HIOKI

L2020

PIN TYPE LEAD

Instruction Manual

EN

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HIOKI

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Introduction

Thank you for purchasing the Hioki L2020 Pin Type Lead. To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.

Overview

The L2020 Pin Type Lead has a 4-terminal structure that can be used in small spaces where there may be difficulty in contacting an object to be measured, such as during emergency battery maintenance.
Since the conductor contact pins have an outside diameter of 2.9 mm, they can be used to measure batteries via the battery terminal cover's test holes without needing to remove the cover.

Inspection and Maintenance

Initial Inspection

When you receive the device, 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 authorized Hioki distributor or reseller.

Maintenance and Service

- To clean the device, wipe it gently with a soft cloth moistened with water or mild detergent.
- If the device seems to be malfunctioning, contact your authorized Hioki distributor or reseller.

Transporting the device

During shipment of the device, handle it carefully so that it is not damaged due to a vibration or shock.

Disposal

Handle and dispose of the device in accordance with local regulations.

Safety Information

Before using the device be certain to carefully read the following safety notes:

⚠DANGER

Mishandling during use could result in injury or death, as well as damage to the device. Be certain that you understand the instructions and precautions in the manual before use.

⚠WARNING

With regard to the electricity supply, there are risks of electric shock, heat generation, fire, and arc flash due to short circuits. If persons unfamiliar with electricity measuring device are to use the device, another person familiar with such device must supervise operations.

Symbols on the device

⚠	Indicates cautions and hazards. When the symbol is printed on the device, refer to a corresponding topic in the Instruction Manual.

Notation

In this document, the risk seriousness and the hazard levels are classified as follows.

⚠DANGER	Indicates an imminently hazardous situation that will result in death or serious injury to the operator.
⚠WARNING	Indicates a potentially hazardous situation that may result in death or serious injury to the operator.
⚠CAUTION	Indicates a potentially hazardous situation that may result in minor or moderate injury to the operator or damage to the device or malfunction.
IMPORTANT	Indicates information related to the operation of the device or maintenance tasks with which the operators must be fully familiar.

🚫	Indicates prohibited actions.
❗	Indicates the action which must be performed.

Usage Notes

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

⚠DANGER

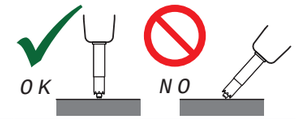
- **To avoid electric shock, be careful to avoid shorting live lines with the device.**
- **Do not use the device and measuring instrument with circuits that exceed its ratings or specifications. Doing so may damage the device or measuring instrument, resulting in electric shock.**

⚠WARNING

To avoid shock and short circuits, turn off all power before connecting the device.

⚠CAUTION

- To avoid damage, do not contact the L2020 tip against the battery at a tilted angle.



- To avoid damage to the L2020, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.

Preliminary Checks

Verify that the device operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your authorized Hioki distributor or reseller.

Points to check: conductive contact pin operation and whether the pin tip is loose
As loose the pin tip can result in damage, be sure to tighten it securely before use.

⚠DANGER

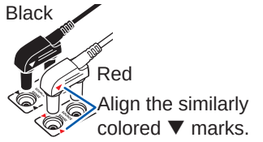
Before using the device, make sure that the insulation on the test leads is undamaged and that no bare conductors are improperly exposed. Using the device in such conditions could cause an electric shock, so contact your authorized Hioki distributor or reseller for repair.

Memo

Procedure

1 Make sure that power of the instrument to connect the L2020 to is off.

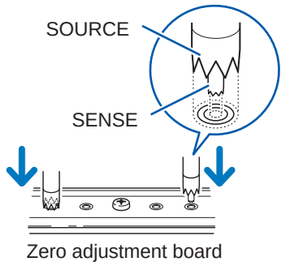
2 Connect the L2020 to the input terminal of the instrument.



3 Perform zero adjustment.

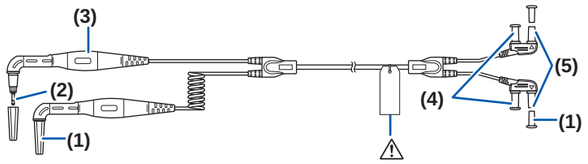
Be sure to use a zero adjustment board which is the accessory or option of connectable instrument.

(See the instruction manual for details of connectable devices.)



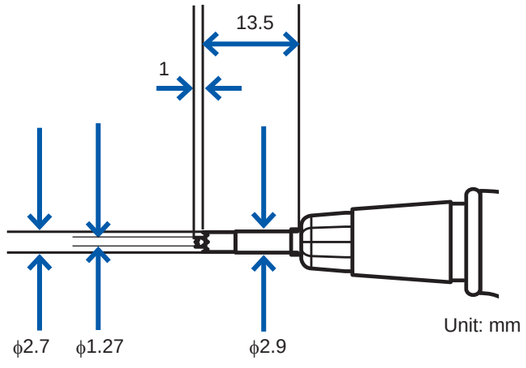
4 Connect the L2020 to a sample.

Part Names



(1)	**Protective cap** Remove this cap before use. Reattach the cap when not using the lead.
(2)	**Conductive contact pin**
(3)	**Grip**
(4)	**SOURCE connector**
(5)	**SENSE connector**

Enlarged view of pin



Specifications

General Specifications

Operating environment	Indoors, Pollution Degree 2, altitude up to 2000 m (6562 ft.)
Operating temperature and humidity	0°C to 40°C (32°F to 104°F), 80% RH or less (no condensation)
Storage temperature and humidity	-10°C to 50°C (14°F to 122°F), 80% RH or less (no condensation)
Dimensions	Approx. 1950 mm (76.77″)
Mass	Approx. 210 g (7.4 oz.)
Accessory	Instruction manual
Option	Model 9465-90 Tip Pin

Basic Specifications

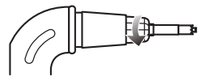
Rated current	2 A AC/DC continuous
Maximum rated voltage to earth	Effective value 30 V, Peak value 42.4 V, Direct current 60 V
Measurement connector	SOURCE Hi, SOURCE Lo, SENSE Hi, SENSE Lo No GUARD connector

Replacing the Pin Tip (Option)

The conductive contact pin is replaceable. Replace the pin with a new one if it is broken or worn. Purchase the 9465-90 Pin Tip, which includes the conductor contact pin and the pin base (plastic portion).

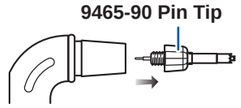
1 Turn off the power of the instrument and remove the L2020.

2 Rotate the grip to loosen it.

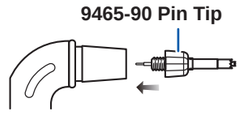


Beware of injury.
The tip has a sharp point.

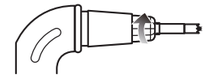
3 Remove the pin tip.



4 Replace the pin tip to a new one.



5 Rotate the grip to fasten it.



Be sure to fasten it tightly.

6 To avoid broken wires and contact failures, check that the cable is firmly held.

7 Check the performance.
Measure an object with a known resistance. Make sure that the measured resistance is correct before using the pin type lead.

IMPORTANT

Measurement values when using 4-terminal measurement (Differences in measurement values due to pin type leads used)

Depending on the subject of measurement, such as a lead-acid battery, measurement values may vary due to the pin type lead used. Since these differences in measurement values are due to the shapes and dimensions of the pin type leads used in 4-terminal measurement, measurement values taken using any pin type lead represent the true values for that pin type lead only.
When judging battery wear using changes in resistance values with time, be sure to use pin type leads having the same dimensions.

Reference example: measurement of an MSE-200 valve-regulated stationary lead-acid battery
(Resistance values vary according to the materials and structure of the terminals of the subject of measurement.)

Pin type lead (Distance between the current-impression pin and the voltage-measurement pin)	Measurement values using the BT3554 Battery Tester
L2020 Pin Type Lead (0.65 mm)	0.538 mΩ
9772 Pin Type Lead (2.5 mm)	0.490 mΩ

See the BT3554 Battery Tester Instruction manual for detailed technical descriptions.

Explanation

Differences in measurement values are physical phenomena resulting from differences in the distances (dimensions) between current-impression pins and voltage-measurement pins. The greater the battery terminal resistance in comparison to the battery's internal resistance, the more marked these differences become. The following diagram shows how differences in voltage detected result from differences in distance when measuring a lead-acid battery.