

# Operation Manual

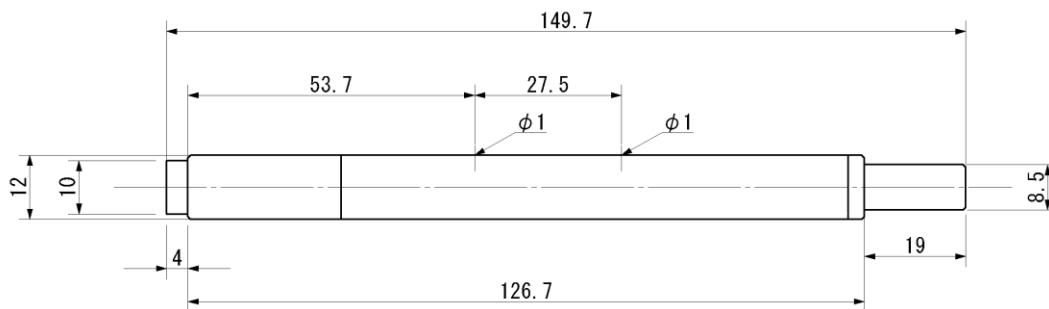
## Positive control light source for PD-20

### 1. Outline

This unit is the positive control light source for Lumitester PD-20.

An LED, the electric double layer capacitors, a constant current element, and a ND filter are built into the unit. it outputs stabile light for testing PD-20. Since the electric double layer capacitors were adopted as the power supply, battery exchange is unnecessary.

### 2. Outline dimensional drawing



### 3. Accessories

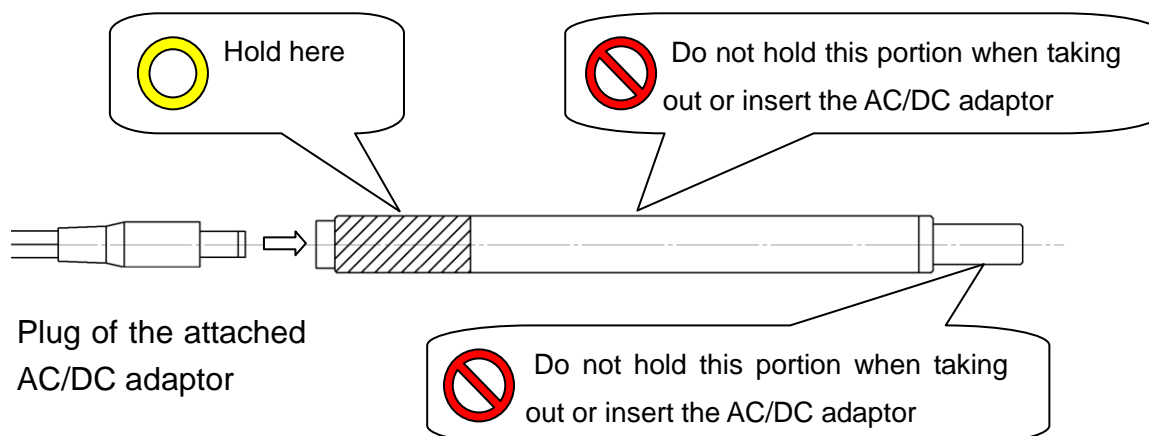
AC/DC adaptor for charge (input AC100-240V 50/60-Hz 0.4A) 1 set

#### 4. Specification

Light source element	Green LED
Center wavelength	545nm @If = 1 mA (catalog value)
Spectral line half width	40nm (Typ.)
Average output	2-6 microwatts (without diffusion cap and ND filter)
Operating ambient temperature	+10 - +40 °C
Storage ambient temperature	0 - +50 °C
Built-in power supply	Electric double layer capacitor 3.3F 2.7V 2 pieces
Charging terminal	Φ5.5x2.1 Center plus
Charge voltage	5.0V
Charging current	Maximum: 1.1A After charging completion: about 2 mA
Charging time	At least 30 seconds
Drive time	1 hour after charging completion
Outline dimension	Φ12x149.7mm
Weight	About 20 g (Excluding AC/DC adaptor)

#### 5. Directions for use

- (1) Connect an AC/DC adaptor to an electric socket.
- (2) Hold near the root of the charge terminal of the light source (shadow area of the following figure), and insert the plug of an attached AC/DC adaptor to the terminal firmly. Please avoid taking out or insert the plug by holding the other interstitial segment (metal part) or the optical diffusion cap of a tip, since a burden will be applied to its structure and may cause damage to it.



- (3) Taking out the plug of an AC/DC adaptor by holding both of the plug portion of it and the shadow area in the following figure, after charging 30 seconds or more. AC Please do not pull with the cable parts of the AC/DC adaptor.
- (4) Taking out the plug of an AC/DC adaptor by holding both of the plug portion of it and the shadow area in the following figure, after charging 30 seconds or more. AC Please do not pull with the cable parts of the AC/DC adaptor.
- (5) Turn on the Lumitester PD-20.
- (6) Insert the light source in the measurement chamber of the PD-20.
- (7) Set the PD-20 on the stand for the PD-20. Press Enter key for measurement according to the operation method of the PD-20.

**<Note>**

As the nature of the capacitor unlike other rechargeable batteries, it is satisfactory even if it performs what is called extension charge.

Moreover, it is satisfactory even if it has been charged exceeding 30 seconds.

Although the temporal duration after charge is about 1 hour, to charge just before use is recommend for reliable test.

Since it is very weak, the output of light from a diffusion cap cannot be checked with the naked eyes.

● **Operating precautions**

- This unit is a precision measuring equipment. Please avoid the following environment.

- Hot, extreme low temperature or humid place, or a place where it may get wet.
- A dusty place
- A place with corrosive gas
- A place with much vibration
- A place where it may be exposed direct sunlight

- Please do not connect except the attached AC/DC adaptor. It may cause damage if AC/DC adaptors other than attached are used.

- There are two small hole placed on the side of the light source for degassing. Please do not cover the holes, when you stick a label etc.

- Please do not turn an optical diffusion cap (milky color portion). Built-in ND filter will be taken off.

- Please give neither dirt nor a crack to an optical diffusion cap. The quantity of light may change.

● **Calibration**

- The calibration period of this equipment is for three years after purchase.

- After the period, the paid re-calibration will be performed by manufacturer at user's request.

● **Warranty**

- The warranty period of the positive control light source is two years from the date of purchase.

- When failure occurred to this device during the warranty period, we will carry out either of charge-free repair or exchange with the replacement. However, the object of the warranty is limited to failure arise from any defect in the material of this device or manufacturing.

- In addition, the following matters are not included in the object of the warranty. Any failure or damage, or any other loss occurred arise from operation or use against description of this instruction manual, carelessness in use, modify or change or any other remodeling of this device, or Force Majeure (including, without limitation to act of providence).

- The scope of indemnification for failure of this device is limited to indemnification provided by this warranty section and indemnification of any other loss or damage including, without limitation to indirect or special loss or damage, is not included in the scope of indemnification.