

CLAMP ON AMMETERS

Product Group
Catalog

CLAMP ON HiTESTER/CLAMP ON SENSOR

The HIOKI clamp-on ammeter series provides simple and accurate measurement for both AC and DC. There are both analog and digital types, multi-function types capable of handling frequency, temperature and resistance, dedicated leak current types, AC/DC types, and a special type that can measure power factor as well: a complete line-up to fully answer customer needs.



(CLAMP ON HiTESTERS)

3261 DIGITAL CLAMP ON HiTESTER

3262 DIGITAL CLAMP ON HiTESTER

3263 CLAMP ON LEAK HiTESTER

3264 CLAMP ON AC/DC HiTESTER

3265 CLAMP ON AC/DC HiTESTER

3266 CLAMP ON P.F. HiTESTER

3127 CLAMP ON HiTESTER

3128 CLAMP ON HiTESTER

3108-01 CLAMP ON HiTESTER

3109-01 CLAMP ON HiTESTER

(CLAMP ON PROBES)

9005-01·9006·9010·9132

(CLAMP ON SENSORS)

9270 to 9279



Digital 3260 Series for Measuring Peak, Valley

3261-3262

DIGITAL CLAMP ON HITESTER



Also measures temp./frequency
The 3262 also measures distorted waveforms.

| | |
|-------|---------------------------------|
| AC-A | 10/100/1000A |
| AC-V | 100/1000V |
| AAHz | 100/1000Hz |
| Ω | 1k/10kΩ |
| °C °F | -50°C ~ +50°C -58°F ~ +302°F |
| HOLD | PEAK VALLEY AVERAGE RMS |

● A variety of measurement functions

The incorporated micro-computer allows a variety of measurements of peak, valley and average values as well as measurements of regular current, voltage, resistance, frequency, capacitance, and temperature values.

● Peak/valley hold display

The peak and valley values detected during measurement are held. Because the held values do not vary with the passage of time, maximum and minimum demand currents can be measured.

● 4-second average display

This function is useful when it is difficult to read display as the measured value changes rapidly.

● Resistance measurement safe up through 250V AC.

● Frequency measurement possible
It is possible to measure from 10~999Hz while using the ammeter clamp.

● Temperature measurement possible

Use of the optional 9029 temperature probe enables temperature measurement over a range of -50 to 150°C or -58 to 302°F

● Data hold function

● 10A range included

● True RMS displayed (3262)

True effective values are accurately displayed for distortion wave AC current and voltage measurement.

3263-3263-01

CLAMP ON LEAK HITESTER



High resolution of 10 μA
Suitable for measuring leak or very small currents

| | |
|-------------|-------------------------|
| AC-A | 10/100m·1/10A·100A |
| DC-V OUTPUT | DC1V f.s. |
| HOLD | PEAK VALLEY AVERAGE RMS |

● Superb 10μA resolution

This instrument is capable of measurement of current over a wide range, from minute strays to loads of 100A.

● Multi-function performance through microcomputer control

An internal microcomputers offers average and peak modes.

● Recorder output terminal

Current recordings can be made easily. Taking recordings enables capture of stray currents that may be generated at random times.

● Minimax effects from position and external magnetic fields

Highly permeable magnetic materials are used in the core and magnetic shield to ensure accurate performance even in the presence of magnetic fields caused by transformers and motors. The display deviation caused by difference in the position of the conductor is also extremely small, for utilization as even a zero-phase rectifier without residual current characteristics, and high-precision measurement.

● True RMS displayed (3263-01)

Accurate measurement is possible through a true effective conversion circuit, for even distortion stray currents.

3264

CLAMP ON AC/DC HITESTER



Handy AC/DC ammeter
-For small current 10/100A range-

| | |
|-------------|-------------------------|
| AC-A | 10/100A |
| AC-V | 100/750V |
| AAHz | 100/1000Hz |
| DC-A | 10/100A |
| DC-V | 100/1000V |
| DC-V OUTPUT | DC ±1V f.s. |
| HOLD | PEAK VALLEY AVERAGE RMS |

● Maximum auto-ranging through AC/DC 100A

The auto-range function automatically selects the 10 A or 100 A range for ac and dc currents.

In the 10 A range, measurement is done with a resolution of 10 mA.

● Maximum, minimum and average value display

In the peak or valley mode, the maximum and minimum input values are automatically held when measuring current or voltage.

The average mode is convenient for highly erratic input because it displays average values at intervals of 4 seconds.

● Auto-zero and data hold function

The auto-zero function makes one-touch zero adjustment possible. The data hold function is convenient when measurement is done at tight spots where the display can not be read directly.

● Output terminal/output converter (optional)

An output terminal is provided to allow connection of a recorder for monitoring and recording current waveforms. By connecting the optional 9309 output converter, all data measured with the 3264-including the maximum values, minimum values and frequency-can be output for recording.

● True RMS display

An accurate true-RMS value is displayed even for a distorted ac currents or voltages.

and Average

3265

CLAMP ON AC/DC HITESTER



Handy AC/DC ammeter
-For large current 100/1000A range-

| | |
|--------|-------------------------|
| AC-A | 100/1000A |
| AC-V | 100/750V |
| AAHz | 100/1000Hz |
| DC-A | 100/1000A |
| DC-V | 100/1000V |
| OUTPUT | DC ±1V f.s. |
| HOLD | PEAK VALLEY AVERAGE RMS |

● **Maximum auto-ranging through AC/DC 1000A**

In addition to maximum AC/DC current measurement up through 1000A, the 3265 also offers 0.1A resolution for smaller amperages of 100A and under.

● **Measures up to 1000V**

The system functions perfectly up through 750V AC or 1000V DC, and is equipped with auto-ranging, auto-polarity functions.

● **Frequency measurement for 10 to 999 Hz**

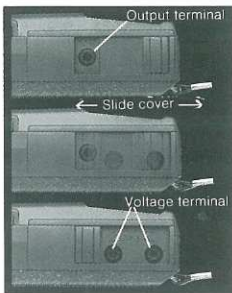
During AC current/voltage measurement, the frequency can also be measured.

● **Display of maximum, minimum and average readings**

● **Auto-zero/data hold function**

● **Output terminal/output converter (option)**

● **True RMS reading**



(Main unit)

3266

CLAMP ON P.F. HITESTER



Also measures power factor and phase angle

| | |
|---------------------|----------------------------------------------|
| AC-A | 10/100A · 100/1000A |
| AC-V | 100/600V |
| AAHz | 100/1000Hz |
| PF | LEAD~1~LAG0 |
| PEAK VALLEY AVERAGE | Positive, negative and missing phase display |
| HOLD | RMS |

● **Measures power factor, phase angle, reactivity, and phase detection.**

Equipped with built-in phase testing functions that provide:

- Direct power factor read-out for single-phase or 3-phase current,
- Phase difference between voltage and current,
- Reactivity for computing reactive power, and
- Phase sequence in 3-phase circuits.

● **Voltage/frequency measurement**

● **Peak and valley hold function.**

Averaging display mode.

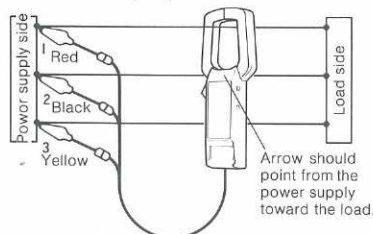
One of the 3266's functions automatically holds and displays peaks and valleys obtained while measuring voltage, current, and power factor. Its averaging mode, which displays averages over a 4-second period, is convenient when testing lines with large fluctuations.

● **Measures bus bars and thick cables.**

Despite its compact, handy size, the 3266 readily performs tests on bus bars, etc., with diameters of up to 55mm and widths up to 80mm.

● **Optional data recording capability.**

● **True RMS display**



Power factor measurement on three-phase three-wire line.

● **Option**

9309

OUTPUT CONVERTER



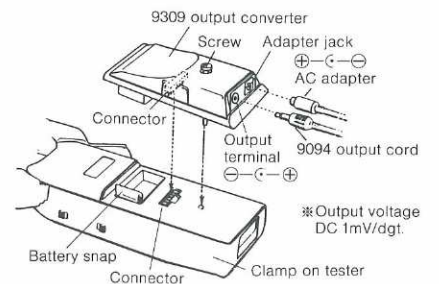
All measured data can be recorded
-For 3264, 3265 and 3266 only-

By installing the 9309 output converter to the above model, an analog output (record out) insulated from the input can be obtained. The output value (including polarity) varies by 1 mV as the display value varies by 1 digit. Thus, this converter allows you to record all measured data.

Note: With cos measurement by 3266, (1,000-display value) is output with polarity added.



Photo shows the 3265 with 9309 output converter



● **SPECIFICATIONS**

Conversion method: D/A conversion

Analog output: 1mV/dgt.

Accuracy: 0.3% rdg. ±2mV

Output response: depending on the sampling rate of the clamp device

Temperature/humidity: 0 to 40°C, less than 80% RH

Temperature characteristics: Less than ±1% at 0 to 40°C

Power supply: 11.5V ±1V, using AC adapter (9V, 200mA)

Dielectric strength: 2200V AC for 1 minute (between connector)

Dimensions: 100H×60W×35Dmm

Weight: Approx. 70g

Accessories: 9094 output cord

Optional accessory: An AC adapter (12V, 300mA) is required for the 9309



Analog output



True RMS



Data hold



Max. min. average



Power factor



Phase angle



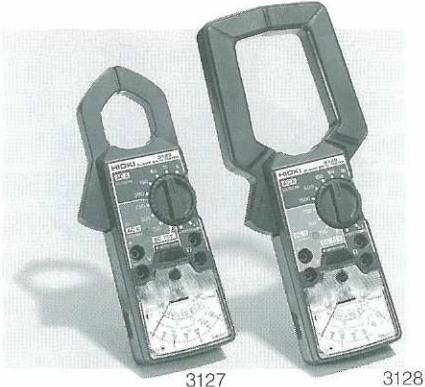
Drop proof

Continuous Changes Traceable

With Analog Type 3100 Series

3127-3128

CLAMP ON HITESTER



Drop-proof, multi-function
—3128, clamps over busbars and large power lines—

| | |
|-------------|-------------------------|
| AC-A | Up to 300A (1500A:3128) |
| AC-V | Up to 750V |
| DC-V | Up to 75V |
| Ω | 1kΩ/100kΩ |
| TEMP | -50°C to +200°C |
| HOLD | DROP PROOF |

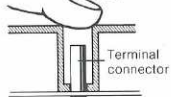
● **Drop-proof**

Will withstand a 1-meter drop to a concrete floor.

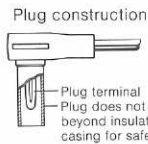
● **Safety-oriented test leads with fuse**

Even if the test lead is pulled out during measurement, the plug is insulated and will prevent shorts to metal surfaces.

Terminal construction
Impossible to touch
connector for
safety



The test lead itself
has a fuse, providing
double safety.



9153 test leads with fuse

● **Ohmmeter safe up to 250V AC**

● **Includes thermometer**

(-50° to 200°C)

Convenient for checking temperature during installation or testing of air conditioners and water heaters.



● **Meter lock mechanism**

● **Clamping possible on even thick busbars and conductors (3128)**

● **Includes carrying case**

Belt hanger makes carrying easy, and protects against impact.



3108-01-3109-01

CLAMP ON HITESTER



Direct current measurable simply by clamping
—Type 3109 for currents up to 2000A—

| | |
|-----------------|-------------------------|
| AC-A | Up to 250A (2000A:3109) |
| AC-V | Up to 500V |
| DC-A | Up to 250A(2000A:3109) |
| DC-V | Up to 500V |
| WAVEFORM | RMS |

● **Measures both AC and DC currents**

The ammeters are capable of measuring a wide range of voltages and currents for both AC and DC

● **Zero-centering**

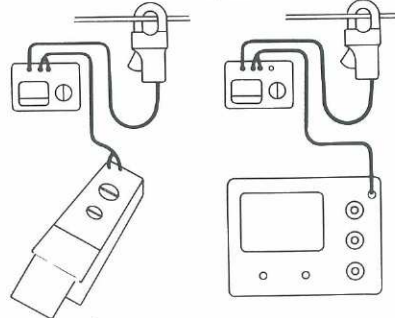
DC current can be zero-centered, enabling direct reading of ± values

● **Wave-form monitor and recorder output terminal**

Setting the measurement mode to DC enables the waveform monitor output, and setting the mode to AC enables the recorder output. These outputs can be utilized for a wide range of functions from input waveform measurement through oscilloscopes and memory recorders to level recordings through standard recorders.

Level recording using recorder (Recorder output)

Waveform recording using oscilloscope and waveform recorder (Wave form monitor)



● **True RMS displayed**

True effective values are accurately displayed for distortion wave AC current and voltage measurement.

● **Clamp-on Probes**

9005-01-9006

RMS type CLAMP-ON AMMETER CONVERTER

RMS



Output voltage: 300mV DC
Accuracy: ±2% f.s.
Frequency: 50/60Hz
Max. core jaw dia.: φ46mm
Load resistance: 300Ω
Cord length: 1.5m (approx.)
Max. circuit voltage: 600V AC
Power supply: 006P (1) or AC adapter (9V, 200mA)
Dimensions: 200H×80W×36Dmm 450g

| Model | Compatible Models | Ranges |
|---------|-------------------|--------------------|
| 9005-01 | 3030 | AC3/12/30/120/300A |
| 9006 | 3124 | AC3/10/30/100/300A |

9010 CLAMP ON PROBE



Measurement range: 10/20/50/100/200/500A AC
Output voltage: 0.2V AC f.s.
Accuracy: ±3% f.s.
Frequency: 40Hz to 1kHz
Max. core jaw dia.: φ46mm
Max. circuit voltage: 600V AC
Dimensions: 185H×62W×33Dmm •420g
Options: 9184 Carrying case

9132 CLAMP ON PROBE



Measurement range: 20/50/100/200/500/1000A AC
Output voltage: 0.2V AC f.s.
Accuracy: ±3% rdg. ±0.5mV
Frequency characteristics: ±1% > (40 to 1000Hz)
Effect of conductor position: ±3.5% >
Max. core jaw dia.: φ55mm, 88mm width
Max. circuit voltage: 600V AC
Cord length: Approx. 3m
Dimensions: 192H×99W×33Dmm 580g

Measurement of distorted waveforms possible with separate recorder

9270·9271·9272

CLAMP ON SENSOR



This series of clamp-on power measurement sensors was developed to support inverter power systems, with a frequency range for the 9270 and 9271 of 5Hz to 50kHz, and for the 9272 of 5Hz to 10kHz. Used together with the 9555 sensor unit these allow current waveform monitor using a waveform recorder or oscillograph

9273·9274·9275·9276

CLAMP ON SENSOR



The 9273 and 9274 are wide frequency range clamp-on sensors ranging up to 10MHz and the 9275 and 9276 range up to 100kHz. Used together with the 3270 current monitor or the 3271 current monitor, these allow accurate monitoring of current waveforms over a wide range of frequencies, including DC and harmonics.

9277·9278·9279

UNIVERSAL CLAMP ON CT



The combination of universal clamp on CT and sensor unit provides a waveform monitor output covering frequencies from DC to high harmonics. The clamp on sensors for DC measurement boast low zero drift. For waveform measurement and recording of inverter control systems, for example, connection to an oscilloscope or Memory HiCorder allows simple and accurate monitoring.

■9270-9272 Specifications

| Item | 9270 | 9271 | 9272 | |
|----------------------------------------------|-----------------------------------------------------------|------------------|----------------------------------------------------------|------------------|
| Rated current (output/range) | 20A AC(2V/20A) | 200A AC(2V/200A) | 20A AC(2V/20A) | 200A AC(2V/200A) |
| Accuracy(23±3°C 45 to 66Hz) | ±0.5% rdg. ±0.05% f.s. (amplitude), ±0.2° max. (phase) | | | |
| Frequency characteristics (amplitude, phase) | at 10Hz to 30kHz ±1.0% max. at 5Hz to 50kHz ±2.5% max. | | at 10Hz to 1kHz ±1.0% max. at 5Hz to 10kHz ±2.5% max. | |
| Operating input range | 0 to 50 Arms | 0 to 300 Arms | 0 to 60 Arms | 0 to 300 Arms |
| Max. allowable input (continuous) | 100 Arms | 500 Arms | 400 Arms (for 10s) | |
| Max. circuit voltage | 600V rms (insulated wire) | | | |
| Max. core jaw dia. | φ20mm max. | | φ46mm, 50×20mm busbar max. | |

■9273-9276 Specifications

| Item | 9273 | 9274 | 9275 | 9276 |
|--------------------------------|------------------------------------------------------------------------------------------------------|-------------------|-----------------------|-----------------------|
| Rated current (output/range) | 20A AC(2V/20A) | 20A AC/DC(2V/20A) | 150A AC(1.5V/150A) | 150A AC/DC(1.5V/150A) |
| Amplitude accuracy (23°C ±3°C) | 9273·9275: ±0.5% rdg. ±0.05% f.s.(45 to 66Hz) 9274·9276: ±0.5% rdg. ±0.1% f.s.(DC, or 45 to 66Hz) | | | |
| Phase accuracy (23°C ±3°C) | Within ±0.2° (45 to 66Hz) | | | |
| Frequency characteristics | 0.7Hz to 10MHz(-3dB) | DC to 10MHz(-3dB) | 0.5Hz to 100kHz(-3dB) | DC to 100kHz(-3dB) |
| Max. allowable input | 50A (non-continuous) | | 400A (non-continuous) | |
| Max. circuit voltage | 600V peak (insulated wire) | | | |
| Max. core jaw dia. | φ5mm | | φ20mm | |

*The core, shield case, and electrical circuits are not insulated.

■9277-9279 Specifications

| Item | 9277 | 9278 | 9279 |
|-------------------------------------|------------------------------------------------------------------|------------|------------------------------------|
| Rated current (output 2V) | 20A AC/DC | 200A AC/DC | 500A AC/DC |
| Accuracy (23±3°C, 45 to 66Hz) | ±0.5% rdg. ±0.05% f.s. (amplitude), ±0.2° (phase) | | |
| Frequency characteristics | DC to 1kHz: ±1.0% | | |
| | to 50kHz: ±2.5% to 100kHz: ±5.0% | | to 10kHz: ±2.5% to 20kHz: ±5.0% |
| Temperature coefficient (0 to 40°C) | Sensitivity: max. ±0.05% rdg./°C Offset: max. ±0.005% f.s./°C | | |
| Max. allowable input | 50Arms | 350Arms | 600Arms |
| Max. circuit voltage | 600V AC rms (insulated wire) | | |
| Max. core jaw dia. | φ20mm | | φ40mm |
| Power supply | 9555 sensor unit or 9495 clamp input unit (for 3192 power meter) | | |

■9555 SENSOR UNIT

Compatible models: 9270, 9271, 9272, 9277, 9278, 9279
Output: 2V f.s.
Power supply: 85 to 250V AC(47 to 440Hz)
Dimensions: 100H×50W×180Dmm·700g

■3270 CURRENT MONITOR

Compatible models: 9273 to 9276
Output: 1V f.s.
Measurement ranges:
0.1 to 10A(7 ranges, for 9273 or 9274)
1 to 100A(7 ranges, for 9275 or 9276)
Filter: On/off, $f_c = 100\text{kHz}$
Frequency characteristics: DC; DC to 10MHz(-3dB), AC; 0.2Hz to 10MHz(-3dB)
Power supply: 100/120/220/240V
Dimensions: 125H×80W×260Dmm·1.7kg

■3271 AC CURRENT MONITOR

Compatible models: 9273, 9275
Output: 1V f.s.
Measurement ranges:
1A/10A(for 9273 sensor)
10A/100A(for 9275 sensor)
Frequency characteristics: DC to 20MHz(-3dB)
Power supply: 100/120/220/240V
Dimensions: 110H×60W×186Dmm·1.0kg

SPECIFICATIONS

| | | 3261 | 3262 (RMS) | 3263 | | 3264 (RMS) | 3265 (RMS) | 3266 (RMS) | | <ul style="list-style-type: none"> ● Single-phase and 3-phase lines (balanced load) ● Effective measurement range (voltage): 80 to 600V ● Effective measurement range (current): 10 to 1000A (100 to 1000A range) 1 to 100A (10/100A range) |
|-----------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | -01 (RMS) | | | | P.F. | cos ϕ (power factor) Lead 0 to 1 to Lag 0 | |
| DC A | Normal Average | — | — | — | — | 10/100A | 100/1000A | | | P.F. |
| | Peak Valley | — | — | — | — | 100A | 1000A | | | |
| DC V | Normal Average | — | — | — | — | 100/1000V * | 100/1000V * | P.F. | sin ϕ (reactivity) | Lead 90° to 0 to Lag 90° |
| | Peak Valley | — | — | — | — | 1000V * | 1000V * | | | |
| AC A | Normal Average | 10/100/1000A | 10/100m·1/10A·100A | 10/100A | 100/1000A | 10/100A | 100/1000A | 10/100A·100/1000A | | |
| | Peak Valley | 10/1000A | 100m·10·100A | 100A | 1000A | 100A | 1000A | 100A·1000A | | |
| | Hz | 100/1000Hz | — | 100/1000Hz | 100/1000Hz | 100/1000Hz | 100/1000Hz | 100/1000Hz | | |
| AC V | Normal Average | 100/1000V | — | 100/750V * | 100/750V * | 100/600V | 100/600V | 100/600V | | |
| | Peak Valley | 1000V | — | 750V * | 750V * | 600V | 600V | 600V | | |
| | Hz | 100/1000Hz | — | 100/1000Hz | 100/1000Hz | 100/1000Hz | 100/1000Hz | 100/1000Hz | | |
| Resistance | 1k/10k Ω $\pm 1\%$ rdg. ± 3 dgt. | | — | — | — | — | — | — | | |
| Temperature | -50°C to 150°C -58°F to 302°F ± 1 dgt. (main unit) | | — | — | — | — | — | — | | |
| Analog output | — | | DC 1Vf.s. $\pm 1\%$ rdg. ± 5 mV | | DC ± 1 Vf.s. $\pm 1.3\%$ rdg. $\pm 0.3\%$ f.s. | | — | | | |
| Output response time | — | | Approx. 120ms (Circuit time constant) | | Approx. 120ms (Circuit time constant, record out) | | — | | | |
| Accuracy | DC A | — | | — | | $\pm 1.3\%$ rdg. ± 3 dgt. | | cos ϕ , sin ϕ | $\pm 3^\circ \pm 2$ dgt. | |
| | DC V | — | | — | | $\pm 1.0\%$ rdg. ± 3 dgt. (Input resistance approx. 2M Ω) | | Phase angle | $\pm 3^\circ$ | |
| | AC A | $\pm 1\%$ rdg. ± 5 dgt. | | $\pm 1\%$ rdg. ± 5 dgt. | | $\pm 1.3\%$ rdg. ± 3 dgt. | | $\pm 1.0\%$ rdg. ± 3 dgt. | | |
| | | Hz | $\pm 0.3\%$ rdg. ± 1 dgt. | | — | | $\pm 0.3\%$ rdg. ± 1 dgt. | | — | |
| | AC V | $\pm 1\%$ rdg. ± 3 dgt. | | — | | $\pm 1.0\%$ rdg. ± 3 dgt. (Input resistance approx. 2M Ω) | | (Input resistance approx. 1M Ω) | | |
| Hz | | $\pm 0.3\%$ rdg. ± 1 dgt. | | — | | $\pm 0.3\%$ rdg. ± 1 dgt. | | — | | |
| Display | Max. 999 LCD, unit symbol display | | | | | | | cos ϕ · sin ϕ : 1000, phase angle: 900 | | |
| Display hold | Data held by pressing the push-button | | | | | | | | | |
| Input over display | "O.L." display | | | | | | | | | |
| Range selection | Automatic (without 10A) | | Semi-automatic | | Automatic | | Automatic (A:semi-auto) | | | |
| Battery low indicator | [B] mark appears when battery voltage drops below the operating voltage | | | | | | | | | |
| Sampling rate | Approx. 2 times/sec (Average: 4 times/sec) | | | | | | | | | |
| Peak/valley hold response time | Circuit time constant approx. 200ms | Holds peak and valley values during A/V measurements. circuit time constant (AC): approx. 120ms | | | | | | | cos ϕ circuit time constant approx. 160ms | |
| Frequency characteristics | $\pm 3\% >$ (10A) $\pm 2\% >$ (100/1000A) $\pm 1\% >$ (100/1000V) at 40 to 500Hz | | $\pm 2\% >$ at 40 to 1kHz | | $\pm 4\% >$ (A) $\pm 1\% >$ (V) at 20 to 500Hz (AC V: 1kHz) | | $\pm 2.5\% >$ (A) $\pm 1.5\% >$ (V) at 20 to 1kHz | | $\pm 2\% >$ (A,V) at 40 to 1kHz | |
| Temp. characteristics (at 0 to 40°C) | $\pm 1.5\% >$ | | $\pm 1.0\% >$ | | $\pm 2.5\% >$ (A) $\pm 1.5\% >$ (V) | | $\pm 2^\circ >$ (P.F.) $\pm 1.5\% >$ (A,V) | | | |
| Max. core jaw dia | Approx. ϕ 46mm Approx. 50×20mm busbar | | Approx. ϕ 34mm 35mm | | Approx. ϕ 30mm | | Approx. ϕ 46mm Approx. 50×20mm busbar | | Approx. ϕ 55mm Approx. 80mm busbar | |
| Effect of conductor position | $\pm 2\% >$ | | $\pm 0.1\% >$ | | $\pm 0.5\% >$ | | $\pm 0.7\% >$ | | $\pm 2\% >$ | |
| Effect of external magnetic field (at 400A/m) | 1.0A equivalent $>$ | | 5mA equivalent $>$ | | 0.5A equivalent $>$ | | 1.5A equivalent $>$ | | 1.0A equivalent $>$ | |
| Crest factor | — | | 2.2 $>$ | | — | | 3.5 $>$ | | 2.5 $>$ | |
| Max. circuit voltage | 600V AC $>$ | | | | | | | | | |
| Dielectric strength | 3000V AC/1 minute | | 2200V AC/1 minute | | 2500V AC/1 minute | | 2500V AC/1 minute | | | |
| Power supply | 6F22 (006P) 9V×1 | | | | | | | | | |
| Power consumption | Approx. 36mW(80h) | | Approx. 40mW(80h) | | Approx. 95mW(20h) | | Approx. 90mW(25h) | | Approx. 45mW(60h) | |
| Rectifying method | Average value True RMS | | Average value True RMS | | True RMS | | | | | |
| Dimensions/weight | 230H×63W×40Dmm Approx. 420g | | 215H×63W×40Dmm Approx. 600g | | 232H×63W×40Dmm Approx. 430g | | 252H×62W×40Dmm Approx. 560g | | 258H×63W×40Dmm Approx. 670g | |
| Accessories | 9067 test leads (1) 0.5A fuse (non-arcing, 1) 9148 carrying case | | 9148 carrying case | | 9067 test leads 9355 carrying case | | 9176 voltage test leads 0.3A fuse (non-arcing, midget type) 9355 carrying case | | | |

3261, 3262 : With 0.5A/250V fuse (non-arcing)

-50: With 0.5A/250V and 1A/600V fuses

*9029 Temperature probe is sold separately.

*When the 9309 output converter is used, the 750V DC or 600V AC range is used.

| | 3127 | 3128 | 3108-01 | 3109-01 |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|
| DC A | — | — | 10/25/50/100 250A | 100/250/500/1000/ 2500A Measurement up to 2000A |
| DC V | Max. 75V | | 10/25/50/250/500V | |
| AC A | 6/15/60/150/300A | 15/60/150/600/ 1500A | 10/25/50/100/ 250A | 100/250/500/1000/ 2500A Measurement up to 2000A |
| AC V | 150/300/750V | | 10/25/50/250/500V | |
| Resistance | 1k/100kΩ (30Ω center value) | | — | — |
| Temperature | -50 to 200°C | | — | — |
| Analog output | — | — | DC ±1 Vf.s. | |
| Output response time | — | — | Approx. 160ms (-01 specification 270ms) (Circuit time constant) | |
| Accuracy | DC A | — | ±2.5% f.s. (1500 to 2000A, ±5% f.s.) | |
| | DC V | ±3% f.s. | | ±2.5% f.s. |
| | AC A | ±3% f.s. | | ±2.5% f.s. (1500 to 2000A, ±5% f.s.) |
| | AC V | ±3% f.s. | | ±2.5% f.s. |
| Display | Analog | | Analog | |
| Range selection | Manual | | Manual | |
| Battery low indicator | — | — | Battery check | |
| Frequency characteristics | 50/60Hz | | 20 to 500Hz ±1%> | |
| Temperature characteristics | — | — | 0 to 40°C ±1.5%> | |
| Max core jaw dia | Approx. φ33mm | Approx. φ55mm 80mm bus | Approx. φ30mm | Approx. φ46mm |
| Effect of external magnetic fields | — | — | 0.1A equivalent>, at 400A/m | 0.2A equivalent>, at 400A/m |
| Effect of conductor position | — | — | ±1%> | |
| Crest factor | — | — | 3> | |
| Max circuit voltage | 750V AC> | | 500V AC> | |
| Dielectric strength | 2500V AC | | — | — |
| Power supply | R6P (AA) ×1 | | R14P(C)×4 or AC adapter (6V-300mA) | |
| Power consumption | — | — | Approx. 360mW (29h) | |
| Fuse protection | Protects the ohm range when 250V AC (commercial power) is applied (0.5A fuse, non-arcing) 9153 test leads with fuse | | — | — |
| Rectifying method | Average value | | True RMS | |
| Dimensions/weight | 190H×78W×34Dmm Approx. 340g | 237H×99W×34Dmm Approx. 570g | 175H×85W×40Dmm Approx. 1,850g | 180H×90W×40Dmm Approx. 1,900g |
| Accessories | 9153 test leads with fuse (1) 0.5 fuse (non-arcing) Carrying case (9351:for 3127,9148:for 3128) | | 9060 test leads 9083 carrying case | |

● Accuracy and tolerance

Both indicate the allowable error included in the measured values. In this catalog, accuracy is used for digital instruments and tolerance is used for analog instruments. Accuracy and tolerance on specifications are defined as values corresponding to full scale (f.s.), reading (rdg.) or digit (dgt.) value.

● f.s. (maximum indicated value, maximum scale, scale length)

Represents the maximum indicated (scale) value or scale length (for non-linear scale or when the maximum value cannot be specified). Generally, this is a range value (marked by the range switch etc.). However, if the maximum display value is 2,000V and the range value is 600V since the measurement limit is 600V, the maximum display value (scale value) is used as f.s.

● rdg. (read value, display value, indicated value)

Represents a currently measured value or currently displayed or read value.

● dgt. (resolution)

Represents the minimum unit value on a digital instrument or "1" of the minimum digit of a digital display. Although this originally represents a ±1 digit error due to fraction treatment of analog/digital conversion, the f.s. error converted into the digit value is added to the ±1 digit error when the dgt. value is represented.

The error limit for a currently measured value can be obtained from these values listed on the specifications.

Example:

Assume that the specification of the 2000 kohm range are as follows:

Maximum display value:1999

Accuracy: ±0.1% rdg. ±5 dgt.

When a measured value of 1000 ohm is obtained, the error limit can be calculated as follows:

$$* 1 \text{ dgt.} = [\text{range value}] / [\text{maximum display value}]$$

$$= 2000 \text{ kohm} / 1999 = \pm 1 \text{ kohm}$$

$$* \text{dgt. error} = \pm 5 \text{ dgt.} = \pm 5 \text{ kohm}$$

$$* \text{rdg. error} = \pm ([\text{measured value}] \times [\text{error rate}])$$

$$= \pm (1000 \text{ kohm} \times 0.1\%)$$

$$= \pm 1 \text{ kohm}$$

$$* \text{Total error limit} = \pm ([\text{rdg error}] + [\text{dgt error}])$$

$$= \pm (5 \text{ kohm} + 1 \text{ kohm})$$

$$= \pm 6 \text{ kohm}$$

● Crest factor

As shown below, the crest factor is the ratio between the peak value and effective value of the waveform.

Crest factor = peak value/effective value

When the crest factor is extremely large, the dynamic range of the measuring device may be exceeded so that a measurement error may result. It is important to make sure the crest factor of the measuring device used.

● Output response

For measurements of AC current and voltage, a measuring device has a unique circuit time constant for internal processing. The output response time of a measuring device is determined by the time constant. If the quantity to be measured changes rapidly, it takes a time four or 5 times longer than the circuit time constant for the measured value to come within the range where the accuracy is assured. As for display response, it is necessary to add meter response (for analog devices) or sampling time (inverse number of sampling rate) for A/D conversion (for digital devices) to the above response time.

● RMS Root Mean Square

Root mean square actually means the true measured value is displayed. Most AC voltage and current measurement circuits use an averaging rectification technique that converts the resultant DC value (average) to a value representative of the true value, assuming the measured wave is a perfect sine wave. For waveforms that are not perfect sine waves, such as those with excessive distortion, this technique will not yield an accurate measurement. The RMS type, however, uses an internal operation to determine the precise measurement for each given instant, and can accurately measure even distorted waveforms.

⚠ DANGER



To avoid short circuits, and accidents that could result in injury or death, use only with power lines carrying voltages within the rated limit of the clamp on testers.

Some clamp on testers have clamp portions with non-insulated cores and shieldings. Therefore, to avoid short circuits and accidents that could result in injury or death, do not use on bare conductors.

SELECTION GUIDE

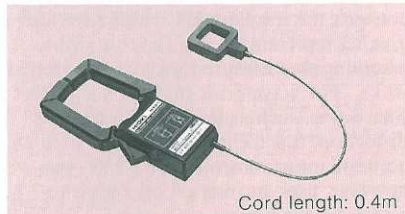
| No. of model | | 3127 | 3128 | 3108-01 | 3109-01 | 3261 | 3262 | 3263 -01 | 3264 | 3265 | 3266 |
|------------------------|--------------------------------|--------|--------|--------------|--------------|-------------------------|---------------|-----------------|-----------------|--------------------------|------|
| Measurement function | AC A | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | DC A | | | ○ | ○ | | | | ○ | ○ | |
| | AC V | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ |
| | DC V | ○ | ○ | ○ | ○ | | | | ○ | ○ | |
| | Frequency | | | | | ○ | | | ○ | ○ | ○ |
| | Resistance | ○ | ○ | | | ○ | | | | | |
| | Temperature | ○ | ○ | | | ○ | | | | | |
| | Power factor | | | | | | | | | | ○ |
| Miscellaneous function | HOLD | ○ | ○ | | | ○ | | ○ | ○ | ○ | ○ |
| | Analog output | | | ○ | ○ | | | ○ | ○ *1 | ○ *1 | ○ *2 |
| | Drop proof | ○ | ○ | | | | | | | | |
| | True RMS | | | ○ | ○ | | ○ | ○ | ○ | ○ | ○ |
| | Range selection | Manual | Manual | Manual | Manual | Automatic (without 10A) | Semi-auto | Automatic | Automatic | Automatic (A: semi-auto) | |
| | Display | Analog | Analog | Analog | Analog | LCD「999」 | LCD「999」 | LCD「999」 | LCD「999」 | LCD「999」 | |
| | Resolution | 0.2A | 0.5A | 0.2A | 2A | 0.01A | 10μA | 0.01A | 0.1A | 0.01A | |
| | Frequency characteristics (Hz) | 50/60 | 50/60 | DC to 500 | DC to 500 | 40 to 500 | 40 to 1k | DC to 500 | DC to 1k | 40 to 1k | |
| | AC power supply | | | ○ (6V,300mA) | ○ (6V,300mA) | | ○ (12V,300mA) | ○ *2 (9V,200mA) | ○ *1 (9V,200mA) | ○ *2 (9V,200mA) | |

* 1 With an optional 9309 output converter, all data can be output for recording.

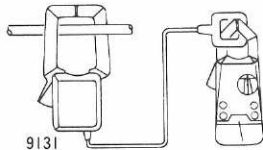
* 2 Possible only when a 9309 output converter is used.

OPTIONAL ACCESSORIES

9131 CLAMP ON ADAPTER



Cord length: 0.4m



9131

This clamp adapter is capable of utilization on conductors up to 55 cm in diameter, or busbars up to 80 mm wide. Operation is simple: merely clamp the large end around the busbar or conductor, and clamp the smaller secondary coil to the clamp of the ammeter. The conductor current is shown at 10% of the actual value.

Measurement range: AC 0 to 1500A (50/60Hz)
 CT ratio: 10:1
 Measurement time: Continuous up to 1000A, maximum 2 minutes at 1500A
 Accuracy: $\pm 3\%$ reading (at 100 to 1500A)
 Frequency characteristics: $\pm 3\%$ from 20 to 1000Hz
 Effect of conductor: $\pm 1\%$ (as per JEMIS-020 method)
 Effect of external magnetic fields: 0.8A equivalent maximum (at 400A/m)
 Max. core jaw dia: 55 mm. diameter maximum busbar width 80 mm.
 Usable temperature range: 0°C to 40°C
 Dimensions weight: 192H×99W×33D mm
 Approx. 450g

9290 CLAMP ON ADAPTER



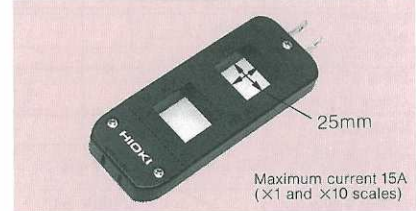
Cord length: 3m

(for large currents over a wide frequency range)

The 9290 is a 10:1 clamp adapter that permits measurement of conductors up to 55mm in diameter, and busbars up to 80mm thick. Compared with former types, it offers higher accuracy, better phase characteristics and wider frequency characteristics, being ideal for use with the 9270 series high-precision clamp sensors. In particular, its excellent phase characteristics reduce the influence of the power factor, making it suitable for power measurement with a poor power factor.

Measurement range: 0 to 1500 A AC
 CT ratio: 10:1
 Measurement time: Continuous below 1000A, within 5 minutes at 1500 A
 Maximum circuit voltage: 600 V AC
 Accuracy (23°C±3°C): (10 A to 1500 A, 45 Hz to 66 Hz). Amplitude: $\pm 1.5\%$ rdg. Phase: 1.0° max.
 Frequency characteristic (deviation from accuracy): Amplitude: $\pm 1\%$ rdg. (40 Hz to 1 kHz) $\pm 2.5\%$ rdg. (20 Hz to 4 kHz). Phase: 1.0° max. (40 Hz to 1 kHz) 3.0° max. (20 Hz to 4 kHz)
 Effect of conductor position Within: $\pm 1.5\%$ max.
 Effect of external magnetic fields: 0.8 A equivalent (at 400 A/m)
 Dielectric resistance: 2200 V AC (between the core and the case)
 Core opening: 55 mm dia.; accepts up to 80 mm-wide busbar
 Dimensions weight: 194H×99W×33D mm, approx. 500g
 Accessories: 9148 carrying case I, Marking bands 6

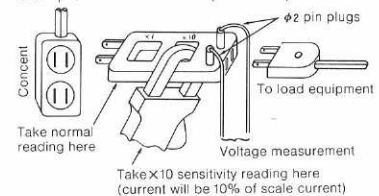
CT-101A LINE SPLITTER



25mm
 Maximum current 15A (×1 and ×10 scales)

This is useful for measuring current and power for equipment connected to an 100V AC line. Using the ×10 function allows current sensitivity to be increased tenfold for detection of small currents. This further enhances the measurement ranges of the clamps.

Example of CT-101A use (max. 15A)



Take normal reading here

Take ×10 sensitivity reading here (current will be 10% of scale current)

9021-01 Temperature probe (for 3127, 3128) 9029 Temperature probe (for 3261, 3262)

| Range | Accuracy | Range | Accuracy |
|-------------|----------|-------------|----------|
| -50 ~ 150°C | | -50 ~ 302°F | |
| -50 ~ 50°C | ±3°C | -58 ~ 62 °C | ± 6 °F |
| 50 ~ 100°C | ±4°C | 62 ~ 182 °C | ± 8 °F |
| 100 ~ 150°C | ±5°C | 182 ~ 302°C | ± 10°F |

9094 Output cord (for 3263, 3264, 3265, 9309) cord length 1.5m

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