1. SAFETY INFORMATION

⚠️ REMEMBER: SAFETY IS NO ACCIDENT

These instructions contain both information and cautions that are necessary for the correct operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood.

Particular attention should be paid to the Precautions and Technical Specifications.

Please keep these instructions for future reference. Updated instructions and product information are available at: www.martindale-electric.co.uk

1.1 Meaning of Symbols and Markings

⚠️ Caution - refer to instructions

🍏 Equipment complies with relevant EU Directives

🔥 End of life disposal of this equipment should be in accordance with relevant EU Directives.

1.2 Precautions

Please pay attention to the following cautions before use.

⚠️ Cautions

The LM195 must only be used under the conditions and for the purposes for which it has been constructed and specified.

Before use, check the unit for cracks or any other damage. Make sure the unit is free from dust, grease and moisture. Do not use if damaged.

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged or when the unit is not in use for an extended period.

Keep the plastic domed cosine corrector covered by the protective cover supplied when not in use.
2. INTRODUCTION

2.1 Inspection
Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

2.2 Description
The LM195 has the following functions and features:
- Light intensity measurement to 199900 lux, 19990 fc
- Spectral response: CIE photopic
- Hold, Max and Min functions
- Auto power off
- Low battery indication
- LCD display with backlight

2.3 Accessories
The LM195 comes with the following accessories:
- 2 x 1.5V AA batteries
- Protective case for safe storage
- Instructions

2.4 Battery Installation
Refer to Section 4.1 (Battery Replacement).

3. OPERATION

3.1 Description of Press Buttons and LM195 Elements

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3.2 Description of LCD symbols

- Minimum value indicator
- Maximum value indicator
- Value hold indicator
- Set light source mode indicator
- Illumination value indicator
- Illumination Unit indicator
- Range indicator

3.3 Low Battery Indication
If the symbol is displayed, the battery needs replacing as measurement accuracy can no longer be guaranteed (See section 4.1 Battery Replacement).

3.4 Power On/Off
The LM195 will perform a self-test calibration check when powered up. This requires a completely dark environment so the protective sensor cap must be left on the sensor when the meter is powered up.

With the sensor cap fitted, press [CAP] to start the self-test. CAP will flash on the LCD for a few seconds, followed by CAL. Once a value of 0.0 appears on the LCD, the calibration is complete. Remove the sensor cap and place it behind the sensor head on the fixing mount. The LM195 is now ready for use. To switch off the LM195, press the [CAP] button and hold for 3 seconds until the unit has powered off.

Please note: If ERR1 appears on the LCD during the self-test calibration, check that the sensor cap is securely fixed over the sensor and start the Power-On process again.

3.5 Auto Power Off (APO)
If the unit is inactive for a period of 30 minutes, it will automatically power off.
To disable this function, press and hold the HOLD button while pressing the button. Release both buttons and the LM195 will perform the self-test. The symbol will disappear from the LCD to confirm the auto power off is disabled.

3.6 Backlight
Press the button to turn on the display backlight. It will automatically turn off after 30 seconds if there is no further operation of the unit.

3.7 Min/Max
Press the button to enable the MIN/MAX mode. By pressing the button, the user can select between the minimum, maximum and current readings. If the LM195 is to be left monitoring lux levels over a period of time greater than 30 minutes, please note that Auto power off function will need to be disabled first (see section 3.5). Failure to disable the Auto power off will result in the LM195 switching off while recording lux levels. To exit MIN/MAX mode, hold the button for 3 seconds and the MIN & MAX symbols will disappear to confirm the function is disabled.

3.8 Hold Mode
To enter the HOLD mode, press the HOLD button while in measurement mode. The HOLD symbol will appear on the LCD. To exit display hold, press the HOLD button again.

3.9 Unit of Measurement
Press the fc/lx button to change the unit of measurement between Foot Candle (fc) and Lux (lx).

The light level measurement should be taken at the application height. For light level measurements at a work station, the LM195 should be positioned at desk height. When measuring a work area or corridor, it should be placed on the floor.

It is important that the light source completely fills the sensor with minimal movement of the meter during measurement.

It is also advisable where possible to hold the LM195 away from your body when taking measurements to avoid reflections or creating a shadow on the sensor. The light sensing probe can be detached from the LM195. Avoid flexing the cable excessively at either end of the cable. For best accuracy, repeat the measurement several times to ensure that the light source has remained stable.

The Inverse-square Law
The illuminance E at a point on a surface varies directly with the intensity I of a point source, and inversely as the square of the distance d between the source and the point. If the surface at the point is normal to the direction of the incident light, the law is expressed by $E = \frac{I \cos \theta}{d^2}$.

3.10 Auto/Manual Ranging
The LM195 defaults to Auto range and selects the lowest range available. The user can select a different measuring range by pressing the RANGE button.

The available ranges are:
- AUTO, 200, 2000, 20000, 200000 lx
- AUTO, 20, 200, 2000, 20000 fc

3.11 Measurement Mode
The LM195 has preset correction factors which can be applied to ensure accurate measurements for different light sources:
- L0 – Standard incandescent light source
- L1 – LED white daylight (5000K)
- L2 – LED AMBER (yellow) light (3000K)
- L3 – LED GREEN light
- L4 – LED RED light
- L5 – LED BLUE light
- L6 – Warm white fluorescent lamp (2700K)
- L7 – Cold white fluorescent lamp (6500K)
- L8 – User adjustable mode

Press the button and use the and buttons to select the required light source correction factor setting. Once selected, press the SET button to save the setting.

Hold the LM195 so the light sensor is directed toward the light source (see note 3.12). Read the measured light intensity from the display.

3.12 Measurement Considerations
Keep the plastic domed sensor clean and free of scratches. It may be cleaned with a soft cloth and isopropyl alcohol.

Cosine Law
The illuminance on any surface varies as the cosine of the angle of incidence. The angle of incidence $\theta$ is the angle between the normal to the surface and the direction of the incident light. The inverse-square law and the cosine law can be combined as $E = \frac{I \cos \theta}{d^2}$

Spectral Mismatch Correction Factor
Spectral mismatch is the result of the differences between the relative spectral responsivity of a light meter’s sensor and the CIE photopic curve it is designed to simulate, when the light meter is used to measure a light source with a different relative spectral power distribution to that of the light source used to calibrate the light meter.

The LM195 has been calibrated against a standard tungsten light source at a correlated colour temperature of 2856K.

3.13 CIE Photopic Curve
4. MAINTENANCE

4.1 Battery Replacement

The battery compartment is on the rear of the unit. To gain access, undo the retaining screw and lift the cover away from the back of the unit.

Replace with 2 new AA batteries (IEC LR6, NEDA 15A), observing correct polarity. Replace the battery cover.

Note: Do not mix old and new batteries.

4.2 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved Calibration Laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.

Email: service@martindale-electric.co.uk
Tel: 01923 650660

5. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale’s opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale. Martindale’s warranty obligation is limited, at Martindale’s option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale withing the warranty period.

This warranty is the buyer’s sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or part of that provision.

Nothing in this statement reduces your statutory rights.
Specification
LM195
LED Light Meter

All specified accuracies are at 25°C ±1°C, <80% R.H. for 1 year
Temperature coefficient: 0.1 x (specified accuracy) per °C
(0-24°C, 26-40°C)
Accuracy: ±3% rdg ±5 dgts (Standard A light source) Note 1
±8% (other visible light sources)
Spectral response: CIE photopic Note 2
Range: 0.0 to 199.9/1999/19990/199900 lx
0.00 to 19.99/199.9/1999/19990 fc
Resolution: 0.1lx, 0.01fc
Angle deviation from cosine characteristics error:
10° ± 1% 30° ± 2%
60° ± 5% 80° ± 20%
Light detector: SI photodiode
Note 1: The CIE standard illuminant A can be realized by means of CIE standard source A, which is defined as: A gas-filled tungsten-filament lamp operating at a correlated colour temperature of 2856K.
Note 2: The CIE photopic curve is an international standard for the colour response of the average human eye.

PRESET LIGHT SOURCE WEIGHTING
Preset Light Source Weighting:
L0: Standard Incandescent Light Source
L1: LED White Daylight
L2: LED Amber (Yellow) Light
L3: LED Green Light
L4: LED Red Light
L5: LED Blue Light
L6: Warm White Fluorescent Lamp
L7: Cold White Fluorescent Lamp
L8: User Setup Mode

GENERAL
Display: liquid crystal display
Sampling rate: twice per second
Over range: OL is displayed
Power: 2 x 1.5V AA alkaline batteries (IEC LR6, NEDA 15A)
Continuous operating time: approximately 80 hours
Auto power off: after 30 minutes (can be disabled)
Dimensions: 169 (L) x 63 (W) x 37mm (H)
Weight: 185g including batteries
Includes: storage case, 2 x 1.5V AA batteries and instruction manual.

ENVIRONMENTAL
Temperature & Humidity (Operating): 0°C to 40°C & 80% R.H.
(Storage): -10°C to 50°C & 70% R.H. with batteries removed
Altitude: up to 2000m
Pollution degree: 2
EMC: Conforms to BS EN 61326-1

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- Continuity Testers
- Electricians’ Kits
- Environmental Products
- Full Calibration & Repair Service
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- Labels
- Microwave Leakage Detectors
- Motor Maintenance Equipment
- Multifunction Testers
- Non-trip Loop Testers
- Pat Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrhom Testers (4 & 5kV)
- Specialist Drummond Testers

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