3169-20, 3169-21
CLAMP ON POWER HiTESTER

- Measures power lines of up to 254 mm in diameter
- Measures up to two 3-phase, 3-wire systems (displays voltage and current for three lines)
- Measures up to four single-phase, 2-wire systems
- 0.5 A to 5000 A range
- Compact and lightweight
- PC card data storage
- Power recording for individual waveforms
- Simultaneous recording of demand values and harmonics
- 9625 POWER MEASUREMENT SUPPORT SOFTWARE

The photo shows the 3169-21 combined with the 9661 and 9669 CLAMP ON SENSORS (optional) for measuring two systems. The 3169-20 can also be used in combination with CLAMP ON SENSORS (optional) rated up to 5000 A.

**Offering a new approach to energy-related measurement**

such as energy conservation, ISO14001 testing, equipment diagnosis, and harmonics measurement.

**The 3169-20 and 3169-21 are CLAMP ON POWER HiTESTERS** that allow measurement of single-phase to three-phase 4-wire circuits with a single unit. In addition to measuring standard parameters such as voltage, current, power, power factor, and integrated values, these clamp-on power meters can simultaneously perform demand measurements required for carrying out power management and energy-saving measures, as well as harmonic measurements. The two new power meters also feature PC card data storage, and come equipped with an RS-232C interface for PC communications. Further, with greater data processing speeds, it is possible to measure the power of just a few cycles, enabling more detailed and effective energy-saving measures for equipment. The 3169-20 and 3169-21 are ideal for users who want to achieve close control over energy-saving management activities and measures.

**9667 FLEXIBLE CLAMP ON SENSOR**

http://www.hioki.co.jp/

ISO14001
JQA-E-90091

HIOKI company overview, new products, environmental considerations and other information are available on our website.
I Measure power lines of up to four systems (with a common voltage)

One single unit can measure four circuits (single-phase 2-wire), two circuits (3-phase, 3-wire), or a one circuit (3-phase, 4-wire) system.

I A wide range of measurement functions

The 3169-20/21 can simultaneously measure voltage, current, power (active, reactive, and apparent), integrated power, power factor, and frequency. Further, when using 3-phase, 3-wire (3P3W2M) mode, you can display the voltage and current for all three lines by measuring just two of them. When using the 3-phase, 4-wire (3P4W4I) mode, neutral line current can be displayed using 4 current measurement.

I Housed in a compact A5 body size

The 3169-20 and 3169-21 feature a compact design that makes them portable and easy to use in tight spaces, and are approximately 30% more compact than the 3166 CLAMP ON POWER HiTESTER.

I Multi-language Compatibility

Select from nine languages, including Japanese and English.

I Detect incorrect connection using vector diagrams

Use the vector display on the connection confirmation screen to check the phase, whether a connection is loose, or whether the clamp-on sensor connection has been reversed during VT/CT terminal measurement.

I High-speed D/A output

The 3169-21 comes equipped with 4-channel high-speed D/A output to enable analog output of RMS values for individual waveforms.

I Ideal for power and harmonics management

The power meters come equipped with a harmonics measurement function that supports measurement of 3-phase power lines. They can also perform simultaneous measurement of harmonics and demand values, enabling both power and harmonics management.
The ultimate in clamp-on power meters!

**Sleek Design and Engineering**
The photo shows the 3169-21 with D/A output.

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**Range Configuration Table**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current Connection</th>
<th>9695-02 CLAMP ON SENSOR (CAT III 300V) (50mA, 1A, 5A, 10A, 50A)</th>
<th>9660, 9695-03 CLAMP ON SENSOR (CAT III 300V) (5A, 10A, 50A, 100A, 500A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150.00V</td>
<td>Single-phase 2-wire</td>
<td>75.000 W</td>
<td>1.5000kW</td>
</tr>
<tr>
<td></td>
<td>Single-phase 3-wire</td>
<td>150.00 W</td>
<td>3.0000kW</td>
</tr>
<tr>
<td></td>
<td>Three-phase 3-wire</td>
<td>225.00 W</td>
<td>4.5000kW</td>
</tr>
<tr>
<td></td>
<td>Three-phase 4-wire</td>
<td>450.00 W</td>
<td>9.0000kW</td>
</tr>
<tr>
<td>300.00V</td>
<td>Single-phase 2-wire</td>
<td>150.00 W</td>
<td>3.0000kW</td>
</tr>
<tr>
<td></td>
<td>Single-phase 3-wire</td>
<td>300.00 W</td>
<td>6.0000kW</td>
</tr>
<tr>
<td></td>
<td>Three-phase 3-wire</td>
<td>600.00 W</td>
<td>12.000kW</td>
</tr>
<tr>
<td></td>
<td>Three-phase 4-wire</td>
<td>900.00 W</td>
<td>18.000kW</td>
</tr>
<tr>
<td>600.00V</td>
<td>Single-phase 2-wire</td>
<td>150.00 W</td>
<td>3.0000kW</td>
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<td>600.00 W</td>
<td>12.000kW</td>
</tr>
<tr>
<td></td>
<td>Three-phase 4-wire</td>
<td>900.00 W</td>
<td>18.000kW</td>
</tr>
</tbody>
</table>

---

**Key Points**
- **Note 1:** The range configuration table displays the full-scale display values for each measurement range.
- **Note 2:** In the table, "unit W" has been replaced with "VA" or "var" for the apparent-power and reactive power measurement ranges.
- **Note 3:** Voltage and current input values 0.4% or less than the measurement range are displayed as "zero." When either the voltage or current for the power line is zero, the power value is displayed as zero.
- **Note 4:** You can display measurement values up to 130% of each measurement range.

---

Use the 9441 CONNECTION CABLE to connect to external devices. (Output resistance: 100Ω)
The addition of a vector display for viewing the connection status completes the preparation required for measurement.

When measurement accuracy is crucial
The addition of a vector display for viewing the connection status completes the preparation required for measurement.

Have you ever experienced incorrect measurement results? The most common cause of incorrect data is a faulty connection. With the 3169-20/21 you can use the vector display to check the phase, whether a connection is loose, or whether the clamp-on sensor connection has been reversed. Also, you are assured of proper connection when measuring the VT (PT)/CT terminals even if you cannot see the line you are measuring.

The basic settings are constantly displayed, allowing you to measure with confidence.
During measurement, in addition to displaying the voltage and current ranges, and VT (PT) and CT ratios for each system, the unit can also display items such as the measurement interval. Because the basic settings are constantly visible, you can be confident of obtaining the correct measurement results.

Measure another device simultaneously
Using the external I/O function, you can obtain even more detailed measurements for energy conservation.
In addition to measurement start/stop control through external input, you can use this function to output the measurement start/stop signal for the 3169-20/21. Simultaneous recording of a variety of signals is also possible for equipment when using multiple devices to perform start control and multi-channel recording.
Large storage capacity to accommodate power and harmonics data for individual waveforms. Supports energy saving measures that can be carried out from your PC.

Greater flexibility for energy saving measures through detailed measurement!

**Reduce energy consumption by “1%!** Why not try analyzing your energy saving measures?

**Save measurement details to PC card for extended measurements!**

Why not try a shorter data management interval?

With the 3169-20/21, you can set the data recording interval to 1 minute. If you are unsure how to proceed with energy conservation, you can use a large capacity PC card to save measurement details, then use the data to create a load fluctuation graph and analyze this to help reduce wasted power consumption.

Further, because you can save a variety of data, including simultaneous recording of power and harmonics data, waveform data storage, and print-outs of the screen, these two new units help by storing measurement details.

**Identify even small amounts of power waste using individual waveform measurements**

The 3169-20/21 can help turn you into a keen energy saving specialist. These two new units allow you to measure power data by recording the RMS values for individual waveforms. By measuring just a few seconds of machine cycles or changes in operating patterns of facilities such as manufacturing equipment, you can grasp power fluctuations over a relatively short amount of time and view improvements in the form of numerical data. Gain unsurpassed energy savings by achieving simple improvements around the work environment.

**Improve energy-saving operations and create an energy-efficient facility**

Why not try to improve your energy-saving measures using the 3169-21?

Using the D/A output (4 ch) function on the 3169-21, you can simultaneously record a variety of measurement and control signals for equipment, such as the power fluctuation and temperature/flow for individual waveforms, onto a HIOKI MEMORY HiCORDER or logger.

A slight reduction in power consumption due to changes in the inverter motor operating temperature/flow for individual waveforms, onto a HIOKI MEMORY HiCORDER or logger.

**Unbalanced loads are an enemy to energy saving activities. Solve your problems with careful management of power lines.**

Unbalanced 3-phase loads can result in a damaged power line. To provide detailed management of measurements, the 3169-20/21 displays voltage and current for all three lines even when measuring just two circuits (3P2W2M). Further, because the effective power for each phase is displayed based on a virtual centre point when measuring the voltage and current for all three lines (3P3W3M), the units can also be used to implement energy saving measures and power management systems.

**Harmonics cause wasted power**

Did you think that harmonics and energy saving activities were unrelated? Due to a spread in equipment that uses semiconductor control devices, such as inverters, power quality has decreased. Also, power consumed in harmonic components is all wasted power. Harmonic control and management are essential for energy conservation.

You can switch channels to easily check the harmonics for each circuit.

**To identify causal factors with harmonic measurements of multiple systems circuits**

If production equipment malfunctions, power is wasted if repeated manufacture results in defective products again.

If you think harmonics are causing malfunctions, you can simultaneously measure the harmonics of individual circuits using multi-circuit measurement to obtain detailed information about the occurrence of harmonics along with the current direction for each phase. Using the 3169-20/21 you can accurately determine the relationship for harmonic inflows and outflows between power lines by analyzing the data acquired simultaneously, and then devising energy-saving measures based on the cause of the occurrence.
9625 POWER MEASUREMENT SUPPORT SOFTWARE

Graphically process measurement data from Model 3169-20/21 easily on a PC!

The Model 9625 POWER MEASUREMENT SUPPORT SOFTWARE application provides easy graphical processing on a computer of measurement data saved on the Models 3169-20/21 and 3166 CLAMP ON POWER HiTESTERS.

Features

- **Time Series Graph Display Function**
  Measurement data can be displayed as a time series graph. Demand data measured in different series can be overlaid on the display.

- **Summary Display Function**
  Measurement data can be displayed directly in table form.

- **Daily, Weekly and Monthly Report Display Function**
  Daily, weekly and monthly reports of demand data can be displayed.

- **Harmonic Analysis Function**
  Display harmonic measurement data as a graph, list or waveform. (Also compatible with the harmonic measurement data captured by Model 3166.)

- **Print Function**
  Each screen can be printed.

Easily display and print various screens such as graphs and spreadsheet tables

**Step 1. Load measurement data**
Load up to 16 data sets from the 3169-20/21 or 3166 at once. Measured numerical values and waveform data are recognized and displayed automatically.
1. Loading and deleting data, and changing data names, can be done easily.
2. Multiple sets of measurement data can be loaded and managed in a single file.

**Step 2. Select the display (screen) type**
Select from time series graph, summary, daily, weekly or monthly report, harmonic list, harmonic graph, harmonic waveform or settings.

**Step 3. Select display items (two-axis display is possible)**
1. Select the data items (up to 16) to display.
   - For graph displays, the type of graph (line or bar) can be selected.
2. Enter details for data display. (data item names, levels, etc.)

**Step 4. Set the start/stop times and data interval to be displayed**
1. Set the data period to display. (start/stop time and data interval)
   - The displayed period can be easily changed by scrolling.
Time Series Graph Display Function (two-axes display possible)
- The displayed graph can be set to suit particular start/stop times and data intervals. Harmonic time series graphs can be displayed.

Convenient Functions
1. The horizontal (time) axis can be easily scrolled to show the desired range.
2. Upper and lower limits (measurement values) of the vertical axis can be easily set and changed.
   * Graph type (line, bar or stacked bar), line type (such as solid or dashed), color and details of upper and lower numerical values can be set.
3. Any desired numerical data value on a graph can be confirmed and displayed by cursor movement.
4. The display can be switched between 2D and 3D graphs.

Summary Display Function
Summary
- Displays a summary of the data values between specified start/stop times, at the specified data interval.

Convenient Functions
1. In addition to measurement values within the period being displayed, the summary shows period, maximum, minimum and average values.
2. Measurement data names and measurement units can be edited in the summary.

Daily, Weekly or Monthly Report Display
- Displays a summary covering the total values in daily, weekly or monthly reports.

Convenient Functions
1. The time axis for each total scrolls to easily change the totalized period.
2. The total time range of measurement data can be totalized in up to four sections per time period.

Harmonic Display Function
Harmonic Time Series Display
- While displaying a time series graph, select the harmonic item for the vertical axis to display a time series graph of harmonics.

Convenient Functions
1. Up to 32 graphs can be displayed simultaneously using 2-axes display. For one circuit measurement, up to 32 orders can be graphed. Using multiple instruments, time series of harmonics can be easily compared.
2. Any desired chronological detail can be easily confirmed using the cursors on the graph.

Harmonic List Display
- Displays harmonic data for the selected display item as a list.

Harmonic Graph Display
- Displays harmonic data for the selected display item as a bar graph.

Harmonic Waveform Display
- Displays the voltage and current waveforms upon which harmonic data is based.
## 9625 Specifications

### General Specifications

- **Supported instrument models**: 3169-20, 3169-21, and 3166 (CLAMP ON POWER HiTESTERs)
- **Operating environment**:
  - Computer: PC-AT compatible (DOS/V machine)
  - CPU: Pentium 200 MHz or higher
  - Memory: 128 MB or more (recommended)
  - Hard disk: 128 MB or more free space
  - Display: XGA (1024×768) or higher
  - Disc device: CD-ROM drive (for installation)
  - Operating system: Windows95/98, NT4.0, 2000, Me, XP (English edition)
  - Internet Explorer 4.0 or later

### Functional Specifications

#### [Data Load/Save Functions]

<table>
<thead>
<tr>
<th>Loading data</th>
<th>File extension</th>
<th>Data format</th>
<th>Data contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>3169-20/21</td>
<td>Data file</td>
<td>CSV</td>
<td>Instantaneous value, average value, maximum value, minimum value, integrated value, demand value, harmonic</td>
</tr>
<tr>
<td></td>
<td>Waveform data file</td>
<td>WUI</td>
<td>Instantaneous waveform</td>
</tr>
<tr>
<td></td>
<td>Short-interval data file</td>
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<td>DEM</td>
<td>Instantaneous value, maximum value, minimum value, demand value</td>
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<td>Harmonic measurement data file</td>
<td>HRM</td>
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<td></td>
<td>Setting file</td>
<td>SET</td>
<td>–</td>
</tr>
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<td>Combined file</td>
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<td>Binary</td>
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<th>Data format</th>
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### Print Function

- Reports and screen copies of the displayed screen can be easily printed.
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  1. Printing results can be confirmed by print preview.
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[Basic Specifications]

- **Measurement line type**: Single-phase 2-wire, single-phase 3-wire, three-phase 3-wire, and three-phase 4-wire systems (50/60 Hz)
- **Number of systems that can be measured**: Single-phase: 1P2W, 1P3W, 1P4W; Three-phase: 3P2W/3M, 3P3W, 3P4W
- **Total display area**: 5-inch LCD (320 x 480 dots), with backlight
- **Harmonics list**: Harmonic level, Harmonic phase angle, Harmonic content percentage

[Display Specifications]

- **Instantaneous value display**: Voltage, current, active power, reactive power, apparent power, power factor, frequency, average voltage, current average (values are for each system)
- **Average value display**: Voltage, current, active power, reactive power, apparent power, power factor, frequency, average voltage, current average
- **Demand volume display**: Active power volume (consumption/regeneration), Reactive power volume (lag/lead)
- **Total demand display**: Active power volume (consumption/regeneration)
- **Harmonics graph**: Harmonics list
- **Waveshape display**: Measurement value enlargement display

[Measurement Specifications]

- **Input/Output current**: 10 mA (rms)
- **Measurement method**: Time RMS method
- **Polarity display**: For lag phase (LAG: current is slower than voltage): no symbol
- **Polarization display**: For lag phase (LEAD: current is faster than voltage): " + "
- **Power factor value measurement method**: OFF: Calculates the reactive power directly using the reactive power measurement method
- **Input area for guaranteed accuracy**: Within 10 to 110% of the range (for sine wave input)
- **Measurement range**: 100 kVA, 300 kVA, 400 kVA, 750 kVA, 1 MVA, 5 MVA
## External Interface Specifications

**[D/A output]**

<table>
<thead>
<tr>
<th>(3169-21 only)</th>
<th>4 channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of output channels</td>
<td>4</td>
</tr>
<tr>
<td>Output items</td>
<td>For instantaneous values: Voltage, current, average voltage, average current, active power, reactive power, apparent power, power factor, frequency, noise power factor, harmonic frequency, and phase angle, total value, THD-F and THD-R.</td>
</tr>
<tr>
<td>Output level</td>
<td>±5 V DC/±1 mV</td>
</tr>
<tr>
<td>Resolution</td>
<td>10 mV/1 mV</td>
</tr>
<tr>
<td>Accuracy temperature characteristic</td>
<td>±0.05% at 25°C</td>
</tr>
<tr>
<td>Output data update rate</td>
<td>4 nibbles per cycle (each 32 samples per cycle)</td>
</tr>
</tbody>
</table>

**[PC card]**

- Slot: 1
- Copy/Save: 1P2W, 1P3W, 3P3W2M, 3P3W3M, 3P4W, 3P4W4I
- Dimension: 96.60 mm x 96.60 mm (excluding protrusions)
- Weight: 1.2 kg (42.3 oz.)

**[RS-232C]**

- Port: RS-232C, connected to an RS-232C port
- Communication: EIA-RS-232C-compliant
- Transfer method: Asynchronous communication method.
- Band rate: 2400, 9600, 19200, 38400 bps
- Flow control: Xon and Xoff settings possible

**[External I/O]**

- Control input: OFF, 2, 5, 10, 20 times (for movement averaging) for each harmonic order (level, content percentage, and phase angle), total value, maximum/minimum value for THD-F/THD-R for each interval.
- Control output: OFF, 2, 5, 10, 20 times (for movement averaging) for each harmonic order (level, content percentage, and phase angle), total value, maximum/minimum value for THD-F/THD-R for each interval.

**[General Specifications]**

- Operating environment: Indoor, up to 2000 m(7740 ft) ASL
- Operating temperature and humidity: 0 to 40°C, 80% RH or less (non-condensing) / -10 to 50°C, 80% RH or less (non-condensing)
- Storage temperature and humidity: 55 ±5Kvms AC: Between the voltage input terminal and the 3169 casing
- Power supply voltage rating: 100 to 240 V AC, 50/60 Hz
- Dimensions and weight: 102.5 x 49 x 76 mm (excluding protrusions)
- Approx. 1.2 kg (42.3 oz.)

### Formulae

**[for single-phase 2-wire systems]**

\[
U = \sqrt{\frac{1}{M} \sum_{n=1}^{M} |U_n|^2}
\]

- \(U_n\): Inter-line voltage
- \(I\): Line current
- \(M\): Number of samples
- \(s\): Sample count
- \(m\): 128 samples per cycle

**Measurement is also possible using the reactive power measurement method**

In addition to conventional calculation methods that search for reactive power using voltage, current, and active power, you can select the reactive power measurement method, which derives reactive power directly from voltage and current values, just as with the reactive power volume measurement method used in large-volume power consumers.

When using the reactive power measurement method:

\[
Q = \frac{1}{M} \sum_{n=1}^{M} \left( I_n \cdot U_n \right)
\]

- Derives reactive power directly from voltage and current values, just as with the measurement of active power.
- (The same measurement principle is the same as that used to determine reactive power by large-volume power consumers.)

When not using the reactive power measurement method:

\[
Q = \frac{1}{M} \sum_{n=1}^{M} \left( I_n \cdot U_n \right)
\]

Calculates reactive power after calculating the apparent power using the voltage, current, and RMS values.
### Measurement accuracy

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current/active power</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.2% rdg. ±0.1% f.s.</td>
<td>±0.2% rdg. ±0.1% f.s. + clamp-on sensor accuracy</td>
</tr>
</tbody>
</table>

#### Table of current and active power accuracy with clamp-on sensor combinations

<table>
<thead>
<tr>
<th>Current range</th>
<th>9694</th>
<th>9695-02</th>
<th>9660, 9695-03</th>
<th>9660</th>
<th>9669</th>
<th>9667</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5% rdg. ±0.5% f.s.</td>
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</tr>
<tr>
<td>±0.3% rdg. ±0.02% f.s.</td>
<td>±0.3% rdg. ±0.02% f.s.</td>
<td>±0.3% rdg. ±0.01% f.s.</td>
<td>±0.3% rdg. ±0.01% f.s.</td>
<td>±0.3% rdg. ±0.02% f.s.</td>
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</tr>
<tr>
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</tr>
</tbody>
</table>

Note: The table of accuracy for different clamp-on sensor combinations indicates the measurement accuracy for each current range of the 3169-20/21 current measurement range. (The accuracy for each clamp-on sensor is converted and displayed according to the 3169-20/21 current measurement range.)

#### Frequency accuracy

- ±0.5% rdg. ±1 deg.
- ±0.5% rdg. ±1 deg. for the calculation obtained from each measurement value
- ±0.5% rdg. ±1 deg. for the measurement accuracy of effective power, reactive power, and apparent power

#### Integration accuracy

- ±0.1 deg. ±0.1 sec. (23°C, less than 80% relative humidity)
- ±0.1 deg. ±0.1 sec. (45 to 66 Hz, reactive factor = 0.5, when using the reactive power measurement method)

#### Reactive power accuracy

- ±10 ppm ±1 second (23°C (within ±1.9 sec/day (23°C))
- ±10 ppm ±1 second (23°C) (within ±1.9 sec/day (23°C))

#### Power factor influence

- ±1% (within ±1.9 sec/day (23°C))

#### Effect of external magnetic field

- ±0.1% rdg.
- ±0.1% rdg. (within ±1.9 sec/day (23°C))

#### Real-time clock accuracy

- ±0.1% rdg.
- ±0.1% rdg. (within ±1.9 sec/day (23°C))

#### Reference:

- Accuracy: of the 9669, 9665-01, 9665-03, 9696, 9661, 9667, and 9669 CLAMP ON SENSORS
- ±0.5% rdg. ±0.02% f.s.
- ±0.3% rdg. ±0.01% f.s.
- ±0.1% rdg. ±0.01% f.s.
- ±0.5% rdg. ±0.1% f.s.
- ±0.3% rdg. ±0.02% f.s.
- ±0.3% rdg. ±0.02% f.s.
- ±0.3% rdg. ±0.02% f.s.

#### Option Specifications

### CLAMP ON SENSOR

#### Appearance

- 9694: Cat III 300V
- 9660: Cat III 300V
- 9661: Cat III 300V
- 9669: Cat III 300V

#### Primary current rating

- AC 5 A
- AC 100 A
- AC 500 A
- AC 1000 A

#### Output voltage

- AC 10 mV/A
- AC 20 mV/A
- AC 40 mV/A
- AC 200 mV/A

### Accuracy

<table>
<thead>
<tr>
<th>Frequency characteristic</th>
<th>±0.3% rdg. ±0.02% f.s.</th>
<th>±0.3% rdg. ±0.02% f.s.</th>
<th>±0.3% rdg. ±0.01% f.s.</th>
<th>±0.1% rdg. ±0.01% f.s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>±2% (45 to 66 Hz)</td>
<td>±1% (45 to 66 Hz)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>±2% (45 to 66 Hz)</td>
<td>±1% (45 to 66 Hz)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Effect of external magnetic field

- Equivalent to 0.1 A or less (with a magnetic field of 400 A/m AC)
- Equivalent to 0.1 A or less (with a magnetic field of 400 A/m AC)

### Power supply

- LE2 alkaline battery (4 continuous operation max. 168 hours) or 9454 AC ADAPTER (optional)

- After 30 minutes of warm-up, sine-wave input, FF=1
- 23°C ±5°C, less than 80% relative humidity
- 45 to 66 Hz

### Note:

- The table of accuracy for different clamp-on sensor combinations indicates the measurement accuracy for each current range of the 3169-20/21 current measurement range.
- The accuracy for each clamp-on sensor is converted and displayed according to the 3169-20/21 current measurement range.
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Option Specifications

9442 PRINTER

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print method</td>
<td>Thermal serial dot printing</td>
</tr>
<tr>
<td>Paper width</td>
<td></td>
</tr>
<tr>
<td>Print speed</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions and weight

When purchasing the 9442 printer, make sure you also purchase the 9721 RS-232C cable and 9443-02/03 AC adapter so that you can connect it to the 3169-2021.

9721 RS-232C CABLE

Cord length for connecting to the 9442: 1.5 m (4.92 ft)

Photo: 9443-03

9443-02/03 AC ADAPTER

For the 9442

Cord length: 2 m (2.65 ft)

9441 CONNECTION CABLE

For external I/O

9444 CONNECTION CABLE

For D/A output (supplied with the 3169-21)

Cord length: 2 m (2.65 ft)

3169-20 CLAMP ON POWER HiTESTER

(supplied with the 9438-03 voltage cord (1), and power cord (1))

3169-21 (with D/A output)

CLAMP ON POWER HiTESTER

(supplied with the 9438-03 voltage cord (1), 9441 connection cable (1) and power cord (1))

Accessory Specifications

9438-03 VOLTAGE CORD (1 cord each of black, red, yellow, and blue, cord length: 3 m (9.84 ft))

9441 CONNECTION CABLE (D/A output cable, supplied with the 3169-21)

Current and power cannot be measured using the 3169-20/21 CLAMP ON POWER HiTESTER on its own. To perform current and power measurement, make sure you also purchase a CLAMP ON SENSOR (9694, 9660, 9661, 9667, or 9669) (sold separately).

Use only PC Cards (9726, 9727, or 9728) sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

Combination examples

For single-phase 2-wire systems (one system) : 3169-20 + 9660 (100A) x 1 + 9726 (128 MB)
For single-phase 3-wire systems (one system) : 3169-20 + 9661 (500A) x 2 + 9726 (128 MB)
For three-phase 3-wire systems (one system) : 3169-20 + 9661 (500A) x 3 + 9726 (128 MB)
For three-phase 4-wire systems (one system) : 3169-20 + 9661 (500A) x 3 + 9726 (128 MB)

9726 to 9728 PC CARD

Use only PC Cards (9726, 9727, or 9728) sold by HIOKI.

9720 CARRYING CASE

A soft type case for storing the 3169-2021 and its accessories, such as the clamp-on sensors.

Dimensions and weight

Approx. 445 W (17.52") x 340H (13.39") x 150D (5.91") mm,
approx. 2.2 kg (77.6 oz.)

9200-10 CLAMP ON ADAPTER

Cord length: 3 m (9.84 ft)

9219 CONNECTION CABLE

For connection to the 9695-02, 9695-03

Cord length: 3 m (9.84 ft)

Max. 1500 A AC (continuous: 1000 A)

Measurable conductor diameter:
Bus bar : φ 55 mm (2.17") , width 80 mm (3.14")
CT ratio: 10:1
*Used for expanding the measurement range of the 9660 and 9661 sensors

9612 RS-232C CABLE (for connection to a PC)

9442 PRINTER

9443-03 AC ADAPTER (for the 9442, for Europe)

9443-03 AC ADAPTER (for the 9442, for USA)

9721 RS-232C CABLE (for connection to the 9442)

1196 RECORDING PAPER (25 m (82 ft) rolls, for the 9442)

9720 CARRYING CASE

9625 POWER MEASUREMENT SUPPORT SOFTWARE

PC CARD 128M

PC CARD 256M

PC CARD 512M

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All information correct as of Dec. 19, 2005. All specifications are subject to change without notice.