

3441 • 3441-02
3442 • 3442-03

TEMPERATURE
HiTESTER

INSTRUCTION MANUAL

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Introduction

Thank you for purchasing the HIOKI "3441, 3441-02, 3442, 3442-03 TEMPERATURE HiTESTER."

To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference.

Inspection

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

Supplied accessories

R6P manganese batteries	4
Strap band	1
Instruction manual	1

Shipping the Instrument

Use the original packing materials when reshipping the instrument, if possible.






Safety Notes






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 instrument defects.

Safety symbols

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.

	<ul style="list-style-type: none">• 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).

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

	Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
	Indicates that incorrect operation presents a possibility of injury to the user or damage to the instrument.
	Indicates advisory items related to performance or correct operation of the instrument.

Accuracy

We define measurement tolerances in terms of rdg. (reading) values, with the following meanings:

- 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.

Measurement categories (Overvoltage categories)

This instrument conforms to the safety requirements for CAT I measurement instruments.

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.

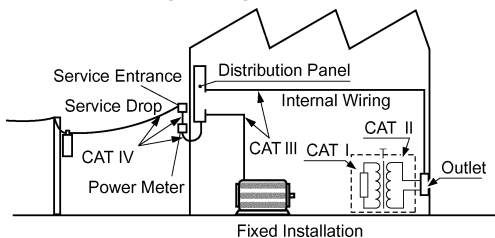
CAT IV: The circuit from the service drop to the service entrance, and to the power meter

and primary overcurrent protection device (distribution panel).

Higher-numbered categories correspond to electrical environments with greater momentary energy, so a measurement instrument designed for CAT III environments can endure greater momentary energy than one 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.

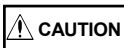


Notes on Use

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

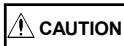
Preliminary Checks

- Before using the instrument 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.
- Before using the instrument, make sure that the insulation on the test leads and probes 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 replacements.



- This device is intended solely for use with thermocouple sensors (K type). To avoid damage, do not connect it to any other type of sensor. Do not input a voltage signal from the sensor terminal.
- This instrument should be installed and operated indoors only, between 0 to 40°C (32 to 104°F) and 80% RH.

The operational temperature range for the temperature probe is provided in the specifications given in Chapter 5.



- The 3441, 3441-02 is not designed to be entirely water- or dust-proof. To avoid damage, do not use it in a wet or dusty environment.
- Although this 3442, 3442-03 is designed to resist the ingress of dust and water, it is not entirely water- or dust-proof, so to avoid shock or damage, do not use it in a wet or dusty environment.
- Please be aware that direct contact of the instrument to oil and other substances for a long period of time may cause deformation of the case or damage to the instrument.
- 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.
- The sheath of the temperature probe is filled with magnesium oxide powder. If the probe is broken, the magnesium oxide powder may spill out. Be careful not to subject the sheath to excess stress. Inhaling large quantities of magnesium oxide may be hazardous to your health.

Organization of this Manual

Chapter 1

Summary

Provides an outline and describes device characteristics, as well as part names and terminal and key functions.

Chapter 2

Specification

Provides device specifications.

Chapter 3

Before Measurement

Describes preparation of sensor and power source.

Chapter 4

Measurement

Describes measurement procedures.

Chapter 5

Sensor (Options)

Describes the optional temperature probe.

Chapter 6

Maintenance and Service

Describes maintenance procedures.

Chapter 1 Summary

1.1 Product Summary

Used with a thermocouple (K type), the 3441, 3441-02 and 3442, 3442-03 HiTESTER thermometers provide high-resolution measurements across a wide range of temperatures. A recorded measurement function permits recording of maximum and minimum temperatures. With its drip-proof design, the 3442, 3442-03 offers extended versatility, allowing use in moisture-prone environments when used with a special-purpose temperature probe.

1.2 Features

High resolution

Measurement with resolution of 0.1°C(°F)
(-100.0°C to 199.9°C, -148.0°F to 391.9°F).

Wide measurement range

Measurement range of -100°C to 1,300°C (-148 to 2,372°F).

Recorded measurement function

With the press of a key, display maximum and minimum temperatures recorded during measurement.

Automatic power-conservation feature

Automatically reduces battery consumption during periods of inactivity.

°C/°F switching function

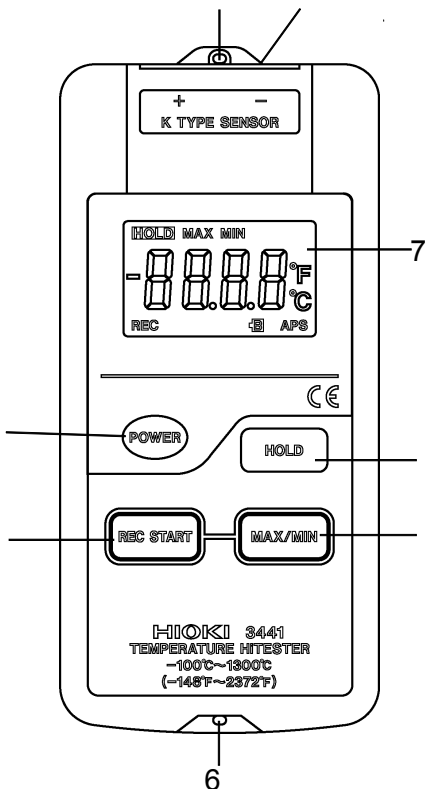
(the 3441-02, 3442-03)

Switching between Celsius and Fahrenheit.


Drip-proof design (the 3442, 3442-03 only)

Water-resistant when used with the single-purpose temperature probe, enabling use in high-humidity environments.

1.3 Names and Functions of Parts



The 3441, 3441-02 and 3442, 3442-03 have identical functions and names for corresponding components.

- 1 **POWER** key
Turns ON/OFF power to the device.
- 2 **HOLD** key
Holds displayed measurement values.
- 3 **REC START** key
Starts and stops recorded measurement.
- 4 **MAX/MIN** key
Shifts LCD indications each time the key is pressed:
measurements maximum value minimum
value measurements.
- 5 Connector
Connects the temperature probe.
- 6 Strap-band hole
Use to fasten the accompanying strap band.
- 7 LCD display
Displays information for measurements and settings.
 - . Decimal point
 - HOLD** Lights when the HOLD function is activated.
 - MAX** Lights when a maximum value is displayed.
 - MIN** Lights when a minimum value is displayed.
 - REC** Lights during recorded measurement.
 - APS** Lights when the AUTO POWER SAVING function is activated.
 -  Lights when battery power is consumed.
 - °C Unit for temperature measurement in Celsius.
 - °F Unit for temperature measurement in Fahrenheit.

Chapter 2

Specification

2.1 General Specification

Measurement Sensor	Thermocouple, K type
Measurement Range	-100 to 1300°C, -148 to 2372°F
Resolution	0.1°C [-100.0 to 199.9°C] 1°C [200 to 1300°C] 0.1°F [-148.0 to 391.9°F] 1°F [392 to 2372°F] AUTO RANGE
Accuracy (23°C ± 5°C) (73°F ± 9°F)	<p>Period of Guaranteed Accuracy: 6 months</p> <p>±(0.1% rdg.+0.8°C) [-100.0 to 199.9°C] ±(0.1% rdg.+1.4°F) [-148.0 to 391.9°F] ±(0.2% rdg.+1°C) [200 to 1300°C] ±(0.2% rdg.+1.8°F) [392 to 2372°F]</p> <p>Period of Guaranteed Accuracy: 1 year</p> <p>±(0.15% rdg.+1.2°C) [-100.0 to 199.9°C] ±(0.15% rdg.+2.1°F) [-148.0 to 391.9°F] ±(0.3% rdg.+1.5°C) [200 to 1300°C] ±(0.3% rdg.+2.7°F) [392 to 2372°F]</p>
Temperature Coefficient	0.03°C/°C [-100 to 199.9°C] 0.05°C/°C [200 to 1300°C] 0.05°F/°F [-148.0 to 391.9°F] 0.09°F/°F [392 to 2372°F]
Sampling Time	0.5s
Display	LCD

Functions	REC (Displayed when maximum and minimum values are being recorded.) MAX (Displays the maximum value during REC measurement.) MIN (Displays the minimum value during REC measurement.) HOLD (Keeps data on-screen.) Burnout (Sensor disconnection indication: ----) Outside-range display (0.F, -0.F) APS (Automatic Power Saving) ☒ (Batteries low warning)
Power source	LR6 alkaline battery x 4 R6P manganese battery x 4 Rated supply voltage 1.5 V DC x 4
Maximum rated power	35mVA
Continuous operating time	Approx.200 hours (R6P manganese battery x 4)
Dimensions	Approx.74W x 155H x 24D mm Approx.2.91W" x 6.10H" x 0.94D" (except for the projection and the probe)
Mass	Approx. 160 g Approx. 5.6 oz. (except for the batteries and the probe)
Accessories	R6P manganese battery x 4 Strap band Instruction manual
Options	9180 SHEATH TYPE TEMPERATURE PROBE (for general) [Limit deviation tolerance: $\pm 2.5^{\circ}\text{C}$ ($\pm 4.5^{\circ}\text{F}$) or $\pm 0.75\%$ rdg. whichever is greater.]

9181

SURFACE TEMPERATURE PROBE

9182

SHEATH TYPE TEMPERATURE
PROBE (for general)

[Limit deviation tolerance:

 $\pm 2.5^{\circ}\text{C}$ ($\pm 4.5^{\circ}\text{F}$) or $\pm 0.75\%$ rdg.
whichever is greater.]

9183

SHEATH TYPE TEMPERATURE
PROBE (for High-Temperature)

[Limit deviation tolerance:

 $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg.
whichever is greater.]

9472

SHEATH TYPE TEMPERATURE
PROBE (for general)

[Limit deviation tolerance:

 $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg.
whichever is greater.]

9473

SHEATH TYPE TEMPERATURE
PROBE (for High-Temperature)

[Limit deviation tolerance:

 $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg.
whichever is greater.]

9474

SHEATH TYPE TEMPERATURE
PROBE (for food)

[Limit deviation tolerance:

 $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg.
whichever is greater.]

9475

SHEATH TYPE TEMPERATURE
PROBE (for food)

[Limit deviation tolerance:

 $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg.
whichever is greater.]

9476

SURFACE TEMPERATURE PROBE

9386-01 CARRYING CASE

2.2 Environmental Conditions

Operating temperature and humidity range	0 to 40°C, 32 to 104 °F, 80%RH or less (no condensation)
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Storage temperature and humidity range	-10 to 50°C, 14 to 122 °F, 80% RH or less (no condensation)
--	---

Location for use	Indoor, altitude up to 2000 m altitude up to 6562 feet
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2.3 Applicable Standards

Safety	EN61010-1:2001 Voltage input: Pollution level 2, measurement categories
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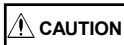
EMC	EN61326:1997+A1:1998+A2:2001 +A3:2003
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Waterproof (the 3442, 3442-03 only)	EN60529:1991 IP54
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Chapter 3

Before Measurement



To avoid damage to the instrument, protect it from vibration or shock during transport and handling, and be especially careful to avoid dropping.

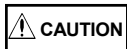
3.1 Preparations for the Batteries



- **To avoid electrocution, turn off the power switch and disconnect the probes before removing the lithium battery. After replacing the batteries, replace the lower case and screws before using the instrument.**
- **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.**
- **Handle and dispose of batteries in accordance with local regulations.**



- To replace the battery, remove the lower case. The lower case is secured with two screws. Take care to avoid misplacing screws during battery replacement.
- The 3442, 3442-03 has rubber rings furnished in the lower case and on the fastening screws. After removing the lower case for battery replacement, make sure the rubber rings are firmly in place before closing the case. Improper seating of a rubber ring will permit passage of moisture into the device and damage it.

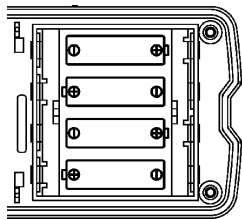
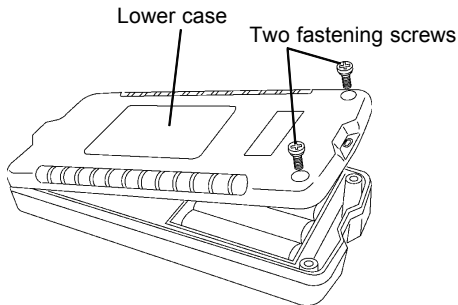
NOTE

To avoid corrosion from battery leakage, remove the batteries from the instrument if it is to be stored for a long time.

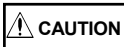
The 3441, 3441-02 and 3442, 3442-03 are intended for use with R6P manganese battery (R6P x 4) or LR6 alkaline battery (LR6 x 4) dry cells.

Battery Installation

1. Remove the two fastening screws at the back of the device. Remove the lower case.
2. Check the polarity of the battery. Install R6P manganese battery (R6P x 4) or LR6 alkaline battery (LR6 x 4) dry cells.
3. Close the lower case and secure with the two fastening screws.



3.2 Connecting the Temperature Probe



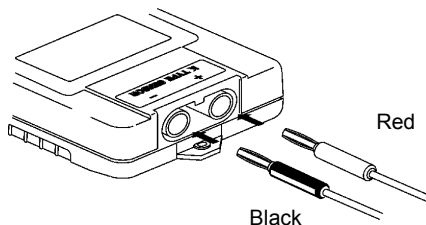
- The 9180, 9181, 9182, 9183, and 9476 temperature probes are not drip-proof. Water droplets on the grip or connector may result in malfunctions.
- The 9472, 9473, 9474, and 9475 have a drip-proof design. However, droplets occurring on the metal terminal of the connector may cause measurement errors.
- The ends of the 9474 and 9475 sheath type temperature probes are sharp. Be careful to avoid injury.
- To avoid breaking the probes, do not bend or pull them.
- When measuring high temperatures, do not let the grip of the temperature probe or the compensation lead wire exceed the temperature range (Chapter 5: Sensor (Options)).
- The sheath of the temperature probe is filled with magnesium oxide powder. If the probe is broken, the magnesium oxide powder may spill out. Be careful not to subject the sheath to excess stress. Inhaling large quantities of magnesium oxide may be hazardous to your health.

Connect the optional probe.

Check the polarity of the connector, and connect correctly.

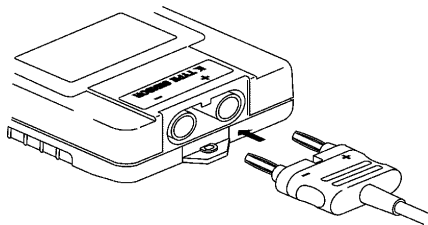
3.2.1 Connecting the 9180 • 9181 • 9182 • 9183 Temperature Probe

Connect the plugs of temperature probe to the connector of the instrument.



3.2.2 Connecting the 9472 • 9473 • 9474 • 9475 • 9476 Temperature Probe

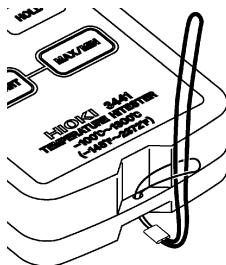
Connect the plugs of temperature probe to the connector of the instrument.



3.3 Attaching the Strap Band

The accompanying strap band may be attached to the device.

A small hole is provided for the band at the head and tail of the device.



Chapter 4 Measurement

4.1 Turning ON/OFF

Press the **POWER** key.

The LCD will light for two seconds before a temperature measurement is displayed.

Press the **POWER** key again to turn off power.

4.2 Switching Celsius/Fahrenheit (the 3441-02 • 3442-03)

Temperature display may be switched between Celsius and Fahrenheit.

At shipment, the device is preset to the Celsius scale.

To measure in Fahrenheit, press the **REC START** key, then power on while continuing to hold the **REC START** key.

When the LCD lights, release both the **REC START** and **POWER** keys.

The LCD displays an °F for Fahrenheit.

Once made, the Fahrenheit setting remains in effect even if the device is powered off.

To restore the Celsius display, press the **POWER** key while pressing the **REC START** key.

$$^{\circ}\text{F} = ^{\circ}\text{C} \times 9/5 + 32$$

When the LCD lights, release both the

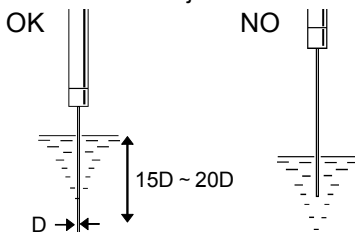
REC START and **POWER** keys.

The LCD displays a °C indicator for Celsius.

NOTE

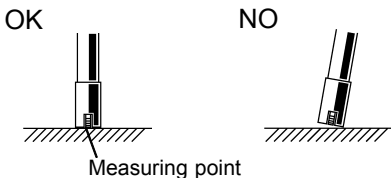
- With the sheath type temperature probe, the temperature is measured at the end of the metal sheath. For accurate measurements of an objects internal temperature, insert the metal sheath to a depth of 15 to 20 times its diameter.

Measurement of an objects internal temperature



- When measuring surface temperature with the surface type temperature probe, bring the measuring point into full contact with the measured object (In the case of the 9181 temperature probe, measurement should be performed after the protective cap is removed from the tip of the probe).

Measurement of surface temperature



NOTE

- Sudden changes in ambient temperature can make the reference contact compensation temperature highly unstable. Before use in such environments, leave the device connected to the temperature probe at operating temperatures for 10 to 20 minutes to acclimate it to the ambient temperature.
- Measurements may fluctuate when measurements are taken close to equipment that generates magnetic fields, such as motors. If this occurs, move the device away from such equipment.

4.3 Display Hold

Used to hold the displayed value.

Press the **HOLD** key.

The **HOLD** indicator is displayed on the LCD to indicate that the displayed value is being held.

To cancel Display Hold, press the **HOLD** key again.

The **HOLD** indication should disappear.

4.4 Recorded Measurement

Maximum and minimum recorded values during recorded measurement are saved in internal memory.

Press the **REC START** key.

The **REC** indicator appears on the LCD, and recorded measurement begins.

To stop measurement, press the **REC START** key again. The **REC** indicator disappears.

During recorded measurement, the **APS** indicator disappears, and the automatic power saving function is disabled.

Maximum and minimum values remain in memory. On resuming a recorded measurement, previous data is replaced by the latest data.

The recorded data remains in memory even after switching power ON/OFF.

4.5 Maximum/Minimum Value Display

A maximum or minimum value is displayed during recorded measurement.

Press the **MAX/MIN** key.

The **MAX** indicator appears on the LCD, and the maximum value saved in memory is displayed.

Press the **MAX/MIN** key again.

The **MIN** indicator appears on the LCD, and the minimum value saved in memory is displayed.

Press the **MAX/MIN** key, the **MIN** indicator disappears, again to return to the measurement screen.

4.6 Automatic Power Saving Feature

After a period of inactivity of 30 minutes, the device shuts off power to reduce battery power consumption.

Press the **POWER** key to turn on power. The **APS** indicator appears on the LCD, and the automatic power saving feature is activated.

For measurements expected to take over 30 minutes, you must first disable the automatic power saving feature.

To disable automatic power saving, press the **HOLD** key, then press the **POWER** key while continuing to press the **HOLD** key.

When the LCD lights, release the **HOLD** and **POWER** keys.

The **APS** indicator does not appear on the LCD, indicating that the automatic power saving function is disabled.

The **APS** indicator does not appear during recorded measurement, indicating that the automatic saving function is disabled.

4.7 Overflow Display

When a measurement exceeds the measurement range of the device (-100°C to $1,300^{\circ}\text{C}$), the device displays **-O.F.** or **O.F.**


4.8 Sensor Disconnection Display

If the sensor has not been turned on or if it is disconnected, the indication ---- is displayed.

NOTE

- If the indication ---- is displayed even when the temperature probe is on, a loose connection is the likely cause. To check for a disconnection, use a tester to measure the resistance between the terminals on the temperature probe. An excessively high resistance may indicate a disconnection.

4.9 Battery Consumption Display

The  indicator appears when battery voltage becomes low. Replace the batteries as soon as possible.

4.10 Switching the display resolution

If the temperature rises from 189.9°C (373.9°F) or below, the display resolution will automatically switch over when the temperature enters the range from 199.9°C (391.9°F) to 200°C (392°F).

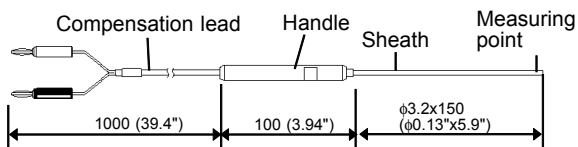
If the temperature falls from -200°C (392°F) or more, the display resolution will automatically switch over when the temperature enters the range from 190°C (374°F) to 189.9°C (373.9°F).

Chapter 5

Sensor (Options)

5.1 9180 • 9183 SHEATH TYPE TEMPERATURE PROBE (for general)

Thermocouple Material	K
Contact Type	Isolated Junction (ungrounded)
Accuracy	(9180) $\pm 2.5^{\circ}\text{C}$ ($\pm 4.5^{\circ}\text{F}$) or $\pm 0.75\%$ rdg. whichever is greater. (9183) $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg. whichever is greater.
Dimensions (sheath)	Approx. ϕ 3.2 x 150 mm Approx. ϕ 0.13" x 5.9"
Compensation Lead	Conventional type (-20 to 90°C, -4 to 194°F), Approx. 1 m, 39.4"
Operating Temperature	-50 to 750°C -58 to 1382°F
Allowable Heat (Handle)	150°C 302°F
Protective Shield Material	SUS 316
Dielectric Strength	500 VAC for 1 minute
Insulation Resistance	100 M or more (100 VDC)

**NOTE****• Thermocouple Allowance**

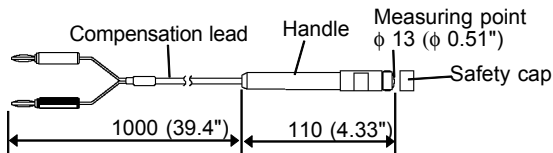
The thermocouple used in the temperature probe complies with specifications for Class 1 and Class 2 provided in IEC 584. For the permitted tolerances, refer to the following:

Class 1: At -40°C (-40°F) and more, the greater of $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) and $\pm 0.4\%$ of the measured value.

Class 2: At -40°C (-40°F) and more, the greater of $\pm 2.5^{\circ}\text{C}$ ($\pm 4.5^{\circ}\text{F}$) and $\pm 0.75\%$ of the measured value.

5.2 9181 SURFACE TEMPERATURE PROBE

Thermocouple Material	K
Contact Type	Grounded
Measurement Accuracy	$\pm 2.5^{\circ}\text{C} (\pm 4.5^{\circ}\text{F})$ $(T-T_s) \leq 100^{\circ}\text{C} (180^{\circ}\text{F})$ $-0.035 \times T^{\circ}\text{C}$ to $+2.5^{\circ}\text{C} (4.5^{\circ}\text{F})$ $100^{\circ}\text{C} (180^{\circ}\text{F}) < (T-T_s)$ T : Measurement temperature $(-50^{\circ}\text{C}$ to $400^{\circ}\text{C} / -58^{\circ}\text{F}$ to $752^{\circ}\text{F})$ Ts: Surroundings temperature $(0^{\circ}\text{C}$ to $50^{\circ}\text{C} / 32^{\circ}\text{F}$ to $122^{\circ}\text{F})$
Dimensions (Measuring point)	Approx. ϕ 13 mm, ϕ 0.51"
Compensation Lead	Conventional type $(-20$ to 90°C , -4 to $194^{\circ}\text{F})$, Approx. 1 m, 39.4"
Operating Temperature	-50 to 400°C -58 to 752°F
Allowable Heat (Handle)	150°C 302°F

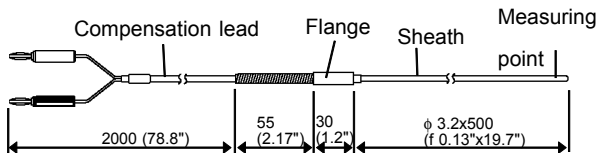


NOTE

- The surface type temperature probe is designed to maximize the heat capacity of the measuring point. However, errors may occur due to effects such as heat dissipation on contact.

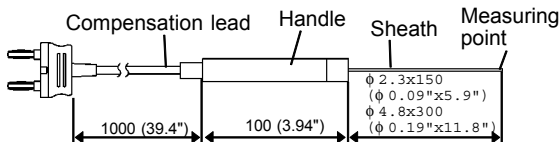
5.3 9182 SHEATH TYPE TEMPERATURE PROBE (for high temperature)

Thermocouple Material	K
Contact Type	Isolated Junction (ungrounded)
Accuracy	$\pm 2.5^{\circ}\text{C}$ ($\pm 4.5^{\circ}\text{F}$) or $\pm 0.75\%$ rdg., whichever is greater.
Dimensions (sheath)	Approx. ϕ 3.2 x 500 mm, ϕ 0.13" x 19.7"
Compensation Lead	Heat resisting type (0 to 150°C , 32 to 302°F), Approx. 2 m, 78.8"
Operating Temperature	-50 to 750°C -58 to 1382°F
Allowable Heat (Flange)	90°C 194°F
Protective Shield Material	INCONEL
Dielectric Strength	500 VAC for 1 minute
Insulation Resistance	100 M or more (100 VDC)



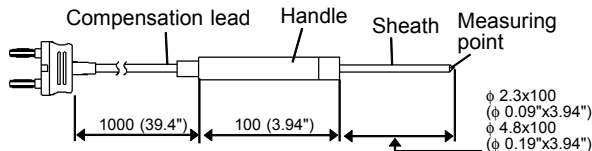
5.4 9472 • 9473 SHEATH TYPE TEMPERATURE PROBE (for general, drip-proof)

Thermocouple Material	K
Contact Type	Isolated Junction (ungrounded)
Accuracy	$\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg., whichever is greater.
Dimensions (sheath)	<p>(9472) Approx. ϕ 2.3 x 150 mm ϕ 0.09" x 5.9"</p> <p>(9473) Approx. ϕ 4.8 x 300 mm ϕ 0.19" x 11.8"</p>
Compensation Lead	Conventional type (-20 to 90°C , -4 to 194°F), Approx. 1 m, 39.4"
Operating Temperature	<p>(9472) -100 to 300°C, -148 to 572°F</p> <p>(9473) 0 to 800°C, 32 to 1472°F</p>
Allowable Heat (Handle)	80°C 176°F
Protective Shield Material	SUS 316
Dielectric Strength	500 VAC for 1 minute
Insulation Resistance	100 M or more (500 VDC)



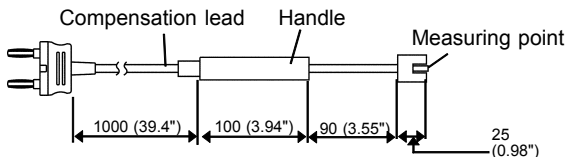
5.5 9474 • 9475 SHEATH TYPE TEMPERATURE PROBE (for food, drip-proof)

Thermocouple Material	K
Contact Type	Isolated Junction (ungrounded)
Accuracy	$\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) or $\pm 0.4\%$ rdg., whichever is greater.
Dimensions (sheath)	<p>(9474) Approx. ϕ 2.3 x 100 mm ϕ 0.09" x 3.94"</p> <p>(9475) Approx. ϕ 4.8 x 100 mm ϕ 0.19" x 3.94"</p>
Compensation Lead	Conventional type (-20 to 90°C , -4 to 194°F), Approx. 1 m, 39.4"
Operating Temperature	<p>(9474) -100 to 300°C, -148 to 572°F</p> <p>(9475) -100 to 500°C, -148 to 932°F</p>
Allowable Heat (Handle)	80°C 176°F
Protective Shield Material	SUS 316
Dielectric Strength	500 VAC for 1 minute
Insulation Resistance	100 M or more (500 VDC)



5.6 9476 SURFACE TYPE TEMPERATURE PROBE

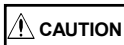
Thermocouple Material	K
Contact Type	Grounded
Measurement Accuracy	$\pm 2.5^{\circ}\text{C} (\pm 4.5^{\circ}\text{F})$ $(T-T_s) \leq 100^{\circ}\text{C} (180^{\circ}\text{F})$ $-0.03 \times T^{\circ}\text{C} \text{ to } +2.5^{\circ}\text{C} (4.5^{\circ}\text{F})$ $100^{\circ}\text{C} (180^{\circ}\text{F}) < (T-T_s)$ T : Measurement temperature (-40°C to 500°C / -40°F to 932°F) T _s : Surroundings temperature (0°C to 40°C / 32°F to 104°F)
Dimensions (Measuring point)	Approx. ϕ 20 mm, 0.79"
Compensation Lead	Conventional type (-20 to 90°C, -4 to 194°F), Approx. 1 m, 39.4"
Operating Temperature	-40 to 500°C -40 to 932°F
Allowable Heat (Handle)	80°C 176°F





Chapter 6

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.

6.1 Changing the Batteries



- **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.**
- **Handle and dispose of batteries in accordance with local regulations.**

The  indicator appears when battery voltage becomes low. Replace the batteries as soon as possible.

Continued use with the  indicator displayed may result in unexpected power shutdown.

(For battery-replacement procedures, see 3.1.)

6.2 Troubleshooting (before calling for help)

Trouble	Cause	Action
Nothing is displayed when power is turned on.	Is a battery installed?	See '3.1: Preparations for the Batteries.'
	Is the battery dead?	Replace with a fresh battery.
No temperature measurement is displayed. (O.F or ---- is displayed)	Is the temperature probe connected correctly?	Reconnect the temperature probe.
	Is the sensor disconnected?	Replace with a new sensor.

Service

- If the instrument seems to be malfunctioning, confirm that the batteries are not discharged, and that the temperature probes are not open circuited before contacting your dealer or Hioki representative.
- When sending the instrument for repair, remove the batteries and pack carefully to prevent damage in transit. Include cushioning material so the instrument cannot move within the package. Be sure to include details of the problem. Hioki cannot be responsible 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: TEMPERATURE HITESTER
Model Number: 3441, 3441-02, 3442, 3442-03
Options: 9180 SHEATH TYPE TEMPERATURE PROBE
9181 SURFACE TEMPERATURE PROBE
9182 SHEATH TYPE TEMPERATURE PROBE
9183 SHEATH TYPE TEMPERATURE PROBE
9472 SHEATH TYPE TEMPERATURE PROBE
9473 SHEATH TYPE TEMPERATURE PROBE
9474 SHEATH TYPE TEMPERATURE PROBE
9475 SHEATH TYPE TEMPERATURE PROBE
9476 SURFACE TYPE TEMPERATURE PROBE

The above mentioned product conforms to the following product

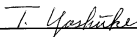
Safety: EN61010-1:2001
EMC: EN61326:1997+A1:1998+A2:2001+A3:2003
ClassB equipment
Portable test and measurement equipment

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC, but is not applicable to the Low Voltage Directive 73/23/EEC.

HIOKI E.E. CORPORATION

15 September 2006



Tatsuyoshi Yoshiike
President

3441A999-04

HIOKI 3441, 3441-02, 3442, 3442-03

TEMPERATURE HiTESTER

Instruction Manual

Publication date: September 2006 Revised edition 9

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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 International Sales and Marketing Department at HIOKI headquarters.
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 - Unauthorized reproduction or copying of this manual is prohibited.
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