

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.

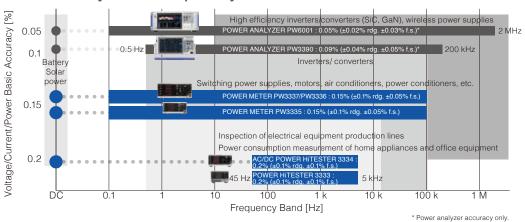
Designed for power consumption testing, the 3334 and 3333 are guaranteed for accuracy for up to 3 years.



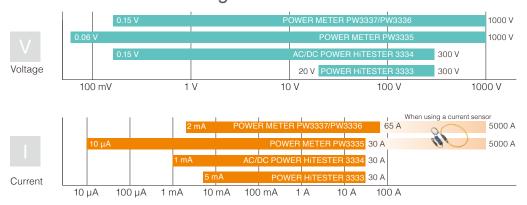




Basic Accuracy and Frequency Bands



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 measurement range, voltage		0.15 V to 1000 V		0.06 V to 1000 V	0.15 V to 300 V	20 V to 300 V
Effective measurement range, current		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 k	DC, 45 Hz to 5 kHz	45 Hz to 5 kHz	
Basic accuracy, AC (Voltage, current, power)		±0.1% rdg. ±0.05% f.s.			±0.1% rdg. ±0.1% f.s.	±0.1% rdg. ±0.2% f.s.
Basic accuracy, DC (Voltage, current, power)		±0.1% rdg. ±0.1% f.s.			±0.1% rdg. ±0.2% f.s.	-
Integrated power measurement		Yes			Yes	-
Harmonic measurement		IEC61000-4-7 compliant			-	
Current sensor input		Ye	Yes PW3335-03, -04			
	LAN		Yes		-	
Interface	RS-232C	Ye	es	PW3335, -02, -03, -04	Yes	
IIICIIACE	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.





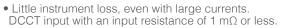
PW3337-03 Front Panel

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

PW3335-04 Front Panel

PW3335-04 Rear Panel

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





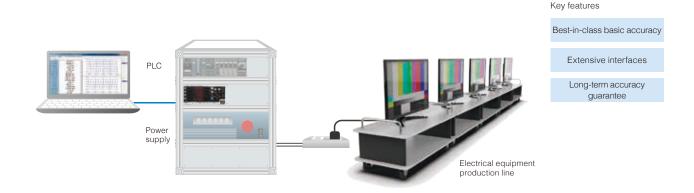
- Compact model for saving space, even when added to a system
- Accuracy guaranteed up to 3 years

Dimensional Drawings

Units: mm 32.5 M6×12L ÔÔ PW3337 127.75 PW3336 27.75 245 M6×12I 0 0 0 0 0 0 0 PW3335 M6×12L = O = O 3334 95.5 54 25 3333

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



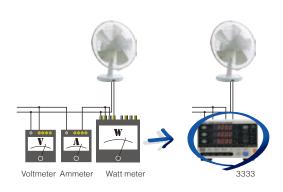
The built-in interfaces are convenient for transferring data to a PC and equipping the unit on automated machines. PC communication software can be downloaded free of charge from the HIOKI website. For details about the built-in interfaces, refer to the specifications for each model.



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

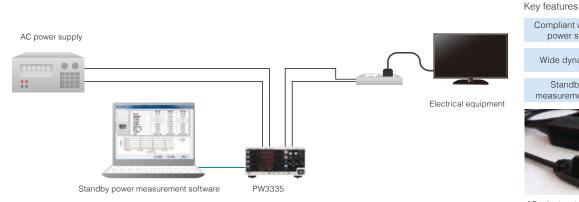
Standby Power Measurement



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 well 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		

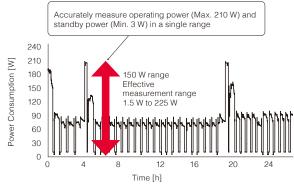
THD (Total Harmonic Distortion): Indicates to what extent harmonic components are present in an AC waveform

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

Wide Range of Effective Measurement

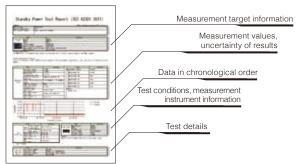
The PW3335 has an effective measurement range of 1% to 150%. Due to this wide range of effective measurement, even equipment with large load fluctuations, such as refrigerators, heaters, and pumps, can be measured accurately under all conditions from noload to full operation.



Long-term Measurement of Refrigerator Power

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.

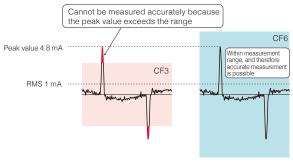


Example of Report Output

Support for CF6 (Crest Factor 6)

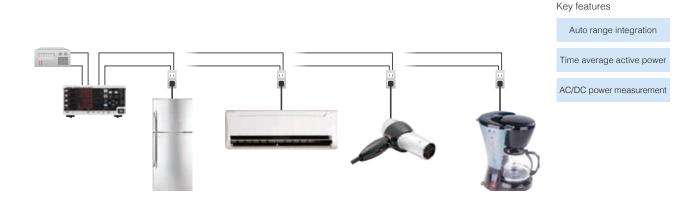
When an AC adapter or switching power supply operates with no load, the crest factor of the current waveform increases. The PW3335 can measure waveforms that exceed the range of watt meters that support crest factor 3.

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)

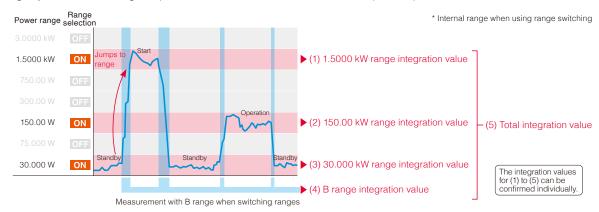
Measurement of Fluctuating Loads and Power Supply Control



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.

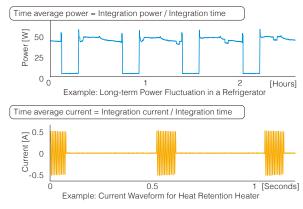


Intermittent Power Supply



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.

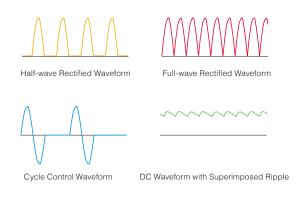


AC/DC Measurement



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.

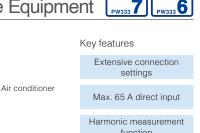
- Half-wave rectified waveforms used for dryers and fans
- Full-wave rectified waveforms used for AC adapters
- Cycle control waveforms used for voltage and temperature adjustment heaters
- DC waveforms with superimposed ripple components



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.

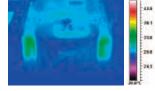
Support for Various Connections

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.



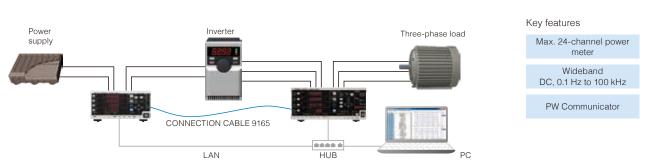


DCCT current sensor (in the PW3337)

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

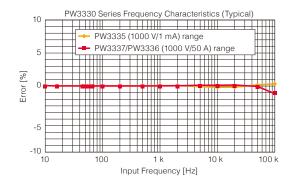
PW333 7 PW333 6 PW333

Inverter Efficiency Measurement



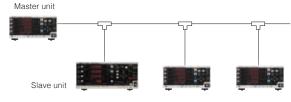
Wide Frequency Band (DC, 0.1 Hz to 100 kHz)

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

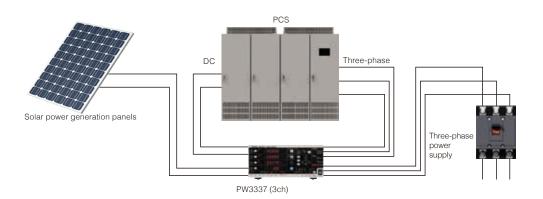
Connect 8 units for synchronous measurement of up to 24 channels. The calculation and control timing for PW3337, PW3336, and PW3335 units that are set as slaves are synchronized with the master unit. Use this feature to measure the I/O efficiency of power supply devices, compare multiple pieces of equipment, 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

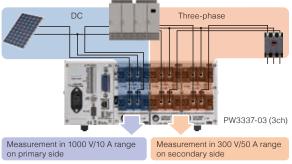




Key features Independent range per channel Extensive calculation functions Harmonic measurement function

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.

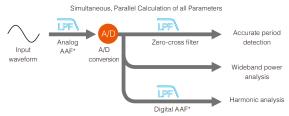


Setting Optimal Range According to Target to be Measured

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.

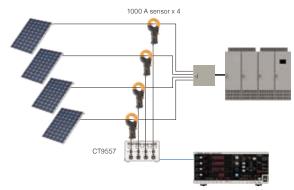
1000 V Range for Evaluation of Large Power Conditioners

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.



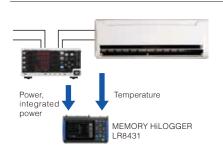
Aggregation of Output from DC Current Sensors (Up to 4000 A)

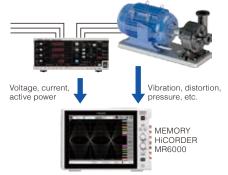
SENSOR UNIT CT9557 is a power supply for highly accurate current sensors that have a waveform output function. In addition to using it as a 4-channel power supply, it is also equipped with a sum feature for aggregating the input waveforms into a single waveform to be output.



Aggregating the Output from 4 Sensors into One Unit

Output Function Linked with Recorder





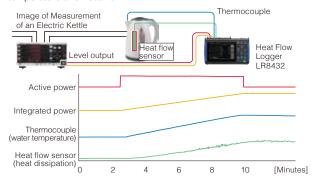
Key features
Level output
Waveform output
High-speed level output
LR8410Link

	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

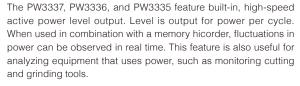


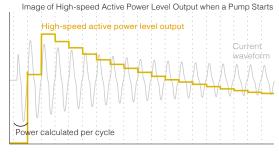
The level output (analog output) function delivers measured values that are displayed on the power meter with an analog voltage that is updated every 200 ms. Connect the unit to a data logger to check trends through synchronization with data such as temperature and heat flow*.



* 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





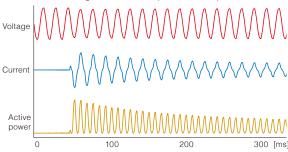
* With the PW3335, high-speed level output is also possible for 45 Hz to 66 Hz

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.

Image of Waveform Output when a Pump Starts



Log Data Measured by a Power Meter Wirelessly on a Hioki Logger(LR8410 Link)



Wirelessly transmit measurement parameters from the Power Meter PW3335 (excluding model -01) to a Wireless Logging Station LR8410 via Bluetooth® wireless technology*.

- The PW3335-02 and PW3335-04 can transmit 7 D/A output parameters.
- The PW3335, PW3335-03 can transmit 4 parameters: voltage, current, power and power factor.

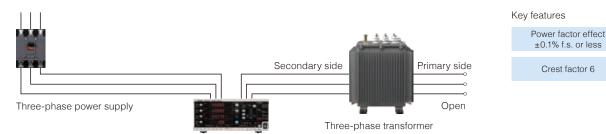
This allows you to combine the voltage and temperature data from the Logger with the current and power from the Power Meter in real time



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

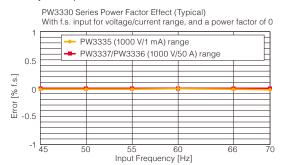
No-load Loss Measurements for Transformers





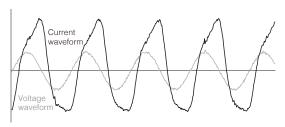
Power Factor Effect of 0.1% or Less, Even at Low Power Factors

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.



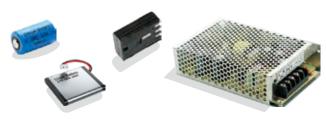
Example of Transformer Current Waveform during No-load Operation

Key features

DC power accuracy ±0.2% rdg.

Power integration function

DC Power Measurement for Batteries and Power Supplies



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.





±0_1%

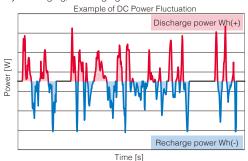
* For complete details, please refer to the specifications



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.



Options

TYPE 1 Current Sensor (General Current Measurements)

Connect this unit to the current sensor input terminal (BNC) on the PW3337/PW3336. 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
	*/	CLAMP ON SENSOR 9660	100 A	40 Hz to 5 kHz	ф 15 mm (0.59 in)	±0.3% rdg. ±0.02% f.s. Within ±1°		
Clamp	CLAMP ON SENSOR 9661	500 A	40 Hz to 5 kHz	φ 46 mm (1.81 in)	±0.3% rdg. ±0.01% f.s. Within ±0.5°		Not used	
	CLAMP ON SENSOR 9669	1000 A	40 Hz to 5 kHz	φ 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°	3 m (9.84 ft)		
method	80	FLEXIBLE CLAMP ON SENSOR CT9667-01			ф 100 mm (3.94 in)		(9.04 11)	AA (LR6) Alkaline Batteries x
30	%	FLEXIBLE CLAMP ON SENSOR 500 A/ CT9667-02 5000 A		10 Hz to 20 kHz	ф 180 mm (7.09 in)	±2.0% rdg. ±0.3% f.s. Within ±1°		2 (approx. 7 days) or
	3	FLEXIBLE CLAMP ON SENSOR CT9667-03			ф 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
O O	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)

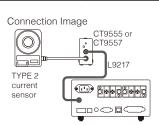
Connect this unit to the current sensor input terminal (BNC) on the PW3337/PW3336/PW3335. SENSOR UNIT CT9555 or CT9557 and CONNECTION CABLE L9217 are required.



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	φ 24 mm (0.94 in)	±0.05% rdg. ±0.01% f.s.		
		CT6863-05	200 A	DC to 500 kHz	φ 24 mm (0.94 in)	Within ±0.2°		
Through method		CT6875	500 A	DC to 2 MHz	ф 36 mm (1.42 in)			
		CT6876	1000 A	DC to 1.5 MHz	5 MHz φ 36 mm (1.42 in) ±0.04% rdg. ±0.008% f Within ±0.1°	±0.04% rdg. ±0.008% f.s. Within ±0.1°		
Q.		CT6877	2000 A	DC to 1 MHz	ф 80 mm (3.15 in)			
	8	CT6841-05	20 A	DC to 1 MHz	φ 20 mm (0.79 in)		3 m (9.84 ft)	CT9555 or CT9557
	Clamp	CT6843-05	200 A	DC to 500 kHz	ф 20 mm (0.79 in)			
Clamp		CT6844-05	500 A	DC to 200 kHz	ф 20 mm (0.79 in)	±0.3% rdg. ±0.01% f.s. Within ±0.1°		
method	8	CT6845-05	500 A	DC to 100 kHz	φ 50 mm (1.97 in)			
	8	CT6846-05	1000 A	DC to 20 kHz	φ 50 mm (1.97 in)			
	% \	9272-05	20 A/ 200 A	1 Hz to 100 kHz	ф 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 E	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.GE+0,I,+014.82E+0, P,+02.727E+3,S,+02.964E+3,FF,+00.920E+0



PRINTER 9442

Thermal serial dot method, 112 mm (4.41 in) paper wid 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)







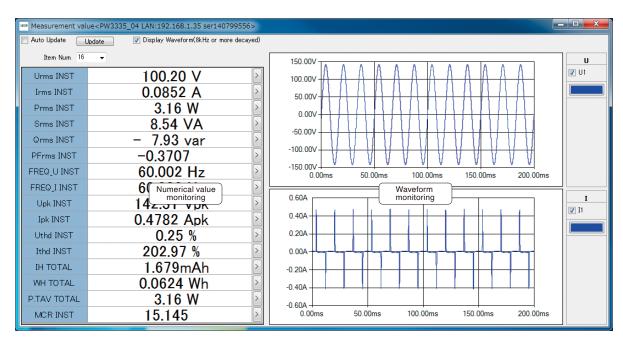


Software

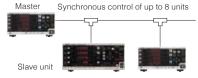
PW Communicator



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 narmonics

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.

ronological The minimum time interval for recording is 200 ms.

LabVIEW Driver

PW333 **7** PW333 **6** PW333 **5**

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.



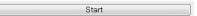
4. Configure the test conditions

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



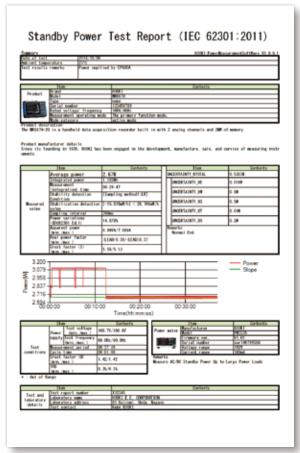
5. Run test

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	PV6335				
Sorial Number	perf.40290656				
Firmwara Ver	V0:07				
Start Time	2014	7	28	14	32
Voltage Florige	1509				
Current Ringe	200eyA				
Update Rate	200ms				
Algorithm	LR	OA:	821	SPE	SAE
Stop Factor	Page Done kent D	JHI.			
Valid Period	0	100			
Time Sect	Test ustass(V)	Test hequerby(Hz)	U-THD(s)	Crest Factor U	Creat Factor I
148	99.49	60.002	0.26	1 4207	58212
15	59.49	500.002	027	1,4199	5 6565
152	50,49	60,000	025	1,4198	5,6896
15.4	20.40	60,002	026	1:4150	5,6004
15.5	99.49	60,005	026	1.4198	5.6852
150	99.49	60,000	026	1.4198	5,6568
16	99.49	60,002	026	1.4199	5.6464
162	99.49	60 002	0.26	1.4198	5,6575

CSV output example

PW3337 and PW3336 Specifications

Input Specificati	ons					
Measurement line	PW3336 series					
type	Single-phase 2-wire			se 3-wire (†	1P3W),	
	Three-phase 3-wire	(3P3W, 3F	P3W2M)			
	Wiring	CH1	CH2			
	1P2W×2	1P2W	1P2W			
	1P3W		3W			
	3P3W		3W			
	3P3W2M	3P3\	N2M			
	PW3337 series					
	Single-phase 2-wire	(1P2W), S	Single-phas	se 3-wire (1P3W),	
	Three-phase 3-wire	(3P3W, 3F	P3W2M, 3\	/3A, 3P3W	3M),	
	Three-phase 4-wire	(3P4W)				
	Wiring	CH1	CH2	CH3		
	1P2W×3	1P2W	1P2W	1P2W		
	1P3W&1P2W		3W	1P2W		
	3P3W&1P2W		3W	1P2W		
	3P3W2M	3P3\	N2M			
	3V3A		3V3A			
	3P3W3M		3P3W3M			
	3P4W		3P4W			
Input methods	Voltage Isolated input					
	Current Isolated input, I					
Voltage measurement	AUTO/ 15.000 V/ 30.00				0 V/	
ranges 600.00 V/ 1000.0 V (set for each wiring mode)						
Current	AUTO/ 200.00 mA/ 500.00 mA/ 1.0000 A/ 2.0000 A/ 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					
Dames seems	external current sensor input specifications					
Power ranges	ver ranges Depends on the combination of voltage and current ranges; PW3336: from 3.0000W to 100.00kW (also applies to VA, var					
	PW3336: Irom 3.00					
Input resistance	Voltage input terminal		0.00kw (ai	σο αρριίσο	io va, vai)	
(50/60 Hz)	Current direct input ter			c		

Input resistance (50/60 Hz)	Voltage input terminal Current direct input ter	: 2 MΩ minal : 1 mΩ or less					
(00/00112)	Odirent direct input ter	. 1 1112 01 1000					
Basic Measuren	nent Specifications	s					
	Simultaneous voltage simultaneous calculati	and current digital sam	npling, zero-cross				
Sampling frequency	Approx. 700 kHz						
A/D converter	16-bit resolution						
Frequency bands	DC, 0.1 Hz to 100 kHz U1, U2, U3, I1, I2, I3, E	O (fixed at 000 ma)					
Synchronization sources	Can be set separately						
Measurement items	Voltage Curr Reactive power Pow Efficiency Active power integrat Voltage waveform pe Voltage crest factor Time average current Voltage ripple factor	ent Active power factor Phase and Current inlicion Integrated ak value Current cr	gle Frequency tegration I time aveform peak value est factor age active power				
	Current fundamental Apparent power fundamer Power factor fundame Voltage current phase Interchannel voltage Interchannel current i Harmonic voltage coe Harmonic active pow	IS value Harmonic et distortion Voltage fu waveform Active power tall waveform Grantal waveform (displace difference fundamen fundamental wave pha fundamental wave harntet % Harmonic er content %	er fundamental waveform wer fundamental waveform cement power factor) tal waveform use difference se difference current content %				
	communication but no	ase angle · Harmonic	_				
Rectifiers	AC+DC Umr: AC+DC Display of average voltage and true Rh DC: DC measurement Display of simple av Display of values c: value) for active pov AC: AC measurement Display of values c: Display of values c: for active power FND Extraction and disp from harmonic mea	S values for both voltag measurement value rectified RMS co MS values for current verages for both voltag alculated by (voltage D wer alculated by $\sqrt{AC+DC}$ blay of the fundamental	pe and current I/C value)x (current DC value)x (current DC value) current C value) ² - (DC value) ²				
Zero-Crossing Filter	500 Hz/200 kHz 500 Hz: 0.1 Hz to 500 Hz, 200 kHz: 0.1 Hz to 200 kHz						
Measurement accuracy	300 HZ. 0.1 HZ 10 300	nz, 200 knz. 0.1 nz to	ZUU KIIZ				
Voltage							
Frequency (f)	Input < 50% f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input				
DC 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.				
	±0.1%rdg. ±0.2%f.s. ±0.1%rdg. ±0.1%f.s.						
0.1Hz ≤ f < 16Hz		±0.3%rdg.	±0.3%rdg.				
0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz	±0.1%rdg. ±0.1%f.s.	±0.3%rdg. ±0.2%rdg.	±0.3%rdg. ±0.2%rdg.				
$\begin{array}{c} 0.1 \text{Hz} \leq f < 16 \text{Hz} \\ 16 \text{Hz} \leq f < 45 \text{Hz} \\ 45 \text{Hz} \leq f \leq 66 \text{Hz} \\ 66 \text{Hz} < f \leq 500 \text{Hz} \\ 500 \text{Hz} < f \leq 10 \text{kHz} \end{array}$	±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.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg.				
$\begin{array}{c} 0.1 Hz \leq f < 16 Hz \\ 16 Hz \leq f < 45 Hz \\ 45 Hz \leq f \leq 66 Hz \\ 66 Hz < f \leq 500 Hz \\ 500 Hz < f \leq 10 kHz \\ 10 kHz < f \leq 50 kHz \\ \end{array}$	±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. ±0.5%rdg. ±0.3%f.s.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg.				
0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 100kHz	±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.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg.				
$\begin{array}{ c c c c }\hline 0.1Hz \le f < 16Hz \\ \hline 16Hz \le f < 45Hz \\ \hline 45Hz \le f \le 66Hz \\ \hline 66Hz < f \le 500Hz \\ \hline 500Hz < f \le 10kHz \\ \hline 10kHz < f \le 50kHz \\ \hline 50kHz < f \le 100kHz \\ \hline Current (direct input) \\ \hline \end{array}$	±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.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.				
$\begin{array}{l} 0.1 \text{Hz} \leq f < 16 \text{Hz} \\ 16 \text{Hz} \leq f < 45 \text{Hz} \\ 45 \text{Hz} \leq f \leq 66 \text{Hz} \\ 66 \text{Hz} < f \leq 500 \text{Hz} \\ 500 \text{Hz} < f \leq 10 \text{kHz} \\ 10 \text{kHz} < f \leq 50 \text{kHz} \\ 50 \text{kHz} < f \leq 50 \text{kHz} \\ \end{array}$	±0.1%rdg, ±0.1%f.s, ±0.1%rdg, ±0.05%f.s, ±0.1%rdg, ±0.10%f.s, ±0.1%rdg, ±0.2%f.s, ±0.5%rdg, ±0.3%f.s, ±2.1%rdg, ±0.3%f.s,	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.2%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.				
0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 10kHz 50kHz < f ≤ 10kHz Frequency (f)	±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. ±0.1%rdg, ±0.3%f.s.	±0.3%rdg, ±0.2%rdg, ±0.15%rdg, ±0.2%rdg, ±0.3%rdg, ±0.3%rdg, ±2.4%rdg. 50%fs. ≤ Input < 100%fs. ±0.1%rdg, ±0.1%f.s.	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.3%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg.				
$\begin{array}{c} 0.1 \text{Hz} \leq f < 16 \text{Hz} \\ 16 \text{Hz} \leq f < 45 \text{Hz} \\ 45 \text{Hz} \leq f \leq 66 \text{Hz} \\ 66 \text{Hz} < f \leq 500 \text{Hz} \\ 500 \text{Hz} < f \leq 10 \text{kHz} \\ 10 \text{kHz} < f \leq 50 \text{kHz} \\ 50 \text{kHz} < f \leq 100 \text{kHz} \\ \hline \text{Current (direct input)} \\ \hline \text{Frequency (f)} \\ \text{DC} \\ 0.1 \text{Hz} \leq f < 16 \text{Hz} \\ \end{array}$	±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. ±0.5%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, ±0.2%f.s.	±0.3%rdg, ±0.2%rdg, ±0.15%rdg, ±0.15%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,	±0.3%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.				
0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz 45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz 500Hz < f ≤ 10kHz 10kHz < f ≤ 50kHz 50kHz < f ≤ 10kHz Current (direct input) Frequency (f) DC 0.1Hz ≤ f < 16Hz 16Hz ≤ f < 45Hz	±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.05%f.s. ±0.1%rdg, ±0.1%f.s. ±0.1%rdg, ±0.2%f.s. ±0.5%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.	±0.3%rdg. ±0.2%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%fs. ±0.3%rdg. ±0.3%rdg.	±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. ±0.2%rdg.				
$\begin{array}{c} 0.1Hz \le f < 16Hz \\ 16Hz \le f < 45Hz \\ 45Hz \le f \le 66Hz \\ 66Hz < f \le 500Hz \\ 500Hz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 50kHz < f \le 50kHz \\ 00kHz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 00kHz < f \le 100kHz \\ 10kHz < f \le 60kHz \\ 00kHz < f \le 60kHz \\ 00kHz < f \le 60kHz \\ 00kHz \le f \le 60kHz \\ 00kHz \le f \le 66kHz \\ 00kH$	±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. ±0.1%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, ±0.2%f.s. ±0.1%rdg, ±0.2%f.s.	±0.3%rdg, ±0.2%rdg, ±0.15%rdg, ±0.2%rdg, ±0.3%rdg, ±0.3%rdg, ±2.4%rdg. 50%fs. ≤ Input < 100%fs. ±0.1%rdg, ±0.1%f.s. ±0.2%rdg, ±0.2%rdg,	±0.3%rdg. ±0.2%rdg. ±0.15%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.				
$\begin{array}{c} 0.1Hz \le f < 16Hz \\ 16Hz \le f < 45Hz \\ 45Hz \le f \le 66Hz \\ 66Hz < f \le 500Hz \\ 500Hz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 50kHz < f \le 100kHz \\ \hline 00kHz < f \le 100k$	±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. ±0.1%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.	±0.3%rdg, ±0.2%rdg, ±0.15%rdg, ±0.15%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, ±0.25%rdg, ±0.25%rdg,	±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. ±0.15%rdg. ±0.15%rdg.				
$\begin{array}{c} 0.1Hz \le f < 16Hz \\ 16Hz \le f < 45Hz \\ 45Hz \le f \le 66Hz \\ 66Hz < f \le 500Hz \\ 500Hz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 50kHz < f \le 50kHz \\ 00kHz < f \le 10kHz \\ 10kHz < f \le 50kHz \\ 00kHz < f \le 100kHz \\ 10kHz < f \le 60kHz \\ 00kHz < f \le 60kHz \\ 00kHz \le f \le 66kHz \\ 16kHz \le f \le 66kHz \\ 16kH$	±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. ±0.1%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, ±0.2%f.s. ±0.1%rdg, ±0.2%f.s.	±0.3%rdg, ±0.2%rdg, ±0.15%rdg, ±0.2%rdg, ±0.3%rdg, ±0.3%rdg, ±2.4%rdg. 50%fs. ≤ Input < 100%fs. ±0.1%rdg, ±0.1%f.s. ±0.2%rdg, ±0.2%rdg,	±0.3%rdg. ±0.2%rdg. ±0.15%rdg. ±0.3%rdg. ±0.8%rdg. ±2.4%rdg. 100%f.s.≤Input ±0.2%rdg. ±0.3%rdg. ±0.2%rdg. ±0.2%rdg. ±0.15%rdg.				

Active 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	±0.1%rdg. ±0.1%f.s.	±0.2%rdg.	±0.2%rdg.			
500Hz < f ≤ 1kHz	±0.1%rdg. ±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
1kHz < 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	±(0.07×F)%rdg. ±0.3%f.s.	±(0.3+0.07×F)%rdg.	±(0.3+0.07×F)%rdg.			
50kHz < f ≤ 100kHz	±(0.6+0.07×F)%rdg. ±0.3%f.s.	±(0.9+0.07×F)%rdg.	±(0.9+0.07×F)%rdg.			
	power. • When using the 200r current and active po • Values for voltage, c • 1 Hz ≤ f < 10Hz are. • Values for voltage, c 20A for which 10Hz ≤ • Values for current an 500Hz < f ≤ 50kHz ar • Values for current an 50kHz < f ≤ 100kHz	urrent, and activé power if < 16Hz are for refere d active power in exce re for reference only, d active power in exce are for reference only, and active power in exce	dd ±0.1% rdg. to ≤ 10kHz. er for which er in excess of 220V or nce only. ss of 20A for which ss of 15A for which			
Guaranteed accuracy period	1 year	,				
Post-adjustment	6 months					
accuracy guaranteed	o monaro					
Maximum effective	±600% of each voltag	e range				
oeak voltage		00 V, and 1000 V range	s. ±1500 Vpeak			
Maximum effective	±600% of each curren		, , , , , , , , , , , , , , , , , , , ,			
oeak current	However, for 20 A range	ge and 50 A range, ±10	0 Apeak			
Conditions of	Temperature and hum	idity: 23°C ±5°C, 80%	RH or less			
guaranteed	Warm-up time: 30 min					
accuracy		power factor of 1, term				
	voltage of 0V, after zero adjustment; within range in which the					
		ve satisfies synchroniza	tion source conditions			
emperature characteristic	±0.03% f.s. per °C or I					
Power factor effects	Internal circuitry voltage	o 66 Hz, at power facto ge/current phase differe				
Effect of common node voltage	±0.02% f.s. or less (600 V, 50/60 Hz, appl	lied between input term	ninals and enclosure)			
Effect of external	400 A/m, DC and 50/6	0 Hz magnetic field				
magnetic field		s. or less				
nterference		s. or ±10 mA, whicheve				
Henerence		a ar (valtage influence	$(\Delta m \Omega L) \sim (\mu titue)$			
illeriererice	Active power:±3.0% f.		γ quantity) \wedge (\pm 10 m \wedge)			
	whichev	er is greater, or less	quantity) x (±10 m/)			
Magnetization	whichev ±10 mA equivalent or I	er is greater, or less ess				
Magnetization effect	whichev ±10 mA equivalent or I (after inputting 100 A I	er is greater, or less ess DC to the current direct				
Magnetization Iffect Adjacent channel Input effect	whichev ±10 mA equivalent or I	er is greater, or less ess OC to the current direct ess				

Magnetization effect Adjacent channel input effect Voltage/ Current/ Active Power Measurement Specifications

Measurement types	Rectifiers: AC+DC, DC, AC, FND, AC+DC Umn
Effective	Voltage: 1% to 130% of range
measuring range	(However, up to ±1500 V peak value and 1000 V RMS value)
	Current: 1% to 130% of range
	Active power: 0% to 169% of the range
	(However, defined when the voltage and current fall
	within the effective measurement range.)
Display range	Voltage/ Current: 0.5% to 140% of range (zero-suppression when less than 0.5%)
	Active power: 0% to 196% of the range (no zero-suppression)
Polarity	Voltage/ Current: Displayed when using DC rectifier
	Active power: +: Positive: Power consumption (no polarity display)
	-: Regenerated power

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	$Xsum = \frac{1}{3} (X_{(1)} + X_{(2)} + X_{(3)})$	$P_{sum} = (P_{(1)} + P_{(2)} + P_{(3)})$	
	3P3W3M		7 34 = (1 (1) 1 1 (2) 1 1 (3))	
	3P4W			

(i): Measurement channel

Voltage Waveform Peak Value / Current Waveform Peak Value Measurement Specifications

Measurement	Inteasures the wavelorin's peak value (for both positive and										
method	negative polarity) based on sampled instantaneous voltage values.										
Sampling frequency	Approx.	700 kHz	:								
Voltage peak range											
Voltage range	15V	30V	60'	V	15	0V	3	00V		600V	1000V
Voltage peak range	90.000V	180.00	V 360.0)OV	900	.00V	1.8	000kV	3.	6000kV	6.0000kV
Current peak range											
Current range	200mA	500mA	1A	2	2A	5 <i>A</i>	4	10A		20A	50A
Current peak range	1.2000A	3.0000A	6.0000A	12.0	A000	30.00	A00	60.000	DΑ	120.00A	300.00A
Measurement accuracy	Same as the voltage or current measurement accuracy at DC and when 10 Hz \leq f \leq 1 kHz (f.s.: voltage peak range or current peak range). Provided as reference value when 0.1 Hz \leq f $<$ 10 Hz and when in excess of 1 kHz.										
Effective measuring range	±5% to ±100% of voltage peak range (up to ±1500 V) or ±5% to ±100% of current peak range (up to ±100 A)										
Display range	±0.3% to ±102% of voltage peak range or current peak range (values less than ±0.3% are subject to zero-suppression)										

Voltage Crest Factor/ Current Crest Factor Measurement Specifications

	Calculates values from display values once each display update
	interval for voltage and voltage waveform peak values or current
	and current waveform peak values.
	As per voltage and voltage waveform peak value or current and
range	current waveform peak value effective measurement ranges.
Display range	1.0000 to 612.00 (no polarity)

Measurer method		Calculates the A	AC com	ponent	(peak t	rement Specification opeak [peak width]) as Component	
Effective measuring range		proportion of the voltage or current DC component As per voltage and voltage waveform peak value or current and current waveform peak value effective measurement ranges					
measurin Display ra		0.00[%] to 500.		value e	errective	e measurement ranges	
Polarity		None					
			ver Fac	tor/ Pha	ase Ang	le Measurement Specif	ications
Measurer types	nent		Reactive	Power/ F	ower Fac	etor : AC+DC, AC, FND, AC+	DC Umn
						: AC, FND effective measurement ra	
Display range		Power Factor Phase Angle		:	±0.000 +180.00	% of the range (no zero-suppress 0 to ±1.0000 0 to -180.00	sion)
Polarity		voltagé wavefo	gned ac orm risir urrent la	ccording ng edge ags volt	g to the and the age (no	Angle lead/lag relationship of t current waveform rising polarity display)	he g edge.
ower ch	nannel an	d sum value ca	alculati	ion for	nulas		
	ring	S: Appa		wer		Q: Reactive power	
All channels	1P2W 1P3W	$S_{(i)} = U_{(i)} \times $ $S_{sum} = S_{(1)} +$	l _(i)		-	$Q(i) = si(i)\sqrt{S(i)^2 - P(i)^2}$	
	3P3W	$S_{sum} = \frac{V_{(1)}}{2}$ $S_{sum} = \frac{\sqrt{3}}{2} (S_{(1)})$.)	\dashv	$Q_{\text{sum}} = Q_{(1)} + Q_{(2)}$	
Sum values	3P3W2M	$S_{sum} = \frac{\sqrt{3}}{3} (S_{(1)})$				Q _{sum} − Q ₍₁₎ + Q ₍₂₎	
	3V3A 3P3W3M	$S_{sum} = S_{(1)} +$			+	$Q_{\text{sum}} = Q_{(1)} + Q_{(2)} + Q_{(3)}$	
i): Meas	3P4W urement ch		(2)	(3)		sum (1) - (2) - (3	,
	ring	λ : Pov	ver fact	or		Φ : Phase angle	
All channels			$Si(i) \frac{P(i)}{S(i)}$		\dashv	$\phi(i) = si(i) \cos^{-1}l \lambda(i).$	ı
	1P3W		10(1)		Wh	nen Psum≥0	
Sum	3P3W 3P3W2M	$\lambda_{sum} = 3$	Sisum Psu	um um		Φsum = Sisum COS ⁻¹ $λ$ sum (0° to	±90°)
values	3V3A 3P3W3M		Osu			nen Psum≥0 Фsum = sisum 180 - cos⁻1	
i). Measu	3P4W rement char	nel · The polarity	symbol	sisum is	s acquire	(±90° t ed from the Qsum symbol	to ±180°)
		surement Sp					
Number of r	measurement		000				
channels Measureme	ent source	Select from U (\	/Hz) or	I (AHz)	by cha	nnel	
Measureme		Calculated from input waveform period (reciprocal method)					
Measurement range Measurement accuracy		500 Hz/ 200 kHz (linked to zero-cross filter) ±0.1% rdg. ±1 dgt. (0°C to 40°C)					
	ent accuracy	±0.1% rdg. ±1 c	z (linke lgt. (0°0	d to zer	o-cross		
Effective i		±0.1% rdg. ±1 c	z (linke lgt. (0°0 Iz	d to zer C to 40°	o-cross C)		
Effective i	ent accuracy	±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave in source's measu	z (linke lgt. (0°0 lz iput tha rement	d to zer C to 40° at is at le range.	o-cross C) east 209	s filter) % of the measurement	0 sec.
Effective i range	ent accuracy measuring	±0.1% rdg. ±1 c 0.1 Hz to 100 kF For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999	z (linke lgt. (0°0 lz iput tha rement wer limi	to to zer to 40° at is at le range. it freque	co-cross CC) east 209 ency set	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz	·,
Effective i range Display fo	ent accuracy measuring ormat	±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	z (linke lgt. (0°0 lz put tha rement wer limi 99 Hz, 9. 9 kHz, 9	at is at least range. it frequences 1.900 kHz	co-cross CC) east 209 ency set	s filter) % of the measurement ting: 0.1 sec. / 1 sec. / 1	·,
Effective in range Display for Efficience	ent accuracy measuring ormat	±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement 0 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec	z (linke lgt. (0°0 Iz put tha rement wer limi 99 Hz, 9. 9 kHz, 9	to to zer to to 40° at is at le range. it freque 900 Hz t .900 kHz	ency set to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz	, 0 kHz
Effective range Display for Efficient Measureme Wiring mo	ent accuracy measuring primate primat	±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 Calculated base	z (linke lgt. (0°C Hz uput tha rement wer limi 99 Hz, 9. 99 kHz, 9 ification ncy h [%]	at is at lear range. It frequences to the second range. It frequences from the results of the second range. It frequences to the second range range.	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz J9 kHz, 99.00 kHz to 220.00	, 0 kHz
Effective range Display for Efficience Measureme	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculates the efficie Calculated base PW3336	z (linke lgt. (0°0 Hz uput tha rement wer limi 99 Hz, 9. 9 kHz, 9 ification ncy h [%]	at is at lear range. It is at lear range. It freque 900 Hz t900 kHz tone AC+	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz by 8Hz, 99.00 kHz to 220.00 kHz to 220.	o kHz
Effective range Display for Efficience Measureme Wiring moand calcu	ent accuracy measuring primat prim prim primat primat primat prim	±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 Calculated base	z (linke lgt. (0°C Hz uput tha rement wer limi 99 Hz, 9. 99 kHz, 9 ification ncy h [%]	at is at lear range. It frequences to the second range. It frequences from the results of the second range. It frequences to the second range range.	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 vive power values for channels a lifter active power Calculation formula 1=100×[P2] / [P1	o kHz
Effective range Display for Efficience Measureme Wiring moand calcu	ent accuracy measuring primat prim prim primat primat primat prim	±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement 10 0.1000 Hz to 9.999 9900 kHz to 9.999 yrement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W	z (linke gt. (0° 0 dz dz dput that rement wer limit 99 Hz, 9. 99 kHz, 9 ification ncy h [%] ed on the	d to zero d to 40° at is at le range. it freque 900 Hz t . 900 kHz DDS from the range AC+	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.00 kHz do 220.	nd wires
Effective range Display for Efficience Measureme Wiring moand calcu	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2	z (linke lgt. (0°0 Hz sput that rement wer limit 199 Hz, 9. 9 kHz, 9. ification cyh [%] ed on the CH1 1P2W 1P. 3P.	d to zer to 40° at is at lea range. it freque 900 Hz t .900 kHz Dns from the r ne AC+ CH2 1P2W	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 vive power values for channels a lifter active power Calculation formula 1=100×[P2] / [P1	nd wires
Effective in range Display for Efficient Measureme Wiring moand calculations and calculations are supplied to the calculations and calculations are supplied to the calculations are supplied to	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337	z (linke lgt. (0°C lz lgt. (0°C lz lgt. (0°C lgt. (0°C lgt. lgt. (0°C lgt. lgt. lgt. lgt. (0°C lgt. lgt. lgt. lgt. lgt. (0°C lgt. lgt. lgt. lgt. lgt. lgt. lgt. lgt.	d to zer C to 40° at is at learning range. it freque 900 Hz t .900 kHz DNS from the r ne AC+ 1P2W 3W 3W W2M	east 205 ency set o 99.999 to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 live power values for channels a lifter active power Calculation formula 1=100×[P2] / [P1 n2=100×[P1] / [P2	and wires
Effective in range Display for Efficient Measureme Wiring moand calculations and calculations are supplied to the calculations and calculations are supplied to the calculations are supplied to	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M	z (linke lgt. (0°0 Hz sput that rement wer limit 199 Hz, 9. 9 kHz, 9. ification cyh [%] ed on the CH1 1P2W 1P. 3P.	d to zer C to 40° at is at le r range. it freque 9900 Hz t .900 kHz Dns from the r ne AC+ 1P2W 3W 3W	ency set o 99.999 z to 99.99	% of the measurement ting: 0.1 sec. / 1 sec. / 1 hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 ive power values for channels a ifier active power Calculation formula 1=100× P2 / P1 n2=100× P1 / P2 Calculation formula η1=100× P1 / P2 Calculation formula η1=100× P3 / P1	and wires
Effective in range Display for Efficient Measureme Wiring moand calculations and calculations are supplied to the calculations and calculations are supplied to the calculations are supplied to	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W	z (linke z (at is at learning at lea	co-cross CO) east 20% ency set o 99.999 to 99.998 atio of act DC rect	% of the measurement ting: 0.1 sec. / 1 sec. /	and wires as
Effective in range Display for Efficient Measureme Wiring moand calculations and calculations are supplied to the calculations and calculations are supplied to the calculations are supplied to	ent accuracy measuring primat prim prim primat primat primat prim	±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 Irement Spec Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3	z (linke gt. (0°) (12 ggt. (0°	d to zer C to 40° at is at le range. it freque 900 Hz t .900 kHz Dns from the r ne AC+ CH2 1P2W 3W W2M CH2 1P2W	co-cross CO) east 205	% of the measurement ting: 0.1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 live power values for channels a lifter active power Calculation formula η1=100×[P2] / [P1 η2=100×[P1] / [P2 η1=100×[P3] / [P1 η2=100×[P1] / [P1] / [P1 η2=100×[P1] / [P1] /	and wires as
Effective in range Display for Efficient Measureme Wiring moand calculations and calculations are supplied to the calculations and calculations are supplied to the calculations are supplied to	ent accuracy measuring primat prim prim primat primat primat prim	±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement loo 0.1000 Hz to 9.99 9900 kHz to 9.999 9900 kHz to 9.999 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W2M 1P3W & 1P2W 3P3W2M 3W3A	z (linke gt. (0°(linke gt. (0°)	d to zer C to 40° tt is at le range. on 800 Hz t freque The 400 H	CH3 1P2W 1P2W 1P2W 1	% of the measurement ting: 0.1 sec. / 1 sec. /	and wires as
Effective range Display for Efficienc Measureme Wiring mand calcuequations	ent accuracy measuring permat	±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 irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W2M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P4W	z (linke gt. (0°(linke gt. (0°(lin	d to zer d to zer to 40° to 40	east 20% eas	S filter) % of the measurement ting: 0.1 sec. / 1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 live power values for channels a lifter active power Calculation formula: η1=100× P2 / P1 η2=100× P1 / P2 η2=100× P1 / P2 η2=100× P1 / P3 η1=100× P3 / Psum / P5 η2=100× P5 / P5 η2=	and wires as
Effective range Display for Efficienc Measureme Wiring mand calculations	ent accuracy measuring primate	±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 9900 kHz to 9.999 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W 3P3W3M 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W & 1P2W 3P3W & 1P2W 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3HW3M 3P4W As per the activ	z (linke gt. (0°(linke gt. (0°(lin	d to zer d to zer to 40° to 40	east 20% eas	% of the measurement ting: 0.1 sec. / 1 sec. /	and wires as
Effective range Display for Efficience Measureme Wiring mand calcumed equations Effective means	ent accuracy measuring permat permat permat permat permat permat permat permat permat permate	±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 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M 3P3W2M PW3337 Wiring 1P2W × 3 1P3W & 1P2W 3P3W2M 3P3W3M 3P4W As per the activ 0.00[%] to 200.	z (linke gt. (0°(linke gt. (0°(lin	d to zer d to zer to 40° to 40	co-cross co-	% of the measurement ting: 0.1 sec. / 1 sec. / 1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz 99 kHz, 99.00 kHz to 220.0 live power values for channels a lifter active power Calculation formula: η1=100× P2 / P1 η2=100× P1 / P2 η2=100× P1 / P2 η2=100× P1 / P3 η1=100× P3 / P3 η1=100× P3 / P3 η1=100× P3 / P3 η1=100× P3 / P3 η2=100× P3 / P3 η2=100× P3 / P3 η2=100× P3 / P3 η3 η3 η3 η4	r. 0 kHz
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Effective medical programme and calculations of the programme and calculat	ent accuracy measuring measuring permat courselve measuring permatent method odes assuring range assuring range curred method ent accuracy meant method ent entre method entre entre method	±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.100 Hz to 9.999 9900 kHz to 9.999 9900 kHz to 9.999 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2 1P3W 3P3W2M PW3337 Wiring 1P2W × 3 1F3W & 1P2W 3P3W2M 1P2W × 3 1F3W & 1P2W 3P3W2M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P3W3M 3P4W As per the activ 0.00[%] to 200. nt / Time Averag Calculates the ave ±(Current or activ	z (linke gt. (0°c linke gt. (0°c lin	d to zer C to 40° tit is at le range. The frequency of th	CH3 1P2W 1P2W 1P2W 1P2W 1P2W 1P2W 1P2W 1P2W	S filter) % of the measurement ting: 0.1 sec. / 1 sec.	on time
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Scaling	Applies user-defined VT and CT ratio set	
(VT, CT)	These settings can be configured separa VT ratio setting range : OFF (1.0), 0.1	to 1000 (setting: 0000)
		01 to 1000 (setting: 0000)
HOLD	· Stops display updates for all measured	
(HOLD)	display values at that point in time.	niantiana ia alaa fiyad at
	 Measurement data acquired by communithat point in time. 	ilications is also lixed at
	· Internal calculations (including integration	on and integration elapsed
	time) will continue.	not hold
Maximum value/	 Analog output and waveform output are Detects maximum and minimum measure 	
minimum value	maximum and minimum values for the v	
hold	waveform peak and holds them on the d	
(MAX/MIN HOLD)	 For data with polarity, display of the max value for the data's absolute values is he 	
	and negative polarity values are shown)	
	Internal calculations (including integrations)	on and integration elapsed
	time) will continue. · Analog output and waveform output are	not held.
Zero Adjustment	Degausses the current input unit DCCT a	
(0 ADJ)	current input offset.	· · · · · · · · · · · · · · · · · · ·
Key-lock (KEY LOCK)	Disables key input in the measurement st key and KEY LOCK key.	ate, except for the SHIFT
Backup	Backs up settings and integration data if	the instrument is turned
	off and if a power outage occurs.	
System Reset	Initializes the instrument's settings. Communicat	
	(communications speed, address, and LAN-rela	ileu sellings) are not initializeu.
Integration Mea	surement Specifications	
Measurement items	Simultaneous integration of the following 6 pa	rameters for each channel
	(total of 18 parameters): Sum of current integrated values (displayed	as Ah on nanol display)
	Positive current integrated value (displayed	
	Negative current integrated value (displayed	l as Ah- on panel display)
	Sum of active power integrated values (display	
	Positive active power integrated value (displaye Negative active power integrated value (displ	
Measurement types	Rectifiers: AC+DC, AC+DC Umn	., on parior diopidy)
	Current:	. DMC
	Displays the result of integrating cu	
	(display values) once every display 200 ms) as an integrated value.	, upuate interval (approx.
	Active power:	
	Displays the result of integrating ac	
	by polarity calculated once every of synchronization source as integrat	
	Rectifier: DC	00 70.000.
	Displays the result of integrating instan	
	sampling both current and active power values (When the active power contain	
	DC component will not be integrated)	
Integration time	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% rag. ±1 agt.)
Effective measuring range	Until PEAK OVER U or PEAK OVER I occ	urs
Display resolution	999999 (6 digits + decimal point)	
Functions	Stopping integration based on integration	
	 Displaying the integration elapsed time (displayable). Additional integration by repeatedly star 	
	 Backing up integrated values and the integration el 	apsed time during power outages
Enternal control	Stopping integration when power return	
External control Measuring range	Stopping/starting integration and resetting integrated Corresponds to the range set for START	
	urement Specifications (built-in f	
Measurement method	 Zero-cross simultaneous calculation me by channel according to the wiring mode 	
metriod	· Uniform thinning between zero-cross ev	
	a digital antialiasing filter	
	 Interpolation calculations (Lagrange integration than the synchronization frequency falls with the synchro	
	Nifer the synchronization frequency falls with a lEC 61000-4-7:2002 compliant	uio 40 i iz io oo Hz ialiye
	» Gaps and overlaps may occur if the measuremer	_
	When the synchronization frequency falls outs No gaps or overlap will occur.	
Synchronization source	» No gaps or overlap will occur	side the 45 Hz to 66 Hz range
Measurement channels	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the b 	side the 45 Hz to 66 Hz range
Measurement channels	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the base Harmonic voltage RMS value Harmonic voltage RMS value	side the 45 Hz to 66 Hz range hasic measurement specifications nic voltage content %
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to a Harmonic voltage RMS value Harmonic voltage phase angle Harmonic voltage phase angle	pasic measurement specifications nic voltage content % nic current RMS value
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic voltage hase angle - Harmonic voltage phase angle - Harmonic voltage phase angle - Harmonic voltage phase angle	side the 45 Hz to 66 Hz range hasic measurement specifications nic voltage content %
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic woltage current phase difference - Total h	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic voltage current phase difference - Total harmonic current distortion - Voltager	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic woltage current phase difference - Total h	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of transpo	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic voltage current phase difference - Total harmonic voltage current distortion - Total harmonic current distortion - Active - Apparent power fundamental waveform - Reactive - Power factor fundamental waveform - Voltage current phase difference fundamental voltage current phase difference fundamental waveform - Pacative - Apparent power fundamental waveform - Active - Acti	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion to fundamental waveform power fundamental waveform power fundamental waveform power fundamental waveform power fundamental waveform tental waveform tental waveform
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Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transcription of transcription of the transcription of trans	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform ental waveform whase difference thase difference
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic voltage current phase difference - Total harmonic ourrent distortion - Voltage - Current fundamental waveform - Apparent power fundamental waveform - Voltage current phase difference fundam - Interchannel voltage fundamental wave p - Interchannel current fundamental wave p - Interchannel voltage fundamental wave p - Interchannel voltage fundamental wave p - Interchannel voltage fundamental wave p - Interchannel current fundamental wave p - Interchannel voltage fundamental wave p	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform the power fundame
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of transpo	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform shase difference thase difference ded as data during PC onic current phase angle
Measurement channels Measurement items	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic outlage current phase difference Harmonic outlage current distortion Total harmonic current distortion Voltage Current fundamental waveform Apparent power fundamental waveform Voltage current phase difference fundam Interchannel voltage fundamental wave p Interchannel current fundamental wave p The following parameters can be downloacommunication but not displayed: Harmonic voltage phase angle Harmonic voltage phase angle Harmonic voltage current phase difference Harmonic voltage current phase difference	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform shase difference thase difference ded as data during PC onic current phase angle
Measurement channels Measurement items	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic voltage current phase difference Harmonic outlage current distortion Current fundamental waveform Apparent power fundamental waveform Voltage current phase difference fundamental varies Interchannel voltage fundamental wave promer factor fundamental wave promer factor fundamental wave promer factor fundamental wave promer search annel voltage fundamental wave promer fundamenta	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform shase difference thase difference ded as data during PC onic current phase angle
Measurement channels Measurement items	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic outlage current phase difference Harmonic outlage current distortion Total harmonic current distortion Active Apparent power fundamental waveform Active Apparent power fundamental waveform Voltage current phase difference fundam Interchannel voltage fundamental wave p The following parameters can be downloacommunication but not displayed: Harmonic voltage phase angle Harmonic voltage current phase differen 32 bits 4096 Rectangular	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform that waveform of the power fundamental waveform of the power fundamental waveform that waveform that waveform the power fundamental waveform the power fundamental
Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic voltage phase angle Harmonic active power Harmonic active power Harmonic voltage difference Total harmonic current distortion Current fundamental waveform Active Apparent power fundamental waveform Voltage current phase difference fundamental wave promer factor fundamental wave promer fundamental wave	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion a fundamental waveform power fundamental waveform power fundamental waveform shase difference ded as data during PC onic current phase angle ce
Measurement channels Measurement items FFT processing word length Number of FFT points Window function	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of transport o	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform the power fun
Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic current content % Harmonic active power Harmonic voltage current phase difference Total harmonic voltage current distortion Current fundamental waveform Apparent power fundamental waveform Power factor fundamental waveform Voltage current phase difference fundam Interchannel voltage fundamental wave p Interchannel current fundamental wave p The following parameters can be downloacommunication but not displayed: Harmonic voltage phase angle Harmonic voltage current phase difference 12 bits 12 bits 13 bits 14 c ≤ 6 < 6 Hz: 178.57 ms to 222.22 m Frequencies other than the above: 185.92 m	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform the power fun
Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width Data update rate	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of transport o	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform the power fun
Measurement channels Measurement items FFT processing word length Number of FFT points Window function Analysis window width	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmo - Harmonic voltage phase angle - Harmo - Harmonic current content % - Harmonic active power - Total harmonic outrent phase difference - Total harmonic ourrent distortion - Voltage - Total harmonic current distortion - Active - Apparent power fundamental waveform - Active - Power factor fundamental waveform - Reactive - Power factor fundamental waveform - Harmonic voltage current phase difference fundamental wave power factor fundamental wave power factor fundamental waveform - Harmonic voltage fundamental wave power factor fundamental waveform - Harmonic voltage current phase difference fundamental wave power factor fundame	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform the power fun
FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value - Harmonic harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic active power - Harmonic current distortion - Harmonic current distortion - Voltage current distortion - Active - Apparent power fundamental waveform - Apparent power fundamental waveform - Voltage current phase difference fundam - Interchannel voltage fundamental wave p - Interchannel current fundamental wave p - Interchannel current fundamental wave p - Interchannel current fundamental wave p - Interchannel voltage fundamental wave p - Interchannel voltage fundamental wave p - Interchannel current fundamental wave p - Interchannel voltage fundamental voltage fundamental wave p - Interchannel voltage fundamental wave p - Interchannel voltage fundamental voltage fundamental voltage fundamental voltage fundamental voltage fundamental voltage fundamental voltage funda	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform et al. waveform power fundamental waveform de power fundamental waveform subase difference dided as data during PC decinic current phase angle ce
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FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current content % Harmonic current content % Harmonic outree power Harmonic outree power Harmonic voltage current phase difference Total harmonic current distortion Voltage Current fundamental waveform Apparent power fundamental waveform Power factor fundamental waveform Voltage current phase difference fundam Interchannel voltage fundamental wave p Interchannel current fundamental wave p The following parameters can be downloæ communication but not displayed: Harmonic voltage phase angle Harmonic voltage base angle Harmonic volt	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform et al. waveform power fundamental waveform de power fundamental waveform subase difference dided as data during PC decinic current phase angle ce
FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 - Harmonic voltage RMS value Harmonic voltage phase angle Harmonic voltage phase angle Harmonic voltage phase angle Harmonic voltage current content % - Harmonic voltage current ghase difference Total harmonic voltage current stortion Voltage. - Total harmonic current distortion Voltage. - Current fundamental waveform Apparent power fundamental waveform - Voltage current phase difference fundam Interchannel voltage fundamental wave promount of the properties of the propert	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform to e power fundamental waveform to e power fundamental waveform to enter the power fundamental waveform to enter the power fundamental waveform to the power fundamental waveform t
FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the total conforms to synchronization frequency (SYNC) for the total conforms to synchronization sou	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform base difference did a data during PC on the current phase angle ce decense of the current phase angle ce decense difference did a data during PC on the current phase angle ce decense
FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the the synchronization of the synchronization of the synchronization of the synchronization frequency (f) range yellow synchronization synchro	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform the power fundamental waveform power fundamental waveform the power fundamental
FFT processing word length Number of FFT points Window function Analysis window width Data update rate Synchronization frequency range Maximum	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the total conforms to synchronization frequency (SYNC) for the total conforms to synchronization sou	side the 45 Hz to 66 Hz range basic measurement specifications nic voltage content % nic current RMS value nic current phase angle nic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform base difference did a data during PC on the current phase angle ce decense of the current phase angle ce decense difference did a data during PC on the current phase angle ce decense



	_					
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	A) x (voltage read value) to active power.				
Display Specific	Display Specifications					
Dieplay	7 cogmont LED					

Display	7-segment LED
Number of display parameters	4
Display resolution Other than integrated values: 99999 count	
	Integrated values: 999999 count
Display update rate	200 ms to 20 s (varies with number of averaging iterations setting)

Synchronized C	ontrol
Functions	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.
Terminal	BNC terminal × 1 (non-isolated)
Terminal name	EXT SYNC
I/O settings	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).
Number of units for which	1 master unit and 7 slave units (total 8 units)
synchronized control can	,,
be performed	

External Current Sensor Input Specifications (built-in feature)

External Carrent	ochool input opcon	ioationo (bant in ioc	aturo)
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		
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	3-05, CT6844-05, CT684	15-05, CT6846-05, etc.
Current		A (range noted on pane	
measurement		ch wiring mode. Can b	e read directly by
range	manually setting the C		
Power range		ination of voltage and o	
configuration	60.000W to 15.000MV	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

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.

Temperature 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

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

Current, active power:

±0.08% f.s./°C (instrument 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.

•(External current sensor input instrument accuracy) + (±2.0% f.s.)

(f.s.current peak range) Power factor effects Current peak value measurement accuracy Harmonic measurement

accuracy

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 crest 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). Hi-P1 to Hi-P3 and Hi-Psum (high-speed active power level): Fixed to AC+DC For other level output, select AC+DC, AC+DC Umn, 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
Mariana autoria altare	: 1 V f.s. relative to 100% of range
Maximum output voltage Output update rate	Approx. ±12 V DC Level output
Output update rate	: 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
	: 1 cycle
Temperature characteristic	±0.05% f.s./°C or less
Output resistance	100 Ω ±5 Ω

External control (built-in feature)

_xtorrial oorition	terrial centrel (ballt in reatare)							
Functions	Integration st	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	01711170101					
	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 x 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)

ordinara, opedin	saliene (predict gaaranteed ier e year)
Operating environment	Indoors, altitude up to 2000 m (6562-ft.), pollution degree 2
Operating temperature	0 to 40°C (32 to 104°F), 80% RH or less (non-condensating)
and humidity	
	-10 to 50°C (14 to 122°F) 80% RH or 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
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
Applicable Standards	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 x 1, Measurement guide x 1, Power cord x 1

waas 5 PW3335 Specifications

ı	Input	Sn	ecifi	icat	ion	19

par opcomoan	mpar opermeaners					
Measurement line type	Single-phase 2-wire(1P2W) Voltage Isolated input, resistive voltage divider method					
Input methods						
	Current Isolated input,	shunt input method				
Voltage measurement	AUTO/ 6 .0000 V/ 15.000 V/	30.000 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 m.					
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	From 6.0000 mW to 20.000 kW (also applies to VA, var)				
	The details are as below.					
Input resistance	Voltage input terminal: 2	ΜΩ				
	Current input terminal: 1	mA to 100 mA range 520 mΩ or less				
	2	00 mA to 20 A range 15 mΩ or less				

Rasic	Measuren	ent Sne	cifications

	Ü	From 6.0000 mW to 20.000 kW (also applies to VA, var)					
Loc		The details are as below. Voltage input terminal: 2 MΩ					
In	put resistance	$ \begin{array}{lll} \mbox{Voltage input terminal:} & 2 \mbox{ M} \\ \mbox{Current input terminal:} & 1 \mbox{ mA to } 100 \mbox{ mA range } 520 \mbox{ m} \Omega \mbox{ or les} \\ \mbox{200 mA to } 20 \mbox{ A range } 15 \mbox{ m} \Omega \mbox{ or les} \\ \end{array} $					
В	asic Measuren	nent Specification	s				
	easurement	Simultaneous voltage		digital sam	pling, zero-cross		
m	ethod	simultaneous calculati		. 3			
	ampling frequency	Approx. 700 kHz					
	D converter resolution						
		DC, 0.1 Hz to 100 kHz (Va U, I, DC (fixed to 200 r		1Hz ≤ t < 10 F	tz are for reference only)		
	easurement items	Voltage	Current		Active power		
		Apparent power Reactive power Power factor Phase angle Frequency Active power integration Voltage waveform peak value Voltage crest factor Maximum current ratio Time average active power Voltage ripple rate Harmonic parameters Harmonic voltage RMS value Harmonic active power Total harmonic current distortion Fundamental wave apparent power Fundamental wave power factor (Displacement power factor) Fundamental wave power factor (Displacement power factor) Harmonic current content percentage Harmonic active power content percentage					
		(The following parameters Harmonic voltage pl Harmonic current ph Harmonic voltage cu	nase angle nase angle				
Rectifiers		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 simple averages for both voltage and current Display of values calculated by (voltage DC value) × (current DC value) for active power AC: AC measurement Display of values calculated by (AC+DC value)² (DC value)² for both voltage and current Display of values calculated by (AC+DC value) - (DC value) for active power FND: Extraction and display of the fundamental wave component from harmonic measurement					
7,	ero-cross Filter						
		100 Hz: 0.1 Hz to 100 Hz 500 Hz: 0.1 Hz to 500 Hz 5 kHz: 0.1 Hz to 5 kHz 100 kHz: 0.1 Hz to 100 kHz					
M	easurement accuracy						
V	oltage						
	Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Inp		100%f.s. ≤ Input		
	DC	±0.1rdg.±0.1%f.s.		.±0.1%f.s.	±0.2%rdg.		
	0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.39		±0.3%rdg.		
	16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.		%rdg.	±0.2%rdg.		
	45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.	±0.15		±0.15%rdg.		
	66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.1%f.s.</td><td></td><td>%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.		%rdg.	±0.2%rdg.		
Į	500Hz <f≤10khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td></td><td>%rdg.</td><td>±0.3%rdg.</td></f≤10khz<>	±0.1%rdg.±0.2%f.s.		%rdg.	±0.3%rdg.		
Į	10kHz <f≤50khz< td=""><td>±0.5%rdg.±0.3%f.s.</td><td></td><td>%rdg.</td><td>±0.8%rdg.</td></f≤50khz<>	±0.5%rdg.±0.3%f.s.		%rdg.	±0.8%rdg.		
	50kHz <f≤100khz< td=""><td>±2.1%rdg.±0.3%f.s.</td><td>±2.49</td><td>%rdg.</td><td>±2.4%rdg.</td></f≤100khz<>	±2.1%rdg.±0.3%f.s.	±2.49	%rdg.	±2.4%rdg.		
-	Current						
ì	Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Inp	ut < 100%f s	100%f.s. ≤ Input		
	DC	±0.1%rdg.±0.1%f.s.	±0.1%rdg		±0.2%rdg.		
	0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.1761dg		±0.2%rdg.		
	16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.	±0.29		±0.2%rdg.		
	45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.		%rdg.	±0.15%rdg.		
	66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.1%f.s.</td><td>±0.13</td><td></td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.	±0.13		±0.2%rdg.		
	500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.2</td><td></td><td>±0.2%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s.	±0.2		±0.2%rdg.		
	1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg. ±0.2%f.s.</td><td>±(0.23+0.0</td><td></td><td>±(0.23+0.07×F)%rdg.</td></f≤10khz<>	±(0.03+0.07×F)%rdg. ±0.2%f.s.	±(0.23+0.0		±(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+0.0</td><td>4×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+0.0	4×F)%rdg.	±(0.6+0.04×F)%rdg.		

_					
Α	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="" ±0.1%rdg.±0.2%f<=""><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤1khz>		±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.			
_		111 (()			

- 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 $\pm (0.02 \times F)\%$ rdg. to the measurement accuracy for current and active power for which (10 kHz $_{\odot}$ f $_{\odot}$ 100 kHz).

 The measurement results for following input are considered reference values: Values for voltage, current, and active power for which 0.1 Hz $_{\odot}$ f $_{\odot}$ 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 Maximum effective 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

guaranteed accuracy

Temperature and humidity range: 23°C±5°C (73°F±9°F), 80% RH or less Warm-up time: 30 minutes 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 #0.00% is. per C or less.

#0.1% is. or less (45 to 66 Hz, at power factor = 0)

Internal circuitry voltage/current phase difference: ±0.0573°

±0.01% is. 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) With input of at least 15 A to current input terminals

Effect of selfheating 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)

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

Magazzament tunga Bootificas AC - DC DC AC END AC - DC Imp		
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 that		
	Current	
	Up to ±152% of the range.	
	However, zero-suppression when less than ±0.5% or less than ±9 µA.	
	Active Power	
	±0% to ±231.04% of the range (no zero-suppression)	
Polarity	Voltage/ Current	
1 Oldinty	Displayed when using DC rectifier	
	Displayed which doing Do rootillel	
Active Power		
	Positive : Power consumption (no polarity display)	
	Negative : generation or regenerated power	
	140gativo : generation of regenerated power	

Voltage Waveform Peak Value/ Current Waveform Peak Value

Measurement Specifications			
Measurement	Measures the voltage waveform's peak value (for both positive and		
method	negative polarity) based on sampled instantaneous voltage		
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	
	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	Provided as reference value when	f ≤ 1 kHz (f.s.: current peak range). 0.1 Hz ≤ f < 10 Hz and when 1 kHz < f. v 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

Measurement	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	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
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	$Q = si\sqrt{S^2 - P^2}$	
λ: Power factor	$\lambda = silP/Sl$	
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	±0.1% rdg. ±1 dgt. However, for	1 mA range, ±0.2% rdg. ±1 dgt.
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.	
Measurement accuracy	(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	

Range select

Hold

	Time Average Active Power ±0% to ±3745.4% of the range (Has polarity)
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.

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. Disabled (do not use):

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 threshold level 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. Averaging 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	FFT processing	FFT processing word length: 32		
minimum value hold (MAX/MIN	current integration, active power integration, integration elapsed 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 does not apply to the voltage waveform peak value or the current		Analysis window width	45 Hz ≤ f < 56 Hz : 178.57 ms to 222.22 ms (10 cycles) 56 Hz ≤ f < 66 Hz : 181.82 ms to 214.29 ms (12 cycles) Frequencies other than the above : 185.92 ms to 214.08 ms		
		Data update rate	Depends on window width.		
	waveform peak value. Internal calculations (including integration and integration	Maximum analysis	Synchronization fraguency (f) r	anga Anglysis order	
	elapsed time) will continue. The maximum and minimum values during integration are detected (maximum/minimum value measurement during the	order	Synchronization frequency (f) r. 10 Hz ≤ f < 45 Hz	50th	
	integration interval). • Analog output and waveform output are not held.		45 Hz ≤ f < 56 Hz 56 Hz ≤ f ≤ 66 Hz	50th 50th	
Zero Adjustment	Zeroes out the voltage and current input offset.		66 Hz < f ≤ 100 Hz	50th	
key-lock	Disables key input in the measurement state, except for the KEY		100 Hz < f ≤ 200 Hz	40th	
Backup	LOCK key. Backs up settings and integration data if the instrument is turned		200 Hz < f ≤ 300 Hz 300 Hz < f ≤ 500 Hz	25th 15th	
	off and if a power outage occurs.		500 Hz < f ≤ 640 Hz	11th	
System Reset	Initializes the instrument's settings.	Analysis order	2nd to 50th		
	surement Specifications	upper limit setting Measurement	f.s.: Measurement range		
ntegration peration modes	Switchable between fixed-range integration and auto-range integration. Fixed-range integration	accuracy	Frequency (f)	Voltage, Current, Active power	
	Integration can be performed for all voltage and current ranges.		DC	±0.4% rdg. ±0.2%f.s.	
	The voltage and current ranges are fixed once integration starts.		10 Hz ≤ f < 30 Hz 30 Hz ≤ f ≤ 400 Hz	±0.4% rdg. ±0.2%f.s.	
	Auto-range integration		400 Hz < f ≤ 1 kHz	±0.3% rdg. ±0.1%f.s. ±0.4% rdg. ±0.2%f.s.	
	Integration can be performed for all voltage ranges. The current is set to auto-range operation using ranges from 200 mA		1 kHz < f ≤ 5 kHz	±1.0% rdg. ±0.5%f.s.	
	to 20 A.		5 kHz < f ≤ 8 kHz	±4.0% rdg. ±1.0%f.s.	
Measurement items	The integrated value for each range can be displayed by switching the current range (200 mA to 20 A) while integration is stopped. Simultaneous integration of the following 6 parameters:			easurement accuracy for current.	
nd display	Positive current integrated value (Ah+) Negative current integrated value (Ah-)		Add (±1 μA) × (voltage read value measurement accuracy for active	ve power.	
	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 ypes	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 rang Add ±10 µA to DC measurement accuracy for current.		
	Active power: Displays the result of integrating active power values by polarity		Add (±10 µA) × (voltage read va for active power.	alue) to DC measurement accurac	
	calculated once every cycle for the selected synchronization source as integrated values.	Display Specific	ations		
		Display	7-segment LED		
Rectifier: DC Displays the result of integrating instantaneous data obtained by sampling both current and active power by polarity as		Number of display parameters Display resolution	4 (display area a, b, c, and d) Other than integrated values: 99		
	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components)	Display update	Integrated values: 999999 coun 200 ms ±50 ms (approx. 5 upda		
ntegration time	1 min. to 10000 hr., settable in 1 min. blocks	rate	number of averaging iterations s	etting)	
ntegration time accuracy	±0.01% rdg. ±1 dgt.	Synchronized co	ontrol		
ntegration	(Current or active power measurement accuracy) + (±0.01% rdg.	Functions	·	updates; data updates; integration	
neasurement accuracy Effective measuring range Display resolution	±1 dgt.) 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 PW33 is synchronized with the master PW3335 series. Synchronize 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		BNC terminal × 1 (non-isolated)		
	based on external control	Terminal Terminal name	External synchronization terminal (EXT.SYNC)		
Displaying the integration elapsed time (displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration. Backing up integrated values and the integration elapsed time.				I (EXT.SYNC)	
	(displayed as TIME on panel display) • Additional integration by repeatedly starting/stopping integration • Backing up integrated values and the integration elapsed time	I/O settings	Off Synchronized control function o synchronization terminal (EXT.S	ff (signals input to the external	
Harmonic Meas	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns	I/O settings	Synchronized control function o synchronization terminal (EXT.S	iff (signals input to the external YNC) are ignored)	
	(displayed as TIME on panel display) • Additional integration by repeatedly 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 In The external synchronization ter	iff (signals input to the external YNC) are ignored)	
Measurement	(displayed as TIME on panel display) • Additional integration by repeatedly starting/stopping integration • Backing up integrated values and the integration elapsed time during power outages • Stopping integration when power returns urement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation)	I/O settings	Synchronized control function o synchronization terminal (EXT.S In The external synchronization ter and a dedicated synchronizatio	if (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, n signal can be input (slave). ninal (EXT.SYNC) is set to output,	
Measurement	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns wrement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal synchronization terminal synchronization	off (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, in signal can be input (slave). rninal (EXT.SYNC) is set to output, signal can be output (master).	
Measurement	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns Wrement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range:	Number of units for which synchronized control can be performed	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal addicated synchronization terminal addicated synchronization terminal addicated synchronization up to 7 slaves per master (total of 8 units including the PWS)	off (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, in signal can be input (slave). rninal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series)	
Measurement nethod	(displayed as TIME on panel display) • Additional integration by repeatedly starting/stopping integration • Backing up integrated values and the integration elapsed time during power outages • Stopping integration when power returns urement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic	Number of units for which synchronized control can be performed	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal a dedicated synchronization Up to 7 slaves per master (total of 8 units including the PWS) tt Sensor Input Specification	off (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, in signal can be input (slave). rninal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series)	
Measurement nethod	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns wrement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic measurement specifications.	Number of units for which synchronized control can be performed	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal a dedicated synchronization Up to 7 slaves per master (total of 8 units including the PWS) tt Sensor Input Specification	off (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, in signal can be input (slave). rninal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series)	
Measurement nethod	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic measurement specifications. Harmonic voltage RMS value Harmonic current RMS value Harmonic current content percentage Harmonic active power	Number of units for which synchronized control can be performed External Curren (PW3335-03 and	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal a dedicated synchronization Up to 7 slaves per master (total of 8 units including the PWS) tt Sensor Input Specification d PW3335-04)	iff (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, n signal can be input (slave). ninal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series)	
Harmonic Meas Measurement method Synchronization source Measurement items	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic measurement specifications. Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current tontent percentage Harmonic active power Harmonic active power Harmonic voltage distortion Total harmonic current distortion	Number of units for which synchronized control can be performed External Curren (PW3335-03 an Terminal Current sensor type	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal and a dedicated synchronization. The external synchronization and a dedicated synchronization. Up to 7 slaves per master (total of 8 units including the PW3 total of 8 units including the PW3 total of 8 units including the PW3 lesolated BNC terminals. Off / TYPE.1 / TYPE.2 When set to off, input from the experiments of the property of the synchronization of the pw3 total synchronization.	fff (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, n signal can be input (slave). rinal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series) ons eternal current sensor input	
Measurement nethod	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns Wrement Specifications Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic measurement specifications. Harmonic voltage RMS value Harmonic voltage content percentage Harmonic current content percentage Harmonic active power Harmonic active power content percentage Harmonic voltage current phase difference	Number of units for which synchronized control can be performed External Curren (PW3335-03 an Terminal Current sensor type switching Current sensor	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal a dedicated synchronization Up to 7 slaves per master (total of 8 units including the PW3 tt Sensor Input Specification d PW3335-04) Isolated BNC terminals Off / TYPE.1 / TYPE.2 When set to off, input from the exterminal is ignored. TYPE1 (100 A to 5000 A sensors 9660, 9661, 9669, CT9667-0: TYPE2 (20 A to 1000 A sensors, CT6862-05, CT6863-05, CT6	fff (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, n signal can be input (slave). rinal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series) ons eternal current sensor input	
Measurement nethod	(displayed as TIME on panel display) Additional integration by repeatedly starting/stopping integration Backing up integrated values and the integration elapsed time during power outages Stopping integration when power returns Zero-cross simultaneous calculation method Uniform thinning between zero-cross events after processing with a digital antialiasing filter Interpolation calculations (Lagrange interpolation) 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. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlap will occur. Conforms to synchronization source (SYNC) for the basic measurement specifications. Harmonic voltage RMS value Harmonic voltage phase angle Harmonic current tontent percentage Harmonic active power Harmonic active power content percentage Harmonic voltage current phase difference Total harmonic voltage distortion Total harmonic current distortion Fundamental wave voltage Fundamental wave active power Fundamental wave apparent power Fundamental wave power Fundamental wave power factor	Number of units for which synchronized control can be performed External Curren (PW3335-03 an Terminal Current sensor type switching Current sensor	Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal a dedicated synchronization Up to 7 slaves per master (total of 8 units including the PW3 It Sensor Input Specification Off / TYPE.1 / TYPE.2 When set to off, input from the exterminal is ignored. TYPE1 (100 A to 5000 A sensors 9660, 9661, 9669, CT9667-0 TYPE2 (20 A to 1000 A sensors, CT6862-05, CT6863-05, CT68641-05, CT6841-05, CT6843-05, CT6865.	ff (signals input to the external YNC) are ignored) rminal (EXT.SYNC) is set to input, n signal can be input (slave). rinal (EXT.SYNC) is set to output, signal can be output (master). 3336/PW3337 series) ons eternal current sensor input 1/-02/-03 Power supply is required to use) 875, CT6876, CT6877, 9272-05, 44-05, CT6845-05, CT6846-05, et on panel)	



PW333			
Power range		nbination of voltage and	
configuration	from 24.000 W to 5.0	0000 MW (also applies	to VA, var)
Measurement			
accuracy			
Current/ Active Po	ower		
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 ±(0.3+0.04×f)%rdg.<br="">±0.3%f.s.</f≤100khz>		±(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	$\pm 2.0\%$ at DC or 10 Hz \leq f \leq 1 kHz (f.s.: current peak range) Add the current sensor accuracy to the above.			
Harmonic	External current sensor input instru	ument 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 meas To obtain the current or active psensor's accuracy to the above accuracy figures. When using the CT684x-05 seriseries accuracy after performinadjustment using the 1 A range	ower accuracy, add the current current and active power ies, add ±2 mV to the CT684x-05 g CT684x-05 series zero		

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

(1 W3333-02 and 1 W3333-04)			
Number of output channels	7 channels		
Configuration	16-bit D/A converter (polarity + 15 bits)		
Output voltage			
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 rate	Level output 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

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)

ı	Connector	D-sub 9-pin connector x 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 Specific	cations		
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 Power cord ×1		

Voltage and current input terminal safety cover ×2

3334 Specifications

Measu	rable lines	Single-phase, 2-wire (AC/DC)					
Measu	rement eters	Voltage, current, active power, apparent power, power factor, frequency, integrated current and active power, waveform peak (voltage and current)					
Measure	ement method	Simultaneo	us digital s	ampling of	voltage and	current, Tru	ue RMS
Samplin	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
For any and the second of alab							

Frequency bandwidth DC, 45Hz to 5kHz

Measurement accuracy

Warm-up time	3 minutes				
Period of guaranteed accuracy	3 years (bet	3 years (better accuracy specifications available for 1-year period)			
Post-adjustment accuracy guarantee	1 year (accu	1 year (accuracy specifications available for 1-year period)			
	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)		

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.
43 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.
00 HZ < 1 \ 1 KHZ	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

	- reprint a production		
Display indication 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			
Integration measurement	No.of displayed digits: Current Integration:	Six digits From 0.00000mAh, Polarity-independent integration and Sum value	
	Active power Integration:	From 0.00000mWh, Polarity-independent integration and Sum value	
	Integration time: Measurement accuracy:	1 min to 10000 h Measurement accuracy of active power ±1dgt.	
Wave peak measurement	current (up to 300% of	tive and negative waveform of voltage/ full scale range) /: ±1.2%f.s. ("f.s." is 300% of each range)	
Rectification method	Switchable between AC+DC(T	rue RMS), DC(simple average display) and AC(True RMS)	
Analog output (D/A output)	D/A select an item from Apparent power, power Voltage output: ±2 V	ctive power (3 simultaneous channels) n Current integration, Active power integration, r factor	
Waveform output	Parameter output repre Voltage, Current and Voltage output: 1 VE	sentation: Active power (3 simultaneous channels)	
Average function	Simple averaging of specif	ed number of samples: 1, 2, 5, 10, 25, 50 or 100	
VT or CT ratio		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	GP-IB interface (Model	nunication method: rate: 9600 bps (fixed)	
Miscellaneous		n 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

Measu	rable lines	Single-pha	se, 2-wire (.	AC)			
Measure	ment parameters	Voltage, Cu	urrent, Activ	e power, Ap	parent pov	ver, Power f	actor
Measure	ement method	Simultaneo	us digital s	ampling of v	oltage and	current, Tru	ie RMS
Samplin	ng frequency	Approx. 48	kHz		•		
Measur	rement ranges						
	Currnet	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
Frequen	cy bandwidth	45Hz to 5k	Hz				

Measurement accuracy

(Guaranteed at 25°C±5, max. 80°sm, sine wave input, power factor=1; in-priase voltage =0v, accuracy specifications differ depending on usage period of 1 or 5°	
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 Coemicient		Maximum ±0.03%i.s./-C
		0 1 10 1

Temperature coefficient Maximum ±0.03 %1.8.7 C			
Frequency	Guaranteed Period	Voltage, current and active power	
45 Hz < f < 66 Hz	1 year	±0.1 %rdg. ±0.1 %f.s.	
43 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.	
	3 years	±0.1 %rdg. ±0.35 %f.s.	
1 kHz < f < 5 kHz *	1 year	±3.0 %f.s.	
1 KHZ < 1 ≤ 3 KHZ	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 range])

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)

0 410 4141011 10111	10100 (6666 d 6661)
Measurement	Formula
Parameters	
Apparent Power (S)	$S = U \times I$
Power Factor (λ)	$\lambda = IP/SI$
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	~	~	~	~	×	~	~
	PW3337-02	3	AC/ DC	~	~	•	×	~	~	~
	PW3337-03	3	AC/ DC	~	~	•	~	~	~	~
	PW3336	2	AC/ DC	~	~	~	×	×	~	~
POWER METER PW3336	PW3336-01	2	AC/ DC	~	~	~	•	×	~	~
	PW3336-02	2	AC/ DC	~	~	v	×	~	~	~
	PW3336-03	2	AC/ DC	V	~	~	~	~	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
POWER METER PW3335	PW3335	1	AC/ DC	~	/	~	×	×	×	~
	PW3335-01	1	AC/ DC	V	~	×	~	×	×	~
	PW3335-02	1	AC/ DC	~	~	~	×	~	×	~
	PW3335-03	1	AC/ DC	~	~	~	×	×	~	~
	PW3335-04	1	AC/ DC	~	~	~	~	~	~	~
AC/ DC POWER HITESTER 3334	3334	1	AC/ DC	×	×	~	×	~	×	×
	3334-01	1	AC/ DC	×	×	~	~	~	×	×
POWER HITESTER 3333	3333	1	AC	×	×	~	×	V	×	×
1000 1000 1000 1000 1000 1000 1000 100	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)



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



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



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

 $Note: Company\ names\ and\ product\ names\ appearing\ in\ this\ brochure\ are\ trademarks\ or\ registered\ trademarks\ of\ various\ companies$



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