HIOKI

TEMPERATURE HiTESTER 3441/3442/3446-01/3447-01

Environmental Measuring Instruments

3447-01 for HACCP Temperature Recording/Management

- 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 TemperatureRecording/Management in Energy Conservation Applications

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

3447

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.

ISO 9001 JMI-0216

ISO14001 JQA-E-90091

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CE

Temperature Management of Food Preparation and

■ 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 (using the optional Printer **9670**)

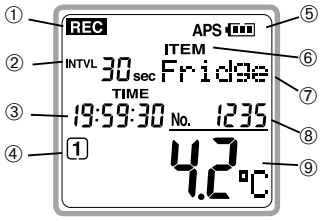
***1 Maximum recording time in interval recording mode**

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 Time	Interval	Recording Time	Interval	Recording Time	Interval	Recording Time
1 sec	8 h	15 sec	5 days	1 min	20 days	15 min	300 days
2 sec	16 h	20 sec	6 days 16 h	2 min	40 days	20 min	400 days
5 sec	1 days, 6 h	30 sec	10 days	5 min	100 days	30 min	600 days
10 sec	3 days, 8 h			10 min	200 days	60 min	1200 days

Screen Display



①REC: recording
②INTVL: Interval recording mode, recording interval
③ Time display
④ Channel number being recorded (3447-01)
⑤APS:auto power save function ON and battery charge remaining display
⑥ITEM/ID: Product name/name of inspector
⑦Memo, such as product name
⑧Data 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 : ±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 by the key on the 9479 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 back-up: Measurement data, Setting data
Interface: RS-232C (using dedicated cable)
Applicable standards: Safety, EN61010-1:2001; Measurement category I, Pollution degree 2/EMC, EN613260:1997+A1:1998+A2:2001
Ambient conditions
for use: 0 to 40°C, 80% rh or less (non-condensating)
for storage: -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 min)
Dimensions/mass: 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

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 RS-232C Package **9674** is used for PC communications.

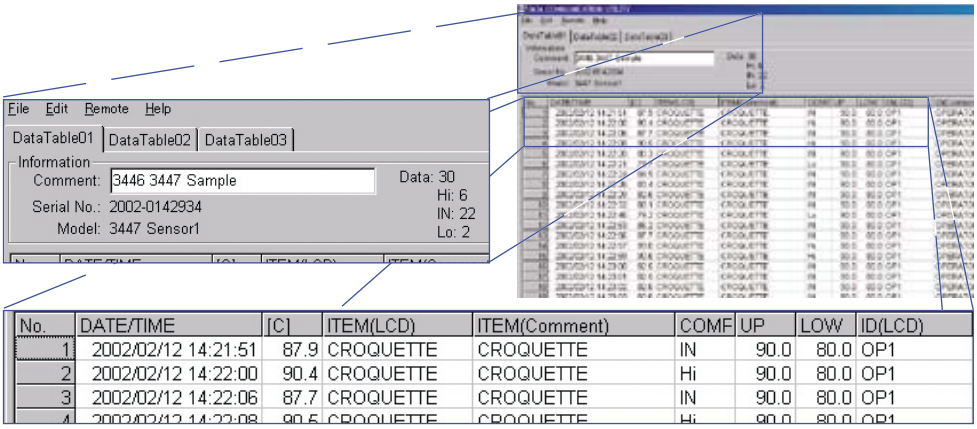
RS-232C Package 9674 (Optional)

(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)

Printer 9670

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

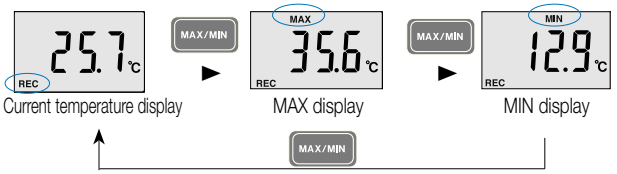


No.	DATE/TIME	[C]	ITEM(LCD)	ITEM(Comment)	COMF	UP	LOW	ID(LCD)
1	2002/02/12 14:21:51	87.9	CROQUETTE	CROQUETTE	IN	90.0	80.0	OP1
2	2002/02/12 14:22:00	90.4	CROQUETTE	CROQUETTE	Hi	90.0	80.0	OP1
3	2002/02/12 14:22:06	87.7	CROQUETTE	CROQUETTE	IN	90.0	80.0	OP1

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

- The **3442** has a water-resistant construction.
- 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.

- Recording of maximum temperature and minimum temperature



Current temperature display — MAX display — MIN display

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

■ 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	:	±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 min, can be disabled), low battery warning
Operating environment	:	Indoors, at altitude up to 2000 m
Ambient conditions		
for use	:	0 to 40°C (32°F to 104°F), 80% rh or less (non-condensating)
for storage	:	-10 to 50°C (14°F to 122°F), 80% rh or less (non-condensating)
Applicable standards	:	Safety, EN61010-1:2001; Measurement category I, Pollution degree 2/EMC, EN613260:1997+A1:1998+A2:2001 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	:	200 hours or more (using manganese batteries)
Dimensions/mas	:	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

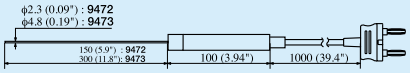
Choose from a wide range of temperature sensors for various applications (optional)

unit=mm (inch)

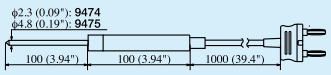
TEMPERATURE PROBE for 3441 / 3442

:water--resistant structure

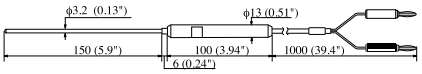
9472 / 9473 SHEATH TYPE



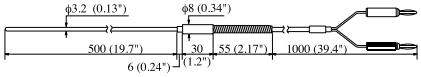
9474 / 9475 SHEATH TYPE



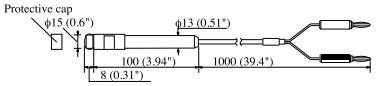
9180 / 9183 SHEATH TYPE



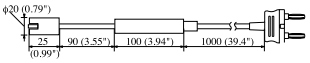
9182 SHEATH TYPE



9181 SURFACE TYPE

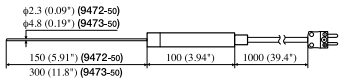


9476 SURFACE TYPE

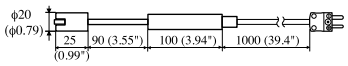


TEMPERATURE PROBE for 3446-01

9472-50 / 9473-50 SHEATH TYPE



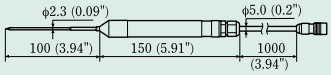
9476-50 SURFACE TYPE



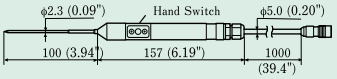
TEMPERATURE PROBE for 3447-01

: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

TEMPERATURE HiTESTER 3412-50

Item	water-resistant structure									waterproof structure	
	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

TEMPERATURE HiTESTER 3446-01
TEMPERATURE HiTESTER 3447-01

Options for 3446-01, 3447-01

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

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

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

SHEATH TYPE TEMPERATURE PROBE	9180
SURFACE TYPE TEMPERATURE PROBE	9181
SHEATH 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
SURFACE TYPE TEMPERATURE PROBE	9476
CARRYING CASE	9386

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