

LUMINANCE METER

# ***BM-9A***



The Luminance meter BM-9A is a handy-type luminance meter with a wide measurement range and excellent operational convenience. With newly added 1° measuring field detector, totally three types of detectors(2°/1°/0.2°) can handle a wider range of usage.

Measurement mode selection using dip switches has greatly improved operational ease.

Also, in-line arrangement can be easily dealt with, due to the built-in USB and the separation of the detector and the display unit.

There are a wide variety of options, such as extension cable, Attachment lens, etc.

#### Examples of use

- Luminance measurement of LCDs, OLEDs, LEDs, etc.
- Luminance sensor for robots.
- Luminance measurement of street lighting, tunnel lighting, etc.
- Measurement of airport lighting facilities, sea route signals.
- Transmittance measurement for LCD polarizing plates and various filters.
- Measurement of medical lighting.
- Illuminance irregularities of automobile license plates.
- Luminance measurement of various lighting facilities, etc.
- Luminance measurement of Block for guiding visually handicapped person.



## Features

Three type of detectors are interchangeable and Main unit of BM-9A is shared by three detectors.



### ■ A wide range of measurements can be performed at high precision

Measuring field	Detector model	Measurable range
2°	BM-9A20D	0.01 to 280,000 cd/m <sup>2</sup>
1°	BM-9A10D	0.1 to 2,800,000 cd/m <sup>2</sup>
0.2°	BM-9A02D	1 to 28,000,000 cd/m <sup>2</sup>

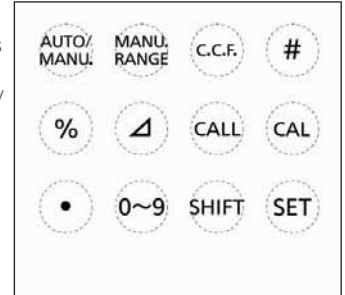
- Lens cap on objective/eyepiece lens is not required to conduct 0 adjustment. So the BM-9A is easy to operate even when the BM-9A is installed in measurement systems.
- Built-in Keyboard enable to calculate luminous intensity.
- Response speed are selectable. flicker and waveform can be observed by connecting oscilloscope.
- Extension cable (option) enable BM-9A to detach Detector unit and Display unit.
- Display unit automatically recognize each detector unit, so you need not to multiply readout value by 10 and 100, unlike BM-9.

Measurement range	1	2	3	4	5
2°(BM-9A20D)	0.01 to 28.00	15.0 to 280.0	150 to 2,800	1,500 to 28,000	15,000 to 280,000
1°(BM-9A10D)	0.1 to 280.0	150 to 2,800	1,500 to 28,000	15,000 to 280,000	150,000 to 2,800,000
0.2°(BM-9A02D)	1 to 2,800	1,500 to 28,000	15,000 to 280,000	150,000 to 2,800,000	1,500,000 to 28,000,000
Response speed (FAST mode : 90%)	About 22ms	About 2ms	About 1ms	About 1ms	About 1ms

\*Analogue output speed is a period of time which analogue output reach 90% of its maximum value from 10% of the maximum value.

### ■ You can select measurement mode by using built-in keyboard.

- Correction factor (C.C.F.mode)  
Inputting correction factor displays the post-correction data.
- Deviation measurement (Δ mode) / Percentage measurement (% mode)  
Deviation and percentage measurement displayed by inputting reference illuminance.



## Measurement Program MT-100 (Standard accessory)

Standard optional software MT-100 can obtain measured data from BM-9A. The MT-100 operates continuous measurement up to 99,999 times. Measured data can be stored with CSV format, which can be opened by spread sheet software.

OS	Windows® 7 Ultimate (32bit / 64bit) Windows® 7 Professional (32bit / 64bit) Windows® 8.1 Pro (32bit / 64bit) Windows® 10 Pro (32bit / 64bit)
CPU	Intel® Core™ i3 2.4GHz or higher
Memory / HDD	1GB or more
Port	USB2.0 port (One port)
Display	1024x768 or more
Others	CD-ROM Drive

\*Windows is trademark and registered trademark by Microsoft Corporation.

## ■ USB interface

Measured data can be retrieved from BM-9A via USB.

Pin No.	Signal
1	VBUS
2	D-
3	D+
4	GND
5	GND

Baud rate	38400
Data length	7
Parity	ODD
Spread bit	1



\*Mini USB series B connect mail (5pin)

### ○ Meaning of "of rdg." and "digit"

"of rdg" is for reading values. For example, "±2% of rdg" means ±2% of reading values.

±1 digit means reading values. "digit" means 1 count in digital and indicates that there may be error of one count in the last significant digit of the digital display.

## Options

### ▶ Attachment lens AL-13

A lens for reducing the measurement area of the BM-9A. Attach to the tip of the objective lens.

- Measurement diameter when using the AL-13 (units : mmø)

Measurement angle	measurement distance(mm)
2°	1.02 to 1.26
1°	0.51 to 0.63
0.2°	0.10 to 0.12



\* Measurement diameter differs according to the finishing precision of the aperture mirror.  
\* Measurement distance shown here is the distance from the tip of the attachment lens metal piece.

### ▶ Tripod 5N



The tripod 5N make collimation easy.

- Max height : 1835mm
- Min height : 585mm
- Length when stored : 810mm
- Leg stages : 3steps
- Weight 4.7kg with tripod head

### ▶ AC adapter ZV-42

AC adapter is used in long time continuous measurement.

### ▶ Extension cable (2, 5, 10, 20, 30m)

Effective if you want to separate the detector and the display unit for measurement.

Five types are available;

- 2m (ZV-21)
- 5m (ZV-22)
- 10m (ZV-23)
- 20m (ZV-24)
- 30m (ZV-25)



### ▶ WS-3 Reference White Board



Used for measurement of light source with directionality.

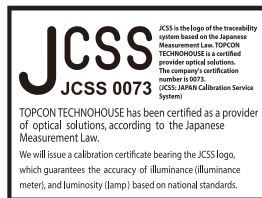
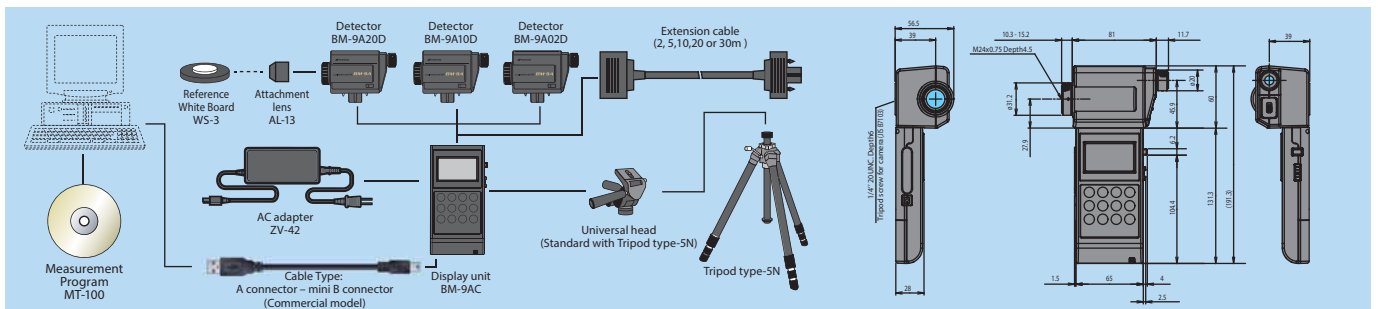
- Luminance factor : 90% or above (for measurement parameters of 0°incidence and 45°observation)
- Material : Barium sulfate (BaSO<sub>4</sub>)
- Dimensions : 78 mmø, t = 12.5 mm
- Effective white surface : 40 mmø (at center)

## Specifications

Detector model	BM-9A20D		BM-9A10D		BM-9A02D			
Measuring field	2°		1°		0.2°			
Optical system	Object lens f=36mm F2.5							
Viewing field	5°							
Measurement distance	350mm - ∞							
Measurement diameter (Units: mmø)	Measuring field	Measurement distance(mm)						
		350	400	600	800	1000	3000	5000
	2°	9.5	11.2	18.2	25.3	32.3	102	173
	1°	4.7	5.59	9.10	12.7	16.2	51.1	86.1
	0.2°	0.95	1.12	1.82	2.53	3.23	10.2	17.3
*Differs somewhat according to the finishing precision of the aperture mirror. *Measurement distance from the tip of the attachment lens metal piece.								
Minimum measurement diameter	9.5mmø <0.102mmø When using AL-13 (Optional)>		4.7mmø <0.51mmø When using AL-13 (Optional)>		0.95mmø <0.10mmø When using AL-13 (Optional)>			
Display	6-digit LCD							
Photo cell	Silicone Photodiode							
Spectral sensitivity characteristics	Within 6% (deviation from the relative luminous efficiency) *JIS C 1609-2006							
Measurement range	0.01 - 280,000 cd/m <sup>2</sup>		0.1 - 2,800,000 cd/m <sup>2</sup>		1 - 28,000,000 cd/m <sup>2</sup>			
	Auto 5-step range							
Precision	±2% of rdg. ±2 digit		±2% of rdg. ±2 digit		±2% of rdg. ±2 digit			
	(Standard light source A, 23±3°C, auto range, 0.1 cd/m <sup>2</sup> or above)		(Standard light source A, 23±3°C, auto range, 1 cd/m <sup>2</sup> or above)		(Standard light source A, 23±3°C, auto range, 10 cd/m <sup>2</sup> or above)			
Temperature properties	Within ±3% (0 - 40°C 23°C as standard)							
Humidity properties	Within 3% (85% R.H. or lower, 60% R.H. as standard)							
Analog signal output	0 - 3Vmax. Response speed at time of analog output 1 - 22ms at FAST							
Interface	USB (Virtual COM port)							
Power supply	AA battery x 2							
Operating conditions	Temperature : 0 - 40°C Humidity : 85% R.H. or lower							
External dimensions	Approx. 191(L)×108(W)×57(H)mm							
	Display unit : Approx. 131(L)×65(W)×28(H)							
	Detector : Approx. 60(L)×108(W)×57(H)mm							
Weight	Display unit : Approx. 130g (including battery) / Detector : Approx. 220g							

\*Three type of detectors are interchangeable and Main unit of BM-9A is shared by three detectors.

## System/Dimension



\*Some screens are simulated.

\*The specifications and external appearances of product in this catalogue may be changed without prior notice due to improvements.

\*The catalogue includes products that are sold separately.

\*The actual color of products may differ slightly from the catalogue due to lighting and printing conditions.

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### SAFETY PRECAUTIONS



Make sure to carefully read the "Manual" to ensure that you use the product properly and safely.

- Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.
- Be sure to use the specified batteries. Using improper batteries may cause a fire or electric shock.

For more information please visit our website.

<https://www.topcon-techno.co.jp/en/>

