HIOKI

9772

PIN TYPE LEAD

INSTRUCTION MANUAL

March 2006 Edition 1 Printed in Japan
9772A980-00 06-03H

HIOKI E.E. CORPORATION

HEAD OFFICE
81 Koizumi, Ueda, Nagano 386-1192, Japan
TEL +81-268-28-0562 / FAX +81-268-28-0568
E-mail: os-com@hioki.co.jp URL http://www.hioki.co.jp/

HIOKI USA CORPORATION
6 Corporate Drive, Cranbury, NJ 08512, USA
TEL +1-609-409-9109 / FAX +1-609-409-9108

Introduction

Thank you for purchasing the HIOKI “Model 9772 PIN TYPE LEAD.” To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Overview

The 9772 PIN TYPE LEAD is a four-terminal pin lead designed to be usable in narrow spaces where it is difficult to make contact with the subject of measurement, such as when maintaining emergency batteries. Its two parallel 1.88-millimeter extendable coil pins make it possible to achieve stable connections with the subjects of measurement, as well as measurement using the testing holes in battery terminal covers.

Inspection and Maintenance

Initial Inspection

When you receive the product, 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 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.
- If the product seems to be malfunctioning, contact your dealer or Hioki representative.
- Pack the product so that it will not sustain damage during shipping, and include a description of existing damage. We cannot accept responsibility for damage incurred during shipping.

Safety

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

⚠DANGER

Mishandling this product during use could result in injury or death, as well as damage to the product. 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.

Safety Symbol

⚠	In the manual, the ⚠ symbol indicates particularly important information that the user should read before using the product.

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.
⚠CAUTION	Indicates that incorrect operation presents a possibility of injury to the user or damage to the product.
NOTE	Indicates advisory items related to performance or correct operation of the product.

Usage Notes

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

⚠DANGER

- **To avoid electrical shock, be careful to avoid shorting live lines with the Pin type leads.**
- **The maximum rated voltage between input terminals and ground is 33 Vrms, 46.7 Vp AC and 70 V DC. Attempting to measure voltages exceeding these limits with respect to ground could damage the product and result in personal injury.**
- **The maximum input current is is as follows;**
  2 A AC/DC
  Never exceed this limit, as doing so could result in destruction of the instrument and personal injury or death.
- **To avoid shock and short circuits, turn off all power before connecting leads.**

⚠CAUTION

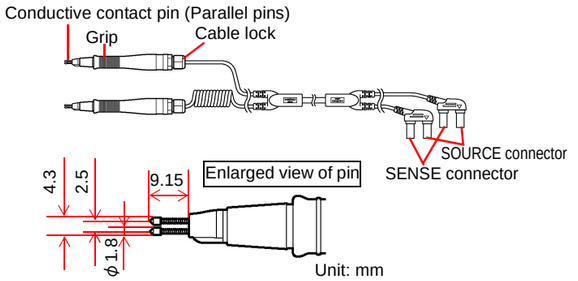
- To avoid damage to the product, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.
- To avoid breaking the leads, do not bend or pull them.
- The ends of the leads are sharp. Be careful to avoid injury. Fit the protective pin cap when the product is not in use.

NOTE

A cap are placed on pin for protection during transport. Remove the cap before use.

Parts Names

The model 9772 PIN TYPE LEAD



Specifications

Maximum rated voltage to earth	33 Vrms or less, 46.7 Vp AC or less and 70 V DC or less
Maximum input current	AC/DC 2 A continuous
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°C to 122°C), 80%RH or less (no condensation)
Operating Environment	Altitude up to 2000 m (6562 feet), Indoors
Size&Weight	Approx. 1900 mm (33.86”)/ Aprrox. 180g (3.9 oz.)
Accessories	Instruction manual
Option	The model 9772-90’s pin

Procedure

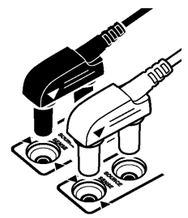
Preliminary Checks

Before using the product the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. Points to check include the pin operation and whether the pin and cable lock are loose. As loose screwing of the cable lock and other components can result in damage, be sure to tighten them securely before use.
If you find any damage, contact your dealer or Hioki representative.

⚠DANGER

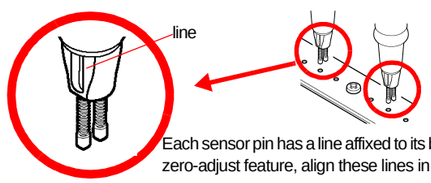
Before using the product, make sure that the insulation on the test leads is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

1. Make sure that power of the device to connect the pin type lead to is off.
2. Connect the pin type lead to the input terminal of the device.



Plug the ▲ mark on the red lead into the red ▲ marked jack on the instrument, and plug the ▲ mark on the black lead into the black ▲ marked jack on the instrument.

3. Perform zero adjustment.
   Be sure to use a 9454 zero-adjust board.
   See the instruction manual for details of connectable devices.



Each sensor pin has a line affixed to its base. When using the zero-adjust feature, align these lines in the same direction.

4. Connect the model 9772 to a sample.

NOTE

- Please cap it when you do not using.

Important
Measurement values when using four-terminal measurement (Differences in measurement values due to measurement leads used)

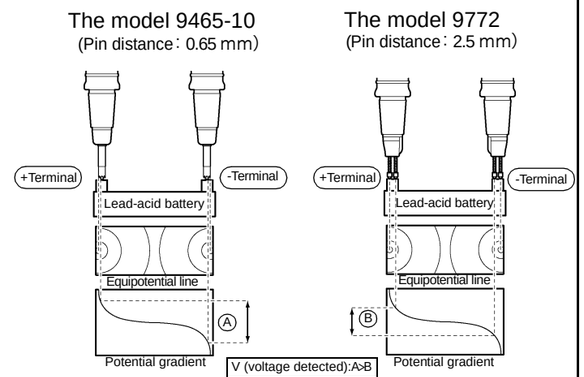
Depending on the subject of measurement, such as a lead-acid battery, measurement values may vary due to the measurement lead used. Since these differences in measurement values are due to the shapes and dimensions of the probes used in four-terminal measurement, measurement values taken using any probe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

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

measurement lead (Distance between the current-impression pin and the voltage-measurement pin)	Measurement values using the 3554 Battery HiTESTER
9465-10 PIN TYPE LEAD (0.65 mm)	0.538 mΩ
9772 PIN TYPE LEAD (2.5 mm)	0.490 mΩ

See the 3554 Battery HiTESTER manual for detailed technical descriptions.

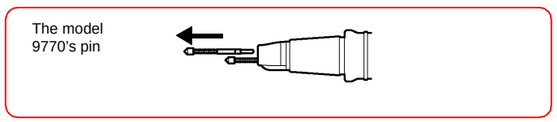
– Explanation –
Differences in measurement values are physical phenomena resulting from differences in the distances (dimensions) between current-impression pins and voltage-measurement pins. The greater the battery terminal resistance in comparison to the battery's internal resistance, the more marked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



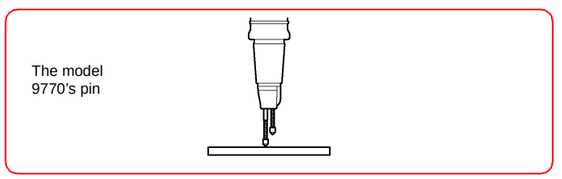
Replacing the Pin

The conductive-tip contact pin is replaceable. Replace the pin with a new one if it is broken or worn. One-piece conductive-tip contact pins with a plastic pin base are available separately.

1. Turn off power of the device, and disconnect the cable.
2. Pull out the pin tip to be replaced, using pliers or a similar tool.



3. Replace the 9772-90 pin tip by inserting a new pin into the socket and pressing against a hard board or other surface to fix the pin firmly in place.



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