

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







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.

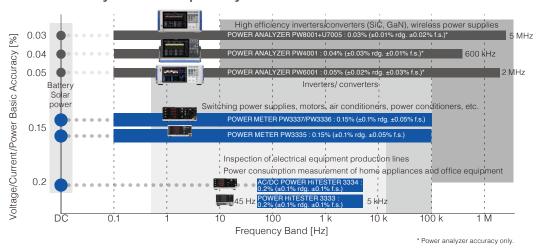
Compliant with the IEC62301 measurement standard for standby power, it is capable of measuring current as low as 10 µA.







Basic Accuracy and Frequency Bands



Effective Measurement Range



Comparison Chart

прапзоі	Onan				Discontinued	Discontinued	
		PW3337	PW3336	PW3335	3334	3333	
No. of channels	3	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 measurange, current	Effective measurement		2 mA to 65 A		1 mA to 30 A	5 mA to 30 A	
Frequency band		DC, 0.1 Hz to 100 kHz			DC, 45 Hz to 5 kHz	45 Hz to 5 kHz	
Basic accuracy (Voltage, currer	,	±0.1% rdg. ±0.05% f.s.			±0.1% rdg. ±0.1% f.s.	±0.1% rdg. ±0.2% f.s.	
Basic accuracy (Voltage, currer	,	±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		
пцепасе	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.





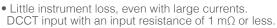
PW3337-03 Front Panel

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 D/A output terminal
- Current input terminal
- LAN connector
- RS-232C connector

External control 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 Discontinued

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

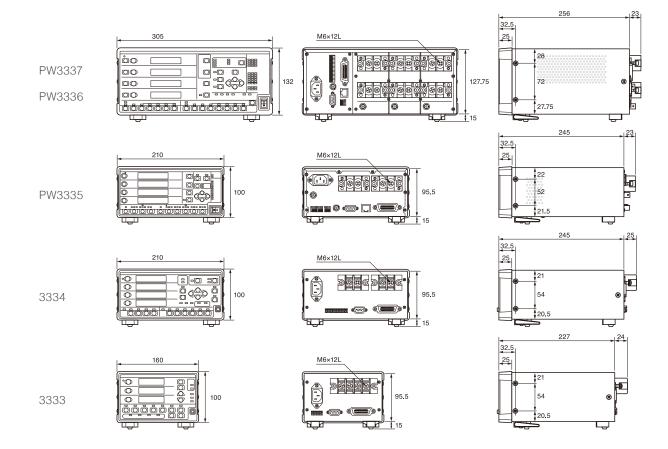




- Compact model for saving space, even when added to a system
- Accuracy guaranteed up to 3 years

Dimensional Drawings

Units: mm



Applications

Inspection of Electrical Equipment Production Lines



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

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





Basic accuracy, AC

±0.1%

Extensive Interfaces



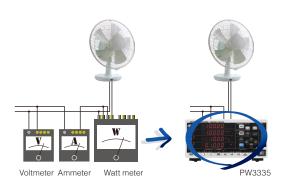
The built-in interfaces are convenient for transferring data to a PC and equipping the unit on automated machines. PC communication software can be downloaded free of charge from the HIOKI website. For details about the built-in interfaces, refer to the specifications for each model.



Replacement for Analog Meters



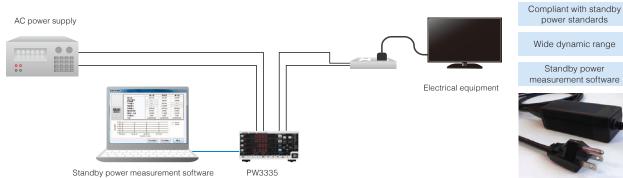
These models can be used as replacements for analog voltmeters, ammeters, and watt meters. Up to 4 parameters such as voltage, current, and power can be displayed at the same time, allowing 3 measuring devices to be covered with a single unit. The digital display avoids issues such as parallax due to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



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

Standby Power Measurement





power standards Wide dynamic range

Standby power

Key features

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

Compliant with IEC62301 and EN50564 Standards

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

Requirements for Measurement Instruments for Standby Power Measurements (excerpt)

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

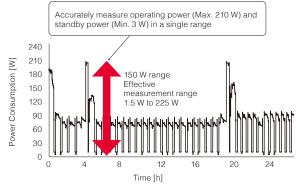
THD (Total Harmonic Distortion): Indicates to what extent harmonic components are present in an AC waveform

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

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

Wide Range of Effective Measurement

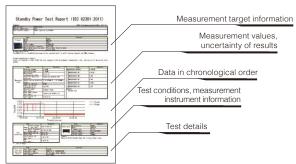
The PW3335 has an effective measurement range of 1% to 150%. Due to this wide range of effective measurement, even equipment with large load fluctuations, such as refrigerators, heaters, and pumps, can be measured accurately under all conditions from noload to full operation.



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.

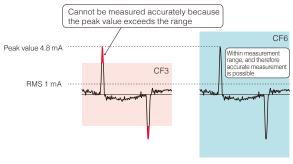


Example of Report Output

Support for CF6 (Crest Factor 6)

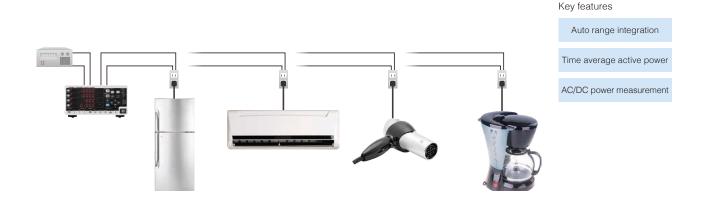
When an AC adapter or switching power supply operates with no load, the crest factor of the current waveform increases. The PW3335 can measure waveforms that exceed the range of watt meters that support crest factor 3.

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)

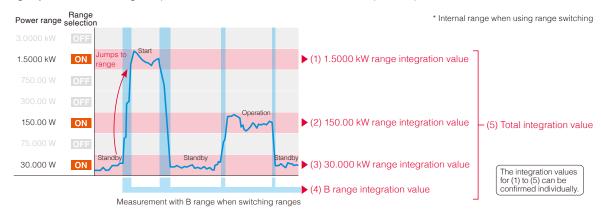
Measurement of Fluctuating Loads and Power Supply Control



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.

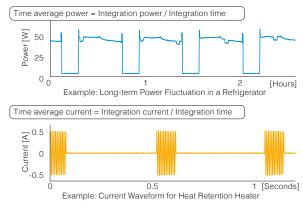


Intermittent Power Supply



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.

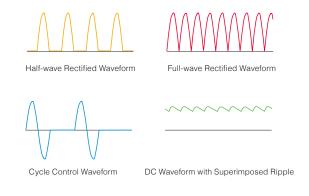


AC/DC Measurement



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

Air conditioner

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.



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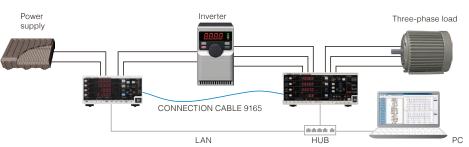
DCCT current sensor (in the PW3337)

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

Inverter Efficiency Measurement

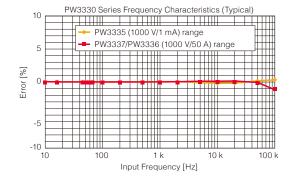


PW333 7 PW333 6 PW333



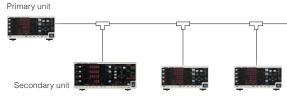
Wide Frequency Band (DC, 0.1 Hz to 100 kHz)

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

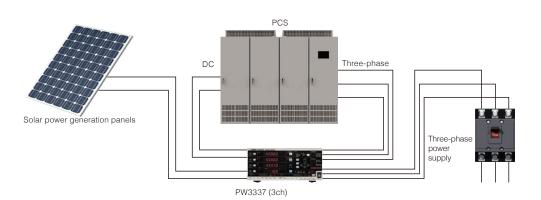
Connect 8 units for synchronous measurement of up to 24 channels. The calculation and control timing for PW3337, PW3336, and PW3335 units that are set as secondaries are synchronized with the primary unit. Use this feature to measure the I/O efficiency of power supply devices, compare multiple pieces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



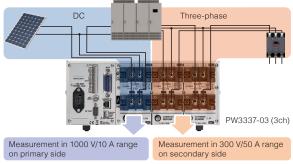


Key features Independent range per channel Extensive calculation functions Harmonic measurement

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.

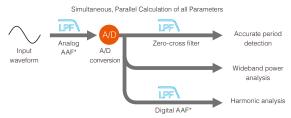


Setting Optimal Range According to Target to be Measured

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.

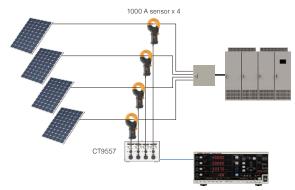
1000 V Range for Evaluation of Large Power Conditioners

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.



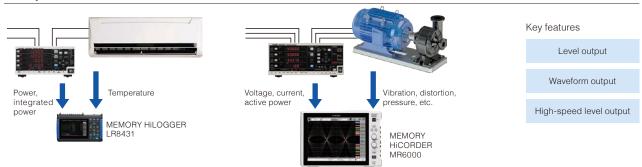
Aggregation of Output from DC Current Sensors (Up to 4000 A)

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

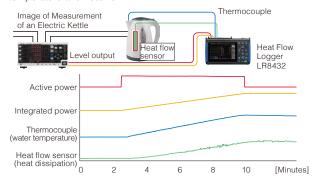


				Discontinued	Discontinued
	PW3337-02 PW3337-03	PW3336-02 PW3336-03	PW3335-02 PW3335-04	3334 3334-01	3333 3333-01
Level output (Analog output)	Yes		Yes	Yes	Yes
Waveform output	Yes		Yes	Yes	-
High-speed level output	Active power only		Voltage, current, active power	-	-

Display Trends with a Data Logger



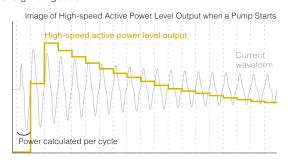
The level output (analog output) function delivers measured values that are displayed on the power meter with an analog voltage that is updated every 200 ms. Connect the unit to a data logger to check trends through synchronization with data such as temperature and heat flow*.



^{*} 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 PW333

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



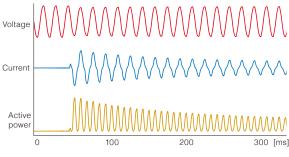
^{*} With the PW3335, high-speed level output is also possible for 45 Hz to 66 Hz

Observe Waveforms with a Memory Hicorder



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



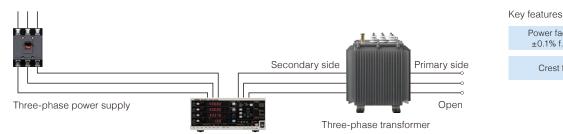


No-load Loss Measurements for Transformers



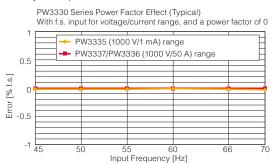
Power factor effect ±0.1% f.s. or less

Crest factor 6



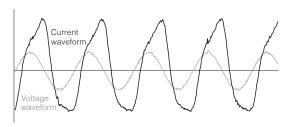
Power Factor Effect of 0.1% or Less, Even at Low Power Factors

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



Support for Crest Factor 6

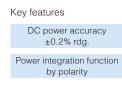
The crest factor of a current waveform increases during no-load operation. The PW3337, PW3336, and PW3335 support a crest factor 6. Therefore, even if the waveform peak value is large relative to the range, accurate measurements are possible without exceeding the range.



Example of Transformer Current Waveform during No-load Operation

DC Power Measurement for Batteries and Power Supplies





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.



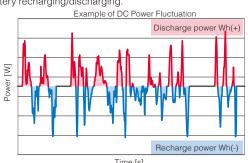


±0_1%

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.



Time [s

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

Options

TYPE 1 Current Sensor (General Current Measurements)

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

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 φ 15 mm (0.59 in) ±0.3% rdg. ±0.02% f.s. Within ±1°		±0.3% rdg. ±0.02% f.s. Within ±1°					
Clamp method	31	CLAMP ON SENSOR 9661		40 Hz to 5 kHz	φ 46 mm (1.81 in)	±0.3% rdg. ±0.01% f.s. Within ±0.5°		Not used
	S	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)	
	80	FLEXIBLE CLAMP ON SENSOR CT9667-01			ф 100 mm (3.94 in)		(9.04 11)	AA (LR6) Alkaline Batteries x
	80	FLEXIBLE CLAMP ON SENSOR CT9667-02	500 A/ 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
		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	
Q	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)

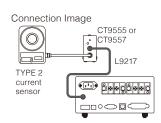
Connect this unit to the current sensor input terminal (BNC) on the PW3337/PW3336/PW3335. SENSOR UNIT CT9555 or CT9557 and CONNECTION CABLE L9217 are required.

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7		
DW222	DW222	DW222
F W 333	F W 333	F W 333

Wiring method	External appearance	Product name/ model no.	Cord lengths	Rated current	Frequency band	Diameter of measurable conductors	Basic accuracy (amplitude)	Power supply
		CT6862-05	3 m (9.84 ft)		DC to 1 MHz	φ 24 mm (0.94 in)	±0.05% rdg. ±0.01 % f.s.	
-		CT6872	3 m (9.84 ft)	50 A	DC to 10 MHz	ф 24 mm (0.94 in)	±0.03% rdg. ±0.007 %f.s.	
		CT6872-01	10 m (32.81 ft)		DC to 10 MHz	φ 24 mm (0.94 m)	±0.03% rag. ±0.007 %i.s.	
		CT6863-05	3 m (9.84 ft)		DC to 500 kHz	φ 24 mm (0.94 in)	±0.05% rdg. ±0.01 %f.s.	
-		CT6873	3 m (9.84 ft)	200 A	DC to 10 MHz	ф 24 mm (0.94 in)	.0.03% rda .0.007 %f o	
Through		CT6873-01	10 m (32.81 ft)		DC to 10 MHz	φ 24 mm (0.94 m)	±0.03% rdg. ±0.007 %f.s.	
method		CT6875A	3 m (9.84 ft)	500 A	DC to 2 MHz	- ф 36 mm (1.42 in)	±0.04% rdg. ±0.008 %f.s.	CT9555 or CT9557
		CT6875A-1	10 m (32.81 ft)	300 A	DC to 1.5 MHz			
		CT6876A	3 m (9.84 ft)	1000 A	DC to 1.5 MHz	ф 36 mm (1.42 in)		
_		CT6876A-1	10 m (32.81 ft)	1000 A	DC to 1.2 MHz			
		CT6877A	3 m (9.84 ft)	- 2000 A	DC to 1 MHz	DC to 1 MHz φ 80 mm (3.15 in)		
		CT6877A-1	10 m (32.81 ft)		DO TO TIWITIZ			
	1	CT6841A	3 m (9.84 ft)	20 A	DC to 2 MHz	ф 20 mm (0.79 in)		
	1	CT6843A	3 m (9.84 ft)	200 A	DC to 700 kHz	ф 20 mm (0.79 in)		
Clamp	•	CT6844A	3 m (9.84 ft)	500 A	DC to 500 kHz	ф 20 mm (0.79 in)	±0.2% rdg. ±0.01% f.s.	
method	% \	CT6845A	3 m (9.84 ft)	500 A	DC to 200 kHz	φ 50 mm (1.97 in)		
	% \	CT6846A	3 m (9.84 ft)	1000 A	DC to 100 kHz	φ 50 mm (1.97 in)		
	8	9272-05	3 m (9.84 ft)	20 A/ 200 A	1 Hz to 100 kHz	φ 46 mm (1.81 in)	±0.3% rdg. ±0.01% f.s.	

Options for Current Sensor TYPE 2

External appearance	Product name/ model no.	Max. no. of sensors	Functions	Power supply	Cord lengths
170	SENSOR UNIT CT9555	1	For supplying power to the TYPE 2 current sensor	100 V to 240 V AC	-
2000	SENSOR UNIT CT9557	4	For supplying power to the TYPE 2 current sensor With addition output function	100 V to 240 V AC	-
//	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).

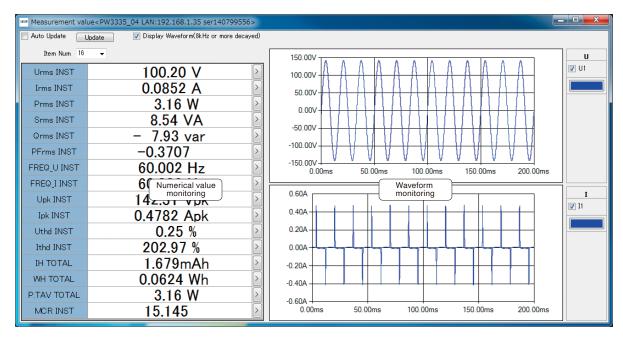
Please contact your Hioki distributor or subsidiary for more information.

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.



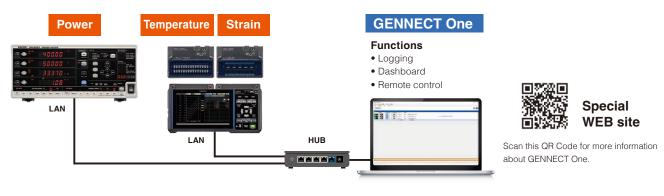




GENNECT One SF4000



Simultaneous measurements in combination with different measuring instruments (e.g., Memory HiLOGGER LR8450 and Power Meter PW3337) are possible. A single PC can be connected to up to 30 measuring instruments via Ethernet, enabling real-time batch display and recording of measurement data, as well as centralized data management.



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.)

Standby Power Measurement Software



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

Workflow for Standby Power Test

1. Connect to power meter

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



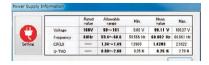
2. Configure the test target

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



3. Configure the test power supply

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



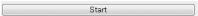
4. Configure the test conditions

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



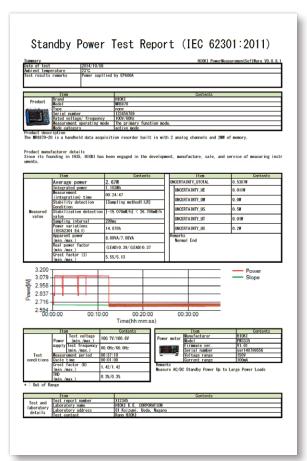
5. Run test

The consumed power is measured according to the configured settings.



6. Create report

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



Example of report output

Model	PW0005				
Serial Number	ser1 40799556				
Firmware Ver	V0.07				
Start Time	2014	7	28	14	32
Voltage Range	150V				
Current Range	200mA				
Update Rate	200ms				
Algorithm	LR	CA	SP1	SP2	SAE
Stop Factor	Pass[Condition1 (LR)]			
Valid Period	0	180			
Time(Sec)	Test voltage(V)	Test frequency(Hz)	U-THD(%)	Crest Factor U	Crest Factor I
14.8	99.49	60.002	0.26	1.4202	5.6212
15	99.49	60.002	0.27	1.4199	5.6585
15.2	99.49	60.002	0.25	1.4198	5.6696
15.4	99.49	60.002	0.26	1.4198	5.6834
15.6	99.49	60.002	0.26	1.4198	5.6652
15.8	99.49	60.002	0.26	1.4198	5.6668
16	99.49	60.002	0.26	1.4199	5.6484
16.2	99 49	60 002	0.26	1 4198	5.6675

CSV output example

PW3337 and PW3336 Specifications

input Specificati	ons						
Measurement line	PW3336 series						
type		Single-phase 2-wire (1P2W), Single-phase 3-wire (1P3W),					
	Three-phase 3-wire (3P3W, 3P3W2M)						
	Wiring	CH1	CH2				
	1P2W×2	1P2W	1P2W				
	1P3W		3W				
	3P3W		3W				
	3P3W2M] 3P3\	W2M				
	PW3337 series						
	Single-phase 2-wire	e (1P2W), S	Single-phas	se 3-wire (1P3W),		
	Three-phase 3-wire		⊇3W2M, 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\	W2M				
	3V3A		3V3A				
	3P3W3M		3P3W3M				
	3P4W		3P4W				
Input methods	Voltage Isolated input						
	Current Isolated input,						
Voltage measurement					0 V/		
ranges	600.00 V/ 1000.0 V (se						
Current	AUTO/ 200.00 mA/ 50						
measurement	10.000 A/ 20.000 A/ 5						
ranges	For more information about external current sensor input, see the						
_	external current senso						
Power ranges	Depends on the comb						
	PW3336: from 3.00						
Input registance	PW3337: from 3.00		<u>0.00kw (ai</u> 2 MO	so applies	to va, var)		
Input resistance	Voltage input terminal			0			

(50/60 Hz)	Current direct input ter	minal : 1 mΩ or less					
Basic Measuren	nent Specifications	9					
	Simultaneous voltage	and current digital sam	pling, zero-cross				
Sampling frequency	simultaneous calculati Approx. 700 kHz	On					
A/D converter	16-bit resolution DC, 0.1 Hz to 100 kHz						
Frequency bands Synchronization	U1, U2, U3, I1, I2, I3, E						
sources	Can be set separately						
Measurement items		rent Active power factor Phase and					
	Active power integrat Voltage waveform pe						
	Voltage crest factor Time average current	· Current cr t · Time avera	est factor age active power				
	Voltage ripple factor Harmonic parameters						
	Current fundamental Apparent power fundamer Power factor fundamer Voltage current phas Interchannel voltage Interchannel current Harmonic voltage co	rer Total harmon to distortion - Voltage fu waveform - Active powental waveform - Reactive powental waveform (displace difference fundamen fundamental wave pha fundamental wave pha hentent % Harmonic	er fundamental waveform ver fundamental waveform cement power factor) tal waveform se difference				
	Harmonic active power content % The following parameters can be downloaded as data during PC communication but not displayed: Harmonic voltage phase angle						
Rectifiers		rrent phase difference					
Zero Croosing	AC+DC: AC+DC measurement Display of true RMS values for both voltage and current AC+DC Umn: AC+DC measurement Display of average value rectified RMS converted values for voltage and true RMS values for current DC: DC measurement Display of simple averages for both voltage and current Display of values calculated by (voltage DC value)× (current DC value) for active power AC: AC measurement Display of values calculated by for both voltage and current Display of values calculated by √(AC+DC value)² - (DC value)² for active power FND Extraction and display of the fundamental wave component from harmonic measurement						
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	300 112. 0.1112 to 300	112, 200 KHZ. 0.1 112 to	200 KI IZ				
Voltage		Inner I inner	1000/1				
Frequency (f)	Input < 50% f.s.	50%f.s. ≤ Input < 100%f.s.					
DC	±0.1%rdg. ±0.1%f.s.	±0.1%rdg. ±0.1%f.s.	±0.2%rdg.				
$0.1Hz \le f < 16Hz$ $16Hz \le f < 45Hz$	±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	±0.1%rdg. ±0.05%f.s.	±0.15%rdg.	±0.15%rdg.				
500Hz < f ≤ 10kHz	±0.1%rdg. ±0.1%f.s. ±0.1%rdg. ±0.2%f.s.	±0.2%rdg. ±0.3%rdg.	±0.2%rdg. ±0.3%rdg.				
10kHz < f ≤ 50kHz		±0.3%rdg. ±0.8%rdg.	±0.3%rdg. ±0.8%rdg.				
50kHz < f ≤ 100kHz	±2.1%rdg. ±0.3%f.s.	±0.8%rdg. ±2.4%rdg.	±0.8%rdg. ±2.4%rdg.				
	±2.1/01uy. ±0.3/01.S.	±2.4 /01ug.	±∠.↔ %IUY.				
Current (direct input)		F00//	1000/1				
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.				
$500Hz < f \le 1kHz$ $1kHz < f \le 10kHz$	±0.1%rdg. ±0.2%f.s. ±(0.03+0.07×F)%rdg. ±0.2%f.s.	±0.3%rdg. ±(0.23+0.07×F)%rdg.	±0.3%rdg. ±(0.23+0.07×F)%rdg				
10kHz < f ≤ 100kHz	±(0.3+0.04×F)%rdg.	±(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
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		±0.2%rdg.	±0.2%rdg.
500Hz < f ≤ 1kHz		±0.3%rdg.	±0.3%rdg.
1kHz < 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	±(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.
	Add (±1mA) × (voltage rei power. When using the 200 r current and active po Values for voltage, c: 0.1Hz ≤ f < 10Hz are: Values for voltage, c: 20A for which 10Hz ≤ Values for current an 500Hz < f ≤ 50kHz ar: Values for current to to the current an 50kHz < f ≤ 100kHz ar:	urrent, and activé power if < 16Hz are for refere id active power in exce re for reference only, id active power in exce are for reference only, and active power in exce are for reference only, and active power in exce	at accuracy for active 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		
Maximum effective	±600% of each voltag	e range	
peak voltage	However, for 300 V. 60	00 V, and 1000 V range	s. +1500 Vpeak
Maximum effective	±600% of each curren		o, 21000 v podit
peak current		ge and 50 A range, ±10	∩ Aneak
Conditions of		idity: 23°C ±5°C, 80%	
guaranteed	Warm-up time: 30 min		
accuracy		power factor of 1, term	inal-to-ground
,		ter zero adjustment; wit	
	fundamental war	ve satisfies synchroniza	ation source conditions
Temperature characteristic	±0.03% f.s. per °C or I		
Power factor effects	±0.1% f.s. or less (45 t	o 66 Hz, at power facto	
Effect of common	±0.02% f.s. or less	, s, s s i on pridoc dirion	
mode voltage		lied between input tern	ninals and enclosure)
Effect of external	400 A/m, DC and 50/6		
magnetic field		s. or less	
interference		s. or ±10 mA, whicheve	er is greater or less
		s. or (voltage influence	
		er is greater, or less	
Magnetization	±10 mA equivalent or I		
effect		DC to the current direct	input terminals)
Adjacent channel	±10 mA equivalent or I		pat torrillialoj
input effect	(when inputting 50 A to	o adiacent channel)	

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	$X_{sum} = \frac{1}{3} (X_{(1)} + X_{(2)} + X_{(3)})$	$P_{sum} = (P_{(1)} + P_{(2)} + P_{(3)})$
	3P3W3M	3 (X(1) 1 X(2) 1 X(3))	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 method		Measures the waveform's peak value (for both positive and negative polarity) based on sampled instantaneous voltage values.									
Sampling frequency	Approx. 7	'00 kHz									
Voltage peak range											
Voltage range	15V	30V	60'	/	15	0V	30	VO	6	V006	1000V
Voltage peak range	90.000V	180.00V	360.0	VOC	900.	00V	1.80	00kV	3.6	6000kV	6.0000kV
Current peak range											
Current range	200mA 5	500mA	1A	2	2A	5 <i>A</i>	4	10A	П	20A	50A
Current peak range	1.2000A 3	3.0000A 6.	A0000	12.0	000A	30.00	00A 6	0.000)A	120.00A	300.00A
Measurement accuracy	when 10 l range). Pi	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	±5% to ±	100% of v	oltage	pea	ak rai	nge (up to	±150	00 \	V) or	
measuring range	±5% to ±	100% of c	urrent	pea	ak rar	nge (i	up to	±100	(A ()	
Display range	±0.3% to										ıge

Voltage Crest Factor/ Current Crest Factor Measurement Specifications

	method	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)

Measurement method		ate / Current Ripple Factor Measurement Specifications Calculates the AC component (peak to peak [peak width]) as a proportion of the voltage or current DC component					
Effective		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	enective	measurement ranges	
Polarity		None					
			wer Fac	tor/ Pha	ise Ang	le Measurement Specifi	cations
Measurer types	nent			Power/ F	ower Fac	tor : AC+DC, AC, FND, AC+E	OC Umn
Effective measuring range		Phase Angle : AC, FND As per voltage, current, and active power effective measurement ranges.					
Display range		Power Factor Phase Angle		:	±0.000 +180.00	% of the range (no zero-suppressi 0 to ±1.0000 0 to -180.00	ion)
Polarity		voltagé wavefo	igned ac orm risir urrent la	ccording ng edge ags volt	g to the and the age (no	Angle lead/lag relationship of the current waveform rising polarity display)	ne edge.
Power ch	nannel an	d sum value ca					
	ring	S: Apparent power				Q: Reactive power	
All channels		$S_{(i)} = U_{(i)} \times$	I _(i)			$Q(i) = si(i)\sqrt{S(i)^2 - P(i)^2}$	
	1P3W 3P3W	$S_{sum} = S_{(1)} + S_{sum} = \frac{\sqrt{3}}{2} (S_{(1)})$)	\dashv	0 0 0	
Sum values	3P3W2M	$S_{sum} = \frac{\sqrt{3}}{2} (S_{(1)})$			-	$Q_{sum} = Q_{(1)} + Q_{(2)}$	
	3V3A 3P3W3M				-	0 -0 +0 +0	
i)· Maac	3P4W urement ch	$S_{sum} = S_{(1)} +$	J ₍₂₎ + 3	(3)		$Q_{\text{sum}} = Q_{(1)} + Q_{(2)} + Q_{(3)}$)
		λ : Pov	war fact	or		Φ. Dhane	
All channels	ring		wer fact $si(i) \frac{P(i)}{S(i)}$			ϕ : Phase angle $\phi_{(i)} = si_{(i)} cos^{-1} l \lambda_{(i)} l$,
All Utlatifiels	1P3W	7(1)-	- ' S(i)	1	IA/F	$\Psi(i) = SI(i) \cos i \Lambda(i)I$ then $P_{sum \ge 0}$	
Sum	3P3W 3P3W2M	1	Sisum Psu	ım	"	Psum = Sisum COS ⁻¹ I λ suml (0° to:	±90°)
values	3V3A 3P3W3M	Asum = S	Ssum Ssu	ım		nen Psum≥0	
; Ma	3P4W	anol. The release	oumal I	oic		$Φ_{sum} = si_{sum} 1180 - cos^{-1} l \lambda_{sum} 1$ $(±90° to ±180°)$	
			•			ed from the Qsum symbol.	
	neasurement	surement Sp	ecilica	alions			
channels Measureme	nt cource	Soloet from LL()	/Hz) or	1 (A 🖂 z)	by cha	nnol	
Measureme		Select from U (VHz) or I (AHz) by channel Calculated from input waveform period (reciprocal method)					
Manageman			ı input v	wavefor			
	nt range	500 Hz/ 200 kH	z (linke	d to zer	m perio o-cross	d (reciprocal method)	
Measureme Effective i	nt range nt accuracy measuring	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH	z (linke lgt. (0°0 lz	d to zer C to 40°	m perio o-cross °C)	d (reciprocal method)	
Measureme Effective i	nt accuracy	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH	z (linke lgt. (0°0 lz nput tha	d to zer C to 40° at is at le	m perio o-cross °C)	d (reciprocal method)	
Measureme Effective i range	nt accuracy measuring	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo	z (linke dgt. (0°0 Hz nput tha rement wer limi	d to zer C to 40° at is at le range. it freque	m perio o-cross C) east 209	d (reciprocal method) if filter) % of the measurement ting: 0.1 sec. / 10	
Measureme Effective i range	nt accuracy measuring	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999	z (linke dgt. (0°0 Hz nput tha rement wer limi 99 Hz, 9.	to to zer to 40° at is at le range. it freque	m perio o-cross C) east 209 ency set	d (reciprocal method) filter) % of the measurement	,
Measureme Effective i range Display fo	measuring ormat cy Measu	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 urement Spec	z (linke dgt. (0°0 Hz nput tha rement wer limi 99 Hz, 9. 19 kHz, 9	to to zer to to 40° at is at le range. it freque 900 Hz t .900 kHz	m perio o-cross C) east 209 ency set o 99.999	d (reciprocal method) filter) % of the measurement ting: 0.1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00	,) kHz
Measureme Effective i range Display fo Efficienc Measureme	nt accuracy measuring ormat by Measu	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculates the efficie	z (linke dgt. (0°C Hz nput tha rement wer limi 99 Hz, 9. 99 kHz, 9 ificatio ncy h [%]	at is at lear range. It frequences to the second range ra	m perio o-cross (C) east 209 ency set o 99.999 t to 99.99	d (reciprocal method) if filter) % of the measurement ting: 0.1 sec. / 1 sec. / 11 Hz, 99.00 Hz to 999.99 Hz, 19 kHz, 99.00 kHz to 220.00 ive power values for channels a	,) kHz
Measureme Effective is range Display for Measureme Wiring moand calcu	ormat or	500 Hz/ 200 kH ±0.1% rdg. ±1 c 0.1 Hz to 100 kH For sine wave ir source's measu Measurement lo 0.1000 Hz to 9.999 9900 kHz to 9.999 Irement Spec Calculates the efficie	z (linke dgt. (0°0 Hz nput tha irrement wer limi 99 Hz, 9. 19 kHz, 9 ification ed on th	at is at lear range. It frequences to the second range ra	m perio o-cross (C) east 209 ency set o 99.999 t to 99.99	d (reciprocal method) filter) % of the measurement ting: 0.1 sec. / 1 Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00	,) kHz
Measureme Effective in range Display for Efficiency Measureme Wiring mo	ormat or	500 Hz/ 200 kH ±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 Irement Spec Calculates the efficie Calculated base PW3336	z (linke dgt. (0°0 Hz nput tha irement wer limi 39 Hz, 9. 19 kHz, 9 ification ed on the	d to zer to 40° at is at lear range. it freque 900 Hz t .900 kHz DDS from the r ne AC+	m perio o-cross (C) east 209 ency set o 99.999 t to 99.99	d (reciprocal method) if filter) % of the measurement ting: 0.1 sec. / 1 sec. / 11 Hz, 99.00 Hz to 999.99 Hz, 99 kHz, 99.00 kHz to 220.00 we power values for channels a ifier active power Calculation formula) kHz nd wires
Measureme Effective i range Display fo Efficience Measureme Wiring ma	ormat or	500 Hz/ 200 kH ±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 9900 kHz to 9.999 Irement Spec Calculates the efficie Calculated base PW3336 Wiring 1P2W × 2	z (linke dgt. (0°0 Hz nput tha irement wer limi 99 Hz, 9. 19 kHz, 9 ificatio ncy h [%] ed on the	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	m perio o-cross (C) east 209 ency set o 99.999 t to 99.99	d (reciprocal method) filter) % 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 ive power values for channels a iffer active power	nd wires
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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)
		001 to 1000 (setting: 0000)
HOLD	· Stops display updates for all measured	
(HOLD)	display values at that point in time.	nigations is also fived at
	 Measurement data acquired by commu- that point in time. 	HICALIONS IS AISO HXEU AL
	· 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 measu 	
minimum value	maximum and minimum values for the v	
hold	waveform peak and holds them on the c	
(MAX/MIN HOLD)	 For data with polarity, display of the may value for the data's absolute values is he 	
	and negative polarity values are shown)	
	· Internal calculations (including integration	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.	tate, 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	ated settings) are not initialized.
Integration Meas	surement Specifications	
Measurement items	Simultaneous integration of the following 6 pa	arameters for each channel
	(total of 18 parameters):	Ale Ale
	Sum of current integrated values (displayed Positive current integrated value (displayed	
	Negative current integrated value (displayed	
	Sum of active power integrated values (disp	layed as Wh on panel display)
	Positive active power integrated value (display Negative active power integrated value (displ	
Measurement types	Rectifiers: AC+DC, AC+DC Umn	ayou as wiir oii pariei dispiay)
wicasurement types	Current:	
	Displays the result of integrating co	
	(display values) once every display 200 ms) as an integrated value.	y update interval (approx.
	Active power:	
	Displays the result of integrating a	ctive power values
	by polarity calculated once every	
	synchronization source as integrat Rectifier: DC	ed values.
	Displays the result of integrating instan	taneous data obtained by
	sampling both current and active power	er by polarity as integrated
	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	(Current or active power measurement accu	racy) + (±0.01% rdg. ±1 dgt.)
measurement accuracy Effective measuring range	Until PEAK OVER U or PEAK OVER I occ	rure
Display resolution	999999 (6 digits + decimal point)	7010
Functions	· Stopping integration based on integration	
	Displaying the integration elapsed time (displaying the integration by reported by the distribution of the distribution o	
	Additional integration by repeatedly stal Backing up integrated values and the integration e	
	· Stopping integration when power return	S
External control	Stopping/starting integration and resetting integrated	
Measuring range	Corresponds to the range set for START	
Harmonic Meas	urement Specifications (built-in f	
Measurement	· Zero-cross simultaneous calculation me	
method	by channel according to the wiring mod Uniform thinning between zero-cross ev	
	a digital antialiasing filter	onto artor proceeding with
	· Interpolation calculations (Lagrange inte	
	 When the synchronization frequency falls wit IEC 61000-4-7:2002 compliant 	thin the 45 Hz to 66 Hz range
	» Gaps and overlaps may occur if the measuremer	
	· When the synchronization frequency falls out:	
Synchronization course	» No gaps or overlap will occur	side the 45 Hz to 66 Hz range
Synchronization source Measurement channels		side the 45 Hz to 66 Hz range
Measurement channels	 No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to 3 Harmonic voltage RMS value Harmonic voltage RMS value 	side the 45 Hz to 66 Hz range pasic measurement specifications onic voltage content %
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the to a synchronization source (SYNC) for the total synchronization synchroniza	pasic measurement specifications onic voltage content % onic 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 phase angle	side the 45 Hz to 66 Hz range pasic measurement specifications whic voltage content % whic current RMS value whic current phase angle
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 phase angle	side the 45 Hz to 66 Hz range pasic measurement specifications whice voltage content % whice current RMS value whice current phase angle inic active power content %
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of	side the 45 Hz to 66 Hz range basic measurement specifications onic voltage content % onic current RMS value onic current phase angle nic active power content % armonic voltage distortion of 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 voltage current phase difference - Total harmonic voltage current distortion - Current fundamental waveform - Active - Active	side the 45 Hz to 66 Hz range pasic measurement specifications whice voltage content % whice current RMS value whice current phase angle hicactive power content % harmonic 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	side the 45 Hz to 66 Hz range pasic measurement specifications whice voltage content % whice current RMS value whice current phase angle hicactive power content % harmonic voltage distortion e fundamental waveform 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 - Reactive - Voltage current phase difference fundamental voltage - Active - Apparent power fundamental waveform - Reactive - Apparent power fundamental waveform - Reactive - Voltage current phase difference fundamental waveform - Reactive - Apparent power fundamental waveform - Active - Apparent power fundamental waveform - Active - Apparent power fundamental waveform - Active - Apparen	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value noic current phase angle nic active power content % tarmonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform mental waveform waveform the power fundamental waveform ental waveform the power fundamental waveform t
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport to synchronization source (SYNC) for the transport to synchronization source (SYNC) for the transport to state of transport transport to state of transport transp	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value unic current phase angle nic active power content % larmonic voltage distortion of fundamental waveform power fundamental waveform e power fundamental waveform enental waveform waveform that waveform one fundamental waveform one 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 which voltage content % unic current RMS value unic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform ental waveform waveform the power fundamental waveform and the power fundamental waveform the power fundamental waveform waveform waveform the power fundamental waveform waveform waveform waveform the power fundamental waveform
Measurement channels	» No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport to synchronization source (SYNC) for the transport to synchronization source (SYNC) for the transport to state of transport transport to state of transport transp	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % unic current RMS value unic active power content % armonic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform ental waveform waveform the power fundamental waveform and the power fundamental waveform the power fundamental waveform waveform waveform the power fundamental waveform waveform waveform waveform the 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 which voltage content % unic current RMS value unic active power content % unic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform unic active power specification of the power fundamental waveform and the power fundamental waveform unicated waveform contents waveform whase difference and add as data during PC unic current phase angle
Measurement channels Measurement items	No gaps or overlap will occur Conforms to synchronization source (SYNC) for the transport of the transport of the transport of transpo	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % unic current RMS value unic active power content % unic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform unic active power specification of the power fundamental waveform and the power fundamental waveform unicated waveform contents waveform whase difference and add as data during PC unic 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 active power - Harmonic voltage current phase difference - Total harmonic ourrent distortion - Voltage - Current fundamental waveform - Active - Apparent power fundamental waveform - Voltage current phase difference fundamental vance - Interchannel voltage fundamental wave promote - Interchannel current fundamental wave promote - Interchannel current fundamental wave promote - Interchannel voltage fundamental wave promote - Interchannel current fundamental wave promote - Interchannel voltage fundamental wave promote - Interchannel voltage fundamental wave promote - Interchannel current fundamental wave promote - Interchannel current fundamental wave promote - Interchannel voltage fundamental wave	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % unic current RMS value unic active power content % unic voltage distortion e fundamental waveform power fundamental waveform e power fundamental waveform unic active power specification of the power fundamental waveform and the power fundamental waveform unicated waveform contents waveform whase difference and add as data during PC unic current phase angle
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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 translation to the translation of the translation to the translation translation to the translation translati	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % mic current RMS value mic current phase angle mic active power content % harmonic voltage distortion of fundamental waveform power fundamental waveform enantal waveform whase difference shase difference add as data during PC onic current phase angle ce
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 outlage current phase difference Total harmonic voltage current distortion Voltage Current fundamental waveform Apparent power fundamental waveform Power factor fundamental waveform Nottage 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 Rectangular 45 Hz ≤ f < 56 Hz: 178.57 ms to 222.22 n Frequencies other than the above: 185.92 m Frequencies other than the above: 185.92 m	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % mic current RMS value mic current phase angle mic active power content % harmonic voltage distortion of fundamental waveform power fundamental waveform enantal waveform whase difference shase difference add as data during PC onic current phase angle ce
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 translation to the translation of the translation to the translation translation to the translation translati	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % mic current RMS value mic current phase angle mic active power content % harmonic voltage distortion of fundamental waveform power fundamental waveform enantal waveform whase difference shase difference add as data during PC onic current phase angle ce
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 harmonic voltage phase angle - Harmonic current content % - Harmonic active power - Harmonic harmonic outrent phase difference - Total harmonic current distortion - Voltage current fundamental waveform - Active - Apparent power fundamental waveform - Apparent power fundamental waveform - Woltage current phase difference fundam - Interchannel voltage fundamental wave promover fundam	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % mic current RMS value mic current phase angle mic active power content % harmonic voltage distortion of fundamental waveform power fundamental waveform enantal waveform whase difference shase difference add as data during PC onic 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 current content % Harmonic current content % Harmonic active power Harmonic active power Harmonic durent phase difference Total harmonic current distortion Current fundamental waveform Apparent power fundamental waveform Power factor fundamental waveform Power factor fundamental waveform Voltage current phase difference fundam Interchannel voltage fundamental wave p The following parameters can be downloa communication but not displayed: Harmonic voltage phase angle Harmonic voltage phase angle Harmonic voltage current phase differen 32 bits 4096 Rectangular 45 Hz ≤ f < 66 Hz: 178.57 ms to 222.22 n 45 Hz ≤ f < 66 Hz: 181.82 ms to 214.29 m Frequencies other than the above: 185.92 m Depends on window width 10 Hz to 640 Hz Synchronization frequency (f) range	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value unic active power content % harmonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform and the second of the sec
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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 voltage phase angle Harmonic voltage phase angle Harmonic voltage current content % - Harmonic voltage treet to the total phase difference Total harmonic voltage current phase difference Total harmonic voltage current state that waveform Apparent power fundamental waveform Paparent power fundamental waveform Paparent power fundamental waveform Interchannel voltage fundamental wave pather to the total phase difference fundamental voltage current fundamental wave pather to the total phase difference fundamental wave pather to the total phase difference fundamental wave pather to the total phase angle Harmonic voltage phase angle Harmonic voltage current phase difference that the total phase difference to the tot	side the 45 Hz to 66 Hz range basic measurement specifications which voltage content % onic current RMS value onic current RMS value onic active power content % harmonic voltage distortion of fundamental waveform power fundamental waveform et power fundamental waveform et power fundamental waveform onic active power fundamental waveform et power fundamental wavefo
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 synchronization source (SYNC) for the total conforms to synchronization synchroni	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value unic current phase angle nic active power content % tarmonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform and the second difference of
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 current content % - Harmonic voltage phase angle Harmonic current content % - Harmonic barbonic current content % - Harmonic current content % - Harmonic barbonic current distortion - Total harmonic current distortion - Total harmonic current distortion - Voltage current phase difference - Total harmonic power fundamental waveform - Apparent power fundamental waveform - Voltage current phase difference fundam - Interchannel voltage fundamental wave printerchannel over the difference fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel voltage fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel voltage fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave printerchannel voltage fundamental wave printerchannel voltage fundamental wave printerchannel voltage phase angle - Harmonic voltage fundamental wave printerchannel current fundamental wave printerchannel current fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave printerchannel current fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmonic voltage fundamental wave proventation but not displayed: - Harmoni	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value unic current phase angle nic active power content % harmonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform the power fundamental waveform on the second difference and dea as data during PC unic current phase angle ce Analysis order 50th 50th 50th 50th 40th 25th
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 synchronization source (SYNC) for the total conforms to synchronization synchroni	side the 45 Hz to 66 Hz range basic measurement specifications whice voltage content % unic current RMS value unic current phase angle nic active power content % tarmonic voltage distortion e fundamental waveform power fundamental waveform power fundamental waveform and the second difference of



Analysis order	2nd to 50th					
upper limit setting Measurement	f.s.: Measurement range	ae				
accuracy	Frequency (f)		rrent, Active power		
	DC 10 Hz ≤ f < 30	Hz		%rdg.±0.2%f.s. %rdg.±0.2%f.s.		
	30 Hz ≤ f ≤ 400) Hz	±0.39	%rdg.±0.1%f.s.		
	400 Hz < f ≤ 1 1 kHz < f ≤ 5 k			6rdg.±0.2%f.s. 6rdg.±0.5%f.s.		
	5 kHz < f ≤ 8 k			6rdg.±1.0%f.s.		
	For DC, add ± 1 mA to current and (± 1 mA) \times (voltage read value) to active power					
Display Specific						
Display Number of display parameters	7-segment LED					
Display resolution	Other than integrated	values: 999	99 count			
Dienlay undata rata	Integrated values: 999 200 ms to 20 s (varies		or of avoragi	na itoratione cattina		
		WILLITIUM	ei oi averagi	ng iterations setting,		
Synchronized C Functions	Timing of calculations, displa	v undatas data	undates intern	ation start/ston/reset		
i dilotions	events, display hold operation	n, key lock oper	ation, and zero-	adjustment operation for th		
Torminal	secondary PW3336/ PW3337		ed with the prin	nary PW3336/ PW3337.		
Terminal Terminal name	BNC terminal × 1 (non EXT SYNC	i-isolateu)				
I/O settings	Off: Synchronized cor					
	In : The EXT SYNC te synchronization si					
	Out: The EXT SYNC to	erminal is se	t to output,	and a dedicated		
Number of units for which	synchronization si 1 primary unit and 7 se					
synchronized control can	primary unit and 7 si	econdary di	iils (totai o t	1111(5)		
be performed						
External Current	Sensor Input Speci	fications (built-in fea	iture)		
Terminal	Isolated BNC terminal	s, 1 for eacl	n channel			
Current sensor type switching	Off / Type 1 / Type 2 When set to off, input from	the external	current sensor	input terminal is ignore		
Current sensor	TYPE1 (100 A to 5000 A senso	ors)		mpat terriman le igriere		
options	9660, 9661, TYPE2 (20 A to 2000 A sensor	, 9669, CT9667-		(02		
	CT6862-05,	CT6863-05, CT	6872, CT6872-0	1, CT6873, CT6873-01,		
				1, CT6877A, CT6877A-1, T6845A, CT6846A		
Current	Auto / 10 A / 20 A / 50					
measurement	User-selectable for ea	ch wiring m				
range Power range	manually setting the C Depends on the comb		oltage and o	current ranges: from		
configuration	60.000W to 15.000MV					
Measurement accuracy Current, Active power						
Frequency	Input < 50%f.s.	50%f.s. ≤ Inp	ut < 100%f.s.	100%f.s. ≤ Input		
DC 0.1Hz≤ f <16Hz	±0.2%rdg. ±0.6%f.s.		±0.6%f.s.	±0.8%rdg. ±0.4%rdg.		
16Hz≤ f < 45Hz	±0.2%rdg. ±0.2%f.s. ±0.2%rdg. ±0.2%f.s.	±0.49	%rdg.	±0.4%rdg.		
45Hz ≤ f ≤ 66Hz 66Hz < f ≤ 500Hz	±0.2%rdg. ±0.1%f.s. ±0.2%rdg. ±0.2%f.s.	±0.39		±0.3%rdg. ±0.4%rdg.		
500Hz < f ≤ 1kHz	±0.2%rdg. ±0.3%f.s.	±0.59	%rdg.	±0.5%rdg.		
1kHz < f ≤ 10kHz 10kHz < f ≤ 50kHz	±5.0%rdg.	±5.09	%rdg.	±5.0%rdg.		
50kHz < f ≤ 100kHz						
	f.s.: Each measureme					
	To obtain the current or accuracy to the above of					
	•The effective measu	rement rang	ge and freq	uency characteristic		
	 conform to the currer Values for current, ar 					
	0.1 Hz ≤ f < 10 Hz are	e for referen	ce only.			
	•Values for voltage in			power for which		
Temperature	10 Hz ≤ f < 16 Hz are Current, active power:		oc offig.			
	±0.08% f.s./°C (ins					
				eni range)		
	f.s. Add current sensor ter	.: instrument mperature c		above.		
characteristics Power factor	Add current sensor ter · Instrument: ±0.15% f.s.	mperature of or less (45 H	oefficient to z to 66 Hz wi	th power factor = 0)		
characteristics Power factor	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag	mperature of or less (45 H e/current ph	coefficient to z to 66 Hz wi nase differer	th power factor = 0) nce: ±0.086°		
characteristics Power factor effects	Add current sensor ter · Instrument: ±0.15% f.s. · Internal circuit voltag · Add the current sens voltage/current phase	mperature of or less (45 H le/current phe for phase ac e difference	coefficient to z to 66 Hz winase different couracy to the noted above	th power factor = 0) nce: ±0.086° ne internal circuit re.		
Power factor effects Current peak value	Add current sensor ter Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phase (External current sen	mperature of or less (45 Hale/current phase acong difference sor input ins	coefficient to z to 66 Hz winase different couracy to the noted above	th power factor = 0) nce: ±0.086° ne internal circuit re.		
Power factor effects Current peak value measurement	Add current sensor ter · Instrument: ±0.15% f.s. · Internal circuit voltag · Add the current sens voltage/current phase	mperature of or less (45 H e/current phoror phase ace difference sor input insige)	coefficient to z to 66 Hz winase different couracy to the noted above strument acc	th power factor = 0) nce: ±0.086° te internal circuit re. curacy) + (±2.0% f.s		
Power factor effects Current peak value measurement accuracy Harmonic	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phas (External current sen (f.s.:current peak ran Add the current sen Frequency	mperature of or less (45 H se/current photor phase ace difference sor input insige) or accuracy Voltage	coefficient to z to 66 Hz with asse different curacy to the noted above strument according to the above curacy to the above cu	th power factor = 0) nce: ±0.086° te internal circuit te. curacy) + (±2.0% f.s re. trent, Active power		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor te Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phass (External current sen (f.s.:current peak ran Add the current sens Frequency DC ±0 Internal current sens	mperature of or less (45 H e/current phore phase ace difference sor input insige) or accuracy Voltage 0.4%rdg. ±0	coefficient to z to 66 Hz winase difference curacy to the noted above strument according to the above curacy curacy cura	th power factor = 0) nce: ±0.086° nce: ±0.086° te internal circuit re. curacy) + (±2.0% f.s re. rrent, Active power 1.6%rdg. ±0.8%f.s.		
Current peak value measurement accuracy Harmonic measurement	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens (External current phase (External current peak rane) Add the current sens (f.s.:current peak rane) Add the current sens Frequency DC ±0 10Hz≤f < 30Hz ±0 30Hz≤f ≤ 400Hz ±0	mperature c or less (45 H e/current ph sor phase ac e difference sor input ins ge) or accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0	coefficient to z to 66 Hz winase difference cocuracy to the noted above strument according to the above z to th	th power factor = 0) nce: ±0.086° nce: ±0.086° nce internal circuit re. curacy) + (±2.0% f.s re. rent, Active power .6%rdg. ±0.8%f.s .6%rdg. ±0.4%f.s .5%rdg. ±0.3%f.s		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phass (External current sen (f.s.:current peak ran Add the current sens Frequency DC ±0 10H2≤ f < 30Hz ±0 30Hz≤ f ≤ 400Hz ±0 400Hz ≤ f ≤ 1kHz ±0	mperature c or less (45 Hierorum) ele/current ph or phase ace edifference sor input insigned volume of the Voltage 0.4%rdg. ±0 0.3%rdg. ±0 0.3%rdg. ±0	to the above 2.2%f.s. ±0 1.176f.s. ±0 2.26f.s. ±0 2.28f.s. ±0 2.28f.s. ±0	th power factor = 0) nce: ±0.086° einternal circuit e. curacy) + (±2.0% f.s ee. rrent, Active power 1.6%rdg. ±0.8%f.s. 1.6%rdg. ±0.4%f.s. 1.5%rdg. ±0.3%f.s. 1.6%rdg. ±0.3%f.s. 1.6%rdg. ±0.5%f.s. 1.6%rdg. ±0.5%f.s.		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens (External current phase (External current sens f.s.:current peak rane Add the current sens Frequency DC ±C 10Hz≤f<30Hz ±C 30Hz≤f<400Hz ±C 400Hz <f≤1khz 1khz<f≤5khz="" td="" ±1<="" ±c=""><td>mperature c or less (45 H le/current ph lor phase ac e difference sor input ins ge) lor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 0.3%rdg. ±0 0.3%rdg. ±0</td><td>coefficient to z to 66 Hz win asse different couracy to the noted above strument according to the above to th</td><td>th power factor = 0) nce: ±0.086° nce: ±0.086° nce internal circuit re. curacy) + (±2.0% f.s re. rent, Active power .6%rdg. ±0.8%f.s .6%rdg. ±0.4%f.s .5%rdg. ±0.3%f.s</td></f≤1khz>	mperature c or less (45 H le/current ph lor phase ac e difference sor input ins ge) lor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 0.3%rdg. ±0 0.3%rdg. ±0	coefficient to z to 66 Hz win asse different couracy to the noted above strument according to the above to th	th power factor = 0) nce: ±0.086° nce: ±0.086° nce internal circuit re. curacy) + (±2.0% f.s re. rent, Active power .6%rdg. ±0.8%f.s .6%rdg. ±0.4%f.s .5%rdg. ±0.3%f.s		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phas: (External current peak ran; Add the current sens (f.s.:current peak ran; Add the current sens Frequency DC ±0 10Hz≤f < 30Hz ±0 30Hz≤f ≤ 400Hz ±0 400Hz <f≤1khz 1khz="" <f≤5khz="" <f≤6="" each="" f.s.:="" kkhz="" measurement<="" td="" ±0="" ±1="" ±4=""><td>mperature c or less (45 H e/current ph or phase ac e difference sor input ins ge) or accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 0.4%rdg. ±0 1.0%rdg. ±1 1.0%rdg. ±1 1.0%rdg. ±1</td><td>coefficient to z to 66 Hz with anase difference or to the noted above strument according to the above services. It to the above services to the above services to the above services se</td><td>th power factor = 0) nce: ±0.086° einternal circuit e. curracy) + (±2.0% f.s ee. rrent, Active power 6.6% rdg. ±0.8% f.s. 6.6% rdg. ±0.4% f.s. 5.6% rdg. ±0.3% f.s. 6.6% rdg. ±0.5% f.s. 0.0% rdg. ±5.5% f.s. 0.0% rdg. ±5.5% f.s. 0.0% rdg. ±6.0% f.s.</td></f≤1khz>	mperature c or less (45 H e/current ph or phase ac e difference sor input ins ge) or accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 0.4%rdg. ±0 1.0%rdg. ±1 1.0%rdg. ±1 1.0%rdg. ±1	coefficient to z to 66 Hz with anase difference or to the noted above strument according to the above services. It to the above services to the above services to the above services se	th power factor = 0) nce: ±0.086° einternal circuit e. curracy) + (±2.0% f.s ee. rrent, Active power 6.6% rdg. ±0.8% f.s. 6.6% rdg. ±0.4% f.s. 5.6% rdg. ±0.3% f.s. 6.6% rdg. ±0.5% f.s. 0.0% rdg. ±5.5% f.s. 0.0% rdg. ±5.5% f.s. 0.0% rdg. ±6.0% f.s.		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor te Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens (External current sens (External current sens (f.s.:current peak ran) Add the current sens Frequency DC ±0 10Hz≤f<30Hz ±0 30Hz≤f<400Hz ±1 400Hz <f≤1khz 1khz<f≤5khz="" 5khz<f≤5khz="" 5khz<f≤8khz="" current="" each="" f.s.:="" measuremen="" obtain="" on<="" td="" the="" to="" ±0="" ±1="" ±4=""><td>mperature c or less (45 H e/current ph or phase ace difference sor input ins ge) vor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0</td><td>coefficient to z to 66 Hz with asset difference of the above strument accuracy to the above strument accuracy to the above strument accuracy to the above 2.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.5%f.s. ±1.0%f.s. ±2 ar accuracy, it is a to 5 to</td><td>th power factor = 0) ice: ±0.086° ice: ±0.086° ice: ±0.086° curacy) + (±2.0% f.s) ice. rent, Active power .6%rdg. ±0.8%f.s6%rdg. ±0.3%f.s5%rdg. ±0.3%f.s6%rdg. ±0.5%f.s0%rdg. ±5.5%f.s0%rdg. ±5.5%f.s.</td></f≤1khz>	mperature c or less (45 H e/current ph or phase ace difference sor input ins ge) vor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0	coefficient to z to 66 Hz with asset difference of the above strument accuracy to the above strument accuracy to the above strument accuracy to the above 2.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.5%f.s. ±1.0%f.s. ±2 ar accuracy, it is a to 5 to	th power factor = 0) ice: ±0.086° ice: ±0.086° ice: ±0.086° curacy) + (±2.0% f.s) ice. rent, Active power .6%rdg. ±0.8%f.s6%rdg. ±0.3%f.s5%rdg. ±0.3%f.s6%rdg. ±0.5%f.s0%rdg. ±5.5%f.s0%rdg. ±5.5%f.s.		
Power factor effects Current peak value measurement accuracy Harmonic measurement	Add current sensor tel Instrument: ±0.15% f.s. Internal circuit voltag Add the current sens voltage/current phas: (External current peak ran; Add the current sens (f.s.:current peak ran; Add the current sens Frequency DC ±0 10Hz≤f < 30Hz ±0 30Hz≤f ≤ 400Hz ±0 400Hz <f≤1khz 1khz="" <f≤5khz="" <f≤6="" each="" f.s.:="" kkhz="" measurement<="" td="" ±0="" ±1="" ±4=""><td>mperature c or less (45 H e/current ph or phase ace difference sor input ins ge) vor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0</td><td>coefficient to z to 66 Hz with asset difference of the above strument accuracy to the above strument accuracy to the above strument accuracy to the above 2.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.5%f.s. ±1.0%f.s. ±2 ar accuracy, it is a to 5 to</td><td>th power factor = 0) ice: ±0.086° ice: ±0.086° ice: ±0.086° curacy) + (±2.0% f.s) ice. ice. ice. ice. ice. ice. ice. ice.</td></f≤1khz>	mperature c or less (45 H e/current ph or phase ace difference sor input ins ge) vor accuracy Voltage 0.4%rdg. ±0 0.3%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0 1.0%rdg. ±0	coefficient to z to 66 Hz with asset difference of the above strument accuracy to the above strument accuracy to the above strument accuracy to the above 2.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.2%f.s. ±0.5%f.s. ±1.0%f.s. ±2 ar accuracy, it is a to 5 to	th power factor = 0) ice: ±0.086° ice: ±0.086° ice: ±0.086° curacy) + (±2.0% f.s) ice. ice. ice. ice. ice. ice. ice. ice.		
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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) 11 to I3 (current level) or i1 to i3 (instantaneous current waveform) (switchable) P1 to P3 (active power level) or 11 to 93 (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 find.

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

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

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

GI ID IIICOI	1400 (1 110000 0 17 00, 1 110007 0 17 00)
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 operations)		TCP/IP
		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)

cioneral operations (product guaranteed for e year)				
	Indoors, altitude up to 2000 m (6562-ft.), pollution degree 2			
	0 to 40°C (32 to 104°F), 80% RH or less (non-condensating)			
and humidity				
and humidity	-10 to 50°C (14 to 122°F) 80% RH or less (non-condensating)			
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 × 1, Measurement guide × 1, Power cord × 1			

waas 5 PW3335 Specifications

ı	Input	Sne	cific	catio	าทร

input opcomout	input opcomodiono				
Measurement line type	e Single-phase 2-wire(1P2W)				
Input methods	Voltage Isolated input	ut, resistive voltage divider method			
	Current Isolated inpu	ut, 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/ 1.00	000 kV			
Current	AUTO/ 1.0000 mA/ 2.000	00 mA/ 5.0000 mA/ 10.000 mA/			
measurement	20.000 mA/ 50.000 mA/	100.00 mA/ 200.00 mA/ 500.00 mA/			
ranges	ges 1.0000 A/ 2.0000 A/ 5.0000 A/ 10.000 A/ 20.000 A				
Power ranges	Depends on the combina	ition of voltage and current ranges;			
	From 6.0000 mW to 20.00	00 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			
		200 mA to 20 A range 15 mΩ or less			

D : -	N / · · ·		0	-:::	4:
Basic	Measur	ement	Spe	CHICS	ltions

Power ranges	Depends on the combination of voltage and current ranges;					
	From 6.0000 mW to 20.000 kW (also applies to VA, var)					
Input resistance	The details are as below. Voltage input terminal: 2 MΩ					
input resistance	Current input terminal:		nge 520 mΩ or less			
		200 mA to 20 A rar				
Davis Marca						
	nent Specification					
Measurement		and current digital sam	pling, zero-cross			
method Compling frequency	simultaneous calculati	on				
Sampling frequency A/D converter resolution	Approx. 700 kHz 16-bit					
	DC, 0.1 Hz to 100 kHz (Va	alues within 0.1Hz < f < 10.F	Hz are for reference only)			
	U, I, DC (fixed to 200 r					
Measurement items	Voltage	Current	Active power			
	Apparent power	Reactive power	Power factor			
	Phase angle	Frequency	Current integration			
	Active power integra Voltage waveform pe		veform peak value			
	Voltage crest factor	Current cre				
	Maximum current ra					
	Time average active					
	Voltage ripple rate	Current rip	ple rate			
	Harmonic parameters Harmonic voltage RI	MS value Harmonie	current RMS value			
	Harmonic active pov		onic voltage distortion			
	Total harmonic curren		ntal wave voltage			
	Fundamental wave of	current Fundamen	tal wave active power			
		parent power Fundament				
		oower factor (Displacer voltage current phase c				
	Harmonic voltage co		interence			
	Harmonic current co					
		wer content percentage)			
	(The following parameters can be downloaded as data via PC communication)					
	Harmonic voltage phase angle					
	Harmonic current ph					
Rectifiers	Harmonic voltage current phase difference					
necliners	AC+DC : AC+DC measurement Display of true RMS values for both voltage and current					
	AC+DC Umn : AC+DC		and current			
	Display of average value rectified RMS converted values for					
	voltage and true RM					
	DC : DC measurement					
		erages for both voltage d by (voltage DC value) × (curre				
	AC : AC measurement		stil Do value) for active power			
	Display of values ca					
		value) ² for both voltag lculated by	e and current			
	Display of values ca	Iculated by				
	(AC+DC value) - (DC value) for active power FND: Extraction and display of the fundamental wave component from harmonic measurement					
Zero-cross Filter		Hz 500 Hz: 0.1 Hz to 5				
2010 010001 11101		100 kHz: 0.1 Hz to				
Measurement accuracy						
Voltage						
Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input			
DC	±0.1rdg.±0.1%f.s.	±0.1%rdg.±0.1%f.s.	±0.2%rdg.			
0.1Hz≤f<16Hz	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
16Hz≤f<45Hz	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.			
45Hz≤f≤66Hz	±0.1%rdg.±0.05%f.s.	±0.15%rdg.	±0.15%rdg.			
66Hz <f≤500hz< td=""><td>±0.1%rdg.±0.1%f.s.</td><td>±0.2%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.			
500Hz <f≤10khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤10khz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.			
10kHz <f≤50khz< td=""><td>±0.5%rdg.±0.3%f.s.</td><td>±0.8%rdg.</td><td>±0.8%rdg.</td></f≤50khz<>	±0.5%rdg.±0.3%f.s.	±0.8%rdg.	±0.8%rdg.			
50kHz <f≤100khz< td=""><td>±2.1%rdg.±0.3%f.s.</td><td>±2.4%rdg.</td><td>±2.4%rdg.</td></f≤100khz<>	±2.1%rdg.±0.3%f.s.	±2.4%rdg.	±2.4%rdg.			
Current						
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. ±0.1%rdg.±0.1%f.s.	±0.15%rdg.	±0.15%rdg.			
66Hz <f≤500hz 500Hz<f≤1khz< td=""><td>±0.1%rdg.±0.1%f.s. ±0.1%rdg.±0.2%f.s.</td><td>±0.2%rdg. ±0.3%rdg.</td><td>±0.2%rdg. ±0.3%rdg.</td></f≤1khz<></f≤500hz 	±0.1%rdg.±0.1%f.s. ±0.1%rdg.±0.2%f.s.	±0.2%rdg. ±0.3%rdg.	±0.2%rdg. ±0.3%rdg.			
1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg.</td><td>±0.3%rdg. ±(0.23+0.07×F)%rdg.</td><td>±0.3%rdg. ±(0.23+0.07×F)%rdg.</td></f≤10khz<>	±(0.03+0.07×F)%rdg.	±0.3%rdg. ±(0.23+0.07×F)%rdg.	±0.3%rdg. ±(0.23+0.07×F)%rdg.			
INTIZ NE TUNITZ	±0.2%f.s.	1,0.20+0.01X1 1/01UY.	1,0.20+0.01 XI) /01Uy.			
10kHz <f≤100khz< td=""><td>±(0.3+0.04×F)%rdg.</td><td>±(0.6+0.04×F)%rdg.</td><td>±(0.6+0.04×F)%rdg.</td></f≤100khz<>	±(0.3+0.04×F)%rdg.	±(0.6+0.04×F)%rdg.	±(0.6+0.04×F)%rdg.			
12	±0.3%f.s.	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			

_				
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< td=""><td>±0.1%rdg.±0.1%f.s.</td><td>±0.2%rdg.</td><td>±0.2%rdg.</td></f≤500hz<>	±0.1%rdg.±0.1%f.s.	±0.2%rdg.	±0.2%rdg.
	500Hz <f≤1khz< td=""><td>±0.1%rdg.±0.2%f.s.</td><td>±0.3%rdg.</td><td>±0.3%rdg.</td></f≤1khz<>	±0.1%rdg.±0.2%f.s.	±0.3%rdg.	±0.3%rdg.
	1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg.</td><td>±(0.23+0.07×F)%rdg.</td></f≤10khz<>	±(0.03+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.	±(0.23+0.07×F)%rdg.
		±0.2%f.s.		
	10kHz <f≤50khz< td=""><td>±(0.07×F)%rdg.</td><td>±(0.3+0.07×F)%rdg.</td><td>±(0.3+0.07×F)%rdg.</td></f≤50khz<>	±(0.07×F)%rdg.	±(0.3+0.07×F)%rdg.	±(0.3+0.07×F)%rdg.
		±0.3%f.s.		
	50kHz <f≤100khz< td=""><td></td><td>±(0.9+0.07×F)%rdg.</td><td>±(0.9+0.07×F)%rdg.</td></f≤100khz<>		±(0.9+0.07×F)%rdg.	±(0.9+0.07×F)%rdg.
		±0.3%f.s.		
_		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×F)% rdg, to the measurement accuracy for current and active power for which (10 kHz < f \le 100 kHz).

•The measurement results for following input are considered reference values: Values for voltage, current, and active power for which 0.1 Hz \le f < 10 Hz.

Values for voltage, current, and active power in excess of 220 V or 20 A for which 10 Hz \le f \le 16 Hz. Values for current and active power in excess of 20 A for which 500 Hz < f \le 50 kHz. Values for current and active power in excess of 10 A for which 50 kHz < f \le 100 kHz.
 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%)

Effective measuring range

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 Conditions of

Temperature and humidity range: 23°C±5°C (73°F±9°F), 80% RH or less Warm-up time: 30 minutes guaranteed accuracy Input:

Sine wave input, power factor of 1, voltage to earth of 0 V, after zero-adjustment; within range in which the fundamental wave satisfies synchronization

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

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

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

Internal circuitry voltage/current phase difference: ±0.0573°
±0.01%f.s. or less (600 V, 50 Hz/60 Hz, applied between input coefficient Effect of power Effect of common mode voltage Effect of magnetic terminals and enclosure)
400 A/m, DC and 50 Hz/60 Hz magnetic field

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

±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(±20 mA) 1 mA/2 mA/5 mA/10 mA/20 mA/50 mA/100 mA range: (Voltage influence quantity)x(±20 mA)

Effect of self-With input of at least 15 A to current input terminals heating Current

AC input signal

±(0.025+0.005×(I-15))%rdg. or less

200 mA/500 mA/1 A/2 A/5 A/10 A/20 A range ±((0.025+0.005×(1-15))% rdg.+(0.5+0.1×(1-15))mA) or less 1 mA/ 2 mA/ 5 mA/ 10 mA/ 20 mA/ 50 mA/ 100 mA range ±((0.025+0.005×(I-15))% rdg.+(5+1×(I-15))µA) or less I: Current read value (A)

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

Range table (Power ranges)

5	3 - 7							
Voltage	6.0000 V	15.000 V	30.000 V	60.000 V	150.00 V	300.00 V	600.00 V	1.0000 kV
1.0000 mA	6.0000 mW	15.000 mW	30.000 mW	60.000 mW	150.00 mW	300.00 mW	600.00 mW	1.0000 W
2.0000 mA	12.000 mW	30.000 mW	60.000 mW	120.00 mW	300.00 mW	600.00 mW	1.2000 W	2.0000 W
5.0000 mA	30.000 mW	75.000 mW	150.00 mW	300.00 mW	750.00 mW	1.5000 W	3.0000 W	5.0000 W
10.000 mA	60.000 mW	150.00 mW	300.00 mW	600.00 mW	1.5000 W	3.0000 W	6.0000 W	10.000 W
20.000 mA	120.00 mW	300.00 mW	600.00 mW	1.2000 W	3.0000 W	6.0000 W	12.000 W	20.000 W
50.000 mA	300.00 mW	750.00 mW	1.5000 W	3.0000 W	7.5000 W	15.000 W	30.000 W	50.000 W
100.00 mA	600.00 mW	1.5000 W	3.0000 W	6.0000 W	15.000 W	30.000 W	60.000 W	100.00 W
200.00 mA	1.2000 W	3.0000 W	6.0000 W	12.000 W	30.000 W	60.000 W	120.00 W	200.00 W
500.00 mA	3.0000 W	7.5000 W	15.000 W	30.000 W	75.000 W	150.00 W	300.00 W	500.00 W
1.0000 A	6.0000 W	15.000 W	30.000 W	60.000 W	150.00 W	300.00 W	600.00 W	1.0000 kW
2.0000 A	12.000 W	30.000 W	60.000 W	120.00 W	300.00 W	600.00 W	1.2000 kW	2.0000 kW
5.0000A	30.000 W	75.000 W	150.00 W	300.00 W	750.00 W	1.5000 kW	3.0000 kW	5.0000 kW
10.000 A	60.000 W	150.00 W	300.00 W	600.00 W	1.5000 kW	3.0000 kW	6.0000 kW	10.000 kW
20.000 A	120.00 W	300.00 W	600.00 W	1.2000 kW	3.0000 kW	6.0000 kW	12.000 kW	20.000 kW



Voltage/ Current/ Active Power Measurement Specifications

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

Voltage Waveform Peak Value/ Current Waveform Peak Value

Measurement S	Specifications				
Measurement	Measures the voltage waveform's peak value (for both positive and				
method	negative polarity) based on sampled instantaneous voltage values.				
Range	Voltage				
configuration	Voltage range	Voltage peak range			
	6.0000 V	36.000 V			
	15.000 V	90.000 V			
	30.000 V	180.00 V			
	60.000 V	360.00 V			
	150.00 V	900.00 V			
	300.00 V	1.8000 kV			
	600.00 V	3.6000 kV			
	1.0000 kV	6.0000 kV			
	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 wher	$\leq f \leq 1 \text{ kHz (f.s.: current peak range).}$ 1 0.1 Hz $\leq f < 10 \text{ Hz and when 1 kHz} < f.$ 1 y 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	•				

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

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

Frequency Measurement Specifications

Number of measurement channels	2 (Voltage, current)		
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 measuring range	0.1 Hz to 100 kHz For sine wave input that is at lea source's measurement range Measurement lower limit frequer sec. (linked to synchronization ti	ncy setting: 0.1 sec. / 1 sec. / 10	
Display format	0.1000 Hz to 9.9999 Hz, 99.00 Hz to 999.99 Hz, 9.900 kHz to 99.999 kHz,	9.900 Hz to 99.999 Hz, 0.9900 kHz to 9.9999 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

Averaging

Hold

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

> 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

Averages the voltage, current, active power, apparent power, and reactive

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
_		

Applies user-defined VT and CT ratio settings to measured values.
VT ratio setting range
CT ratio setting range
OFF (1.0), 0.001 to 1000
OFF (1.0), 0.001 to 1000 Scaling (VT, CT)

Stops display updates for all measured values and fixes the display values at that point in time.

Measurement data acquired by communications is also fixed at

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

Analog output and waveform output are not held

Maximum value/			
	Detects maximum and minimum measured values (except current integration, active power integration, integration plansed)		
minimum value hold (MAX/MIN	current integration, active power integration, integration elapsed time, time average current, and time average active power		
HOLD)	values) as well as maximum and minimum values for the voltage 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 waveform peak value.		
	Internal calculations (including integration and integration		
	elapsed time) will continue. The maximum and minimum values during integration are		
	detected (maximum/minimum value measurement during the		
	integration interval).Analog output and waveform output are not held.		
Zero Adjustment	Zeroes out the voltage and current input offset.		
Key-lock	Disables key input in the measurement state, except for the KEY LOCK key.		
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.		
	surement Specifications		
ntegration operation modes	Switchable between fixed-range integration and auto-range integration.		
pporation modeo	Fixed-range integration Integration can be performed for all voltage and current ranges.		
	The voltage and current ranges are fixed once integration starts.		
	Auto-range integration		
	Integration can be performed for all voltage ranges.		
	The current is set to auto-range operation using ranges from 200 mA to 20 A.		
	The integrated value for each range can be displayed by switching		
	the current range (200 mA to 20 A) while integration is stopped.		
Measurement items and display	Simultaneous integration of the following 6 parameters: Positive current integrated value (Ah+)		
a alopiuy	Negative current integrated value (Ah-)		
	Sum of current integrated values (Ah) Positive active power integrated value (Wh+)		
	Negative active power integrated value (Wh-)		
	Sum of active power integrated values (Wh)		
Measurement types	Rectifiers: AC+DC, AC+DC Umn		
types	Current: Displays the result of integrating current RMS value data (display		
	values) once every display update interval as an integrated value.		
	Active power:		
	Displays the result of integrating active power values by polarity		
	calculated once every cycle for the selected synchronization source as integrated values.		
	Source as integrated values.		
	Rectifier: DC		
	Displays the result of integrating instantaneous data obtained		
	by sampling both current and active power by polarity as		
	by sampling both current and active power by polarity as integrated values (these values are not integrated values for the		
	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC		
	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components)		
	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components) 1 min. to 10000 hr., settable in 1 min. blocks		
Integration time	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components)		
Integration time accuracy	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components) 1 min. to 10000 hr., settable in 1 min. blocks		
Integration time accuracy Integration measurement accuracy	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components) 1 min. to 10000 hr., settable in 1 min. blocks ±0.01% rdg. ±1 dgt. (Current or active power measurement accuracy) + (±0.01% rdg. ±1 dgt.)		
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Integration time accuracy Integration measurement accuracy Effective measuring range Display resolution Functions Harmonic Meas Measurement method Synchronization source	integrated values (these values are not integrated values for the DC component when active power contains both DC and AC components) 1 min. to 10000 hr., settable in 1 min. blocks ±0.01% rdg. ±1 dgt. (Current or active power measurement accuracy) + (±0.01% rdg. ±1 dgt.) Until PEAK OVER U lamp or PEAK OVER I lamp lights up. 999999 (6 digits + decimal point) • Stopping integration based on integration time setting (timer) • Stopping/starting integration and resetting integrated values based on external control • 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 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 overlaps may occur if the measurement frequency is not 50 Hz. When the synchronization frequency falls outside the 45 Hz to 66 Hz range: No gaps or overlaps may occur if the measurement frequency is not 50 Hz. When the synchronization source (SYNC) for the basic measurement specifications. Harmonic voltage RMS value Harmonic voltage content percentage Harmonic voltage phase angle Harmonic current phase angle Harmonic current phase angle Harmonic voltage current phase difference Total harmonic voltage distortion Total harmonic current distortion Fundamental wave active power Fundamental wave apparent power Fundamental wave apparent power		

FFT processing	FFT processing word length: 32 Number of FFT points: 4096 poin			
Window function	Rectangular			
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.			
Maximum analysis	Synchronization frequency (f) ra	ange	Analysis order	
order	10 Hz ≤ f < 45 Hz		50th	
	45 Hz ≤ f < 56 Hz 56 Hz ≤ f ≤ 66 Hz		50th 50th	
	56 HZ ≤ T ≤ 66 HZ 66 Hz < f ≤ 100 Hz		50th	
	100 Hz < f ≤ 200 Hz		40th	
	200 Hz < f ≤ 300 Hz		25th	
	300 Hz < f ≤ 500 Hz 500 Hz < f ≤ 640 Hz		15th 11th	
Analysis order	2nd to 50th			
upper limit setting Measurement	f.s.: Measurement range			
accuracy			Current, Active power	
	DC		4% rdg. ±0.2%f.s.	
	10 Hz ≤ f < 30 Hz 30 Hz ≤ f ≤ 400 Hz		±0.4% rdg. ±0.2%f.s.	
	400 Hz < f ≤ 1 kHz		±0.3% rdg. ±0.1%f.s. ±0.4% rdg. ±0.2%f.s.	
	1 kHz < f ≤ 5 kHz	±1.	0% rdg. ±0.5%f.s.	
	5 kHz < f ≤ 8 kHz		0% rdg. ±1.0%f.s.	
	 When using the 1 mA/ 2 mA ran Add ±1 µA to 10 Hz to 8 kHz mea 	asureme		
	Add (±1 µA) × (voltage read value measurement accuracy for active		Hz to 8 kHz	
	When using the 200 mA/ 500 m/ Add ±1 mA to DC measurement			
	Add ±1 mA) × (voltage read valid for active power.			
	When using the 1 mA/ 2 mA/ 5 mA/	10 m A / 20	. mΔ / 50 mΔ / 100 mΔ range	
	Add ±10 µA to DC measurement	t accurac	y for current.	
	Add (±10 μA) × (voltage read va for active power.	lue) to D(C measurement accurac	
Diamin. On a sife				
Display Specific Display	7-segment LED			
Number of display	4 (display area a, b, c, and d)			
parameters Display resolution	Other than integrated values: 99999 count (5 digits) Integrated values: 99999 count (6 digits)			
Display update rate	200 ms ±50 ms (approx. 5 updates per sec.) to 20 s (varies with number of averaging iterations setting)			
Synchronized c	ontrol			
Functions	i a	updates;	data updates;	
	The timing of calculations; display updates; data updates; integration start, stop, and reset events; display hold operation; key lock operation, and zero-adjustment operation for the secondary PW3335 series is synchronized with the primary PW3335 series. Synchronization with the PW3336 series and PW3337 series is also			
	PW3335 series is synchronized wit Synchronization with the PW3336 s	h the prin	nary PW3335 series.	
	PW3335 series is synchronized wit Synchronization with the PW3336 s supported. BNC terminal × 1 (non-isolated)	h the prim series and	nary PW3335 series. I PW3337 series is also	
Terminal name	PW3335 series is synchronized wit Synchronization with the PW3336 s supported. BNC terminal × 1 (non-isolated) External synchronization terminal	h the prim series and	nary PW3335 series. I PW3337 series is also	
Terminal name	PW3335 series is synchronized wit Synchronization with the PW3336 s supported. BNC terminal × 1 (non-isolated)	h the primseries and	nary PW3335 series. I PW3337 series is also NC)	
Terminal name	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization term	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.SY)	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input,	
Terminal name	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.SY)	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input,	
Terminal name	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization term	h the prime series and (EXT.SY) If (signals YNC) are minal (EXT.SY) inal (EXT.SY)	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output,	
Terminal name I/O settings Number of units for which synchronized control can be	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization Out The external synchronization terminal (EXT.S)	h the primeries and (EXT.SY) if (signals yNC) are minal (EX n signal cuinal (EXT.signal care)	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary).	
Number of units for which synchronized control can be performed External Currer (PW3335-03 ar	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization support of the external synchronization terminal a dedicated synchronization support of the external synchronization support of t	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.sy) in signal cuital (EXT.signal car.	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary).	
Number of units for which synchronized control can be performed External Currer PW3335-03 ar Terminal	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal and a dedicated synchronization terminal a dedicated synchronization sync	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.sy) in signal cuital (EXT.signal car.	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary).	
Number of units for which synchronized control can be performed External Currer PW3335-03 ar Terminal Current sensor type	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization support of the external synchronization terminal a dedicated synchronization support of the external synchronization support of t	h the primeries and (EXT.SY if (signals YNC) are minal (EXT. in signal c inal (EXT. inal	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary).	
Number of units for which synchronized control can be performed External Currer (PW3335-03 ar Terminal Current sensor type switching Current sensor	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization of the external synchronization terminal and a dedicated synchronization of the external synchronization terminal synchronization of PW3335-04) Isolated BNC terminals Off / TYPE.1 / TYPE.2 When set to off, input from the external synchronization of the external synchronization of the external synchronization of the external synchronization of the external synchronization terminals.	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.SY) inal (EXT.SY)	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary).	
Number of units for which synchronized control can be performed External Currer PW3335-03 ar Terminal Current sensor type switching Current sensor	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization synchronization terminal a dedicated synchronization terminal a dedicated synchronization terminal a dedicated synchronization of Up to 7 secondaries per primary (total of 8 units including the PW3 It Sensor Input Specification of 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)	h the primeries and (EXT.SY if (signals YNC) are minal (EXT. signal can inal (EXT. signa	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary). 3337 series) Trent sensor input pply is required to use) 163-05, CT6873, 1876A, CT6876A-1,	
Number of units for which synchronized control can be performed External Currer (PW3335-03 ar Terminal Current sensor type switching Current sensor options	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal x 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization term and a dedicated sy	h the primeries and (EXT.SY if (signals yNC) are minal (EXT.sy in signal can inal (EXT.signal	nary PW3335 series. I PW3337 series is also NC) Is input to the external ignored) (T.SYNC) is set to input, an be input (secondary) SYNC) is set to output, a be output (primary). 3337 series) Trent sensor input pply is required to use) 363-05, CT6873, 3876A, CT6876A-1, 13A, CT6844A, CT6845A	
Terminal Terminal name I/O settings Number of units for which synchronized control can be performed External Currer (PW3335-03 ar Terminal Current sensor type switching Current sensor options Current measuremen range Constraints Power range	PW3335 series is synchronized wit Synchronization with the PW3336 supported. BNC terminal × 1 (non-isolated) External synchronization terminal Off Synchronized control function of synchronization terminal (EXT.S) In The external synchronization term and a dedicated synchronization term and a dedicated synchronization term and a dedicated synchronization synchron	h the primeries and (EXT.SY) If (signals YNC) are minal (EXT.SY) If (signals YNC) are minal (EXT.signal car) If (signals YNC) are minal (EXT.signal car) If (signals YNC) are minal (EXT.signal car) If (ST.SY) If (signals YNC) are minal (EXT.signal car) If (ST.SY)	nary PW3335 series. I PW3337 series is also NC) s input to the external ignored) CT.SYNC) is set to input, can be input (secondary) SYNC) is set to output, n be output (primary). 3337 series) Trent sensor input pply is required to use) 363-05, CT6873, 3876A, CT6845A ne CT ratio.	



Measurement accuracy Current/ Active Power

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< th=""><th>±(0.03+0.07×F)%rdg.</th><th>±(0.23+0.07×F)%rdg.</th><th>±(0.23+0.07×F)%rdg.</th></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≤100khz< td=""><td>±(0.3+0.04×F)%rdg. ±0.3%f.s.</td><td>±(0.6+0.04×F)%rdg.</td><td>±(0.6+0.04×F)%rdg.</td></f≤100khz<>	±(0.3+0.04×F)%rdg. ±0.3%f.s.	±(0.6+0.04×F)%rdg.	±(0.6+0.04×F)%rdg.

Active Power

Frequency (f)	Input < 50%f.s.	50%f.s. ≤ Input < 100%f.s.	100%f.s. ≤ Input
1kHz <f≤10khz< td=""><td>±(0.03+0.07×F)%rdg.</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>±(0.6+0.07×F)%rdg. ±0.3%f.s.</td><td>±(0.9+0.07×F)%rdg.</td><td>±(0.9+0.07×F)%rdg.</td></f≤100khz<>	±(0.6+0.07×F)%rdg. ±0.3%f.s.	±(0.9+0.07×F)%rdg.	±(0.9+0.07×F)%rdg.

- ¥0.3%t.s.
 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 CT684xA series, add ±2 mV to the CT684xA series accuracy after performing CT684xA 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	±2.0% at DC or 10 Hz ≤ f ≤ 1 kHz	(f.s.: current peak range)		
value measurement specifications	Add the current sensor accuracy to the above.			
Harmonic	External current sensor input instru	iment measurement accuracy only		
measurement	Frequency (f)	Voltage, Current, Active power		
accuracy	DC	±0.4% rdg.±0.2%f.s.		
	10 Hz ≤ f < 30 Hz ±0.4% rdg.±0.2%f.s.			
	30 Hz ≤ f ≤ 400 Hz ±0.3% rdg.±0.1%f.s.			
	400 Hz < f ≤ 1 kHz ±0.4% rdg.±0.2%f.s.			
	1 kHz < f ≤ 5 kHz ±1.0% rdg.±0.5%f.s.			
	5 kHz < f ≤ 8 kHz ±4.0% rdg.±1.0%f.s.			
	Values for f.s. depend on measurement ranges. To obtain the current or active power accuracy, add the current sensor's accuracy to the above current and active power accuracy figures. When using the CT684xA series, add ±2 mV to the CT684A series accuracy after performing CT684xA series zero adjustment using the 1 A range noted on the panel.			

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

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

Output accuracy	f.s.: Relative to the output voltage rated value for each output parameter Level output (Output parameter measurement accuracy) + (±0.2%f.s.) High-speed level output (Output parameter measurement accuracy) + (±0.2%f.s.) Waveform output (Output parameter measurement accuracy) + (±1.0%f.s.)
Output frequency band	Waveform output, high-speed level output At DC or 10 Hz to 30 kHz, accuracy is as defined above.
Maximum output voltage	Approx. ±12 V DC
Output update 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 SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Address	00 to 30

	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)
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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

4 3334 Specifications Discontinued

Basic Specifications

	<u> </u>						
Measural	ble lines	Single-phase, 2-wire (AC/DC)					
Measure	ment	Voltage, cu	rrent, active	e power, ap	parent pow	er, power fa	ctor,
paramete	ers	frequency,	integrated	current and	active pow	er, waveforr	n peak
		(voltage an	d current)				
Measureme	ent method	Simultaneo	us digital s	ampling of v	oltage and	current, Tru	ue RMS
Sampling F	requency	Approx. 74.4kHz					
Measurem	nent Ranges						
Vo	Currnet	100.00 mA	300.0 mA	1.0000 A	3.000 A	10.000 A	30.00 A
	15.000 V	1.5000 W	4.500 W	15.000 W	45.00 W	150.00 W	450.0 W
	30.00 V	3.000 W	9.000 W	30.00 W	90.00 W	300.0 W	900.0 W
	150.00 V	15.000 W	45.00 W	150.00 W	450.0 W	1.5000 kW	4.500 kW
	300.0 V	30.00 W	90.00 W	300.0 W	900.0 W	3.000 kW	9.000 kW
Frequency	y bandwidth	DC, 45Hz t	o 5kHz				

Measurement accuracy

1 year

3 years

(Guaranteed at 23°C±5, max. 80%rh, sine wave input, power factor=1, in-phase voltage =0V, accuracy specifications differ depending on usage period of 1 or 3 years)					
Warm-up time	3 minutes				
Period of guaranteed accuracy	3 years (bet	ter accuracy specifications	available for 1-year period)		
Effective measurement	Voltage, current:1% to 100% (Power: 0% to 100%)				
range	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)		
DC *	1 year	±0.1 %rdg. ±0.2 %f.s.			
DC	3 years	±0.1 %rdg.	±0.35 %f.s.		
45 Hz ≤ f ≤ 66 Hz	1 year	±0.1 %rdg. ±0.1 %f.s.	±0.2 %rdg.		
45 HZ ≤ l ≤ bb 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.		
OO FIZ < 1 S T KFIZ	3 years	±0.1 %rdg. ±0.35 %f.s.	±0.45 %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

±3.0 %rdg.

±4.5 %rdg.

Input Specifications

1 kHz < f ≤ 5 kHz *

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)

±4.5 %f.s.

Display Specifications

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

runctional Spec	cilications						
Integration	No.of displayed digits:	Six digits					
measurement	Current Integration:	From 0.00000mAh, Polarity-independent					
		integration and Sum value					
	Active power Integration:	From 0.00000mWh, Polarity-independent					
		integration and Sum value					
	Integration time:	1 min to 10000 h					
		Measurement accuracy of active power ±1dgt.					
Wave peak		tive and negative waveform of voltage/					
measurement	current (up to 300% of						
		y: ±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	Parameter output repre						
(D/A output)	Voltage, Current and Active power (3 simultaneous channels)						
	D/A select an item from Current integration, Active power integration,						
	Apparent power, power factor						
	Voltage output: ±2 VDC f.s. for each range						
	Output accuracy: ±0.5% f.s. + individual measurement accuracy						
Waveform output	Parameter output repre						
	Voltage, Current and Active power (3 simultaneous channels)						
	Voltage output: 1 VDC f.s. for each range						
A		% f.s. + individual measurement accuracy					
Average function		ied number of samples: 1, 2, 5, 10, 25, 50 or 100					
VT or CT ratio	VT ratios: 1, 2, 4, 10, 20						
		8, 10, 12, 15, 16, 20, 24, 25, 30, 40, 50, 60, 75,					
		300, 500, 1000, 2000, 3000, 5000, 10000					
External Interfaces	RS-232C interface: Inc						
	Asynchronous comn						
		full-duplex; Baud rate: 9600 bps (fixed)					
	GP-IB interface (Model						
		mpliant, IEEE-488.2 1987 reference					
Miscellaneous		value hold, Peak value hold, Key lock,					
	Backup function (preserves 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 Discontinued

Basic specifications

Measura	able lines	Single-pha	Single-phase, 2-wire (AC)						
Measurem	ent parameters	Voltage, Current, Active power, Apparent power, Power factor							
Measuren	nent method	Simultaneo	Simultaneous digital sampling of voltage and current, True RMS						
Sampling	g frequency	Approx. 48	kHz						
Measure	ment ranges								
	Currnet /oltage	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 4.00							4.000 kW		
Frequency	y bandwidth	45Hz to 5k	Hz						

Measurement accuracy

Suaranteed at 23°C±5, max. 80% h, sine wave input, power factor=1, in-phase voltage =0V, accuracy specifications differ depending on usage period of 1 or 3 years)								
Warm-up time	10 minutes	0 minutes						
Period of guaranteed accuracy	3 years (better accuracy spe	years (better accuracy specifications available for 1-year period)						
Effective measurement range		oltage, current, power: 10% to 150% leasurements below 1% of the voltage or current range will be zero suppressed.						
Effect of power factor (at pf=0.5)	Maximum ±0.4%±rdg. (4	Maximum ±0.4%±rdg. (45 to 66Hz)						
Temperature Coefficient	Maximum ±0.03%f.s./°C							
Frequency	Guaranteed Period	Voltage, current and active power						
45 Hz ≤ f ≤ 66 Hz	1 year	±0.1 %rdg. ±0.1 %f.s.						
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.						
00 HZ < 1 \ 1 KHZ	3 years	±0.1 %rdg. ±0.35 %f.s.						

* Accuracy not defined for current input exceeding 20A

±3.0 %f.s.

±4.5 %f.s.

1 year

3 years

Input specifications

 $1 \text{ kHz} < f \le 5 \text{ kHz}$

Input impedance	2.4 M Ω for voltage, 7 m Ω 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

Display indication	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)

Measurement Parameters	Formula
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	~	~	~	~	×	~	~
3310.	PW3337-02	3	AC/ DC	•	✓	•	×	~	~	~
	PW3337-03	3	AC/ DC	~	✓	~	~	~	•	~
	PW3336	2	AC/ DC	~	~	~	×	×	•	~
POWER METER PW3336	PW3336-01	2	AC/ DC	~	~	v	~	×	~	~
\$ 5000 \$ 33370.	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
	PW3335	1	AC/ DC	~	~	~	×	×	×	~
POWER METER	PW3335-01	1	AC/ DC	V	~	×	~	×	×	~
PW3335	PW3335-02	1	AC/ DC	V	~	~	×	~	×	~
**************************************	PW3335-03	1	AC/ DC	V	~	V	×	×	~	~
	PW3335-04	1	AC/ DC	~	~	~	✓	~	~	✓
AC/ DC POWER HITESTER 3334	3334	1	AC/ DC	×	×	~	×	V	×	×
Discontinued	3334-01	1	AC/ DC	×	×	~	~	~	×	×
POWER HITESTER 3333	3333	1	AC	×	×	~	×	~	×	×
Discontinued	3333-01	1	AC	×	×	~	~	~	×	×

Accessories : Instruction manual ×1, Power cord ×1

Communications and control options



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



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



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



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

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