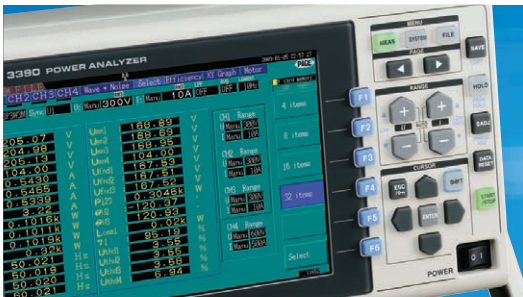


# Electrical Measuring Instruments

## General Catalog



# Recorders



# Power



# Electronic



# Field

Recorders / Data Loggers / Remote Measurement System / Component Measuring Instruments / Signal Generators / Signal Sources / Safety Standards Measuring Instruments / Power Measuring Instruments / Clamp Sensors / Telecommunications / Environmental Measuring Instruments / Digital Multimeters / Insulation and Earth Testers / Clamp On Meters / Meter Relays / Automatic Testing Equipment



ISO14001  
JQA-E-90091



ISO 9001  
JMI-0216

# About the Catalog

## Searching for product pages and notes ...

Products in this catalog are grouped according to functions so you can easily find the right instrument for your application by referring to the list of product groups in the table of contents on the first page, and moving directly to the indicated section.



**ISO 14001**  
CERTIFICATE No. JQA-E90091

HIOKI is certified under the international standard ISO 14001 for environmental management systems.



**ISO 9001**  
CERTIFICATE No. JQA-Q216

HIOKI's product has been manufactured in conformity with the ISO 9001 international standard on Quality Control and Quality Assurance.

Dimensions and mass:

Exterior dimensions exclude protrusions, and are given in order of width(W), height(H), and depth(D), in mm units. Indicated weight represents an approximation of the mass of the main unit only, not including case, accessories, etc.

## About the marks ...



New products in the 2010 Electrical Measuring Instruments GENERAL CATALOG.



True RMS measuring capability for accurate measurement of even distorted waveforms.

**/LAN/ /GP-IB/ /RS-232C/ /SCSI/ /FAX/modem/ /USB<sub>1.1</sub>/ /USB<sub>2.0</sub>/**

Models are available with interfaces compatible with LAN, GP-IB, RS-232C, SCSI, FAX/modem and USB standards.

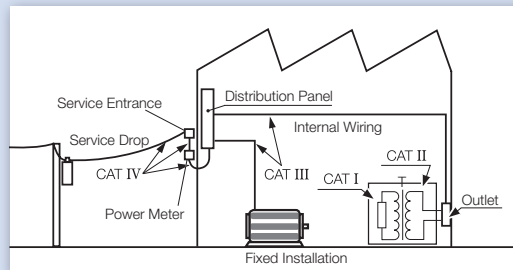
## Measurement categories (Overvoltage categories)

To ensure safe operation of measurement products, IEC 61010 establishes safety standards for various electrical environments, categorized as CAT I to CAT IV, and called measurement categories. These are defined as follows.

- CAT I** : Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.
- CAT II** : Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)
- CAT III** : Primary electrical circuits of heavy equipment (fixed installations) connected directly to the distribution panel, and feeders from the distribution panel to outlets.
- CAT IV** : The circuit from the service drop to the service entrance, and to the power meter and primary overcurrent protection device (distribution panel).

Higher-numbered categories correspond to electrical environments with greater momentary energy, so a measurement product designed for **CAT III** environments can endure greater momentary energy than one designed for **CAT II**. Using a measurement product in an environment designated with a higher-numbered category than that for which the product is rated could result in a severe accident, and must be carefully avoided.

Never use a **CAT I** measuring product in **CAT II, III, or IV** environments. The measurement categories comply with the Overvoltage Categories of the IEC60664 Standards.



### What is the CE Mark?

The CE mark certifies that a product complies with electrical safety standards established by European

Community directives (EC directives). These EC directives require conformance of a product to EN/IEC standards for electrical safety.

- HIOKI's products bearing the CE Mark are designed to confirm to the Low Voltage and EMC directives based on the EC directives.
- The Low Voltage directive is applicable to products operating from 50 to 1000V AC and 75 to 1500V DC, and require protection from electrical hazards such as electric shock.
- The EMC directive requires suppression of emissions of harmful electromagnetic radiation, and the ability to withstand exposure to external electromagnetic radiation without malfunction.

### WARNING



In some cases, power lines may carry voltage spikes of several times the normal supply voltage. For reasons of safety, ordinary testers should not be used to measure power lines carrying more than 250V. When measuring such power lines, always use a tester with built-in overcurrent protection to guard against short circuits, such as Model 3008 and CAT III marked products.

**Note** : An industrial power line refers to a high-capacity supply circuit to equipment in factories or offices. A high-capacity supply circuit refers generally to a line carrying 20 A or more. This does not therefore include supply lines protected by overcurrent protection (fuses) or distribution breakers.

## Notes on accuracy ...

The specifications in this catalog include figures for "measurement accuracy" when referring to digital measuring instruments, and for "measurement tolerance" when referring to analog instruments.

The accuracy and tolerance figures in the product specifications are defined in terms of **full scale (f.s.) value** and **displayed reading (rdg.)** or **digit resolution (dgt.)** as described below.

**f.s.**  
(maximum display, or length of scale, ...full-scale)

Signifies the maximum display (scale) value or the length of the scale (in cases where the scale consists of unequal increments or where the maximum value cannot be defined). In general, this is the range value (the value written on the range selector, or equivalent) currently in use. However, be aware that in cases where the maximum display value is 2000V but the range value is only 600V, the maximum display value (scale value) is still used as the f.s. value.

**rdg.**  
(displayed or indicated value, ...reading value)

This signifies the value actually being measured, i.e., the value that is currently indicated or displayed by the measuring instrument.

**dgt.** (digital resolution, ...digit)

Signifies the smallest display unit on a digital measuring instrument, i.e., the value displayed when the last digit on the digital display is "1". Essentially, this indicates an error of 1 digit (based on decimal processing in analog-to-digital conversion), but in actuality this is the digit error combined with the f.s. error converted to a fraction of a digit unit. The accuracy associated with a particular measured value as shown in the product specifications is derived from these values.

### WARNING



1. To avoid short circuits and electric shock accidents when using a clamp-on sensor, use only with power lines carrying voltages within the rating limit of the sensor.

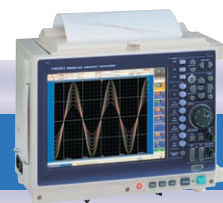
2. To avoid short circuits and electric shock accidents when the clamp-on sensor is open, do not use on bare conductors.

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**Power Measuring Instruments P.21 to 27**



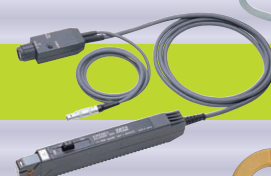
**Electronic Measuring Instruments P.28 to 38**



**Environmental Measuring Instruments P.39 to 43**



**Clamp Sensors P.44 to 47**



**Clamp Testers P.48 to 54**



**Field Measuring Instruments P.55 to 64**



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 Temperature Probe, Sensors ..... P.66  
 Test Leads, Test Probes ..... P.67 to P.68  
 Carrying cases, Clamp on sensors ..... P.69 to P.70  
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 Company Guide & Internet Website ..... P.74



# Recorders, Memory Recorders

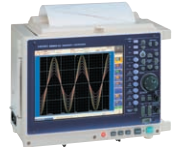
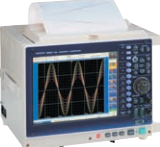
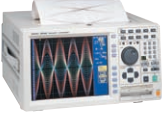




## Recorders, Memory Recorders Index

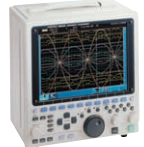
### Handy units for service and maintenance recording

 <p><b>8870-20</b>    €€</p> <p>1 MS/sec (2 ch) 2 MW/ch memory 12 bits A/D resolution handheld type</p> <p>.....p.15</p>	 <p><b>8807-01/8808-01</b>    €€</p> <p>400 kS/sec (2ch, 4 ch) 256 kW memory 12 bits A/D resolution Battery operation</p> <p>.....p.14</p>	 <p><b>8835-01</b>    €€</p> <p>1 MS/sec (8 ch) 4 MW (1 ch) memory 12 bits A/D resolution</p> <p>.....p.10</p>	 <p><b>8205-10</b>    €€</p> <p>Recorder (1 ch) 100 sampling/sec. No memory</p> <p>.....p.19</p>	 <p><b>LR8400-20/ 8401-20/8402-20</b>    €€</p> <p>Data logger (30 ch) 10 ms to 1h interval 8 MW internal memory Battery operation</p> <p>.....p.17</p>	 <p><b>8847</b>    €€</p> <p>20MS/sec Analog 16ch + Logic 16ch to Analog 10ch + Logic 64ch 12/16 bits A/D resolution</p> <p>.....p.7</p>
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### For simultaneous recording of multiple signals

 <p><b>8860-50</b>    €€</p> <p>20 MS/sec. (12 bits 8 ch) 2 MS/sec. (16 bits 8 ch) 50 ms/all ch (16 bits 64 ch) 32 MW up to 1GW memory</p> <p>.....p.5</p>	 <p><b>8861-50</b>    €€</p> <p>20 MS/sec. (12 bits 16 ch) 2 MS/sec. (16 bits 16 ch) 50 ms/all ch (16 bits 128 ch) 64 MW up to 2GW memory</p> <p>.....p.5</p>	 <p><b>8826</b>    €€</p> <p>1 MS/sec. (32 ch) 4 MW (1 ch) memory- expandable up to 4 times 12 bits A/D resolution</p> <p>.....p.10</p>	 <p><b>8423</b>    €€</p> <p>15 ch to 600 ch isolated input Minimum 10 ms interval LAN/USB PC based data acquisition</p> <p>.....p.16</p>	 <p><b>8430-20</b>    €€</p> <p>10 ch isolated input 4 ch pulse input Minimum 10 ms interval PC based data acquisition USB</p> <p>.....p.18</p>
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### For waveform capture of high-speed signals



**8855**    €€

8 channels  
20 MS/sec (8 ch)  
Max. 512 MW memory  
12 bits A/D resolution  
(16 bits A/D 1 MS/sec.)

.....p.13

### Record and Analyze CAN-Bus Signals




**8910**    €€

2 channels  
CAN-Bus interface  
(Receive only)  
12 Analog + 6 Logic outputs

.....p.13

### Options for MEMORY HiCORDER series



.....p.5,6,7, 8,9,11,12, 13

### WAVE COMPARATOR



**8730-10/8731-10**    €€

Geared for the  
Production line  
8730-10: 1ch input  
8731-10: 2ch input

.....p.19

### For power line fault monitoring



**8206-10**    €€

Recorder for power lines  
100 sampling/sec.(2 ch)  
AC voltage and current  
No memory

.....p.19

### NOISE HiLOGGER



**8808-51**    €€

Harmonic analysis  
400 kS/sec (4 ch)  
256 kW (1 ch)Memory  
12 bits A/D resolution

.....p.14

### NOISE SEARCH TESTER



**3145-20**    €€

Measures the noise  
levels and frequencies  
on telecom, power and  
grounding lines

.....p.20

### NOISE SEARCH TESTER



**3144-20**    €€

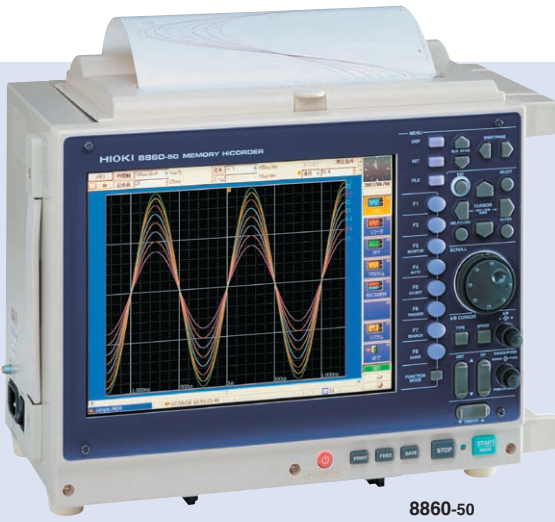
Identifies noise in  
communication and  
power lines  
Frequency range 500 Hz  
to 30 MHz

.....p.20

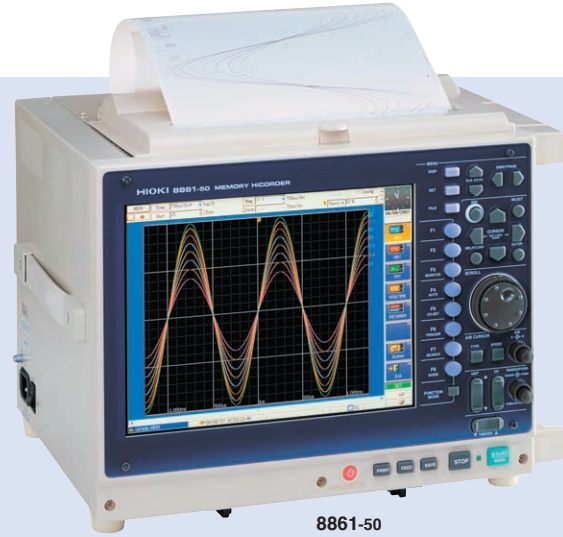
# MEMORY HiCODER | 8860-50 | 8861-50

## HIOKI's Next Generation Recorder High Performance Isolated High-speed Recorder and Data Logger All in One Complete Instrument

- High and Low Speed Dual Sampling - High speed at 20MS/s (with 8956 input unit)
- Maximum 128 channels (8861-50) or 64 channels (8860-50) of data logging
- Large capacity memory, LAN/USB and other popular PC interfaces standard
- Intuitive operation using GUI/mouse/keyboard



8860-50



8861-50

Recorders, Memory Recorders

### SPECIFICATIONS

Measurement ranges using 8956 ANALOG UNIT /option	5 mV to 20 V/division, 12 ranges (20 divisions f.s.), resolution: 1/100 of range
Frequency band	DC to 10 MHz $\pm 3$ dB (using 8956 ANALOG UNIT /option)
Time axis at memory function	5 $\mu$ s to 5 minutes/division, 26 settings; external sampling (100 samples/division, desired setting)
Measurement functions	Memory, Recorder, Recorder & Memory (Version 2.00 or later), FFT, Real-time save function
Number of input channels	8860-50: Analog (up to 16 channels) + logic (16 channels standard) or Logger Input (up to 64 channels) 8861-50: Analog (up to 32 channels) + logic (16 channels standard) or Logger Input (up to 128 channels)
Memory capacity	8860-50: 32 M words/9715-50x1 (Total 1 GW, 9715-03 (x1)) 8861-50: 64 M words/9715-50x2 (Total 2 GW, 9715-03 (x2))
Data storage	Type II PC card slot, Hard disk drive (optional)
Interfaces	USB2.0 (3 ports), LAN, GP-IB (with GP-IB CARD 9558), Monitor output (SVGA)
Recording and display	10.4-inch TFT color LCD, 216 mm $\times$ 30 m (A4) or 112 mm $\times$ 18m (A6), thermal paper roll
Other functions	Scaling, Vernier function, cursor measurement, comment insertion, other functions
Power supply	100 to 240 V AC (50/60 Hz)
Dimensions, mass (base unit only)	8860-50: 330 mmW $\times$ 250 mmH $\times$ 184.5 mmD, 8.0 kg 8861-50: 330 mmW $\times$ 250 mmH $\times$ 284.5 mmD, 10.5 kg
Accessories	Power cord (1), input cord label (1), Wave viewer software (1)

### OPTIONS

(The 8860-50 or 8861-50 cannot be used alone. Measurement requires optional input unit or similar peripheral.)


#### ●Options (Factory fitted)

A4 PRINTER UNIT	8995	MEMORY BACK UP UNIT	9719-50
A6 PRINTER UNIT	8995-01	DC POWER UNIT	9684
MEMORY BOARD(32MW to 1GW)*	9715-50,-51,-52,-53	PROBE POWER UNIT	9687
HD UNIT	9718-50		

#### ●Options

CONNECTION CORD (500V Max.)	9197	LOGIC PROBE (for 20Ms)	9327
CONNECTION CORD (300V Max.)	9198	LOGIC PROBE	9320-01
CONNECTION CORD (BNC-BNC)	9217	LOGIC PROBE	9321-01
10:1 PROBE	9665	CARRYING CASE (for 8860-50)	9723
100:1 PROBE	9666	CARRYING CASE (for 8861-50)	9724
RECORDING PAPER (for A4-printer 8995 only)	9231	MEMORY HiVIEWER	9725
A4 width 216 mm $\times$ 30 m, 6 rolls		LAN CABLE	9642
RECORDING PAPER (for A6-printer 8995-01 only)	9234	PC CARD 256MB	9727
A6 width 112 mm $\times$ 18 m, 10 rolls		PC CARD 512MB	9728
DIFFERENTIAL PROBE (9418-15 or 9687/9248 is necessary)	9322	PC CARD 1GB	9729
		PC CARD 2GB	9830
		CLAMP ON SENSORs (refer to p.42-45)	
		Other common options (refer to p.12)	

\*One MEMORY BOARD is required in Model 8860-50, and two MEMORY BOARDS of the same capacity are required in Model 8861-50



Input modules	
ANALOG UNIT (20MS/s)	8956
HIGH RESOLUTION UNIT	8957
16ch SCANNER UNIT	8958
DC/RMS UNIT	8959
ANALOG UNIT (1MS/s)	8936
VOLTAGE/TEMP UNIT	8937
FFT ANALOG UNIT	8938
STRAIN UNIT (12Bit)	8939
F/V UNIT	8940
4ch ANALOG UNIT	8946
CHARGE UNIT	8947
STRAIN UNIT (16Bit)	8960
HIGH VOLTAGE UNIT	8961

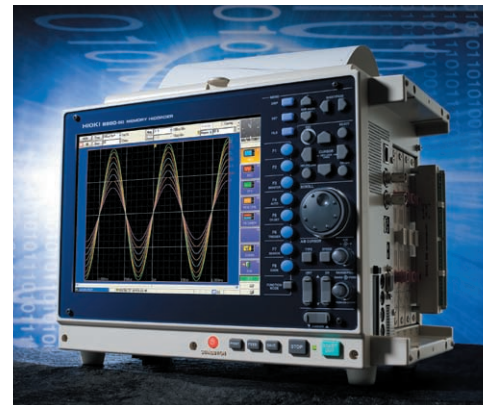
(refer to P.6,11)



8860-50



8861-50



# INPUT Units For 8860-50, 8861-50 only

**Dimensions and mass: approx.**  
170W × 20H × 148.5D mm, approx. 290g  
**Accessories:** None



**8956**

<b>ANALOG UNIT 8956</b>	
<b>Measurement functions</b>	Number of channels: 2, for voltage measurement
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 40 pF), Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/division, 12 ranges, full scale: 20 divisions, AC voltage for possible measurement/display using the memory function: 280 V rms, low-pass filter: 5/500/5k/1M Hz
<b>Measurement resolution</b>	1/100 of measurement range (using 12-bit A/D conversion; installed in 8860-50/8861-50)
<b>Highest sampling rate</b>	20 MS/s (simultaneous sampling in 2 channels)
<b>Accuracy</b>	DC amplitude: ±0.4% of full scale (with filter 5 Hz) Zero position: ±0.1% of full scale (with filter 5 Hz, after zero adjustment)
<b>Frequency characteristics</b>	DC to 10 MHz ±3 dB, with AC coupling: 7 Hz to 10 MHz ±3 dB
<b>Input coupling</b>	DC, GND, AC
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
170W × 20H × 148.5D mm, approx. 290g  
**Accessories:** None



**8959**

<b>DC/RMS UNIT 8959</b>	
<b>Measurement functions</b>	Number of channels: 2, for voltage measurement
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), Max. rated voltage to earth: 370 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/division, 12 ranges, full scale: 20 divisions, AC voltage for possible measurement/display using the memory function: 280V rms, low-pass filter: 5/500/5k/100k Hz
<b>Measurement resolution</b>	1/80 of measurement range (using 12-bit A/D conversion; installed in 8860-50/8861-50)
<b>Highest sampling rate</b>	1 MS/s (simultaneous sampling in 2 channels)
<b>Accuracy</b>	DC amplitude: ±0.4% of full scale (with filter 5 Hz), zero position: ±0.1% of full scale (with filter 5 Hz, after zero adjustment)
<b>RMS measurement</b>	RMS amplitude accuracy: ±1% of full scale (DC, 20 Hz to 1 kHz), ±3% of full scale (1 kHz to 100 kHz), response time: SLOW 5 s (rise time from 0 to 90% of full scale), MID 800 ms (rise time from 0 to 90% of full scale), FAST 100 ms (rise time from 0 to 90% of full scale), crest factor: 2
<b>Frequency characteristics</b>	DC to 400 kHz ±3 dB, with AC coupling: 7 Hz to 400 kHz ±3 dB
<b>Input coupling</b>	DC, GND, AC
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
170W × 20H × 148.5D mm, approx. 310g  
**Accessories:** None



**8957**

<b>HIGH-RESOLUTION UNIT 8957</b>	
<b>Measurement functions</b>	Number of channels: 2, for voltage measurement
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 40 pF), Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/division, 12 ranges, full scale: 20 divisions, AC voltage for possible measurement/display using the memory function: 280 V rms, low-pass filter: 5/50/500/5k/50k Hz
<b>Anti-aliasing filter</b>	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)
<b>Measurement resolution</b>	1/1600 of measurement range (using 16-bit A/D conversion; installed in 8860-50/8861-50)
<b>Highest sampling rate</b>	2 MS/s (simultaneous sampling in 2 channels)
<b>Accuracy</b>	DC amplitude: ±0.2% of full scale (with filter 5 Hz) Zero position: ±0.1% of full scale (with filter 5 Hz, after zero adjustment)
<b>Frequency characteristics</b>	DC to 200 kHz ±3 dB, with AC coupling: 7 Hz to 200 kHz ±3 dB
<b>Input coupling</b>	DC, GND, AC
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
170W × 20H × 183D mm, approx. 385g  
**Accessories:** Flathead screwdriver × 1, short bar × 2



**8958**

<b>16ch SCANNER UNIT 8958</b>	
<b>Measurement functions</b>	Number of channels: 16, for voltage measurement/temperature measurement with thermocouple
<b>Input connectors</b>	Voltage input/Thermocouple input: screw-type terminal strip, recommended wire diameter <sup>*1</sup> , detachable terminal block (with cover) <sup>*1</sup> *1 Recommended cable, single-wire: 0.14 to 1.5 mm <sup>2</sup> , braided wire 0.14 to 1.0 mm <sup>2</sup> (conductor wire diameter min. 0.18 mm), AWG 26 to 16 Input impedance: 1 MΩ, 850 kΩ with line fault detection ON, Max. rated voltage to earth: 33 Vrms or 70 V DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Voltage measurement range</b>	5m, 50m, 500m, 2 V/division, 4 ranges, full scale: 20 divisions, measurement range: ±100% of full scale, digital filter: 10/50/60 Hz, measurement resolution 1/1600 of measurement range (using 16-bit A/D conversion; installed in 8860-50/8861-50)
<b>Temperature measurement range</b> (Upper and lower limit values depend on measurement input range of sensor)	10°C/division (-100°C to +200°C), 50°C/division (-200°C to +1000°C), 100°C/division (-200°C to +2000°C), 3 ranges, full scale: 20 divisions, digital filter: 10/50/60 Hz, measurement resolution 1/1000 of measurement range (using 16-bit A/D conversion; installed in 8860/8861)
<b>Thermocouple range</b>	K: -200 to 1350°C, J: -200 to 1200°C, E: -200 to 1000°C, T: -200 to 400°C, N: -200 to 1300°C, R: 0 to 1700°C, S: 0 to 1700°C, B: 400 to 1800°C, W (WRe5-26): 0 to 2000°C, reference junction compensation: internal/ external (switchable), line fault detection ON/OFF switchable
<b>Data refresh rate</b>	50 ms/all channels (digital filter OFF), 300 ms/all channels (digital filter 50/60 Hz), 1.4 s/all channels (digital filter 10 Hz)
<b>Accuracy</b>	Voltage: ±0.2% of full scale, thermocouple (K, J, E, T, N): ±0.05% of full scale ±1°C, (R, S, B, W): ±0.05% of full scale ±2°C (400°C or more), ±0.05% of full scale ±3.5°C (less than 400°C), reference junction compensation accuracy: ±1°C (added to measurement accuracy with internal reference junction compensation)
<b>Max. allowable input</b>	40 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
170W × 20H × 148.5D mm, approx. 290g  
**Accessories:** Conversion cable × 2, cable length 50cm



**8960**

<b>STRAIN UNIT 8960</b>	
<b>Measurement functions</b>	Number of channels: 2, for distortion measurement (electronic auto-balancing, balance adjustment range within ±100000 μe)
<b>Input connectors</b>	Via conversion cable, TAJIMI PRC03-12A10-7M10.5, Max. rated voltage to earth: 33 Vrms or 70 V DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Suitable transducer</b>	Strain gauge converter, bridge impedance: 120 Ω to 1 kΩ (bridge voltage 2 V), 350 Ω to 1 kΩ (bridge voltage 5 V, 10 V), bridge voltage 2, 5, 10 ±0.05 V
<b>Measurement range</b>	20 μe to 1000 μe/division, 6 ranges, full scale: 20 divisions, low-pass filter: 5/10/100/1k Hz
<b>Anti-aliasing filter</b>	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)
<b>Measurement resolution</b>	1/1600 of measurement range (using 16-bit A/D conversion; installed in 8860-50/8861-50)
<b>Highest sampling rate</b>	200 kS/s (2-channel simultaneous sampling)
<b>Accuracy After auto-balancing</b>	DC amplitude: ±(0.4% of full scale +2 μe), zero position: ±(0.1% of full scale +2 μe) (at 5 Hz filter ON)
<b>Frequency characteristics</b>	DC to 20 kHz +/−3 dB
<b>Max. allowable input</b>	10 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
170W × 19.8H × 148.5D mm, approx. 310g  
**Accessories:** CONNECTION CORD 9242 × 2 (1.7 m), GRABBER CLIP 9243 × 2



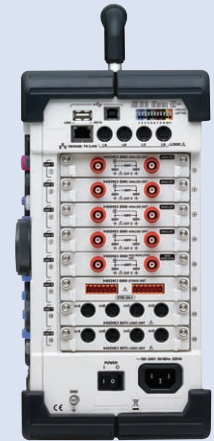
**8961**

<b>HIGH VOLTAGE UNIT 8961</b>	
<b>Measurement functions</b>	Number of channels: 2, for voltage measurement, DC/RMS selectable (10Mohm 5pF)
<b>Measurement range</b>	1 V to 50 V/div, 6 ranges, full scale: 20 div, Max. 700 V rms, low-pass filter: 5/50/500/5 kHz
<b>Highest sampling rate</b>	2 MS/s (simultaneous sampling in 2 channels)
<b>Accuracy</b>	DC amplitude: ±0.25% of full scale (with filter 5 Hz)
<b>RMS measurement</b>	RMS amplitude accuracy: ±1% of full scale (DC, 40 Hz to 1 kHz, sine waveform), crest factor: 2
<b>Frequency characteristics</b>	DC to 100 kHz ±3dB, Install only up to four units in one 8860-50/8861-50
<b>Max. allowable input</b>	1000 V DC (the maximum voltage that can be applied across input pins without damage)

# MEMORY HiCORDER | 8847

## Rapid 20MS/s sampling with isolated inputs

- Analog 16ch + Logic 16ch to Analog 10ch + Logic 64ch
- Fast built-in printer with single-touch operation
- LAN and USB interfaces
- Ruggedly designed to protect against dusty environments



Recorders, Memory Recorders

### SPECIFICATIONS

<b>Measurement ranges (20div full scale)</b>	5mV/div to 20V/div (12 ranges), Resolution: 1/100 of range Max. input voltage 400V DC
<b>Frequency band</b>	DC to 5MHz (±3dB)
<b>Time axis range</b>	5 μs to 5 min/div, 26 ranges (1 division = 100samples)
<b>Measurement function</b>	Memory, Recorder, X-Y Recorder, FFT (Ver.2.00 or the later)
<b>Number of channels</b>	Analog 16ch + Logic 16ch to Analog 10ch + Logic 64ch
<b>Memory capacity</b>	Total 64M-Words 32MW/ch (2ch), 16MW/ch (4ch), 8MW/ch (8ch), 4MW/ch (16ch)
<b>Data storage</b>	CF Card Slot (Max2GB), Hard disk drive (option 80GB), USB memory
<b>Display</b>	10.4 inch TFT color LCD (SVGA, 800 × 600 dots)
<b>Recording Paper</b>	216 mm × 30 m
<b>Interface</b>	USB 2.0, LAN: 100BASE-TX
<b>Power supply</b>	100 to 240 V AC (50/60 Hz)
<b>Dimensions, mass</b>	351W × 261H × 140D mm, 6.7kg
<b>Accessories</b>	Printer paper (1), Power cord (1), Protective cover (1), Roll paper attachment (2), PC card protector (1), Application Disk (Wave Viewer Wv, Communication Commands table) (1), USB cable (1)

### OPTIONS

ANALOG UNIT	8966	10:1 PROBE	9665
TEMP UNIT	8967	100:1 PROBE	9666
HIGH RESOLUTION UNIT	8968	LOGIC PROBE	9320-01
STRAIN UNIT	8969	LOGIC PROBE	9321-01
FREQ UNIT	8970	LOGIC PROBE	9327
CURRENT UNIT	8971	DIFFERENTIAL PROBE	9322
DC/RMS UNIT	8972	(9418-15 is necessary)	
LOGIC UNIT	8973	PC CARD 256MB	9727
HD UNIT	9664 (Factory fitted)	PC CARD 512MB	9728
DC POWER UNIT	9784 (Factory fitted)	PC CARD 1GB	9729
CONNECTION CORD	9197	PC CARD 2GB	9830
CONNECTION CORD	9198	RECORDING PAPER	9231
CONNECTION CORD	9217	WAVE PROCESSOR	9335
CONNECTION CORD (Thin Type)	*9790	CARRYING CASE	9783
ALLIGATOR CLIP (Use with 9790)	9790-01		
GRABBER CLIP (Use with 9790)	9790-02		
CONTACT PIN (Use with 9790)	9790-03		

\* Attachment clips sold separately



## INPUT Units For 8847

**Dimensions and mass: approx.**  
106W × 19.8H × 207.5D mm, approx. 250g  
**Accessories:** None



8966

<b>ANALOG UNIT 8966</b>	
<b>Measurement functions</b>	Number of channels: 2, for voltage measurement
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/div, 12 ranges, full scale: 20 div AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/50 k/500 kHz
<b>Measurement resolution</b>	1/100 of measurement range (using 12-bit A/D conversion; installed in 8847)
<b>Highest sampling rate</b>	20 MS/s (simultaneous sampling in 2 channels)
<b>Measurement accuracy</b>	±0.5 % of full scale (with filter 5 Hz, zero position accuracy included)
<b>Frequency characteristics</b>	DC to 5 MHz -3 dB, with AC coupling: 7 Hz to 5 MHz -3dB
<b>Input coupling</b>	AC/DC/GND
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
106W × 19.8H × 204.5D mm, approx. 2400 g  
**Accessories:** Ferrite clamp × 2



8967

### TEMPERATURE UNIT 8967

<b>Measurement functions</b>	Number of channels: 2, for temperature measurement with thermocouple (voltage measurement impossible)
<b>Input connectors</b>	Thermocouple input: plug-in connector, Recommended wire diameter: single-wire, 0.14 to 1.5 mm <sup>2</sup> , braided wire 0.14 to 1.0 mm <sup>2</sup> (conductor wire diameter min. 0.18 mm), AWG 26 to 16 Input impedance: min. 5 MΩ (with line fault detection ON/OFF). Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Temperature measurement range</b>	10 °C/div (-100 °C to 200 °C), 50 °C/div (-200 °C to 1000 °C), 100 °C/div (-200 °C to 2000 °C), 3 ranges, full scale: 20 div, Measurement resolution: 1/1000 of measurement range (using 16-bit A/D conversion; installed in 8847) <small>Note: Upper and lower limit values depend on the thermocouple</small>
<b>Thermocouple range (JIS C 1602-1995) (ASTM E-988-96)</b>	K: -200 to 1350 °C, J: -200 to 1100 °C, E: -200 to 800 °C, T: -200 to 400 °C, N: -200 to 1300 °C, R: 0 to 1700 °C, S: 0 to 1700 °C, B: 400 to 1800 °C, W (WRε5-26): 0 to 2000 °C, Reference junction compensation: internal/ external (switchable), Line fault detection ON/OFF possible
<b>Data refresh rate</b>	3 stages, Fast: 1.2 ms (digital filter OFF), Normal: 100 ms (digital filter 50/60 Hz), Slow: 500 ms (digital filter 10Hz)
<b>Measurement accuracy</b>	Thermocouple K, J, E, T, N: ±0.1 % of full scale ±1 °C (±0.1 % of full scale ±2 °C at -200 °C to 0 °C), Thermocouple R, S, W: ±0.1 % of full scale ±3.5 °C (at 0 °C to 400 °C or less), ±0.1 % of full scale ±3 °C (at 400 °C or more), Thermocouple B: ±0.1 % of full scale ±3 °C (at 400 °C or more), Reference junction compensation accuracy: ±1.5 °C (added to measurement accuracy with internal reference junction compensation)



# INPUT Units For 8847

**Dimensions and mass: approx.**  
106W × 19.8H × 207.5D mm, approx. 250 g  
**Accessories:** Flathead screwdriver × 1, short bar × 2



8968

### HIGH-RESOLUTION UNIT 8968

<b>Measurement functions</b>	Number of channels: 2, for voltage measurement
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/div, 12 ranges, full scale: 20 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5k/50k Hz
<b>Measurement resolution</b>	1/1600 of measurement range (using 16-bit A/D conversion)
<b>Highest sampling rate</b>	1 MS/s (simultaneous sampling in 2 channels)
<b>Measurement accuracy</b>	±0.3 % of full scale (with filter 5 Hz, zero position accuracy included)
<b>Frequency characteristics</b>	DC to 100 kHz -3 dB, with AC coupling: 7 Hz to 5 MHz -3dB
<b>Input coupling</b>	AC/DC/GND
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
106W × 19.8H × 196.5D mm, approx. 220 g  
**Accessories:** None



8969

### STRAIN UNIT 8969

<b>Measurement functions</b>	Number of channels: 2, for distortion measurement (electronic auto-balancing, balance adjustment range within ±10000 με)
<b>Input connectors</b>	Weidmuller SL 3.5/7/90G (via conversion cable 9769, TAJIMI PRC03-12A10-7M10.5) Max. rated voltage to earth: 33 Vrms or 70 V DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Suitable transducer</b>	Strain gauge converter, Bridge impedance: 120 Ω to 1 kΩ, Bridge voltage: 2 V ±0.05 V, Gauge rate: 2.0
<b>Measurement range</b>	20 με to 1000 με/div, 6 ranges, full scale: 20 division, Low-pass filter: 5/10/100 Hz, 1 kHz
<b>Measurement resolution</b>	1/1250 of measurement range (using 16-bit A/D conversion)
<b>Highest sampling rate</b>	200 kS/s (2-channel simultaneous sampling)
<b>Measurement accuracy</b>	±(0.5 % of full scale +4 με) (at 5 Hz filter ON, After auto-balancing)
<b>Frequency characteristics</b>	DC to 20 kHz +1/-3dB

**Dimensions and mass: approx.**  
106W × 19.8H × 196.5D mm, approx. 250 g  
**Accessories:** None



8970

### FREQ UNIT 8970

<b>Measurement functions</b>	Number of channels: 2, for voltage input based frequency measurement, rotation, power frequency, integration, pulse duty ratio, pulse width
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Frequency mode</b>	Range: Between DC to 100kHz (minimum pulse width 2μs), 1Hz/div to 5kHz/div (full scale= 20 div), 8 settings Accuracy: ±0.1% f.s. (exclude 5kHz/div), ±0.7% f.s. (at 5kHz/div)
<b>Rotation mode</b>	Range: Between 0 to 2 million rotations/minute (minimum pulse width 2μs), 100 (r/min)/div to 100k (r/min)/div (full scale= 20 div), 7 settings Accuracy: ±0.1% f.s. (excluding 100k (r/min)/div), ±0.7% f.s. (at 100k (r/min)/div)
<b>Power frequency mode</b>	Range: 50Hz (40 - 60Hz), 60Hz (50 - 70Hz), 400Hz (390 - 410Hz) (full scale = 20 div), 3 settings, Accuracy: ±0.03Hz (exclude 400Hz range), ±0.1Hz (400Hz range)
<b>Integration mode</b>	Range: 2k counts/div to 1M counts/div, 6 settings, Accuracy: ±range/2000
<b>Duty ratio mode</b>	Range: Between 10Hz to 100kHz (minimum pulse width 2μs), 5%/div (full scale=20 div), Accuracy: ±1% (10Hz to 10kHz), ±4% (10kHz to 100kHz)
<b>Pulse width mode</b>	Range: Between 2μs to 2sec, 500μs/div to 100ms/div (full scale=20 div) Accuracy: ±0.1% f.s.
<b>Measurement resolution</b>	1/2000 of range (Integration mode), 1/500 of range (exclude integration, power frequency mode), 1/100 of range (power frequency mode)
<b>Input voltage range and threshold level</b>	±10V to ±400V, 6 settings, selectable threshold level at each range
<b>Other functions</b>	Slope, Level, Hold, Smoothing, Low-pass filter, Switchable DC/AC input coupling, Frequency dividing, Integration over-range keep/return

**Dimensions and mass: approx.**  
106W × 19.8H × 196.5D mm, approx. 250 g  
**Accessories:** CONVERSION CABLE 9318 × 2  
(To connect the current sensor to the 8971)



8971

### CURRENT UNIT 8971

<b>Measurement functions</b>	Number of channels: 2, Current measurement with optional current sensor, Maximum 4 units connectable to the 8847
<b>Input connectors</b>	Sensor connector (input impedance 1 MΩ, exclusive connector for current sensor via conversion cable the 9318, common ground with recorder)
<b>Compatible current sensors</b>	CT6863, CT6862, 9709, 9279, 9278, 9277, 9272-10 (To connect the 8971 via conversion cable the 9318)
<b>Measurement range</b>	Using 9272-10 (20A), 9277: 100mA to 5A/div (f.s.=20div, 6 settings) Using CT6862: 200mA to 10A/div (f.s.=20div, 6 settings) Using 9272-10 (200A), 9278, CT6863: 1A to 50A/div (f.s.=20div, 6 settings) Using 9279, 9709: 2A to 100A/div (f.s.=20div, 6 settings)
<b>Accuracy</b>	Using 9278, 9279: ±0.85% f.s. Using other sensor: ±0.65% f.s. RMS amplitude accuracy: ±1% f.s. (DC, 30Hz to 1kHz), ±3% f.s. (1kHz to 10kHz) RMS response time: 100ms (rise time from 0 to 90% of full scale), Crest factor: 2 Frequency characteristics: DC to 100kHz, ±3dB (with AC coupling: 7Hz to 100kHz)
<b>Measurement resolution</b>	1/100 of range
<b>Highest sampling rate</b>	1 MS/s (simultaneous sampling across 2 channels)
<b>Other functions</b>	Input coupling: AC/DC/GND, Low-pass filter: 5, 50, 500, 5k, 50kHz, or OFF

**Dimensions and mass: approx.**  
106W × 19.8H × 207.5D mm, approx. 250 g  
**Accessories:** Conversion cable × 2, cable length 50cm



8972

### DC/RMS UNIT 8972

<b>Measurement functions</b>	Number of channels: 2, for voltage measurement, DC/RMS selectable
<b>Input connectors</b>	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), Max. rated voltage to earth: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
<b>Measurement range</b>	5 mV to 20 V/div, 12 ranges, full scale: 20 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/100 kHz
<b>Measurement resolution</b>	1/100 of measurement range (using 12-bit A/D conversion)
<b>Highest sampling rate</b>	1 MS/s (simultaneous sampling in 2 channels)
<b>Measurement accuracy</b>	±0.5 % of full scale (with filter 5 Hz, zero position accuracy included)
<b>RMS measurement</b>	RMS amplitude accuracy: ±1 % of full scale (DC, 30 Hz to 1 kHz), ±3 % of full scale (1 kHz to 100 kHz), Response time: SLOW 5 s (rise time from 0 to 90% of full scale), MID 800 ms (rise time from 0 to 90% of full scale), FAST 100 ms (rise time from 0 to 90% of full scale), Crest factor: 2
<b>Frequency characteristics</b>	DC to 400 kHz -3 dB, with AC coupling: 7 Hz to 400 kHz -3dB
<b>Input coupling</b>	AC/DC/GND
<b>Max. allowable input</b>	400 V DC (the maximum voltage that can be applied across input pins without damage)

**Dimensions and mass: approx.**  
106W × 19.8H × 204.5D mm, approx. 310 g  
**Accessories:** CONNECTION CORD 9242 × 2 (1.7 m), GRABBER CLIP 9243 × 2



8973

### LOGIC UNIT 8973

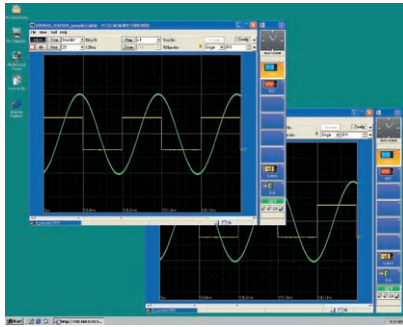
<b>Measurement functions</b>	Number of channels: 16 channels (4 ch/1 probe connector × 4 connectors)
<b>Input connectors</b>	Mini DIN connector (for HIOKI logic probes only), Compatible logic probes: 9320-01, 9327, 9321-01

# MEMORY HiVIEWER (for 8860-50,8861-50)

# 9725

## Perform 8860-50 and 8861-50 functions on your PC

- Application software enables you to perform the same data analysis on a Windows computer as on the 8860-50 and 8861-50 MEMORY HiCORDERs.
- No confusion, because the screens appearing on the computer are identical to those of the 8860 Series.
- Functions identical to those of the MEMORY HiCORDER, such as waveform processing calculation, run on the computer.



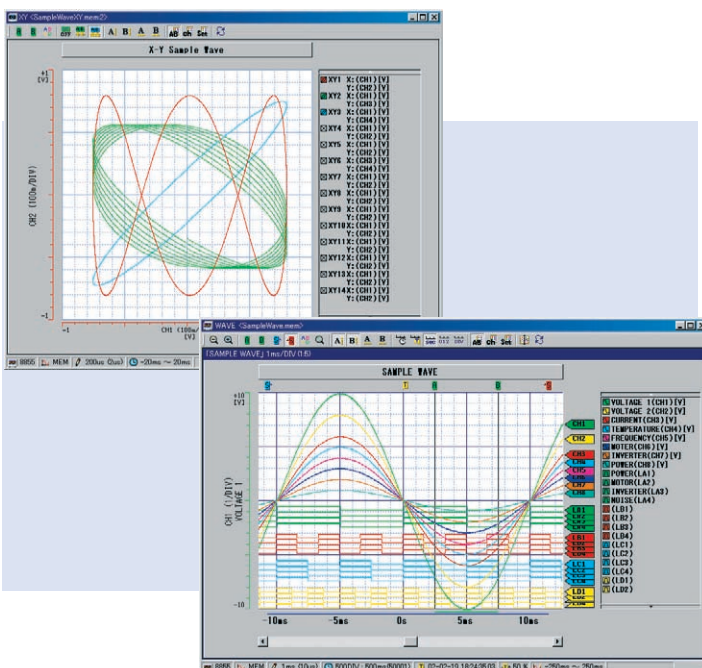
SPECIFICATIONS	
Compatible devices	MEMORY HiCORDER 8860-50/8861-50
Supplied Media	One CD-ROM disc
Operating environment	Computer running under Windows 2000/XP / Vista
File loading	Readable data formats : Only for 8860 Series data (.MEM, .REC, FFT, .SEQ, .IDX, .SET) Maximum file size : 2 GW
File saving	Saved contents: measurement data (binary and ASCII), (partial saving of the area between cursors A and B), setting conditions, screen image (BMP, PNG), and calculation results
Display	<ul style="list-style-type: none"> <li>■ Waveform display: 1-, 2-, 3-, 4-, 6-, and 8-split screen, horizontal, vertical, consecutive scroll, and zoom in/out along the time axis, move the zero position, zoom in/out, setting of variables independently for each channel</li> <li>■ X-Y axis composite display (for the MEM function only): 1-, 2-, and 4-split display, dot/line interpolation, composite area can be specified</li> <li>■ Numerical display: digital values of waveform data can be displayed</li> <li>■ Display sheet: 16 sheets</li> <li>■ Display channel count (per sheet): 32 analog channels, 16 logic channels, 16 calculated waveforms, 8 X-Y axis composite waveforms</li> <li>■ Cursor function: vertical cursor, horizontal cursor, trace cursor, two cursors (cursor A and cursor B), time and voltage display</li> <li>■ Clipboard copy: images on the waveform screen can be transferred to the clipboard</li> </ul>
Print	<ul style="list-style-type: none"> <li>■ Supported printer: printer compatible with the OS</li> <li>■ Print format: waveform image (1-, 2-, 3-, 4-, 6-, 8-, and 16-split), numerical print, report format, list print, calculation results, screen image</li> <li>■ Print area: the entire area, area between cursors A and B</li> <li>■ Print preview</li> </ul>

# WAVE PROCESSOR (for MEMORY HiCORDER)

# 9335

## Display, Convert, Calculate and Print Waveforms with a PC

- Display, print, convert, and calculate on large volumes of waveform data (recorded in the MEMORY HiCORDER Series)
- Display waveform screens, X-Y graphs, and numerical results
- Comprehensive Search function
- Rich printing and hard copy functions to assist in creating reports
- Save in CSV format and export to spreadsheet application (EXCEL)

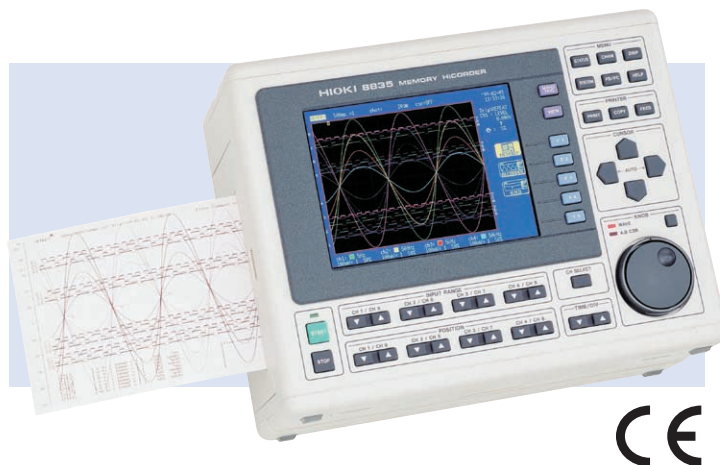


SPECIFICATIONS	
Compatible devices	MEMORY HiCORDER: 8807 (-01/-51), 8808 (-01/-51), 8826, 8835 (-01), 8841, 8842, 8847, 8855, 8870-20, 8860 Series (Dual-axis processing not available) POWER HiCORDER: 8714 (-01), 8715 (-01) VISUAL HiCORDER: 8720 WAVE COMPARATOR: 8730-10, 8731-10
Supplied Media	One CD-ROM disc
Operating environment	Computers running Windows 95, 98, Me, NT4.0, 2000 or XP, Vista Pentium (133MHz) or better, at least 32MB of memory (Recommended: Pentium (200MHz) or better, at least 64MB of memory)
Display functions	<ul style="list-style-type: none"> <li>■ Waveform Display: Displays image of loaded waveform data on screen</li> <li>■ X-Y display: Memory function format (.MEM file) only</li> <li>■ Digital Value Display: Displays waveform data as digital values, and allows images and digital values to be displayed simultaneously</li> <li>■ Cursor function: Allows you to display the time and potential differences between cursors A and B, the time and electrical potential between each cursor, and the absolute and relative times</li> <li>■ Scroll function: available</li> <li>■ Maximum number of channels: 32 analog channels, 32 logic channels</li> <li>■ Gauge display: Time gauge, voltage axis gauge</li> <li>■ Graphical input: Possible</li> </ul>
File loading	<ul style="list-style-type: none"> <li>■ Loading data format: Memory (.MEM, except for data stored in real time); recorder (.REC), effective value recorder (.RMS)</li> <li>■ Maximum loadable file size: Maximum size that can be stored by hardware. The maximum size that can be handled may be smaller in some PC environments.)</li> </ul>
Data conversion functions	<ul style="list-style-type: none"> <li>■ Target data: All data, data between cursors</li> <li>■ Data interval: Simple interval (number of samples can be specified)</li> <li>■ Data conversion: Converts analog waveform data into numeric values, converts logic data into binary</li> <li>■ Data conversion format: CSV format, tab delimited, space delimited (selectable when data is saved)</li> <li>■ Conversion channel: Can be selected when data is saved</li> <li>■ Batch conversion: Multiple files can be specified for batch conversion</li> </ul>
Printing functions	<ul style="list-style-type: none"> <li>■ Printing format: Can print no partitions, 2 to 16 partitions, 2 to 16 columns, X-Y 1 to 4 partitions, gauges, channel comments</li> <li>■ Print preview: Possible</li> <li>■ Waveform screen hard copy: Possible</li> <li>■ Compatible printers: Any printer supported by the OS (color or black and white)</li> </ul>
Parameter calculation functions	<ul style="list-style-type: none"> <li>■ Target data: All data, data between cursors</li> <li>■ Calculation items: Average value, effective value, peak value, maximum value, time of maximum value, minimum value, time of minimum value, rise time, fall time, standard deviation, area, cycle, frequency, pulse width, duty ratio, ON time, OFF time, number of times turned ON</li> </ul>
Other	<ul style="list-style-type: none"> <li>■ Search functions: Event mark, date and time (absolute time, time relative to trigger), maximum, minimum, absolute maximum, absolute minimum, level up/down, window in/out</li> <li>■ Clipboard copy: Waveform screen, cursor value, digital value, file information</li> <li>■ Startup of other applications: Other applications can be launched by specifying run file</li> </ul>

## MEMORY HiCORDER | 8835-01

### High-visibility, Compact, Multi-channelled Field measurement has never been easier

- Compact 4/8 ch recorder saves space with slim profile
- 110mm-width recording paper and a color display (6.4-inch)
- Maximum 8 analog channels and 16 logic channels



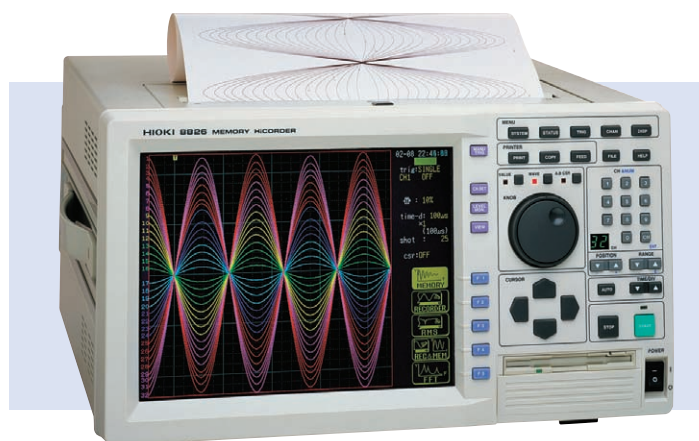
SPECIFICATIONS	
<b>Measurement ranges</b> using 8936 ANALOG UNIT /option	10mV to 50V/division, 12 ranges (10 division f.s.) resolution; 1/160 of range
<b>Frequency band</b>	DC to 400kHz , ±3dB
<b>Time axis at memory function</b>	100µs to 5 minutes/division, 20 ranges (1division =100samples)
<b>Functions</b> *Additional functions, using 9540-01 FUNCTION UP DISK /option	Memory recorder, Recorder (included X-Y), RMS recorder (50/60Hz or DC only), *Recorder and Memory, *FFT
<b>Number of input channels</b> using 8936, 8946 ANALOG UNIT /option	4 analog channels plus 16 logic channels (using 8936) 8 analog channels plus 16 logic channels (using 8946)
<b>Memory capacity</b>	12bits×4M words/channel (using 1 channel)
<b>Data storage</b>	FDD×1, Type-III PC card×1; PC CARD 9727-9729, 9830
<b>Recording and display</b>	110mm×30 m, roll type thermal paper, Recording speed: 25mm/s, 6.4-inch color TFT LCD
<b>Other functions</b>	Scaling, Waveform parameter calculations, Memory segmentation, Cursor readout, etc.
<b>Power supply</b>	100 to 120V AC or 200 to 240V AC (50/60 Hz) * 10 to 28V DC, using the DC POWER ADAPTER 9439
<b>Dimensions, mass</b>	285W×220H×132D mm, 4.5kg
<b>Accessories</b>	Power cord(1), Recording paper(1 roll), Dust cover(1), PC card protector(1), Wave viewer software(1)

Input Units: refer to P.11, Options: refer to P.12

## MEMORY HiCORDER | 8826

### 32-channel recorder with all isolated inputs

- Simultaneous sampling, display and recording of all 32 analog and 32 logic channels
- Large capacity memory of max. 16M-word Memory expandable four times (option)
- High resolution of 12-bit, 1 M-sampling /second
- B4-size (paper width 264 mm) wide printer
- High-visibility waveforms displayed on a 10.4-inch color TFT liquid crystal display

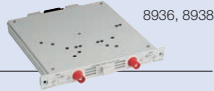


SPECIFICATIONS	
<b>Measurement ranges</b>	5 mV to 20 V/division, 12 ranges (normal f.s.; 20 division, wide f.s.; 24 division), resolution: 1/80 of range
<b>Frequency band</b>	DC to 400kHz , ±3dB
<b>Time axis at memory function</b>	100µs to 5 minutes/division, 20 ranges (1division =100samples)
<b>Functions</b>	Memory recorder, Recorder (included X-Y), RMS recorder, Recorder and Memory, FFT
<b>Number of input channels</b>	32 analog channels plus 32 logic channels
<b>Memory capacity</b>	(analog 12 bits) × 4M words/channel (using 4ch) * Expandable up to 4 times capacity, using 9599 MEMORY BOARD
<b>Data storage</b>	FDD × 1, Type-III PC card × 1, PC CARD 9727-9729, 9830
<b>Recording and display</b>	264 mm×30 m, roll type thermal paper, Recording speed: 25 mm/s, 10.4-inch color TFT LCD
<b>Other functions</b>	Scaling, Waveform judgment, Waveform processing calculations, Waveform parameter calculations, Memory segmentation, Logging print, Clock, Cursor readout, Comment entry, etc.
<b>Power supply</b>	100 to 240 V AC, 50/60 Hz
<b>Dimensions, mass</b>	401W×235H×382D mm, 11 kg (excluding input units)
<b>Accessories</b>	Power cord (1), Recording paper (1 roll), Dust cover (1), PC card protector (1), Wave viewer software (1)

Input Units: refer to P.11  
Options: refer to P.12

# INPUT Units For 8826, 8835-01, 8860 Series

**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 290g



## ANALOG UNIT 8936

<b>Input</b>	Number of channels: 2, Connector: Insulated BNC * Input isolated from output, inter-channel isolation
<b>Measurement range</b>	5mV to 20V/division, 12 ranges, full-scale (f.s.) = 20 divisions, AC voltage for possible measurement/ display using the memory function : 280V rms, Low-pass filter, 5/500/ 5k/ 100kHz, the measurement resolution is 1/80 of range
<b>Max. sampling rate</b>	1 MS/s (simultaneous sampling of two channels)
<b>Accuracy</b>	DC amplitude: ±0.4% f.s. Zero-position: ±0.1% f.s.
<b>Zero-position</b>	-50% to 150%, 1 % step * With zero-adjustment function
<b>Frequency characteristics</b>	DC to 400kHz ±3 dB, with AC coupling: 7Hz to 400kHz ±3dB
<b>Input resistance and capacitance</b>	1MΩ, 30 pF approx. (at C 100kHz)
<b>Input coupling</b>	DC, GND, AC
<b>Max. allowable input</b>	400V DC (upper voltage which when applied to between input pins does not damage them)
<b>Max. rated voltage to earth</b>	370V AC, DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	None * Input cord optional

## FFT ANALOG UNIT 8938

<b>Anti-aliasing filter</b>	Cutoff frequency 20, 40, 80, 200, 400, 800, 2k, 4k, 8k, 20k, 40kHz auto-select (linked to frequency range)
<b>Other functions</b>	Same as the <b>ANALOG UNIT 8936</b>
<b>Accessories</b>	None * Input cord optional

\* When used with 8835-01, some measurement specifications are different from descriptions above. Please see the 8835-01 catalog on our website.

**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 300g

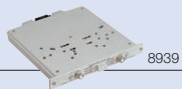


## VOLTAGE/TEMPERATURE UNIT 8937

<b>Input</b>	Number of channels: 2 each for voltage and temperature * Input isolated from output, inter-channel isolation Voltage input: isolated BNC, thermocouple input: plug-in terminal
<b>Voltage measurement range</b>	500μV to 2V/division; 12 settings, full scale (f.s.) = 20 divisions, low-pass filter: 5/500/5k/ 100kHz, the measurement resolution is 1/80 of range
<b>Temperature measurement range</b>	10 °C to 100 °C/division; 4 settings, full scale (f.s.) = 20 divisions, low-pass filter: 5/ 500Hz, measurement resolution: 1/80 of range
<b>Thermocouple range</b>	K: -200 to 1350 °C, E: -200 to 800 °C, J: -200 to 110 °C, T: -200 to 400 °C, N: -200 to 1300 °C, R: 0 to 1700 °C, S: 0 to 1700 °C, B: 300 to 1800 °C, Reference junction compensation: internal/ external (switchable)
<b>Max. sampling rate</b>	Voltage input: 1 MS/s, Temperature measurement: 4kS/s (2-channel simultaneous sampling)
<b>Accuracy</b>	Voltage input: DC amplitude ±0.4% of f.s. Zero-position ±0.15% of f.s. Temperature measurement (K, E, J, T, N): ±0.1% of f.s. ±1 °C, ±0.1% of f.s. ±2 °C (-200 to 0 °C), (R, S): ±0.1% of f.s. ±3 °C, (B): ±0.1% of f.s. ±4 °C (400 to 1800 °C) Reference junction compensation accuracy: ±0.1 % f.s. ±1.5 °C (internal compensation)
<b>Zero position</b>	Voltage input: -50% to 150%, 1% steps * With zero-adjust function Temperature measurement: -100% to 100%, 1% steps
<b>Frequency characteristics</b>	Voltage input: DC to 400kHz + 1/-3dB Temperature measurement: DC to 1 kHz + 1/-3dB
<b>Input resistance and capacitance</b>	Voltage input: 1 MΩ, 50pF approx. (at C 100 kHz) Temperature measurement: 5.1MΩ
<b>Input coupling</b>	DC, GND, AC
<b>Max. allowable input</b>	30V rms or 60V DC (upper voltage which when applied to between input pins does not damage them)
<b>Max. rated voltage to earth</b>	30V rms or 60V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	None * Input cord optional

\* When used with 8835-01, some measurement specifications are different from descriptions above. Please see the 8835-01 catalog on our website.

**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 250g



## STRAIN UNIT 8939

<b>Input</b>	Number of channels: 2, Connector: Adapter cable connector * Input isolated from output, inter-channel isolation
<b>Converter connector</b>	Via adapter cable, TAJIMI PRC03-32A10-7M10.5
<b>Suitable converter</b>	Strain gage converter, bridge impedance: 120Ω to 1kΩ, gage factor 2.00, bridge voltage 2 ±0.05 V
<b>Measurement range</b>	20μe to 1000μe/division; 6 settings, full scale (f.s.) = 20 divisions, low-pass filter: 10 Hz, 30 Hz, 300 Hz, 3 kHz, OFF the measurement resolution is 1/80 of range * Using 8720
<b>Max. sampling rate</b>	1 MS/s (simultaneous sampling for 2 channels)
<b>Accuracy (after auto-balancing)</b>	DC amplitude: ±(0.5 % f.s. + 2me) Zero-position: ±0.5 % f.s.
<b>Balancing</b>	Electronic auto-balancing, max. adjustment range ±10000μe
<b>Zero position</b>	-50 % to 150 %; in 1% steps * With auto-balancing
<b>Frequency characteristics</b>	DC to 20 kHz +1/-3 dB
<b>Max. allowable input</b>	10 V (DC + AC peak) (upper voltage which when applied to between input pins does not damage them)
<b>Max. rated voltage to earth</b>	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	Conversion cable (2)

9318



**CONVERSION CABLE 9318**  
(to connect the clamp-on sensor to the 8940)

**CONVERSION CABLE 9319**  
(to connect the 3273-50 to the 8940)



**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 300g

## F/V UNIT 8940

<b>Input</b>	Number of channels: 2, Voltage input: BNC terminal
<b>Sensor connector terminal</b>	Number of channels: 2 (for current measurement) * Max. number of connectable sensors (1 to 8) depends on MEMORY HiCORDER used and/or on sensors connected.
<b>Compatible current sensors</b>	9272-50, 9277, 9278, 9279, 3273-50
<b>Measurement range</b>	Frequency: 0.05Hz to 5kHz/division, 11 ranges, 5 (r/min) to 500 (r/min)/division, 5 ranges, P50 Hz (40 to 60 Hz), P60 Hz (50 to 70 Hz) Integration: 5 counts to 500 k counts/division, Pulse duty ratio: 100 % f.s. Current: 5 mA to 100 A/division, 10 ranges, linked to use with type of the clamp-on sensor, Voltage: 0.5 mV to 2 V/division, 12 ranges, Max. allowable input: 30 V rms or 60 V DC, full-scale (f.s.) = 20 divisions, low-pass filter, 5/500/5k/ 100kHz or OFF, the measurement resolution is 1/80 of range
<b>Max. sampling rate</b>	1MS/s (voltage, current)
<b>Other functions</b>	Voltage input pull-up: ON (10kΩ)/ OFF Input coupling: DC, GND, AC (voltage, current), DC (others)
<b>Max. rated voltage to earth</b>	30V rms or 60V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	None * Input cord and conversion cable optional

**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 310g



## 4 ch ANALOG UNIT 8946

<b>Input</b>	Number of channels: 4, Terminal: Metallic BNC Input isolated from output, inter-channel isolation (Not compatible with Model 8826)
<b>Measurement range</b>	10 mV to 2 V/division, 8 ranges, full scale (f.s.) = 20 divisions, low-pass filter, 5/ 500/ 5 k/ 50 kHz; the measurement resolution is 1/80 of range
<b>Maximum sampling rate</b>	1 MS/s (simultaneous sampling of four channels)
<b>Accuracy</b>	DC amplitude: ±0.5 % f.s. Zero-position: ±0.15 % f.s.
<b>Zero-position</b>	-50 % to 150 %, 1 % step With zero-adjustment function(Not compatible with Model 8826)
<b>Frequency characteristics</b>	DC to 100 kHz ±3 dB
<b>Input resistance and capacitance</b>	1 MΩ, 15 pF approx. (at C 100 kHz)
<b>Input coupling</b>	DC, GND
<b>Max. allowable input</b>	30 V rms or 60 V DC (upper voltage which when applied to between input pins does not damage them)
<b>Max. rated voltage to earth</b>	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	None * Input cord optional

\* When used with 8835-01, some measurement specifications are different from descriptions above. Please see the 8835-01 catalog on our website.

**Dimensions and mass:**  
Approx. 170W × 20H × 148D mm, approx. 310g



## CHARGE UNIT 8947

<b>Input</b>	Number of channels: 2 Measurement objects can be selected individually for each channel. Full isolation between inputs, and between inputs and recorder. Common GND for voltage input and charge input channels. Voltage and pre-amplifier internal inputs: BNC terminals (With voltage input: input resistance, 1MΩ; input capacitance, less than 200 pF) Charge input: miniature connector (#10-32 UNF)
<b>Suitable converter</b>	Charge input: piezoelectric charge output acceleration pickup sensors. Internal pre-amplifier input: acceleration pickup sensors with built-in pre-amplifier
<b>Measurement range</b>	Charge input (miniature connector) Pre-amplifier internal input (BNC terminal) 50m (m/s <sup>2</sup> )/DIV to 10 k (m/s <sup>2</sup> )/DIV, 12 ranges×6 types, the measurement resolution is 1/80 to 1/32 of range (changes according to measurement sensitivity) Measurement sensitivity: 0.1 to 10pC / (m/s <sup>2</sup> ), Pre-amplifier internal input measurement sensitivity: 0.1 to 10mV / (m/s <sup>2</sup> ), Amplitude accuracy: ±2 % f.s., Frequency characteristics: 1 to 50 kHz +1/-3 dB, Low-pass filter: 500 / 5kHz, Pre-amplifier driving power supply: 2mA ±20%, +15V ±5%, Highest input charge : ±500pC (high sensitivity side 6 ranges), ±50000 pC (low sensitivity side 6 ranges)
<b>Measurement ranges</b>	500μV to 2V/DIV, 12 ranges, the measurement resolution is 1/80 to 1/32 of range (changes according to measurement sensitivity) Voltage input (BNC terminal) DC amplitude accuracy: ±0.4 % f.s., Frequency characteristics: DC to 400kHz +1/-3 dB. Low-pass filter: 5 / 500 / 5k/ 100kHz, Input coupling: DC, AC, GND, Max. allowable input: 30V rms or 60V DC
<b>Max. sampling rate</b>	1 MS/s (simultaneous sampling of 2 channels)
<b>Max. rated voltage to earth</b>	30V rms or 60V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
<b>Accessories</b>	None * Input cord optional

## MEMORY HiCORDER

# Common options for 8800 series

\*Designated products are not CE-Mark compliant

Note: Product names appearing herein are trademarks or registered trademarks of the various companies.

### Logic Signal Measurement



**LOGIC PROBE 9321(9321-01)**  
4-channel isolated, on/off detection of AC/DC voltage

**LOGIC PROBE 9320(9320-01)**  
4-channel, on/off detection of voltage/contact signal, Fir IMS/s memory HiCorders



**LOGIC PROBE 9327**  
4-channel, on/off detection of voltage/contact signal. For 20MS/s memory HiCorders



**CONVERSION CABLE 9323**  
Convert 9320/9321 terminals into 9320-01/9321-01

### Storage Media



PC CARD 256 MB	9727
PC CARD 512 MB	9728
PC CARD 1GB	9729
PC CARD 2GB	9830 *

\* for 8730-10, 8731-10, 8826, 8835-01, 8847, 8855, 8860-50, 8861-50, 8870-20

### PC Communication

**WAVE PROCESSOR 9335**  
software required to convert the binary file to CSV text file, to remote control with Windows 95/ 98/ NT 4.0 /Me/ 2000/ XP/Vista

Refer to Page 9

### CAN-Bus Signals



**CAN ADAPTER 8910**  
2 channels  
Converts CAN signals into Analog/Logic signals for recording. (Receive only)  
12 Analog + 6 Logic outputs  
Used for all Memory HiCorders recording



### Input Modules

Various input modules (for 8860 series, 8835-01, 8826)  
Install by inserting into the instrument  
Can be replaced by user

<b>ANALOG UNIT</b>	8936
<b>VOLTAGE/TEMPERATURE UNIT</b>	8937
<b>FFT ANALOG UNIT</b>	8938
<b>STRAIN UNIT</b>	8939
<b>F/V UNIT</b>	8940
<b>4ch ANALOG UNIT</b>	8946
<b>CHARGE UNIT</b>	8947

### High-voltage input

**POWER CORD 9324**  
for logic terminal

**POWER CORD 9325**  
for 8940 sensor terminal

**POWER CORD 9248**  
for 9687(8860-50/8861-50)

**DIFFERENTIAL PROBE 9322**  
for up to 2 kV DC, 1 kV AC

**AC ADAPTER 9418-15**  
for 9322

**CONNECTION CORD 9197**  
for high voltage (up to 500V)

**CONNECTION CORD 9198**  
for low voltage (up to 300V) (9332 only)

**10:1 PROBE 9665**  
Max. Input Voltage 1 kV rms. (to 1 MHz)

**100:1 PROBE 9666**  
Max. Input Voltage 5 kV peakV (to 1 MHz)

**CONNECTION CORD 9790**  
for low voltage (up to 300V)  
Thin type

**ALLIGATOR CLIP 9790-01**  
**GRABBER CLIP 9790-02**  
**CONTACT PIN 9790-03**

### Current Measurement, other options

**CLAMP ON PROBE 9018-50**  
Input from 10 to 500 A  
40 Hz to 3 kHz for 0.2 V AC output. BNC terminal

**CLAMP ON PROBE 9132-50**  
Input from 20 to 1000 A  
40 Hz to 1 kHz for 0.2 V AC output. BNC terminal

**CONVERSION ADAPTER 9199**  
Banana-to-BNC, use to connect to BNC terminal on Input Module

**\*CT-101A LINE SPLITTER**  
For 100V/15A, convenient for measuring 100 VAC line current with clamp-on probe

**CONNECTION CORD 9217**  
Insulation BNC-to-insulation BNC, use to connect to insulation-BNC terminal on Input Module

**CONNECTION CORD \*9165**  
Metal BNC-to-metal BNC, use to connect to metal-BNC terminal on Input Module

**9318**  
**9709**  
**CT6862**  
**CT6863**  
**9272-10**  
**9277**  
**9278**  
**9279**  
**9555-10**  
**9555-10**

**AC/DC CURRENT SENSOR 9709**  
DC to 100 kHz, 500A rated 2V/500A output  
Ø 36 mm core jaw dia.

**AC/DC CURRENT SENSOR CT6862**  
DC to 500 kHz, 50A rated 2V/50A output  
Ø 24 mm core jaw dia.

**AC/DC CURRENT SENSOR CT6863**  
DC to 1 MHz, 200A rated 2V/200A output  
Ø 24 mm core jaw dia.

**CLAMP ON SENSOR 9272-10**  
Enables observation of distorted AC current waveforms. Input selectable 20/200 A, 5 to 10 kHz for 2 VAC out  
*Note* : Can only be used in combination with the **SENSOR UNIT 9555** or **F/V UNIT 8940**.

**CONVERSION CABLE 9318**  
Connects 9277 to 9279 clamp-on sensors to **F/V UNIT 8940**.

**UNIVERSAL CLAMP ON CT 9277**  
Observe waveforms from DC to distorted AC.  
Input up to 20 A, DC to 100 kHz for 2 VAC out

**UNIVERSAL CLAMP ON CT 9278**  
Observe waveforms from DC to distorted AC.  
Input up to 200 A, DC to 100 kHz for 2 VAC out

**UNIVERSAL CLAMP ON CT \*9279**  
Observe waveforms from DC to distorted AC.  
Input up to 500 A, DC to 20 kHz for 2 VAC out  
*Note* : Can only be used in combination with the **SENSOR UNIT 9555-10** or **F/V UNIT 8940**.

**SENSOR UNIT 9555-10**  
Used together with 9272-10, 9277 to 9279 clamp-on sensors. Power supply unit.

**PT \*9303**  
Insulation transformer, 400 V or 200 V AC input, 10 V AC output, for AC power line measurement.

**220H**

**PAPER WINDER \*220H**  
Paper width 70 - 220 mm  
AC100V

**POWER SUPPLY 3269/3272**

**3274**  
**3273-50**

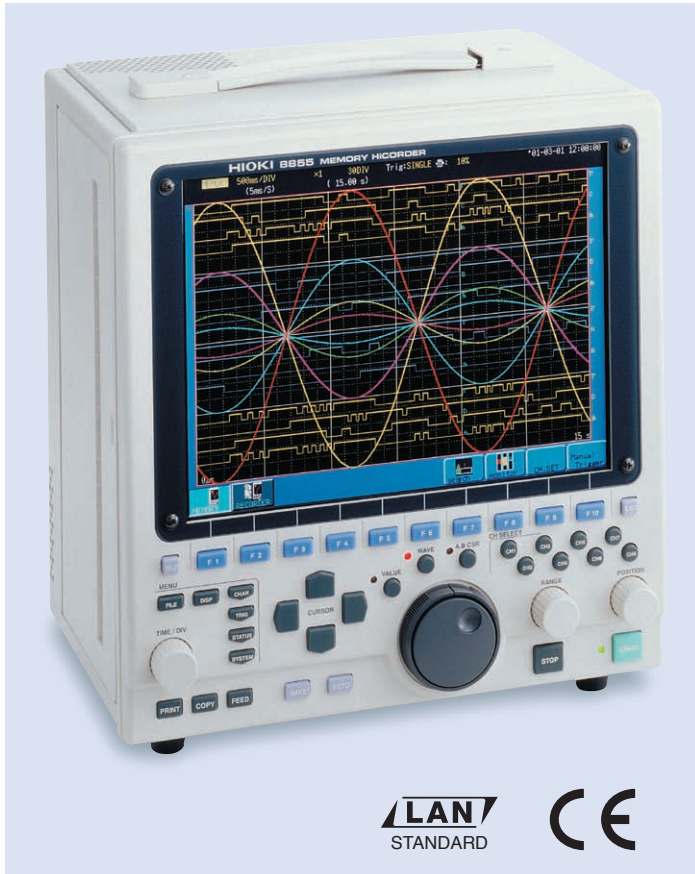
**CLAMP ON PROBE 3273-50/3276**  
Wide (DC to 50 MHz/100 MHz) range, mA-level to 50 A peak current. Requires power from 3272 or 3269 or F/V UNIT 8940.

**CLAMP ON PROBE 3274/3275**  
Wide (DC to 10 MHz) range, mA-level to 500 A rms current. Requires power from 3272 or 3269 only and requires scaling operations

# MEMORY HiCORDER 8855

## 8ch high-speed isolated inputs of 20MS/s, 512 M words long storage memory

- Maximum 8 analog channels and 16 logic channels
- 20MS/s, 8ch 12-bit high-speed isolated Input (8950/8951/8952)
- 1MS/s, 8ch 16-bit HIGH RESOLUTION Input (8953-10)
- Max. 512 M words long storage memory
- Zoom and scroll functions providing enlarged and compressed displays
- Standard LAN interface



SPECIFICATIONS	
Measurement ranges using 8950 ANALOG UNIT /option	5 mV to 20 V/division, 12 ranges (20 division f.s.) resolution: 1/100 of range
Frequency band	DC to 10 MHz $\pm$ 3dB Sampling speed max.20MS/s
Time axis at memory function	5 $\mu$ s to 5 minutes/division, 24 ranges (1 division =100 samples)
function	Memory, Recorder (Included X-Y), Rec & Memory, FFT/function
Number of channels	8 analog channels plus 16 logic channels (analog inputs are isolated up to 370V)
Memory capacity	4M words/channel (Total 32MW) Max.64M words/channel (Total 512MW)(Option)
Data storage	FDD $\times$ 1, Type-II PC card $\times$ 1; PC CARD 9727 to 9729, 9830 (HDD $\times$ 1/option)
Interface	LAN
Display and recording	10.4 inch TFT color LCD (option; 216mm $\times$ 30mm, roll type thermal paper)
Other functions	Scaling, Waveform judgment, Waveform processing calculations, Waveform parameter calculations, Memory segmentation, Waveform zoom display, Clock, Cursor readout, Comment entry, etc.
Power supply	100 to 240V AC 50/60 Hz Max. 180VA
Dimensions, mass	275W $\times$ 285H $\times$ 170D mm, 6.3kg
Accessories	Power cord(1), PC card protector(1) Input cord label(1), Wave viewer software(1)

### OPTIONS

(The 8855 cannot be used alone. Measurement requires optional input unit or similar peripheral.)

#### ●Options (Factory fitted)

PRINTER UNIT	8994
MEMORY BOARD (96MW)	9645
MEMORY BOARD (512MW)	9645-01
HD UNIT (20GB)	9663

#### ●Options

ANALOG UNIT	8950	LOGIC PROBE	9327
VOLTAGE/CURRENT UNIT	8951	LOGIC PROBE	9321-01
DC/RMS UNIT	8952	LAN COMMUNICATOR	9333
HIGH RESOLUTION UNIT	8953-10	WAVE PROCESSOR	9335
VOLTAGE/TEMP UNIT	8954	CARRYING CASE	9397-01
F/V UNIT	8955	FUNCTION UP DISK	9549
CONNECTION CORD (500V Max.)	9197	LAN CABLE	9642
CONNECTION CORD (300V Max.)	9198	PC CARD 256 MB	9727
CONNECTION CORD (BNC-BNC)	9217	PC CARD 512 MB	9728
RECORDING PAPER (30m, 6 rolls /1set)	9231	PC CARD 1 GB	9729
DIFFERENTIAL PROBE	9322	PC CARD 2 GB	9830
(9418-15 is necessary)		CLAMP ON SENSORS (refer to p.44-47)	
POWER CORD (for 8950/8953-9322)	9328	Other common options (refer to p.12)	

**MEMORY BOARD 9645 (total 128 megawords)**  
Expands instrument memory by 4 times its original size. Specify upon order; factory installation only.

**MEMORY BOARD 9645-01 (total 512 megawords)**  
Expands instrument memory by 16 times its original size. Specify upon order; factory installation only.

**HD UNIT 9663**  
Specify upon order; factory installation only. (20 GB)

**Input modules (8855 only)**  
Install or replace simply by inserting the module into the base unit  
*Note: Input cords are not provided. Please purchase the appropriate input cord for the probe type and application separately.*

ANALOG UNIT	8950
VOLTAGE/CURRENT UNIT	8951
DC/RMS UNIT	8952
HIGH RESOLUTION UNIT	8953-10
VOLTAGE/TEMP UNIT	8954
F/V UNIT	8955

**FUNCTION UP DISK 9549**  
Voltage, current, and power waveforms on the secondary side of an inverter

By installing the power monitor function in the MEMORY HiCORDER 8855, you can monitor power transient waveforms and view power trend graphs. Use of this function requires the optional FUNCTION UP DISK 9549, which is sold separately

**Logic input**

**LOGIC PROBE 9327**  
4 channels, ON/OFF detection of voltage/contact signals (high-speed type for use with the 8855)

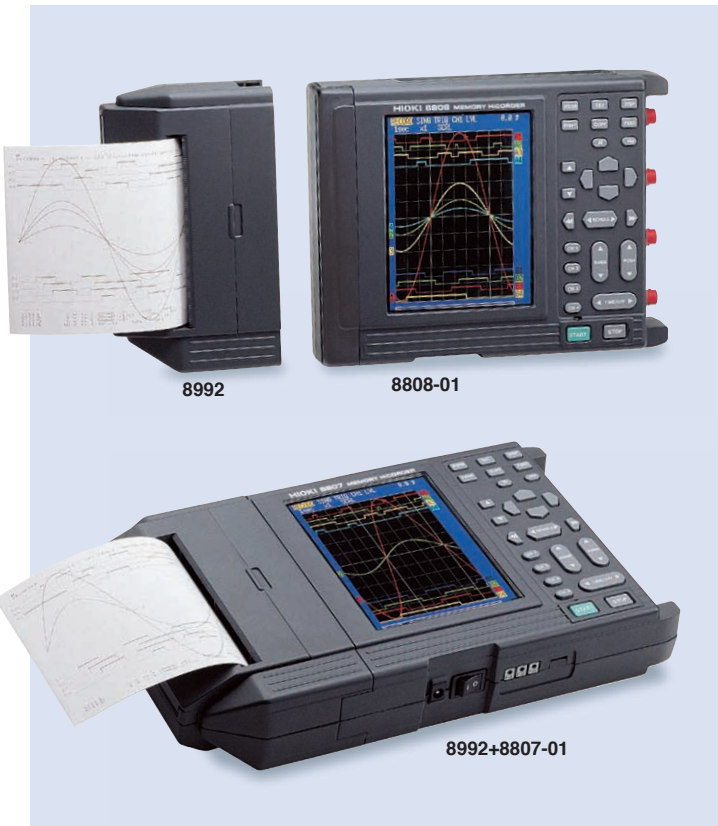
**LOGIC PROBE 9321-01**  
4 isolated channels, ON/OFF detection of AC/DC voltage (small terminal-type for use with the 8855, 8807-01, and 8808-01)

**ADAPTER CABLE 9323**  
(Terminal conversion cable for connecting the all-purpose LOGIC PROBE 9321 and the 8855 when terminals do not match.)

## MEMORY HiCORDER | 8807-01 | 8808-01

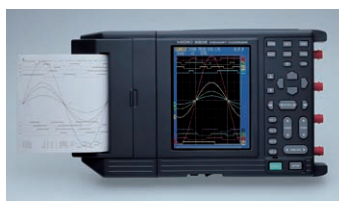
### New concept incorporating detachable printer, B5-sized handy recorder

- B5 book-sized, compact, and handy high-speed recorders
- 2 analog channels (8807-01) 4 analog channels (8808-01) isolated inputs (with 8 logic)
- PC card slot, 4-way power supply, and powerful trigger functions



SPECIFICATIONS	
Measurement ranges	Memory function, Recorder function: 10 mV to 100 V/div, 13 ranges RMS & Memory function: 5mV to 50V/div, 13 ranges (10 div f.s.) Max. input voltage AC 450 V rms, DC 450V
Frequency band	DC to 50 kHz, ±3 dB
Time axis at memory function	200µs to 5 minutes/division, 19 ranges (1 division =80 samples)
function	Memory recorder, Recorder, RMS & memory recorder (50/60 Hz or DC only)
Number of channels	8807-01: fixed input section, 2 analog <sup>±2</sup> +8 logic 8808-01: fixed input section, 4 analog <sup>±2</sup> +8 logic <sup>±2</sup> analog inputs are isolated up to 450V
Memory capacity	(analog 12 bits+ logic 4 bits)×256 k words <sup>7</sup> /channel * using CH1
Data storage	PCMCIA Type-II PC card ×1 PC CARD 9727-9729
Interface	RS-232C, Printer (PRINTER UNIT 8992 can be connected)
Recording and display	112 mm×18 m, roll type thermal paper, Recording speed: 10 mm/s (using AC adapter), 5 mm/s (using batteries), 5.7-inch STN color LCD
Power supply	AC ADAPTER 9418-15, LR6 (AA)×6 (Continuous use 1 hour, LR6 batteries cannot be used with PRINTER UNIT 8992), BATTERY PACK (Continuous use 3 hours) 9447, 12V DC Car battery
Dimensions, mass	203W×170H×52D mm (printer detached) 280W×170H×52D mm (printer attached) 8807-01: 1.1 kg (printer detached), 1.5 kg (printer attached) 8808-01: 1.2 kg (printer detached), 1.6 kg (printer attached)
Accessories	LR6 (AA) Alkaline batteries(6), Alkaline battery box(1), Shoulder belt(1), Wave viewer software(1)

OPTIONS	
<i>(The 8807-01 &amp; 8808-01 cannot be used alone. Measurement requires optional INPUT CORD or similar peripheral.)</i>	
PRINTER UNIT (print size 100 mm width)	8992
RECORDING PAPER (18m, 10 rolls /1 set)	9234
LOGIC PROBE (refer to p.12)	9320-01
LOGIC PROBE (refer to p.12)	9321-01
CONVERSION CABLE	9323
CARRYING CASE (soft)	9391
CARRYING CASE (hard)	9648
AC ADAPTER (universal 100 to 240VAC, 12VDC/2.5A output)	9418-15
BATTERY PACK (7.2V, 2400 mAh, recharging with the 9418-15)	9447
RS-232C CABLE (mini DIN 9-pin to Dsub 9-pin, 1.5 m)	9612
CLAMP ON SENSORS (refer to p.42-45)	
WAVE PROCESSOR	9335
CHARGE STAND	9643
Other common options (refer to p.12)	
<i>*Note: An input cord is not supplied with the 8807-01 &amp; 8808-01. Requires the 9197 or 9198</i>	

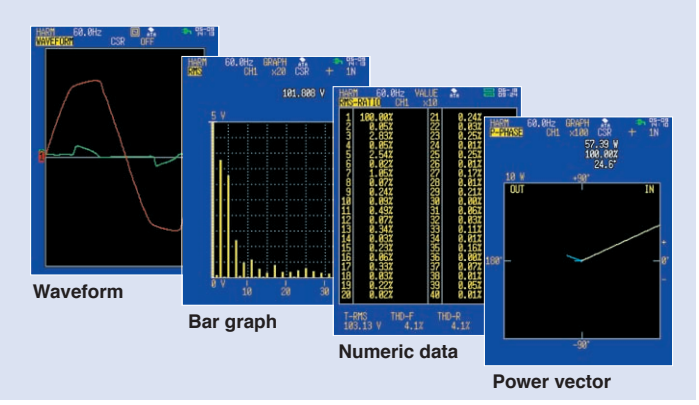


Recorders, Memory Recorders

## MEMORY HiCORDER | 8808-51

### Instantaneous Analysis and Long-term Recording of Harmonic Waves for Maintenance of Commercial Power Systems

- #### Instantaneous harmonic analysis
- Measures harmonics up to 40th orders from the fundamental wave
  - Analysis display includes RMS value, content factor, phase angle, active power, and power phase angle for each order of harmonics (numeric and graphic display)
  - Analysis display of total RMS value, total distortion, active/reactive/apparent power, and power factor (numeric display)
  - Bar graph and numeric data display
  - Power phase angle can be displayed as a vector



# MEMORY HiCORDER | 8870-20

**Anytime and Anywhere! Easy-to-Use Memory Recorder that Fits in the Palm of Your Hand**

- Compact but powerful 2-channel recorder with 1MS/s sampling
- Highly intuitive user interface
- Brilliant wide screen QVGA-TFT display



Recorders, Memory Recorders

SPECIFICATIONS	
Measurement ranges (10div full scale)	10mV/div to 50V/div (12 ranges), Resolution: 1/100 of range Max. input voltage 400V DC
Frequency band	DC to 50kHz (-3dB)
Time axis range	100µs/div to 5min/div (20 ranges), Resolution: 100 points/div Zoom: ×2 to ×10 (3 steps), Compression: ×1/2 to ×1/1000 (9 steps)
Measurement function	Memory recorder
Number of channels	Analog 2ch + Logic 4ch (isolated between analog channels)
Memory capacity	2MW/ch, 12-bit
External memory	CF card slot (1), TYPE I, 2 GB max.
Display	4.3" WQVGA-TFT color LCD (480 x 272 dots)
Interface	USB 2.0
Functions	Numeric calculations, Cursor measurement, Scaling, Screen copy, Gauge display, Waveform/setting backup, Auto save, Numeric display (instantaneous or RMS)
Power Consumption	(1) 100 to 240 V AC, 50/60 Hz using AC Adapter Model 9786 (2) Battery Pack Model 9780 (when used with the AC Adapter, the AC Adapter has priority) (3) 12 V battery (10 to 16 V DC ±10%, Please contact HIOKI for connection cord)
Dimensions, mass	176W × 101H × 41D mm, 600g (including 9780)
Accessories	AC adapter 9786 (1), Strap (1), USB cable (1), Wave processor for 8870-20 (1), PROTECTION SHEET 9809 × 1 LCD Protection Sheet (1)

### OPTIONS

CONNECTION CORD	9197		
CONNECTION CORD	9198	PC CARD 256MB	9727
CONNECTION CORD (Thin type)	9790	PC CARD 512MB	9728
ALLIGATOR CLIP	9790-01	PC CARD 1GB	9729
GRABBER CLIP	9790-02	PC CARD 2GB	9830
CONTACT PIN	9790-03	CARRYING CASE	9782
LOGIC PROBE	9320-01	SOFT CASE	9812
LOGIC PROBE	9321-01	BATTERY PACK	9780
CONVERSION CABLE	9323	CLAMP ON SENSORS (refer to p.44-47)	
DIFFERENTIAL PROBE	9322		

(9418-15 is necessary)





## MEMORY HILOGGER | 8423

### Fast 10ms Sampling Up to 600 Channels Data Logging

- Capture data with 15 to a maximum of 600 channels
- Send data to the PC in real time
- Isolated to sustain up to 600 V between modules and earth
- USB 2.0, LAN 100BASE-TX, Store to 1GB PC Card
- Simultaneous fast-and low-speed sampling allows for media storage space efficiency



Recorders, Memory Recorders

SPECIFICATIONS	
<b>No. of connectable units</b>	Maximum 8 units (total 120 channels), Bundle 8 Modules together to achieve a 120-channel System, Bundle 5 Systems together to enable a maximum of 600 channels of simultaneous recording
<b>Measurement parameters Model 8948</b>	Voltage : $\pm 150\text{mV}$ to $\pm 100\text{V}$ , 1-5V f.s. 6 ranges, Max. resolution $5\mu\text{V}$ Temperature (thermocouples) : $-200^\circ\text{C}$ to $2000^\circ\text{C}$ (depend on the sensor), 3 range (K, E, J, T, N, W (Wre5-26), R, S, B), Max. resolution $0.01^\circ\text{C}$ Max. allowable input : DC 100V, Max. rated voltage between channels : 200 V DC, Max. rated voltage to earth : 600 V DC, AC
<b>Measurement parameters Model 8949</b>	Voltage : $\pm 150\text{mV}$ to $\pm 60\text{V}$ , 1-5V f.s. 6 range, Max. resolution $5\mu\text{V}$ Temperature (thermocouples) : $-200^\circ\text{C}$ to $2000^\circ\text{C}$ (depend on the sensor), 3 range (K, E, J, T, N, W (Wre5-26), R, S, B), Max. resolution $0.01^\circ\text{C}$ Temperature (Resistance temperature sensor) : $-200^\circ\text{C}$ to $800^\circ\text{C}$ , 3 range (Pt 100, JPt 100), Max. resolution $0.01^\circ\text{C}$ Humidity : 100% rh f.s., 5.0 to 95.0% rh (use with the 9701), resolution 0.1% rh Max. allowable input : DC 60V, Max. rated voltage between channels : 120 V DC, Max. rated voltage to earth : 600 V DC, AC

<b>Measurement parameters Model 8996</b>	Totalized pulses : 0 to 1000M pulse, 1 range (No-voltage 'a' contact, open collector or voltage input), Max. resolution 1 pulse Rotation count : 0 to 5000/n (r/s) f.s. 1 range (No-voltage 'a' contact, open collector or voltage input), Resolution 1/n (r/s) Note: n = pulses per rotation (1 to 1,000) Digital input : ON/OFF digital signal Max. allowable input : DC 50V, Max. rated voltage between channels : 33V AC, 70V DC, Max. rated voltage to earth : 600 V DC, AC, (Upper limit voltage that does not cause damage when applied between CH-1 to CH-5 each channel and chassis, CH-6 to CH-10 each channel and chassis, CH-11 to CH-15 each channel and chassis, and between each UNITS), (common ground for CH-1 to CH-5, common ground for CH-6 to CH-10, common ground for CH-11 to CH-15)
<b>Recording intervals</b>	10ms to 1hr, 19 range (5s to 1hr when combined with humidity measurement), Dual sampling : Recording intervals can be specified for every input module (high-speed and low-speed)
<b>Function</b>	Measurement data are saved to the CF Card in real time, Trigger function, Digital filter (Input unit), Alarm output (use with the ALARM UNIT 8997), Data acquisition is controlled by the PC data acquisition program, FTP server function, HTTP server function
<b>Interface</b>	LAN : supports 100Base-TX, USB : Ver 2.0, mini-B receptacle, CF card slot
<b>Power supply</b>	Using the AC ADAPTER 9418-15 /20 VA (when connected with 8 units), 12V Battery (voltage may range from -20% to +30%, Please contact HIOKI for connection cord).
<b>Dimensions &amp; Mass</b>	67 W x 133 H x 125D mm , 600 g (main unit 8423 only)
<b>Accessories</b>	AC adapter 9418-15 (1), Logger Utility(1)



### OPTIONS

VOLTAGE/TEMP UNIT	8948	CONNECTION CABLE	9683
UNIVERSAL UNIT	8949	PC CARD 256M	9727
HUMIDITY SENSOR	9701	PC CARD 512M	9728
DIGITAL/PULSE UNIT	8996	PC CARD 1G	9729
ALARM UNIT	8997	LAN CABLE	9642

*\*Note: 8423 cannot operate alone. You must install one or more optional input modules in the unit. Thermocouples are not provided by HIOKI, and must be purchased from a separate vendor.*

# MEMORY HILOGGER | LR8400-20 | 8401-20 | 8402-20

## Protect Your Important Data Logged Over an Entire Year

- Pick and choose from 3 types of terminal blocks
- 30 channels of analog input as standard
- Expand to 60 channels but still maintain a small footprint
- Record data for up to 1 year
- Protect data even during sudden power interruptions



LR8402-20 (Japanese version shown)



Recorders, Memory Recorders

SPECIFICATIONS		LR8400-20	LR8401-20	LR8402-20
Number of Input Channels	Analog inputs	30 channels isolated by Photo-MOS relays (2xM3 screw-type terminals per channel)	30 channels isolated by Photo-MOS relays (4xpush button terminals per channel)	30 channels isolated by Photo-MOS relays (2xM3 screw-type terminals for 15 ch, and 4xpush button terminals for 15 ch)
	Pulse inputs	8 ch (each input channel and the main instrument chassis share common ground)		
Measurement Types	Voltage	10mV to 100V, 1-5V f.s., 10 ranges (5 $\mu$ V resolution)		
	Thermocouple	-200°C to 2000°C (Upper and lower temperature limits depend on the measurement range of the sensor used) 3 range (K, E, J, T, N, W, R, S, B), (0.01°C resolution)		
	Platinum measurement resistance	None	-200°C to 800°C, 3 range (Pt 100, JPt 100), (0.01°C resolution)	
	Humidity	100% rh f.s., 5.0 to 95.0% rh (using HUMIDITY SENSOR Z2000) (0.1% rh resolution)		
	Resistance	None	10 to 200 $\Omega$ f.s., 4 ranges (0.5 m $\Omega$ resolution)	
	Pulse Totalization	0 to 1,000 M counts, Resolution: 1 counts (No-voltage contact points (always open connection), open collector, or voltage input)		
	Rotation Rate	0 to 5,000/n (r/s), Resolution: 1/n (r/s), (using same input signal for pulse integration) Note: n = pulses per rotation (1 to 1,000)		
	Digital Input	Record 1/0 per recording interval		
Maximum Input Voltage		$\pm$ 100V DC 250V DC between analog input channels 300V AC/DC to ground	$\pm$ 100V DC 300V DC between analog input channels, 300V AC/DC to ground (Platinum resistance thermometer input and resistance input are not isolated; also, maximum input voltage at the 2xM3 screw-type terminals is 250V DC between channels.)	
Recording interval		10 ms to 1 hour, Note: All input channels are scanned at high speed during each recording interval. (Certain limits exist for the intervals between 10ms and 50ms.)		
Digital Filter		OFF / 50 Hz / 60 Hz (To filter out harmonic components, for analog input the cut off frequency is automatically set based on the recording interval.)		
Memory capacity		Internal: 8 MW, External: Compact Flash Card, USB memory		
Interfaces		USB 2.0 Series Mini B, LAN (supports 100Base-TX)		
Display Type		5.7-inch TFT Color LCD (640 x 480 dots)		
Function		Real-time save to CF card or USB memory stick, numerical/waveform calculation, FTP server/Client Function, e-mail sending, HTTP Server Function (LAN functions are available with firmware version 1.20 or later.), etc.		
Power supply		(1) Using the AC ADAPTER 9418-15, 100 to 240 VAC, 50/60 Hz (2) BATTERY PACK Z1000 or 10 to 28V DC		
Dimensions, mass		272W x 182.5H x 66.5D mm 1.8kg (LR8400, LR8402), 1.7 kg (LR8401)		
Accessories		AC ADAPTER 9418-15 (1), USB cable (1), Application software (1)		

### OPTIONS

ANALOG/TEMPERATURE UNIT (2-terminal M3 screw terminal block, 15ch, Voltage/Thermocouple/Humidity)	LR8500
UNIVERSAL UNIT (4-terminal push button terminal block, 15ch, Voltage/Thermocouple/Humidity/Platinum temperature-measurement, Resistance)	LR8501
BATTERY PACK (NiMH, recharging with the LR8400)	Z1000
CARRYING CASE (also stores options)	C1000
FIXED STAND (for wall-mounting, standing on benchtop, etc.)	Z5000
HUMIDITY SENSOR (Cord length: 3m)	Z2000
PC CARD 256M	9727
PC CARD 512M	9728
PC CARD 1GB	9729
PC CARD 2GB	9830

## MEMORY HILOGGER | 8430-20

**Small and light enough for the palm of your hand !  
Personal Data Logger with 10 Isolated Channels**

- Provides ten electrically isolated analog input channels
- For measuring voltage, temperature, plus 4 pulse-counting inputs
- 10ms rapid scanning of all channels
- CompactFlash card makes direct recording a snap
- Widescreen, bright LCD gives excellent viewability



### SPECIFICATIONS

<b>Input System/ Channels</b>	Analog inputs: 10 (M3 mm dia. screw terminal block), electrically isolated between channels, and from chassis ground. Input impedance: 1 MΩ (when voltage input or temperature measuring with thermocouple burn-out detection OFF), 800 kΩ (with thermocouple burn-out detection ON) Pulse inputs: 4 channels (requires HIOKI Input Cable 9641) Note: all pulse inputs share common ground with the HILOGGER
<b>Analog Inputs</b>	Maximum rating: 60 V DC (max. voltage between input terminals without damage) Maximum rated voltage from isolated terminals to ground: 60 V DC (max. voltage between input channel terminals, and from terminals to chassis ground without damage)
<b>Pulse Inputs</b>	Input limits: -5 to +10 V DC (max. voltage between input terminals without damage), non-isolated (common ground between pulse input channels, and with chassis) Pulse signal characteristic: no-voltage relay contact "a", open collector or voltage input (High: ≥ 2.5 V, Low: ≤ 0.9 V), Period: at least 200 μs (both high and low periods at least 100 μs)
<b>Alarm Output</b>	One channel, non-isolated: output from external control connector (common ground) Signal criteria: configurable high/low threshold levels, enter/exit threshold window, logical sum (OR) and logical product (AND) for every input channel. Output is refreshed each time recording starts. Signal characteristic: Open-collector output (active low, with voltage output) Voltage levels: 4.0 to 5.0 V (H) and 0 to 0.5 V (L), Max. sink current: 5 mA DC, Max. applied voltage: 30 V DC
<b>Data Recording Capacity</b>	Internal storage: 3.5 MWords (7 MB of two-byte data points, or four-byte pulse measurements) External storage: Up to 2 GB (HIOKI CF cards only)
<b>Real-Time Data Saving</b>	Waveforms are saved in real time as binary, or CSV data to the CF card, and can be saved to separate files at preset times. (CSV data in real-time is 50 msec sampling or later, Firmware Ver. 1.10) Overwriting saving is available. Stored data can be recalled by the HILOGGER in 3.5 MWord (7 MB) quantities (for a single channel; less for multiple channels, only binary data)

<b>Backup Function (@25°C)</b>	Backup battery life for clock and settings: approx. 5 years For measurement data: 100 hours with fully charged battery pack, or for as long as AC adapter is connected
<b>External Control Terminals</b>	Using the AC ADAPTER 9418-15/20 VA (when connected with 8 units), 12V Battery (voltage may range from -20% to +30%, Please contact HIOKI for connection cord).
<b>Display type</b>	4.3-inch WQVGA-TFT color LCD (480 × 272 dots)
<b>Displayable languages</b>	English, Japanese
<b>External Interface</b>	One USB 2.0 series B receptacle Functions: Control from a PC (Ver 1.00 or later), Transfers internal data on the CF card to a PC (Ver 1.10 or later)
<b>Environmental conditions (no condensation)</b>	Temperature and humidity range for use: 0°C to 40°C (32°F to 104°F), (or 5°C to 30°C, 41°F to 86°F when battery charging) 80% rh or less Temperature and humidity range for storage: -10°C to 50°C (14°F to 122°F), 80% rh or less
<b>Compliance standard</b>	Safety: EN61010, EMC: EN61326, EN61000
<b>Power Sources</b>	(1) 100 to 240 V AC, 50/60 Hz using AC Adapter Model 9786 (2) Battery Pack Model 9780 (when used with the AC Adapter, the AC Adapter has priority) (3) 12 V battery (10 to 16 V DC ±10%, Please contact HIOKI for connection cord)
<b>Power Consumption</b>	10 VA (using 12 V battery, while charging Battery Pack 9780) 30 VA (using AC Adapter, while charging Battery Pack 9780)
<b>Continuous Operating Time</b>	Approx. 2.5 hours (with Battery Pack Model 9780) Charging time: Approx. 200 minutes (@5°C to 30°C ambient)
<b>Dimensions and mass</b>	Approx. 176 mm (6.93 in) W × 101 mm (3.98 in) H × 41 mm (1.61 in) D, 550 g (19.4 oz) (HiLOGGER only)
<b>Supplied Accessories</b>	Instruction Manual × 1, Measurement Guide × 1, Application Disk (Logger Utility program) × 1, USB cable × 1, AC Adapter 9786 × 1, Shoulder Strap × 1, Protection Sheet 9809 × 1

### OPTIONS

CONNECTION CABLE	9641	PC CARD 256M	9727
BATTERY PACK	9780	PC CARD 512M	9728
SOFT CASE	9812	PC CARD 1G	9729
CARRYING CASE	9782	PC CARD 2G	9830

*Note: The 8430-20 is not bundled with the Battery Pack 9780. Use only PC cards sold by HIOKI. Thermocouples are not provided by HIOKI, and must be purchased from a separate vendor.*



# WAVE COMPARATOR | 8730-10 | 8731-10

## A MEMORY HiCORDER geared for the production line

- Easy installation into production lines for high speed measurement and assessment
- Compare the signals of manufactured components and devices with a memorized reference signal to conduct PASS/FAIL evaluations on a waveform level
- 8730-10: 1ch input/comparison 8731-10: 2ch input/2ch simultaneous comparison
- Connect to a PC via LAN for networking capabilities



### SPECIFICATIONS

<b>Measurement ranges</b>	100 mV to 5 V/division, 6 ranges (10 division f.s.) resolution: 1/160 of range
<b>Maximum input voltage</b>	30Vrms or 60V DC (CAT I, max. voltage that can be applied without damage between input terminals)
<b>Frequency characteristic</b>	DC to 400 kHz ±3 dB
<b>Number of input channels</b>	8730-10: Analog 1 channel 8731-10: Analog 2 channels
<b>Memory capacity</b>	12bits×50 k words/ch
<b>Time axis</b>	100µs to 5 minutes/division, 20 settings (1 division =100 samples) external sampling (up to 1 kHz, minimum sampling period 1 ms)
<b>Measurement functions</b>	Memory recorder with waveform evaluation function. Reference area waveform evaluation X-Y Measurement function Waveform parameter calculation Waveform processing calculation
<b>Test Mode Saving</b>	Up to 16 setup configurations and up to 16 comparison area settings (into internal memory)
<b>Data storage</b>	PC card Type II slot
<b>Interfaces</b>	RS-232C LAN (10BASE-T) External I/O
<b>Display</b>	7.2-inch STN color LCD
<b>Power supply</b>	100 to 240 V AC (50/60 Hz)
<b>Dimensions, mass</b>	8730-10:288W×144H×190D mm, 3.6 kg 8731-10:288W×144H×190D mm, 3.7 kg
<b>Accessories</b>	Power cord (1), Wave viewer software (1)

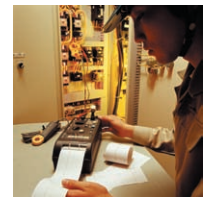
### OPTIONS

LAN COMMUNICATOR	9333	PC CARD 1GB	9729
WAVE PROCESSOR	9335	PC CARD 2GB	9830
PC CARD 256M	9727	LAN CABLE	9642
PC CARD 512M	9728		

# MICRO HiCORDER | 8205-10 | 8206-10

## Easy data recording as convenient as a simple tester, yet with broad functionality

- Record voltage and current variations simply with full line-up of optional clamp on sensors of up to 1000A
- Input levels can be monitored on the LCD like an analog display
- Built-in thermal printer for printing data such as time and amplitude axis



### 8205-10: SPECIFICATIONS

<b>Measurement ranges</b>	DC /AC Voltage: 0.1V to 500V f.s. 12 ranges AC Current: 10A to 1000A f.s. 7 ranges (using CLAMP ON SENSOR / option)
<b>Sampling period</b>	10ms
<b>Frequency band</b>	20Hz to 30kHz, ±3 dB
<b>Paper feed speed</b>	20cm/minute to 2cm/hour, 5 ranges
<b>Number of channels</b>	Voltage or Current, 1 channel
<b>Accuracy</b>	Voltage: ±2% f.s. Current: ±4% f.s. (using 9651 CLAMP ON SENSOR / option)
<b>Power supply</b>	100 to 240V AC (50/60 Hz) or 9.5 to 14V DC, 2 way
<b>Dimensions, mass</b>	250W×122H×93.5D mm, 1.2 kg
<b>Accessories</b>	Power cord(1), Recording paper(1 roll), CONNECTION CORD 9257 (1), CARRYING CASE 9344(1)

### 8206-10: SPECIFICATIONS

<b>Measurement ranges</b>	AC Voltage: 100/ 200/ 500 V extended scale, 3 ranges AC Current: 10A to 1000A f.s. 7 ranges (using CLAMP ON SENSOR / option)
<b>Sampling period</b>	10ms
<b>Frequency band</b>	30Hz to 30kHz, ±3dB
<b>Paper feed speed</b>	60 cm/hour to 2 cm/hour, 5 ranges
<b>Number of channels</b>	Voltage and Current, 2 channels alternate recording
<b>Accuracy</b>	Voltage: ±2% f.s. Current: ±4 % f.s. (using 9651 CLAMP ON SENSOR / option)
<b>Power supply</b>	100 to 240V AC (50/60 Hz) or 9.5 to 14V DC, 2 way
<b>Dimensions, mass</b>	250W×122H×93.5D mm, 1.2 kg
<b>Accessories</b>	Power cord(1), Recording paper(1 roll), CONNECTION CORD 9257 (1), CARRYING CASE 9344(1)

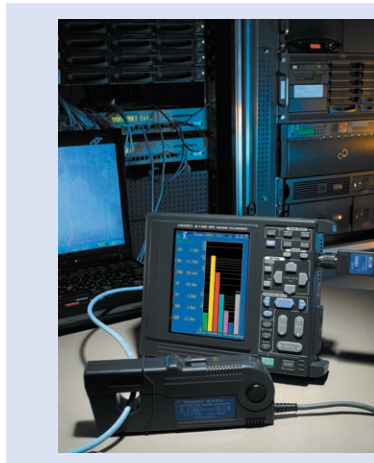
### OPTIONS

- CLAMP ON SENSOR 9650 (for 8205-10, 8206-10, 100A f.s.,40Hz~1kHz, 3m length)
- CLAMP ON SENSOR 9651 (for 8205-10, 8206-10, 500A f.s.,40Hz~1kHz, 3m length)
- CLAMP ON SENSOR 9668 (for 8205-10, 8206-10, 1000A f.s.,40Hz~1kHz, 3m length)
- RECORDING PAPER (15m, 10rolls /1 set) 9235
- RECORDING PAPER (Climate-resistant, 15m, 10rolls/1set) 9236-01
- CONNECTION CORD (for 8205-10 only) 9326
- 220H PAPER WINDER (refer to p.12)

## NOISE HILOGGER 3145-20

Measures the noise Current levels and frequencies on telecom, power and grounding lines

- Easily view the noise current level in each band
- Record noise level variations over time in each band
- Measures noise current on earth lines easily
- Reliably capture one-shot noise that is hard to detect with a spectrum analyzer or oscilloscope
- Automatically save data to a PC Card for continuous long-term recording



Recorders, Memory Recorders

### 3145-20 SPECIFICATIONS

<b>Input terminal</b>	BNC (max. input voltage 5V peak), 5kHz to 100MHz (-3dB)
<b>Measurement ranges</b>	[Current] 0.2mA, 2A, 20A (used with the 9754) [Voltage] 10mV, 100mV, 1V
<b>Band Path Filter characteristics</b>	Center frequency: 15k, 70k, 250k, 1M, 5M, 20M, 60MHz, 7 BPFs separates noise (fixed), measuring the peak value in each band
<b>Monitor function</b>	Displays real-time peak-to-peak values in each frequency band on level meters, Refresh interval: 100ms
<b>Logging function</b>	Records maximum peak-to-peak values in each frequency band at the specified recording interval to internal memory (16 days at 1sec interval to 2.5 years at 60sec interval)
<b>Recording interval</b>	1, 2, 5, 10, 20, 30, 60 sec
<b>Functions</b>	Displays a time-series graph, Alarm function, Event mark function, External trigger
<b>Interface</b>	LAN, RS-232C
<b>Power consumption</b>	AC ADAPTER 9418-15 /30VA max., BATTERY PACK 9447 / Continuous use 1hour (20VA max.)
<b>Dimensions and mass</b>	203 W x 170 H x 52D mm, 1.2kg
<b>Accessories</b>	AC ADAPTER 9418-15 x 1, Carrying case x 1, Strap x 1, Ferrite clamp x 3, CD-R (DATA VIEWER for 3145-20 software, Communication commands manual, or other) x 1, Operating manual x 1, Operating guide x 1

### 9754 SPECIFICATIONS (huddled with the 3145-20 upon purchases)

<b>Band width</b>	1kHz to 100MHz (-3dB)
<b>Rated current</b>	AC 10A (15A peak)
<b>Amplitude accuracy</b>	±3.0% rdg, ±0.001% f.s. (f.s. =10A, f=15kHz, with conductor centered in clamp)
<b>Measurable conductor diameter</b>	up to φ20mm
<b>Max. rated voltage to earth</b>	CAT II 600V, CAT III 300V (insulated conductor)
<b>Dimensions and mass</b>	176 W x 69H x 27D mm, 450g, Cord length 2m

### OPTIONS

<b>CLAMP ON NOISE SENSOR</b>	9754 (required)	<b>LAN CABLE</b>	9642
<b>AC ADAPTER</b>	9418-15	<b>PC CARD 256M</b>	9727
<b>BATTERY PACK</b>	9447	<b>PC CARD 512M</b>	9728
<b>CHARGE STAND</b>	9643	<b>PC CARD 1G</b>	9729
<b>RS-232C CABLE</b>	9721		
<b>RS-232C CABLE</b>	9612		

## NOISE SEARCH TESTER 3144-20

Identify noise Voltage in communication and power lines

### 3144-20 SPECIFICATIONS

<b>Input unit configuration</b>	9741 dedicated input terminal, BNC input terminal (9741 takes priority)
<b>Frequency range band</b>	500Hz to 30MHz, separated into 7ranges (-3 dB) 500Hz to 3kHz (1 kHz range) / 7.5kHz to 22.5kHz (15kHz range) / 35kHz to 105kHz (70kHz range) / 125kHz to 375kHz (250kHz range) / 0.5MHz to 1.5MHz (1MHz range) / 1.5MHz to 4.5kHz (3MHz range) / 10MHz to 30MHz (20MHz range) / (BNC input 50Ω termination)
<b>Detection method</b>	RMS value conversion
<b>Detection accuracy</b>	500Hz to 1 MHz or less±1.5dBV 1MHz to 30 MHz±2.0dBV
<b>Monitoring function</b>	Display of measurement voltage level of each frequency range in levels on LCD (2.5dBV/SEG equivalent)
<b>Logging function</b>	Measurement data and time saved to internal memory according to specified recording interval
<b>Recording interval</b>	1/2/5/10/20/30 seconds 1/2/5/10/20/30/60 minutes
<b>Output function</b>	Wave monitoring (Output of input signal coming from 9741 or BNC input) Audible range monitoring (Use earphone to monitor for detected envelope signals)
<b>Power</b>	AA-size alkaline batteries (LR6) x6, DC9 V 500mA
<b>Dimensions and mass</b>	98W x 179H x 46D mm, 430g (excluding batteries)



### 9741 SPECIFICATIONS (bundled with the 3144-20 upon purchase)

<b>Sensor configuration</b>	Electrostatic coupling non-contact voltage sensor
<b>Frequency range</b>	600Hz to 30MHz (-3dB)
<b>Conductor diameter</b>	φ20mm
<b>Dimensions and mass</b>	62W x 158H x 40D mm, 260g
<b>Accessories</b>	CLAMP ON VOLTAGE SENSOR 9741 x 1, AC adapter 9445-02(UL) or 9445-03(CEE) x 1, Carrying case x 1, PC application software CD-R x 1, USB cable x 1, strap x 1, earphone x 1, AA alkaline(LR6)batteries x 6

# Power Measuring Instruments



## Power Measuring Instruments Index

### For high level performance



**3390**  
DC, or Single-phase to 3-phase 4-wire  
4 ch-Current sensor input  
DC, 0.5 to 150 kHz bandwidth  
±0.1% basic accuracy



.....p.26

### Advanced power evaluation and analysis



**3193**  
DC, or Single-phase to 3-phase  
4-wire Wide-band up to 1 MHz  
6 ch-Direct/ Clamp input



.....p.25



**3194**  
Analysis station for Motor  
Evaluation Power, Harmonics,  
Rotation Speed, Torque,  
Converter efficiency



.....p.25



**3196**  
Power Quality Analyzer  
DC, or Single-phase to 3-phase  
4-wire  
Clamp input



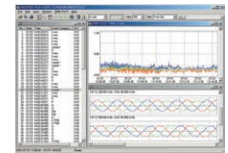
.....p.23



**3197**  
Fully portable Power Quality  
Analyzer  
1P2W to 3P4W  
Clamp Input



.....p.24



**9624-50**  
PQA- HiVIEW PRO  
Software application for 3196  
and 3197

.....p.25

### For use on production lines



**3331**  
3-phase 3-wire (2 power meter  
method)  
(no independent setting for each line)  
V, A, W, VA, var, integ., PF  
Phase angle, Hz Direct input only



.....p.27



**3332**  
Single-phase 2-wire V, A, W, VA,  
var, integ., PF, Phase angle, Hz  
Direct input only



.....p.27



**3333/3333-01**  
Single-phase 2-wire  
High Accuracy  
(±0.1%rdg, ±0.1% f.s.)  
Maximum Cost Performance  
Direct input only



.....p.27



**3334/3334-01**  
Wide Input Range  
DC, Single-phase 2-wire  
Bandwidth DC, 45 to 5kHz  
Basic accuracy ±0.2% Direct  
input only



.....p.27

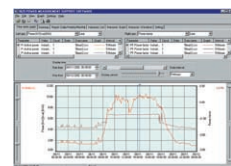
### For managing power lines



**3169-20/21**  
Single-phase to 3-phase 4-wire  
V, A, W, VA, var, integ., PF, Hz  
Clamp input only



.....p.22



**9625**  
POWER MEASUREMENT  
SUPPORT SOFTWARE  
for 3169-20/21

.....p.22



**3286-20**  
Clamp-On Power Meter V, A, W,  
VA, var, PF, Hz, Harmonics (V, A)



.....p.54

## CLAMP ON POWER HITESTER | 3169-20 | 3169-21

Offering a new approach to energy-related measurement such as energy conservation, ISO14001 testing, equipment diagnosis, and harmonics measurement.



CAT III 600V



RS-232C  
STANDARD

True RMS

- From 1-phase 2-wire to 3-phase 4-wire systems
- 5 A to 5000 A range, PC card data storage
- Power recording for individual waveforms
- Simultaneous recording of demand values and harmonics
- D/A output with 3169-21



9661×2, 9669×2 (option)

SPECIFICATIONS	
Measurement lines	Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, and three-phase 4-wire systems (50/60 Hz)
Measurement item	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Integrated value, Frequency, Harmonics
Measurement range	Voltage: 150 V to 600 V, 3 ranges Current (When using 9660): 5 A to 100 A, 4 ranges Current (When using 9661): 5 A to 500 A, 5 ranges Current (When using 9669): 100 A to 1 kA, 3 ranges Current (When using 9667): 500 A / 5 kA, 2 ranges Current (When using 9694): 0.5 A to 5 A, 3 ranges Power: 75 W to 9 MW, 108 combination patterns
Basic accuracy	±0.2% rdg, ±0.1% f.s. + Clamp accuracy (for active power)
Clamp sensor accuracy	9660 (rated for 100 A): ±0.3% rdg, ±0.02% f.s. 9661 (rated for 500 A): ±0.3% rdg, ±0.01% f.s. 9669 (rated for 1000 A): ±1.0% rdg, ±0.01% f.s. 9667 (rated for 5000 A): ±2.0% rdg, ±1.5 mV 9694 (rated for 5 A): ±0.3% rdg, ±0.02% f.s.
Frequency characteristic	Fundamental waveforms up to the 50th order ±3% f.s. + measurement accuracy
Other functions	PC card, RS-232C, D/A output (3169-21 only, 4 channels), External I/O
Power supply voltage rating	100 to 240 V AC, 50/60 Hz
Dimensions, mass	210W×160H×60D mm ±5 mm, 1.2 kg ±100 g (3169-20, 3169-21)
Accessories	Voltage cord set 9438-53 (1), Power cord (1), Input cord label (1), Operating manuals (2), CD-R (1), Connection cable 9441 (1) (for the 3169-21 only)



### PRINTER 9442 \* Note: Non-CE mark product

Print method : Thermal serial dot printing  
Paper width : 112 mm  
Print speed : 52.5cps  
Power supply : AC adapter 9443-02/03, or supplied nickel-metal hydride battery (approx. 3000 lines of printing when fully charged and used with the 9443-02/03)  
Dimensions, mass : Approx. 160W × 66.5H × 17D mm, approx. 580g

When purchasing the Printer 9442, make sure you also purchase the RS-232C cable 9721 and AC adapter 9443-02/03 so that you can connect it to the 3169-20/21.

### OPTIONS

#### ● Current measurement

(The 3169-20/-21 cannot be used alone. Measurement requires one or more optional clamp-on sensors.)

CLAMP ON SENSOR rated current 100 A AC	9660
CLAMP ON SENSOR rated current 500 A AC	9661
CLAMP ON SENSOR rated current 1000 A AC	9669
FLEXIBLE CLAMP ON SENSOR rated current 5000 A AC	9667
CLAMP ON SENSOR rated current 5 A AC	9694
CLAMP ON ADAPTER rated current 1500 A AC, output 150 A (10:1 ratio)	9290-10
AC ADAPTER (for the 9667, for America, Japan)	9445-02
AC ADAPTER (for the 9667, for Europe)	9445-03

#### ● Voltage measurement

VOLTAGE CORD (Supplied as standard with 3169-20/-21)

9438-53	9438-53
*1 MAGNETIC ADAPTER (for the 9438-53, generally compatible with M6 pan screws, Red)	9804-01
*1 MAGNETIC ADAPTER (for the 9438-53, generally compatible with M6 pan screws, Black)	9804-02

\*1 Red and black adapters sold separately. Purchase the quantity and color appropriate for your application. (Example: 3P3W-3 adapters, 3P4W-4 adapters)

#### ● PC communication

POWER MEASUREMENT SUPPORT SOFTWARE	9625
RS-232C CABLE for connection to PC	9612
PC CARD 256M	9727
PC CARD 512M	9728

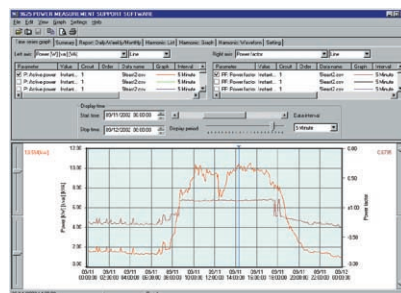
#### ● Other options

CARRYING CASE	9720-01
CONNECTION CABLE for external I/O, 2 m length	9440
CONNECTION CABLE (standard with the 3169-21), for D/A output, 2 m length	9441

#### ● Printer

*2 PRINTER	9442
*2 AC ADAPTER for the 9442 PRINTER, for 200~240 V power lines	9443-02
RS-232C CABLE for connection to the 9442, 1.5 m length	9721
RECORDING PAPER 112 mm width×25 m, roll type, 10 rolls per set	1196

\*2 Note: Non-CE mark product



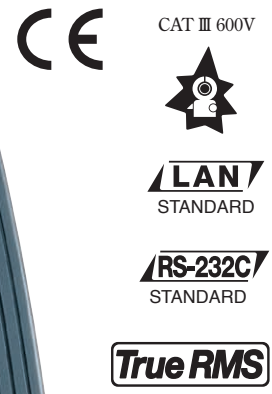
POWER MEASUREMENT SUPPORT SOFTWARE 9625

# POWER QUALITY ANALYZER 3196

**Monitor and record the quality of power to analyze the cause of trouble when it occurs !**

Most complete instrument for power quality troubleshooting

- Measure Dips, Swells, Interruptions, Flicker, Transients
- Harmonic to the 50th order
- High frequency transient over voltage
- Detection and waveform display
- 4 current and 4 voltage channels
- 400Hz Fundamental wave
- GPS Synchronization (option required)



9661x4 (option)

Power Measuring Instruments

## SPECIFICATIONS

<b>Measurement lines</b>	Single-phase two-wires, Single-phase three-wires, Three-phase three-wires, Three-phase four-wires
<b>Voltage Range</b>	ch1, ch2, ch3: 150/300/600V ch4: 60/150/300/600V(AC), 60/600V(DC)
<b>Current Range</b>	9660: 50/100A, 9661:50/500A, 9667:500/5000A, 9669:1000A
<b>Measurement Method</b>	Transient overvoltage: 2MS/s Arithmetic operation: 256points/cycle Harmonic/Inter-harmonic: 2048points/10cycles (for 50Hz) 2048points/12cycles (for 60Hz)
<b>Measurement Function</b>	1. Transient overvoltage 2. Voltage swell, Voltage dip, Voltage interruption 3. Frequency, Voltage, Current, Voltage/Current peak, Active/Reactive / Apparent power, Power factor, DPF 4. Voltage unbalance ratio, Current unbalance ratio 5. Harmonic voltage/current/power, Inter harmonic voltage/current, Harmonic voltage current phase angle, Total harmonic/inter harmonic distortion 6. IEC flicker[Pst, Plt], K factor / ΔV10(Japan) 7. EN50160
<b>Internal Memory</b>	13MB
<b>Interface</b>	PC card (Flash ATA card / up to 528 MB) RS-232C, LAN (10BASE-T), HTTP server function
<b>Power supply</b>	9458 AC adapter or 9459 battery pack
<b>Dimensions and Mass</b>	298W × 215H × 67D mm, 2.0 kg
<b>Accessories</b>	Voltage cord (1set), 9458 AC adapter (1), Battery pack 9459 (1), strap (1), Down 96 (data download software)

## OPTIONS

(The 3196 cannot be used alone. Measurement requires one or more optional sensors.)

- **Current measurement**
  - CLAMP ON SENSOR rated current 100A AC 9660
  - CLAMP ON SENSOR rated current 500A AC 9661
  - CLAMP ON SENSOR rated current 1000A AC 9669
  - FLEXIBLE CLAMP ON SENSOR rated current 5000A AC 9667
  - CLAMP ON SENSOR rated current 5A AC 9694
  - CLAMP ON ADAPTER rated current 1500A AC, output 150A (10:1 ratio) 9290-10
  - AC ADAPTER (for the 9667, for America, Japan) 9445-02
  - AC ADAPTER (for the 9667, for Europe) 9445-03
- **Voltage measurement**
  - VOLTAGE CORD (standard accessory) 9438-02
  - WIRING ADAPTER (3P3W) 9264-01
  - WIRING ADAPTER (3P4W) 9264-02
- **PC communication**
  - PQA HiVIEW PRO (PC application software for advanced data processing) 9624-50
  - LAN CABLE (5m, with straight and crossover connectors) 9642
  - PC CARD 256 M 9727
  - PC CARD 512 M 9728
- **Other options**
  - AC ADAPTER (included) 9458
  - BATTERY PACK (included) 9459
  - CARRYING CASE (soft) 9339
  - CARRYING CASE (hard) 9340
- **Printer**
  - \* PRINTER (with one roll of recording paper) 9670
  - \* AC ADAPTER (for 9670) 9671
  - RECORDING PAPER (80 mm×25 m, 4 rolls, for 9670) 9237
  - RS-232C CABLE (1.5 m, for printer connection) 9638

\*Note: Non-CE mark product



**CLAMP ON SENSOR 9660**  
Current up to 100A  
**CLAMP ON SENSOR 9694**  
Current up to 5A AC



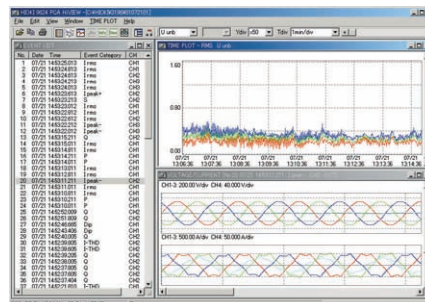
**FLEXIBLE CLAMP-ON SENSOR 9667**  
Current up to 5000A AC Diameter up to 254mm Rogowski-type current sensor



**CLAMP ON SENSOR 9661**  
Current up to 500A



**CLAMP ON SENSOR 9669**  
Current up to 1000A



**PQA-HiVIEW 9624-50**  
Model 9624-50 PQA-HiVIEW PRO software application is a program for analyzing binary codes stored on a PC card by Model 3196.



## POWER QUALITY ANALYZER | 3197

### The Most Comprehensive Portable PQA on The Market

Catch Power Quality Problems on the Fly...

- Monitor for:
  - Inrush Current
  - Voltage Swells
  - Voltage Dips
  - Transient Overvoltage
  - Interruptions
- Measure and Record:
  - Power and Power Factor
  - Active/Reactive Energy
  - Demand
  - Load Changes (with graph display!)
  - Voltage and Current



9661×3 (option)



SPECIFICATIONS	
Measurable Circuits	1P2W/1P3W/3P3W2M/3P3W3M/3P4W/3P4W2.5E
Measurement Line Frequency	Auto-detect (50Hz/60Hz)
Voltage Range	600.0V
Current Range	Manually Switchable from 2 Range Sets According to Clamp Sensor 500.0mA/5.000A/50.00A/10.00A/100.0A/500.0A/1.000kA/5.000kA
Measurement Function	1. Transient overvoltage 2. Voltage swell, Voltage dip, Voltage interruption 3. Frequency, Voltage, Current, Voltage/Current peak, Active/Reactive/Apparent power, Power factor, DPF 4. Voltage unbalance ratio 5. Harmonic voltage/current/power, Harmonic voltage current phase angle, Total harmonic distortion 6. Inrush current
Interval Settings	AUTO/1/5/10/15/30/60 minutes
Maximum Recordable Period	125 Days with internal non-volatile memory of 4MB - stored data will not be deleted upon power OFF; partition memory into 4 segments for maximum 31 days of recording each
Internal Memory	4MB
PC Interface	USB Ver.2.0 (for data transfer only)
Power supply	9418-15 AC Adapter or 9459 Battery Pack
Dimensions and Mass	128W × 246H × 63D mm, 1.2 kg with battery pack
Accessories	Voltage cords (4), BATTERY PACK (1), AC ADAPTER (1), USB Cable (1), Basic PC Software (1), Carrying Case (1), Strap (1)

### OPTIONS

CLAMP ON SENSOR 100A AC	9660
CLAMP ON SENSOR 500A AC	9661
FLEXIBLE CLAMP ON SENSOR 5000A AC	9667
CLAMP ON SENSOR 1000A AC	9669
CLAMP ON SENSOR 5A AC	9694
CLAMP ON SENSOR 50A AC	9695-02
CLAMP ON SENSOR 100A AC	9695-03
CONNECTION CORD (for the 9695-02/9695-03)	9219
* CLAMP ON LEAK SENSOR 10A AC	9657-10
* CLAMP ON LEAK SENSOR 10A AC	9675
VOLTAGE CORDS (bundled with standard 3197)	9438-05
BATTERY PACK (bundled with standard 3197)	9459
PQA HiVIEW PRO (PC application software)	9624-50
AC ADAPTER (for the 9667, for America, Japan)	9445-02
AC ADAPTER (for the 9667, for Europe)	9445-03

\* for leakage current measurement only-Not possible to measure power



# PQA-HiVIEW PRO | 9624-50

## Basic PC Analysis of Model 3196 and 3197 Data

### Viewer function

Use this function to display screens similar to those used for the 3196/3197.

Select from the **TIME PLOT screen** (voltage fluctuation, RMS fluctuation, harmonic fluctuation, inter-harmonic fluctuation), **event list screen**, **event data screen** (waveforms, vectors, DMM, harmonics, event details), **ΔV10 screen** (Japanese standard), or **settings screen**. In the TIME PLOT screen, and use the two cursors (A and B) to calculate waveforms within a specified interval.

### Demand/integral power consumption function

Calculate demand and integral power consumption from TIME PLOT data for effective power.

### Binary CSV format conversion function

Convert binary data into CSV format for event waveforms within the specified range in the TIME PLOT screen or event waveforms selected in the event waveform screen. Files saved in CSV format can be used with spreadsheet software on your PC.

### Print function

Use this function in each screen to output reports to a printer connected to your PC.

### ITIC curve display function

Make ITIC (CBEMA) curve analyses (limit curve) based on the power quality control standards of the U.S.A.

### EN50160 display functions

(applicable standard is EN50160:1999)

Effectively evaluate and analyze the quality of power according to EU standards.

### Downloading from LAN

Data (BINARY/TEXT/BMP) recorded on a PC card or the internal memory of the 3196 can be downloaded via LAN to a personal computer. (\*This can be done without use of the freeware Down96. Measurement on the 3196 must be halted during download.)

### Report generation function

Choose from 3 types of report generation settings to take care of all the troublesome reporting operations, and either send the data to a printer or save as a Rich Text file. (Automatic: Output basic items. Individual setting: Select any item for output. Detailed setting: Specify a time-series graph in details for output.)

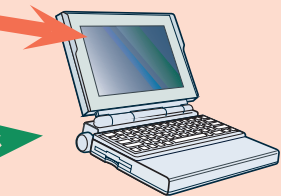
### Positive phase, negative phase, and zero phase function

Recalculate event data captured by 3P4W circuits, and display each component of the voltage/current of the positive phase, negative phase, and zero phase.

Measurement data is saved in binary format



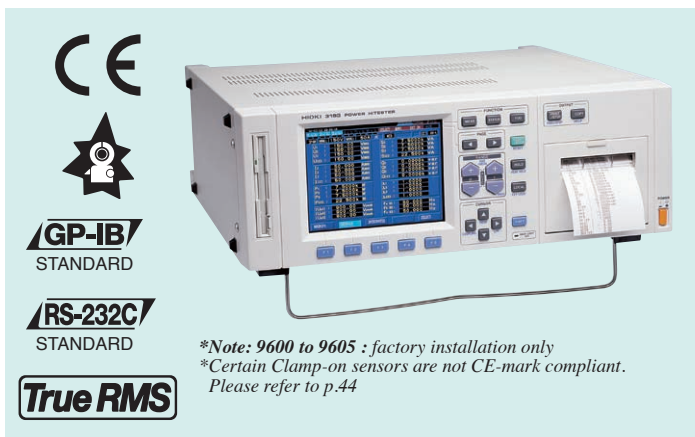
Data processing is quick and easy using the 9624-50 PQA-HiVIEW software



- Use it to create reports
- Use data converted to CSV format

# POWER HiTESTER | 3193

## Wide spectrum power meter for comprehensive device assessment



### SPECIFICATIONS

<b>Measurement lines</b>	Single-phase/two-wires to three-phase/four-wires (Through the use of various input units)
<b>Measurement items</b>	(When using 9600, 9601, 9602, optional) Voltage, current, voltage/current peak, effective/reactive/apparent power, power factor, phase, frequency, current/power integration, load rate, efficiency (When using 9603, optional) Voltage, torque, RPM, frequency, motor output (When using 9605, optional) Harmonic, waveform, voltage fluctuation / flicker measurement function
<b>Measurement ranges</b>	Voltage: 6.0000V to 1.0000kV (depends on use of the input unit) Current: 200.00mA to 500.00A (depends on use of the input unit) Power: Depends on combination of voltage and current ranges
<b>Integration range</b>	0 to ±9999999 TAh/ TWh, (integration time up to 10000 hours)
<b>Basic accuracy used with 9600 to 9602 Input unit</b>	±0.1% rdg. ±0.1% f.s. (voltage, current, power, at 45 to 66Hz) Note: When used together with the 9270 to 9272, and 9277 to 9279, resulting accuracy is the sum of that indicated above and the accuracy of these clamp sensors.
<b>Frequency band</b>	using with 9600: DC, 0.5Hz to 1MHz using with 9601: 5Hz to 100kHz using with 9602: DC, 0.5 Hz to 200 kHz (depends on the clamp accuracy)
<b>Signal output</b>	Analog level: Voltage, current, active power, 5V DC f.s. Waveform monitor: Voltage, current, IV rms f.s. D/A output: Outputs 8 arbitrarily selected items, DC±5V f.s.
<b>Other functions</b>	6.4 inch TFT color LCD, RMS/MEAN rectification, FDD, GP-IB/RS-232C interface, scaling, averaging
<b>Power supply</b>	100/120/200/230 V AC (switched automatically), 50/60 Hz
<b>Dimensions and Mass</b>	430W × 150H × 370D mm, 15 kg (with all options)
<b>Accessories</b>	Power cord (1), Connector for EXT I/O (1)

### OPTIONS

(The 3193 cannot be used alone. Measurement requires one or more input units.)

AC/DC DIRECT INPUT UNIT	9600	HARMONIC / FLICKER MEASUREMENTS UNIT	9605
AC DIRECT INPUT UNIT	9601	CLAMP ON SENSOR	9277, 9278, *9279, 9709
AC/DC CLAMP INPUT UNIT	*9602	CLAMP ON ADAPTER	9290-10
EXTERNAL SIGNAL INPUT UNIT	9603	AC/DC CURRENT SENSOR	CT6862/CT6863
PRINTER UNIT	9604		

\*Note: Non-CE mark product

## POWER ANALYZER | 3390

**Measure the Secondary Side of Inverters with the Latest Technology**  
**Maximum accuracy of ±0.16% achieved with current sensors!**

- Directly measure the primary and secondary sides of inverters
- Advanced motor analysis functions
- DC, 0.5 Hz to 5 kHz (frequency response: DC, 0.5 Hz to 150 kHz) measurement range
- Sample and save waveforms at high speeds of 500 kS/s
- Powerful yet portable to cover a wide range of applications from bench to on-vehicle measurements
- Measure inverter noise



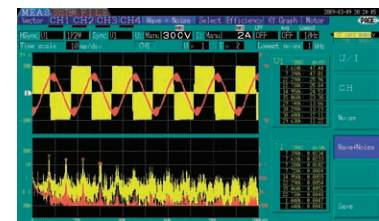
LAN  
STANDARD

USB 2.0  
STANDARD

True RMS

Power Measuring Instruments

SPECIFICATIONS	
Measurement lines	Single-phase two-wire (1P2W), single-phase three-wire (1P3W), three-phase three-wire (3P3W2M, 3P3W3M), three-phase four-wire (3P4W)
Measurement parameters	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)
Measurement ranges	<b>Voltage:</b> 15.000V / 30.000V / 60.000V / 150.00V / 300.00V / 600.00V / 1500.0V <b>Current:</b> ( ) indicates the sensor rating used *400.00mA / *800.00mA / 2.0000A / 4.0000A / 8.0000A / 20.000A (20 A rating) 4.0000A / 8.0000A / 20.000A / 40.000A / 80.000A / 200.00A (200 A rating) 1.0000A / 2.0000A / 5.0000A / 10.000A / 20.000A / 50.000A (50 A rating) 10.000A / 20.000A / 50.000A / 100.00A / 200.00A / 500.00A (500 A rating) * Only Universal Clamp-On CT 9277 is applicable <b>Power:</b> Depends on the combination of voltage and current (6.0000 W to 2.2500 MW) <b>Synchronization Frequency:</b> 0.5 Hz to 5 kHz
Basic accuracy	<b>Voltage:</b> ±0.05%rdg ±0.05%f.s. <b>Current:</b> ±0.05%rdg ±0.05%f.s. (+ accuracy of the current sensor) <b>Power:</b> ±0.05%rdg ±0.05%f.s. (+ accuracy of the current sensor)
Synchronization frequency range	0.5 Hz to 5 kHz
Frequency band	DC, 0.5 Hz to 150 kHz
Harmonic analysis	Input: 4ch, Synchronization frequency range: 0.5 Hz to 5 kHz, Analysis order: 100th order max.
Noise analysis	Input: 1ch, Maximum analysis frequency: 100 kHz
Data update rate	50 ms
Interval times	OFF/50 ms/100 ms/200 ms/500 ms/1 s/5 s/10 s/15 s/30 s/1 min/5 min/10 min/15 min/30 min/60 min
Interfaces	LAN, USB, RS-232C, USB memory, CF card, Synchronization control (standard)
Power supply	100 to 240 V AC (expected transient overvoltage of 2500 V), 50/60 Hz, 140VA
Dimensions and mass	340 W × 170 H × 157 D mm (excluding protrusions), 4.8 kg (including the 9793)
Accessories	Operation Manual (1), Measurement Guide (1), power cord (1), ground adapter (1, only in Japan), USB cable (1), connector for D-sub (1, only for the 9792 and 9793), color label (2)



### OPTIONS

CLAMP ON SENSOR (AC)	9272-10
UNIVERSAL CLAMP ON CT (AC/DC)	9277
UNIVERSAL CLAMP ON CT (AC/DC)	9278
UNIVERSAL CLAMP ON CT (AC/DC)	*9279
AC/DC CURRENT SENSOR (AC/DC)	9709
AC/DC CURRENT SENSOR (AC/DC)	CT6862
AC/DC CURRENT SENSOR (AC/DC)	CT6863
Voltage Cord (Red x 1 and black x 1, 600 V specifications)	9438-50
Voltage Cord (Red x 1 and black x 1, 1000 V specifications)	9438-70
Grabber Clip (Red x 1 and black x 1)	9243
PC Card 256M (Capacity: 256 MB)	9727
PC Card 512M (Capacity: 512 MB)	9728
PC Card 1G (Capacity: 1 GB)	9729
PC Card 2G (Capacity: 2 GB)	9830
LAN CABLE	9642
CONNECTION CORD (For input of the 9791 and 9793 with a length of 1.5 m)	9217
CONNECTION CABLE (For synchronized measurement with a length of 1.5 m)	9683
CARRYING CASE (Hard case dedicated to the 3390)	9794
Rack mount brackets	
PRINTER	9670
AC ADAPTER (for the 9670)	9671
RS-232C CABLE (to connect the 9670, length: 1.8 m)	9638
RECORDING PAPER (80 mm×25 mm, 4 rolls)	9237

Factory options (please specify at the time of order)

MOTOR TESTING OPTION	9791
D/A OUTPUT OPTION	9792
MOTOR TESTING & D/A OUTPUT OPTION	9793



**MOTOR TESTING OPTION 9791**  
 3-channel inputs for sensor output signals  
 CH A: Analog DC voltage / Frequency input  
 CH B: Analog DC voltage / Pulse input  
 CH Z: Pulse input  
 BNC connectors

**D/A OUTPUT OPTION 9792**  
 16-channel output  
 Analog output / Waveform output  
 (Waveform output is only 8 channels.)  
 D-sub 25-pin connector

**MOTOR TESTING & D/A OUTPUT OPTION 9793**  
 Combination of the 9791 and the 9792

\*Note: Non-CE mark product

# POWER HiTESTER 3332

Measure very low effective power, for stand-by mode of home use equipment

- Ultra high-sensitive measurement, for use to measure the effective power of equipment in stand-by mode: Current 1.0000 mA full-scale, 0.1  $\mu$ A resolution
- Wide measurement range, up to 50.000 A direct input



SPECIFICATIONS	
Measurement lines	Single-phase/two-wire
Measurement items	Voltage, Current, Current peak, Active power, Apparent power, Reactive power, Power factor, Phase angle, Frequency, Power integration, Current integration
Measurement ranges	Voltage: 15.000V to 600.00V, auto or 6 ranges Current: 1.0000mA to 50.000A, auto or 15 ranges Power: 15.000mW to 30.000kW, auto or 90 ranges Frequency: 1Hz to 100kHz, auto or 2 ranges
Integration range	0 to $\pm$ 999999MAh/ MWh, (integration time up to 10000 hours)
Wave peak measurement	Current (displays maximum absolute value), Effective input range: multiply six current range, or Max.90 A peak
Basic accuracy	$\pm$ 0.1% rdg. $\pm$ 0.1% f.s. (active power, at 45 to 66Hz)
Frequency band	1Hz to 100kHz (1Hz to 100kHz at 10A or less, 10Hz to 10kHz at 20A to 30A, 50/60Hz at 30A to 50A)
Signal output	Analog level: Voltage, current, active power, 5V DC f.s. Waveform monitor: Voltage, current, 1V rms f.s.
Other function	Comparator function for 2 items (Decision for Hi/In/Lo and results output), Backup, Scaling, Average function
Sampling rate	5 times /second
Power consumption	100 to 240 V AC, 50/60 Hz
Dimensions and mass	210W $\times$ 100H $\times$ 261D mm, 2.7kg
Accessories	Power cord (1), Connector for EXT I/O (1)

OPTIONS	
GP-IB CONNECTOR CABLE (2 m)	9151-02
* PRINTER	9442
* AC ADAPTER (for the 9442)	9443-02 (for 200~240V powr lines)
CONNECTION CABLE (for the 9442)	9444
RECORDING PAPER	1196 (25 m, 10 rolls /1 set, for the 9442)
RS-232C CABLE	9637 (9-pin to 9-pin, crossed cable/1.8m)
RS-232C CABLE	9638 (9-pin to 25-pin, crossed cable/1.8m)

\*Note: Non-CE mark product

# POWER HiTESTER 3333 3333-01

Your Solution to Meeting Energy Saving Requirements

- Guaranteed for 3 years
- High Accuracy ( $\pm$ 0.1% rdg.  $\pm$ 0.1% f.s.)
- Maximum Cost Performance



SPECIFICATIONS	
Measurement lines	Single-phase/two-wire
Measurement items	Voltage, Current, Active power, Apparent power, Power factor
Measurement ranges	Voltage: 200.0 V (300.0 Vmax), Current: 50.00 mA to 20.000 A (30.00 Amax), 6 ranges Power: 10.000 W to 4.000 kW, 6 ranges
Basic accuracy	$\pm$ 0.1% rdg. $\pm$ 0.1% f.s. (active power, at 45 to 66 Hz)
Frequency band	45 Hz to 5 kHz
Other functions	Scaling function (PT/CT), Displays a simple average function, RS-232C interface (Model 3333-01 also includes GP-IB interface)
Sampling rate	5 times/second
Power supply	100 to 240 V AC, 50/60 Hz, 20 VA
Dimensions, mass	160W $\times$ 100H $\times$ 227D mm, 1.9 kg
Accessories	Power cord (1)

OPTIONS			
* PRINTER	9442	RS-232C CABLE (9-pin to 9-pin, crossed cable/1.8m)	9637
CONNECTION CABLE (for 9442)	9444	RS-232C CABLE (9-pin to 25-pin, crossed cable/1.8m)	9638
RECORDING PAPER	1196	GP-IB CONNECTOR CABLE (2m)	9151-02
* AC ADAPTER (for 9442, EU)	9443-02		

(for 200~240V powr lines) \*Note: Non-CE mark product

# POWER HiTESTER 3334 3334-01

Solves All of your Energy Consumption Testing Needs

- Compliant with the SPECpower® Benchmark  
\*SPECpower is a registered trademark of Standard Performance Evaluation Corporation
- DC measurement mode, AC, and AC+DC measurement possible
- Integration function for current and power
- High basic accuracy  $\pm$ 0.2%
- Extended Period of Guaranteed Accuracy of 3 Years



SPECIFICATIONS	
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 15.000/30.00/150.00/300.0V [Current] AC/DC 100.00/300.0 mA, 1.0000/3.000/10.000/30.00A [Power] 1.5000 W ~ 9.000 kW (combination of voltage and current ranges)
Integration measurement	[Current] No. of displayed digits: 6 digits (from 0.00000mAh, Polarity-independent integration and Sum value)
Integration time up to 10,000 hours	[Active power] No. of displayed digits: 6 digits (from 0.00000mWh, Polarity-independent integration and Sum value)
Basic accuracy	$\pm$ 0.1% rdg. $\pm$ 0.2% f.s. (DC), $\pm$ 0.2% rdg. (45Hz to 66Hz) Note: Provided accuracy of 1 Year, typical value
Display refresh rate	5 times per second
Frequency band	DC, 45Hz to 5kHz
Waveform output	Parameter output representation: Instantaneous voltage, current and active power (3 simultaneous channels), Output voltage: 1V f.s.
Analog output (D/A output)	Simultaneously output voltage, current, active power and one additional parameter from the following: apparent power, power factor, current integration, active power integration over 4 channels. Output voltage: $\pm$ 2V 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
Power consumption	100V to 240V AC, 50/60Hz, 20VA
Dimensions and mass	210W $\times$ 100H $\times$ 245D mm, 2.5kg
Accessories	Power cord (1)

OPTIONS	
RS-232C CABLE (9-pin to 9-pin, crossed cable/1.8m)	9637
RS-232C CABLE (9-pin to 25-pin, crossed cable/1.8m)	9638
GP-IB CONNECTOR CABLE (2m)	9151-02

# Electronic Measuring Instruments








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### Digital ultra-insulation / micro ammeter

 <p><b>DSM-8104 (1ch) DSM-8542 (4ch)</b> PSU-8541(power source unit) Measurement voltage : DC 0.1 - 1,000 V Measurement range : 1 × 10<sup>7</sup> - 3 × 10<sup>16</sup> Ω ..... p.34</p>
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### Safety Standards Measuring Instruments

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# RESISTANCE HiTESTER

# RM3542 | RM3542-01

## High-speed and High-accuracy milli-ohm Testing

- Finest resolution of 0.1 micro-ohm
- Store 30000 data into internal memory
- Integrate with automated taping machines



### SPECIFICATIONS

<b>Measurement</b>	Four-terminal resistance measurement: 0.0000mΩ (100 mΩ range) to 120.0000 MΩ Low power four-terminal resistance measurement: 0.000mΩ (1000mΩ range) to 1200.000 Ω
<b>Accuracy</b>	±(0.006 % rdg+0.001 %) (1000Ω range, slow)
<b>Functions</b>	Self-calibration, probe short-circuit detection, contact improver, current mode setting, OVC (offset voltage compensation), settings monitor, retry, statistical calculations, key-lock, comparator (relative tolerance or absolute range modes), EOM pulse width setting, data export, export data format, auto-memory
<b>Interface</b>	EXT I/O, RS-232C, Printer, Settings Monitor/Functional terminals (SET MONITOR), GP-IB (Model RM3542-01)
<b>Power supply</b>	100 to 240 V AC ±10%, 50/60 Hz
<b>Dimensions, mass</b>	Approx. 260W × 88H × 300D mm (without projections), Approx. 2.9 kg
<b>Accessories</b>	Power Cord, EXT I/O Male Connector

### OPTIONS

FOUR-TERMINAL PROBE	9140	*AC ADAPTER (for the 9670)	9671
TEST FIXTURE (direct connection type)	9262	BATTERY PACK (for the 9670)	9672
SMD TEST FIXTURE (direct connection type)	9263	*BATTERY CHARGER (for the 9672)	9673
GP-IB CONNECTION CABLE (2 m)	9151-02	RECORDING PAPER (80mm×25 m, 4 rolls)	9237
* PRINTER	9670	RS-232C CABLE (9pin-9pin/cross/1.8m)	9637
		RS-232C CABLE (9pin-25pin/cross/1.8m)	9638

\*Note: Non-CE mark product

# RESISTANCE HiTESTER

# 3541

## Measure from very low (μΩ) to very high (MΩ) resistances with a single instrument

- Wide Measurement Range 0.1μΩ (20 mΩ range) to 110.000 MΩ
- High Speed & High Precision Measurements  
As fast as 0.6 ms with 70 ppm precision (in the 2 kΩ to 110 kΩ range)
- Two Types of Temperature Correction  
Correction by Pt sensor or Infrared Thermometer
- Equipped with EXT I/O, GP-IB and RS-232C interfaces  
Easily integrates into automated production lines



### SPECIFICATIONS

<b>Measurement</b>	Four-terminal resistance measurement: 0.1μΩ (20 mΩ range) to 110.000 MΩ Low power four-terminal resistance measurement: 10μΩ (2Ω range) to 2.00000 kΩ Temperature measurement (Pt) -10.0 to 99.9 °C Temperature measurement (analog input) 0 to 2V
<b>Accuracy</b>	70ppm of rdg+15ppm of f.s. (2kΩ, 20kΩ range slowΩ)
<b>Functions</b>	Temperature correction, temperature conversion, self calibration, measurement fault detection, overflow detection, offset voltage compensation, average, statistical calculation, key lock, save/load, comparator, BIN measurement
<b>Interface</b>	GP-IB, RS-232C, EXT-I/O
<b>Power supply</b>	100 to 240 VAC 50/60 Hz
<b>Dimensions, mass</b>	Approx. 215W × 80H × 295D mm (excluding projections), Approx. 2.6 kg
<b>Accessories</b>	CLIP TYPE LEAD 9287-10, TEMPERATURE PROBE 9451, Power Cord, EXT I/O Male Connector

### OPTIONS

CLIP TYPE LEAD	9452	LARGE CLIP TYPE LEAD	9467
FOUR TERMINAL LEAD	9453	CONNECTION CABLE (for multipolar connectors)	9300
ZERO ADJUSTMENT BOARD	9454	RS-232C CABLE (9pin-9pin/cross/1.8m)	9637
PIN TYPE LEAD (for ultra precision)	9455	RS-232C CABLE (9pin-25pin/cross/1.8m)	9638
PIN TYPE LEAD	9461	GP-IB CONNECTOR CABLE (2m)	9151-02
PIN TYPE LEAD	9465	GP-IB CONNECTOR CABLE (4m)	9151-04
PIN TYPE LEAD	9465-10	*PRINTER	9670
PIN TYPE LEAD	9770	*AC ADAPTER (for 9670)	9671
PIN TYPE LEAD	9771	RECORDING PAPER (80mm × 25m, 4 rolls)	9237

\*Note: Non-CE mark product

# mΩ HiTESTER | 3540 | 3540-01 | 3540-02 | 3540-03

## Offers selectable manual measurement or system application

- 4-terminal method mΩ meter (Fast 100-ms Response)
- Comparator function memorizes up to seven tables
- Temperature compensation function measures temperature and calculates value relative to copper at 20°C



### SPECIFICATIONS

<b>Measurement ranges and Accuracy</b>	30 mΩ to 30 kΩ, 7 ranges, 3500 full digits ±0.1 % rdg. ±6 dgt. (30 mΩ, 3Ω range), ±0.1 % rdg. ±4 dgt. (300 mΩ, 30Ω to 30 kΩ range)
<b>Measurement current</b>	100 mA (30 mΩ, 300 mΩ range) to 10μA (3kΩ, 30kΩ range)
<b>Max. applied measurement voltage</b>	3.5 mV DC (30 mΩ range) to 350 mV DC (30 kΩ range)
<b>Sampling speed</b>	16 times /second (fast mode), 4 times /second (slow mode)
<b>Response time</b>	100 ms (fast mode), 300 ms (slow mode)
<b>Display</b>	3500 full digits, Liquid Crystal Display
<b>Measurement method</b>	Four-terminal measurement
<b>Open-circuit terminal voltage</b>	4.0 V Max. (30 mW to 30 kW all ranges)
<b>Digital input/output (-01, -02 and -03 Ver. only)</b>	TTL output BCD, or other inputs /outputs for external control
<b>Comparator functions</b>	Setting: Upper and lower limit, or reference value and % for resistance. Up to 7 tables Output: 3 levels (Hi, In, Lo), Open-collector, LED display, beep sound
<b>Interface</b>	External printer (-02 only), RS-232C (-03 only)
<b>Power supply</b>	LR6 (AA) or R6P (AA) × 6, or 9445-02, -03 AC ADAPTER (9V, 1A)
<b>Dimensions, mass</b>	215W × 61H × 213D mm, 900 g, 1 kg (-01, -02, -03)
<b>Accessories</b>	CLIP-TYPE LEAD 9287-10(1), TEMPERATURE PROBE 9451 (1), Fuse (1), Ferrite Clamp (1), External Connector Socket (-01 only)

### OPTIONS

DIGITAL PRINTER	9203	CLIP TYPE LEAD	9452
RECORDING PAPER (10 m, 10 rolls /1set)	9233	FOUR-TERMINAL LEAD	9453
CONNECTION CORD (for 9203-3540-02, 2m)	9425	PIN TYPE LEAD	*9455
AC ADAPTER (100 to 240 VAC, 9 V/1A output, for USA)	9445-02	PIN TYPE LEAD	9461
AC ADAPTER (100 to 240 VAC, 9 V/1A output, for EU)	9445-03	PIN TYPE LEAD	9465
CLIP TYPE LEAD WITH TEMPERATURE SENSOR	9460	PIN TYPE LEAD	9465-10
LARGE CLIP-TYPE LEAD	9467	PIN TYPE LEAD	9770
RS-232C CABLE (9pin-9pin)	9637	PIN TYPE LEAD	9771
RS-232C CABLE (9pin-25pin)	9638		

\*Note: The 9455 probe is a precision instrument. Exercise appropriate care when handling it.

The 3540 is the low-price version without external control interfaces, for manual measurement. The 3540-01 adds BCD output and external control, the 3540-02 includes a printer interface and the 3540-03 includes an RS-232C interface.

## AC mΩ HiTESTER | 3560

**For measurement requirements from contact resistance to internal resistance and voltage of batteries**

- Contact Resistance measurement for switches
- Low-power resistance measurement
- Battery measurement
- High-resolution ( $1\mu\Omega$  in the 30mΩ. range)



### SPECIFICATIONS

<b>Measurement ranges</b>	30 mΩ to 3 kΩ, 6 ranges, $\pm 0.5\%$ rdg. $\pm 8$ dgt. (all ranges)
<b>Accuracy</b>	In case of MEDIUM: Add 3 dgt. to the above dgt. error. FAST: $\pm 0.5\%$ rdg. $\pm 8$ dgt. (30 mΩ), $\pm 0.5\%$ rdg. $\pm 6$ dgt. (other ranges). However, in case of FAST, the display counter decreases 4 digits in all ranges.
<b>Measurement current</b>	7.4 mA (30 mΩ range) to 1.5mA (3 kΩ range)
<b>Max. applied measurement voltage</b>	60 V DC (AC input is not possible)
<b>Sampling speed</b>	50 times /s (FAST) to 1.56 times /s (SLOW) :at 50 Hz mode 60 times /s (FAST) to 1.88 times /s (SLOW) :at 60 Hz mode
<b>Display</b>	31000 full digits (resistance), 50000 full digits (voltage), Fluorescent tube.
<b>Measurement method</b>	1kHz AC four-terminal measurement
<b>Open-circuit terminal voltage</b>	20mV peak max. (30 mΩ to 3 kΩ all ranges)
<b>Comparator functions</b>	<b>Setting:</b> Upper and lower limit. Up to 30 tables <b>Output:</b> 3 levels (Hi, In, Lo) or (Pass, Fail), Open-collector, Display, Beep sound
<b>Interface</b>	RS-232C (standard), GP-IB or External printer (option)
<b>Power supply</b>	100 to 240 V AC, 50/60 Hz
<b>Dimensions, mass</b>	215W × 80H × 320D mm, 2.1 kg
<b>Accessories</b>	CLIP-TYPE LEAD 9287-10 (1), Power cord (1)

### OPTIONS

DIGITAL PRINTER	9203
RECORDING PAPER (10 m, 10 rolls /1set)	9233
CONNECTION CORD (for 9203-3560, 2m)	9425
CLIP-TYPE LEAD	9452
FOUR-TERMINAL LEAD	9453
ZERO ADJUSTMENT BOARD (when 9461 or 9465 is used)	9454
PIN TYPE LEAD	9455*1
PIN TYPE LEAD	9461
PIN TYPE LEAD	9465
PIN TYPE LEAD	9465-10
PIN TYPE LEAD	9770
PIN TYPE LEAD	9771
LARGE CLIP-TYPE LEAD	9467
GP-IB INTERFACE	9588*2
PRINTER INTERFACE	9589
GP-IB CONNECTION CABLE (2 m /4 m)	9151-02/04

\*1>Note: The 9455 probe is a precision instrument. Exercise appropriate care when handling it.

\*2>Note: Non-CE mark product

## BATTERY HiTESTER | 3561 | 3561-01

**Simultaneous high-speed testing of the internal resistance and voltage of small secondary batteries**

- The perfect battery tester for the production line
- High speed and reliable battery inspection
- High precision accuracy
- Choice of PC interfaces for full remote operation



### SPECIFICATIONS

<b>Measurement ranges and Accuracy</b>	300 mΩ to 3Ω, 2 ranges, $\pm 0.5\%$ rdg. $\pm 5$ dgt. 20 V, $\pm 0.01\%$ rdg. $\pm 3$ dgt. (Input impedance 1MΩ)
<b>Measurement current</b>	10 mA (300 mΩ range) to 1 mA (3Ω range)
<b>Max. applied measurement voltage</b>	$\pm 22$ V DC rated input voltage $\pm 70$ V DC maximum rated voltage above ground
<b>Sampling speed</b>	Four steps 7 ms(Extra-FAST), 23 ms(FAST), 83/69 ms(Medium), 258/251 ms(Slow)
<b>Display</b>	31000 full digits (resistance), 199999 full digits (voltage), Fluorescent tube
<b>Measurement method</b>	1kHz AC four-terminal measurement
<b>Comparator functions</b>	<b>Setting:</b> Upper and lower limit <b>Output:</b> 3 levels (Hi, In, Lo) or (Pass, Fail), Open-collector, Display, Dual audible indicator
<b>Panel save/load</b>	Up to 126 configuration settings
<b>Other functions</b>	Over-range display, measurement error detection Self-calibration, dual comparators, key-lock
<b>Interface</b>	External I/O, RS-232C, Printer (RS-232C), GP-IB(Model 3561-01)
<b>Power supply</b>	100 to 240 V AC, 50/60 Hz
<b>Dimensions, mass</b>	215W × 80H × 295D mm, 2.4 kg
<b>Accessories</b>	Power cord (1)

### OPTIONS

CLIP-TYPE LEAD	9287-10
CLIP-TYPE LEAD	9452
FOUR TERMINAL LEAD	9453
PIN TYPE LEAD (for ultra precision)	9455
PIN TYPE LEAD	9465-10
LARGE CLIP-TYPE LEAD	9467
PIN TYPE LEAD	9770
PIN TYPE LEAD	9771
RS-232C CABLE (9pin-9pin/cross/1.8m)	9637
RS-232C CABLE (9pin-25pin/cross/1.8m)	9638
GP-IB CONNECTOR CABLE (2m)	9151-02
GP-IB CONNECTOR CABLE (4m)	9151-04
* PRINTER	9670
* AC ADAPTER (for 9670)	9671
* BATTERY PACK (for 9670)	9672
* BATTERY CHARGER (for 9672, 100V only)	9673
RECORDING PAPER (80 mm × 25 mm, 4 rolls)	9237

\*Note: Non-CE mark product

# LCR HiTESTER 3535

High-speed LCR meter with up to 120MHz sampling

- Wide range from 100kHz to 120MHz
- High speed LCR testing (6ms/sample)
- Removable head amplifier
- "Load compensation function" for comparing standard component and providing compensation



SPECIFICATIONS			
Measurement parameters	Zl,  Yl, Q, Rp, Rs(ESR), G, X, B, q, Ls, Lp, Cs, Cp, D(tand)		
Measurement Range:	1kΩ range	10kΩ range	100kΩ range
Reference Value	Z: R 100Ω to 2kΩ	1kΩ to 20kΩ	10kΩ to 300kΩ
	C 0.66pF to 15.9μF	0.066pF to 1.59nF	4.4fF to 159pF
	L 0.133nH to 3.18mH	1.33μH to 31.8mH	13.3μH to 477mH
	θ	-180.00° to 180.00°	
Measurement Frequency	Range 100kHz to 120MHz		
	Resolution setting 4digits (when using front panel to make setting)		
	100.0kHz to 1.000MHz 100Hz steps		
	1.000MHz to 10.000MHz 1kHz steps		
	10.00MHz to 100.0MHz 10kHz steps		
	100.0MHz to 120.0MHz 100kHz steps		
	When using GP-IB or RS-232C interfaces, resolution is 1Hz.		
	Accuracy ±0.005% max. against set value		
Measurement Levels	Open Terminal Voltage (V) and Constant Voltage (CV) Modes 5mV to 500mV, max. 10mA (from 10.01MHz)		
	Resolution 1mV steps		
	Accuracy ±(5%+5mV)×(2+log f) (f in terms of MHz)		
	Constant Current (CC) Mode 200μA to 20mA, max. 1V (up tp 10.00MHz)		
	Resolution 10μA steps		
	Accuracy ±(10%+50μA)×(2+log f) (f in terms of MHz)		
Basic accuracy	Zl : ±0.5% rdg. ; q : ±0.3°		
Output impedance	50Ω ±10Ω (at 100kHz)		
Power supply	100V to 240V AC, 50/60Hz Approx. 50VA		
Dimensions, mass	Approx. 360W × 130H × 360D mm ; 8.3kg		

OPTIONS			
(Model 3535 cannot be used alone. Measurement requires optional head amp unit and test fixture or Probe.)			
HEAD AMP UNIT	9700-10	GP-IB CONNECTION CABLE (2m)	9151-02
* SMD TEST FIXTURE	9677	* PRINTER	9442
SMD TEST FIXTURE	9699	* AC ADAPTER (for the 9442, for 200~240 V power lines)	9443-02
CONNECTION CABLE	9678	CONNECTION CABLE (for the 3535/9442)	9444
		RECORDING PAPER (25m, 10rolls/1set, for the 9442)	1196
		RS-232C CABLE (9pin-9pin/1.8m)	9637
		RS-232C CABLE (9pin-25pin/1.8m)	9638

\*Note: Non-CE mark product

# LCR HiTESTER 3511-50

Compact & powerful dedicated LCR measurement in 5m second timeframes

- High speed measurement : 5ms (1 kHz) or 13ms (120 Hz)
- High precision accuracy : ±0.08 %
- Built-in comparator



SPECIFICATIONS	
Measurement parameters	Zl, θ, C, L, D, Q, R
Measurement method	Source : open terminal voltage 50mV, 500mV, 1Vrms (AC) sense: voltage, AC
Source frequency	120 Hz or 1 kHz
Measurement range	Zl, R : 10 mΩ to 200.00 MΩ (depending on condition) θ : -90.00 to +90.00° ; C : 0.940 pF to 999.99 mF, L : 1.600 μH to 200.00 kH, D : 0.0001 to 1.9900, Q : 0.85 to 999.99
Basic accuracy	Zl : ±0.08% rdg. ; q : ±0.05°
Measurement time	Fast : 5 msec. to Slow : 300 msec. (at 1 kHz) Fast : 13 msec. to Slow : 400 msec. (at 120 Hz)
Display	99999 full digits, LED
Comparator functions	Setting : Upper and lower limit, absolute value, Output : 3 levels (Hi, In, Lo), Open-collector, Isolated
External printer	9442 (use with the 9443-02 or -03/9444)
Power supply	100 to 240 V AC, 50/60Hz
Dimensions and mass	210W × 100H × 168D mm, 2.5 kg
Supplied accessories	Power cord(1), Fuse(1)

OPTIONS	
(The 3511-50 cannot be used alone. Measurement requires optional test fixture or probe.)	
FOUR-TERMINAL PROBE (DC to 100 kHz)	9140
PINCHER PROBE (DC to 5 MHz)	9143
TEST FIXTURE (cable connection type, DC to 5 MHz)	9261
TEST FIXTURE (direct connection type, DC to 5 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 5 MHz)	9263
DC BIAS VOLTAGE UNIT (± 40 V DC max.)	9268
DC BIAS CURRENT UNIT (± 2 A DC max.)	9269
CONNECTION CORD (for 9268/9269; BNC to BNC, 1.5 m)	9165
CONNECTION CORD (for 9268/9269; BNC to clip, 1.5 m)	9166
GP-IB CONNECTION CABLE (2 m)	9151-02
GP-IB INTERFACE	9518-01
* PRINTER	9442
* AC ADAPTER (for the 9442, for 200~240 V power lines)	9443-02
CONNECTION CABLE (for the 3511-50/9442)	9444
RECORDING PAPER (25 m, 10 rolls/1 set, for the 9442)	1196

\*Note: Non-CE mark product

# C HiTESTER 3504-40, -50, -60 3505 3506



A capacitance measurement instrument for High-speed MLCC Inspection with Constant Voltage

SPECIFICATIONS	
Measurement items	Cs, Cp, D (loss coefficient), Q (3505, 3506)
Measurement frequency	3504-40, -50, -60: 120Hz, 1 kHz 3505: 1 kHz, 100 kHz, 1 MHz 3506: 1 kHz, 1 MHz Accuracy: ±0.01% or less Signal level: 1V or 500 mV, 100 mV (3504-60 only)
Measurement range	C : 0.940 pF to 20.0000 mF (5-digit display), Accuracy : ± 0.09 % (3504-40, -50, -60) D : 0.00001 to 1.99000, Accuracy : ± 0.0016
Measurement time	Nominal 2 ms (1kHz, FAST) Measurement speed: FAST, NORMAL, SLOW
Other function	Comparator, Audible buzzer, Printer (option) Bin (except the 3504.40) Contact check (3504.60 only), Phase-synchronous function
Interface	RS-232C and EXT I/O (standard) GP-IB (except the 3504.40)
Power supply	AC 100 V, 120 V, 220 V, or 240 V ±10% (selectable), 50/60 Hz, 100 VA max.
Dimensions and mass	Approx. 260 W×100 H×220 D mm, 3.8 kg (3504-40, -50, -60) Approx. 260 W×100 H×298 D mm, 4.8 kg (3505, 3506)
Supplied accessories	Power cord (1), spare fuse (1)



## LCR HiTESTER | 3522-50

### Better functionality and performance at a low cost

- High speed measurement of 5 ms LCR meter
- Higher frequency range (DC or 1 mHz to 100 kHz)
- Fourteen parameters measured (High resolution and high accuracy)
- DC resistance measurement



**GP-IB**  
OPTION

**RS-232C**  
OPTION

## LCR HiTESTER | 3532-50

### Impedance meter with a wide test frequency range

- Higher frequency range (42 Hz to 5 MHz)
- High speed measurement of 5 ms LCR meter
- Interactive touch panel operation
- Wide setting range for measurement voltage and current



**GP-IB**  
OPTION

**RS-232C**  
OPTION

#### SPECIFICATIONS

Measurement parameters	Z ,  Y , $\theta$ , Rp(DCR), Rs(ESR, DCR), G, X, B, Cp, Cs, Lp, Ls, D(tand), and Q
Measurement method	Source: constant current 10 $\mu$ A to 100 mA(AC/DC), or constant voltage 10 mV to 5 V (AC/DC) open terminal voltage
Source frequency	DC, or 1mHz to 100kHz
Measurement ranges	Z ,  R , X: 10.00 m $\Omega$ to 200.00 M $\Omega$ (depending on condition) $\theta$ : -180.00 to +180.00°, C: 0.3200 pF to 1.0000 F, L: 16.000 nH to 750.00 kH, D: 0.00001 to 9.99999, Q: 0.01 to 999.99,  Y , G, B: 5.0000 nS to 99.999 S
Basic accuracy	Z : $\pm 0.08\%$ rdg., $\theta$ : $\pm 0.05^\circ$
Measurement times typical values for displaying Z	Fast: 5 msec. to Slow2: 828 msec.
Display	99999 full digits, LCD with backlight display
Comparator functions	Setting: Upper and lower limit, percentage, or absolute value, Output: 3 levels (Hi, In, Lo), Open-collector, Isolated
External printer	9442 (use with the 9443-02 or -03/9446/9593-01)
Power supply	100 to 240 V AC, 50/60 Hz
Dimensions, mass	313W x 125H x 290D mm, 4.5 kg
Accessories	Power cord(1), Fuse(1)

#### OPTIONS

(The 3522-50 cannot be used alone. Measurement requires optional test fixture or probe.)

FOUR-TERMINAL PROBE (DC to 100 kHz)	9140
PINCHER PROBE (DC to 5 MHz)	9143
TEST FIXTURE (cable connection type, DC to 5 MHz)	9261
TEST FIXTURE (direct connection type, DC to 5 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 5 MHz)	9263
DC BIAS VOLTAGE UNIT ( $\pm 40$ V DC max.)	9268
DC BIAS VOLTAGE UNIT ( $\pm 4$ V DC max. for HDMI )	9268-01
DC BIAS CURRENT UNIT ( $\pm 2$ A DC max.)	9269
CONNECTION CORD (for 9268/9269; BNC to BNC, 1.5 m)	9165
CONNECTION CORD (for 9268/9269; BNC to clip, 1.5 m)	9166
GP-IB CONNECTION CABLE (2 m )	9151-02
GP-IB INTERFACE	9518-01
RS-232C INTERFACE	9593-01
* PRINTER	9442
* AC ADAPTER (for the 9442, for 200-240 V power lines)	9443-02
CONNECTION CABLE (for the 3522-50 /9442)	9446
RECORDING PAPER (25 m, 10 rolls /1 set, for the 9442)	1196

\*Note: Non-CE mark product

#### SPECIFICATIONS

Measurement parameters	Z ,  Y , $\theta$ , Rp, Rs(ESR), G, X, B, Cp, Cs, Lp, Ls, D(tand), and Q
Measurement method	Source: constant current 10 $\mu$ A to 100 mA (42 Hz to 1 MHz), 50 $\mu$ A to 20 mA (1 MHz to 5 MHz), or constant voltage 10 mV to 5 V (42 Hz to 1 MHz), 50 mV to 1 V (1 MHz to 5 MHz) open terminal voltage
Source frequency	42 Hz to 5 MHz
Measurement ranges	Z , R, X: 10.00 m $\Omega$ to 200.00 M $\Omega$ (depending on condition) $\theta$ : -180.00 to +180.00°, C: 0.3200 pF to 370.00 mF, L: 16.000 nH to 750.00 kH, D: 0.00001 to 9.99999, Q: 0.01 to 999.99, Y, G, B: 5.0000 nS to 99.999 S
Basic accuracy	Z : $\pm 0.08\%$ rdg., $\theta$ : $\pm 0.05^\circ$
Measurement times typical values for displaying Z	Fast: 5 msec. to Slow2: 140 msec.
Display	99999 full digits, LCD with backlight display
Comparator functions	Setting: Upper and lower limit, percentage, or absolute value Output: 3 levels (Hi, In, Lo), Opencollector, Isolated
External printer	9442 (use with the 9443-02 or -03/9446/9593-01)
Power supply	100 to 240 V AC, 50/60Hz
Dimensions, mass	352W x 124H x 323D mm, 6.5kg
Accessories	Power cord(1), Fuse(1)

#### OPTIONS

(The 3532-50 cannot be used alone. Measurement requires optional test fixture or probe.)

FOUR-TERMINAL PROBE (DC to 100 kHz)	9140
PINCHER PROBE (DC to 5 MHz)	9143
TEST FIXTURE (cable connection type, DC to 5 MHz)	9261
TEST FIXTURE (direct connection type, DC to 5 MHz)	9262
Note: Measurement ranges are limited when using the 9140, 9143	
SMD TEST FIXTURE (direct connection type, DC to 5 MHz)	9263
DC BIAS VOLTAGE UNIT ( $\pm 40$ V DC max.)	9268
DC BIAS VOLTAGE UNIT ( $\pm 4$ V DC max. for HDMI )	9268-01
DC BIAS CURRENT UNIT ( $\pm 2$ A DC max.)	9269
CONNECTION CORD (for 9268/9269; BNC to BNC, 1.5 m)	9165
CONNECTION CORD (for 9268/9269; BNC to clip, 1.5 m)	9166
GP-IB CONNECTION CABLE (2 m)	9151-02
GP-IB INTERFACE	9518-01
RS-232C INTERFACE	9593-01
* PRINTER	9442
* AC ADAPTER (for the 9442, for 200-240 V power lines)	9443-02
CONNECTION CABLE (for the 3532-50 /9442)	9446
RECORDING PAPER (25 m, 10 rolls /1 set, for the 9442)	1196

\*Note: Non-CE mark product

# DIGITAL HiTESTER | 3238 | 3239

## High-accuracy, multi-functional model (3238) 4-terminal resistance measurement (3239)

- Samples at rates of up to 300 samples/sec. (3.3 ms/ sample)
- Comparator function provides high-speed pass/fail evaluation
- Equipped with external input and output for sequence control
- Useful Save/Load function helps work go faster
- Interface supports full remote operation
- AC/DC current and frequency functions



### SPECIFICATIONS

DC voltage (DC V)	200m/2/20/200/1000V(±0.01% rdg. ±2dgt./2V)
AC voltage (AC V)	2/20/200/750V(±0.1% rdg. ±100dgt./45 to 10kHz) True RMS
DC current (DC A)	200m/2A(±0.1% rdg. ±6dgt./200mA)
AC current (AC A)	200m/2A(±0.3% rdg. ±100dgt./200mA, 45 to 3kHz) True RMS
Frequency	100/1k/10k/100k/300kHz (±0.015% rdg. ±2dgt./10 to 300kHz)
Resistance (Ω)	200/2k/20k/200k/2000k/20M/100MΩ (±0.02% rdg. ±2dgt./2k to 200kΩ)
Resistance (LPΩ)	2k/20k/200k/2000kΩ (±0.02% rdg. ±6dgt./2k to 200kΩ)
Open terminal voltage	6V DC max. (Ω, Diode check) 0.45V DC max. (LPΩ, Continuity check)
Continuity check	A built-in buzzer sounds when the resistance value is less than 50.00Ω.
Sampling rate	FAST approx. 300 samples/s, MEDIUM approx. 8 to 9 samples/s, SLOW approx. 1 sample/s
Display	LED max. 199999 (999999 for frequency)
Ancillary functions	Comparator, Average, Zero Adjust, Trigger and the Save/Load functions
Interface	External input/output, RS-232C, GP-IB (3238-01, 3239-01)
Power supply	AC 100V/120V/220V/240 V, (50/60Hz)
Dimensions and mass	approx. 215W × 80H × 265D mm, 2.6 kg
Accessories	TEST LEAD 9170(1)

### OPTIONS

CLAMP ON PROBE (10/20/50/100/200/500 A AC)	9010-50
CLAMP ON PROBE (10/20/50/100/200/500 A AC)	9018
CLAMP ON PROBE (20/50/100/200/500/1000 A AC)	9132
RS-232C CABLE (9pin-9pin, Reverse type/1.8m)	9637
RS-232C CABLE (9pin-25pin, Reverse type/1.8m)	9638
GP-IB CONNECTION CABLE (2 m /4 m)	9151-02/04
* PRINTER	9442
* AC ADAPTER (for the 9442, for 200~240 V power lines)	9443-02
CONNECTION CABLE (for 9442 printer)	9444
RECORDING PAPER (25 m, 10 rolls/1 set, for the 9442)	1196
FOUR TERMINAL LEAD for 3239 (refer to P.68)	

\*Note: Non-CE mark product

# DIGITAL HiTESTER | 3237

## High-speed DMM (3.3ms/sample) Minimizing tact time with sequence control at a truly affordable price

- Samples at rates of up to 300 samples/sec. (3.3ms/ sample)
- Comparator function provides high-speed pass/fail evaluation
- Equipped with external input and output for sequence control
- Useful Save/Load function helps work go faster
- Interface supports full remote operation

### SPECIFICATIONS

DC voltage (DC V)	200m/2/20/200/1000V (±0.025% rdg. ±2dgt./2V)
AC voltage (AC V)	2/20/200/750V (±0.2% rdg. ±100dgt./45 to 3kHz) True RMS
Resistance (Ω)	200/2k/20k/200k/2000k/20M/100MΩ (±0.05% rdg. ±2dgt./2k to 2MΩ)
Resistance (LPΩ)	2k/20k/200k/2000kΩ (±0.05% rdg. ±6dgt./2k to 200kΩ)
Open terminal voltage	6V DC max. (Ω, Diode check) 0.45V DC max. (LPΩ, Continuity check)
Continuity check	A built-in buzzer sounds when the resistance value is less than 50.00Ω.
Sampling rate	FAST approx. 300 samples/s, MEDIUM approx. 8 to 9 samples/s, SLOW approx. 1 sample/s
Display	LED max. 199999
Ancillary functions	Comparator, Average, Zero Adjust, Trigger and the Save/Load functions
Interface	External input/output, RS-232C, GP-IB (3237-01)
Power supply	AC 100V/120V/220V/240 V, (50/60Hz)
Dimensions and mass	approx. 215W × 80H × 265D mm, 2.6 kg
Accessories	TEST LEAD 9170 (1)

### OPTIONS

CLAMP ON PROBE (10/20/50/100/200/500 A AC)	9010-50
CLAMP ON PROBE (10/20/50/100/200/500 A AC)	9018-50
CLAMP ON PROBE (20/50/100/200/500/1000 A AC)	9132-50
RS-232C CABLE (9pin-9pin, Reverse type/1.8m)	9637
RS-232C CABLE (9pin-25pin, Reverse type/1.8m)	9638
GP-IB CONNECTION CABLE (2 m /4 m)	9151-02/04
* PRINTER	9442
* AC ADAPTER (for the 9442, for 200~240 V power lines)	9443-02
CONNECTION CABLE (for 9442 printer)	9444
RECORDING PAPER (25 m, 10 rolls/1 set, for the 9442)	1196

\*Note: Non-CE mark product



CAT II 300V  
CAT I 500V



3237-01



STANDARD



## DIGITAL ULTRA-INSULATION / MICRO AMMETER 1-CH | DSM-8104

- Measurement voltage : DC 0.1 to 1,000 V  
Measurement range :  $1 \times 10^7$  to  $3 \times 10^{16} \Omega$
- Measures insulation resistance of capacity with high speed & high accuracy
- High resolution current measurements of 0.1 fA

### SPECIFICATIONS

Measurement range	
DC Measurement Capability	
Current Measurement	
DC Current	10 pA / ± (3.0% of rdg+1.2% of range) 100 pA / ± (1.5% of rdg+0.6% of range) 1 nA / ± (0.6% of rdg+0.6% of range)
Measurement Range	10 nA / ± (0.4% of rdg+0.5% of range)
Name (Accuracy)	100 nA / ± (0.4% of rdg+0.5% of range)
Measurement Time:300ms	1 μA / ± (0.4% of rdg+0.5% of range) 10 μA / ± (0.4% of rdg+0.5% of range) 100 μA / ± (0.4% of rdg+0.5% of range)
Resistance	
Measurement Range	$1 \times 10^7 \sim 3 \times 10^{16}$
Measurement Time Setting	
Delay	0-9,999ms
Sampling Time	2-300ms
Voltage Generator	
Setting Voltage Accuracy and Resolution	
Setting Voltage Range	0.1 to 250.0V / ± (0.1% of setting + 150mV)
Accuracy	251 to 1,000V / ± (0.1% of setting + 400mV)
Current Limiter	
Setting Voltage Range	Current Limit Value
0.1 to 250.0V	5/10/50mA
251 to 1,000V	5/10mA
Measurement Check Function	
Voltage Monitor, Contact Check Function.	



**GP-IB** STANDARD    **RS-232C** STANDARD    **LAN** OPTION

\* When the optional LAN interface is installed in the main unit, the RS-232C interface cannot be installed at the same time.

Measurement Function	Comparator Measurement, Deviation/Percentage Measurement, Surface/Volume Resistivity Measurement
Interface, EXT-I/O	GP-IB, RS-232C or LAN (Option), Handler Interface
Power Supply	100V AC (115V, 220V, 240V factory option), ± 10% at 50/60Hz Approx. 55VA
Dimension, mass	Approx. 332W × 89H × 450D mm    Approx. 6.7kg
Accessories	Power cord (1) (Measurement leads must be purchased separately.)

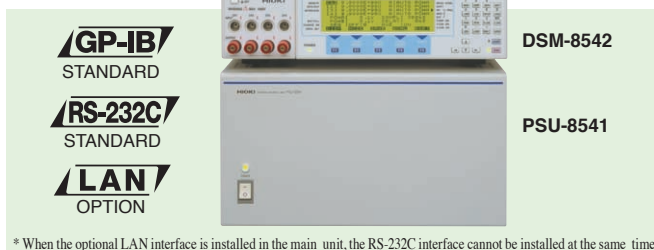
### OPTIONS

Measurement lead	0GE0002	1m, red
	0GE0001	1m, black
Interlock Connection Cable	DSM8104F	1m
Rack Mount Adapter	DSM8104E	
LAN Interface	DSM8104D	
Electrodes : refer to P.72		

## DIGITAL ULTRA-INSULATION / MICRO AMMETER 4-CH | DSM-8542

### POWER SOURCE UNIT | PSU-8541

- 4-channel, high-speed measurement capability when combined with PSU-8541 dedicated power source unit sold separately
- System compatibility made easy by connecting charge terminal handler interface
- Measures insulation resistance of capacity with high speed & high accuracy



\* When the optional LAN interface is installed in the main unit, the RS-232C interface cannot be installed at the same time.

### SPECIFICATIONS DSM-8542

Measurement Specification	4-ch same as DSM-8104 Specifications (with PSU-8541 dedicated power source unit sold separately)
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### SPECIFICATIONS PSU-8541

Configuration	Voltage generator A (HIGH) 1 circuit 250V-150W, 1000V-120W Voltage generator B (LO) 1 circuit 10V-6W Current control Circuits (Measurement System) 4 circuits Current control Circuits (Charge System) 20 circuits
Voltage Generator (HIGH)	0.1V to 250.0V (±0.1% of setting +150 mV) Max.600mA 251V to 1,000V (±0.1% of setting +400 mV) Max.120mA
Voltage Generator (LO)	0.1V to 10.0V (±0.1% of setting +150 mV) Max.600mA
Current limiter	0.1V to 250.0V (5/10/25/50mA) 251V to 1,000V (5mA)
Control	Control by the DSM-8542
Power Supply	100V AC ± 10% at 50/60Hz Max. Approx. 350VA
Dimension, mass	Approx. 332W × 178H × 450D mm    Approx. 28kg
Accessories	Power cord (1), DSM-8542 Connection Cable (2)

### OPTIONS

RACK MOUNT ADAPTER	LMA-PSU
Electrodes : refer to P.72	

## SUPER MEGOHM METER | SM-8200 SERIES

- Meas. voltages : 5 – 1000V DC
- Digital/analog display on LCD (except SM-8216)
- Equipped with timer, remote starter, comparator & interlock function
- Compatible for measurement of several sample types of electrode & other devices



### SPECIFICATIONS

	SM-8213	SM-8215	SM-8220	SM-8216
Measuring voltage & Measuring range	5V	2.5x10 <sup>8</sup> to 1x10 <sup>10</sup> Ω		
	10V	5x10 <sup>8</sup> to 2x10 <sup>10</sup> Ω	5x10 <sup>8</sup> to 2x10 <sup>10</sup> Ω	5x10 <sup>8</sup> to 2x10 <sup>10</sup> Ω
	15V	7.5x10 <sup>8</sup> to 3x10 <sup>10</sup> Ω		
	25V	1.25x10 <sup>9</sup> to 5x10 <sup>10</sup> Ω		1.25x10 <sup>9</sup> to 5x10 <sup>10</sup> Ω
	50V	2.5x10 <sup>9</sup> to 1x10 <sup>11</sup> Ω	2.5x10 <sup>9</sup> to 1x10 <sup>11</sup> Ω	2.5x10 <sup>9</sup> to 1x10 <sup>11</sup> Ω
	100V	5x10 <sup>9</sup> to 2x10 <sup>11</sup> Ω	5x10 <sup>9</sup> to 2x10 <sup>11</sup> Ω	5x10 <sup>9</sup> to 2x10 <sup>11</sup> Ω
	250V		1.25x10 <sup>10</sup> to 5x10 <sup>11</sup> Ω	1.25x10 <sup>10</sup> to 5x10 <sup>11</sup> Ω
500V		2.5x10 <sup>10</sup> to 1x10 <sup>12</sup> Ω	2.5x10 <sup>10</sup> to 1x10 <sup>12</sup> Ω	
1,000V		5x10 <sup>10</sup> to 2x10 <sup>12</sup> Ω	5x10 <sup>10</sup> to 2x10 <sup>12</sup> Ω	
Accuracy of measuring voltage	± 3% of setting voltage value			
Output current	Max. 50mA		Max. 2mA	
Measuring accuracy	± 10% (within 10 times range of min. value on each range at 20°C)			
Display	LCD (digital & analog display)			
Standard function	timer, comparator (alarm), remote start, HV-EN, RS-232C			
Power supply	100V, 120V, 220V, 240VAC ±10%, but max. 250VAC, 50/60Hz (approx.25VA)			
Dimensions, mass	approx.284W × 139H × 215D mm (approx.4.3kgs)			
Accessories	0GE00002 1m, red, 0GE00001 1m, black, Power cord (1)			

### OPTIONS

Electrodes : refer to P.72

# AUTOMATIC INSULATION / WITHSTANDING HiTESTER

# 3153

## Programmable testing, full remote control Automatic Insulation Withstanding Tester

- Insulation resistance test (DC50V~1200V), Withstanding voltage test (AC/DC5000V), full remote control in series
- Programmable testing (Testing Programs 32 files, Testing points 50 steps/file)
- Accurate testing voltage generation by PWM control method
- HIGH VOLTAGE SCANNER 3930 (Option)



### SPECIFICATIONS

<b>■ Withstanding test</b>	
Testing voltage	AC 0.2 to 5.00 kV 500 VA (maximum 30 minutes) DC 0.2 to 5.00 kV 50 VA (continuous)
Voltage setting method	Digital setting
Waveform	Sin wave
Frequency	50/60Hz DC
Measurement range	Current: 0.01 to 100.0 mA, ±(2% rdg. +5dgt.) 10 mA/100 mA(AC) AC (Average value rectified, RMS display)
<b>■ Insulation test</b>	
Testing voltage	DC 50 to 1200 V
Measurement range	0.1 to 9999 MΩ, 4 ranges
Judgment function	Contents: UPPER-FAIL / PASS / LOWER-FAIL (Digital setting window comparator method)
Timer section	Setting range: 0.3 to 999 seconds
Interfaces	EXT I/O, EXT SW, RS-232C, GP-IB
Display	Fluorescent tube display (digital), Analog meter
Monitor function	Output voltage, detection current, Insulation resistance
Power Supply	AC100-120V/AC200-240V, (50/60 Hz), 1000VA max.
Dimension, mass	320W × 155H × 480D mm, 18 kg
Accessories	H.V. TEST LEAD (high voltage side and return, 1 each) 9615, Power cord (1), spare fuse (1)

### OPTIONS

REMOTE CONTROL BOX (single)	9613
REMOTE CONTROL BOX (dual)	9614
HIGH VOLTAGE SCANNER	3930
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267
RS-232C CABLE (Dsub 9pin-9pin, cross,1.8m)	9637
RS-232C CABLE (Dsub 9pin-25pin,cross,1.8m)	9638
GP-IB CONNECTOR CABLE (2m)	9151-02

# INSULATION / WITHSTANDING HiTESTER

# 3159

## Perform insulation resistance and withstand voltage testing in a single series

- Insulation resistance test (DC500V/1000V)
- Withstanding voltage test (AC5000V)
- Testing in series (Insulation resistance test to Withstanding voltage test)
- Standard Interfaces (EXT I/O, EXT SW, RS-232C, STATUS OUT)



### SPECIFICATIONS

<b>■ Withstanding test</b>	
Testing voltage	0 to 2.5 kV / 0 to 5.0 kV AC, dual-range configuration (Average value rectified, effective value display) 500 VA (maximum 30 minutes)
Voltage setting method	Manual adjusted transformer
Waveform	Same as the power supply waveform
Frequency	Same as the power supply frequency
Measurement range	Current: 0.01 to 120 mA, ±(3% f.s.+20μA) 2mA/8mA/32mA/120mA AC (Average value rectified, RMS display)
<b>■ Insulation test</b>	
Testing voltage	DC500V/1000V
Measurement range	0.5 MΩ to 999 MΩ (500V), 1 MΩ to 2000 MΩ (1000V)
Judgment function	Contents: UPPER-FAIL / PASS / LOWER-FAIL (Digital setting window comparator method)
Timer section	Setting range: 0.5 to 999 seconds
Interfaces	EXT I/O, EXT SW, RS-232C
Display	Fluorescent tube display (digital), Analog meter
Monitor function	Output voltage, detection current, Insulation resistance
Power Supply	120 V AC, 50/60 Hz (3159-01) 220 V AC, 50/60 Hz (3159-02) 230 V AC, 50/60 Hz (3159-03) 240 V AC, 50/60 Hz (3159-04)
Dimension, mass	320W × 155H × 330D mm, 18 kg~21.5kg
Accessories	H.V. TEST LEAD (high voltage side and return, 1 each) 9615, Power cord (1), spare fuse (1)

### OPTIONS

REMOTE CONTROL BOX (single)	9613
REMOTE CONTROL BOX (dual)	9614
HIGH VOLTAGE SCANNER	3930
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267
RS-232C CABLE (Dsub 9pin-9pin, cross,1.8m)	9637
RS-232C CABLE (Dsub 9pin-25pin,cross,1.8m)	9638
GP-IB CONNECTOR CABLE (2m)	9151-02

## AC AUTOMATIC INSULATION / WITHSTANDING HiTESTER

# 3174 | 3174-01

- Built-in contact check function for both withstanding voltage and insulation resistance
- 100VA capacity for withstanding voltage testing
- Accurate test voltage generation by PWM method
- Full remote operation
- Store up to 8 settings in memory



**GP-IB**  
3174-01

**RS-232C**  
STANDARD

SPECIFICATIONS	
[Withstanding voltage test]	
Output voltage	0.2 to 5.0kV AC, 100 VA
Voltage setting method	Digital setting, 0.01kV resolution
Waveform, Frequency	Sine wave (5% or less distortion with no load), 50/60Hz selectable
Measurement range	0.01mA to 20.0mA, True RMS
Voltage meter	True RMS, $\pm 1.5\%$ rdg. (1000V or higher), $\pm 15V$ (1000V or lower)
Judgment method	Window comparator method
[Insulation resistance test]	
Testing voltage	500, 1000V DC
No load voltage	1 to 1.2 times than the testing voltage
Rated testing current	1 to 1.2mA, Short circuit current: 4 to 5mA (500V) / 2 to 3mA (1000V)
Measurement range and accuracy	0.5M $\Omega$ to 999M $\Omega$ (500V), 1M $\Omega$ to 999M $\Omega$ (1000V): $\pm 4\%$ rdg. 1000M $\Omega$ to 2000M $\Omega$ : $\pm 8\%$ rdg.
Judgment method	Window comparator method

[Timer]	
Range and accuracy	0.3 to 999s (0.3 to 99.9s: $\pm 50$ ms, 100 to 999s: $\pm 0.5$ s)
Delay/Ramp timer	0.1 to 99.9s ( $\pm 50$ ms)
Interface	EXT I/O, EXT SW, RS-232C, GP-IB (3174-01)
Function	8 settings memory, Hold, Beeper, Contact check (withstanding voltage, insulation resistance)
Monitor function	Output voltage, Measured current, Insulation resistance
Power supply	100 to 240V AC (50/60Hz), 200VA max.
Dimensions, mass	320W $\times$ 155H $\times$ 395D mm, 15kg
Accessories	High Voltage Test Lead 9615 (1 each for HV and Return), Power cord (1)

### OPTIONS

REMOTE CONTROL BOX (single)	9613	RS-232C CABLE	9638
REMOTE CONTROL BOX (dual)	9614	(Dsub 9pin-25pin, cross, 1.8m)	
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267	GP-IB CONNECTOR CABLE (2m)	9151-02
RS-232C CABLE	9637		
		(Dsub 9pin-9pin, cross, 1.8m)	

## DIGITAL M $\Omega$ HiTESTER | 3154

For the laboratory to the production line, six test voltages from 25 to 1000V



**RS-232C**  
STANDARD

SPECIFICATIONS	
Measurement function	Insulation resistance (Applied DC voltage method)
Testing voltage	25, 50, 100, 250, 500, 1000 V DC
Measurement range	25 to 50 V: 2M $\Omega$ to 200 M $\Omega$ , 3 ranges 100 to 250 V: 2M $\Omega$ to 2000 M $\Omega$ , 4 ranges 500 to 1000 V: 2M $\Omega$ to 4000 M $\Omega$ , 4 ranges
Accuracy	$\pm 2\%$ rdg., $\pm 5$ dgt. (at 25 to 100 V testing voltage, 0 to 20.00 M $\Omega$ ) (at 250 V testing voltage, 0 to 100.0 M $\Omega$ ) (at 500 to 1000 V testing voltage, 0 to 999 M $\Omega$ ) $\pm 5\%$ rdg., (at 25 to 50V testing voltage, 19.0 to 200.0M $\Omega$ ) (at 100V testing voltage, 19.0 to 2000M $\Omega$ ) (at 250V testing voltage, 100.1 to 2000M $\Omega$ ) (at 500 to 1000V testing voltage, 1000 to 4000M $\Omega$ )
Response times	Fast: less than 0.7 second, Slow: less than 1.5 seconds (at manual ranging)
Sampling rates	Fast: 10 samples/s, Slow: 1 sample/s
Functions	Comparator functions: judgments PASS or FAIL Test time timer functions: 0.5 to 99 second Delay time timer functions: 0.1 to 99 second
Display	LED
Power supply	100 to 240 V AC (50/60 Hz)
Dimensions and mass	215W $\times$ 61H $\times$ 213D mm, 1.1 kg
Accessories	Power cord (1)

### OPTIONS

TEST PROBE	9289 (Non-CE mark product)
TEST PROBE	9294
SWITCHED PROBE	9299
RS-232C CABLE (1.8 m) (9pin-9pin/Cross)	9637
RS-232C CABLE (1.8 m) (9pin-25pin/Cross)	9638
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267

# LEAK CURRENT HiTESTER | 3156

## Leakage Current Measurement Essential for Electrical Safety

- Automatically compatible with Networks stipulated by IEC/UL/JIS standards (up to IEC60601:1995 2nd Edition)
- Automatic measurement function (Measuring power supply polarity switching as well as the normal state / single failure state)
- Stores data for 100 units
- Power supply separation

### SPECIFICATIONS

<b>Measurement mode</b>	Earth leakage current Leakage current between enclosure and earth / Leakage current between enclosure and enclosure / Leakage current between enclosure and line / Patient leakage current I / Patient leakage current II / Patient leakage current III / Patient auxiliary current
<b>Target current</b>	DC / AC / AC+DC (25mA max), AC peak (75mA max)
<b>Measurement range</b>	DC / AC / AC+DC mode ; 50 $\mu$ A / 500 $\mu$ A / 5 mA / 25 mA AC peak mode ; 500 $\mu$ A / 1 mA / 10 mA / 75 mA
<b>Measurement system</b>	Indication of a current value calculated based the measured drop in voltage caused by simulated resistance of the human body. Measurement of true effective value. The measurement section ; chassis-grounded and floating.
<b>Best Accuracy</b>	AC / AC+DC mode ; $\pm(2.0\%$ rdg. + 6 dgt.) AC peak mode ; $\pm(2.0\%$ rdg. + 2 dgt.) DC mode ; $\pm(0.2\%$ rdg. + 3 dgt.)
<b>Input resistance</b>	1 M $\Omega$ $\pm$ 1 % (Excluding voltmeter section, simulated resistance of the human body)
<b>Network (human simulated resistance)</b>	For medical electrical equipment / For IEC 60990 / For JIS / For UL / General-purpose 1 / General-purpose 2



**GP-IB**  
STANDARD

**RS-232C**  
STANDARD



<b>Functions</b>	110 % voltage application function / Wiring check function / Automatic measurement function / Application line selection function / Ground fault prevention function / Setting of single-fault condition / Switching power supply polarity / Setting of measuring time / Measurement delay / Maximum value hold / Allowable value judgement / Data save / Clock / Data back up / etc.
<b>Interface</b>	EXT I/O , RS-232C , GP-IB
<b>Power supply</b>	100, 120, 220, 240 V AC (default setting) (50/60 Hz, Rated power ; 30VA)
<b>Dimensions, mass</b>	Approx. 320W x 110H x 263D mm, 4.0 kg
<b>Accessories</b>	TEST LEAD 9170-10(2), ENCLOSURE PROBE 9195(1), CARRYING CASE 9399(1), Alligator clip(3)(2 red, 1 black) AC Power cord(2), Spare fuse(2)

### OPTIONS

RS-232C CABLE (1.8 m) (9pin-9pin/Cross)	9637
RS-232C CABLE (1.8 m) (9pin-25pin/Cross)	9638
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267

# AC GROUNDING HiTESTER | 3157-01

## Protective ground tester indispensable for standard certification



**GP-IB**  
OPTION

**RS-232C**  
OPTION

### SPECIFICATIONS

<b>Measurement items</b>	Low resistance, AC 4-terminal method
<b>Generator section</b>	Current generator principle: PWM constant current control, Current setting range: 3.0A to 31.0A (0.1A resolution), into 0.1 $\Omega$ load, Maximum output power: 130VA (at output terminals) Subject to derating according to ambient temperature (80% at 40°C) Frequency: 50Hz or 60Hz sine wave Soft start function: Apply current only after checking load connection
<b>Monitor section</b>	Resistance measurement: 0 to 1.800 $\Omega$ (0.001 $\Omega$ resolution), Accuracy: $\pm 2\%$ rdg. $\pm 4$ dgt. (after zero-adjust), Current monitoring range: 0 to 35.0A AC (0.1A resolution), Monitoring cycle: 2 times/second
<b>Other functions</b>	Timer setting: Counts down time after start until preset time, or shows elapsed time after start, Setting range: 0.5 to 999 second, Comparator: Pass/Fail evaluation using preset upper/lower limit, I/O output, Memory function: max. 20 settings (with save/load)
<b>Display</b>	Fluorescent tube digital display
<b>Power supply</b>	100 to 120V, 200 to 240V AC (auto-switching), 50/60Hz
<b>Dimensions, mass</b>	320W x 90H x 263D mm, 7kg
<b>Accessories</b>	Power cord(1), Spare fuse(1), Shorting bar(2)

### OPTIONS

RS-232C CABLE (1.8 m) (9pin-9pin/Cross)	9637
RS-232C CABLE (1.8 m) (9pin-25pin/Cross)	9638
SAFETY TEST DATA MANAGEMENT SOFTWARE	9267
CURRENT PROBE (1.5 m, alligator clip type)	9296
CURRENT APPLY PROBE (1.5 m, with switch type)	9297

# PORTABLE WITHSTANDING VOLTAGE HiTESTER | 3173

## An Economical and Simple way to Handle Withstand Voltage Testing

- Measures between 0 to 3kV AC
- External Control (Standard)



### SPECIFICATIONS

<b>Basic Specifications</b>	
[Voltage generator]	
<b>Output voltage range</b>	0 to 3 kV AC (single range), 30 VA
<b>Accuracy</b>	$\pm 5\%$ f.s.
<b>Waveform</b>	Power waveform, Synchronized to power
[Current detector]	
<b>Current cut-off</b>	0.1 to 9.9 mA
<b>Current cut-off accuracy</b>	Setting value $\pm(5\%+0.05\text{mA})$
<b>Evaluation method</b>	Analog comparator PASS, FAIL a buzzer sound and external I/O
[Timer area]	
<b>Setting range</b>	1 to 99 sec (1-second resolution)
<b>Timer accuracy</b>	Setting value $\pm(1\%+50\text{msec})$
<b>General Specifications</b>	
<b>EXT I/O signal</b>	START and STOP, PASS and FAIL, TEST
<b>Power supply</b>	120 V AC (3173-01), 220 V AC (3173-02) 230 V AC (3173-03), 240 V AC (3173-04) 50/60 Hz 50 VA
<b>Dimensions, Mass</b>	Approx. 149 (W) x 200 (H) x 215 (D) mm Approx. 7.0 kg (for 120 to 240 V AC)
<b>Accessories</b>	Power cord, spare fuse, H.V. TEST LEAD 9615 (1)

## SIGNAL SOURCE | 7016

### Signal Generator with DMM

- Constant voltage 0 to ± 1.5000V 0 to ± 15.000V
- Constant current 0 to ± 25.000mA
- Pulse generation and measurement



#### OPTIONS

COMMUNICATION PACKAGE(USB)	3856-02
SHEATH TYPE TEMPERATURE PROBE	*9180
SURFACE TYPE TEMPERATURE PROBE	*9181
SHEATH TYPE TEMPERATURE PROBE	*9182
SHEATH TYPE TEMPERATURE PROBE(class1)	*9183
SHEATH TYPE TEMPERATURE PROBE(class1)	9472
SHEATH TYPE TEMPERATURE PROBE(class1)	9473
SHEATH TYPE TEMPERATURE PROBE(class1)	9474
SHEATH TYPE TEMPERATURE PROBE(class1)	9475
SURFACE TYPE TEMPERATURE PROBE	9476
TEST LEAD (Lead length: 1m/standard accessories)	3851-10

\*Non-CE mark products



Non-CE mark products

#### SPECIFICATIONS

<b>Generator functions and Accuracy</b>	<b>Constant voltage:</b> 0 to ±1.5V, 100μV resolution, 0 to ±15V, 1mV resolution, Sink/source: ±25mA, ±0.03% of setting ±3dgt. <b>Constant current:</b> 0 to ±25mA, 1μA resolution, Sink/source: ±12V, ±0.03% of setting ±5dgt. <b>Pulse signal generation:</b> 0.5 to 4800Hz, 28 ranges, ±0.005% of setting ±0.01Hz
<b>Measurement functions and Basic accuracy</b>	<b>DC Voltage:</b> 50mV to 250V, 6 ranges, ±0.03% rdg. ±5dgt. <b>AC Voltage:</b> 50mV to 250V, 6 ranges, ±0.7% rdg. ±20dgt. <b>AC+DC Voltage:</b> 50mV to 250V, 6 ranges, ±0.8% rdg. ±25dgt. <b>DC Current:</b> 50 to 500mA, 2 ranges, ±0.03% rdg. ±5dgt. <b>AC Current:</b> -50 to 500mA, 2 ranges, ±0.6% rdg. ±20dgt. <b>AC+DC Current:</b> 50 to 500mA, 2 ranges, ±0.7% rdg. ±40dgt.
<b>Measurement functions and Accuracy</b>	<b>Resistance:</b> 500W to 50MW, 6 ranges, ±0.15% rdg. ±5dgt. <b>Diode&amp;Continuity check:</b> Possible <b>Temperature:</b> -40 to 1372°C, ±0.3% rdg. ±3°C (K type thermocouple, °F display possible) <b>Frequency:</b> 100Hz to 200kHz, 5 ranges, ±0.02% rdg. ±3dgt.
<b>Display</b>	LCD with backlight 28,000 counts
<b>Power supply</b>	LR6(AA) × 8, included Ni-MH battery pack, or included AC adapter
<b>Dimensions, mass</b>	90W × 192H × 54D mm, 735g (instrument only)
<b>Accessories</b>	Carrying case(1), Battery(8), TEST LEAD 3851 (1), Alligator clips(1), Yellow test lead(1), Test leads(1)

## DC SIGNAL SOURCE | SS7012

### Portable Calibrator for Instrumentation

- Voltage/current/thermocouples calibrator
- Calibrate 4-20mA DC (Instrumentation)
- Simultaneously generate and measure calibration signals



#### OPTIONS

RJ SENSOR	9184
(for reference contact compensation)	
AC ADAPTER (EU)	9445-03
AC ADAPTER (US, Japan)	9445-02
CARRYING CASE	9380
CARRYING CASE	9782
COMMUNICATION PACKAGE	SS9000

#### SPECIFICATIONS

<b>Generator functions and Accuracy</b>	<b>Constant voltage:</b> 0 to ±2.5000 V, 100μV resolution (±0.03% of setting ±300 μV) 0 to ±25.000 V, 1 mV resolution (±0.03% of setting ±3 mV) Sink /source: ±25 mA, <b>Constant current:</b> 0 to ±25.000 mA, 1μA resolution, Sink /source: ±25 V, ±0.03 % of setting ±3 μA
<b>Thermoelectric power</b>	TC (0°C)/TC (RJ) <b>K:</b> -176.0 to 1372.0°C, <b>E:</b> -220.0 to 839.0°C, <b>J:</b> -208.0 to 1108.0°C, <b>T:</b> -169.0 to 400.0°C, <b>R:</b> -50 to 100°C, 101 to 1768°C, <b>S:</b> -50 to 100°C, 101 to 1768°C, <b>B:</b> 300 to 600°C, 601 to 1820°C, -113.0 to 1300.0°C
<b>Basic Accuracy</b>	±0.05% of setting ±0.5°C (at Thermoelectric power K) TC (0°C)
<b>Measurement functions and Accuracy</b>	<b>Voltage:</b> 0 to ±2.8 V, 100μV resolution (±0.03% rdg. ±300 μV) 0 to ±28 V, 1 mV resolution, (±0.03% rdg. ±3 mV) Input resistance: 1 MΩ <b>Current:</b> 0 to ±28 mA, 1μA resolution, Input resistance: 30 Ω, ±0.03 % rdg. ± 3μA
<b>Temperature</b>	-25.0 to 80.0°C, 0.1°C resolution (using the 9184)
<b>Standard resistance</b>	100 Ω, ± 0.2 Ω
<b>Power supply</b>	LR6 (AA) × 4 or 9445-03 AC ADAPTER (EU) or HR6 (AA) × 4
<b>Dimensions, mass</b>	104W × 180H × 58D mm, 570 g (excluding batteries)
<b>Accessories</b>	INPUT CORD 9168 (1), TEST LEAD 9170-10 (1), Fuse (1), LR6 (AA) (4)

## WAVEFORM GENERATOR | 7075 | 7075-01

### Arbitrary waveform generator with four independently controllable channels

- Even for complex signals, evaluation is made easy
- Easy touch panel operation
- Multiple channels, 4CH (7075), 2CH (7075-01)
- Large 128,000-Word/channel memory, sweep sequence functions



#### OPTIONS

- **Output cord**  
CONNECTION CORD (BNC to BNC, 1.5 m length) 9165  
CONNECTION CORD (BNC to clip, 1.5 m length) 9166
- **PC communication**  
GP-IB CONNECTION CABLE (2 m length) 9151-02

#### SPECIFICATIONS

<b>Number of channels</b>	7075: 4-channels, 7075-01: 2-channels
<b>Output functions</b>	Function generator, Arbitrary waveform generator (for each channel)
<b>Max. output voltage</b>	10 V range: 10 mV to 10 V o.c. (1 mV resolution) 1 V range: 1 mV to 1 V o.c. (0.1 mV resolution) 0.1 V range: 0.1 mV to 0.1 V o.c. (0.01 mV resolution) (o.c.: open-circuit)
<b>Minimum load impedance</b>	40 Ω
<b>Output impedance</b>	50 Ω ± 2 % (DC)
<b>Function generator mode</b>	Waveform types: sine, square (fixed 50 % duty), triangle, ramp-up, ramp-down, pulse, noise, DC. Frequency range: sine (10 mHz to 10 MHz), square (10 mHz to 10 MHz), triangle (10 mHz to 200 kHz), pulse (10 mHz to 200 kHz)
<b>Arbitrary waveform generation mode</b>	Voltage axis resolution: 16 bits (64000 counts) Waveform memory capacity: 128 kW/ch Filtering: 2-stage LPF, 50 Hz to 1 MHz, 14 steps. Waveform input methods: FD/GP-IB (direct download from MEMORY HiCORDER by FD or GP-IB), or RS-232C download (at use of 7990). Arbitrary waveform clock: Max. 4ch, Frequency range: 10 mHz to 10 MHz (10 mHz resolution)
<b>Display</b>	5.7-inch LCD (with touch panel)
<b>Data storage</b>	FDD × 1, MS-DOS format
<b>Power supply</b>	100/120/200/230 V AC/auto selects, (50/60 Hz)
<b>Dimensions, mass</b>	345W × 130H × 286Dmm, 7075: 7.8 kg, 7075-01: 7.5 kg
<b>Accessories</b>	WAVEFORM CREATION SOFTWARE (CD-R × 1) 7990

# Environmental Measuring Instruments









## Environmental Measuring Instruments Index







### Temperature measurement Illumination Sound level Rotation Magnetic Fields

 <p><b>3441/3442</b> €€ -100 °C to 1300 °C Choose from Basic or Waterproof models ..... p.43</p>	 <p><b>3446-01, 3447-01</b> €€ -100°C to 1000°C 1 ch (3446) -100°C to 300°C 2 ch (3447) with built-in memory ..... p.43</p>	 <p><b>3423</b> €€ Illumination 20 to 200,000 lx, digital ..... p.43</p>	 <p><b>FT3432</b> €€ Sound level meter 30 to 130 dB, digital ..... p.43</p>	 <p><b>3403 Rotation</b> €€ 30 to 100,000 r/min <b>3404 Rotation</b> €€ 30 to 100,000 r/min, Max./Min./Total /Period ..... p.62</p>	 <p><b>3470</b> €€ Magnetic field tester for home appliances ..... p.64</p>
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### Non-contact temperature measurement (via infrared radiation energy) 2D Thermo Testing

 <p><b>3419-20</b> €€ -35°C to 500 °C One-beam laser marker, MAX/MIN indication, Data memory ..... p.42</p>	 <p><b>3415-01, 3416-01</b> €€ -50 °C to 500 °C 3415-01:Narrow field measurement Two-beam laser marker 3416-01:LED spot marker Spot measurement ..... p.42</p>	 <p><b>3443</b> €€ -50.0 °C to 500.0 °C Two-beam laser marker Narrow field measurement Data memory, Memory dump to printer, RS-232C interface ..... p.42</p>	 <p><b>3444</b> €€ -50.0 °C to 500.0 °C Two-beam laser marker Narrow field measurement MAX. MIN. indication, Analog output, RS-232C interface ..... p.42</p>	 <p><b>3445</b> €€ -50.0 °C to 500.0 °C Two-beam laser marker Spot measurement MAX. MIN. indication, Analog output, RS-232C interface ..... p.42</p>	 <p><b>3460-50</b> €€ 64-element thermopile array sensor Transfer data to PC via RS-232C ..... p.42</p>
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### Data Loggers (Temperature/Humidity/Instrumentation/DC-Voltage/AC-Current/AC-Voltage/Leak-Current)

 <p><b>2300 Series</b> Remote Measurement System Various measurement modules Internal memory LAN or SS Air Module ..... p.40</p>	 <p><b>3641-20, 3632-20, 3633-20</b> €€ Temperature/Humidity -40~85°C 0~100% rh (using the 9680 sensor) -20.0 °C to 70.0 °C (internal sensor) ..... p.41</p>	 <p><b>3634-20</b> €€ Instrumentation 0 to 20.00 mA DC ..... p.41</p>	 <p><b>3635-24, -25, -26</b> €€ DC Voltage -24: ±500.0 mV DC -25: ±5.000 V DC -26: ±50.00 V DC ..... p.41</p>	 <p><b>3636-20</b> €€ AC Current (2ch) 0 to 50.00/500.0 A AC <b>3637-20</b> €€ AC Voltage (1ch) 0 to 600.0 V AC ..... p.41</p>	 <p><b>3638-20</b> €€ AC Leak Current (2ch) with clamp-on leak sensor ..... p.41</p>
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### Data Loggers (Pulse/Illumination/DC-Voltage/Communication Base)

 <p><b>3639-20</b> €€ Pulse Totalizer 9,999counts/interval (1ch) ..... p.41</p>	 <p><b>3640-20</b> €€ Illumination 2000/20000/200000 lx (1ch) ..... p.41</p>	 <p><b>3645-20</b> €€ Multi-range Voltage Logger with preheat signal function ..... p.41</p>	 <p><b>3911-20, 3912-20</b> €€ Communication Base to analyze and process on a personal computer ..... p.41</p>
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## REMOTE MEASUREMENT SYSTEM | 2300 Series

### Easily Construct a Centralized Data Management System for Monitoring Multiple Locations

LAN Module that paves the way for a low cost remote measuring system by utilizing existing data network

## Smart Site

- Various measurement modules for temperature and humidity, instrumentation, and pulse
- Power measurement module for multiple circuits
- Large internal memory to prevent data loss due to communication problems
- Communication module with built-in real-time clock tracks the data of each measurement module to the second



**RS-232C** 2343-20    **LAN** 2353-20

<b>HUMIDITY MODULE</b> 2301-20	Temperature 1ch and humidity 1ch. Use with optional sensor 9764 Temperature: -40.0 to 85.0°C Humidity: 0.0 to 100%RH
<b>Pt MODULE</b> 2302-20	Temperature 2ch (Pt100) 2 types of platinum resistance thermo sensors available
<b>TC MODULE</b> 2303-20	2ch temperature measurement using thermocouples (K, E, J, T). 4 TC types available
<b>PULSE MODULE</b> 2304-21	For 2ch pulse input (voltage, contact), maximum 16M pulses/interval Input pulse: 4kHz max. (voltage/electronic contact signal) 25Hz max. (mechanical contact signal)
<b>INSTRUMENTATION MODULE</b> 2305-20	Voltage / current 2ch measurement, for 4-20mA, 1-5V instrumentation signals
<b>MULTI-FUNCTION MODULE</b> 2306	[For measuring voltage, current, and temperature with K-thermocouples or Resistance Temperature Detectors] Temperature: K/E/J/T/R, Pt100/JPt100 Voltage: DC 50mV to 50V Current: DC 30mA All channels isolated; scanner measuring method
<b>POWER METER MODULE</b> 2331-20	For single circuit power measurement. Single-phase 2-wire to 3-phase 4-wire Voltage: AC 100/200V Current: AC 5A (with CLAMP ON SENSOR 9695-02), AC 50A (with 9695-02), AC 100A (with 9695-03 or 9661-01), AC 500A (with 9661-01)
<b>POWER METER MODULE</b> 2332-20	For multiple circuit power measurement: from 6 circuits of single-phase 2-wire to 3 circuits of 3-phase 3-wire installations Voltage: AC200V (100V accepted at 200V range) Current: AC 5A (with CLAMP ON SENSOR 9695-02), AC 50A (with 9695-02), AC 100A (with 9695-03 or 9661-01), AC 500A (with 9661-01) *3-phase 4-wire circuit cannot be measured
<b>INPUT MODULE</b> 2341-20	For recording the status of contact signals Input 8 ch, Input internal bus isolated Easily capture on/off status with LED
<b>OUTPUT MODULE</b> 2342-20	Acts as receiver of higher order external control device, outputs control signals and monitors data of measurement modules Output 8ch (Open collector output), Output internal bus isolated

<b>RS LINK MODULE</b> 2343-20	For communicating with RS-232C interface equipped instruments Interface: RS-232C, Transfer speed: 57.6kbps(max.) Please inquire regarding compatible instruments. (Existing compatible HIOKI instruments include Models 3331 and 3332.)
<b>WIRE MODULE</b> 2352-20	For small-scale measurement systems or built-in use Interface: RS-232C, Transfer speed: 57.6kbps(max.)
<b>LAN MODULE</b> 2353-20	For data logging via LAN Interface: 10BASE-T
<b>MEMORY MODULE</b> 2354	Store measurement data to the Compact Flash card or transfer data to a PC via LAN (100BASE-TX) , FTP Server Function
<b>AC POWER MODULE</b> 2361-20	Power supply for the communication modules and measurement modules (max. 10 modules) Input: AC 100 to 240V, Output: DC5V/2.4A
<b>DC POWER MODULE</b> 2362-20	Power supply for the communication modules and measurement modules (max. 10 modules) Input: DC 19 to 36V, Output: DC5V / 2.4A
<b>MODULE BASE</b> 2391 Series	For connecting modules (3 slots reserved for power supply and communication module) 2391-02: 5 measurement module slots, 2391-03: 10 measurement module slots *Model 2331 uses 2 slots
<b>MODULE BASE</b> 2392 Series	For connecting MODULES (also connects with additional MODULE BASES for increased measurement capabilities) 2392-01: 1 slot; includes power and internal bus connection terminal 2392-02: 2 slots; connect with 2391-01 for additional measurement module slots * POWER MODULE not compatible; must use with Model 2392-01 to access POWER MODULE
<b>SMART SITE UTILITY PRO</b> 9768 (Required for setup monitoring 2300 series)	Application software for 2300 series setup and monitoring Measurement setup for all 2300 series modules Retrieve data in real time Alarm setting and measurement Create Excel format reports Windows 2000/XP

# Data Loggers | 3600 Series

USB<sub>1.1</sub>

RS-232C

## Data Loggers for All Types of Measurements

### For HACCP-related Temperature and Humidity Recording

#### HUMIDITY LOGGER

3641-20



Alternately record temperature and humidity on two channels for temperature and humidity measurement  
-40.0 °C to 85.0 °C  
0.0 %rh to 100.0 %rh

#### TEMPERATURE LOGGERS

3632-20



Waterproof with built-in sensor for temperature measurement  
-20.0 °C to 70.0 °C

3633-20



External sensor for temperature measurement  
-40.0 °C to 180.0 °C

### For Recording Voltage

#### VOLTAGE LOGGERS

3635-24, -25, -26



For measurement DC voltage  
-24: ± 500.0 mV DC  
-25: ± 5.000 V DC  
-26: ± 50.00 V DC

3645-20



With preheat function  
For measuring DC voltage  
Range: ± 50.00 mV to ± 50.00 V DC

3637-20



For measuring AC voltage  
Range: 600.0 V AC

### For Recording Precipitation or Illumination

#### PULSE LOGGER

3639-20



For cumulative pulse measurement for precipitation gauges, flow gauges, etc.

#### ILLUMINATION LOGGER

3640-20



For illumination measurement  
Range: 2,000 lux to 200,000 lux

### For Recording Load Current and Monitoring Leak Current

#### INSTRUMENTATION LOGGER

3634-20



For measuring typical instrumentation signals  
Range: 20.00 mA DC

#### CLAMP LOGGER

3636-20



For measuring alternating current on two channels  
Range: 50.00/500.0 A AC  
(Clamp sensors sold separately)

#### LEAK LOGGER

3638-20



For measuring alternating current on two channels  
Range: 100.0/1000 mA AC  
(Clamp sensors sold separately)

USB<sub>1.1</sub>  
3912-20: OPTION

RS-232C  
3911-20: OPTION



#### Accessories

HUMIDITY SENSOR 9680-50 Cord length: 1 m	CONNECTION CABLE 9632 Cord length: 1 m	CONNECTION CORD 9639 Cord length: 3 m	CONNECTION CABLE 9629 Cord length: 5 m	LUX SENSOR 9662 Cord length: 2 m

#### Options for 3634-20

CONNECTION CABLE 9633 Cord length: 1 m	CONNECTION CABLE 9634 Cord length: 1 m

#### Options for 3636-20

CLAMP ON SENSOR 9650 AC 100 A f.s./Up to φ 15 mm Cord length: 3 m	CLAMP ON SENSOR 9651 AC 500 A f.s./Up to φ 46 mm Cord length: 3 m

#### Options for 3638-20

CLAMP ON SENSOR 9657 AC 1.0 A f.s./Up to φ 40 mm Cord length: 3 m	CLAMP ON SENSOR 9658 AC 1.0 A f.s./Up to φ 12 × 30 mm Cord length: 3 m

#### Options for 3641-20 / 3633-20

HUMIDITY SENSOR (for 3641-20) 9680-50/9680-51/9680-52 -40.0 °C to 85.0 °C 0.0 %rh to 100.0 %rh Cord length: 9680-50: 1 m (provided), 9680-51: 5 m, 9680-52: 10 m	TEMPERATURE SENSOR (Molded plastic type) 9631-01/9631-11/9631-21 -40.0 °C to 180.0 °C Cord length: 9631-01: 1 m, 9631-11: 5 m, 9631-21: 10 m	TEMPERATURE SENSOR (Needle type) 9631-02 -40.0 °C to 120.0 °C Cord length: 1 m	TEMPERATURE SENSOR (Sheathed type) 9631-03 -40.0 °C to 120.0 °C Cord length: 1 m	TEMPERATURE SENSOR (Molded plastic type) 9631-05 -40.0 °C to 180.0 °C Cord length: 30 mm	TEMPERATURE SENSOR (Lug type) 9631-04/9631-14/9631-24 -30.0 °C to 180.0 °C Cord length: 9631-04: 1 m, 9631-14: 5 m, 9631-24: 10 m

# COMMUNICATION BASE | 3911-20 | 3912-20

## Analyze and Process Data on a Personal Computer

The 3911-20, 3912-20 COMMUNICATION BASE are used to transfer data to a personal computer.

USB<sub>1.1</sub>  
3912-20

RS-232C  
3911-20

3911-20

3912-20

Communication software included with the 3911-20, 3912-20  
Compatible OS: Windows 98/Me/2000/XP/Vista (32 bit)

### 3911-20, 3912-20 : SPECIFICATIONS

<b>Recording Capacity</b>	Max. 16,000 data points × 16 ch, 32,000 data points × 8 ch
<b>Communication method</b>	RS-232C (3911-20 to a PC) USB 1.1 (3912-20 to a PC)
<b>Power supply</b>	4 × 1.5 V, LR03 (AAA) alkaline dry cell batteries
<b>Dimensions, mass</b>	3911-20: 69W × 92H × 36D mm, 150g (including batteries) 3912-20: 69W × 128H × 36D mm, 180g (including batteries)
<b>Accessories</b>	3911-20: LR03 (AAA) alkaline dry cell batteries (4), Communication software (1) 3912-20: USB cable (1), LR03 (AAA) alkaline dry cell batteries (4), Communication software (1)

#### Options for 3911-20

	RS-232C CABLE 9637 9-pin to 9-pin crossed cable/1.8 m		RS-232C CABLE 9638 9-pin to 25-pin crossed cable/1.8 m
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## INFRARED THERMO HiTESTER

# 3419-20

**Gun-shaped design with easy-to-see display**

- Hand-held infrared thermometer for hard-to-reach places
- Easy battery replacement
- Switchable between Celsius or Fahrenheit
- Audible Alarm Feature

SPECIFICATIONS	
Detection element	Thermopile
Measurement temperature range	-35.0 to 500.0 °C (-31.0 to 932.0 °F)
Display resolution	0.1 °C (0.2 °F)
Response time	2 times/ second
Measurement wavelength	6 to 14 μm
Adjustable emissivity	0.17 to 1.00 by steps of 0.01
Diameter of field of measurement	125 mm at 1000 mm (D : S=8 : 1)
Sighting	Laser marker MAX 1 mW (class 2)
Power supply	6F22 manganese battery × 1 or 6LR61 alkaline battery × 1
Continuous operating time	Approx. 55 hours (manganese battery), Approx. 80 hours (alkaline battery), When laser marker and backlight are OFF
Accuracy	-35.0 to -0.1°C: ±10 % rdg, ±2 °C 0.0 to 100°C: ±2 °C, 100.1 to 500.0°C: ±2 % rdg.
Temperature coefficient	Measurement accuracy × 0.1/ °C
Dimensions	Approx. 46 W × 172 H × 118 D mm (1.81" W × 6.77" H × 4.65" D)(excluding projections)
Mass	Approx. 220 g (7.8 oz.) (including manganese battery × 1)
Location for use	Indoors, altitude up to 2000 m (6562-ft.)
Operating temperature and humidity	0 to 50°C (32°F to 122°F), 80%RH or less (non-condensating)
Storage temperature and humidity	-10 to 50°C (14°F to 122°F), 80%RH or less (non-condensating) 50 to 60°C (122°F to 140°F), 70%RH or less (non-condensating)
Applicable standards	EN61326
Laser	IEC60825-1 CLASS 2 LASER
MAX/MIN display	Available
Additional Function	Alarm function, Backlight function, Memory (50 data)
Accessories	Instruction manual, 6F22 manganese battery × 1 (supplied with this product for monitor), Carrying case × 1



### OPTIONS

Black body tape (50 mm × 10 mm, 1 roll) Withstands 180 °C, ε=0.95

## TEMPERATURE HiTESTER

# 3443 | 3444 | 3445

**Non-contact measurement, quick and easy temperature management**



### 3443 : SPECIFICATIONS

Measurement range	-50.0°C to 500.0°C, 0.1°C resolution
Measurement field diameter	φ24mm at a distance of 1 m
Accuracy	±1 % rdg. (at 200.1 to 500.0 °C), ±2°C (at 0.0 to 200.0 °C), ±10 % rdg. ±2°C (at -50.0 to -0.1 °C)
Response time	1.6 seconds (95% response)
Date memory function	130 points of data, memory dump to printer
Analog output function	None
Interface	RS-232C output (requires 3909 INTERFACE PACK)
Other functions	Auto power save, low battery warning, auto-hold
Power supply	6F22 (006P) × 1, or AC adapter
Operating time	Continuous use of 20 hours (light on) and 50 hours (light off)
Dimensions, mass	47W × 200H × 48D mm, 280 g
Accessories	Carrying case (1), hand strap (1), 6F22 (1), screwdriver (1)

### 3444, 3445 : SPECIFICATIONS

Measurement range	-50.0°C to 500.0°C, 0.1°C, 0.1 or 1°C resolution switchable
Measurement field diameter	3444 : φ24mm at a distance of 1 m 3445 : φ2.5mm at a distance of 7 cm
Accuracy	±1 % rdg. (at 200.1 to 500.0 °C), ±2°C (at 0.0 to 200.0 °C), ±10 % rdg. ±2°C (at -50.0 to -0.1 °C)
Response time	1.6 sec (95% at 0.1°C resolution), 0.7 sec (95% at 1°C resolution)
Date memory function	None
Analog output function	Possible (requires 3909 INTERFACE PACK)
Interface	RS-232C output (requires 3909 INTERFACE PACK)
Other functions	Auto power save, low battery warning
Power supply	6F22(006P)× 1, or AC adapter
Operating time	Continuous use of 20 hours (light on) and 50 hours (light off)
Dimensions, mass	47W × 200H × 48D mm, 280 g
Accessories	Carrying case (1), hand strap (1), 6F22 (1), screwdriver (1)

OPTIONS : CONNECTING CABLE (2m) 9436

# TEMPERATURE HiTESTER

# 3441 | 3442



**Supports temperature management demands of various applications**

- Compact and weighing only 160g
- More than 200 hours of continuous operation on a single battery
- An assortment of 9 optional temperature sensors
- 3442 : Waterproof construction

SPECIFICATIONS	
Material type	K type thermocouple (Chromel /Alumel)
Measurement range	-100 °C to 1300 °C (-148 °F to 2372 °F) The actual measurement range is restricted by the temperature probe.
Resolution	0.1 °C*1 or 1 °C*2
Unit Accuracy	±0.1%rdg. ±0.8 °C (1.5 °F)*1 or ±0.2% rdg. ±1 °C (1.8 °F)*2 (in addition to accuracy of temperature sensor) *1 during measurement from -100 to 199.9 °C (-148 °F to 392 °F) *2 during measurement from 200 to 1300 °C (392 °F to 2372 °F)
Display	LCD
Sampling rate	2 times/second
Contact compensation	Auto compensation
Functions	Max/Min temperature recording and display, display data hold, sensor discontinuity display, Over-range display, °C/ °F display switching (3441-02, 3442-03), auto power save, low battery warning
Place of use	Indoor use to altitude of 2000 m
Power supply	R6P (AA) × 4, or LR6 (AA) × 4
Operating time	200 hours or better of continuous use (with manganese battery)
Dimensions, mass	74W × 155H × 24D mm, 160 g
Accessories	Strap band(1), R6P(AA) Batteries(4)

Temperature sensors sold separately



3441

3442  
(Waterproof construction)

# LUX HiTESTER 3423

**Digital illumination meter, maximum scale of 199,900 lx**

- Easy-to-operate, hand-held unit
- From the low light up to a maximum intensity of 199,900lx
- For illumination equipment, lighting work, and facility management

SPECIFICATIONS	
Measurement range	20 to 200,000 lx full-scale, 5 ranges
Accuracy	±4 % rdg. ±1 dgt. (environment temperature: 23 ±5 °C)
Display	1999 full digits, LCD with EL backlight (Note: in the 20,000 lx range, the maximum is 19990/10 digits steps, and in the 200,000 lx range, the maximum is 199900/100 digits steps)
Response time	5 sec. or less (auto range), 2 sec. or less (manual range)
Receptor element	Silicon photodiode
Other functions	Sensor separate: Permits remote measurement with the sensor separated from the main unit. (using the 9436) Analog output: 200 mV DC at full scale rate
Power supply	R6P (AA) × 2 (Continuous use of 25 hours) or AC adapter (6 V, 300 mA)
Dimensions, mass	74W × 170H × 30D mm, 310 g (including the dry cells)
Accessories	9376 CARRYING CASE(1), Sensor cap(1), R6P(2)



Environmental Measuring Instruments

# SOUND LEVEL METER FT3432

**The ideal noise pollution management device for users aiming to create a comfortable working environment - perfect for school and factory use.**

- Single-handed testing
- Auto-ranging and easy operation using only 3 buttons

SPECIFICATIONS	
Processing type	Sound level (Lp), Equivalent continuous sound level (Leq), Sound exposure level (LE), Maximum Sound level (Lmax), C weighting peak sound level (LCpeak)
Measurement times	1 minute, 5 minutes, 10 minutes, or 1hour
Microphone	1/2-inch electret condenser microphone, Model: UC-52
Measurement level range	(Wide range) A weighting: 30 dB to 130 dB, C weighting: 36 dB to 130 dB
Inherent noise level	(Wide range) A weighting: 24 dB or less, C weighting: 30 dB or less
Measurement frequency range	20 Hz to 8 kHz
Power supply	LR03 or R03 (AAA) × 2
Dimensions and Mass	Approx. 120 mm(H)×63 mm(W)×23.5 mm(D), 105g
Accessories	Windscreen WS-14(1), Hand strap VM-63-017(1), Windscreen fall out prevention rubber NL-27-014(1), Silicon cover NL-27-026(1), Carrying Case 9757(1), Size AAA(IEC LR03) alkaline batteries(2)



IEC 61672-1:2002 Class 2

# Clamp Sensors



## Clamp Sensors Index

### Wide-band frequency, high-precision, ideal for observing waveforms (for AC / DC)

 <b>3273-50/3276</b> DC to 50 MHz / DC to 100 MHz 30 A maximum 0.1 V / A output φ 5 mm core jaw dia. ..... p.45	 <b>3274</b> DC to 10 MHz 150 A maximum 0.01 V / A output φ 20 mm core jaw dia. ..... p.45	 <b>3275</b> DC to 2 MHz 500 A maximum 0.01 V / A output φ 20 mm core jaw dia. ..... p.45	 <b>3272/3269</b> Power supply for 3273-50, 3274, 3275, 3276 Single sensor (3272) Four sensors (3269) ..... p.45
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### High-precision sensors to view waveforms or to use with power meters (for AC/DC, or AC only)

 <b>9709</b> DC to 100 kHz 500 A rated 2 V / 500 A output φ36 mm core jaw dia. ..... p.46	 <b>CT6862</b> DC to 1 MHz, 50 A rated 2 V / 50 A output φ24 mm core jaw dia. <b>CT6863</b> DC to 200 kHz, 200 A rated 2 V / 200 A output φ24 mm core jaw dia. ..... p.46	 <b>9277</b> DC to 100 kHz 20 A rated 2 V / 20 A output φ20 mm core jaw dia. ..... p.46	 <b>9278</b> DC to 100 kHz 200 A rated 2 V / 200 A output φ20 mm core jaw dia. ..... p.46	 <b>9279</b> DC to 20 kHz 500 A rated 2 V / 500 A output φ40 mm core jaw dia. ..... p.46	 <b>9272-10</b> 1 Hz to 100 kHz 20 or 200 A rated 2 V / 20 or 200 A output φ46 mm core jaw dia. ..... p.46	 <b>9555-10</b> Power supply for 9272-10, 9277, 9278, 9279, 9709 Single sensor connectable ..... p.46
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### For power lines (50/60 Hz use)

 <b>9010-50/9132-50</b> 40Hz to 1kHz 200mV / each A range 9010-50: 10A to 500A range, φ46mm core jaw dia. 9132-50: 20A to 1000A range, φ55mm core jaw dia. ..... p.46	 <b>9018-50</b> 40Hz to 3kHz 10A to 500A range 200mV / each A range φ46 mm core jaw dia. ..... p.46	 <b>9661-01</b> 40Hz to 5kHz AC 500A range AC 1mV/A output φ46 mm core jaw dia. ..... p.47	 <b>9695-02, -03</b> 9695-02 AC 50A, 10 mV/A less than φ15mm 9695-03 AC 100A, 1 mV/A less than φ15mm ..... p.47	 <b>9657-10/9675</b> 9657-10 LEAK CLAMP ON SENSOR AC 25mV/A Up to φ40mm 9675 LEAK CLAMP ON SENSOR AC 100mV/A Up to φ30mm ..... p.47
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### Conversion Adapter

 <b>9290-10</b> AC current up to 1500 A, secondary current 1/10 of primary, φ55 mm dia. or 88 mm width Superior phase angle characteristics	 <b>CT-101A</b> AC current up to 15 A, secondary current 1/1 or 10 times of primary, φ25 mm dia.
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### Clamp Sensors for 3169/3196 Power meters

 <b>9660</b> 45Hz to 5kHz (±1%) AC current up to 100A AC 1mV / A output ..... p.47 <b>9694</b> 45Hz to 5kHz (±1%) AC current up to 5A AC 10mV / A output ..... p.47	 <b>9661</b> 45Hz to 5kHz (±1%) AC current up to 500A AC 1mV / A output ..... p.47	 <b>9667</b> 10Hz to 20kHz (±3dB) AC current up to 5000/500A AC 0.1mV / A, AC 1mV / A output ..... p.47	 <b>9669</b> 40Hz to 1kHz (2.0%) AC current up to 1000 A AC 0.5mV / A output ..... p.47
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### Clamp Sensors for 8205-10/8206-10, 3636-20

 <b>9650</b> 40Hz to 1kHz (±8%) AC current up to 100A Secondary current 100mA AC ..... p.47	 <b>9651</b> 40Hz to 1kHz (±3%) AC current up to 500A Secondary current 500mA AC ..... p.47	 <b>9668</b> 40Hz to 1kHz (±3%) AC current up to 1000A Secondary current 1000mA AC ..... p.47
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Clamp Sensors

# CLAMP ON PROBE 3273-50 | 3274 | 3275 | 3276

## POWER SUPPLY 3269/3272

### Wide-range current probe allows direct input to oscilloscope

- 3273-50/3276: Wide Band from DC to 50/100 MHz, For Large Current Measurements (30 A rms)
- 3274/3275: Wide Band from DC to 10/2 MHz, For Large Current Measurements (150/500 A rms)



CLAMP ON PROBE : 3276  
Wide-band model from DC to 100 MHz

#### SPECIFICATIONS

	3273-50	3276	3274	3275
Frequency bandwidth	DC to 50 MHz (-3dB)	DC to 100 MHz (-3dB)	DC to 10 MHz (-3dB)	DC to 2 MHz (-3dB)
Rise time	7 ns or less	35 ns or less	35 ns or less	175 ns or less
Continuous maximum input range	30 A rms	30 A rms	150 A rms	500 A rms
Maximum peak current	Non-continuous 50 A peak	Non-continuous 50 A peak	Non-continuous 300 A peak 500 A peak at pulse width of $\leq 30 \mu\text{s}$	Non-continuous 700 A peak
Output voltage rate	0.1 V/A	0.1 V/A	0.01 V/A	0.01 V/A
Amplitude accuracy	$\pm 1.0\%$ rdg. $\pm 1$ mV (0 to 30 A, DC, 45 to 66 Hz) $\pm 2.0\%$ rdg (30 A to 50 A Peak, DC, 45 to 66 Hz)	$\pm 1.0\%$ rdg. $\pm 1$ mV (0 to 30 A, DC, 45 to 66 Hz) $\pm 2.0\%$ rdg (30 A to 50 A Peak, DC, 45 to 66 Hz)	$\pm 1.0\%$ rdg. $\pm 1$ mV (0 to 150 A / DC, 45 to 66 Hz) $\pm 2.0\%$ rdg. (150 A to 300 A peak / DC, 45 to 66 Hz)	$\pm 1.0\%$ rdg. $\pm 5$ mV (0 to 500 A / DC, 45 to 66 Hz) $\pm 2.0\%$ rdg. (500 A to 700 A peak / DC, 45 to 66 Hz)
Noise	2.5 mA rms or less (measured with 20 MHz bandwidth equipment)	2.5 mA rms or less (measured with 20 MHz bandwidth equipment)	25 mA rms or less (measured with 20 MHz bandwidth equipment)	25 mA rms or less (measured with 20 MHz bandwidth equipment)
Sensitivity temperature characteristics	Within $\pm 2\%$ (At 50 Hz / 30 A input, 0 to 40 °C)	Within $\pm 2\%$ (At 50 Hz / 30 A input 0 to 40 °C)	Within $\pm 2\%$ (At 55 Hz/150 A input, 0 to 40 °C)	Within $\pm 2\%$ (At 50 Hz/500 A input, 0 to 40 °C)
Maximum rated	5.6 VA	5.3 VA	5.5 VA (Input within the maximum input range.)	7.2 VA (Input within the maximum input range.)
Power supply voltage	$\pm 12$ V $\pm 0.5$ V	$\pm 12$ V $\pm 0.5$ V	$\pm 12$ V $\pm 1$ V	$\pm 12$ V $\pm 0.5$ V
Ambient conditions for usage	0 to 40 °C, max. 80 % rh (no condensation)	0 to 40 °C, max. 80 % rh (no condensation)	0 to 40 °C, max. 80 % rh (no condensation)	0 to 40 °C, max. 80 % rh (no condensation)
External magnetic field resistance	Max. 20 mA (equivalent) (DC and 60 Hz, Magnetic field of 400 A/m)	Max. 5 mA (equivalent) (DC and 60 Hz, Magnetic field of 400 A/m)	Max. 150 mA (equivalent) (DC and 60 Hz, Magnetic field of 400 A/m)	Max. 800 mA (equivalent) (DC and 60 Hz, Magnetic field of 400 A/m)
Maximum voltage in measurement circuit	300 V, CAT-I (insulated conductor)	300 V, CAT-I (insulated conductor)	600 V CAT-II, 300 V CAT-III (insulated conductor)	600 V CAT-II, 300 V CAT-III (insulated conductor)
Measurement conductor	Diameter max. 5 mm	Diameter max. 5 mm	Diameter max. 20 mm	Diameter max. 20 mm
Dimensions and mass	Sensor: approx. 175W x 18H x 40D mm; 230g Termination unit: approx. 27W x 55H x 18D mm	Sensor: approx. 175W x 18H x 40D mm; 240g Termination unit: approx. 27W x 55H x 18D mm	Sensor: approx. 176W x 69H x 27D mm; 500g Termination unit: approx. 27W x 55H x 18D mm	Sensor: approx. 176W x 69H x 27D mm; 520 g Termination unit: approx. 27W x 55H x 18D mm
Cable length	Sensor cable: approx. 1.5 m (BNC connector) Power cable: approx. 1 m	Sensor cable: approx. 1.5 m (BNC connector) Power cable: approx. 1 m	Sensor cable: approx. 2 m (BNC connector) Power cable: approx. 1 m	Sensor cable: approx. 2 m (BNC connector) Power cable: approx. 1 m
Supplied accessories	Soft case 1	Hard case 1	Hard case 1	Hard case 1

#### ● Optional accessories

### POWER SUPPLY 3269/3272

Please specify voltage when ordering for use with 120 V, 220 V, or 240 V.

Use the 3269/3272 Power Supply for general measurements or when power is not available from the MEMORY HiCORDER or oscilloscope.



3269 (Four sensors)

3272 (Single sensor)

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

#### 3269/3272 SPECIFICATIONS

Suitable sensor model	3273-50, 3274, 3275, 3276 CLAMP ON PROBE
Number of power supply connectors	1 (3272), 4 (3269) (connector type: LEMO inc./ FFA..0S.304.CNAC42Z)
Output voltage	$\pm 12$ V $\pm 0.5$ V
Ambient conditions for usage	0 to 40 °C, max. 80 %rh (no condensation)
Power requirements	Please specify voltage when ordering for use with 120 V, 220 V, or 240 V.
Maximum rated power consumption	20 VA max. (3272) 170 VA max. (3269)
Dimensions and mass	Approx. 73W x 110H x 186D mm; 1.1 kg (3272) Approx. 80W x 119H x 200D mm; 1.1 kg (3269)
Supplied accessories	Power cord x 1, spare fuse x 1 (3272)

## UNIVERSAL CLAMP ON CT | 9277 | 9278 | 9279

### High-precision sensors to view waveforms or to use with power meters (for AC/DC)

- Wide frequency ranges including DC
- Use together with the 9555-10 SENSOR UNIT for current waveform monitoring (with a waveform recorder or oscilloscope)



#### SPECIFICATIONS

	9277	9278	9279 (Non-CE mark product)
Rated current	20 A AC/DC (continuous 50 A)	200 A AC/DC (continuous 350 A)	500 A AC/DC (continuous 650 A)
Frequency band width	DC to 100 kHz (±5 % f.s.)	DC to 100 kHz (±5 % f.s.)	DC to 20 kHz (±5 % f.s.)
Accuracy (DC or 45 to 66 Hz)	±0.5 % rdg, ±0.05 % f.s., phase ±0.2°	±0.5 % rdg, ±0.05 % f.s., phase ±0.2°	±0.5 % rdg, ±0.05 % f.s., phase ±0.2°
Output rate (with the 9555)	2 V/rated current range (waveform output, with the 9555-10)	2 V/rated current range (waveform output, with the 9555-10)	2 V/rated current range (waveform output, with the 9555-10)
Max. circuit voltage	600 V rms (insulated wire)	600 V rms (insulated wire)	600 V rms (insulated wire)
Core jaw dia.	φ20 mm	φ20 mm	φ40 mm
Power supply	9555-10 SENSOR UNIT or compatible HIOKI power meter	9555-10 SENSOR UNIT or compatible HIOKI power meter	9555-10 SENSOR UNIT or compatible HIOKI power meter
Dimensions, mass	176W × 63H × 34D mm, 430 g, cord length: 3 m	176W × 63H × 34D mm, 430 g, cord length: 3 m	220W × 103H × 43.5D mm, 860 g, cord length: 3 m
Accessories	9375 CARRYING CASE (1)	9375 CARRYING CASE (1)	9375 CARRYING CASE (1)

## AC/DC CURRENT SENSOR | 9709 | CT6862 | CT6863

### Measure with Absolute Precision

- High current measurement
- Wide frequency range: DC to 100kHz (9709), DC to 1MHz (CT6862), DC to 500kHz (CT6863)



#### SPECIFICATIONS

	9709	CT6862	CT6863
Rated current	500A AC/DC	50A AC/DC	200A AC/DC
Output voltage	2V/500A	2V/50A	2V/200A
Maximum input current	700A rms (1000A peak, 50/60 Hz, continuous)	Within a derating	
Output resistance	50 Ω		
Frequency characteristic	DC to 45 Hz: ±0.2 % rdg ±0.02 % f.s. (±0.3°) 5 kHz to 10 kHz: ±2 % rdg ±0.1 % f.s. (±2.0°) 20 kHz to 100 kHz: ±30 % rdg ±0.1 % f.s. (±30°)	DC to 16 Hz: ±0.1 % rdg ±0.02 % f.s. (±0.3°) 5 kHz to 10 kHz: ±1 % rdg ±0.02 % f.s. (±1.0°) 500 kHz to 1 MHz: ±30 % rdg ±0.05 % f.s.	DC to 16 Hz: ±0.1 % rdg ±0.02 % f.s. (±0.3°) 5 kHz to 10 kHz: ±1 % rdg ±0.02 % f.s. (±1.0°) 300 kHz to 500 kHz: ±30 % rdg ±0.05 % f.s.
Accuracy (DC or 45 to 66 Hz)	±0.05 % rdg, ±0.01 % f.s., phase ±0.2° (10 minutes after power is turned on)	±0.05 % rdg, ±0.01 % f.s., phase ±0.2° (DC, 16 Hz to 400 Hz)	
Max. rated voltage to earth	1000 V AC/DC (50/60 Hz)		
Core jaw dia.	φ36 mm	φ24 mm	φ24 mm
Power supply voltage	DC ±11 V to ±15 V (tracking)	DC ±11 V to ±15 V (tracking)	DC ±11 V to ±15 V (tracking)
Dimensions, mass	160W × 112H × 50D mm, 850 g, cord length: 3 m	70W × 100H × 53D mm, 340 g, cord length: 3 m	
Accessories	Mark bands (6)		

## CLAMP ON PROBE | 9010-50 | 9018-50 | 9132-50 | 9272-10 | 9555-10

### New & Improved

**CONVERSION ADAPTER 9704**  
Receiving: BNC male  
Output: Banana female

**9010-50**  
40 Hz to 1 kHz  
10 A to 500 A range  
200 mV / range output  
φ46 mm core jaw dia.

**9018-50**  
40 Hz to 3 kHz  
10 A to 500 A range  
200 mV / range output  
φ46 mm core jaw dia.

**9132-50**  
40Hz to 1kHz  
20A to 1000A range  
200mV / range output  
φ55 mm core jaw dia.






**9272-10**  
1 Hz to 100 kHz  
20 or 200 A rated  
2 V / 20 or 200 A output  
φ46 mm core jaw dia.

**SENSOR UNIT 9555-10**  
Power supply for the 9277 / 9278 / 9279, and the 9709  
Single sensor connectable  
AC ADAPTER 9418-15

# Clamp On Sensors

## For power line current measurement Voltage output (3196, 3197, 3169s, 8800s)

### SPECIFICATIONS




MODEL	9694	9660	9661	9669	9667	
						
	CAT III 300V	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V	
Primary current rating	AC 5 A	AC 100 A	AC 500 A	AC 1000 A	AC 500 A / 5000 A	
Maximum input (45 to 66 Hz)	50 A continuous	130 A continuous	550 A continuous	1000 A continuous	10000 A continuous	
Output voltage	AC 10 mV/A	AC 1 mV/A	AC 1 mV/A	AC 0.5 mV/A	AC 500 mV f.s.	
Accuracy (45 to 66 Hz)	Amplitude	$\pm 0.3 \%rdg \pm 0.02 \%f.s.$	$\pm 0.3 \%rdg \pm 0.02 \%f.s.$	$\pm 0.3 \%rdg \pm 0.01 \%f.s.$	$\pm 1.0 \%rdg \pm 0.01 \%f.s.$	$\pm 2.0 \%rdg \pm 1.5 mV$ (for input 10% or more of the range)
	Phase	within $\pm 2^\circ$	within $\pm 1^\circ$	within $\pm 0.5^\circ$	within $\pm 1^\circ$	within $\pm 1^\circ$ (minimum 10% input)
Frequency characteristic	within $\pm 1.0\%$ at 40 Hz to 5 kHz (9669: within $\pm 2.0\%$ )					
Max. rated voltage to earth	300 V rms		600 V rms		1000 V rms	
Measurable conductor diameter	Less than $\phi$ 15 mm		Less than $\phi$ 46 mm	$\phi$ 55 mm, 80 × 20 mm	Less than $\phi$ 254 mm	
Power supply	—				LR03 alkaline battery × 4 (continuous operation max. 168 hours) or AC adapter 9445-02/-03 (option)	
Dimensions and weight	46W × 135H × 21D mm, 230 g		77W × 151H × 42D mm, 360 g	99.5W × 188H × 42D mm, 590 g	Sensor: 910 mm long, 240g, Circuit: 57W × 86H × 30D mm, 140g	
	Cord length : 3 m, Output terminal : BNC terminal					

● 9667 OPTION AC ADAPTER 9445-02/-03 (DC 9 V/1 A output)

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

## For power line current measurement Voltage output (2300, 3169s)

### SPECIFICATIONS




MODEL	9695-02	9695-03	9661-01
			
	2331/3169 CAT III 300V	2331/3169 CAT III 300V	2331 CAT III 600V
Primary current rating	AC 50 A	AC 100 A	AC 500 A
Maximum input (45 to 66 Hz)	60 A continuous	130 A continuous	550 A continuous
Output voltage	AC 10 mV/A	AC 1 mV/A	
Accuracy (45 to 66 Hz)	Amplitude	$\pm 0.3 \%rdg \pm 0.02 \%f.s.$	$\pm 0.3 \%rdg \pm 0.01 \%f.s.$
	Phase	within $\pm 2^\circ$	within $\pm 1^\circ$
Frequency characteristic	within $\pm 1.0\%$ at 40 Hz to 5 kHz		
Max. rated voltage to earth	300 V rms		600 V rms
Measurable conductor diameter	Less than $\phi$ 15 mm		Less than $\phi$ 46 mm
Dimensions and weight	51W × 58H × 19D mm, 50 g		77W × 151H × 42D mm, 360 g
	Output terminal : M3 terminal Option: Connection cable 9219		Cord length : 3 m

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

● 9695 OPTION CONNECTION CABLE 9219 (for 3169, 3m)




## ZCT type leak current sensor Voltage output

### SPECIFICATIONS

MODEL	9657	9658	9675
			
	9657-10* CAT III 300V	CAT III 150V	CAT III 300V
Primary current rating	AC 1 A (9657-10; AC 10A)		AC 10 A
Maximum input (45 to 66 Hz)	AC 60 A continuous (-10: AC 30 A continuous)	30 A continuous	10 A continuous
Output voltage	AC 25 mV/A (9657-10 : AC 100 mV/A)		AC 100 mV/A
Amplitude Accuracy (45 to 66 Hz)	$\pm 1.0 \%rdg \pm 12 \mu V$	$\pm 3.5 \%rdg \pm 12 \mu V$	$\pm 1.0 \%rdg \pm 0.5 mA$
Residual current	5 mA	1 mA	1 mA
Effect of external magnetic fields	Equivalent to 5mA, 7.5A max.(with a magnetic field of 400 A/m, AC)		
Max. rated voltage to earth	300 V rms	150 V rms	300 V rms
Measurable conductor diameter	Less than $\phi$ 40 mm	Less than 12 mm × 30 mm	Less than $\phi$ 30 mm
Dimensions and weight	74W × 145H × 42D mm, 340 g (-10 : 380 g)	100 g	60W × 112.5H × 23.6D mm, 160 g
	Cord length : 3 m, Output terminal : 2P plug (for 3638)		Cord length : 3 m, BNC

## For power line current measurement: Current output (8205-10, 8206-10, 3636-20)

### SPECIFICATIONS

MODEL	9650	9651	9668
			
	3636/ 8205-10/8206-10 CAT III 300V	3636/ 8205-10/8206-10 CAT III 600V	8205-10/ 8206-10 CAT III 600V
Primary current rating	AC 100 A	AC 500 A	AC 1000 A
Maximum input (45 to 66 Hz)	130 A continuous	600 A continuous	1000 A continuous
Secondary current rating	AC 100 mA	AC 500 mA	AC 1000 mA
Amplitude Accuracy (45 to 66 Hz)	$\pm 1.5 \%rdg \pm 0.03 \%f.s.$		$\pm 3.0 \%rdg \pm 0.03 \%f.s.$
Frequency characteristic	$\pm 8\%$ or better from 40 Hz to 1 kHz	$\pm 3\%$ or better from 40 Hz to 1 kHz (deviation from accuracy)	
Max. rated voltage to earth	300 V rms	600 V rms	
Measurable conductor diameter	Less than $\phi$ 15 mm	Less than $\phi$ 46 mm	$\phi$ 55 mm, 80 × 20 mm
Power supply	—		
Dimensions and weight	46W × 135H × 21D mm, 200 g	77W × 151H × 42D mm, 340 g	99.5W × 188H × 42D mm, 550 g
	Cord length : 3 m, Output terminal : 2P plug		

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



## Clamp Testers



### Clamp Testers Index

#### Current Meters (for AC only, basic type)

 <p><b>3127-10</b> AC current, up to 300A, φ33 mm dia. ..... p.53</p>	 <p><b>3280-10</b> AC current, up to 1000A, φ33 mm dia., 100g light and 16mm slim ..... p.51</p>	 <p><b>3280-20</b> AC current, up to 1000A, φ33 mm dia., 100g light and 16mm slim True RMS ..... p.51</p>	 <p><b>3281</b> AC current, 600A, 33mm dia., CAT III 600V, True RMS ..... p.52</p>	 <p><b>3282</b> AC current, 1000A, 46mm dia., CAT IV 600V, True RMS ..... p.52</p>	 <p><b>3291-50</b> AC current, 1000A, 30mm dia., 115g light- weight, LCD Display reversible, True RMS ..... p.53</p>
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#### Current Meters (for AC/DC, two-way type)

 <p><b>3284</b> AC/DC current, 200A, 33mm dia., True RMS ..... p.52</p>	 <p><b>3285/3285-20</b> AC/DC current, 2000A, 55mm dia., Resistance measurement feature (3285-20 only), True RMS ..... p.52</p>	 <p><b>3287</b> AC/DC current, 100A, 35mm dia., True RMS ..... p.51</p>	 <p><b>3288/3288-20</b> AC/DC current, 1000A, 35mm dia., 3288-20: True RMS ..... p.51</p>	 <p><b>3290/3290-10</b> AC/DC current, 2000A, Choice of three sensors, True RMS ..... p.53</p>	 <p><b>9691/9692/9693</b> 9691 100A φ35mm 9692 200A φ33mm 9693 200A φ55mm ..... p.53</p>
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#### Leakage Current Meters

 <p><b>3283</b> AC leakage current only, min. 10mA range (10 μA resolution), Load current up to 200A, 40mm dia., True RMS ..... p.52</p>	 <p><b>3293-50</b> AC leakage current only, min. 30mA range (10 μA resolution), Load current up to 1000A, 24mm dia., LCD Display reversible, True RMS ..... p.53</p>	 <p><b>3286-20</b> Clamp-on Power Meter for AC, Various parameters (V, A, W, VA, var, PF, Hz, V-Harm, I-Harm), 55mm dia. (or 80mm busbar), True RMS ..... p.54</p>
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#### Power/Harmonic measurement

#### Conversion Adapter (for AC only, clamp-on type)

 <p><b>9290-10</b> AC current up to 1500 A, secondary current 1/10 of primary, φ55 mm dia. or 88 mm width Superior phase angle characteristics ..... p.53</p>	 <p><b>CT-101A</b> AC current up to 15 A, secondary current 1/1 or 10 times of primary, φ25 mm dia. ..... p.53</p>
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# CLAMP ON HiTESTERS

## Table of functions

	3280-10 3280-20 True RMS	3281 True RMS 3282 True RMS	3283 True RMS	3284 True RMS 3285 True RMS 3285-20 True RMS	3286-20 True RMS
AC Current ranges	42.00/420.0/1000A AC 3280-10: Average rectifier effective value 3280-20: Effective value rectifier	3281: 30.00/300.0/600A AC 3282: 30.00 /300.0/1000A AC Effective value rectifier	10.00m/100.0m/1/10/200 A AC Effective value rectifier	AC, AC+DC (RMS or Peak value) 3284: 20.00/200.0A AC 3285/3285-20: 200.0/2000A AC Effective value rectifier	20.00/200.0/1000 A AC Effective value rectifier
Other current ranges	None	Wave peak value at AC Current 3281: 75.0 to 1000A peak 3 ranges 3282: 75.0 to 1700A peak 3 ranges	None	DC (Average or Peak value) 3284: 20.00/200.0A DC 3285/3285-20: 200.0/2000A DC	None
AC Voltage ranges	4.200/42.00/420.0/600V AC 3280-10 : Average rectifier effective value 3280-20 : Effective value rectifier	300.0/600V AC Effective value rectifier	None	AC, AC+DC (RMS or Peak value) 30.00/300.0/600V AC Effective value rectifier	150.0/300.0/600 V AC Effective value rectifierNone
Other voltage ranges	DC Voltage range: 420.0m/4.2/42/20/ to 600V DC	Wave peak value at AC Voltage up to 750/1000V peak	None	DC (Average or Peak value) 30.00/300.0/600V DC	None
Other functions	Resistance: 420.0 to 42.00 MΩ, 6 ranges Accuracy: ±2.0 % rdg. ±4 dgt. (at 420 to 420 kΩ range) Continuity: 420.0Ω (Buzzer sounds at approx. 50Ω ±40Ω)	Distortion check: 1 to 5 Crest factor Resistance: 1k or 10kΩ range Temperature*: -50 to 150°C Frequency: 30.0 to 1000 Hz Mode: Slow/Peak/C.F./RMS Record mode/Auto-off/ Conduction	Frequency: 30.0 to 1000 Hz Filter function: 180Hz±30Hz/-3dB	Resistance: 1k or 10kΩ range (3285-20 only)	Power (Single-phase or 3 phase): 3kW to 600kW(Single-phase) 6kW to 1200kW(3-phase) Power factor, Phase angle: Frequency: 30.0 to 1000Hz Voltage/current harmonic levels
Analog output Printer output	None	None	DC, or AC 1V / f.s. (200A range:2V / f.s.) Level output with REC mode Waveform output with MON mode	DC, or AC 1V / f.s. Level output with REC mode Waveform output with MON mode (except for 3285-50)	9442 PRINTER (Option)
Basic Accuracy (at 50 or 60Hz)	AC current: ±1.5 % rdg. ±5 dgt. AC voltage: ±2.3 % rdg. ±8 dgt. DC voltage: ±1.3 % rdg. ±4 dgt. Continuity: ±2.0 % rdg. ±6 dgt.	AC current: ±1% rdg. ±5 dgt. AC voltage: ±1% rdg. ±3 dgt. Peak: ±3% rdg. ±5 dgt. Frequency: ±0.3% rdg. ±1 dgt.	10m to 10A range: ±1.0 % rdg. ±5 dgt. 200A range: ±1.5 % rdg. ±5 dgt. Frequency: ±0.3 % rdg. ±1 dgt.	AC current: ±1.3% rdg. ±3 dgt. AC voltage: ±1.0% rdg. ±3 dgt. Frequency: ±0.3% rdg. ±1 dgt.	AC current: ±1.3 % rdg. ±3 dgt. AC voltage: ±1.0 % rdg. ±3 dgt. Power: ±2.3% rdg. ±5 dgt.(1f) ±3.0% rdg. ±10 dgt.(3f) (Accuracy guaranteed only for 50/60Hz cosφ=1)
Frequency characteristics AC current / voltage	AC voltage: 50 to 500Hz AC current: 50 or 60Hz (3280-10) 40 to 1kHz (3280-20)	40 to 1000 Hz	40 to 2 kHz	3284: DC, 10 to 2kHz 3285/3285-20: DC, 10 to 1kHz	AC current: 45 to 1kHz AC voltage: 30 to 1kHz
Display	Digital /LCD, maximum 4199 dgt.	Digital /3000 dgt. Bar graph /35 seg.	Digital /2000 dgt. Bar graph /35 seg.	Current / 2500 dgt. Voltage / 3750 dgt. Bar graph /35 seg.	Digital /LCD, maximum 6000 dgt.
Sampling rate	2.5 times /sec or 1 time /3 sec	2 or 4 times /sec (Slow: 1 time /3 sec)	2 or 4 times /sec (Slow: 1 time /3 sec)	2 or 4 times /sec (Slow: 1 time /3 sec)	Normal: 1 time /sec (Slow: 1 time /3 sec)
Crest factor (RMS)	3280-10: None 3280-20: 2.5 or less (current measurement only)	2.5 (1.7 at 600A, 1000A, 600 V range)	2.5 (1.5 at 200A range)	3284: 2.5, 1.5 (200A range) 3285/3285-20: 1.42 (2000A range)	2.5 (1.7 at 1000 A, 600 V range)
Effect of external magnetic fields	No provision	3281: 1.5A equivalent max. at 400 A/m 3282: 0.2A equivalent max. at 400 A/m	corresponds to 5mA, max. 7.5 mA equivalent max. at 400A/m	3284: 0.5A equivalent max. at 400 A/m 3285/3285-20: 2.0A equivalent max. at 400 A/m	1.00 A equivalent max. at 400 A/m
Max. circuit voltage	600V AC rms	600V AC rms (insulated wire)	300 V AC rms (insulated wire)	600V AC rms (insulated wire)	600 V AC rms (insulated wire)
Core jaw dia.	φ33 mm	3281: φ33 mm 3282: φ46 mm	φ40 mm	3284: φ33 mm 3285/3285-20: φ55 mm	φ55 mm or 80mm busbar
Power supply	CR2032 (3 VDC) × 1	6F22 (006P) × 1	6F22 (006P) × 1 or AC adapter	6F22 (006P) × 1 or AC adapter	6LR61/6LF22 (006P) × 1
Dimensions/mass	57W × 175H × 16D mm /100 g	3281: 62W × 218H × 39D mm/350 g 3282: 62W × 230H × 39D mm/400 g	62W × 225H × 39D mm/400 g	3284: 62W × 230H × 39D mm, 460 g 3285/3285-20: 62W × 260H × 39D mm, 540 g	100W × 287H × 39D mm /650 g
Included accessories	TEST LEAD 9208 (1) CARRYING CASE 9398 (1)	TEST LEAD 9207-10 (1) CARRYING CASE 9399 (1 for 3281/3282) Hand strap (1)	CARRYING CASE 9399 (1) Hand strap (1)	TEST LEAD 9207-10 (1) CARRYING CASE (1 for 3284) 9399 CARRYING CASE (1 for 3285/3285-20) 9345 Hand strap (1)	VOLTAGE CORD 9635 (1) CARRYING CASE 9245 (1) Hand strap (1)

3287 True RMS 3288 3288-20 True RMS	3290 True RMS 3290-10 True RMS	3291-50 True RMS	3293-50 True RMS	3127-10
3287: 10.00/100.0A AC/ Effective value rectifier 3288/-20: 100.0/1000A AC 3288 Average rectifier effective value 3288-20 Effective value rectifier	3290+9691: 20.00A/100.0A AC 3290+9692: 20.00A/200.0A AC 3290+9693: 200.0A/2000A AC AC+DC, AC RMS, AC MEAN	60.00/600.0/1000 A AC	30.00 m/300.0 m/ 6.000/60.00/600.0/1000 A AC	6/15/60/150/300A AC Average rectifier effective value
DC mode 3287: 10.00 or 100.0 A DC, 2 ranges 3288/-20: 100.0 or 1000 A DC, 2 ranges	3290+9691 : 20.00A/100.0A DC 3290+9692 : 20.00A/200.0A DC 3290+9693 : 200.0A/2000A DC	None	None	None
3287: 4.200/42.00/420.0/600V AC Effective value rectifier 3288/-20: 4.200/42.00/420.0/600V AC 3288 Average rectifier effective value 3288-20 Effective value rectifier	None	None	None	150/300/750V AC Average rectifier effective value
DC mode 420.0m/4.200/42.00/420.0/600 V DC	None	None	None	DC Voltage range: 75 V DC 1 range
Resistance: 420.0Ω/4.200Ω/42.00kΩ/ 420.0kΩ/4.200MΩ/42.00MΩ Accuracy: ±2.0% rdg. ±4 dgt. (at 420 to 420kΩ range) Continuity: 420.0Ω (Buzzer sounds at approx. 50Ω ±40Ω)	Frequency : 10.00Hz/100.0Hz/1000 Hz	None	None	Resistance: 1k or 100kΩ range Temperature*: -50 to 200°C *9021-01 TEMPERATURE PROBE required, (sold separately)
None	DC.or AC Current : 2V/f.s. Level output with REC mode Waveform output with MON mode Integ./Frequency : 1V/f.s.	None	None	None
AC current: ±1.5 % rdg. ±5 dgt. AC voltage: ±2.3 % rdg. ±8 dgt. DC voltage: ±1.3 % rdg. ±4 dgt. DC current: ±1.5 % rdg. ±5 dgt. Continuity: ±2.0 % rdg. ±6 dgt.	AC/DC/AC+DC Current: ±1.3 % rdg.±3 dgt. (Typical) Frequency: ±0.3 % rdg.±1 dgt. (Typical)	AC current: ±1.5 % rdg. ±5 dgt.	AC current: ±1.5 % rdg. ±5 dgt.	AC current: ±3% f.s. AC/DC voltage: ±3% f.s.
AC current: 3287 DC, 10 to 1kHz AC current: 3288/-20 DC, 10 to 500Hz AC voltage: 30 to 500Hz	DC to 500Hz (9691) DC to 1kHz (9692, 9693) ±2.3 % rdg. + 8 dgt.	45 to 400Hz	45 to 400Hz	50 or 60 Hz
Digital /LCD, maximum 4199 dgt.	Digital / LCD maximum 3000 dgt. Bar graph / 20 seg. 3290-10 maximum 9999 dgt.	Digital /LCD, maximum 6000 dgt. Bar graph / 91 seg.	Digital /LCD, maximum 6000 dgt. Bar graph / 91 seg.	Indicator type
2.5 times /sec	3290 FAST : 4 times/sec (3290-10 AC, AC+DC FAST: 10 times/sec) Normal : 2 times/ sec Slow : 1 time / 3sec	Maxmum 1.1 sec	Maxmum 1.1 sec	None
3287: 2.5 (150A, 1000V maximum) 3288: None 3288-20: 3 (1000A/2 max, voltage/1.5 max.)	2.5 or less	2.8 1.68 (1000 A range)	2.8 1.68 (1000 A range)	None
No provision	9691 : 0.5 A equivalent max. at 400 A/m 9692 : 0.7 A equivalent max. at 400 A/m 9693 : 2.0 A equivalent max. at 400 A/m	None	7.5 mA equivalent max. at 400 A/m	No provision
600 V AC rms (insulated wire)	600 V AC rms (insulated wire)	600 V AC rms (insulated wire)	300 V AC rms (insulated wire)	600V AC rms (insulated wire)
3287: φ35 mm 3288/-20: φ35 mm	9691 : φ35 mm 9692 : φ33 mm 9693 : φ55 mm	φ30 mm	φ24 mm	φ33 mm
CR2032 (3VDC) × 1	Type 3 alkaline dry cell (LR6) × 4 or AC adapter	CR2032 (3VDC) × 1	CR2032 (3VDC) × 1	R6P (AA) × 1
3287: 57W × 180H × 16D mm/170 g 3288/-20: 57W × 180H × 16D mm/150 g	3290/-10 : 155W × 98H × 47D mm/545 g 9691 : 53W × 129H × 18D mm/230 g 9692 : 62W × 167H × 35D mm/410 g 9693 : 62W × 196H × 35D mm/500 g	50W × 136H × 26D mm/115 g	50W × 130H × 26D mm/135 g	78W × 190H × 34D mm/340 g
TEST LEAD 9208 (1) CARRYING CASE 9398 (1)	strap	CARRYING CASE 9757 (1) strap	CARRYING CASE 9757 (1) strap	TEST LEAD 9207-30 (1) CARRYING CASE (for 3127) 9351 (1)

# CLAMP ON HiTESTER

# 3280-10

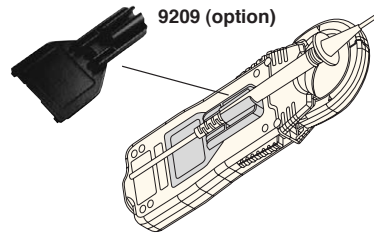


## Easy operation !

- 1000 A clamp aperture: 33 mm dia.
- 100g light and 16mm slim
- Independent-opening double-lever design
- Slim body allows easy clamping even for narrow conductors
- No metal (iron core) exposure, ensuring enhanced safety



CAT III 600 V  
(Current range)  
CAT II 600 V  
CAT III 300 V  
(Voltage range)



### OPTIONS

TEST LEADS HOLDER 9209  
LINE SPLITTER \*CT-101A

*\*Note: Non-CE mark product*

# CLAMP ON HiTESTER | 3280-20

## True RMS !

- 1000 A rms, clamp aperture: 33 mm dia.
- 100g light and 16mm slim
- Independent-opening double-lever design
- Slim body allows easy clamping even for narrow conductors
- No metal (iron core) exposure, ensuring enhanced safety



CAT III 600 V  
(Current range)  
CAT II 600 V  
CAT III 300 V  
(Voltage range)



**True RMS**



### OPTIONS

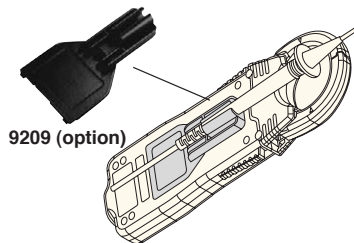
TEST LEADS HOLDER 9209  
LINE SPLITTER \*CT-101A

*\*Note: Non-CE mark product*

# CLAMP ON AC/DC HiTESTER | 3287 | 3288 | 3288-20

## Compact & easy, one-touch maintenance on all types of AC/DC equipment

- New Model 3288-20 True RMS AC/DC pocket clamp meter measuring up to 1000 A further expands the HIOKI lineup
- The 3287 can handle even cogenerator / inverter energy-saving equipment (100/1000A)
- Use the 3288 for high current measurements such as UPS emergency batteries and train motors (100/1000A)
- A slim core of only 10 mm (0.39") for easy clamping even in crowded wiring



### OPTIONS

TEST LEADS HOLDER 9209  
LINE SPLITTER \*CT-101A

*\*Note: Non-CE mark product*



**True RMS**  
3287/3288-20



CAT III 600 V  
(AC/DC A)  
CAT II 600 V  
CAT III 300 V  
(AC/DC V)



## DIGITAL CLAMP ON HiTESTER

# 3281 | 3282

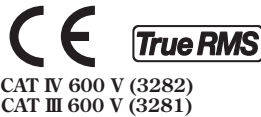
### CAT IV 600V Safety

- 3281: 600A ACrms,  $\Phi$ 33mm dia.
- 3282: 1000A ACrms,  $\Phi$ 46mm dia.
- Non-fuse type protects up to 600VAC

#### OPTIONS

THERMISTOR TEMPERATURE PROBE \*9462  
 LINE SPLITTER \*CT-101A

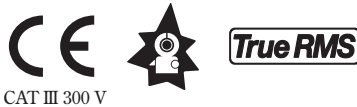
\*Note: Non-CE mark product



## CLAMP ON LEAK HiTESTER | 3283

### Easily monitor leakage current fluctuations

- High-sensitivity with a full scale of 10mA (resolution:10 $\mu$ A)
- High-accuracy at  $\pm$ 1%
- True RMS measurement
- Analyzer functions, for filtering and output signals
- Wide bandwidth, 5Hz to 15kHz (Monitor output)



#### OPTIONS

AC ADAPTER (for USA) 9445-02  
 AC ADAPTER (for EU) 9445-03  
 CLAMP ON ADAPTER 9290-10  
 LINE SPLITTER \*CT-101A  
 (cannot be used for leakage current,  
 for use on load current only)

OUTPUT CORD \*9094  
 BNC TO BANANA ADAPTER 9199

\*Note: Non-CE mark product

## CLAMP ON AC/DC HiTESTER

# 3284 | 3285 | 3285-20

### Analysis for DC to distorted waves

- 3284: 200 Arms, clamp aperture: 33 mm dia.
- 3285: 2000 Arms, clamp aperture: 55 mm dia.
- 3285-20: With resistance measurement range  
 No analog output  
 Cannot be used with AC adapter
- Inrush current crest value
- RMS value of full-wave rectified waveforms
- Waveform and harmonic analysis



#### OPTIONS

AC ADAPTER (for USA) 9445-02  
 AC ADAPTER (for EU) 9445-03  
 CLAMP ON ADAPTER 9290-10

LINE SPLITTER \*CT-101A (cannot be used for  
 DC, AC+DC current, for use on AC current only)  
 OUTPUT CORD \*9094  
 BNC TO BANANA ADAPTER 9199

\*Note: Non-CE mark product

# CLAMP ON HITESTER | 3291-50 | 3293-50



3291-50

**DIGITAL CLAMP ON HITESTER**  
**3291-50** **Flip Clamp!** **True RMS**  
 CAT III 600 V  
 CAT IV 300V

**SPECIFICATIONS**

<b>AC Current range</b>	60.00 A / 600.0A / 1000 A AC (3 ranges) Filter on : ±1.5 % rdg. ±5 dgt. at 50 or 60Hz Filter off : ±1.5 % rdg. ±5 dgt. at 45 to 66Hz Filter off : ±3.0 % rdg. ±5 dgt. at 66 to 400Hz
<b>Other functions</b>	Filter on/off (180Hz, -3dB), Display hold, Max. value hold, Auto power off, LCD Display reversible
<b>Frequency bandwidth</b>	45 to 400 Hz
<b>Sampling rate</b>	Maximum 1.1 sec
<b>Crest factor (RMS)</b>	2.8 / Max. 1.68 (1000A range)
<b>Core jaw dia.</b>	φ30 mm
<b>Power supply</b>	CR2032× 1
<b>Dimensions, mass</b>	50 mm W × 136 mm H × 26 mm D, 115 g
<b>Accessories</b>	CARRYING CASE 9757 (1), strap (1)



3293-50

**CLAMP ON LEAK HITESTER**  
**3293-50** **Flip Clamp!** **True RMS**  
 CAT III 300 V

**SPECIFICATIONS**

<b>AC Current range</b>	30.00 mA / 300.0 mA / 6.000A / 60.00 A / 600.0A / 1000 A AC (Auto range) Filter on : ±1.5 % rdg. ±5 dgt. at 50 or 60Hz Filter off : ±1.5 % rdg. ±5 dgt. at 45 to 66Hz Filter off : ±3.0 % rdg. ±5 dgt. at 66 to 400Hz
<b>Other functions</b>	Filter on/off (180Hz, -3dB), Display hold, Max. value hold, Auto power off, LCD Display reversible
<b>Frequency bandwidth</b>	45 to 400 Hz
<b>Sampling rate</b>	Maximum 1.1 sec
<b>Crest factor (RMS)</b>	2.8 / Max. 1.68 (1000A range)
<b>Core jaw dia.</b>	φ24 mm
<b>Power supply</b>	CR2032× 1
<b>Dimensions, mass</b>	50 mm W × 130 mm H × 26 mm D, 135 g
<b>Accessories</b>	CARRYING CASE 9757 (1), strap (1)



Flip clamp  
Display reversible

# CLAMP ON AC/DC HITESTER | 3290/3290-10

# CLAMP ON AC/DC SENSOR | 9691 | 9692 | 9693

## All the Functions You Need for Measurement at DC or 1Hz and Up

- Choice of three sensors (Example combinations)  
 3290+9691 : Measure up to 100A (φ35mm)  
 3290+9692 : Measure up to 200A (φ33mm)  
 3290+9693 : Measure up to 2000A (φ55mm)
- Choice of measurement methods  
 DC (for battery measurement)  
 AC+DC RMS (for full-/half-wave rectification measurement)  
 AC RMS (for current distortion measurement)  
 PEAK (for peak value measurement) of inrush current, etc.)
- Choice of output (Simultaneous output)  
 Effective value output, frequency output, waveform output
- Choice of response times (Switchable among three response times)
- LPF function (filters out unnecessary harmonics : fc=550Hz)
- 3290-10 Functions  
 Current integral measurement (obtain polarity-specific integrated DC values)  
 Operating time/duty measurement



3290-10

9692

3290

9691

**True RMS**  
 CAT III 600 V

# CLAMP ON HITESTER | 3127-10



## One meter drop-proof "Tested Tough!"

- With the range of 300 A
- Temperature measurement
- Ohmmeter circuit tested to 250 V AC over voltage-OK

**OPTIONS**

THERMISTOR TEMPERATURE PROBE	*9021-01
CLAMP ON ADAPTER ( for large AC current )	9290-10
LINE SPLITTER	*CT-101A

\*Note: Non-CE mark product

Clamp Testers

## CLAMP ON POWER HiTESTER | 3286-20

**All powerful ! Easy operation !  
True-RMS Clamp-on Power Meter !**

- Use as a single-phase power meter or power factor meter (3kW to 600kW range)
- Simple checking of three-phase lines (6kW to 1200kW range)
- Check power supply fluctuations
- 1000 A, 1000 Hz, peak and harmonic measurement
- True RMS (effective value) display method
- Optional printer (9442 PRINTER)



RS-232C PACKAGE 9636-01



9635

### SPECIFICATIONS

Measurement items	Voltage, current, voltage/current peak, effective/reactive/apparent power (Single-phase or 3-phase), power factor, reactivity, phase angle, frequency, phase detection (3-phase), voltage/current harmonic levels (up to 20th)
Measurable conductor diameter	φ55 mm (2.16") max.
Display	LCD, digital (6000 counts)
Rectification method	RMS (true root mean square value)
Display update rate	NORMAL approx. 1 time/sec, SLOW 1 time/3-sec at HARM meas. approx. 1time/2-sec
Analog response time	4 seconds or less (when input is changed from 0% to 90% of range)

### Voltage/ Current/ Power measurement

Range Table		AC Current			
		20.0 A	200.0 A	1000 A	
AC Voltage	150.0 V	Single-phase	3.000 kW	30.00 kW	150.0 kW
		*3-phase(balanced load)	6.000 kW	60.00 kW	300.0 kW
	300.0 V	Single-phase	6.000 kW	60.00 kW	300.0 kW
		*3-phase(balanced load)	6.000/12.00 kW	60.00/120.0 kW	600.0 kW
	600 V	Single-phase	12.00 kW	120.0 kW	600.0 kW
		*3-phase(balanced load)	24.00 kW	240.0 kW	600.0/1200 kW

\*3-phase power is calculated and displayed on the basis of a balanced, 50/60 Hz, sine wave input.  
For apparent power and reactive power, the unit of watts in the above table is replaced by VA and var respectively.

Effective value P.F.	0.000 (lead) to 1.000 to 0.000 (lag); 1φonly
Max. allowable current	1000 Arms cont.
Max. usable circuit voltage	600 Vrms (insulated conductor)
Effective input range	Voltage: 10 V to 600 V, Current: 1 A to 1000A, Power: 80 V to 600 V and 1 A to 1000 A
Min. Display value	Voltage: 0.6 Vrms, Current: 0.6 Arms
Display indication range (RMS value)	5 or less are zero-suppressed, and the upper limit is to 125% of the range setting (to 100% for the 1000 A range)
Circuit dynamic	2.5 or less (1000 A and 600 V range is 1.7 or less)

### Power factor/ Phase angle/ Reactivity measurement

Detection method	Phase discrimination by phase detection (zero crossing)
Power factor (cosφ)	0.000 (lead) to 1.000 to 0.000 (lag)
Phase angle	90.0° (lead) to 0.0° to 90.0° (lag)
Reactivity (sinφ)	0.000 (lead) to 1.000 to 0.000 (lag)

### Frequency measurement

Measurement range	30.0 Hz to 100 Hz (at 100.0Hz range) 100 Hz to 1000Hz (at 1000Hz range)
Min. input level	Voltage 10 Vrms-sine wave, Current 1 Arms-sine wave

### Wave peak measurement

Measurement range	150 (375 peak) / 300 (750 peak) / 600 (1020 peak) V 20 (50 peak) / 200 (500 peak) / 1000 (1700 peak) A
Effective Input Range	Effective value of sine wave is within effective input permissible in the range and within circuit dynamic

### Harmonic measurement

Measurement items	Level of each order, percentage of each order and total harmonic distortion (THD-F and THD-R)
Measurement range	Fundamental frequency 50/60 Hz
Window width	1 cycle (50/60Hz), Data points: 256 points
Window type	Rectangular
Orders analyzed	Up to 20th

### Other functions

Phase detection	Normal/ reverse/ missing (at 3-phase balanced load)
Record	MAX. value and MIN. value (Effective in the voltage, current and effective / apparent power functions)
Battery capacity	Displayed in % when the unit is powered on
Data hold	Holds display
Auto power off	Approx. 10 minutes, buzzer sounds just before power is turned off, can be extended or cancelled
Data output	RS-232C interface by optical insulating coupler

### OPTIONS

VOLTAGE CORD	9635	* PRINTER	9442
VOLTAGE CORD (3m)	9635-01	* AC ADAPTER (for 9442, for 200~240 V power lines)	9443-02
RS-232C CABLE (for 9442 printer)	9636	RECORDING PAPER (for 9442 ,10 rolls)	1196
RS-232C PACKAGE	9636-01		

\*Note: Non-CE mark product

# Field Measuring Instruments

## Field Measuring Instruments Index

### Analog Multi Meters



**3030-10** CE  
Basic type analog tester, Average rectifier  
..... p.63



**3008**  
Use for industrial power lines  
Average rectifier

### LAN Cable Tester



**3665-20** CE  
Affordable LAN cable testing, Wire-Map, Cable length, Direction-Check  
..... p.64

### Optical Power Meter



**3661-20, 3662-20** CE  
Optical loss measurement tool  
**LASER LIGHT SOURCE 3662-20**  
..... p.64

### Magnetic Field HITESTER



**3470** CE  
Magnetic field tester for home appliances  
..... p.64

### Rotation



**3403** Rotation CE  
30 to 100,000 r/min  
**3404** Rotation CE  
30 to 100,000 r/min, Max./Min./Total/Period  
..... p.62

### Digital Multi Meters (basic functions)



**3246** CE  
Pencil type DMM  
**3244-50**  
Card size DMM with emphasis on safety  
..... p.57



**3245** CE  
A card size DMM with solar charged battery, Average rectifier



**3255-50** CE  
Built tough for use with industrial power lines  
DMM, Average rectifier  
..... p.58



**3256-50, -51** CE  
Terminal shutter interlock mechanism DMM, Average rectifier  
..... p.58



**3258** CE  
Non-contact testing to safely measure voltage breaker panels  
AC 600V  
..... p.57



**3126-01** CE  
Phase detector, Rotary disk style, 110 to 480V



**3129/3129-10** CE  
Phase Detector, Non-contact types, AC 70 to 600 V(50/60 Hz) AC 70 to 1000V (3129-10)  
..... p.62

### Digital Multi Meters (multi-functional and high precision)



**3257-50, -51** CE  
Terminal shutter interlock mechanism DMM, True RMS rectifier  
..... p.58



**3801-50** CE  
Multi-function type, 51000 count display, RS-232C/USB communication, True RMS rectifier  
..... p.57



**3802-50** CE  
Low-cost type, 51000 count display, RS-232C/USB communication, True RMS rectifier



**3803** CE  
Low-cost type, 4000 count display, RS-232C/USB communication, Average rectifier  
..... p.58



**3804-50, 3805-50** CE  
Multi-function type, 9999 count display (V range), RS-232C/USB communication, True RMS rectifier (3805)



**3237, 3238, 3239** CE  
High speed DMMs  
199999 count display  
..... p.33



**3120-20, 3480-21** CE  
Voltage Detector  
AC 70 to 600 V(50/60 Hz)  
**3481-21, 3481-22** CE  
Bright LED lights  
..... p.59

### Insulation Testers



**IR4016-20, 4017-20, 4018-20** CE  
Single range IR4016-20: 500V/100MΩ  
IR4017-20: 500V/1000MΩ  
IR4018-20: 1000V/2000MΩ  
Compact and lightweight, Luminous scale indicator type  
..... p.61



**3490** CE  
3 insulation resistance ranges, continuity, plus 4000MΩ testing at the 1000V range  
Conforms to IEC 61557/60364-6-61  
..... p.61



**3453/3453-01** CE  
Testing voltage 125V to 1000V, Four ranges in one body, Compact and lightweight, Digital display, Comparator and memory function  
..... p.60



**3454-10/-11/-51** CE  
Innovative and low-cost insulation resistance tester with continuity function  
..... p.60



**3455** CE  
Testing voltage 250V to 5000V, Five ranges  
10 MΩ to 5 TΩ  
Seven ranges  
..... p.59



**3151** CE  
Grounding resistance meter, Two-wire or three-wire measurement method, Tough and durable design  
..... p.62

### Earth Testers



# DIGITAL HiTESTERS

## Table of functions

	3244-50	3246	3256-50, 3256-51 3257-50, 3257-51 (3257s are True RMS.)	3801-50 True RMS 3802-50 True RMS	3803	3804-50	3805-50 True RMS	3255-50	3030-10
DC Voltage ranges	420.0 mV to 500V, 5 ranges Best accuracy: ±0.7% rdg. ±4 dgt.	420.0mV to 600V, 5 ranges Best accuracy: ±1.3 % rdg. ±4 dgt.	420.0mV to 1000V, 5 ranges Best accuracy: ±0.5% rdg. ±2 dgt.	51mV to 1000V, 7 ranges Best accuracy 3801-50: 0.025% rdg.± 5dgt. 3802-50: 0.03% rdg.± 5dgt.	400.0mV to 1000V, 5 ranges Best accuracy: ±0.6% rdg. ±2 dgt.	999.9mV to 999.9V, 4 ranges Best accuracy: ±0.09% rdg. ±2 dgt.	999.9mV to 999.9V, 4 ranges Best accuracy: ±0.09 % rdg. ±2 dgt.	420mV to 1000 V, 5 ranges, Best accuracy: ±0.5 % rdg. ±4 dgt.	0.3V (16.7kΩ/V) 3/12/30/120/300/ 600V(20kΩ/V) Accuracy: ±2.5% f.s.
AC Voltage ranges	4.200 V to 500V, 4 ranges Accuracy: ±2.3 % rdg. ±8 dgt. Average rectifier effective value	4.2V to 600V, 4 ranges Accuracy: ±2.3% rdg. ±8 dgt. Average rectifier effective value	420.0mV to 1000V, 5 ranges Best accuracy: ±1.2% rdg. ±3 dgt. Average rectifier effective value	51mV to 1000V,7 ranges Best accuracy 3801-50: 0.4% rdg. ± 25dgt. 3802-50: 0.6% rdg. ± 25dgt.	400.0mV to 1000V, 5 ranges Best accuracy: ±2.0% rdg. ±2 dgt. Average rectifier effective value	999.9mV to 999.9V, 4 ranges Best accuracy: ±1.2 % rdg. ±5 dgt. Average rectifier effective value	999.9mV to 999.9V, 4 ranges Best accuracy: ±1% rdg. ±5dgt. Effective value rectifier	420mV to 1000 V, 5 ranges, Best accuracy: ±1.2% rdg. ±4 dgt. Average rectifier effective value	12V±4% f.s. (9kΩ/V) 30/120/300/600V ±2.5% f.s. Average rectifier effective value
Frequency characteristics at AC Voltage	50 to 500 Hz	50 to 500 Hz	50 to 500 Hz	3801-50: 20 to 100 kHz 3802-50: 30 to 30 kHz	40 to 500Hz	40 to 500 Hz	40 to 2 kHz	50 to 500 Hz	None
Resistance ranges	420.0 Ω to 42.00 MΩ, 6 ranges Best accuracy: ±2.0% rdg. ±4 dgt.	420.0Ω to 42.00MΩ, 6 ranges Best accuracy: ±2.0 % rdg. ±4 dgt.	420.0Ω to 42.00 MΩ, 6 ranges Best accuracy: ±0.7% rdg. ±2 dgt.	510Ω to 510MΩ , 7(6) ranges (3802-50) Best accuracy 3801-50: 0.05% rdg.± 5 dgt. 3802-50: 0.08% rdg.± 5 dgt.	400.0Ω to 40.00MΩ, 6 ranges Best accuracy: ±0.6% rdg. ±3 dgt.	999.9Ω to 99.99MΩ, 6 ranges Best accuracy: ±0.3 % rdg. ±3 dgt.	999.9Ω to 99.99MΩ, 6 ranges Best accuracy: ±0.3 % rdg. ±3 dgt.	420Ω to 42 MΩ, 6 ranges, Best accuracy: ±0.7 % rdg. ±4 dgt.	0 to 3kΩ (center scale 30Ω) R × 1, R × 10, R × 100, R × 1k ±3.0% of scale length
DC Current ranges	None	None	42.00μA to 10.00A, 6 ranges Accuracy: ±1.5 % rdg. ±4 dgt.	510μA to 10A, 6 ranges Best accuracy 3801-50: 0.05% rdg. ± 25 dgt. 3802-50: 0.1% rdg.± 25 dgt.	400.0μA to 10.00A, 5 ranges Best accuracy: ±1.5 % rdg. ±2 dgt.	999.9μA to 9.99A, 5 ranges Best accuracy: ±0.1 % rdg. ±3 dgt.	999.9μA to 9.99A, 5 ranges Best accuracy: ±0.1% rdg. ±3 dgt.	None	60μA/30m/300mA (300mV internal voltage drop) Accuracy: ±3% f.s.
AC Current ranges	None	None	42.00μA to 10.00 A, 6 ranges Best accuracy: ±2.5 % rdg. ±5 dgt. Average rectifier effective value	510μA to 10A, 6 ranges Best accuracy 3801-50: 0.7% rdg. ± 20 dgt. 3802-50: 0.9% rdg.± 25dgt.	400.0μA to 10.00A, 5 ranges Best accuracy: ±2.0 % rdg. ±2 dgt. Average rectifier effective value	999.9μA to 9.99A, 5 ranges Best accuracy: ±1.2 % rdg. ±5 dgt. Average rectifier effective value	999.9μA to 9.99A, 5 ranges Best accuracy: ±1 % rdg. ±5 dgt. Effective value rectifier	Main unit Accuracy 10.00A to 1000A, 7 ranges Best accuracy: ±2.0% rdg. ±4 dgt. Add the accuracy of clamp sensor	None
Frequency characteristics at AC Current	None	None	50 to 500Hz	3801-50: 20 to 100kHz 3802-50: 30 to 20kHz	40 to 500Hz	40 to 2 kHz	40 to 2kHz	None	None
Frequency ranges	None	None	0.50Hz to 500.0kHz, 5 ranges input level: 800mV to 1000V rms Accuracy: ±0.02% rdg. ±1 dgt.	99.999Hz to 999.99kHz Best accuracy 0.02% rdg. ± 3 dgt.	None	None	0.5Hz to 999.9kHz / 0.5V to 1000V rms Best accuracy: ±0.03% rdg. ±3 dgt.	None	None
Continuity	50Ω ±40Ω	50Ω±40Ω	50Ω ±40Ω or less	10Ω or less (at 510Ω range)	34.5Ω or less (at 400Ω range)	10Ω or less (at 999.9Ω range)	10Ω or less (at 999.9Ω range)	50Ω±40Ω	None
Diode check	None	judgement only 3.4 V open terminal voltage	3.4 V open terminal voltage	3.1 V open terminal voltage	3 V open terminal voltage	3.5 V open terminal voltage	3.5 V open terminal voltage	judgement only 3.4 V open terminal voltage	3 V open terminal voltage
Other functions	None	None	Voltage detect function Hold-auto function Relative function	3801-50 only: AC+DC measurement, Pulse output Common functions: Capacitance, Data hold, dBm measurement, Duty ratio/Pulse width, Temperature, 1ms peak hold Relative, Max/Min/Ave, RS-232C, USB	RS-232C, USB Data hold	Capacitance, Data hold, Refresh hold, Max/Min/Ave/ Relative/4-20mA% display, RS-232C, USB	Capacitance, Data hold, Refresh hold, Max/Min/ Ave/Relative/ 4-20mA% display, RS-232C, USB Temperature	CLAMP (ACA) function (Clamp-on probe : Option) 10A to 1000A 7ranges	Battery check: 0.9 to 1.8V, load resistance 10Ω Temperature: -20 to 150 (Thermister Temperature Probe 9021-01 is necessary, sold separately)
Auto power save	(Cancel impossible)	(Cancel possible)	(Cancel possible)	(Cancel possible)	(Cancel possible)	(Cancel possible)	(Cancel possible)	(Cancel possible)	None
Range switching	Auto	Auto or Manual	Auto or Manual	Auto or Manual	Auto or Manual	Auto or Manual	Auto or Manual	Auto or Manual	Manual
Display/Safety	Digital/LCD, maximum 4199 dgt Safety: EN61010, Pollution degree 2, CAT II 600V, CAT III 300V	Digital/LCD, with Back light max. 4199 dgt. Safety: EN61010, Pollution degree 2, CAT III 600V, CAT IV 300V	Digital/LCD, max. 4200 dgt. (all mode) max. 19999 dgt.(Frequency) Safety: EN61010, Pollution degree 2, CAT II 1000V, CAT III 600V	Digital/LCD, max. 51000 dgt. with Back light Safety: EN61010, Pollution degree 2, CAT III 1000V, CAT IV 600V	LCD, max. 4000 dgt. Safety: EN61010, Pollution degree 2, CAT II 1000V, CAT III 600V	LCD, max. 9999 dgt. Safety: EN61010, Pollution degree 2, CAT II 1000V, CAT III 600V	LCD, max. 9999 dgt. Safety: EN61010, Pollution degree 2, CAT II 1000V, CAT III 600V	LCD, max. 4199 dgt., Safety: EN61010, Pollution degree 2, CAT II 1000V, CAT III 600V	Indicator type
Bar graph display	None	None	Maximum 40 segments	Maximum 21 dots	Maximum 41 dots	Maximum 41 dots	Maximum 41 dots	None	None
Sampling rate	2.5 times /sec	2.5 times/sec	2.5 times/sec (all mode) 5 times/sec (Frequency) 25 times/sec (Bar graph)	3.75 times/sec	2.5 times/sec 13 times/sec (Bar graph)	7 times/sec (exclusive Ω range) 14 times/sec (Ω range)	7 times/sec (exclusive Hz and Ω range) 1 time/sec (Hz range) 14 times/sec (Ω range)	2.5 times/sec	None
Power supply	CR2032 × 1 batteries (Continuous use 150 hours)	CR2032 × 1 batteries (Continuous use 150 hours)	R03(AAA) × 2 dry batteries (Continuous use 100 hours)	6LR61 × 1 (9.0V) (Continuous use 50 hours)	6F22 (006P) × 1	6F22(006P) × 1 6LR61 × 1(9.0V) (continuous use 60 hours)	6F22(006P) × 1 6LR61 × 1(9.0V) (continuous use 60 hours)	R03(AAA) × 2 dry batteries (continuous use 200 hours)	R6P(AA) × 2 batteries
Dimensions/ mass	55W × 109H × 9.5D mm, 60g	30W × 182H × 26.5D mm, 80 g	76W × 167H × 33D mm, 260 g	90W × 192H × 37D mm, 940 g	76W × 167H × 33D mm, 400 g	76W × 167H × 33D mm, 390 g	76W × 167H × 33D mm, 400 g	70W × 145H × 31D mm, 210g	95W × 141H × 39D mm, 280g
Included accessories	Hard case (1)		TEST LEAD 9207-10 (1) Fuse (2) CARRYING CASE 9378 (1) (3256-50) Holster (3256-51)	TEST LEAD 3851-10 (1) Holster (1)	TEST LEAD 3851-10 (1) Holster (1)	TEST LEAD 3851-10 (1) Holster (1)	TEST LEAD 3851-10 (1) Holster (1)	TEST LEAD 9207-10 (1) fuse (1) CARRYING CASE 9371 (1)	TEST LEAD 9207-30 (1) fuse (1) CARRYING CASE 9390 (1)

# SAFETY HiTESTER | 3258

**Voltage measurement safety assured by non contact testing**

- Non-Metallic contact for optimum safety
- Capture the voltage value of covered electric wires
- Also ideal for metallic busbars and terminals
- Optimized for 400 V AC circuits



**OPTIONS**  
CARRYING CASE (included)



# PENCIL HiTESTER | 3246

**Pencil-type DMM with Penlight**

In addition to being compact, this pencil-type tester comes with auto-range and data hold functions for incredibly easy measurement of electrical and electronic circuitry.

- Full-auto ranging, 4199 count display
- Penlight brightly illuminates test points
- Overload protection to 600 V (Ω and continuity functions)



Penlight brightly illuminates test points  
**OPTIONS**  
10A SHUNT \*9081  
*\*Note: Non-CE mark product*



# CARD HiTESTER | 3244-50

**Compact! palm side body. Less than 1cm thin!**

- Only 9.5 mm thick and 60 g in weight
- 4199 count display
- Test leads fit neatly inside the case.
- Automatic power saving function saves your batteries even when you forget to turn off the power.

**OPTIONS**  
10A SHUNT \*9081 *\*Note: Non-CE mark product*

# DIGITAL HiTESTER | 3801-50

**High-precision, high-resolution, and multi-functional handy DMMs**

- Display two different parameters simultaneously
- Optional USB package for transferring data captured by the 3801-50 to a PC
- Measures the AC components in DC voltage or DC current
- 1ms peak hold mode makes it possible to capture the peak value of a waveform

**OPTIONS**

CARRYING CASE	3853	CLIP ON BASE	*9617
COMMUNICATION PACKAGE (USB)	3856-02	(for capacitance measurement)	
TEMPERATURE PROBE	*9180 to *9183	CLIP TYPE LEAD	*9618
TEMPERATURE PROBE	9472 to 9476	(for capacitance measurement)	

*\*Note: Non-CE mark product*



Field Measuring Instruments



USB 1.1  
OPTION

UL  
LISTED

CE

CAT III 600 V  
CAT II 1000 V

# DIGITAL HiTESTER 3803

## Compact and basic DMM

- 4000 count display full scale
- Average rectified RMS indication type
- Optional USB package for transferring data captured by the 3803 to a PC

### OPTIONS

CARRYING CASE	3853
COMMUNICATION PACKAGE (USB)	3856-02
HIGH-VOLTAGE PROBE	*9014

\*Note: Non-CE mark product

## DIGITAL HiTESTER

# 3256-50/-51 | 3257-50/-51

### Terminal shutter interlock mechanism

- Terminal shutter interlock mechanism exposes only the correct terminals for connection in the currently selected function
- Wide range, maximum reading 4200 digit
- High-speed response, bar graph display
- Conforms with IEC1010
- Hold-auto function automatically displays voltage or current value and resistance value

### Fail-safe!

Shutter mechanism prevents incorrect test lead connection



Voltage ranges  
Only V and COM terminals open

Single operation  
Simple operation with rotary switch



10A range  
Only A and COM terminals open

\* The above photograph shows a special model with a transparent cover.



3257-50  
(True RMS)

CE

3256-50/-51  
CAT II 1000 V  
CAT III 600 V  
3257-50/-51  
CAT III 1000 V  
CAT IV 600 V

3256-51

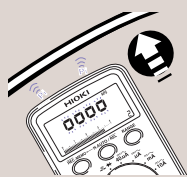
### Model

(Standard type)	3256-50
(3256-50 with holster)	3256-51
(Standard type)	3257-50
(3257-50 with holster)	3257-51

### OPTIONS

HIGH-VOLTAGE PROBE	*9014
CARRYING CASE (for 3256-51)	3853

\*Note: Non-CE mark product



### Check for live lines safely and easily

In the AC V range, the 3256-50 can be used to check whether power lines are live. When the sensitivity level is set to 4 and the test head is placed near a live power line, the built-in buzzer sounds and a display indicator lights. Sensitivity threshold: 100 V AC or higher

## DIGITAL HiTESTER 3255-50

### Tough for use on industrial power lines

- Built-in current limiter and fuse capable of withstanding 1000 V to prevent short-circuit accidents
- Wide range, maximum reading 4199 digit
- Two-terminal configuration eliminates the need for probe reconnections
- Industrial grade test leads for enhanced safety



CE  
CAT II 1000 V  
CAT III 600 V

### OPTIONS

TEST LEAD 9207-10	(Supplied as standard with the 3255-50)
CARRYING CASE 9371	(Supplied as standard with the 3255-50)

# VOLTAGE DETECTOR | 3120-20 | 3480-21 | 3481-21 | 3481-22

## Twin Light Audible Voltage Detector



- Green for Battery Check
- Red for Voltage Detection

- Bright white LED (Self battery check)
- Bright red LED and crystal audio buzzer (Voltage detection)
- Auto power off

SPECIFICATIONS		
Model	3480-21 (for 200V Installations)	3120-20 (for 100V Installations)
Measurement Function	Voltage Detection	Voltage Detection
Voltage Range	AC 90 to 600 V, 50/60 Hz	AC 70 to 600 V, 50/60 Hz
Indication	Red LED and continuous beeping sound	Red LED and continuous beeping sound
Battery Check	Green LED	Green LED
Power supply	LR44 Button alkaline batteries × 2	AAA manganese(R03) or alkaline(LR03) batteries × 2
Continuous Use	approx. 15 hours	approx. 200 hours
Dimensions, mass	20W × 126H × 15D mm, 25 g	149 mmH × φ18.5 mm, 38 g

SPECIFICATIONS		
Model	3481-21 (for use on 200 to 240V lines)	3481-22 (for use on 100 to 120V lines)
Measurement Function	Voltage Detection	Voltage Detection
Voltage Range	AC 180 to 600 V, 50/60 Hz	AC 90 to 600 V, 50/60 Hz
Indication	Red Flashing LED and Beeping Buzzer	Red Flashing LED and Beeping Buzzer
Battery Check	White LED at Power ON	White LED at Power ON
Power supply	LR44 Button alkaline batteries × 3	LR44 Button alkaline batteries × 3
Continuous Use	approx. 5 hours	approx. 5 hours
Dimensions, mass	20W × 126H × 15D mm, 30g	20W × 126H × 15D mm, 30g

# HIGH VOLTAGE INSULATION HiTESTER | 3455

**Maximum 5kV Test Voltage - Up to 5TΩ of Insulated Resistance Testing**  
**Safely evaluate the insulation characteristics of high voltage transformers, motors and cables**

- Wide voltage range (250V to 5kV) for maximum 5TΩ of insulation resistance measurements
- Automatically calculate and display the PI (Polarization Index) and DAR (Dielectric Absorption Ratio) for all types of insulation evaluations
- Temperature compensation to accurately respond to variations in insulation material
- Internal memory stores 100 blocks of manually recorded data and 10 sets of log data
- USB interface, compact rugged case, and safe design



SPECIFICATIONS	
250 V range	0.00 MΩ to 250 GΩ, Accuracy: ±5 % rdg. ±5 dgt. (0 to 2.50 GΩ) ±20 % rdg. ±5 dgt. (2.50 to 250 GΩ)
500 V range	0.00 MΩ to 500 GΩ, Accuracy: ±5 % rdg. ±5 dgt. (0 to 5.00 GΩ) ±20 % rdg. ±5 dgt. (5.00 to 500 GΩ)
1 kV range	0.00 MΩ to 1.00 TΩ, Accuracy: ±5 % rdg. ±5 dgt. (0 to 10.0 GΩ) ±20 % rdg. ±5 dgt. (10.0 to 500 GΩ) ±30 % rdg. ±50 dgt. (500 G to 1.00 TΩ)
2.5 kV range	0.00 MΩ to 2.50 TΩ, Accuracy: ±5 % rdg. ±5 dgt. (0 to 25.0 GΩ) ±20 % rdg. ±5 dgt. (25.0 to 500 GΩ) ±30 % rdg. ±50 dgt. (500 G to 2.50 TΩ)
5 kV range	0.00 MΩ to 5.00 TΩ, Accuracy: ±5 % rdg. ±5 dgt. (0 to 50.0 GΩ) ±20 % rdg. ±5 dgt. (50.0 to 500 GΩ) ±30 % rdg. ±50 dgt. (500 G to 5.00 TΩ)
Functions	Insulation resistance mode: Data memory(100 data), measurement value hold, average, bar graph display, timer etc. Leak current: (1.00nA to 1.20mA), Temperature: (-10°C to 70°C) Voltage: (DC±50V to 1kV AC 50V to 750V) All measurement mode: live wire warning, battery indicators, auto power save
Interface	USB ver 2.0 (full speed)
Display	LCD with backlight
Power supply	LR6(AA) alkaline batteries × 6, 9459 BATTERY PACK, 9753 AC ADAPTER
Dimensions, mass	260 W × 250.6 H × 119.5 D mm, 2.8 kg
Accessories	TEST LEAD (red, black, blue 3m) 9750-01 to 03, ALLIGATOR CLIPS (red, black, blue), LR6(AA) Alkaline batteries (6), USB CABLE(1)



### OPTIONS

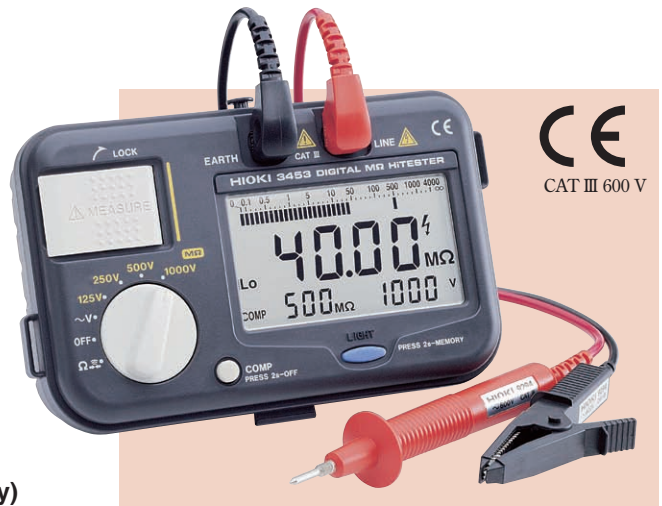
TEST LEAD (red, black, blue 3m)	9750-01 to 03
ALLIGATOR CLIPS (red, black, blue)	9751-01 to 03
TEMPERATURE SENSOR (1m)	9631-01
TEMPERATURE SENSOR (6cm)	9631-05
TEST LEAD (red, black, blue 10m)	9750-11 to 13
BATTERY PACK	9459
AC ADAPTER	9753

## DIGITAL MΩ HiTESTER

# 3453 | 3453-01

**For efficient insulation measurement!**

- One body with four ranges: 125 V/40 MΩ, 250 V/2000 MΩ, 500 V/2000 MΩ, and 1000 V/4000 MΩ
- Accurate digital display
- Insulation measurement through sight and sound
- Store data on the spot (Memorizes up to 20 data points)
- Recognizes variations of resistance
- Ability to measure AC voltage and low resistance (continuity)



### SPECIFICATIONS

Testing voltage	125 V DC	250 V DC	500 V DC	1000 V DC
Measurement range	4.000 MΩ or 40.00 MΩ	Voltage Detection		
First effective measurement range	±2 % rdg. ±3 dgt. at 0.100 to 10.00 MΩ	±2 % rdg. ±3 dgt. at 0.200 to 20.00 MΩ	±2 % rdg. ±3 dgt. at 0.200 to 50.00 MΩ	±2 % rdg. ±3 dgt. at 0.200 to 999 MΩ
Second effective measurement range	±5 % rdg. at 10.01 to 40.00 MΩ	±5 % rdg. at 20.01 to 2000 MΩ	±5 % rdg. at 50.1 to 2000 MΩ	±2 % rdg. ±6 dgt. at 0 to 0.199 MΩ ±5 % rdg. at 1000 to 4000 MΩ
Voltage with no load	Not more than 1.2 times rated testing voltage			
Min. resistance measurement value (Resistance value to maintain rated voltage)	0.125 MΩ	0.250 MΩ	0.500 MΩ	2.000 MΩ
Shorting measurement current	1.2 mA max.			0.6 mA max.
Response time	Infinity to center, infinity to zero-MΩ within 5 second (within accuracy range)			
Low resistance (continuity)	±2 % rdg. ±8 % dgt. at 0 to 400.0Ω (aural warning below: 30Ω), Open terminal voltage: 4 V max.			
AC voltage range and accuracy	±3 % rdg. ±8 dgt. at 0 to 600 V, 50 to 60 Hz, Input resistance: 170 kΩ			

### Common SPECIFICATIONS

Discharge function : effective  
 Display : Digital/4000 dgt. LCD, Bar graph/42 seg. with backlight  
 Functions : Insulation resistance mode: comparator, memory (20 data), measurement value hold, auto discharge, bar graph display (measurement switch ON); insulation resistance; measure switch OFF: voltage across measurement terminals), auto display of measurement value 1 minute after measurement start, All measurement mode: live wire warning, battery indicators, auto power save  
 Sampling rate : 2 times/second  
 Dimensions : 155W × 98H × 80D mm, 500g  
 Power supply : R6P(AA) × 4 or LR6(AA) × 4  
 Accessories : TEST PROBE 9294(1), display cover and suspension band(1)

### OPTIONS

- BREAKER PIN \*9288
- TEST PROBE \*9289
- \*Note: Non-CE mark product*



3453-01: Includes semi-hard case

## DIGITAL MΩ HiTESTER

# 3454-10/-11/-51

**Revolutionary insulation resistance tester with continuity function all in one low price**

- 25V/125V/250VDC (3454-10)
- 250V/500V/1000VDC (3454-11, 3454-51)
- 200mA current continuity
- Compact storage without disconnecting test probes



**3454-11/-51**  
 Test voltage:  
 250V / 500V / 1000V DC  
 3454-51:  
 Non-CE mark product



### OPTIONS

- TEST PROBE 9294 TEST PROBE \*9289
- BREAKER PIN \*9288 CONNECTOR CORD 9257

*\*Note: Non-CE mark product*

### SPECIFICATIONS

Model	3454-10	3454-11/51
Insulation testing voltage	50 V DC / 125 V DC / 250 V DC / 500 V DC	250 V DC / 500 V DC / 1000 V DC
Measurement range	4.000/40.00/400.0/200.0 MΩ, 400.0/2000 (250V/500V range only) MΩ	4.000/40.00/400.0/500.0 MΩ, 4000 (1000V range only) MΩ
Accuracy	1st effective range: ±3 %rdg. ±4 dgt. / 2nd effective range: ±5 %rdg. ±5 dgt.	
Voltage with no load	Not more than 1.2 rated measurement voltage	
Short circuit current	1.2 mA max.	
Response time	∞ to center, ∞ to 0 MΩ within 5 s (within accuracy range)	
Low resistance (continuity)	Measurement range: 40.00 / 400.0 / 4.000 k / 40.00 k / 400.0 k / 4.000 MΩ Short circuit current: 200 mA Accuracy: ±3 %rdg. ±6dgt. (±5 %rdg. ±6dgt. at 400 kΩ range or higher) Open terminal voltage: 4 to 6 V Response time: 5 s max.	
AC voltage	Display indication range: 0 to 750 V Accuracy: ±3 %rdg. ±6 dgt.(up to 600V), Frequency range: 50 / 60 Hz, Input impedance: 100kΩ	
Accessories	TEST PROBE (for 3454-11/3454-10) 9294, TEST PROBE 9289. Alligator Clips (for 3454-51), Strap band (1)	

- Other functions: Insulation and low resistance mode - comparator, measurement value hold; Insulation resistance mode - auto discharge; insulation and AC voltage mode - live wire warning (when voltage of 70V ±10V exists across measurement terminals); Low resistance mode - zero adjust; All measurement modes - battery indicators, auto power save
- Display update rate: 2 times / second
- Power source: R6P manganese battery×4 or LR6 alkaline battery×4
- Dimensions and Mass: Approx. 175 W×148 H×56 D mm; Approx. 530g (with display cover closed)

# ANALOG MΩ HiTESTER

## IR4016-20 to IR4018-20

Reliable and Efficient Insulation Testing in the field

- Single range insulation resistance meters
- Luminous scale lets you see better in the dark
- Drop proof (1m)

### Common SPECIFICATIONS

Discharge function : effective  
 Power source : Rated power voltage: 1.5 VDC× 4, LR6 alkaline battery × 4  
 Dimensions, mass : 159W × 177H × 53D mm, 610 g (including battery, not including test lead)  
 Accessories : TEST LEAD 9787(1), Shoulder strap(1)  
 Safety : EN61010, EMC EN61326, EN61557-1/-2



CE  
 CAT III 600 V

### OPTIONS

- TEST LEAD WITH REMOTE CONTROL SWITCH (1m) 9788
- COMPLETE TEST LEAD WITH REMOTE CONTROL SWITCH (1m) 9788-01
- TIP PIN (replacement pin for Model 9788) 9788-90
- TEST PROBE (1.2m) 9294
- CONNECTION CORD (1.3m) 9257
- MAGNETIC ADAPTER (for Models 9788, 9788-01, 9787) 9804-02

### SPECIFICATIONS

Model	IR4016-20	IR4017-20	IR4018-20
Testing voltage	500 V DC	500 V DC	1000 V DC
Rated resistance	100 MΩ	1000 MΩ	2000 MΩ
First effective measurement range and tolerances	±5 % of scale indication at 0.1 to 50 MΩ	±5 % of scale indication at 1 to 500 MΩ	±5 % of scale indication at 2 to 1000 MΩ
Second effective measurement range and tolerances	±10 % of scale indication at 0.01 to 0.1 MΩ, 50 to 100 MΩ	±10 % of scale indication at 0.5 to 1 MΩ, 500 to 1000 MΩ	±10 % of scale indication at 1 to 2 MΩ, 51000 to 2000 MΩ
Lower limit measurement resistance value to be maintained reted output voltage	0.5 MΩ	0.5 MΩ	1 MΩ
Open circuit voltage	1 to 1.2 times of rated output voltage		
Rated current	1mA (Tolerance: 1 to 1.2 times of the rating value)		
AC voltage range	0 to 600 V (50/60 Hz), ±5% of maximum scale value accuracy		
Input resistance	500 kW or more (50/60Hz)		

# ANALOG MΩ HiTESTER

## 3490

Insulation Testing in 3 Easy Steps  
 Flip the Cover, Select Range & Test

- 3-range testing voltage, Insulation meter
- Continuity check, 3Ω range via 200mA testing
- Luminous scale
- Check for live circuits
- Check for the battery status



CE  
 CAT III 600 V

### SPECIFICATIONS

Testing voltage	250 V DC	500 V DC	1000 V DC
Rated resistance	100 MΩ	100 MΩ	4000 MΩ
Accuracy	±5 % of indicated value	±5 % of indicated value	±5 % of indicated value
1st effective measuring range	0.05 to 50 MΩ	0.05 to 50 MΩ	2 to 1000 MΩ
Rated measurement current	1 mA		
Low resistance	3 Ω range, ±0.09 Ω accuracy, 200 mA DC measuring current, 4.1 to 6.9 V open-circuit voltage	30 Ω range, ±0.9 Ω accuracy, 20 mA DC measuring current, 4.1 to 6.9 V open-circuit voltage	
AC voltage range	0 to 600 V (50/60 Hz), ±5 % of maximum scale value accuracy		
Other functions	Luminous scale, Battery status check, Live circuit check		
Power consumption	AA alkaline (LR6) battery × 4, Continuous use: 20 hours (at 500 V range, no load)		
Dimensions, mass	159 mm (6.26 in) W × 177 mm (6.97 in) H × 53 mm (2.09 in) D, 610g (21.5 oz.)		
Accessories	Test lead 9787 × 1, Operation manual × 1, Shoulder strap × 1, AA alkaline battery (LR6) × 4		

### OPTIONS

- TEST LEAD WITH REMOTE CONTROL SWITCH 9788
- TEST PROBE 9294
- CONNECTION CORD 9257



## EARTH HiTESTER 3151

Stable measurement for earth resistance

- Measurement range for grounding resistance increased to 115 % of normal range
- Elastomer rotary knob fits the hand perfectly.
- Select the "simple" two-wire measurement method, using a low ground conductor such as the ground side of a commercial power supply, or the conventional three-wire measurement method
- Select a measurement frequency to reduce the influence of harmonics of the power supply frequency on the ground current



### SPECIFICATIONS

Measurement item	Grounding resistance, Grounding voltage
Measurement ranges	10Ω (0 to 11.5Ω) to 1000Ω (0 to 1150Ω), 3 ranges / 30V (0 to 30 VAC), 1 range *Using the two-wire measurement method; applied to 100Ω/1000Ω range only.
Operating method	AC phase difference
Open terminal voltage	50V AC max.
Measurement current	15mA AC max. *3mA AC max. using two-wire method.
Measurement frequency	575Hz or 600 Hz selectable
Basic accuracy	Grounding resistance: ±2.5% f.s., Grounding voltage: ±3% f.s.
Power supply	R6P (AA), 6 pieces (at least 500 operations) or LR6 (AA), 6 pieces (at least 1400 operations) *Operating time: 30 second measurement, 30 second off
Dimensions, Mass	164W × 119H × 88D mm, 800g (main unit only)
Accessories	AUXILIARY EARTHING ROD(2) 9214, MEASURING CABLE 9215 (one earth: black 5m, yellow 10m, red 20m, 9216 CABLE WINDER: 3), CARRYING CASE 9393(1)

### OPTIONS

EARTH NET (set of two) 9050  
\*Use in location where there is no driven-in ground and where water seepage is present

## PHASE DETECTOR 3129 | 3129-10

Non-Metallic Contact for Optimal Safety

### SPECIFICATIONS

Measurement Function	Phase detection (positive, negative), live wire check (R-S/S-T only)	
Voltage Detection Method	Electrostatic induction method	
Voltage Range	70V to 600V AC(50/60Hz)(sine wave, continuous input) (3129) 70V to 1000V(3129-10)	
Clamp Diameter	φ2.4 to 17mm max. (3129), φ7 to 40mm (3129-10)	
Display	Phase Detection	Positive:4 LEDs lit in clockwise order and 3 short beeps Negative:4 LEDs lit in counterclockwise order and one continuous beep
	Live Wire Check	R-S and S-T lamps will light if voltage between wires are within voltage range
	Battery Check Function	ON lamp blinks to indicate battery low status when instrument is turned on
Auto Power Off	Auto shut off if no activity is detected after power is turned ON for 15 minutes	
Power Supply	Two "AA" size batteries; rated voltage: DC3.0V; maximum rated power: 300mVA; continuous use: approx.70 hours (standby)	
Dimensions, Mass	70W×75H×30D mm, 200g (3129), 240g (3129-10) Cord length:0.7m	
Accessories	Carrying case (1), strap (1), R6P manganese battery (2), spiral tube (1)	



3129 CAT III 600 V  
3129-10 CAT IV 600 V  
CAT III 1000 V

4 magnets on the rear panel



Improved Efficiency

## TACHO HiTESTER 3403 | 3404

Precise rotation speed meter



3404

3403

### OPTIONS

REFLECTIVE TAPE 9211 (30 pieces/sheet, 10 sheets/1set, 12 mm × 12 mm/1 piece size)	METAL CONTACT TIP 9032
CONTACT ADAPTER SET 9213 (include 9032 × 2, 9033 × 2, 9212 × 1)	RUBBER CONTACT TIP 9033
	PERIPHERAL RING 9212

### 3403 SPECIFICATIONS

Measurement ranges	r/min: rotation per minute, r/s: rotation per second r/min: (30.00 to 199.99) range to (20000 to 99990) range, 4 ranges, r/s: (0.5000 to 1.9999) range to (200.0 to 1600.0) range, 4 ranges
Sampling period	0.5 second to 2 seconds
Detection distance	Distance of 50 mm to 200 mm
Analog output	None
Power Supply	R6P (AA) × 4 (continuous use of 17 hours) or AC Adapter (6 V, 300 mA, 100V only)
Dimensions, Mass	62W × 180H × 38D mm, 260 g
Accessories	REFLECTIVE TAPE(1Sheet) 9211, Carrying case(1)

### 3404 SPECIFICATIONS

Measurement ranges	r/min: (30.00 to 199.99)range to (20000 to 99990)range, 4 ranges (at slow sampling mode) r/s: (0.5000 to 1.9999)range to (200.0 to 1600.0)range, 4 ranges (at slow sampling mode) Total: Total rotation counts from 0 to 599999 Period: Measure rotation pulses from 600μs to 2 sec.
Sampling period	Slow: 0.5 sec. to 2 sec., Fast: 0.1 sec. to 0.5 sec.
Detection distance	Distance of 50 mm to 200 mm
Analog output	1V DC at full-scale range output
Power Supply	R6P (AA) × 4 (continuous use of 16 hours) or AC Adapter (6 V, 300 mA, 100V only)
Dimensions, Mass	62W × 180H × 38D mm, 260 g
Accessories	REFLECTIVE TAPE (1Sheet) 9211, OUTPUT CORD 9094(1), Carrying case (1)

# BATTERY HiTESTER 3554

## The New Standard for Assessing Deterioration of Lead-acid Batteries

- Ideal for testing UPS batteries
- Auto Hold and Auto Memory
- Store up to 4800 sets of battery data
- Averaging function



SPECIFICATIONS	
Resistance Range	3.100m/31.00 m/310.0 m/3.100 Ω
Accuracy	±0.8 %rdg.±6 dgt.; 3.000 mΩ range only: ±1.0 %rdg.±8 dgt.
Voltage Range	±6.000 V/60.00 V
Accuracy	±0.08 %rdg.±6 dgt.
Temperature Measurement Range	-10.0°C to 60.0°C (when used with 9460)
Accuracy	±1°C
Measurement Frequency	1 kHz ± 30 Hz
Measurement Current (Range)	150 mA (3 m/30 mΩ), 15 mA(300 mΩ), 1.5 mA(3 Ω); Open terminal voltage: 5 V max.
Max. Allowable Voltage	60V DC (No AC input allowed)
Comparator	Primary and secondary resistance limits, minimum voltage limit
No. of Comparator Settings	200
Data Storage	4800 sets(date & time, resistance, voltage, temperature, comparator value, judgement decision)
PC interface	USB (with bundled software for data transfer to PC)
Power Supply	AA (LR6) Alkaline Batteries × 8 for up to 10 hours of continuous use
Dimensions & Mass	192W×121H × 55D mm, 790 g
Accessories	9465-10 PIN TYPE LEAD (1), USB cable (1), Application software CD (1), Carrying case (1), Strap (1), LR6 alkaline batteries (8), Replacement fuse (1), Zero adjustment board (1)

OPTIONS	
CLIP TYPE LEAD Temperature Sensor	9460
PIN TYPE LEAD Lead	9772
REMOTE CONTROL SWITCH	9466
LARGE CLIP TYPE LEAD (non CE mark)	*9467
TIP PIN (for 9465-10)	9465-90
TIP PIN (for 9772)	9772-90
PIN TYPE LEAD (bundled with standard 3554)	9465-10

# BATTERY HiTESTER 3555

## Instantaneous determination of battery deterioration

- Ideal for testing compact storage batteries
- Three-rank rating of battery state: Pass, Warning, or Fail



SPECIFICATIONS	
Resistance Measurement	300 mΩ to 30Ω, 3 ranges, 100mΩ resolution max.
Voltage Measurement	3 or 30V DC, 2 ranges, 1 mV resolution max.
Sampling rate	1.25 times/second
Comparator functions	Setting: Upper and lower limit, for resistance, and lower limit for voltage; Output: LED, beep
Power Supply	LR6(AA), 6 pieces (Continuous use of 18 hours)
Dimensions, Mass	196W × 130H × 50D mm, 680g (including batteries)
Accessories	9461 PIN-TYPE LEAD (1), LR6 (6)

OPTIONS	
LARGE CLIP TYPE LEAD	*2 9467
PIN TYPE LEAD	*1 9455
CLIP TYPE LEAD	9287-10
CARRYING CASE	9382
ZERO ADJUSTMENT BOARD(when 9461 or 9465 is used)	9454
PIN TYPE LEAD	9770
PIN TYPE LEAD	9771

\*1Note: The 9455 probe is a precision instrument. Exercise appropriate care when handling it.  
\*2Note: Non-CE mark product

# HiTESTER 3030-10

## Basic tester with improved safety features

- Protected against transient voltages up to 250 V AC, preventing electric shock accidents before they can happen
- Drop proof design withstands dropping onto a concrete floor from a height of 1 meter
- LED check function
- Temperature measurement support (with optional probes)
- CE marking



SPECIFICATIONS	
DC Voltage range	0.3 V (16.7 k-ohm/V), 3/12/30/120/300/600 V (20 k-ohm/V) Accuracy: ±2.5 % f.s.
AC Voltage range	12 V (9 k-ohm/V) Accuracy: ±4 % f.s. 30/120/300/600 V (9 k-ohm/V) Accuracy: ±2.5 % f.s. Average rectifier effective value
Resistance range	0 to 3 k-ohm (center scale 30 ohm), R × 1, R × 10, R × 100, R × 1 k ±3 % of scale length
DC Current range	60 μA/30 m/300 mA (150 mV internal voltage drop) Accuracy: ±3 % f.s.
Other functions	Battery check: 0.9 to 1.8 V, load resistance 10 ohm Temperature: -50 to 150 °C ( 9021-01 Thermister Temperature Probe is necessary, sold separately)
Safety considerations	Complies with EN61010-1:1992+A2:1995, EN61010-2-031:1994, Installation Category III (anticipated transient overvoltage 6000 V), Pollution Degree 2
Power supply	R6P(AA) × 2 batteries
Dimensions, mass	95 mm(3.74 in)W × 141 mm(5.55 in)H × 39 mm(1.54 in)D, 280 g (9.9 oz)
Accessories	TEST LEAD 9207-30 (1), fuse (1), CARRYING CASE 9390 (1)

To prevent electric shock, a fuse for protection up to a commercial power supply of 250V is integrated into the internal circuitry of Model 3030-10. Please note that the fuse is not intended for preventing damage to the unit.

OPTIONS	
THERMISTER TEMPERATURE PROBE 9021-01	for temperature measurement
*HIGH-VOLTAGE PROBE 9017	up to 30 kV DC
*Note: Non-CE mark product	



## LAN CABLE HiTESTER | 3665-20

Identify the 3 most important criteria for proper networking at a glance

- Wire map check : Detect split pairs with wiring check
- Cable length : Get NVP-Enhanced measurement accuracy
- Direction check : Identify up to 21 cable destinations



SPECIFICATIONS	
Measurable cable	Twisted-pair cable 100Ω characteristic impedance, shielded and unshielded, CAT 3, 4, 5, 5e and 6
Compatible connectors	RJ-45 plugs
WireMap check	Wiring condition and shielding can be confirmed using the HIOKI TERMINATOR 9690 Detectable errors: open, short, reversed, transposed, split pairs and other miswiring
Cable length check	Measurable lengths: 2 to 300 m, 6.6 to 984 ft Measurement accuracy: ± 4% rdg. ± 1 m, ± 4% rdg. ± 3.3 ft Display resolution: 0.1 m, 0.3ft
Direction check	Up to 21 cables can be identified using the supplied TERMINATOR 9690 and optional Models 9690-01 to 9690-04
Display	128 × 64 dot matrix LCD (with backlight)
Functions	Auto Backlight: pressing a button turns the backlight on (it turns off automatically after about 20 seconds) Beeper: sounds when pressing buttons and when measurement results are displayed Energy-Saving Mode: enter into energy-saving mode after measurement (and resume when the TEST button is pressed) Auto Power Save: the 3665-20 turns off automatically about 10 minutes after the last button press Battery Check: Battery indicator blinks when voltage falls below 2.4 V Unit Switch: Select between meters or feet
Power supply	Two AA-size (LR6) alkaline batteries 1.4VA Approx. 50 hours
Dimensions, mass	Approx. 85 W × 130 H × 33 D mm, approx. 160 g
Accessories	TERMINATOR 9690 (1) CARRYING CASE (1) (Stores the HiTESTER 3665-20 and TERMINATORS 9690)

## OPTICAL POWER METER | 3661-20

### LASER LIGHT SOURCE | 3662-20

Test for Optical Loss in Fiber Optic Cables

#### 3661-20 SPECIFICATIONS

Measurement functions	Optical power measurement (dBm) Measure absolute value of input optical power Optical loss measurement (dB) Automatically compare measured power with previously input reference value to calculate and display loss
Calibration wavelength	850 nm, 1310 nm, 1550 nm
Range	-60 dBm to +9 dBm (auto range)
Accuracy	±0.22 dB (±5 %) at -10dBm, CW, 23°C ±5°C
Connector	FC, SC (using optional connector adapter)
Fiber type	Single mode, multi mode (core dia. 62.5mm max. NA: 0.275 max.)
Light receiver	InGaAs (dia. 1 mm)
Memory	Max. 1000 data per wavelength
Power supply	LR6(AA) alkaline battery × 4, 0.5 VA
Dimensions and mass	Approx. 85W × 192H (including 36 mm cover) × 35D mm, Approx. 300g (without batteries)



#### 3662-20 SPECIFICATIONS

Light-emitting element	Laser diode
Output connector	FC, SC (using optional connector adapter)
Fiber type	Single mode
Output mode	Continuous wave (CW) or modulated light (270 Hz, 1 kHz, 2 kHz)
Output wavelength	1550±20 nm (3662-20)
Power supply	LR6(AA) alkaline battery × 2, 0.6 VA
Dimensions and mass	Approx. 76W × 159H (including 36 mm cover) × 35D mm, Approx. 180g (without batteries)

## MAGNETIC FIELD HiTESTER | 3470

### MAGNETIC FIELD SENSOR | 3471 | 3472

Test the magnetic field effect of home appliances against human exposure (for IEC62233, EN50366, ICNIRP1998)

#### 3470 SPECIFICATIONS

Magnetic flux density (Band)	10 Hz to 400 kHz / 10Hz to 2 kHz / 2kHz to 400 kHz
Exposure level	General Public/Occupational
Measurement ranges	Magnetic flux density : 2.000μT / 20.00μT / 200.0μT / 2.000mT Exposure level : 20.00% / 200.0% / 2000%
Display	Indicated axis (x,y,z,R) / Magnetic flux density / Exposure level (LCD Display)
Accuracy (with a 3471 or 3472)	±3.5%rdg., ±0.5%f.s.
Output	200 mV/l.s. (for single axis of each range) 3-axis waveform output, resultant RMS output
Interface	USB ver.1.1
Power supply	Four LR6 alkaline battery 1.5V (Battery life : Approx. 10 hours) Or 9445-02 AC Adapter, 9445-03 AC Adapter
Dimensions, mass	100 W × 150 H × 42 D mm, 870 g (batteries included)
Accessories	CD (PC application software), USB cable (1), LR6 alkaline battery (4), Carrying Case (1)



#### 3470-01 Package:

- MAGNETIC FIELD HiTESTER 3470 × 1
- MAGNETIC FIELD SENSOR (3-axis, 100cm<sup>2</sup> sensor) 3471 × 1
- AC Adapter 9445-02 or -03 × 1

#### 3470-02 Package:

- MAGNETIC FIELD HiTESTER 3470 × 1
- MAGNETIC FIELD SENSOR (3-axis, 100cm<sup>2</sup> sensor) 3471 × 1
- MAGNETIC FIELD SENSOR (3-axis, 3cm<sup>2</sup> sensor) 3472 × 1
- AC Adapter 9445-02 or -03 × 1
- Extension Cable 9758 × 1
- Output Cable 9759 × 1

#### 3471 SPECIFICATIONS

Sensor cross-sectional area	100 cm <sup>2</sup>
Rated magnetic flux density	2 mT at a single axis (There is a derating characteristics dependent on frequency)
Frequency characteristics	10 Hz to 400 kHz
Measured axes	x, y, z
External dimensions	Approx. φ122 × 295 (L) mm
Weight	Approx. 220 g

(for IEC 62233, EN 50366)

#### 3472 SPECIFICATIONS

Sensor cross-sectional area	3 cm <sup>2</sup>
Rated magnetic flux density	2 mT at a single axis (There is a derating characteristics dependent on frequency)
Frequency characteristics	10 Hz to 400 kHz
Measured axes	x, y, z
External dimensions	Approx. φ27 × 165 (L) mm
Weight	Approx. 105 g

# Options & Peripherals

## METER RELAY | 2103 | 2104

### Advancing power saving and automation

- Electronic design assures high accuracy and reliability
- Ultra sensitive 1μA, 10 mV DC movement
- Includes a display lamp to illuminate movement at a glance
- Relay action delays circuit closure upon power on
- Both power circuitry and relay built-in

#### Standard SPECIFICATIONS

<b>Meter class</b>	2103: ±2.5% class, 2104: ±1.5% class
<b>Deflecting range</b>	Passing type, full scale
<b>Setting pointer</b>	Lance shape, upper limit and lower limit pointer
<b>Setting accuracy</b>	±1.5% of scale length
<b>Minimum setting width</b>	Within 3% of scale length
<b>Relay power delay circuit</b>	Approx. 2 second
<b>Relay output response</b>	Approx. 0.5 second
<b>Output contact capacity</b>	5A (under condition of 250V AC, 30V DC, resistance load)
<b>Power supply</b>	100 or 200V AC ±10%, 3VA max.

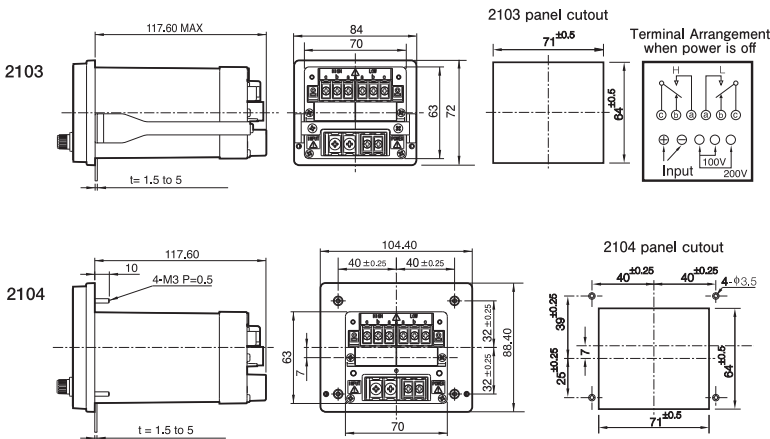
#### OPTIONS

(Special specifications)

- **±1.5% class:** for Model 2103
- **Extended scale:** double or triple extended scale
- **Segmented scale:** magnified scale for up to 40 % of the maximum scale value
- **Double deflection meter:** for example, zero-centered scale
- **Relay response time:** time constant 0.05 second fixed (DC) and variable types also available
- **Delay time:** Version with variable delay time after power on. 0.1 to 10 seconds: (for instruments input DC), 2 to 12 seconds: (for instruments input AC)
- **Output signal:** Version with 1 V DC /f.s. output terminal  
\*not isolated from input circuit ground.
- **Power supply:** Version with 110, 120, 220, 230, 240 V AC ±10 %



#### ■ Dimensions



#### ■ Standard Scale Graduations

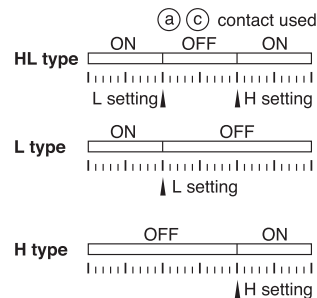
Full-Scale Value	Graduations	Graduation Illustration
1,10,100	50	0 2 4 6 8 10
1.5,15,150	30	0 5 10 15
2,20,200	40	0 5 10 15 20
2.5,25,250	50	0 5 10 15 20 25
3,30,300	30	0 1 2 3
4, 8, 40	40	0 1 2 3 4
5,50,500	50	0 1 2 3 4 5
6,60,600	30	0 2 4 6
7.5,75,750	37.5	0 2 4 6 7.5

#### ■ Standard Full-Scale Values

DC Ammeter		DC Voltmeter		Rectifying AC Ammeter		Rectifying AC Voltmeter		
Std. Full-Scale Value	Meter Sensitivity Spec.	Std. Full-Scale Value	Meter Sensitivity Spec.	Std. Full-Scale Value	Meter Sensitivity Spec.	Std. Full-Scale Value	Meter Sensitivity Spec.	
1 μA	50mV	10 mV	100kΩ/V	200 μA	50mV	50 mV	10kΩ/V	
10		15	100kΩ/V	500		100	10kΩ/V	
20		30	100kΩ/V	1 mA		150	10kΩ/V	
50		50 <sup>*1</sup>	100kΩ/V	2		300	10kΩ/V	
100		100	100kΩ/V	5		500	1kΩ/V	
200		150	100kΩ/V	10		1 V	3	1kΩ/V
500		300	100kΩ/V	20		1.5	5	1kΩ/V
1 mA		500	10kΩ/V	50		5	10	1kΩ/V
2		1 V	10kΩ/V	100		5	15	1kΩ/V
5		1.5	10kΩ/V	200		10	30	1kΩ/V
10	3	10kΩ/V	500	15	50	1kΩ/V		
20	5	10kΩ/V	1 A	30	100	1kΩ/V		
50	10	10kΩ/V	2	50	150	1kΩ/V		
100	15	10kΩ/V	3	100	300	1kΩ/V		
200	30	10kΩ/V	5 <sup>**2</sup>					
500	50	10kΩ/V						
1 A	100	10kΩ/V						
2	150	10kΩ/V						
5	300	10kΩ/V						
10								
20								
<b>Full-Scale:</b> 4-20mA	50mV	<b>Full-Scale:</b> 1-5V	10kΩ/V					

- When the full-scale value is larger than 20A, an external shunt device is used with the 50-mV instrument denoted by <sup>\*1</sup>.
- When the full-scale value is larger than 5A, an external CT is used with the 5A instrument denoted by <sup>\*\*2</sup>.

#### ■ Contact operation



## Options & Peripherals

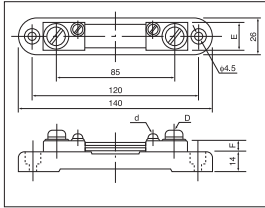
### EXTERNAL SHUNTS

## HS-1 | HS-2

Used with a 50mV full scale meter

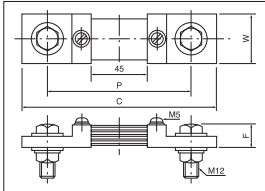
## CT-2MR | CT-5MRN

CURRENT TRANSFORMER



HS-1

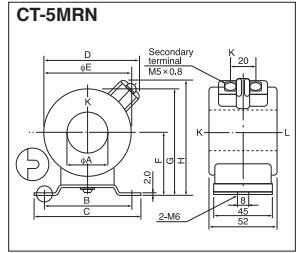
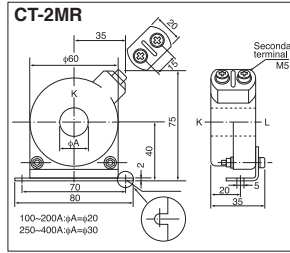
HS-1 SPECIFICATIONS	
Model & rated current	HS-1(30A), HS-1(50A), HS-1(75A), HS-1(100A), HS-1(150A), HS-1(200A), HS-1(300A)
Accuracy (50/60 Hz)	JIS-Class0.5 (±0.5% at rated current)
Rating	50 mV
Dimensions, mass	30A type:20(E), 6(F),M4(d), M5(d) mm, 110g 50A type:20(E), 8(F),M4(d), M8(d) mm, 150g 75A type:20(E), 8(F),M4(d), M8(d) mm, 150g 100A type:20(E),15(F),M5(d), M8(d) mm, 250g 150A type:20(E),15(F),M5(d), M8(d) mm, 250g 200A type:25(E),15(F),M5(d),M10(d) mm, 320g 300A type:25(E),15(F),M5(d),M10(d) mm, 330g
Accessories	None



HS-2

HS-2 Standard SPECIFICATIONS	
Model & rated current	HS-2(500A), HS-2(750A), HS-2(1000A)
Accuracy (50/60 Hz)	JIS-Class0.5 (±0.5% at rated current)
Rating	50 mV
Dimensions, mass	500A type:115(P),155(C),45(W),20(F)mm,740g 750A type:135(P),175(C),60(W),30(F)mm 1000A type:135(P),175(C),60(W),30(F)mm
Accessories	None

Note: The total resistance of the connection cord must be 0.1Ω or less.



### CT-2MR SPECIFICATIONS

Model & rated current	CT-2MR(250A), CT-2MR(300A)
Accuracy (50/60 Hz)	JIS-Class1.0 (±1% of rated value)
Rated load	2VA
Secondary current	5A (all models)
Conductor voltage rating	1150VAC
Dimensions	See figure
Accessories	None

### CT-5MRN SPECIFICATIONS

Model & rated current	CT-5MRN(100A), CT-5MRN(120A), CT-5MRN(150A)
Accuracy (50/60 Hz)	JIS-Class1.0 (±1% of rated value)
Rated load	5VA
Secondary current	5A (all models)
Conductor voltage rating	1150VAC
Dimensions	A:23(φA),70(B),85(C),65(D),60(φE),45(F),75(G),83(H) mm
Accessories	None

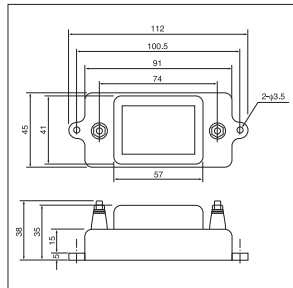
Wiring: Pass the wire through center of the C.T. When measuring under 100 A, use the equation below to find the number of times that the wire is to be passed through. Number of turns = (Primary current of C.T.)÷(Maximum value measured) However, in order to make the number of turns a full number, select the primary current or full scale.

### EXTERNAL MULTIPLIER

## HB-1

Used with a 1mA full scale meter

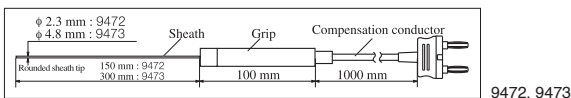
HB-1 SPECIFICATIONS	
Model & rated voltage	HB-1(500V), HB-1(750V)
Accuracy (50/60 Hz)	JIS-Class0.5 (±0.5% at rated voltage)
Rating	1 mA
Dimensions, mass	See figure, 75g
Accessories	None



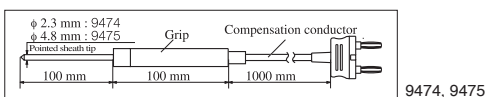
## Temperature probes or sensors ...Included as accessories with main unit, or sold separately (optional products)

Model	Type/Note	Compatible Instrument
THERMISTOR TEMPERATURE PROBE 9021-01	-50 to 200°C	3030-10, 3127-10, 3128-10
TEMPERATURE PROBE 9180	Sheath type, up to 750°C, non-waterproof	3412-50, 3441, 3442
TEMPERATURE PROBE 9181	Surface type, up to 400°C, non-waterproof	3412-50, 3441, 3442
TEMPERATURE PROBE 9182	Sheath type, up to 750°C, non-waterproof	3412-50, 3441, 3442
TEMPERATURE PROBE 9183	Sheath type, up to 750°C, non-waterproof	3412-50, 3441, 3442
RJ SENSOR 9184	reference contact compensation, -25 to 80°C	7011*
TEMPERATURE PROBE 9188	included with the 3227	3227*
TEMPERATURE PROBE 9451	included with the 3540	3540
THERMISTOR TEMPERATURE PROBE 9462	-50 to 150°C	3281, 3282
TEMPERATURE HUMIDITY SENSOR 9463	fixed type	3625*
TEMPERATURE HUMIDITY SENSOR 9464	extension type, (2.7m)	3625*
TEMPERATURE PROBE 9472	Sheath type, up to 300°C, waterproof structure	3441, 3442
TEMPERATURE PROBE 9472-50	Sheath type, up to 300°C, waterproof structure	3446-01
TEMPERATURE PROBE 9473	Sheath type, up to 800°C, waterproof structure	3441, 3442
TEMPERATURE PROBE 9473-50	Sheath type, up to 800°C, waterproof structure	3446-01
TEMPERATURE PROBE 9474	Sheath type, up to 300°C, waterproof structure	3441, 3442
TEMPERATURE PROBE 9475	Sheath type, up to 500°C, waterproof structure	3441, 3442

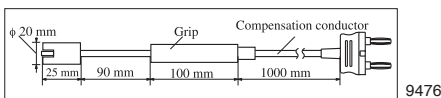
Model	Type/Note	Compatible Instrument
TEMPERATURE PROBE 9476	Surface type, up to 500°C, non-waterproof	3441, 3442
TEMPERATURE PROBE 9476-50	Surface type, up to 500°C, non-waterproof	3446-01
TEMPERATURE PROBE 9478	Sheath type, up to 300°C Waterproof structure	3447-01 (Pt-100)
TEMPERATURE PROBE 9479	Sheath type, up to 300°C Waterproof structure	3447-01 (Pt-100)
TEMPERATURE SENSOR 9631-01	1 m length	3632/3633/3641-20
TEMPERATURE SENSOR 9631-02	1 m length	
TEMPERATURE SENSOR 9631-03	1 m length	
TEMPERATURE SENSOR 9631-04	1 m length	
TEMPERATURE SENSOR 9631-05	30 mm length	
TEMPERATURE SENSOR 9631-11	5 m length	3632/3633/3641-20
TEMPERATURE SENSOR 9631-14	5 m length	
TEMPERATURE SENSOR 9631-21	10 m length	3632/3633/3641-20
TEMPERATURE SENSOR 9631-24	10 m length	3632/3633/3641-20
HUMIDITY SENSOR 9680-50	1 m length	
HUMIDITY SENSOR 9680-51	5 m length	
HUMIDITY SENSOR 9680-52	10 m length	
HUMIDITY SENSOR 9681*	3 m length	8420/-50*, 8421/-50*
HUMIDITY SENSOR 9701	3 m length	8420/-50*, 8421/-50*, 8423
HUMIDITY SENSOR Z2000	3 m length	LR8400s



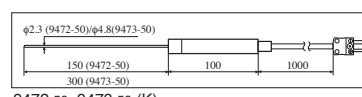
9472, 9473



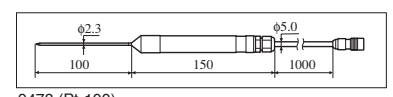
9474, 9475



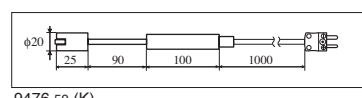
9476



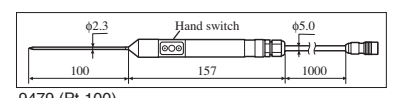
9472-50, 9473-50 (K)



9478 (Pt-100)



9476-50 (K)



9479 (Pt-100)



9021-01



9680-50, -51, -52



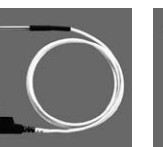
9631-01, -11, -21



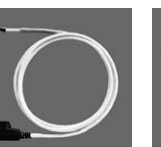
9631-02



9631-03



9631-04, 14, 24



9631-05




9631-05

Test Leads and Probes ... Included as accessories with main unit, or sold separately (optional products)

Model	Model	Model	Model
 TEST LEAD 3851-10 for 3251*, 3252*, 3253* 3801-50, 3802-50, 3803 3804-50, 3805-50, 7016	 CLIP TYPE LEAD 9175 for 3220*, 3224* 3225*	 TEST FIXTURE 9261 for 3503*, 3511-50 3520*, 3521*, 3522-50 3530*, 3531*, 3532-50	 CURRENT APPLY PROBE 9297 for 3157, 3157-01
 HIGH VOLTAGE PROBE 9014 for 3250s	 INPUT CORD 9177 for 8904, 8906, 8932 9555	 TEST FIXTURE 9262 for 3511-50, 3522-50 3532-50	 SWITCHED PROBE 9299 for 3154
 HIGH VOLTAGE PROBE 9017 for 3030-10	 ENCLOSURE PROBE 9195 for 3280-10, 3280-20 3287, 3288	 SMD TEST FIXTURE 9263 for 3511-50, 3522-50 3532-50	 CONNECTION CABLE 9300 for 3541
 THERMISTER TEMPERATURE PROBE 9021-01 for 3030-10, 3127-10 3128-10	 CONNECTION CORD 9197 for MEMORY HiCORDER	 WIRING ADAPTER 9264-01 for 3196	 CONVERSION CABLE 9318 for 8940 (9270, 9271, 9272, 9277, 9278, 9279)
 TEST LEAD 9060, 9060-01 for 3008	 CONNECTION CORD 9198 for MEMORY HiCORDER	 WIRING ADAPTER 9264-02 for 3196	 CONVERSION CABLE 9319 for 8940 (3273*, 3273-50)
 OUTPUT CORD 9094 for 3412-50, 3283, 3284 3285, 3290, 3290-10 3404	 CONVERSION ADAPTOR 9199 for MEMORY HiCORDER	 MEASURING CABLE 9265 for 3143	 LOGIC PROBE 9320 for 8800s
 CLIP TYPE LEAD 9099 for 3220*, 3224*	 TEST LEAD 9207-10 for 3281, 3282, 3284 3285, 3255-50 3256-50/-51, 3257-50/-51	 DC BIAS VOLTAGE UNIT 9268 for 3511-50, 3522-50 3532-50	 LOGIC PROBE 9320-01 for 8807, 8808
 4-TERMINAL PROBE 9140 for 3504, 3504-10, 3505 3506, 3511-50, 3522-50 3532-50	 TEST LEAD 9207-30 for 3030-10	 DC BIAS CURRENT UNIT 9269 for 3511-50, 3522-50 3532-50	 LOGIC PROBE 9321 for 8800s
 PINCHER PROBE 9143 for 3504, 3504-10, 3505 3506, 3511-50, 3522-50 3532-50	 TEST LEADS 9208 for 3280-10, 3280-20 3287, 3288	 TEST PROBE 9286 for 3119*	 LOGIC PROBE 9321-01 for 8807, 8808
 TEST LEAD with FUSE 9153 for 3021*, 3127* 3128*, 3030*	 TEST LEADS HOLDER 9209 for 3280-10, 3280-20 3287, 3288	 CLIP TYPE LEAD 9287-10 for 3239, 3540, 3541 3555, 3560, 3561	 DIFFERENTIAL PROBE 9322 for 8800s, 8714*, 8715*
 CONNECTION CORD 9165 for 7075	 MEASURING CABLE 9215 for 3151	 BREAKER PIN 9288 for 3118-11, 3118-12 3451-11, -12, -13, -14, -15 3452-11, -12, -13, 3453, 3454s	 CONVERSION CABLE 9323 for 8807, 8808 (9320/9321)
 CONNECTION CORD 9166 for 7075	 CABLE WINDER 9216 for 3143, 3151	 TEST PROBE 9289 for 3118-11, -12 3154, 3453, 3454s	 POWER CORD 9324 for 9322 (LOGIC INPUT)
 INPUT CORD 9168 for 7010*, 7011*	 CONNECTION CORD 9217 for MEMORY HiCORDER	 TEST PROBE 9292 for 3451-11, -12, -13, -14 -15, 3452-11, -12	 POWER CORD 9325 for 9322(8940)
 TEST LEAD 9170-10 for 3156, 3237, 3238 3239, 3256, 7011*	 CONNECTION CABLE 9219 for 9695-02, 9695-03	 PIN TYPE EARTH PROBE 9293 for 3451-11, -12, -13, -14 -15, 3452-11, -12	 CONNECTION CORD 9326 for 8205*, 8205-10
 4-TERMINAL LEAD 9173 for 3220*, 3224* 3225*	 GRABBER CLIP 9243 for 3390	 TEST PROBE 9294 for 3117s*, 3118-11 3118-12, 3154, 3453	 LOGIC PROBE 9327 for 8855
 PIN TYPE LEAD 9174 for 3220*, 3224* 3225*	 CONNECTION CORD 9257 for 8205-10, 8206-10 3454-11, 3454-10 3453, 3118-11, 3118-12	 CURRENT PROBE 9296 for 3157, 3157-01	 POWER CORD 9328 for 9322(8950/8953)

## Test Leads and Probes ... Included as accessories with main unit, or sold separately (optional products)

Model	Model	Model	Model
 CONNECTION CABLE <b>9425</b> for 9203	 ZERO ADJUSTMENT BOARD <b>9454</b> for 3239, 3540, 3541 3554, 3555, 3560, 3561	 CONNECTION CORD <b>9633</b> for 3634-20, 3635-23*	 LOGIC CABLE <b>9714-02</b> for 8910
 CONNECTION CABLE <b>9436</b> for 3423	 PIN TYPE LEAD <b>9455</b> for 3239, 3540, 3541 3555, 3560, 3561	 CONNECTION CORD <b>9634</b> for 3634-20, 3635series	 FC-FC OPTICAL FIBER CABLE <b>9735</b> for 3661-20, 3662-20, 3663-20*
 VOLTAGE CORD <b>9438</b> for 3166*	 CLIP TYPE LEAD WITH TEMPERATURE SENSOR <b>9460</b> for 3540, 3554	 VOLTAGE CORD <b>9635</b> for 3286-20	No image SC-SC OPTICAL FIBER CABLE <b>9736</b> for 3661-20, 3662-20, 3663-20*
 VOLTAGE CORD <b>9438-02</b> for 3196	 PIN TYPE LEAD <b>9461</b> for 3239, 3540, 3541 3555, 3560, 3561	 VOLTAGE CORD <b>9635-01</b> for 3286-20	No image SC-FC OPTICAL FIBER CABLE <b>9737</b> for 3661-20, 3662-20, 3663-20
 VOLTAGE CORD <b>9438-03</b> for 3169, 3197	 PIN TYPE LEAD <b>9465</b> for 3239, 3540, 3541 3555, 3560, 3561	 CONNECTION CABLE <b>9639</b> for 3637-20, 3645-20	 TEST LEAD <b>9750-01 (Red, 3m)</b> <b>9750-02 (Black, 3m)</b> <b>9750-03 (Blue, 3m)</b> for 3455
 VOLTAGE CORD <b>9438-05</b> for 3197	 PIN TYPE LEAD <b>9465-10</b> for 3239, 3540, 3541 3554, 3555, 3560, 3561	 CONNECTION CABLE <b>9641</b> for 8420-51 8421-51, 8422-51	 ALLIGATOR CLIP <b>9751-01 (Red)</b> <b>9751-02 (Black)</b> <b>9751-03 (Blue, for GUARD)</b> for 3455
 VOLTAGE CORD <b>9438-50</b> for 3390, 3193	 REMOTE CONTROL SWITCH <b>9466</b> for 3554, 3560, 3561	 10:1 PROBE <b>9665</b> for MEMORY HiCORDER	 EXTENSION CABLE <b>9758</b> for 3470
 VOLTAGE CORD <b>9438-53</b> for 3169-20, -21	 LARGE CLIP TYPE LEAD <b>9467</b> for 3239, 3540, 3541 3554, 3560, 3561	 100:1 PROBE <b>9666</b> for MEMORY HiCORDER	 OUTPUT CABLE <b>9759</b> for 3470
 VOLTAGE CORD <b>9438-70</b> for 3390, 3193	 4-TERMINAL PROBE <b>9500</b> for 3532-80	 SMD TEST FIXTURE <b>9677</b> for 3511-50, 3522-50 3532-50, 3535	 PIN TYPE LEAD <b>9770</b> for 3239, 3540 3541 3555, 3560, 3561
 CONNECTION CABLE <b>9440</b> for 3166*	 INPUT CORD <b>9574</b> for 8944(8855)	 CONNECTION CABLE <b>9678</b> for 3535	 PIN TYPE LEAD <b>9771</b> for 3239, 3540 3541 3555, 3560, 3561
 CONNECTION CABLE <b>9441</b> for 3166*, 3169-21	 H.V. TEST LEAD <b>9615</b> for 3153, 3158, 3159 3173, 3930	 CONNECTION CABLE <b>9683</b> for 8423	 PIN TYPE LEAD <b>9772</b> for 3239, 3540 3541 3554, 3555, 3560 3561
 CONNECTION CABLE <b>9444</b> for 3166*, 3332 9442, 3511*	 H.V. TEST LEAD <b>9615-01</b>	 SMD TEST FIXTURE <b>9699</b>	 TEST LEAD <b>9787</b> for 3490, IR4000s
No image CONNECTION CABLE <b>9446</b> for 3522*, 3532* 3330-02*	 CLIP ON BASE <b>9617</b> for 3501, 3801-50 3802-50, 3804-50 3805-50	 HUMIDITY SENSOR <b>9701</b> for 8420-50, 8421-50 <b>Z2000</b> for LR8400s	 TEST LEAD WITH REMOTE CONTROL SWITCH <b>9788</b> for 3490, IR4000s
 CONCENT INPUT CORD <b>9448</b> for 3168*, 8715-01*	 CLIP-TYPE LEAD <b>9618</b> for 3501, 3801-50 3802-50, 3804-50 3805-50	 CONVERSION CABLE <b>9705</b> for 9272-10, 9709	 CONNECTION CORD <b>9790</b> for 8870-20
 CLIP TYPE LEAD <b>9452</b> for 3239, 3540, 3541 3555, 3560, 3561	 CONNECTION CORD <b>9629</b> for 3639	 EXTENSION CABLE <b>9706</b> for 9272-10, 9709	 ALLIGATOR CLIP <b>9790-01</b> for 8870-20
 FOUR TERMINAL LEAD <b>9453</b> for 3239, 3540, 3541 3555, 3560, 3561	 CONNECTION CORD <b>9632</b> for 3634-20, 3636-20	 LOGIC CABLE <b>9714-01</b> for 8910	 GRABBER CLIP <b>9790-02</b> for 8870-20



CONTACT PIN  
9790-03  
for 8870.20



MAGNETIC ADAPTER  
9804-01, 9804-02  
for 3169.20, 3169.21  
9804-01:Red  
9804-02:Black



ALLIGATOR CLIPs  
(used with Test Lead,  
insert), for 9170, or  
similar devices

CARRYING CASE ...Sold separately (optional products)

Image	Model
	<b>3853</b> for 3803, 3804*, 3805* 3804.50, 3805.50 3256.50, 3257.50
	<b>9148</b> for 3218*, 3261* 3262*, 3263*, 9010* 9018*, 9290*
	<b>9245</b> for 3286.20
	<b>9246</b> for 3664, 9742
	<b>9338</b> for 3143
	<b>9339</b> for 3196
	<b>9340</b> for 3193
	<b>9344</b> for 8205*, 8205.10 8206*, 8206.10
	<b>9345</b> for 3285
	<b>9349</b> for 8842*

Image	Model
	<b>9351</b> for 3127*, 3100*
	<b>9355</b> for 3264*, 3265* 3266*, 3267*, 3286* 9270*, 9271*, 9272*
No image	<b>9363</b> for 3118.11
No image	<b>9364</b> for 3118.12
	<b>9371</b> for 3255*, 3255.50
No image	<b>9375</b> for 9277-9279
No image	<b>9376</b> for 3423
	<b>9378</b> for 3256*, 3256.50 3257*, 3257.50
	<b>9380</b> for SS7012
	<b>9382</b> for 3550*, 3555
	<b>9384</b> for 3451, 3452

Image	Model
	<b>9386-01</b> for 3441, 3442, 3446 3447
	<b>9388</b> for 8835*, 8835.01 3155*
	<b>9390</b> for 3030.10
	<b>9391</b> for 8807, 8808
	<b>9393</b> for 3151
	<b>9397-01</b> for 8855, 8841* 8720*
	<b>9398</b> for 3280, .01, .10, .11, .20 3287, 3288, 3288.20
	<b>9399</b> for 3281, 3282, 3284
	<b>9400</b> for 3290, 3290.10
	<b>9648</b> for 8420 series

Image	Model
	<b>9696</b> for 3453.01
	<b>9720-01</b> for 3169.20, .21
	<b>9730</b> for 3661.20, 3662.20 3663.20*
	<b>9757</b> for 3291, 3293
	<b>9782</b> for 8870.20, SS7012
	<b>9783</b> for 8847
	<b>9794</b> for 3390
	<b>9812</b> for 8870.20
	<b>C1000</b> for LR8400s

Clamp on sensors

Image	Model
	CLAMP ON PROBE <b>9010-50</b> for 3255.50, 3237, 3238, 3239, 8714*, 8715*
	CLAMP ON PROBE <b>9018-50</b> for MEMORY HiCORDERs
	CLAMP ON PROBE <b>9132-50</b> for AC1000A

Image	Model
	CLAMP ON SENSOR <b>9272-10</b> for 3390, 3191*, 3165* 3192* 3167* (20/200A)
	UNIVERSAL CLAMP ON CT <b>9277</b> for 3390, 3192*, 3193 3167* (AC/DC20A)
	UNIVERSAL CLAMP ON CT <b>9278</b> for 3390, 3192*, 3193 3167* (AC/DC200A)

Image	Model
	UNIVERSAL CLAMP ON CT <b>9279</b> for 3390, 3192*, 3193 3167* (AC/DC 500A)
	CLAMP ON ADAPTER <b>9290-10</b> for 1000A CT 10 : 1
	CLAMP ON SENSOR <b>9291</b> for 3166*

Image	Model
	CLAMP ON SENSOR <b>9650</b> for 100A 8205*, 8205.10, 8206* 8206.10, 3636.20
	CLAMP ON SENSOR <b>9651</b> for 500A 8205*, 8205.10, 8206* 8206.10, 3636.20
	CLAMP ON LEAK SENSOR <b>9657</b> for 3638

Note: \* marked products are discontinued models.












## Clamp on sensors

Image	Model	Image	Model	Image	Model	Image	Model
	CLAMP ON LEAK SENSOR <b>9657-10</b> for 8808series (BNC)		FLEXIBLE CLAMP ON SENSOR <b>9667</b> for 3191*, 3165*, 3192*, 3167* (200A)		CLAMP ON AC/DC SENSOR <b>9692</b> for 3290 AC200A		AC/DC CURRENT SENSOR <b>CT6862</b> for 3390
	CLAMP ON LEAK SENSOR <b>9658</b> for 3638		CLAMP ON SENSOR <b>9668</b> for 8205.10/8206.10 AC1000A		CLAMP ON AC/DC SENSOR <b>9693</b> for 3290 AC2000A		AC/DC CURRENT SENSOR <b>CT6863</b> for 3390, 3193
	CLAMP ON SENSOR <b>9660</b> for 3196 AC100A 3169, 3197		CLAMP ON SENSOR <b>9669</b> for 3196 AC1000A 3197		CLAMP ON SENSOR <b>9694</b> for 3169, 3196, 3197 AC5A		
	CLAMP ON SENSOR <b>9661</b> for 3196 AC500A 3169, 3197		CLAMP ON AC/DC SENSOR <b>9691</b> for 3290 AC100A		AC/DC CURRENT SENSOR <b>9709</b> for 3390, 3193		

## Others

Image	Model	Image	Model	Image	Model	Image	Model
No image	COMMUNICATION PACK (USB) <b>3856-02</b> for 3801-50, 3802-50, 3803 3804-50, 3805-50, 7016		GP-IB CONNECTOR CABLE <b>9151-02</b> for 3511*, 3330.02* 3332 (2m)		LOGGER COMMUNICATOR <b>9334</b> for 8420 Series*		AC ADAPTER <b>9458</b> for 3196
No image	INTERFACE PACK <b>3909</b> for 3443, 3444, 3445		DIGITAL PRINTER <b>9203</b> for 3227*, 3540, 3550* 3560		WAVE PROCESSOR <b>9335</b> for MEMORY HiCORDER		BATTERY PACK <b>9459</b> for 3196, 3197
	HIGH VOLTAGE SCANNER <b>3930</b> for 3153	No image	REFLECTIVE TAPE <b>9211</b> for 3402*, 3403, 3404		AC ADAPTER <b>9418-10</b> for 3167*, 3551*, 7011*	No image	GP-IB INTERFACE <b>9518-01</b> for 3511*, 3522* 3531*, 3532*, 3511-50, 3522-50, 3532-50
	METAL CONTACT TIP <b>9032</b> 3402*, 3403, 3404		PERIPHERAL RING <b>9212</b> for 3402*, 3403, 3404		AC ADAPTER <b>9418-15</b> for 3197, 8420 Series* 8714*/15, 8807/08	No image	GP-IB INTERFACE <b>9518-02</b> for 3157, 3157-01
	RUBBER CONTACT TIP <b>9033</b> for 3402*, 3403, 3404		CONTACT ADAPTER <b>9213</b> for 3403, 3404		DC POWER ADAPTER <b>9439</b> for 8835*, 8835-01		FUNCTION UP DISK <b>9540-01</b> for 8835-01
No image	AC ADAPTER <b>9035</b> for 3108*, 3131*, 3132* 3161*, 3162*, 3220*, 3205* 3209*, 3402-04, 3422 (6V)* for 100V AC power lines only	No image	AUXILIARY EARTHING ROD <b>9214</b> for 3151		PRINTER <b>9442</b> for 3332, 3154, 3443, 3444 Non-CE mark product		FUNCTION UP DISK (POWER MONITOR) <b>9549</b> for 8855
No image	AC ADAPTER <b>9036</b> for 3110*, 3204*, 9005*, 9006*, 3411 (9V)* for 100V AC power lines only	No image	SAFETY TEST DATA MANAGEMENT SOFTWARE <b>9267</b> for 3153, 3156, 3157 3158, 3159, 3332		AC ADAPTER <b>9443-02</b> for 3166*, 3330.02* 3332, 3511*, 3154 Non-CE mark product		SENSOR UNIT <b>9555-10</b> for 9272-10, 9277 9278, 9279
	AC ADAPTER <b>9039</b> for 3501 (12V) for 100V AC power lines only		PT <b>9303</b> for 8815*, 8825* 8830*, 8832*, 8851* (PT 40:1.20:1)		AC ADAPTER <b>9445-02</b> (for USA, CANADA) for 3283, 3284, 3285 3540, 3670, 3671 3913	No image	GP-IB INTERFACE <b>9588</b> for 3227*, 3167*, 3187*, 3330*, 3330.02*, 3560
	EARTH NETS <b>9050</b> for 3124*, 3150*, 3151		TRIGGER CORD <b>9305</b> for 8801*, 8802*, 8803*, 8820*, 8835-01	No image	AC ADAPTER <b>9445-03</b> (for EU)	No image	PRINTER INTERFACE <b>9589</b> for 3227*, 3560
	AC ADAPTER <b>9070</b> for 3118, 3119* for 100V AC power lines only		LAN COMMUNICATOR <b>9333</b> for MEMORY HiCORDER		BATTERY PACK <b>9447</b> for 8807, 8808 8420 series*		COMMUNICATION PACKAGE <b>SS9000</b> for SS7012

Others

	Model		Model		Model		Model
No image	RS-232C INTERFACE <b>9593-01</b> for 3522*, 3531*, 3532*, 3522-50, 3532-50		POWER MEASUREMENT SUPPORT SOFTWARE <b>9625</b> for 3166*, 3169		BATTERY CHARGER <b>9673</b> for 9670  Non-CE mark product		SC CONNECTOR ADAPTER <b>9732</b> for 3661-20
No image	RS-232C INTERFACE <b>9593-02</b> for 3157, 3157-01		LAN CABLE <b>9628</b> for 3660	No image	RS-232C PACKAGE <b>9674</b> for 3446, 3447		FC CONNECTOR ADAPTER <b>9733</b> for 3662-20, 3663-20*
	MEMORY BOARD <b>9599</b> for 8826 (48M-word)		RS-232C CABLE <b>9636</b> for 3286*, 3286-20		DC POWER UNIT <b>9684</b> for 8860-50, 8861-50		SC CONNECTOR ADAPTER <b>9734</b> for 3662-20, 3663-20*
	AC/DC DIRECT INPUT UNIT <b>9600</b> for 3193, 3194		RS-232C PACKAGE <b>9636-01</b> for 3286*, 3286-20		HEAD AMP UNIT <b>9700-10</b> for 3535		OPTICAL CONNECTOR CLEANER <b>9738</b> for 3661-20, 3662-20, 3663-20*
	AC DIRECT INPUT UNIT <b>9601</b> for 3193, 3194		RS-232C CABLE (9pin-9pin/1.8m) <b>9637</b> for 3154, 3630S 3911-20		CONVERSION ADAPTER <b>9704</b> for 9010-50, 9018-50		SPARE CLEANER <b>9739</b> for 3661, 3662, 3663*
	AC/DC CLAMP INPUT UNIT <b>9602</b> for 3193, 3194		RS-232C CABLE (9pin-25pin/1.8m) <b>9638</b> for 3154, 3630S 3911-20, 9593-01		MEMORY BOARD <b>9715-50, -51, -52, -53</b> for 8860-50, 8861-50		OPTICAL SENSOR <b>9742</b> for 3664
	EXTERNAL SIGNAL INPUT UNIT <b>9603</b> for 3193, 3194		LAN CABLE <b>9642</b> for 8420 series*, 3196, 3390, Memory HiCORDERS		HD UNIT <b>9718-50</b> for 8860-50, 8861-50		OPTICAL SENSOR <b>9742-10</b> for 3664
No image	EXTERNAL SIGNAL INPUT UNIT <b>9603-01</b> for 3194		CHARGE STAND <b>9643</b> for 8420 series*	No image	MEMORY BACK UP UNIT <b>9719-50</b> for 8860-50, 8861-50		PAPER WINDER <b>220H</b> TEPTOM-220H
	PRINTER UNIT <b>9604</b> for 3193, 3194		MEMORY BOARD <b>9645</b> for 8855		RS-232C CABLE <b>9721</b> for 3169		LINE SPLITTER <b>CT-101A</b> for 3127-11 etc.
No image	HARMONIC/FLICKER MEASUREMENTS UNIT <b>9605</b> for 3193	No image	MEMORY BOARD <b>9645-01</b> for 8855		MEMORY HIEWER <b>9725</b> for 8860*, 8860-50 8861*, 8861-50		ANALOG/ TEMPERATURE UNIT <b>LR8500</b> for LR8400s
No image	HARMONIC MEASUREMENTS UNIT <b>9605-01</b> for 3194		LUX SENSOR <b>9662</b> for 3640		PC CARD 256M <b>9727</b> for 8800s, 3169, 3196		UNIVERSAL UNIT <b>LR8500</b> for LR8400s
	RS-232C CABLE <b>9612</b> for DIN 9pin-Dsub 9pin 8807, 8808, 8420		HD UNIT <b>9663</b> for 8855		PC CARD 512M <b>9728</b> for 8800s, 3169, 3196		BATTERY PACK <b>Z1000</b> for LR8400s
	REMOTE CONTROL BOX (SINGLE) <b>9613</b> for 3158, 3159		PRINTER <b>9670</b> for 3390, 3196, 3446 3447, 3197  Non-CE mark product		PC CARD 1GB <b>9729</b> for 8800s		FUXED STAND <b>Z5000</b> for LR8400s
	REMOTE CONTROL BOX (DUAL) <b>9614</b> for 3158, 3159		AC ADAPTER <b>9671</b> for 9670  Non-CE mark product		PC CARD 2GB <b>9830</b> for 2354/3390/8430/8730 /8731/8826/8835-01/8841 /8842/8847/8855/8860s/ 8861s/8870-20		
	PQA-HIEW PRO <b>9624-50</b> for 3196, 3197		BATTERY PACK <b>9672</b> for 9670		FC CONNECTOR ADAPTER <b>9731</b> for 3661		



## RECORDING PAPER ...Sold separately (optional products)

Model	Paper Size	Compatible Instrument
1196	112 mm × 25 m, 10 rolls	for 1105*, 1107, 1114/1115*, 1116*, 1117, 1240, 9442
9073	70 mm × 15 m, 10 rolls	for 8201*, 8202*, 8204
9074	70 mm × 15 m, 10 rolls	for 8203*
9221	110 mm × 30 m, 10 rolls	for 3195*, 3620*, 8710*, 8801*, 8802*, 8803*, 8810S*, 8815*, 8830S*, 8835S*, 8851*, 8852*, 8853*
9222	38 mm × 8.5 m, 5 rolls	for 3223.02*, 3224.02*, 3225.02*, 3235*, 9200*, 9514*
9223	80 mm × 30 m, 5 rolls	for 3165*, 3191*
9227	38 mm × 3 m, 5 rolls	for 3234*
9228	114 mm × 30 m, 10 rolls	for 8850*
9229	264 mm × 30 m, 6 rolls	for 8825*, 8826*
9229-01	264 mm × 30 m, 6 rolls	for 8825*, 8826*
9231	216 mm × 30 m, 6 rolls	for 8840*, 8841*, 8842*, 8845*, 8846*, 8847, 8855, 8860*, 8861*, 8860.50, 8861.50
9232	74 mm × 10 m, 10 rolls	for 3193, 8804*, 8805*, 8806*, 8712*, 8713*
9233	58 mm × 10 m, 10 rolls	for 3155*, 9203
9234	112 mm × 18 m, 10 rolls	for 8714*, 8715*, 8992 (8807, 8808, 8420S*), 8995.01(8860*, 8861*, 8860.50, 8861.50)
9235	60 mm × 15 m, 10 rolls	for 8205*, 8206*, 8205.10, 8206.10
9236-01	60 mm × 15 m, 10 rolls	for 8205*, 8206*
9237	80 mm × 25 m, 4 rolls	for 9670 (3196)

## ELECTRODE and SHIELDING BOX (for SM-8200 Series, DSM-8104, DSM8542 options)

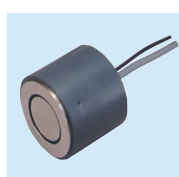
### ELECTRODE FOR CHIP CAPACITOR SME-8360



The electrodes on this fixture are for insulation resistance measurement of chip capacitors, and the fixture can be adjusted anywhere from 0 to 11 mm to measure a wide range of chip capacitors. When the fixture is connected with the interlock connection cable, measurement voltage is disabled when the lid is open. Plugs need to be modified when used in combination with the SM-8200 series.

External Dimensions: Approx. 200 (W) × 52 (H) × 150 (D) mm, Lead Length: Approx. 85 cm, connects with special Hioki plug.

### SURFACE RESISTANCE MEASUREMENT ELECTRODE SME-8301



Measures surface resistivity simply by pressing the probe tips on the sample. Primarily intended for use with the SM-8213, to measure surface resistivity of electrostatic-discharge-related samples. Measures up to  $10^{10}\Omega$ .

External Dimensions: Approx. 60 OD × 50 mm long, Lead Length: Approx. 1 m, connects with special Hioki plug.

### PLATE SAMPLE ELECTRODE SME-8310



The electrodes on this fixture are for measuring the characteristic resistivity of flat samples up to 100 mm square and 8 mm thick: the main electrode is 50 mm in diameter, and the guard electrode has 70 mm ID and 80 mm OD. When the fixture is connected with the interlock connection cable, measurement voltage is disabled when the lid is open. A side panel switch easily selects between volume and surface resistivity.

External Dimensions: Approx. 215 (W) × 78 (H) × 165 (D) mm, Lead Length: Approx. 75 cm, connects with special Hioki plug.

### LIQUID SAMPLE ELECTRODE SME-8330



The electrodes for fluid samples are equipped with a guard. Capacity is 25 mL, capacitance between main and counter electrodes is approximately 45 pF, electrode constant is about 500 cm inter-electrode spacing is 1 mm, electrode OD is 36 mm and height is about 140 mm. Measures up to  $10^{15}\Omega\text{cm}$  (@1,000 V) when combined with the SM-8220.

Accessories: Connection cable, one each red and black, approx. 60 cm long

### ELECTRODE FOR FLAT SAMPLE SME-8311

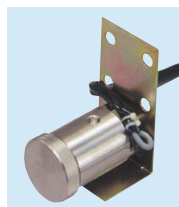


The electrodes on this fixture are for measuring characteristic resistivity of flat samples up to 40 × 100 mm and 8 mm thick. The main electrode is 19.6 mm in diameter, and the guard electrode has 24.1 mm ID and 28.8 mm OD.

A side panel switch easily selects between volume and surface resistivity.

External Dimensions: Approx. 215 (W) × 78 (H) × 165 (D) mm, Lead Length: Approx. 75 cm, connects with special Hioki plug.

### CONTINUOUS LIQUID SAMPLE ELECTRODE SME-8335



The insulation resistance of fluids such as machine oil or irrigation fluid can be measured in the flowing state through 1/4-inch NPT joints. The cell can be mounted with U-bolts using the supplied metal accessory. Container volume is about 30 mL, and electrode constant is about 75 cm.

External Dimensions: Approx. 58 OD × 80 mm height, Lead Length: Approx. 5 m, with special Hioki plug.

### WEIGHT ELECTRODE SME-8320



These electrodes for flat samples are used in combination with the SME-8350 Shielded Enclosure. Easily measures surface and volume resistivity of even coarse surfaces such as carpet. The main electrode is 50 mm in diameter, and the guard electrode has 70 mm ID and 80 mm OD. The jig for concentric electrodes is included.

Accessories: Two banana-plug leads

Note: Illustrated with the SM-8350 shielded enclosure.

### SHIELDING BOX SME-8350



This enclosure provides electromagnetic shielding when measuring samples with high insulation resistance or reactivity.

When used with the SME-8320 Weight Electrodes, it provides the counter or guard electrode. When measuring electronic components such as capacitors and transformers, it shields against external noise and leakage current to provide stable measurements.

\*When used with the DSM-8104, the optional DSM-8104F interlock connection cable is required.

External Dimensions: Approx. 250 (W) × 100 (H) × 200 (D) mm, Lead Length: Approx. 80 cm, with special Hioki plug. Accessorie: Rubber seat

### ELECTRODE FOR SURFACE RESISTANCE SME-8302



This two-electrode probe is suitable for surface resistivity measurement of curved surfaces such as molded resin and rubber products, and for small samples. Measures surface resistivity simply by pressing the probe tips on the sample. Electrode spacing is 10 mm, and measures up to  $10^{10}\Omega$ . (4 mm inter-electrode spacing)

External Dimensions: Approx. 40 mm OD × 115 mm long, Lead Length: Approx. 1 m, connects with special Hioki plug.

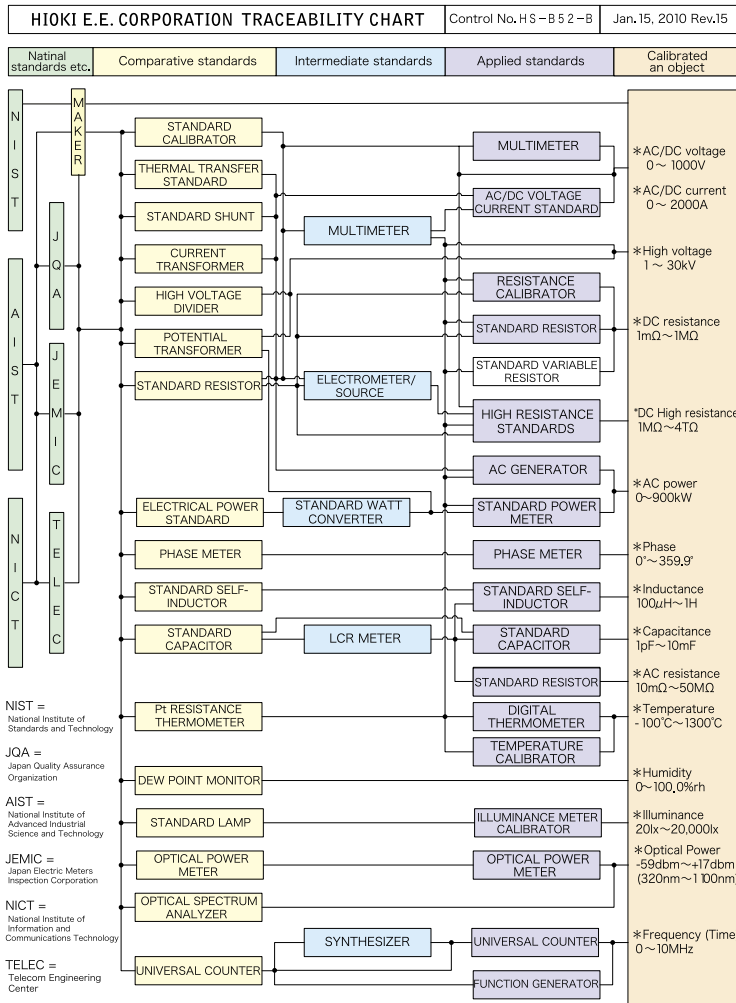
### STANDARD RESISTOR SR-2



This resistance box is designed for calibrating Hioki's series of ultra insulation testers. The construction ensures secure connection between the box and the tester. Maximum operating voltage is 1,000 V DC, and it provides 24 resistance values between 10 MΩ and 10,000 MΩ.

External Dimensions: Approx. 270 (W) × 90 (H) × 195 (D) mm

# HIOKI - Offering Top Quality Products and Services



Accuracy can be regarded as the heart of a measuring instrument. To maintain accuracy, traceability and accountability in the form of a coherent and comprehensive management system that reaches to the national standards are indispensable.

Traceability allows us to manage and maintain instrument accuracy characteristics that are tied to recognized national and international standards. How they are managed and maintained are dependent on the measurement facilities that offer accuracy testing at the various levels, skilled technicians, as well as a strong link between national standards, manufacturer reference equipment, field measuring instruments, and basic measuring instruments.

The HIOKI Traceability System as indicated by the chart on the left is strictly managed by accounting for each individual instrument - from reference instruments to field equipment - and their constant accuracy. As scientific techniques and manufacturing technology continue to expand and develop, we will strive to meet new demands by not only providing the appropriate measuring instruments for our users, but also enhancing the accuracy in our test instruments and maintaining our Traceability System so that they are constantly on par with global standards.

Note: Only the primary standards are indicated above. For detail, please refer each product's TRACEABILITY CHART. Please also note that the naming of the standards indicated in this chart may differ from the naming used in each product's TRACEABILITY CHART.

## HIOKI's Calibration System

By regularly calibrating HIOKI instruments using reference calibrating equipment traceable to national standards while complying with the reference equipment organizational chart, customers are guaranteed complete accuracy. After purchase, it is highly recommended that customers regularly re-calibrate their HIOKI instruments to maintain their accuracy. Depending on your needs, calibration and adjustment can be conducted at HIOKI in one of 3 ways as illustrated on the right.

### Types of Calibration

Type	Action	Price
Type 1	The relationship between the measurement values of the instrument being serviced and those of the reference and testing instruments placed in the higher order in the calibration flow are observed and the results are recorded in a data sheet. (If the measurement values fall outside of the specifications for accuracy, these values are not indicated.) 	Calibration + Data Sheet
Type 2	The relationship between the measurement values of the instrument being serviced and those of the reference and testing instruments placed in the higher order in the calibration flow are observed and the results are recorded in a data sheet. The instrument is then adjusted, and once again compared to the same reference and testing instruments, and the results are recorded in a separate data sheet. 	Calibration + Adjustment + 2 Data Sheet
Type 3	The relationship between the measurement values of the instrument being serviced and those of the reference and testing instruments placed in the higher order in the calibration flow are observed and the results are recorded in a data sheet. If the values are within the specifications for accuracy, calibration is completed. If the values fall outside of the specifications, the instrument is then adjusted, compared again to the same reference and testing instruments, and the results are recorded in a separate data sheet. 	Calibration + Data Sheet + Calibration + Adjustment + 2 Data Sheet

## About our Company



Established in 1935, HIOKI E. E. CORPORATION has grown to be a leading developer and manufacturer of advanced test and measurement technologies for use both in the field and leading edge facilities around the world. Our goal is simple: contribute to the advancement of society, while making sure the natural environment is not compromised. As a reliable producer and member of society, we pledge to continue to actively contribute to the cultural and educational development of the local community through activities such as greening efforts, scholarship programs and sponsoring children's sports teams. With the support of our customers and worldwide network, we are confident that our values and beliefs, and products and services, will be brought forth through the 21st century and beyond.



Reforestation program in Kenya (2007)

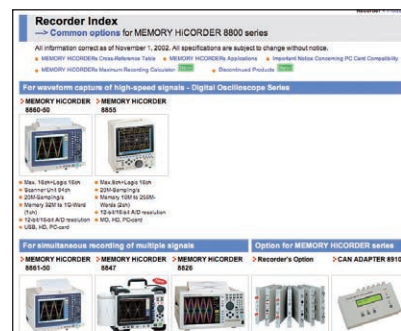


Local children also contribute to the tree planting.

## Corporate History

- 1935 HIOKI starts manufacturing electrical measuring instruments in Tokyo
- 1945 Move to Nagano Prefecture due to war
- 1946 Tester No.1 put to market
- 1952 HIOKI E.E. CORPORATION established  
Designated as the manufacturer of MULTITESTER (MIL Standard) for the U.S. Far East Air Forces
- 1965 Mass production of VU instruments for recording level adjustments to tape recorders
- 1975 Independent development and sale of instruments with internal magnetic taut bands
- 1983 Multiple awards received for innovative clamp-style instruments
- 1990 Move to HIOKI Forest Hills
- 1991 Registered on the over-the-counter market
- 1992 Awarded the Afforestation Center Presidential Award for positively promoting afforestation
- 1993 ISO9001 certified
- 1997 ISO14001 certified
- 1998 HIOKI USA CORPORATION established
- 2001 HIOKI Shanghai Representative Office established  
Listed on the Second Section of the Tokyo Stock Exchange
- 2003 Listed on the First Section of the Tokyo Stock Exchange
- 2005 "Solution Fair" - 70th Anniversary Celebration
- 2006 THT Technology Joint Venture in Taiwan established  
HIOKI Tianjin Representative Office established  
"Solution Factory" Building B Completed  
Electronic Measuring Instruments Business Segment of DKK-TOA Corporation acquired  
HiNTEC Corporation established

## Internet website



[www.hioki.com](http://www.hioki.com)



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