

**PHOTOSENSOR**  
With built-in amplifier

**UX SERIES**

# INSTRUCTION MANUAL

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

## 1 SPECIFICATIONS

Type	Straight	Side view	UX-R2	UX-R3	UX-R5	UX-R5V
NPN output type	UX-T100D	UX-T50DS	UX-R2PN	UX-R3PN	UX-R5PN	UX-R5VPN
PNP output type	UX-T100DPN	UX-T50DSPN				
Detection method	Through beam		Diffuse reflective			
Detecting distance	1000mm	500mm	3-20mm	3-30mm	3-50mm	3-50mm *1
Detection object	φ4mm (opaque) Mir.	φ5mm (opaque) Mir.	100mm×100mm white paper			
Thread size	M5×0.5		M6×0.75			
Power supply	12-24V DC ±10% / Ripple 10% Max.					
Current consumption	Transmitter 15mA Max. 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)	10% Max.			
Hysteresis	_____		Infrared LED (870nm)			
Light source	Red LED (630nm)	Red LED (625nm)	Operation : Orange, Stability : Green			
Indicator	_____					
Sensitivity adjustment	_____					
Short circuit protection	Built-in					
Material	Case, Mnt. Washer : SUS303, Lens : Polysulfone					
Connection	Permanently attached cord (outer dimension : dia. 2.8) 2m length Tms : 0.15sq.X2 core Rcvr : 0.15sq.X3 core Tms : 30g, Rcvr : 30g					
Mass	30g					

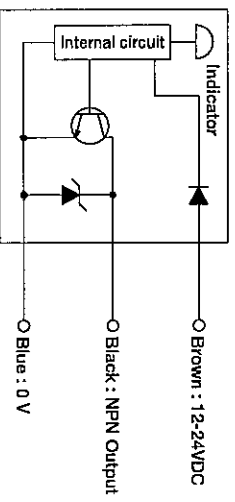
\*1 The tightening torque should be 8m·N·m or less for potentiometer.

## 2 ENVIRONMENTAL SPECIFICATION

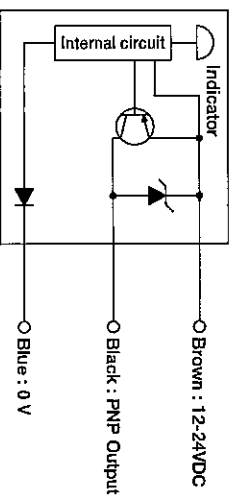
Ambient light	3,000 lx Max.
Ambient temperature	-25 to +55°C (non-freezing)
Ambient humidity	35 to 85%RH (non-condensing)
Protective structure	IP67
Vibration	10 to 55Hz / 1.5mm amplitude / 2 hours each in 3 direction
Shock	500 m/s <sup>2</sup> / 3 times each in 3 directions
Dielectric withstanding	500VAC for 1 minute
Insulation resistance	500VDC, 20MΩ or higher

## 4 INPUT/OUTPUT CIRCUIT AND CONNECTION

(NPN output)



(PNP output)



## 3 INDICATORS

- Light axis alignment and sensitivity adjustment are simple. Setting within the stable range increases the reliability against variation of environment after setting.
- The operation indicator (orange LED) and stability indicator (green LED) respectively show different received light intensity levels as described in the figure.

Stability indicator (green LED) Stable light reception range	Operation indicator (orange LED) Light-ON mode	Dark-ON mode
120 Illuminated	Illuminated	Illuminated
100 -----	-----	-----
80 Illuminated	-----	Illuminated

- The output transistor becomes OFF when it's short or overload.
- Make sure all connections are correct before turning the power on.

## 5 SETTING

### (Through-beam type)

- For light axis alignment, swivel the receiver vertically and horizontally to install it at the center of the area in which the light reception indicator (Orange LED) is illuminated for the individual direction.
- Repeat activation and deactivation to check the operation.

### (Diffuse-reflective type)

- Set the sensor so that the operation indicator (orange LED) is illuminated with the detection object placed at a given position and not illuminated with the object removed.
- Bring any background of the detection object as far away as possible or use black surface with low reflectance.
- The detecting distance depends on the surface condition of the detection object. This sensor is not provided with a sensitivity adjustment volume and needs to be adjusted for stable operation by changing the distance, angle, background object, etc.

### (Diffuse-reflective with Sensitivity adjustment)

- ※ In case of reflective background
- ① Set a target object to the desired position and then increase the sensitivity adjustment gradually from the minimum position until the indicator orange LED is on. (Point A)
- ② Remove the target object and gradually decrease the sensitivity adjustment from the maximum position until the orange LED is off (Point B). If the orange LED is still off even though the potentiometer is at the maximum position, this maximum position should be the point B.
- ③ Set the potentiometer at the center between Point A and B.



※ In case of no-reflective background

- Point A is the same point mentioned above.
  - Set the potentiometer at the center between Point A and MAX.
- Confirm both of orange LED and green LED light



## 6 NOTES ON INSTALLATION

- Any reflecting object (wall, floor, machine, etc.) within the effective range between the transmitter and receiver may allow the light of the sensor to go around the detection object, which is supposed to block the light, and reach the receiver. Choose the installation location carefully.

## 7 NOTES

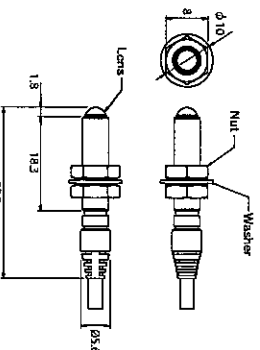
- In cleaning the lens and the case, be sure to use a dry cloth and gently wipe off dusts from them.
- Do not use thinner or alcohol.
- Avoid such a usage as continuously switching on and off the power source.
- Though this sensor is of water-proof construction, you can not use the sensor at the place with water being sprayed at all times or under the water.
- Don't wire together with power lines.
- When a commercial available switching regulator is used, ground the frame ground FG.
- Use an insulated transformer. Don't use an auto-transformer.
- Available cable diameter is 0.3mm<sup>2</sup> (min.) for extension.
- Tightening torque is within 1N·m when mounting by screw.
- Use which is limited the current in accordance with the lead wire size of the sensor.

## 8 DIMENSIONS

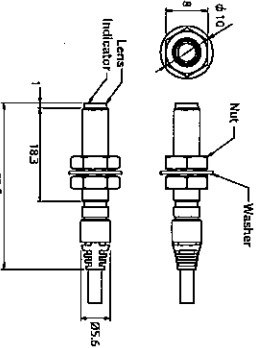
(in mm)

### ● Through beam (straight type)

UX-T100D  
UX-TL100 (Transmitter)

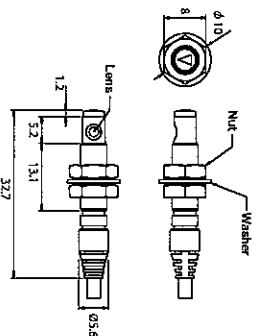


UX-TR100D (PN) (Receiver)

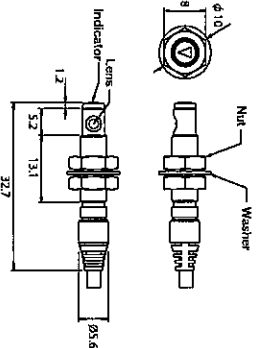


### ● Through beam (Side view type)

UX-T50DS  
UX-TL50S (Transmitter)

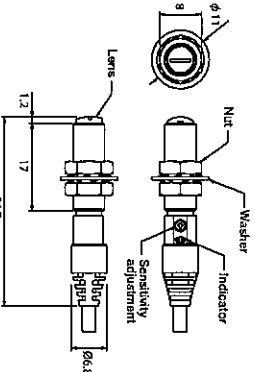


UX-TR50DS (PN) (Receiver)



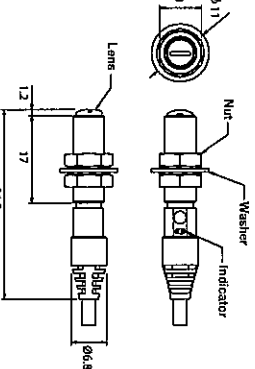
### ● Diffuse reflective (with sensitivity adjustment)

UX-R5V (PN)



### ● Diffuse reflective

UX-R□ (PN)



- 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.