



- 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 complying with the IP 67 standard
Sensor can be washed with water.

Type

Detection method	Detecting distance	Model		In-line sensitivity adjustment volume	Operation mode	Output mode
		NPN Output	PNP Output			
Through beam 	150mm	UM2-T15T	UM2-T15TP	—	Light-On	Open collector output
		UM2-T15DT	UM2-T15DTP		Dark-On	
		UM2-T15TV	UM2-T15TVP	Provided	Light-On	
		UM2-T15DTV	UM2-T15DTVP		Dark-On	
	500mm	UM2-T50T	UM2-T50TP	—	Light-On	
		UM2-T50DT	UM2-T50DTP		Dark-On	
		UM2-T50TV	UM2-T50TVP	Provided	Light-On	
		UM2-T50DTV	UM2-T50DTVP		Dark-On	
		UM2-T50S	UM2-T50SP	—	Light-On	
		UM2-T50DS	UM2-T50DSP		Dark-On	
		UM2-T50SV	UM2-T50SVP	Provided	Light-On	
		UM2-T50DSV	UM2-T50DSVP		Dark-On	
Diffuse reflective 	2-30mm	UM2-R3T	UM2-R3TP	—	Light-On	
		UM2-R3DT	UM2-R3DTP		Dark-On	
		UM2-R3TV	UM2-R3TVP	Provided	Light-On	
		UM2-R3DTV	UM2-R3DTVP		Dark-On	
	2-50mm	UM2-R5T	UM2-R5TP	—	Light-On	
		UM2-R5DT	UM2-R5DTP		Dark-On	
		UM2-R5TV	UM2-R5TVP	Provided	Light-On	
		UM2-R5DTV	UM2-R5DTVP		Dark-On	
Convergent reflective 	5-30mm	UM2-Z3SV	UM2-Z3SVP	Provided	Light-On	
		UM2-Z3DSV	UM2-Z3DSVP		Dark-On	

*PNP output type models identified by "P" at the end of model number and comes with output conversion unit.

Rating/Performance/Specification

Type	Light-ON		UM2-T15T	UM2-T15TV	UM2-T50T	UM2-T50TV	UM2-T50S	UM2-T50SV	UM2-R3T	UM2-R3TV	UM2-R5T	UM2-R5TV	UM2-Z3SV
	PNP output		UM2-T15TP	UM2-T15TVP	UM2-T50TP	UM2-T50TVP	UM2-T50SP	UM2-T50SVP	UM2-R3TP	UM2-R3TVP	UM2-R5TP	UM2-R5TVP	UM2-Z3SVP
Dark-ON	NPN output		UM2-T15DT	UM2-T15DTV	UM2-T50DT	UM2-T50DTV	UM2-T50DS	UM2-T50DSV	UM2-R3DT	UM2-R3DTV	UM2-R5DT	UM2-R5DTV	UM2-Z3DSV
	PNP output		UM2-T15DTP	UM2-T15DTVP	UM2-T50DTP	UM2-T50DTVP	UM2-T50DSP	UM2-T50DSVP	UM2-R3DTP	UM2-R3DTVP	UM2-R5DTP	UM2-R5DTVP	UM2-Z3DSVP
Detection method		Through beam						Diffuse reflective				Convergent reflective	
Detecting distance		150 mm			500 mm			2-30mm*		2-50mm*		5-30mm	
Detection object		φ3mm (or more) Opaque			φ3mm (or more) Opaque								
Power supply		24VDC±10% / Ripple 10% or less *1						12-24VDC±10% / Ripple 10% or less					
Current consumption	NPN output	Transmitter	15mA or less						20mA or less	27mA or less	17mA or less	23mA or less	27mA or less
		Receiver	15mA or less	22mA or less	15mA or less	22mA or less	15mA or less	22mA or less					
PNP output	Transmitter	15mA or less						27mA or less	35mA or less	23mA or less	30mA or less	32mA or less	
		Receiver	15mA or less	22mA or less	15mA or less	22mA or less	15mA or less	22mA or less					
Output mode		NPN open collector Rating: sink current 80mA (30 VDC) or less											
		PNP open collector Rating: source current 80mA (30 VDC) or less											
Operation mode		(See the Type table in the previous page)											
Response time		0.5ms or less											
Operating angle		15° (at receiver)											
Hysteresis								Up to 10% of detecting distance					
Light source (light wavelength)		Red LED (660nm)						Red LED (640nm)					
Indicator		Transmitter: - Receiver: Operation indicator (orange LED), Stability indicator (green LED)						Operation indicator (orange LED), Stability indicator (green LED)					
Volume (VR) *2			in-line sensitivity adjustment		in-line sensitivity adjustment		in-line sensitivity adjustment		in-line sensitivity adjustment		in-line sensitivity adjustment		in-line sensitivity adjustment
Material	Case	ABS resin											
	Lens	Acrylic resin											
Connection		Attached cable (dia. 2.8)											
		Transmitter: 0.15 mm ² x 2 cores 2m (gray) Receiver: 0.15 mm ² x 3 cores 2m (black)						0.15 mm ² x 3 cores 2m (black)					
Accessory		Mounting screws, washers, nuts (material: Fe), screwdriver for adjustment (provided for models with adjustment volume only), instruction manual											
Weight	Transmitter	Approx. 30g						Approx. 25g	Approx. 30g	Approx. 25g	Approx. 30g	Approx. 40g	
	Receiver	Approx. 30g	Approx. 40g	Approx. 30g	Approx. 40g	Approx. 30g	Approx. 40g						
Notes		* Standard detection object: 50x50 white drawing paper * 1 12 VDC type also available. PNP output type models identified by "P" at the end of model number. Comes with output conversion unit.											

The detecting distance of diffuse reflective type varies, depending on transmittance of the detection object. Please be sure to check the detection beforehand.

Environmental Specification

Ambient light	3,000 lx or less
Ambient temperature	-25 - +55 °C (non-freezing)
Ambient humidity	35 - 85%RH (non-condensing)
Protective structure	IP67
Vibration	10 - 55 Hz / 1.5 mm double amplitude / 2 hours each in 3 direction
Dielectric withstanding	AC 1000V for 1 or more
Insulation resistance	500VDC, 20 MΩ or higher
Shock	500 m/s ² / 3 times each in 3 directions

● 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



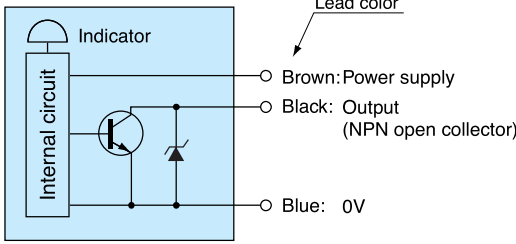
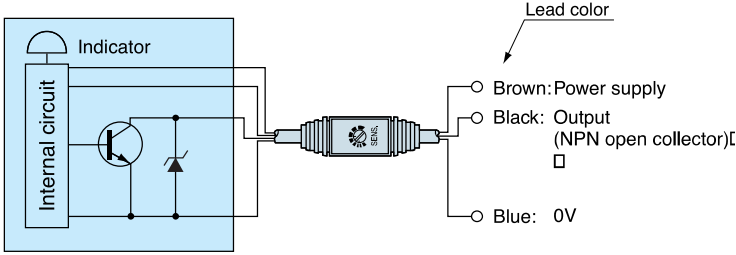
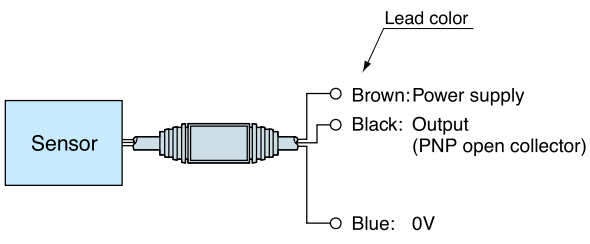
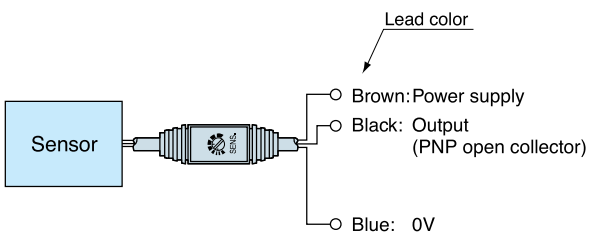
● In-line sensitivity volume for various purposes

Space-saving and easy-to-use in-line volume adjustment

- The length of the cable between the sensor (receiver) and the in-line volume is 300 mm (fixed).
- The mounting bracket, UM-V2, is sold separately.



Input/Output Circuit and Connection

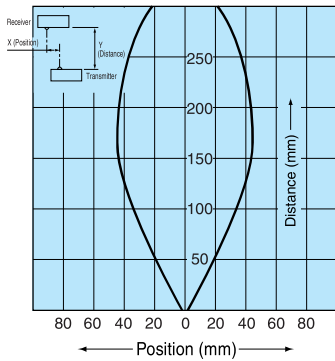
Model	Input/output circuit and connection
<p>NPN output type</p> <p>UM2-T15DT UM2-T50DT UM2-T50DS UM2-R3T UM2-R5T</p>	 <p>The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.</p>
<p>NPN output type with in-line sensitivity adjustment</p> <p>UM2-T15DTV UM2-T50DTV UM2-T50DSV UM2-R3TV UM2-R5TV UM2-Z3SV</p>	 <p>The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.</p>
<p>PNP output type</p> <p>UM2-T15DTP UM2-T50DTP UM2-T50DSP UM2-R3TP UM2-R5TP</p>	 <p>The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.</p>
<p>PNP output type with in-line sensitivity adjustment</p> <p>UM2-T15DTVP UM2-T50DTVP UM2-T50DSVP UM2-R3TVP UM2-R5TVP UM2-Z3SVP</p>	 <p>The transmitter is provided with power supply lines (brown: operating power; blue: 0 V) only.</p>

In the condition of load short-circuit or overload, the output transistor turns off. Check the load condition before restarting.

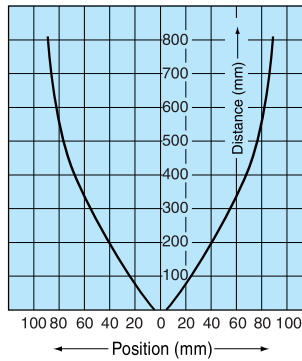
Performance Curves (Typical Example)

● Response Curves : Beam Pattern

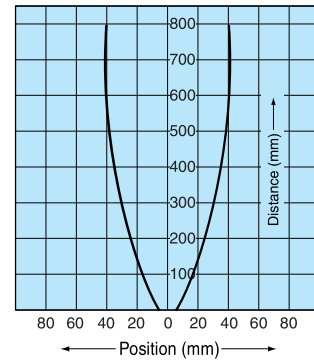
UM2-T15DT · UM2-T15DTV



UM2-T50DT · UM2-T50DTV

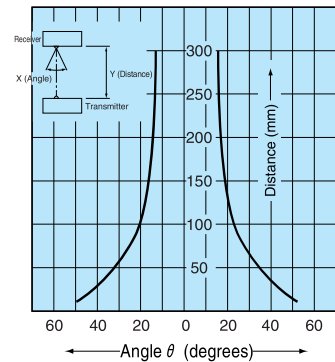


UM2-T50DS · UM2-T50DSV

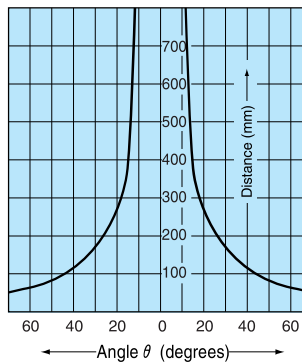


● Response Curves : Tilt Angle

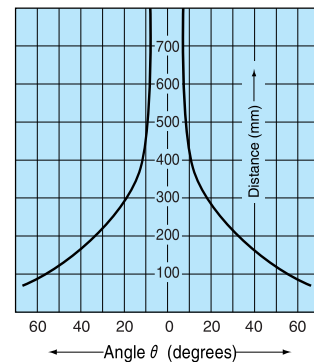
UM2-T15DT · UM2-T15DTV



UM2-T50DT · UM2-T50DTV

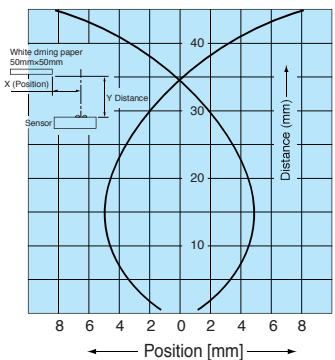


UM2-T50DS · UM2-T50DSV

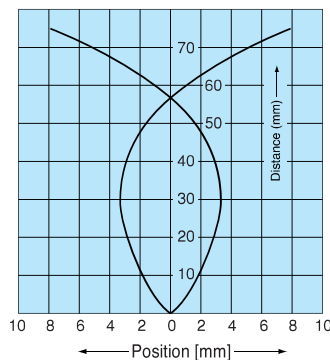


● Response Curves : Detecting Position

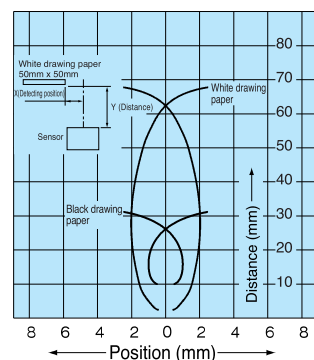
UM2-R3T · UM2-R3TV



UM2-R5T · UM2-R5TV

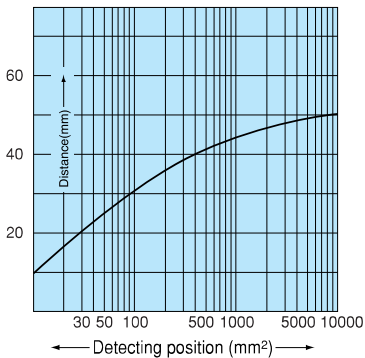


UM2-Z3SV · UM2-Z3DSV

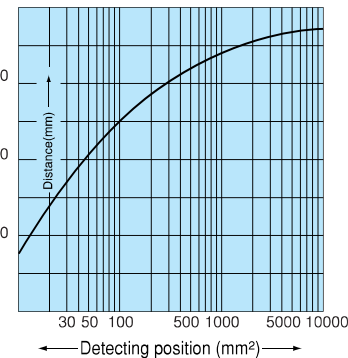


● Response Curves : Target Size

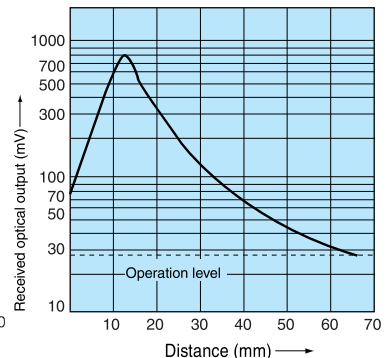
UM2-R3T · UM2-R3TV



UM2-R5T · UM2-R5TV



UM2-Z3SV · UM2-Z3DSV



For Correct Use

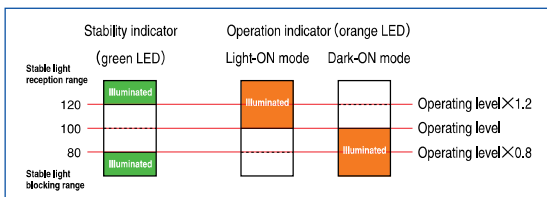
Be sure to follow the instructions in the operation manual provided for correct use of the product.



- This sensor is not designed to prevent death or injury. It is not a life saving device.
- For safety applications except such usage, ensure safe operation of the system as a whole including detection and control functions.
- This product is not explosion proof.

Indicators

- The operation indicator (orange LED) and stability indicator (green LED) respectively show different received light intensity levels as described in the figure.
- After aligning the optical axis and adjusting the sensitivity, make sure the light received and the light blocked is within the stable ranges by blocking and unblocking the lights with a detection object repeatedly. Setting within the stable range increases reliability against differences in environment after installation.

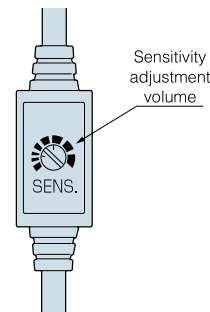


- The orange LED is the operation indicator. For the light ON mode, the indicator is illuminated when the light is detected. For the dark ON mode, the indicator is illuminated when the light is blocked.

● Operation timing chart

● 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.
- The tightening torque for the sensitivity adjustment volume must be up to 0.1 N · m.



● Notes on usage

- Avoid use in which the power is turned on and off consecutively.
- Detection can start 50 msec after power-up. If the load and this sensor use different power sources, be sure to turn on the sensor first.
- To extend the cord, use the thickest wires possible and limit their length to within 10 m. Also take drops in voltage into consideration.
- 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.
- The stainless steel sleeve in the mounting hole is for reinforcement and may come off.