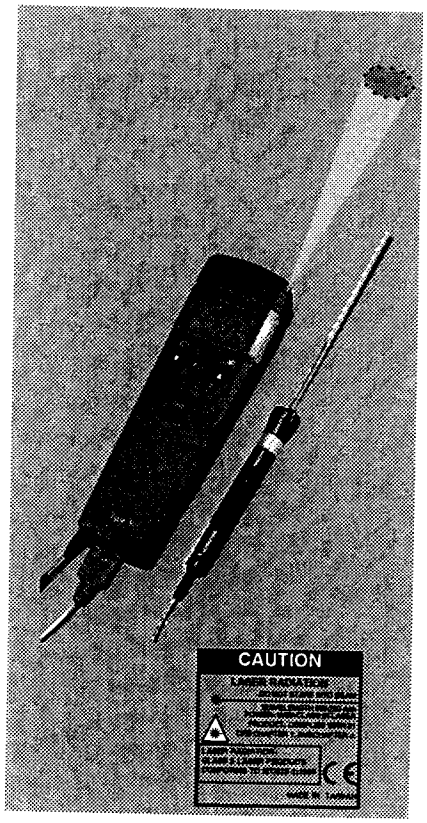


User's Guide

OMEGAETTE™ OS545
Infrared/Type K Thermometer

M3659/0401

INTRODUCTION

The Infrared Thermometer is digital and accepts as a second input a type K thermocouple. The Infrared Thermometer is a Non-contact thermometer with built-in laser circle sighting. It can be used to measure the temperature of objects' surface that is improper to be measured by traditional (contact) thermometer (such as moving object, the surface with electricity current or the objects which are impractical to be touched.)

I. SAFETY INFORMATION

1. Read the following safety information carefully before attempting to operate or service the meter.
2. Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

CAUTION

You may receive harmful laser radiation exposure if you do not adhere to the warnings listed below.

- **USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HERE MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.**
- **DO NOT LOOK AT THE LASER BEAM COMING OUT OF THE LENS OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS -EYE DAMAGE CAN RESULT.**
- **USE EXTREME CAUTION WHEN OPERATING THE LASER SIGHTING**
- **NEVER POINT THE LASER BEAM AT A PERSON.**
- **KEEP OUT OF REACH OF CHILDREN**

3. Precautions:

a). Do not operate the thermometer near the large electrical or magnetic field.

b). Keep the thermometer away from direct sunlight or strong source of light, hot objects (70°C/158°F), high temperatures, high humidity, or dust during using and storaging.

c). If the thermometer was at the environment where's temperature changes drastically, it would be fine to start measuring until the thermometer return to the stable status.

d). Condensation may from on the focal lens if the thermometer was moved quickly from a cold to a hot environment. Before taking measurements, please wait for the condensation to evaporate.

4. Environment Conditions:

a). Altitude up to 2000 meters.

b). Relatively humidity 80% max.

c). Operating Ambient 0 ~ 40°C

5. Maintenance & Cleaning

a). Repairs or serving aren't covered in this manual should only be performed by qualified personnel.

b). Periodically wipe the case with a dry cloth. Don't use abrasives or solvents on this instrument.

c). When serving, use only specified replacement parts.

d). Keep Lens Clean: use detergent and lint free cloth.

6. Safety Symbols:

CE Complies with EMC

II. FEATURES

- ➢ °C / °F Selectable
- ➢ Back-light LCD display
- ➢ Laser targeting
- ➢ Emissivity adjustable
- ➢ Audible and visible alarm

III. SPECIFICATIONS

3-1 General Information

Display:	Backlight LCD Display.
Auto power off:	Approx. 15sec (Infrared)
Over range indication:	"OL" or "-OL"
Low battery indication:	The BT will be displayed in LCD when the battery voltage drops below the operating voltage.
Power supply:	Single 9V battery006P 9V or IEC6F22, or NEDA 1604
Battery life:	Approx. 50hours (laser pointer and backlight turn off)
Operating temperature: and humidity	0°C to 40°C (32°F to 104°F), below 80%RH.

Storage temperature: and humidity	-10°C to 60°C (14°F to 140°F). below 70%RH
Dimensions:	170(L)x52(W)x38mm(H) 6.7(L) x 2.1(W) x 1.5(H) inches.
Weight:	Approx. 180g with battery.
Accessories:	Instruction manual, carry case, battery.

3-2 ELECTRICAL SPECIFICATIONS

❑ Infrared

Measuring range:	-20°C to 500°C (-4°F to932°F).
Resolution:	1°C , 1°F.
Accuracy:	± 3% reading or ± 3°C or 6°F.
Temperature coefficient:	0.1 times the applicable accuracy specification per °C to 18°C and 28°C to 40°C. (32°F to 64°F and 82°F to 104°F).
Responding time:	once per second.
Spectral Response:	6 ~ 14um.
Field of view:	8:1 optics ratio with a 1" min target.
Emissivity:	0.1 ~ 1.0.
Sighting	Circle 1mW (class 2).
Sensor:	Thermopile.
Laser Wavelength:	670mm (Red).
Max. Laser Power Output:	1mW (class 2).

❑ Type K

Measuring range:	-50°C to 1333°C (-58°F to 1999°F)
Resolution:	0.1°C , 1°C , 0.1°F , 1°F.
Response time:	1 second.
Basic accuracy:	(@ 23±5°C calibration) accuracy area ± (...% of reading = degree) at 18°C to 28°C with relative humidity up 80%.

Function	Resolution	Range	Accuracy
℃	0.1℃	-50℃～0℃	± (0.2%rdg + 1.0℃)
		0℃～200℃	± (0.1%rdg + 0.8℃)
	1℃	200℃～1333℃	± (0.2%rdg + 2℃)
℉	0.1℉	-58℉～32℉	± (0.2%rdg + 2℉)
		32℉～200℉	± (0.1%rdg + 1.6℉)
	1℉	200℉～1999℉	± (0.2%rdg + 3℉)

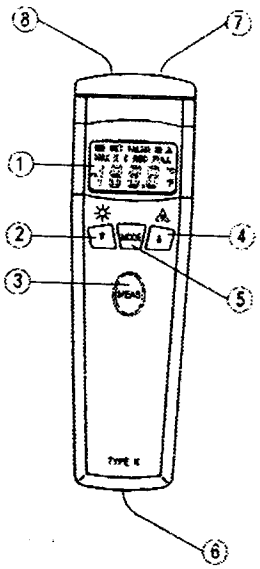
TEMPERATURE COEFFICIENT:

0.1 times the applicable accuracy specification per °C from o°C to 18°C and 28°C to 40°C (32°F to 64°F and 82°F to 104°F).

NOTE:

The basic accuracy specification does not include the error of the probe. Please refer to the probe accuracy specification for additional details.

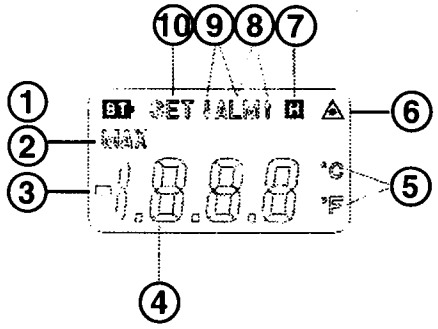
IV. FRONT PANEL DESCRIPTION



1. Display.
2. ▼ ☼ : Backlight button.
3. MEAS : Button for powering on.
   Press MEAS button to turn on the thermometer, the Infrared Thermometer is selected.
4. ▲ ⚠ : Laser pointer button.

5. MODE : Measuring mode and mode settings selection.
   a). Press MODE button to select measuring mode.(Infrared thermometer ↔ Type K thermometer)
   b). Press MODE button for 3 seconds entering into the mode settings.
6. Type K input connector
7. Laser aperture
8. Focal lens

V. LCD DISPLAY DESCRIPTION



1. Low battery mark.	6. Laser indicator
2. Maximum	7. Hold function
3. Negative polarity	8. Hi Alarm
4. Measure value	9. Lo Alarm
5. Unit " ℃ , ℉ "	10. SET symbols

VI. EMISSIVITY

1. Emissivity Principles:

Emissivity is a value between 0 and 1 that indicates an object's ability to emit infrared energy, Emissivity is determined primarily by the object's composition and surface finish.
The thermometer's sensitivity to emissivity "ε" was set at 0.95 before shipment because the objects of 90% that emissivity are around 0.95.

2. Emissivity Procedure

a). Apply black tape, black mat paint, or black magic marker to the object if it is safe.

b). "ε" is set at 0.95 to measure the dark surface.

c). To aim the laser at dark surface, press MEAS button to get measurement as T1.

d). Remove the black tape or black mat paint and aim laser at the same area again then press MEAS button to get the measurement as (T).

e). Change & reset a value for emissivity "ε" to get measurement (T) until T equal to T1.

Emissivity VALUES (cont.)

Typical Emissivity Values-Metals (cont.)	
SURFACE	EMISSIVITY
Zinc (oxidized)	0.1*
Galvanized iron	0.3
Tin-plated steel	0.1*
Gold (polished)	0.1*
Silver (polished)	0.1*
Chromium (polished)	0.1*
Emissivity Values-Non-Metals	0.75 to 0.9
Refractory & Building Materials	
Red brick (rough)	

Fire clay	0.75
Asbestos	0.95
Concrete	0.7
Marble	0.9
Carborundum	0.85
Plaster	0.9
Alumina (fine grain)	0.25
Alumina (coarse grain)	0.45
Silica (fine grain)	0.4
Silica (coarse grain)	0.55
Zirconium silicate up to 500°C	0.85
Zirconium silicate at 850°C	0.6
Quartz (rough)	0.9
Carbon (graphite)	0.75
Carbon (soot)	0.95
Timber (various)	0.8 to 0.9
Miscellaneous	
Enamel (any color)	0.9
Oil paint (any color)	0.95
Lacquer	0.9
Matte black paint	0.95 to 0.98
Aluminum lacquer	0.5
Water	0.98
Rubber (smooth)	0.9
Rubber (rough)	0.98
Plastics (various, solid)	0.8 to 0.95
Plastic films (05 mm thick)	0.5 to 0.95
Polythene film (03 mm thick)	0.2 to 0.3
Paper and cardboard	0.9
Silicone polish (03 mm thick)	0.7
* Emissivity vanes with punty	

EMISSIVITY VALUES	
Typical Emissivity Values-Metals	
SURFACE	EMISSIVITY
Iron and Steel	
Cast iron (polished)	0.2

Cast iron (turned at 100℃)	0.45
Cast iron (turned at 1000℃)	0.6 to 0.7
Steel (ground sheet)	0.6
Mild steel	0.3 to 0.5
Steel plate (oxidized)	0.9
Iron plate (rusted)	0.7 to 0.85
Cast iron (rough) rusted	0.95
Rough ingot iron	0.9
Molten cast iron	0.3
Molten mild steel	0.3 to 0.4
Stainless steel (polished)	0.1
Stainless steel (various)	0.2 to 0.8
Aluminum	
Polished aluminum	0.1*
Aluminum (heavily oxidized)	0.25
Aluminum oxide at 260℃	0.6
Aluminum oxide at 800℃	0.3
Aluminum Alloys various	0.1 to 0.25
Brass	
Brass (polished)	0.1*
Brass (roughened surface)	0.2
Brass (oxidized)	0.6
Copper	
Copper (polished)	0.05*
Copper plate (oxidized)	0.8
Molten copper	0.15
Lead	
Lead (pure)	0.1*
Lead (oxidized at 25℃)	0.3
Lead (oxidized , reated to 200℃)	0.6
Nickel and its alloys	
Nickel (pure)	0.1*
Nickel plate (oxidized)	0.4 to 0.5
Nichrome	0.7
Nichrome (oxidized)	0.95

VII. TEMPERATURE MEASUREMENT

1. Infrared measuring :

a). Infrared measuring : Press MEAS button to power on the meter and start measuring. Release MEAS button to stop measuring and auto hold the reading, the meter will be off automatically after 15 secs.

b). Under the Infrared measuring mode, press & hold MEAS button and press MODE button to select MAX measurement & General measuring mode.

2. Continuous infrared measuring

Start with power-off status, press MODE and MEAS buttons to power on the meter, the Infrared Thermometer can start the continuous measurement. In the meanwhile, H symbol won't appear in LCD, the Hold function is unavailable.

a). Under continuous measurement, press MEAS button to stop continuous measurement and lock the reading, the meter will be off automatically after 15 secs.

b). Under continuous measurement, press & hold MEAS button and press MODE button to select MAX measurement & General measurement.

Note:

- ❑ Laser offset: The laser beam is offset 16mm(0.63in) from the focal lens. Choose a sampling spot that is large enough to include the laser offset.
- ❑ Surface Temperatures: The thermometer will measure the first surface it detects, even a glass cover, dust, or fog. Make sure the object is not obstructed.

3. Type - K measuring :

a). Under the Infrared measuring mode, press MODE button entering into Type - K measuring.

b). Under Type - K measuring mode, press MEAS button for 3 secs to **power off** the meter.

4. Selecting ℃/℉ unit

While powering on the meter, the temperature unit that appears in LCD would be the last unit you measured. If user wants to change the temperature unit, first of all, user has to power-off the meter, then press & hold ▲ (℃) or ▼ (℉) and press MEAS button to power on the meter and get the proper unit.

VIII. MODE SETTING

Press MEAS button to power on the meter, then press & hold MODE button for 3 seconds entering into the setting mode for option. While flashed "SET" symbol appears in LCD, user should press ▼ ▲ to choose the setting mode for Infrared or Type K measurement.

It is under the parameter settings of infrared measurement if "K" doesn't appear in LCD.

1. Parameter settings for **Infrared** measuring:
   Under the infrared parameter setting mode, LCD will show SET ---, press MODE button to select in turn for setting "ε ", "ALM↑", "↓ALM", press MODE button again to escape the setting mode and return to the general measurement.

   Note: In the setting mode, if users don't push any button in 15 seconds, then it will escape from setting mode and enter into Infrared temperature measuring mode.

2. Parameter settings for **Type-K** measuring:
   Under the Type-K parameter setting mode, LCD will show , SET K --- press MODE button to select in turn for setting "ALM↑" , "↓ALM", press MODE button again to escape the setting mode and return to the general measurement.

   Note: In the set mode, if users don't push any button in 15 seconds , then it will escape from setting mode and enter into Type K temperature measuring mode.

   ε : Emissivity, users can press ▲ or ▼ button to adjust parameter.

   ALM↑: Hi Alarm Function. Press ▲ or ▼ to set up a value as an alarm value, while the measurement exceed it, the beeper will beep and "ALM↑" symbol will appear in LCD.

   ↓ALM: Lo Alarm Function. Press ▲ or ▼ to set up a value as an alarm value, while the measurement low it, the beeper will beep and "↓ALM" symbol will appear in LCD.

   MAX: Display the Maximum reading.

▲ : Button for increasing the value of Parameters, increasing the parameter rapidly.

▼ : Button for decreasing the value of Parameters, decrease the parameter rapidly.

Note:

- ❑ After finishing the setting procedure, the parameter will be memorized until next setting.
- ❑ Under mode settings, Backlight and Laser light function will be disabled.

IX. BATTERY REPLACEMENT

1. As battery power is not sufficient, LCD will display BT replacement with one new battery type 9V is required.
2. Open battery cover, then take out the battery from instrument and replace with a new 9-Volt battery and place the battery cover back.

LASER SIGHT COVERED BY ONE OR MORE OF THE FOLLOWING PATENTS :

Patent Notice: U.S.PAT. B1 5,368,392; 5,524,984; 5,727,880; 5,823,678; 5,823,679; 6,123,453/Germany G 94 22 197.9. G 94 22 203.7/ EPO 0 644 408/ France 2 767 921/ Holland 1007752/ Other Patents Pending.

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If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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