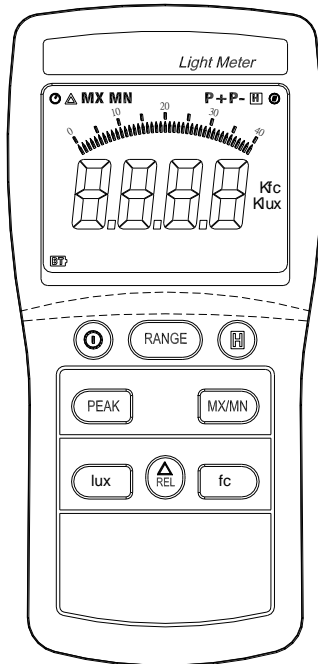




DIGITAL ILLUMINANCE METER

TES-1335

INSTRUCTION MANUAL



TES ELECTRICAL ELECTRONIC CORP

I INSTRUCTION

- The digital illuminance meter is a precision instrument used to measure illuminance (lux, footcandle) in the field.
- It meets 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 photodiode and spectral response filter.
- **U.S. Pat. No. Des. 446,135**
- **U.S. Pat. No. Des. 469,025**

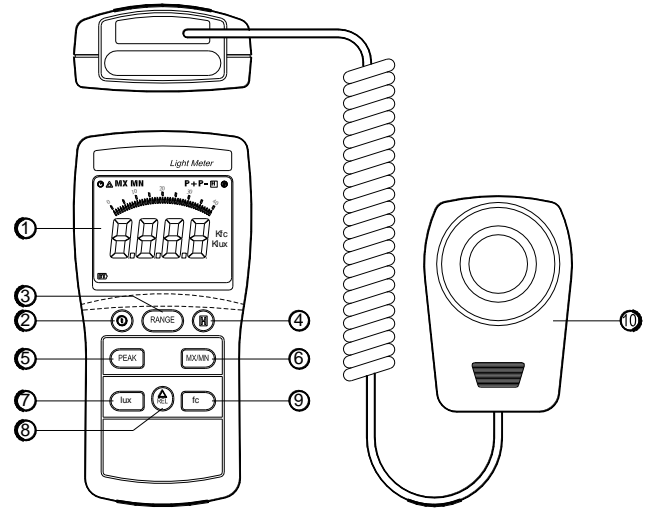
II FEATURES

- 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 the peak signal of light pulse with least duration 10 μ s and keeping it.
- Capable of selecting measuring mode in lux or fc scale, alternatively.
- Auto power off 30 minutes.
- Maximum and minimum measurements.
- Relative reading function.

III SPECIFICATIONS

- Display : 3-3/4 digit LCD with high speed 42 segment bargraph.
- 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
- Overrange Display : LCD will show "OL" symbol.
- Spectral Response : CIE Photopic. (CIE human eye response curve).
- Spectral Accuracy : CIE V_{λ} function $f'_{1} \leq 6\%$
- Cosine Response : $f'_{2} \leq 2\%$
- Accuracy : $\pm 3\%$ rdg $\pm 0.5\%$ f.s. ($\pm 4\%$ rdg ± 10 dgts as $> 10,000$ lux/fc range) .
(calibrated to standard incandescent lamp at color temperature 2856K).
- Repeatability : $\pm 2\%$.
- Temperature Characteristics : $\pm 0.1\% / ^{\circ}\text{C}$.
- 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 : 92Lx60Wx29H (mm);
- Meter Dimensions : 150Lx72Wx35H (mm);
- Weight : 320g .
- Accessories : Carry case, instruction manual,battery.

IV 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 400.0 klux/40.00 fc, 400.0 fc, 4000 fc, 40.00 Kfc total 5 range for lux and 4 range for fc.
4. 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.

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 \triangle REL 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.

V 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 HOLD key to select Data-Hold mode. When HOLD mode is selected, the illuminance meter stops all further measurements. Press the HOLD key again to exit DATA-HOLD mode. Then it resumes normal operation.
7. Peak-Hold recorder mode : Press and hold down PEAK key until display shown the "CAL" letter, then press PEAK key cycle through P+ and P- recorder mode, and expose the photo detector to light pulse measuring field. Press and hold down PEAK key 2 seconds to exit PEAK recorder mode, then the meter will resume normal operation.

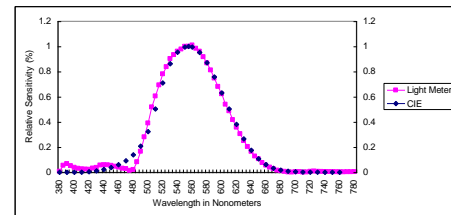
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VI BATTERY CHECK-UP & REPLACEMENT

1. As the battery power is not sufficient, LCD will display "BT" ; and, replacement of one new batterie type 6×1.5V is required.
2. After turning off the meter, press the battery cover and push in the direction of the arrow to open.
3. Disconnect the battery from the instrument and replace it with a standard 6×1.5V battery and go for the cover.

VII 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 $V(\lambda)$ as the following chart described.



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VIII 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.

IX RECOMMENDED ILLUMINATION

1fc = 10.76 Lux

LOCATIONS	Lux	fc
● OFFICE		
Conference, Reception room.	200 ~ 750	18 ~ 70
Clerical work	700 ~ 1,500	65 ~ 140
Typing drafting	1000 ~ 2,000	93 ~ 186
● FACTORY		
Visual work at production line	300 ~ 750	28 ~ 70
Inspection work	750 ~ 1,500	70 ~ 140
Electronic parts assembly line	1500 ~ 3,000	140 ~ 279
Packing work, Entrance passage	150 ~ 300	14 ~ 28

● 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	1500 ~ 3,000	140 ~279
● HOSPITAL		
Sickroom, Warehouse	100 ~ 200	9 ~ 18
Medical Examination room	300 ~ 750	28 ~ 70
Operating room		
Emergency Treatmet	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



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