

Series of Photoelectric Sensors

Overview

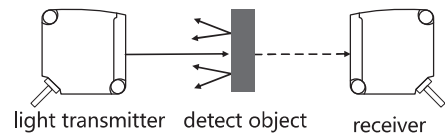
Photoelectric sensor is a sensor which uses photoelectric element as detection element. It first converts the measured change into the change of optical signal, and then further converts the optical signal into electrical signal with the help of photoelectric element. Photoelectric sensor is generally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

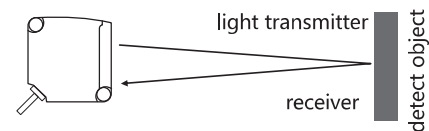
① Through Beam Photoelectric Sensor

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

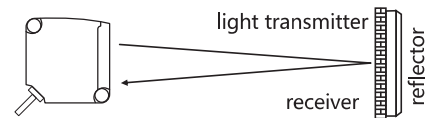
The light transmitter and receiver are photoelectric sensor. The light transmitter sends out light to the detecting object, after the detected object is reflected to the receiver, the light intensity of the reflected light is recognized and detected and the output of the object is detected.



③ Mirror Reflection Photoelectric Sensor

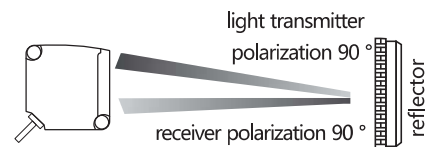
Mirror Reflection Photoelectric Sensor

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.



④ **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)

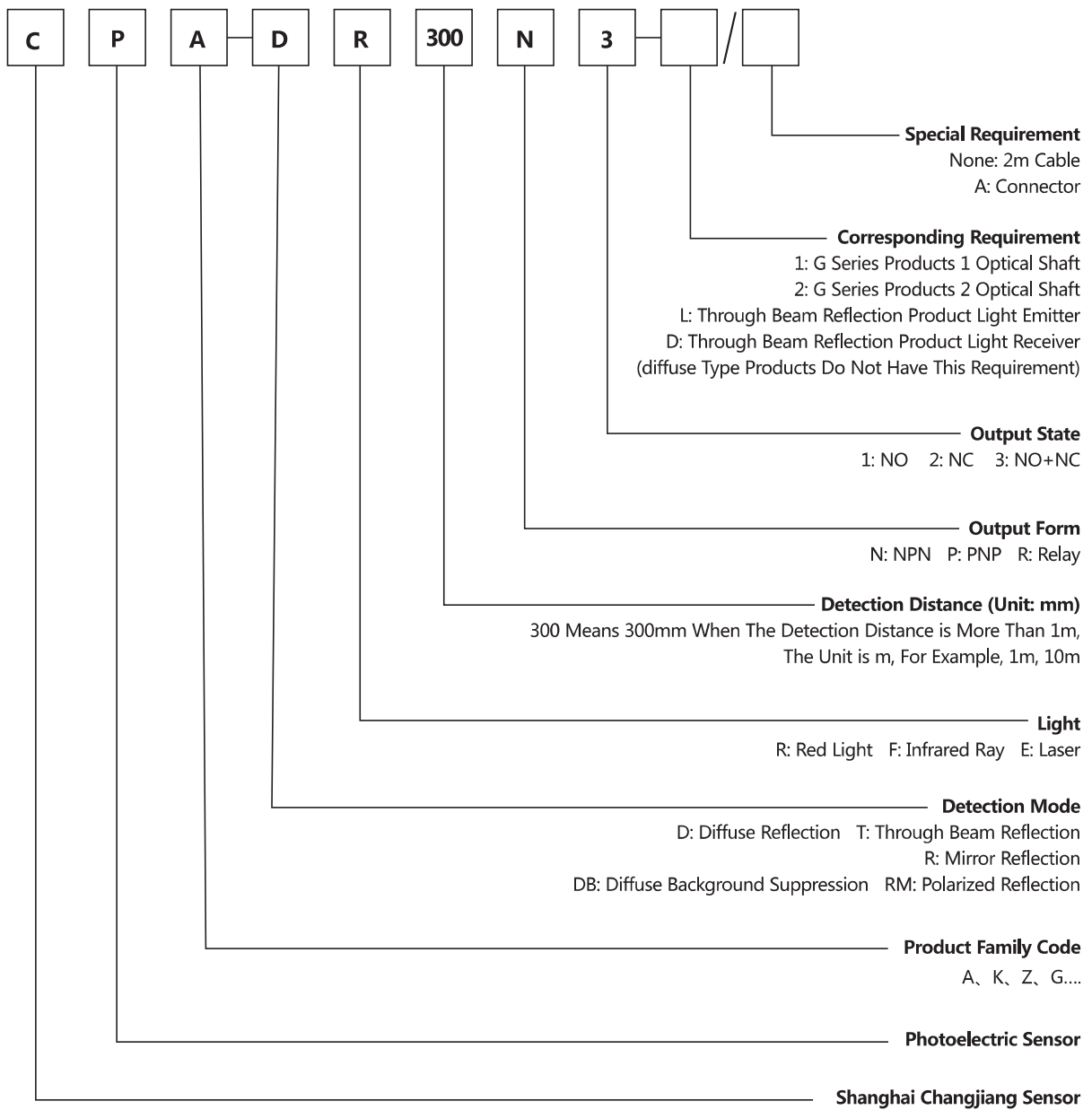
The light emitted from the light emitter, the output of the receiver when it doesn't receive light, (between the light transmitter and the receiver between the detection of objects) in the ON mode.

▶ 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.

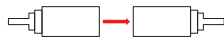





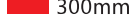

Series of Photoelectric Sensor

Model Naming



CPA Cylindrical Photoelectric Sensor

Red Light 

Detection Mode	Simple Graph	Detection Distance	Connection Mode	Output Form	Model
Through Beam Reflection		 20m	Formed Cable	NPN	CPA-TR20MN3 2M Emitter:CPA-TR20MN3-L 2M Receiver:CPA-TR20MN3-D 2M
				PNP	CPA-TR20MP3 2M Emitter:CPA-TR20MP3-L 2M Receiver:CPA-TR20MP3-D 2M
			M12 Connector	NPN	CPA-TR20MN3-A Emitter:CPA-TR20MN3-L/A Receiver:CPA-TR20MN3-D/A
				PNP	CPA-TR20MP3-A Emitter:CPA-TR20MP3-L/A Receiver:CPA-TR20MP3-D/A
Polarized Reflection		 0.1~4m	Formed Cable	NPN	CPA-RMR4MN3
				PNP	CPA-RMR4MP3
			M12 Connector	NPN	CPA-RMR4MN3-A
				PNP	CPA-RMR4MP3-A
Diffuse Reflection		 100mm	Formed Cable	NPN	CPA-DR100N3
				PNP	CPA-DR100P3
		M12 Connector	NPN	CPA-DR100N3-A	
			PNP	CPA-DR100P3-A	
		 300mm	Formed Cable	NPN	CPA-DR300N3
				PNP	CPA-DR300P3
		M12 Connector	NPN	CPA-DR300N3-A	
			PNP	CPA-DR300P3-A	
		 1m	M12 Connector	NPN	CPA-DR1MN3
				PNP	CPA-DR1MP3
M12 Connector	NPN		CPA-DR1MN3-A		
	PNP		CPA-DR1MP3-A		

CPA Cylindrical (Ø 18 mm) Photoelectric Sensor

- ▶ Long detection distance, through beam reflection up to 20m, diffuse reflection up to 1m;
- ▶ Fast response time: 0.5ms;
- ▶ Adopt advanced visible red light technology;
- ▶ Action mode Dark ON/Light ON switches freely;
- ▶ Strong anti-interference ability
- ▶ Stable and reliable performance, good consistency, high cost performance.



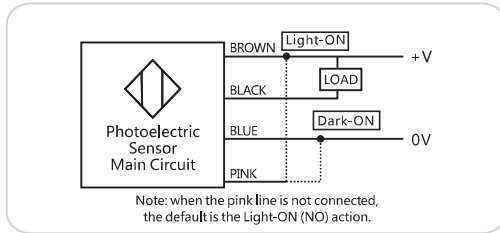
Specification

Sensor Type		Through Beam Reflection	Polarized Reflection	Diffuse Reflection			
Type	NPN output	Cable	CPA-TR20MN3	CPA-RMR4MN3	CPA-DR100N3	CPA-DR300N3	CPA-DR1MN3
	NPN output	Connector	CPA-TR20MN3-A	CPA-RMR4MN3-A	CPA-DR100N3-A	CPA-DR300N3-A	CPA-DR1MN3-A
	PNP output	Cable	CPA-TR20MP3	CPA-RMR4MP3	CPA-DR100P3	CPA-DR300P3	CPA-DR1MP3
	PNP output	Connector	CPA-TR20MP3-A	CPA-RMR4MP3-A	CPA-DR100P3-A	CPA-DR300P3-A	CPA-DR1MP3-A
Detection Distance		20m	0.1~4m	100mm	300mm	1m	
Spot Diameter (Reference Value)		-		40×45mm	40×50mm	120×150mm	
Standard Object Detection		Opaque objects above φ 7mm	opaque objects above φ 75mm	White drawing paper : 300×300mm			
Angle of Direction		Min 2°		-			
Light Source (Wavelength)		Red emitting diode(617nm)					
Supply Voltage		DC12~24V ripple (P-P) less than 10% (DC10~30V)					
Consumed Current		Below 40mA (emitter 25mA Below, under receiver 15mA)		Less than 25mA			
Control Output		NPN/PNP (collector open-circuit output) load current less than 100mA (residual voltage less than 3V), load supply voltage less than 30V					
Action Mode		Dark ON / Light ON select by wire connection					
Indicator		Action indicator (orange)					
		Stable indicator (green)					
		Power indicator (green): through beam emitter only					
Protection Circuit		Power supply reverse connection protection, surge absorption, load short circuit protection					
Response Time		0.5ms	1ms (in 0.5ms in upgrading)				
Sensitivity Adjustment		Single knob					
Ambient Illumination (Receiver Side)		Lighting collecting surface illumination incandescent lamp: less than 3000lx, sunlight: less than 10000lx					
Ambient Temperature Range		Working: -25 ~ 55 °C / Storing: -40 ~ 70 °C (no freeze, no dew)					
Ambient Humidity Range		Working: 35~85%RH/ Storing: 35~95%RH (no dew)					
Insulation Resistance		Above 20MΩ (DC500VMeg-ohmmeter)					
Withstand Voltage		AC 1,000V 50/60Hz 1min between the whole charging part and the shell					
Vibration		10~55Hz up and down amplitude is 1.5mm, 2 hours in X、 Y、 Z directions					
Impact		300m/s ² 3 times in X、 Y、 Z directions					
IP Grade		IEC standard IP67					
Weight (Packing Status / Sensors Only)	Pre-wire (2m)	Cable Weight: about 94g			Cable weight: about 50g		
	Connector	M12 connector weight: about 80g			M12 connector weight: about 55g		
Material	Case	ABS					
	Lens / Display Window	PDM					
	Knob	POM					
	Blind Nut	ABS					
Attachment		Instructions for use, M18 nuts (4)	Reflective plate, manual of use, M18 nut (2)	Instructions for use, M18 nuts (2)			

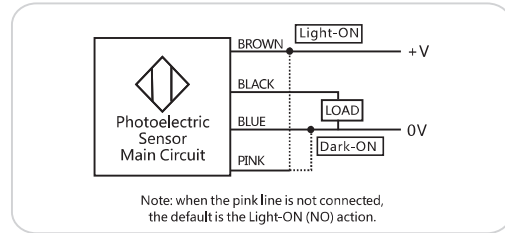
CPA Cylindrical (∅ 18 mm) Photoelectric Sensor

CPA Control Output Diagram

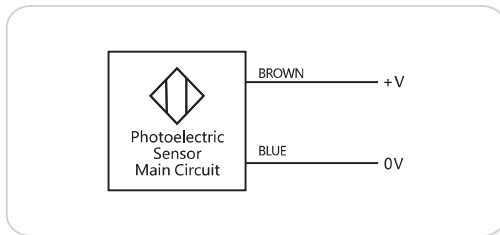
NPN Open-Collector Output



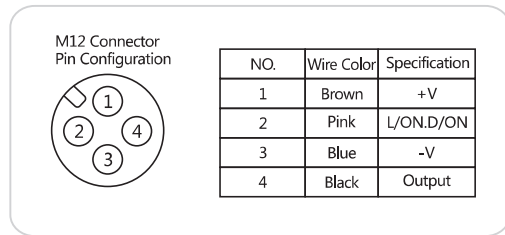
PNP Open-Collector Output



Through Beam Reflection Light Emitter

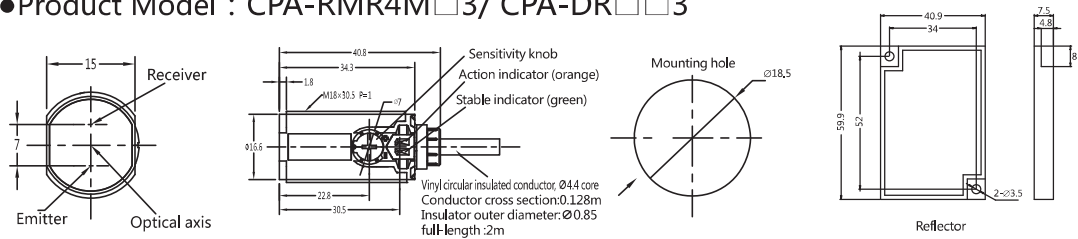


Connector Pin Configuration

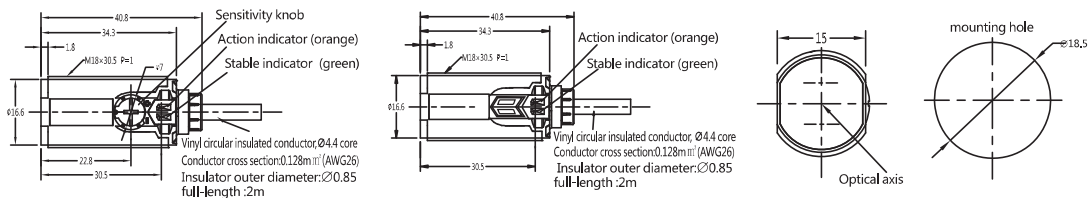


CPA Outline Dimensional Diagram

- Product Model : CPA-RMR4M□3/ CPA-DR□□3



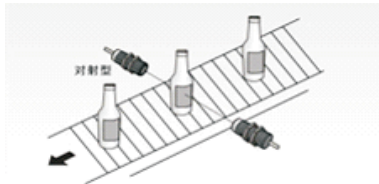
- Product Model : CPA-TR20M□3



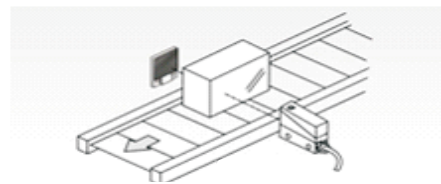
Industry Application Case

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.

Check the label on the empty glass bottle



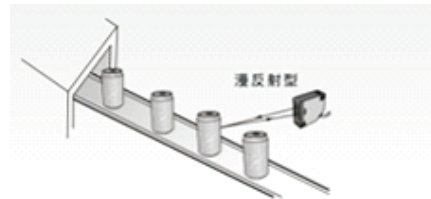
Object detection whether or not



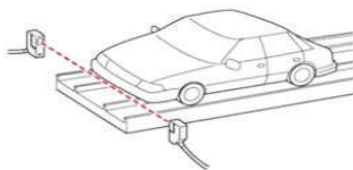
Check whether there is any cardboard



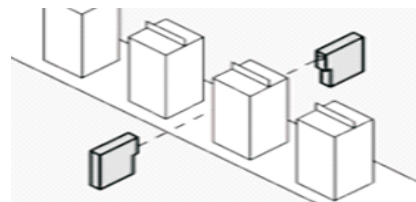
Check for bottles on the conveyor belt



Check if a car has passed



Test milk carton



Transmission line detection



Detect whether the object is straightened

