MAVO-MONITOR

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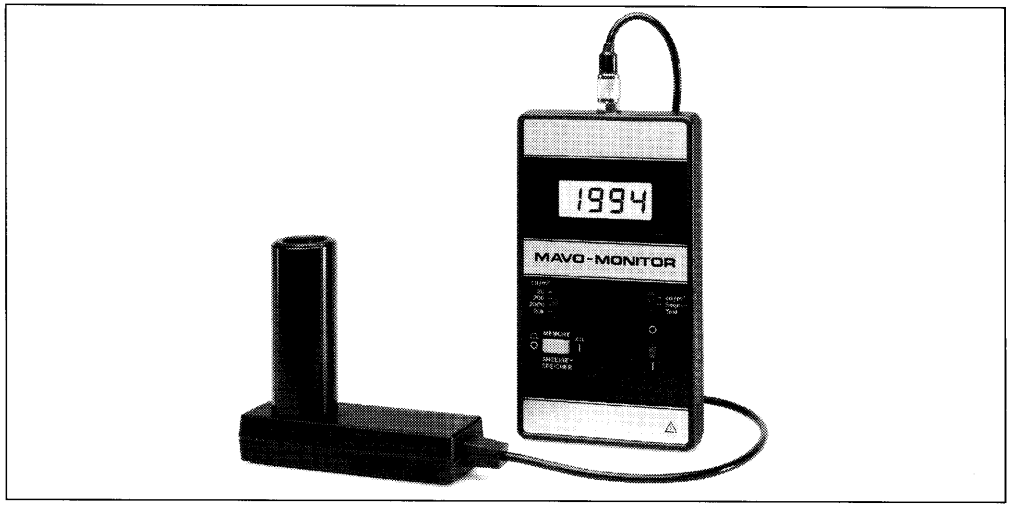
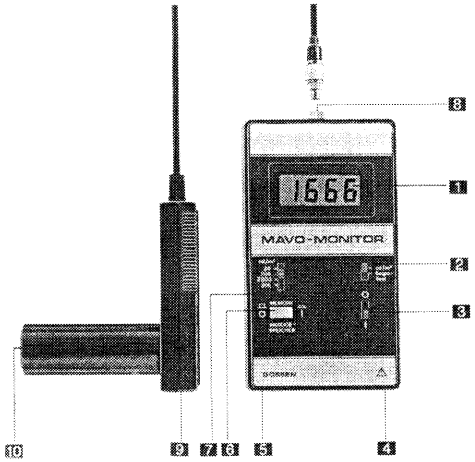




1 Display
2 cd/m²-segment test selector slider switch
Segment test selector slider switch
3 ON/OFF switch
4 Rechargeable battery socket [1)]
5 Recorder output socket [2)]
6 Display hold pushbutton
7 Range selector slider switch
8 Sensor connector socket
9 Sensor
10 Sensor aperture

1) Only use battery charger with safety transformer
2) Corresponding to safety class III

Contents

1 Description

Your MAVO-MONITOR is an illumination level meter designed for easy and precise measurements in cd/m² on backlighted or luminous surfaces such as, for instance, monitors, TV receivers, graphic panels, diffusor enclosures, traffic signs, smoked glass covers, and the like.

This meter is **color-corrected**, i.e. its spectral sensitivity is matched to the eye curve V (λ). The correction filters are incorporated in the sensor. They can thus practically measure all salient kinds of light without having to take correction factors into account.

The **recorder output** of the MAVO-MONITOR makes it particularly suitable for monitoring applications, checking technical acceptance conditions and wherever hardcopy results are required.

2 Operating instructions

First of all insert the supplied battery in the battery compartment on the rear of the meter. To open the compartment turn the screw through 45° using a coin so that the lid pops open.

2.1 Battery check

Meter has AUTO battery check. When a flashing arrow appears in the display the battery needs changing.

When using a rechargeable battery (IEC 6 LF 22) it must be recharged via the charging socket.

Make sure your battery charger is used in conjunction with a safety transformer.

2.2 Prior to measuring

Connect the sensor to the meter. Then switch on the meter using the ON/OFF switch and carry out a segment test.

2.3 Segment test

For this purpose move the slider switch to the position SEGM. TEST. The display is working properly when the readout 1888 appears for 1.5 seconds (followed by an undefined, readout). If not, the meter must be returned to us for repair.

2.4 Measuring

Move the slider switch EI to "cd/m²" and position the range slider selector U to the range permitting optimum utilization of the 31/2 digit readout.

2.5 Out of range indication

... range is exceeded the display will merely read a ... other digits will be blank. Correct by moving the range ... to the next highest range.

2.6 Display hold

Pressing the display hold button will „freeze" the readout at that time. Pressing this button again will release the hold and normal measurements can be resumed.

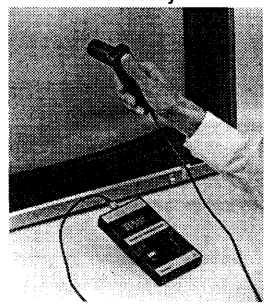
2.7 Recorder connection

The recorder output produces 1.00 V for every full-range value measurement. To obtain precise recordings the recorder must have a DC voltage measuring range of 0 . . . 1.00 V and its input impedance must be at least 500 kΩ. The recorder connector socket is coded safety class III.

2.8 Carrying case

The carrying case and its strap serve to transport and protect the meter. It contains an extension strap for hanging the case from the neck, a notice block and a loop to take the sensor.

2.9 How to measure correctly



Make sure the surface being measured is fully in contact with the sensor tube opening. Avoid strong ambient light conditions. This is particularly important when a glass pane is sandwiched between the actual screen surface and the sensor. This could result in reflected light distorting the measurement.

Keep the meter dry and clean, away from dust. Avoid exposing the sensor to unnecessary light. In short, keep the meter in its carrying case.

Please note that

- artificial light sources do not achieve full luminance until having warmed up over a lengthy period,
- the luminance of light sources depends on the power supply, i.e. check the voltage with a voltmeter, where necessary.

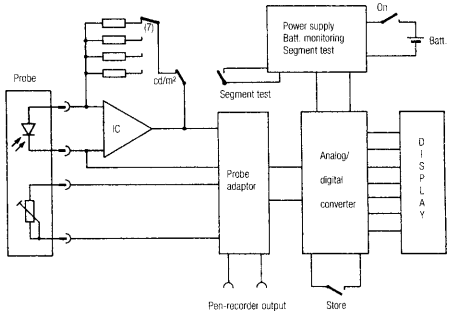
3 Technical data

Measuring ranges and resolution	0.01 ... 19.99 cd/m²	(10 mcd/m²)
	0.1 ... 199.9 cd/m²	(100 mcd/m²)
	1 ... 1999 cd/m²	(1 cd/m²)
	0.01 ... 19.99 kcd/m²	(10 cd/m²)
	All ranges protected with out-of-range indication, i.e. a 1 at the highest digit, remaining digits blank	
Accuracy	for incandescent bulb light (normal light A) ± (2.5% of input + 4 digits)	
	Additional error to max. ± 3% of input other light sources (as per CIE TC – 2.2):	
Recorder output	0 ... 1.00 V for each range required input impedance of recorder at least ≥ 500 kΩ. Recorder output socket complies with safety class III requirements.	
Sensor		
Aperture	18.5 mm dia.	
Sensor surface area	10 x 10 mm	
Display	LCD 3½ digit	
Digit height	12.7 mm	
Case	Plastic	
Dimensions	Meter: 86 x 153 x 25 mm Sensor: 32 x 105 x 95 mm Connecting cable 1,5 m long Carrying case: approx. 140 x 200 x 40 mm	
Weight	incl. carrying case approx. 0.7 kg	
Power supply	Battery 9 V IEC 6 F 22 (e. g. Mallory MN 1604 (alkaline) or Varta Super 438) Rechargeable battery IEC 6 LF (e. g. Varta 4002)	
Accessories	Rechargeable battery IEC 6 LF Wall outlet battery charge 9 V/9 mA	

4 Function

The meter essentially comprises the sensor containing the silicon photocell and the correction filters and the meter itself. In an integrated (IC) operational amplifier the short-circuit current of the photocell, which is located directly at the input to the op amp, is measured. This kind of short-circuit current measurement has the advantage of low dependency on temperature and producing a linear result.

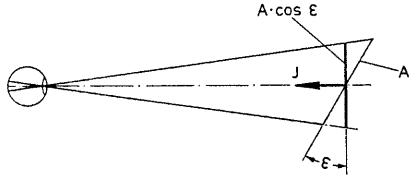
Range selection is done by means of the selector slider switch. Sensors can be interchanged by means of the "sensor matching" circuit in conjunction with the potentiometer control in the sensor. This circuit also generates the voltage level for the recorder output.



5 Theory in brief

What is illumination level, i.e. luminance?

This is the amount of light as registered by the eye. Luminance thus expresses the brightness of a surface. The luminance in a certain direction is the density of the illumination emsitted from the light-source surface, i.e. the quotient of the illuminance J in the direction concerned and the illuminating surface area A · cos ε.



The unit of measurement of luminance is the candela per square centimeter = cd/cm² or for very low luminance levels cd/m². Former unit was "apostilb" (1 asb = 0.31831 cd/m²).

Also used:

1 fL (foot lambert) = 3.426 cd/m²
1 cd/ft² (candela per square foot) = 10.76 cd/m²