HIOKI

AC/DC POWER HiTESTER 3334
POWER HiTESTER 3333

By Popular Demand

Ideal for Meeting Energy Efficiency Standards

High Accuracy & Cost Performance All in One Device

Choose the 3334 for DC and Current/Power Integration Applications

3334:Compatible with the SPECpower® benchmarking for server's power consumption

* SPECpower is a registered trademark of Standard Performance Evaluation Corporation.

True RMS

3334

- **High Accuracy (±0.1% rdg. ±0.1% f.s. for 1 year)**
  Exceeds the 0.5% accuracy benchmark stipulated by international standards.
- **Extended Period of Guaranteed Accuracy of 3 Years**
  Calibration expenses are reduced by a calibration interval six times that of our former models.
- **Maximum Cost Performance**
  All the necessary functions and accuracy requirements are provided in an easy-to-use, no-frills device.

3333

CALRIGHT INSTRUMENTS
The Right Source For Your Test & Measurement Needs

8715 Mesa Point Terrace San Diego, CA 92154
Toll Free: 1.866.363.6634 Tel: 1.619.429.4545 Fax: 1.619.374.7012
Email: sales@calright.com http://www.calright.com

The HIOKI AC/DC POWER HiTESTER Solves All

3334 AC/DC POWER

All the Features for DC and Current/Power Integration Measurements

■ Complete Accuracy Over a Wide Input Range

1.00mA
0.150V
0.0000W

All Measurements Within this Range Fully Guaranteed for Accuracy

30.00A
300.0V
9.000kW

Current: 1mA to 30A, Voltage: 0.15V to 300V, Apparent Power: 0W to 9kW

■ Measure AC or DC Loads

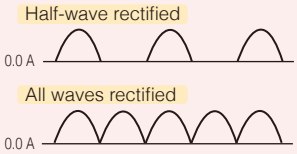
With a DC to 5kHz frequency bandwidth, all AC and DC measurement and AC/DC elements such as half-wave rectified values can be tested reliably and accurately

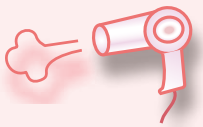
[AC+DC Mode]: For half-wave rectified loads common in small household appliances such as hair dryers

[DC Mode]: For pure DC loads in batteries

[AC Mode]: For loads in commercial power lines powering common household appliances

Switch modes simply by pressing the DC/AC button on the panel



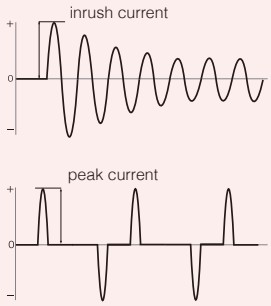


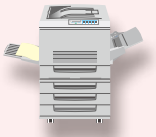
Some hair dryers operate by switching the output by a half-wave rectified.

■ Capture Inrush Current with the Peak Measurement Function

Measure for the Peak Value of Voltage and Current for Each Polarity Indepedently. Also measure the inrush current or surge current of electrical equipment.

Measure simply by pressing the SHIFT+HOLD keys.





Measure the inrush current when copiers and similar equipment are started

Measure the peak current of the standby power of home entertainment devices

Small Footprint

80% of Actual Size Shown

■ Intuitive Setting Procedures and Easy-to-Understand Displays

Both the 3333 and 3334 offer simple operating procedures and quick and easy-to-understand readings and alarm displays. Settings can be made for obtaining the average of captured data (AVG), VT ratio (conversion ratio), CT ratio, GP-IB address, integration time (from 1 minute to 10,000 hours), and D/A Output Parameters. Information regarding the Power HiTESTER's currents status such as display hold, remote control settings, and key lock (to prevent unauthorized reconfigurations) can be viewed at a glance.

*Easily test for over-consumption even when testing distorted waveforms that are commonly found in switching power supplies and similar devices by monitoring for the [PEAK OVER] alarm, simply by setting for the alarm to activate and the display to light up when the input exceeds the range.

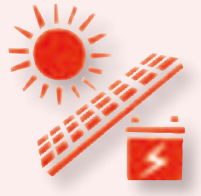
# of your Energy Consumption Testing Needs

- Meet Industrial Standard Requirements for Test Accuracy
- Measure for Consumed Power

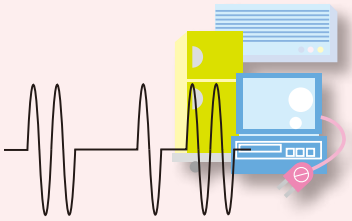
Also ideal for measuring the standby power and power consumption level of household appliances

AC/DC Current and Power Integration

Even measure the discharge level of each individual polarity of batteries



Measure the amount of solar generated power and how much is being sold back to the power company

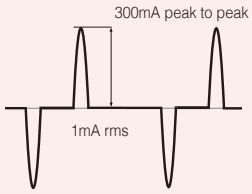


Devices that are highly vulnerable to power fluctuations such as copiers and cycle-controlled equipment can also be measured for integrated power

Accurate Even for Waveforms with Large Crest Factors

Reliably test waveforms with large crest factors (CF:peak value with respect to the RMS value) such as pulsed systems

*Highest effective peak voltage and peak current values on the 3334 are 300% of the range. Accuracy is guaranteed for 1% to 100% of both ranges.

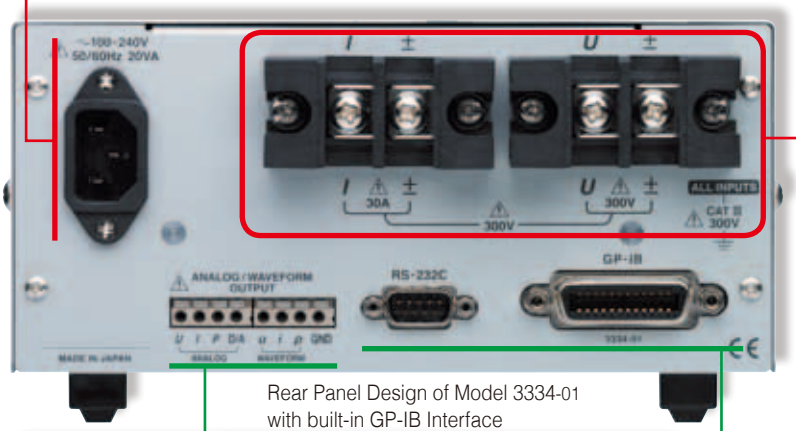


For example, in the 100mA range where the
RMS value= 1mA
Peak value= 300mA,
CF=300

Even waveforms such as this can be measured accurately with the 3334.

Universal Power Supply

Compatible to 100 - 240V AC Power Supplies



Rear Panel Design of Model 3334-01 with built-in GP-IB Interface

Evaluate the power consumption of your servers

Model 3334 is compatible with the SPECpower® benchmarking criteria for evaluating the power consumption of servers.

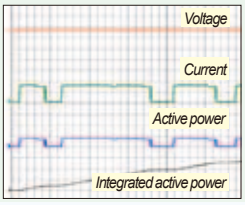
- Supported by Ver.1.10 or later.

Link to SPECpower's® Website
http://www.spec.org/power_ssj2008/docs/device-list.html

* SPECpower is a registered trademark of Standard Performance Evaluation Corporation.

Analog Output on All 4 Channels

•Simultaneously ouput the voltage, current and active power values (DC ±2 V f.s., data refreshed 5 times/second)
•Output the apparent power, power factor, or integrated current/active power over an additional 1 channel



Easy-to-connect Terminals

Make a secure connection with the screw-type terminals

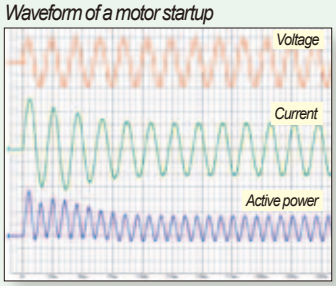
Use a No.3 Phillips screwdriver

Actual Size

Waveform Output over 3 Channels

Instantaneous waveforms of the measured voltage, current and active power can be simultaneously output
•Output: 1 V f.s.
•Sampling speed: 74.4kHz
(at 50Hz: 1488 points/waveform)
(at 60Hz: 1240 points/waveform)

Waveform of a motor startup



Data management with PC

Ask your distributor for more information regarding the freeware for processing your measurement data

Make full use of these interfaces to increase efficiency
•RS-232C (3334)
•RS-232C, GP-IB (3334-01)

Fully Answering the Needs for a High Accuracy, Long-lasting, and User-

3333 AC POWER

Accuracy That Can Only Be Realized with a Digital Display

Multifunctional - 3 Meters In One

Selectable simultaneous display of voltage, current, power (active or apparent) or power factor
Display a: voltage, current or active power
Display b: current, active power or apparent power
Display c: active power, power factor, voltage or current

Operation: Press the a, b or c key to switch between parameters

Quick and Simple Settings

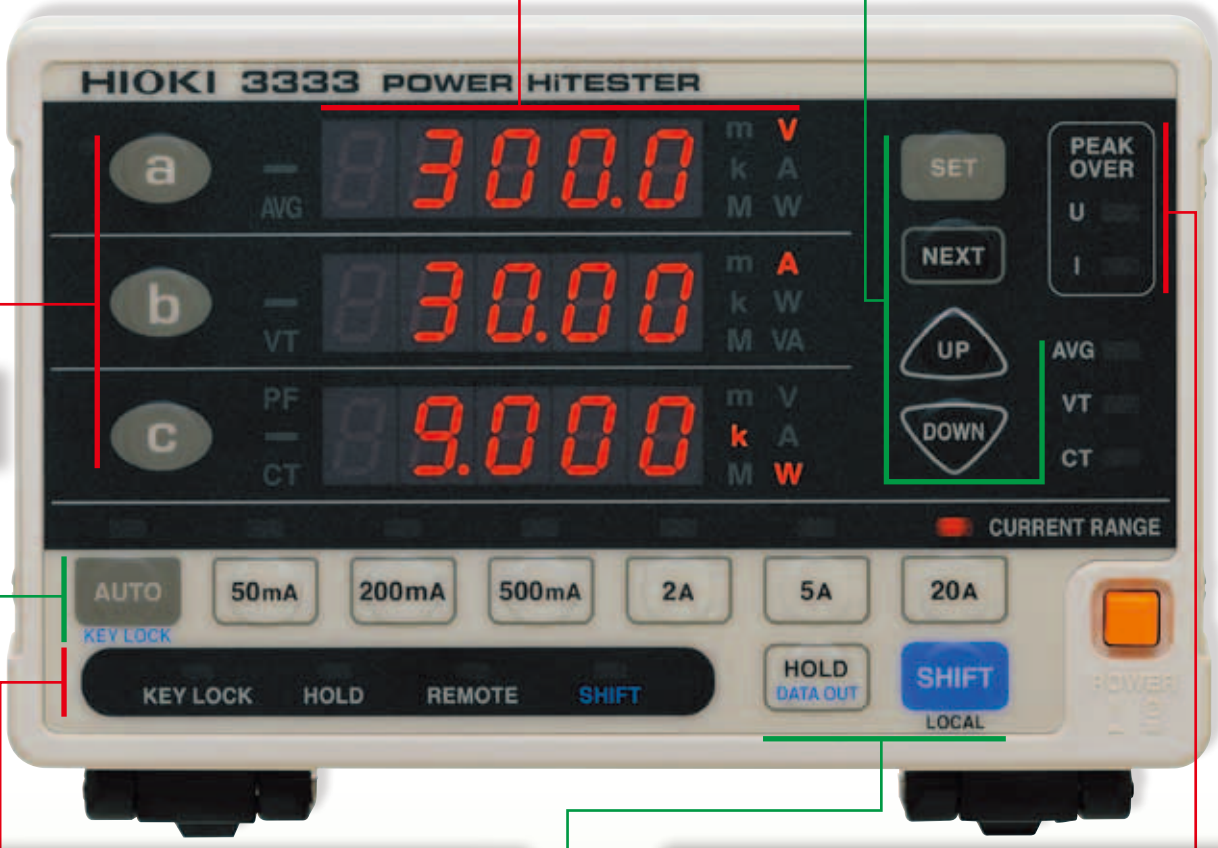
Press the SET key to display settings
Display a: AVG setting (number of samples to average)
convenient for displaying severely fluctuating values
Display b: VT (voltage transformer) ratio setting
Display c: CT (current transformer) ratio setting
To expand the measurement input level, VT and CT ratios can be set for transformer measurements. Primary winding input values can be read directly.

Operation: Press NEXT or the a, b or c key to select a setting item

Easy-to-see display

Bright emissive numeric and unit symbol display

Actual Size



Clearly visible instrument status

Display hold, remote control and key-lock states are indicated separately.

Check for Errors at a Glance

Warning lights indicate out-of-range input to Model 3333 when measuring voltage and current of distorted waveforms, such as in power switching circuits.

Easy range setting

Select current range simply by pressing the button (accepts up to 30 AAC, including auto-ranging)
No voltage range setting required (accepts up to 300 VAC)

Convenient functions

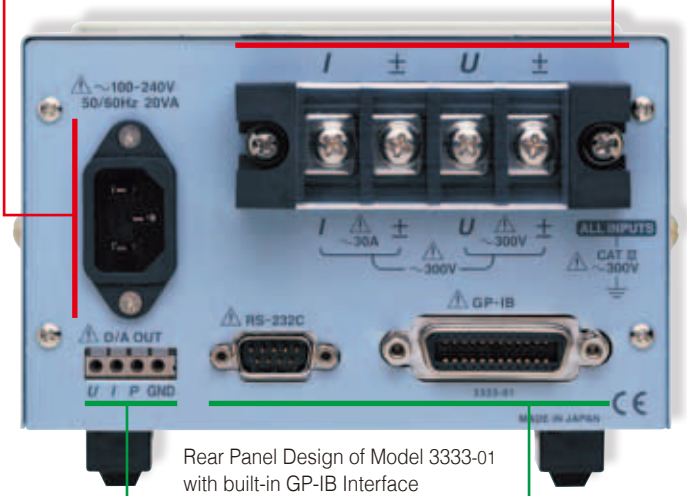
1. Key Lock (SHIFT + KEY LOCK keys)
   Useful for avoiding inadvertent operations on production lines.
2. Data Print (SHIFT + DATA OUT keys)
   Obtain hard copies of measurement data using the optional Printer Model 9442.

Friendly Power Measuring Device for the Production and Inspection Lines

Model 3333	What are the advantages?
Measurement accuracy: ±0.5% rdg. or better	Model 3333 fully exceeds the accuracy level of traditional analog meters that has an accuracy of only ±0.5% f.s.
Period of guaranteed accuracy (Recommended calibration interval): 3 years	±0.5% f.s is assured for a full three years, reducing calibration costs and production time losses
Easy Operation	Gone is the need to check for zero-position before measurement as you would on traditional analog meters
Digital Display	Quickly grasp the measurement data at a glance
Data management on a PC	Facilitate reporting and data recording needs using your computer
Cost-Performance	Take care of a multitude of measurement needs with a single low-cost instrument

■ Universal Power Supply

Compatible to 100 - 240V AC Power Supplies



Rear Panel Design of Model 3333-01
with built-in GP-IB Interface

■ Easy-to-connect Terminals

Screw-in terminal block affixes wires securely.
Because bad wiring connections can present a fire hazard, the screw-type terminal block has been incorporated to ensure secure wiring.

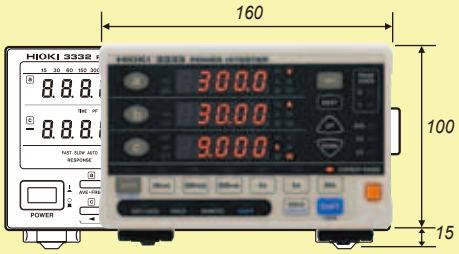
**Be sure to use a No. 3 Phillips screwdriver (available as an optional accessory) to loosen and secure the screws.*

Actual Size

■ Space-saving footprint

Smaller installation space.
The installed footprint of the POWER HiTESTER 3333 is about 34% smaller than that of former models. This size reduction makes the instrument especially easy to install.

**Rack mounts for various installations also available on special order. Please inquire for details.*



■ Three-channel analog output

Voltage, current and active power measurements are simultaneously output as +2 VDC f.s. levels (refreshed about five times per second).

■ Connect to Printer Model 9442

Use the optional Printer Model 9442 to print without concern for troublesome settings.

■ PC measurement and data management

- ❍ RS-232C interface built-in
- ❍ Select Model 3333-01 for additional built-in GP-IB interface

■ 3334 and 3333 Specifications

	3334 (AC/DC)	3333 (AC)
● General Specifications		
Measurable lines	Single-phase, 2-wire (AC/DC)	Single-phase, 2-wire (AC)
Measurement parameters	Voltage, current, active power, apparent power, power factor, frequency, integrated current and active power, waveform peak (voltage and current)	Voltage, current, active power, apparent power, power factor
Measurement method	Simultaneous digital sampling of voltage and current, True RMS	
Sampling Frequency	Approx. 74.4kHz	Approx. 48kHz
Measurement Range	Switch between auto-range or manual	
Voltage	15.000/ 30.00/ 150.00/ 300.0V	200.0V
Current	100.00m/ 300.0m/ 1.0000/ 3.000/ 10.000/ 30.00A	50.00m/ 200.0m/ 500.0m/ 2.000/ 5.000/ 20.00A
Power	1.5000W to 9.000kW (refer to range composition table below)	10.000W to 4.000kW (refer to range composition table below)
Frequency bandwidth	DC, 45Hz to 5kHz	45Hz to 5kHz
● Accuracy	Guaranteed at 23°C±5, max. 80%rh, sine wave input, power factor=1, in-phase voltage =0V (accuracy specifications differ depending on usage period of 1 or 3 years)	
Warm-up time	3 minutes	10 minutes
Period of guaranteed accuracy	3 years (better accuracy specifications available for 1-year period)	
Effective measurement range	Voltage, current:1% to 100% (Power: 0% to 100%)	Voltage, current, power: 10% to 150%
Effect of power factor (at pf=0.5)	Maximum ±0.4%±rdg. (45 to 66Hz)	
Temperature Coeffi cient	Maximum ±0.03%f.s./°C	

●Measurement ranges - Model 3334

Values in the ( ) represent the effective measurement range
Measurements below 0.5% of the voltage or current range will be zero suppressed.

Voltage \ Current	100.00mA (1.00 to 100.00mA)	300.0mA (3.0 to 300.0mA)	1.0000A (0.0100 to 1.0000A)	3.000A (0.030 to 3.000A)	10.000A (0.100 to 10.000A)	30.00A (0.30 to 30.00A)
15.000V (0.150 to 15.000V)	1.5000W (0.0000 to 1.5000W)	4.500W (0.000 to 4.500W)	15.000W (0.000 to 15.000W)	45.00W (0.00 to 45.00W)	150.00W (0.00 to 150.00W)	450.0W (0.0 to 450.0W)
30.00V (0.30 to 30.00V)	3.000W (0.000 to 3.000W)	9.000W (0.000 to 9.000W)	30.00W (0.00 to 30.00W)	90.00W (0.00 to 90.00W)	300.0W (0.0 to 300.0W)	900.0W (0.0 to 900.0W)
150.00V (1.50 to 150.00V)	15.000W (0.000 to 15.000W)	45.00W (0.00 to 45.00W)	150.00W (0.00 to 150.00W)	450.0W (0.0 to 450.0W)	1.5000kW (0.0000 to 1.5000kW)	4.500kW (0.000 to 4.500kW)
300.0V (3.0 to 300.0V)	30.00W (0.00 to 30.00W)	90.00W (0.00 to 90.00W)	300.0W (0.0 to 300.0W)	900.0W (0.0 to 900.0W)	3.000kW (0.000 to 3.000kW)	9.000kW (0.000 to 9.000kW)

●Measurement ranges - Model 3333

Values in the ( ) represent the effective measurement range
Measurements below 1% of the voltage, current range will be zero suppressed.

Voltage \ Current	50.00mA (5.00 to 75.00mA)	200.0mA (20.0 to 300.0mA)	500.0mA (50.0 to 750.0mA)	2.000A (0.200 to 3.000A)	5.000A (0.500 to 7.500A)	20.00 A (2.00 to 30.00A)
200.0V (20.0 to 300.0V)	10.000W (1.000 to 15.000W)	40.00W (4.00 to 60.00W)	100.00W (10.00 to 150.00W)	400.0W (40.0 to 600.0W)	1.0000kW (0.1000 to 1.5000kW)	4.000kW (0.400 to 6.000kW)

●Measurement accuracy - Model 3334

Frequency	Guaranteed Period	Voltage, current and active power (at less than 50% of input range)	Current and active power (at 50% to 100% of input range)	Notes
DC	1 year	±0.1%rdg.±0.2%f.s.		
	3 years	±0.1%rdg.±0.35%f.s.		
45 Hz ≤ f ≤ 66 Hz	1 year	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	
	3 years	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	
66 Hz < f ≤ 1 kHz	1 year	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	Accuracy not defined for current input exceeding 20A
	3 years	±0.1%rdg.±0.35%f.s.	±0.45%rdg.	
1 kHz < f ≤ 5 kHz	1 year	±3.0%f.s.	±3.0%rdg.	
	3 years	±4.5%f.s.	±4.5%rdg.	

**Add ±50μA to the accuracy when measuring DC current*
**Add (±50μA x voltage value) to the accuracy when measuring DC active power*

●Measurement accuracy - Model 3333 *Values in the ( ) indicate accuracy when input exceeds 100% of range.*

Frequency	Guaranteed Period	Voltage, current and active power (input current 20 A or less)	Current and active power (input current over 20 A)	Notes
45 Hz ≤ f ≤ 66 Hz	1 year	±0.1%rdg.±0.1%f.s. (±0.2%rdg.)		
	3 years	±0.1%rdg.±0.2%f.s. (±0.3%rdg.)		
66 Hz < f ≤ 1 kHz	1 year	±0.1%rdg.±0.2%f.s. (±0.3%rdg.)		Accuracy not defined for current input exceeding 20A
	3 years	±0.1%rdg.±0.35%f.s. (±0.45%rdg.)		
1 kHz < f ≤ 5 kHz	1 year	±3.0%f.s. (±3.0%rdg.)		
	3 years	±4.5%f.s. (±4.5%rdg.)		

●3334 and 3333 Arithmetic Expressions

Measurement Parameters	Formula
Apparent Power (S)	$S=U\times I$
Power Factor (λ)	$\lambda=\lvert P/S \rvert$
Integrated Current	(Sum of I from start of integration) / (1 hour of data)
Integrated Active Power	(Sum of P from start of integration) / (1 hour of data)

**U=Tested Voltage Value, I=Tested Current Value, P=Tested Active Power Value*
Calculating precision is ±1dgt. against the results obtained from each measured value
Current and active power integration available only on Model 3334.

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Email: sales@calright.com http://www.calright.com

	3334 (AC/DC)	3333 (AC)
● Input		
Input impedance	2.4 MΩ for voltage, 10 mΩ or better (50/60 Hz) for current	2.4 MΩ for voltage, 7 mΩ or better (50/60 Hz) for current
Maximum input voltage	300V, ±425Vpeak	300 Vrms, 425 Vpeak
Maximum input current	30 A, ±54.0Apeak *1	30 Arms, 42.5 Apeak
Maximum effective peak voltage	±300% of each voltage range, Within ±425Vpeak	Within 425Vpeak
Maximum effective peak current	±300% of each current range, Within ±54.0Apeak *1	±300% of each current range, Within ±42.5Apeak
Max. rated voltage to earth	300V (DC, 50/60Hz)	300V (50/60Hz)
● Display		
Display indication range	voltage and current: 0.5% to 105% of range active power: 0% to 110.25% of range	voltage and current: 1% to 152% of range active power: 0% to 231.04% of range
Displacement power factor	0.000 to 1.000 (no polarity display)	
Display refresh rate	approx. 5 times per second	
Response time	within 0.5 s (time to rated accuracy after abrupt change in input [0 to 90% or 100 to 10% of range])	
● Functions		
Integration measurement	No.of displayed digits: Six digits Current Integration: from 0.00000mAh, Polarity-independent integration and Sum value Active power Integration: from 0.00000mWh, Polarity-independent integration and Sum value Integration time: 1 min to 10000 h Measurement accuracy: measurement accuracy of active power ±1dgt.	
Wave peak measurement	Maximum value of positive and negative waveform of voltage/current (up to 300% of full scale range) Measurement accuracy: ±1.2%f.s. ("f.s." is 300% of each range)	
Rectification method	Switchable between AC+DC(True RMS), DC(simple average display) and AC(True RMS)	AC(True RMS)
Analog output (D/A output)	Parameter output representation: voltage, current and active power (3 simultaneous channels) D/A select an item from current integration, active power integration, apparent power, power factor Voltage output: ±2 VDC f.s. for each range Output accuracy: ±0.5% f.s. + individual measurement accuracy	Parameter output representation: voltage, current and active power (3 simultaneous channels) Voltage output: +2 VDC f.s. for each range Output accuracy: ±0.5% f.s. + individual measurement accuracy
Waveform output	Parameter output representation: voltage, current and active power (3 simultaneous channels) Voltage output: 1 VDC f.s. for each range Output accuracy: ±1.0% f.s. + individual measurement accuracy	
Average function	Simple averaging of specified number of samples: 1, 2, 5, 10, 25, 50 or 100	
VT or CT ratio	VT ratios: 1, 2, 4, 10, 20, 30, 60, 100 CT ratios: 1,2,3,4,5,6,8,10,12,15,16,20,24,25,30,40,50,60, 75, 80,100,200,300,500,1000,2000,3000,5000, 10000	VT ratios: 1, 2, 4, 10, 20, 30, 60, 100 CT ratios: 1,2,3,4,5,6,8,10,12,15,16,20,24,25,30,40,50,60, 75,80,100
External Interfaces	RS-232C interface: included as standard, Asynchronous communication method: full-duplex; Baud rate: 9600 bps (fixed)	
	GP-IB interface: Model 3334-01 only IEEE-488.1 1987 compliant, IEEE-488.2 1987 reference	GP-IB interface: Model 3333-01 only IEEE-488.1 1987 compliant, IEEE-488.2 1987 reference
Miscellaneous	Display Hold (HOLD), Maximum value hold, Peak value hold, Key Lock (KEYLOCK), Backup function (preserves settings, integration data)	Display Hold (HOLD), Key Lock (KEYLOCK), Settings backup (preserves settings)
● General Specifications		
Safety	EN61010 Pollution Factor 2, Measurement Category III (4000 V anticipated overvoltage)	
EMC	EN61326, EN61000-3-2, EN61000-3-3	
Operating environment	0 to 40 °C, 80% RH or less, non-condensating	
Storage environment	-10 to 50 °C, 80% RH or less, non-condensating	
Rated supply voltage	100 to 240 VAC, 50/60 Hz	
Maximum rated power	20 VA	
Size and weight	210 mm (8.27 in)W × 100 mm (3.94 in)H × 245 mm (9.65 in)D (excluding feet and projections), 2.5 kg (88.2 oz)	160 mm (6.30 in)W × 100 mm (3.94 in)H × 227 mm (8.94 in)D (excluding feet and projections), 1.9 kg (67.0 oz)

*1 Supported by Ver.1.10 or later.

■ Operate the Power HiTESTER from Your PC

Data Management is as Easy as 1-2-3

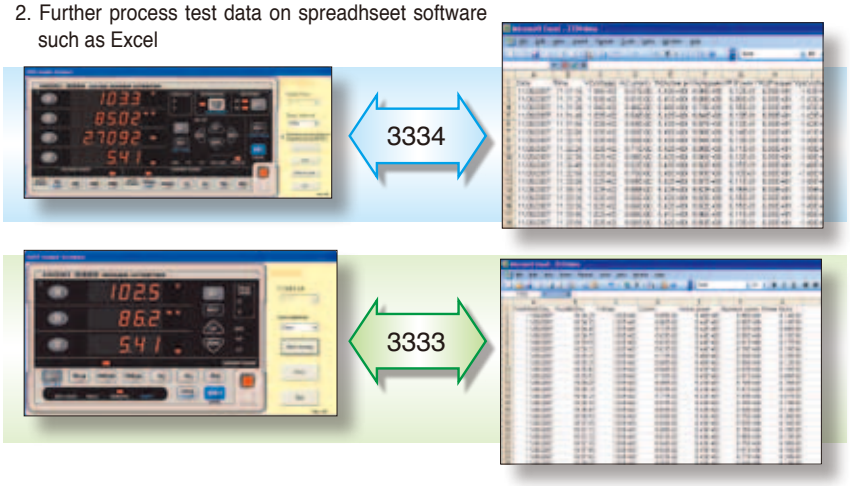
■ RS-232C (built-in with the 3334 and 3333)

■ RS-232C, GP-IB (built-in with the 3334-01 and 3333-01)

Free RS-232C application for both models available from your authorized HIOKI distributor only.

•Features and Functions

1. Operate the Power HiTESTER's keys on the PC as you would on the actual unit
2. Further process test data on spreadhseet software such as Excel



Use of the software require a comprehensive understanding of the protocols and commands.
Support for modifications to the software not available.

■ Customized versions of Model 3334 also available on Special Order!

1/10 of current ranges

Model 3334-20

Most appropriate for standby power measurement

Compatible to IEC62301
(standby power measurement)

- Current ranges 10.000mA to 3.000A
- Active power ranges
  1.5000W to 450.0W (150V range)
  3.000W to 900.0W (300V range)

Please contact your HIOKI distributors for further details.

GP-IB -01 Model
RS-232C
CE
True RMS

Model : AC/DC POWER HiTESTER 3334	
Model No. (Order Code)	(Note)
3334	
3334-01	(with GP-IB)

Accessories: Instruction manual ×1, Power cord ×1

GP-IB -01 Model
RS-232C
CE
True RMS

Model : POWER HiTESTER 3333	
Model No. (Order Code)	(Note)
3333	
3333-01	(with GP-IB)

Accessories: Instruction manual ×1, Power cord ×1

■ Options (Common to both Models 3334 and 3334-01)

RS-232C CABLE (9-pin to 9-pin, crossed cable/1.8m(0.07ft)) 9637
RS-232C CABLE (9-pin to 25-pin, crossed cable/1.8m(0.07ft)) 9638
GP-IB CONNECTOR CABLE (2m) 9151-02
No. 3 Phillips screwdriver

RS-232C CABLE 9637

GP-IB CONNECTOR CABLE 9151-02

No. 3 Phillips screwdriver

■ Option Printer (For the 3333 and 3333-01)

PRINTER 9442
CONNECTION CABLE (for printer 9442) 9444
RECORDING PAPER 1196
AC ADAPTER (for printer 9442 operation in Europe, except Switzerland) 9443-02

Print method : Thermal serial dot printing
Paper width : 112 mm(4.41ft)
Power supply : AC adapter 9443-02, or supplied nickel-metal hydride battery
Dimensions and weight : 160W(6.30")× 66.5H(2.62") × 17D(0.67") mm, 580g(20.5oz.)

CONNECTION CABLE 9444

AC ADAPTER 9443-02

When purchasing the Printer 9442, make sure you also purchase the Connection cable 9444 and AC adapter 9443-02 so that you can connect it to the 3333/3333-01.