

LD-MX5R series


Laser Type

Embedded Amplifier Photo Sensor






Long-range high-precision locating detection!
Additional easy optical axis alignment

- Extra fine beam suitable for detection of minute objects.
- Coaxial reflective laser detects an object in a narrow gap or through a hole.
- Polarized reflective method easily detects a mirror-like object.
 - Equipped with mutual interference prevention function.
 - Provided with laser emission inhibit input.
 - Class 1 laser type is also available.

 This is a laser product. To use the product safely, do not look at the beam directly and do not point towards the human body.

Type

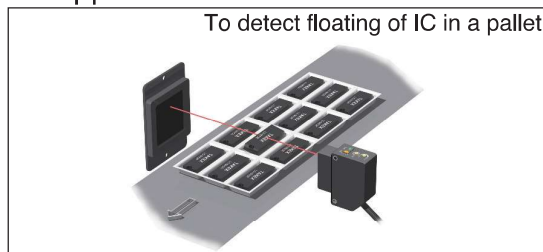
Detection method	Detecting distance	Model	Operation Mode	Output mode
 Polarized retroreflective	 0-5m (When using K-7*)	LD-MX5R	Light ON/ Dark ON selectable (with switch)	NPN open collector
		LD-MX5RPN		PNP open collector
	 0.3-3m (When using K-7*)	LD-MX5R-C1		NPN open collector
		LD-MX5RPN-C1		PNP open collector

* The detecting distance varies, depending on reflector types combined with the sensor.
Reflectors are available as optional parts.

Optional Parts

Product name	Type	Detecting distance (m)		Effective reflecting surface (mm)
		LD-MX5R	LD-MX5R-C1	
Reflector	S-0503A	0-2.5	0-1.5	24x24
	K-72	0-3.5	0-1.5	29x8
	K-71	0-4	0.3-1.2	32x19
	K-7	0-5	0.3-3	56x36

Applications



Rating/Performance/Specification

Model	NPN type	LD-MX5R	LD-MX5R-C1
	PNP type	LD-MX5RPN	LD-MX5RPN-C1
Detection method		Polarized retroreflective	
Detecting distance		Depending on reflectors(Reflectors are optional)	
Power supply		12-24VDC ±10% / Ripple 10% or less	
Current consumption	NPN type	32mA or less *1	30mA or less *1
	PNP type	37mA or less *1	35mA or less *1
Output mode	NPN type	NPN open collector Rating: sink current 100 mA (30 VDC) or less	Residual voltage: 1 V or less
	PNP type	PNP open collector Rating: source current 100 mA (30 VDC) or less	Residual voltage: 2 V or less
Operation mode		Light ON/Dark ON selectable (with switch)	
Cross talk prevention		Built-in(up to 2 sensors)	
Test input		Non voltage input(Contact or Non contact)	
Response time		0.5ms or less	
Spot diameter		ø5mm (detecting distance at 5m)	Ø3mm (detecting distance at 3m)
Light source (wavelength)		Red semiconductor laser (650nm) Class 2	Red semiconductor laser (650nm) Class 1
Indicator		Operation indicator (orange LED) / Stability indicator (green LED)	
Volume (VR)		SENS: sensitivity adjustment	
Switch (SW)		Dark ON / Light ON selector switch	
Short circuit protection		Provided	
Material	Case	Heat resistant ABS	
	Lens	Glass	
Connection		Cable type (outer dimension: dia. 4 mm) 0.2 mm ² 4 cores 2 m (black)	
Weight		Approx. 80g	
Accessory		Screwdriver for adjustment, mounting bracket, operation manual, warning label *2, instruction label	

The detecting distance and detection object of retroreflective types varies, depending on reflector types combined with the sensor.

The detecting distance is the range which you can set for the reflector. The sensor can detect an object even in extremely short range.

*1 The laser diode is equipped with a circuit that maintains the same light intensity level by increasing the current if it becomes dark. For this reason, allow sufficient margin in the capacity of the power supply.

*2 Excepting LD-MX5RC1 and LD-MX5RPN-C1.

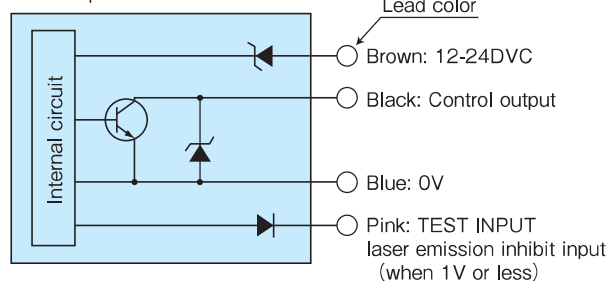
Environmental Specification

Ambient light	5000 lx or less
Ambient temperature	-10 - +55°C (non-freezing)
Ambient humidity	35~85%RH (non-condensation)
Protective structure	IP66
Vibration	10-55 Hz / 1.5 mm double amplitude / 2 hours each in 3 direction
Shock	500 m/s ² / 3 times each in 3 directions
Dielectric withstanding	1000 VAC for 1 minute
Insulation resistance	500 VDC 20 MΩ or higher

Input/Output Circuit and Connection

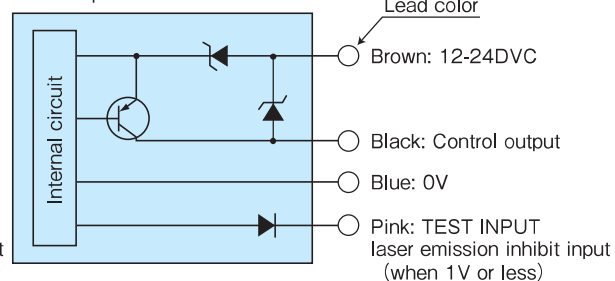
• LD-MX5R/LD-MX5R-C1

NPN output



• LD-MX5RPN/LD-MX5RPN-C1

PNP output

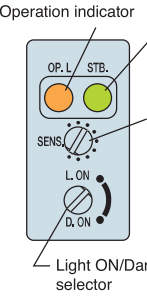


• This product applies a slow starter circuit for laser emission. The laser light turns on about one seconds after power-up or reset of a short circuit caused by emission inhibit input.

• The output transistor turns off if a load short-circuit or overload occurs. The output transistor turns off. Check the load state before restarting.

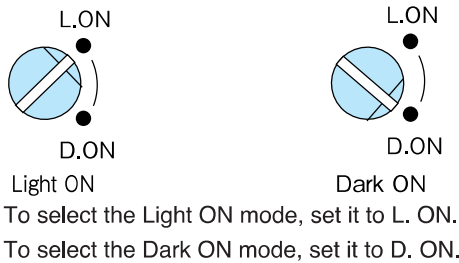
LD-MX5R

Panel and Indicators

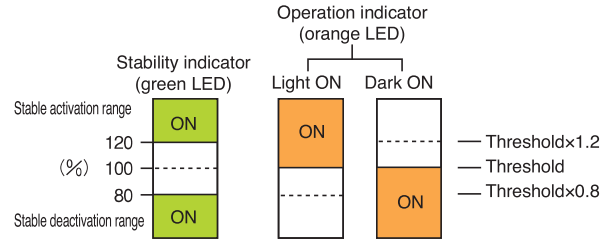


- **Operation indicator (orange LED)**
Illuminates when the output transistor is ON.
- **Stability indicator (green LED)**
Illuminates when the light intensity is 80% or lower of the threshold or 120% or higher.
- **Sensitivity adjustment volume**
To increase sensitivity, turn it clockwise. To decrease sensitivity, turn it counterclockwise.
- **Light ON/Dark ON selector**
When it is set to L.ON, the sensor works if it receives the light. When it is set to D.ON, the sensor works if it doesn't receive the light.

How to select Light ON/Dark ON



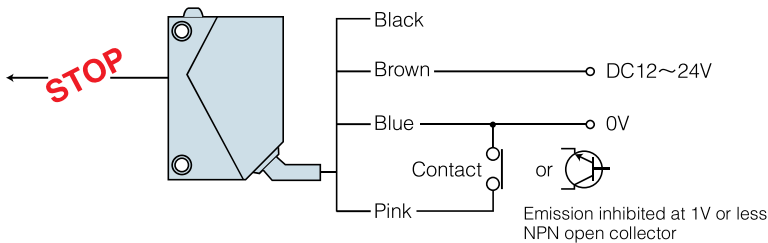
Indicators



- Operation indicator (orange LED) and Stability indicator (green LED) turn on as the figure above shows. After aligning the optical axis and adjusting the sensitivity, make sure that light reception and light blocking are occurred within the stable activation or deactivation ranges by blocking and unblocking the light with the detection object.
- Setting within the stable range increases the reliability against variations in the environment after installation.

How to Use Light Emission Inhibit Function

- Short circuiting the blue and pink leads of the transmitter stops the laser light emission at a certain time. When not using the light emission inhibit function, connect the pink lead to the brown.



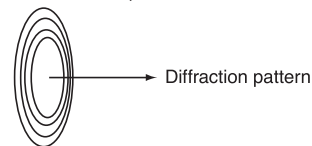
For Correct Use



- Do not use this product to protect the human body.
- When using the product for safety purposes, ensure "System-Wide" safety with the control system as a whole as well as the detection.
- This product is not explosion proof. Please use a type approved product, "Barrier Sensor," for explosion proof equipment.

- The semiconductor laser used in this product falls under the following class as defined in JIS C 6802 "Safety of Laser Products."
 - Class 1 (Intrinsically safe under the rationally predictable operation conditions)
 - Class 2 (Emits visible radiation from which the eyes are generally protected by the aversion reactions)
- This product employs the parallel beam of a laser and care should be taken not to allow the laser light to enter the human eye. Never look into the laser radiation outlet of the transmitter connected to the power supply. Looking straight into the laser light may damage the eye.
- This product is provided with warning and instruction labels as shown below for notifying and alerting the operator of the sensor of the degree of danger. After the product has been installed, attach the labels in prominent locations on the sensor.

- The radiated laser beam is elliptic due to the characteristics of semiconductor laser. In addition, a diffraction pattern is generated due to the optical diffraction phenomenon.

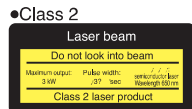


- Be aware that this product uses a semiconductor laser and is prone to deterioration due to surge current or static electricity.
- The laser diode is equipped with a circuit that maintains the same light intensity level by increasing the current if it becomes dark. For this reason, allow sufficient margin in the capacity of the power supply.
- Always avoid use in which the power is turned on and off consecutively.
- Be sure to turn off the power before moving including mounting and removing or repairing.

Warning label



Instruction level



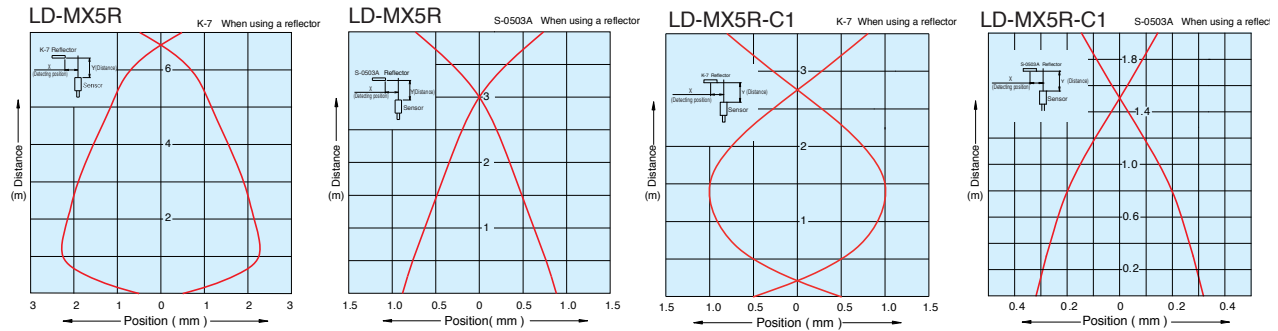
Class 1



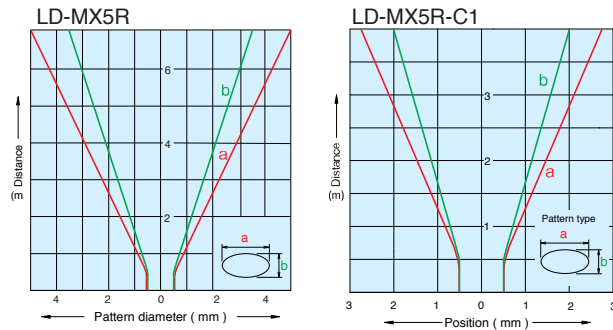
LD-MX5R

Performance Curves (Typical)

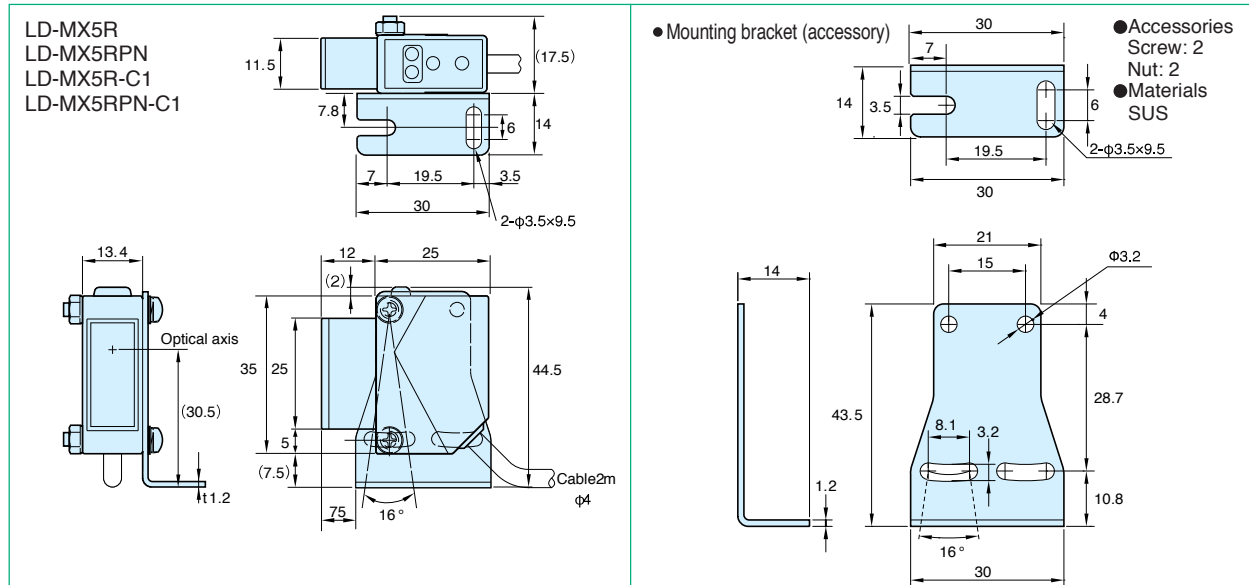
Response curves: Beam pattern



Beam patterns



Dimensions (in mm)



Optional Parts (in mm)

Reflector model	K-7	K-71	K-72	S-0503A
Effective reflecting surface	56×36mm	30×18mm	29×8mm	24×24mm
Dimensions (in mm)				