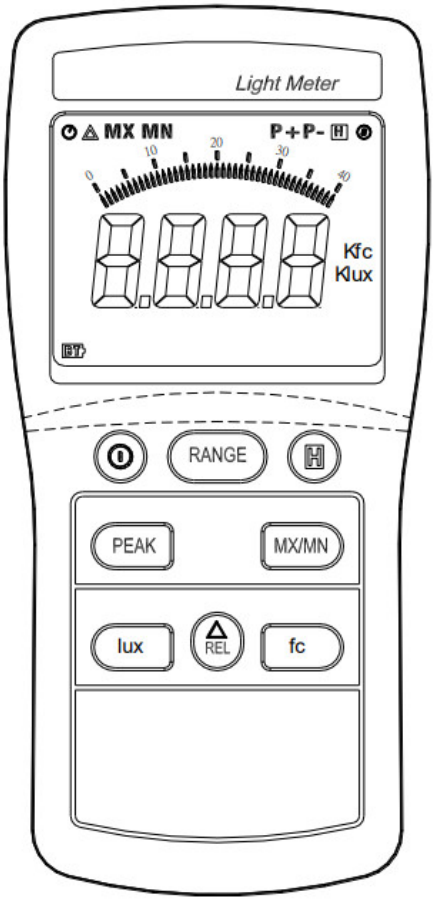
Elma 1335 Digital Luxmeter With Large Measuring Range Instruction Manual

Manual
Elma 1335 Lux meter
EAN: 5706445340217

Contents

1335 Digital Luxmeter With Large Measuring Range

Elma 1335



U.S. Pat. No. Des. 446,135
U.S. Pat. No. Des. 469,025

Instruction

The digital illuminance meter is a precision instrument used to measure illuminance (lux, footcandle) in the field.

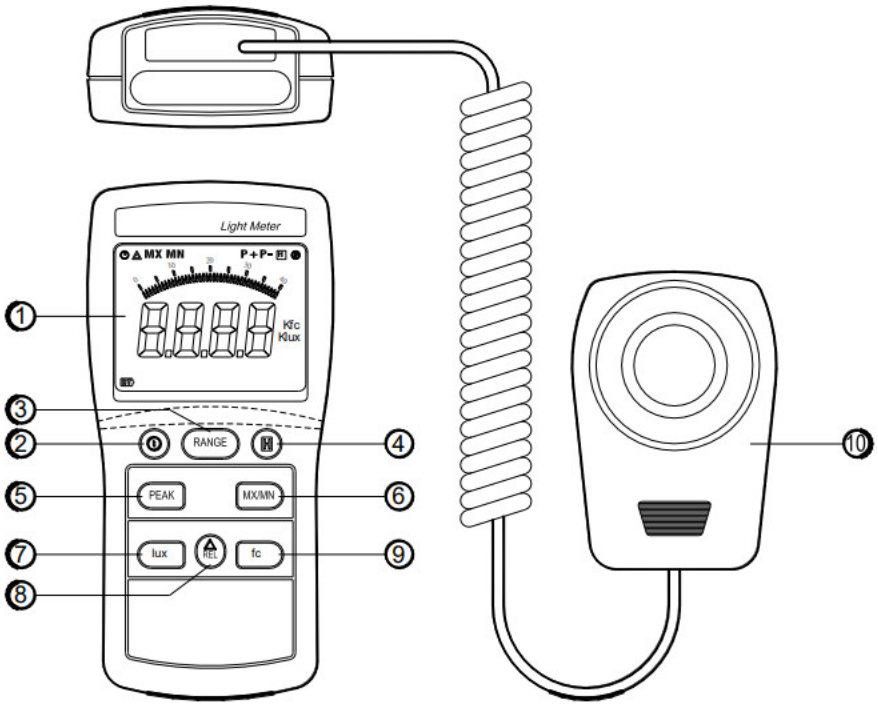
- It is meet CIE Photopic spectral response.
- It is fully cosine corrected for the angular incidence of light.
- The illuminance meter is compact, tough and easy to handle owing to its construction.
- The light sensitive component used in the meter is a very stable, long-life silicon photo diode and spectral response filter.

Features

- Light measuring levels ranging from 0.01 lux ~ 0.1 klux / 0.01 fc ~ 0.01 kfc, repeatedly.
- High accuracy and rapid response.
- Data-hold function for holding measuring values.
- Unit and sign display for easy reading.
- Automatic zeroing.
- Meter corrected for spectral relative efficiency.
- Correction factor need not be manually calculated for non-standard light sources.
- Short rise and fall times.
- Peak-hold function for tracing a peak signal of light pulse with least duration 10 s and keeping it.
- Capable of selecting measuring mode in lux or fc scale, alternatively.

- Auto power off after 30 minutes.
- Maximum and minimum measurements.
- Relative reading function.
- User calibration factor (CAL) and spectral correction factor (SCF) function. (Include LED)

Name Of Parts and Positions



1. LCD Display: 3-3/4 digit displays with a maximum reading of 3999, and the indicating signs of measured values, unit function symbols, and decimal points etc.are display.
2. Power Control key: The power switch key turns the illuminance meter ON or OFF.
3. Range Selector key: It indicates 40.00 lux, 400.0 lux, 4000 lux, 40.00 Klux 400.0klux/40.00 fc, 400.0 fc, 4000 fc, 40.00 Kfc total 5 range for lux and 4 range for fc.
4. “H” Data-Hold key: Data Hold control key.
5. Peak Hold key: Peak Hold recorder control key.
6. MX/MN key: Maximum and Minimum reading recorder control key.
7. Lux key: Pressing the “lux” key selects taking measurement of illuminance in lux scale.
8. Relative Reading key: Relative reading control key.
9. fc key: Pressing the “fc” key selects taking measurement of illuminance in footcandle scale; and, 1 footcandle=10.76 lux.
10. Photo Detector.

Operating Instructions

1. Power-up: Press the power key to turn the meter ON or OFF.
2. Selecting the lux or fc scale: Set the range selection switch to desired lux or fc range.
3. Remove the photo detector cap and face it perpendicular to the light source.
4. Read the illuminance nominal from the LCD display.
5. Overrange: If the instrument only display “OL”, the input signal is too strong, and a higher range should be

selected.

6. Data-Hold mode: Press the “H” key to select Data-Hold mode. When HOLD mode is selected, the illuminance meter stops all further measurements. Press the “H” key again to exit DATAHOLD mode. Then it resumes normal operation.
7. Peak-Hold recorder mode: Press “PEAK” key to enter P+ recorder mode and expose the photo detector to light pulse-measuring field. Press “PEAK” key again to exit PEAK recorder mode, then the meter will return to normal position.
8. Maximum and Minimum recorder mode: Press “MX/MN” key to cycle through Maximum (MX) reading, Minimum (MN) reading and current reading (MX/MN blink) recorder mode. Press “MX/MN” key two seconds to exit this mode.
9. Relative reading mode: Press “ΔREL” key to enter Relative mode. The display shown zero value and the current reading will be stored as a zero-in value. Press again to exit this mode.
10. When the measurement is completed, replace the photo detector cap and turn the meter off.

Setting the Calibration Factor (CAL)

The CAL allows the user to calibrate the meter to any subject desired. It can be used to calibrate the meter to another standard subject for which the illuminance is known, to precisely standardize meters to the same subject.

1. Press ⊙ power key to turn on the meter.
2. Press “H” key for 2 seconds to enter the setting mode, the “SEt1” mark is displayed.
3. Press “ΔREL” key to enter CAL setting mode.
4. Press “RANGE” key to position the cursor on the factor value element to adjust and press “lux” or “fc” key to change the selected element value from 0.800 to 1.500.
5. Press “ΔREL” key to complete the action and exit.

Setting the Spectral Correction Factor (SCF)

When measuring under a light source which has a considerably different spectral distribution from the meter calibration light source, the meter will cause an indication error due to a sight deviation of the relative spectral response from spectral luminous efficiency (Vλ). To correct this error, the meter has SCF function, allowing you to set the SCF values. The SCF function can also be used for correction of indication errors between the meters and for user calibration under an accurately set light source.

In SCF mode, the following value is displayed.
Display value = Measurement value x SCF

1. Press ⊙ power key to turn on the meter.
2. Press ”H” key for two seconds to enter the setting mode, the “SEt1” mark is displayed.
3. Press “RANGE” key to select “SEt2”.
4. Press “ΔREL” key to enter the SCF setting mode, the previously selected light source is displayed.
5. Press “RANGE” key to cycle select the desired light source.

“L0 uuHitE	SCF	0.990”:	LED white daylight
“L1 rEd	SCF	0.516”:	LED red light
“L2 grEEn	SCF	1.216”:	LED green light
“L3 bLUE	SCF	1.475”:	LED blue light
“L4 YELLO	SCF	0.815”:	LED yellow light
“L5 PUrPLE	SCF	1.148”:	LED purple light
“L6 – L9 USEr	SCF	1.000”:	User-specified
“U0 FLd	SCF	0.994”:	Daylight fluorescent lamp
“U1 Fuu	SCF	0.996”:	White fluorescent lamp
“U2 FL3	SCF	1.007”:	Three-way fluorescent lamp
“U3 HgL	SCF	0.993”:	High-pressure mercury vapor lamp
“U4 nAL	SCF	0.988”:	High-pressure sodium vapor lamp
“U5 Stb	SCF	0.996”:	Standard light source B
“U6 StC	SCF	0.995”:	Standard light source C
“U7 uut	SCF	0.997”:	Equal-energy source (400 – 760nm)
“U8 – U9 USEr	SCF	1.000”:	User-specified

6. Make a choice
   ① Press “REL” key to confirm the selected light source and exit this mode.
   ② Press “MX/MN” key to enter to return the factory all default value mode, the “rE n” mark is displayed.
   Press “RANGE” key to select YES “y” or NO “n”, then press “ΔREL” key to perform the selected and exit.
   ③ Press “PEAK” key to enter the selected light source SCF value setting mode, press “RANGE” key to position the cursor on the factor value element to adjust and press “lux” or “fc” key to change the selected element value from 0.200 to 5.000.
   Press “ΔREL” key to stored the SCF value and exit.
7. In the measurement mode, press “lux” key for 2 seconds to enter select enable or disable the SCF function mode, press “RANGE” key to select “on” or “OFF” then press “ΔREL” key to stored the selected and exit.
   If select “on” will enable SCF function, the bargraph “–” mark will blinking displayed.
8. In the measuring mode, press “fc” key for 2 seconds to show the previously selected light source and the SCF value for 3 seconds.

ENABLE AUTO POWER OFF FUNCTION

When enable auto power function, the meter will automatically enter sleep mode when no key press approx. 30 minutes to save power consumption.

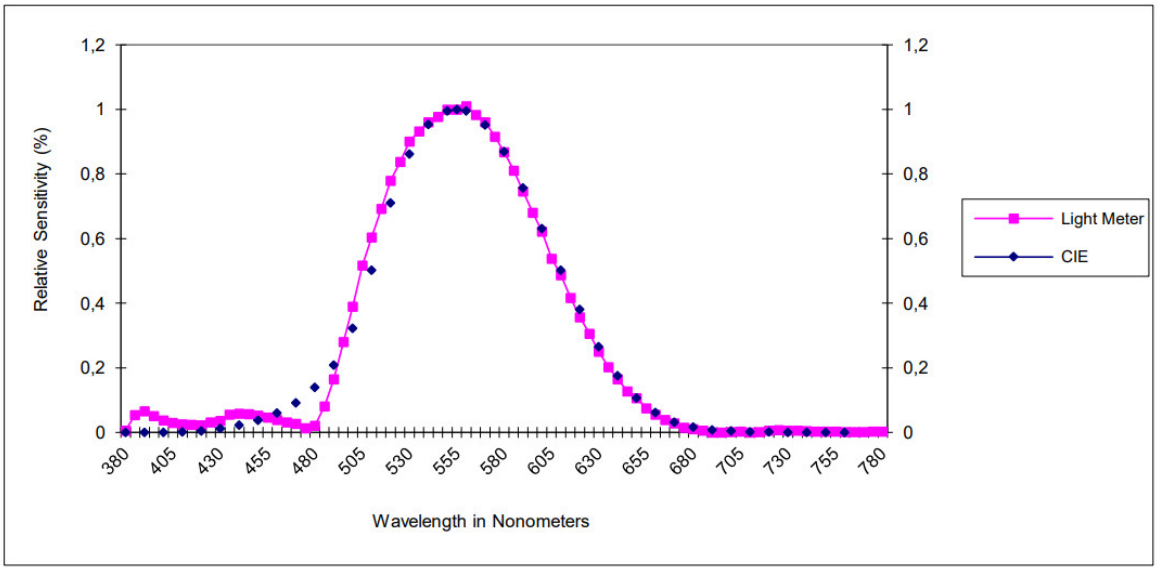
1. Press ⊙ power key to turn on the meter.
2. Press “HOLD” key for 2 seconds to enter the setting mode, the “SEt1” mark is displayed.
3. Press “RANGE” key to select “SEt3”.
4. Press “REL” key to enter the auto power off function setting mode, the “oFF” mark is displayed.
5. Press “RANGE” key to select APO function is “on” or “oFF”. If select “on”, the APO mark is displayed.
6. Press “REL” key to exit this mode.

Battery Check & Replacement

1. When the battery power is low, the “BT” indicator appears on the LCD, indicating that the battery needs to be replaced.
2. Remove the power supply from all test terminals, use a screwdriver or coin to unscrew the slotted screw on the battery cover behind the bracket, take out the battery cover, remove the battery from the battery connector, and replace with six new 1.5V batteries.
3. Close the battery cover and use a screwdriver or coin to lock the flat-blade screw.
4. Prevention of battery fluid leakage: When the meter will not be in use for the long period of time, please remove the batteries out of meter to prevent the possibility of battery fluid leakage damage.

Spectral Sensitivity Characteristic

- To the detector, the applied photo diode with filters makes the spectral sensitivity characteristic almost meet C.I.E. (INTERNATIONAL COMMISSION ON ILLUMINATION) photopic curve V(λ) as the following chart described.



Maintenance

1. The white plastic disc on the top of the detector should be cleaned with a damp cloth when necessary.
2. Do not store the instrument where temperature or humidity is excessively high.
3. The reference level, as marker on the face plate, is the tip of the photo detector globe.
4. The calibration interval for the photo detector will vary according to operational conditions, but generally the sensitivity decreases in direct proportion to the product of luminous intensity by the operational time. In order to

maintain the basic accuracy of the instrument, periodic calibration is recommended.

Recommended illuminations.

1fc = 10.76 Lux

LOCATIONS	lux	fc
• **OFFICE**		
Conference, Reception room	200 ~ 750	18 ~ 70
Clerical work	700 ~ 1,500	65 ~ 140
Typing drafting	1,000 ~ 2,000	93 ~ 186
• **FACTORY**		
Packing work, Entrance passage	150 ~ 300	14 ~ 28
Visual work at production line	300 ~ 750	28 ~ 70
Inspection work	750 ~ 1,500	70 ~ 140
Electronic parts assembly line	1,500 ~3,000	140 ~ 279
• **HOTEL**		
Public room, Cloakroom	100 ~ 200	9 ~ 18
Reception	200 ~ 500	18 ~ 47
Cashier	750 ~ 1000	70 ~ 93
• **STORE**		
Indoors Stairs Corridor	150 ~ 200	14 ~ 18
Show window, Packing table	750 ~ 1,500	70 ~ 140
Forefront of show window	1,500 ~ 3,000	140 ~ 279
• **HOSPITAL**		
Sickroom, Warehouse	100 ~ 200	9 ~ 18
Medical Examination room	300 ~ 750	28 ~ 70
Operating room		
Emergency Treatment	750 ~ 1,500	70 ~ 140
• **SCHOOL**		
Auditorium, Indoor Gymnasium	100 ~ 300	9 ~ 28
Class room	200 ~ 750	18 ~ 70
Laboratory, Library, Drafting room	500 ~ 1,500	47 ~ 140

Specifications

- Display:3-3/4 digit LCD with high speed 42 segment bar-graph.
- Measuring Range: 40.00 lux, 400.0 lux, 4000 lux, 40.00 Klux and 400.0 klux / 40.00 fc, 400.0 fc, 4000 fc, 40.00 Kfc.

  Note: 1fc=10.76Lux , 1Klux=1000Lux , 1Kfc=1000fc
- Over range Display: LCD will show “OL” symbol.
- Spectral Response: CIE Photopic (CIE human eye response curve).
- Spectral Accuracy: CIE Vλ function f ’1 ≤ 6%
- Cosine Response: f ’2 ≤ 2%
- Accuracy: ±3% rdg ± 0.5% f.s. (±4% rdg±10 dgts as > 10,000 lux/fc range).

  (Calibrated to standard incandescent lamp at colour temperature 2856K).
- Repeatability: ±2%.
- Temperature Characteristics: ±0.1%/°C.
- Sampling Rate: 13.3 times/sec of analog bar-graph indication-1.3 times/sec of digital display.
- Photo Detector: One silicon photo diode and spectral response filter.
- Operating Temperature & Humidity: 0°C to 40°C (32°F to 104°F) & 0% to 80% RH.
- Storage Temperature and Humidity: -10°C to 50°C (14°F to 140°F) & 0% to 70% RH.
- Power Source: 6 pcs size AAA battery. Battery life (typical): 400 hours (carbon zine).
- Photo detector Lead Length: 150 cm (approx.).
- Photo detector Dimensions: 92L×60W×29H (mm).
- Meter Dimensions: 150L×72W×35H (mm).
- Weight: 320g.
- Accessories: Carry case, instruction manual, battery

Elma Instruments A/S Ryttermarken 2 DK-3520 Farum T: +45 7022 1000 F: +45 7022 1001 info@elma.dk www.elma.dk	Elma Instruments AS Garver Ytteborgsvei 83 N-0977 Oslo T: +47 22 10 42 70 F: +47 22 216200 firma@elma-instruments.no www.elma-instruments.no

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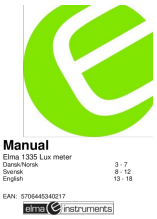
Documents / Resources



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1335 Digital Luxmeter With Large Measuring Range, 1335, Digital Luxmeter With Large Measuring Range, Luxmeter With Large Measuring Range, With Large Measuring Range, Large Measuring Range, Measuring Range