

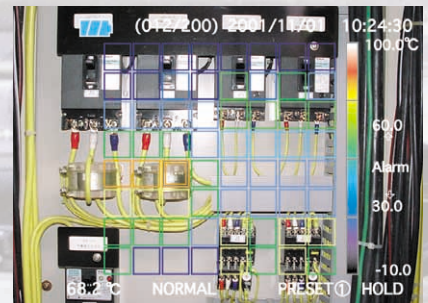
HIOKI

2002



Instantaneous Imaging of 64-Point Temperature Distributions 3460 2D THERMO HiTESTER

Environmental Measuring Instruments



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

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



ISO14001
JQA-E-90091

Photo shows simulated screen.

Imaging of 64-Point Temperature Distributions

The 3460 2D THERMO HiTESTER utilizes the world's first 64-element thermopile array sensor.

Now you can take simultaneous 2-dimensional radiative temperature measurements and display results in 64 on-screen boxes.

This advanced functionality makes measuring temperature distribution as easy as using a digital camera, and extends the applications for temperature measurement practically without limit.

Instantaneous Measurement of the Temperature Distribution Within the Measurement Area

The 3460 2D THERMO HiTESTER performs 2-dimensional temperature measurement with a newly developed thermopile array sensor* (8×8 elements), dividing the measured part of the visual image area into 64 boxes and displaying the temperature with a high-speed response of approximately 0.2 seconds.

Basic functionality for parameters such as temperature measurement accuracy and radiation ratio can be specified with the same convenience as for thermography (measurement wavelength 8 to 16 μm , comparable to non-cooled thermography, but at about 1/10 the cost of thermography).

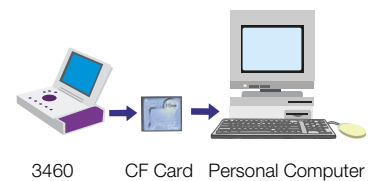
*Thermopile array sensor: A device that miniaturizes and arranges multiple infrared sensors (thermopiles), each of which contains multiple thermocouples connected in series.



Measurement Data Recorded on a Compact Flash Card and Edited on a Personal Computer

A Compact Flash Card slot comes standard in the instrument.

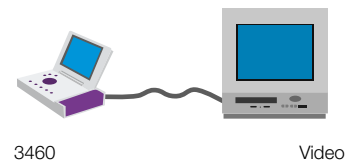
Measurement data can be recorded and accumulated along with image data on this convenient storage media, making it possible to simultaneously record an image in JPEG format and measurement data in CSV format. Data can be easily viewed and edited on a personal computer or PDA, without any other special software. (A card adapter is required.)



Video Output Allows You to Make Video Recordings of Temperature Changes

The instrument is small and lightweight, with a 3.8 inch color TFT liquid crystal screen that is easy to see, even outdoors, making it as portable as a digital camera.

It also comes with a CMOS camera, which can simultaneously display a temperature image and optical image on the same screen. An NTSC video terminal enables video recording.



Automatic, Continuous Measurement Enables Logging Measurement (Interval Recording)

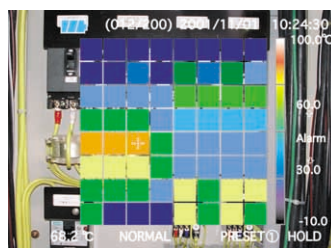
Automatic, continuous recording at a single location is possible by mounting the 3460 with a tripod screw and utilizing the logging function.

Selectable Screen Modes for Different Scenarios

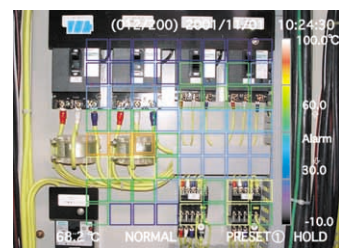
The 3460 provides three selectable screen display modes: "Visual Image", "64-Point Mosaic Image", and "64-Point Temperature Box Display". Setup, measurement, and recording operation are easy. When a temperature alarm is set up in advance, measurement values flash at locations where there are abnormal temperatures.



▲Visual Image



▲64-Point Mosaic Image



▲64-Point Box Display

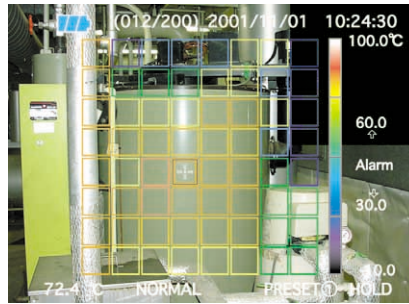
2-Dimensional Visualization Improves Work Efficiency

Greatly increased efficiency of temperature distribution measurement allows dramatic improvements in activities such as maintenance, research and development, and quality assurance.

Instantaneous Detection of Temperature Abnormalities



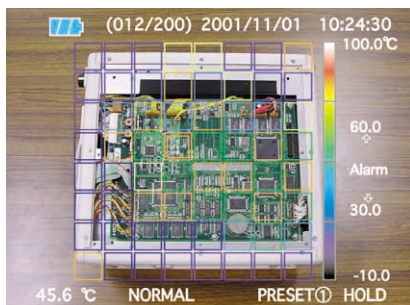
■ Maintenance of Transformer Facilities and Distribution Panels



■ Maintenance of Plant Facilities Such as Boilers and Pipes



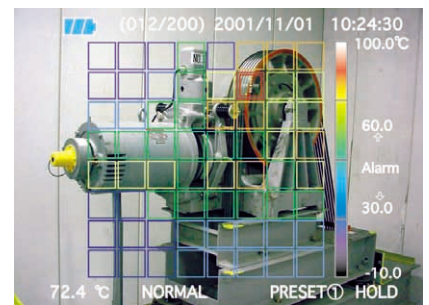
■ Maintenance of UPS and Batteries



■ Detection of Heating in Circuit Boards and Electrical Devices



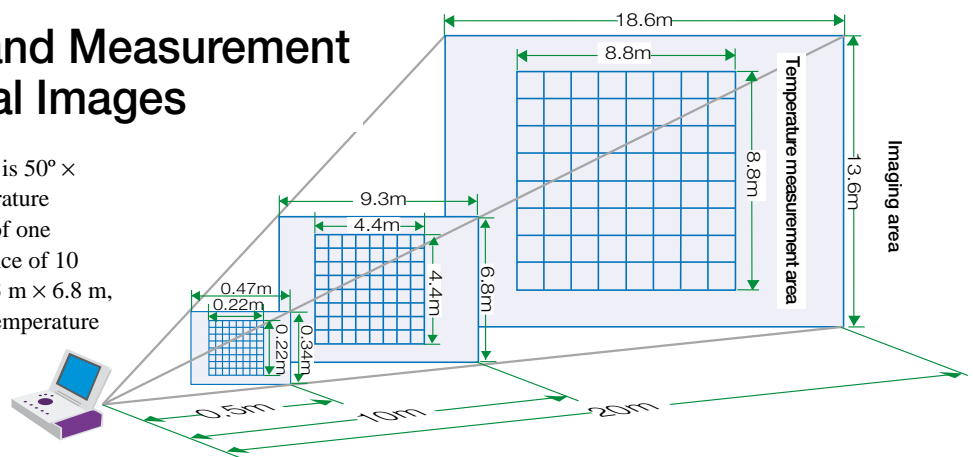
■ Detection of Outer Building Wall Exfoliation and Fire Wall Degradation, Thermal Design of Floor Heaters



■ Maintenance of Moving Equipment, Such as Elevators

Field of View and Measurement Range of Visual Images

The screen angle of the imaging area is $50^\circ \times 37.5^\circ$, and the resolution of the temperature measurement area (the screen angle of one measurement box) is 3.1° . At a distance of 10 meters, the image range measures $9.3 \text{ m} \times 6.8 \text{ m}$, and the range contained with all 64 temperature measurement boxes is $4.4 \text{ m} \times 4.4 \text{ m}$.



Because the 3460's two optical axes are parallel, parallax (the displacement between the visual image optical axis and the optical axis of the temperature sensor unit) is independent of the distance from the measurement target, and is 26 mm in the horizontal direction and 0 mm in the vertical direction.

By specifying the measurement object as 0.5mm, 1.0m, or 2.0m or above in the settings, the influence of parallax can almost be completely disregarded.

The images shown above have been graphically enhanced for better presentation in this catalog.

SPECIFICATIONS

■ Temperature Measurement

Detection Element	Thermopile Array
Measurement Range	-50 to 1000°C
Response Speed	0.2 seconds maximum
Number of Elements	64
Measurement View Angle for One Element	3.1° square (55 mm square at 1 m)
Measurement View Angle	24.8° square (440 mm square at 1 m)
Infrared Wavelength	8 to 16 μm
Radiation Ratio Correction	0.1 to 1.00 (steps of 0.01)
Resolution	0.1°C
Accuracy	± (10% rdg + 2°C) (-50 ~ 0.1°C) ± 2.0°C (0 ~ 200°C) ± 1% rdg (200.1 ~ 1000°C)
Relative Accuracy	1.5°C (P-P, 23°C)

■ Visual Photography

Detection Element	Color CMOS
Frame Time	Less than 0.5 seconds
Number of Pixels	300,000 (640 × 480) (Horizontal 930 mm × Vertical 680 mm at 1 m)
Image Angle	Horizontal 50.0° × Vertical 37.5°
Smallest Distance	0.5 m (Recommended Distance 1 m)

■ Display

Display Element	Transmission Type Color TFT Liquid Crystal
Size	3.8 Inch
Number of Pixels	76,800 (320 × 240)
Display Colors	65535 Colors (16-Bit)
Backlight	Cold Cathode Tube
Temperature Display (Each Element)	Box Color Display (Display range and pattern can be chosen.)
Temperature Display (Selection Element)	Numerical Display
Parallax Error	26 mm Constant
Optical Axis Displacement	1.15° (20 mm at 1 m, excluding parallax)

■ Functions

Display Language	English
Temperature Units	°C (or °F, option)
Logging Measurement	Specified in units of minutes (hh:mm), Maximum length 24:00.
Measurement Data Memory	Compact Flash Card (8 to 256 MB)
Storage Format	JPEG File (Image Data, 76800 pixels) CSV File (Temperature Value Data)
Image Data Deletion	Selective Deletion
Audible Click	Yes
Alarm	Yes (Buzzer and Display Alarm)
Automatic Power Save	Yes
Clock	YY/MM/DD hh:mm:ss
Backlight Intensity	3-Level Adjustment or None
Battery Remaining Indicator	3-Level Display

■ Basic Specifications

Image Output	NTSC Video Output
Power Source	LR6 (AA) Alkaline Batteries × 6 AC Adapter (Option)
Rated Power Source Voltage	DC 1.5V × 6 (LR6), DC 9V
Maximum Rated Power	13.5 VA
Stand-by Current	Less than 2mA
Continuous Operating Time	70 minutes (LCD Intermediate Level, 20°C)
Operating Temperature and Humidity Range	0 to 40°C, 35 to 75% RH (No Condensation)
Guaranteed Accuracy Temperature and Humidity Range	23 ± 5°C, 35 to 75% RH (No Condensation)
Dimensions and Weight	167 W × 55 H × 123 D mm, About 700 g (Instrument only, with display closed.)
Included Accessories	LR6 (AA) Alkaline Batteries × 6, Shoulder Strap, Compact Flash Card (16 MB), User's Guide
Options	3915 Option Pack (Portable Case, Video Cable, AC Adapter), PC Card (32M, 64M Compact Flash Card and Adapter), PC Card Adapter (for Compact Flash Card)



Portable for convenience, with a lightweight, compact body. Mounts on a tripod. Capable of continuous recording and interval recording.

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