

3283

**CLAMP ON
LEAK HiTESTER**

INSTRUCTION MANUAL

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Introduction

Thank you for purchasing this HIOKI "3283 CLAMP ON LEAK HiTESTER." To get the maximum performance from the unit, please read this manual first, and keep this at hand.

A Request

We have tried to bring this manual as close to perfection as we could achieve. If perchance you find any unclear portions, mistakes, omissions, or the like, we would be most obliged if you could please notify us of them via any HIOKI agent, or directly.

Shipping Check

When the unit is delivered, check and make sure that it has not been damaged in transit. In particular, check the accessories, panel switches, keys, and terminals.

If the unit is damaged, or fails to operate according to the specifications, contact your dealer or HIOKI representative.

Check the 3283 Unit and the Supplied Accessories

Main unit

3283 CLAMP ON LEAK HiTESTER

Supplied accessories

9399 Carrying Case 1

Hand Strap 1

6F22(006P) 1

Instruction manual 1

Options

9094 OUTPUT CORD

9445 AC ADAPTER(UP01211090, POTRANS)





Safety

⚠ DANGER






This equipment is designed according to IEC 1010 Safety Standards, and has been tested for safety prior to shipment. Incorrect measurement procedures could result in injury or death, as well as damage to the equipment. Please read this manual carefully and be sure that you understand its contents before using the equipment. The manufacturer disclaims all responsibility for any accident or injury except that resulting due to defect in its product.

This Instruction Manual provides information and warnings essential for operating this unit in a safe manner and for maintaining it in safe operating condition. Before using this unit, be sure to carefully read the following safety notes.

The following symbols are used in this Instruction Manual to indicate the relative importance of cautions and warnings.

	Indicates that incorrect operation presents extreme danger of accident resulting in death or serious injury to the user.
	Indicates that incorrect operation presents significant danger of accident resulting in death or serious injury to the user.
	Indicates that incorrect operation presents possibility of injury to the user or damage to the equipment.
	Denotes items of advice related to performance of the equipment or to its correct operation.

Safety Symbols

	<p>This symbol is affixed to locations on the unit where the operator should consult corresponding topics in this manual (which are also marked with the  symbol) before using relevant functions of the unit.</p> <p>In the manual, this mark indicates explanations which it is particularly important that the user read before using the unit.</p>
	Indicates AC (Alternating Current).
	Indicates DC (Direct Current).
	Indicates a device which is double-insulated.



Points for Attention During Use

In order to ensure safe operation and to obtain maximum performance from the unit, observe the cautions listed below.

⚠ DANGER

- When conductors being measured carry in excess of the safe voltage level (SELV-E) and not more than 300 V, to prevent short circuits and electric shock while the clamp core jaw is open, make sure that conductors to be measured are insulated with material conforming to (1) Overvoltage Category I, (2) Pollution Degree 2, and (3) Basic Insulation Requirements for Working Voltages of 300 V. Refer to the following standards regarding the meanings of underlined terms.
 - IEC61010-1
 - IEC61010-2-031
 - IEC61010-2-032
- Use clamp testers only on power lines up to 300 Vrms AC, to avoid short-circuits and accidents that could result in injury or death.
- Do not use clamp testers on bare conductors. When the clamp core jaw is open, there is a risk of short-circuits and accidents that could result in injury or death.

**⚠ DANGER**

- **Always connect the clamp sensor to the secondary side of a breaker. On the secondary side of a breaker, even if the lines are shorted the breaker can trip and prevent an accident. On the primary side, however, the current capacity may be large, and in the event of a short-circuits there may be a serious accident.**
- **When using an AC adapter, use only the specified HIOKI model 9445 (UP01211090, POTRANS).**

**⚠ WARNING**

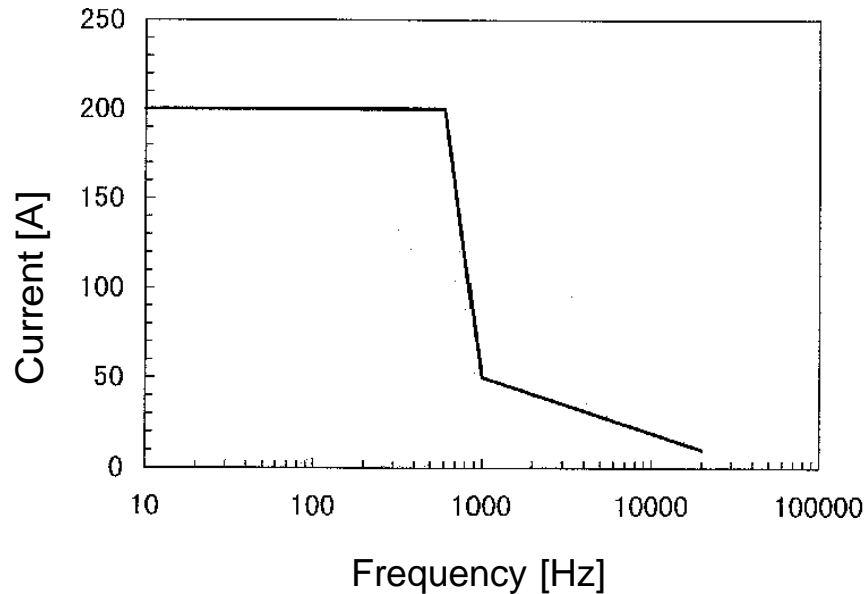
- To prevent electric shock, do not allow the unit to become wet and do not use the unit when your hands are wet.
- To avoid electric shock accidents, when carrying out measurement on live lines, wear proper protective gear, including insulating rubber gloves, insulating rubber boots, and safety helmet, and use extreme caution.
- When measuring the ground conductor on a transformer Class 2 connection site, be careful not to approach high voltage devices or conductors. Also, if close to high voltage charging devices or if measurement is otherwise difficult, first change the route of the grounding wire.
- To avoid electric shock when replacing the batteries, first disconnect the clamp portion from the object to be measured. Also, after replacing the batteries, always replace the back case before using the unit.
- When replacing the batteries, be sure to insert them with the polarity correct.
- Do not short-circuits used batteries, disassemble them, or throw them in a fire. Doing so may cause the batteries to explode.
- Be sure to dispose of used batteries according to their type in the prescribed manner and in the proper location.

⚠ CAUTION

- Do not store or use the unit where it will be exposed to direct sunlight, high temperature, high humidity, or condensation. If exposed to such conditions, the unit may be damaged, the insulation may deteriorate, and the unit may no longer satisfy its specifications.
- This is a precision instrument: do not clamp any foreign objects in the end of the clamp core, or insert anything in the core gap.
- To avoid damage to the unit, do not subject the unit to vibrations or shocks during transport or handling. Be especially careful to avoid dropping the unit. Do not exert excessive pressure on the clamp sensor or attempt to wedge the sensor into a tight spot for measurement.
- Before using the unit, inspect it and check the operation to make sure that the unit was not damaged due to poor storage or transport conditions. If damage is found, contact your dealer or HIOKI representative.

⚠ CAUTION

- Do not exceed the maximum input current rating, which depends on the frequency of the current being measured (see Fig.).



Frequency-dependent deletion characteristics

- Do not use the unit if the battery is exhausted (when the **B** mark lights in the display area). Be sure to replace the exhausted battery with a new one.
- When replacing the battery, make sure that the metal battery snap fitting is firmly connected. If the metal fitting is loose, adjust it and recheck the connection.
- Make sure the power is turned off before plugging in or unplugging the AC adapter.

NOTE

- For circuits which carry several superimposed currents, correct measurements may not be obtained.
- Accurate measurement may be impossible in locations subject to strong external magnetic fields, such as transformers and high-current conductors, or in locations subject to strong external electric fields, such as radio transmission equipment.
- Gently wipe dirt from the surface of the unit with a soft cloth moistened with a small amount of water or mild detergent. Do not try to clean the unit using cleaners containing organic solvents such as benzine, alcohol, acetone, ether, ketones, thinners, or gasoline. They may cause discoloration or damage.

Organization of this manual

Chapter 1

Product Outline

Explains the parts and functions of the unit.

Chapter 2

Measurement Procedure

Explains how to use the 3283 for measurement.

Chapter 3

Battery Replacement

Explains how to replace the battery used to power the 3283.

Chapter 4

Attaching the Hand Strap

Explains how to attach the hand strap, for easy handling of the unit in the field.

Chapter 5

Specifications

Lists the specifications of the 3283 CLAMP ON LEAK HiTESTER.

Chapter 6

Troubleshooting

Describes points to check before requesting service.

Chapter 7

Service

Explains how to get the unit serviced.

Chapter 1

Product Outline

1.1 Product Outline

The 3283 CLAMP ON LEAK HiTESTER is designed for wide-range measurement on live circuits, from very small leak currents up to load currents of 200 amperes. The clamp part is made of material with high magnetic permeability, to minimize adverse effects caused by external magnetic fields, and to reduce tolerances due to the position of the measured conductor.

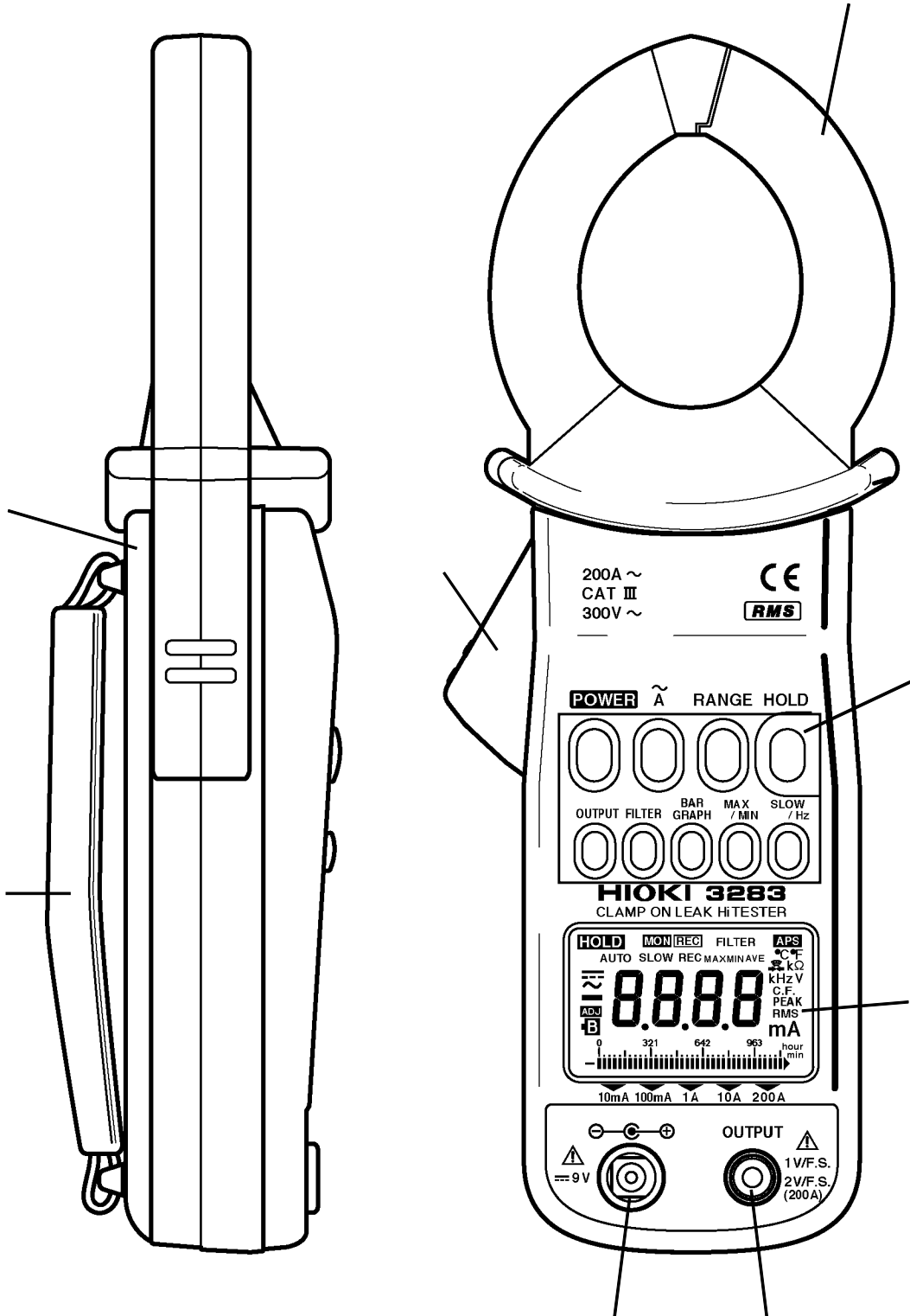
1.2 Features

- **High-sensitivity range with 10-mA full-scale point**
Allows accurate measurement even of minute leak currents (resolution 10 μ A).
- **Wide measurement range**
Five range settings from 10 mA to 200 A make the 3283 suitable for many applications.
- **Microprocessor-controlled functions**
In spite of the compact dimensions of the unit, versatile functions such as SLOW and MAX/MIN are made possible by the built-in microprocessor.
- **True rms indication**
The true rms conversion circuit delivers accurate results not affected by leak current distortion.
- **Filtering**
The widespread use of switching power supplies and equipment incorporating inverter technology frequently causes harmonics to be superimposed in the leak current waveform. The filter in the 3283 allows two kinds of measurement, for leak current caused by insulation faults and for leak currents including harmonics.
- **Output jack**
The output jack allows easy connection to a level recorder or other equipment (level recorder output: DC, waveform output: AC).

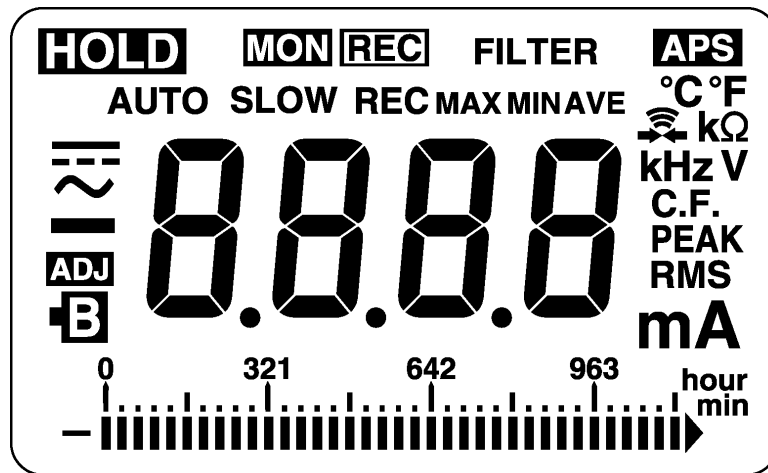
- **Unaffected by external magnetic fields and conductor position**
The core and magnetic shield are made of material with high magnetic permeability, allowing precise measurement also in the vicinity of transformers, electric motors and other sources of magnetic fields. Since the influence of the conductor position on the measurement result is negligible, residual current characteristics are not a problem even when using the unit as a zero-phase transformer.
- **Low power consumption**
Power consumption is less than 100 mVA, allowing the unit to operate continuously for up to 50 hours on a single 6F22 (006P1) battery.
- **Dual power supply design**
The unit can be powered using the optional 9445 AC adapter (UP01211090, POTRANS) or from a battery.

1.3 Parts and Functions

Top and Side View



Clamp sensor
Operation lever
Key switches
Display (LCD)
Output jack
AC adapter jack
Rear cover
Hand Strap



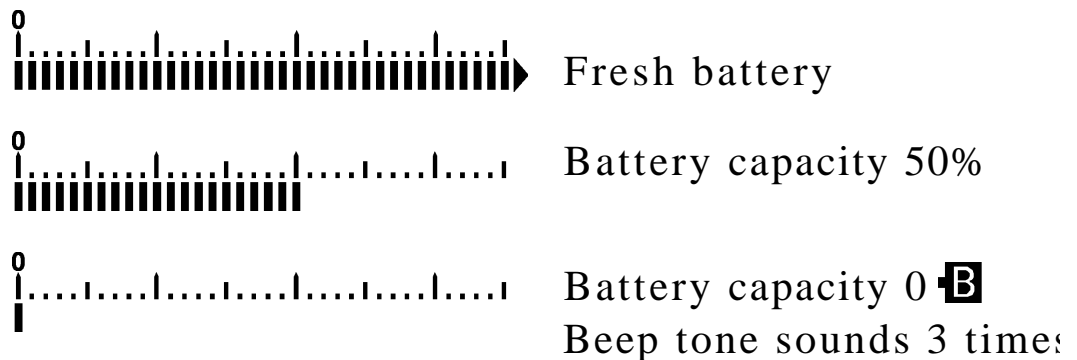
~	AC
AUTO	Auto-range
SLOW	Update display once every 3 seconds
REC	Record function
MAX	Maximum value
MIN	Minimum value
AVE	Average value = (maximum value + minimum value/2)
min	1 minute/segment (bar graph)
hour	1 hour/segment (bar graph)
HOLD	Data hold function
APS	Auto power off function
MON	Waveform output (AC) is active
REC	Recording output (DC) is active
FILTER	Filter function is active
Hz	Frequency
A, mA	current
RMS	True root mean square value
▶	Input over (bar graph)
B	Battery low warning

Chapter 2

Measurement Procedure

2.1 Preparations

1. Remove the rear cover and insert the battery.
(Refer to "Chapter3 Battery Replacement".)
2. Press the **POWER** key to turn the unit on.
Verify that all segments of the display light up briefly. Then the model name is shown, and the bar graph indicates the battery condition.



3. The AC current measurement mode is activated.

【 Low battery voltage detection function 】

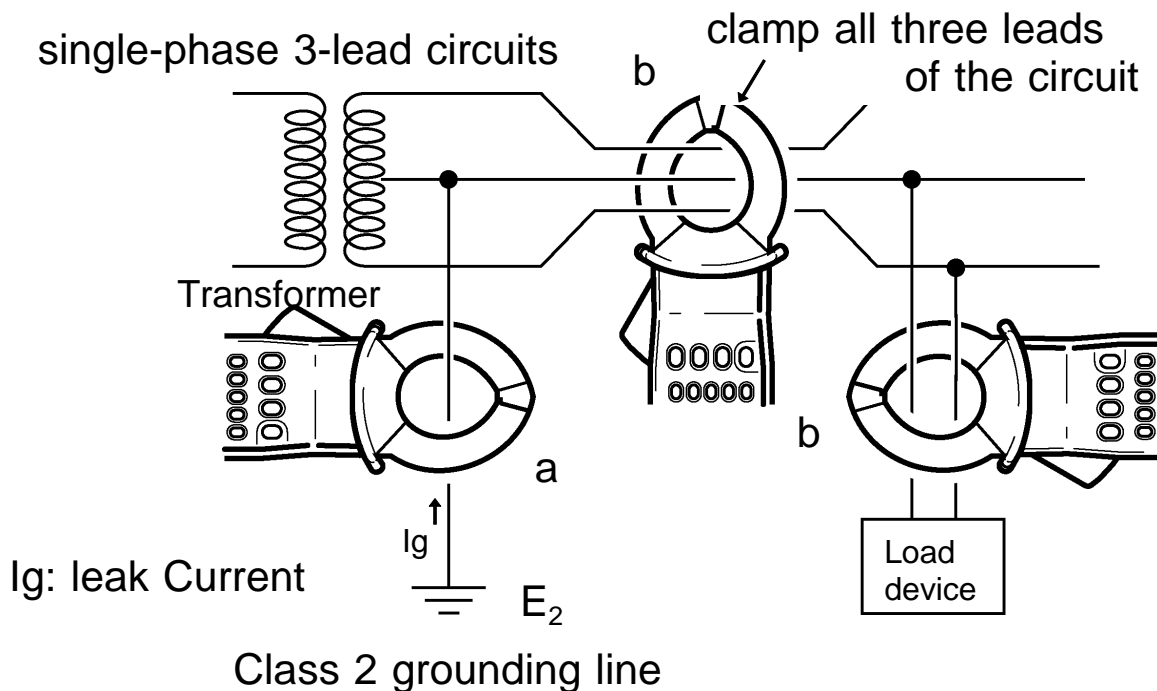
After the **B** mark lights and battery voltage drops below a certain level, the power goes off automatically. When this occurs, **bAtt** and **Lo** are displayed.

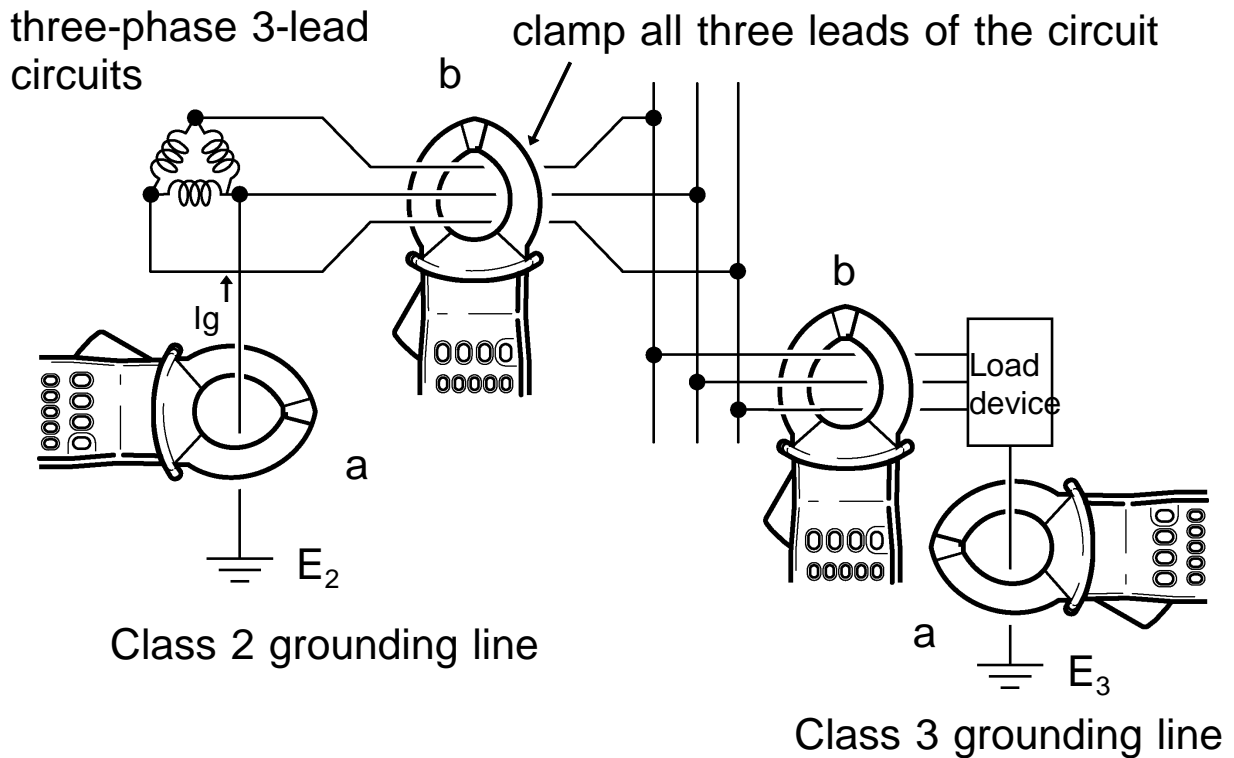
When power goes off after display of these marks, replace the exhausted battery with a new one.

2.2 Leak Current Measurement \tilde{A}

1. Press the \tilde{A} key.
2. Clamp the tester on the conductor, so that the conductor passes through the center of the clamp core. For measurement of grounded leads, clamp the tester on one lead only (see a). For overall measurements, clamp the tester on the entire circuit path (see B).

NOTE • When the current to be measured is unknown, begin measurement with the 200 A range selected (filter off).



**NOTE**

- For measurement of single-phase 2-lead circuits, clamp both leads of the circuit.
- For measurement of three-phase 4-lead circuits, clamp all four leads of the circuit. If this is not possible, the measurement can also be carried out on the ground lead of the equipment.

3. The effective value (**RMS**) of the leak current is shown on the digital display. The selected current range is shown at the bottom of the display.

NOTE

- If a strong current (on the order of 100 A) is flowing in an adjacent circuit, accurate measurement may not be possible. Perform the measurement at a sufficient distance from other current-carrying conductors.
- The frequency of special waveforms such as at the secondary side of an inverter may not be indicated correctly.

NOTE

- Do not input a current which exceeds the maximum continuous input rating.
- When the clamp is open and while the range is being changed, an indicated value in the range of tens may appear; this is not a malfunction.

The indication goes progressively to zero, but this may take a little time. Beginning measurement before the display reaches zero has no effect on measurement.

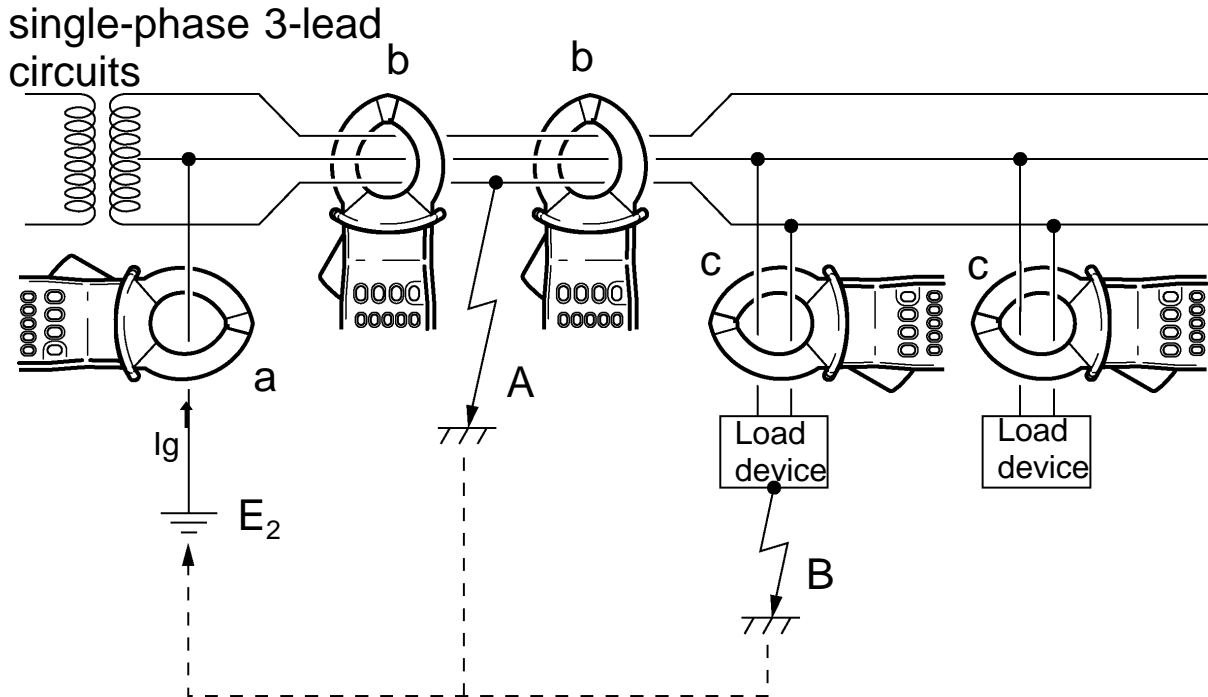
【Checking for insulation faults】

Normally, for a type 2 grounding installation of a transformer, the measurement will first be made to check for overall circuit leak current in the ground lead (a). Current changes can be used to diagnose the leak current condition.

When leak current has been detected, the measurement should proceed from the power source towards the load, using overall measurement.

1. If an insulation fault in the wiring has occurred at position A in the illustration, leak current will be detected at position b using overall measurement, but not at position b'.
2. If an insulation fault in the load equipment has occurred at position B in the illustration, leak current will be detected at position c using overall measurement, but not at position c'.

3. For detection of intermittent leak current conditions (such as only when a certain piece of equipment is operating), the use of a level recorder will be helpful.



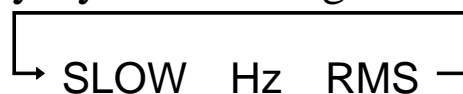
【 Range switching 】

Each push of the **RANGE** key switches the range in the order 10 mA 100 mA 1 A 10 A 200 A **AUTO**.

【 Changing the display characteristics **SLOW** 】

If the display fluctuates rapidly and is hard to read, you can select a slower update rate (once every 3 seconds) by pressing the **SLOW/Hz** key.

The key cycles through the following modes:



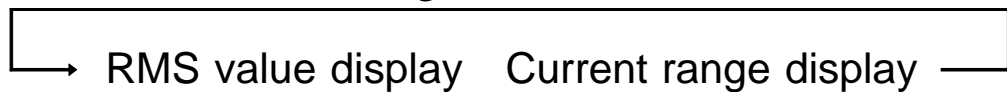
- NOTE** • When using frequency display, the display update rate cannot be changed.

【Bar graph display **BAR GRAPH**】

The current range display can be switched to bar graph operation. The bar graph shows the rms value of the measured current.

1. Press the **BAR GRAPH** key.
2. The current range display is switched to bar graph operation.

Each push of the **BAR GRAPH** key toggles between the following modes:



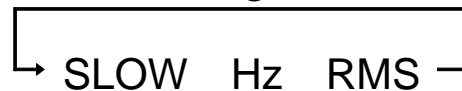
- NOTE**
- The flashing segment indicates the full-scale position.
 - The bar graph display refresh rate is "FAST" (4 times per second).

【Frequency (Hz) display】

1. While the display is switched to **SLOW** mode, press the **SLOW/Hz** key.
2. The frequency of the measured current is displayed.

If there is no input " - - - - " is shown.

Each push of the **SLOW/Hz** key cycles through the following modes:



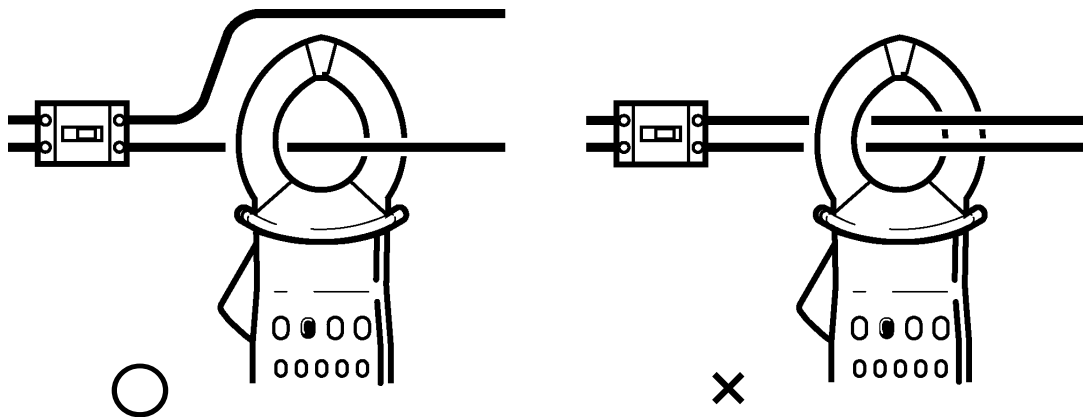
- NOTE**
- There is no frequency output function.
 - The frequency of special waveforms such as at the secondary side of an inverter may not be indicated correctly. Enable the filter function (see page 14) in such a case.
 - If the frequency is 30 Hz or less, " - - - - " is shown.

NOTE

- Spurious display indications may be produced as a result of noise. In this case, enable the filter function.
- If the input is less than 1/10 of the full-scale value, or if the filter function is activated for measurement of high frequencies, the frequency indication may not be accurate.
- The **AUTO** indication and range indication show the current range.

【Load current measurement】

Be sure to clamp only one lead of the conductor.

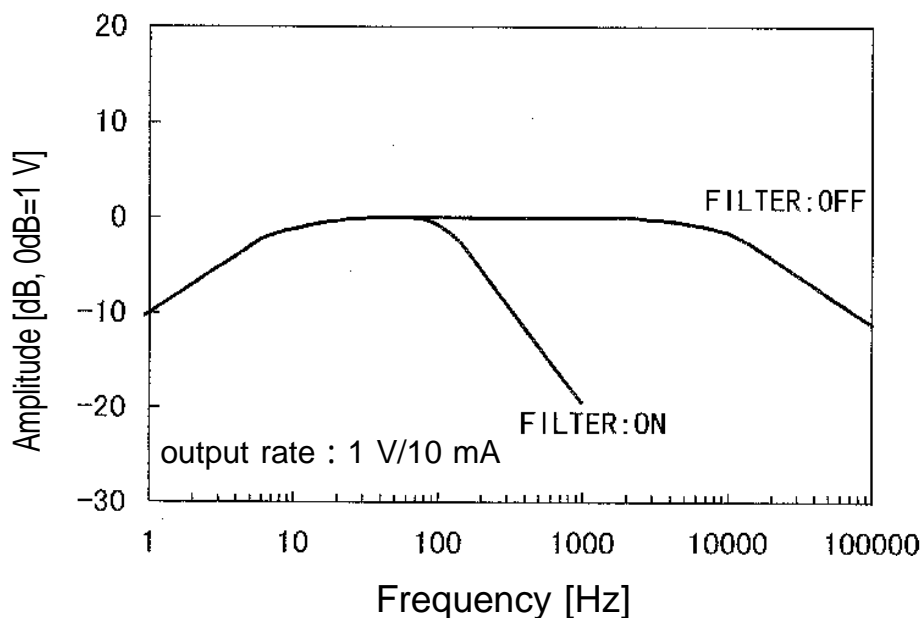
**NOTE**

- The frequency of special waveforms such as at the secondary side of an inverter may not be indicated correctly.
- Depending on the magnitude and frequency of the measured current, resonances may be heard from the clamp jaw. This does not affect the measurement.
- When the current to be measured is unknown, begin measurement with the 200 A range selected (filter off).
- Do not input a current which exceeds the maximum continuous input rating.

2.3 Filter Function **FILTER**

The widespread use of switching power supplies and equipment incorporating inverter technology can cause harmonics to be superimposed on the leak current waveform.

1. Press the **FILTER** key. The **FILTER** indication appears. The integrated low-pass filter is now active, cutting off unwanted higher-frequency components.
2. Pressing the **FILTER** key once more turns the low-pass filter off, allowing measurement of leak current including any high-frequency components. The **FILTER** indication disappears.



MON output frequency bandwidth (example: 10 mA range)

- NOTE** • The filter also affects the recording output and waveform output.

2.4 Data Hold Function **HOLD**

This function allows freezing the display at any desired point for easy reading.

1. Press the **HOLD** key. The **HOLD** indication appears on the display and the digital display value is maintained.

To cancel the data hold function, press the **HOLD** key again.

2.5 Recording Function **REC**

The recording function can be used to display the maximum display value, minimum display value, maximum/minimum average, and the instantaneous value.

1. Press the **RANGE** key to select the current measurement range.
2. Press the **MAX/MIN** key while measuring current with the conductor clamped. The **REC** indication flashes and the maximum, minimum, or average value for the period starting when the key was pressed to the present point can be displayed. The instantaneous value can also be displayed. Only one of these values can be shown at any one time, but the other values are kept in memory.

NOTE

- Pressing the **MAX/MIN** key during auto-ranging (**AUTO**) fixes the range at the current setting.

3. During measurement, the **MAX/MIN** key can be used to select the value that should be shown.

MAX: Maximum value is shown.

MIN: Minimum value is shown.

AVE: Average value is shown = (maximum value + minimum value/2)

If none of the **MAX**, **MIN**, or **AVE** indicators is shown, the display shows the instantaneous value.

4. Pressing the **HOLD** key will stop the recording function. The **HOLD** indication appears and the **REC** indication stops flashing.

By pressing the **MAX/MIN** key in this condition, the **MAX**, **MIN**, and **AVE** values stored in the internal memory can be called up on the display, as follows.

→	MAX	MIN	AVE	instantaneous value	—
				(no indication)	

While **HOLD** is shown, the elapsed time is not incremented. Also if the clamp sensor is removed from the conductor for easier reading, the minimum value will not return to zero.

Pressing the **HOLD** key once more causes the **HOLD** indication to go out. The recording function resumes, and **REC** flashes again.

【Bar graph indication BAR GRAPH】

The bar graph display can be changed. It is also possible to display the current range, effective (rms) value of the measured current, and the elapsed time (hours and minutes).

1. Press the **BAR GRAPH** key.
2. The current range display switches to bar graph indication.

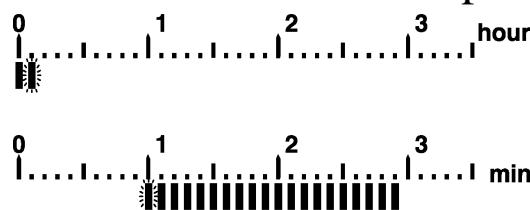
Each push of the **BAR GRAPH** key cycles through the following modes:

↳ rms value elapsed time elapsed time current range _
 (instantaneous value)(hours)(minutes)

When the elapsed time display is activated, the bar graph segments flash and the elapsed time from the point when the **MAX/MIN** key was pressed is displayed.

When "**hour**" is selected, one segment corresponds to one hour, and the maximum length of time that can be displayed is 59 hours. When "**min**" is selected, one segment corresponds to one minute, and the maximum length of time that can be displayed is 59 minutes.

The illustration below shows indication when 1 hour 40 minutes have elapsed.



NOTE

- Momentary power loss and power surges cannot be detected.
- When the unit is turned off, accumulated data are lost.
- The maximum recording duration depends on the remaining battery capacity.
- The lowest possible frequency that can be displayed is 30 Hz.
- If the measurement object was clamped after activating the recording function, the minimum value is always zero. To prevent this, clamp the conductor first and then press the **MAX/MIN** key to activate the recording function.
- If the clamp sensor is removed from the measurement object while the recording function is active, the minimum value will become zero. To prevent this, press the **HOLD** key before removing the clamp sensor.
- To turn off the recording function, press **⌂** key. The maximum value, minimum value, and average value are cleared.

2.6 Auto Power-Off Function **APS**

When **APS** is displayed, the auto power-off function is active.

If no key is pressed for about 10 minutes, the unit turns itself off automatically.

Immediately before turning off, the **APS** indication flashes and a beep tone is heard for about 30 seconds.

Pressing any key except the **POWER** key will extend the powered state for another 10 minutes.

To disable the auto power-off function, hold down the **HOLD** key while turning the unit on by pressing the **POWER** key. The **APS** indication then is not shown.

While using the recording function or the output function of the unit, auto power-off is disabled.

2.7 Battery Low Warning **B**

When this indication appears, the battery is exhausted and correct measurement is not assured. Replace the battery as early as possible.

If the optional AC adapter is connected, the battery low warning may also appear, remove the old battery, or replace the exhausted battery with a new one.

Refer to "Chapter 2 **【Low battery voltage detection function】**".

2.8 Beep Tone

To disable the beep tone, hold down the **RANGE** key while turning the unit on by pressing the **POWER** key.

2.9 Fast Mode

The digital display update rate can be set to 4 times per second. This is useful for example for inrush current measurements and similar applications.

1. Press the **⌘** key twice in succession.
The indication "F" is briefly shown, and the unit switches to fast mode. From now on, the indication "F" will appear every time the **⌘** key is pressed. To cancel the fast mode, press the **⌘** key twice in succession.

NOTE • If SLOW is selected while the unit is in fast mode, the display update rate will be normal (2 times per second).

【Example for inrush current measurement】

1. Press the **⌘** key twice in succession to activate fast mode.
2. Press the **RANGE** key to set the current range to a fixed setting.
When the drive current is unknown, begin measurement with the 200 A range selected
3. Use the recording function to record the maximum value, for easier reading.

NOTE • Circuit time constant 200 ms MAX.



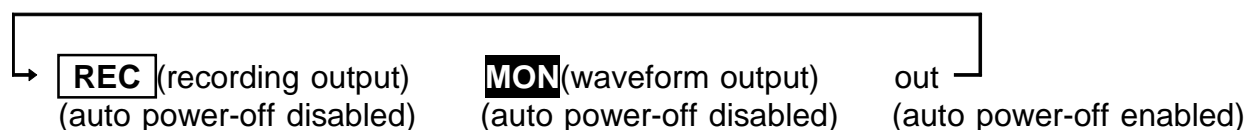
2.10 Output Function **OUTPUT**

An output signal corresponding to the measured value can be obtained from the unit. The output voltage (AC/DC) normally is 1 V for the full-scale count (1000). In the 200 A range, the output voltage (AC/DC) is 2 V for the full-scale count (2000). The output type is indicated by the **REC** (recording output, DC) or **MON** (waveform output, AC) indication.

1. Press the **RANGE** key to set the current range to a fixed setting.
2. Press the **OUTPUT** key so that the **REC** indication appears. The output function is now active.

Auto power-off is disabled. (The **APS** indication goes out.)

Each push of the **OUTPUT** key cycles through the following modes:



NOTE

- To use the output function, be sure to push the **OUTPUT** key so that either **REC** or **MON** is shown.
- There is no frequency output function.
- The filter function can be used to cut unwanted high- frequency components.
- If the **OUTPUT** key is pressed while auto-range (**AUTO**) is enabled, the range is fixed at the current setting (**AUTO** indication goes out).
- For connection to a level recorder, use the separately available 9094 OUTPUT CORD.
- The input impedance of the level recorder should be at least 100 kilohms. Otherwise accurate recording is not assured.
- For long-term recordings, use the AC adapter (option).
- When the AC adapter is used and there is a high amount of noise in the power line, the display may show several counts or noise may be present in the output. In such a case, connect the ground terminal of the level recorder or the L side of the input to ground.
- Pressing the **HOLD** key does not hold the waveform.
- The output signal is available also when the **REC** and **MON** indications are out, but the auto power-off function is enabled, causing the output to be cut off after 10 minutes of inactivity.

【Output rate】

MON (waveform output : AC),

REC (recording output : DC)

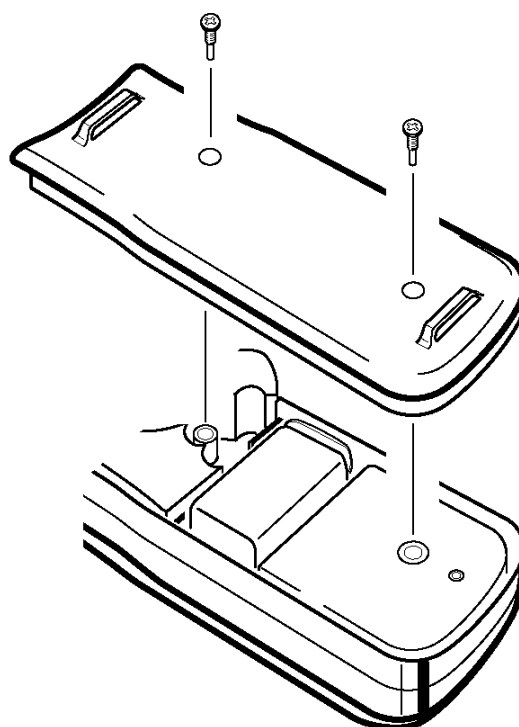
Current Range	Output rate	Accuracy	Crest Factor
10 mA	AC/DC 1 V/10 mA	40 Hz to 25 Hz AC/DC: ± 3.0%rdg ± 10 mV	2.5or less
100 mA	AC/DC 1 V/100 mA		
1 A	AC/DC 1 V/1 A		
10 A	AC/DC 1 V/10 A		
200 A	AC/DC 2 V/200 A		1.5or less

【Output response】

REC	MON
(Circuit time constant) 200 ms or less	frequency bandwidth (-3dB) 5 Hz to 15 kHz

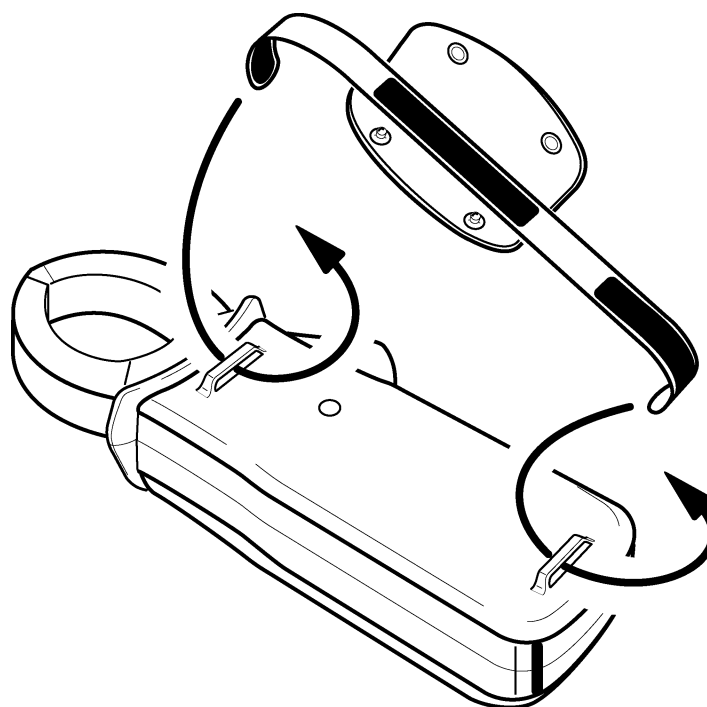
Chapter 3 Battery Replacement

1. Remove the two fastening screws of the rear cover, using a Phillips screwdriver.
2. Remove the rear cover.
3. Remove the old battery without pulling the codes of the snap.
4. Securely connect the battery to the battery snap.
5. Replace the rear cover and tighten the fastening screws.



Chapter 4 Attaching the Hand Strap

Explains how to attach the hand strap, for easy handling of the unit in the field.



Chapter 5

Specifications

5.1 Measurement Specifications (23°C ± 5°C, 80% RH max.)

5.1.1 AC current Arms (true rms indication)

Current Range (Accuracy Range)	Resolution	Accuracy (NOTE) ± (%rdg.+dgt.)	Maximum permitted current
10 mA (1.00 to 10.00 mA)	0.01 mA	45 to 66 Hz: ± (1.0%+5) 40 to 45, 66 to 2 kHz: ± (2%+5)	20 A AC rms, continuous (see fig. A)
100 mA (10.0 to 100.0 mA)	0.1 mA		
1 A (0.100 to 1.000 A)	0.001 A		
10 A (1.00 to 10.00 A)	0.01 A		
200 A (10.0 to 200.0 A)	0.1 A	45 to 66 Hz: ± (1.5%+5) 40 to 45, 66 to 2 kHz: ± (2.0%+5)	200 A AC rms, continuous (see fig. A)

NOTE

- Accuracy is for filter OFF.
- Accuracy is for filter ON.

10 mA Range to 10 A Range:

50 Hz to 60 Hz (1.5%+5)

200 A Range: 50 Hz to 60 Hz (2.0%+5)

Effect of conductor position	within $\pm 0.1\%$ (in any direction from sensor center) 100 A MAX: within $\pm 0.5\%$
Effect of external magnetic fields	AC 400 A/m corresponds to 5 mA, max. 7.5 mA
Voltage in measured circuit	max. 300 Vrms AC (insulated conductor)

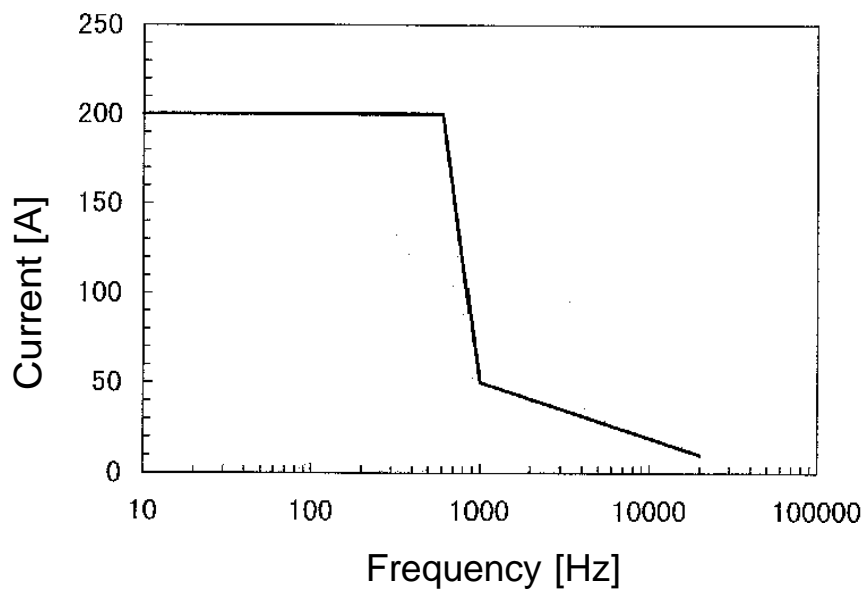


Fig.A Frequency-dependent deletion characteristics

5.1.2 Frequency Hz

Frequency Range (Accuracy Range)	Resolution	Accuracy \pm (%rdg.+dgt.)
100 Hz (30.0 to 99.9 Hz)	0.1 Hz	\pm (0.3%+1)
1000 Hz (95 to 1000 Hz)	1 Hz	\pm (1%+1)

5.2 General Specifications

Functions	
Recording	Maximum (MAX), minimum (MIN), average (AVE) value display selectable for AC current and frequency measurement
Data hold	Data hold function
Auto power-off	Automatic shutdown after 10.5 ± 1 minutes. Beep tone warning. Extension and disabling possible.
Beep tone	ON/OFF
Display	LCD panel
Digital indication	2000 counts
Bar graph indication	35 segments Range display or rms display selectable
Over-range indication	"O.L." ► (bar graph)
Battery low warning	B
Data hold indication	HOLD
Auto power-off indication	APS
Filter function	Cutoff frequency $180 \text{ Hz} \pm 30 \text{ Hz}$ (-3 dB)

Display update rate	Digital indication NORMAL 500 ms \pm 25 ms (approx. 2 times/second) SLOW 3 s \pm 0.15 s (approx. 1 time/3 seconds) FAST 250 ms \pm 12.5 ms (approx. 4 times/second)
Bar graph	FAST only
Display response time	2.2 s max.
Range switching	Auto range, manual (fixed) range (selectable). Frequency measurement with auto-range only.
Output function	REC (recording output), MON (waveform output) (selectable)
Output rate	REC: 1 V DC at full-scale point (In the 200 A range only, 2 V DC/f.s.) MON: 1 V AC at full-scale point (In the 200 A range only, 2 V AC/f.s.)
Accuracy	\pm 3.0%rdg. \pm 10 mV (40 to 2 kHz)
Output response	REC (DC): circuit time constant 200 ms max. MON (AC): frequency bandwidth (-3 dB) 5 Hz to 15 kHz
Output impedance	200 max.
Circuit dynamic characteristics (crest factor)	2.5 max. (1.5 for 200 A range)
Withstand voltage	Chassis - clamp core: 3.7 kV AC for 1 minute

Insulation resistance	Clamp core - circuitry: 630 kilohms min.
Location for use	Indoor, altitude up to 2000 m
Applicable standards	Safety: EN61010-1:1993+A2:1995 Voltage input: Pollution level 2, overvoltage category (expected transient overvoltage: 4000 V) EN61010-2-032:1995 EN60529:1991 IP40 (protected against access to hazardous parts with a wire) EMC: EN55011:1991+A2:1996 Group1 ClassB EN50082-1:1992
Maximum conductor diameter for measurement	40 mm max.
Operating temperature and humidity range	0 to 40 °C, 80%RH or less (no condensation)
Temperature characteristics	In 0 to 40 °C range: 0.05 % accuracy specifications/
Storage temperature range	-10 to 50 °C (no condensation)
Power source	One 6F22 (006P) 9 V battery or 9445 AC ADAPTER (UP01211090, POTRANS) (option)
Maximum power consumption	100 mVA
Battery life	50 hours max. (continuous, no load)
External dimensions	62(W) × 225(H) × 39(D) mm

Mass	approx. 400 g
Accessories	9399 CARRYING CASE 1 Hand Strap 1 6F22(006P) 1 Instruction manual 1
Options	9445 AC ADAPTER (UP01211090, POTRANS) 9094 OUTPUT CORD

Chapter 6

Troubleshooting

If the unit seems not to be working normally, check the following points first before requesting service.

Symptom	Battery	Battery clip
Unit does not come on.	Yes	Yes
• B indication appears and unit immediately turns off.	Yes	
• B indication appears.	Yes	
Unit turns off during use.	Yes	Yes
Remedy: If problem persists, request service.	Replace battery.	Check connection of battery to clip.
An indication E.001 to E.005 appears.	Send the unit for repair.	

Chapter 7 Service

- The minimum stocking period for replacement parts is five years after end of production.
- For information regarding service, please contact your dealer or the nearest HIOKI representative.
- If the unit is not functioning properly, check the battery. If a problem is found, contact your dealer or HIOKI representative. Pack the unit carefully so that it will not be damaged during transport, and write a detailed description of the problem. HIOKI cannot bear any responsibility for damage that occurs during shipment.

HIOKI

DECLARATION OF CONFORMITY

Manufacturer's Name: HIOKI E.E. CORPORATION

Manufacturer's Address: 81 Koizumi, Ueda, Nagano
386-1192, Japan

Product Name: CLAMP ON LEAK HiTESTER

Model Number: 3283

Product Option(s): 9094 OUTPUT CORD
9445 AC ADAPTER

The above mentioned product conforms to the following product specifications:

Safety: EN61010-1:1993+A2:1995
EN61010-2-032:1995

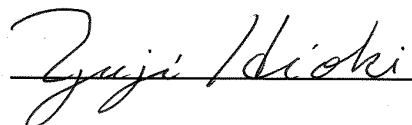
EMC: EN55011:1991+A2:1996 Group1 ClassB
IEC801-2:1988/EN50082-1:1992 ± 8 kV AD
IEC801-3:1984/EN50082-1:1992 3V/m

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

HIOKI E.E. CORPORATION

28 July 1998



Yuji Hioki
President

3283A999-01

HIOKI 3283 CLAMP ON LEAK HiTESTER

Instruction Manual

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- All reasonable care has been taken in the production of this manual, but if you find any points which are unclear or in error, please contact your supplier or the Sales and Marketing International Department at HIOKI headquarters.
- In the interests of product development, the contents of this manual are subject to revision without prior notice.
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