

PART1

PHOTO SENSOR

PHOTO SENSOR

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PHOTO SENSOR

KPS-CT Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-CTV (Vertical)	Through-Beam Type	1.5m max.	Ø6mm min. Opaque objects	12~24VDC ± 10% Ripple 10% max.	
	KPS-CTH (Horizontal)					

KPS-Z Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-ZT/ZTN/ZTP KPS-ZTS/ZTNS/ ZTPS	Through-Beam Type	15m max.	Ø12mm min. Opaque object	12~24VDC ± 10% Ripple 10% max.	
	KPS-ZRN/ZRP KPS-ZRNS/ZRPS	Retro-Reflective Type	3m max.	Opaque object larger than Reflector area (KPS-R3)		
	KPS-Z2DN/Z2DP KPS-ZDNS/ZDPS ZDN/ ZDP KPS-Z2DNS/ Z2DPS	Dif- fuse-Re- flective Type	1m max. 0.5m max. 1m max.	20cm x 20cm White paper		
	KPS-ZDBN	Distance-adjustable Type	10~40mm	Opaque object Translucent object	12~24VDC ± 10% Ripple 15% max.	—

KPS-AL Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-AL	Through-Beam Type	10m max.	Ø20mm min. Opaque object	AC/DC 24~240V ± 10%	
	KPS-ALTR	Retro-Re-reflective Type	5m max.	Opaque object larger than Reflector area (KPS-R3)		
	KPS-ALTRP	Retro-Re-reflective Type (Polarizing filter)	3m max.			
	KPS-ALD	Diffuse Reflective Type	1m max.	Translucent object Opaque object		

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KPS-AR Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-AR500	Through-Beam Type	5m max.	Ø 16mm min. Opaque object	AC/DC 24~240V ± 10%	
	KPS-AR250TR	Retro-Reflective Type	2.5m max.	Opaque object Reflector area		
	KPS-AR40DR	Diffuse-Reflective Type	0.6m max.	Ø 16mm min. Translucent object, Opaque object		

KPS-AP Series (Discontinued)

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-AP500	Through-Beam Type	5m max.	Ø 20mm min. Opaque object	110VAC: 88~121VAC, 220VAC: 76~242VAC	
	KPS-AP500TR	Retro-Reflective Type	5m max.	Opaque object larger than Reflector area		
	KPS-AP50DR	Diffuse-Reflective Type	0.5m max.	Ø 20mm min. Translucent material, Opaque object		

KPS-O Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-OTE-L Emitter	Through-Beam Type	15m max.	Ø 15mm min. Opaque object	12~24VDC ± 10% Ripple 10% max.	CE
	KPS-OTN-L KPS-OTP-L Receiver					
	KPS-ORN-L KPS-ORP-L	Retro-Reflective Type	3m max.	Opaque object larger than Reflector (KPS-R3)		
	KPS-ODN-L KPS-ODP-L KPS-ODN-1L KPS-ODP-1L	Diffuse-Reflective Type	10cm max. 40cm max.	20cm x 20cm White paper		

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

PHOTO SENSOR

KPS-M Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-M20	Through-Beam Type	5mm (Fixed)	0.8mm x 1.8mm Opaque object	5~24VDC ± 10% Ripple 10% max.	CE
	KPS-M21					
	KPS-M22					
	KPS-M23					
	KPS-M24					
	KPS-M60					
	KPS-M61					
	KPS-M62					
	KPS-M63					
	KPS-M64					

PHOTO SENSOR

KPS-M Series

Product	Model	Detection Method	Detection Range	Detectable Object	Power	Certification
	KPS-M60C	Through-Beam Type	5mm (Fixed)	0.8mm x 1.8mm Opaque object	5~24VDC ± 10% Ripple 10% max.	CE
	KPS-M61C					
	KPS-M62C					
	KPS-M63C					
	KPS-M64C					
	KPS-M-C	Relay Cable (2m)				

K Photo sensor

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M Counter Timer

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O Signal phone

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Q Square light

R Touch swith

S Floatless controller

T Temp. controller

PHOTO SENSOR

KPS-P Series

Product	Model	Detection Method	Detection Range	Current Consumption	Power	Certification
	KPS-P300S	Diffuse-Reflective Type	0.5~5m Detection Distance Adjustable	Approx. 2.5VA	110~220VAC (50/60Hz)	CE
	KPS-P300DAS			Approx. 100mA max.	12VDC $\pm$ 20%	
	KPS-P300DBS				24VDC $\pm$ 20%	
	KPS-P300DS				12~24VDC	

Photo Sensor Controller

Product	Model	Sensor Type	Power Supply Voltage	Power Consumption	Control Output	Certification
	KPS-CP012	Photo Sensor	100~110 VAC, 200~220 VAC (50/60Hz)	Approx. 3.5VA	Relay Output	
	KPS-CP024	Proximity Sensor		Approx. 2.8VA		

Reflector for Photo Sensor

Product	Model	Housing	Reflector	Weight	Certification
	KPS-RF-S3	ABS (Black)	Acrylic (Transparent)	Approx. 24g	
	KPS-R3	ABS (Black)		Approx. 24g	
	KPS-RF4	ABS (White)		Approx. 74g	

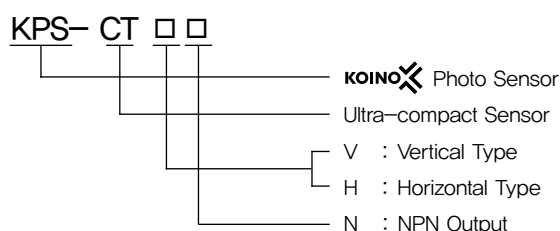
KPS-CT Series

Features

- Ultra-compact sensor
- Mounted on locations such as parts feeders for component detection
- Various SLIT shapes available (sold separately)
- Certified
- RoHS Compliant
- UL Certification
- All models of input are Class 2.
- Ambient air temperature 40° C.
- Pollution degree 3 environment.



Classification



Model	KPS - CT □ □
Detection Method	Through-Beam Type
Power Supply Voltage	12~24VDC ± 10% (Ripple max. 10%)
Power Consumption	40mA max. (Emitting Section: 20mA max., Receiving Section: 20mA max.)
Detection Distance	1.5m
Response Time	1ms max.
Detectable Objects	Opaque objects with a diameter of 6mm min.
Operating Mode	DARK ON
Control Output	NPN open collector Type Load power supply voltage ≤ 26.4V, Load current ≤ 80mA
Indicator Light	Red LED "ON" when Output ON
Light Source	Infrared Emitting Diode (940nm)
Withstand Voltage	1 minute at 500VAC (50/60Hz)
Vibration Resistance	10 ~ 55 Hz (1-minute cycle) Double amplitude 1.5mm, X, Y, Z directions for 2 hours
Shock Resistance	500 ㉮ (50G) X, Y, Z directions for 2 hours
Insulation Resistance	20 M Ω min. (500 VDC Insulation Resistance Meter)
Operating Ambient Temperature	-20°C to +60°C (without freezing)
Operating Ambient Illuminance	Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.
Ingress Protection	IP40 (IEC STANDARD)
Material	Case: PBT, Lens: PC
Cable	Emitter: 2P, Receiver: 3P, Outer Diameter: Ø2.4, Length: 2m
Weight	Approx. 20g (including wiring)
Certifications	CE: EN 60947-5-2 UL: UL 60947-5-2, CAN/CSA C 22.2

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

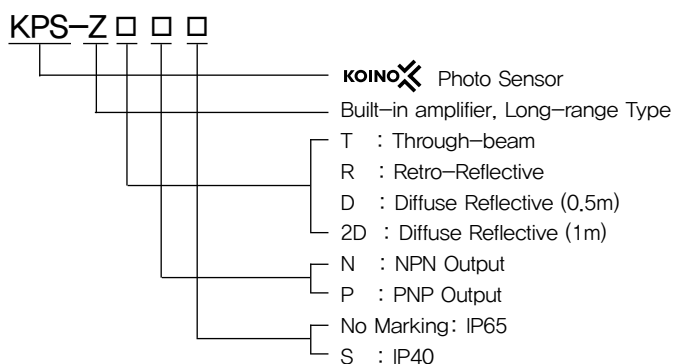
KPS-Z Series

Features

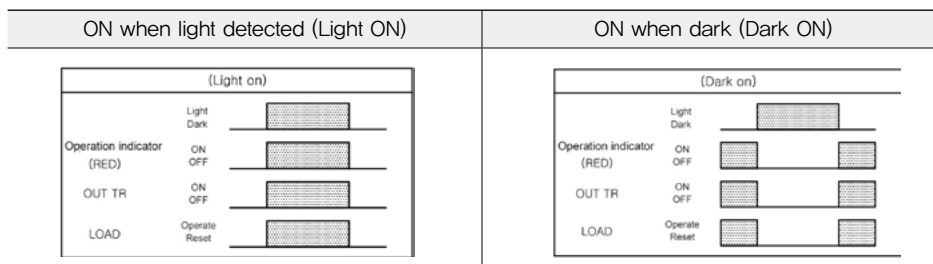
- Compact and lightweight easy to install even in confined spaces
- Operates on 12~24VDC power supply
- Light-on or Dark-on operation selectable
- Through-Beam, Retro-Reflective and Diffuse-Reflective models available
- CE certified



Classification

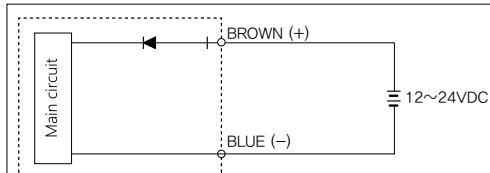


Output Type

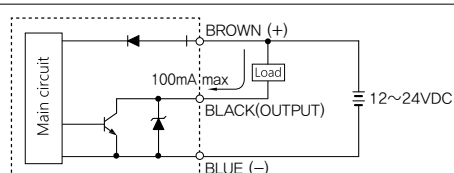


Wiring Diagram

◆ Through-Beam Type emitter



◆ NPN Output



◆ PNP Output

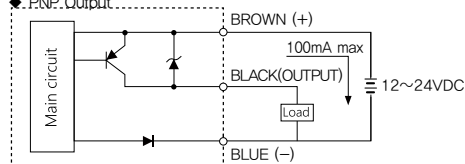


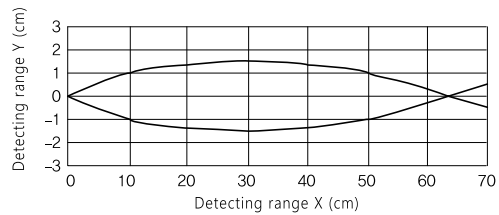
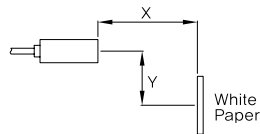
PHOTO SENSOR

Specifications

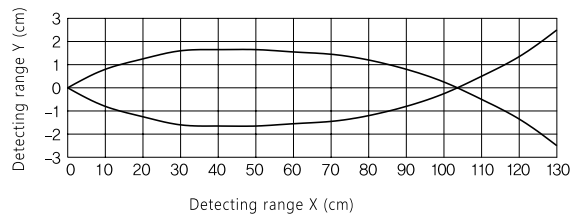
		Diffuse-Reflective Type		Retro-Reflective Type		Through-Beam Type	
Model Name	NPN Output	KPS-ZDN	KPS-Z2DN	KPS-ZRNS	KPS-ZRN	KPS-ZT (Emitter)	KPS-ZTN (Receiver)
		KPS-ZDNS	KPS-Z2DNS			KPS-ZTS (Emitter)	KPS-ZTNS (Receiver)
	PNP Output	KPS-ZDP	KPS-Z2DP	KPS-ZRPS	KPS-ZRP	KPS-ZT (Emitter)	KPS-ZTP (Receiver)
		KPS-ZDPS	KPS-Z2DPS			KPS-ZTS (Emitter)	KPS-ZTPS (Receiver)
Detection Distance		0.5m	1m	3m		15m	
Detectable objects		20cm X 20cm White paper		Ø75mm min. Opaque object		Ø12mm min. Opaque object	
Response distance		20% of detection distance		—		—	
Light Source		Infrared LED (850nm)		Red LED (660nm)		Infrared LED (850nm)	
Power Supply Voltage		12~24VDC ± 10% Ripple (p-p) 10% max.					
Power Consumption		25 mA max.				Emitter: 20 mA Receiver: 17 mA	
Control Output		NPN or PNP open collector mode Load power supply voltage 26.4VDC max., Load current 100mA max.					
Operating Mode		Light on / Dark on switch-selectable					
Response Time		Operation and return time: 1ms each					
Sensitivity adjustment		Single-turn volume					
Operating Ambient Illuminance		Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.					
Operating Ambient Temperature		-20℃ to +60℃ (without freezing)					
Operating Ambient Humidity		35 ~ 85% RH					
Insulation Resistance		20M Ω min. (DC500V Insulation Resistance Meter)					
Withstand Voltage		1 minute at 500VAC (50/60Hz)					
Vibration Resistance		10~55Hz (Cycle: 1 minute) Double amplitude 1.5mm X, Y, Z directions 3 cycles each					
Shock Resistance		500 %g (50G) X, Y, Z directions 3 cycles each					
Ingress Protection		IP 65 (KPS-Z □ □ S IP40)					
Connection Method		Cord extraction method (standard cord length 2m)					
Indicator Lights		Receiver: Operation pilot light (Red), Safety pilot light (Green) Emitter: Power indicator (Green)					
Weight		Approx. 50g					
Material		Case: PBT Lens: PC					
Certifications		CE: EN 60947-5-2					

Parallel Movement Characteristics

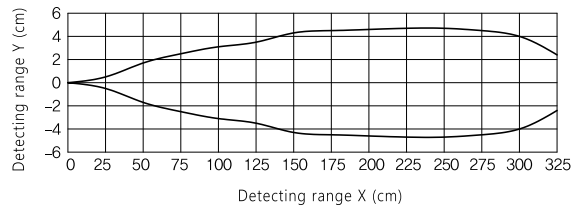
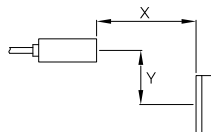
KPS-ZDN
KPS-ZDNS
KPS-ZDP
KPS-ZDPS



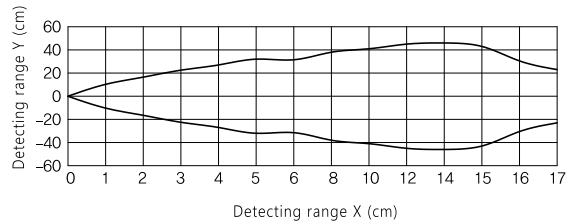
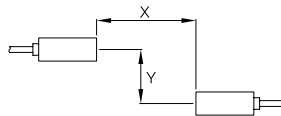
KPS-Z2DN
KPS-Z2DNS
KPS-Z2DP
KPS-Z2DPS



KPS-ZRN
KPS-ZRNS
KPS-ZRP
KPS-ZRPS

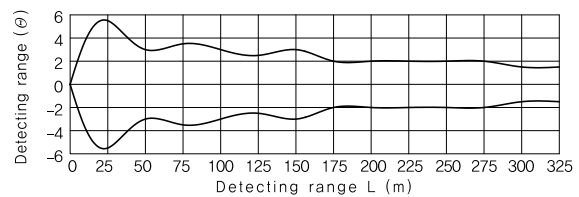
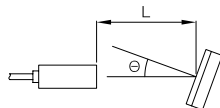


KPS-ZT/ZTN
KPS-ZTS/ZTNS
KPS-ZT/ZTP
KPS-ZTS/ZTPS

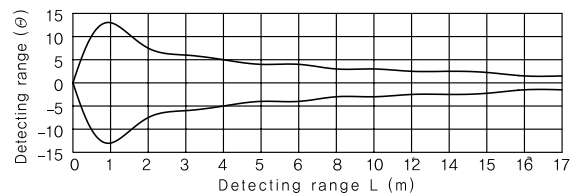
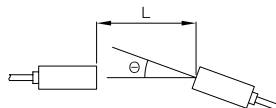


Detection Angle Characteristics

KPS-ZRN
KPS-ZRNS
KPS-ZRP
KPS-ZRPS



KPS-ZT/ZTN
KPS-ZTS/ZTNS
KPS-ZT/ZTP
KPS-ZTS/ZTPS



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

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Dimensions

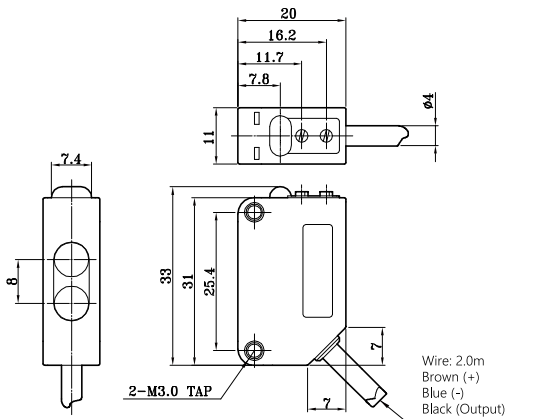
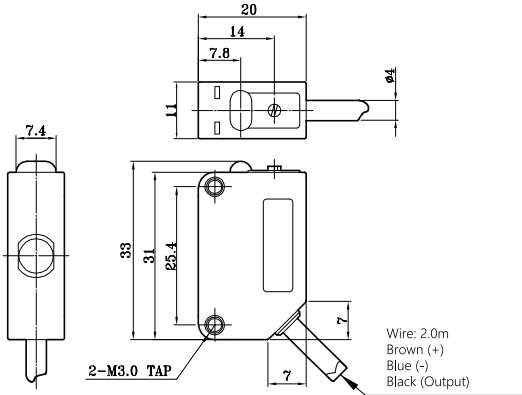
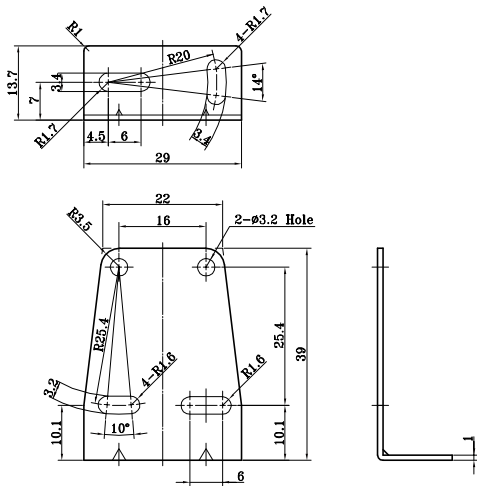
Dimensions	Dimensions
KPS-ZRN, KPS-ZRNS KPS-Z2DN, KPS-ZDNS, KPS-Z2DNS KPS-ZRP, KPS-ZRPS KPS-Z2DP, KPS-ZDPS, KPS-Z2DPS CE 	 Wire: 2.0m Brown (+) Blue (-) Black (Output)
KPS-ZT, KPS-ZTS KPS-ZTN, KPS-ZTNS KPS-ZTP, KPS-ZTPS CE 	 Wire: 2.0m Brown (+) Blue (-) Black (Output)
Bracket 	

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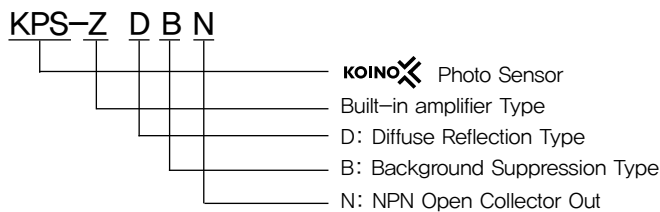
KPS-ZDBN

Features

- Minimized detection distance error rate based on color and material
- Light-ON / Dark-ON selectable
- Adjustable detection distance – Single-turn volume control
- Built-in protection circuit: Reverse power connection protection circuit, Output short-circuit protection circuit, Overcurrent protection circuit



Classification

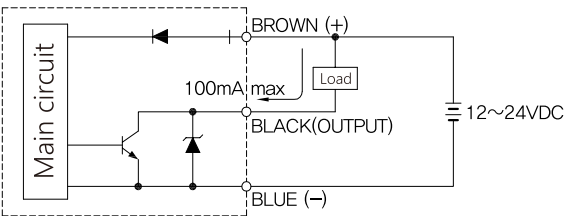


Output Type

ON when light detected (Light ON)		ON when dark (Dark ON)	
	Light Dark		Light Dark
Indicator Red LED	ON OFF	Indicator Red LED	ON OFF
OUT TR	ON OFF	OUT TR	ON OFF
LOAD	Operate Reset	LOAD	Operate Reset

Wiring Diagram

◆ KPS-ZDBN (NPN Output)



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

PHOTO SENSOR

Specifications

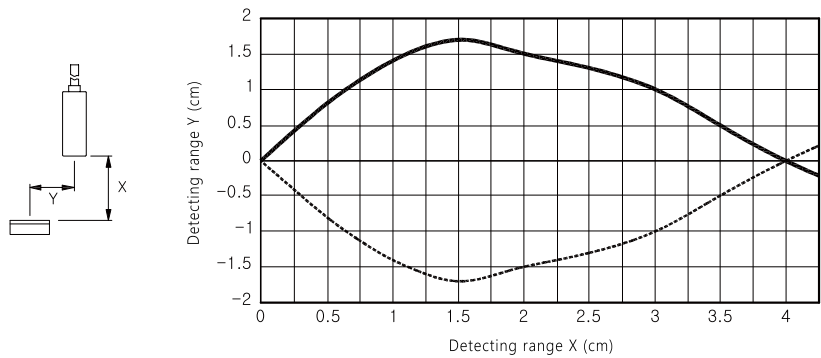
	Distance Adjustable Type
Model Name Npn Output	KPS-ZDBN
Detection Distance	10~40mm
Detectable Objects	Opaque, Translucent
Response Distance	10% max. of detection distance
Light Source	Red LED (645nm)
Power Supply Voltage	12~24VDC $\pm$ 10% Ripple (p-p) 15% max.
Power Consumption	30mA max.
Control Output	NPN open collector Type Load power supply voltage $\leq$ 30VDC, Load current $\leq$ 200mA
Operation Mode	Light on / Dark on switch-selectable
Response Time	Operation and return time: 1.5ms max.
Sensitivity Adjustment	Single-turn volume
Operating Ambient Light Level	Sunlight: 10,000 lx max., Incandescent light: 3,000 lx max. (when illuminating the light-receiving surface with an incandescent bulb)
Operating Ambient Temperature	Operating: -20°C to +60°C , Storage: -25°C to +75°C (without freezing)
Operating Humidity	35 ~ 85% RH
Insulation Resistance	20M Ω min. (DC500V Insulation Resistance Meter)
Withstand Voltage	1000VAC (50/60Hz) for 1 minute
Vibration Resistance	10~55Hz (Cycle: 1 minute) Double amplitude 1.5mm X, Y, Z directions 3 cycles each
Shock Resistance	500 ㉫ (50G) X, Y, Z directions 3 cycles each
Ingress Protection	IP 65
Connection Method	Pre-wired (standard cord length 2m)
Protection Circuit	Power reverse connection protection circuit, Output short-circuit protection circuit, Overcurrent protection circuit
Indicator Lights	Power indicator light: Green, Operation indicator light: Red
Weight	Approx. 50g
Material	Case: ABS Lens: Acrylic
Certifications	—

PHOTO SENSOR

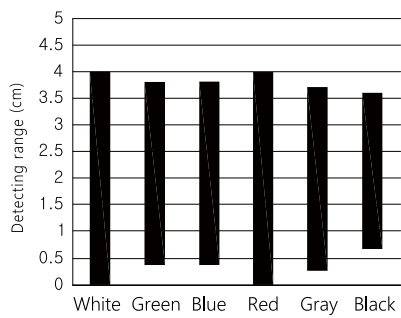
Light Detection Characteristics

KPS-ZDBN (Distance Setting Type)

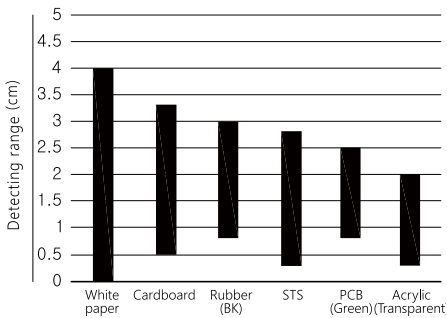
► Parallel Movement Characteristics



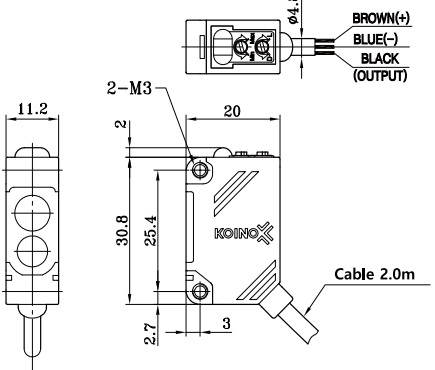
► Detection Distance by Color



► Detection Distance by Material



Dimensions

Dimensions	Dimensions
KPS-ZDBN (Distance Setting Type) 	 Technical drawing details: - Top view dimensions: 11.2 (width), 20 (length), 2 (hole spacing), 30.8 (total height), 25.4 (mounting hole center-to-center), 2.7 (bottom flange), 3 (bottom flange width). - Side view dimensions: 2 (top flange), 20 (length), 30.8 (total height), 25.4 (mounting hole center-to-center), 2.7 (bottom flange), 3 (bottom flange width). - Wiring: BROWN(+), BLUE(-), BLACK (OUTPUT). - Mounting: 2-M3. - Cable: Cable 2.0m.

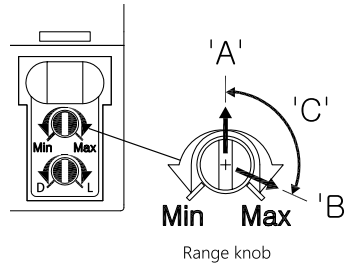
- K Photo sensor
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PHOTO SENSOR

Detection Distance Adjustment Method

■ Position Description

- Position 'A': The first point where the detector fails to detect the target.
- Position 'B': The first point where background objects are not detected.
- Range 'C': The range where the detector can detect the target object without detecting background objects.



■ Detection Distance Adjustment Method

- Stable detection is possible within the range 'C' between position 'A', which does not detect background objects, and position 'B', which does not detect the target object.

■ Method for Stable Detection Distance Adjustment

- When the detection object is positioned at a distance of 10% max. from the maximum detection distance (initial detection object recognition position), the most stable detection and Output operation. (Ex. Maximum detection distance (initial object recognition) 4cm → Recommended object position 3.6cm)

Installation Precautions and Usage Method

- Before applying power, always verify the polarity and take care to ensure the polarity does not change.
- After selecting the position, place the detection object on the optical axis area and verify operation.
- Using within 80% of the maximum operating distance is recommended.
- Do not connect power or load exceeding the rated specifications.
- Please keep the length of extension cables within 10 meters.
- Install the product within the specified environmental conditions to maintain warranty coverage.
- Avoid installing in areas prone to vibration, high impact, or noise, as these conditions may cause malfunctions.
- When installing the product, pay attention to the angle relative to the detector.
- Avoid detecting objects moving vertically relative to the product's reference plane.
- When mounting the product, select a location where surrounding interference (such as detectable objects and stray light) is minimized.

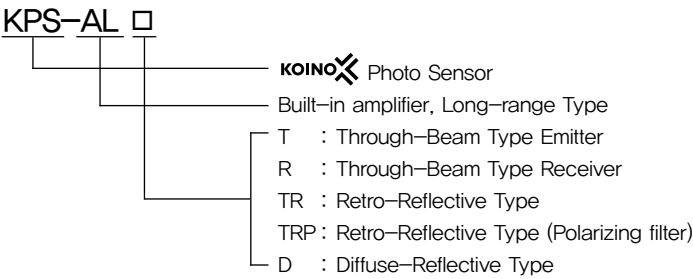
KPS-AL Series

Features

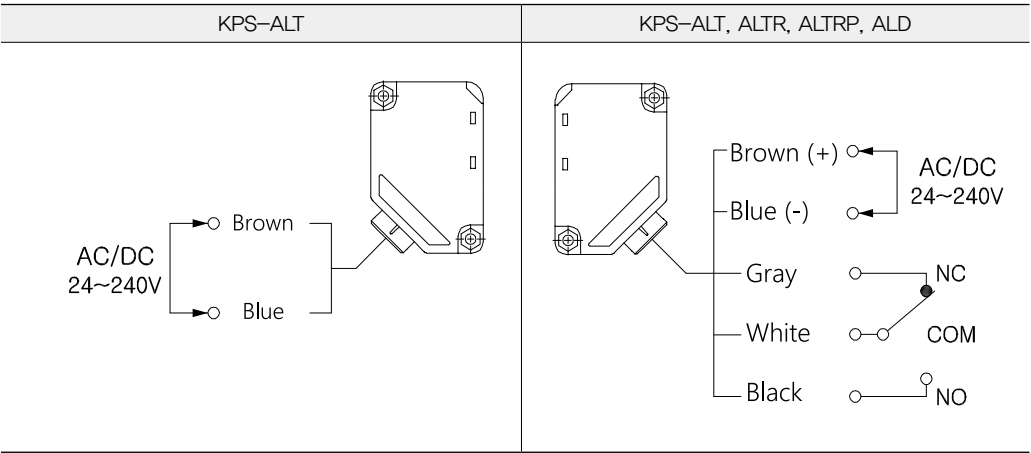
- 18mm (W) × 52mm (H) × 34mm (D)
Compact, built-in power supply
- Achieves excellent Long-range detection distance
- Built-in polarization filter enables more stable filtering (KPS-ALTRP)
- Enhanced waterproof structure (IP65 level)
- CE certified



Classification



Wiring Diagram



- K Photo sensor
- L Proximity sensor
- M Counter Timer
- N Buzzer
- O Signal phone
- P Tower light
- Q Square light
- R Touch switch
- S Floatless controller
- T Temp. controller

PHOTO SENSOR

Specifications

Model	KPS-AL		KPS-ALTR	KPS-ALTRP	KPS-ALD
	KPS-ALT	KPS-ALR			
Detection Method	Through-Beam Type		Retro-Reflective Type	Polarizing Filter Retro-Reflective Type	Diffuse-Reflective Type
	Emitter	Receiver			
Detection Distance	10m max.		5m max.	3m max.	1m max.
Detectable objects	Ø20 min. Opaque object		Opaque object larger than Reflector area (KPS-R3)		Translucent objects, Opaque object
Power consumption	1.5W max.	2W max.	2W max.		
Light Source	Infrared Emission Diode (870nm)		Red LED (700nm)		Infrared Emission Diode (870nm)
Power Supply Voltage	AC/DC 24 to 240V				
Response Time	—	20ms max., RELAY response time			
Output Method	—	Relay contact output: 1C			
Contact Rating	—	30VDC 2A, 125VAC 0.6A			
Indicator Lights	—	Red LED			
		DARK ON			LIGHT ON
Sensitivity adjustment	None		Present		
Operating Ambient Light Level	—	Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.			
Ingress Protection	IP65				
Insulation Resistance	20MΩ min. (DC500V Insulation Resistance Meter)				
Withstand Voltage	2,000VAC (50/60Hz) for 1 minute between charging and non-charging sections				
Noise	Noise Simulator ± 2,000V, 1μs (Power Terminal)				
Operating Ambient Temperature	-20℃ to +60℃ (without freezing)				
Operating Ambient Humidity	35 ~ 85% RH				
Vibration Resistance	10 to 55 Hz (1-minute cycle) Double amplitude 1.5 mm, 2 hours in each X, Y, Z direction				
Shock Resistance	150 ㉮ (15G) X, Y, Z directions				
Material	PC (Black)				
Cable	Ø6.1, 1.5m cable				
	2P	5P			
Weight	Approx. 132g	Approx. 147g			
Certifications	CE: EN 55011, EN 60947-5-2				

Output Type

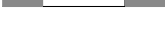
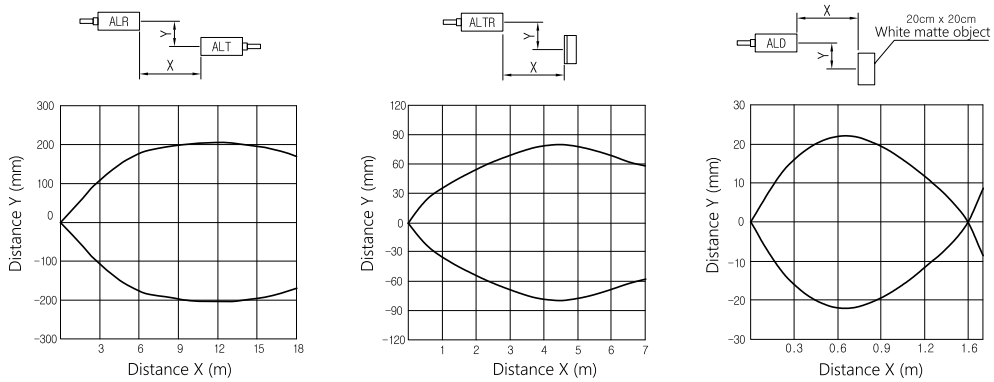
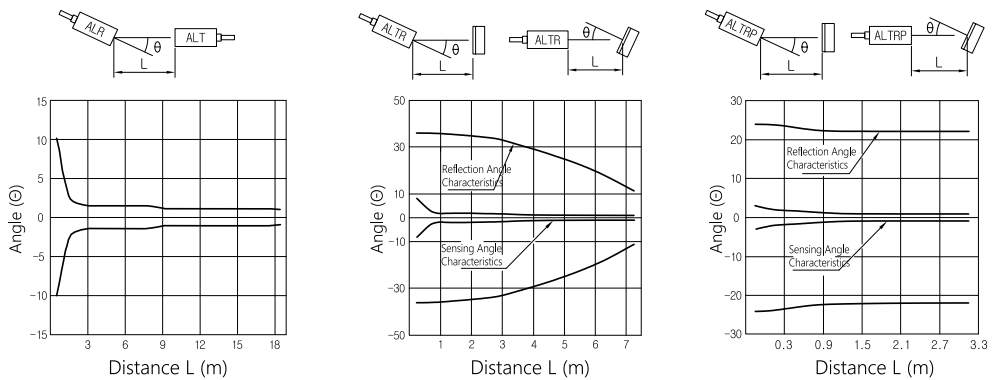
Diffuse, Reflective			Transmissive, Retro-Reflective		
Operation Indicator	Light		Light		
	Dark		Dark		
	ON		ON		
	OFF		OFF		
	NO(1a)		NO(1a)		
	NO(1b)		NO(1b)		

PHOTO SENSOR

Parallel Movement Characteristics



Detection Angle Characteristics



Dimensions

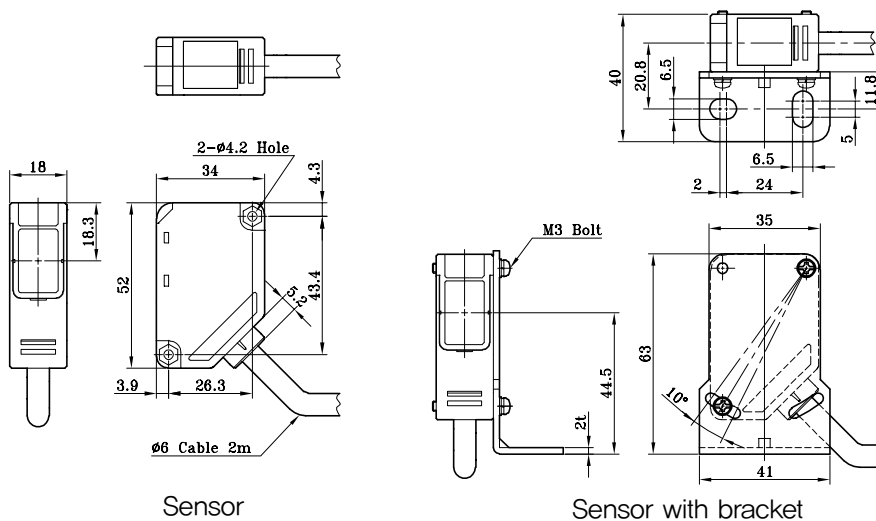


PHOTO SENSOR

KPS-AR Series

Features

- Operation on a universal voltage system (AC/DC 24V to 240V), completely eliminating issues caused by voltage fluctuations or the use of AC/DC power sources.
- Excellent performance enables long-distance detection.
- Utilizes a high-performance Output relay, enabling contact Output operation within 20ms.
- Easy installation.



KPS-AR500
Through-Beam Type



KPS-AR250TR
Retro-Reflective Type



KPS-AR40DR
Diffuse-Reflective Type

Classification

KPS-AR □

KOINO[®] Photo Sensor

Built-in amplifier, Long-range Type

500T : Through-Beam Type Emitter

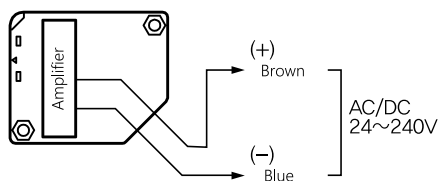
500R : Through-Beam Type Receiver

250TR : Retro-Reflective Type

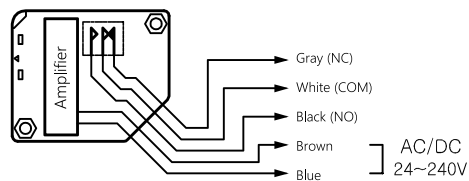
40DR : Diffuse-Reflective Type

Wiring Diagram

Transmissive Emitter,
Emitter



Through-Beam Receiver,
Retro-Reflective Type, Diffuse-Reflective Type
Receiver



Parallel Movement Characteristics

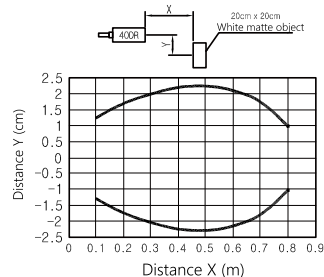
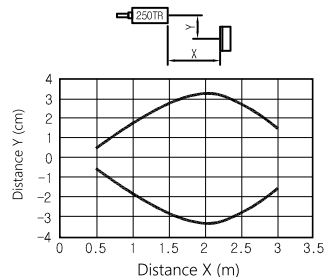
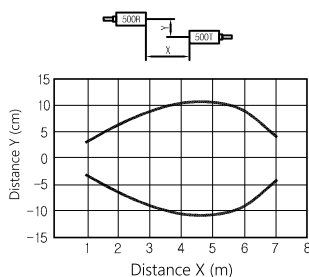
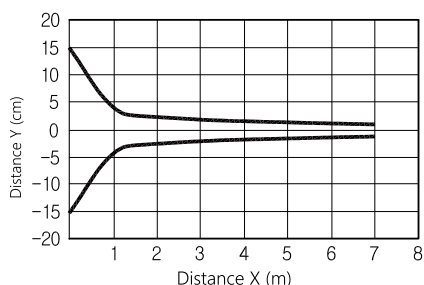


PHOTO SENSOR

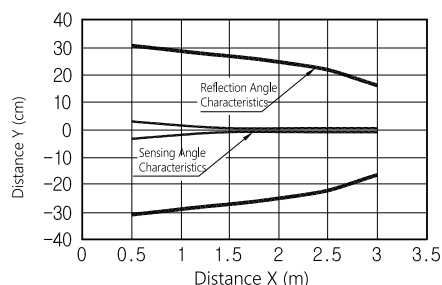
Specifications

Model	KPS-AR500		KPS-AR250TR	KPS-AR40DR
	KPS-AR500T	KPS-AR500R		
Detection Method	Through-Beam Type		Retro-Reflective Type	Diffuse-Reflective Type
	Emitter	Receiver		
Detection Range	5m max.		2.5m max.	0.6m max.
Detectable Object	Opaque objects Ø16mm min.		Reflector (KPS-RS3), Opaque object	Translucent object, Opaque object
Power Consumption	1.5W max.	4W max.	4W max.	
Light source	Infrared LED		Red LED	Infrared LED
Power Supply Voltage	AC/DC 24 to 240V			
Response Time	—	20ms max., relay response time		
Output Method	—	Relay contact Output: 1c contact		
Contact Rating	—	30VDC, 3A 250VAC, 3A		
Indicator Lights	—	Red LED		
		DARK ON		LIGHT ON
Sensitivity Adjustment	None		Yes	
Operating Ambient Illuminance	—	Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.		
Ingress Protection	IP 50, Indoor Use Only			
Insulation resistance	DC 500V 20MΩ min. (Insulation Resistance Meter)			
Withstand Voltage	Between charged and non-charged parts: 2,000VAC (50/60Hz) for 1 minute			
Internal Noise	Noise simulator ± 2,000V, 1μs (power terminals)			
Operating Ambient Temperature	-20°C to +60°C (without freezing)			
Ambient operating humidity	35 ~ 85% RH			
Vibration Resistance	10 to 55 Hz (Cycle: 1 minute) Double amplitude 1.5 mm X, Y, Z directions for 2 hours			
Shock Resistance	10G, 3-axis each direction			
Quality	ABS (Black)			
Cable	Ø6, 1.5m cable			
	2P	5P		
Weight	Approx. 107g			

Detection Angle Characteristics



KPS-AR500



KPS-AR250TR

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

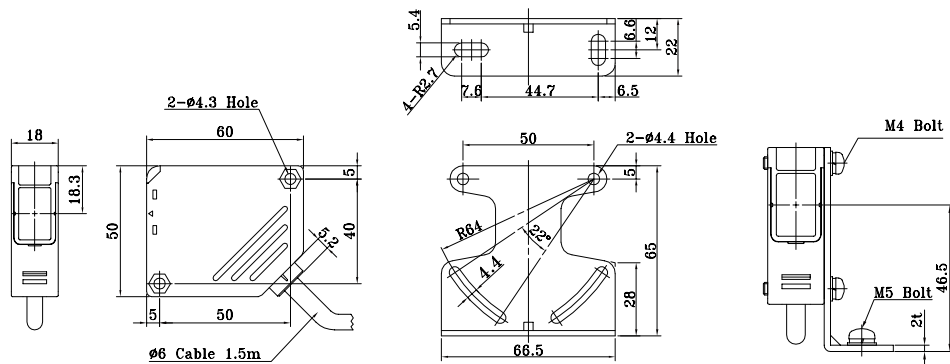
S Floatless controller

T Temp. controller

PHOTO SENSOR

Dimensions

KPS-AR500, KPS-AR250TR, KPS-AR40DR



Precautions

- Ensure the input power matches the product's rated voltage before connecting the wiring.
- When connecting wiring, do not place it in close proximity to high-voltage lines or power lines, nor route it within the same conduit.
- Avoid locations with severe vibration or shock, as these can cause malfunctions.
- When installing multiple emitters and receivers, mutual reflected light may cause malfunctions. Ensure sufficient distance between the emitter and receiver, or install them in a cross pattern.
- Avoid using the photosensor in locations where the lens may become contaminated by foreign substances such as dust, oil, or moisture. If unavoidable, set the detection distance to 1/2 of the rated distance.
- When installing the Retro-Reflective and Diffuse Reflective sensors, raise the mounting height. If installed too low, the sensor may not switch to the OFF state even after the detected object has passed.
- When installing Diffuse-Reflective sensors, a background with higher reflectivity than the target object may cause malfunctions. It is recommended to use a black background. (Note: Operation may become unstable if the target object itself is black or dark gray.)
- If the diffuse reflection Type sensor is affected by background objects, take the following measures:
 - 1) Remove the background object.
 - 2) Move the background object at least twice the detection distance away.
 - 3) Install the background object at an angle to prevent reflection.
- Depending on environmental conditions, dust or dirt accumulating on the lens surface may Reduce detection distance. Please clean the lens surface regularly with a soft gauze cloth.

PHOTO SENSOR

KPS-AP Series (Discontinued)

Features

KPS-AP500 Through-beam

- The Emitter and receiver are separated in a vertical configuration. With its wide beam and long detection distance, it is suitable for detecting large objects.

KPS-AP500TR Retro-Reflective

- Vertical Type with the Emitter and receiver integrated into a single housing and detects objects using a reflective mirror.

KPS-AP50DR Diffuse-Reflective Type

- Vertical Type with the Emitter and receiver integrated into a single housing. It is a diffuse reflection type that operates based on the reflection of the detected object.



* KPS-AP1000 (10m), AP2000 (20m), AP3000 (30m), and KPS-AP1000TR (10m) are produced to order.

Specifications

Detection Method	Through-Beam Type	Retro-Reflective Type	Diffuse-Reflective Type
Model	KPS-AP500	KPS-AP500TR	KPS-AP50DR
Detection Distance	5m max.	5m max.	0.5m maximum.
Detectable objects	Ø20mm min. Opaque object	Opaque object larger than Reflector area	Translucent object with Ø20mm min. Opaque object
Power Supply Voltage	110V/220VAC (50/60Hz)		
Allowable voltage	110VAC: 88V ~ 121VAC, 220VAC: 176V ~ 242VAC		
Power consumption	Projector 2.0VA, Receiver 1.9VA	2.0VA (when using 110VAC)	
Light Source	Infrared LED, Modulated Light / λ : 940 nm		
Response Time	25ms max., Relay response time		
Response distance	—		20% max. at detection distance
Control Output	Relay contact Output: 1c contact / 250VDC, 2.0A when using resistive load		
Lifespan	Mechanical life: 5,000,000 cycles min., Electrical life: 100,000 cycles min.		
Operation Indication	Red LED indicator, ON when illuminated		
Sensitivity adjustment	None	Yes	Yes
Operating Ambient Illuminance	Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.		
Mounting Method/Ingress Protection	Exposed Type / IP 50, indoor use only		
Wiring Connection/Insulation Resistance	Wiring connection Type / 20MΩ min. (DC500V Insulation Resistance Meter)		
Withstand Voltage/Noise Resistance	Between charged and non-charged parts: 1,000VAC (50/60Hz) for 1 minute / Between power terminals: ± 1,000V		
Operating Ambient Temperature	-20°C to +60°C (without freezing)		
Ambient operating humidity	35 ~ 85% RH		
Vibration/Shock	10 to 55 Hz, 0.75 mm peak-to-peak amplitude, 4 cycles per direction on 3 axes (8 minutes per cycle) / 10G, 3 axes in each direction		
Housing Material	Aluminum alloy die-casting		
Weight	Emitter (approx. 635g), Receiver (approx. 635g)	approx. 635g	
Cable Length	1.5m		

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

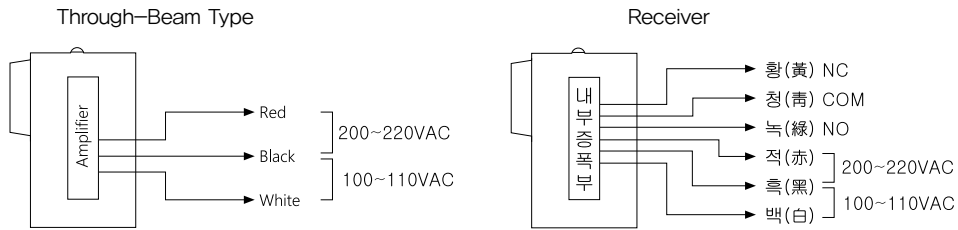
R Touch switch

S Floatless controller

T Temp. controller

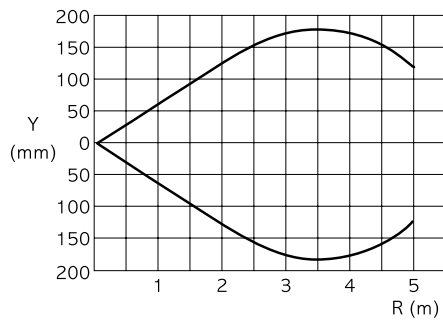
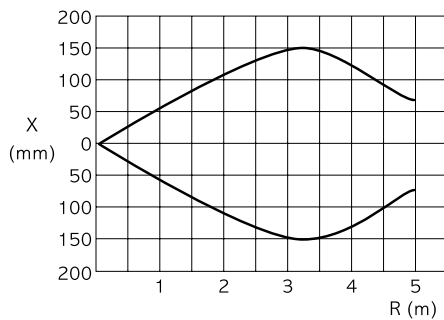
PHOTO SENSOR

Wiring Diagram

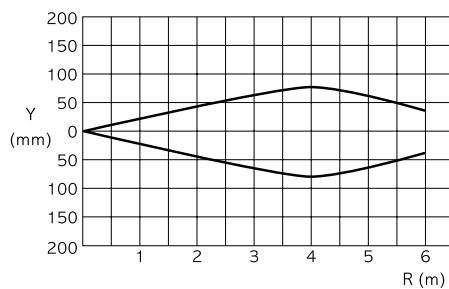
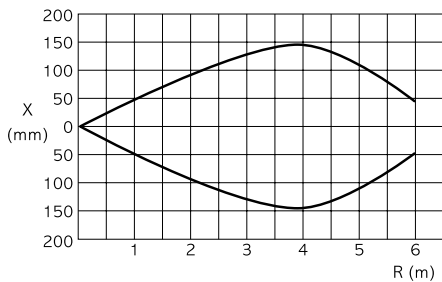


Photodetection Characteristics

Retro-Reflective KPS-AP500TR (X, Y-axis)

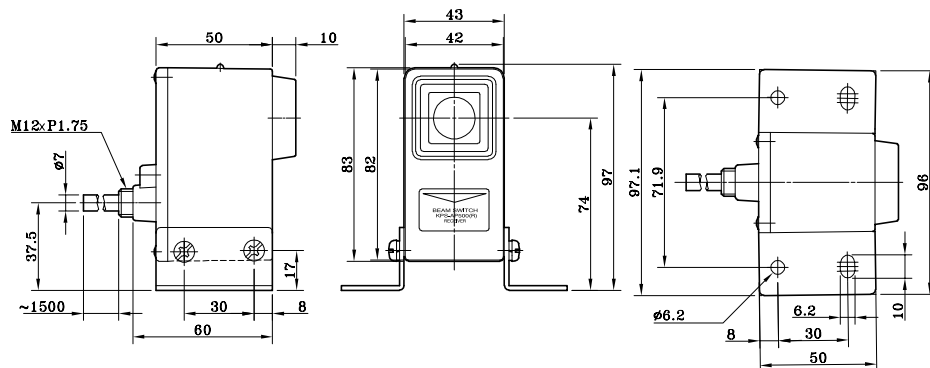


Through-beam KPS-AP500 (X,Y axes)



Dimensions

KPS-AP500, KPS-AP500TR, KPS-AP50DR



KPS-O Series

Features

- Ø18 Cylindrical Photo Sensor
- Built-in sensitivity adjustment knob
- Light on/Dark on selection via control line
- Through-beam, Retro-Reflective, Diffuse-Reflective product manufacturing
- Built-in protection circuit



Classification

KPS-O □ □ - □ □

KOINO Photo Sensor

Ø18 Cylindrical

T : Through-beam
R : Retro-Reflective
D : Diffuse-Reflective Type

N : NPN Output
P : PNP Output
E : Through-Beam Type emitter

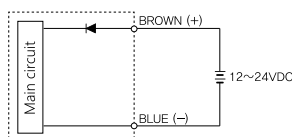
No Marking : Standard Type
1 : Diffuse-Reflective Type (40cm)
L : Nylon material

Output Type

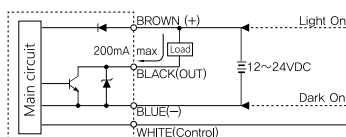
ON when light detected (Light ON)		ON when dark (Dark ON)	
Light		Light	
Dark		Dark	
Indicator		Indicator	
Red LED		Red LED	
ON		ON	
OFF		OFF	
OUT TR		OUT TR	
ON		ON	
OFF		OFF	
Operation		Operation	
LOAD		LOAD	
Reset		Reset	

Wiring Diagram

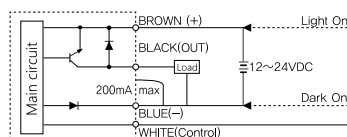
◆ Through-Beam Emitter



◆ NPN Output



◆ PNP Output



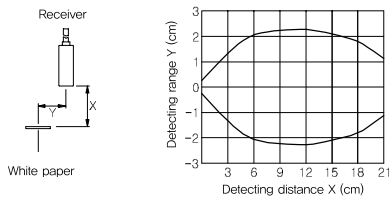
- When the White (Control) wire is connected to Brown (+), it operates in Light On mode.
- When the White (Control) wire is connected to Blue (-), it operates in Dark On mode.
- When the White (Control) wire is not connected, it operates in Light On mode by default.

Specifications

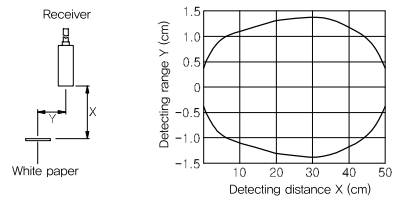
Model Name	KPS-OTE-L	KPS-OTN-L	KPS-ORN-L	KPS-ODN-L	KPS-ODN-1L
		KPS-OTP-L	KPS-ORP-L	KPS-ODP-L	KPS-ODP-1L
Detection Method	Through-Beam Type		Retro-Reflective Type	Diffuse-Reflective Type	
	Emitter	Receiver			
Detection Distance	15m		3m	10cm	40cm
Detectable objects	Ø15mm min. Opaque object		Ø75mm min. Opaque object	20cm × 20cm White paper	
Response distance	—		—	20% of detection distance	
Light Source	Infrared LED (850nm)		Red LED (640nm)	Infrared LED (850nm)	
Power Supply Voltage	12~24VDC ± 10%, Ripple (p-p) 10% max.				
Power Consumption	30mA max.				
Control Output	NPN/PNP open collector Type, load power supply voltage 26.4VDC max., load current 200mA max.				
Operating Mode	Light on / Dark on switching via White (Control) line				
Response Time	Operation and return time: 1ms each				
Sensitivity adjustment	Fixed		Multi-turn volume control (15 turns)		
Operating Ambient Illuminance	Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.				
Indicator Lights	Power pilot light	Power indicator light (Green), Operation indicator light (Red)			
	(Green)				
Protection Circuit	Reverse Power Connection Protection Circuit, Output Short Circuit Protection Circuit, Overcurrent Protection Circuit				
Operating Ambient Temperature	Operating: -10℃ to 60℃ , Storage: -25℃ to 75℃ (without freezing)				
Operating Ambient Humidity	Operating, Storage: 35 ~ 85% RH				
Insulation Resistance	20MΩ min. (DC500V Insulation Resistance Meter)				
Withstand Voltage	1000VAC (50/60Hz) for 1 minute				
Vibration Resistance	10~50Hz (Cycle: 1 minute) Double amplitude 1mm X, Y, Z directions 2 hours each				
Shock Resistance	500 ㉮ × 3 cycles each in X, Y, Z directions				
Ingress Protection	IP 67				
Connection Method	Cord Extraction Method (Ø4, 2m Cable)				
Cable	Ø4, standard cable length 2m				
	2P	4P			
Accessories	—		Reflector (40x60mm), sensitivity adjustment driver	Sensitivity adjustment screwdriver	
	Fixing Nut				
Weight	Approx. 62g				
Material	Case: Nylon Lens: PC				
Certifications	CE: EN 55011 / EN 60947-5-2 (clause 8.6)				

PHOTO SENSOR

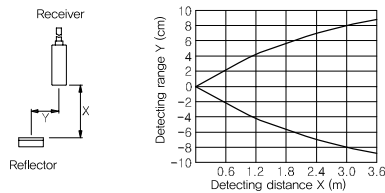
Parallel Movement Characteristics



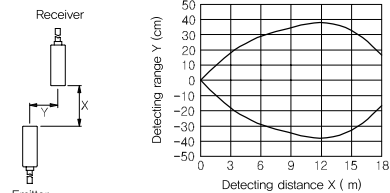
KPS-ODN-L/KPS-ODP-L



KPS-ODN-1L/KPS-ODP-1L

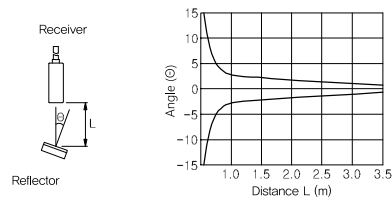


KPS-ORN-L/KPS-ORP-L

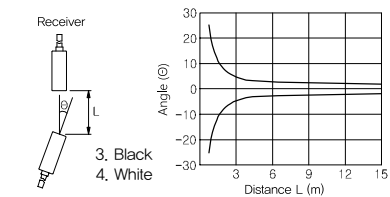


KPS-OTE-L /KPS-OTN-L /KPS-OTP-L

Detection Angle Characteristics



KPS-ORN-L/KPS-ORP-L



KPS-OTE-L /KPS-OTN-L /KPS-OTP-L

Dimensions

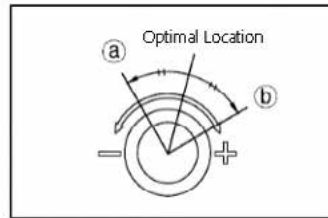
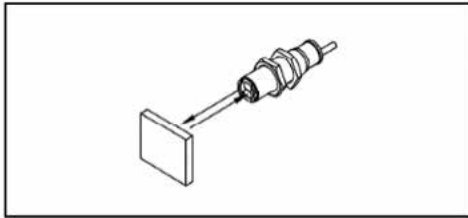
Reflective type KPS-ODN-L KPS-ODP-L KPS-ODN-1L KPS-ODP-1L KPS-ORN-L KPS-ORP-L				Panel Cutting Size Unit : mm
Receiver KPS-OTN-L KPS-OTP-L				Panel Cutting Size Unit : mm
Emitter KPS-OTE-L				Panel Cutting Size Unit : mm
Reflector KPS-R3				Unit : mm

PHOTO SENSOR

Installation Method

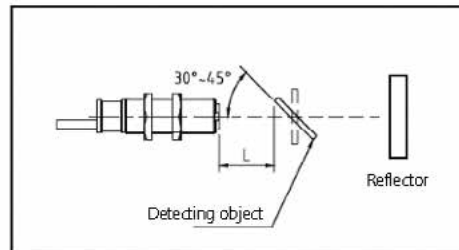
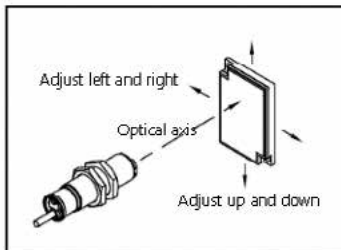
■ Diffuse Reflection Type

1. Generally use at maximum sensitivity, but adjust sensitivity considering the influence of surrounding objects, walls, or pillars outside the detection target.
2. Place the detection object at the detection position and gradually increase the sensitivity volume from the minimum sensitivity position to identify the operating position ㊸.
3. With the detection object removed, increase the sensitivity volume to identify the operating position ㊹.
4. The midpoint between ㊸ and ㊹ is the optimal volume setting.
5. The volume has 15 turns.



■ Retro-Reflective Type

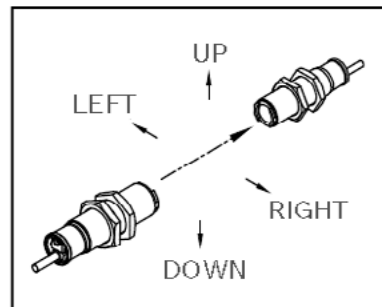
1. Position the sensor and the included reflector facing each other and connect the power.
 2. Move the reflector and photosensor left and right to find the range where the Pilot light lights up, then install them centrally.
 3. Adjust the vertical position using the same method.
 4. After adjustment, place the detection object on the optical axis to confirm stable operation before securing it.
- * The volume has 15 turns.
 - * When using two min. photo sensors in parallel, maintain a distance of at least 30 cm between them.
 - * Refer to the diffuse reflection Type for volume adjustment methods.
 - * If the detected object has a higher reflectivity than white matte paper, install the object's detection surface at a $30^{\circ}\sim 45^{\circ}$ angle relative to the sensor.(see figure).
 - * Light On Operation: Outputs when an object is detected between the receiver and the reflector.
 - * Dark On Operation: Output is generated when the receiver and the reflector are directly facing each other.



■ Through-Beam Type

1. Set the emitter and receiver to face each other in a straight line and ensure the wiring is correct before powering on.
2. Fix one of the emitter or receiver in place and adjust the other up, down, left, or right to determine the operational range of the pilot light, and install it at the center position.

- * If the detected object is Translucent or small, it may pass through undetected.
- * When using multiple emitters and receivers in close proximity, so install them with the emitter and receiver positions offset.

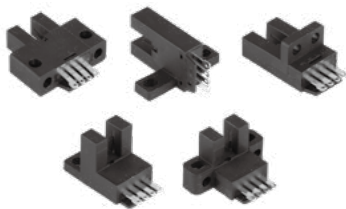


KPS-M Series

- Ultra-compact and compact packages (5 design Types)
- Built-in overcurrent protection circuit, reverse connection and output connection error protection circuit
- High-speed response frequency: 3kHz
- Equipped with two independent outputs: Dark On/Light On
- Connector type is available: M6C series
- Operation indicator light status visible from three sides: front, rear and top
- CE certified



KPS-M2 Series



KPS-M □ □ C Series



KPS-M6 Series

Classification

KPS-M □ □ □ □

Classification	Symbol	Symbol Description	
		M2 Series	M6 Series
Product Name	KPS	KOINO [®] Photo Sensor	
	M	Micro	
Classification	2	Ultra-small package	
	6	Small package	
Type	0	K Type	K Type
	1	L Type	L Type
	2	F Type	F Type
	3	R Type	R Type
	4	U Type	U Type
Output Type	No Marking	NPN Type	
Connection Type	C	Connector Type	
	No Marking	Wire Type	

Output Type

ON when light detected (Light ON)			ON when dark (Dark ON)		
Indicator Red LED	Light		Indicator Red LED	Light	
	Dark			Dark	
OUT TR	ON		OUT TR	ON	
	OFF			OFF	
LOAD	ON		LOAD	ON	
	OFF			OFF	
Operation	Reset		Operation	Reset	
	Reset			Reset	

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

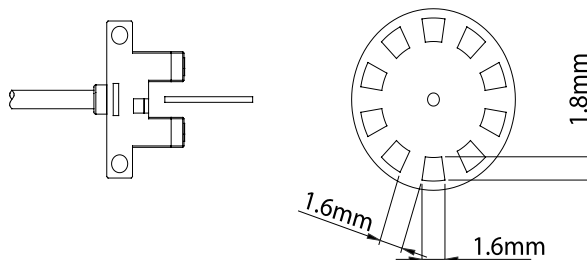
T Temp. controller

PHOTO SENSOR

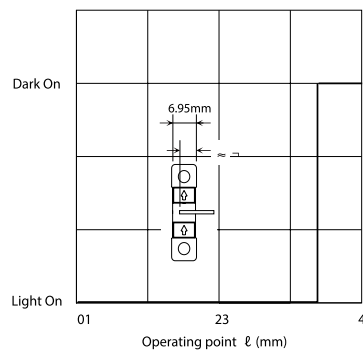
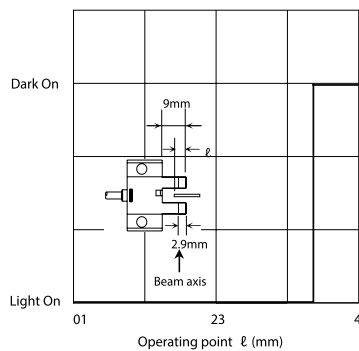
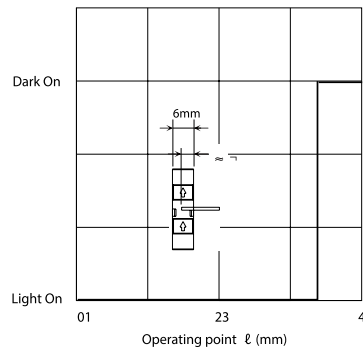
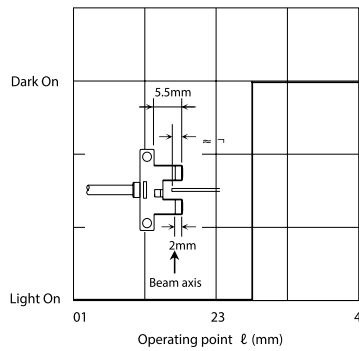
Specifications

Classification	KPS-M2 Series	KPS-M6 Series
Rated Operating Distance	5mm (fixed)	
Minimum detectable object	0.8mm x 1.8mm Opaque object	
Response distance	0.05mm max.	
Repeatability	0.03mm max.	
Power Supply Voltage	5 ~ 24 VDC $\pm$ 10% Ripple P-P 10% max.	
Power Consumption	15 mA max.	
Output Method	NPN Open Collector Type Load power supply voltage $\leq$ 30VDC, Load current $\leq$ 50mA, Residual voltage $\leq$ 0.7V (50mA), $\leq$ 0.4V (16mA)	
Output Operation	2 Outputs: Output 1 (Black) Light On, Output 2 (White) Dark On	
Response Time	Response Frequency: 3KHz min. (Light On: 20 μ s max., Light Off: 100 μ s max.)	
Indicator Light	Operation indicator: Orange LED (illuminates during light input)	
Operating Ambient Temperature	-25°C to +55°C (provided no freezing or condensation occurs)	
Operating Ambient Humidity	During Use/Storage: 35~85%RH (No condensation)	
Ambient Illuminance	Fluorescent lighting: 1,000 lx max. at the light-receiving surface	
Insulation Resistance	50M Ω min. (using a 250VDC Insulation Resistance Meter, between conductive and non-conductive parts)	
Withstand Voltage	1,000VAC (50~60Hz) for 1 minute (between conductive and non-conductive parts)	
Vibration Resistance	10 to 2,000 Hz, peak-to-peak amplitude 1.5 mm, 2 hours in each of 3 axes	
Shock Resistance	Approx. 1,500G (15,000 %g), 3-axis in each direction	
EMC	EN 50081-2, EN 50082-2, EN 60947-5-2	
Light Source	Infrared LED (unmodulated)	
Material	Case: PBT, Slit Cover: PC	
Cable Length	0.09 mm ² 4-core cap tire cable 1m	
Weight	Approx. 10g	Approx. 15g
Power reverse connection protection circuit	NPN Output Type	
Overcurrent protection circuit	NPN Output Type	
Output error (short circuit) protection circuit	NPN Output Type	
Certifications	CE: EN 60947-5-2	

■ Note: The response frequency is the value when the disk shown in the figure below is rotating.

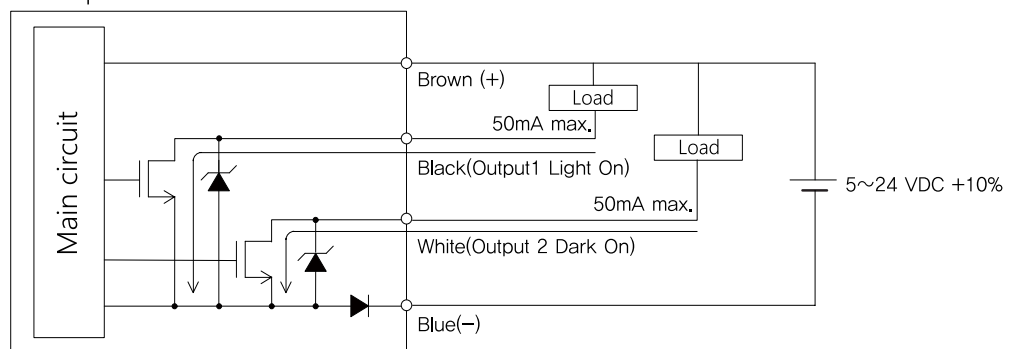


Operating Characteristics



Wiring Diagram

NPN output



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

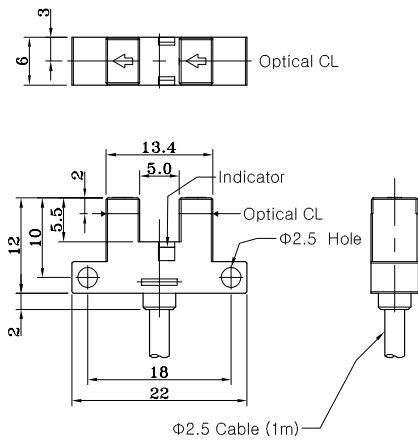
S Floatless controller

T Temp. controller

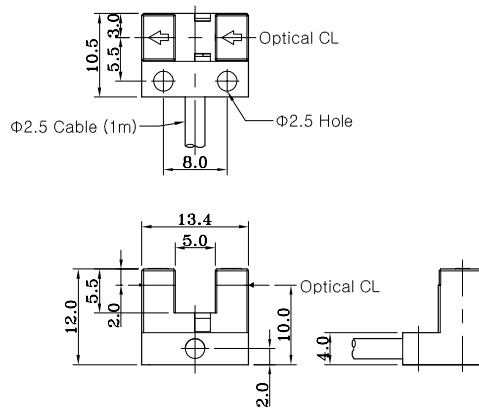
PHOTO SENSOR

Dimensions

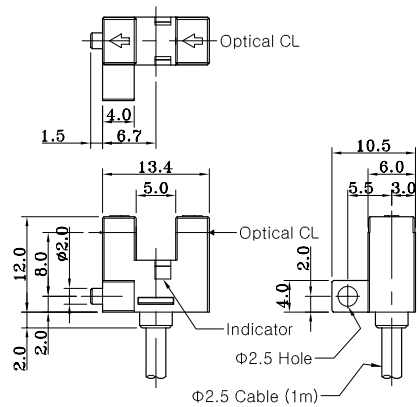
KPS-M20



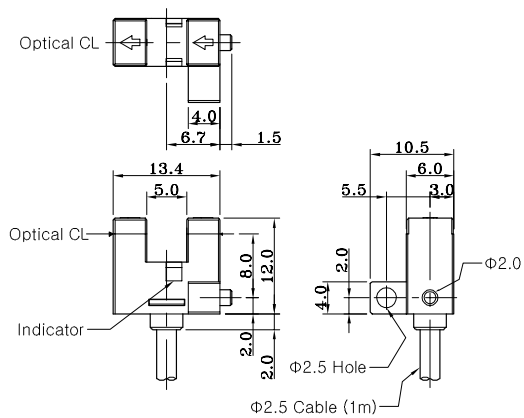
KPS-M21



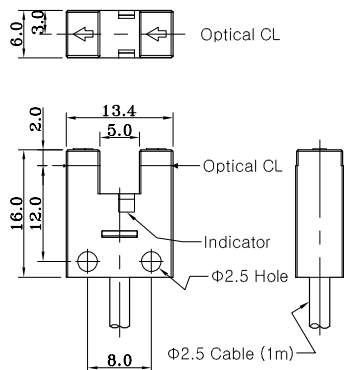
KPS-M22



KPS-M23

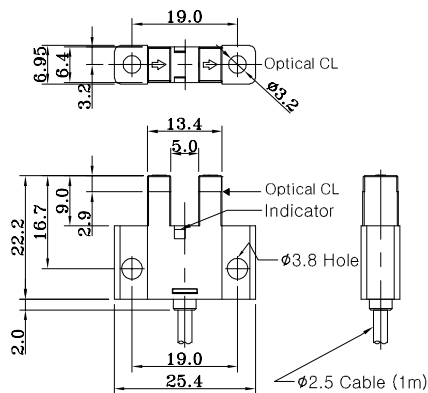


KPS-M24

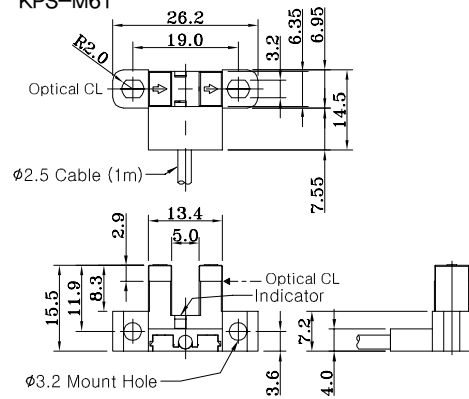


Dimensions

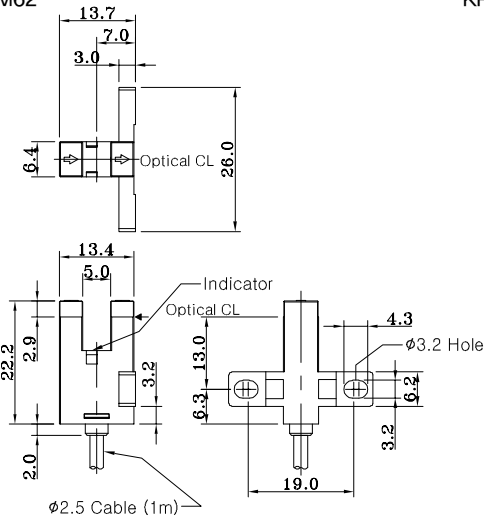
KPS-M60



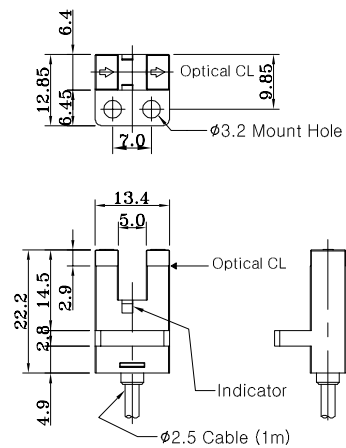
KPS-M61



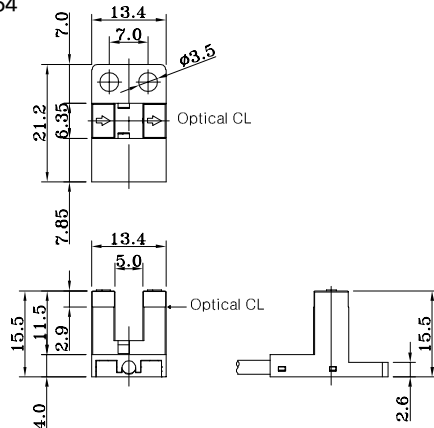
KPS-M62



KPS-M63



KPS-M64



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

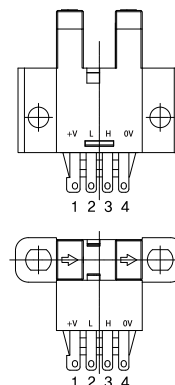
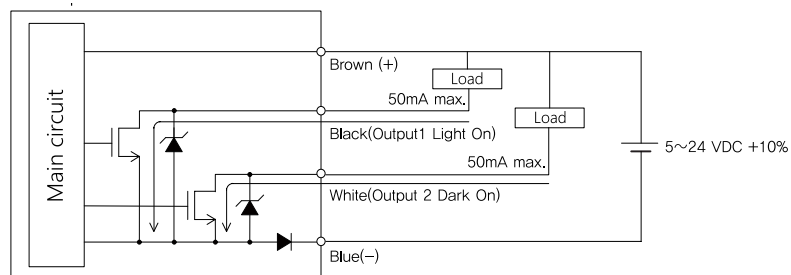
S Floatless controller

T Temp. controller

PHOTO SENSOR

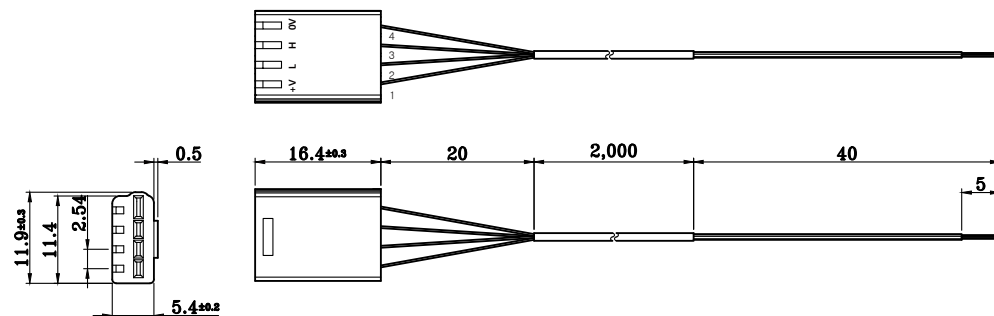
Wiring Diagram

KPS-M6C Series



No.	Item	Function	Output Operation	Wiring Color
1	+V	VCC	—	Brown
2	L	Output1	Light On	Black
3	H	Output2	Dark On	White
4	0V	GND	—	Blue

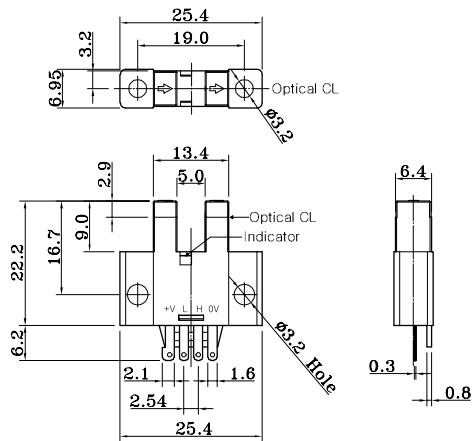
Dimensions



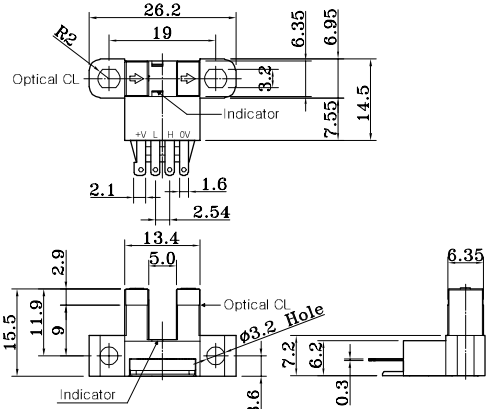
No.	Item	Function	Wiring Color
1	+V	VCC	Brown
2	L	Output1	Black
3	H	Output2	White
4	0V	GND	Blue

Dimensions

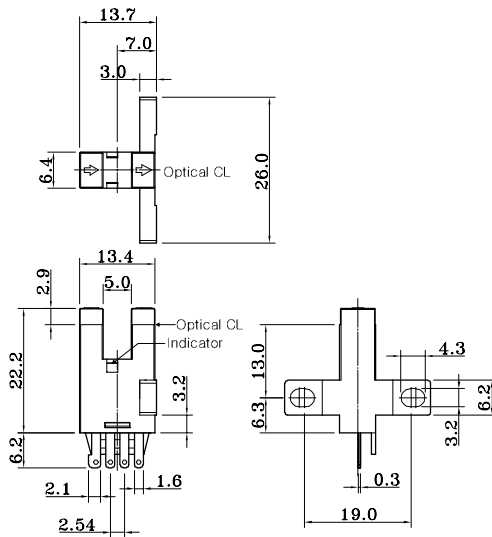
KPS-M60C



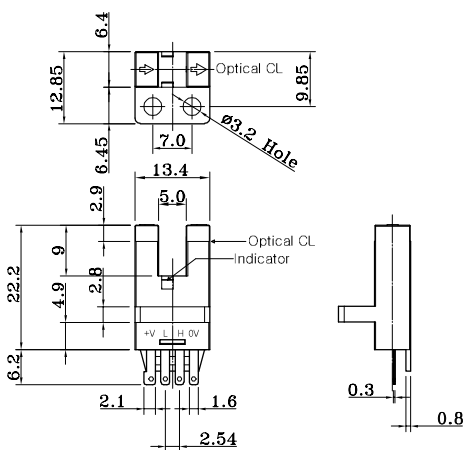
KPS-M61C



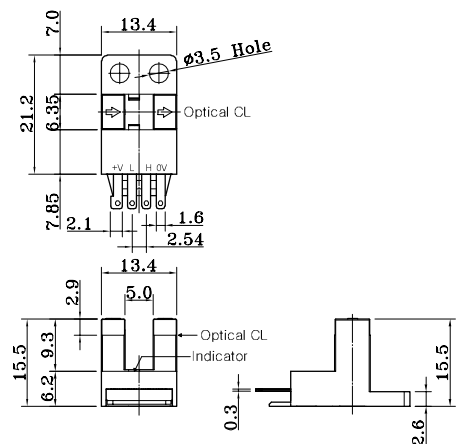
KPS-M62C



KPS-M63C



KPS-M64C



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

PHOTO SENSOR

Precautions

Power Supply & Wiring

- Ensure that the input power matches the rated voltage of the product before connecting any wiring.
- Do not route the wiring in close proximity to or within the same conduit as high-voltage lines or power lines to prevent electrical noise interference.

Environment

- Avoid installation in locations subject to severe vibration or impact, as this may cause malfunction.
- Avoid using the photoelectric sensor in environments where the lens may become contaminated by dust, oil, moisture, or other foreign matter.

Application Limitations (Disclaimer)

- This product is designed as a general-purpose object detection sensor and is not a safety sensor. It is not engineered or intended to prevent personal injury, loss of life, or property damage near hazardous areas of machinery.
- This sensor is intended for internal machinery integration and is not equipped with special protection against ambient light interference. Ensure that direct external light does not strike the receiver unit.

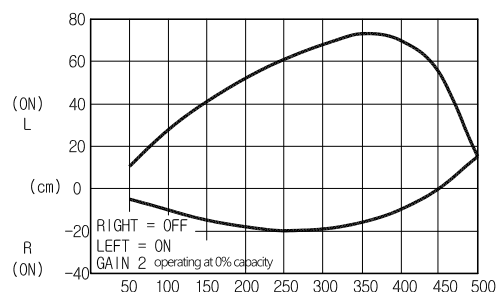
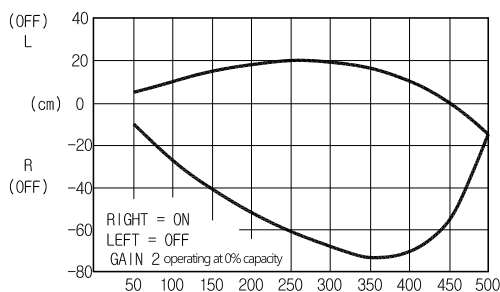
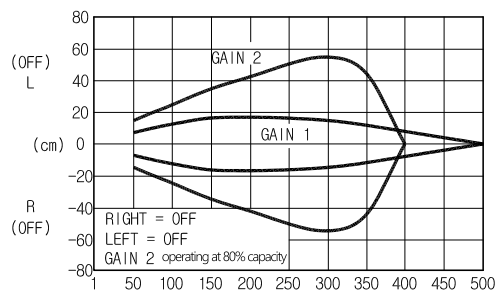
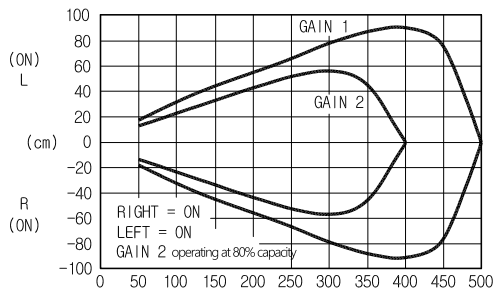
KPS-P Series

Features

- This photosensor is suitable for collision prevention during object movement.
- Both contactless and contact Outputs can be used simultaneously.
- Detection distance adjustment can be set in two ways.
- When using the non-contact Output, a built-in protection circuit activates to prevent Output short circuits caused by overload.
- CE Certified



Detection Range and DIP Switch Settings



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

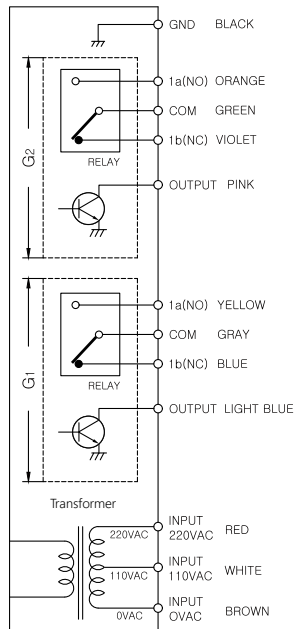
T Temp. controller

PHOTO SENSOR

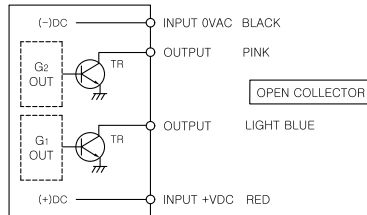
Specifications

Type		AC Power	DC Power		
Model		KPS-P300S	KPS-P300DAS	KPS-P300DBS	KPS-P300DS
Detection Range	G1	0.5m to 5m max, adjustable detection distance			
	G2	Adjustable from 30% to 80% of G1 detection distance			
Power Supply Voltage		110~220VAC (50/60Hz)	12VDC ± 20%	24VDC ± 20%	12 ~24VDC
Allowable voltage			Ripple P-P 10% max.		
Power Consumption		Approx. 2.5VA	Approx. 100 mA max.		
Light Source		Infrared LED, Modulated Light			
Light Source Wavelength		λ : 940 nm			
Response Time		80ms max.			
Response distance		20% max. at detection distance			
Output Method	G1	Non-contact Output: NPN transistor collector Output (OPEN COLLECTOR)			
		Contact Output: Relay (RELAY) 1C Contact Output			Non-contact Output
	G2	Non-contact Output: NPN transistor collector Output (OPEN COLLECTOR)			
		Contact Output: Relay (RELAY) 1C Contact Output			Non-contact Outputt
Contact Rating		Non-contact Output capacity: Current max. 80mA, Voltage max. 70VDC			
		Contact Output Capacity: 30VDC, 2A; 125VAC, 0.6A when using resistive load			Non-contact Output
Relay Life		Mechanical : Over 5,000,000 cycles, Electrical: Over 200,000 cycles			
Operating Mode		Light ON operation when illuminated (LIGHT ON) Dark ON operation when dark (DARK ON) *Selected via attached DIP switch			
Sensitivity adjustment		Volume control (VOLUME) for adjusting G1 and G2 detection distances is attached			
Detection Function		Four functions selectable via attached DIP switch			
Operating Ambient Illuminance		Incandescent light: 3,000 lx, Sunlight: 10,000 lx max.			
Mounting Method		Exposed Type, flat surface mounting Type			
Indicator Lights		G1 Green, G2 Red LED (Light Emitting Diode), ON when light is detected			
Ingress Protection		IP 54, Indoor Use Only *Protective cover (COVER) for external impact resistance available (depending on order specifications)			
Wiring		Wiring Connection Type			
Insulation Resistance		100 MΩ min. (DC 500 V Insulation Resistance Meter)			
Withstand Voltage		Between conductive and non-conductive parts: 1,000VAC (50/60Hz) for 1 minute			
Noise		Between power terminals: ± 1,000V			
Operating Temperature		-20℃ to +60℃ (without freezing)			
Operating Humidity		35 ~ 85% RH			
Vibration		10 to 55 Hz, amplitude 0.75 mm, 3-axis, 4 cycles per direction (8 minutes per cycle)			
Shock		10G, 3-axis each direction			
Housing Material		ABS (Ivory)			
Weight		Approx. 470g	Approx. 400 g		
Cable Length		2m			
Certifications		CE: EN 60947-1 / 60947-5-2			

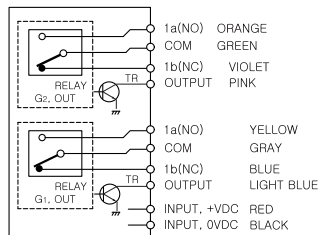
Wiring Diagram



KPS-P300DS(12~24VDC)

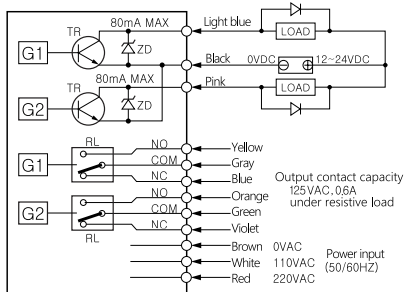


KPS-P300DAS : DC12V
KPS-P300DBS : DC24V

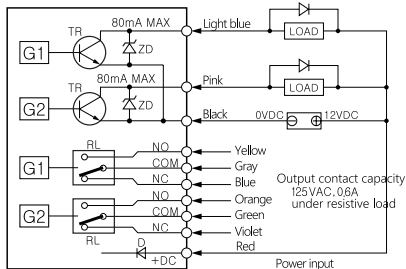


Load Wiring Diagram

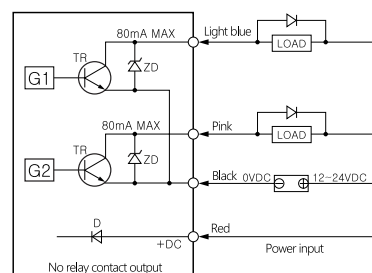
KPS-P300S (AC power)



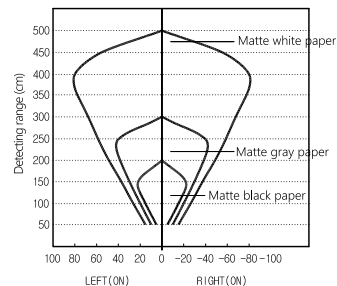
KPS-P300DAS : DC12V
KPS-P300DBS : DC24V



KPS-P300DS (DC 12V-24V)



KPS-P300S Detection Range by Color



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

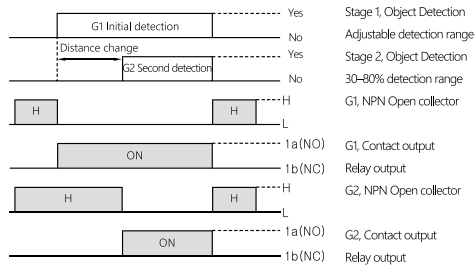
S Floatless controller

T Temp. controller

PHOTO SENSOR

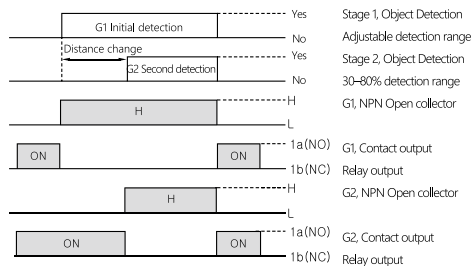
Lighting ON

ON (LIGHT ON)



Lighting OFF

ON (DARK ON)

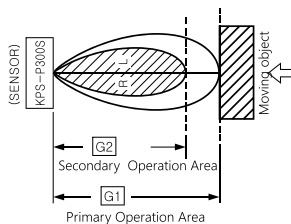


Installation



- KPS-P300S Photo Sensor is not waterproof; avoid outdoor installation.
※ If outdoor installation is unavoidable, ensure thorough protection against rain, snow, and moisture penetration.
- The KPS-P300S Photo Sensor has an ABS resin housing. Be careful of external impacts.
※ Dedicated protective cover is available.
- Avoid using in locations where corrosive gases are present, where humidity or oil components are high, or where the ambient temperature is elevated.
- Using a load exceeding the rated capacity on the built-in relay may damage the contacts. Therefore, you must use an external auxiliary relay with a higher rated capacity.
- When installing KPS-P300S photo sensors facing each other, be careful as this can cause malfunctions.

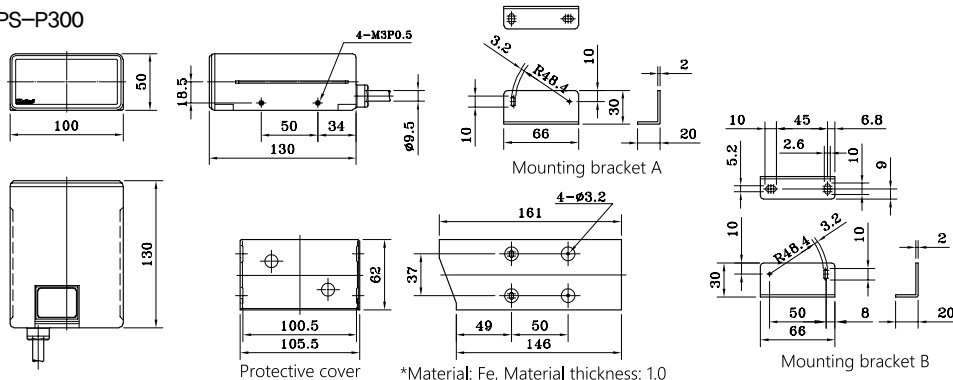
Operation Method



- When the moving object approaches within the primary detection distance, G1 turns ON. Simultaneously, the G1 Output, which includes a relay and a TRANSISTOR (OPEN COLLECTOR) for contactless Output, becomes an ON (L) signal.
- If the moving object continues to approach within the secondary detection distance setting, G2 turns ON the Output method is the same as G1.
- Setting the detection area selection switch to DARK ON (D) reverses the operation mode.

Dimensions

KPS-P300



Precautions

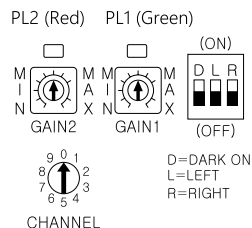
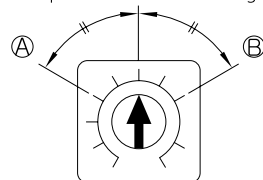
- Verify the input power is within the rated range before connecting the wiring.
- Be sure to double-check the wiring connections.
- When using equipment that generates strong high-frequency noise, such as high-frequency welders or switching regulators, be sure to ground the FRAME GROUND terminal.
- Wiring extensions are possible up to 70m using wire with a cross-sectional area of 0.3 mm² min..
- When wiring, do not install it in close proximity to high-voltage lines or power lines, or within the same conduit.
- Ensure direct sunlight or other strong external light does not enter the front of the photo sensor.
 Sunlight: 3,000 Lux on the light-receiving surface
 Incandescent light: 1,000 Lux on the light-receiving surface
- Do not install mirrors or highly Reflective objects near the detection area.
- Ensure light from other photo sensors does not directly enter the sensor.
- Detection distance may vary depending on the color or gloss of the detected object. Adjust the detection distance using the actual object before use.
- Since reflected light may occur from the mounting bracket where the photo sensor is installed, install it at least 30 cm above the bracket, from the mounting surface.
- Take care to prevent dust or dirt from adhering to the photo sensor lens
- If dust or dirt accumulates on the front lens of the photo sensor, wipe it off with a soft cloth.

Sensitivity Adjustment Method

- Please double-check that all wiring is correctly connected.
- Set the photo sensor input switch to the OFF position.
- Open the adjustment cover on the top surface of the photosensor housing.
- Set the detection area selection switch to the required position.
- Remove any unnecessary Reflective objects within the photo sensor's detection area.
- Turn on the photo sensor's input power.
- Turn the adjustment knobs G1 and G2 to their minimum positions.
- Stop the object to be detected at the set distance position.
- Slowly turn adjustment knob G1 clockwise max. until the G1 LED (green) illuminates, then select that position.
- Remove the moving object to be detected from the detection area. At this point, the G1 LED (green) will turn off.
- * Check the G1 volume scale position. Point A
- When the green LED illuminates while turning the G1 volume to maximum with the detection target removed, check the volume scale position, Point B
- Set the volume by turning it to the midpoint between G1 volume points A and B.
- * If the green LED does not illuminate when the volume is turned to maximum with the moving object for detection removed,
- Please set it by confirming the detection of moving objects 2-3 cycles.
- G2 volume adjustment is the same as the G1 method. (Refer to Figure 1).

Figure 1

Example of control knob settings



- Channel Usage Method: When installing multiple KPS-300S photo sensors side by side, adjust the number of channels to match the number of units installed.

K	Photo sensor
L	Proximity sensor
M	Counter Timer
N	Buzzer
O	Signal phone
P	Tower light
Q	Square light
R	Touch switch
S	Floatless controller
T	Temp. controller

PHOTO SENSOR

Photo Sensor Controller

Features

- Built-in power supply and output detection device for DC-powered photosensors.
- The operating voltage: AC100~110V and AC200~220V.
- The output voltage: DC12V (CP012) and DC24V (CP024)
- Compact design with object detection pilot light (LED) attached to the front.



KPS-CP012



KPS-CP024

Specifications

Model	KPS-CP012	KPS-CP024
Power Supply Voltage	100~110VAC, 200~220VAC (50/60Hz)	
Power consumption	Approx. 3.5VA	Approx. 2.8VA
Sensor Output voltage	12VDC $\pm$ 5% (Ripple: $\pm$ 5% max.)	24VDC $\pm$ 5% (Ripple: $\pm$ 5% max.)
Sensor Output current	100 mA max.	
Sensor Type	Photo sensors, Proximity sensors and etc.	
Control Output	Relay Output	
Contact Rating	Electrical: 200,000 cycles, Mechanical: 5,000,000 cycles (1,800 cycles/hour) at 250VAC, 2.5A resistive load	
Operating Ambient Temperature	-20°C to +60°C (without freezing)	
Ambient operating humidity	35~85%RH	
Insulation Resistance	10M Ω min. (DC500V Insulation Resistance Meter)	
Withstand Voltage	Between charged and non-charged parts: 1,000VAC (50/60Hz) for 1 minute	
Vibration/Shock resistance	10~55Hz, peak-to-peak 0.75mm, 3-axis each direction / Approx. 5G (50g), 3-axis each direction	
Housing Material	ABS (Ivory)	
Weight	226g	226g
Applicable Socket	KPS-TDR-R8	

PHOTO SENSOR

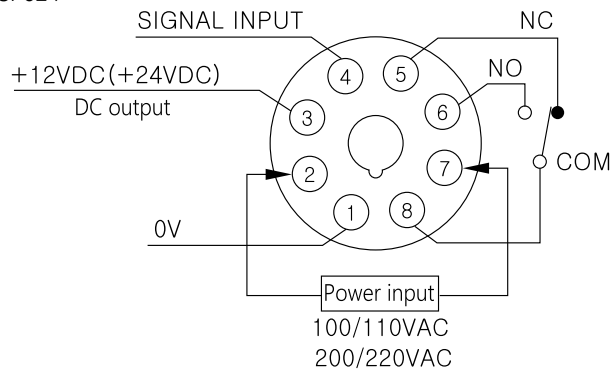
Controller Operation Description

KPS-CP012, KPS-CP024

- For DC12~24V Photo sensors and Proximity sensors The controller incorporates a power supply unit and an output detection unit.
- Operating voltages are 100~110VAC and 200~220VAC, available in DC12V Type (KPS-CP012) and DC24V Type (KPS-CP024)
- Compact design with a detection indicator LED.

Controller Input/Output Circuit Connection Diagram

KPS-CP012, KPS-CP024

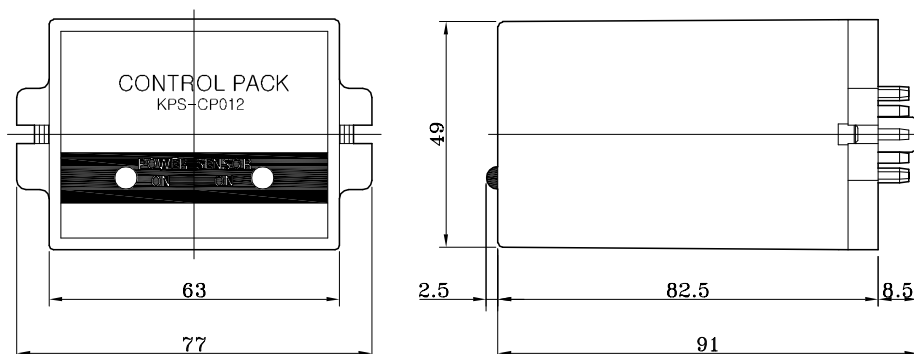


Precautions

- Verify the input power before connecting.
- Before use, check the input/Output circuit connection diagram and connect accordingly.
- When connecting sensors to the controller, verify the sensor's current consumption matches the DC Output capacity (100mA) before connecting. (Do not connect more than two photosensors).

Dimensions

KPS-CP



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

PHOTO SENSOR

Reflector for Photo Sensor



KPS-R3



KPS-RF-S3



KPS-RF4

Features

- When using a retro-Reflective photo sensor, you must use the dedicated reflector for the photo sensor to achieve maximum performance and effectiveness.
- The reflector surface and body are made of synthetic resin (KPS-R3, KPS-RF-S3), making them non-corrosive to gases and humidity.
- Compact and lightweight with excellent reflectivity.
- Easy panel mounting.

Material

Classification Model Name	Housing	Reflector	Weight
KPS-RF4	ABS (White)	Acrylic (Transparent)	Approx. 74g
KPS-R3	ABS (Black)	Acrylic (Transparent)	Approx. 24g
KPS-RF-S3	ABS (Black)	Acrylic (Transparent)	Approx. 24g

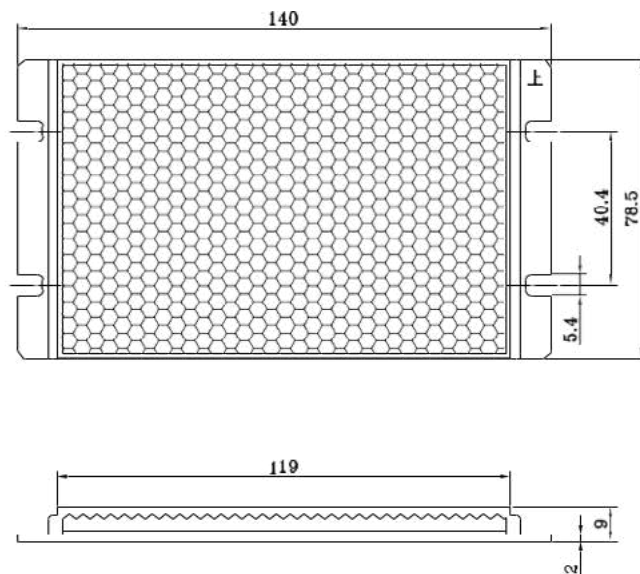
Precautions

- When installing the panel, ensure it is securely mounted to achieve a perfectly flat surface.
- Clean the Reflective surface regularly to prevent scratches and other contaminants.
- Exercise caution as excessive impact or undue force applied to the mirror surface may cause damage.

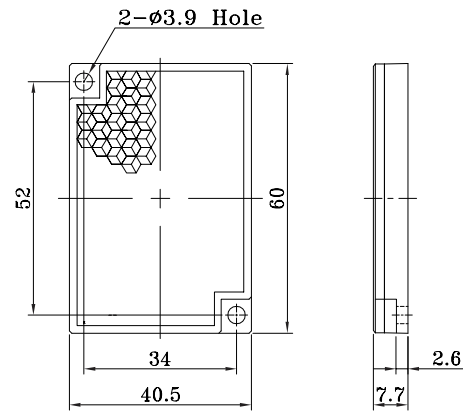
PHOTO SENSOR

Dimensions

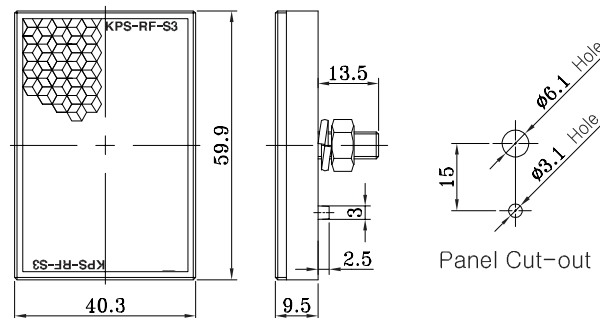
KPS-RF4



KPS-R3



KPS-RF-S3



K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

S Floatless controller

T Temp. controller

PHOTO SENSOR

Notes

- Please verify before using the products
- Be sure to verify the performance and characteristics of the product.
- Confirm that this product is suitable for your intended purpose.
- Product characteristics and specifications must be selected based on whether the installation location is indoors or outdoors.
- Prior to installation, assess whether the location is subject to excessive external light interference, temperature fluctuations, vibration, dust, humidity, oil, hazardous gases, or other electrical noise.
- Verify the power supply status and Output load characteristics and ratings before selecting the product.

Basic Operating Principle

A photosensor is a device that controls Output at the light-receiving unit by utilizing the principle of projecting light onto a target object and detecting its reflection, transmission, or blocking. Using this principle, it can detect an object's movement state, presence/absence state, or change state, and is widely used to enhance productivity and manage quality.

Emitter

- When pulses determined by the pulse generator's pulse width and repetition period are amplified and applied to an Infrared emitting diode This is the principle whereby the emitted light is projected outward through the lens.
 - Infrared diodes emit light with low current, generating no heat, and pulse modulation allows momentary high current flow. However, the average current flowing through the light-emitting element is consequently low. Therefore, Infrared light-emitting diodes can be used semi-permanently.
- * Figure 1: During the T1 period, a pulse (PULSE) current of width T2 flows, causing light to be emitted for the duration of T2.

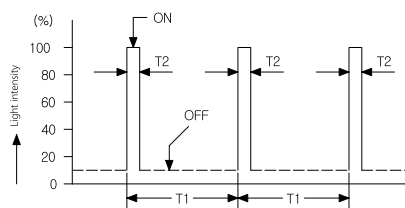


Figure 1 LED Lighting Method

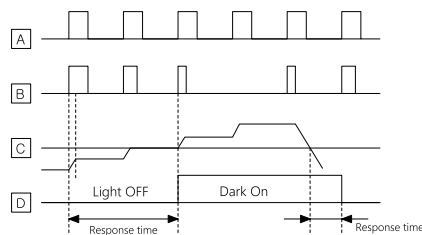


Figure 2

Receiver

- The receiving unit converts the pulsed Infrared light into a periodic signal, which is then amplified, integrated, and shaped into the required ON/OFF digital output.
- An integrated optical filter blocks unwanted wavelengths, ensuring only the target signal reaches the photodetector for maximized performance and minimal interference.
- Optimized Amplification: An amplification circuit enhances the signal up to the required operating level, precisely matching the current converted from the incident light.
- Accurate ON/OFF Control: Because the amplified signal level is proportional to the input pulse waveform, it cannot be directly converted into a low-level logic signal. Therefore, the amplified pulse signal goes through an integration process to guarantee stable and accurate ON/OFF switching.

* Figure 2

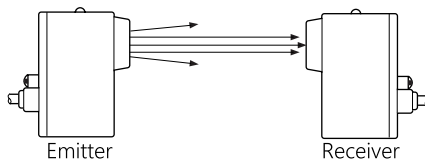
A: Pulse waveform of the light-emitting section

B: Waveform incident on the light-receiving section

C, D: Conversion of the pulse waveform into an ON/OFF signal by integration

PHOTO SENSOR

Through-Beam Type

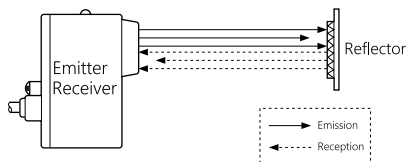


■ The light-emitting and light-receiving units are separate, and the optical axis must be precisely aligned at the set distance.

■ During installation, align the light source and receiver in a straight line, then slightly adjust one side vertically or horizontally until the optical axes are perfectly aligned.

* When the optical axis is perfectly aligned, the receiver LED illuminates. Pass a target object through the beam to verify that the light-received (ON) and light-blocked (OFF) indicator LEDs flash accurately. Once proper operation is confirmed, securely fasten both the emitter and receiver.

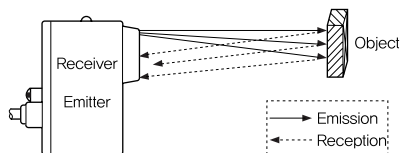
Retro-Reflective Type



■ Installation follows the same method as the transmission type.

* It is convenient to adjust the reflector side when aligning the optical axis.

Diffuse-Reflective Type



■ When the detected object aligns with the front lens within the set distance, the sensor operates.

* It detects the effect of light being reflected when it hits the surface of a moving object the sensor operates.

■ Since the emitted light uses Infrared, the detection distance may vary depending on the color of the detected object when using the diffuse reflection Type. the detection distance may vary depending on the color of the detected object.

■ When installing the photosensor, ensure it is securely mounted to prevent device shaking

■ When using the photo sensor, it is recommended to install and operate it within a distance of 1/2 to 2/3 of the maximum distance indicated on the rating, as shown in the figure.

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

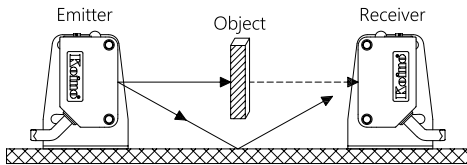
R Touch switch

S Floatless controller

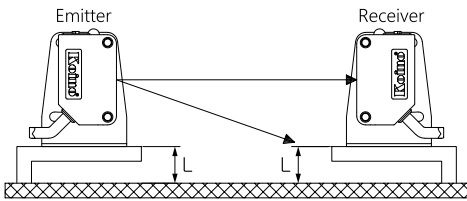
T Temp. controller

PHOTO SENSOR

Installation Method

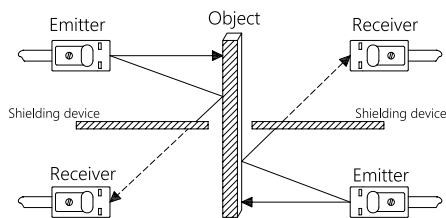


Installing the sensor as shown in the figure creates unwanted reflections from the mounting surface, which prevents accurate object detection. This background reflection keeps the receiver continuously in a light-received state, failing to verify the presence or absence of the target.



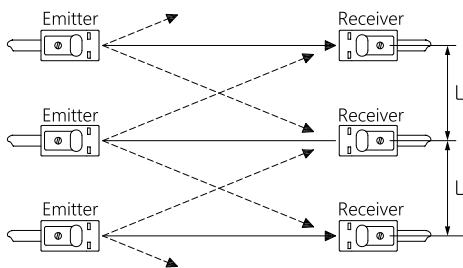
To avoid unnecessary reflected light, adjust the mounting height of the photosensor as shown in the figure to prevent false operation caused by reflected light.

* L: Installation height,



When using multiple Through-Beam Type photo sensors in close proximity, they must be installed as shown in the figure to prevent mutual interference.

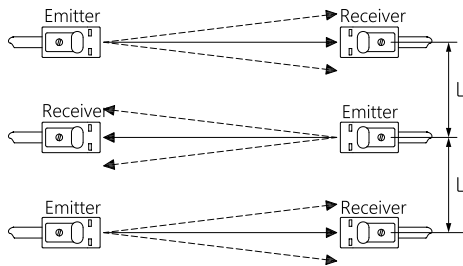
* When an object approaches the receiving side, reflected light may be generated. Therefore, install a shielding device between the emitter and receiver to shield the reflected light.



If sensors are installed too close together as shown in the diagram, it may cause cross-talk or malfunction in adjacent receivers. To prevent this, increase the installation clearance (L).

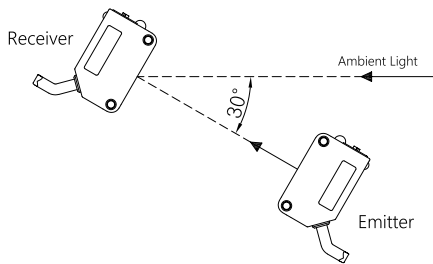
PHOTO SENSOR

Installation Method



When installing transmissive photosensors in parallel, install the emitter and receiver units in a zigzag pattern as shown in the figure for stable operation.

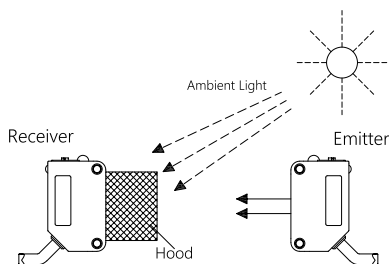
* L: Installation spacing



When installing the emitter and receiver, avoid direct incident light from extraneous light sources onto the receiver lens surface.

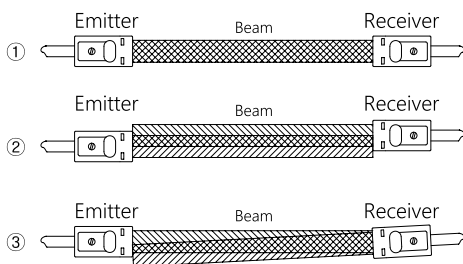
External light sources: Sunlight, fluorescent light, mercury vapor light ..., etc.

Install the emitter and receiver as shown in the figure.



When installing in locations with severe stray light, covering the lens surface side of the receiver with a hood as shown in the figure can prevent malfunctions caused by stray light.

* Note that the angle of incidence of sunlight changes between summer and winter; the optical axis of the light receiver and the external light axis must be set at an angle of approximately 30° min..



For Thorough-Beam Type, perfectly aligning the emitter and receiver horizontally matches the optical axes, ensuring maximum light reception. This optimization guarantees stable, reliable operation even in challenging environmental conditions

- ① Good: Optical axes aligned
- ② Poor: Horizontal optical axis misalignment
- ③ Poor: Optical axis angle misalignment

K Photo sensor

L Proximity sensor

M Counter Timer

N Buzzer

O Signal phone

P Tower light

Q Square light

R Touch switch

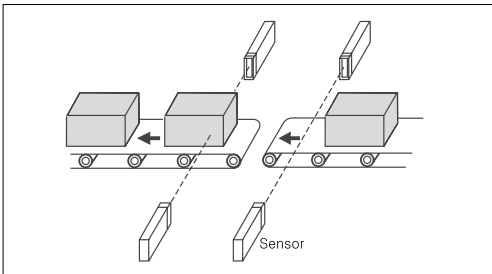
S Floatless controller

T Temp. controller

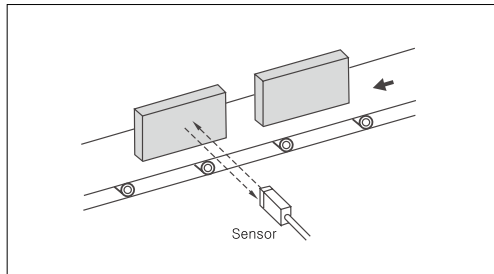
PHOTO SENSOR

Installation Method

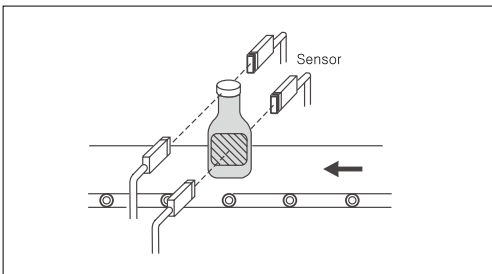
Through-Beam



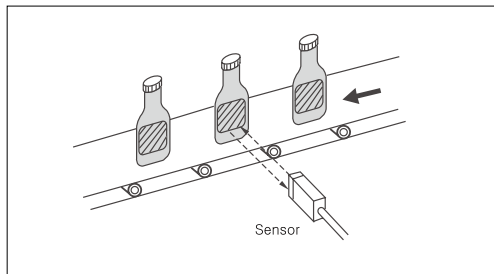
Diffuse-Reflective



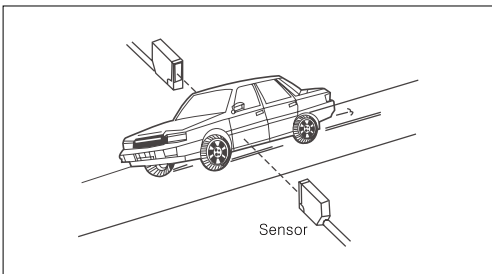
Through-Beam



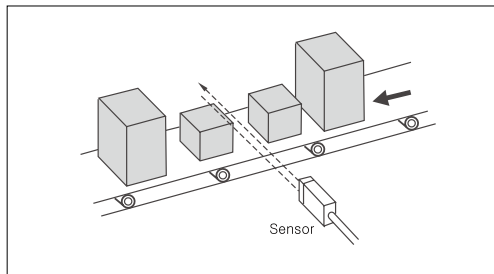
Diffuse-Reflective



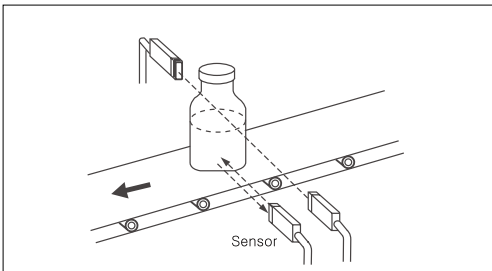
Through-Beam



Diffuse-Reflective



Through-Beam
Diffuse-Reflective



Retro-Reflective

