

WARNING
MANUFACTURER ASSUMES NO LIABILITY
IF UNIT OPERATED IN AN UNSAFE
MANNER.

WARNING
THIS INSTRUMENT GENERATES AND
DELIVERS A HAZARDOUSLY HIGH
VOLTAGE (5kV). BE EXTREMELY
CAREFUL WHEN USING THIS
INSTRUMENT. BE SURE TO READ
MANUAL SECTION 3 PRECAUTIONS

EC Declaration of Conformity

We
GOOD WILL INSTRUMENT CO., LTD.
No.7-1, Jhongsing Road, Tucheng City, Taipei County 236, Taiwan
GOOD WILL INSTRUMENT (SUZHOU) CO., LTD.
No. 69 Lushan Road, Suzhou New District Jiangsu, China.
declares that the below mentioned product
GPT-805/815, GPI-825/826
are herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Law of Member States relating to Electromagnetic Compatibility (89/336/EEC,92/31/EEC) and Low Voltage Equipment Directive (73/23/EEC, 93/68/EEC).
For the evaluation regarding the Electromagnetic Compatibility and Low Voltage Equipment Directive, the following standards were applied:

EN 61326-1: Electrical equipment for measurement, control and laboratory use — EMC requirements (1997+A1: 1998+A2:2001)	
Conducted and Radiated Emissions EN 55011 Group 1 class A: 1998	Electrostatic Discharge EN 61000-4-2: 1995+A1 :1998
Current Harmonic EN 61000-3-2: 2000	Radiated Immunity EN 61000-4-3: 1996+A1 :1998
Voltage Fluctuation EN 61000-3-3: 1995	Electrical Fast Transients EN 61000-4-4: 1995
-----	Surge Immunity EN 61000-4-5: 1995
-----	Conducted Susceptibility EN 61000-4-6: 1996
-----	Power Frequency Magnetic Field IEC 61000-4-8: 1993
-----	Voltage Dips/ Interrupts EN 61000-4-11: 1994

Low Voltage Equipment Directive 73/23/EEC & amended by 93/68/EEC
Safety Requirements IEC/EN 61010-1: 2001
Remark: Also complied with Continuity of Protective Bonding Tester, Insulation Resistance Test, Voltage Test, and Residual Voltage Test in accordance with the Sub-Clauses 19.2, 19.3, 19.4 and 19.5 of EN 60204-1: 1997

CONTENTS	PAGE
1. PRODUCT INTRODUCTION.....	1
1-1.Description.....	1
1-2.Feature.....	2
2. SPECIFICATION.....	3
3. PRECAUTIONS BEFORE OPERATION.....	6
3-1.Unpacking the instrument.....	6
3-2.Checking the Line Voltage.....	6
3-3.Environment.....	8
4. PANEL INTRODUCTION.....	9
4-1.Front Panel.....	11
4-2.Rear Panel.....	12
5. OPERATION METHOD.....	13
5-1.AC Withstanding Test.....	13
5-2.DC Withstanding Test.....	14
5-3.Insulation Test.....	16
6. MAINTENANCE.....	17
6-1.Fuse rating and type.....	17
6-2.Cleaning.....	17

SAFETY TERMS AND SYMBOLS

These terms may appear in this manual or on the product:



WARNING. Warning statements identify condition or practices that could result in injury or loss of life.



CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.



The equipment shall not be used for measurements within category II, III and IV.

The following symbols may appear in this manual or on the product:



DANGER
High Voltage



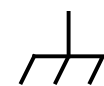
ATTENTION
refer to Manual



Protective
Conductor
Terminal



Earth (ground)
Terminal



Frame or
Chassis
Terminal

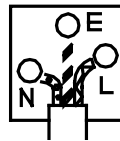
FOR UNITED KINGDOM ONLY

NOTE: This lead/appliance must only be wired by competent persons

WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow:	Earth
Blue:	Neutral
Brown:	Live (Phase)



As the colours of the wires in main leads may not correspond with the colours marking identified in your plug/appliance, proceed as follows:

The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with the letter E or by the earth

symbol  or coloured Green or Green & Yellow.

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.

The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.

If in doubt, consult the instructions provided with the equipment or contact the supplier.

This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, cable of 0.75mm² should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any moulded mains connector that requires removal /replacement must be destroyed by removal of any fuse & fuse carrier and disposed of immediately, as a plug with bared wires is hazardous if engaged in live socket. Any re-wiring must be carried out in accordance with the information detailed on this label.

1. PRODUCT INTRODUCTION

1-1. Description

The GPT/GPI-800 Electrical Safety Testers (EST) are designed for AD/DC Withstanding Voltage test and Insulation Resistance test (IR) in order to provide a safe and accurate test environment for the operator. With thoughtful design described in 1-2. Feature insures a safe operation environment of high voltage test to protect user from hazardous impact.

The Electrical Safety Testers comply with the requirement of the electrical equipment & appliance control ordinances and JIS, CSA, UL, BS and other overseas standards as well. The testers can be used for withstanding voltage test of the various types of electrical and equipment and components.

The GPT/GPI-800 series are based on the family of GW withstanding voltage tester including AC Withstanding Voltage test, DC Withstanding Voltage test and Insulation Resistance test. Please refer to the table as follows:

Model \ Function	AC	DC	IR
GPT-805 (500VA)	✓		
GPT-815 (500VA)	✓	✓	
GPI-825 (500VA)	✓		✓
GPI-826 (100VA)	✓		✓

1-2. Features

The GPT/GPI-800 series offer several other features:

1) Current and output voltage setting

A safe way to set the current and output voltage without high voltage activated.

2) Easily and quickly setting with front panel control

A user-friendly interface provides user an easy and quick way to set all parameters.

3) Testing time

Use micro processor to control testing time.

4) Adjustable ARC detect level

The ARC detect level can be adjusted with front panel control.

5) Adjustable output voltage during test

The output voltage can be adjusted during testing that add an operation flexibility.

6) An alert indicator for high voltage

A flashing red LED indicates dangerous situation during high voltage output is activated.

7) Remote I/O controller

In addition to the 9 pin remote I/O controller to control START/RESET, it also provides PASS/FAIL/TEST signal for professional use.

2. SPECIFICATION (15°C~35°C RH≤75%)

500VA	
1) AC Hi-Pot Specifications (only for GPT-805/815, GPI-825)	
Voltage Regulation	15%
Voltage Range	0.200~5.00kV
Voltage Accuracy	±3% of reading ±3 counts
Current cut-off range	0.3mA~100mA
Current Accuracy	≤1mA ±(5% of reading +40μA)
	> 1 mA ±(5% of reading +20μA)



Warning: The test time by using 5000V 100mA is within 180s, it needs 15 minutes interval after 180s of continuous testing. If proceed continuity test, the test voltage and current must be at 5000V 50mA.

2) DC Hi-Pot Specifications (only for GPT-815)	
Voltage Regulation	20%
Voltage Range	0.200~5.00kV
Voltage Accuracy	±3% of reading ±3 counts
Current cut-off range	0.3mA~10mA
Current Accuracy	≤1mA ±(5% of reading +40μA)
	> 1 mA ±(5% of reading +20μA)



Warning: The test time by using 5000V 10mA is within 180s, it needs 15 minutes interval after 180s of continuous testing. If proceed continuity test, the test voltage and current must be at 5000V 5mA.

100VA	
3) AC Hi-Pot Specifications (only for GPI-826)	
Voltage Regulation	15%
Voltage Range	0.200~5.00kV
Voltage Accuracy	±3% of reading ±3 counts
Current cut-off range	0.3mA~20mA
Current Accuracy	≤1mA ±(5% of reading +40μA)
	> 1 mA ±(5% of reading +20μA)



Warning: The test time by using 5000V 20mA is within 180s and it needs 15 minutes interval after 180s of continuous testing. If proceed continuity test, the test voltage and current must be at 5000V 10mA.

4) Insulation Resistance Specifications (only for GPI-825/826)	
DC Voltage	500V/1000V
Resistance Range	1~2000MΩ
Resistance Accuracy	1~500MΩ : ±5% of reading ± 2counts
	501~2000MΩ : ±10% of reading



Warning: The main purpose provided by the series of the instruments is for Puncture Testing.



Warning: Unlike power supply which can be used on the extreme low load range, when the series are used on the AC voltage, the suggestive load should be more than 500VA at 50kΩ and 100VA at 250kΩ, while used on the DC voltage, more than 500kΩ load is suggested.

5) ARC Detect	
Detect Current	500VA : 0.3~100mA
	100VA : 0.3~20mA
6) Interface	
Terminal type	Terminal seat
7) General Specification	
Power Source	AC115V/ 230V±10%, 50/60Hz
Operation Environment	Indoor use, altitude up to 2000m. Relative Humidity 80% (Maximum). Installation category II Pollution Degree 2
Operation Temperature & Humidity	0°C ~ 40°C, <70%
Storage temperature & Humidity	-10°C ~ 70°C, <70%
Accessories	Power cord × 1, Test lead (GHT-105A) × 1, Instruction manual × 1
Dimension	446(L) × 330(W) × 149(H) (m/m) GPT/GPI-8X5: 20kgs, GPI-826: 13kgs approx.

* All specifications are guaranteed under the distortion of AC power source less than 3%.

3. PRECAUTIONS BEFORE OPERATION

3-1. Unpacking the instrument

The product has been fully inspected and tested before shipping from the factory. Upon receiving the instrument, please unpack and inspect it to check if there is any damage caused during transportation. If any sign of damage is found, notify the bearer and/or the dealer immediately.

3-2. Checking the Line Voltage

The instruments can be applied with any kind of line voltage shown in the table below. Before connecting the power plug to an AC line outlet, make sure the voltage selector of the rear panel is set to the correct position corresponding to the line voltage. It might be damaged the instrument if connected to the wrong AC line voltage.



WARNING: To avoid electrical shock the power cord protective grounding conductor must be connected to ground.



The equipment shall not be used for measurements within category II, III and IV.

When line voltages are changed, replace the required fuses shown as below:

Line voltage	Range	Fuse	Line voltage	Range	Fuse
115V	105-125V	T 6.3A 250V	230V	207-250V	T 3.15A 250V



WARNING: To avoid personal injury, disconnect the power cord before removing the fuse holder.

Operator's Precaution

- (1) With immense high output voltage and current of the puncture tester, only qualified person can operate the tester in order to avoid fatal electric shock.
- (2) On-job training is required for operator to better use the tester smoothly and safely.
- (3) The operator is prohibited to dress with metal ornaments or wear metal decoration in order to avoid electric shock.
- (4) The person with cardiac or wear a pacemaker must not to operate the tester.
- (5) Be sure to wear electric protective gloves whenever operating this instrument, in order to guard against electric shock hazards.
- (6) Before turning on the power switch, make sure that the TEST VOLTAGE dial is in the counterclockwise extreme position(Min. voltage).
- (7) Be sure to turn off the power switch each time the instrument is not used even for a short period of time or when the operator leaves the instrument.
- (8) Before touching the leads or output terminals, be sure to turn off the instrument

Secure Testing

Never operate the tester in the place with electric circuit device around.

The earth lead should be well connected in accordance with instruction. The Return Lead has to be connected to the tested object first before linking up test probe. Do not plug the high voltage test probe to the high voltage output terminal before doing the testing. Also, do not touch the electric conductor of test probe and the operator has to fully control the power on/off by using switch or remote control, which should not be lay aside carelessly.



WARNING: During the testing, do not touch the tested object or any other connected objects.

3-3. Environment

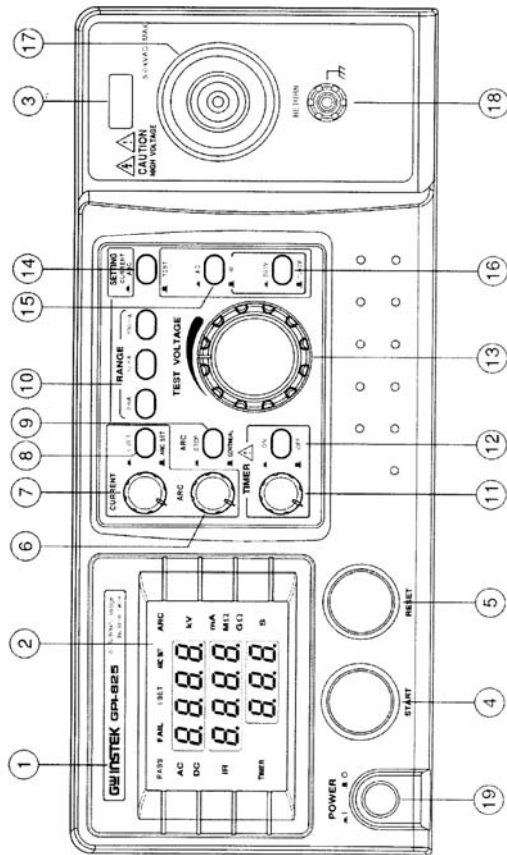
The normal ambient temperature range of this instrument is from 0° to 40°C (32° to 104°F). To operate the instrument over this specific temperature range may cause damage to the circuits.

Do not use the instrument in a place where strong magnetic or electric field exists as it may disturb the measurement.

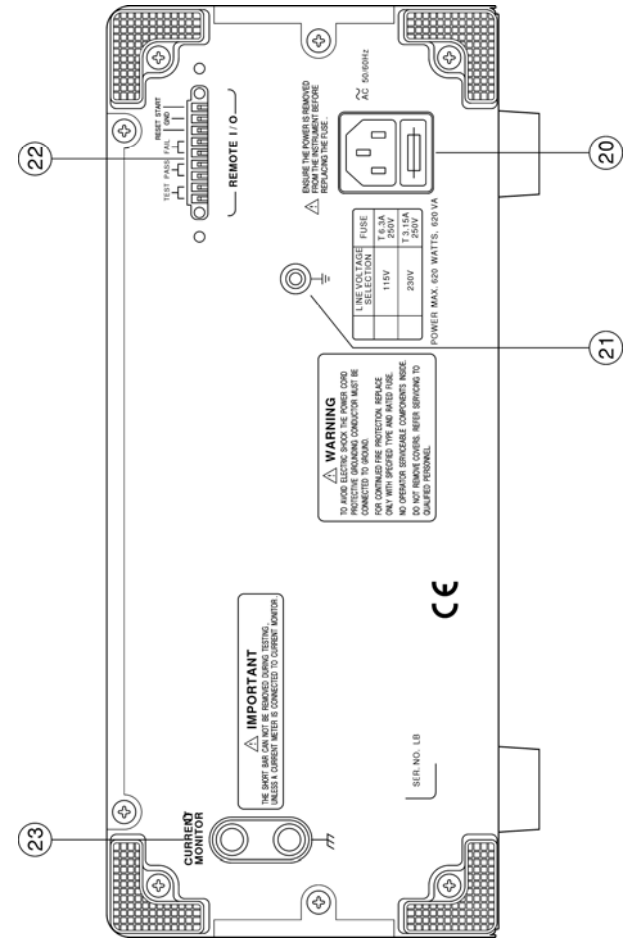


WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

4. PANEL INTRODUCTION



Front Panel



Rear Panel

4-1. Front Panel

1	Model Number	Model number and description
2.	Display	Indicate all messages about test procedure.
3.	CAUTION Indicator LED	During test the red LED will flash to indicate dangerous.
4.	START Button	Press the green button to start a test procedure.
5.	RESET Button	Press the red button to reset/stop a test procedure.
6.	ARC VR	Control ARC range.
7.	Current VR	Control the range of Cut-off current.
8.	I Set/ARC Set	■ : I Set, ■ : ARC Set
9.	ARC Con./Stop	■ : A signal for stop test. when the ARC is in use, the test will be stopped. ■ : A signal for continuous test.
10.	Range	Switch over the range.
11.	Time VR	Control test time.
12.	TIMER ON/OFF	■ : Power on and the test time can be adjusted. ■ : Power off and the test time can not be adjusted.
13.	Test Voltage	Test voltage adjustment.
14.	Setting (Current, ARC, & Test)	■ : Can adjust Current/ARC VR to set current and ARC. ■ : Stand by status for testing.
15.	AC/DC or AC/IR	■ : AC withstand voltage test. ■ : DC withstand voltage test (only for GPT-815) or Insulation Test (only for GPI-825/826).
16.	500V/1000V	■ : 500V, ■ : 1000V(for GPI-825/826 only)
17.	High Voltage Output Seat	High voltage output terminal
18.	RETURN terminal	The test return terminal.
19.	Power switch	Power on to start test.

4-2. Rear Panel

20.	Fuse Holder with Voltage Selector	To change AC source voltage, pull the fuse holder and replace with an adequate fuse to connect with AC power cord.
21.	Ground Terminal	Connect Ground terminal to the earth ground.
22.	Remote I/O Control	Remote I/O output joint point: Test signal: Two test holes has to be shorted when getting into test mode by pressing Start key, and it won't return to open status until the test result of PASS or FAIL comes available, or the RESET key is pressed. PASS signal: At the time when the test result comes out to be PASS, two PASS holes has to be shorted, and return to open until the RESET key is pressed. FAIL signal: At the time when the test result comes out to be FAIL, two FAIL holes has to be shorted, and return to open until the RESET key is pressed. RESET: The function is same as the RESET key on the front panel. START: The function is same as the START key on the front panel.
23.	Current Monitor	The cutoff current can be directly monitored by disconnecting the shorting bar from these terminals and connecting a milliammeter (DC/AC) between them. The milliammeter should be capable of measuring the cutoff current. Be sure to connect the shorting bar when no milliammeter is connected between these terminals.

5. OPERATION

5-1. AC Withstanding Test

Take GPT-805 as example, if want to output 5000VAC, set the cut-off current to 100mA and ARC to 50mA. During the 60s test time, the instrument will keep on testing even when the ARC appears.

- 1) Connect the Withstanding/Insulation Tester to the ground.
- 2) Adjust the “Voltage Knob” counter-clockwise to the lowest voltage position.
- 3) Set power switch to ON **■** position.
- 4) Set CURRENT/ARC to **■** position.
- 5) Set Range to 100mA range.
- 6) Set to I Set **■** position by pressing (8) key, then adjust the Current VR until the value of 100.0 is displayed on the panel.
- 7) Set to ARC Set **■** by pressing (8) key, then adjust ARC VR until the value of 50.0 is displayed on the panel.
- 8) Set to Test **■** by pressing (14) key.
- 9) Set Timer to ON **■** position, adjust the knob until the timer value is at 60s.
- 10) Connect a test lead from the Return terminal (18) to the EUT (equipment under test).
- 11) Connect a red high pot probe from “High voltage output terminal” (17) to the EUT (equipment under test).
- 12) Press **START** key once to appear STBY(Stand by) on the display, then adjust (13) the voltage knob until the value of 5.00 is display on the panel.
- 13) Then, press START key to proceed testing, during testing, the warning indicator(3) will be flashing continuously.
- 14) If the value displayed on the panel drops because of the load

adding test, adjust “Voltage knob” to maintain the value at 5.00.

- 15) If the test on the EUT is approval, the PASS indicator on the panel will be lighted up.
- 16) If the test on the EUT is disapproval, the FAIL indicator on the panel will be lighted up and the buzzer will blare out a warning. Now remove the high pot probe from the EUT, and press RESET to turn off the buzzer and FAIL light, then the instrument will be back to the initial status.

5-2. DC Withstanding Test

Take GPT-815 as example, if want to output 5000VDC, set the cut-off current to 10mA and ARC to 10mA. During the 180s test time, the instrument will stop testing when the ARC appears.

- 1) Connect the Withstanding/Insulation Tester to the ground.
- 2) Adjust the “Voltage Knob” counter-clockwise to the lowest voltage position.
- 3) Set power switch to ON **■** position.
- 4) Set the key (15) to DC **■** position.
- 5) Set CURRENT/ARC of SETTING to **■** position.
- 6) Set Range to 10mA range.
- 7) Set to I Set **■** position by pressing (8) key, then adjust the Current VR until the value of 10.0 is displayed on the panel.
- 8) Set to ARC Set **■** by pressing (8) key, then adjust ARC VR until the value of 10.0 is displayed on the panel.
- 9) Set to Test **■** by pressing (14) key.
- 10) Set Timer to ON **■** position, adjust the knob until the timer value is at 180s.
- 11) Connect a test lead from the Return terminal (18) to the EUT

- (equipment under test).
- 12) Connect a red high pot probe from “High voltage output terminal (17)” to the EUT (equipment under test).
 - 13) Press START key once to appear STBY (Stand by) on the display, then adjust (13) the voltage knob until the value of 5.00 is display on the panel.
 - 14) Then, press START key to proceed testing, during testing, the warning indicator (3) will be flashing continuously.
 - 15) If the value displayed on the panel drops because of the load adding test, adjust “Voltage knob (13)” to maintain the value at 5.00.
 - 16) If the test on the EUT is approval, the PASS indicator on the panel will be lighted up.
 - 17) During testing, if the ARC is occurred, both the lights of ARC and FAIL will be on, and the buzzer will blare out a warning, now remove the high pot probe from the EUT, and press RESET to turn off the buzzer, ARC and FAIL lights, then the instrument will be back to the initial status.
 - 18) If the test is over the jump-out current, the FAIL indicator on the panel will be lighted up and the buzzer will blare out a warning. Now remove the high pot probe from the EUT, and press RESET to turn off the buzzer and FAIL light, then the instrument will be back to the initial status.

5-3. Insulation Test

Take GPT-825 as example, set output to 1000V, but without specifying the test time.

- 1) Connect the Withstanding/Insulation Tester to the ground.
- 2) Adjust the “Voltage Knob” counter-clockwise to the lowest voltage position.
- 3) Set power switch to ON position.
- 4) Set the key (15) to IR position.
- 5) Set the Timer to OFF position.
- 6) Connect a test lead from the Return terminal (18) to the EUT (equipment under test).
- 7) Connect a red high pot probe from “High voltage output terminal (17)” to the EUT (equipment under test).
- 8) Press START key once to appear STBY (Stand by) on the display, then, press START key to proceed testing. During testing, the warning indicator (3) will be flashing continuously.
- 9) If the insulation resistance of the EUT is within $2000M\Omega$, thus the panel will display the insulation resistance value of the EUT, and the testing is kept going until the RESET key is pressed.
- 10) If the test on the EUT is disapproval, the FAIL indicator on the panel will be lighted up and the buzzer will blare out a warning. Now remove the high pot probe from the EUT, and press RESET to turn off the buzzer and FAIL light, then the instrument will be back to the initial status.

6. MAINTENANCE

The following instructions are used by qualified person only to avoid electrical shock, do not perform any service other than contained in the operation instructions unless you are qualified to do so.

6-1. Fuse Rating and type

If the fuse blows, the product will not operate. Try to determine and correct the cause of the blown fuse, then replace the fuse with correct rating and type shown as below:



WARNING: For continued fire protection, replace only with 250V fuse of the specified type and rating, and disconnect the power cord before proceeding fuse replacement.

6-2. Cleaning

To keep the instrument clean, wipe the case with a damp cloth and detergent. Do not use abrasives or solvents.