

Perfect for use in R&D and production lines of next-generation optical discs and for evaluation of blue-violet and high-power lasers



- A wide selection of optical sensors for different use
 - Three-wavelength optical sensors covering 405/650/780nm
 - Blue-violet optical sensors for 405nm laser measurement
 - High-power optical sensors for high-power laser measurement
 - Low-price general-purpose optical sensors
 - Both thin type and cylindrical type available
- Optical power calibration wavelengths: 405/650/780nm
- 5½-digit display and 0.001dB resolution
- USB interface



■ Ideal for Making Automated Systems

The 8230 is an optical power meter optimal for building up automated production lines of Blu-ray Disc, DVD, CD and other optical pickups.

It is equipped with a USB interface as standard, which allows easy establishment of automated systems at a low price without adding any external unit.

In addition, the latest USB driver is available from our website to make your operation easier.



■ Nine Types of Optical Sensors to Meet Various Applications

● Blue-violet sensors to measure lasers of Blu-ray Disc

To measure blue-violet lasers precisely, the 82312B and 82322B blue-violet sensors have realized a maximally flat wavelength sensitivity characteristic. This saves time in performing sensitivity correction at each measurement and always offers high-accuracy measurement results.

405nm (Blu-ray)

● Three-wavelength sensors to measure lasers with different wavelengths

The 82314B, 82324B and 82314BW sensors are capable of measuring all lasers of 405nm wavelength for Blu-ray Disc, 650 nm wavelength for DVD and 780nm wavelength for CD. In the range from 400 to 420nm wavelengths in particular, sensitivity correction is unnecessary because of the flat wavelength sensitivity characteristic. In other wavelength ranges, the wavelength sensitivity values stored in the sensor help easy operation.

405nm 650nm 780nm

● High-power sensors to measure high-power lasers for write

The power output of a laser disc for write such as CD-RW exceeds 100mW at the peak even with a pickup installed. The 82313B and the 82323B are high-power sensors capable of measuring up to

200mW with high accuracy. These sensors have high linearity up to 200mW approximately even at beam spot of 0.1mm diameter.

200mW

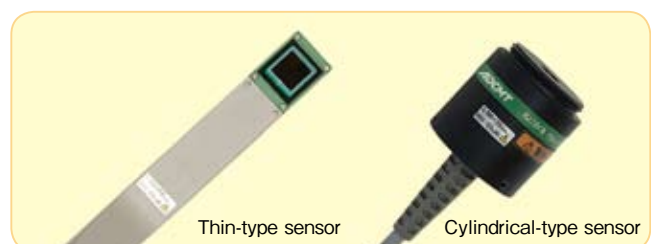
● Low-priced and easy-to-use general-purpose sensors

The 82311B and the 82321B are low-price general-purpose sensors that can be used in a wide wavelength range from 390nm to 1100nm.

The calibration wavelength is 780nm and the correction value is stored in the sensors. Sensitivity correction of other wavelengths is also available by using the options.

● Both thin types and cylindrical types

Two shapes of sensors can be selected for each purpose. Thin types of sensors are convenient for measuring optical power in a limited space with a pickup installed, and cylindrical types of sensors are used for measuring the output power from a fiber with an optical bench.



Specifications

All accuracies are guaranteed for one year at a temperature of +23 ± 5°C and a relative humidity of 70% or less.

Sensor Specifications (Sold Separately)

| Model | 82311B (General-purpose) | 82312B (Blue-violet) | 82313B (High-power) |
|---|-----------------------------------|----------------------|-----------------------|
| Wavelength range | 390 to 1100nm | 390 to 450nm | 390 to 1100nm |
| Power range | Display in dBm | -60 to +17dBm | -50 to +20dBm |
| | Display in W | 1nW to 50mW | 10nW to 100mW |
| | Beam spot | 3mm dia. or more | 1mm dia. or more |
| Light receiving element | Si Photodiode | | |
| Light receiving area | Approx. 9.5mm × 9.5mm | Approx. 10mm × 10mm | Approx. 8.5mm dia. |
| Effective light receiving area *1 | Approx. 8.5mm × 8.5mm | | Approx. 6mm dia. |
| Calibration wavelength *2 | 780nm | 405nm | 650nm |
| Measurement accuracy (at 1mW input) | ±2.5% (at calibration wavelength) | | |
| | (±3.5%)*3 (400 to 1000nm) | ±3.5% (390 to 450nm) | ±3.5% (400 to 1000nm) |
| Wavelength sensitivity correction range | 390 to 1100nm | 390 to 450nm | 390 to 1100nm |
| Shape | Thin type | | |
| Separation from a sensor section *4 | Impossible | Possible | Possible |
| Dimensions (width) × (height) × (thickness of the light receiving section) mm | 18×180×3.2 | 18×180×3.7 | 18×180×5 |

| Model | 82321B (General-purpose) | 82322B (Blue-violet) | 82323B (High-power) |
|---|-----------------------------------|----------------------|-----------------------|
| Wavelength range | 390 to 1100nm | 390 to 450nm | 390 to 1100nm |
| Power range | Display in dBm | -60 to +17dBm | -50 to +20dBm |
| | Display in W | 1nW to 50mW | 10nW to 100mW |
| | Beam spot | 3mm dia. or more | 1mm dia. or more |
| Light receiving element | Si Photodiode | | |
| Light receiving area | Approx. 8.5mm dia. | | |
| Effective light receiving area *1 | Approx. 6.5mm dia. | | Approx. 6mm dia. |
| Calibration wavelength *2 | 780nm | 405nm | 650nm |
| Measurement accuracy (at 1mW input) | ±2.5% (at calibration wavelength) | | |
| | (±3.5%)*3 (400 to 1000nm) | ±3.5% (390 to 450nm) | ±3.5% (400 to 1000nm) |
| Wavelength sensitivity correction range | 390 to 1100nm | 390 to 450nm | 390 to 1100nm |
| Shape | Cylindrical type | | |
| Dimensions (width) × (height) mm | 38×40 | | |

| Model | 82314B/82314BW (Three-wavelength) | | |
|---|---|-------------------------------------|----------------------------|
| Wavelength range | 390 to 900nm | | |
| Wavelength | 405nm | 650nm | 780nm |
| Power range | Display in dBm | -50 to +20dBm | |
| | Display in W | 10nW to 100mW | |
| | Beam spot | 1mm dia. or more / 2mm dia. or more | 3mm dia. or more |
| Light receiving element | Si Photodiode | | |
| Light receiving area | Approx. 10mm × 10mm / Approx. 18mm × 18mm | | |
| Effective light receiving area *1 | Approx. 9.5mm × 9.5mm / Approx. 15.5mm × 15.5mm | | |
| Calibration wavelength *2 | Standard | OPT82314B+22/ OPT82314BW+22 | OPT82314B+23/OPT82314BW+23 |
| Measurement accuracy (at 1mW input) | ±2.5% (at calibration wavelength) | | |
| | ±3.5% (390 to 900nm) | | |
| Wavelength sensitivity correction range | 390 to 900nm | | |
| Shape | Thin type | | |
| Separation from a sensor section *4 | Possible | | |
| Dimensions (width) × (height) × (thickness of the light receiving section) mm | 18×180×3.7/35.1×197×3.7 | | |

| Model | 82324B (Three-wavelength) | | |
|---|-----------------------------------|------------------|------------------|
| Wavelength range | 390 to 900nm | | |
| Wavelength | 405nm | 650nm | 780nm |
| Power range | Display in dBm | -50 to +20dBm | |
| | Display in W | 10nW to 100mW | |
| | Beam spot | 1mm dia. or more | 3mm dia. or more |
| Light receiving element | Si Photodiode | | |
| Light receiving area | Approx. 8.5mm dia. | | |
| Effective light receiving area *1 | Approx. 6.5mm dia. | | |
| Calibration wavelength *2 | Standard | OPT82324B+22 | OPT82324B+23 |
| Measurement accuracy (at 1mW input) | ±2.5% (at calibration wavelength) | | |
| | ±3.5%(390 to 900nm) | | |
| Wavelength sensitivity correction range | 390 to 900nm | | |
| Shape | Cylindrical type | | |
| Dimensions (width) × (height) mm | 38×40 | | |

*1: Relative sensitivity to the center is within the ±10% range. *2: Can be added by using options. *3: For the 82311B or 82321B, Option+20 is specified.

*4: The warranty does not include cut cables and/or damaged or degraded elements caused by connecting and disconnecting the sensor section.

Instrument Specifications

| | |
|--|--|
| Display resolution: | 0.1pW (display in W), 0.001dB (display in dBm) |
| Accuracy: | The following is added to the accuracy of each sensor. (Within 24 hours after offset zero execution, unit: W) |
| 20nW range | ±(0.55% + 2000 digits) |
| 200nW range | ±(0.15% + 200 digits) |
| 2μW to 200mW range | ±(0% + 70 digits) |
| Display: | LCD with three-level backlight |
| Wavelength display: | 4 digits |
| Power display: | 5½ digits (Unit: mW, μW, nW, dBm, dBμ) |
| Bar graph display | |
| Range switching: | 8 ranges; auto, manual and remote |
| Sampling rate: | 5 readings/sec or more |
| Wavelength sensitivity correction: | Automatic correction of sensor wavelength sensitivity by wavelength setting (in 1nm step) |
| Offset zero: | Sensor offset stored in the memory for automatic correction |
| Relative value display function: | Ratio (display in W), dBr (display in dBm) |
| Analog output: | Analog output according to the input signal ⁵ |
| Output voltage: | 0 to 2V, output resistance: 10Ω or less |
| Output connector: | 2P mini-jack (3.5mm dia.) |
| USB interface: | USB 2.0 Full-Speed compliant (connector mini B/female) |
| Auto power off: | Powers off approximately 30 minutes after any key operation or remote operation is not performed. (Function can be set ON or OFF.) |
| Backup function: | Stores four setting conditions. |
| Smoothing function: | Moving average from 2 to 100 times |
| Max value hold function: | Holds the maximum measured value. |
| Calibration wavelength selection function: | Available only with calibration wavelength option(s) installed |
| Wavelength preset function ⁶ : | Registers four wavelengths of which sensitivity is corrected. |
| Other functions: | CF calculation (sets one correction coefficient for measured values.) Display digit selection, key lock, and battery check |

⁵: The full-scale value varies depending on the sensor model, wavelength setting, correction value (CF), and range setting.

⁶: This function is available when the software revision is B00 or later.

General Specifications

| | |
|------------------------|--|
| Operating environment: | Ambient temperature: 0°C to +40°C Relative humidity: 80% or less, no condensation |
| Storage environment: | Ambient temperature: -20°C to +70°C Relative humidity: 80% or less, no condensation |
| Warm-up time: | 30 minutes or more (until the specified accuracy is reached.) |
| Power supply | |
| Battery drive: | AA battery × 4 ⁷ |

| | |
|--------------------|--|
| Service life: | 60 hours (with 1mW or less power, with back light OFF, using the alkaline battery, and at +23°C±5°C) |
| DC input: | 9V 100mA or less |
| AC adapter: | 100-240VAC |
| Line frequency: | 50/60Hz |
| Power consumption: | 100-120V: 5VA or less, 220-240V: 10VA or less (when the supplied AC adapter is used.) |
| Dimensions: | Approx. 80 (W) × 180 (H) × 40 (D) mm |
| Mass: | 300g or less (excluding AA batteries) |

⁷: Use alkaline batteries only. Batteries are not included.

Supplied Accessories

| | |
|--------------------------|---------|
| AC adapter (100-240VAC): | A146001 |
|--------------------------|---------|

Optional Accessories

| | |
|---|----------|
| USB cable | |
| (1m USB A/male-mini B/male): | A112010 |
| Analog output cable (1m): | A01225 |
| FC adapter (for 82321B/82322B/82323B/82324B): | A08012 |
| Power cable (UL/CSA): | CC014001 |
| Power cable (EN): | CC014002 |
| Power cable (CCC): | CC014003 |

| Option | Standard | Opt.94 | Opt.95 | Opt.96 |
|---------------------|----------|-----------|---------|-----------|
| Applicable standard | JIS | CCC | UL/CSA | EN |
| Rated | 125V/7A | 250V/2.5A | 125V/3A | 250V/2.5A |

Wavelength Sensitivity Correction Option and Calibration Wavelength Option

Wavelength sensitivity correction option:

The wavelength sensitivity of each sensor is measured and corrected when calibrating. (The 82311B/82321B of the standard specification is corrected by using the typical value.)

Calibration wavelength option:

The calibration is performed at wavelengths other than the standard specification. (Multiple wavelengths can be specified.)

| Option | 82311B | 82312B | 82313B |
|-----------------------------------|--------------|------------------------|------------------------|
| Wavelength sensitivity correction | OPT82311B+20 | Standard specification | Standard specification |
| Calibration wavelength | 405nm | OPT82311B+21 | Standard specification |
| | 650nm | OPT82311B+22 | Standard specification |
| | 780nm | Standard specification | OPT82313B+23 |

| Option | 82321B | 82322B | 82323B |
|-----------------------------------|--------------|------------------------|------------------------|
| Wavelength sensitivity correction | OPT82321B+20 | Standard specification | Standard specification |
| Calibration wavelength | 405nm | OPT82321B+21 | Standard specification |
| | 650nm | OPT82321B+22 | Standard specification |
| | 780nm | Standard specification | OPT82323B+23 |

| Option | 82314B | 82314BW | 82324B |
|-----------------------------------|------------------------|------------------------|------------------------|
| Wavelength sensitivity correction | Standard specification | Standard specification | Standard specification |
| Calibration wavelength | 405nm | Standard specification | Standard specification |
| | 650nm | OPT82314B+22 | OPT82314BW+22 |
| | 780nm | OPT82314B+23 | OPT82314BW+23 |

Optical power meter software revisions and applicable optical sensors

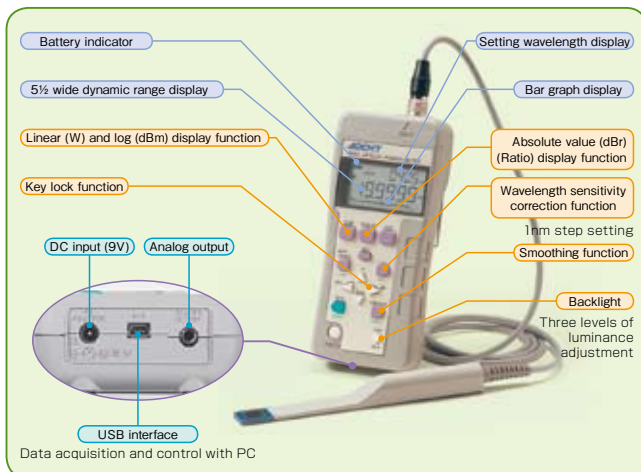
In addition to the optical sensors described in this brochure, discontinued products 82311, 82312, 82313, 82314A, 82314W, 82321, 82322, 82323 and 82324A can be used.

The following table shows software revisions required for optical sensor operations.

| Optical sensor | Software revision | Optical sensor | Software revision |
|----------------|-------------------|----------------|-------------------|
| 82311B | D01 or later | 82311 | A00 or later |
| 82312B | D01 or later | 82312 | A00 or later |
| 82313B | D01 or later | 82313 | A00 or later |
| 82314B | D01 or later | 82314A | B01 or later |
| 82314BW | D01 or later | 82314W | B01 or later |
| 82321B | D01 or later | 82321 | A00 or later |
| 82322B | D01 or later | 82322 | A00 or later |
| 82323B | D01 or later | 82323 | A00 or later |
| 82324B | D01 or later | 82324A | B01 or later |

If the software revision of your optical power meter is other than the above, the applicable software to be installed can be downloaded from our website. For more information, please visit our website.

- Please read through the operation manual carefully before using the products.
- All specifications are subject to change without notice.

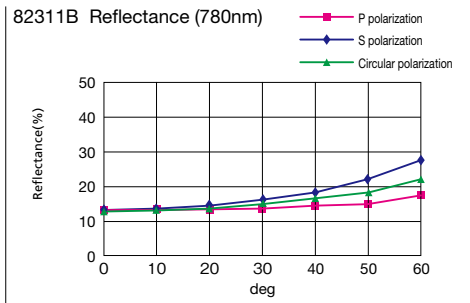
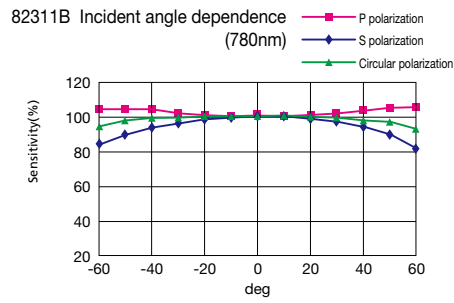


Sensor Characteristics (Typical Values)

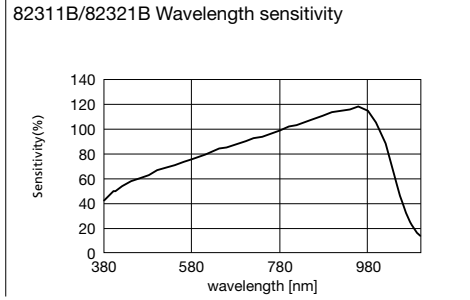
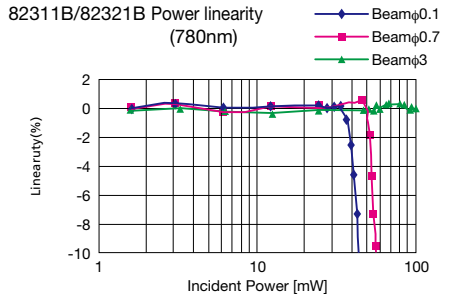
General-purpose sensor



82311B



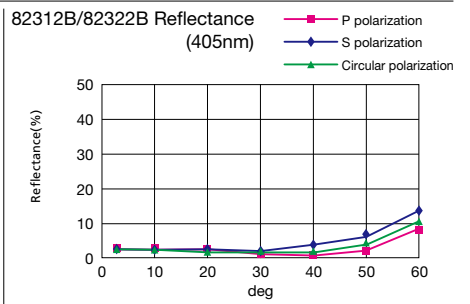
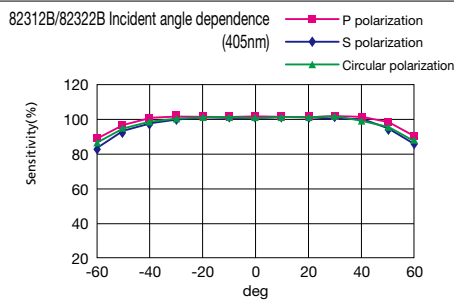
82321B



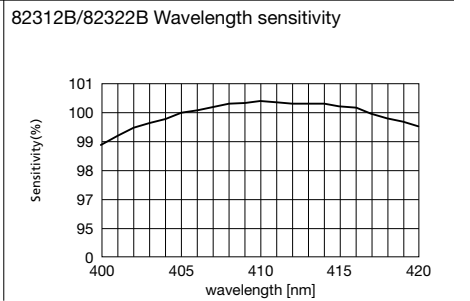
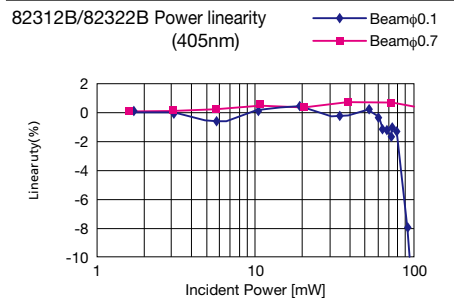
Blue-violet sensor



82312B



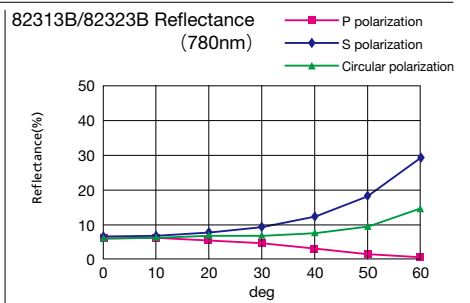
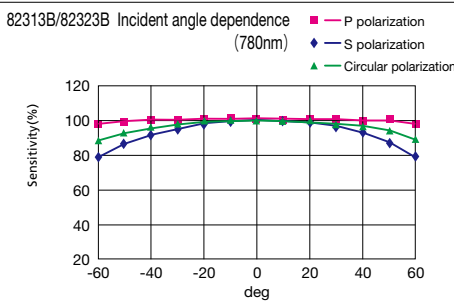
82322B



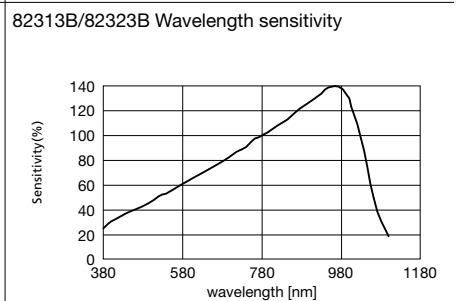
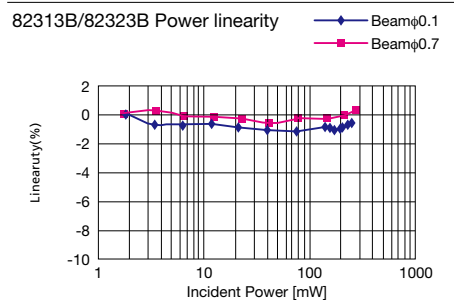
High-power sensor



82313B



82323B



Sensor Characteristics (Typical Values)

Three-wavelength sensor



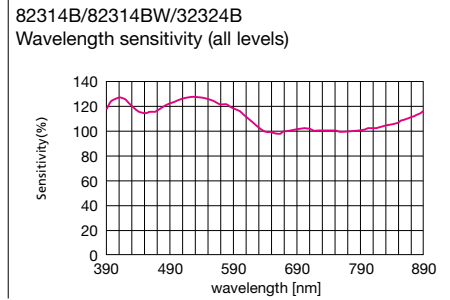
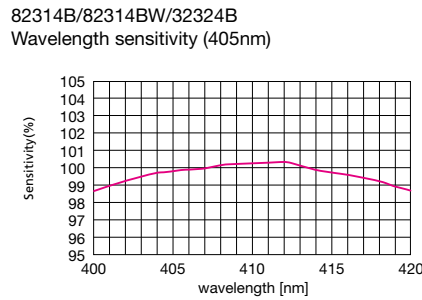
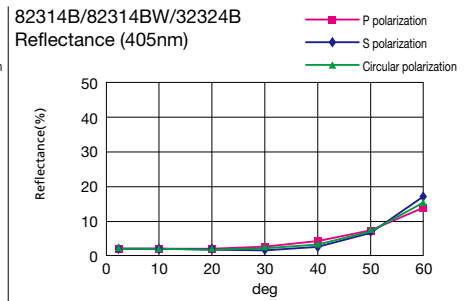
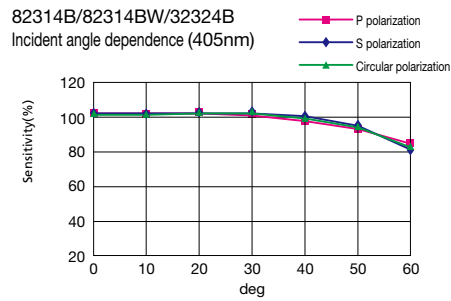
82314B



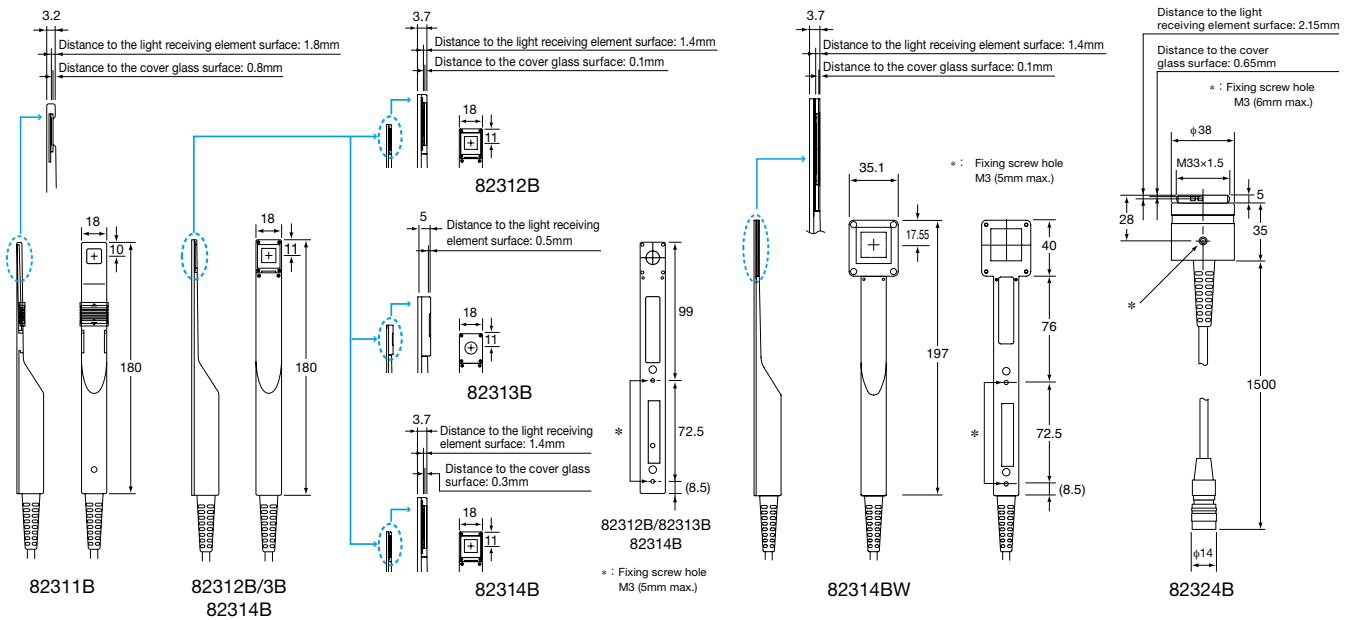
82314BW



82324B



Dimensional Drawing



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