

# HIOKI

2001

**3441** (Economically priced)

**3442** (Waterproof type)

## TEMPERATURE HiTESTER

Environmental measuring instruments



# Precision Thermometer

## Handy Waterproof design

(3442 only)

## Broad-range

-100°C to 1300°C

(-148°F to 2372°F)

## High-resolution

0.1°C (0.1°F)

from -100°C to 200°C (-148°F to 392°F)

## Max / min recording



Actual-size photo of 3442



<http://www.hioki.co.jp/>

ISO14001  
JQA-E-90091

HIOKI company overview, new products, environmental considerations and other information are available on our website.

# Long operation time, Max/min temperature Supports temperature



Although compact and weighing only 160 grams, the 3441 / 3442 TEMPERATURE HiTESTER provide better than 200 hours of continuous operation on a single battery, provide improved operability through a simple key arrangement, and bear the CE marking in certification of their safe design. An assortment of 9 optional temperature sensors is available to meet the needs of various applications. Further, the 3442 has a waterproof construction that allows it to be used in wet environments.

These portable thermometers are ideal for use in a wide variety of situations.

## Common Features of the 3441 and 3442

### ●Wide range coverage with a single instrument

The 3441/ 3442 measure temperatures ranging from -100°C to 1300°C, making them suitable for applications ranging from the low-temperature requirements of liquefied gases in laboratories and food storage locker conditions to high-temperature applications such as ovens and kilns. Additionally, both units provide high resolution of 0.1°C over the range from -100°C to 200°C.

### ●Power-efficient design eliminates frequent battery changes

After 30 minutes, an auto power-save function operates, automatically turning off the power to prevent battery consumption while the unit is not being used. When necessary, the APS function can be disabled, allowing in excess of 200 hours (1 week) of continuous measurement.

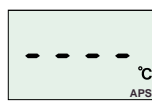


The APS function is automatically disabled during operation in the REC mode.

APS operational

### ●Sensor discontinuity check

A discontinuity indicator appears to warn when no sensor is connected or when there is a sensor discontinuity. This eliminates concerns about incorrect measurement.



Sensor discontinuity

### ●Convenient display hold function

Handy when measuring in dark corners, where the display is unreadable.



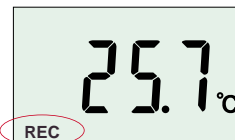
Display holding time

Display holding time

### ●Recording of max. and min. temperatures

The recording function internally records maximum and minimum temperatures. This makes it possible to grasp the range of temperature conditions throughout a process interval, a useful capability for temperature management.

Pressing the REC START button starts recording.



During REC operation

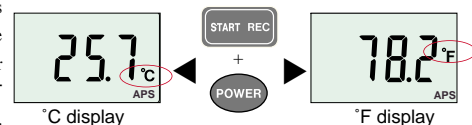


Pressing the MAX/MIN key switches display between screens. Maximum and minimum temperatures to date can be checked even during recording.

### ●Switching between °C and °F display<sup>(3441-02)</sup><sub>(3442-03)</sub>

The display mode can be switched between Celsius and Fahrenheit as necessary.

The display mode is switched by pressing the POWER key together with REC START while the power is off.



recording, waterproof construction (3442 only)

# management needs of various trades

## ■ 3442 for use in wet environments



### ● Waterproof construction, including sensors

The sensor terminal of the 3442 has a 1-piece molded resin construction which provides fully waterproof construction when used with the optional temperature probes (9472 to 9475).

### ● Temperature measurement of food (HACCP)

With the adoption of the HACCP (Hazard Analysis Critical Control Point) system, even greater importance is attached to thorough temperature management from the time of food production. The optional waterproof food temperatures (9474 and 9475) for the 3442 are ideally suited for work in wet environments, allowing them to be confidently used to measure temperatures when hands are wet, while cooking, or under humid conditions.

## ■ 3441 / 3442 Specifications (accuracy at 23°C±5°C, 80% rh or less)

**Sensor** : Thermocouple (K)  
**Measurement range** : -100°C to 1300°C  
**Resolution** : 0.1°C\*<sup>1</sup> or 1°C\*<sup>2</sup>  
**Unit accuracy** : ±0.1% rdg. ±0.8°C\*<sup>1</sup> or ±0.2% rdg. ±1°C\*<sup>2</sup>  
 (additive to accuracy of temperature sensor)  
**Thermal coefficient** : 0.03°C/°C\*<sup>1</sup> or 0.05°C/°C\*<sup>2</sup>  
**Sampling rate** : 2 samples/sec  
**Display** : LCD display  
**contact compensation** : Auto compensation  
**Functions** : Max/Min temperature recording and display, display data hold, sensor discontinuity display (----), Over-range display (O.F., -O.F), auto power save (operates after 30 minutes, cancelable), low battery warning

**Place of use** : Indoor use to altitudes of 2000 m  
**Ambient temperature of use** : 0 to 40°C, 80%rh or less (no condensation)  
**Storage temperature range** : -10 to 50°C, 80%rh or less (no condensation)  
**Applicable standards** : Safety; EN-61010-1:1993+A2:1995 pollutant level 2, over-voltage category I  
 EMC; EN55011, EN50082  
 Waterproof structure (3442 only); EN60529:1991 IP54  
**Power supply** : R6P manganese battery X4, or LR6 alkaline battery X4  
**Power consumption** : 35 mVA  
**Continuous operating time** : 200 hours or better (with manganese battery)  
**Dimensions and mass** : Approx. 74 WX 155 HX 24 D mm, 160g (not including batteries or sensor)  
**Accessories** : Strap band

\*<sup>1</sup> during measurement from -100 to 199.9°C

\*<sup>2</sup> during measurement from 200 to 1300°C

## Introducing a Calibrator

### Handy signal generator

for calibrating (checking) thermoelectric thermometers



Accurate temperature measurement requires that thermometers be periodically calibrated before starting work. The 7011 is capable of generating thermo-electromotive force corresponding to 7 thermocouple temperatures, and when used with the optional RJ sensor can be used for calibration, including standard temperature contact compensation. This makes it a handy signal generator for efficiently checking thermometers quickly and inexpensively.

## 7011 DC SIGNAL SOURCE

OPTIONS: 9420 BATTERY PACK ● 9184 RJ SENSOR ● 9380 CARRYING CASE  
 ● 9418-10 AC ADAPTER

### ■ Basic Specifications

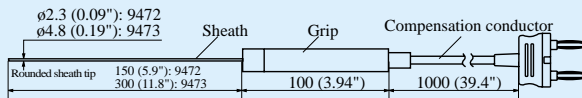
**Generator**  
**Constant voltage** : 0 to ±25.000V (±0.03% of setting±3dgt.)  
**Constant current** : 0 to ±25.000mA (±0.03% of setting±3dgt.)  
**Thermo-**  
**electromotive force** : K / -176.0 to 1372.0°C  
 E / -220.0 to 839.0°C  
 (TC 0°C) J / -208.0 to 1108.0°C  
 T / -169.0 to 400.0°C  
 etc. Thermo-electromotive force R/S/B  
 accuracy: ±0.05% of setting±0.5°C  
 [Range over which TC RJ is generated is same as with TC0°C.  
 Accuracy is additive with following. ±2.0°C max.]  
**Memory generation** : Max 20 steps, at intervals of 1 to 99 sec  
**Measurement** : Voltage, current, temperature (using the 9184 RJ sensor)  
**Power supply** : LR6 alkaline battery X6, or 9420 battery pack (NiCd battery), or 9418-10 AC adapter  
**Dimensions and mass** : Approx. 104WX180HX58Dmm · 590g

TC 0°C: For calibration of thermometers without standard contact compensation, or with standard contacts that are compensated at 0°C  
 TC RJ: For calibration of thermometers with built-in standard contact compensation (requires the 9184 RJ sensor).

■ A wide variety of temperature sensors for various applications (optional)

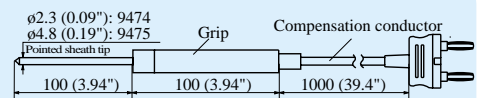
Sheath types (waterproof structure)

9472 · 9473 SHEATH TYPE TEMPERATURE PROBE



For general precision measurement (gas or liquid): 9472  
For general precision measurement of high temperatures (gas or liquid): 9473

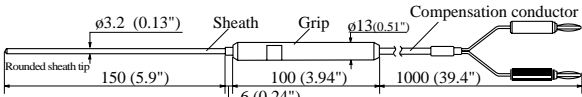
9474 · 9475 SHEATH TYPE TEMPERATURE PROBE



For precision measurement of food temperatures (soft substances): 9474  
For precision measurement of semi-hard or hard substances (such as asphalt and frozen products): 9475

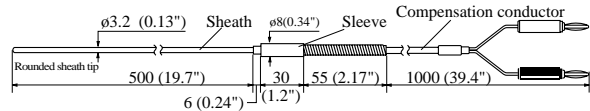
Sheath types (non-waterproof)

9180 · 9183 SHEATH TYPE TEMPERATURE PROBE



For general measurement (gas or liquid): 9180  
For general precision measurement (gas or liquid): 9183

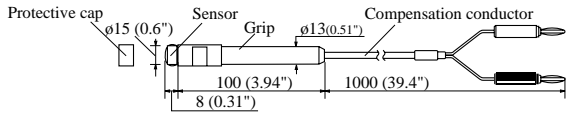
9182 SHEATH TYPE TEMPERATURE PROBE



For general precision measurement of high temperatures (gas or liquid): 9182

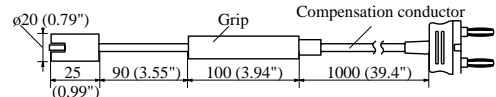
Surface-type (non-waterproof)

9181 SURFACE TYPE TEMPERATURE PROBE



For measurement of solid surfaces: 9181

9476 SURFACE TYPE TEMPERATURE PROBE



For measurement of solid surfaces: 9476

Item	9472	9473	9474	9475	9183	9180	9476	9181	9182
Thermocouple material	K type (Chromel/Almel)								
Tolerance	The greater of $\pm 1.5^{\circ}\text{C}$ or $\pm 0.4\%$ of measured temperature				The greater of $\pm 2.5^{\circ}\text{C}$ or $\pm 0.75\%$ of measured temperature				
Response (90%)*	About 5 sec	About 10 sec	About 5 sec	About 10 sec	About 5 sec		About 3 sec		About 5 sec
Compensation conductor	General use ( $-20^{\circ}\text{C}$ to $90^{\circ}\text{C}$ ) 1 m								Heat-resistant use 2m
Grip heat resistance	80 $^{\circ}\text{C}$				150 $^{\circ}\text{C}$		80 $^{\circ}\text{C}$	150 $^{\circ}\text{C}$	90 $^{\circ}\text{C}$
Max use temperature	300 $^{\circ}\text{C}$	800 $^{\circ}\text{C}$	300 $^{\circ}\text{C}$	500 $^{\circ}\text{C}$	750 $^{\circ}\text{C}$		500 $^{\circ}\text{C}$	400 $^{\circ}\text{C}$	750 $^{\circ}\text{C}$

waterproof structure

\*1 9180, 9182: The greater of  $\pm 2.5^{\circ}\text{C}$  or  $\pm 0.75\%$  of measured temperature  
9476:  $(-0.03 \times T)^{\circ}\text{C}$  to  $+2.5^{\circ}\text{C}$  at  $100^{\circ}\text{C} < (T-T_s)$   
9181:  $(-0.035 \times T)^{\circ}\text{C}$  to  $+2.5^{\circ}\text{C}$  at  $100^{\circ}\text{C} < (T-T_s)$   
T: measured temperature,  $T_s$ : environmental temperature

\* Sheath type: Responsiveness in ice water at  $0^{\circ}\text{C}$  and in boiling water at  $100^{\circ}\text{C}$   
Surface type: Responsiveness on a metal surface at  $0^{\circ}\text{C}$  and at  $100^{\circ}\text{C}$

Related Products

Management of temperature recordings.



The 3412-50 produces a voltage output of 1 mV per degree Centigrade. Using the thermometer and recorder together allows recording of temperature variations.

\* The CE marking does not pertain to the waterproof structure. Also, the recorder, 9036 AC adaptor, 9094 output cord, and temperature probes are optional.

3412-50 TEMPERATURE HITESTER

		$^{\circ}\text{C}$ display only	
Measurement range	-50 $^{\circ}\text{C}$ to 999 $^{\circ}\text{C}$		
Measurement sensor	Thermocouple K (CA)		
Unit accuracy	$\pm 0.2\%$ f.s. $\pm 1$ dgt.		
Sampling rate	Approx 1.25 times/sec		
out put unit	Analog output	1mV/ $^{\circ}\text{C}$	Not isolated from input.
	Output accuracy	$\pm 0.25\%$ f.s.	
Power supply	6F22 battery X1 or AC adaptor		
Dimensions and mass	75W X 173H X 24Dmm · 220g		

- 3441 ( $^{\circ}\text{C}$  only, Economically priced)
  - 3441-02 ( $^{\circ}\text{C}$  /  $^{\circ}\text{F}$  selectable, Economically priced)
  - 3442 ( $^{\circ}\text{C}$  only, Waterproof design)
  - 3442-03 ( $^{\circ}\text{C}$  /  $^{\circ}\text{F}$  selectable, Waterproof design)
- (All include with strap band)



Can be used without removal from case.

9386 CARRYING CASE (optional)

Option (\*No CE marking)

- \*9180 SHEATH TYPE TEMPERATURE PROBE
- \*9181 SURFACE TYPE 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
- 9386 CARRYING CASE



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