GPT-9800 Series

Electrical Safety Tester

2 Year WARRANTY

FEATURES

- 200VA AC Test Capacity
- 240x64 Ice Blue Dot Matrix LCD
- Manual/Auto Mode
- Function Key for Quick Selecting
- High Intensity Flash for Caution & Status Indication
- Safety Interlock Function
- Zero Crossing Turn-on Operation
- Controllable Ramp-up Time
- True RMS Current Measurement
- High Resolution : 1μA for Measuring Current, 2V for Setting Voltage
- PWM Switching Amplifier to Enhance the Power Efficiency and Reliable Testing
- Max. 100 Memory Block for Test Condition(Step) Setting. And Each Step can be Named Individually
- Remote Terminal on the Front Panel for “Start”and“Stop” Control by External
- Interface : RS-232C, USB Device, Signal I/O and GPIB (Optional)

GW INSTEK
Simply Reliable

A Solid Foundation for Reliable, Safe and Practical Safety Compliance Testing.

The GPT-9800 Series Electrical Safety Tester, with high durability and multiple user-protection design, look to meet the test requirements of a variety of safety standards, such as IEC, EN, UL, CSA, GB, JIS, and other safety-related tests for the electronic products and components.

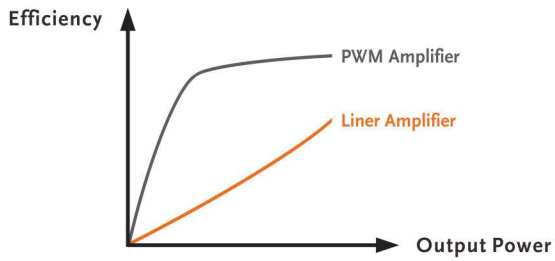
A total of 4 safety testers in the GPT-9800 Series, namely GPT-9804, GPT-9803, GPT-9802 and GPT-9801, are available for various applications. The GPT-9804 is a 4-in-1 model capable of performing AC withstanding, DC withstanding, insulation resistance and ground bond tests. The GPT-9803 is a 3-in-1 model capable of performing AC withstanding, DC withstanding as well as insulation resistance tests. The GPT-9802 is capable of performing both AC and DC withstanding tests, whereas the GPT-9801 is able to perform AC withstanding test. The series of safety tester is built upon a high-efficiency PWM amplifier platform with AC 200VA maximum output capacity to impede the influence from the voltage fluctuation of the input AC source. This ensures a stable voltage supply for all the tests of the GPT-9800 Series.

Targeting user's protections, the GPT-9800 Series uses a combination of hardware and software controls to improve safety: A self-check is performed to make sure all the functions and operations are under normal condition each time when the tester is turned on; the Zero Crossing Turn-On design imposes the output voltage to always begin at the zero crossing of a sine wave to avoid the impact of surge voltage output; and the output voltage is automatically cut off (within 150μs) when abnormal output voltages have been detected or when the upper or lower current limits have been reached during testing. To protect operator from hazardous injury, the GPT-9800 Series automatically discharges the DUT after test (within 200ms) each time to eliminate excessive voltage that remains on the DUT. To further ensure safety, the interlock key can also be used as double protections to prevent inadvertent operation.

The GPT-9800 Series, equipped with a simple & clear panel layout, a high resolution dot matrix LCD display, and color LED indicators, allows operators to interpret measurement results easily and quickly. All major test functions, including AC withstanding (AC 5kV/40mA), DC withstanding (DC 6kV/10mA), insulation resistance (DC 50V ~ 1000V) and ground bond (AC 30A max.) tests, are performed under a high-stability voltage output with high-resolution measurement results. Further more, the test duration, ramp up time and upper/lower limits of the output voltage are fully-adjustable to accommodate a wide variety of safety tests with accurate measurement results.

Other functions and features of the GPT-9800 include: open circuit detection for ground bond testing to get correct measurement result with confidence; 100 sets of memory to save panel settings, which can be recalled for single test individually or for automatic tests in sequence; a remote output on-off terminal in the front panel and a signal I/O port in the rear panel provided as the means for remote start/stop control of the safety tester; RS-232C, USB and GPIB (optional) interfaces available for PC remote control and test result logging.

A. HIGH EFFICIENCY AND HIGH STABILITY OUTPUT



PWM Amplifier Efficiency

Unlike conventional safety tester design that uses variable voltage transformer and class A/B amplifier to provide test voltage, the GPT-9800 Series, carrying a high-efficiency PWM amplifier design, generates output source up to 98% efficiency. This greatly reduces the amount of power loss to heat and therefore lowers the temperature within the cabinet. The suppression of temperature rise during heavy-duty operations of the tester significantly increases its reliability and service lifetime. In addition, as PWM amplifier is comparatively more resistant to the fluctuations of input power voltage, a stable high-voltage output with less than 1% regulation is provided by the GPT-9800 Series to perform precision tests.

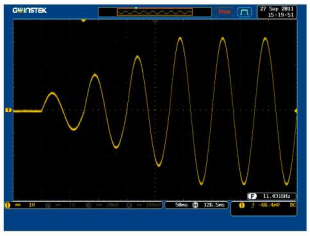
B. HIGH ACCURACY AND HIGH RESOLUTION TESTING PERFORMANCE

High Adjustment & Measurement Resolution

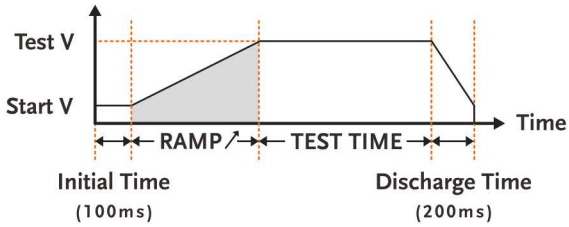
In order to provide high accuracy safety test for product manufacturing, regulation compliance, and characteristic verification, the withstanding test voltage (AC 5kV Max. /DC 6kV Max.) of the GPT-9800 Series can be adjusted in 2V steps, while the current measurement can be done with 1 μA resolution and ±(1.5% + 30 μA) accuracy to enable small leakage current measurements of the products or the components. In addition, the test voltage of insulation resistance of the GPT-9800 Series can be adjusted in 50V steps within its DC output range from 50V to 1000V, carrying a measurement accuracy of ±(10% of reading +1 MΩ) at full scale (2000MΩ/9500MΩ). This provides the flexibility for performing I.R. measurements under variable levels of applied voltage. As the majority of safety regulations need an AC source for ground bond test, the GPT-9800 Series provides 6Vac voltage (open circuit) and 3A~30Aac current for ground bond test, meeting IEC 60601-1 requirements. Furthermore, open circuit detection (via SOURCE H, SENSE H and SOURCE L terminals) for ground bond testing is also provided to check if the test apparatus has been properly connected before the start of a test. This is to ensure the ground bond test is done accurately without any unnoticeable misconnection between the test leads and the test terminals.

With these capabilities, the user is able to perform various safety tests and verifications with high flexibility, accuracy and confidence.

C. SAFETY GUARDING THROUGHOUT THE TESTING PERIOD



Zero-Crossing Operation



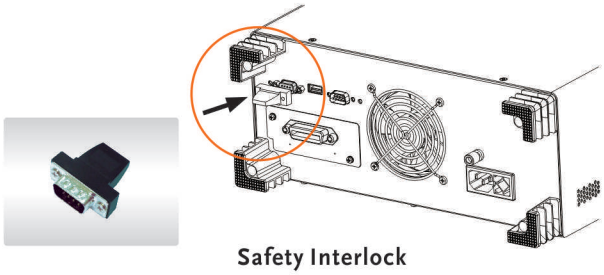
Output Voltage Variation in One Test Cycle

To protect operator from high voltage shock and DUT from unintended damage, the protection functions are always in operation throughout the testing period. When the power is turned on, the GPT-9800 Series immediately goes through the self-check procedures to ensure that all test functions are performed under normal conditions, as the first protection function being applied.

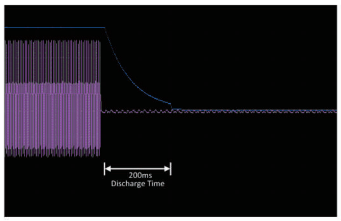
The second protection function is activated once the "Start" (output) button is pressed. Within the100ms initialization period of output start, the GPT-98000 will send a detection voltage (~100V) to check whether the DUT has any short circuit defect due to poor insulation before the high voltage is applied. This is to prevent high voltage or current from returning to the DUT during the test time. To protect DUT from insulation breakdown caused by the rapid increase of test voltage at output start, and avoid flashover or arcing phenomena that could affect the test results, the GPT-9800 Series has a Zero Crossing Turn-On feature, which ensures the output voltage to always start from the zero crossing of a sine wave. Moreover, the adjustable voltage ramp-up time (0.1s ~ 999.9s) allows the test voltage to slowly rise to the set test voltage to reduce the risk of damaging DUT during mandatory production testing.

Furthermore, after the voltage has ramped to the set test voltage, the GPT-9800 will continue monitoring the test voltage and cut off power output once any irregularity is detected. This provides both the safety tester and the operator with a high level protection, which allows the test to be done in a safe and accurate manner.

D. MULTIPLE PROTECTION MECHANISMS



Safety Interlock

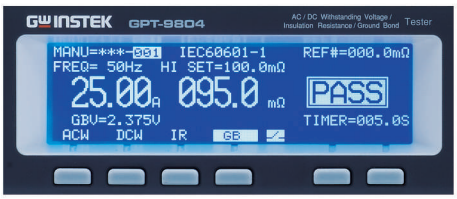


Fast Cutoff in 150μs

The GPT-9800 Series also offers a variety of features for personnel protection to ensure operator's safety when operating the safety tester. The interlock function is provided to set double-start operation procedures for high voltage output. When the interlock function is activated, a dedicated interlock key must be inserted into the Signal I/O port for the tester to start sending out test voltage. This mechanism is designed to prevent unauthorized person from getting access to the tester; the safety tester operator only needs to remove the interlock key to disable the tester output before leaving the working environment. The interlock I/O can also be connected to an external safety device, such as a senor switch or the safety door of a test fixture, to provide "double start" protection. This additional output on/off switch disables the output before the external safety device is activated and thus prevent operator from the exposure of hazardous voltages/currents.
In addition, the GPT-9800 series can quickly cut off its high voltage output within 150μs after the test has been completed, or the high/low current limit has been reached, or an abnormal situation occurs. When a test is completed, the unit will automatically discharge the DUT within 200ms to reduce the hazardous risk of the operator in case of an inadvertent touch of the test apparatus.

E. FRIENDLY USER INTERFACE

High Intensity Indicators

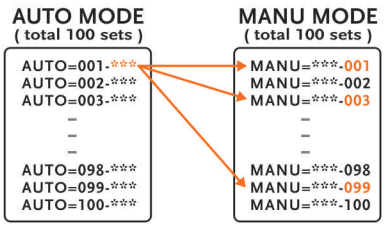


Large LCD and Function Keys

With a 240 x 64 LCD display, the GPT-9800 Series clearly shows test conditions, test parameters, measurement values and test results on the screen at the same time. The real-time status update on the LCD display accompanied by the multi-colored LED status indicators on the front panel allow operator to have a full control of the test process to perform precession test and avoid unnecessary operation risk at the same time. The status indicator above the high voltage output terminal will automatically flash when an output voltage is in place. The function keys below the LCD display allow user to select main test functions on the LCD screen directly without going through tedious processes of multilayer menu operation.

F. CONVENIENT MANUAL AND AUTOMATED TEST

Variety of Control Methods



AUTO Testing include Multiple MANU Processing

In order to comply with all safety regulations, the GPT-9800 Series allocates a large number of memory locations (100 sets in total) for the storage of a variety of test conditions. When a test condition is saved into one of the 100 fixed memory locations, a unique test file name (up to 12 characters) can be assigned to this memory location. For example, a test file named "IEC61010AH" (for IEC61010 AC Withstanding test) can be saved and recalled for future use. Any stored test condition can be recalled for a single test individually, or linked with other test conditions in free-arrangement sequence for automatic testing- eliminating the need to perform a series of tests manually.
In addition to using the START/STOP buttons on the front panel to control the output on/off of the safety tester, the GPT-9800 Series also provides a "Remote" terminal on the front panel for the connection to an external remote controller, and a signal I/O port on the rear panel for the connection to a PLC for actuator control. With RS-232C and USB as standard features (GPIB optional) for all models, the GPT-9800 Series is able to store and retrieve test data and test results via a PC connection.

PANEL INTRODUCTION

1. 240 x 64 Ice blue matrix LCD display, supporting a grater view of setting parameters and testing results
2. High intensity LED indicators to show the status of safety tester
3. Withstanding high voltage output for AC 5kV max. and DC 6kV max. in 2V per step; insulation resistance test from 50V~1000V in 50V per step
4. Quick selecting function keys, corresponding to the functions or parameters displayed on the screen
5. Remote terminal provides “start” and “stop” control by an external controller
6. High current output up to 30A ac for 4 wires Ground Bond testing
7. The Signal I/O port provides remote control “start” and “stop” functions and monitor the test status of the tester
8. USB and RS-232C communication ports facilitate the easy & convenient communication
9. GPIB communication is supported as optional

CE | USB | RS-232 | GPIB | Remote Terminal | Signal I/O

APPLICATIONS

- **Safety Testing of Electrical Product in Manufacturing**
  - Power Cord
  - Home Appliances
  - Information Technology Equipment
  - Medical Equipment
- **Quality Assurance Verification**
- **Safety Standard Compliance Pre-qualification in R&D**

AC/DC Withstanding Voltage/Insulation Resistance/ Ground Bond Tester

GPT-9804

AC/DC Withstanding Voltage/Insulation Resistance Tester

GPT-9803/9802/9801

SPECIFICATIONS

AC WITHSTANDING	**Output-Voltage Range**	0.100kV~ 5.000kV ac
	Output-Voltage Resolution	2V/step
	Output-Voltage Accuracy	±(1% of setting + 5V) [no load]
	Maximum Rated Load	200 VA (5kV/40mA)
	Maximum Rated Current	40mA (0.5kV< V≤5kV); 10mA (0.1kV≤V≤0.5kV)
	Output-Voltage Waveform	Sine wave
	Output-Voltage Frequency	50Hz/60Hz selectable
	Voltage Regulation	±(1% of reading + 5V) [full load → no load]
	Voltmeter Accuracy	±(1% of reading + 5V)
	Current Measurement Range	0.001mA~40.0mA
	Current Best Resolution	0.001mA/0.01mA/0.1mA
	Current Measurement Accuracy	±(1.5% of reading + 30μA)
	Window Comparator Method	Yes
	ARC Detect	Yes
	RAMP (Ramp-Up Time)	0.1s~999.9s
	TIMER (Test Time)*	OFF, 0.5s~999.9s
	GND	RETURN/GUARD
DC WITHSTANDING	**Output-Voltage Range**	0.100kV~6.000kV dc
	Output-Voltage Resolution	2V/step
	Output-Voltage Accuracy	±(1% of setting + 5V) [no load]
	Maximum Rated Load	50W(5kV/10mA)
	Maximum Rated Current	10mA(0.5kV< V≤6kV); 2mA (0.1kV≤V≤0.5kV)
	Voltage Regulation	±(1% of reading + 5V)[full load → no load]
	Voltmeter Accuracy	±(1% of reading + 5V)
	Current Measurement Range	0.001mA~10.0mA
	Current Best Resolution	0.001mA/0.01mA/0.1mA
	Current Measurement Accuracy	±(1.5% of reading + 30μA)
	Window Comparator Method	Yes
	ARC Detect	Yes
	RAMP (Ramp-Up Time)	0.1s~999.9s
	TIMER (Test Time)*	OFF, 0.5s~999.9s
	GND	RETURN/GUARD
INSULATION RESISTANCE	**Output Voltage**	50V~1000V dc
	Output-Voltage Resolution	50V/step
	Output-Voltage Accuracy	±(1% of setting +5V)
	Resistance Measurement Range	1MΩ~ 9500MΩ

Test Voltage	Measurable Range	Accuracy
50V≤V< 500V	1~50MΩ ; 51~2000MΩ	±(5% of reading+1MΩ); ±(10% of reading+1MΩ)
500V≤ V≤1000V	1~500MΩ ; 501~9500MΩ	±(5% of reading+1MΩ); ±(10% of reading+1 MΩ)

	Window Comparator Method	Yes
	RAMP (Ramp-Up Time)	0.1s~999.9s
	TIMER (Test Time)	1s~999.9s
	GND	GUARD (fix)
GROUND BOND	**Output-Current**	03.00A~30.00A ac
	Output-Current Resolution	0.01A
	Output-Current Accuracy	3A ≤ I≤8A : ±(1% of reading + 0.2A) 8A< I≤30A : ±(1% of reading + 0.05A)
	Test-Voltage	6Vac max (open circuit)
	Test-Voltage Frequency	50Hz/60Hz selectable
	Resistance Measurement Range	10 mΩ~ 650.0mΩ
	Resistance Measurement Resolution	0.1mΩ
	Resistance Measurement Accuracy	±(1% of reading + 2mΩ)
	Window Comparator Method	Yes
	TIMER (Test Time)	0.5s~999.9s
	Test Method	Four Terminal
MEMORY	**Single Step Memory**	MANU : 100 blocks
	Automatic Testing Memory	AUTO : 100 blocks, menu per auto : 16
INTERFACE	**RS-232C**	Standard
	USB	Standard
	GPIB	Option
	Remote Terminal (Front)	Standard
	Signal I/O	Standard
DISPLAY	240 x 64 Ice Blue Dot matrix LCD	
POWER SOURCE	AC100V/120V/220V/230V±10% , 50/60Hz	
DIMENSIONS & WEIGHT	330(W) x 150(H) x 460(D) mm ; Approx. 15kg max. for GPT-9803/9802/9801; Approx. 19kg max. for GPT-9804	

* The timer can only be turned-off when the tester is in the special MANU mode.

Specifications subject to change without notice. PT-9800GD1BH

ORDERING INFORMATION

GPT-9804 AC 200VA AC/DC Withstanding Voltage/Insulation Resistance/Ground Bond Tester
GPT-9803 AC 200VA AC/DC Withstanding Voltage/Insulation Resistance Tester
GPT-9802 AC 200VA AC/DC Withstanding Voltage Tester
GPT-9801 AC 200VA AC Withstanding Voltage Tester

ACCESSORIES

Quick Start Guide x 1, Power cord x 1, CDx1(complete user manual), Interlock Key x 1, Remote terminal male plug x 1, Test lead GHT-114 x 1 for GPT-9803/9802/9801, Test lead GHT-114 x 1, GTL-115 x 1 for GPT-9804

OPTIONAL

Opt.1 GPIB card

OPTIONAL ASSESSORIES

GHT-113 High Voltage Test Pistol
GHT-205 High Voltage Test Probe
GTL-232 RS232C Cable, 9-pin Female to 9-pin, null Modem for Computer
GTL-247 USB Cable, A-A type, approx. 1.8m
GTL-248 GPIB Cable, approx. 2m
GRA-417 RACK Adapter Panel (19", 4U)

Global Headquarters
GOOD WILL INSTRUMENT CO., LTD.
No.7-1, Jhongsing Road, Tucheng Dist., New Taipei City 236, Taiwan
T +886-2-2268-0389 **F** +886-2-2268-0639
E-mail: marketing@goodwill.com.tw

China Subsidiary
GOOD WILL INSTRUMENT (SUHZOU) CO., LTD.
NO. 69, Lushan Road, Snd, Suzhou Jiangsu 215011 China
T +86-512-6661-7177 F +86-512-6661-7277
E-mail: marketing@instek.com.cn

Malaysia Subsidiary
GOOD WILL INSTRUMENT (M) SDN. BHD.
27, Persiaran Mahsuri 1/1, Sunway Tunas,
11900 Bayan Lepas, Penang, Malaysia
T +604-6309988 **F** +604-6309989
E-mail: sales@goodwill.com.my

U.S.A. Subsidiary
INSTEK AMERICA CORP.
3661 Walnut Avenue Chino, CA 91710, U.S.A.
T +1-909-5918358 **F** +1-909-5912280
E-mail: sales@instekamerica.com

Japan Subsidiary
INSTEK JAPAN CORPORATION
4F, Prosper Bldg, 1-3-3 Iwamoto-Cho Chiyoda-Ku,
Tokyo 101-0032 Japan
T +81-3-5823-5656 **F** +81-3-5823-5655
E-mail: info@instek.co.jp

Korea Subsidiary
GOOD WILL INSTRUMENT KOREA CO., LTD.
Room No.805, Ace Hightech-City B/D 1Dong,
Mullae-Dong 3Ga 55-20, Yeongduengpo-Gu, Seoul, Korea
T +82-2-3439-2205 **F** +82-2-3439-2207
E-mail : gwinstek@gwinstek.co.kr

GW INSTEK
Simply Reliable

www.gwinstek.com