

## Series of Photoelectric Sensors

## **Overview**

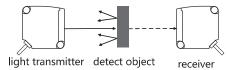
Photoelectric sensor is a sensor which uses photoelectric element as detection element. It first converts the measured change into the change of optical signal, and then further converts the optical signal into electrical signal with the help of photoelectric element. Photoelectric sensor is generally composed of light source, optical path and photoelectric element.

### **Functional Classification of Photoelectric Sensors**

According to different detection methods, photoelectric sensors can be divided into three types: contrast type, the diffuse type and the specular type.

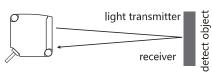
## ① Through Beam Photoelectric Sensor

The photophore and the receiver are installed on the same optical axis. When there is an object between them, the object will be detected and output according to the change of light transmission. This kind of sensor is called the photoelectric sensor.



### 2 Diffuse Reflection Photoelectric Sensor

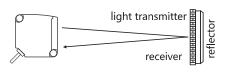
The light transmitter and receiver are photoelectric sensor. The light transmitter sends out light to the detecting object, after the detected object is reflected to the receiver, the light intensity of the reflected light is recognized and detected and the output of the object is detected.



#### ③ Mirror Reflection Photoelectric Sensor

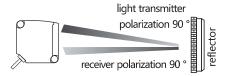
#### Mirror Reflection Photoelectric Sensor

The light transmitter and the receiver are photoelectric sensor. The light emitted by the light transmitter is reflected through the reflector to the receiver. When there is an object in the middle between the photoelectric sensor and the reflector, the object is judged by the change in the amount of light reflected back to judge the object and output. This photoelectric sensor is a mirror photoelectric sensor.



#### Polarized Reflection Photoelectric Sensor

Polarized mirror reflection photoelectric sensor and specular reflection action are in the same way. The light emitter and the receiver are installed with a polarizing filter, the filter angle is 90 °, the receiver only receives the light emitting after filter angle of 90 °. It uses this feature to detect the things with metal reflection.



- ① Consumed Current of Photoelectric Sensor: The current required for the working state of the photoelectric sensor.
- ② Response Time of Photoelectric Sensor: The time from the receiver of photoelectric sensor receiving the light to output to ON immediately.
- 3 Action Mode of Photoelectric Sensor : Dark ON and Light ON
- ▶ Dark ON ( Shading Action )

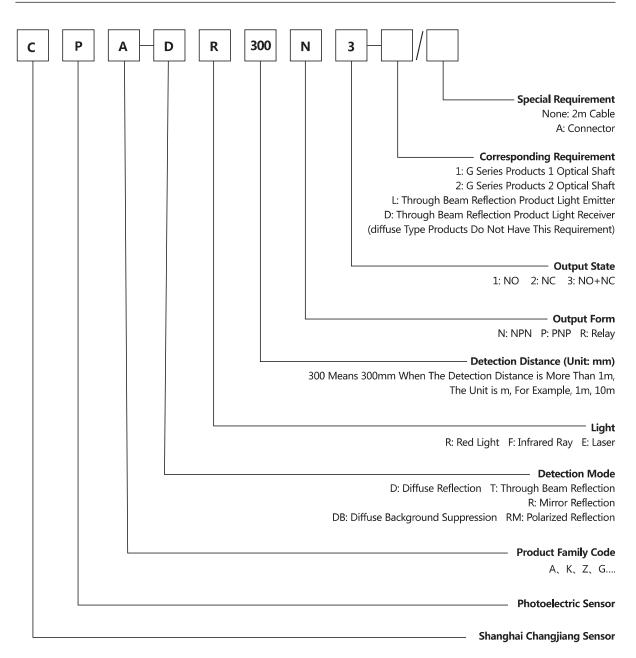
The light emitted from the light emitter, the output of the receiver when it doesn't receive light, (between the light transmitter and the receiver between the detection of objects) in the ON mode.

► Light ON (Light Action)

The light emitted from the light emitter, the output of the receiver when it receives light, (there is no object blocking between the light emitter and the receiver) is the ON mode.

## **Series of Photoelectric Sensor**

## **Model Naming**



## Series of Photoelectric Sensors

# **CPK Rectangular Photoelectric sensor**

# Red Light

Detection Mode	Simple Graph	<b>Detection Distance</b>	Output Form	Model
Through Beam Reflection		40m		CPK-TR40MR3 2M Emitter:CPK-TR40MR3-L 2M Receiver:CPK-TR40MR3-D 2M
		20m		CPK-TR20MR3 2M Emitter:CPK-TR20MR3-L 2M Receiver:CPK-TR20MR3-D 2M
Polarized Reflection		<b>──</b> 6m		CPK-RMR6MR3 2M
Diffuse Reflection		■ 300mm		CPK-DR300R3 2M
		1m		CPK-DR1MR3 2M
		2.5m		CPK-DR2.5MR3 2M

# **CPG U-Shaped Photoelectric Sensor**

Red Light

Detection	Simple Graph	Detection Width	Connection Mode	Optical Axis Number	Model	
Mode					NPN Output	PNP Output
Through Beam Reflection		25mm -	Formed cable (2m)	1 Optic Axis	CPG-TF25N3-1	CPG-TF25P3-1
			Connector relay (M8)		CPG-TF25N3-1/A	CPG-TF25P3-1/A
			Formed cable (2m)	2 Optic Axis	CPG-TF25N3-2	CPG-TF25P3-2
			Connector relay (M8)		CPG-TF25N3-2/A	CPG-TF25N3-2/A



## **CPK Rectangular Photoelectric sensor**

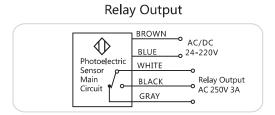
- ► Long detection distance, through beam reflection up to 40m, diffuse reflection up to 2.5m;
- Adopt advanced technology visible red light;
   Action mode: Dark ON/Light ON switches freely;
- ► Strong anti-interference ability
- ► IP67 grade;



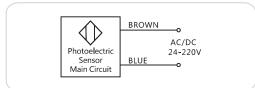
## **Specification**

Sensor Type   Through Beam Reflection   Polarized Reflection   Type   Relay Output   CPK-TRA0MAR   CPK-TRA0MAR   CPK-DR10M3   CPK-DR	Specii	ication							
Detection Distance   40 m   20 m   0.1~6 m   300 mm   1m   2.5 m	Sens	sor Type	Through Bea	m Reflection	Polarized Reflection		Diffuse Reflection	1	
Sandard Detection Object Opaque objects above Φ17mm	Type	Relay Output	CPK-TR40MR3	CPK-TR20MR3	CPK-RMR6MR3	CPK-DR300R3	CPK-DR1MR3	CPK-DR2.5MR3	
Return Difference   The detected distance is less than 20%	Detecti	on Distance	40m	20m	0.1~6m	300mm	1m	2.5m	
Direction Angle  Light Source (Wavelength)  Supply Voltage Consumed Euront Control Output  Action Mode  Indicator  Protection Circuit  Life (Relay Output)  Life (Relay Consumed Euront Control Output  Life (Relay Consumed Euront Control Co	Standard D	Detection Object	Opaque objects	above Φ17mm	Opaque objects above Φ75mi	m White drawing paper:1	00×100mm White dr	awing paper:300×300mm	
Supply Voltage	Return	Difference	The detected distance is less than 20%						
Supply Voltage  Consumed Fower/ Consumed Courrent Consumed Cournet Control Output Action Mode  Action Mode  Action Mode  Indicator  Indicator  Protection Circuit  Function of preventing mutual interference Stable indicator (green) Power indicator (green): through beam emitter only Function of preventing mutual interference  Itie (Relay Machinery Output)  Responses Time Sensitivity Adjustment Ambient Tumination (Receiver Sido)  Ambient Tumination (Receiver Si	Direct	tion Angle	emitter, receiver: more than 3 °of each more than 1.5°						
Control Output  Action Mode  Indicator  Indicator  Relay output: 1c contact AC250V less than 3V (cos φ = 1), DC5V above 10mA  Dark ON / Light On switches freely  Action indicator (orange) Stable indicator (green) Power indicator (green): through beam emitter only  Protection Circuit  If (Relay Machinery (output) Response Time  Sensitivity Adjustment Ambient Humidity Range  More than 100000 times (switching frequency is 18000 times / h)  Lighting collecting surface illumination incandescent lamp: less than 3000k, sunlight: less than 11000k  Ambient Temperature Range  More than 50 million times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Ambient Humidity Range  Working: -25 -55 °C / Storing: -40 -70 °C (no freeze, no dew)  More than 10000k (preceiver only)  Ambient Humidity Range  More than 10000k (preceiver only)  Ambient Humidity Range  More than 10000k (preceiver only)  Ambient Humidity Range  More than 10000k (preceiver only)  Lighting collecting surface illumination incandescent lamp: less than 3000k, sunlight: less than 11000k  Working: 35 - 85 °KR   / Storing: -40 -70 °C (no freeze, no dew)  More than 10000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 3000k, sunlight: less than 11000k  Working: -25 -55 °C / Storing: -40 -70 °C (no freeze, no dew)  More than 10000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 3000k, sunlight: less than 11000k  More than 10000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 1000k  More than 10000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)	Light Sour	ce (Wavelength)	Red emitting diode (617nm)						
Control Output  Control Output  Action Mode  Indicator  Protection Circuit  Action Mode  Indicator  Protection Circuit  Action Mode  Action indicator (green)  Power indicator (green): through beam emitter only  Protectical  Indicator  More than 50 million times (switching frequency is 18000 times / h)  More than 100000 times (switching frequency is 18000 times / h)  Electrical  More than 100000 times (switching frequency is 18000 times / h)  Ess stan 2 Ww  Machinery  More than 50 million times (switching frequency is 18000 times / h)  More than 100000 times (switching frequency is 18000 times / h)  Ess stan 20ms  Sensitivity Adjustment  Ambient Allumination  Consecutor Side  Ambient Humidity Range  Working: -25-55 °C / Storing: -40-70 °C (no freeze, no dew)  Ambient Humidity Range  Working: -25-55 °C / Storing: 35-95%RH (no dew)  Insulation Resistance  Working: Above 20m (DC500V megabit meter)  Withstand Voltage  Vibration (Durability)  10-55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  10-55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  About 215g  About 146g  About 132g  ABS  Shell  Case  ABS  PDM  About 44 Gas Analysis Anal	Supp	ly Voltage	DC24~240V±10% Pulsation (P-P) is less than 10% AC24~240V±10% 50/60Hz						
Action Mode  Indicator  Indicator  Protection Circuit  Life (Relay Output)  Life (Relay Output)  Output)  Response Time  Sensitivity Adjustment  Ambient Tillumination  Ambient Tillumination  Lighting collecting surface illumination incandescent lamp: less than 3000k, sunlight: less than 11000k  More than 10000 times (switching: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  More than 10000 times (switching: 35~95%RH (no dew)  Insulation Resistance  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Withstand Voltage  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  IEC standard IP67  Connection Mode  Weight (Packing State)  About 215g  About 215g  About 146g  ABS  PDM  Cable  Ampula five a parating bracket.  Manual of use, mounting bracket.	Consu Consu	med Power/ med Current	Less than 3W (tra 1.5W optomete	nsmitter less than r less than 1.5W)		Less than 2'	W		
Action indicator (orange) Stable indicator (green) Power indicator (green): through beam emitter only  Protection Circuit  Function of preventing mutual interference  Life (Relay Output) Electrical Machinery Output) Electrical More than 50 million times (switching frequency is 18000 times / h)  Less than 20ms Sensitivity Adjustment Ambient Illumination (Receiver Side) Ambient Temperature Range Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Ambient Humidity Range Insulation Resistance Working: 35~85%RH / Storing: 35~95%RH (no dew)  Insulation Resistance Withstand Voltage Withstand Voltage AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  IP Grade Connection Mode Lead out type (standard Conductor 2m)  Weight (Packing State) About 215g About 146g ABS PDM Cable  Applied for a majorities hooket.  Manual of use, mounting bracket. Manual of use, mounting bracket	Contr	rol Output		Relay o	utput: 1c contact AC250V	less than 3A (cos $\varphi = 1$	1), DC5V above 10	)mA	
Indicator Stable indicator (green) Power indicator (green): through beam emitter only  Protection Circuit	Actio	on Mode	Dark ON / Light On switches freely						
Protection Circuit			Action indicator (orange)						
Protection Circuit  Life (Relay Output)  Life (Relay Output)  Response Time  Sensitivity Adjustment  Ambient Illumination  Remier Humidity Range  Insulation Resistance  Withstand Voltage  Withstand Voltage  Vibration (Durability)  Lighting to Back and an analysis and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  Lighting Same Shell  PGrade  Connection Mode  Weight (Packing State)  Case  Shell  Lighting Same More than 100000 times (switching frequency is 18000 times / h)  More than 100000 times (switching frequency is 18000 times / h)  Less than 20ms  Less than 20ms  Single knob (receiver only)  Less than 3000lx, sunlight: less than 11000lx  Response Time  Vorking: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Working: 35~85%RH / Storing: 35~95%RH (no dew)  Above 20m (DC500V megabit meter)  Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IEC standard IP67  Connection Mode  Lead out type (standard conductor 2m)  Weight (Packing State)  About 215g  About 146g  ABS  Shell  Display Window  Cable  2m PVC cable cable bend radius : R18  Manual of use mounting bracket.  Manual of use mounting bracket.	Inc	dicator	Stable indicator (green)						
Life (Relay Output)  Response Time  Sensitivity Adjustment  Ambient Illumination (Receiver Side)  Ambient Temperature Range  More than 50 million times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 3000lx, sunlight: less than 11000lx  Ambient Illumination (Receiver Side)  Ambient Humidity Range  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  More than 100000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Lighting collecting surface illumination incandescent lamp: less than 3000lx, sunlight: less than 11000lx  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  More than 100000 times (switching frequency is 18000 times / h)  More than 100000 times (switching frequency is 18000 times / h)  Less than 20ms  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  More than 100000 times (switching frequency is 18000 times / h)  More than 100000 times (switching frequency is 18000 times / h)  Less than 20ms  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  More than 100000 times (switching frequency is 18000 times / h)  Less than 20ms  Single knob (receiver only)  Less than 20ms  Solon (Solon (Sol			Power indicator (green) : through beam emitter only						
Output)  Response Time  Sensitivity Adjustment  Ambient Illumination (Receiver Side)  Ambient Illumination (	Protec	tion Circuit	<ul> <li>Function of preventing mutual interference</li> </ul>						
Response Time  Sensitivity Adjustment  Anbient Temperature Range  Ambient Temperature Range  Morking: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Ambient Temperature Range  Morking: 35~85%RH / Storing: 35~95%RH (no dew)  Insulation Resistance  Withstand Voltage  Vibration (Durability)  Impact (Durability)  Insulation (Durability)  Impact (Durability)  About 215g  About 146g  About 132g  About 132g  About 132g  About 132g  About 132g  About 146g  Annual of use, mounting bracket.  Manual of use, mounting bracket.	Life (Relay Machinery		More than 50 million times (switching frequency is 18000 times / h)						
Sensitivity Adjustment  Ambient Illumination (Receiver Side)  Ambient Illumination (Receiver Side)  Ambient Temperature Range  Ambient Humidity Range  Insulation Resistance  Withstand Voltage  Vibration (Durability)  Impact (Durability)  IP Grade  Connection Mode  Weight (Packing State)  About 215g  About 215g  About 215g  About 216g  About	Output	Electrical	More than 100000 times (switching frequency is 18000 times / h)						
Ambient Illumination (Receiver Side)  Ambient Illumination (Receiver Side)  Ambient Temperature Range  Ambient Humidity Range  Ambient Humidity Range  Morking: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Ambient Humidity Range  Morking: 35~85%RH / Storing: 35~95%RH (no dew)  Insulation Resistance  Above 20m (DC500V megabit meter)  Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  Connection Mode  Lead out type (standard IP67  Connection Mode  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  Shell  Case  ABS  PDM  Cable  2m PVC cable cable bend radius: R18	Respo	onse Time	Less than 20ms						
Ambient Temperature Range  Working: -25~55 °C / Storing: -40~70 °C (no freeze, no dew)  Morking: 35~85%RH / Storing: 35~95%RH (no dew)  Insulation Resistance  Above 20m (DC500V megabit meter)  Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  Connection Mode  Lead out type (standard IP67  Connection Mode  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  Shell  Display Window  Cable  2m PVC cable cable bend radius : R18  Manual of use, mounting bracket.  Manual of use, mounting bracket.			Single knob (receiver only)						
Ambient Humidity Range  Insulation Resistance  Above 20m (DC500V megabit meter)  Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  Connection Mode  Lead out type (standard IP67  Connection Mode  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  PDM  Case  Shell  Display Window  Display Window  Display Window  Display Window  ABS  PDM  About date the provided based of the amounting bracket.  Manual of use, mounting bracket.  Manual of use, mounting bracket.  Manual of use, mounting bracket.	Ambient Illumination (Receiver Side)		Lighting collecting surface illumination incandescent lamp: less than 3000lx, sunlight: less than 11000lx						
Insulation Resistance  Above 20m (DC500V megabit meter)  Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  IEC standard IP67  Connection Mode  Lead out type (standard conductor 2m)  Weight (Packing State)  About 215g  About 146g  ABS  Shell  Case  ABS  PDM  Cable  2m PVC cable cable bend radius : R18	Ambient Temperature Range		Working: $-25\sim55$ °C / Storing: $-40\sim70$ °C (no freeze, no dew)						
Withstand Voltage  AC1,500V 50/60Hz 1min between the whole charging part and the shell  Vibration (Durability)  10~55Hz up and down amplitudes is 1.5mm, 2 hours in X, Y, Z directions  Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  IEC standard IP67  Connection Mode  Lead out type (standard conductor 2m)  Weight (Packing State)  About 215g  About 146g  ABS  Shell  Case  ABS  PDM  Cable  2m PVC cable cable bend radius : R18	Ambient I	Humidity Range	Working: 35~85%RH / Storing: 35~95%RH (no dew)						
Vibration (Durability)  Impact (Durability)  Impact (Durability)  Impact (Durability)  IP Grade  IEC standard IP67  Connection Mode  Lead out type (standard conductor 2m)  Weight (Packing State)  About 215g  About 146g  About 132g  About 132g  ABS  Shell  Shell  Display Window  Cable  Display Window  Cable  Appared of use mounting bracket.  Manual of use, mounting bracket.  Manual of use, mounting bracket.	Insulation Resistance		Above 20m (DC500V megabit meter)						
Impact (Durability)  300m/s² 3 times in X, Y, Z directions  IP Grade  Connection Mode  Connection Mode  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  Shell  Cable  Cable  2m PVC cable cable bend radius : R18	Withsta	and Voltage	AC1,500V 50/60Hz 1min between the whole charging part and the shell						
IP Grade  Connection Mode  Lead out type (standard conductor 2m)  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  Shell  Case  Shell  Case  ABS  PDM  Cable  2m PVC cable cable bend radius : R18  Manual of use, mounting bracket.  Manual of use, mounting bracket.	Vibration (Durability)		$10{\sim}55 Hz$ up and down amplitudes is 1.5mm, 2 hours in X、Y、Z directions						
Connection Mode  Weight (Packing State)  About 215g  About 146g  About 132g  ABS  Shell  Case  Shell  Display Window  Cable  Cable  About 215g  About 146g  ABS  PDM  Cable  2m PVC cable cable bend radius : R18	Impact (Durability)		300m/s² 3 times in X、Y、Z directions						
Weight (Packing State)  About 215g  About 146g  ABS  Shell  Case  Shell  Display Window  Cable  About 215g  About 146g  ABS  PDM  Cable  2m PVC cable cable bend radius : R18  Manual of use, mounting bracket, Manual of use,	IP Grade		IEC standard IP67						
Shell Case Shell Display Window Cable 2m PVC cable cable bend radius : R18  And the state of the mounting bracket, Manual of use, mounting bracket, Manual of use mounting bracket, Manual of use mounting bracket.	Connection Mode		Lead out type (standard conductor 2m)						
Shell Display Window  Cable 2m PVC cable cable bend radius : R18  Manual of use, mounting bracket, Manual of use, mounting bracket, Manual of use, mounting bracket, Manual of use mounting bracket.	Weight (I	Packing State)	Abou	t 215g	About 146g		About 132g		
Cable 2m PVC cable cable bend radius: R18  And the control of the mounting bracket, Manual of the mounting bracket, Manual of the mounting bracket.	Shell <sub>D</sub>								
Manual of use mounting bracket, Manual of use, mounting bracket,		Lens / Display Window	PDM						
Attachment Manual of use, mounting bracket Manual of use, mounting bracket, reflective plate Manual of use, mounting bracket		Cable							
	Atta	achment	Manual of use, r	nounting bracket	Manual of use, mounting brack reflective plate	et, Manua	l of use, mounting	g bracket	

# **CPK Control Output Diagram**

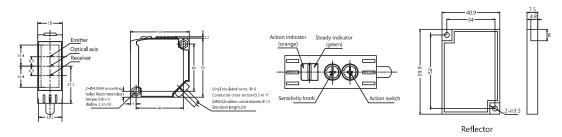




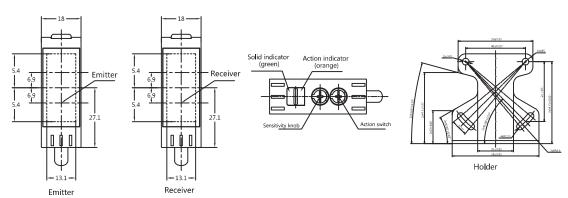


## **CPK Outline Dimensional Diagram**

• CPK-RMR6MR3 / CPK-DR300R3/ CPK-DR1MR3/ CPK-DR2.5MR3



• CPK-TR





## **Industry Application Case**

Our products are widely used in packaging machinery, transportation equipment, textile machinery, semiconductor, printing machinery, pharmaceutical machinery, logistics industry, medical devices, elevators and so on.

