

Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

WARNING

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

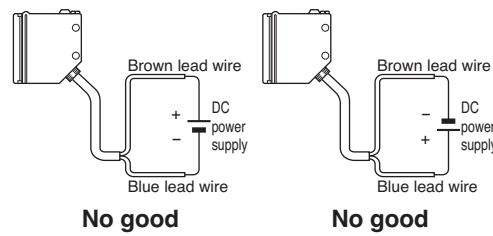
1 SPECIFICATIONS

Type	Thru-beam	Retroreflective with polarizing filters (Note 2)	Diffuse reflective
Item	RX2-M5	RX2-PRVM2	RX2-D300
Sensing range	5m	0.1 to 2m (Note 3)	300mm (Note 4)
Hysteresis	—	—	15% or less of operation distance
Supply voltage	12 to 24V DC ±10% Ripple P-P 10% or less		
Current consumption	Emitter: 8mA or less Receiver: 0.8mA or less (Note 5)	1mA or less (Note 5)	
Sensing output	Non contact DC 2-wire type · Load current: 5 to 100mA · Residual voltage: 4V or less (Note 6)		
Output operation	Switchable either Light-ON or Dark-ON		
Short-circuit protection	Incorporated		
Response time	3ms or less		
Protection	IP67 (IEC)		
Ambient temperature	-20 to +60°C (No dew condensation or icing allowed), Storage: -30 to +70°C		
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH		
Emitting element	Infrared LED (modulated)	Red LED (modulated)	Infrared LED (modulated)
Material	Enclosure: Die-cast zinc alloy, Indicator cover: Polyethersulphone Lens: Polycarbonate (RX2-PRVM2: Acrylic)		
Cable	0.15mm ² 2-core oil, heat and cold resistant cable, 2m long		
Weight	Emitter: 70g approx., Receiver: 70g approx.	75g approx.	70g approx.
Accessories	MS-RX-1 (Sensor mounting bracket): 1 set for emitter and receiver Adjusting screwdriver: 1 pc.	MS-RX-1 (Sensor mounting bracket): 1 set RF-230 (Reflector): 1 pc. Adjusting screwdriver: 1 pc.	MS-RX-1 (Sensor mounting bracket): 1 set Adjusting screwdriver: 1 pc.

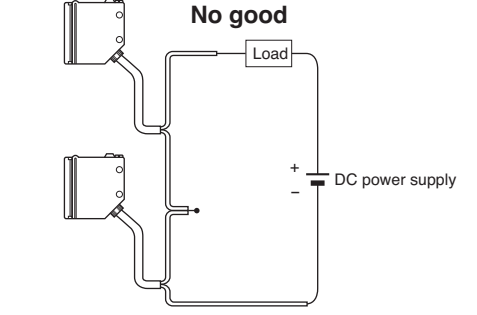
Notes: 1) The model No. with suffix '-C5' stands for the 5m cable length type. (e.g.) As for the 5m cable length type of **RX2-M5** 'RX2-M5-C5' The model No. with suffix 'P' shown on the label affixed to the thru-beam type sensor is the emitter, 'D' shown on the label is the receiver.
Thru-beam type sensor emitter: **RX2-M5P**, Thru-beam type sensor receiver: **RX2-M5D**
2) The retroreflective type sensor with polarizing filters may not stably detect specular or glossy objects through transparent film since light is polarized by the transparent film. For details, refer to '7 RETROREFLECTIVE TYPE SENSOR WITH POLARIZING FILTERS (RX2-PRVM2)'.
3) The sensing range for **RX2-PRVM2** is specified for the **RF-230** reflector. Further, the sensing range is the possible setting range for the reflector. The sensor can detect an object less than 0.1m away.
4) The sensing range of **RX2-D300** is specified for white non-glossy paper (200 × 200mm) as the object.
5) It is the leakage current when the output is in the OFF state.
6) When extending the cable, the residual voltage will be increased depending on the type of cable used. Verify the residual voltage when extending the cable.

2 CAUTIONS

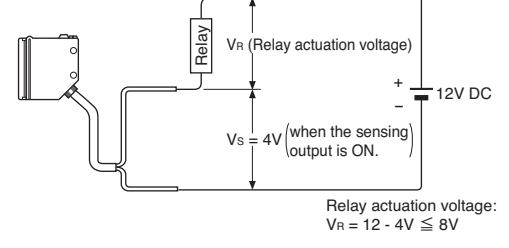
- Make sure that the power supply is off while wiring.
- Take care that wrong wiring will damage the sensor.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Extension up to total 100m, is possible with 0.3mm², or more, cable. However, in order to reduce noise, make the wiring as short as possible.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.
- After sensitivity adjustment is made, close the front panel completely and tighten the panel securing screw firmly so that the protective structure could be maintained.



- Do not connect sensors in series (AND circuit).

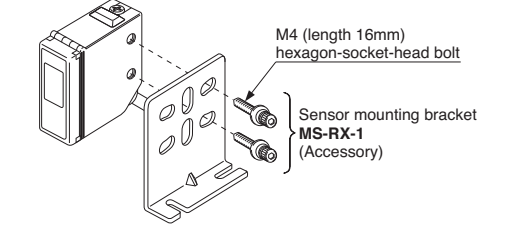


- A parallel connection (OR circuit) is possible. However, make sure that 5mA, or more, current flows on each sensor. Note that the current consumption (leak current) increases according to the number of the units to use.
- The residual voltage of the sensor is 4V. Before connecting to a relay, be aware of the actuation voltage of the relay. (Not all 12V relays may be connected as the load.)



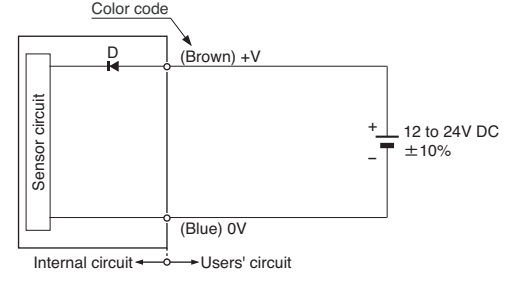
3 MOUNTING

- The tightening torque should be 1.17N·m or less.

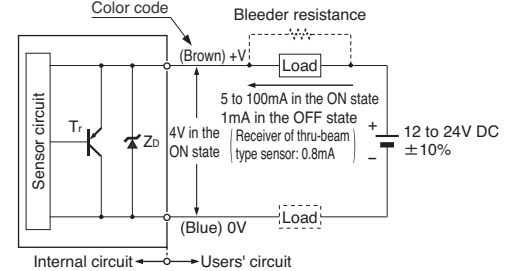


4 I/O CIRCUIT DIAGRAMS

● Emitter of thru-beam type sensor



● Receiver of thru-beam type sensor, retroreflective and diffuse reflective type sensors



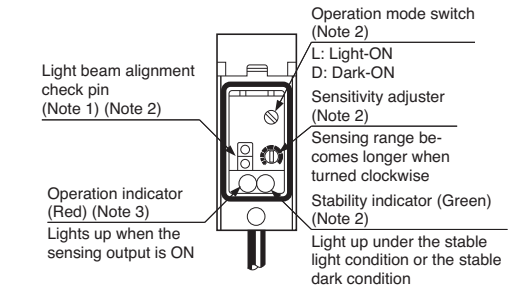
Symbols... D : Reverse supply polarity protection diode
Zs : Surge absorption zener diode
Tr : NPN output transistor

Conditions for the load

- (1) The load should not be actuated by the leakage current (1mA; 0.8mA for receiver of thru-beam type sensor) in the OFF state.
- (2) The load should be actuated by (supply voltage -4V) in the ON state.
- (3) The current in the ON state should be between 5 to 100mA DC.
(In case the current is less than 5mA, connect a bleeder resistance in parallel to the load (shown in dotted line above) so that a current of 5mA, or more, flows.

5 ADJUSTMENTS

● Part description

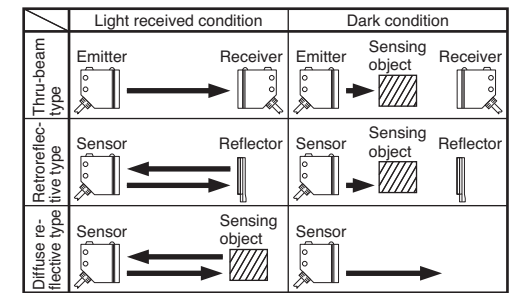


Notes: 1) This is for the sensor checker **CHX-SC1**. Note that **CHX-SC1** has been with down since Feb. 2001.
2) Not incorporated on the thru-beam type sensor emitter.
3) It is the emission halt indicator (lights up when emission halts) for the thru-beam type sensor emitter.

● Sensitivity adjustment

Step	Sensitivity adjuster	Description
①	MIN. MAX.	Turn the sensitivity adjuster fully counter-clockwise to the minimum sensitivity position, Min.
②	MIN. MAX.	In the light received condition, turn the sensitivity adjuster slowly clockwise and confirm the point ㉑ where the sensor enters the 'Light' state operation.
③	MIN. MAX.	In the dark condition, turn the sensitivity adjuster further clockwise until the sensor enters the 'Light' state operation and then bring it back to confirm point ㉒ where the sensor just returns to the 'Dark' state operation. If the sensor does not enter the 'Light' state operation even when the sensitivity adjuster is turned fully clockwise, the position is point ㉑.
④	MIN. MAX.	The position at the middle of points ㉑ and ㉒ is the optimum sensing position.

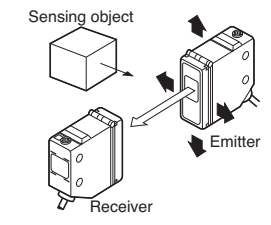
Note: Use the accessory adjuster screwdriver to turn the adjuster slowly. Turning with excessive strength will cause damage to the adjuster.



● Beam alignment

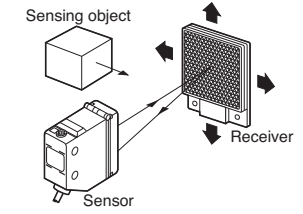
Thru-beam type sensor

- ① Set the operation mode switch to the Light-ON mode position (MODE L side).
- ② Placing the emitter and the receiver face to face along a straight line, move the emitter in the up, down, left and right directions, in order to determine the range of the light received condition with the help of the operation indicator (red). Then, set the emitter at the center of this range.
- ③ Similarly, adjust for up, down, left and right angular movement of the emitter.
- ④ Further, perform the angular adjustment for the receiver also.
- ⑤ Check that the stability indicator (green) lights up.
- ⑥ Choose the operation mode, Light-ON or Dark-ON, as per your requirement, with the operation mode switch.



Retroreflective type sensor

- ① Set the operation mode switch to the Light-ON mode position (MODE L side).
- ② Placing the sensor and the reflector face to face along a straight line, move the reflector in the up, down, left and right directions, in order to determine the range of the light received condition with the help of the operation indicator (red). Then, set the reflector at the center of this range.
- ③ Similarly, adjust for up, down, left and right angular movement of the reflector.
- ④ Further, perform the angular adjustment for the sensor also.
- ⑤ Check that the stability indicator (green) lights up.
- ⑥ Choose the operation mode, Light-ON or Dark-ON, as per your requirement, with the operation mode switch.



Relation between sensing output and indicators

In case of Light-ON			In case of Dark-ON			
Stability indicator	Operation indicator	Sensing output	Sensing condition	Sensing output	Operation indicator	Stability indicator
☀	☀	ON	Stable light receiving	OFF	●	☀
●	●	OFF	Unstable light receiving	ON	☀	●
☀	●	OFF	Unstable dark receiving	ON	☀	☀
●	☀	ON	Stable dark receiving	OFF	●	●

☀ : Lights up ● : Turns off

6 SLIT MASK (OPTIONAL) (Exclusively for thru-beam type sensor)

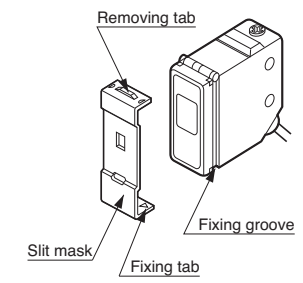
- With the slit mask, the sensor can detect a small object. However, the sensing range is reduced when the slit mask is mounted.

How to mount

- ① Insert the fixing tab into the fixing groove.
- ② Then, pressing the slit mask against the main unit, insert the fixing tab into the fixing groove.

How to remove

- ① Insert a screwdriver into the removing tab.
- ② Pull forward while lifting the removing tab.



7 RETROREFLECTIVE TYPE SENSOR WITH POLARIZING FILTERS (RX2-PRVM2)

- If a shiny object is covered or wrapped with a transparent film, such as those described below, the retroreflective type sensor with polarizing filters may not be able to detect it. In that case, take the following measures given below.

<Example of sensing objects>

- Can wrapped by clear film
- Aluminum sheet covered by plastic film
- Gold or silver color (specular) label or wrapping paper

<Measures>

- Tilt the sensor with respect to the sensing object while fitting.
- Reduce the sensitivity.
- Increase the distance between the sensor and the sensing object.