

Leak Current Measurement, an Essential Part of Electrical Safety (for medical-use electrical devices)

LEAK CURRENT HiTESTER ST5540



USB 1.1

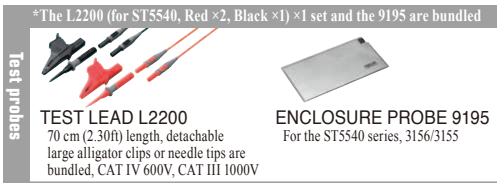
RS-232C



- IEC 60601-1: (2005) 3rd Edition, JIS T0601-1:2012 compliant
- The ST5540 complies with JIS, IEC, and UL standards governing medical- and general-use electrical devices
- Uninterrupted polarity switching function dramatically reduces cycle time
- Support for rated currents up to 20 A gives the instrument more than adequate capability for testing products designed to comply with new standards
- Touch panel features simple, interactive operation
- Communications functionality and external I/O support allow automatic testing on production lines

Order Code: ST5540 (for medical-use electrical devices)

Note: Always use an isolation transformer when measuring leak current for medical-use electrical devices. The ST5540 does not include an isolation transformer. When measuring medical-use electrical devices, use a step-up isolation transformer or similar component operating at 110% of the rated supply voltage as the power supply for the device under test.



Test probes

TEST LEAD L2200
70 cm (2.30ft) length, detachable
large alligator clips or needle tips are
bundled, CAT IV 600V, CAT III 1000V

ENCLOSURE PROBE 9195
For the ST5540 series, 3156/3155

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement methods	Measurement of voltage drop across body simulated resistance points, Calculation and display of current values, True rms measurement, Measurement unit floats relative to instrument ground.
Measurement modes	Leak current measurement, voltage measurement, safety conductor current measurement
Standards compliance	Medical electrical equipment: IEC 60601-1 (1988) + A2:1995, (2005, 3rd Edition), JIS T0601-1:1999, 2012 Electrical Appliances and Materials Safety Act Measurement of touch current and protective conductor current: IEC 60990 (1999) Electrical equipment for measurement, control, and laboratory use: IEC 61010-1 (2001) Information technology equipment: IEC 60950-1 (2005) Household and similar appliances: IEC 60335-1 (2001) + A1:2004 + A2:2006 Audio, video and similar electronic apparatus: IEC 60065 (2001) + A1:2005 Personnel Protection Systems for EV: UL-2231-1 (2002), UL-2231-2 (2002) UL: UL-1492 (1996) Electrical equipment for measurement, control, and laboratory use; current measurement circuits in damp conditions: IEC 61010-1 (2001)
Leak current measurement	Ground leak current, 3 types of contact current, 7 types of patient leak current, patient measurement current, 4 types of total patient leak current, free current measurement, 3 types of enclosure leak current
Measurement current	DC, AC (true rms, 0.1 Hz to 1 MHz), AC+DC (true rms, 0.1 Hz to 1 MHz), AC peak (15 Hz to 1 MHz)
Measurement ranges	DC / AC / AC+DC mode: 50 μ A/500 μ A/5 mA/50 mA AC peak mode: 500 μ A/1 mA/10 mA/75 mA
Measurement accuracy (current measurement)	DC measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (typ.) AC / AC+DC measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (15 Hz to 100 kHz, typ.) AC peak measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (15 Hz to 10 kHz, typ.)
Interfaces	External I/O, medical device relay output, USB 1.1 (communications), RS-232C
Functionality	110% voltage application, automatic test, data storage for 100 target devices, clock, data backup, printed output (optional), etc.
Power supply	100/120/220/240 V AC (specify at time of order), 50/60 Hz, 30 VA rated power
Target device power supply input	100 to 240 V AC, 50/60 Hz Rated current input from terminal block: 20 A
Target device power supply output	Output from terminal block: 20 A Output from outlet: 15 A
Dimensions and mass	320 mm (12.60 in)W \times 110 mm (4.33 in)H \times 253 mm (9.96 in)D, 4.5 kg (158.7 oz)
Accessories	Test lead L2200 (for ST5540, Red $\times 2$, Black $\times 1$) $\times 1$ set, Enclosure probe 9195 $\times 1$, Power cord $\times 3$, Spare fuse for measurement line $\times 1$, Instruction manual $\times 1$, User guide $\times 1$, CD-ROM $\times 1$

Safety Testing

Leak Current Measurement, an Essential Part of Electrical Safety (for electrical devices)

LEAK CURRENT HiTESTER ST5541



USB 1.1

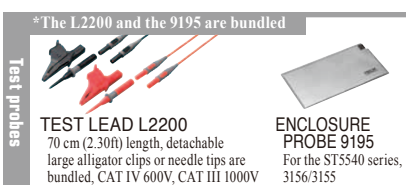
RS-232C



- LEAK CURRENT HiTESTER ST5541: A low-cost solution that complies with standards governing general-use electrical devices
- Uninterrupted polarity switching function dramatically reduces cycle time
- Support for rated currents up to 20 A gives the instrument more than adequate capability for testing products designed to comply with new standards
- Touch panel features simple, interactive operation
- Communications functionality and external I/O support allow automatic testing on production lines

Order Code: ST5541 (for electrical devices)

Note: Always use an isolation transformer when measuring leak current for medical-use electrical devices. The ST5540 does not include an isolation transformer. When measuring medical-use electrical devices, use a step-up isolation transformer or similar component operating at 110% of the rated supply voltage as the power supply for the device under test.



Test probes

TEST LEAD L2200
70 cm (2.30ft) length, detachable
large alligator clips or needle tips are
bundled, CAT IV 600V, CAT III 1000V

ENCLOSURE PROBE 9195
For the ST5540 series,
3156/3155

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement methods	Measurement of voltage drop across body simulated resistance points, Calculation and display of current values, True rms measurement, Measurement unit floats relative to instrument ground.
Measurement modes	Leak current measurement, voltage measurement, safety conductor current measurement
Standards compliance	Electrical Appliances and Materials Safety Act Measurement of touch current and protective conductor current: IEC 60990 (1999) Electrical equipment for measurement, control, and laboratory use: IEC 61010-1 (2001) Information technology equipment: IEC 60950-1 (2005) Household and similar appliances: IEC 60335-1 (2001) + A1:2004 + A2:2006 Audio, video and similar electronic apparatus: IEC 60065 (2001) + A1:2005 Personnel Protection Systems for EV: UL-2231-1 (2002), UL-2231-2 (2002) UL: UL-1492 (1996) Electrical equipment for measurement, control, and laboratory use; current measurement circuits in damp conditions: IEC 61010-1 (2001)
Leak current measurement	Ground leak current, 3 types of contact current, free current measurement, 3 types of enclosure leak current
Measurement current	DC, AC (true rms, 15 Hz to 1 MHz), AC+DC (true rms, 15 Hz to 1 MHz), AC peak (15 Hz to 1 MHz)
Measurement ranges	DC / AC / AC+DC mode: 50 μ A/500 μ A/5 mA/50 mA AC peak mode: 500 μ A/1 mA/10 mA/75 mA
Measurement accuracy (current measurement)	DC measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (typ.) AC / AC+DC measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (15 Hz to 100 kHz, typ.) AC peak measurement: $\pm 2.0\%$ rdg. ± 6 dgt. (15 Hz to 10 kHz, typ.)
Interfaces	External I/O, USB 1.1 (communications), RS-232C
Functionality	Automatic test, data storage for 100 target devices, clock, data backup, printed output (optional), etc.
Power supply	100/120/220/240 V AC (specify at time of order), 50/60 Hz, 30 VA rated power
Target device power supply input	100 to 240 V AC, 50/60 Hz Rated current input from terminal block: 20 A
Target device power supply output	Output from terminal block: 20 A Output from outlet: 15 A
Dimensions and mass	320 mm (12.60 in)W \times 110 mm (4.33 in)H \times 253 mm (9.96 in)D, 4.5 kg (158.7 oz)
Accessories	Test lead L2200 (Red $\times 1$, Black $\times 1$) $\times 1$ set, Enclosure probe 9195 $\times 1$, Power cord $\times 3$, Spare fuse for measurement line $\times 1$, Instruction manual $\times 1$, User guide $\times 1$, CD-ROM $\times 1$

ST5540, ST5541 shared options

Printer options					PC communication		
	PRINTER 9442 For printing numerical values 112 mm (4.41 in) paper width	AC ADAPTER 9443-02 For the Printer 9442, EU type	CONNECTION CABLE 9444 For the Printer 9442, 9 pin - 9 pin, 1.5 m (4.92 ft) length	RECORDING PAPER 1196 For the Printer 9442, 112 mm (4.41 in) \times 25 m (82.03 ft), 10 rolls/set		RS-232C CABLE 9637 For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length	RS-232C CABLE 9638 For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length

Safety Testing

ST5540, ST5541 List of functions

Item	ST5540	ST5541	
Network	Network A (Electrical Appliances and Materials Safety Act)	✓	✓
	Network B (Medical-use electrical devices)	✓	-
	Network C (IEC 60990)	✓	✓
	Network D (UL)	✓	✓
	Network E (General-purpose 1)	✓	✓
	Network F (General-purpose 2)	✓	✓
	Network G (IEC 61010-1)	✓	✓
Major functions	Power on polarity switching function	✓	✓
	Rated current 20 A	✓	✓
	Function for checking for blown fuses	✓	✓
	Frequency band switching	✓	-
	110% voltage output terminal (T3 terminal)	✓	-
	S10, S12, S13, E terminal	✓	-

ST5540, ST5541 List of functions

Item	ST5540	ST5541	
Testing leakage current mode	Earth leakage current	✓	✓
	Touch current	✓	✓
	Patient auxiliary current	✓	-
	Patient leakage current	✓	-
	Total patient leakage current	✓	-
	Free current	✓	✓
	Enclosure - Earth leakage current	✓	✓
	Enclosure - Enclosure leakage current	✓	✓
	Enclosure - Line leakage current	✓	✓
	Patient leakage current I	✓	-
	Patient leakage current II	✓	-
	Patient leakage current III	✓	-

Safety Testing

General-purpose option for easy printing of values

Printer 9442



Specifications overview

Interface	RS-232C
Paper width	112 mm
Print speed	52.5 cps (characters per second)
Power supply	AC Adapter 9443-01 or included nickel-metal hydride battery (sufficient for approx. 3,000 rows of print when fully charged)
Dimensions and mass	160 mm (6.30 in)W × 67 mm (2.64 in)H × 170 mm (6.69 in)D, 580 g (20.5 oz)



Order Code: 9442 (Requires AC Adapter 9443-01 for power)

Supported models: 3511-50, 3522-50, 3532-50, 3532-80, 3535, ST5541/40, SM-8213/15/20, 3506/05, 3504-40/-50/-60, 3351, 3334/33/32/31, 3239/38/37, 3169, 3157/54

- Used with the Connection Cable 9444: 3154, 3156, 3237 to 3239, 3331 to 3333, 3504 to 3506, 3511-50, 3535, ST5540s
- Used with Connection Cable 9446 and RS-232C interface: 3157, 3522-50, 3532-50/-80
- Used with RS-232C Cable 9271: 3169

Options (If your device requires an RS-232C interface, please purchase separately)

CONNECTION CABLE 9444 For the Printer 9442, 9 pin - 9 pin, 1.5 m (4.92 ft) length	CONNECTION CABLE 9446 For the Printer 9442, 25 pin - 9 pin, 1.5 m (4.92 ft) length	RS-232C CABLE 9271 Mini DIN 9 pin to D-sub 9 pin, straight, 1.5 m (4.92 ft) length	AC ADAPTER 9443-02 For the Printer 9442, EU type	RECORDING PAPER 1196 For the Printer 9442, 112 mm (4.41 in) × 25 m (82.03 ft), 10 rolls/set

For Multi-point, High-voltage Automatic Testing and Automation of Insulation and Dielectric Strength Testing

HIGH VOLTAGE SCANNER 3930



Rear



- Output of the input high voltage from a user-selected channel
- 8 ch per unit (single mode), with up to 32 ch (4 connected units)
- Isolated high-voltage I/O, control signal lines, and power supply
- Control using the 3153 program function or with a standard sequencer

Order Code: 3930

Basic Specifications

Operation modes	Multi-mode: Scanning of user-selected points for high 4 ch / low 4 ch Single mode: Common scan of high 8 ch - common
Rated voltage used	5 kV AC / 5 kV DC
Operation indications	Lamps light up when power is supplied and when a specified channel is operating
[Relay area]	
Max. open and closed voltage	5000 V DC, 5000 V AC
Max. open and closed current	1.0 A (open and closed capacity: 50 W)
Contact point indirect contact resistance	500 mΩ or less, with 1 mA AC
Contact point max. capacity	50 W
Time	Operation time: 6 ms or less, Recovery time: 6 ms or less
Power supply	VSCV 24 V DC, ±10% (applied using the control signal input connector), 12 VA max.
Dimensions and mass	316 mm (12.44 in)W × 100 mm (3.94 in)H × 350 mm (13.78 in)D, 4.2 kg (148.1 oz)
Accessories	Control input connector connection cable ×1, H.V. Test lead 9615-01 (red) ×8, H.V. Test lead (black) ×1, Grounding cable ×1, Instruction manual ×1

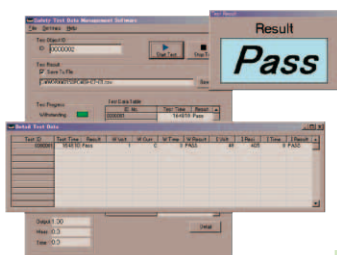
Options

*The 9615-01 is bundled

H.V. TEST LEAD 9615-01
Red, high voltage side, 1.5 m (4.92 ft) length

Control insulation, dielectric strength, protective continuity, and leak current testing from a PC

SAFETY TEST DATA MANAGEMENT SOFTWARE 9267



- Control the ST5520*/ST5540 as well as the 3153/3154/3156/3157, 3174, and other instruments from a computer

*Control of the ST5520 is subject to certain limitations.

- Perform automatic insulation and dielectric strength testing of up to 32 points with the High Voltage Scanner 3930

Order Code: 9267

Basic Specifications

Compatible models	ST5520*, ST5540/ST5541, 3153, 3154, 3156, 3157, 3158, 3159, 3174, 3332, 3333, 3334, and PLCs from various manufacturers (for connection switching) *Control of the ST5520 is subject to certain limitations.
Supplied media	CD-R ×1
Operating environment	Windows 7 (32-/64-bit), Vista (32-bit), XP/2000
Test types	Insulation and dielectric strength, protective continuity, leak current, energization
Recording data	Recording of test results (measured values) as a text file (CSV format)
Interface	RS-232C

This dedicated application allows you to control and take measurements through insulation testing, dielectric strength testing, protective continuity testing, leak current testing, and energization testing and to record test results as a text file.

Industry's Fastest Testing Speed

INSULATION TESTER ST5520

New



RS-232C

CE

- Rapidly assess in as fast as 50 ms
- Quick discharge of residual voltage
- Freely configurable test voltage (Set from 25 V to 1000 V, 1 V resolution)
- Contact check function (Prevents errors due to poor contact)
- Short-circuit check function (Stops potential defects from reaching the market)

Order Code: ST5520 (with external I/O output)
ST5520-01 (with BCD output)

Note: The ST5520 and ST5520-01 cannot be operated alone. Please select and purchase the optional test leads to accommodate your application.

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement items	Insulation resistance (Applied DC voltage method)
Testing voltage/ measurement ranges (Auto / Manual)	25 V ≤ V < 100 V (2,000/20.00/200.0 MΩ), 100 V ≤ V < 500 V (2,000/20.00/200.0/2000 MΩ), 500 V ≤ V ≤ 1000 V (2,000/20.00/200.0/4000/9990 MΩ)
Basic accuracy	±2% rdg. ±5 dgt. 25 V ≤ V < 100 V [0 to 20 MΩ] 100 V ≤ V < 500 V [0 to 20 MΩ] 500 V ≤ V ≤ 1000 V [0 to 200 MΩ]
Measurement speed	Fast: 30 ms/time, Slow: 500 ms/time (selectable)
Display	LCD (service life: 100,000 hours), 4-level backlight
Internal memory	Saved items: rated measurement voltage, comparator upper limit / lower limit values, test mode, beep sound to distinguish the result, test time, response time, resistance range, measurement speed Memory capacity: up to 10 items (can be saved/loaded)
Comparator setting	UPPER_FAIL: Measured value ≥ upper limit value PASS: Upper limit value > measured value > lower limit value LOWER_FAIL: Measured value ≤ lower limit value
Judgement process	Beep sound, PASS / U.FAIL / L.FAIL: light up on LED display. When UL_FAIL, U.FAIL / L.FAIL light up simultaneously, EXT.I/O output, judgement result can be obtained via RS-232C
Test duration	Definition of test duration: Test duration = Response time + Measurement time Function: Set the time from voltage application until pass/fail assessment Configuration range: 0.045 s to 999.999 s (0.001 s resolution)
Response time timer	After the start of the test, comparator judgment operation can be prohibited until a set interval from 0.005 sec. to 999.999 sec. (at 0.001 sec. resolution) has passed.
Analog output	DC +4 V f.s.
Interface	RS-232C (standard), External I/O (External control input, Judgment result) BCD output (ST5520-01 only)
Power supply	100 to 240 V AC, 50/60 Hz, 25 VA max.
Dimensions and mass	215 mm (8.46 in)W × 80 mm (3.15 in)H × 166 mm (6.54 in)D, 1.1 kg (38.8 oz)
Accessories	Instruction Manual ×1, Power cord ×1, EXT. I/O Connector ×1, Connector Cover ×1

Input/Output cords

*Please contact your HIOKI distributor for extending the L2200 cable length

TEST LEAD L2200 70 cm (2.30 ft) length, detachable large alligator clips or needle tips are bundled, CAT IV 600V, CAT III 1000V	CONNECTION CORD L9257 1.2 m (3.94 ft) length	SWITCHED PROBE 9299 80 cm (2.62 ft) length	OUTPUT CORD 9094 3.5 mm (0.14 in) dia. mini plug to banana, 1.5m (4.92 ft) length	CONVERSION ADAPTER 9199 Catch side banana, output BNC terminal

PC Communication

RS-232C CABLE 9637 For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length	RS-232C CABLE 9638 For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length

Contact Check and Full Remote Control

AC AUTOMATIC INSULATION/WITHSTANDING HIESTER 3174



RS-232C

CE

- Continuous testing of insulation (500/1000 V) and withstand voltage (100 VA transformer capacity)
- Full remote operation when used in combination with the Safety Test Data Management Software 9267
- Save up to 8 test settings each for the withstanding and insulation testing modes
- Precise test voltage without power voltage dependency is generated using the PWM method

Order Code: 3174

Note: To perform contact checks, please purchase another High Voltage Test Lead 9615 set separately.

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

[Withstanding test section]	
Testing voltage	0.2 V AC to 5.00 kV AC
Voltage setting	Digital setting, Setting resolution: 0.01 kV
Waveform/Frequency	Sine wave (Distortion ratio 5% or less at no load), 50/60 Hz selectable
Current measurement	0.01 mA to 20.0 mA, True RMS rectified (digital display)
Measurement range	10 mA (0.01 mA resolution), 20 mA (0.1 mA resolution)
Voltage meter	Accuracy: ±1.5% rdg. (1000 V or more), ±15 V (less than 1000 V), True RMS rectified
Judgment function	Window comparator method (Digital setting)
[Insulation test section]	
Testing voltage	500 V DC, 1000 V DC
Unloaded voltage	1 to 1.2 times rated voltage
Rated testing current	1 to 1.2 mA, Shorted current: 4 to 5 mA (at 500 V), 2 to 3 mA (at 1000 V)
Measurement range, Accuracy	0.5 MΩ to 999 MΩ (at 500 V), and 1 MΩ to 999 MΩ (at 1000 V): ±4% rdg., 1000 MΩ to 2000 MΩ: ±8% rdg.
Judgment function	Window comparator method (Digital setting)
[Timer section] *Test times may differ from set timer times depending on the load.	
Setting range	0.3 to 999 s
Ramp, Delay	Testing voltage ramp-up, or down, Insulation test delay: 0.1 to 99.9 s
[General section]	
Functions	Saving 8 testing conditions, hold, buzzer, contact check
Monitor function	Output voltage, detected current, insulation resistance, Refresh rate: 4 times/s
Power supply	100 to 240 V AC, (50/60 Hz), 200 VA max.
Dimensions and mass	320 mm (12.60 in)W × 155 mm (6.10 in)H × 395 mm (15.55 in)D, 15 kg (529.1 oz)
Accessories	H.V. Test lead 9615 (high voltage side and return, 1 each) ×1, Power cord ×1, Instruction manual ×1, Disconnection prevention plate ×1

*The 9615 is bundled

H.V. TEST LEAD 9615 Red, Black each 1, 1.5 m (4.92 ft) length	REMOTE CONTROL BOX (SINGLE) 9613 For Start/Stop control, 1.5m (4.92 ft) cord length	REMOTE CONTROL BOX (DUAL) 9614 For Start/Stop control, 1.5m (4.92 ft) cord length	RS-232C CABLE 9637 For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length	RS-232C CABLE 9638 For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length

*The 9637, 9638 are not CE marked when combined with the 3174

Other

SAFETY TEST DATA MANAGEMENT SOFTWARE 9267
For PC control application software

Programmable Testing, Full Remote Control, Automatic Insulation Withstanding Tester

AUTOMATIC INSULATION / WITHSTANDING HiTESTER 3153



GP-IB

RS-232C



- Programmable insulation (50 to 1,200 V DC) and dielectric strength (AC/DC) testing
- Program up to 32 files of test types, test points (50 steps), and measurement settings
- Optional scanner for multipoint automatic testing
- Uses the PWM method to generate accurate test voltages that do not depend on the supply voltage
- Ramp timer function for increasing or decreasing the applied voltage during dielectric strength testing at user-specified times

Order Code: 3153

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

[Withstanding test section]	
Testing voltage AC/DC	0.2 kV to 5.00 kV AC, 500 VA (max. 30 minutes), 0.2 kV to 5.00 kV DC, 50 VA (continuance)
Voltage setting	Digital setting (0.01 kV setting resolution)
Waveform/Frequency	Sine wave (5% or less distortion, unloaded), 50/60 Hz selectable
Current measurement	0.01 mA to 100.0 mA, Average rectified display (Digital)
Measurement range	10 mA (0.01 mA resolution), 100 mA (0.1 mA resolution)
Voltmeter	Digital: accuracy $\pm 1.5\%$ f.s. (f.s.=5.00 kV) (Average rectified display)
Decision method	Window comparison (digital settings)
[Insulation test section]	
Rated testing voltage	50 to 1,200 V DC (in 1 V steps)
Rated testing current	1 mA, Short-circuit current: 200 mA or less
Measurement range/accuracy	0.10 to 9999 M Ω , 4 ranges, $\pm 4\%$ rdg. (representative values for 0.5 M Ω to 1,000 M Ω)
Decision method	Window comparison (digital settings)
[Timer section] *Test times may differ from set timer times depending on the load.	
Setting range	0.3 to 999 s
Ramp, Delay	Testing voltage ramp-up, or down, Insulation test delay: 0.1 to 99.9 s
[General section]	
Functions	Program up to 32 files of 50 step test settings. 10 sets each of dielectric strength and insulation test settings, hold, buzzer
Monitor functions	Output voltage, detected current, measured resistance, Refresh rate: 2 times/s
Power supply	100 to 120 V, 200 to 240 V AC, (50/60 Hz), 1000 VA max.
Dimensions and mass	320 mm (12.60 in)W \times 155 mm (6.10 in)H \times 480 mm (18.9 in)D, 18 kg (634.9 oz)
Accessories	H.V. Test lead 9615 (high voltage side and return, 1 each) \times 1, Power cord \times 1, Instruction manual \times 1, Spare fuse \times 1

Safety Testing

*The 9615 is bundled

Input/Output cords

- H.V. TEST LEAD 9615
Red, Black each 1, 1.5 m (4.92 ft) length
- REMOTE CONTROL BOX (SINGLE) 9613
For Start/Stop control, 1.5m (4.92 ft) cord length
- REMOTE CONTROL BOX (DUAL) 9614
For Start/Stop control, 1.5m (4.92 ft) cord length
- RS-232C CABLE 9637
For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length
- RS-232C CABLE 9638
For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length
- GP-IB CONNECTOR CABLE 9151-02
2 m (6.56 ft) length

*The 9637, 9638 are not CE marked when combined with the 3153

Other

- HIGH VOLTAGE SCANNER 3930
Automatic multipoint testing of high voltages
- SAFETY TEST DATA MANAGEMENT SOFTWARE 9267
For PC control application software

Perform Insulation Resistance and Withstand Voltage Testing in a Single Series

INSULATION / WITHSTANDING HiTESTER 3159



RS-232C

Not CE Marked

- Continuous testing of insulation (500/1000 V) and withstand voltage (500 VA transformer capacity)
- Insulation to withstand series test or withstand to insulation series test at auto mode, or individual test at manual mode
- Save up to 10 test settings each for the withstanding and insulation testing modes
- External I/O, RS-232C interface, Status output (relay contacts)

Order Code: 3159-02 (220 V AC power supply)

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

[Withstanding test section]	
Testing voltage	0 to 2.5 kV / 0 to 5.0 kV AC, 2 range configuration 500 VA (30 minutes rated)
Voltage setting	Manual setting
Waveform/Frequency	Same as the power supply waveform, synchronized with the power supply
Current measurement	0.01 mA to 120 mA, True RMS rectified (digital display)
Voltage meter	Accuracy: $\pm 1.5\%$ f.s. (digital), $\pm 5\%$ f.s. (analog, f.s.=5 kV)
Current measurement	0.01 mA to 120 mA, (Average value rectified, effective value digital display)
Measurement range	2 mA/8 mA (0.01 mA resolution), 32 mA (0.1 mA resolution), 120 mA (1 mA resolution)
Voltage meter	Digital, Accuracy: $\pm 1.5\%$ rdg. (f.s.=5.00 kV)
Judgment function	Window comparator method (Digital setting)
[Insulation test section]	
Testing voltage	500 V DC, 1000 V DC, Unloaded voltage: 1 to 1.2 times rated voltage
Rated testing current	1 to 1.2 mA, Shorted current: 4 to 5 mA (at 500 V), 2 to 3 mA (at 1000 V)
Measurement range, Accuracy	0.5 M Ω to 999 M Ω (at 500 V), and 1 M Ω to 999 M Ω (at 1000 V): $\pm 4\%$ rdg., 1000 M Ω to 2000 M Ω : $\pm 8\%$ rdg.
Judgment function	Window comparator method (Digital setting)
[Timer section]	
Setting range	0.5 to 999 s
[General section]	
Monitor function	Output voltage, detected current, insulation resistance, Refresh rate: 2 times/s
Power supply	220 V AC, (50/60 Hz), 800 VA max.
Dimensions and mass	320 mm (12.60 in)W \times 155 mm (6.10 in)H \times 330 mm (12.99 in)D, 21.5 kg (758.4 oz)
Accessories	H.V. Test lead 9615 (high voltage side and return, 1 each) \times 1, Power cord \times 1, Instruction manual \times 1, Spare fuse \times 1

*The 9615 is bundled

Input/Output cords

- H.V. TEST LEAD 9615
Red, Black each 1, 1.5 m (4.92 ft) length
- REMOTE CONTROL BOX (SINGLE) 9613
For Start/Stop control, 1.5m (4.92 ft) cord length
- REMOTE CONTROL BOX (DUAL) 9614
For Start/Stop control, 1.5m (4.92 ft) cord length
- RS-232C CABLE 9637
For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length
- RS-232C CABLE 9638
For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length

Other

- SAFETY TEST DATA MANAGEMENT SOFTWARE 9267
For PC control application software

Protective Ground Tester Indispensable for Standards Certification

AC GROUNDING HiTESTER 3157



GP-IB
option
RS-232C
option
CE

- Easily perform protective continuity testing in compliance with international safety standards and laws
- Protective continuity resistance measurement for medical devices and general electrical devices
- Ground connectivity testing when installing electrical machine tools and distribution panels
- Testing of protective grounding and isopotential grounding work for medical equipment
- Evaluation of contact status using large currents
- Feedback control system that is capable of applying a stable current even with a fluctuating load
- Soft-start function that checks the connection to the device under test before applying the current

Order Code: 3157-01 (100-120 / 200-240 VAC switching)

Note: This instrument is not capable of performing measurement by itself. Please purchase two Current probe 9296 units or one Current probe 9296 and one Current apply probe 9297, depending on your measurement application.

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Basic functions	AC 4-terminal method resistance measurement
Display	Fluorescent tube (digital display)
Current setting range	3.0 A to 31.0 A AC (0.1 A resolution), into 0.1Ω load
Max. output power	130 VA (at output terminals)
Open-terminal voltage	Max. 6 V AC
Generator frequency	50 Hz or 60 Hz sine wave (selectable)
Resistance measurement	0 to 1.800 Ω (0.001 Ω resolution), Accuracy: ±2% rdg. ±4 dgt. after zero-adjust
Voltage measurement	0 to 6.00 V AC (single range 0.01 V resolution), Accuracy: (1 % rdg. +5 dgt.)
Monitor section	0 to 35.0 A AC/ 0 to 6 V AC, Refresh rate: 2 times/s
Timer display	Counts down time after start until preset time, Shows elapsed time after start
Timer setting	0.5 s to 999 s
Comparator	PASS/FAIL evaluation using preset upper/lower limit, buzzer sound, signal output
Memory function	Max. 20 settings (with save/load)
Interfaces	EXT I/O, EXT SW, GP-IB or RS-232C (option)
Power supply	100 to 120 V/200 to 240 V AC (switching, 50/60 Hz)
Dimensions and mass	320 mm (12.60 in)W × 90 mm (3.54 in)H × 263 mm (10.35 in)D, 7 kg (246.9 oz)
Accessories	Power cord ×1, Instruction Manual ×1, Spare fuse (inlet) ×1, Shorting bar ×2

*When using the Printer 9442, also purchase the RS-232C Interface 9593-02

Printer options				
	PRINTER 9442 For printing numerical values 112 mm (4.41 in) paper width	AC ADAPTER 9443-02 For the Printer 9442, EU type	CONNECTION CABLE 9446 For the Printer 9442, 25 pin - 9 pin, 1.5 m (4.92 ft) length	RECORDING PAPER 1196 For the Printer 9442, 112 mm (4.41 in) × 25 m (82.03 ft), 10 rolls/set

Input/Output cords						Other
	REMOTE CONTROL BOX (SINGLE) 9613 For Start/Stop control, 1.5m (4.92 ft) cord length	REMOTE CONTROL BOX (DUAL) 9614 For Start/Stop control, 1.5m (4.92 ft) cord length	CURRENT PROBE 9296 Alligator clip, 1.45m (4.76 ft) length	CURRENT APPLY PROBE 9297 With switch, 1.48m (4.86 ft) length	GP-IB CONNECTOR CABLE 9151-02 2 m (6.56 ft) length	
					GP-IB INTERFACE 9518-02 For the 3157-01, built in type	SAFETY TEST DATA MANAGEMENT SOFTWARE 9267 For PC control application software
					RS-232C INTERFACE 9593-02 For the 3157-01, built in type, not CE marked	

*The 3157-01's handshake function cannot be used with the RS-232C Cable 9638