

PHOTOELECTRIC SENSOR

INSTRUCTION MANUAL

Thank you very much for selecting Aotero products.
Please read this instruction manual before you use
this unit.

2B50-6C-VE

Ordering information

EK50-DS30M1

- 1 : NO
- 2 : NC
- 4 : NO/NC control
- C(E): 3-wire NPN output
- B(F): 3-wire PNP output
- M : 5-wire relay output
free AC/DC power supply
- A : 5-wire relay output
AC power supply
- D : 5-wire relay output
DC power supply
- Z : 2-wire AC SCR output
- Detecting distance:
30:30cm 50:50cm
2 : 2m 5 : 5m
- DS:diffusing reflective
- R :retroreflective
- ():through- beam
- GS:flute profile
- Diameter of head
or side length
- R : cylindrical type
- K : rectangle relay type
- A : universal type
- U : flute profile type
- Q : particular type
- X : fiber optic type

E: photoelectric sensor

The classification of photoelectric sensor

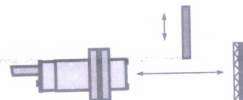
Classified by detecting ways

Diffusing reflective type



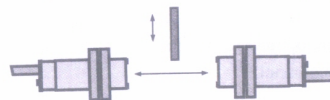
Characteristic: could detect anything including
transparent object

Retroreflective type



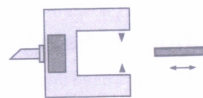
Characteristic: matched with optic axis
adjusting simply

Through-beam type



Characteristic: high work stability
long detecting distance

Flute profile type



Characteristic: high work-position accuracy
adjusting simply

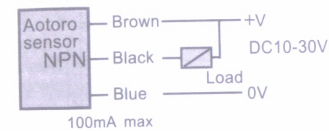
Fiber type



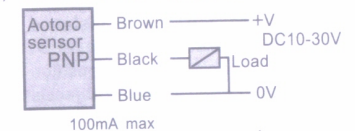
Characteristic:
could detect mini object with high accuracy

Classified by output form :

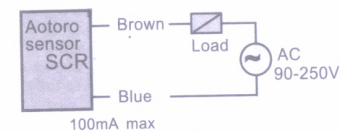
(1) DC 3-wire NPN NO or NC



(2) DC 3-wire PNP NO or NC



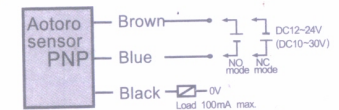
(3) AC 2-wire SCR output



(4) DC 3-wire NPN NO/NC control



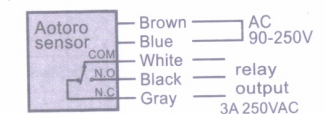
(5) DC 3-wire PNP NO/NC control



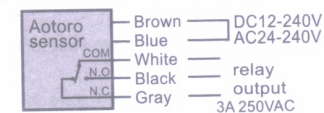
(6) DC 5-wire relay output



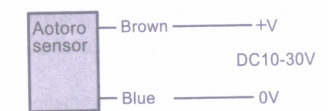
(7) AC 5-wire relay output



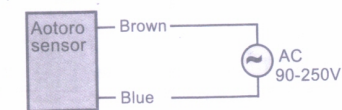
(8) Free AC/DC 5-wire relay output



(9) DC type emitter connections



(10) AC type emitter connections



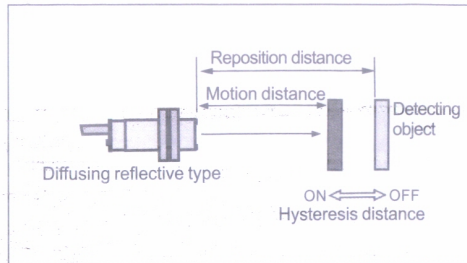
(11) Free AC/DC type emitter connections



■ Detecting distance and hysteresis

When adopting diffusing reflective photoelectric sensor, the motion distance means the space distance between the induction surface of photoelectric sensor and basic position of sensor motion when detecting object is moving according to certain regulation.

Hysteresis distance: the absolute Difference between motion distance and Deposition distance



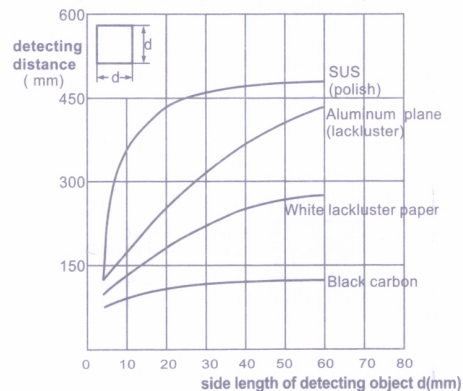
■ The detecting object's influence on detecting distance

When adopting diffusing reflective type photoelectric sensor, the surface color, volume of detecting object would produce effect on detecting distance and motion zone: according to drawing(1), (2)

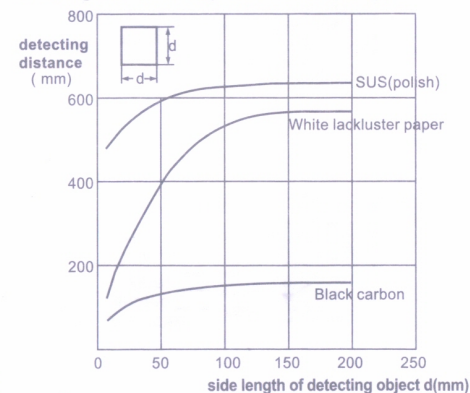
When enlarging detecting object's volume, the effect of detect mini object's distance is inferior to detect bigger object.

The bigger is reflection ratio of detecting object's surface, the longer is the detecting distance

Drawing (1) adopting ER18-DS10C1 type



Drawing (2) adopting EK50-DS30M1 type

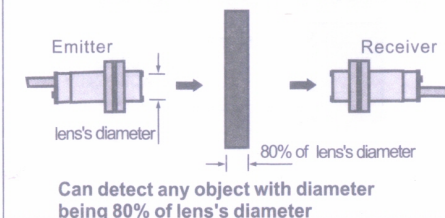


■ Minimum detecting object and lens's diameter

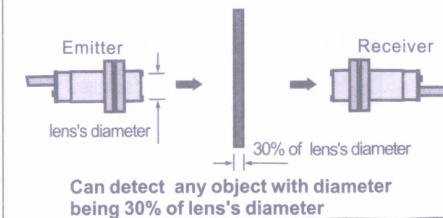
When adopting through-beam type photoelectric sensor, the volume of minimum detecting object is determined by lens's diameter.

Adopting through-beam type, the smaller object is detected better at the middle position between emitter and receiver than closer to any side.

Max. Sensitivity position of adjuster



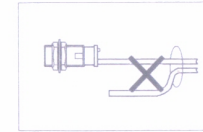
If adjusting sensitivity



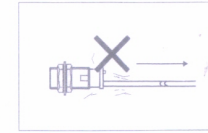
■ Caution for using



◀ Avoid sunshine, water please do not use this unit at outdoors as much as possible



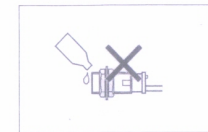
◀ If a power line or high voltage pass near by proximity cable. Malfunction of sensor will be caused, therefore be sure to wire the sensor cable though a metallic conduit.



◀ Please do not pull excessively at the cable.



◀ Please do not shock to the photoelectric sensor.



◀ Avoid using the sensor in a place chemicals. Particularly strong alkali acid, nitric acid, chromic acid, solvents etc.



◀ Please do not put overload to tighten nut, please use washer for tightening.

- Surge protection: when the photoelectric sensor is used at near position occurring big surge (welding operation etc.), Please connect absorber in this unit, etc.
- If connect the load with big inrush current (DC type bulb) to this unit, the big inrush current will flow due to the initial resistance is low. If the current flows, the resistance of load will be bigger, then it will return to standard current. In this case, photoelectric sensor might be damaged by inrush current. If you use DC type bulb, please connect extra relay or resistance in order to protect photoelectric sensor from.
- The photoelectric sensor may cause malfunction under the fluorescent lamp light, so be sure to use cut-off light with panel.
- When more than 2 sets of diffuse reflection types are installed adjacently, it can be occurred malfunction by light beam from the other target. So it must be installed at an enough interval.
- When more than 2 sets of Through-beam types sensor are used closely, it might cause interference each other. Be sure to put enough space between them in order to avoid malfunction.
- Please check the voltage changes of power source in order not to excess rating power input.
- Do not use this unit during transient time (100ms) after apply power.

■ Precautions in using the product

When the product is used under the circumstances below, ensure adherence to the limitations of the ratings and functions. Also, take countermeasures for safety precaution such as failsafe installations:

1. Use under the circumstances or environment which are not described in the instruction manual.
2. Use for the equipment which require higher level of safety, such as nuclear devices, railroad, aircrafts, vehicles, combustion devices, amusement machinery, medical equipment, safety device.
3. Use for the applications where death, serious injury or property damage is possible and extensive safety precautions are required.