Amplifier embedded in M5 or M6 threaded screw

- Simple installation reduces man-hours.
- Replacing fiber sensors contributes to lower power consumption.
- Can be used in the battery industry thanks to its stainless steel housing.
- Our line includes both straight and side view through- beam types.
- Diffuse reflective type is equipped with sensitivity volume. (Model: UX-R5V, UX-R5VPN)

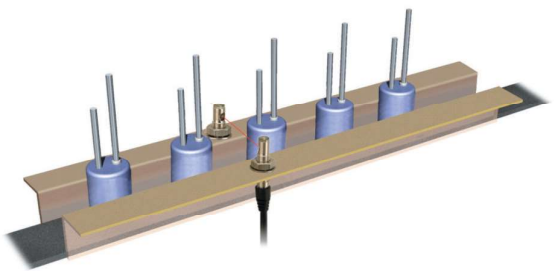
Type

Detection method	Detecting distance	Model		Operation mode	Output mode
		NPN Output	PNP Output		
Through beam	1m	**UX-T100D**	**UX-T100DPN**	Dark-On	Open collector output
	500mm	**UX-T50DS**	**UX-T50DSPN**		
Diffuse reflective	3-20mm	**UX-R2**	**UX-R2PN**	Light-On	
	3-30mm	**UX-R3**	**UX-R3PN**		
	3-50mm	**UX-R5**	**UX-R5PN**		
	3-50mm	**UX-R5V**	**UX-R5VPN**		

Typical application

- Detection of passing condensers

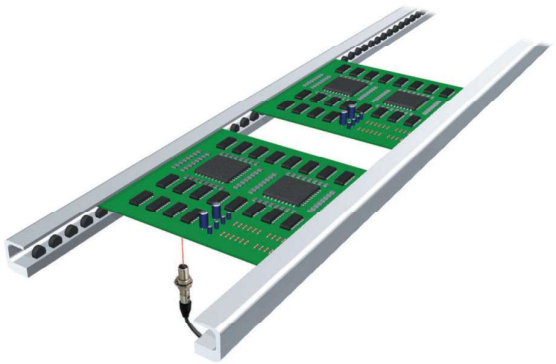
The sensor built into the guide detects the condensers.



UX-T50DS side view through beam

- Detection of passing PCBs

The sensor detects PCBs equipped in machines.



UX-R5V diffuse reflective

Rating/Performance/Specification

Type		UX-T100D	UX-T50DS	UX-R2	UX-R3	UX-R5	UX-R5V
	NPN output type	UX-T100DPN	UX-T50DSPN	UX-R2PN	UX-R3PN	UX-R5PN	UX-R5VPN
Detecting distance		1000mm	500mm	3-20mm	3-30mm	3-50mm	3-50mm *1
Detection object		ϕ 4mm opaque	ϕ 5mm opaque	100×100mm white paper			
Thread size		M5×0.5		M6×0.75			
Power supply		12-24VDC±10% ripple 10% or less					
Current consunp		Transmitter 15mA or less Receiver 15mA or less		20mA or less			
Output mode		Open collector output					
	NPN output	Rating: sink current 80mA (DC 30V) or less					
	PNP output	Rating: source current 80mA (DC 30V) or less					
Operation mode		Dark on		Light on			
Response time		0.5ms or less					
Operating angle		2° (Receiver side)	10° (Receiver side)	—			
Light source		Red LED (630nm)	Red LED (625nm)	Infrared LED (870nm)			
Indicator		Operation: orange LED, Stability: green LED					
Sensitivity adjustment		—					SENS.VR *1
Short circuit protection		Built-in					
Material		Case, Nut and Washer: SUS303, Lens: Polysultiopne					
Connection		Attached cable outer diameter ϕ2.8 mm Length 2m					
		Transmitter: 0.15 mm²× 2 cores Receiver: 0.15 mm²× 3 cores		0.15 mm² × 3 cores			
Mass		Transmitter: 30g, Receiver: 30g		30g			
Accessory		Instruction manual, Nut, Washer					Screw driver

*1 Maximum torque specification on sensitivity Pot of 8mN.m (use supplied screwdriver)

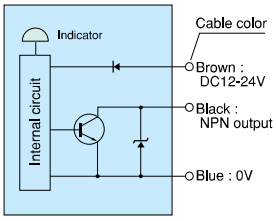
*2 The detecting distance of the diffuse reflective type varies, depending on transparency of the detection object. Please be sure to check detection beforehand.

Environmental specification

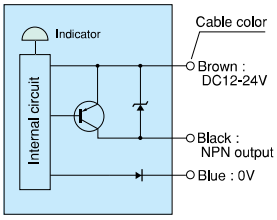
Ambient light	3,000lx or less
Ambient temperature	−25 to +55℃ (non-freezing) storage: −30 to +70℃ (non-freezing)
Ambient humidity	35 to 85%RH (non-condensing)
Protective structure	IP67
Vibration	10 to 55Hz /1.5mm double amplitude, 2 hours in X.Y.Z direction for each
Shock	500m/s² 3 times each in 3 directions
Dielectric withstanding	500VAC for 1 minute
Insulation resistance	500VDC, 20M ohms or higher

Input/outut circuit and connection

NPN output



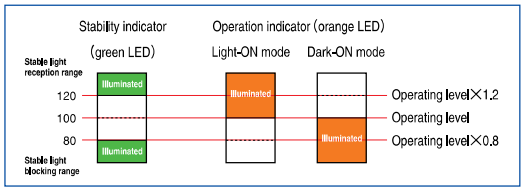
PNP output



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

Indicators

- The operation indicator (orange LED) and stability indicator (green LED) each show different light intensity levels received as described in the figure.
- After aligning the optical axis and adjusting the sensitivity, make sure the light received and light blocked are within the stable ranges by blocking and unblocking the lights with a detection object repeatedly. Setting within the stable range increases the reliability against variation of environment after setting.

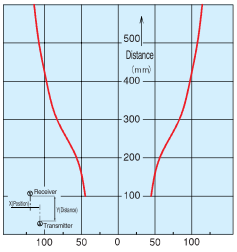


- The orange LED is the operation indicator. For the light ON mode, the indicator is illuminated when the light is detected. For the dark ON mode, the indicator is illuminated when the light is blocked.

Performance Curves (Typical Example)

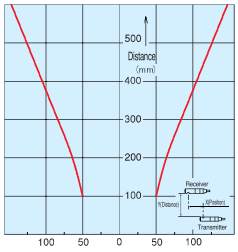
● Response Curves: Beam Pattern

UX-T50DS (PN)



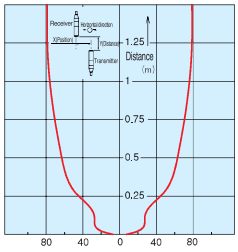
Position [mm]

UX-T50DS (PN)



Position [mm]

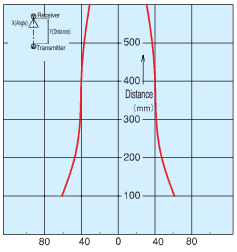
UX-T100D (PN)



Position [mm]

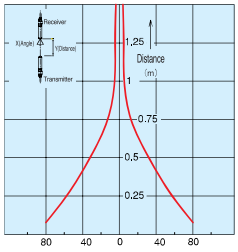
● Response Curves: Tilt Angle

UX-T50DS (PN)



Angle θ [degrees]

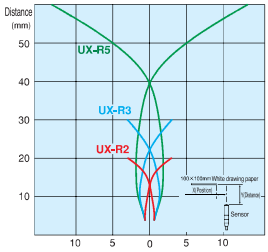
UX-T100D (PN)



Angle θ [degrees]

● Response Curves: Detecting Position

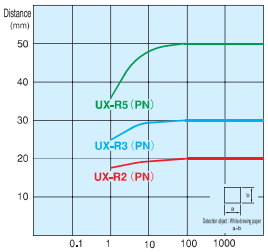
UX-R□ (V) (PN)



Detecting position [mm]

● Response Curves: Target Size

UX-R□ (V) (PN)



Detecting area [cm²]

Sensitivity adjustment

(Through beam type)

- Align the light axis with the center of the range where the operation indicator (orange LED) turns off when the receiver is placed in to any direction.
- Make sure the sensor works correctly by blocking and receiving the light repeatedly.

(Diffuse reflective type)

- Set as follows:
  When the detection object is placed in a given position, the operation indicator turns on.
- When the detection object is removed, the operation indicator turns off.
- Keep the background of the detection object as far away as possible or use a black surface as the background because of its low reflectivity.
- Adjust so that the sensor works stably by changing the distance, angle, or background object because the sensor does not have a sensitivity adjustment volume.

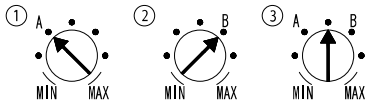
(Diffuse reflective type with volume)

※ When any light-reflecting object is in the background

(1) Place the detection object in a given position, turn up the sensitivity adjustment volume gradually and find the point at which the operation indicator (orange LED) is illuminated (Point A).

(2) Remove the object, turn down the sensitivity adjustment volume gradually from MAX, and find the point at which the operation indicator (orange LED) goes out (Point B). (If the operation indicator is not illuminated even at Max., MAX. is regarded as Point B).

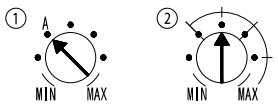
(3) Set the volume midway between Points A and B.



※ When no light-reflecting object is in the background

(1) Place the detection object in a given position, turn up the sensitivity adjustment volume gradually and find the point at which the operation indicator (orange LED) is illuminated (Point A).

(2) Set the volume midway between Points A and MAX. Make sure both the operation indicator (orange LED) and the stability indicator (green LED) are illuminated when the detection object is placed in a given position.



For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

- This sensor is not designed to prevent death or injury. It is not a life saving device.
- For safety applications except such usage, ensure safe operation of the system as a whole including detection and control functions.
- This product is not explosion proof.

(When installing)

- If you tighten the nut of this product excessively, the thread may be stripped and the screw may become loose. The tightening torque for the threaded part must be up to 1 N・m.
- Once you install the sensor, you cannot adjust the mounting angle. Please be careful not to shift the light axis when installing the product.

Dimensions (in mm)

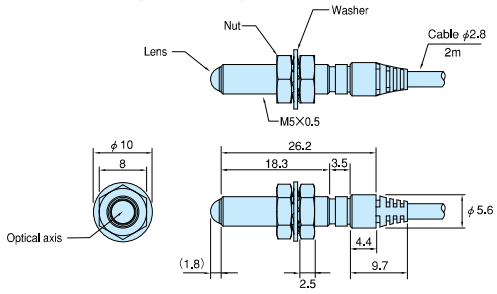
Through-beam Straight type

UX-T100D

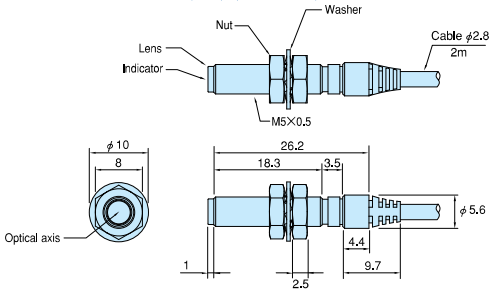
CAD

- Accessories
  Nuts ×4pcs
  Washer ×2pcs
- Materials: SUS

UX-TL100 (Transmitter)



UX-TR100D (PN) (Receiver)



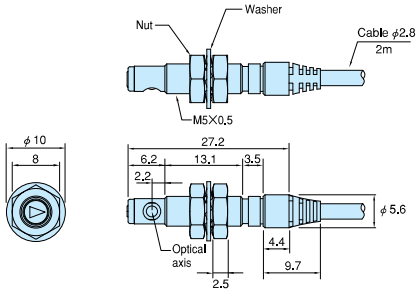
Through-beam Side-view type

UX-T50DS

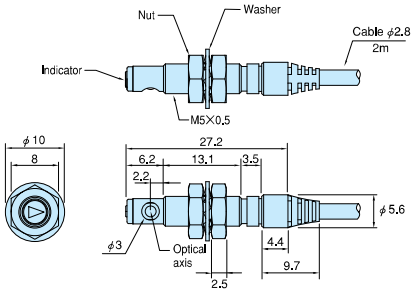
CAD

- Accessories
  Nuts ×4pcs
  Washer ×2pcs
- Materials: SUS

UX-TL50S (Transmitter)



UX-TR50DS (PN) (Receiver)

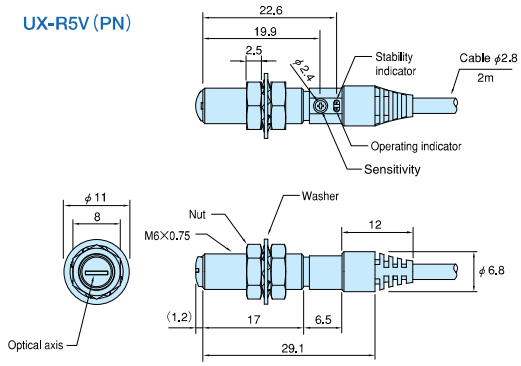


Diffuse reflective type

CAD

- Accessories
  Nuts ×4pcs
  Washer ×1pcs
- Materials: SUS

UX-R5V (PN)



UX-R□ (PN)