-4 are met, the HT-10000P will continue to test. Voltage output may sag if the power required by the circuit is beyond the capabilities of the HT-10000P.
8. If the Timer Control switch is set to ON, the HT-10000P 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.
9. If a insulation system breakdown is detected, and
   - The Shutdown Limit switch is ON, the Hipot Fail indicator will light, the buzzer will sound, the voltage will ramp down to a safe level, and the test will terminate.
   - The Shutdown Limit switch is set to DEFEAT, and the requirements of Table 3-4 are met, the Hipot Fail indicator will light and the test will continue as long as the TEST button is pressed.
10. If no breakdown is detected, the high voltage will ramp down, the Hipot Pass indicator will light, and the RESET button will light.
11. Do not disconnect the leads from the equipment being tested until test has terminated, and the meter indicates less than 50 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 (AC tests): 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 **Adjustment of the Leakage Current Shutdown point**.
   If the Shutdown Limit level is at its highest setting and failures continue, switch to a DC test. If failures still continue after switching to a DC test, check the circuit being tested with an ohmmeter; it may be shorted.

2. Ramp Time (DC tests): May be set too low. A very fast ramp time may allow input capacitors to charge, triggering a Leakage Current Fail light and terminating the test. Consider lengthening the ramp time; see **Ramp Time Adjust.**

Front Panel Switch Truth Table

SWITCH NAME	SWITCH POSITION							
VOLTAGE RAMP	ON	DEFEAT	ON	DEFEAT	ON	DEFEAT	ON	DEFEAT
TEST TIMER	ON	ON	DEFEAT	DEFEAT	ON	ON	DEFEAT	DEFEAT
FAILURE SHUTDOWN	ON	ON	ON	ON	DEFEAT	DEFEAT	DEFEAT	DEFEAT
See Result Table	A	B	C	D	E	F	G	H

Table 3-4: Front Panel Switch Truth Table

Result Table

RESULT	DESCRIPTION
A	Fully automatic operation. When Test button is pressed, the output voltage will ramp at a rate determined by the position of the TEST TIME adjustment knob. Test will stop automatically on all leakage or breakdown failures.
B	Voltage Ramp is defeated. Same as (A) above except that full voltage is produced at the output immediately. Test will stop automatically on all leakage or breakdown failures. For safety, we recommend that you begin testing with the front panel voltage knob set at minimum.
C	Test Timer is defeated. Same as (A) above except that 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.
D	Voltage Ramp and Test Timer are defeated. Full voltage is produced at the output immediately when the Test button is pressed. 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. For safety, we recommend that you begin testing with the front panel voltage knob set at minimum.
E	Voltage Ramp and Test Timer are ON, Failure Shutdown is defeated. The HT-10000P will not shut down when a breakdown is detected, allowing evaluation of arcing within the EUT. The Hipot Fail light may flash when an arc is detected. The HT-10000P ramp and test time will be controlled by the knobs on the front panel. At the end of the test, the Hipot Pass light will not illuminate. For safety reasons, excessive leakage current, as set by the Breakdown Detect knob, will cause the HT-10000P to shut down.
F	Test Timer is ON, Voltage Ramp and Failure Shutdown are defeated. The HT-10000P will not shut down when a breakdown is detected, allowing evaluation of arcing within the EUT. The Hipot Fail light may flash when an arc is detected. The HT-10000P test time will be controlled by the knob on the front panel, but voltage will be immediately applied to the EUT when the TEST button is pushed (no ramping). At the end of the test, the Hipot Pass light will not illuminate. For safety reasons, excessive leakage current, as set by the Breakdown Detect knob, will cause the HT-10000P to shut down.
G	Voltage Ramp is ON, Test Timer and Failure Shutdown defeated. The HT-10000P will not shut down when a breakdown is detected, allowing evaluation of arcing within the EUT. The Hipot Fail light may flash when an arc is detected. The HT-10000P ramp time will be controlled by the knob on the front panel, but the test will last for only one second when the full voltage is reached. No operator intervention will make the test continue longer; i.e. pushing the TEST button will have no effect. At the end of the test, the Hipot Pass light will not illuminate. For safety reasons, excessive leakage current, as set by the Breakdown Detect knob, will cause the HT-10000P to shut down.
H	Hipot Test Defeat. Full voltage is produced at the output immediately. Test will continue only as long as the TEST button is held in, minimum one second. The HT-10000P 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, we recommend that you begin testing with the front panel voltage knob set at minimum. For safety reasons, excessive leakage current, as set by the Breakdown detect knob, will cause the HT-10000P ac/dc to shut down.

Table 3-5: Result Table

Section 4

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-10000P 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, 10.P.
   B) The version of the software
   C) Laboratory number to designate who performed the last calibration:
   (1= Compliance West USA, 2= another company)

Section 5

Maintenance and Calibration

WARNING

MAINTENANCE AND CALIBRATION INSTRUCTIONS ARE FOR QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THE CONTAINED IN THE OPERATING INSTRUCTIONS.

Introduction

This section of the manual contains maintenance information for the MegaPulse Defib-5 P impulse tester. A 1-year calibration cycle is recommended to maintain the specifications of the factory. The test equipment required for the performance test is a digital oscilloscope, high voltage oscilloscope probe, digital meter and a high voltage probe.

Service Information

The MegaPulse tester 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.

General Maintenance

To avoid contaminating the PWB with oil from your fingers, handle it by the edges or wear gloves. If the PWB becomes contaminated, refer to the cleaning procedures given later in this section.

WARNING

Dangerous voltages exist when energized. Exercise extreme care when working on an energized circuit.

Cleaning

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)

CAUTION

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

Calibration Information

The Calibration Procedure should be performed annually and any time the instrument has been repaired. The calibration procedure should be performed at an ambient temperature of 23°C ±5°C (73.4°F ±9°F). The procedure consists on internal components tolerance verification and calibrating the meter reading to agree with the capacitor bank. The Calibration procedure must be performed by qualified personnel, for more information contact Compliance West USA.

Section 6

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**

Contact:

Compliance West USA
650 Gateway Center Way, Suite D,
San Diego, CA., 92102
United States of America.

Phone: (619) 878-9696
FAX: (619) 794-0404