# TAKEX

PHOTOSENSOR
with built-in amplifier

# UX SERIES Instruction Manual


**TAKENAKA ELECTRONIC INDUSTRIAL CO.,LTD.**

Head office, factory : 20-1 Shinomiya Narano-cho, Yamashina-ku,
: Kyoto 607-8032, Japan
Telephone : +81−75−581−7111
FAX : +81−75−581−7118


- Thank you for using **TAKEX** products.
- Please read this manual carefully prior to use the sensor.

## 1 SPECIFICATIONS

| Type | Straight | Side view | Straight | | | |
|---|---|---|---|---|---|---|
| NPN output type | UX−T100D | UX−T50DS | UX−R2 | UX−R3 | UX−R5 | UX−R5V |
| PNP output type | UX−T100DPN | UX−T50DSPN | UX−R2PN | UX−R3PN | UX−R5PN | UX−R5VPN |
| Detection method | Through beam | | Diffuse reflective | | | |
| Detecting distance | 1000㎜ | 500㎜ | 3−20㎜ | 3−30㎜ | 3−50㎜ | 3−50㎜ ※1 |
| Detection object | φ4㎜ (opaque) Min. | φ5㎜ (opaque) Min. | 100×100㎜ white paper | | | |
| Thread size | M5×0.5 | | M6×0.75 | | | |
| Power supply | 12−24V DC ±10% ／ Ripple 10% Max. | | | | | |
| Current consumption | Transmitter 15mA Max.<br>Receiver 15mA Max. | | 20mA Max. | | | |
| Output mode | Open collector | | | | | |
| NPN output type | Rating : sink current 80mA (30VDC) Max. | | | | | |
| PNP output type | Rating : source current 80mA (30VDC) Max. | | | | | |
| Operation mode | Dark ON | | Light ON | | | |
| Response time | 0.5 ms Max. | | | | | |
| Operating angle | 2° (Receiver) | 10° (Receiver) | ——— | | | |
| Light source | Red LED (630nm) | Red LED (625nm) | Infrared LED (870nm) | | | |
| Indicator | Operation : Orange, Stability : Green | | | | | |
| Sensitivity adjustment | ——— | | | | | Potentiometer ※1 |
| Short circuit protection | Built-in | | | | | |
| Material | Case, Nut, Washer : SUS303, Lens : Polysulfone | | | | | |
| Connection | Permanently attached cord (outer dimension : dia. 2.8) 2m length | | | | | |
| | Trns : 0.15sq.×2 core Rcvr : 0.15sq.×3 core | | 0.15sq.× 3 core | | | |
| Mass | Trns : 30g, Rcvr : 30g | | 30g | | | |

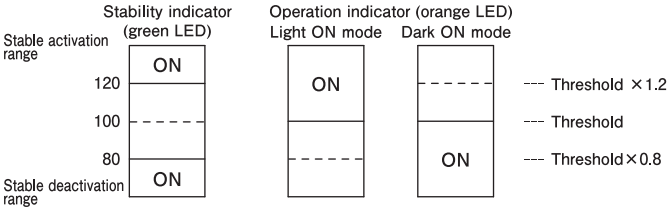
※1 The rotating torque should be 0.8 N·cm or less for the potentiometer.

## 2 ENVIRONMENTAL SPECIFICATION

| | |
|---|---|
| Ambient light | 3,000 l x Max. |
| Ambient temperature | Operating : −25 to +55℃<br>Storage : −30 to +70℃ (non-freezing) |
| Ambient humidity | 35 to 85%RH (non-condensing) |
| Protective structure | I P67 |
| Vibration | 10 to 55Hz / 1.5㎜ amplitude / 2 hours each in 3 direction |
| Shock | 500 m/s² / 3 times each in 3 directions |
| Dielectric withstanding | 500VAC for 1 minute |
| Insulation resistance | 500VDC mega, 20MΩ or higher |

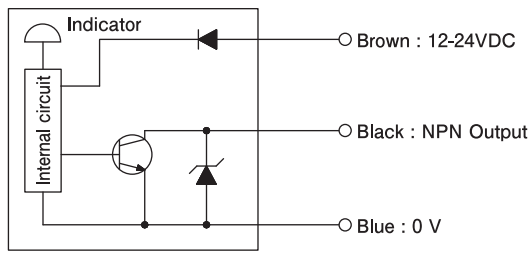
## 3 INDICATORS

- The operation indicator (orange LED) and stability indicator (green LED) show the levels of received light intensity as described in the figure.
- After aligning the optical axis and adjusting the sensitivity, use a detection object to block and unblock the light beam several times to make sure that the both operation are within the range that allows stable activation and deactivation.
- Setting in the range which allows stable operation achieves higher reliability against changes in the operating environment generated after installation.

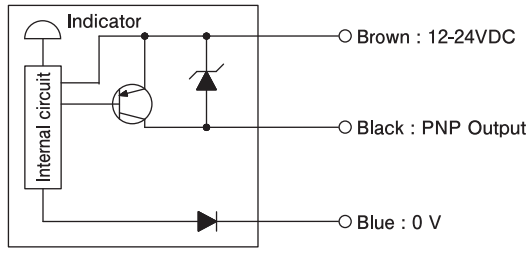



## 4 INPUT/OUTPUT CIRCUIT AND CONNECTION

(NPN output)




(PNP output)




- The transmitter for the through beam type has power cables only.
- The output transistor becomes OFF when it's short circuit or overload. Make sure all connections are correct before turning the power on.

## 5 INSTALLATION

**(Through beam)**

- Install the transmitter and the receiver linearly. By swinging the transmitter vertically and holizontally, find the range where the operation indicator (orange) turns on and direct the sensor in the center of the range. Adjust the position of the receiver in the same way.

**(Diffuse reflective)**

- Set the sensor so that the operation indicator (orange) turns on when a detection object is placed at a given position and turns off when it is removed.
- Keep any background away from the detection position. If necessary use black surface with low reflectance.
- This sensor is not equipped with sensitivity adjustment, find a setting and detecting position where the sensor stably detects the object by changing the distance, angle or background.

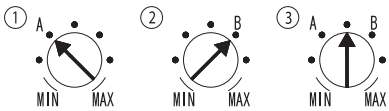
**(Diffuse reflective with sensitivity adjustment)**

※ When any light reflecting object is in the background.

① Place a detection object at a given position and turn up the sensitivity adjustment volume from MIN until the operation indicator turns on (Point A).

② Remove the object and turn down the Sensitivity adjustment volume from MAX until the operation indicator turns off (Point B). (MAX is regarded as Point B if the operation indicator doesn't turn off at MAX.)

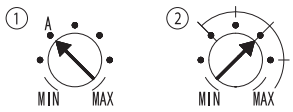
③ Set the volume at the middle point between Points A and B.




※ When no light reflecting object is in the background

① Place a detection object at a given position and turn up the sensitivity volume from MIN until the operation indicator turns on (Point A).

② Set the volume at the middle point between Point A and MAX. Make sure that the operation indicator and turns on when the detection object is placed at the given position.




## 6 NOTES

- When there is any reflective objects (wall, floor, or eqipment) within the directional field between the transmitter and the receiver, the sensor may not detect an object due to unwanted light caused by reflection. Ensure a correct mounting position.

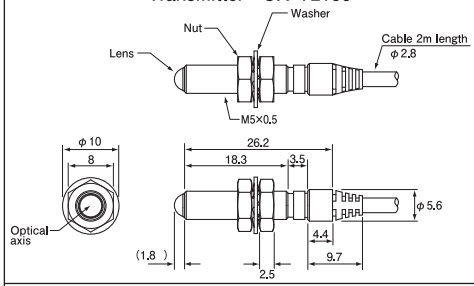
## 7 PRECAUSIONS DURING USE

- Use attached nuts and washer for mounting the sensor.
- Tighten the nuts with a torque of 1.0 N·m or less. The thread may be stripped if an excess torque is applied.
- Check the mounting position and the optical axis before fixing the sensor. Once the sensor is fixed, the mounting angle is not adjustable.
- Clean the lens by a soft and dry cloth periodically. A stain or dirt stuck on the lens deteriorates the performance. Do not use organic solvent including alcohol and thinner.
- Avoid turning the power on and off consecutively.
- Though this sensor has IP67 rated housing, do not use the sensor where water is splashing constantly or under the water.
- Be sure to route the sensor cables separate from any power transmission or high voltage line, or else use shielded cables. Using the same conduit or duct as high voltage or power lines will cause malfunctions or damage because of electromagnetic induction.
- When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminal.
- High frequency fluorescent lamps or inverters may cause faulty operation as these equipment may emit light or noise of similar modulated frequency that photo sensors generate. Do not install the sensor in the vicinity of high frequency equipment.
- When extending the wire, use 0.3㎟ cable or more in size and limit the length up to 10m. Check a voltage drop.
- Limit the current of the power supply to 1A.

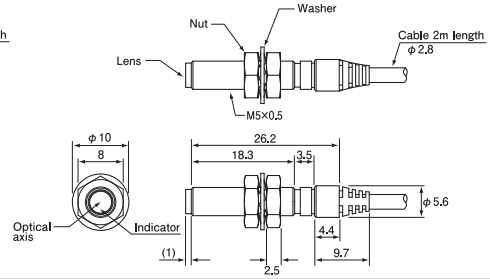
## 8 DIMENSIONS (in ㎜)

**Through beam (straight type)**

UX-T100D Transmitter : UX-TL100

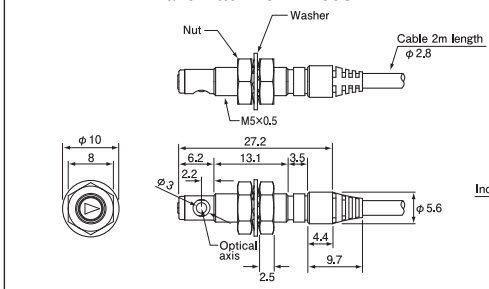



Receiver : UX-TR100D、UX-TR100DPN

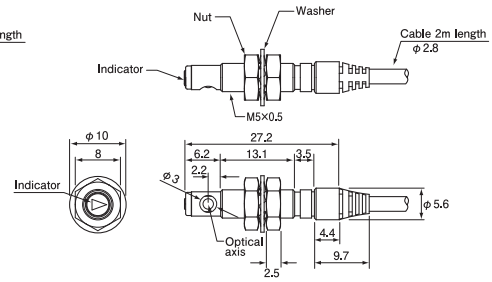



**Through beam (Side view type)**

UX-T50DS Transmitter : UX-TL50S

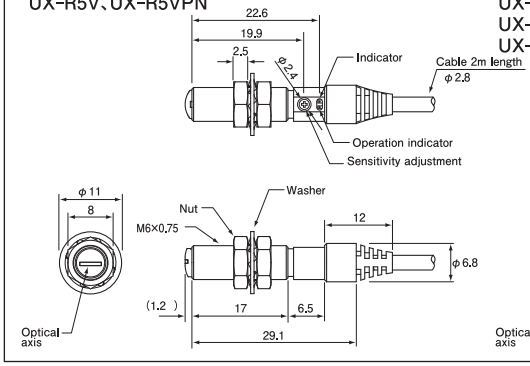



Receiver : UX-TR50DS、UX-TR50DSPN

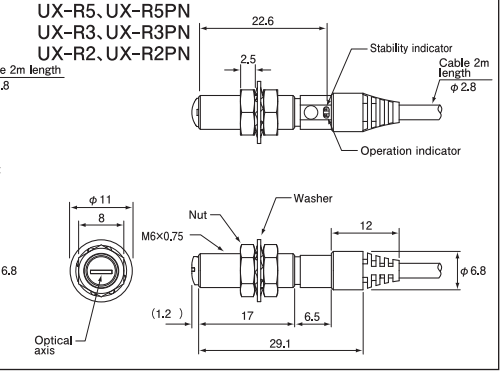



**Diffuse reflection**

UX-R5V、UX-R5VPN




UX-R5、UX-R5PN
UX-R3、UX-R3PN
UX-R2、UX-R2PN




- The guarantee period of this product is one year after the delivery.
- If any defect is found during the guarantee period, Takenaka will repair or replace the defective product.
- This product is an industrial sensor which issues an output upon detecting an object. It does not have any function to prevent accidents, death or injuries.
- Takenaka will not held responsible for any damage or loss incurred due to accidents, faulty installation, abuse, misuse, improper maintenance or acts of God including lighting surge.