

Power Analyzers

Improve Power Conversion Efficiency

POWER ANALYZER PW6001

New



USB2.0
LAN
GP-IB
RS-232C



- Basic accuracy of $\pm 0.02\%$ *1 for power measurement (*1 PW6001 accuracy only. Instrument delivers accuracy of $\pm 0.07\%$ even after the current sensor accuracy has been added.)
- High noise resistance and stability (80 dB/100 kHz CMRR, $\pm 0.01\%/^{\circ}\text{C}$ temperature characteristics)
- Accurate measurement even when the load is characterized by large fluctuations; TrueHD 18-bit resolution
- 10 ms data refresh while maintaining maximum accuracy (using a specially designed IC to make all measurements independently while performing simultaneous calculations.)
- DC basic accuracy of $\pm 0.07\%$, which is key for stable, accurate efficiency measurement
- Broad frequency band and sampling that are 10 times better than those of legacy models
- Synchronize 2 units for up to 12 channels*2 in real time
- *2 Two 6-channel models can be connected with an optical connection cable (over a max. length of 500 m) to enable numerical and waveform synchronization.
- Special triggers to enable waveform analysis and motor analysis without the need for an oscilloscope
- Wideband harmonic analysis up to the 100th order with a 1.5 MHz band

Order Code:	Configuration
PW6001-01	(1ch)
PW6001-11	(1ch, motor analysis, D/A output)
PW6001-02	(2ch)
PW6001-12	(2ch, motor analysis, D/A output)
PW6001-03	(3ch)
PW6001-13	(3ch, motor analysis, D/A output)
PW6001-04	(4ch)
PW6001-14	(4ch, motor analysis, D/A output)
PW6001-05	(5ch)
PW6001-15	(5ch, motor analysis, D/A output)
PW6001-06	(6ch)
PW6001-16	(6ch, motor analysis, D/A output)

Basic specifications (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)

Measurement line type	Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, three-phase 4-wire
Number of input channels	Max. 6 channels; each input unit provides 1 channel for simultaneous voltage and current input (Voltage measurement unit: Photoisolated input, resistance voltage divider, Current measurement unit: Isolated input from current sensor)
Measurement items	Voltage (U), current (I), active power (P), apparent power (S), reactive power (Q), power factor (λ), phase angle (ϕ), frequency (f), efficiency (η), loss (Loss), voltage ripple factor (Urf), current ripple factor (Irf), current integration (Ih), power integration (WP), voltage peak (Upk), current peak (Ipk) Harmonic measurement: Harmonic active power, select calculation order from 2nd order to 100th order Waveform recording: Voltage and current waveforms/ Motor pulse: Always 5 MS/s Motor waveforms: Always 50 kS/s, 16 bits Recording capacity: 1 Mword \times (voltage + current) \times number of channels + motor waveforms Motor analysis (PW6001-11 to -16 only): Voltage, Torque, Rotation, Frequency, Slip, or Motor output
Measurement range	Voltage range: 6 to 1500 V, 8 ranges Current range (Probe 1): 400 mA to 1 kA (depends on current sensor) Current range (Probe 2): 100 mA to 50 kA (depends on current sensor) Power range: 2.40000W to 4.50000MW (depends on combination of voltage and current range) Frequency range: 0.1 Hz to 2 MHz
Basic accuracy	Voltage: $\pm 0.02\%$ rdg. $\pm 0.02\%$ f.s. Current: $\pm 0.02\%$ rdg. $\pm 0.02\%$ f.s. + current sensor accuracy Active power: $\pm 0.02\%$ rdg. $\pm 0.03\%$ f.s. + current sensor accuracy
Synchronization frequency range	Power measurement: 0.1 Hz to 2 MHz Harmonic measurement: 45 Hz to 66 Hz (IEC standard mode), 0.1 Hz to 300 kHz (Wideband mode)
Frequency band	DC, 0.1 Hz to 2 MHz
Data update rate	Power measurement: 10 ms/ 50 ms/ 200 ms Harmonic measurement: 200 ms (IEC standard mode), 50 ms (Wideband mode)
Data save interval	OFF, 10 msec to 500 msec, 1 sec to 30 sec, 1 minute to 60 minutes User-selected from all measured values, including harmonic measured values, Specified measured values can be saved in internal memory or USB flash drive.
External interfaces	USB (memory), LAN, GP-IB, RS-232C, External control, Synchronization control
Power supply	100 to 240 V AC, 50/60 Hz, 200 VA max.
Dimensions and mass	430 mm (16.93 in)W \times 177 mm (6.97 in)H \times 450 mm (17.72 in)D, 14 kg (49.4 oz) (PW6001-16)
Accessories	Instruction Manual \times 1, Power cord \times 1, D-sub connector \times 1 (PW6001-1x only)

Note: Optional voltage cords and current sensor are required for taking measurements. *Specify the number of built-in channels and inclusion of Motor Analysis & D/A Output upon order for factory installation. These options cannot be changed or added at a later date

* To connect Probe 1, when using a sensor without "-05" in the model number, Conversion Cable CT9900 must be used to make the connection.

High-Precision Sensors	AC/DC CURRENT SENSOR CT8865-05	AC/DC CURRENT SENSOR 9709-05	AC/DC CURRENT SENSOR CT8863-05	AC/DC CURRENT SENSOR CT8862-05	AC/DC CURRENT PROBE CT6843-05	AC/DC CURRENT PROBE CT6841-05	CONVERSION CABLE CT9900
	CAT III 1000 V, 1000 A AC/DC rated current, DC to 20 kHz response, ϕ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length	CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, ϕ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length	CAT III 1000 V, 200 A AC/DC rated current, DC to 500 kHz response, ϕ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length	CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, ϕ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length	AC/DC 200 A rated current, DC to 500 kHz response, ϕ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length	AC/DC 20 A rated current, DC to 1 MHz response, ϕ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length	For current sensor connector, 10pin - 12pin

Wide-Band Current Probes	Current Probe CT6701	Current Probe CT6700	Clamp On Probe 3276	Clamp On Probe 3275	Clamp On Probe 3274	Clamp On Probe 3273-50
	1 mA to 5 A rms, DC to 120 MHz response, ϕ 5 mm (0.20 in), 1.5 m (4.92 ft) cord length	1 mA to 5 A rms, DC to 50 MHz response, ϕ 5 mm (0.20 in), 1.5 m (4.92 ft) cord length	10 mA to 30 A rms, DC to 100 MHz response, ϕ 5 mm (0.20 in) core dia., 1.5 m (4.92 ft) cord length	10 mA to 500 A rms, DC to 2 MHz response, ϕ 20 mm (0.79 in) core dia., 2 m (6.56 ft) cord length	10 mA to 150 A rms, DC to 10 MHz response, ϕ 20 mm (0.79 in) core dia., 2 m (6.56 ft) cord length	10 mA to 30 A rms, DC to 50 MHz response, ϕ 5 mm (0.20 in) core dia., 1.5 m (4.92 ft) cord length

Voltage measurement	Voltage Cord L9438-50	Voltage Cord L1000	Grabber Clip 9243	Other options
	Black/ Red, 3 m (9.84 ft) length, Alligator clip \times 2	Red/ Yellow/ Blue/ Gray each 1, Black 4, Alligator clip \times 8, 3m (9.84ft) length	Attaches to the tip of the connection cable, 196 mm (7.72 in) length, CAT III 1000 V	The following made-to-order items are also available. Please contact your Hioki distributor or subsidiary for more information. OPTICAL CONNECTION CABLE Max. 500 m (1640.55 ft) RACK MOUNT BRACKETS (For EIA, JIS) CARRYING CASE (hard trunk, with casters)

Connection Options	Optical Connection Cable L6000	LAN Cable 9642	RS-232C Cable 9637	Connection Cable 9444	GP-IB Connector Cable 9151-02	Connection Cord L9217
	50/125 μm wavelength multimode fiber, 10 m (32.81 ft) length	Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length	For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length	For the Printer 9442, 9 pin - 9 pin, 1.5 m (4.92 ft) length	2 m (6.56 ft) length	Cord has insulated BNC connectors at both ends, 1.6 m (5.25 ft) length

*9444 for external control interface, L9217 for motor signal input

Maximizing the Efficiency of Energy Conversion

POWER ANALYZER 3390-10



LAN /
USB 2.0 /
RS-232C /
CE

True RMS

- Super precise $\pm 0.1\%$ accuracy model to meet the demanding needs of today
- Switch from one range to another and still maintain the same $\pm 0.1\%$ accuracy on all ranges
- Guaranteed accuracy period is extended another 6 months from the basic Model 3390 (other functions remain the same)
- Advanced motor analysis functions (measures the electric angle and supports vector control)
- High-speed harmonic analysis function (50 ms data refresh rate)
- Noise analysis function for inverters (using FFT analysis technology)
- Inverter power measurement with the convenience of clamp on sensors

Order Code: **3390-10** (Super Precise Version)

Basic specifications (Where different from Model 3390. Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

Basic accuracy (45Hz to 66Hz)	Voltage: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. Current: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. (Defined at combined accuracy with dedicated sensors) Active power: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. (Defined at combined accuracy with dedicated sensors) <i>Note: Accuracy for the high accuracy Models 3390-10 and Current Sensors are not defined individually. Please use these products in combination to obtain $\pm 0.1\%$ accuracy.</i>
Accessories	Instruction Manual for Model 3390-10 $\times 1$, Instruction Manual for Model 3390 $\times 1$, Power cord $\times 1$, Measurement Guide $\times 1$, USB cable $\times 1$, Measurement cable label sheet $\times 2$, D-sub connector $\times 1$ (when 9792 or 9793 is installed)
Other Specifications	Same as Model 3390

Note: Data sheets for specific combinations of Model 3390-10 and current sensors available upon request. Note: Optional current sensor and voltage cord are necessary to measure current or power parameters.

Options other than current sensors are the same as for the 3390

*Use with the 3390-10 only, Dedicated Pull-through Current Sensors (High Accuracy Models)

AC/DC CURRENT SENSOR 9709-10 CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, $\phi 36$ mm (1.42 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT SENSOR CT6863-10 CAT III 1000 V, 200 A AC/DC rated current, DC to 500 kHz response, $\phi 24$ mm (0.94 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT SENSOR CT6862-10 CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, $\phi 24$ mm (0.94 in) core dia., 3 m (9.84 ft) cord length

Measure the Secondary Side of Inverters with Cutting Edge Technology

POWER ANALYZER 3390



LAN /
USB 2.0 /
RS-232C /
CE

True RMS

- Advanced motor analysis functions (measures the electric angle and supports vector control)
- High-speed harmonic analysis function (50 ms data refresh rate)
- Noise analysis function for inverters (using FFT analysis technology)
- Inverter power measurement with the convenience of clamp on sensors
- Achieve the same superior accuracy as direct wiring method meters at maximum $\pm 0.16\%$ (when combined with the 9709)
- LAN, USB, and CF card - a rich array of interfaces

Order Code: **3390** (main unit only)

Note: Optional current sensor is necessary to measure current or power parameters.

Basic specifications (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)

Measurement line type	Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, three-phase 4-wire, Voltage 4 channels, Current 4 channels, Isolated between each channel
Measurement items	Voltage, Current, Voltage/current waveform peak, Active power, Reactive power, Apparent power, Power factor, Phase angle, Frequency, Current integration, Power integration, Efficiency, Loss, Voltage/current ripple factor Noise measurement (FFT processing): RMS spectrum of voltage/current Harmonic measurement: RMS value, Content factor, Phase angle, Total distortion, Disequilibrium factor Additional functions (With optional 9791 or 9793 installed in the main unit): Torque, Rotation, Frequency, Slip, or Motor output
Harmonic measurement	Input: 4 ch, Synchronization frequency range: 0.5 Hz to 5 kHz, Number of harmonic orders: Max. 100th order
Noise measurement	Number of channels: 1 ch (select one channel from CH1 to CH4), Maximum analysis frequency: 100 k/50 k/20 k/10 k/5 k/2 kHz
Measurement range	Voltage range: 15 to 1500 V, 7 ranges Current range: 400 mA to 500 A (depends on current sensor, 20A/50A/200A or 500A rated) Power range: 6.0000 W to 2.2500 MW (depends on combination of voltage and current range) Frequency range: 0.5 Hz to 5 kHz
Basic accuracy	Voltage: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. Current: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. + current sensor accuracy Active power: $\pm 0.05\%$ rdg. $\pm 0.05\%$ f.s. + current sensor accuracy
Synchronization frequency range	0.5 Hz to 5 kHz
Frequency band	DC, 0.5 Hz to 150 kHz
Data update rate	50 ms (For harmonic measurement, depends on the synchronization frequency when less than 45 Hz)
Display refresh rate	200 ms (Independent of internal data update rate; waveform and FFT depend on the screen)
Data save interval	OFF, 50 msec to 500 msec, 1 sec to 30 sec, 1 minute to 60 minutes, 15 settings
External interfaces	LAN, USB (communication/memory), RS-232C, CF card, Synchronization control
Power supply	100 to 240 V AC, 50/60 Hz, 140 VA max.
Dimensions and mass	340 mm (13.39 in)W \times 170 mm (6.69 in)H \times 157 mm (6.18 in)D, 4.8 kg (10.6 lb)
Accessories	Instruction Manual $\times 1$, Power cord $\times 1$, Measurement Guide $\times 1$, USB cable $\times 1$, Measurement cable label sheet $\times 2$, D-sub connector $\times 1$ (when 9792 or 9793 is installed)

*Must specify when ordering

MOTOR TESTING OPTION 9791 Factory-installed option - not user installable, built in the main unit	D/A OUTPUT OPTION 9792 Factory-installed option - not user installable, built in the main unit	MOTOR TESTING & D/A OUTPUT OPTION 9793 Factory-installed option - not user installable, built in the main unit

AC/DC CURRENT SENSOR CT6865 CAT III 1000 V, 1000 A AC/DC rated current, DC to 20 kHz response, $\phi 36$ mm (1.42 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT SENSOR 9709 CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, $\phi 36$ mm (1.42 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT SENSOR CT6863 CAT III 1000 V, 200 A AC/DC rated current, DC to 500 kHz response, $\phi 24$ mm (0.94 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT SENSOR CT6862 CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, $\phi 24$ mm (0.94 in) core dia., 3 m (9.84 ft) cord length	UNIVERSAL CLAMP ON CT 9279 600 Vrms insulated wire, 500 A AC/DC rated current, DC to 20 kHz response, $\phi 40$ mm (1.57 in) core dia., 3 m (9.84 ft) cord length, not CE marked	AC/DC CURRENT PROBE CT6843 AC/DC 200 A rated current, DC to 500 kHz response, $\phi 20$ mm (0.79 in) core dia., 3 m (9.84 ft) cord length	AC/DC CURRENT PROBE CT6841 AC/DC 20 A rated current, DC to 1 MHz response, $\phi 20$ mm (0.79 in) core dia., 3 m (9.84 ft) cord length	CLAMP ON SENSOR 9272-10 CAT III 600 Vrms, 20 A/200 A AC rated current, 1 Hz to 100 kHz response, $\phi 46$ mm (1.81 in) core dia., 3 m (9.84 ft) cord length

VOLTAGE CORD L9438-50 Black/ Red, 3 m (9.84 ft) length, Alligator clip $\times 2$	GRABBER CLIP 9243 Attaches to the tip of the Cord L9430/9197/9322 or other, CAT III 1000 V, 196 mm (7.72 in) length	CONNECTION CORD L9217 Cord has insulated BNC connectors at both ends, signal output use, 1.6 m (5.25 ft) length	LAN CABLE 9642 Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length	CONNECTION CABLE 9683 For synchronization, cable length 1.5 m (4.92 ft)	RACK MOUNT BRACKETS Please contact HIOKI for rack mounting

CARRYING CASE 9794 Hard trunk to protect your 3390 during transportation, with casters.

Eliminate the risk of short-circuits and electrical accidents

CLAMP ON POWER LOGGER PW3365



GOOD DESIGN AWARD 2013
BEST 100

GOOD DESIGN AWARD 2014
DESIGN FOR THE FUTURE AWARD

For Safety Voltage Sensor
PW9020

Current sensors : sold separately

- The PW3365's dedicated voltage sensor delivers the world's first no-metal-contact measurement.
- Supports single to three-phase, 4-wire circuits
- Measure between 90V to 520V
- Slim, compact design that can be placed anywhere
- Store months of data on SD cards
- The QUICK SET function guides you in making the right connections

Order Code: PW3365-20 (main unit only)

Note: Clamp On Power Logger PW3365-20 by itself does not support current and power measurements. Current and power measurements require clamp on sensors, sold separately. Use only HIOKI SD cards guaranteed to work for saving measurement data (options, sold separately).

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

Measurement line & number of circuits	50/60 Hz, Single phase 2 wires (1/2/3 circuits), Single phase 3 wires (1 circuit), Three phases 3 wires (1 circuit), Three phases 4 wires (1 circuit), Current only: 1 to 3 channels
Measurement items	Voltage RMS, current RMS, voltage fundamental wave value, current fundamental wave value, voltage fundamental wave phase angle, current fundamental wave phase angle, frequency (UI), voltage waveform peak (absolute value), current waveform peak (absolute value), active power, reactive power, apparent power, power factor (with lag/lead display) or displacement power factor (with lag/lead display), active energy (consumption, regeneration), reactive energy (lag, lead), energy cost display, active power demand quantity (consumption, regeneration), reactive power demand quantity (lag, lead), active power demand value (consumption, regeneration), reactive power demand value (lag, lead), power factor demand
Voltage ranges	400 V AC (Effective measurement range: 90.0 V to 520.0 V)
Current ranges	500.00 mA to 5.0000 kA AC (depends on current sensor in use), 50.0000 mA to 5.0000 A AC (Leak clamp on sensor only)
Power ranges	200.00 W to 6.0000 MW (Depends on voltage/current combination and measured line type)
Basic accuracy	Voltage : $\pm 1.5\%$ rdg. $\pm 0.2\%$ f.s.(combined accuracy with PW3365-20 + PW9020) Current : $\pm 0.3\%$ rdg. $\pm 0.1\%$ f.s. + clamp sensor accuracy Active power : $\pm 2.0\%$ rdg. $\pm 0.3\%$ f.s. + clamp sensor accuracy (at power factor = 1)
Display update rate	0.5 sec (except when accessing SD card or internal memory, or during LAN/USB communication)
Save destination	SD Memory card, or internal memory at real time
Data save interval	1 sec to 30 sec, 1 minute to 60 minutes, 14 selections
Save items	Measurement value save: Average only / Average, Maximum, Minimum value Screen copy: BMP form (saved every 5 min. at minimum interval time) Waveform save: Binary waveform data
Interfaces	SD memory card HTTP server function, remote settings via communication program, data download USB 2.0: When connected to a PC, the SD Card and internal memory are recognized as removable storage devices, remote settings via communication program, data download Pulse output: proportional to active power consumption when measuring integral power consumption, Isolated open-collector signal
Functions	Connection check, Quick Set navigation guide, clock
Power supply	AC adapter Z1008: (100 to 240 V AC, 50/60 Hz), 45 VA (including AC adapter) Battery pack 9459: (DC 7.2 V, 3 VA, charging time 6 hr 10 m), 5 hours of continuous use (with back light off)
Dimensions and mass	180 mm (7.09 in)W x 100 mm (3.94 in)H x 48 mm (1.89 in)D, 540 g (19 oz) without PW9002 180 mm (7.09 in)W x 100 mm (3.94 in)H x 68 mm (2.68 in)D, 820 g (28.9 oz) with PW9002
Accessories	Safety Voltage Sensor PW9020 x1 set, AC adapter Z1008 x1, USB cable x1, Instruction manual x1, Measurement guide x1, Color spiral tubes x1 set: red, yellow, blue/four each, Spiral tubes for grouping clamp sensor cords x10

Voltage measurement

*PW9020 x4 pieces are bundled, additional single sensors also available

SAFETY VOLTAGE SENSOR PW9020
For PW3365, 3 m (9.84 ft) length

Current measurement

*For clamp current sensor options, please see p.61

Storage media

SD Card Precaution
Use only SD Cards sold by HIOKI. Compatibility and performance are not guaranteed for SD cards made by other manufacturers. You may be unable to read from or save data to such cards.

SD MEMORY CARD 2GB Z4001
2GB capacity

Power supply

*Z1008 is bundled, Model 9459 is a replacement battery pack included with the Battery Set PW9002.

AC ADAPTER Z1008
100 to 240 V AC

BATTERY SET PW9002
Battery case and Battery Pack 9459 Set

BATTERY PACK 9459
NiMH, Charges while installed in the main unit

Other options

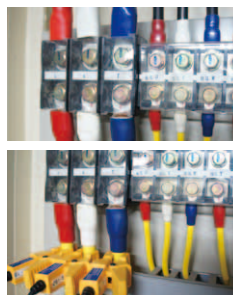
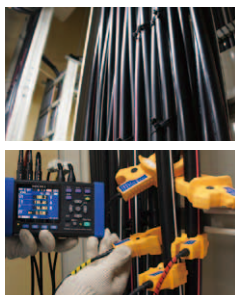
POWER LOGGER VIEWER SF1001
Easy graphical processing of measurement data saved with the PW3360/3365 series, 3169 series on a PC

LAN CABLE 9642
Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.4 ft) length

CARRYING CASE C1008
For PW3365, for storing Current sensor x3, Voltage sensor x4 pieces

CARRYING CASE C1005
For PW3365/3360 series, for storing options

PW3365-20: Measure in potentially hazardous locations



Locations without energized parts

Locations with covered terminals

Locations with a risk of electric shock

Measure on the outside of cables

Measure without removing the covers

Measure at safer points

Clamp-on Power Meters

Identify Your Power Condition to Reveal Energy Saving Ideas

CLAMP ON POWER LOGGER PW3360



Current sensors :
Sold separately

- Supports single to three-phase, 4-wire circuits
- Measure between 90V to 780V
- Simultaneously measure up to three single-phase, 2-wire circuits (in the same power system)
- Slim, compact design that can be placed anywhere
- Store months of data on SD cards
- The QUICK SET function guides you in making the right connections
- Choose PW3360-21 for harmonic measurements up to the 40th order

Order Code: **PW3360-20** (main unit only)
PW3360-21 (harmonic analysis model)

Note: At least one optional current sensor is necessary to measure current or power parameters. To store measurement data, use only the guaranteed SD cards sold by HIOKI.

Measurement examples

Where no AC power is available

Battery* power provides about eight hours of continuous operation. In addition, a Voltage Line Power Adapter* is available to power the PW3360 series from the measurement lines.

In severe temperature environments

The operating temperature range extends from -10°C (14°F) to 50°C (122°F). Even under battery operation, measurements can be performed from 0°C (32°F) to 40°C (104°F).

Reduce energy usage in factories

The pulse input function can be used to record power data and production volume counts simultaneously. The power data and pulse volume (production volume) information are useful for unit cost production management.



Voltage measurement

*L9438-53 is bundled with the PW3360-20/-21

VOLTAGE CORD L9438-53
Black/ Red/ Yellow/ Blue, 3 m (9.84 ft) length, Alligator clip ×4

MAGNETIC ADAPTER 9804-01
Attaches to the tip of the Voltage Cord, Red ×1

MAGNETIC ADAPTER 9804-02
Attaches to the tip of the Voltage Cord, Black ×1

Power supply

*Z1006 is bundled with the PW3360-20/-21. Model 9459 is a replacement battery pack included with the Battery Set PW9002.

AC ADAPTER Z1006
100 to 240 V AC

VOLTAGE LINE POWER ADAPTER PW9003
For PW3360s, supplies power from measurement lines, up to 240V AC

BATTERY SET PW9002
Battery case and Battery Pack 9459 Set

BATTERY PACK 9459
NiMH, Charges while installed in the main unit

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

Measurement line & number of circuits	50/60 Hz, Single phase 2 wires (1/2/3 circuits), Single phase 3 wires (1 circuit), Three phases 3 wires (1 circuit), Three phases 4 wires (1 circuit), Current only: 1 to 3 channels
Measurement items	Voltage RMS, current RMS, voltage fundamental wave value, current fundamental wave value, voltage fundamental wave phase angle, current fundamental wave phase angle, frequency (UI), voltage waveform peak (absolute value), current waveform peak (absolute value), active power, reactive power (with lag/lead display), apparent power, power factor (with lag/lead display) or displacement power factor (with lag/lead display), active energy (consumption, regeneration), reactive energy (lag, lead), energy cost display, active power demand quantity (consumption, regeneration), reactive power demand quantity (lag, lead), power factor demand, pulse input [PW3360-21 only]: Harmonic voltage level, harmonic current level, harmonic power level, content percentage, phase angle, total harmonic distortion (THD-F or THD-R), up to 40th order
Voltage ranges	600 V AC (Effective measurement range: 90.00 V to 780.00 V)
Current ranges	500.00 mA to 5.0000 kA AC (depends on current sensor in use), 50.000 mA to 5.0000 A AC (Leak clamp on sensor only)
Power ranges	300.00 W to 9.0000 MW (Depends on voltage/current combination and measured line type)
Basic accuracy	Voltage : ±0.3% rdg. ±0.1% f.s. Current : ±0.3% rdg. ±0.1% f.s. + clamp sensor accuracy Active power : ±0.3% rdg. ±0.1% f.s. + clamp sensor accuracy (at power factor = 1)
Display update rate	0.5 sec (except when accessing SD card or internal memory, or during LAN/USB communication)
Save destination	SD Memory card, or internal memory at real time
Data save interval	1 sec to 30 sec, 1 minute to 60 minutes, 14 selections
Save items	Measurement value save: Average only / Average, Maximum, Minimum value [PW3360-21 only]: Harmonic data save: Average only / average, maximum, minimum value in binary format Screen copy: BMP form (saved every 5 min. at minimum interval time) Waveform save: Binary waveform data
Interfaces	SD memory card HTTP server function, remote settings via communication program, data download USB 2.0: When connected to a PC, the SD Card and internal memory are recognized as removable storage devices, remote settings via communication program, data download Pulse output: proportional to active power consumption when measuring integral power consumption, Isolated open-collector signal
Functions	Connection check, Quick Set navigation guide, clock, pulse input
Power supply	AC adapter Z1006: (100 to 240 V AC, 50/60 Hz), 40 VA (including AC adapter) Battery pack 9459: (DC 7.2 V, 3 VA, charging time 6 hr 10 m), 8 hours of continuous use (with back light off)
Dimensions and mass	180 mm (7.09 in)W × 100 mm (3.94 in)H × 48 mm (1.89 in)D, 550 g (19.4 oz) without PW9002 180 mm (7.09 in)W × 100 mm (3.94 in)H × 67.2 mm (2.65 in)D, 830 g (29.3 oz) with PW9002
Accessories	Voltage cord L9438-53 ×1 set, AC adapter Z1006 ×1, USB cable ×1, Instruction manual ×1, Measurement guide ×1, Color spiral tubes ×1 set: red, yellow, blue/two each, for color-coding clamp sensors, Spiral tubes for grouping clamp sensor cords ×5

Storage media

SD Card Precaution
Use only SD Cards sold by HIOKI. Compatibility and performance are not guaranteed for SD cards made by other manufacturers. You may be unable to read from or save data to such cards.

SD MEMORY CARD 2GB Z4001
2GB capacity

Other options

POWER LOGGER VIEWER SF1001
Easy graphical processing of measurement data saved with the PW3360/3365 series, 3169 series on a PC

LAN CABLE 9642
Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length

CARRYING CASE C1005
For PW3365/3360 series, for storing options

Shared options for PW3365-20, PW3360-20/-21, 3197, 3196, 3169-20/-21 (CLAMP ON SENSORS)

For power or load current measurement (1 sensor necessary for single-phase measurements, and 2 or 3 sensors required for 3-phase measurements)

CLAMP ON SENSOR 9694
5A AC rated current, φ 15 mm (0.59 in) core dia., 3 m (9.84 ft) length

CLAMP ON SENSOR 9660
100A AC rated current, φ 15 mm (0.59 in) core dia., 3 m (9.84 ft) length

CLAMP ON SENSOR 9661
500A AC rated current, φ 46 mm (1.81 in) core dia., 3 m (9.84 ft) length

FLEXIBLE CLAMP ON SENSOR CT9667
5000/500 A AC rated current, φ 25.4 mm (10.0 in) core dia., Cable length: Between sensor - box 2 m (6.56 ft), Output cable 1 m (3.28 ft)

CLAMP ON SENSOR 9669
1000A AC rated current, φ 55 mm (2.17 in) core dia., 3 m (9.84 ft) length

CLAMP ON SENSOR 9695-02
50A AC rated current, φ 15 mm (0.59 in) core dia., Requires the Connection cord 9219

CLAMP ON SENSOR 9695-03
100A AC rated current, φ 15 mm (0.59 in) core dia., Requires the Connection cord 9219

CONNECTION CORD 9219
Connect with the 9695-02/-03, Output BNC terminal

Shared options for PW3365-20, PW3360-20/-21, 3197
For leak current measurement (not capable of power measurement)

CLAMP ON LEAK SENSOR 9675
10A AC rated current, φ 30 mm (1.18 in) core dia., 3 m (9.84 ft) length

CLAMP ON LEAK SENSOR 9657-10
10A AC rated current, φ 40 mm (1.57 in) core dia., 3 m (9.84 ft) length

Power Meters/Power Quality Analyzers

The New World Standard for Power Quality Analysis, with Recording & Analyzing According to Class A Requirements for PQAs

POWER QUALITY ANALYZER PW3198



Clamp sensors : Sold separately



- Verify power problems in accordance with the IEC61000-4-30 Class A standard
- High accuracy and continuous gapless recording (V: $\pm 0.1\%$ of nominal voltage, A and W: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s.)
- CAT IV 600V - safe enough for incoming power lines
- Broadband voltage range lets you measure even high-order harmonic components of up to 80 kHz
- Wide dynamic range from low voltages up to 1300V (3P4W line-to-line voltage)
- Maximum 6000V transient overvoltage up to 700kHz
- LAN, USB and SD card interfaces
- Optional GPS BOX for synchronizing multiple devices

Order Code: PW3198 (main unit only)
PW3198-90 (set model with the PQA-HiView Pro 9624-50)

Note: Voltage can be measured with the main unit alone. An optional current sensor is necessary to measure current or power parameters. Use the PQA-HiView Pro 9624-50 (version 2.00 or later) with a PC to analyze the data collected to the SD card.

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

Measurement line type	Single-phase 2-wire, Single-phase 3-wire, Three-phase 3-wire or Three-phase 4-wire plus one extra input channel (must be synchronized to reference channel during AC/DC measurement)
Voltage ranges	Voltage measurement: 600.00 V rms Transient measurement 6.0000 kV peak
Current ranges	500.00 mA to 5.0000 kA AC (depends on current sensor in use)
Basic accuracy	Voltage: $\pm 0.1\%$ of nominal voltage Current: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s. + current sensor accuracy Active power: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s. + current sensor accuracy
Measurement items	1. Transient over voltage : 2 MHz sampling 2. Frequency cycle : Calculated as one cycle, 40 to 70 Hz 3. Voltage (1/2) RMS: one cycle calculation refreshed every half cycle Current (1/2) RMS: half-cycle calculation 4. Voltage swell, Voltage dips, Voltage interruption 5. Inrush current 6. Voltage waveform comparison 7. Instantaneous flicker value: As per IEC61000-4-15 8. Frequency: Calculated as 10 or 12 cycles, 40 to 70 Hz 9. 10-sec frequency: Calculated as the whole-cycle time during the specified 10 s period, 40 to 70 Hz 10. Voltage waveform peak, Current waveform peak 11. Voltage, Current, Active power, Apparent power, Reactive power, Active energy, Reactive energy, Power factor, Displacement power factor, Voltage unbalance factor, Current unbalance factor (negative-phase, zero-phase) 12. High-order harmonic component (voltage/ current): 2 kHz to 80 kHz 13. Harmonic/ Harmonic phase angle (voltage/ current), Harmonic power: 0th to 50 th orders 14. Harmonic voltage-current phase angle: 1th to 50 th orders 15. Total harmonic distortion factor (voltage/ current) 16. Inter harmonic (voltage/ current): 0.5 Hz to 49.5 Hz 17. K Factor (multiplication factor) 18. IEC Flicker, Δ V10 Flicker
Record	55 weeks (with repeated recording set to [1 Week], 55 iterations) 35 days (with repeated recording set to [OFF])
Interfaces	SD/SDHC card, RS-232C, LAN (HTTP server function), USB2.0
Display	6.5-inch TFT color LCD (640 × 480 dots)
Power supply	AC adapter Z1002 (12 V DC, Rated power supply 100 V AC to 240 V AC, 50/60 Hz) Battery pack Z1003 (Ni-MH 7.2 V DC 4500 mAh)
Dimensions and mass	300 mm (11.81 in)W × 211 mm (8.31 in)H × 68 mm (2.68 in)D (excluding protrusions), 2.6 kg (91.7 oz) (including battery pack)
Accessories	Instruction manual ×1, Measurement guide ×1, Voltage cord L1000 ×1 set (Red/Yellow/Blue/Gray, each 1, Black ×4, Alligator clip ×8), Spiral tube ×20, Input Cable Labels ×1, AC adapter Z1002 ×1, Strap ×1, USB cable (1 m 3.28 ft length) ×1, Battery pack Z1003 ×1, SD memory card 2GB Z4001 ×1

PW3198 Options in Detail

For power or load current measurement (1 sensor necessary for single-phase measurements, and 2 or 3 sensors required for 3-phase measurements)

Current measurement								
	CLAMP ON SENSOR 9694 5A AC rated current, ϕ 15 mm (0.59 in) core dia., 3 m (9.84 ft) length	CLAMP ON SENSOR 9660 100A AC rated current, ϕ 15 mm (0.59 in) core dia., 3 m (9.84 ft) length	CLAMP ON SENSOR 9661 500A AC rated current, ϕ 46 mm (1.81 in) core dia., 3 m (9.84 ft) length	FLEXIBLE CLAMP ON SENSOR CT9667 5000/500 A AC rated current, ϕ 254 mm (10.0 in) core dia., Cable length: Between sensor - box 2 m (6.56 ft), Output cable 1 m (3.28 ft)	CLAMP ON SENSOR 9669 1000A AC rated current, ϕ 55 mm (2.17 in) core dia., 3 m (9.84 ft) length	CLAMP ON SENSOR 9695-02 50A AC rated current, ϕ 15 mm (0.59 in) core dia., Requires the Connection cord 9219	CLAMP ON SENSOR 9695-03 100A AC rated current, ϕ 15 mm (0.59 in) core dia., Requires the Connection cord 9219	CONNECTION CORD 9219 Connect with the 9695-02/-03, Output BNC terminal

For leak current measurement (not capable of power measurement)

Leak current		
	CLAMP ON LEAK SENSOR 9675 10A AC rated current, ϕ 30 mm (1.18 in) core dia., 3 m (9.84 ft) length	CLAMP ON LEAK SENSOR 9657-10 10A AC rated current, ϕ 40 mm (1.57 in) core dia., 3 m (9.84 ft) length

For clamp sensor Adapter

CLAMP ON ADAPTER 9290-10 CT for 1000A AC, secondary current 1/10 of primary

Current measurement

CLAMP ON AC/DC SENSOR CT9691-90 DC to 10kHz (-3dB), 100A, Output 0.1 V/f.s., Cord length 2 m (6.56 ft)	CLAMP ON AC/DC SENSOR CT9692-90 DC to 20kHz (-3dB), 200A, Output 0.2 V/f.s., Cord length 2 m (6.56 ft)	CLAMP ON AC/DC SENSOR CT9693-90 DC to 15kHz (-3dB), 2000A, Output 0.2 V/f.s., Cord length 2 m (6.56 ft)

*The L1000 is bundled

Voltage measurement						
	VOLTAGE CORD L1000 Red/Yellow/Blue/Gray each 1, Black 4, Alligator clip ×8, 3m (9.84ft) length	WIRING ADAPTER PW9000 For three-phase 3-wire	WIRING ADAPTER PW9001 For three-phase 4-wire	GRABBER CLIP 9243 Attaches to the tip of the Cord L4930/9197/9322 or other, CAT III 1000 V, 196 mm (7.72 in) length	MAGNETIC ADAPTER 9804-01 Attaches to the tip of the Voltage Cord, Red ×1	MAGNETIC ADAPTER 9804-02 Attaches to the tip of the Voltage Cord, Black ×1

*The Z1002, Z1003 are bundled

Power supply		
	AC ADAPTER Z1002 For main unit, 100 to 240 V AC	BATTERY PACK Z1003 NiMH, Charges while installed in the main unit

*The Z4001 is bundled

Storage media	
	SD MEMORY CARD 2GB Z4001 For storing measurement data

SD Card Precaution
Use only the SD Card Z4001 sold by HIOKI. Compatibility and performance are not guaranteed for SD cards made by other manufacturers. You may be unable to read from or save data to such cards.

Other options

GPS BOX PW9005 To synchronize the PW3198 clock to UTC	PQA-HiVIEW PRO 9624-50 Analyze data on the PC. Convenient report creation function	LAN CABLE 9642 Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.4 ft) length	CARRYING CASE C1001 Soft type, Includes compartment for options	CARRYING CASE C1002 For the PW3198, hard trunk type, Includes compartment for options

The Most Comprehensive Portable PQA on the Market

POWER QUALITY ANALYZER 3197



Clamp sensors : Sold separately

USB 2.0

CE

True RMS

- Single-phase 2-wire/single-phase 3-wire/three-phase 3-wire/three-phase 4-wire
- Catch power quality problems on the fly, before they catch you
- Record measurement data on internal memory for easy transfer to a PC via USB
- Analyze measurement data on a bundled PC application software

Order Code: 3197 (main unit only)

Note: Optional current sensor is necessary to measure current or power parameters.

<p>Voltage measurement</p> <p>*The L9438-55 is bundled</p> <p>VOLTAGE CORD L9438-55 Black x4, 3 m (9.84 ft) length, Alligator clip x4</p>	<p>Power supply</p> <p>*The 9459, 9418-15 are bundled</p> <p>BATTERY PACK 9459 NiMH, Charges while installed in the main unit</p> <p>AC ADAPTER 9418-15 100 to 240V AC</p>	<p>Other options</p> <p>PQA-HiVIEW PRO 9624-50 Analyze data on the PC, Convenient report creation function</p>
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■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)	
Measurement line type	Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, three-phase 4-wire
Measurement range	[Voltage] 600.0 V AC, [Current] 500.0 mA to 5.000 kA AC (depends on current sensor in use), [Power] 300.0 W to 9.00 MW (depends on combination of current range and line type)
Basic accuracy	Voltage: $\pm 0.3\%$ rdg. $\pm 0.2\%$ f.s. Current: $\pm 0.3\%$ rdg. $\pm 0.2\%$ f.s. + current sensor accuracy Active power: $\pm 0.3\%$ rdg. $\pm 0.2\%$ f.s. + current sensor accuracy (at power factor=1)
Measurement items	1. RMS Voltage and Current (200 ms calculation) 2. Voltage (1/2) RMS: one cycle calculation refreshed every half cycle 3. Current (1/2) RMS: half-cycle calculation 4. Frequency 5. Active Power/ Reactive Power/ Apparent Power/ Power Factor/ Displacement Power Factor/ Active or Reactive Energy Consumption 6. Demand (Active or Reactive power) 7. Up to 50th Harmonic Analysis (Time series measurement or recording is not available) 8. Peak Voltage and Current 9. Total harmonic voltage distortion ratio 10. Voltage Unbalance Factor 11. K Factor (Time series recording is not capable) 12. Total harmonic current distortion ratio (Time series recording is not available)
Event Detection	1. Voltage Swells (Rise), Voltage Dips (Drop), Interruptions: RMS value detected using voltage (1/2) measured every half cycle 2. Inrush Current: RMS value detected using current (1/2) every half cycle 3. Transient Overvoltage: 50 Vrms or more detection, 10 to 100 kHz 4. Timer: Detect events at preset intervals 5. Manual: Detect events when keys are pressed
Number of Recordable Events	50 event waveforms, 20 event voltage fluctuation graphs, 1 inrush current graph, 1000 event counts
Interfaces	USB 2.0 (Communication with the PC)
Display	4.7-inch color STN LCD
Power supply	AC adapter 9418-15 (100 - 240 V, 50/60 Hz), Battery pack 9459, Continuous use 6 hr (LCD Back-light auto-OFF 5 min.), 23 VA max.
Dimensions and mass	128 mm (5.04 in)W x 246 mm (9.69 in)H x 63 mm (2.48 in)D, 1.2 kg (42.3 oz) (with Battery pack)
Accessories	Voltage cord L9438-55 x1, AC adapter 9418-15 x1, Power cord x1, Battery pack 9459 x1, Input terminal labels x1, Input cord labels x1, Strap x1, Instruction manual x1, Measurement guide x1, USB Cable x1, CD-R (Applications software) x1, Carrying case x1

Current sensors

*For clamp current sensor options, please see p.61

Power Analyzers

Demand Measurement up to 4 Circuits and Simultaneous Harmonics Analysis

CLAMP ON POWER HiTESTER 3169



Clamp sensors : Sold separately

RS-232C

CE

True RMS

- Simultaneously measure demand and harmonic waveforms that share the same voltage line over 4-circuits
- Data can be saved onto a PC card
- High-speed and continuous processing to measure individual waveforms
- High-speed D/A output for analog graph recording (Model 3169-21)

Order Code: 3169-20 (basic model)
3169-21 (with D/A output function model)

Note: Optional current sensor is necessary to measure current or power parameters. To store measurement data, use only the guaranteed PC cards sold by Hioki.

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)	
Measurement line & number of circuits	Single-phase 2-wires (4 circuits), Single-phase 3-wires (2 circuits), Three-phases 3-wires (2 or 1 circuit), and Three-phases 4-wires (1 circuit) Note: 50 or 60 Hz, and that share the same voltage line
Measurement items	Voltage, Current, Active/ reactive/ apparent power, Active/ reactive power integration, Power factor, Frequency, Harmonic waveform value (up to 40th order)
Measurement range	[Voltage] 150.00 V to 600.00 V AC, 3 ranges, [Current] 500.00 mA to 5.0000 kA AC (depends on current sensor in use), [Power] 75.000 W to 900.00 kW (depends on combination of voltage, current range, and measurement line)
Basic accuracy	AC Voltage: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s. AC Current: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s. + current sensor accuracy Active power: $\pm 0.2\%$ rdg. $\pm 0.1\%$ f.s. + current sensor accuracy (at power factor = 1) Clamp on sensor 9661: $\pm 0.3\%$ rdg. $\pm 0.01\%$ f.s. (different from each sensor models)
Measurement method	Digital sampling, PLL synchronization or 50/60 Hz fixed clock
Display refresh rate	2 times /sec (except when a PC card accessing, or RS-232C communications)
Data save interval	Standard interval: 1 sec to 30 sec, 1 minute to 60 minutes, 13 selects Fast interval: A single waveform, or 0.1, 0.2, or 0.5 sec (at instant value only)
Frequency characteristics	Fundamental waveforms up to the 50th order $\pm 3\%$ f.s. + measurement accuracy (of a 45 to 66 Hz fundamental waveform)
Other functions	Error connect check, language selection, display hold, setting backup, power shut off management, key lock, [3169-21 only] D/A output 4 channels, ± 5 V DC f.s.)
Power supply	100 to 240 V AC, 50/60 Hz, 30 VA max.
Dimensions and mass	210 mm (8.27 in)W x 160 mm (6.30 in)H x 60 mm (2.36 in)D, 1.2 kg (42.3 oz)
Accessories	Voltage cord L9438-53 x1 (Black/ Red/ Yellow/ Blue, 3 m (9.84 ft) length, Alligator clip x4), Power cord x1, Instruction manual x1, Quick start manual x1, CD-R x1 (RS-232C interface operating manual) x1, Input cord label x1, Connection cable 9441 x1 (for the 3169-21 only)

<p>Current measurement</p> <p>*For clamp current sensor options, please see p.58</p>	<p>Voltage measurement</p> <p>*The L9438-53 is bundled</p> <p>VOLTAGE CORD L9438-53 Black/ Red/ Yellow/ Blue, 3 m (9.84 ft) length, Alligator clip x4</p>	<p>MAGNETIC ADAPTER 9804-01 Attaches to the tip of the Voltage Cord, Red x1</p>	<p>MAGNETIC ADAPTER 9804-02 Attaches to the tip of the Voltage Cord, Black x1</p>
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Storage media

PC CARD 2G 9830, PC CARD 1G 9729 : cannot use with the 3169-20, 3169-21
* Supplied with PC Card adapter

PC Card Precaution PC CARD 512M 9728 (512 MB capacity)
Use only PC Cards sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

<p>Printer options</p> <p>PRINTER 9442 For printing numerical values 112 mm (4.41 in) paper width</p> <p>AC ADAPTER 9443-02 For the Printer 9442, EU type</p>	<p>RS-232C CABLE 9721 Mini DIN 9pin to D-sub 9pin, straight, 1.5 m (4.92 ft) length</p>	<p>RECORDING PAPER 1196 For the Printer 9442, 112 mm (4.41 in) x 25 m (82.03 ft), 10 rolls/set</p>	<p>Other options</p> <p>POWER MEASUREMENT SUPPORT SOFTWARE 9625 PC application software with Time series graph, Daily/ weekly/ monthly report, Harmonic level, Print</p>	<p>RS-232C CABLE 9612 For the PC, Mini DIN 9pin to D-sub 9pin, cross, 1.5 m (4.92 ft) length</p>	<p>CARRYING CASE 9720-01 Soft type, Includes compartment for options, for the 3169 series</p>	<p>CONNECTION CABLE 9440 For external I/O, 2 m (6.56 ft) length</p>	<p>CONNECTION CABLE 9441 For D/A output, 2 m (6.56 ft) length</p>
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*The 9441 is bundled with the 3169-21

DC, or 0.5 Hz to 1 MHz Wide Bandwidth. Wide Spectrum Power Meter for Comprehensive Device Assessment

POWER HiTESTER 3193-10



GP-IB

RS-232C



True RMS

Basic specifications (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)

Measurement lines	Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, and three-phase 4-wire systems
Measurement items	[Using the optional 9600, 9601, 9602] Voltage, current, voltage/current peak, active power, reactive power, apparent power, power factor, phase angle, frequency, current integration, power integration, load rate, efficiency [Using the optional 9603, added function] Voltage, torque, rotation, frequency, motor output
Measurement range (using the 9600)	[Voltage] 6/ 15/ 30/ 60/ 150/ 300/ 600/ 1000 V [Current] 200/ 500 mA, 1/ 2/ 5/ 10/ 20/ 50 A [Power] 1.2 W to 150 kW (Depends on measurement mode and combination of voltage and current range) [Frequency] 50/ 500/ 5 k/ 50 k/ 2 MHz
Basic accuracy (Active power)	±0.1 % rdg. ±0.1 % f.s. (45 Hz to 66 Hz, using the 9600)
Display refresh rate	8 times/s
Frequency characteristics	[Using the 9600] DC, 0.5 Hz to 1 MHz [Using the 9601] 5 Hz to 100 kHz [Using the 9602] DC, 0.5 Hz to 200 kHz
Functions	Waveform peak measurement, Efficiency measurement, D/A output, External control, Scaling, Averaging, Back up function, PM measurement at motor output (using the optional 9603), etc.,
Interfaces	RS-232C, GP-IB standard
Power supply	100/ 120/ 200/ 230 V AC, switched automatically, 50/60 Hz, 150 VA max.
Dimensions and mass	430 mm (16.93 in)W × 150 mm (5.91 in)H × 370 mm (14.57 in)D, 15 kg (529.1 oz) (at options installed)
Accessories	Instruction manual ×1, Power cord ×1, Connector ×1

- A rich assortment of measurement functions including voltage, current, power, waveform peak value and efficiency
- High-precision with basic accuracy of ±0.2 %, high-speed response of 0.1 s
- Measure up to six circuits simultaneously
- Select from 3 types of input units

Order Code: 3193-10 (main unit only)

Note: Main unit 3193-10 cannot operate alone - please purchase an input unit Model 9600 to 9605 for factory installation prior to shipment. All subsequent input unit replacements or expansions must be conducted at HIOKI for an additional service charge.

Factory-installed options

* Input modules are factory-installed options, must specify when ordering * Use the same input unit for a particular measurement line.
* When selecting the 9602 Input Unit, be sure to also purchase the appropriate clamp sensor.



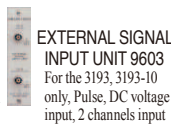
AC/DC DIRECT INPUT UNIT 9600
6 V to 1 kV, 200 mA to 50 A



AC DIRECT INPUT UNIT 9601
60 V to 1 kV, 200 mA to 50 A



AC/DC CLAMP INPUT UNIT 9602
6 V to 600 V, 500 mA to 500 A. * Depends on clamp on sensor in use



EXTERNAL SIGNAL INPUT UNIT 9603
For the 3193, 3193-10 only, Pulse, DC voltage input, 2 channels input



PRINTER UNIT 9604
Data print, screen copy, built-in unit type, not CE Marked

Printer option



RECORDING PAPER 9232
For the Printer option 9604, 74 mm (2.91 in) × 10 m (32.81 ft), 10 rolls/set

Shared options for Model 3193-10 and discontinued Models 3193, 3194

* Model CT6863 is recognized as the UNIVERSAL CLAMP ON CT Model 9278 by Model 3193/ 3193-10/ 3194, but operability is supported.
* In order to use AC/DC CURRENT SENSOR Model CT6862 with Model 3193/ 3194, a firmware upgrade of Model 3193/ 3194 is required.

Current measurement



AC/DC CURRENT SENSOR CT6865
CAT III 1000 V, 1000 A
AC/DC rated current, DC to 20 kHz response, φ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length



AC/DC CURRENT SENSOR 9709
CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, φ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length



AC/DC CURRENT SENSOR CT6863
CAT III 1000 V, 200 A AC/DC rated current, DC to 500 kHz response, φ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length



AC/DC CURRENT SENSOR CT6862
CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, φ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length



UNIVERSAL CLAMP ON CT 9279
600 Vrms insulated wire, 500 A AC/DC rated current, DC to 20 kHz response, φ 40 mm (1.57 in) core dia., 3 m (9.84 ft) cord length, not CE marked



AC/DC CURRENT PROBE CT6843
AC/DC 200 A rated current, DC to 500 kHz response, φ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length



AC/DC CURRENT PROBE CT6841
AC/DC 20 A rated current, DC to 1 MHz response, φ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length



CLAMP ON SENSOR 9272-10
CAT III 600 Vrms, 20 A/200 A AC rated current, 1 Hz to 100 kHz response, φ 46 mm (1.81 in) core dia., 3 m (9.84 ft) cord length

Voltage measurement



VOLTAGE CORD L9438-50
Black/ Red, 3 m (9.84 ft) length, Alligator clip ×2



MAGNETIC ADAPTER 9804
Attaches to the tip of the Voltage Cord L9438-50 or other, Red/Black set (each 1)

PC communication



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



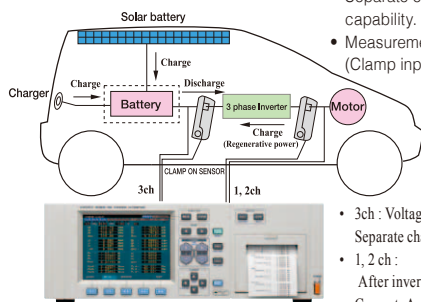
RS-232C CABLE 9638
For the PC, 9pin - 25pin, cross, 1.8m (5.91 ft) length



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

Comprehensive measurement of motor power, rpm, torque, converter efficiency, and harmonics with a single instrument (Model 3193-10)

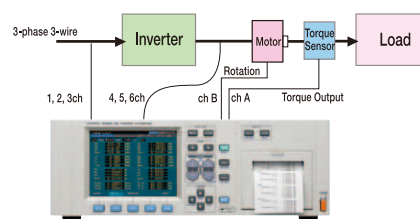
Evaluating an electric vehicle



- Separate charge/generation integration capability.
- Measurement under live circuit conditions. (Clamp input)

- 3ch : Voltage, Current, Active power
Separate charge / generation integration ±Wh
- 1, 2 ch :
After inverted DC to AC three phase Voltage, Current, Active power, integration (Wh)

Comprehensive analysis of motor power or converter efficiency



Using the 9603 External signal input unit, the analog output of a torque sensor is directly connected to chA. By inputting the output of a tachometer (analog signal or pulse signal) to chB, a system for measuring torque, rotation count and motor power can be obtained.

Accurately Measure Devices Up to 1000 V/65 A AC/DC with Direct Input

POWER METER PW3337



LAN
Standard

RS-232C
Standard

GP-IB
-01/-03 Model



True RMS

- Measure DC, and single-phase 2-wire to 3-phase 4-wire with 3-channel input
- For development and production of motors, inverters, power conditioners, power supplies, and other devices
- High-precision basic accuracy $\pm 0.1\%$ (*1)
- (*1) For complete details, please refer to the specifications
- Wide frequency bandwidth of 0.1 Hz to 100 kHz or DC
- High-current measurement up to 65 A direct input
- Harmonic measurement up to the 50th order with IEC 61000-4-7 compliance
- High-accuracy measurement, even with a low power factor for no-load testing of transformers and motors
- Built-in external sensor input terminals multi-unit measure up to 5000 A AC
- Synchronize up to 8 units for multi-unit measurement

Order Code: PW3337 (3ch model)
 PW3337-01 (3ch, GP-IB installed model)
 PW3337-02 (3ch, D/A output installed model)
 PW3337-03 (3ch, GP-IB, D/A output installed model)

■ Basic specifications (Accuracy guaranteed for 1 year. Post-adjustment accuracy guaranteed for 6 months)

Measurement lines	Single-phase 2-wires, single-phase 3-wires, 3-phase 3-wires, 3-phase 4-wires (voltage / current measurement range set for each wiring mode)
Measurement items	Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Frequency, Efficiency, Current integration, Active power integration, Integrated time, Voltage waveform peak value, Current waveform peak value, Voltage crest factor, Current crest factor, Time average current, Time average active power, Voltage ripple factor, Current ripple factor
Harmonic parameters	Synchronization frequency range: 10 Hz to 640 Hz, Analysis order up to 50th Harmonic voltage RMS value, Harmonic current RMS value, Harmonic active power, Total harmonic voltage distortion, Total harmonic current distortion, Voltage fundamental waveform, Current fundamental waveform, Active power fundamental waveform, Apparent power fundamental waveform, Reactive power fundamental waveform, Power factor fundamental waveform (displacement power factor), Voltage current phase difference fundamental waveform, Interchannel voltage fundamental wave phase difference, Interchannel current fundamental wave phase difference, Harmonic voltage content %, Harmonic current content %, Harmonic active power content % (The following parameters can be downloaded as data during PC communication but not displayed: Harmonic voltage phase angle, Harmonic current phase angle, Harmonic voltage current phase difference)
Measurement range	Voltage: AC/DC 15 V to 1000 V, 7 ranges Current: AC/DC 200 mA to 50 A, 8 ranges Power: 3.0000 W to 150.00 kW (Depends on combination of voltage and current range)
Integration measurement (Integration time up to 10,000 hours)	[Current] No. of displayed digits: 6 digits (from 0.00000 mAh, Polarity-independent integration and Sum value) [Active power] No. of displayed digits: 6 digits (from 0.00000 mWh, Polarity-independent integration and Sum value)
Input resistance (50/60 Hz)	[Voltage] 2 M Ω , [Current] 1 m Ω or less (direct input)
Basic accuracy (Active power)	$\pm 0.1\%$ rdg. $\pm 0.1\%$ f.s. (DC) $\pm 0.1\%$ rdg. $\pm 0.05\%$ f.s. (45 Hz to 66 Hz, at Input < 50% f.s.) $\pm 0.15\%$ rdg. (45 Hz to 66 Hz, at 50% f.s. \leq Input)
Display refresh rate	5 times/s to 20 seconds (depends on average times settings)
Frequency characteristics	DC, 0.1 Hz to 100 kHz
D/A output (-02/-03 model only)	16 channels (selectable from following items): Level output DC ± 2 V, Waveform output 1 V f.s. Level output, instantaneous waveform output (voltage, current, active power), Level output (apparent power, reactive power, power factor, or other), High-speed active power level output
Functions	[Rectification method] AC+DC, AC+DC Umn, AC, DC, FND, Auto-range, Average, VT or CT ratio settings, Synchronized control, MAX/MIN, or other functions
Interfaces	RS-232C / LAN standard, (-01/-03 model also includes GP-IB)
Power supply	100 to 240 V AC, 50/60 Hz, 40 VA max.
Dimensions and mass	305 mm (12.01 in)W \times 132 mm (5.20 in)H \times 256 mm (10.08 in)D, 5.6 kg (197.5 oz)
Accessories	Instruction manual $\times 1$, Measurement guide $\times 1$, Power cord $\times 1$

Accurately Measure Devices Up to 1000 V/65 A AC/DC with Direct Input

POWER METER PW3336



LAN
Standard

RS-232C
Standard

GP-IB
-01/-03 Model



True RMS

- Measure DC, and single-phase 2-wire to 3-phase 3-wire with 2-channel input
- Other characteristics are the same as the PW3337 series

Order Code: PW3336 (2ch model)
 PW3336-01 (2ch, GP-IB installed model)
 PW3336-02 (2ch, D/A output installed model)
 PW3336-03 (2ch, GP-IB, D/A output installed model)

■ Basic specifications (Accuracy guaranteed for 1 year. Post-adjustment accuracy guaranteed for 6 months)

Measurement lines	Single-phase 2-wires, single-phase 3-wires, 3-phase 3-wires, (voltage / current measurement range set for each wiring mode)
Measurement items	Same as the PW3337 series
Harmonic parameters	Same as the PW3337 series
Measurement range	Voltage: AC/DC 15 V to 1000 V, 7 ranges Current: AC/DC 200 mA to 50 A, 8 ranges Power: 3.0000 W to 100.00 kW (Depends on combination of voltage and current range)
Other specifications	Same as the PW3337 series
Dimensions and mass	305 mm (12.01 in)W \times 132 mm (5.20 in)H \times 256 mm (10.08 in)D, 5.2 kg (183.4 oz)

Shared options for the POWER METER PW3337, PW3336 series

Can be connected to the current sensor input terminals (1 sensor necessary for single-phase measurement, and 2 or 3 sensors required for 3-phase measurements)

Current measurement (Type 1)

CLAMP ON SENSOR 9660
 100A AC rated current, ϕ 15 mm (0.59 in) core dia., 3 m (9.84 ft) length

CLAMP ON SENSOR 9661
 500A AC rated current, ϕ 46 mm (1.81 in) core dia., 3 m (9.84 ft) length

FLEXIBLE CLAMP ON SENSOR CT9667
 5000/500 A AC rated current, ϕ 254 mm (10.0 in) core dia., Cable length: Between sensor - box 2 m (6.56 ft), Output cable 1 m (3.28 ft)

CLAMP ON SENSOR 9669
 1000A AC rated current, ϕ 55 mm (2.17 in) core dia., 3 m (9.84 ft) length

Power supply for sensor

SENSOR UNIT 9555-10
 Power supply for the 9270 series, 9709, CT6860 series, single sensor connectable

CONNECTION CORD L9217
 Cord has insulated BNC connectors at both ends, signal output use, 1.6 m (5.25 ft) length

Current measurement (Type 2)

AC/DC CURRENT SENSOR CT6865
 CAT III 1000 V, 1000 A AC/DC rated current, DC to 20 kHz response, ϕ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length

AC/DC CURRENT SENSOR 9709
 CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, ϕ 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length

AC/DC CURRENT SENSOR CT6863
 CAT III 1000 V, 200 A AC/DC rated current, DC to 500 kHz response, ϕ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length

AC/DC CURRENT SENSOR CT6862
 CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, ϕ 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length

UNIVERSAL CLAMP ON CT 9279
 600 Vrms insulated wire, 500 A AC/DC rated current, DC to 20 kHz response, ϕ 40 mm (1.57 in) core dia., 3 m (9.84 ft) cord length, not CE marked

AC/DC CURRENT PROBE CT6843
 AC/DC 200 A rated current, DC to 500 kHz response, ϕ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length

AC/DC CURRENT PROBE CT6841
 AC/DC 20 A rated current, DC to 1 MHz response, ϕ 20 mm (0.79 in) core dia., 3 m (9.84 ft) cord length

CLAMP ON SENSOR 9272-10
 CAT III 600 Vrms, 20 A/200 A AC rated current, 1 Hz to 100 kHz response, ϕ 46 mm (1.81 in) core dia., 3 m (9.84 ft) cord length

PC communication

LAN CABLE 9642
 Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length

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

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

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

Other options

Synchronize Multiple Units
CONNECTION CORD 9165
 Cord has metallic BNC connectors at both ends, use at metallic terminal, 1.5 m (4.92 ft) length, not CE marked

Measure AC/DC Standby Power Up to Large Power Loads

POWER METER PW3335



LAN
All Models
RS-232C
PW3335, -02/-03/-04
GP-IB
PW3335-01, -04
CE
True RMS

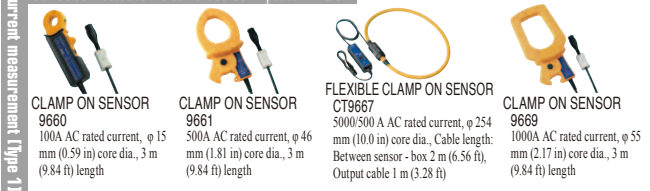
- High-precision $\pm 0.1\%$ basic accuracy (For complete details, please refer to the specifications)
- Wide 1mA to 20A measurement range, max. continuous input of 30 A
- Wide frequency bandwidth of 0.1 Hz to 100 kHz or DC
- Measure harmonic and standby power consumption according to IEC62301
- Achieve superior accuracy even with a low power factor for no-load testing of transformers and motors
- Synchronized control using up to 8 instruments
- Built-in external sensor input terminals to measure up to 5000 A AC (PW3335-03, PW3335-04 only)

Order Code: **PW3335** (with LAN, RS-232C)
PW3335-01 (with LAN, GP-IB)
PW3335-02 (with LAN, RS-232C, D/A output)
PW3335-03 (with LAN, RS-232C, external current sensor terminal)
PW3335-04 (with LAN, RS-232C, GP-IB, D/A output, external current sensor terminal)

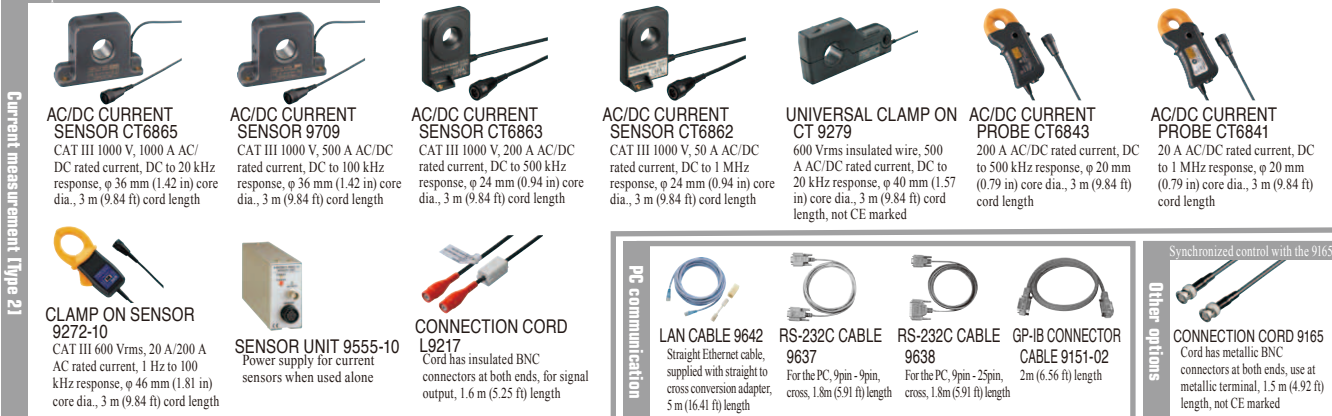
Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

Measurement lines	Single-phase/ two-wires
Measurement items	Voltage, current, active power, apparent power, reactive power, power factor, phase angle, frequency, maximum current ratio, current integration, active power integration, integration time, voltage waveform peak value, current waveform peak value, voltage crest factor, current crest factor, time average current, time average active power, voltage ripple rate, current ripple rate
Harmonic parameters	Synchronization frequency range : 10 Hz to 640 Hz Maximum analysis order : 50th Harmonic voltage RMS value, harmonic current RMS value, harmonic active power, total harmonic voltage distortion, total harmonic current distortion, fundamental wave voltage, fundamental wave current, fundamental wave active power, fundamental wave apparent power, fundamental wave reactive power, fundamental wave power factor (displacement power factor), fundamental wave voltage current phase difference, harmonic voltage content percentage, harmonic current content percentage, harmonic active power content percentage (The following parameters can be downloaded as data with only PC communications : Harmonic voltage phase angle, harmonic current phase angle, harmonic voltage current phase difference)
Measurement ranges	[Voltage] AC/DC 6 V to 1000 V, 8 ranges [Current] AC/DC 1 mA to 20 A, 14 ranges [Power] 6.0000 mW to 20.000 kW (Depends on combination of voltage and current range) Effect of power factor : $\pm 0.1\%$ f.s. or less (45 to 66 Hz, at power factor = 0)
Integration measurement (Integration time up to 10,000 hours)	Switchable between fixed-range integration and auto-range integration. [Current] No. of displayed digits: 6 digits (from 0.00000 mAh, polarity-independent integration and sum value) [Active power] No. of displayed digits: 6 digits (from 0.00000 mWh, polarity-independent integration and sum value)
Input resistance (50/60 Hz)	[Voltage input terminal] 2 M Ω [Current input terminal] 520 m Ω or less (at 1 mA to 100 mA range), 15 m Ω or less (at 200 mA to 20 A range)
Basic accuracy (Active power)	$\pm 0.1\%$ rdg. $\pm 0.1\%$ f.s. (DC) $\pm 0.1\%$ rdg. $\pm 0.05\%$ f.s. (45 Hz to 66 Hz, at input < 50% f.s.) $\pm 0.15\%$ rdg. (45 Hz to 66 Hz, at 50% f.s. \leq input)
Display refresh rate	5 times/s to 20 seconds (depend on average times settings)
Frequency characteristics	DC, 0.1 Hz to 100 kHz
D/A output (-02/-04 models only)	7 channels (selectable from the following items): level output DC ± 2 V f.s. or 5 V f.s., waveform output 1 V f.s., level output (instantaneous waveform output (voltage, current, active power), level output (apparent power, reactive power, power factor, or other), high-speed level output (voltage, current, active power)
Functions	[Rectification method] AC+DC, AC+DC U _{nn} , AC, DC, FND, Auto-range, Average, VT or CT ratio settings, Synchronized control, MAX/MIN, and more
Interfaces	LAN (all models), RS-232C (except -01 model), GP-IB (-01, -04 models only)
Power supply	100 V to 240 V AC, 50/60 Hz, 30 VA max.
Dimensions and mass	210 mm (8.27 in)W \times 100 mm (3.94 in)H \times 245 mm (9.65 in)D, 3 kg (105.8oz)
Accessories	Instruction manual $\times 1$, power cord $\times 1$, voltage and current input terminal safety cover $\times 2$, safety cover installation screws (M3 \times 6 mm) $\times 4$

Can be connected to the current sensor input terminals



Requires Sensor unit 9555-10 and Connection cord L9217



Functionality and Safety Packed into a Handheld Unit

CLAMP ON POWER HITESTER 3286-20

CE True RMS
CAT III 600 V

- Single phase 600 kW & up to 20th Harmonic levels measurement
- Simple checking of three-phase lines (Should be balanced and no distortion)
*Integration function not available.

*For more information, please see clamp meters section

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

Measurement line	Single-phase, Three-phase (should be balanced and no distortion)
Measurement items	Voltage, Current, Voltage/current peak, Active/ reactive/ apparent power, Power factor, Phase angle, Reactivity, Frequency, Voltage/current harmonic levels
Power ranges	[Single phase] 3.000 kW to 600.0 kW [Balanced three phase] 6.000 kW to 1200 kW
Core jaw dia.	$\phi 55$ mm (2.17 in) or 80 mm (3.15 in) \times 20 mm (0.79 in) busbar
Power supply	Stacked alkaline battery (6LR61, 6LF22) $\times 1$, Continuous use: 25 hours

Solve All of Your Energy Consumption Testing Needs

AC/DC POWER HiTESTER 3334



GP-IB/
-01 Model

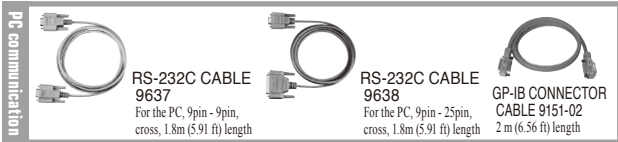
RS-232C/



True RMS

- Compatible with the SPECpower® benchmarking for server's power consumption
- ® SPECpower is a registered trademark of Standard Performance Evaluation Corporation
- DC measurement mode, AC, and AC+DC measurement
- Integration function for current and power
- ±0.2% high basic accuracy
- Extended period of guaranteed accuracy of 3 years
- Complete accuracy over a wide input range

Order Code: **3334** (basic model)
3334-01 (with GP-IB interface)



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

Measurement lines	Single-phase/ two-wires
Measurement items	Voltage, Current, Active power, Apparent power, Power factor, Frequency, Integration (current, active power), Waveform peak (voltage and current)
Measurement ranges	[Voltage] AC/DC 15.000/ 30.00/ 150.00/ 300.0 V [Current] AC/DC 100.00/ 300.0 mA, 1.0000/ 3.000/ 10.000/ 30.00 A [Power] 1.5000 W to 9.000 kW (combination of voltage and current ranges)
Integration measurement	[Current] No. of displayed digits: 6 digits (from 0.00000 mAh, Polarity-independent integration and Sum value) [Active power] No. of displayed digits: 6 digits (from 0.00000 mWh, Polarity-independent integration and Sum value)
Integration time up to 10,000 hours	
Input resistance (50/60 Hz)	[Voltage] 2.4 MΩ, [Current] 10 mΩ or less (direct input)
Basic accuracy	±0.1% rdg. ±0.2% f.s. (DC), ±0.1% rdg. ±0.1% f.s. (45 Hz to 66 Hz) <i>Note: Provided accuracy of 1 Year, typical value</i>
Display refresh rate	5 times/s
Frequency characteristics	DC, 45 Hz to 5 kHz
Waveform output	Parameter output representation: voltage, current and power (3 simultaneous channels), Output voltage: 1 V DC f.s.
Analog output (D/A output)	Parameter output representation: voltage, current active power and selected 1 item (4 simultaneous channels), Selected 1 item from apparent power, power factor, current integration, active power integration, Output voltage: ±2 V DC f.s.
Functions	Rectification method switchable between AC+DC (True RMS), DC (simple average), AC (True RMS), Wave peak measurement, VT or CT ratio settings, Average function
Interfaces	RS-232C included as standard, GP-IB (Model 3334-01 only)
Power supply	100 V to 240 V AC, 50/60 Hz, 20 VA max.
Dimensions and mass	210 mm (8.27 in)W × 100 mm (3.94 in)H × 245 mm (9.65 in)D, 2.5 kg (88.2oz)
Accessories	Instruction manual ×1, Power cord ×1

User-Friendly Power Measuring Device for Production and Inspection Lines

POWER HiTESTER 3333



GP-IB/
-01 Model

RS-232C/



True RMS

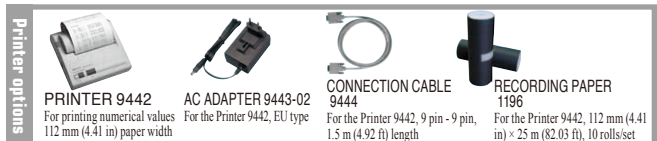
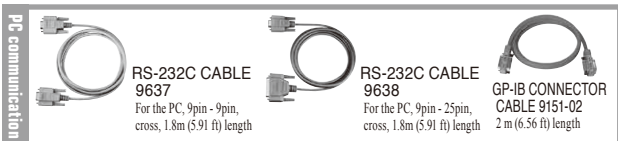
- Digital accuracy
- ±0.2% basic accuracy (±0.1% rdg. ±0.1% f.s.)
- 50mA to 20A AC current range
- Print out with the 9442 and RS-232C interface

Order Code: **3333** (basic model)
3333-01 (with GP-IB interface)

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

Measurement lines	Single-phase 2-wires
Measurement items	Voltage, Current, Active power, Apparent power, Power factor
Measurement range	[Voltage] 200 V AC (300 V Max.) [Current] 50/ 200/ 500 mA, 2/ 5/ 20 A AC (30 A Max.) [Power] 10.000 W to 4.000 kW (combination of voltage and current ranges)
Input resistance (50/60 Hz)	[Voltage] 2.4 MΩ, [Current] 7 mΩ or less (direct input)
Basic accuracy	[Guaranteed for 1 year, Voltage, Current, Active power] ±0.1 % rdg. ±0.1 % f.s. (45 Hz to 66 Hz, input current 20 A or less) [Guaranteed for 3 years, Voltage, Current, Active power] ±0.1 % rdg. ±0.2 % f.s. (45 Hz to 66 Hz, input current 20 A or less)
Display refresh rate	5 times/s
Frequency characteristics	45 Hz to 5 kHz
D/A output	3 channels outputs simultaneously for voltage, current, active power +2 V DC f.s.
Functions	Scaling (VT, CT ratio settings), Average function
Interfaces	RS-232C standard, GP-IB (Model 3333-01 only)
Power supply	100 to 240 V AC, 50/60 Hz, 20 VA max.
Dimensions and mass	160 mm (6.30 in)W × 100 mm (3.94 in)H × 227 mm (8.94 in)D, 1.9 kg (67.0 oz)
Accessories	Instruction manual ×1, Power cord ×1

Shared options for Model 3333 and 3332 series



AC/DC Current Probes

10x the sensitivity of legacy probes deliver precise measurement of low current waveforms from 1 mA

CURRENT PROBE CT6700, CT6701

New



Insulated wire



CT6700

- Wide band: [CT6700] DC to 50 MHz (-3 dB), [CT6701] DC to 120 MHz (-3 dB)
- High S/N characteristic ideal for ultra low mA-range current waveforms
- Connect directly to an oscilloscope's BNC input terminal
- Connect directly to Hioki Memory HiCorder for waveform monitoring
- Optional power supply available for use with oscilloscopes that do not provide probe power

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

	CT6700	CT6701
Frequency bandwidth	DC to 50 MHz (-3 dB)	DC to 120 MHz (-3 dB)
Rise time	≈7.0 ns	≈2.9 ns
Noise level	60 μA rms typical, 75 μA rms max (for 30 MHz band measuring instrument)	
Continuous allowable input	5 A rms (DC, and sine wave, requires derating at frequency)	
Max. allowable peak input	±7.5 A peak (non-continuous)	
Amplitude accuracy	Typ.: ±1% rdg. ±1 mV (DC, 45 to 66 Hz sine wave, 0 to 5 A rms) Guaranteed: ±3% rdg. ±1 mV (DC, 45 to 66 Hz sine wave, 0 to 5 A rms)	
Output rate	1 V/A (use with a device having a 1 MΩ input resistance or higher)	
Core diameter	φ 5 mm (0.20 in)	
Power supply	±12 V ±0.5 V, 3.2 VA	
Dimensions and mass	Sensor: 155 mm (6.10 in)W × 18 mm (0.71 in)H × 26 mm (1.02 in)D, Terminator: 29 mm (1.14 in)W × 83 mm (3.27 in)H × 40 mm (1.57 in)D mm, Mass: 250 g (8.8 oz), Sensor cable BNC terminal: 1.5 m (4.92 ft), Power cable: 1 m (3.28 ft), Power plug: FFA.0S.304.CLAC37Y / LEMO inc.	
Accessories	Instruction manual ×1, Carrying case ×1	

Order Code: **CT6700** (5 A, DC to 50 MHz)
CT6701 (5 A, DC to 120 MHz)

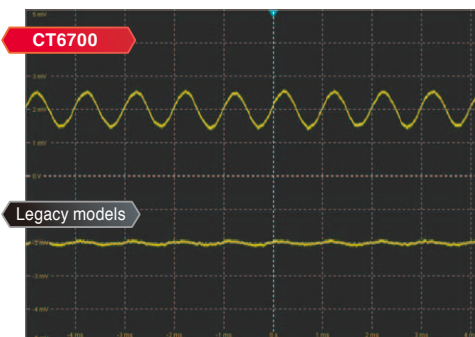
Note: Use optional power supply 3269 or 3272 to drive the current probe when power from the Memory HiCorder or oscilloscope is not available.

POWER SUPPLY 3272
For single sensor, 120/ 220/ 240 V AC, specify when ordering

POWER SUPPLY 3269
For four sensors, 100 V to 240 V AC

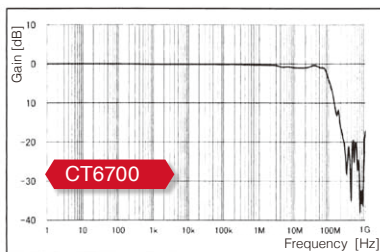
High Performance

10x sensitive for clearly observing even 1 mA waveforms

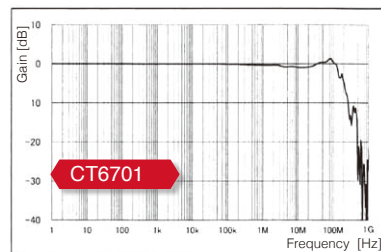


Input: 1 mA_{p-p}, 1 kHz, sine wave
Oscilloscope: Bandwidth 2 GHz (Bandwidth limit 20 MHz), 1 mV/div

DC to 50MHz wide bandwidth



DC to 120MHz wide bandwidth



Streamlining Measurement

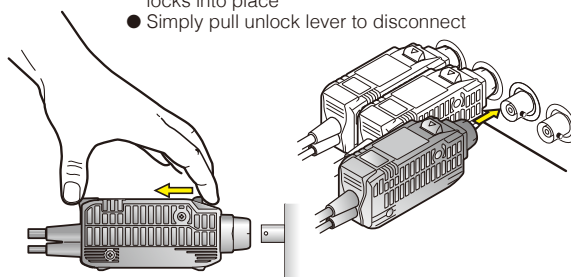
1 Automatic Zero-Adjustment and Demagnetization in One Button

- Automatically perform zero-adjustment by pressing a single button
- Press and hold for demagnetization



2 One-touch Disconnection from the BNC Terminal

- No need to rotate the BNC connector when connecting to an oscilloscope
- Insert the connector until it automatically locks into place
- Simply pull unlock lever to disconnect



3 Warning Features

- Warning lamp flashes if a current exceeding the rating is input
- "JAW UNLOCKED" will display if the sensor is unlocked when clamped



Wide-Band Current Probe Allows Direct Input to Oscilloscope

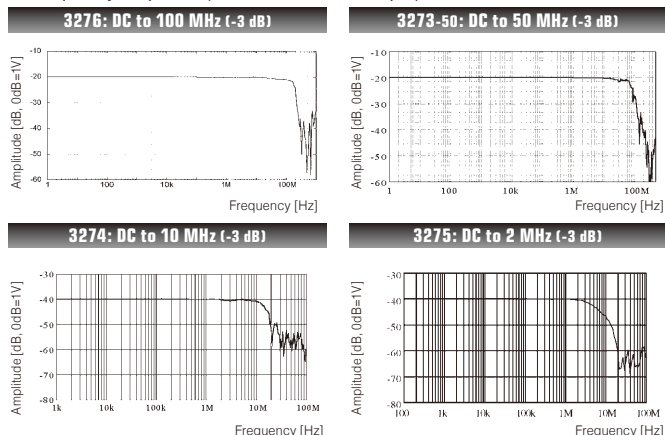
CLAMP ON PROBE 3273-50, 3274, 3275, 3276



- Highly accurate observation across a wide band from DC to MHz
- Indium-antimony (InSb) thin-film Hall element
- Connects directly to oscilloscope or Memory HiCorder BNC input terminal
- High S/N characteristics enable the measurement of ultra low mA order current waveforms (3273-50, 3276)

Order Code:	3273-50	(DC to 50 MHz, 30 A)
	3274	(DC to 10 MHz, 150 A)
	3275	(DC to 2 MHz, 500 A)
	3276	(DC to 100 MHz, 30 A)

■ Frequency response (Characteristics Example)



Power supply plug pin assignment



- 1 : Not connected
- 2 : GND
- 3 : V- (-12V)
- 4 : V+ (+12V)

* Connector type: LEMO inc./ FFA.0S.304.CLAC37Y
(Plug as seen from the front)

Connects to the FET probe power supply outlet of an oscilloscope, or to the optional 3269 / 3272 power supply unit.

Note: Use the Power Supply 3269/3272 for general measurements or when power is not available from the Memory HiCorder or oscilloscope. When performing continuous measurements, be aware of offset voltage drift.

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

	3276	3273-50	3274	3275
Frequency bandwidth	DC to 100 MHz (-3 dB)	DC to 50 MHz (-3 dB)	DC to 10 MHz (-3 dB)	DC to 2 MHz (-3 dB)
Rise time	3.5 ns or shorter	7 ns or shorter	35 ns or shorter	175 ns or shorter
Noise level	2.5 mA rms max. (bandwidth limited to 20 MHz)		25 mA rms max. (bandwidth limited to 20 MHz)	
Continuous allowable input	30 A rms		150 A rms	500 A rms
Frequency Derating Y axis: Max. input current (A rms) X axis: Frequency (Hz)				
Max. allowable peak input	50 A peak (non continuous)		300 A peak (non continuous) 500 A peak (pulse width: 30 μs or shorter)	700 A peak (non continuous)
Amplitude accuracy (30 min. after power-on, after degaussing and zero-adjustment)	±1.0 % rdg. ±1 mV f.s. (DC, 45 to 66 Hz, 0 to 30 A rms) ±2 % rdg. (DC, 45 to 66 Hz, 30 A rms to 50 A peak)		±1.0 % rdg. ±1 mV f.s. (DC, 45 to 66 Hz, 0 to 150 A rms) ±2.0 % rdg. (DC, 45 to 66 Hz, 150 A to 300 A peak)	±1.0 % rdg. ±5 mV f.s. (DC, 45 to 66 Hz, 0 to 500 A rms) ±2.0 % rdg. (DC, 45 to 66 Hz, 500 A to 700 A peak)
Output rate	0.1 V/A *Device output is terminated internally. Use with a device having a 1 MΩ input resistance or higher.		0.01 V/A *Device output is terminated internally. Use with a device having a 1 MΩ input resistance or higher.	
Core diameter	φ 5 mm (0.20 in)		φ 20 mm (0.79 in)	
Power supply	±12 V ±0.5 V, 5.3 VA max.		±12 V ±0.5 V, 5.5 VA max.	
Dimensions and mass	175 mm (6.89 in)W × 18 mm (0.71 in)H × 40 mm (1.57 in)D, 240 g (8.5 oz)	175 mm (6.89 in)W × 18 mm (0.71 in)H × 40 mm (1.57 in)D, 230 g (8.1 oz)	176 mm (6.93 in)W × 69 mm (2.72 in)H × 27 mm (1.06 in)D, 500 g (17.6 oz)	176 mm (6.93 in)W × 69 mm (2.72 in)H × 27 mm (1.06 in)D, 520 g (18.3 oz)
Accessories	Instruction manual ×1, Carrying case × 1		Instruction manual ×1, Carrying case × 1	

■ Option for 3273-50 (to connect to a Memory HiCorder)

CONVERSION CABLE 9319

(To connect the 3273-50 and the F/V UNIT 8940)



Power Supply for Clamp-on Probes

POWER SUPPLY 3269, 3272



- Power supply for the CLAMP ON PROBE 3273-50/3274/3275/3276
- Supplies power when connected to a general-purpose instrument such as a recorder.

Order Code:	3269
	3272

■ Basic specifications

	3269	3272
Compatible sensors	Model CT6700, CT6701, 3273-50, 3274, 3275 or 3276: up to 4 units Note: Also up to 4 units for the discontinued Model 3273	Model CT6700, CT6701: up to 2 units Model 3273-50, 3274, 3275 or 3276: up to 1 unit Note: May be used with up to 2 units of Model 3273 (not -50 type), and up to 2 units of Models 3273-50, 3274, 3275 or 3276 on condition that the measurement current is sufficiently low.
Number of power supply connectors	4	2
Output	±12 V ±0.5 V, ±2.5 A (sum total of all channels)	±12 V ±0.5 V, 600 mA (sum total of all channels)
Power supply	100 V to 240 V AC (free) 50/60 Hz 170 VA max.	100 V or 120/ 220/ 240 V AC (specify when ordering), 50/60 Hz 20 VA max.
Dimensions and mass	80 mm (3.15 in)W × 119 mm (4.69 in)H × 200 mm (7.87 in)D, 1.1 kg (38.8 oz)	73 mm (2.87 in)W × 110 mm (4.33 in)H × 186 mm (7.32 in)D, 1.1 kg (38.8 oz)
Accessories	Instruction manual ×1, Power cord ×1	Power cord ×1, Instruction manual ×1, Spare fuse ×1

Note: These products cannot be used alone. To measure current, a compatible current sensor is required.

Wide-Bandwidth, High-Precision and Large Current Measurements

AC/DC CURRENT SENSOR CT6865, 9709

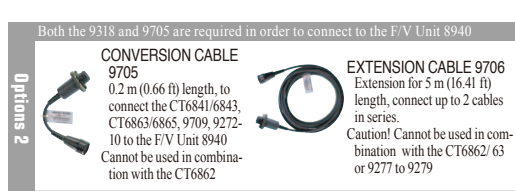
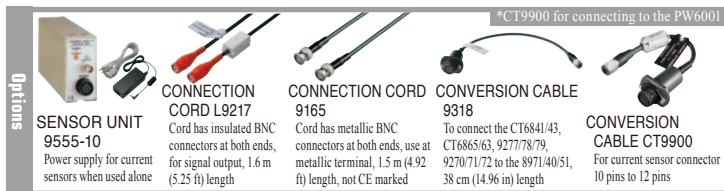


- 1000A large current measuring applications in the fields of electric and hybrid electric vehicles (CT6865)
- Unparalleled characteristics in a 1000 A class sensor
- Operating temperature range of -30°C to 85°C (CT6865)
- Super high precision, $\pm 0.06\%$ amplitude accuracy, $\pm 0.2^\circ$ phase accuracy
- Wide-bandwidth DC to 20 kHz (CT6865), 100 kHz (9709) excellent frequency characteristics
- Ideal for evaluation of solar power generation and fuel cells to measure battery charge and discharge and the secondary side of inverters
- For observing waveforms to be used with the oscilloscopes or Memory HiCorders (use with the 9555-10)

Order Code: **CT6865** (1000 A AC/DC)
CT6865-05 (1000 A AC/DC, 12 pin terminal, for the PW6001 only)
9709 (500 A AC/DC)
9709-05 (500 A AC/DC, 12 pin terminal, for the PW6001 only)

Basic specifications

	CT6865 (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)	9709 (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)
Rated input current	1000 A AC/DC	500 A AC/DC
Max. allowable input	1200 A AC/DC (Continuous 1800 A peak, up to 100 Hz, up to 40 °C (104 °F), other requires derating characteristics)	700 Arms (1000 A peak, requires derating at frequency)
Frequency characteristics	Amplitude: DC to 20 kHz Phase: DC to 1 kHz	Amplitude: DC to 100 kHz Phase: DC to 100 kHz
Amplitude and Phase accuracy	DC $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: Not defined) 16 Hz $\leq f \leq 66$ Hz $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s., Phase: ± 0.2 deg. Amplitude is defined to 20 kHz, Phase is defined to 1 kHz	DC, 45 Hz $\leq f \leq 66$ Hz ($\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: ± 0.2 deg)) Defined to 100 kHz
Power consumption	7 VA max. (at 1000 A/55 Hz, ± 12 V power requirement)	5 VA max. (at 500 A/55 Hz, ± 12 V power requirement)
Output voltage rate	2 V /rated current value (voltage output with the Sensor Unit 9555-10, use with a device having a 1 M Ω input resistance or higher)	
Max. rated voltage to earth	AC/DC 1000 V (50/60 Hz, CAT III)	
Core diameter	ϕ 36 mm (1.42 in)	
Operating temperature, humidity	-30°C to +85°C (-22°F to 185°F) 80% rh or less (with no condensation)	0°C to +50°C (32°F to 122°F) 80% rh or less (with no condensation)
Power supply	DC ± 11 V to ± 15 V (Power supplied via the 9555-10, which supports 100 to 240 V AC)	
Dimensions and mass	160 mm (6.30 in)W \times 112 mm (4.41 in)H \times 50 mm (1.97 in)D, 980 g (34.6 oz), cord length 3 m (9.84 ft)	160 mm (6.30 in)W \times 112 mm (4.41 in)H \times 50 mm (1.97 in)D, 850 g (30.0 oz), cord length: 3 m (9.84 ft)
Accessories	Instruction manual $\times 1$, Mark bands $\times 6$	



Delivering Wide-bandwidth and High-precision Current Measurement

AC/DC CURRENT SENSOR CT6862, CT6863

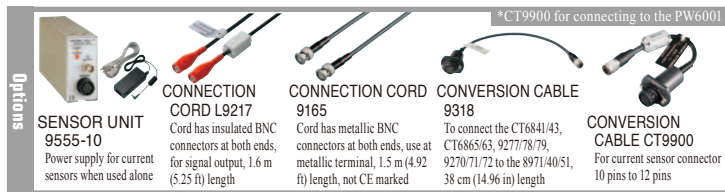


- Super high precision, $\pm 0.06\%$ amplitude accuracy, $\pm 0.2^\circ$ phase accuracy
- Wide-bandwidth DC to 1 MHz (CT6862) excellent frequency characteristics
- Applications in the fields of electric and hybrid electric vehicles
- Wide operating temperature range fit for automobile applications
- Ideal for evaluation of solar power generation and fuel cells to measure battery charge and discharge and the secondary side of inverters
- For observing waveforms to be used with the oscilloscopes or Memory HiCorders (use with the 9555-10)

Order Code: **CT6862** (50 A AC/DC)
CT6862-05 (50 A AC/DC, 12 pin terminal, for the PW6001 only)
CT6863 (200 A AC/DC)
CT6863-05 (200 A AC/DC, 12 pin terminal, for the PW6001 only)

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

	CT6862	CT6863
Rated current	50 A AC/DC	200 A AC/DC
Max. allowable input	100 A continuous (requires derating at frequency or temperature)	400 A continuous (requires derating at frequency or temperature)
Frequency characteristics	Amplitude: DC to 1 MHz Phase: DC to 300 kHz	Amplitude: DC to 500 kHz Phase: DC to 300 kHz
Amplitude and Phase accuracy	DC $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: Not defined) 16 Hz $\leq f \leq 400$ Hz $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: $\pm 0.2^\circ$) Defined to 1 MHz	DC $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: Not defined) 16 Hz $\leq f \leq 400$ Hz $\pm 0.05\%$ rdg. $\pm 0.01\%$ f.s. (Phase: $\pm 0.2^\circ$) Defined to 500 kHz
Power consumption	5 VA max. (at 50 A/55 Hz, ± 12 V power requirement)	6 VA max. (at 200 A/55 Hz, ± 12 V power requirement)
Output voltage	2 V /rated current range (voltage output with the Sensor Unit 9555-10, use with a device having a 1 M Ω input resistance or higher)	
Max. rated voltage to earth	AC/DC 1000 V (50/60 Hz, CAT III)	
Core diameter	ϕ 24 mm (0.94 in)	
Operating temperature, humidity	-30°C to +85°C (-22°F to 185°F), 80% rh or less (with no condensation)	
Power supply	DC ± 11 V to ± 15 V (Power supplied via the 9555-10, which supports 100 to 240 V AC)	
Dimensions and mass	70 mm (2.76 in)W \times 100 mm (3.94 in)H \times 53 mm (2.09 in)D, cord length: 3 m (9.84 ft), 340 g (12.0 oz)	70 mm (2.76 in)W \times 100 mm (3.94 in)H \times 53 mm (2.09 in)D, cord length: 3 m (9.84 ft), 350 g (12.3 oz)
Accessories	Instruction manual $\times 1$, Mark bands $\times 6$	



Model CT6865, 9709, CT6862, CT6863 Compatibility

Compatible models	CT6865 Combination status	9709 Combination status	CT6862 Combination status	CT6863 Combination status
Model PW6001	✓	✓	✓	✓
Model 3390	▲ Recognized as 500A rated sensor; set CT ratio to 2	✓	✓	✓
Model 8971 for the MR8847 series	▲ Recognized as 500A rated sensor; set CT ratio to 2, also need Conversion Cable 9318. Maximum number of connectable sensors when using the MR8847 series or Model 8847: 7	✓	✓	✓
Input unit Model 9602 for the 3193-10/3193/3194	▲ Recognized as Model 9279 (500A rated sensor); set CT ratio to 2	In combination, recognized as the 9279	In the latest version, the CT ratio [2.5] is automatically set	In combination, recognized as the 9278
Model 8940 for Memory HiCorders	▲ Recognized as 500A rated sensor; set CT ratio to 2, also need Conversion Cable 9705 and 9318. Maximum number of connectable sensors when using the 8860 Series: 8; with the 8835-01: 4	▲ Requires Conversion Cable 9705 and Conversion Cable 9318, used as a substitute for the 9279	N/A	▲ Requires Conversion Cable 9705 and Conversion Cable 9318, used as a substitute for the 9278

Consistent, High-precision Current Testing Across a Wide Temperature Range

AC/DC CURRENT PROBE CT6841, CT6843



- Ideal for use in environmental testing with broad -40°C to 85°C temperature range
- High precision with a clamp-type design, $\pm 0.3\%$ amplitude accuracy, $\pm 0.1^\circ$ phase accuracy
- Wide-bandwidth DC to 1 MHz (CT6841), DC to 500 kHz (CT6843)
- Single-handed operation and robust locking mechanism
- Reduced effects from magnetic fields, conductor position, and noise from nearby wires
- For EV/HEV battery charge and discharge efficiency measurement and inverter and power conditioner conversion efficiency evaluation

Order Code: **CT6841** (20 A AC/DC)
CT6841-05 (20 A AC/DC, 12 pin terminal, for the PW6001 only)
CT6843 (200 A AC/DC)
CT6843-05 (200 A AC/DC, 12 pin terminal, for the PW6001 only)

Note: These products cannot be used alone. The optional 9555-10 is required in order to supply power and connect the clamp to a Memory HiCorder or other instrument. Products can be directly connected to the Power Meter 3193-10 and Power Analyzer 3390 (Does not support Model 3390-10).

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

	CT6841	CT6843
Rated current	20 A AC/DC	200 A AC/DC
Max. allowable input	40 A continuous (requires derating at frequency or temperature)	400 A continuous (requires derating at frequency or temperature)
Frequency characteristics	Amplitude: DC to 1 MHz Phase: DC to 300 kHz	Amplitude: DC to 500 kHz Phase: DC to 300 kHz
Amplitude and phase accuracy	DC $\pm 0.3\%$ rdg. $\pm 0.05\%$ f.s. (Phase: Not defined) DC < $f \leq 100$ Hz $\pm 0.3\%$ rdg. $\pm 0.01\%$ f.s. (Phase: ± 0.1 deg) Defined to 1 MHz	DC $\pm 0.3\%$ rdg. $\pm 0.02\%$ f.s. (Phase: Not defined) DC < $f \leq 100$ Hz $\pm 0.3\%$ rdg. $\pm 0.01\%$ f.s. (Phase: ± 0.1 deg) Defined to 500 kHz
Power consumption	5 VA max. (at 20 A/55 Hz, ± 12 V power requirement)	6 VA max. (at 200 A/55 Hz, ± 12 V power requirement)
Output voltage	0.1 V/A (CT6841), 0.01 V/A (CT6843) (voltage output with the Sensor Unit 9555-10, use with a device having a 1 M Ω input resistance or higher)	
Core diameter	ϕ 20 mm (0.79 in)	
Operating temperature, humidity	-40 °C to +85 °C (-40 °F to 185 °F), 80% rh or less (with no condensation)	
Power supply	DC ± 11 V to ± 15 V (Power supplied via the 9555-10, which supports 100 to 240 V AC)	
Dimensions and mass	153 mm (6.02 in)W \times 67 mm (2.64 in)H \times 25 mm (0.98 in)D, cord length: 3 m (9.84 ft), 350 g (12.3 oz)	153 mm (6.02 in)W \times 67 mm (2.64 in)H \times 25 mm (0.98 in)D, cord length: 3 m (9.84 ft), 370 g (13.1 oz)
Accessories	Instruction manual \times 1, Mark bands \times 6, Carrying Case	

Compatible products



Both the 9318 and 9705 are required in order to connect to the F/V Unit 8940

Options

SENSOR UNIT 9555-10
Power supply for current sensors when used alone

CONNECTION CORD L9217 9165
Cord has insulated BNC connectors at both ends, for signal output, 1.6 m (5.25 ft) length

CONNECTION CORD 9165
Cord has metallic BNC connectors at both ends, use at metallic terminal, 1.5 m (4.92 ft) length, not CE marked

CONVERSION CABLE 9318
To connect the CT6841/43, CT6865/63, 9277/78/79, 9270/71/72 to the 8971/40/51, 38 cm (14.96 in) length

CONVERSION CABLE CT9900
For current sensor connect 10 pins to 12 pins

*CT9900 for connecting to the PW6001

Options

CONVERSION CABLE 9705
0.2 m (0.66 ft) length, to connect the CT6841/6843, CT6863/6865, 9709, 9272-10 to the F/V Unit 8940
Cannot be used in combination with the CT6862

EXTENSION CABLE 9706
Extension for 5 m (16.41 ft) length, connect up to 2 cables in series.
Caution! Cannot be used in combination with the CT6862/ 63 or 9277 to 9279

Dramatically improved characteristics, compared to the legacy Universal Clamp On CT 9277/9278

Broad temperature range

Ideal for use in environmental testing

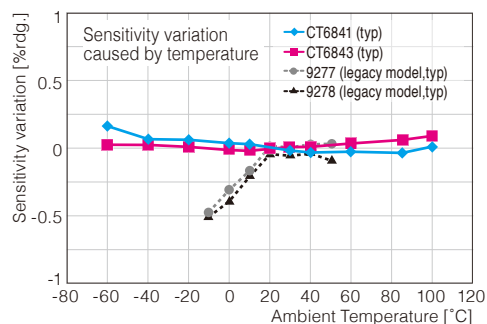
The CT6841 and CT6843 feature broad temperature characteristics and an operating temperature range of -40°C to 85°C, allowing them to be used in operational evaluations of devices and inside equipment that are subject to extreme temperature changes. The current sensors' tough performance helps ensure you can make the measurements you need.



High accuracy

Reliable track record and high accuracy of $\pm 0.3\%$ rdg.

The CT6841/CT6843 feature a smaller sensor head and grip than legacy models, making single-handed operation easy. Each sensor also features a robust locking mechanism so that external shocks won't knock it off the wire being measured.



Wide-bandwidth DC to 20kHz High-precision Sensors to View Waveforms (for AC/DC)

UNIVERSAL CLAMP ON CT 9279



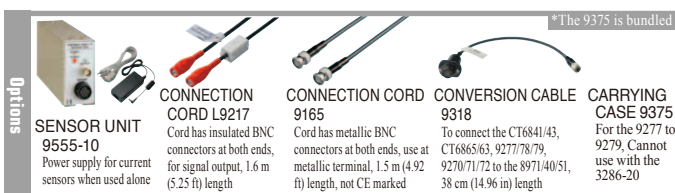
- Wide DC to 200 kHz frequency bandwidth
- Minimal zero drift for stable, long-term measurements
- For power lines and secondary side of inverters
- 650 A of continuous input
- Use together with the SENSOR UNIT 9555-10 for high precision waveform monitoring and recording
- Also pair with AC/DC clamp on power meters

Order Code: 9279 (DC to 20 kHz, 500 A)
9279-01 (CE marked model, DC to 20 kHz, 500 A)

Note: Model 9279-01 compliant to CE-mark requirements is available on special order. Note: These products cannot be used alone. The optional 9555-10 is required in order to supply power and connect the clamp to a Memory HiCorder or other instrument. Products can be directly connected the Power Meter 3193-10 and 3390 (cannot use with the 3390-10).

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 6 months)

Rated current	500 A AC/DC
Continuous allowable input	650 A rms
Amplitude accuracy	±0.5 % rdg. ±0.05 % f.s. (DC and 45 to 66 Hz, 30 min or more warming-up after degaussing)
Phase accuracy	±0.2° (45 to 66 Hz, 30 min or more warming-up after degaussing)
Frequency characteristics (Amplitude/Phase, deviation from accuracy)	DC to 1 kHz: ±1.0 % (±0.5°) 1 k to 10 kHz: ±2.5 % (±2.5°) 10 k to 20 kHz: ±5.0 % (±5.0°)
Output rate (Via the 9555-10)	2 V/Rated current (voltage output with the Sensor Unit 9555-10, use with a device having a 1 MΩ input resistance or higher)
Core diameter	φ 40 mm (1.57 in)
Power consumption	7.2 W (with rated input)
Power supply	DC ±12 V to ±15 V (Power supplied via the 9555-10, which supports 100 to 240 V AC)
Dimensions and mass	220 mm (8.66 in)W × 103 mm (4.06 in)H × 43.5 mm (1.71 in)D, 470 g (16.6 oz), cord length: 3 m (9.84 ft)
Accessories	Carrying case 9375 ×1, Instruction manual ×1, Mark-band ×6



Ideal for Measuring Current with Low Frequencies such as Inverter Control Devices

CLAMP ON SENSOR 9272-10



- Superior low frequency and phase characteristics suitable for testing the current and power of inverter control devices
- Wide 1 Hz to 100 kHz frequency bandwidth perfect for harmonic analysis, FFT analysis and waveform monitoring

Order Code: 9272-10 (200/20 A AC)

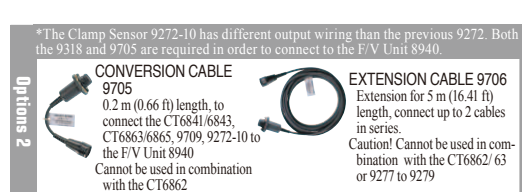
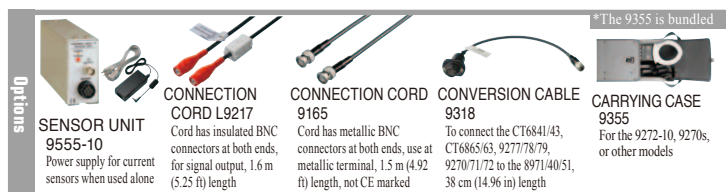
Note: This product cannot be used alone. The optional 9555-10 is required in order to supply power and connect the clamp to a Memory HiCorder or other instrument. The clamp can be directly connected the Power Meter 3193-10 and 3390.

Basic specifications (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)

Rated current	20 A AC, or 200 A AC (selectable)
Max. allowable input	20 A range: 50 A rms Max. 200 A range: 300 A rms Max.
Accuracy	Amplitude: ±0.3 % rdg. ±0.01 % f.s. Phase: ±0.2° (45 to 66 Hz)
Frequency characteristics	1 Hz (±2 % rdg. ±0.1 % f.s.) to 100 kHz (±30 % rdg. ±0.1 % f.s.)
Output rate (With the 9555-10)	2 V/20 A rated current range, or 2 V/200 A rated current range (voltage output with the Sensor Unit 9555-10, use with a device having a 1 MΩ input resistance or higher)
Max. rated voltage to earth	600 V rms (CAT III)
Core diameter	φ 46 mm (1.81 in)
Power supply	DC ±11 V to ±15 V (Power supplied via the 9555-10, which supports 100 to 240 V AC)
Power consumption	5 VA Max. (when measuring 200 A)
Dimensions and mass	78 mm (3.07 in)W × 188 mm (7.40 in)H × 35 mm (1.38 in)D, 430 g (15.2 oz), cord length: 3 m (9.84 ft)
Accessories	Carrying case 9355 ×1, Instruction manual ×1, Mark bands ×6

Model 9272-10 Compatibility (use with the connection cord)

Compatible models	Status	Note
3193-10, 3193, 3194 (use with the 9602)	✓	Directly connectable, Add 0.1% rdg. to accuracy
MR8847s (use with the 8971)	✓	To connect via the Conversion Cable 9318
Model 8940 for Memory HiCorders	✓	Need the Conversion Cable 9705, and use with the Conversion Cable 9318 to connect Model 9272-10 to the F/V Unit 8940. (Not necessary when using Model 9272 due to different output wiring specifications.)



SENSOR UNIT 9555-10



- Power supply for the Current Sensor series when the sensors are used alone

Order Code : 9555-10

Basic specifications

Compatible sensor	One of the CT6865 to CT6862s, CT6843/CT6841, 9709, 9279 to 9277s, 9272-10, 9272 to 9270 series
Output Terminal	BNC Terminal
Power supply	AC Adapter 9418-15, 100 to 240 V, 50/60 Hz, 20 VA
Dimensions and mass	42 mm (1.65 in)W × 82 mm (3.27 in)H × 132 mm (5.20 in)D, 600 g (21.2 oz)
Accessories	Instruction manual ×1, AC Adapter 9418-15 ×1

AC/DC Clamp Sensors to Meet New DC Measurement Needs

CLAMP ON AC/DC SENSOR CT9691/9692/9693 series



- Ideal for solar power generation systems, UPS and battery testing
- Large current measuring applications in the fields of electric and hybrid electric vehicles (CT9693)
- Wide-bandwidth DC to 10 kHz (CT9691), 20 kHz (CT9692) excellent frequency characteristics
- Applications in solar power generation, battery charge and discharge, and measuring the secondary side of inverters
- For observing waveforms in combination with oscilloscopes or Hioki Memory HiCorders (use with the CT6590)

Order Code: **CT9691-90** (DC to 10 kHz, 100 A, power supply bundled with CT9691)
CT9691 (DC to 10 kHz, 100 A, sensor only)
CT9692-90 (DC to 20 kHz, 200 A, power supply bundled with CT9692)
CT9692 (DC to 20 kHz, 200 A, sensor only)
CT9693-90 (DC to 15 kHz, 2000 A, power supply bundled with CT9693)
CT9693 (DC to 15 kHz, 2000 A, sensor only)
CT6590 (bundled with the CT969x-90)

*Note: To use the CT9691/ CT9692/ CT9693 sensor with the Hioki PW3198 Power Quality Analyzer or the Hioki Memory HiCorder series, it must be connected and powered via the Sensor Unit CT6590.
 Note: The CT9691/ CT9692/ CT9693 sensor may also be used with the Clamp on AC/DC HiTester 3290/ 3290-10 (without the Sensor Unit CT6590).*

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

	CT9691	CT9692	CT9693
Rated input current	100 A AC/DC	200 A AC/DC	2000 A AC/DC
Max. allowable input	Continuous 100 Arms	Continuous 200 Arms	Continuous 2000 Arms
Bandwidth	DC to 10 kHz (-3dB)	DC to 20 kHz (-3dB)	DC to 15 kHz (-3dB)
Max. rated voltage to earth	600 V AC/DC CAT III		
Power consumption	50 mVA		
Core diameter	φ 35 mm (1.38 in)	φ 33 mm (1.30 in)	φ 55 mm (2.17 in)
Dimensions and mass	53 mm (2.09 in)W × 129 mm (5.08 in)H × 18 mm (0.71 in)D, 230 g (8.1 oz)	62 mm (2.44 in)W × 167 mm (6.57 in)H × 35 mm (1.38 in)D, 410 g (14.5 oz)	62 mm (2.44 in)W × 196 mm (7.72 in)H × 35 mm (1.38 in)D, 500 g (17.6 oz)
Cord length	2 m (6.56 ft)		
Accessories	Instruction manual ×1		

■ CT6590 Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

	CT9691, 9691 (Discontinued model 9691: Phase not defined)	CT9692, 9692 (Discontinued model 9692: Phase not defined)	CT9693, 9693 (Discontinued model 9693: Phase not defined)
Output	Selectable H range/ L range, BNC terminal		
Output (in combination with a sensor)	100 mV f.s./100 A range 100 mV f.s./10 A range	200 mV f.s./200 A range 200 mV f.s./20 A range	200 mV f.s./2000 A range 200 mV f.s./200 A range
Amplitude basic accuracy (in combination with a sensor)	±1.5 % rdg. ±1.0 % f.s. (DC ≤ f ≤ 66 Hz)	±1.5 % rdg. ±0.5 % f.s. (DC ≤ f ≤ 66 Hz)	±1.5 % rdg. ±0.5 % f.s. (45 ≤ f ≤ 66 Hz)
Phase basic accuracy (in combination with a sensor)	±2° (DC < f ≤ 66 Hz)	±2° (DC < f ≤ 66 Hz)	±2° (45 ≤ f ≤ 66 Hz)
Power supply	LR6 (AA) alkaline batteries ×2, Continuous use : 25 hr (Rated Power 1 VA), or AC adapter 9445-02/-03 (Rated Power 1.5 VA), or External power supply 5 to 15 V DC (Rated Power 1.5 VA)		
Dimensions and mass	36 mm (1.42 in)W × 120 mm (4.72 in)H × 34 mm (1.34 in)D, 165 g (5.8 oz) (including batteries), cord length 1 m (3.28 ft)		
Accessories	LR6 (AA) alkaline batteries ×2, Instruction manual ×1, Connector cover ×1		

Options	AC ADAPTER 9445-02 For USA, 9V/ 1A	AC ADAPTER 9445-03 For EU, 9V/ 1A

Simply Connect to a Tester or Recorder to Easily Measure Large Currents

CLAMP ON PROBE 9132-50, 9010-50



- Economical clamp sensors for waveform recording with Memory HiCorders
- Choose from up to six general-purpose ranges

Order Code: **9132-50** (BNC output terminal)
9010-50 (BNC output terminal)

Note: For commercial power lines, 50/60 Hz (separate power supply not required).

■ Basic specifications (Accuracy guaranteed for 1 year)

	9132-50	9010-50
Rated current	20 A to 1000 A AC, 6 ranges	10 A to 500 A AC, 6 ranges
Accuracy	±3 % rdg. ±0.2 % f.s. (45 to 66 Hz)	±2 % rdg. ±1 % f.s. (45 to 66 Hz)
Frequency characteristics	Add to amplitude accuracy for frequencies from 40 to 1 kHz: ±1 % rdg.	Add to amplitude accuracy for frequencies from 40 to 1 kHz: ±6 % rdg. (at 10 A and 20 A range) ±3 % rdg. (for 50 A range and above)
Output rate	0.2 V AC f.s. (f.s. = setting range) (Connect to a voltage input device providing a high input impedance of 1 MΩ)	
Max. allowable input	1000 A rms continuous (all ranges) (For 40 Hz to 500 Hz: 100 %, and for 500 Hz to 1 kHz: within 90 % of derating)	150 A rms continuous (10/20/50 A ranges) 400 A rms continuous (100/200 A ranges) 650 A rms continuous (500 A range) (For 40 Hz to 100 Hz: 100 %, and for 100 Hz to 1 kHz: within 50 % of derating)
Max. rated voltage to earth	600 Vrms (50/60 Hz, CAT III)	
Core diameter	φ55 mm (2.17 in), or 20 mm (0.79 in) × 80 mm (3.15 in) busbar	φ46 mm (1.81 in)
Dimensions and mass	100 mm (3.94 in)W × 224 mm (8.82 in)H × 35 mm (1.38 in)D, 600 g (21.2 oz), cord length: 3 m (9.84 ft)	78 mm (3.07 in)W × 188 mm (7.40 in)H × 35 mm (1.38 in)D, 420 g (14.8 oz), cord length: 3 m (9.84 ft)
Accessories	Instruction manual ×1	Instruction manual ×1

Options	CONVERSION ADAPTER 9704
	Receiving end: Female BNC; Output end: Male banana-plug *Not compatible with older generation Memory HiCorders with banana input terminals

Superior Phase Characteristics Let You Record Waveforms Accurately

CLAMP ON PROBE 9018-50



- Choose from up to six general-purpose ranges
- Accurately record and analyze waveforms and harmonic signals

Order Code: **9018-50** (BNC output terminal)

Note: For commercial power lines, 50/60 Hz (separate power supply not required).

■ Basic specifications (Accuracy guaranteed for 1 year)





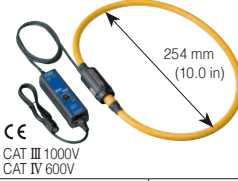
Rated current	10 A to 500 A AC, 6 ranges
Accuracy	±1.5 % rdg. ±0.1 % f.s. (45 to 66 Hz)
Frequency characteristics	Add to amplitude accuracy : ±1 % rdg. Add to phase accuracy : ±2.5 ° for frequencies from 40 Hz to 3 kHz
Output rate	0.2 V AC f.s. (f.s. = setting range) (Connect to a voltage input device providing a high input impedance of 1 MΩ)
Max. allowable input	150 A rms continuous (10/20/50 A ranges) 400 A rms continuous (100/200 A ranges) 650 A rms continuous (500 A range) (For 40 Hz to 100 Hz: 100 %, and for 100 Hz to 1 kHz: within 50 % of derating)
Max. rated voltage to earth	600 Vrms (50/60 Hz, CAT III)
Core diameter	φ46 mm (1.81 in)
Dimensions and mass	78 mm (3.07 in)W × 188 mm (7.40 in)H × 35 mm (1.38 in)D, 420 g (14.8 oz), cord length: 3 m (9.84 ft)
Accessories	Instruction manual ×1

Options	CONVERSION ADAPTER 9704
	Receiving end: Female BNC; Output end: Male banana-plug *Not compatible with older generation Memory HiCorders with banana input terminals

Sensors for Master to Branch Circuits

Voltage output type for use with load currents: for the PW3360 series, PW3198, 3197, 3169 series, and 8800 series/MR8800 series

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



Model	9694	9660	9661	9669	CT9667	
						
Primary current rating	5 A AC	100 A AC	500 A AC	1000 A AC	5000 A AC	500 A AC
Max. allowable input	Continuous 50 A rms (45 to 66 Hz)	Continuous 130 A rms (45 to 66 Hz)	Continuous 550 A rms (45 to 66 Hz)	Continuous 1000 A rms (45 to 66 Hz)	Continuous 10000 A rms (45 to 66 Hz) (with frequency-based deratings)	
Output voltage	AC 10 mV/ A	AC 1 mV/ A	AC 1 mV/ A	AC 0.5 mV/ A	AC 500 mV/ A (AC 0.1 mV/ A)	AC 500 mV/ A (AC 1 mV/ A)
Amplitude accuracy	±0.3 % rdg. ±0.02 % f.s. (45 to 66 Hz)		±0.3 % rdg. ±0.01 % f.s. (45 to 66 Hz)	±1.0 % rdg. ±0.01 % f.s. (45 to 66 Hz)	±2 % rdg. ±0.3 % f.s. (at center of sensor, 45 to 66 Hz)	
Phase accuracy	±2° (45 Hz to 5 kHz)	±1° (45 Hz to 5 kHz)	±0.5° (45 Hz to 5 kHz)	±1° (45 Hz to 5 kHz)	±1° (45 to 66 Hz)	
Frequency characteristics	40 Hz to 5 kHz: ±1.0 % (deviation from accuracy)			40 Hz to 5 kHz: ±2.0 % (deviation from accuracy)		10 Hz to 20 kHz (±3dB)
Max. rated voltage to earth	Less than 300 Vrms		Less than 600 Vrms			Less than 1000 Vrms (CAT III), 600V rms (CAT IV)
Core diameter	φ 15 mm (0.59 in)		φ 46 mm (1.81 in)	φ 55 mm (2.17 in) or 80 mm (3.15 in) × 20 mm (0.79 in) bus-bar		φ 254 mm (10.0 inch)
Power supply	Not required		Not required	Not required		LR6 (AA) alkaline batteries ×2, Continuous use : 7 days, or AC adapter 9445-02/-03, or External power supply 5 to 15 VDC
Dimensions and mass	46 mm (1.81 in)W × 135 mm (5.31 in)H × 21 mm (0.83 in)D, 230 g (8.1 oz)		78 mm (3.07 in)W × 152 mm (5.98 in)H × 42 mm (1.65 in)D, 380 g (13.4 oz)	99.5 mm (3.92 in)W × 188 mm (7.40 in)H × 42 mm (1.65 in)D, 590 g (20.8 oz)		Sensor thickness: φ 13 mm, Cable length: Between sensor and battery box: 2 m (6.56 ft), Output cable: 1 m (3.28 ft), Battery box: 35 mm (1.38 in)W × 120.5 mm (4.74 in)H × 34 mm (1.34 in)D, 470 g (16.6 oz)
Cord length 3 m (9.84 ft), Output terminal: BNC						

● CT9667 OPTION: AC ADAPTER 9445-02/-03 (DC 9 V/1 A output)

f.s. is the sensor's rated primary current value.

For load current levels: Voltage output

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

Model	9695-02	9695-03
		
Primary current rating	50 A AC	100 A AC
Max. allowable input	Continuous 60 Arms (45 to 66 Hz)	Continuous 130 Arms (45 to 66 Hz)
Output voltage	AC 10 mV/ A	AC 1 mV/ A
Amplitude accuracy	±0.3 % rdg. ±0.02 % f.s. (45 to 66 Hz)	
Phase accuracy	±2° (45 to 5 kHz)	±1° (45 to 5 kHz)
Frequency characteristics	40 Hz to 5 kHz: ±1.0 % (Amplitude deviation from accuracy)	
Max. rated voltage to earth	Less than 300 Vrms (Insulated conductor)	
Core diameter	φ 15 mm (0.59 in)	
Power supply	Not required	
Dimensions and mass	50.5 mm (1.99 in)W × 58 mm (2.28 in)H × 18.7 mm (0.74 in)D, 50 g (1.8 oz) Output terminal : M3 terminal (outside 3 mm, 0.12 inch diameter) Option: Connection cable 9219 (3 m, 9.84 ft length)	

f.s. is the sensor's rated primary current value.

● 9695 OPTION



CONNECTION CABLE 9219

Connect with the 9695-02/-03, Output BNC terminal, 3 m (9.84 ft) length



For leak current: Voltage output

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

Model	9675	9657-10
		
Primary current rating	10 A AC (Leak current, 50/60 Hz)	
Max. allowable input	Continuous 10 Arms (45 to 66 Hz)	Continuous 30 Arms (45 to 66 Hz)
Output voltage	AC 100 mV/ A	
Amplitude accuracy	±1.0 % rdg. ±0.005 % f.s. (45 to 66 Hz)	±1.0 % rdg. ±0.05 % f.s. (45 to 66 Hz)
Phase accuracy	±5° (50 or 60 Hz)	±3° (50 or 60 Hz)
Frequency characteristics	40 Hz to 5 kHz: ±5 % (deviation from accuracy)	40 Hz to 5 kHz: ±3 % (deviation from accuracy)
Residual current	1 mA (With 10 A AC forward and return lines)	5 mA (With 100 A AC forward and return lines)
Effect of external magnetic fields	Equivalent to 7.5A max. (With a magnetic field of AC 400 A/m)	Equivalent to 5mA, 7.5A max. (With a magnetic field of AC 400 A/m)
Max. rated voltage to earth	Less than 300 Vrms, (Insulated conductor)	
Core diameter	φ 30 mm (1.18 in)	φ 40 mm (1.57 in)
Power supply	Not required	
Dimensions and mass	60 mm (2.36 in)W × 112.5 mm (4.43 in)H × 23.6 mm (0.93 in)D, 160 g (5.6 oz)	74 mm (2.91 in)W × 145 mm (5.71 in)H × 42 mm (1.65 in)D, 380 g (13.4 oz)
Cord length : 3 m (9.84 ft), Output BNC terminal		