HIOKI

3441(-02)/3442(-03)/3446-01/3447-01 TEMPERATURE HiTESTERs

Environmental Test Equipment

3447

3447-01 for HACCP Temperature Recording/Management (New!)

- Compatible with Platinum temperature-measurement resistors (Pt 100) (-100˚C to 300˚C)
- Waterproof construction (IP67), 2-channel measurement
- Accommodates a temperature probe with hand switch
- Record temperature, time, and name of measurement object
- Record using either interval (28,800 data items) or manual (7,200 data items) recording modes

3446-01 For Temperature Recording/Management in Energy Conservation Applications (New !)

- 1-channel recording for use with Thermocouple (Type K) sensors (-100 C to 1000 C*)

3442

3442(-03) With Water-resistant Construction for Use in Damp Environments

- Use with Thermocouple (Type K) sensor with water-resistant construction (-100˚C to 1300˚C*)
- Max/min temperature recording

3441(-02) Basic Temperature HiTESTER

- Thermocouple (Type K) sensor (-100˚C to 1300˚C*)
- A choice of temperature sensors for different applications

* Measurable temperature range varies according to temperature sensor type.

ISO14001
JQA-E-90091

INTERNET HIOKI Website
http://www.hioki.co.jp/
HIOKI company overview, new products, environmental considerations and other information are available on our website.

CE

Temperature Management of Food Preparation

3446-01, 3447-01 Record data and memos using either manual or interval recording mode.

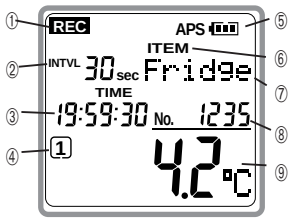
- 3447-01 has waterproof construction in both thermometer and sensor.
- 2-channel Class A temperature measurement using a platinum temperature-measurement resistor
- Single-channel recording with 3446-01 using type K thermocouple (-100˚C to 1000˚C).
- Both provide two recording modes, manual and interval, allowing recording at arbitrary times or at set intervals.
- Records product name and inspector name or pass/fail result along with temperature.
- Send data to a computer by RS-232C connection.
- Print recorded data*2 (using the optional 9670 printer)

*1 Maximum recording time in interval recording mode

When using only interval recording, the relationship between recording interval and maximum recording time are as shown below:
Note that the amount of continuous recording time available may be limited by remaining battery charge.

Interval Recording	Recording Time	Interval Recording	Recording Time	Interval Recording	Recording Time	Interval Recording	Recording Time
1 second	8 hours	15 seconds	5 days	1 minute	20 days	15 minutes	300 days
2 seconds	16 hours	20 seconds	6 days, 16 hours	2 minutes	40 days	20 minutes	400 days
5 seconds	1 days, 6 hours	30 seconds	10 days	5 minutes	100 days	30 minutes	600 days
10 seconds	3 days, 8 hours			10 minutes	200 days	60 minutes	1200 days

Screen Display



① REC: recording
② INTVL: Interval recording mode, recording interval
③ Time display
④ Channel number being recorded (3447-01)
⑤ APS: auto power save function ON and battery charge remaining display
⑥ ITEM/ID: Product name/name of inspector
⑦ Memo, such as product name
⑧ Data number
⑨ Temperature display

3447-01 Measurement Specifications

Sensor type	:	Platinum temperature-measurement resistor Pt 100 (3 line type)
Measurement current	:	0.5 mA
No. of inputs	:	2 channel
Measurement range	:	-100.0 to 300.0˚C
Resolution	:	0.1˚C
Measurement accuracy, thermometer	:	±0.1% rdg. ±0.4˚C
Sampling rate	:	1/second
Water resistance	:	IP67 (EN60529:1991)

3446-01 Measurement Specifications

Sensor type	:	Type K thermocouple
No. of inputs	:	1 channel
Measurement range	:	-100 to 1000˚C
Resolution	:	0.1˚C (-100.0 to 300.0˚C), 1˚C (-100 to 1000˚C)
Measurement accuracy, thermometer	:	±0.1% rdg. ±0.5˚C (with 0.1˚C resolution) ±0.2% rdg. ±1˚C (with 1˚C resolution)
Sampling rate	:	1/second

3446-01 / 3447-01 Common Specifications

Measurement Modes

Manual recording : Temperature recording by key operation
(Recording also possible via the key on the handle of the 9479 Temperature Probe. 3447-01 only)
Data recorded : Time, temperature, item, ID, comparator test result
Data items recorded : Max 7,200 (for the 3447-01: 4,800 with 2-ch recording)

Interval recording : Measurement values recorded at a set interval
Data recorded : Time, temperature, item, ID, comparator test result
Data items recorded : Max 28,800 (with the 3447, 14,400 with 2-ch recording)
Recording interval : OFF, 1, 2, 5, 10, 15, 20, or 30 seconds,
1, 2, 5, 10, 15, 20, 30, or 60 minutes
* Manual recording when set to OFF

Display

LCD display : Measured temperature, date, time, item, ID, etc.
Item display : 12 character (alphanumeric) item display, holds up to 300 entries
ID display : 12 character (alphanumeric), holds up to 100 entries
* Item and ID settings can be made from a computer using the 9674 PC software.

Functions

Comparator : Set for individual items (Hi, IN, Lo evaluation)
Result output : Result display, buzzer output

Clock : Real time control (year, month, day, hour, minute, second)
Data read-out : Measurement data, time, data number
Display hold : Holds measurement value.
Auto power save : Automatically switches the power off if no key is pressed for 10 minutes. Display automatically turned off during interval recording.
* Auto power save function can be disabled.
Data backup : Measurement data, Setting data
Communications interface : RS-232C (using dedicated cable)
Applicable ratings : Safety, EN61010-1:1993+A2;1995; Over-voltage category I, Pollution degree 2/EMC EN613260-1:1997+A1:1998
Operating temperature/humidity range : 0 to 40˚C, 80% RH or less (non-condensating)
Storage temperature/humidity range : -10 to 50˚C, 80% RH or less (non-condensating)
Power supply : 4 LR03 (AAA) alkaline dry cell batteries
Maximum rated power : 60 mVA
Continuous use time : 15 days (at 20˚C, with auto power save disabled)
1 month (at 20˚C, using auto power save, with a recording interval of 1 minute)
Dimensions/weight : Approx. 66 x 150 x 31.5 mm (2.6 x 5.9 x 1.25 in), approx. 240 g (8.47 ozs)
Accessories : Batteries, strap band

and Storage, Support for Electronic Device Temperation Control

Settings can be made from and data transferred to a connected computer

When a PC is connected to the 3446-01/3447-01, it can be used to make various settings (item, ID, comparator), or to store recorded data transferred from the Temperature HiTESTER. Computerization of temperature management can greatly increase work efficiency. The optional 9674 RS-232C Package is used for PC communications.

9674 RS-232C Package (Optional)

(Package contents: RS-232C cable, PC software on CD-ROM)

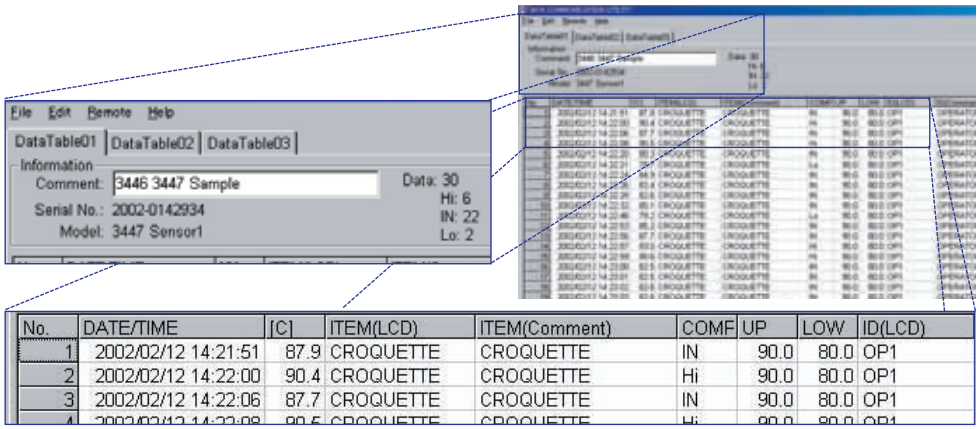
RS-232C cable (cable length: 2 m; Connector on PC side: Dsub-9 pin; Connector on thermometer side: Dedicated connector)

- PC software (Windows 95/98/Me/NT 4.0/2000/XP compatible)

  Functions: Item/ID setting, comparator setting, data list display, graph display, printing, file storage (in proprietary format or text format)

*2 9670 Printer

When outputting recorded data to the optional 9670 Printer, use the RS-232C cable provided in the 9674 RS-232C Package and a commercially-available connector adapter (male Dsub-9 pin <-> male Dsub-25 pin).

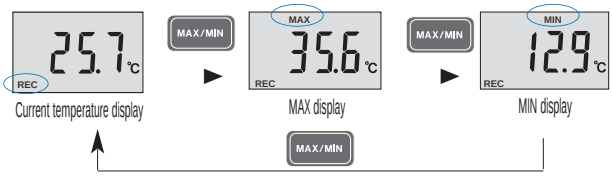


No.	DATE/TIME	[C]	ITEM(LCD)	ITEM(Comment)	COMP	UP	LOW	ID(LCD)
1	2002/02/12 14:21:51	87.9	CROQUETTE	CROQUETTE	IN	90.0	80.0	OP1
2	2002/02/12 14:22:00	90.4	CROQUETTE	CROQUETTE	Hi	90.0	80.0	OP1
3	2002/02/12 14:22:06	87.7	CROQUETTE	CROQUETTE	IN	90.0	80.0	OP1

3441/3442 Extended Operation, Max/Min Temperature Recording, Water-resistant Construction (3442 only)

- The 3442 has a water-resistant construction for use in damp environments.
- Measurement in damp environments is possible by using the thermometer in combination with the 9472 or 9475 temperature probe.
- Choose from 9 different temperature sensors (optional), according to your application.
- Switching between °C/°F display (3441-02, 3442-03)

- Recording of maximum temperature (MAX) and minimum temperature (MIN)



The 3441 and 3442 support temperature management by recording maximum and minimum temperatures in memory after the REC START key is pressed. By pressing the MAX/MIN key, you can switch to display of the current maximum and minimum temperatures at any time, even during recording.

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

Sensor	:	Type K thermocouple
Measurement range	:	-100°C to 1300°C (-148°F to 2372°F)
Resolution	:	0.1°C (100 to 199. 9°C), 1°C (200 to 1300°C)/ 0.1°F (-148°F to 392°F), 1°F (393°F to 2372°F)
Measurement accuracy, thermometer	:	±0.1% rdg. ±0.8°C (from -100 to 199.9°C)/ ±0.1% rdg. ±1.5°F (-148°F to 392°F) ±0.2% rdg. ±1°C (from 200 to 1300°C)/±0.2% rdg. ±1.8°F (393°F to 2372°F) (Accuracy of temperature sensor is added.)
Temperature coefficient	:	0.03°C/°C (from -100 to 199.9°C) / 0.054°F/°F (-148°F to 392°F) 0.05°C/°C (from 200 to 1300°C) / 0.09°F/°F (393°F to 2372°F)
Sampling rate	:	2 / second
Display	:	LCD display
Reference contact compensation	:	Automatic
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, can be disabled), low battery warning

Operating environment	:	Indoors, at altitude up to 2000 m
Usable temperature/humidity range of main unit	:	0 to 40°C (32°F to 104°F), 80% RH or less (non-condensating)
Storage temperature/humidity range of main unit	:	-10 to 50°C (14°F to 122°F), 80% RH or less (non-condensating)
Applicable ratings	:	Safety, EN61010-1:1993+A2:1995 Pollution index 2, over-voltage category I EMC:EN55011, EN50082 Water-resistant construction: EN60529:1991 IP54
Power supply	:	4 R6P manganese dry cell batteries or 4 LR6 alkaline batteries (AAA)
Maximum rated power	:	35 mVA
Continuous operating time	:	200 hours or more (using manganese batteries)
Dimensions/weight	:	Approx. 74(W) x 155(H) x 24(D) mm (2.6 x 5.9 x 0.95 in), approx. 160g (5.6 oz) (not including batteries or sensor)
Accessories	:	Batteries, strap band

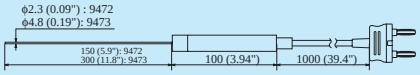
Choose from a wide range of temperature sensors for various applications (optional)

1=mm (inch)

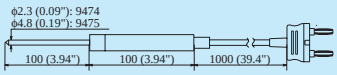
TEMPERATURE PROBE for 3441 / 3442

:water--resistant structure

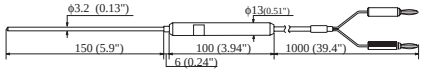
9472 / 9473 SHEATH TYPE



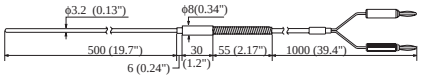
9474 / 9475 SHEATH TYPE



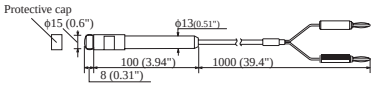
9180 / 9183 SHEATH TYPE



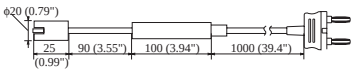
9182 SHEATH TYPE



9181 SURFACE TYPE

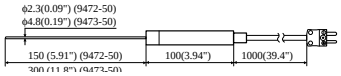


9476 SURFACE TYPE

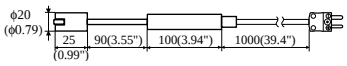


TEMPERATURE PROBE for 3446-01

9472-50 / 9473-50 SHEATH TYPE



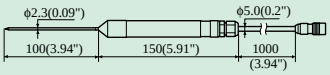
9476-50 SURFACE TYPE



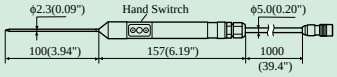
TEMPERATURE PROBE for 3447-01

:waterproof structure

9478 SHEATH TYPE



9479 SHEATH TYPE with Hand Switch



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 adapter, 9094 output cord, and temperature probes are optional.

Range: –50˚C to 999˚C (–58 to 1830˚F), Sensor : Thermocouple K (CA), Unit accuracy: ±0.2% f.s.±1dgt. Analog output: 1mV / ˚C, Power supply: 6F22 battery

3412-50 TEMPERATURE HiTESTER

	water-resistant structure									waterproof structure	
Item	9472 (-50)	9473 (-50)	9474	9475	9183	9180	9476 (-50)	9181	9182	9478	9479
Thermocouple material	K type (Chromel/Almel)									Pt 100(3-wires)*1	
Tolerance	The greater of ±1.5˚C(2.7˚F) or ±0.4% of measured temperature					The greater of ±2.5˚C(4.5˚F) *2				± 0.15˚C ±0.002 T*3	
Response (90%)*	About 5 sec	About 10 sec	About 5 sec	About 10 sec	About 5 sec		About 3 sec		About 5 sec	About 5 sec	
Size of Sheath	ϕ2.3×150mm	ϕ4.8×300mm	ϕ2.3×100mm	ϕ4.8×100mm	ϕ3.2×150 mm		ϕ20 mm	ϕ15 mm	ϕ3.2×500mm	ϕ2.3×100 mm	
Cable	General use (–20˚C to 90˚C,– 4˚F to 194˚F) 1 m								(0˚C~150˚C) 2m	(– 40˚C~120˚C) 1m	
Grip heat resistance	80˚C				150˚C		80˚C	150˚C	90˚C	80˚C	
Max use temperature	–100~300˚C –148~572˚F	0~800˚C 32~1472˚F	–100~300˚C –148~572˚F	–100~500˚C –148~932˚F	–50~750˚C –58~1382˚F		–40~500˚C –40~932˚F	–50~400˚C –58~752˚F	–50~750˚C –58~1382˚F	–100~300˚C –148~572˚F	

* Sheath type: Responsiveness in ice water at 0˚C (32˚F) and in boiling water at 100˚C(212˚F)
Surface type: Responsiveness on a metal surface at 0˚C (32˚F) and at 100˚C(212˚F)

*1 Platinum Temperature-measurement Resistor
*2 9180, 9182: The greater of ±2.5˚C(4.5˚F) or ±0.75% of measured temperature
9476: (–0.03 ×T)˚C to + 2.5˚C at 100˚C<(T–Ts)
9181: (–0.035×T)˚C to + 2.5˚C at 100˚C<(T–Ts)
T: measured temperature, Ts: environmental temperature
*3 T: measured temperature

3446-01 TEMPERATURE HiTESTER
3447-01 TEMPERATURE HiTESTER

Options for 3446-01, 3447-01

9674	RS-232C PACKAGE (with PC Software)
9386-01	CARRYING CASE
9472-50	SHEATH TYPE TEMPERATURE PROBE
9473-50	SHEATH TYPE TEMPERATURE PROBE
9476-50	SURFACE TYPE TEMPERATURE PROBE
9478	SHEATH TYPE TEMPERATURE PROBE
9479	SHEATH TYPE TEMPERATURE PROBE
9670	PRINTER (with 1 roll of Recording Paper)
9671	AC ADAPTER for 9670
9237	RECORDING PAPER (for 9670, 80mm × 25m, 4 rolls)

3441 TEMPERATURE HiTESTER (˚C only)
3442-02 (˚C/ ˚F selectable)
3442 TEMPERATURE HiTESTER(˚C only)
3442-03 (˚C/ ˚F selectable)

Options for 3441(-02), 3442(-03)

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

HIOKI
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

HIOKI USA CORPORATION :
6 Corporate Drive, Cranbury, NJ 08512 USA
TEL +1-609-409-9109 / FAX +1-609-409-9108
E-mail: hioki@hiokiusa.com

Europe Representative Office :
Meineckestrasse 48, 40474 Dusseldorf, Germany
TEL / FAX +49-211-4544153
E-mail: hioki-eu@ doitsu.de

Shanghai Representative Office :
1108 Union Building, 100 Yan An Road (East),
Shanghai, 200002, P.R.China
TEL +86-21-6328-9947/4938
FAX +86-21-6328-2064
E-mail: hioki-sh@sh.cngb.com

All information correct as of Apr 10, 2002. All specifications are subject to change without notice.
3440SE1-24M-05P Printed in Japan