



# HIOKI

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INSTRUCTION MANUAL

**3638-20**

**LEAK LOGGER**

HIOKI E. E. CORPORATION

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## Introduction

Thank you for purchasing the Hioki 3638-20 LEAK LOGGER. To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference.

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## Inspection

When you receive the instrument, inspect it carefully to ensure that no damage occurred during shipping. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

### Accessories

9632 CONNECTION CABLE

Instruction Manual

LR03 alkaline battery X 4

(built into this unit, for monitor)

Before using the product the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.

**NOTE**

- Testing monitor batteries installed in the unit may possibly be weak. Replace batteries before extended measurement usage.
- Before using the product, make sure that the insulation on the sensor cables is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

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## Safety Notes

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**This instrument is designed to conform to IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the instrument. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from product defects.**

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This manual contains information and warnings essential for safe operation of the instrument and for maintaining it in safe operating condition. Before using the instrument, be sure to carefully read the following safety notes.

### Safety Symbols







- The  symbol printed on the instrument indicates that the user should refer to a corresponding topic in the manual (marked with the ) before using the relevant function.
- In the manual, the  symbol indicates particularly important information that the user should read before using the instrument.



Indicates DC (Direct Current).

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The following symbols in this manual indicate the relative importance of cautions and warnings.

 <b>DANGER</b>	Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
 <b>WARNING</b>	Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
 <b>CAUTION</b>	Indicates that incorrect operation presents a possibility of injury to the user or damage to the instrument.
 <b>NOTE</b>	Advisory items related to performance or correct operation of the instrument.

## Accuracy

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

- 
- f.s. (maximum display or scale value, or length of scale)  
Signifies the maximum display (scale) value or the length of the scale (in cases where the scale consists of unequal increments or where the maximum value cannot be defined).  
In general, this is the range value (the value written on the range selector or equivalent) currently in use.
- rdg. (displayed or indicated value)  
This signifies the value actually being measured, i.e., the value that is currently indicated or displayed by the measuring instrument.
- dgt. (resolution)  
Signifies the smallest display unit on a digital measuring instrument, i.e., the value displayed when the last digit on the digital display is "1".
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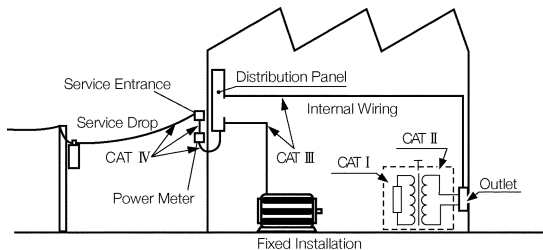
## Measurement categories (Overvoltage categories)

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

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

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

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





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## Notes on Use



Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

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**DANGER**

- **This product cannot be used on following voltage lines. If the voltage exceeds, there will be a short-circuit accident or electrocution accident will result.**  
CAT III, AC300 Vrms for 9657  
CAT III, AC150 Vrms for 9658
  - **To avoid short circuits and potentially life-threatening hazards, never attach the clamp-on leak sensor to a circuit that operates at more than the following maximum rated voltage to earth.**  
AC300 Vrms for 9657  
AC150 Vrms for 9658
  - **Clamp-on leak sensor should only be connected to the secondary side of a breaker, so the breaker can prevent an accident if a short circuit occurs. Connections should never be made to the primary side of a breaker, because unrestricted current flow could cause a serious accident if a short circuit occurs.**
  - **For model 9657**  
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) Measurement Category III, (2) Pollution Degree 2, and (3) Basic Insulation Requirements for Working Voltages of 300 V.
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For model 9658

When conductors being measured carry in excess of the safe voltage level (SELV-E) and not more than 150 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) Measurement Category III, (2) Pollution Degree 2, and (3) Basic Insulation Requirements for Working Voltages of 150 V.

Refer to the following standards regarding the meanings of underlined terms.

IEC61010-1

IEC61010-2-031

IEC61010-2-032

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- To avoid electric shock, do not allow the product to get wet, and do not use it when your hands are wet.
  - 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 damage to the product, protect it from vibration or shock during transport and handling, and be especially careful to avoid dropping.
  - 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.
  - Do not exert excessive pressure on the clamp sensor or attempt to wedge the sensor into a tight spot for measurement.
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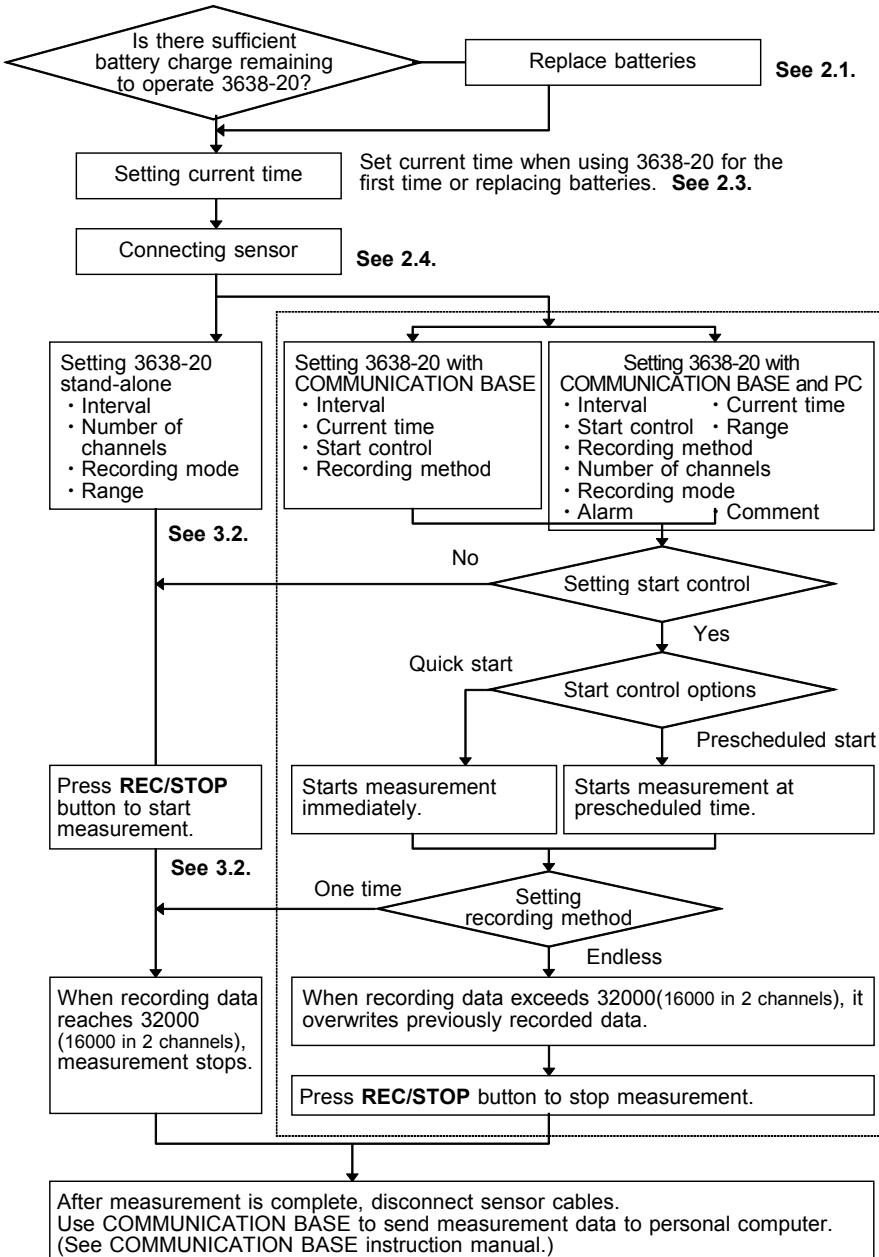
**CAUTION**

- To avoid electric shock when measuring live lines, wear appropriate protective gear, such as insulated rubber gloves, boots and a safety helmet.
  - This product is designed for indoor use, and operates reliably from 0°C to 50°C.
  - Do not store or use the product where it could be exposed to direct sunlight, high temperature or humidity, or condensation. Under such conditions, the product may be damaged and insulation may deteriorate so that it no longer meets specifications.
- 

**NOTE**

Accurate measurement may be impossible in the presence of strong magnetic fields, such as near transformers and high-current conductors, or in the presence of strong electromagnetic fields such as near radio transmitters.

## Measurement Flow Chart and Reference Guide



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# Chapter 1

## Product Outline

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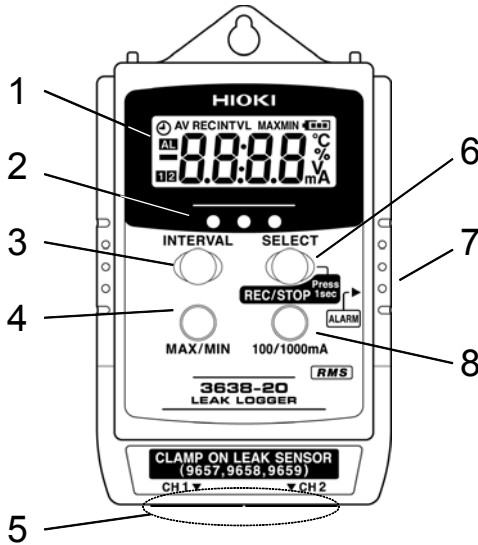
3638-20 LEAK LOGGER with clamp on leak sensor records 1 or 2 channels of data at leakage current value. It measures and records AC RMS current values of up to 1 Arms at fixed intervals.

With two optional recording modes; recording maximum value and recording average value, extended duration of current recording is possible with battery operation. Data is saved in nonvolatile memory when batteries are weak or removed for replacement.

**NOTE**

3638-20 LEAK LOGGER cannot be set with 3910-20 COMMUNICATION BASE.

## 1.1 Name and Functions of Parts



1. LCD	Displays measurement value and settings.
2. Optical data transfer ports	Enables optical data transfer to COMMUNICATION BASE.
3. INTERVAL button	Calls up interval setting display to set interval, recording mode and measurement channels.
4. MAX./MIN. button	Displays maximum value or minimum value of recorded data.
5. Clamp connection terminal	Connects 9657/9658 CLAMP ON LEAK SENSOR.
6. REC/STOP button	Pressing more than 1 second initiates or stops recording.
(SELECT) button	Interval is selected in interval setting display.
7. Alarm output terminal	Connects 9632 CONNECTION CABLE and outputs alarm signal (open drain output).
8. 100/1000 mA button	Changes measurement range from 100/1000 mA.

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## 1.2 Interval and Maximum Recording Time

Interval and maximum recording time (when power save function is valid) are as follows.

When 3638-20 LEAK LOGGER is used in 2 channels, maximum recordable data is 16000 per unit.

INTVL	Maximum Recording Time
1 s	4 h 26 min 40 s
2 s	8 h 53 min 20 s
5 s	22 h 13 min 20 s
10 s	1 day 20 h 26 min 40 s
15 s	2 day 18 h 40 min
20 s	3 day 16 h 53 min 20 s
30 s	5 day 13 h 20 min
1 min	11 day 2 h 40 min
2 min	22 day 5 h 20 min
5 min	55 day 13 h 20 min*
10 min	111 day 2 h 40 min*
15 min	166 day 16 h*
20 min	222 day 5 h 20 min*
30 min	333 day 8 h*
60 min	666 day 6 h*

\*: Maximum recording time is limited by battery charge condition.

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When 3638-20 LEAK LOGGER is used in 1 channel, maximum recordable data is 32000 per unit.

INTVL	Maximum Recording Time
1 s	8 h 53 min 20 s
2 s	17 h 46 min 40 s
5 s	1 day 20 h 26 min 40 s
10 s	3 day 16 h 26 min 40 s
15 s	5 day 13 h 20 min
20 s	7 day 9 h 46 min 40 s
30 s	11 day 2 h 40 min
1 min	22 day 5 h 20 min
2 min	44 day 10 h 40 min*
5 min	111 day 2 h 40 min*
10 min	222 day 5 h 20 min*
15 min	333 day 8 h*
20 min	444 day 10 h 40 min*
30 min	666 day 6 h*
60 min	1333 day 8 h*

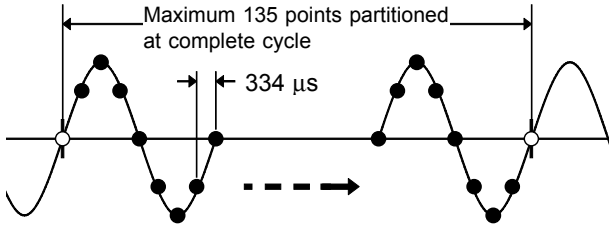
\*: Maximum recording time is limited by battery charge condition.



## 1.3 Measurement Value Recording Modes

### Effective value calculation

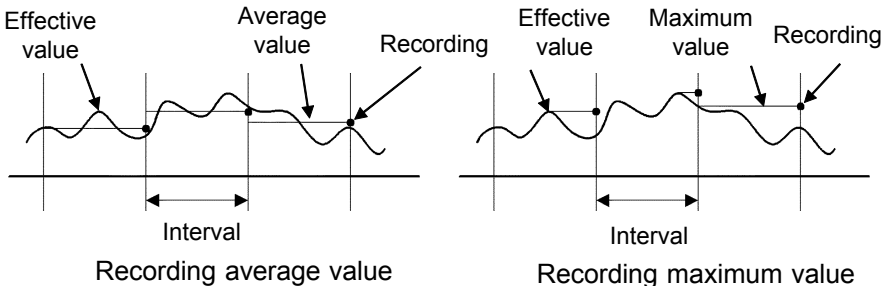
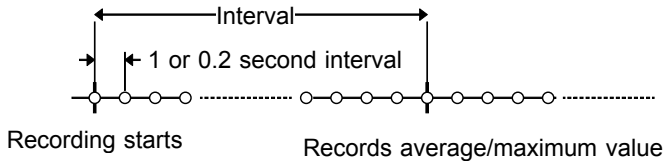
To calculate effective value, measurement signal is sampled every  $334 \mu\text{s}$  and operation is carried out from data with maximum 135 points to seek effective value.



### Recording

To record measurement value, calculate effective value per 1 second or 0.2 second and record average or maximum value of all data within interval in memory.

After recording starts, average or maximum value within interval is recorded, so the initial data is not recorded immediately after recording starts but is recorded from the following interval.

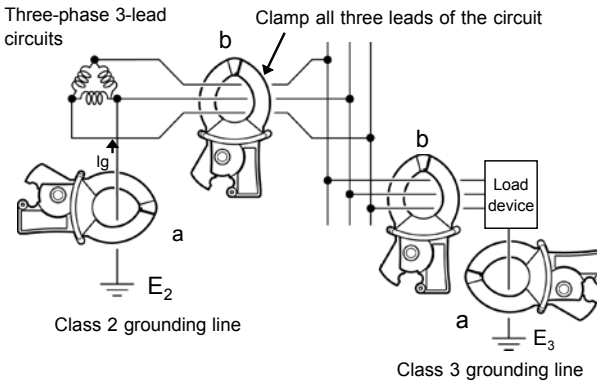
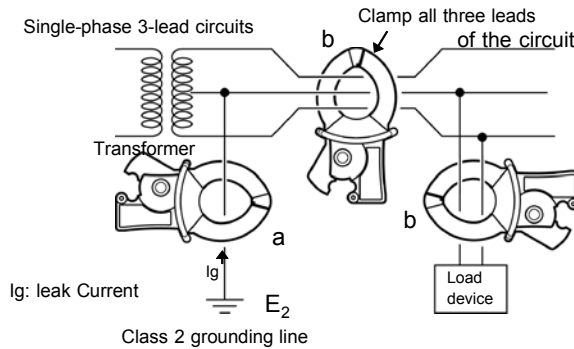


## 1.4 Leak Current Measurement

Clamp the sensor on the conductor, so that the conductor passes through the center of the clamp core. For measurement of grounded leads, clamp the sensor on one lead only (see a). For overall measurements, clamp the sensor on the entire circuit path (see b).

**NOTE**

When the current to be measured is unknown, begin measurement with the 1000 mA range selected.



**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.

**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.
- 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.

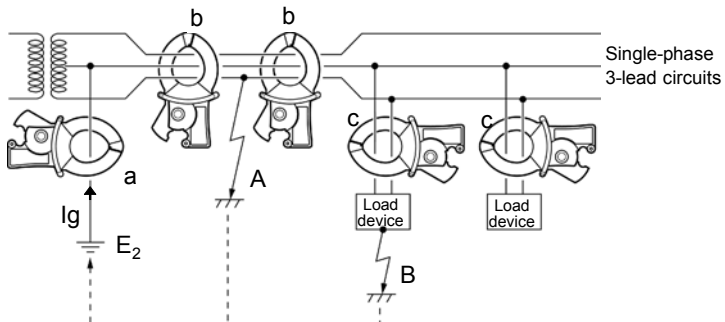
The indication goes progressively to zero, but this may take a little time. Beginning measurement before the display reaches zero has no effect on measurement.

### 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.

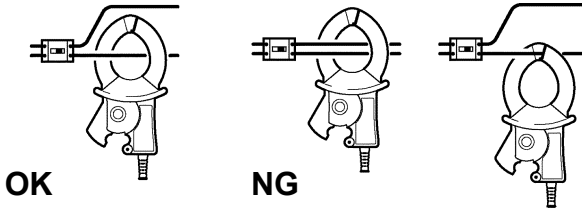
1. If an insulation fault in the wiring has occurred at position A in the illustration, leak current will be detected at position b using overall measurement, but not at position b'.
2. If an insulation fault in the load equipment has occurred at position B in the illustration, leak current will be detected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



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## 1.5 Load current measurement

Be sure to clamp only one lead of the conductor. Clamp so that the conductor is in the center of the sensor aperture.

**NOTE**

- The frequency of special waveforms such as at the secondary side of an inverter can not be indicated correctly.
- When the current to be measured is unknown, begin measurement with the 1000 mA range selected.
- Do not input a current which exceeds the maximum continuous input rating.

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# Chapter 2

## Set Up

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### 2.1 Replacing the Battery



- 
- To avoid electric shock when replacing the batteries, first disconnect the connection cables from the object to be measured.
  - During battery replacement, use caution not to put any foreign materials such as a metal object into the unit to avoid damage to the unit.
  - Before using the product after replacing the batteries, replace the cover and screw.
  - Do not mix old and new batteries, or different types of batteries. Also, be careful to observe battery polarity during installation. Otherwise, poor performance or damage from battery leakage could result.
  - To avoid the possibility of explosion, do not short circuit, disassemble or incinerate batteries.
  - To avoid corrosion from battery leakage, remove the batteries from the product if it is to be stored for a long time.
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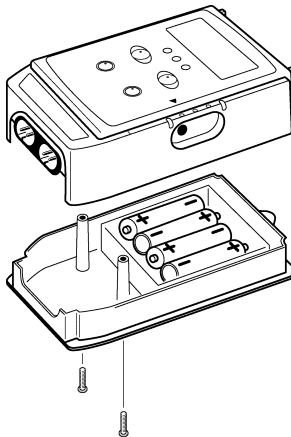
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Installing new batteries ensures about one month of recording (when interval is set at 1 sec) and about 10 days of recording (when interval is set at 0.2 sec). (reference value with power save setting set to valid and at 20°C)



Remaining battery power indicator (■■■■) indicates remaining battery life reducing incrementally from right.

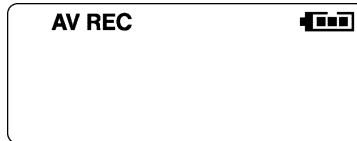
Empty battery power indicator (■□□□) indicates time to replace batteries.

1. Remove back cover screw to remove cover. Verify polarity and install four new LR03 alkaline batteries.
2. Fit cover properly and tighten screw.



## 2.2 Power Save Function

Display window is automatically turned off in approximately 15 seconds after last key entry. (Sleep) However, while recording, **REC/AV/**  /  / **AL** mark shows each conditions.



Sleeping.....

Press any button to turn display on to display measurement value or to set settings.

Note when interval setting display is on, sleep does not engage with no button press.

Initially, power save function is on. To turn off power save function, follow the instructions below.

When power save function is off, maximum continuous duration is approximately 10 days.

1. Connect logger, COMMUNICATION BASE and personal computer.
2. Start up application software packaged with COMMUNICATION BASE.
3. Go to Communications on the menu bar and select Power Save Options. Choose Off to turn off power save function.

**NOTE**

See COMMUNICATION BASE instruction manual to connect logger and to install application software. To use application software, see operation guide.

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## 2.3 Setting Current Time

When replacing 3638-20 LEAK LOGGER batteries or using 3638-20 stand-alone (with manual operation) for the first time, connect with COMMUNICATION BASE and set current time.

See how to set current time in COMMUNICATION BASE instruction manual.

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## 2.4 Connecting Sensor Cable

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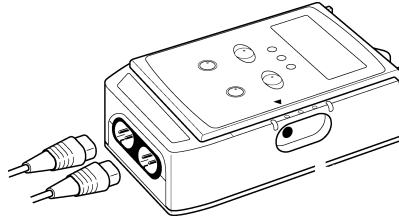
- **Maximum input current is 1 Arms. Do not exceed the continuous maximum input current.**
  - **This product cannot be used on following voltage lines. If the voltage exceeds, there will be a short-circuit accident or electrocution accident will result.  
CAT III, AC300 Vrms for 9657  
CAT III, AC150 Vrms for 9658**
  - **When connecting the clamp on leak sensor, if a metallic part of the sensor exposed while the clamp is open should touch the two wires of the line, or if the sensor is used on a bare conductor, a shorting accident or electric shock may result.**
  - **The 3638-20 measurement range is set at 100 mA, do not exceed 100 mArms.**
  - **To avoid damaging the unit, do not use any other sensors except 9657/9658 CLAMP ON LEAK SENSOR as sensor connector.**
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## Connecting clamp on leak sensor

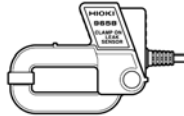
3638-20 LEAK LOGGER enables 2 channels of data measurement when connected with 9657/9658 CLAMP ON LEAK SENSOR.



9657/9658 CLAMP ON LEAK SENSOR



9657



9658

**NOTE**

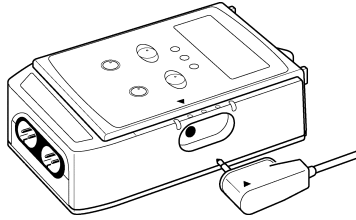
Carefully read 9657/9658 CLAMP ON LEAK SENSOR instruction manuals before use.

Improper measurement method may result in accidental injury, death or damage in the unit.

## Connecting 9632 CONNECTION CABLE

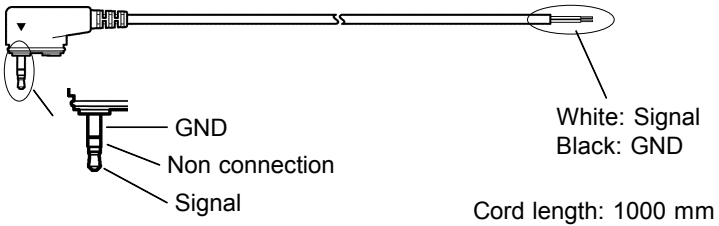
Connecting 9632 CONNECTION CABLE to alarm output terminal. When connecting connection cable, securely insert connection cable to unit as designated by triangle mark on connection terminal.

Improper connection results in failure to output accurate signal.



9632 CONNECTION CABLE

## 9632 CONNECTION CABLE



# Chapter 3

## Settings

### 3.1 Setting Items

Logger stand-alone manual settings and settings in combination with COMMUNICATION BASE with measurement conditions stored in memory loaded from personal computer.

	3638-20	3638-20+ COMMUNICATION BASE	3638-20+ COMMUNICATION BASE + PC
1. Start recording	Valid	Valid	Valid
2. Stop recording	Valid	---	---
3. Interval setting	Valid	Valid	Valid
4. Current time setting	---	Valid	Valid
5. Start control	---	Valid	Valid
6. Recording method setting	---	Valid	Valid
7. Measurement interval setting	Valid	---	Valid
8. Range setting	Valid	---	Valid
9. Setting number of channels	Valid	---	Valid
10. Recording mode setting	Valid	---	Valid
11. Alarm setting	---	---	Valid
12. Comments	---	---	Valid
13. Minimum/Maximum value display	Valid	---	---

**NOTE**

- When PC, COMMUNICATION BASE and 3638-20 are connected, separate range can be set in each channel. Once settings are set, range setting with manual operation sets common range.
- Alarm and comment setting are available when personal computer is connected to both logger and COMMUNICATION BASE.

## 1. Start recording

Start manual recording by pressing logger **REC/STOP** button for 1 second or initiate by prescheduled start set using COMMUNICATION BASE.

When time scheduled start is engaged, clock icon appears in display. When batteries are weak, recording does not start. During recording, weak battery interrupts recording.



## 2. Stop recording

Stop recording by pressing logger **REC/STOP** button for 1 second. Or recording stops automatically when data is full when set to recording method: one time.

## 3. Interval setting

Set interval with logger alone or using COMMUNICATION BASE.

(1/2/5/10/15/20/30 s, 1/2/5/10/15/20/30/60 min)

## 4. Current time setting

To set current time, see COMMUNICATION BASE instruction manual.

## 5. Start control

Set specific recording date and time using COMMUNICATION BASE to engage time scheduled start. When time scheduled start is engaged, clock icon appears in display.

## 6. Recording method setting

Set recording method using COMMUNICATION BASE. Choose either one time or endless recording method. Default setting is one time.

One time: Ends recording when data reaches 32000 (2 ch: 16000).

Endless : Overwrites previously recorded data when data exceeds 32000 (2 ch: 16000).

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## 7. Setting the measurement interval

You can set the measurement interval on the 3638-20 or through the COMMUNICATION BASE. Select between an interval of 0.2 sec (when measuring just 1 channel) or 1 second.

The factory setting is 1 second.

## 8. Range setting

With 3638-20 stand-alone, or connected with COMMUNICATION BASE and PC, range setting is available.

Two measurement range options are 100 mA range and 1000 mA.

Select and set in accordance with measurement current.

When manually operated, common settings apply to channel 1 and channel 2.

When 3638-20 measurement range is set at 100 mA, do not exceed 100 mArms.

### NOTE

When PC, COMMUNICATION BASE and 3638-20 are connected, separate range can be set in each channel. Once settings are set, range setting with manual operation sets common range.

## 9. Setting number of channels

With 3638-20 stand-alone, or connected with COMMUNICATION BASE and PC, setting is available.

Select input for channel 1 or channel 2.

At factory shipment settings, both channel 1 and channel 2 are valid.

## 10. Recording mode setting

With 3638-20 stand-alone, or connected together with COMMUNICATION BASE and PC, setting is available.

Two recording mode options are maximum value recording and average value recording (**AV** displayed).

At factory shipment setting, average value recording is selected.

### NOTE

Maximum value recording mode records maximum value within interval, so the initial data is not recorded immediately after recording starts but is recorded from the following interval. For example, when measurement started at 12:00 at 1 minute intervals, the first data is data recorded when 1 minute has passed at 12:01.

## 11. Alarm setting

Alarm setting is available when 3638-20, COMMUNICATION BASE and personal computer are connected.

Designate upper limit and lower limit value of measurement value with personal computer to output alarm signal when measurement value goes outside of set range. Two channels pass individual judgment.

During signal output, **AL** appears on the display.

### NOTE

Alarm signal output terminal is an open drain output. During signal output, signal side and GND side are internally grounded and any other time, it remains open. When external power supply is supplied, alarm signal can control relay or sequencer. Maximum rate: 30 V, 200 mA (allowable loss 200 mW)

## 12. Comments

Set comments entered by personal computer to logger using COMMUNICATION BASE. When sorting collected recording data, comments are helpful.

Comment setting is available when personal computer is connected to both logger and COMMUNICATION BASE.

## 13. Maximum/Minimum value display

3638-20 stand-alone enables maximum/minimum value display settings. Maximum value or minimum value of recorded data is alternately displayed.

### NOTE

- Maximum value and minimum value are from data recorded in memory and may vary from each displayed value per second.
- When recording method is set as endless, maximum value and minimum value from the beginning of recording are displayed. When old data is overwritten after extended recording, data currently recorded may differ from displayed maximum value and minimum value.

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## 3.2 Manual Setting

3638-20 LEAK LOGGER stand-alone manual operation settings are shown below.

### (1) Interval setting

Press **INTERVAL** button to switch measurement value display to interval setting display. (**INTVL** appears.)

Press **SELECT** button to designate interval.

Press **INTERVAL** button to complete setting.



### (2) Setting number of channels

Press **INTERVAL** button to display interval setting display.

Each **100/1000 mA** button press selects channel to be used.

When channel 1 is selected, only display "**1**" is turned on

and when channel 2 is selected, display "**2**" is turned on.

When both channel 1 and channel 2 are selected, display "**12**" is turned on.

In these cases, the measurement interval is 1 second. When neither "**1**" nor "**2**" is lit, the measurement interval is 0.2 second (measurement on CH1 only).

### (3) Setting recording mode

Press **INTERVAL** button to display interval setting display.

Each **MAX/MIN** button press alternates and selects maximum value recording and average value recording (**AV** displayed).

To set maximum value recording and average value recording, see 1.3 Measurement Value Recording Modes.





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#### (4) Setting range

Press **100/1000 mA** button on monitor screen to select 100 mA or 1000 mA.

When measurement range is reselected, decimal point moves its position.

When manual operation is conducted, common range settings apply to both channel 1 and channel 2.



100 mA range



1000 mA range

#### (5) Starting and ending recording

Press **REC/STOP** button for 1 second to clear last recorded data and start recording. (**REC** appears.)

Press **REC/STOP** button for 1 second to stop recording.

When memory is full, recording automatically stops when recording method: one time is selected.

When batteries are weak, recording does not start. During recording, weak batteries interrupt recording.



#### (6) Maximum/Minimum value display

Press **MAX/MIN** button to display maximum or minimum value from recorded data.

Each button press alternates display.

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### 3.3 Setting by COMMUNICATION BASE

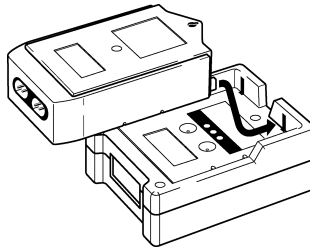
1. Press logger **INTERVAL** button lightly to display LCD.
2. When logger LCD shows **REC** mark or clock icon, press **REC/STOP** button for more than 1 second to stop recording.

During recording or waiting time before recording start time, data transfer cannot be established with COMMUNICATION BASE.

3. Press logger **INTERVAL** button to display interval setting display. (**INTVL** appears.)



4. Connect COMMUNICATION BASE with logger.
5. Press COMMUNICATION BASE **SEND** button for more than 1 second to send data settings to logger.

**NOTE**

- Previously recorded logger data is erased when recording is resumed. Be sure to load data to be saved to COMMUNICATION BASE or to personal computer before recording.
- At any other time even when interval setting display is not shown, except during recording and waiting for recording, communication with COMMUNICATION BASE is available. However communication is disabled when logger is set to sleep.

3638-20 settings in application software COMMUNICATION UTILITY packaged with COMMUNICATION BASE are as follows.

Go to 'Communication' on the menu bar in COMMUNICATION UTILITY and select 'Set measurement condition'. When measurement condition setting window is open, select '3638-20' setting items to set settings.

**Setting measurement conditions.**  
Select a model to set measurement conditions: in and execute sending.

Send Cancel

3631-3635,3641 | 3636 | 3637 | 3638 | 3639 | 3640 | 3645 | 3910 | 3911,3912

**common settings**

Recording interval: 1sec  
Recording method:  One time  Endless

Start control:  Do not set  Quick start  Start time scheduling

Scheduled time: 2003 year 1 month 16 day 8 hour 22 minute

Comments:  Sets comments in LOGGER.

**3638 settings**

Recording mode:  Maximum value  Average value  
Measurement interval:  0.2sec  1 sec  
Measurement Channel:  CH1  CH2

CH1 range:  100mA  1000mA  
CH2 range:  100mA  1000mA

CH1 Alarm value:  Change alarm value  Activate alarm  
Upper limit [mA]: 100.0  
Lower limit [mA]: 0

CH2 Alarm value:  Change alarm value  Activate alarm  
Upper limit [mA]: 0500  
Lower limit [mA]: 0000

**NOTE**

- Comment, recording mode, measurement channel, measurement interval, range and alarm setting are only available in 3638-20 setting items. Personal computer, COMMUNICATION BASE and 3638-20 must be connected during setting.
- Common settings are available to be set in '3911-20, 3912-20' setting items.



# Chapter 4

## Specifications

Sensor types	9657/9658 CLAMP ON LEAK SENSOR
Input	AC voltage (AC25 mV/A)
Maximum input current	AC35 mVrms, 50 mV peak value
Number of input	2 channels (1 or 2 channels settable)
Measurement range	0 to 1000 mA
Range structure	100.0 mA, 1000 mA
Measurement method	True effective value calculation
Measurement interval	0.2 second (1 ch only), 1 second (1 or 2 ch)
Measurement accuracy	Unit: $\pm 1\%$ rdg. $\pm 5$ dgt. (50/60 Hz)
Unit + Sensor	9657: $\pm 2\%$ rdg. $\pm 10$ dgt. (100 mA range, 50/60 Hz) $\pm 2\%$ rdg. $\pm 6$ dgt. (1000 mA range, 50/60 Hz)
	9658: $\pm 4.5\%$ rdg. $\pm 10$ dgt. (100 mA range, 50/60 Hz) $\pm 4.5\%$ rdg. $\pm 6$ dgt. (1000 mA range, 50/60 Hz)
Operating temperature and humidity for guaranteed accuracy	$23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ( $73^{\circ}\text{F} \pm 9^{\circ}\text{F}$ ), 80%RH or less
Period of guaranteed accuracy	1 year
Temperature coefficient	Accuracy X 0.05/ $^{\circ}\text{C}$
LCD display	Measurement value, Interval, Battery status (remaining battery power indicator: 4 phases) Unit (A), recording (REC), prescheduled( $\oplus$ ), average value recording (AV), maximum value (MAX), minimum value (MIN), alarm ( <b>AL</b> )
Recording mode	Recording maximum value (records maximum value within interval) Recording average value (records average value within interval)
Interval	1/2/5/10/15/20/30 s, 1/2/5/10/15/20/30/60 min
Recording capacity	32,000 data X 1 channel 16,000 data X 2 channels

Recording start	Manual start, Prescheduled start
Recording stop	Manual stop, Memory full
Recording method	One time, Endless
Displaying Max/Min value	Displays maximum value and minimum value.
Alarm output	Turns ON (open drain output) when value goes outside previously set upper limit or lower limit.
Data backup	Available (Data not erased by weak batteries or battery replacement)
Interface	Infrared optical data transfer
Power supply	LR03 alkaline battery X 4 (1.5 VDC X 4)
Maximum rated power	0.1 VA
Battery life	About 10 days (temperature at 20°C, power save function: valid, measurement interval: 0.2 second) About 1 month (temperature at 20°C, power save function: valid, measurement interval: 1 second)
Dimensions	Approx. 57W X 86H X 30D mm (excluding projections)/ 2.24"W X 3.39"H X 1.18"D
Mass	Approx. 130 g (4.6 oz) (including batteries)
Location for use	Indoors, altitude up to 2000 m
Operate temperature and humidity range	0 to 50°C, 80% RH or less (no condensation) (32 to 122°F)
Storage temperature and humidity range	-10 to 60°C, 80% RH or less (no condensation) (14 to 140°F)
Accessories	LR03 alkaline battery X 4 9632 CONNECTION CABLE Instruction Manual
Options	3911-20 COMMUNICATION BASE 3912-20 COMMUNICATION BASE 9657 CLAMP ON LEAK SENSOR 9658 CLAMP ON LEAK SENSOR
Standards Applying	
	EMC EN61326:1997+A1:1998+A2:2001+A3:2003
	Safety EN61010-1:2001 Pollution Degree 2

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# Chapter 5

## Maintenance and Service

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### **Cleaning**

To clean the product, wipe it gently with a soft cloth moistened with water or mild detergent. Never use solvents such as benzene, alcohol, acetone, ether, ketones, thinners or gasoline, as they can deform and discolor the case.

### **Service**

If the product seems to be malfunctioning, confirm that the batteries are not discharged, and that the sensor cables are not open circuited before contacting your dealer or Hioki representative.





**HIOKI**

**DECLARATION OF CONFORMITY**

Manufacturer's Name: HIOKI E.E. CORPORATION  
Manufacturer's Address: 81 Koizumi, Ueda, Nagano 386-1192, Japan  
Product Name: LEAK LOGGER  
Model Number: 3638-20  
Accessory: 9632 CONNECTION CABLE  
Options: 9637, 9638 RS-232C CABLE

The above mentioned products conform to the following product specifications:

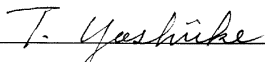
Safety: EN61010-1:2001  
EMC: EN61326:1997+A1:1998+A2:2001+A3:2003  
Class B equipment  
Portable test, measuring and monitoring  
equipment used in low-voltage distribution  
systems

Supplementary Information:

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

HIOKI E.E. CORPORATION

15 September 2006

  
\_\_\_\_\_  
Tatsuyoshi Yoshiike  
President

3638A999-03



## **HIOKI 3638-20 LEAK LOGGER**

### 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.
  - Unauthorized reproduction or copying of this manual is prohibited.
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