UM2 Series

Embedded Amplifier Photo Sensors

- Highly-advanced type of ultra miniature sensor
- High-intensity indicator and red LED light source

  Allows long distance checking of both sensor operation and light transmission.
- NPN and PNP output types are available
- Excellent water resistance to IP 67 standard

  Sensor allows washing with water.

Type

Detection method	Detecting distance	Model	In-line sensitivity adjustment volume	Operation mode	Output mode
Through-beam type	150mm	**UM2-T15DT**	—	Dark-ON (Contact Takex for Light-ON type.)	NPN Open collector (Contact Takex for PNP-output type.)
		UM2-T15DTV	Provided		
	500mm	**UM2-T50DT**	—		
		UM2-T50DTV	Provided		
		UM2-T50DS	—		
		UM2-T50DSV	Provided		
Limited reflection type	5~30mm	**UM2-Z3SV**	Provided	Light-ON	
		UM2-Z3DSV		Dark-ON	

- In-line sensitivity adjustment allows for wider range of applications

  Models with space-saving and easy-to-use in-line volume adjustment are available.

- Length of cord between sensor (receiver) and in-line sensitivity adjustment : 300 mm (fixed)
- Mounting bracket (separately available): model UM-V2

Rating/Performance/Specification

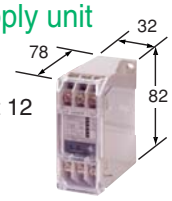
	Type		UM2-T15DT	UM2-T15DTV	UM2-T50DT	UM2-T50DTV	UM2-T50DS	UM2-T50DSV	UM2-Z3SV	UM2-Z3DSV
Rating/performance	Detection method		Through-beam type						Limited reflection type	
	Detecting distance		150mm		500mm				5 - 30mm*	
	Detection object		ϕ2mm (Min.) Opaque		ϕ3mm (Min.) Opaque				————	
	Power supply		24V DC ±10% / Ripple 10% max. *1						12 - 24V DC ±10%/ Ripple 10% max.	
	Current consumption	Transmitter	15mA max.						26mA max.	30mA max.
		Receiver	15mA max.	22mA max.	15mA max.	22mA max.	15mA max.	22mA max.		
	Output mode		NPN open collector Rating: sink current 80 mA (30 VDC) max. (PNP output type also available. *2)							
	Operation mode		Dark-ON						Light-ON	Dark-ON
	Response time		0.5ms max							
	Operating angle		15° (at receiver)						————	
	Hysteresis		————						Up to 10% of detecting distance	
Specification	Light source (light wavelength)		Red LED (660nm)							
	Indicator		Operation indicator (orange LED)—— For through-beam type, provided on receiver. Stability indicator (green LED)							
	Volume (VR)		———	In-line sensitivity adjustment	———	In-line sensitivity adjustment	———	In-line sensitivity adjustment		
	Material	Case	ABS resin							
		Lens	Acrylic resin							
	Connection		Permanently attached cord (outer dimension: dia. 2.8)							
			Transmitter: 0.15sq. 2 core 2 m length (gray) Receiver: 0.15sq. 3 core 2 m length (black)						0.15sq. 3 core 2 m length (black)	
	Mass	Transmitter	Approx. 30g						Approx. 40g	
		Receiver	Approx. 30g	Approx. 40g	Approx. 30g	Approx. 40g	Approx. 30g	Approx. 40g		
	Accessory		Mounting screws, washers, nuts (material: Fe), screwdriver for adjustment (provided for models with adjustment volume only), operation manual							
	Notes		*Standard detection object: 50 x 50 mm white drawing paper *1 12 VDC type also available. *2 PNP output type models identified by ﾒPﾓ at the end of model number. Comes with output conversion unit.							

Environmental Specification

Environment	Ambient light	3,000 lx max.
	Ambient temperature	–25 - +55 –C (non-freezing)
	Ambient humidity	35 - 85%RH (non-condensing)
	Protective structure	IP67
	Vibration	10 - 55 Hz / 1.5 mm amplitude / 2 hours each in 3 direction

• Applicable power supply unit

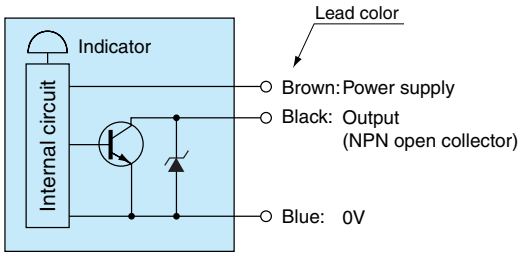
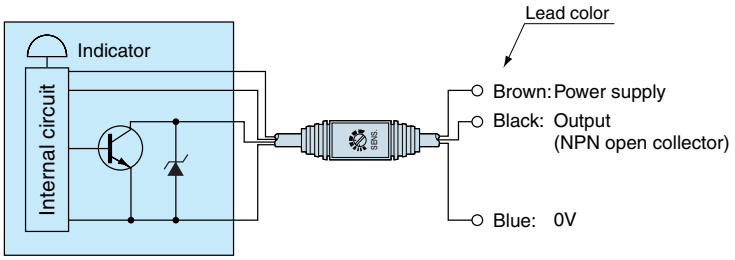
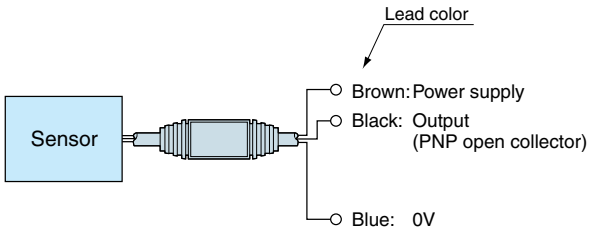
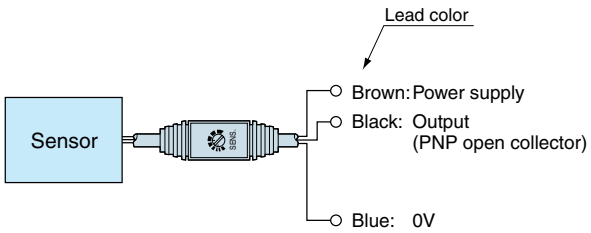
PS series
High capacity of 200 mA at 12 VDC



(General-purpose type) PS3N
PS3N-SR
(Multifunctional type) PS3F
PS3F-SR

UM2

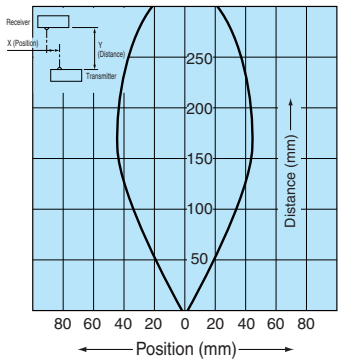
Input/Output Circuit and Connection

Model	Input/output circuit and connection
NPN output type UM2-T15DT UM2-T50DT UM2-T50DS	 The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.
NPN output type with in-line sensitivity adjustment UM2-T15DTV UM2-T50DTV UM2-T50DSV UM2-Z3SV UM2-Z3DSV	 The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.
PNP output type UM2-T15DTP UM2-T50DTP UM2-T50DSP	PNP open collector output available with in-line output conversion unit.  The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.
PNP output type with in-line sensitivity adjustment UM2-T15DTVP UM2-T50DTVP UM2-T50DSVP UM2-Z3SVP UM2-Z3DSVP	PNP open collector output available with in-line volume/output conversion unit.  The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.

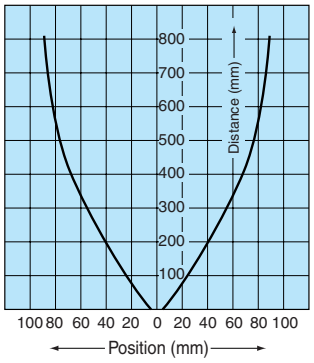
Characteristics (Typical Example)

● Directional characteristics

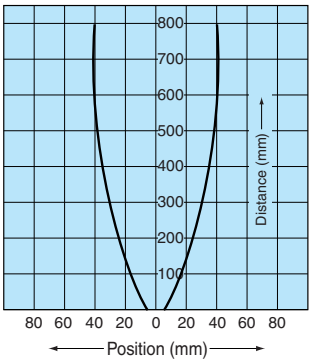
UM2-T15DT・UM2-T15DTV



UM2-T50DT・UM2-T50DTV

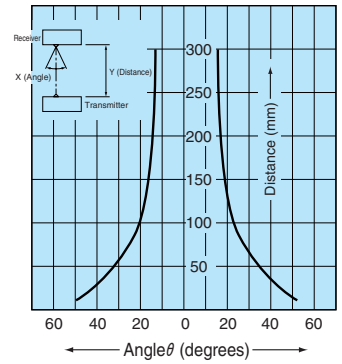


UM2-T50DS・UM2-T50DSV

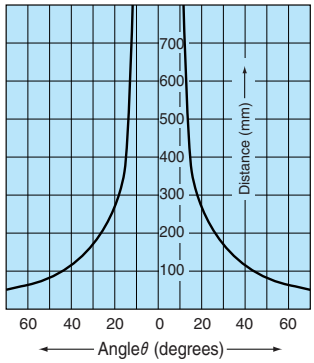


● Operating angle characteristics

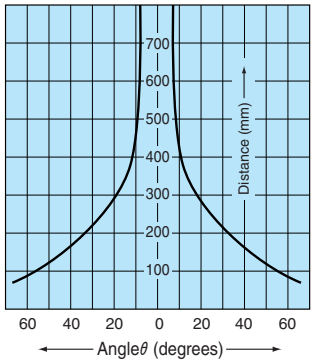
UM2-T15DT・UM2-T15DTV



UM2-T50DT・UM2-T50DTV

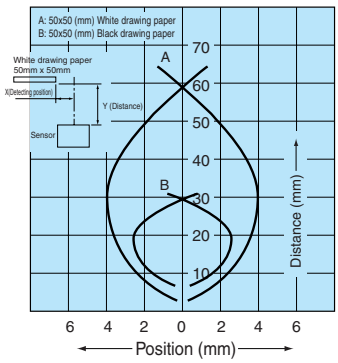


UM2-T50DS・UM2-T50DSV



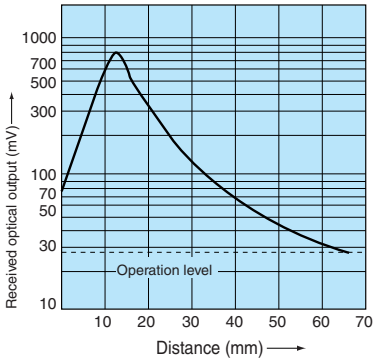
● Activation area characteristics

UM2-Z3SV・UM2-Z3DSV



● Distance-area characteristics

UM2-Z3SV・UM2-Z3DSV



UM2

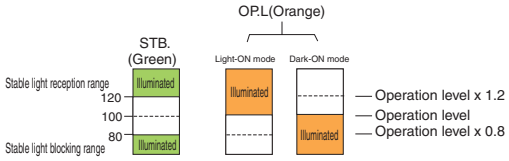
For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

- Do not use the product for detection for the protection of human body.
- When using the product for safety purposes, ensure safety with the control system as a whole as well as the detection.
- This product is not explosion proof.

About indicators

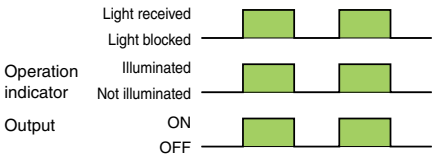
- The operation indicator (orange LED) and stability indicator (green LED) show the levels of light intensity as described in the figure below.
- After aligning the optical axis and adjusting the sensitivity, use a detection object to block and unblock the light beam several times to make sure that the sensitivity level is in a range that allows stable activation and deactivation. Setting the sensitivity in a range allowing stable operation achieves higher reliability against changes in the operating environment generated after the sensitivity is set.



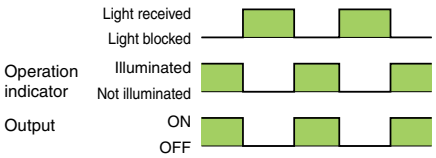
- The orange LED (OP.L) is the operation indicator.
  In the L.ON (light ON) mode, the indicator is illuminated when a certain amount of light is detected.
  In the D.ON (dark ON) mode, the indicator is illuminated when a certain amount of light is not detected.

Operation timing chart

Light-ON mode

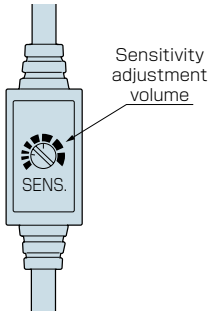


Dark-ON mode



Sensor mounting and adjustment

- No mounting bracket is provided.
- For mounting, use the M2 x 10 screws, washers and nuts provided.
  The tightening torque should not exceed 0.3 N·m. Excessively high torque may damage the sensor.
- The models with an in-line volume allows sensitivity adjustment when light is not adequately blocked due to translucent or small objects in detection with a through-beam-type sensor or when any influence of the background must be avoided or the amount of reflected light is small in detection with a reflective-type sensor.
  Turning the volume counterclockwise reduces the sensitivity.



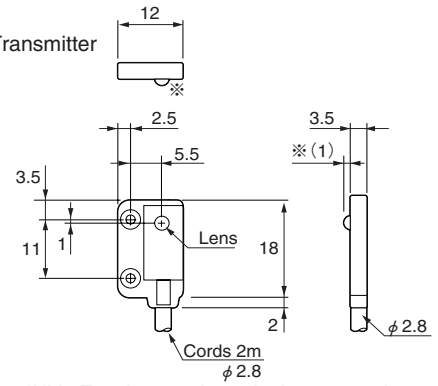
Notes on usage

- Avoid use in which the power is turned on and off consecutively.
- For output, avoid the transient condition immediately after power-up (50 ms).
- To extend the cord, use thick wires (at least 0.3 mm2) and limit their length to within 50 m whenever possible. Take voltage drop into consideration when the length exceeds 50 m.
- Be sure to route the sensor lines separately from any power transmission or high-voltage line. Using the same conduit or duct may cause electric induction, which leads to faulty operation or damage.

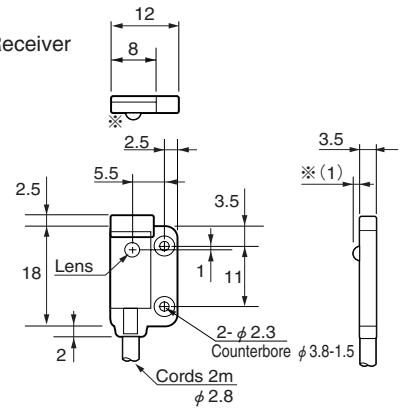
Dimensions (in mm)

UM2-T15DT
UM2-T15DTV (sensor)
UM2-T50DT
UM2-T50DTV (sensor)

Transmitter



Receiver

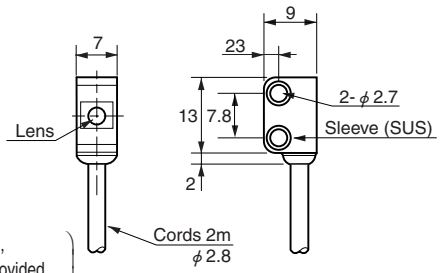


M2 x 10 mm screws, nuts, internal toothed washers provided.

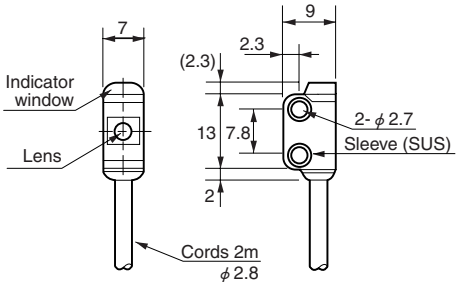
*UM2-T15 does not have the lens convexity.

UM2-T50DS
UM2-T50DSV (sensor)

Transmitter

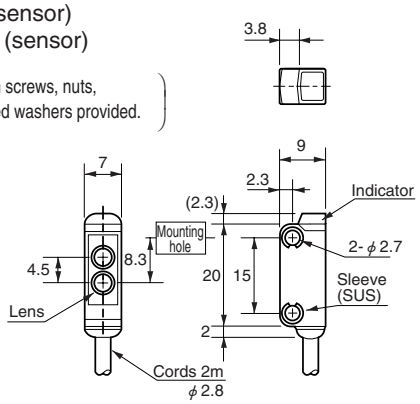


Receiver



M2.6 x 12 mm screws, nuts, internal toothed washers provided.

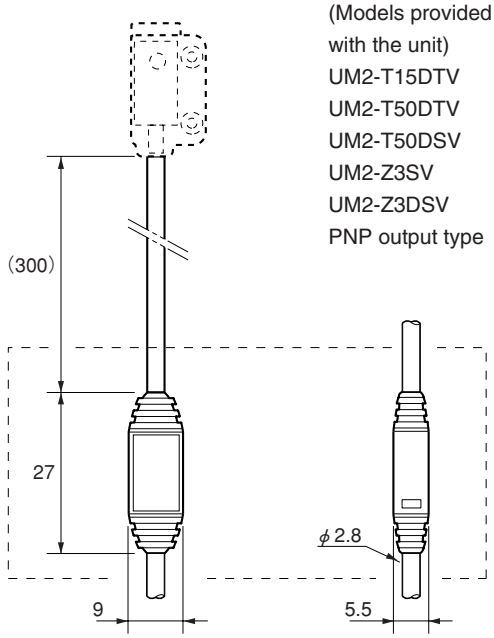
UM2-Z3SV (sensor)
UM2-Z3DSV (sensor)



M2.6 x 12 mm screws, nuts, internal toothed washers provided.

● In-line sensitivity adjustment volume/PNP output conversion unit
Provided in the receiver cord for through-beam model.

(Models provided with the unit)
UM2-T15DTV
UM2-T50DTV
UM2-T50DSV
UM2-Z3SV
UM2-Z3DSV
PNP output type



● For mounting, directly screw onto the surface.
The tightening torque should be up to 0.3 N·m.