

HIOKI 3120 VOLTAGE DETECTOR

INSTRUCTION MANUAL
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Introduction

Thank you for purchasing the HIOKI "Model 3120 VOLTAGE DETECTOR." To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference.

HIOKI DECLARATION OF CONFORMITY	
Manufacturer's Name:	HIOKI E.E. CORPORATION
Manufacturer's Address:	81 Koizumi, Ueda, Nagano 386-1192, Japan
Product Name:	VOLTAGE DETECTOR
Model Number:	3120
The above mentioned product conforms 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 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 15 September 2006 <i>T. Yoshida</i> Tatsuyoshi Yoshida President 3120A999-01	

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Overview

This noncontact type of voltage detector unit enables the hot-line state of AC voltage to be checked through the wire or cable covering.

Initial 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.

Maintenance and Service

- To clean the instrument, 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.
- If the instrument seems to be malfunctioning, confirm that the batteries are not discharged, before contacting your dealer or Hioki representative.

Safety

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

⚠ DANGER

This instrument is designed to comply with 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 instrument defects.

Safety Symbol

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

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

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

Measurement categories (Overvoltage categories)

This instrument complies with CAT IV (600 V) safety requirements. To ensure safe operation of measurement instruments, 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.

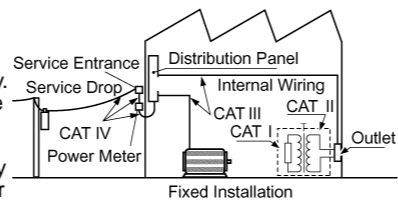
CAT II: Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)

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 instrument in an environment designated with a higher-numbered category than that for which the instrument is rated could result in a severe accident, and must be carefully avoided. Never use a CAT I measuring instrument in CAT II, III, or IV environments. The measurement categories comply with the Overvoltage Categories of the IEC60664 Standards.



Usage Notes

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

⚠ CAUTION

- This instrument is designed for use indoors. It can be operated at temperatures between 0 and 40°C without degrading safety.
- This instrument is not designed to be entirely water- or dust-proof. Do not use it in an especially dusty environment, nor where it might be splashed with liquid. This may cause damage.
- To avoid damage to the instrument, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.

NOTE

A weak green light indicates dead battery. Replace the batteries immediately.

Detection

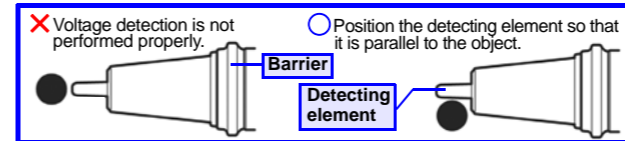
Performance Check and Voltage Detection

⚠ DANGER

The maximum rated voltage between input terminals and ground is 600V AC. Attempting to measure voltages exceeding 600V with respect to ground could damage the instrument and result in personal injury.

NOTE

- The green LED indicates battery consumption but is not a guarantee of the performance of the instrument. Be sure to check its performance using a known power source (e.g., AC outlet) prior to use.
- The 3120 voltage detector works using a live AC circuit. It will not work using an earthed wire or neutral point. If there are several lines, such as 2-phase wires and 3-phase wires, perform voltage detection on each line separately.
- The 3120 cannot perform voltage detection on a shielded wire.
- Be sure to grip the 3120 firmly during measurement. But, do not touch the portion beyond the barrier. It will not produce any detection.
- Make sure the detecting element properly contacts the object to be measured. (See the right figure.)



Performance Check

Be sure to check the following before use to avoid electrical shock.

1. Inspect the 3120 carefully to ensure that no damage.	There is no damage.	The 3120 is damaged.
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OK

NG

Contact your dealer or Hioki representative.

2. Turn the switch ON. (Turn it clockwise.)	
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The green LED lights up.	The green LED does not light up or is dim.
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OK

NG

The batteries are running low. Replace the batteries.

3. Grip the 3120 firmly and apply the detecting element to a known power supply (e.g., AC outlet) in order to check the performance.	
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The red LED lights up and the buzzer sounds.	The red LED and buzzer sound are getting off.	The red LED does not light up or the buzzer does not sound.
--	---	---

OK

NG

NG

The 3120 is operating properly. It can be used.

The batteries are running low. Replace the batteries.

The 3120 may be malfunctioning. Do not use it.

Detection

Turn on the switch. In the state that the green LED is lighting up, apply the detecting element to the object to be measured. If there are several wires, conduct a voltage check of each wire separately. (Check some points for bundle of wires.)	
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The red LED lights up and the buzzer sounds.	The green LED is still lighting up.
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The object is live.	The object cannot perform voltage detection. (It is not live or the earth potential is below the measurement-voltage range (70 V or less).)
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3120 VOLTAGE DETECTOR	Object to be Measured
The red LED lights up and the buzzer sounds.	Live.
Only the green LED lights up.	Not live or below the measurement-voltage range (70 V or less).

Replacing the batteries

⚠ WARNING

- After replacing the batteries, replace the switch section before using the instrument.
- To avoid the possibility of explosion, do not short circuit, disassemble or incinerate batteries.
- Handle and dispose of batteries in accordance with local regulations.
- 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.

NOTE

- Use R03 manganese battery or LR03 alkaline battery.
- After use, always turn OFF the power.

Replacing the batteries

Specifications

Basic Specifications

Measurement function	Detection
Measurement voltage	70 to 600 VAC (when in contact with an IV2mm ² or equivalent insulated wire)
Measurement frequency	50/60 Hz
Pilot light	The red LED lights up and the buzzer sounds when the wire is live.
Battery check	The green LED is dim or out when the batteries are low.
Power supply	Two R03 manganese batteries or Two LR03 alkaline batteries.
Dimensions	Approx. 149H × φ18.5 mm (5.87"H × φ0.73") (excluding projections)
Mass	Approx. 38 g (1.3 oz.) (including two R03 manganese batteries)
Operating environment	Indoors, altitude up to 2000 m (6562-ft.)
Operating temperature and humidity range	0 to 40°C (32 to 104°F), 80%RH max. (with no condensation)
Storage temperature and humidity range	-20 to 60°C (68 to 140°F), 80%RH max. (with no condensation)
Period of guaranteed accuracy	3 years
Accessories	Instruction manual Two R03 manganese batteries (For monitor built into the main unit)
Standards applying	Safety EN61010-1:2001, Pollution degree 2, Measurement category IV 600 V (anticipated transient overvoltage 8000 V) UL1436:1998, CSA C22.2 No.160-M1985 EMC EN61326:1997+A1:1998+A2:2001+A3:2003

Electrical Specifications

Maximum rated voltage to earth	600 VAC
Withstand voltage	6.88 kVrms
Rated supply voltage	1.5 VDC × 2
Operating supply-voltage range	From 3.45 V to the voltage at which the green LED goes out (central value: 2.1 V)
Maximum rated power	170 mW (Max) Power supply voltage 3.0 VDC
Rated power	27 mW (Typ) Power supply voltage 3.0 VDC (Power ON Standby state)
Continuous operating time	R03 manganese batteries: Approx.100 hours LR03 alkaline batteries: Approx.200 hours (Power ON Standby state)