



Quick Start Guide

RSST-2000 Series

Stock number: 2010446, 2010448, 2010449, 2010450

EN





Limited Warranty

This product is warranted to the original purchaser against defects in material and workmanship for 3 years from the date of purchase. During this warranty period, RS PRO will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction. This warranty does not cover fuses, disposable batteries, or damage from abuse, neglect, accident, unauthorized repair, alteration, contamination, or abnormal conditions of operation or handling. Any implied warranties arising out of the sale of this product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. RS PRO shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expense or economic loss. Some states or countries laws vary, so the above limitations or exclusions may not apply to you. For full terms and conditions, refer to the RS PRO website.

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The information in this quick start guide was correct at the time of printing. However we continue to improve our products and therefore reserve the right to change the specifications, equipment, and maintenance procedures at any time without notice.

SAFETY INSTRUCTIONS

This section contains the basic safety symbols that may appear on the accompanying User Manual CD or on the instrument. For detailed safety instructions and precautions, please see the Safety Instructions chapter in the user manual CD.

Safety Symbols

These safety symbols may appear in the user manual or on the instrument.



Warning

Warning: Identifies conditions or practices that could result in injury or loss of life.



Caution

Caution: Identifies conditions or practices that could result in damage to the instrument or to other properties.



DANGER High Voltage



Attention Refer to the Manual



Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.



Power Cord for the United Kingdom

When using the instrument in the United Kingdom, make sure the power cord meets the following safety instructions.

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 coloured 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 either the letter E, the earth symbol  or coloured Green/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, a cable of 0.75mm^2 should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any exposed wiring from a cable, plug or connection that is engaged in a live socket is extremely hazardous. If a cable or plug is deemed hazardous, turn off the mains power and remove the cable, any fuses and fuse assemblies. All hazardous wiring must be immediately destroyed and replaced in accordance to the above standard.

GETTING STARTED

Main Features

- Performance
- ACW: 5kVAC
 - DCW: 6kVDC
 - IR: 50V~1200V (50V steps)*
 - GB: 3A~32A
 - CONT: 100mA
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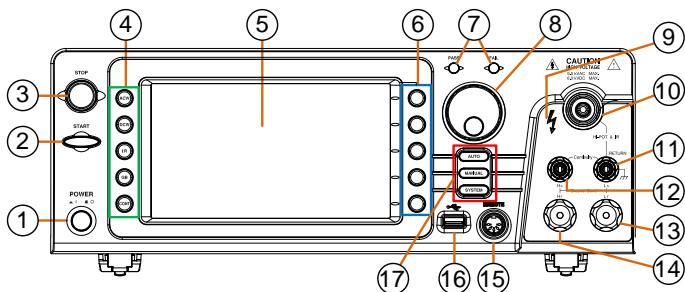
- Features
- Ramp up time control
 - Ramp down time control
 - Safety discharge
 - 100 test conditions (MANU mode)
 - 100 automatic tests (AUTO mode)
 - Over temperature, voltage and current protection
 - Pass, Fail, Test, High Voltage and Ready indicators
 - PWM output (90% efficiency, increased reliability)
 - Interlock (configurable)
 - Rear panel output
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- Interface
- Remote control start/stop interface terminal
 - RS232/USB interface for programming
 - Optional GPIB interface for programming
 - Signal I/O port for pass/fail/test monitoring and start/stop control/interlock



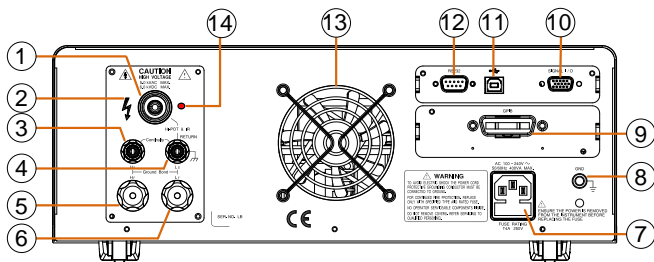
Appearance

Front Panel Overview



Description	
1. Power Switch	2. START Button
3. STOP Button	4. Test Function Keys (Green Zone)
5. Display	6. Soft Keys (Blue Zone)
7. PASS/FAIL Indicators	8. Scroll Wheel
9. HIGH VOLTAGE Indicator	10. HIGH VOLTAGE Output Terminal
11. SENSE L & RETURN Terminal	12. SENSE H & Output Terminal
13. SOURCE L (RSST-2004 only)	14. SOURCE H (RSST-2004 only)
15. REMOTE Terminal	16. USB A-Type Host Port
17. Mode Keys (AUTO, MANUAL, SYSTEM in Red Zone)	

Rear Panel Overview

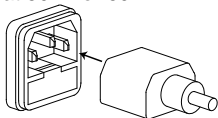


Description	
1. HIGH VOLTAGE Output Terminal	2. HIGH VOLTAGE Indicator
3. SENSE H & Output Terminal	4. SENSE L & RETURN Terminal
5. SOURCE H (RSST-2004 only)	6. SOURCE L (RSST-2004 only)
7. AC Mains Input (Power Cord Socket)	8. GND
9. GPIB	10. Signal I/O Port
11. USB B-Type Interface Port	12. RS-232 Port
13. Fan	14. HIGH VOLTAGE pilot lamp

Line Voltage Connection and Power Up

The RSST-2000 accepts line voltages of 100 - 240V at 50Hz or 60Hz.

1. Connect the power cord to the AC Mains Input socket on the rear panel.



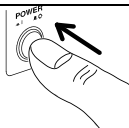
2. If the power cord does not have an earth ground, ensure the ground terminal is connected to an earth ground.



Warning

Ensure the power cord is connected to an earth ground.
Failure could be harmful to the operator and instrument.

3. Press the Power button.



4. When the unit is powered up, the display will show the last time parameters in either MANU or AUTO test mode as shown below.



Workplace Precautions

The RSST-2000 is a high voltage instrument that outputs dangerous voltages. The following section describes precautions and procedures that must be followed to ensure a safe work environment.



Warning

The RSST-2000 generates voltages in excess of 5kVAC or 6kVDC. Follow all safety precautions, warnings and directions given in the following section when using the instrument.

1. Only technically qualified personnel should be allowed to operate the safety tester.
2. The operating workplace must be fully isolated, especially when the instrument is in operation. The instrument should be clearly labeled with appropriate warning signage.
3. The operator should not wear any conductive materials, jewelry, badges, or other items, such as wrist watches.
4. The operator should wear insulation gloves for high voltage protection.
5. Ensure the earth ground of the line voltage is properly grounded.
6. Ensure any devices that are adversely affected by magnetic fields are not placed near the tester.

Operating Precautions

The RSST-2000 is a high voltage instrument that outputs dangerous voltages. The following section describes precautions and procedures that must be followed to ensure that the tester is operated in a safe manner.



Warning

The RSST-2000 generates voltages of up to 5kVAC or 6kVDC. Follow all safety precautions, warnings and directions given in the following section when using the instrument.



1. Never touch the safety tester, lead wires, terminals, probes and other connected equipment when the tester is testing.
2. Do not turn the safety tester on and off quickly or repeatedly. When turning the power off, please allow a few moments before turning the power back on. This will allow the protection circuits to properly initialize.
Do not turn the power off when a test is running, unless in an emergency.
3. Only use those test leads supplied with the instrument. Leads with inappropriate gauges can be dangerous to both the operator and the instrument.
For GB testing, never use the Sense leads on the SOURCE terminals.
4. Do not short the HIGH VOLTAGE terminal with ground. Doing so could charge the chassis to dangerously high voltages.
5. Ensure the earth ground of the line voltage is properly grounded.
6. Only connect the test leads to the HIGH VOLTAGE/SOURCE H/SENSE H terminals before the start of a test. Keep the test leads disconnected at all other times.
7. Always press the STOP button when pausing testing.
8. Do not leave the safety tester unattended. Always turn the power off when leaving the testing area.
9. When remotely controlling the safety tester, ensure adequate safety measures are in place to prevent:
 - Inadvertent output of the test voltage.
 - Accidental contact with the instrument during testing. Ensure that the instrument and DUT are fully isolated when the instrument is remotely controlled.
10. Ensure an adequate discharge time for the DUT.
When DCW or IR tests are performed, the DUT, test leads and probes become highly charged. The RSST-2000 has discharge circuitry to

discharge the DUT after each test. The time required for a DUT to discharge depends on the DUT and test voltage.

Never disconnect the safety tester before a discharge is completed.

Basic Safety Checks

The RSST-2000 is a high voltage device and as such, daily safety checks should be made to ensure safe operation.

1. Ensure all test leads are not broken and are free from defects such as cracks or splitting.
 2. Ensure the safety tester is always connected to an earth ground.
 3. Test the safety tester operation with a low voltage/current output: Ensure the safety tester generates a FAIL judgment when the HIGH VOLTAGE and RETURN terminals are shorted (using the lowest voltage/current as the testing parameters)
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Warning

Do not use high voltages/currents when the HIGH VOLTAGE and RETURN terminals are shorted. It may result in damage to the instrument



SPECIFICATIONS

The specifications apply when the RSST-2000 is powered on for at least 30 minutes at 15°C~35°C.

Environment

Range	Temperature	Humidity
Warranty	15°C ~ 35°C	≤70% (No condensation)
Operation	0°C ~ 40°C	≤70% (No condensation)
Storage	-10°C ~ 70°C	≤85% (No condensation)
Installation Location	Indoors at an amplitude of up to 2000m.	

AC Withstanding Voltage

Output Voltage Range	0.050kV~ 5.000kV ¹
Output Voltage Resolution	1V
Output Voltage Accuracy	± (1% of setting +5V) with no load
Maximum Rated Load ¹	200 VA (5kV/40mA)
	40mA
Maximum Rated Current	0.001mA ~ 10mA(0.1kV≤V≤0.5kV) 0.001mA ~ 40mA(0.5kV<V≤5kV)
Output Voltage Waveform	Sine wave
Frequency	50 Hz / 60 Hz
Voltage Regulation	± 1% +5V [Maximum rated load → no load]
Voltmeter Accuracy	± (1% of reading+ 5V)
Current Measurement Range	0.001mA~40.0mA
	1μA
Current Best Resolution	1μA (1μA~9.999mA);10μA (10.00mA~40.00mA)
Current Measurement Accuracy	± (1.5% of reading + 30μA)
Current Offset	60μA(Maximum)

Judgment Accuracy	\pm (3% of setting + 30 μ A)
Window Comparator Method	Yes
ARC DETECT	Yes
Rise-time Control Function	Yes
RAMP Time (Rise Time)	0.1~999.9s
Fall-time Control Function	Yes
RAMP Down Time	0.0~999.9s
TIMER (Test Time) ²	OFF, 0.3s~999.9s
TIMER Accuracy	\pm (100ppm+20ms)
GND	ON/OFF
Wait Time	0.0~999.9s

¹ At least 0.3 seconds is needed to reach a set voltage of 50V/10mA.

² Timer can only be turned off when the upper current is set below 30mA.

DC Withstanding Voltage

Output Voltage Range	0.050kV ~ 6.000kV ¹
Output Voltage Resolution	1V
Output Voltage Accuracy	\pm (1% of setting +5V) with no load
Maximum Rated Load	50W (5kV/10mA)
	10mA
Maximum Rated Current	0.001mA ~ 2mA (0.05kV \leq V \leq 0.5kV) 0.001mA ~ 10mA (0.5kV<V \leq 6kV)
Voltmeter Accuracy	\pm (1% of reading+ 5V)
Voltage Regulation	\pm 1% +5V [Maximum rated load \rightarrow no load]
Current Measurement Range	0.001mA~10.00mA
	0.1 μ A
Current Best Resolution	0.1 μ A (0.1 μ A~999.9 μ A) 1 μ A (1 μ A~9.999A) 10 μ A (10.00mA)
Current Measurement Accuracy	\pm (1.5% of reading + 3 μ A) when I <1mA \pm (1.5% of reading + 30 μ A) when I \geq 1mA
Judgment Accuracy	\pm (3% of setting + 30 μ A)



Window Comparator Method	Yes
ARC DETECT	Yes
Rise-time Control Function	Yes
RAMP (Ramp Time)	0.1~999.9S
Fall-time Control Function	Yes
RAMP Down Time	0.0~999.9s
TIMER (Test Time)	OFF, 0.3s~999.9s
TIMER Accuracy	± (100ppm+20ms)
GND	ON/OFF
Wait Time	0.0~999.9s
Maximum Capacitive Load	1μF
DC Mode	

¹ At least 0.3 seconds is needed to reach a set voltage of 50V/2mA.

Insulation Resistance Test

Output Voltage	50V~1200V	
Output Voltage Resolution	50V	
Output Voltage Accuracy	(1% of setting+5V) with no load	
Resistance Measurement Range	1MΩ~ 50MΩ	
Test Voltage	Measurement Range	Accuracy
50V≤V≤450V	0.1MΩ ~1MΩ	5% of reading +3 count
	1MΩ ~50MΩ	5% of reading +1 count
	51MΩ ~2GΩ	10% of reading +1 count
500V≤V≤1200V	0.1MΩ ~50MΩ	5% of reading +3 count
	1MΩ ~500MΩ	5% of reading +1 count
	501MΩ ~9.999GΩ	10% of reading +1 count
	10G~50GΩ	20% of reading +1 count
Output Impedance	2kΩ	
Window Comparator Method	Yes	
Rise-time Control Function	Yes	
RAMP TIME (Rise Time)	0.1~999.9s	
Fall-time Control Function	Yes	

RAMP DOWN Time	0.0~999.9s
WAIT TIME	0.0~999.9s
TIMER (Test Time)	0.3s~999.9s ²
TIMER Accuracy	± (100ppm+20ms)
GND	OFF

Note: It is required to implement GND OFFSET action when IR Ground Mode is On.

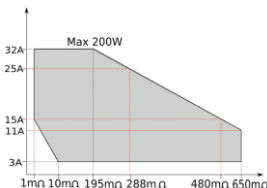
¹ When IR Ground Mode is On, the maximum 30Gohm measurement range is guaranteed.

² When IR Ground Mode is On, test time starts from 0.5 second.

Ground Bond Test

Output Current Range	3.00A~32.00A
Output Current Accuracy	± (1% of setting + 0.2A) when 3A≤I≤8A ± (1% of setting + 0.05A) when 8A<I≤32A
Output Current Resolution	0.01A
Frequency	50Hz/60Hz selectable
Test Voltage	Approximately max. 8VAC (open-circuit)
	1mΩ~650mΩ

Ohmmeter Measurement Range



Ohmmeter Measurement Resolution	0.1mΩ
Ohmmeter Measurement Accuracy	± (1% of reading + 2mΩ)
Ohmmeter Judgment Accuracy	±(1% of setting+2mΩ)
Windows Comparator Method	Yes
TIMER (Test Time)	0.3s~999.9S
TIMER Accuracy	± (100ppm+20ms)

GND	OFF
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Continuity Test

Output Current	100mA(DC)
Ohmmeter Measurement Range	0.10Ω~70.00Ω
Ohmmeter Measurement Resolution	0.01Ω
Ohmmeter Measurement Accuracy	±(10% of reading+2Ω)
Ohmmeter Judgment Accuracy	±(10% of setting+2Ω)
Window Comparator Method	Yes
TIMER (Test Time)	0.3s~999.9s
TIMER Accuracy	± (100ppm+20ms)

Interface

REMOTE (Remote terminal)	Yes
SIGNAL I/O	Yes
RS232	Yes
USB (Device)	Yes(USB 2.0)
Rear Output	Yes
USB (Host) for data output port	Yes (USB 2.0)
GPIB	Yes (OPTION)

General

DISPLAY	7" color LCD
MEMORY	AUTO/MANU mode 100 memory blocks total
POWER SOURCE	AC100V~240V/230V ±10%, 50Hz/60Hz
ACCESSORIES	Power cord x1, Quick Start Guide User Manual x1 (CD) GHT-115x1 for 2010446/2010448/2010449 GHT-115x1, GTL-215x1 for 2010450
DIMENSIONS & WEIGHT	2010446/2010448/2010449: Approx. 380(W) x 148(H) x 436(D) mm, 11kg 2010450: Approx. 380(W) x 148(H) x 454(D) mm, 15kg

EC Declaration of Conformity

We declare that the below mentioned product

2010446, 2010449, 2010448, 2010450

satisfies all the technical relations application to the product within the scope of council:

Directive: 2014/30/EU; 2014/35/EU; 2011/65/EU; 2012/19/EU. The above product is in conformity with the following standards or other normative documents:

⊙ EMC

EN 61326-1 : EN 61326-2-1:	Electrical equipment for measurement, control and laboratory use — EMC requirements (2013)
Conducted & Radiated Emission EN 55011: 2016+A1: 2017 Calss A	Electrical Fast Transients EN 61000-4-4: 2012
Current Harmonics EN 61000-3-2: 2014	Surge Immunity EN 61000-4-5: 2014
Voltage Fluctuations EN 61000-3-3: 2013	Conducted Susceptibility EN 61000-4-6: 2014
Electrostatic Discharge EN 61000-4-2: 2009	Power Frequency Magnetic Field EN 61000-4-8: 2010
Radiated Immunity EN 61000-4-3: 2006+A2: 2010	Voltage Dip/ Interruption EN 61000-4-11: 2004

⊙ Safety

Low Voltage Equipment Directive 2014/35/EU	
Safety Requirements	EN 61010-1: 2010 EN 61010-2-030: 2010 EN 61010-2-034: 2017



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AUDITED

In compliance with industry standards



INSPECTED

For guaranteed quality and performance



TESTED

By leading engineers

