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4-in-1
Environment Monitor

Code: 343500

Operating
Instructions

1. INTRODUCTION

The 4-in-1 digital Multi-Function Environment Meter has been designed to combine the functions of Sound Level Meter, Light Meter, Humidity Meter and Temperature Meter. It is an ideal Multi-Function Environment Meter Instrument with scores of practical applications for professional and home use.

The Sound Level function can be used to measure noise in factories, schools, offices, airports, home, etc. checking acoustics of studios, auditoriums and hi-fi installations.

The Light function is used to measure illuminance in the field. It is fully cosine corrected for the angular incidence of light. The light sensitive component used in the meter is a very stable, long life silicon diode.

The Humidity/Temperature is for usewith a humidity/semiconductor sensor and K type thermocouple. This manual contains general information and specification.

2. FEATURES

- 4 functions measure Sound level, Light, Humidity and Temperature.
- 3½ large LCD display with units of Lux, °C, %RH and C & dB, A & dB indication.
- Easy to use.
- Light measuring levers ranging from 0.01 lux to 20,000 lux.
- Sound level range:
  - A LO (low) - Weighting: 35-100dB
  - A HI (high) - Weighting: 65-130dB
  - C LO (low) - Weighting: 35-100dB
  - C HI (high) - Weighting: 65-130dB
  - Resolution: 0.1dB
- Humidity measurement from 25%RH to 95%RH with 0.1%RH resolution and fast time response.
- Temperature measuring levers ranging from -20°C ~ +750°C/-4°F ~ +1400°F

3. SPECIFICATIONS

Display: Large 1999 counts LCD display with function of Lux, x10 Lux, °C, °F, %RH and dB, A & dB, C & dB, Lo & dB, Hi & dB, MAX HOLD, DATA HOLD indication.
Polarity: Automatic, (-) negative polarity indication.
Over-range: "OL" mark indication.
Low battery indication: The "BAT" is displayed when the battery voltage drops below the operating level.
Measurement rate: 1.5 times per second, nominal.
Storage temperature: -10°C to 60°C (14°F to 140°F) at < 80% relative humidity
Auto power off: Meter automatically shuts down after approx 10mins of inactivity.
Power: One standard 9V, NEDA1604 or 6f22 battery.
Dimensions/Wt: 251.0 (h) x 63.8 (w) x 40mm (d) / 250g
Photo detector dimensions: 115 x 60 x 27mm
Sound level
Measurement range:
  A LO (low) - Weighting: 35-100dB
  A HI (high) - Weighting: 65-130dB
  C LO (low) - Weighting: 35-100dB
  C HI (high) - Weighting: 65-130dB

Resolution: 0.1dB
Typical instrument frequency range: 30Hz - 10kHz
Frequency rating: A, C - weighting
Time weighting: Fast
Maximum hold: decay <1.5dB/3min
Accuracy: ±3.5dB at 94dB sound level, 1kHz sine wave
Microphone: Electric condenser microphone
Light
Measuring range: 20, 200, 2000, 20,000Lux
                    (20,000Lux range reading x10)
Overrate display: Highest digit of "1" is displayed
Accuracy: ±5%rdg + 10 digits (calibrated to standard incandescent lamp at colour temperature 2856k)
Repeatability: ±2%
Temperature characteristic: ±0.1%/°C
Photo detector: One silicon photo diode with filter
Humidity/Temperature
Measurement range:
Humidity   25%RH ~ 95%RH
Temperature -20.0°C ~ +50.0°C   (-4°F ~ +122°F)
K Type   -20.0°C ~ +200.0°C   -20.0°C ~ +750.0°C
              (-4°F ~ +200°F)   (-4°F ~ +1400°F)
Resolution: 0.1%RH, 0.1°C, 1°C/0.1°F, 1°F
Accuracy (after calibration):
Humidity: °5%RH (at 25°C, 35% ~ 95%RH)
Response time of the humidity sensor: approx. 6min
Temperature:
  ±3%rdg±2°C (at -20.0°C ~ +200.0°C)
  ±3.5%rdg±2°C (at -20.0°C ~ +750°C)
  ±3%rdg±2°F (at -4.0°F ~ +200.0°F)
  ±3.5%rdg±2°F (at -4°F ~ +1400°F)
Input protection: 60V dc or 24V ac rms.

4. PANEL DESCRIPTION

1) LCD Display: 3½ digits LCD display with units of Lux, x10 Lux, °C, °F, %RH, dB, A, C, Lo, Hi and low battery
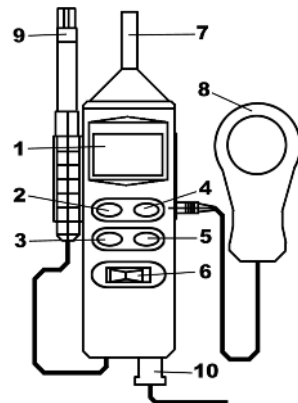
"BAT", MAX HOLD, DATA HOLD indication.
2) Power Button: selects meter's power ON or power OFF.
3) Selection Button: selects meter's functions and ranges.
4) MAX HOLD: If you press the MAX button, the maximum reading will be held. Press the button once again to release the hold and allow further measuring.
5) DATA HOLD: The reading will be held when Data Hold button is pressed. Press the button once again to release the hold and allow further measuring.
6) Function Switch: Selects measurement functions of Lux, Temperature, humidity and Sound Level.
7) Microphone: Electric condenser microphone inside.
8) Photo Detector: Long life silicon photo diode inside.
9) Humidity at Temperature: Humidity Sensor and Semi-conductor Sensor inside.
10) Temperature Terminal: Insert the temperature probe in this terminal.

5. OPERATING INSTRUCTIONS

Measuring Sound Level
1. Turn the function switch to "dB" position.
2. Remove the meter and face the microphone to the sound source in a horizontal position.
3. Press Select Button: Selects A & dB, C & dB, Lo & dB and Hi & dB.
4. The A, C-weighting curve is nearly uniform over the frequency range from 30 to 10kHz, thus giving an indication of overall sound level.
5. the Fast response is suitable to measure short bursts and peak values from a sound source.
6. The sound level will be displayed.
7. Note: Strong wind (over 10m/sec) striking the microphone can cause misreading for measurement in windy locations, a windscreen should be used in front of the microphone.

Measuring Light
1. Turn the function switch to select the lux.
2. Remove the detector and face the photo detector to the light source in a horizontal position.
3. Press Select Button: selects 20, 200, 2000, 20,000 LUX ranges.
4. Read the illuminance nominal from the LCD display.
5. Over-range: If the instrument only displays one "1" in the M.S.D. the input signal is too strong, and a higher range should be selected.
6. When the measurement is completed remove the photo detector from the light source.
7. 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) photopia curve V (λ) as the following chart describes.
8. Recorded Illumination:

Locations	Lux

Office
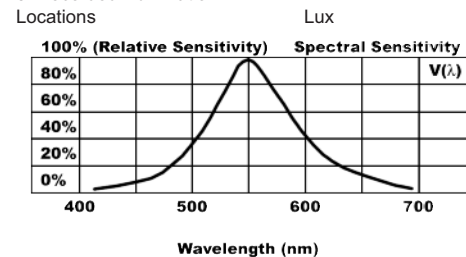
Conference, Reception room	200 ~ 750
Clerical work	700 ~ 1500
Typing drafting	1000 ~ 2000
Factory	
Packing work, Entrance passage	150 ~ 300
Visual work at production line	300 ~ 750
Inspection work	750 ~ 1500
Electronic parts assembly line	1500 ~ 3000
Hotel	
Public room, Cloakroom	100 ~ 200
Reception, Cashier	200 ~ 1000
Store	
Indoors Stairs Corridor	150 ~ 200
Show window, Packing table	750 ~ 1500
Forefront of show window	1500 ~ 3000
Hospital	
Sickroom, Warehouse	100 ~ 200
Medical examination room	300 ~ 750
Operation room	
Emergency treatment	750 ~ 1500
School	
Auditorium, Indoor gymnasium	100 ~ 300
Classroom	200 ~ 750
Laboratory, Library, Drafting room	500 ~ 1500

Measuring Humidity/Temperature
1. Humidity Measurement:
 (1) Set the function switch to "%RH" position.
 (2) Then the display will show the humidity reading value (%RH) directly.
 (3) When the tested environment humidity changes, the instrument needs a few minutes to get a stable "%RH" reading.

Warning:
Don't expose the humidity sensor to direct sunlight.
Don't touch or manipulate the humidity sensor.

2. Temperature Measurement:
 (1) Set the function switch to "TEMP"
 (2) Press Select Button: Selects 0.1°C or 1°C and 0.1°F or 1°F range.
 (3) Then the display will show the environment temperature reading value (°C/°F) directly.
 (4) Insert the temperature probe into the K-type thermocouple socket.
 (5) Touch the end of the temperature sensor to the area or surface of the object to be measured. The display will show the temperature reading value (°C/°F) directly.

Warning:
When the function switch is on temperature 0.1°C or 1°C and 0.1°F or 1°F range, never attempt a voltage measurement with the test leads inserted into the K-type thermocouple socket. You might be injured or damage the meter.

6. MAINTENANCE

Battery Replacement
If the sign "BAT" appears on the LCD display, it indicates that the battery should be replaced. Open the battery case and replace the exhausted battery with a new battery (1x 9V battery NEDA 1604, 6F22 or equivalent).