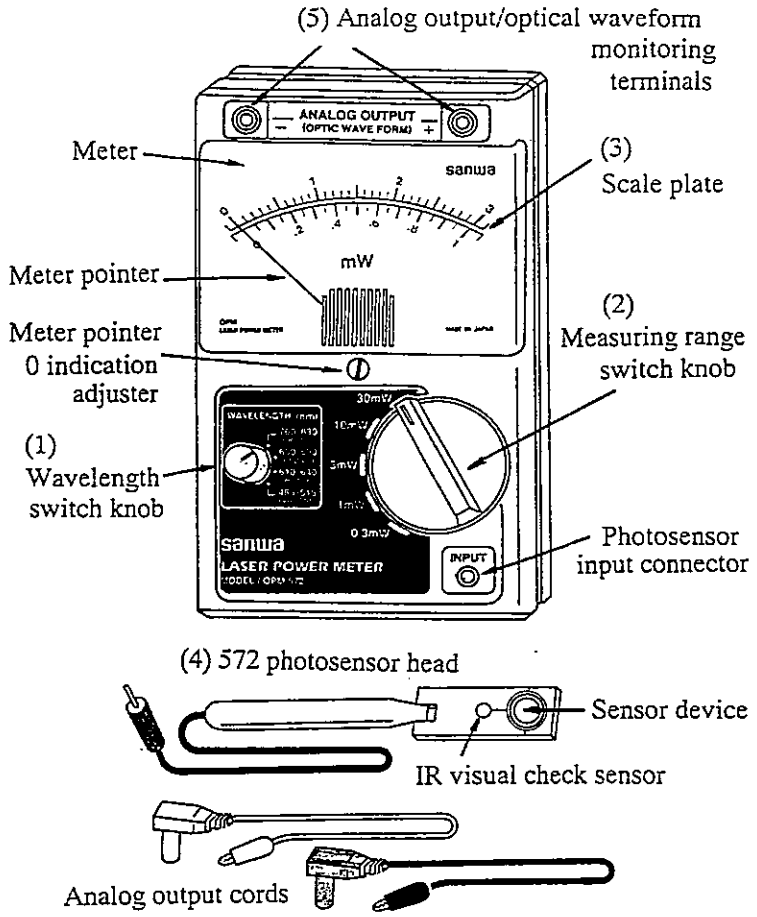
3. Specifications

Measuring ranges:	5 ranges; 0.3 mW, 1 mW, 3 mW, 10 mW and 30 mW.
Measurable wavelengths:	485 to 515 nm, 610 to 640 nm, 650 to 690 nm, 760 to 830 nm
Measuring accuracy:	±5% at 1 mW full scale value at 633 nm, 670 nm and 780 nm, using the photosensor head paired with the main unit
Photosensor:	Si photodiode (sensor diameter approx. 9 mm)
IR beam visual sensor:	Approx. 5 mm diameter)
Analog output:	0 to approx. 50 mV max. (output impedance approx. 70 kΩ)

[Optical waveform monitoring]	[Max. 100 kHz, for oscilloscope monitoring]
Dimensions & weight:	Main unit 163H x 100W x 48D mm, approx. 280 g, cable length approx. 0.9 m
Accessories:	Instruction manual, carrying case, 572 photosensor head, analog output cords (1 set of red and black cords)

4. Appearance, Controls



5. Description of Controls

(1) WAVELENGTH switch
Turn this knob to select one of the 4 wavelength ranges.

- 760-830 nm range: For measurement of laser power between 760 and 830 nm. Mainly used with IR-LDs.
- 650-690 nm range: For measurement of laser power between 650 and 690 nm. Mainly used with red LDs (visible light LDs).
- 610-640 nm range: For measurement of laser power between 610 and 640 nm. Mainly used with He-Ne laser and red LDs.
- 485-515 nm range: For measurement of laser power from 485 and 515 nm. Mainly used with Argon laser and 488 and 514.5 nm wavelengths.

(2) Measurement range switch
Turn this knob to select the laser power measuring range from 5 ranges of 0.3 mW, 1 mW, 3 mW, 10 mW and 20 mW.

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OPT

LASER POWER METER
OPM-572
INSTRUCTION MANUAL

sanwa
SANWA ELECTRIC INSTRUMENT CO., LTD.
Denpa Bldg., Sotokanda 2-Chome
Chiyoda-Ku, Tokyo, Japan

OPM-572 Instructions

1. Introduction

Thank you for purchasing the OPM-572 laser power meter.
Please read this manual carefully before using the product so that you can use it correctly.
After reading, retain this manual for future reference.

2. Outline

This product is a handy laser power meter with analog indication, designed for measurement of laser beam output from a laser diode (LD) as well as He-Ne and argon ion laser beams.
In addition to the capability of checking optical power levels up to 30 mW, the laser power meter has an ultra-slim, mobile photosensor head that is particularly convenient for measurement of Compact Disc (CD) players and Mini Disc (MD) recorders. It needs no power supply to function so it can be used anywhere, anytime.
This product's design emphasizes compact size, light weight and easy operation in consideration of its applications as a checking tool.
Additional functions include terminals which output an analog signal for recording by a recorder or optical waveform monitoring by an oscilloscope.

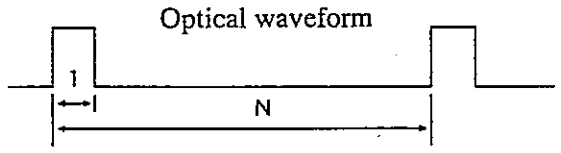
(3) Meter scale plate
Two graduations, with full scale values of 3 and 1, are provided.
- With the 0.3 mW range, multiply the reading on the black graduation with full scale of 3 by 0.1.
- With the 1 mW range, directly read the amber graduation with full scale of 1.
- With the 3 mW range, directly read the black graduation with full scale of 3.
- With the 10 mW range, multiply the reading on the amber graduation with full scale of 1 by 10.
- With the 30 mW range, multiply the reading on the black graduation with full scale of 3 by 10.

(4) Photosensor head
The photosensor head is composed of a sensor and IR visual check sensor.
- Photosensor: This is the main detector which is to be exposed to the beam to be measured.

- IR visual check sensor: The IR laser beam is invisible. Therefore, this sensor has been designed to light in amber when it is exposed to IR laser light so that the beam diameter, etc. can be confirmed. (The amber light emission power is variable, depending on laser beam irradiation power and wavelength.)
- A photosensor head has been defined to be paired with the main unit. They are given the same numbers and their measurement accuracy is always calibrated in the same combination.

(5) ANALOG OUTPUT (OPTIC WAVE FORM) terminals
This output signal can be used for either recording or optical waveform monitoring. Using the provided analog output cords, connect the output to a recorder or an oscilloscope probe.
- Analog output:
  The output voltage is about 50 m V full scale, regardless of the wavelength range. (The calibration has been applied using the 610 to 640 nm range. The output voltages in the other 3 ranges are proportional

to the respective meter indications, but are not always exact.)
- Waveform monitoring:
  Pulse light up to 100 kHz can be monitored in the 3 to 30 mW ranges. Pulse light up to 10 kHz can be monitored in the 1 and 0.3 mV ranges.
- Laser pulse power measurement:
  The peak power of laser pulses can be measured using the two functions of meter indication and waveform monitoring.
  When the optical waveform is a pulse as shown in the following diagram, the laser pulse peak power can be calculated approximately using formula (3-1) below.



$$Pp\ (mW) = P\ (mW) \times N \quad \cdots\cdots\cdots (3\text{-}1)$$
where $1 < N \leqq 20$

P : Power indicated by the meter
Pp : Laser pulse peak power

6. Measuring Method
[Preparation before measurement, remarks]
- Perform the following preparation operation without inserting the photosensor head into the INPUT connector.

(1) Ensure that the pointer of the meter indicates the 0 position on the left end of the scale plate.
(2) If the pointer is deviated from the 0 position, adjust the meter pointer 0 indication adjuster so that the pointer indicates the 0 line of the scale correctly.

(P. 7)
- **Laser power measurement**

(1) Insert the plug of the photosensor head into the INPUT connector of the main unit.
(2) Set the WAVELENGTH switch knob according to the measured laser wavelength.
(3) Set the measuring range switch knob to the maximum, i.e., 30 mW range position, and decrease the range in sequence according to the swinging of the meter pointer, so that the target value can be measured at an easy-to-read position near the full scale.
Since the infrared laser beam is not clearly visible, measurement of an IR LD should begin by searching for the beam. Position the IR visual check sensor on the photosensor head to the position where the laser

beam may be; the laser beam position or beam spot can be located easily because the IR visual check sensor section which is struck by the laser beam emits amber light.
(4) After locating the light axis of the laser beam, gently tilt the photosensor head so that the laser beam hits the center of the sensor at an angle of about 10 degrees from the perpendicular.

7. Operating Precautions

• ⚠ DANGER

Some measurement objects may output high power of more than 30 mW. Remember that the infrared light from LDs are invisible and be careful not to view the laser beam directly or let the reflection enter your eye because penetration of such high-power laser light into your eyes may result in loss of vision.

(1) Do not touch the sensor of the photosensor head directly with your hand (staining it may result in error in the meter indication). When the sensor becomes dirty, wipe lightly with a piece of tissue paper slightly moistened with alcohol.
(2) Measurement of weak laser power below 1 mW may be affected by ambient light (including external disturbance). Lower the lighting in the room before measuring such weak laser power.
(3) The photosensor head has an ultraslim design and is made of plastic material. Do not bend it; prevent damaging or fracturing it.
(4) The IR visual check sensor has a limited service life.

A life of about 2 years can be guaranteed under normal use. However, note that the performance of the light-emitting coating of the IR visual check sensor may become degraded due to aging.
(5) Storage caution
If the product is not to be used for a long period of time, store it in a cool, dry place. Do not leave it in a place where the temperature and humidity may rise to high levels.

8. Calibration
(1) To maintain safety and accuracy of measurement, the equipment should be calibrated and inspected at least once a year.
(2) Calibration and inspection will be performed by the manufacturer. Please consult the manufacturer for details.

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