

Introduction

Thank you for purchasing the HIOKI "3412-50 TEMPERATURE HiTESTER". To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Safety

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

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

	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 product.
	NOTE Advisory items related to performance or correct operation of the product.

Safety symbols

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

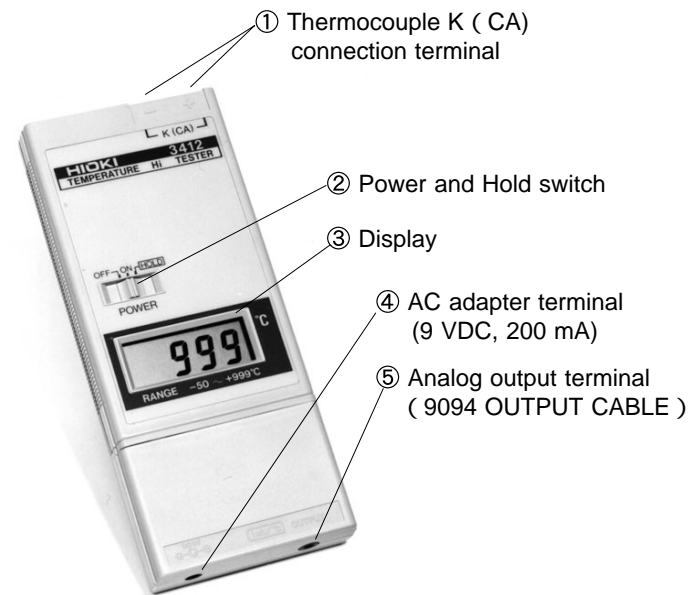
When you receive the product, inspect it carefully to ensure that no damage occurred during shipping. In particular, check the accessories, panel switches, and connectors. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

Precautions

WARNING
Do not attempt to measure the temperature of objects carrying a voltage. Doing so will result in a short-circuit accident or an electrocution accident.

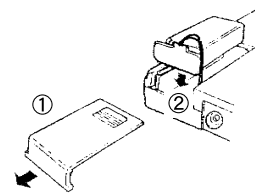
CAUTION
When measuring temperature, use only the metal tip portion of the probe. Do not expose or immerse the handle or cable portion of the probe. Do not store or use the product where it could be exposed to direct sunlight, high temperature or humidity, or condensation. Under such conditions, the product may be damaged and insulation may deteriorate so that it no longer meets specifications. To avoid damage to the product, do not short the output terminal and do not input voltage to the output terminal. In order to prevent damage to the unit, make sure that the center terminal on the AC adapter is negative before using the AC adapter.

Part Names



Measurement Procedure

- Install the 6F22 battery
During the unit use, low battery voltage is indicated by "BATT" appearing in the display. Replace the battery at this time.



- To remove the battery cover, slide it in the direction of the arrow marked OPEN.
- Snap the battery connector on the battery, put the battery into the battery compartment, then reattach the battery cover. Make sure the battery snap cord is not pinched by the battery cover.

- Connect the sensor.
Plug the red banana plug into the (+) terminal, and the black plug into (-) terminal.
- Place the power/hold switch in the "ON" position and take the measurement.
- If you desire to hold the reading, position the power/hold switch to **HOLD**. The value in the display at this time will be held.
- When you are through using the meter, position the power/hold switch to "OFF".

Analog output

Output from 3412-50 is 1 mV per 1 (0 V at 0). Set recorder range according to the temperature you are going to measure.

Analog Output	: 1 mV/
Analog Resistance	: 10 max.
Accuracy	: ±0.25%f.s.
Temperature coefficient	: 1 mV/10

NOTE • If the probe circuit is broken wire (rearing), or not connected securely, voltage output will exceed 1 V. Be careful when using the recorder in the lower ranges.
• Note that input (sensor input terminal) and analog output is not insulated.

Specifications

Measurement Range	: -50 to 999 , -58 to 1830°F
Measurement Resolution	: 1
Measurement Sensor	: Thermocouple, K type
Input Resistance	: Approx. 2 M or more
Reference Junction Compensation	: Automatic, by diode
Over range Display	: "OVER"
Burnout Display	: "OVER"
Low Battery Display	: "BATT"
Accuracy (at 23 ±3)	: ±0.2%f.s. ± 1 dgt. Accuracy includes errors in reference junction compensation and in linearizer.
Temperature Coefficient	: 0.1 dgt/
Sampling Time	: Approx. 0.8 s/sample
Operating Temperature/Humidity	: 0 to 50 (32 to 122°F) < 80% RH
Storage Temperature	: -10 to 50 , 14 to 122°F
Power source	: One (6F22) battery (9 VDC x 1) (Life : 25 hours)
AC adapter	: 9 VDC-200 mV, has 5 mm dia terminal
Dimensions	: 75W x 173H x 24D mm, 2.95W" x 6.8H" x 0.94D"
Mass	: Approx. 220 g, 7.8 oz
Accessories	: Instruction Manual, 6F22 battery, Soft case
Option	: 9094 OUTPUT CABLE

Sensor Probe (optional)

9180/9183 SHEATH TYPE TEMPERATURE PROBE

Thermocouple Material	: K type
Contact Type	: Isolated junction (ungrounded)
Accuracy 9180	: ±2.5 (±4.5°F) or ±0.75%rdg., whichever is greater.
9183	: ±1.5 (±2.7°F) or ±0.4%rdg., whichever is greater.
Dimensions (Sheath)	: Approx. 3.2 x 150 mm, 0.13" x 5.91"
Compensation Lead	: Conventional type (-20 to 90), Approx. 1 m, 39.4"
Operating Temperature	: -50 to 750 , -58 to 1382°F
Allowable Heat (Handle)	: 150 , 302°F
Protective Shield Material	: SUS 316
Dielectric Strength	: 500 VAC (50/60 Hz) for 1 minute
Isolation Resistance	: 100 M or more (100 VDC)

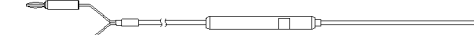
9181 SURFACE TEMPERATURE PROBE

Thermocouple Material	: K type
Contact Type	: Grounded
Measurement Accuracy	: ±2.5 (±4.5°F)[(T-Ts) 100 (180°F) -0.035 x T to +2.5 (4.5°F) [100 (180 F) < (T-Ts)] T : Measurement temperature (-50 to 400 , -58 to 752°F) Ts: Surroundings temperature (0 to 50 , 32 to 122°F)
Dimensions	: Approx. 15 x 110 mm, 0.59" x 4.33"
Compensation Lead	: Conventional type (-20 to 90 , -4 to 194°F), Approx. 1 m , 39.4"
Operating Temperature	: -50 to 400 , -58 to 752°F
Allowable Heat (Handle)	: 150 , 302°F

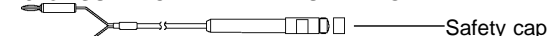
9182 SHEATH TYPE TEMPERATURE PROBE

Thermocouple Material	: K type
Contact Type	: Isolated junction (ungrounded)
Accuracy	: ±2.5 (±4.5°F) or ±0.75%rdg., whichever is greater.
Dimensions (Sheath)	: Approx. 3.2 x 500 mm, 0.13" x 19.7"
Compensation Lead	: Heat resisting type (0 to 150 , 32 to 302°F), Approx. 2 m, 78.8"
Operating Temperature	: -50 to 750 , -58 to 1382°F
Allowable Heat (Flange)	: 90 , 194°F
Protective Shield Material	: INCONEL
Dielectric Strength	: 500 VAC (50/60 Hz) for 1 minute
Isolation Resistance	: 100 M or more (100 VDC)

9180/9183 SHEATH TYPE TEMPERATURE PROBE



9181 SURFACE TEMPERATURE PROBE



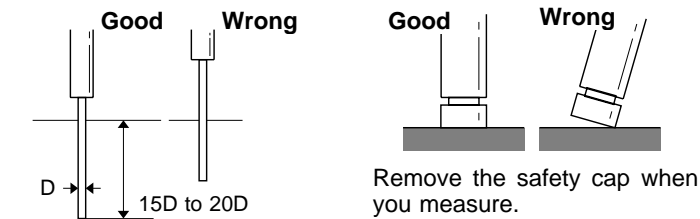
9182 SHEATH TYPE TEMPERATURE PROBE



Measurement Precautions

- Where the inner temperature of a fluid is to be measured, immerse the probe to a depth of 15 to 20 times the diameter of the protective shield. (Applicable to sheath type probe.)
- For surface temperature measurements, make sure that solid thermal contact is made with the object being measured. 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.
- If the unit is used in a place where sudden changes in ambient temperature are expected, unbalanced reference contact compensation will result. It will be necessary, therefore, to connect the sensor to the main unit and leave them at the measurement place for 20 to 30 minutes in order to balance the reference contact compensation prior to operation.
- Do not overheat the handle portion of temperature probes.

- Inner Temp
- Surface Temp



Battery replacement

WARNING
To avoid electric shock when replacing the batteries, first disconnect the probe from the object to be measured. Before using the product after replacing the batteries, replace the cover. To avoid the possibility of explosion, do not short circuit, disassemble or incinerate batteries. Handle and dispose of batteries in accordance with local regulations.

Maintenance/Service

Service

- If the product seems to be malfunctioning, confirm that the batteries are not discharged, and that the probes are not open circuited before contacting your dealer or Hioki representative.
- Pack the product carefully so that it will not be damaged during shipment, and include a detailed written description of the problem. Hioki cannot be responsible for damage that occurs during shipment.

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.

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