

**MINOLTA/LAND**  
infrared

# **CYCLOPS Meltmaster**

INSTRUCTION MANUAL



**CE**

# Safety Symbols

The following symbols are used in this manual to prevent accidents which may occur as result of incorrect use of the instrument.



Denotes a sentence regarding safety warning or note.

Read the sentence carefully to ensure safe and correct use.



Denotes a sentence regarding safety precaution for risk of fire.

Read the sentence carefully to ensure safe and correct use.



Denotes a prohibited operation.

The operation must never been performed.



Denotes an instruction.

The instruction must be strictly adhered to.



Denotes a prohibited operation.

The part must never be disassembled.

## **SAFETY PRECAUTIONS**

- To ensure correct use of this Cyclops, read the following points carefully and adhere to them. After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.



### **WARNING**

(Failure to adhere to the following points may result in death or serious injury.)



Never aim the Cyclops directly at the sun and look through the viewfinder. Doing so can damage your eyes and the spot thermometer.



Do not dispose of batteries in fire, short their terminals, apply heat to them, or disassemble them. Also, do not recharge disposable batteries, such as alkaline batteries. Doing so may result in heating or explosion of the battery, fire, or injury.



If the Cyclops requires repair or emits, smoke or odors, halt use immediately, set POWER switch to O (off), and remove battery. Contact the nearest LAND distributor. Never disassemble the Cyclops or attempt to repair it yourself.



Do not use this instrument in an explosive atmosphere such as one containing gasoline fumes. Use in such an area may result in an explosion.



### **CAUTION**

(Failure to adhere to the following points may result in injury or damage to the Cyclops or other property.)



Do not use batteries other than those specified. Also, be sure to install the battery with the battery terminals positioned as shown inside the battery chamber. Use of other batteries or incorrect installation may result in battery explosion or leakage, fire, or injury.



Do not walk while looking through the viewfinder. Doing so may cause you to trip or bump something.

Minolta/Land Cyclops Meltmaster is a portable infrared thermometers designed for non-contact temperature measurements. Cyclops Meltmaster features temperature displays inside the viewfinder, so measurements can be confirmed while viewing the subject. Three measuring modes are available: CONT. for continuously displaying the measured temperatures, PEAK for displaying the highest temperature measured, and AVERAGE for displaying a running average of a maximum of 10 measurements.

Emissivity can be easily adjusted to ensure exact temperature measurements.

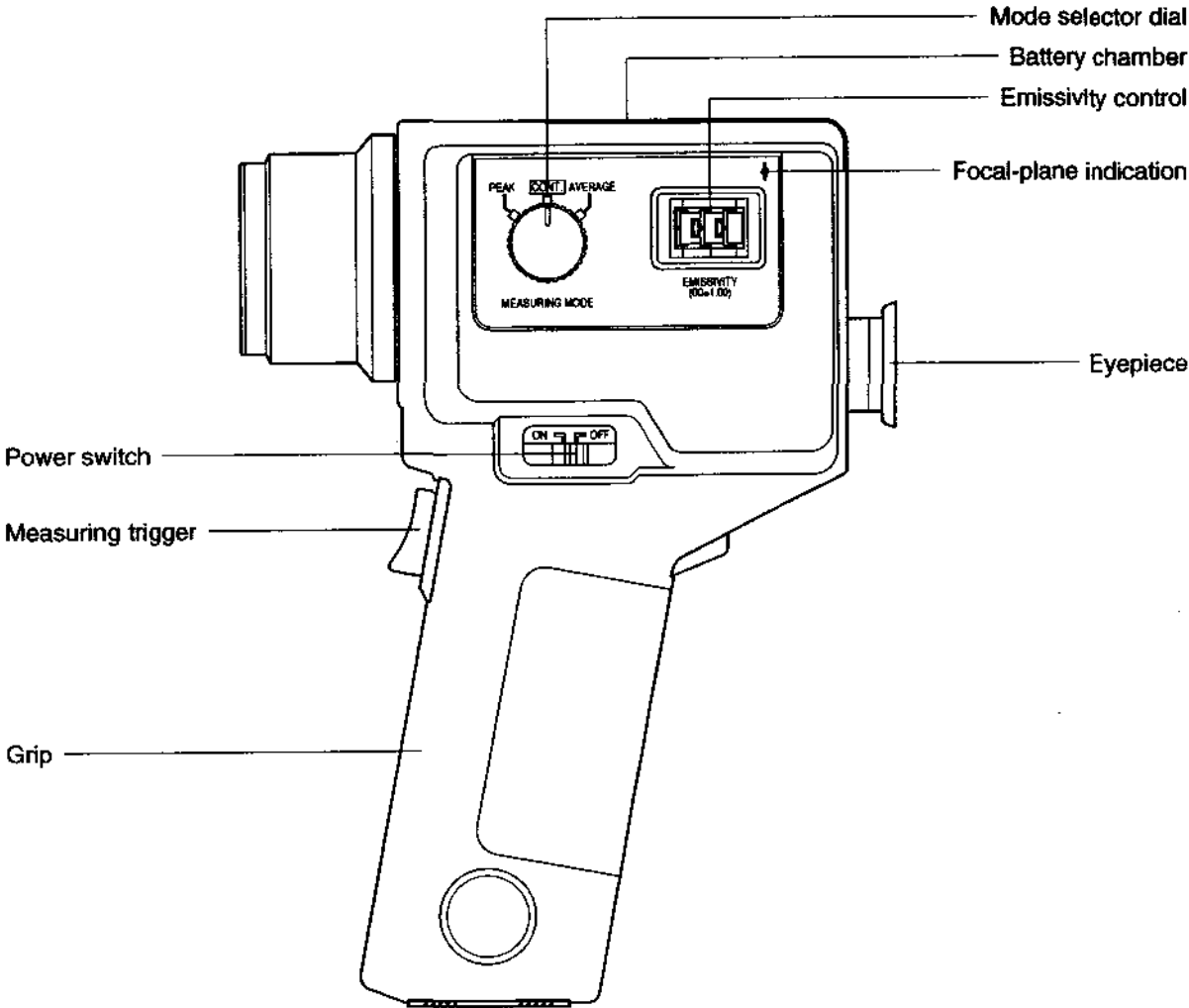
**Notes on use**

- Do not use the Cyclops in areas with ambient temperatures of less than 0°C (32°F) or higher than 50°C (120°F).
- Do not use the Cyclops in extremely dusty atmospheres or subject the thermometer to strong vibrations. If it must be used in a dusty atmosphere, use a blower to clean off dust after use and then wipe with a soft, dry cloth, preferably silicon-treated. Do not use organic solvents for cleaning. These may damage the thermometer.
- After use, set the power switch to OFF and cover the lens with the lens cap.
- Never attempt to disassemble the Cyclops. Any necessary repairs should be done carried out by LAND Infrared.
- If used in the vicinity of strong electromagnetic fields, this instrument may display an incorrect temperature. However it will recover to normal, when the field is removed.
- If aimed at an extremely harmful beam of light, this instrument will display an incorrect temperature. Never measure the temperature of an extremely harmful beam of light with this instrument.
- This instrument conforms to Installation Category I (the specified batteries must be used), Pollution degree 2 (use it in areas where there is no metal dust and no possibility of condensation). This instrument should not be used at altitudes above 2000 meters.

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**NAMES OF PARTS**



## FUNCTIONS OF CONTROLS

### 1. Power switch

Switches power on and off.

Sets monitor mode if slid from OFF to ON while measuring trigger is held pressed and mode selector dial is set to any of the three measuring modes.

### 2. Measuring trigger

Performs measurement when mode selector dial is set to any of the three measuring modes; measurement will be performed continuously while trigger is held pressed. When trigger is released, latest displayed value will be held in the display.

### 3. Mode selector dial

Selects mode of operation. Three measuring modes are available.

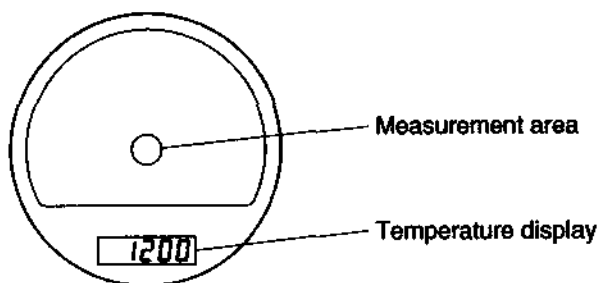
Measuring modes:

PEAK	Highest temperature measured while trigger was held pressed is displayed.
CONT.	Temperature of object presently being viewed is displayed.
AVERAGE	A running average of a maximum of 10 measurements is displayed while the trigger is held down.

### 4. Emissivity control

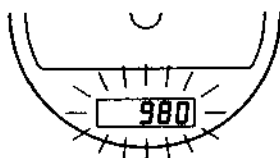
Sets emissivity of target being measured.

## VIEWFINDER DIAGRAM

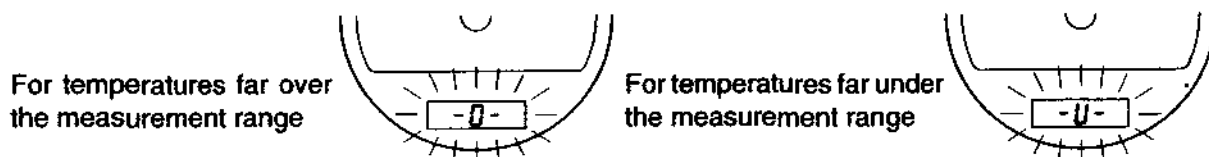


- When taking measurements, ensure that the subject completely fills the measurement area. If the subject does not fill the measurement area, measured temperature will not be correct.

If the measured temperature is slightly outside the measurement range, the back light will blink as shown below.



If the measured temperature is far outside the measurement range, the display will show "-O-" (for temperatures over the measurement range) or "-U-" (for temperatures under the measurement range).



The exact ranges for each of these error displays is shown below.

"-U-" display range	Blinking display range	"-O-" display range
949°C or less (1739°F or less)	950 to 999°C: 1801 to 1850°C (1740 to 1829°F: 3271 to 3360°F)	1851°C or more (3361°F or more)



## PREPARATIONS

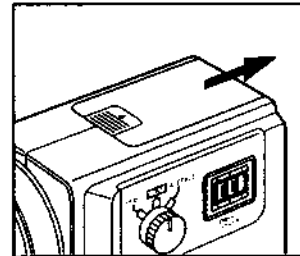
### Installing Battery

#### **⚠ WARNING**

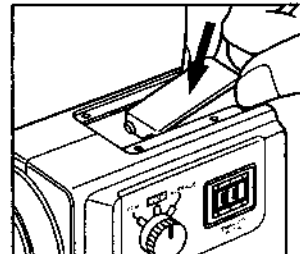
- |   |
|---|
| <p>⊘ Do not dispose of batteries in fire, short their terminals, apply heat to them, or disassemble them. Also, do not recharge disposable batteries, such as alkaline batteries. Doing so may result in heating or explosion of the battery, fire, or injury.</p>                |
| <p>⊘ Do not use batteries other than those specified. Be sure to install the battery with the battery terminals positioned as shown inside the battery chamber. Use of other batteries or incorrect installation may result in battery explosion or leakage, fire, or injury.</p> |

The Cyclops is powered by a single 9V alkaline-manganese battery (Eveready 216 or equivalent). To install the battery, follow the steps below.

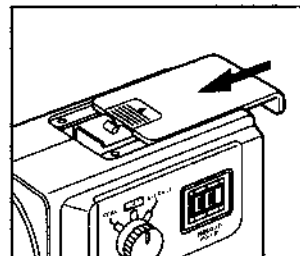
1. Check that the power switch is at OFF.
2. Remove the battery-chamber cover by pressing down on the thumb grip and sliding it in the direction shown in the diagram.



3. Position the battery terminals as shown inside the battery chamber and insert the battery, terminal end first.



4. Replace the battery-chamber cover by realigning it and sliding towards the lens of the Cyclops until the cover snaps securely in place.



### BATTERY CHECK


After fitting the battery, set the power switch to ON and press the measuring trigger. If the temperature display area becomes illuminated, the battery power is sufficient.


- If the temperature display area does not illuminate, check that the battery is fitted correctly, and refit if necessary.
- If battery is fitted correctly but temperature display area still does not illuminate, battery power is exhausted.

Place battery with a new one.

## MEASUREMENTS

### WARNING

 Never aim the Cyclops directly at the sun and look through the viewfinder. Doing so can damage your eyes and the Cyclops.

 Do not walk while looking through the viewfinder. Doing so may cause you to trip or bump something.

### Notes on Taking Measurements

- When taking measurements, ensure that the object being measured completely fills the measurement area indicated in the viewfinder. If the object does not completely fill the measurement area, the background may cause the displayed temperature value to be different than the actual temperature of the object.
- Measurements of objects in direct sunlight may result in temperature values which are higher than the actual temperature of the object, due to infrared radiation reflected from the object.

### Setting Emissivity

To measure the correct temperature of the surface being viewed, the emissivity control must be set to the value appropriate for that surface.

The emissivity control can be set to any value from 0.01 to 1.00 in 0.01 increments. The emissivity control is set to indicate the first two decimal places of the required emissivity value. For example, when measuring an object with an emissivity of 0.65, the emissivity control should be set to "65". When 1.00 is required, the emissivity control should be set to "00".

- The emissivity value which should be used when taking measurements with an infrared thermometer varies according to the measurement wavelength range of the model being used.

The appropriate emissivity value can be determined in any of the following ways:

- A. Checking reference literature.
- B. 1) Measure the temperature of the subject with a contact-type thermometer (such as a thermocouple, thermistor, etc.)  
2) Measure the same area of the subject with the Cyclops.  
3) While pressing the measuring trigger, adjust the emissivity control until the temperature shown in the display is the same as the temperature measured in step 1. The emissivity value set is the emissivity of the subject.
- C. 1) Attach something of known emissivity, such as one of the following.

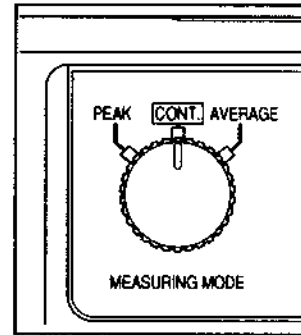
### Selecting Measuring Mode

Three different modes can be selected for taking measurements: PEAK, CONT., or AVERAGE. The temperature which is displayed in the viewfinder depends on the mode selected.

If PEAK is selected, the displayed temperature will be the highest temperature which was measured during the period from when the trigger was pressed until the trigger was released.

If CONT. is selected, the displayed temperature will be the temperature presently being measured.

If AVERAGE is selected, a running average of a maximum of 10 measurements is displayed.

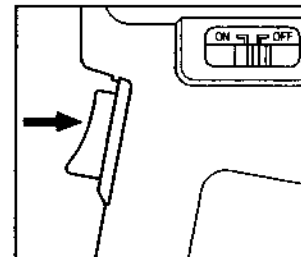


Mode selector dial

### Taking Measurements

To take measurements of a subject, follow the steps below.

1. Set emissivity to the value appropriate for the subject being measured. See p. 8.
2. Select measuring mode.
3. Set power switch to ON.
4. A buzzer sounds.
5. Aim the Cyclops at the subject.
  - Ensure that the subject completely fills the measurement area indicated in the viewfinder.
  - The focus distance of the Cyclops Meltmaster is fixed at 5m (as measured from the focal-plane indication). If it is necessary to take measurements at distances other than 5m, ensure that the subject fills as much of the viewfinder (not just the measurement area indicated in the viewfinder) as possible. If the subject fills only the indicated measurement area and the subject distance is greater or less than 5m, measurement may not be accurate.
  - Measurement areas at different subject distances are shown on p. 12.
6. Press the measuring trigger. A buzzer sounds. The first measured value will appear in the display.



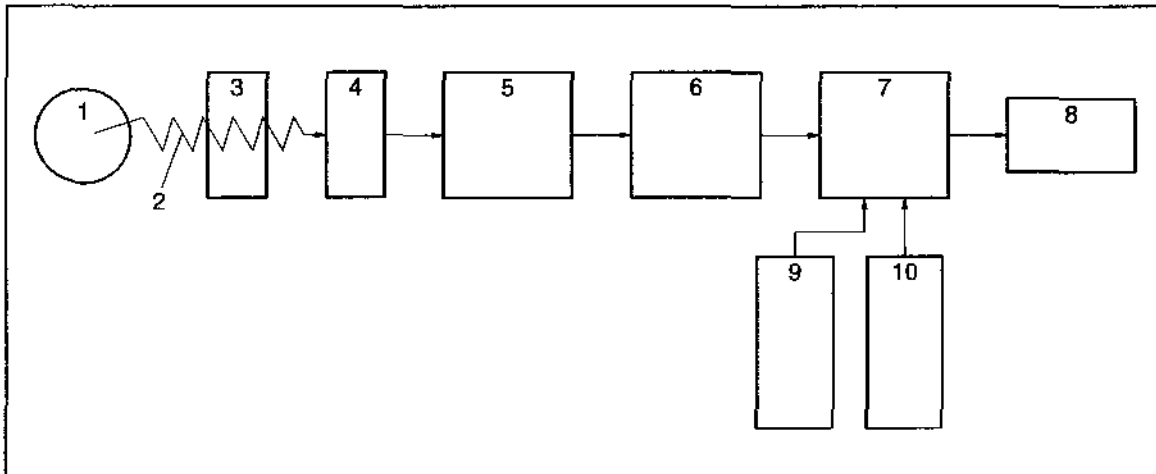
- Measurements will continue to be taken as long as the measuring trigger is held pressed. When the measuring trigger is released, the latest displayed value will be held in the display. The display will automatically be cancelled approximately 30 seconds after the trigger is released.

## MEASUREMENT PRINCIPLE

The Cyclops determines the temperature of an object by measuring the amount of radiant energy emitted by the object. Every object emits an amount of radiant energy proportional to the temperature of the object.

For exact temperature measurements, it is necessary to set the emissivity of the object on the Cyclops. Emissivity is the ratio of the radiant energy emitted by the object and the radiant energy emitted by a blackbody at the same temperature as the object. The emissivity depends on the object being measured, and also on the wavelength range which is detected by the Cyclops. The emissivity can be set using the emissivity control on the Cyclops.

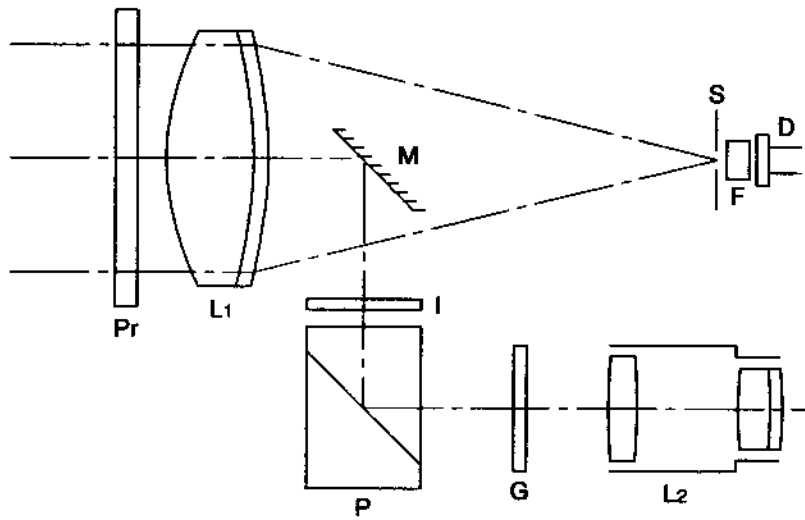
### Block Diagram



- |                       |                        |
|-----------------------|------------------------|
| 1. Measurement object | 6. A/D converter       |
| 2. Emitted energy     | 7. Microprocessor      |
| 3. Optical system     | 8. Display             |
| 4. Detector           | 9. Emissivity control  |
| 5. Amplifier          | 10. Mode selector dial |

Radiant energy emitted by the object is transmitted by the optical system, and is focused on the detector, which converts the radiant energy to an analog electrical signal. This analog signal is amplified and then sent to the A/D converter, where the analog signal is converted to a digital signal. The digital signal is received by the microprocessor, which calculates the appropriate temperature value according to the setting of the emissivity control and the mode selector dial. The mode selector dial can be used to select PEAK, CONT., or AVERAGE measuring modes. The value calculated by the microprocessor is then shown in the display.

# OPTICAL SYSTEM



- |    |                   |   |                 |
|----|-------------------|---|-----------------|
| L1 | Objective Lens    | P | Porro Prism     |
| L2 | Eyepiece          | G | Graticule Plate |
| M  | Mirror            | F | Filter          |
| S  | Field Stop        | D | Detector        |
| Pr | Protection Filter | I | ND. Filter      |

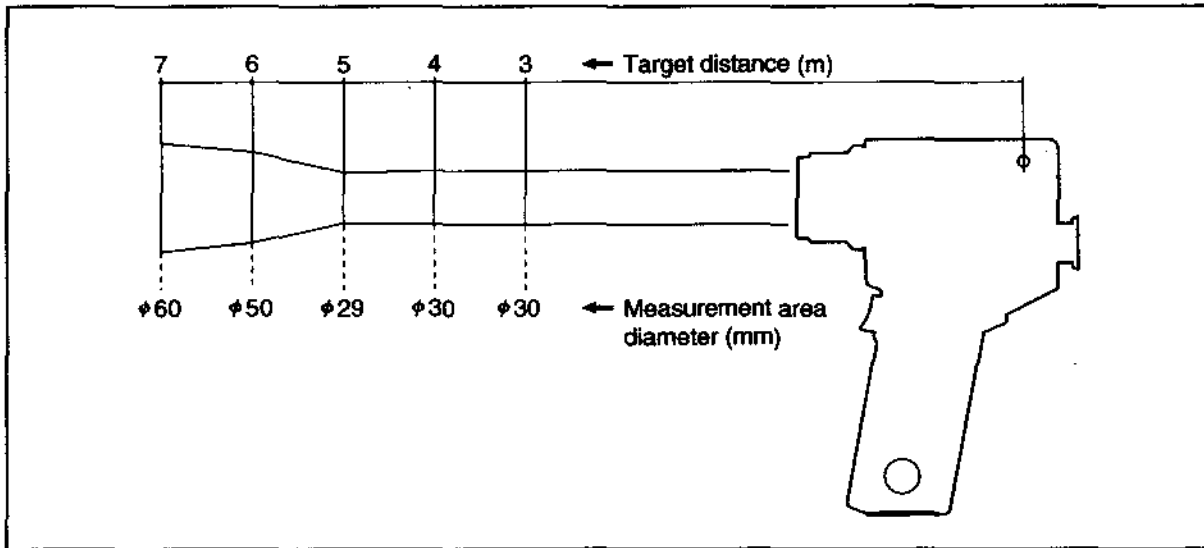
## MEASUREMENT AREA

The size of the measurement area varies according to the target distance as shown below.

Target distance (m)	$\infty$	7	6	5	4	3
Measurement area (mm)	$\infty$	$\phi 60$	$\phi 50$	$\phi 29$	$\phi 30$	$\phi 30$

- Target distance is measured from the focal-plane indication ( $\phi$ ).

The focus distance of the Cyclops Meltmaster is fixed at 5m (as measured from the focal-plane indication). At this distance, the measurement area is 29mm in diameter. The measurement area at target distances other than 5m can be determined from the diagram below.



- Target distance is measured from the focal-plane indication ( $\phi$ ).

## **CARE**

- If the Cyclops becomes dirty, it can be cleaned with a soft, dry cloth. Never use organic solvents, such as benzene or thinner, for cleaning. These may damage the thermometer.
- Be extremely careful to keep the protective filter clean. If the filter becomes dirty, use a blower to blow off dust; if necessary, the filter can then be wiped lightly with a lens tissue.

## **STORAGE**

- The Cyclops should be stored in a cool, dry place at temperatures between  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) and  $+55^{\circ}\text{C}$  ( $+131^{\circ}\text{F}$ ). In damp environments it should be stored in a sealed airtight container with a drying agent such as silica gel.
- If the Cyclops will be not used for more than two weeks, remove the battery to avoid the possibility of damage due to corrosion.
- Do not leave the Cyclops inside a closed motor vehicle, in direct sunlight, or near sources of heat such as stoves, strong lights, etc.

## TROUBLESHOOTING

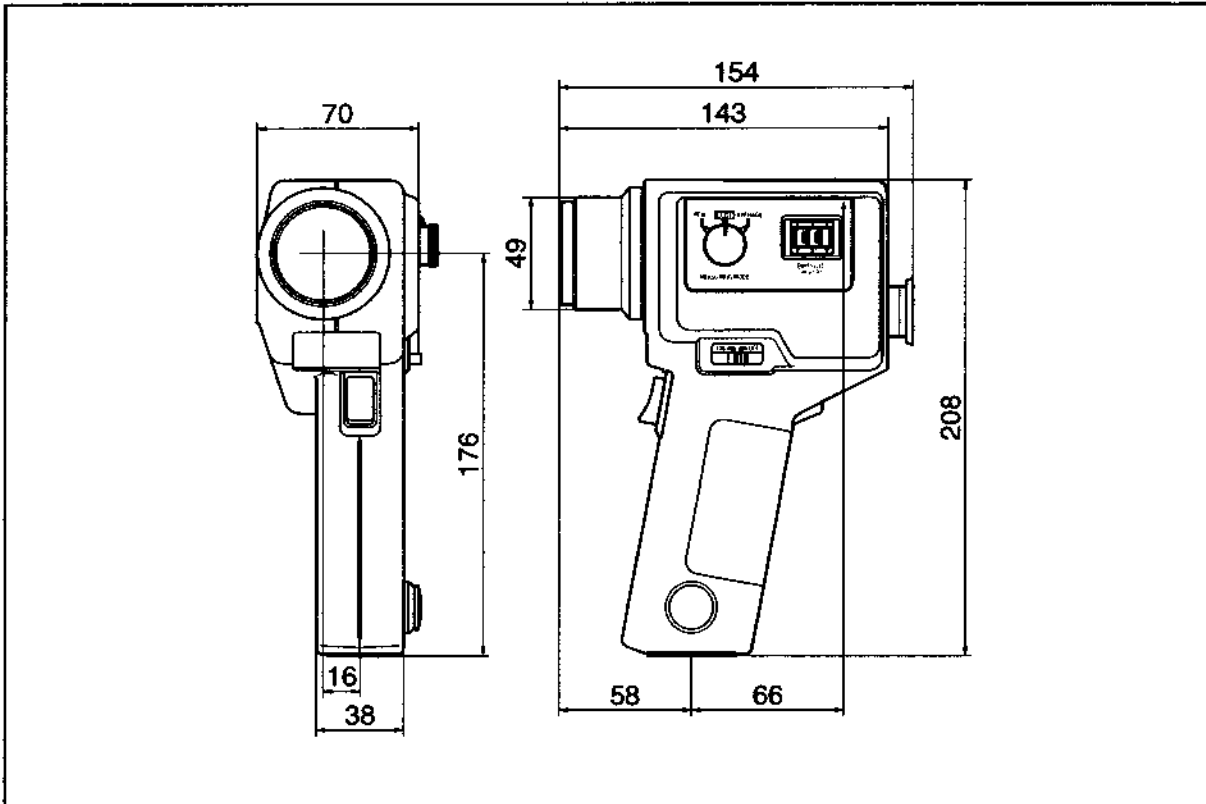
If a problem occurs with the Cyclops, please check the following points before requesting service.

Display doesn't illuminate even though measurement trigger is pressed.	Is battery old?	Replace old battery with fresh one.
	Is battery fitted correctly?	Fit battery correctly.
	Is power switch set to ON?	Set power switch to ON.
		Possible malfunction. Contact the nearest LAND distributor.
Displayed value doesn't change even if a different object is measured.	Is mode selector dial set to PEAK?	Set mode selector dial to a measuring mode (PEAK or CONT.).
		When mode selector dial is set to PEAK, displayed value will not change unless the object being measured is hotter than all other objects measured previously during the period when measuring trigger was held pressed.
		Possible malfunction. Contact the nearest LAND distributor.
Displayed measurement value seems strange.	Is protective filter dirty, scratched, or broken?	If filter is dirty, clean filter. If filter is scratched or broken, contact the nearest LAND distributor.
	Is emissivity setting correct?	Set correct emissivity for object being measured.
		Possible malfunction. Contact the nearest LAND distributor.
Object to be measured cannot be seen clearly in the viewfinder.	For Cyclops: Is object closer or further away than 5m (from the focal-plane indication)?	The focus distance of the Cyclops Meltmaster is fixed at 5m (from the focal-plane indication). Measurements should be taken at this target distance for best accuracy. Measurements at other distances will not be in focus.
Viewfinder is too dark to see anything.	Is lens cap still attached?	Remove lens cap.



# DIMENSION DIAGRAM

(Units: mm;)



## SPECIFICATION

Type:	Cyclops Meltmaster
Temperature range:	1000 to 1800°C (1830 to 3270°F)
Indication:	4-digit LCD display in 1° steps in the viewfinder; in measuring modes, display held for 30 seconds after switch-off; blinking display warns that temperature is out of measurable range
Measuring mode:	Continuous (CONT), peak hold (PEAK), average (AVERAGE)
Optical system:	9° field of view with 1/3° measuring circle; single-lens-reflex system;
Focusing Distance:	5m
Target Diameter:	29mm at 5m
Detector:	Silicon photocell
Spectral response:	0.55 μm
Emissivity adjustment:	0.1 to 1.0 in 0.01 step graduations
Response time:	Digital display 0.8 seconds (approx.)
Operating temperature range:	0 to 50°C/32 to 122°F; relative humidity 85% or less (at 35°C/95°F) with no condensation
Storage temperature range:	-20 to 55°C/-4 to 131°F; relative humidity 85% or less (at 35°C/95°F) with no condensation
Accuracy:	±1.0% of reading ±1 digit (in ambient temperature of 18 to 28°C; ε≈1.00)
Repeatability:	±0.3% of reading ±1 digit (in ambient temperature of 18 to 28°C; ε≈1.00)
Temperature drift:	±0.06%/°C of reading ± 1digit (ε≈1.00)
Power source:	One 9V dry battery (Eveready 216 or equivalent); consumption is 20mA with display on and 5mA with display off (approx.)
Dimensions:	208 × 70 × 143mm (8-1/4 × 2-3/4 × 5-1/2 in.)
Weight:	800g (1-3/4 oz.) without battery
Standard accessories:	Lens cap; 9V battery; hard case; wrist strp
Optional accessories:	dust protection case

Specifications subject to change without notice



The Quality Management System of Land Instruments International Ltd. is approved to BS EN ISO 9001 for the design, manufacture, and on-site servicing of combustion, environmental monitoring and non contact temperature measuring instrumentation, associated software is designed and developed in accordance with TickIT. Stock holding of the Minolta/Land Cyclops range of portable thermometers is covered by approval to BS EN ISO 9002. Traceability of calibration is to National Standards. Calibration certificates are available from the UKAS accredited calibration laboratory 0034.



THIS PRODUCT complies with current European directives relating to electromagnetic compatibility and safety (EMC directive 89/336/EEC).



All packaging material used for This product is 100% recyclable.

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