

Measure Everything from AC, DC and 3-Phase Power Sources to Standby Power

The optimal power meter lineup for all applications

POWER METER PW3337/PW3336



AC/DC POWER HITESTER 3334

POWER HITESTER 3333







Advancing the Standard for Power Measurement

The best performing instruments for power measurement on production lines, in laboratories, and in research facilities.

Hioki delivers the optimal power testing solutions based on use case conditions, practical application, and accuracy.

Three-phase Power Meter

The PW3337 and PW3336 are suitable for a wide variety of connections, such as measuring three-phase circuits and single-phase 2-wire multiple circuits.

There is little internal resistance for the current input, and large currents up to 65 A can be measured with great accuracy.





Single-phase Power Meter

The PW3335 provides highly accurate measurements for everything from standby power to operating power.

Compliant with the IEC62301 measurement standard for standby power, it is capable of measuring current as low as 10 µA.

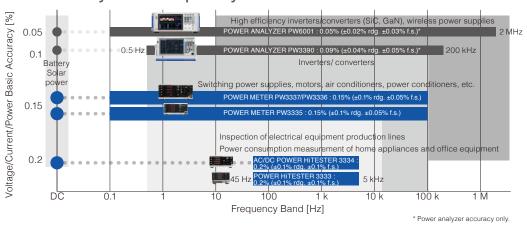
Designed for power consumption testing, the 3334 and 3333 are guaranteed for accuracy for up to 3 years.



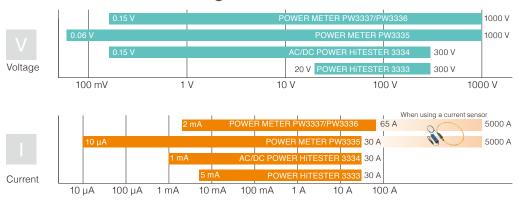




Basic Accuracy and Frequency Bands



Effective Measurement Range



Comparison Chart

		PW3337	PW3336	PW3335	3334	3333	
No. of channels		3	2	1	1	1	
Supported connections		Three-phase, three-phase + single-phase, single-phase x 3, DC x 3	Three-phase, single-phase x 2, DC x 2	Single-phase, DC	Single-phase, DC	Single-phase	
Effective measur range, voltage	rement	0.15 V to 1000 V		0.06 V to 1000 V	0.15 V to 300 V	20 V to 300 V	
Effective measur range, current	rement	2 mA to 65 A		10 μA to 30 A	1 mA to 30 A	5 mA to 30 A	
Frequency band		DC, 0.1 Hz to 100 kHz			DC, 45 Hz to 5 kHz	45 Hz to 5 kHz	
Basic accuracy, (Voltage, current		±0.1% rdg. ±0.05% f.s.			±0.1% rdg. ±0.1% f.s.	±0.1% rdg. ±0.2% f.s.	
Basic accuracy, (Voltage, current		±0.1% rdg. ±0.1% f.s.			±0.1% rdg. ±0.2% f.s.	-	
Integrated powe measurement	r	Yes			Yes	-	
Harmonic measu	Harmonic measurement		IEC61000-4-7 compliant			-	
Current sensor input		Yes PW3335-03, -04			-		
	LAN		Yes		-		
Interface	RS-232C	Ye	es	PW3335, -02, -03, -04	Yes		
Interiace	GP-IB	PW3337-01, -03	PW3336-01, -03	PW3335-01, -04	3334-01	3333-01	
	D/A output	PW3337-02, -03	PW3336-02, -03	PW3335-02, -04	Yes		

Features

POWER METER PW3337/PW3336

Accurate measurement of power for three-phase equipment, through direct input up to 1000 V AC/DC / 65 A.





PW3337-03 Front Panel

PW3337-03 Rear Panel



Maximum 65 A input. Cable terminals are fixed securely with large screws on the terminal block.

- Voltage/current/power basic accuracy of ±0.1% *
- Direct input up to 1000 V AC/DC / 65 A
- Harmonic measurement as standard feature, IEC61000-4-7 compliant





- Measurement of multiple connections in the optimal range for each due to independent ranges for each channel
- Measure up to 5000 A AC with optional current sensor

POWER METER PW3335

Highly accurate AC/DC measurements from standby power to operating power











PW3336-03

Half-rack Size to Save Space



For development/production lines for electrical equipment

- Voltage/current/power basic accuracy ±0.1% *
- Highly accurate AC/DC measurements from standby power to operating power
- Accuracy guaranteed throughout a wide range, from 10 µA to 30 A and 60 mV to 1000 V AC/DC
- Harmonic measurement as standard feature, IEC61000-4-7 compliant
- Compliant with the IEC62301 and EN50564 measurement standards for standby power
- Power factor effect of ±0.1% f.s. delivers highly accurate measurements even for no-load testing of transformers with a low power factor
- Accurate measurement of fluctuating electric power thanks to auto range integration with guaranteed accuracy for measurements while range switching
- Measure up to 5000 A AC with optional current sensor (PW3335-03, -04)

- Voltage input terminal
- Current input terminal
- LAN connector
- RS-232C connector
- GP-IB connector

- D/A output terminal
- Current sensor input terminal
- Synchronous control terminal

AC/DC POWER HITESTER 3334

Measurement of power consumption and integrated power for battery-operated equipment, home appliances, and office equipment





- Accuracy guaranteed up to 3 years
- Compliant with the SPECpower® server power evaluation test

POWER HITESTER 3333

Low-price model for measurement of power consumption on production/inspection lines

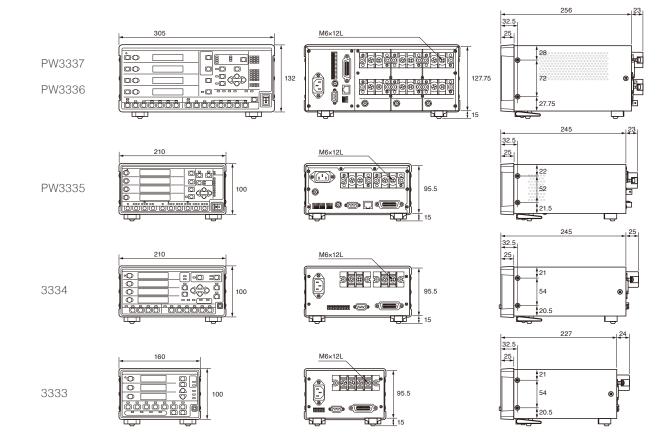




- Compact model for saving space, even when added to a system
- Accuracy guaranteed up to 3 years

Dimensional Drawings

Units: mm



Applications

Inspection of Electrical Equipment Production Lines



Best-in-class Accuracy ±0.1% * PW333 7 PW333 6 PW333 5

Our lineup provides reliable accuracy for a variety of measurement scenarios. Accurately measure the power consumption of a variety of household appliances, such as liquid crystal displays, refrigerators, and air conditioners.





Basic accuracy, AC

±0.1%

Accuracy Guaranteed Up to 3 Years (Longest in the Industry)



The 3333 and 3334 are guaranteed for accuracy for 3 years. Even after 3 years, they maintain an accuracy of $\pm 0.5\%$ rdg. as required for measurements. This 3-year accuracy guarantee, the longest in the industry, helps to save on calibration expenses.



Extensive Interfaces



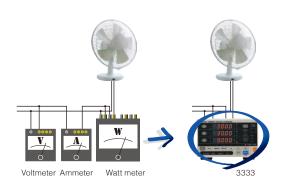
The built-in interfaces are convenient for transferring data to a PC and equipping the unit on automated machines. PC communication software can be downloaded free of charge from the HIOKI website. For details about the built-in interfaces, refer to the specifications for each model.



Replacement for Analog Meters



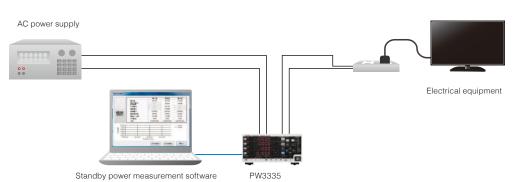
These models can be used as replacements for analog voltmeters, ammeters, and watt meters. Up to 4 parameters such as voltage, current, and power can be displayed at the same time, allowing 3 measuring devices to be covered with a single unit. The digital display avoids issues such as parallax due to viewing angle and zero shift of the indicator.



^{*} For complete details, please refer to the specifications

Standby Power Measurement





Key features

Compliant with standby power standards

Wide dynamic range

Standby power measurement software



AC adapter standby power measurement, for primary AC and secondary DC

Compliant with IEC62301 and EN50564 Standards

The PW3335 is compliant with measurement standards for standby power, as welll as other measurement standards including the ErP Directive and Energy Star. Special parameters required by such standards including THD, CF, and MCR can also be checked with this unit.

Requirements for Measurement Instruments for Standby Power Measurements (excerpt)

Requirement	PW3335 Performance
Power resolution of 1 mW or better	Minimum resolution of 0.01 mW (in the 300 V/1 mA range)
Crest factor 3 support	Crest factor 6 support
Harmonic component measurement of up to at least 50th order	Harmonic measurement as standard feature
Data acquisition via interface	LAN (standard feature), RS-232C, GP-IB

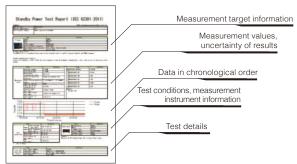
THD (Total Harmonic Distortion): Indicates to what extent harmonic components are present in an AC waveform

CF (Crest Factor): Ratio of the peak value to the effective (RMS) value of an AC waveform

MCR (Maximum Current Ratio): Current evaluation index, calculated from the crest factor and power factor

Create Reports with Free Software

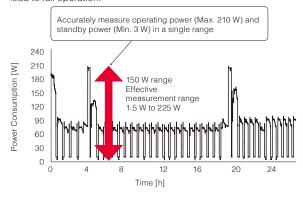
Standby power measurement software can be downloaded free of charge from the HIOKI website. Enter the required information to perform standby power measurements according to standards. Use this software to create reports of measurement results and save test data in CSV format.



Example of Report Output

Wide Range of Effective Measurement

The PW3335 has an effective measurement range of 1% to 150%. Due to this wide range of effective measurement, even equipment with large load fluctuations, such as refrigerators, heaters, and pumps, can be measured accurately under all conditions from noload to full operation.

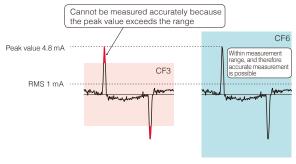


Long-term Measurement of Refrigerator Power

Support for CF6 (Crest Factor 6)

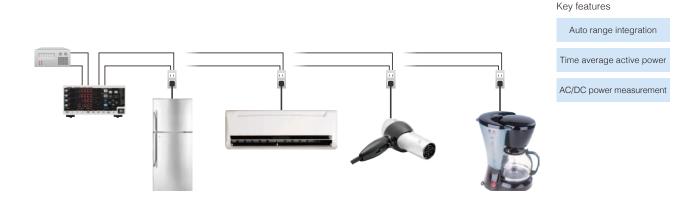
When an AC adapter or switching power supply operates with no load, the crest factor of the current waveform increases. The PW3335 can measure waveforms that exceed the range of watt meters that support crest factor 3.

In addition, although the power factor is low during no-load operation, the PW3335 is affected very little by power factor and can therefore achieve accurate measurements.



Example of Standby Current Waveform (CF = Peak Value, RMS = 4.8)

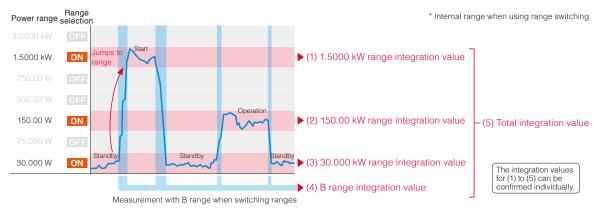
Measurement of Fluctuating Loads and Power Supply Control



Auto Range Integration with Guaranteed Accuracy when Switching Ranges



These models automatically jump to the optimal power range according to current consumption when performing integration measurements. When switching ranges, power is integrated using the B range*, and therefore there is no loss of integration data. Achieve seamless power integration with guaranteed accuracy, even with loads that experience frequent and repeated fluctuations. In addition, since power integration can be performed for individual ranges, you can measure integrated power for the various conditions of devices that experience power fluctuations.

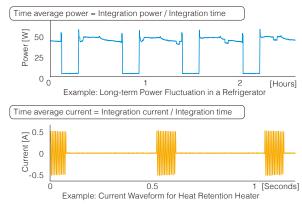


Intermittent Power Supply



Devices that perform intermittent operation and cycle control repeat a cycle of stopped states and operating states. Therefore, with normal power measurement, it is not possible to determine a value for rated power consumption.

Time average active power (current) is a function that allows the measurement of the time average for power (current) that experiences fluctuations.

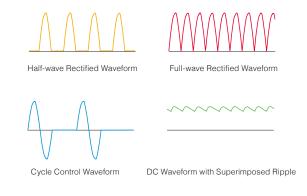


AC/DC Measurement



For equipment that uses rectifiers and control devices, it might not be possible to accurately measure voltage or current without an AC/DC power meter.

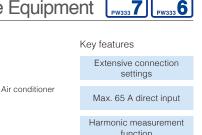
- Half-wave rectified waveforms used for dryers and fans
- Full-wave rectified waveforms used for AC adapters
- Cycle control waveforms used for voltage and temperature adjustment heaters
- DC waveforms with superimposed ripple components



Research, Development, and Inspection of Three-Phase Equipment [PW333 7] [PW333 6]

Transformer

Motor



Current sensor input

Compliant with IEC61000-4-7 Harmonic Measurement Standards

Three-phase

These models are compliant with the IEC61000-4-7 international standard for harmonic measurements. Conduct harmonic analysis up to the 50th order. The upper limit for harmonic analysis can be set from 2nd to 50th, according to the standard used.

IEC61000-4-7 is an international standard for the measurement of harmonic current and harmonic voltage in power supply systems, and the harmonic current emitted from devices. It specifies the performance of standard measurement instruments. Among the series of standards that include specifications for power measurements, it is used as a reference standard for harmonic measurements.

Support for Various Connections

The PW3337 supports not only 3V3A, but also a variety of three-phase connections such as 3P4W, 3P3W2M, and 3P3W3M.

Accuracy Guaranteed for Currents Up to 65 A

Because DCCT allows a current with an input resistance of 1 m Ω or less, accuracy is guaranteed up to 65 A. No heat is generated even with the input of large currents, so there is no loss of accuracy due to self heating. Even if the current exceeds 65 A, an optional current sensor allows measurements up to 5000 A.



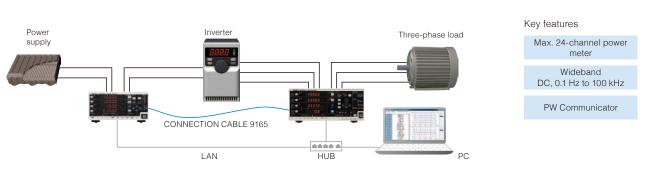


DCCT current sensor (in the PW3337)

Temperature distribution image at 30 A DC/10-minute input

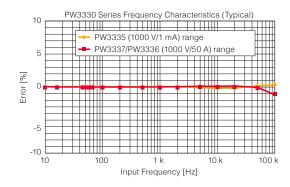
PW333 7 PW333 6 PW333

Inverter Efficiency Measurement



Wide Frequency Band (DC, 0.1 Hz to 100 kHz)

These models cover not only the fundamental frequency bands for inverters, but also carrier frequency bands, in a wide range that includes DC and frequencies from 0.1 Hz to 100 kHz.



24-channel Power Meter with Synchronous Control for up to 8 Units

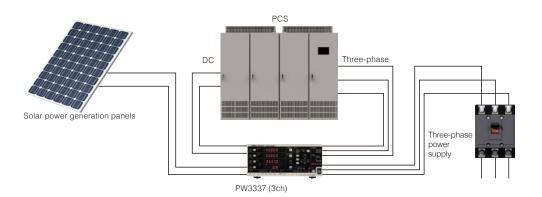
Connect 8 units for synchronous measurement of up to 24 channels. The calculation and control timing for PW3337, PW3336, and PW3335 units that are set as slaves are synchronized with the master unit. Use this feature to measure the I/O efficiency of power supply devices, compare multiple pieces of equipment, or to perform simultaneous parallel testing of production lines. Use the free PW COMMUNICATOR* software to calculate the efficiency between multiple units and to acquire data simultaneously from multiple units.



* This software can be downloaded from the HIOKI website.

PV Power Conditioner (PCS) Efficiency Measurements



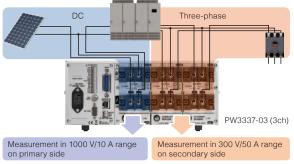


Key features Independent range per channel Extensive calculation functions Harmonic measurement

function

Independent Ranges Per Channel for Highly Accurate Measurements

Independent channels allow the selection of the optimal range for each connection. One example is the simultaneous measurement of the primary side (DC) and secondary side (three-phase) of a PCS using a single unit. Selecting the optimal range for each target to be measured enables highly accurate measurements.

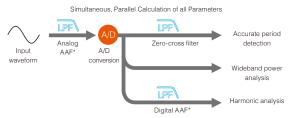


Setting Optimal Range According to Target to be Measured

Simultaneous Measurement of Power Data and Harmonics

In addition to standard measurement items such as voltage, current, and power, all items related to harmonics, such as distortion and content percentage, are calculated internally in parallel at the same time. Items such as RMS value, MEAN value, DC components, AC components, and fundamental wave components can all be confirmed simply by switching the display. Even for DC waveforms with superimposed ripple components, the AC/DC components can be measured separately.

In addition, when using PC software, more than 180 measurement items can be acquired at the same time.



* AAF (Anti-aliasing filter): Filter that prevents aliasing errors during sampling

I/O Efficiency Calculation with a Single Unit

Input and output can be measured independently at the optimal ranges, and the PCS efficiency can be calculated and displayed on a single unit. PCS can be evaluated with a simple system configuration.

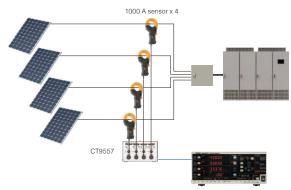
1000 V Range for Evaluation of Large Power Conditioners

These models support the measurement of large voltages, which is required in order to measure power conditioners for solar power generation. Measure up to 1000 Vrms and 1500 Vpeak.



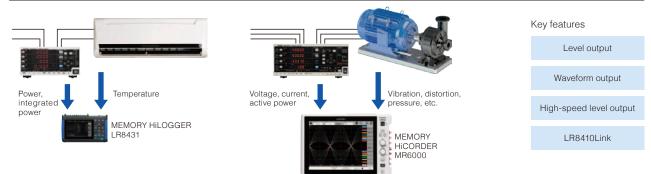
Aggregation of Output from DC Current Sensors (Up to 4000 A)

SENSOR UNIT CT9557 is a power supply for highly accurate current sensors that have a waveform output function. In addition to using it as a 4-channel power supply, it is also equipped with a sum feature for aggregating the input waveforms into a single waveform to be output.



Aggregating the Output from 4 Sensors into One Unit

Output Function Linked with Recorder

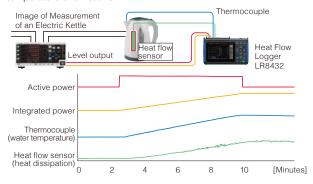


	PW3337-02 PW3337-03	PW3336-02 PW3336-03	PW3335-02 PW3335-04	3334 3334-01	3333 3333-01
Level output (Analog output)	Yes		Yes	Yes	Yes
Waveform output	Yes		Yes	Yes	-
High-speed level output	Active power only		Voltage, current, active power	-	-

Display Trends with a Data Logger



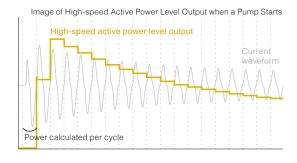
The level output (analog output) function delivers measured values that are displayed on the power meter with an analog voltage that is updated every 200 ms. Connect the unit to a data logger to check trends through synchronization with data such as temperature and heat flow*.



* Heat flow: Parameter for understanding the heat reception and heat dissipation of an object. Can be measured with a heat flow sensor.

Observe Power for Each Cycle PW333 7 PW333 6

The PW3337, PW3336, and PW3335 feature built-in, high-speed active power level output. Level is output for power per cycle. When used in combination with a memory hicorder, fluctuations in power can be observed in real time. This feature is also useful for analyzing equipment that uses power, such as monitoring cutting and grinding tools.

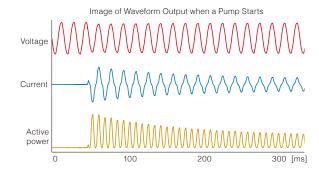


* With the PW3335, high-speed level output is also possible for 45 Hz to 66 Hz

Observe Waveforms with a Memory Hicorder



The waveform output function outputs the voltage/current waveforms captured by a power meter in the form of high-speed analog voltage. Connect to a memory recorder to check behavior when load fluctuates, such as with the inrush current of a motor.



Transfer Information to Data Logger Wirelessly (LR8410Link)



Connect the PW3335 (excluding model -01) and a data logger (with support for LR8410 Link) via Bluetooth® wireless technology* to wirelessly transmit 8 measurement parameters from the power meter to the data logger. In addition to the voltage and temperature measured by the multichannel data logger, you can also integrate current and power and observe and record them in real time.

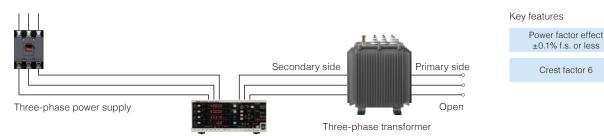


* Connection requires the serial - Bluetooth® wireless technology conversion adapter recommended by Hioki. Please inquire with your Hioki distributor

No-load Loss Measurements for Transformers

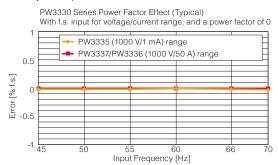


Crest factor 6



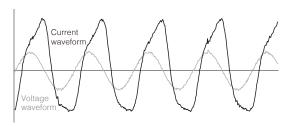
Power Factor Effect of 0.1% or Less, Even at Low Power Factors

A no-load loss test is one indicator for evaluating energy conservation for transformers and motors. The PW3337 and PW3336 are affected very little by power factor, at $\pm 0.1\%$ f.s. or less, allowing active power to be measured with a high level of accuracy at low power factors.



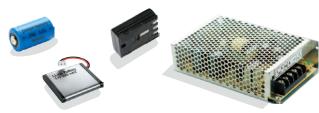
Support for Crest Factor 6

The crest factor of a current waveform increases during no-load operation. The PW3337, PW3336, and PW3335 support a crest factor 6. Therefore, even if the waveform peak value is large relative to the range, accurate measurements are possible without exceeding the range.



Example of Transformer Current Waveform during No-load Operation

DC Power Measurement for Batteries and Power Supplies



Key features DC power accuracy ±0.2% rdg. Power integration function

Best-in-class DC Power Accuracy



These models are best for measuring battery power consumption and output from switching power supplies. Make accurate measurements of DC power, which is an important factor in improving efficiency and saving energy.



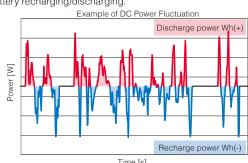


DC power accuracy

Current and Power Integration Function by Polarity



For integrated measurements, recharging power and discharging power are integrated by polarity every 200 ms. The amount of power in the positive direction, the amount of power in the negative direction, and the sum of the amounts of power in the positive and negative direction during the integration period are measured. Accurate measurement of recharging power and discharging power is possible even if there is rapid repetition of battery recharging/discharging.



^{*} For complete details, please refer to the specifications

Options

TYPE 1 Current Sensor (General Current Measurements)

Connect this unit to the current sensor input terminal (BNC) on the PW3337/PW3336/PW3335. It can be used with a direct connection.



Wiring method	External appearance	Product name/ model no.	Rated current	Frequency band	Diameter of measurable conductors	Basic accuracy (amplitude) Basic accuracy (phase)	Cord lengths	Power supply
	1	CLAMP ON SENSOR 9660	100 A	40 Hz to 5 kHz	☑ 15 mm (0.59 in)	±0.3% rdg. ±0.02% f.s. Within ±1°		
	7	CLAMP ON SENSOR 9661	500 A	40 Hz to 5 kHz	☑ 46 mm (1.81 in)	±0.3% rdg. ±0.01% f.s. Within ±0.5°		Not used
Clamp		CLAMP ON SENSOR 9669 1000 A		40 Hz to 5 kHz	⊠ 55 mm (2.17 in), 80 mm (3.15 in) × 20 mm (0.79 in) BUS BAR	±1.0% rdg. ±0.01% f.s. Within ±1°		
method	30	FLEXIBLE CLAMP ON SENSOR CT9667-01			☑ 100 mm (3.94 in)		(9.84 ft)	AA (LR6) Alkaline Batteries x
	80	FLEXIBLE CLAMP ON SENSOR 500 A/ CT9667-02 5000 A			☑ 180 mm (7.09 in)	±2.0% rdg. ±0.3% f.s. Within ±1°		2 (approx. 7 days) or
		FLEXIBLE CLAMP ON SENSOR CT9667-03			⊠ 254 mm (10.00 in)			AC ADAPTER 9445-02 (optional)

Options for CT9667-01/-02/-03

External appearance	Product name/ model no.	Functions	Power supply
- VO	AC ADAPTER 9445-02	For supplying power to CT9667-01/-02/-03	100 to 240 V AC

TYPE 2 Current Sensor (Highly Accurate Current Measurements)

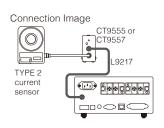
Connect this unit to the current sensor input terminal (BNC) on the PW3337/PW3336/PW3335. SENSOR UNIT CT9555 or CT9557 and CONNECTION CABLE L9217 are required.



Wiring method	External appearance	Product name/ model no.	Rated current	Frequency band	Diameter of measurable conductors	Basic accuracy (amplitude) Basic accuracy (phase)	Cord lengths	Power supply
		CT6862-05	50 A	DC to 1 MHz	☑ 24 mm (0.94 in)	±0.05% rdg. ±0.01% f.s.		
		CT6863-05	200 A	DC to 500 kHz	☑ 24 mm (0.94 in)	Within ±0.2°		
Through method		CT6875	500 A	DC to 2 MHz	⊠ 36 mm (1.42 in)			
		CT6876	1000 A	DC to 1.5 MHz	⊠ 36 mm (1.42 in)	±0.04% rdg. ±0.008% f.s. Within ±0.1°		
	Q	CT6877	2000 A	DC to 1 MHz	⊠ 80 mm (3.15 in)		3 m CT9555 or CT9557	or
	1	CT6841-05	20 A	DC to 1 MHz	■ 20 mm (0.79 in)			
	*	CT6843-05	200 A	DC to 500 kHz	■ 20 mm (0.79 in)	_		C19557
Clamp	*	CT6844-05	500 A		±0.3% rdg. ±0.01% f.s. Within ±0.1°			
method	8	CT6845-05	500 A	DC to 100 kHz	⊠ 50 mm (1.97 in)			
	8	CT6846-05	1000 A	DC to 20 kHz	⊠ 50 mm (1.97 in)			
	% \	9272-05	20 A/ 200 A	1 Hz to 100 kHz	☑ 46 mm (1.81 in)	±0.3% rdg. ±0.01% f.s. Within ±0.2°		

Options for Current Sensor TYPE 2

External appearance	Product name/ model no.	Max. no. of sensors	Functions	Power supply	Cord lengths
•	SENSOR UNIT CT9555	1	For supplying power to the TYPE 2 current sensor	100 V to 240 V AC	-
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSOR UNIT CT9557	4	For supplying power to the TYPE 2 current sensor With addition output function	100 V to 240 V AC	-
11	CONNECTION CORD L9217	-	For connecting CT9555/CT9557 and PW3330 series units	-	1.6 m (5.25 ft)



Rack Mount Hardware

HIOKI can also manufacture rack mount hardware (EIA, JIS). Please contact your Hioki distributor or subsidiary for more information.

Printing with a Printer

Connect the 3333 to PRINTER 9442* to print out values.

Printing example

STATUS,000000.U,+0200.0E+0,1,+014.82E+0, P,+02.727E+3,S,+02.964E+3,PF,+00.920E+0



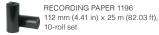
PRINTER 9442

Thermal serial dot method, 112 mm (4.41 in) paper widt Power supply: AC ADAPTER 9443-02, or the included nickel hydride batteries

included nickel hydride batteries
Dimensions, mass: 160 mm W × 67 mm H × 170 mm D
(6.30 in W × 2.64 in H × 6.69 in D),
580 g (20.5 oz)





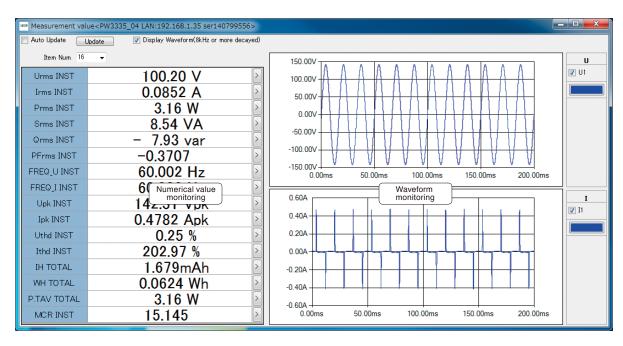


Software

PW Communicator



PW Communicator is an application for communicating between a PW3337/PW3336/PW3335 and a PC. This software can be downloaded free of charge from the HIOKI website. Use this software to configure the power meter, acquire interval data with a PC, perform numerical calculations for measurement data, calculate efficiency between multiple units, display 10 or more measurement items, and display waveforms.







Numerical value monitoring

Display the PW3337/PW3336/PW3335 measurement values on the PC screen. You can freely select up to 64 values, such as voltage, current power and harmonics

such as voltage, current, power, and harmonics.

Waveform monitoring

The voltage, current, and waveforms measured by the unit can be monitored on the PC screen.

Meter setting The configuration of the connected power meter can be changed on the PC screen.

Synchronous Efficiency calculations, such as input/output of the power supply conversion device, are possible between multiple measurement power meters. Use a sync cable to connect and synchronize the control of up to 8 units.

Save in chronological order

More than 180 pieces of measured data can be recorded to a file in CSV format at regular time intervals.

ogical The minimum time interval for recording is 200 ms.

LabVIEW Driver



Obtain data and configure measurement systems with the LabVIEW driver. (LabVIEW is a registered trademark of NATIONAL INSTRUMENTS.)

Sample Software



Sample software for loading data (via RS-232C) can be downloaded from the HIOKI website.

- The 3333/3334 front panel is displayed on the PC screen. Operate the power meter or change settings directly on the PC.
- The measured values for the 3333/3334 are displayed in real time on the PC screen. Save data as a CSV file.

Standby Power Measurement Software



"Standby Power Measurement Software" is an application software exclusively designed for the Power Meter PW3335. This software lets you to view PW3335 measurement data and also save them as reports or in CSV format via a LAN, GP-IB, or RS-232C. Measure standby power consumption in accordance with IEC62301. Download the software free of charge from the HIOKI website.

Workflow for Standby Power Test

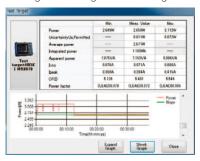
1. Connect to power meter

Configure the settings for communication with a power meter. Connect the PC to a power meter, and enter the settings required for the interface used (LAN/RS-232C/GP-IB).



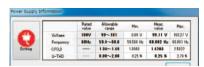
2. Configure the test target

Enter the information of the device under test. The information to be entered includes manufacturer name, model name, serial number, and operation mode. You can also register an image of the test target.



3. Configure the test power supply

Enter the information of the test power supply. Information to be entered includes rating and frequency. Also, enter the values of uncertainty due to the connection method, wiring, power supply, and temperature.



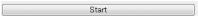
4. Configure the test conditions

Set the current range, stop conditions, algorithm used to judge stability, cycle time, and upper limit for test time.



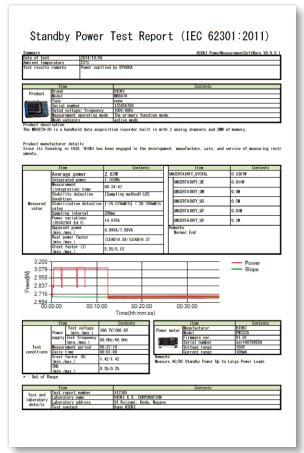
5. Run test

The consumed power is measured according to the configured settings.



6. Create report

Create a report of the test results. Output either a PDF report or CSV file.



Example of report output

Model	PW0005				
Serial Number	ser1 40799556				
Firmware Ver	V0.07				
Start Time	2014	7	28	14	32
Voltage Range	150V				
Current Range	200mA				
Update Rate	200ms				
Algorithm	LR	CA	SP1	SP2	SAE
Stop Factor	Pass[Condition1 (LR)]			
Valid Period	0	180			
Time(Sec)	Test voltage(V)	Test frequency(Hz)	U-THD(%)	Crest Factor U	Crest Factor I
14.0	99.49	60.002	0.26	1.4202	5.6212
15	99.49	60.002	0.27	1.4199	5.6585
15.2	99.49	60.002	0.25	1.4198	5.6696
15.4	99.49	60.002	0.26	1.4198	5.6834
15.6	99.49	60.002	0.26	1.4198	5.6652
15.8	99.49	60.002	0.26	1.4198	5.6668
16	99.49	60.002	0.26	1.4199	5.6484
16.2	99.49	60.002	0.26	1.4198	5.6675

CSV output example

PW3337 and PW3336 Specifications

Input Specificati	ons					
Measurement line type	PW3336 series Single-phase 2-wire (1P2W), Single-phase 3-wire (1P3W), Three-phase 3-wire (3P3W, 3P3W2M)					
Wiring CH1 CH 1P2W×2 1P2W 1P2						
	1P3W		3W			
	3P3W	3P	3W			
	3P3W2M	3P3\	N2M			
PW3337 series Single-phase 2-wire (1P2W), Single-phase 3-wire (1 Three-phase 3-wire (3P3W, 3P3W2M, 3V3A, 3P3W3 Three-phase 4-wire (3P4W)						
	Wiring	CH1	CH2	CH3	1	
	1P2W×3	1P2W	1P2W	1P2W		
	1P3W&1P2W	1P3W		1P2W		
	3P3W&1P2W	3P3W		1P2W		
	3P3W2M	3P3W2M				
	3V3A	3V3A				
	3P3W3M		3P3W3M			
	3P4W	3P4W				
Input methods	Voltage Isolated input Current Isolated input,					
Voltage measurement ranges	AUTO/ 15.000 V/ 30.00 600.00 V/ 1000.0 V (se				0 V/	
Current	AUTO/ 200.00 mA/ 500	0.00 mA/ 1	.0000 A/ 2	2.0000 A/ 5	5.0000 A/	
measurement	10.000 A/ 20.000 A/ 50.000 A (set for each wiring mode)					
ranges	For more information about external current sensor input, see the					
	external current sensor input specifications					
Power ranges	Depends on the combi PW3336: from 3.00 PW3337: from 3.00	00W to 10	0.00kW (al	so applies	to VA, var)	
Input registance	Voltage input terminal				, , , , , , ,	

(50/60 Hz)		minal : 1 mΩ or less					
Basic Measurem	nent Specifications	S					
	Simultaneous voltage simultaneous calculati	and current digital sam	pling, zero-cross				
Sampling frequency	Approx. 700 kHz	011					
A/D converter	16-bit resolution						
Frequency bands Synchronization	DC, 0.1 Hz to 100 kHz U1, U2, U3, I1, I2, I3, DC (fixed at 200 ms)						
sources	Can be set separately						
Measurement items			ver . Apparent power				
	Reactive power Pow						
	Efficiency	- Current in					
	· Active power integrat						
	 Voltage waveform pe Voltage crest factor 	ak value - Current wa - Current cr	aveform peak value				
	Time average current		age active power				
	· Voltage ripple factor	· Current rip					
	Harmonic parameters						
	· Harmonic voltage RN	IS value · Harmonic	current RMS value				
	Harmonic active pow		onic voltage distortion				
		nt distortion. Voltage fu					
		waveform Active power					
		ntal waveform · Reactive pov ental waveform (displac					
		e difference fundamen					
		fundamental wave pha					
		fundamental wave pha					
	· Harmonic voltage co		current content %				
	· Harmonic active pow						
	The following parameters can be downloaded as data during PC						
	communication but not displayed: - Harmonic voltage phase angle - Harmonic current phase angle						
		rrent phase difference	current priace angle				
Rectifiers	AC+DC: AC+DC measurement						
	Display of true RMS values for both voltage and current						
	AC+DC Umn: AC+DC measurement						
	Display of average value rectified RMS converted values for						
	voltage and true RMS values for current DC: DC measurement						
	Display of simple averages for both voltage and current						
	Display of values calculated by (voltage DC value)x (current DC						
	value) for active power						
	AC: AC measurement Display of values calculated by for both voltage and current						
	Display of values calculated by $\sqrt{(AC+DC \text{ value})^2 - (DC \text{ value})^2}$						
	for active power						
	FND Extraction and display of the fundamental ways companent						
	Extraction and display of the fundamental wave component from harmonic measurement						
Zero-Crossing	500 Hz/200 kHz						
Filter	500 Hz: 0.1 Hz to 500	Hz, 200 kHz: 0.1 Hz to	200 kHz				
Measurement accuracy							
Voltage	L	E00/6 - 1 - 1 - 4000/6 -	4000/6 - 4				
Frequency (f)	Input < 50% f.s. ±0.1%rdg. ±0.1%f.s.	50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s.	100%f.s. ≤ Input ±0.2%rdg.				
0.1Hz ≤ f < 16Hz	±0.1%rdg. ±0.1%f.s.	±0.1%1dg. ±0.1%1.s.	±0.2%rdg.				
		±0.0701 ag.	±0.07014g.				
		+0.2%rda.	+0.2%rda.				
16Hz ≤ f < 45Hz	±0.1%rdg. ±0.1%f.s.	±0.2%rdg. ±0.15%rdg.	±0.2%rdg. ±0.15%rdg.				
		±0.2%rdg. ±0.15%rdg. ±0.2%rdg.	±0.2%rdg. ±0.15%rdg. ±0.2%rdg.				
$16Hz \le f < 45Hz$ $45Hz \le f \le 66Hz$ $66Hz < f \le 500Hz$ $500Hz < f \le 10kHz$	±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg.				
	±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s. ±0.5%rdg. ±0.3%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg.				
$\begin{array}{c} 16\text{Hz} \leq f < 45\text{Hz} \\ 45\text{Hz} \leq f \leq 66\text{Hz} \\ 66\text{Hz} < f \leq 500\text{Hz} \\ 500\text{Hz} < f \leq 10\text{kHz} \\ 10\text{kHz} < f \leq 50\text{kHz} \\ 50\text{kHz} < f \leq 100\text{kHz} \\ \end{array}$	±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg.				
$ \begin{array}{c} 16Hz \leq f < 45Hz \\ 45Hz \leq f \leq 66Hz \\ 45Hz \leq f \leq 500Hz \\ 66Hz < f \leq 500Hz \\ 500Hz < f \leq 10kHz \\ 10kHz < f \leq 50kHz \\ 50kHz < f \leq 100kHz \\ \end{array} $	±0.1%rdg. ±0.1%f.s ±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s. ±0.5%rdg. ±0.3%f.s. ±2.1%rdg. ±0.3%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.				
$ \begin{array}{c c} \hline 16Hz \le f < 45Hz \\ 45Hz \le f \le 66Hz \\ 66Hz < f \le 500Hz \\ 500Hz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 50kHz < f \le 100kHz \\ \hline Current (direct input) \\ Frequency (f) \\ \hline \end{array} $	±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s. ±0.5%rdg. ±0.3%f.s. ±2.1%rdg. ±0.3%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 10kHz Current (direct input) Frequency (f) DC	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±0.1%rdg, ±0.3%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±0.5%rdg, ±0.3%f.s. ±0.1%rdg, ±0.3%f.s. lnput < 50% f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s. ±0.3%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%fs. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. lnput < 50% f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg. ±0.2%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.1%rdg, ±0.2%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s. ±0.3%rdg. ±0.2%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 1kHz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. input < 50% f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s. ±0.3%rdg. ±0.15%rdg. ±0.2%rdg. ±0.2%rdg. ±0.2%rdg. ±0.2%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.15%rdg. ±0.3%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 10kHz Eurent (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.2%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.1%rdg, ±0.2%f.s. ±(0.03+0.07×F)%rdg,	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%fs. ≤ Input < 100%fs. ±0.1%rdg. ±0.1%f.s. ±0.2%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.15%rdg.				
16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz 50kHz < f ≤ 50kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 1kHz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. ±2.1%rdg, ±0.3%f.s. input < 50% f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.1%f.s.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 50%f.s. ≤ Input < 100%f.s. ±0.1%rdg. ±0.1%f.s. ±0.3%rdg. ±0.15%rdg. ±0.2%rdg. ±0.2%rdg. ±0.2%rdg. ±0.2%rdg.	±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s. ≤ Input ±0.2%rdg. ±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.15%rdg. ±0.3%rdg.				

Active power	Innut - FOO/ f -	E00/4 a x langet 4000/4	1000/10 11			
Frequency (f)	Input < 50% f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input			
DC 0.1Hz cf c.16Hz	±0.1%rdg. ±0.1%f.s.	±0.1%rdg. ±0.1%f.s.	±0.2%rdg. ±0.3%rdg.			
0.1Hz ≤ f < 16Hz	±0.1%rdg. ±0.2%f.s.	±0.3%rdg.				
16Hz ≤ f < 45Hz	±0.1%rdg. ±0.1%f.s.	±0.2%rdg. ±0.15%rdg.	±0.2%rdg. ±0.15%rdg.			
$45Hz \le f \le 66Hz$ $66Hz < f \le 500Hz$	±0.1%rdg. ±0.05%f.s. ±0.1%rdg. ±0.1%f.s.	±0.13%rdg.	±0.13%rdg.			
500Hz < f ≤ 1kHz	±0.1%rdg. ±0.1%f.s.	±0.2%rdg.	±0.2%rdg.			
1kHz < f ≤ 10kHz	±(0.03+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.	±(0.23+0.07×F)%rdg			
10kHz < f ≤ 50kHz	±0.2%f.s. ±(0.07×F)%rdg.	±(0.3+0.07×F)%rdg.	±(0.3+0.07×F)%rdg			
50kHz < f ≤ 100kHz	±0.3%f.s. ±(0.6+0.07×F)%rdg.	±(0.9+0.07×F)%rdg.	±(0.9+0.07×F)%rdg			
0011112 172 10011112	±0.3%f.s.	d on measurement ran				
	• "F" in the tables refe	rs to the frequency in k	Hz.			
	 Add (±1mA) × (voltage re 	asurement accuracy fo ad value) to DC measuremer				
		mA or 500mA range, a				
		wer for which 1kHz < f urrent, and active power				
	0.1Hz ≤ f < 10Hz are	for reference only. urrent, and active powe				
	20A for which 10Hz ≤	of < 16Hz are for reference active power in exce	nce only.			
	500Hz < f ≤ 50kHz ar	re for reference only.				
	 Values for current an 50kHz < f ≤ 100kHz a 	d active power in exce are for reference only.	ss of 15A for which			
	 Values for voltage ar 30kHz < f ≤ 100kHz a 	nd active power in exce	ess of 750V for which			
Guaranteed	1 year	are for reference only.				
accuracy period	-					
Post-adjustment	6 months					
accuracy guaranteed	0000/ -f h h h					
Maximum effective peak voltage	±600% of each voltage range					
Maximum effective	However, for 300 V, 600 V, and 1000 V ranges, ±1500 Vpeak ±600% of each current range					
peak current		ge and 50 A range, ±10				
Conditions of		idity: 23°C ±5°C, 80%	RH or less			
guaranteed	Warm-up time: 30 min		Social decision of			
accuracy	Input: Sine wave input	power factor of 1, term	inal-to-ground			
	voltage of UV, at	ter zero adjustment; wit	nin range in which the			
Temperature characteristic	±0.03% f.s. per °C or l	ve satisfies synchroniza	ation source condition			
Power factor effects		o 66 Hz, at power facto	νr Ο\			
i ower lactor effects	Internal circuitry voltage	ge/current phase differ	nce: +0.0573°			
Effect of common	±0.02% f.s. or less	go/ourront phase amon	51100. ±0.0070			
mode voltage		lied between input tern	ninals and enclosure)			
Effect of external	400 A/m, DC and 50/6	0 Hz magnetic field				
magnetic field	Voltage :±1.5% f.	s. or less				
interference		s. or ±10 mA, whicheve				
		s. or (voltage influence er is greater, or less	e quantity) × (±10 mA)			
Magnetization	±10 mA equivalent or					
effect		DC to the current direct	input terminals)			
Adjacent channel input effect	±10 mA equivalent or (when inputting 50 A to	less				
•		easurement Speci	fications			
Measurement types	Rectifiers: AC+DC DC	C, AC, FND, AC+DC Ur	nn			
Effective	Voltage: 1% to 130	0% of range				
measuring range		up to ±1500 V peak value a	and 1000 V RMS value)			
3 3-		0% of range				
	Active power: 0% to 169					
	(However	r, defined when the volt	age and current fall			
	within the	effective measuremer				
D: 1						
Display range	Voltage/ Current: 0.5% to					
	Voltage/ Current: 0.5% to Active power: 0% to	196% of the range (no	zero-suppression)			
Display range Polarity	Voltage/ Current: 0.5% to Active power: 0% to Voltage/ Current: Displa		zero-suppression) ctifier			

Voltage/ Current/ Active power channel and sum value calculation formulas

Wiring		X: U(Voltage) or I(Current)	P (Active power)	
All channels	1P2W	X(i)	P(i)	
	1P3W 3P3W	$X_{sum} = \frac{1}{2}(X_{(1)} + X_{(2)})$	$Psum = (P_{(1)} + P_{(2)})$	
Sum	3P3W2M			
values 3V3A	3V3A	$X_{sum} = \frac{1}{3} (X_{(1)} + X_{(2)} + X_{(3)})$	Psum = (P(1) + P(2) + P(3))	
	3P3W3M	3 (X(1) 1 X(2) 1 X(3))	7 Sum = (1 (1) 1 1 (2) 1 1 (3))	
	3P4W			

(i): Measurement channel

Voltage Waveform Pea	k Value / Current Waveform	Peak Value Measurement Specifications
----------------------	----------------------------	---------------------------------------

Measurement		Measures the waveform's peak value (for both positive and negative polarity) based on sampled instantaneous voltage values.								
method	negative	polarity) b	ased	on s	amp	led ir	nstantan	eou	s voltag	e values.
Sampling frequency	Approx. 7	700 kHz								
Voltage peak range										
Voltage range	15V	30V	60'			0V	300V		600V	1000V
Voltage peak range	90.000V	180.00V	360.0)OV	900	.00V	1.8000k\	/ 3	.6000kV	6.0000kV
Current peak range										
Current range		500mA	1A		2A	5 <i>A</i>			20A	50A
Current peak range	1.2000A 3	3.0000A 6.	A0000	12.0	A000	30.00	0.09 AOC	AOC	120.00A	300.00A
Measurement	Same as	the voltag	e or c	urre	nt me	easur	ement a	ccu	racy at	DC and
accuracy	when 10 l	$Hz \le f \le 1$	kHz (f	.s.: ۱	voltag	ge pe	ak rang	e or	current	peak
	range). P	rovided as	refer	enc	e vali	ie wł	nen 0.1 F	lz ≤	f < 10 F	Iz and
	when in e	excess of 1	l kHz.							
Effective	±5% to ±	100% of v	oltage	pea	ak rai	nge (up to ±1:	500	V) or	
measuring range	±5% to ±	100% of c	urrent	pea	ak rar	nge (i	up to ±10)O A	۱)	
Display range		±102% of								nge
	(values le	ess than ±	0.3%	are:	subje	ct to	zero-sui	opre	ession)	-

Voltage Crest Factor/ Current Crest Factor Measurement Specifications

date
rent
and

Measurer method	ment					to peak [peak width]) as a
Effective		proportion of the voltage or current DC component As per voltage and voltage waveform peak value or current and				
measurin		current wavefor	m peak			measurement ranges
Display ra Polarity	ange	0.00[%] to 500.00[%] None				
Apparent	Power/ Rea	active Power/ Pov	ver Fact	tor/ Pha	se Ana	le Measurement Specification
Measurer		Rectifiers				
types		Apparent Power/ Phase Angle	Reactive	Power/ P	ower Fac	ctor : AC+DC, AC, FND, AC+DC Umn : AC, FND
Effective measuring range		As per voltage, ci				effective measurement ranges.
Display range		Power Factor	eactive FC	:	±0.000	% of the range (no zero-suppression) 10 to ±1.0000
Polarity		Phase Angle Reactive Power	/ Power	: Factor	+180.00 Phase	0 to -180.00 Angle
		Polarity is assi	gned ac	ccording	to the	lead/lag relationship of the current waveform rising edge.
		+ : When cu	urrent la	īgs volti	age (no	polarity display)
		- : When cu				
	nannei an ring	d sum value ca			nuias	Q: Reactive power
All channels		$S_{(i)} = U_{(i)} \times$				$Q(i) = si(i)\sqrt{S(i)^2 - P(i)^2}$
	1P3W	$S_{sum} = S_{(1)} +$				
Sum	3P3W	$S_{sum} = \frac{\sqrt{3}}{2} (S_{(1)})$	+ S ₍₂₎)		$Q_{sum} = Q_{(1)} + Q_{(2)}$
values	3P3W2M 3V3A	$S_{sum} = \frac{\sqrt{3}}{3} (S_{(1)})$, + S ₍₂₎	+ S ₍₃₎)		Sum (1) (2)
	3P3W3M	$S_{sum} = S_{(1)} +$				$Q_{\text{sum}} = Q_{(1)} + Q_{(2)} + Q_{(3)}$
i): Meas	3P4W urement ch		(2)	(3)		sun (1)(2)(3)
	ring		wer facto	or		ϕ : Phase angle
All channels			$Si(i) \frac{P(i)}{S(i)}$		-	
ni cilaiifiels	1P3W	74(1)-	-'\'/ \(\overline{S}(i)\)	<u> </u>	14/4	$\Psi(i) = SI(i) COS \cdot I \Lambda(i)I$ then $P_{Sum} > 0$
Sum	3P3W		, ID.	ml		$\Phi_{\text{sum}} = \text{Sisum } \cos^{-1} \lambda_{\text{sum}} $
Sum values	3P3W2M 3V3A	$\lambda_{sum} = 0$	Sisum Ssur	m		(0° to ±90°) nen P _{sum} ≥ 0
	3P3W3M 3P4W					$\Phi_{sum} = Sisum [180 - cos^{-1}] \lambda_{sum} [18$
i): Measu		nnel; The polarity	symbol	sisum is	acquire	ed from the Qsum symbol.
requer	ncy Mea	surement Sp	ecifica	ations		
Number of r	neasurement	3 ch				
Measureme	ent source	Select from U (\				
Measureme		OCICCI II OIII O (√Hz) or	I (AHz)	by cha	nnel
	ent method	Calculated from	input w	vavefor	m perio	d (reciprocal method)
Measureme	nt range	Calculated from 500 Hz/ 200 kH	input w z (linke	vavefor d to zer	n perio o-cross	d (reciprocal method)
Measureme Measureme Effective		Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH	n input w z (linked lgt. (0°C	vaveford d to zer C to 40°	m perio o-cross C)	d (reciprocal method) s filter)
Measureme Measureme	ent range ent accuracy	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH	input w z (linked lgt. (0°C Hz nput tha	vaveford d to zer C to 40°	m perio o-cross C)	d (reciprocal method)
Measureme Measureme Effective range	ent range ent accuracy measuring	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo	n input w z (linked lgt. (0°C Hz nput tha irement wer limi	vaveford d to zer t to 40° t is at le range. t freque	m perio o-cross C) east 209	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec.
Measureme Measureme Effective	ent range ent accuracy measuring	Calculated from 500 Hz/200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.995	input w z (linked dgt. (0°C Hz nput tha irement wer limit 99 Hz, 9.9	vaveford d to zer c to 40° t is at le range. t freque 900 Hz to	m perio o-cross C) east 209 ency set	d (reciprocal method) s filter) % of the measurement
Measureme Measureme Effective range	ent range ent accuracy measuring ormat	Calculated from 500 Hz/200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.995	n input w z (linked dgt. (0°C Hz nput tha prement wer limi 99 Hz, 9.9 19 kHz, 9.9	vaveford d to zer C to 40° t is at le range. t freque 900 Hz to .900 kHz	m perio o-cross C) east 209 ency set	d (reciprocal method) is filter) % of the measurement ting: 0.1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz,
Measureme Measureme Effective range Display fo Efficience Measureme	entrange entraccuracy measuring ormat ormat cy Measu	Calculated from 500 Hz/200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 trement Spec Calculates the efficie	n input v lz (linked lgt. (0°C Hz nput tha rrement wer limi 99 Hz, 9.9 99 kHz, 9. ifficatio ncy h [%]	vaveford to zer to 40° to 40° to is at learninge. the frequence of the frequency of the fre	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires
Measureme Measureme Effective range Display fo	ent range ent accuracy measuring ormat cy Measuring the method	Calculated from 500 Hz/200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 trement Spec Calculates the efficie	n input v lz (linked lgt. (0°C Hz nput tha rrement wer limi 99 Hz, 9.9 99 kHz, 9. ifficatio ncy h [%]	vaveford to zer to 40° to 40° to is at learninge. the frequence of the frequency of the fre	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) s filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz
Measureme Measureme Effective range Display for Measureme Wiring me	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/200 kH ± 0.1% rdg, ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 1.000 Hz to 9.999 9900 kHz to 9.999 urement Spec Calculates the efficie Calculated bass	n input v lz (linked lgt. (0°C Hz nput tha rrement wer limi 99 Hz, 9.9 99 kHz, 9. ifficatio ncy h [%]	vaveford to zer to 40° to 40° to is at learninge. the frequence of the frequency of the fre	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 19 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/200 kH 20.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 trement Spec Calculates the efficie Calculated base PW3336	n input w z (linked dgt. (0°C Hz nput tha rement wer limi 99 Hz, 9.9.99 kHz, 9. ification oncy h [%]	vaveforing to to 40° control to 40°	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 199 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas 1=100× P2 / P1
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W	input wiz (linked light) (local light) (loca	vaveforing to zero do to zero do to zero do control do control do to zero do control do	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 19 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2	n input waz (linked dgt. (0°C Hz hput tha ment wer limit 199 Hz, 9.9 kHz, 9. iffication control (%) ed on the CH1 hput than 199 kHz, 9. iffication control (%) ed on the CH1 hput than 199 kHz, 9.	vaveforid to zero to 40° to 10° to 40° to 40	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 199 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas 1=100× P2 / P1
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337	n input will input will input will input will input that input input that input in	vaveforid to zero to 40° ti is at learninge. It freque 900 Hz tr. 900 kHz tr.	m perio o-cross C) east 209 ency set o 99.999 to 99.99	Id (reciprocal method) is filter) % of the measurement ting: 0.1 sec. / 10
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficie Calculates the summary of the summary	input wiz (linked linked linke	vaveforid to zero to 40° ti is at learninge. It freque 900 Hz tr. 900 kHz tr.	m perio o-cross C) east 209 ency set o 99.999 to 99.99	ind (reciprocal method) is filter) % of the measurement ting: 0.1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 Hz, 99 Hz, 99.00 KHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas \[\eta_1 = 100 \times P1 / P2 \] \[\eta_2 = 100 \times P1 / P2 \] Calculation formulas
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficie Calculates the efficie TP2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3	input wiz (linked linked linke	waveform d to zero to 40° to 10° to 1	m perio o-cross C) east 20% ency set o 99.999 to 99.99 atio of act DC rect	ind (reciprocal method) is filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffier active power Calculation formulas η1=100× P2 / P1 η2=100× P1 / P2 Calculation formulas η1=100× P3 / P1 η2=100× P3 / P1 η2=100× P3 / P3
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficie Calculates the summary of the summary	input wiz (linked linked linke	vaveforr d to zere c to 40° tt is at le range. g00 Hz tr freque g00 Hz tr freque L g100 Hz tr g10 Hz tr g100 H	m perio o-cross C) east 209 ency set o 99.999 to 99.99	d (reciprocal method) s filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 198 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100× P1 / P2 Calculation formulas η1=100× P1 / P2
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficie Calculates the efficie Calculated base PW33336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3 1P3W & 1P2W 3 1P3W & 1P2W 3 1P3W & 1P2W 3 1P3W3M2M	n input with a line of the control o	vaveford d to zer d t	m perio o-cross C) east 20% ency set o 99.999 to 99.999 atio of act	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / P3 η1=100x P3 / P3
Measureme Measureme Effective range Display for Measureme Wiring meand calcu	entrange entraccuracy measuring primat cy Measurent method odes ulation	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 rement Spec Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M 3P3W2M PW3337 Wiring 1P2W × 3 1P3W × 3 1P3W × 3 1P3W × 3 1P3W × 1P2W 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W3M 3P3W3M	n input w z (linkered) z (linkered) dz (link	vaveforr d to zer d to zer t is at le it is at le it is at le compared to the total compared to the compared t	n perio o-cross C) concrete C) noy set 20% noy set 50 99.999 to 99.999 to 99.99 CH3 1P2W 1P2W 1P2W 1	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / P3 η1=100x P3 / P3
Measureme Measureme Effective irange Display for Measureme Measureme Ming measureme Mind calco equations	entrange intrange int	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficiency and the efficiency of th	n input v z (linkered) z (linkered) z (linkered) z (linkered) z (linkered) z (linkered) z z (linkered) z z (linkered) z z z z z z z z z z z z z z z z z z z	vaveford to zer d to	m perio o-cross CO co-cross CO	d (reciprocal method) s filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffier active power Calculation formulas η1=100× P2 / P1 η2=100× P1 / P2 Calculation formulas η1=100× P3 / P1 η2=100× P3 / P1 η2=100× P3 / P3 η1=100× P3 / P3 η1=100× P3 / P3 η2=100× P3 / P3
Measureme Measureme Effective range Display fo Efficienc Measureme Wiring mand calcule equations	entrange entraccuracy measuring permat cy Measuring entraction method odes allation s s	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficiency and the efficiency of th	n input w input w input w input w input w input	vaveford to zer d to	m perio o-cross CO co-cross CO	d (reciprocal method) is filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires tiffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / P3 η1=100x P3 / P3
Measureme Measureme Effective range Display fo Efficienc Measureme Wiring mand calcue equations	entrange intrange int	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 virement Spec Calculates the efficie Calculates the efficiency of the	n input v z (linkereit) z (linkereit) z (linkereit) z (linkereit) z (linkereit) z (linkereit) z z (linkereit) z z (linkereit) z z z z z z z z z z z z z z z z z z z	vaveford to zer d to	m perio o-cross CO east 20% act 20% ac	d (reciprocal method) s filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffier active power Calculation formulas η1=100× P2 / P1 η2=100× P1 / P2 Calculation formulas η1=100× P3 / P1 η2=100× P1 / P3 η1=100× P3 / P3 η2=100× P3 / P3
Measureme Measureme Effective irange Display for Efficienc Measureme Wiring me and calculations Effective me Display ra Fime Avei	entrange entraccuracy measuring primat cy Measuring method odes allation s s asuring range ange rage Currer	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measurement to 0.1000 Hz to 9.999 9900 kHz to 9.999 wirement Spec Calculates the efficie Calculates the efficie Calculates the efficie Calculated base PW33336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W2M 3P3W2M 3P3W2M 3P3W3M 3P3W3	n input v z (linkut z z z (linkut z z z (linkut z z z (linkut z z z z z z z z z z z z z z z z z z z	vaveford to zer d to zer d to zer t is at le range. It is at le range. It frequence geographic ge	n perio o-cross CC) seast 20% ncy set to 99,999 to 99,99 t	d (reciprocal method) s filter) % of the measurement tting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffier active power Calculation formulas η1=100× P2 / P1 η2=100× P1 / P2 Calculation formulas η1=100× P3 / P1 η2=100× P3 / P1 η2=100× P3 / P3 η1=100× P3 / P3 η1=100× P3 / P3 η2=100× P3 / P3
Measureme Measureme Measureme Effective range Display for Measureme Wiring mand calculum and calculum and calculum Effective me Display ra Display for Measureme Measureme Measureme Measureme Measureme Measureme Measureme	entrange entraccuracy measuring permat cy Measuring method odes culation s assuring range assuring range range Curre entre method entraccuracy	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculated base PW3336 Wiring 1P2W × 2	n input w z (linkered) z (linke	vaveford d to zer d t	n perio o-cross C) east 20° ncy set 10° 99 999 999 10° 999 999 10° 999 999 10° 999 10	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P3 / P5 η3=100x P3 / P5 η4=100x P3 / P5 η4=100x P3 / P5 η5=100x P3
Measureme Measureme Measureme Effective range Display for Measureme Wiring me and calculations Effective me Display ra Time Avei Measureme Measureme Measureme Measureme Measureme Measureme Measureme Measureme Measureme	entrange entraccuracy measuring permat cy Measuring method odes culation s assuring range assuring range range Curre entre method entraccuracy	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculated base PW3336 Wiring 1P2W × 2	n input w z (linkered) z (linke	vaveford d to zer d t	n periodo-cross CD periodo CD per	In the measurement of the measur
Measureme Measureme Measureme Effective range Display fo Measureme Mining mand calculations Measureme Mining mand calculations Measureme Mining mand calculations Measureme Measureme Measureme Measureme Effective me Functio	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz / 200 kH vi 2	n input w z (linker to z z (linker to z z (linker to z z z z z z z z z z z t z z z z z z z z	vaveford to zer d to	m perio o-cross C) east 20°C ea	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / P3 surrement Specifications (T.AV rated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt.) ective measurement range
Measureme Measureme Effective range Display for Measureme Wind measureme Measureme Wind measureme Mind calcute equations Effective me Display ra Time Avel Measurem Measureme M	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz/ 200 kH 2/ 200 kH 2/ 200 kH 2/ 200 kH 2/ 200 kH 50 sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 9900 kHz to 9.999 1rement Spec Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M 3P3W2M 1P3W X 3P3W2M 3P3W3M 3P4W As per the activ 0.00 [%] to 200.	n input v z (linke z z z (linke z z z z z z z z z z z z z z z z z z z	vaveford to zer d to	m perio o-cross C) ast 20s as	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P3 / P5 η3=100x P3 / P5 η4=100x P3 / P5 η4=100x P3 / P5 η5=100x P3
Measureme Measureme Effective range Display for Measureme Wind measureme Measureme Wind measureme Mind calcute equations Effective me Display ra Time Avel Measurem Measureme M	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz / 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculated base PW3336 Wiring 1P2W × 2	n input w z (linke vice) z (linke vi	vaveford to zer d to	n perio o-cross C) east 20% e	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P3 / P1 η2=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / P3 surement Specifications (T.AV rated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt.) ective measurement range
Measureme Measureme Effective repaired in the control of the contr	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measurement to 0.1000 Hz to 9.999 9900 kHz to 9.	input w z (linke z z z linke z z z (linke z z z z z z z z z z z z z z z z z z z	vaveford to zer d to	m perio o-cross CO ast 20% ast	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100× P2 / P1 η2=100× P1 / P2 Calculation formulas η1=100× P3 / P1 η2=100× P1 / P2 authorized by 1
Measureme Measureme Effective repaired in the control of the contr	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M 3P3W2M 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W2M 3P3W3M 3P4W As per the active calculates the ave ±(Current or active 4(Current or active Automatically c wiring mode ac Range up: The range Tange The range The range The range The range The range Tange The range The ra	in input w z (linke z z z z z z z z z z z z z z z z z z z	vaveford to zer d to	m perio o-cross C) ast 20% as	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / Psum η2=100x P3 / P3 assurement Specifications (T.AV trated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt,) ective measurement range and current range for each sput exceeds 130% of the leded.
Measureme Measureme Effective range Display for Measureme Wind measureme Measureme Wind measureme Mind calcute equations Effective me Display ra Time Avel Measurem Measureme M	asuring range asuring range asuring range arage Curre tent method and accuracy asuring range arage Curre tent method and accuracy asuring range nal Spec	Calculated from 500 Hz / 200 kH	in input w i	vaveford to zer d to	m perio o-cross C) east 20°C ea	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas \[\eta \frac{1}{1} = 100 \times \begin{array}{c ccc} P2 / P1 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P2 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P2 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccccccccccccccccccccccccccccccccc
Measureme Measureme Effective me Display ra Fine Avel Measureme Effective me Display ra Fine Avel Measureme Measureme Measureme Measureme Measureme Measureme Measureme Functio Auto-rang (AUTO)	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz/ 200 kH 0.1 Hz to 100 kF 0.1 Hz to 100 kF o.1 Hz to 10	in input w z (linke w	vaveford to zere do zer	m perio o-cross C) ast 20s ast 20s ncy set 199,999 to 99,999 to 99,99 to	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas \[\eta \frac{1}{1} = 100 \times \begin{array}{c ccc} P2 / P1 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P2 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P2 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c cccccccc} P3 / P3 \\ \eta \frac{2}{1} = 100 \times \begin{array}{c ccccccccccccccccccccccccccccccccccc
Measureme Measureme Effective range Display fo Efficienc Measureme Wiring mand calcule equations Effective me Display ra Time Avei Measurem Measurem Effective me Effective me	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz / 200 kH vi 2	in input w z (linke vice z vice vice vice vice vice vice vice vice	vaveford to zer d to	n perio o-cross C) past 209 past 2	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P3 η1=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / Psum η2=100x P3 / P3 asurement Specifications (T.AV rated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt.) ective measurement range and current range for each sput exceeds 130% of the seded. Input falls below 15% of the to decreased when the peak
Measureme Measureme Effective range Display for Measureme Wiring mand calculations Effective me Display rafine Avel Measureme Measureme Measureme Measureme Measureme Effective me Tunction Autorang (AUTO)	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 9900 kH	n input w z clinkew z z linkew z z z z z z z z z z z z z z z z z z z	vaveford to zerd zerd zerd zerd zerd zerd zerd zerd	n perio o-cross C) auto 20% not y set to 99,999 to 99,99 to 99,	d (reciprocal method) is filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. / 18 sec. / 10 sec. / 19 s
Measureme Measureme Effective range Display for Measureme Wiring mand calculations Effective me Display rafine Averaging Measureme Measureme Measureme Measureme Effective me Tunction Auto-rang (AUTO)	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz/ 200 kH ± 0.1% rdg. ±1 c 0.1 Hz to 100 kF or sine wave ir source's measus Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 9900 kH	iniput w z (linker de z z z z z z z z z z z z z z z z z z	vaveford to zere do zere d	m perio o-cross C) ast 20° cross 20	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P2 asurement Specifications (T.AV trated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt.) ective measurement range and current range for each sput exceeds 130% of the ededd. Input falls below 15% of the ot decreased when the peak sepower, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and
Measureme Measureme Effective range Display for Measureme Wiring mand calculations Effective me Display rafine Averaging Measureme Measureme Measureme Measureme Effective me Tunction Auto-rang (AUTO)	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz / 200 kH for sine wave ir source's measu Measurement lo 0.1000 Hz to 9.99 9900 kHz to 9.99 990 ppg 990 kHz to 9.99 990 kHz to 9.99 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 kHz to 9.99 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990	in input w z (linker do z control to z (linker do z control to z contr	vaveford do zero do to zero do	n perio o-cross C) ast 20°. ast 20°. ncy set 599.999. to 99.99 to 99.99	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas \[\eta = 100 \times P1 P1 \\ \eta 2 = 100 \times P1 P2 \\ \eta 2 = 100 \times P1 P2 \\ \eta 2 = 100 \times P3 P1 \\ \eta 2 = 100 \times P3 P3 \\ \eta 3 = 100 \times P3 P3 \\ \eta 3 = 100 \times P3 P3 \\ \eta 4 = 100 \times P3 P3 \\ \eta 5 = 100 \times P3 P3 \
Measureme Measureme Effective range Display for Measureme Wiring mand calculations Effective me Display rafine Averaging Measureme Measureme Measureme Measureme Effective me Tunction Auto-rang (AUTO)	assuring range ange range Curred ent accuracy assuring range ange range range mal Spec	Calculated from 500 Hz / 200 kH for sine wave ir source's measu Measurement lo 0.1000 Hz to 9.99 9900 kHz to 9.99 990 ppg 990 kHz to 9.99 990 kHz to 9.99 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 kHz to 9.99 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990 ppg 990 ppg 990 ppg 990 kHz to 9.99 990 ppg 990	input w z (linke z z z z z z z z z z z z z z z z z z z	vaveford do zero do to zero do	n perio o-cross C) ast 20°. ast 20°. ncy set 599.999. to 99.99 to 99.99	d (reciprocal method) s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 10 sec. Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 kHz ive power values for channels and wires iffer active power Calculation formulas η1=100x P2 / P1 η2=100x P1 / P2 Calculation formulas η1=100x P3 / P1 η2=100x P1 / P2 asurement Specifications (T.AV trated value by the integration time accuracy) ±(±0.01%rdg, ±1dgt.) ective measurement range and current range for each sput exceeds 130% of the ededd. Input falls below 15% of the ot decreased when the peak sepower, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and calculated from averaged data. It is power, apparent power, and

Scaling (VT, CT)		
HOLD	· Stops display updates for all measured	
(HOLD)	display values at that point in time. · Measurement data acquired by commu	nications is also fixed at
	that point in time.	
	 Internal calculations (including integration time) will continue. 	on and integration elapsed
	· Analog output and waveform output are	
Maximum value/ minimum value	 Detects maximum and minimum measu maximum and minimum values for the v 	
hold	waveform peak and holds them on the o	display.
(MAX/MIN HOLD)	 For data with polarity, display of the max value for the data's absolute values is he 	ximum value and minimum eld (so that both positive
	and negative polarity values are shown)	i. '
	 Internal calculations (including integration time) will continue. 	on and integration elapsed
	· Analog output and waveform output are	
Zero Adjustment (0 ADJ)	Degausses the current input unit DCCT a current input offset.	and then zeroes out the
Key-lock	Disables key input in the measurement s	tate, except for the SHIFT
(KEY LOCK) Backup	key and KEY LOCK key. Backs up settings and integration data if	the instrument is turned
Васкир	off and if a power outage occurs.	the instrument is turned
System Reset	Initializes the instrument's settings. Communica (communications speed, address, and LAN-relations)	
Intonuction Mon		aled settings) are not initialized.
	surement Specifications	aramatara far asah ahansal
weasurement items	Simultaneous integration of the following 6 pa (total of 18 parameters):	
	Sum of current integrated values (displayed	as Ah on panel display)
	Positive current integrated value (displayed Negative current integrated value (displayed	d as Ah- on panel display)
	Sum of active power integrated values (disp Positive active power integrated value (display	layed as Wh on panel display)
	Negative active power integrated value (display	
Measurement types	Rectifiers: AC+DC, AC+DC Umn	. 1 -97
	Current: Displays the result of integrating c	urrent RMS value data
	(display values) once every display	
	200 ms) as an integrated value. Active power:	
	Displays the result of integrating a	
	by polarity calculated once every synchronization source as integrat	
	Rectifier: DC	
	Displays the result of integrating instant sampling both current and active power	
	values (When the active power contain	ns both AC and DC, the
Integration time	DC component will not be integrated) 1 min. to 10000 hr., settable in 1 min. blo	
Integration time accuracy	±100 ppm ±1 dgt. (0°C to 40°C)	
Integration measurement accuracy	(Current or active power measurement accu	racy) + (±0.01% rdg. ±1 dgt.)
Effective measuring range	Until PEAK OVER U or PEAK OVER I occ	curs
Display resolution	999999 (6 digits + decimal point)	
Functions	 Stopping integration based on integration Displaying the integration elapsed time (displaying the integration) 	
	· Additional integration by repeatedly sta	rting/stopping integration
	 Backing up integrated values and the integration e Stopping integration when power return 	
External control	Stopping/starting integration and resetting integrated	d values based on external control
Measuring range	Corresponds to the range set for START	
	urement Specifications (built-in f	
Harmonic Meas Measurement method	· Zero-cross simultaneous calculation me	ethod (separate windows
Measurement	 Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev 	ethod (separate windows le)
Measurement	 Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter 	ethod (separate windows le) vents after processing with
Measurement	 Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter Interpolation calculations (Lagrange inte When the synchronization frequency falls wi 	ethod (separate windows e) vents after processing with erpolation)
Measurement	 Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter Interpolation calculations (Lagrange int When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant 	ethod (separate windows e) vents after processing with erpolation) thin the 45 Hz to 66 Hz range
Measurement	Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter Interpolation calculations (Lagrange inte When the synchronization frequency falls wi IEC 61000-4-7:2002 compliant Gaps and overlaps may occur if the measureme When the synchronization frequency falls out	ethod (separate windows e) e) wents after processing with erpolation) thin the 45 Hz to 66 Hz range on frequency is not 50 Hz or 60 Hz
Measurement method	Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter Interpolation calculations (Lagrange interwhen the synchronization frequency falls wi IEC 61000-4-7:2002 compliant Gaps and overlaps may occur if the measurement the synchronization frequency falls out No apps or overlap will occur	ethod (separate windows e) rents after processing with erpolation) thin the 45 Hz to 66 Hz range nt frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I 3	ethod (separate windows le) error after processing with erpolation) thin the 45 Hz to 66 Hz range nt frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications
Measurement method Synchronization source	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange int · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer. When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the total synchronization source (SYNC) for the syn	ethod (separate windows le) wents after processing with erpolation) thin the 45 Hz to 66 Hz range and frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content %
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I 3 · Harmonic voltage RMS value · Harmonic voltage phase angle · Harmonic - Harmonic voltage phase angle · Harmonic - Harmonic current content % · Harmonic - Harmonic voltage has eagle · Harmonic - Har	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range nt frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic outrent after the specific current RMS value onic current phase angle
Measurement method Synchronization source Measurement channels	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange int · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the 1 3 · Harmonic voltage RMS value · Harmonic voltage phase angle · Harmonic active power · Harmonic - Harm	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range and frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle onic active power content %
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I 3 · Harmonic voltage RMS value · Harmonic Harmonic current content % · Harmo Harmonic active power · Harmo Harmonic outlage current phase difference · Total h · Total harmonic current distortion · Voltage	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % armonic voltage distortion of fundamental waveform
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the tarmonic voltage RMS value · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference · Total harmonic outlege current phase difference · Total harmonic voltage current fistortion · Voltage Current fundamental waveform · Active ·	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range interest frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle inci active power content % armonic voltage distortion e fundamental waveform power fundamental waveform
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I 3 · Harmonic voltage RMS value · Harmonic harmonic current content % · Harmonic - Harmonic current content % · Harmonic orbitage current flast difference · Total harmonic voltage current flast orbital harmonic outrent distortion · Voltag · Current fundamental waveform · Active · Apparent power fundamental waveform reacting modern · Recurrent content of waveform · Recurrent · Active · Apparent power fundamental waveform · Recurrent · Power factor fundamental waveform · Power fundamental waveform · Power fundamental waveform · Power factor fundamental waveform · Power fund	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % armonic voltage distortion of fundamental waveform power fundamental waveform e power fundamental waveform
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inter · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the tarmonic voltage RMS value · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic current content % · Harmonic nactive power · Harmonic voltage current phase difference · Total h · Total harmonic outred distortion · Voltage Current fundamental waveform · Reactiv · Apparent power fundamental waveform · Reactiv · Power factor fundamental waveform · Reactiv · Power factor fundamental waveform · Reactiv · Voltage current phase difference fundamental waveform · Voltage current phase difference fundamental waveform · Reactiv · Voltage current phase difference fundamental waveform · Voltage current phase difference fundamental waveform · Reactiv · Voltage current phase difference fundamental waveform · Voltage · Volt	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % harmonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform e power fundamental waveform ental waveform
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I 3 · Harmonic voltage RMS value · Harmonic harmonic current content % · Harmonic - Harmonic current content % · Harmonic orbitage current flast difference · Total harmonic voltage current flast orbital harmonic outrent distortion · Voltag · Current fundamental waveform · Active · Apparent power fundamental waveform reacting modern · Recurrent content of waveform · Recurrent · Active · Apparent power fundamental waveform · Recurrent · Power factor fundamental waveform · Power fundamental waveform · Power fundamental waveform · Power factor fundamental waveform · Power fund	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range examined the second of the side the 45 Hz to 66 Hz range examined to the second of the seco
Measurement method Synchronization source Measurement channels	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross et a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the I sammonic voltage RMS value - Harmonic voltage phase angle - Harmonic voltage phase angle - Harmonic outrent content % - Harmonic voltage current phase difference - Total h - Total harmonic cutive power - Active - Apparent power fundamental waveform - Reactiv - Power factor fundamental waveform - Noltage current phase difference fundam - Interchannel voltage fundamental wave printerchannel current fundamental wave printerchannel value printerchannel valu	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range exastic measurement specifications onic voltage content % onic current RMS value onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform ental waveform ental waveform ental waveform ental waveform on the second of the secon
Measurement method Synchronization source Measurement channels	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measurene · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the 1 3 · Harmonic voltage RMS value · Harmonic voltage phase angle · Harmonic current content % · Harmonic current content % · Harmonic current fundamental waveform · Voltag · Active · Apparent power fundamental waveform · Reactiv · Power factor fundamental waveform · Voltage current phase difference fundam · Interchannel voltage fundamental wave punter channel current fundamental wave punter · Interchannel · Inte	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle onic active power content % inarmonic voltage distortion e fundamental waveform power fundamental waveform by ower fundamental waveform in the power fundamental waveform one that waveform one difference on the power fundamental waveform on the powe
Synchronization source Measurement channels Measurement items	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange inte · When the synchronization frequency falls wi » IEC 61000-47-i2002 compliant · Gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out · No gaps and overlaps may occur if the measuremer · When the synchronization frequency falls out · No gaps or overlap will occur · Conforms to synchronization source (SYNC) for the larmonic voltage RMS value · Harmonic voltage Phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference · Total harmonic active power · Harmonic voltage current phase difference · Total harmonic outlage current phase difference · Total harmonic outlage current phase difference · Indamal Interchannel voltage fundamental waveform · Noltage current phase difference fundamal interchannel current fundamental wave particular outlage fundamental wave particular out	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range exist measurement specifications onic voltage content % onic current RMS value onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform enert and waveform expanse difference existed as data during PC onic current phase angle
Measurement method Synchronization source Measurement channels Measurement items FFT processing word length	Zero-cross simultaneous calculation me by channel according to the wiring mod Uniform thinning between zero-cross ev a digital antialiasing filter Interpolation calculations (Lagrange inter When the synchronization frequency falls wi IEC 61000-47-:2002 compliant Gaps and overlaps may occur if the measuremer When the synchronization frequency falls out No gaps or overlap will occur Conforms to synchronization frequency falls out No gaps or overlap will occur Conforms to synchronization source (SYNC) for the lagrange of the measurement of the measurem	ethod (separate windows le) rents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range exist measurement specifications onic voltage content % onic current RMS value onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform enert and waveform expanse difference existed as data during PC onic current phase angle
Synchronization source Measurement channels Measurement items FFT processing word length Number of FFT points Window function	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross et a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-47-7:2002 compliant • Gaps and overlaps may occur if the measuremen. When the synchronization frequency falls out • No gaps or overlap will occur Conforms to synchronization frequency falls out • No gaps or overlap will occur Conforms to synchronization frequency falls out • No gaps or overlap will occur Conforms to synchronization frequency falls out • No gaps or overlap will occur Conforms to synchronization source (SYNC) for the larmonic voltage RMS value • Harmonic voltage phase angle • Harmonic voltage current phase difference • Total harmonic ocurent distortion • Conforms of the very conformal waveform • Apparent power fundamental waveform • Apparent power fundamental waveform • Power factor fundamental waveform • Noltage current phase difference fundamental wave promound of the properties of the following parameters can be downlos communication but not displayed: • Harmonic voltage phase angle • Harmonic voltage current phase difference fundamental value properties of the following parameters can be downlos communication but not displayed: • Harmonic voltage current phase difference fundamental value properties of the following parameters can be downlos communication but not displayed: • Harmonic voltage current phase difference fundamental value properties of the following parameters can be downlos communication but not displayed: • Harmonic voltage phase angle • Harmonic voltage current phase difference fundamental value properties of the following parameters can be downlos communication but not displayed: • Harmonic voltage phase angle • Harmonic voltage ph	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % harmonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform shase difference ohase difference aded as data during PC onic current phase angle
Synchronization source Measurement items FFT processing word length Number of FFT points Window function Analysis window	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) of the wiring mod · When the synchronization frequency falls wi » IEC 61000-47-:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the lagrange of the synchronization sure of the synchronization source (SYNC) for the lagrange of the synchronization sure of the synchronization sure of the synchronization but not displayed: Harmonic voltage current phase difference fundamental wave proceed of the synchronization of the	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic active power content % incrandic voltage distortion e fundamental waveform power fundamental waveform be power fundamental waveform onic active power content % incrandic voltage distortion e fundamental waveform e power fundamental waveform onase difference anded as data during PC onic current phase angle ince increase increase angle increase increase increase angle increase increase increase angle increase increas
Synchronization source Measurement channels Measurement items FFT processing word length Number of FFT points Window function	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the 1 3 · Harmonic voltage RMS value · Harmonic voltage phase angle · Harmonic current content % · Harmonic active power · Harmonic voltage phase difference · Total h - Total harmonic current distortion · Voltage Current fundamental waveform · Active · Apparent power fundamental waveform · Active · Power factor fundamental waveform · Reactiv · Power factor fundamental waveform · Interchannel current fundamental wave printerchannel voltage fundamental wave printerchannel voltage fundamental wave printerchannel voltage fundamental wave printerchannel current fundamental wave printerchannel voltage fundamental wave printerchannel voltage fundamental wave printerchannel voltage fundamental wave printerchannel voltage phase angle · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase differen · 32 bits · Harmonic voltage current phase differen · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage phase an	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range masic measurement specifications onic voltage content % onic current RMS value onic current phase angle onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform others of the difference others of difference added as data during PC onic current phase angle onic (10 cycles) ins (10 cycles)
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross et a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) and compliant · When the synchronization frequency falls wi » IEC 61000-47-:2002 compliant · Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out · No gaps or overlap will occur · Conforms to synchronization frequency falls out · No gaps or overlap will occur · Conforms to synchronization source (SYNC) for the lagrange in · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic active power · Harmonic active power · Harmonic voltage current distortion · Voltage Current phase difference · Total harmonic voltage current distortion · Voltage · Current phase difference · Total · Notage current phase difference · Total · Notage current phase difference · Total · Notage · Synchronic · Synchron	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range masic measurement specifications onic voltage content % onic current RMS value onic current phase angle onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform others of the difference others of difference added as data during PC onic current phase angle onic (10 cycles) ins (10 cycles)
Synchronization source Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ex a digital antialiasing filter · Interpolation calculations (Lagrange inter · When the synchronization frequency falls wi » IEC 61000-47-:2002 compliant · Gaps and overlaps may occur if the measuremet · When the synchronization frequency falls out · No gaps or overlap will occur · Conforms to synchronization frequency falls out · No gaps or overlap will occur · Conforms to synchronization source (SYNC) for the larmonic voltage RMS value · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference · Total h · Total harmonic current content · Section · Total harmonic outlege current phase difference · Total harmonic voltage current phase difference · Total harmonic voltage fundamental waveform · Reactive · Apparent power fundamental waveform · Notage current phase difference fundamental vave printerchannel ourrent fundamental wave printerchannel current phase difference fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel current phase angle · Harmonic voltage current phase difference · Harmonic voltage · Harmonic voltage · Harmonic voltage · Harmonic · Harmonic voltage · Harmonic · Harmon	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range int frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range masic measurement specifications onic voltage content % onic current RMS value onic current phase angle onic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform others of the difference others of difference added as data during PC onic current phase angle onic (10 cycles) ins (10 cycles)
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-47-:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the tage of the synchronic voltage phase angle · Harmonic voltage phase angle · Harmonic outrent content % · Harmonic active power · Harmonic voltage current distortion · Voltage · Harmonic voltage current distortion · Voltage Current phase difference · Total h · Total harmonic voltage fundamental waveform · Active · Apparent power fundamental waveform · Active · Power factor fundamental waveform · Notage current phase difference fundam · Interchannel current fundamental wave promover interchannel voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference fundamental wave promover interchannel voltage phase angle · Harmonic voltage current phase difference fundamental wave promover interchannel voltage current phase difference fundamental wave promover interchannel voltage current phase difference fundamental wave promover interchannel voltage phase angle · Harmonic voltage current phase difference fundamental wave promover interchannel voltage phase angle · Harmonic voltage current phase difference fundamental wave promover interchannel voltage phase angle · Harmonic	athod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle incic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform onic active power content so that waveform entitle waveform on the fundamental waveform on the fundament
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the 1 3 · Harmonic voltage RMS value · Harmonic voltage phase angle · Harmonic current content % · Harmonic current content % · Harmonic dative power · Harmonic voltage current distortion · Voltage - Total harmonic ourrent distortion · Voltage - Total harmonic phase difference · Total hortonic synchronization but not displayed: · Interchannel voltage fundamental wave promounication but not displayed: · Harmonic voltage phase angle · Harmonic voltage current phase difference fundamental wave promounication but not displayed: · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference fundamental wave promounication but not displayed: · Harmonic voltage phase angle · Harmonic voltage phase angle · Harmonic voltage current phase difference fundamental wave promounication but not displayed: · Harmonic voltage phase angle · Harmonic v	athod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range obtained the
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) and complete when the synchronization frequency falls wi » IEC 61000-47-:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the tagget of the synchronization frequency (f) range tagget of the synchronization frequ	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range obasic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % inic active power content warmonic voltage distortion e fundamental waveform power fundamental waveform en power fundamental waveform on the fundamental w
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant » Gaps and overlaps may occur if the measureme · When the synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization frequency falls out » No gaps or overlap will occur Conforms to synchronization source (SYNC) for the 1 3 - Harmonic voltage RMS value — Harmonic voltage phase angle — Harmonic current content % — Harmonic current content % — Harmonic dactive power — Harmonic voltage power — Harmonic voltage current distortion — Voltage harmonic voltage timental waveform — Active — Apparent power fundamental waveform — Reactiv - Power factor fundamental waveform — Reactiv - Power factor fundamental waveform — Harmonic voltage current phase difference fundam - Interchannel voltage fundamental wave promounication but not displayed: — Harmonic voltage phase angle — Harmonic voltage current phase difference fundam - Harmonic voltage phase angle — Harmonic voltage current phase difference fundamental wave promounication but not displayed: — Harmonic voltage phase angle — Harmonic voltage phase angle — Harmonic voltage current phase difference fundamental wave promounication but not displayed: — Harmonic voltage phase angle — Harmonic voltage current phase difference fundamental wave promounication but not displayed: — Harmonic voltage phase angle — Harmonic voltage phase an	athod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range hasic measurement specifications on the ventor of
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross et a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) with the synchronization frequency falls wi in IEC 61000-47-:2002 compliant in Gaps and overlaps may occur if the measuremet. When the synchronization frequency falls out in No gaps or overlap will occur. Conforms to synchronization frequency falls out in No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the text in No gaps or overlap will occur. Harmonic voltage Phase angle — Harmonic voltage phase angle — Harmonic active power — Harmonic active power — Harmonic voltage current distortion — Voltage — Harmonic voltage current distortion — Voltage Current fundamental waveform — Reactiv Power factor fundamental waveform — Reactiv Power factor fundamental waveform — Reactiv Power factor fundamental waveform — Notage difference fundamental wave provided in the provided pro	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range obasic measurement specifications onic voltage content % onic current RMS value onic current phase angle inic active power content % inic active power content warmonic voltage distortion e fundamental waveform power fundamental waveform en power fundamental waveform on the fundamental w
Synchronization source Measurement channels Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	- Zero-cross simultaneous calculation me by channel according to the wiring mod · Uniform thinning between zero-cross ev a digital antialiasing filter · Interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation calculations (Lagrange interpolation) when the synchronization frequency falls wi » IEC 61000-4-7:2002 compliant • Gaps and overlaps may occur if the measuremet • When the synchronization frequency falls out • No gaps or overlap will occur Conforms to synchronization source (SYNC) for the tarmonic voltage RMS value • Harmonic voltage phase angle • Harmonic voltage phase angle • Harmonic voltage phase angle • Harmonic voltage current content • Harmonic voltage current distortion • Voltage • Harmonic voltage current distortion • Voltage Current fundamental waveform • Reactive • Power factor fundamental waveform • Reactive • Power factor fundamental waveform • Power factor fundament	ethod (separate windows le) vents after processing with erpolation) thin the 45 Hz to 66 Hz range in frequency is not 50 Hz or 60 Hz side the 45 Hz to 66 Hz range basic measurement specifications on the voltage content % on the voltage distortion in the v



PW333 PW333		
Analysis order	2nd to 50th	
upper limit setting		
Measurement	f.s.: Measurement range	
accuracy	Frequency (f)	Voltage, Current, Active power
	DC	±0.4%rdg.±0.2%f.s.
	10 Hz ≤ f < 30 Hz	±0.4%rdg.±0.2%f.s.
	30 Hz ≤ f ≤ 400 Hz	±0.3%rdg.±0.1%f.s.
	400 Hz < f ≤ 1 kHz	±0.4%rdg.±0.2%f.s.
	1 kHz < f ≤ 5 kHz	±1.0%rdg.±0.5%f.s.
	5 kHz < f ≤ 8 kHz	±4.0%rdg.±1.0%f.s.
	For DC, add ±1 mA to current and (±1 mA	(voltage read value) to active power.
Display Specific	ations	
Display	7-segment LED	
AL L CP L	4	

Display Number of display parameters 4

Display resolution Other than integrated values: 99999 count Integrated values: 99999 count Display update rate 200 ms to 20 s (varies with number of averaging iterations setting)

Synchronized Control Timing of calculations, display updates, data updates, integration start/stop/reset events, display hold operation, key lock operation, and zero-adjustment operation for the slave PW3336/PW3337 are synchronized with the master PW3336/PW3337. Functions Terminal BNC terminal × 1 (non-isolated) Terminal name **EXT SYNC** Off: Synchronized control function off
In : The EXT SYNC terminal is set to input, and a dedicated synchronization signal can be input (slave).
Out: The EXT SYNC terminal is set to output, and a dedicated synchronization signal can be output (master).

1 master unit and 7 slave units (total 8 units) I/O settings Number of units for which be performed

External Current Sensor Input Specifications (built-in feature)

Terminal	Isolated BNC terminals	s, 1 for each channel	
Current sensor	Off / Type 1 / Type 2		
type switching	When set to off, input from	the external current senso	r input terminal is ignored.
Current sensor	TYPE1 (100 A to 5000	A sensors)	
options	9660, 9661, 9669,	CT9667-01/-02/-03	
	TYPE2 (20 A to 1000 A	A sensors, Power suppl	y is required to use)
	CT6862-05, CT686	3-05, CT6875, CT6876	S, CT6877, 9272-05,
	CT6841-05, CT6843	-05, CT6844-05, CT684	5-05, CT6846-05, etc.
Current	Auto / 10 A / 20 A / 50	A (range noted on pan-	el)
measurement	User-selectable for ear	ch wiring mode. Can b	e read directly by
range	manually setting the C	T ratio.	
Power range	Depends on the comb	ination of voltage and of	current ranges; from
configuration	60.000W to 15.000MW	V (also applies to VA, va	ar)
Measurement accuracy			
Current, Active power			
Frequency	Input < 50%f.s.	50%f.s. < Input < 100%f.s.	100%f.s. < Input

differit, Active power			
Frequency	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input
DC	±0.2%rdg. ±0.6%f.s.	±0.2%rdg. ±0.6%f.s.	±0.8%rdg.
0.1Hz≤ f <16Hz	±0.2%rdg. ±0.2%f.s.	±0.4%rdg.	±0.4%rdg.
16Hz≤ f < 45Hz	±0.2%rdg. ±0.2%f.s.	±0.4%rdg.	±0.4%rdg.
45Hz ≤ f ≤ 66Hz	±0.2%rdg. ±0.1%f.s.	±0.3%rdg.	±0.3%rdg.
66Hz < f ≤ 500Hz	±0.2%rdg. ±0.2%f.s.	±0.4%rdg.	±0.4%rdg.
500Hz < f ≤ 1kHz	±0.2%rdg. ±0.3%f.s.	±0.5%rdg.	±0.5%rdg.
1kHz < f ≤ 10kHz	±5.0%rdg.	±5.0%rdg.	±5.0%rdg.
10kHz < f ≤ 50kHz			
50kHz < f ≤ 100kHz			

f.s.: Each measurement range
•To obtain the current or active power accuracy, add the current sensor's accuracy to the above current and active power accuracy figures.
•The effective measurement range and frequency characteristics conform to the current sensor's specifications.

•Values for current, and active power for which
0.1 Hz ≤ f < 10 Hz are for reference only.
•Values for voltage in excess of 220 V active power for which

Temperature characteristics

accuracy

10 Hz ≤ f < 16 Hz are for reference only.

Current, active power:

±0.08% f.s./°C (instrument temperature coefficient;

f.s., o (nisudifier) temperature coefficient;
f.s. instrument measurement range)
Add current sensor temperature coefficient to above.
Instrument: ±0.15% f.s. or less (45 Hz to 66 Hz with power factor = 0)
Internal circuit voltage/current phase difference: ±0.086°
Add the current sensor phase accuracy to the internal circuit voltage/current phase difference noted above. Power factor effects (External current sensor input instrument accuracy) + (±2.0% f.s.) (f.s.:current peak range) Current peak value measurement

accuracy Harmonic measurement

(f.s.:current peak range)
Add the current sensor accuracy to the above.

Frequency

Voltage

Current, Active power

DC

±0.4%rdg, ±0.2%f.s. ±0.6%rdg, ±0.8%f.s.

10Hz≤ f < 30Hz

±0.4%rdg, ±0.2%f.s. ±0.6%rdg, ±0.4%f.s.

30Hz≤ f ≤ 400Hz

±0.3%rdg, ±0.1%f.s. ±0.5%rdg, ±0.3%f.s.

400Hz < f ≤ 1kHz

±0.4%rdg, ±0.2%f.s. ±0.6%rdg, ±0.5%f.s.

1kHz < f ≤ 5kHz

±1.0%rdg, ±0.5%f.s. ±1.0%rdg, ±5.5%f.s. $5kHz < f \le 8kHz$ | $\pm 4.0\%rdg$. $\pm 1.0\%f$.s. | $\pm 2.0\%rdg$. $\pm 6.0\%f$.s

f.s.: Each measurement range
•To obtain the current or active power accuracy, add the current sensor's accuracy to the above current and active power accuracy figures.

D/A Output Specifications (PW3336-02/-03 and PW3337-02/-03)

Number of	16
output channels	
Configuration	16-bit D/A converter (polarity + 15 bits)
Output parameters	U1 to U3 (voltage level) or u1 to u3 (instantaneous voltage waveform) (switchable) I1 to I3 (current level) or i1 to i3 (instantaneous current waveform) (switchable) P1 to P3 (active power level) or p1 to p3 (instantaneous power waveform) (switchable) Psum (active power level) or Hi-Psum (high-speed active power level) (switchable) Psum and Hi-Psum output is not available (0 V) when using the 1P2W wiring mode.P12 is output when using 1P3W, 3P3W, or 3P3W2M, and P123 is output when using 3V3A, 3P3W3M, or 3P4W. D/A1 to D/A3 : Select any 3 from channel or sum value for Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Total harmonic voltage/current distortion, Inter-channel voltage/current fundamental wave phase difference, Voltage/current rest factor, Time average current/active power, Voltage/current ripple rate, Frequency, Efficiency, Current integration, Active power integration (Harmonic output is not available for individual orders). Hirt to Hi-P3 and Hi-Psum (high-speed active power ilvel): Fixed to AC+DC For other level output, select AC+DC, AC+DC Uvm), DC, AC, or fnd.

Output accuracy	f.s.: Relative to the output voltage rated value for each output parameter
	Level output
	: (Output parameter measurement accuracy) + (±0.2% f.s.)
	High-speed active power level output
	: (Output parameter measurement accuracy) + (±0.2% f.s.)
	Instantaneous waveform output
	: (Output parameter measurement accuracy) + (±1.0% f.s.)
	Instantaneous voltage, instantaneous current: RMS value level Instantaneous power: Average value level
Output frequency	Instantaneous waveform output, high-speed active power level output
band	At DC or 10 Hz to 5 kHz, accuracy is as defined above.
Output voltage	Level output
	Voltage, Current, Active power, Apparent power,
	Reactive power, Time average current/active power
	: ±2 V DC for ±100% of range
	Power factor
	: ±2 V DC at ±0.0000, 0 V DC at ±1.0000
	Phase angle
	: 0 V DC at 0.00°, ±2 V DC at ±180.00° Voltage/current ripple rate, total harmonic voltage/current distortion
	: + 2 V DC at 100.00%
	Voltage/current crest factor
	: +2 V DC at 10.000
	Frequency
	: Varies with measured value.
	+2 V DC per 100 Hz from 0.1000 Hz to 300.00 Hz
	+2 V DC per 10 kHz from 300.01 Hz to 30.000 kHz
	+2 V DC per 100 kHz from 30.001 kHz to 220.00 kHz
	Efficiency : +2 V DC at 200.00%
	Current integration, active power integration
	: ±5 V DC at (range) × (integration set time)
	Waveform output
	: 1 V f.s. relative to 100% of range
Maximum output voltage	Approx. ±12 V DC
Output update rate	Level output
	: Fixed at 200 ms ±50 ms (approx. 5 times per sec.)
	Update rate is unrelated to number of averaging iterations
	setting and display hold operation. Waveform output
	: Approx. 11.4 µs (approx. 87.5 kHz)
	High-speed P level
	: Updated once every cycle for the input waveform set as the synchronization source.
Response time	Level output
	: 0.6 sec. or less (when the input changes abruptly from 0% to 90%, or from
	100% to 10%, the time required in order to satisfy the accuracy range)
	Waveform output
	: 0.2 ms or less
	High-speed active power level output
Tomporatura characteristic	: 1 cycle ±0.05% f.s./°C or less
Temperature characteristic Output resistance	100 Ω ±5 Ω
Output resistance	100 77 ±9 77

External control (built-in feature)

External control	(Dulit-III le	eature)		
Functions	Integration start/stop, integration reset and hold via external control			
External control	Input signal level: 0 to 5 V (high-speed CMOS level or shorted [Lo]/open [Hi])			
	Functions	External control signal	External control terminal	
	Start	Hi → Lo	START/STOP	
	Stop	Lo → Hi	01741170101	
	Reset	Lo interval of at least 200 ms	RESET	
	Hold on	Hi → Lo	HOLD	
	Hold off	Lo → Hi	HOLD	

GP-IB interface (PW3336-01/-03, PW3337-01/-03)

	(* *******************************
Method	IEEE488.1 1978 compliant; see IEEE488.2 1987
	Interface functions: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
	Remote control by controller
Address	00 to 30

RS-232C interface (built-in feature)

Connector	D-sub 9-pin connector × 1
Communication Full duplex, Start-stop synchronization, Stop bits: 1 (fixed),	
method	Data bits: 8 (fixed), Parity: None
Remote control by controller	
Communication Speed	9600bps/ 38400bps

LAN interface (built-in feature)

Connector	RJ-45 connector × 1
	IEEE802.3 compliant
Transmission Method	10BASE-T/100BASE-TX (automatic detection)
Protocol	TCP/IP
Functions HTTP server (remote operation, firmware updates)	
	Dedicated ports (command control, data transfer)
	Remote control by controller (REMOTE lamp will light up.)

General Specifications (product guaranteed for 3 year)

Operating environment	findoors, attitude up to 2000 in (6362-it.), poliution degree 2
Operating temperature	0 to 40°C (32 to 104°F), 80% RH or less (non-condensating)
and humidity	J (
	-10 to 50°C (14 to 122°F) 80% RH or less (non-condensating)
	1-10 to 30 G (14 to 122 F) 60% htt of less (non-condensating)
and humidity	
Dielectric strength	4290 Vrms AC (sensed current: 1 mA)
	Between voltage input terminals and (case, interface, and output terminals)
	Between current direct input terminals and (case, interface, and output terminals)
	Between voltage input terminals and current direct input terminals
Marriagram rated	
Maximum rated	Voltage input terminal, Current direct input terminal
voltage to earth	Measurement category III 600 V (anticipated transient overvoltage 6000 V)
	Measurement category II 1000 V (anticipated transient overvoltage 6000 V)
Maximum input voltage	Between voltage input terminals U: 1000 V, ±1500 Vpeak
Maximum input current	Between +/- current direct input terminals I: ±70 A, ±100 Apeak
	Safety: EN61010, EMC: EN61326 Class A/ EN61000-3-2/ EN61000-3-3
Rated supply voltage	100 VAC to 240 VAC, Rated power supply frequency: 50/60 Hz
Maximum rated power	40 VA or less
Dimensions	Approx. 305W(12.01") × 132H(5.20") × 256D(10.08") mm
	(excluding protrusions)
Mass	PW3336 series Approx. 5.2 kg (183.4 oz.)
	PW3337 series Approx. 5.6 kg (197.5 oz.)
Accessories	Instruction manual × 1, Measurement guide × 1, Power cord × 1

wss.5 PW3335 Specifications

١	Inni	ıt S	Sne	cifi	cat	ion	c

par opcomoan	put opcomouncie		
Measurement line type	Single-phase 2-wire(1P2W)		
Input methods	Voltage Isolated input, resistive voltage divider method		
	Current Isolated input, shur	nt input method	
Voltage measurement	AUTO/ 6 .0000 V/ 15.000 V/ 30.0	000 V/ 60.000 V/ 150.00 V/	
ranges	300.00 V/ 600.00 V/ 1.0000 kV		
Current	AUTO/ 1.0000 mA/ 2.0000 mA/ :	5.0000 mA/ 10.000 mA/	
measurement	20.000 mA/ 50.000 mA/ 100.00	mA/ 200.00 mA/ 500.00 mA/	
ranges	1.0000 A/ 2.0000 A/ 5.0000 A/ 10.000 A/ 20.000 A		
Power ranges	Depends on the combination of voltage and current ranges;		
	From 6.0000 mW to 20.000 kW (also applies to VA, var)		
	The details are as below.		
Input resistance	Voltage input terminal: 2 MΩ		
	Current input terminal: 1 mA	to 100 mA range 520 mΩ or less	
	200 m	A to 20 A range 15 mΩ or less	

Rasic	Measurement	Specifications

Power ranges	Depends on the combination of voltage and current ranges; From 6.0000 mW to 20.000 kW (also applies to VA, var)			
			to VA, var)	
Input resistance	The details are as below. Voltage input terminal: 2 MΩ			
mpat recictaries	Current input terminal:		ange 520 mΩ or less	
	'		nge 15 mΩ or less	
Pagia Magauran	nent Specification	0		
Measurement	Simultaneous voltage		npling, zero-cross	
method Sampling frequency	simultaneous calculati Approx. 700 kHz	IUII		
A/D converter resolution				
	DC, 0.1 Hz to 100 kHz (Va	alues within 0.1Hz ≤ f < 10	Hz are for reference only)	
	U, I, DC (fixed to 200 r	ms)		
Measurement items	Voltage	Current	Active power	
	Apparent power	Reactive power	Power factor	
	Phase angle	Frequency ation Integration	Current integration	
	Active power integra Voltage waveform pe		aveform peak value	
	Voltage crest factor	Current cr		
	Maximum current ra	tio Time avera	age current	
	Time average active			
	Voltage ripple rate	Current rip	pple rate	
	Harmonic parameters Harmonic voltage R	MS value Harmonie	current RMS value	
	Harmonic active por		onic voltage distortion	
	Total harmonic curren		ntal wave voltage	
	Fundamental wave of	current Fundamer	ntal wave active power	
			tal wave reactive power	
		oower factor (Displace		
	Harmonic voltage co	oltage current phase	umerence	
	Harmonic current co			
		wer content percentag	е	
	(The following parameters	can be downloaded as da	ata via PC communication)	
	Harmonic voltage pl			
	Harmonic current ph	nase angle		
		urrent phase difference	<u> </u>	
Rectifiers	AC+DC : AC+DC mea			
	AC+DC Umn : AC+DC	values for both voltage	e and current	
		alue rectified RMS co	overted values for	
	voltage and true RMS values for current			
	DC : DC measurement			
	Display of simple averages for both voltage and current Display of values calculated by (voltage DC value) x (current DC value) for active po			
	AC : AC measurement		rent DC value) for active power	
	Display of values ca			
	(AC+DC value)2 - (DC	value)2 for both voltac	e and current	
	Display of values ca	value)2 for both voltag Iculated by	,	
	(AC+DC value) - (DC	C value) for active pow	er	
Zero-cross Filter			nent from harmonic measurement	
Zero-cross Filler	100 Hz: 0.1 Hz to 100 5 kHz: 0.1 Hz to 5 kHz			
Measurement accuracy	3 KI IZ. 0.1 I IZ (0 3 KI IZ	100 KHZ. 0.1 HZ to	100 KHZ	
Voltage Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	. 100%f.s. ≤ Input	
DC DC	±0.1rdg.±0.1%f.s.	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	
0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.	
16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.	
45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.	±0.15%rdg.	±0.15%rdg.	
66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.1%f.s.</td><td>±0.2%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.	
500Hz <f≤10khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤10khz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.	
10kHz <f≤50khz< td=""><td>±0.5%rdg.±0.3%f.s.</td><td>±0.8%rdg.</td><td>±0.8%rdg.</td></f≤50khz<>	±0.5%rdg.±0.3%f.s.	±0.8%rdg.	±0.8%rdg.	
50kHz <f≤100khz< td=""><td>±2.1%rdg.±0.3%f.s.</td><td>±2.4%rdg.</td><td>±2.4%rdg.</td></f≤100khz<>	±2.1%rdg.±0.3%f.s.	±2.4%rdg.	±2.4%rdg.	
Current				
Current Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input	
DC	±0.1%rdg.±0.1%f.s.	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	
0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.2%rdg.	
16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.	
45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.	±0.15%rdg.	±0.15%rdg.	
66Hz <f≤500hz< td=""><td></td><td>±0.2%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>		±0.2%rdg.	±0.2%rdg.	
00HZ<150UHZ	±0.1%rdg.±0.1%f.s.	±0.2 /61ug.	1 ±0.2 /01 dg.	
500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.2 %rdg.</td><td>±0.3%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s.	±0.2 %rdg.	±0.3%rdg.	
	±0.1%rdg.±0.2%f.s. ±(0.03+0.07×F)%rdg.			
500Hz <f≤1khz 1kHz<f≤10khz< td=""><td>±0.1%rdg.±0.2%f.s. ±(0.03+0.07×F)%rdg. ±0.2%f.s.</td><td>±0.3%rdg. ±(0.23+0.07×F)%rdg.</td><td>±0.3%rdg. ±(0.23+0.07×F)%rdg.</td></f≤10khz<></f≤1khz 	±0.1%rdg.±0.2%f.s. ±(0.03+0.07×F)%rdg. ±0.2%f.s.	±0.3%rdg. ±(0.23+0.07×F)%rdg.	±0.3%rdg. ±(0.23+0.07×F)%rdg.	
500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s. ±(0.03+0.07×F)%rdg.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s. ±(0.03+0.07×F)%rdg.	±0.3%rdg.	±0.3%rdg.	

A	ctive power			
Frequency (f)		Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input
	DC	±0.1%rdg.±0.1%f.s.	±0.1%rdg.±0.1%f.s.	±0.2%rdg.
	0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.
	16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.
	45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.	±0.15%rdg.	±0.15%rdg.
	66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.1%f.s.</td><td>±0.2%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.
	500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.
	1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg.</td></f≤10khz<>	±(0.03+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.
		±0.2%f.s.		
	10kHz <f≤50khz< td=""><td>±(0.07×F)%rdg.</td><td>±(0.3+0.07×F)%rdg.</td><td>±(0.3+0.07×F)%rdg.</td></f≤50khz<>	±(0.07×F)%rdg.	±(0.3+0.07×F)%rdg.	±(0.3+0.07×F)%rdg.
		±0.3%f.s.		
	50kHz <f≤100khz< td=""><td></td><td>±(0.9+0.07×F)%rdg.</td><td>±(0.9+0.07×F)%rdg.</td></f≤100khz<>		±(0.9+0.07×F)%rdg.	±(0.9+0.07×F)%rdg.
		±0.3%f.s.		
		1/1 (()		

- Values for f.s. depend on measurement ranges
- "F" in the tables refers to the frequency in kHz.

 When using the 1 mA/ 2 mA range:
 Add ±1 μA to 0.1 Hz to 100 kHz measurement accuracy for current.

Add (±1 µA) × (voltage read value) to 0.1 Hz to 100 kHz measurement accuracy for active power.

•When using the 200 mA/ 500 mA/ 1 A/ 2 A/ 5 A/ 10 A/ 20 A range:

- Add ±1 mA to DC measurement accuracy for current.
 Add (±1 mA) × (voltage read value) to DC measurement accuracy for active power.

 •When using the 1 mA/2 mA/5 mA/10 mA/20 mA/50 mA/100 mA range: Add ±10 µA to DC measurement accuracy for current. Add (\pm 10 µÅ) × (voltage read value) to DC measurement accuracy for active power. •When using the 200 mA/ 500 mA/ 1 A/ 2 A/ 5 A/ 10 A/ 20 A range:
- Add ± (0.02×F)% rdg, to the measurement accuracy for current and active power for which (10 kHz < f ≤ 100 kHz).

 •The measurement results for following input are considered reference values: Values for voltage, current, and active power for which 0.1 Hz ≤ f < 10 Hz. Values for voltage, current, and active power in excess of 220 V or 20 A for which $10 \, \text{Hz} \cdot \text{s}^{-1} < 16 \, \text{Hz}$. Values for current and active power in excess of 20 A for which $500 \, \text{Hz} < \text{f} < 50 \, \text{kHz}$. Values for current and active power in excess of 10 A for which $500 \, \text{Hz} < \text{f} \le 100 \, \text{kHz}$.

Effective measuring range

 Values for voltage and active power in excess of 750 V for which 30 ktz < f ≤ 100 ktdz.</th>

 Voltage
 1% to 150% of the range (1000 V range, up to 1000 V)

 Current
 1% to 150% of the range (when using 1000 V range, up to 150%)
 However, valid when the voltage and current fall within the

effective measurement range ±600% of each voltage range
However, for 300 V, 600 V, and 1000 V ranges, ±1500 V peak
±600% of each current range

peak voltage Maximum effective However, for 20 A range, ±60 A peak peak current Guaranteed accuracy

period
Post-adjustment
accuracy guaranteed
Conditions of 6 months

Maximum effective

Temperature and humidity range: 23°C±5°C (73°F±9°F), 80% RH or less Warm-up time: 30 minutes guaranteed accuracy Input: Sine wave input, power factor of 1, voltage to earth of 0 V, after zero-adjustment; within range in which the fundamental wave satisfies synchronization

source conditions ±0.03%f.s. per °C or less. Temperature

±0.05/s/s. per C or less.

±0.19/s.s. or less (45 to 66 Hz, at power factor = 0)

Internal circuitry voltage/current phase difference: ±0.0573°

±0.01%f.s. or less (600 V, 50 Hz/60 Hz, applied between input coefficient Effect of power factor Effect of common mode voltage Effect of magnetic terminals and enclosure) 400 A/m, DC and 50 Hz/60 Hz magnetic field

field

400 A/m, DC and 50 H2/60 H2 magnetic field

Voltage

±1.5%f.s. or less

Current

±1.5%f.s. or less than or equal to the following value, whichever is greater 200 mA/ 500 mA/ 1 A/ 2 A/ 5 A/ 10 A/ 20 A range: ±20 mA 1 mA/ 2 mA/ 5 mA/ 10 mA/ 20 mA/ 50 mA/ 100 mA range: ±200 μA Active power ±3.0%f.s. or less than or equal to the following value, whichever is greater

200 mA/ 500 mA/ 1 A/ 2 A/ 5 A/ 10 A/ 20 A range: (Voltage influence quantity)x(\pm 20 mA) 1 mA/ 2 mA/ 5 mA/ 10 mA/ 20 mA/ 50 mA/ 100 mA range: (Voltage influence quantity)x(\pm 200 µA)

Effect of selfheating

With input of at least 15 A to current input terminals Current

AC input signal

±(0.025+0.005×(I-15))%rdg. or less DC input signal

200 mA/ 500 mA/ 1 A/ 2 A/ 5 A/ 10 A/ 20 A range ±((0.025+0.005×(I-15))% rdg.+(0.5+0.1×(I-15))mA) or less 1 mA/ 2 mA/ 5 mA/ 10 mA/ 20 mA/ 50 mA/ 100 mA range $\pm ((0.025+0.005\times(I-15))\% \text{ rdg.}+(5+1\times(I-15))\mu\text{A}) \text{ or less}$

I: Current read value (A)

(above current influence quantity) x (voltage read value) or less The effects of self-heating will continue to manifest themselves until the input resistance temperature falls, even if the current value is low

Range table (Power ranges)

5								
Voltage	6.0000 V	15.000 V	30.000 V	60.000 V	150.00 V	300.00 V	600.00 V	1.0000 kV
1.0000 mA	6.0000 mW	15.000 mW	30.000 mW	60.000 mW	150.00 mW	300.00 mW	600.00 mW	1.0000 W
2.0000 mA	12.000 mW	30.000 mW	60.000 mW	120.00 mW	300.00 mW	600.00 mW	1.2000 W	2.0000 W
5.0000 mA	30.000 mW	75.000 mW	150.00 mW	300.00 mW	750.00 mW	1.5000 W	3.0000 W	5.0000 W
10.000 mA	60.000 mW	150.00 mW	300.00 mW	600.00 mW	1.5000 W	3.0000 W	6.0000 W	10.000 W
20.000 mA	120.00 mW	300.00 mW	600.00 mW	1.2000 W	3.0000 W	6.0000 W	12.000 W	20.000 W
50.000 mA	300.00 mW	750.00 mW	1.5000 W	3.0000 W	7.5000 W	15.000 W	30.000 W	50.000 W
100.00 mA	600.00 mW	1.5000 W	3.0000 W	6.0000 W	15.000 W	30.000 W	60.000 W	100.00 W
200.00 mA	1.2000 W	3.0000 W	6.0000 W	12.000 W	30.000 W	60.000 W	120.00 W	200.00 W
500.00 mA	3.0000 W	7.5000 W	15.000 W	30.000 W	75.000 W	150.00 W	300.00 W	500.00 W
1.0000 A	6.0000 W	15.000 W	30.000 W	60.000 W	150.00 W	300.00 W	600.00 W	1.0000 kW
2.0000 A	12.000 W	30.000 W	60.000 W	120.00 W	300.00 W	600.00 W	1.2000 kW	2.0000 kW
5.0000A	30.000 W	75.000 W	150.00 W	300.00 W	750.00 W	1.5000 kW	3.0000 kW	5.0000 kW
10.000 A	60.000 W	150.00 W	300.00 W	600.00 W	1.5000 kW	3.0000 kW	6.0000 kW	10.000 kW
20.000 A	120.00 W	300.00 W	600.00 W	1.2000 kW	3.0000 kW	6.0000 kW	12.000 kW	20.000 kW



Voltage/ Current/ Active Power Measurement Specifications

Measurement types	Rectifiers: AC+DC, DC, AC, FND, AC+DC Umn
Effective	Voltage
measuring range	±1% to ±150% of the range.
	However, up to ±1500 V peak value and 1000 V RMS value
	Current
	±1% to ±150% of the range
	Active Power
	±0% to ±225% of the range.
	However, valid when the voltage and current fall within the
	effective measurement range.
Display range	Voltage
	Up to ±152% of the range. However, zero-suppression when less than ±0.5%
	Current
	Up to ±152% of the range.
	However, zero-suppression when less than $\pm 0.5\%$ or less than $\pm 9~\mu A$.
	Anti Device
	Active Power
D. L. 11	±0% to ±231.04% of the range (no zero-suppression)
Polarity	Voltage/ Current
	Displayed when using DC rectifier
	Active Power
	Positive : Power consumption (no polarity display) Negative : generation or regenerated power
	I riegative . generation of regenerated power

Voltage Waveform Peak Value/ Current Waveform Peak Value Measurement Specifications

Measurement Specifications					
Measurement	Measures the voltage waveform's peak value (for both positive and				
method	negative polarity) based on sampled instantaneous voltage values.				
Range	Voltage				
configuration	Voltage range	Voltage peak range			
	6.0000 V	36.000 V			
	15.000 V	90.000 V			
	30.000 V	180.00 V			
	60.000 V	360.00 V			
	150.00 V	900.00 V			
	300.00 V	1.8000 kV			
	600.00 V	3,6000 kV			
	1.0000 kV	6,0000 kV			
	1.0000 KV	6.0000 KV			
	Current				
	Current range	Current peak range			
	1.0000 mA	6.0000 mA			
	2.0000 mA	12.000 mA			
	5.0000 mA	30.000 mA			
	10.000 mA	60.000 mA			
	20.000 mA	120.00 mA			
	50.000 mA	300.00 mA			
	100.00 mA	600.00 mA			
	200.00 mA	1.2000 A			
	500.00 mA	3.0000 A			
	1.0000 A	6.0000 A			
	2.0000 A	12.000 A			
	5.0000 A	30.000 A			
	10.000 A	60.000 A			
	20.000 A	120.00 A			
Measurement accuracy	$\pm 2.0\%$ f.s. at DC and when 10 Hz \leq f \leq 1 kHz (f.s.: current peak range). Provided as reference value when 0.1 Hz \leq f $<$ 10 Hz and when 1 kHz $<$ f. The above measurement accuracy is multiplied by 2 for the 1 mA range.				
Effective measuring range	±5% to ±100% of current peak range, however, up to ±60 A				
Display range	Up to ±102% of current peak range, however, the value 0 will be displayed if the current RMS value triggers the instrument's zero suppression function.				

Voltage Crest Factor/Current Crest Factor Measurement Specifications

	Calculates the ratio of the voltage waveform peak value to the voltage RMS value.
	As per voltage and voltage waveform peak value, or current and
measuring range	current waveform peak value effective measurement ranges.
Display range	1.0000 to 612.00 (no polarity)

Voltage Ripple Rate/ Current Ripple Rate Measurement Specifications

	Calculates the AC component (peak to peak [peak width]) as a
method	proportion of the voltage or current DC component.
Effective	As per voltage and voltage waveform peak value, or current and
measuring range	current waveform peak value effective measurement ranges.
Display range	0.00 to 500.00 (No polarity)

Apparent Power/ Reactive Power/ Power Factor/ Phase Angle Measurement Specifications

	Measurement Specifications		
	Measurement	Rectifiers	
	types	Apparent Power/ Reactive Power/ Power Factor AC+DC, AC, FND, AC+DC Umn	
		Phase Angle AC, FND	
	Effective	As per voltage, current, and active power effective measurement	
measuring range ranges		ranges	
	Display range	Apparent Power/ Reactive Power 0% to 231.04% of the range (no zero-suppression)	
		Power Factor ±0.0000 to ±1.0000	
		Phase Angle +180 00 to -180 00	

Polarity	Reactive Power/ Power Factor/ Phase Angle
	Polarity is assigned according to the lead/lag relationship of the
	voltage waveform rising edge and the current waveform rising edge.
	+: When current lags voltage (no polarity display)
	-: When current leads voltage

Power Calculation Formulas

S : Apparent power	$S = U \times I$		
Q : Reactive power	ctive power $Q = si\sqrt{S^2 - P^2}$		
λ: Power factor	λ : Power factor $\lambda = si \mid P/S \mid$		
φ: Phase angle	$\phi = si \cos^{-1} \lambda $ $\phi = si 180 - \cos^{-1} \lambda $	(±90° to ±180°)	

U: Voltage, I: Current, P: Active Power, si: Polarity symbol (acquired based on voltage waveform and current waveform lead and lag)

Frequency Measurement Specifications

Number of	2 (Voltage, current)		
measurement channels			
Measurement method	Calculated from input waveform	period (reciprocal method)	
Measurement ranges	100 Hz/ 500 Hz/ 5 kHz/ 100 kHz	(linked to zero-cross filter)	
Measurement accuracy	cy ±0.1% rdg. ±1 dgt. However, for 1 mA range, ±0.2% rdg. ±1 d		
Effective	0.1 Hz to 100 kHz		
measuring range	For sine wave input that is at least 20% of the measurement		
	source's measurement range		
	Measurement lower limit frequency setting: 0.1 sec. / 1 sec. / 10		
	sec. (linked to synchronization timeout setting)		
Display format	0.1000 Hz to 9.9999 Hz,	9.900 Hz to 99.999 Hz,	
	99.00 Hz to 999.99 Hz,	0.9900 kHz to 9.9999 kHz,	
	9 900 kHz to 99 999 kHz	99 00 kHz to 100 00 kHz	

Maximum Current Ratio Measurement Specifications (MCR)

Measurement	Calculates the ratio of the current crest factor to the power factor.
method	(MCR) = (Current Crest Factor) / (Power Factor)
Effective	As per power factor (voltage, current, active power) and current crest factor
measuring range	(current, current waveform peak value) effective measurement ranges.
Display range	1.0000 to 6.1200 M (no polarity)

Time Average Current/ Time Average Active Power Measurement Specifications

	Calculates the average by dividing the current or active power integrated value by the integration time.
	(Current or Active power measurement accuracy) + (±0.01% rdg. ±1 dgt.)
Effective measuring range	As per the current or active power integration effective measurement range.
Display range	Time Average Current ±0% to ±612% of the range (Has polarity when using the DC rectifier.)
	Time Average Active Power

	±0 % to ±3743.4% of the range (rias polanty)			
Functional Specifications				
	Auto-range (AUTO)	Automatically changes the voltage and current range according to the input.		
		Range up: The range is increased when input exceeds 150% of the range or when the peak is exceeded.		
		Range down: The range is decreased when input falls below 15% of the range. However the range is not decreased when the neak is exceeded.		

The range is decreased when input falls below 15% of the range. However, the range is not decreased when the peak is exceeded at the lower range.

The input level is monitored, and the range is switched over multiple ranges.

Range select can be used to disable ranges so that they are not selected.
Selects whether to enable (turn on) or disable (turn off) individual voltage and current ranges.
Enabled (use):
Ranges can be selected with the range keys.

Range switching occurs using auto-range operation.
Range switching occurs during auto-range integration.

Range select

Averaging

Hold

Disabled (do not use):
Ranges cannot be selected with the range keys.
Range switching does not occur using auto-range operation.

Range switching does not occur during auto-range integration.

Zero-cross filter's Sets the zero-cross filter's threshold level for voltage and current ranges. Set from 1% to 15% (in 1% intervals). Synchronization occurs when the

percentage level set for each measurement range is exceeded.

Averages the voltage, current, active power, apparent power, and reactive power. (Other than harmonic measurement parameters.)

The power factor and phase angle are calculated from averaged data.

Averaging is not performed for parameters other than those listed above. Method: Simple averaging

Number of averaging iterations and display update interval

Number of averaging iterations	Display update interval
1 (OFF)	200 ms
2	400 ms
5	1 s
10	2 s
25	5 s
50	10 s
100	20 s

Scaling (VT, CT) Applies user-defined VT and CT ratio settings to measured values.

VT ratio setting range OFF (1.0), 0.001 to 1000

CT ratio setting range OFF (1.0), 0.001 to 1000

Stops display updates for all measured values and fixes the display values at that point in time.
 Measurement data acquired by communications is also fixed at

that point in time.

Internal calculations (including integration and integration elapsed time) will continue.

Analog output and waveform output are not held

Maximum value/	Detects maximum and minimum measured values (except current integration, active power integration, integration elapsed	FFT processing	FFT processing word length : 32 bits		
minimum value hold (MAX/MIN HOLD)	time, time average current, and time average active power values) as well as maximum and minimum values for the voltage	Window function	Number of FFT points : 4096 points Rectangular		
,	waveform peak and current waveform peak and holds them on the display. • For data with polarity, display of the maximum value and minimum value for the data's absolute values is held (so that both positive and negative polarity values are shown). However, this	Analysis window width	45 Hz \leq f $<$ 56 Hz : 178.57 ms to 56 Hz \leq f $<$ 66 Hz : 181.82 ms to Frequencies other than the above	214.29 ms (12 cycles)	
	does not apply to the voltage waveform peak value or the current waveform peak value.	Data update rate	Depends on window width.		
	Internal calculations (including integration and integration elapsed time) will continue.	Maximum analysis order	Synchronization frequency (f) r		
	The maximum and minimum values during integration are detected (maximum/minimum value measurement during the	order	10 Hz \leq f $<$ 45 Hz 45 Hz \leq f $<$ 56 Hz	50th 50th	
	integration interval). • Analog output and waveform output are not held.		56 Hz ≤ f ≤ 66 Hz	50th	
Zero Adjustment Key-lock	Zeroes out the voltage and current input offset. Disables key input in the measurement state, except for the KEY		66 Hz < f ≤ 100 Hz 100 Hz < f ≤ 200 Hz	50th 40th	
Backup	LOCK key. Backs up settings and integration data if the instrument is turned		200 Hz < f ≤ 300 Hz	25th	
·	off and if a power outage occurs.		300 Hz < f ≤ 500 Hz 500 Hz < f ≤ 640 Hz	15th 11th	
	Initializes the instrument's settings.	Analysis order	2nd to 50th		
Integration Measure Integration	surement Specifications Switchable between fixed-range integration and auto-range integration.	upper limit setting Measurement	f.s.: Measurement range		
·	Fixed-range integration	accuracy	Frequency (f)	Voltage, Current, Active power	
	Integration can be performed for all voltage and current ranges. The voltage and current ranges are fixed once integration starts.		DC 10 Hz ≤ f < 30 Hz	±0.4% rdg. ±0.2%f.s. ±0.4% rdg. ±0.2%f.s.	
	Auto-range integration		30 Hz ≤ f ≤ 400 Hz	±0.3% rdg. ±0.1%f.s.	
	Integration can be performed for all voltage ranges.		400 Hz < f ≤ 1 kHz 1 kHz < f ≤ 5 kHz	±0.4% rdg. ±0.2%f.s. ±1.0% rdg. ±0.5%f.s.	
	The current is set to auto-range operation using ranges from 200 mA to 20 A.		5 kHz < f ≤ 8 kHz	±4.0% rdg. ±1.0%f.s.	
Measurement items and display	Positive current integrated value (Ah+)		When using the 1 mA/2 mA rar Add ±1 µA to 10 Hz to 8 kHz me Add (±1 µA) × (voltage read vall measurement accuracy for active	easurement accuracy for current. ue) to 10 Hz to 8 kHz	
	Negative current integrated value (Ah-) Sum of current integrated values (Ah) Positive active power integrated value (Wh+) Negative active power integrated value (Wh-) Sum of active power integrated values (Wh)		When using the 200 mA/500 mA/1 A/2 A/5 A/10 A/20 A range: Add ±1 mA to DC measurement accuracy for current. Add (±1 mA) × (voltage read value) to DC measurement accuracy for active power.		
Measurement types	Rectifiers: AC+DC, AC+DC Umn Current: Displays the result of integrating current RMS value data (display values) once every display update interval as an integrated value.		 When using the 1 mA/2 mA/5 mA/10 mA/20 mA/50 mA/100 mA range: Add ±10 µA to DC measurement accuracy for current. Add (±10 µA) x (voltage read value) to DC measurement accuracy for active power. 		
	Active power: Displays the result of integrating active power values by polarity calculated once every cycle for the selected synchronization	Display Specific	Specifications		
	source as integrated values.	Display Number of display	7-segment LED 4 (display area a, b, c, and d)		
	Rectifier: DC Displays the result of integrating instantaneous data obtained by sampling both current and active power by polarity as integrated values (these values are not integrated values for the	parameters Display resolution	Other than integrated values: 99999 count (5 digits) Integrated values: 99999 count (6 digits)		
	DC component when active power contains both DC and AC components)	Display update rate	200 ms ±50 ms (approx. 5 updates per sec.) to 20 s (varies w number of averaging iterations setting)		
Integration time Integration time	1 min. to 10000 hr., settable in 1 min. blocks ±0.01% rdg. ±1 dgt.				
accuracy		Synchronized control			
Integration (Current or active power measurement accuracy) + (±0.01% rdg. measurement accuracy ±1 dgt.) Functions Functions The timing of calculations; display updates; data start, stop, and reset events; display hold operations.					
Effective measuring range	Until PEAK OVER U lamp or PEAK OVER I lamp lights up. 999999 (6 digits + decimal point)		start, stop, and reset events; display hold operation; key lock operation; and zero-adjustment operation for the slave PW3335 se is synchronized with the master PW3335 series. Synchronization w the PW3336 series and PW3337 series is also supported.		
Functions	Stopping integration based on integration time setting (timer) Stopping/starting integration and resetting integrated values	Terminal	BNC terminal × 1 (non-isolated)		
	based on external control Displaying the integration elapsed time	Terminal name	External synchronization terminal (EXT.SYNC) Off		
	Additional integration by repeatedly starting/stopping integration Backing up integrated vrepeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages	I/O settings	Synchronized control function o synchronization terminal (EXT.S		
Harmonic Meas	Stopping integration when power returns urement Specifications			minal (EXT.SYNC) is set to input, n signal can be input (slave).	
	Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation)		Out The external synchronization term and a dedicated synchronization		
	When the synchronization frequency falls within the 45 Hz to 66 Hz range: IEC 61000-4-7:2002 compliant Gaps and overlaps may occur if the measurement frequency is not 50 Hz or 60 Hz.	Number of units for which synchronized control can be performed	Up to 7 slaves per master (total of 8 units including the PW3	3336/PW3337 series)	
	When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur.	External Curren	nt Sensor Input Specification	ons	
Synchronization source	Conforms to synchronization source (SYNC) for the basic measurement specifications.	(PW3335-03 ar	nd PW3335-04)		
Measurement items	Harmonic voltage RMS value Harmonic voltage content percentage Harmonic voltage phase angle Harmonic current RMS value Harmonic current content percentage Harmonic active power	Terminal Current sensor type switching	Isolated BNC terminals Off / TYPE.1 / TYPE.2 When set to off, input from the exterminal is ignored.	ternal current sensor input	
	Harmonic active power content percentage Harmonic voltage current phase difference Total harmonic voltage distortion Total harmonic current distortion Fundamental wave voltage Fundamental wave current	Current sensor options	TYPE1 (100 A to 5000 A sensors 9660, 9661, 9669, CT9667-0		
	Fundamental wave active power Fundamental wave apparent power Fundamental wave reactive power Fundamental wave power factor Fundamental wave voltage current phase difference		CT6841-05, CT6843-05, CT68-	875, CT6876, CT6877, 9272-05, 44-05, CT6845-05, CT6846-05, etc.	
	(The following parameters can be downloaded as data with communications) Harmonic voltage phase angle Harmonic current phase angle Harmonic voltage current phase difference	Current measurement range Constraints	Auto/ 1 A/ 2 A/ 5 A (range noted of Can be read directly by manually Auto-range integration not support	setting the CT ratio.	



PW333						
Power range	Depends on the combination of voltage and current ranges;					
configuration	from 24.000 W to 5.0	from 24.000 W to 5.0000 MW (also applies to VA, var)				
	Measurement					
accuracy						
Current/ Active Po		F00// 1 1 1000//	1000/6			
Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input			
DC	±0.1%rdg.±0.2%f.s.	±0.1%rdg.±0.2%f.s.	±0.3%rdg.			
0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
16Hz≤f<45Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
45Hz≤f≤66Hz	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.			
66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤500hz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
Current						
Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input			
1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg. ±0.2%f.s.</td><td>±(0.23+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg.</td></f≤10khz<>	±(0.03+0.07×F)%rdg. ±0.2%f.s.	±(0.23+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.			
10kHz <f≤100khz< td=""><td>±(0.3+0.04×F)%rdg. ±0.3%f.s.</td><td>±(0.6+0.04×F)%rdg.</td><td>±(0.6+0.04×F)%rdg.</td></f≤100khz<>	±(0.3+0.04×F)%rdg. ±0.3%f.s.	±(0.6+0.04×F)%rdg.	±(0.6+0.04×F)%rdg.			
Active Power						
Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input			
1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg. ±0.2%f.s.</td><td>±(0.23+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg</td></f≤10khz<>	±(0.03+0.07×F)%rdg. ±0.2%f.s.	±(0.23+0.07×F)%rdg.	±(0.23+0.07×F)%rdg			
10kHz <f≤50khz< td=""><td>±(0.07×F)%rdg. ±0.3%f.s.</td><td>±(0.3+0.07×F)%rdg.</td><td>±(0.3+0.07×F)%rdg.</td></f≤50khz<>	±(0.07×F)%rdg. ±0.3%f.s.	±(0.3+0.07×F)%rdg.	±(0.3+0.07×F)%rdg.			

±0.3%f.s.

50kHz<f≤100kHz ±(0.6+0.07×F)%rdg.

±(0.9+0.07×F)%rdg.

±(0.9+0.07×F)%rdg.

- Values for f.s. depend on measurement ranges.
 "F" in the tables refers to the frequency in kHz.
 To obtain the current or active power accuracy, add the current sensor's accuracy to the above current and active power accuracy figures.
 The effective measurement range and frequency characteristics conform to the current sensor's specifications.
 The following input are considered reference values:
 Values for voltage, current, and active power for which 0.1 Hz ≤ f < 10 Hz.
 Values for voltage and active power in excess of 220 V for which 10 Hz ≤ f < 16 Hz.
 Values for voltage and active power in excess of 750 V for which 30 kHz < f ≤ 100 kHz.
 When using the CT684x-05 series, add ±2 mV to the CT684x-05 series accuracy after performing CT684x-05 series zero adjustment using the 1 A range noted on the panel.

Temperature coefficient	Current, active power: ±0.08%f.s./°C or less (instrument temperature coefficient; f.s.: instrument measurement range) Add current sensor temperature coefficient to above.			
Effect of power factor	Instrument: ±0.15%f.s. or less (45 to 66 Hz with power factor = 0) Internal circuit voltage/current phase difference: ±0.0859° Add the current sensor phase accuracy to the internal circuit voltage/current phase difference noted above.			
Current waveform peak value measurement specifications	 ±2.0% at DC or 10 Hz ≤ f ≤ 1 kHz (f.s.: current peak range) Add the current sensor accuracy to the above. 			
Harmonic	External current sensor input instrument measurement accuracy only			
measurement	Frequency (f)	Voltage, Current, Active power		
accuracy	DC	±0.4% rdg.±0.2%f.s.		
	10 Hz ≤ f < 30 Hz	±0.4% rdg.±0.2%f.s.		
	30 Hz ≤ f ≤ 400 Hz	±0.3% rdg.±0.1%f.s.		
	400 Hz < f ≤ 1 kHz	±0.4% rdg.±0.2%f.s.		
	1 kHz < f ≤ 5 kHz	±1.0% rdg.±0.5%f.s.		
	5 kHz < f ≤ 8 kHz	±4.0% rdg.±1.0%f.s.		
	Values for f.s. depend on measurement ranges. To obtain the current or active power accuracy, add the current sensor's accuracy to the above current and active power accuracy figures. When using the CT684x-05 series, add ±2 mV to the CT684x-05 series accuracy after performing CT684x-05 series zero adjustment using the 1 A range noted on the panel.			

D/A Output Specifications (PW3335-02 and PW3335-04)

Number of output channels	7 channels
Configuration	16-bit D/A converter (polarity + 15 bits)
Output voltage	The output level, output speed, and waveform output can be selected. Level output 2 Vf.s. or 5 Vf.s., linked to display updates High-speed level output 2 Vf.s. or 5 Vf.s., linked to synchronization interval Waveform output 1 Vf.s., linked to sampling
Output	Output parameters for all channels
parameters	Available selections vary with the output parameter. Level output/ High-speed level output/ Waveform output Voltage, current, active power Only Level output Apparent power, reactive power, power factor, phase angle, total harmonic voltage distortion, total harmonic current distortion, voltage ripple rate, current ripple rate, voltage crest factor, current crest factor, time average current, time average active power, maximum current ratio Only Level output 5 Vf.s. Frequency, current integration, active power integration The rectifier can be selected.
	Harmonic-order output is not supported.

Output accuracy	f.s.: Relative to the output voltage rated value for each output parameter Level output
	(Output parameter measurement accuracy) + (±0.2%f.s.) High-speed level output
	(Output parameter measurement accuracy) + (±0.2%f.s.) Waveform output
	(Output parameter measurement accuracy) + (±1.0%f.s.)
Output frequency band	Waveform output, high-speed level output At DC or 10 Hz to 30 kHz, accuracy is as defined above.
Maximum output voltage	Approx. ±12 V DC
Output update	Level output
rate	Same as the data update period.
	High-speed level output
	AC Updated once every cycle for the input waveform set as the
	synchronization source. However, voltage and current are only updated once every cycle for input signals from 45 to 66 Hz.
	Waveform output
	Approx. 1.43 µs (approx. 700 kHz)
Response time	Level output
	0.6 sec. or less
	High-speed level output
	2 ms or less
	Waveform output
	0.2 ms or less
Temperature coefficient	±0.05%f.s./°C or less
Output resistance	Approx. 100 Ω
External control	
Functions	Integration start/stop, integration reset and hold via external control
Input signal level	0 to 5 V (high-speed CMOS level) or shorted [Lo]/ open [Hi]
GP-IB interface (PW3335-01 an	d PW3335-04)
Method	Compliant with IEEE488.1 1987, in reference to IEEE488.2 1987
	Interface functions
	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Address	00 to 30

	Method	Compliant with IEEE488.1 1987, in reference to IEEE488.2 1987
		Interface functions
		SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
	Address	00 to 30

RS-232C interface

(PW3335, PW3335-02, PW3335-03, and PW3335-04)

	1,,,,		
ı	Connector	D-sub 9-pin connector × 1	
	Communication method	Full duplex, Start-stop synchronization Stop bits: 1 (fixed) Data length: 8 (fixed) Parity: None	
	Communication speed	9600 bps/ 38400 bps	

LAN interface

Connector	RJ-45 connector x 1
Electrical specifications	Compliant with IEEE802.3
Transmission method	10Base-T/ 100Base-TX (automatic detection)
Protocol	TCP/ IP
Functions	HTTP server (remote operation, firmware updates) Dedicated ports (command control, data transfer) Remote control by controller

General Specifications			
Product warranty period	3 year		
Operating environment	Indoors, altitude up to 2000 m (6562 ft.), pollution degree 2		
Operating temperature and humidity	0°C to 40°C (32°F to 104°F), 80% RH or less (no condensation)		
Storage temperature and humidity	-10°C to 50°C (14°F to 122°F), 80% RH or less (no condensation)		
Dielectric strength	4290 V rms AC (current sensitivity: 1 mA) Between the voltage input terminals and a connection consisting of chassis, interfaces, and output terminals Between the current input terminals and a connection consisting of chassis, interfaces, and output terminals Between the voltage input terminals and current input terminals		
Maximum rated voltage to earth	Voltage input terminal, Current input terminal Measurement category III 600 V (anticipated transient overvoltage: 6000 V) Measurement category II 1000 V (anticipated transient overvoltage: 6000 V)		
Maximum input voltage	Between the voltage input terminals U and ± 1000 V, ±1500 V peak		
Maximum input current	Between the current input terminals I and ± 200 mA to 20 A range 30 A, ±100 A peak 1 mA to 100 mA range 20 A, ±30 A peak		
Applicable Standards	Safety EN61010 EMC EN61326 Class A EN61000-3-2 EN61000-3-3		
Rated supply voltage	100 V AC to 240 V AC 50 Hz/60 Hz		
Maximum rated power	30 VA or less		
Dimensions	Approx. 210W \times 100H \times 245D mm (8.27"W \times 3.94"H \times 9.65"D) (excluding protrusions)		
Mass	Approx. 3 kg (105.8 oz.)		
Accessories	Instruction manual ×1		

Voltage and current input terminal safety cover ×2

Power cord ×1

3334 Specifications

Basic Specifications

Measu	rable lines	Single-phase, 2-wire (AC/DC)					
Measu	rement	Voltage, current, active power, apparent power, power factor,					
parameters		frequency, integrated current and active power, waveform peak					
		(voltage and current)					
Measure	ement method	Simultaneous digital sampling of voltage and current, True RMS					
Sampling	g Frequency	Approx. 74.4kHz					
Measure	ement Ranges						
	Currnet Voltage	100.00 mA	300.0 mA	1.0000 A	3.000 A	10.000 A	30.00 A
	15.000 V	1.5000 W	4.500 W	15.000 W	45.00 W	150.00 W	450.0 W
	30.00 V	3.000 W	9.000 W	30.00 W	90.00 W	300.0 W	900.0 W
	150.00 V	15.000 W	45.00 W	150.00 W	450.0 W	1.5000 kW	4.500 kW
	300.0 V	30.00 W	90.00 W	300.0 W	900.0 W	3.000 kW	9.000 kW
Frequency bandwidth DC, 45Hz to 5kHz							

.

Measurement accuracy
(Crustated at 2926-5 may 808th sine value input nover factor-1 in phase unitarie -0V accuracy specifications differ denenting on usage period of 1 or 3 years

Warm-up time	3 minutes			
Period of guaranteed accuracy	3 years (bet	ter accuracy specifications	available for 1-year period)	
Post-adjustment accuracy guarantee	1 year (accu	racy specifications available	e for 1-year period)	
Effective measurement range	Voltage, current:1% to 100% (Power: 0% to 100%) Measurements below 0.5% of the voltage or current range will be zero suppressed.			
Effect of power factor (at pf=0.5)	Maximum ±0.4%±rdg. (45 to 66Hz)			
Temperature Coefficient	Maximum ±0.03%f.s./°C			
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)	
	1 voor	+0.1 %rda	±0.2 %f c	

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)	
DC *	1 year	±0.1 %rdg. ±0.2 %f.s.		
DC	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.	
45 HZ S I S 00 HZ	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.	
	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.	
I KITZ < I S O KITZ	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 ** Accuracy not defined for current input exceeding 20A

Input Specifications

Input impedance	2.4 M Ω for voltage, 10 m Ω or better (50/60 Hz) for current		
Maximum input voltage	300 V, ±425 Vpeak		
Maximum input current	30 A, ±54.0 Apeak		
Maximum effective peak voltage	±300% of each voltage range, Within ±425 Vpeak		
Maximum effective peak current	±300% of each current range, Within ±54.0 Apeak *1		
Max. rated voltage to earth	300 V (DC, 50/ 60 Hz)		

Display Specifications

Diopidy opcome	
	Voltage and current: 0.5% to 105% of range
range	Active power: 0% to 110.25% 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])

Functional Specifications

i unctional Specifications				
Integration	No.of displayed digits:	Six digits		
measurement	Current Integration:	From 0.00000mAh, Polarity-independent		
		integration and Sum value		
	Active power Integration:			
	Integration time:	integration and Sum value 1 min to 10000 h		
	Measurement accuracy:			
Wave peak measurement	Maximum value of posi current (up to 300% of	tive and negative waveform of voltage/		
measurement		y: ±1.2%f.s. ("f.s." is 300% of each range)		
Rectification method		rue RMS), DC(simple average display) and AC(True RMS)		
Analog output	Parameter output repre	esentation:		
(D/A output)	Voltage, Current and A	ctive power (3 simultaneous channels)		
		n Current integration, Active power integration,		
	Apparent power, power			
	Voltage output: ±2 VDC f.s. for each range			
Mariafarma aritarit	Output accuracy: ±0.5% f.s. + individual measurement accuracy Parameter output representation:			
Waveform output	Voltage, Current and Active power (3 simultaneous channels)			
	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		ied number of samples: 1, 2, 5, 10, 25, 50 or 100		
VT or CT ratio	VT ratios: 1, 2, 4, 10, 20	0, 30, 60, 100		
		8, 10, 12, 15, 16, 20, 24, 25, 30, 40, 50, 60, 75, 300, 500, 1000, 2000, 3000, 5000, 10000		
External Interfaces	RS-232C interface: Inc	luded as standard		
	Asynchronous comn			
		rate: 9600 bps (fixed)		
	GP-IB interface (Model	npliant, IEEE-488.2 1987 reference		
Miscellaneous		value hold, Peak value hold, Key lock,		
		erves settings, integration data)		

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
Dimensions and mass	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)

3333 Specifications

Basic specifications

	-1								
Measur	easurable lines Single-phase, 2-wire (AC)								
Measurem	nent parameters	Voltage, Cu	urrent, Activ	e power, Ap	parent pov	ver, Power f	actor		
Measurer	ment method	Simultaneo	ous digital s	ampling of v	oltage and	current, Tru	ue RMS		
Sampling	g frequency	Approx. 48kHz							
Measure	ement ranges								
	Currnet Voltage	50.00 mA	200.0 mA	500.0 mA	2.000 A	5.000 A	20.00 A		
	200.0 V	10.000 W	40.00 W	100.00 W	400.0 W	1.0000 kW	4.000 kW		
Frequenc	y bandwidth	45Hz to 5k	Hz						

Measurement accuracy

(dualanteed at 25 G±5, max. 60 km, s	the wave input, power lacture 1, in-priase voltage =0v, accuracy specifications differ depending on usage period of 1 of 3 years)
Warm-up time	10 minutes
Period of guaranteed accuracy	3 years (better accuracy specifications available for 1-year period)
Post-adjustment accuracy guarantee	1 year (accuracy specifications available for 1-year period)
Effective measurement	Voltage, current, power: 10% to 150%
range	Measurements below 1% of the voltage or current range will be zero suppressed.
Effect of power factor (at pf=0.5)	Maximum ±0.4%±rdg. (45 to 66Hz)
Temperature Coefficient	Maximum ±0.03%f.s./°C

Frequency	Guaranteed Period	Voltage, current and active power
45 Hz < f < 66 Hz	1 year	±0.1 %rdg. ±0.1 %f.s.
45 HZ S I S 00 HZ	3 years	±0.1 %rdg. ±0.2 %f.s.
66 Hz < f ≤ 1 kHz *	1 year	±0.1 %rdg. ±0.2 %f.s.
00 HZ < I ≤ I KHZ	3 years	±0.1 %rdg. ±0.35 %f.s.
1 kHz < f < 5 kHz *	1 year	±3.0 %f.s.
I KMZ < I S 3 KMZ	3 years	±4.5 %f.s.

^{*} Accuracy not defined for current input exceeding 20A

Input specifications

Input impedance	2.4 MΩ for voltage, 7 mΩ or better (50/60 Hz) for current
Maximum input voltage	300 Vrms, 425 Vpeak
Maximum input current	30 Arms, 42.5 Apeak
Maximum effective peak voltage	Within 425Vpeak
Maximum effective peak current	±300% of each current range, Within ±42.5Apeak
Max. rated voltage to earth	300V (50/60Hz)

Display specifications

	voltage and current: 1% to 152% of range
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 rangel)

Functional Specifications

Rectification method	AC(True RMS)
Analog output (D/A output)	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
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
External Interfaces	RS-232C interface: Included as standard Asynchronous communication method: full-duplex; Baud rate: 9600 bps (fixed) GP-IB interface (Model 3333-01 only) IEEE-488.1 1987 compliant, IEEE-488.2 1987 reference
Miscellaneous	Display hold, Key lock, 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						
Dimensions and mass	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)						

Calculation formulas (3333 & 3334)

	,
Measurement	Formula
Parameters	
Apparent Power (S)	$S = U \times I$
Power Factor (図)	$\lambda = IP/SI$
Integrated Current*	(Sum of I from start of integration)/ (Number of 1 hour data)
Integrated Active	(Sum of P from start of integration)/ (Number of 1 hour data)
Power *	

^{*} Current and active power integration available only on Model 3334.

3-phase Power Meter

Model & Appearance	Model No. (Order Code)	Number of Channels	AC/ DC	Harmonic Measurement	LAN	RS-232C	GP-IB	D/A output	Current Sensor Input	Synchronized Control
	PW3337	3	AC/ DC	~	~	~	×	×	~	~
POWER METER PW3337	PW3337-01	3	AC/ DC	~	~	~	~	×	~	~
\$5000 \$3370 (08)	PW3337-02	3	AC/ DC	~	~	•	×	~	~	~
	PW3337-03	3	AC/ DC	•	✓	•	•	~	•	~
	PW3336	2	AC/ DC	~	~	~	×	×	•	~
POWER METER PW3336	PW3336-01	2	AC/ DC	~	~	v	~	×	~	~
\$ 5000 TO \$ 5000	PW3336-02	2	AC/ DC	~	~	v	×	~	~	~
	PW3336-03	2	AC/ DC	~	v	~	~	~	~	~

Accessories: Instruction manual ×1, Measurement guide ×1, Power cord ×1

Single-phase Power Meter

Model & Appearance	Model No. (Order Code)	Number of Channels	AC/ DC	Harmonic Measurement	LAN	RS-232C	GP-IB	D/A output	Current Sensor Input	Synchronized Control
	PW3335	1	AC/ DC	~	✓	~	×	×	×	~
POWER METER	PW3335-01	1	AC/ DC	~	~	×	~	×	~	~
PW3335	PW3335-02	1	AC/ DC	~	~	~	×	~	×	~
-	PW3335-03	1	AC/ DC	~	~	~	×	×	~	~
	PW3335-04	1	AC/ DC	~	~	~	~	~	~	~
AC/ DC POWER HITESTER 3334	3334	1	AC/ DC	×	×	~	×	~	×	×
12000 93000 120000 - = = = = = = = = = = = = = = = = =	3334-01	1	AC/ DC	×	×	~	~	~	×	×
POWER HITESTER 3333	3333	1	AC	×	×	v	×	~	×	×
3000 3000 5000:	3333-01	1	AC	×	×	~	~	~	×	×

Accessories : Instruction manual ×1, Power cord ×1

Communications and control options



RS-232C CABLE 9637 Cable length: 1.8 m (5.91 ft) 9pin to 9pin



GP-IB CONNECTOR CABLE 9151-02 Cable length: 2 m (6.56 ft)

DISTRIBUTED BY



9642
Cable length: 5 m (16.41 ft) supplied with straight to cross conversion cable



CONNECTION CORD 9165 For synchronized control Cable length: 1.5 m (4.92 ft), metal BNC to metal BNC

 $Note: Company\ names\ and\ Product\ names\ appearing\ in\ this\ catalog\ are\ trademarks\ or\ registered\ trademarks\ of\ various\ companies.$

HOKI

HIOKI E.E. CORPORATION

HEADQUARTERS

81 Koizumi, Ueda, Nagano 386-1192 Japan https://www.hioki.com/



Our regional contact information