

INNOVATIVE TECHNOLOGY

NI SENSORE[®]

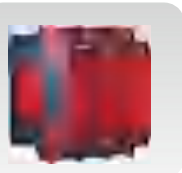
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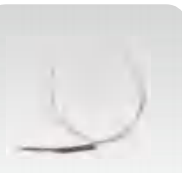
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Company Profile

BINGGO Automation's technological foundation is rooted in its sister company, **NIPPON KODO TECHNOLOGY AUTOMATION CO., LIMITED.** (Est. 1997). For over 25 years, **NIPPON KODO** has been a cornerstone of the bearings and linear motion industry. Its flagship brand, **NIKO**, synonymous with "Precision Engineered to Last," supplies **high-qualities of linear guides, pinions/racks, shafts, ball screws and bearings** to clients worldwide in heavy machinery, automotive assembly, and industrial robotics.

In 2018, to address Industry 4.0 demands for agility and customization, the Group launched its **Dual-Brand Strategy**:

- **NIPPON KODO** (via **NIKO**) continues to refine standardized components, optimizing global supply chains for cost-efficiency and durability.
- **BINGGO Automation** (via **NiSENSORE**) focuses on high-tech customization, pushing boundaries with digital twin modeling and rapid prototyping.

United by 25+ years of engineering expertise, the two brands form a synergistic ecosystem: **NIKO powers industrial foundations, while NiSENSORE drives intelligent innovation**, delivering seamless solutions for both legacy industries and emerging technological challenges.



High-Tech Precision, Customized for Innovation (BINGGO)

- Cutting-edge stainless steel linear guides & smart sensors
- Using digital platforms for facing worldwide customers
- Quick delivery for specialized industries (semiconductors, medical, aerospace and so on)



Proven Motion Solutions, Built to Last (NIPPON KODO)

- 27+ years in bearings & linear motion systems
- Standardized components for heavy-duty applications
- Global supply chain for cost-effective reliability

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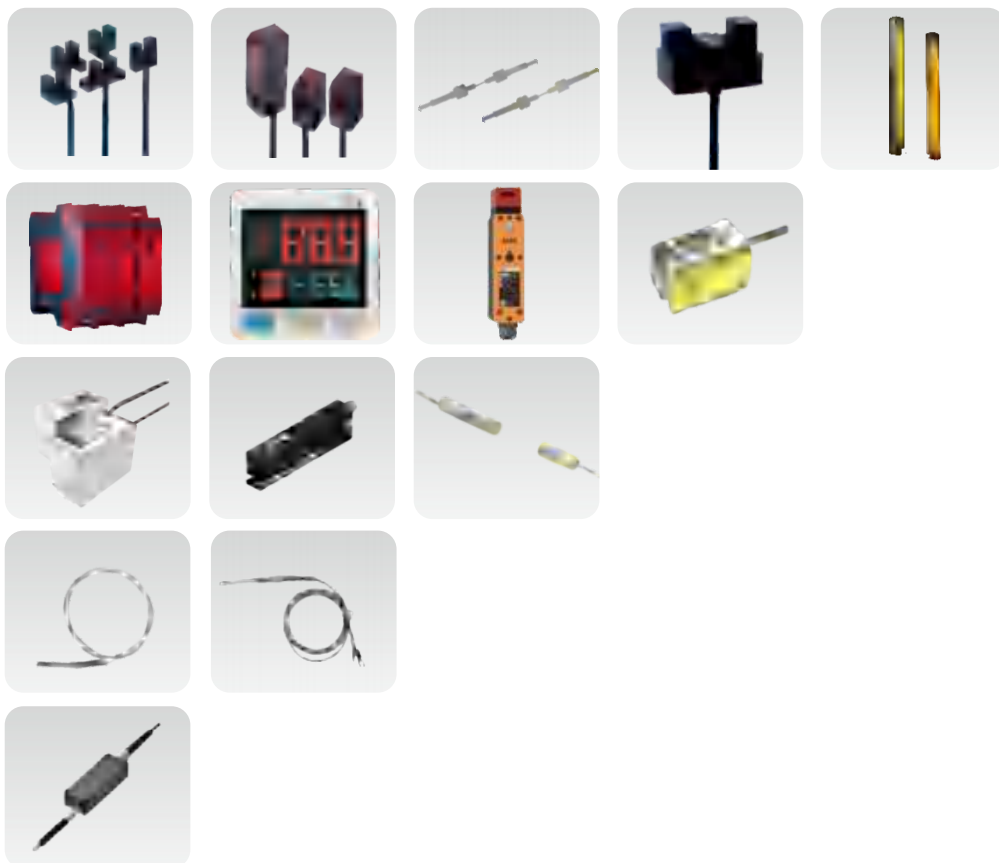
NISENSORE

Sensore di settore



Slot Sensors

Sensori a forma di slot



Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>

Slot Sensors Contents

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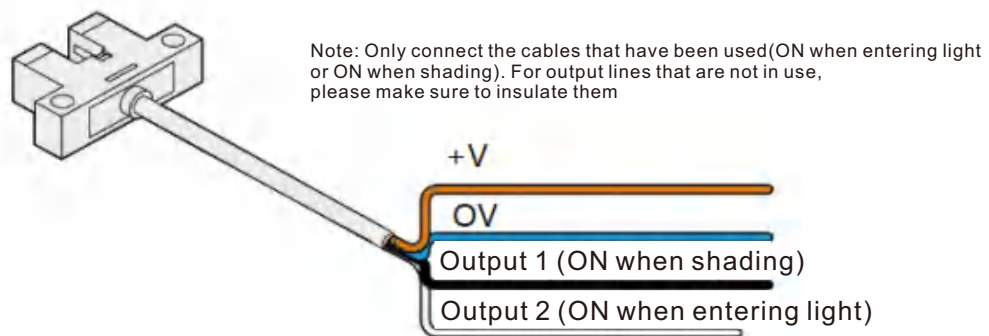
Slot Sensors

SFX 95 SERIES Subminiature



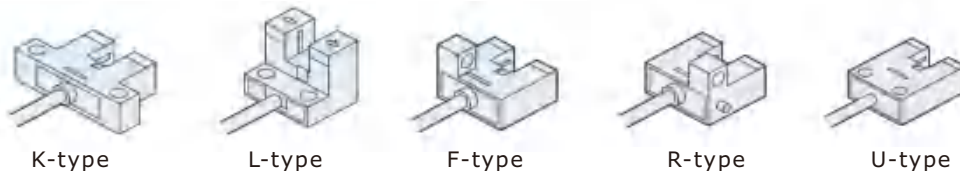
The equip has two independent outputs

All models are equipped with two independent outputs - ON when entering the light and ON when shading the light, which can cope with different output requirements according to the different places of use



Easy connection

Simple connection type eliminates all the troubles of welding, insulation treatment, and other requirements in the past, achieving fast connection, which is very simple.



Line lead out

Standard 2M flexible wire, with customizable wire length.
Optional bending resistant drag chain - GR
Optional white normally open and black normally closed - SX






Voltage range

Power supply voltage range 5~24VDC

High speed response

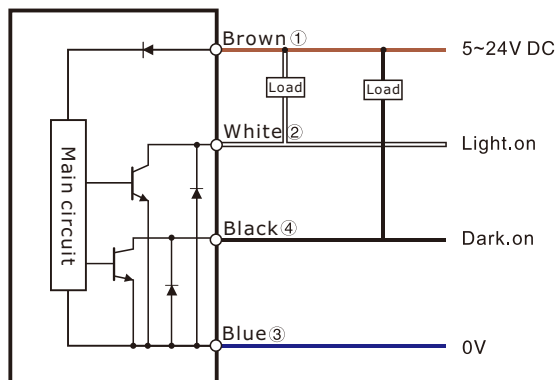
High speed response with a response frequency of 3KHZ

Product Specifications

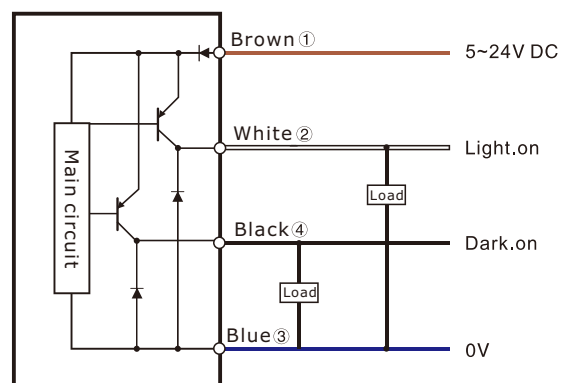
Type					
Appearance					
Type	K-type	L-type	F-type	R-type	U-type
Detection distance	5mm (slot width)				
Standard test substance	Opaque objects larger than 0.8 * 1.2mm				
Repetitive accuracy	Below 0.03mm				
Output mode	NPN or PNP collector open circuit				
Switching mode	L. On (in light action)/D.on (shading action) can be switched				
Indicator lamp	The light turns off when an object is detected, and on when there is no object				
Response frequency	3KHz				
Illuminant	Infrared light				
Working voltage	5~24V DC				
Residual voltage	Below 1V (when the load current is 100mA)				
Consumption current	≤8mA				
Protection circuit	Surge protection				
Environmental luminosity	Illumination on the receiving surface, incandescent lamp: below 1000lux				
Ambient temperature	Working hours: -25°C~+55°C Storage hours: -30°C~+80°C, no freezing				
Ambient humidity	Working hours: 5%~85%RH Storage hours: 5%~95%RH, no freezing				
Voltage withstand	AC, 1000V1 minute, between all power connection terminals and the casing				
Vibration resistance	Frequency 10Hz~2000Hz Dual amplitude 1.5mm (maximum acceleration 196m/s ²) XYZ for 2 hours in all directions				
Insulation resistance	Between all power connection terminals and the casing, 20M Ω or more (based on DC250V)				
Protection level	IP 50				
Material	ABS+PC				
Entry cable	2M4 core cable				
Model NPN	SFX950-WR	SFX951-WR	SFX952-WR	SFX953-WR	SFX954-WR
Model PNP	SFX950P-WR	SFX951P-WR	SFX952P-WR	SFX953P-WR	SFX954P-WR

Circuit

DC 4-wire NPN output

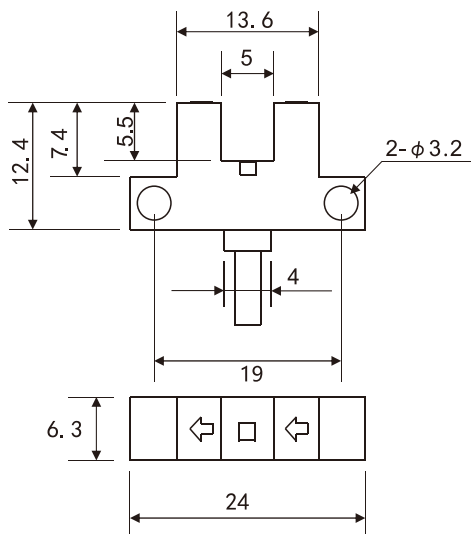


DC 4-wire NPN output

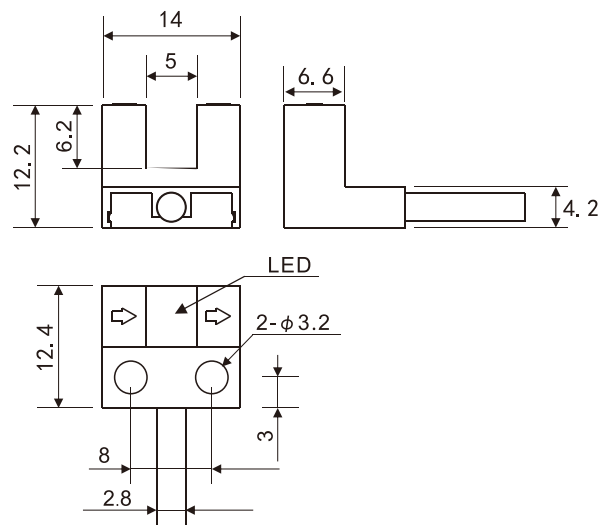


Outline dimension drawing (unit: mm)

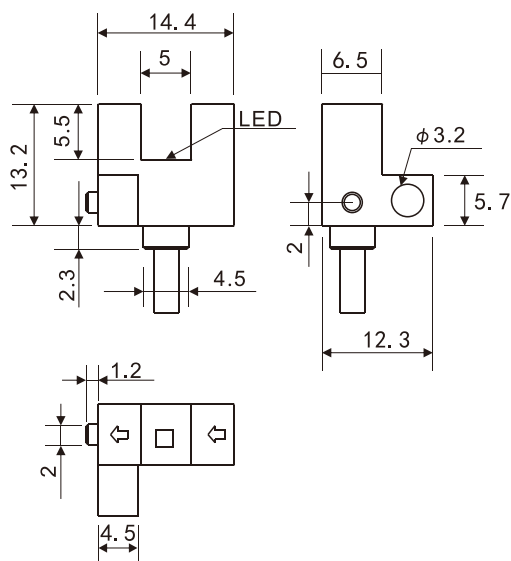
SFX950-WR



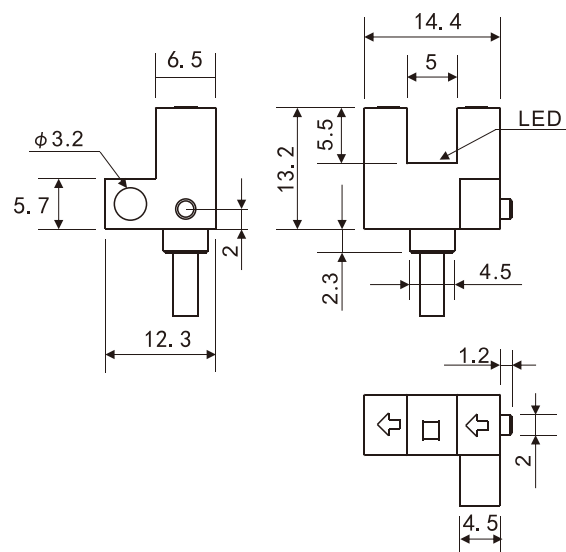
SFX951-WR



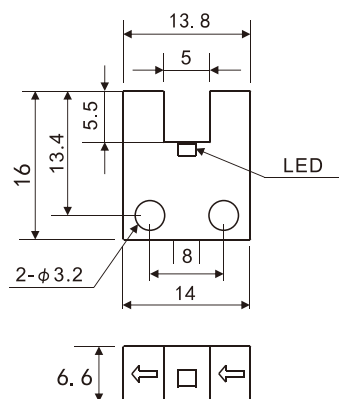
SFX952-WR



SFX953-WR



SFX954-WR



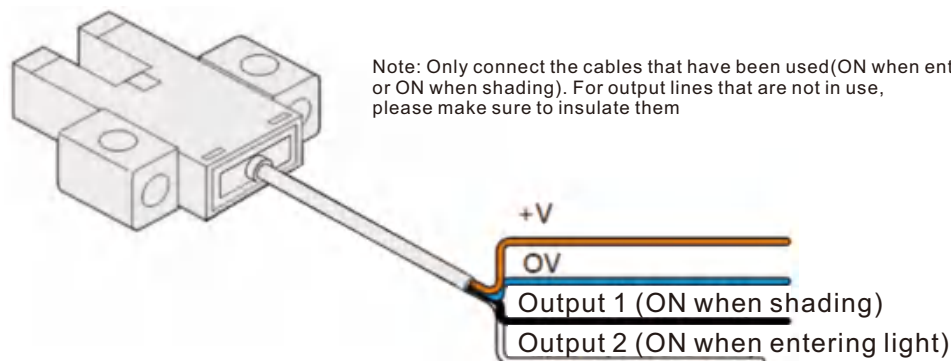
Slot Sensors

SFX 45 SERIES Compact



The equip has two independent outputs

All models are equipped with two independent outputs - ON when entering the light and ON when shading the light, which can cope with different output requirements according to the different places of use



Easy connection

Rich in variety, with up to 6 shapes, you can choose the model that meets your installation requirements.



Line lead out

Standard 2M flexible wire, with customizable wire length.
Optional bending resistant drag chain - GR
Optional white normally open and black normally closed - SX







Voltage range

Power supply voltage range 5~24VDC

High speed response

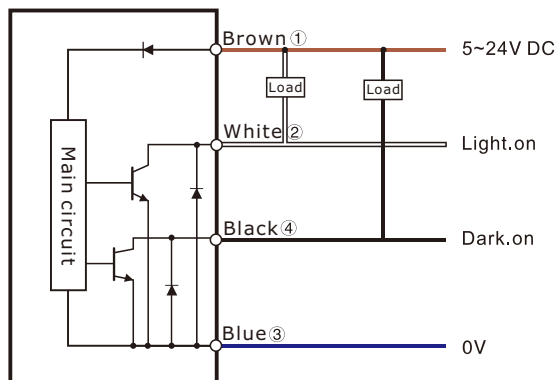
High speed response with a response frequency of 3KHZ

Product Specifications

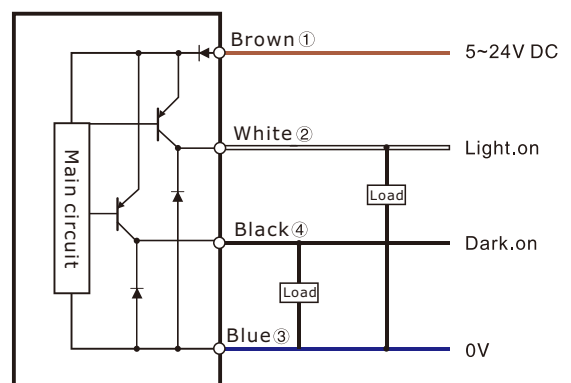
Type						
Appearance						
Type	K-type	L-type	T-type	Y-type	F-type	R-type
Detection distance	5mm (slot width)					
Standard test substance	Opaque objects larger than 0.8 * 1.2mm					
Repetitive accuracy	Below 0.03mm					
Output mode	NPN collector open circuit					
Switching mode	L. On (in light action)/D.on (shading action) can be switched					
Indicator lamp	The light turns off when an object is detected, and on when there is no object					
Response frequency	3KHz					
Illuminant	Infrared light					
Working voltage	5~24V DC					
Residual voltage	Below 1V (when the load current is 100mA)					
Consumption current	≤8mA					
Protection circuit	Surge protection					
Environmental luminosity	Illumination on the receiving surface, incandescent lamp: below 1000lux					
Ambient temperature	Working hours: -25°C~+55°C Storage hours: -30°C~+80°C, no freezing					
Ambient humidity	Working hours: 5%~85%RH Storage hours: 5%~95%RH, no freezing					
Voltage withstand	AC, 1000V1 minute, between all power connection terminals and the casing					
Vibration resistance	Frequency 10Hz~2000Hz Dual amplitude 1.5mm (maximum acceleration 196m/s2) XYZ for 2 hours in all directions					
Insulation resistance	Between all power connection terminals and the casing, 20M Ω or more (based on DC250V)					
Protection level	IP 50					
Material	ABS+PC					
Entry cable	2M4 core cable					
Model NPN	SFXK45	SFXL45	SFXT45	SFXY45	SFXF45	SFXR45
Model PNP	SFXK45P	SFXL45P	SFXT45P	SFXY45P	SFXF45P	SFXR45P

Circuit

DC 4-wire NPN output

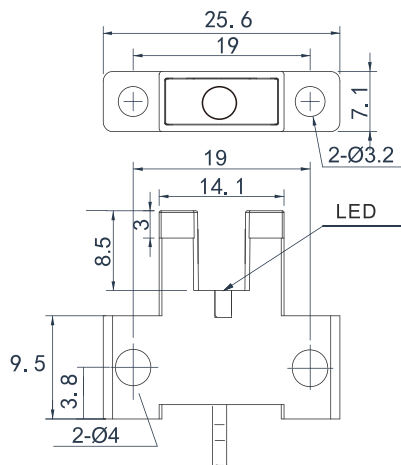


DC 4-wire NPN output

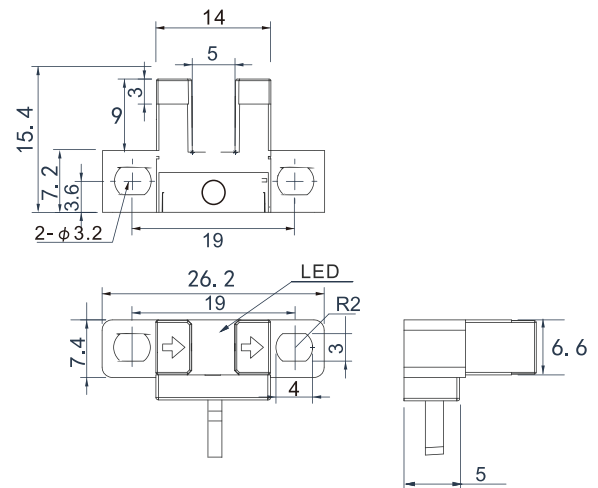


Outline dimension drawing (unit: mm)

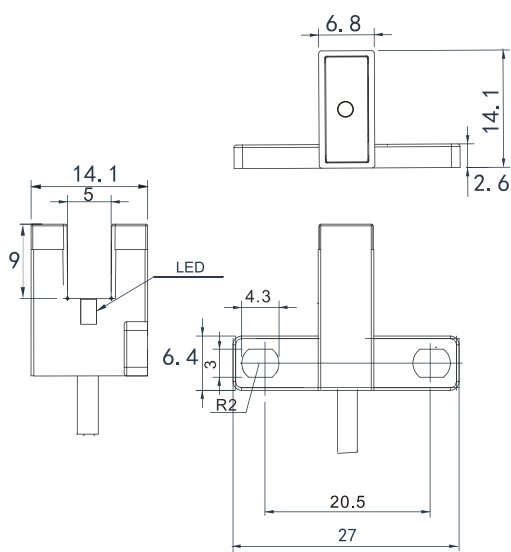
SFXK45



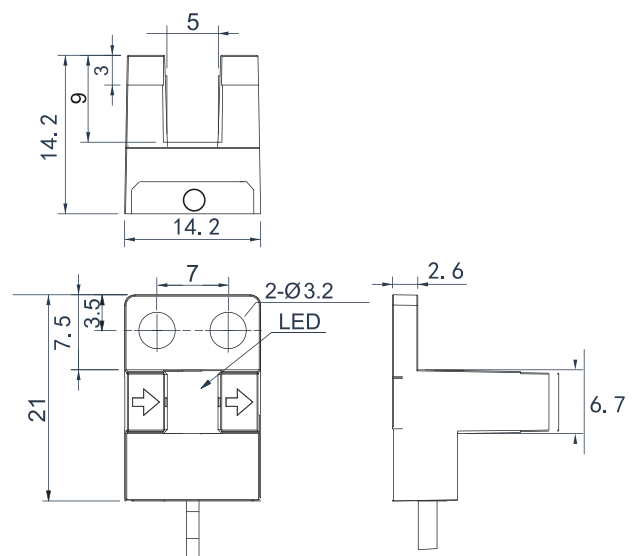
SFXL45



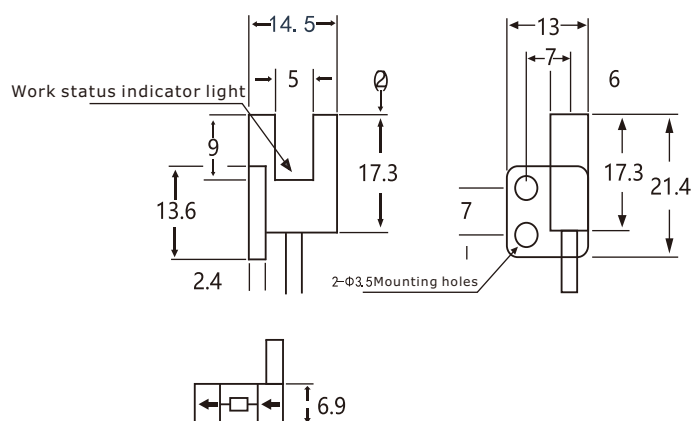
SFXT45



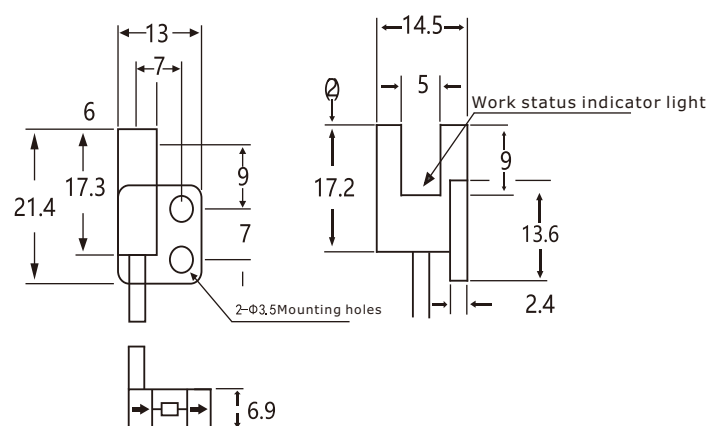
SFXY45



SFXF45



SFXR45

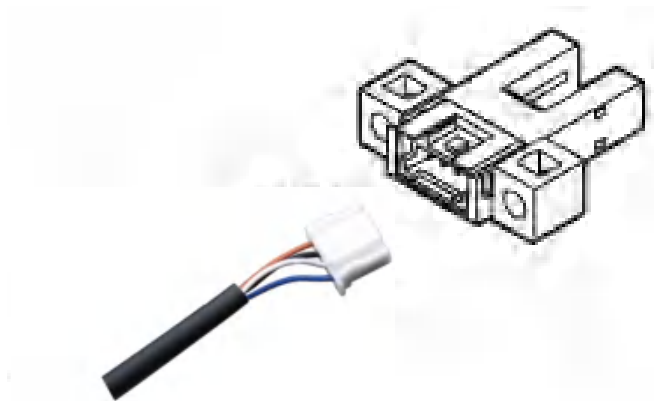


Slot Sensors

SP 65 SERIES Plug-in type



Comes with connector cables



Multiple models

Rich in variety, with up to 6 shapes, you can choose the model that meets your installation requirements.



K-type



T-type



L-type



Y-type

Line lead out

Optional UX1008 connection cable
Optional UX1008-GR high flexible cable







Voltage range

Power supply voltage range 5~24VDC

High speed response

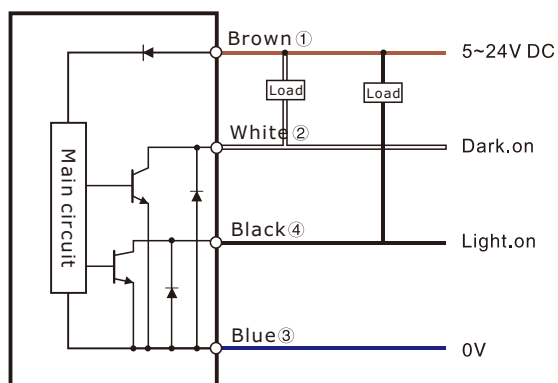
High speed response with a response frequency of 3KHZ

Product Specifications

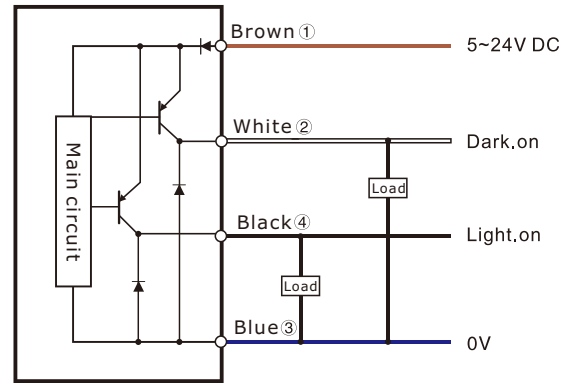
Type						
Appearance						
Type	K-type	L-type	T-type	Y-type	F-type	R-type
Detection distance	5mm (slot width)					
Standard test substance	Opaque objects larger than 0.8 * 1.2mm					
Repetitive accuracy	Below 0.03mm					
Output mode	NPN collector open circuit					
Switching mode	L. On (in light action)/D.on (shading action) can be switched					
Indicator lamp	Orange LED (lights up when illuminated)					
Response frequency	3KHz					
Illuminant	Infrared light					
Working voltage	5V DC~24V DC±10% pulsation P-P below 10%					
Residual voltage	Below 1V (when the load current is 100mA)					
Consumption current	≤8mA					
Protective structure	IP50(IEC)					
Environmental luminosity	Illumination on the receiving surface, incandescent lamp: below 1000lux					
Ambient temperature	-25℃~+55℃ (note not to condense or freeze), during storage: -30℃~+80℃					
Ambient humidity	5%RH~85%RH Storage hours: 5%RH~95%RH					
Voltage withstand	AC, 1000V1 minute, between all power connection terminals and the casing					
Vibration resistance	Frequency 10Hz~2000Hz Dual amplitude 1.5mm (maximum acceleration 196m/s2) XYZ for 2 hours in all directions					
Insulation resistance	Between all power connection terminals and the casing, with a resistance of over 20M Ω, based on a DC250V high resistance meter					
Protection level	IP 50(IEC)					
Material	ABS+PC					
Entry cable	Connector					
Model NPN	SFXK65	SFXL65	SFXT65	SFXY65	SFXF65	SFXR65
Model PNP	SFXK65P	SFXL65P	SFXT65P	SFXY65P	SFXF65P	SFXR65P

Circuit

DC 4-wire NPN output

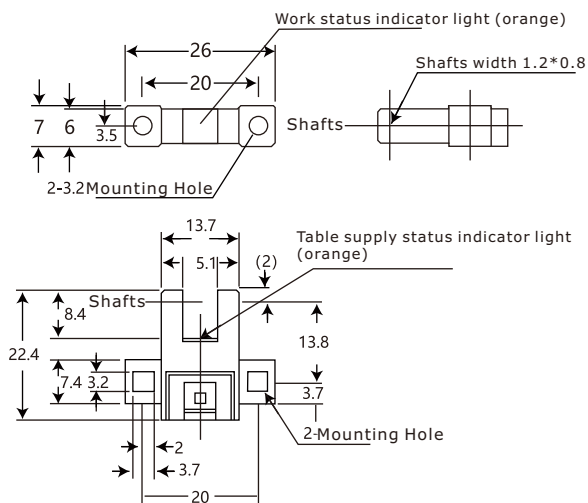


DC 4-wire PNP output

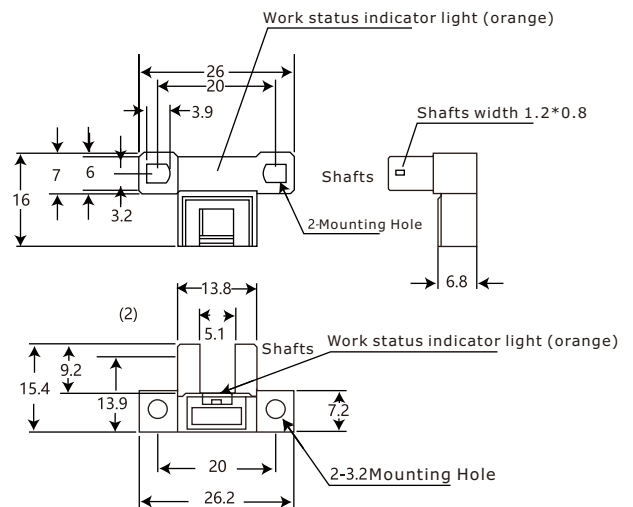


Outline dimension drawing (unit: mm)

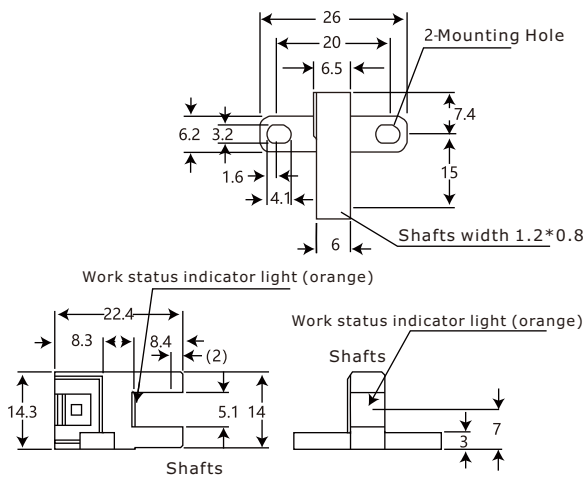
SFXK65



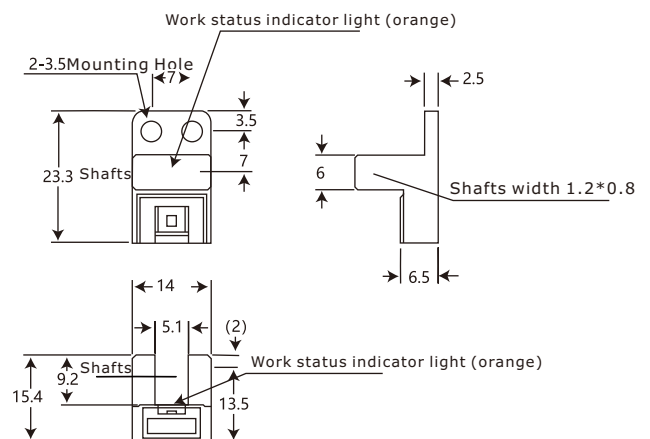
SFXL65



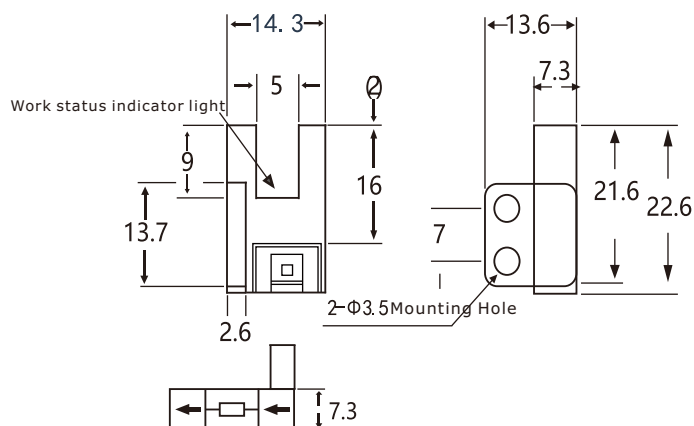
SFXT65



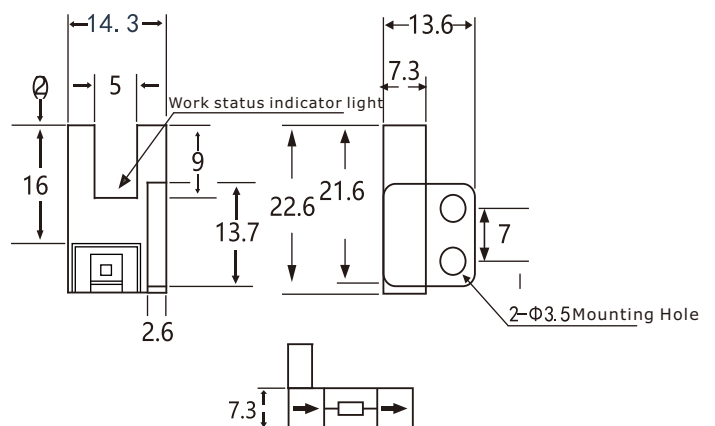
SFXY65



SFXF65



SFXR65



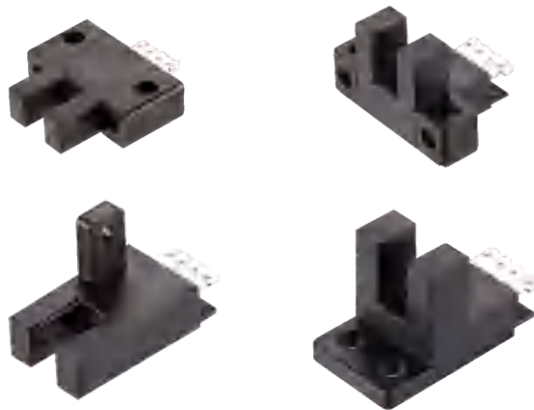
Accessory

UX 1008 (default 2m, available for sale in 1m, 3m, 5m, 7m, 10m)

Slot Sensors

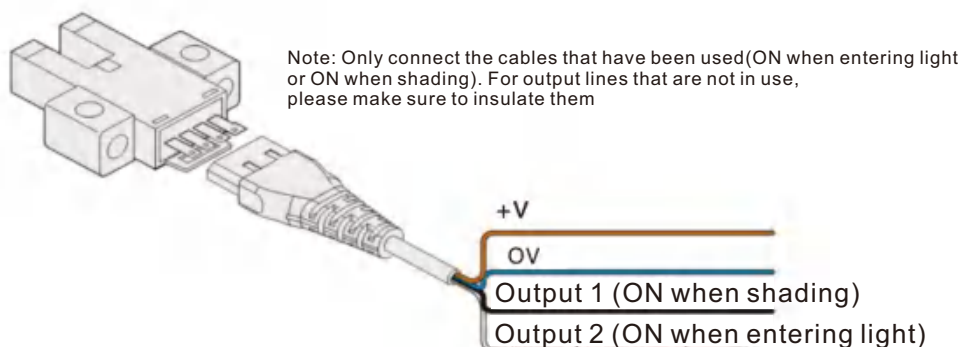
SFX 67 SERIES

Plug-in type



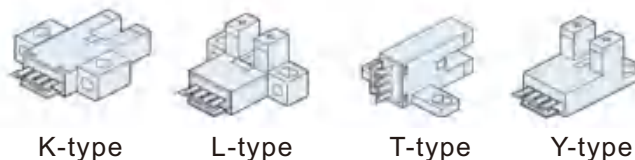
The equip has two independent outputs

All models are equipped with two independent outputs - ON when entering the light and ON when shading the light, which can cope with different output requirements according to the different places of use



Multiple models

Rich in variety, with up to 4 different shapes, you can choose the model that meets your installation requirements.



Easy connection





Simple connection type eliminates all the hassle of implementing tin welding, insulation treatment, and other requirements in the past, achieving fast connection, which is very simple. Product selection with black output and pink switching - QH

High speed response

High speed response with a response frequency of 3KHZ

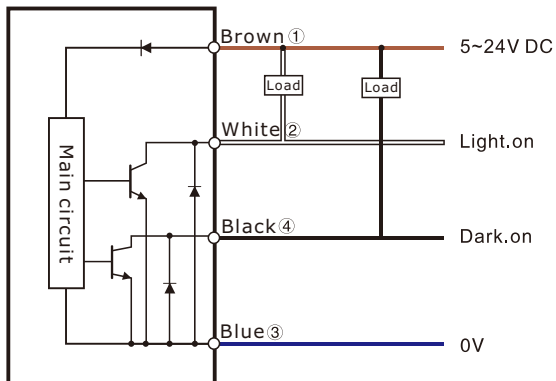


Product Specifications

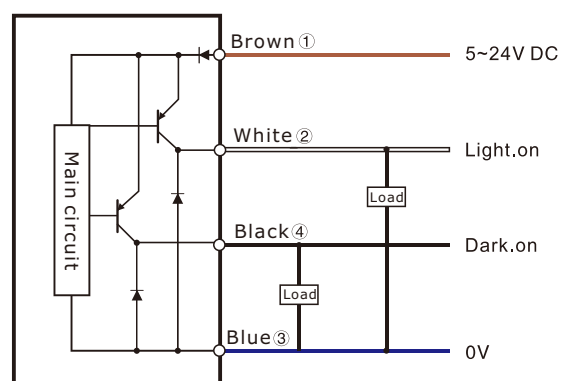
Type				
Appearance				
Type	K-type	L-type	T-type	Y-type
Detection distance	5mm (slot width)			
Standard test substance	Opaque objects larger than 0.8 * 1.2mm			
Repetitive accuracy	Below 0.03mm			
Output mode	NPN collector open circuit			
Switching mode	L. On (in light action)/D.on (shading action) can be switched			
Indicator lamp	The light turns off when an object is detected, and on when there is no object			
Response frequency	3KHz			
Illuminant	Infrared light			
Working voltage	5~24V DC			
Residual voltage	Below 1V (when the load current is 100mA)			
Consumption current	≤8mA			
Protection circuit	Surge protection, reverse polarity protection			
Environmental luminosity	Illumination on the receiving surface, incandescent lamp: below 1000lux			
Ambient temperature	Working hours: -25°C~+55°C Storage hours: -30°C~+80°C, no freezing			
Ambient humidity	Working hours: 5%~85%RH Storage hours: 5%~95%RH, No condensation			
Voltage withstand	AC, 1000V1 minute, between all power connection terminals and the casing			
Vibration resistance	Frequency 10Hz~2000Hz Dual amplitude 1.5mm (maximum acceleration 196m/s ²) XYZ for 2 hours in all directions			
Insulation resistance	Between all power connection terminals and the casing, 20M Ω or more (based on DC250V)			
Protection level	IP 50			
Material	ABS+PC			
Entry cable	Connector			
Model NPN	SFX670	SFX671	SFX672	SFX674
Model PNP	SFX670P	SFX671P	SFX672P	SFX674P

Circuit

DC 4-wire NPN output

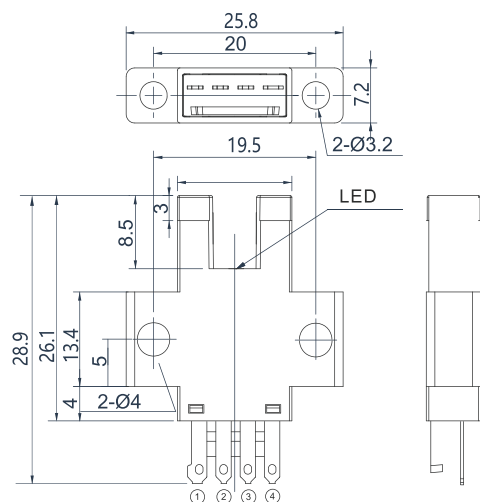


DC 4-wire PNP output

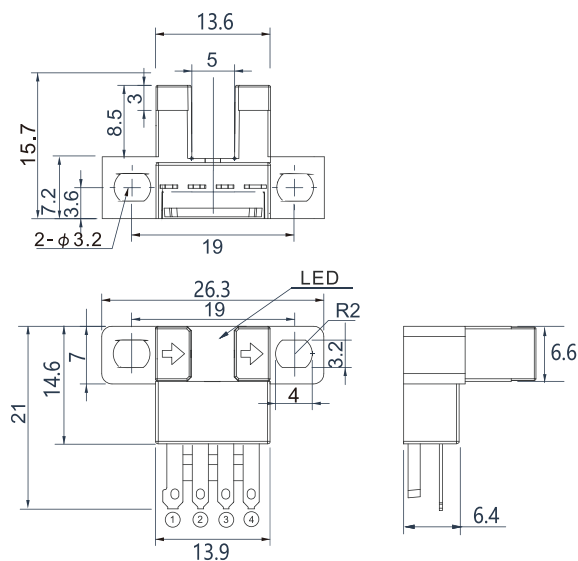


Outline dimension drawing (unit: mm)

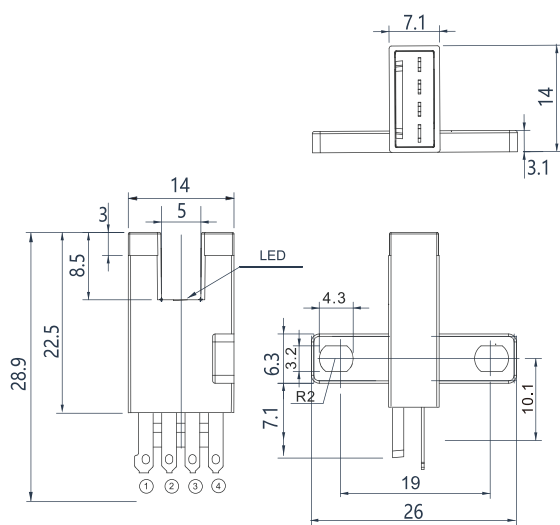
SFX670



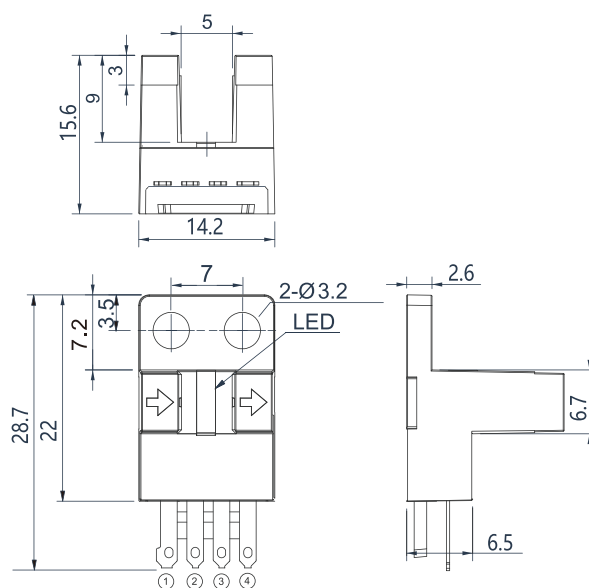
SFX671



SFX672



SFX674



Accessories

UX 1006 (default 2m, available for sale in 1m, 3m, 5m, 7m, 10m)

UX 1010 (default 2m, available for sale in 1m, 3m, 5m, 7m, 10m)

Slot Sensors

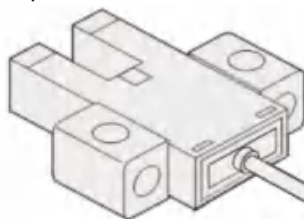
SPX 67-WR SERIES

Wire type

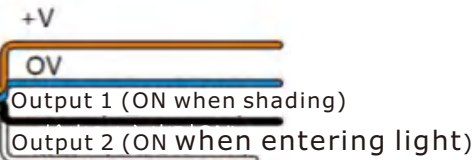


The equip has two independent outputs

All models are equipped with two independent outputs - ON when entering the light and ON when shading the light, which can cope with different output requirements according to the different places of use

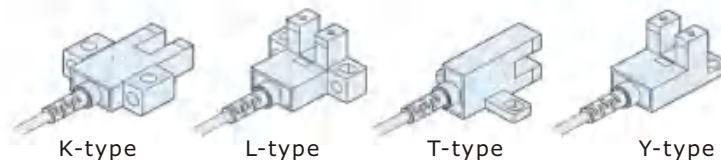


Note: Only connect the cables that have been used (ON when entering light or ON when shading). For output lines that are not in use, please make sure to insulate them



Multiple models

Rich in variety, with up to 6 shapes, you can choose the model that meets your installation requirements.



Line lead out

Standard 2M flexible wire, with customizable wire length.
Optional bending resistant drag chain - GR.
Optional white normally open and black normally closed - SX.







Voltage range

Power supply voltage range 5~24VDC

High speed response

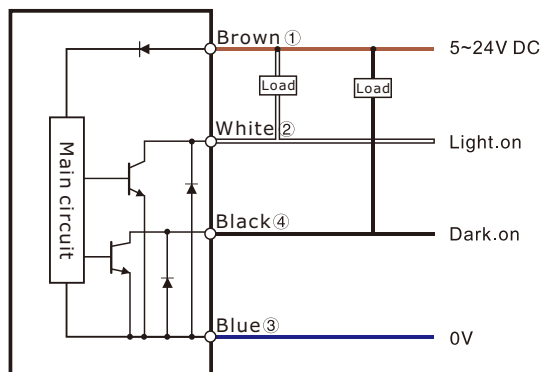
High speed response with a response frequency of 3KHZ

Product Specifications

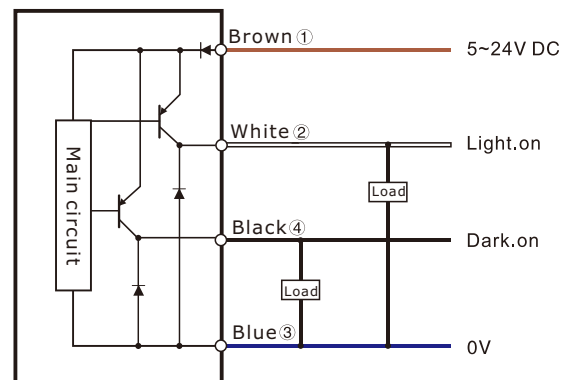
Type						
Appearance						
Type	K-type	L-type	T-type	U1-type	Y-type	T1-type
Detection distance	5mm (slot width)					
Standard test substance	Opaque objects larger than 0.8 * 1.2mm					
Repetitive accuracy	Below 0.03mm					
Output mode	NPN collector open circuit					
Switching mode	L. On (in light action)/D.on (shading action) can be switched					
Indicator lamp	The light turns off when an object is detected, and on when there is no object					
Response frequency	3KHz					
Illuminant	Infrared light					
Working voltage	5~24V DC					
Residual voltage	Below 1V (when the load current is 100mA)					
Consumption current	≤8mA					
Protection circuit	Surge protection, reverse polarity protection					
Environmental luminosity	Illumination on the receiving surface, incandescent lamp: below 1000lux					
Ambient temperature	Working hours: -25℃~+55℃ Storage hours: -30℃~+80℃, no freezing					
Ambient humidity	Working hours: 5%~85%RH Storage hours: 5%~95%RH, No condensation					
Voltage withstand	AC, 1000V1 minute, between all power connection terminals and the casing					
Vibration resistance	Frequency 10Hz~2000Hz Dual amplitude 1.5mm (maximum acceleration 196m/s2) XYZ for 2 hours in all directions					
Insulation resistance	Between all power connection terminals and the casing, 20M Ω or more (based on DC250V)					
Protection level	IP 50					
Material	PC					
Entry cable	2M4 core cable					
Model NPN	SFX670-WR	SFX671-WR	SFX672-WR	SFX673-WR	SFX674-WR	SFX675-WR
Model PNP	SFX670P-WR	SFX671P-WR	SFX672P-WR	SFX673P-WR	SFX674P-WR	SFX675P-WR

Circuit

DC 4-wire NPN output



DC 4-wire PNP output



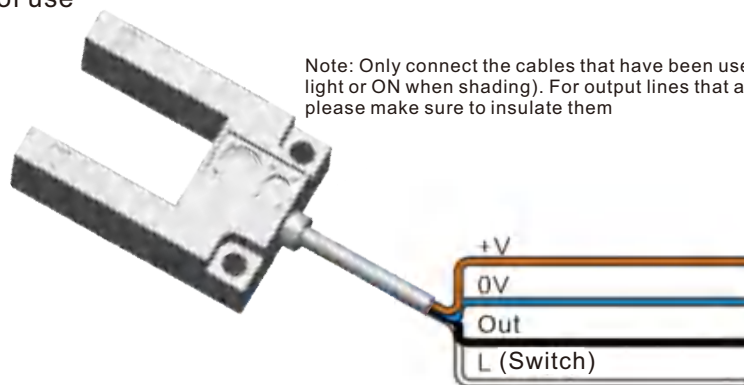
Slot Sensors

SPXG SERIES Wide groove type



The equip has two independent outputs

All models are equipped with two independent outputs - ON when entering the light and ON when shading the light, which can cope with different output requirements according to the different places of use



Note: Only connect the cables that have been used (ON when entering light or ON when shading). For output lines that are not in use, please make sure to insulate them

Strong anti-interference ability

Strong resistance to external noise interference, with a minimum detection object of 1mm, High speed response with a response frequency of 1KHz




Three types of groove width selection

The groove width is divided into two types: 15mm, 25mm, and 30mm. You can choose the model that meets your installation requirements according to your needs

Sensitivity adjustable

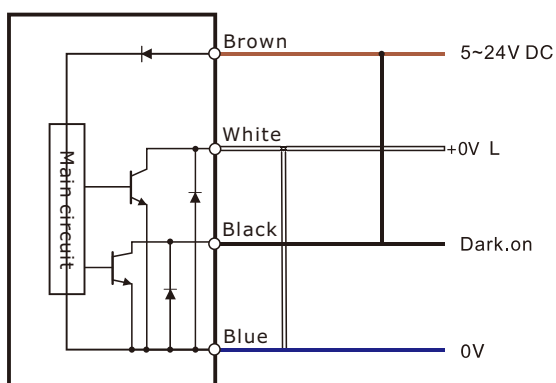
Built in single turn potentiometer, adjustable sensitivity can detect transparent film or labels above 0.1mm

Product Specifications

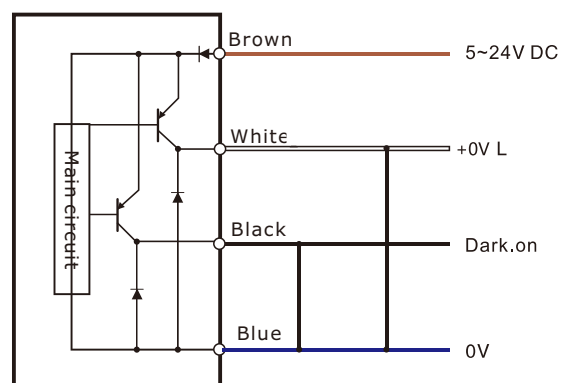
Type			
Appearance			
Type	UXG15	UXG25	UXG30
Detection distance	15mm	25mm	30mm
Standard test substance	Opaque objects with a diameter of over 1mm		
Response frequency	1KHz		
Light source (luminous wavelength)	Infrared light-emitting diode (950nm)		
Supply voltage	DC 12-24V \pm 10% pulsation (p-p) below 10%		
Consumption current	Below 40mA		
Control output	Load supply voltage DC 24 V or less, load current 80 mA or less (residual voltage 2 V or less), NPN voltage output type ON when entering light/ON when shielding from light, wire connection switching mode		
Protection circuit	Power supply reverse connection protection, output short circuit protection		
response time	Action and reset: less than 1ms each		
Sensitivity adjustment	Unidirectional rotation button		
Using ambient illumination	Illuminated surface illumination, incandescent lamp: 3000lx, daylight: 10000lx		
Ambient temperature	Operating: -25~+55°C, Storage: -40~+70°C (no icing, condensation)		
Ambient humidity	Operating: 35~85%RH, Storage: 35~95%RH (no condensation)		
Insulation resistance	20MΩ or more (DC500V megohmmeter)		
Voltage withstand	AC1,000V 50/60Hz 1min		
Vibration (durability)	10~55Hz dual amplitude 1.5mm, 2 hours in X, Y, and Z directions		
Impact (durability)	500m/s ² , 3 times in X, Y, and Z directions		
Protective structure	IEC standard Ip67		
Connection method	Lead out type (standard wire length 2m)		
Quality (after packaging)	Approx. 330g		
NPN model	SFXG15	SFXG25	SFXG30
PNP model	SFXG15P	SFXG25P	SFXG30P

Circuit

DC 4-wire NPN output

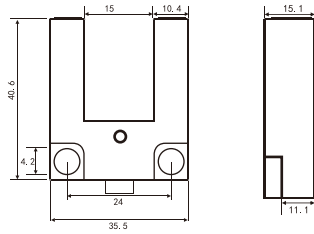


DC 4-wire PNP output

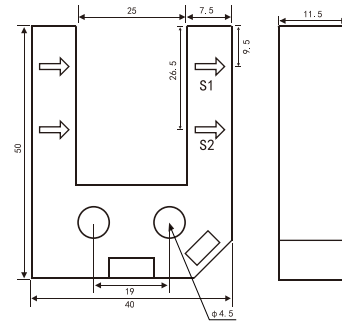


Outline dimension drawing (unit: mm)

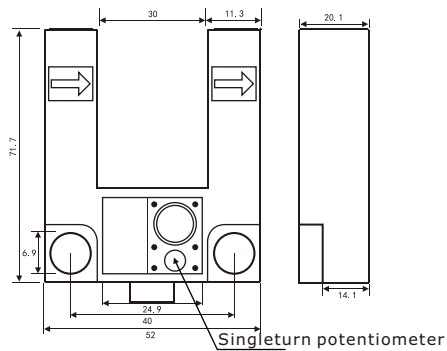
SFXG15



SFXG25 (Two optical axes and two channel outputs)



SFXG30



Sensore di settore



Photoelectric Sensors

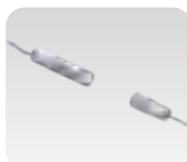
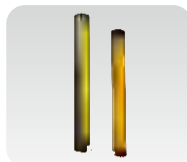
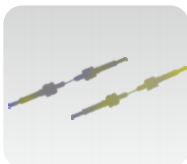
Sensori fotoelettronici

Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Photoelectric Sensors Contents

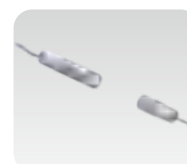
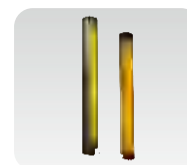
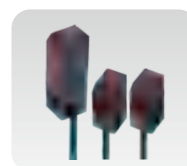
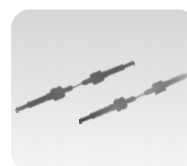
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Miniature Lasers

Small light spot, efficient detection of tiny objects.

Technical Specifications

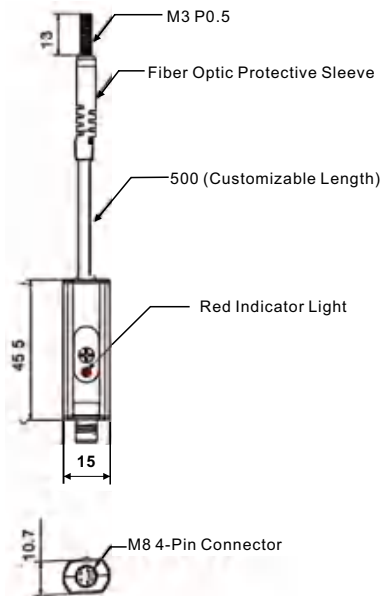
Model	PLR03-05N	PLR03-05P	PLR04-06N	PLR04-06P
Appearance				
Detection Method	Diffuse reflection, background suppression (not affected by the color of the detected object)			
Detection Distance	Adjustable from 1~50mm		Adjustable from 1~60mm	
Laser Head Diameter	M3		M4	
Beam Size	Ø 2mm			
Standard Detection Object	White standard plane			
Repeatability	<5%			
Sensitivity Adjustment	Single-knob adjustment			
Output Mode	NPN Open Collector	PNP Open Collector	NPN Open Collector	PNP Open Collector
Switching Mode	Light.on (light entry action) / Dark.on (light obstruction action) switchable			
Response Time	<500μs			
Response Frequency	700Hz			
Light Source	660nm Red Light			
Operating Voltage	DC10~30V±10%			
Residual Voltage (Drop)	<1.5V		<2.0V	
Maximum Load Current	100mA			
Consumption (No Load) Current	<12mA			
Ambient Illuminance	Incandescent light ≤3000Lux; Sunlight ≤10000Lux			
Ambient Temperature	Operating: -10°C~55°C; Storage: -25°C~70°C, no freezing			
Ambient Humidity	Operating: 35%~85%RH; Storage: 35%~95%RH, no condensation			
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection			
Protection Rating	Ip54			
Indicator Light	Red			
Connection Method	4-core, M8 connector			
Housing	ABS+PC			
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each			
Shock Resistance	300m/S². X/Y/Z directions for 3 times each			

Miniature Lasers

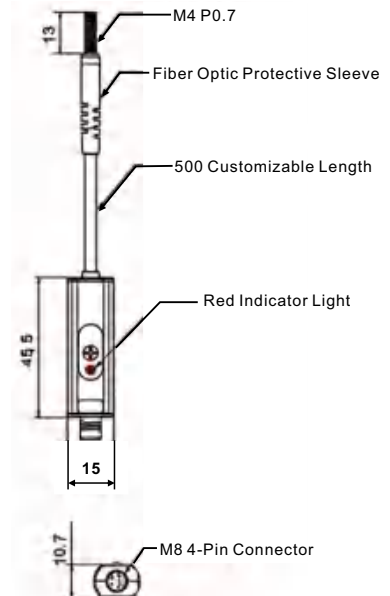
Small light spot, efficient detection of tiny objects.

Outline Dimension Drawing (Unit:mm)

[PLR03]

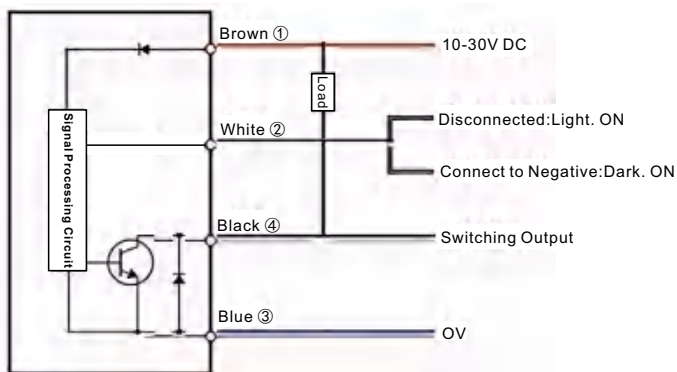


[PLR04]

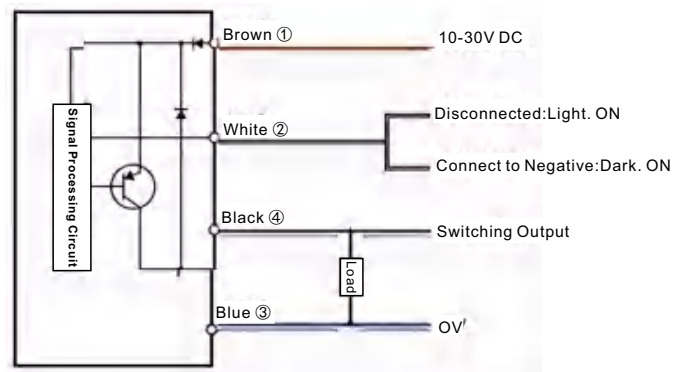


Circuit Wiring Diagram

[NPN]



[PNP]



Miniature Photoelectric Sensors

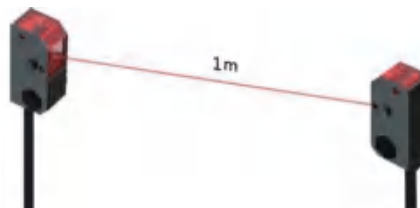
PEZ-T21 / D21



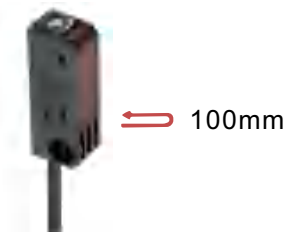
Ultra-Compact Specification

The sensor is only the size of a fingertip, ultra-small and ultra-thin, making it suitable for installation in various narrow spaces.

Opposite Emission Type



Diffuse Reflection Type



Types

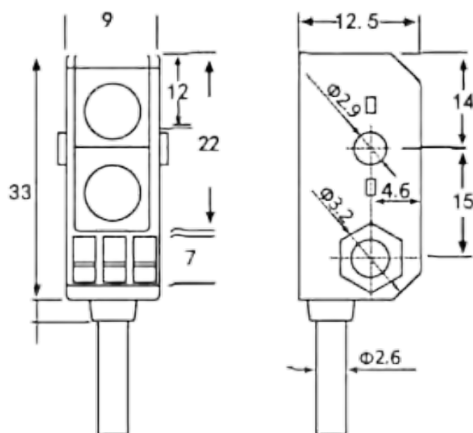
Detection Method	Shape	Type	Detection Distance	Model	
				NPN Output	PNP Output
Opposite Emission		Infrared (940nm)	1m 	PEZ-T21	PEZ-T21P
Diffuse Reflection		Infrared (940nm)	100mm 	PEZ-D21	PEZ-D21P

Product Parameters

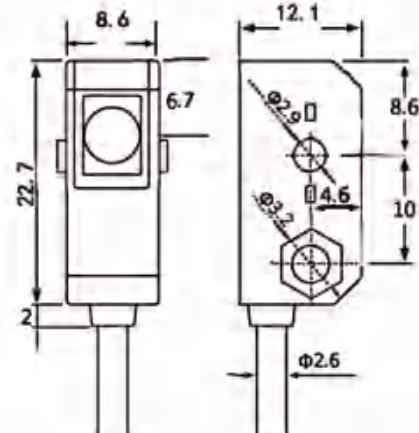
Model	NPN Output	Detection Method	Opposite Emission Type	Diffuse Reflection Type
		Cable Lead	PEZ-T21	PEZ-D21
Detection Distance		1.5m		100mm
Detection Object		Opaque object with a diameter of 4mm or more		
Contrast		More than 20% of the detection distance		
Control Output		Simultaneously matches two independent outputs / NPN/PNP transistor collector output		
Response Frequency		Less than 1ms		
Power Supply Voltage		DC12-24V ripple (p-p) 10% or less (DC10-30V)		
Consumption Current		≤25mA		
Control Output	Switching Capacity	≤3W		
	Residual Voltage	Less than 1V (load current 100mA)		
Circuit Protection		Surge protection, short-circuit protection, reverse polarity protection		
Light Source		Infrared modulated light		
Indicator Light		Action indicator light (red)		
Ambient Temperature		Operating: -25°C to +70°C (no icing, no dew) Storage: -40°C to +85°C (no icing, no dew)		
Effect of Ambient Illumination		Daylight: below 10000LX Incandescent: below 3000LX		
Operating Environment Humidity		Operating: 45%-85% (no icing) RH Storage: 35%-85% (no icing) RH		
Effect of Voltage		Within ±15% of the rated supply voltage range, the detection distance varies by ±1% or less		
Insulation Resistance		50MΩ or more between the charging part and the casing		
Dielectric Strength		AC1000V or more at 50/60Hz for 1 minute between the charging part and the casing		
Vibration (Endurance)		10-55Hz, 1.5mm double amplitude, 2 hours in X, Y, Z directions		
Shock (Endurance)		500m/s² double amplitude, 10 times in X, Y, Z directions		
Protection Structure		IP65		
Connection Method		Cable lead type (standard 2m)		
Housing Material		PC 8		

Size drawing (Unit: mm)

PEZ-D21



PEZ-T21



Ultra-Thin Photoelectric Sensors

PEZ-FD / FT / LT



Ultra-Thin and Ultra-Compact Design

The ultra-thin and small size allows for easy installation wherever there is a little space.

Flexible Installation Options

Diffuse reflection type sensors are front detection models and can be used like sticking them onto a wall surface.

Opposite beam sensors come with both front and side detection types, allowing for flexible installation.

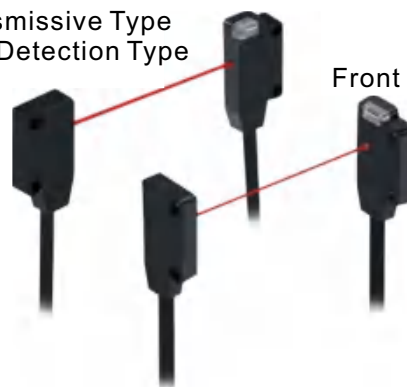


Red: Operating status indicator light
Green: Stability indicator light

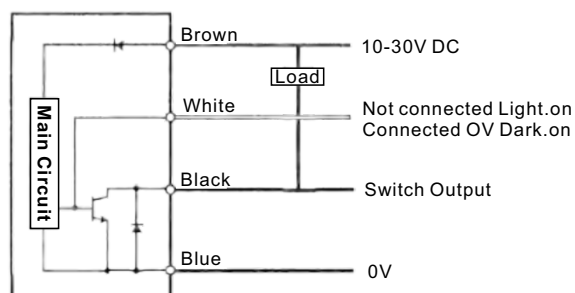
Clear and Visible Dual-Color Indicator Lights

Transmissive Type
Side Detection Type




Front Detection Type



Compatible Signal Switching

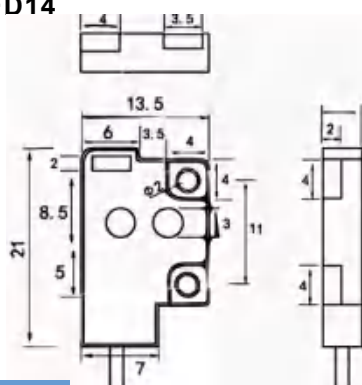


Product Parameters

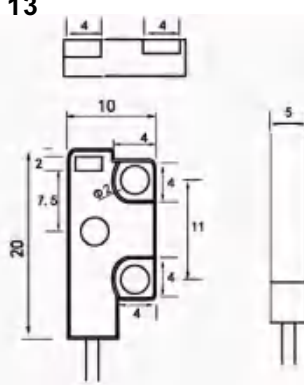
Product Illustration							
Model	NPN Output	Diffuse Reflection Type		Front Opposite Type		Side Opposite Type	
		PEZ-FD14	PEZ-FD12	PEZ-FT13	PEZ-FT19	PEZ-LT13	PEZ-LT19
Detection Distance		40mm	20mm	500mm	1000mm	500mm	1000mm
Light Source (Wavelength)		650nm Red LED					
Detection Object		Opaque object with a diameter of 4mm or more					
Contrast		More than 20% of the detection distance					
Control Output		Black wire is the signal output line, normally open and normally closed can be switched using the white wire					
Response Frequency		Less than 1ms					
Power Supply Voltage		DC12-24V ripple (p-p) 10% or less (DC10-30V)					
Consumption Current		≤25mA					
Control Output	Switching Capacity	≤3W					
	Residual Voltage	Less than 1V (load current 100mA)					
Circuit Protection		Surge protection, short-circuit protection, reverse polarity protection					
Indicator Light		Action indicator light (red)					
Ambient Temperature		Operating: -25℃ to +70℃ (no icing, no dew) Storage: -40℃ to +85℃ (no icing, no dew)					
Effect of Ambient Illumination		Daylight: below 10000LX Incandescent: below 3000LX					
Operating Environment Humidity		Operating: 45%-85% (no icing) RH Storage: 35%-85% (no icing) RH					
Effect of Voltage		Within ±15% of the rated supply voltage range, the detection distance varies by ±1% or less					
Insulation Resistance		50MΩ or more between the charging part and the casing					
Dielectric Strength		AC1000V or more at 50/60Hz for 1 minute between the charging part and the casing					
Vibration (Endurance)		10-55Hz, 1.5mm double amplitude, 2 hours in X, Y, Z directions					
Shock (Endurance)		500m/s² double amplitude, 10 times in X, Y, Z directions					
Protection Structure		IP65					
Connection Method		Cable lead type (standard 2m)					
Housing Material		PC					

Size drawing (Unit: mm)

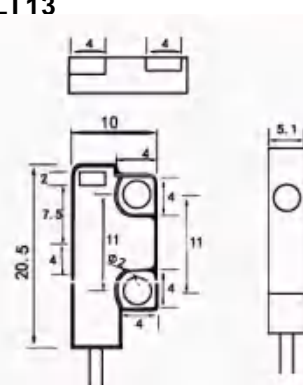
PEZ-FD14



PEZ-FT13



PEZ-LT13




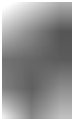


Square Series

Photoelectric Sensors

25.4mm standard hole spacing, hassle-free replacement

Technical Specifications

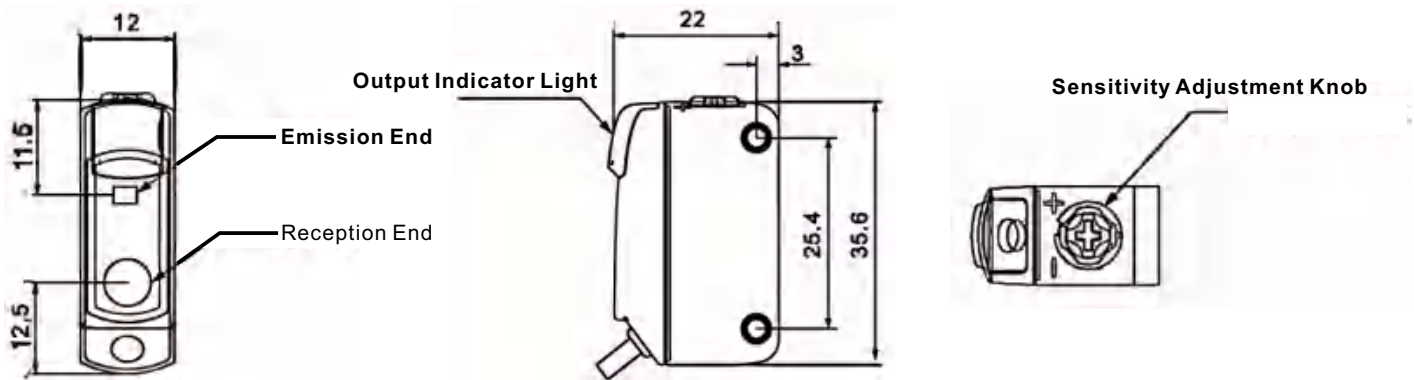
Model	PWRX-40N	PBGX-35N	PBGX-40N	PBGSX-LS61	PBGSX-LS100TX
Appearance					
Detection Method	Diffuse reflection		Diffuse reflection, Background suppression (not affected by the color of the detected object)		Diffuse reflection, Slot light
Detection Distance	Adjustable from 30~350mm	Adjustable from 60~400mm	Adjustable from 30~400mm		
Beam Size	/	1x2mm(400mm)	1x2mm(300mm)	Ø5mm/200mm	6x70mm(100mm)
Hysteresis Range	<20%				
Minimum Detectable Object	Opaque object with a diameter of Ø10mm or more	Opaque object with a diameter of Ø5mm or more	Opaque object with a diameter of Ø5mm or more	Opaque object	Holes or irregular objects with a diameter of Ø10mm or more
Repeatability	<5%				
Sensitivity Adjustment	Single-knob adjustment	Multi-knob adjustment			
Output Mode	NPN Open Collector				
Switching Mode	Light.on (Light entry action) / Dark.on (Light obstruction action) switchable				
Response Time	<500µs				
Response Frequency	700Hz				
Light Source	850nm Infrared Light	660nm Red Laser		650nm Visible Red Light	
Operating Voltage	DC 12~24V±10%				
Residual Voltage (Drop)	<1.5V				
Maximum Load Current	100mA				
Consumption (No Load) Current	15mA				
Ambient Temperature	Operating: -25℃ to 55℃; Storage: -40℃ to 85℃, no freezing				
Ambient Humidity	Operating: 5% to 85%RH; Storage: 5% to 95%RH, no condensation				
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection				
Protection Rating	IP65				
Indicator Light	Red: Black wire output Green: White wire output				
Connection Method	Cable lead type (4-core, standard cable length 2 meters)				
Housing	ABS				
Vibration Resistance	10~55Hz, double amplitude 1.0mm, 30 minutes in X/Y/Z directions				
Shock Resistance	300m/s², 3 times in X/Y/Z directions				

Square Series

Photoelectric Sensors

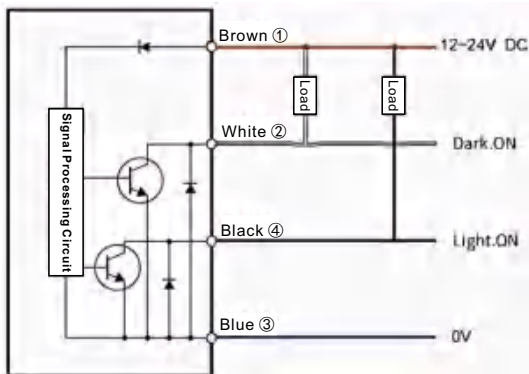
25.4mm standard hole spacing, hassle-free replacement

Outline Dimension Drawing (Unit:mm)



Circuit Wiring Diagram

[NPN]







Square Series

Photoelectric Sensors

25.4mm standard hole spacing, hassle-free replacement

Technical Specifications

Model	PWT-100N	PBG-T3000N	PBG-G1000N	PWR-R61	PWR-R66
Appearance					
Detection Method	Opposite Emission		Retro-reflection		Retro-reflection Transparent Object Detection
Detection Distance	15m	30m	10m	5cm-300cm	5cm-100cm
Beam Size	Ø30mm/10m	Ø30mm/30m	Ø15mm/10m	Ø15mm/100cm	
Hysteresis Range	<20%				
Minimum Detectable Object	Opaque object with a diameter ofØ12mm or more		Opaque object with a diameter of Ø12mm or more	Opaque object with a diameter of Ø10mm or more	Transparent object
Repeatability	<5%				
Sensitivity Adjustment	Multi-turn knob adjustment				
Output Mode	NPN Open Collector				
Switching Mode	Light.on (Light entry action) / Dark.on (Light obstruction action) switchable				
Response Time	<1ms				
Response Frequency	2KHz	1KHz			
Light Source	640nm visible red light	650nm laser		700nm visible red light	
Operating Voltage	DC 12~24V±10%				
Residual Voltage (Drop)	<1.5V				
Maximum Load Current	100mA				
Consumption (No Load) Current	15mA				
Ambient Temperature	Operating: -25℃ to 55℃; Storage: -40℃ to 85℃, no freezing				
Ambient Humidity	Operating: 5% to 85%RH; Storage: 5% to 95%RH, no condensation				
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection				
Protection Rating	IP65				
Indicator Light	Orange				
Connection Method	2-meter 4-core cable	2-meter 3-core cable	2-meter 4-core cable	2-meter 3-core cable	
Housing	ABS+PC				
Vibration Resistance	10~55Hz, double amplitude 1.0mm, 30 minutes in X/Y/Z directions				
Shock Resistance	300m/s², 3 times in X/Y/Z directions				

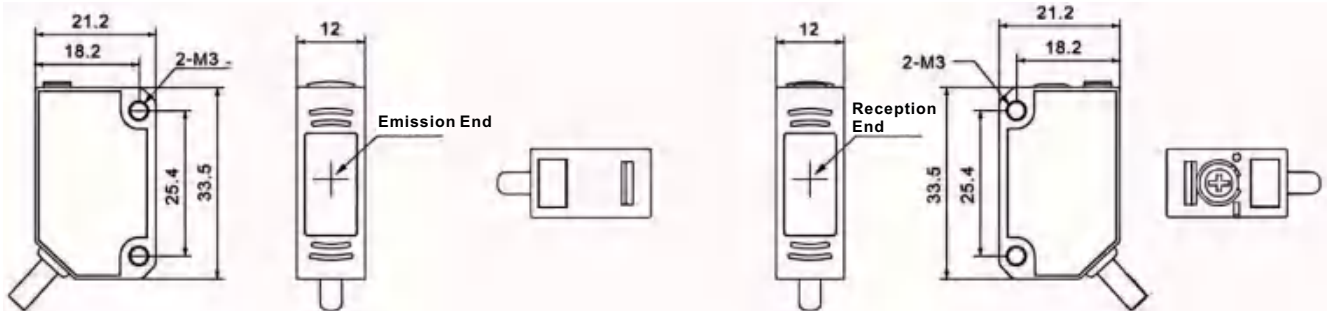
Square Series

Photoelectric Sensors

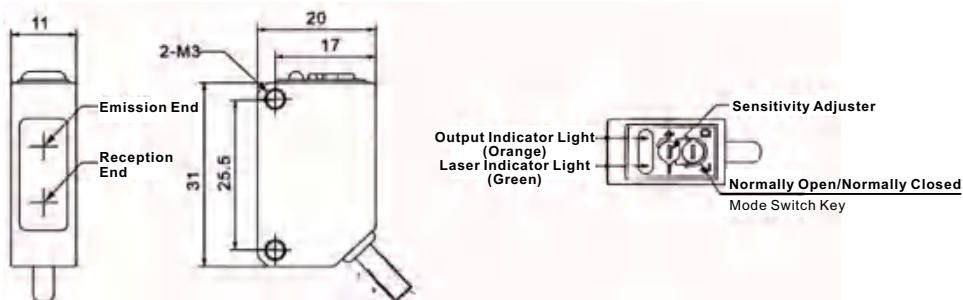
25.4mm standard hole spacing, hassle-free replacement

Outline Dimension Drawing (Unit:mm)

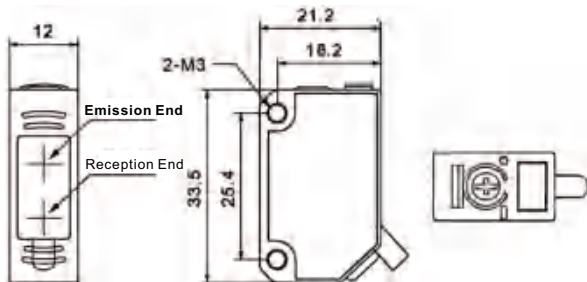
[PWT-100N/PBG-T3000N]



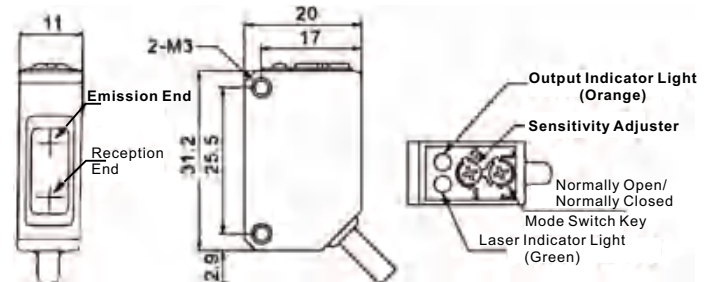
[PBG-R1000N]



[PWR-R61]

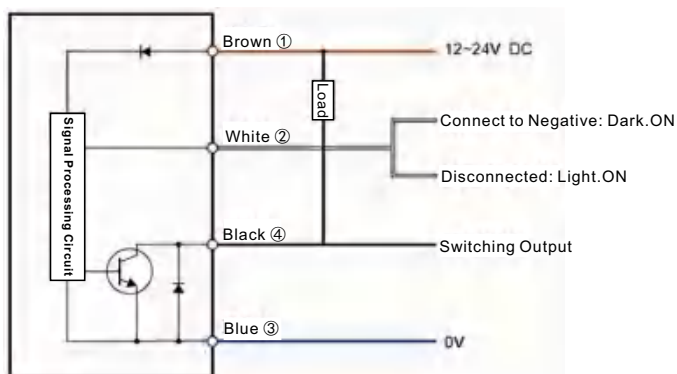


[PWR-R66]

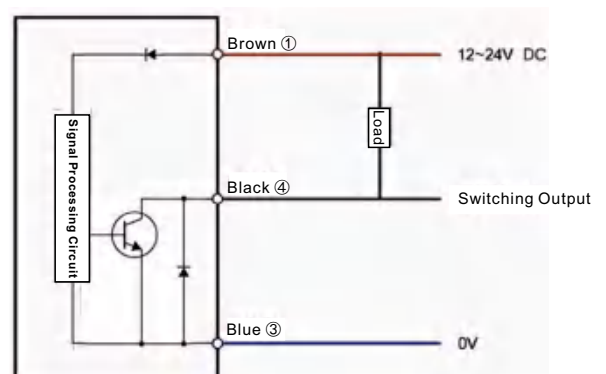


Circuit Wiring Diagram

[PWT-100N/PBG-T3000N/PWR-R61]





[PBG-R1000N/PWR-R66]



Background Suppression Series

Achieve equal-distance detection of black and white objects.

Technical Specifications

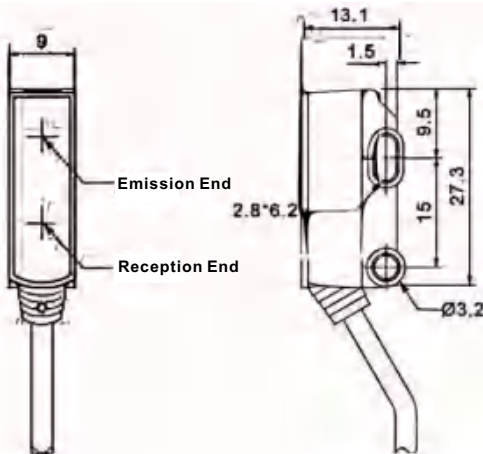
Model	PDG-09N	PBGS-LS41
Appearance		
Detection Method	Diffuse reflection, background suppression (not affected by the color of the detected object)	
Detection Distance	Adjustable to 12mm	Adjustable to 80mm
Beam Size	Ø 8mm/30cm	Ø 5/200mm
Hysteresis Range	<20%	
Standard Detection Object	Opaque object with a diameter of Ø10mm or more	
Repeatability	<5%	
Sensitivity Adjustment	Multi-turn knob adjustment	
Output Mode	NPN Open Collector	
Switching Mode	Light.on (light entry action) / Dark.on (light obstruction action) switchable	
Response Time	<1ms	<500µs
Response Frequency	1KHz	700Hz
Light Source	650nm Red Light	
Operating Voltage	DC 12~24V±10%	
Residual Voltage (Drop)	100mA	
Maximum Load Current	<3V	<1V
Consumption (No Load) Current	<25mA	<15mA
Ambient Illuminance	Incandescent light ≤3000Lux; Sunlight ≤10000Lux	
Ambient Temperature	Operating: -10°C~55°C; Storage: -25°C~70°C, no freezing	
Ambient Humidity	Operating: 35%~85%RH; Storage: 35%~95%RH, no condensation	
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection	
Protection Rating	IP65	IP66
Indicator Light	Orange	
Connection Method	Cable lead type (4-core, standard cable length 2 meters)	
Housing	ABS	
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each	
Shock Resistance	300m/S². X/Y/Z directions for 3 times each	

Background Suppression Series

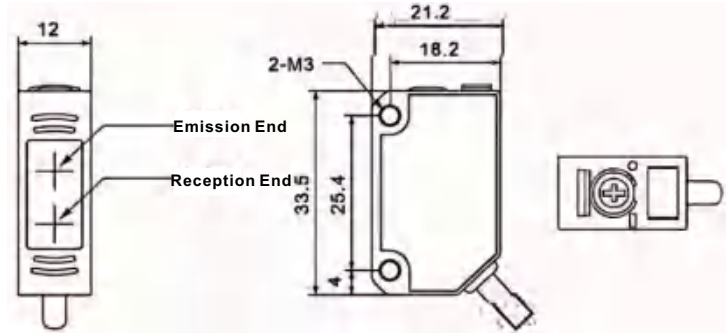
Achieve equal-distance detection of black and white objects.

Outline Dimension Drawing (Unit:mm)

[PDG-09N]

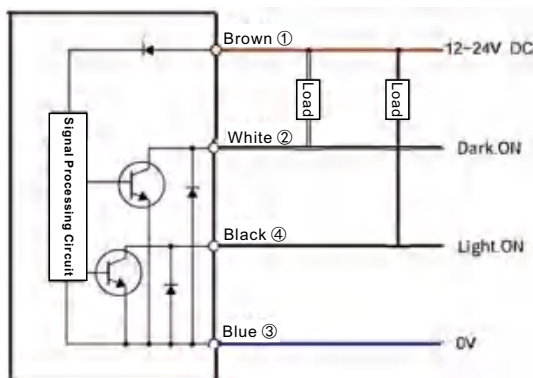


[PBGS-LS41]

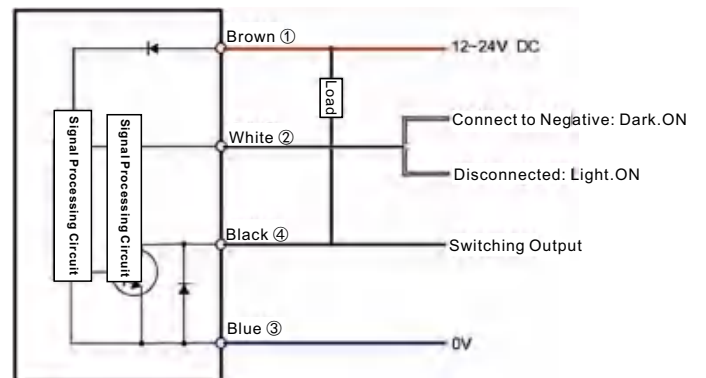


Circuit Wiring Diagram

[PDG-09N]




[PBGS-LS41]



Background Cancellation Series

Eliminate interference from background colors

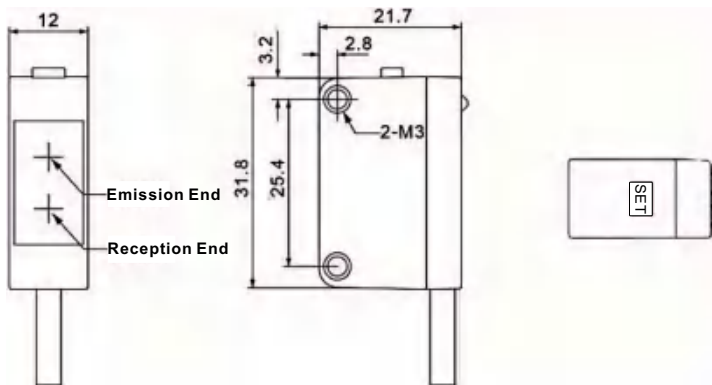
Technical Specifications

Model	PBGS-500QC
Appearance	
Detection Method	Diffuse reflection, background cancellation (diffuse reflection)
Detection Distance	2cm - 60cm
Beam Size	Ø10mm/30cm
Hysteresis Range	<10%
Minimum Detectable Object	Translucent or dark-colored objects
Repeatability	<5%
Sensitivity Adjustment	One-touch setting
Output Mode	NPN Open Collector
Switching Mode	Light.on (light entry action)
Response Time	<1ms
Response Frequency	1KHz
Light Source	650nm visible red light
Operating Voltage	DC 12~24V±10%
Residual Voltage (Drop)	<3V
Maximum Load Current	100mA
Consumption (No Load) Current	<25mA
Ambient Temperature	Operating: -25°C to 75°C; Storage: -40°C to 85°C, no freezing
Ambient Humidity	Operating: 5% to 85%RH; Storage: 5% to 95%RH, no condensation
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection
Protection Rating	IP65
Indicator Light	Orange
Connection Method	Cable lead type (3-core, standard cable length 2 meters)
Housing	PC+ABS
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each
Shock Resistance	300m/S². X/Y/Z directions for 3 times each

Background Cancellation Series

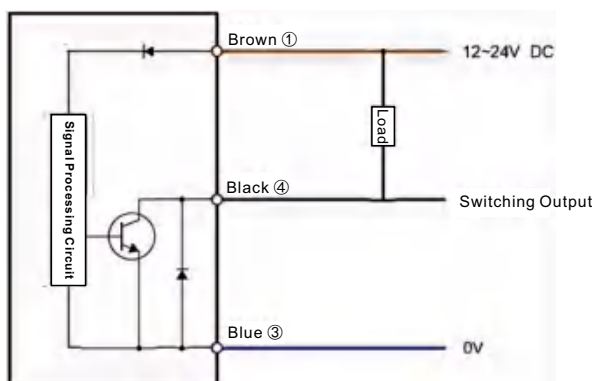
Eliminate interference from background colors

Outline Dimension Drawing (Unit:mm)



Circuit Wiring Diagram



[NPN]



Limited Reflection Series

Short detection distance, stable performance.

Technical Specifications

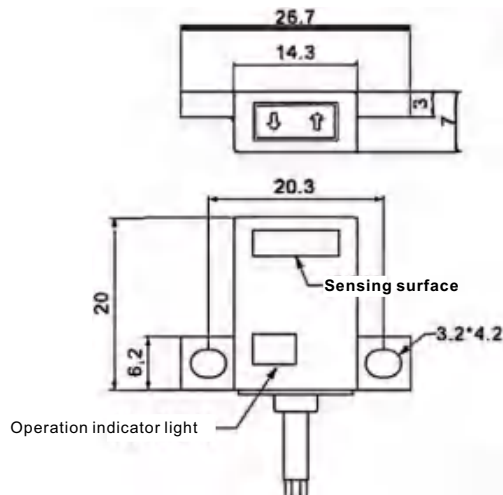
Model	PSPY401	PSPY402
Appearance		
Detection Method	Diffuse reflection	
Detection Direction	Front	Head
Detection Distance	White paper 5mm	
Beam Size	N/A	
Hysteresis Range	<20%	
Standard Detection Object	100*100 white paper	
Repeatability	<5%	
Output Mode	NPN Open Collector	
Switching Mode	Output signal with object present	
Response Time	<0.8ms	
Response Frequency	2KHz	
Light Source	940nm infrared light	
Operating Voltage	DC 12~24V±10%	
Residual Voltage (Drop)	100mA	
Maximum Load Current	<3V	
Consumption (No Load) Current	<25mA	
Ambient Illuminance	Incandescent light ≤3000Lux; Sunlight ≤10000Lux	
Ambient Temperature	Operating: -10°C to 55°C; Storage: -25°C to 70°C, no freezing	
Ambient Humidity	Operating: 35% to 85%RH; Storage: 35% to 95%RH, no condensation	
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection	
Protection Rating	IP65	
Indicator Light	Red	
Connection Method	Cable lead type (3-core, standard cable length 2 meters)	
Housing	PC	
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each	
Shock Resistance	300m/S². X/Y/Z directions for 3 times each	

Limited Reflection Series

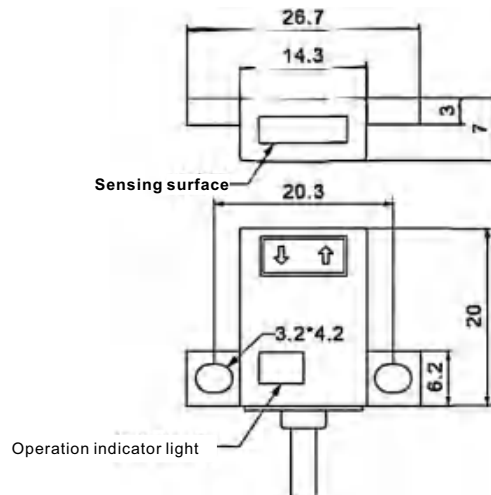
Short detection distance, stable performance.

Outline Dimension Drawing (Unit:mm)

[PSPY401]

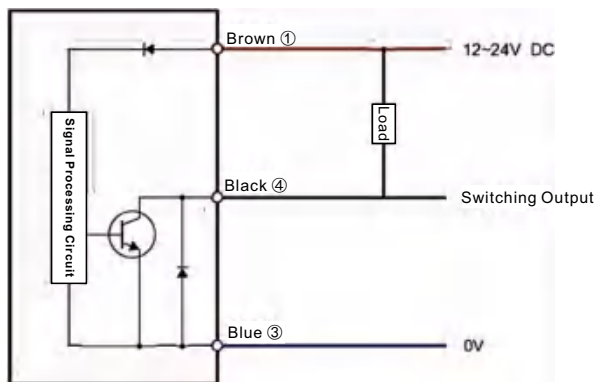


[PSPY402]



Circuit Wiring Diagram



[NPN]



Cylindrical Series

M12/M18, two optional appearances.

Technical Specifications

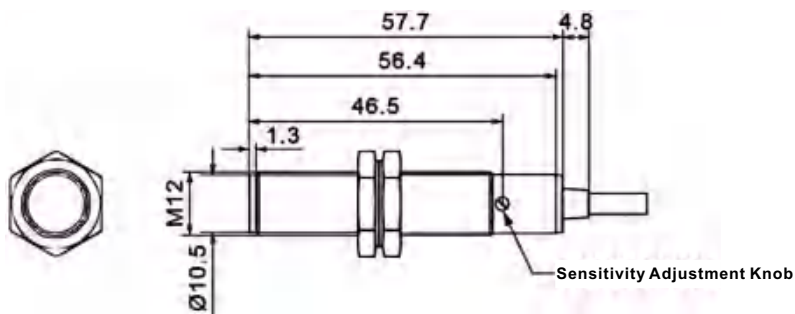
Model	PWR-M12150N	PWR-M1850N
Appearance		
Size	M12	M18
Detection Method	Diffuse reflection	
Detection Distance	15cm	50cm
Beam Size	/	Ø 15mm/50cm
Hysteresis Range	<20%	
Standard Detection Object	100*100 white paper	
Repeatability	<5%	
Sensitivity Adjustment	Knob adjustment	
Output Mode	NPN Open Collector	
Switching Mode	Output signal with object present	
Response Time	<1ms	
Response Frequency	2KHz	
Light Source	850nm invisible light	650nm visible red light
Operating Voltage	DC 12~24V±10%	
Residual Voltage (Drop)	<1V	
Maximum Load Current	100mA	
Consumption (No Load) Current	<25mA	
Ambient Illuminance	Incandescent light ≤3000Lux; Sunlight ≤10000Lux	
Ambient Temperature	Operating: -10°C~55°C; Storage: -25°C~70°C, no freezing	
Ambient Humidity	Operating: 35%~85%RH; Storage: 35%~95%RH, no condensation	
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection	
Protection Rating	IP67	IP66
Indicator Light	Red	
Connection Method	Cable lead type (3-core, standard cable length 2 meters)	
Housing	Brass plated with nickel + PC	ABS
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each	
Shock Resistance	300m/S ² . X/Y/Z directions for 3 times each	

Cylindrical Series

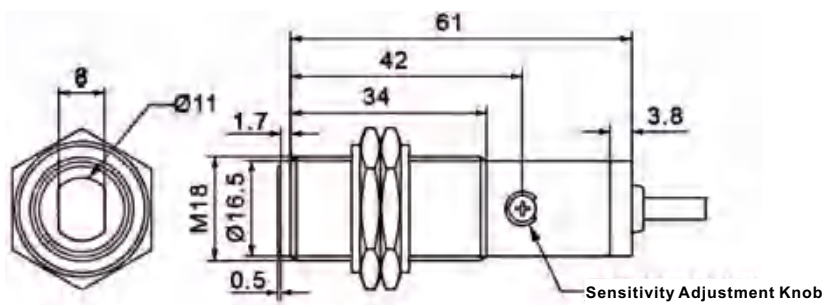
M12/M18, two optional appearances.

Outline Dimension Drawing (Unit:mm)

[PWR-M12150N]

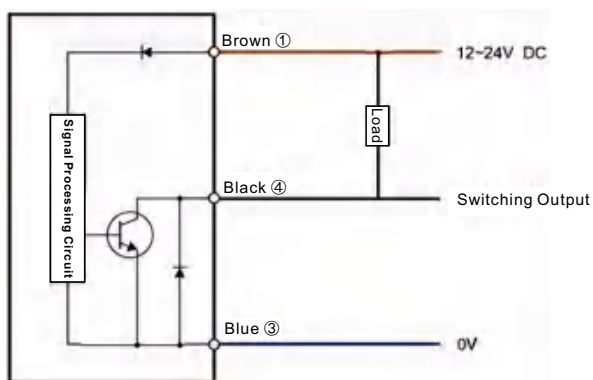


[PWR-M1850N]



Circuit Wiring Diagram

[NPN]

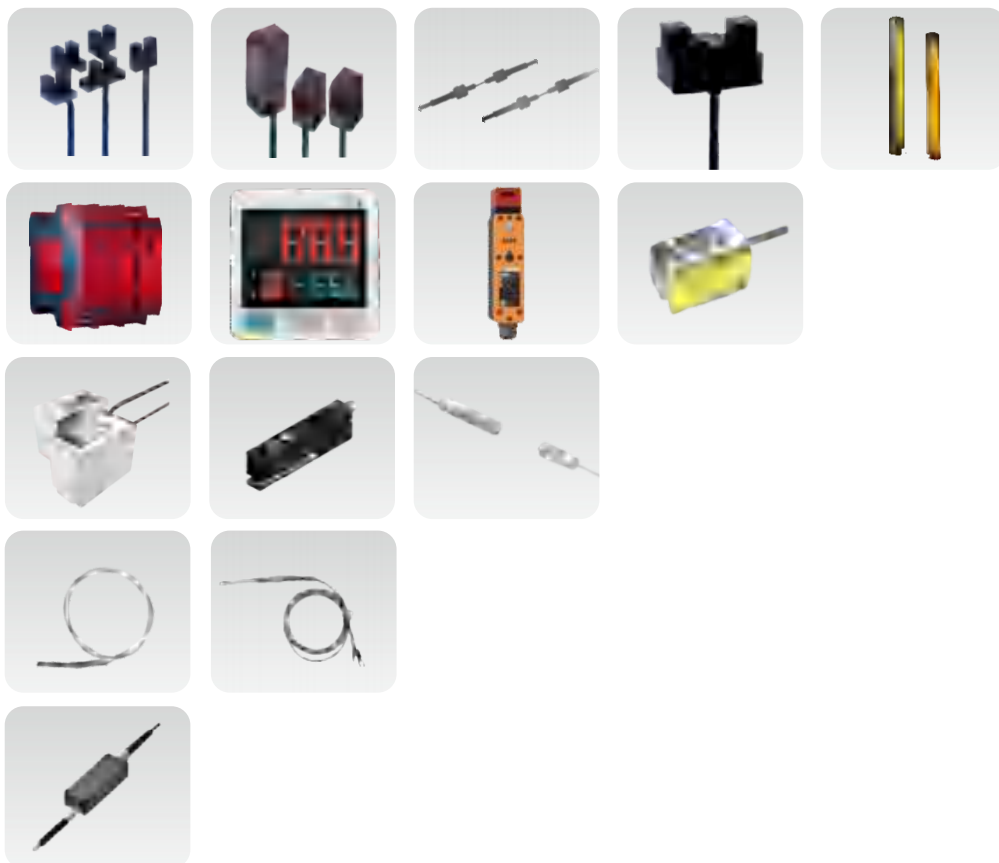


Sensore di settore

Fiber Optic Sensors

Sensori a fibra ottica





Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>

Fiber Optic Sensors Contents

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会社法人等番号 1309-01-001332

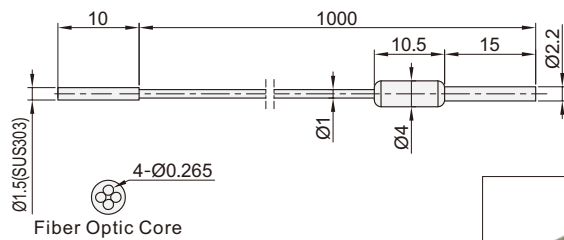
Website: <http://www.nipponkodobearings.com>

Fiber Optic Component

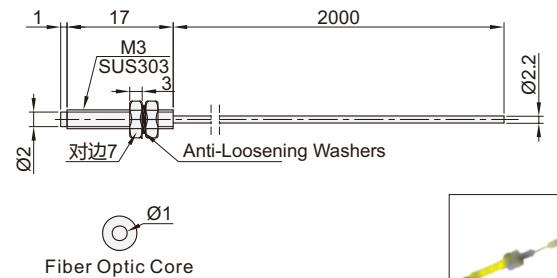
Opposite Beam Type Standard Type

Code	Type	Detection Method
FO10	Standard Type	Opposite Emission

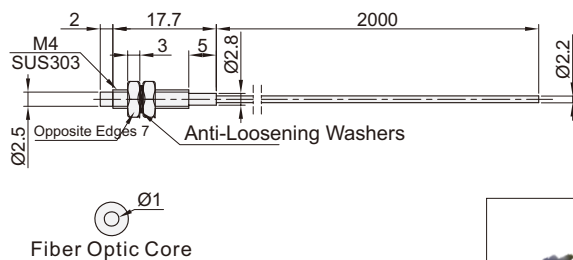
Specification: 1



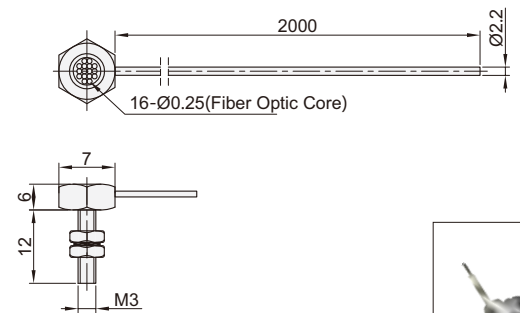
Specification: 2



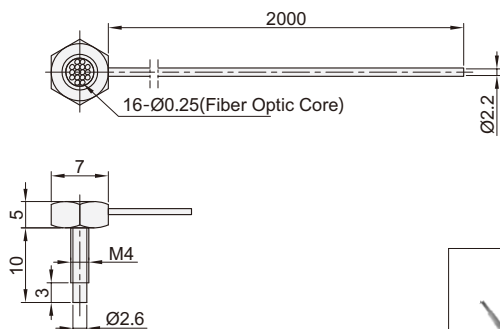
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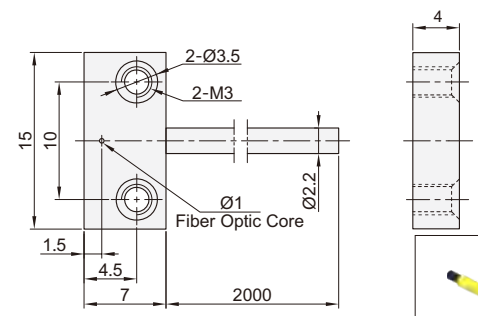
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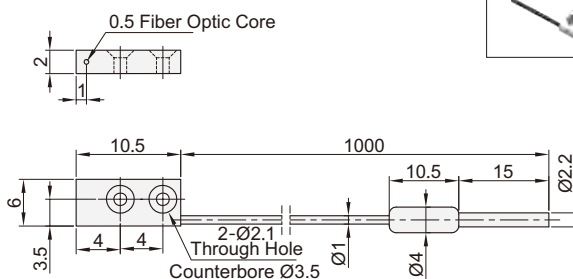
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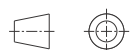
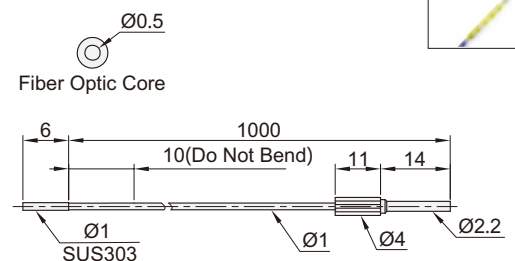
Specification: 6



Specification: 7

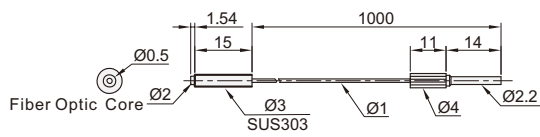


Specification: 8

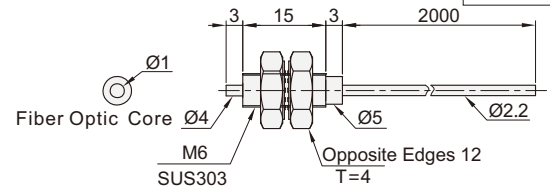


Perspective Standard: First Perspective

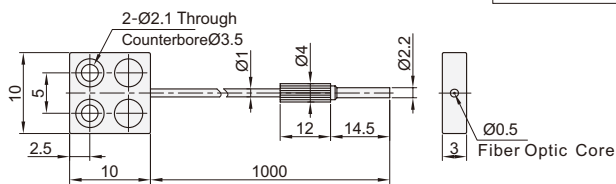
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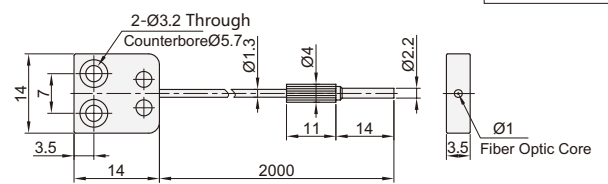
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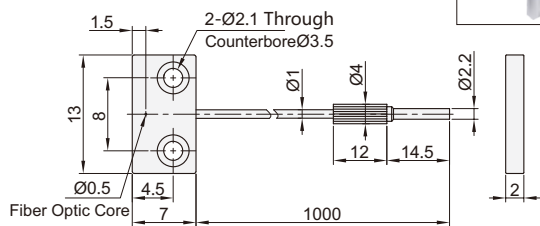
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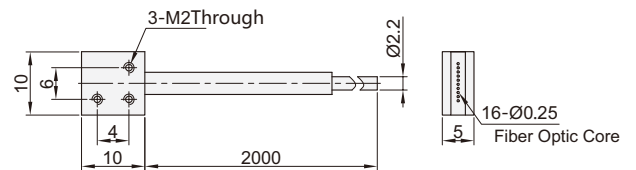
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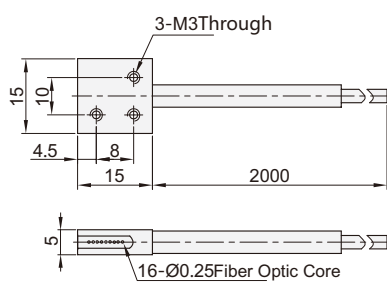
Specification: 13



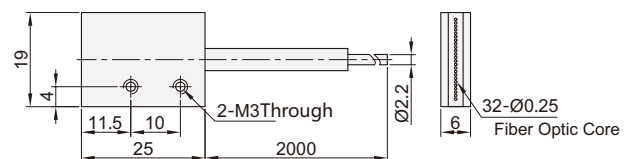
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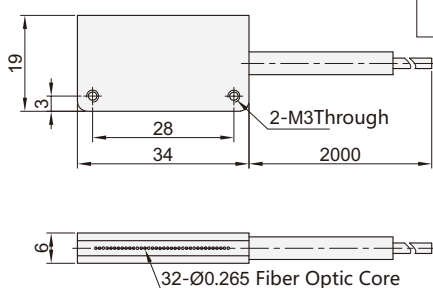
Specification: 15



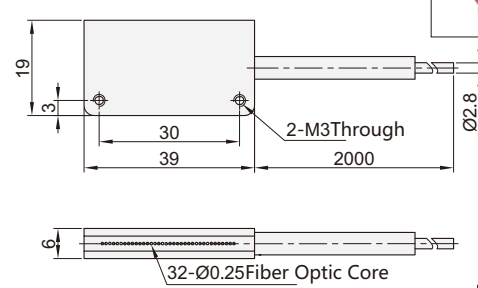
Specification: 16



Specification: 17

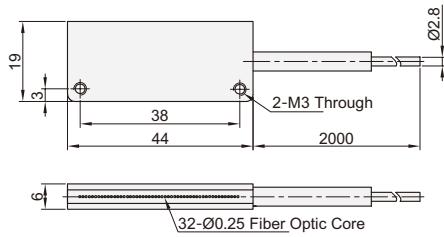


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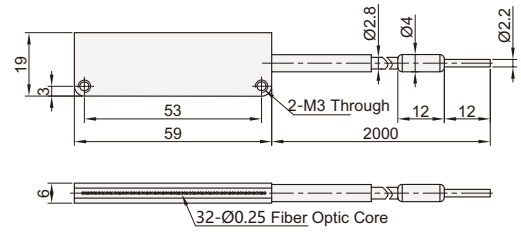


Perspective Standard: First Perspective

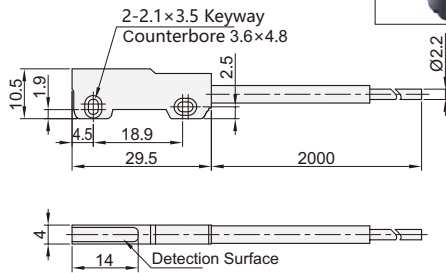
Specification: 19



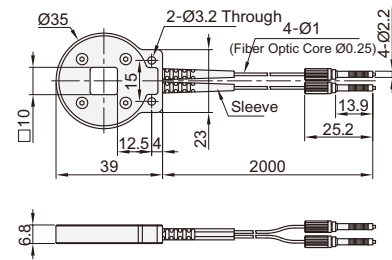
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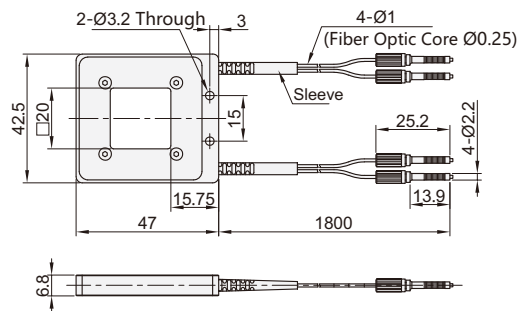
Specification: 21



Specification: 22



Specification: 23



Perspective Standard: First Perspective

Model		Detection Distance	Size	Core Structure	Minimum Bending Radius	Optical Fiber Length	Housing Material	Compatible Amplifier
Code	Specification							
FO10	1	700	Ø1.5	Multicore	4	1000	Stainless Steel	E-ZJH07
	2	500	M3	Standard	25			
	3	500	M4		Coaxial	5		
	4	600	M3	15				
	5	400	M4					
	6	1900	Thin Direction Emission		2			
	7	480	Wide Direction Emission		2			
	8	430	Ø1	Standard	4	1000		
	9	140	Ø3		15			
	10	600	M6		25	2000		
	11	130	10×10			1000	Aluminum Alloy	
	12		14×14		2	2000		
	13	80	7×13			1000	Stainless Steel	
	14		10×10					
	15	550	15×15					
	16		19×25					
	17	600	19×34		25			
	18	1000	19×39	Multicore		2000	Aluminum Alloy	
	19	550	19×44					
	20	600	19×59					
	21	500	10.5×29.5		2			
	22		35×39					
	23		—	42.5×47		—	1800	

Model	
Code	Specification
FO10	1
	2

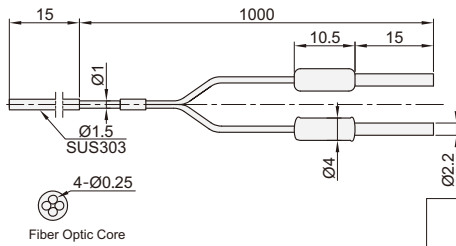
FO10 - 1

Fiber Optic Component

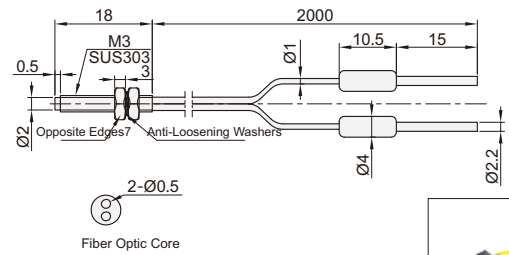
Diffuse Reflection Type Standard Type

Code	Type	Detection Method
FO13	Standard Type	Diffuse Reflection Type

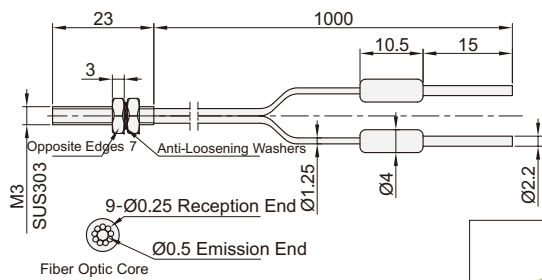
Specification: 1



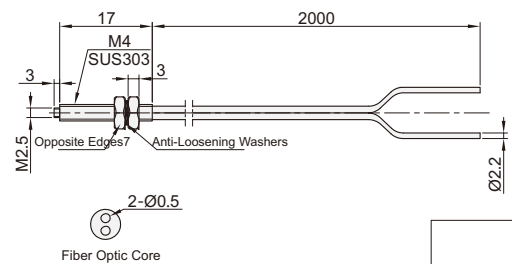
Specification: 2



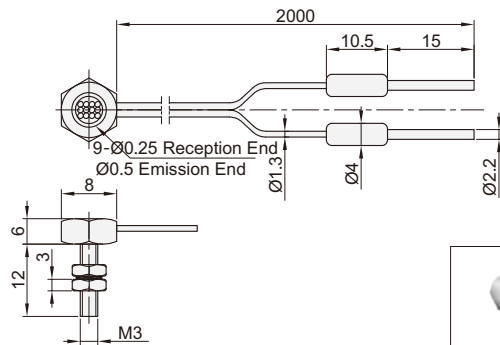
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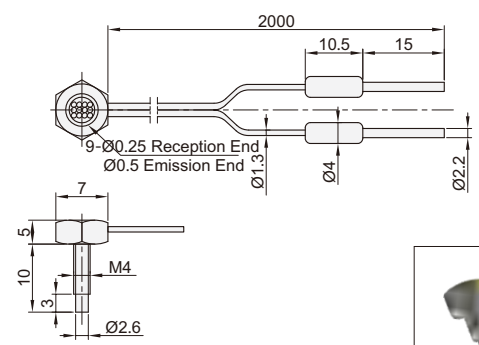
Specification: 4



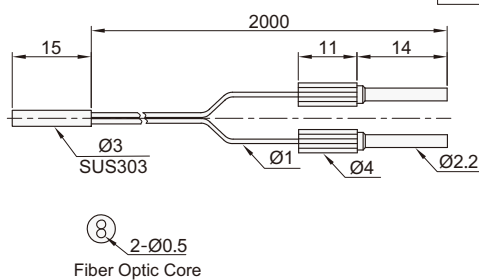
Specification: 5



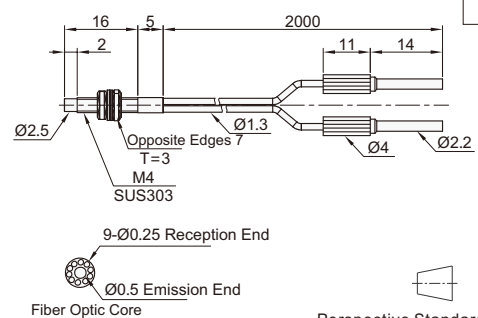
Specification: 6



Specification: 7



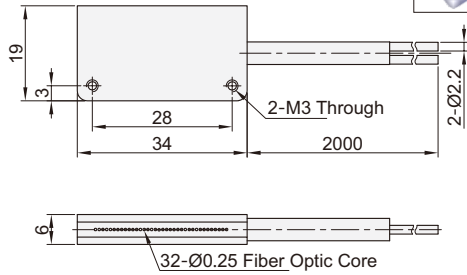
Specification: 8



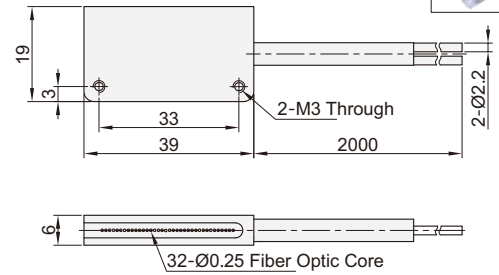
Perspective Standard: First Perspective

55

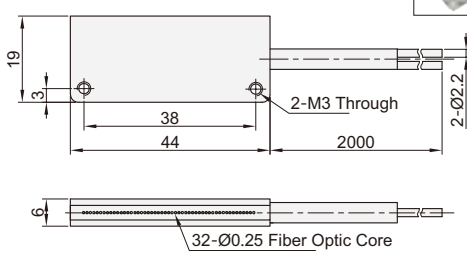
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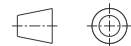
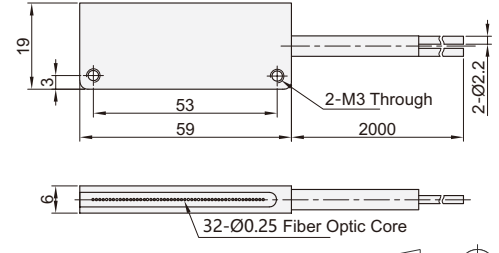
Specification: 20



Specification: 21



Specification: 22



Perspective Standard: First Perspective

Model		Detection Distance	Size	Core Structure	Minimum Bending Radius	Optical Fiber Length	Housing Material	Compatible Amplifier
Code	Specification							
FO13	1	90	Ø1.5	Standard	2	1000	Stainless Steel	E-ZJH07
	2	35	M3	Standard		2000		
	3	45	M3	Coaxial		1000		
	4	90	M4	Standard	15	2000		
	5	35	M3	Coaxial		2000		
	6	40	M4	Coaxial		2000		
	7	100	Ø3	Standard	10	2000		
	8	70	M4	Coaxial	15	2000		
	9	160	M6	Standard		2000		
	10	170	M6	Coaxial	25	2000		
	11	20	Thin Direction Emission	Standard		1000		
	12	100	Thin Direction Emission			2000		
	13	55	Short Direction Emission			1000		
	14	25	Wide Direction Emission			1000		
	15	80	9.6×10					
	16	85	15×15					
	17	150	20×20	Multicore	25	2000	Aluminum Alloy	
	18	140	19×25					
	19	150	19×34					
	20		19×39					
	21		19×44					
	22	130	19×59					

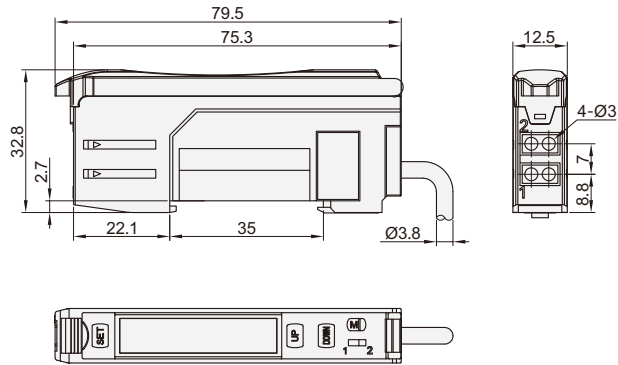
Model	
Code	Specification
Fo13	1
	2

FO13 - 1

Fiber Optic Amplifier

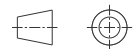
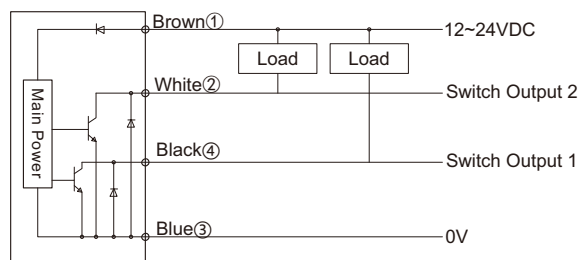
◀ Dual Display Dual-Channel Type
Standard Type for Fiber Optic Use

Code	Type	Housing Material
FO42	Dual Display Dual-Channel Type	ABS



Wiring Diagram

NPN



Perspective Standard: First Perspective

Model Code	Output Function	Output Status
FO42	NPN	Normally Open/Normally Closed switchable

Model Code
FO42

Performance Table

Consumption Current	≤30mA
Power Supply Voltage	12~24VDC±10%
Light Source	4-element red LED
Response Time	P-1 : <50μs; P-2: <200μs; P-3: <400μs; P-4: <800μs; P-5: <3200μs; P-6: <6400μs
Response Frequency	5KHz
Delay Function	Break delay / Turn on delay / Single delay / Single turn on delay
Maximum Input Current	100mA
Maximum Residual Voltage	<1V
Switching Mode	Light.on (light entry action) / Dark.on (light obstruction action) switchable
Display	Set value: 4-digit green LED, Current value: 4-digit red LED
Ambient Illuminance	D≤3000Lux, D≤10000Lux
Ambient Temperature	Operating: -10℃ to 55℃; Storage: -25℃ to 70℃, no freezing
Ambient Humidity	Operating: 35% to 85%RH; Storage: 35% to 95%RH, no condensation
Protective Circuit	Reverse polarity protection / Surge protection / Short circuit protection
Protection Rating	IP64
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each
Shock Resistance	300m/S². X/Y/Z directions for 3 times each
Cable Out	Direct wire out 2M / 4-core wire

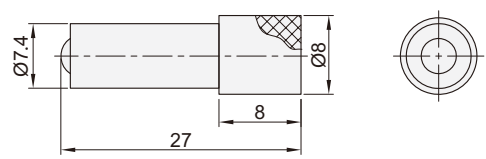
Focusing Lens

Standard Type for Optical Fiber Use

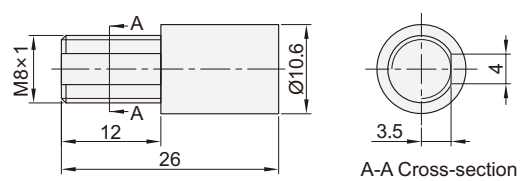
Code	Type	Housing Material	Lens Material
FO28	Standard Type for Optical Fiber Use	Aluminum	Glass



Focal Length 15



Focal Length 35



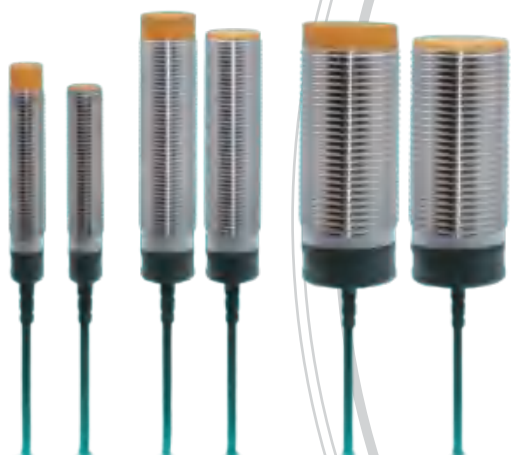
Perspective Standard: First Perspective

Model			Thread Size	Beam Diameter	Tip Size
Code	Focal Length				
FO28	15	±2	M3	Ø0.5	Ø7.4
	35			Ø2.0	Ø10.6

Model	
Code	Focal Length
FO28	15
	35

FO28

Sensore di settore



Proximity Sensors

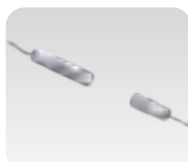
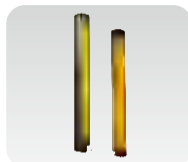
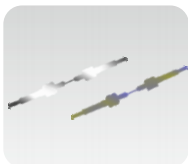
Sensori di prossimità

Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Proximity Sensors Contents

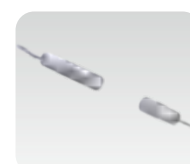
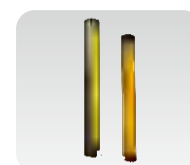
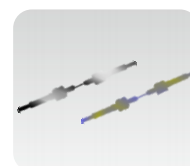
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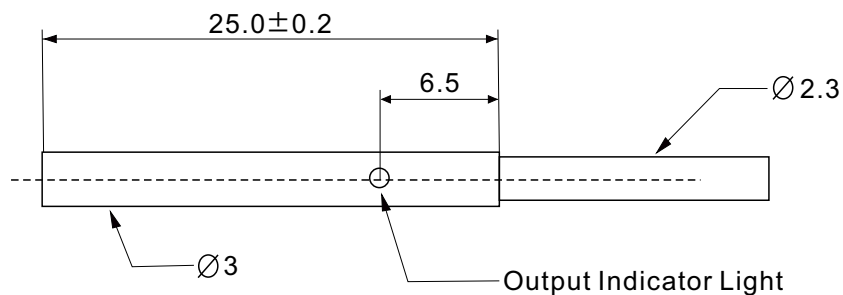
Cylinder Φ3 Series

Inductive Proximity Sensors

Technical Specifications (For PNP models, please contact the sales representative)

Model	NPN Normally Open	PSX03Q-0.6NOF	PSX03Q-0.8NOF
	NPN Normally Closed	PSX03Q-0.6NCF	PSX03Q-0.8NCF
Appearance			
Mounting Method	Flush		
Sensing Distance	0.6mm		0.8mm
Repeat Accuracy	<1%(Sr)		
Hysteresis (Discrimination Distance)	<15%(Sr)		
Response Frequency	2000Hz		
Operating Voltage	DC10~30V±10%		
Residual Voltage (Drop Voltage)	<1.5V		
Maximum Load Current	100mA		
Consumption (Idle) Current	<10mA		
Temperature Drift	<10%		
Ambient Temperature	Operating: -25°C~70°C; Storage: -40°C~85°C, No Freezing		
Ambient Humidity	35%~85%Rh, No Condensation		
Protection Circuit	Reverse Polarity Protection/Surge Protection/Short Circuit Protection		
Protection Level	IP67		
Material	Sensing Face: POM; Housing: Stainless Steel		
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each		
Shock Resistance	300m/S ² , X/Y/Z Direction for 3 Times Each		
Indicator Light	Yellow when detecting object		
Connection Method	2-meter 3-core standard cable		


Outer Dimension Diagram (Unit:mm)



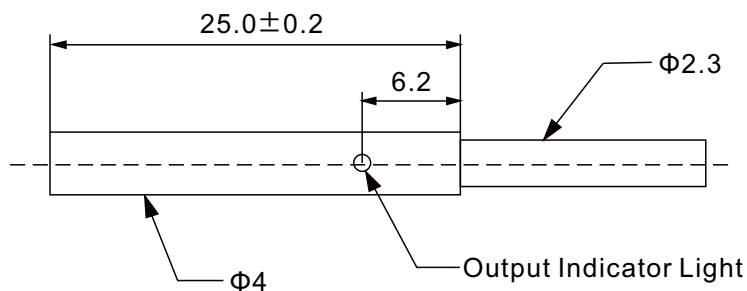
Cylinder Φ4 Series

Inductive Proximity Sensors

Technical Specifications (For PNP models, please contact the sales representative)

Model	NPN Normally Open	PSX04Q-1.0NOF	PSX04Q-1.5NOF
	NPN Normally Closed	PSX04Q-1.0NCF	PSX04Q-1.5NCF
Appearance			
Mounting Method	Flush		
Sensing Distance	1.0mm		1.5mm
Repeat Accuracy	< 1%(Sr)		
Hysteresis (Discrimination Distance)	< 15%(Sr)		
Response Frequency	2000Hz		
Operating Voltage	DC10~30V±10%		
Residual Voltage (Drop Voltage)	<1.5V		
Maximum Load Current	100mA		
Consumption (Idle) Current	< 10mA		
Temperature Drift	< 10%		
Ambient Temperature	Operating: -25°C~70°C; Storage: -40°C~85°C, No Freezing		
Ambient Humidity	35%~85%Rh, No Condensation		
Protection Circuit	Reverse Polarity Protection/Surge Protection/Short Circuit Protection		
Protection Level	IP67		
Material	Sensing Face: POM; Housing: Stainless Steel		
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each		
Shock Resistance	300m/S ² , X/Y/Z Direction for 3 Times Each		
Indicator Light	Yellow when detecting object		
Connection Method	2-meter 3-core standard cable		


Outer Dimension Diagram (Unit:mm)



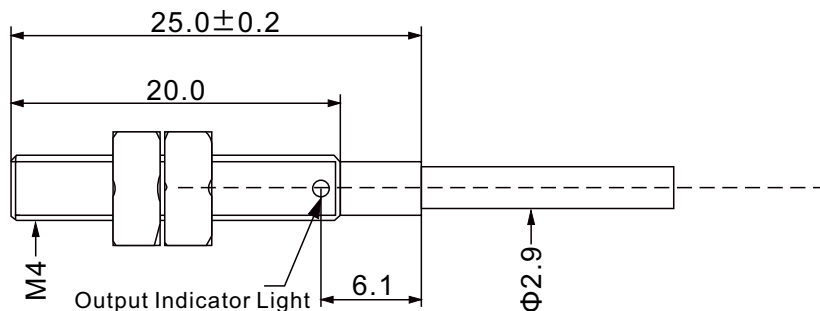
Cylinder M4 Series

Inductive Proximity Sensors

Technical Specifications (For PNP models, please contact the sales representative)

Model	NPN Normally Open	PSX04-0.6NOF	PSX04-0.8NOF
	NPN Normally Closed	PSX04-0.6NCF	PSX04-0.8NCF
Appearance			
Mounting Method	Flush		
Sensing Distance	0.6mm		0.8mm
Repeat Accuracy	<1%(Sr)		
Hysteresis (Discrimination Distance)	<15%(Sr)		
Response Frequency	2000Hz		
Operating Voltage	DC10~30V±10%		
Residual Voltage (Drop Voltage)	<1.5V		
Maximum Load Current	100mA		
Consumption (Idle) Current	<10mA		
Temperature Drift	<10%		
Ambient Temperature	Operating: -25°C~70°C; Storage: -40°C~85°C, No Freezing		
Ambient Humidity	35%~85%Rh, No Condensation		
Protection Circuit	Reverse Polarity Protection/Surge Protection/Short Circuit Protection		
Protection Level	IP67		
Material	Sensing Face: POM; Housing: Stainless Steel		
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each		
Shock Resistance	300m/S ² , X/Y/Z Direction for 3 Times Each		
Indicator Light	Yellow when detecting object		
Connection Method	2-meter 3-core standard cable		


Outer Dimension Diagram (Unit:mm)



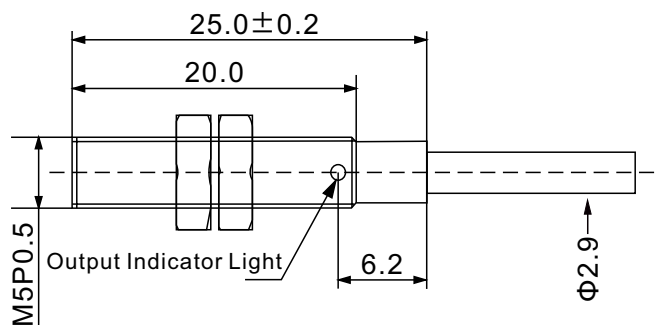
Cylinder M5 Series

Inductive Proximity Sensors

Technical Specifications (For PNP models, please contact the sales representative)

Model	NPN Normally Open	PSX05-1.0NOF	PSX05-1.5NOF
	NPN Normally Closed	PSX05-1.0NCF	PSX05-1.5NCF
Appearance			
Mounting Method	Flush		
Sensing Distance	1.0mm		1.5mm
Repeat Accuracy	<1%(Sr)		
Hysteresis (Discrimination Distance)	<15%(Sr)		
Response Frequency	2000Hz		
Operating Voltage	DC10~30V±10%		
Residual Voltage (Drop Voltage)	<1.5V		
Maximum Load Current	100mA		
Consumption (Idle) Current	<10mA		
Temperature Drift	<10%		
Ambient Temperature	Operating: -25°C~70°C; Storage: -40°C~85°C, No Freezing		
Ambient Humidity	35%~85%Rh, No Condensation		
Protection Circuit	Reverse Polarity Protection/Surge Protection/Short Circuit Protection		
Protection Level	IP67		
Material	Sensing Face: POM; Housing: Stainless Steel		
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each		
Shock Resistance	300m/S ² , X/Y/Z Direction for 3 Times Each		
Indicator Light	Yellow when detecting object		
Connection Method	2-meter 3-core standard cable		

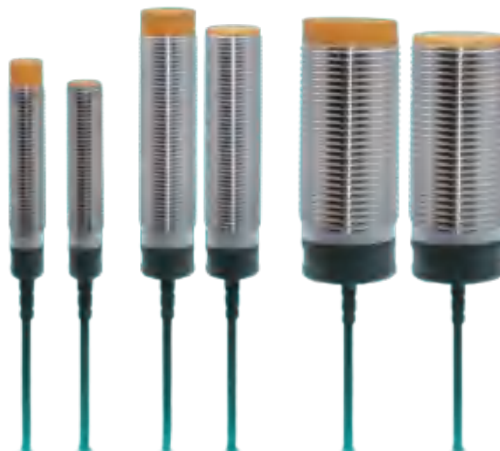
Outer Dimension Diagram (Unit:mm)



Cylindrical Proximity Sensors

PEB-M

Three-wire Type



Complete Variety

Product specifications and dimensions are complete, and models can be selected based on installation requirements.

Quality Assurance

Uses a dedicated IC for a longer lifespan.

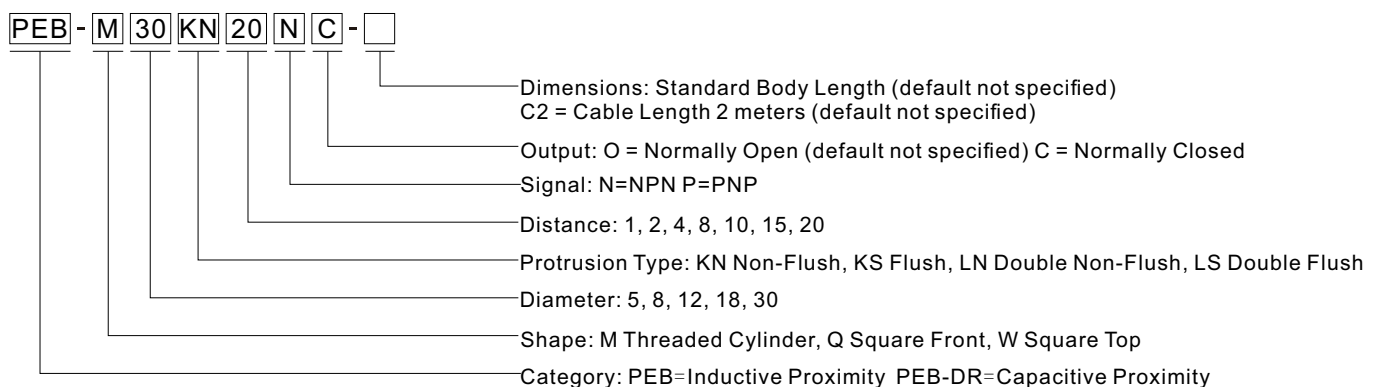
Protection Circuit

Surge protection circuit, short-circuit protection, reverse polarity protection.

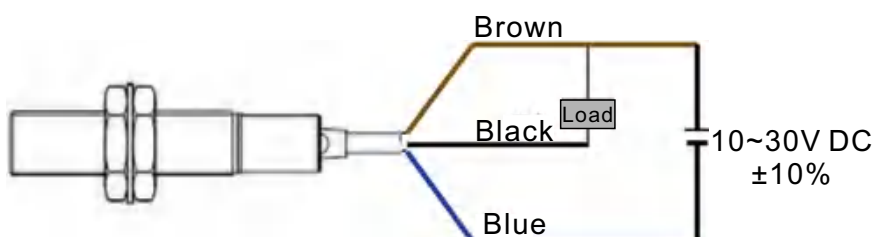
Protection Level IP67

Achieves an IP67 protective structure, with excellent water and oil resistance.

Selection Rules








Connection Diagram



Type

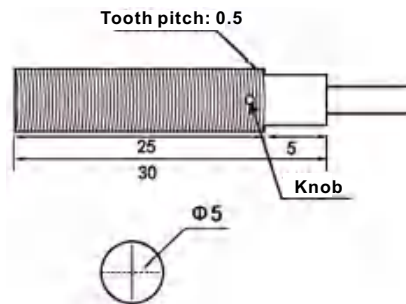
Standard Distance Type	Type	Size	Sensing Distance	NPN Type		PNP Type		Output Action
	Non-Flush	M5	1mm	PEB-M05KS01N		PEB-M05KS01P		Normally Open
				PEB-M05KS01NC		PEB-M05KS01PC		Normally Closed
	Flush	M8	1.5mm	PEB-M08KS01N		PEB-M08KS01P		Normally Open
				PEB-M08KS01NC		PEB-M08KS01PC		Normally Closed
	Non-Flush	M8	2mm	PEB-M08KN02N		PEB-M08KN02P		Normally Open
				PEB-M08KN02NC		PEB-M08KN02PC		Normally Closed
	Flush	M12	2mm	PEB-M12KS02N		PEB-M12KS02P		Normally Open
				PEB-M12KS02NC		PEB-M12KS02PC		Normally Closed
	Non-Flush	M12	4mm	PEB-M12KN04N		PEB-M12KN04P		Normally Open
				PEB-M12KN04NC		PEB-M12KN04PC		Normally Closed
	Flush	M18	4mm	PEB-M18KS04N		PEB-M18KS04P		Normally Open
				PEB-M18KS04NC		PEB-M18KS04PC		Normally Closed
	Non-Flush	M18	8mm	PEB-M18KN08N		PEB-M18KN08P		Normally Open
				PEB-M18KN08NC		PEB-M18KN08PC		Normally Closed
	Flush	M30	10mm	PEB-M30KS10N		PEB-M30KS10P		Normally Open
				PEB-M30KS10NC		PEB-M30KS10PC		Normally Closed
	Non-Flush	M30	16mm	PEB-M30KN16N		PEB-M30KN16P		Normally Open
				PEB-M30KN16NC		PEB-M30KN16PC		Normally Closed

Product Parameters

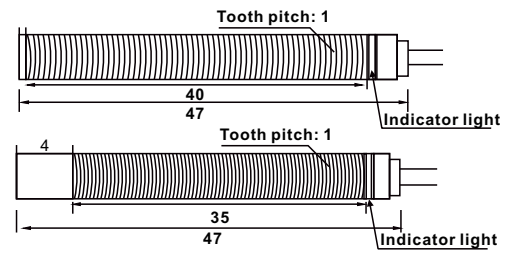
<div>Model</div> <div>Item</div>		Type				
						
		PEB-M05KS	PEB-M08KS PEB-M08KN	PEB-M12KS PEB-M12KN	PEB-M18KS PEB-M18KN	PEB-M30KS PEB-M30KN
Outer Diameter Size		5mm	8mm	12mm	18mm	30mm
Sensing Distance		1.0mm±10%	1.0mm±10% 2mm±10%	2mm±10% 4mm±10%	4mm±10% 8mm±10%	8mm±10% 15mm±10%
Set Distance		0~1.2mm	0~1.2mm 0~1.6mm	0~1.6mm 0~4mm	0~4mm 0~8mm	0~8mm 0~14mm
Detection Object (Iron)		8x8x1mm	8x8x1mm 12x12x1mm	12x12x1mm 18x18x1mm	18x18x1mm 30x30x1mm	30x30x1mm 54x54x1mm
Response Frequency		1KHZ	1KHZ	1KHZ	1KHZ / 500HZ	500HZ
Repeatability		0.01mm				
Detection Object		Magnetic Metal (Non-magnetic metal detection distance is reduced)				
Contrast Distance		Less than 10% of detection distance				
Power Supply Voltage		10~30VDC				
Power Consumption		Below 10mA				
Control Output		Load power supply current below 100mA (residual voltage below 1V)				
Indicator Light		Action indicator light (red)				
Action Pattern		NO: Normally Open NC: Normally Closed				
Protective Circuit		Surge protection circuit, short circuit protection, reverse polarity protection				
Ambient Temperature		Operating: -25-+70°C Storage: -40-85°C (no freezing)				
Ambient Humidity		Operating, Storage: each 35-90% RH (no dew)				
Temperature Effect		Temperature range -25~70°C, detection distance varies ±15% for every 23°C change				
Voltage Effect		Detection distance varies +1% within ±15% fluctuation of rated supply voltage range				
Insulation Resistance		Over 50MΩ (DC 500V Megger) between charging unit and housing				
Dielectric Strength		Over AC 1000V at 50/60Hz for 1 minute between charging unit and housing				
Vibration (Endurance)		10~55Hz, 1.5mm double amplitude, in X, Y, Z directions for 2 hours				
Shock (Endurance)		500m/s ² double amplitude, in X, Y, Z directions for 10 times				
Protective Structure		IP67				
Connection Type		Cable lead type (standard 2m)				
Material	Housing	Copper plated				
	Detection Surface	PBT				
	Fastening Nut	Brass plated				
	Toothed Washer	Iron plating				

Size drawing (Unit: mm)

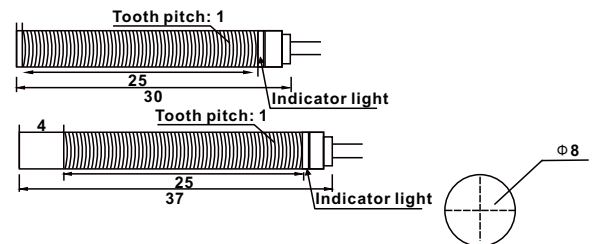
PEB-M05KS/KN



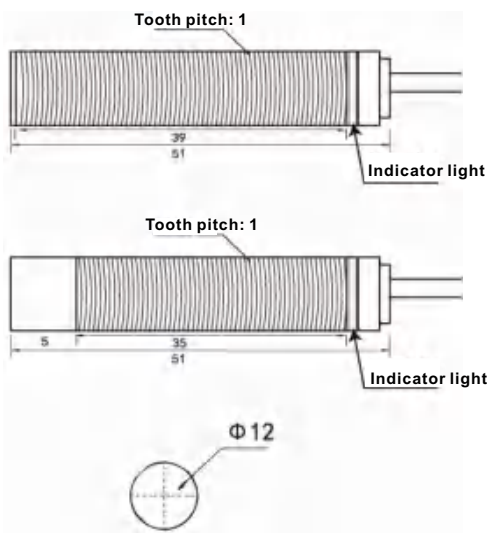
PEB-M08KS/KN



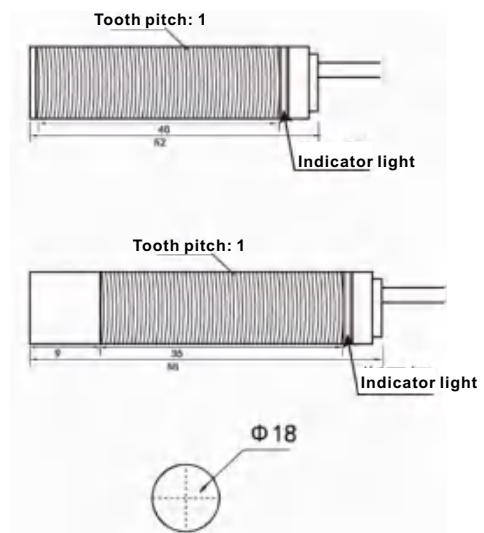
Short type -D:



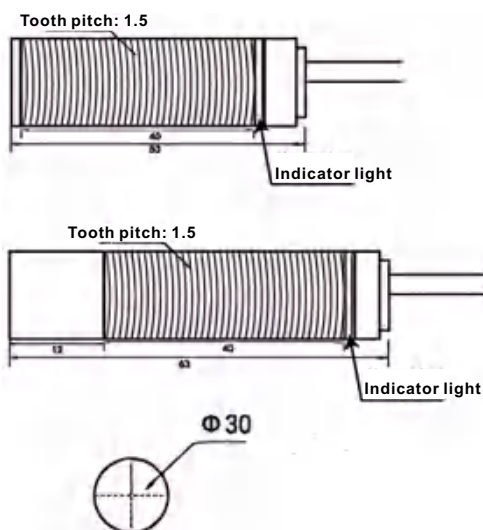
PEB-M12KS/KN



PEB-M18KS/KN

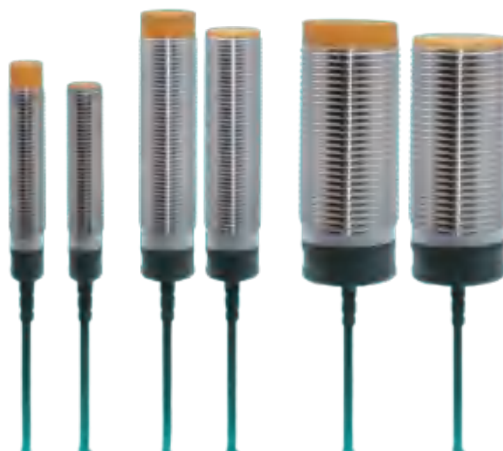


PEB-M30KS/KN



Cylindrical Proximity Sensors

PEB-M Double Distance



Complete Variety

Product specifications and dimensions are complete, and models can be selected based on installation requirements.

Quality Assurance

Uses a dedicated IC for a longer lifespan.

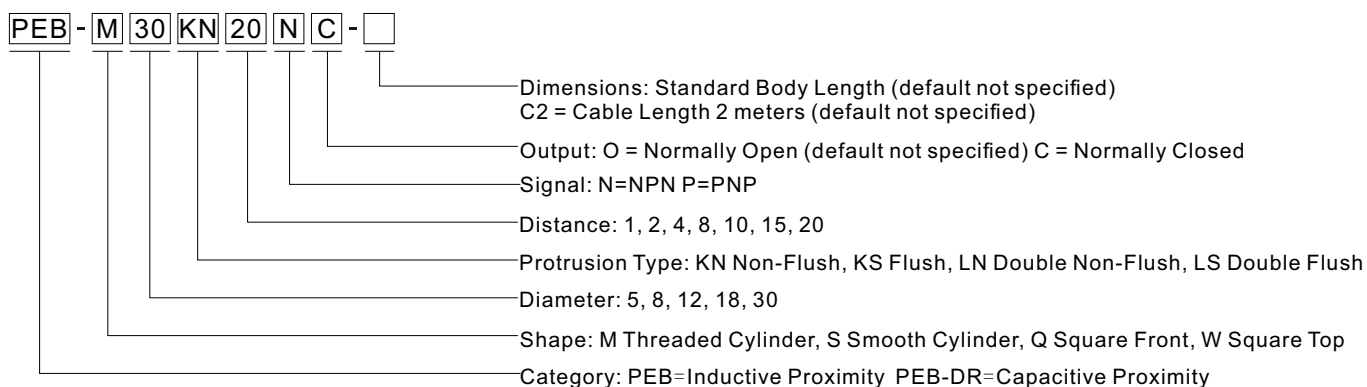
Protection Circuit

Surge protection circuit, short-circuit protection, reverse polarity protection.

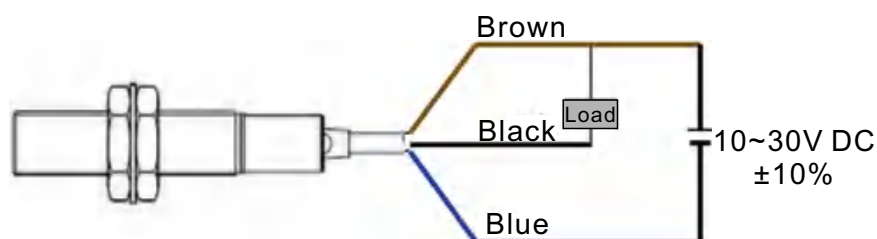
Protection Level IP67

Achieves an IP67 protective structure, with excellent water and oil resistance.

Selection Rules



Connection Diagram



Type

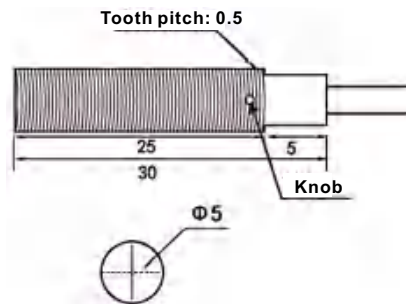
Double Distance Type	Type	Size	Sensing Distance	NPN Type		PNP Type		Output Action
	Flush	M5	1.5mm	PEB-M05LS015N		PEB-M05LS015P		Normally Open
				PEB-M05LS015NC		PEB-M05LS015PC		Normally Closed
	Flush	S6	2mm	PEB-S06LS02N		PEB-S06LS02P		Normally Open
				PEB-S06LS02NC		PEB-S06LS02PC		Normally Closed
	Non-Flush	S6	4mm	PEB-S06LN04N		PEB-S06LN04P		Normally Open
				PEB-S06LN04NC		PEB-S06LN04PC		Normally Closed
	Flush	M8	2mm	PEB-M08LS02N		PEB-M08LS02P		Normally Open
				PEB-M08LS02NC		PEB-M08LS02PC		Normally Closed
	Non-Flush	M8	4mm	PEB-M08LN04N		PEB-M08LN04P		Normally Open
				PEB-M08LN04NC		PEB-M08LN04PC		Normally Closed
	Flush	M12	4mm	PEB-M12LS04N		PEB-M12LS04P		Normally Open
				PEB-M12LS04NC		PEB-M12LS04PC		Normally Closed
	Non-Flush	M12	8mm	PEB-M12LN08N		PEB-M12LN08P		Normally Open
				PEB-M12LN08NC		PEB-M12LN08PC		Normally Closed
	Flush	M18	8mm	PEB-M18LS08N		PEB-M18LS08P		Normally Open
				PEB-M18LS08NC		PEB-M18LS08PC		Normally Closed
	Non-Flush	M18	15mm	PEB-M18LN15N		PEB-M18LN15P		Normally Open
				PEB-M18LN15NC		PEB-M18LN15PC		Normally Closed
	Flush	M30	15mm	PEB-M30LS15N		PEB-M30LS15P		Normally Open
				PEB-M30LS15NC		PEB-M30LS15PC		Normally Closed
	Non-Flush	M30	25mm	PEB-M30LN25N		PEB-M30LN25P		Normally Open
				PEB-M30LN25NC		PEB-M30LN25PC		Normally Closed

Product Parameters

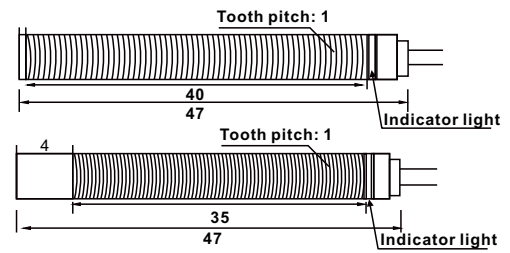
Model 	
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Size drawing (Unit: mm)

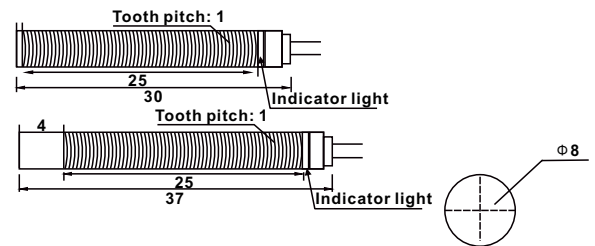
PEB-M05LS/LN



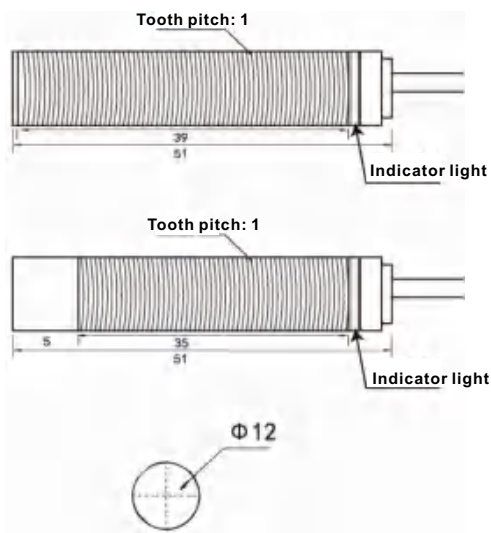
PEB-M08LS/LN



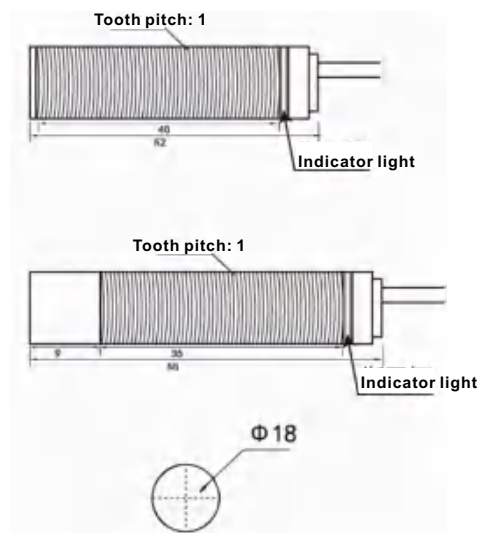
Short type -D:



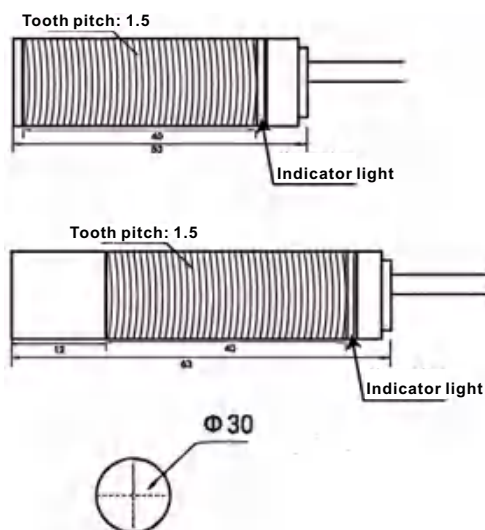
PEB-M12LS/LN



PEB-M18LS/LN









PEB-M30LS/LN



Square Series

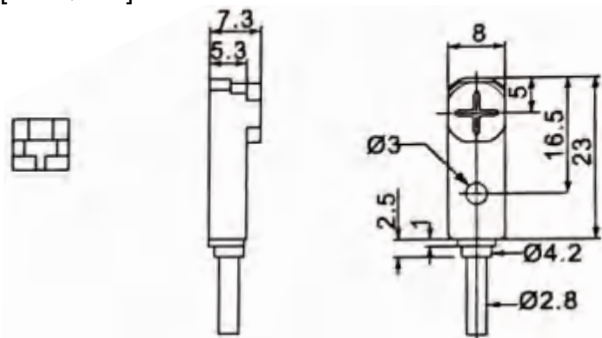
Inductive Sensors

Technical Specifications (For PNP models, please contact the sales representative)

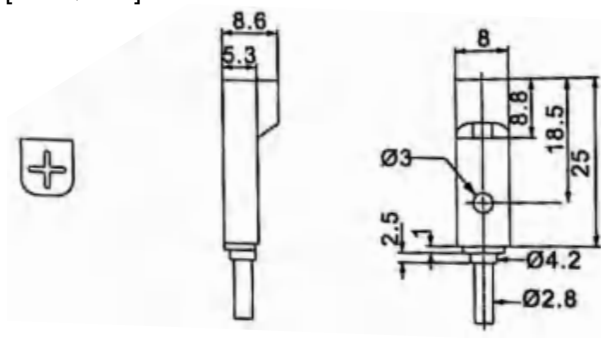
Model	NPN Normally Open	PSQ08F-2.5NON	PSQ08H-2.5NON	PSQ12F-04NON	PSQ12H-04NON	PSQ15F-04NON	PSQ15H-04NON
	NPN Normally Closed	PSQ08F-2.5NCN	PSQ08H-2.5NCN	PSQ08F-04NCN	PSQ12H-04NCN	PSQ15F-04NCN	PSQ15H-04NCN
Appearance							
Mounting Method		Non-Flush					
Sensing Surface		Front	Head	Front	Head	Front	Head
Sensing Distance		2.5mm		4.0mm		5.0mm	
Repeat Accuracy		<3%(Sr)					
Hysteresis (Discrimination Distance)		<20%(Sr)					
Response Frequency		500Hz					
Operating Voltage		DC10~30V±10%					
Residual Voltage (Drop Voltage)		<1.0V					
Maximum Load Current		100mA					
Consumption (No Load) Current		<15mA					
Temperature Drift		<10%					
Ambient Temperature		Operating: -25°C~75°C; Storage: -40°C~85°C, No Freezing					
Ambient Humidity		35%~85%Rh, No Condensation					
Protective Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection					
Protection Level		IP67					
Material		PBT					
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each					
Shock Resistance		300m/S², X/Y/Z Direction for 3 Times Each					
Indicator Light		Red when detecting an object					
Connection Method		2-meter 3-core standard cable, customizable length					

Outer Dimension Diagram (Unit:mm)

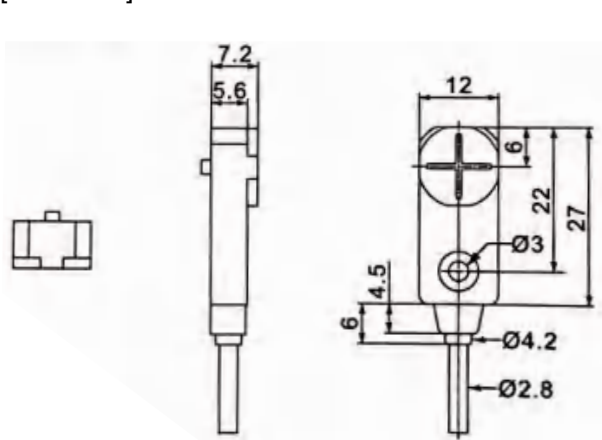
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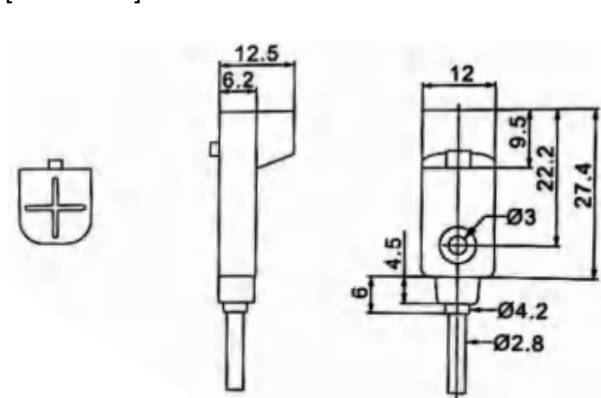
[PSQ08H]



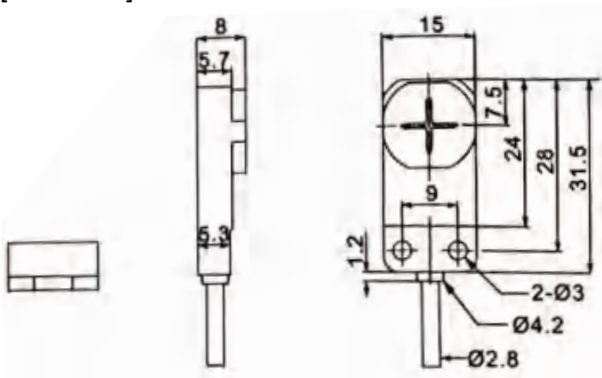
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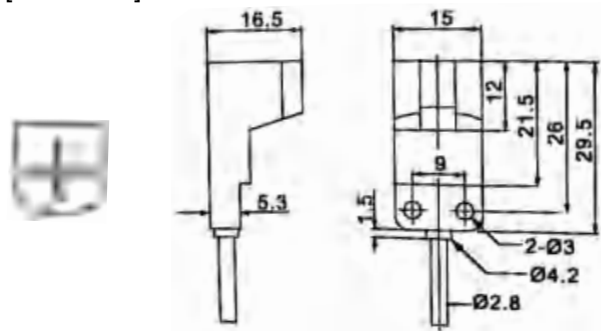
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[PSQ12F]






[PSQ12H]



Square Series

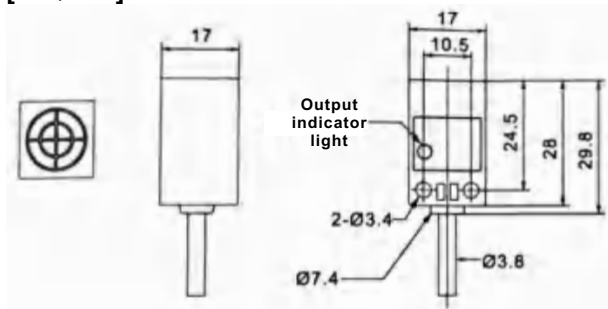
Inductive Sensors

Technical Specifications (For PNP models, please contact the sales representative)

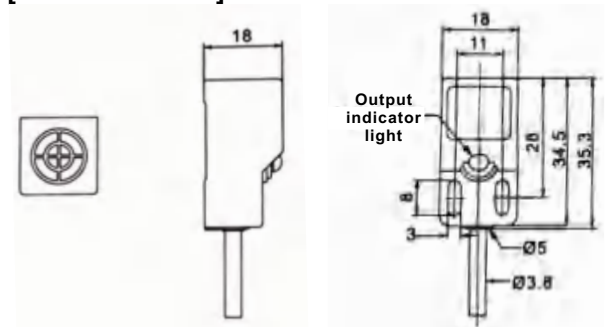
Model	NPN Normally Open	PQS05-N	PSN04-N	PSN08-N	PSND05-N
Appearance					
Mounting Method		Flush	Flush	Non-Flush	Flush
Sensing Distance		5.0mm	4.0mm	8.0mm	4.0mm
Repeat Accuracy		<3%(Sr)			
Hysteresis (Discrimination Distance)		<20%(Sr)			
Response Frequency		1000Hz			
Operating Voltage		DC10~30V±10%			
Residual Voltage (Drop Voltage)		<1.5V			
Maximum Load Current		100mA			
Consumption (No Load) Current		<10mA			
Temperature Drift		<10%			
Ambient Temperature		Operating: -25°C~75°C; Storage: -40°C~85°C, No Freezing			
Ambient Humidity		35%~85%Rh, No Condensation			
Protective Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection			
Protection Level		IP67			
Material		PBT			
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Direction for 30 Minutes Each			
Shock Resistance		300m/S², X/Y/Z Direction for 3 Times Each			
Indicator Light		Red when detecting an object			
Connection Method		2-meter 3-core standard cable, customizable length			

Outer Dimension Diagram (Unit:mm)

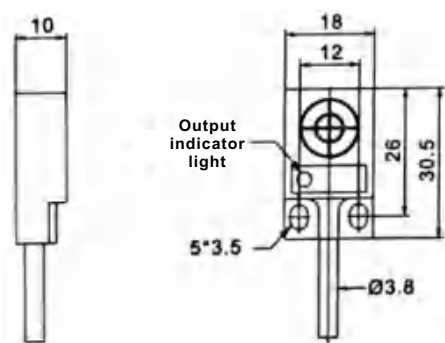
[PQS05]



[PSN04/PSN08]



[PSND05]



Annular Proximity Sensors

PEB-C

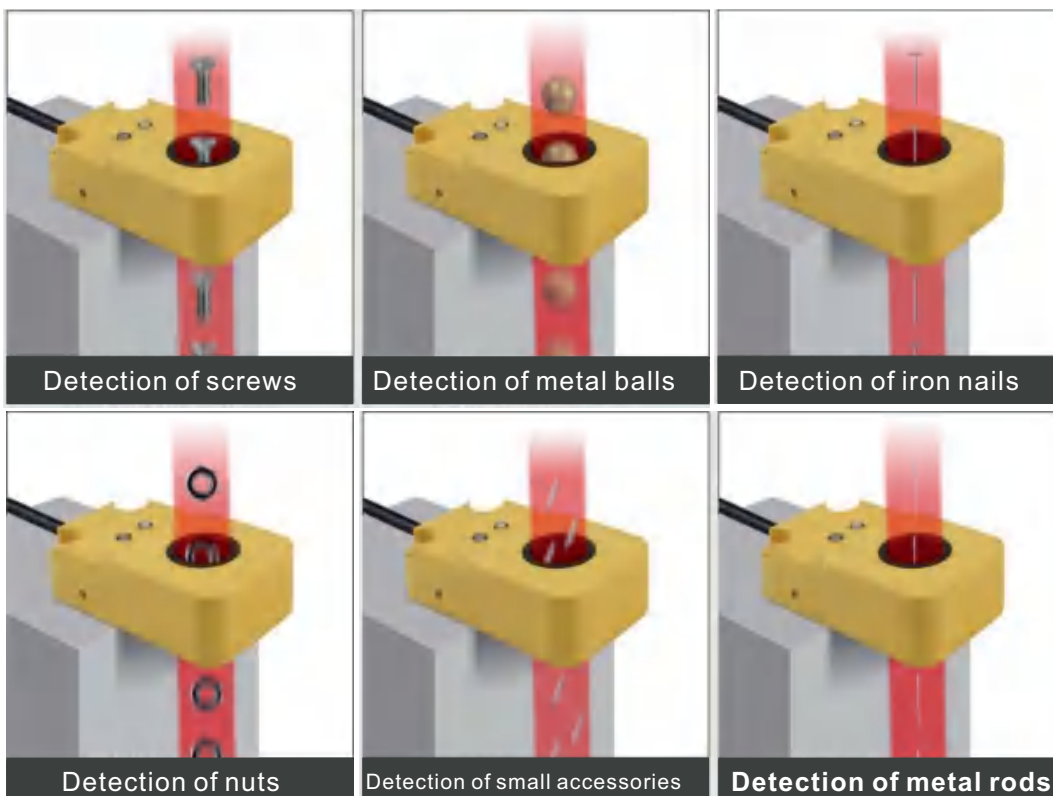
Three-Wire Type






Features

- ▶ Non-contact position detection, wear-free, high reliability.
- ▶ High sensitivity, high repeatability, and a product lifespan of up to 8 years.
- ▶ A variety of housing materials, from stainless steel, nickel-copper alloy to plastic, and Teflon coating are all available.
- ▶ Comprehensive range of specifications and sizes covering almost all dimensions
- ▶ Designed with IP67 protection rating for excellent water and oil resistance

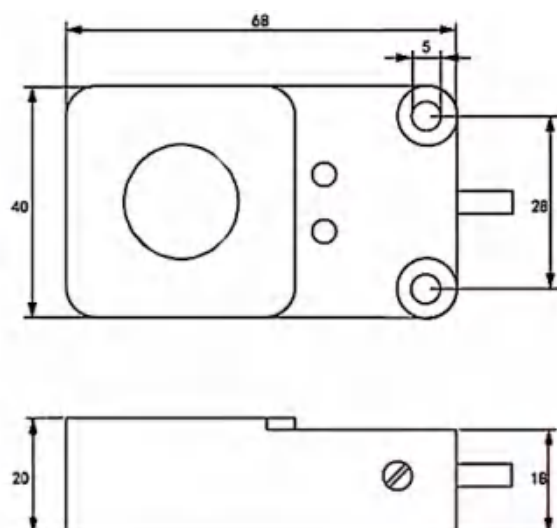
Application scenarios



Product Parameters

Appearance			
Model	PEB-C06	PEB-C10	PEB-C15
Hole Diameter	6mm	10mm	15mm
Hole Height	20mm		
Operating Voltage	10~30VDC (Voltage Fluctuation <10%)		
Residual Voltage	<1.5V		
Maximum Load Current	150mA		
Consumption Current	<15mA		
Leakage Current	<10mA		
Switching Frequency	2KHz	1.5KHz	1KHz
Minimum Detectable Object	D=2.5mm;L=4mm	D=3mm;L=6mm	D=6mm;L=12mm
Repeatability	<2.0% (Sr)		
Hysteresis	<15% (Sr)		
Housing Material	PBT		
Operating Temperature	-25°C to +75°C		
Protective Circuit	Short Circuit Protection / Reverse Polarity Protection		
Protection Rating	IP67		

Dimension Diagram (Unit:mm)



Cylindrical Type - CK Series

Resin housing

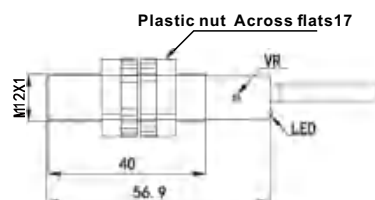


Basic Features	Working Principle	Capacitive Sensor					
	Housing Style	Cylindrical					
	Mounting Method	Flush			Non-flush		
	Detection Distance	3.0mm	8.0mm	20mm	6.0mm	15mm	30mm
	Thread Specification	M12	M18	M30	M12	M18	M30
	Sensing Surface Material	PBT					
	Detectable Objects	Metals, liquids, powders, wood, paper, plastic, and other materials					
	Indicator Light	Operating status: LED					
	Detection Distance Adjustment	Yes					
	Switch Mode	NO: Normally Open, NC: Normally Closed					
Electrical Data	Output Mode	NPN or PNP Open Collector					
	External Input	None					
	Switching Frequency	0.1kHz					
	Repeatability	5%					
	Hysteresis (Dead Band/Response Difference)	15%					
	Operating Voltage	10~30V DC±10%					
	Consumption Current	≤10mA					
	Residual Voltage	≤2V					
	Load Current	150mA	300mA	150mA	300mA		
	Leakage Current	<0.01mA					
	Insulation Resistance	Between power terminal and housing ≥50MΩ(500VDC)					
	Withstand Voltage	1000VAC(50/60Hz), 1 minute between power terminal and housing					
	Vibration Resistance	10~55Hz, amplitude 1.5mm, X/Y/Z axes, 2 hours each					
	Protective Circuit	Short Circuit Protection					
Environmental Conditions	Operating Ambient Temperature	-25~75℃					
	Operating Ambient Humidity	35~85%					
	Protection Rating	IP67					
Mechanical Data	Connection Method	2m/3-wire cable					
	Dimensions	M12x56.9mm	M18x72.5mm	M30x87.0mm	M12x61.4mm	M18x76.0mm	M30x85.0mm
	Material	PBT					
	Weight	0.05kg	0.08kg	0.12kg	0.05kg	0.08kg	0.12kg
	Accessories	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5
Model	NPN Normally Open	PCKF12-03NO	PCKF18-08NO	PCKF30-20NO	PCKN12-06NO	PCKN18-15NO	PCKN30-30NO
	Other	NO: NPN Normally Open NC: NPN Normally Closed PO: PNP Normally Open PC: PNP Normally Closed					

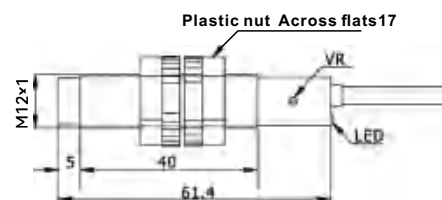
Size drawing (Unit: mm)

M12

PCKF 12-03 ☐ ☐

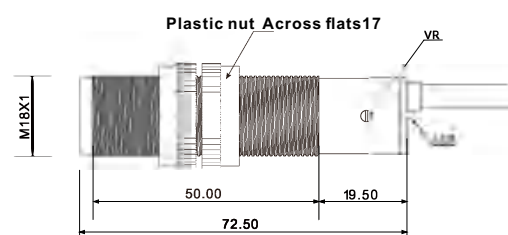


PCKN12-06 ☐ ☐

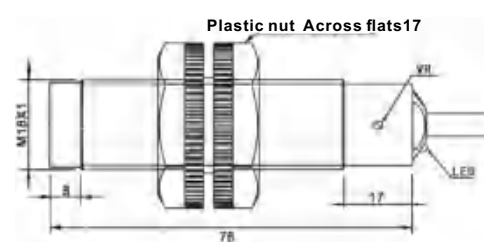


M18

PCKF 18-08 ☐ ☐

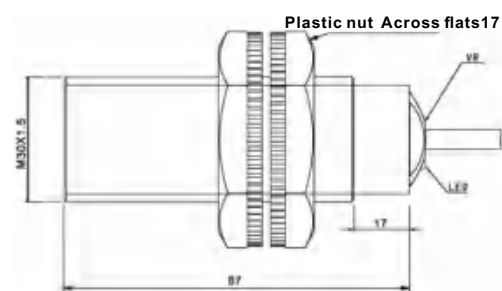


PCKN18-15 ☐ ☐

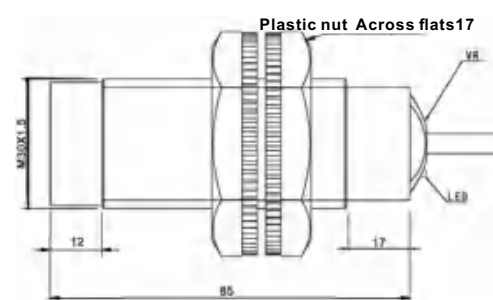


M30

PCKF 30-20 ☐ ☐



PCKN30-30 ☐ ☐



Flat Type - CQ Series

Cable Style



Basic Features	Working Principle	Capacitive Sensor	
	Housing Style	Flat block	
	Mounting Method	-	
	Detection Distance	5.0mm	15mm
	Thread Specification	-	
	Sensing Surface Material	-	
	Detectable Objects	Metals, liquids, powders, wood, paper, plastic, and other materials	
	Indicator Light	Operating status: LED	
	Detection Distance Adjustment	Yes	
	Switch Mode	NO: Normally Open, NC: Normally Closed	
Electrical Data	Output Mode	NPN or PNP Open Collector	
	External Input	None	
	Switching Frequency	0.1kHz	
	Repeatability	5%	
	Hysteresis (Dead Band/Response Difference)	-	
	Operating Voltage	24V DC±10%	
	Consumption Current	≤10mA	
	Residual Voltage	≤1.5V	
	Load Current	≤150mA	
	Leakage Current	<0.01mA	
	Insulation Resistance	Between power terminal and housing ≥50MΩ(500VDC)	
	Withstand Voltage	1000VAC(50/60Hz), 1 minute between power terminal and housing	
	Vibration Resistance	10~55Hz, amplitude 1.5mm, X/Y/Z axes, 2 hours each	
	Protective Circuit	Reverse Polarity Protection / Short Circuit Protection / Pulse Overvoltage Protection	
Environmental Conditions	Operating Ambient Temperature	-30~75℃	
	Operating Ambient Humidity	35~85%	
	Protection Rating	IP67	
Mechanical Data	Connection Method	2m/3-wire cable	
	Dimensions (LxWxH)	50.6x30.3x7.0mm	
	Material	Plastic	
	Weight	0.05kg	
	Accessories	-	
Model	NPN Normally Open	PCQ07-05N□	PCQ07-10N□
	Other	N□: NPN Normally Open NC: NPN Normally Closed PO: PNP Normally Open PC: PNP Normally Closed	

Flat Type - CQ Series

Cable Style



CE

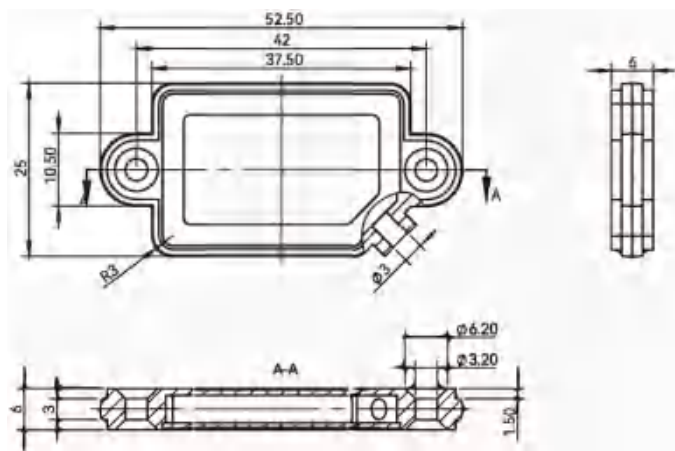


Basic Features	Working Principle	Capacitive Sensor
	Housing Style	Flat block
	Mounting Method	Flush
	Detection Distance	8.0mm
	Thread Specification	–
	Sensing Surface Material	–
	Detectable Objects	Metals, liquids, powders, wood, paper, plastic, and other materials
	Indicator Light	Operating status: LED
	Detection Distance Adjustment	Yes
	Switch Mode	NO: Normally Open, NC: Normally Closed
Electrical Data	Output Mode	NPN or PNP Open Collector
	External Input	None
	Switching Frequency	0.035kHz
	Repeatability	1%
	Hysteresis (Dead Band/Response Difference)	10%
	Operating Voltage	10~30V DC±10%
	Consumption Current	≤10mA
	Residual Voltage	≤1.5V
	Load Current	≤150mA
	Leakage Current	<0.01mA
	Insulation Resistance	Between power terminal and housing ≥50MΩ(500VDC)
	Withstand Voltage	1000VAC(50/60Hz), 1 minute between power terminal and housing
	Vibration Resistance	10~55Hz, amplitude 1.5mm, X/Y/Z axes, 2 hours each
	Protective Circuit	Reverse Polarity Protection / Short Circuit Protection / Surge Protection
Environmental Conditions	Operating Ambient Temperature	–10~55℃
	Operating Ambient Humidity	35~85% Relative Humidity
	Protection Rating	IP66
Mechanical Data	Connection Method	2m/3-wire cable
	Dimensions (LxWxH)	48.8x20.0x7.0mm
	Material	Plastic
	Weight	0.05kg
	Accessories	–
Model	NPN Normally Open	PCQ07-08N□
	Other	□: NPN Normally Open □: NPN Normally Closed □: PNP Normally Open □: PNP Normally Closed

Size drawing (Unit: mm)

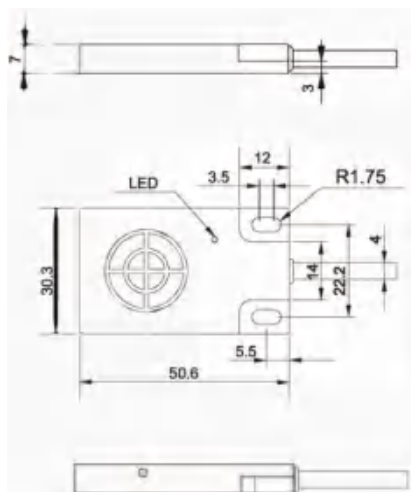
PCQ06-04 N/O

PCQ06-08 N/O

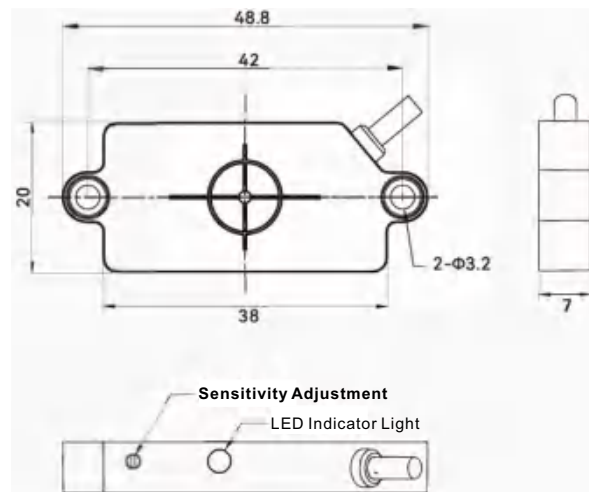


PCQ07-05 N/O

PCQ07-10 N/O



PCQ07-08 N/O



Capacitive Proximity Sensors

PEB-DRF



Features

Can Sense Any Object



Metal conductors

Insulators

Non-metallic plastics

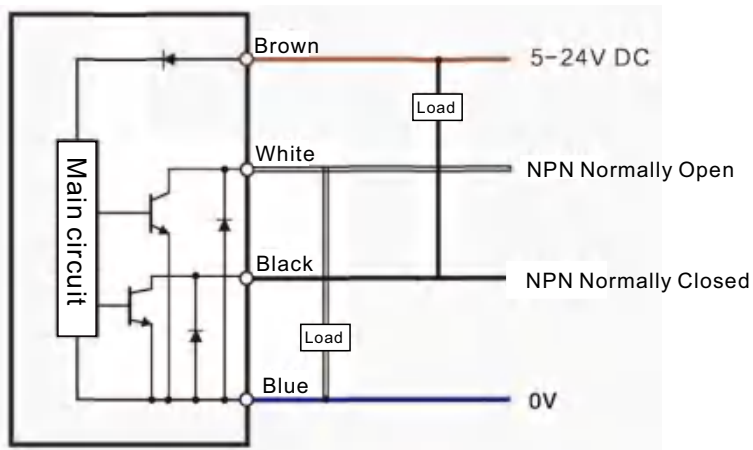
Liquids

- ▶ Adjustable Sensitivity
- ▶ Capable of detecting water, plastic, human body, and all other objects
- ▶ Strong anti-interference, suitable for various complex industrial environments



The detection distance is influenced by the conductivity and dielectric constant of objects made of different materials, leading to variations in distance.

Material	Water	Alcohol	Glass	Wood	Paper	Rubber	Crystal	Nylon
Operating Distance	100%	85%	40%	30%	25%	30%	20%	20%

Circuit

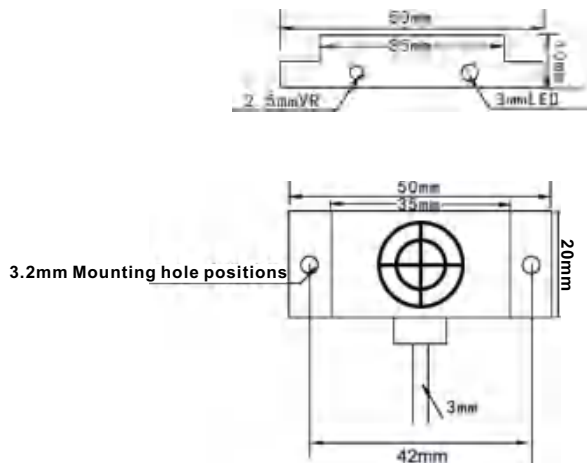


Product Parameters

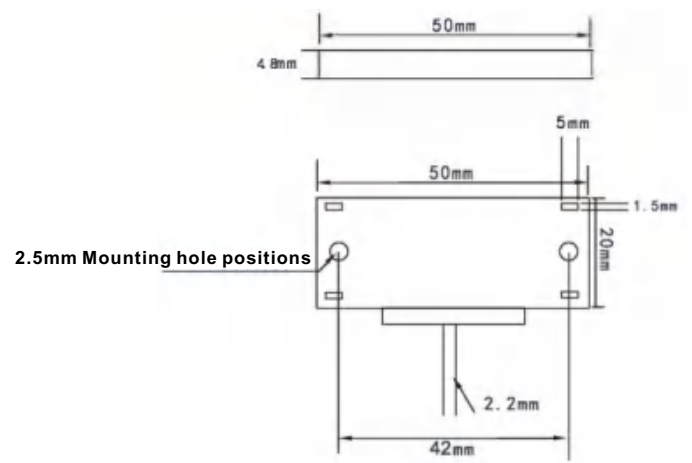
Appearance		
Model	PEB-DRF10	PEB-DRF05
Size	Flat Type, Top Sensing	Flat Type, Top Sensing
Detection Distance	Adjustable from 0~10mm	0~5mm
Detectable Objects	Plastic, Black/Blue	
Operating Voltage	24VDC (Ripple <10%)	
Residual Voltage	$\leq 1.5V@1L=50mA$	
Maximum Load Current	NPN or PNP-NO/NC	
Consumption Current	$\leq 50mA$	
Leakage Current	$\leq 100mA$	
Response Time	100Hz	
Isolation Impedance	<5%	
Hysteresis	0°C~+60°C	
Insulation Withstand Voltage	-30°C~+75°C	
Operating Temperature	$\leq 20\%$	
Protection Level	Reverse Polarity Protection, Pulse Overvoltage Protection, Short Circuit Protection	
Cable Exit Method	IP67	
Weight	50G	

Dimension Diagram (Unit:mm)

PEB-DRF10



PEB-DRF05



Level Detection - CE Series

Cable Style



Basic Features	Working Principle	Capacitive Sensor	
	Housing Style	Square	
	Mounting Method	Non-flush	
	Detection Distance	13mm	26mm
	Thread Specification	-	
	Sensing Surface Material	-	
	Detectable Objects	Metals, liquids, powders, wood, paper, plastic, and other materials	
	Indicator Light	Operating status: Yellow LED	
	Detection Distance Adjustment	Yes	
	Switch Mode	NO: Normally Open, NC: Normally Closed	
Electrical Data	Output Mode	NPN or PNP Open Collector	
	External Input	None	
	Switching Frequency	0.02kHz	
	Repeatability	3%	
	Hysteresis (Dead Band/Response Difference)	20%	
	Operating Voltage	10~30V DC±10%	
	Consumption Current	≤15mA	
	Residual Voltage	≤2.5V	
	Load Current	≤150mA	
	Leakage Current	<0.01mA	
	Insulation Resistance	Between power terminal and housing ≥50MΩ(500VDC)	
	Withstand Voltage	1000VAC(50/60Hz), 1 minute between power terminal and housing	
	Vibration Resistance	10~55Hz, amplitude 1.5mm, X/Y/Z axes, 2 hours each	
	Protective Circuit	Reverse polarity protection/Short circuit protection	
Environmental Conditions	Operating Ambient Temperature	-25~75℃	
	Operating Ambient Humidity	35~85%	
	Protection Rating	IP67	
Mechanical Data	Connection Method	2m PVC cable	
	Dimensions (LxWxH)	44.2x24.4x22.6mm	35.0x33.4x22.4mm
	Material	PBT	
	Weight	0.05kg	
	Accessories	-	
Model	NPN Normally Open	PCE15-13 NO	PCE30-26 NO
	Other	NO : NPN Normally Open NC : NPN Normally Closed PO : PNP Normally Open PC : PNP Normally Closed	

Photoelectric Liquid Level Sensors

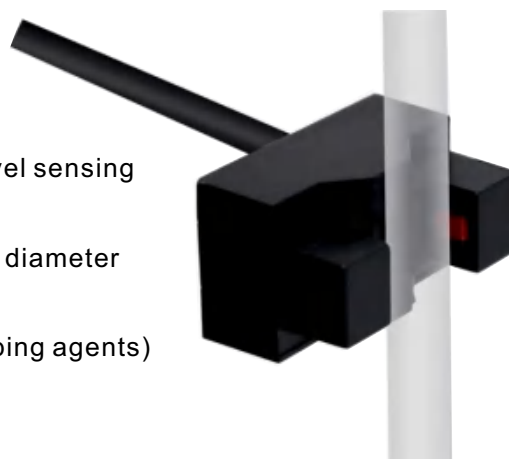
PE3F


Photoelectric Type



Features

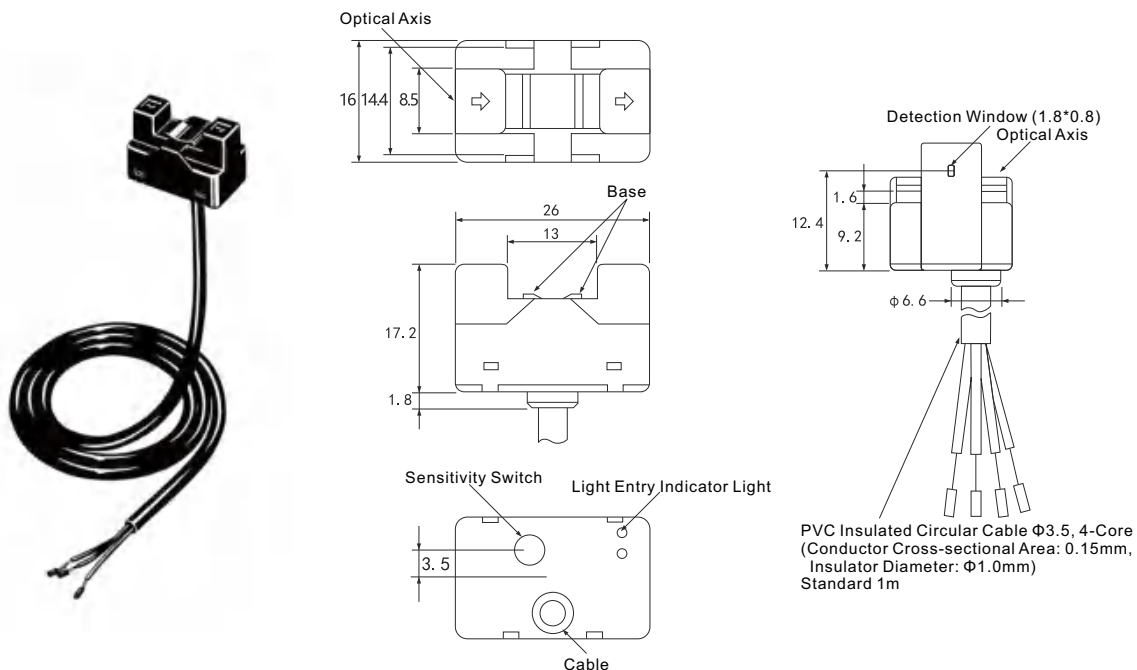
- Equipped with output action switching function and sensitivity switching function for more convenient liquid level sensing
- One-click setup makes the sensor smarter
- Suitable for transparent and semi-transparent tubes with a diameter of $\phi 6 \sim 13\text{mm}$ and a thickness of 1mm
- Uses environmentally friendly cables (free of powder stripping agents)



Shape	Detection Method	Output Type	Action Mode	Cable Length	Model
	Opposite Emission	NPN	ON when light is blocked ON when light enters	2m	PE3F-SPX613
		PNP			PE3F-SPX613P



Product Parameters

Model	PE3F-SPX613	
Applicable Tube	Transparent tubes with an outer diameter of 6~13mm (thickness 1mm) (made of FEP (fluororesin) or materials with equivalent transparency)	
Standard Detection Object	Liquid inside the tube (may not be detectable if the liquid has high viscosity or contains suspended solids)	
Light Source (Maximum Emission Wavelength)	GaAs infrared light-emitting diode (940nm)	
Action Indicator Light	Lights up when light enters (GaP red LED: maximum emission wavelength 700nm)	
Power Supply Voltage	DC12~24V±10% ripple (p-p) less than 5%	
Power Consumption	Average below 30mA, maximum below 80mA	
Control Output	Load power supply voltage DC5~24V, load current below 100mA NPN open collector output type	
Ambient Illuminance for Use	Incandescent light, sunlight: each below 3,000lx	
Ambient Temperature Range	Operating: -10~+55°C Storage: -25~+65°C (no freezing, condensation)	
Ambient Humidity Range	Operating: 5~85%RH Storage: 5~95%RH (no condensation)	
Vibration (Endurance)	10~500Hz single amplitude 1.0mm or acceleration 150m/s X, Y, Z each direction 3 times sweep frequency (11min/sweep)	
Shock (Endurance)	500m/s X, Y, Z each direction 3 times	
Protective Structure	IEC specification IP50	
Connection Method	Cable lead-out type (standard cable length 1m)	
Weight (Packaged)	Approximately 55g	
Material	Housing	ABS+PC
	Cover	



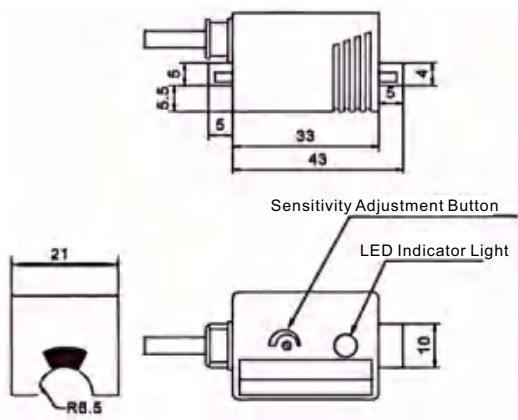
Liquid Level Sensors

Technical Specifications

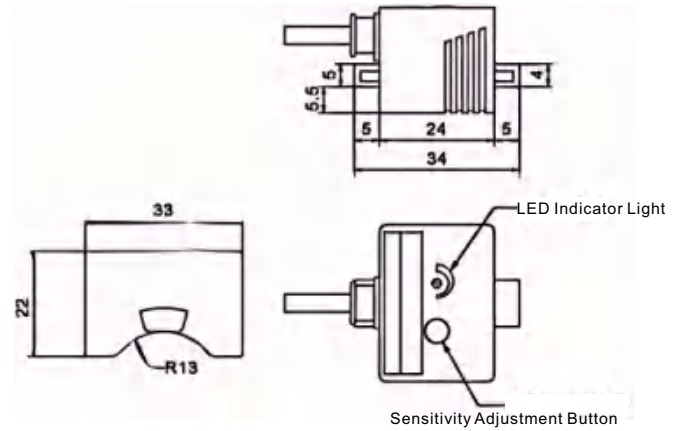
Model		PYW15N	PYW30N
Appearance			
Suitable Pipe	Material	Non-metallic	
	Outer Diameter	Φ06~Φ13mm	Φ14~Φ26mm
	Wall Thickness	<1.5mm	<2mm
Detectable Objects		Liquid	
Repeatability		<0.2mm	
Sensitivity Adjustment		Knob adjustment	
Response Frequency		20Hz	
Output Mode		NPN Open Collector	
Action Mode		Normally Open	
Operating Voltage		DC10~30V±10%	
Residual Voltage (Drop)		<1V	
Consumption (No Load) Current		<12mA	
Ambient Temperature		Operating: -10℃~55℃; Storage: -25℃~70℃, no freezing	
Ambient Humidity		Operating: 35%~85%RH; Storage: 35%~95%RH, no condensation	
Protective Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection	
Protection Level		IP66	
Indicator Light		Action Indicator Light: Red	
Connection Method		Cable lead-out type (3-core, standard cable length 2 meters)	
Housing Material		Heat-resistant ABS	
Vibration Resistance		10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each	
Shock Resistance		300m/S ² , X/Y/Z directions for 3 times each	

Outer Dimension Diagram (Unit:mm)

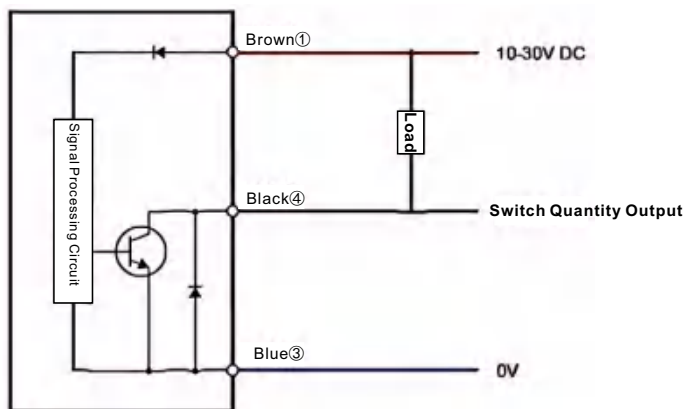
[PYW15N]



[PYW30N]



Circuit Wiring Diagram

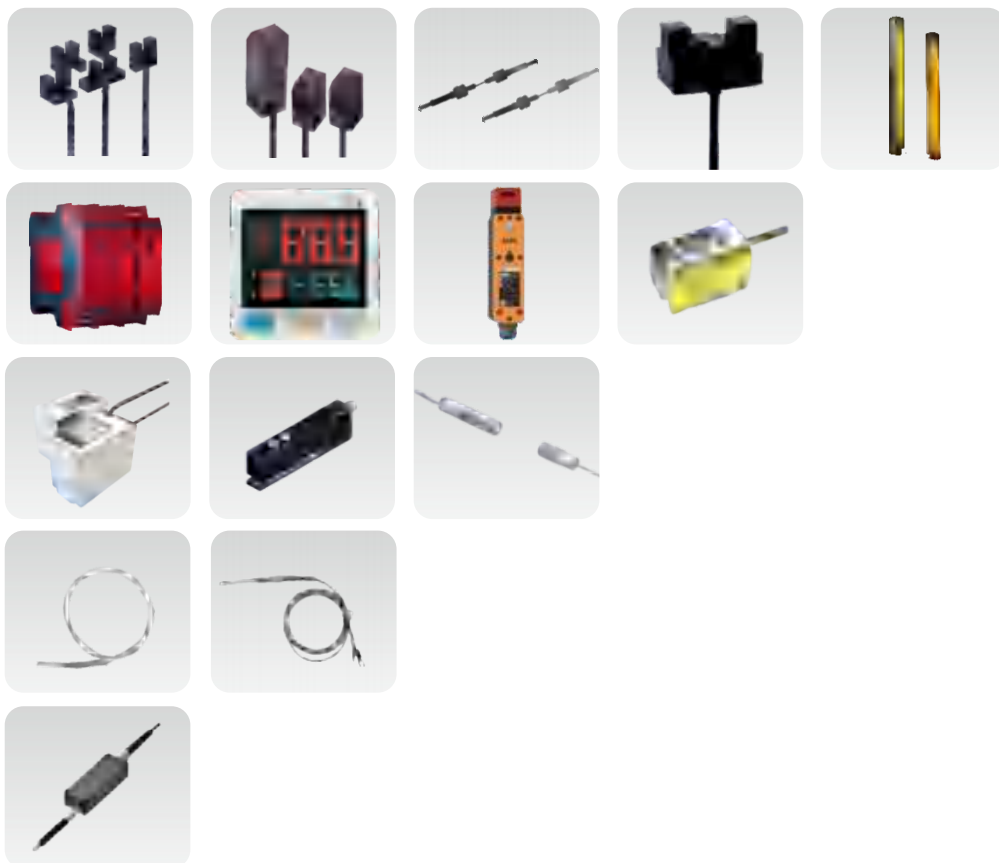


Sensore di settore



Safety Light Curtains

Cortine di luce di sicurezza



Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>

Safety Light Curtains Contents

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Ultra-Thin Safety Light Curtains - LB15	114 - 120
Area Light Curtains - LBD	121 - 129
Plastic Shell Safety Light Curtains - LBT	130- 131



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No-Blind-Zone Safety Light Curtains

LBP

The LBP series light curtain is a no-blind-zone safety light curtain designed according to the EU's level 4 safety standards. It features an MCU redundant design internally, with periodic self-check and mutual-check functions.

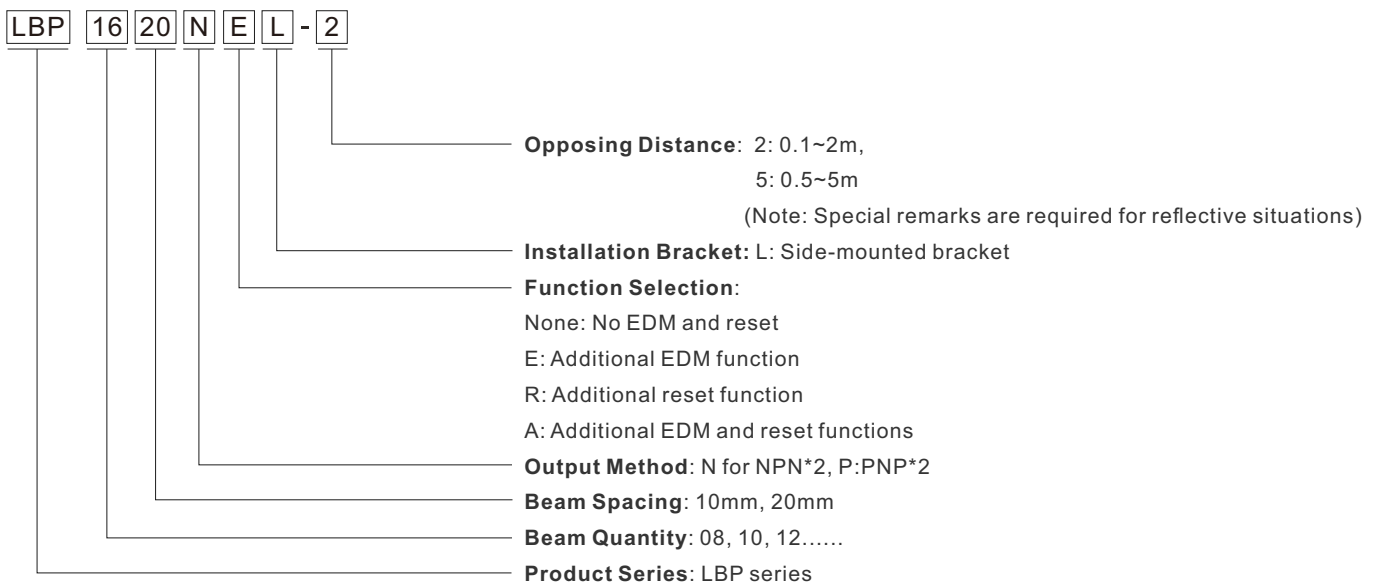
The light curtain uses a redundant dual independent dual-circuit output design, ensuring high safety levels.



Product Features

- Designed according to the IEC 61496 Level 4 standard.
- Employs self-inspection and cross-inspection design: Periodic dual inspections enhance safety.
- Independent redundant dual output: Prevents safety hazards caused by single loop failure.
- Uses line synchronization technology: Effectively avoids interference from external infrared light.

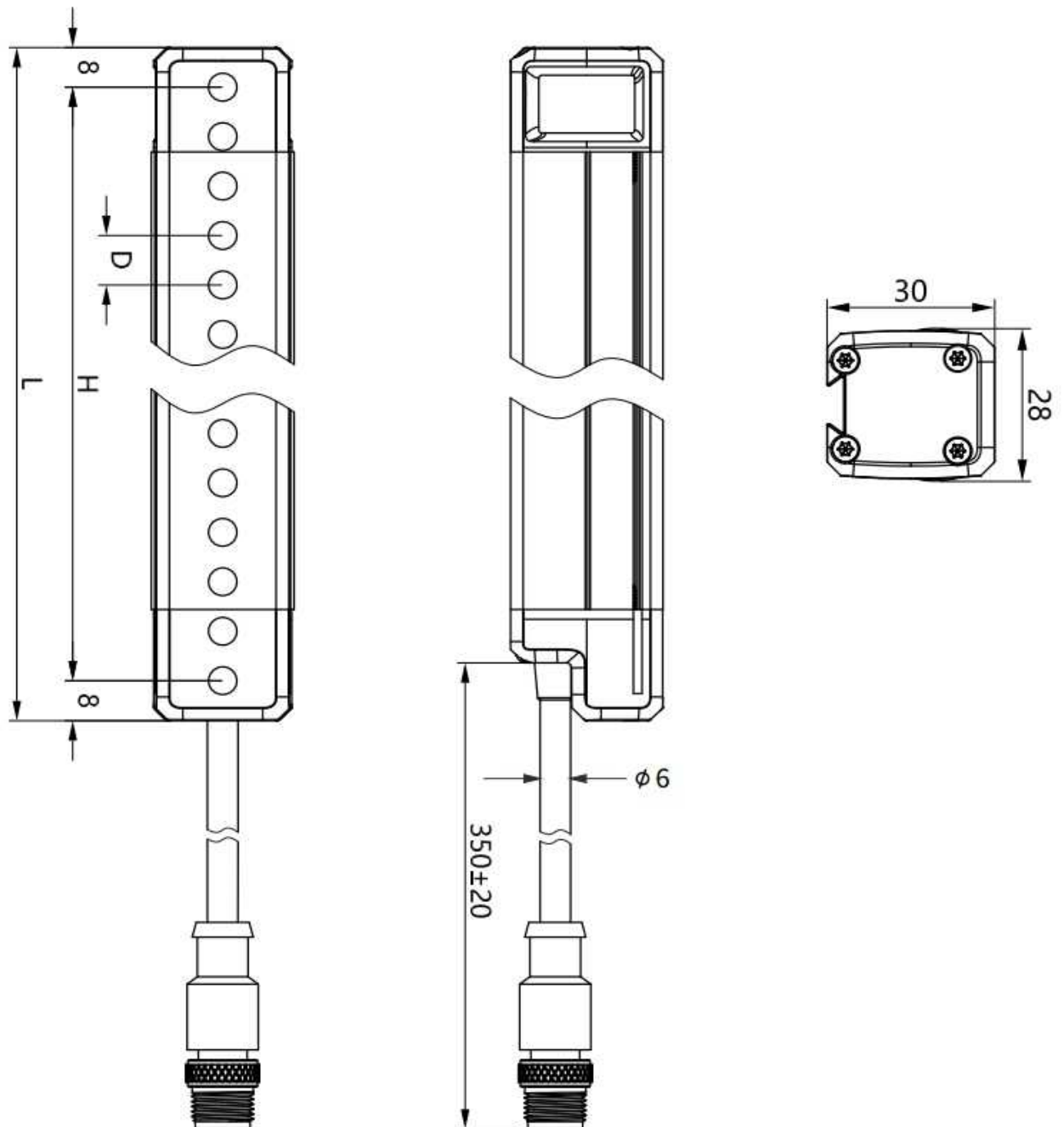
Selection Rules



Product Attributes

Compliance Standards	EN 61496-1 (Type 4 ESPE)
	EN 61496-2 (Type 4 AOPD)
	EN ISO 13849-1 (Category 4, Ple)
Safety Level	Type 4
Power Supply	DC 24V ± 20%
Power Consumption	<5W
Beam Spacing	10mm, 20mm
Resolution	15mm, 25mm
Number of Beams	For 10mm spacing: 16, 20.....160, For 20mm spacing: 8, 10.....80
Protective Height	Protective height $H = (N - 1) * \text{Beam spacing}$, N is the number of beams
Emission Source	940nm
Response Time	Response time = $((N + 1) * 0.1\text{ms}) + 0.4\text{ms}$ (N is the number of beams)
Safety Output (OSSD)	PNP transistor output, load current below 200mA,
	residual voltage below 1V
	(except for voltage drop due to cable extension),
	leakage current below 1mA;
	NPN transistor output, load current below 200mA,
	residual voltage below 1V
	(except for voltage drop due to cable extension),
Protective Circuit	leakage current below 1mA.
	Overvoltage protection on power supply,
	reverse polarity protection, and output overcurrent protection
Opposing Distance	0.1~2m, 0.5~5m(Note:Special remarks required for reflective situations)
Anti-Light Interference	10000Lux (incident angle $I > 2.5^\circ$)
Light Curtain Type	Opposing
Synchronization Method	TypeWire synchronization
Housing Material	Aluminum alloy
Housing Protection Grade	IP6528*30mm
Cross Section Size	Frequency 10Hz~55Hz, amplitude $0.35 \pm 0.05\text{mm}$,
Vibration Resistance	20 cycles in X, Y, and Z directions
Operating Environment Temperature	each-10°C to 55°C (no condensation)
Storage Environment Temperature	-30°C to 70°C (no condensation)
Operating Environment Humidity	At 20°C, relative air humidity < 85%

Product Size Chart



D: Optical Axis Spacing

H: Grating Protection Height

L: Grating Total Height

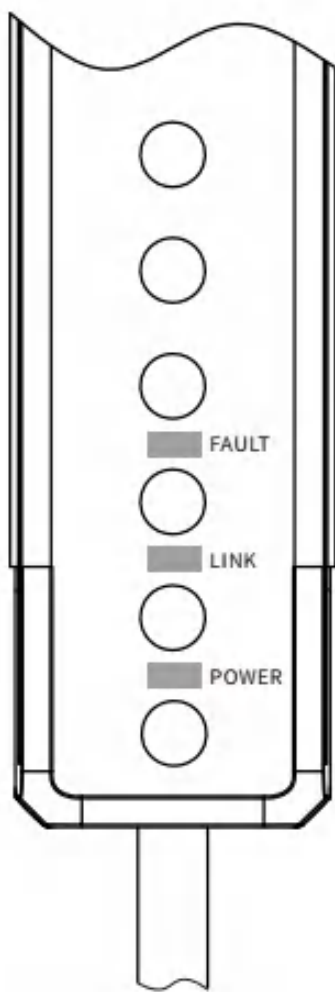
L represents the total height of the grating:

$L = \text{UpperBlindArea} + \text{ProtectionHeight}$

H represents the protection height of the grating:

$H = (\text{NumberOfOpticalAxes} - 1) \times \text{OpticalAxisSpacing}$

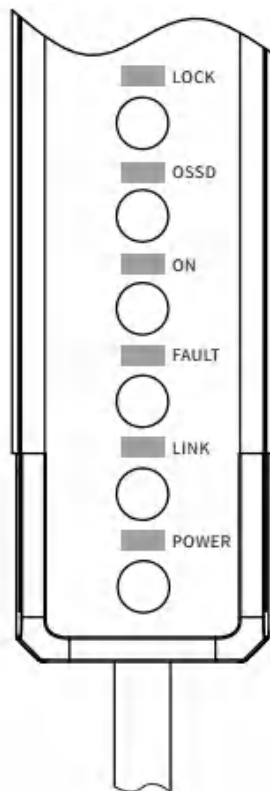
Indicator Light Instructions



Transmitter

Transmitter Indicator Instructions		
Indicator Light	Indicator Light Status	Function Description
POWER (Green)	Lit	Power indicator light working normally
	Off	Internal detection abnormality
	Blinking at 1Hz	Under-voltage
	Blinking at 2Hz	Over-voltage
LINK (Green)	Off	Normal operation
	Blinking at 2Hz	Internal detection abnormality
FAULT (Red)	Lit	Internal detection abnormality
	Off	Normal operation
	Blinking at 2Hz	Internal detection abnormality

Indicator Light Instructions




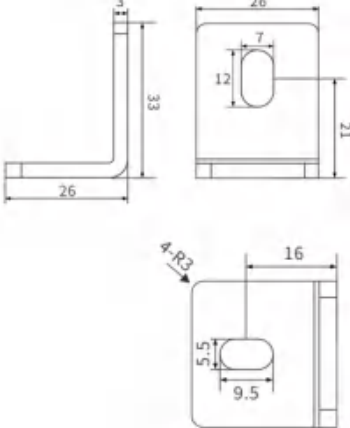
Receiver

Receiver Indicator Instructions		
Indicator Light	Indicator Light Status	Description
POWER (Green)	Lit	Normal operation
	Off	Internal detection abnormality
	Blinking at 1Hz	Under-voltage
	Blinking at 2Hz	Over-voltage
LINK (Green)	Off	Normal operation
	Blinking at 2Hz	Internal detection abnormality
FAULT (Red)	Lit	Internal detection abnormality
	Off	Normal operation
	Blinking at 2Hz	Internal detection abnormality
ON (Green)	Lit	Beam on
	Blinking at 1Hz	EDM fault
	Off	Beam blocked
OSSD (Red/Green)	Green light on	Output open
	Red light on	Output closed
LOCK (Yellow)	Lit	Waiting for reset
	Blinking at 1Hz	Wiring fault
	Off	Normal operation

Wire Legend

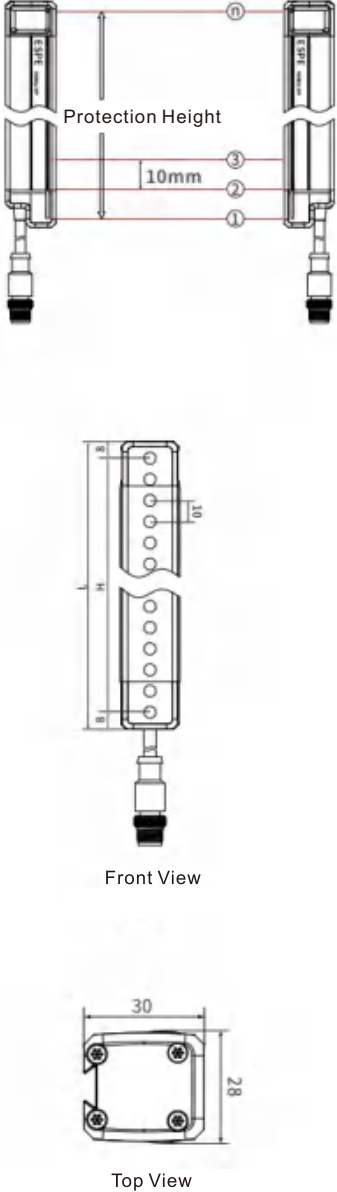
Grating	Line Color	Line Mark	Function	Wiring Instructions
Transmitter	Brown	24V	Power Positive	Connect to the positive terminal of the 24V DC power supply
	Blue	0V	Power Negative	Connect to the negative terminal of the 24V DC power supply (GND)
	Gray	CP	Synchronization Line	Connect to the receiver's CP
	Yellow-green	PE	Shield Line	Ground/Connect to GND
Receiver	Brown	24V	Power Positive	Connect to the positive terminal of the 24V DC power supply
	Blue	0V	Power Negative	Connect to the negative terminal of the 24V DC power supply (GND)
	Gray	CP	Synchronization Line	Connect to the transmitter's CP
	Yellow-green	PE	Shield Line	Ground/Connect to GND
	Black	OSSD1	Output Signal 1	Connect to safety input interface 1
	White	OSSD2	Output Signal 2	Connect to safety input interface 2
	Yellow	EDM	External Device Monitoring	Connect to externally closed monitoring contacts (leave unconnected if no functional requirement)
	Green	Reset	Reset	Connect to reset button (leave unconnected if no functional requirement)

Installation Bracket Selection

Image	Name	Accessories	Bracket Dimensions
	L-side Installation Bracket	L26 Bracket (4PCS) ESM-M5 Slider (4PCS) M6 Washer (4PCS) M6 Spring Washer (4PCS) M6*16 Screw (4PCS) M56* Screw (4PCS)	

LBP Series Selection Table

Grating Pitch: 10mm, Resolution: 15mm

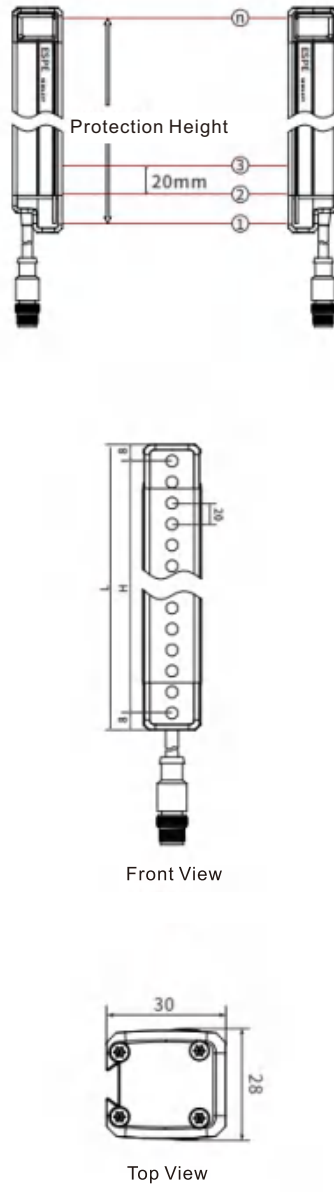
Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Protection Height</p> <p>10mm</p> <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	16	150	166	LBP1610	30*28*166
	20	190	206	LBP2010	30*28*206
	24	230	246	LBP2410	30*28*246
	28	270	286	LBP2810	30*28*286
	32	310	326	LBP3210	30*28*326
	36	350	366	LBP3610	30*28*366
	40	390	406	LBP4010	30*28*406
	44	430	446	LBP4410	30*28*446
	48	470	486	LBP4810	30*28*486
	52	510	526	LBP5210	30*28*526
	56	550	566	LBP5610	30*28*566
	60	590	606	LBP6010	30*28*606
	64	630	646	LBP6410	30*28*646
	68	670	686	LBP6810	30*28*686
	72	710	726	LBP7210	30*28*726
	76	750	766	LBP7610	30*28*766
	80	790	806	LBP8010	30*28*806
	84	830	846	LBP8410	30*28*846
	88	870	886	LBP8810	30*28*886
	92	910	926	LBP9210	30*28*926
	96	950	966	LBP9610	30*28*966
	100	990	1006	LBP10010	30*28*1006
	104	1030	1046	LBP10410	30*28*1046
	108	1070	1086	LBP10810	30*28*1086
	112	1110	1126	LBP11210	30*28*1126
	116	1150	1166	LBP11610	30*28*1166
	120	1190	1206	LBP12010	30*28*1206
	124	1230	1246	LBP12410	30*28*1246
	128	1270	1286	LBP12810	30*28*1286
	132	1310	1326	LBP13210	30*28*1326
	136	1350	1366	LBP13610	30*28*1366

	160	1590	1606	LBP16010	30*28*1606

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

LBP Series Selection Table

Grating Pitch: 20mm, Resolution: 25mm

Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	8	140	156	LBP0820	30*28*156
	10	180	196	LBP1020	30*28*196
	12	220	236	LBP1220	30*28*236
	14	260	276	LBP1420	30*28*276
	16	300	316	LBP1620	30*28*316
	18	340	356	LBP1820	30*28*356
	20	380	396	LBP2020	30*28*396
	22	420	436	LBP2220	30*28*436
	24	460	476	LBP2420	30*28*476
	26	500	516	LBP2620	30*28*516
	28	540	556	LBP2820	30*28*556
	30	580	596	LBP3020	30*28*596
	32	620	636	LBP3220	30*28*636
	34	660	676	LBP3420	30*28*676
	36	700	716	LBP3620	30*28*716
	38	740	756	LBP3820	30*28*756
	40	780	796	LBP4020	30*28*796
	42	820	836	LBP4220	30*28*836
	44	860	876	LBP4420	30*28*876
	46	900	916	LBP4620	30*28*916
	48	940	956	LBP4820	30*28*956
	50	980	996	LBP5020	30*28*996
	52		1036	LBP5220	30*28*1036
	54	1060	1076	LBP5420	30*28*1076
	56	1100	1116	LBP5620	30*28*1116
	58	1140	1156	LBP5820	30*28*1156
	60	1180	1196	LBP6020	30*28*1196
	62	1220	1236	LBP6220	30*28*1236
	64	1260	1276	LBP6420	30*28*1276
	66	1300	1316	LBP6620	30*28*1316
	68	1340	1356	LBP6820	30*28*1356

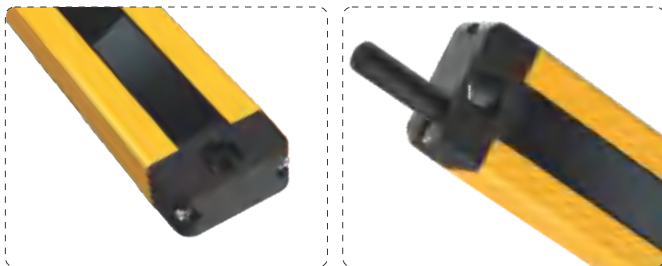
	80	1580	1596	LBP8020	30*28*1596

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

Ultra-Thin Safety Light Curtains

LB13

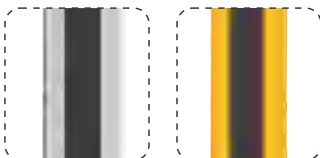
The LB13 series ultra-thin safety light grid emits light from the front, with a grid structure thickness of only 13mm, saving installation space, easy to align, strong resistance to light and electromagnetic interference, low power consumption design with short response time, and high reliability. The product is insured by Dadi Insurance Company, ensuring reliable product quality.



Product Features

- Compact appearance, ultra-thin size, with a cross-sectional dimension of 28*13mm.
- Short response time, with the fastest response time less than 1ms.
- Low to wide voltage supply, operating voltage is DC10-30V.
- Strong resistance to electromagnetic interference, effectively combating various electromagnetic interference from motor equipment.
- Use line synchronization technology, strong resistance to light interference.
- Easy to install and simple to operate.

Color: Silver/Yellow



Selection Rules

LB13 - 10 20 N C S C - 2

Opposing Distance:

05:0.1~0.5m

1:0.1~1m

25:0.1~2.5m

(Note: Special remarks are required for reflective situations)

Scanning Method: None: Parallel Scanning, C: Cross Scanning

Surface Color: S:Silver, Y:Yellow

Sensing Method: C: Normally Closed

Output Method: N: NPN Output, P: PNP Output

Beam Spacing: 10mm, 20mm, 40mm

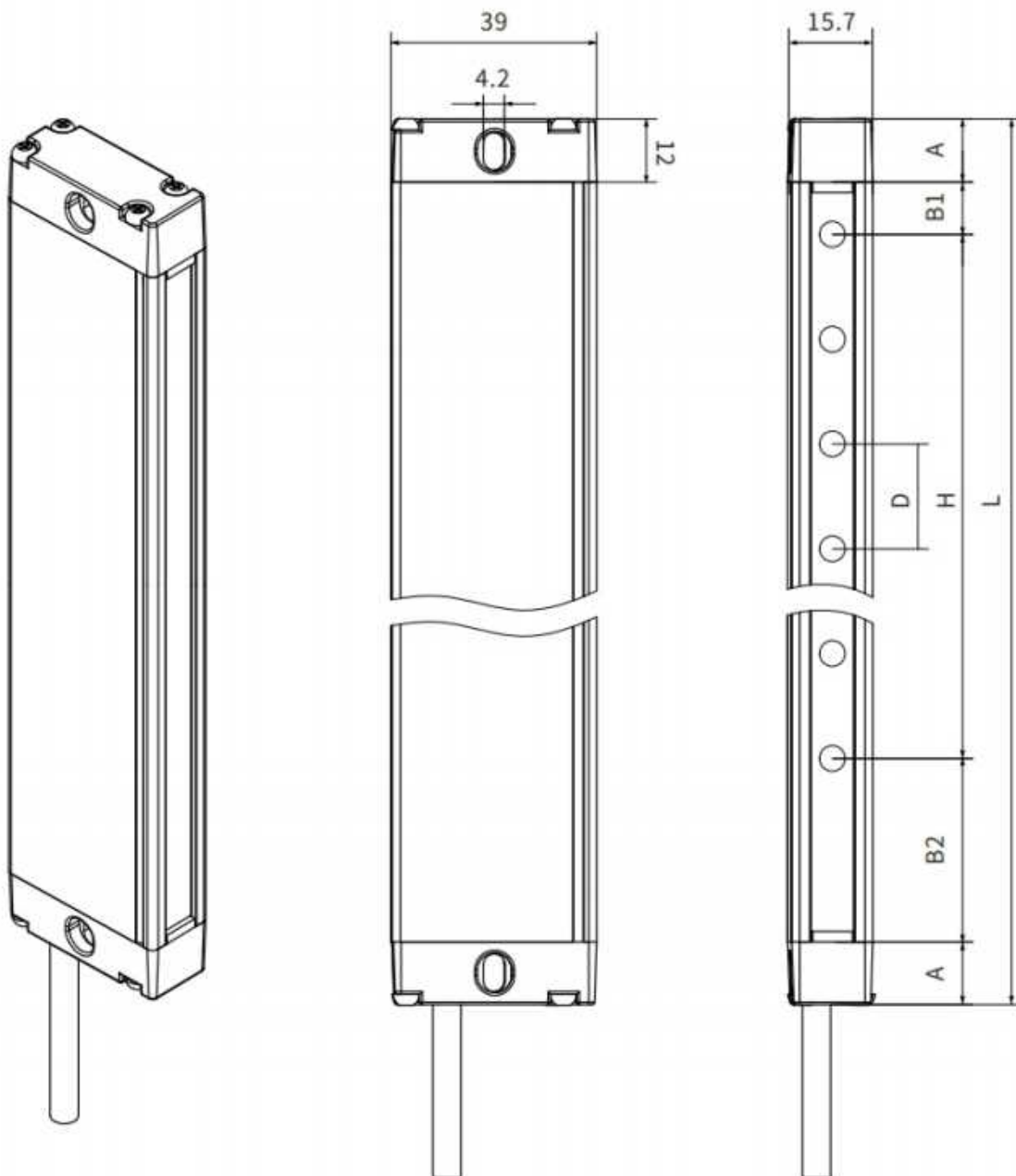
Beam Quantity: 04, 06, 08, 10, 12.....

Product Series: LB13 series

Product Attributes

Working Power Supply	DC10V~30V
Power	<5W
Beam Spacing	10mm, 20mm, 40mm
Resolution	15mm, 25mm, 45mm
Number of Beams	10mm spacing: 8, 12, 16...128
	20mm spacing: 4, 6, 8...64
	40mm spacing: 4, 6, 8...32
Protection Height	Protection Height $H = (N-1) * \text{Beam Spacing}$, N is the number of beams
Emission Wavelength	940nm
Response Time	Response Time = $(N*0.1\text{ms}) + 0.4\text{ms}$ (N is the number of beams)
Safe Output (OSSD)	PNP transistor output, load current below 200mA, residual voltage below
	1V (except for voltage drop due to cable extension), leakage current
	below 1mA; NPN transistor output, load current below 200mA, residual
	voltage below 1V (except for voltage drop due to cable extension), leakage current below 1mA.
Protection Circuit	Overvoltage protection, reverse polarity protection, and output
	overcurrent protection
Beam Distance	0.1~0.5m, 0.1~1m, 0.1~2.5m
	(Note: Special notes required for reflective situations)
Anti-Light Interference	10000Lux (Incidence angle $I > 5^\circ$)
Light Curtain Form	Opposite-type
Synchronization Method	Wire synchronization
Housing Material	Aluminum alloy
Housing Protection Level	IP54
Cross-sectional Dimensions	28*13mm
Operating Temperature	-10°C~55°C (no condensation)
Storage Temperature	-30°C~70°C (no condensation)
Operating Humidity	At 20°C, relative humidity of air <85%

Product Size Chart



A: Top and Bottom Covers

B1: Upper Blind Spot

B2: Lower Blind Spot

D: Beam Spacing
(10mm/20mm/40mm)

H: Grating Protection Height

L: Total Height of Grating

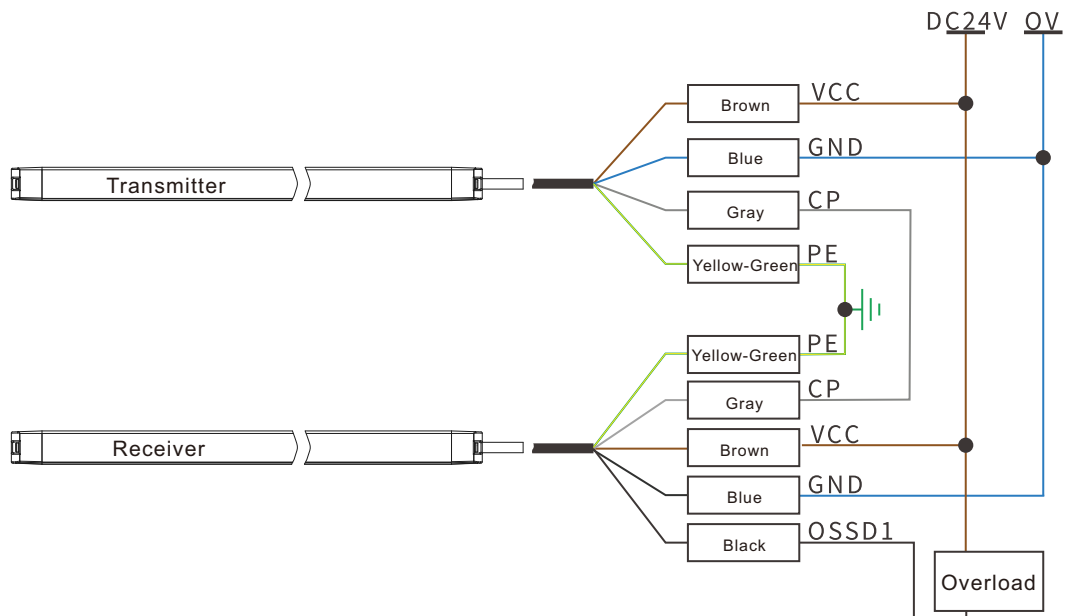
A: The size of the top and bottom covers is 12mm.
When D size is 10mm: B1 size is 5mm; B2 size is 5mm.
When D size is 20mm: B1 size is 10mm; B2 size is 10mm.
When D size is 40mm: B1 size is 10mm; B2 size is 30mm.

L: The total height of the grating:
 $L = \text{Height of Top and Bottom Covers} +$
 $\text{Upper and Lower Blind Spots} + \text{Protection Height}$

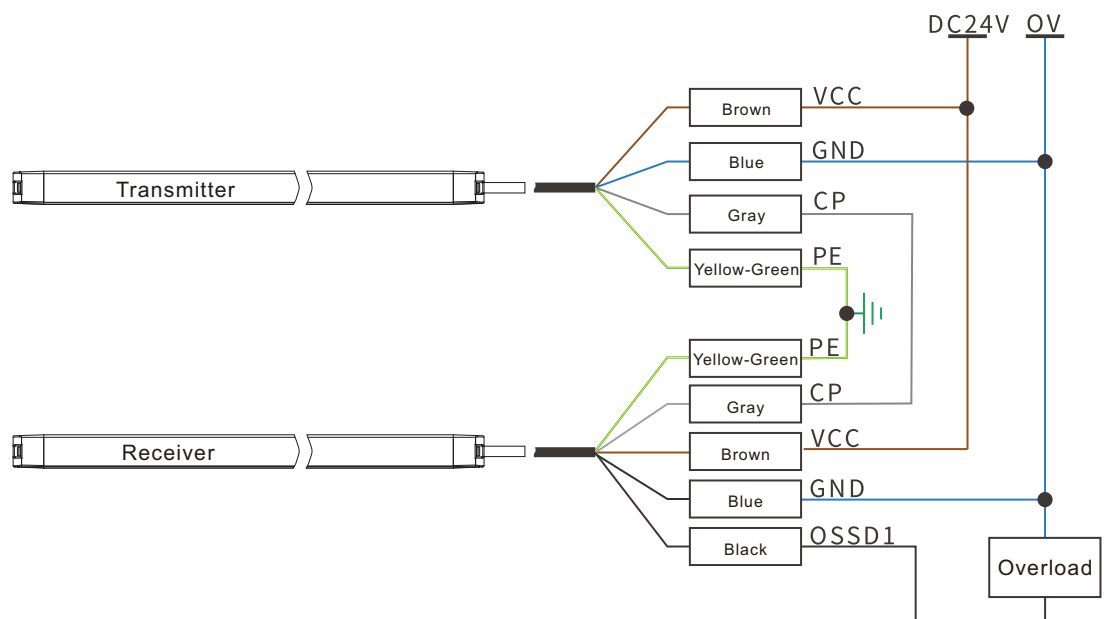
H: The protection height of the grating:
 $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$

Application Wiring Diagram

NPN Wiring Diagram

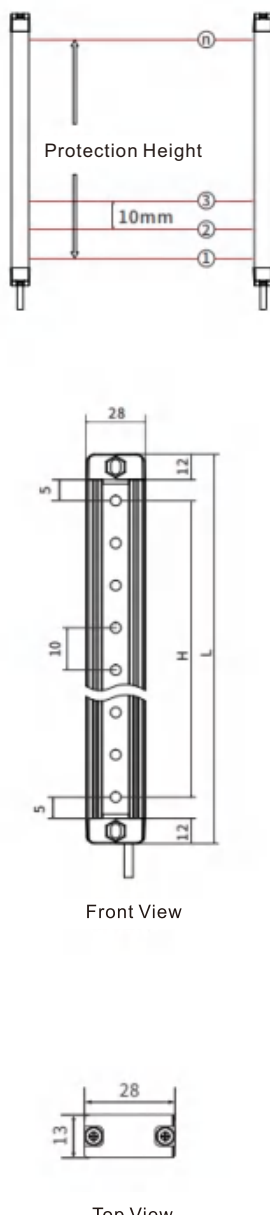


PNP Wiring Diagram



LB13 Series Selection Table

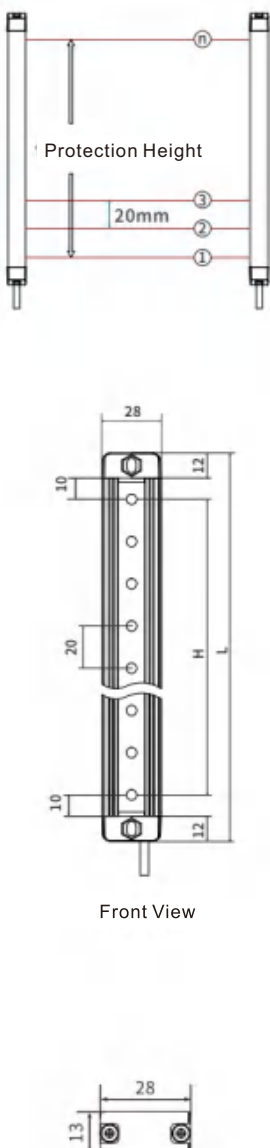
Grating Pitch: 10mm, Resolution: 15mm

Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Protection Height</p> <p>10mm</p> <p>1, 2, 3, n</p> <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	8	70	104	LB13-0810	28*31*104
	12	110	144	LB13-1210	28*31*144
	16	150	184	LB13-1610	28*31*184
	20	190	224	LB13-2010	28*32*224
	24	230	264	LB13-2410	28*32*264
	28	270	304	LB13-2810	28*33*304
	32	310	344	LB13-3210	28*33*344
	36	350	384	LB13-3610	28*33*384
	40	390	424	LB13-4010	28*34*424
	44	430	464	LB13-4410	28*34*464
	48	470	504	LB13-4810	28*35*504
	52	510	544	LB13-5210	28*35*544
	56	550	584	LB13-5610	28*35*584
	60	590	624	LB13-6010	28*36*624
	64	630	664	LB13-6410	28*36*664
	68	670	704	LB13-6810	28*37*704
	72	710	744	LB13-7210	28*37*744
	76	750	784	LB13-7610	28*37*784
	80	790	824	LB13-8010	28*38*824
	84	830	864	LB13-8410	28*38*864
	88	870	904	LB13-8810	28*39*904
	92	910	944	LB13-9210	28*39*944
	96	950	984	LB13-9610	28*39*984
	100	990	1024	LB13-10010	28*31*1024
	104	1030	1064	LB13-10410	28*31*1064
	108	1070	1104	LB13-10810	28*31*1104
	112	1110	1144	LB13-11210	28*31*1144
	116	1150	1184	LB13-11610	28*31*1184
	120	1190	1224	LB13-12010	28*31*1224
	124	1230	1264	LB13-12410	28*31*1264
	128	1270	1304	LB13-12810	28*31*1304

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

LB13 Series Selection Table

Grating Pitch: 20mm, Resolution: 25mm

Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Protection Height</p> <p>20mm</p> <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	4	60	104	LB13-0420	28*13*104
	6	100	144	LB13-0620	28*13*144
	8	140	184	LB13-0820	28*13*184
	10	180	224	LB13-1020	28*13*224
	12	220	264	LB13-1220	28*13*264
	14	260	304	LB13-1420	28*13*304
	16	300	344	LB13-1620	28*13*344
	18	340	384	LB13-1820	28*13*384
	20	380	424	LB13-2020	28*13*424
	22	420	464	LB13-2220	28*13*464
	24	460	504	LB13-2420	28*13*504
	26	500	544	LB13-2620	28*13*544
	28	540	584	LB13-2820	28*13*584
	30	580	624	LB13-3020	28*13*624
	32	620	664	LB13-3220	28*13*664
	34	660	704	LB13-3420	28*13*704
	36	700	744	LB13-3620	28*13*744
	38	740	784	LB13-3820	28*13*784
	40	780	824	LB13-4020	28*13*824
	42	820	864	LB13-4220	28*13*864
	44	860	904	LB13-4420	28*13*904
	46	900	944	LB13-4620	28*13*944
	48	940	984	LB13-4820	28*13*944
	50	980	1024	LB13-5020	28*13*1024
	52	1020	1064	LB13-5220	28*13*1064
	54	1060	1104	LB13-5420	28*13*1104
	56	1100	1144	LB13-5620	28*13*1144
	58	1140	1184	LB13-5820	28*13*1184
	60	1180	1224	LB13-6020	28*13*1224
	62	1220	1264	LB13-6220	28*13*1264
	64	1260	1304	LB13-6420	28*13*1304

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements


LB13 Series Selection Table

Grating Pitch: 40mm, Resolution: 45mm

[illegible]

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

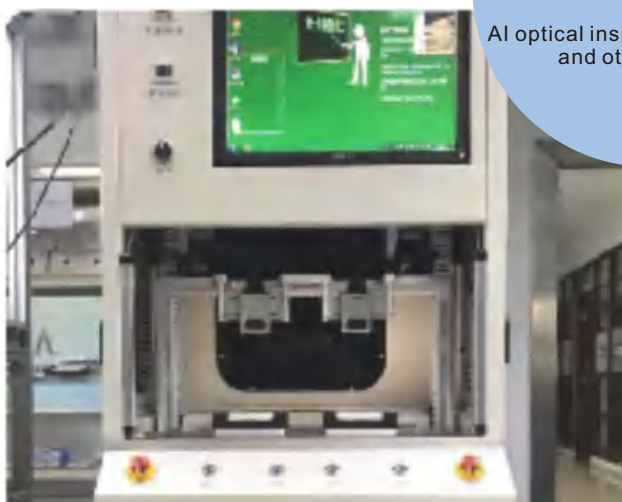
Product Installation Chart

Image	Installation Method	Accessories
	End Cap Installation Hole Position	Round Head M4*16 Screws (4PCS)

Application



**Widely used
in automation**



AI optical inspection equipment,
and other devices



Ultra-Thin Safety Light Curtains

LB15

The LB15 series safety light grid features a unique structural design with a 15mm ultra-thin infrared sensing section size. The sensing surface is on the side, offering multiple output options. It is easy to install and wire, with fast response speed and high reliability.



Product Features

- Ultra-thin sensing surface, 15mm in size.
- Short response time, with the fastest response time less than 1ms.
- Low to wide voltage supply, operating voltage is DC10~30V.
- Strong resistance to electromagnetic interference, effectively combating various electromagnetic interference from motor equipment.
- Uses line synchronization technology, strong resistance to light interference.
- Easy to install, with end cap fixed mounting method, simple operation.
- Cross-sectional dimensions are 39*15mm.

Selection Rules

LB15 - 10 20 N C C - 2

Opposing Distance:

05: 0.1~0.5m

2: 0.1~2m

4: 0.1~4m

(Note: Special notes required for reflective situations)

Scanning Method: None: Parallel Scanning, C: Cross Scanning

Sensing Method: C: Normally Closed

Output Method: N: NPN Output, P: PNP Output

Beam Spacing: 10mm, 20mm, 40mm

Number of Beams: 04, 06, 08, 10, 12 ...

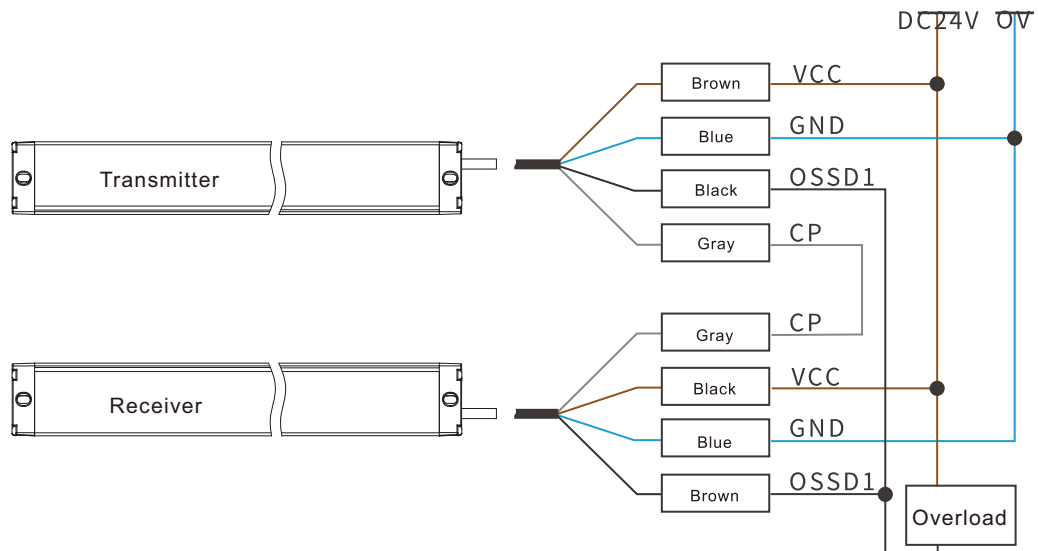
Product Series: LB15 Series

Product Attributes

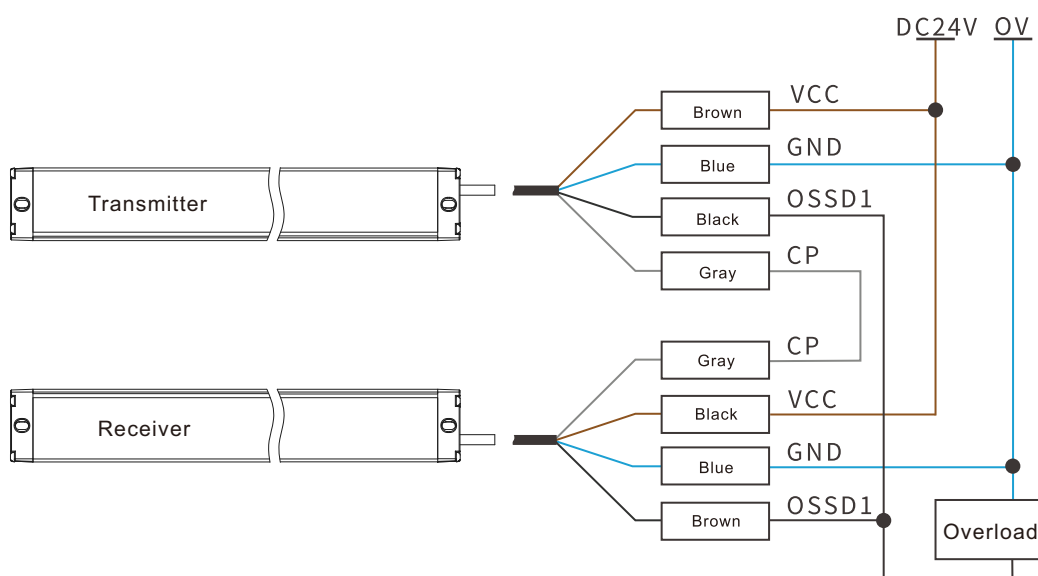
Working Power Supply	DC10V~30V
Power	<5W
Beam Spacing	10mm, 20mm, 40mm
Resolution	15mm, 25mm, 45mm
Number of Beams	10mm spacing: 8, 12, 16...160
	20mm spacing: 4, 6, 8...80
	40mm spacing: 4, 6, 8...40
Protection Height	Protection Height $H = (N-1) * \text{Beam Spacing}$, N is the number of beams
Emission Wavelength	940nm
Response Time	Response Time = $(N * 0.1\text{ms}) + 0.4\text{ms}$ (N is the number of beams)
Safe Output (OSSD)	PNP transistor output, load current below 200mA, residual voltage below 1V (except for voltage drop due to cable extension), leakage current below 1mA; NPN transistor output, load current below 200mA, residual voltage below 1V (except for voltage drop due to cable extension), leakage current below 1mA.
Protection Circuit	Overvoltage protection, reverse polarity protection, and output overcurrent protection
Beam Distance	0.1~0.5m, 0.1~2m, 0.1~4m
	(Note: Special notes required for reflective situations)
Anti-Light Interference	10000Lux (Incidence angle $I > 5^\circ$)
Light Curtain Form	Opposite-type
Synchronization Method	Wire synchronization
Housing Material	Aluminum alloy
Housing Protection Level	IP54
Cross-sectional Dimensions	39*15mm
Operating Temperature	-10℃~55℃ (no condensation)
Storage Temperature	-30℃~70℃ (no condensation)
Operating Humidity	At 20℃, relative humidity of air <85%

Application Wiring Diagram

NPN Wiring Diagram

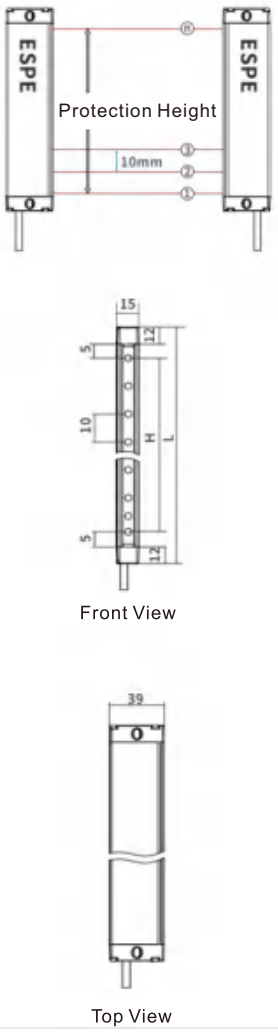


PNP Wiring Diagram



LB15 Series Selection Table

Grating Pitch: 10mm, Resolution: 15mm

Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Protection Height</p> <p>10mm</p> <p>Front View</p> <p>Top View</p> <p>39</p> <p>104</p>	8	70	104	LB15-0810	39*15*104
	12	110	144	LB15-1210	39*15*144
	16	150	184	LB15-1610	39*15*184
	20	190	224	LB15-2010	39*15*224
	24	230	264	LB15-2410	39*15*264
	28	270	304	LB15-2810	39*15*304
	32	310	344	LB15-3210	39*15*344
	36	350	384	LB15-3610	39*15*384
	40	390	424	LB15-4010	39*15*424
	44	430	464	LB15-4410	39*15*464
	48	470	504	LB15-4810	39*15*504
	52	510	544	LB15-5210	39*15*544
	56	550	584	LB15-5610	39*15*584
	60	590	624	LB15-6010	39*15*624
	64	630	664	LB15-6410	39*15*664
	68	670	704	LB15-6810	39*15*704
	72	710	744	LB15-7210	39*15*744
	76	750	784	LB15-7610	39*15*784
	80	790	824	LB15-8010	39*15*824
	84	830	864	LB15-8410	39*15*864
	88	870	904	LB15-8810	39*15*904
	92	910	944	LB15-9210	39*15*944
	96	950	984	LB15-9610	39*15*984
	100	990	1024	LB15-10010	39*15*1024
	104	1030	1064	LB15-10410	39*15*1064
	108	1070	1104	LB15-10810	39*15*1104
	112	1110	1144	LB15-11210	39*15*1144
	116	1150	1184	LB15-11610	39*15*1184
	120	1190	1224	LB15-12010	39*15*1224
	124	1230	1264	LB15-12410	39*15*1264
	128	1270	1304	LB15-12810	39*15*1304

	160	1590	1624	LB15-16010	39*15*1624

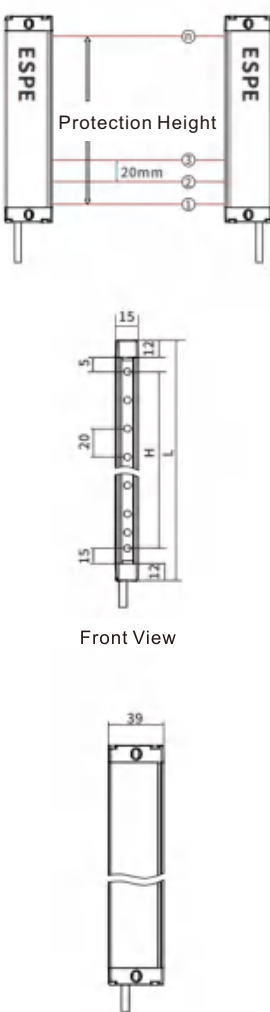
H is the protection height of the grating:
 $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$

L is the total height of the grating:
 $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

LB15 Series Selection Table

Grating Pitch: 20mm, Resolution: 25mm

Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Front View</p> <p>Top View</p>	4	60	104	LB15-0420	39*15*104
	6	100	144	LB15-0620	39*15*144
	8	140	184	LB15-0820	39*15*184
	10	180	224	LB15-1020	39*15*224
	12	220	264	LB15-1220	39*15*264
	14	260	304	LB15-1420	39*15*304
	16	300	344	LB15-1620	39*15*344
	18	340	384	LB15-1820	39*15*384
	20	380	424	LB15-2020	39*15*424
	22	420	464	LB15-2220	39*15*464
	24	460	504	LB15-2420	39*15*504
	26	500	544	LB15-2620	39*15*544
	28	540	584	LB15-2820	39*15*604
	30	580	624	LB15-3020	39*15*624
	32	620	664	LB15-3220	39*15*664
	34	660	704	LB15-3420	39*15*704
	36	700	744	LB15-3620	39*15*744
	38	740	784	LB15-3820	39*15*784
	40	780	824	LB15-4020	39*15*824
	42	820	864	LB15-4220	39*15*864
	44	860	904	LB15-4420	39*15*904
	46	900	944	LB15-4620	39*15*944
	48	940	984	LB15-4820	39*15*984
	50	980	1024	LB15-5020	39*15*1024
	52	1020	1064	LB15-5220	39*15*1064
	54	1060	1104	LB15-5420	39*15*1104
	56	1100	1144	LB15-5620	39*15*1144
	58	1140	1184	LB15-5820	39*15*1184
	60	1180	1224	LB15-6020	39*15*1224
	62	1220	1264	LB15-6220	39*15*1264
	64	1260	1304	LB15-6420	39*15*1304

	80	1580	1624	LB15-8020	39*15*1624

H is the protection height of the grating:
 $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$

L is the total height of the grating:
 $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements


LB15 Series Selection Table

Grating Pitch: 40mm, Resolution: 45mm

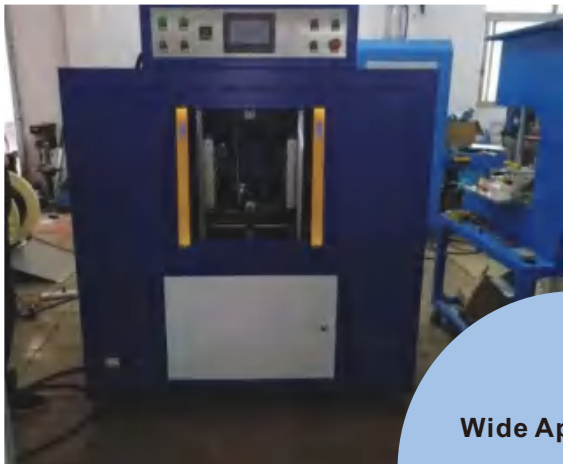
[illegible]

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

Product Installation Chart

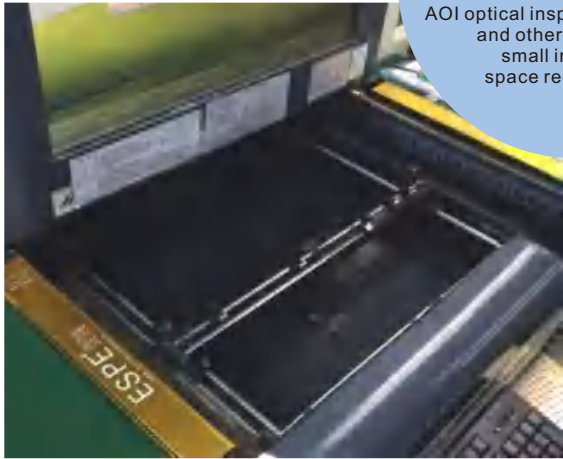
Image	Installation Method	Accessories
	End Cap Installation Hole Position	M4*20 Screws (4PCS)

Application



Wide Application

Suitable for non-standard automation,
AOI optical inspection equipment,
and other devices with
small installation
space requirements.



Area Light Curtains

LBD

The LBD series area light grid is compact in size and suitable for various automation equipment. It features a fixed end cap installation design, easy to align with light, strong resistance to light and electromagnetic interference, low power consumption, short response time, and high reliability.



Installation Hole End Cap



Upper Bracket End Cap



Product Features

- Compact appearance, ultra-thin size, with a cross-sectional dimension of 28*28mm.
- Short response time, with the fastest response time less than 1ms.
- Low to wide voltage supply, operating voltage is DC10~30V.
- Strong resistance to electromagnetic interference, effectively combating various electromagnetic interference from equipment.
- Uses line synchronization technology, strong resistance to light interference.
- Easy to install, simple operation.

Selection Rules

LBD - 10 20 Q3 N C C - 2

Opposing Distance:

2: 0.1~2m

5: 0.1~5m

(Note: Special notes required for reflective situations)

Scanning Method: None: Parallel Scanning, C: Cross Scanning

Sensing Method: C: Normally Closed

Output Method: N: NPN Output, P: PNP Output

Installation Bracket:

None: Installation Holeless Installation, Q3: Q3 Bracket

Beam Spacing: 10mm, 20mm, 40mm

Number of Beams: 04, 06, 08, 10, 12, 16 ...

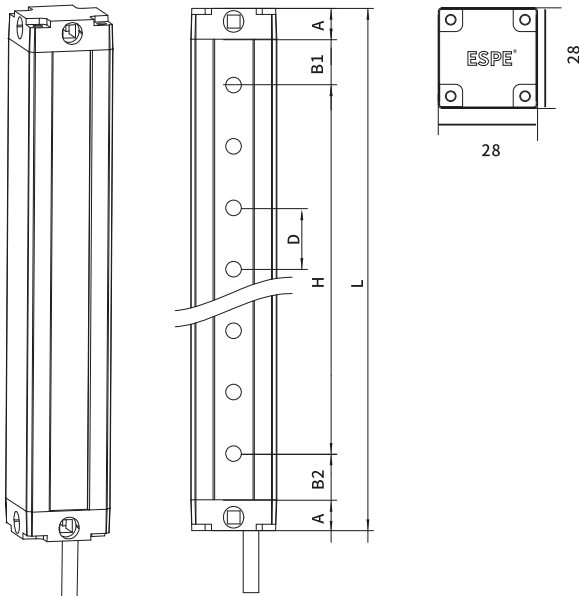
Product Series: LBD Series

Product Attributes

Working Power Supply	DC10V~30V
Power	<5W
Beam Spacing	10mm, 20mm, 40mm
Resolution	15mm, 25mm, 45mm
Number of Beams	10mm spacing: 8, 12, 16...148
	20mm spacing: 4, 6, 8...74
	40mm spacing: 4, 6, 8...36
Protection Height	Protection Height $H = (N-1) * \text{Beam Spacing}$, N is the number of beams
Emission Wavelength	940nm
Response Time	Response Time = $(N * 0.1\text{ms}) + 0.4\text{ms}$ (N is the number of beams)
Safe Output (OSSD)	PNP transistor output, load current below 200mA, residual voltage below 1V (except for voltage drop due to cable extension), leakage current below 1mA; NPN transistor output, load current below 200mA, residual voltage below 1V (except for voltage drop due to cable extension), leakage current below 1mA.
Protection Circuit	Overvoltage protection, reverse polarity protection, and output overcurrent protection
Beam Distance	0.1~2m, 0.1~5m
	(Note: Special notes required for reflective situations)
Anti-Light Interference	10000Lux (Incidence angle $\theta > 5^\circ$)
Light Curtain Form	Opposite-type
Synchronization Method	Wire synchronization
Housing Material	Aluminum alloy
Housing Protection Level	Ip65
Cross-sectional Dimensions	28*28mm
Operating Temperature	-10℃~55℃ (no condensation)
Storage Temperature	-30℃~70℃ (no condensation)
Operating Humidity	At 20℃, relative humidity of air <85%

Product Size Chart

Installation Port Model



A1: Upper Cover

A2: Lower Cover + Air Port

B1: Upper Blind Spot

B2: Lower Blind Spot

D: Beam Spacing (10mm/20mm/40mm)

H: Grating Protection Height

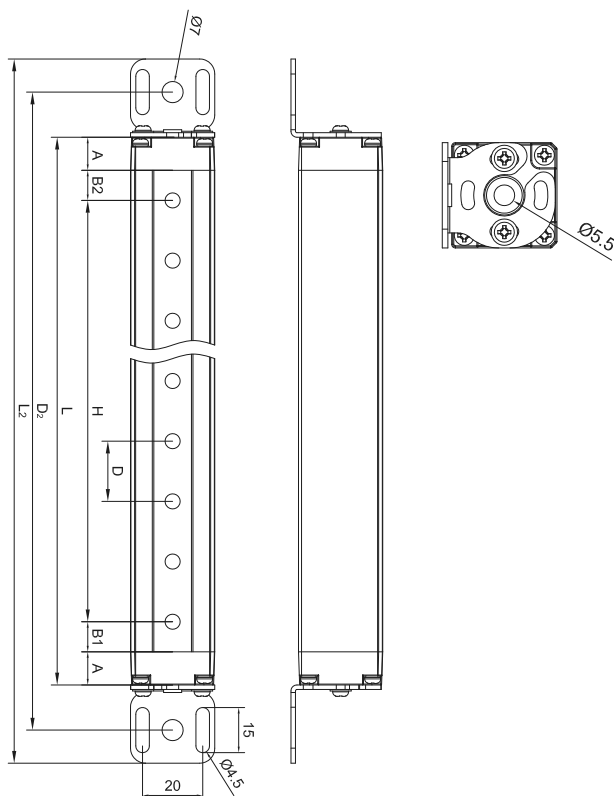
L: Total Height of Grating

A: The size of the upper and lower covers is 10mm.
When D size is 10mm: B1 size is 5mm; B2 size is 5mm.
When D size is 20mm: B1 size is 10mm; B2 size is 10mm.
When D size is 40mm: B1 size is 20mm; B2 size is 20mm.

L is the total height of the grating:
 $L = \text{height of upper and lower covers} + \text{upper and lower blind spots} + \text{protection height}.$

H is the protection height of the grating:
 $H = (\text{number of beams} - 0) * \text{beam spacing}.$

Upper and Lower Bracket Model



A1: Upper Cover

A2: Lower Cover + Air Port

B1: Upper Blind Spot

B2: Lower Blind Spot

D: Beam Spacing (10mm/20mm/40mm)

H: Grating Protection Height

L: Total Height of Grating

A: The size of the upper and lower covers is 11mm.
When D size is 10mm: B1 size is 5mm; B2 size is 5mm.
When D size is 20mm: B1 size is 10mm; B2 size is 10mm.
When D size is 40mm: B1 size is 20mm; B2 size is 20mm.

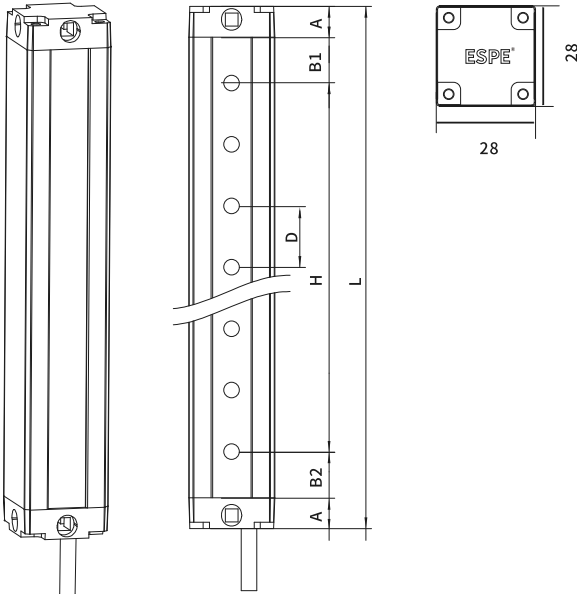
L is the total height of the grating:
 $L = \text{height of upper and lower covers} + \text{upper and lower blind spots} + \text{protection height}.$

H is the protection height of the grating:
 $H = (\text{number of beams} - 0) * \text{beam spacing}.$

$D2 = L + 30; L2 = L + 52$

Product Size Chart

Installation Port Model



A1: Upper Cover

A2: Lower Cover + Air Port

B1: Upper Blind Spot

B2: Lower Blind Spot

D: Beam Spacing (10mm/20mm/40mm)

H: Grating Protection Height

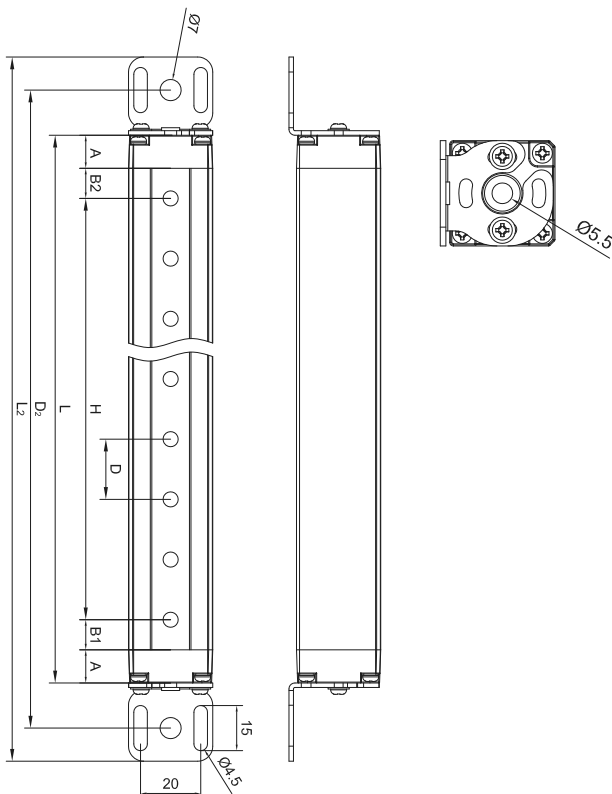
L: Total Height of Grating

A: The size of the upper and lower covers is 10mm.
When D size is 10mm: B1 size is 5mm; B2 size is 5mm.
When D size is 20mm: B1 size is 10mm; B2 size is 10mm.
When D size is 40mm: B1 size is 20mm; B2 size is 20mm.

L is the total height of the grating:
 $L = \text{height of upper and lower covers} + \text{upper and lower blind spots} + \text{protection height}.$

H is the protection height of the grating:
 $H = (\text{number of beams} - 0) * \text{beam spacing}.$

Upper and Lower Bracket Model



A1: Upper Cover

A2: Lower Cover + Air Port

B1: Upper Blind Spot

B2: Lower Blind Spot

D: Beam Spacing (10mm/20mm/40mm)

H: Grating Protection Height

L: Total Height of Grating

A: The size of the upper and lower covers is 11mm.
When D size is 10mm: B1 size is 5mm; B2 size is 5mm.
When D size is 20mm: B1 size is 10mm; B2 size is 10mm.
When D size is 40mm: B1 size is 20mm; B2 size is 20mm.

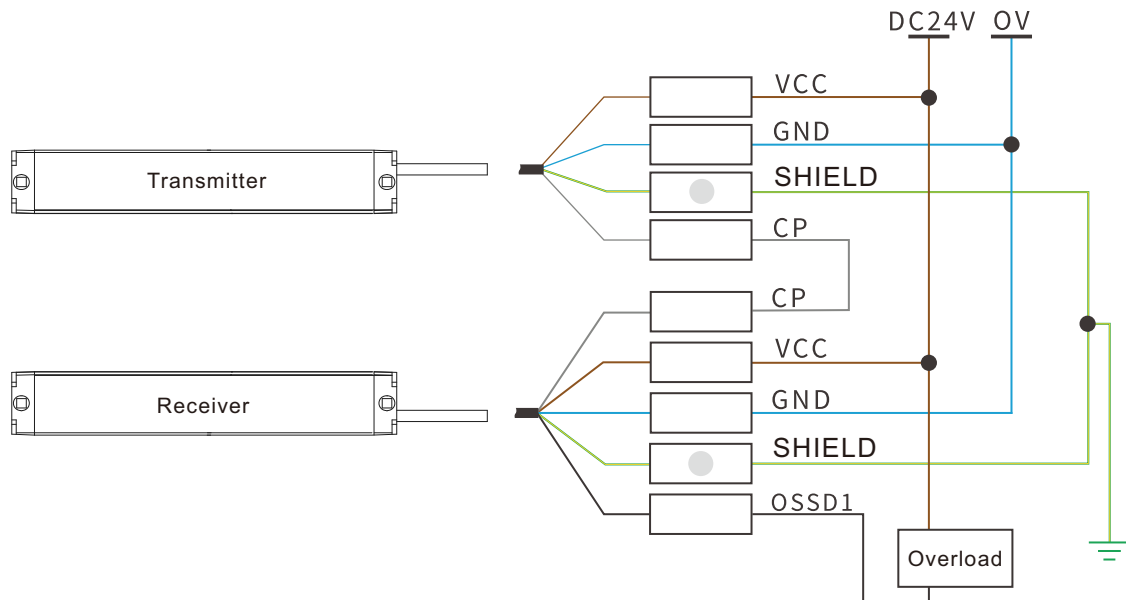
L is the total height of the grating:
 $L = \text{height of upper and lower covers} + \text{upper and lower blind spots} + \text{protection height}.$

H is the protection height of the grating:
 $H = (\text{number of beams} - 0) * \text{beam spacing}.$

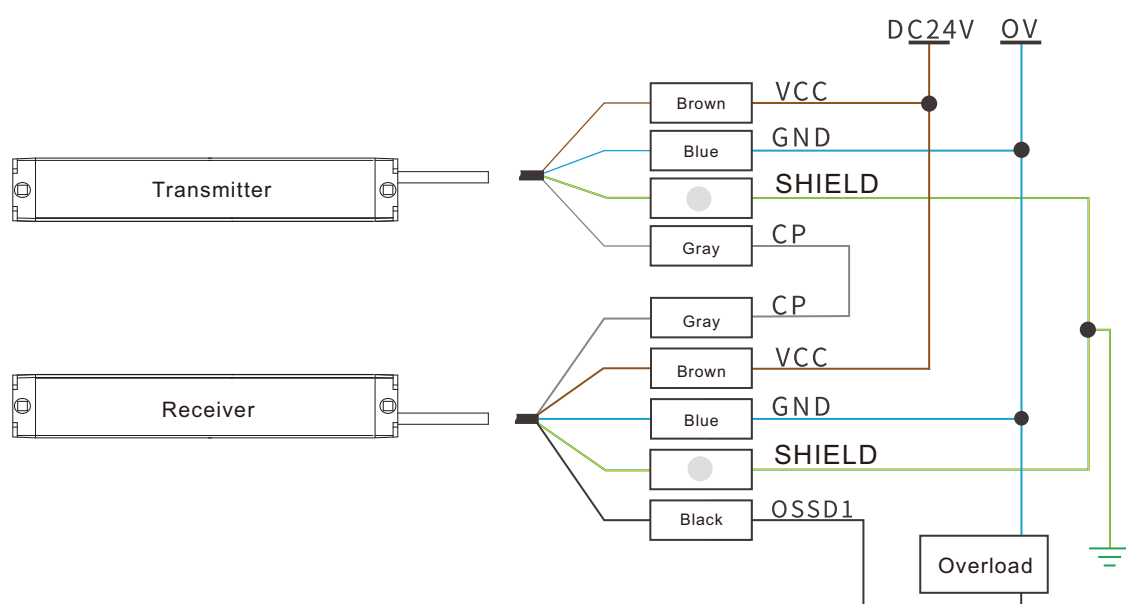
$D2 = L + 30; L2 = L + 52$

Application Wiring Diagram

Installation Port Model

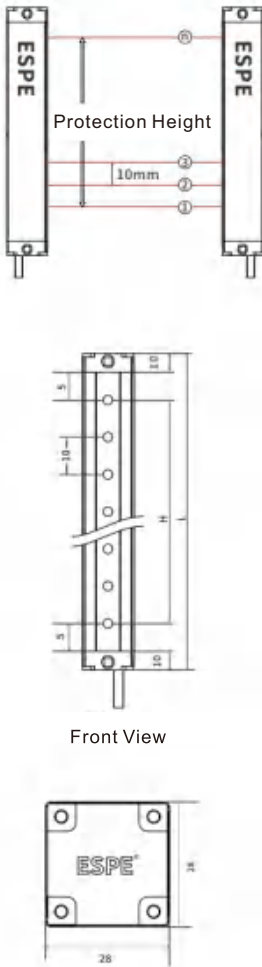


Upper and Lower Bracket Model



LBD Series Selection Table

Grating Pitch: 10mm, Resolution: 15mm

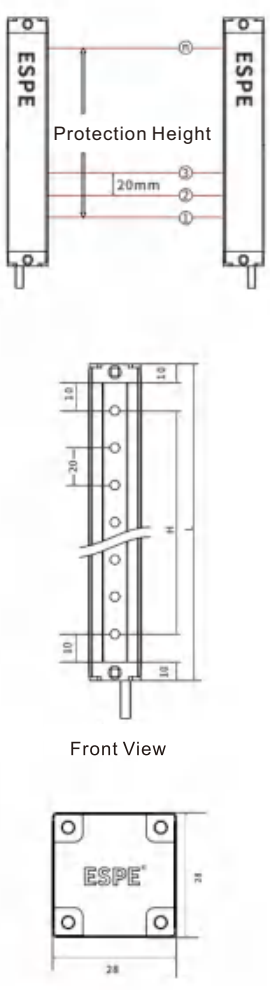
Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	8	70	100	LBD0810	28*28*100
	12	110	140	LBD1210	28*28*140
	16	150	180	LBD1610	28*28*180
	20	190	220	LBD2010	28*28*220
	24	230	260	LBD2410	28*28*260
	28	270	300	LBD2810	28*28*300
	32	310	340	LBD3210	28*28*340
	36	350	380	LBD3610	28*28*380
	40	390	420	LBD4010	28*28*420
	44	430	460	LBD4410	28*28*460
	48	470	500	LBD4810	28*28*500
	52	510	540	LBD5210	28*28*540
	56	550	580	LBD5610	28*28*580
	60	590	620	LBD6010	28*28*620
	64	630	660	LBD6410	28*28*660
	68	670	700	LBD6810	28*28*700
	72	710	740	LBD7210	28*28*740
	76	750	780	LBD7610	28*28*780
	80	790	820	LBD8010	28*28*820
	84	830	860	LBD8410	28*28*860
	88	870	900	LBD8810	28*28*900
	92	910	940	LBD9210	28*28*940
	96	950	980	LBD9610	28*28*980
	100	990	1020	LBD10010	28*28*1020
	104	1030	1060	LBD10410	28*28*1060
	108	1070	1100	LBD10810	28*28*1100
	112	1110	1140	LBD11210	28*28*1140
	116	1150	1180	LBD11610	28*28*1180
	120	1190	1220	LBD12010	28*28*1220
	124	1230	1260	LBD12410	28*28*1260
	128	1270	1300	LBD12810	28*28*1300

	148	1470	1500	LBD14810	28*28*1500

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

LBD Series Selection Table

Grating Pitch: 20mm, Resolution: 25mm

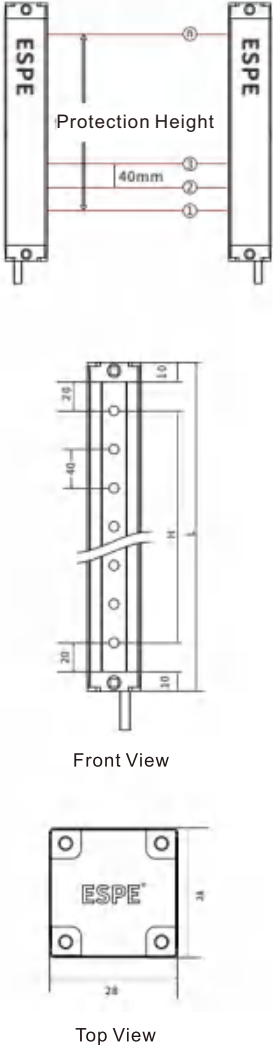
Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	4	60	100	LBD0420	28*28*100
	6	100	140	LBD0620	28*28*140
	8	140	180	LBD0820	28*28*180
	10	180	220	LBD1020	28*28*220
	12	220	260	LBD1220	28*28*260
	14	260	300	LBD1420	28*28*300
	16	300	340	LBD1620	28*28*340
	18	340	380	LBD1820	28*28*380
	20	380	420	LBD2020	28*28*420
	22	420	460	LBD2220	28*28*460
	24	460	500	LBD2420	28*28*500
	26	500	540	LBD2620	28*28*540
	28	540	580	LBD2820	28*28*580
	30	580	620	LBD3020	28*28*620
	32	620	660	LBD3220	28*28*660
	34	660	700	LBD3420	28*28*700
	36	700	740	LBD3620	28*28*740
	38	740	780	LBD3820	28*28*780
	40	780	820	LBD4020	28*28*820
	42	820	860	LBD4220	28*28*860
	44	860	900	LBD4420	28*28*900
	46	900	940	LBD4620	28*28*940
	48	940	980	LBD4820	28*28*980
	50	980	1020	LBD5020	28*28*1020
	52	1020	1060	LBD5220	28*28*1060
	54	1060	1100	LBD5420	28*28*1100
	56	1100	1140	LBD5620	28*28*1140
	58	1140	1180	LBD5820	28*28*1180
	60	1180	1220	LBD6020	28*28*1220
	62	1220	1260	LBD6220	28*28*1260
	64	1260	1300	LBD6420	28*28*1300

	74	1460	1500	LBD7420	28*28*1500

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements



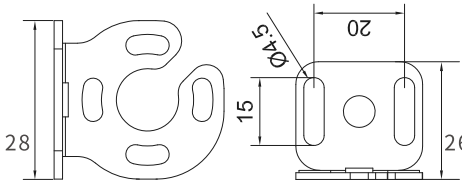
LBD Series Selection Table

Grating Pitch: 40mm, Resolution: 45mm

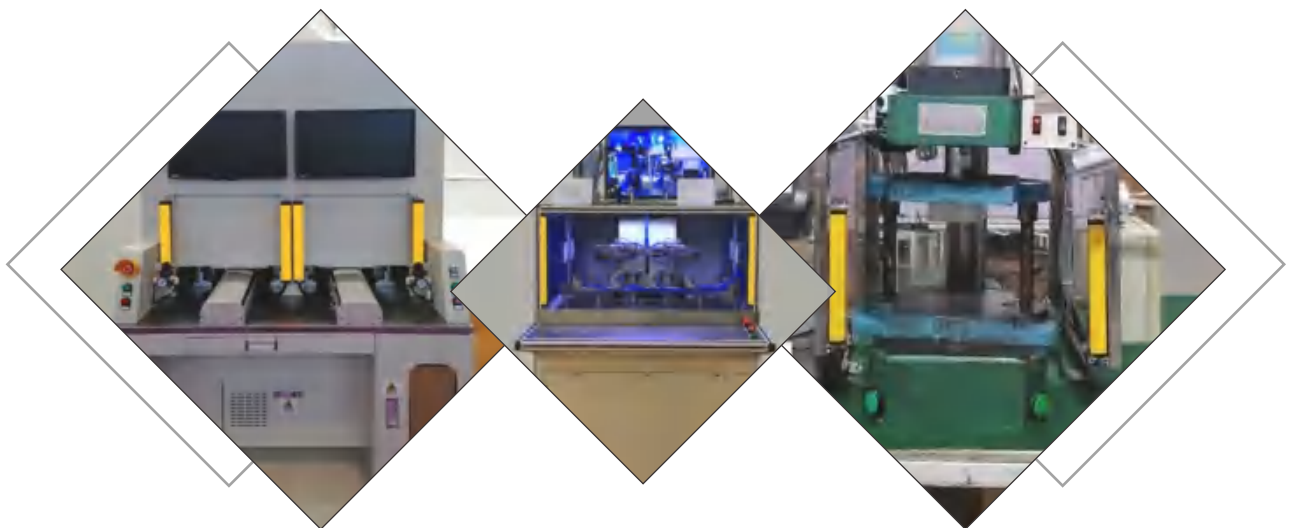
Shape (mm)	Beam Quantity (n)	Protection Height (mm)	Grating Total Height (mm)	Model Number	Dimensions L*W*H (mm)
 <p>Protection Height</p> <p>40mm</p> <p>Front View</p> <p>Top View</p> <p>H is the protection height of the grating: $H = (\text{Number of Beams} - 1) \times \text{Beam Spacing}$</p> <p>L is the total height of the grating: $L = \text{Top and Bottom Cover Height} + \text{Top and Bottom Blind Spots} + \text{Protection Height}$</p>	04	120	180	LBD0440	28*28*180
	06	200	260	LBD0640	28*28*260
	08	280	340	LBD0840	28*28*340
	10	360	420	LBD1040	28*28*420
	12	440	500	LBD1240	28*28*500
	14	520	580	LBD1440	28*28*580
	16	600	660	LBD1640	28*28*660
	18	680	740	LBD1840	28*28*740
	20	760	820	LBD2040	28*28*820
	22	840	900	LBD2240	28*28*900
	24	920	980	LBD2440	28*28*980
	26	1000	1060	LBD2640	28*28*1060
	28	1080	1140	LBD2840	28*28*1140
	30	1160	1220	LBD3040	28*28*1220
	32	1240	1300	LBD3240	28*28*1300
	34	1320	1380	LBD3440	28*28*1380
	36	1400	1460	LBD3640	28*28*1460

Note: In addition to the above models, grating with corresponding protection heights can be customized according to customer requirements

Product Installation Chart

Image	Installation Method	Accessories	Dimension
	Front/Side Mounting Hole Installation	M4*30 Screws (4PCS)	None
	Q3 Bracket Mounting	<ol style="list-style-type: none"> 1. Upper and Lower Brackets (4PCS) 2. M6*16 Screws (4PCS) 3. M6 Flat Washers (4PCS) 4. M6 Spring Washers (4PCS) 5. M36 Screws (8PCS) 	

Application

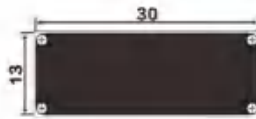
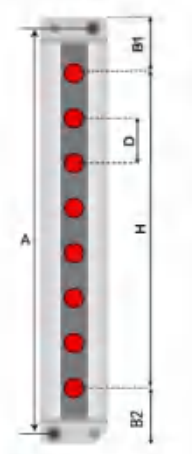


Plastic Shell Safety Light Curtains

LBT



Product Size Chart



B1=25mm
B2=25mm

B1: Upper Blind Spot
B2: Lower Blind Spot
D: Beam Spacing
H: Protection Height
L: Total Height
Z: Z-type Mounting Hole

Selection Rules

MBT 16 20 N C 01 Z

Cable Specification:

None = Direct cable 2 meters
J = Pigtail connector
S20n = Shielded cable type
W = Wire synchronization
Cn = Cable length n meters

Installation Method: Z: Z-type Mounting Hole

Installation Distance: 01: 0-1m, 02: 1-2m, 03: 2-3m

Signal Mode: C=Normally Closed, O=Normally Open

Signal Output: N: NPN Output, P: PNP Output

Beam Spacing: 20mm

Number of Beams: 6, 8, 12, 16, 28

MTP Series Safety Light Grid

LBT Series Selection Table

Grating Pitch: 20mm

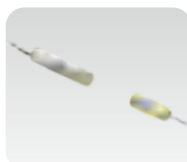
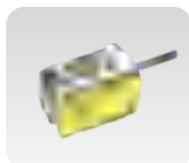
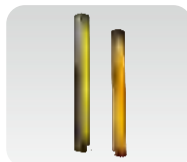
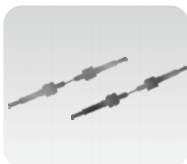
Beam Quantity	Protection Height (mm)	Total Height (mm)	Model
6	100	140	LBT0620
8	140	190	LBT0820
12	220	270	LBT1220
16	300	350	LBT1620
28	540	590	LBT2820

Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Sensore di settore



Safety Relays

Rilevatori di Sicurezza

Quality Management & Consultancy



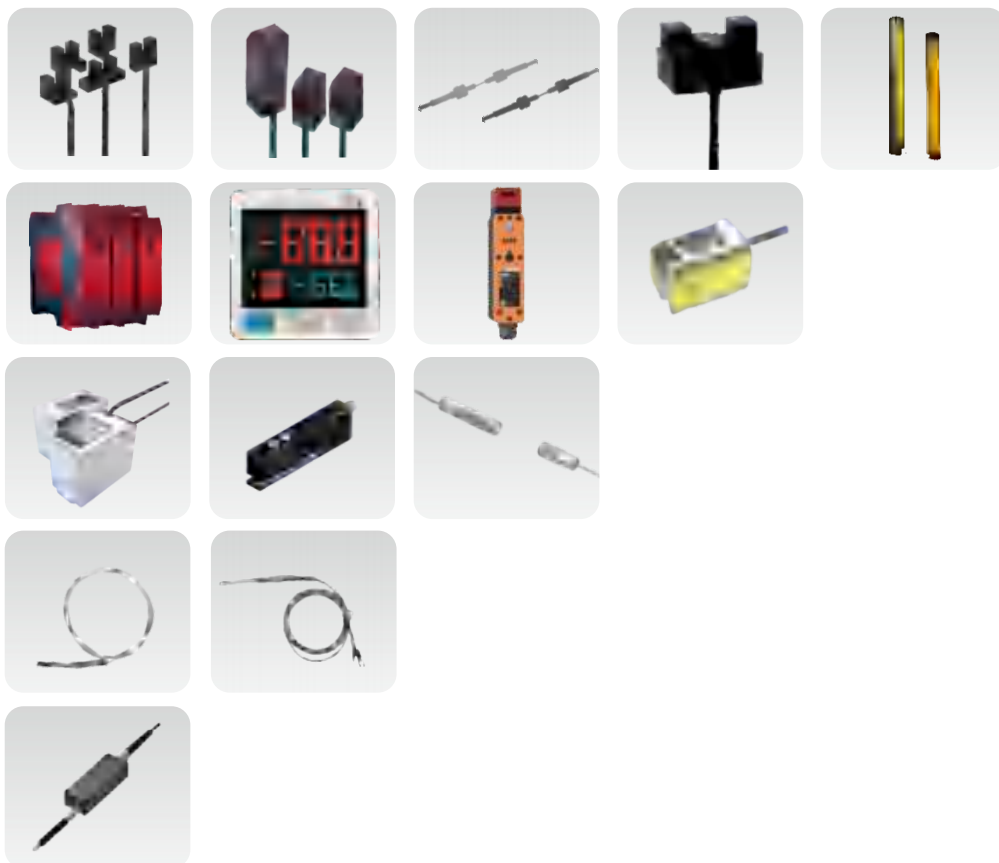
日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Safety Relays Contents

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Safety Relay Expansion Modules - SRE-4A2B	150 - 154



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Website: <http://www.nipponkodobearings.com>

Safety Relay Modules

SR Series

Introduction to SR Series Safety Relay Modules

The SR safety relay Modules complies with the PLe safety requirements of EN/ISO 13849-1 and is suitable for monitoring various signals in industrial sites with high safety requirements, including emergency stop buttons, safety door switches, safety light grid signals, and two-hand buttons. It can provide 2 normally open and 1 normally closed / 3 normally open and 1 normally closed outputs, with the option of monitored manual reset and automatic reset.

Product Features

- Designed according to EN ISO 13849-1 (Category 4, PLe).
- Relay output: 2 or 3 normally open contacts, 1 normally closed auxiliary contact.
- Choice between manual reset and automatic reset.
- Internal circuit with cross-fault monitoring.
- Redundant circuit design for self-checking function.
- Input overvoltage and overcurrent protection function.
- Power anti-reverse protection design.
- Intuitive status indicator lights for easy operation status diagnosis.
- Removable terminal blocks for easy maintenance.
- Standard 35mm width guide rail mounting design.



Technical Parameters

Standard Level

Compliance Standard	EN/ISO 13849-1 (Category 4/Plc)
Safety Level	EN/ISO 13849-1 (Category 4/Plc) Category 4

Electrical Parameters

Supply Voltage	DC24V \pm 10%
Power Consumption	<3W
Response Time	<20ms
Suction Release Time	<50ms
Power-On Startup Time	<1s
Protection Circuit	Input overvoltage and overcurrent protection, anti-reverse protection
Safe Input	Dual NPN normally open input (ESRN type), dual PNP normally closed input (ESRSP type), dual-channel safety door or emergency stop button (ESRS type)
Input Synchronization	Unlimited before S1 in S2
Safe Output	2 normally open contacts without source, 1 normally closed contact without source, 3 normally open contacts without source, 1 normally closed contact without source
Contact Capacity	Ac15: 5A/250V, DC13: 6A/24V
Electrical Life	\geq 100,000 cycles
Mechanical Life	\geq 10 million cycles

Environment

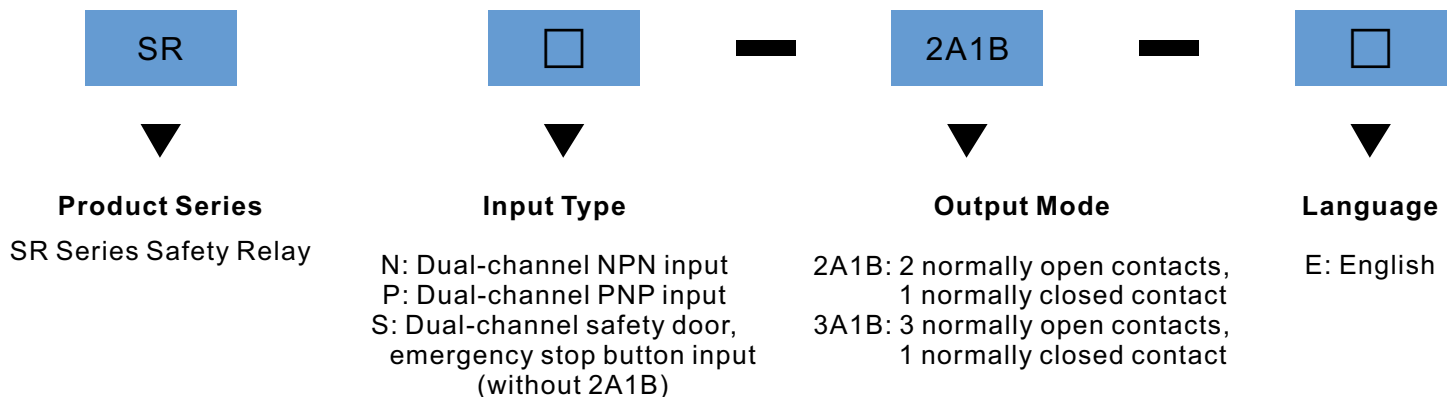
Vibration Resistance	Frequency 10Hz~55Hz, amplitude 0.35 \pm 0.05mm, X, Y, and Z directions each 20 times
Impact Resistance	Acceleration 10g, pulse duration 16ms, X, Y, and Z directions each 1000 times
Operating Temperature	-25~+60°C
Storage Temperature	-40~+85°C
Protection Level	Enclosure protection/terminal protection: IP40/IP20

Installation/Structure

Installation	35mm DIN rail
Wire Size	0.2~2.5mm ²
Dimensions (mm)	117×100.6×22.5

Safety Relay Model Explanation

(e.g., SR□-2A1B-□)



Panel Functions

SR(N/P)-2A1B-E

- **Power:** Power indicator light, lights up when power is on normally.
- **CH1:** Channel 1 indicator, lights up when relay 1 is activated, turns off when released.
- **CH2:** Channel 2 indicator, lights up when relay 2 is activated, turns off when released.
- **V+/V-:** Power input terminal.
- **VCC/GND:** Power output terminal.
- **PE:** Protective ground terminal.
- **S1:** Light grid input signal 1 terminal.
- **S2:** Light grid input signal 2 terminal.
- **S33/S34:** Connect S33 and S34 to select automatic reset.
- **S33/S35:** Connect S33 and S35 to select manual reset.
- **13/14, 23/24:** Two safety output (NO) terminals.
- **31/32:** One auxiliary output (NC) terminal.



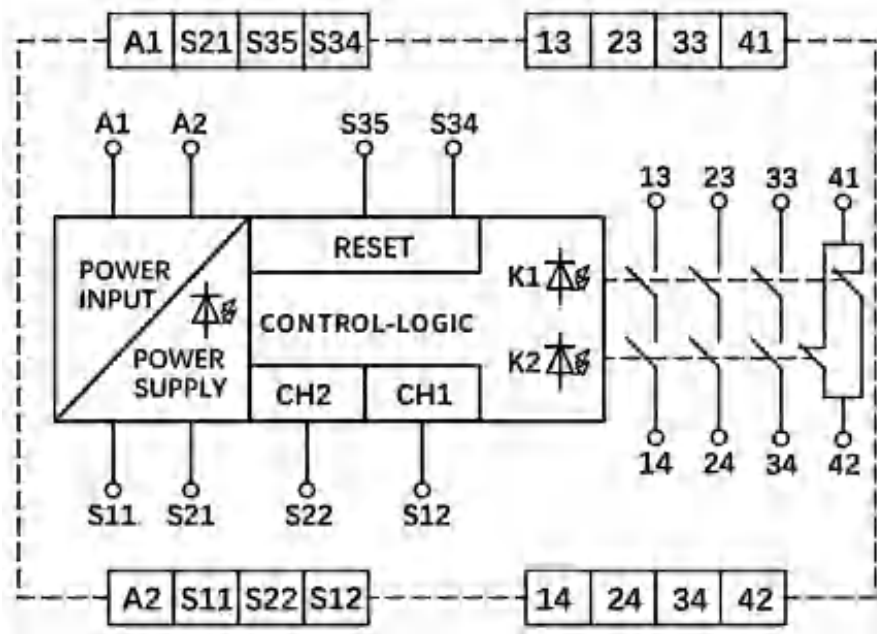
SR(P/N/S)-3A1B

- **Power:** Power indicator light, lights up when power is on normally.
- **CH1:** Channel 1 indicator, lights up when relay 1 is activated, turns off when released.
- **CH2:** Channel 2 indicator, lights up when relay 2 is activated, turns off when released.
- **A1/A2:** Power input terminal.
- **S1:** Light grid output signal 1 terminal.
- **S2:** Light grid output signal 2 terminal.
- **S11/S12:** Safety door or emergency stop monitoring input signal 1 terminal.
- **S21/S22:** Safety door or emergency stop monitoring input signal 2 terminal.
- **S34/S35:** Select automatic reset or monitored manual reset.
- **13/14, 23/24, 33/34:** Three safety output (NO) terminals.
- **41/42:** One auxiliary output (NC) terminal.



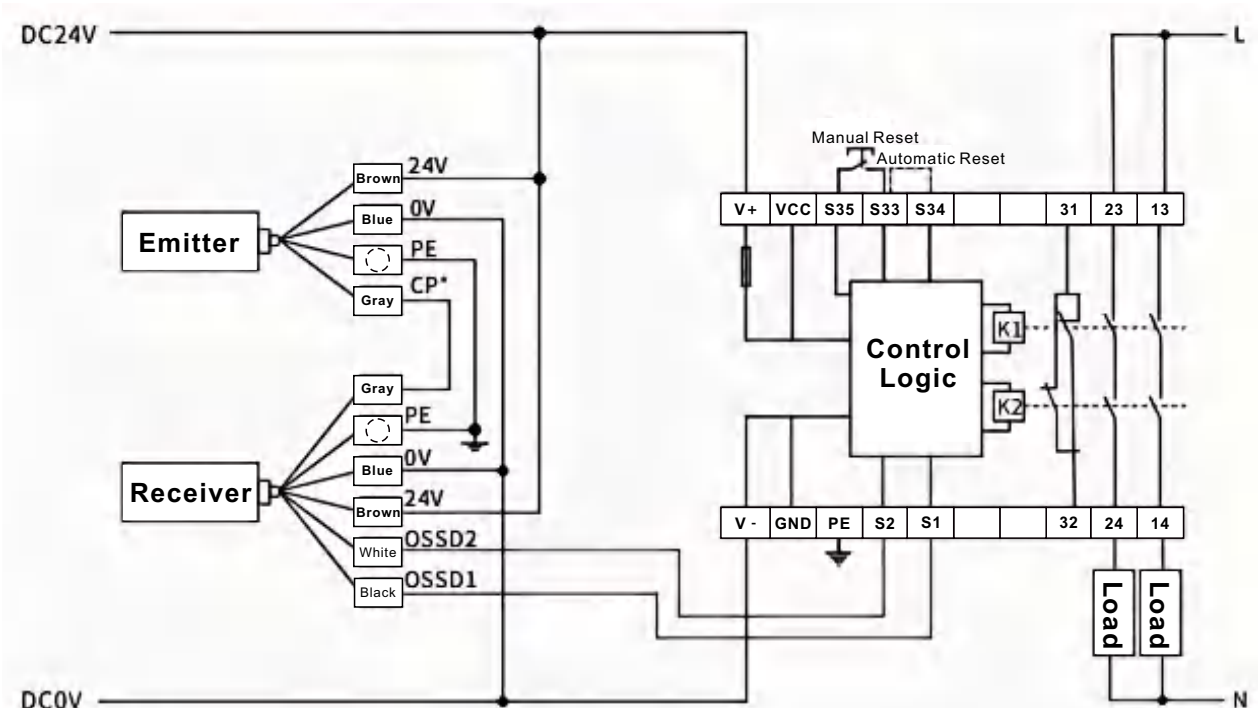
Functional Block Diagram

SR(N/P)-2A1B



Wiring Diagram

SR-2A1B for Safety Light Curtain Manual Reset/Automatic Reset Wiring Diagram

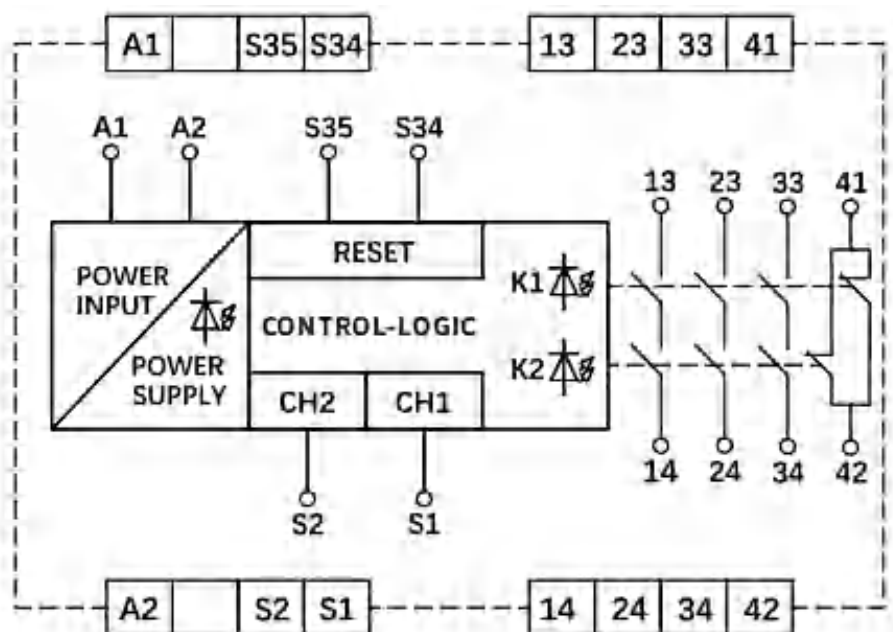


*In light synchronization mode, no CP line or CP is connected in a specific way.

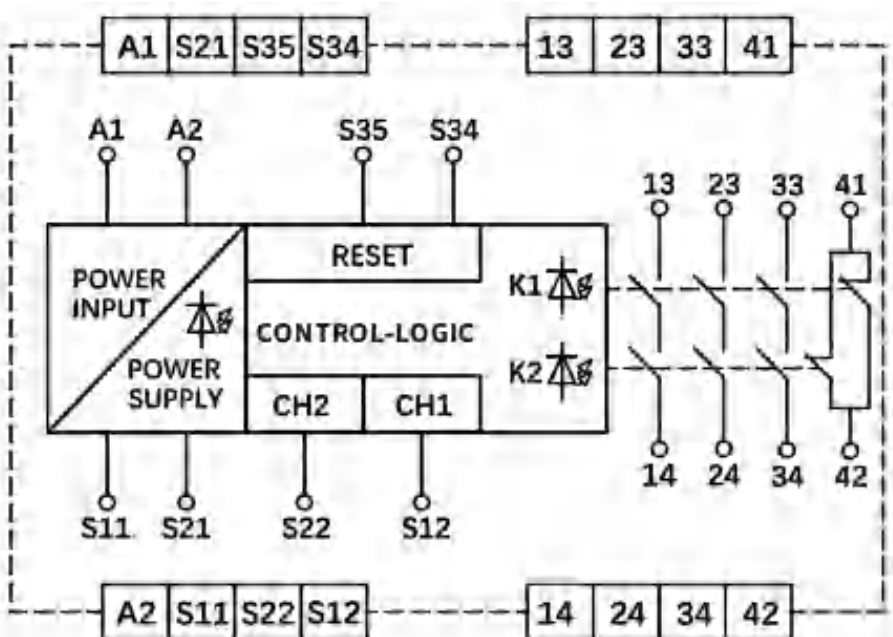
*Manual Reset / Automatic Reset (choose one)

Functional Block Diagram

SR(N/P)-3A1B

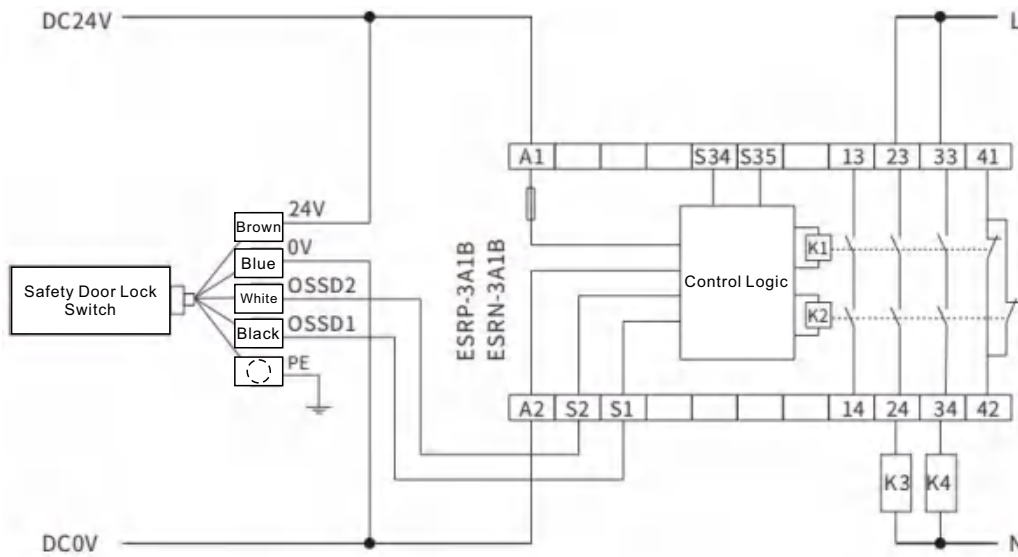


SRS-3A1B



Safety Relay SR(N/P)-3A1B

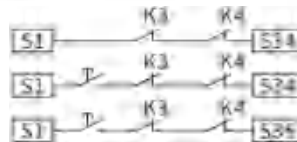
For Safety Door Lock Switch (NPN/PNP Output Type)



Automatic Reset (Monitored Output)

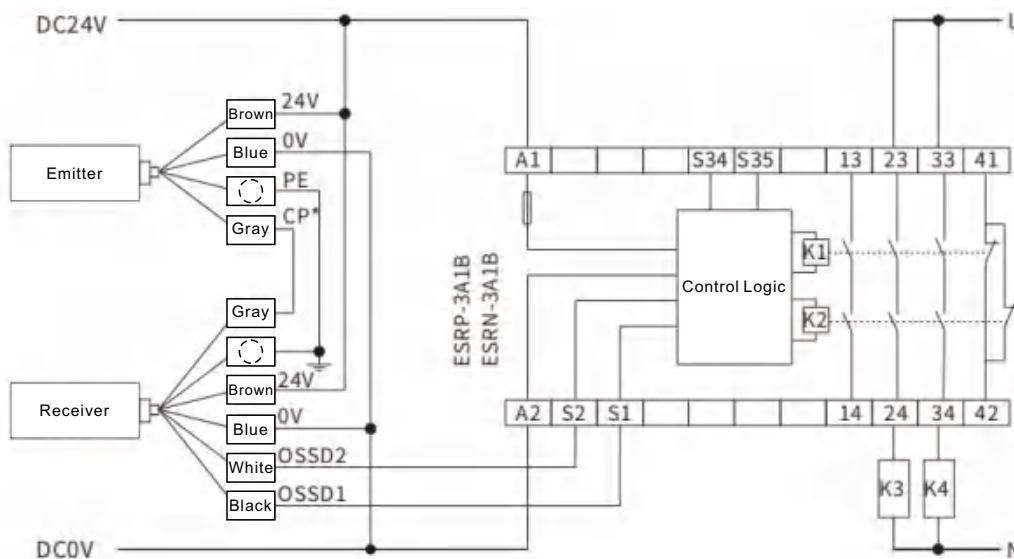
Manual Reset (Monitored Output)

Monitored Manual Reset (Monitored Output)



Safety Relay SR(N/P)-3A1B

For Safety Light Grid (NPN/PNP Output Type)

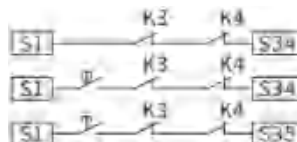


*In light synchronization mode, no CP line or CP is connected in a specific way.

Automatic Reset (Monitored Output)

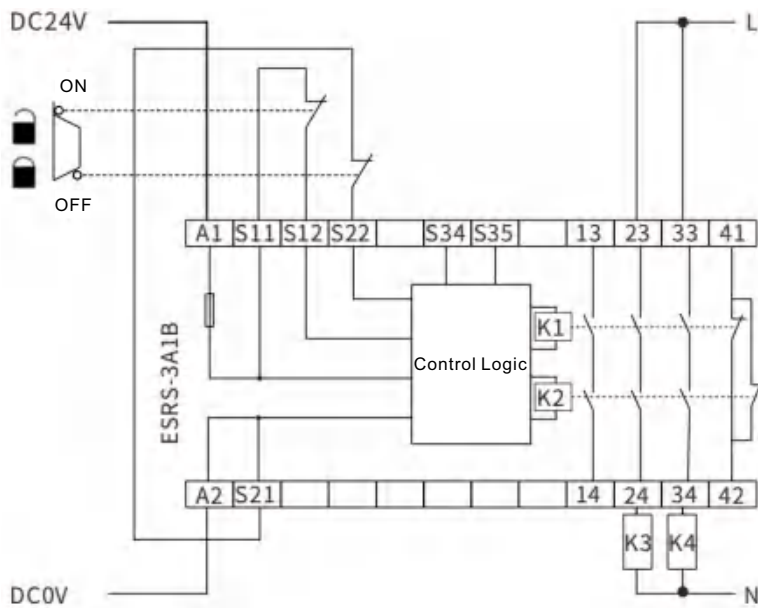
Manual Reset (Monitored Output)

Monitored Manual Reset (Monitored Output)



Safety Relay SRS-3A1B

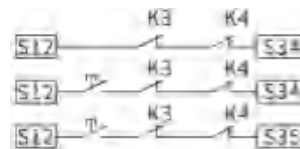
For Dual-Channel Safety Door



Automatic Reset (Monitored Output)

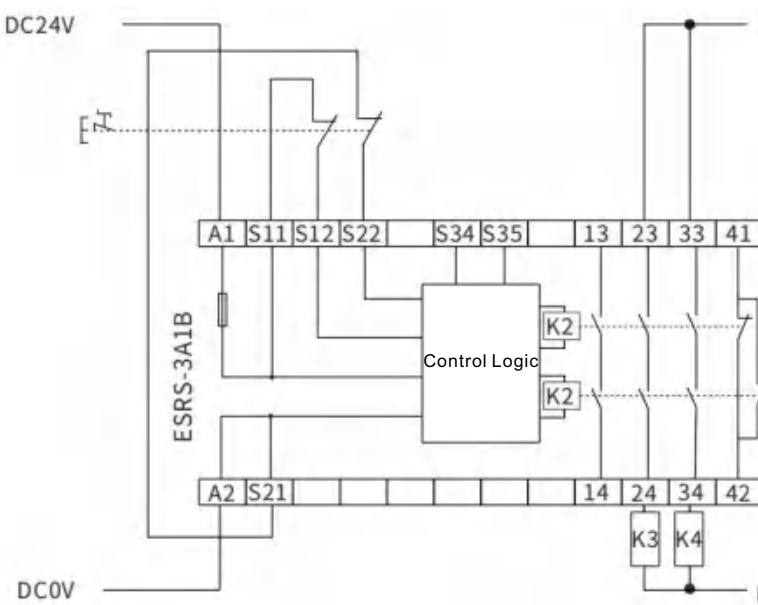
Manual Reset (Monitored Output)

Monitored Manual Reset (Monitored Output)



Safety Relay SRS-3A1B

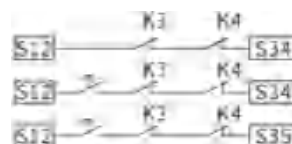
For Emergency Stop Button



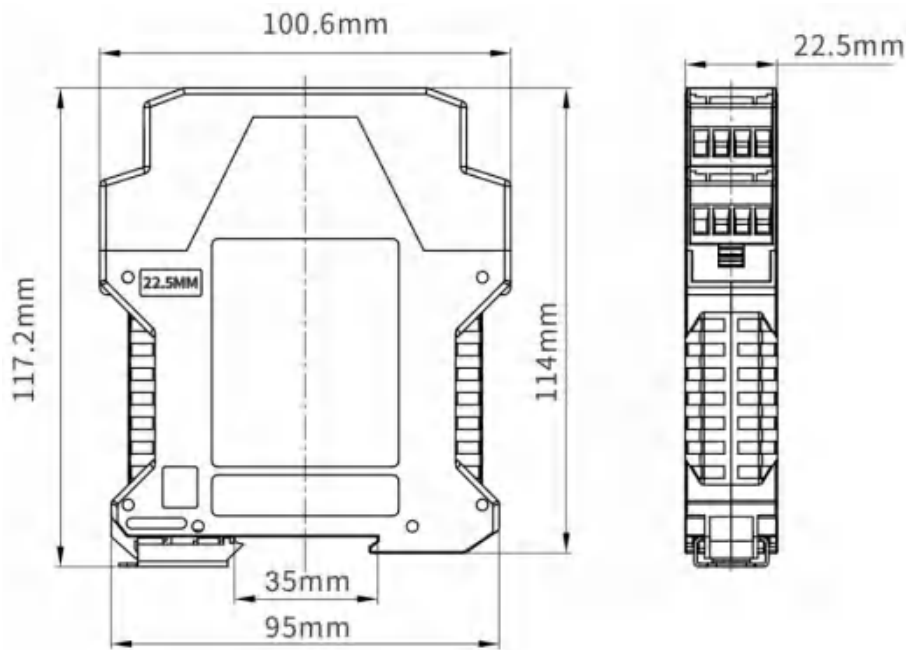
Automatic Reset (Monitored Output)

Manual Reset (Monitored Output)

Monitored Manual Reset (Monitored Output)



Product Size Diagram



Installation

- Turn off the machine's power supply to ensure there is no dangerous voltage inside the machine, except for lighting and emergency sockets.
- This product is installed using a 35mm DIN rail.
- Connect the cables according to the wiring diagram of the safety relay.
- Before powering on, check to confirm that the cable connections are correct and that the relay is securely fastened to the installation rail.



Removal

- Before removing the safety Modules, the machine's power supply must be turned off.
- Loosen the securing screws or remove the terminals.

Two-Hand Button Control Modules

SRH-3A1B

Introduction to SRH Two-Hand Button Control Modules

The SRH two-hand button control Modules complies with the PLe safety requirements of EN/ISO 13849-1. The SRH-3A1B is a Modules suitable for monitoring two-hand buttons in industrial sites with high safety requirements. It uses a dual-channel input mode and has a detection function where the synchronization time between dual channels does not exceed 0.5 seconds. It features a two-hand button control Modules with 3 NO safety output contacts and 1 NC auxiliary output contact.

Product Features

- Designed according to EN ISO 13849-1 (Category 4, PLe).
- Relay output: 3 normally open contacts, 1 normally closed auxiliary contact.
- Internal circuit with cross-fault monitoring.
- Redundant circuit design for self-checking function.
- Input overvoltage and overcurrent protection function.
- Power anti-reverse protection design.
- Intuitive status indicator lights for easy operation status diagnosis.
- Removable terminal blocks for easy maintenance.
- Standard 35mm width rail mounting design.



Technical Parameters

Standard Level

Compliance Standard	EN/ISO13849-1
Safety Level	EN/ISO13849-1 Category 4

Electrical Parameters

Supply Voltage	DC24V \pm 10%
Power Consumption	<3W
Response Time	<20ms
Suction Release Time	<50ms
Power-On Startup Time	<1s
Protection Circuit	Input overvoltage and overcurrent protection, anti-reverse protection
Safe Input	Dual-hand button switch signal
Input Synchronization	\leq 500ms (typical value 200ms)
Safe Output	3 normally open contacts 1 normally closed contact
Contact Capacity	Ac15: 5A/250V DC13: 6A/24V
Electrical Life	\geq 100,000 cycles
Mechanical Life	\geq 10 million cycles

Environment

Vibration Resistance	Frequency 10Hz~55Hz, amplitude 0.35 ± 0.05 mm, X, Y, and Z directions each 20 cycles
Impact Resistance	Acceleration 10g, pulse duration 16ms, X, Y, and Z directions each 1000 cycles
Operating Temperature	-10~+55°C
Storage Temperature	-40~+85°C
Protection Level	Enclosure protection/terminal protection: IP40/IP20

Installation/Structure

Installation	35mm DIN rail
Wire Size	0.2~2.5mm ²
Dimensions (mm)	117×100.6×22.5

Model Explanation for Two-Hand Button Control Modules

(e.g., SR□-3A1B-□)

SR	□	—	3A1B	—	□
▼	▼		▼		▼
Product Series	Input Type		Output Mode		Language
SR Series Safety Relay	H: Two-Hand Button		3A1B: 3 normally open contacts, 1 normally closed contact		E: English

Panel Functions

- **Power:** Power indicator light, lights up when power is on normally.
- **CH1:** Channel 1 indicator light, lights up when relay 1 is activated, turns off when deactivated.
- **CH2:** Channel 2 indicator light, lights up when relay 2 is activated, turns off when deactivated.
- **A1/A2:** DC24 power input/output terminal.
- **S11:** Two-hand button input signal 1 terminal.
- **S21:** Two-hand button input signal 2 terminal.
- **Y1-Y2:** Connect Y1 and Y2 to select automatic reset.
- **13/14, 23/24, 33/34:** Three safety contact outputs (NO) terminals.
- **41/42:** One auxiliary contact output (NC) terminal.



Application Description

The two-hand button control Modules SRH-3A1B provides three safety contact outputs and one auxiliary contact output in the safety circuit. Connect the Modules's port A1 to the positive terminal of the DC24V power supply, and port A2 to the negative terminal. The two-hand button control Modules will only operate when the signals in the input circuits S11 and S21 are correct and the reset circuit is activated.

SRH-3A1B Functional Block Diagram

Automatic Reset

SRH-3A1B: Short circuit Y1-Y2.

When the input circuits S11 and S21 receive valid signals, the component will function.

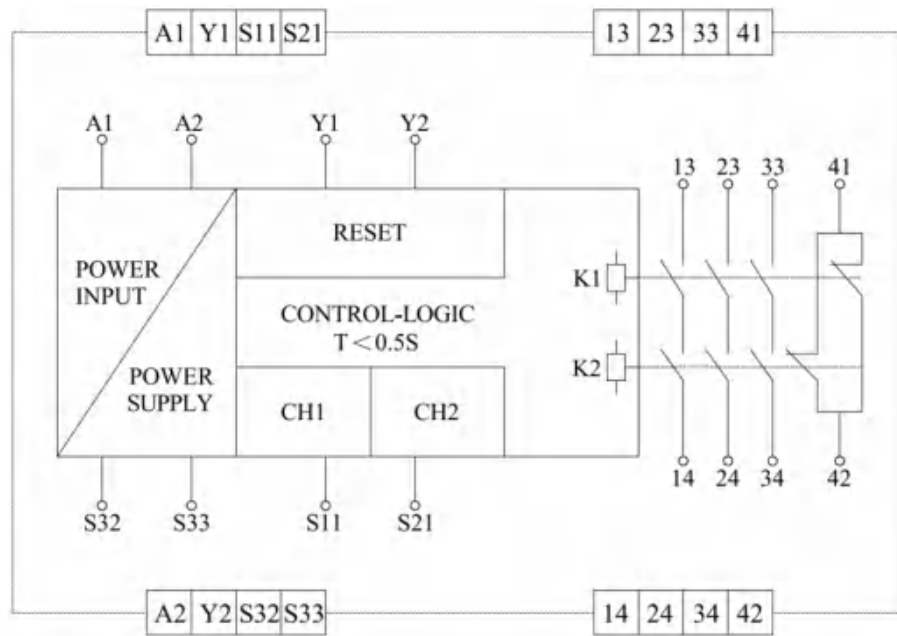
- **When the input circuit is closed** (the input circuit outputs a valid signal to the two-hand button control Modules), and the reset circuit is activated, relays K1 and K2 are energized and held, indicator lights Ch1 and CH2 are lit, safety contacts 13-14/23-24/33-34 are closed, and auxiliary contacts 41-42 are open.

Input Circuit

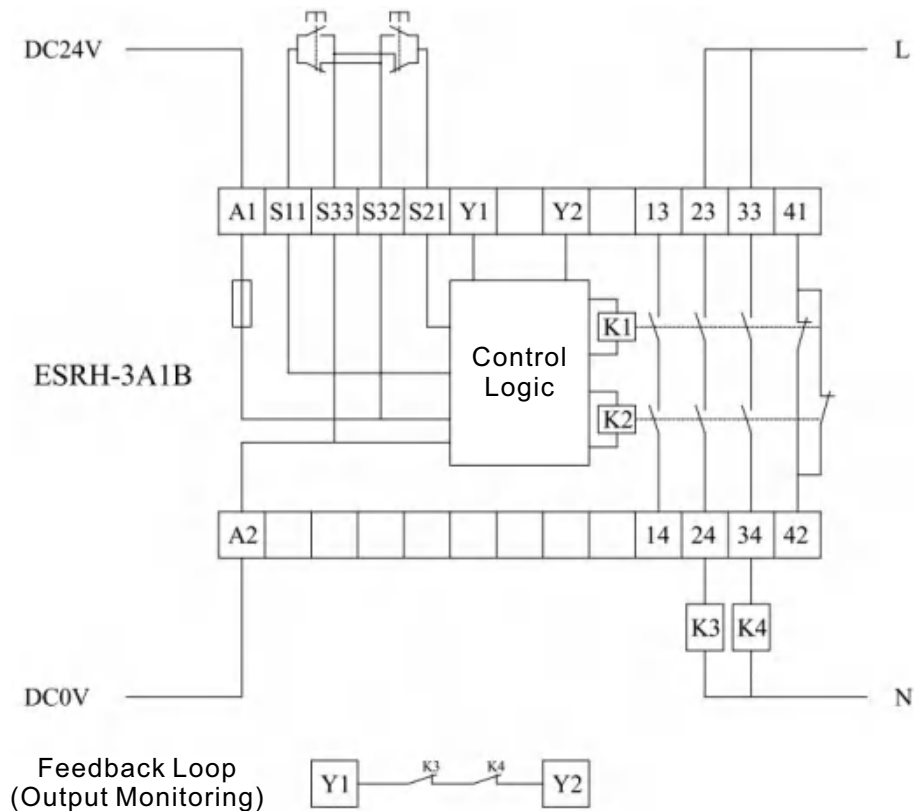
Dual circuit input, connect safety relay's S11 and S21 to the two-hand buttons, and connect the normally open and normally closed points of the two-hand buttons as shown in the diagram.

SRH-3A1B Functional Block Diagram

- **When the input circuit is open** (the input circuit does not output a valid signal to the two-hand button control Modules), and the reset circuit is activated, relays K1 and K2 are de-energized, indicator lights CH1 and CH2 are extinguished, safety contacts 13-14/23-24/33-34 are open, and auxiliary contacts 41-42 are closed.

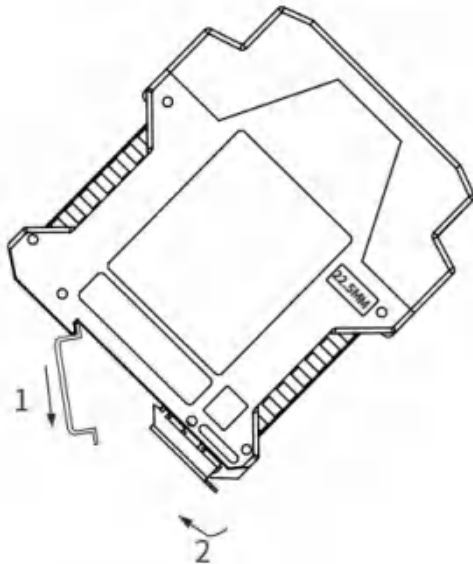


Wiring Diagram

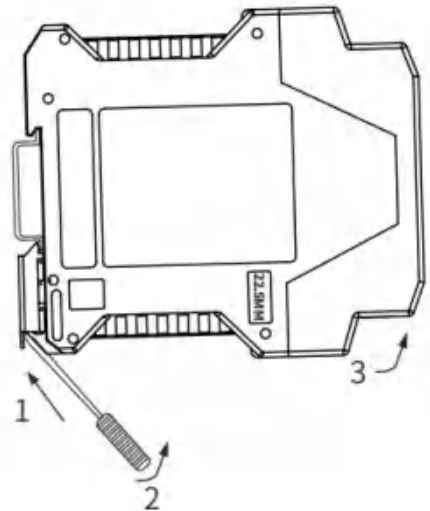


Product Installation

- Before installing the product, cut off the machine's power supply to ensure there is no dangerous voltage inside the machine, except for lighting and emergency sockets; directly clip the product onto the 35mm rail inside the equipment cabinet. Check and confirm that the cable connections are correct and that the product is securely fastened to the mounting rail before powering on. Before removing the product, you must first cut off the machine's power supply, then loosen the securing screws or remove the terminals.



Product Installation Diagram



Product Removal Diagram

Product Installation

- Before installing the product, cut off the machine's power supply to ensure there is no dangerous voltage inside the machine, except for lighting and emergency sockets; directly clip the product onto the 35mm rail inside the equipment cabinet. Check and confirm that the cable connections are correct and that the product is securely fastened to the mounting rail before powering on. Before removing the product, you must first cut off the machine's power supply, then loosen the securing screws or remove the terminals.



When wiring this product, the power should be turned off. Do not work on live circuits. Wire according to the relevant instructions to ensure the product functions properly.

Safety Relay Expansion Modules

SRE-4A2B

Introduction to SRE Safety Relay Expansion Modules

The SRE safety relay expansion Modules complies with the EN/ISO 13849-1 standard for PLe safety requirements. The SRE-4A2B is a product designed for industrial sites with high safety requirements, for expanding the output points of safety relay Modules. It takes the safety switch signal from the upper level as input, expanding into 4 NO safety output points and 2 NC auxiliary output points.

Product Features

- Designed according to EN ISO 13849-1 (Category 4, PLe).
- Relay output: 4 normally open contacts, 2 normally closed auxiliary contacts;
- Internal circuit with cross-fault monitoring;
- Input overvoltage and overcurrent protection function;
- Power anti-reverse protection design;
- Intuitive status indicator lights for easy operation status diagnosis;
- Removable terminal blocks for easy maintenance;
- Standard 35mm width rail mounting design;



Technical Parameters

Standard Level

Compliance Standard	EN/ISO 13849-1
Safety Level	EN/ISO 13849-1 Category 4

Electrical Parameters

Supply Voltage	DC24V \pm 10%
Power Consumption	<3W
Response Time	<20ms
Suction Buffer Time	<50ms
Power-On Time	<1s
Protective Circuit	Input overvoltage and overcurrent protection, anti-reverse protection
Safe Input	Safety switch signal
Input Synchronization	No requirement
Safe Output	4 normally open contacts, 2 normally closed contacts
Contact Capacity	Ac15: 5A/250V DC13: 6A/24V
Electrical Life	\geq 100,000 cycles
Mechanical Life	\geq 10 million cycles

Environment

Vibration Resistance	Frequency 10Hz~55Hz, amplitude 0.35 \pm 0.05mm, X, Y, and Z directions each 20 cycles
Impact Resistance	Acceleration 10g, pulse duration 16ms, X, Y, and Z directions each 1000 cycles
Operating Temperature	-10~+55°C
Storage Temperature	-40~+85°C
Protection Level	Enclosure protection/terminal protection: IP40/IP20

Installation/Structure

Installation	35mm DIN rail
Wire Size	0.2~2.5mm ²
Dimensions (mm)	117×100.6×22.5

Safety Relay Expansion Modules Model Explanation

(e.g., SR□-4A2B-□)

SR	□	—	4A2B	—	□
▼	▼		▼		▼
Product Series	Input Type		Output Mode		Language
SR Series Safety Relay	E: Safety Expansion Modules		4A2B: 4 normally open contacts, 2 normally closed contacts		E: English

Note: SRE-4A2B-E is suitable for expanding the output of safety relays.

Panel Functions

- **Power:** Power indicator light, lights up when the relay is powered on normally.
- **CH1:** Channel 1 indicator light, lights up when relay 1 is activated, turns off when deactivated.
- **CH2:** Channel 2 indicator light, lights up when relay 2 is activated, turns off when deactivated.
- **A1/A2:** Upper-level switch signal input terminal.
- **Y1-Y2:** Connect Y1, Y2 to implement status feedback function.
- **13/14, 23/24, 33/34, 43/44:** Four safety contact output (NO) terminals.
- **51/52, Y1/Y2:** Two auxiliary contact output (NC) terminals.



Application Description

The safety relay expansion Modules SRE-4A2B provides four safety contact outputs and two auxiliary contact outputs in the safety circuit. Connect the Modules's terminal A1 to the upper-level switch signal output, A2 to the corresponding power supply terminals. When the signal from the upper-level input circuit is correct, the expansion Modules's contacts perform the corresponding actions.

SRE-4A2B Functional Block Diagram

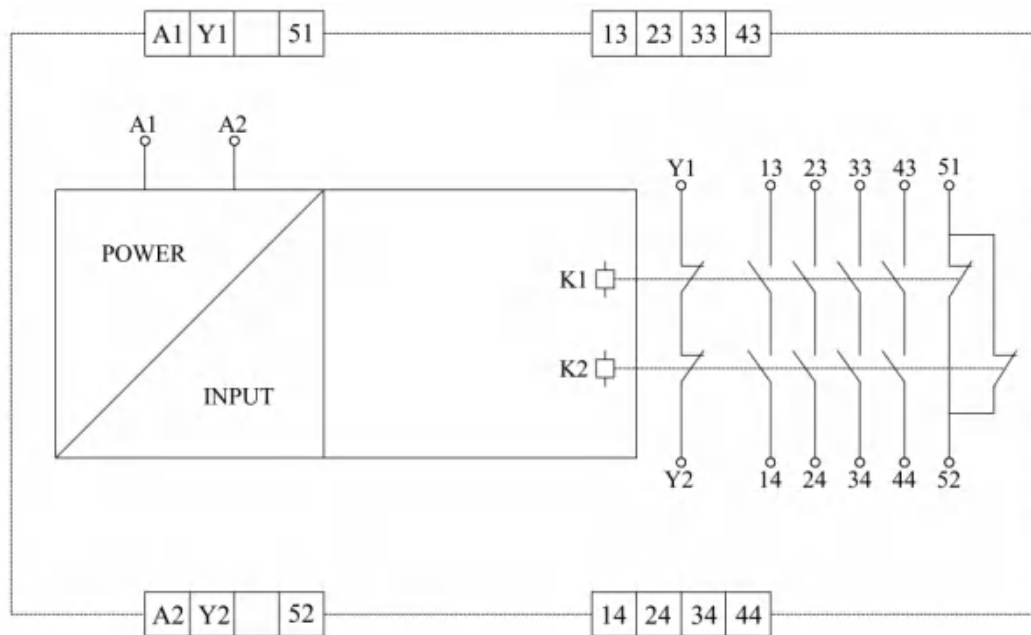
Input Circuit

SRE-4A2B: Connect SRE-4A2B A1 and A2 terminals as shown in the diagram.

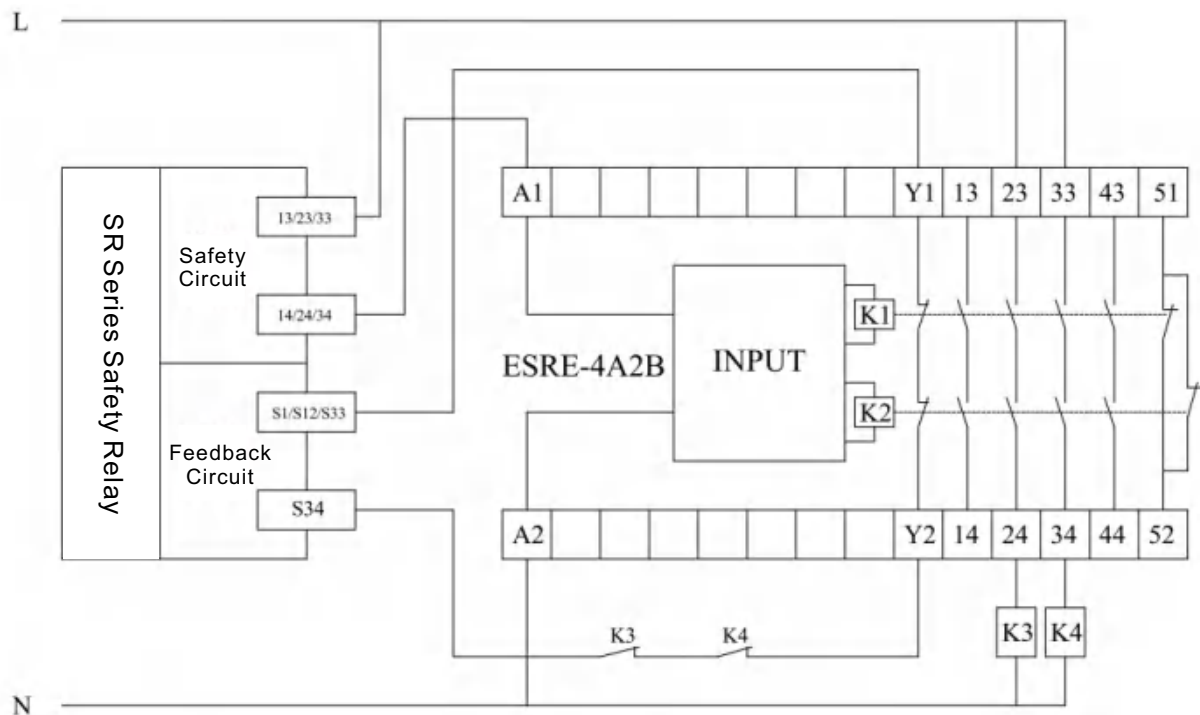
When the upper-level switch outputs a valid signal, the component will function.

- **When the input circuit is closed** (the input circuit outputs a valid signal to the safety relay expansion Modules), relays K1 and K2 are energized and held, indicator lights CH1 and CH2 are lit, safety contacts 13-14/23-24/3-34 are closed, and auxiliary contacts Y1-Y2/52 are open.
- **Status Feedback Circuit**
Connect Y1 and Y2 into the feedback circuit of the upper-level safety relay expansion Modules. If a fault occurs, the safety relay expansion Modules will not perform the corresponding action.
- **When the input circuit is open** (no valid signal output to the safety relay expansion Modules), relays K1 and K2 are de-energized, indicator lights CH1 and CH2 are extinguished, safety contacts 13-14/23-24/3-34 are open, and auxiliary contacts Y1-Y2/52 are closed.

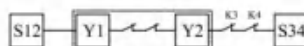
SRE-4A2B Functional Block Diagram



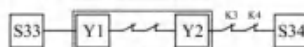
Wiring Diagram



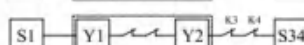
SRS-3A1B Feedback Circuit



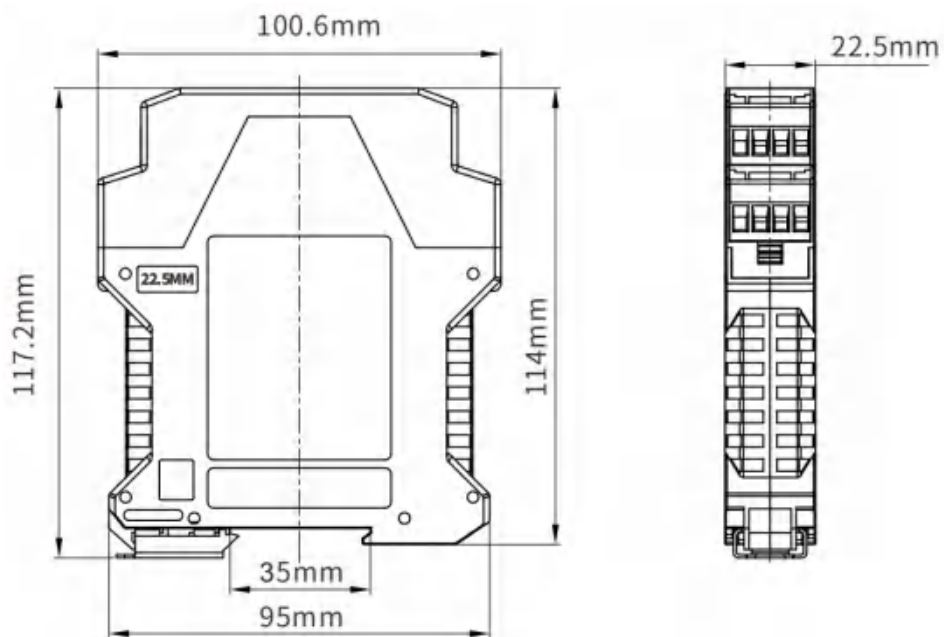
SRN/P-2A1B Feedback Circuit



SRN/P-3A1B Feedback Circuit



Product Size Diagram



Sensore di settore



Air Pressure Sensors

Sensori di pressione dell'aria



Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
 会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>

Air Pressure Sensors Contents

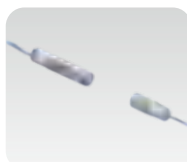
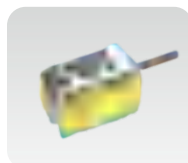
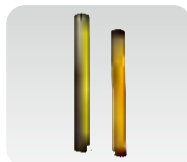
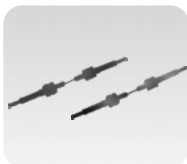
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Triple Colour Dual Display/Analog Output	161
Triple Colour Dual Display/RS485 Communication	162 - 163

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Website: <http://www.nipponkodobearings.com>



Air Pressure Sensors

◀ Triple-colour Dual Display/Comparison Output

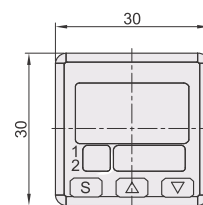
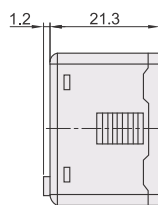
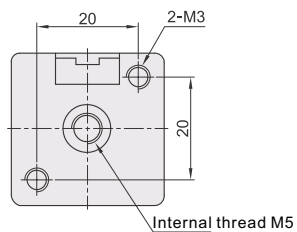
Code	Type	
AP51	Air Pressure Sensor	Triple-colour Dual Display/Comparison Output
AP56		L-type Mounting Bracket
AP57	Accessories	Z-type Mounting Bracket
AP58		Panel Mounting Bracket

● Product Features

- Ultra-high cost-performance ratio;
- Triple-colour dual display for clearer visibility;
- New unit display function for more intuitiveness;
- New housing structure for space-saving;
- New button lock icon added.

Air Pressure Sensor

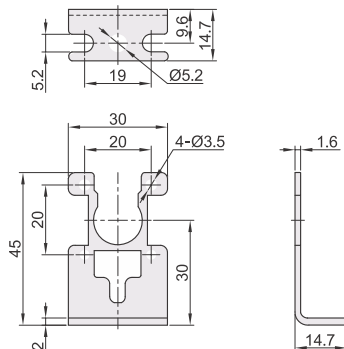
AP51



● Select Accessories

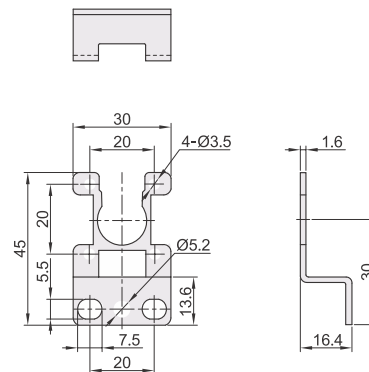
L-type Mounting Bracket

AP56



Z-type Mounting Bracket

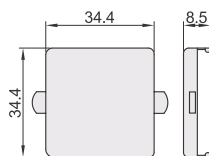
AP57



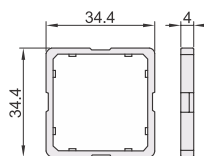
Panel Mounting Bracket

AP58

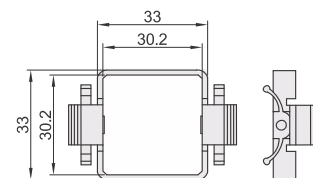
● Protective Cover



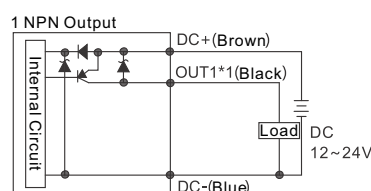
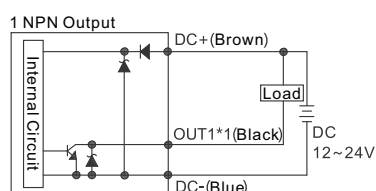
● Fastener



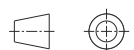
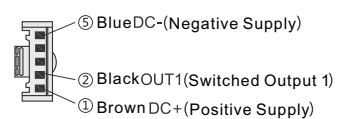
● Clip Fastener



● Circuit Wiring Diagram



● Wiring Definition



Perspective Standard: First Perspective

Air Pressure Sensors

◀ Triple-colour Dual Display/Comparison Output

○ Air Pressure Sensors

Code	Model	Output Type	Connection Size	Standard Accessories	Optional Accessories
	Pressure Type				
AP51	P (High Pressure Type: -0.101~1.000 MPa) C (Low Pressure Type: -101.3~101.3 KPa)	1 (1 NPN) 2 (1 PNP)	Female Thread M5	2m power cord with terminal, 1 copy of "Product User Manual"	AP56 (L-type Mounting Bracket) AP57 (Z-type Mounting Bracket) AP58 (Panel Mounting Bracket)

○ Accessories

Model	Type
Code	
AP56	L-type Mounting Bracket
AP57	Z-type Mounting Bracket
AP58	Panel Mounting Bracket

Model	Pressure Type	Output Type
Code		
AP51	P (High Pressure Type) C (Low Pressure Type)	1 (1 NPN) 2 (1 PNP)

AP51 - P - 1

○ Specification Table

Model		AP51-P (High Pressure Type)	AP51-C (Low Pressure Type)
Rated Pressure Range		-0.101~1.000MPa	-101.3~101.3KPa
Set Pressure Range		-0.100~1.000MPa	-101.0~101.0KPa
Maximum Withstand Pressure		1.5MPa	500KPa
Applicable Gases		Non-corrosive gases, non-combustible gases, compliant with ISO 8573-1:2010 [7:4:4]	
Power Supply Voltage		12~24V DC±10%	
Consumption Current		Below 45mA (No Load)	
Display Resolution for Different Pressure Units	KPa	—	0.1
	MPa	0.001	—
	kgf/cm ²	0.01	0.001
	bar	0.01	0.001
	psi	0.1	0.01
	mmHg	—	0.1
	inchHg	—	1
Comparison Output[Note]*1		NPN Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 30VDC Internal Voltage Drop: Below 1.5V	PNP Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 24VDC Internal Voltage Drop: Below 1.5V
Display Accuracy		±1% F.S. ±1 digits (Operating Temperature 25±10℃)	
Repeatability		±0.2% F.S. ±2 digits	
Response Time		2.0ms, 50ms, 100ms, 250ms, 500ms, 2000ms selectable [Note]*2	
Display		3-colour (Red, Orange, Yellow-Green) display (Sampling Rate: 4 times/second)	
Temperature Characteristics		Within 1% F.S., Comparison Reference Temperature 25℃ (Operating Range 0~50℃)	
Operating Environment		0~50℃ (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Storage Environment		-10~50℃ (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Protection Rating		IP40	
Weight		Approximately 70g (Including Power Cable)	

[Note]*1 The output type corresponds to the product model, for details, please refer to the "Selection Table".

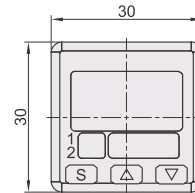
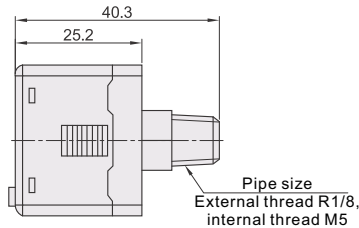
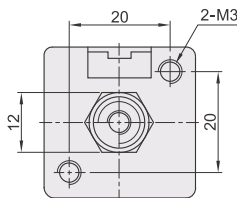
[Note]*2 For setting the response speed, please refer to the "Product User Manual".

Air Pressure Sensors

Triple colour Dual Display/Analog Output

Code	Type
AP52	Air Pressure Sensor Triple colour Dual Display/Analog Output
AP56	L-type Mounting Bracket
AP57	Accessories Z-type Mounting Bracket
AP58	Panel Mounting Bracket

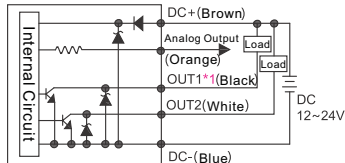
Air Pressure Sensor
AP52



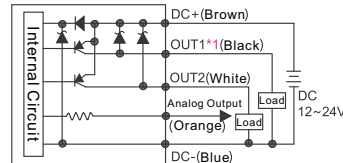
Perspective Standard: First Perspective

Circuit Wiring Diagram

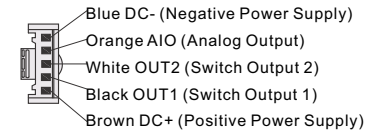
2 NPN Outputs + 1 Analog Output



2 PNP Outputs + 1 Analog Output



Wiring Definition



*1 OUT1 is a switch output that shares functionality with the parameter copy feature. Please switch through settings.

Air Pressure Sensors

Model		Output Type	Pipe Size	Standard Accessories	Optional Accessories
Code	Pressure Type				
AP52	P (High Pressure Type: -0.101~1.000 MPa)	11 (2 NPN + 1 Analog Output 1~5V)	External thread R1/8, Internal thread M5	1 piece of 2m power cable with terminals, 1 copy of "Product User Manual"	AP56 (L-type Mounting Bracket) AP57 (Z-type Mounting Bracket) AP58 (Panel Mounting Bracket)
		12 (2 NPN + 1 Analog Output 4~20mA)			
	C (Low Pressure Type: -101.3~101.3 KPa)	13 (2 PNP + 1 Analog Output 1~5V)			
		14 (2 PNP + 1 Analog Output 4~20mA)			

Accessories

Model	Type
Code	
AP56	L-type Mounting Bracket
AP57	Z-type Mounting Bracket
AP58	Panel Mounting Bracket

Model	Pressure Type	Output Type
Code		
AP52	P (High Pressure Type) C (Low Pressure Type)	11 12

AP52 - P - 11

Specification Table

Model	AP52-P (High Pressure Type)	AP52-C (Low Pressure Type)
Rated Pressure Range	-0.101~1.000MPa	-101.3~101.3KPa
Set Pressure Range	-0.100~1.000MPa	-101.0~101.0KPa
Maximum Withstand Pressure	1.5MPa	500KPa
Applicable Gases	Non-corrosive gases, non-combustible gases, compliant with ISO 8573-1:2010 [7:4.4]	
Power Supply Voltage	12~24V DC±10%	
Consumption Current	Below 45mA (No Load)	
Display Resolution for Different Pressure Units	KPa	0.1
	MPa	0.001
	kgf/cm ²	0.001
	bar	0.001
	psi	0.01
	mmHg	0.1
Comparison Output[Note]*1	NPN Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 30VDC Internal Voltage Drop: Below 1.5V	PNP Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 24VDC Internal Voltage Drop: Below 1.5V
	Output Voltage: 1~5V±2.5%F.S. Linearity: ±1%F.S. Output Impedance: Approximately 1KΩ	
Voltage Type Analog Output[Note]*1	Output Current: 4~20mA±2.5%F.S. Linearity: ±1%F.S. Load Resistance: Minimum 50Ω Maximum 300Ω@12V; 600Ω@24V	
Current Type Analog Output[Note]*1	±1%F.S.±1digits (Operating Temperature 25±10°C)	
Display Accuracy	±0.2%F.S.±2digits	
Repeatability	1ms[Note]*2, 2.0ms, 50ms, 100ms, 250ms, 500ms, 2000ms selectable	
Response Time	3-colour (Red, Orange, Yellow-Green) display (Sampling Rate: 4 times/second)	
Display	Within 1%F.S., Comparison Reference Temperature 25°C (Operating Range 0~50°C)	
Temperature Characteristics	0~50°C (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Operating Environment	-10~50°C (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Storage Environment	IP40	
Protection Rating	Approximately 85g (including power cable)	
Weight		

[Note]*1 The output type corresponds to the product model, for details, please refer to the "Selection Table";

[Note]*2 To support a response speed of 1ms, the SUPERSPEED mode must be activated, for the activation and deactivation of this mode, please refer to the "Product User Manual".

Air Pressure Sensors

◀ Triple colour Dual Display/RS485 Communication

Code	Type	
AP53	Air Pressure Sensor	Triple colour Dual Display/RS485 Communication
AP56		L-type Mounting Bracket
AP57	Accessories	Z-type Mounting Bracket
AP58		Panel Mounting Bracket

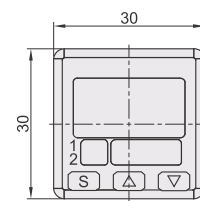
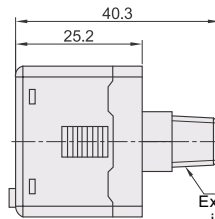
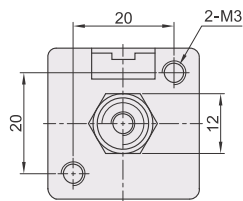
Product Features

- Supports MODBUS standard protocol;
- Retains 1 traditional switch output;
- Preferred for "Industry 4.0" and intelligent manufacturing;
- Supports remote reading and setting operations;
- Real-time monitoring and quick setup.



Air Pressure Sensor

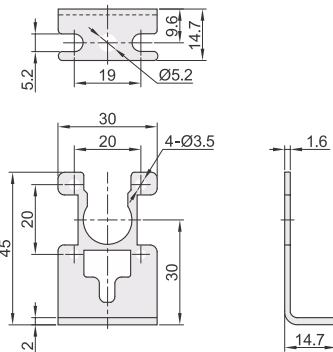
AP53



Select Accessories

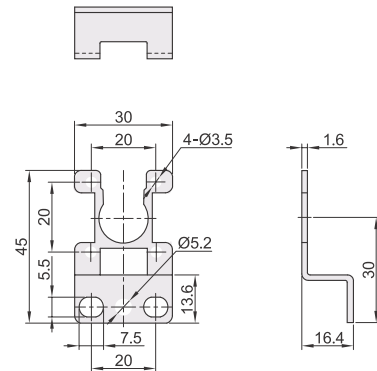
L-type Mounting Bracket

AP56



Z-type Mounting Bracket

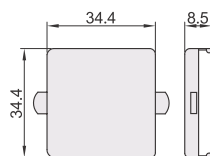
AP57



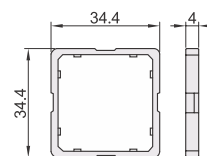
Panel Mounting Bracket

AP58

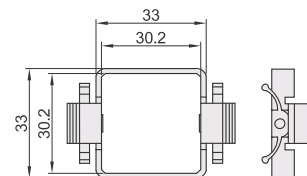
Protective Cover



Fastener

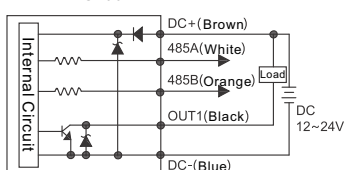


Clip Fastener

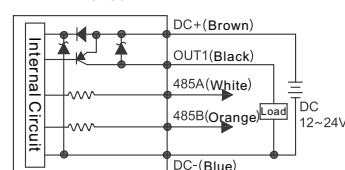


Circuit Wiring Diagram

1 NPN + RS485

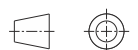


1 PNP + Rs485



Wiring Definition

- ⑤ Blue DC- (Negative Power Supply)
- ④ Orange 485B (MODBUS)
- ③ White 485A (MODBUS)
- ② Black OUT1 (Switch Output)
- ① Brown DC+ (Positive Power Supply)



Perspective Standard: First Perspective

Air Pressure Sensors

◀ Triple colour Dual Display/RS485 Communication

○ Air Pressure Sensors

Code	Model Pressure Type	Output Type	Pipe size	Standard Accessories	Optional Accessories
AP53	P (High Pressure Type: -0.101~1.000 MPa) C (Low Pressure Type: -101.3~101.3 KPa)	21 (1NPN+1RS485) 22 (1PNP+1RS485)	External thread R1/8, internal thread M5	2m power cord with terminal, 1 copy of "Product User Manual"	AP56 (L-type Mounting Bracket) AP57 (Z-type Mounting Bracket) AP58 (Panel Mounting Bracket)

○ Accessories

Model Code	Type
AP56	L-type Mounting Bracket
AP57	Z-type Mounting Bracket
AP58	Panel Mounting Bracket

Model Code	Pressure Type	Output Type
AP53	P (High Pressure Type) C (Low Pressure Type)	21 22

AP53 - P - 21

○ Specification Table

Model	AP53-P (High Pressure Type)	AP53-C (Low Pressure Type)
Rated Pressure Range	-0.101~1.000MPa	-101.3~101.3KPa
Set Pressure Range	-0.100~1.000MPa	-101.0~101.0KPa
Maximum Withstand Pressure	1.5MPa	500KPa
Applicable Gases	Non-corrosive gases, non-combustible gases, compliant with ISO 8573-1:2010 [7:4:4]	
Power Supply Voltage	12~24V DC±10%	
Consumption Current	Below 45mA (No Load)	
Display Resolution for Different Pressure Units	KPa	0.1
	MPa	—
	kgf/cm ²	0.001
	bar	0.001
	psi	0.01
	mmHg	0.1
	inchHg	1
Comparison Output[Note]*1	NPN Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 30VDC Internal Voltage Drop: Below 1.5V	PNP Open Collector Output Maximum Load Current: 100mA Maximum Supply Voltage: 24VDC Internal Voltage Drop: Below 1.5V
MODBUS Function[Note]*2	Equipped	
Display Accuracy	1% F.S. ±1 digits (Operating Temperature 25±10°C)	
Repeatability	±0.2% F.S. ±2 digits	
Response Time	2.0ms, 50ms, 100ms, 250ms, 500ms, 2000ms selectable [Note]*3	
Display	3-colour (Red, Orange, Yellow-Green) display (Sampling Rate: 4 times/second)	
Temperature Characteristics	Within 1% F.S., Comparison Reference Temperature 25°C (Operating Range 0~50°C)	
Operating Environment	0~50°C (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Storage Environment	-10~50°C (Non-condensing, Non-freezing); 35~85%RH (No Dew)	
Protection Rating	IP40	
Weight	Approximately 85g (including power cable)	

[Note]*1 The output type corresponds to the product model, for details, please refer to the "Selection Table";

[Note]*2 Only the AP53 series supports MODBUS mode, for operation, please refer to the "Product User Manual";

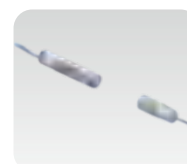
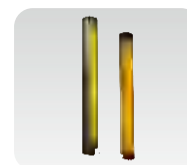
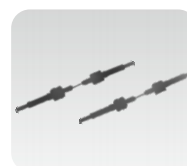
[Note]*3 For setting the response speed, please refer to the "Product User Manual".

Quality Management & Consultancy



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会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>

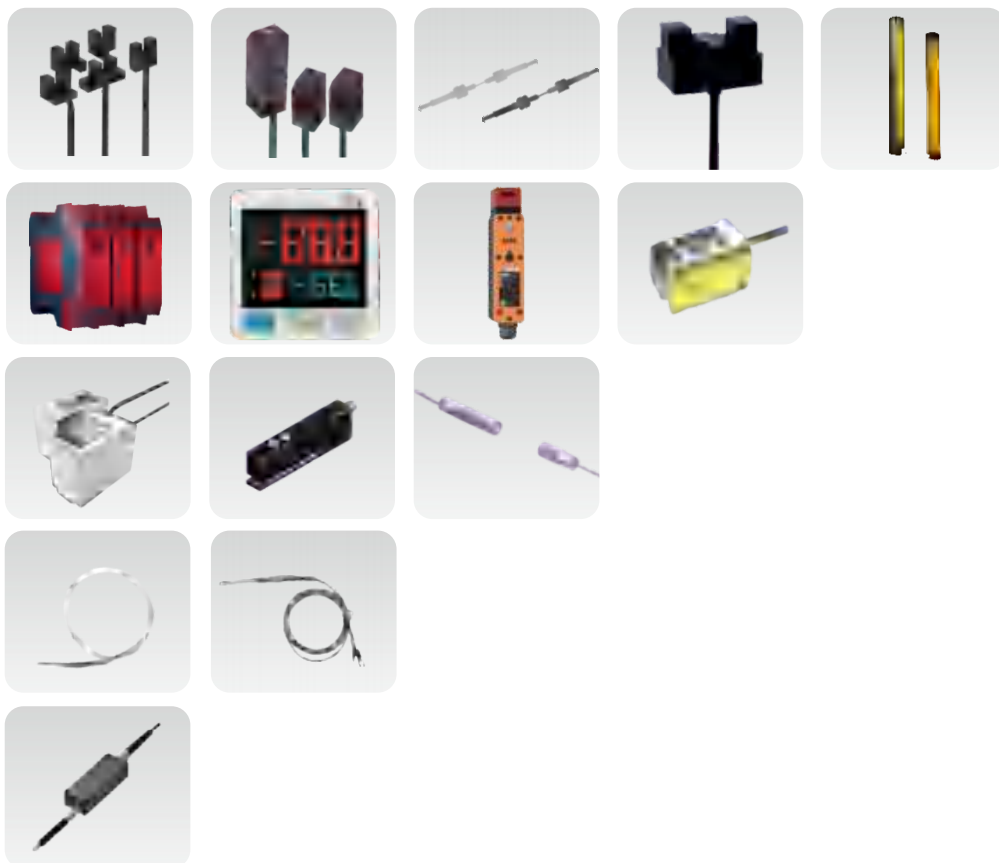


Sensore di settore



**Safety Door Locks
/ Switches**

Barrature di Sicurezza per Cancelli / Interruttori



Quality Management & Consultancy



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Safety Door Locks

SDL21 Series

Introduction to SDL21 Series Safety Door Lock

The SDL21 series safety door lock comes in a variety of models, is easy to operate, and offers the choice of operation key insertion direction and adjustable installation to ensure installation flexibility. The lock strength reaches a reassuring 1300N, with an IP67 protection structure that guarantees its wide application in various industrial environments.

Product Features

- Built-in multi-contact structure options
- Locking force of 1300N
- IP67 protection rating
- Various metal head options available
- Suitable for general or light loads

Safety Protection / Forced Locking

- EN 60947-5-1/IEC60947-5-1
- GB/T14048.5
- EN ISO 14119/ISO 14119
- GB/T18831



Safety Door Lock Model Description

(e.g., SDL21-BPMF2)

SDL 21 - ☐ ☐ ☐ ☐ ☐
1 2 3 4 5

1. Switch Contacts (Door Opening/Closing Detection Switch + Lock Monitoring Switch)

- A: 1NC/1NO (Delayed Contact) + 1NC/1NO (Delayed Contact)
- B: 1NC/1NO (Delayed Contact) + 2NC (Delayed Contact)
- C: 2NC (Delayed Contact) + 1NC/1NO (Delayed Contact)
- D: 2NC (Delayed Contact) + 2NC (Delayed Contact)
- E: 2NC/1NO (Delayed Contact) + 1NC/1NO (Delayed Contact)
- F: 2NC/1NO (Delayed Contact) + 2NC (Delayed Contact)
- G: 2NC/1NO (Delayed Contact) + 2NC/1NO (Delayed Contact)
- H: 3NC (Delayed Contact) + 1NC/1NO (Delayed Contact)
- I: 3NC (Delayed Contact) + 2NC (Delayed Contact)
- J: 3NC (Delayed Contact) + 3NC (Delayed Contact)
- K: 3NC (Delayed Contact) + 2NC/1NO (Delayed Contact)
- L: 2NC/1NO (Delayed Contact) + 3NC (Delayed Contact)

2. Head Installation Direction/Material

- P: Four installation directions available (delivered with front side installation)/Plastic
- M: Four installation directions available (delivered with front side installation)/Metal

3. Door Locking/Release Method

- M: Mechanical locking/DC24V electromagnetic release
- E: DC24V electromagnetic locking/Mechanical release

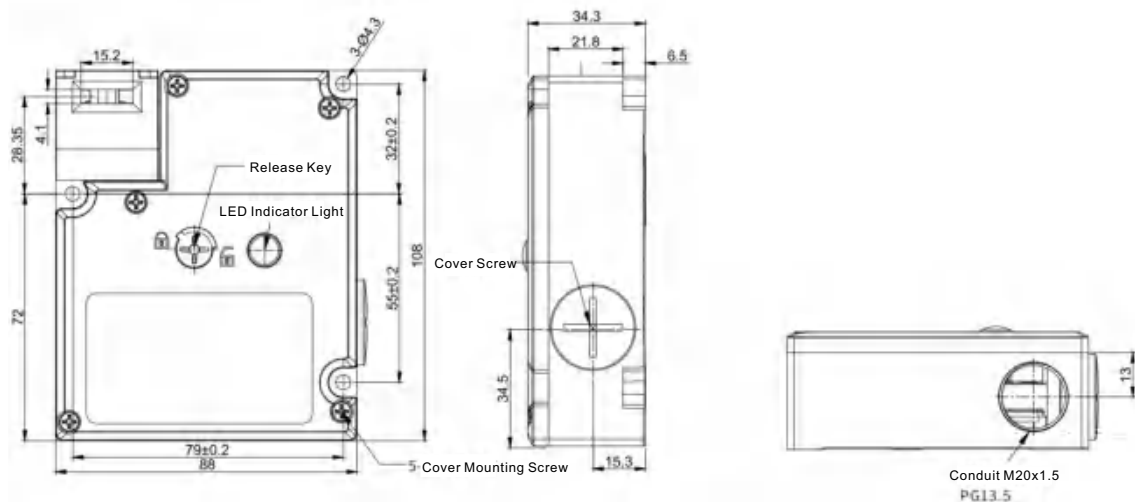
4. Release Key Position

- T: Top
- F: Front

5. Conduit Size

- 2: M20

Product Dimensions



Technical Parameters

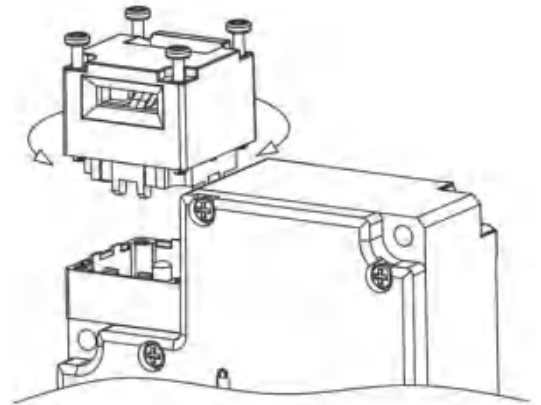
Electromagnetic Coil		
Rated Operating Voltage	DC24V	
Power	4.8W	
Rated Current	Approximately 200mA	
Insulation Grade	B Grade (130°C)	
LED Indicator Light		
Rated Operating Voltage	DC24V	
Rated Current	Approximately 1mA	
LED Color	Green	
Safety Level	Can reach up to PLd based on ISO 13849-1	
Certification	CE, TUV Rheinland	
Standards	EN60947-5-1, IEC60947-5-1, GB/T 14048.5, EN ISO 14119, GB/T 18831	
Protection Level	IP67	
Material	PA 66 Flame Retardant	
Mechanical Life	Over 1 million cycles	
Electrical Life	Over 150,000 cycles (AC240V3A, resistive load)	
Usage Types	AC-15	DC-13
Rated Operating Voltage (Ue)	240V	24V
Rated Operating Current (Ie)	3A	2A
Electrical		
Contact Resistance	Below 25mΩ	
Rated Release Heat Current (Ith)	10A	
Rated Insulation Voltage (Ui)	300V	
Dielectric Strength	Class II (Double Insulation)	
Impulse Withstand Voltage(EN60947-5-1)	2.5kV	
Insulation Resistance	Over 100MΩ	
Short Circuit Protection Device	10A, 250V/with quick-acting fuse	
Vibration Resistance	10-55Hz, 1.5mm double amplitude	
Impact Resistance	Durability: 1000m/s, Malfunction: 300m/s	
Conditional Short Circuit Current	100A (EN 60947-5-1)	
Touch Distance	Over 2x2mm	
Operational Characteristics		
Forced Breakaway Force	Minimum 60N	
Forced Breakaway Stroke	Over 10mm	
Operating Speed	0.1m - 0.5m/s	
Permissible Operating Frequency	Up to 30 operations per minute	
Locking Force at Pull Strength	1300N	
Environment		
Pollution Degree (Usage Environment)	3 (EN60947-5-1)	
Usage Environment Temperature	-10°C to +55°C (no icing)	
Usage Environment Humidity	Below 95%RH	

SDL21 Series Selection Table

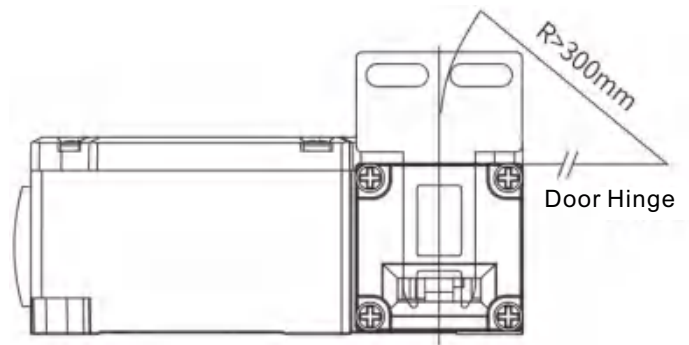
Release Key Position	Head Material	Electromagnet Voltage / Indicator Light	Locking/Releasing Method	Contact Type (Door Monitoring + Lock Monitoring)	Conduit Size	Model
Front Unlock	Metal	Electromagnet DC24V Green LED	Mechanical Locking Electromagnetic Release	1NC/1NO+1NC/1NO	M20	SDL21-AMMF2
				1NC/1NO+2NC	M20	SDL21-BMMF2
				2NC+1NC/1NO	M20	SDL21-CMMF2
				2NC+2NC	M20	SDL21-DMMF2
				2NC/1NO+1NC/1NO	M20	SDL21-EMMF2
				2NC/1NO+2NC	M20	SDL21-FMMF2
				2NC/1NO+2NC/1NO	M20	SDL21-GMMF2
				3NC+1NC/1NO	M20	SDL21-HMMF2
				3NC+2NC	M20	SDL21-IMMF2
				3NC+3NC	M20	SDL21-JMMF2
				3NC+2NC/1NO	M20	SDL21-KMMF2
				2NC/1NO+3NC	M20	SDL21-LMMF2
			Electromagnetic Locking Mechanical Release	1NC/1NO+1NC/1NO	M20	SDL21-AMEF2
				1NC/1NO+2NC	M20	SDL21-BMEF2
				2NC+1NC/1NO	M20	SDL21-CMEF2
				2NC+2NC	M20	SDL21-DMEF2
				2NC/1NO+1NC/1NO	M20	SDL21-EMEF2
				2NC/1NO+2NC	M20	SDL21-FMEF2
				2NC/1NO+2NC/1NO	M20	SDL21-GMEF2
				3NC+1NC/1NO	M20	SDL21-HMEF2
				3NC+2NC	M20	SDL21-IMEF2
				3NC+3NC	M20	SDL21-JMEF2
				3NC+2NC/1NO	M20	SDL21-KMEF2
				2NC/1NO+3NC	M20	SDL21-LMEF2

Installation Method

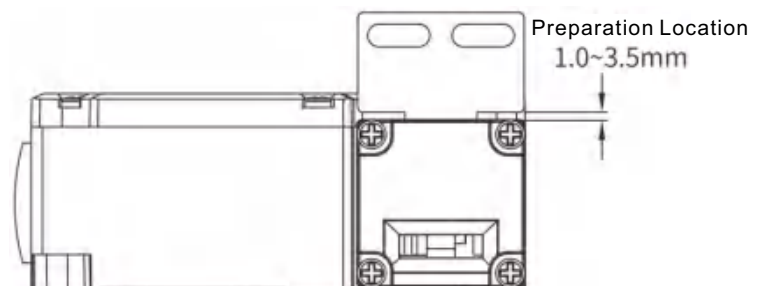
- ★ Loosen the 4 screws at the top of the head, rotate the head to select the appropriate operation key hole position before installation.



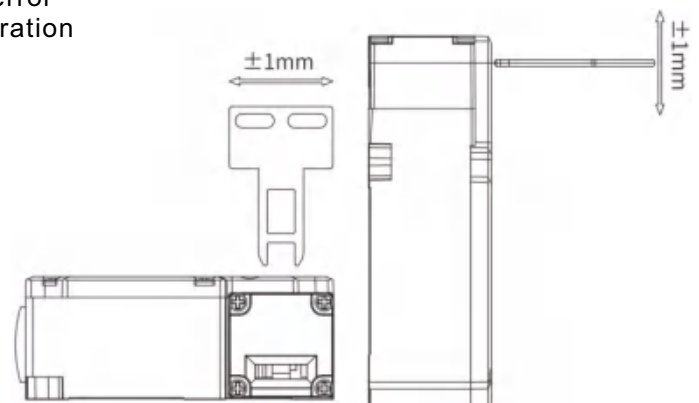
- ★ When installing on a flat door, it needs to be greater than the minimum radius.



- ★ Please install the switch and operation key within the preparation position range of 1 to 3.5mm.



- ★ The installation of the operation key allows for an error of $\pm 1\text{mm}$ from the center of the hole where the operation key is inserted.



Multi-Contact Safety Door Lock

SDL11 Series

Introduction to the SDL11 Series Multi-Contact Safety Door Lock

The SLM11 series safety door lock is equipped with multiple contact points, featuring electromagnetic or mechanical locking functions. It offers the option to choose the direction of the operation key insertion and adjustable installation, ensuring flexible installation. The lock strength is as high as a reassuring 1300N, with an IP67 protection structure, guaranteeing its wide application in various industrial environments.

Product Features

- Built-in multi-contact structure options
- Locking force of 1300N
- IP67 protection rating
- A variety of metal head options available
- Suitable for general or light loads

Safety Protection / Forced Locking

- TUVEN60947-5-1/IEC60947-5-1
- GB/T14048.5
- EN ISO 14119/ISO 14119
- GB/T18831







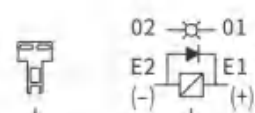
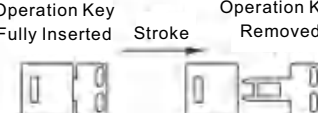
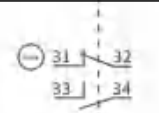
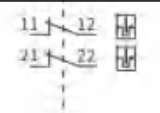
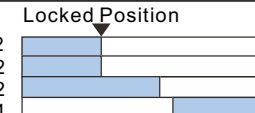
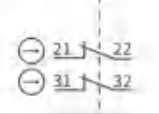
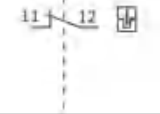
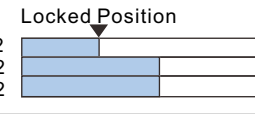
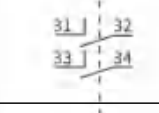
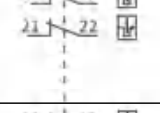
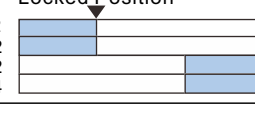
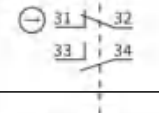
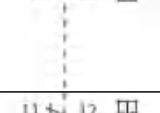
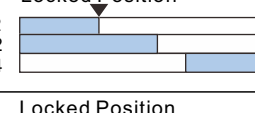
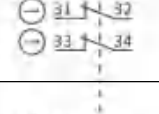
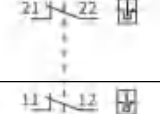
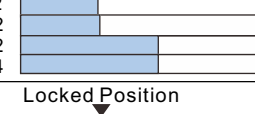
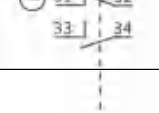
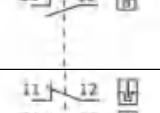
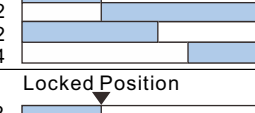
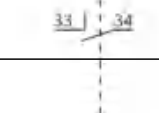
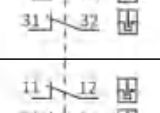
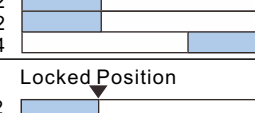
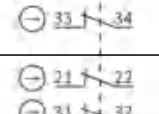
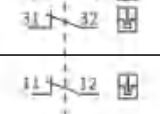
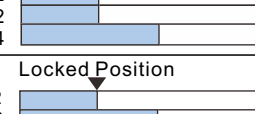
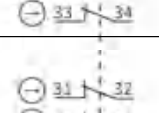
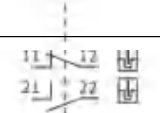
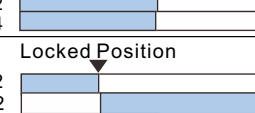
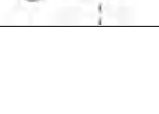
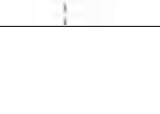
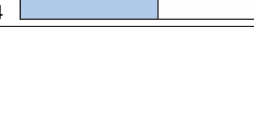
Technical Parameters

Electromagnetic Coil		
Rated Operating Voltage	DC24V	
Power	4.8W	
Rated Current (approx.)	Approximately 200mA	
Insulation Grade	B Grade (130°C)	
LED Indicator Light		
Rated Operating Voltage	DC24V	
Rated Current (approx.)	Approximately 1mA	
Light Color (LED)	Green	
Safety Level	Can reach up to PLd based on ISO 13849-1	
Certification	CE, TUV Rheinland	
Standards	EN60947-5-1, IEC60947-5-1, GB/T 14048.5, EN ISO 14119, GB/T 18831	
Protection Level	IP67	
Material	PA 66 Flame Retardant	
Mechanical Life	Over 1 million cycles	
Mechanical and Electrical	Over 150,000 cycles (AC240V3A, resistive load)	
Usage Types	AC-15	DC-13
Rated Operating Voltage (Ue)	240V	24V
Rated Operating Current (Ie)	3A	2A
Electrical		
Contact Resistance	Below 25mΩ	
Rated Release Heat Current (Ith)	10A	
Rated Insulation Voltage (Ui)	300V	
Dielectric Strength	Class II (Double Insulation)	
Impulse Withstand Voltage(EN60947-5-1)	2.5kV	
Insulation Resistance	Over 100MΩ	
Short Circuit Protection Device	10A, 250V/with quick-acting fuse	
Vibration Resistance	10-55Hz, 1.5mm double amplitude	
Impact Resistance	Durability: 1000m/s, Malfunction: 300m/s	
Conditional Short Circuit Current	100A (EN 60947-5-1)	
Contact Spacing	Over 2x2mm	
Operational Characteristics		
Forced Breakaway Force	Minimum 60N	
Forced Breakaway Stroke	Over 10mm	
Operating Speed	0.1m - 0.5m/s	
Permissible Operating Frequency	Up to 30 operations per minute	
Locking Force at Pull Strength	1300N	
Environment		
Pollution Degree (Usage Environment)	3 (EN60947-5-1)	
Usage Environment Temperature	-10°C to +55°C (no icing)	
Usage Environment Humidity	Below 95%RH	

SDL11 Series Selection Table

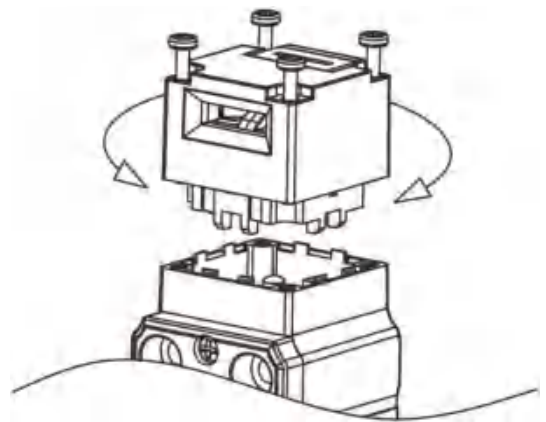
Release Key Position	Head Material	Electromagnet Voltage / Indicator Light	Locking/Releasing Method	Contact Type (Door Monitoring + Lock Monitoring)	Conduit Size	Model
Front Unlock	Metal	Electromagnet DC24V Green LED	Mechanical Locking Electromagnetic Release	1NC/1NO+2NC	M20	SDL11-BMM2
				2NC+1NC	M20	SDL11-DMM2
				2NO+2NC	M20	SDL11-EMM2
				1NC/1NO+1NC	M20	SDL11-FMM2
				2NC+2NC	M20	SDL11-GMM2
				1NC/1NO+1NC/1NO	M20	SDL11-HMM2
				1NO+3NC	M20	SDL11-IMM2
				1NC+3NC	M20	SDL11-JMM2
				3NC+1NC	M20	SDL11-LMM2
				2NC+1NC/1NO	M20	SDL11-MMM2
			Electromagnetic Locking Mechanical Release	1NC/1NO+2NC	M20	SDL11-BME2
				2NC+1NC	M20	SDL11-DME2
				2NO+2NC	M20	SDL11-EME2
				1NC/1NO+1NC	M20	SDL11-FME2
				2NC+2NC	M20	SDL11-GME2
				1NC/1NO+1NC/1NO	M20	SDL11-HME2
				1NO+3NC	M20	SDL11-IME2
				1NC+3NC	M20	SDL11-JME2
				3NC+1NC	M20	SDL11-LME2
				2NC+1NC/1NO	M20	SDL11-MME2

Contact Configuration and Action

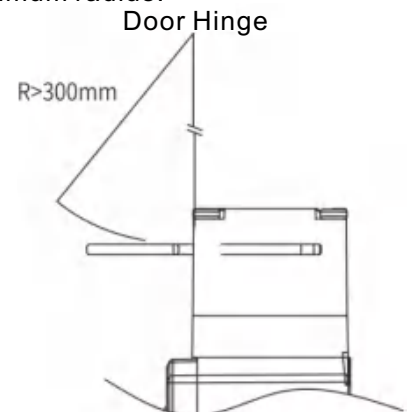
Model	Contact Type (Door Monitoring + Lock Monitoring)	Wiring Diagram		Contact Action	
		Door Monitoring	Lock Monitoring	Contact ON	Contact OFF
	<div>Door Monitoring</div> <div>Door Lock Monitoring</div> <div>NC  NC </div> <div>NO  NO </div>			<div>Operation Key Fully Inserted</div> <div>Stroke</div> <div>Operation Key Removed</div> 	
SDL11 - BP□□ SDL11 - BM□□	1NC/1NO+2NC			<div>Locked Position</div> 	
SDL11 - DP□□ SDL11 - DM□□	2NC+1NC			<div>Locked Position</div> 	
SDL11 - EP□□ SDL11 - EM□□	2NO+2NC			<div>Locked Position</div> 	
SDL11 - FP□□ SDL11 - FM□□	1NC/1NO+1NC			<div>Locked Position</div> 	
SDL11 - GP□□ SDL11 - GM□□	2NC+2NC			<div>Locked Position</div> 	
SDL11 - HP□□ SDL11 - HM□□	1NC/1NO+1NC/1NO			<div>Locked Position</div> 	
SDL11 - IP□□ SDL11 - IM□□	1NO/3NC			<div>Locked Position</div> 	
SDL11 - JP□□ SDL11 - JM□□	1NC+3NC			<div>Locked Position</div> 	
SDL11 - LP□□ SDL11 - LM□□	3NC+1NC			<div>Locked Position</div> 	
SDL11 - MP□□ SDL11 - MM□□	2NC+1NC/1NO			<div>Locked Position</div> 	

Installation Method

- ★ Loosen the 4 screws at the top of the head, rotate the head to select the appropriate operation key hole position before installation.

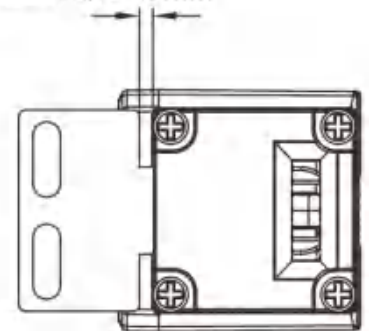


- ★ When installing on a flat door, it is necessary to be greater than the minimum radius.

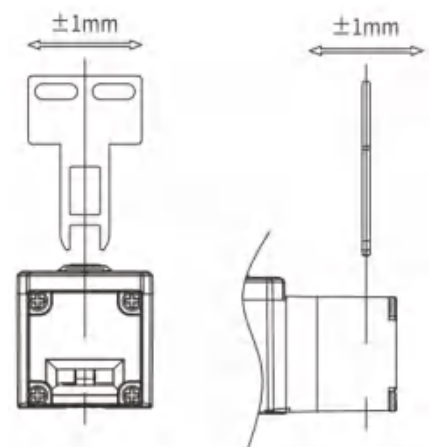


- ★ Please install the switch and operation key within the preparation position range of 1 to 3.5mm.

Preparation Location: 1.0~3.5mm

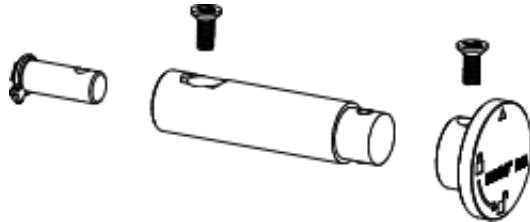


- ★ The installation of the operation key allows for a tolerance of ± 1 mm from the center of the hole where the operation key is inserted.



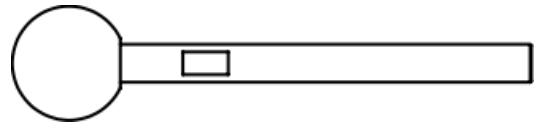
Rear Unlock Kit

Model: SU-50



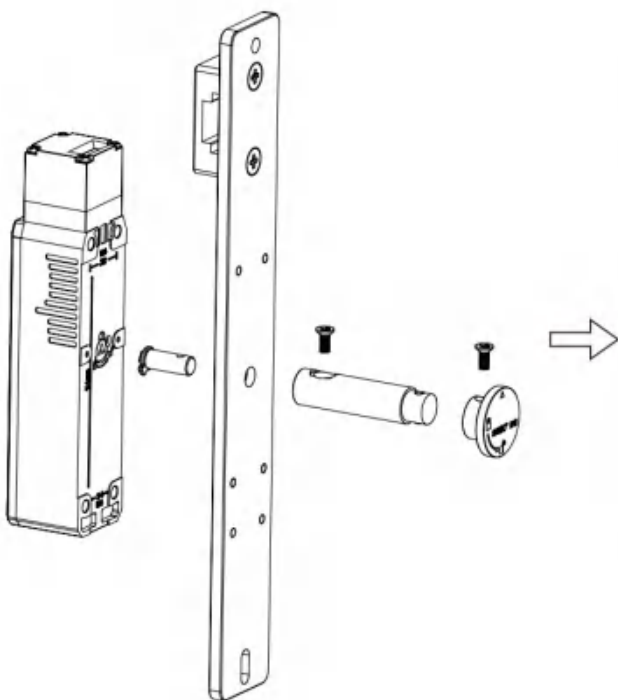
Rear Handle

Model: SH-1

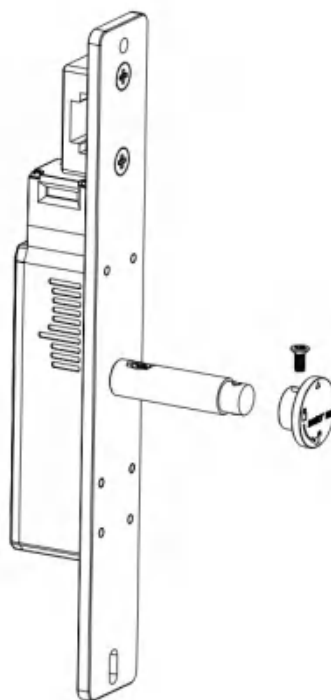


Rear Unlock Kit Installation Method

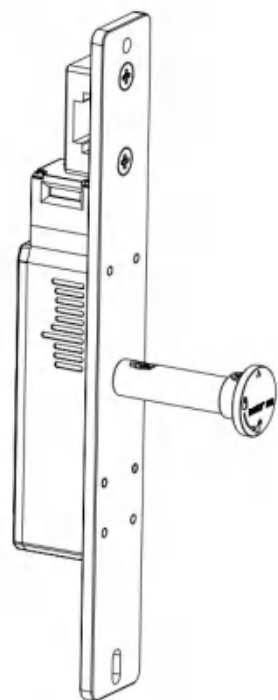
Step1



Step2



Step3



Precautions for Rear Emergency Unlock Knob

1. The rear unlock knob is a safety measure for emergency evacuation in case workers are accidentally stranded inside the safety fence (hazardous area).
2. Rotate the metal knob counterclockwise by 90° to release the safety door lock, and the door can be opened.
3. To restore the locked state, please rotate the metal knob clockwise by 90°. When the metal knob is in the unlocked position, the door cannot be locked even if it is closed.
4. The rear emergency unlock knob must be installed in a place that is operable within the safety fence (hazardous area).
5. Do not use tools or excessive force to operate the rear unlock knob, or apply force in directions other than the operating direction, or beyond the rotation range of the knob, to avoid damaging the knob components and making it inoperable.

Two-Contact Safety Door Lock

SDL11 Series

Introduction to the SDL11 Series Two-Contact Safety Door Lock

The two-contact safety door lock of the SDL11 series can be easily installed in confined spaces, greatly enhancing convenience. By rotating the head to adjust the direction of the operation key insertion, it ensures flexible installation, simple operation, and significantly reduces the time required for installation and wiring. The two-contact type is suitable for scenarios with lower safety performance requirements, such as machinery and injection molding machines.

Product Features

- Locking force of 1300N
- IP67 protection rating
- Compact design for installation in confined spaces
- Suitable for general or light loads

Safety Protection / Forced Locking

- TUV EN 60947-5-1/IEC60947-5-1
- GB/T14048.5
- EN ISO 14119/ISO 14119
- GB/T 18831



Safety Door Lock Model Description

(e.g., SDL11-APM3)

SDL 11 - ☐ ☐ ☐ ☐
1 2 3 4

1. Switch Contacts (Door Opening/Closing Detection Switch + Lock Monitoring Switch)

A: 1NO (Delayed Contact) + 1NC (Delayed Contact)

C: 1NC (Delayed Contact) + 1NC (Delayed Contact)

2. Head Installation Direction/Material

P: Four installation directions available (delivered with front side installation)/Plastic

M: Four installation directions available (delivered with front side installation)/Metal

3. Door Locking/Release Method

M: Mechanical locking/DC24V electromagnetic release

E: DC24V electromagnetic locking/Mechanical release

4. Conduit Size

3: M16

SDL11 Series Selection Table

Head Material	Electromagnet Voltage /Indicator Light	Locking/Release Method	Contact Type (Door Monitoring + Lock Monitoring)	Conduit Size	Model
Metal	Electromagnet DC24V Green LED	Mechanical Locking Electromagnetic Release	1NO+1NC	M16	SDL11-AMM3
			1NC+1NC	M16	SDL11-CMM3
		Electromagnetic Locking Mechanical Release	1NO+1NC	M16	SDL11-AME3
			1NC+1NC	M16	SDL11-CME3

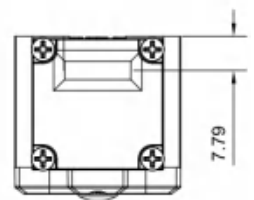
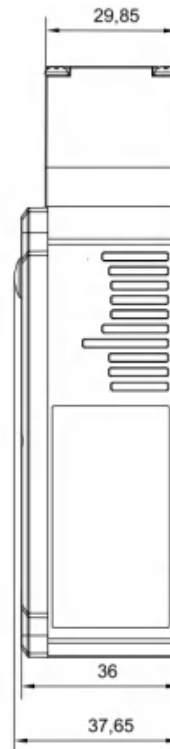
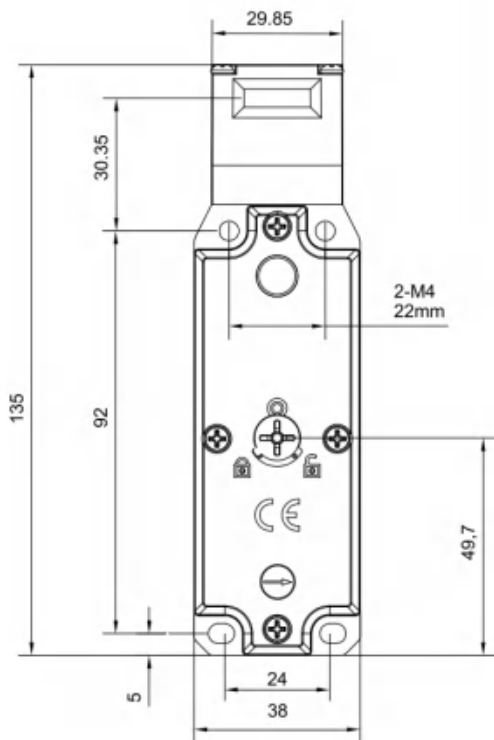
Contact Configuration and Action

Model	Contact Type (Door Monitoring + Lock Monitoring)	Wiring Diagram		Contact Action	
		Door Monitoring	Lock Monitoring	Contact ON	Contact OFF
	Door Monitoring: NC <input type="checkbox"/> NO <input type="checkbox"/> Door Lock Monitoring: NC <input type="checkbox"/> NO <input type="checkbox"/>				
SDL11 - AP□□ SDL11 - AM□□	1NO+1NC			Locked Position 11--12 <input type="checkbox"/> 33--34 <input type="checkbox"/>	
SDL11 - CP□□ SDL11 - CM□□	1NC+1NC			Locked Position 11--12 <input type="checkbox"/> 31--32 <input type="checkbox"/>	

Technical Parameters

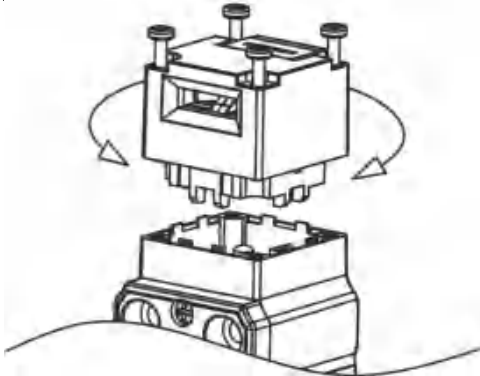
Electromagnetic Coil		
Rated Operating Voltage	DC24V	
Power	4.8W	
Rated Current (approx.)	Approximately 200mA	
Insulation Grade	B Grade (130°C)	
LED Indicator Light		
Rated Operating Voltage	DC24V	
Rated Current (approx.)	Approximately 1mA	
Light Color (LED)	Green	
Safety Level	Can reach up to PLd based on ISO 13849-1	
Certification	CE, TUV Rheinland	
Standards	EN60947-5-1, IEC60947-5-1, GB/T 14048.5, EN ISO 14119, GB/T 18831	
Protection Level	IP67	
Material	PA 66 Flame Retardant	
Mechanical Life	Over 1 million cycles	
Mechanical and Electrical	Over 150,000 cycles (AC240V3A, resistive load)	
Usage Types	AC-15	DC-13
Rated Operating Voltage (Ue)	240V	24V
Rated Operating Current (Ie)	3A	2A
Electrical		
Contact Resistance	Below 25mΩ	
Rated Thermal Current (Ith)	10A	
Rated Insulation Voltage (Ui)	300V	
Protection Level Against Electric Shock	Class II (Double Insulation)	
Impulse Withstand Voltage(EN60947-5-1)	2.5kV	
Insulation Resistance	Over 100MΩ	
Short Circuit Protection Device	10A, 250V/with quick-acting fuse	
Vibration Resistance	10-55Hz, 1.5mm double amplitude	
Impact Resistance	Durability: 1000m/s, Malfunction: 300m/s	
Conditional Short Circuit Current	100A (EN 60947-5-1)	
Contact Spacing	Over 2x2mm	
Operational Characteristics		
Forced Breakaway Force	Minimum 60N	
Forced Breakaway Stroke	Over 10mm	
Operating Speed	0.1m - 0.5m/s	
Permissible Operating Frequency	Up to 30 operations per minute	
Locking Force at Pull Strength	1300N	
Environment		
Pollution Degree (Usage Environment)	3 (EN60947-5-1)	
Usage Environment Temperature	-10°C to +55°C (no icing)	
Usage Environment Humidity	Below 95%RH	

Product Dimensions

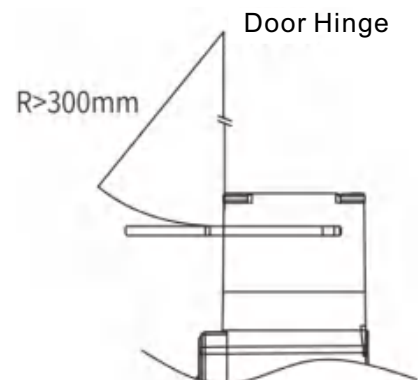


Installation Method

- ★ Loosen the 4 screws at the top of the head, rotate the head to select the appropriate operation key hole position before installation.

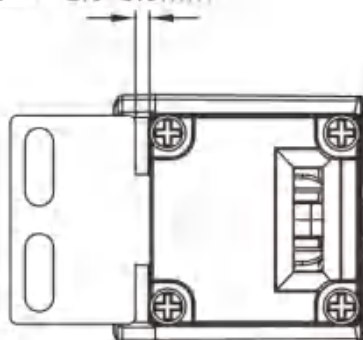


- ★ When installing on a flat door, it is necessary to be greater than the minimum radius.

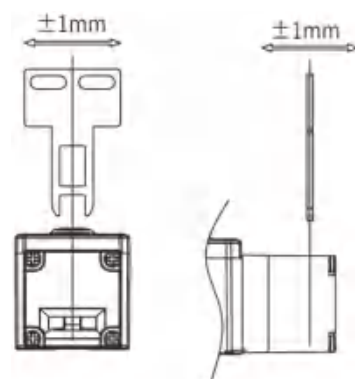


- ★ Please install the switch and operation key within the preparation position range of 1 to 3.5mm.

Preparation Location: 1.0~3.5mm



- ★ The installation of the operation key allows for a tolerance of $\pm 1\text{mm}$ from the center of the hole where the operation key is inserted.



Safety Switch

DLM11 Series

Introduction to the DLM11 Series Safety Switch

The new generation of multi-contact safety switches saves labor and is environmentally friendly, equipped with a 3-contact structure featuring 2NC/1NO and 3NC contact configurations. It is a switch without locking force for doors, capable of detecting whether mechanical guards or covers are closed.

Product Features

- This product series offers a choice of multi-contact structures.
- Suitable for standard and light loads.
- Simple installation and wiring, saving labor, and easy to replace.
- A variety of metal head options are available.

Safety Protection / Forced Locking

- TUV EN 60947-5-1/IEC60947-5-1
- GB/T14048.5
- EN ISO 14119/ISO 14119
- GB/T 18831



Safety Door Lock Model Description

(e.g., DLM11-AP2)

DLM 11 - ☐ ☐ ☐
1 2 3

1. Built-in Switch

- A: 1NC/1NO (Delayed Action Type)
- B: 2NC (Delayed Action Type)
- C: 2NC/1NO (Delayed Action Type)
- D: 3NC (Delayed Action Type)

3. Conduit Size

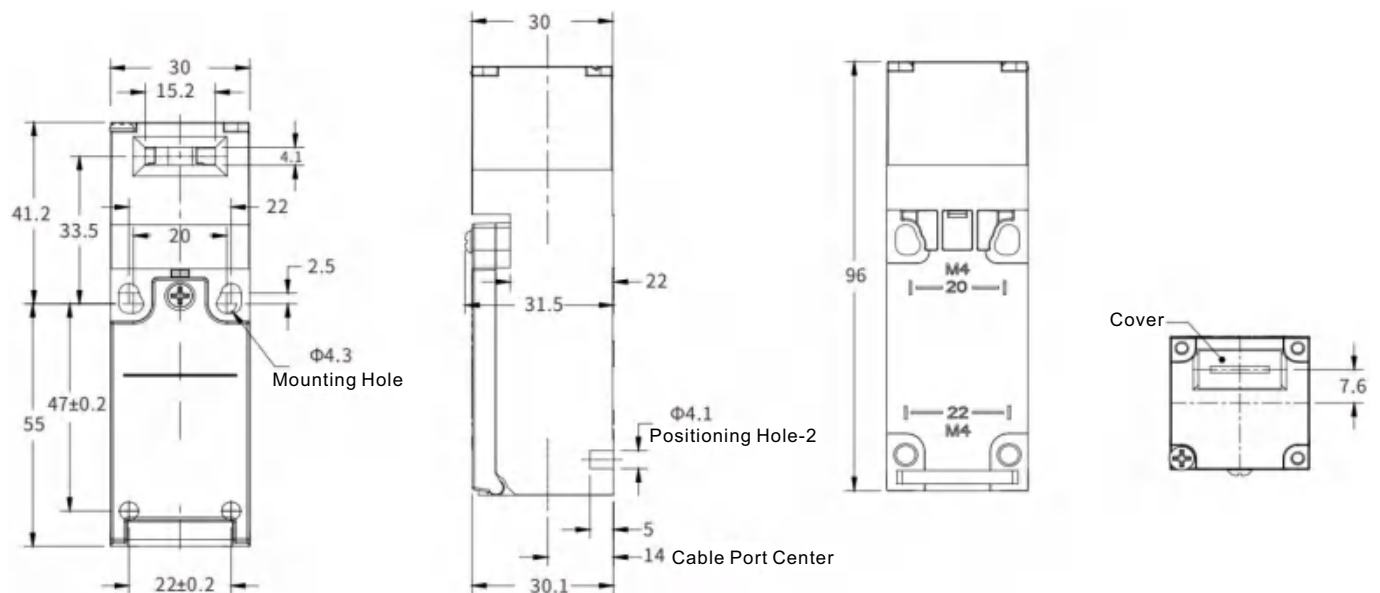
- 2: M20

2. Head Installation Direction/Material

P: Four installation directions available (delivered with front side installation)/Plastic

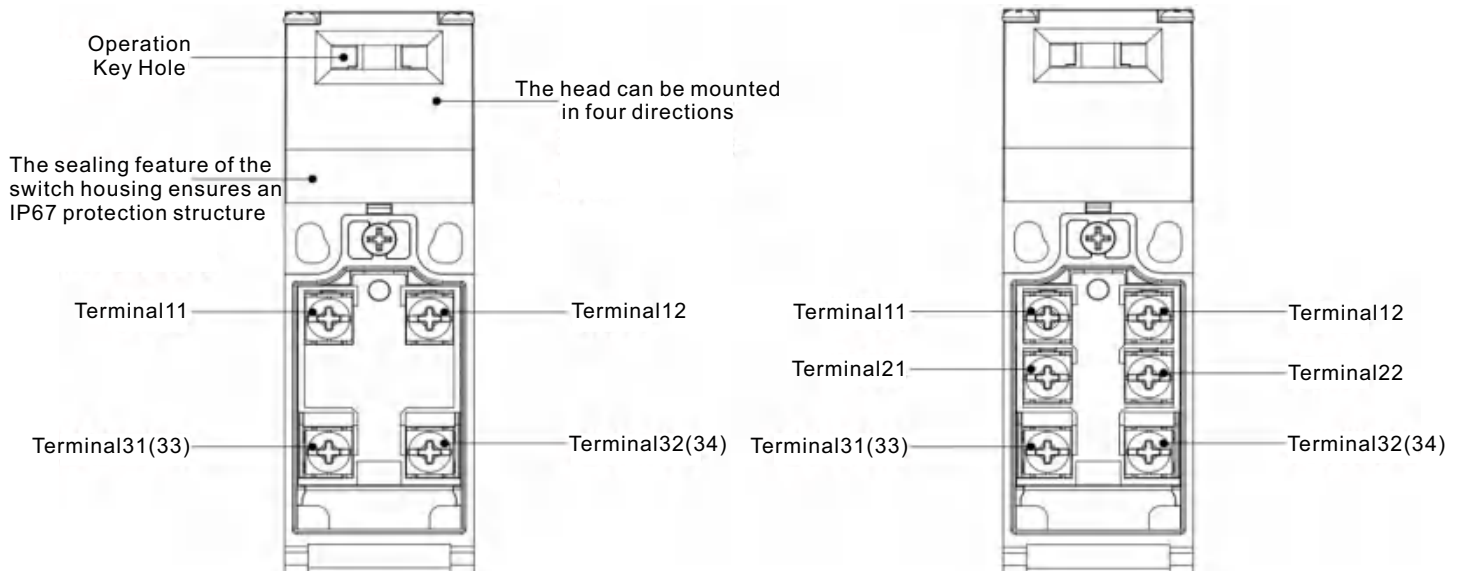
M: Four installation directions available (delivered with front side installation)/Metal

Product Dimensions



Structure and Part Names

Note: The terminal arrangement for the extended cable type is the same.



Technical Parameters




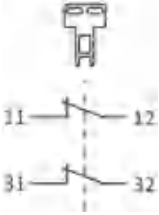





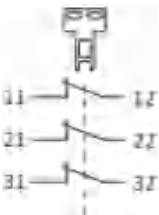


Safety Level	Up to PLd based on ISO 13849-1	
Certification	CE	
Standards	EN60947-5-1, IEC60947-5-1, GB/T 14048.5, EN ISO 14119, GB/T 18831	
Protection Level	IP67	
Material	Flame Retardant Pa66	
Mechanical Lifespan	Over 1 million cycles	
Electrical Lifespan	Over 150,000 cycles	
Usage Types	AC-15	DC-13
Rated Operating Voltage (Ue)	240V	24V
Rated Operating Current (Ie)	3A	2A
Electrical		
Contact Resistance	Below 25mΩ	
Rated Insulation Voltage (Ui)	300V	
Protection Level Against Electric Shock	Class II (Double Insulation)	
Impulse Withstand Voltage(EN60947-5-1)	2.5kV	
Insulation Resistance	Over 100MΩ (at 500VDC or less)	
Short Circuit Protection Device	10A, 250V requires a fast-acting fuse	
Vibration Resistance	10-55Hz, 1.5mm double amplitude	
Impact Resistance	Endurance 1000m/s², malfunction 300m/s²	
Conditional Short Circuit Current	100A (EN 60947-5-1)	
Contact Spacing	Over 2x2mm	
Operational Characteristics		
Forced Breakaway Force	Standard Type: Minimum 60N	
	High Force Type: Minimum 80N	
Forced Breakaway Stroke	Over 10mm	
Operating Speed	0.1m - 0.5m/s	
Permissible Operating Frequency	Up to 20 operations per minute	
Environment		
Pollution Degree (Usage Environment)	3 (EN60947-5-1)	
Usage Environment Temperature	-10°C to +70°C (no icing)	
Usage Environment Humidity	Below 85%RH	

DLM11 Series Selection Table

Head Material	Contact Type	Conduit Size	Model
Metal	1NC/1NO	M20	DLM11-AM2
	2NC	M20	DLM11-BM2
	2NC/1NO	M20	DLM11-CM2
	3NC	M20	DLM11-DM2

Contact Configuration and Action

The diagram shows the locked state when the operation key is inserted.

Model	Contact Type	Contact Form	Contact Action
DLM11 - AM2	1NO+1NC		<p>Operation Key Fully Inserted Operation Key Removed</p> <p>Stroke</p> <p>11--12 33--34</p> <p>Contact ON:  Contact OFF: </p>
DLM11 - BM2	2NC		<p>Operation Key Fully Inserted Operation Key Removed</p> <p>Stroke</p> <p>11--12 31--32</p> <p>Contact ON:  Contact OFF: </p>
DLM11 - CM2	2NC/1NO		<p>Operation Key Fully Inserted Operation Key Removed</p> <p>Stroke</p> <p>11--12 21--22 33--34</p> <p>Contact ON:  Contact OFF: </p>
DLM11 - DM2	3NC		<p>Operation Key Fully Inserted Operation Key Removed</p> <p>Stroke</p> <p>11--12 21--22 31--32</p> <p>Contact ON:  Contact OFF: </p>

Operation Key


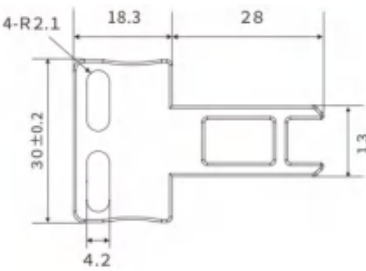


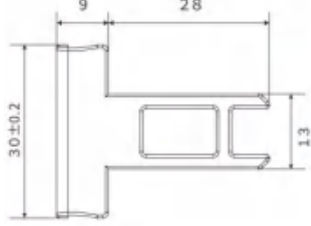



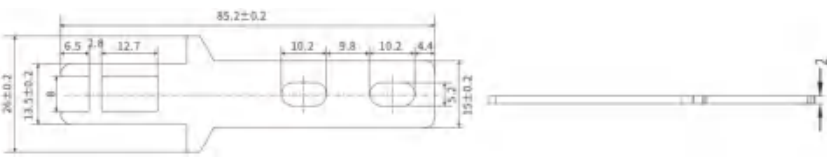

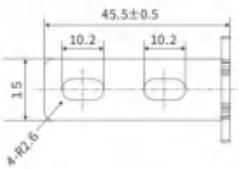
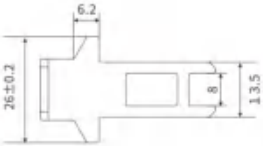
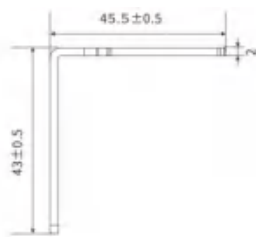

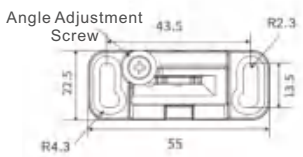

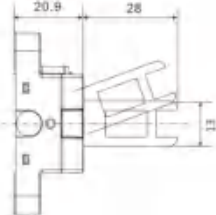
DL - ☐

Operation Key Types

- 1: T-type Operation Key
- 2: L-type Operation Key
- 3: Long T-type Operation Key
- 4: Long L-type Operation Key
- 5: Adjustable Horizontal/Vertical Operation Key

Product Series

SK Series

Type	Model	Size
 <p>T-type Operation Key</p>	DL-1	 
 <p>L-type Operation Key</p>	DL-2	  
 <p>Long T-type Operation Key</p>	DL-3	
 <p>Long L-type Operation Key</p>	DL-4	  
 <p>Adjustable Horizontal/Vertical Operation Key</p>	DL-5	  

Safety Bolt

DLB-M02 Series

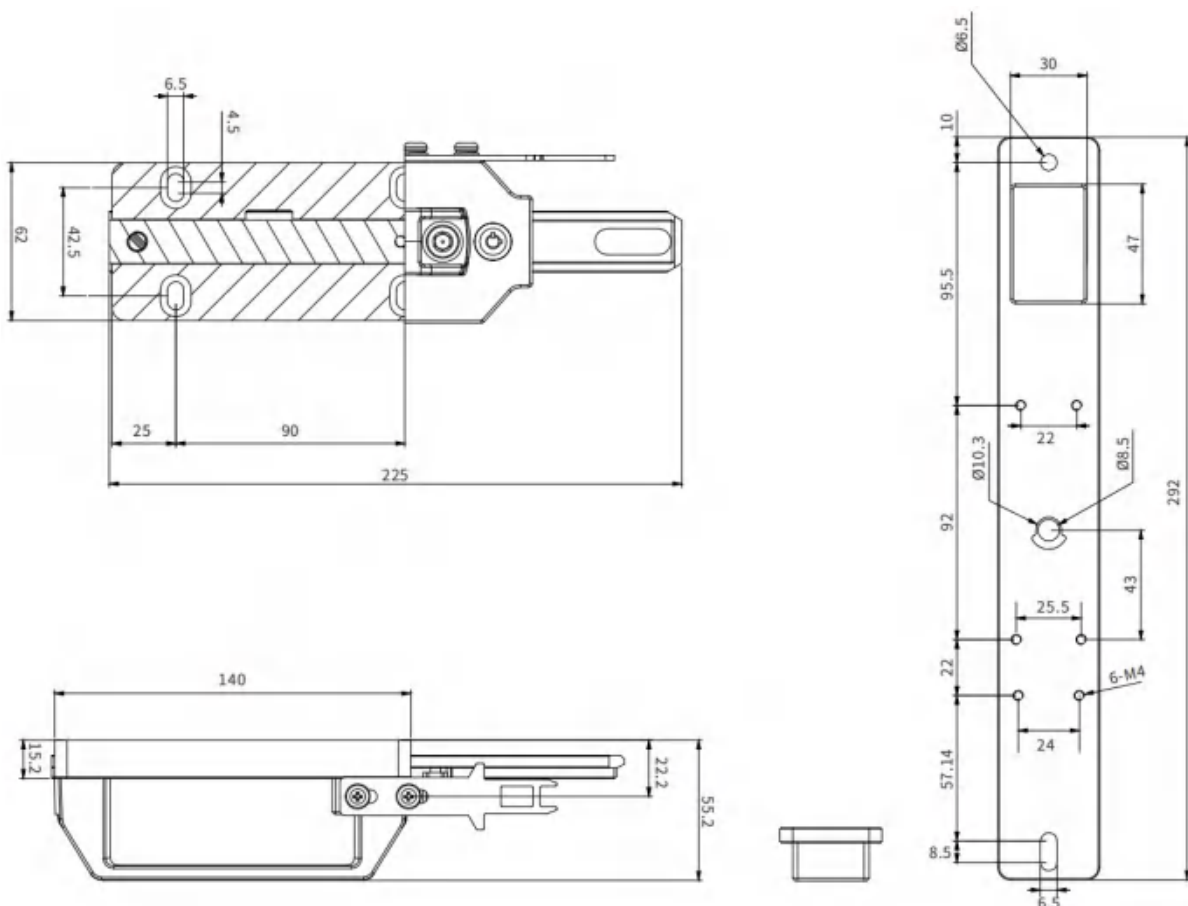
Safety Bolt Product Features

The safety bolt is an ideal complement to safety switches and safety locking devices. The accurate guidance of the actuator element enhances the tolerance during door misalignment, ensuring the proper function of the installed safety switch. Additionally, the safety bolt effectively prevents the breakage of the actuator element. This eliminates malfunctions, thereby achieving a high-performance level for the overall structure. Optional features such as hinged locks or emergency release mechanisms can reliably prevent accidental entry by maintenance personnel.

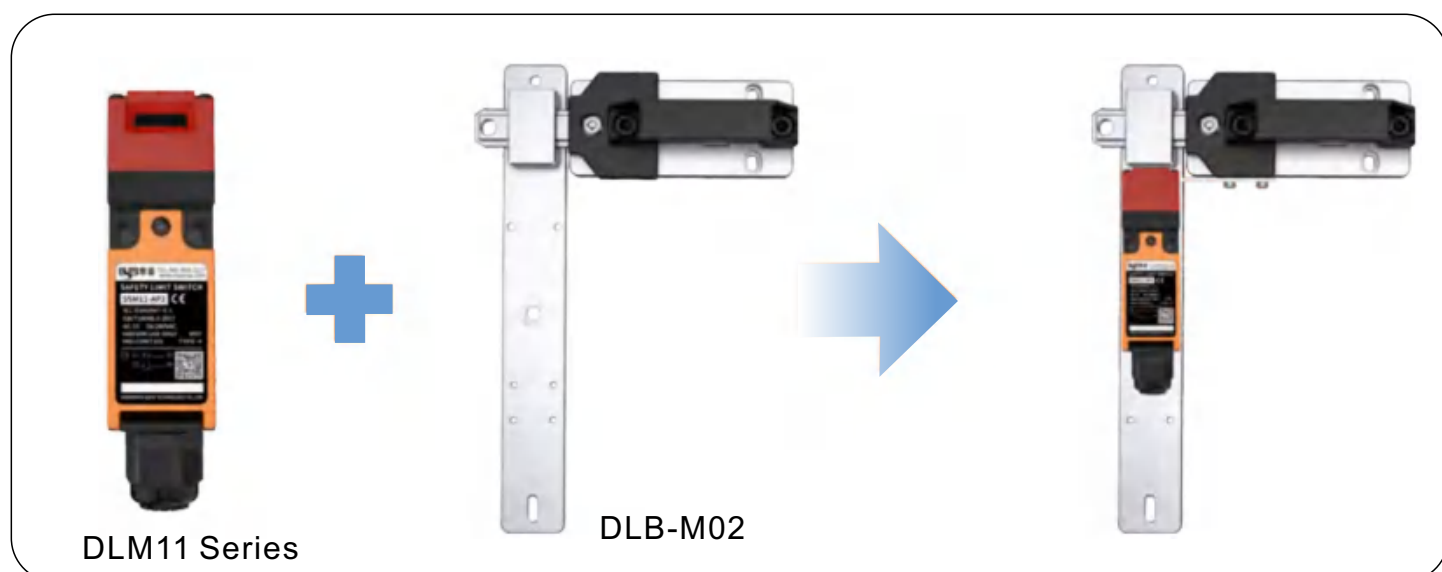
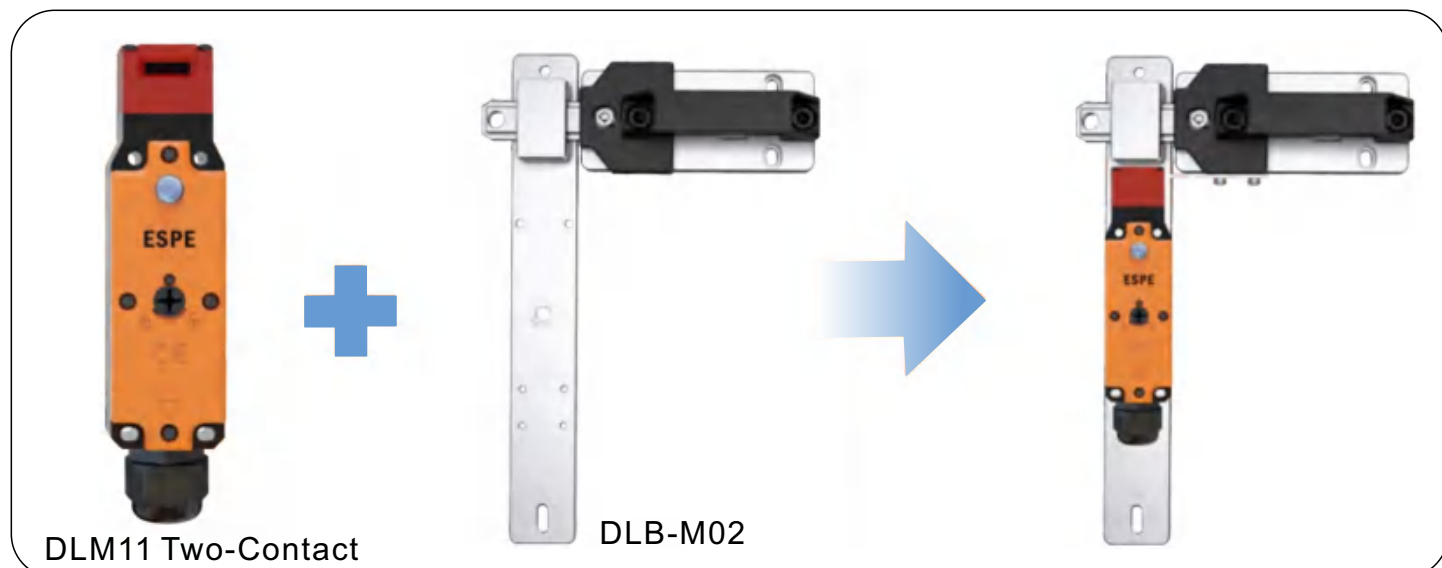
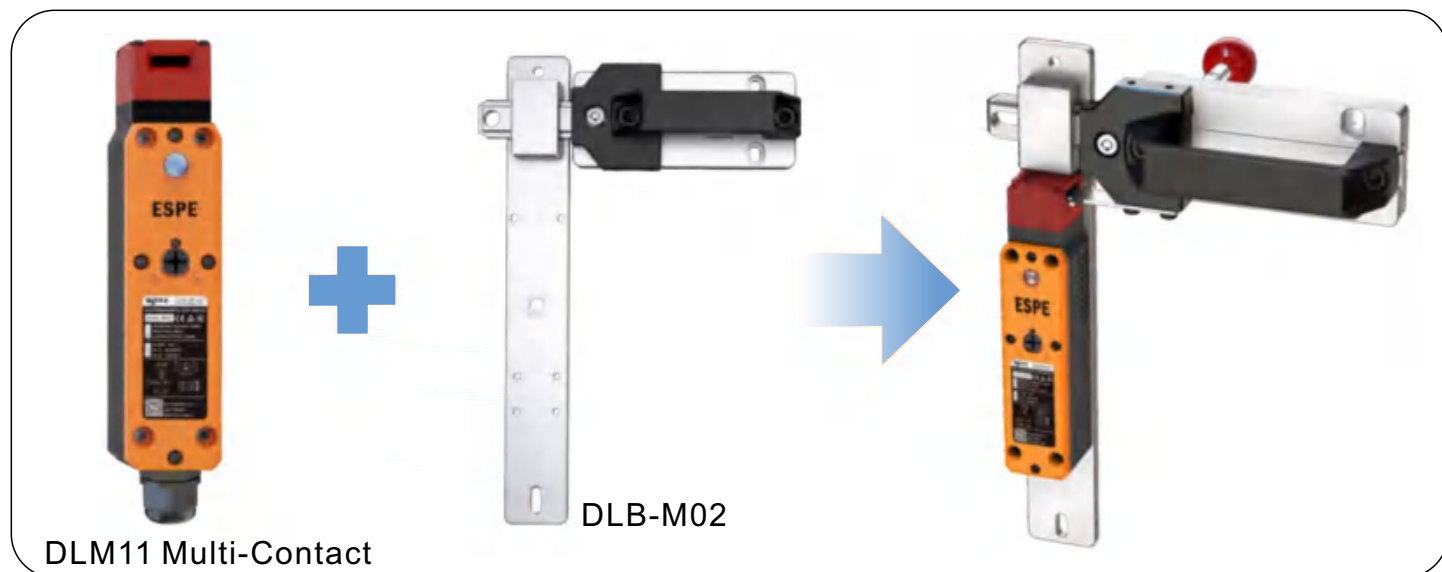
- Reduces development and installation costs.
- Mechanical protection and robust materials ensure an extremely long service life.
- Enhances productivity with a sturdy design and sensor protection.
- Models with unlock buttons can prevent accidental operation.
- Prevents accidental entry by staff through the use of padlockable locking.



Product Dimensions



Bolt Assembly Diagram



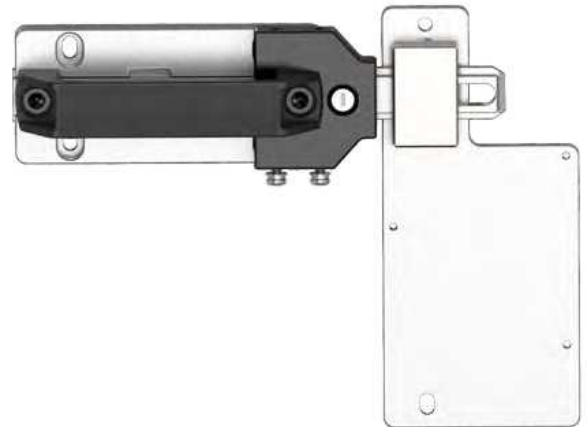
Safety Bolt

DLB-M03 Series

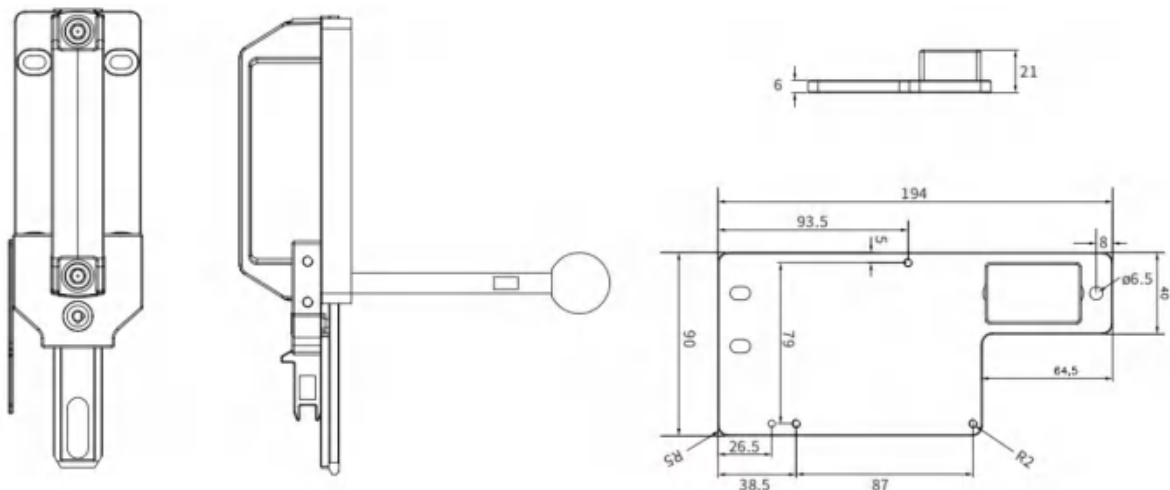
Safety Bolt Product Features

The safety bolt is an ideal complement to safety switches and safety locking devices. The accurate guidance of the actuator element enhances tolerance during door misalignment, ensuring the proper function of the installed safety switch. Additionally, the safety bolt effectively prevents the actuator element from breaking. This eliminates malfunctions, thereby achieving a high-performance level for the overall structure. Optional features such as hinged locks or emergency release mechanisms can reliably prevent accidental entry by maintenance personnel.

- Reduces development and installation costs.
- Mechanical protection and robust materials ensure an extremely long service life.
- Enhances productivity with a sturdy design and sensor protection.
- Models with unlock buttons can prevent accidental operation.
- Prevents accidental entry by staff through the use of padlockable locking.



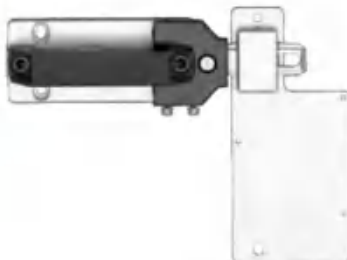
Product Dimensions



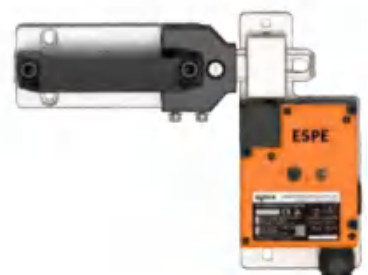
Bolt Assembly Diagram



SDL21 Series



DLB-M03



Safety Door Lock

DLR11 Series

Introduction to the DLR11 Safety Door Lock

The safety door lock is a security device used for locking and monitoring confirmation of doors on safety fences, protective covers, and other movable mechanisms. The DLR11 series safety door lock features a high-strength structural design capable of withstanding high tensile forces. It also incorporates RFID detection technology, offering enhanced security and confidentiality. Between the sensor and the tag, both universal encoding and unique encoding methods can be selected. Its compact size facilitates easy installation.

Product Features

- Multifunctionality: Equipped with both locking and monitoring capabilities.
- Variety of encoding methods: Options for unique and universal encoding methods.
- Self-inspection cross-checking design: Periodic dual checks enhance security.
- Independent redundant dual output: Prevents safety hazards caused by a single circuit failure.
- Compact design: Cross-sectional dimensions of 29.7mm by 29.7mm.
- Flexible installation: Can be directly mounted on an aluminum frame up to 30mm thick without the need for a bracket.



Technical Parameters

Standard		ISO 13849-1 (Category 4/Plc); IEC/EN60947-5-3
Certification		CE
Locking Method		Mechanical Locking/Electromagnetic Locking
Safe Output		NPN*2/PNP*2
Response Time	Locking → Unlocking	100ms (Stand-alone Operation)
	Unlocking → Locking	
Locking	Lock Retention Force Fzh	≥2000N
	Bolt Insertion Tolerance	≤2mm
	Mechanical Durability	1 million cycles (Door Operating Speed 1m/s)
	Operating Frequency	1Hz
	Minimum Usage Radius for Rotating Door	≥220mm
	Manual Unlocking	Front, Back
Cascade connection		Up to 20 units
Control Output (OSSD Output)	Output Type	Transistor Output x2
	Maximum Load Current	≤200mA
	Residual Voltage (ON)	<2.5V@200mA
	Voltage OFF	≤2V@Cable 5m
	Leakage Current	≤0.5mA
	Maximum Load Capacity	2.2uF
	Load Connection Resistance	≤2.5Ω
AUX Output (Non-Safety Output)	Output Type	Transistor Output
	Number of Outputs	1
	Maximum Load Current	50mA
	Residual Voltage (ON)	<2.5V@50mA
External Input (Circuit Breaker Current)	Safe Input	1.5mA*2
	Reset/EDM Input	Approximately 10mA*1
	Lock Control Input	Approximately 10mA*1
Power Supply	Operating Voltage	DC24V±15%
	Rated Power	4.6W (No Load)
Protection		Safety circuit protection, current limiting, over current protection, over voltage protection, overheat protection with stop and restart, reverse polarity protection, transient noise protection, fault pulse protection
Environmental Resistance	Enclosure Protection Level	IP65
	Operating Temperature Range	-20°C to 55°C (No Freezing)
	Storage Temperature Range	-25°C to 70°C (No Freezing)
	Operating Humidity Range	5% to 95%RH
	Storage Humidity Range	5% to 95%RH
	Vibration Resistance	10 to 55Hz, double amplitude 2.0mm, X, Y, Z axes for 5 minutes each (IEC60947-5-3)
	Impact Resistance	30g for X, Y, Z axes, 6 times each (IEC60947-5-3)
Risk Time		100ms
Startup Time		3.5s
Material		Nylon/Zinc Alloy/Stainless Steel

Safety Door Lock Model Explanation

DLR11 - □ □ □ □ □ - □

Cable Length	3: 3m, 5: 5m, 10: 10m, 20: 20m
Wiring Method	C: M12 Connector None: Direct Wiring
Output Method	N: NPN P: PNP
Encoding Method	0: Universal Encoding
Configuration Type	0: Standard Type 1: Premium Type
Locking Method	0: Electromagnetic Locking 1: Mechanical Locking
Product Series	DLR11 Series Safety Door Lock

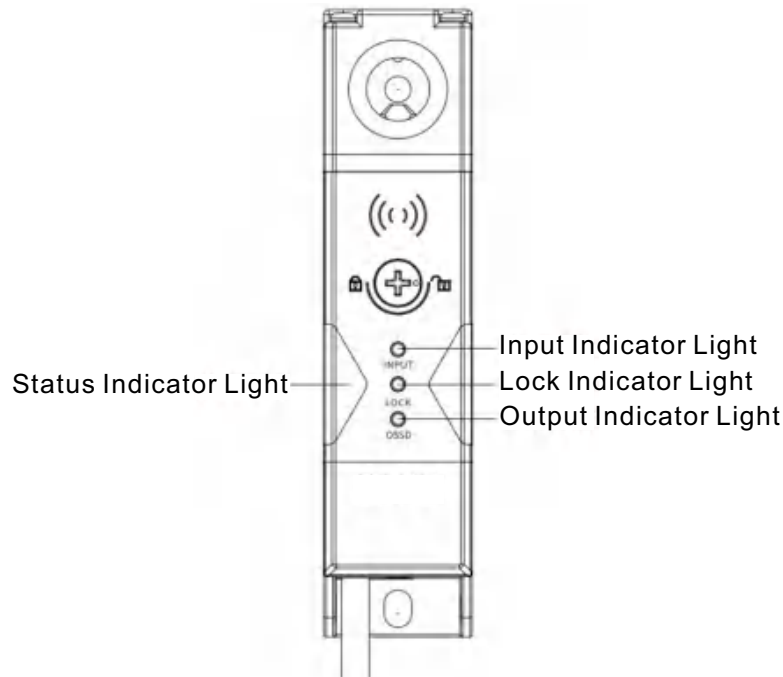
Standard and Premium Type Explanation

	Safety Output Channel	AUX Output Channel	Safety Input Channel	Lock Input Channel	EDM	Reset
Standard Type	●	●	●	●	-	-
Premium Type	●	●	●	●	●	●

DLR11 Series Selection Table

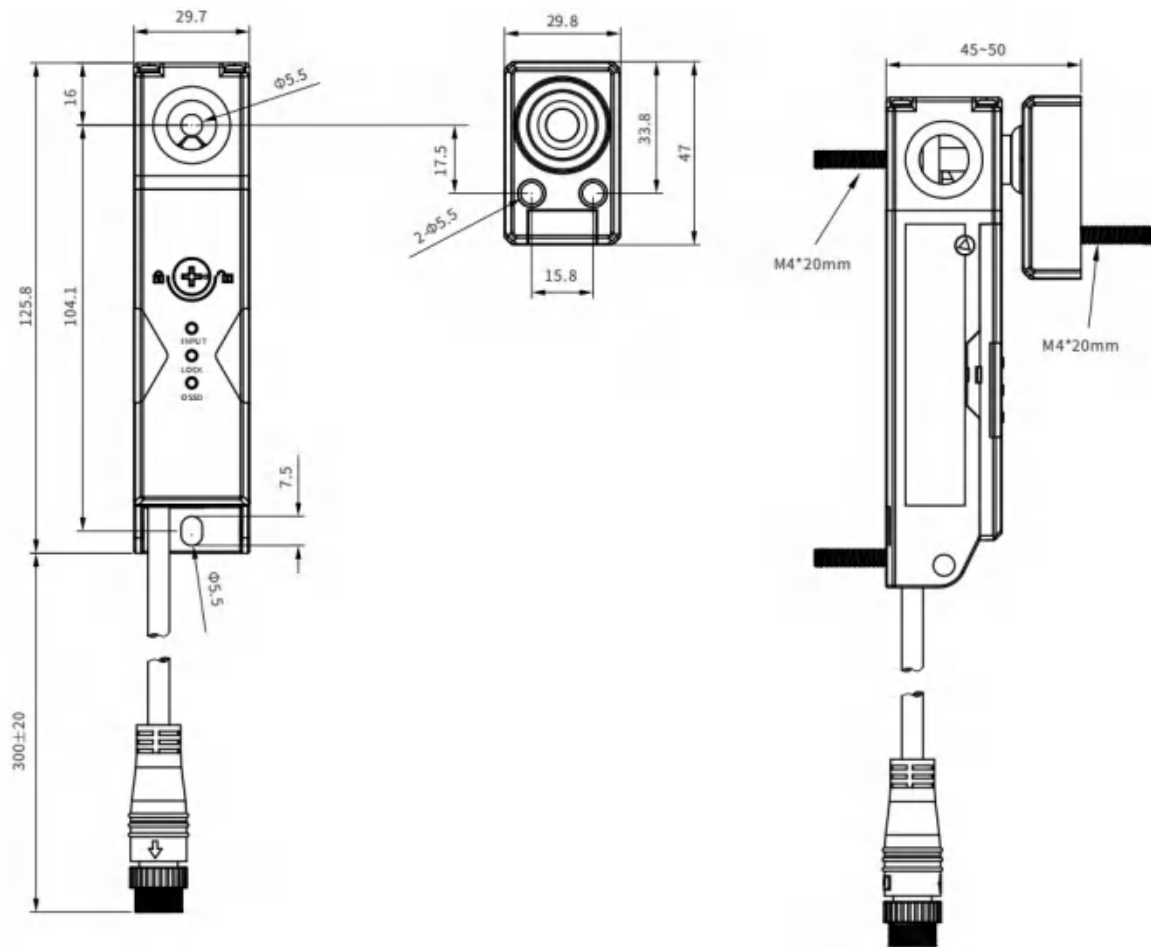
Locking Method	Configuration	Output Method	Encoding Method	Model
Electromagnetic Locking	Standard	NPN	Universal Encoding	DLR11-000N
		PNP	Universal Encoding	DLR11-000P
	Premium	NPN	Universal Encoding	DLR11-010N
		PNP	Universal Encoding	DLR11-010P
Mechanical Locking	Standard	NPN	Universal Encoding	DLR11-100N
		PNP	Universal Encoding	DLR11-100P
	Premium	NPN	Universal Encoding	DLR11-110N
		PNP	Universal Encoding	DLR11-110P

Indicator Light Explanation



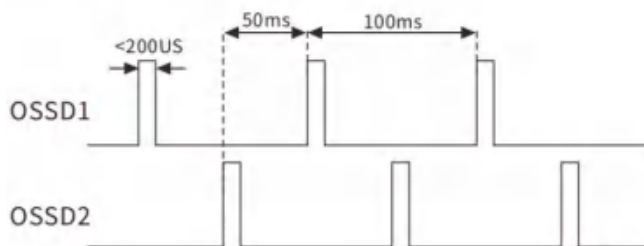
Indicator Light Name	Light Color	Status Description
Input Indicator Light	Red, Green	OSSD Output: Green OSSD Off: Red OSSD Error: Red Flashing (2Hz) EDM Error: Red Flashing (1Hz)
Lock Indicator Light	Green	Door Lock Engaged: Lit Lock Exception: 2Hz Flashing (Solenoid Error, Optocoupler Error, RFID Loss) No RFID: 1Hz Flashing Attempting to Lock: Double Flash Attempting to Unlock: Double Flash Off Not Locked: Off
Output Indicator Light	Orange	Normal Input: Lit No Input (Waiting for Input): Off Waiting for RSET Reset: 1Hz Flashing
Operating Status Indicator Light	Green, Red, Orange	Locked and Outputting: Green Light No Output and No System Errors (Excluding the Above Three Lights): Red Light Voltage Error: Orange Light Flashing at 1Hz Internal Communication Self-Check Error: Red Light Flashing at 2Hz Internal Signal Self-Check Error: Red Light Flashing at 1Hz Internal Data Verification Error: Green Light Flashing at 1Hz

Product Dimensions

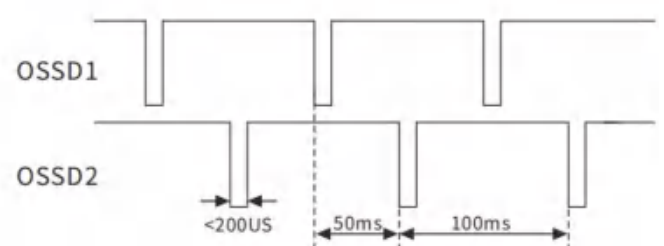


Timing Diagram

NPN Output Diagnostic Timing

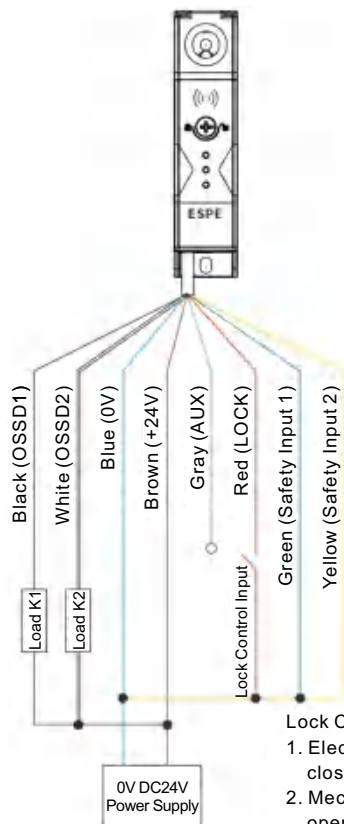


PNP Output Diagnostic Timing



Wiring Diagram

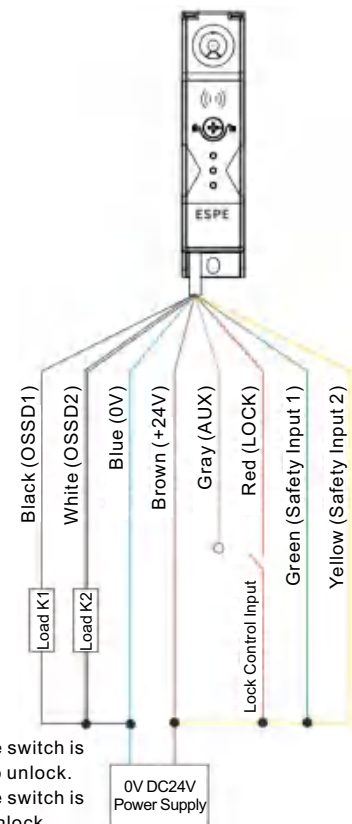
DLR11 Standard Type (NPN, Non-Daisy Chain)



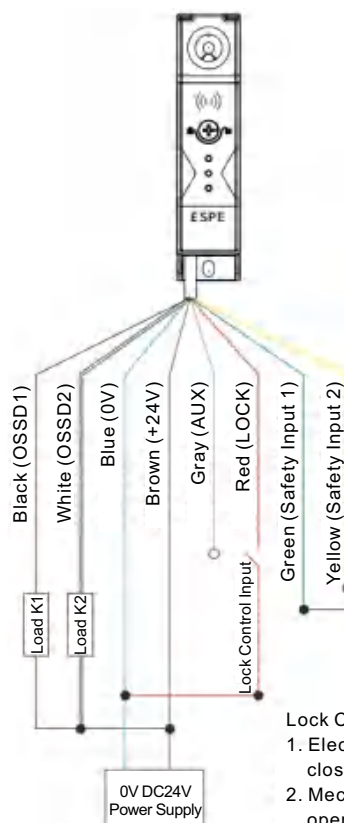
Lock Control Output:

1. Electromagnetic Locking, Mechanical Releasing: The switch is closed in the locked state, and the switch is opened to unlock.
2. Mechanical Locking, Electromagnetic Releasing: The switch is open in the locked state, and the switch is closed to unlock.

DLR11 Standard Type (PNP, Non-Daisy Chain)

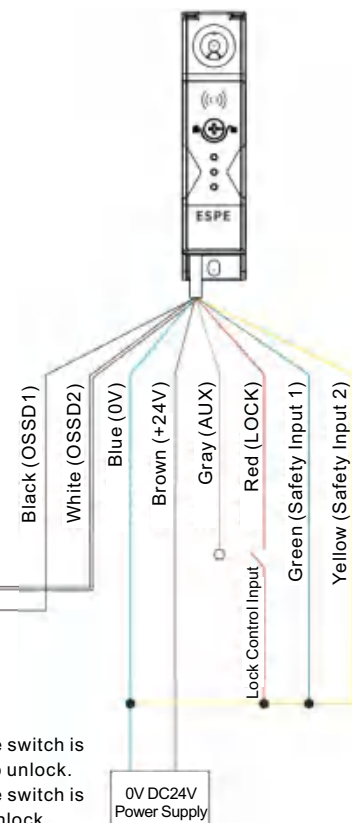


DLR11 Standard Type (NPN, Daisy Chain)



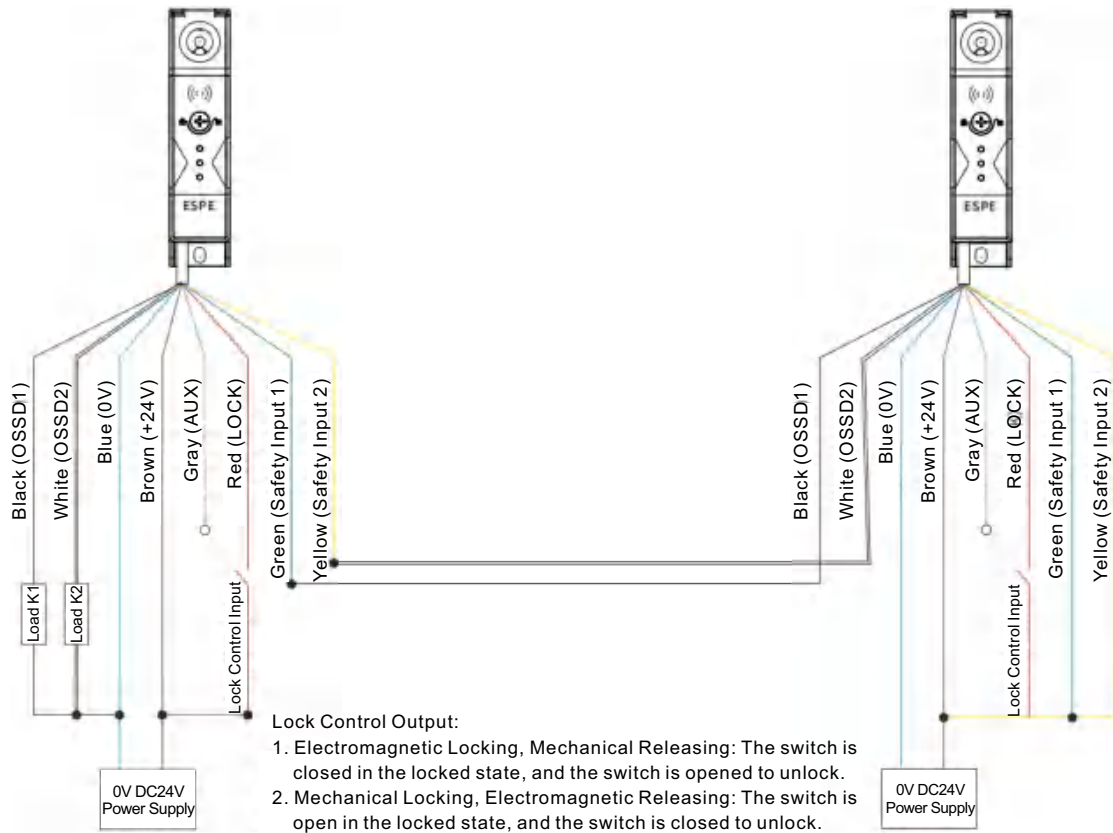
Lock Control Output:

1. Electromagnetic Locking, Mechanical Releasing: The switch is closed in the locked state, and the switch is opened to unlock.
2. Mechanical Locking, Electromagnetic Releasing: The switch is open in the locked state, and the switch is closed to unlock.

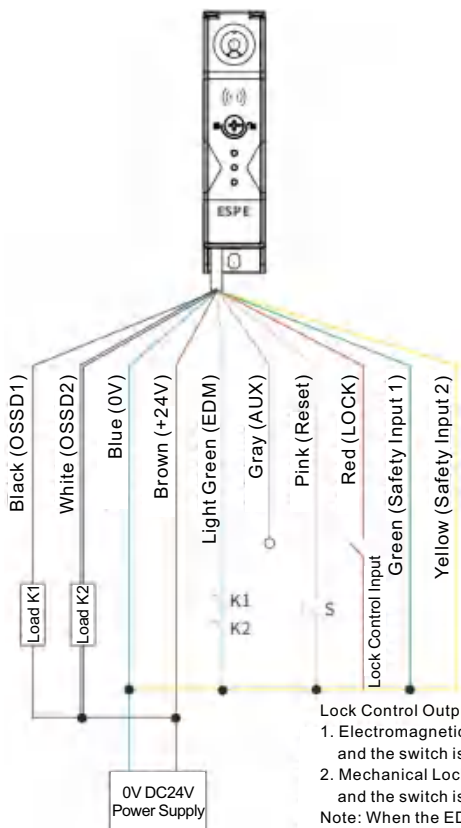


Wiring Diagram

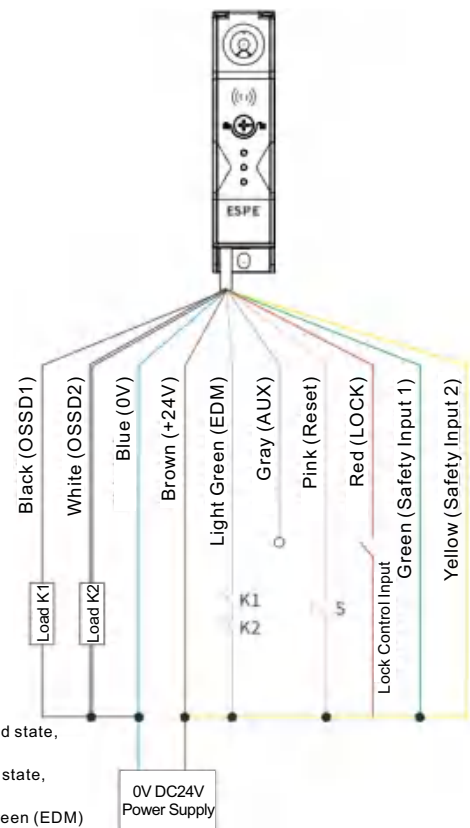
DLR11 Standard Type (PNP, Daisy Chain)



DLR11 Premium Type (NPN, Non-Daisy Chain)

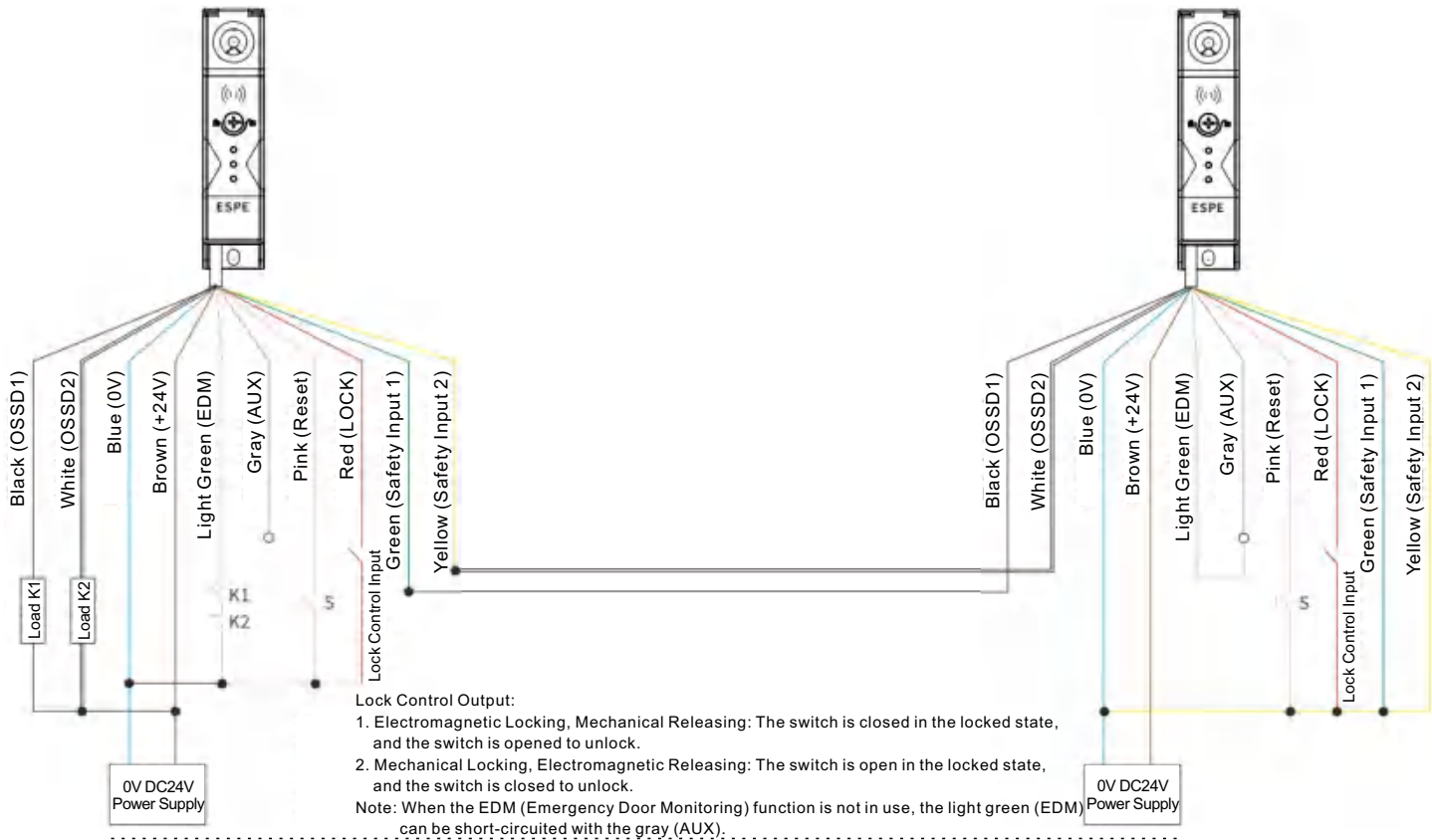


DLR11 Premium Type (PNP, Non-Daisy Chain)

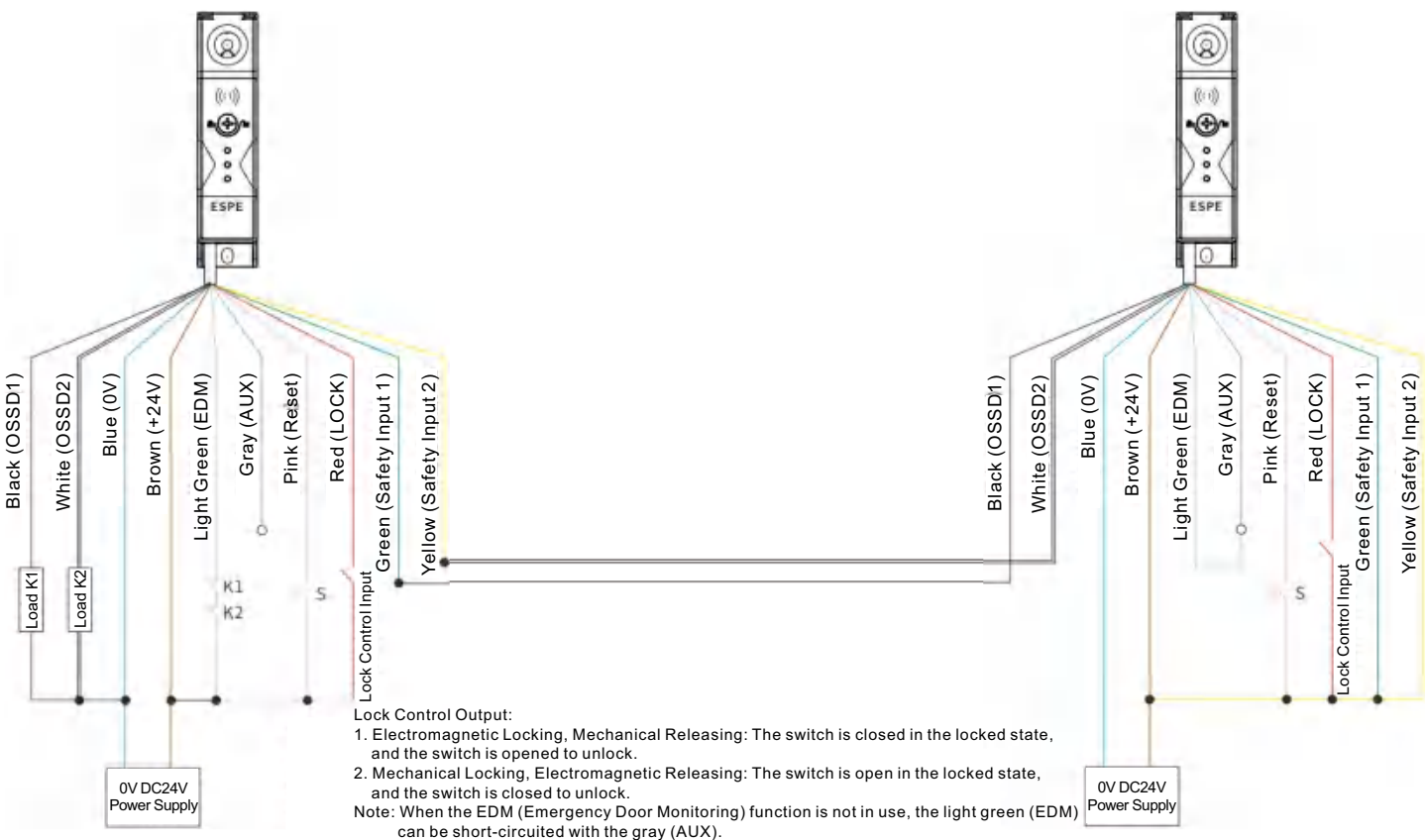


Wiring Diagram

DLR11 Premium Type (NPN, Daisy Chain)



DLR11 Premium Type (PNP, Daisy Chain)



Compact Safety Door Switch

DLE21 Series

Introduction to the DLE21 Series Safety Door Switch

The DLE21 series is an electromagnetic force locking safety door switch, designed with a flat "electromagnetic" locking structure. It uses electromagnetic force to securely lock the door, providing an optimized locking solution for scenarios where the door may shift or vibrate. This door lock takes advantage of magnetic attraction, and its compact size saves space, making it a new type of door lock that can meet the trend of miniaturization for equipment. It is suitable for equipment with low assembly inertia and can be used in dust-free environments that require high cleanliness, such as the semiconductor, automotive manufacturing, and food production industries.

Product Features

- Electromagnetic force locking of 500N.
- Uses a compact flat "electromagnetic" locking structure.
- Supports daisy-chain connection of up to 16 to 20 units.
- Equipped with a permanent magnet design.
- Compact body, easy to install.
- Visible indicator lights from all angles.
- Does not produce wear powder.
- IP65/IP67 protection.



PL e

Category4

SIL3

Technical Parameters

Type		Hinge Application	
		Small Type	
		M12 Connector	
		Standard Type	High Performance Type
Operating Distance	Sa (Off-On)	4mm	
	Sr (On-Off)	4mm	
Response Time	Locking → Unlocking	155ms	
	Unlocking → Locking	155ms	
	Detection → Non-Detection	20ms ±2ms (Dependent on the type of switch)	
	Non-Detection → Detection	300ms ±25ms (Dependent on the type of switch)	
Control Output (OSSD Output)	Output Method	Transistor Output ×2	
	Maximum Load Current	150mA	
	Residual Voltage (ON Time)	Maximum 2.5V (with a 5m cable) / 3.5V (with a 31m cable)	
	OFF Voltage	Maximum 2.0V (with a 5m cable) / 3.0V (with a 31m cable)	
	Leakage Current	Maximum 0.5mA	
	Maximum Load Capacity	0.8uF	
	Load Wire Resistance	Maximum 2.5 ohms	
AUX Output (Non-Safety Output)	Output Method	Transistor Output	
	Maximum Load Current	50mA	
	Residual Voltage (ON Time)	Maximum 2.5V (with a 5m cable) / 3.5V (with a 31m cable)	
External Input (Short Circuit Current)	Safety Input	Approximately 1.5mA × 2	
	Lock Control Input OSSD Action Switch Input	Approximately 2.5mA	
	Reset/EDM Input	Approximately 5mA (Only for High Performance Type)	
	EDM Selection Input	Approximately 2.5mA (Only for High Performance Type)	
Power Supply	Voltage	24VDC ±10% including ripple (P-P) 10% Class 2	
	Power Consumption	<5W	
Protection Circuit		Power supply reverse protection, output short circuit protection, output surge protection, reverse output protection	
Environmental Resistance	Enclosure Protection Level	IP65/IP67 (IEC60529)	
	Operating Temperature Range	-20°C to 55°C without freezing	
	Storage Temperature Range	-25°C to 70°C without freezing	
	Operating Humidity Range	5% to 95%RH	
	Storage Humidity Range	5% to 95%RH	
	Vibration Resistance	10 to 55Hz, double amplitude 2.0mm, X, Y, Z axes for 5 minutes each (IEC60947-5-3)	
	Impact Resistance	30G for X, Y, Z axes, 6 times each (IEC60947-5-3)	
Applicable Standards		EN ISO13849-1:2015 (PLe, Category 4), IEC60947-5-3, EN60947-5-3	

Safety Door Switch Model Explanation

DLE21 - □ □ □ □ □ - □

Cable Length	1: 1m
	2: 2m
Wiring Method	C: M12 Connector
Output Method	N: NPN
	P: PNP
Encoding Method	0: Universal Encoding
Configuration Type	0: Standard Type
	1: High Function Type
Locking Method	0: Electromagnetic Locking
Product Series	DLE21 Series Safety Door Switch

Standard and High Function Type Explanation

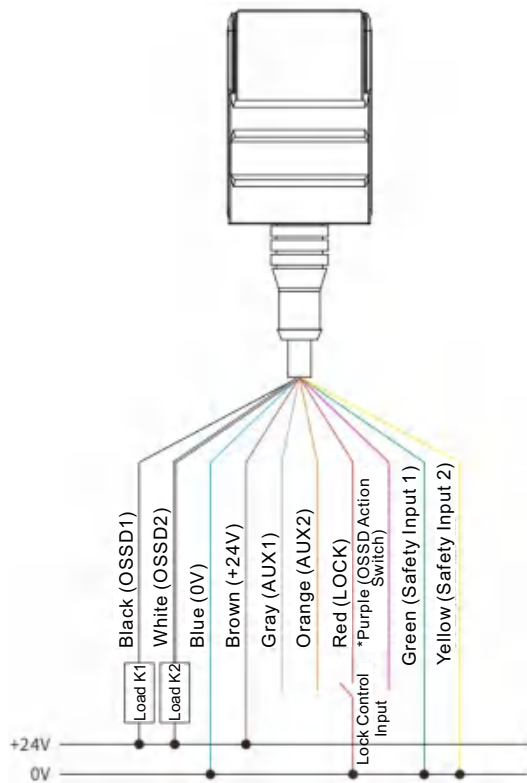
	Safety Output Channel	AUX Output Channel	Safety Input Channel	Lock Input Channel	EDM	Reset
Standard Type	●	●	●	●	-	-
High Function Type	●	●	●	●	●	●

DLE21 Series Selection Table

Locking Method	Configuration	Output Method	Encoding Method	Model
Electromagnetic Locking	Standard	NPN	Universal Encoding	DLE21-000NC
		PNP	Universal Encoding	DLE21-000PC
	High Function Type	NPN	Universal Encoding	DLE21-010NC
		PNP	Universal Encoding	DLE21-010PC

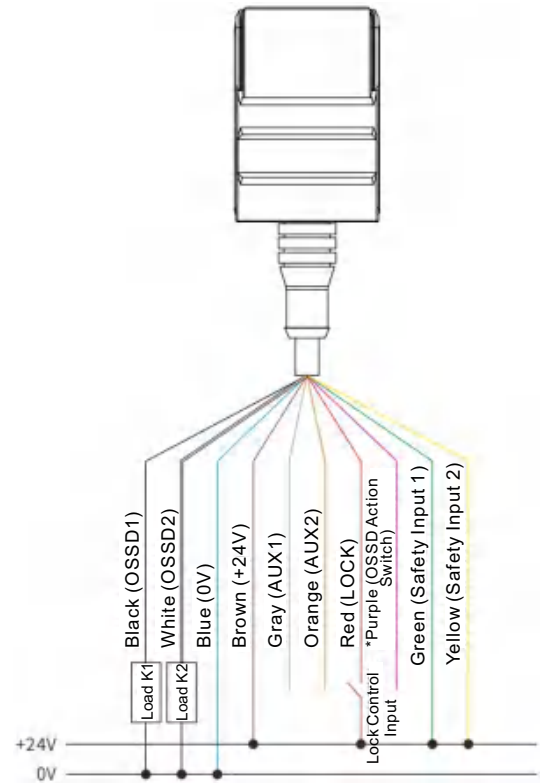
Wiring Diagram

DLE21 Standard Type (NPN, Non-Daisy Chain)



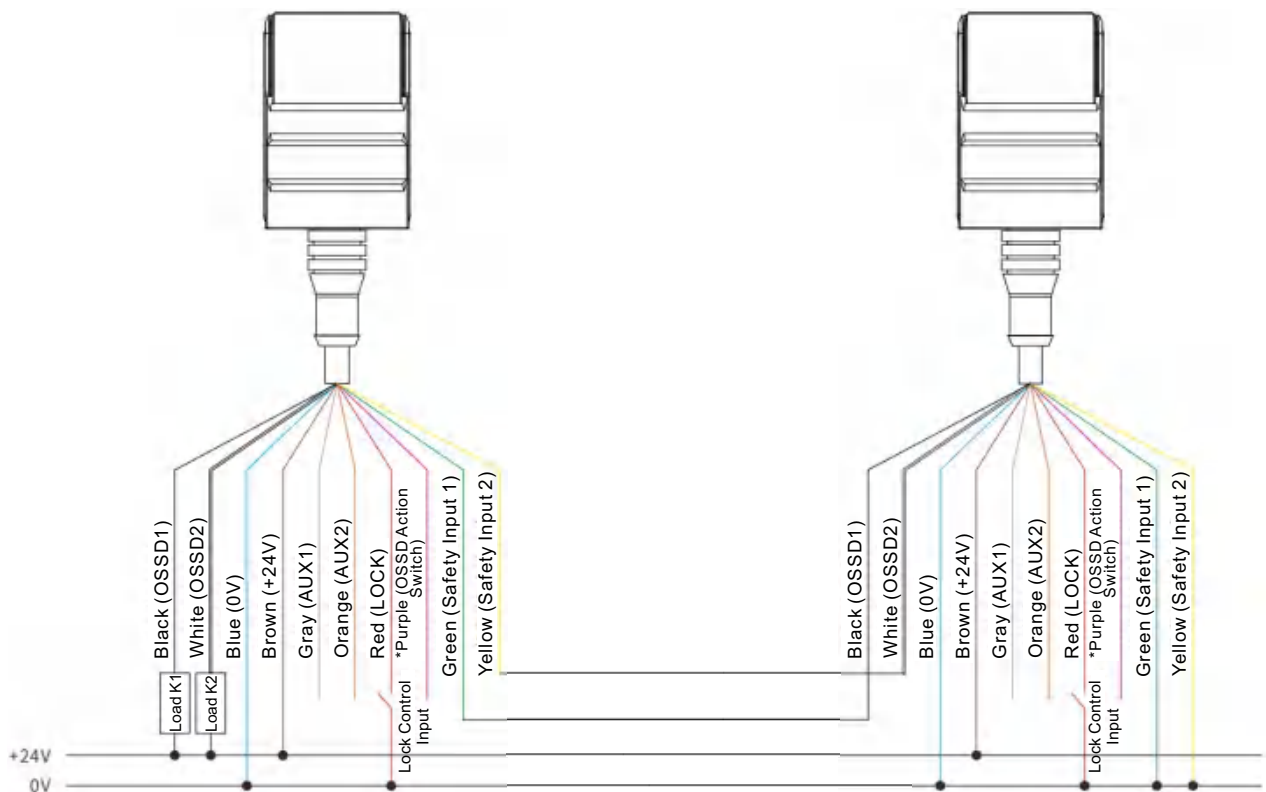
*Open Circuit Connection, Purple connects to 0V;
Closed Circuit Connection, Purple disconnects.

DLE21 Standard Type (PNP, Non-Daisy Chain)



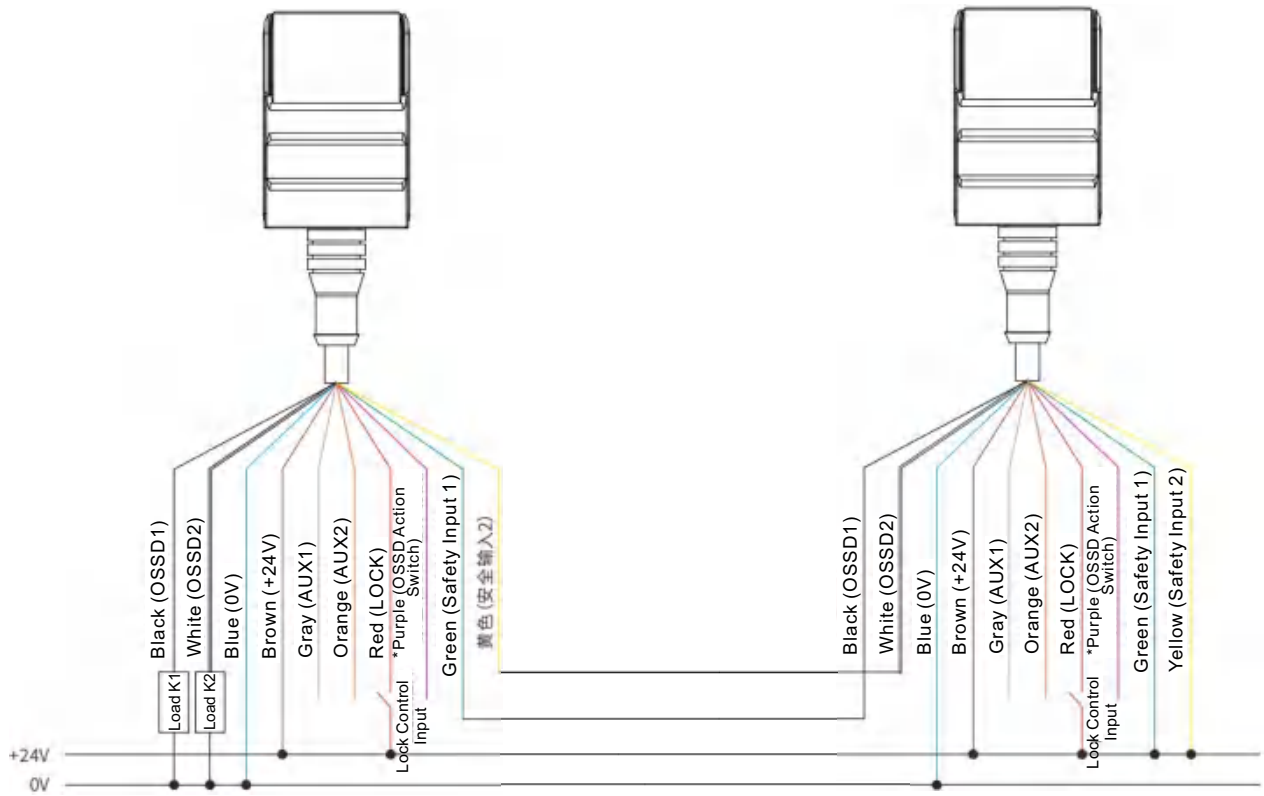
*Open Circuit Linkage, Purple connects to +24V;
Closed Circuit Linkage, Purple disconnects.

DLE21 Standard Type (NPN, Daisy Chain)



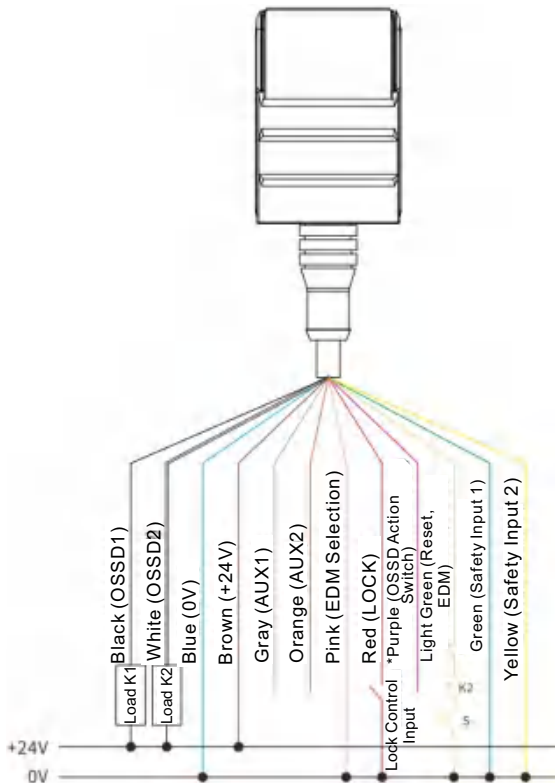
*Open Circuit Linkage, Purple connects to 0V; Closed Circuit Linkage, Purple disconnects.

DLE21 Standard Type (PNP, Daisy Chain)



*Open Circuit Linkage, Purple connects to +24V; Closed Circuit Linkage, Purple disconnects.

DLE21 Premium Type (NPN, Non-Daisy Chain)



*Open Circuit Linkage, Purple connects to 0V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

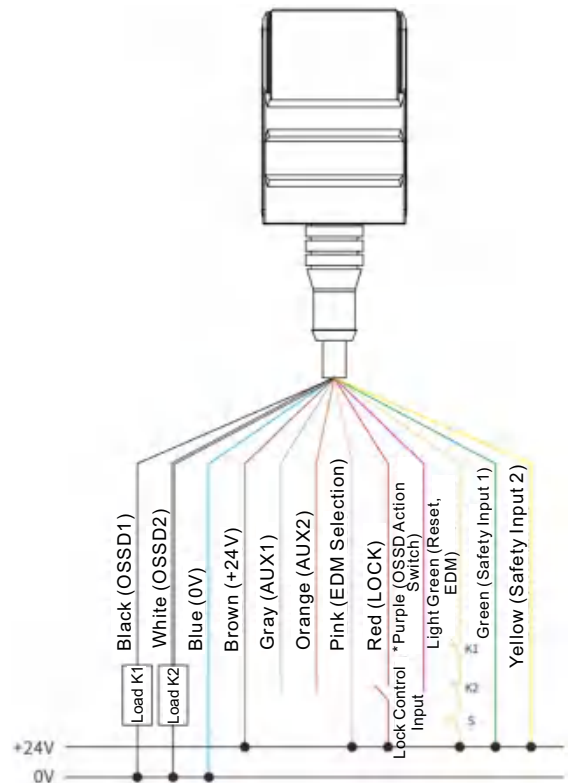
2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

DLE21 Premium Type (PNP, Non-Daisy Chain)



*Open Circuit Linkage, Purple connects to +24V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

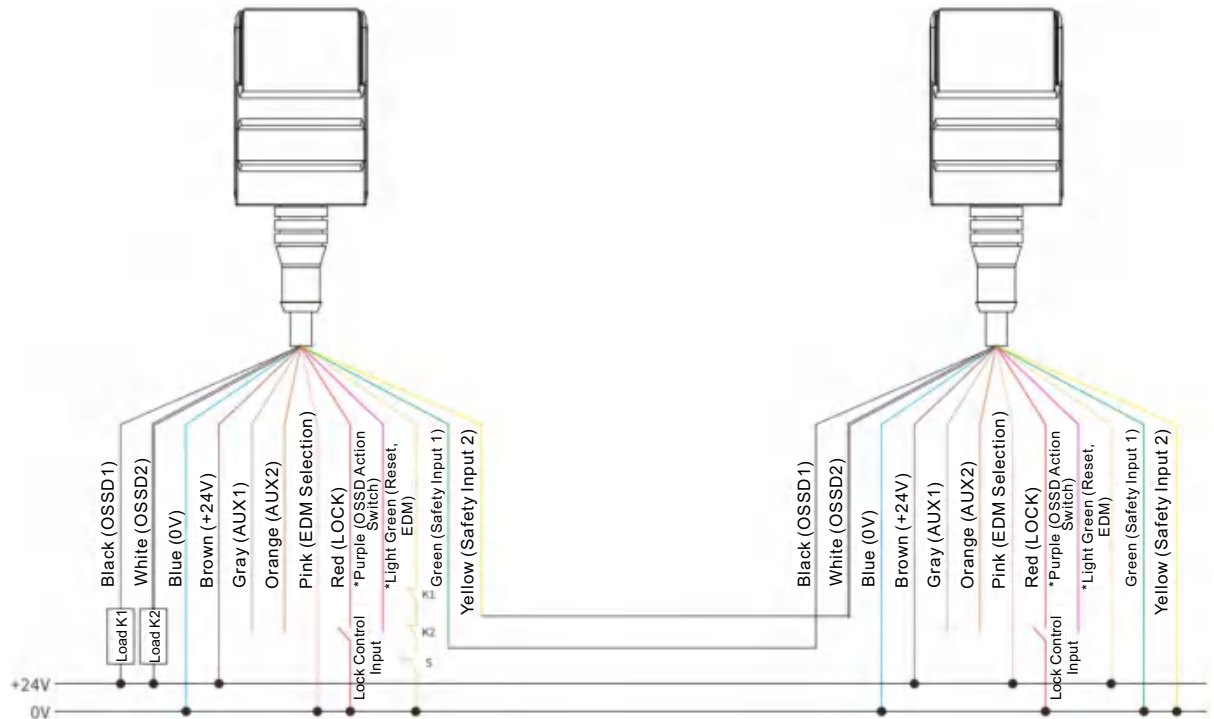
2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

DLE21 Premium Function Type (NPN, Daisy Chain)



*Open Circuit Linkage, Purple connects to 0V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

*Open Circuit Linkage, Purple connects to 0V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

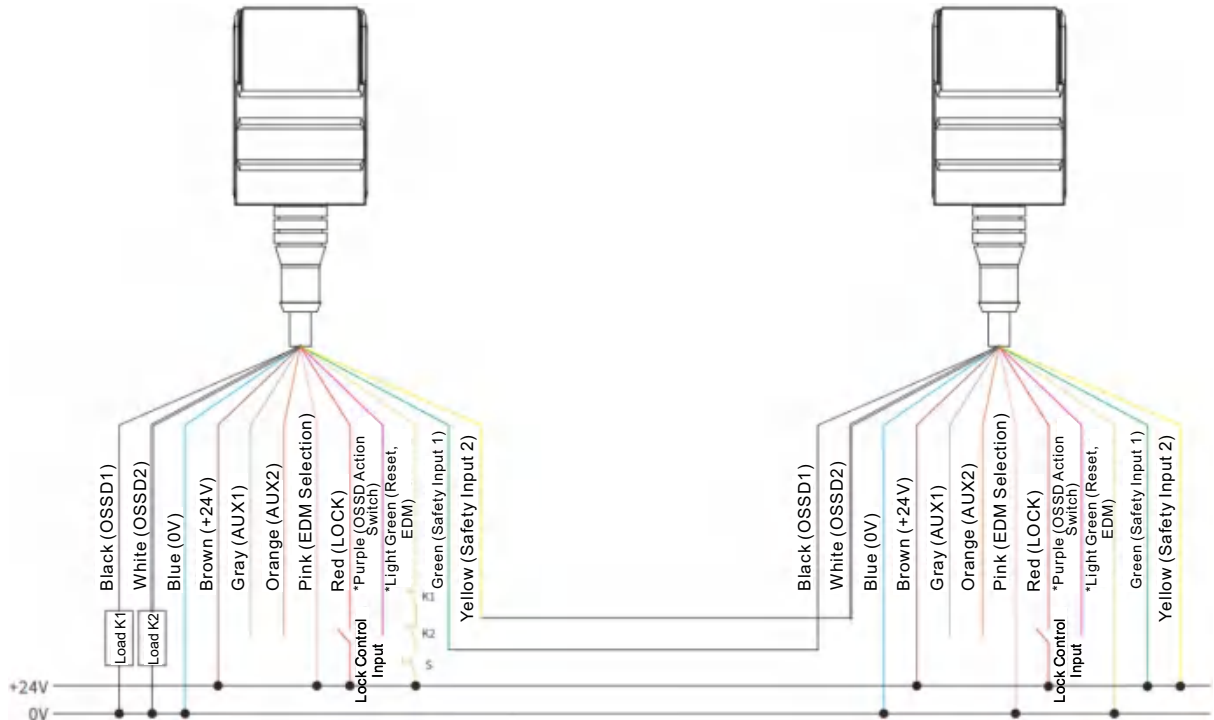
2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

DLE21 Premium Function Type (PNP, Daisy Chain)



*Open Circuit Linkage, Purple connects to +24V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

*Open Circuit Linkage, Purple connects to +24V; Closed Circuit Linkage, Purple disconnects.

*1. To enable EDM (Emergency Door Monitoring) and Reset: Connect as shown in the wiring diagram.

2. Not using EDM and Reset: Short-circuit the EDM selection (Pink wire) and Reset/EDM (Light Green wire) to +24V.

3. Only using EDM: Open the EDM selection (Pink wire).

K1, K2: External devices (e.g., Solenoid Valve, Electromagnetic Contactor, etc.)

S: Reset Switch

Indicator Light Explanation



Door Not Locked
Green Light Flashing

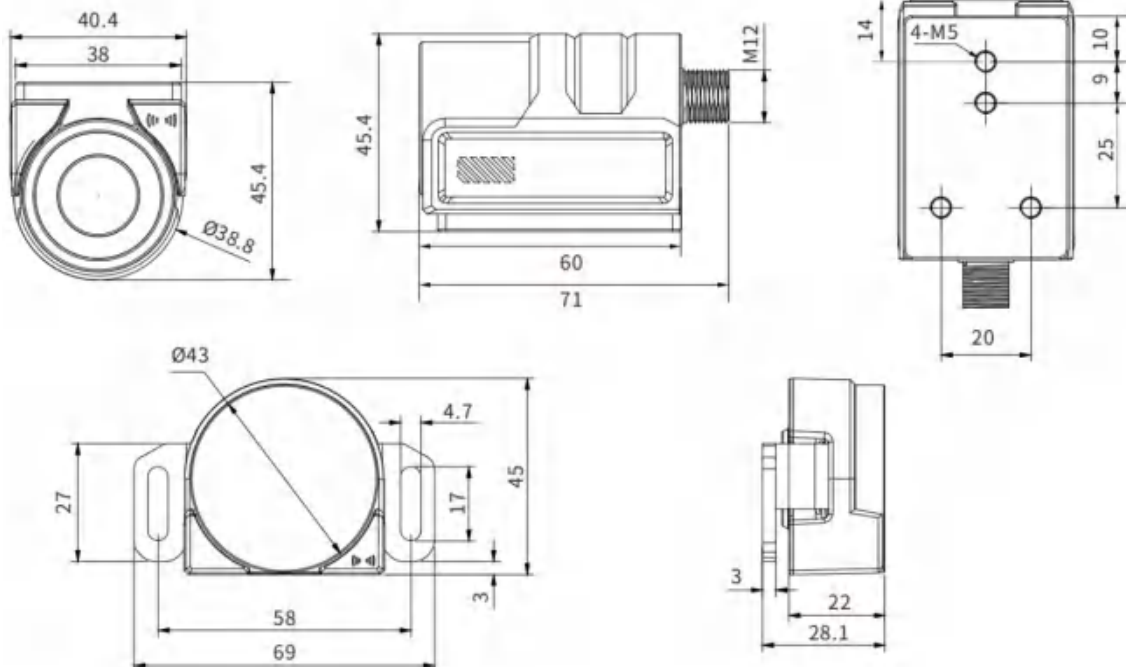


Door Locked
Green Light On



Door Open
Red Light On

Product Size Diagram



Safety Interlock Device DLE21 Series Selection Method

Step1	Step2	Step3
		
Door Switch Main Body	Matcher	Installation Bracket

Safety Door Lock

SDR22 Series

Introduction to the SDR22 Series Safety Door Lock

The safety door lock is a safety device used to confirm the open and closed status of doors and protective covers of movable protective structures such as safety fences. The SDR22 series safety door switch uses RFID detection technology, offering higher security and confidentiality. It allows for the selection between universal coding and unique coding between the sensor and the tag. Its compact size facilitates easy installation.

Product Features

- Equipped with a self-inspection and cross-inspection design: Periodic dual inspections enhance safety.
- Independent redundant dual output: Prevents safety hazards caused by the failure of a single circuit.
- Magnetic retention function: The magnetic holding force can reach up to 15N, which can replace the door magnetic lock.

Safety Switch Model Explanation

SDR22 - 0 0 N C - 3

Cable Length	3: 3m, 5: 5m, 10: 10m, 20: 20m
Wiring Method	None: Direct Wires
	C: M12 Connector
Output Method	N: NPN
	P: PNP
Encoding Method	0: Universal Encoding
Configuration Type	2: High Function Type
	1: Standard Type
	0: Simple Type
Product Series	SDR22 Series Safety Door Lock



Technical Parameters

Specification	Details
Compliance Standards	ISO 13849-1 (Cat. 4/PLe),
	IEC/EN60947-5-1,
	IEC/EN60947-5-3
Power Supply	DC24V \pm 15%
Power Consumption	<1W
Risk Time	50ms
Response Time	50ms
Magnetic Holding Force	>15N
Operating Frequency	1Hz
Safety Output (OSSD)	The PNP transistor output can handle a load current of up to 200mA,
	with a residual voltage of less than 1V (excluding voltage drops caused
	by cable extension), and a leakage current of less than 1mA.
	The NPN transistor output also supports a load current of up to 200mA,
	with a residual voltage of less than 1V (excluding voltage drops due to
	cable length), and a leakage current of less than 1mA.
Protection Circuit	Over-voltage, reverse polarity, over-current
Coding Method	Universal code, Unique code
Housing Protection Level	Ip65
Viewing Angle	48 x 30mm
Vibration Resistance	10Hz~55Hz, 0.35 \pm 0.05mm amplitude, 20 cycles in X, Y, Z directions
Operating Ambient Temperature	-10°C to 55°C (no condensation)
Storage Ambient Temperature	-30°C to 70°C (no condensation)
Operating Ambient Humidity	<85% relative humidity at 20°C

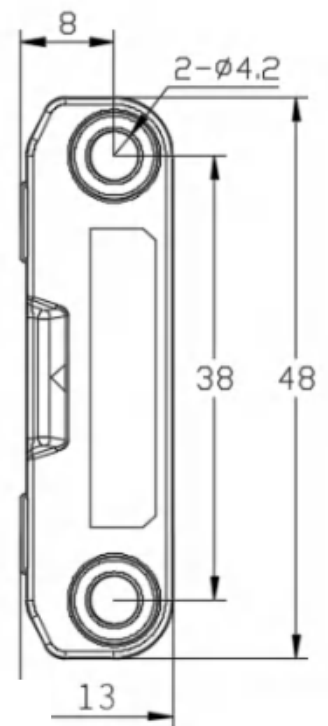
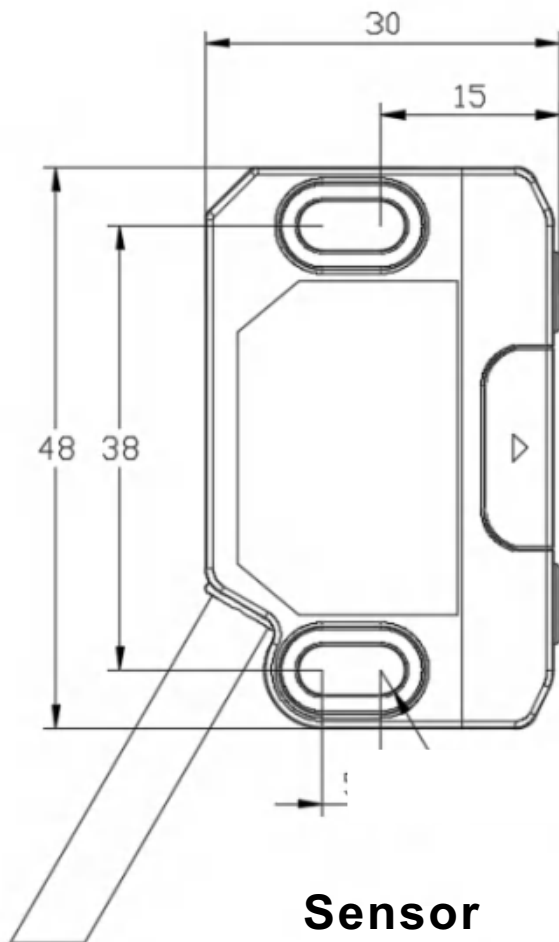
Type Description

Type	Safety Output	Cascading Function	EDM Function	Reset Function	Auxiliary Output
Simple	●				
Standard	●	●			
High Function	●	●	●	●	●

SDR22 Series Selection Table

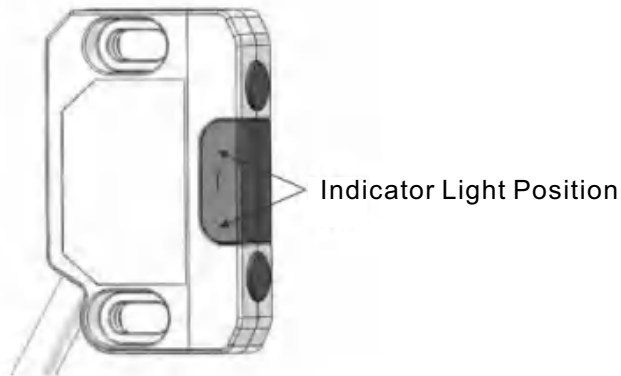
Model	Type	Output Method	Encoding Method
SDR22-00N	Simple Type	NPN	Universal Encoding
SDR22-00P		PNP	Universal Encoding
SDR22-10N	Standard Type	NPN	Universal Encoding
SDR22-10P		PNP	Universal Encoding
SDR22-20N	High Function Type	NPN	Universal Encoding
SDR22-20P		PNP	Universal Encoding

Product Dimensions



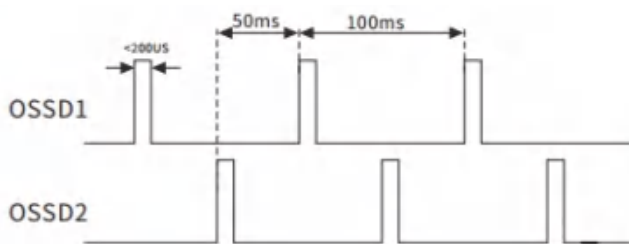
Indicator Light Explanation

Switch Status	Indicator Light
EEPROM Error/SPI Error	Red light flashes at 4Hz
Output Error/EDM Error	Red light flashes at 1Hz
Voltage Error	Red light double flashes
Unique Coding Not Matched	Red and green lights alternate at 4Hz
No Error, No RFID, No Output	Red light stays on
No Error, RFID Present, Cascading, Awaiting Reset Signal	Green light flashes at 4Hz
No Error, RFID Present, No Cascading	Green light flashes at 1Hz
No Error, RFID Present, Cascading Signal Error	Green light double flashes
No Error, All Conditions Met, Output Present	Green light stays on

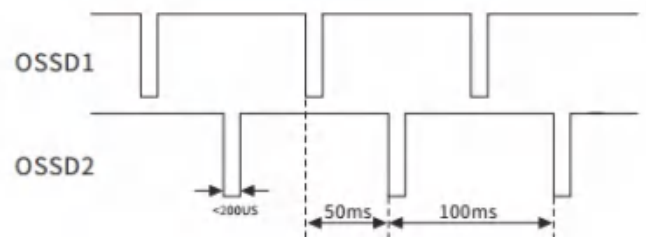


Timing Diagram

NPN Output Diagnostic Timing

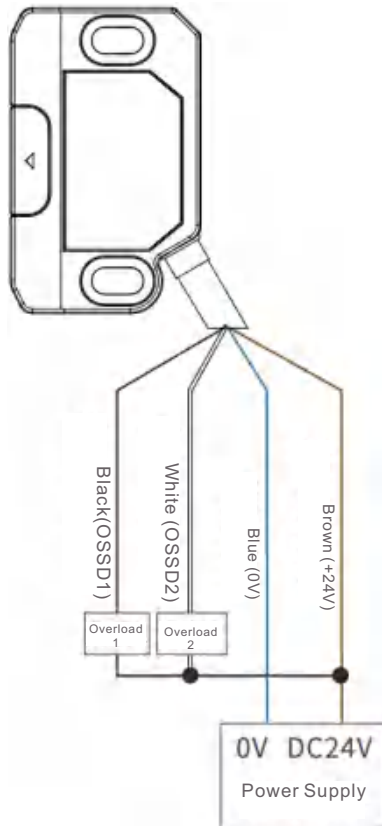


PNP Output Diagnostic Timing

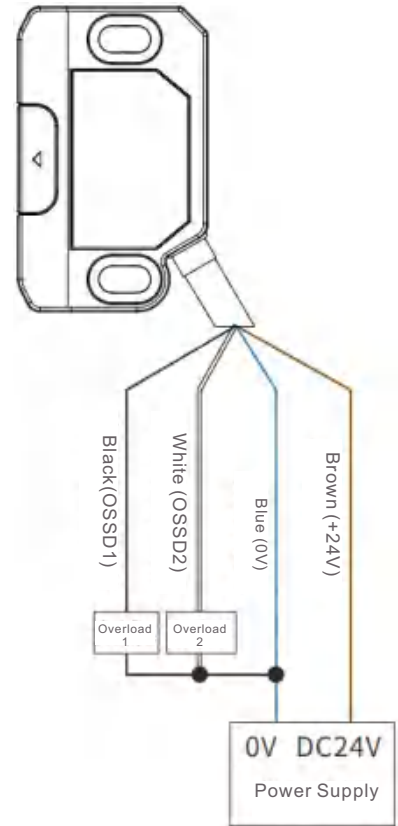


Wiring Diagram

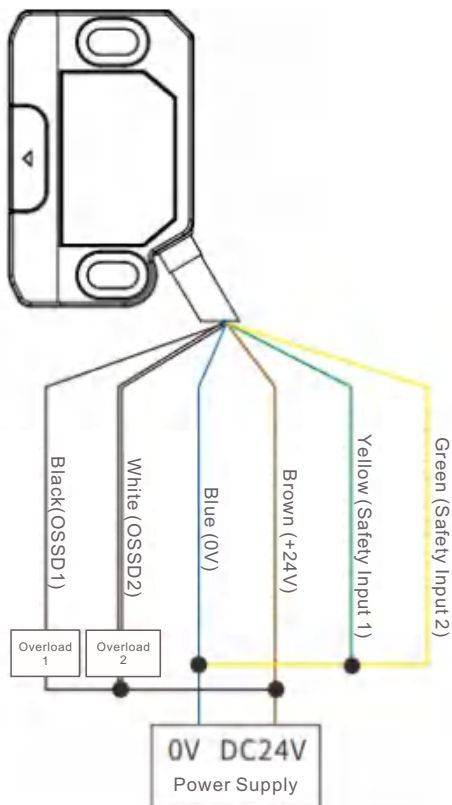
SDR22 Simple Type (NPN)



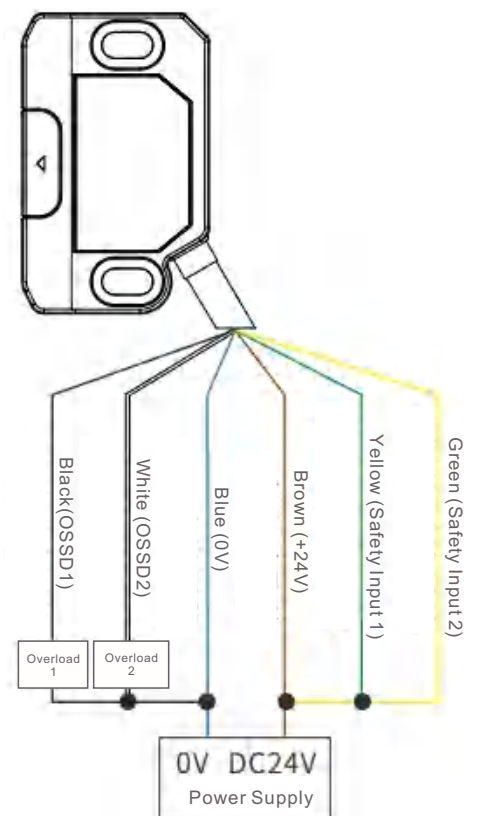
SDR22 Simple Type (PNP)



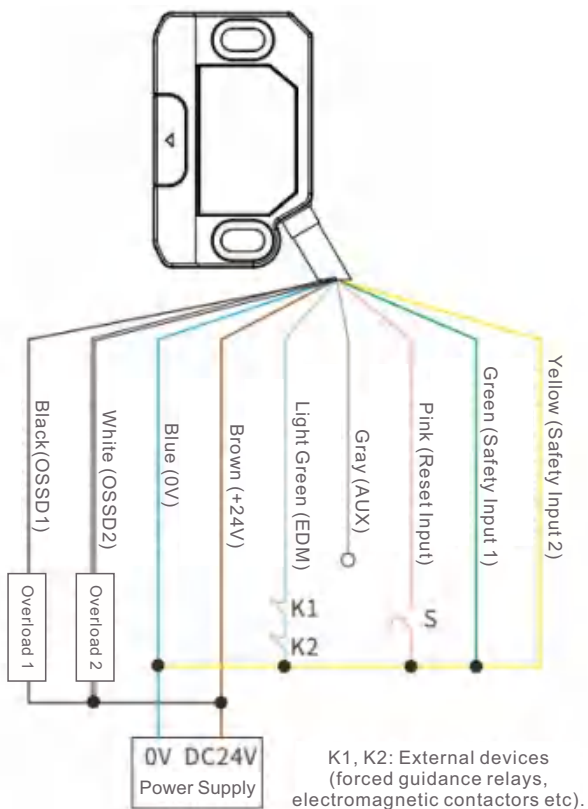
SDR22 Standard Type (NPN)



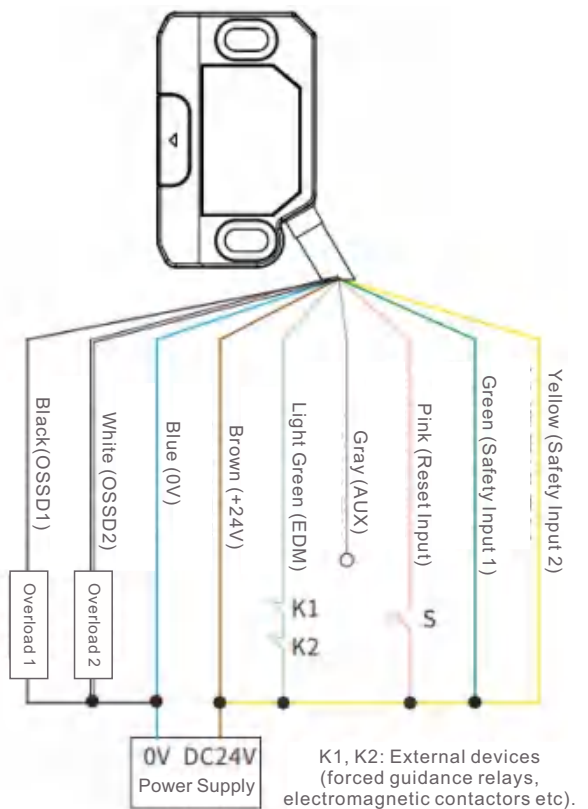
SDR22 Standard Type (PNP)



SDR22 High Function Type (NPN)





SDR22 High Function Type (NPN)



Wiring Instructions

Wire Color	Function	Wiring Description
Brown	Power Positive	Connect to the positive terminal of a DC 24V power supply.
Blue	Power Negative	Connect to the negative terminal of a DC 0V power supply.
Black	Safety Output 1	Connect to a safety PLC or other safety input control interface.
White	Safety Output 2	
Green	Safety Input 1	Non-cascading: Connect to +24V power.
		Cascading:
Yellow	Safety Input 2	Connect to the switch's safety input signal (OSSD1 and OSSD2).
Light Green	EDM Monitoring	For monitoring external relays or solenoid valves.
Pink	Reset	Connect to a reset switch.
Gray	Auxiliary Output	Connect to a PLC.

Specifications

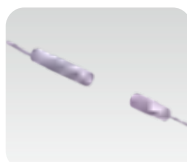
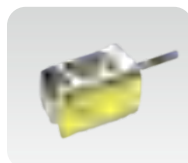
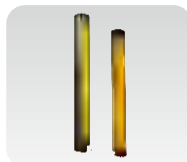
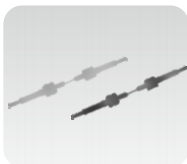
Appearance		
Model	DLT-AZC	DLT-GLS
Detection Head Size	59.5mm x 38mm x 16.2mm	50mm x 14mm x 14mm
Type	Magnetic Actuator/ 1 Normally Open 1 Normally Closed	Reed Switch/ Proximity Conduction
Detection Distance	15mm	
Response Frequency	Below 20Hz	
Operating Temperature Range	-20~60°C	
Storage Temperature Range	-20~60°C	
Operating Humidity Range	35~85%RH	
Storage Humidity Range	35~85%RH	
Withstand Voltage	Between terminals and housing: AC1000V 50/60Hz 1 minute	
Vibration (Endurance)	Endurance: 10~55Hz, double amplitude 1.5mm in X, Y, Z directions for 2 hours	
Shock (Endurance)	Endurance: 300m/s ² in X, Y, Z directions for 3 times	
Protection Level	IEC: IP40	
Connection Method	Terminal Block Type	
	Sensor: ABS, Magnet: ABS	

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Sensore di settore



Laser Displacement Sensors

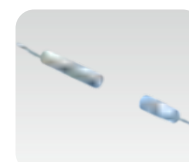
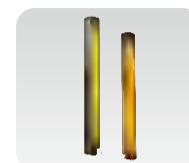
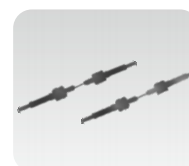
sensori di spostamento laser

Quality Management & Consultancy



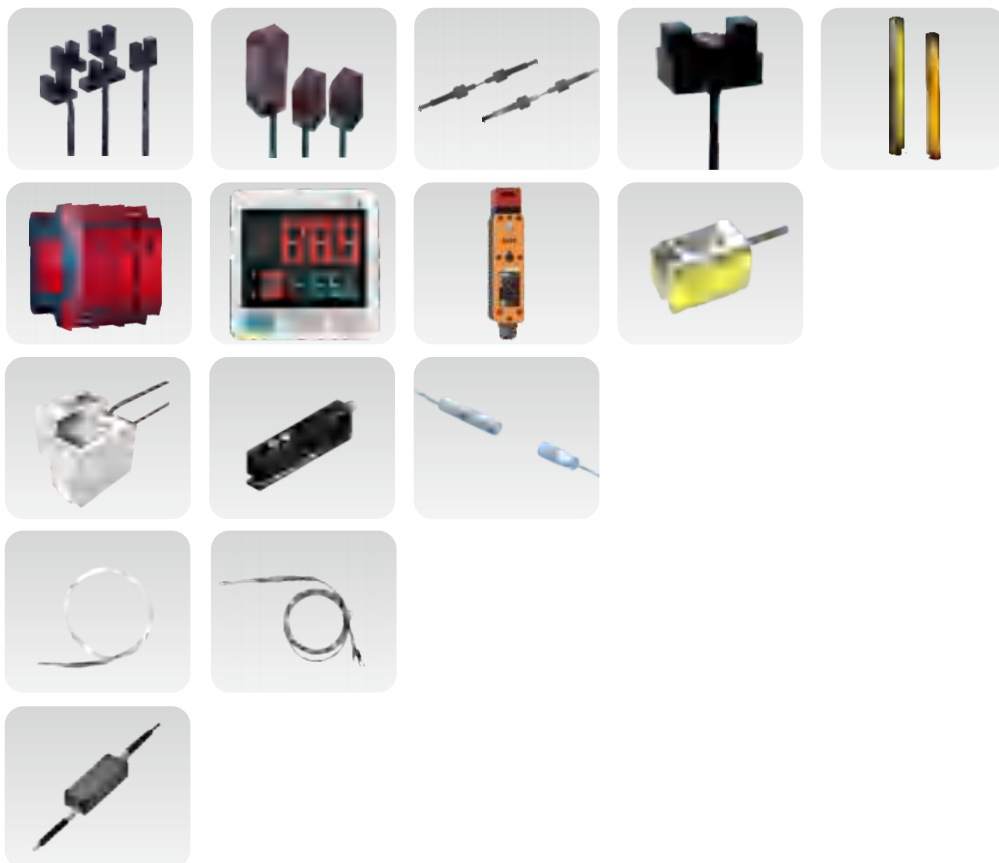
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Website: <http://www.nipponkodobearings.com>



Laser Displacement Sensors Contents

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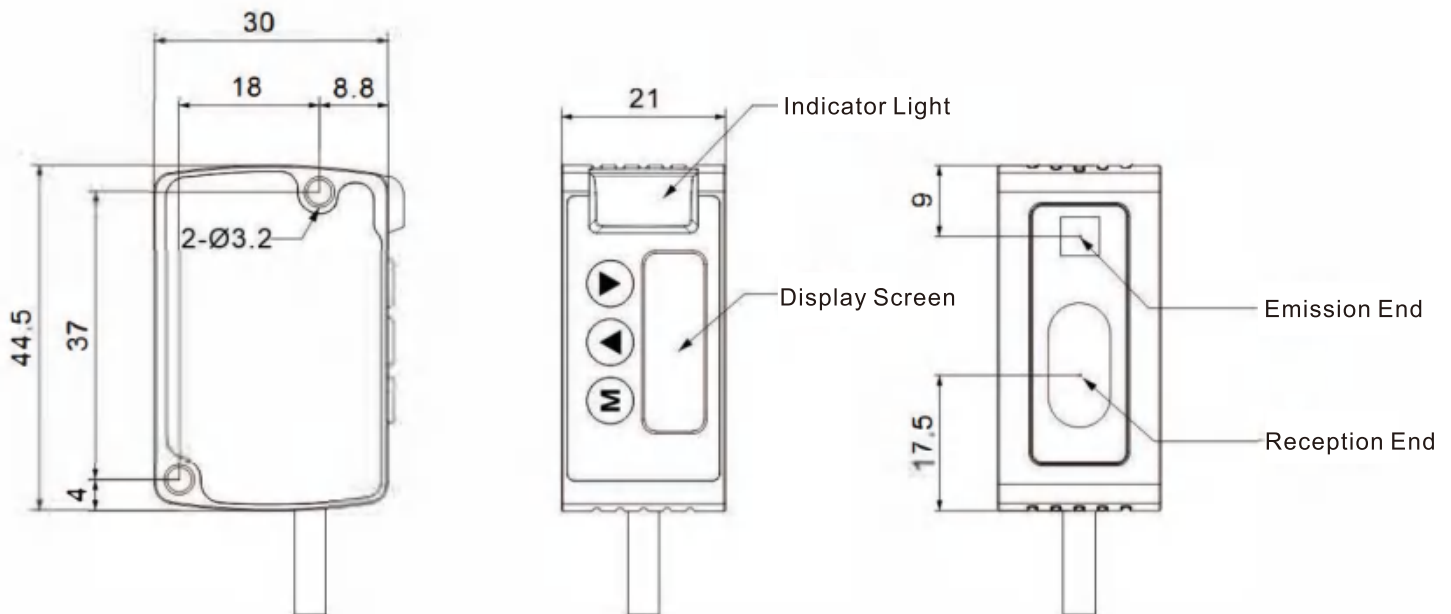
Wide Range Series

Laser Displacement Sensors

Technical Specifications

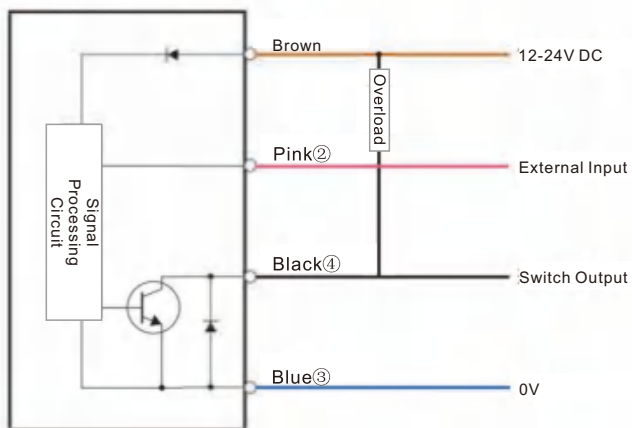
Model	NPN	LDS-235NZ
	NPN+Analog	LDS-235NMZ
	NPN+RS485	LDS-235NZ-485
Appearance		
Detection Method	Diffuse Reflection	
Base (Center) Distance	235mm	
Measurement Range (F.S.)	35~435mm	
Full Scale	400mm	
Repeatability	35-135mm: 0.1mm, 135-235mm: 0.3mm, 235-335mm: 0.8mm, 335-435mm: 1.5mm	
Linearity Accuracy	35-200mm: $\pm 0.1\%$ F.S., 200-400mm: $\pm 0.2\%$ F.S., 400-435mm: $\pm 0.3\%$ F.S.	
Temperature Drift Characteristic	$\pm 0.03\%$ F.S./°C	
Light Source	Dielectric	Red Diode Laser, Wavelength 655nm
	Output Power	<1mW
	Laser Class	IEC Class 2
Output	Switch	NPN Open Collector, $\leq 50\text{mA}/\text{DC}24\text{V}$, Residual Voltage <1.5V
	Analog	Analog Voltage: 0~5V (Alarm: 52V); Analog Current: 4~20mA (Alarm: 0mA), Switchable
	Output Action	Light.on (Light Entry Action) / Dark.on (Light Obstruction Action) Selectable
Response Time	1.5ms/5ms/10ms, Switchable	
Operating Voltage	DC 12~24V $\pm 10\%$	
Consumption (No Load) Current	<30mA (Power Supply Voltage 24VDC),	
	<60mA (Power Supply Voltage 12VDC)	
Indicator Light	Output Indicator Light: Yellow; Power Indicator Light: Green	
Ambient Temperature	Operating: -10°C~45°C; Storage: -20°C~60°C, No Freezing	
Ambient Humidity	Operating: 35%~85% RH; Storage: 35%~85% RH, No Condensation	
Protection Circuit	Reverse Polarity Protection/Surge Protection/Short Circuit Protection	
Protection Level	IP67 (IEC)	
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm,	
	X/Y/Z Directions Each 30 Minutes	
Shock Resistance	300m/S ² , X/Y/Z Directions Each 3 Times	
Material	Surface	Aluminum Alloy
	Lens	PMMA
	Wire	PVC (Polyvinyl Chloride)
Connection Method	2.5M Core Standard Wire (Wire Diameter 4.0mm),	
	Customizable Length	
Packaging Weight	Approximately 85g (Including 2.5M Core Standard Wire)	

Dimensional Drawing (Unit:mm)

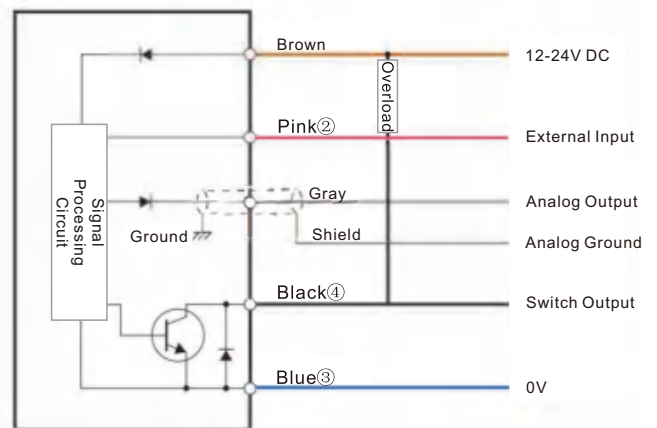


Wiring Diagram

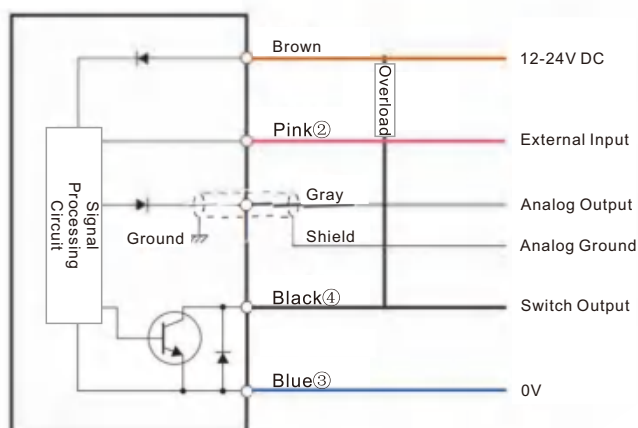
【LDS-235NZ】



【LDS-235NMZ】




【LDS-235NZ-485】




Budget Series

Laser Displacement Sensors

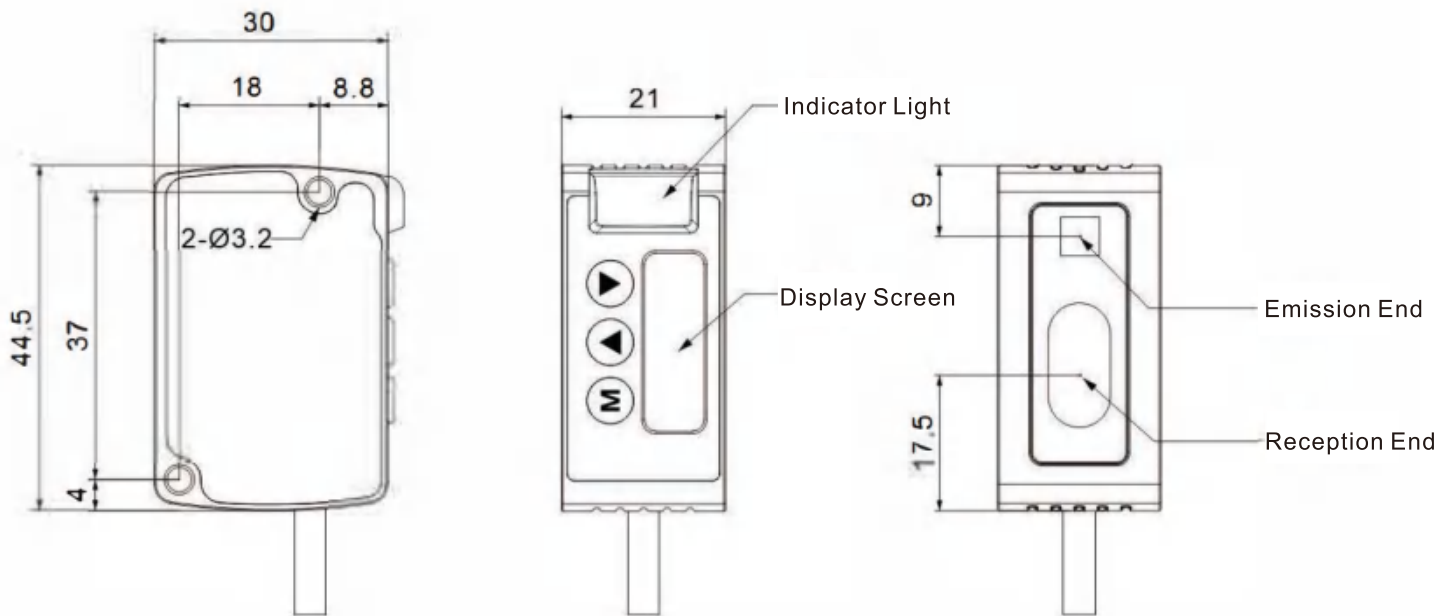
Technical Specifications

Model	NPN	LDS-30NZ	LDS-50NZ	LDS-100NZ
	NPN+Analog	LDS-30NMZ	LDS-50NMZ	LDS-100NMZ
	NPN+RS485	LDS-30NZ-485	LDS-50NZ-485	LDS-100NZ-485
Appearance				
Detection Method	Diffuse Reflection			
Base (Center) Distance		30mm	50mm	100mm
Measurement Range (F.S.)		25~35mm	35~65mm	65~135mm
Full Scale		10mm	30mm	70mm
Repeatability		10μm	30μm	70μm
Linearity Accuracy		±0.1% F.S.		
Temperature Drift Characteristic		±0.03% F.S./°C		
Light Source	Dielectric	Red Diode Laser, Wavelength 655nm		
	Output Power	<1mW		
	Laser Class	IEC Class 2		
Beam Diameter		Ø 50μm	Ø 70μm	Ø 120μm
Analog Output		Analog Voltage:0~5V (AI arm: 5.2V); Analog Current:4~20mA (Alarm: 0mA)		
Output Action		Light.on (Light Entry Action) / Dark.on (Light Obstruction Action)		
Response Time		1.5ms/5ms/10ms, Switchable		
Operating Voltage		DC 12~24V±10%		
Consumption (No Load) Current		<30mA (Power Supply Voltage 24VDC),		
		<60mA (Power Supply Voltage 12VDC)		
Indicator Light		Output Indicator Light: Yellow; Power Indicator Light: Green		
Ambient Illumination		Incandescent Light ≤3000Lux; Sunlight ≤20000Lux		
Ambient Temperature		Operating: -10°C~40°C; Storage: -20°C~60°C (No Freezing)		
Ambient Humidity		Operating: 35%~85% RH; Storage: 35%~85% RH (No Condensation)		
Protection Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection		
Protection Level		IP67 (IEC)		
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Directions Each 30 Minutes		
Shock Resistance		300m/S ² , X/Y/Z Directions Each 3 Times		
Material	Surface	Aluminum Alloy		
	Lens	PMMA		
	Wire	PVC (Polyvinyl Chloride)		
Connection Method		2.5M Core Standard Wire (Wire Diameter 4.0mm), Customizable Length		
Packaging Weight		Approximately 85g (Including 2.5M Core Standard Wire)		

Technical Specifications

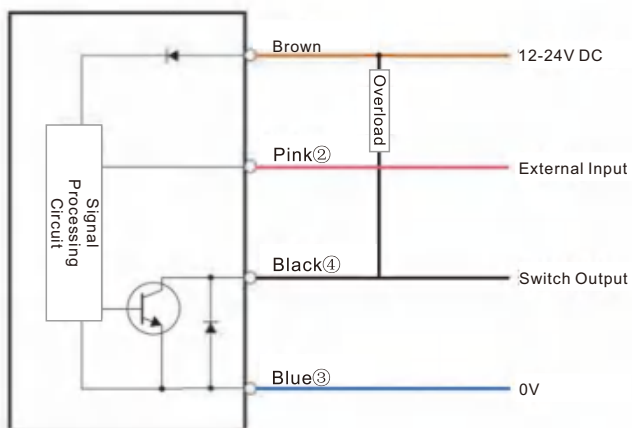
Model	NPN	LDS-200NZ	LDS-400NZ
	NPN+Analog	LDS-200NMZ	LDS-400NMZ
	NPN+RS485	LDS-200NZ-485	LDS-400NZ-485
Appearance			
Detection Method		Diffuse Reflection	
Base (Center) Distance		200mm	400mm
Measurement Range (F.S.)		120~280mm	200~600mm
Full Scale		160mm	400mm
Repeatability		200μm	200-400mm: 600μm
			400-600mm: 1500μm
Linearity Accuracy		±0.2% F.S.	200-400mm: ±0.2% F.S.
			400-600mm: ±0.3% F.S.
Temperature Drift Characteristic		±0.03% F.S./°C	
Light Source	Dielectric	Red Diode Laser, Wavelength 655nm	
	Output Power	<1mW	
	Laser Class	IEC Class 2	
Beam Diameter		Ø300μm	Ø500μm
Analog Output		Analog Voltage:0~5V (Alarm: 5.2V); Analog Current:4~20mA (Alarm: 0mA)	
Output Action		Light.on (Light Entry Action) / Dark.on (Light Obstruction Action)	
Response Time		1.5ms/5ms/10ms, Switchable	
Operating Voltage		DC 12~24V±10%	
Consumption (No Load) Current		<30mA (Power Supply Voltage 24VDC),	
		<60mA (Power Supply Voltage 12VDC)	
Indicator Light		Output Indicator Light: Yellow; Power Indicator Light: Green	
Ambient Illumination		Incandescent Light ≤3000Lux; Sunlight ≤20000Lux	
Ambient Temperature		Operating: -10℃~40℃; Storage: -20℃~60℃ (No Freezing)	
Ambient Humidity		Operating: 35%~85% RH; Storage: 35%~85% RH (No Condensation)	
Protection Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection	
Protection Level		IP67 (IEC)	
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Directions Each 30 Minutes	
Shock Resistance		300m/S2, X/Y/Z Directions Each 3 Times	
Material	Surface	Aluminum Alloy	
	Lens	PMMA	
	Wire	PVC (Polyvinyl Chloride)	
Connection Method		2.5M Core Standard Wire (Wire Diameter 4.0mm),, Customizable Length	
Packaging Weight		Approximately 85g (Including 2.5M Core Standard Wire)	

Dimensional Drawing (Unit:mm)

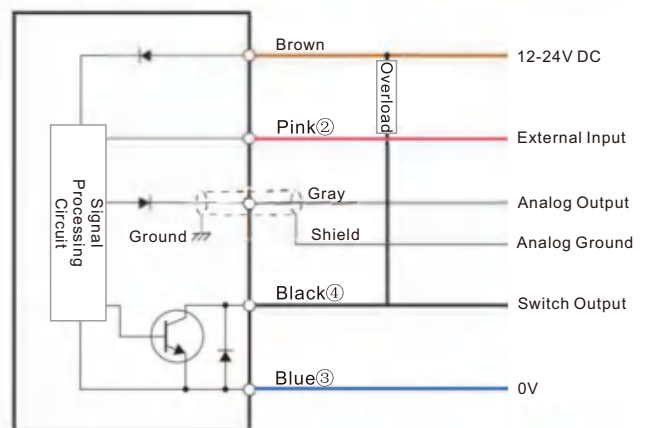


Wiring Diagram

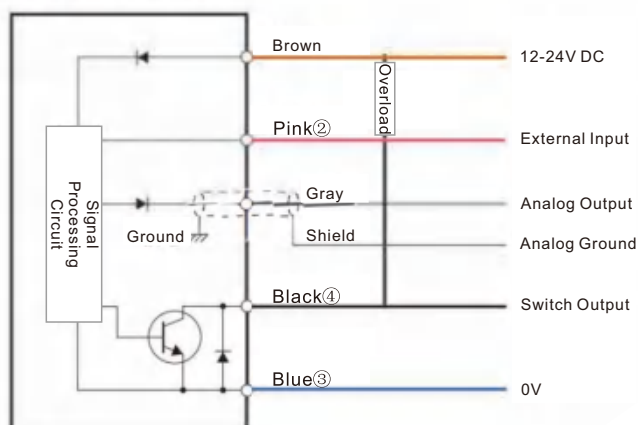
【 NPN 】



【 NPN+Analog 】



【 NPN+RS485 】




High Precision Series

Laser Displacement Sensors

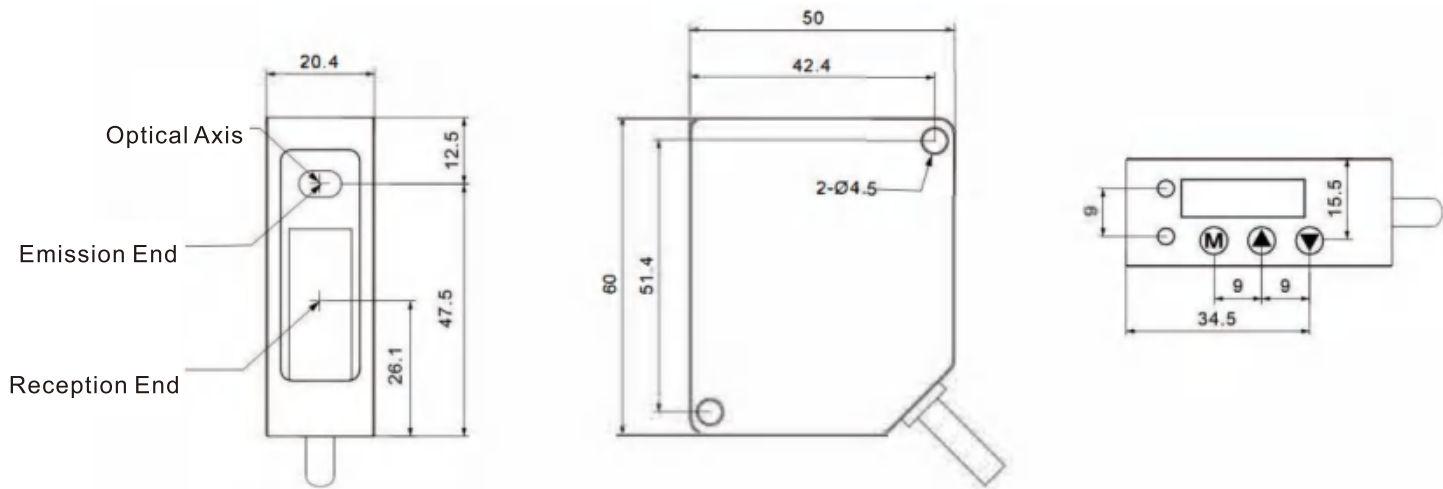
Technical Specifications

Model	NPN+Analog	LDS-30NM	LDS-50NM
	NPN+RS485	LDS-30N-485	LDS-50NZ-485
Appearance			
Detection Method		Diffuse Reflection	
Base (Center) Distance		30mm	50mm
Measurement Range (F.S.)		26~34mm	40~60mm
Full Scale		8mm	20mm
Repeatability		2μm	5μm
Linearity Accuracy		±0.1% F.S.	
Temperature Drift Characteristic		±0.08% F.S./°C	
Light Source	Dielectric	Red Diode Laser, Wavelength 655nm	
	Output Power	<1mW	
	Laser Class	IEC Class 2	
Beam Diameter		0.1x0.1mm	0.5x1.0mm
Analog Output		Analog Voltage: 0~10V; Analog Current: 4~20mA	
Output Action		Light.on (Light Entry Action) / Dark.on (Light Obstruction Action)	
Response Time		≤11.5ms	
Operating Voltage		Analog Current: 12~24VDC (-5%, +10%);	
		Analog Voltage: 18~24VDC (-5%, +10%)	
Consumption (No Load) Current		<30mA (Analog Current Output), <60mA (Analog Voltage Output)	
Indicator Light (When Object Detected)		Distance less than center point: Orange;	
		Distance greater than center point: Green;	
		No object detected: Green	
Ambient Illumination		Incandescent Light ≤3000Lux; Sunlight ≤10000Lux	
Ambient Temperature		Operating: -10℃~40℃; Storage: -20℃~60℃ (No Freezing)	
Ambient Humidity		Operating: 35%~85% RH; Storage: 35%~85% RH (No Condensation)	
Protection Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection	
Protection Level		IP67 (IEC)	
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Directions Each 30 Minutes	
Shock Resistance		300m/S2, X/Y/Z Directions Each 3 Times	
Material	Surface	Aluminum Alloy	
	Lens	PMMA	
	Wire	PVC (Polyvinyl Chloride)	
Connection Method		2.6M Core Standard Wire,Customizable Length	
Packaging Weight		Approximately 250g (Including 2.6M Core Standard Wire)	

Technical Specifications

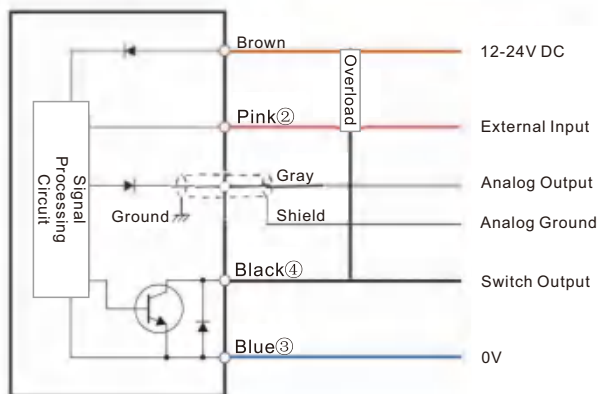
Model	NPN+Analog	LDS-85NM	LDS-250NM
	NPN+RS485	LDS-85N-485	LDS-250NZ-485
Appearance			
Detection Method		Diffuse Reflection	
Base (Center) Distance		85mm	250mm
Measurement Range (F.S.)		65~105mm	100~400mm
Full Scale		40mm	300mm
Repeatability		10μm	75μm
Linearity Accuracy		±0.1% F.S.	±0.3% F.S.
Temperature Drift Characteristic		±0.08% F.S./°C	
Light Source	Dielectric	Red Diode Laser, Wavelength 655nm	
	Output Power	<1mW	
	Laser Class	IEC Class 2	
Beam Diameter		0.75x1.25mm	1.75x3.5mm
Analog Output		Analog Voltage: 0~10V; Analog Current: 4~20mA	
Output Action		Light.on (Light Entry Action) / Dark.on (Light Obstruction Action)	
Response Time		≤11.5ms	≤15.5ms
Operating Voltage		Analog Current: 12~24VDC (-5%, +10%);	
		Analog Voltage: 18~24VDC (-5%, +10%)	
Consumption (No Load) Current		<30mA (Analog Current Output), <60mA (Analog Voltage Output)	
Indicator Light (When Object Detected)		Distance less than center point: Orange;	
		Distance greater than center point: Green;	
		No object detected: Green	
Ambient Illumination		Incandescent Light ≤3000Lux; Sunlight ≤10000Lux	
Ambient Temperature		Operating: -10 ~40 ; Storage: -20 ~60 (No Freezing)	
Ambient Humidity		Operating: 35%~85% RH; Storage: 35%~85% RH (No Condensation)	
Protection Circuit		Reverse Polarity Protection/Surge Protection/Short Circuit Protection	
Protection Level		IP67 (IEC)	
Vibration Resistance		10~55Hz, Double Amplitude 1.0mm, X/Y/Z Directions Each 30 Minutes	
Shock Resistance		300m/S2, X/Y/Z Directions Each 3 Times	
Material	Surface	Aluminum Alloy	
	Lens	PMMA	
	Wire	PVC (Polyvinyl Chloride)	
Connection Method		2.6M Core Standard Wire, Customizable Length	
Packaging Weight		Approximately 250g (Including 2.6M Core Standard Wire)	

Dimensional Drawing (Unit:mm)

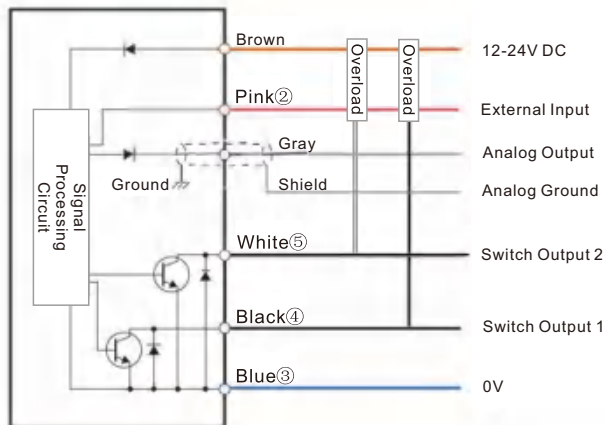


Wiring Diagram

【NPN+RS485】




【NPN+Analog】




Long Distance Series

Laser Displacement Sensors

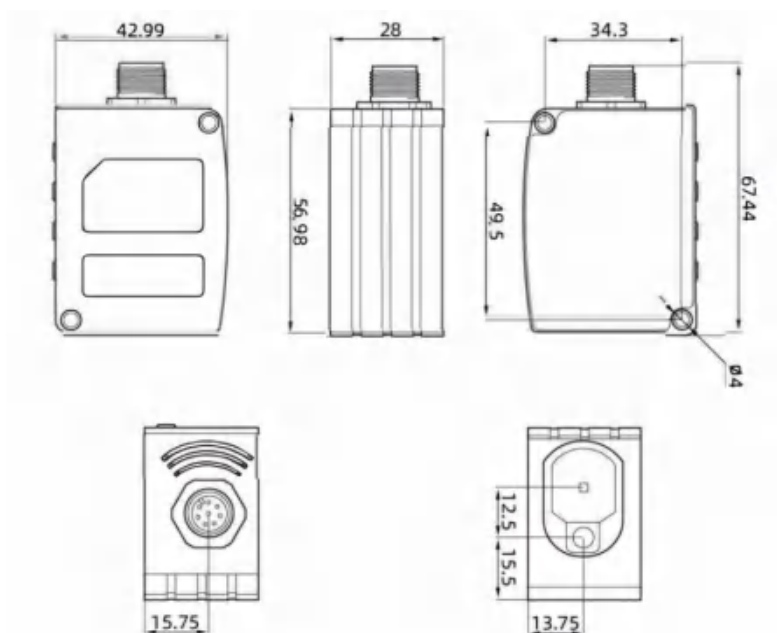
Technical Specifications

Model	NPN+Analog+485	LDS-100NM-485	LDS-200NM-485	LDS-500NM-485
	PNP+Analog+485	LDS-100PM-485	LDS-200PM-485	LDS-500PM-485
Appearance				
Measurement Range	0.1m-1m		0.1m-2m	0.1m-5m
Resolution	1mm			
Measurement Error	±(2mm+d*0.0001)★			
Laser Type	Red Diode Laser, Wavelength 655nm, ±10nm<1mW			
Power Supply Voltage	12V-24V DC±10% Ripple P-P10%			
Power Consumption	≤50mA@24V			
Control Output	NPN or PNP open-drain output			
	Open-drain collector transistor output			
	Maximum current: 50mA			
	External voltage: less than 30V DC			
	Residual voltage: less than 1.5V			
	Leakage current: less than 0.1mA			
Output Action	Can switch between normally open and normally closed			
Short Circuit Protection	Automatic recovery type			
Analog Voltage Output	Output range: 0-5V (Alarm: 5.2V)			
	Output impedance: 100 ohms			
Analog Current Output	Output range: 4-20mA (Alarm: 0mA)			
	Output impedance: Maximum 300 ohms			
Response Time	50-200ms			
External Input	NPN contact less input			
Protection Structure	IP67			
Operating Temperature	-10℃ -+45℃ (Note: No condensation or freezing)			
Storage Temperature	-20℃ -+60℃			
Operating Humidity	35%~85%RH			
Ambient Light	Incandescent light: Illumination below 3000 lux on the receiving surface			
Operating Altitude	Below 2000m			
Cable	With 8-core composite cable 2m			
Material	Aluminum			
Weight	Approximately 150g			
	★: Indicates measurement distance. In adverse environments, such as excessive sunlight, large temperature fluctuations, or dark reflective surfaces, there may be significant measurement errors. In such cases, using a target reflector can improve the effect.			

Technical Specifications

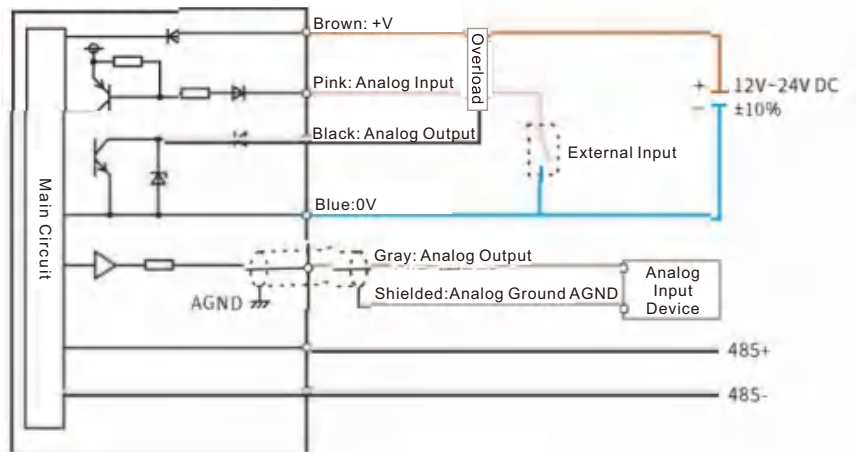
Model	NPN+Analog+485	LDS-10NM-485	LDS-20NM-485	LDS-50NM-485
	PNP+Analog+485	LDS-10PM-485	LDS-20PM-485	LDS-50PM-485
Appearance				
Measurement Range	0.1m-10m		0.1m-20m	0.1m-50m
Resolution	1mm			
Measurement Error	±(2mm+d*0.0001)★			
Laser Type	Red Diode Laser, Wavelength 655nm, ±10nm<1mW			
Power Supply Voltage	12V-24V DC±10% Ripple P-P10%			
Power Consumption	≤50mA@24V			
Control Output	NPN or PNP open-drain output			
	Open-drain collector transistor output			
	Maximum current: 50mA			
	External voltage: less than 30V DC			
	Residual voltage: less than 1.5V			
	Leakage current: less than 0.1mA			
Output Action	Can switch between normally open and normally closed			
Short Circuit Protection	Automatic recovery type			
Analog Voltage Output	Output range: 0-5V (Alarm: 5.2V)			
	Output impedance: 100 ohms			
Analog Current Output	Output range: 4-20mA (Alarm: 0mA)			
	Output impedance: Maximum 300 ohms			
Response Time	50-200ms			
External Input	NPN contactless input			
Protection Structure	IP67			
Operating Temperature	-10℃~+45℃ (Note: No condensation or freezing)			
Storage Temperature	-20℃~+60℃			
Operating Humidity	35%~85%RH			
Ambient Light	Incandescent light: Illumination below 3000 lux on the receiving surface			
Operating Altitude	Below 2000m			
Cable	With 8-core composite cable 2m			
Material	Aluminum			
Weight	Approximately 150g			
	★: Indicates measurement distance. In adverse environments, such as excessive sunlight, large temperature fluctuations, or dark reflective surfaces, there may be significant measurement errors. In such cases, using a target reflector can improve the effect.			

Dimensional Drawing (Unit:mm)

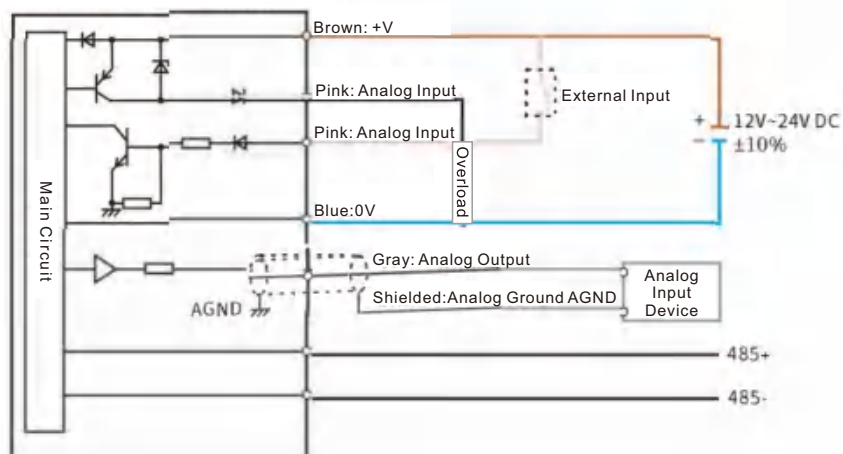


Wiring Diagram

【NPN+RS485+Analog】



【PNP+RS485+Analog】





Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
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Sensore di settore



Contrast Sensors

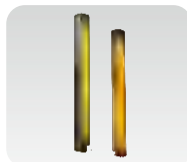
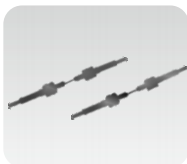
Sensori di contrasto

Quality Management & Consultancy



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会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Contrast Sensors Contents

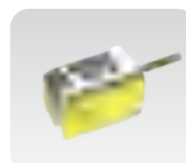
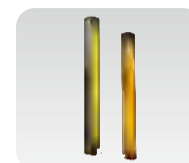
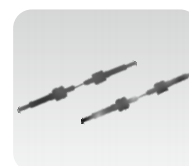
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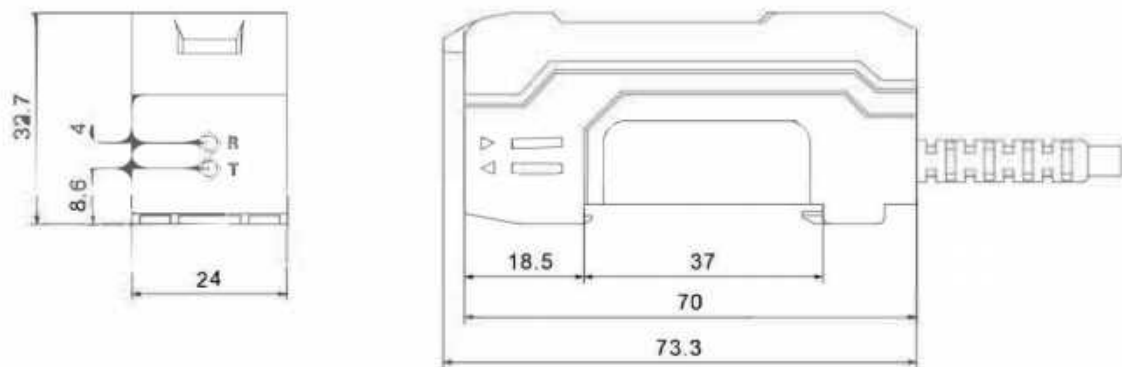
1.1 The Four-Colour Detection Series

Contrast Sensors

Technical Specifications

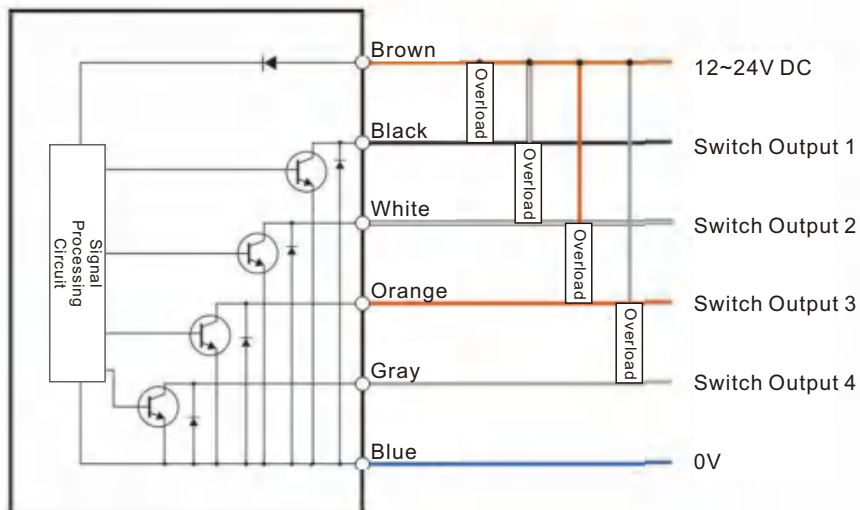
Model	CS-801	CS-801P
Appearance		
Operating Voltage	DC 12~24V \pm 10%	
Consumption (No Load) Current	\leq 20mA	
Detection Distance	18~28mm	
Light Source	RGB Three Colours, 4-element Light Emitting Diodes	
Detection Mode	Switchable between Colour Mode and Colour Mark Mode	
Response Time	<130 μ s	
Response Frequency	1000Hz	
Output Mode	NPN Open Collector,	PNP Open Collector,
	4-channel Output	4-channel Output
Maximum Input Current	100mA	
Residual Voltage	<1.0V	
Switching Mode	L.on (Light Action) / D.on (Dark Action) Switchable	
Ambient Illumination	Incandescent Light \leq 3000Lux; Sunlight \leq 10000Lux	
Ambient Temperature	Operating: -10°C~55°C; Storage: -25°C~70°C, No Freezing	
Ambient Humidity	Operating: 35%~85% RH; Storage: 35%~95% RH, No Condensation	
Protective Circuit	Reverse Polarity Protection / Surge Protection / Short Circuit Protection	
Protection Level	Ip65	
Connection Method	Wire Lead Type (6 Cores, Standard Length 2 Meters)	
Housing Material	PBT	
Vibration Resistance	10~55Hz, Double Amplitude 1.0mm, X/Y/Z Directions Each for 30 Minutes	
Impact Resistance	300m/S ² , X/Y/Z Directions Each for 3 Times	

Dimensional Drawing (Unit:mm)

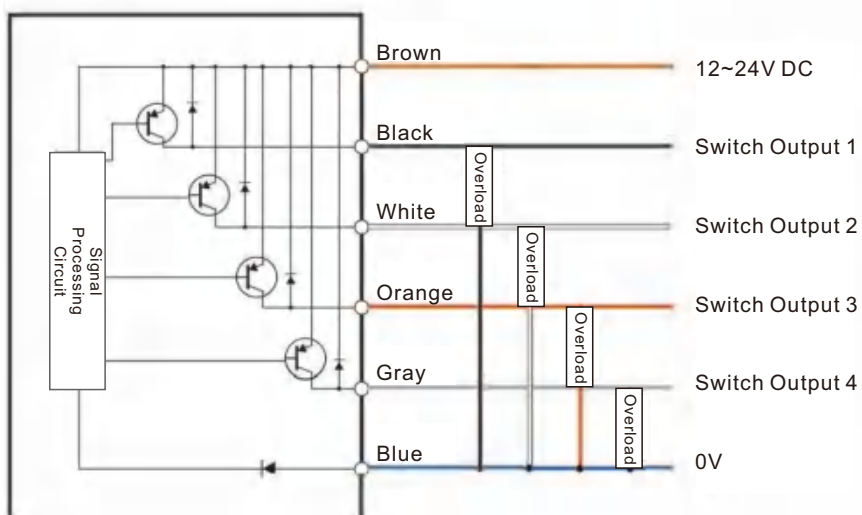


Wiring Diagram

【 NPN 】



【 PNP 】



White Light Colour Contrast Sensor Series

CS-W70N



Warning ⚠

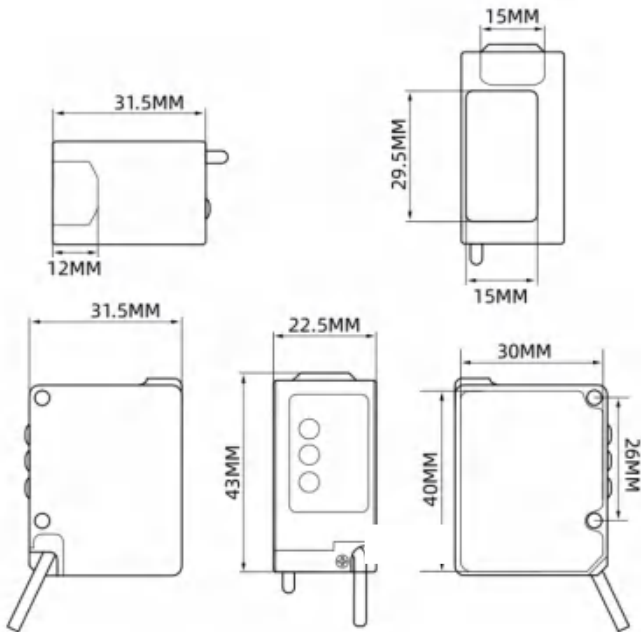
1. This product uses a visible semiconductor laser as its light source. It is forbidden to allow the laser beam to enter the eyes directly or indirectly from reflective objects. If the laser beam enters the eyes, it may cause the risk of blindness.
2. This product is not equipped with an explosion-proof structure. It is forbidden to use in environments with flammable or explosive gases or liquids.
3. Do not disassemble or modify this product, as it is not designed to automatically shut off the laser emission when the body is opened. Unauthorized disassembly or modification by the client may result in personal injury, fire, or electric shock hazards.
4. Using controls, adjustments, or operational steps not specified here may result in dangerous radiation leakage.

Attention ⚠

1. To ensure your safety, please strictly follow the following regulations when using:
 1. This product is for object detection only. Do not use this product for the purpose of protecting the human body or body parts.
 2. This product should not be used as an explosion-proof product. Do not use this product in hazardous locations or environments with potential explosive gases.
 3. This product is a DC power sensor. Do not use AC power. Otherwise, it may cause the product to explode or catch fire.
 4. Do not wire the amplifier along power lines or high-voltage lines; otherwise, the sensor may malfunction or be damaged due to noise.
 5. When using a commercial switch-mode power supply, ensure that the frame ground terminal and the ground terminal are grounded.
 6. Do not use in outdoor locations or where external light can directly enter the light-receiving surface.

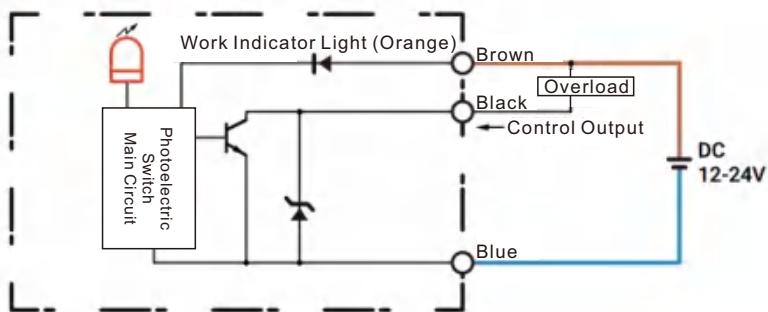
⚠ This product cannot be used as a safety device to protect the human body.

Dimensional Drawing

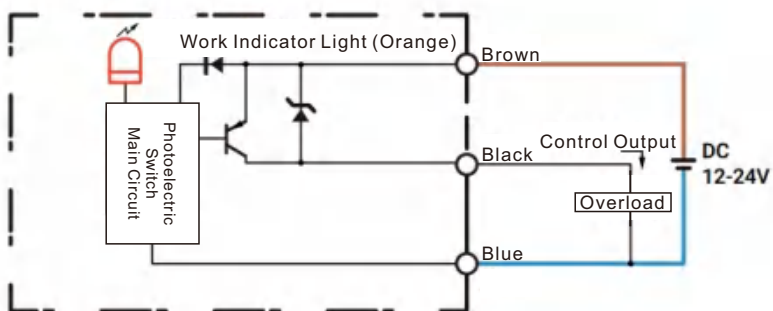


Circuit Diagram

CS-W70N NPN Model



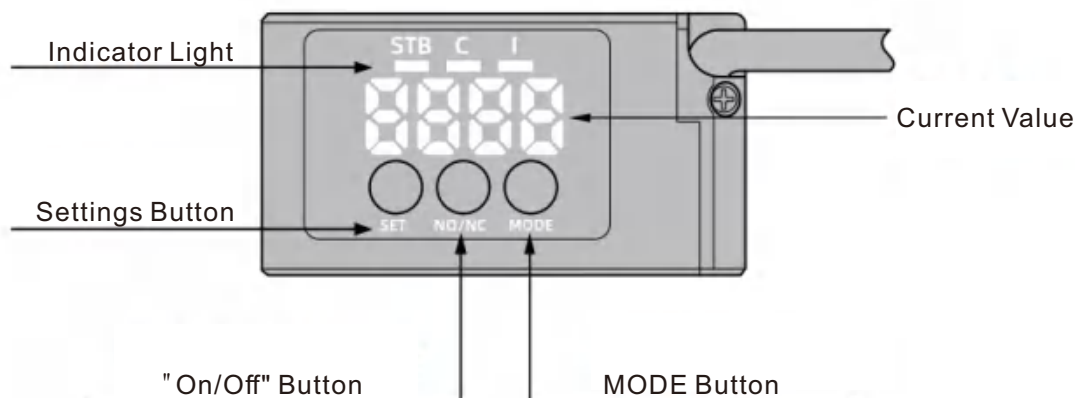
CS-W70NP PNP Model



Specifications

Model	CS-W70N	CS-W70NP
	NPN Output	PNP Output
Output Type	1 output port, 1 external output port with wire lead out, external self-learning with white line	
Control Output	1 output port, equipped with short-circuit protection, equipped with automatic anti-interference function	
Light Source	2 white light LEDs, minimum spot size at 50MM is 1.5*3MM	
Response Time	AUTO, C and CI mode 200US, MARK mode is 160US	
Output Selection	LIGHT-ON/DARK-ON (selectable via button menu)	
Display Indicator	Operation indicator light: red LED, LED screen display	
Detection Method	AUTO, C and CI mode and MARK mode, Detection distance: 20MM-150MM long distance	
Delay Function	Disconnection delay timer/activation delay timer/single shot timer/ activation delay single shot timer, Selectable. The timer display can choose a duration of 1ms to 9999ms	
Control Output	NPN/PNP open collector 24V, maximum 100mA (limited to main unit), maximum consumption current 40mA (when expansion unit is connected, residual voltage: 2V)	
Power Supply	Between 12 and 24VDC $\pm 10\%$, ripple ratio (P-P): maximum 10% grade 2	
Operating Environment Brightness	Incandescent light: maximum 20,000 lux, daylight: maximum 30,000 lux	
Power Consumption	Maximum voltage: 24V, current within 60MA	
Vibration Resistance	10 to 55Hz, double amplitude: 1.5mm, X, Y, Z axes are 2 hours each	
Ambient Temperature	-10 to +55°C, no freezing	

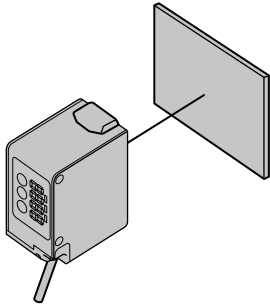
Circuit Diagram



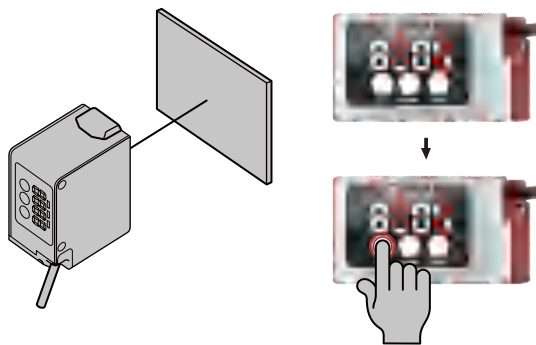
Product Function Settings

A. Sensitivity Adjustment

When the function is set to A1, the differential mode is selected. Self-learning is not performed by pressing the SET button, but by manually adjusting the threshold value.

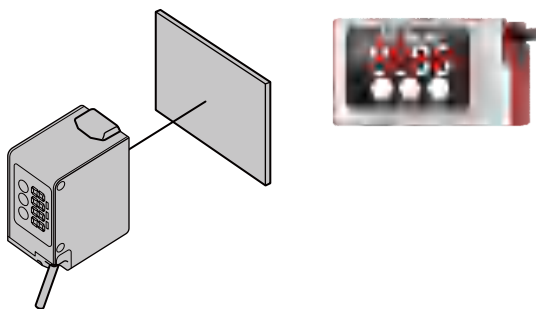


When A2 mode is selected, self-learning is completed by pressing the SET button once for 3 seconds. In 1SP mode, self-learning can be performed as follows:



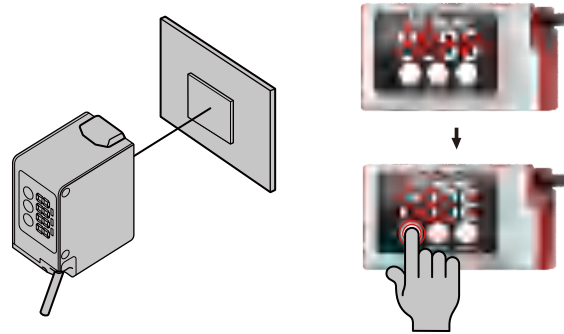
B. Two-Point Calibration in Mark Condition

In MARK mode, the STB light among the STB, C, and I indicator lights will be lit, while the C and I lights will be off. This indicates that the operating mode is in the MARK Colour mark status.

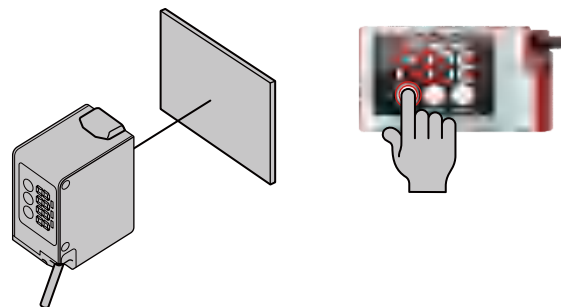


Step 1: Align the cursor with the Colour mark that needs to be detected and press the SET button.

The display will flash the word SET1.



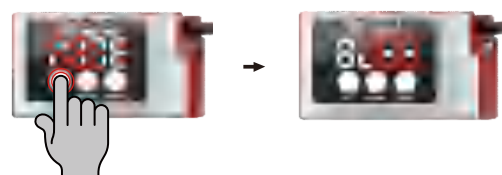
Step 2: Move the cursor to the background and press the SET button. The sensor will then automatically select the appropriate receiving channel (R, G, or B channel) and remember the threshold value. The display will alternately show the threshold value and the received channel. If R is displayed, it means the red channel is selected; if G is displayed, the green channel is selected; if B is displayed, the blue channel is selected.



C. Two-Point Calibration in C and CI Colour Modes:

Directly align the cursor with the Colour mark that needs to be detected and press the SET button. The display will show the word SET1. Then, aim the light spot at the background and press the SET button again. The sensor will determine the threshold value and display it. The default threshold value is 900.

When the working mode is set to CI, the STB, C, and I indicator lights will all light up. If the working mode is set to C mode, only the STB and C lights will be on, and the I light will not light up.

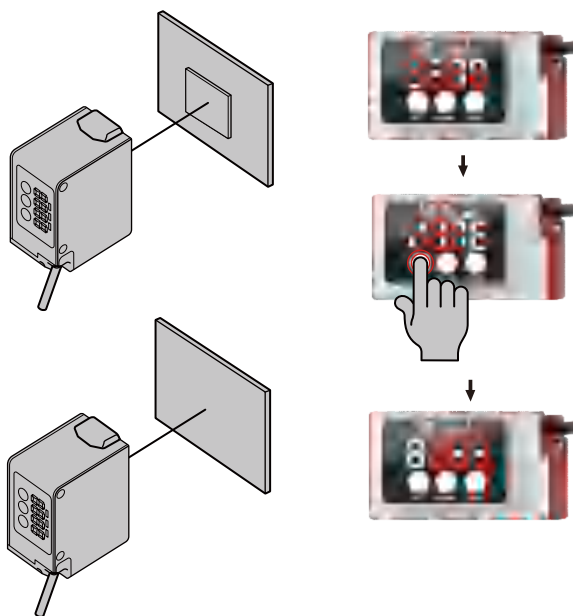


D. Two-Point Calibration in AUTO Colour Mode

Align the cursor directly with the Colour mark that needs to be detected and press the SET button. The display will show the word SET1. Then, aim the light spot at the background and press the SET button again. The sensor will determine the threshold value and display it. The default threshold value is 800. During self-learning in AUTO mode, the sensor will automatically choose between C mode or CI mode.

When the Colour difference between the object and the background is significant, the sensor will choose C mode. When the Colour difference is not significant, the sensor will choose CI mode.

If the working mode is set to CI, the STB, C, and I indicator lights will all light up. If the working mode is set to C mode, only the STB and C lights will be on, and the I light will not light up.



E. Additional Self-Learning During Self-Learning (ADD Function)

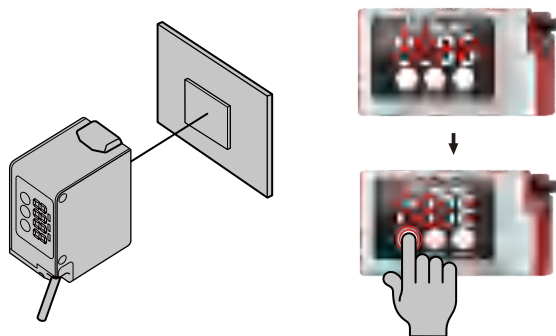
In AUTO, C, or CI mode, press the SET button, and the display will show the word SET1. Then, press and hold the SET button again, and the display will alternately show SET and ADD. At this point, by dragging the object, the sensor will automatically learn all the Colour states of the object.

In the ADD function, the sensor selects CI. The threshold value defaults to 700, 800, or 900. This data is selected in the menu THRD.

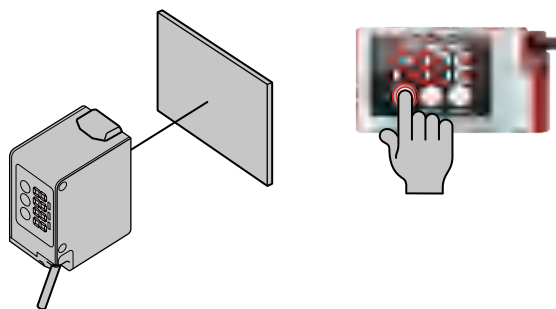
The ADD self-learning function is very effective for objects that are particularly reflective and bright, such as in lithium batteries or photovoltaic applications.

Step 1: Align the cursor with the Colour mark that needs to be detected and press the SET button.

The display will flash the word SET1.



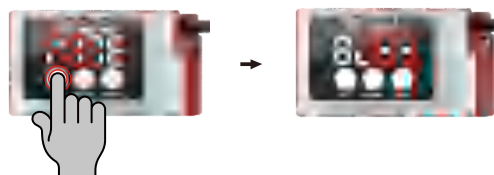
Step 2: Move the cursor to the background and press the SET button. The sensor will then automatically select the appropriate receiving channel (R, G, or B channel) and remember the threshold value. The display will alternately show the threshold value and the received channel. If R is displayed, it means the red channel is selected; if G is displayed, the green channel is selected; if B is displayed, the blue channel is selected.

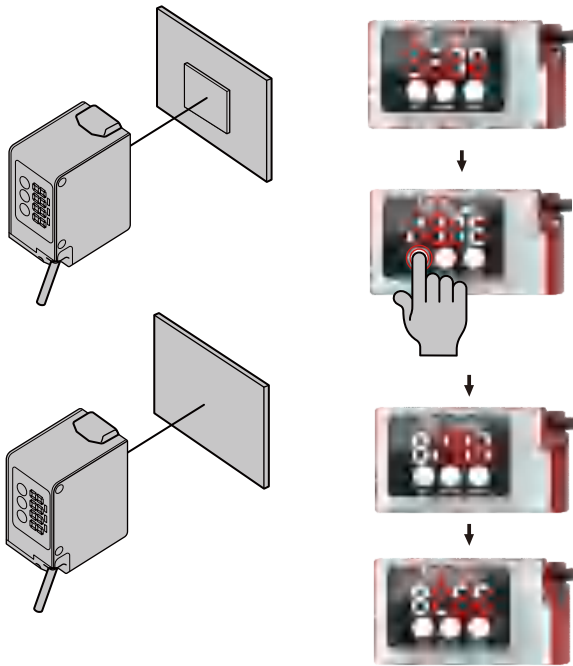


C. Two-Point Calibration in C and CI Colour Modes:

Directly align the cursor with the Colour mark that needs to be detected and press the SET button. The display will show the word SET1. Then, aim the light spot at the background and press the SET button again. The sensor will determine the threshold value and display it. The default threshold value is 900.

When the working mode is set to CI, the STB, C, and I indicator lights will all light up. If the working mode is set to C mode, only the STB and C lights will be on, and the I light will not light up.





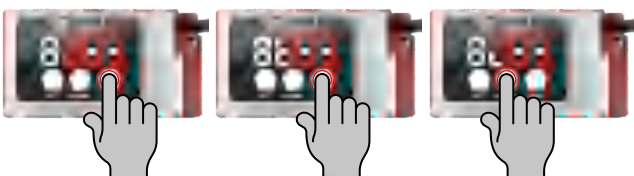
F. Select LIGHT ON Normally Open or Normally Closed DARK ON

Press the NO/NC button for 3 seconds, and the display will show LION or D ON. At this point, pressing the NO/NC or MODE button briefly will toggle the setting.



G. Adjust Threshold Value Function:

Press the MODE button or NO/NC button briefly, and the threshold value will flash on the display. Press the MODE button to decrease the threshold value, and press the NO/NC button to increase the threshold value.

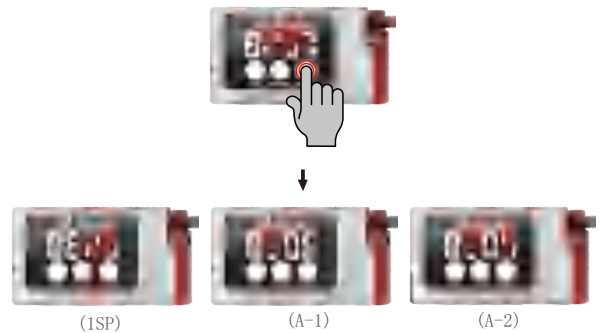


Function Setting Parameter Menu

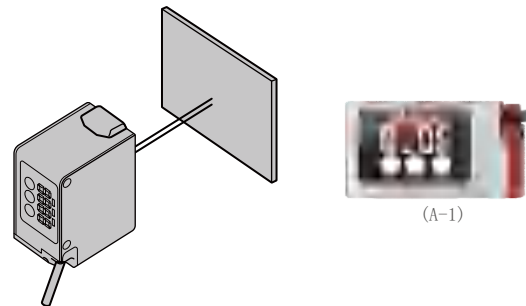
The software initially operates in display mode. When FNC is set to AUTO, C, or CI:

Press the MODE button for 3 seconds to enter the following process:

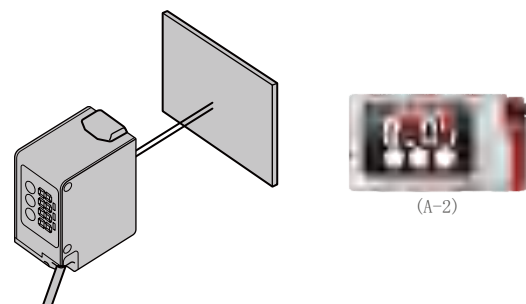
The SPT menu is for selecting the number of light-emitting LEDs, with three options: 1SP, A-1, and A-2. These can be confirmed by pressing the MODE or NO/NC buttons. The default is 1SP mode, which represents a single light spot.



A-1 indicates the emission of two light spots, based on the differential mode, representing the difference between two detected Colours. If the difference is greater than or equal to the threshold value, the output is ON. The default threshold value is 200, which can be manually adjusted.

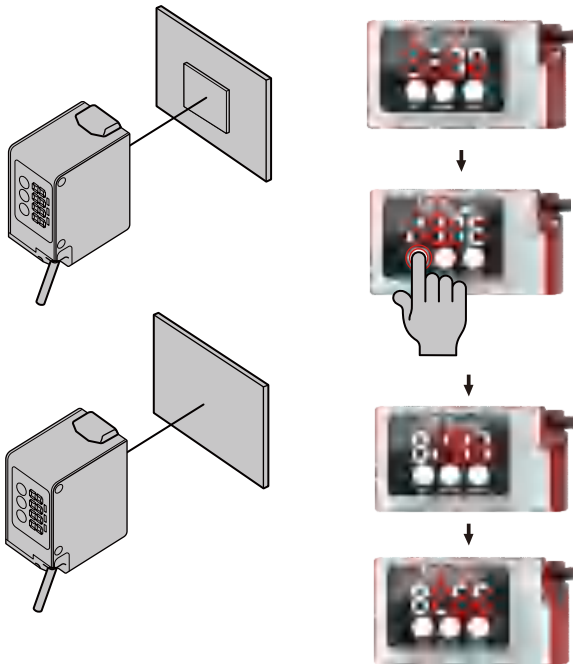


A-2 also emits two light spots, based on the matching mode, where the two spots compare with the Colours learned during self-learning. If the Colours are the same or similar, the output is ON. The default threshold value is 950, which can be manually adjusted.



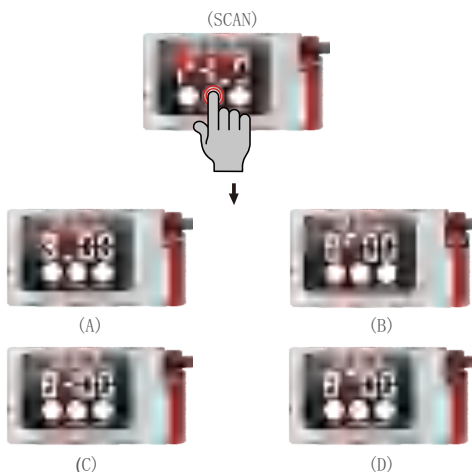
SPD is an abbreviation for SPEED, which refers to the response time. In SPD mode, pressing NO/NC briefly cycles the response time through HSP1, 10, 100, and 500.

HSP stands for 160US response time, where 1, 10, 100, and 500 represent milliseconds (MS). Pressing MODE briefly confirms the response time and returns to the SPD menu. The default is 10MS. If the object is highly reflective, it is best to set the time to 100 or 500MS.



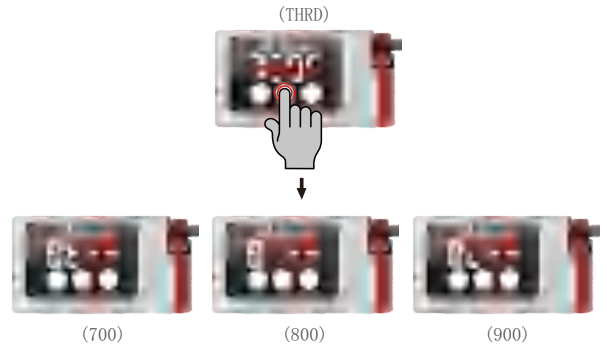
SCAN indicates the scanning cycle. The sensor has four cycles: A, B, C, and D. When multiple sensors are used close to each other, they may interfere with each other. In this case, changing the SCAN cycle to A, B, C, or D will prevent interference. The default is A.

The scanning cycles of A, B, C, and D progressively increase, and so does the response time.



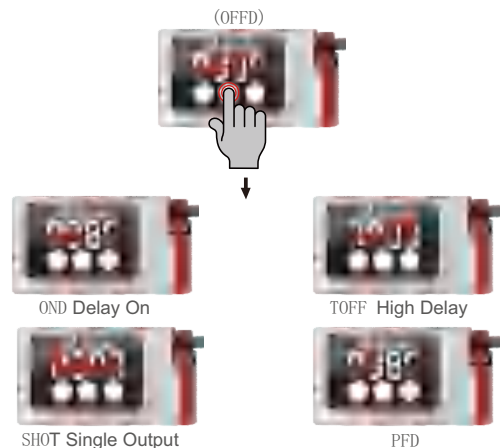
Entering Delay Mode TOFF

The THRD menu is for setting the threshold values for ADD additional self-learning, which are 700, 800, and 900. The default is 800. You can also press the NO/NC button to toggle between 700, 800, and 900.

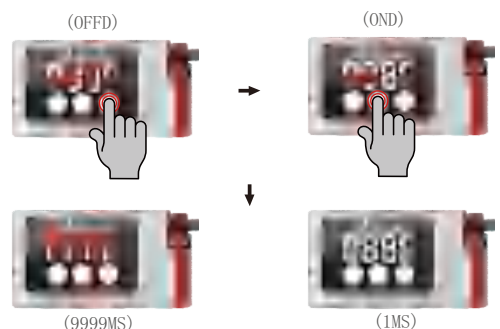


Entering Timer Mode OFFD

In the OFFD menu, under the THRD menu, press the NO/NC button to cycle through TOFF, OFD, OND, and SHOT.

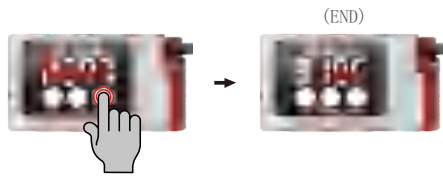


Press the MODE button briefly to enter the OND delay time menu. Press the NO/NC button to increase the delay time to 9999MS, then it will jump to 1MS. Press the MODE button to confirm the delay time.



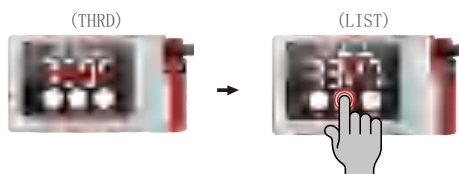
Display END

To return to the display menu mode from any of the above menus, press and hold the MODE button for 3 seconds to return to the END menu and enter the display menu.

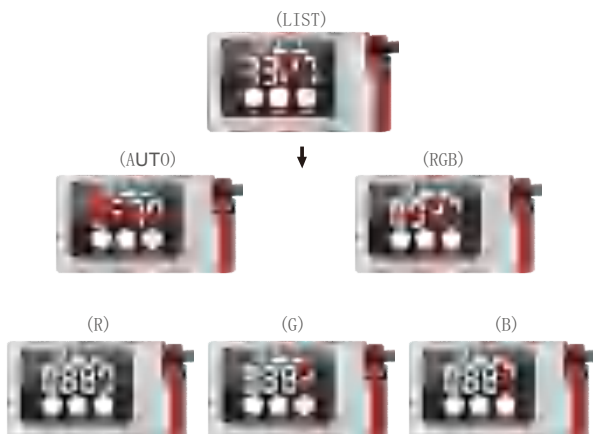


MARK Mode

When the user selects the MARK mode, the THRD menu will be replaced by the LIST menu. In the LIST menu, press the NO/NC button briefly to enter the next level menu.



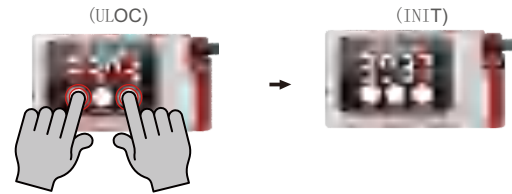
The LIST menu includes five options: AUTO, RGB, R, G, B. AUTO means that under MARK, the sensor automatically selects one of R, G, or B during self-learning. If the RGB menu is selected, the sensor selects all three RGB channels during self-learning.



If R, G, or B channel is selected, the sensor will choose R, G, or B as specified during self-learning, and the sensor will not automatically select the channel. When the operator is experienced, choosing RGB or R or G or B will be very convenient. The default is AUTO.

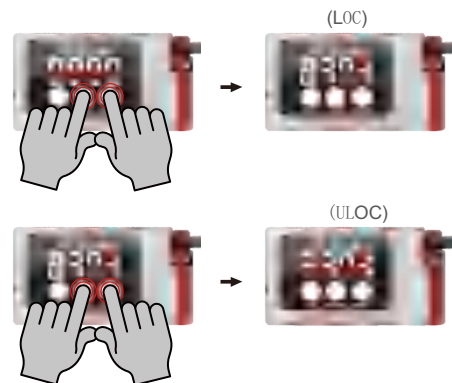
Initialization Settings

In display mode, press MODE + SET for three seconds, the screen will show INIT, indicating a return to factory default settings



Using the Keyboard Lock Function to Disable All Key Functions

Press and hold MODE + NO/NC buttons for more than 3 seconds, the screen will display LOC, at which point all buttons are locked. Press and hold MODE + NO/NC buttons again for more than 3 seconds to unlock the buttons, and the screen will display ULOC.



White Light Colour Contrast Sensors Series

CS-W50N



Warning ⚠

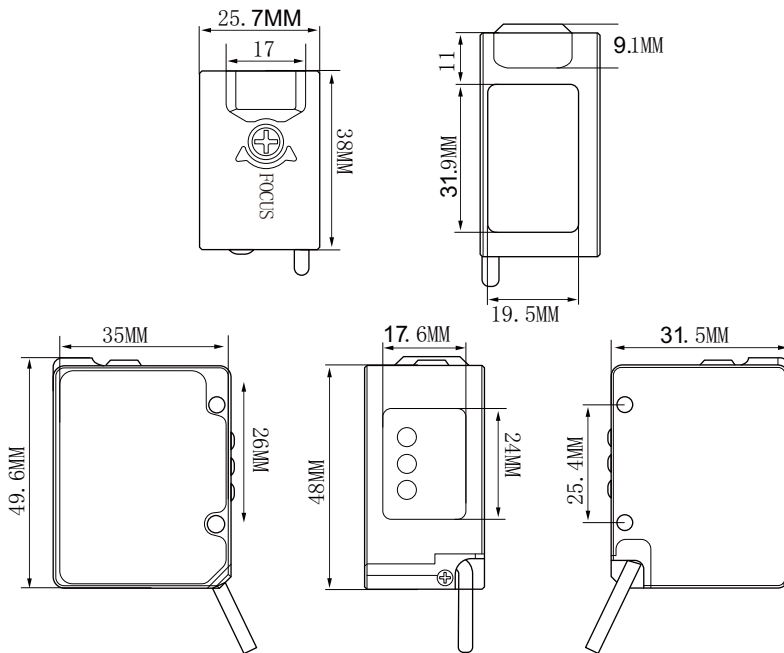
1. This product uses a visible semiconductor laser as its light source. It is forbidden to allow the laser beam to enter the eyes directly or indirectly from reflective objects. If the laser beam enters the eyes, it may cause the risk of blindness.
2. This product is not equipped with an explosion-proof structure. It is forbidden to use in environments with flammable or explosive gases or liquids.
3. Do not disassemble or modify this product, as it is not designed to automatically shut off the laser emission when the body is opened. Unauthorized disassembly or modification by the client may result in personal injury, fire, or electric shock hazards.
4. Using controls, adjustments, or operational steps not specified here may result in dangerous radiation leakage.

Attention ⚠

1. To ensure your safety, please strictly follow the following regulations when using:
 1. This product is for object detection only. Do not use this product for the purpose of protecting the human body or body parts.
 2. This product should not be used as an explosion-proof product. Do not use this product in hazardous locations or environments with potential explosive gases.
 3. This product is a DC power sensor. Do not use AC power. Otherwise, it may cause the product to explode or catch fire.
 4. Do not wire the amplifier along power lines or high-voltage lines; otherwise, the sensor may malfunction or be damaged due to noise.
 5. When using a commercial switch-mode power supply, ensure that the frame ground terminal and the ground terminal are grounded.
 6. Do not use in outdoor locations or where external light can directly enter the light-receiving surface.

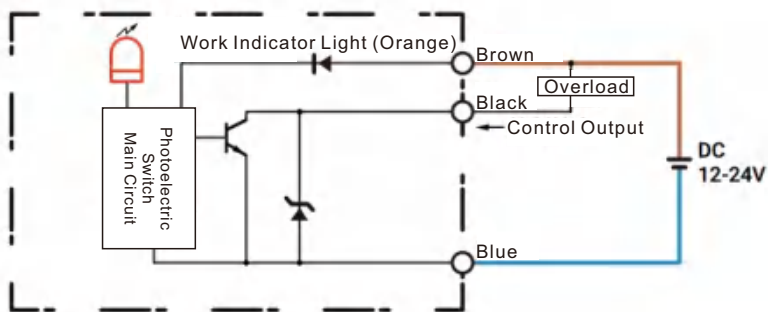
⚠ This product cannot be used as a safety device to protect the human body.

Dimensional Drawing

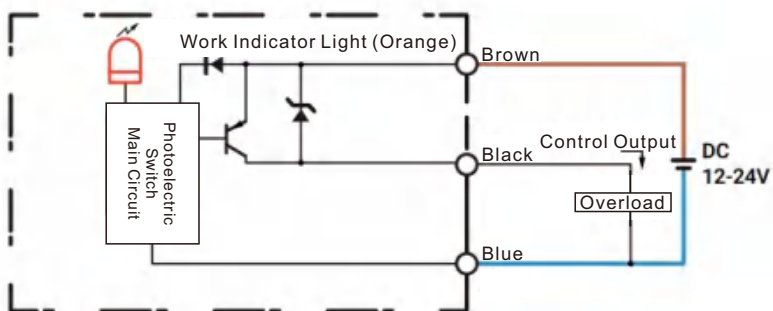


Circuit Diagram

CS-W50N NPN Model



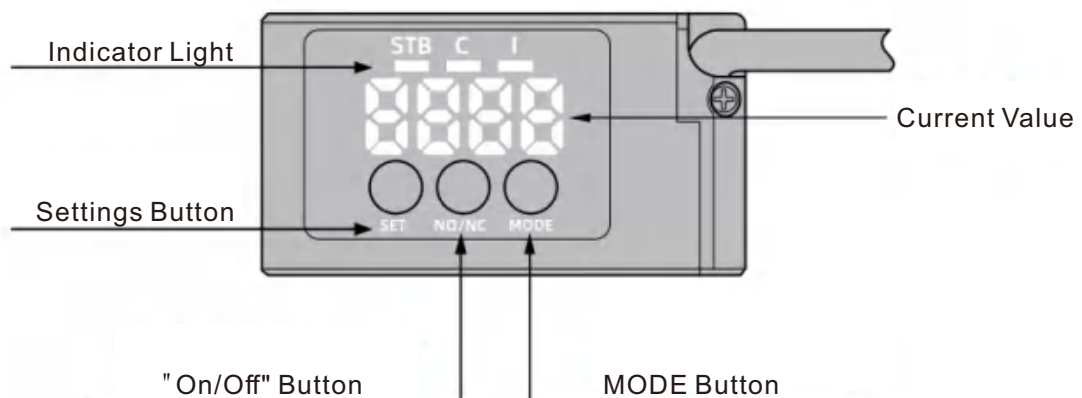
CS-W50NP PNP Model



Specifications

Model	CS-W50N	CS-W50NP
	NPN Output	PNP Output
Output Type	1 output port,	
	1 external output port with wire lead out,	
Control Output	1 output port, equipped with short-circuit protection,	
	equipped with automatic anti-interference function	
Light Source	White light LED, adjustable spot size, minimum spot diameter 3.6MM	
Response Time	AUTO, C and CI mode 200US, MARK mode is 160US	
Output Selection	LIGHT-ON/DARK-ON (selectable via button menu)	
Display Indicator	Operation indicator light: red LED, LED screen display	
Detection Method	AUTO, C and CI mode and MARK mode,	
	Detection distance: 30MM-500MM long distance	
Delay Function	Disconnection delay timer/activation delay timer/single shot timer,	
	Selectable,	
	The timer display can choose a duration of 1ms to 9999ms	
Control Output	NPN/PNP open collector 24V, maximum 100mA (limited to main unit),	
	maximum consumption current 40mA	
	(when expansion unit is connected, residual voltage: 2V)	
Power Supply	Between 12 and 24VDC $\pm 10\%$, ripple ratio (P-P): maximum 10% grade 2	
Operating Environment Brightness	Incandescent light: maximum 20,000 lux, daylight: maximum 30,000 lux	
Power Consumption	Maximum voltage: 24V, current within 60MA	
Vibration Resistance	10 to 55Hz, double amplitude: 1.5mm, X, Y, Z axes are 2 hours each	
Ambient Temperature	-10 to +55°C, no freezing	

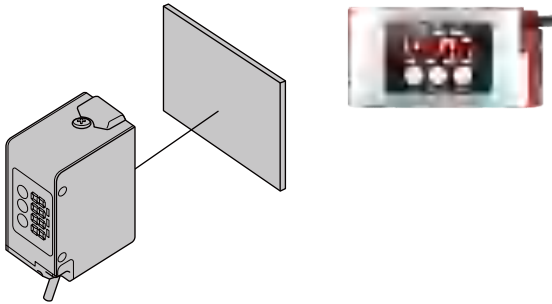
Circuit Diagram



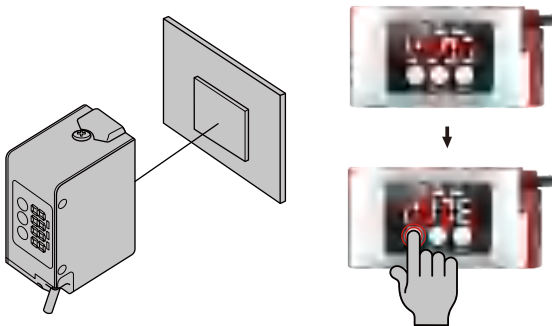
Product Function Settings

A Two-Point Calibration in Mark Condition:

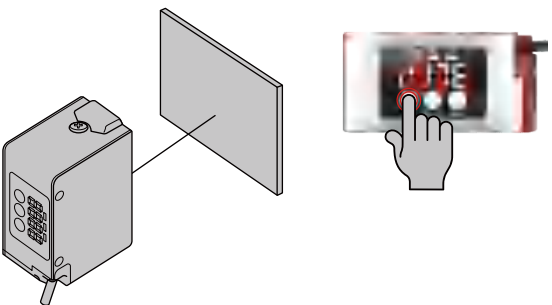
In MARK mode, the STB light among the STB, C, and I indicator lights will be lit, while the C and I lights will be off. This indicates that the operating mode is in the MARK Colour mark state.



Step 1: Align the cursor with the Colour mark that needs to be detected and press the SET button. The display will flash the word SET1.



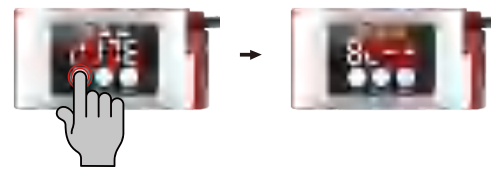
Step 2: Move the cursor to the background and press the SET button. The sensor will then automatically select the appropriate receiving channel (R or G or B channel), and remember the threshold value. The display will alternately show the threshold value and the received channel. If R is displayed, it means the red channel is selected; if G is displayed, the green channel is selected; if B is displayed, the blue channel is selected.



B Two-Point Calibration in C and CI Colour Modes

Align the cursor directly with the Colour mark that needs to be detected and press the SET button. The display will show the word SET1. Then, aim the light spot at the background and press the SET button again. The sensor will determine the threshold value and display it. The default threshold value is 900.

When the working mode is set to CI, the STB, C, and I indicator lights will all light up. If the working mode is set to C mode, only the STB and C lights will be on, and the I light will not light up.

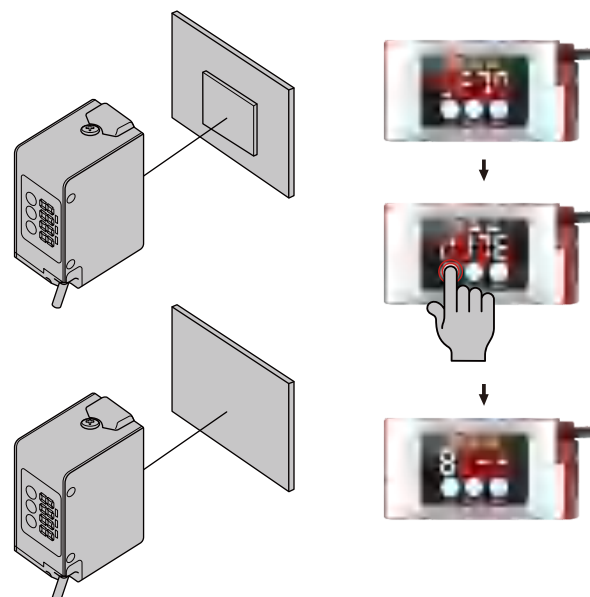


C Two-Point Calibration in AUTO Colour Mode

Align the cursor directly with the Colour mark that needs to be detected and press the SET button. The display will show the word SET1. Then, aim the light spot at the background and press the SET button again. The sensor will determine the threshold value and display it. The default threshold value is 800. During self-learning in AUTO mode, the sensor will automatically choose between C mode or CI mode.

When the Colour difference between the object and the background is significant, the sensor will choose C mode. When the Colour difference is not significant, the sensor will choose CI mode.

If the working mode is set to CI, the STB, C, and I indicator lights will all light up. If the working mode is set to C mode, only the STB and C lights will be on, and the I light will not light up.

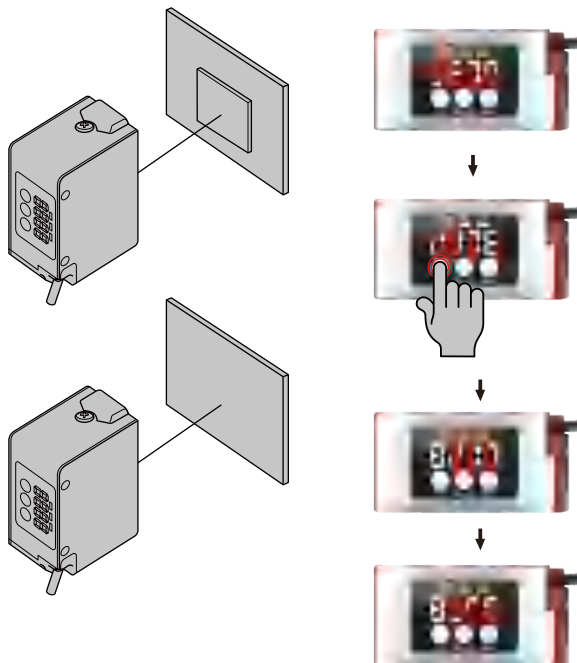


D Additional Self-Learning During Self-Learning (ADD Function)

In AUTO, C, or CI modes, press the SET button, and the display will show SET1. Then, press and hold the SET button again, and the display will alternately show SET and ADD. At this point, by dragging the object, the sensor will automatically learn all the Colour states of the object.

In the ADD function, the sensor selects CI. The threshold value defaults to 700, 800, or 900. This data is selected in the menu THRD.

The ADD self-learning function is very effective for objects that are particularly reflective and bright, such as in lithium batteries or photovoltaic applications.



E Select LIGHT ON Normally Open or Normally Closed DARK ON

Press the NO/NC button for 3 seconds, and the display will show LION or D ON. At this point, pressing the NO/NC or MODE button briefly will toggle the setting.



F Adjust Threshold Value Function

Press the MODE or NO/NC button briefly, and the threshold value will flash on the display. Press the MODE button to decrease the threshold value, and press the NO/NC button to increase the threshold value.



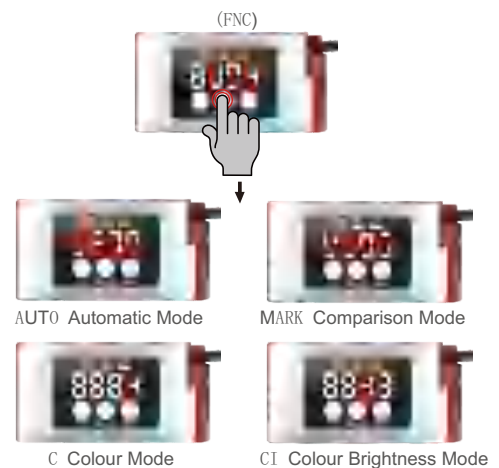
Function Setting Parameter Menu

The software initially operates in display mode. When FNC is set to AUTO, C, or CI:

The software initially operates in display mode. When FNC is set to AUTO, C, or CI:

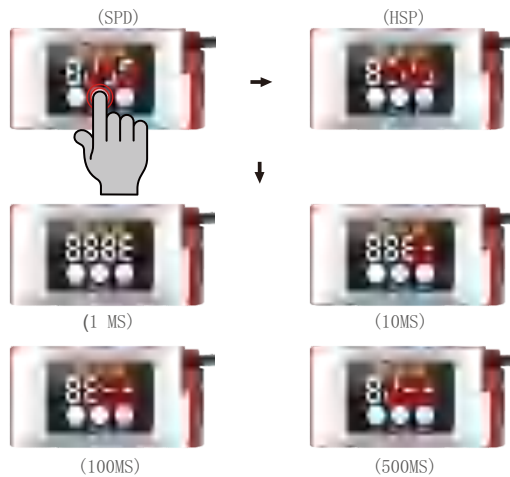
Press the MODE button for 3 seconds to enter the following process:

FNC is the function menu; pressing NO/NC briefly cycles through CI, AUTO, C, and MARK modes. Pressing the MODE button briefly confirms the current function menu and returns to display the FNC menu. The default is AUTO function.



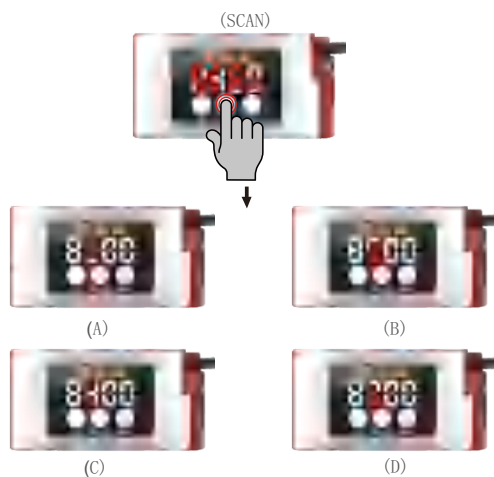
SPD is an abbreviation for SPEED, which refers to the response time. In SPD mode, pressing NO/NC briefly cycles the response time through HSP1, 10, 100, and 500.

HSP stands for 160US response time, where 1, 10, 100, and 500 represent milliseconds (MS). Pressing MODE briefly confirms the response time and returns to the SPD menu. The default is 10MS. If the object is highly reflective, it is best to set the time to 100 or 500MS.



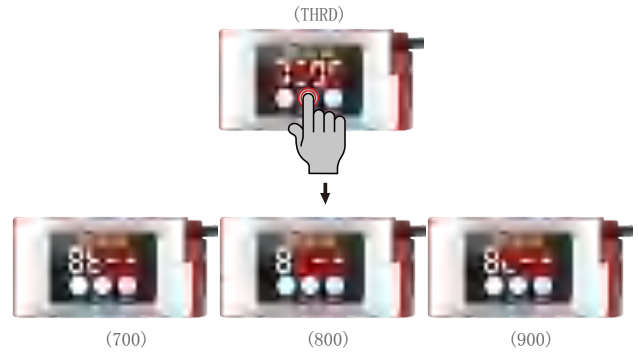
SCAN indicates the scanning cycle. The sensor has four cycles: A, B, C, and D. When multiple sensors are used close to each other, they may interfere with each other. In this case, changing the SCAN cycle to A, B, C, or D will prevent interference. The default is A.

The scanning cycles of A, B, C, and D progressively increase, and so does the response time.



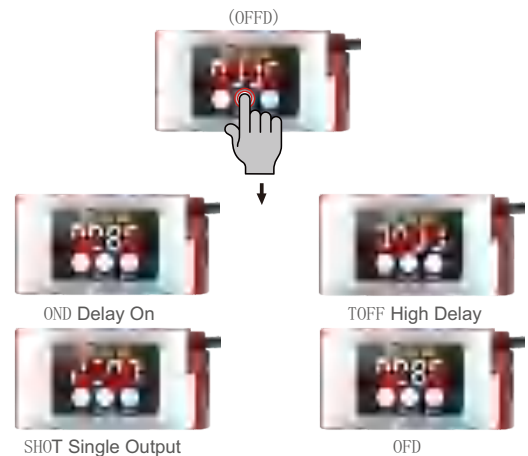
Entering Delay Mode TOFF

The THRD menu is for setting the threshold values for ADD additional self-learning, which are 700, 800, and 900. The default is 800. You can also press the NO/NC button to switch between 700, 800, and 900.

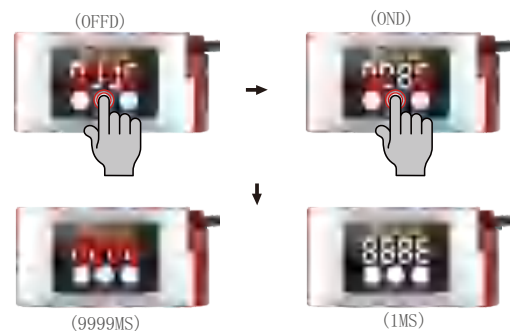


Entering Timer Mode OFFD

In the OFFD menu, under the THRD menu, press the NO/NC button to cycle through TOFF, OFFD, OND, and SHOT.

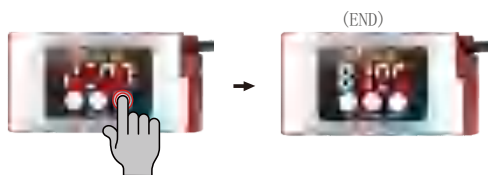


Press the MODE button briefly to enter the OND delay time menu. Press the NO/NC button to increase the delay time to 9999MS, then it will jump to 1MS. Press the MODE button to confirm the delay time.



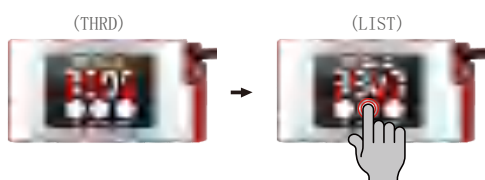
Display END

To return to the display menu mode from any of the above menus, press and hold the MODE button for 3 seconds to return to the END menu and enter the display menu.



MARK Mode

When the user selects the MARK mode, the THRD menu will be replaced by the LIST menu. In the LIST menu, press the NO/NC button briefly to enter the next level menu.

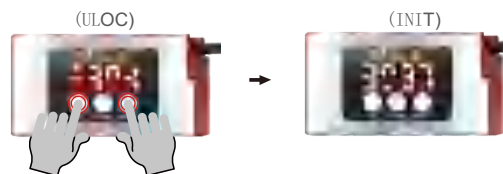


The LIST menu includes five options: AUTO, RGB, R, G, B. AUTO means that under MARK, the sensor automatically selects one of R, G, or B during self-learning. If the RGB menu is selected, the sensor selects all three RGB channels during self-learning.



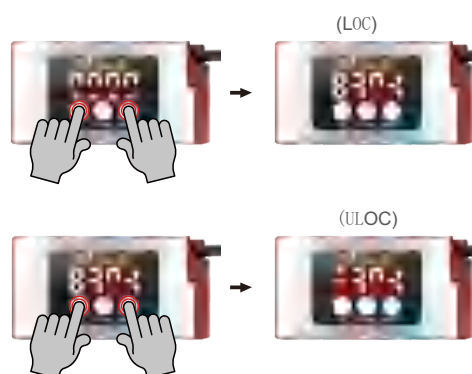
Initialization Settings

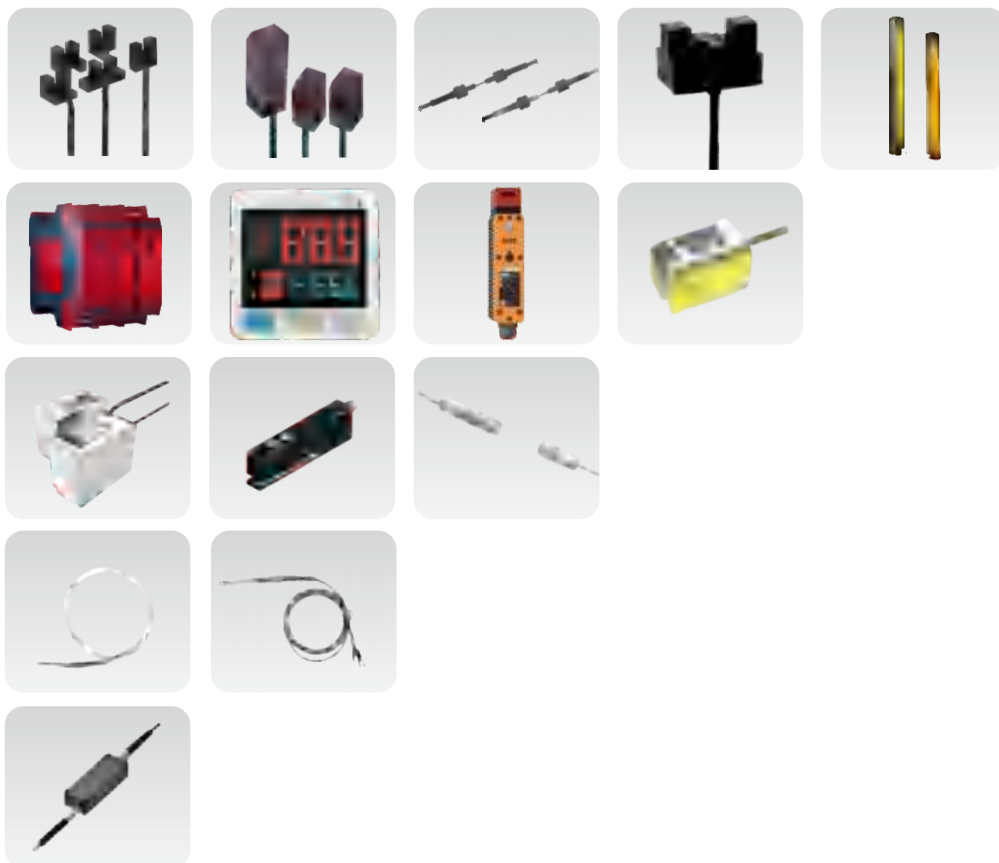
In display mode, press MODE + SET for three seconds, the screen will show INIT, indicating a return to factory default settings.



Using the Keyboard Lock Function to Disable All Key Functions

Press and hold MODE + NO/NC buttons for more than 3 seconds, the screen will display LOC, at which point all buttons are locked. Press and hold MODE + NO/NC buttons again for more than 3 seconds to unlock the buttons, and the screen will display ULOC.





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Sensore di settore



Ultrasonic Sensors

Sensori a ultrasuoni



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Ultrasonic Sensors Contents

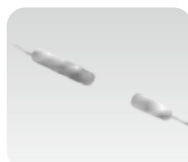
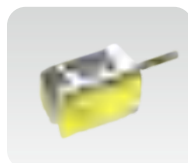
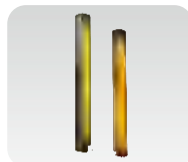
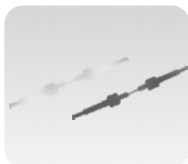
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Transparent Object Detection Series

Ultrasonic Sensors

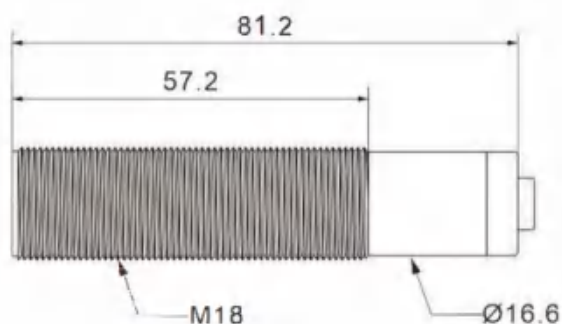
Technical Specifications

Model	U18-100N	U18-100P
Appearance		
Detection Range	60-1000mm	
Adjustment Range	60-1000mm	
Blind Zone	0-60mm	
Resolution	0.4mm	
Repeatability	±0.1% F.S	
Temperature Effect	±0.9% F.S /°C (Internal Temperature Compensation)	
Standard Detection Board	100×100mm Plate	
Angle	±7°	
Probe Frequency	~200KHz	
Response Delay	<100ms	
Output Mode	NPN	PNP
Operating Voltage	DC 12~30V ±10%	
No Load Current	≤15mA	
Ambient Temperature	Operating: -20°C~70°C; Storage: -40°C~85°C, No Freezing	
Ambient Humidity	35%~85% R.H No Freezing	
Protective Circuit	Polarity Reverse Protection/Surge Protection/Short Circuit Protection	
Shell Material	Copper Plated with Nickel	
Indicator Lamp	Output Time Lamp	
Product Net Weight	45g	
Protection Level	Ip67	
Connection Method	M12 4-pin Connector	

Technical Specifications

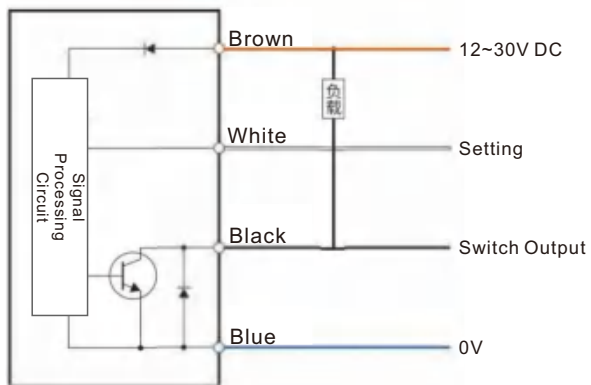
Model	U18-100V5	U18-100V10	U18-100A
Appearance			
Detection Range	60-1000mm		
Adjustment Range	60-1000mm		
Blind Zone	0-60mm		
Resolution	0.4mm		
Repeatability	±0.1% F.S		
Temperature Effect	±0.9% F.S /°C (Internal Temperature Compensation)		
Standard Detection Board	100×100mm Plate		
Angle	±7°		
Probe Frequency	~200KHz		
Response Delay	<100ms		
Output Mode	Analog Voltage 0~5V	Analog Voltage 0~10V	Analog Current 4~20mA
Operating Voltage	DC 12~30V ±10%		
No Load Current	≤15mA		
Ambient Temperature	Operating: -20°C~70°C; Storage: -40°C~85°C, No Freezing		
Ambient Humidity	35%~85% R.H No Freezing		
Protective Circuit	Polarity Reverse Protection/Surge Protection/Short Circuit Protection		
Shell Material	Copper Plated with Nickel		
Indicator Lamp	Output Time Lamp		
Product Net Weight	45g		
Protection Level	Ip67		
Connection Method	M12 4-pin Connector		

Dimensional Drawing (Unit:mm)

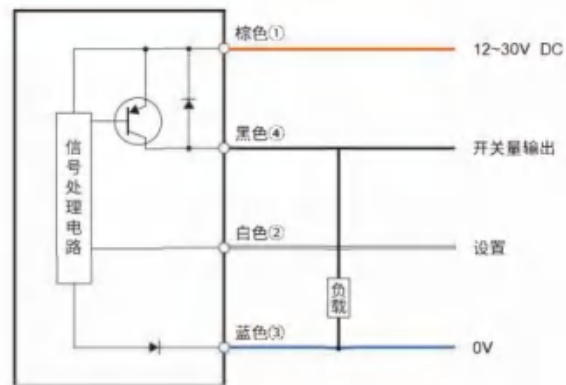


Wiring Diagram

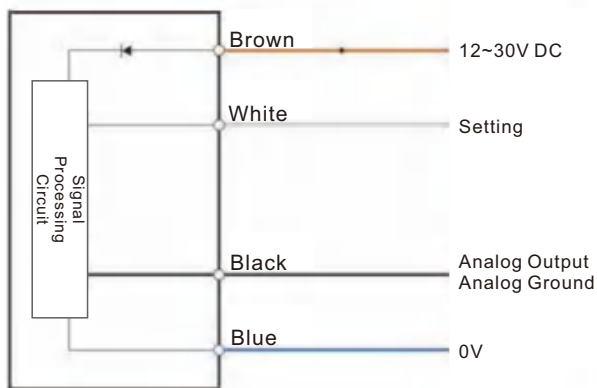
【 NPN 】



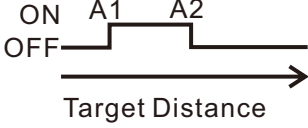
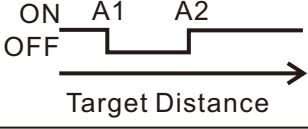
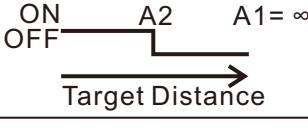
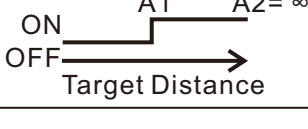

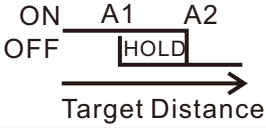
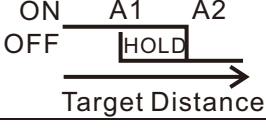
【 PNP 】



【Analog Output】




	NPN	PNP	NPN Latching	PNP Latching	4-20 mA	0-5 V	0-10 V
<p>Analog Output vs Target Distance (A1 to A2)</p>					Supported	Supported	Supported
<p>Analog Output vs Target Distance (A2 to A1)</p>					Supported	Supported	Supported

Working Mode	Output Mode	NPN	PNP	NPN Latching	PNP Latching	4-20 mA	0-5 V	0-10 V
Window Mode, Always On A1 < A2 		Supported	Supported					
Window Mode, Always Off A1 > A2 		Supported	Supported					
Single Point Mode, Always On A1 set to ∞, A2 set to normal 		Supported	Supported					
Single Point Mode, Always Off A1 set to normal, A2 set to ∞ 		Supported	Supported					
Object Presence Mode A1 set to ∞, A2 set to ∞ ON: A1 = ∞ A2 = ∞ Detected OFF: Not detected 		Supported	Supported					
Latching Mode, Always On A1 < A2 				Supported	Supported			
Latching Mode, Always Off A1 > A2 				Supported	Supported			

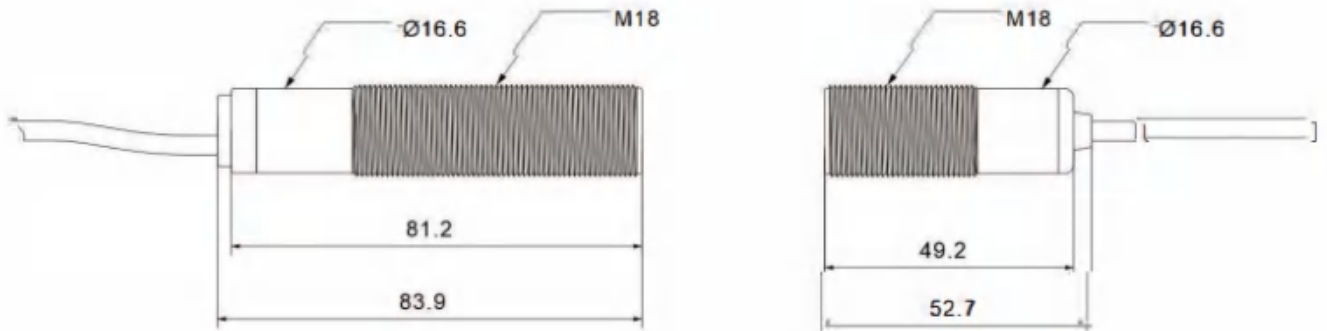
Doublesheet Detection Series

Ultrasonic Sensors

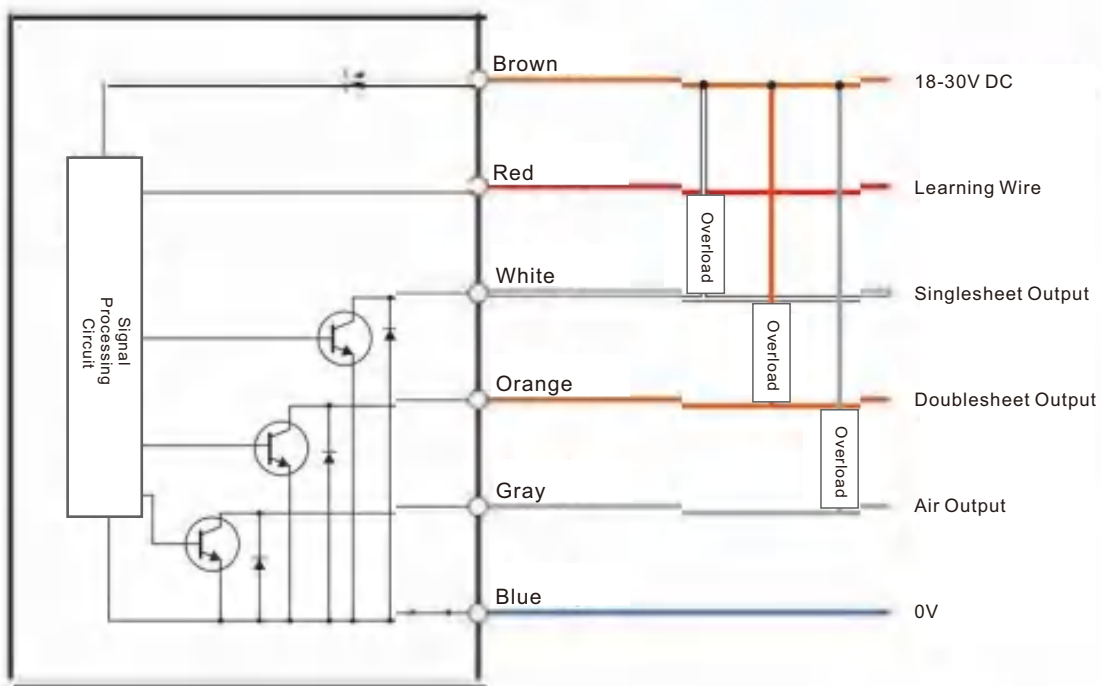
Technical Specifications

Model	U18-06N	U18-06P
Appearance		
Detection Range	20-60 mm, Optimal Distance: 45 mm	
Refresh Rate	1 ms	
Detection Material	Suitable for detecting non-, single or multi-layered materials	
Pulse Width	<100 ms	
Probe Frequency	200 KHz	
Response Time	<15 ms	
Calibration Method	Built-in Calibration Mode	
Output Mode	NPN Common Emitter Open Collector,	PNP Common Emitter Open Collector,
	Three Independent Outputs	Three Independent Outputs
Operating Voltage	DC 18-30V±10%	
No-load Current	≤10 mA	
Voltage Drop	<3V	
Power Consumption	≤550 mW	
Resistance	≥60 kΩ	
Ambient Temperature	Operating: -20°C to 70°C; Storage: -40°C to 85°C, No Condensation	
Ambient Humidity	35% to 85% RH, No Condensation	
Protective Circuit	Reverse Polarity Protection / Overvoltage Protection / Short Circuit Protection	
Shell Material	Copper Plated	
Indicator Light	Yellow: No Object (Air);	
	Green: Detected Single Sheet;	
	Red: Detected Double Sheets	
Net Weight	170 g	
Protection Level	Ip67	
Connection Method	Wire Lead Type (6 Core, Standard Length 2m)	

Dimensional Drawing (Unit:mm)



Wiring Diagram



Sensore di settore



Label Sensors

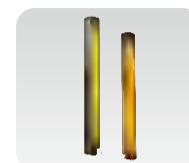
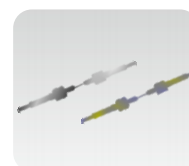
Sensori di etichetta

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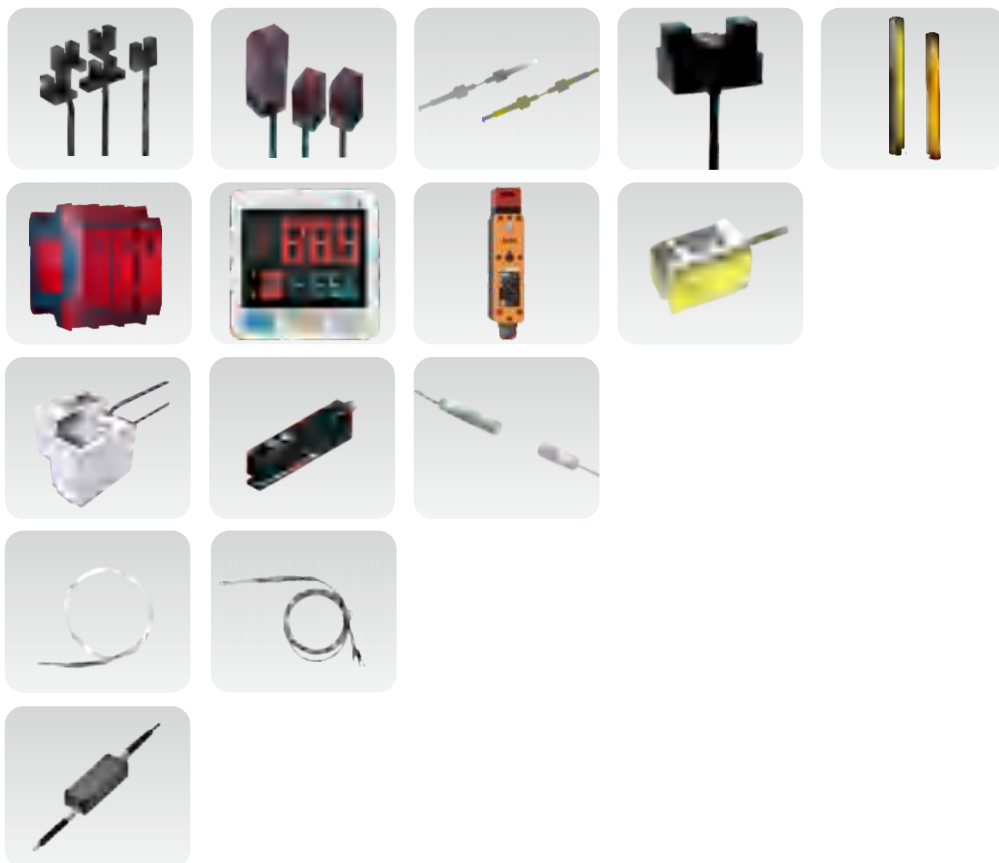
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会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



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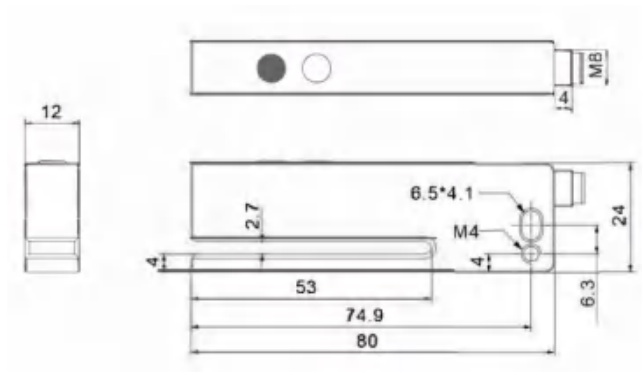
Website: <http://www.nipponkodobearings.com>

Label Sensors

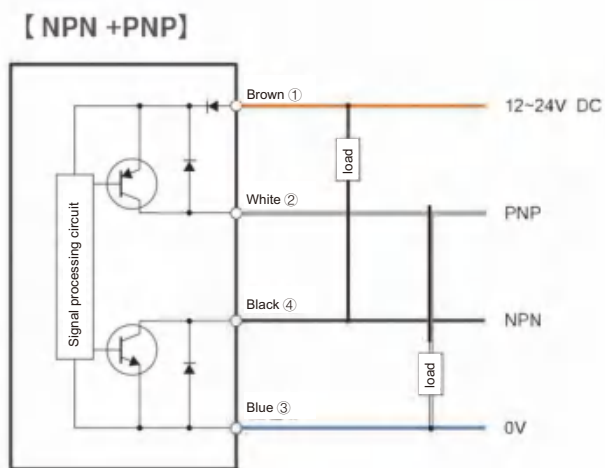
Specifications

Model	LS-100NP-MS
Appearance	
Mounting Method	Photoelectric beam
Slot Width	2.7mm
Slot Depth	53mm
Window Size	3mm non-transparent label
Standard Detection Object	3mm non-transparent body
Repeatability	±0.5mm
Sensitivity Adjustment	Button learning, plus key fine-tuning
Output Mode	NPN and PNP dual simultaneous outputs
Switch Mode	Light.on (light action) / Dark.on (dark action) switchable
Response Time	<100μs
Response Frequency	1000Hz
Light Source	940nm visible red light
Operating Voltage	DC12~24V±10%
Residual Voltage (Drop)	<1.5V (Load Current 100mA, Wire 2M)
Maximum Load Current	100mA
Consumption (No Load) Current	<20mA
Ambient Temperature	Operating: -10~55°C; Storage: -25~70°C, no freezing
Ambient Humidity	Operating: 35%~85%RH; Storage: 35%~95%RH, no condensation
Protective Circuit	Reverse polarity protection/Surge protection/Short circuit protection
Protection Level	Ip65
Indicator Light	Red: Function indicator, Green: Output indicator
Connection Method	M8, 4-pin connector
Housing	Aluminum alloy + anodized
Vibration Resistance	10~55Hz, double amplitude 1.0mm, X/Y/Z directions for 30 minutes each
Shock Resistance	300m/S2, X/Y/Z directions for 3 times each

Outer Dimension Diagram (Unit:mm)



Circuit Wiring Diagram



LS Series

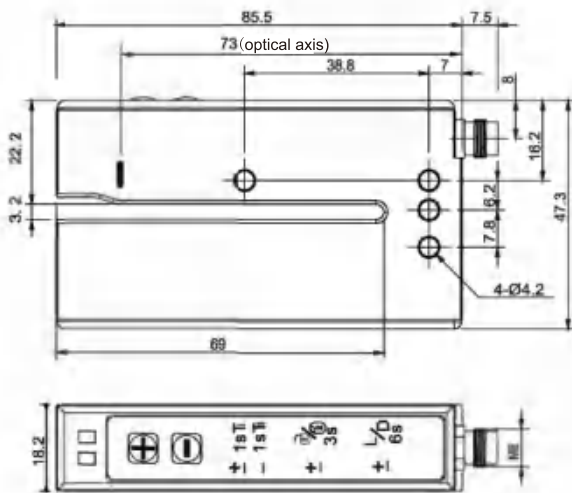
Label Detection Type

Specifications

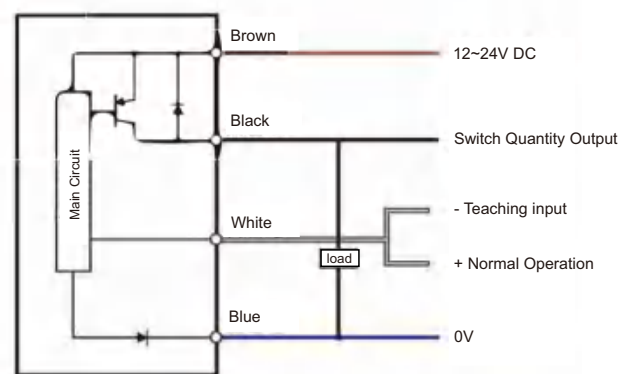
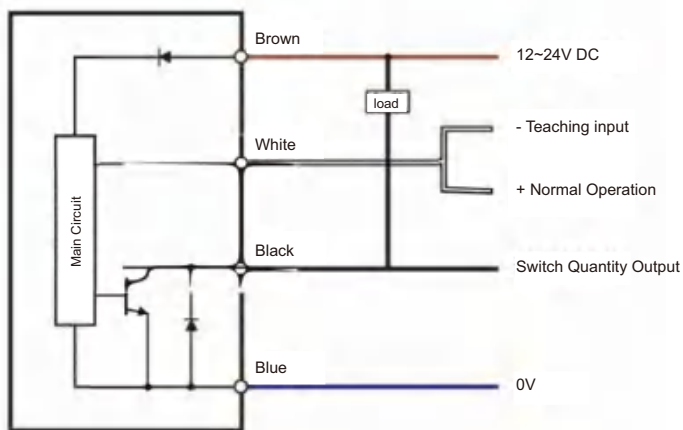


Appearance		
Model	NPN	PNP
	LS08-0307N	LS08-0307P
Detection Distance	3mm	
Minimum Label Length	2mm	
Minimum Label Gap	2mm	
Slot Depth	69mm	
Slot Width	3mm	
Emitter	Ultrasonic	
Maximum Detection Speed	180m/min	
Repeatability	±0.20mm (120m/min)	
Switch Mode	L.on (Light on action) / D.on (Dark on action) switchable	
Operating Voltage	12~24V DC±10%	
No-Load Current	45mA	
Load Current	100mA	
Residual Voltage	<2V@1L=100 mA	
Response Frequency	1500Hz	
Response Time	300μs	
Protective Circuit	Output short circuit protection, interference suppression	
Operating Temperature	-5°C ~+55°C	
Storage Temperature	-20°C ~+70°C	
Protection Rating	Ip65	
Housing Material	Aluminum	
Wiring Method	M8 4-pin plug	
Weight	130g	

Dimensional Specifications



Circuit Diagram



Sensore di settore



Heat Sensors

Sensori Termici



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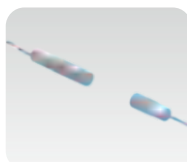
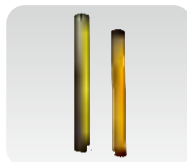
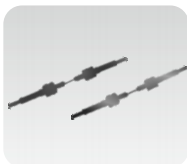
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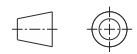
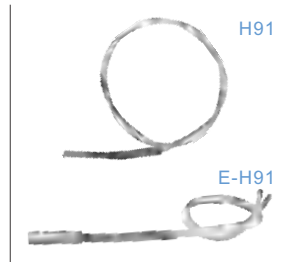
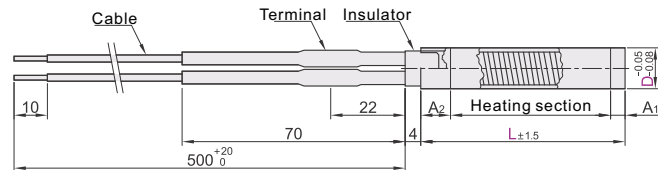
General Purpose

Code	Type		Material				
			Sheath	Heating wire	Lead wire	Cable	Insulating Powder
H91	General Purpose	Standard Type	SUS321	Ni80Cr20	Pure Nickel Heat-resistant Wire	Ni-GB	MgO
E-H91		Economical Type			Copper Plated with Nickel		

Precautions

- The maximum operating temperature is the temperature of the armored tube section, and the maximum temperature resistant for the wire is 200°C. The wire must be led out from the installation hole;
- Do not expose the heating tube to burn in the air with the heated object;
- For use at temperatures below 500°C.

Not suitable for use on moving equipment, customization is required.



Perspective Standard: First Perspective

Standard Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length
Code	D					
H91	5	30	40	220	A=A ₁ +A ₂ 30≤L≤60吋 A ₁ =5mm, A ₂ =5mm 60<L≤150吋 A ₁ =7mm, A ₂ =10mm	L-A
		40	40			
		50	50			
		60	100			
		80	150			
	6	30	50			
		40	80			
		50	100			
		60	130			
		80	100			
	6.25	60	50			
		100	120			
		30	60			
		50	100			
		80	150			
	8	100	200			
		30	60			
		50	100			
		80	150			
		100	350			
	10	50	120			
		100	400			
		100	300			
		150	500			
	12					

Other lengths can be customized

Economical Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length
Code	D					
E-H91	5	30	40	220	A=A ₁ +A ₂ A ₁ =7 A ₂ =8	L-A
		40	60			
		50	50			
		60	100			
		80	150			
	6	30	50			
		40	80			
		50	100			
		60	130			
		80	100			
	6.25	60	50			
		100	120			
		30	60			
		50	100			
		80	150			
	8	100	200			
		30	60			
		50	100			
		80	150			
		100	350			
	10	50	120			
		100	400			
		100	300			
		150	500			
	12					

Other lengths can be customized

Model		L	Rated power W ±5%	Rated voltage V ±5%
Code	D			
H91	8	50	150	220
		100	200	

H91 - D8 - L50 - W150 - V220

Heat Sensors

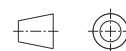
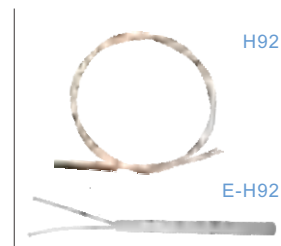
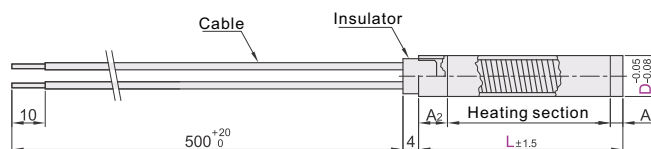
Internal Lead-out Type

Code	Type		Material				
			Sheath	Heating wire	Lead wire	Cable	Insulating Powder
H92	Internal Lead-out	Standard Type	SUS321	Ni80Cr20	Pure Nickel Heat-resistant Wire	Ni-GB	MgO
E-H92	Type	Economical Type			Pure Nickel		

Precautions

- The maximum operating temperature is the temperature of the armored tube section, and the maximum temperature resistance for the wire is 200°C. The wire must be led out from the installation hole;
- Do not expose the heating tube to burn in the air with the heated object;
- For use at temperatures below 500°C, with an economical type suitable for temperatures up to 400°C.

[1] Suitable for use on moving equipment.



Perspective Standard: First Perspective

Standard Type

Model		L	Rated power W $\pm 5\%$	Rated voltage V $\pm 5\%$	Cold end length A	Heating section length
Code	D					
H92	8	60	100	220	$A = A_1 + A_2$ $L = 60$ 吋 $A_1 = 5$ mm, $A_2 = 5$ mm $60 < L \leq 150$ 吋 $A_1 = 7$ mm, $A_2 = 10$ mm	L-A
		80	120			
		100	150			
		150	200			
	10	300	350			
		60	120			
		80	150			
		100	180			
	12	200	250			
		300	300			
		450	450			
		60	100			
	12	80	150			
		100	250			
		300	300			
		150	500			

[1] Other lengths can be customized

Economical Type

Model		L	Rated power W $\pm 5\%$	Rated voltage V $\pm 5\%$	Cold end length A	Heating section length
Code	D					
E-H92	8	60	100	220	$A = A_1 + A_2$ $A_1 = 7$ $A_2 = 8$	L-A
		80	120			
		100	150			
		150	200			
	10	300	350			
		60	120			
		80	150			
		100	180			
	12	200	250			
		300	300			
		450	450			
		60	100			
	12	80	150			
		100	250			
		300	300			
		150	500			

[1] Other lengths can be customized

Model		L	Rated power W $\pm 5\%$	Rated voltage V $\pm 5\%$
Code	D			
H92	8	80	150	220
		100	200	


H92 - D8 - L80 - W150 - V220

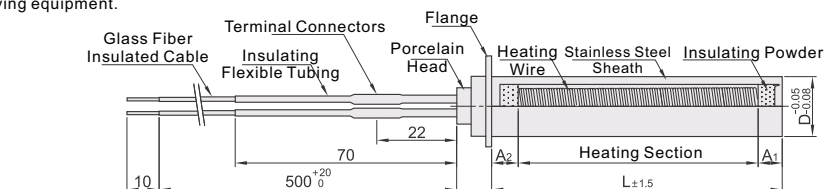
Heat Sensors

Flange Fixed Type

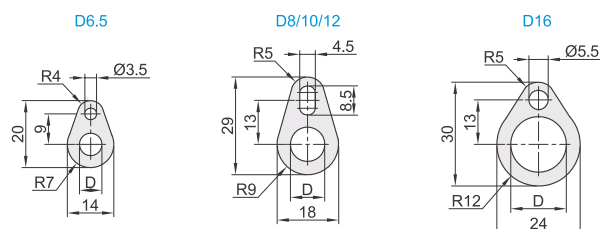
Code	Type		Material					
			Sheath	Flange	Heating wire	Lead wire	Cable	Insulating Powder
H93	Flange Fixed	Standard Type	SUS321	SUS304	Ni80Cr20	Pure Nickel Heat-resistant Wire	Ni-GB	MgO
E-H93	Type	Economical Type				Copper Plated with Nickel		

- The maximum operating temperature is the temperature of the armored tube section, and the maximum temperature resistance for the wire is 200°C. The wire must be led out from the installation hole;
 - Do not expose the heating tube to burn in the air with the heated object;
 - For use at temperatures below 500°C.

 Suitable for use on moving equipment.



☐ Flange Size



Perspective Standard: First Perspective

☒ Standard Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length	
Code	D						
H93	6.5	50	110	220	A=A ₁ +A ₂ L=50吋 A ₁ =5mm, A ₂ =5mm 100≤L≤200吋 A ₁ =7mm, A ₂ =10mm 200<L≤300吋 A ₁ =10mm, A ₂ =15mm	L-A	
		100	250				
	100	320					
	150	270					
	500						
	180	330					
	620						
	500						
	200	690					
	800						
	250	700					
	150	500					
	180	720					
	450						
	10	200	650				
	860						
	880						
	1100						
	700						
	12	180	1050				
200							
250	1300						
16	200	1200					
300	1500						

- ❗ Other lengths can be customized

 Economical Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length
Code	D					
E-H93	6.5	50	110	220	A=A ₁ +A ₂ A ₁ =7 A ₂ =8	L-A
			250			
	100	320				
	150	270				
		500				
	8	180	330			
			620			
		500				
	200	690				
		800				
		500				
	180	720				
		10	450			
	200		650			
	860					

- ❗ Other lengths can be customized

Model		L	Rated power W $\pm 5\%$	Rated voltage V $\pm 5\%$
Code	D			
H93	6.5	50	110	220
		100	250	

Heat Sensors

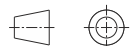
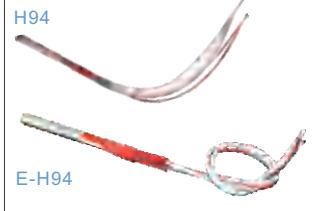
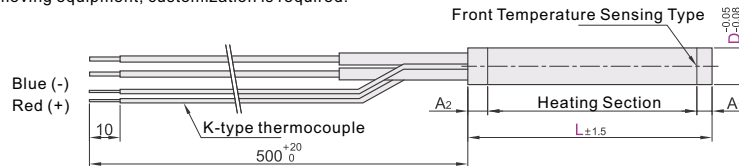
◀ Sensor Equipped Type

Code	Type		Material			
	Standard Type	Economical Type	Sheath	Heating wire	Lead wire	Cable Insulating Powder
H94	Sensor Equipped	Standard Type	SUS321	Ni80Cr20	Pure Nickel Heat-resistant Wire	Ni-GB MgO
E-H94	Type	Economical Type			Copper Plated with Nickel	

ⓘ Precautions

- The maximum operating temperature is the temperature of the armored tube section, and the maximum temperature resistance for the wire is 200°C. The wire must be led out from the installation hole;
- Do not expose the heating tube to burn in the air with the heated object;
- For use at temperatures below 500°C.

❗ Not suitable for use on moving equipment, customization is required.



Perspective Standard: First Perspective

ⓘ Standard Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length
Code	D					
H94	8	50	80	220	A=A ₁ +A ₂ L=50吋 A ₁ =5mm, A ₂ =5mm 80≤L≤150吋 A ₁ =7mm, A ₂ =10mm	L-A
		80	100			
		120	120			
		160	160			
		200	200			
		280	280			
	10	260	260			
		350	350			
		90	90			
		120	120			
		150	150			
		200	200			
	12	250	250			
		320	320			
		350	350			
		450	450			
		90	90			
		150	150			
	15	140	140			
		180	180			
		230	230			
		250	250			
		380	380			
		300	300			
	20	500	500			

❗ Other lengths can be customized

ⓘ Economical Type

Model		L	Rated power W ±5%	Rated voltage V ±5%	Cold end length A	Heating section length
Code	D					
E-H94	8	50	80	220	A=A ₁ +A ₂ A ₁ =7 A ₂ =8	L-A
		80	100			
		120	120			
		160	160			
		200	200			
		280	280			
	10	260	260			
		350	350			
		90	90			
		120	120			
		150	150			
		200	200			
	12	250	250			
		320	320			
		350	350			
		450	450			

❗ Other lengths can be customized

Model		L	Rated power W ±5%	Rated voltage V ±5%
Code	D			
H94	8	50	80	220
		100		

H94 - D8 - L50 - W80 - V220

Heat Sensors

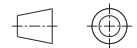
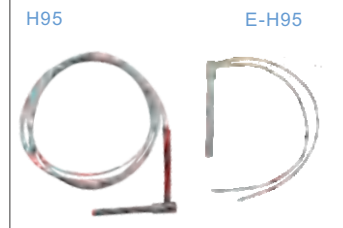
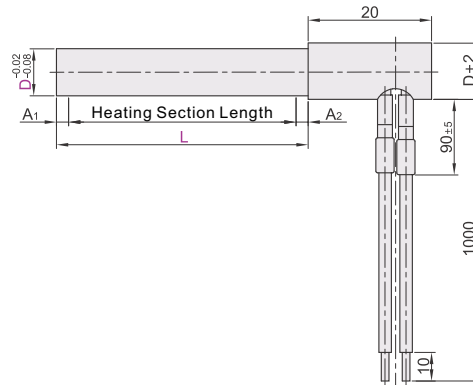
L-Type

Code	Type		Material				
			Sheath	Heating wire	Lead wire	Cable	Insulating Powder
H95	L-Type	Standard Type	SUS321	Ni80Cr20	Pure Nickel Heat-resistant Wire	Copper Plated with Nickel High-Temperature Wire	MgO
E-H95		Economical Type			Copper Plated with Tin	Ni-GB	

Precautions

- The maximum operating temperature is the temperature of the armored tube section, and the maximum temperature resistance for the wire is 200°C. The wire must be led out from the installation hole;
- Do not expose the heating tube to burn in the air with the heated object;
- For use at temperatures below 500°C, with an economical type suitable for temperatures up to 400°C.

Not suitable for use on moving equipment, customization is required.



Perspective Standard: First Perspective

Standard Type

Model		L	Rated power W $\pm 5\%$	Voltage V $\pm 5\%$	50 \leq L \leq 60		60 < L \leq 100		Cold end length A	Heating section length
Code	D				A1	A2	A1	A2		
H95	6	50	100	220	7	5	7	10	A = A1 + A2	L - A
		80	100	180						
		100	200	380						
	8	50	100	220						
		80	200	380						
		100	200	220						
	10	50	120	220						
		80	180	380						
		100	200	220						
	10	50	120	220						
		80	180	380						
		100	200	220						

Other lengths can be customized

Economical Type

Model		L	Rated power W $\pm 5\%$	Rated voltage V $\pm 5\%$	Cold end length A	Heating section length
Code	D					
E-H95	6	50	100	220	A = A1 + A2 A1 = 7 A2 = 8	L - A
		80	180	380		
		100	200	380		
	8	50	100	220		
		80	200	380		
		100	200	220		
	10	50	120	220		
		80	180	380		
		100	200	220		
	10	50	120	220		
		80	180	380		
		100	200	380		

Other lengths can be customized

Model		L	W	V
Code	D			
H95	6	80	180	380
		100	200	

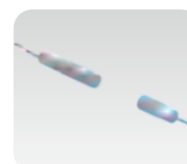
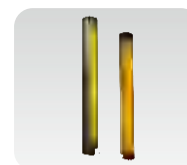
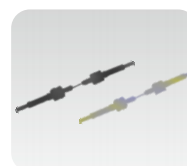
H95 - D6 - L80 - W180 - V380

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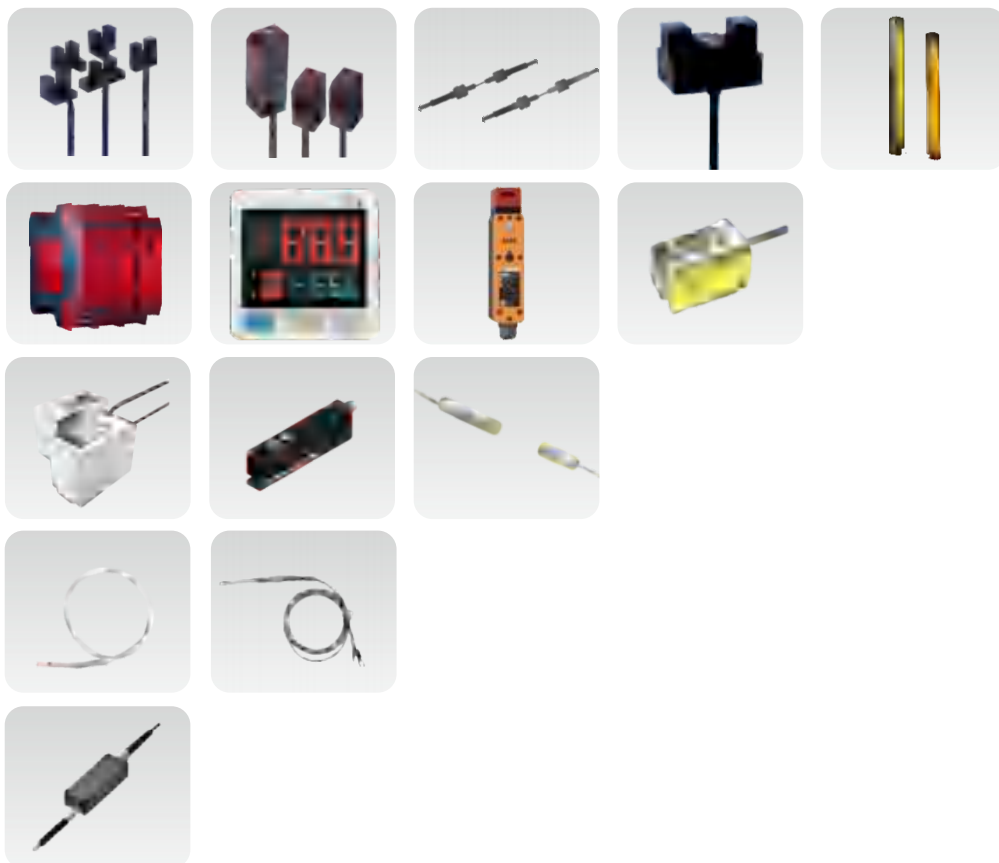


Sensore di settore



Temperature Sensors

Sensore di temperatura



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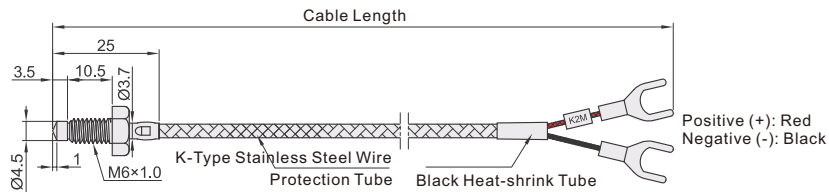
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Temperature Sensors

Standard/Flexible Type Thermocouple Temperature Sensors K-Type Thermocouple Screw-in/Terminal Type

● Economical Wet Waste Sensor · Screw-in Type

Code	Type	Installation Method	Wire Type
TS05	K-Type Thermocouple	Screw-in	Standard



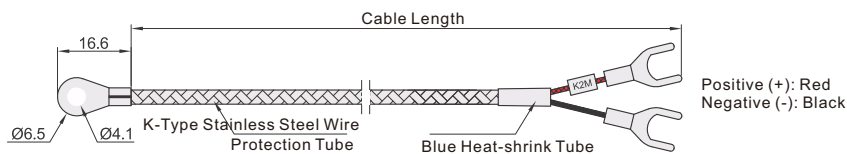
Model		Cable Length (m)	Temperature Range	Resistance Type	Grade	Temperature Contact	Protection Tube Material
Code	Head Size						
TS05	M6(M6)	1 2 5	0~200°C	K-Type Resistance	1	Non-grounded Type	SUS304

Model		Cable Length (m)
Code	Head Size	
TS05	M6	1 2 5

TS05 - M6 - 2

● Thermocouple Temperature Sensor Terminal Type · Standard Type

Code	Type	Installation Method	Wire Type
TS01	K-Type Thermocouple	Terminal Type	Standard



Model		Cable Length (m)	Temperature Range	Resistance Type	Grade	Temperature Contact	Protection Tube Material
Code	Head Size						
TS01	4 (04)	2	0~200°C	K-Type Resistance	1	Grounded Type	SUS304

Model		Cable Length (m)
Code	Head Size	
TS01	4 (04)	2

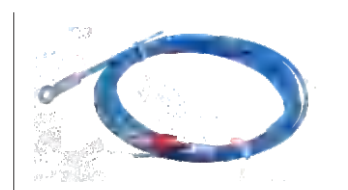
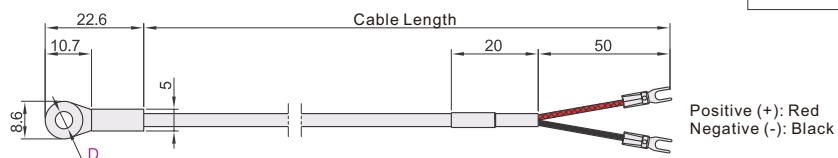
TS01 - 4 - 2

● Thermocouple Temperature Sensor Terminal Type · Flexible Type

Code	Type	Installation Method	Wire Type
TS02	K-Type Thermocouple	Terminal Type	Flexible

● Features

- Strong resistance to bending;
- Suitable for measuring the surface temperature of parts and work pieces.



Model		Cable Length (m)	Temperature Range	Resistance Type	Grade	Temperature Contact	Protection Tube Material
Code	D						
TS02	4	1 2 5	0~250°C	K-Type Resistance	1	Grounded Type	Copper
	5						

Model		Cable Length (m)
Code	D	
TS02	4	1 2 5
	5	

TS02 - D4 - 2

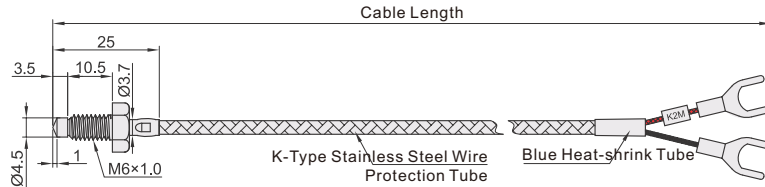
Temperature Sensors

Standard Type / Bendable Type
K-type thermocouple screw-in type

Standard Type

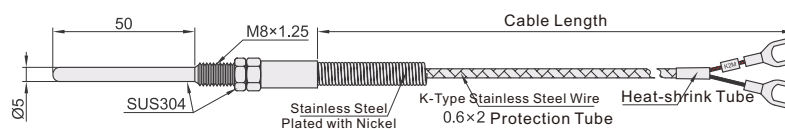
Code	Type	Installation Method	Wire Type
TS05	K-Type Thermocouple	Screw-in	Standard

TS05-M6



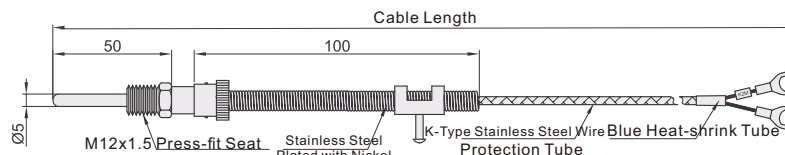
Positive (+): Red
Negative (-): Black

TS05-M8



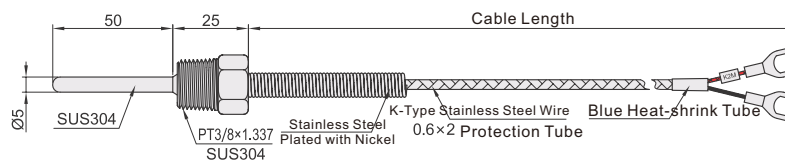
Positive (+): Red
Negative (-): Black

TS05-M12



Positive (+): Red
Negative (-): Black

TS05-3



Positive (+): Red
Negative (-): Black

Perspective Standard: First Perspective

Model		Cable Length (m)	Temperature Range	Resistance Type	Grade	Temperature Contact	Protection Tube Material
Code	Head Size						
TS05	M6(M6)	1 2 5	0~200°C	K-Type Resistance	1	Non-grounded Type	SUS304
	M8(M8)						Copper Plated with Nickel
	M12(M12)						SUS304
	3(PT3/8)						SUS304

Model		Cable Length (m)
Code	Head Size	
TS05	M6	1 2 5

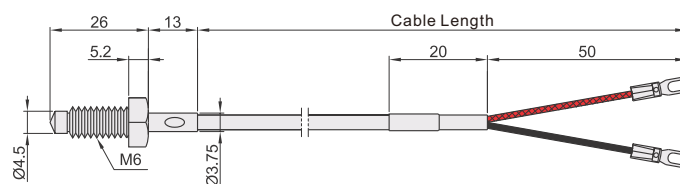
TS05 - M6 - 2

Bendable-resistant Type

Code	Type	Installation Method	Wire Type
TS06	K-Type Thermocouple	Screw-in	Bendable-resistant

Features

- Strong resistance to bending;
- Detect the surface temperature of parts and workpieces.



Positive (+): Red

Negative (-): Black

Perspective Standard: First Perspective

Model		Cable Length (m)	Temperature Range	Resistance Type	Grade	Temperature Contact	Protection Tube Material
Code	Head Size						
TS06	M6 (M6)	1 2 5	0~250°C	K-Type Resistance	1	Grounded Type	SUS304

Model		Cable Length (m)
Code	Head Size	
TS06	M6	1 2 5

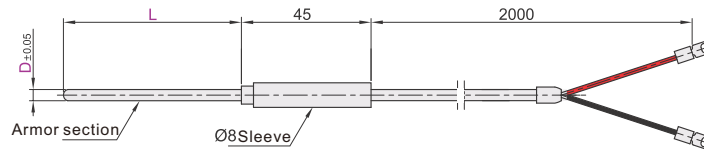
Temperature Sensors

Standard Type / Spring Loaded Type Temperature Sensors K-type thermocouple with standard protective sheath

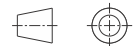
Standard Type

Code	Type	Shape
TS07	K-Type Thermocouple Standard Protective Sheath	Straight-through Type

[i] The protective sheath has a heat resistance of up to 90°C. For objects with high temperatures, please choose a specification with a longer armored section.



Positive (+): Red
Negative (-): Black



Perspective Standard: First Perspective

Model			Temperature Range	Cable (metal wire)	Resistance Type	Temperature Contact	Armor material
Code	D	L					
TS07	1	30	0~500℃	2m	K-Type Resistance	Non-grounded Type	Ch3030
		30					
	1.6	50					
		100	0~650℃				
	2.3	30					
		50					
		100					
		30					
	3.2	50					
		100	0~750℃				
	4.8	30					
		50					
	100						

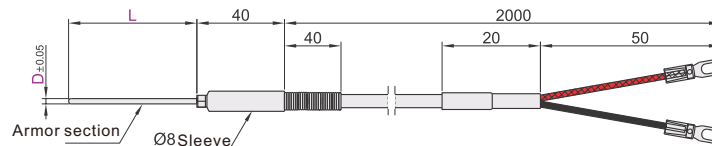
Model		
Code	D	L
TS07	1.6	50
		100

TS07 - D1.6 - L50

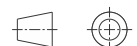
Spring Loaded Type

Code	Type	Cable Type	Shape
TS08	K-Type Thermocouple Standard Protective Sheath	Spring Loaded Type	Straight-through Type

[i] The protective sheath has a heat resistance of up to 90°C. For objects with high temperatures, please choose a specification with a longer armored section.



Positive (+): Red
Negative (-): Black



Perspective Standard: First Perspective

[i] Custom lengths are available upon request.

Model			Temperature Range	Cable (metal wire)	Resistance Type	Grade	Temperature Contact	Armor material
Code	D	L						
TS08	1	30	0~500℃					
		30						INC0600
	1.6	50						(Nickel based alloy)
		100	0~650℃					
		30						
	2.3	50						SUS310
		100		2m	K-Type Resistance	1	Non-grounded Type	
		30						
	3.2	50	0~750℃					SUS321
		100						
		30						
	4.8	50	0~800℃					INC0600
	100						(Nickel based alloy)	

Model		
Code	D	L
TS08	1.6	30
		50

TS08 - D1.6 - L30

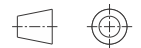
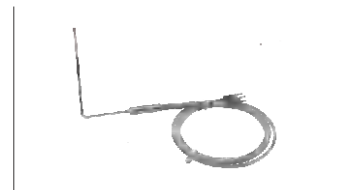
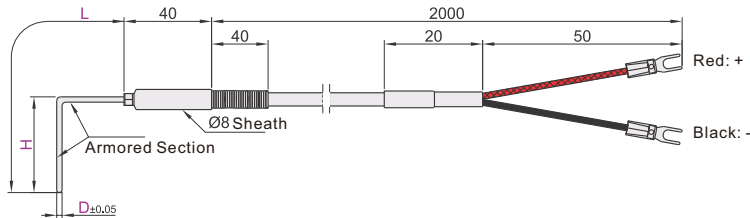
Temperature Sensors

L-Type / Radiation-proof Plug K-Type thermocouple

L-Type

Code	Type	Shape
TS09	K-Type Thermocouple	L-Type

Features: Can be used in narrow areas.



Perspective Standard: First Perspective

Model Code	D	L	H	Temperature Range	Cable (metal wire)	Resistance Type	Grade	Temperature Contact	Armor material
TS09	1.6	100	20	0~650°C	2M	K-Type Resistance	1	Non-grounded Type	INC0600 (Nickel based alloy)
			30						
			40						
			50						
			70						
			100						
	1.6	150	20	0~650°C	2M	K-Type Resistance	1	Non-grounded Type	INC0600 (Nickel based alloy)
			30						
			40						
			50						
			70						
			100						
	1.6	200	20	0~650°C	2M	K-Type Resistance	1	Non-grounded Type	INC0600 (Nickel based alloy)
			30						
			40						
			50						
			70						
			100						
	1.6	300	20	0~650°C	2M	K-Type Resistance	1	Non-grounded Type	INC0600 (Nickel based alloy)
			30						
			40						
			50						
			70						
			100						
	2.3	100	20	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			30						
			40						
			50						
			70						
			100						
	2.3	150	20	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			30						
			40						
			50						
			70						
			100						

Model Code	D	L	H	Temperature Range	Cable (metal wire)	Resistance Type	Grade	Temperature Contact	Armor material
TS09	1.6	100	100	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						
	1.6	150	100	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						
	1.6	200	100	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						
	1.6	300	100	0~700°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						
	2.3	100	100	0~750°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						
	2.3	150	100	0~750°C	2M	K-Type Resistance	1	Non-grounded Type	SUS310
			120						
			40						
			50						
			70						
			100						

Model Code	D	L	H
TS09	1.6	100	20
			30

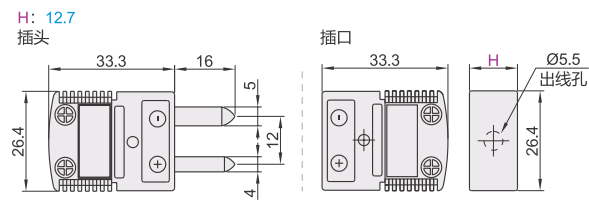
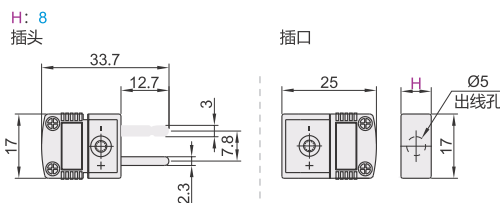
TS09 - D1.6 - L100 - H20

Radiation-proof Plug

Code	Type	Sales Method	Material
TS17	K-Type Thermocouple Plug + Jack	Set	PA66 (Nylon)

Features: The compensating lead wire is connected to the connector's plug and jack, making the assembly and disassembly of the compensating lead wire more convenient.

Plug and jack are used in pairs and shipped together.



Perspective Standard: First Perspective

Model Code	H	Temperature Range
TS17	8	0 ~ 200°C
	12.7	

Model Code	H
TS17	8
	12.7

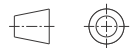
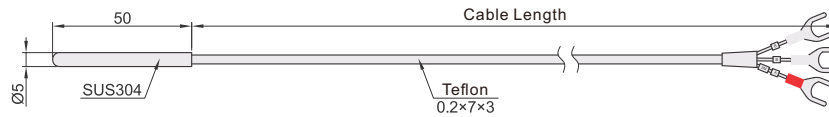
TS17 - H8

Temperature Sensors

Compact/Screw-in Type Pt100 Thermistor

Compact Type

Code	Type	Installation Method
TS11	Pt100 Thermistor	Compact



Perspective Standard: First Perspective

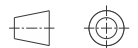
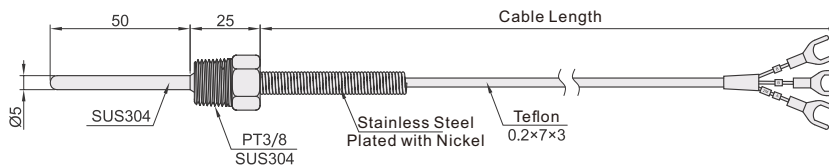
Model		Cable Length (m)	Temperature Range	Resistance Type	Grade
Code	Head Size				
TS11	5(Ø5)	2	0~200°C	Pt100	1

Model		Cable Length (m)
Code	Head Size	
TS11	5(Ø5)	2

TS11 - 5 - 2

Screw-in Type

Code	Type	Installation Method
TS15	Pt100 Thermistor	Screw-in Type



Perspective Standard: First Perspective

Model		Cable Length (m)	Temperature Range	Resistance Type	Grade
Code	Head Size				
TS15	3(PT3/8)	2	0~200°C	Pt100	1

Model		Cable Length (m)
Code	Head Size	
TS15	3(PT3/8)	2

TS15 - 3 - 2

Sensore di settore



Contact Displacement Sensors

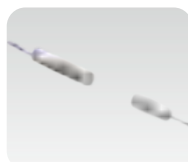
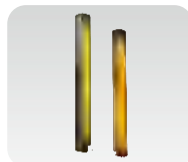
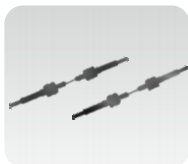
Sensori a contatto

Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



Contact Displacement Sensors Contents

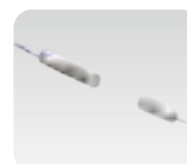
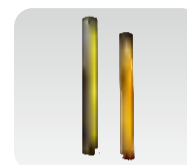
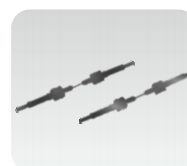
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Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



CDS-H Series

Contact Displacement Sensors

Technical Specifications



Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	≤1.4μm	≤2μm
	Resolution	0.2μm	0.5μm
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.1~1.2N	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	146.9×26.2×18mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 71.7g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12R04S	CDS-H12R02S
	Cable Type* ₂	CDS-H12R04W	CDS-H12R02W

*₁:The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

*₂:The standard M8 four-core cable is used, which does not require a matching digital control module for operation. If a digital control module is needed, please select the corresponding aviation plug type.

Technical Specifications



Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	±2μm	≤10μm
	Resolution	1μm	5μm
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.1~1.2N	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	146.9×26.2×18mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 71.7g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12R12S	CDS-H12R10S
	Cable Type* ₂	CDS-H12R12W	CDS-H12R10W

*₁:The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

*₂:The standard M8 four-core cable is used, which does not require a matching digital control module for operation. If a digital control module is needed, please select the corresponding aviation plug type.

Technical Specifications



Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0~25.4mm	
Electrical Data	Accuracy	1.8μm	≤3μm
	Resolution	0.2μm	0.5μm
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.6~1.8N	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	206.9x26.2x18mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 91.5g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H25R08S	CDS-H25R03S
	Cable Type* ₂	CDS-H25R08W	CDS-H25R03W

*₁:The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

*₂:The standard M8 four-core cable is used, which does not require a matching digital control module for operation. If a digital control module is needed, please select the corresponding aviation plug type.

Technical Specifications

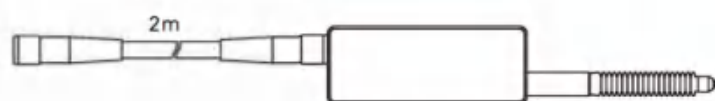


Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0~25.4mm	
Electrical Data	Accuracy	±3μm	≤10μm
	Resolution	1μm	5μm
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.6~1.8N	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	206.9x26.2x18mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 91.5g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H25R13S	CDS-H25R10S
	Cable Type* ₂	CDS-H25R13W	CDS-H25R10W

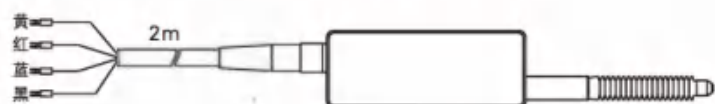
*₁:The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

*₂:The standard M8 four-core cable is used, which does not require a matching digital control module for operation. If a digital control module is needed, please select the corresponding aviation plug type.

Specification Type



(0–12.7mm) Aviation Plug Type



(0–12.7mm) Lead Type




(0–25.4mm) Aviation Plug Type



(0–25.4mm) Lead Type


Technical Specifications

			
Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	$\leq 1.4\mu\text{m}$	$\leq 2\mu\text{m}$
	Resolution	$0.2\mu\text{m}$	$0.5\mu\text{m}$
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.1~1.2N	
	Operating Pressure Range	-	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	146.9×26.2×24mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 90.5g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12R04DS	CDS-H12R02DS
	Cable Type* ₂	CDS-H12R04DW	CDS-H12R02DW

1. The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

2. The standard M8 four-core cable is used.


Technical Specifications

			
Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Output Type	Box Type	
	Drive Method	Rebound Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	$\pm 2\mu\text{m}$	$\leq 10\mu\text{m}$
	Resolution	$1\mu\text{m}$	$5\mu\text{m}$
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	$-10\sim 50^{\circ}\text{C}$ (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	1.1~1.2N	
	Operating Pressure Range	-	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	146.9×26.2×24mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 90.5g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12R12D5	CDS-H12R10D5
	Cable Type* ₂	CDS-H12R12DW	CDS-H12R10DW

1. The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

2. The standard M8 four-core cable is used.


Technical Specifications

			
Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Pneumatic Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	$\leq 1.4\mu\text{m}$	$\leq 2\mu\text{m}$
	Resolution	$0.2\mu\text{m}$	$0.5\mu\text{m}$
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	2.4-3.4N	
	Operating Pressure Range	0.16~0.2Mpa	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	149.6 x34x20mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 99.2g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12Q04S	CDS-H12Q02S
	Cable Type* ₂	CDS-H12Q104W.	CDS-H12Q02W

1.The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

2.The standard M8 four-core cable is used.

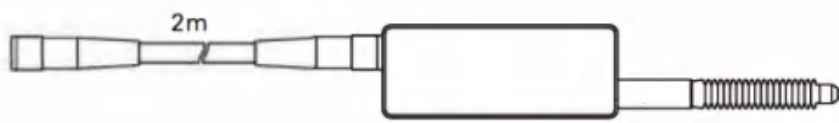
Technical Specifications

			
Basic Features	Working Principle	CMOS Optical Measurement (No Gap Error)	
	Appearance	Box Type	
	Drive Method	Pneumatic Type	
	Measurement Range	0-12.7mm	
Electrical Data	Accuracy	±2μm	≤10μm
	Resolution	1μm	5μm
	Response Time	50ms	
	Sampling Rate	40ms	
	Operating Voltage	5V DC	
	Current Consumption	<50mA	
	Communication Protocol	Modbus RTU	
Environmental Conditions	Operating Temperature Range	-10~50°C (No Condensation)	
	Operating Humidity Range	35~80% RH (No Condensation)	
	Protection Level	Ip65	
Mechanical Data	Measurement Force	2 4-3 4N	
	Operating Pressure Range	0 16~0 2Mpa	
	Connection Method	M8/4 Pin Connector	
	Dimensions (W×H×D)	149.6 x34x20mm	
		Aluminum Alloy Body,	
	Material	Nitrile Rubber Dust Cover,	
		Hard Alloy Sensor Head	
	Weight	Approx. 99.2g	
	Accessories	M8/4-core cable	
Model	Aviation Plug Type* ₁	CDS-H12Q12S	CDS-H12Q10S
	Cable Type* ₂	CDS-H12Q12W.	CDS-H12Q10W

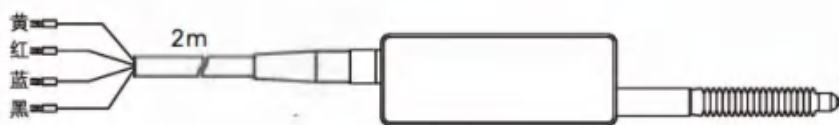
1.The standard CA08FF-S4F2C M8 dual-mother connector cable is used, which requires a matching digital control module for operation. One sensor head requires one CA08FF-S4F2C, and one digital control module can connect to four sensor heads.

2.The standard M8 four-core cable is used.

Specification Type



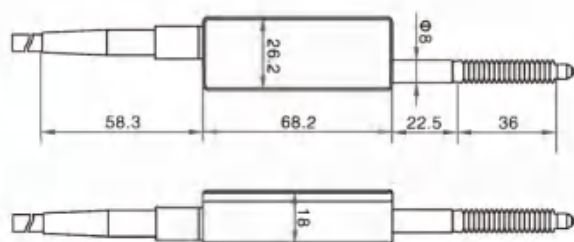
(0–12.7mm) Aviation Plug Type



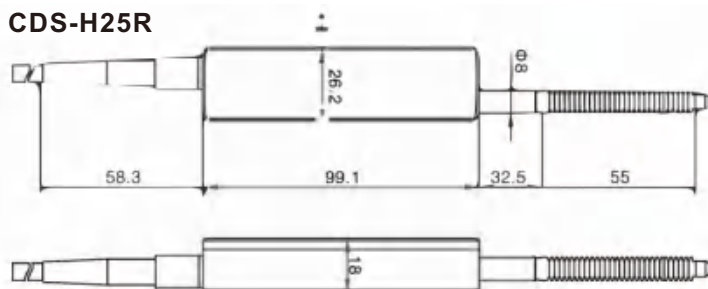
(0–12.7mm) Lead Type

Size Specification (Unit: mm)

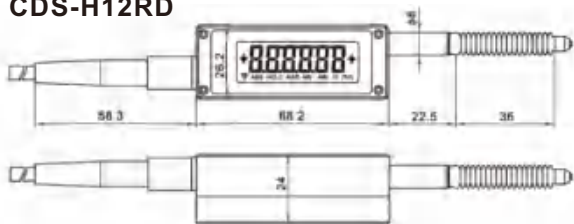
CDS-H12R



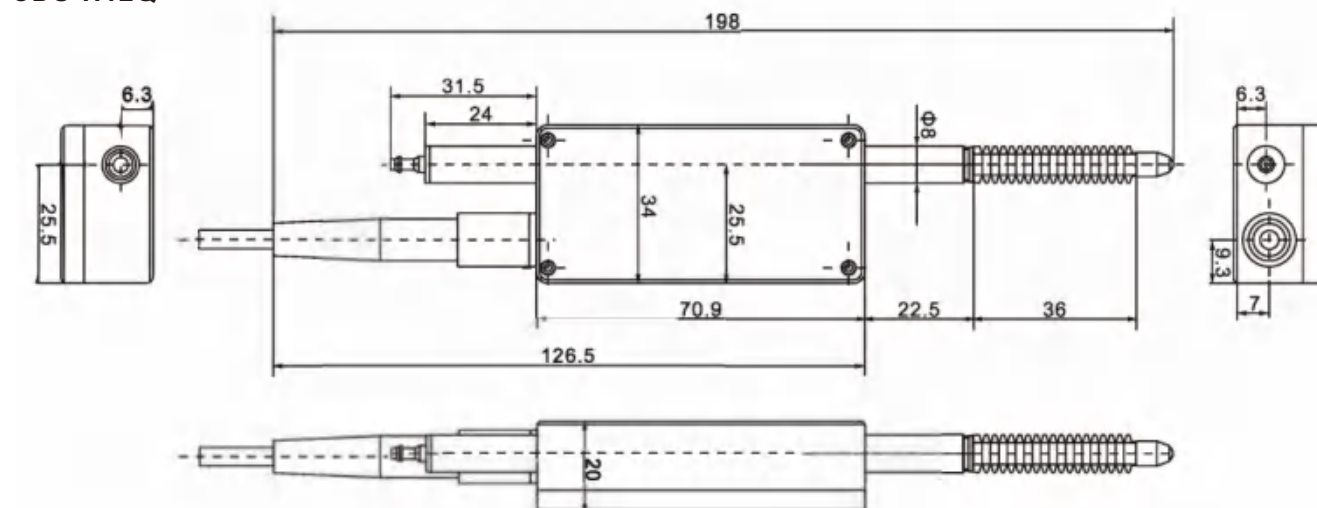
CDS-H25R



CDS-H12RD

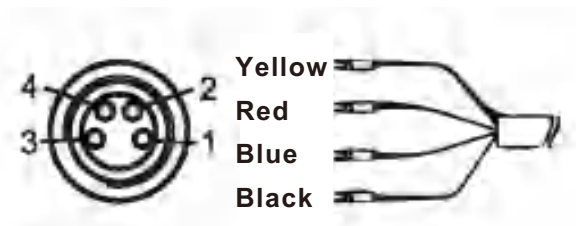


CDS-H12Q



Wiring Diagram

Port Output Description:



Aviation Plug Type	
Pin Number	Function
1	DC 5V (Power)
2	RXD
3	TXD
4	GND (Ground)

Rs232 Lead Type	
Pin Color	Function
Blue	RXD
Black	TXD
Yellow	DC 5V (Power)
Red	GND (Ground)

1.2 CDS-H Controller and Accessories

Contact Displacement Sensors

Technical Specifications



Basic Features	Appearance	Square
	Display Range	-199.9999 to 199.9999
	Display Resolution	5μm/1μm/0.5μm/0.2μm
		(depending on the sensor type)
Electrical Data	Operating Voltage	12-24VDC
	Power Consumption	240mW
		(without sensors, without control module)
	Response Time	50/100/500/1000ms(configurable)
	Control Input	Timer, preset, reset, channel input,
		no voltage input
	Control Output	NPN output, maximum output current 20mA
	Communication Protocol	Modbus RTU
Environmental Conditions	Communication Interface	RS232/RS485
	Operating Temperature	-10~60°C (no freezing)
Mechanical Data	Operating Humidity	35~80% RH (no condensation)
	Number of Expansion Slots	1 main control module,
		can be expanded with up to 4 sub-modules
	Number of Connectable Sensors	4
	Dimensions	Main and Unit: 78.3x87.3x51.4mm
	Materials	Main body: ABS, Buttons: ABS Panel,
		MMA Cabl PVC
	Weight	Main control module: approximately 201.6g
	Accessories	The main controller can be equipped with up
		to 4 sub-modules, up to 20 sensors,
		each sensor requires 1 CA08FF-S4F2C
	Model	CDS-M01

Technical Specifications

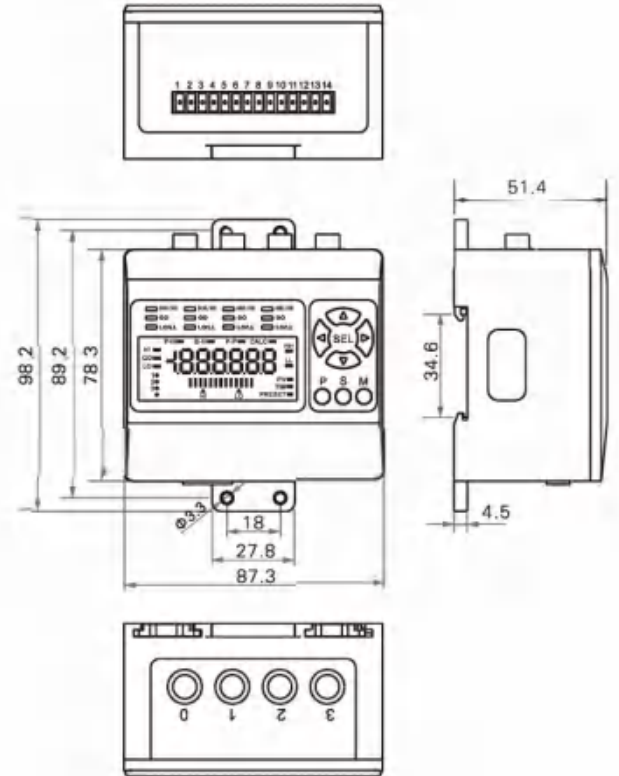
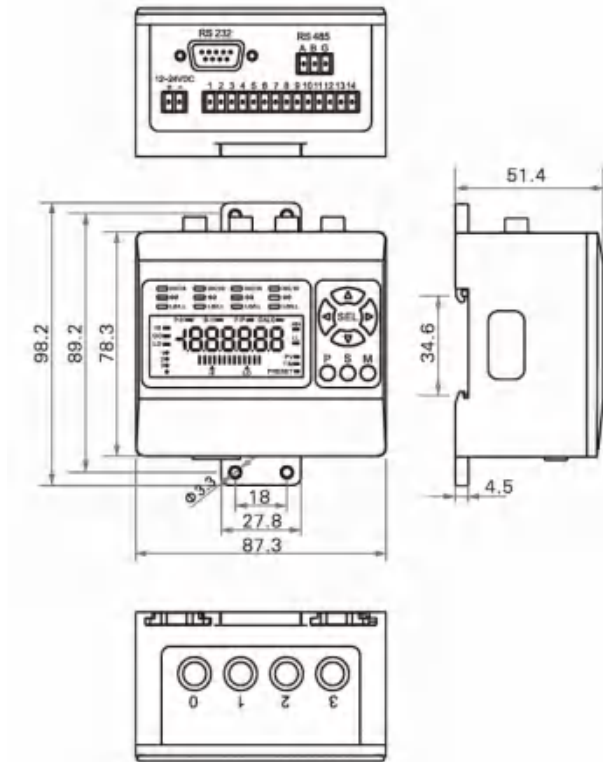


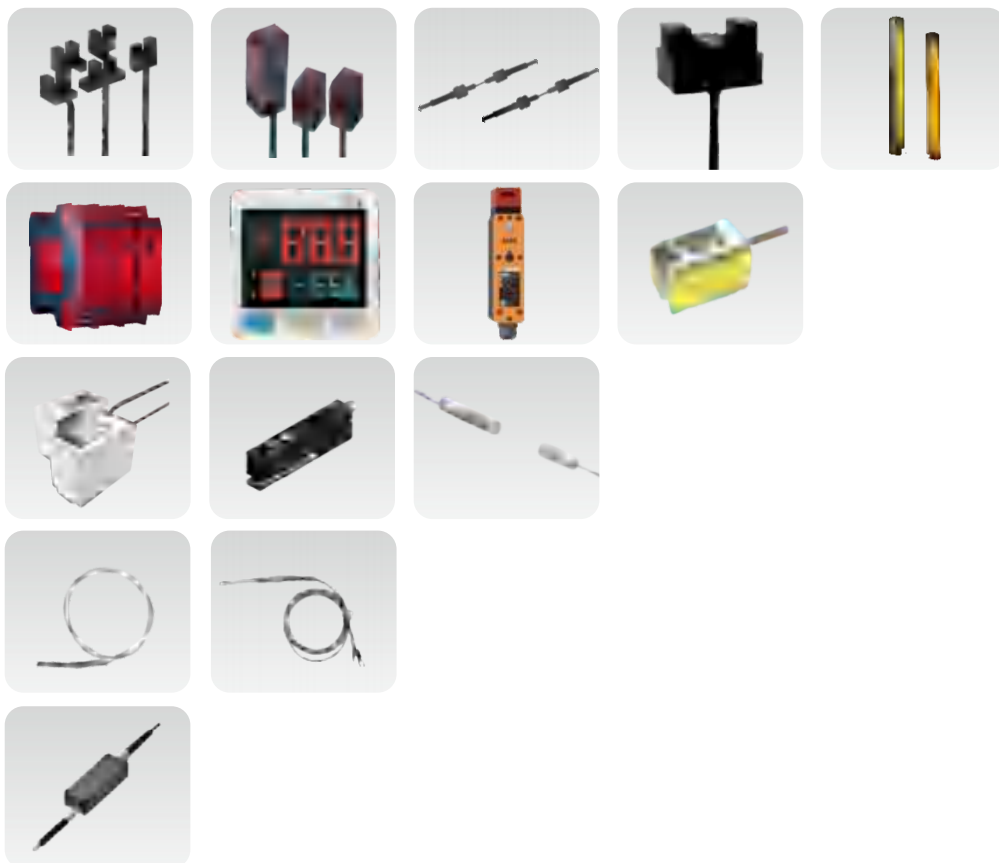
Basic Features	Appearance	Square
	Display Range	-199.9999 to 199.9999
	Display Resolution	5μm/1μm/0.5μm/0.2μm (depending on the sensor type)
Electrical Data	Operating Voltage	12-24VDC
	Power Consumption	≤100mW (without sensors)
	Response Time	50/100/500/1000ms(configurable)
	Control Input	Timer, preset, reset, channel input, no voltage input
	Control Output	NPN output, maximum output current 20mA
	Communication Protocol	-
	Communication Interface	-
Environmental Conditions	Operating Temperature	-10~60°C (no freezing)
	Operating Humidity	35~80% RH (no condensation)
Mechanical Data	Number of Expansion Slots	-
		-
	Number of Connectable Sensors	4
	Dimensions	Main and Unit: 78.3x87.3x51.4mm
	Materials	Main body: ABS, Buttons: ABS Panel,
		MMA Cabl PVC
	Weight	Sub-module: approximately 168.3g
	Accessories	The main controller can be equipped with up to 4 sub-modules, up to 20 sensors, each sensor requires 1 CA08FF-S4F2C
	Model	CDS-M01A

Size Specification (Unit: mm)

Main Control Module CDS-M01

Side Control Module CDS-M02





Quality Management & Consultancy



日本高導オートメーションテクノロジー株式会社
会社法人等番号 1309-01-001332

Website: <http://www.nipponkodobearings.com>



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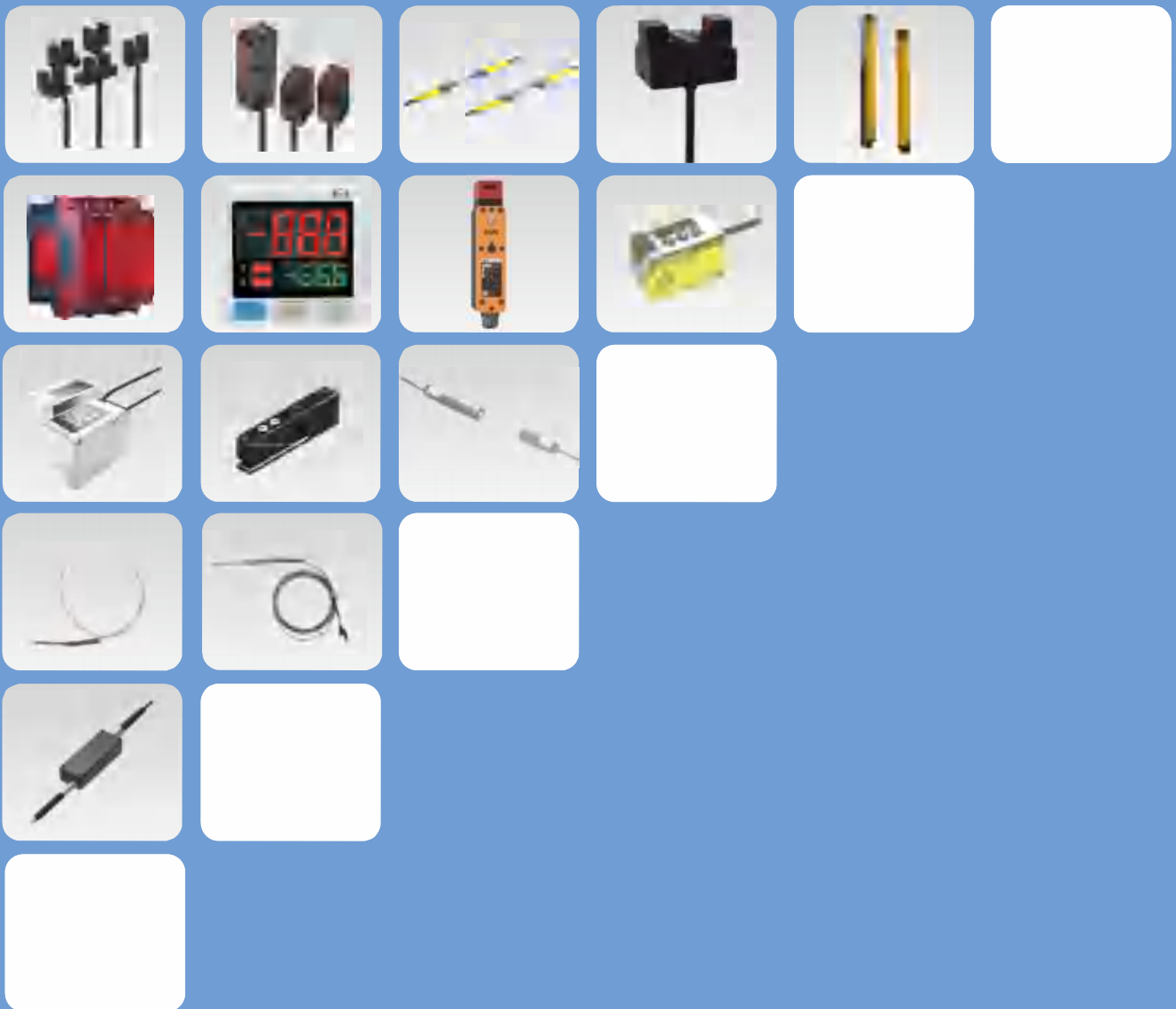
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Binggo Automation International Limited
Flat 815, 8/F, Tower B, Southmark,
11 Yip Hing Street, Wong Chuk Hang, Hong Kong
T 852 2857 9931
F 852 2803 2861
E marketing@binggo-intl.com
Website: <https://binggo-intl.com/>