LASER SENSOR **LD-MX5R** SERIES
(Coaxial retro-reflective type)

INSTRUCTION MANUAL

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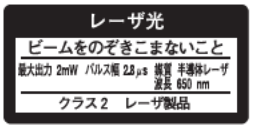
HANDLING PRECAUTION

- This product is a laser sensor of the coaxial polarized retro reflector type.
  Therefore, a minute object can be detected.
- This sensor uses Class 2 or Class 1 semiconductor laser in accordance with JIS 6802 "Laser Product Radiation Safety Standard."
  (Class 2 : Exposure to visible radiation from Class 2 laser is not harmful operator, owing to the human body's protective reflex.)
- Do not expose operator's eyes to laser beam.
  Also do not look through emitter's laser radiation port.
  Direct exposure to laser beam may be harmful to operator's eyes.
- In case of installing or detaching the sensor, power should be off.
- This product is provided with a caution label and an instruction label for persons who handle sensors. After installing the product, affix these labels to the emitter so that they can be easily seen and read.

Caution label



Instruction label (Japanese)

Instruction label (English)

- Do not use it for the human body protection detection.
- It is not an equipment of an explosion-proof.
  Do not use the sensor in the explosion danger environment.

SPECIFICATIONS

Models	NPN OUTPUT	LD-MX5R	LD-MX5R-C1
	PNP OUTPUT	LD-MX5RPN	LD-MX5RPN-C1
Detecting method		Coaxial polarized retro-reflective	
Detecting range		Depending on reflectors (Reflectors are optional)	
Power supply		12 to 24VDC±10%, Ripple 10% Max.	
Current consumption	NPN OUTPUT	32mA or less	30mA or less
	PNP OUTPUT	37mA or less	35mA or less
Output mode	NPN OUTPUT	Open collector output, Sink current 100mA (30VDC) Max., Residual voltage 1V or less	
	PNP OUTPUT	Open collector output, Source current 100mA (30VDC) Max., Residual voltage 2V or less	
Operating mode		Light-on/Dark-on selectable	
Cross talk prevention		Built-in (2 sensors)	
Test input		Non voltage input (Contact or Non contact)	
Response time		0.5ms Max.	
Spot diameter		φ5mm (detecting distance at 5m)	φ3mm (detecting distance at 3m)

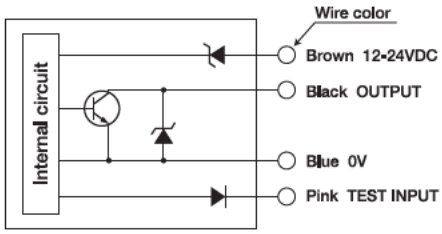
Light source	Red semiconductor laser (650nm) Class 2	Red semiconductor laser (650nm) Class 1
Indicator	Operating (Orange LED), Stability (Green LED)	
Sensitivity adjustment	Potentiometer	
Switch	Light-on/Dark-on Selectable	
Short circuit protection	Built-in	
Wiring	Flying lead (Outer dia 4mm) 2m lengths	
Material	Housing : Heat proof ABS, Lens : Glass	
Weight (Max.)	Approx. 80g	
Accessory	Bracket, Instruction manual, Screw driver and Caution label (※1)	

(※1) Caution label is not attached for Class 1.

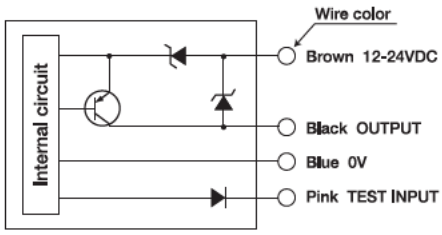
Ambient light	5,000 lx or less
Operating temp.	−10 to +55℃, Storage : −30 to +70℃
Humidity	35 to 85%RH
Case protection	I P66
Vibration	10 to 55Hz, Amplitude 1.5mm X, Y and Z directions 2 hours
Impact	500m/s² X.Y.Z directions 3 times
Dielectric withstanding	AC1,000V, 1minute
Insulation resistance	DC500Vmega 20MΩ(Min.)

OUTPUT

NPN



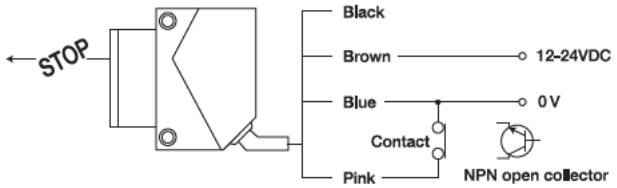
PNP



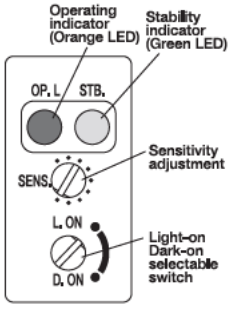
- This product adopts the slow starter circuit for the laser radiation. The laser radiates about one second after the power supply is turned on.
- Loaded short circuit or overload shuts off the output transistor is off. Turn on the power supply again after confirming the state of the load.

■ LASER RADIATION STOP FUNCTION (TEST INPUT)

The laser radiation stops TEST INPUT (Pink) and 0V (Blue) if short-circuited according to random timing.
Connect TEST INPUT (Pink) with the plus side (Brown) of the power supply when you do not use the Laser radiation stop function.



PANEL DESCRIPTION



◆ **Operating indicator (OP.L)**
When output transistor is ON, orange LED lights.

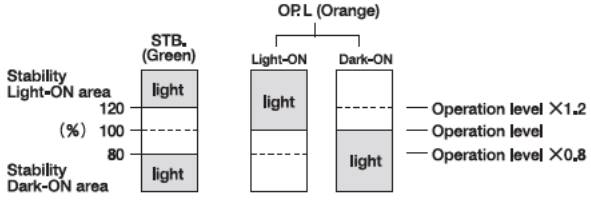
◆ **Stability indicator (STB.)**
Green LED lights when the light quantity of receiver has 120% sufficient margin and 80% insufficient.

◆ **Sensitivity adjustment (SENS.)**
Clockwise : Increase sensitivity
Counter clockwise : Decrease sensitivity

◆ **Light-on/Dark-on selectable switch**
L. ON : Light-on operation
D.ON : Dark-on operation

INDICATORS

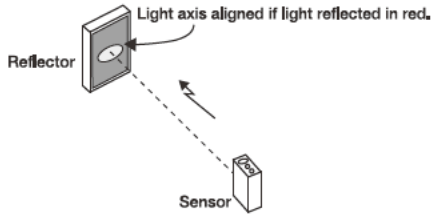
- Operating indicator (orange LED) and stability indicator (green LED) show the status of the receiving light level.
- When it set in the stability area, the reliability will be higher against environmental change after setting.



ADJUSTMENT

1) Arrange the sensor face-to-face and in line with the reflector. Swivel the operation indicator (orange LED) to check the area in which the sensor is activated and install the sensor at the center of the area. Make sure that the stability indicator (green LED) is illuminated.
2) Use the sensitivity adjustment volume for fine-tuning when detecting thin rod-like or small objects.

(Note)
Light reflected on the object may be detected depending on the object such as glossy detection objects including stainless steel. In this case, use the sensitivity adjustment volume to prevent detection of light from the object.



■ Choose the reflector by the distance and the usage.

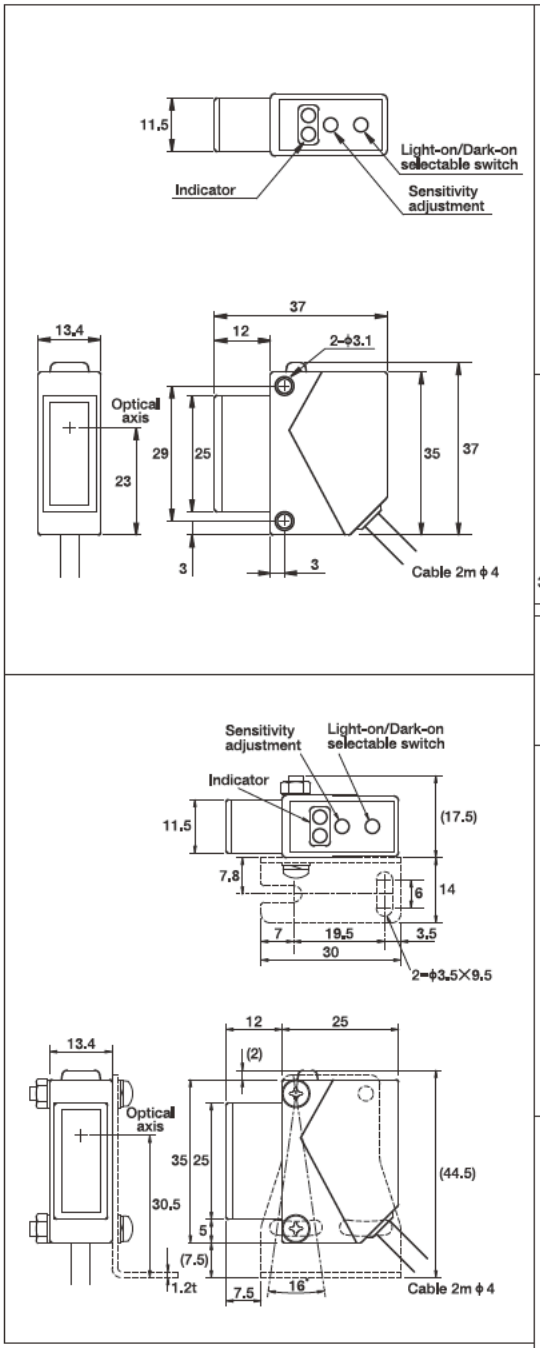
Reflector		S-0503A	K-7	K-71	K-72
Range	LD-MX5R	2.5m or less	5m or less	4m or less	3.5m or less
	LD-MX5R-C1	1.5m or less	0.3 to 3m	0.3 to 1.2m	1.5m or less
Effective reflection area		24×24mm	56×36mm	32×19mm	29×8mm
Usage		Detection for small object	Detection for long range	Small space for reflector	Detection for small object

Be careful it is not likely to be able to use it with reflectors other than the above-mentioned.

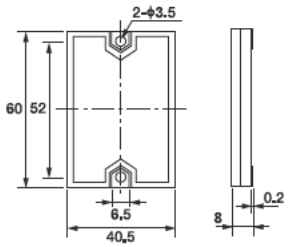
NOTES

- Use power supply which is limited the current (2A) in accordance with the lead wire size of the sensor.
- Do not turn power ON / OFF in rapid sequence.
- Use a soft, dry cloth for cleaning the lens and housing and wipe it off gently. Never use solvents such as thinner or alcohole.
- If cable must be lengthened, use thick cable (0.3mm²). If extending cable, be alert for voltage drops or external noise.
- When a commercial switching regulator is used, ground the frame ground terminal (FG). Otherwise, power switching noise may cause operation error.
- High-frequency equipment such as fluorecent lights, or inverters may cause light or noise at frequencies approximating photosensor modulation frequency. Do not use the product close to such equipment.
- Be sure to wire high-voltage lines, power lines, and photosensor separately. If these cables are installed in the same piping or duct, induction may occur, causing operation error or damage.
- Laser beam radiates in oval from and shows a diffraction pattern.
- This product is highly subject to deterioration or destruction by current surges or static electricity arising from semiconductor laser use.
- The laser diode is equipped with a circuit designed to maintain constant luminous. Lower luminous increases current, to keep luminous constant. Therefore, use a high-capacity power source.
- The tightening torque should be 0.6N·m.(Max.)

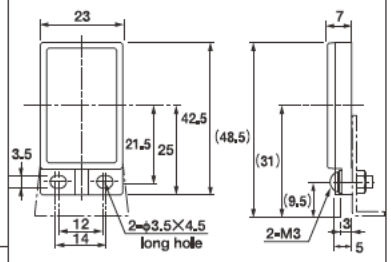
DIMENSIONS (Unit : mm)



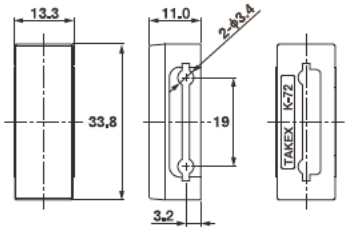
K-7



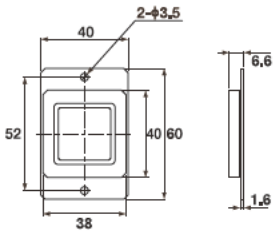
K-71

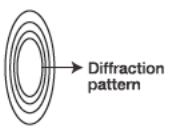


K-72



S-0503A





- This sensor is designed to detect an object : it is not a safety device. TAKENAKA is not responsible for damage or losses caused by accident, calamity, acts of God, abuse, misuse abnormal usage, faulty installation or improper maintenance.
- Specifications and external dimensions described herein may be subject to change without notice, if necessary for the purpose of improvements.