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КАТАЛОГ



- Optical fiber amplifiers operated with automatic light compensation technology to effectively guarantee the stability of detection.
- Full range of optical fiber components can work as perfect replacement for popular models in the market.
- Customization is available according to the users' on-site applications.
- Abundant inventory, quick response and fast delivery.



PG1 Dual Digital Display Fiber Optic Amplifier

- With automatic light compensation technology, 4-channel anti-light interference
- Small hysteresis, dual output for option, the fastest speed up to 13 μs

PA-04



PE1 Standard Dual Digital Fiber Amplifier

- Automatic light compensation technology and great adaptability for less maintenance.
- Six adjustable response speeds, up to 50μs small hysteresis ;
- High power mode for longer detection distances.

PA-05



PC1 Ultra High Speed Response Dual Digital Display Fiber Optic Amplifier

- Fastest response time in the industry (15ms)
- Digital display of red and green lights for comparison, easy to set up
- Unique technology for light compensation, stable detection

PA-06

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

Fiber lens



Regular Type

- Imported fiber optic core, wonderful performance
- Long sensing distance, cost-effective

PA-08



Array-type

- Suitable for moving object detection
- To detect unclear position objects

PA-12



Flat Bracket Type

- Flexible installation, easy to fix
- Suitable for limited space

PA-14



Side-view Type

- To detect objects in narrow space
- Easy access to detected objects with high precision

PA-15



High Elasticity Type

- Good performance with excellent flexibility
- After bending at angles of 90 degree, transmission ability only reduces 10%

PA-16



High Temperature Resistant Type

- Heat resistant stainless steel jacket, strong chemical resistance
- Withstand temperatures up to 350°C.

PA-17



Small Spot Type

- Built-in lens, small beam spot
- Customizable high-flex optical fiber cables

PA-18



Combination Type

- Several fiber units combined together
- Customizable fiber length to tail your needs

PA-19



High End Type

- Pioneering hot melt leveling technology
- Metal protective cap design

PA-20



Lens

- Offering a full range specifications that can replace most of the popular products in the market
- Thru-beam and diffuse reflection types are optional.

PA-20

Fiber Optic

Slot Sensors

Photoelectric

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Fiber amplifiers

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Ultra high speed

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Flat bracket type

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High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

Fiber lens

PG1 Dual Digital Display Fiber Optic Amplifier

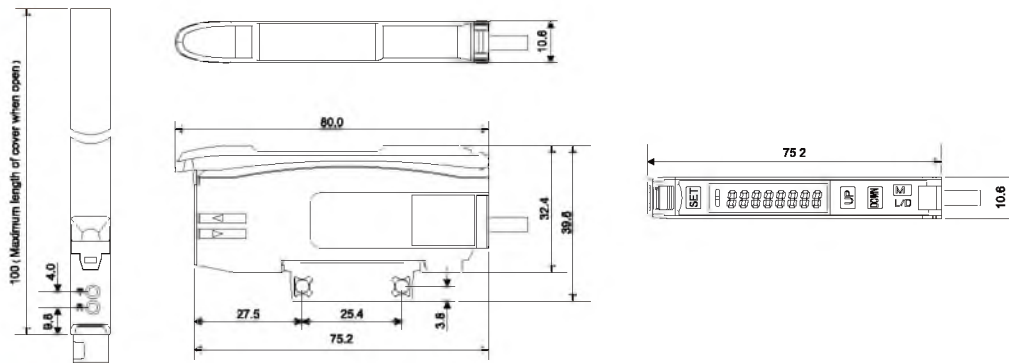
- With automatic light compensation technology, 4-channel anti-light interference
- Small hysteresis, dual output selectable, the fastest speed up to 13 μ s



Model No.	PG1-N HOT	PG1-P
Control output	1 output port	
Light source	Red, 4-element LED	
Response time	SHP: 13 μ s, FINE: 30 μ s, SUPR: 100 μ s, MEGA: 200 μ s	
Output selection	LIGHT-ON/DARK-ON (Short press MODE and select with UP DOWN)	
Display indicator	Operation indicator: Red LED, dual digital monitor: Dual 7-digit display, threshold (4-digit green LED body indicator) and current value (4-digit red LED body indicator) lit together. Current value range: 0-9999	
Detection method	Light intensity (area detection is available for automatic sensitive tracking)	
Delay function	1ms~9999ms	
Control output	NPN open collector, maximum 100mA, residual voltage: 1V	PNP open collector, maximum 100mA, residual voltage: 1V
Power supply	12~24V DC $\pm$ 10%	
Ambient illuminance	Incandescent lamp $\leq$ 20,000 lux, Sunlight $\leq$ 30000 Lux	
Power consumption	Standard mode: Max 300mW	
Vibration resistance	10~55Hz, double amplitude: 1.5mm, X, Y, Z axis are 2 hours respectively	
Ambient temperature	-10 $^{\circ}$ C~+55 $^{\circ}$ C, No freezing	

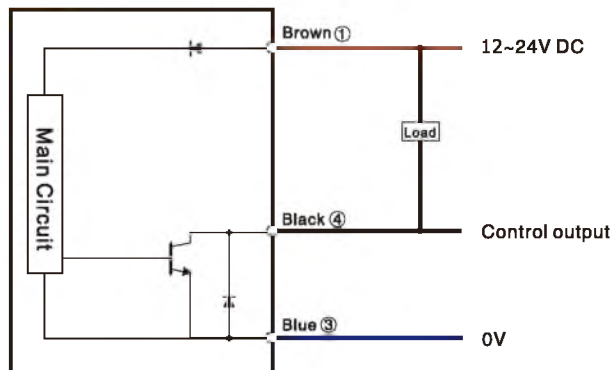
Dimensions

Unit: mm

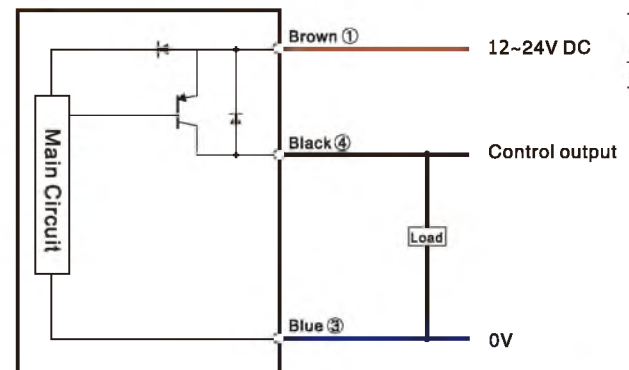


Circuit diagram

NPN



PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

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Accessories

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Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Fat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

Fiber lens

PE1 Standard Dual Digital Fiber Optic Amplifier

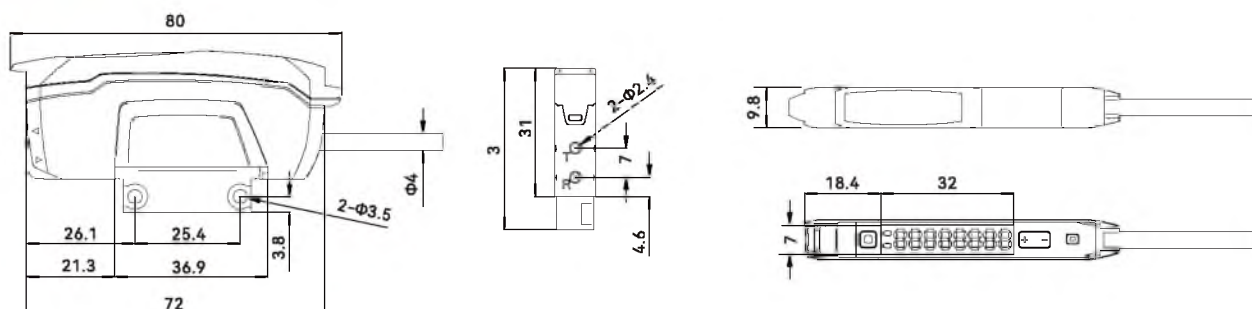
- No more tedious operations, easy one-touch teaching;
- With automatic light compensation technology, great adaptability with less maintenance;
- Six adjustable response speeds, small hysteresis up to 50 μ s.



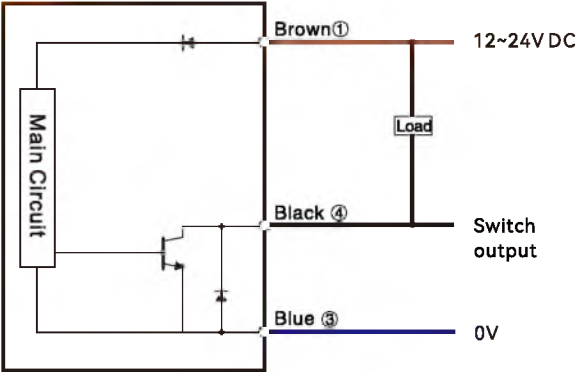
Model	PE1-N	PE1-P
Light source	Red modulated light (650nm)	
Operating voltage	12~24V	
Operating current	40mA	
Output type	NPN open collector	PNP open collector
Switch type	L.on /D.on selectable	
Display	7 segment 8 digit display (red: 4 digit, green: 4 digit)	
Response time	50 μ s (HIGH SPEED)/250 μ s (FINE)/500 μ s (TURBO)/1 ms (SUPER)/4 ms (ULTRA)/16 ms (MEGA)	
Calculator function	Timer off, break delay, on delay, single (output delay method)	
Sensitivity adjustment	Teach-in adjustment, manual adjustment	
Hysteresis	$\leq 20\%$ SN	
Switch type	L.on /D.on selectable	
Indicator	Work indicator: green; Action indicator: red	
Leakage current	<1.5V (load current<100mA)	
Load current	100mA	
Circuit protection	Power reverse polarity protection / surge protection / short circuit protection	
Ambient temperature	Operating temperature: -20° C to +50° C No freezing, no condensation; storage: -30 to +70° C	
Ambient humidity	Operating: 35%~85%RH, no condensation; Storage: 35%~95%RH	
Insulation	20M Ω	
Pressure resistance	± 1000 V 50/60Hz 60s	
Static electricity	± 8000 V(Air discharge)	
Group pulse	± 2000 V (5kHz/50kHz)	
Anti-vibration	10~50Hz amplitude 0.5mm,X Z Y three directions,2 hours each	
Ambient illuminance	Incandescent lamp: ≤ 3000 lux / Sunlight: ≤ 10000 lux	
Degree of protection	IP50	
Housing material	PC	
Connector	2m 3 wire cable 4mm diameter	

Dimensions

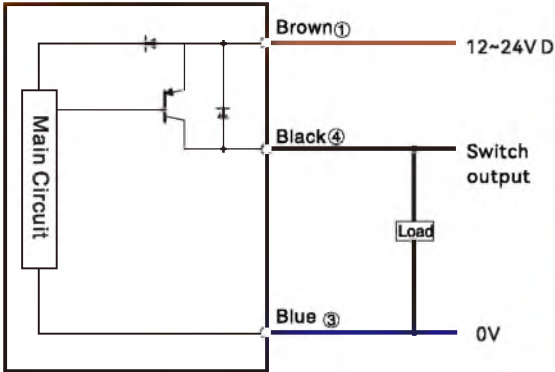
Unit: mm



NPN



PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

Fiber lens

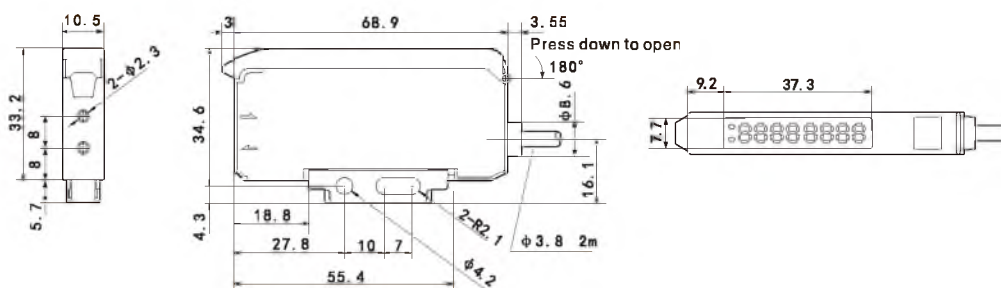
PC1 Ultra High Speed Response Dual Digital Display Fiber Amplifier

- Fastest response time in the industry (15ms)
- Digital display of red and green light in comparison, easy installation
- Unique technology for light compensation, stable detection



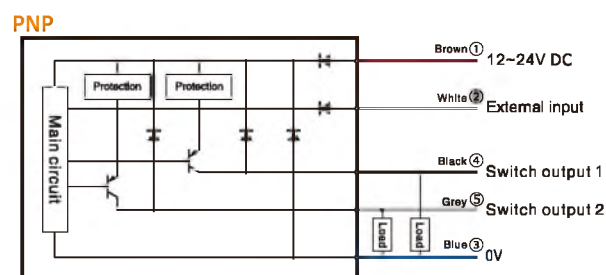
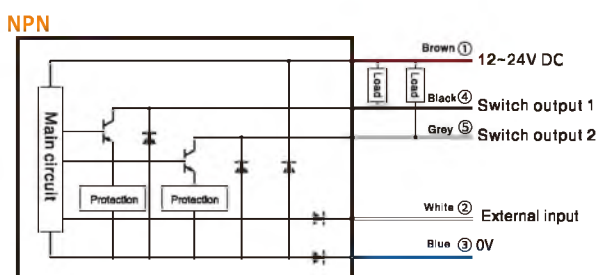
Model No.	PC1-NH	PC1-NH2	PC1-PH	PC1-PH2
Light source	Red LED 660nm			
Operating voltage	12~24V DC			
Current consumption	Standard mode: 36mA max.(Single output), 39mA max.(Dual output) Energy-saving mode: 25mA max.(Single output), 28mA max.(Dual output)			
Output type	Single output NPN	Dual output NPN	Single output PNP	Dual output PNP
Switch type	Selectable L.on, D.on			
Indicator	Single output indicator (Red), dual output indicator (Orange)			
Display screen	7 segment 8 digit display (red: 4 digit, orange: 4 digit)			
Response time	15 μ s(22us(1-HS), 70 μ s(2-FS), 250 μ s(3-ST), 500 μ s(4-LG), 1ms(5-PL), 2ms(6-UL), 8ms(7-EL)			
ON/OFF Time delay function	ON delay, OFF delay, Single pulse output, ON + OFF delay, ON delay+Single pulse output 0.1~9.999ms			
Sensing distance	Thru-beam: 4000mm, Diffuse reflection: 1200mm			
Sensitivity adjustment	Teach-in / Manual			
External input function	Remote teach-in, Input stops once it shines, Syn trigger input, reset-input (for two outputs only)			
Operating temperature	-25℃~+55℃			
Operating humidity	35%~85%RH			
Ambient illuminance	Sunlight $\leq$ 10000lux, Incandescent lamp $\leq$ 3000lux			
Anti-vibration	10~55Hz Double amplitude 1.5mm, XYZ three directions, 2 hours each			
Shock resistance	50G(500m/S ²), XYZ three directions			
Degree of protection	IP50			
Material	Housing: PPE, Display: PC			
Connection method	2m 5 core cable			
Weight	50g			

Dimensions



Unit: mm

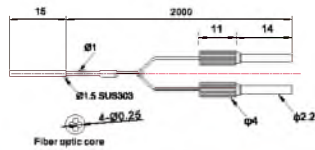
Circuit diagram



Note: Gray line (switching output 2) is only available for the dual channel type (PC1-NH2/PH2).

Diffuse reflection

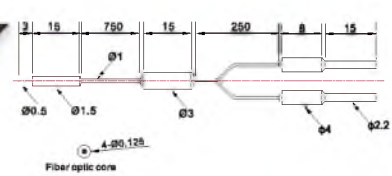
PD-R49Y



Size: $\phi 1.5$
Minimum bending radius: R2
Sensing distance:
PC1:100mm
PG1:20mm

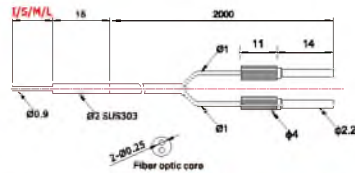
(HOT)

PD-R46



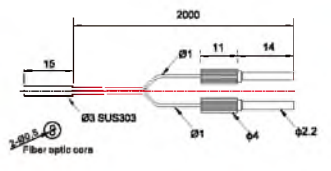
Size: $\phi 1.5$
Minimum bending radius: R10
Sensing distance:
PC1:30mm
PG1:8mm

PD-E22-Q-I/S/M/L



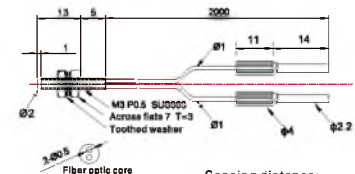
Size: $\phi 2$
Minimum bending radius: R10
Sensing distance: 15mm
(Sensing distance varies with different amplifiers)
Convex tube:
L:10mm S:20mm M:40mm L:90mm

PD-S32-Q



Size: $\phi 3$
Minimum bending radius: R10
Sensing distance:
PC1:120mm
PG1:40mm

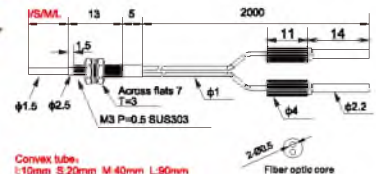
PD-32



Size: M3
Minimum bending radius: R15
Sensing distance:
PC1:120mm
PG1:60mm

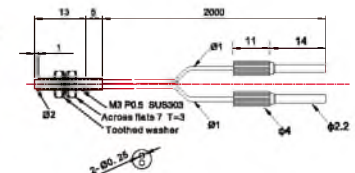
(HOT)

PD-32-I/S/M/L



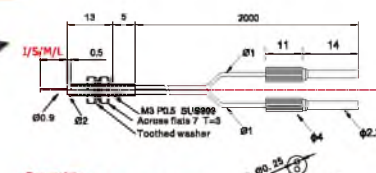
Size: M3
Minimum bending radius: R15
Sensing distance:
PC1:160mm
PG1:60mm

PD-E32



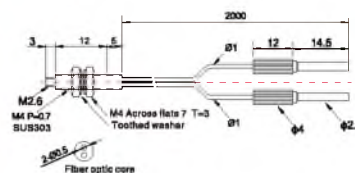
Size: M3
Minimum bending radius: R10
Sensing distance:
PC1:30mm
PG1:10mm

PD-E32-I/S/M/L



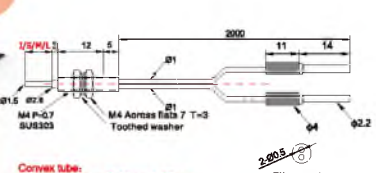
Size: M3
Minimum bending radius: R10
PC1:30mm
PG1:10mm

PD-42



Size: M4
Minimum bending radius: R15
Sensing distance:
PC1:120mm
PG1:45mm

PD-42-I/S/M/L



Size: M4
Minimum bending radius: R15
Sensing distance:
PC1:110mm
PG1:45mm

Fiber Optic

Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Fiber amplifiers

Economical
Standard
Ultra high speed

Fiber components

Regular type

Array-type
Flat bracket type
Side-view type
High flexible type
High temperature resistant
Small spot type
Combination type
High end type

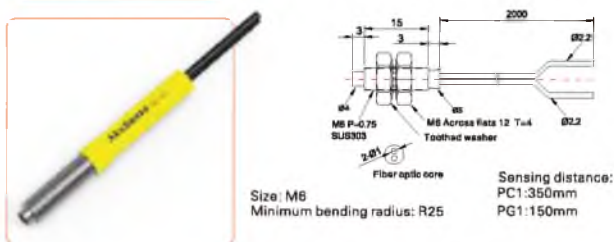
Fiber lens

Fiber lens

*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

Diffuse reflection

PD-62



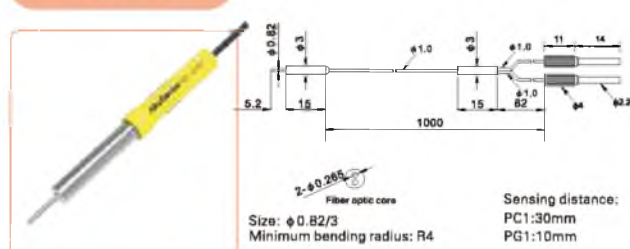
PD-62-I/S/M/L



PD-L35GA



PD-G45Y



PD-C310-35FA



PD-C310-35FA-I/S/M/L



PD-C42



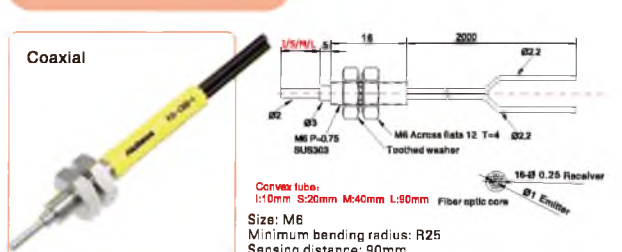
PD-C42-I/S/M/L



PD-C62



PD-C62-I/S/M/L



*PG1: TEGA with a threshold setting of 200;
 PC1: 7-step with a threshold setting of 200.
 *Cable length listed above can be customized.

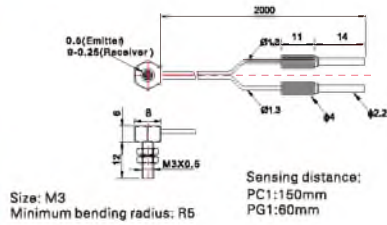
Diffuse reflection

PD-C32TZ

Coaxial



(HOT)

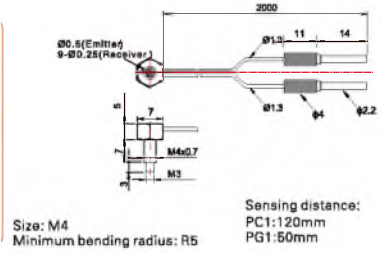


PD-C42TZ

Coaxial



(HOT)



Fiber Optic

Slot Sensors

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Laser

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Fiber amplifiers

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Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

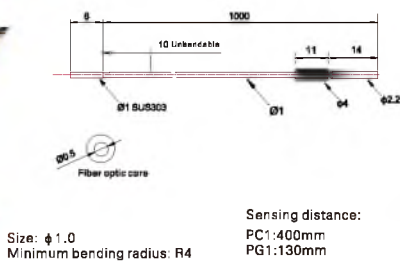
Fiber lens

Thru-beam

PT-R58V



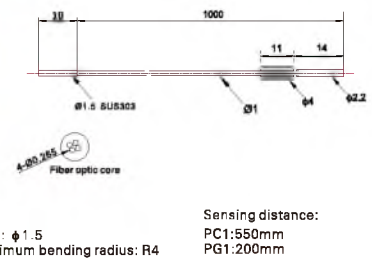
(HOT)



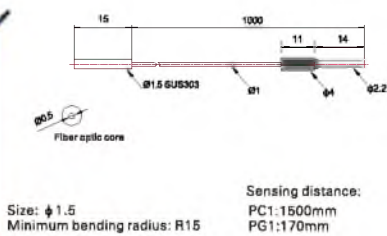
PT-R59



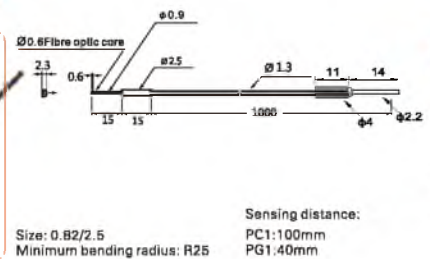
(HOT)



PT-S1520-Q



PT-G32



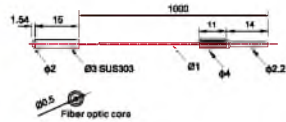
*PG1: TEGA with a threshold setting of 200;

PC1: 7-step with a threshold setting of 200.

*Cable length listed above can be customized.

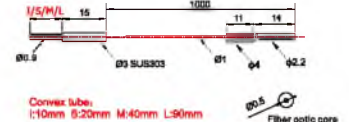
Diffuse reflection

PT-S31-Q



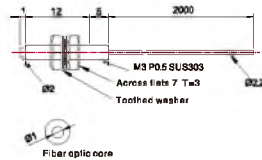
Size: $\phi 3$
Minimum bending radius: R15
Sensing distance: 140mm
(Sensing distance varies with different amplifiers)

PT-S31-Q-I/S/M/L



Convex tube:
L:10mm S:20mm M:40mm L:90mm
Size: $\phi 3$
Minimum bending radius: R15
Sensing distance:
PC1:1000mm
PG1:180mm

PT-32



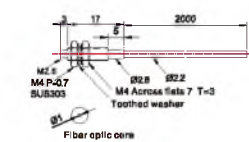
Size: M3
Minimum bending radius: R25
Sensing distance:
PC1:1900mm
PG1:600mm

PT-32-I/S/M/L



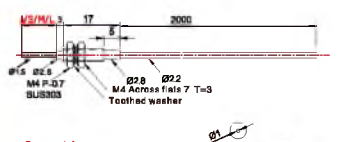
Convex tube:
L:10mm S:20mm M:40mm L:90mm
Size: M3
Minimum bending radius: R25
Sensing distance:
PC1:1900mm
PG1:700mm

PT-42



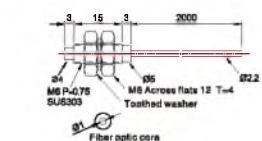
Size: M4
Minimum bending radius: R25
Sensing distance:
PC1:2200mm
PG1:600mm
(Sensing distance varies with different amplifiers)

PT-42-I/S/M/L



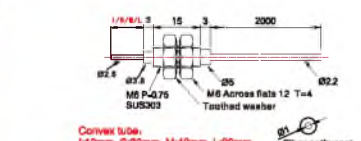
Convex tube:
L:10mm S:20mm M:40mm L:90mm
Size: M4
Minimum bending radius: R25
Sensing distance:
PC1:1800mm
PG1:400mm

PT-62



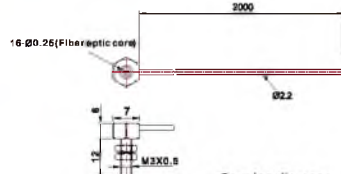
Size: M6
Minimum bending radius: R25
Sensing distance:
PC1:1400mm
PG1:600mm

PT-62-I/S/M/L



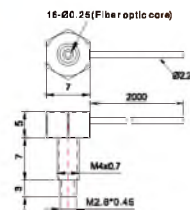
Convex tube:
L:10mm S:20mm M:40mm L:90mm
Size: M6
Minimum bending radius: R25
Sensing distance:
PC1:1400mm
PG1:600mm

PT-C32TZ



Size: M3
Minimum bending radius: R5
Sensing distance:
PC1:1300mm
PG1:600mm

PT-C42TZ

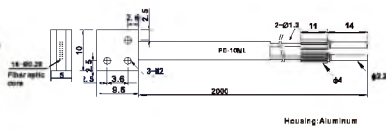


Size: M4
Minimum bending radius: R15
Sensing distance:
PC1:1500mm
PG1:600mm

*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

Diffuse reflection

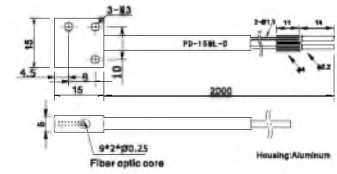
PD-10ML



Minimum bending radius: R25
Min-size Detected object: $\phi 0.05\text{mm}$

Sensing distance:
PC1:250mm
PG1:80mm

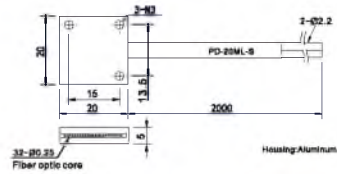
PD-15ML-D



Minimum bending radius: R25
Min-size Detected object: $\phi 0.05\text{mm}$

Sensing distance:
PC1:200mm
PG1:85mm

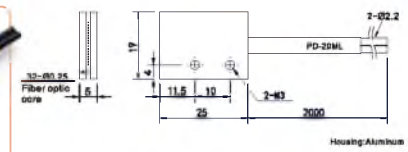
PD-20ML-S



Minimum bending radius: R25
Min-size Detected object: $\phi 0.05\text{mm}$

Sensing distance:
PC1:350mm
PG1:150mm

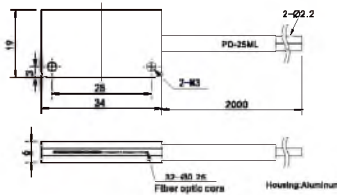
PD-20ML



Minimum bending radius: R25
Min-size Detected object: $\phi 0.05\text{mm}$

Sensing distance:
PC1:530mm
PG1:140mm

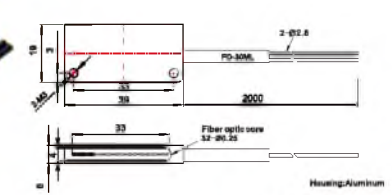
PD-25ML



Minimum bending radius: R25
Min-size Detected object: $\phi 2\text{mm}$

Sensing distance:
PC1:300mm
PG1:150mm

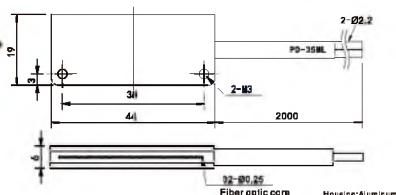
PD 30ML



Minimum bending radius: R25
Min-size Detected object: $\phi 4\text{mm}$

Sensing distance:
PC1:300mm
PG1:150mm

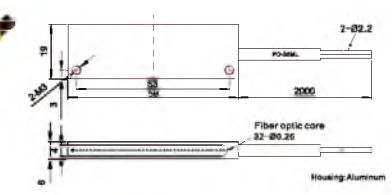
PD-35ML



Minimum bending radius: R25
Min-size Detected object: $\phi 6\text{mm}$

Sensing distance:
PC1:460mm
PG1:120mm

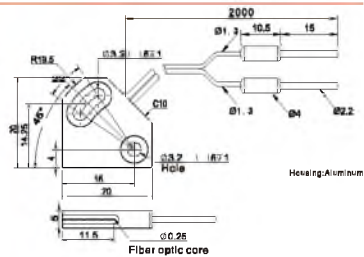
PD-50ML



Minimum bending radius: R25
Min-size Detected object: $\phi 10\text{mm}$

Sensing distance:
PC1:260mm
PG1:130mm

PD-A10



Minimum bending radius: R25
Min-size Detected object: $\phi 0.05\text{mm}$

Sensing distance:
PC1:200mm
PG1:95mm

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

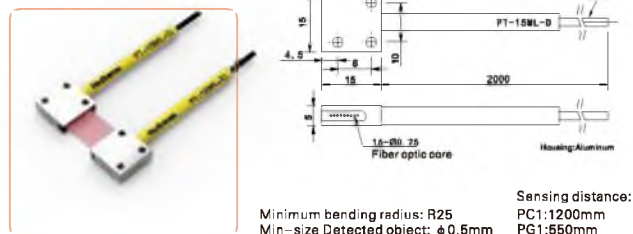
Fiber lens

Thru-beam

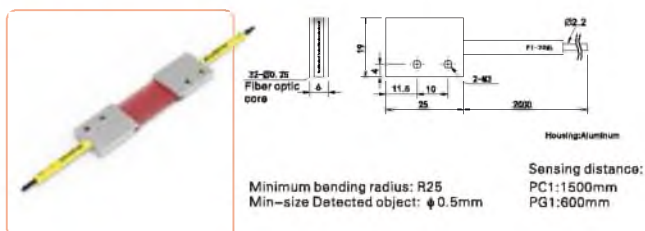
PT-10ML



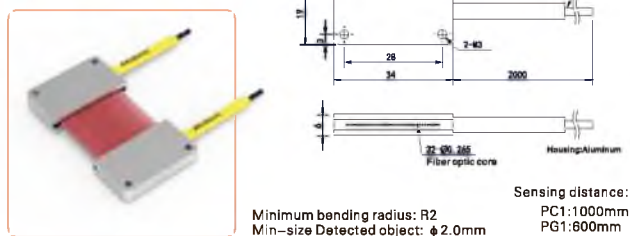
PT-15ML-D



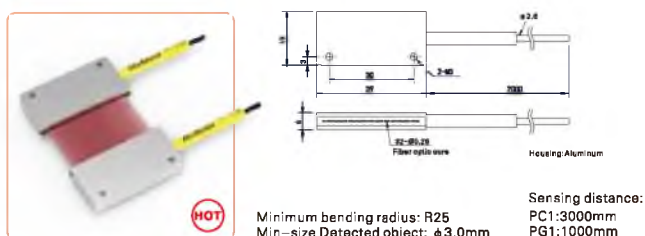
PT-20ML



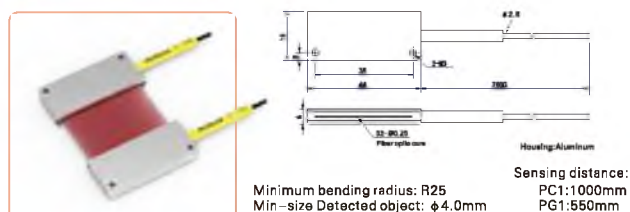
PT-25ML



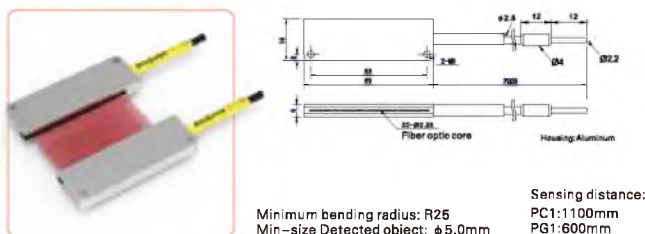
PT-30ML



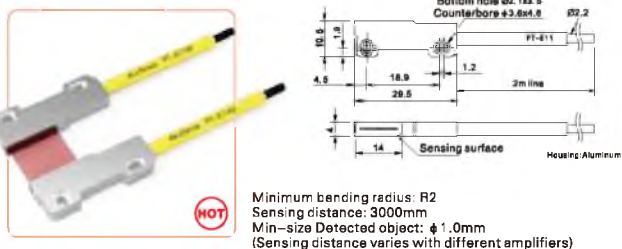
PT-35ML



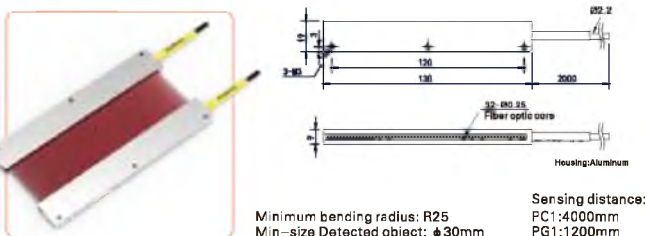
PT-50ML



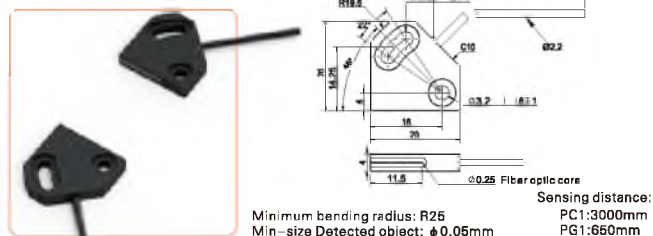
PT-E11M



PT-120ML



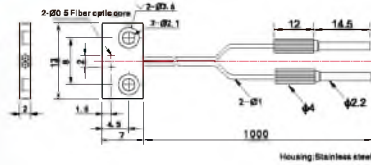
PT-A10



*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

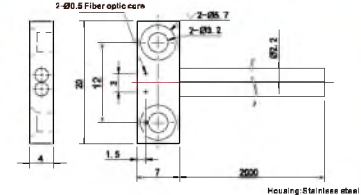
Diffuse reflection

PD-F41UA



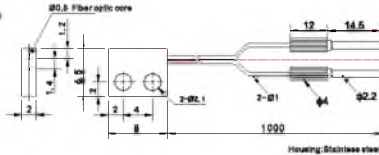
Sensing distance:
PC1:80mm
PG1:30mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PD-F42UA



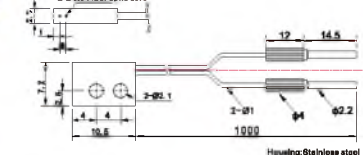
Sensing distance:
PC1:160mm
PG1:120mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PD-F44UA



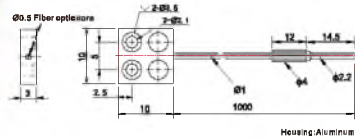
Sensing distance:
PC1:120mm
PG1:65mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PD-F47UA



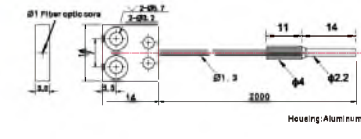
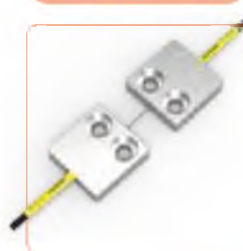
Sensing distance:
PC1:80mm
PG1:25mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PT-F51UA



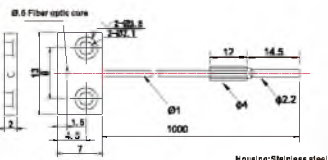
Sensing distance:
PC1:400mm
PG1:130mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PT-F52UA



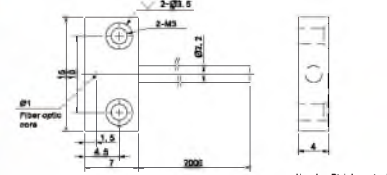
Minimum bending radius: R2
Sensing distance: 1900mm
Min-size Detected object: ϕ 0.05mm
(Sensing distance varies with different amplifiers)

PT-F53UA



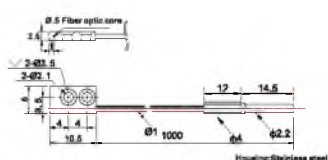
Sensing distance:
PC1:210mm
PG1:80mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PT-F54UA



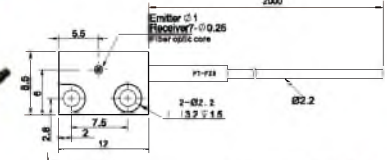
Sensing distance:
PC1:1300mm
PG1:450mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PT-F57UA



Sensing distance:
PC1:400mm
PG1:100mm
Minimum bending radius: R2
Min-size Detected object: ϕ 0.05mm

PT-FZ8



Minimum bending radius: R15
Sensing distance: 120mm
Min-size Detected object: ϕ 0.1mm
(Sensing distance varies with different amplifiers)

*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

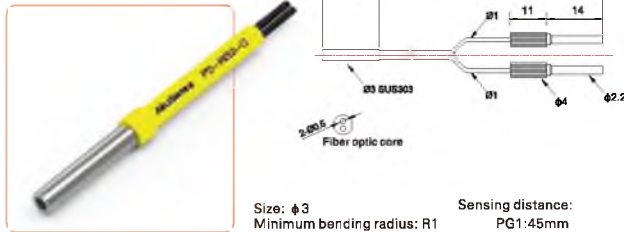
Fiber lens

PD-32-DQ

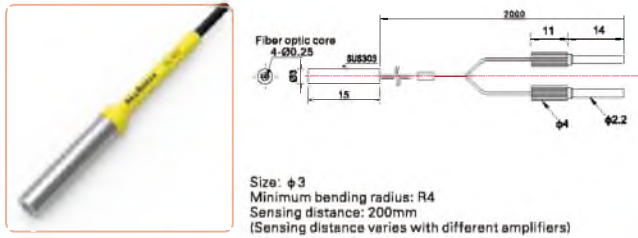
A-15 **Akusense**

Diffuse reflection

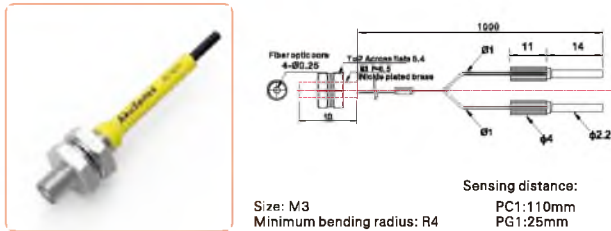
PD-W32-Q



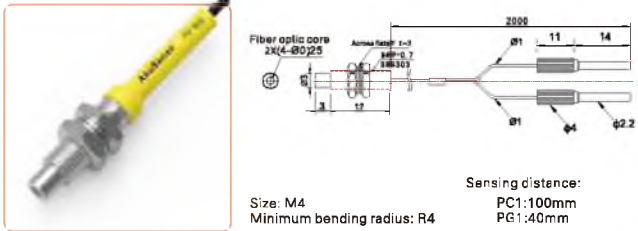
PD-W48



PD-W69Y



PD-W68

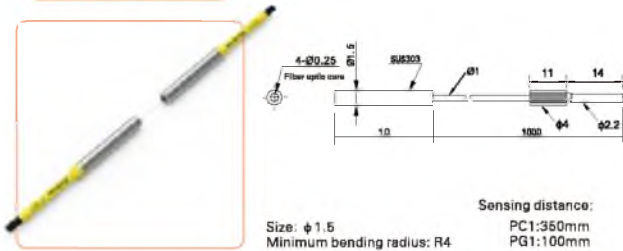


Fiber Optic

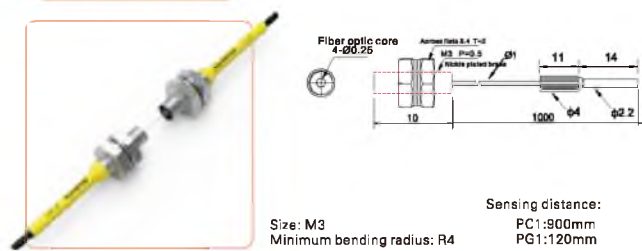
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Thru-beam

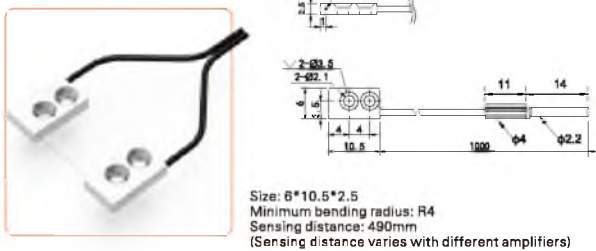
PT-W59



PT-W79



PT-W57UF



Guidance

Fiber amplifiers

- Economical
- Standard
- Ultra high speed

Fiber components

- Regular type
- Array-type
- Flat bracket type
- Side-view type
- High elastic type
- High temperature resistant
- Small spot type
- Combination type
- High end type

Fiber lens

- Fiber lens

*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

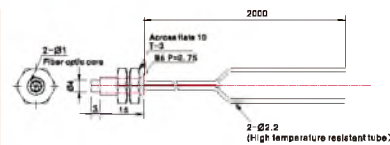
Diffuse reflection

PD-H42Y



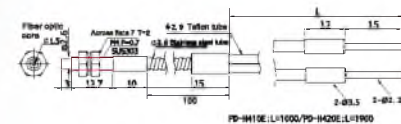
Size: M4
Max. temperature: 105°C
Sensing distance: 160mm
(Sensing distance varies with different amplifiers)

PD-H62Y



Size: M6
Max. temperature: 105°C
Sensing distance: 230mm
(Sensing distance varies with different amplifiers)

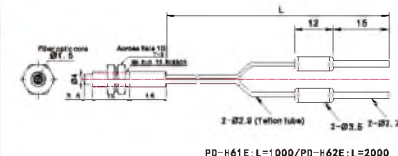
PD-H41E/H42E



Size: M4
Max. temperature: 200°C

Sensing distance:
PC1:350mm
PG1:150mm

PD-H61E/H62E



Size: M6
Max. temperature: 200°C
Sensing distance: 190mm/180mm
(Sensing distance varies with different amplifiers)

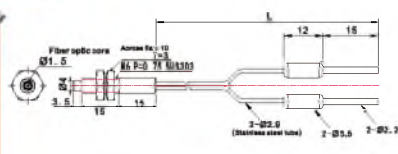
PD-H41S/H42S



Size: M4
Max. temperature: 350°C

Sensing distance:
PC1:300mm
PG1:150mm

PD-H61S/H62S

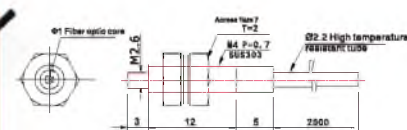


Size: M6
Max. temperature: 350°C
Sensing distance: 190mm/180mm

Sensing distance:
PG1:150mm

Thru-beam

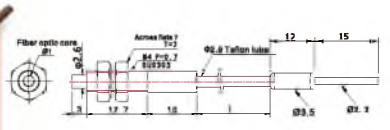
PT-H42Y



Size: M4
Max. temperature: 105°C

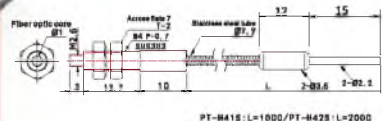
Sensing distance:
PC1:2300mm
PG1:700mm

PT-H41E/H42E



Size: M4
Max. temperature: 200°C
Sensing distance: 450mm/390mm
(Sensing distance varies with different amplifiers)

PT-H41S/H42S



Size: M4
Max. temperature: 350°C

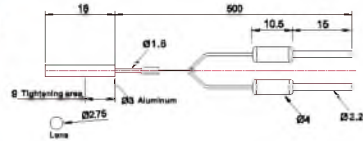
Sensing distance:
PC1:1500mm
PG1:600mm

*PG1: TEGA with a threshold setting of 200;
PC1: 7-step with a threshold setting of 200.
*Cable length listed above can be customized.

PD-X20



HOT



Size: $\phi 3$
Minimum bending radius: R25
Focal distance: 5mm

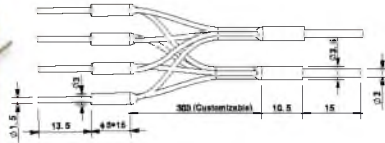
Sensing distance:
PC1:25mm
PG1:20mm

Combination type Fiber components

PD-S4Q3-30



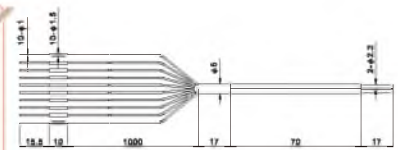
Customizable



Size: $\phi 3$
Fiber optic sensor heads: 4 Units

Sensing distance:
PC1:250mm
PG1:50mm

PD-S10Q1.5-100



Size: $\phi 1.5$
Fiber optic sensor heads: 10 Units

Sensing distance:
PC1:80mm
PG1:20mm

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

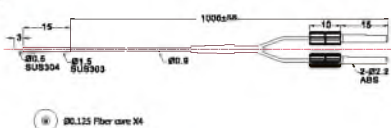
Combination type

High end type

Fiber lens

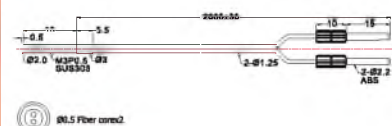
Fiber lens

PD-R15



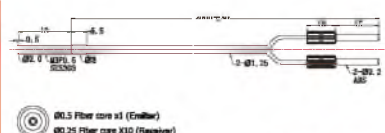
Size: $\phi 1.5$
Minimum bending radius: R10
Sensing distance: 4.8mm
(Sensing distance varies with different amplifiers)

PD-R32



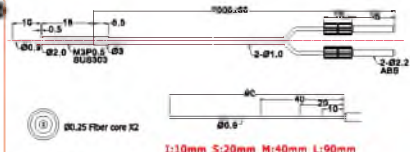
Size: M3
Minimum bending radius: R15

Sensing distance:
PC1:240mm

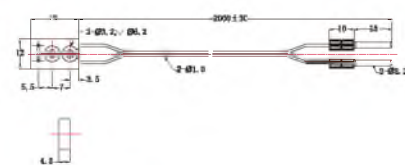


Size: M3
Minimum bending radius: R15

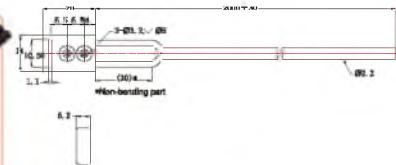
Sensing distance:
PC1:250mm
PG1:75mm



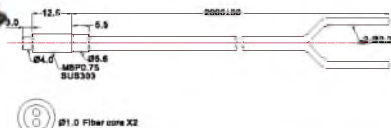
Size: M3
Minimum bending radius: R15
Sensing distance: 10mm
(Sensing distance varies with different amplifiers)



Minimum bending radius: R10
Sensing distance: 0-4mm
(Sensing distance varies with different amplifiers)

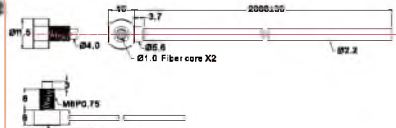


Minimum bending radius: R25
Sensing distance: 8–32mm
(Sensing distance varies with different amplifiers)



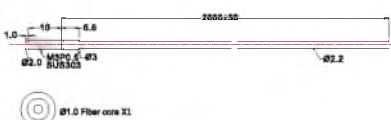
Size: M6
Minimum bending radius: R25

Sensing distance:
PC1:400mm
PG1:180mm



Size: M6
Minimum bending radius: R2
Sensing distance: 140mm
(Sensing distance varies with different amplifiers)

PT-R32

A sleek, silver and black PT-R32 ballpoint pen, shown diagonally.

Size: M3
Minimum bending radius: R25
Sensing distance: 1000mm
(Sensing distance varies with different amplifiers)



Size: M4
Minimum bending radius: R25

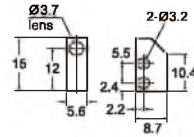
Sensing distance:
PC1:2200mm
PG1:500mm

Diffuse reflection

PF-5D



Housing: aluminum
Lens: glass

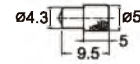


Diameter of beam: $\phi 0.5 \sim 3$
Suit to M3 diameter fiber optic sensor
Focal distance: 8~30mm

PF-3D



Housing: aluminum
Lens: plastic

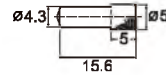


Size of pointed end: $\phi 4.3$
Diameter of beam: Approx. $\phi 4$ (Sensing distance: 0~20mm)
Suit to M3 diameter fiber optic sensor

PF-2D



Housing: aluminum
Lens: plastic



Size of pointed end: $\phi 4.3$
Diameter of beam: Approx. $\phi 0.4$
Suit to M3 diameter fiber optic sensor
Focal distance: 7 ± 2 mm

PF-4D



Housing: aluminum
Lens: glass

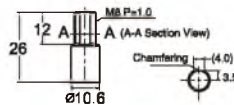


Size of pointed end: $\phi 7.4$
Diameter of beam: Approx. $\phi 0.5$
Suit to M3 diameter fiber optic sensor
Focal distance: 15 ± 2 mm

PF-6D



Housing: aluminum
Lens: glass



Size of pointed end: $\phi 10.6$
Diameter of beam: Approx. $\phi 2.0$
Suit to M3 diameter fiber optic sensor
Focal distance: 35 ± 2 mm

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

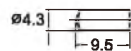
Guidance

Thru-beam

PF-4T



Housing: aluminum
Lens: glass



Size of pointed end: $\phi 4.3$
Suit to M2.6 diameter fiber optic sensor
Max. sensing distance: 3600mm

PF-2T



Housing: nickel plated brass
Lens: glass

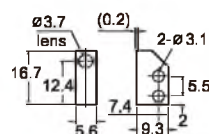


Size of pointed end: $\phi 4$
Suit to M2.6 diameter fiber optic sensor
Max. sensing distance: 3600mm

PF-5T



Housing: aluminum
Lens: glass

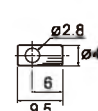


Suit to M2.6 diameter fiber optic sensor
Max. sensing distance: 3600mm

PF-1T



Housing: nickel plated brass
Lens: acrylic



Size of pointed end: $\phi 4$
Suit to M2.6 diameter fiber optic sensor
Max. sensing distance: 3600mm

Fiber amplifiers

Economical

Standard

Ultra high speed

Fiber components

Regular type

Array-type

Flat bracket type

Side-view type

High flexible type

High temperature resistant

Small spot type

Combination type

High end type

Fiber lens

Fiber lens

Communication And Connection

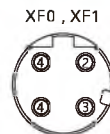


- Rich communication interfaces, plug-and-play capability, rapid configuration.
- Data visualization, proactive maintenance.

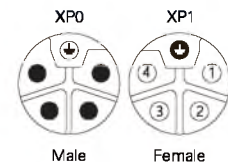


NEW!

Basic parameters	Shell material	Aluminum alloy	
	Shell color	Metallic silver	
	Protect degree	IP67, Epoxy encapsulation	
	External dimensions	205mm × 60mm × 34.4mm	
	Weight	515g	
	Operating temperature	-25°C~70°C	
	Storage/transport temperature	-40°C~85°C	
	Operating humidity	5%~95%	
	Storage/transport humidity	5%~95%	
	Operating atmospheric pressure	80KPa~106KPa	
	Storage/transport atmospheric pressure	80KPa~106KPa	
	I/O port fastening torque	M12:0.5Nm	
	Application environment	Compliant with EN-61131	
	Vibration testing	Compliant with IEC60068-2	
	Shock testing	Compliant with IEC60068-27	
	Free fall testing	Compliant with IEC60068-32	
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4	
	Certification	CE,RoHS	
	Installation hole specifications	Φ4.5mm × 1 ; Φ5.5mm × 1	
Pinout definition for data port	M12 D-code Female end	Connection method	2 × M12 D-code; 4-pin socket
		Physical layer	Ethernet
		Transmission speed	10/100 Mbps, Full duplex
		Characteristics	Compliant with protocol specifications
		Alarm function	Diagnosis alarm, process alarm
		Minimum cycle time	1 ms
		Communication port fastening torque	M12:0.5Nm
Pinout definition for auxiliary power supply port	Auxiliary power supply port	Power supply connection method	M12, 5-pin, L-code, male/female
		System power supply voltage us	18~30 VDC(type.24VDC)
		Auxiliary power supply voltage ua	18~30 VDC(type.24VDC)
	M12 L-code Female end & Male end	Total current Is	12A
		Total current Ia	12A
		Static operating current Ic	≤150mA
	Pinout definition	Reverse power protection	Have
		Power port fastening torque	M12:0.5Nm



1. TX+
2. RX+
3. TX-
4. RX-



- Male Female
1. +24V_Us
 2. GND_Ua
 3. GND_Us
 4. +24V_Ua
 5. FE

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

Module main station

CIO 200 Series

IO-Link Master station parameters	The number of ports on the master station	Maximum configurable 8 ports						
	Master station connection method	M12, 5-pin, A-code, female						
	IO-link Version	V1.1.2						
	Communication rate	COM1:4.8KBps;COM2:38.4KBps;COM3:230.4KBps						
	Port voltage L+	type.24VDC (via US)						
	Port current L+	2A(via US)						
	Class A	8 ports, X1~X8						
	Master-slave communication distance	≤20m						
	Master-master communication distance	≤100m						
Digital input Output parameters	Number of inputs	8-channel, adaptive						
	Input port location	X1~X8						
	Input polarity	PNP						
	Signal "0" voltage	-0.3~5VDC						
	Signal "1" voltage	12~30VDC						
	Input current	type.5mA(via US)						
	Number of outputs	8-channel, adaptive						
	Output port location	X1~X8						
	Input polarity	PNP						
	Output current	Single channel 2A (via UA)						
Port protection	Power supply short-circuit protection, overload protection for power supply port							
Module indicator lights	PWR	Module power normal						
		Red: Module power reverse connection						
	I/O	Green: Channel signal normal						
		Red: Port power short-circuit						
	LINK	Green: Connection normal						
		Yellow flashing: Connection normal, data communication normal						
		Off: No connection established						
		RUN	Green: OP status		SF	Red: module failure	MS	Green: Module status is normal
			Green slow flashing: SAFEOP status					Green flash: module is not configured
			Green fast flashing: Pre-OP status		BF	Red: internal error	NS	Red: module failure
			Off: Init status					Flashing red: Device name/IP address/module group status error	Green: The network status is normal
		ERR	Red flashing: Communication error		Green flash: communication not established			
			Off: module status is normal		Flashing red: communication interrupted			
	IO-LINK	Green: Port operation (running) status						
		Flashing green quickly: port connection process or wrong device						
		Flashing green slowly: The port is in pre-operation state						
		Green off: port is closed						
	Protocol	EtherCat Protocol		ProfiNet Protocol		EtherNet/IP Protocol		
	Model	CIO200-ECIO-8A		CIO200-PNIO-8A		CIO200-EIIO-8A		

I/O Port pin definition

Pin definition		Address distribution																		
Port	M12(X1~X8)  Class A 1. V+ 2. In/Output 3. 0 V 4. C/Q 5. N/C	<table><tr><th>Byte</th><th>0</th></tr><tr><td>Bit0</td><td>X1P2</td></tr><tr><td>Bit1</td><td>X2P2</td></tr><tr><td>Bit2</td><td>X3P2</td></tr><tr><td>Bit3</td><td>X4P2</td></tr><tr><td>Bit4</td><td>X5P2</td></tr><tr><td>Bit5</td><td>X6P2</td></tr><tr><td>Bit6</td><td>X7P2</td></tr><tr><td>Bit7</td><td>X8P2</td></tr></table>	Byte	0	Bit0	X1P2	Bit1	X2P2	Bit2	X3P2	Bit3	X4P2	Bit4	X5P2	Bit5	X6P2	Bit6	X7P2	Bit7	X8P2
Byte	0																			
Bit0	X1P2																			
Bit1	X2P2																			
Bit2	X3P2																			
Bit3	X4P2																			
Bit4	X5P2																			
Bit5	X6P2																			
Bit6	X7P2																			
Bit7	X8P2																			
M12																				
A-code																				
female end																				

CIO 200 Series

IO-Link Master station parameters	The number of ports on the master station	Maximum configurable 8 ports					
	Master station connection method	M12, 5-pin, A-code, female					
	IO-link Version	V1.1.2					
	Communication rate	COM1:4.8KBps;COM2:38.4KBps;COM3:230.4KBps					
	Port voltage L+	type.24VDC (via US)					
	Port current L+	2A(via US)					
	Class B auxiliary voltage	type.24VDC(via UA)					
	Class B auxiliary current	2A(via UA)					
	Class A	4 ports, X1~X4					
	Class B	4 ports, X5~X8					
	Master-slave communication distance	≤20m					
	Master-master communication distance	≤100m					
	Digital Input Output parameters	Number of inputs	4-channel, adaptive				
Input port location		X1~X4					
Input polarity		PNP					
Signal "0" voltage		-0.3~5VDC					
Signal "1" voltage		12~30VDC					
Input current		type.5mA(via US)					
Number of outputs		4-channel, adaptive					
Output port location		X1~X4					
Input polarity		PNP					
Output current		Single channel 2A (via UA)					
Port protection		Power supply short-circuit protection, overload protection for power supply port					
Module indicator lights	PWR	Module power normal					
		Red: Module power reverse connection					
	I/O	Green: Channel signal normal					
		Red: Port power short-circuit					
	LINK	Green: Connection normal					
		Yellow flashing: Connection normal, data communication normal					
		Off: No connection established					
	RUN	Green: OP status Green slow flashing: SAFEOP status Green fast flashing: Pre-OP status Off: Init status	SF	Red: module failure		MS	Green: Module status is normal
				Red: internal error			Green flash: module is not configured
			BF	Flashing red: Device name/IP address/module group status error		NS	Red: module failure
							Green: The network status is normal
		ERR	Red flashing: Communication error			Green flash: communication not established	
			Off: module status is normal			Flashing red: communication interrupted	
	IO-LINK	Green: Port operation (running) status					
		Flashing green quickly: port connection process or wrong device					
		Flashing green slowly: The port is in pre-operation state					
		Green off: port is closed					
	Protocol	EtherCat Protocol		ProfiNet Protocol		EtherNet/IP Protocol	
Model	CIO200-ECIO-4A4B		CIO200-PNIO-4A4B		CIO200-EIIO-4A4B		

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

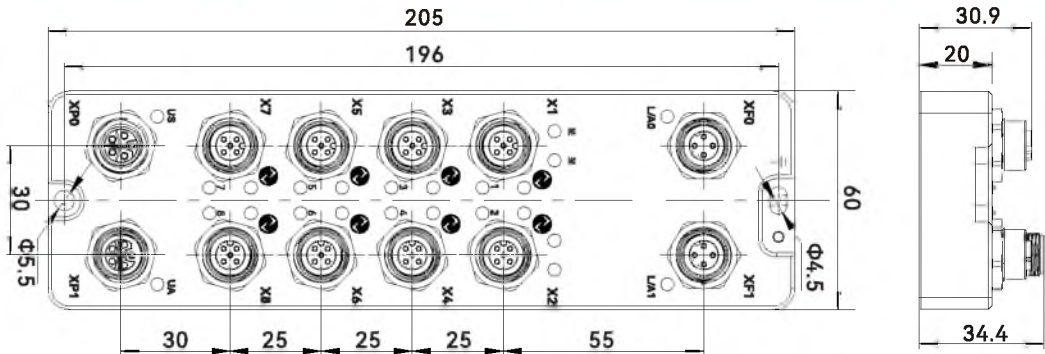
I/O Port pin definition

Pin definition		Address distribution										
Port	M12(X1~X8) 	<table><tr><th>Byte</th><th>0</th></tr><tr><td>Bit0</td><td>X1P2</td></tr><tr><td>Bit1</td><td>X2P2</td></tr><tr><td>Bit2</td><td>X3P2</td></tr><tr><td>Bit3</td><td>X4P2</td></tr></table>	Byte	0	Bit0	X1P2	Bit1	X2P2	Bit2	X3P2	Bit3	X4P2
	Byte	0										
Bit0	X1P2											
Bit1	X2P2											
Bit2	X3P2											
Bit3	X4P2											
M12	Class A 1. V+ 2. In/Output 3. 0V 4. C/Q 5 N/C	Class B 1. V+ 2. P24V 3. 0V 4. C/Q 5 N24V										
A-code												
female end												

Module main station

Dimensions

Unit: mm



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety door lock
- Pressure Switch
- Communication
- Accessories

IO Bus

- Module main station
- Module Slave

- Controller & Communicator
- Controller
- Communicator



Basic parameters	Shell material	PA6 + GF
	Shell color	Black
	Ptotect degree	IP67 , Epoxy full potting
	External dimensions	155mm × 53mm ×28.7mm
	Weight	217g
	Operating temperature	-25℃~70℃
	Storage/transport temperature	-40℃~85℃
	Operating humidity	5%~95%
	Storage/transport humidity	5%~95%
	Operating atmospheric pressure	80KPa~106KPa
	Storage/transport atmospheric pressure	80KPa~106KPa
	I/O port fastening torque	M12:0.5Nm
	Application environment	Compliant with EN-61131
	Vibration testing	Compliant with IEC60068-2
	Shock testing	Compliant with IEC60068-27
	Free fall testing	Compliant with IEC60068-32
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4
	Certification	CE,RoHS
	Installation hole specifications	Φ4.3mm × 4
Pinout definition for data port	IO-Link	IO-Link M12 MALE
	Pinout definition for port	 1. V+ 2. P24V 3. 0V 4. C/Q 5. N/C

- Fiber Optic
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- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

- IO Bus
- Module main station
- Module Slave
- Controller & Communicator
- Controller
- Communicator

Module slave

CIO 100 Series

IO-Link Master station Parameters	IO-Link Number of ports	1 × device	
	IO-Link Handle data length	2 input bytes	2 Output bytes
	Minimum cycle time	3 ms	
Input/Output parameters	Input and output quantity	16 inputs	16 inputs
	Rated working voltage	18~30V DC	
	Maximum load current (sensor)	200 mA	–
	Maximum load current (actuator)	–	500 mA
	Total current UI	< 1.6A	–
	Total current UO	–	< 2.5A
Module indicator lights	IO-LINK RUN	Green: No communication connection	
		Green flash: communication is normal	
		Red: communication interrupted	
	PWR	Green: module power supply is normal	
		Off: module power is not connected	Yellow: Auxiliary power is not connected
	I/O	Green: Channel signal is normal	
		Red: Port failure	
	IO-Link	Class A	
Model	PNP	CIO100-M12-DI16P	CIO100-M12-DO16P
	NPN	CIO100-M12-DI16N	CIO100-M12-DO16N

I/O Port pin definition

	Pin definition	Address distribution																											
Port	M12(J1~J8) 	<table><tr><th>Byte</th><th>1</th><th>0</th></tr><tr><td>Bit0</td><td>J1 P4</td><td>J5 P4</td></tr><tr><td>Bit1</td><td>J1 P2</td><td>J5 P2</td></tr><tr><td>Bit2</td><td>J2 P4</td><td>J6 P4</td></tr><tr><td>Bit3</td><td>J2 P2</td><td>J6 P2</td></tr><tr><td>Bit4</td><td>J3 P4</td><td>J7 P4</td></tr><tr><td>Bit5</td><td>J3 P2</td><td>J7 P2</td></tr><tr><td>Bit6</td><td>J4 P4</td><td>J8 P4</td></tr><tr><td>Bit7</td><td>J4 P2</td><td>J8 P2</td></tr></table>	Byte	1	0	Bit0	J1 P4	J5 P4	Bit1	J1 P2	J5 P2	Bit2	J2 P4	J6 P4	Bit3	J2 P2	J6 P2	Bit4	J3 P4	J7 P4	Bit5	J3 P2	J7 P2	Bit6	J4 P4	J8 P4	Bit7	J4 P2	J8 P2
Byte	1	0																											
Bit0	J1 P4	J5 P4																											
Bit1	J1 P2	J5 P2																											
Bit2	J2 P4	J6 P4																											
Bit3	J2 P2	J6 P2																											
Bit4	J3 P4	J7 P4																											
Bit5	J3 P2	J7 P2																											
Bit6	J4 P4	J8 P4																											
Bit7	J4 P2	J8 P2																											
M12 A-code female end	<table><tr><td>PNP</td><td>NPN</td></tr><tr><td>Input</td><td>Input</td></tr><tr><td>1.24VDC+</td><td>1.24VDC+</td></tr><tr><td>2. Input</td><td>2. Input</td></tr><tr><td>3.0V</td><td>3.0V</td></tr><tr><td>4. Input</td><td>4. Input</td></tr><tr><td>5.FE</td><td>5.FE</td></tr></table>	PNP	NPN	Input	Input	1.24VDC+	1.24VDC+	2. Input	2. Input	3.0V	3.0V	4. Input	4. Input	5.FE	5.FE														
PNP	NPN																												
Input	Input																												
1.24VDC+	1.24VDC+																												
2. Input	2. Input																												
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Port	M12(J1~J8) 	<table><tr><th>Byte</th><th>1</th><th>0</th></tr><tr><td>Bit0</td><td>J1 P4</td><td>J5 P4</td></tr><tr><td>Bit1</td><td>J1 P2</td><td>J5 P2</td></tr><tr><td>Bit2</td><td>J2 P4</td><td>J6 P4</td></tr><tr><td>Bit3</td><td>J2 P2</td><td>J6 P2</td></tr><tr><td>Bit4</td><td>J3 P4</td><td>J7 P4</td></tr><tr><td>Bit5</td><td>J3 P2</td><td>J7 P2</td></tr><tr><td>Bit6</td><td>J4 P4</td><td>J8 P4</td></tr><tr><td>Bit7</td><td>J4 P2</td><td>J8 P2</td></tr></table>	Byte	1	0	Bit0	J1 P4	J5 P4	Bit1	J1 P2	J5 P2	Bit2	J2 P4	J6 P4	Bit3	J2 P2	J6 P2	Bit4	J3 P4	J7 P4	Bit5	J3 P2	J7 P2	Bit6	J4 P4	J8 P4	Bit7	J4 P2	J8 P2
Byte	1	0																											
Bit0	J1 P4	J5 P4																											
Bit1	J1 P2	J5 P2																											
Bit2	J2 P4	J6 P4																											
Bit3	J2 P2	J6 P2																											
Bit4	J3 P4	J7 P4																											
Bit5	J3 P2	J7 P2																											
Bit6	J4 P4	J8 P4																											
Bit7	J4 P2	J8 P2																											
M12 A-code female end	<table><tr><td>PNP</td><td>NPN</td></tr><tr><td>Output</td><td>Output</td></tr><tr><td>1.N/C</td><td>1.24VDC+</td></tr><tr><td>2. Output</td><td>2. Output</td></tr><tr><td>3.0V</td><td>3.N/C</td></tr><tr><td>4. Output</td><td>4. Output</td></tr><tr><td>5.FE</td><td>5.FE</td></tr></table>	PNP	NPN	Output	Output	1.N/C	1.24VDC+	2. Output	2. Output	3.0V	3.N/C	4. Output	4. Output	5.FE	5.FE														
PNP	NPN																												
Output	Output																												
1.N/C	1.24VDC+																												
2. Output	2. Output																												
3.0V	3.N/C																												
4. Output	4. Output																												
5.FE	5.FE																												

Master station parameters	IO-Link Number of ports	1 × device	
	IO-Link Handle data length	2 input bytes; 2 output bytes	1 input byte; 1 output byte
	Minimum cycle time	3 ms	
Input/Output parameters	Input and output quantity	16-way adaptive	8 inputs 8 outputs
	Rated working voltage	18~30V DC	
	Maximum load current (sensor)	200 mA	
	Maximum load current (actuator)	500 mA	
	Total current UI	< 1.6A	
	Total current UO	< 2.5A	
Module indicator lights	IO-LINK RUN	Green: No communication connection	
		Green flash: communication is normal	
		Red: communication interrupted	
	PWR	Green: module power supply is normal	
		Yellow: Auxiliary power is not connected	
	I/O	Green: Channel signal is normal	
		Red: Port failure	
Model	IO-Link	Class A	
	PNP	CIO100-M12-DIO16P	CIO100-M12-DI8DO8P
	NPN	CIO100-M12-DIO16N	CIO100-M12-DI8DO8N

Fiber Optic

Slot Sensors

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AI Image

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Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

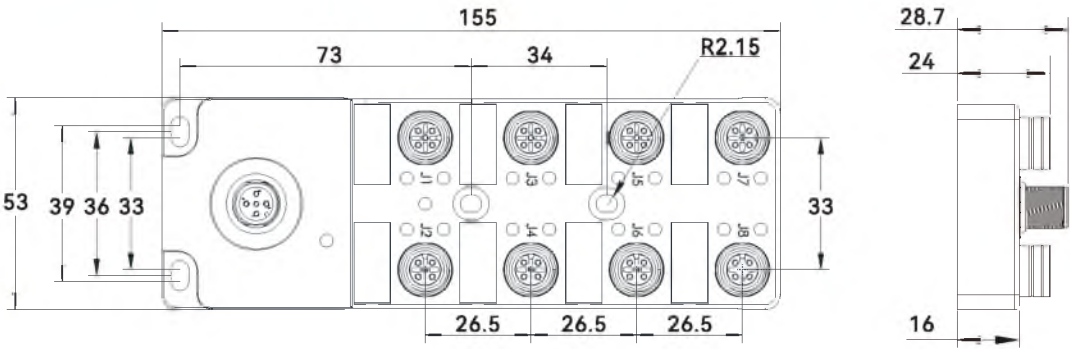
I/O Port pin definition

	Pin definition	Address distribution																																				
Port	M12(J1~J8)  PNP Input/Output 1. 24VDC+ 2. Input/Output 3. 0V 4. Input/Output 5. FE NPN Input/Output 1. 24VDC+ 2. Input/Output 3. 0V 4. Input/Output 5. FE	<table><tr><th>Byte</th><th>1</th><th>0</th></tr><tr><td>Bit0</td><td>J1P4</td><td>J5P4</td></tr><tr><td>Bit1</td><td>J1P2</td><td>J5P2</td></tr><tr><td>Bit2</td><td>J2P4</td><td>J6P4</td></tr><tr><td>Bit3</td><td>J2P2</td><td>J6P2</td></tr><tr><td>Bit4</td><td>J3P4</td><td>J7P4</td></tr><tr><td>Bit5</td><td>J3P2</td><td>J7P2</td></tr><tr><td>Bit6</td><td>J4P4</td><td>J8P4</td></tr><tr><td>Bit7</td><td>J4P2</td><td>J8P2</td></tr></table>	Byte	1	0	Bit0	J1P4	J5P4	Bit1	J1P2	J5P2	Bit2	J2P4	J6P4	Bit3	J2P2	J6P2	Bit4	J3P4	J7P4	Bit5	J3P2	J7P2	Bit6	J4P4	J8P4	Bit7	J4P2	J8P2									
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M12 A-code female end																																						
Port	M12(J1~J8)  PNP Input 1. 24VDC+ 2. Input 3. 0V 4. Input 5. FE Output 1. N/C 2. Output 3. 0V 4. Output 5. FE NPN Input 1. 24VDC+ 2. Input 3. 0V 4. Input 5. FE Output 1. 24VDC+ 2. Output 3. N/C 4. Output 5. FE	<table><tr><th>Byte</th><th>1</th><th>Byte</th><th>0</th></tr><tr><td>Bit0</td><td>J1P4</td><td>Bit0</td><td>J5P4</td></tr><tr><td>Bit1</td><td>J1P2</td><td>Bit1</td><td>J5P2</td></tr><tr><td>Bit2</td><td>J2P4</td><td>Bit2</td><td>J6P4</td></tr><tr><td>Bit3</td><td>J2P2</td><td>Bit3</td><td>J6P2</td></tr><tr><td>Bit4</td><td>J3P4</td><td>Bit4</td><td>J7P4</td></tr><tr><td>Bit5</td><td>J3P2</td><td>Bit5</td><td>J7P2</td></tr><tr><td>Bit6</td><td>J4P4</td><td>Bit6</td><td>J8P4</td></tr><tr><td>Bit7</td><td>J4P2</td><td>Bit7</td><td>J8P2</td></tr></table>	Byte	1	Byte	0	Bit0	J1P4	Bit0	J5P4	Bit1	J1P2	Bit1	J5P2	Bit2	J2P4	Bit2	J6P4	Bit3	J2P2	Bit3	J6P2	Bit4	J3P4	Bit4	J7P4	Bit5	J3P2	Bit5	J7P2	Bit6	J4P4	Bit6	J8P4	Bit7	J4P2	Bit7	J8P2
Byte	1	Byte	0																																			
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Bit7	J4P2	Bit7	J8P2																																			
M12 A-code female end																																						

Module slave

Dimensions

Unit: mm



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety door lock
Pressure Switch
Communication
Accessories
IO Bus
Module main station
Module Slave
Controller & Communicator
Controller
Communicator



Basic parameters	Shell material	PA6 + GF
	Shell color	Black
	Protect degree	IP67 , Epoxy full potting
	External dimensions	140mm × 30mm × 24.8mm
	Weight	180g
	Operating temperature	-25℃~70℃
	Storage/transport temperature	-40℃~85℃
	Operating humidity	5%~95%
	Storage/transport humidity	5%~95%
	Operating atmospheric pressure	80KPa~106KPa
	Storage/transport atmospheric pressure	80KPa~106KPa
	I/O port fastening torque	M12:0.5Nm
	Application environment	Compliant with EN-61131
	Vibration testing	Compliant with IEC60068-2
	Shock testing	Compliant with IEC60068-27
	Free fall testing	Compliant with IEC60068-32
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4
	Certification	CE,RoHS
	Installation hole specifications	Φ4.3mm × 2
Pinout definition for data port	IO-Link	IO-Link M12 MALE
	Pinout definition for port	 1. V+ 2. P24V 3. 0V 4. C/Q 5. N/C

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Pressure Switch
Communication
Accessories

IO Bus
Module main station
Module Slave

Controller & Communicator
Controller
Communicator

Module slave

CIO 100 Series

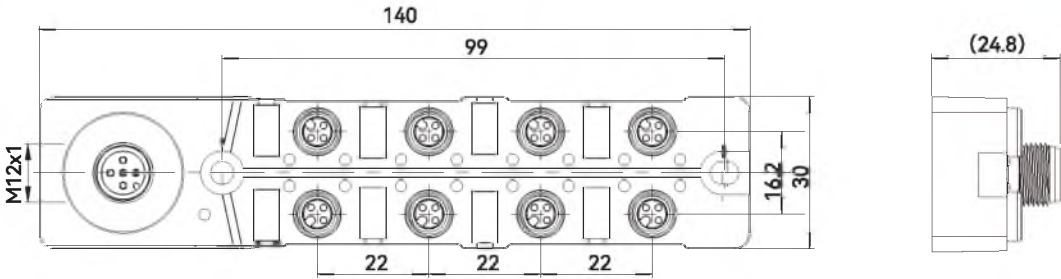
IO-Link Master station Parameters	IO-Link Number of ports	1 x device	
	IO-Link Handle data length	1 input byte	1 output byte
	Minimum cycle time	3 ms	
Input/Output parameters	Input and output quantity	8 inputs	8 outputs
	Rated working voltage	18~30V DC	
	Maximum load current (sensor)	200 mA	—
	Maximum load current (actuator)	—	500 mA
	Total current UI	< 1.6A	—
	Total current UO	—	< 2.5A
Module indicator lights	IO-LINK RUN	Green: No communication connection	
		Green flash: communication is normal	
		Red: communication interrupted	
	I/O	Green: Channel signal is normal	
		Red: Port failure	
	IO-Link	Class A	
Model	PNP	CIO100-M08-DI8P	CIO100-M08-DO8P
	NPN	CIO100-M08-DI8N	CIO100-M08-DO8N

I/O Port pin definition

Pin definition		Address distribution																		
Port	M8(J1~J8) 	<table><tr><th>Byte</th><th>1</th></tr><tr><td>Bit0</td><td>J1P4</td></tr><tr><td>Bit1</td><td>J2P4</td></tr><tr><td>Bit2</td><td>J3P4</td></tr><tr><td>Bit3</td><td>J4P4</td></tr><tr><td>Bit4</td><td>J5P4</td></tr><tr><td>Bit5</td><td>J6P4</td></tr><tr><td>Bit6</td><td>J7P4</td></tr><tr><td>Bit7</td><td>J8P4</td></tr></table>	Byte	1	Bit0	J1P4	Bit1	J2P4	Bit2	J3P4	Bit3	J4P4	Bit4	J5P4	Bit5	J6P4	Bit6	J7P4	Bit7	J8P4
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M12 A-code female end	PNP Input 1. 24 VDC+ 4. Input 3. 0 V NPN Input 1. 24 VDC+ 4. Input 3. 0 V																			
Port	M8(J1~J8) 	<table><tr><th>Byte</th><th>1</th></tr><tr><td>Bit0</td><td>J1P4</td></tr><tr><td>Bit1</td><td>J2P4</td></tr><tr><td>Bit2</td><td>J3P4</td></tr><tr><td>Bit3</td><td>J4P4</td></tr><tr><td>Bit4</td><td>J5P4</td></tr><tr><td>Bit5</td><td>J6P4</td></tr><tr><td>Bit6</td><td>J7P4</td></tr><tr><td>Bit7</td><td>J8P4</td></tr></table>	Byte	1	Bit0	J1P4	Bit1	J2P4	Bit2	J3P4	Bit3	J4P4	Bit4	J5P4	Bit5	J6P4	Bit6	J7P4	Bit7	J8P4
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M12 A-code female end	PNP Output 1. N/C 4. Output 3. 0 V NPN Output 1. 24VDC+ 4. Output 3. N/C																			

Unit: mm

Dimensions



Fiber Optic

Slot Sensors

Photoelectric

Laser

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AI Image

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Vibration

Temperature

RFID

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Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

Controller

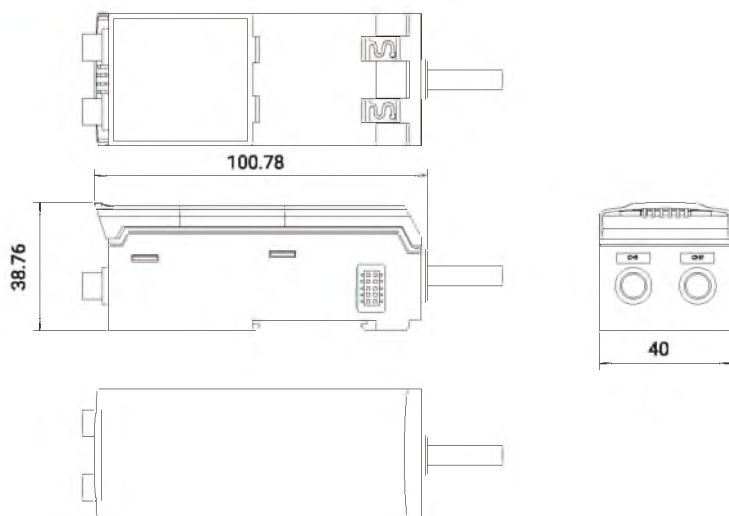
CR-M02



Installation method	DIN rail installation
Operating voltage	+24VDC±10%
Current consumption of a single controller	Under 100mA(When connecting the sensor)
Number of connected sensors	Two pairs of sensors
The communication with sensors	RS485
Number of controllers connected in parallel	Up to 16 controllers can be connected
Display	240*240TFT display
Indicator light	Output 1~3 and function indicator light red
Analog output	Analog output current 4~20mA, voltage 0~5V can be switched
Switching output	3-channel output, NO, NC, PO, PC can be switched
External input	3-channel input, NPN and PNP input optional
Display resolution	1μm
Display range	-99.999mm~99.999mm
Protective structure	IP40
Operating temperature	10°C~+50°C
Working humidity	35%RH~85%RH
Insulation resistance	The resistance of all connecting terminals and shells is above 20MΩ
Withstand voltage	All connection terminals and housing withstand voltage AC 1000V
Vibration resistance	Frequency 10~55HZ, 1.5m double amplitude, two hours each in X, Y and Z directions
Shock proof	98m/s ² (about 10G) 5 times each in X, Y, and Z directions
Model	CR-M02

Dimensions

Unit: mm





NEW!

	Installation method	DIN rail installation		
	Operating voltage	24V DC(10~30V DC)		
	Indicator light	PWR: Power indicator/green RUN: running indicator light/green ERR: Error indicator/red Sensor communication indicator light: red light (RTU communication abnormality) Ethernet port: (green) D-BUS: RTU Communication normal/green light Ethernet port(green): RTU communication abnormality/traffic light alternation of some slave stations No RTU communication activity/off The Ethernet port has established a valid network connection/on. The Ethernet port is in network activity/blinks. The Ethernet port does not establish a network connection or the port is abnormal/off.		
	100M Ethernet port	10/100Base-T (X) RJ45, automatic flow control, full and half-duplex mode, MDI/MDI-X automatic detection		
	Burning port	The software programming port uses 8-bit terminal blocks with a pitch of 2.0mm, occupying 2-5 positions from the left		
	Console port	The CLI command management port uses 8-position terminal blocks with a spacing of 2.0mm, occupying 6-8 positions from the left		
	RS-485 serial port	Supports 2 RS-485 serial ports, one of which is reserved, using 10-bit terminal blocks with a spacing of 2.0mm, and the serial port occupies 4 bits		
	Reset button	Reset button		
	Access terminal,load power consumption at normal temperature	10-position terminal block with a pitch of 2.0mm, 2 positions for power supply, 0.7w@10VDC 0.7w@20VDC 0.7w@30VDC		
	Full-load power consumption at normal temperature	0.7w@10VDC 0.7w@20VDC 0.7w@30VDC		
	High temperature full load power consumption	0.8w@10VDC 0.8w@20VDC 0.8w@30VDC		
	Operating temperature	-40℃~75℃		
	Storage temperature	-40℃~85℃		
	Working humidity	5%~95% (No condensation)		
	Model	CTM01-EC		

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

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Ultrasonic

AI Image

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Safety door lock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

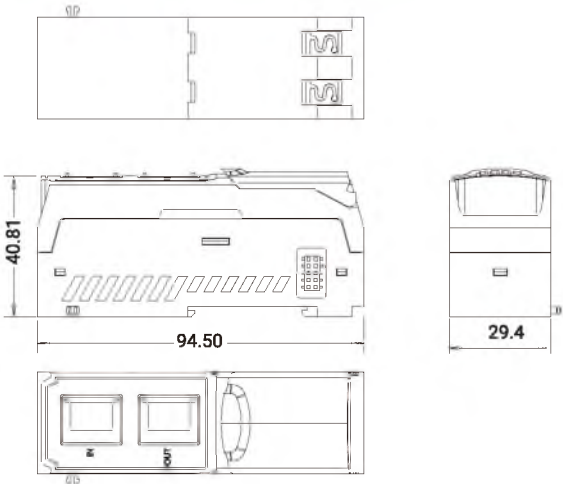
Module Slave

Controller & Communicator

Controller

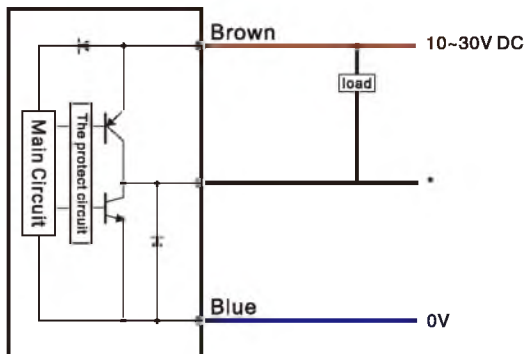
Communicator

Unit: mm Dimensions

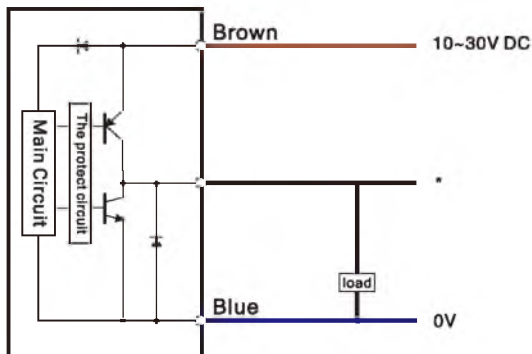


Input circuit diagram

NPN output



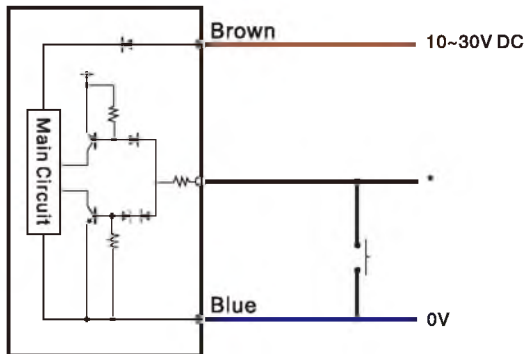
PNP output



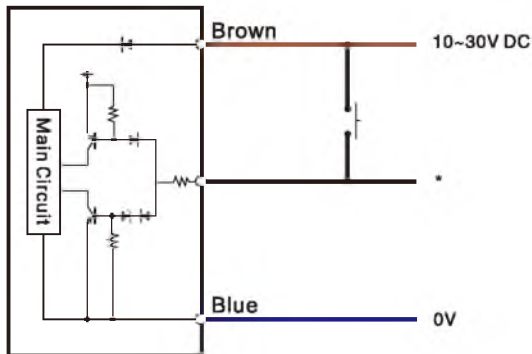
* Black (HIGH judgment output)/white (LOW judgment output)/grey (GO judgment output)/green (verification input)

Output circuit diagram

NPN output



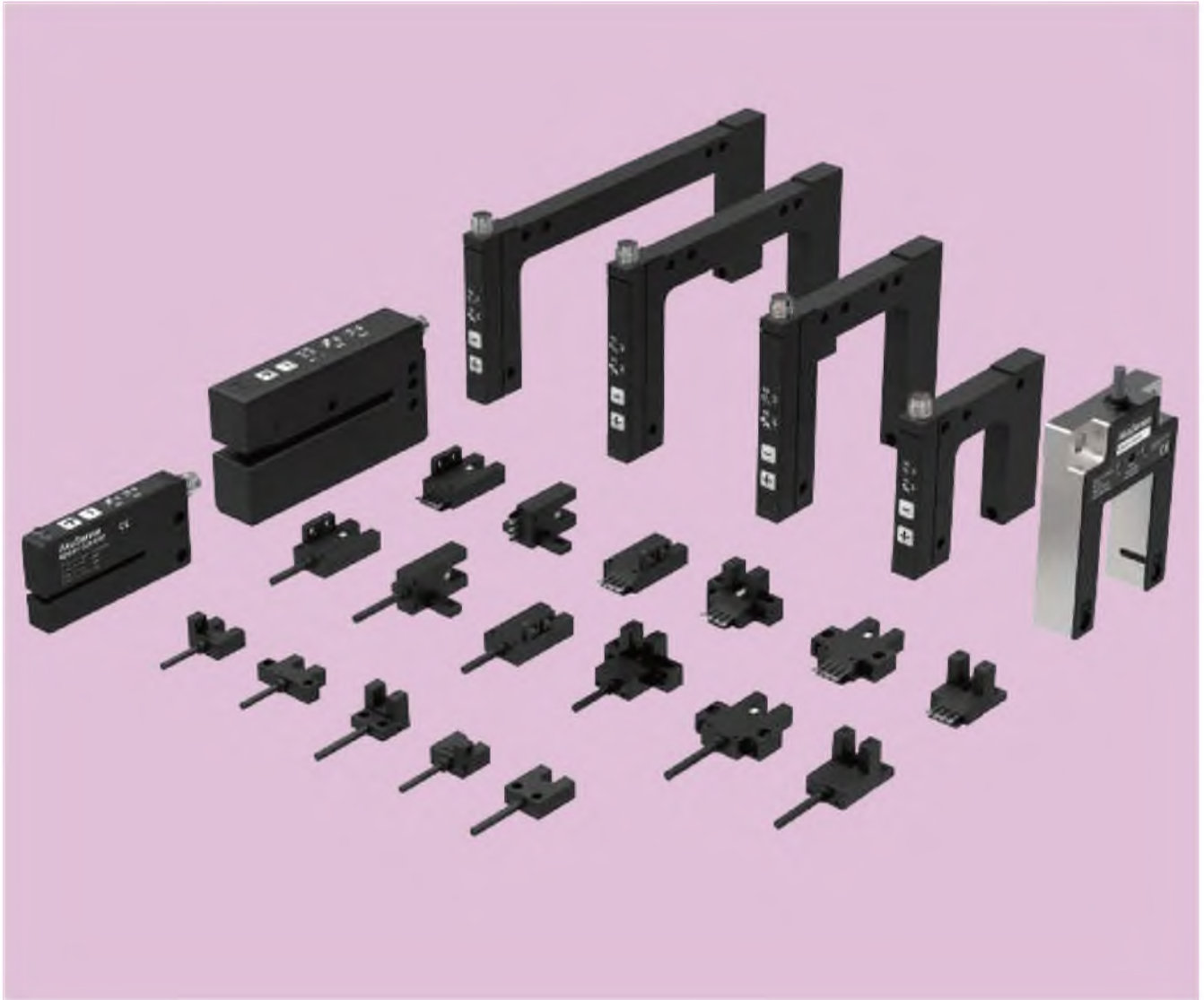
PNP output



* Pink (External input 1)/Yellow (External input 2)/Pink·Purple (External input 3)/Purple (External input 4)

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Slot-Type Sensors



- ◎ Multiple product line, slot width ranges from 5mm to 120mm
- ◎ Mircoslot sensors can fully substitute for the popular models from other well-known brands.
- ◎ Label sensors are equipped with standard teach-in function, can stably detect various labels.
- ◎ Can be customized according to clients' requirements, such as oil resistance, drag chain, etc.



Micro Slot Type

- Newly developed products, competitive price and good quality
- Derived from Japanese advanced technology, excellent performance
- 6.5mm slot depth (effectively prevents detected objects from hitting the bottom of the slots)

P.B-04



Slot Type

- Available in pre-wired and connector type, 12 specifications such as F/T/R/L/K.T for option
- NO/NC output (easy wiring)
- 8.5 mm slot depth (prevents detected objects from hitting the bottom of the slot to a large extent)

P.B-06



NPN and PNP in one

Wide Slot Type

- Flexible to switch NPN and PNP output
- Provide laser and infrared light sources according to different needs
- Various wide slots are available, 30mm, 50mm, 80mm, 120mm, etc.

P.B-10



Label Detection Type

- Stably detects those labels with 2mm gaps or 2mm lengths.
- With two-point and single-point teaching function
- Infrared detection and ultrasonic detection are available

P.B-12

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection

Micro Slot Type

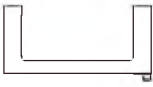
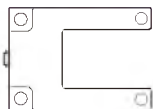
Series	Appearance	Slot width			Model number		Pages
					NPN Normally open	PNP Normally open	
Micro slot type(4-wire)		K shape	 5mm	D.on/ L.on	SK-206NA-W	SK-206PA-W	B-04
		L shape	 5mm	D.on/ L.on	SL-205NA-W 	SL-205PA-W	
		F shape	 5mm	D.on/ L.on	SF-202NA-W	SF-202PA-W	
		R shape	 5mm	D.on/ L.on	SR-204NA-W	SR-204PA-W	
		U shape	 5mm	D.on/ L.on	SU-201NA-W	SU-201PA-W	

Slot Type

Series	Appearance	Slot width	Model number			Pages			
			When detecting objects	NPN Normally open&Normally closed	PNP Normally open&Normally closed				
Slot type(Pre-wired)		F shape	 5mm	Light on when detecting object Light off when detecting object	SF-302N-W SF-302NA-W	SF-302P-W SF-302PA-W	B-06		
		T shape	 5mm	Light on when detecting object Light off when detecting object	ST-303N-W (HOT) ST-303NA-W (HOT)	ST-303P-W ST-303PA-W			
		R shape	 5mm	Light on when detecting object Light off when detecting object	SR-304N-W SR-304NA-W	SR-304P-W SR-304PA-W			
		L shape	 5mm	Light on when detecting object Light off when detecting object	SL-305N-W (HOT) SL-305NA-W (HOT)	SL-305P-W SL-305PA-W			
		K shape	 5mm	Light on when detecting object Light off when detecting object	SK-306N-W SK-306NA-W	SK-306P-W SK-306PA-W			
		Y shape	 5mm	Light on when detecting object Light off when detecting object	SY-307N-W (HOT) SY-307NA-W (HOT)	SY-307P-W SY-307PA-W			
	Slot type (Connector type)		F shape	 5mm	Light on when detecting object Light off when detecting object	SF-302N-E SF-302NA-E		SF-302P-E SF-302PA-E	B-08
			T shape	 5mm	Light on when detecting object Light off when detecting object	ST-303N-E (HOT) ST-303NA-E (HOT)		ST-303P-E ST-303PA-E	
			R shape	 5mm	Light on when detecting object Light off when detecting object	SR-304N-E SR-304NA-E		SR-304P-E SR-304PA-E	
			L shape	 5mm	Light on when detecting object Light off when detecting object	SL-305N-E (HOT) SL-305NA-E (HOT)		SL-305P-E SL-305PA-E	
			K shape	 5mm	Light on when detecting object Light off when detecting object	SK-306N-E SK-306NA-E		SK-306P-E SK-306PA-E	
			Y shape	5mm	Light on when detecting object Light off when detecting object	SY-307N-E (HOT) SY-307NA-E (HOT)		SY-307P-E SY-307PA-E	

■ Remark: Standard 2 or 4m cable, cable length is customizable

Wide Slot Type

Series	Appearance	Slot width	Output mode	Model number	Pages
KLM		30mm	NPN & PNP dual output	KLM06-0304NP	B-10
		50mm		KLM06-0506NP	
		80mm		KLM06-0806NP	
		120mm		KLM06-1206NP	
KIM		30mm	NPN D.on/L.on	KIM30-0304N	B-11
		30mm	PNP D.on/L.on	KIM30-0304P	

Label Detection

Series	Appearance	Slot width	Min length of label	Model number		Pages
				NPN	PNP	
KIM		3mm	2mm	KIM07-0204NP		B-12
KUM		3mm	2mm	KUM08-0307N	KUM08-0307P	B-13

Appearance						
Shape	U shape	F shape	R shape	L shape	K shape	
Sensing distance	5mm (Slot width)					
Standard sensing object	Opaque objects (Size: > 0.8*1.2mm)			Opaque objects (Size: > 1.2*1.8mm)	Opaque objects (Size: > 0.8*1.2mm)	
Repeat accuracy	< 0.03mm					
Output type	NPN or PNP open-collector					
Switch type	Selectable L.on/D.on					
Indicator	Light off when objects are detected; light on when no objects are detected					
Response frequency	3KHz					
Light source	Infrared LED (940nm)					
Operating voltage	5~24V DC					
Voltage drop	< 1V(Load current 50mA)					
Current brightness	≤8mA			≤16mA	≤8mA	
Protective circuit	Surge protection , Reverse polarity protection					
Ambient brightness	Incandescent lamp< 1000 Lux					
Ambient temperature	Operation: -25℃~+55℃, Storage: -30℃~+80℃,no freezing					
Ambient humidity	Operation:5%~85%, Storage: 5%~95%, no condensation					
Withstand voltage	AC, 1000V for 1 minute, between all power connection terminals and housing					
Anti-vibration	10 to 2000 Hz with 1.5mm(Maximum acceleration 196m/s ²) amplitude for 2 hours each in X, Y, and Z directions			10 to 55 Hz with 1.5mm amplitude for 2 hours each in X, Y, and Z directions	10 to 2000 Hz with 1.5mm (Maximum acceleration 196m/s ²) amplitude for 2 hours each in X, Y, and Z directions	
Insulation resistance	20MΩ or more between all power connection terminals and housing (based on DC250V)					
Degree of protection	IP50					
Material	ABS+PC			ABS	ABS+PC	
Connection method	2M 4core cable					
Model No.	NPN	SU-201NA-W	SF-202NA-W	SR-204NA-W	SL-205NA-W 	SK-206NA-W
	PNP	SU-201PA-W	SF-202PA-W	SR-204PA-W	SL-205PA-W	SK-206PA-W

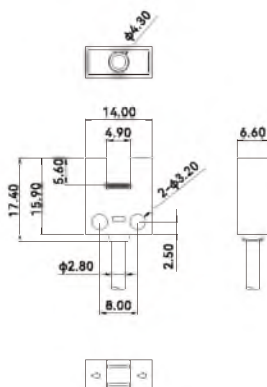
Remarks: SL-205NA/PA-W, suggest to install with small-head or non-standard M3(diameter less than 5.2mm) screws; for other models, please take regular M3 screws for mounting.

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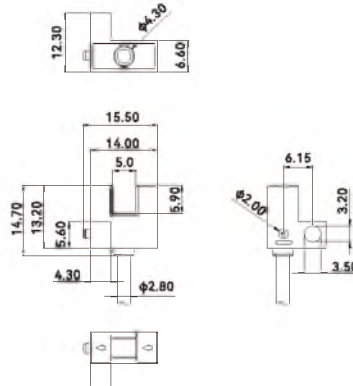
Dimensions

Unit: mm

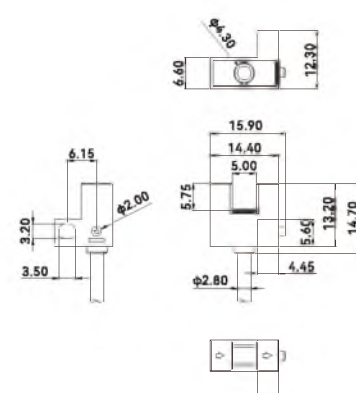
U Shape



F Shape



R Shape



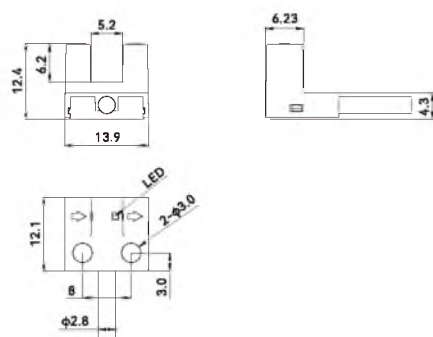
Slot type sensors
Micro slot type
Slot type
Wide slot type
Label detection

Micro Slot Type

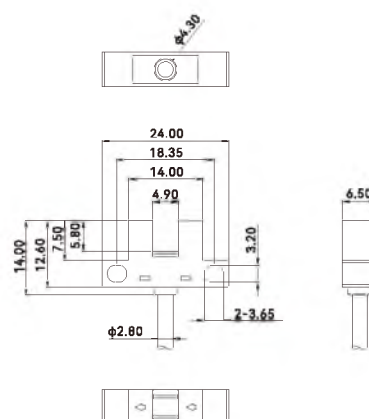
Dimensions

Unit: mm

L Shape

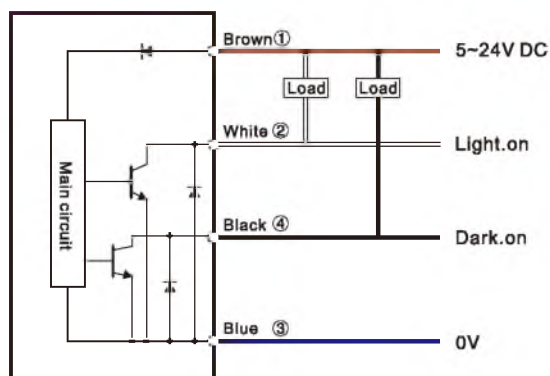


K Shape

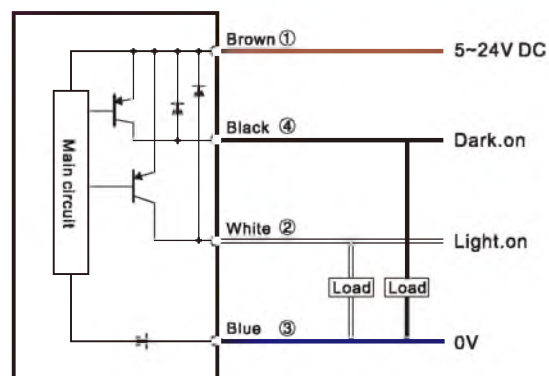


Circuit diagram

NPN



PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

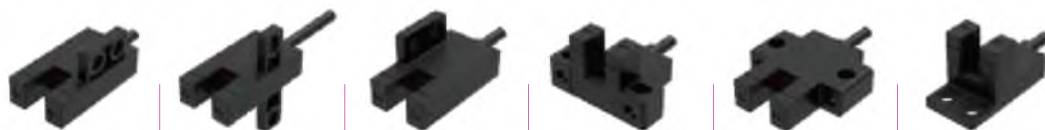
Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection



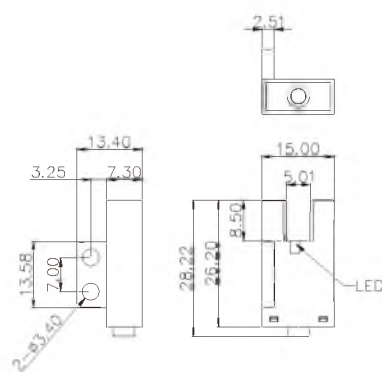
Shape	F Shape	T Shape	R Shape	L Shape	K Shape	Y Shape	
Sensing distance	5mm (Slot width)						
Standard sensing object	Opaque objects (Size: 1.2*1.8mm)						
Repeat accuracy	< 0.03mm						
Output type	NPN or PNP open–collector						
Switch type	Selectable L.on/D.on						
Indicator	Red LED						
Response frequency	3KHz						
Response time	≦0.3ms						
Light source	Infrared LED (940nm)						
Operating voltage	5~24V DC						
Voltage drop	<1.5V (load current 100mA, 2m cable length)						
Current consumption	<20mA						
Protective circuit	Surge protection, Reverse polarity protection						
Ambient temperature	Operation:–25℃~+55℃, Storage: –30℃~+80℃, no freezing						
Ambient humidity	Operation:5%~85%, Storage: 5%~95%, no condensation						
Ambient brightness	Incandescent lamp ≦1000Lux						
Withstand voltage	AC, 1000V 1 minute between all supply terminals connected to the housing						
Vibration resistance	10 to 55 Hz with 1.5mm amplitude for 2 hours each in X, Y, and Z directions						
Insulation resistance	Between all supply terminals connected with the housing, 20M Ω or more (based DC250V)						
Degree of protection	IP50						
Material	PC						
Connection method	2M 4core cable						
NPN	Light on when objects are detected	SF-302N-W	ST-303N-W	SR-304N-W	SL-305N-W	SK-306N-W	SY-307N-W
	Light off when objects are detected	SF-302NA-W	ST-303NA-W	SR-304NA-W	SL-305NA-W	SK-306NA-W	SY-307NA-W
PNP	Light on when objects are detected	SF-302P-W	ST-303P-W	SR-304P-W	SL-305P-W	SK-306P-W	SY-307P-W
	Light off when objects are detected	SF-302PA-W	ST-303PA-W	SR-304PA-W	SL-305PA-W	SK-306PA-W	SY-307PA-W

Remarks: SL-305NA/PA-W, suggest to install with small-head or non-standard M3(diameter less than 5.2mm) screws; SK-306NA/PA-W, suggest to install with universal M3.5 screws; for other models, please take regular M3 screws for mounting

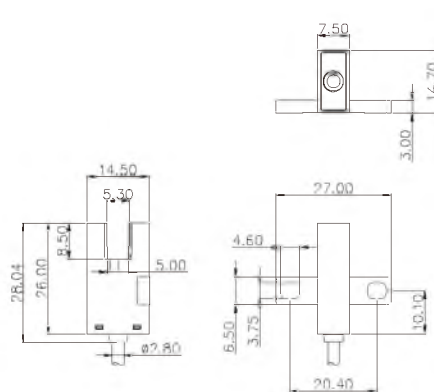
Dimensions

Unit: mm

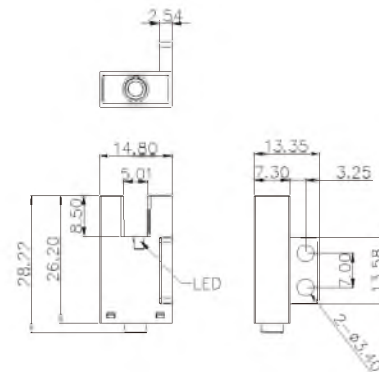
F Shape



T Shape



R Shape



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

Wide slot type

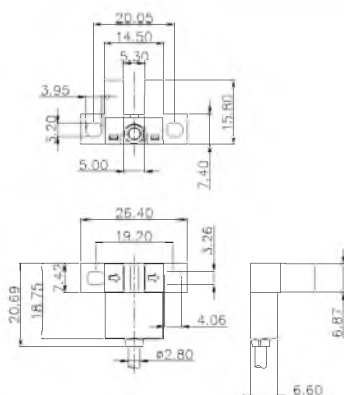
Label detection

Slot Type

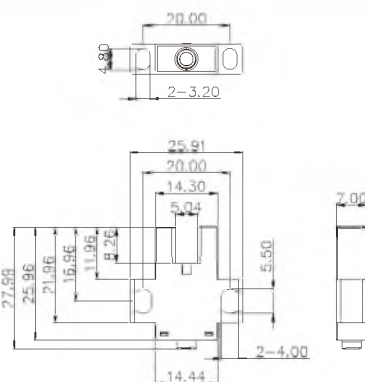
Dimensions

Unit: mm

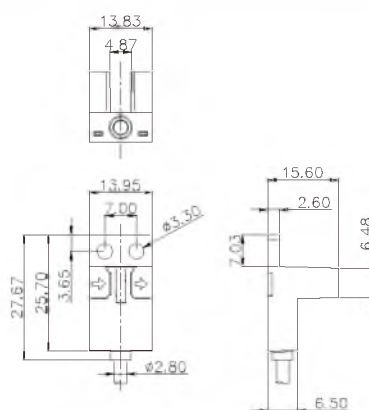
L Shape



K Shape

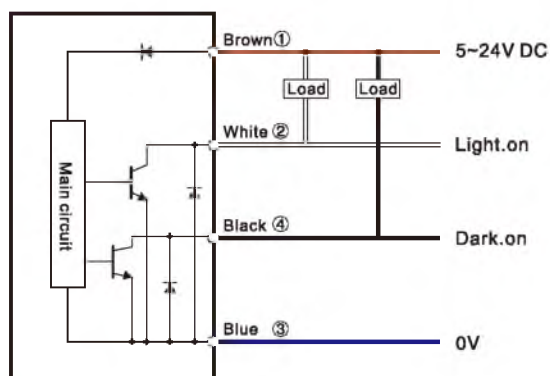


Y Shape

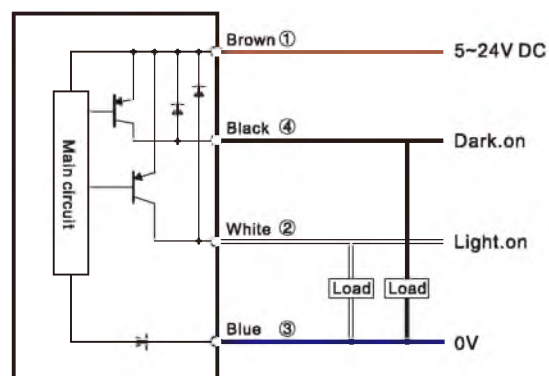


Circuit diagram

NPN



PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

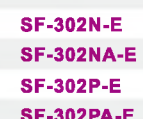
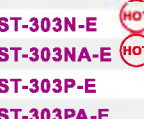
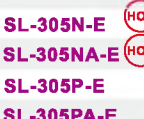
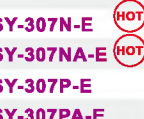
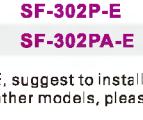
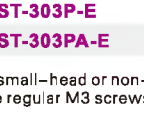
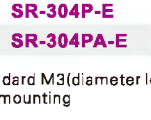
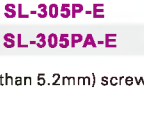
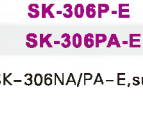
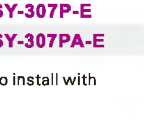
Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection

Appearance						
Shape	F Shape	T Shape	R Shape	L Shape	K Shape	Y Shape
Sensing distance	5mm (Slot width)					
Standard sensing objects	Opaque objects (Size: 1.2*1.8mm)					
Repeat accuracy	< 0.03mm					
Output type	NPN or PNP open-collector					
Switch type	Selectable L.on/D.on					
Indicator	Red LED					
Response frequency	3KHz					
Response time	≦0.3ms					
Light source	Infrared LED(840nm)					
Operating voltage	5~24V DC					
Voltage drop	0.2V or less (load current 10mA), 1.5V or less (load current 100mA)					
Current consumption	<20mA					
Protective circuit	Surge protection , Reverse polarity protection					
Ambient temperature	Operation: -25℃~+55℃, Storage: -30℃~+80℃, no freezing					
Ambient humidity	Operation: 5%~85%, Storage: 5%~95%, no condensation					
Ambient brightness	Incandescent lamp ≦ 1000Lux					
Withstand voltage	AC, 1000V 1 minute between all supply terminals connected to the housing					
Vibration resistance	10 to 55 Hz with 1.5mm amplitude for 2 hours each in X, Y, and Z directions					
Insulation resistance	Between all supply terminals connected with the housing, 20MΩ or more (based DC250V)					
Degree of protection	IP60					
Material	PC					
Connection method	Connector					
NPN						
PNP						

Remarks: SL-305NA/PA-E, suggest to install with small-head or non-standard M3(diameter less than 5.2mm) screws; SK-306NA/PA-E, suggest to install with universal M3.5 screws; for other models, please take regular M3 screws for mounting
Cable: ME-1007 (P:O-11)

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

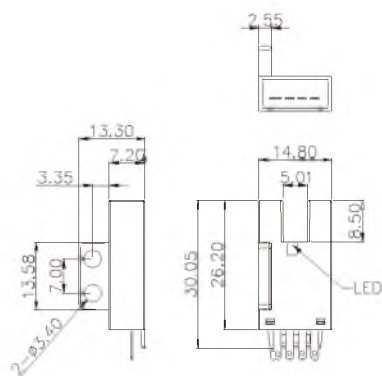
Wide slot type

Label detection

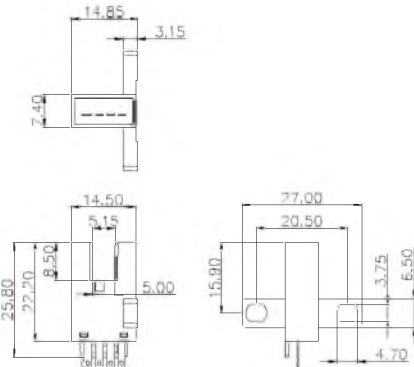
Unit: mm

Dimensions

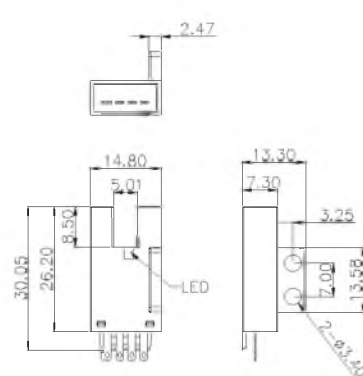
F Shape



T Shape



R Shape

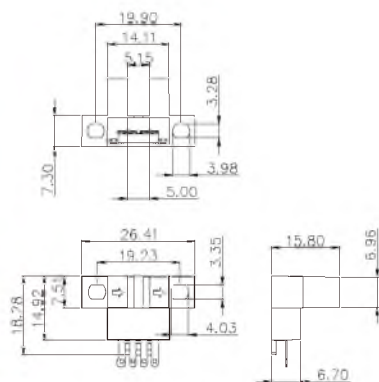


Slot Type

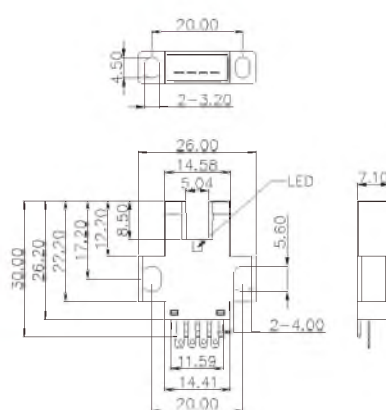
Dimensions

Unit: mm

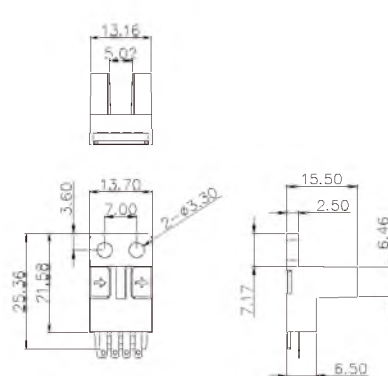
L Shape



K Shape

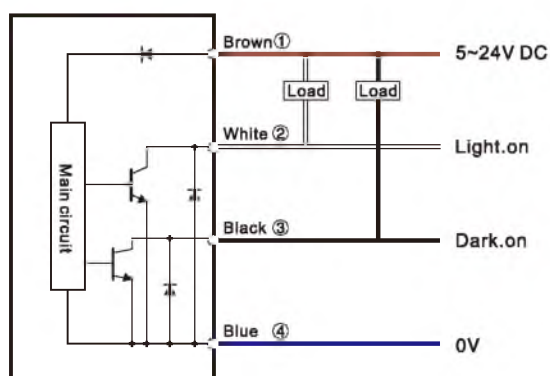


Y Shape

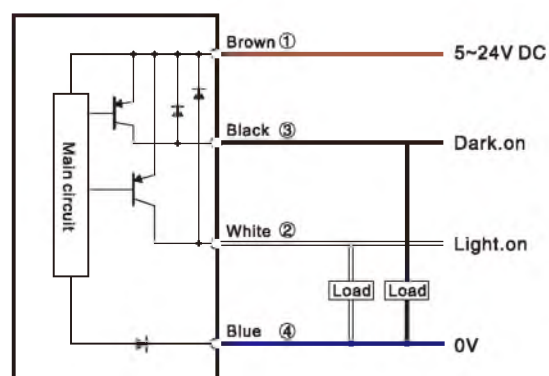


Circuit diagram

NPN



PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection

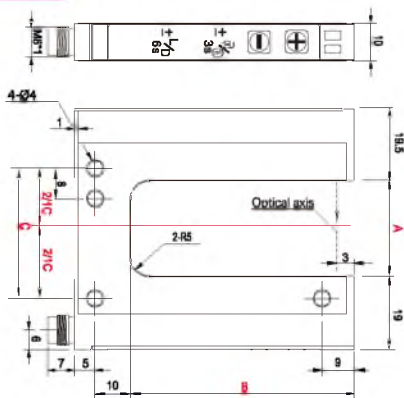


Appearance

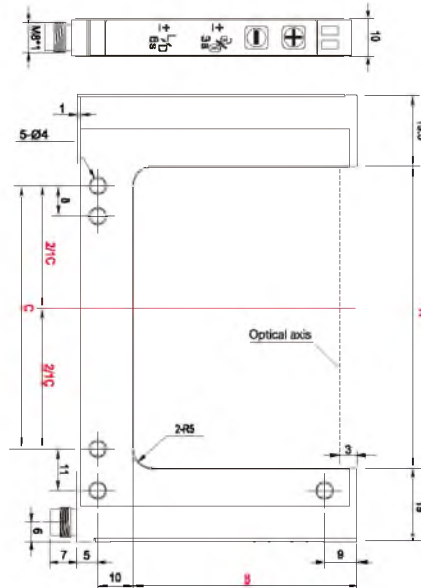
Slot depth	42mm	59mm	59mm	59mm
Slot width	30mm	50mm	80mm	120mm
Sensing distance	30mm	50mm	80mm	120mm
Diameter of the min detector	0.05mm			
Output mode	NPN & PNP dual output			
Switch mode	Selectable L.on/D.on			
Light source	Laser (670nm) modulated light, class1			
Ambient brightness	≤10000Lux			
Operating voltage	12~24V DC ± 10%			
No-load current	40mA			
Load current	100mA			
Residual voltage	< 2V@1L=100mA			
Response frequency	10KHz			
Protective circuit	Reverse polarity protection, Output short circuit protection, Interference suppression			
Ambient temperature	-20℃~+50℃			
Storage temperature	-30℃~+80℃			
Degree of protection	IP65			
Housing shell material	Al, glass			
Connection method	M8 4pin plug			
Weight	55g to 128g			
Model No.	KLM06-0304NP	KLM06-0506NP	KLM06-0806NP	KLM06-1206NP

Dimensions

Unit: mm



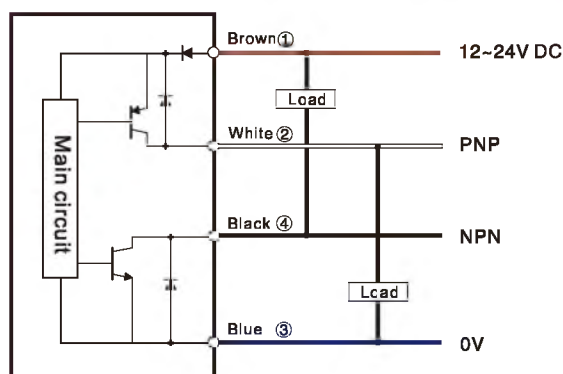
Model number	A	B	C
KLM06-0304NP	30	42	42



Model number	A	B	C
KLM06-0506NP	50	59	40
KLM06-0806NP	80	59	70
KLM06-1206NP	120	59	110

Circuit diagram:

NPN/PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

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Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection

Wide Slot Type

KIM Series

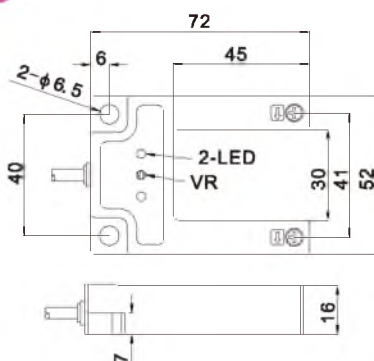


Appearance

Defection method	Thru-beam
Sensing distance	30mm
Output mode	NPN and PNP open collector
Switch mode	Selectable L.on/D.on
Standard test object	Opaque objects diameter>2mm
Output instructions	Yellow LED
Response time	≤1ms
Light source	Infrared LED (modulation)
Operating voltage	12~24V DC
Residual voltage	≤2.5V DC
Current consumption	≤15mA
Load current	≤200mA
Circuit protection	Reverse polarity protection, short circuit protection
Ambient temperature	-15℃~+55℃
Withstand voltage	1000V/AC 50/60Hz 1 minute
Shock resistance	10 to 50 Hz with 1.5mm amplitude for 2 hours each in X, Y, and Z directions
Impact resistance	500m/s ² (50G), 3 times in XYZ direction
Insulation resistance	≥50MΩ/500V DC
Degree of protection	IP60
Material	Aluminum alloy
Connection	2M 4core cable
Model No.	NPN D.on/L.on KIM30-0304N PNP D.on/L.on KIM30-0304P

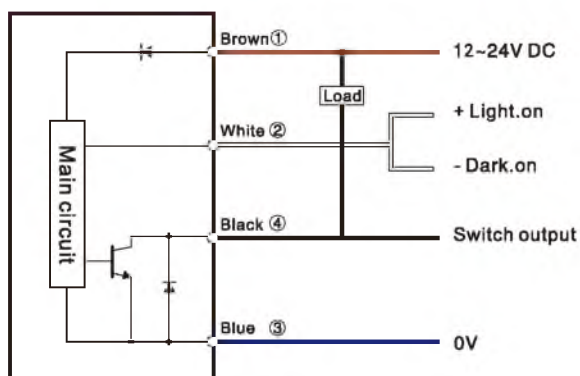
Dimensions

Unit: mm

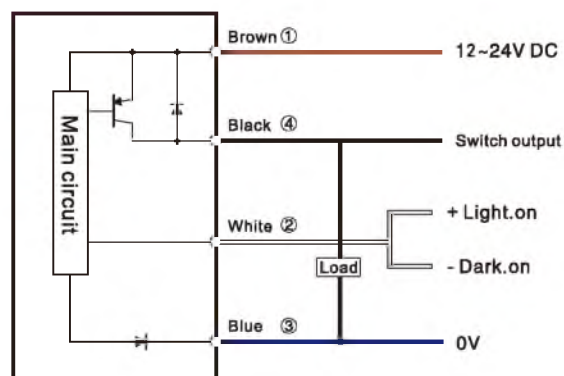


Circuit diagram

NPN



PNP



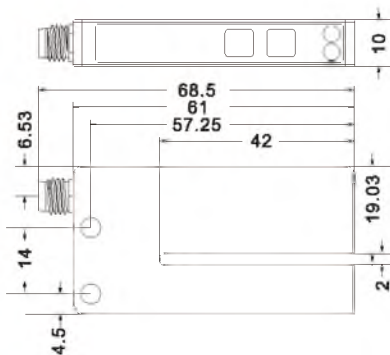


Appearance

Sensing distance	2mm
Slot depth	42mm
Slot width	3mm
Light source	Infrared light (940nm)
Switch mode	Selectable L.on/D.on
Operating voltage	12~24V DC $\pm 10\%$
No-load current	40mA
Load current	100mA
Response frequency	10KHz
Response time	$\leq 20\mu s$
Protection circuit	Reverse polarity protection, Output short circuit protection; Interference suppression
Protection degree	IP65
Material	Aluminum
Connection method	M8 4-pin connector
Weight	35g
Output method	NPN/PNP
Ambient brightness	Sunlight $\leq 10000\text{Lux}$
Model No.	KIM07-0204NP

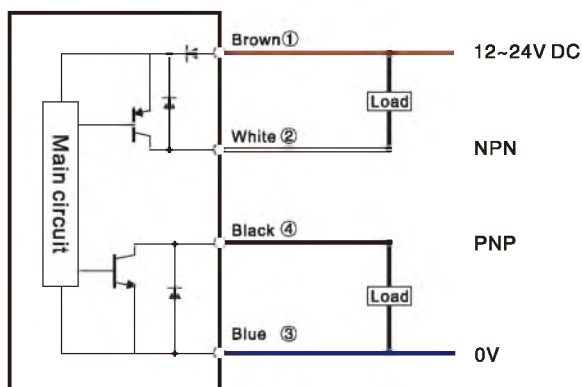
Dimensions

Unit: mm



Circuit diagram

NPN/PNP



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Slot type sensors

Micro slot type

Slot type

Wide slot type

Label detection

Label Detection

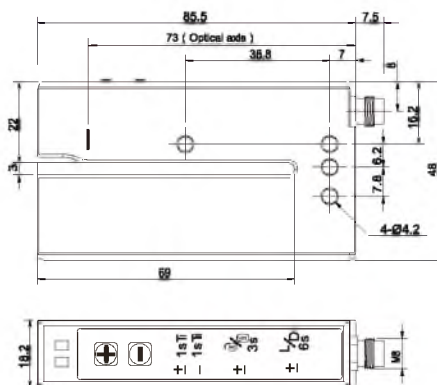
KUM Series



Appearance

Sensing distance	3mm
Min length of label	2mm
Min gap of label	2mm
Slot depth	69mm
Slot width	3mm
Emitter	Ultrasonic
Max detection speed	180m/min
Repeat accuracy	± 0.20mm(120m/min)
Switch mode	Selectable L.on/D.on
Operating voltage	12~24V DC ± 10%
No-load current	45mA
Load current	100mA
Residual voltage	< 2V@1L=100mA
Response frequency	1500Hz
Response time	300 μs
Circuit protection	Output short circuit protection; Interference suppression
Operating temperature	-5~+55℃
Storage temperature	-20~+70℃
Degree of protection	IP65
Housing material	Aluminum
Connection method	M8 4-pin connector
Weight	130g
Mode	NPN KUM08-0307N
	PNP KUM08-0307P

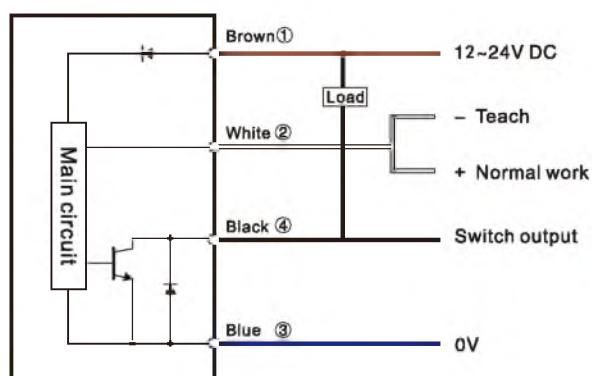
Dimensions



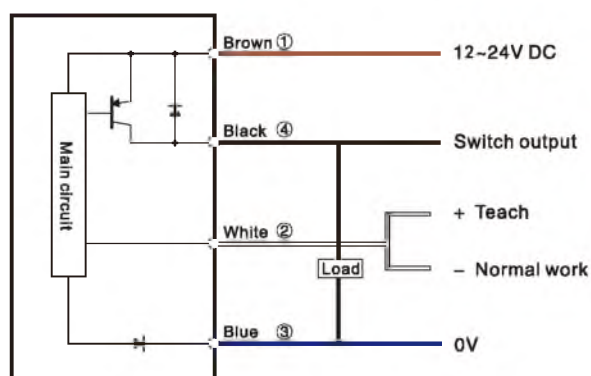
Unit: mm

Circuit diagram

NPN



PNP



Area/Security/Obstacle Avoidance Sensor



- ◉ Adopting line synchronization mode with safe and reliable performance.
- ◉ Detecting fingers, hands and arms in different sizes.
- ◉ A wide range of dimensions, protection heights and detection methods are available.
- ◉ Can be customized according to various non-standard requirements of customers.



Standard Type (BML Series)

- Cross-sectional size is 30mm * 30mm.
- Multiple resolutions for option.
- 3M cable as standard

PI-05



Top-emitting Type (BZL Series)

- Frontal detection, thickness is only 17mm.
- With plastic installation hole, easy to install.
- The protection distance can be customized according to clients' requirements.

PI-06



Side-emitting Type (BCL Series)

- Side detection, thickness is only 15mm.
- With plastic installation hole, easy to install.
- Small upper and lower blind area, saving installation space.

PI-12



Waterproof Type (BPL Series)

- Cylindrical design with a diameter of only 48mm
- High-strength sealing ring, IP68
- Extraordinary self-checking function and strong anti-interference capability

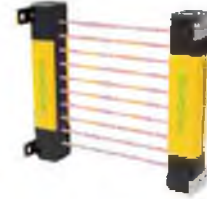
PI-15



Measuring Type (BAL Series)

- Surface mount technology for superior shock resistance
- Extraordinary self-checking function and strong anti-interference capability
- Customizable RS485/232/422 communication protocols

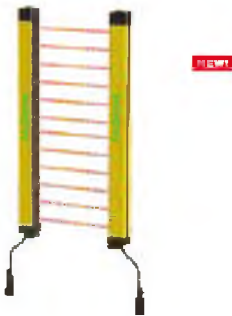
PI-18



Economical Type (BKL Series)

- Strong anti-electromagnetic interference
- Class 4 safety grating design standards
- Satisfying different installation scenarios, suitable for a variety of working environments

PI-23



Guidance Economical type (BSL Series)

- Response time ≤ 20 ms, fast response for safe production.
- Detection distance of 1-6m, covering general protection scenarios.
- Robust housing construction, resistant to pressure, vibration and shock.

PI-21



Safety Light Curtain (SAF Series)

- Type 4 standard providing security, providing security for high-risk sites
- Beam Pitch: 10mm, 20mm, 30mm and 40mm.
Protection distance: 3m or 12m, 8-20m

PI-25

Lidar Scanner



TOF LIDAR Scanner (AS-21C/41C)

- 20M/40M sensing distance
- 300° scanning range
- 25HZ (Max.) scanning frequency
- 0.125° (Max.) resolution

PI-26



MINI LIDAR Scanner (AS-11C)

- 20M sensing distance, small size
- 360° scanning range, no dead ends
- 12.5HZ (Max.) scanning frequency
- 0.5° (Max.) resolution

PI-29



Navigation Lidar (AS-100C)

- Height: 72mm, scanning range: 360 degrees
- Scanning frequency: 10Hz/20Hz, scanning angle resolution: 0.05 degree/0.1 degree
- Scanning distance: 20m (10% reflectivity), range: 0.2m-100m
- Millimeter-level distance data resolution, RSSI function, suitable for navigation and map surveying.

PI-32

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

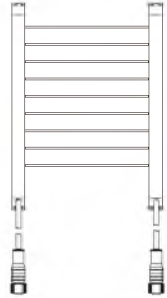
Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Standard Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	10mm	> ϕ 14mm, opaque	6~32	50~310mm	0.3~3m	NPN:BML10-TXX03NC PNP:BML10-TXX03PC	I-05
	14mm	> ϕ 19mm, opaque	6~32	70~434mm	0.3~3m	NPN:BML14-TXX03NC PNP:BML14-TXX03PC	
	20mm	> ϕ 25mm, opaque	4~32	60~620mm	0.3~3m	NPN:BML20-TXX03NC PNP:BML20-TXX03PC	
	25mm	> ϕ 30mm, opaque	6~32	125~775mm	0.3~3m	NPN:BML25-TXX03NC PNP:BML25-TXX03PC	
	30mm	> ϕ 35mm, opaque	4~32	90~930mm	0.3~3m	NPN:BML30-TXX03NC PNP:BML30-TXX03PC	
	40mm	> ϕ 45mm, opaque	4~32	120~1240mm	0.3~3m	NPN:BML40-TXX03NC PNP:BML40-TXX03PC	

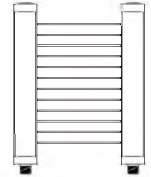
Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Top-emitting Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	10mm	> ϕ 18mm, opaque	6~32	50~310mm	0.3~1.5m	NPN:BZL10-TXX03NC PNP:BZL10-TXX03PC	I-08
	14mm	> ϕ 22mm, opaque	6~32	70~434mm	0.3~1.5m	NPN:BZL14-TXX03NC PNP:BZL14-TXX03PC	
	20mm	> ϕ 28mm, opaque	4~32	60~620mm	0.3~1.5m	NPN:BZL20-TXX03NC PNP:BZL20-TXX03PC	
	25mm	> ϕ 33mm, opaque	6~32	125~775mm	0.3~1.5m	NPN:BZL25-TXX03NC PNP:BZL25-TXX03PC	
	30mm	> ϕ 38mm, opaque	4~32	90~930mm	0.3~1.5m	NPN:BZL30-TXX03NC PNP:BZL30-TXX03PC	
	40mm	> ϕ 48mm, opaque	4~32	120~1240mm	0.3~1.5m	NPN:BZL40-TXX03NC PNP:BZL40-TXX03PC	

Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Measuring Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	2.5mm	> ϕ 3.75mm, opaque	32~1000	77.5~2497.5mm	0.3~3m	Voltage: BAL02-TXX03V Current: BAL02-TXX03A	I-18
	5mm	> ϕ 6.5mm, opaque	16~1000	75~4995mm	0.3~3m	Voltage: BAL05-TXX03V Current: BAL05-TXX03A	
	10mm	> ϕ 15mm, opaque	8~296	70~2950mm	0.3~3m	Voltage: BAL10-TXX03V Current: BAL10-TXX03A	
	20mm	> ϕ 25mm, opaque	4~596	60~11900mm	0.3~3m	Voltage: BAL20-TXX03V Current: BAL20-TXX03A	
	40mm	> ϕ 45mm, opaque	4~146	120~5800mm	0.3~3m	Voltage: BAL40-TXX03V Current: BAL40-TXX03A	

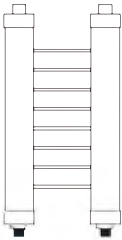
Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Side-emitting Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	20mm	> ϕ 28mm, opaque	6~32	100~620mm	0.3~1m	NPN:BCL20-TXX03NC PNP:BCL20-TXX03PC	I-12
	40mm	> ϕ 48mm, opaque	4~32	120~1240mm	0.3~1m	NPN:BCL40-TXX03NC PNP:BCL40-TXX03PC	

Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Waterproof Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	10mm	> ϕ 15mm, opaque	4~32	50~310mm	0.3~3m	NPN:BPL10-TXX03NC PNP:BPL10-TXX03PC	I-15
	14mm	> ϕ 19mm, opaque	4~32	70~434mm	0.3~3m	NPN:BPL14-TXX03NC PNP:BPL14-TXX03PC	
	20mm	> ϕ 25mm, opaque	4~32	60~620mm	0.3~3m	NPN:BPL20-TXX03NC PNP:BPL20-TXX03PC	
	25mm	> ϕ 30mm, opaque	4~32	125~775mm	0.3~3m	NPN:BPL25-TXX03NC PNP:BPL25-TXX03PC	
	30mm	> ϕ 35mm, opaque	4~32	90~930mm	0.3~3m	NPN:BPL30-TXX03NC PNP:BPL30-TXX03PC	
	40mm	> ϕ 45mm, opaque	4~32	120~1240mm	0.3~3m	NPN:BPL40-TXX03NC PNP:BPL40-TXX03PC	

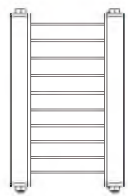
Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Economical Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	30mm	> ϕ 38mm, opaque	4~32	90~930mm	0.1~6m	NPN:BSL30-TXX06NC PNP:BSL30-TXX06PC	I-21
	40mm	> ϕ 48mm, opaque	4~32	120~1240mm	0.1~6m	NPN:BSL40-TXX06NC PNP:BSL40-TXX06PC	
	10mm	> ϕ 14mm, opaque	14~48	130~470mm	0.1~6m	NPN:BKL10-TXX06NC PNP:BKL10-TXX06PC	I-23
	20mm	> ϕ 25mm, opaque	8~48	140~940mm	0.1~6m	NPN:BKL20-TXX06NC PNP:BKL20-TXX06PC	
	40mm	> ϕ 45mm, opaque	4~48	120~1880mm	0.1~6m	NPN:BKL40-TXX06NC PNP:BKL40-TXX06PC	

Note: XX represents the number of beam, eg. 06 represents the 6 axis.

Safety Type

Appearance	Pitch	Min. sized detectable objects	Beams	Protection height	Protection distance	Model No.	Pages
	10mm	> ϕ 18mm, opaque	16~72	150~710mm	0~3m 0~12m 8~20m	PNP:SAF10-TXXYYPC	I-25
	20mm	> ϕ 28mm, opaque	8~72	140~1420mm	0~3m 0~12m 8~20m	PNP:SAF20-TXXYYPC	
	30mm	> ϕ 38mm, opaque	6~72	150~2130mm	0~3m 0~12m 8~20m	PNP:SAF30-TXXYYPC	
	40mm	> ϕ 48mm, opaque	4~72	120~2840mm	0~3m 0~12m 8~20m	PNP:SAF40-TXXYYPC	

Note: XX represents the number of beam, eg. 06 represents the 6 axis. YY stands for protection distance. For example: 03 means 0~3m.

Standard Type

BML Series

Area



Appearance	
Sectional area	30X30mm
NO. beams	4~32
Protection height	50~1240mm
Scanning range	0.3~3m
Resolution	10/14/20/25/30/40mm
Min. sized detectable objects	> ϕ 14/ ϕ 19/ ϕ 25/ ϕ 30/ ϕ 35/ ϕ 45mm, opaque
Supply voltage	24V DC $\pm$ 10%
Current consumption	< 200mA
Power consumption	4~6W
Output type	NPN/PNP
Synchronization type	line synchronization
Response time	$\leq$ 15ms
Light source	Infrared LED (Modulated)
Circuit protection	Reverse polarity, over-load, output short circuit protection
Ambient temperature	-10~+55℃ (No condensation, no freezing)
Ambient humidity	35~85% RH
Anti-interference ability	10000Lux
Insulation resistance	Above 50M Ω (DC 500V megger)
Shock resistance	10~150Hz, 1.5mm double amplitude for 2 hours each in X, Y and Z directions
Vibration resistance	Acceleration: 500m/s ² (Approx: 50G); x, y and z direction (3 times each)
Degree of protection	IP65
Material	Housing: Aluminum alloy; Transmissive cover: Polyester; End cover: Reinforced nylon
Connection	M12 connector
Accessories	Cable length 3m, female (Customization available)

BML10

Resolution	10mm						
Min. sized detectable objects	> ϕ 14mm, opaque						
Protection distance	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	50mm	70mm	90mm	110mm	130mm	... ..	310mm
Light curtain height	106mm	126mm	146mm	166mm	186mm	... ..	366mm
Model NO.	NPN NC	BML10-T0603NC	BML10-T0803NC	BML10-T1003NC	BML10-T1203NC	BML10-T1403NC	BML10-T3203NC
	PNP NC	BML10-T0603PC	BML10-T0803PC	BML10-T1003PC	BML10-T1203PC	BML10-T1403PC	BML10-T3203PC

Remarks: maximum number of optical axis 70 axis.

BML14

Resolution	14mm						
Min. sized detectable objects	> ϕ 19mm, opaque						
Protection distance	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	70mm	98mm	126mm	154mm	182mm	... ..	434mm
Light curtain height	128mm	156mm	184mm	212mm	240mm	... ..	492mm
Model NO.	NPN NC	BML14-T0603NC	BML14-T0803NC	BML14-T1003NC	BML14-T1203NC	BML14-T1403NC	BML14-T3203NC
	PNP NC	BML14-T0603PC	BML14-T0803PC	BML14-T1003PC	BML14-T1203PC	BML14-T1403PC	BML14-T3203PC

BML20

Resolution	20mm						
Min. sized detectable objects	> ϕ 25, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	60mm	100mm	140mm	180mm	220mm	... ..	620mm
Light curtain height	115mm	155mm	195mm	235mm	275mm	... ..	675mm
Model NO.	NPN NC	BML20-T0403NC	BML20-T0603NC	BML20-T0803NC	BML20-T1003NC	BML20-T1203NC	BML20-T3203NC
	PNP NC	BML20-T0403PC	BML20-T0603PC	BML20-T0803PC	BML20-T1003PC	BML20-T1203PC	BML20-T3203PC

Remarks: maximum number of optical axis 72 axis.

BML25

Resolution	25mm						
Min. sized detectable objects	> ϕ 30, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	125mm	175mm	225mm	275mm	325mm	... ..	775mm
Light curtain height	182.5mm	232.5mm	282.5mm	332.5mm	382.5mm	... ..	832.5mm
Model NO.	NPN NC	BML25-T0603NC	BML25-T0803NC	BML25-T1003NC	BML25-T1203NC	BML25-T1403NC	BML25-T3203NC
	PNP NC	BML25-T0603PC	BML25-T0803PC	BML25-T1003PC	BML25-T1203PC	BML25-T1403PC	BML25-T3203PC

BML30

Resolution	30mm						
Min. sized detectable objects	> ϕ 35, opaque						
Protection distance	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	90mm	150mm	210mm	270mm	330mm	... ..	930mm
Light curtain height	150mm	210mm	270mm	330mm	390mm	... ..	990mm
Model NO.	NPN NC	BML30-T0403NC	BML30-T0603NC	BML30-T0803NC	BML30-T1003NC	BML30-T1203NC	BML30-T3203NC
	PNP NC	BML30-T0403PC	BML30-T0603PC	BML30-T0803PC	BML30-T1003PC	BML30-T1203PC	BML30-T3203PC

BML40

Resolution	40mm						
Min. sized detectable objects	> ϕ 45, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	1240mm
Light curtain height	185mm	265mm	345mm	425mm	505mm	... ..	1305mm
Model NO.	NPN NC	BML40-T0403NC	BML40-T0603NC	BML40-T0803NC	BML40-T1003NC	BML40-T1203NC	BML40-T3203NC
	PNP NC	BML40-T0403PC	BML40-T0603PC	BML40-T0803PC	BML40-T1003PC	BML40-T1203PC	BML40-T3203PC

Remarks: maximum number of optical axis 72 axis.

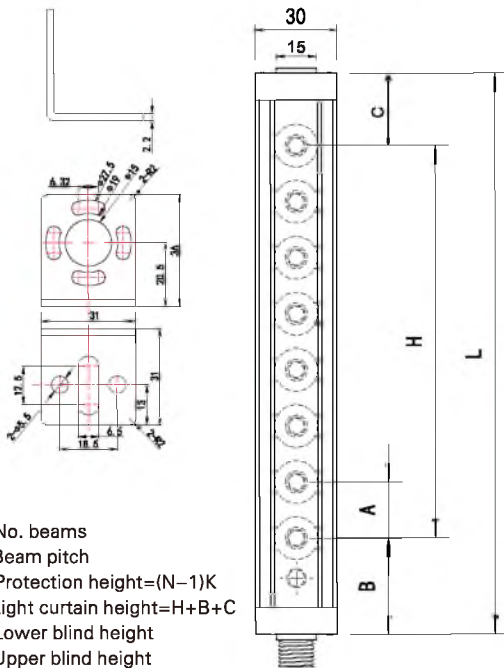
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

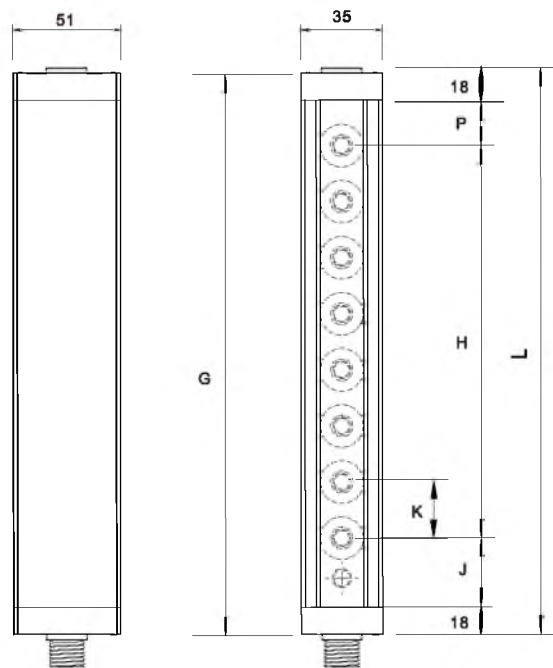
Standard Type

BML Series

Area



N: No. beams
K: Beam pitch
H: Protection height=(N-1)K
L: Light curtain height=H+B+C
B: Lower blind height
C: Upper blind height



When the detection distance is more than 10m and the number of optical axis exceeds 32 axis:

H: Detection height
 $H=(N-1)*k$
L: Light curtain height
N: No. beams
 $L=P+H+J+18+18$

BML10

K: 10
H: (N-1)*10
L: H+56
B: 41
C: 15

BML20

K: 20
H: (N-1)*20
L: H+55
B: 35
C: 20

BML30

K: 30
H: (N-1)*30
L: H+60
B: 35
C: 25

BML14

K: 14
H: (N-1)*14
L: H+58
B: 41
C: 17

BML25

K: 25
H: (N-1)*25
L: H+57.5
B: 35
C: 22.5

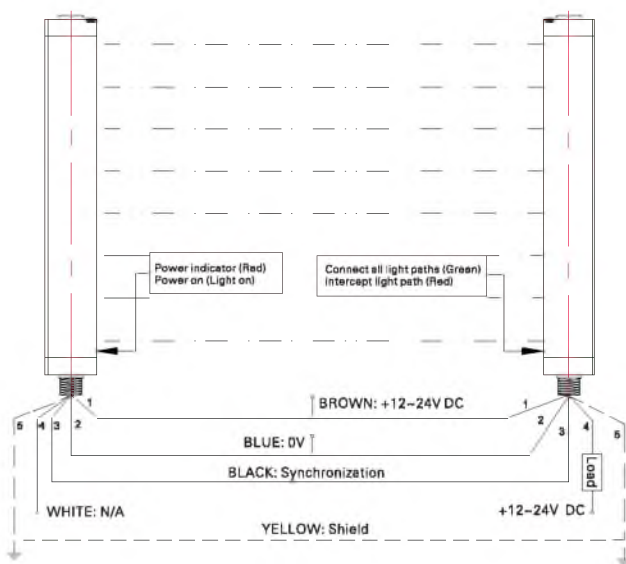
BML40

K: 40
H: (N-1)*40
L: H+65
B: 35
C: 30

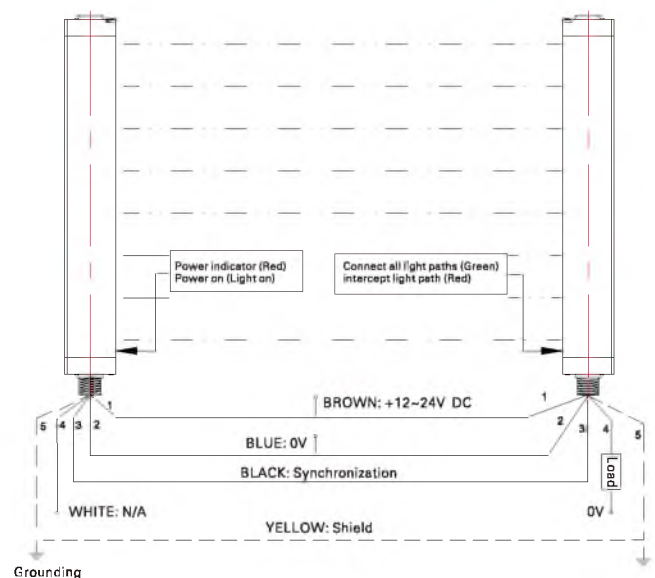
K	14	20	25	30	40
P	7	10	12.5	15	20
J	32	25	25	25	25

Connection Diagram

NPN



PNP





Appearance	
Sectional area	17.2*30mm
NO. beams	6~32
Protection height	50~1240mm
Scanning range	0.3~3m
Resolution	10/14/20/25/30/40mm
Min. sized detectable objects	> ϕ 18/ ϕ 22/ ϕ 33/ ϕ 38/ ϕ 48mm, opaque
Supply voltage	24V DC $\pm$ 10%
Current consumption	<200mA
Power consumption	3~8W
Output type	NPN/PNP
Synchronization type	line synchronization
Response time	$\leq$ 15ms
Light source	Infrared LED (Modulated)
Circuit protection	Reverse polarity, output short circuit protection
Ambient temperature	-10°C~+55°C (No condensation, no freezing)
Ambient humidity	35~85%RH
Anti-interference ability	10000Lux
Insulation resistance	Above 100M Ω (DC 500V megger)
Degree of protection	IP65
Material	Aluminium alloy
Connection	M12 connector
Accessories	3M cable, female (Customization available)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

BZL10

Resolution	10mm						
Min. sized detectable objects	> ϕ 18, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	50mm	70mm	90mm	110mm	130mm	... ..	310mm
Light curtain height	110mm	130mm	150mm	170mm	190mm	... ..	370mm
Model NO.	NPN NC	BZL10-T0603NC	BZL10-T0803NC	BZL10-T1003NC	BZL10-T1203NC	BZL10-T1403NC	BZL10-T3203NC
	PNP NC	BZL10-T0603PC	BZL10-T0803PC	BZL10-T1003PC	BZL10-T1203PC	BZL10-T1403PC	BZL10-T3203PC

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

BZL14

Resolution	14mm						
Min. sized detectable objects	> ϕ 22, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	70mm	98mm	126mm	154mm	182mm	... ..	434mm
Light curtain height	132mm	160mm	188mm	216mm	244mm	... ..	496mm
Model NO.	NPN NC	BZL14-T0603NC	BZL14-T0803NC	BZL14-T1003NC	BZL14-T1203NC	BZL14-T1403NC	BZL14-T3203NC
	PNP NC	BZL14-T0603PC	BZL14-T0803PC	BZL14-T1003PC	BZL14-T1203PC	BZL14-T1403PC	BZL14-T3203PC

Top-emitting Type

BZL Series

BZL20

Resolution	20mm						
Min. sized detectable objects	> ϕ 28, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	60mm	100mm	140mm	180mm	220mm	... ..	620mm
Light curtain height	119mm	159mm	199mm	239mm	279mm	... ..	679mm
Model NO.	NPN NC	BZL20-T0403NC	BZL20-T0603NC	BZL20-T0803NC	BZL20-T1003NC	BZL20-T1203NC	BZL20-T3203NC
	PNP NC	BZL20-T0403PC	BZL20-T0603PC	BZL20-T0803PC	BZL20-T1003PC	BZL20-T1203PC	BZL20-T3203PC

BZL25

Resolution	25mm						
Min. sized detectable objects	> ϕ 33, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	125mm	175mm	225mm	275mm	325mm	... ..	775mm
Light curtain height	186.5mm	236.5mm	286.5mm	336.5mm	386.5mm	... ..	836.5mm
Model NO.	NPN NC	BZL25-T0603NC	BZL25-T0803NC	BZL25-T1003NC	BZL25-T1203NC	BZL25-T1403NC	BZL25-T3203NC
	PNP NC	BZL25-T0603PC	BZL25-T0803PC	BZL25-T1003PC	BZL25-T1203PC	BZL25-T1403PC	BZL25-T3203PC

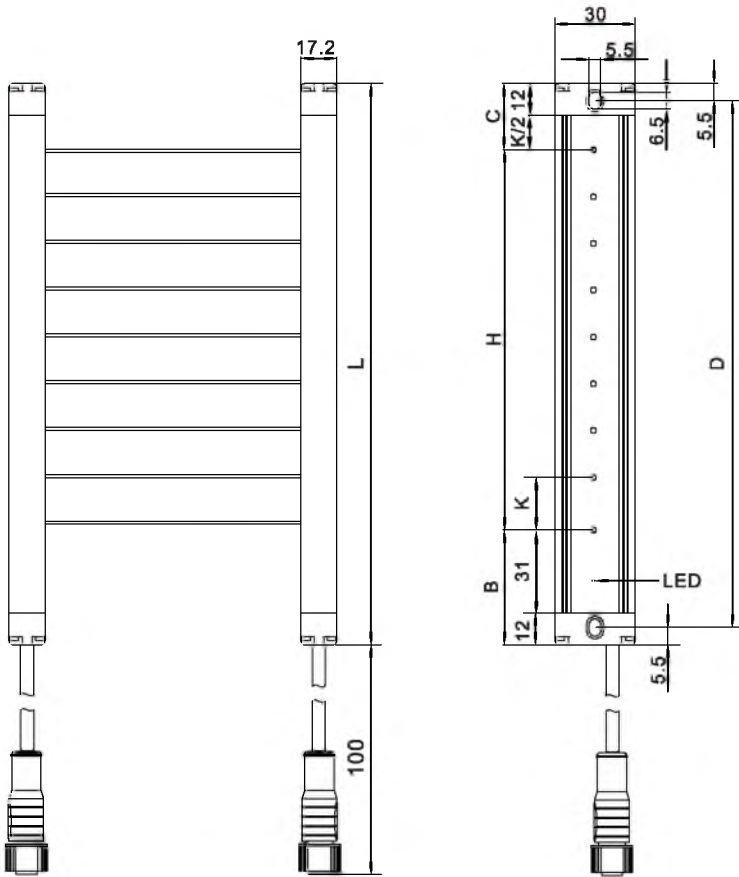
BZL30

Resolution	30mm						
Min. sized detectable objects	> ϕ 38, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	90mm	150mm	210mm	270mm	330mm	... ..	930mm
Light curtain height	154mm	214mm	274mm	334mm	394mm	... ..	994mm
Model NO.	NPN NC	BZL30-T0403NC	BZL30-T0603NC	BZL30-T0803NC	BZL30-T1003NC	BZL30-T1203NC	BZL30-T3203NC
	PNP NC	BZL30-T0403PC	BZL30-T0603PC	BZL30-T0803PC	BZL30-T1003PC	BZL30-T1203PC	BZL30-T3203PC

BZL40

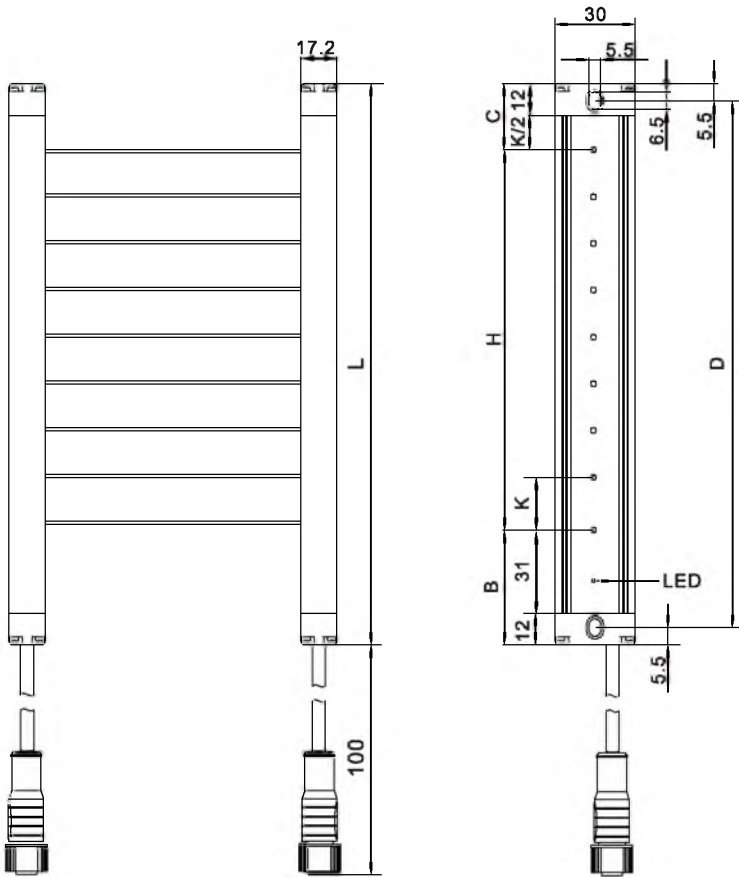
Resolution	40mm						
Min. sized detectable objects	> ϕ 48, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	1240mm
Light curtain height	189mm	269mm	349mm	429mm	509mm	... ..	1309mm
Model NO.	NPN NC	BZL40-T0403NC	BZL40-T0603NC	BZL40-T0803NC	BZL40-T1003NC	BZL40-T1203NC	BZL40-T3203NC
	PNP NC	BZL40-T0403PC	BZL40-T0603PC	BZL40-T0803PC	BZL40-T1003PC	BZL40-T1203PC	BZL40-T3203PC

BZL10



H:Protection Height= (N-1) K
L:Light curtain total height=H+60
N:No. beams
K:Beam pitch=10
B:Lower blind height=43
C:Upper blind height=17
D:Mounting hole spacing= (L-11)

BZL14



H:Protection Height= (N-1) K
L:Light curtain total height=H+62
N:No. beams
K:Beam pitch=14
B:Lower blind height=43
C:Upper blind height=19
D:Mounting hole spacing= (L-11)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

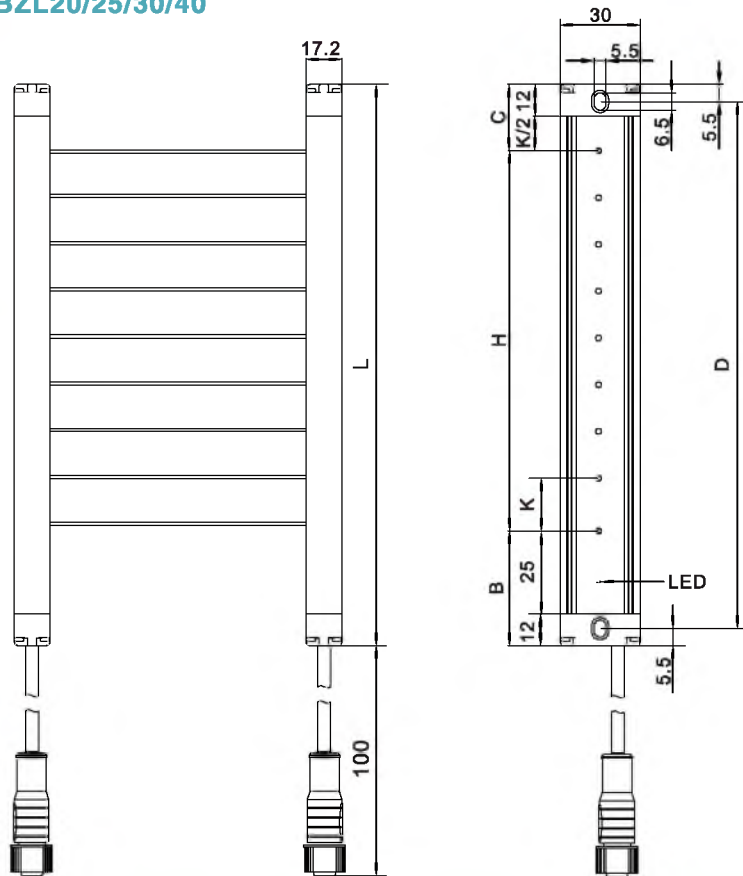
Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Top-emitting Type

BZL Series

BZL20/25/30/40

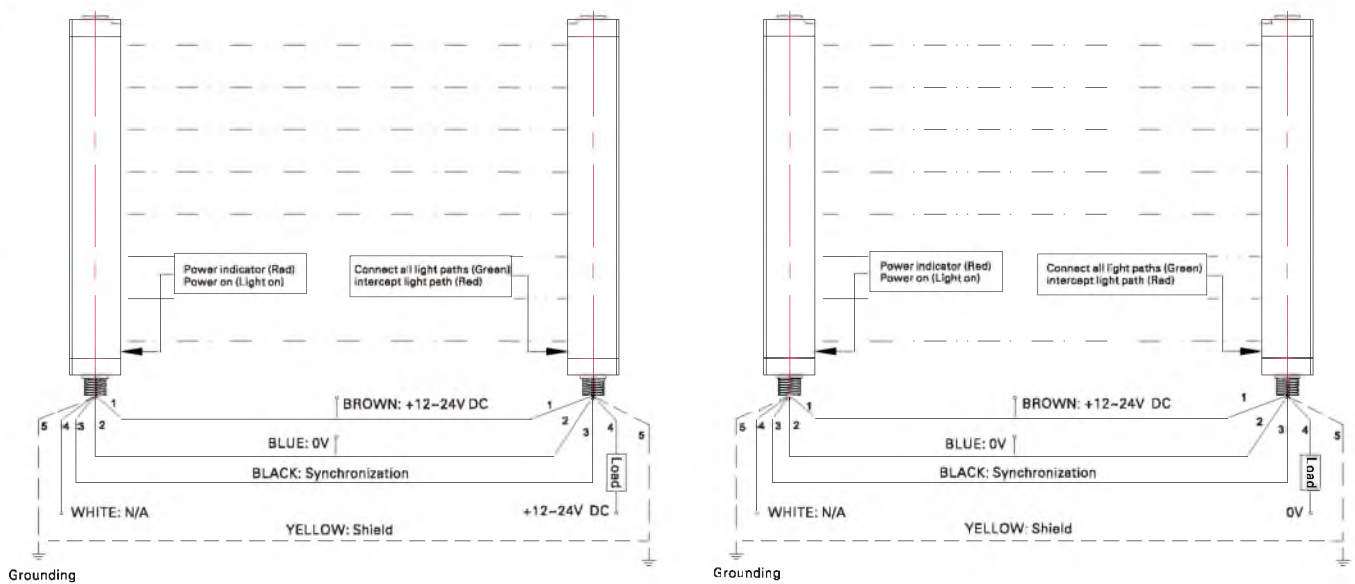


H: Protection Height= (N-1) K
 L: Light curtain total height=(N-1/2)K+49
 N: No. beams
 K: Beam pitch
 B: Lower blind height=37
 C: Upper blind height=K/2+12
 D: Mounting hole spacing= (L-11)

Connection Diagram

NPN

PNP





Appearance

Sectional area	30*15mm
NO. beams	8~32
Protection height	50~1240mm
Scanning range	0.3~3m
Resolution	20~40mm
Min. sized detectable objects	> ϕ 28/ ϕ 48mm, opaque
Supply voltage	24V DC $\pm$ 10%
Current consumption	<200mA
Power consumption	3~8W
Output type	NPN/PNP
Synchronization type	line synchronization
Response time	$\leq$ 15ms
Light source	Infrared LED (Modulated)
Circuit protection	Reverse polarity, output short circuit protection
Ambient temperature	-10~+55°C (No condensation, no freezing)
Ambient humidity	35~85% RH
Anti-interference ability	10000Lux
Insulation resistance	Above 100M Ω , Based on 500V DC megger
Degree of protection	IP65
Material	Aluminium alloy
Connection	M12 connector
Accessories	3M cable, female (Customization available)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

BCL20

Resolution	20mm						
Min. sized detectable objects	> ϕ 28, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	100mm	140mm	180mm	220mm	260mm		620mm
Light curtain height	159mm	199mm	239mm	279mm	319mm	... ..	679mm
Model NO.	NPN NC	BCL20-T0603NC	BCL20-T0803NC	BCL20-T1003NC	BCL20-T1203NC	BCL20-T1403NC	BCL20-T3203NC
	PNP NC	BCL20-T0603PC	BCL20-T0803PC	BCL20-T1003PC	BCL20-T1203PC	BCL20-T1403PC	BCL20-T3203PC

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

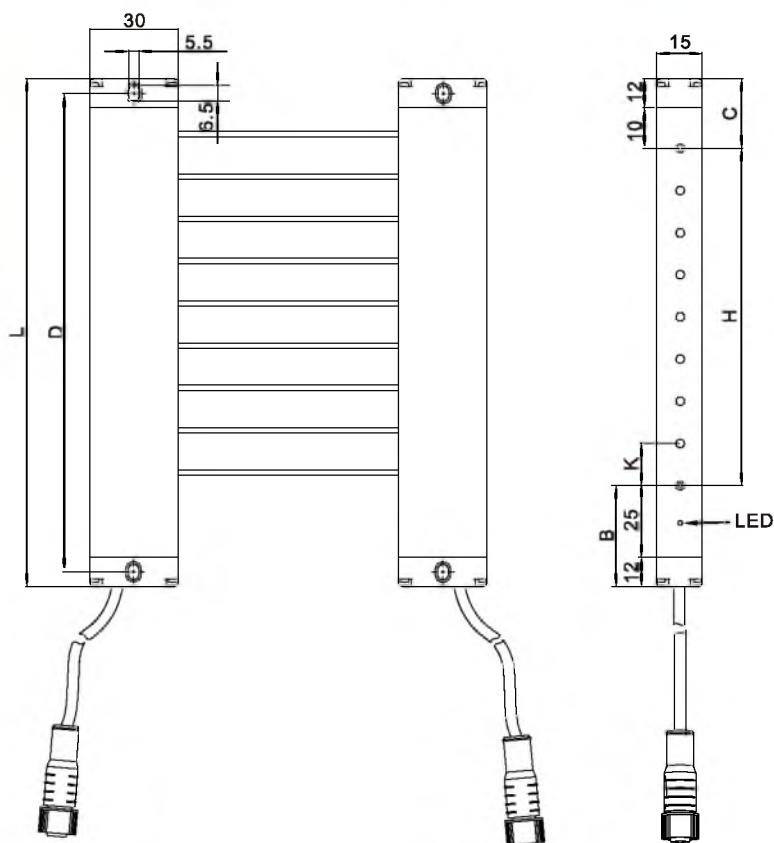
BCL40

Resolution	40mm						
Min. sized detectable objects	> ϕ 48, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12		32
Protection height	120mm	200mm	280mm	360mm	440mm		1240mm
Light curtain height	172.5mm	252.5mm	332.5mm	412.5mm	492.5mm	... ..	1292.5mm
Model NO.	NPN NC	BCL40-T0403NC	BCL40-T0603NC	BCL40-T0803NC	BCL40-T1003NC	BCL40-T1203NC	BCL40-T3203NC
	PNP NC	BCL40-T0403PC	BCL40-T0603PC	BCL40-T0803PC	BCL40-T1003PC	BCL40-T1203PC	BCL40-T3203PC

Side-emitting Type

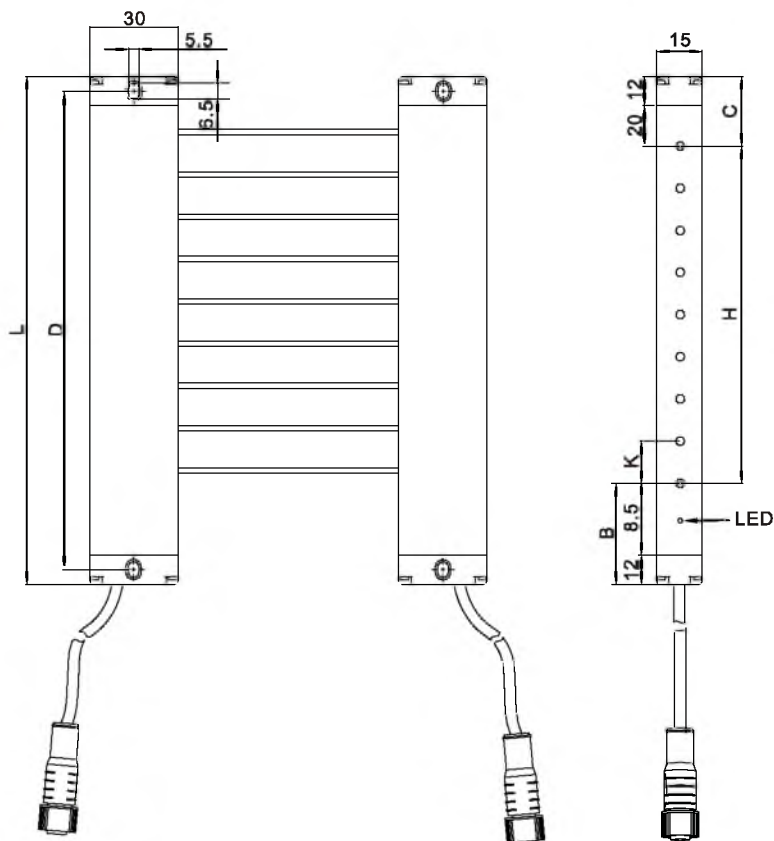
Dimensions(Unit:mm)

BCL20



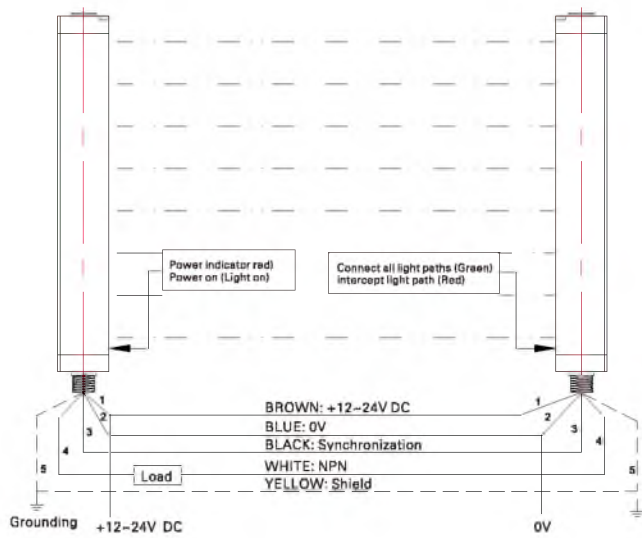
H: Protection Height= (N-1) K
 L: Light curtain total height=H+59
 N: No. beams
 K: Beam pitch=20
 B: Lower blind height=37
 C: Upper blind height=22
 D: Mounting hole spacing= (L-11)

BCL40

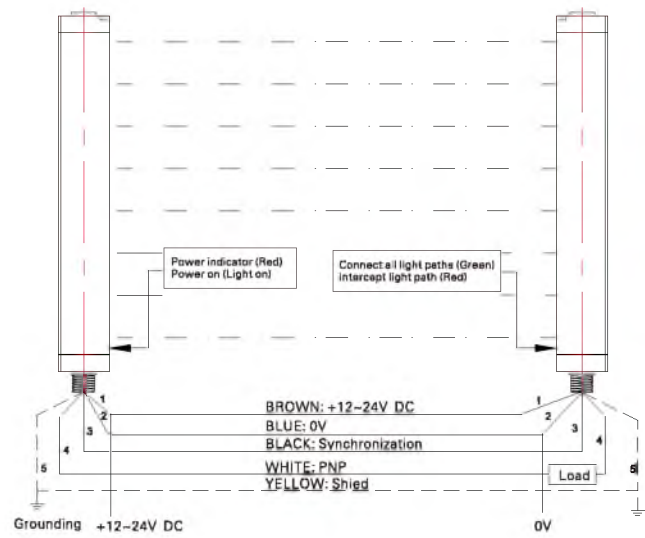


H: Protection Height= (N-1) K
 L: Light curtain total height=H+52.5
 N: No. beams
 K: Beam pitch=40
 B: Lower blind height=20.5
 C: Upper blind height=32
 D: Mounting hole spacing= (L-11)

NPN



PNP



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

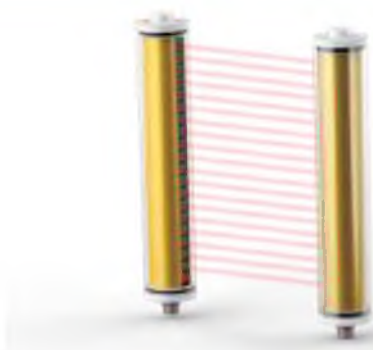
Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Waterproof Type

BPL series

Area



Appearance	
Sectional area	φ 48mm
NO. beams	4~32
Protection height	50~1240mm
Scanning range	0.3~3m
Resolution	10/14/20/25/30/40mm
Min. sized detectable objects	> φ 15/φ 19/φ 25/φ 30/φ 35/φ 45mm, opaque
Supply voltage	24V DC±10%
Current consumption	<200mA
Power consumption	3~8W
Output type	NPN/PNP
Synchronization type	Line synchronization
Response time	≤15ms
Light source	Reverse LED (Modulated)
Circuit protection	Reverse polarity, output short circuit protection
Ambient temperature	-10~+55°C, No freezing
Ambient humidity	35~85%RH, No condensation
Anti-interference ability	10000Lux
Insulation resistance	Above 100M Ω, Based on 500V DC megger
Degree of protection	IP68
Material	Aluminium alloy
Connection	M12 connector
Accessories	3M cable, female (Customization available)

BPL10

Resolution	10mm							
Min. sized detectable objects	> φ 15, opaque							
Scanning range	0.3~3m							
NO. beams	6	8	10	12	14	... ..	32	
Protection height	50mm	70mm	90mm	110mm	130mm	... ..	310mm	
Light curtain height	118mm	138mm	158mm	178mm	198mm	... ..	378mm	
Model NO.	NPN NC	BPL10-T0603NC	BPL10-T0803NC	BPL10-T1003NC	BPL10-T1203NC	BPL10-T1403NC		BPL10-T3203NC
	PNP NC	BPL10-T0603PC	BPL10-T0803PC	BPL10-T1003PC	BPL10-T1203PC	BPL10-T1403PC		BPL10-T3203PC

BPL14

Resolution	14mm							
Min. sized detectable objects	> ϕ 19, opaque							
Scanning range	0.3~3m							
NO. beams	6	8	10	12	14	... ..	32	
Protection height	70mm	98mm	126mm	154mm	182mm	... ..	434mm	
Light curtain height	140mm	168mm	196mm	224mm	252mm	... ..	504mm	
Model NO.	NPN NC	BPL14-T0603NC	BPL14-T0803NC	BPL14-T1003NC	BPL14-T1203NC	BPL14-T1403NC		BPL14-T3203NC
	PNP NC	BPL14-T0603PC	BPL14-T0803PC	BPL14-T1003PC	BPL14-T1203PC	BPL14-T1403PC		BPL14-T3203PC

BPL20

Resolution	20mm						
Min. sized detectable objects	> ϕ 20, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	60mm	100mm	140mm	180mm	220mm	... ..	620mm
Light curtain height	127mm	167mm	207mm	247mm	287mm	... ..	687mm
Model NO.	NPN NC	BPL20-T0403NC	BPL20-T0603NC	BPL20-T0803NC	BPL20-T1003NC	BPL20-T1203NC	BPL20-T3203NC
	PNP NC	BPL20-T0403PC	BPL20-T0603PC	BPL20-T0803PC	BPL20-T1003PC	BPL20-T1203PC	BPL20-T3203PC

BPL25

Resolution	25mm						
Min. sized detectable objects	> ϕ 30, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	125mm	175mm	225mm	275mm	325mm	... ..	775mm
Light curtain height	194.5mm	244.5mm	294.5mm	344.5mm	394.5mm	... ..	844.5mm
Model NO.	NPN NC	BPL25-T0603NC	BPL25-T0803NC	BPL25-T1003NC	BPL25-T1203NC	BPL25-T1403NC	BPL25-T3203NC
	PNP NC	BPL25-T0603PC	BPL25-T0803PC	BPL25-T1003PC	BPL25-T1203PC	BPL25-T1403PC	BPL25-T3203PC

BPL30

Resolution	30mm						
Min. sized detectable objects	> ϕ 35, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	90mm	150mm	210mm	270mm	330mm	... ..	930mm
Light curtain height	162mm	222mm	282mm	342mm	402mm	... ..	1002mm
Model NO.	NPN NC	BPL30-T0403NC	BPL30-T0603NC	BPL30-T0803NC	BPL30-T1003NC	BPL30-T1203NC	BPL30-T3203NC
	PNP NC	BPL30-T0403PC	BPL30-T0603PC	BPL30-T0803PC	BPL30-T1003PC	BPL30-T1203PC	BPL30-T3203PC

BPL40

Resolution	40mm						
Min. sized detectable objects	> ϕ 45, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	1240mm
Light curtain height	197mm	277mm	357mm	437mm	517mm	... ..	1317mm
Model NO.	NPN NC	BPL40-T0403NC	BPL40-T0603NC	BPL40-T0803NC	BPL40-T1003NC	BPL40-T1203NC	BPL40-T3203NC
	PNP NC	BPL40-T0403PC	BPL40-T0603PC	BPL40-T0803PC	BPL40-T1003PC	BPL40-T1203PC	BPL40-T3203PC

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

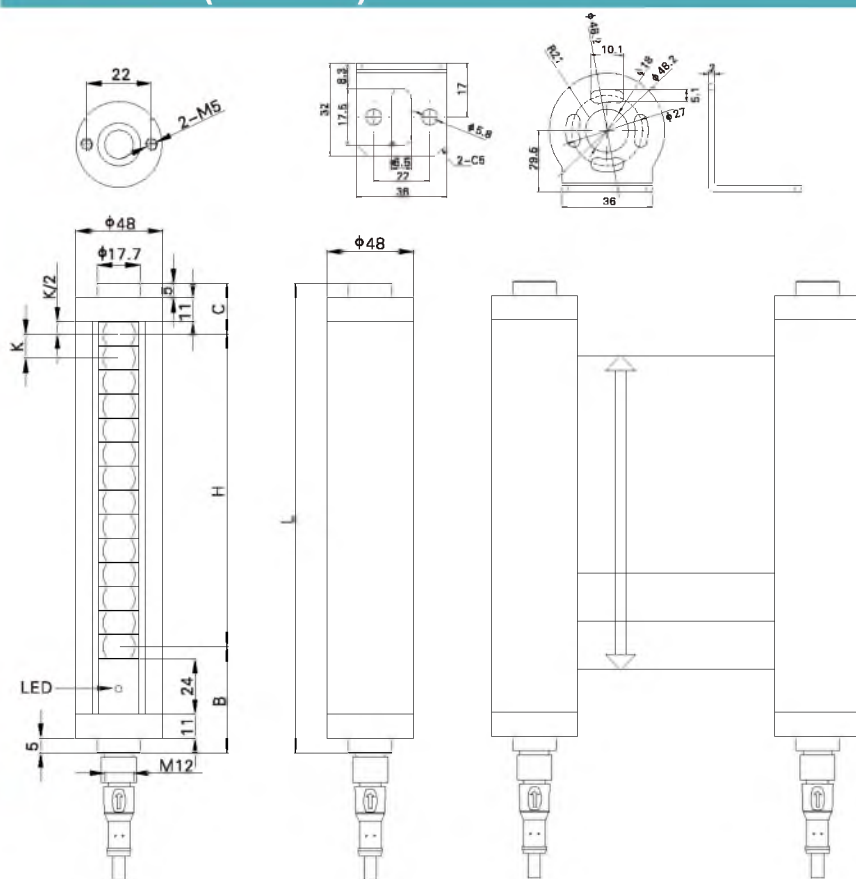
Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm

LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Waterproof Type

Dimensions(Unit:mm)

Area



BPL10
K: 10
H: (N-1)*10
L: H+68
B: 47
C: 21

BPL25
K: 25
H: (N-1)*25
L: H+69.5
B: 41
C: 28.5

BPL14
K: 14
H: (N-1)*14
L: H+70
B: 47
C: 23

BPL30
K: 30
H: (N-1)*30
L: H+72
B: 41
C: 31

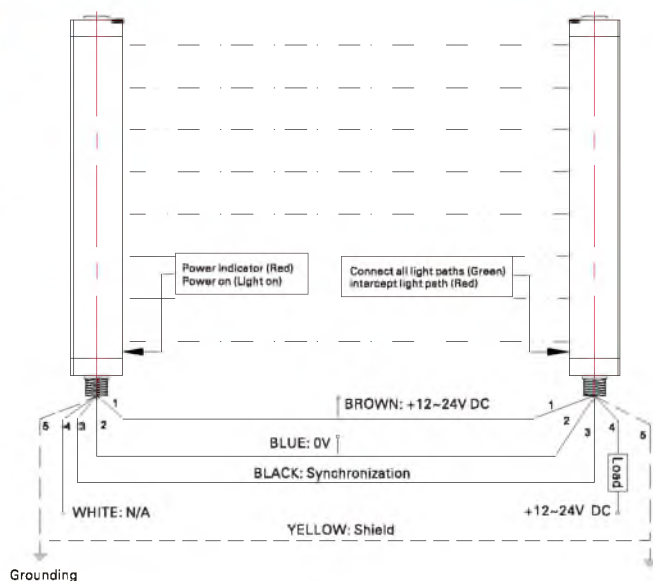
BPL20
K: 20
H: (N-1)*20
L: H+67
B: 41
C: 26

BPL40
K: 40
H: (N-1)*40
L: H+77
B: 41
C: 36

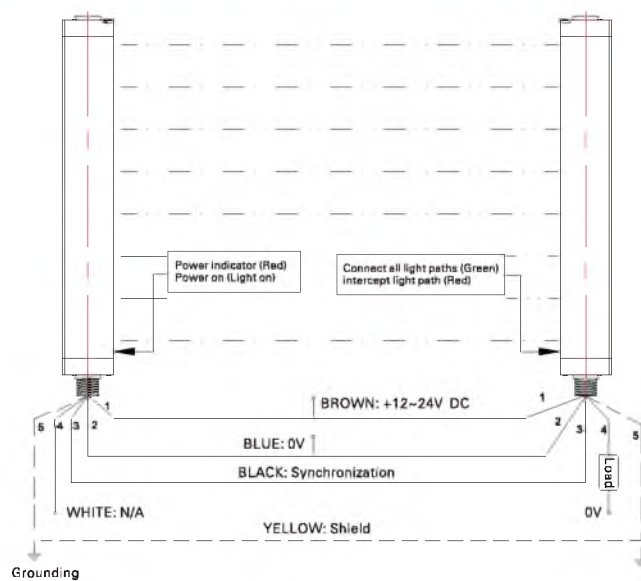
N: No. beams
K: Beam pitch
H: Protection Height=(N-1)K
L: Light curtain total height=H+B+C
B: Lower blind height
C: Upper blind height=K/2+16

Connection Diagram

NPN



PNP





Appearance	
Sectional area	36*36mm
NO. beams	4~1000
Protection height	60~1240mm
Scanning range	0.3~3m
Resolution	2.5/5/10/20/40mm
Min. sized detectable objects	φ 3.75/ φ 6.5/ φ 15/ φ 25/ φ 45mm, opaque
Supply voltage	24V DC±10%
Current consumption	<200mA
Power consumption	3~8W
Output type	4~20mA/1~5V;Selectable NPN/PNP and 485/232 output modes
Synchronization type	line synchronization
Response time	≤15ms
Light source	Infrared LED (Modulated)
Circuit protection	Reverse polarity, output short circuit protection
Ambient temperature	-10~+55℃ (No condensation,no freezing)
Ambient humidity	35~85%RH
Anti-interference ability	10000Lux
Insulation resistance	Above 100MΩ (DC 500V megger)
Degree of protection	IP65
Material	Aluminium alloy
Connection	M12 connector
Accessories	3M cable, female (Customization available)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

BAL02

Resolution	2.5mm						
Min. sized detectable objects	> φ 3.75, opaque						
Scanning range	0.3~3m						
NO. beams	32	64	96	128	160	... ..	1000
Protection height	77.5mm	157.5mm	237.5mm	317.5mm	397.5mm	... ..	2497.5mm
Light curtain height	136.5mm	216.5mm	296.5mm	376.5mm	456.5mm	... ..	2556.5mm
Model NO.	Voltage output BAL02-T3203V Current output BAL02-T3203A	BAL02-T6403V BAL02-T6403A	BAL02-T9603V BAL02-T9603A	BAL02-T12803V BAL02-T12803A	BAL02-T16003V BAL02-T16003A	... .. ... ..	BAL02-T100003V BAL02-T100003A

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

BAL05

Resolution	5mm						
Min. sized detectable objects	> φ 6.5, opaque						
Scanning range	0.3~3m						
NO. beams	16	24	32	40	48	... ..	1000
Protection height	75mm	115mm	155mm	195mm	235mm	... ..	4995mm
Light curtain height	136.5mm	176.5mm	216.5mm	256.5mm	296.5mm	... ..	5056.5mm
Model NO.	Voltage output BAL05-T1603V Current output BAL05-T1603A	BAL05-T2403V BAL05-T2403A	BAL05-T3203V BAL05-T3203A	BAL05-T4003V BAL05-T4003A	BAL05-T4803V BAL05-T4803A	... .. ... ..	BAL05-T100003V BAL05-T100003A

Measuring Type

BAL Series

BAL10

Resolution	10mm						
Min. sized detectable objects	> ϕ 15, opaque						
Scanning range	0.3~3m						
NO. beams	8	10	12	14	16	... ..	296
Protection height	70mm	90mm	110mm	130mm	150mm	... ..	2950mm
Light curtain height	136.5mm	156.5mm	176.5mm	196.5mm	216.5mm	... ..	3016.5mm
Model NO	Voltage output BAL10-T0803V	BAL10-T1003V	BAL10-T1203V	BAL10-T1403V	BAL10-T1603V	... ..	BAL10-T29603V
Current output	BAL10-T0803A	BAL10-T1003A	BAL10-T1203A	BAL10-T1403A	BAL10-T1603A	... ..	BAL10-T29603A

BAL20

Resolution	20mm						
Min. sized detectable objects	> ϕ 25, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	596
Protection height	60mm	100mm	140mm	180mm	220mm	... ..	11900mm
Light curtain height	136.5mm	176.5mm	216.5mm	256.5mm	296.5mm	... ..	11976.5mm
Model NO	Voltage output BAL20-T0403V	BAL20-T0603V	BAL20-T0803V	BAL20-T1003V	BAL20-T1203V	... ..	BAL20-T59603V
Current output	BAL20-T0403A	BAL20-T0603A	BAL20-T0803A	BAL20-T1003A	BAL20-T1203A	... ..	BAL20-T59603A

BAL40

Resolution	40mm						
Min. sized detectable objects	> ϕ 45, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	146
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	5800mm
Light curtain height	196.5mm	276.5mm	356.5mm	436.5mm	516.5mm	... ..	5896.5mm
Model NO	Voltage output BAL40-T0403V	BAL40-T0603V	BAL40-T0803V	BAL40-T1003V	BAL40-T1203V	... ..	BAL40-T14603V
Current output	BAL40-T0403A	BAL40-T0603A	BAL40-T0803A	BAL40-T1003A	BAL40-T1203A	... ..	BAL40-T14603A

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance
Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Area

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories



Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
2D LIDAR scanner
3D LIDAR scanner
Navigation LIDAR

LiDAR scanner
3D OF LiDAR scanner
2D MINI LiDAR scanner
Navigation LiDAR



Economical Type

BSL Series



Economical
NEW

Appearance	
Sectional area	30X30mm
No. beams	4~32 beams
Protection height	90~1240mm
Light curtain height	123.1~1273.1mm
Scanning range	0.1~6m
Resolution	30/40mm
Min.sized detectable object	> $\phi 38/\phi 48$ mm,opaque
Operating voltage	12~24V DC $\pm 10\%$
Current consumption	< 200mA at the transmitter; < 200mA at the receiver
Load current	<150mA
Voltage drop	2V
Indicator light	Transmitter: power indicator: green; receiver: action indicator: red; power indicator: green
Switching mode	D.on
Output type	NPN/PNP
Synchronization type	Cable synchronization
Response time	≤ 20 ms
Light source	Infrared LED860nm (modulated)
Circuit protection	Reverse polarity,over-load,output short circuit protection
Ambient temperature	Operating temperature: -10° C to 55° C, no freezing; no condensation; storage temperature: -10° C to 55° C
Ambient humidity	35~85%RH, for storage: 35~95%RH
Anti interference ability	Incandescent lamp: up to 3000lux; sunlight: up to 10000lux
Insulation withstand voltage	± 500 V 50/60Hz 60s
Vibration resistance	10~150Hz, 1.5mm double amplitude for 2 hours each in X, Y and Z directions
Static electricity	± 8000 V
Group pulse	± 2000 V
Degree of protection	IP65
Material	Housing:Aluminum alloy
Connection method	M12 connector
Accessories	Straight angle fixture

BSL30

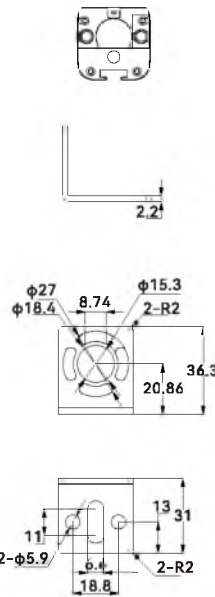
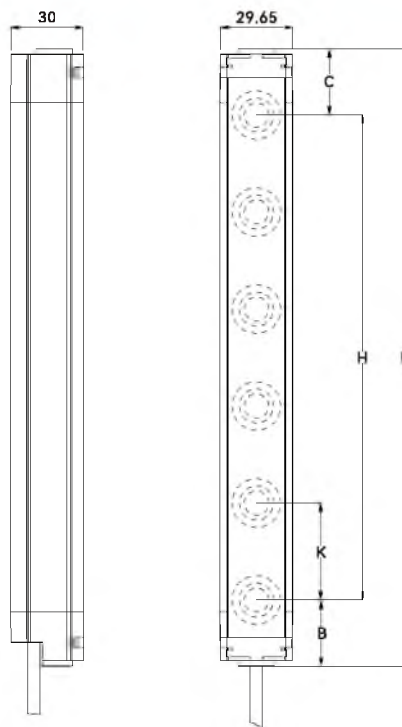
Resolution	30mm							
Min. sized detectable objects	> ϕ 38,opaque							
Scanning range	0.1~6m							
NO. of beams	4 beams	6 beams	8 beams	10 beams	12 beams	... ..	32 beams	
Protection height	90 mm	150mm	210mm	270mm	330mm	... ..	930mm	
Light curtain height	123.1mm	183.1mm	243.1mm	303.1mm	363.1mm	... ..	963.1mm	
Model NO.	NPN NC	BSL30-T0406NC	BSL30-T0606NC	BSL30-T0806NC	BSL30-T1006NC	BSL30-T1206NC		BSL30-T3206NC
	PNP NC	BSL30-T0406PC	BSL30-T0606PC	BSL30-T0806PC	BSL30-T1006PC	BSL30-T1206PC		BSL30-T3206PC

BSL40

Resolution	40mm							
Min. sized detectable objects	> ϕ 48,opaque							
Scanning range	0.1~6m							
NO.of beams	4 beams	6 beams	8 beams	10 beams	12 beams	... ..	32 beams	
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	1240mm	
Light curtain height	153.1mm	233.1mm	313.1mm	393.1mm	473.1mm	... ..	1273.1mm	
Model NO.	NPN NC	BSL40-T0406NC	BSL40-T0606NC	BSL40-T0806NC	BSL40-T1006NC	BSL40-T1206NC		BSL40-T3206NC
	PNP NC	BSL40-T0406PC	BSL40-T0606PC	BSL40-T0806PC	BSL40-T1006PC	BSL40-T1206PC		BSL40-T3206PC

Economical Type

Dimensions(Unit:mm)



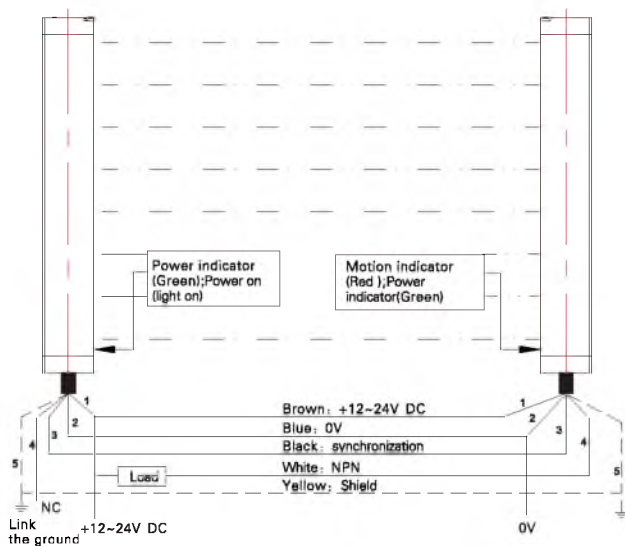
B=16.55mm
C=16.55mm
H=(N-1)*K
L=H+B+C

B: Upper blind height
C: Lower blind height

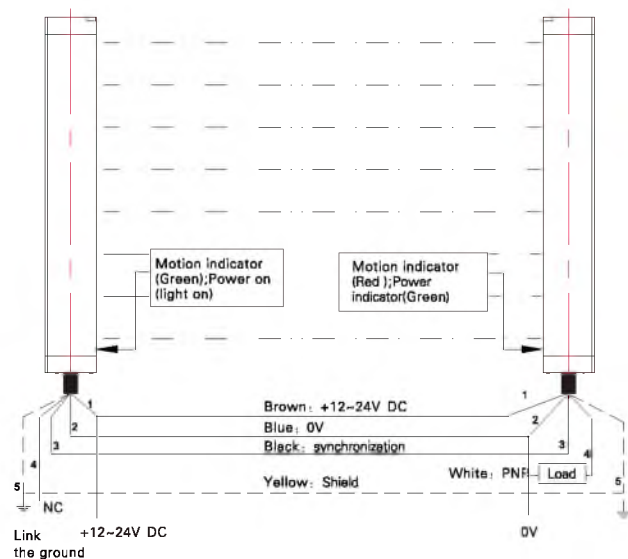
K: Beam pitch
H: Protection height
N: No. beam
L: Total light curtain height

Connection diagram

NPN



PNP



Area

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Economical Type

BKL Series

Area



Appearance

Sectional area	35.5X35.5mm
No. of beams	4~256
Protection height	120~3000mm
Scanning range	0.1~6m
Resolution	10/20/40mm
Min. sized detectable objects	> φ 14/ φ 25/ φ 45mm, opaque
Operating voltage	12~24V DC±10%
Current consumption	<200mA
Power consumption	3~8W
Output type	NPN/PNP
Synchronization type	Line synchronization
Response time	≤15ms
Light source	Infrared LED (modulated)
Protective circuit	Reverse polarity protection, output short circuit protection, overload protection
Ambient temperature	-15℃~+55℃, No freezing
Ambient humidity	35~85% RH, No condensation
Anti-interference ability	10000Lux (Incident angle ≥ 5°)
Insulation resistance	>10M Ω high resistance meter based on DC500V
Vibration resistance	10~150Hz, 1.5mm double amplitude for 2 hours each in X, Y and Z directions
Impact resistance	Acceleration: 500m/s ² (Approx: 50G); x, y and z direction (3 times each)
Degree of protection	IP65
Material	Housing: Aluminum alloy
Connection	M12 connector
Accessories	Right angle fixing frame

BKL10

Resolution	10mm							
Min. sized detectable objects	> φ 14, opaque							
Scanning range	0.1~6m							
NO. of beams	14	16	18	20	22	... ..	48	
Protection height	130mm	150mm	170mm	190mm	210mm	... ..	470mm	
Light curtain height	170mm	190mm	210mm	230mm	250mm	... ..	510mm	
Model NO.	NPN NC	BKL10-T1406NC	BKL10-T1606NC	BKL10-T1806NC	BKL10-T2006NC	BKL10-T2206NC		BKL10-T4806NC
	PNP NC	BKL10-T1406PC	BKL10-T1606PC	BKL10-T1806PC	BKL10-T2003PC	BKL10-T2206PC		BKL10-T4806PC

Remarks: maximum number of optical axis 64 axis.

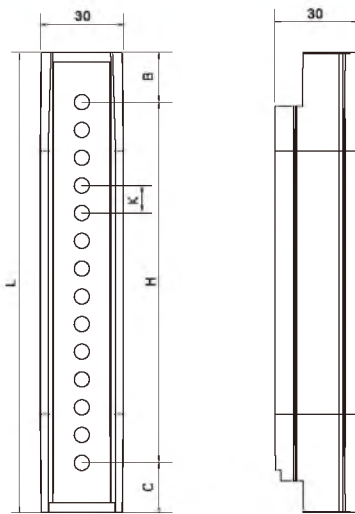
BKL20

Resolution	20mm							
Min. sized detectable objects	> ϕ 25, opaque							
Scanning range	0.1~6m							
NO. of beams	8	10	12	14	16	... ..	48	
Protection height	140mm	180mm	220mm	260mm	300mm	... ..	940mm	
Light curtain height	180mm	220mm	240mm	300mm	340mm	... ..	980mm	
Model NO.	NPN NC	BKL20-T0806NC	BKL20-T1006NC	BKL20-T1206NC	BKL20-T1406NC	BKL20-T1606NC		BKL20-T4806NC
	PNP NC	BKL20-T0806PC	BKL20-T1006PC	BKL20-T1206PC	BKL20-T1406PC	BKL20-T1606PC		BKL20-T4806PC

BKL40

Resolution	40mm					
Min. sized detectable objects	> ϕ 45, opaque					
Scanning range	0.1~6m					
NO. of beams	4	6	8	10	12	48
Protection height	120mm	200mm	280mm	360mm	440mm	1880mm
Light curtain height	140mm	240mm	320mm	400mm	480mm	1920mm
Model NO.	NPN NC	BKL40-T0406NC	BKL40-T0606NC	BKL40-T0806NC	BKL40-T1006NC	BKL40-T1206NC
	PNP NC	BKL40-T0406PC	BKL40-T0606PC	BKL40-T0806PC	BKL40-T1006PC	BKL40-T1206PC

Dimensions(Unit:mm)

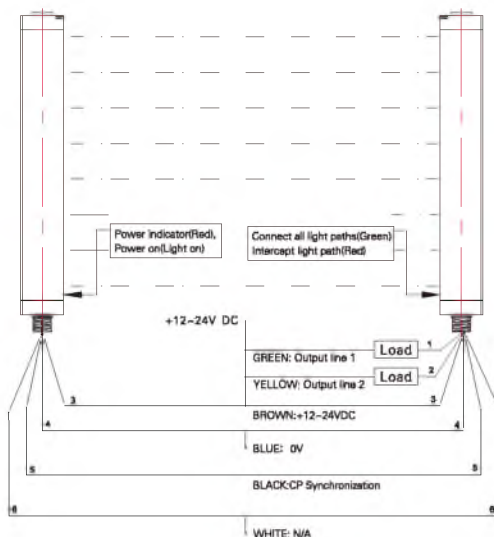


B: Upper blind
 C: Lower blind
 K: Beam pitch
 H: Protection Height
 N: No. beams
 L: Light curtain total height

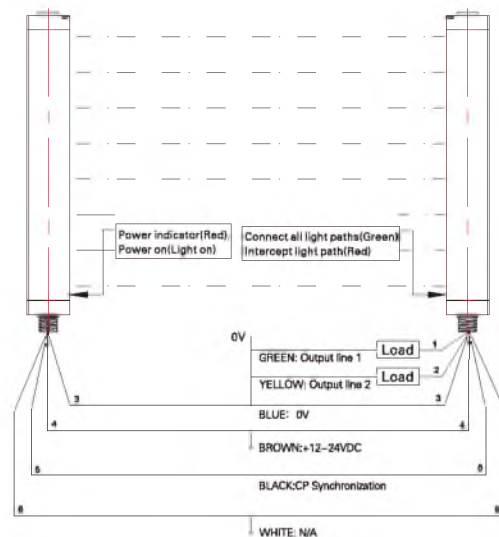
B=19mm
 C=21mm
 $H=(N-1)*K$
 $L=H+B+C$

Connection diagram

NPN



PNP



Safety Light Curtain

SAF Series

Area



Appearance	
Security Level	Type 4 Cat.4 PLe
Executive standard	GB/T19436.1; GB/T 19436.2; GB4584-2007; IEC 61496-1; IEC61496-2
Light source	Infrared LED (center wavelength 940nm)
Sectional area	52X35mm
NO. beams	4~72
Protection height	130~3000mm
Scanning range	0.1~40m
Resolution	10/20/30/40mm
Min. sized detectable objects	> ϕ 18/ ϕ 28/ ϕ 38/ ϕ 48mm, Opaque
EAA	Meet the requirements of IEC 61496-2, when the detection distance is more than 3m, EAA <2.5°
Supply voltage	24V DC $\pm$ 10%
Current consumption	Transmitter $\leq$ 300mA; Receiver $\leq$ 100mA (Non load)
Output type	PNP (Two groups)
EMS	Comply with the requirements of Class 4 safety light curtain in GB / T19436-1 and GB4584-2007
EMI	Comply with EN61326-1 and EN55011 electromagnetic field requirements for industrial sites
Response time	$\leq$ 20ms
Output characteristics	PNP transistor output X2 (ON), load current is less than 300mA, residual voltage is less than 3.5V (excluding the effect of wire extension)
Ambient temperature	Operating: -10°C~+55°C (No freezing and no condensation) ; Storage: -10°C~+55°C
Ambient humidity	Operating: 35~85%RH; Storage: 35~95%RH
Anti-interference ability	Incandescent: 3000Lux; Fluorescent: 3000Lux; Sunlight: 10000Lux
Vibration resistance	Frequency: 10 ~ 55Hz; amplitude: 0.35 $\pm$ 0.05mm; Scanning times: three axes, 20 times per axis
Impact resistance	Acceleration 10g, pulse duration: 16ms, number of collisions: three axes, 1000 $\pm$ 10 times per axis
Degree of protection	IP65
Supporting controller	Not equipped with controller; or equipped with CSRMB module, output relay passive contact signal
Accessories	Transmission line, mounting bracket

Product description

Safety light curtain integrated controller function into the sensor, is designed for risk assessment does not need to be equipped with a controller and need to have level signal control of equipment (for example: using PLC, computer-controlled equipment) to provide photoelectric protection device, can output two safe PNP signal.

Meets the requirements of safety level IV. SAF series photoelectric protection device can effectively detect any opaque objects that enter the light curtain area beyond the detection accuracy. It is suitable for the safety protection of mechanical presses, hydraulic presses, shearing machines, bending machines and other dangerous occasions. Can be used for detection and anti-theft.

Features

- Perfect self-test function, realizing full self-test including output signal.
- Floating shield function can be realized, which is convenient to realize the processing of long materials;
- Provide two relay passive contact outputs, higher safety performance
- High detection accuracy up to 18mm, which can protect fingers
- Large detection distance, up to 40m;
- Large detection height, up to 2840mm;
- Multiple product specifications, wide range of application;
- Can provide split indication function, intuitive display of beam on/off status.
- Good vibration damping performance, suitable for high-speed punching, large tonnage presses, long service life.
- Strong resistance to light interference and electromagnetic interference; more stable work.
- When configured with safety relay module, it can provide 3 normally open and 1 normally closed output and 2 normally open and 1 normally closed output in two forms.

SAF10

Resolution	10mm						
Min. sized detectable objects	φ 18, opaque						
Scanning range	Type A: 0~3m; Type B: 0~12m; Type C: 8~20m;						
NO. beams	16	20	24	28	32	... ..	72
Protection height	150mm	190mm	230mm	270mm	310mm	... ..	710mm
Light curtain height	239mm	279mm	319mm	359mm	399mm	... ..	799mm
Model NO.	PNP NC	SAF10-T16 ⁰³ PC	SAF10-T20 ⁰³ PC	SAF10-T24 ⁰³ PC	SAF10-T28 ⁰³ PC	SAF10-T32 ⁰³ PC	 SAF10-T72 ⁰³ PC
	Other	⁰³ : Type A 0~3m	¹² : Type B 0~12m	²⁰ : Type C 8~20m			

SAF20

Resolution	20mm						
Min. sized detectable objects	φ 28, opaque						
Scanning range	Type A: 0~3m; Type B: 0~12m; Type C: 8~20m;						
NO. beams	8	10	12	14	16	... ..	72
Protection height	140mm	180mm	220mm	260mm	300mm	... ..	1420mm
Light curtain height	239mm	279mm	319mm	359mm	399mm	... ..	1519mm
Model NO.	PNP NC	SAF20-T0803PC	SAF20-T1003PC	SAF20-T1203PC	SAF20-T1403PC	SAF20-T1603PC	 SAF20-T7203PC
	Other	03: Type A 0~3m	12: Type B 0~12m	20: Type C 8~20m			

SAF30

Resolution	30mm						
Min. sized detectable objects	φ 38, opaque						
Scanning range	Type A: 0~3m; Type B: 0~12m; Type C: 8~20m;						
NO. beams	6	8	10	12	14	... ..	72
Protection height	150mm	210mm	270mm	330mm	390mm	... ..	2130mm
Light curtain height	239mm	299mm	359mm	419mm	479mm	... ..	2219mm
Model NO.	PNP NC	SAF30-T06 ⁰³ PC	SAF30-T08 ⁰³ PC	SAF30-T10 ⁰³ PC	SAF30-T12 ⁰³ PC	SAF30-T14 ⁰³ PC	 SAF30-T72 ⁰³ PC
	Other	⁰³ : Type A 0~3m	¹² : Type B 0~12m	²⁰ : Type C 8~20m			

SAF40

Resolution	40mm						
Min. sized detectable objects	φ 48, opaque						
Scanning range	Type A: 0~3m; Type B: 0~12m; Type C: 8~20m;						
NO. beams	4	6	8	10	12	... ..	72
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	2840mm
Light curtain height	239mm	319mm	399mm	479mm	559mm	... ..	2959mm
Model NO.	PNP NC	SAF40-T04 ⁰³ PC	SAF40-T06 ⁰³ PC	SAF40-T08 ⁰³ PC	SAF40-T10 ⁰³ PC	SAF40-T12 ⁰³ PC	 SAF40-T72 ⁰³ PC
	Other	⁰³ : Type A 0~3m	¹² : Type B 0~12m	²⁰ : Type C 8~20m			

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain

Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm

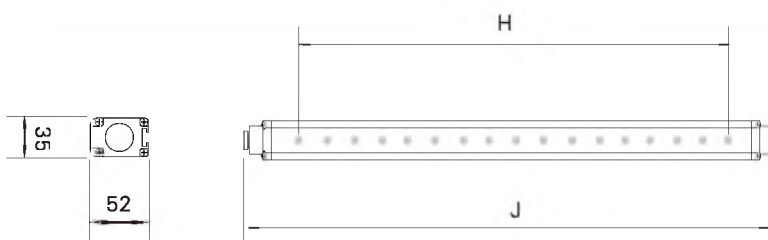
LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

Dimensions(Unit:mm)

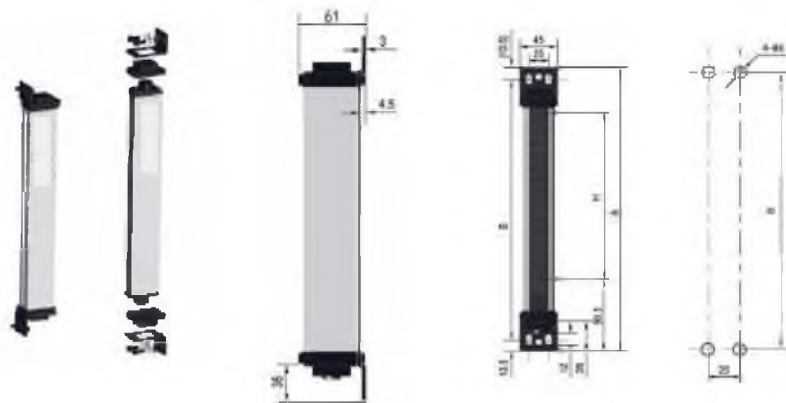


H: Protection height
J: Length of light emitter and light receiver

Safety Light Curtain

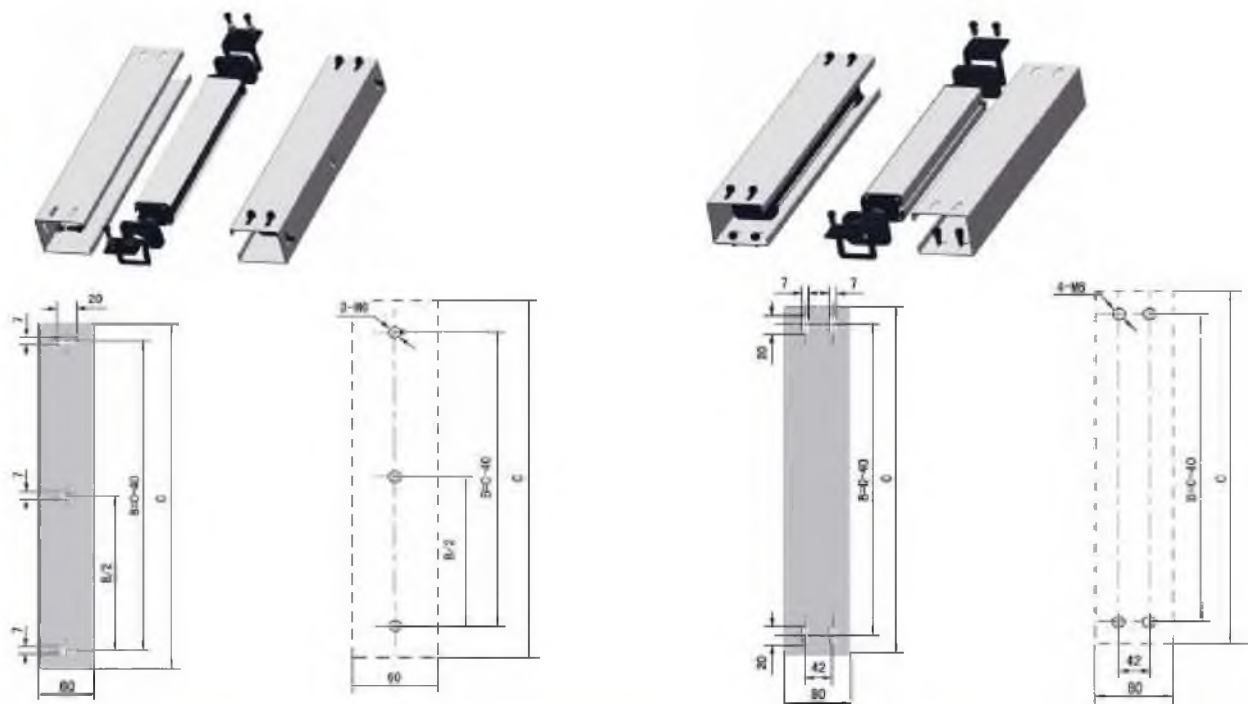
Installation Method

Front and side integrated installation method (ZC)



A	Optical axis spacing 10mm	H+131
	Optical axis spacing 20mm	H+141
	Optical axis spacing 30mm	H+131
	Optical axis spacing 40mm	H+161
B	Optical axis spacing 10mm	H+104
	Optical axis spacing 20mm	H+114
	Optical axis spacing 30mm	H+104
	Optical axis spacing 40mm	H+134
H	Protection height	

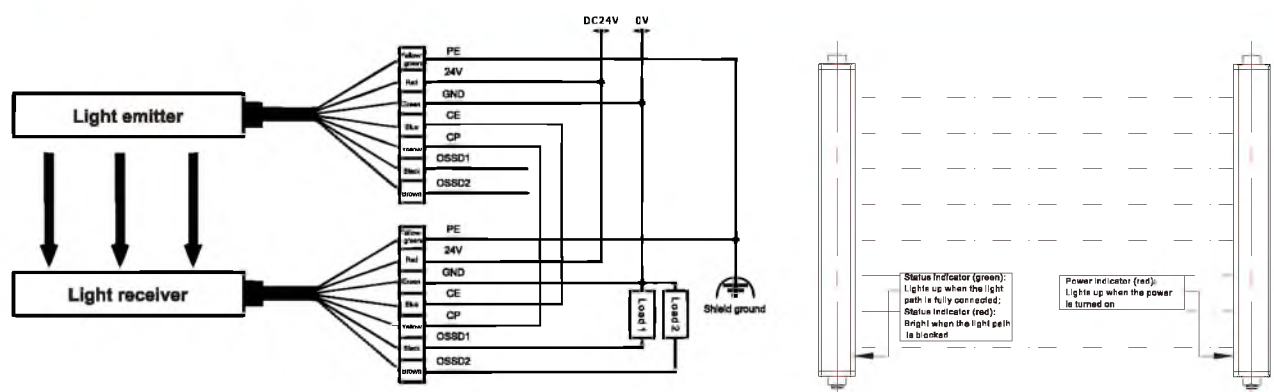
Protective cover installation method (FZC)



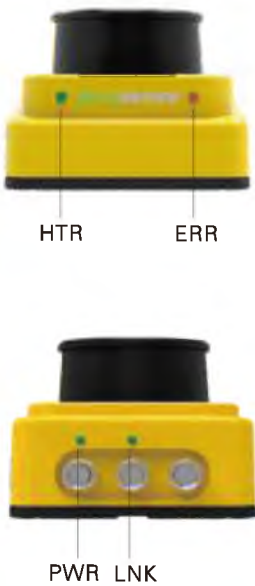
Formal installation of protective cover

Side-mounted protective cover

Connection diagram



Indicator Lights and Operation Buttons

	Name	Description
	PWR	Power Indicator ◆Normal off: no power / power is invalid ◆Constant light: power on
	LNK	Ethernet indicator ◆Always off: no network connection ◆Always on: there is a network connection
	ERR	Work failure indicator ◆Starting state: bright (about 24 seconds) ◆Always off: no fault ◆Always on: internal fault/measurement abnormal ¹ ◆Long flashing (0.5Hz): high temperature/low temperature alarm ◆Short flashing (1 Hz): Dirty/obstructed light transmission cover
	HTR	Normal measurement indicator ◆Starting state: off ◆Always off: the device has not started to measure ◆Always on: the equipment is measuring normally

- 1: Including measurement stop and motor stop;
2: Including being blocked by dense fog.

Accessories

					Mounting screws, washers And easy installation tools
Mounting bracket: AS-100C-AT set	M12 dust plug Comes with	Power cable: AS-100C-EC A	RJ45 network cable: AS-100C-IOCB A	I/O cable: AS-100C-IOCB A	Parts and accessories: M5x8 set

Ultrasonic Sensors



Cylindrical Type

- Sizes of M18 and M30 for choosing
- Sensing distance varies from 40 to 6000mm
- Different output types (NPN/PNP/ Analog Voltage/ Analog Current) are available

P.J-02



Solid Level Switch

- It can detect a variety of viscous liquids such as water, oil, solvent and reagents
- Position repeatability up to 2mm, strong stability
- Integrated NPN/PNP relay output, connection is convenient

P.J-07



Fork Type Liquid Level Switch

- It can detect all kinds of liquid
- Using digital filtering technology, the performance is reliable
- It can work normally under the high pressure environment of 1000PSI

P.J-08



Double Sheet Detection Sensor

- Reliable detection of single and double sheets (multiple sheets) of material
- It can be flexibly set by the Teach-in function
- Stable detection of paper / metal / plastic / platinum / silicon / battery pole pieces and other materials

P.J-09



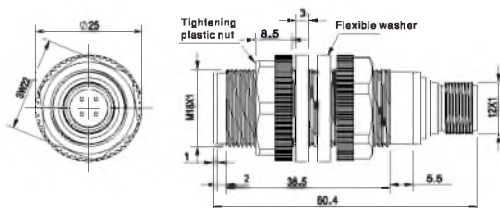
Appearance			
Sensing type	Diffuse reflection		
Sensing range	40~300mm		60~800mm
Repeat accuracy	2%		
Hysteresis	2%		
Linearity error	≤3%		
Resolution	2mm		
Opening angle	7°±2°		±2°
Switch frequency	8Hz		5Hz
Response time (switch output)	12ms		80ms
Response time (analog output)	500ms		
Operating voltage	10~30V DC(±5%)		
Temperature drift	≤5%		
Temperature compensation	Yes		
Voltage drop	2.2Vmax (1L=100mA)		
Current consumption	≤35mA		
Max Load Current	100mA		
Leakage current	≤10 μA@30VDC		
Sensitivity adjustment	External teach-in		
Time delay before availability	≤300ms (Switch); ≤900ms (Analog)		
Operating temperature	-20℃~+70℃		
Storage temperature	-35℃~+70℃(No freezing)		
Circuit protection	Reverse polarity protection, short circuit (auto reset), over voltage pulses protection		
Degree of protection	IP67		
Tightening torque	1Nm		
Housing material	PBT		
Sensing surface material	Epoxy-glass resin		
Weight	15g		
Analog output	Voltage	MS18-30V	MS18-90V
	Current	MS18-30I	MS18-90I
Switch output	NPN	MS18-30N	MS18-90N
	PNP	MS18-30P	MS18-90P

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

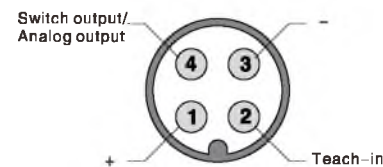
Ultrasonic
Cylindrical type
Solid liquid level switches type
Fork type liquid level switch type
Double-sheet detection sensor

Dimensions

Unit: mm



Wiring Diagram



Cylindrical Type

M18 Plastic Housing Series

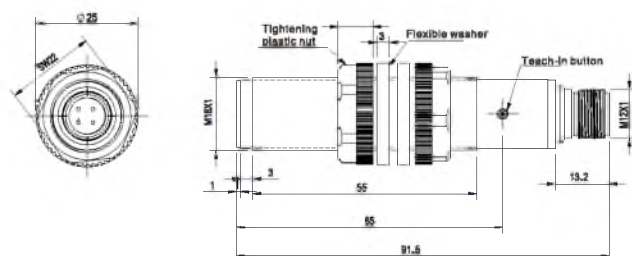


Appearance

Sensing type		Diffuse reflection			
Sensing range		50~400mm	100~900mm	150~1600mm	200~2200mm
Resolution		3mm	2mm	3mm	3mm
Repeat accuracy		0.5%			
Hysteresis		1%			
linearity error		1%			
Opening angle		± 8°	± 7°	± 8°	± 7°
Switch frequency		10Hz	4Hz	2Hz	1Hz
Response time		500ms	≦125ms	250ms	500ms
Operating voltage		15~30V DC(± 5%)			
Temperature compensation		Yes			
Temperature drift		5%			
Voltage drop		2.2V max.(1L=100mA)			
Current consumption		≦50mA			
Output current(Switch output)		100mA			
Min load resistance (Analog voltage)		3kΩ			
Leakage current		≦10 μ A@30V DC			
Sensitivity adjustment		Teach-in			
Time delay before availability (Switch output)		≦500ms; ≦900ms(Dual output)			
Time delay before availability (Analog output)		≦900ms			
Operating temperature		-20℃~+60℃			
Storage temperature		-35℃~+70℃ (No freezing)			
Circuit protection		Reverse polarity protection, short circuit (auto reset), over voltage pulses protection			
Degree of protection		IP67			
Tightening torque		50Nm			
Housing material		PBT			
Sensing surface material		Epoxy-glass resin			
Weight		26g			
Analog output	Voltage	MC18-40V	MC18-90V	MC18-160V	MC18-220V
	Current	MC18-40I	MC18-90I	MC18-160I	MC18-220I
Switch output	NPN	MC18-40N	MC18-90N	MC18-160N	MC18-220N
	PNP	MC18-40P	MC18-90P	MC18-160P	MC18-220P

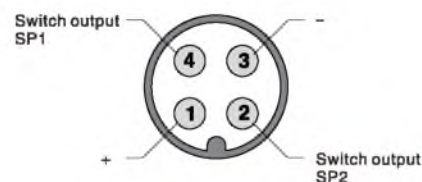
Dimensions

Unit: mm

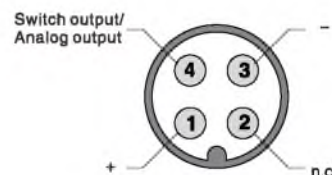


Wiring Diagram

Dual switch outputs:



Switch / Analog:





Appearance

Sensing type		Diffuse reflection
Sensing range		60~1000mm
Blind areas		0~60mm
Standard Test Panel		100 x 100mm
Opening angle		± 7°
Sensor frequency		Approx. 200KHz
No-load Current in Response Delay		100ms
Working Voltage		9~30VDC, 10% V
Circuit Protection		Protection against back-connection and instantaneous overvoltage
No-load current		≤25mA
Rated operating current		200mA, Short circuit protection/overload protection
LED		Red light: no target detected in learning state, normal light; blue light: detected target, flicker in learning state; yellow light: switch state in normal working mode; green light: power indicator light, normal light
Resolution		0.5mm
Repetition accuracy		0.3% full range
Temperature drift		0.05%/° C (built-in temperature compensation)
Linearity		<1%
Operating temperature		-20℃~+70℃ (253~343K)
Storage temperature		-40℃~+85℃(233~358K)
Electromagnetic compatibility		GB/T17626.2-2006;GB/T17626.4-2008
Protection level		IP65
Connection method		V3 connector, 4-pin
Housing material		Copper nickel plating
Weight		62g
Cable length		2m
Analog	Voltage output 0-5V	MT18-100V
	Voltage output 0-10V	MT18-100V2
	Current output 4-20mA	MT18-100A
Switch	NPN	MT18-100N
	NPN Hysteresis mode	MT18-100N2
	PNP	MT18-100P
	PNP Hysteresis mode	MT18-100P2
Numerical capacity	TTL output	MT18-100T

Fiber Optic
Slot Sensors
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Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Ultrasonic

Cylindrical type

Solid liquid

level switches type

Fork type liquid

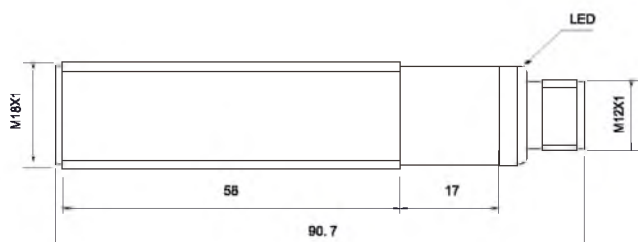
level switch type

Double-sheet

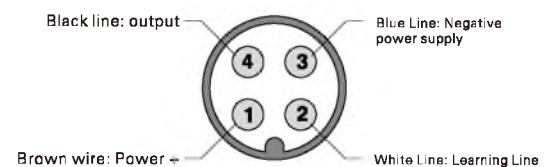
detection sensor

Dimensions

Unit: mm



Circuit Diagram



Cylindrical Type

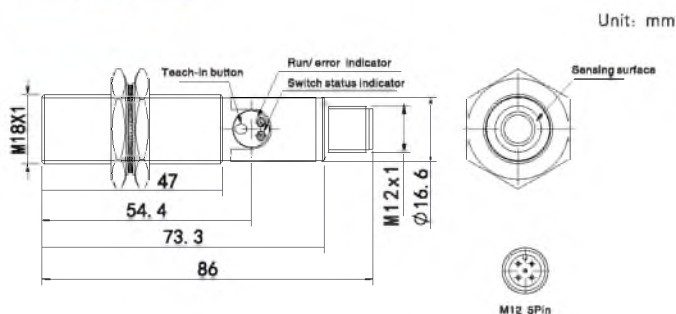
M18 Metal Housing Series



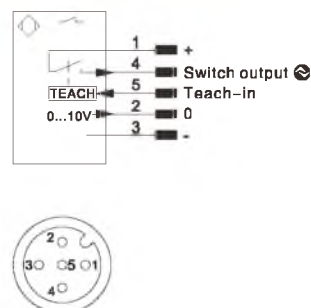
Appearance

Sensing type	Diffuse reflection
Working range	50~400 mm
Sensing range	350 mm
Reproducibility max.	1 mm
Linearity error	5 mm
Resolution	0.1mm
Ultrasonic frequency	300 kHz
Opening angle	< 12°
Service life(Tu=+25℃)	100000 h
Switch hysteresis	2 mm
Supply voltage	18~30 V DC
Current consumption(Ub=24V)	<30 mA
Switch frequency	20 Hz
Response time	25 ms
Temperature range	-25~+60℃
Switch outputs	1
Switch output voltage drop	<2.5 V
PNP switch output/ switch current	100 mA
Analog output	0~10V
Synchronous mode	Up to 40 sensors
Short circuit protection	Yes
Reverse polarity protection	Yes
Overload protection	Yes
Lockable	Yes
Interface	IO-Link
IO-Link version	1.0
Protection class	Class 3
Setting method	Teach-in display
Material	Stainless steel
Full encapsulation	Yes
Degree of protection	IP67
Connection	M12*1; 4/5 Pin
PNP NO/ NC switchable	Yes
Model No.	MD18-35V 

Dimensions



Wiring Diagram



Solid Level Switch Type

MDJ Series



Appearance

Sensing type

Retro-beam

Feature

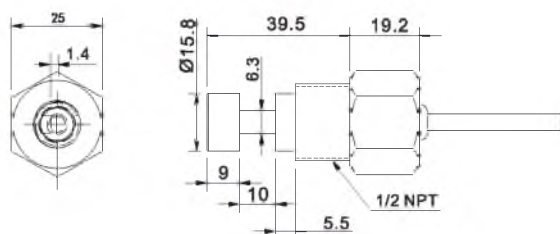
The preferred alternative to mechanical float switches
Can detect water, oil, solvents, reagents and other viscous liquids
Positional repeatability up to 2mm, strong stability
Set NPN/PNP/Relay output in one, convenient connection
Stainless steel housing, withstands up to 1000 PSI pressure
Not affected by air bubbles, steam, impurities and turbulence
Epoxy resin sealed in one, highly reliable

Housing size	1/2" NPT	1/4" NPT
Repeat accuracy	≤2mm	
Delay	0.5s	
Input voltage	5~30 V DC	
Leakage current	≤50uA	
Output	Relay output: 0.5A single pole single throw (NO)	
Circuit protection	Transient voltage and polarity reversed	
Material	stainless steel (316L)	
Ambient temperature	-29℃~+80℃	
Environmental pressure	250PSI, customizable 500/1000PSI	
Lead length	12inch, (305mm)	
Model No.	MDJ-C02-1/2	MDJ-C02-1/4

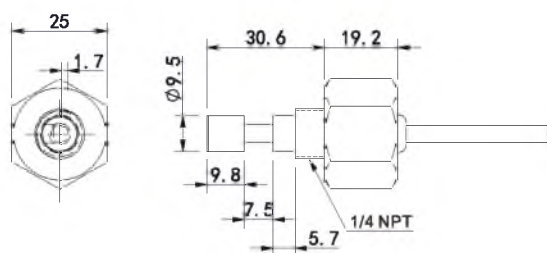
Dimensions

Unit: mm

MDJ-C02-1/2



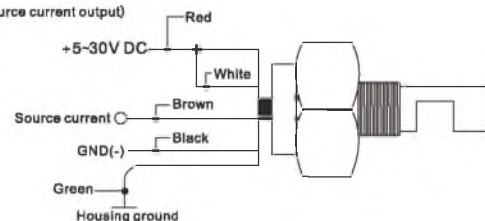
MDJ-C02-1/4



Wiring Diagram

PNP

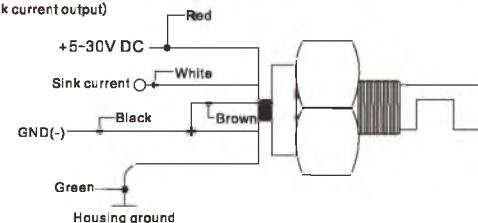
(Source current output)



White line jumper connected to red line(+)

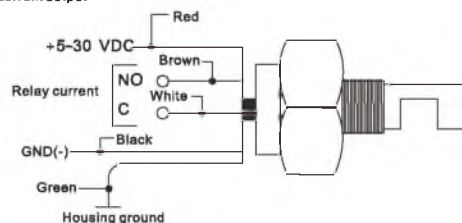
NPN

(Sink current output)



Brown line jumper connected to black line(-)

Relay current output





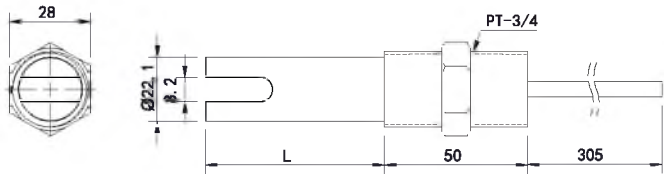
Appearance		
Sensing type	Thru-beam	
Feature	Adopting mature ultrasonic technology and electronic integration technology	
	Almost any kind of liquid can be detected	
	Digital filter technology for reliable performance	
	Filled with epoxy resin, safe and secure	
	No moving parts, easy installation, long service life	
	Can work in high pressure environment of 1000PSI	
	Customizable development of various sizes	
Repeat Accuracy	≤2mm	
Delay	0.5s	
Operate voltage	5~30 V DC	
Input current	≤100 mA	
Leakage current	≤50uA	
Output	Relay output: 0.5A single pole single throw (NO/NC); ≤30V DC	
Screw thread	3/4" NPT STD	
Under pressure	Max 1000PSI	
Material	stainless steel (316L)	
Ambient temperature	-29℃~80℃	
Circuit protection	Reverse protection, instantaneous protection	
Cable length	305mm, can be customized according to customers needs.	
Application	Mercury protection, tank compressors, medical and laboratory equipment, hydraulic supply lines, oil film inspection, coolant storage, sewage treatment systems, hydraulic and lubricant reservoirs, chillers	
Model No.	MX-S1	

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic**
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidence

Dimensions

Unit: mm



*L default value is 62, L can be designed according to requirements

- Ultrasonic**
- Cylindrical type
- Solid liquid level switches type
- Fork type liquid level switch type**
- Double-sheet detection sensor

Double-sheet Detection Sensor

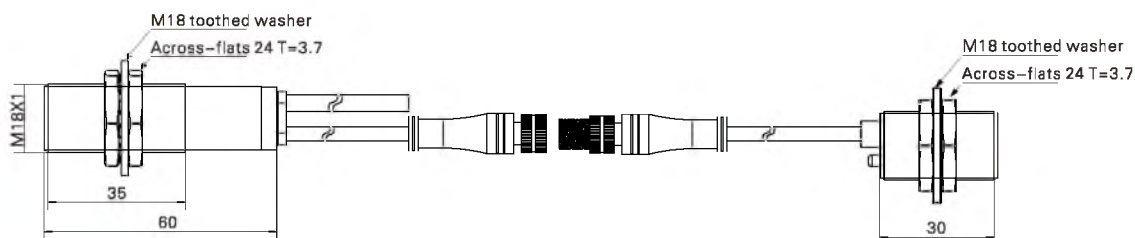
MUD Series



Appearance		
Sensing distance	20~40mm, 20mm ± 2mm(Optimum)	20~60mm, 40mm ± 5mm (Optimum)
Blind area	In front of the transmitter and receiver 5mm	
Angle deviation	± 45° with vertical planes	
Transducer frequency	400kHz	200kHz
Operating voltage	20~30V DC, Reverse polarity protection	
Response time	The automatic operation mode is 2.5ms	The automatic operation mode is 6.5ms
Power-on delay	<750ms	<1.9s
Voltage pulsation	± 10%	
No-load current	≤50mA	
Probe material	Polyurethane foam, glass filled epoxy resin	
Housing material	Copper nickel plating	
Tightening torque	15Nm	
Protection degree	IP65	
Operating temperature	+5℃~+60℃	
Storage temperature	+40℃~+85℃	
Control device	Control input: C1 to C3	
Control description	<-V+6V: Logic 1 (control input terminal -V or floating); >-V+10V: Logic 0 (control input terminal +V)	
Indicator	Green light: single sheet | Green light flashing: teaching Red light: double/multiple sheet | Red light flashing: no paper	
Output	NPN/PNP Output, I _{max} =200mA(-V+2V), short circuit protection	
Output logic	No paper status: White line OFF, Black line OFF	
	Single sheet status: white line ON, black line OFF	
Scope of application	Dual/multiple sheet status: white line OFF, black line ON	
	Paper and paper of 20~1200g/m ² in unit area, alloy laminates and film thickness up to 0.4mm, self-adhesive film	
Model No.	NPN	MUD-60N-400
	PNP	MUD-60P-400
Model No.	NPN	MUD-60N-200
	PNP	MUD-60P-200

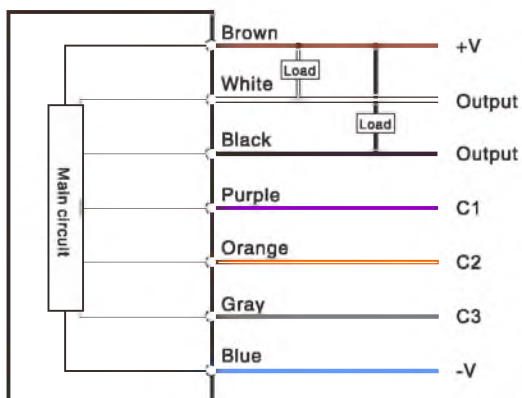
Dimensions

Unit: mm

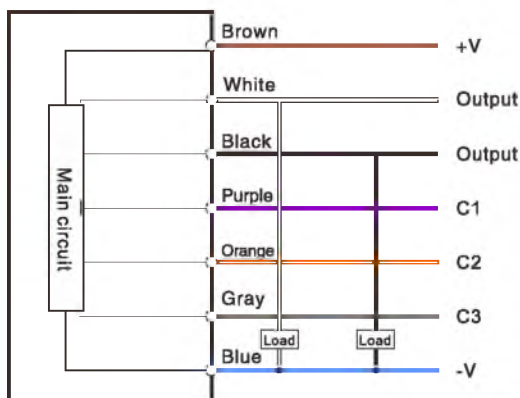


Circuit Diagram

NPN



PNP





Appearance

Sensing range	30~60mm
Transducer frequency	Approx. 200kHz
Working voltage	18~30V DC, 10%V
Refreshment rate	1ms
Detection methods	Non-Contact
Testing materials	Suitable for reliable detection of presence or absence, single or multiple overlapping materials.
Output mode	three NPN/PNP
Calibration mode	Yes
Display	LED green, single sheet detected; LED yellow, no target (air); LED red, double sheet detected
No-load current	< 50mA
Pulse width	> 100ms
Impedance	> 4kΩ
Output	Three NPN/PNP normally open for air, single and multiple; 100mA short-circuit protection, overload protection; voltage drop < 2V
Learning line	Used to calibrate the energy of a single sheet when different materials are used
Response delay	Approx. 15ms
Judgement	Approx. 15ms
Working temperature	-20℃~+70℃ (253~343K)
Storage temperature	-40℃~+70℃(233~343K)
EMC	GB/T17626.2-2006 / GB/T17626.4-2008
Protection level	IP65
Connection mode	2M, 6 CORE CABLE
Housing material	Copper nickel plating
Weight	170g
Model No.	NPN MUD-60N-18 PNP MUD-60P-18

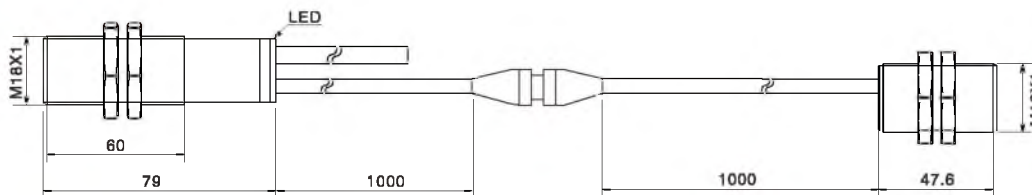
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

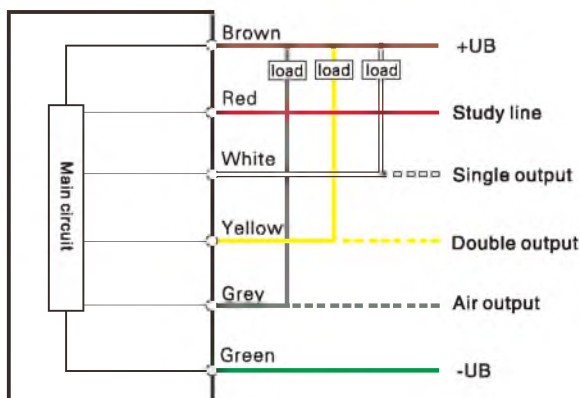
Ultrasonic
Cylindrical type
Solid liquid level switches type
Fork type liquid level switch type
Double-sheet detection sensor

Dimensions

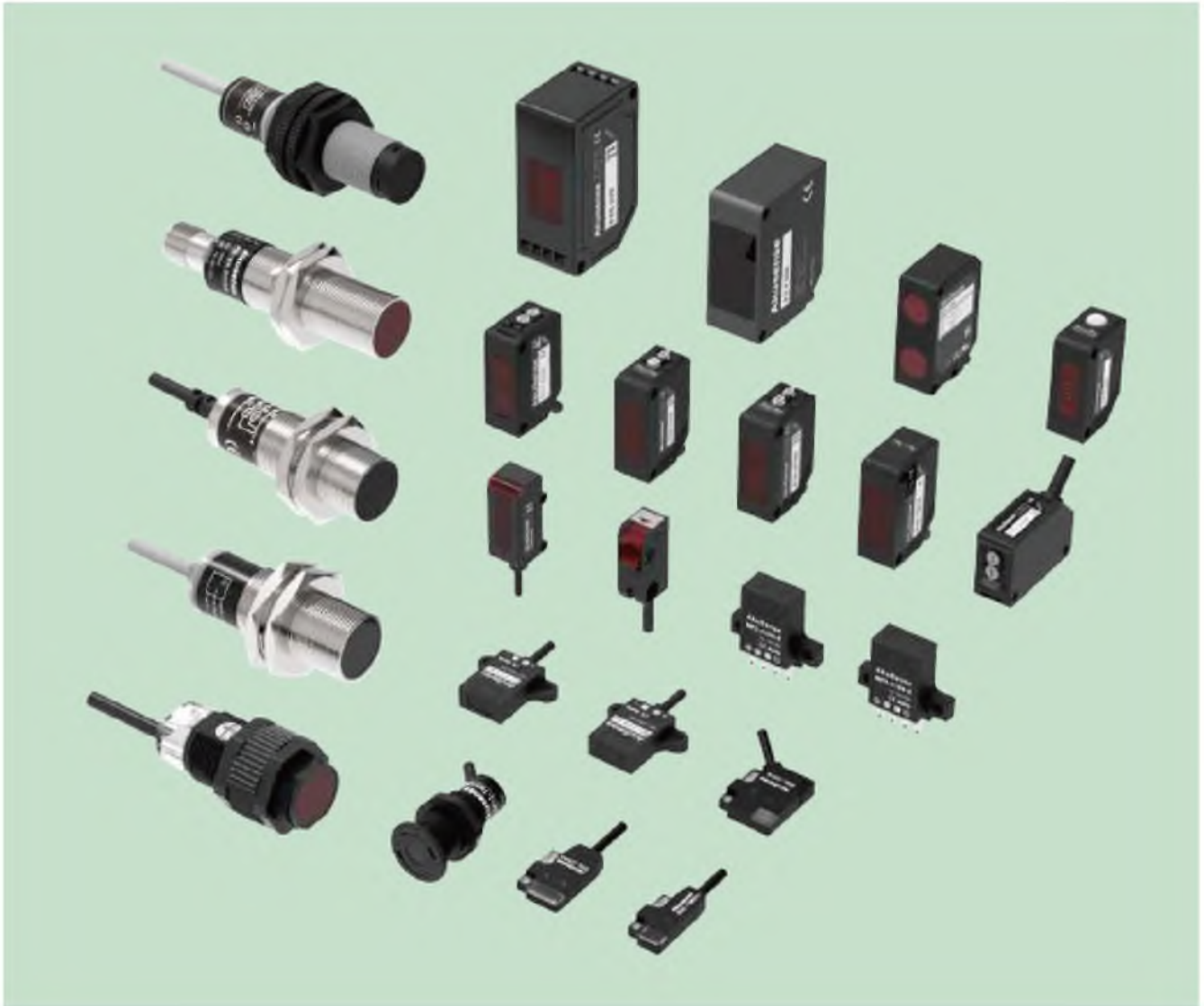
Unit: mm



Circuit Diagram



Photoelectric Sensors



- ◉ Available in a variety of models, like thin type, square type, cylindrical type, transparent object detection type, background suppression type, etc.
- ◉ L.on and D.on switch freely.
- ◉ Solid and durable metal housing; Economical plastic housing and easy to install.
- ◉ Short circuit protection and reverse polarity protection.
- ◉ Switch frequency up to 5000Hz.



Cylindrical Type (PM/PSM/PXM Series)

- Epoxy resin fillings ,powerful in shock resistance
- The smallest diameter(8mm) in the industry
- Nickel plated brass, effectively resist chemicals' corrosion

P.C-07



Square Type (PTE/PTEW/PTV/PTVW/PTN/PTJ-I Series)

- Traditional square housing with great performance
- 25.4mm standard hole pitch for simple installation
- Identifying the action clearly with dual LED indicators

P.C-16



Flat Type (MP2 Series)

- Sensing surfaces on top side and front side support various detections
- Can switch L.on and D.on switch flexibly
- Long distance detection up to 40mm(white cardboard)

P.C-28



Thickness is only 3.5mm

Thin Type (ESL series)

- 3.5mm ultra-thin design, greatly saves installation space
- Ip67 Protection degree , excellent mechanical performance
- LED indicator is bright and can be clearly seen from the back

P.C-30



Not affected by background color

BGS Type (ESB Series)

- Free from objects and background colors with stable detection
- Built-in rotational knobs, with many turns for fine-tuning of sensitivity adjustment
- IP67 protection degree, with excellent mechanical performance

P.C-32



Transparent Object Detection (EST Series)

- No blind spot (detection for every corner)
- Suitable for moving objects
- Best options for different kinds of glass or plastics

P.C-35



RGB Light Source

Color/Mark Detection (ESC/ESE Series)

- Built-in RGB light sources
- Automatic adjustment to the most suitable light source according to the detected color
- Two detection modes, mark and color

P.C-37



TOF Principle Type (PM18-TF/PX series)

- Up to 3 meters range
- TOF principle, high stability
- Independent of object color, background color and reflectivity

P.C-27



IP69K High Protection Type (PM18K Series)

- AISI 316L stainless steel housing material
- Protection grade IP69K, excellent mechanical performance
- Applied in harsh environments.

P.C-42



Anti-glare Type (PTL Series)

- Not interfered by glare, with stable detection
- Built-in multi-turn potentiometer for fine adjustment of sensitivity
- IP67, excellent mechanical performance

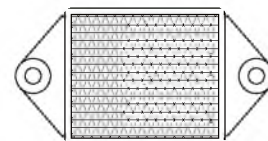
P.C-19



IO-Link Type (PTZ-C Series)

- With IO function, contributing to industrial 4.0
- Identify the action clearly with dual LED indicators
- IP67, excellent mechanical performance

P.C-23



Reflectors

- Made of special material (robust housing)
- Shapes as circular, square and combination etc
- Customization is available as requested by clients

P.C-39

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Photoelectric
Cylindrical
Square
Flat type
Thin type
BGS
Transparent detection
Color/Mark Detection
TOF type
IP69K high protection type
Anti-glare type
IO-Link type

Reflectors
Reflectors

Type	Light Source	Series	
Photoelectric	Red Light/ Infrared Light/ RGB	Cylindrical Type	PM/PSM/PXM Series
		Square Type	PTE/PTEW/PTV/PTVW/ PTN/PTJ-I Series
		Flat Type	MP2 Series
		Thin Type	ESL Series
		BGS Type	ESB Series
		Transparent Object Detection	EST Series
		Color/Mark Detection	ESC/ESE Series
		TOF Principle Type	PM18-TF/PX Series
		IP69K High Protection Type	PM18K Series
		Anti-glare Type	PTL Series
		IO-Link Type	PTZ-C Series

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high
protection type

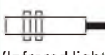
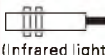
Anti-glare type

IO-Link type

Reflectors

Reflectors

Cylindrical

Series	Sensing type	Sensing distance	Model No.		Pages
			NPN L.on&D.on	PNP L.on&D.on	
PM08	 (Infrared light)	Diffuse reflection	3cm	L.on:PM08-D03NO  L.on:PM08-D03PO	C-07
PM18 (Metal housing)	 (Infrared light)	Diffuse reflection	10cm	PM18-D10NR	C-08
			40cm	PM18-D40NR	
		Thru-beam	1000cm	PM18-TM10NR	
			2000cm	PM18-TM20NR	
PM18 (Economical Type)	 (Infrared light)	Retro-reflection	300cm	PM18-R300NR	C-09
		Diffuse reflection	10cm	L.on:PM18-D10NO	
		Thru-beam	500cm	PM18-TM05NO	
			2000cm	PM18-TM20NO	
PXM18 (PBT housing)	 (D10 Red light) (D40 Infrared light)	Diffuse reflection	10cm	PXM18-D10N	C-15
			40cm	PXM18-D40N	
PSM12	 (Infrared light)	Thru-beam	500cm	PSM12-TM05NO PSM12-TM05NC	C-13
PSM18	 (Red light)	Diffuse reflection	10~40cm	PSM18-D40N	C-14

Square

Series	Sensing type	Sensing distance	Model No.		Pages	
			NPN L.on&D.on	PNP L.on&D.on		
PTE	 (Red light)	Diffuse reflection	 1~30cm	PTE-D30N 	PTE-D30P	C-16
			 0.5~100cm	PTE-D70N	PTE-D70P	
		Convergent reflective	 0.5~14cm	PTE-X09N 	PTE-X09P	
			Retro-reflection	 1~20cm	PTE-R20N		PTE-R20P
		 200cm		PTE-R200N	PTE-R200P	
		 300cm		PTE-R300N	PTE-R300P	
		Thru-beam		PTE-TM10NO	PTE-TM10PO	C-17
			 1000cm	PTE-TM10NC	PTE-TM10PC	
				PTE-TM10AN	PTE-TM10AP	
		PTEW	 (PTEW Red light PTVW Infrared light)	Diffuse reflection	 0.5~20cm	PTEW-D20N	PTEW-D20P	C-18
PTVW	 10cm	PTVW-D10N			PTVW-D10P	
	 20cm	PTVW-D20N			PTVW-D20P	
PTV	 (Infrared light)	Diffuse reflection	 1~30cm	PTV-D30N	PTV-D30P	C-20
			 0.5~100cm	PTV-D70N	PTV-D70P	
		Convergent reflective	 0.5~14cm	PTV-X09N	PTV-X09P	
			 500cm	PTV-T500N	PTV-T500P	
		Thru-beam		PTV-TM20NO	PTV-TM20PO	C-21
			 2000cm	PTV-TM20NC	PTV-TM20NC	
				PTV-TM20AN	PTV-TM20AP	

Guidance

Square

PTN	 (Infrared light)	Diffuse reflection	5cm	PTN-D05N	PTN-D05P	C-25
		Thru-beam	50cm	PTN-T50N	PTN-T50P	
PTJ-I	 (Infrared light)	Thru-beam	80cm	D.on:PTJ-T80NO-I	D.on:PTJ-T80PO-I	C-26
				L.on:PTJ-T80NC-I	L.on:PTJ-T80PC-I	
		Thru-beam	150cm	D.on:PTJ-T150NO-I	D.on:PTJ-T150PO-I	
				L.on:PTJ-T150NC-I	L.on:PTJ-T150PC-I	

Thin Type

Series	Sensing type		Sensing distance	Model No.		Pages
			NPN L.on&D.on		PNP L.on&D.on	
ESL	 (Infrared light)	Convergent reflective	 2~15mm	ESL-15NO	ESL-15PO	C-30
	 (Infrared light)	Diffuse reflection	 2~25mm	ESL-25NO	ESL-25PO	
	 (Red light)	Thru-beam	 500mm	ESL-T50NO	ESL-T50PO	
		Thru-beam	 100cm	ESL-TM01NO	ESL-TM01PO	

BGS

Series	Sensing type		Sensing distance		Model No.		Pages
					NPN L.on&D.on	PNP L.on&D.on	
ESB	 (Red light)	Diffuse reflection	 0.5~10cm	ESB-S10N	ESB-S10P	C-32	
		Diffuse reflection	 0.5~15cm	ESB-15N	ESB-15P		
		Diffuse reflection	 0~30cm	ESB-30N	ESB-30P		
	 (Infrared light)	Diffuse reflection	 1~30cm	ESB-V30N	ESB-V30P	C-33	
	 (Red light)	Diffuse reflection	 1~20cm	ESB-C20N	ESB-C20P		

Flat

Series	Sensing type		Sensing distance	Model No.		Pages
			NPN L.on&D.on	PNP L.on&D.on		
MP2 (Connector)	 (Infrared light)	Diffuse reflection	 40mm	MP2-410N-E 	MP2-410P-E	C-28
	 (Infrared light)	Diffuse reflection	 40mm	MP2-412N-E	MP2-412P-E	
MP2 (Pre-wired)	 (Infrared light)	Diffuse reflection	 2.5~8mm	D.on: MP2-410N-WD L.on: MP2-410N-WL	D.on: MP2-410P-WD L.on: MP2-410P-WL	C-29
		Diffuse reflection	 2.5~8mm	D.on: MP2-412N-WD L.on: MP2-412N-WL	D.on: MP2-412P-WD L.on: MP2-412P-WL	
	 (Infrared light)	Diffuse reflection	 2.5~8mm	D.on: MP2-410N-WD L.on: MP2-410N-WL	D.on: MP2-410P-WD L.on: MP2-410P-WL	
		Diffuse reflection	 2.5~8mm	D.on: MP2-412N-WD L.on: MP2-412N-WL	D.on: MP2-412P-WD L.on: MP2-412P-WL	

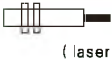
Transparent Detection

Series	Sensing type	Sensing distance	Model No.		Pages
			NPN	PNP	
EST	 (Red light)	Retro-reflection	1~200cm	EST-200N	C-35
			0~200cm Coaxial beam	EST-X200N 	
				EST-200P	
				EST-X200P	

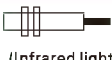
Color/Mark Detection

Series	Sensing type	Sensing distance	Model No.		Pages
			NPN	PNP	
ESC		Diffuse reflection	16~20mm	ESC-18N	C-37
ESE	 (RGB)	Diffuse reflection	17~23mm	ESE-20N	C-38
				ESE-18P	
				ESE-20P	

TOF Principle Type

Series	Sensing type	Sensing distance	Model No.		Pages
			NPN	PNP	
PM18-TF	 (laser)	Reflection	1.2m	PM18-TF120N	C-11
PX	 (Infrared light)	1 Point teach-in	1m	PX-F09N	C-27
		1 Point teach-in	3m	PX-F30N	
				PM18-TF120P	
				PX-F09P	
				PX-F30P	

IP69K High Protection Type

Series	Sensing type	Sensing distance	Model No.		Pages
PM18K	 (Infrared light)	Diffuse reflection	400mm	PM18K-D40NR	C-12

Anti-glare Type

Series	Sensing type	Sensing distance	Model No.		Pages
			NPN	PNP	
PTL		Diffuse reflection	5~100mm	PTL-D10N	C-19
			10~300mm	PTL-D30N	
				PTL-D10P	
				PTL-D30P	

IO-Link Type

Series	Sensing type	Sensing distance	Model No.		Pages
PTZ-C		Diffuse reflection	0~1m	PTZ-D70N-C	C-23
		Thru-beam	0~25m	PTZ-TM25N-C	
		Retro-reflection	0.01~4m	PTZ-R400N-C	

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors

Cylindrical

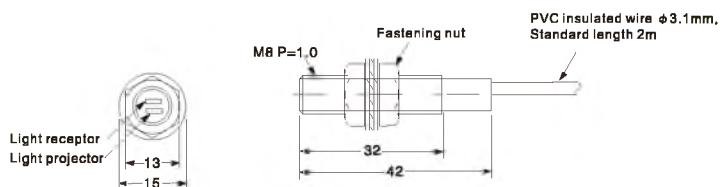
PM08 Series



Appearance		
Sensing type	Diffuse reflection	
Sensing distance	30mm (White 30X30mm)	
Hysteresis	< 20%	
Light source	IR Diode(940nm)	
Operating voltage	12~24V DC $\pm 10\%$ ripple(p-p) < 10%	
Current consumption	$\leq 30\text{mA}$	
Control output	NPN open-collector output	PNP open-collector output
Switch mode	L.on	
Protection circuit	Short circuit protection, reverse polarity protection, anti-interference protection	
Response time	Action/Reset: < 3ms	
Ambient brightness	Sunlight $\leq 10000\text{lux}$, Incandescent Lamp $\leq 3000\text{lux}$	
Ambient temperature	Operation: $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, Storage: $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$ (No freezing, No condensation)	
Ambient humidity	Operation: 30~85% RH, Storage: 35~95% RH	
Insulation resistance	> 20M Ω	
Withstand voltage	500 V/AC 50/60Hz 1min	
Anti-vibration	10 to 55 Hz with 1.5mm up&down amplitude for 2 hours each in X, Y, and Z directions	
Impact resistance	500m/s ² for 3 times each in X, Y, Z directions	
Degree of protection	IP65	
Connection method	2M 3core cable	
Weight	Approx 80g	
Material	Stainless steel	
Accessories	Mounting screws	
Model No.	PM08-D03NO (HOT)	PM08-D03PO

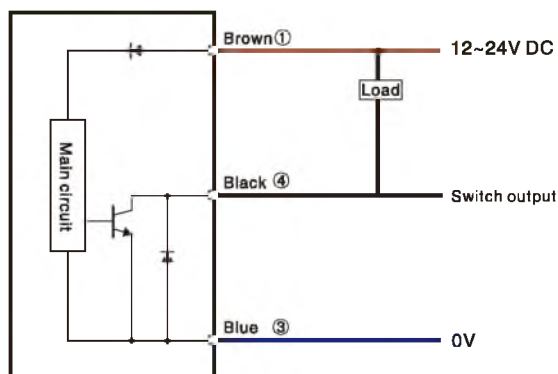
Dimensions

Unit: mm

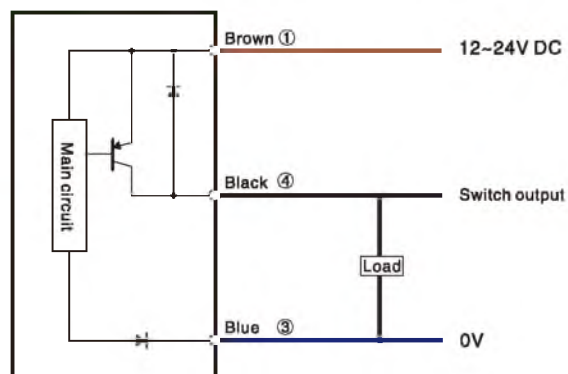


Circuit diagram

NPN Output



PNP Output



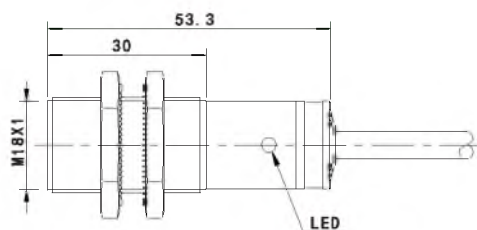


Appearance

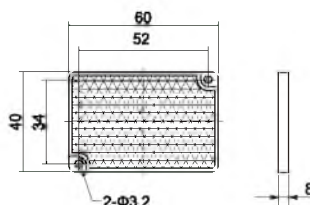
Sensing type		Diffuse reflection		Thru-beam		Retro-reflection	
Sensing distance		10cm(fixed)	40cm(adjustable)	1000cm(fixed)	2000cm(fixed)	300cm(fixed)	
Hysteresis		3~20%		---			
Repeat accuracy		< 5%					
Output type		NPN/PNP Open-collector					
Switch type		Selectable L.on/D.on					
Indicator		Yellow LED		Green LED(Emitter)/Yellow LED(Receiver)		Yellow LED	
Response time		< 8.2 ms					
Light source		Infrared LED(880nm)					
Operating voltage		10~30V DC					
Voltage drop		< 2.5V					
Current consumption		< 25mA					
Load current		< 200mA					
Protection circuit		Reverse polarity, short circuit, surge protection					
Ambient temperature		-15℃~+55℃, No freezing					
Ambient humidity		35%~95%RH, No condensation					
Degree of protection		IP67					
Material		Nickel copper alloy					
Connection method		2M 4core cable					
Accessories		Mounting screws					
Model No.	NPN	PM18-D10NR	PM18-D40NR		PM18-TM10NR	PM18-TM20NR	PM18-R300NR
	PNP	PM18-D10PR	PM18-D40PR		PM18-TM10PR	PM18-TM20PR	PM18-R300PR

Dimensions

Unit: mm



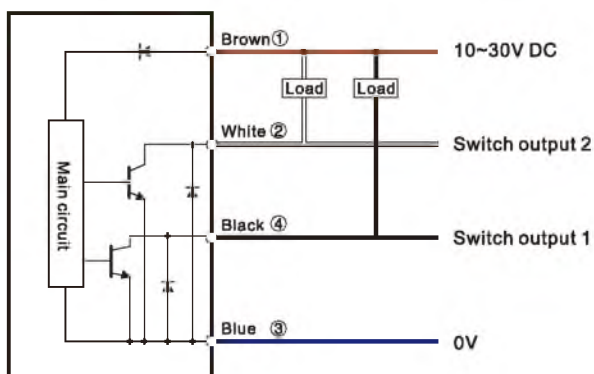
Reflector for PM18-R300



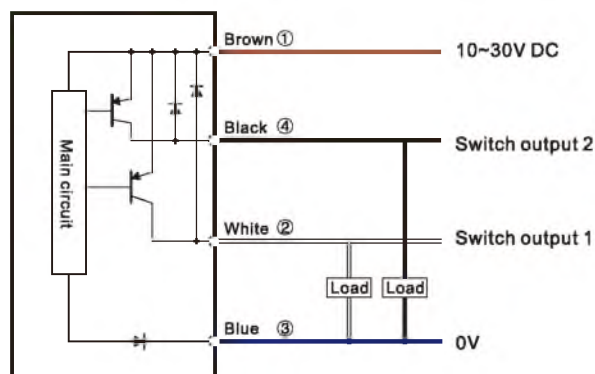
(Standard TD-09)

Circuit diagram

NPN Output



PNP Output



Cylindrical

PM18 Series



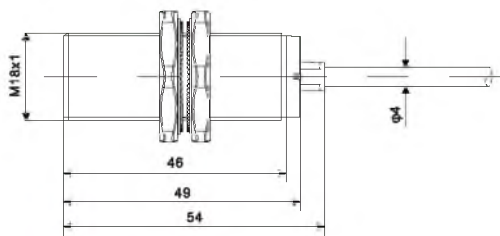
Economical Type

Appearance

Sensing type	Disffuse Reflection		Thru-beam			
Sensing distance	10cm(fixed)		5m(fixed)		20m(fixed)	
Detected object	100mm x 100mm 90% whiteness white paper		> φ 18mm,opaque			
Output type	NPN Open-collector		NPN/PNP Open-collector			
Switch type	L.on		Selectable L.on/D.on			
Indicator	Motion indicator light: yellow		Transmitter end: power indicator: green; Receiving end: action indicator light: yellow			
Response time	0.5ms		33ms			
Light source	Infrared LED 940nm (modulation)		Infrared LED 850nm (modulation)			
Operating voltage	10~30V DC		12~24V DC		10~24V DC	
Residual voltage	<2V					
Current consumption	<25mA		Transmitter < 20 mA; Receiver <20mA		Transmitter < 25 mA; Receiver <25mA	
Load current	<150mA		<100mA			
Circuit protection	Reverse polarity, short circuit, surge protection					
Ambient temperature	-20℃~-+55℃, No freezing		-20℃~-+60℃, No freezing			
Storage temperature	-25℃~-+65℃		-25℃~-+70℃		-20℃~-+60℃	
Ambient humidity	35~90% RH, No condensation					
Storage humidity	35~90% RH					
Withstand Voltage	±1000V 50/60Hz 60s					
Electrostatic	±4000V					
group value	±2000V					
Resistance	10~50Hz, 0.5mm amplitude, X, Y, Z direction 2 hours each					
Ambient illuminance	Incandescent lamp: <3000lux,sunlight: <10000lux					
Degree of protection	IP67					
Material	Nickel copper alloy					
Connection method	2M 3core cable					
Accessories	Mounting screws					
Model No.	NPN	PM18-D10NO	PM18-D10NC	PM18-TM05NO	PM18-TM20NO	PM18-TM20NC
	PNP			PM18-TM05PO	PM18-TM20PO	PM18-TM20PC

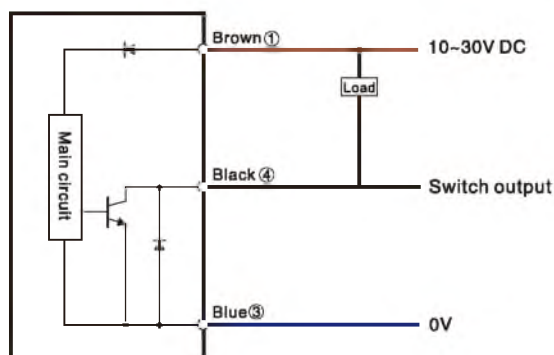
Dimensions

Unit: mm



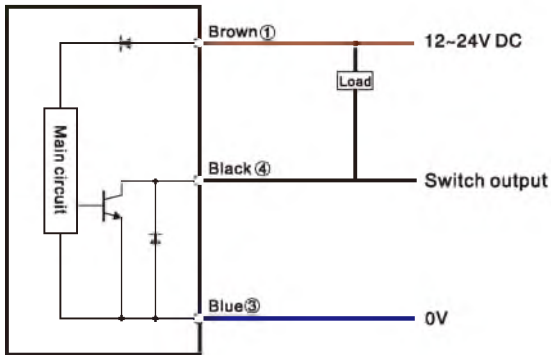
PM18-D10NO(NC)

NPN Output

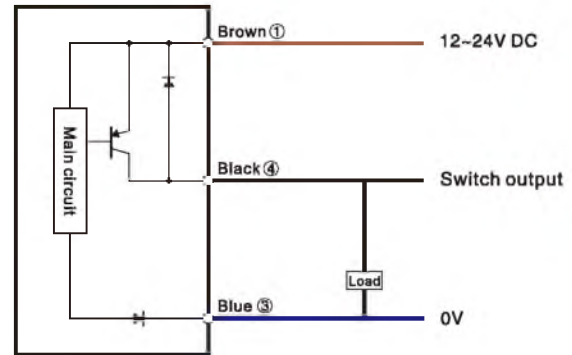


PM18-TM05N(P)O

NPN Output

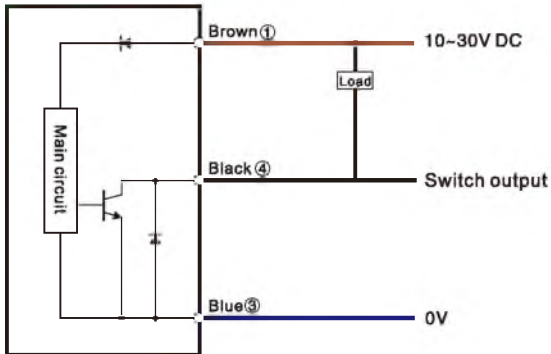


PNP Output

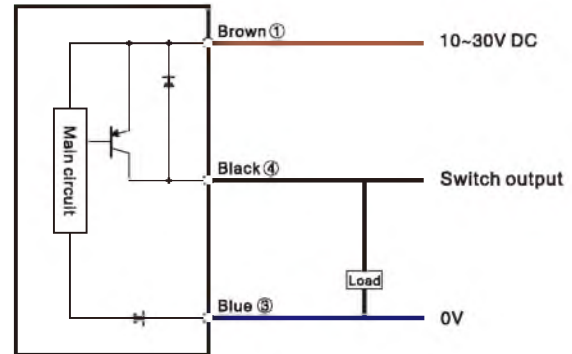


PM18-TM20N(P)O(C)

NPN Output



PNP Output



TOF Type Photoelectric

PM18-TF Series

TOF Principle



Appearance

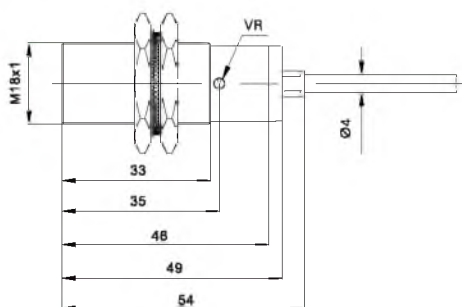
Sensing type	Reflection
Sensing distance	1.2m
Spot divergence angle	30°
Output	NPN / PNP open collector
Switch type	L.on / D.on selectable
Indicator	Operation: green, Motion: Red
Sensitivity adjustment	multi-turn adjuster
Light source	Laser 940nm (Modulated), class 1
Operating voltage	10~30V DC
Voltage drop	< 1.5V
Current consumption	≤20mA
Load current	≤100mA
Circuit protection	Short circuit, reverse polarity, surge protection
Ambient temperature	-10℃~50℃ No freezing
Ambient humidity	35~85% RH, No condensation
Withstand voltage	±1000V 50/60Hz 60s
Static electricity	±8000V (air discharge)
Group pulse	±2000V (5kHz/50kHz)
Impact resistance	10~55Hz amplitude 1.5mm; X, Y, Z 3 directions, 2 hours each
Ambient illuminance	Incandescent lamp: <3,000 lux, Sunlight <5,000 lux
Degree of protection	IP67
Material	Nickel-copper alloy
Connection	2M 3-core cable
Accessories	Mounting screws
Model No.	NPN PNP

PM18-TF120N

PM18-TF120P

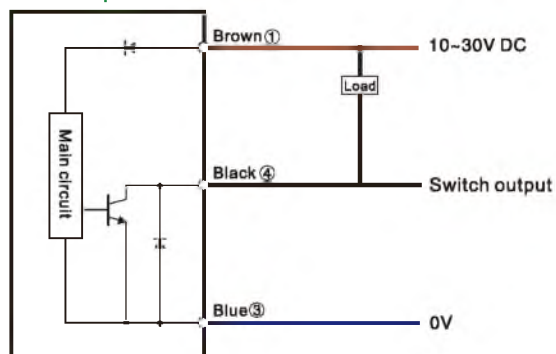
Dimensions

Unit: mm

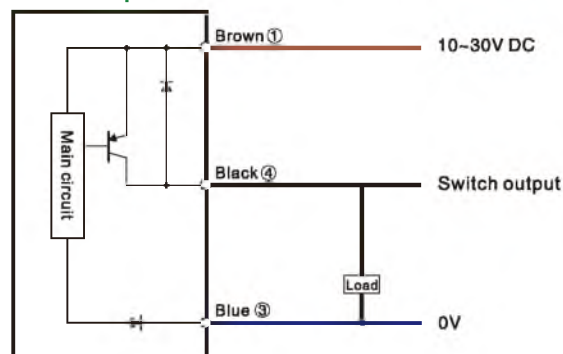


Circuit diagram

NPN Output



PNP Output



Cylindrical

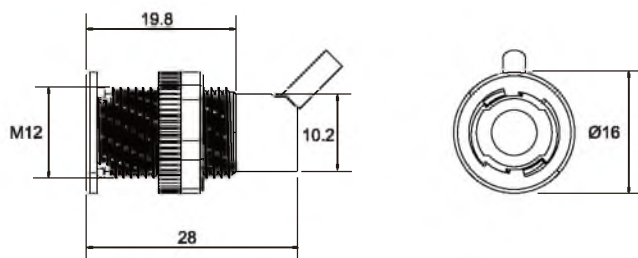
PSM12 Series



Appearance	
Sensing type	Through beam
Sensing distance	5m
Light source	Infrared LED
Detected object	opaque object, $\phi > 8\text{mm}$
Output	NPN / PNP for option
Switch type	Light on/ Dark on selectable
Response time	<2ms
Indicators	Power: Green, Operation indicator: Orange
Power supply	12-24V DC $\pm 10\%$ Ripple P-P10% or less
Residual voltage	< 1 V (When input current is equal to 50 mA)
Current consumption	Emitter < 18 mA, Receiver < 15 mA
Load current	<50mA
Circuit protection	Short circuit protection
Ambient temperature	Operation: $-25\sim 55^{\circ}\text{C}$; storage: $-30\sim 70^{\circ}\text{C}$, no freezing
Ambient humidity	Operation: 30~90% RH, storage: 35~85% RH, no condensation
Degree of protection	IP67
Material	Housing, lens: PC
Connection	Emitter: 2m 2 core cable; Receiver: 2m 2 core cable
Weight	Approx.25g
Model No.	NPN PNP PSM12-TM05NO PSM12-TM05PO PSM12-TM05NC PSM12-TM05PC

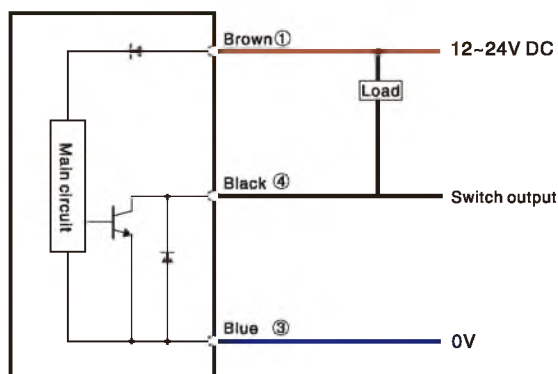
Dimensions

Unit: mm

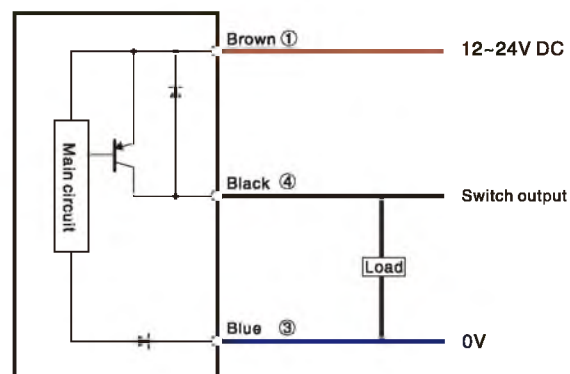


Circuit diagram

NPN Output



PNP Output





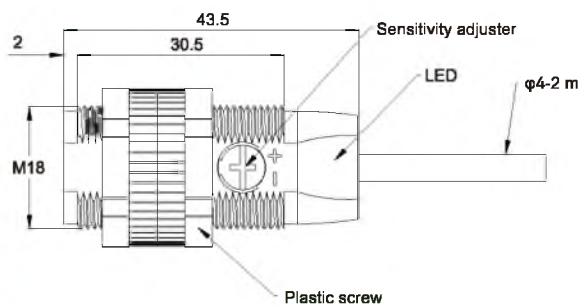
Appearance	
Sensing type	Diffuse reflective
Sensing distance	10~40 cm (adjustable)
Light source	Red light LED
Detected object	opaque object, $\phi > 7$ mm
Output	NPN / PNP for option
Switch Type	Light on/ Dark on selectable
Indicators	Power: Green, Operation indicator: Red
Power supply	10~30V DC
Residual voltage	<1.5V
Current consumption	<25mA
Load current	<120mA
Response time	<2ms
Circuit protection	reverse polarity protection, short circuit protection
Ambient temperature	-15~55°C, no freezing
Ambient humidity	35~90% RH, no condensation
Ambient illuminance	LED ≤ 450 Lux
Withstand voltage	± 1000 V 60/60Hz 60s
Static electricity	± 8000 V
Group pulse	± 2000 V 5KHz/100KHz
Anti-vibration	10~50Hz, amplitude 0.5mm; 2 hours each in X, Y, Z directions
Degree of protection	IP67
Material	PC
Connection	2m 4 wire cable
Model No.	NPN PSM18-D40N PNP PSM18-D40P

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

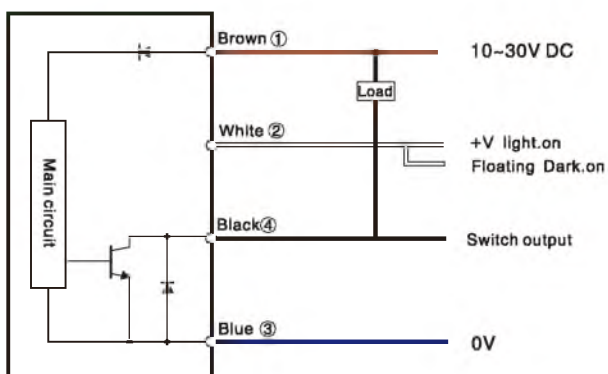
Dimensions

Unit: mm

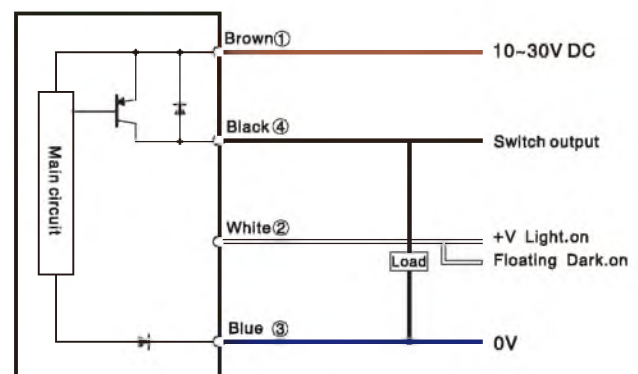


Circuit diagram

NPN Output



PNP Output



Photoelectric
Cylindrical
Square
Flat type
Thin type
BGS
Transparent detection
Color/Mark Detection
TOF type
IP69K high protection type
Anti-glare type
IO-Link type
Reflectors
Reflectors

Cylindrical

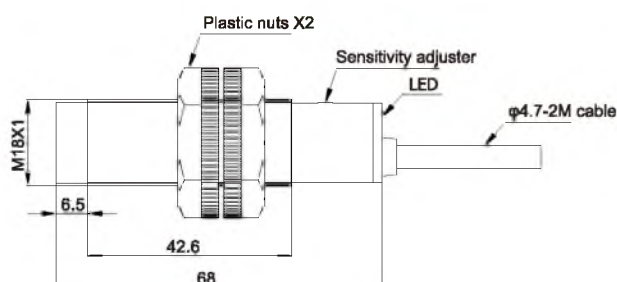
PXM18 Series



Appearance

Sensing type	Diffuse reflection	
Sensing distance	10cm(adjustable)	40cm(adjustable)
Hysteresis	≤10%	
Repeat accuracy	5%	
Output type	NPN/PNP Open-collector	
Switch type	Selectable L.on/D.on	
Response time	20ms	
Indicator	Red LED(660nm)	Red LED(880nm)
Operating voltage	10~30V DC(±10%)	
Voltage drop	2V max 1L=100mA	
Leakage current	10 μA	
Current consumption	30mA	
Load current	100mA	
Circuit protection	Reverse polarity protection, output short circuit protection, pulse overvoltage protection	
Ambient temperature	-25℃~+70℃, No freezing	
Ambient illuminance	Sunlight ≤10000 lux, Incandescent lamp ≤3000 lux	
Degree of protection	IP67	
Tightening torque	1Nm	
Material	Housing: PBT, Lens: PC	
Weight	≈50g	
Connection method	2M 4core cable	
Accessories	Mounting screws	
Model No.	NPN	PXM18-D10N
	PNP	PXM18-D10P
		PXM18-D40N
		PXM18-D40P

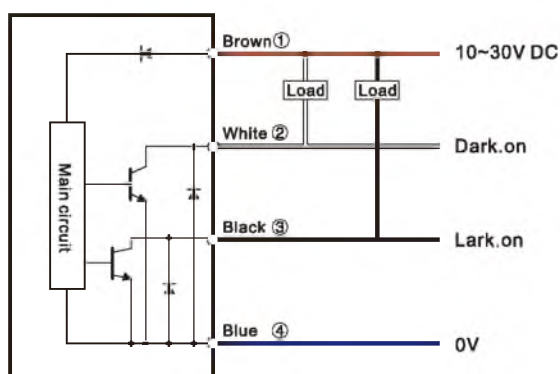
Dimensions



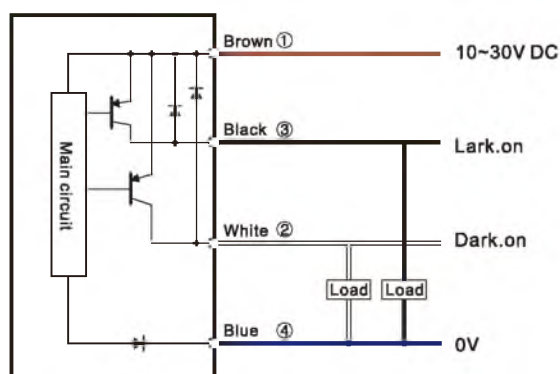
Unit: mm

Circuit diagram

NPN Output



PNP Output



IP69K Type



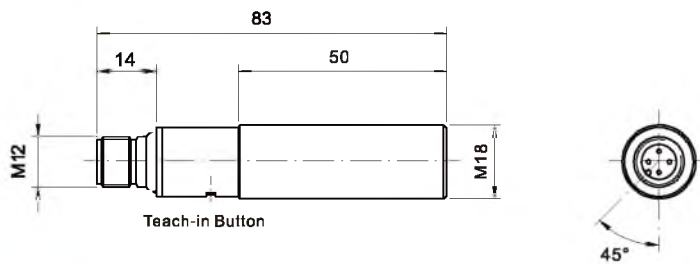
Appearance	
Sensing type	Diffuse Reflection
Sensing distance	400mm
Light source	IR 880 nm
Hysteresis	≤10%
Repeatability	5%
Tolerance	+15/-5% Sn
Operating voltage	10~30V DC
Ripple factor	≤10%
No load current	Max. 35mA (30V)
Load current	≤100mA
LED	Green: teach-in Yellow: Excess gain
Output voltage drop	2Vmax. IL=100mA
Output type	NPN
Switch frequency	500Hz
Start delay	200ms
Ambient illuminance	Incandescent lamp: <5,000 lux, Sunlight < 10,000 lux
Ambient temperature	-25°C~80°C, no condensation
Circuit protection	Reverse polarity protection, short-term overvoltage protection
Output protection	Short circuit protection (Automatic reset)
Sensitivity	Teach-in
Temperature drift	10%Sr
Degree of protection	IP67; IP68 (1m, 7m/days); IP69K (40050-9 standard)
Material	stainless steel 316
Accessories	Mounting screws
Model No.	PM18K-D40NR

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

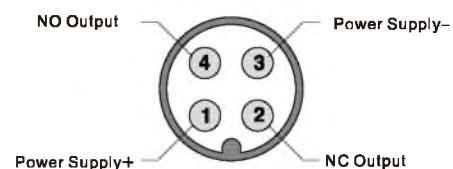
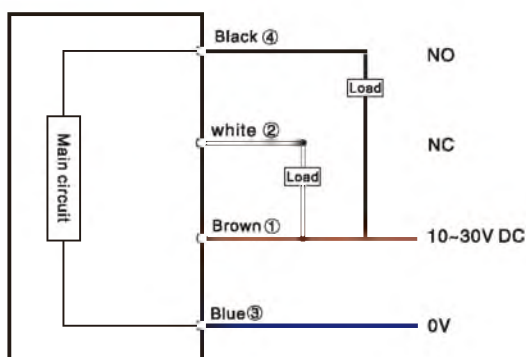
Guidance

Dimensions

Unit: mm



Circuit diagram



Photoelectric
Cylindrical
Square
Flat type
Thin type
BGS
Transparent detection
Color/Mark Detection
TOF type
IP69K high protection type
Anti-glare type
IO-Link type
Reflectors
Reflectors



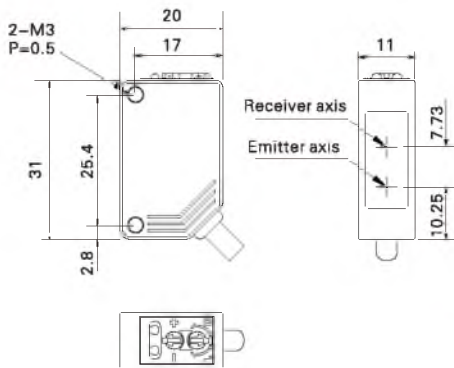
Economical Type

Appearance

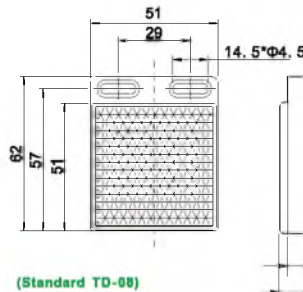
Sensing type	Diffuse reflection		Convergent reflective		Retro-reflection		
Sensing distance	10-300mm	5-1000mm	5-140mm	10-200mm	2m	3m	
Spot size	≈ φ 16mm / 300mm	≈ φ 50mm / 1000mm	≈ φ 9mm / 140mm	φ 10mm / 20cm	φ 50mm / 2m	φ 90mm / 3m	
Output type	NPN or PNP open collector, ≤100mA (30V DC)						
Switch type	L.on / D.on Switchable						
Indicator	Motion indicator: Red ; Operating indicator: Green						
Response time	<1ms			1ms		<1ms	
Sensitivity adjustment	Single-turn potentiometer						
Light source	Red light LED 623 nm (modulated)						
Operating voltage	10-30V DC						
Current consumption	≤25mA			≤20mA			
Ambient illuminance	Sunlight ≤10000 Lux; Incandescent Lamp ≤ 3000 Lux						
Ambient temperature	-25℃~+55℃, No freezing						
Ambient humidity	35%~85%RH, No condensation						
Anti-vibration	10 ~ 50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions						
Circuit protection	Power reverse polarity protection, output reverse polarity protection, surge protection, short circuit protection						
Degree of protection	IP65						
Connection method	2M/3 cores cable, φ 4mm						
Material	PBT+Fiberglass (Housing) , PMMA (Lens)						
Accessories	Screwdriver			Screwdriver, reflective sticker	Screwdriver, reflector		
Model No.	NPN	PTE-D30N	PTE-D70N	PTE-X09N	PTE-R20N	PTE-R200N	PTE-R300N
	PNP	PTE-D30P	PTE-D70P	PTE-X09P	PTE-R20P	PTE-R200P	PTE-R300P

Dimensions

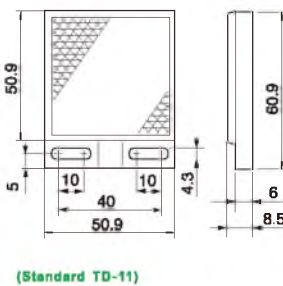
Unit: mm



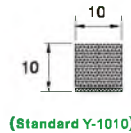
Reflector for PTE-R200



Reflector for PTE-R300

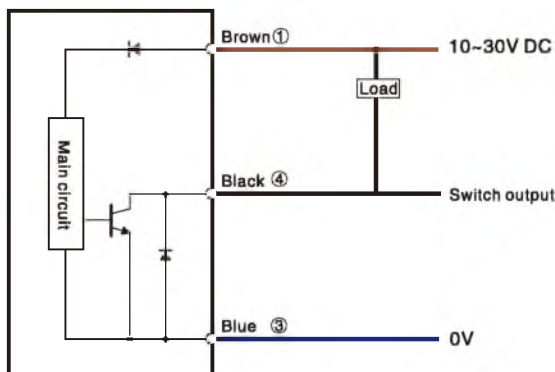


PTE-R20 Reflective Stickers

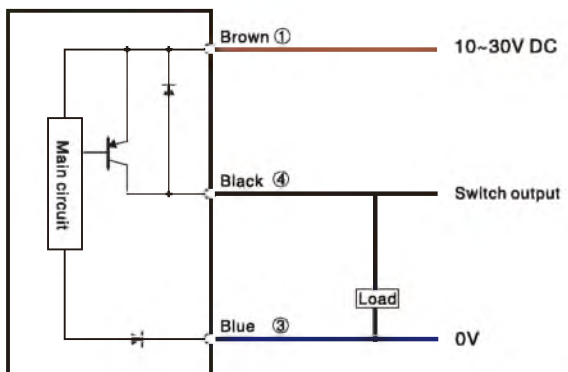


Circuit diagram

NPN Output



PNP Output



Square

PTE Series



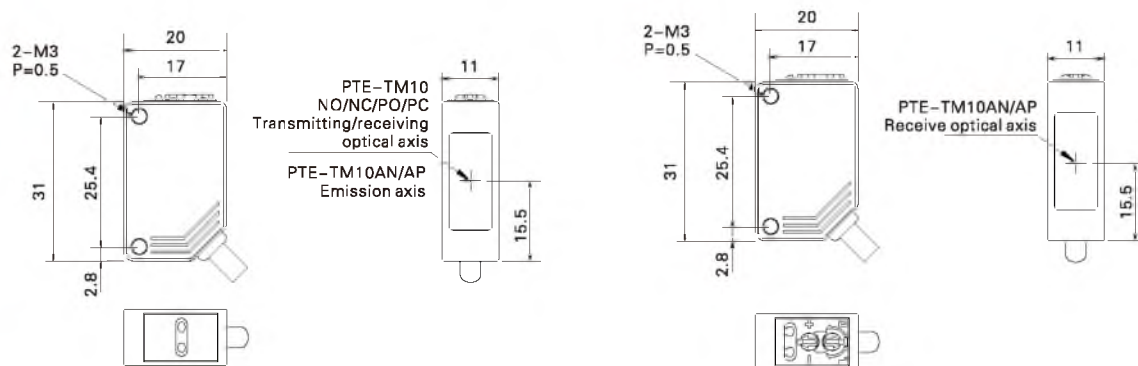
Economical Type

Appearance

Sensing type	Thru-beam Reflection			
Sensing distance	10m			
Detected object	φ>12mm, opaque			
Output type	NPN / PNP open collector			
Switch Type	L.on /D.on selectable		L.on /D.on switchable	
Indicator	Status indicator: green,output indicator: red		Emitter: Power: green; Receiver:Operation: green, Motion: red	
Response time	33ms			
Sensitivity	Not adjustable		Single turn potentiometer	
Light source	IR LED 623nm (modulated)			
Operating voltage	10~30V DC			
Current consumption	Emitter ≤20mA; Receiver ≤20mA			
Ambient illuminance	Sunlight ≤ 10,000 Lux, Incandescent lamp ≤ 3,000 Lux			
Ambient temperature	-25℃~+55℃, No freezing			
Ambient humidity	35%~85% RH, No condensation			
Anti-vibration	10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions			
Circuit protection	Power reverse polarity protection, short circuit protection			
Degree of protection	IP65			
Connection	2M / 3 cores cable 4mm diameter			
Material	Fiberglass (housing), PMMA(lens)			
Accessories	Screwdriver			
Model No.	NPN	PTE-TM10NO	PTE-TM10NC	PTE-TM10AN
	PNP	PTE-TM10PO	PTE-TM10PC	PTE-TM10AP

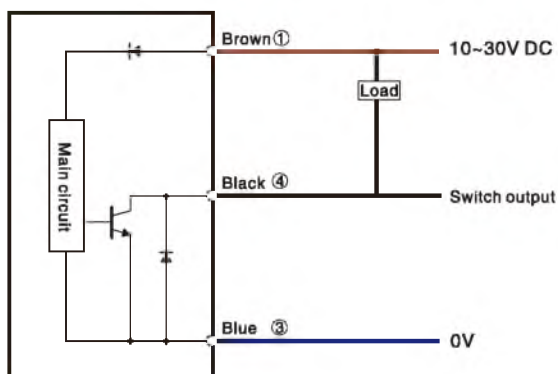
Dimensions

Unit: mm

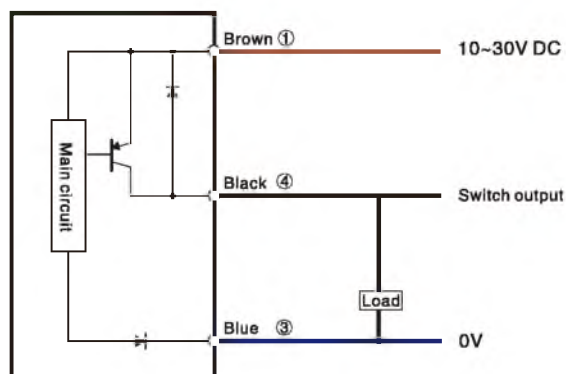


Circuit diagram

NPN Output



PNP Output





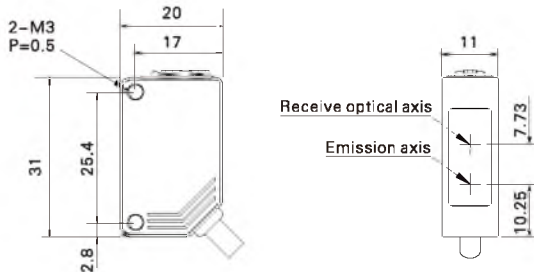
Wide Facula Type

Appearance

Sensing type	Disffuse refection		
Sensing distance	5-200mm	10cm	20cm
Spot diameter	130*130mm/20cm	-	-
Output type	NPN / PNP open collector		
Switch type	L.on /D.on selectable		
indicator	Operation indicator: Green, Motion indicator: Red		
Response time	1ms		
Sensitivity	Single-turn potentiometer		
Light source	Red LED 623nm (modulation)	Infrared LED 840nm (modulation)	
Operating voltage	10~30V DC		
Current consumption	<25mA	≤20mA	
Load current	<100mA	≤100mA	
Ambient illuminance	Sunlight≤10000Lux, Incandescent lamp≤3000Lux		
Ambient temperature	-25℃~+55℃, No freezing		
Ambient humidity	35%~85%RH, No condensation		
Anti-vibration	10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions		
Circuit protection	Power reverse polarity protection, output reverse polarity protection, surge protection, short circuit protection		
Degree of protection	IP65		
Connection	2M 3 core cable, ϕ 4mm		
Material	PBT+Fiberglass (body), PMMA(lens)		
Accessories	Screwdriver		
Model No.	NPN	PTEW-D20N	PTVW-D10N
	PNP	PTEW-D20P	PTVW-D10P

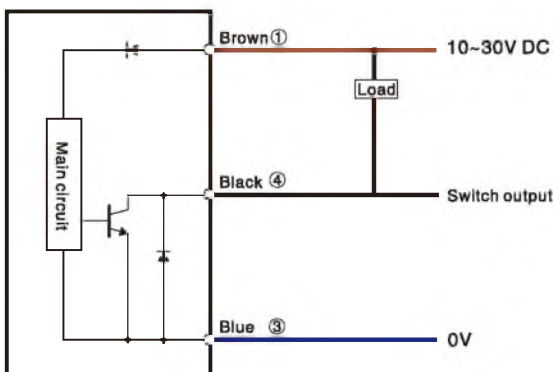
Dimensions

Unit: mm

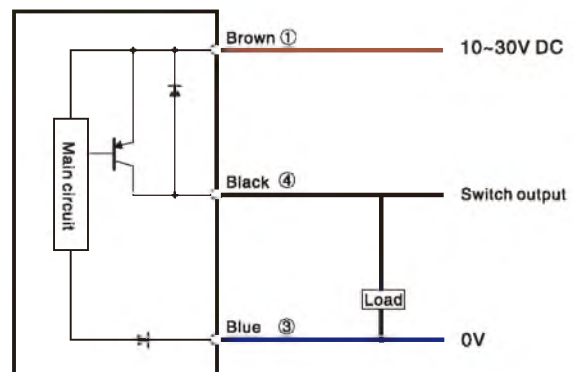


Circuit diagram

NPN Output



PNP Output



Anti-glare Type

PTL Series



Anti-glare Type

Appearance

Sensing type Diffuse reflection-BGS

Sensing distance 5~100mm

10~300mm

Setting distance 20~100mm

50~300mm

Spot diameter $\approx \varnothing 10\text{mm}/100\text{mm}$

$\approx \varnothing 30\text{mm}/300\text{mm}$

Hysteresis

$\leq 3\%$

$\leq 5\%$

Output type

NPN / PNP open collector

Switch type

L.on/D.on selectable

Indicator

Operating indicator: orange, Status indicator: green

Response time

$\leq 1\text{ms}$

Sensitivity

6-turn potentiometer

4-turn potentiometer

Light source

Red LED

Operating voltage

10~30V DC

Current consumption

$\leq 30\text{mA}$

Load current

$\leq 100\text{mA}$

Ambient illuminance

Sunlight $\leq 50,000\text{ Lux}$, Incandescent lamp $\leq 5,000\text{ Lux}$

Ambient temperature

$-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, No freezing

Ambient humidity

35%~85% RH, No condensation

Anti-vibration

10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions

Degree of protection

IP67

Connection

ABS (body), PMMA (lens)

Accessories

Screwdriver

Model No.

NPN

PTL-D10N

PTL-D30N

PNP

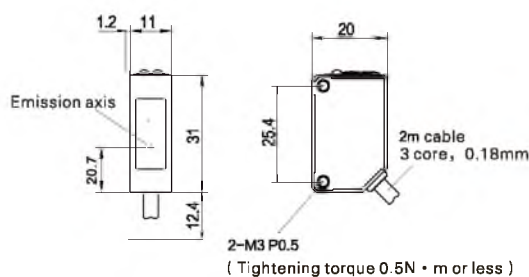
PTL-D10P

PTL-D30P

Dimensions

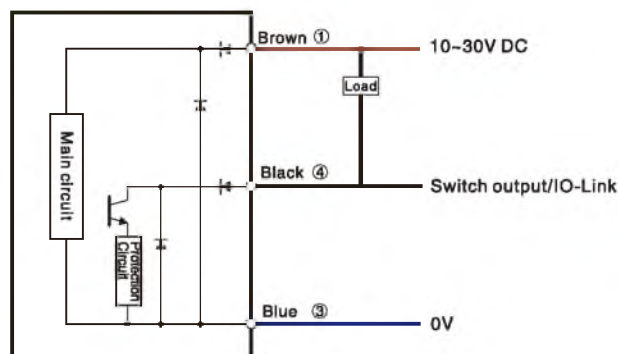
Unit: mm

Output indicator (orange)
Status indicator (green)
Sensitivity adjustment knob
Normally open/normally closed mode switch knob

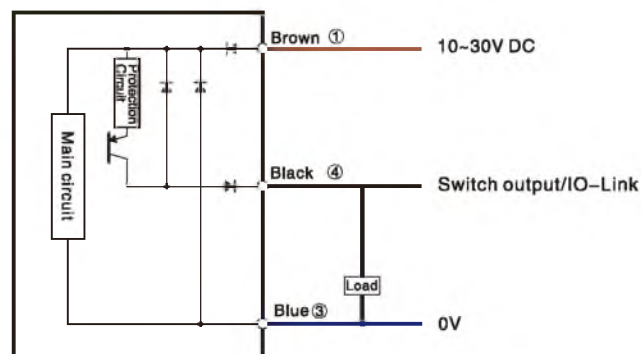


Circuit diagram

NPN Output



PNP Output



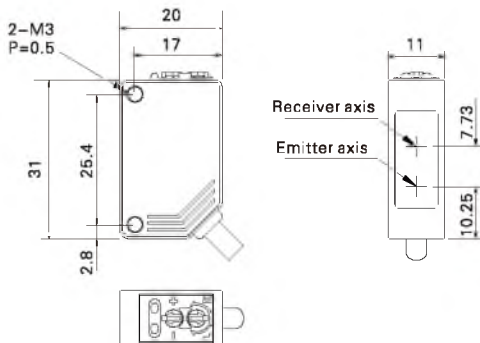


Appearance

Sensing type		Diffuse reflection		Convergent reflective	
Sensing distance		10-300mm		5-1400mm	
Output type		NPN/PNP Open-collector			
Switch type		Selectable L.on/D.on			
Response time		<1ms			
Light source		Infrared LED(940nm modulation)			
Operating voltage		10-30V DC			
No-load supply current		<25mA			
Load current		<100mA			
Ambient temperature		-25℃~+55℃, No freezing			
Ambient humidity		35%~85%RH, No condensation			
Circuit protection		Power reverse polarity,output reverse polarity,surge,short circuit			
Degree of protection		IP65			
Material		PBT+Fiberglass (Housing) , PMMA (Lens)			
Connection method		2M 3core cable			
Weight		≈50g			
Accessories		Screwdriver			
Model No.	NPN	PTV-D30N HOT		PTV-D70N	
	PNP	PTV-D30P		PTV-D70P	
				PTV-X09N	
				PTV-X09P	

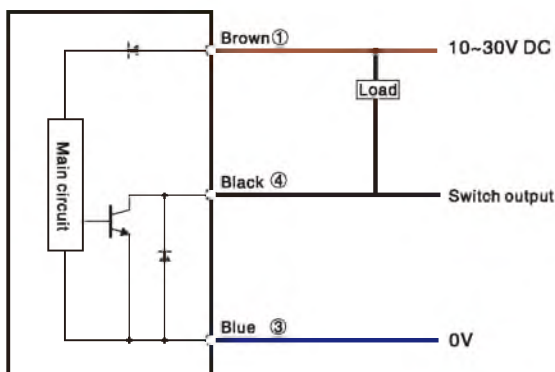
Dimensions

Unit: mm

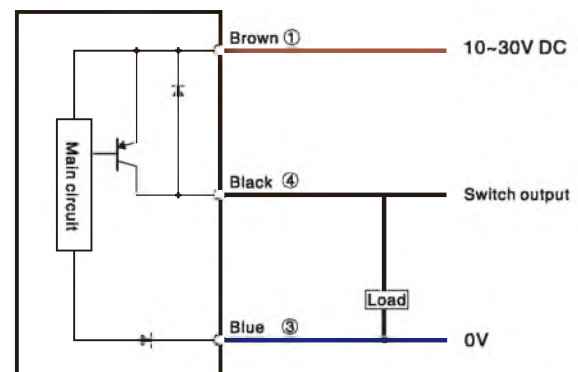


Circuit diagram

NPN Output



PNP Output



Square

PTV Series



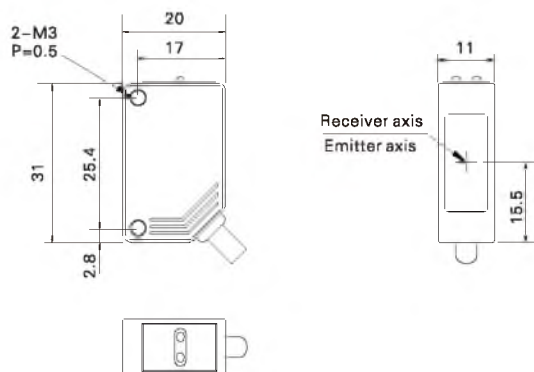
Appearance

Sensing type	Thru-beam				
Sensing distance	20m(fixed)		20m		5m
Output type	NPN/PNP Open-collector				
Switch type	Selectable L.on/D.on, Model optional			Selectable L.on/D.on	
Response time	< 5ms				
Light source	Infrared LED(940nm modulation)				
Operating voltage	10~30V DC				
No-load supply current	Transmitter: <20mA; Receiver end: <20mA				
Load current	<100mA				
Ambient temperature	-25℃~+55℃, No freezing				
Ambient humidity	35%~85%RH, No condensation				
Circuit protection	Power reverse polarity,output reverse polarity,surge,short circuit				
Degree of protection	IP65				
Material	PBT+Fiberglass (Housing) , PMMA (Lens)				
Connection method	2M 3core cable				
Weight	≈50g				
Accessories	Screwdriver				
Model No.	NPN	PTV-TM20NO	PTV-TM20NC	PTV-TM20AN	PTV-T500N
	PNP	PTV-TM20PO	PTV-TM20PC	PTV-TM20AP	PTV-T500P

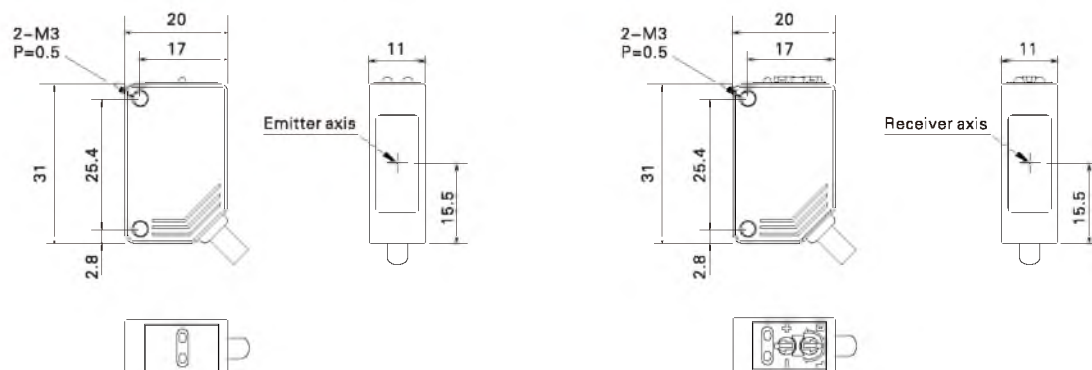
Dimensions

Unit: mm

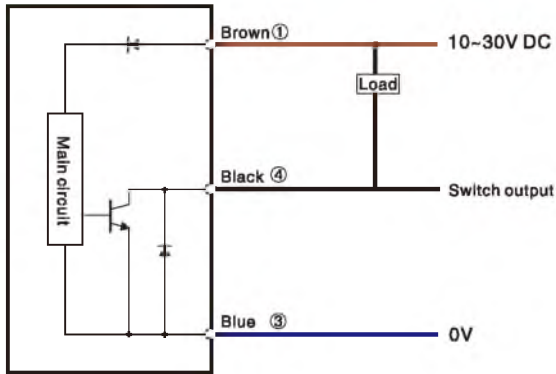
PTV-TM20NO/PO/NC/PC



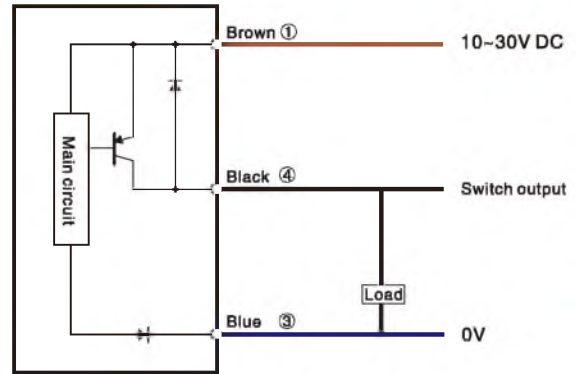
PTV-TM20AN/AP、PTV-T500N/P



NPN Output



PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Photoelectric
- Cylindrical
- Square**
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type
- Reflectors
- Reflectors

PTZ-C Series



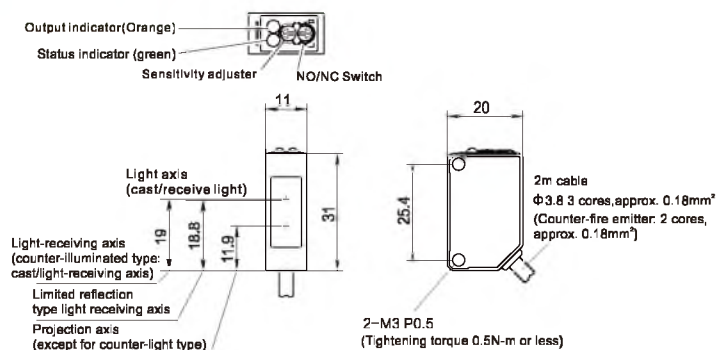
IO-Link

Appearance

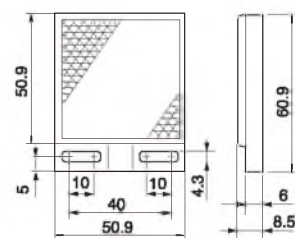
Sensing type		Diffuse reflection	Thru-beam reflection	Retro-reflection
Sensing distance		0~1m(white paper200X200mm)	0~25m	0.01~4m(with reflector)
Spot diameter		φ 75mm / 1m	φ 1800mm / 25m	φ 280mm / 4m
Output type		NPN/PNP Open-collector		
Switch type		L.on/D.on selectable		
Indicator		Input indicator: orange, Status indicator: green		
Response time		≤500us		
Sensitivity		Single turn adjuster		
Light source		Red light LED		
Operating voltage		10~30V DC ± 10%		
Current consumption		<20mA	Emitter<14mA, Receiver<20mA	<20mA
Load current		≤100mA		
Hysteresis		≤20%	—	
Function		IO-LINK		
Ambient illuminance		Sunlight≤5000Lux, Incandescent lamp≤5000Lux		
Ambient temperature		-25℃~+55℃, no freezing		
Ambient humidity		35%~85%RH, No condensation		
Degree of protection		IP67		
Connection		2m 3 core cable(2m 2 core cable for thru-beam models)		
Material		ABS (housing) + PMMA (lens)		
Accessories		—		
Model No.	NPN	PTZ-D70N-C	PTZ-TM25N-C	PTZ-R400N-C
	PNP	PTZ-D70P-C	PTZ-TM25P-C	PTZ-R400P-C

Dimensions

Unit: mm

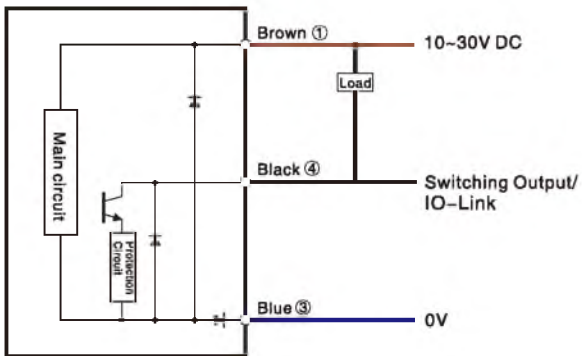


Reflector for PTZ-R400-C

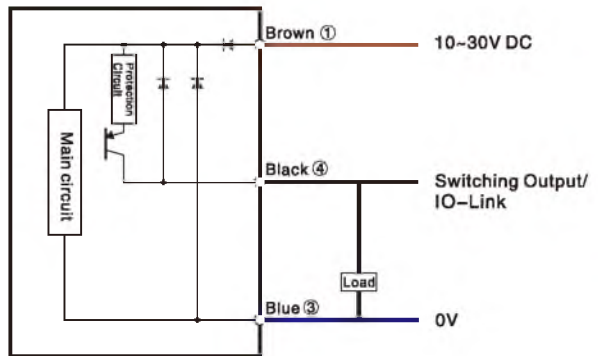


(Optional TD-11)

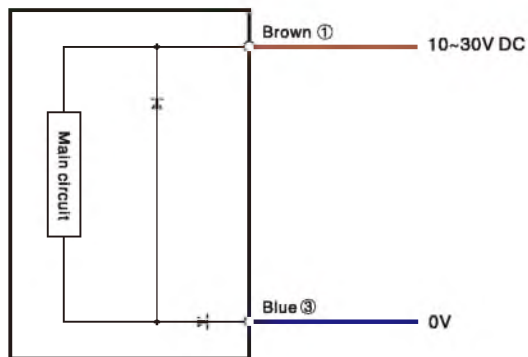
NPN Output



PNP Output



Thru-beam Emitter



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Photoelectric
- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type**

- Reflectors
- Reflectors

Square

PTN Series

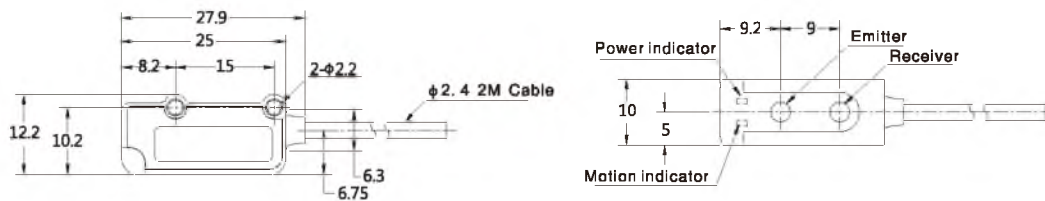


Appearance

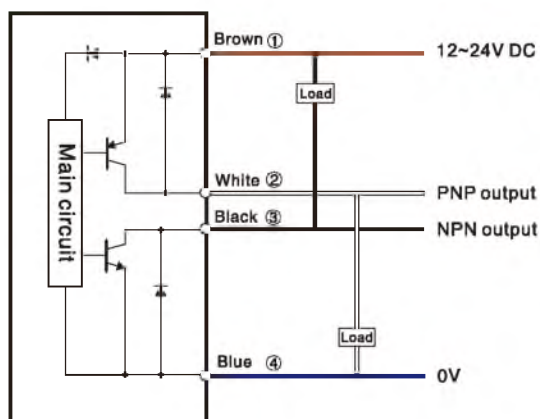
Sensing type	Diffuse reflection	Thru-beam
Sensing distance	5cm, White board 100*100mm(> 5cm)	50cm
Output type	NPN/PNP Open-collector	
Switch type	L.on	D.on
Response time	≤1 ms	
Light source	Infrared LED (940nm)	
Operating voltage	12~24V DC ± 10%	
Current consumption	≤20mA	≤30mA
Load current	≤100mA (24V DC)	
Circuit protection	Reverse polarity protection, short circuit protection	
Ambient temperature	-10℃~+45℃, No freezing	
Ambient humidity	35%~85% RH, No condensation	
Storage temperature	-10℃~+55℃, No freezing	
Storage humidity	35%~95% RH, No condensation	
Withstand voltage	1000 V/AC 50/60Hz 1min	
Insulation resistance	≥20M Ω/500V DC	
Degree of protection	IP64	
Material	ABS	
Connection method	φ 2.4*2M 3core cable	(Receiver) φ 2.4*2M 3core cable/ (Emitter) φ 2.4*2M 3core cable
Weight	≈20g	≈40g
Accessories	Mounting screws	
Model No.	NPN	PTN-D05N
	PNP	PTN-D05P
		PTN-T50N
		PTN-T50P

Dimensions

Unit: mm



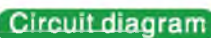
Circuit diagram



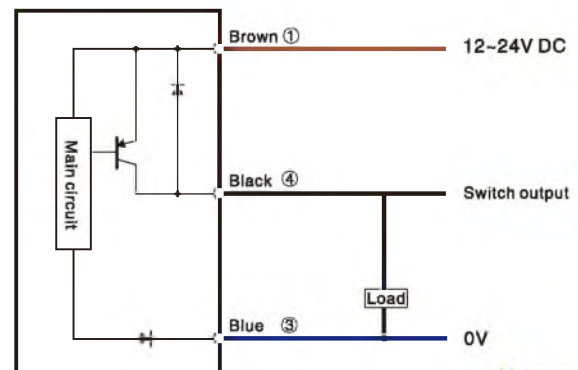


Dimensions

Unit: mm



PNP Output



TOF Type

PX Series



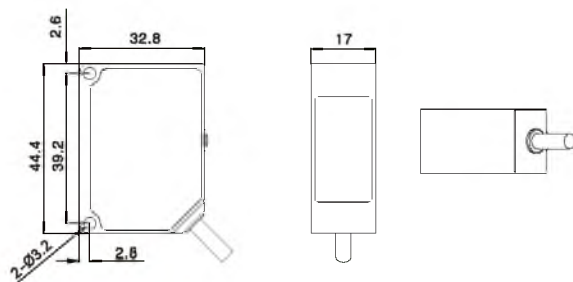
TOF Type

NEW!

Appearance		
Sensing type	TOF (Time of flight) 1 point teaching	
Sensing distance	100cm	300cm
Setting range	5 ~ 100cm (White paper 200 x 200mm)	20 ~ 300cm (White paper 200 x 200mm)
Light source	Infrared LED (940nm)	Infrared LED (850nm)
Detected object	above 200*200mm	above 200*200mm
Output	NPN/PNP Open-collector	
Sensitivity adjustment	Tech-in	
Indicators	Power: green, output indicator: red, When the teaching is successful: the green light flashes and then keeps on; when the teaching fails: the red and green lights flash alternately for 6s	
Response time	< 30 ms	<100 ms
Hysteresis	Range 5~10cm, hysteresis <1cm; Range 10~100cm, hysteresis<10%	Range 20~50 cm, hysteresis <4cm; Range 50~300 cm, hysteresis<10%
Repeatability	Range 5~10cm, hysteresis < 0.5cm; Range 10~100cm, hysteresis<5 %	< 1.5 cm
Operating voltage	12~24V DC $\pm 10\%$	
Residual voltage	<1.5 V (load current <125mA)	
Current consumption	$\leq 30\text{mA}$	$\leq 25\text{mA}$
Load current	$\leq 100\text{mA}$ (24V DC)	
Circuit protection	reverse polarity protection, short circuit protection	
Ambient temperature	Operation temperature: -10°C ~ 60°C , no freezing; storage temperature: -20°C ~ 70°C	
Ambient humidity	Working: 35~90%RH; storage: 35~90%RH, no condensation	
Withstand voltage	$\pm 1000\text{V}$ 50/60Hz 60s	
Static electricity	$\pm 4000\text{V}$ (Contact discharge)	
Group pulse	$\pm 2000\text{V}/5\text{kHz}$ 100kHz	
Anti-vibration	10~50Hz, amplitude 0.5mm; 2 hours each in X, Y, Z directions	
Ambient light	Incandescent light $\leq 5,000\text{Lux}$	
Material	Aluminum alloy	
Connection	$\phi = 4\text{mm}$, 2m 3 wire cable	
Model No.	NPN PNP	PX-F09N PX-F09P
		PX-F30N PX-F30P

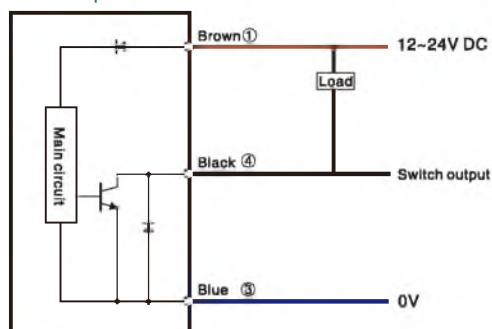
Dimensions

Unit: mm

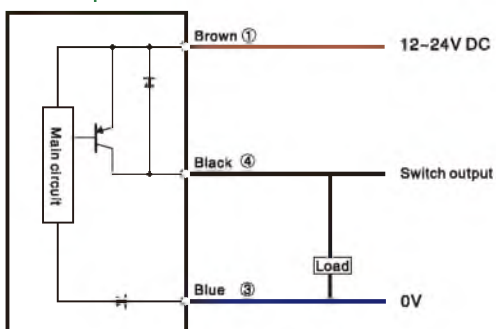


Circuit diagram

NPN Output



PNP Output

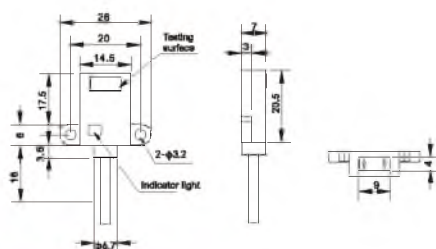




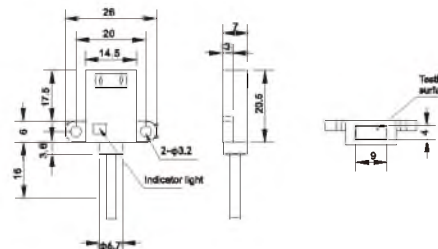
Appearance				
Detection surface		Front	Head	
Sensing type		Diffuse reflection		
Sensing distance		2.5~8mm(black object 3mm)		
Hysteresis		<20%		
Light source		Infrared LED(880nm)		
Response time		<1ms		
Operating voltage		12~24V DC		
Voltage drop		<2.5V (load current is 100mA)		
Residual voltage		Below 3V (load current 100mA/ 2m cable)		
Indicator		Red LED		
Switch type		L.on/D.on model selectable		
Circuit protection		Surge protection, reverse polarity protection		
Storage temperature		Operation: -10℃~55℃, Storage: -25℃~80℃(No freezing)		
Storage humidity		Operation: 45%~85% RH, Storage: 35%~90% RH (No condensation)		
Ambient illuminance		≤3500Lux		
Voltage influence		When the rated power supply voltage range fluctuates within ± 15%, the sensing distance will be changed within ± 1%.		
Insulation resistance		> 50M Ω/500V DC		
Withstand voltage		AC1000V, 50/60Hz, 1min		
Vibration resistance		10~55Hz, Upper and lower amplitude 1.5mm, 2 hours in X, Y, Z direction		
Impact resistance		500m/s² 10 times in X,Y,Z		
Degree of protection		IP50		
Housing Material		PC		
Connection method		2m 3 core cable		
Accessories		-		
Model No.	NPN	Dark on	MP2-410N-WD	MP2-412N-WD
		Light on	MP2-410N-WL	MP2-412N-WL
	PNP	Dark on	MP2-410P-WD	MP2-412P-WD
		Light on	MP2-410P-WL	MP2-412P-WL

Dimensions

MP2-410□-W□



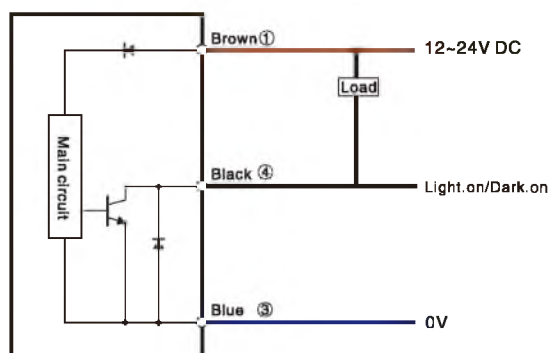
MP2-412□-W□



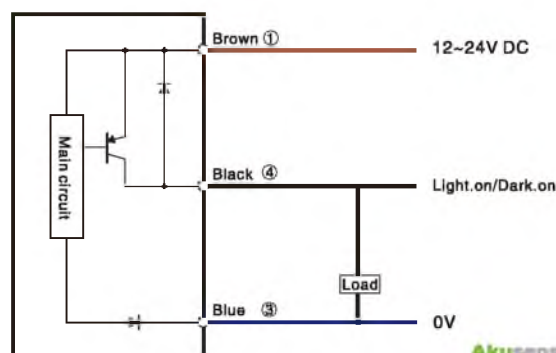
Unit: mm

Circuit diagram

NPN Output



PNP Output



Flat Type

MP2 Series Connector Type



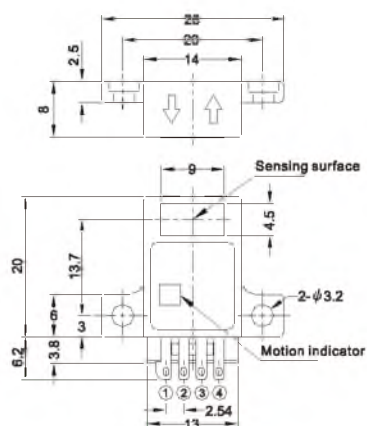
Appearance

Detection surface	Front	Head
Sensing type	Diffuse reflection	
Sensing distance	40mm (50 × 50 white matte paper)	
Hysteresis	< 20%	
Output type	NPN/PNP Open-collector	
Switch type	Selectable L.on/D.on	
Response time	< 1 ms	
Light source	Infrared LED (850nm)	
Operating voltage	12~24V DC	
Current consumption	< 20mA	< 25mA
Voltage drop	< 2.5V (load current is 100mA)	
Load current	< 100mA(24V DC)	
Withstand voltage	AC 1000V 50/60Hz 1min	
Ambient temperature	Operation: -20°C~+55°C, Storage: -25°C~+80°C(No freezing)	
Ambient humidity	Operation: 45%~+85%RH, Storage: 35%~90%RH (No condensation)	
Insulation resistance	> 20M Ω /500V DC	
Ambient illuminance	Incandescent lamp $\leq$ 3000Lux, Sunlight $\leq$ 10000Lux	
Degree of protection	IP50	
Material	PC	
Connection method	connector	
Accessories	Mounting screws	
Model No.	NPN	MP2-410N-E (HOT) MP2-412N-E
	PNP	MP2-410P-E MP2-412P-E

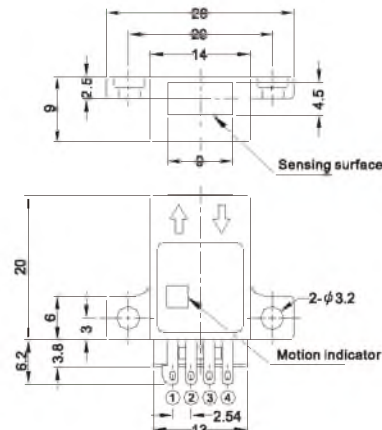
Dimensions

Unit: mm

MP2-410N(P)-E



MP2-412N(P)-E

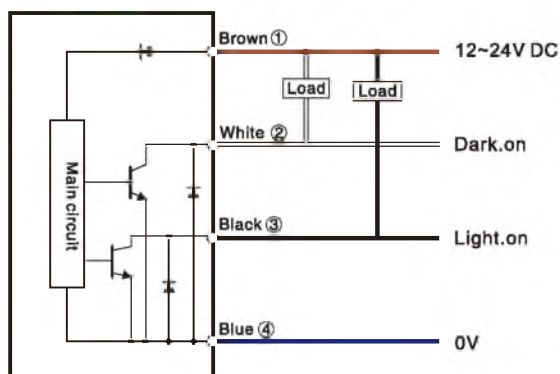


- ①: ⊕ Brown
 ②: OUT1 White
 ③: OUT2 Black
 ④: ⊖ Blue

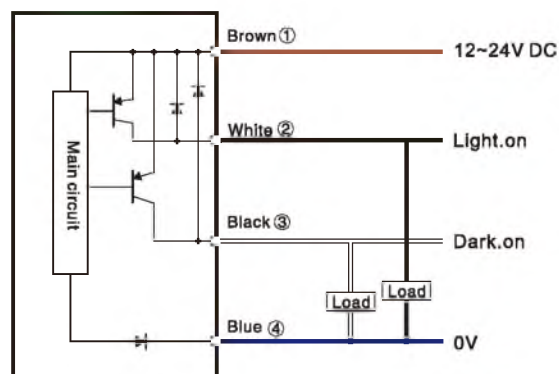
Connection cable: ME-1007 (To O-11)

Circuit diagram

NPN Output



PNP Output





NEW!



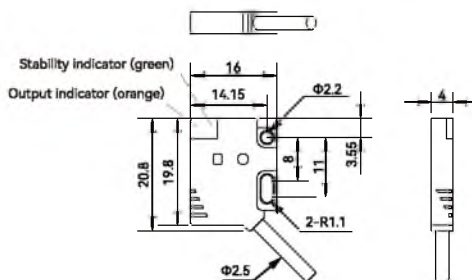
NEW!

Sensing type	Convergent reflective					Thru beam			
Sensing distance	2~15mm			2~25 mm (fixed)		500mm { fixed }		1m (fixed)	
Light source	Infrared light 850nm (modulated)			Infrared light 950nm (Modulated)		Infrared light		Red light	
Detectable object	all objects			50*50mm white paper		Opaque, φ >2 mm			
Output	NPN/PNP Open–collector, ≤100mA								
Switch type	L.on								
Indicator	Motion indicator: orange; Power: green								
Response time	1.2ms			≤1.2ms					
Power-up delay	50ms			—					
Operating voltage	10~30V DC ± 10%								
Residual voltage	<2V (load current <50mA)								
Current consumption	≤20mA								
Load current	< 100mA			< 50mA					
Circuit protection	Overload protection/reverse connection protection/short circuit protection			Reverse polarity protection/surge protection/short circuit protection					
Ambient illuminance	Sunlight ≤ 10,000Lux, Incandescent lamp≤ 3,000Lux								
Ambient temperature	Working : -25℃~+55℃, no freezing; storage: -10℃ ~ +55℃								
Ambient humidity	Working: 35%~85%RH; Storage: 35%~95%RH, no condensation								
Withstand voltage	± 500V 50/60Hz 60s								
Static electricity	± 8000V								
Group pulse	± 2000V (5kHz/50kHz/100kHz)								
Anti-vibration	10~55Hz, amplitude 1.5mm, 2 hours each in X, Y, Z directions			10~50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions					
Degree of protection	IP67								
Connection	Φ2.5* 2M /3 core cable								
Material	PC								
Accessories	Mounting screws								
Model No.	NPN	ESL-15NO	ESL-15NC	ESL-25NO	ESL-25NC	ESL-T50NO	ESL-T50NC	ESL-TM01NO	ESL-TM01NC
	PNP	ESL-15PO	ESL-15PC	ESL-25PO	ESL-25PC	ESL-T50PO	ESL-T50PC	ESL-TM01PO	ESL-TM01PC

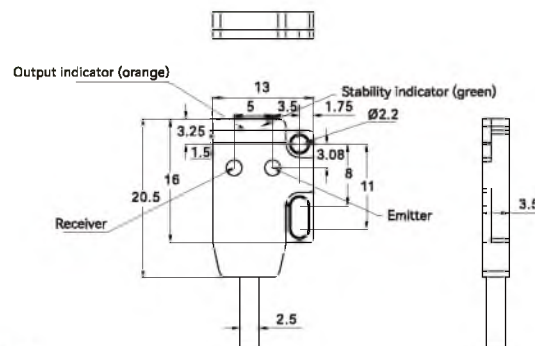
Dimensions

Unit: mm

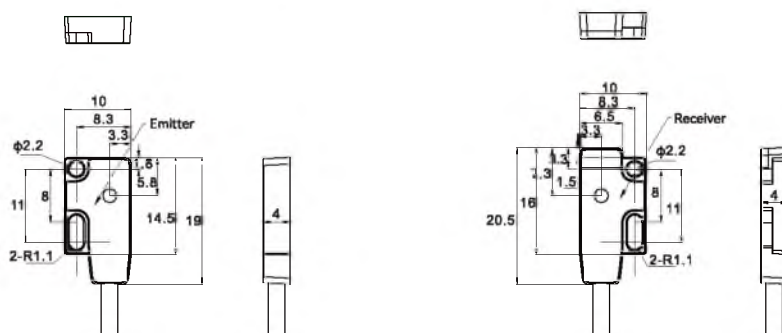
ESL-15



ESL-25



ESL-T50/TM01



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

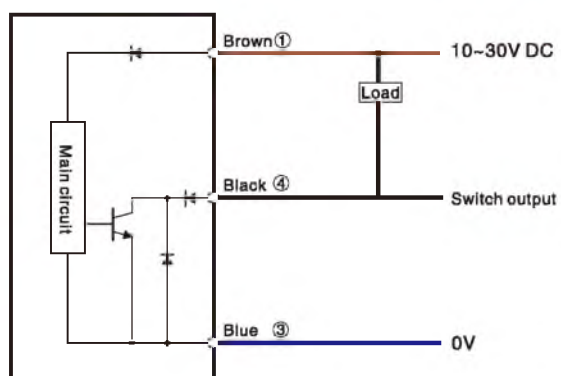
Reflectors

Reflectors

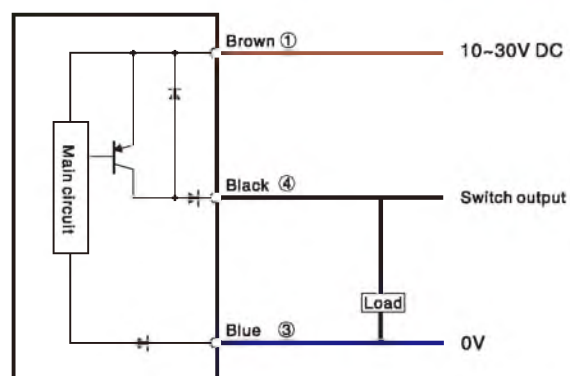
Thin Type

Circuit diagram

NPN Output



PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP68K high protection type

Anti-glare type

IO-Link type

Reflectors

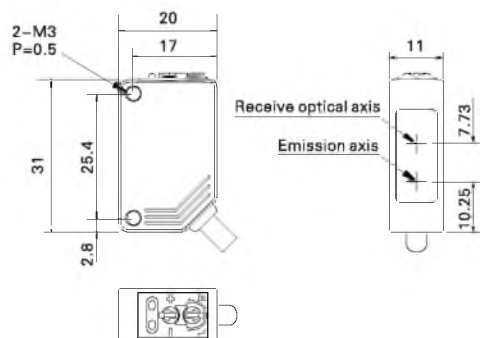
Reflectors

Appearance				
Sensing type		Disffuse refection-BGS		
Sensing distance	5 ~ 100mm(White non-glossy paper)	5mm ~ 150mm(White non-glossy paper)	0 ~ 300mm (White non-glossy paper)	
Setting distance	30 ~ 100mm	40 ~ 150mm	40 ~ 300mm	
Spot size	≈ Ø1.5mm/10cm	≈ Ø9mm/15cm	≈ Ø16mm/30cm	
Hysteresis	≦5%	≦20%	≦5%	
Output type	NPN/PNP Open-collector, ≦100mA/30V DC			
Switch type	L.on/D.on selectable			
Indicator	Operation indicator: Green Motion indicator: Red			
Response time	≦2ms	5ms	≦2ms	
Sensitivity adjustment	Adjuster(6 turns)	Adjuster (single turns)	Adjuster(6 turns)	
Light source	Red LED small spot 623nm (modulation)	Red LED 623nm (modulation)		
Operating voltage	10~30V DC ± 10%	10~24V DC ± 10%	10~30V DC ± 10%	
Current consumption	<20mA		<25mA	
Load current	<100mA			
Ambient illuminance	Sunlight ≦5,000Lux, Incandescent lamp ≦3,000Lux			
Ambient temperature	-25℃~55℃ no freezing			
Ambient humidity	35~85% RH, No condensation			
Degree of protection	IP65			
Connection method	2M/3 core cable			
Material	PBT+fiberglass(body); PMMA(Lens)			
Accessories	Screwdriver			
Model No.	NPN	ESB-S10N	ESB-15N	ESB-30N
	PNP	ESB-S10P	ESB-15P	ESB-30P

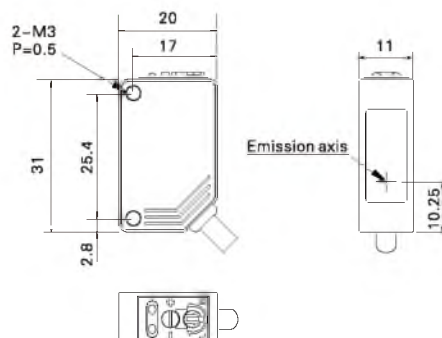
Dimensions

Unit: mm

ESB-S10/15N(P)

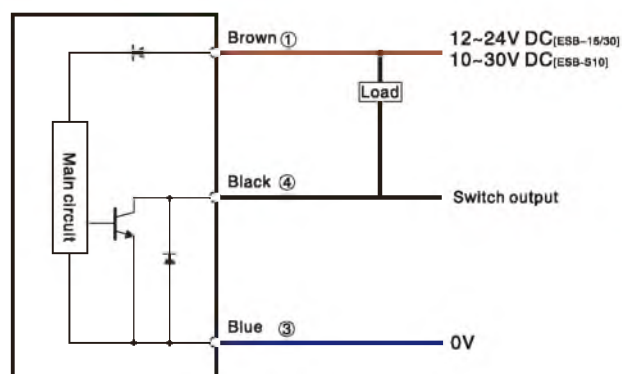


ESB-30N(P)

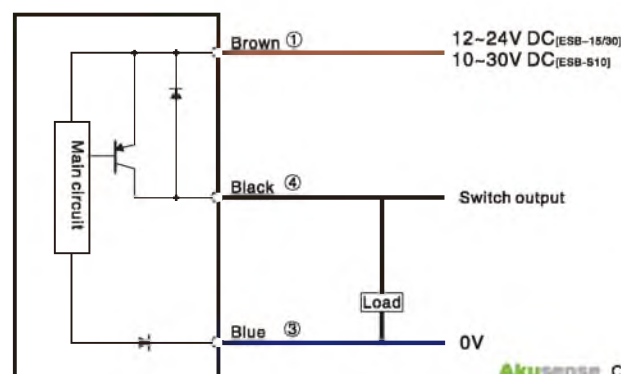


ESB-S10/15/30N(P)

NPN Output



PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors

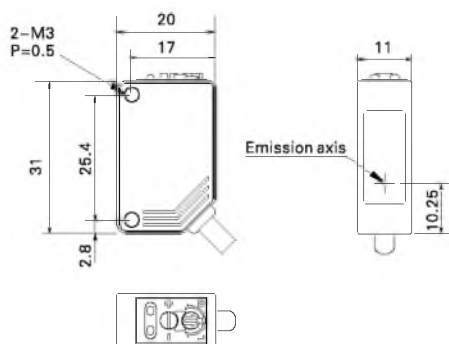


NEW!

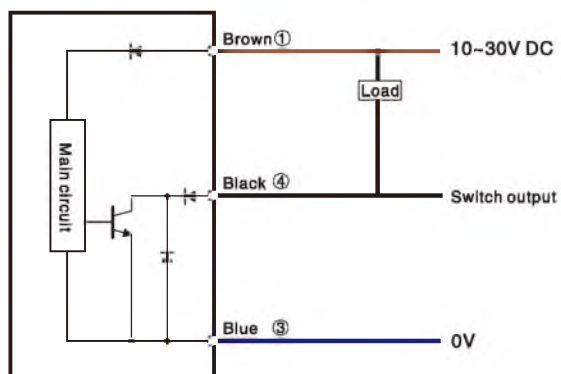
Sensing type	Diffuse reflective – Background suppression	
Sensing distance	10 ~ 300mm	10 ~ 200mm
Setting distance	40 ~ 300mm	40 ~ 200mm
Spot size	—	≈ Ø 12mm/200mm
Hysteresis	≤ 5%	
Output	NPN/PNP Open – collector	
Switch type	L.on /D.on switchable	
Indicators	Power: green; motion indicator: red	
Response time	≤ 2ms	
Sensitivity adjustment	6 turns adjuster	
Light source	Infrared LED 940nm (modulation)	Red LED 623nm (modulation)
Supply voltage	10~30V DC ± 10%	
Residual voltage	<1.5V	
Current consumption	≤ 25mA	
Load current	≤ 100mA	
Circuit protection	Power reverse polarity protection/surge protection/short circuit protection	
Ambient illuminance	Sunlight ≤ 5,000 lux, Incandescent lamp ≤ 3,000 lux	
Ambient temperature	Working temperature: -25℃~+55℃, no freezing; storage: -30 ~ +70℃	
Ambient humidity	Working: 35%~85% RH; storage: 35%~95% RH,; no condensation	
Insulation resistance	20MΩ	
Withstand voltage	± 1000V 50/60Hz 60s	
Static electricity	± 8000V	
Group pulse	± 2000V (5kHz/50kHz)	
Anti-vibration	10~50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions	
Degree of protection	IP65	
Connection	φ 4 mm, 2 m 3 wire cable	
Material	PBT+glass fiber (housing); PMMA (lens)	
Accessories	screwdriver	
Model No.	NPN	ESB-V30N
	PNP	ESB-V30P
		ESB-C20N
		ESB-C20P

Dimensions

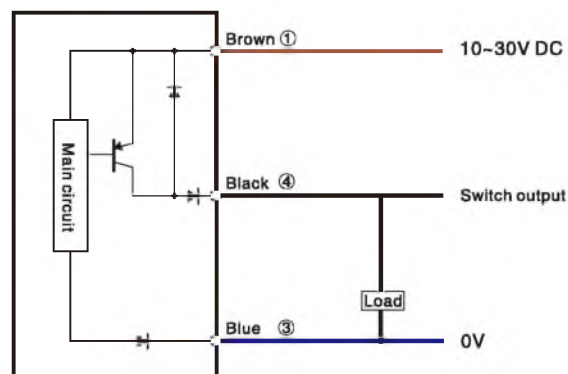
Unit: mm



NPN Output



PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

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Vibration

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Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors

Transparent Detection

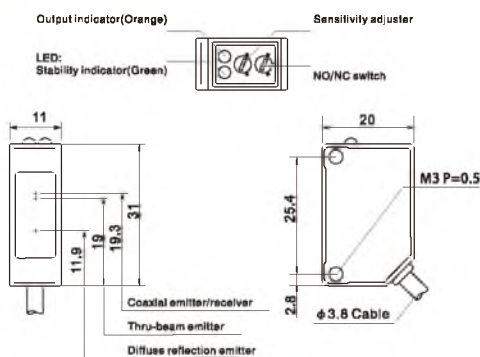
EST Series



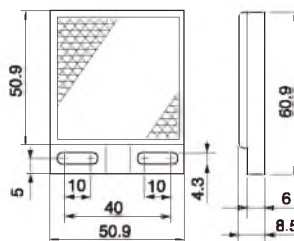
Appearance	Retro-reflection	
Sensing type	General Type	Coaxial beam
Spot size	0.01~2m	0~2m
Sensing distance	0.01~2m	0~2m
Spot size	φ 300mm/200cm	φ 60mm/200cm
Output type	NPN/PNP Open-collector, ≤100mA/30V DC	
Switch type	Selectable L.on/D.on	
Indicator	Work indicator: Green; Output indicator: Orange	Output indicator: Orange
Response time	0.5 ms	
Light source	Red light LED(660nm)	
Operating voltage	10~30V DC ± 10%	
Current consumption	< 20mA	
Load current	≤ 100mA	
Ambient illuminance	Sunlight ≤ 10000Lux, Incandescent lamp ≤ 3000Lux	
Ambient temperature	-25℃~+55℃, No freezing	
Ambient humidity	35%~85%RH, No condensation	
Degree of protection	IP67	
Connection method	2M 3 core cable	
Material	ABS with glass fiber (Housing); PMMA(Lens)	
Accessories	reflector	Bracket, reflector, mounting screw
Model No.	NPN EST-200N PNP EST-200P	EST-X200N (HOT) EST-X200P

Dimensions

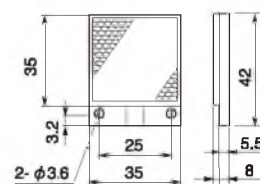
Unit: mm



EST-200 Reflector:



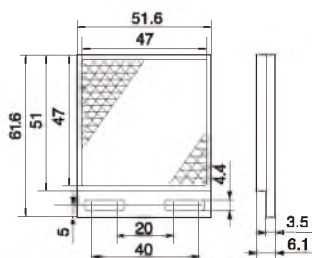
(Standard TD-11)



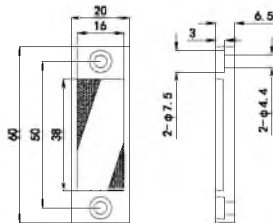
(Optional TD-12)

Noted:
Coaxial products only have one orange LED output indicator.

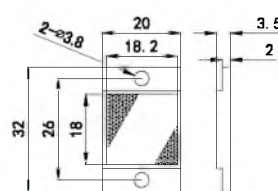
EST-X200 Reflector:



(Standard TD-13)

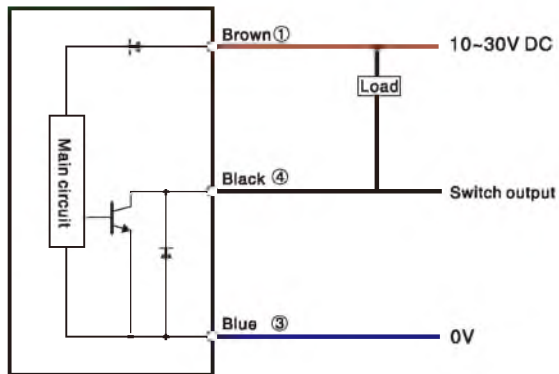


(Optional TD-14)

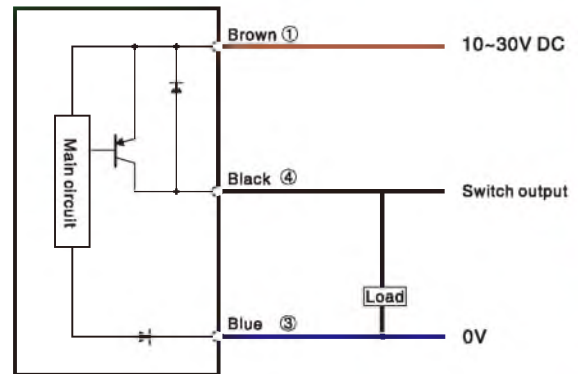


(Optional TD-15)

NPN Output



PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Photoelectric
 - Cylindrical
 - Square
 - Flat type
 - Thin type
 - BGS
 - Transparent detection**
 - Color/Mark Detection
 - TOF type
 - IP69K high protection type
 - Anti-glare type
 - IO-Link type
- Reflectors
 - Reflectors

Color/Mark Detection

ESC Series

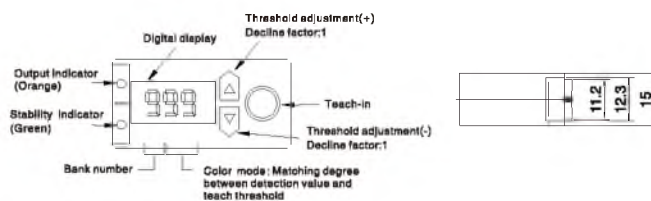
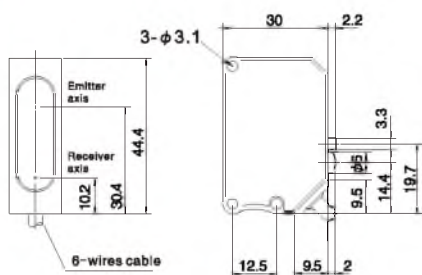


Appearance

Sensing type	Diffuse reflection
Sensing distance	18 ± 2mm
Spot size	φ 6mm/18mm
Output type	NPN/PNP Open-collector, ≤100mA/30V DC
Switch type	Selectable L.on/D.on
Indicator	Output indicator: Orange; Work indicator: Green
Digital display	7 segments, 3 digit display (Red and Green LED)
Response time	Mask mode: H1/0.25 ms, H2/0.5 ms, L/1.2 ms Color mode: H1/0.8 ms, H2/1.6 ms, L/4 ms
Time delay function	OFF delay/ ON delay/ Single pulse delay (0~990ms:10ms; 1~10s unit:1s)
Light source	RGB 3 color light source
Operating voltage	10~30V DC ± 10%
Current consumption	≤40mA
Load current	≤100mA
Ambient illuminance	Sunlight ≤10000Lux, Incandescent lamp ≤3000Lux
Ambient temperature	-25℃~+55℃, No freezing
Ambient humidity	35%~85%RH, No condensation
Insulation resistance	≥20 Ω (500V DC)
Impact resistance	50G(500m/s ²), XYZ three directions
Degree of protection	IP67
Connection method	2M 4 core cable
Material	Housing: ABS, Lens: PMMA
Accessories	Bracket, mounting screw
Model No.	NPN ESC-18N PNP ESC-18P

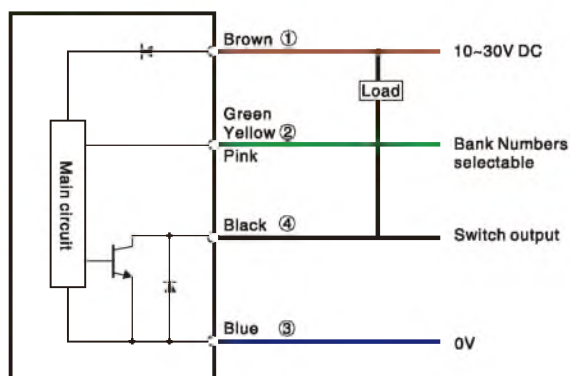
Dimensions

Unit: mm

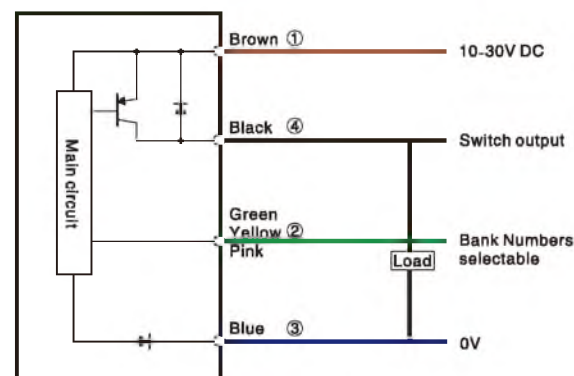


Circuit diagram

NPN Output



PNP Output





NEW!

Appearance	
Sensing type	Diffuse reflective
Sensing distance	20mm ± 3mm
Spot size	1x5mm (setting distance: 20mm)
Output	NPN / PNP for option
Switch type	L.on / D.on switchable
Indicators	Work indicator: Green, motion indicator: Red
Response time	Mark mode: 0.5ms; color mode: 2ms
Digital display	4 digits
Power supply	12~24V Dc ± 10%
Residual voltage	< 1.5 V (load current < 50 mA)
Current consumption	< 35mA (24V)
Load current	< 50mA
Circuit protection	Reverse polarity protection / short circuit protection
Ambient temperature	-10~55°C, no freezing
Storage temperature	-20°C~70°C
Ambient humidity	35~85%RH, no condensation
Storage humidity	35~85%RH
Withstand voltage	± 1000V 50/60Hz 60s
Static electricity	± 8000V
Degree of protection	IP67
Group pulse	± 2000V
Anti-vibration	10~50Hz, amplitude 1.5 mm; 2 hours each in X, Y, Z directions
Ambient luminance	Incandescent lamp: ≤ 3,000 lux, Sunlight: ≤ 10000 lux
Model No.	NPN ESE-20N PNP ESE-20P

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

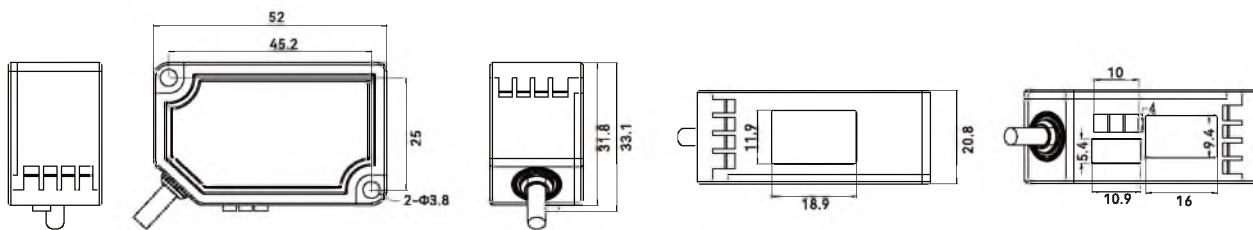
Guidance

Photoelectric
Cylindrical
Square
Flat type
Thin type
BGS
Transparent detection
Color/Mark Detection
TOF type
IP69K high protection type
Anti-glare type
IO-Link type

Reflectors
Reflectors

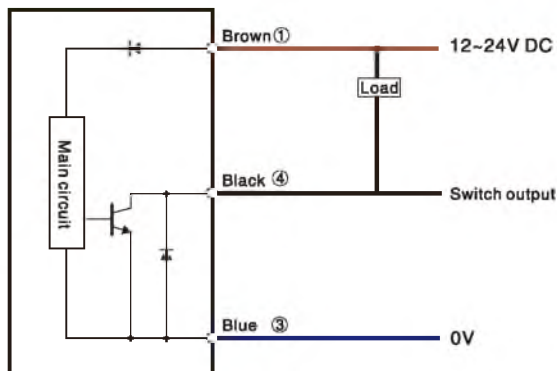
Dimensions

Unit: mm

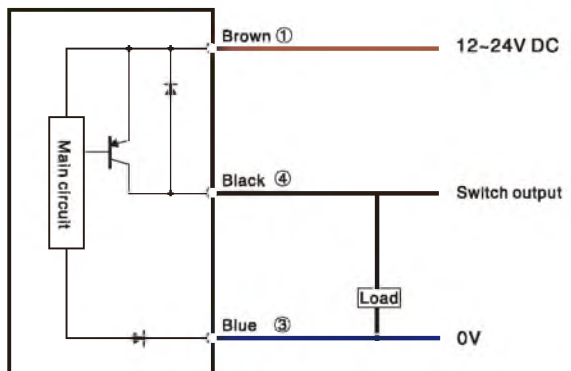


Circuit diagram

NPN Output



PNP Output

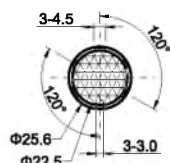


Reflectors

Dimensions

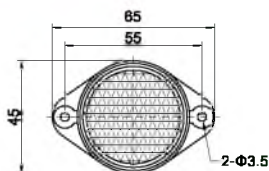
Unit:mm

STD-06



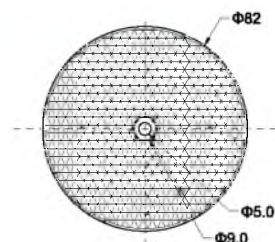
Thickness: 8mm

TD-04



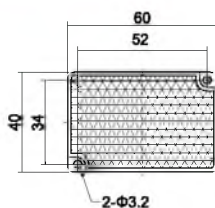
Thickness: 8mm

TD-05



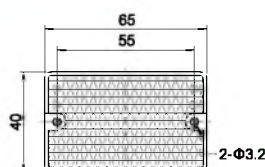
Thickness: 8mm

TD-09



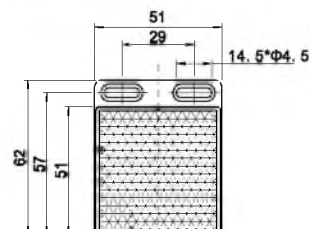
Thickness: 8mm

TD-02



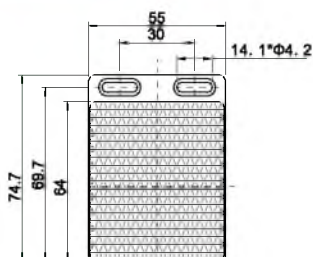
Thickness: 8mm

TD-08



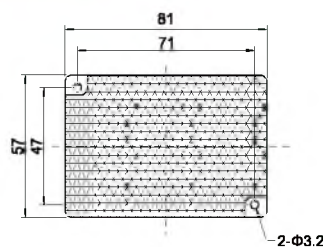
Thickness: 8mm

TD-01



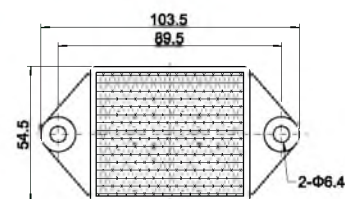
Thickness: 8mm

TD-03



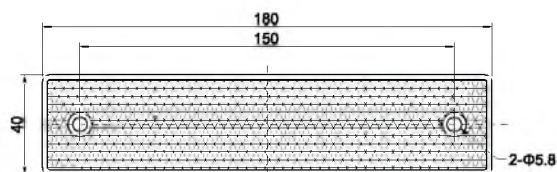
Thickness: 8mm

TD-01-3



Thickness: 8mm

TD-10



Thickness: 8mm

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high

protection type

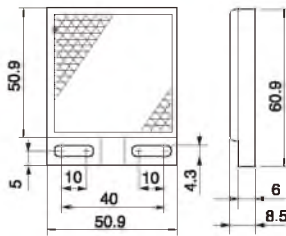
Anti-glare type

IO-Link type

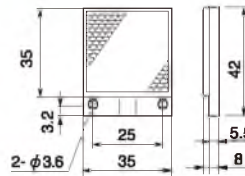
Reflectors

Reflectors

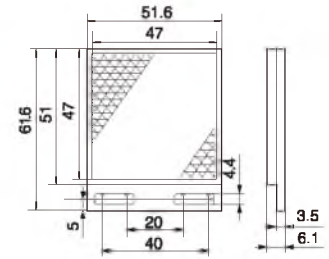
TD-11



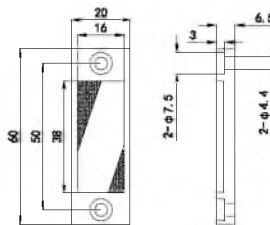
TD-12



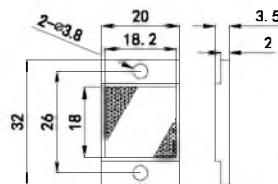
TD-13



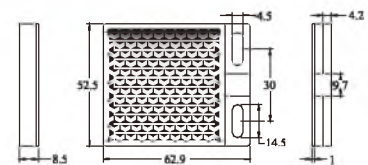
TD-14



TD-15



TD-22



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors

Temperature Sensor



Temperature Sensor

- Suitable for small pipe diameters and confined spaces
- Fast response time
- Different probe diameter and length optional

P.M-02

TSP Series

Temperature



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Temperature
Sensor

Dimensions

BN — + 24 V DC

WH — RS-485 A

BU — 0V DC

BK — RS-485 B

GY — IO output

Technical drawing of the front view of a mechanical component. The component has a total length of 108. The left section has a diameter of M18x1 and a length of 25. The right section has a diameter of 75 and a length of 75. The right end has a diameter of 65.

Technical drawing of the M18x1 shaft. The drawing shows a shaft with a total length of 183. The shaft has a diameter of Ø5. The distance from the left end to the start of the threaded section is 100. The length of the threaded section is 75. The shaft is labeled M18x1.

Deep Learning Camera

meiji AIVS

meiji AIVS(Artificial Intelligent Vision System) provides from image acquisition to model deployment and upgrade, and then to the production line for complete closed loop, through the docking with imaging equipment to achieve image acquisition, the user annotates the collected data, and then perform model training with one-click operation, Export and deploy the model to the production line to directly inspect the materials in real time Measurement. As the production line changes, meiji AIVS will conduct independent training and upgrade models, There is no need for professional AI algorithm personnel to participate in the whole process.



0 Programme 1 Deploy 2 Contents 3 Operations

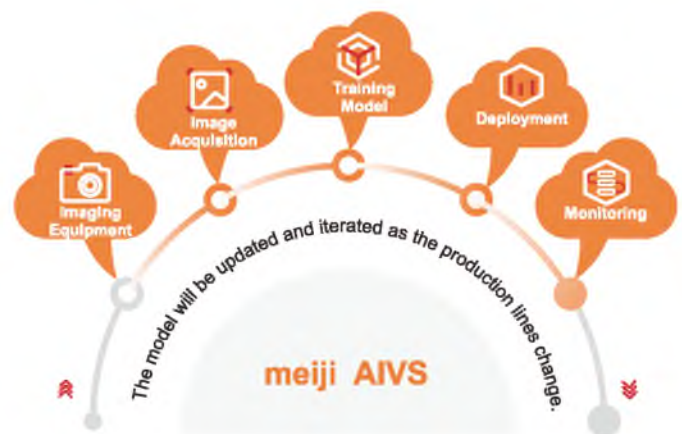
meiji AIVS(Artificial Intelligence Vision System) consists of training and running, no need programming requirements, only 3 steps to complete model training, and 1 click deployment to the production line.

Program Overview

meiji AIVS is a set of end-to-end solutions for industrial vision AI, mainly with two parts: model training and operation. It can provide full flow, one stop AI empowerment and management capabilities for industrial manufacturing to create intelligent manufacturing standardized AI delivery system.

The AIVS model training platform is aimed at AI algorithm autonomous training for complicated scenes like material tracking, defect positioning, workpiece measurement of the production line, and Multi-class appearance detection. The AIVS model training platform imports the model generated by the training platform and deploys it directly to the production line, then connect with the production line equipment to achieve real-time AI detection.

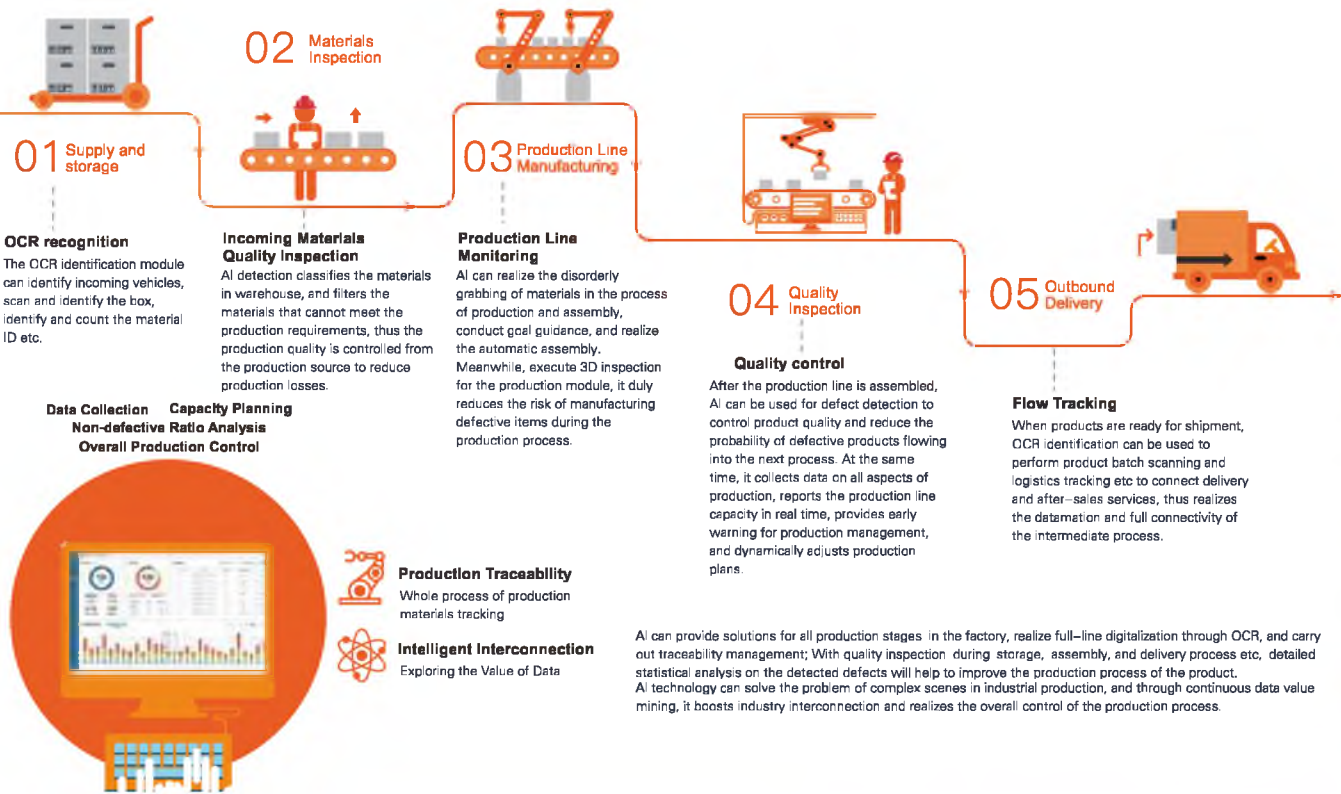
meiji AIVS decreases the industries' dependence to professional AI ability. With the program launched, the corporations do not need algorithm personnel to program on-site, the training and deployment of the AI model can be completed with simple mouse click, so that AI can be used in industrial production line to improve production efficiency, and fulfil the intelligent upgrade of traditional manufacturing. This solution can be widely used in consumer electronics, automobiles, new energy, and pan-industries. At present, it has provided services for a great number of Fortune 500 manufacturers in different fields, with production line equipments seamlessly connected to realize AI real-time detection.



Application

For typical cases and industry applications, please refer to P36-37

meiji AIVS provides AI services for the entire manufacturing process, and help to improve production traceability management and industrial interconnection.



Core Algorithm Function

OCR



Adopting end-to-end solution based on deep learning, it supports single-character and multi-character labeling and recognition, and recognize different background characters, such as steel stamping, laser engraving, printing, textiles etc, breaking the technical limitations of traditional approaches and solving curved characters Recognition, low-contrast character recognition, large character recognition and other complex issues.

Detection



Positioning and categorizing the targets in the detected materials, it is suitable for multi-target detection, small target detection, counting etc, can be used as drug pill counting and 3C device detection etc.

Classification



Classify and analyse the tested materials, such as the OK/NG two-class judgment of materials, the color of the object, the type of food material, and the detailed classification of 3C defects etc.

Segmentation



Pixel level detection and edge recognition of the detected object. Such as identifying the crack area of the silicon wafer, and the bearing bump area etc.



Extreme Fine Recognition Capability

4 Pixels

When the detection objects are very dense, with only 4-5 pixels between different targets, ordinary algorithms cannot distinguish it well. meiji AIVS detects the label structure information of the target through the auto-encoder learning, which can identify the granularity as low as 4 pixels.



Small Sample Error Corrector

Boost 10%+

In order to solve the issue of fewer training samples, meiji AIVS solution will search for typical cases among the samples, cyclically guides and rectifies for the prediction results, so that the recognition rate of the final small samples increases by over 10%.



Super Image Processing Power

100 Million Pixels

Super model parallel capability, image processing on a multi-card machine, can handle 4 times the field of view of the normal network, and can conduct up to 100 million pixels in a single image.



Core algorithm advantage



Dynamic Data Enhancement

Up to 30x Enhancement

The uneven distribution of training sample data leads to poor prediction effects of the model. meiji AIVS can automatically match the optimal data enhancement strategy according to different task requirements, generate new simulation data through learning iteration, and increase the data utilization rate by over 30 times.

Remarks: The above algorithm effect data are calculated based on the actual measurement data of meiji's running projects. Specific to similar projects measured results may produce small deviations.

Functional Features



01

Consumer-level Product Experience

It provides data labeling, management and other functions, humanized interactive design helps to complete labeling work smoothly through guided labeling and quick close up; the platform supports image and labeling data import and export, which can be used for data sharing and management.



02

Visual Training Process

meiji AIVS features characters such as automatic parameter tuning and intelligent data distribution. Users do not need to acquire professional AI knowledge, but conduct simple parameter configuration to perform one-click training; during the model training process, the system provides real-time model effect trend curve, Model performance is shown clearly.



03

Clear Test Results

The model can be tested after training. The test result includes model information, test indicators and visual images for users to judge the performance of the model promptly. The test report supports one-click export, which is convenient for users to conduct further deep learning analysis and summary for the report.



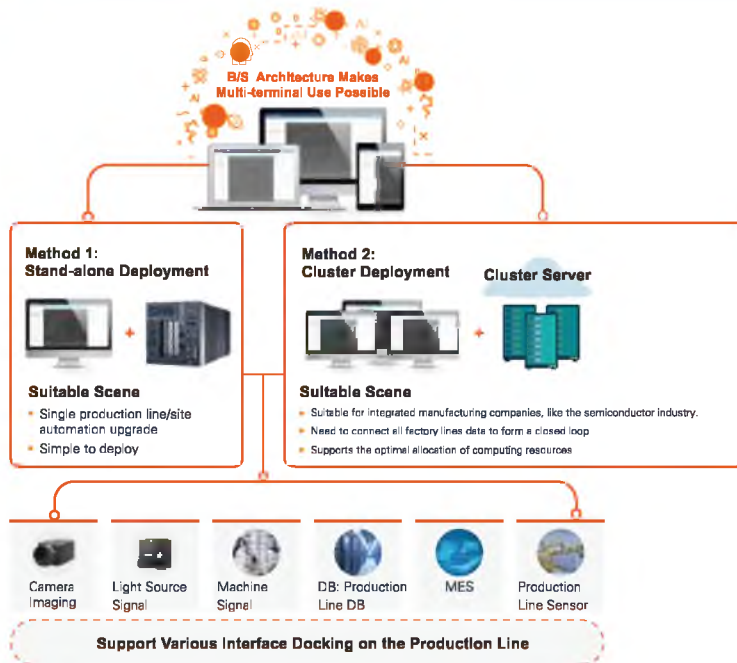
04

Agile Project Delivery

The agile project delivery model can be easily deployed to the operating platform, and the detection results can be displayed in real time. The operating platform supports docking with various camera data interfaces and multi-view configuration. The model can be operated on the production line with simple operation.



Application



meiji AIVS provides two deployment methods, and users can choose flexibly according to their needs.

For a single site/production line, only single link problem needs to be solved through AI, and then stand-alone deployment method can be used.

For production lines with high digital interconnection requirements, in addition to solve the single-point problem of the production line, it is also necessary to open up the data of the whole plant to form industrial interconnection and drive digital management, cluster deployment can be adopted. meiji AIVS can adapt to multiple types of interfaces and communication protocols in industrial production scenarios, and supports the docking of multiple models of cameras, light sources, industrial computers, common sensors, MES and databases, etc., to open up the data link of the production line.

**Stand-alone Deployment Characteristics**

One click deployment, promptly used on the production line, light-weight operation, and supports cross-operating systems.

**Cluster Deployment Features**

meiji AIVS supports multiple server clusters (data centers), training and running machine mixing to achieve maximum sharing of computing power to achieve optimal allocation of resources and to ensure the full mobilization of idle resources. In addition, it can also provide capacity monitoring and statistical analysis of the entire production line to guide for yield analysis and process improvement.

**Platform Architecture Characteristics**

The platform adopts B/S architecture, no matter which deployment solution is selected, users can apply to multiple terminals under the same network segment to use various services provided by meiji AIVS.

Code Readers



Intelligent code reader

- Red, white, and polarized light sources support multiple background reading codes
- Various light angle combinations for different applications
- 4 different distance reading lenses, ultra-small code reading, minimum resolution 0.06mm

PL-02



NEW!

QR code reader

- Highly integrated ASIC hardware
- Minimum 15% barcode printing contrast
- Up to 30 successfully decoded in one second

PL-03



Appearance

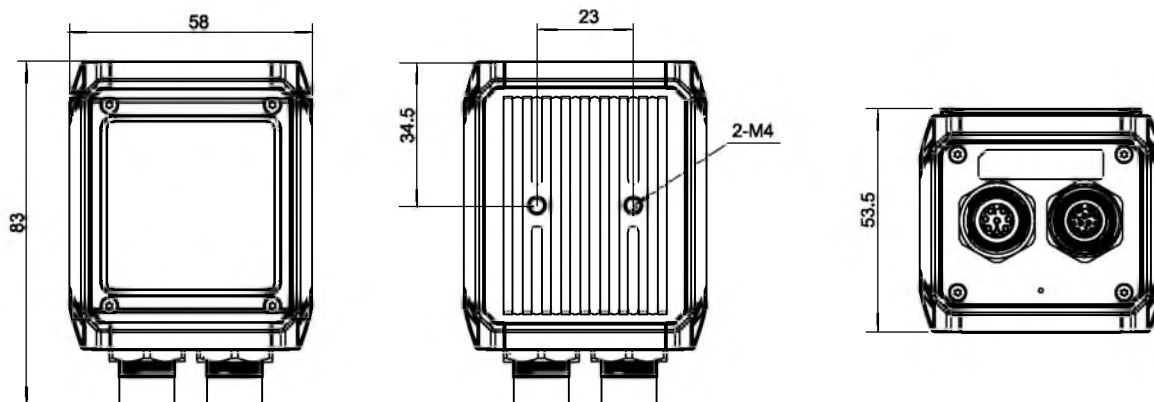
Resolution	1280 × 800				
Frame rate	45				
Shutter	Global shutter				
Color/Monochrome	Monochrome				
Input control	Two-way input control can be controlled by software. Photoelectric isolation-NPN type				
Output control	Three-way output can be controlled by software. Photoelectric isolation-NPN type; Rated voltage 30VDC(max.); Rated current: 50mA(max.)				
Field of view	Horizontal: 38.5° , Vertical: 25.2°				
Skew tolerance	360° rotation; ± 50° pitch; ± 60° skew				
Motion tolerance	Max. 2m/s				
Reading accuracy	Min. resolution: 0.06mm				
Ranging	1. Measure the distance from reader to the code 2. Identify the appearance of the target to realize automatic scanning code				
Position indicator	Light sight indicates the central area of the scanning position				
Status indicator	Five indicator lights show different functions and states				
Focal length	35mm	40mm	80mm	120mm	
Support 1D barcode	1D code: EAN-13, Code128, Code93, Interleaved 2 of 5, Code 39				
Support 2D code	2D code: DataMatrix, QR code				
Light source	Red LED, White LED, Regular and Polarized Sunglasses all-in-one				
Communication Interface	RS232, Ethernet interface				
Power input	12~24V				
Power consumption	≈ 5W				
Dimension	53.5*58*83mm				
Weight	≈ 220g				
Operating temperature	0° C ~ +45° C				
Storage temperature	-20° C ~ +70° C				
Humidity	5% ~ 95% (Non-condensing)				
Degree of protection	IP65				
Anti-drop	50 times in 1.5 meters				
EMC	CE EMC class B and FCC part 15 class B				
ESD	± 16kV(Air discharge) ± 8kV (Direct discharge)				
Certificate	3C				
Model	White LED	RCD-AI100-35W	RCD-AI100-40W	RCD-AI100-80W	RCD-AI100-120W
	Red LED	RCD-AI100-35R	RCD-AI100-40R	RCD-AI100-80R	RCD-AI100-120R
	Red LED+				
	Polarized Sunglasses	RCD-AI100-35RD	RCD-AI100-40RD	RCD-AI100-80RD	RCD-AI100-120RD
	White LED+	RCD-AI100-35WD	RCD-AI100-40WD	RCD-AI100-80WD	RCD-AI100-120WD
	Polarized Sunglasses				

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

Code readers
Intelligent code reader
QR code reader

Dimensions

Unit: mm



Vibration/Inclinometer Sensor



- ◎ Up to 5mg resolution accuracy and 0.5% linearity accuracy for high sensitivity detection.
- ◎ Configurable range in real time online

Various installation methods

MJD series equipped with cylindrical thread structure



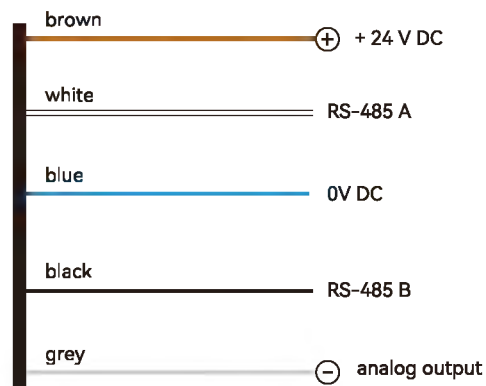
MJD Series



MJL Series

Configure serial ports, analog quantities and IO

MJD series vibration acceleration products are equipped with multiple output modes. Through the debugging software, the voltage and current analog outputs can be easily configured and configured with RS485 and RS232 serial communication outputs.



MJD series	Resolution/Range	15.62mg @ ±2g 31.25mg @ ±4g 62.50mg @ ±8g 125mg @ ±16g (Range can be set)
------------	------------------	---

Excellent measurement accuracy and stability

Up to 5mg resolution accuracy and 0.5% linearity accuracy
High sensitivity detects whether there is vibration or whether the level of vibration has changed

Realize X, Y, Z three-axis acceleration measurement

MJD series products can realize X,Y,Z measurement and output three-axis acceleration measurement values through the serial port.



MEMS(Microelectromechanical systems)



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety door lock
Pressure Switch
Communication
Accessories

Guidance

Vibration

Triaxial Measurement

Inclinometer

Dual axis measurement

Product Highlights

Configure interrupt function

Interrupt signal management via RS485 or analog configuration

Interrupt analog configuration in three modes (standard, switching, pulse)



Standard

The analog output cannot send any alarms reported, whether the interrupt is available or unavailable through the analog output, it follows the standard trend in speed



Switching

The acceleration exceeds the threshold value and the continuous value, causing an alarm.

The output status is at the most Switch between minimum and maximum values



Pulse

In this mode, the analog output is always at the minimum value.

Each time the threshold and duration are exceeded, the output is switched to the maximum value, remains at the high value for at least 5ms, and then returns to the minimum value.

Mode limits alarm acknowledgment frequency

Application



Industrial Robot



Aerial Work Platform



Logistics Conveyor System



Agricultural Tractors/
Earthmoving Vehicles



Oilfield Pumping Units



Photovoltaic Industry



Medical Instruments



Bridge Crane

Selection guide



Three-axis measurement

- Simultaneous measurement of XYZ three directions
- Supported by RS485 communication.
- 316L stainless steel enclosure

P.M-04



Dual Axis Measurement

- Wide voltage input, 9~36V DC
- Resolution is 0.05°
- Biaxial inclination measurement

P.M-05



Basic Features	working principle	Principle of inertia	
	Enclosure type	Cylindrical	
	Detect range	$\pm 16g$ (MAX)	
	Detect axis	3(X,Y,Z)	
	Resolution	15.62mg@ $\pm 2g$; 31.25mg@ $\pm 4g$; 62.50mg@ $\pm 8g$; 125mg@ $\pm 16g$	
	Technical	MEMS(microelectromechanical system)	
Electrical data	Operating Voltage	24VDC $\pm 20\%$	
	Power consumption	<1W	
	Digital output	RS-485 (addressable) 57600 baud - 1 bit stop - no parity	
	Resolution Digital Output	16 bit@RS-485;12 bit@Analog output	
	Voltage analog output	0~5V/0~10V(programmable)	
	Current analog output	0~5V/0~10V(programmable)	
	Vibration frequency	0~400Hz	
	resistance	Resistance (voltage): 1k~1M Ω ; resistance (current): 100~500 Ω	
	protect the circuit	Reverse polarity protection, surge protection	
Environmental conditions	Working temperature	-25°C~+70°C	
	Storage temperature	-30°C~+90°C No condensation	
	Working environment humidity	<80% No condensation	
	Protect degree	IP67	
Mechanical data	Connection method	5 core cable	M12,5PIN Connector (20cm lead)
	Dimensions	M18x40.5mm	
	Material	Stainless steel AISI 316L	
	Weight	100g	
	Accessories	Nut	
	Model	MJD18-W	MJD18-P

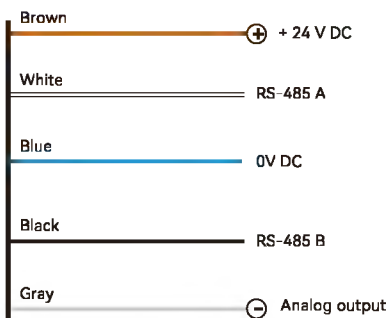
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
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Guidance

Vibration
Triaxial Measurement

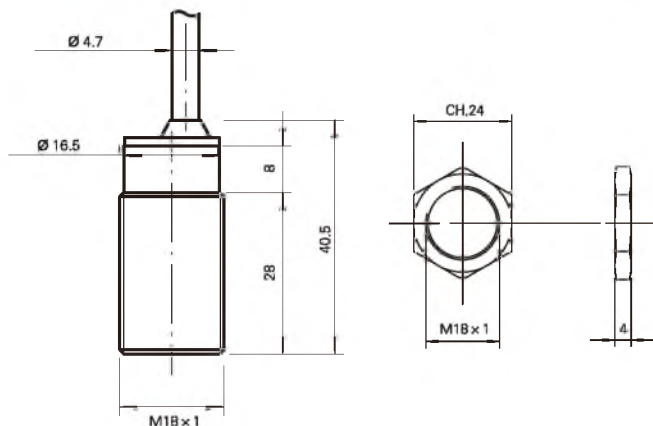
Inclinometer
Dual axis measurement

Circuit Diagram



Dimensions

Unit: mm



Dual Axis Measurement

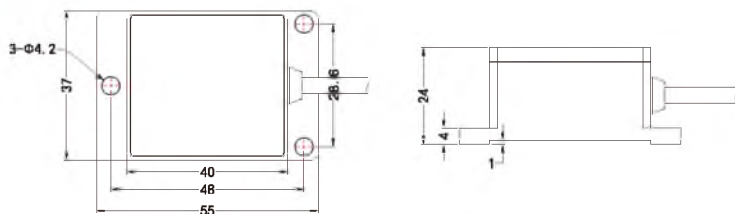
MJL Series



Basic Features	Working principle	Principle of inertia			
	Enclosure type	Square			
	Detection range	± 10°	± 30°	± 60°	± 90°
	Detection axis	X,Y			
	Resolution	0.05°			
	Long-term stability	0.2		0.25	
Electrical data	Absolute precision	0.1°		0.2°	
	Response time	0.02s			
	Power-on startup time	0.5s			
	Operating Voltage	9~36V			
	No load current	40mA			
	Mean time between failures(MTBF)	≥45000h/time			
	Output rate	5Hz、15Hz、35Hz、50Hz Can be set			
	Output signal	RS232/RS485/RS422/TTL/CAN			
	Electromagnetic compatibility	Follow En61000 and GBT17626			
	Insulation resistance	≥100M			
Environmental conditions	Working temperature	-40~+85℃			
	Storage temperature	-55~+100℃			
	Zero temperature drift	±0.01"/℃			
	Sensitivity temperature coefficient	≤150 ppm/℃			
	Vibration Resistance	10grms 10~1000Hz			
	Impact resistance	100g@11ms、Three-axis and Synchronous (Half-Sine Wave)			
	Protect degree	IP67			
Mechanical data	Connection method	M16/5 pin			
	Dimensions	55x37x24mm			
	Material	Stainless steel			
	Weight	90g(Excluding cables)			
	Accessories	Standard 1 meter length, wear-resistant, wide temperature, shielded cable (direct lead)			
Model	4~20mA	MJL326T-10-A1	MJL326T-30-A1	MJL326T-60-A1	MJL326T-90-A1
	0~5V	MJL326T-10-V3	MJL326T-30-V3	MJL326T-60-V3	MJL326T-90-V3
	RS232	MJL326T-10-23	MJL326T-30-23	MJL326T-60-23	MJL326T-90-23
	RS485	MJL326T-10-48	MJL326T-30-48	MJL326T-60-48	MJL326T-90-48

Dimensions

Unit: mm



Measuring displacement sensor

- ◎ By internationally advanced R&D technology and production process, high resolution measurement at the micron level has been achieved.
- ◎ Barely being influenced by the colour and material of workpieces, performs with great stability.
- ◎ One-piece design, compact size, suitable for various installation environments.



Triangulation measuring (MLD21 Series)

- Ultra small size for installations in different environments;
- Intuitively 4-digit display with viable operation;
- 1μm resolution for precise and stable measurement.

P.F-06



Triangulation measuring (MLD23 Series)

- Micron-level display resolution, ultra-high sensitivity detection
- Measurement accuracy reaches to 0.01mm, stable and accurate detection data;
- 2KHZ high sampling frequency, fast response to detection output.

P.F-10



Contact Displacement (MR-DT Series)

- Micron-level accuracy;
- A wide option of sensing ranges to suit different inspection need;
- Serial ports, analogue and switching outputs.

P.F-25



Radar Scanner (navigation)

- Height: 72mm; Scanning range: 360 degrees;
- Scanning frequency: 10Hz/20Hz; Scanning angle resolution: 0.05 degrees/0.1 degrees;
- Scanning distance: 20m (10% reflectivity); Range: 0.2m-100m;
- Millimetre distance data resolution, RSSI function, suitable for navigation and mapping.

P.F-34



Color Confocal (ACC Series)

- Automated precision measurement device;
- Stable detection for any material;
- Latest non-contact optical sensing technology.

P.F-37

Mini Digital Display **Triangulation**

Appearance	Type	Sensing distance	Model number	Pages
	Diffuse reflection	65~135mm	MLD21-100A-485	F-08
		120~320mm	MLD21-220A-485	
		300~700mm	MLD21-500A-485	
Appearance	Type	Sensing distance	Model number	Pages
	Diffuse reflection	25~35mm	MLD23-30N	F-12
		65~135mm	MLD23-100N	
		120~280mm	MLD23-200N	

Built-in Controller **Triangulation**

Appearance	Center of sensing distance	Model number		Pages
		NPN output	PNP output	
	26~34mm	MLD33-30N	MLD33-30P	F-16
		MLD33-30NA	MLD33-30PA	
		MLD33-30NV	MLD33-30PV	
		MLD33-30N-422	MLD33-30P-422	
	40~60mm	MLD33-50N	MLD33-50P	
		MLD33-50NA	MLD33-50PA	
		MLD33-50NV	MLD33-50PV	
		MLD33-50N-422	MLD33-50P-422	
	65~105mm	MLD33-85N	MLD33-85P	
		MLD33-85NA	MLD33-85PA	
		MLD33-85NV	MLD33-85PV	
		MLD33-85N-422	MLD33-85P-422	
	60~180mm	MLD33-120N	MLD33-120P	
		MLD33-120NA	MLD33-120PA	
		MLD33-120NV	MLD33-120PV	
		MLD33-120N-422	MLD33-120P-422	
	100~400mm	MLD33-250NA	MLD33-250PA	
		MLD33-250NV	MLD33-250PV	
		MLD33-250N-422	MLD33-250P-422	

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

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Temperature

Accessories

Guidance

Displacement

Triangulation

Linear measurement

Magnetic displacement

LIDAR Scanner

Color confocal

Triangulation Built-in Controller

Appearance	Type	Center of sensing distance	Model number	Pages	
	Regular Reflection	24.3~28.3mm	NPN output MLD33-L30NA	PNP output MLD33-L30PA	F-17
			MLD33-L30NV	MLD33-L30PV	
			MLD33-L30N-422	MLD33-L30P-422	
		42.3~52.3mm	MLD33-L50NA	MLD33-L50PA	
			MLD33-L50NV	MLD33-L50PV	
			MLD33-L50N-422	MLD33-L50P-422	
		72.9~92.9mm	MLD33-L85NA	MLD33-L85PA	
			MLD33-L85NV	MLD33-L85PV	
			MLD33-L85N-422	MLD33-L85P-422	

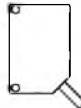
Triangulation MLD17 Series

Appearance	Type	Sensing distance		Model number		Pages
		Analog current output		Analog voltage output		
 Diffuse reflection	 20~30mm	MLD17-10V-485	MLD17-10V-232	MLD17-10I-485	MLD17-10I-232	F-20
	 20~45mm	MLD17-25V-485	MLD17-25V-232	MLD17-25I-485	MLD17-25I-232	
	 30~80mm	MLD17-50V-485	MLD17-50V-232	MLD17-50I-485	MLD17-50I-232	
	 55~155mm	MLD17-100V-485	MLD17-100V-232	MLD17-100I-485	MLD17-100I-232	
	 65~315mm	MLD17-250V-485	MLD17-250V-232	MLD17-250I-485	MLD17-250I-232	
	 105~605mm	MLD17-500V-485	MLD17-500V-232	MLD17-500I-485	MLD17-500I-232	

Triangulation MLD27 Series

Appearance	Type	Sensing distance	Model number	Pages
		Analog current output		F-21
	Diffuse reflection	15~20mm	MLD27-5V-485	
			MLD27-5V-232	
			MLD27-5I-485	
			MLD27-5I-232	
		30~45mm	MLD27-15V-485	
			MLD27-15V-232	
			MLD27-15I-485	
			MLD27-15I-232	
		55~85mm	MLD27-30V-485	
			MLD27-30V-232	
		90~190mm	MLD27-100V-485	
			MLD27-100V-232	
			MLD27-100I-485	
			MLD27-100I-232	
		125~625mm	MLD27-500V-485	
			MLD27-500V-232	
		200~1200mm	MLD27-1000V-485	
			MLD27-1000V-232	
			MLD27-1000I-485	
			MLD27-1000I-232	

Triangulation MLD27-H Series

Appearance	Type	Sensing distance	Model number	Pages
		RS485		F-22
	Diffuse reflection	15~20mm	MLD27-H5V-485	
			MLD27-H5V-232	
		30~45mm	MLD27-H15V-485	
			MLD27-H15V-232	
		55~85mm	MLD27-H30V-485	
			MLD27-H30V-232	
		65~115mm	MLD27-H50V-485	
			MLD27-H50V-232	
		90~190mm	MLD27-H100V-485	
			MLD27-H100V-232	
		60~330mm	MLD27-H250V-485	
			MLD27-H250V-232	

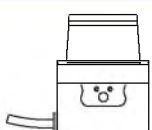
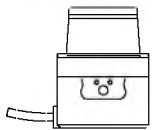
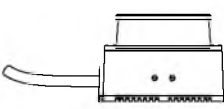
Linear Measurement Type

Appearance	Type	Sensing distance	Model number	Pages
	Diffuse reflection	10mm	ESX-G10	F-23
		50mm	ESX-G50	
		100mm	ESX-G100	
		250mm	ESX-G250	

Magnetic Displacement

Appearance	Size	Sensing distance	Model number		Pages
	φ 8X28mm	1mm	MR-D28-485		F-24
	135X36X20mm	15mm	MR-DT-L15	MR-DT-H15	F-25
	196X36X20mm	35mm	MR-DT-L35	MR-DT-H35	
	246.7X36X20mm	55mm	MR-DT-L55	MR-DT-H55	

LiDAR Scanner

Appearance	Size	Sensing distance	Model number	Pages
	83.5 × 85 × 104.9(mm)	20m	AS-21C	F-28
	83.5 × 85 × 104.9(mm)	40m	AS-41C	F-28
	86 × 85 × 59.5(mm)	20m	AS-11C	F-31
	110*96.5*71.5(mm)	100m	AS-100C	F-34

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Displacement

Triangulation

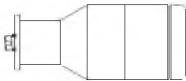
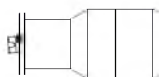
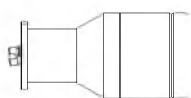
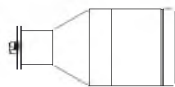
Linear measurement

Magnetic displacement

LiDAR Scanner

Color confocal

Color Confocal

Appearance	Size	Sensing distance	Model number	Pages
	Φ41*93.9(mm)	8±0.2mm	ACC-008L	F-39
	Φ98*266(mm)	11±1.2mm	ACC-011L	F-39
	Φ41*153.6(mm)	16±1mm	ACC-016L	F-39
	Φ34*153.6(mm)	18±1mm	ACC-018L	F-39
	Φ38*82(mm)	30±2mm	ACC-030L	F-39
	Φ18*55(mm)	33±2mm	ACC-033L	F-39
	Φ54*111.2(mm)	40±4mm	ACC-040L	F-39
	Φ33*75(mm)	55±3mm	ACC-055L	F-39

Fiber Optic

Slot Sensors

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Laser

Proximity

Displacement

Magnetic

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Triangulation

Linear

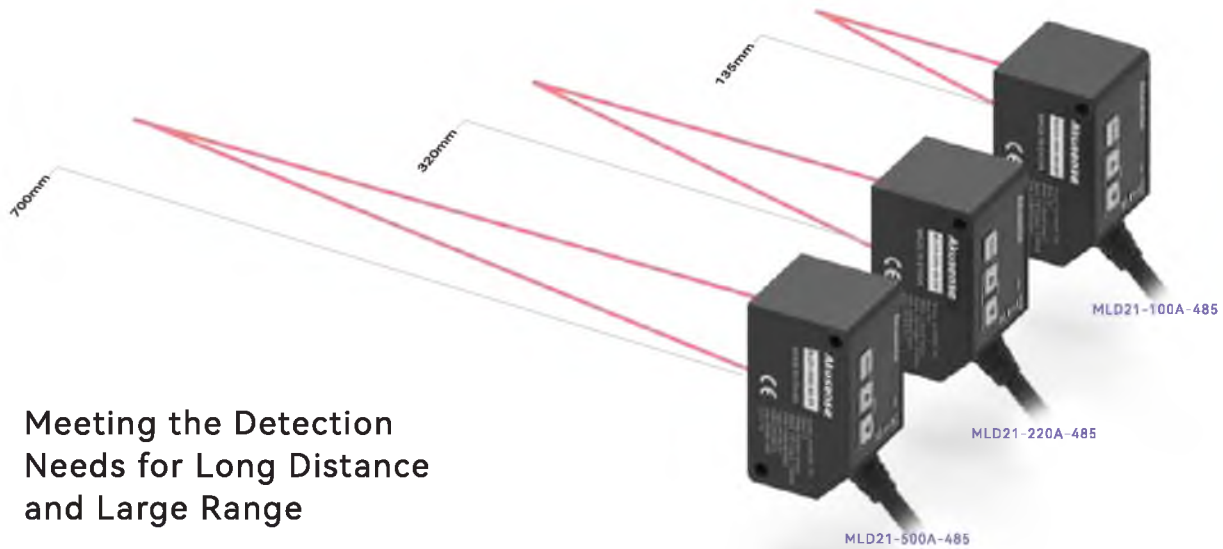
measurement

Magnetic

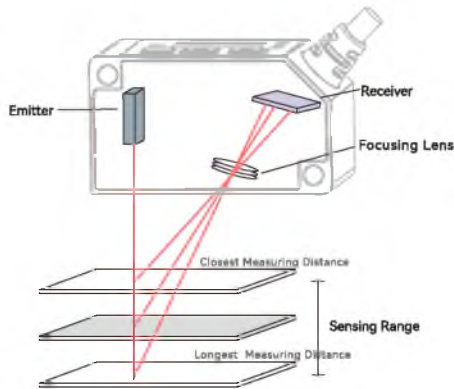
displacement

LIDAR Scanner

Color confocal



Meeting the Detection Needs for Long Distance and Large Range

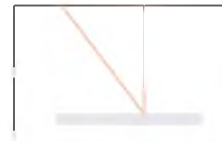


CMOS sensor element
Highly accurate detection achieved by triangulation principle

By triangulation principle, the incoming light port on the CMOS of the sensor receiver moves as the object position changes. And the change of objects can be checked by detecting the incoming light position.

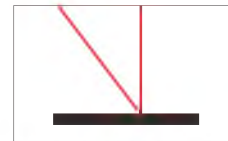
Automatic Exposure Adjustment

The amount of energy received can be automatically adjusted according to different applications;
Detection remains stable even the color or material of the workpiece changes.



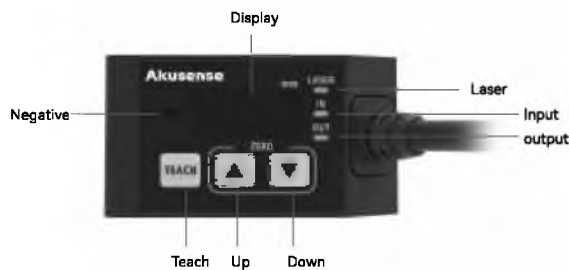
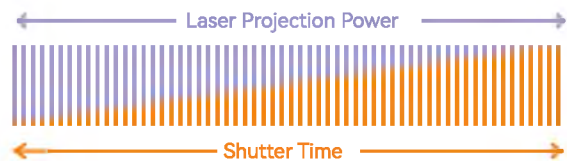
Measuring brighter objects

Laser Weakened



Measuring darker objects

Laser Enhanced



Intuitive digit display on the panel, and button function makes commissioning easy.

Equipped with display and function buttons within a mini space;

The opening/closing of the laser, external trigger signal and control output signal status can be intuitively presented; most function settings can be made directly via the sensor panel.

It includes parameter item setting, function item setting and threshold setting.

Integrated output methods;
Switching, analogue and digital outputs all in one.



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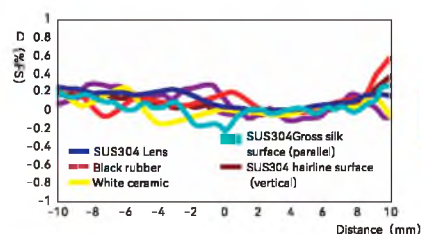
Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

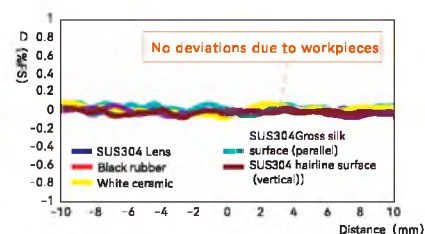
Selection Guide

Detection remains stable even the workpiece moves

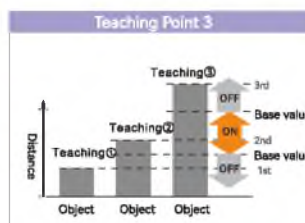
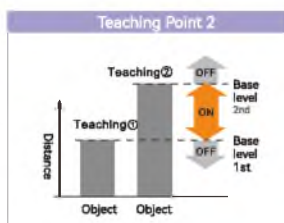
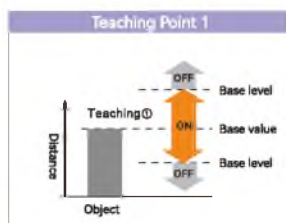
For workpieces with rough surfaces, a linear beam is used to average the amount of reflection. And the amount of light received is corrected at a high speed of 30us for per measurement cycle to reduce the alteration of the amount of light received caused by workpiece moving. Thus the detection remains stable even when the workpiece is displaced during the process of measurement.



Material-based linear properties of previous products



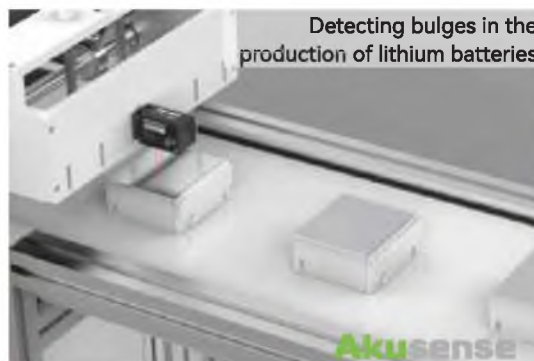
Material-based linear properties of MLD21



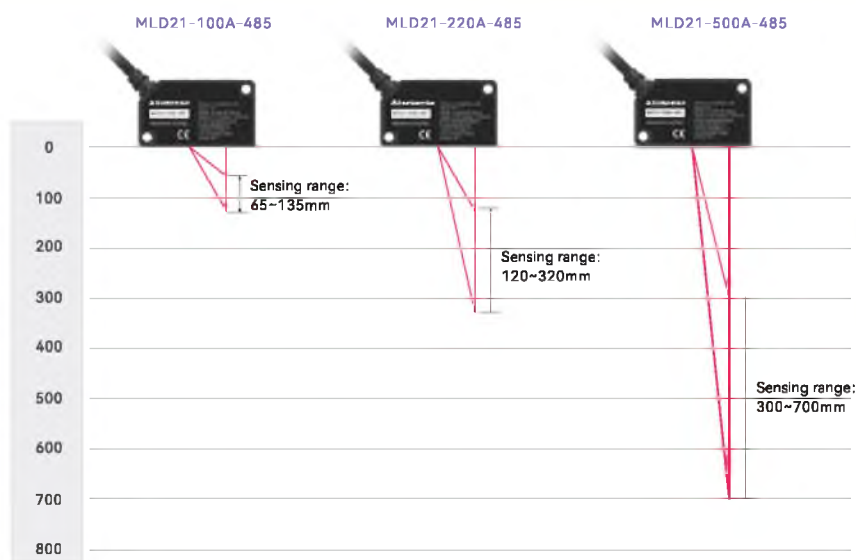
Built-in rich detection modes for greater functionality

In addition to the basic teaching settings, the following three modes have been implemented:
Basic teaching mode for simple setting of the presence or absence of the object to be measured;
A single-point serial comparison mode for deviations from the reference measurement surface;
A two-point teaching serial comparison mode for precise range control.

Application



Selection table



Model	MLD21-100A-485
Repeat accuracy	70μm
Linearity	±0.1%
Base distance	100mm

Model	MLD21-220A-485
Repeat accuracy	200μm
Linearity	±0.2%
Base distance	220mm

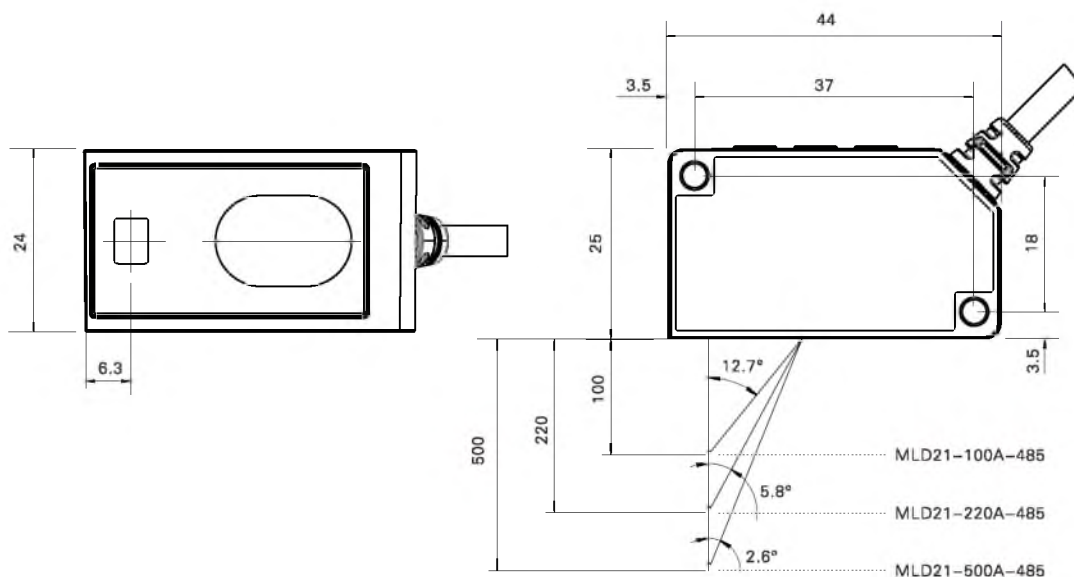
Model	MLD21-500A-485
Repeat accuracy	(300~500mm)300μm (500~700mm)600μm
Linearity	(300~500mm)±0.2% (500~700mm)±0.3%
Base distance	500mm

**Appearance**

Sensing type	Diffuse reflection		
Center of sensing distance	100mm	220mm	500mm
Sensing distance	65~135mm	120~320mm	300~700mm
Spot size	136 x 110 μm	290 x 238 μm	541 x 330 μm
light source	Laser CLASS 2		
Communication interface	Digital I/O/MODBUS RS-485 communication interface Support 9,600, 14400, 19200, 38400, 57600, 115200bps. (Default: 115200bps) Support format: 8,N,1、8,N,2、8,O,1、8,O,2、8,E,1、8,E,2		
Input voltage	12~24VDC $\pm 10\%$, 1W		
Linearity	$\pm 0.1\%$	$\pm 0.2\%$	(300~500mm) $\pm 0.2\%$ (500~700mm) $\pm 0.3\%$
Repeat accuracy	70 μm	200 μm	(300~500mm)300 μm (500~700mm)600 μm
Sampling period	1.5ms/3ms/5ms (Default: ms)		
Analog output	Current:4~20mA(Normal)/22mA(Abnormal) ,Load impedance: $\leq 300\Omega$		
Digital output	Optional function: measurement range/comparison output, Push-Pull Output, <100mA		
Digital input	Optional function:Zero reset/teaching, High-level $\geq 2\text{V}$, Low-level $\leq 0.8\text{V}$		
Indicator	Laser emission indicator(Blue), Digital output(Green), Digital input(Yellow)		
Circuit protection	Reverse voltage protection, output overcurrent protection, input power surge protection, output surge protection		
Degree of protection	IP67		
Ambient temperature	$-10^{\circ}\text{C}\sim+50^{\circ}\text{C}$		
Ambient humidity	35%~85%		
Ambient brightness	3000Lux and below		
Vibration resistance	10~55Hz double amplitude1.5mm, XYZ three directions, 2 hours each		
Insulation resistance	20 M Ω or more(500VDC)		
Pressure resistance	500 VAC 50/60 Hz 1min		
Material	Front cover: PC; Case: Aluminum alloy; Cable: PUR		
Cable	Length:2m		
Model	MLD21-100A-485	MLD21-220A-485	MLD21-500A-485

Dimensions

Unit: mm

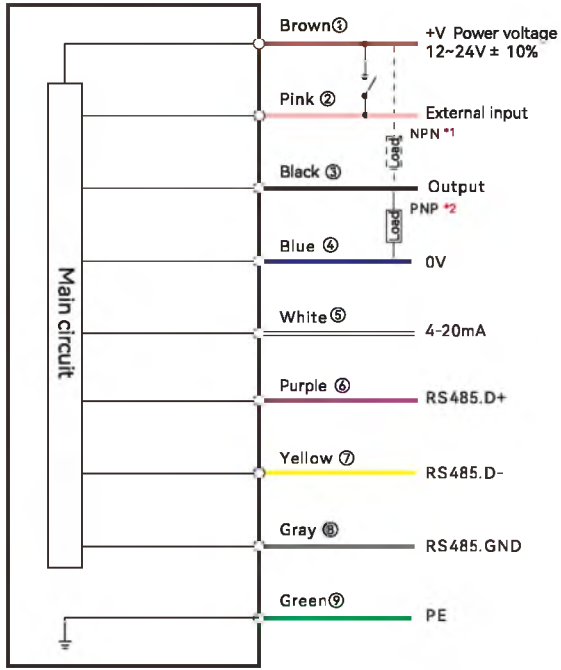


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Accessories

Guidance

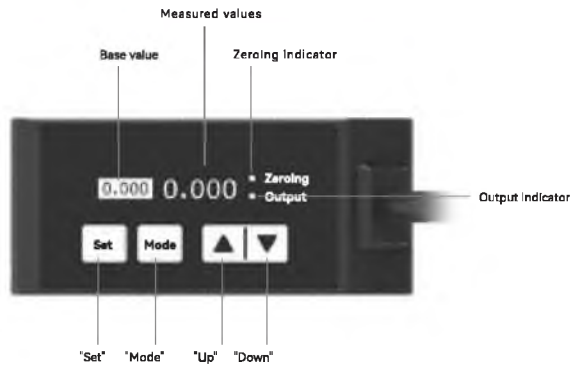
Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Circuit diagram



Remark:

- 1. NPN output connection : Connect Black with Brown (+V)
- 2. PNP output connection: Connect Black with Blue (0V)

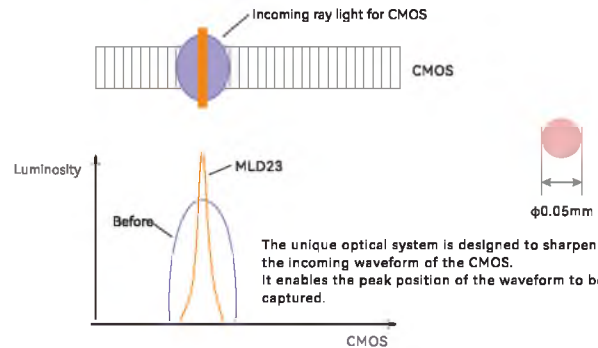


Mini Chinese Display

More Intuitive and Simple for Commissioning

Convergent harnesses for more accurate detection

Akusense has developed its own optical system to significantly converge and improve the beam to 50um;
An ultra-small spot size of 0.05mm formed, which detects objects with stability and accuracy.



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Displacement
- Triangulation
- Linear measurement
- Magnetic displacement
- LIDAR Scanner
- Color confocal

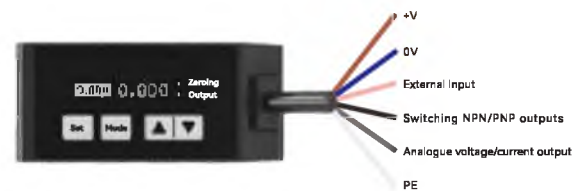


Micron-level linear accuracy

Linear accuracy reaches to 0.01mm for easy inspection with high accuracy

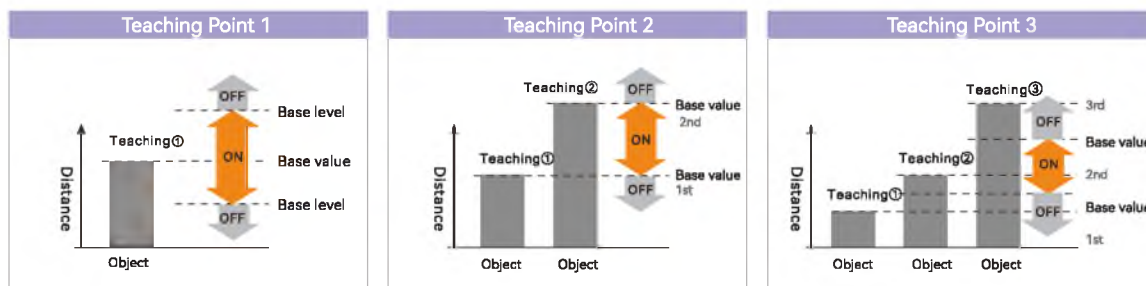
Convenient Installation

Integration of analogue voltage, analogue current and switching



Simple and flexible test patterns

Multiple teaching modes to make testing easier



Selection Guide

MLD23 Series

Faster, more stable, more accurate

Three test modes are for option:
standard, high speed and high accuracy

① Ultra-high speed computing and processing

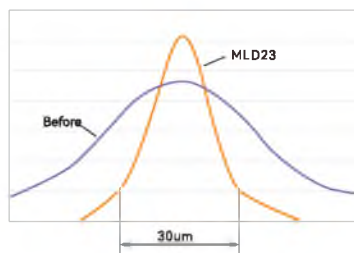
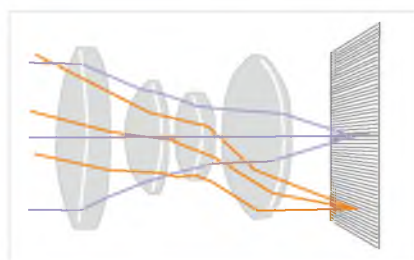
The application of Akusense's advanced IC and algorithm technology has greatly improved the sensor's detection rate and data accuracy, allowing for both high speed transmission and stable detection of measured values.



Max 1.5ms response time

Repeat accuracy up to 10μm

Min ±0.1% F.S linearity

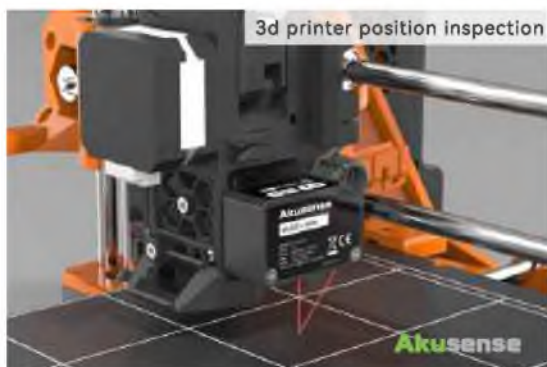


② Achieving greater precision

The new Akusense high-resolution lens design reduces pixel aberration and is assembled with precision.

The small spot of light at any angle can be imaged at the receiving section, resulting in a smaller waveform and higher measurement accuracy.

Application



Selection table



Model	MLD23-30N
Repeat accuracy	10μm
Linear accuracy	±0.1% F.S.
Base distance	30mm

Model	MLD23-100N
Repeat accuracy	70μm
Linear accuracy	±0.1% F.S.
Base distance	100mm

Model	MLD23-200N
Repeat accuracy	200μm
Linear accuracy	±0.2% F.S.
Base distance	200mm



Economical type

Appearance

Principle		Diffuse reflection	
Center of sensing distance		30mm	100mm200mm
Sensing distance		25~35mm	65~135mm120~280mm
Repeat accuracy		10 μ m	70 μ m200 μ m
Light source	Medium, wavelength	Red semiconductor laser, wavelength: 655nm	
	Max. output power	1mW	
	Laser class	Class2	
Standard		EMC	
Temperature drift		± 0.03%/°C F.S.	
Spot size		≈ Φ0.05mm	≈ Φ0.15mm≈ Φ0.3mm
Linearity		± 0.1 % F.S.± 0.2 % F.S.	
Supply voltage		12~24V DC ± 10%	
Current consumption		< 60 mA (24V DC), < 100mA (12V DC)	
Response time		1.5ms/5ms/50ms switchable	
Switch Output		NPN open–collector transistor, max. inflow current: 50mA; applied voltage: < 30V DC (between control output–0V), residual voltage: < 1.5V (inflow current < 50mA)	
Analog output	Voltage	Output range: 0V ~ 5V (when alarm: +5.2V), output impedance: 100 Ω	
	Current	Output range: 4mA ~ 20mA (when alarm: 0mA), load: less than 300 Ω	
External input		Input conditions Invalid: +8V ~ + V DC or open, valid: 0V ~ + 1.2V DC; input impedance: about 10k Ω	
Ambient performance	Protection Degree	IP66	
	Ambient Temperature	–10℃~+45℃, No freezing	
	Ambient humidity	35%~85%RH, No condensation	
	Ambient light	Incandescent lamp: Illumination below 3000Lux on the light–receiving surface	
Cable		5–core 2M cable	
Material		Aluminum, acrylic	
Model		MLD23-30N	MLD23-100NMLD23-200N

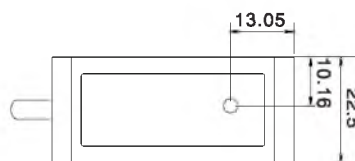
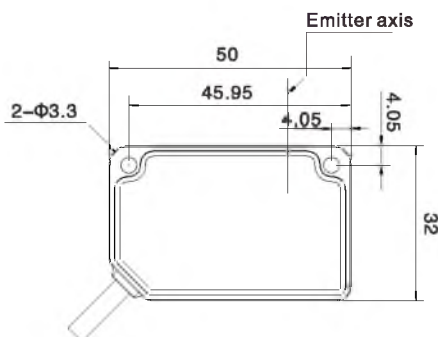
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

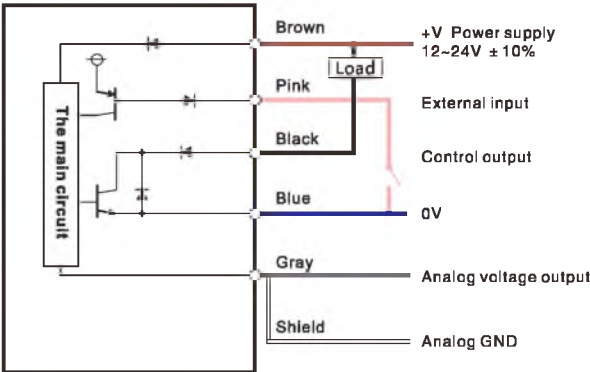
Dimensions

Unit: mm



Mini Digital Display

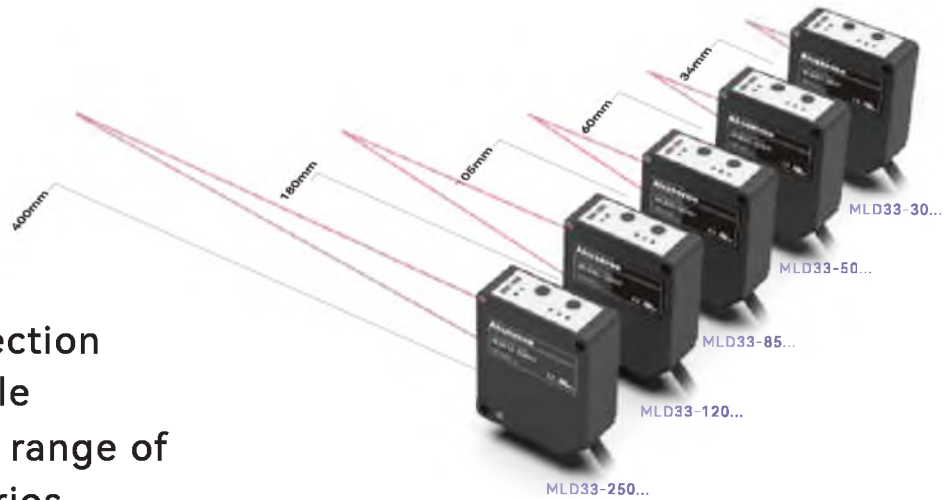
Circuit Diagram



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

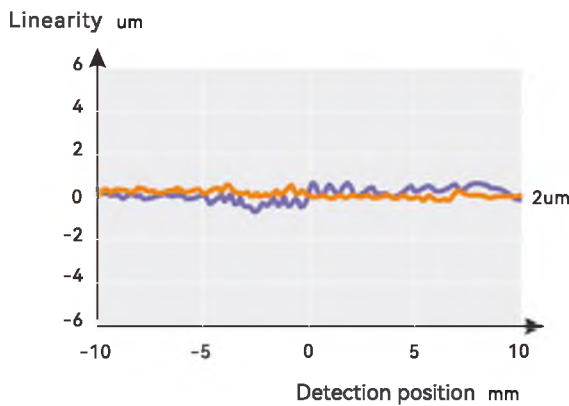
Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

26-400 mm detection distance available
Meeting a wider range of detection scenarios

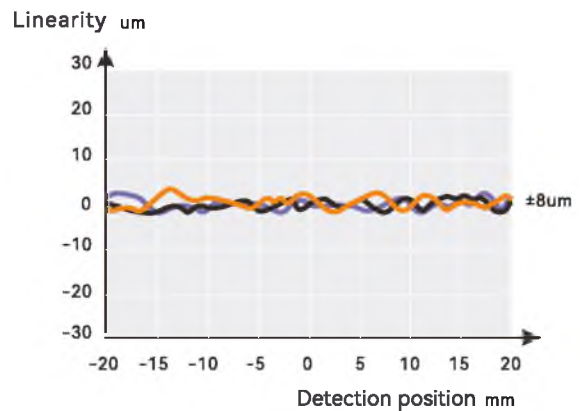


*The maximum detection distances for the respective models are marked in the diagram.

2um ultra-high repeatability

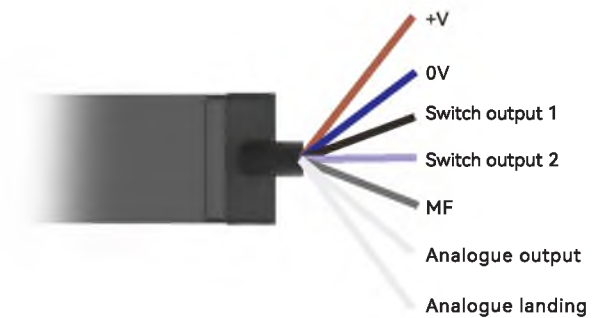
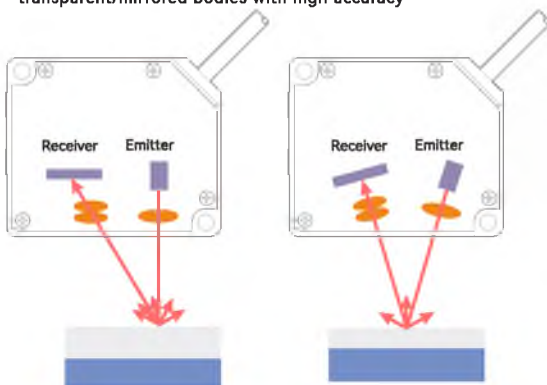


$\pm 8\mu\text{m}$ linear accuracy, high precision measurement



Suitable for the detection of highly reflective transparent objects

Positive reflection detection principle for transparent/mirrored bodies with high accuracy



Equipped with 2 switching outputs

Independent operation without connection to a controller

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

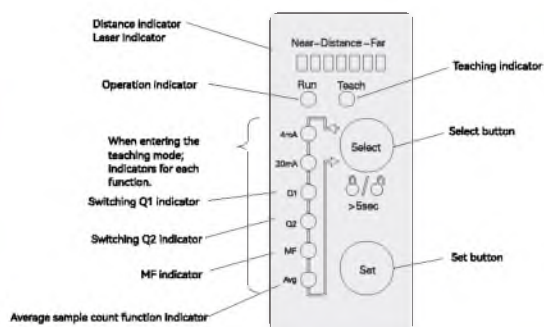
Guidance

- Displacement
- Triangulation**
- Linear measurement
- Magnetic displacement
- LIDAR Scanner
- Color confocal

Selection Guide

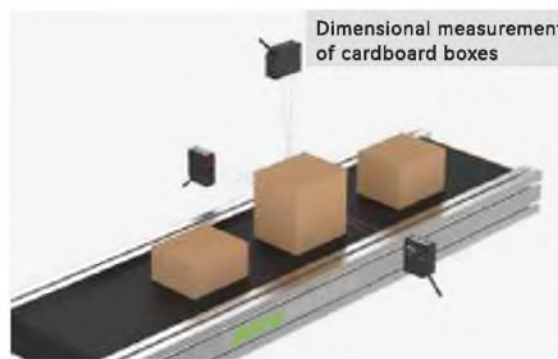
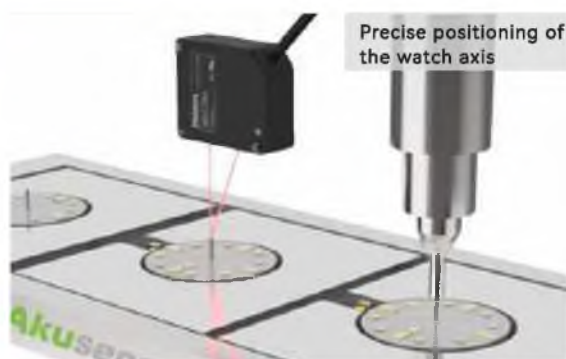
Control panel indicator status display for easy commissioning

7 distance indicators, in order from far to near



LED Display	Detection State	Indicator State
Near-Distance-Far [Red LED] [Green LED] [Red LED]	Beyond the detection range. Note) The indicator also shows this status when the object is within the detection range but the value of the light received is too high or too low	Red LEDs at the both ends on at the same time
[Red LED] [Green LED] [Green LED]	When the object is at the near end of the detection range	The near indicator on the left (red LED) on
[Green LED] [Green LED] [Red LED]	When the object is at the far end of the detection range	The far indicator at the right (red LED) on
[Green LED] [Green LED] [Green LED]	When the object is in a position close to the far end	Green LED next to the right end on
[Green LED] [Orange LED] [Green LED]	When the object is in the centre	Orange LED in the middle on

Application



Selection Table



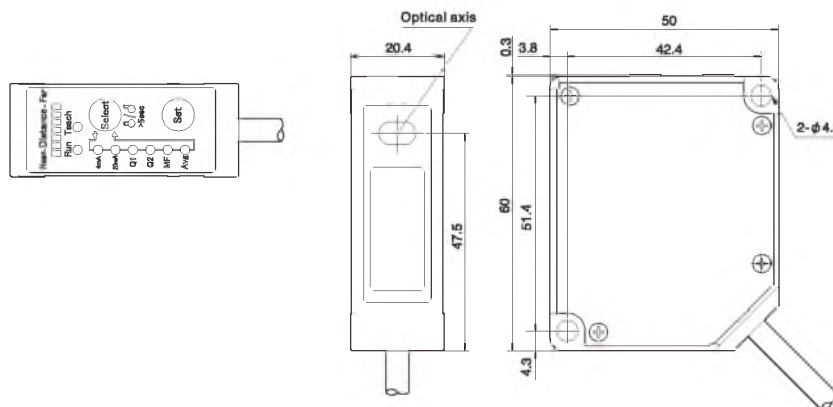
Model	MLD33-30...	MLD33-50...	MLD33-85...	MLD33-120...	MLD33-250...
Repeat accuracy	4μm(Fast mode) 2μm(Other mode)	8μm(Fast mode) 5μm(Other mode)	15μm(Fast mode) 10μm(Other mode)	45μm(Fast mode) 30μm(Other mode)	100μm(Fast mode) 75μm(Other mode)
Linear accuracy	±0.1%F.S	±0.1%F.S	±0.1%F.S	±0.1%F.S	±0.1%F.S
Base distance	30mm	50mm	85mm	120mm	250mm



Appearance

Sensing type		Diffuse reflection				
Center of sensing distance		30mm	50mm	85mm	120mm	250mm
Sensing distance		26~34mm	40~60mm	65~105mm	60~180mm	100~400mm
F.S		8mm	20mm	40mm	120mm	300mm
Light source	Medium Wavelength	Red laser diode wavelength: 655nm				
	Max. output	1mW max				
Laser class	IEC/JIS	Class2				
	FDA	Class2				
Spot size	Short range	0.15*0.15mm	0.6*1.2mm	0.9*1.5mm	1.2*1.8mm	1.5*2.5mm
	Center	0.1*0.1mm	0.5*1.0mm	0.75*1.25mm	1.0*1.5mm	1.75*3.5mm
	Long range	0.15*0.15mm	0.4*0.9mm	0.6*1.0mm	0.5*0.8mm	2.0*4.5mm
Linearity		±0.1% F.S				
Repeat accuracy	Fast mode	4 μm	8 μm	15 μm	45 μm	100 μm
	Others	2 μm	5 μm	10 μm	30 μm	75 μm
Temperature drift		±0.08%/°C F.S.				
Operating voltage		Switch/Current output: 12~24V DC(−5%, +10%), Voltage output: 18~24V DC(−5%, +10%)				
Current consumption		Switch/Voltage output: max.55mA(24V DC), Current output: max.85mA(24V DC)				
Output	Switch output	2 Channels output, NPN/PNP Open–connector output, ≤100/30V DC, Voltage drop≤1.8V				
	Analog output	Current output: 4~20mA; Voltage output: 0~10V				
Response time	Fast mode	max.5ms				
	Standard mode	max.12.5ms				
	High resolution mode	max.36.5ms				
Indicator	Sensitivity switch time	4ms max				
	Distance indicator	7 bar LEDs display				
	Output indicator	Q1 and Q2 LED lights up during output (orange)				
Ambient parameters	Degree of protection	IP67				
	Ambient temperature	−10°C~+45°C, No freezing				
	Ambient humidity	35%~85%RH, No condensation				
	Ambient brightness	Sunlight≤20000Lux, Incandescent lamp≤3000Lux				
	Vibration resistance	10~55Hz Double amplitude1.5mm, XYZ three directions, 2 hours each				
	Shock resistance	500m/s ² (Approx.50G), XYZ three directions 3 times each				
Housing material		Housing: PBT,Front cover: PMMA				
Cable		Switch output: φ5mm 5core 2m cable; Analog output: φ5mm 6core 2m cable; Rs422 CI: φ5mm 8core 2m cable; Max.extended length:10m				
Weight		Approx.65G(Not Including cable)				
2 switch output type (2CH)		MLD33-30N/P	MLD33-50N/P	MLD33-85N/P	MLD33-120N/P	MLD33-250N/P
2CH+Analog current 4~20mA		MLD33-30NA/PA	MLD33-50NA/PA	MLD33-85NA/PA	MLD33-120NA/PA	MLD33-250NA/PA
2CH+Analog voltage 0~10V		MLD33-30NV/PV	MLD33-50NV/PV	MLD33-85NV/PV	MLD33-120NV/PV	MLD33-250NV/PV
1CH+RS422 CI		MLD33-30N/P-422	MLD33-50N/P-422	MLD33-85N/P-422	MLD33-120N/P-422	MLD33-250N/P-422
Remarks		N:NPN output; P:PNP output				

Dimensions



Unit: mm

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
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Code Readers
Vibration
Temperature
Accessories

Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Built-in Controller

MLD33 Series

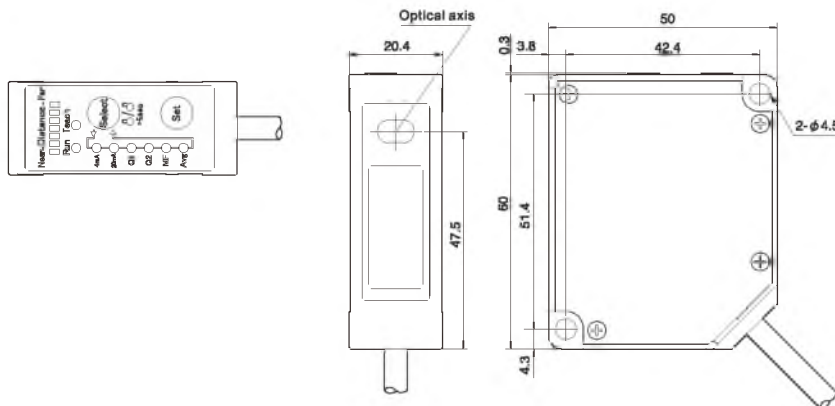


Appearance

Sensing type		Regular Reflection		
Center of sensing distance		26.3mm	47.3mm	82.9mm
Sensing distance		24.3~28.3mm	42.3~52.3mm	72.9~92.9mm
F.S		4mm	10mm	20mm
Light source	Medium Wavelength	Red laser diode wavelength: 655nm		
	Max. output	1mW max		
Laser class	IEC/JIS	Class 2		
	FDA	Class 2		
Spot size	Short range	0.15*0.15mm		
	Center	0.1*0.1mm		
	Long range	0.15*0.15mm		
Linearity		±0.2% F.S		
Repeat accuracy	Fast mode	.....		
	Others	1 μm	2.5 μm	5 μm
Temperature drift		±0.08% F.S./°C		
Supply voltage		Switch/Current output: 12~24V DC(−5%, +10%), Voltage output: 18~24V DC(−5%, +10%)		
Current consumption		Switch/Voltage output: max.55mA(24V DC), Current output: max.85mA(24V DC)		
Output	Switch output	Dual outputs, NPN/PNP Open–connector output, ≤100/30V DC, Voltage drop≤1.8V		
	Analog output	Current output: 4~20mA; Voltage output: 0~10V		
Response time	Fast mode	max.5ms		
	Standard mode	max.12.5ms		
	High resolution mode	max.36.5ms		
	Sensitivity switch time	4ms max		
Indicator	Distance indicator	Strip shaped LED display (7 units)		
	Output indicator	ON state: Orange Q1/Q2 indicator(Orange)on		
Ambient parameters	Degree of protection	IP67		
	Ambient temperature	−10℃~+45℃, No freezing		
	Ambient humidity	35%~85% RH, No condensation		
	Ambient brightness	Sunlight≤20000Lux, Incandescent lamp≤3000Lux		
	Vibration resistance	10~55Hz Double amplitude1.5mm, XYZ three directions, 2 hours each		
	Shock resistance	500m/s² (Approx.50G), XYZ three directions 3 times each		
Housing material		Housing: PBT,Front cover: PMMA		
Cable		Switch output: φ 5mm 5core 2m cable; Analog output: φ 5mm 6core 2m cable; Rs422 CI: φ 5mm 8core 2m cable; Max. extended length:10m Approx.65g (Including cable)		
Weight		Approx.65g (Including cable)		
2CH+Analog current 4~20mA		MLD33-L30NA/PA	MLD33-L50NA/PA	MLD33-L85NA/PA
2CH+Analog voltage 0~10V		MLD33-L30NV/PV	MLD33-L50NV/PV	MLD33-L85NV/PV
1CH+RS422 CI		MLD33-L30N/P-422	MLD33-L50N/P-422	MLD33-L85N/P-422
Remarks		N: NPN output P: PNP output		

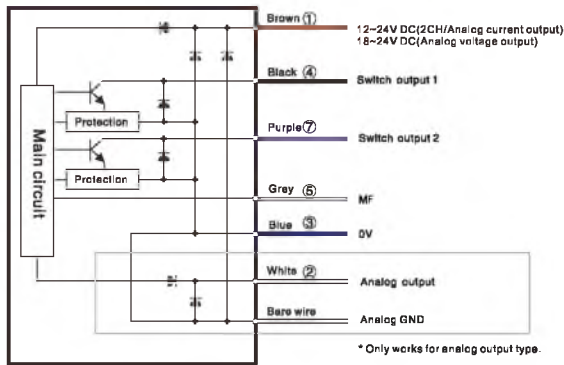
Dimensions

Unit: mm

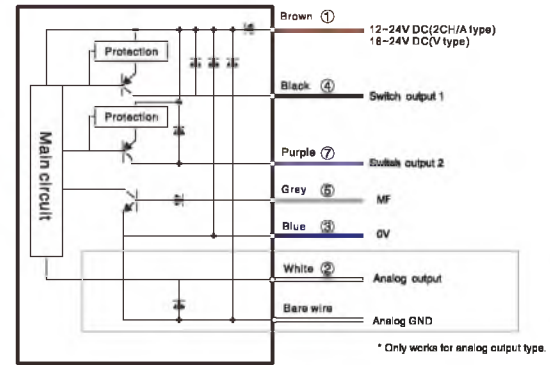


■ Switch output/Analog output

■ NPN

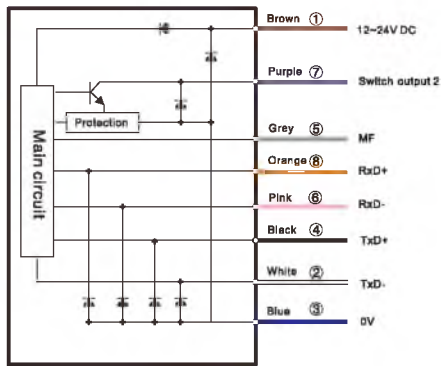


■ PNP

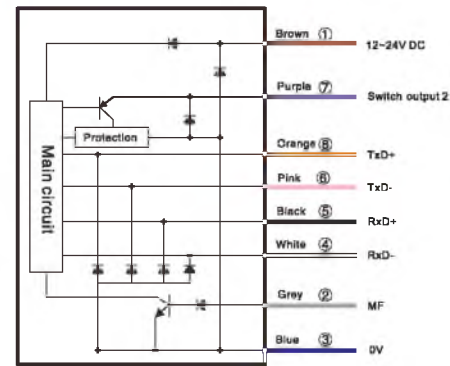


■ RS422

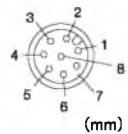
■ NPN



■ PNP



Connector pin line



Fiber Optic
Slot Sensors
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Laser
Proximity
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Ultrasonic
Vision
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Accessories

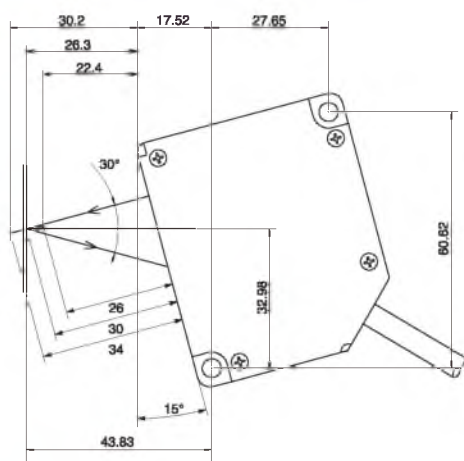
Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

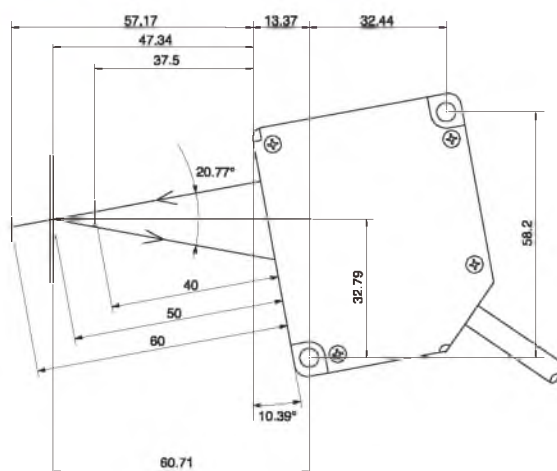
Built-in Controller

Mounting-Reflection Type(Unit:mm)

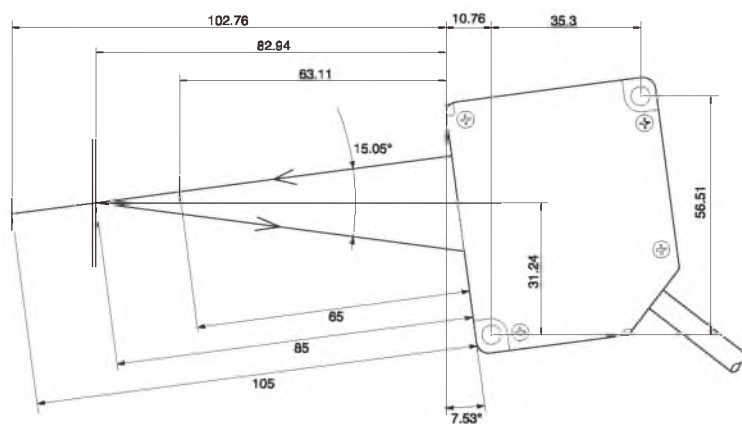
MLD33-L30



MLD33-L50



MLD33-L85



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

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Guidance

Displacement

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Linear measurement

Magnetic displacement

LIDAR Scanner

Color confocal



Appearance

Sensing type	Diffuse reflection					
Sensing distance	20~30mm	20~45mm	30~80mm	55~155mm	65~315mm	105~605mm
F.S	10mm	25mm	50mm	100mm	250mm	500mm
Light source	Red semiconductor laser wavelength: 660nm, blue semiconductor laser wavelength: 405nm					
Medium, Wave length Max.	≤1mW					
output power	Class2					
IEC/JIS						
Linearity	±0.05%					±0.1%
Repeat accuracy	0.01%					0.02%
Sampling period	9400Hz					
Temperature drift	0.02%F.S./°C					
Output						
Analog current	Output 4 ~ 20mA, allowable load resistance 500 Ω					
Analog voltage	0~10v output, output resistance 100 Ω					
Digital output	RS232orRS485					
Operating voltage	9~36V					
Power consumption	2W					
Synchronous input	2.4~24V					
Logic output	Programming function, NPN:100mA Max, 40V Max					
Degree of protection	IP67					
Ambient temperature	-10°C~+60°C, No freezing					
Ambient humidity	5%~95%RH, No condensation					
Ambient illuminance	10000Lux					
Vibration resistance	20g/10~1000Hz, 6 hours in each direction of XYZ					
Shock resistance	30g/6ms					
Material	Housing: aluminum					
Weight	~40g					
485 Voltage output	MLD17-10V-485	MLD17-25V-485	MLD17-50V-485	MLD17-100V-485	MLD17-250V-485	MLD17-500V-485
232 Voltage output	MLD17-10V-232	MLD17-25V-232	MLD17-50V-232	MLD17-100V-232	MLD17-250V-232	MLD17-500V-232
485 Current output	MLD17-10I-485	MLD17-25I-485	MLD17-50I-485	MLD17-100I-485	MLD17-250I-485	MLD17-500I-485
232 Current output	MLD17-10I-232	MLD17-25I-232	MLD17-50I-232	MLD17-100I-232	MLD17-250I-232	MLD17-500I-232

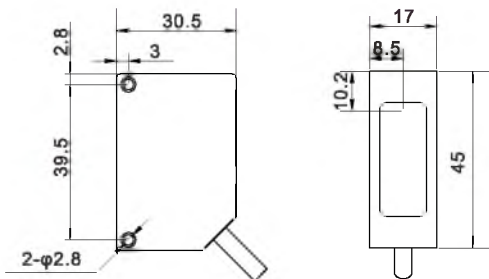
Fiber Optic
Slot Sensors
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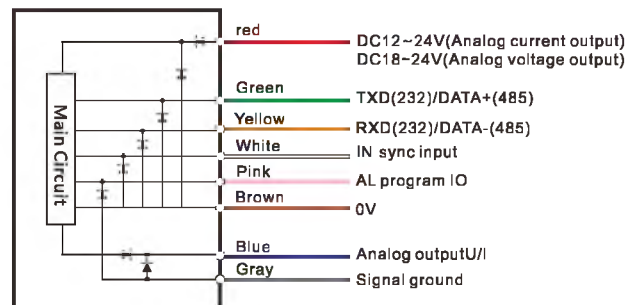
Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Dimensions

Unit: mm



Circuit diagram



Built-in Controller

MLD27 Series

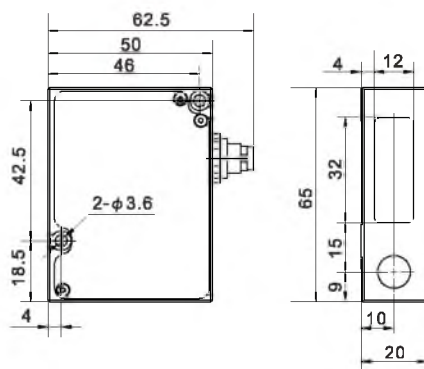


Appearance

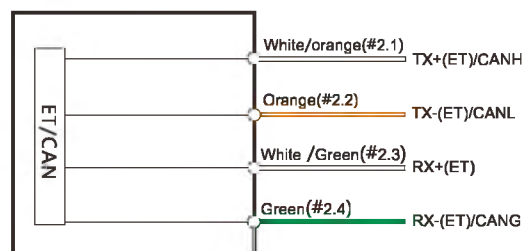
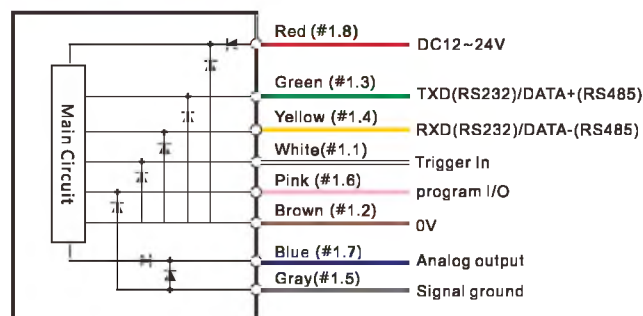
Sensing type		Diffuse reflection					
Sensing distance		15~20mm	30~45mm	55~85mm	90~190mm	125~625mm	245~1245mm
F.S		5mm	15mm	30mm	100mm	500mm	1000mm
Light source	Medium. Wave length	Red semiconductor laser wavelength: 660nm, blue semiconductor laser wavelength: 405nm					
	Max. output power						
IEC/JIS		class2 (Low power) , class3R, class3B (High power)					
Linearity		± 0.05%					± 0.1%
Repeat accuracy		0.01%					0.02%
Sampling period		9400Hz					
Temperature drift		0.02% F.S./℃					
Output	Analog current	Output 4 ~ 20mA, allowable load resistance 500 Ω					
	Analog voltage	0~10v output, output resistance 100 Ω					
Digital output		RS232orRS485					
Operating voltage		9~36V					
Power consumption		1.5~2W					
Synchronous input		2.4~24V					
Logic output		Programming function,NPN:100mA Max,40V Max					
Ambient parameters	Degree of protection	IP67					
	Ambient temperature	-10℃~-+60℃, No freezing					
	Ambient humidity	5%~95% RH, No condensation					
	Ambient illuminance	10000Lux (Low power) , 30000lux, >30000lux (High power)					
	Vibration resistance	20g/10~1000Hz, 6 hours in each direction of XYZ					
	Shock resistance	30g/6ms					
	Material	Housing: aluminum					
Weight		≈100g					
485 Voltage output		MLD27-5V-485	MLD27-15V-485	MLD27-30V-485	MLD27-100V-485	MLD27-500V-485	MLD27-1000V-485
232 Voltage output		MLD27-5V-232	MLD27-15V-232	MLD27-30V-232	MLD27-100V-232	MLD27-500V-232	MLD27-1000V-232
485 Current output		MLD27-5I-485	MLD27-15I-485	MLD27-30I-485	MLD27-100I-485	MLD27-500I-485	MLD27-1000I-485
232 Current output		MLD27-5I-232	MLD27-15I-232	MLD27-30I-232	MLD27-100I-232	MLD27-500I-232	MLD27-1000I-232

Dimensions

Unit: mm



Circuit diagram



connector #1



connector #2(optional)





Appearance

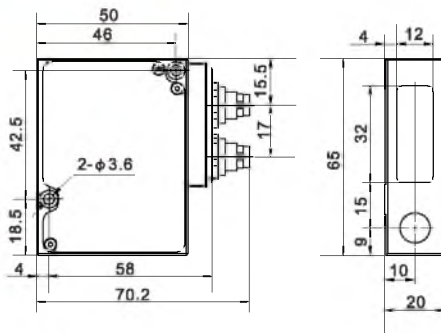
Sensing type		Diffuse reflection					
Sensing distance		15~20mm	30~45mm	55~85mm	65~115mm	90~190mm	80~330mm
F.S		5mm	15mm	30mm	50mm	100mm	250mm
Light source	Medium. Wave length	Red semiconductor laser wavelength (default) : 660nm, blue semiconductor laser wavelength: 405nm					
	Max. output power	≤4.8mW			≤20mW		
IEC/JIS		3R			3B		
Linearity		± 0.1 (60 kHz); ± 0.2 (120 kHz); ± 0.3 (180 kHz)					
Repeat accuracy		0.01 (60 kHz); 0.02 (120 kHz); 0.03 (180 kHz)					
Sampling period		60 or 120 or 180 kHz (default 60K)					
Temperature drift		0.02 % F.S./℃					
Output		Output 0 ~ 10V, output impedance 100 Ω					
Digital output		Parameters: RS232 or 485, data transmission: Ethernet (UDP)					
Operating voltage		9~36V					
Power consumption		4.8W					
Synchronous input		2.4~5V(CMOS, TTL)					
Logic output		Programming function, NPN:100mA Max,40V Max					
Ambient parameters	Degree of protection	IP67					
	Ambient temperature	-10℃~+60℃, No freezing					
	Ambient humidity	5%~95% RH, No condensation					
	Ambient illuminance	30000Lux					
	Vibration resistance	20g/10~1000Hz, 6 hours in each direction of XYZ					
	Shock resistance	30g/6ms					
Material		Housing: aluminum					
Weight		110g					
485 output		MLD27-H5V-485	MLD27-H15V-485	MLD27-H30V-485	MLD27-H50V-485	MLD27-H100V-485	MLD27-H250V-485
232 output		MLD27-H5V-232	MLD27-H15V-232	MLD27-H30V-232	MLD27-H50V-232	MLD27-H100V-232	MLD27-H250V-232

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

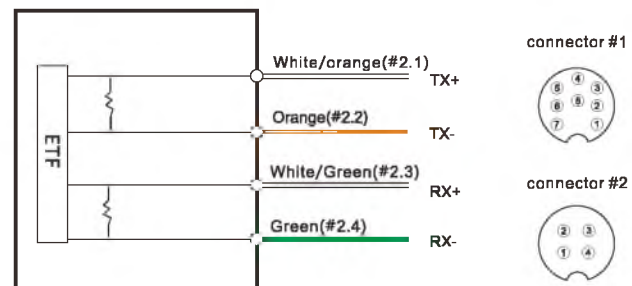
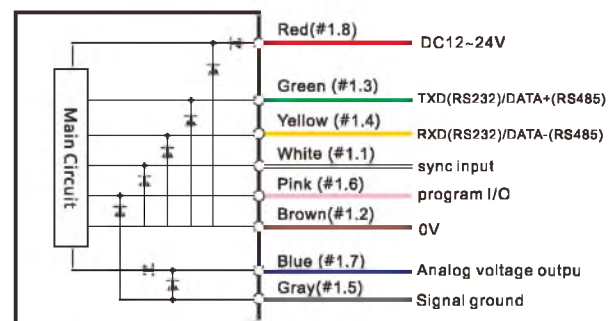
Guidance

Dimensions

Unit: mm



Circuit diagram



Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Linear Measurement Type

ESX series

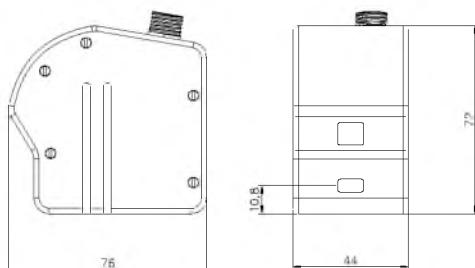


Appearance

Sensing range	Reference distance	35mm	125mm	170mm	340mm
	MR(Range)	10mm	50mm	100mm	250mm
	SMR(Gauge)	25mm	75mm	70mm	90mm
	Xsmr(Near)	8mm	30mm	48mm	65mm
	xsmr(Far)	11mm	41mm	82mm	180mm
Operating voltage		9~30V			
Power consumption		6W (without built-in heater)			
Communication		Ethernet/1000Mbps			
Synchronous input		RS422, 3 channel			
Output		RS422, 1 channel			
Laser source		658nm or405nm or450nm or808nm			
Laser class		class 2M (IEC)			
Linearity	Z axis	± 0.05% F.S. (standard mode); ± 0.1% F.S. (DS mode)			
	X axis	± 0.2% F.S			
Resolution	Z axis	0.01% F.S. (standard mode), 0.02% F.S. (DS mode)			
	X axis	648 or 1296 points (programmable value)			
Standard sampling rate (full working range)		484 profiles / sec (standard mode); 938 profiles / sec (DS mode)			
Maximum sampling rate (ROI mode)		5096 profiles / sec; 6800 profiles / sec (DS mode)			
Temperature drift		0.02%F.S/℃			
Enclosure rating		IP67			
Ambient luminance		Incandescent or fluorescent; Max. 5000 lux			
Ambient temperature		-20℃~+40℃			
Relative humidity		5~95%			
Shock resistance		30g/6ms			
Vibration resistance		20g/10~1000Hz 6 hours in XYZ direction			
Material		Aluminum/Glass			
Storage temperature		-20℃~+70℃			
Weight		550g	600g		
Model No.		ESX-G10	ESX-G50	ESX-G100	ESX-G250

Dimensions

Unit: mm



connector #1



connector #2



Circuit diagram

connector #1

#	Assignment, 100baseTX	Assignment, 1000baseT
1		D4+
2		D3-
3		D3+
4	RX+	D2-
5	RX+	D2+
6	TX+	D1-
7	TX+	D1+
8		D4-

connector #2

#	Assignment	Note
1	OUT1-	RS422
2	IN3-	RS422
3	IN3+	RS422
4	IN2-	RS422
5	IN2+	RS422
6	NEXT_LAS_OFF	Laser OFF
7	IN2+	RS422
8	IN2-	RS422
9	OUT1+	RS422
10	V+	+9~30V, 650mA max
11	GND	Grounding
12	0V	0V power supply (-)



Appearance

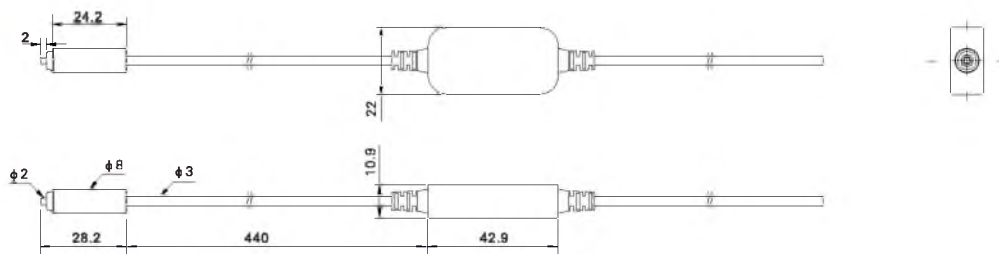
Detection principle	Differential transformer	
Measuring range	1mm	
Resolution	0.2 μm	
Repeat accuracy	5 μm	
Measuring force	Downward mounting	1.0N
	Horizontal mounting	0.9N
	Upward mounting	0.8N
Sampling period	100ms	
Mechanical response	40Hz	
Operating voltage	12~24V	
Indicator light	Monochrome LED	
Degree of protection	IP67	
Ambient temperature	(-10℃~+55℃)	
Ambient humidity	10~85%RH, No freezing	
Vibration resistance	10~55HZ Double amplitude 1.5mm,XYZ three directions,2 hour each	
Shock resistance	1000m/s²	
Material	SUS304. Cable between sensor and repeater:PVC,Relay amplifier:PPSU	
Communication protocol	Modbus RTU	
Weight	≈30g	
Model No.	MR-D28-485	

※ Values display when ambient temperature is 20℃

※ Customization is available at customers' requests

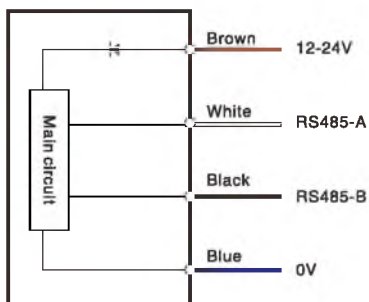
Dimensions

Unit: mm



Circuit diagram

■ 485



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Magnetic Displacement

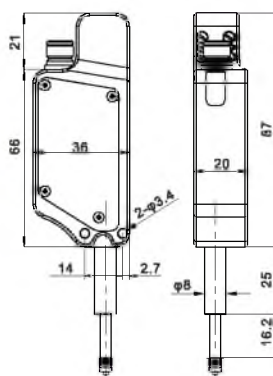
MR-DT Series

Appearance			
Detection principle	Scale pulse system (absolute value type)		
Measuring range	15mm	35mm	55mm
Resolution	0.1 μ m	0.5 μ m	1.0 μ m
Repeat accuracy	$\pm 2 \mu$ m	$\pm 2 \mu$ m	$\pm 3 \mu$ m
Operating Voltage	12V(No analog output) 15V(Analog output)		
Indicator light	2-color LED (red, green)		
Degree of protection	IP50		
Ambient humidity	(-10°C~+50°C)		
Power consumption	0.75W		
Logic output	NPN 100mA Max; 40V Max		
Analog output	4~20mA(Loaded by 50 Ω)/0~10V		
Material	Aluminum		
Communication Interface	Rs485 and SSI or RS232		
Weight	≈ 110 g	≈ 150 g	≈ 180 g
Model No.	12V Voltage Type	15V Voltage Type	
	MR-DT-L15- 485: RS485&SSI Output 232: RS232 Output MR-DT-H15- A: Current output V: Voltage output 485: RS485&SSI Output 232: RS232 Output	MR-DT-L35- 485: RS485&SSI Output 232: RS232 Output MR-DT-H35- A: Current output V: Voltage output 485: RS485&SSI Output 232: RS232 Output	MR-DT-L55- 485: RS485&SSI Output 232: RS232 Output MR-DT-H55- A: Current output V: Voltage output 485: RS485&SSI Output 232: RS232 Output

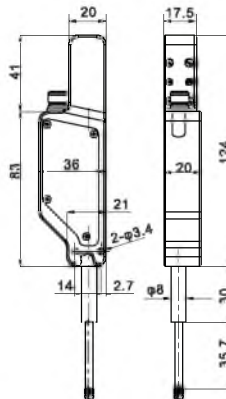
Dimensions

Unit: mm

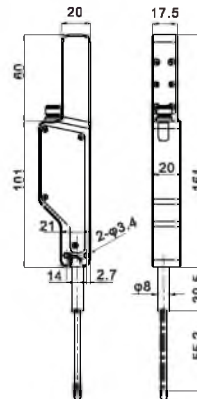
MR-DT-L/H15



MR-DT-L/H35

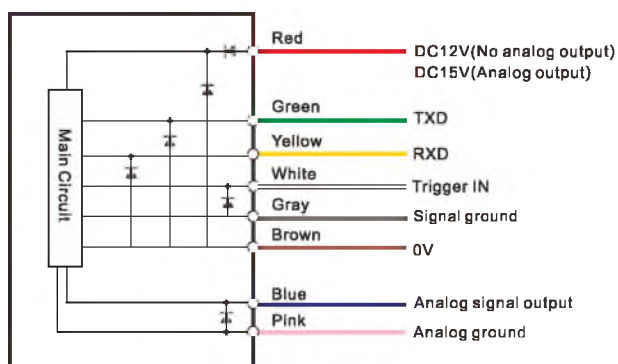


MR-DT-L/H55

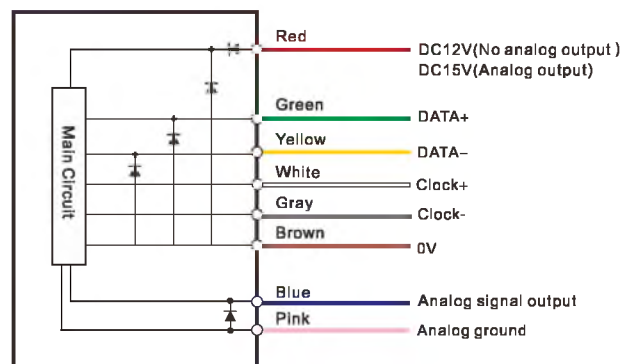


Circuit diagram

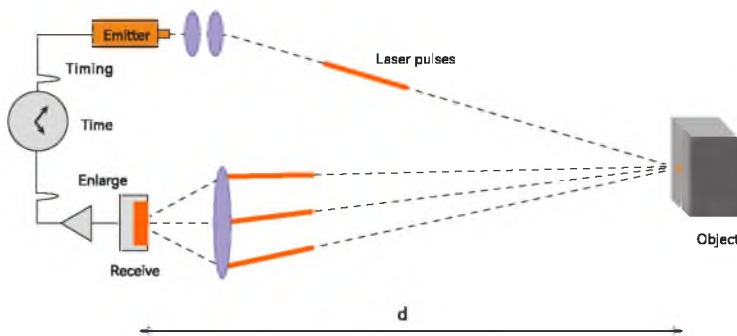
RS232



RS485-SSI



Compact size
Easy to be applied in
various working
environments



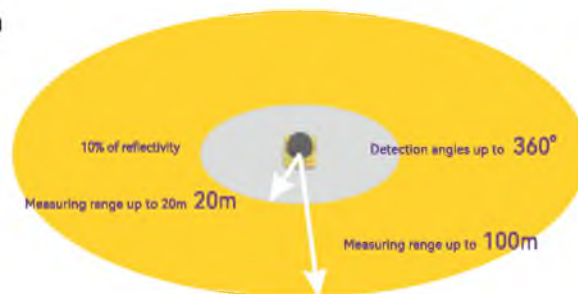
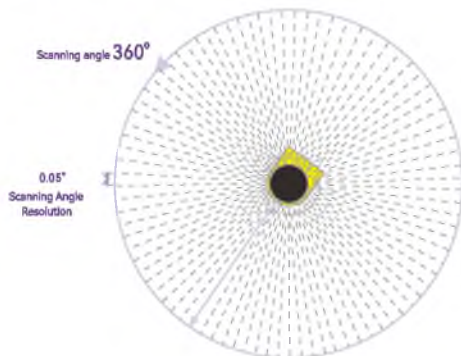
Superior industry TOF radar technology

Highly integrated circuitry, multiple echo filtering, specular reflection filtering, rain and fog filtering algorithm, PID control algorithm, dynamic echo energy filtering method

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Millimetre distance data resolution and RSSI function

Navigation and mapping tasks can be fulfilled



Flexibility to match various scenarios

0-360° scanning range, up to 100m
ultra-long distance

Guidance

- Displacement**
- Triangulation
- Linear measurement
- Magnetic displacement
- LIDAR Scanner**
- Color confocal

Good resistance to interference

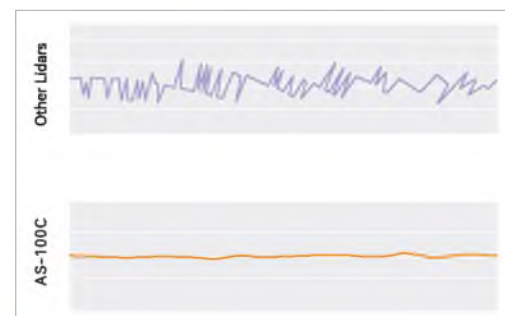
Resistance to glare,
rain, fog and dirt

Highly adaptable to the environment
Protected from glare | splashes | dust



Measurement of Data Quality

Comparison for the measurement of data quality between AS-100C and other LIDARs

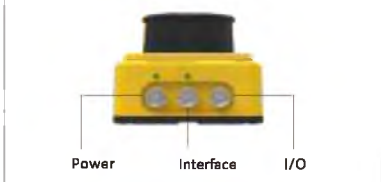


Selection Guide

AS Series

Fully functional structure designed for simple installation and easy commissioning

Intelligent: fully physical interface



Mounting brackets: for easier installation



Status LED: all-round visibility of status



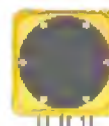
Ethernet :
For central configuration,
diagnostics and data output



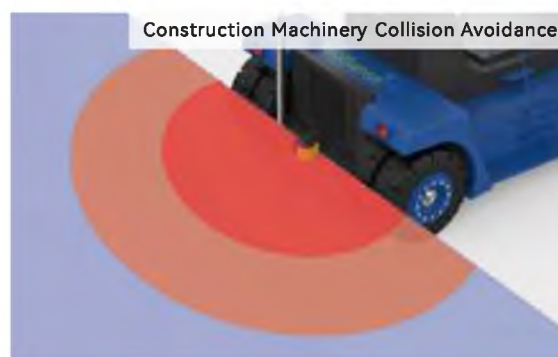
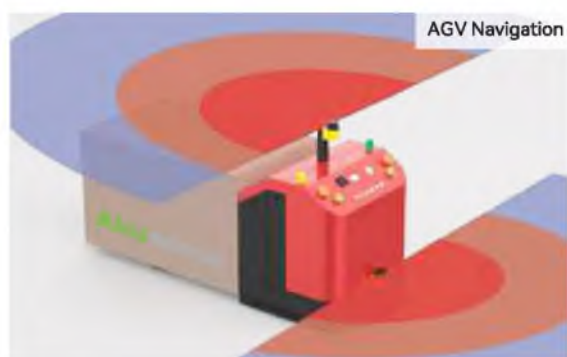
Safe local I/O :
Flexible integration into
different controllers



Precise construction :
Excellent anti-vibration



Application



Selection Table

	AS-11C	AS-21C	AS-41C	AS-100C
				
0	10% reflectance Range:8m	10% reflectance Range:15m	10% reflectance Range:30m	10% reflectance Range:20m
20	Sensing range: 0.1~20m	Sensing range: 0.1~20m	Sensing range: 0.1~40m	Sensing range: 0.2~100m
40				
60				
80				
100				
Model	AS-11C	AS-21C	AS-41C	AS-100C
Scanning angle	360°	300°	300°	360°
Resolution	0.5°	0.5°(System defaults)/0.25°/0.125°	0.5°(System defaults)/0.25°/0.125°	0.05°/0.1°
Scanning frequency	12.5Hz	25Hz(System defaults)/12.5Hz/6.25Hz	25Hz(System defaults)/12.5Hz/6.25Hz	10Hz/20Hz



Appearance			
Light source		Infrared laser(905nm)	
Laser safety level		Class 1 (GB7247.1-2012, Eye-safe IEC)	
Laser spot light diameter		8mm	
Laser spot light scan angle		12.5 mrad	
Scanning angle range		300°	
Scanning frequency		25Hz(system default)/12.5Hz/6.25Hz	
Scanning angle resolution		0.5° (system default)/0.25° /0.125°	
Sensing range		0.1m ~ 20m	0.1m ~40m
10% reflectivity range		15m	30m
Outdoor performance		Anti-dusty, Anti-sunlight	
Rain fog and smoke penetration		Support	
Measurement error	System error (typical)	± 5cm	± 5cm (1m~20m) ; ± 10cm (20m~40m)
	Statistical error (1σ)	± 2cm	± 2cm (1m~20m) ; ± 4cm (20m~40m)
Built-in application Regional monitoring		Monitoring mode: Point number monitoring / target width monitoring / contour monitoring	
		Monitor signal level: Attention / warning / alarm	
		Number of regional groups: 16 groups, support self-learning background exclusion	
		Concurrent work area group number: 16 (max)	
		Guide the network camera to monitor the target video positioning and tracking	
Self-test equipment		Contents: Transparent cover dirt / block / high temperature / low temperature Output mode: Indicator + TCP packets	
Ethernet		Rate: 10/100 Mbps; Network protocol: TCP/IP; Function: Device configuration / measurement data output / monitor signal output	
I/O Input		Quantity: 4; Type: Switching level input; High level range: 10V~28V DC; Low level range: 0V~5V DC Preset function: Monitor area selection (0x0 ~ 0xF); Regional monitoring disarm / forced alarm, active level: high level	
I/O Output		Quantity: 4; Type: PNP switch output ; Output voltage: Supply voltage; Power on: OFF; Device ready (OUT), active state: pass (High level), zone detection signal output (OUT2/OUT3/OUT4) active state: configurable	
Indicator light		Quantity: 2; Definition: ERR (Device alarm: Fault/Abnormal ,Transparent cover dirty / block, high and low temperature, Dense fog); HTR (operation status indication: detection signal / self-learning)	
Front panel button		Quantity: 1; Definition: Shielded monitor signal output / start background self-learning / restart device	
Operating voltage		10V~ 28V DC	
Power		5W(measuring), 3.6W@DC 12V/14.4W@DC 24V(heating)	
Outer covering protection rank(IP)		IP65(GB4208~2008)	
Insulation resistance		1 M Ω (GB16796~2009.5.4.4)	
Dielectric strength		0.5KV(GB16796~2009.5.4.3)	
Weight		0.6kg	
Dimension(L×W×H)		83.5 × 85 × 104.9(mm)	
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2~2006, class 3)	
	Fast bursts	1KV (GB/T17626.4~2008, class 2)	
	Electromagnetic field radiation immunity	GB/T17626.3~2006, class 2	
Surge immunity		GB / T17626.5~2008 Power interface: 1.2 / 50 μs, 2KV / 1KA (Class 3) Ethernet interface: 10 / 700 μs, 1KV / 25A (Class 2); I / O interface: 1.5 / 50 μs, 0.5KV / 0.25KA (Class 1)	
Impact		GB/T 2423.5	
Single impact		15g, 11ms	
Continuous impact		10g, 16ms	
Vibration		GB/T 2423.10	
Frequency Range		10Hz~150Hz	
Amplitude		5g	
Humidity		93%, +40℃, 2h (GB/T 2423.3)	
Operating temperature range		-25℃~+50℃	
Storage temperature range		-30℃~+70℃	
Ambient illumination range		≤70,000lux	
Model NO.		AS-21C	AS-41C

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
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Ultrasonic
Vision
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Vibration
Temperature
Accessories

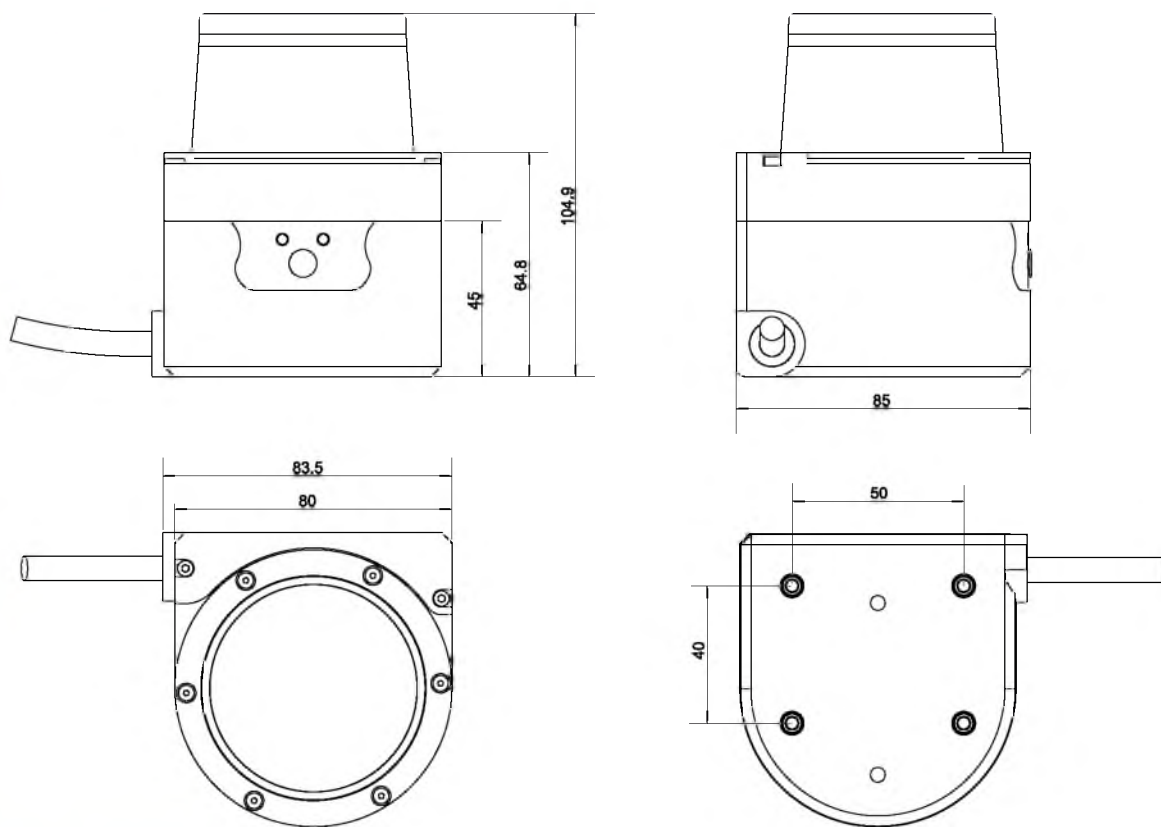
Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LiDAR Scanner
Color confocal

LiDAR Scanner

Dimensions

Unit:mm



Power interface

I/O	Power	Network port	Socket	Type	Explanation
			DC002	Power	Female 2 pin
			Ethernet	RJ45 socket	4 pin
			I/O	Cable	10 pin

Accessories

			Mounting screws, gasket and easy installation tool
Composite Bracket: AS-21C-AT 1 Piece	Power Cable: AS-21C-EC 1 Strip	Crystal Protective Cover: AS-21C-WJ 1 Piece	Accessories: M4x8 1 Set

	Name	Instructions
	 ERR	Work fault indicator ♦ Startup state: Light on(About 27s)Always off: No fault ♦ Always on: Internal fault ♦ Always on: Internal fault, Abnormal measurement ♦ Long flicker (0.25Hz) : High /low temperature alarm ♦ Short flicker(1Hz) : Transmissive cover is dirty/occluded ¹
	 HTR	Work status indicator ♦ Startup state: Off ♦ Off: The device does not start measuring/ready to restart ♦ Always on: Equipment normal measurement ♦ Flash1 (0.5Hz) : Monitor Signal output ♦ Flash2 (1Hz) : Self-learning ² ♦ Flash3 (2.5Hz) : Ready to start self-learning ²
	 SLR	Operation button ♦ short press (1s~5s)Start background self-learning ♦ Long press(≥ 6s) : Delete background

1:Including being blocked by dense fog or the detection area being blocked.

2:Including "background self-learning" and "normal goal self-learning"(customization function).

Measuring coordinate system/scan range/range

AS-21C



AS-41C



Fiber Optic
Slot Sensors
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Temperature
Accessories

Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LiDAR Scanner
Color confocal

LiDAR Scanner

MINI LiDAR Scanner

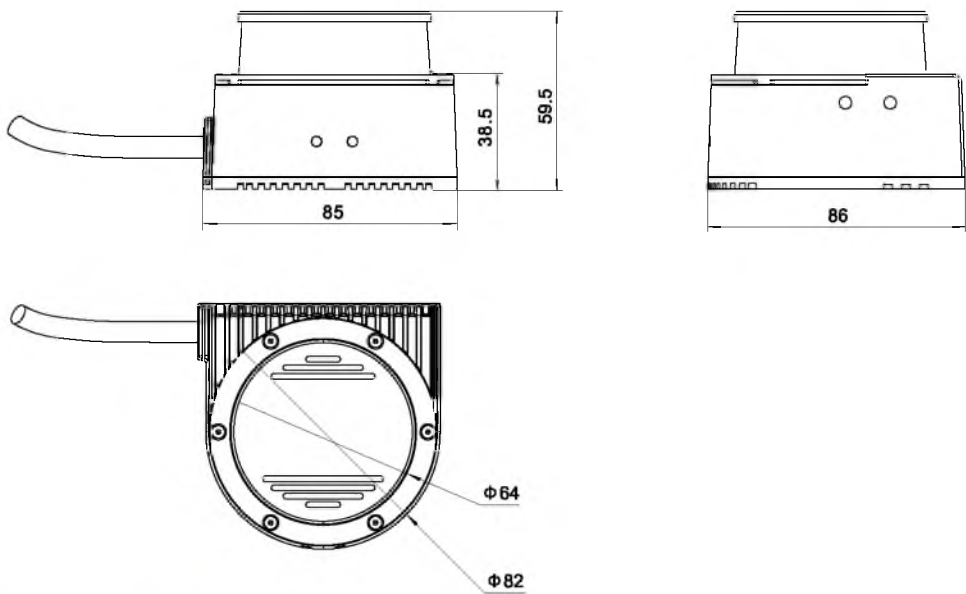
TOF principle


Appearance	
Light source	Infrared laser(905nm)
Laser safety level	Class1(GB7247.1-2012, Eye-safe IEC)
Laser spot light diameter	10mm
Laser spot light scan angle	10.0(H) 2.0(V)mrad
Scanning angle range	360°
Scanning frequency	12.5Hz
Scanning angle resolution	0.5°
Sensing range	0.1m ~20m
10% reflectivity range	15m
Outdoor performance	Indoor, anti - light, anti - dirt
Rain fog and smoke penetration	Support
Measurement error	System error (typical) ± 5cm (1m~15m) Statistical error (1σ) ± 2cm (1m~15m)
Monitoring mode	point number monitoring / target width monitoring / contour monitoring
Monitoring signal type	attention / warning / alarm
Number of regional groups	16 groups
Number of concurrent work area groups	16 (max)
Can detect targets of any shape, support normal target self-learning function	
Self-test equipment	Contents: Dirty cover / blocking / high temperature / low temperature; output method: indicator + TCP message
Ethernet	Rate: 10/100 Mbps; network protocol: TCP / IP; function: device configuration / measurement data output / monitor signal output
I/O Input	Quantity: 4; Type: Level input; High level range: 10V~28V DC; Low level range: 0V~5V DC; Preset function: monitoring area selection (0x0 ~ 0xF); area monitoring disarm / force alarm, effective level: high level;
I/O Output	Quantity: 4; Type: PNP switch output; Output voltage: power supply voltage; Power-on state: off; Device ready (OUT), valid state: on, zone detection signal output (OUT2 / OUT3 / OUT4) valid state: configurable
Indicator light	Quantity: 2; Definition: ERR (equipment alarm: failure / abnormality, dirty / transparent cover, high and low temperature, dense fog); HTR (operation status indication: detection signal / self-learning)
Operating voltage	12V~28V DC
Power	4.5W@DC 24V
Outer covering protection rank(IP)	IP65(GB4208-2008)
Insulation resistance	1M Ω (GB16796-2009.5.4.4)
Dielectric strength	0.5KV(GB16796-2009.5.4.3)
Weight	0.5kg
Dimension(L×W×H)	86.0 × 85.0 × 59.5(mm)
Electromagnetic compatibility (EMC)	Electrostatic discharge 6KV (GB/T17626.2-2006, Class 3) Fast bursts 1KV (GB/T17626.4-2008, Class 2) Electromagnetic field radiation immunity GB/T17626.3-2006, Class 2
Surge immunity	GB/T17626.5-2008; Power interface: 1.2/50 μs, 2KV/1KA (Class 3) ; Ethernet interface: 10/700 μs, 1KV/25A (Class 2) ; I/O interface: 1.5/50 μs, 0.5KV/0.25KA (Class 1) ;
Impact	GB/T 2423.5
Single impact	15g, 11ms
Continuous impact	10g, 16ms
Vibration	GB/T 2423.10
Frequency Range	10Hz~150Hz
Amplitude	5g
Humidity	93% , +40℃, 2h (GB/T 2423.3)
Operating temperature range	-10℃~+45℃
Storage temperature range	-30℃~+70℃
Ambient illumination range	≤70,000lux
Model NO.	AS-11C

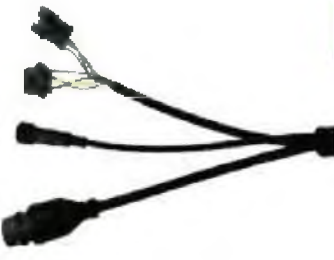
Unit:mm

Dimensions

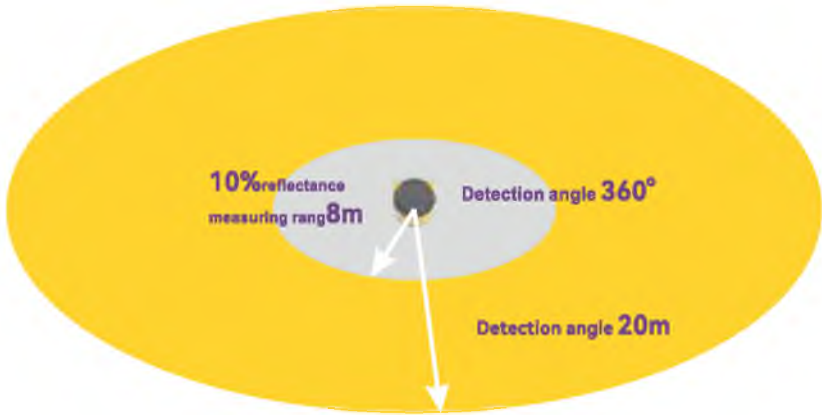
Displacement



Power interface

 I/O Power Network port	Socket	Type	Explanation
	DC002	Power	Female 2 pin
	Ethernet	RJ45 socket	4 pin
	I/O	Cable	9 pin

Accessories



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Displacement

Triangulation

Linear measurement

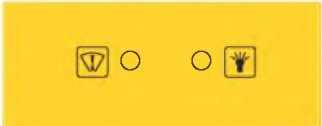
Magnetic displacement

LiDAR Scanner

Color confocal

LiDAR Scanner

Indicators and Operation Buttons

	Name	Instructions
	 ERR	Work fault indicator ◆ Startup status: bright (About 27s) ◆ Off: No fault ◆ Steady light: Internal fault ◆ Long flicker (0.5 Hz): High temperature / low temperature alarm ◆ Short flicker (1Hz): Transmissive cover is dirty/occluded¹
	 HTR	Work status indicator ◆ Startup state: off ◆ Off: The device does not start measurement/ready to reboot ◆ Bright: Normal measurement of equipment ◆ Flashing 1 (0.5Hz): Monitor signal output ◆ Flashing 2 (1Hz): Self-learning² ◆ Flashing 3 (2.5Hz) : Ready for self-learning²

1: Including being blocked by dense fog or the detection area being blocked.

2: Including "background self-learning" and "normal goal self-learning"(customized function).

Accessories

			Mounting screws, gasket and easy installation tool
Side bracket: A AS-11C-AT	Cable: A piece of AS-11C-EC	Network cable crystal head waterproof jacket: A AS-11C-WJ	Accessories: A set of M4x8

Displacement

Triangulation

Linear measurement

Magnetic displacement

LiDAR Scanner

Color confocal



Appearance		
Light source		Infrared laser (905nm)
Laser safety level		Class I (GB7247.1-2012, human eye safety)
Laser spot light diameter		10mm
Laser spot light scan angle		2.0(H)×8.0(V)mrad
Scanning angle range		360°
Scanning frequency		10Hz/20Hz
Scanning angle resolution		0.05° /0.1°
Sensing range		0.2m ~100m
RSSI Measurement Range		3%~1000% (reflector)
10% reflectivity range		20m
Outdoor performance		Anti-sunlight, anti-dirt, support smoke penetration, use under non-rainfall conditio
Measurement data		Composite data (distance + RSSI)
Measurement error	System error (typical)	Distance measurement: 25mm(1m~20m) / 40mm(20m~50m); RSSI measurement: 2%(1m~20m) / 4%(20m~50m)
	Statistical error (1σ)	Distance measurement: 10mm(1m~20m) / 20mm(20m~50m); RSSI measurement: 1%(1m~20m) / 2%(20m~50m)
Self-test equipment		Content: Dirty/blocking/high temperature/low temperature of the translucent cove
Ethernet		Rate: 10/100 Mbps; function: device configuration/measurement data output
I/O Input		Quantity: 3; Type: level input (vs. general input common ground 'GND IN'); high level range: 9V ~ 30V DC; low level range: 0V~0.7V DC; Preset function: power saving and life extension control (In2 / In3), effective level: high lev
I/O Output		Quantity: 3; Type: PNP switch output (vs. power supply positive terminal); Power-on state: off; Preset function: equipment on Thread (OUT), effective state: op
Indicator light		Quantity: 4; Definition: PWR: power indicator; LNK: Ethernet indicator; ERR: working failure indicator; HTR: normal measurement indicator
Operating voltage		9V~30V DC
Power		5W@DC 24V
Outer covering protection rank(IP)		IP65(GB4208-2008)
Insulation resistance		1 MΩ (GB16796-2009.5.4.4)
Dielectric strength		0.5KV(GB16796-2009.5.4.3)
Weight		0.7kg
Dimension(L×W×H)		97.0×97.0×72.0(mm)
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2-2006, Class 3)
	Fast bursts	1KV (GB/T17626.4-2008, Class 2)
	Electromagnetic field radiation immunity	GB/T17626.3-2006, Class 2
Surge immunity		GB/T17626.5-2008; Power interface: 1.2/50μs, 2KV/1KA (Class 3) ; Ethernet interface: 10/700μs, 1KV/25A (Class 2) ; I/O interface: 1.5/50μs, 0.5KV/0.25KA (Class 1) ;
Impact		GB/T 2423.5
Single impact		15g, 11ms
Continuous impact		10g, 16ms
Vibration		GB/T 2423.10
Frequency Range		10Hz~150Hz
Amplitude		5g
Humidity		93%, +40℃, 2h (GB/T 2423.3)
Operating temperature range		-10℃~+50℃
Storage temperature range		-30℃~+70℃
Ambient illumination range		≤80,000lux
Model NO.		AS-100C

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

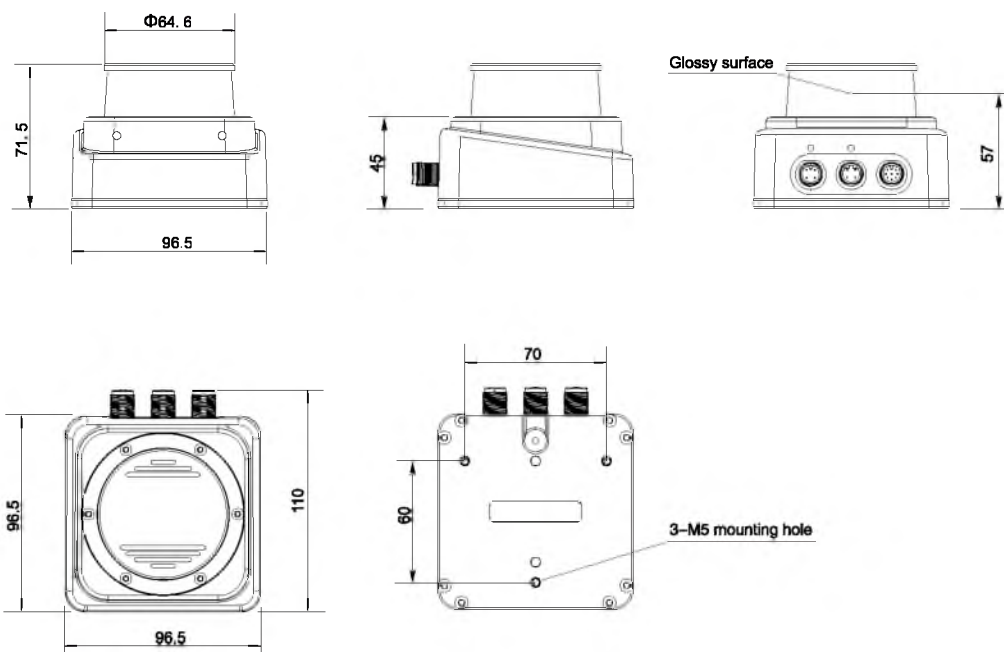
Guidance

Displacement
Triangulation
Linear measurement
Magnetic displacement
LiDAR Scanner
Color confocal

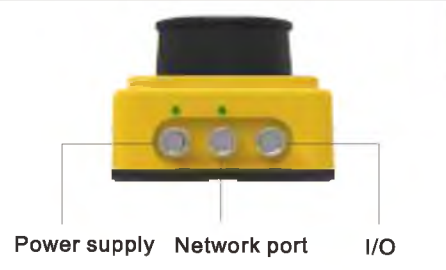
LiDAR Scanner

Dimensions

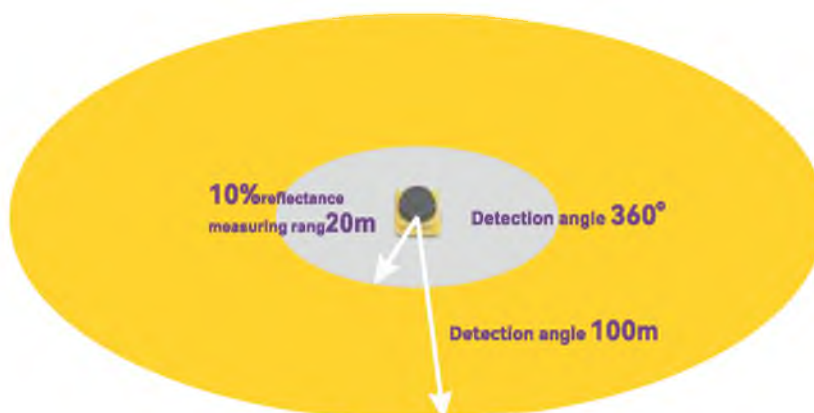
Unit:mm



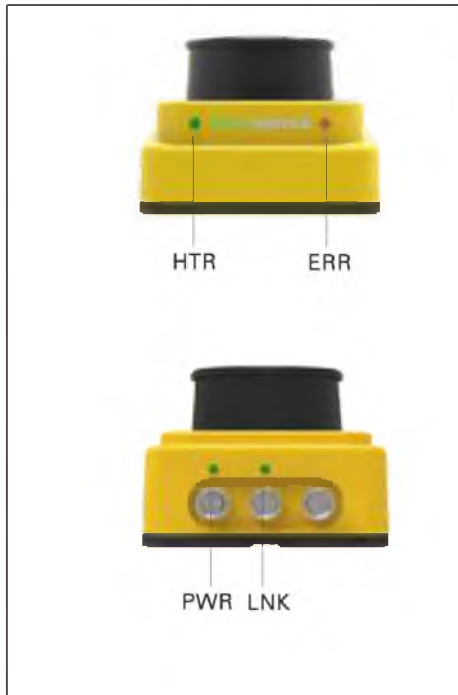
Power connector

	Socket	Types	Number of terminal
	Power supply	M12(Type A), Male	4
	Etherne	M12(Type B), Male	4
	I/O	M12(Type B), Male	8

Measuring coordinate system/scanning range/range



Indicator Lights and Operation Buttons



Name	Description
PWR	Power Indicator ◆ Normal off: no power / power is invalid ◆ Constant light: power on
LNK	Ethernet indicator ◆ Always off: no network connection ◆ Always on: there is a network connection
ERR	Work failure indicator ◆ Starting state: bright (about 24 seconds) ◆ Always off: no fault ◆ Always on: internal fault/measurement abnormal¹ ◆ Long flashing (0.5Hz): high temperature/low temperature alarm ◆ Short flashing (1Hz): Dirty/obstructed light transmission cover
HTR	Normal measurement indicator ◆ Starting state: off ◆ Always off: the device has not started to measure ◆ Always on: the equipment is measuring normally

- 1: Including measurement stop and motor stop;
 2: Including being blocked by dense fog.

Accessories

					Mounting screws, washers And easy installation tools
Mounting bracket: AS-100C-AT set	M12 dust plug Comes with	Power cable: AS-100C-EC A	RJ45 network cable: AS-100C-IOCB A	I/O cable: AS-100C-IOCB A	Parts and accessories: M5x8 set

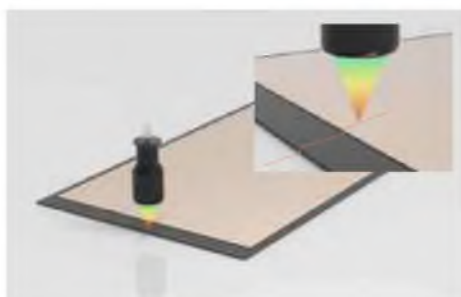
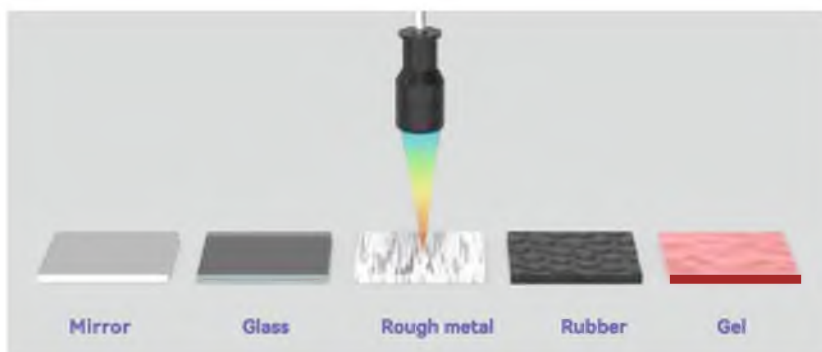
Guidance

Colour Confocal Displacement Sensors

ACC Series

Stable measurement for any material

Metals, ceramics, mirrors, glass, transparent and non-transparent materials can all be detected

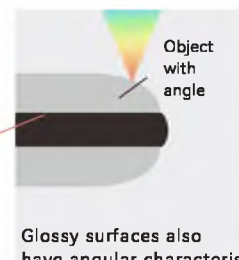


Sub-micron ultra-high measurement accuracy

The maximum resolution is 0.02um, and the minimum spot size is 2um, for precise capture of minute details

Tilt angle measurement up to $\pm 60^\circ$

The shape of object with angles can be accurately tracked, almost no impact by the shape.

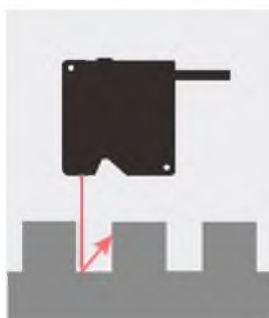


Glossy surfaces also have angular characteristics

High precision measurement for any surface condition

Stable detection for rough surfaces, mirrors, curved surfaces, inclined surfaces, pits, section differences, etc.

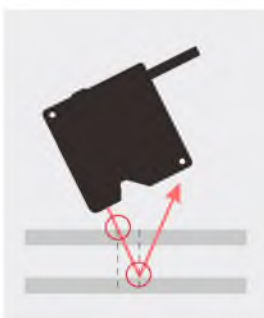
Detection from all directions, even for hollows and segment differences



Traditional laser displacement



ACC Series



Traditional laser displacement



ACC Series

Transparent and mirror objects can also be correctly measured

Application fields



Panel/glass industry



PCB board/IC chip industry



Photovoltaic / semiconductor wafer industries



Metal / precision manufacturing industries



Lithium and other industries



Lens industry

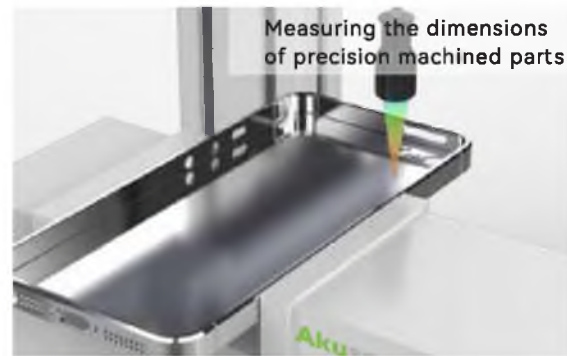
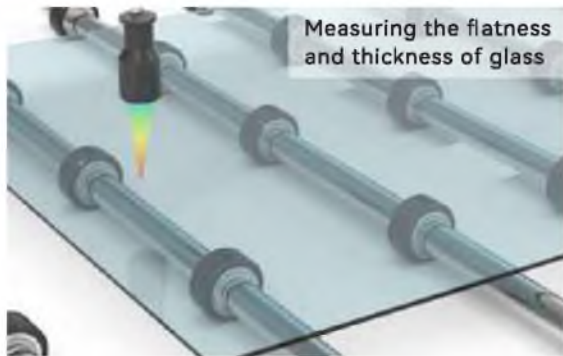


3C electronics and other industries



Printing/ink industry

Applications



Selection table



Model	ACC-008L	ACC-011L	ACC-016L	ACC-018L	ACC-030L	ACC-033L	ACC-040L	ACC-055L
Resolution	0.02μm	0.05μm	0.05μm	0.05μm	0.07μm	0.2μm	0.12μm	0.1μm
Spot size	2μm	16μm	8μm	25μm	9μm	40μm	40μm	45μm
Max. inclination	±40°	±60°	±30°	±22°	±15°	±7°	±15°	±11°

Color Confocal Displacement Sensor

ADV Series

Probe



Sensing distance	8mm	11mm	16mm	18mm
Measuring range	± 0.2mm	± 1.2mm	± 1mm	± 1mm
Resolution* ¹	0.02 μm	0.05 μm	0.05 μm	0.05 μm
Linearity* ²	± 0.15 μm	± 0.45 μm	± 0.35 μm	± 0.3 μm
Spot diameter* ³	2 μm	16 μm	8 μm	25 μm
Maximum inclination* ⁴	± 40°	± 60°	± 30°	± 22°
Probe size	Φ41*99mm	Φ98*266mm	Φ41*159mm	Φ34*75mm
Probe weight	220g	3250g	360g	105g
Degree of protection	IP40	IP40	IP40	IP40
Model NO.	ACC-008L	ACC-011L	ACC-016L	ACC-018L

Probe



Sensing distance	30mm	33mm	40mm	55mm
Measuring range	± 2mm	± 2mm	± 4mm	± 3mm
Resolution* ¹	0.07 μm	0.2 μm	0.12 μm	0.1 μm
Linearity* ²	± 0.45 μm	± 2 μm	± 0.5 μm	± 0.65 μm
Spot diameter* ³	9 μm	40 μm	40 μm	45 μm
Maximum inclination* ⁴	± 15°	± 7°	± 15°	± 11°
Probe size	Φ38*82mm	Φ18*55mm	Φ54*116mm	Φ33*75mm
Probe weight	145g	24g	380g	122g
Degree of protection	IP40	IP40	IP40	IP40
Model NO.	ACC-030L	ACC-033L	ACC-040L	ACC-055L

Controller

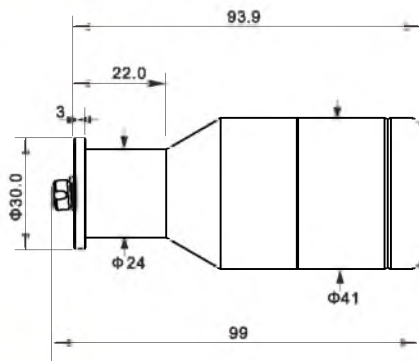


Light Source	White LED		
Size of controller(Lxwxh)	140*122*127mm		185*122*127mm
Weight of controller	1.32kg	1.38kg	—
Rated voltage	24V DC		
External communication interface	RS-232:115200 bps(max.) Ethernet:100BASE-TX/10BASE-T		
Degree of protection	IP20		
Sampling frequency	4K HZ(Max)		2K HZ(Max)
I/O function	Pulse input and output	Pulse input and output, encoder trigger input	
Number of encoder shafts	—	3-axis, incremental (A/B/Z phase)	
Encoder maximum trigger frequency	—	4K HZ(Max)	2K HZ(Max)
Fiber extension cord	Inner armor: ACC-OF-S (standard); Outer armor: ACC-OF-M(optional)		
Length	2/5/10(Standard)m		
Weight	ACC-OF-S: 23/40/69g; ACC-OF-M: 108/218/396g		
Minimum bending radius* ⁵	50mm		
Operating temperature	5~40℃		
Environment humidity	35~80%		
Ambient illumination	<10000lx		
Clamp fixture	Customizable		
Model NO.	ADV-12CK	ADV-12CKS	ADV-12CK2

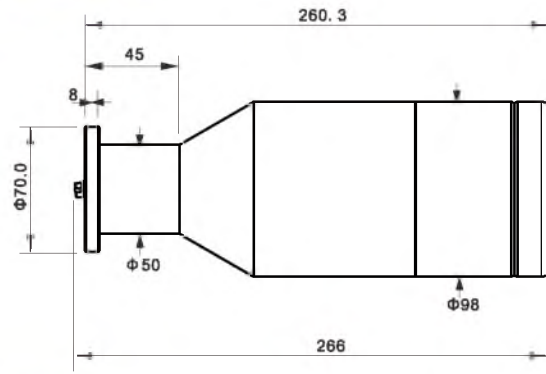
Unit:mm

Dimensions

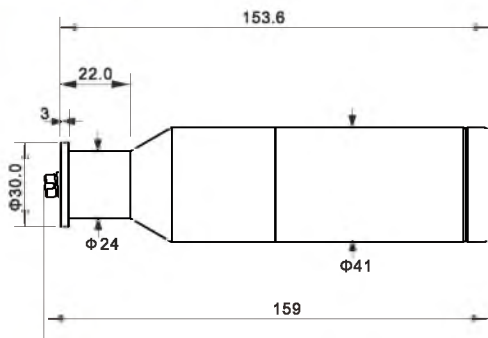
ACC-008L



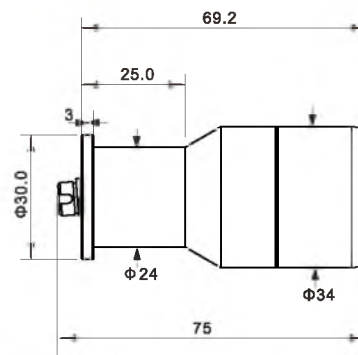
ACC-011L



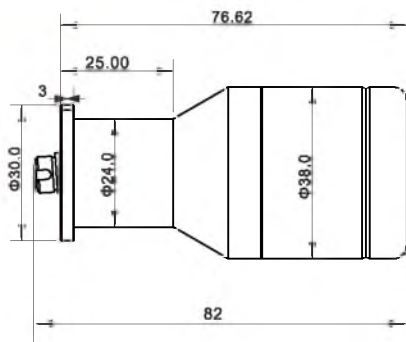
ACC-016L



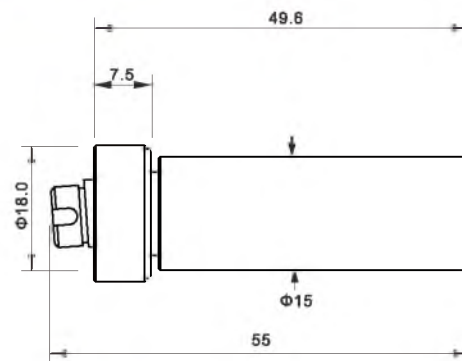
ACC-018L



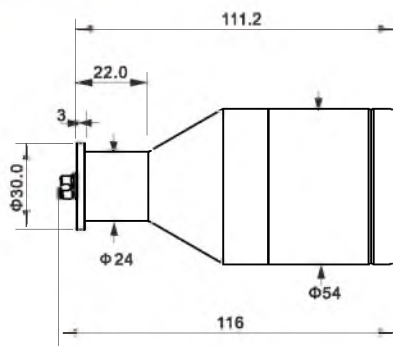
ACC-030L



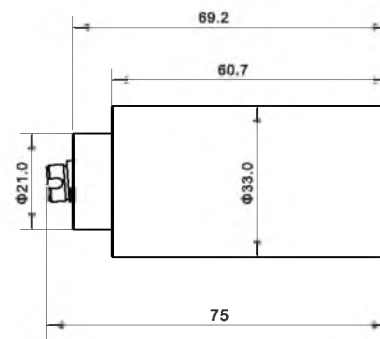
ACC-033L



ACC-040L



ACC-055L



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

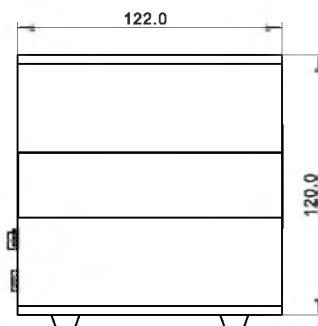
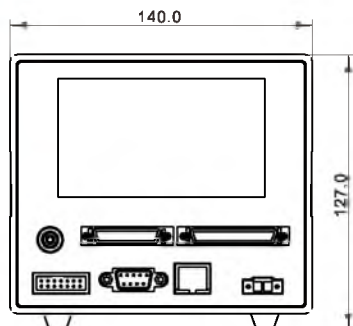
Displacement
Triangulation
Linear measurement
Magnetic displacement
LIDAR Scanner
Color confocal

Color Confocal Displacement Sensor

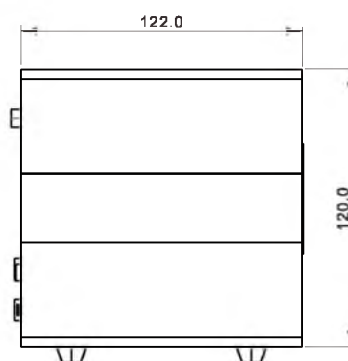
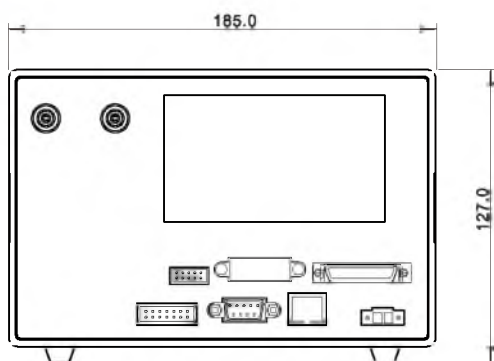
Dimensions

Unit:mm

ADV-12CK(S)



ADV-12CK2



- *1. Resolution: The average level of noise for the stationary workpiece at the zero center of the range center (opening the light intensity auto adjustment and 256 times averaging function)
- *2. Linearity: Maximum error value for full-scale measurement of mirror standard parts after calibration (opening the light intensity auto adjustment and 256 times averaging function)
- *3. Spot diameter: theoretical spot diameter value at the center of the range
- *4. Maximum inclination: refers to the maximum acceptable optical signal angle under the mirror-reflective material workpiece. The diffuse reflection workpiece usually can reach 80 degrees.
- *5. Minimum bending radius: The minimum radius of curvature that can be received when the fiber is crimped and stored. Below this value, it is easy to break and damage.

High Precision Magnetic Sensor



Magnetic Sensors

- Small size, long duration, high sensitivity and long sensing distance
- Response Time at 5 μ s—Fastest response time
- S-pole (standard magnet pole)

P.G-04



High Precision Positioning with Reliable Performance

- High positioning precision, reliable performance
- Vibration and heat resistance
- Response time less than 5 μ s (3-wire type)

P.G-08



Economical Cylinder Sensor

- High positioning accuracy, reliable performance
- Maximum switching frequency up to 1000 Hz

P.G-13



Environmental Resistance Cylinder Sensors

- Full metal material, reliable performance
- Vibration and heat resistance
- Maximum switching frequency up to 1000Hz

P.G-16



Combined Cylinder Sensors

- With different brackets to fit almost all cylinder sensors in the market
- Suitable for replacing contact cylinder sensors
- Suitable for C-slot, T-slot, hoop, guide rail, tie rod and other installation environments

P.G-17



Magnetic Proximity Sensors

- Proximity sensors that detect ferromagnetism materials, such as iron
- No reaction to aluminum and non-ferromagnetic stainless steel
- Can be used on CNC machines, refrigerating equipments, on-standard positioning equipments etc.

P.G-19



Door Sensors

- Small size, excellent sensitivity
- Non-contact, long life and highly reliable
- With magnetic hole (ϕ 12), it still performs well even fixed inside iron doors

P.G-21

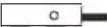


Linear Sensors

- Output voltage varies linearly with magnetic force
- Output voltage changes linearly according to the movements of magnets
- It can be used from low to high temperature

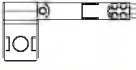
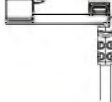
P.G-24

Magnetic Sensors

Appearance	Size	Sensing distance*	Detected poles		Model number	Pages
	φ 4.9X16mm	MR-M10L: 4mm MR-M9K: 8mm	S-pole	Top surface detection	MR-P10-H	G-04
				Side surface detection	MR-P10-X (HOT)	
	φ 6.2X21mm	MR-M10L: 8mm MR-M9K: 10mm	N-pole, S-pole optional	S-pole detection	MR-P13-S	
				N-pole detection	MR-P13-N	
	M9X25mm	MR-M10L: 8mm MR-M9K: 11mm	N-pole, S-pole optional	S-pole detection	MR-P24-S	G-05
				N-pole detection	MR-P24-N	
	M9X25mm	MR-M10L: 13mm MR-M9K: 20mm	N-pole & S-pole detection	N-pole & S-pole detection	MR-P25 (HOT)	
	M6X15mm	MR-M10L: 6mm MR-M9K: 8mm	S-pole	S-pole detection	MR-P26	
	7X5.8X20.5mm	MR-M10L: 5mm MR-M9K: 8mm	N-pole, S-pole optional	S-pole detection	MR-P12-S	G-06
				N-pole detection	MR-P12-N	
	9X9.6X30mm	MR-M10L: 8mm MR-M9K: 11mm	N-pole, S-pole optional	S-pole detection	MR-PH5-S	
				N-pole detection	MR-PH5-N	
	12X7.8X4.2mm	MR-M10L: 8mm MR-M9K: 12mm	S-pole	Top surface detection	MR-P4-H	
				Side surface detection	MR-P4-X	
	17.6X18.6X4.6mm	MR-M10L: 8mm MR-M9K: 12mm	N-pole, S-pole optional	S-pole detection	MR-P9-S	
				N-pole detection	MR-P9-N	

*: Different magnets have different sensing distances

High Precision Combined Cylinder Sensors

Appearance	Size	Detected poles	Suitable applications	Model number	Pages
	6.1X5.1X20mm	N-pole and S-pole, optional	T shaped slot	MR-C6	G-09
	5.8X7X20.5mm	N-pole and S-pole, optional	T shaped slot	MR-C12	
	φ 4X14.5mm	N-pole and S-pole, optional	C shaped slot	MR-C7	
	4X5.5X24.5mm	N-pole and S-pole, optional	C shaped slot	MR-C8-C	
	4X5.5X24.5mm	N-pole and S-pole, optional	U shaped slot	MR-C8-U	
	5X10X22.2mm	N-pole and S-pole, optional	C shaped slot	MR-C13-C	
	5X10X22.2mm	N-pole and S-pole, optional	U shaped slot	MR-C13-U	
	17.6X18.6X5.1mm	N-pole and S-pole, optional	External usage	MR-C92	G-10
	17.6X18.6X5.1mm	N-pole and S-pole, optional	External usage	MR-C9	
	17.6X18.6X4.6mm	N-pole and S-pole, optional	External usage	MR-C9-E	
	Straight	Default S pole	C type	MR-C1-H-C	G-17
			T type	MR-C1-H-T	
			External usage	MR-C1-H-L	
	Bend	Default S pole	C type	MR-C1-V-C	
			T type	MR-C1-V-T	
			External usage	MR-C1-V-L	

Fiber Optic
Slot Sensors
Photoelectric
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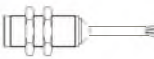
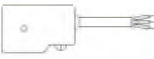
Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

Economical/Magnetic Proximity Sensors

Appearance	Size	Sensing distance		Model number	Pages
	31. 4*6. 2*4. 3mm	Normally Open	200Hz/ 1000Hz	MR-30/30G/30N/P	G-13
	15. 1*4*5mm	Normally Open	1000Hz	MR-C80	
				MR-C81	G-14
				MR-C86	
	14. 3*4*4. 7mm	Normally Open	1000Hz	MR-70	G-16

Magnetic Proximity Sensors

Appearance	Size	Sensing distance		Model number	Pages
	M10X22.8mm	1mm(Iron wire ϕ 1)	Normally open, without LED indicator	MR-F11	G-19
		2mm(High-speed steel drill ϕ 2)	Normally open, with LED indicator	MR-F11-LED	
		2mm(Square iron20Xt1)	Normally closed, without LED indicator	MR-F11-B	
			Normally closed, with LED indicator	MR-F11-B-LED	
	9X14X21mm	6mm(Square iron30Xt10)	Normally open	MR-F2	
		4mm(Square iron30Xt2)	Normally closed	MR-F2-B	

Door Sensors

Appearance	Size	Detected poles	Model number	Pages
	14X14X34mm	Upward detection	MR-D2	G-21
	14X14X34mm	Upward detection	MR-D2P	
	14X14X34mm	Upward detection	MR-DM2	
Matching magnet				
	14X14X34mm	Sideway detection	MR-D2X	
	14X14X34mm	Sideway detection	MR-D2XP	
	14X14X34mm	Sideway detection	MR-DM2X	
Matching magnet				

Linear Sensors

Appearance	Size	Detected poles		Model Number	Pages
	8.6X12X3.5mm	Detect N-pole and S-pole simultaneously	Frontal Detection	MR-L4	G-24
	7.8X12X4.2mm	Detect N-pole and S-pole simultaneously	Sideway Detection	MR-L4-H	
	ϕ 4.9X16mm	Detect N-pole and S-pole simultaneously	Sideway Detection	MR-L10X	

Appearance



Feature	Can execute detection in Fe, perfect for molds and fixtures	Smallest size in same type of products
Sensing distance*	MR-M10L: 4mm; MR-M9K: 8mm	MR-M10L: 8mm; MR-M9K: 10mm
Operating voltage	5~24V DC	
Detected magnetic poles	S-pole	N-pole, S-pole optional
Magnetic sensitivity	5~7mT	2.5~3.5mT
Response time	5 μs	
Active frequency	30Hz	
Output type	NPN (N.O) (When approaching, ON)	
Output current	≤15mA	
Current consumption	≤15mA	
Withstand voltage	AC1000V 1min	
Insulation resistance	250V DC≥20MΩ	
Ambient temperature	-20℃~+85℃, No freezing	
Ambient humidity	20%~95%RH, No condensation	
Material	SUS303	GF strengthened PBT: grey;MR-P13-S cable: grey;MR-P13-N cable: black
Mounting	M3 screws, tightening torque ≤0.2N · m	M7 nuts, tightening torque 0.3N · m
Degree of protection	IP65	IP65
Connection	3 core cable(Length:1m)	
Model NO.	Top surface detection: MR-P10-H Side surface detection: MR-P10-X	S-pole detection: MR-P13-S N-pole detection: MR-P13-N
Wiring diagram	See figure 1 and figure 2 on page G-07	



*:Different magnets have different sensing distances

Appearance



Feature	Built-in indicator (high sensitivity)
Sensing distance*	MR-M10L: 8mm; MR-M9K: 11mm
Operating voltage	5~24V DC
Detected magnetic poles	N-pole, S-pole optional
Magnetic sensitivity	MR-P24-S: 2.5~3.5mT, MR-P24-N: 0.9±0.2mT
Active frequency	30Hz
Response time	5 μs
Output type	NPN (N.O) (When approaching, ON)
Output current	≤12mA
Current consumption	≤12mA
Withstand voltage	AC1000V 1min
Insulation resistance	250V DC≥20MΩ
Ambient temperature	-20℃~+85℃, No freezing
Ambient humidity	20%~95%RH, No condensation
Material	GF strengthened PBT: black;MR-P24-S cable: grey;MR-P24-N cable: black
Mounting	M9 screws, tightening torque ≤0.5N · m (with screws)
Indicator	Red
Degree of protection	IP67
Connection	1M 3 core cable
Model NO.	S-pole detection: MR-P24-S N-pole detection: MR-P24-N
Wiring diagram	See figure 4 on page G-07

*:Different magnets have different sensing distances

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Magnetic

Magnetic sensors

High precision cylinder

Combined cylinder

Near iron sensor

Door sensors

Linear sensors

Ordinary magnets

High precision composite magnets

Mounting accessories

Magnetic Sensors



Appearance

Feature	High sensitivity, detects N-pole and S-pole detection at the same time	IP67 protection degree, stainless steel threaded housing
Sensing distance*	MR-M10L: 13mm; MR-M9K: 20mm	MR-M10L: 6mm; MR-M9K: 8mm
Operating voltage	12~24V DC	5~24V DC
Detected magnetic poles	N-pole & S-pole detection	S-pole
Magnetic sensitivity	S-pole: 0.5 ± 0.1 mT N-pole: 0.45 ± 0.1 mT	3~4 mT
Response time	< 16 μ s	5 μ s
Active frequency	40Hz	
Output type	NPN (N.O) (When approaching, ON)	
Output current	≤ 12 mA	
Current consumption	On: ≤ 30 mA (off ≤ 10 mA)	≤ 4 mA
Withstand voltage	AC1000V 1min	
Insulation resistance	250V DC ≥ 20 M Ω	
Ambient temperature	-20°C~+85°C, No freezing	
Ambient humidity	20%~95% RH, No condensation	
Material	SUS303	
Degree of protection	IP65	IP67
Mounting	M9 screws, tightening torque 5N·m	M6 screws, tightening torque 2N·m
Indicator	S-pole: Red N-pole: Green	Red
Connection	1M 4core cable	1M 3core cable
Model NO.	MR-P25 HOT	MR-P26
Wiring diagram	See figure 5 on page G-07	See figure 6 on page G-07

*: Different magnets have different sensing distances



Appearance

Feature	Built-in indicator, 2-wires output
Sensing distance*	MR-M10L: 5mm; MR-M9K: 8mm
Operating voltage	12~24V DC
Detected magnetic poles	N-pole, S-pole optional
Magnetic sensitivity	2.5~3.5 mT
Response time	50 μ s
Active frequency	30Hz
Output current	≤ 50 mA
Leakage current	OFF, ≤ 0.5 mA
Withstand voltage	AC1000V 1min
Insulation resistance	250V DC ≥ 20 M Ω
Ambient temperature	-20°C~+85°C, No freezing
Ambient humidity	20%~95% RH, No condensation
Material	GF strengthened PBT
Indicator	Red
Degree of protection	IP67
Connection	1M 2core cable
Model NO.	S-pole detection: MR-P12-S N-pole detection: MR-P12-N
Wiring diagram	See figure 7 on page G-07

*: Different magnets have different sensing distances



Appearance

Feature	High sensitivity (can be used outdoors)
Sensing distance*	MR-M10L: 8mm; MR-M9K: 11mm
Operating voltage	5~24V DC
Detected magnetic poles	N-pole, S-pole optional
Magnetic sensitivity	0.9±0.2mT
Response time	5 μs
Active frequency	30Hz
Output type	NPN (N.O) (When approaching, ON)
Output current	≤12mA
Current consumption	≤12mA
Withstand voltage	AC1000V 1min
Insulation resistance	250V DC≥20MΩ
Ambient temperature	-20℃~+85℃, No freezing
Ambient humidity	20%~95%RH, No condensation
Material	GF strengthened PBT: black
Mounting	M3screws, tightening torque 0.3N · m
Indicator	Red
Degree of protection	IP67
Connection	1M 3core cable
Model NO.	S-pole detection: MR-PH5-S N-pole detection: MR-PH5-N
Wiring diagram	See figure 8 on page G-07

*: Different magnets have different sensing distances



Appearance

Feature	Small size, thickness 3.5mm only	Metal housing, water-proof and oil resistant
Sensing distance*	MR-M10L: 8mm; MR-M9K: 12mm	
Operating voltage	5~24V DC	12~24V DC
Detected magnetic poles	S-pole	N-pole, S-pole optional
Magnetic sensitivity	2.5~3.5mT	
Response time	5 μs	
Active frequency	30Hz	
Output type	NPN (N.O) (When approaching, ON)	
Output current	≤15mA	≤80mA
Current consumption	≤15mA	≤12mA
Withstand voltage	AC1000V 1min	
Insulation resistance	250V DC≥20MΩ	
Ambient temperature	-20℃~+85℃, No freezing	
Ambient humidity	20%~95%RH, No condensation	
Material	GF strengthened PBT: Green	Die-casing Zinc alloy
Mounting	M2screws, tightening torque 0.15N · m	M3screws, tightening torque 1.5N · m
Degree of protection	IP65	IP67
Connection	3M 3core cable (Length:0.3m)	1M 3core cable
Model NO.	Top surface detection: MR-P4-H Size surface detection: MR-P4-X	S-pole detection: MR-P9-S N-pole detection: MR-P9-N
Wiring diagram	See figure 9 on page G-07	See figure 10 on page G-07

*: Different magnets have different sensing distances

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

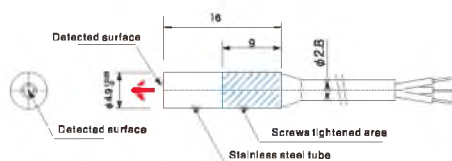
Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

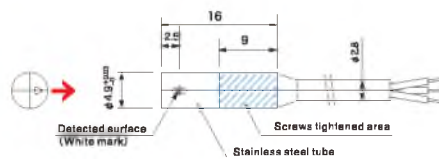
Magnetic Sensors

Dimensions(Unit:mm)

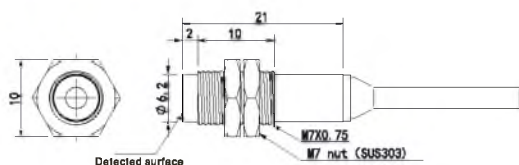
MR-P10-H



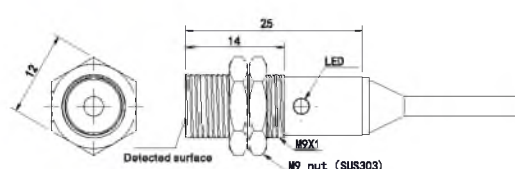
MR-P10-X



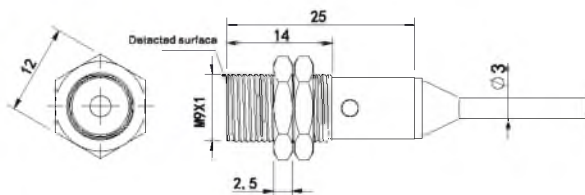
MR-P13-S(N)



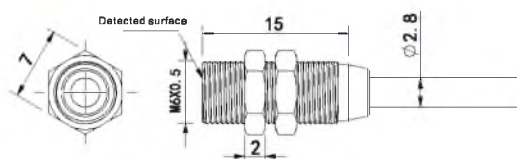
MR-P24-S(N)



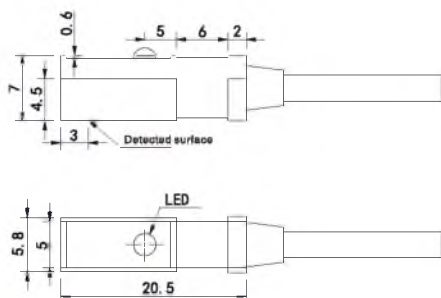
MR-P25



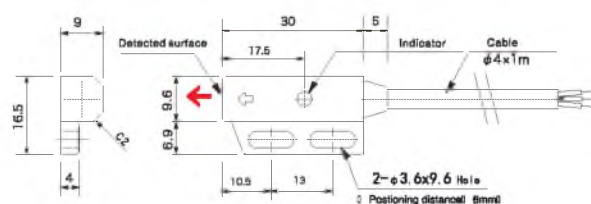
MR-P26



MR-P12-S(N)



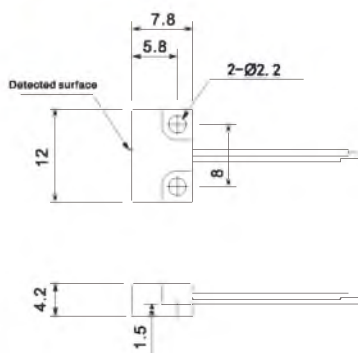
MR-PH5-S(N)



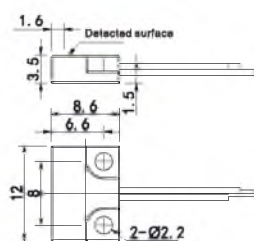
Mounting accessories: HP12-0/HP12-3/HP12-6.2/HP12-t

MR-P4-H(X)

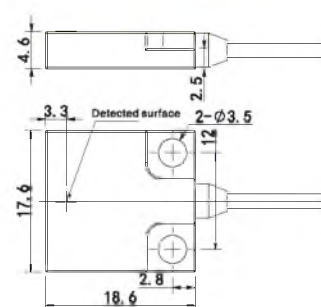
MR-P4-H



MR-P4-X

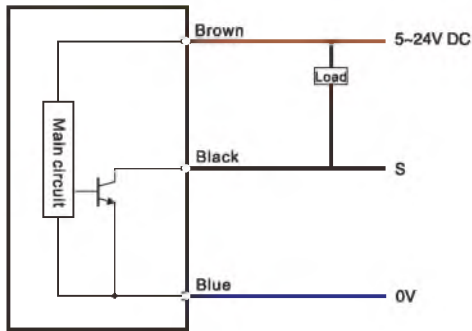


MR-P4-S(N)

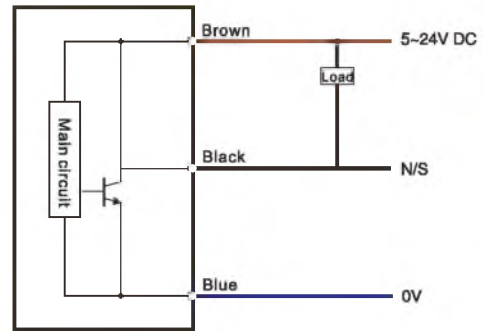


Mounting accessories: -BT: cable protective tube/
-BD: belt shaped mounting accessories

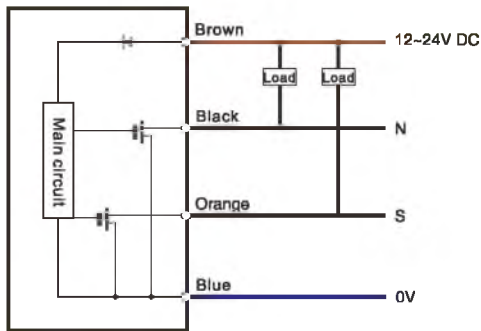
MR-P10/13/P4



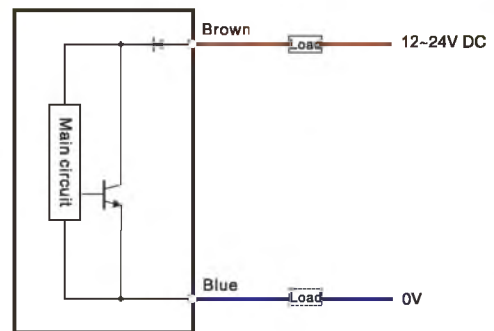
MR-P24/PH5



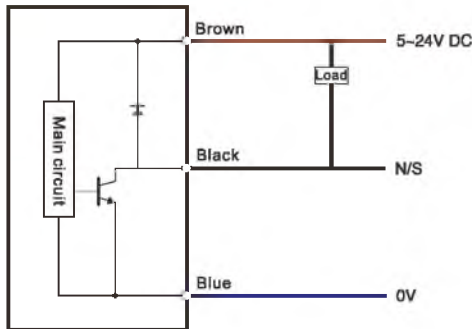
MR-P25



MR-P12



MR-P9



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic**
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Magnetic
- Magnetic sensors
- High precision cylinder**
- Combined cylinder
- Near iron sensor
- Door sensors
- Linear sensors
- Ordinary magnets
- High precision composite magnets
- Mounting accessories

High Precision Cylinder Sensors

3-wire



2-wire



Appearance		
Suitable applications	T shaped slot	T shaped slot
Features	Built-in LED indicators	Can replace 2-wire feed switches for cylinders, and suits to use in cylinders with small range, such as pneumatic fingers.
Operating voltage	5~24V DC	12~24V DC
Detected magnetic poles	N-pole and S-pole, optional	
Magnetic sensitivity	2.5~3.5mT	
Response time	5 μs	50 μs
Output type	NPN (N.O) (When approaching, on)	---
Output current	≤12mA	≤50mA
Current consumption	≤12mA	---
Current leakage	---	OFF States, 0.5mA MAX
Withstand voltage	AC1000V 1min	
Insulation resistance	250V DC≥20MΩ	
Ambient temperature	-20℃~+85℃, No freezing	
Ambient humidity	20%~95%RH, No condensation	
Material	GF reinforced PBT, in black	GF reinforced PBT; in grey
LED Indicator	Red	
Degree of protection	IP67	
Connection	1M 3core cable	1M 2core cable
Model NO.	Detected S-pole	MR-C6-S
	Detected N-pole	MR-C6-N
		MR-C12-S
		MR-C12-N

3-wire



3-wire



2-wire



Appearance						
Suitable applications	C shaped slot	C+U shaped slot	C+U shaped slot			
Features	Suitable for C-shaped slot (φ 4); detect both S-pole and N-pole	Can apply to C-shaped slot(φ 4),built-in LED indicators, suitable for U-shaped slots that manufactured by other factories				
Operating voltage	5~24V DC		12~24V DC			
Detected magnetic poles	N-pole and S-pole, optional					
Magnetic sensitivity	4.5~6mT		2.5~3.5mT			
Response time	5 μ s		50 μ s			
Output type	NPN (N.O) (When approaching, on)		---			
Output current	≤12mA		≤50mA			
Current consumption	≤12mA		---			
Current leakage	---		OFF States, 0.5mA MAX			
Withstand voltage	AC1000V 1min					
Insulation resistance	250V DC≥20MΩ					
Ambient temperature	-20℃~+85℃, No freezing					
Ambient humidity	20%~95%RH, No condensation					
Material	GF reinforced PBT, in black		GF reinforced PBT; in grey			
Mounting	With screws, tightening torque 0.06N・m					
LED Indicator	Approx.100mm distance from main body		Red			
Degree of protection	IP67					
Connection	1M 3core cable		1M 2core cable			
Model NO.		C shaped slot	U shaped slot	C shaped slot	U shaped slot	
	Detected S-pole	MR-C7-S	MR-C8-C-S	MR-C8-U-S	MR-C13-C-S	MR-C13-U-S
	Detected N-pole	MR-C7-N	MR-C8-C-N	MR-C8-U-N	MR-C13-C-N	MR-C13-U-N

Appearance			
	2-wire	3-wire	3-wire
Suitable applications	External usage	External usage	External usage
Features	With belt shaped mounting accessories, can install in $\phi 32 \sim \phi 10$ cylinders; metal housing, watertight, and oil-proof		
Operating voltage	12~24V DC		5~24V DC
Detected magnetic poles	N-pole and S-pole, optional		
Magnetic sensitivity	2.5~3.5mT		
Response time	50 μ s		5 μ s
Output type	***		NPN (N.O) (When approaching, on)
Output current	50mA MAX		≤ 12 mA
Current consumption	***		≤ 12 mA
Current leakage	OFF States, 0.5mA MAX		***
Withstand voltage	AC1000V 1min		
Insulation resistance	250V DC ≥ 20 M Ω		
Ambient temperature	-20 $^{\circ}$ C~+85 $^{\circ}$ C, No freezing		
Ambient humidity	20%~95%RH, No condensation		
Material	Cast zinc alloy		
Mounting	With screws, tightening torque 1.5N $\cdot$ m		M3(SUS), tightening torque 1.5N $\cdot$ m
LED Indicator	Red		None
Degree of protection	IP67		
Connection	1 M 2core cable		1 M 3core cable
Model NO	Detected S-pole	MR-C92-S	MR-C9-S
	Detected N-pole	MR-C92-N	MR-C9-E-S

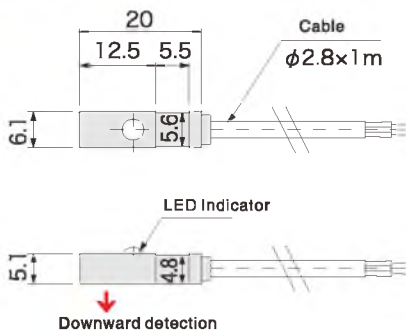
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

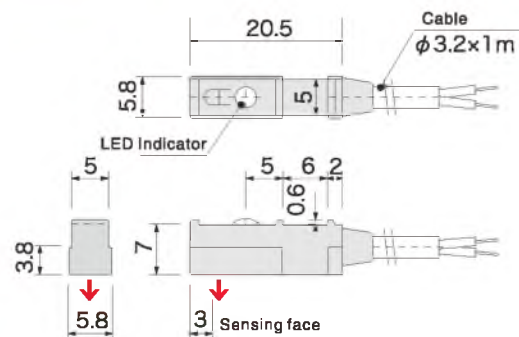
Dimensions(Unit:mm)

MR-C6



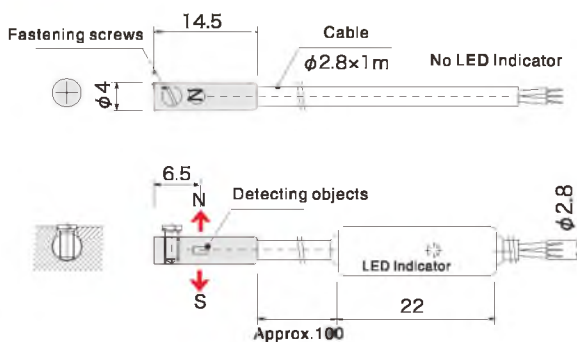
Mounting accessories: HP3-1/HP3-2/HP3-3/HP3-4

MR-C12



Mounting accessories: HP12-0/HP12-3/HP12-6.2/HP12-t

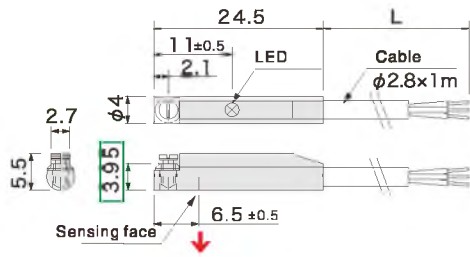
MR-C7



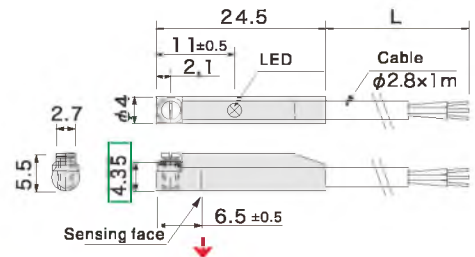
High Precision Cylinder Sensors

Dimensions(Unit:mm)

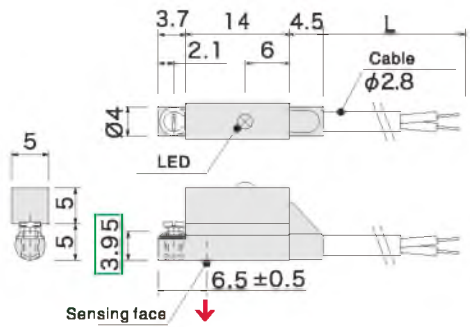
MR-C8(C shaped slot)



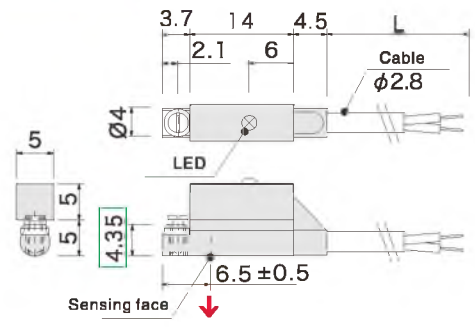
MR-C8(U shaped slot)



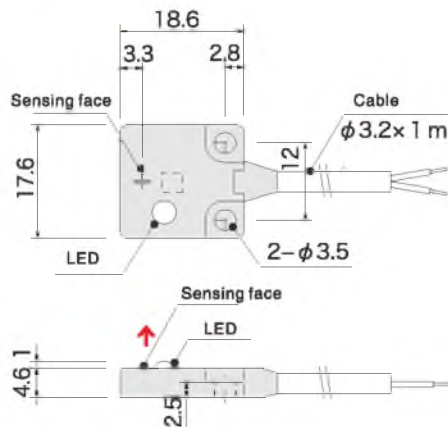
MR-C13(C shaped slot)



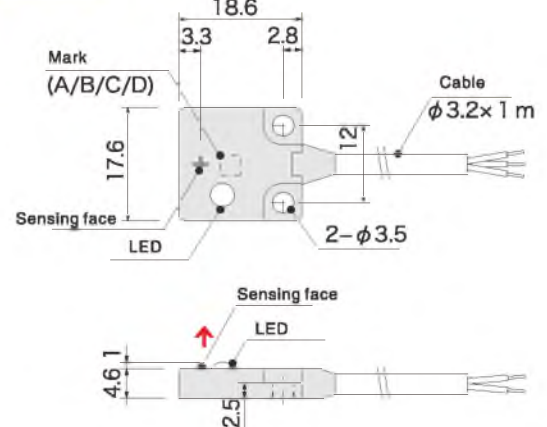
MR-C13(U shaped slot)



MR-C92



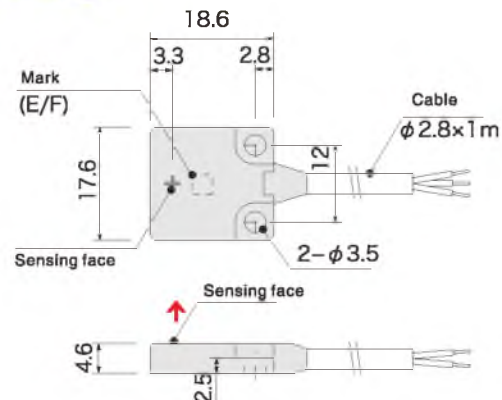
MR-C9



Mounting accessories: -BT: cable protective tube/
-BD: belt shaped mounting accessories

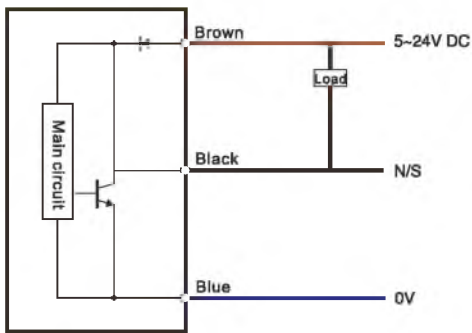
Mounting accessories: -BT: cable protective tube/
-BD: belt shaped mounting accessories

MR-C92(LED)

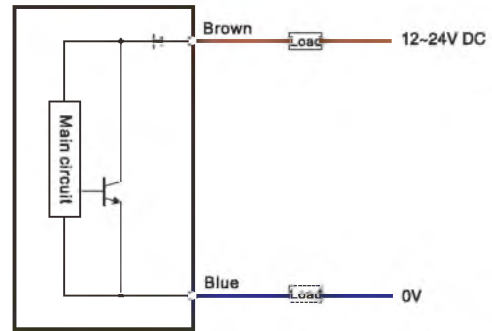


Mounting accessories: -BT: cable protective tube/
-BD: belt shaped mounting accessories

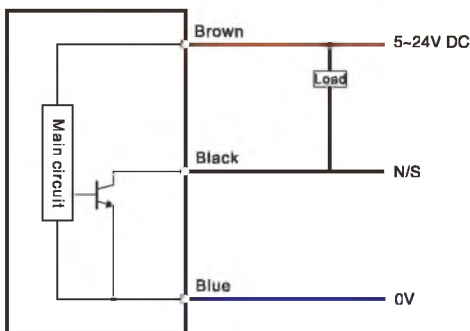
MR-C6



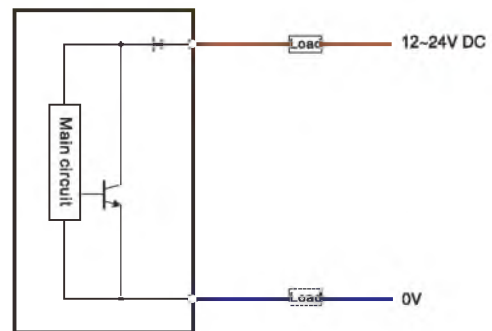
MR-C12



MR-C7



MR-P12



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic**
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Magnetic
- Magnetic sensors
- High precision cylinder**
- Combined cylinder
- Near iron sensor
- Door sensors
- Linear sensors
- Ordinary magnets
- High precision composite magnets
- Mounting accessories

Economical Cylinder Sensor



Economical Type

Appearance

Switch logic	SPST open type	Electronic: regular	Electronic contactless; open type
Switch type	Contact type magnetic spring tube	Two-wire contactless crystal type	Contactless Electrocrystal NPN Type Contactless Electrocrystal PNP Type
Working voltage	5~24V DC	10~28V DC	5~30V DC
Maximum switching current	100mA Max	50mA Max	200mA Max
Maximum switching capacity	10W Max	1.4W Max	6W Max
Internal consumption current	-	40 μ A Max.@24V	14mA Max@24V(Switch Active)
Residual pressure	2.5V Max@100mA DC	2.65V Max@50mA DC	0.5V Max@200mA DC
Leakage current	-	90 μ A Max.@28v	0.01mA Max
Indicator	Red LED		Green LED
Cable	2.9 ϕ ,2C, grey oil-resistant PVC	2.9 ϕ ,2C, grey oil-resistant TPU	2.9 ϕ ,3C, grey oil-resistant TPU
Sensitivity	40G		25~1000G
Maximum switching frequency	200Hz		1000Hz
Working temperature	-10~70° C		
Impact resistance	30G		50G
Vibration resistance	9G		
Degree of protection	IP67 (EN6052)		
Circuit protection	-	Protection of sudden wave absorption	Power polarity reverse protection; sudden wave absorption protection; short circuit protection
Model	MR-30	MR-30G	MR-30N MR-30P



Economical Type

Appearance

Switch logic	Electronic: regular
Switch type	Two-wire contactless crystal type
Suitable load	DC24V relay, PLC
Working voltage	10~30V DC
Maximum switching current	100mA Max
Maximum switching capacity	3W Max
Internal consumption current	6 μ A Max.@24V
Residual pressure	2.65V Max@50mA
Leakage current	40 μ A Max.@28v
Indicator	Red LED
Cable	2.8 ϕ ,2C, grey oil-resistant TPU
Sensitivity	25~1000G
Maximum switching frequency	1000Hz
Working temperature	-10~70° C
Impact resistance	50G
Vibration resistance	9G
Degree of protection	IP67 (EN6052)
Circuit protection	Protection of sudden wave absorption
Model	MR-C80

Economical Type



Appearance

Switch logic	Electronic: regular
Switch type	Two-wire contactless crystal type
Suitable load	DC24V relay, PLC
Working voltage	10~30V DC
Maximum switching current	100mA Max
Maximum switching capacity	3W Max
Internal consumption current	6 μ A Max. @24V
Residual pressure	2.65V Max@50mA
Leakage current	40 μ A Max. @28v
Indicator	Red LED
Cable	2.8 ϕ ,2C, grey oil-resistant TPU
Sensitivity	25~1000G
Maximum switching frequency	1000Hz
Working temperature	-10~70° C
Impact resistance	50G
Vibration resistance	9G
Degree of protection	IP67 (EN6052)
Circuit protection	Protection of sudden wave absorption
Model	MR-C81

Economical Type



Appearance

Switch logic	Electronic: regular
Switch type	Two-wire contactless crystal type
Suitable load	DC24V relay, PLC
Working voltage	10~30V DC
Maximum switching current	100mA Max
Maximum switching capacity	3W Max
Internal consumption current	6 μ A Max. @24V
Residual pressure	2.65V Max@50mA
Leakage current	40 μ A Max. @28v
Indicator	Red LED
Cable	2.8 ϕ ,2C, grey oil-resistant TPU
Sensitivity	25~1000G
Maximum switching frequency	1000Hz
Working temperature	-10~70° C
Impact resistance	50G
Vibration resistance	9G
Degree of protection	IP67 (EN6052)
Circuit protection	Protection of sudden wave absorption
Model	MR-C86

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

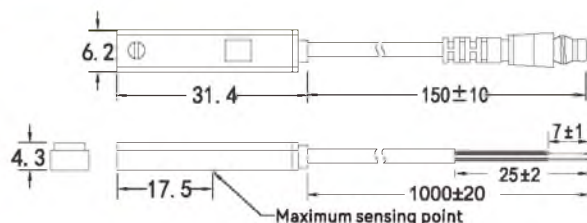
Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

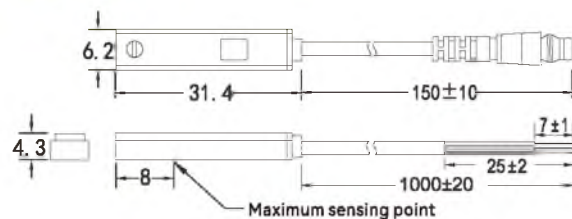
Economical Cylinder Sensor

Dimensions(Unit:mm)

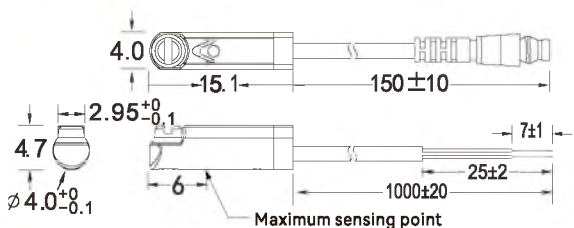
MR-30R/Q



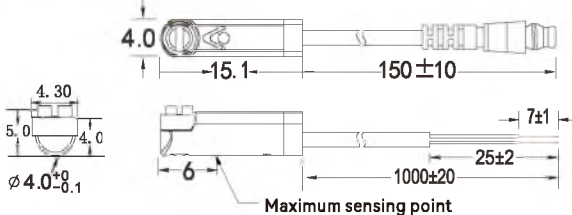
MR-30N/P



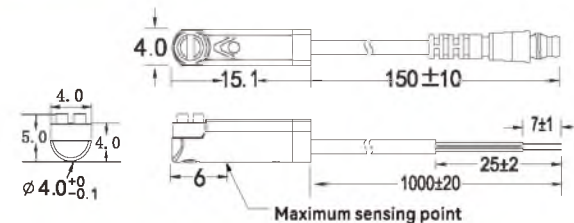
MR-C80



MR-C81

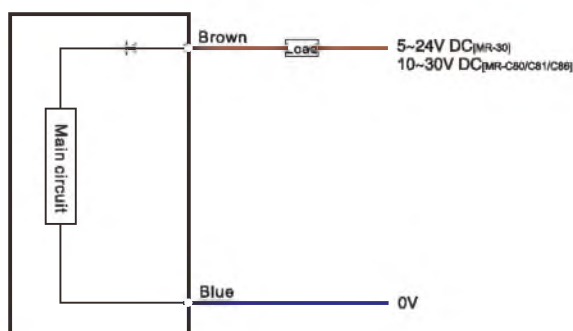


MR-C86

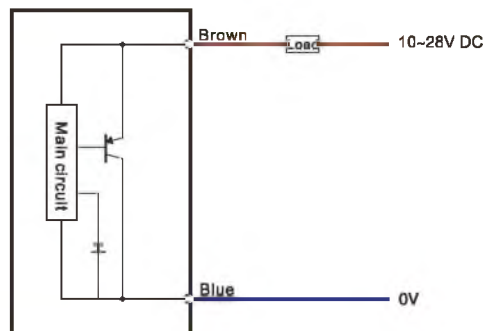


Circuit diagram

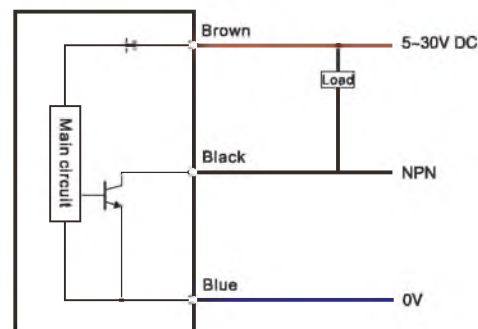
MR-30/C80/C81/C82



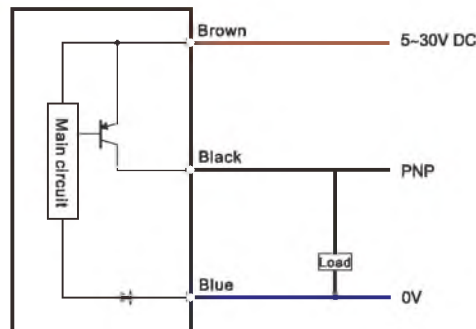
MR-30G



MR-30N



MR-30P



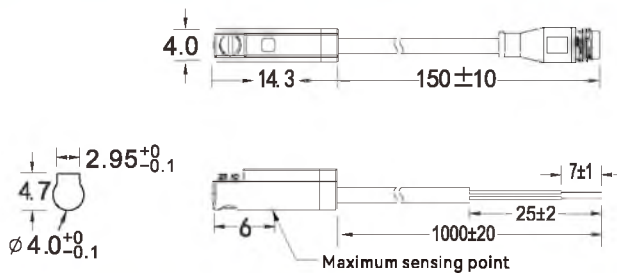
Environmentally Resistant Type



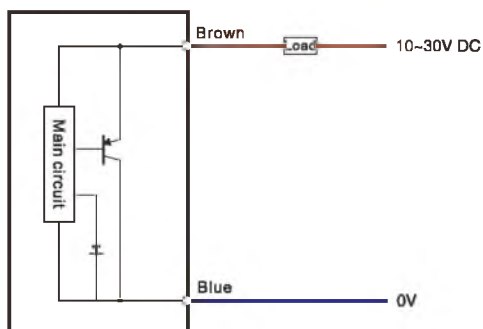
Appearance

Switch logic	Electronic: regular
Switch type	Two-wire contactless crystal type
Suitable load	DC24V relay, PLC
Working voltage	10~30V DC
Maximum switching current	100mA Max
Maximum switching capacity	3W Max
Internal consumption current	6 μ A Max. @24V
Residual pressure	2.65V Max@50mA
Leakage current	40 μ A Max. @28V
Indicator	Red LED
Cable	2.8 ϕ , 2C, grey oil-resistant TPU
Sensitivity	25~1000G
Maximum switching frequency	1000Hz
Working temperature	-10~70° C
Impact resistance	50G
Vibration resistance	9G
Degree of protection	IP67 (EN6052)
Circuit protection	Protection of sudden wave absorption
Model	MR-70

Dimensions(Unit:mm)



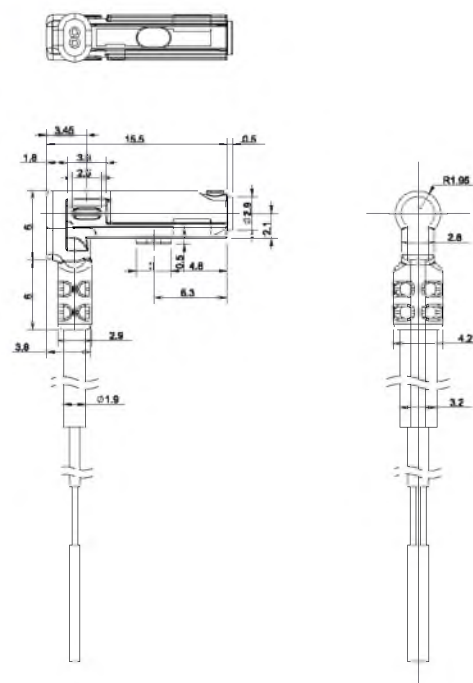
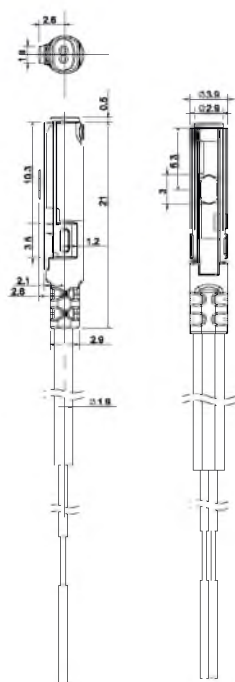
Circuit diagram



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

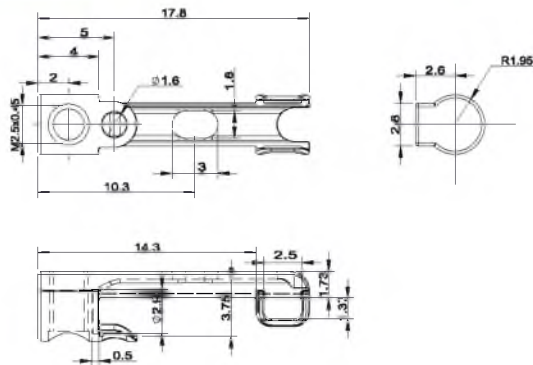
Guidance

Magnetic
Magnetic sensors
High-precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High-precision
composite magnets
Mounting accessories

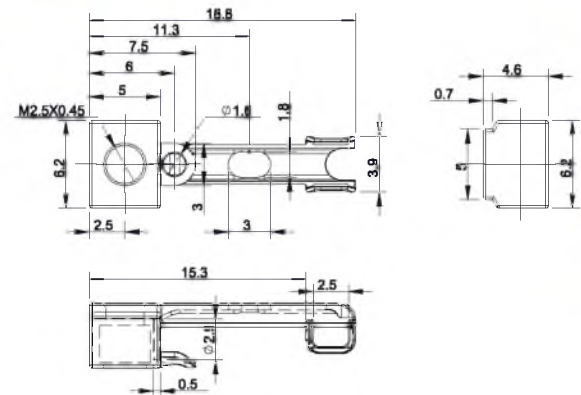


Accessories:

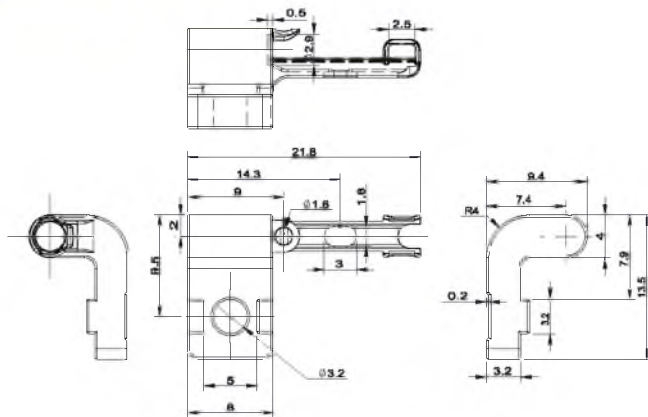
C shaped slot



T shaped slot

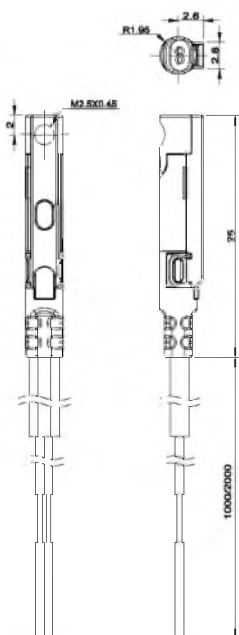


External usage

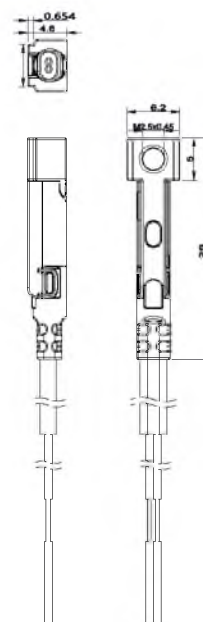


Straight combination:

MR-C1-H-C



MR-C1-H-T



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic**
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Magnetic
- Magnetic sensors
- High precision cylinder
- Combined cylinder**
- Near iron sensor
- Door sensors
- Linear sensors
- Ordinary magnets
- High precision composite magnets
- Mounting accessories

Magnetic Proximity Sensors

Magnetic

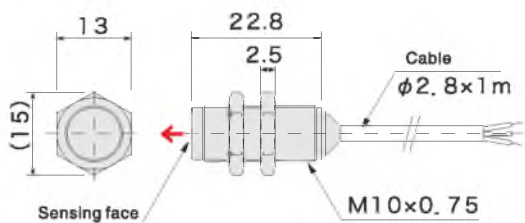


Appearance		
Features		Threaded metal case, water-tolerant
Operating voltage		5~24V DC
Max. Sensing distance	Iron wire ϕ 1	1.0
	High-speed steel drill ϕ 2	2.0
	Square iron 20X11	2.4
Output type		NPN (N.O.) (when approaching On) model number that ends with a 'B' (when approaching OFF)
Output current		$\leq 15\text{mA}$
Current consumption		$\leq 15\text{mA}$
Voltage resistance		AC 1000V 1min
Insulation resistance		250V DC $\geq 20\text{M}\Omega$
Ambient temperature		-20~+85°C, No freezing
Ambient humidity		20~95% RH, No condensation
Motion indicator		Approx 100mm away from the main body
Material		SUS303
Connection		M10 screw, tightening torque 12N · m
Degree of protection		IP67
Model NO.	Normally open, no LED indicator	MR-F11
	Normally open, with LED indicator	MR-F11-LED
	Normally closed, no LED indicator	MR-F11-B
	Normally closed, with LED indicator	MR-F11-B-LED

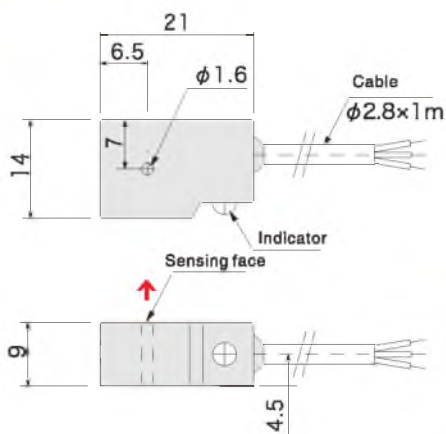


Appearance		
Features		Both sensing faces on the top and bottom is useful
Operating voltage		5~24V DC
Max. Sensing distance	Square iron 30X110	6.0
	Square iron 30X12	4.0
Output type		NPN (N.O.) (when approaching ON), model number that ends with a 'B'
Output current		$\leq 15\text{mA}$
Current consumption		$\leq 15\text{mA}$
Withstand voltage		AC 1000V 1min
Insulation resistance		250V DC $\geq 20\text{M}\Omega$
Ambient temperature		-20~+85°C, No freezing
Ambient humidity		20~80% RH, No condensation
Motion indicator		Approx. 100mm distance from main body
Material		GF reinforced PBT
Connection		M3 screw, tightening torque 0.3N · m
Degree of protection		IP65
Model NO.	Normally open	MR-F2
	Normally closed	MR-F2-B

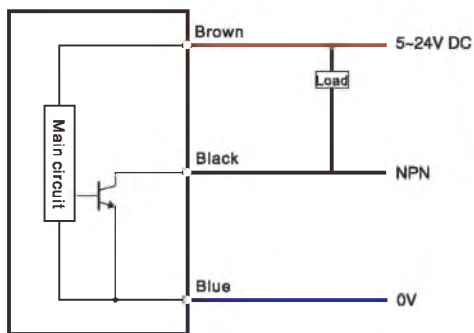
MR-F11



MR-F2



Circuit diagram



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic**
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Magnetic**
- Magnetic sensors
- High precision cylinder
- Combined cylinder
- Non-contact sensor**
- Door sensors
- Linear sensors
- Ordinary magnets
- High precision composite magnets
- Mounting accessories

Door Sensors

Upward Detection



Appearance

Sensing distance	15mm	
Operating voltage	5~24V DC	
Output type	NPN (N.O.) (when approaching ON) model number that ends with a 'B' (when approaching OFF)	
Output current	≤15mA	≤80mA
Current consumption	≤15mA	
Response time	5 μs	
Withstand voltage	AC 1000V 1min	
Insulation resistance	250V DC ≥ 20M Ω	
Ambient temperature	-20~+85℃, No freezing	
Ambient humidity	20~95%RH, No condensation	
Material	GF reinforced PBT(black)	
Connection	M3 screw tightening torque 0.8N · m	
Degree of protection	IP67	
Model NO.	Normally open	MR-D2 MR-D2P
	Normally closed	MR-D2PB

(Matching magnet)

MR-DM2

Sideway Detection



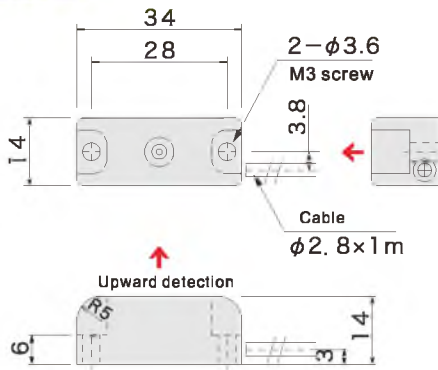
Appearance

Sensing distance	12mm	
Operating voltage	12~24V DC	
Output type	NPN (N.O.) (when approaching ON) model number that ends with a 'B' (when approaching OFF)	
Output current	≤80mA	≤80mA
Current consumption	≤15mA	≤80mA
Response time	5 μs	
Withstand voltage	AC 1000V 1min	
Insulation resistance	250V DC ≥ 20M Ω	
Ambient temperature	-20~+85℃, No freezing	
Ambient humidity	20~95%RH, No condensation	
Material	GF reinforced PBT	
Cable specification	N.O.: Grey N.C.: Black	
Connection	M3 screw tightening torque 0.8N · m	
Degree of protection	IP67	
Model NO.	Normally open	MR-D2X MR-D2XP
	Normally closed	MR-D2XPB

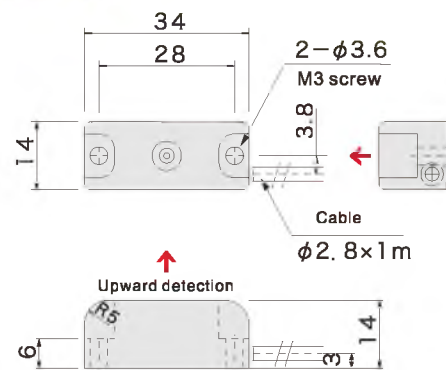
(Matching magnet)

MR-DM2X

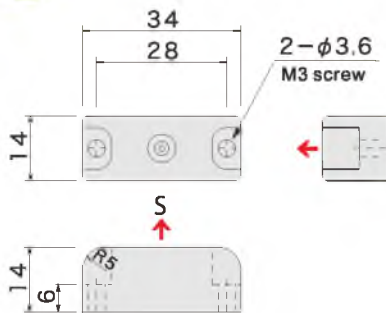
MR-D2



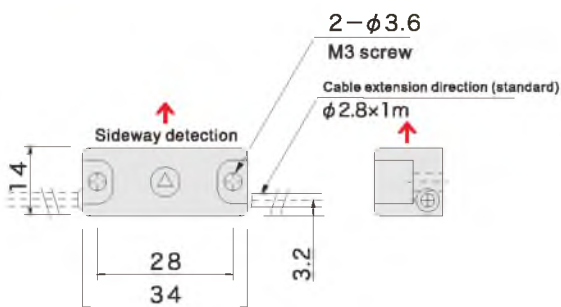
MR-D2P/D2PB



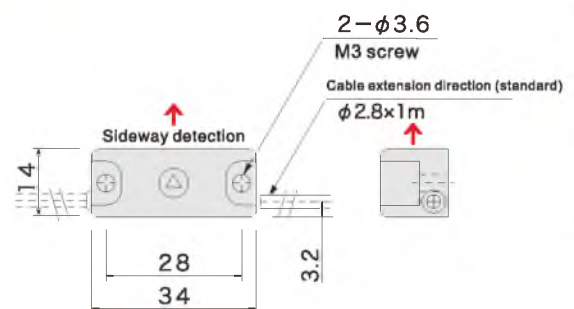
MR-DM2



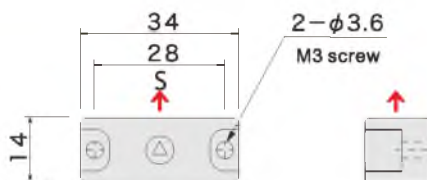
MR-D2X



MR-D2XP/D2XPB



MR-DM2X



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic**
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

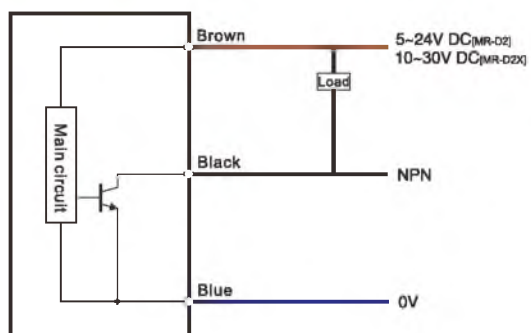
Guidance

- Magnetic**
- Magnetic sensors
- High precision cylinder
- Combined cylinder
- Near iron sensor
- Door sensors**
- Linear sensors
- Ordinary magnets
- High precision composite magnets
- Mounting accessories

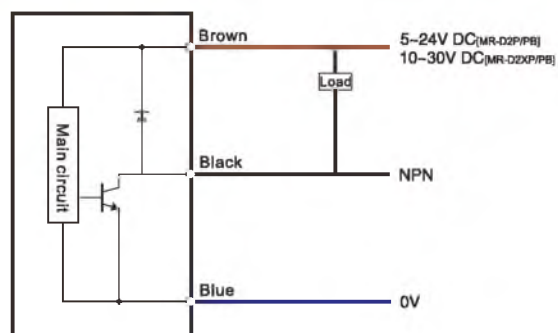
Door Sensors

Circuit diagram

MR-D2/D2X



MR-D2P(PB)/D2XP(PB)



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Magnetic

Magnetic sensors

High precision cylinder

Combined cylinder

Near iron sensor

Door sensors

Linear sensors

Ordinary magnets

High precision composite magnets

Mounting accessories



Appearance

Operating voltage	5V DC
Magnetic sensitivity	65mV/mT (Center value)
Output voltage	0.3→4.7V (-40→+40mT): (Center value)
Center voltage	2.5V ± 0.15V
Output current	≤ ± 12mA
Current consumption	12mA
Response time	5 μs (100kHz)
Magnetic sensitivity temperature coefficient	0 ± 0.04 %/°C
Center voltage temperature coefficient	0 ± 0.5mV/°C
Ambient temperature	-20°C ~ +85°C
Ambient humidity	20~95% RH
Cable length	0.3m
Material	GF reinforced PBT (Orange)
Connection	M2 screw, tightening torque 0.15N · m
Cable specification	3pcs φ 0.9 core cable, 0.3m
Degree of protection	IP 65
Model NO.	Upward detection MR-L4
	Sideway detection MR-L4-H



Appearance

Operating voltage	5V DC
Magnetic sensitivity	65mV/mT (Center value)
Output voltage	0.3→4.7V (-40→+40mT): (Center value)
Center voltage	2.5V ± 0.15V
Output current	≤ ± 12mA
Current consumption	12mA
Response time	5 μs (100kHz)
Magnetic sensitivity temperature coefficient	0 ± 0.04 %/°C
Center voltage temperature coefficient	0 ± 0.5mV/°C
Ambient temperature	-20°C ~ +85°C
Ambient humidity	20~95% RH
Cable length	1m
Material	SUS303
Connection	M3 screw, tightening torque 0.15N · m
Degree of protection	IP 65
Model NO.	MR-L10X

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Magnetic

Magnetic sensors

High precision cylinder

Combined cylinder

Near iron sensor

Door sensors

Linear sensors

Ordinary magnets

High precision composite magnets

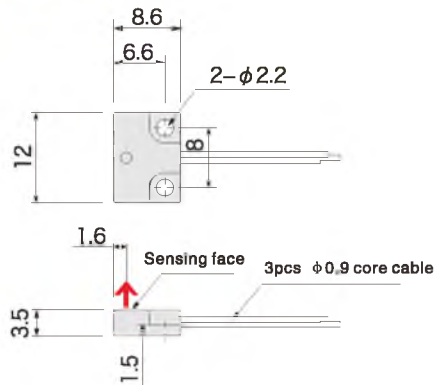
Mounting accessories

Linear Sensors

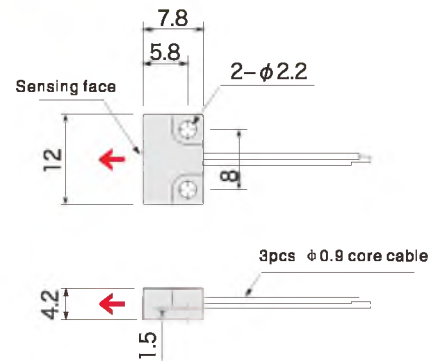
Dimensions(Unit:mm)

Magnetic

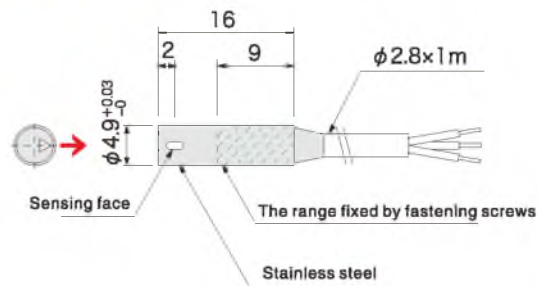
MR-L4



MR-L4-H



MR-L10X



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Magnetic

Magnetic sensors

High precision cylinder

Combined cylinder

Near iron sensor

Door sensors

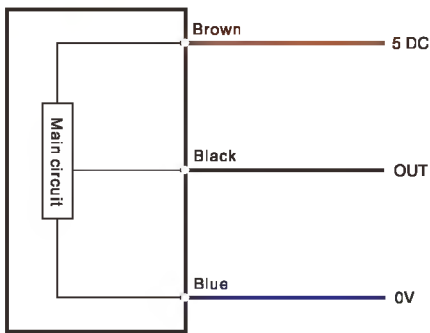
Linear sensors

Ordinary magnets

High precision composite magnets

Mounting accessories

MR-L4

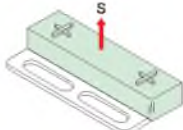
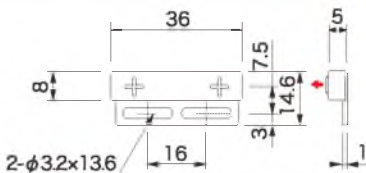
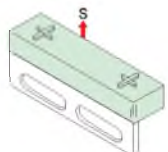
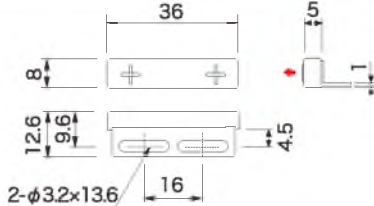
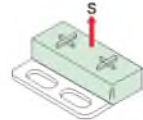
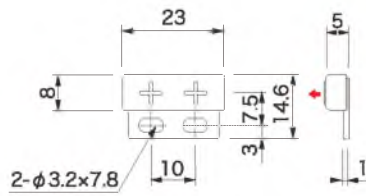
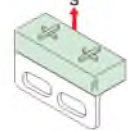
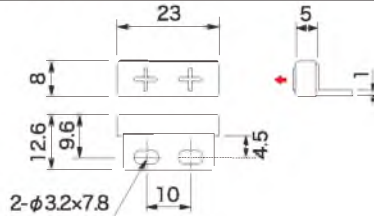
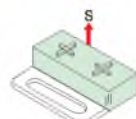
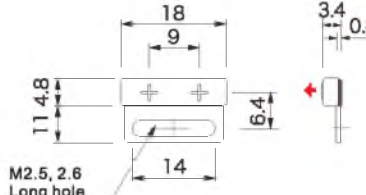
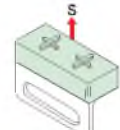
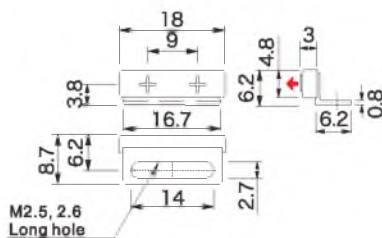
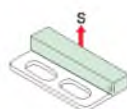
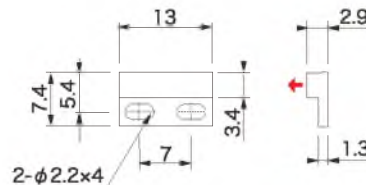
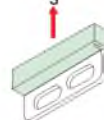
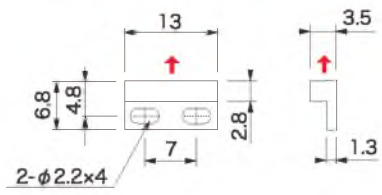
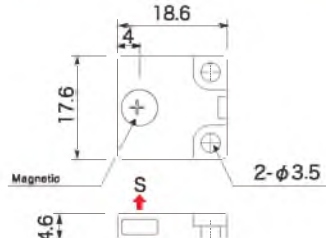
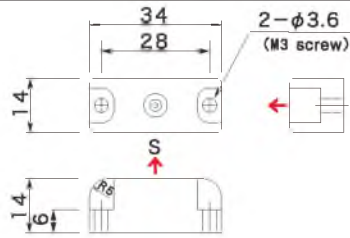
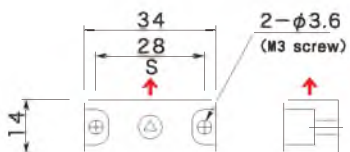
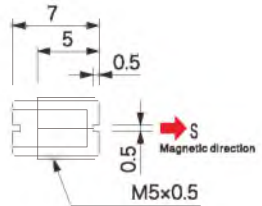
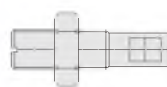
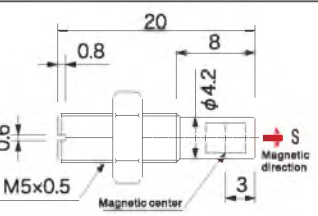
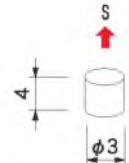
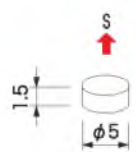


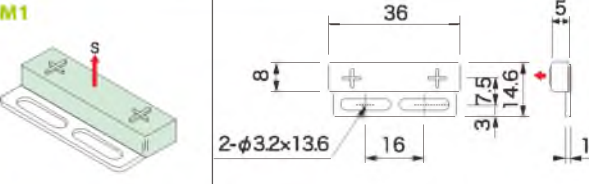
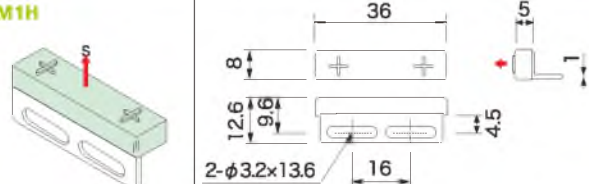
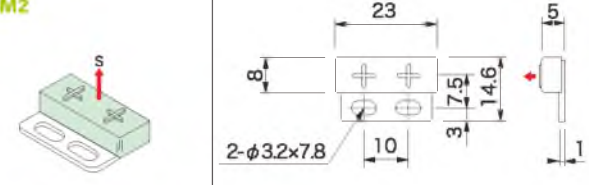
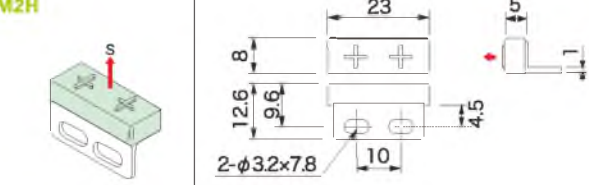
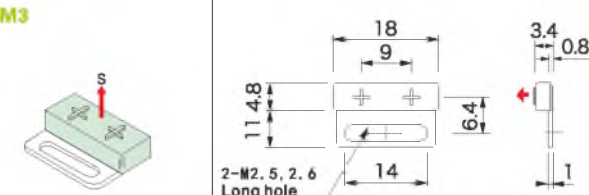
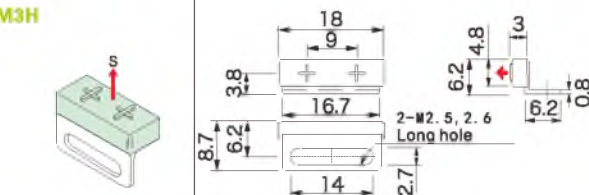
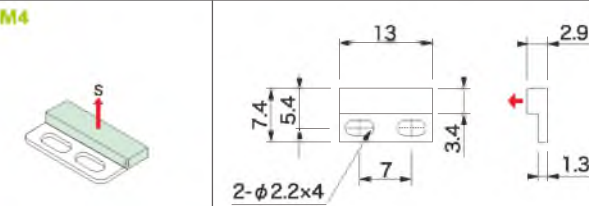
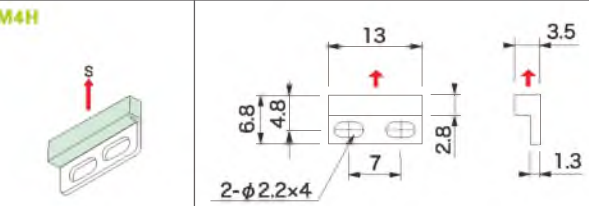
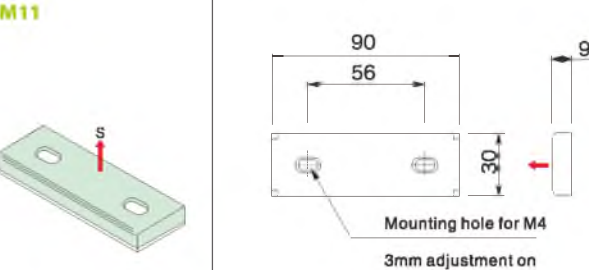
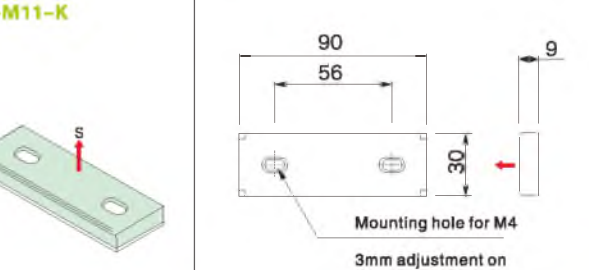
Fiber Optic
Slot Sensors
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Accessories

Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

Ordinary Magnets

Model No.	Dimensions (Unit:mm)	Model No.	Dimensions (Unit:mm)
MR-M1K 	 2-$\phi 32 \times 13.6$	MR-M1KH 	 2-$\phi 32 \times 13.6$
MR-M2K 	 2-$\phi 3.2 \times 7.8$	MR-M2KH 	 2-$\phi 3.2 \times 7.8$
MR-M3K 	 M2.5, 2.6 Long hole	MR-M3KH 	 M2.5, 2.6 Long hole
MR-M4K 	 2-$\phi 2.2 \times 4$	MR-M4KH 	 2-$\phi 2.2 \times 4$
MR-M9K 	 Magnetic	MR-M2 	 2-$\phi 3.6$ (M3 screw)
MR-M2X 	 2-$\phi 3.6$ (M3 screw)	MR-M10S 	 Magnetic direction
MR-M10L 	 Magnetic center	MR-M304 	
MR-M5015 			

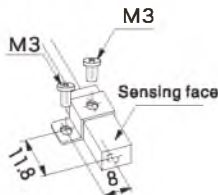
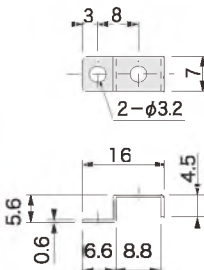
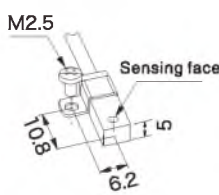
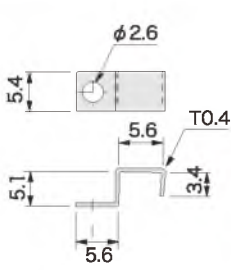
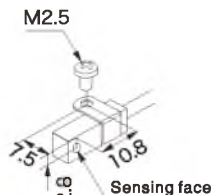
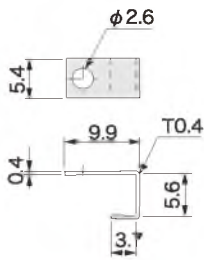
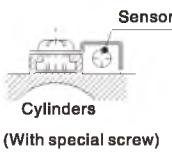
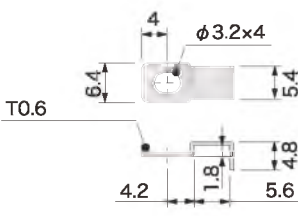
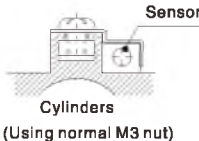
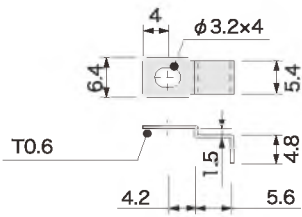
Model No.	Dimensions (Unit:mm)	Model No.	Dimensions (Unit:mm)
MR-M1		MR-M1H	
MR-M2		MR-M2H	
MR-M3		MR-M3H	
MR-M4		MR-M4H	
MR-M11		MR-M11-K	

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Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

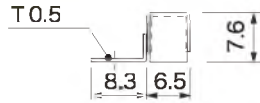
Mounting Accessories

Model No.	Dimensions (Unit:mm)	Model No.	Dimensions (Unit:mm)
HP2-1 		HP3-1 	
HP3-2 		HP3-3 	
HP3-4 			

Appearance and mounting

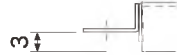
Dimensions(Unit:mm)

HP12-0



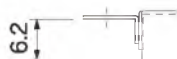
*Mounting deviation: None

HP12-3



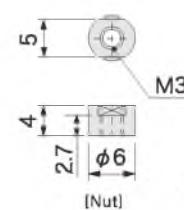
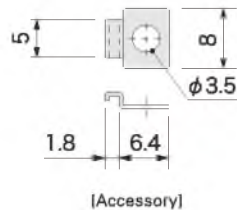
*Mounting deviation: 3mm

HP12-6.2

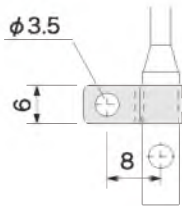


*Mounting deviation: 6.2mm

HP12-t

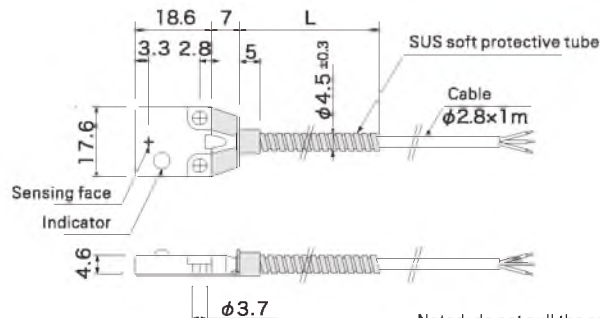


With special screw
*Used for Pneumatic fingers



Mounting accessories:
-BT: cable protective tube

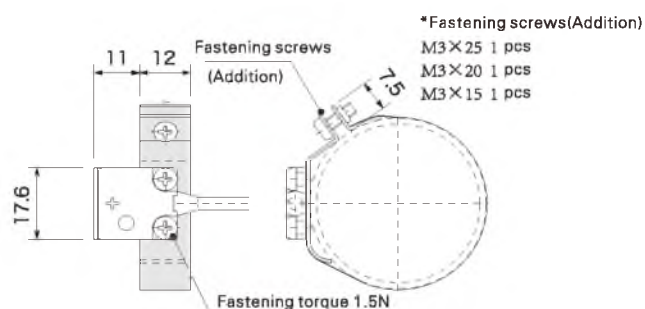
- Extremely strong, even being stomped on the ground, SUS304 soft protective tube
- Can be used in rough environments, such as dust, oil, water, and light, very robust



Noted: do not pull the cable with force more than 10N.

Mounting accessories:
-BD: belt shaped mounting accessories

- Fastening with stainless steel belt shaped accessories.
- Even with huge vibration or shock, it will stay fixed.
- Suitable for normal tube shaped cylinders with inner diameter $\phi 32\sim 100$.



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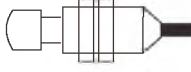
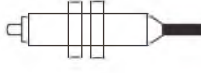
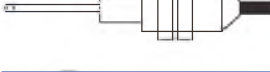
Guidance

Magnetic
Magnetic sensors
High precision cylinder
Combined cylinder
Near iron sensor
Door sensors
Linear sensors
Ordinary magnets
High precision composite magnets
Mounting accessories

High Accuracy Contact Sensors



- ◉ Magnetic detection principle, reliable performance, high durability.
- ◉ Repeat accuracy up to 0.001mm .
- ◉ With high precision spring; Min. detected operating force 0.3N.
- ◉ Customization is available as requested.
- ◉ One sensor can detect 4 action points simultaneously.

Appearance	Position Repeat Accuracy	Size	Range	Operating Force	Main Model No.	Pages
	± 0.001mm	M8X24	1.5mm	0.3N	MR-T8	H-03
	± 0.001mm	M8X35	3mm	0.6N	MR-T8A (HOT)	
	± 0.001mm	M8X38.2	3mm	0.6N	MR-T8B (HOT)	
	± 0.001mm	M8X39	3mm	0.6N	MR-T8P	
	± 0.001mm	M6X21	1.2mm	0.3N	MR-T6 (HOT)	
	± 0.001mm	M10X27	3mm	1N	MR-T10	
	± 0.01mm	M10X21.2	1mm	H:5N J:0.5N	MR-T10B	
	± 0.001mm	M14X37	6mm	0.5~1.5N	MR-T5Z	H-04
	± 0.01mm	φ 14X80.5	5mm	H:2N J:0.8N	MR-T1X	
	± 0.01mm	M6X25	1.2mm	0.3N	MR-T6N	
	± 0.01mm	26X55	360° direction: 3±0.5mm	H:3N J:0.5N	MR-T4X	
	± 0.01mm	φ 12X12.9	1mm	H:7N J:0.5N	MR-T12B	
	± 0.002mm	Leverage: 18X7.4X15.7 Button: 10.4X7.4X14.9	...	Leverage: 0.3N Button: 0.6N	MR-T1QA	
	± 0.01mm	21X22	8mm	0.8N	MR-T93Q	

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Contact
Contact

Contact

Contact



Appearance

Main Model No.	MR-T8	MR-T8A	MR-T8B	MR-T8P
Operating voltage	5~24V DC			
Position repeat accuracy	±0.001mm			
Range	1.5mm		3mm	
Operating force	0.3N		0.6N	
PT	0.4~0.7mm			
MD	<0.1mm			
Action frequency	120 times/min			
Output type	NPN NO/NC selectable			
Output current	No indicator: ≤ 15mA, with indicators: ≤ 12mA			
Current consumption	No indicator: ≤ 15mA, with indicators: ≤ 12mA			
Withstand voltage	AC1000V 1min			
Insulation strength	250V DC ≥20MΩ			
Ambient temperature	-20℃~+85℃, No freezing			
Ambient humidity	20%~95%RH, No condensation			
Housing, nuts and shaft material	SUS303			
Indicator	Approx 100mm away from the main body			
Mounting	With M8 nuts, tightening torque 5N·m			
Degree of protection	IP67			
Connection	1M 3core cable			
Model No.	MR-T8- Action Null: OFF→ON B: ON→OFF Indicator on cables Null: No indicator LED: With indicators	MR-T8A- Action Null: OFF→ON B: ON→OFF Indicator on cables Null: No indicator LED: With indicators	MR-T8B- Action Null: OFF→ON B: ON→OFF Protective head Null: Stainless steel TX: Ceramic	MR-T8P- Action Null: OFF→ON B: ON→OFF



Appearance

Main Model No.	MR-T6	MR-T10	MR-T10B
Operating voltage	5~24V DC		
Position repeat accuracy	±0.001mm		
Range	1.2mm	3mm	1mm
Operating force	0.3N	1N	H: 5N, J: 0.5N
PT	0.4~0.7mm	0.4±0.15mm~2.0±0.15mm	0.3~0.6mm
MD	<0.1mm		
Action frequency	120 times/min	<60 times/min	120 times/min
Output type	NPN NO/NC selectable		
Output current	No indicator: ≤ 15mA, with indicators: ≤ 12mA		
Current consumption	No indicator: ≤ 15mA, with indicators: ≤ 12mA		
Withstand voltage	AC1000V 1min		
Insulation strength	250 V DC ≥20MΩ		
Ambient temperature	-20~+85℃, No freezing		
Ambient humidity	20~95%RH, No condensation		
Housing, nuts and shaft material	SUS303		
Indicator	Approx 100mm away from the main body		
Mounting	With M6 nuts, tightening torque 2N·m	With M10 nuts, tightening torque 12N·m	
Degree of protection	IP67		IP65
Connection	1M 3 core cable		
Model No.	MR-T6- Action Null: OFF→ON B: ON→OFF Indicator on cables Null: No indicator LED: With indicators	MR-T10- Built-in sensors S: Single output D: Dual output Action Null: OFF→ON B: ON→OFF	MR-T10B- Action Null: OFF→ON B: ON→OFF Operating force H: 5N J: 0.5N Indicator on cables Null: No indicator LED: With indicators

Appearance				
	Up to 4 action points available			360° degree detection
Main Model No.	MR-T5Z	MR-T1X	MR-T6N	MR-T4X
Operating voltage	5~24V DC			
Position repeat accuracy	±0.001mm		±0.01mm	
Range	6mm	5mm	1.2mm	Direction:360° 3±0.5mm
Operating force	0.5~1.5N	H: 2N, J: 0.8N	0.3N	H: 3N, J: 0.5N
PT	0.1~0.4mm	.....	0.4~0.7mm	.....
OP	.....	2±0. 5mm	.....	1. 5±0. 5mm
MD	<0.08mm		<0.1mm	
Action frequency	120 times/min			
Output type	NPN (NO)		NPN NO/NCselectable	
Output current	No indicator: ≤ 15mA, with indicators: ≤ 12mA			
Current consumption	No indicator: ≤ 15mA, with indicators: ≤ 12mA			
Withstand voltage	AC1000V 1min			
Insulation strength	250 V DC ≥20MΩ			
Ambient temperature	-20℃~+85℃, No freezing			
Ambient humidity	20%~95%RH, No condensation			
Units of sensors	1~4		.....	
Material	Rubberprotectivetube: NBR; housing&nuts:SUS3003	SUS303		Housing: cast Zinc alloy; ball handle: black phenolic
indicator	Approx 100mm away from the main body			
Mounting	With M14 nuts, tightening torque 18N・m	.....	With M6 nuts, tightening torque 2N・m	.....
Degree of protection	IP65			
Connection	1 M 3core cable			
Model No.	MR-T5Z- 	MR-T1X- 	MR-T6N- 	MR-T4X- 
	The shape of contact position S: SUS ball C: Super-hard ball	Units of sensors 1~4	Operating force H: 2N J: 0.8N	Indicator on cables Null:No indicator LED:With indicators
			Action Null:OFF→ON B:ON→OFF	NT(mm) 40,60,80,100
			Indicator on cables Null:No indicator LED:With indicators	Operating force H: 2N J: 0.8N
				Indicator on cables Null:No indicator LED:With indicators

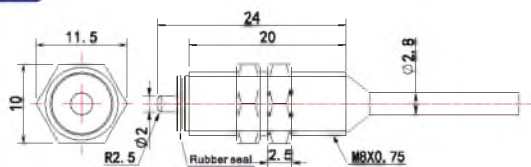
Appearance	Small tightening torque		
Main Model No.	MR-T12B	MR-T1QA	MR-T93Q
Operating voltage	5~24V DC		
Position repeat accuracy	±0.01mm	±0.002mm	±0.01mm
Range	1mm	0.7mm	8mm
Operating force	H: 7N, J: 0.5N	Leverage: 0.3N; Button: 0.6N	0.8N
PT	0.3~0.6mm	0.1~0.4mm	0.3~0.8mm
MD	<0.1mm		
Action frequency	120 times/min		
Output type	NPN NO/NC selectable		
Output current	No indicator: ≤15mA, with indicators: ≤12mA		MR-T93Q: ≤80mA; MR-T93Q-E: ≤15mA
Current consumption	No indicator: ≤15mA, with indicators: ≤12mA		
Withstand voltage	AC1000V 1min		
Insulation strength	250V DC ≥20MΩ		
Ambient temperature	-20℃~+85℃, No freezing		
Ambient humidity	20%~95%RH, No condensation		
Material	SUS303	Housing; heat resistant ABS; rubber seal: NBR	Axis: SUS303; Housing: Glass FB reinforced PBT
Indicator	Approx 100mm away from the main body	.....	MR-T93Q: Red; MR-T93Q-E: Null
Mounting	.....	.....	M3 nuts, tightening torque 0.3N·m
Degree of protection	IP65		
Connection	1M 3core cable		
Model No.	MR-T12B- 	MR-T1QA-B-J ¹ MR-T1QA-H ²	MR-T93Q- 
	Action Null: OFF→ON B: ON→OFF	Operating force H: 7N J: 0.5N	Output current Null: 80mA E: 15mA
		Indicator on cables Null: No indicator LED: With indicators	Action Null: OFF→ON B: ON→OFF

1: MR-T1QA-B-J: indicates action ON → OFF; low operating force;
2: MR-T1QA-H: indicates action OFF → ON; operating force standard;

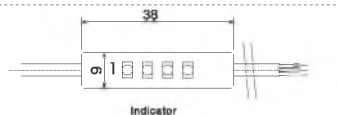
Contact

Dimensions(Unit:mm)

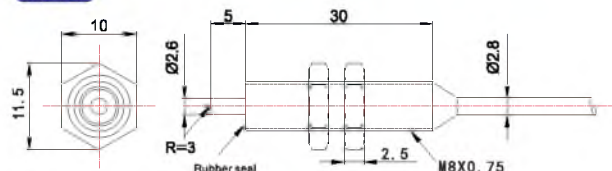
MR-T6



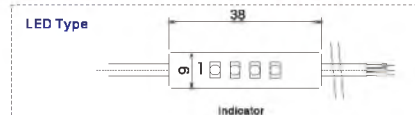
LED Type



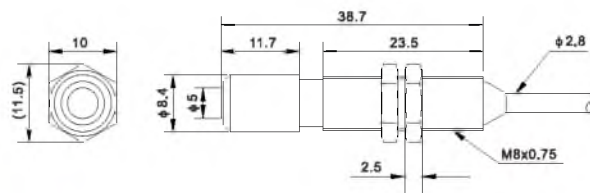
MR-T8A



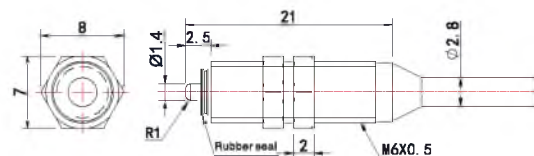
LED Type



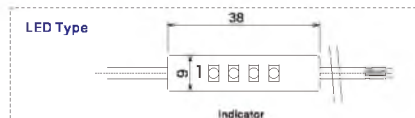
MR-T8B



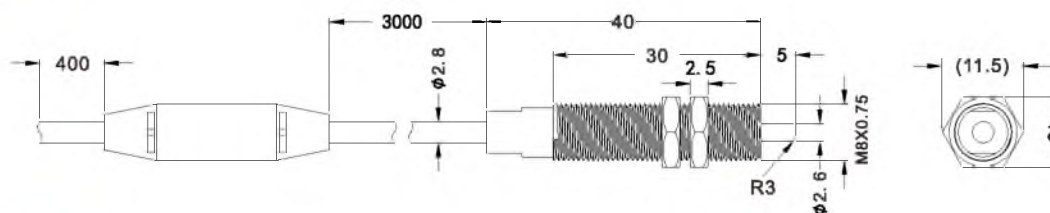
MR-T6



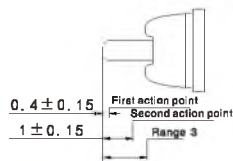
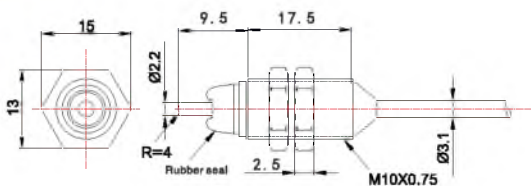
LED Type



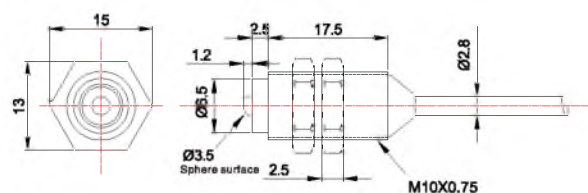
MR-T8F



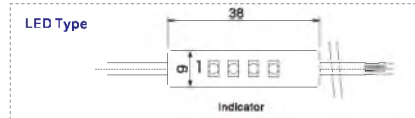
MR-T10



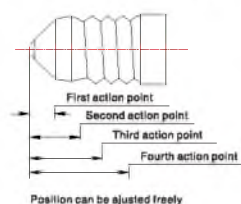
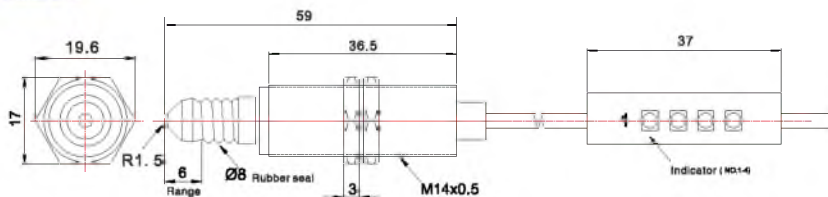
MR-T10B



LED Type

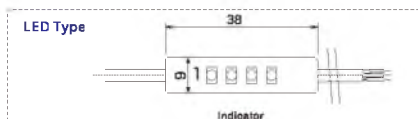
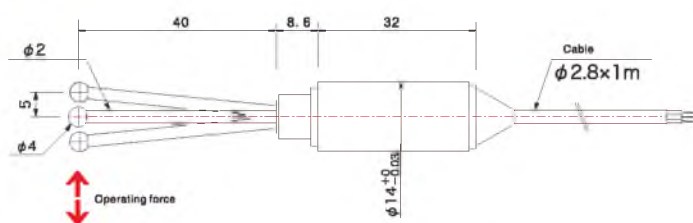


MR-T5Z

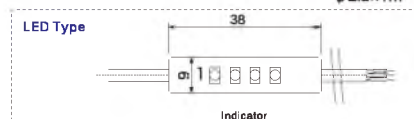
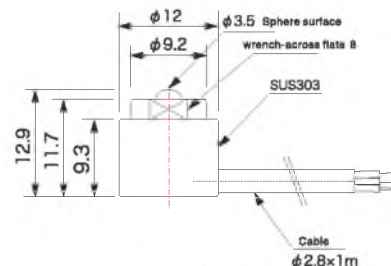


Position can be adjusted freely

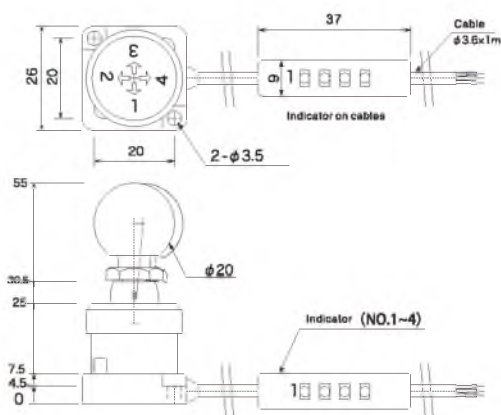
MR-T1X



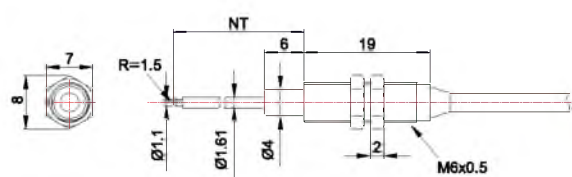
MR-T12B



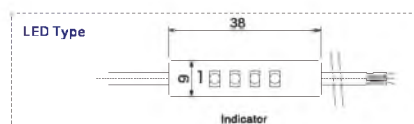
MR-T4X



MR-T6N

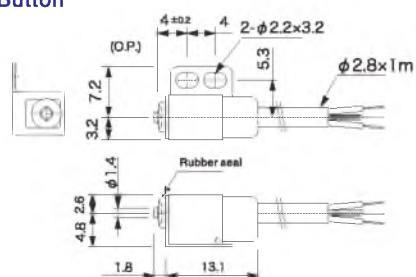


Noted : NT=40/60/80/100

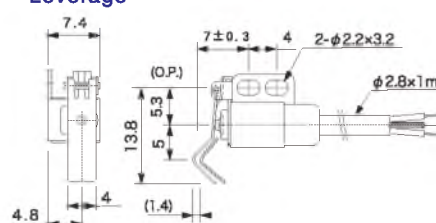


MR-T1QA

Button

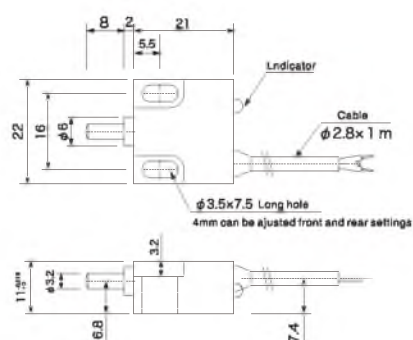


Leverage

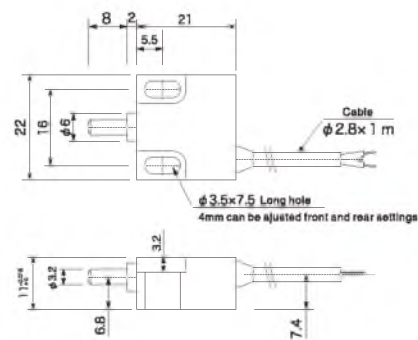


MR-T93Q

With Light



Without Light



- | |
|-----------------|
| Fiber Optic |
| Slot Sensors |
| Photoelectric |
| Laser |
| Proximity |
| Displacement |
| Magnetic |
| Contact |
| Area |
| Ultrasonic |
| Vision |
| Code Readers |
| Vibration |
| Temperature |
| Accessories |
| Guidance |

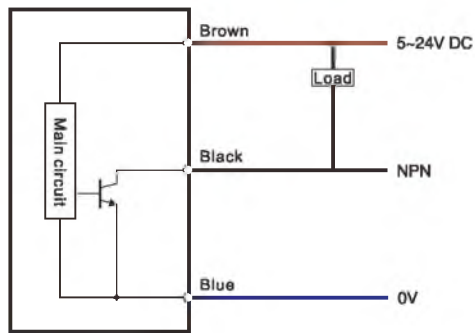
- Contact**

Contact

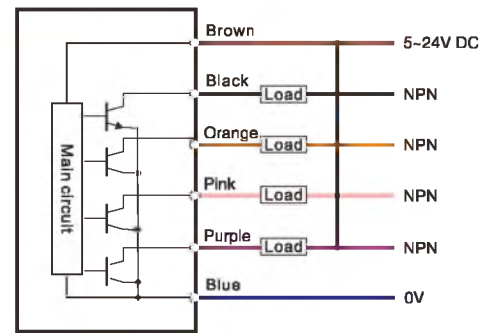
Circuit diagram

Contact

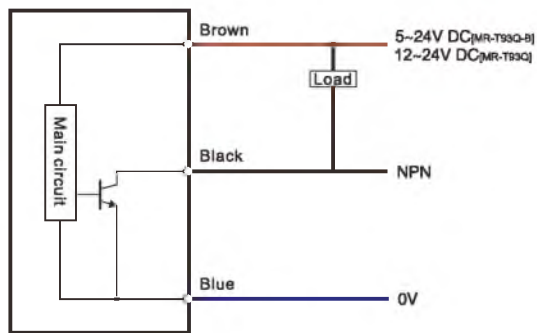
MR-T8(P)/T6/T10(B)/T1X/T6N/T12B/T1QA



MR-T5Z/T4X



MR-T93Q



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Contact

Contact

Laser Sensors



- ◎ The combination of laser source and CMOS can effectively resist to environmental influences
- ◎ Automatic light compensation technology, which can automatically adjust the threshold according to the change of the received light
- ◎ Response speed up to 0.25ms, which helps to detect fast moving objects
- ◎ Up to 6 teaching functions for option, which can easily solve various installation and debugging problems
- ◎ IP67 protection design prevents dust and moisture interference



NEW!



Not affected by background color



Square Type (ELB/ELC/ELE Series)

- Response time high up to 0.25ms, suitable for detecting fast moving objects
- Light spot diameter for thru-beam products is just 30mm(at 30m)
- Protection degree IP67

P.D-03

BGS Type (ELS/ELT Series)

- Free from the interference of objects and background colors, with stable detection
- Laser source, suitable for long distance detection of small objects
- Built-in rotational knobs with multiple turns to realize slight sensitivity adjustment

P.D-08

Transparent Objects Detection (ESQ Series)

- Automatically adjust threshold value according to the amount of lights
- Laser sources, suitable for detections of different glass or PET bottles
- Coaxial light source makes calibration more easy.

P.D-11

Appearance	Type	Sensing Distance		Model No.		Pages
				NPN Normally open & Normally closed	PNP Normally open & Normally closed	
 (Square)	Diffuse reflection	2~35cm		ELB-350N	ELB-350P	D-03
	Thru-beam	3000cm		ELC-TM30N	ELC-TM30P	D-05
	Retro-reflection	1000cm		ELC-RM10N	ELC-RM10P	
	Diffuse reflection	40cm		ELC-D40N	ELC-D40P	
 (Background suppression)	Diffuse reflection	1~15cm		ELE-B15N	ELE-B15P	D-06
	Diffuse reflection	40cm		ELE-D40N	ELE-D40P	
	Retro-reflection	500cm		ELE-RM05N	ELE-RM05P	
	Thru-beam	3000cm		ELE-TM30N	ELE-TM30P	
 (Background suppression)	Diffuse reflection	10~70cm	Long distance type	ELS-ZL70N	ELS-ZL70P	D-08
		1~30cm	Long distance type	ELS-ZL30N HOT	ELS-ZL30P	
		0.5~10cm	Short distance type	ELS-ZL10N	ELS-ZL10P	
		0~450cm	Long distance type	ELT-S450N	ELT-S450P	D-10
 (Transparent objects detection)	Retro-reflection (Coaxial beam)	150cm	High resolution type	ESQ-150N HOT	ESQ-150P	D-11
		400cm	Long distance type	ESQ-400N	ESQ-400P	

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Laser sensors

Square

BGS

Transparent objects detection

Square

ELB series

Laser

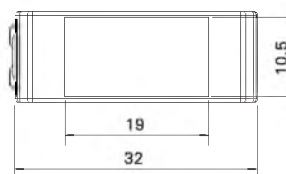
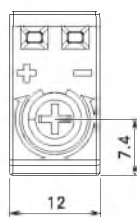
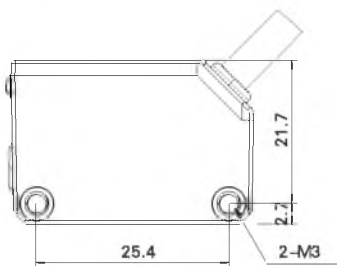


Appearance

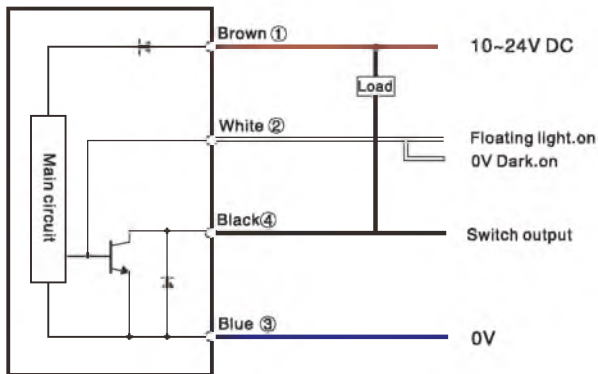
Sensing type	Diffuse reflection – background suppression
Setting distance	50–350mm
Sensing distance	20–350mm
Spot size	φ 1.5mm/350m
Minimum detectable object	φ 0.5mm
Switch type	L.on/D.on Switchable
Indicator	Output indicator: orange; laser indicator: green
Response time	≤0.3ms
Sensitivity adjustment	4–turn adjuster
Light source	Laser (650nm)
Laser class	Class1
Hysteresis range	Black and white equidistant within 250mm, the hysteresis range of 250–350mm is 5%
Light interference	Daylight: ≤5000Lux; ≤20000Lux,LED: ≤2000Lux
Operating Voltage	10~24V DC
Output mode	NPN or PNP open collector
Current consumption	≤20mA
Load current	≤100mA
Residual voltage	<1V
Circuit protection	Reverse connection protection, output overcurrent protection, interference light protection
Protection level	IP 66
Housing shell material	Shell: containing glass fiber ABS, lens: PMMA
Ambient temperature	–10℃~+70℃,No freezing
Ambient humidity	35%~85% RH ,No condensation
Vibration resistant	10~55Hz, Amplitude1.5mm, 2 hours each in X, Y and Z directions
Impact resistant	50G(500m/s2)
Insulation resistance	Between all power connection terminals and housing, 20MΩ or more (based on DC250V)
Accessories	Brackets, Screws
Model	NPN PNP
	ELB-350N ELB-350P

Dimensions

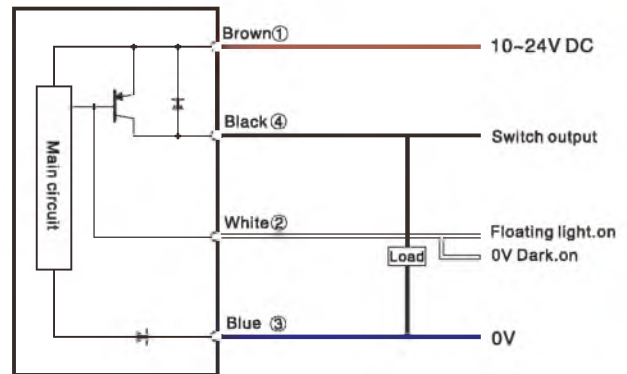
unit: mm



NPN Output



PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser**
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

Laser sensors

Square

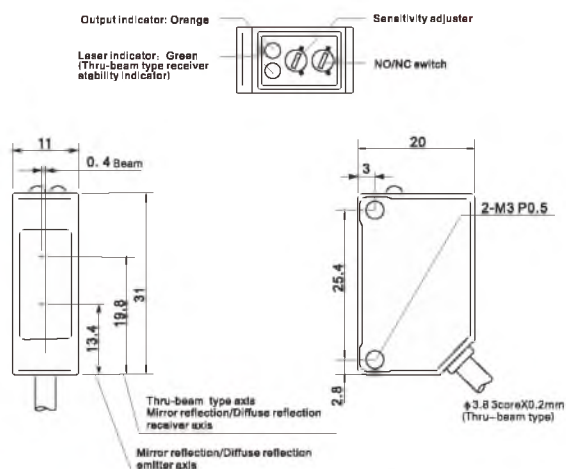
BGS

Transparent objects
detection

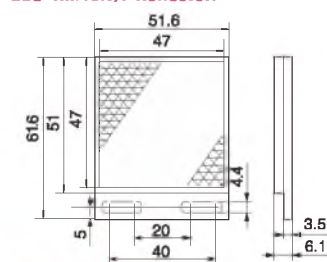


Sensing type		Thru-beam	Retro-reflection	Diffuse reflection
Sensing distance		30m	10m	40cm
Spot size		φ 30mm /30m	φ 10mm/ 10m	φ 2mm/40cm
Switch type		Selectable L.on/D.on		
Indicator		Laser indicator: Green; Output indicator: Yellow		
Response time		0.25 ms		
Sensitivity adjustment		Single-turn potentiometer		
Light source		Laser(650nm)		
Laser class		Class1	Class2	
Operating voltage		12~24V DC± 10%		
Current consumption		≤30mA	≤20mA	
Ambient temperature		-10℃~+50℃, No freezing		
Ambient humidity		35%~85%RH, No condensation		
Anti-vibration		10~55Hz Amplitude1.5mm		
Impact resistance		50G(500m/s²)		
Degree of protection		IP67		
Accessories		Bracket, screw	Bracket, screw, reflector	Bracket, screw
Model No.	NPN	ELC-TM30N	ELC-RM10N	ELC-D40N
	PNP	ELC-TM30P	ELC-RM10P	ELC-D40P

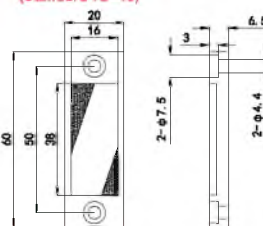
Unit: mm



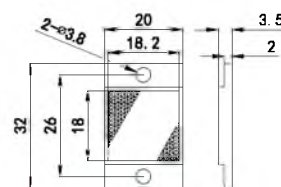
ELC-RM10N/P Reflector:



(Standard TD-13)

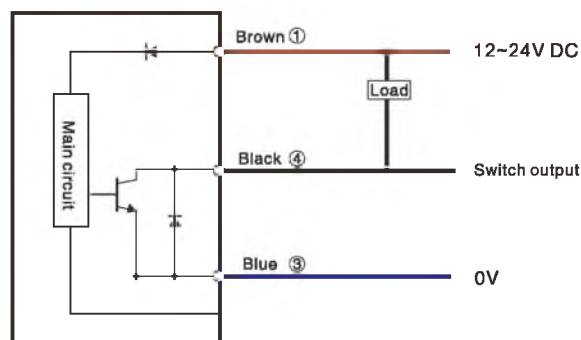


(Optional TD-14)

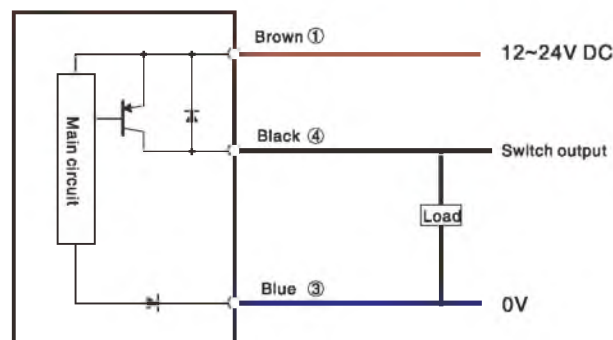


(Optional TD-15)

NPN Output



PNP Output





Economical Type

Appearance

Sensing distance	Diffuse reflection-BGS	Diffuse reflection	Retro-reflection	Thru-beam	
Detection distance	1-15cm	40cm	5m	30m	
Setting distance	2-15cm	-	-	-	
Spot diameter	± Ø1.5mm/15cm	± Ø1.5mm/40cm	± Ø20mm/5m	± Ø60mm/30m	
Hysteresis	≦5%SN	≦20%SN			
Indicator	Working indicator light: green; Action indicator: Red				
Sensitivity adjustment	6 circle potentiometer	Single coil potentiometer			
Output mode	NPN or PNP open collector				
Switch mode	L.on (light-in action)/D.on (light-shielding action) can be switched				
Response time	≦2ms				
light source	Laser 650nm (modulation) Class 2				
Working voltage	10~30V DC				
Voltage	<1.5V				
Current consumption	≦20mA				
Load current	≦100mA				
Ambient illuminance	Incandescent lamp: 3000 lux or less / Sunlight: 5000 lux or less				
Ambient temperature	-25℃~+55℃, no freezing				
Ambient humidity	35%~85%RH, no condensation				
Withstand voltage	±1000V 50/60Hz 60s				
Static electricity	±8000V(air discharge)				
Group pulse	±2000V (5kHz/50kHz)				
Anti-vibration	10-50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions				
Circuit protection	Power reverse polarity protection, output reverse polarity protection, surge protection, short circuit protection Power reverse polarity protection, surge protection, short circuit protection			Power reverse polarity protection, surge protection, short circuit protection	
Degree of protection	IP65				
Material	PBT + glass fiber (body), PMMA (lens)				
Connection	2M/3 core cable				
Accessories	Screwdriver				
Model No.	NPN	ELE-B15N	ELE-D40N	ELE-RM05N	ELE-TM30N
	PNP	ELE-B15P	ELE-D40P	ELE-RM05P	ELE-TM30P

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Laser sensors

Square

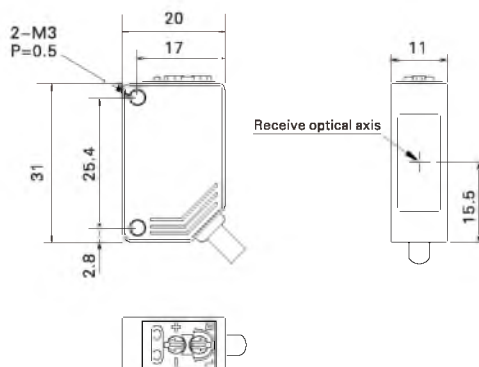
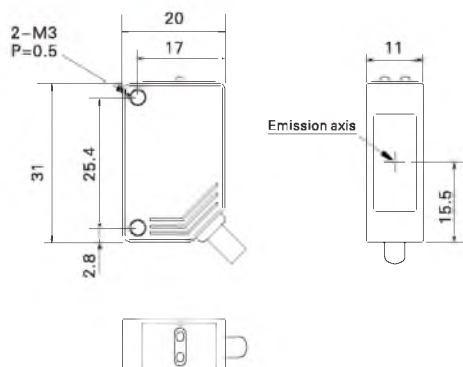
BGS

Transparent objects detection

Dimensions

Unit: mm

ELE-TM30N/P

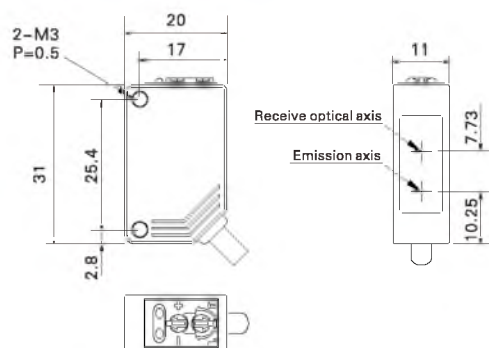


Square

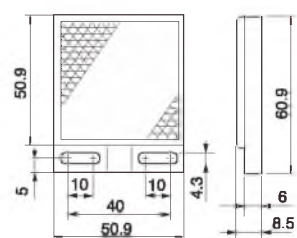
Dimensions

Unit: mm

ELE-B15N/P, ELE-D40N/P, ELE-RM05N/P



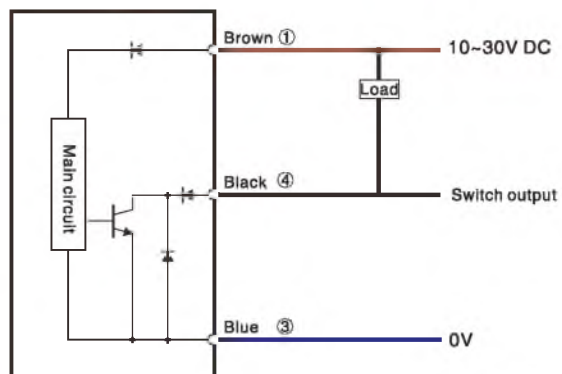
ELE-RM05 With reflector



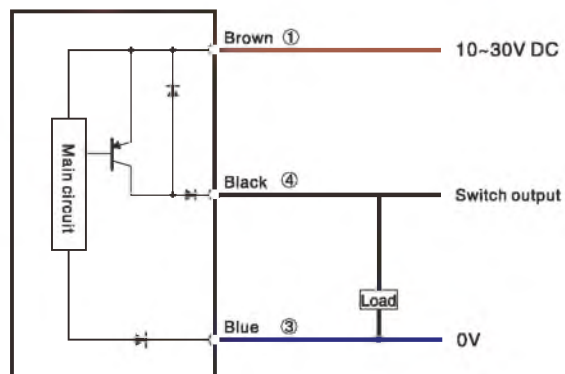
(Optional TD-11)

Circuit diagram

NPN Output



PNP Output



Laser

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Laser sensors

Square

BGS

Transparent objects
detection

Appearance

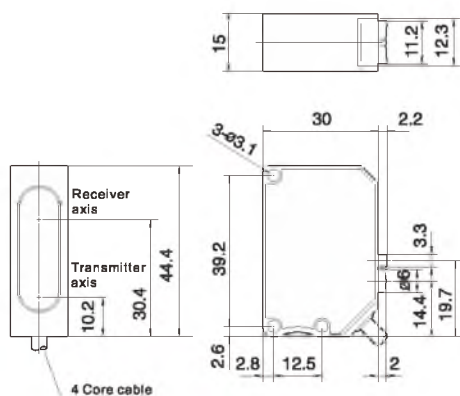


Type	Long distance type		Short distance type	
Sensing type	Diffuse reflection			
Setting distance	50~300mm		20~100mm	
Sensing distance	100~700mm	10~300mm	5~100mm	
Spot size	φ 6mm/200mm	φ 1.5mm/300mm	φ 1mm/100mm	
Switch type	Selectable L.on/D.on			
Indicator	Output indicator: Orange; Laser indicator: Green			
Response time	0.7 ms	0.3 ms		
Sensitivity adjustment	Four-turn potentiometer			
Light source	Laser(650nm)			
Laser class	Class2	Class1		
Operating voltage	10~30V DC± 10%			
Current consumption	35mA	≤30mA		
Ambient temperature	-10℃~+50℃, No freezing			
Ambient humidity	35%~85%RH, No condensation			
Impact resistance	50G(500m/s²)			
Degree of protection	IP67			
Material	Housing: ABS+ fiber glass; Lens: PMMA			
Accessories	None	Bracket,screws		
Model No.	NPN	ELS-ZL70N	ELS-ZL30N 	ELS-ZL10N
	PNP	ELS-ZL70P	ELS-ZL30P	ELS-ZL10P

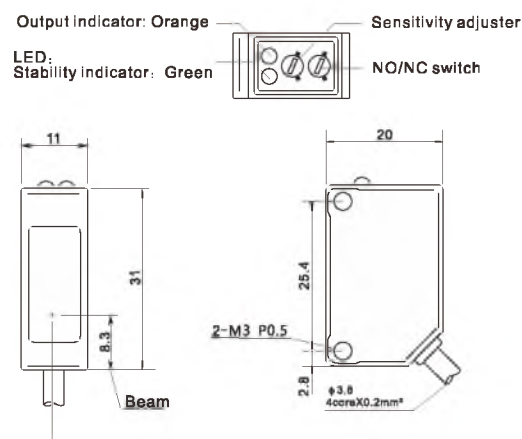
Dimensions

Unit: mm

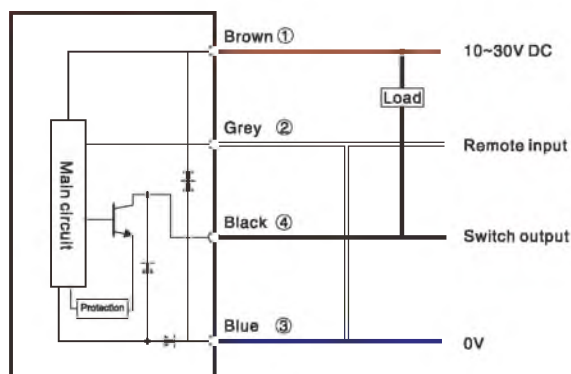
ELS-ZL70N(P)



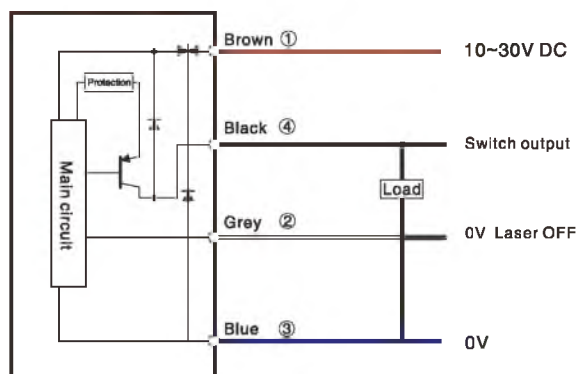
ELS-ZL30N(P)/ELS-ZL10N(P)



Circuit diagram

ELS-ZL30
NPN Output

PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Laser sensors

Square

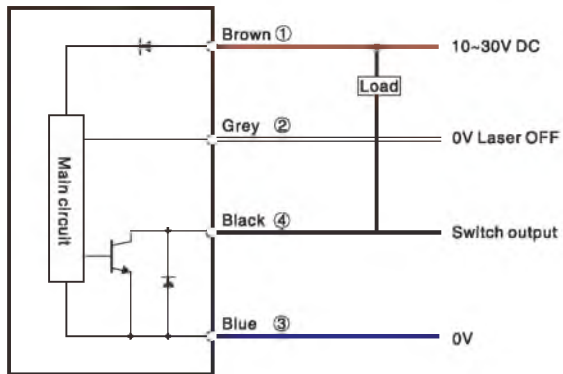
BGS

Transparent objects
detection

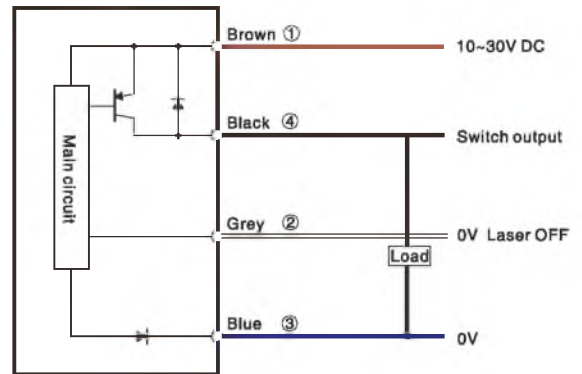
Circuit diagram

ELS-ZL70/ELS-ZL10

NPN Output



PNP Output





TOF Principle

Appearance

Type	Long distance
Sensing type	Diffuse reflection
Sensing distance	0~4.5m
Spot size	About $\phi 17\text{mm}$ (4.5m away)
Switch type	Selectable L.on/D.on
Indicator	Output indicator: Orange; Laser indicator: Green
Response time	$\leq 0.5\text{ms}$
Sensitivity adjustment	Four-turn potentiometer
Light source	Laser(650nm)
Laser class	Class1
Operating voltage	10~30V DC $\pm 10\%$
Current consumption	$\leq 85\text{mA}$
Ambient temperature	$-10^{\circ}\text{C}\sim+50^{\circ}\text{C}$, No freezing
Ambient humidity	35%~85%RH, No condensation
Impact resistance	50G(500m/s ²)
Degree of protection	IP67
Material	Housing: ABS+ fiber glass; Lens PMM
Model No.	NPN ELT-S450N
	PNP ELT-S450P

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

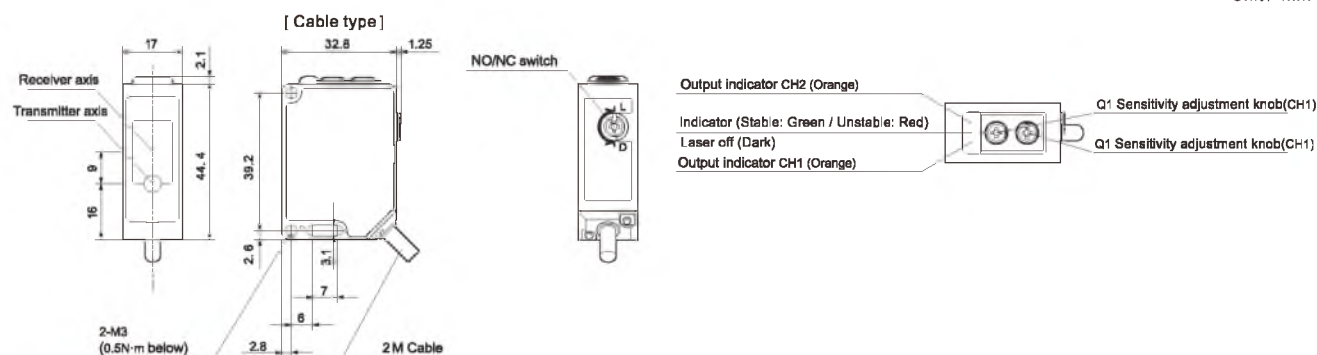
Vibration

Temperature

Accessories

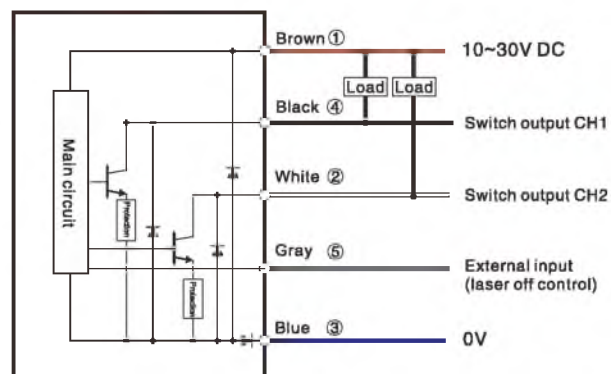
Dimensions

Unit: mm

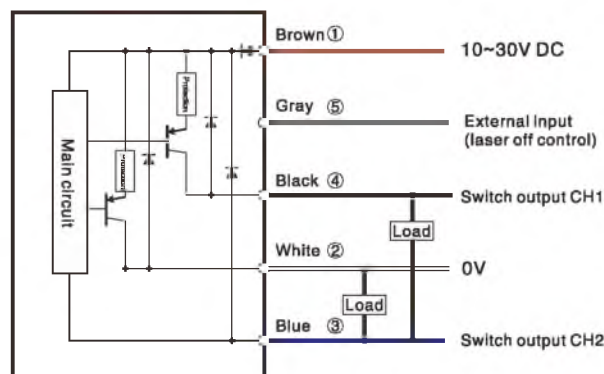


Circuit diagram

NPN Output



PNP Output

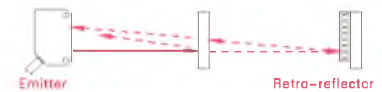


Transparent Objects Detection

ESQ Series

Laser

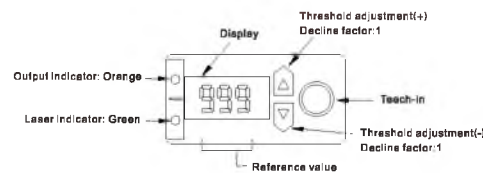
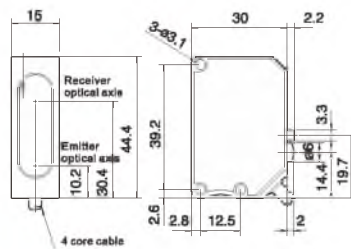
Appearance



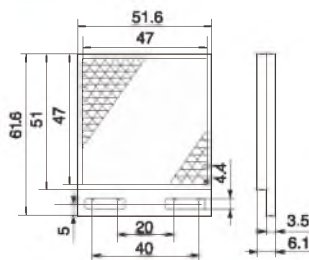
Type	High resolution type	Long distance type	
Sensing type	Retro-reflection (Coxial beam)		
Sensing distance	1.5m	4m	
Spot size	φ 15mm/1.5m	φ 20mm/3.5m	
Output type	NPN/PNP open-collector output, ≤100mA /30V DC		
Switch type	Selectable L.on/D.on		
Indicator	Output indicator: Orange; Laser indicator: Green		
Digital display	7 segments, 3-digit Red LED display		
Response time	0.7 ms		
Time delay	0~999ms Value added unit:1ms;1~10ms Value added unit :1ms		
Sensitivity adjustment	Teach-in button		
Light source	Laser(650nm), Max 1mW		
Laser class	Class2		
Operating voltage	10~30V DC ± 10 %		
Current consumption	35mA		
Ambient brightness	Sunlight≤10000Lux, Incandescent lamp≤3000Lux		
Ambient temperature	-10~+50℃, No freezing		
Ambient humidity	35~85%RH, No condensation		
Insulation resistance	≥20MΩ (500V DC)		
Impact resistance	50G(500m/s²), XYZ three directions		
Certificate	IEC, EC		
Degree of protection	IP67		
Material	Housing: Antibacterial ABS; lens: PMMA		
Accessories	Bracket, screw, reflector		
Model No.	NPN	ESQ-150N 	ESQ-400N
	PNP	ESQ-150P	ESQ-400P

Dimensions

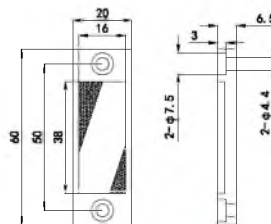
Unit: mm



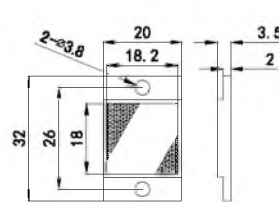
Reflector:



(Standard TD-13)



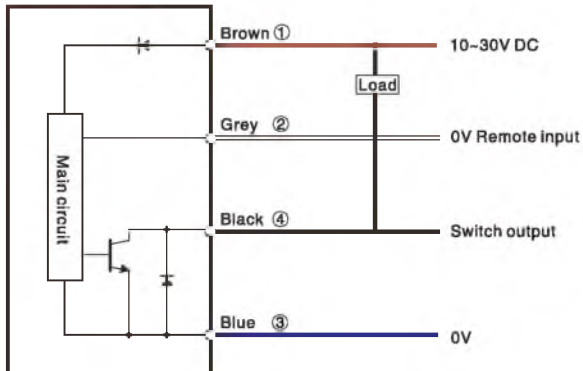
(Optional TD-14)



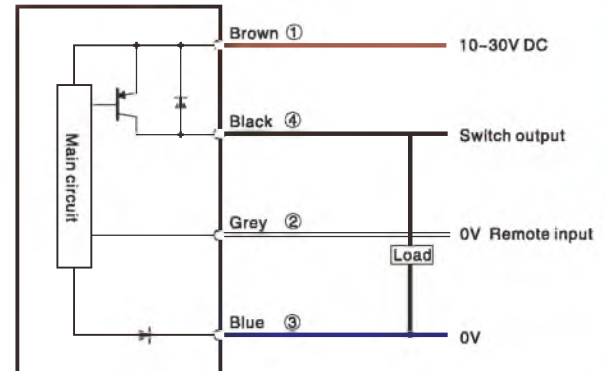
(Optional TD-15)

Circuit diagram

NPN Output



PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Laser sensors

Square

BGS

Transparent objects detection

Proximity Sensors



- ⦿ Non-contact position detection, wear-free and highly reliable.
- ⦿ Highly sensitive and intense accuracy, durability up to 8 years.
- ⦿ A full range of housing materials: stainless steel, nickel-copper alloy, plastic and Teflon coating.
- ⦿ Covering a wide range of specifications and sizes
- ⦿ IP67 protection design, excellent water and oil resistance.



Standard Distance Type (TR series)

- Classical cylindrical appearance, high stability
- Adaptive to different occasions, top-notch quality, low price
- Customizable cables & connectors as requested

P.E-17



Extended Distance Type (TL series)

- sensing distance is double that of standard products
- Save installing space effectively
- Customizable cables & connectors at your request

P.E-20



Long Distance Type (TY series)

- Ultra-long sensing distance, up to 40mm
- Avoid any attenuation caused by the material of detected objects
- IP67 high protection degree

P.E-23



Square Type (TQ series)

- Kidney-shaped hole, easy installation
- Up to 8mm sensing distance
- Plastic housing, protection degree IP67

P.E-26



Mini-square Type (TE series)

- 6mm (extra small), built-in amplifier
- 8mm sensing distance, the longest sensing distance in the industry
- Sensing surface on the top and at the front to suit your needs

P.E-27



Mini-cylindrical Type (TX series)

- Highly stabilized detection in narrow space
- Shield type, can be embedded in detecting objects
- Φ3, Φ4, M4, M5, various models for you to choose from

P.E-29



Short-body Type (TSS/TS series)

- Compared with similar sensors, the length can be shortened 1/3
- 18mm body length can perfectly fit into narrow space
- Epoxy resin fillings exhibit excellent shock resistance

P.E-31



Ring-type (TH series)

- 2mm thickness, the thinnest one in the industry
- Stainless steel casing; strong impact resistance
- Flexible sensitivity adjustment with knobs

P.E-34



Metal Face Type (TM series)

- Stainless steel face, with great impact resistance
- 1000PSI/High pressure resistance
- Wonderful thermal shock and chemical resistance

P.E-35



Temperature Resistance Type (TG/TZ series)

- Extended temperature varies from -40°C to +220°C
- Degree of protection up to IP67
- Reverse polarity protection and surge protection

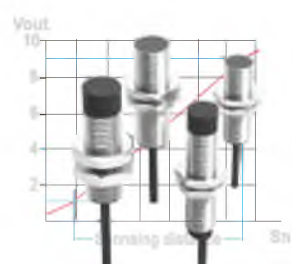
P.E-37



IP69K High Protection (TP series)

- AISI 316L stainless steel housing
- IP67-IP68-IP69K protection level
- Can be used in the food and beverage field

P.E-39



Analog Output Type (TA series)

- First choice of short distance and non-contact detection
- Analog output 0-20mA and 0-10v
- Output PNP-Analog

P.E-41

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction resist type
Flat type
Level detection

**DC 2-wire Type (TD series)**

- Nonpolarized specifications, easy wiring method
- With smallest sensing surface M8
- 10~30V DC and 10~60V DC ,two voltages

PE-42

Guidance Capacitive sensors

**Cylindrical Type (CK series)**

- Detect metal, plastic and liquid, ect
- With reverse polarity, short circuit, surge and many other protection functions
- Metal and plastic housings are available

PE-44

**Corrosion Resistant Type (CWF series)**

- Up to 20 turns sensitivity adjustment
- Teflon coatings ensure superior corrosion resistance
- Widely used in detection of metals, water, oil, glasses, plastic and water, etc

PE-45

**Flat Type (CQ series)**

- 7mm of thickness only for saving space
- Enjoy stability; comparable to world famous brands
- Offer different kinds of sensing distance of 5mm, 6mm, 7mm and 10mm, etc

PE-46

**Liquid Level Detection (CE series)**

- Free from influence of liquid color in pipeline
- Suitable for pipeline diameter from $\Phi 8$ mm to $\Phi 11$ mm, $\Phi 12$ mm to $\Phi 26$ mm
- With built-in amplifier to save installing space

PE-48

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring type
Metal face
Temperature
IP68K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Corrosion resistant type
Flat type
Level detection

Type 1	Type 2	Series	
Inductive Sensors	Cylindrical	Standard Distance	TR Series
		Extended Distance	TL Series
		Long Distance	TY Series
		Mini-cylindrical	TX Series
		Short-body	TSS/TS Series
		Analog Output	TA Series
	Square	DC 2-wire	TD Series
		Standard Square	TQ Series
		Mini-square	TE Series
	Special Applications	Ring-type	TH Series
		Metal Face	TM Series
		Temperature Resistance	TG/TZ Series
		IP69K High Protection	TP Series
Capacitive Sensors	Cylindrical	Plastic Shells	CK Series
	Corrosion Resistant	Teflon Shells	CWF Series
	Flat	Plastic Shells	CQ Series
	Special Applications	Liquid Level Detection	CE Series

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

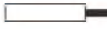
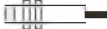
Cylindrical

Corrosion resistant type

Flat type

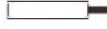
Level detection

Standard Distance DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages
	Unit: mm		NPN Normally open	NPN Normally closed
Pre-wired Type	Shielded	 $\phi 6.5 \times 45.5$ 1.5mm	TRF6.5-1.5NO	TRF6.5-1.5NC
		 M8*45 1.5mm	TRF08-1.5NO	TRF08-1.5NC
		 M12*44.5 2mm	TRF12-02NO	TRF12-02NC
		 M18*55 5mm	TRF18-05NO	TRF18-05NC
		 M30*54 10mm	TRF30-10NO	TRF30-10NC
	Unshielded	 $\phi 6.5 \times 45$ 2mm	TRN6.5-02NO	TRN6.5-02NC
		 M8*45.5 2mm	TRN08-02NO (HOT)	TRN08-02NC
		 M12*46.5 4mm	TRN12-04NO (HOT)	TRN12-04NC
		 M18*54 8mm	TRN18-08NO	TRN18-08NC
		 M30*58 15mm	TRN30-15NO	TRN30-15NC
Connector Type	Shielded	 M8*60 1.5mm	TRF08-1.5NO-E1	TRF08-1.5NC-E1
		 M12*68 2mm	TRF12-02NO-E2	TRF12-02NC-E2
		 M18*82 5mm	TRF18-05NO-E2	TRF18-05NC-E2
		 M30*78 10mm	TRF30-10NO-E2	TRF30-10NC-E2
		 M8*60 2mm	TRN08-02NO-E1	TRN08-02NC-E1
	Unshielded	 M12*67 4mm	TRN12-04NO-E2	TRN12-04NC-E2
		 M18*78 8mm	TRN18-08NO-E2	TRN18-08NC-E2
		 M30*78 15mm	TRN30-15NO-E2	TRN30-15NC-E2

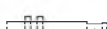
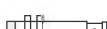
Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ; model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

Extended Distance DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages
	Unit: mm		NPN Normally open	NPN Normally closed
Pre-wired Type	Shielded	 $\phi 6.5 \times 45$ 2mm	TLF6.5-02NO	TLF6.5-02NC
		 M8*45 2mm	TLF08-02NO	TLF08-02NC
		 M12*45 4mm	TLF12-04NO	TLF12-04NC
		 M18*54 8mm	TLF18-08NO	TLF18-08NC
		 M30*54 16mm	TLF30-16NO	TLF30-16NC
	Unshielded	 $\phi 6.5 \times 44$ 4mm	TLN6.5-04NO	TLN6.5-04NC
		 M8*44 4mm	TLN08-04NO (HOT)	TLN08-04NC
		 M12*53 8mm	TLN12-08NO (HOT)	TLN12-08NC
		 M18*58 16mm	TLN18-16NO	TLN18-16NC
		 M30*61 25mm	TLN30-25NO	TLN30-25NC
Connector Type	Shielded	 M8*60 2mm	TLF08-02NO-E1	TLF08-02NC-E1
		 M12*68 4mm	TLF12-04NO-E2	TLF12-04NC-E2
		 M18*82 8mm	TLF18-08NO-E2	TLF18-08NC-E2
		 M30*78 16mm	TLF30-16NO-E2	TLF30-16NC-E2
		 M8*60 4mm	TLN08-04NO-E1	TLN08-04NC-E1
	Unshielded	 M12*71 8mm	TLN12-08NO-E2	TLN12-08NC-E2
		 M18*82 16mm	TLN18-16NO-E2	TLN18-16NC-E2
		 M30*81 25mm	TLN30-25NO-E2	TLN30-25NC-E2

Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ; model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

DC 3-wire Long Distance

Type	Appearance		Sensing distance		Model numbers		Pages
			Unit: mm				
					NPN Normally open	NPN Normally closed	
Pre-wired Type	Shielded		φ 6.5*45	 3mm	TYF6.5-03NO	TYF6.5-03NC	E-23
			M8*45	 3mm	TYF08-03NO	TYF08-03NC	
			M12*45	 6mm	TYF12-06NO	TYF12-06NC	
			M18*54	 12mm	TYF18-12NO	TYF18-12NC	
			M30*54	 22mm	TYF30-22NO	TYF30-22NC	
	Unshielded		φ 6.5*44	 6mm	TYN6.5-06NO	TYN6.5-06NC	
			M8*44	 6mm	TYN08-06NO	TYN08-06NC	
			M12*53	 10mm	TYN12-10NO	TYN12-10NC	
			M18*58	 20mm	TYN18-20NO	TYN18-20NC	
			M30*61	 40mm	TYN30-40NO	TYN30-40NC	
Connector Type	Shielded		M8*60	 3mm	TYF08-03NO-E1	TYF08-03NC-E1	
			M12*68	 6mm	TYF12-06NO-E2	TYF12-06NC-E2	
			M18*82	 12mm	TYF18-12NO-E2	TYF18-12NC-E2	
			M30*78	 22mm	TYF30-22NO-E2	TYF30-22NC-E2	
	Unshielded		M8*60	 6mm	TYN08-06NO-E1	TYN08-06NC-E1	
			M12*71	 10mm	TYN12-10NO-E2	TYN12-10NC-E2	
			M18*82	 20mm	TYN18-20NO-E2	TYN18-20NC-E2	
			M30*81	 40mm	TYN30-40NO-E2	TYN30-40NC-E2	

Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ;model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

DC 3-wire Square

Type	Appearance	Sensing distance		Model numbers		Pages	
Unit: mm		NPN Normally open		NPN Normally closed			
Pre-wired Type	 17*17*27	Q17	Shielded	 5mm	TQF17-05NO	TQF17-05NC	E-26
			Unshielded	 8mm	TQN17-08NO	TQN17-08NC	
	Q18	Shielded	 5mm	TQF18-05NO	TQF18-05NC		
			Unshielded	 8mm	TQN18-08NO	TQN18-08NC	
	Q18C	Shielded	 5mm	TQF18C-05NO	TQF18C-05NC		
			Unshielded	 8mm	TQN18C-08NO	TQN18C-08NC	

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

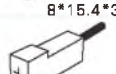
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

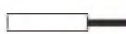
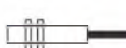
Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Mini Square DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages			
Unit: mm		NPN Normally open		NPN Normally closed			
Pre-wired Type	Unshielded	 6.2*6.4*20.4	E06	1mm	TEN06-01NO	TEN06-01NC	E-27
		 6.1*6.3*20.4	E07	1mm	TEN07-01NO	TEN07-01NC	
		 8*8.4*23.5	E08	2.5mm 3mm	TEN08-2.5NO  TEN08-03NO	TEN08-2.5NC TEN08-03NC	
		 8*8.4*25.5	E09	2.5mm 3mm	TEN09-2.5NO TEN09-03NO 	TEN09-2.5NC TEN09-03NC	
		 6.6*10.4*30.5	E10	2.5mm 4mm	TEN10-2.5NO TEN10-04NO	TEN10-2.5NC TEN10-04NC	
		 8*12.4*30.5	E12	4mm	TEN12-04NO	TEN12-04NC	
		 8*15.4*34.5	E15	5mm 8mm	TEN15-05NO TEN15-08NO	TEN15-05NC TEN15-08NC	
		 15*16.4*34.5	E16	5mm 8mm	TEN16-05NO TEN16-08NO	TEN16-05NC TEN16-08NC	

Noted: Model numbers ended with 'PO' are PNP normally open ;model numbers ended with 'PC' are PNP normally closed.

Mini-cylindrical DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages			
		Unit: mm	NPN Normally open	NPN Normally closed			
Pre-wired Type	Shielded		φ 3*25	0.6mm	TXF03-0.6NO	TXF03-0.6NC	E-29
				0.8mm	TXF03-0.8NO	TXF03-0.8NC	
				1.0mm	TXF03-01NO	TXF03-01NC	
			φ 4*25	0.8mm	TXF04-0.8NO	TXF04-0.8NC	
				1.0mm	TXF04-01NO	TXF04-01NC	
				1.2mm	TXF04-1.2NO	TXF04-1.2NC	
				1.5mm	TXF04-1.5NO	TXF04-1.5NC	
			M4*25	0.6mm	TXFM4-0.6NO	TXFM4-0.6NC	
				0.8mm	TXFM4-0.8NO	TXFM4-0.8NC	
				1.0mm	TXFM4-01NO	TXFM4-01NC	
			M5*25	0.8mm	TXF05-0.8NO	TXF05-0.8NC	
				1.0mm	TXF05-01NO	TXF05-01NC	
				1.2mm	TXF05-1.2NO	TXF05-1.2NC	
				1.5mm	TXF05-1.5NO	TXF05-1.5NC	

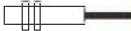
Noted: Model numbers ended with 'PO' are PNP normally open ;model numbers ended with 'PC' are PNP normally closed.

DC 3-wire **Ultra-short Body**

Type	Appearance	Sensing distance	Model numbers	Pages		
Unit: mm		NPN Normally open	NPN Normally closed			
Pre-wired Type	Shielded	 φ 6.5*18	1mm	TSSF6.5-01NO	TSSF6.5-01NC	E-31
		 2mm	TSSF6.5-02NO	TSSF6.5-02NC		
		 3mm	TSSF6.5-03NO	TSSF6.5-03NC		
		 φ 6.5*18	1mm	TSSF6.5Y-01NO	TSSF6.5Y-01NC	
		 2mm	TSSF6.5Y-02NO	TSSF6.5Y-02NC		
		 3mm	TSSF6.5Y-03NO	TSSF6.5Y-03NC		
		 M8*18	1mm	TSSF08-01NO	TSSF08-01NC	
		 2mm	TSSF08-02NO 	TSSF08-02NC		
		 M12*22	2mm	TSSF12-02NO	TSSF12-02NC	
		 4mm	TSSF12-04NO	TSSF12-04NC		

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

DC 3-wire **Short-body**

Type		Appearance		Sensing distance		Model numbers		Pages
		Unit: mm		NPN Normally open		NPN Normally closed		
Pre-wired Type	Shielded		M8*35	1mm	TSF08-01NO	TSF08-01NC	E-32	
				2mm	TSF08-02NO	TSF08-02NC		
			M12*35	2mm	TSF12-02NO	TSF12-02NC		
				4mm	TSF12-04NO	TSF12-04NC		
			M18*35	5mm	TSF18-05NO	TSF18-05NC		
				8mm	TSF18-08NO	TSF18-08NC		
			M30*35	10mm	TSF30-10NO	TSF30-10NC		
				16mm	TSF30-16NO	TSF30-16NC		
	Unshielded		M8*35	2mm	TSN08-02NO	TSN08-02NC		
				4mm	TSN08-04NO	TSN08-04NC		
			M12*35	4mm	TSN12-04NO	TSN12-04NC		
				8mm	TSN12-08NO	TSN12-08NC		
			M18*43	8mm	TSN18-08NO	TSN18-08NC		
				16mm	TSN18-16NO	TSN18-16NC		
			M30*47	15mm	TSN30-15NO	TSN30-15NC		
				25mm	TSN30-25NO	TSN30-25NC		

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini cylindrical

Short-body

Ring type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

Level detection

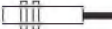
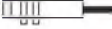
Ring-type DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages
		Unit: mm	NPN Normally open	NPN Normally closed
Pre-wired Type		H10 Hole height:20  10.5mm	TH10-20NO	TH10-20NC
		H15 Hole height:20  15.5mm	TH15-20NO	TH15-20NC
		H21 Hole height:20  22.5mm	TH21-20NO	TH21-20NC
		H43 Hole height:20  43.5mm	TH43-20NO	TH43-20NC

E-34

Noted: Model numbers ended with 'PO' are PNP normally open ;model numbers ended with 'PC' are PNP normally closed.

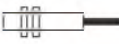
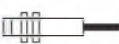
Metal Face DC 3-wire

Type	Appearance	Sensing distance	Model numbers	Pages
		Unit: mm	NPN Normally open	NPN Normally closed
Pre-wired Type	Shielded 	M8*45  1mm	TMF08-01NO	TMF08-01NC
		 2mm	TMF08-02NO	TMF08-02NC
		M12*45  2mm	TMF12-02NO	TMF12-02NC
		 4mm	TMF12-04NO	TMF12-04NC
		M18*54  5mm	TMF18-05NO	TMF18-05NC
		 8mm	TMF18-08NO	TMF18-08NC
		M30*54  10mm	TMF30-10NO	TMF30-10NC
		 16mm	TMF30-16NO	TMF30-16NC
	Unshielded 	M8*49  2mm	TMN08-02NO	TMN08-02NC
		 3mm	TMN08-03NO	TMN08-03NC
		M12*54  4mm	TMN12-04NO	TMN12-04NC
		 8mm	TMN12-08NO	TMN12-08NC
		M18*62  8mm	TMN18-08NO	TMN18-08NC
		 16mm	TMN18-16NO	TMN18-16NC
		M30*66  15mm	TMN30-15NO	TMN30-15NC
		 25mm	TMN30-25NO	TMN30-25NC

E-35

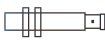
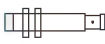
Noted: Model numbers ended with 'PO' are PNP normally open ;model numbers ended with 'PC' are PNP normally closed.

DC 3-wire Temperature Resistance

Type								Appearance	Sensing distance		Model numbers		Pages
				Unit: mm		NPN Normally open		NPN Normally closed					
High temperature resistant	120℃	Shielded		M12*54	 2mm	TGF12-02NO	TGF12-02NC	E-37					
				M18*55	 5mm	TGF18-05NO	TGF18-05NC						
				M30*51.5	 10mm	TGF30-10NO	TGF30-10NC						
	Unshielded		M12*51	 4mm	TGN12-04NO	TGN12-04NC							
			M18*51.5	 8mm	TGN18-08NO 	TGN18-08NC							
			M30*51.5	 15mm	TGN30-15NO	TGN30-15NC							
	220℃	Shielded		M12*55	 2mm	TGF12-02NO2	TGF12-02PO2						
				M18*55	 5mm	TGF18-05NO2	TGF18-05PO2						
				M30*54	 10mm	TGF30-10NO2	TGF30-10PO2						

Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

IP69K High Protection

Type	Appearance	Sensing distance	Model numbers	Pages			
Unit: mm			NPN	PNP			
Pre-wired Type	Shielded		M12*64.6	 2mm	TPF12-02NR-E2	TPF12-02PR-E2	E-39
				 4mm	TPF12-04NR-E2	TPF12-04PR-E2	
		M18*63.1	 5mm	TPF18-05NR-E2	TPF18-05PR-E2	E-40	
			 8mm	TPF18-08NR-E2	TPF18-08PR-E2		
	Unshielded		M12*64.6	 4mm	TPN12-04NR-E2	TPN12-04PR-E2	E-39
				 8mm	TPN12-08NR-E2	TPN12-08PR-E2	
		M18*63.1	 8mm	TPN18-08NR-E2	TPN18-08PR-E2	E-40	
			 12mm	TPN18-12NR-E2	TPN18-12PR-E2		

Note: The model ending with **NR-E2 is NPN normally open + normally closed; the model ending with **PR-E2 is PNP normally open + normally closed.

DC 3-wire Analog Output

Type		Appearance		Sensing distance		Model numbers		Pages	
				Unit: mm		PNP Current output		PNP Volage output	
Pre-wired Type	Shielded		M12*45	 3mm	TAF12-03PA	TAF12-03PV		E-41	
			M18*54	 4mm	TAF18-04PA	TAF18-04PV			
			M30*54	 10mm	TAF30-10PA	TAF30-10PV			
	Unshielded		M12*44	 4mm	TAN12-04PA	TAN12-04PV			
			M18*54	 7mm	TAN18-07PA	TAN18-07PV			
			M30*58	 14mm	TAN30-14PA	TAN30-14PV			

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini cylindrical
Short body
Ring type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

DC 2-Wire

Type	Appearance	Sensing distance	Model numbers	Pages		
		Unit: mm	Normally open	Normally closed		
Pre-wired Type	Shielded		φ 6.5*45	1mm	TDF6.5-01HO	TDF6.5-01HC
			2mm	TDF6.5-02HO	TDF6.5-02HC	
			M8*45	1mm	TDF08-01HO	TDF08-01HC
			2mm	TDF08-02HO	TDF08-02HC	
			M12*45	2mm	TDF12-02HO	TDF12-02HC
			4mm	TDF12-04HO	TDF12-04HC	
			M18*54	5mm	TDF18-05HO	TDF18-05HC
			8mm	TDF18-08HO	TDF18-08HC	
			M30*54	10mm	TDF30-10HO	TDF30-10HC
			16mm	TDF30-16HO	TDF30-16HC	
	Unshielded		φ 6.5*44	2mm	TDN6.5-02HO	TDN6.5-02HC
			4mm	TDN6.5-04HO	TDN6.5-04HC	
			M8*44	2mm	TDN08-02HO	TDN08-02HC
			4mm	TDN08-04HO	TDN08-04HC	
			M12*44	4mm	TDN12-04HO	TDN12-04HC
			8mm	TDN12-08HO	TDN12-08HC	
			M18*54	8mm	TDN18-08HO	TDN18-08HC
			16mm	TDN18-16HO	TDN18-16HC	
			M30*58	15mm	TDN30-15HO	TDN30-15HC
			25mm	TDN30-25HO	TDN30-25HC	

F-42

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP68K high protection

Analog output

DC 2-wires

Capacitive sensors

Cylindrical

Correction resistor type

Flat type

Level detection

DC 3-wire **Cylindrical**

Type	Appearance	Sensing distance	Model numbers	Pages
		Unit: mm	NPN Normally open	NPN Normally closed
Plastic Shells	Shielded	M12*55  3mm	CKF12-03NO	CKF12-03NC
		M18*70  8mm	CKF18-08NO	CKF18-08NC
		M30*80  20mm	CKF30-20NO	CKF30-20NC
	Unshielded	M12*59  6mm	CKN12-06NO	CKN12-06NC
		M18*73  15mm	CKN18-15NO	CKN18-15NC
		M30*82  30mm	CKN30-30NO	CKN30-30NC

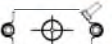
E-44

Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

DC 4-wire **Corrosion Resistant Type**

Type	Appearance	Sensing distance	Model numbers	Pages
		Unit: mm	NPN PNP Normally open/Normally closed	
Teflon casing Shielded		M18*70.5  10mm	CWF18-10NP	E-45

DC 3-wire **Flat Type**

Appearance	Sensing distance	Model numbers	Pages
	 5mm	CQ07-05NO/NC/PO/PC	E-46
	 10mm	CQ07-10NO/NC/PO/PC	
	 8mm	CQ07-08NO/NC/PO/PC	E-47

DC 3-wire **Liquid Level Detection**

Type	Appearance	Exterior diameter of pipes	Model numbers	Pages
			NPN Normally open	NPN Normally closed
Unshielded		$\phi 8 \sim \phi 11$	CE15-13NO	CE15-13NC
		$\phi 12 \sim \phi 26$	CE30-26NO 	CE30-26NC

E-48

Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Corrosion

resistant type

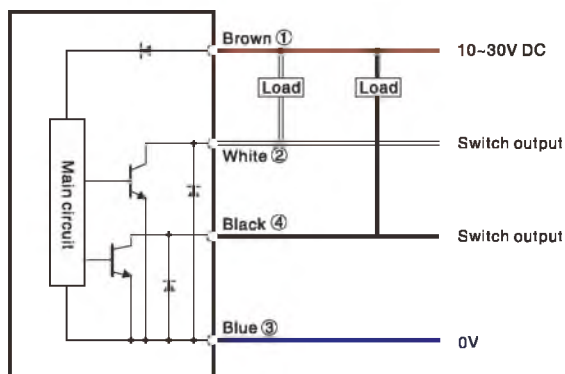
Flat type

Level detection

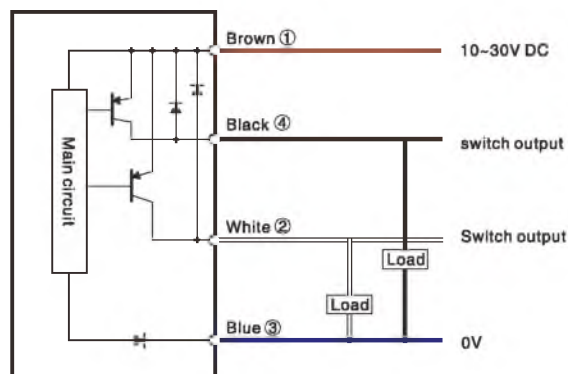
Input/Output Circuit

DC 4-Wire

NPN Output

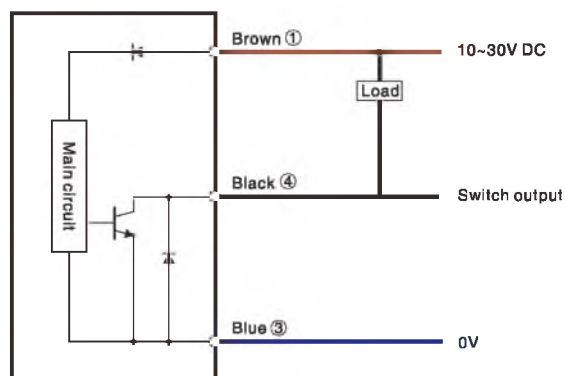


PNP Output

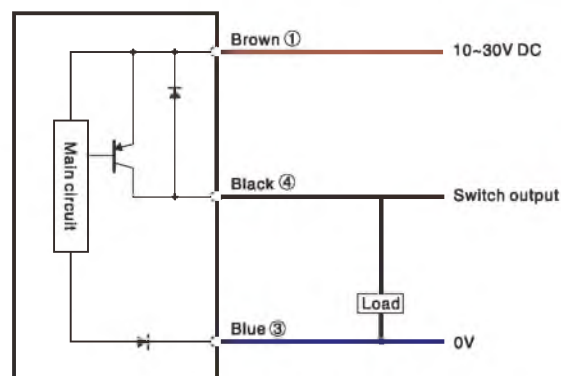


DC 3-Wire

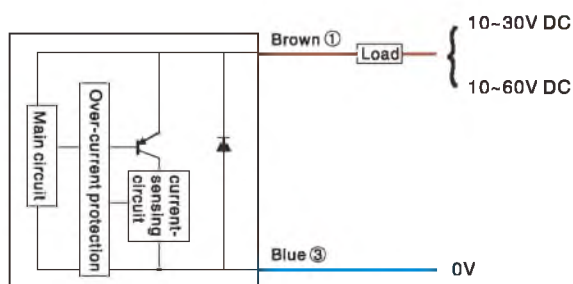
NPN Output



PNP Output

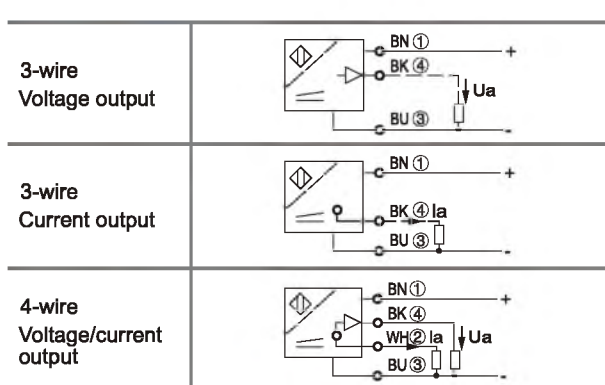


DC 2-Wire



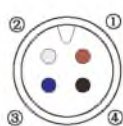
*Load (can be connected between blue wire and negative power supply.)
M8 sensor does not include short-circuit protection or current detection circuit. 1 and 4 in the circuit diagram show the connection of the connector type.

Analog

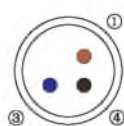


Configuration of Connector Type Sensor

Note:Terminal 1 and 4 are used in connector models



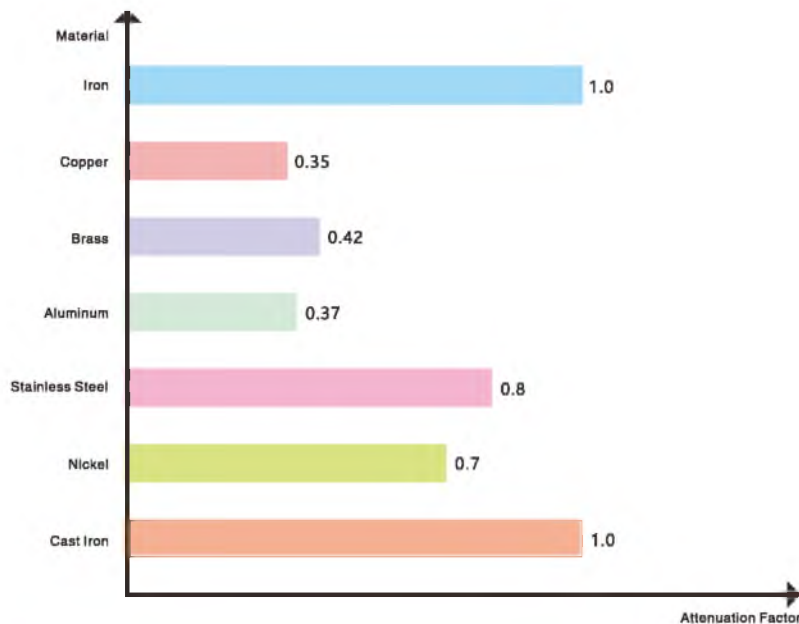
M12 4 pin



M8 3 pin

Inductance Attenuation Coefficient

Sensing distance=Nominal sensing distance*Attenuation factor



Note:

1. Proper installation: shielded or unshielded
2. Specifications
3. Sensing distance
4. Feature of detecting objects(material and size)

Capacitive Sensors Dielectric Constant

For capacitive sensors, the sensing distance and sensitivity vary due to changes in the dielectric constant of the target object. The bigger the dielectric constant of the target object, the farther the sensing distance of the sensor

Dielectric Constant chart

Material	Dielectric Constant
Air	1
Wood	2~7
Paper	2.3
Polypropylene	2.3
Rubber, neoprene	2.5
Porcelain	4.4
Glass, pyrex	5
Water	80

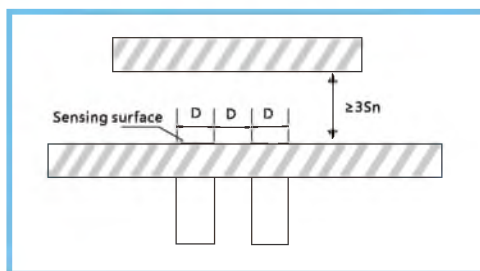
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

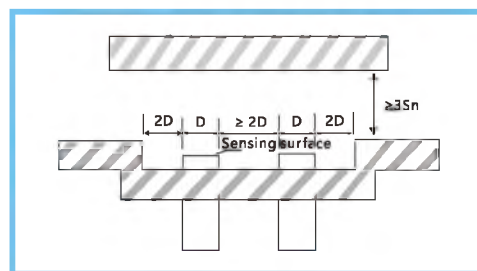
Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Mounting Method-Shielded, Unshielded



Shielded Mounting Proximity Sensors

Sensing surface must be flush with metal surface



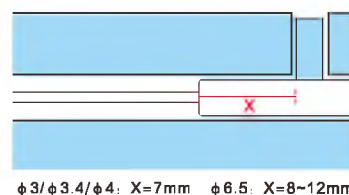
Unshielded Mounting Proximity Sensors

The distance between sensing surface to surrounding metals must be more than 2 times sensing distance

Mounting Torque

Cylindrical Type

1. $\phi 3/3.4/4$: Fix the sensing head with a screw at 7mm where it is near the tip part;
2. $\phi 6.5$ Shielded mounting: Fix the sensing head with a screw at 8mm where it is near the tip part;
3. $\phi 6.5$ Unshielded mounting: Fix the sensing head with a screw at 12mm where it is near the tip part.



$\phi 3 / \phi 3.4 / \phi 4$: X=7mm $\phi 6.5$: X=8-12mm

Thread Type

When installing a threaded sensor, please do not exceed the torque listed below.

Model No.	Tightening torque N
M4*0.5	1.5
M5*0.5	1.5
M8*1	3.5
M12*1	16
M18*1	28
M30*1.5	150

Fiber Optic
Slot Sensors
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Temperature
Accessories

Guidance
Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP68K high protection
Analog output
DC 2 wires
Capacitive sensors
Cylindrical
Correction
resistor type
Fiat type
Level detection

Capacitive Sensors

T ① ② ③ — ④ ⑤ ⑥ — ⑦

No.	Classification	Explanation of model numbers
①	Series	A: Analog Output D: DC 2–wire E: Mini Square G: High–temperature Resistant H: Ring–type L: Extended Distance M: Metal Face Q: Square R: Standard Distance S: Short–body P: IP69K SS: Extra Short Outer Casing X: Mini–cylindrical Y: Long Distance Z: Low Temperature Resistant
②	Mounting	F: Shielded N: Unshielded
③	Specifications	08: M8 12: M12 18: M18 30: M30
④	Sensing Distance	1.5: 1.5mm 02: 2mm 05: 5mm 08: 8mm
⑤	Output Type	N: NPN P: PNP H: DC 2–Wire
⑥	Output Status	O: Normally open C: Normally closed A: Current output V: Voltage output
⑦	Connection	Null: Pre–wired type E1: M8 3 pin connector E2: M12 4 pin connector

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini–cylindrical
Short–body
Ring–type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Corrosion
resistant type
Flat type
Level detection

Capacitive Sensors

C ① ② ③ — ④ ⑤ ⑥ — ⑦

No.	Classification	Explanation of model numbers
①	Series	E: Liquid Level Detection K: Plastic Shells Q: Flat Type W: Corrosion resistant
②	Mounting	F: Shielded N: Unshielded
③	Specifications	08: M8 12: M12 18: M18 30: M30
④	Sensing Distance	1.5: 1.5mm 02: 2mm 05: 5mm 08: 8mm
⑤	Output Type	N: NPN P: PNP H: DC 2–Wire
⑥	Output Status	O: Normally open C: Normally closed
⑦	Connection	Null: Pre–wired type E1: M8 3 pin connector E2: M12 4 pin connector

Standard Distance

Pre-wired

Appearance											
Mounting	Shielded		Shielded			Unshielded		Unshielded			
Size	φ 6.5	M8	M12	M18	M30	φ 6.5	M8	M12	M18	M30	
Sensing distance	1.5mm ± 10%	1.5mm ± 10%	2mm ± 10%	5mm ± 10%	10mm ± 10%	2mm ± 10%	2mm ± 10%	4mm ± 10%	8mm ± 10%	15mm ± 10%	
Housing material	Stainless steel		Nickel copper alloy			Stainless steel		Nickel copper alloy			
Operating voltage	10~30V DC(Ripple < 10%)										
Voltage drop	< 1.5V		< 2.0V			< 1.5V		< 2.0V			
Load Current, Max	150mA										
Current consumption	< 10mA								< 20mA		
Leakage current	< 0.01mA										
Switch frequency	2KHz	1.5KHz	1KHz		300Hz	2KHz	1KHz	800Hz	500Hz	150Hz	
Repeat accuracy			< 1.0%(Sr)					< 5.0%(Sr)		< 1.0%(Sr)	
Hysteresis	< 15%(Sr)										
Sensing surface material	PBT										
Operating temperature	-25℃~+75℃										
Circuit Protection	Short circuit										
Degree of protection	IP67										
Model No.	NPN Normally open	TRF6.5-1.5	TRF08-1.5	TRF12-02	TRF18-05	TRF30-10	TRN6.5-02	TRN08-02	TRN12-04	TRN18-08	TRN30-15
	Others	[NIO]:NPN Normally open	[NIC]:NPN Normally closed	[PIO]: PNP Normally open		[PIC]: PNP Normally closed					

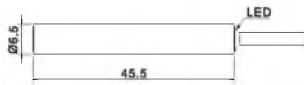
Connector Type



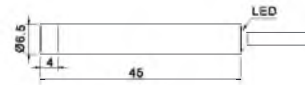

Appearance									
Mounting	Shielded				Unshielded				
Size	M8	M12	M18	M30	M8	M12	M18	M30	
Sensing distance	1.5mm±10%	2mm±10%	5mm±10%	10mm±10%	2mm±10%	4mm±10%	8mm±10%	15mm±10%	
Housing material	Stainless steel	Nickel copper alloy			Stainless steel	Nickel copper alloy			
Operating voltage	10~30V DC(Ripple < 10%)								
Voltage drop	< 1.5V								
Load Current Max	150mA								
Current consumption	< 10mA								
Leakage current	< 0.01mA								
Switch frequency	1.5KHz	2KHz	1KHz	300Hz	1KHz		500Hz	150Hz	
Repeat accuracy	< 1.0%(Sr)								
Hysteresis	< 15%(Sr)								
Sensing surface material	PBT								
Operating temperature	-25℃~+75℃								
Circuit Protection	Short circuit								
Degree of protection	IP67								
Model No.	NPN Normally open	TRF08-1.5NIO-E1	TRF12-02NIO-E2	TRF18-05NIO-E2	TRF30-10NIO-E2	TRN08-02NIO-E1	TRN12-04NIO-E2	TRN18-08NIO-E2	TRN30-15NIO-E2
	Others	PIO:NPN Normally open	NIC:NPN Normally closed	PIO:PNP Normally open		PIC:PNP Normally closed			

φ6.5

TRF6.5-1.5 □ □

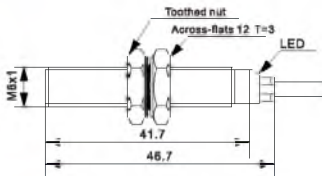


TRN6.5-02 □ □

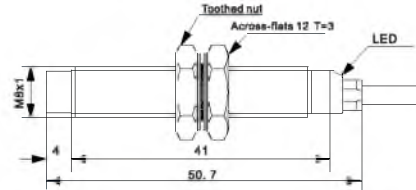


M8

TRF08-1.5 □ □

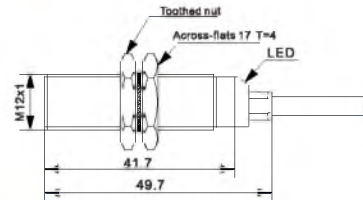


TRN08-02 □ □

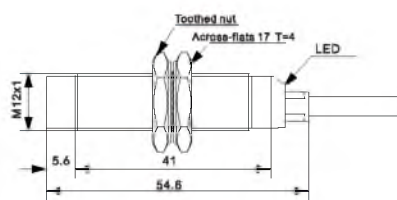


M12

TRF12-02 □ □

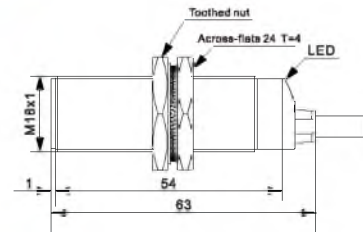


TRN12-04 □ □

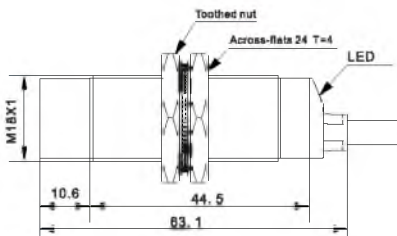


M18

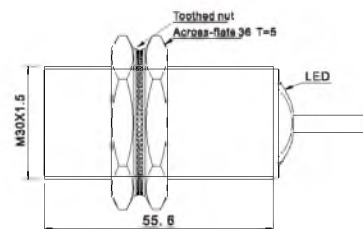
TRF18-05 □ □



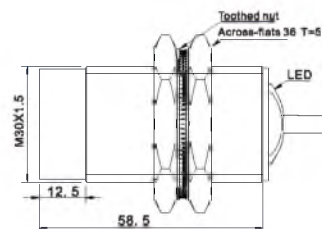
TRN18-08 □ □



TRF30-10 □ □



TRN30-15 □ □



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

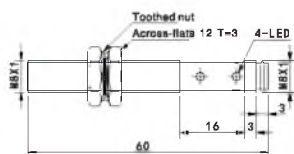
Capacitive sensors
Cylindrical
Correction
resistant type
Flat type
Level detection

Standard Distance

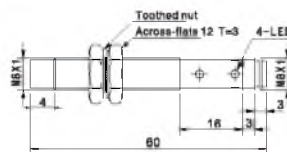
Dimensions- Connector Type (Unit:mm)

M8

TRF08-1.5□□-E1

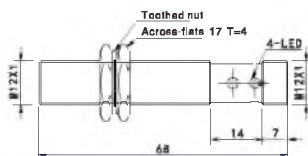


TRN08-02□□-E1

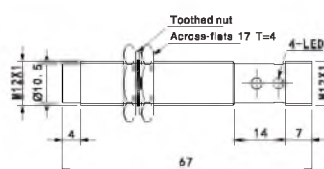


M12

TRF12-02□□-E2

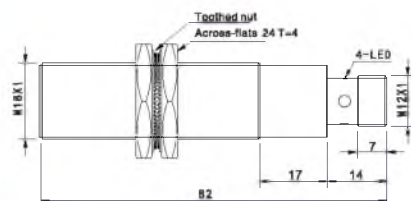


TRN12-04□□-E2

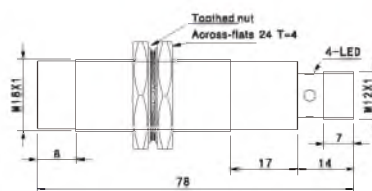


M18

TRF18-05□□-E2

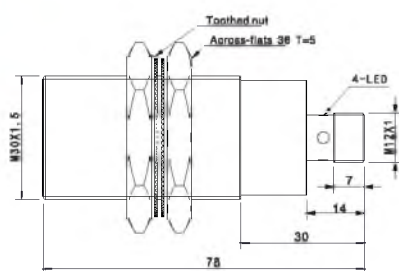


TRN18-08□□-E2

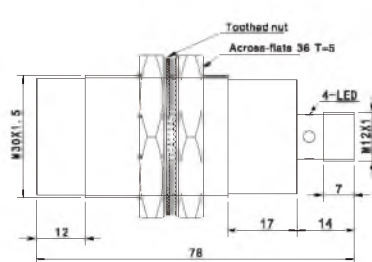


M3C

TRF30-10□□-E2



TRN30-15□□-E2



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories
- Guidance

- Inductive sensors
- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring-type
- Metal face
- Temperature
- IP68K high protection
- Analog output
- DC 2 wires

- Capacitive sensors
- Cylindrical
- Correction
- resistant type
- Flat type
- Level detection

Pre-wired Type

												
Appearance												
Mounting	Shielded		Shielded			Unshielded		Unshielded				
Size	φ 6.5	M8	M12	M18	M30	φ 6.5	M8	M12	M18	M30		
Sensing distance	2mm ± 10%	2mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	4mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	25mm ± 10%		
Housing material	Stainless steel		Nickel copper alloy			Stainless steel		Nickel copper alloy				
Operating voltage	10~30V DC(Ripple < 10%)											
Voltage drop	< 1.5V		< 2.0V			< 1.5V		< 2.0V				
Load Current, Max	150mA											
Current consumption	< 10mA											
Leakage current	< 0.01mA											
Switch frequency	2KHz	1KHz	300Hz	500Hz	150Hz	1KHz	800Hz	500Hz	150Hz	100Hz		
Repeat accuracy	< 1.0% (Sr)		< 5.0% (Sr)		< 1.0% (Sr)		< 5.0% (Sr)		< 1.0% (Sr)			
Hysteresis	< 15% (Sr)											
Sensing surface material	PBT											
Operating temperature	-25℃~+75℃											
Circuit Protection	Short circuit											
Degree of protection	IP67											
Model No.	NPN Normally open	TLF6.5-02[NIO]		TLF08-02[NIO]	TLF12-04[NIO]	TLF18-08[NIO]	TLF30-16[NIO]	TLN6.5-04[NIO]	TLN08-04[NIO]	TLN12-08[NIO]	TLN18-16[NIO]	TLN30-25[NIO]
	Others	[NIO]:NPN Normally open		[NIC]:NPN Normally closed		[PIO]:PNP Normally open		[PIC]:PNP Normally closed				

Connector Type



Appearance									
Mounting	Shielded				Unshielded				
Size	M8	M12	M18	M30	M8	M12	M18	M30	
Sensing distance	2mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	25mm ± 10%	
Housing material	Stainless steel	Nickel copper alloy			Stainless steel	Nickel copper alloy			
Operating voltage	10~30V DC(Ripple < 10%)								
Voltage drop	< 1.5V								
Load Current, Max	150mA								
Current consumption	< 10mA								
Leakage current	< 0.01mA								
Switch frequency	1KHz		500Hz	150Hz	800Hz	500Hz	150Hz	100Hz	
Repeat accuracy	< 1.0%(Sr)								
Hysteresis	< 15%(Sr)								
Sensing surface material	PBT								
Operating temperature	-25℃~+75℃								
Circuit Protection	Short circuit								
Degree of protection	IP67								
Model No.	NPN Normally open	TLF08-02[NIO-E1]	TLF12-04[NIO-E2]	TLF18-08[NIO-E2]	TLF30-16[NIO-E2]	TLN08-04[NIO-E1]	TLN12-08[NIO-E2]	TLN18-16[NIO-E2]	TLN30-25[NIO-E2]
	Others	[NIO]:NPN Normally open		[NIC]:NPN Normally closed	[PIO]:PNP Normally open	[PIC]:PNP Normally closed			

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Extended Distance

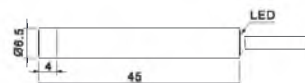
Dimensions-Pre-wired Type (Unit:mm)

φ6.5

TLF6.5-02□□

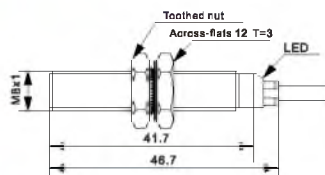


TLN6.5-04□□

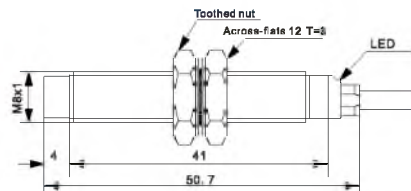


M8

TLF08-02□□

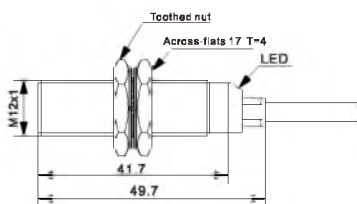


TLN08-04□□

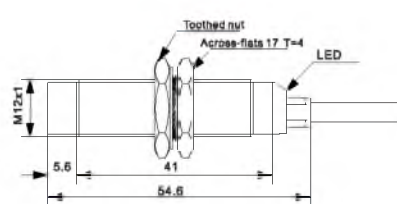


M12

TLF12-04□□

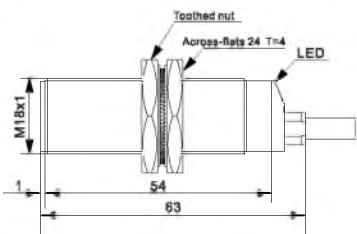


TLN12-08□□

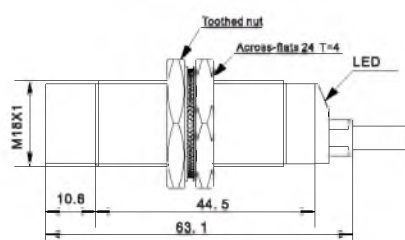


M18

TLF18-08□□

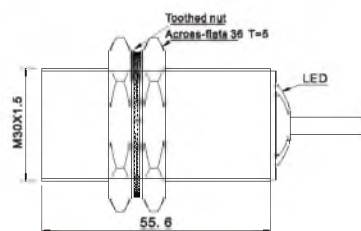


TLN18-16□□

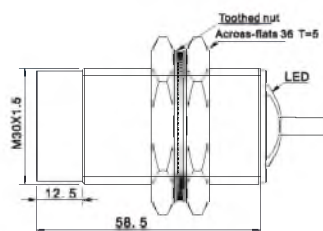


M30

TLF30-16□□

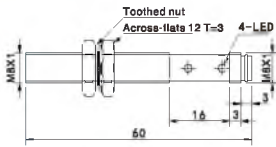


TLN30-25□□

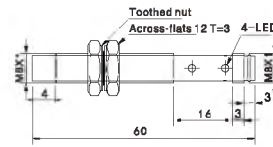


M8

TLF08-02□□-E1

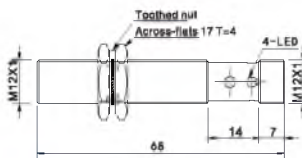


TLN08-04□□-E1

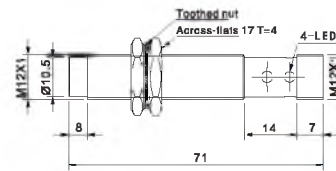


M12

TLF12-04□□-E2

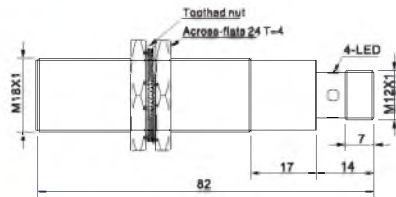


TLN12-08□□-E2

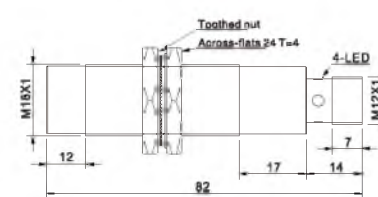


M18

TLF18-08□□-E2

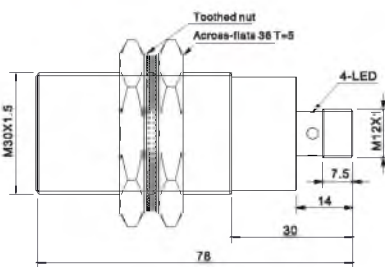


TLN18-16□□-E2

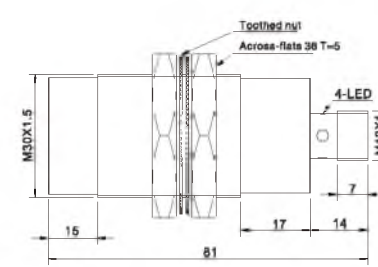


M30C

TLF30-16□□-E2



TLN30-25□□-E2



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Inductive sensors
- Standard distance
- Extended distance**
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring-type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

- Capacitive sensors
- Cylindrical
- Correction
- resistance type
- Flat type
- Level detection

Long Distance

Pre-wired

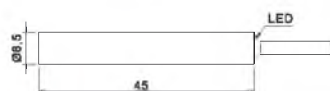
Appearance												
Mounting	Shielded		Shielded			Unshielded		Unshielded				
Size	φ 6.5	M8	M12	M18	M30	φ 6.5	M8	M12	M18	M30		
Sensing distance	3mm ± 10%	3mm ± 10%	6mm ± 10%	12mm ± 10%	22mm ± 10%	6mm ± 10%	6mm ± 10%	10mm ± 10%	20mm ± 10%	40mm ± 10%		
Housing material	Stainless steel		Nickel copper alloy			Stainless steel		Nickel copper alloy				
Operating voltage	10~30V DC(Ripple < 10%)											
Voltage drop	< 1.5V											
Load Current, Max	150mA											
Current consumption	< 10mA											
Leakage current	< 0.01mA											
Switch frequency	1KHz		800Hz	300Hz	150Hz	500Hz		400Hz	100Hz			
Repeat accuracy	< 5.0% (Sr)											
Hysteresis	< 15% (Sr)											
Sensing surface material	PBT											
Operating Temperature	-25℃~+75℃											
Circuit Protection	Short circuit											
Degree of protection	IP67											
Model No.	NPN Normally open	TYF6.5-03[NIO]		TYF08-03[NIO]	TYF12-06[NIO]	TYF18-12[NIO]	TYF30-22[NIO]	TYN6.5-06[NIO]	TYN08-06[NIO]	TYN12-10[NIO]	TYN18-20[NIO]	TYN30-40[NIO]
	Others	[NIO]:NPN Normally open		[NIC]:NPN Normally closed		[PIO]:PNP Normally open		[PIC]:PNP Normally closed				

Connector Type

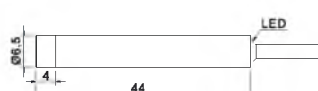
Appearance									
Mounting	Shielded				Unshielded				
Size	M8	M12	M18	M30	M8	M12	M18	M30	
Sensing distance	3mm ± 10%	6mm ± 10%	12mm ± 10%	22mm ± 10%	6mm ± 10%	10mm ± 10%	20mm ± 10%	40mm ± 10%	
Housing material	Stainless steel	Nickel copper alloy			Stainless steel	Nickel copper alloy			
Operating voltage	10~30V DC(Ripple < 10%)								
Voltage drop	< 1.5V								
Load Current , Max	150mA								
Current consumption	< 10mA								
Leakage current	< 0.01mA								
Switch frequency	1KHz	800Hz	300Hz	150Hz	500Hz	400Hz	100Hz		
Repeat accuracy	< 5.0% (Sr)								
Hysteresis	< 15% (Sr)								
Sensing surface material	PBT								
Operating Temperature	-25℃~+75℃								
Circuit Protection	Short circuit								
Degree of protection	IP67								
Model No.	NPN Normally open	TYF08-03NIO-E1	TYF12-06NIO-E2	TYF18-12NIO-E2	TYF30-22NIO-E2	TYN08-06NIO-E1	TYN12-10NIO-E2	TYN18-20NIO-E2	TYN30-40NIO-E2
	Others	NIO: NPN Normally open		NIC: NPN Normally closed		PIO: PNP Normally open		PIC: PNP Normally closed	

φ6.5

TYF6.5-03□□

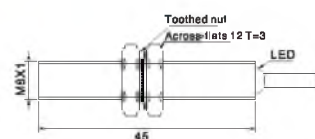


TYN6.5-06□□

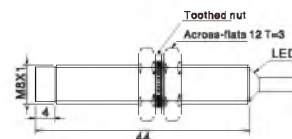


M8

TYF08-03□□

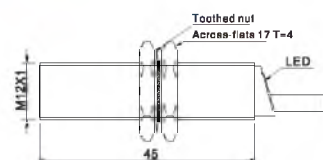


TYN08-06□□

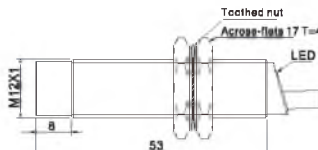


M12

TYF12-06□□

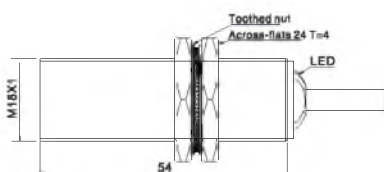


TYN12-10□□

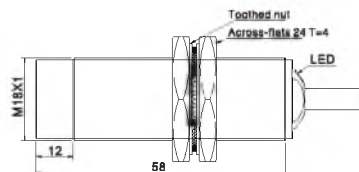


M18

TYF18-12□□

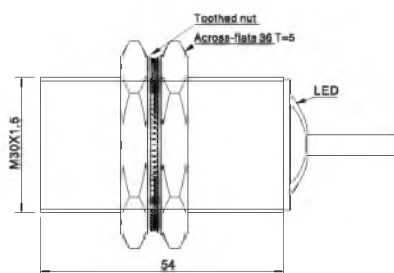


TYN18-20□□

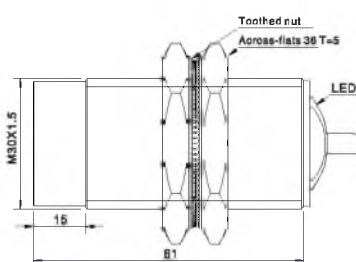


M30

TYF30-22□□



TYN30-40□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistant type

Flat type

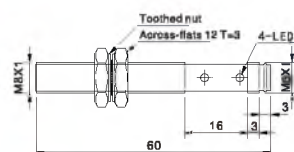
Level detection

Long Distance

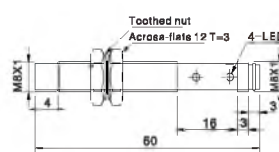
Dimensions-Connector Type (Unit:mm)

M8

TYF08-03□□-E1



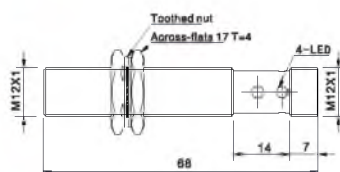
TYN08-06□□-E1



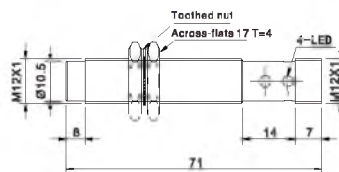
M8 3芯

M12

TYF12-06□□-E2



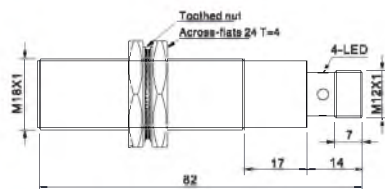
TYN12-10□□-E2



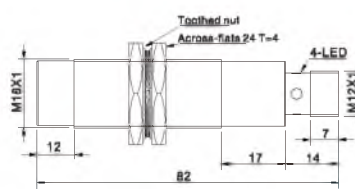
M12 4芯

M18

TYF18-12□□-E2



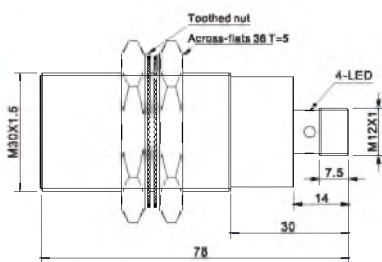
TYN18-20□□-E2



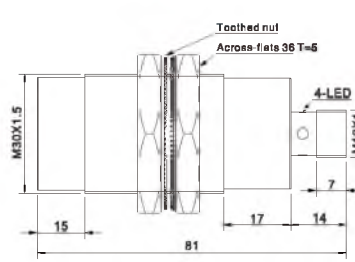
M12 4芯

M30

TYF30-22□□-E2



TYN30-40□□-E2



M12 4芯

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP68K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistant type
Flat type
Level detection

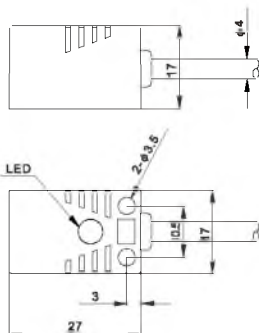


Mounting	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Size	Q17		Q18		Q18C	
Sensing distance	5mm ± 10%	8mm ± 10%	5mm ± 10%	8mm ± 10%	5mm ± 10%	8mm ± 10%
Housing material	Plastic					
Operating voltage	10~30V DC					
Voltage drop	< 1.5V					
Load Current, Max	150mA					
Current consumption	< 10mA					
Leakage current	< 0.01mA					
Switch frequency	1KHz	300Hz	1KHz	300Hz	1KHz	300Hz
Repeat accuracy	< 1.0% (Sr)					
Hysteresis	< 15% (Sr)					
Sensing surface material	ABS					
Operating Temperature	-25°C~+75°C					
Circuit Protection	Short circuit					
Degree of protection	IP67					
Model No.	TQF17-05[NIC]	TQN17-08[NIC]	TQF18-05[NIC] (HOT)	TQN18-08[NIC]	TQF18C-05[NIC] (HOT)	TQN18C-08[NIC]
	[NIC]: NPN Normally open [NIC]: NPN Normally closed [PIO]: PNP Normally open [PIC]: PNP Normally closed					

Dimensions (Unit:mm)

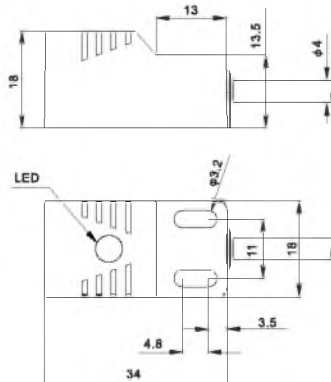
Q17

TQF17-05□□
TQN17-08□□



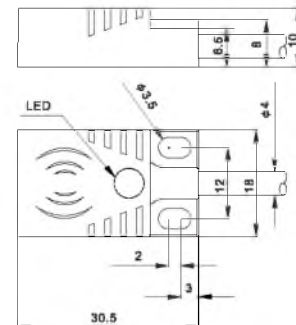
Q18

TQF18-05□□
TQN18-08□□



Q18C

TQF18C-05□□
TQN18C-08□□



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Mini-square

Pre-wired

Appearance



Mounting	Unshielded		Unshielded		Unshielded		Unshielded	
Size	E06		E07		E08		E09	
Sensing distance	1mm ± 15%		1mm ± 15%		2.5mm ± 10%		2.5mm ± 10%	
Housing material	Plastic							
Operating voltage	10~30V DC(Ripple < 10%)							
Voltage drop	< 1.5V							
Load Current , Max	100mA						150mA	
Current consumption					< 10mA			
Leakage current					< 0.01 mA			
Switch frequency	500Hz						800Hz	
Repeat accuracy	< 5% (Sr)						< 1% (Sr)	
Hysteresis					< 15% (Sr)			
Sensing surface material					PC			
Operating Temperature					-25℃~-75℃			
Circuit Protection	-						Short circuit	
Degree of protection					IP67			
Model No.	NPN Normally open	TEN06-01		TEN07-01		TEN08-2.5		TEN09-2.5
	Others							

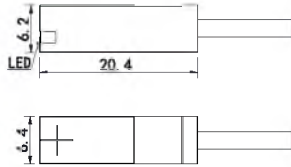
Appearance



Mounting		Unshielded		Unshielded		Unshielded			
Size		E10		E12		E15		E16	
Sensing distance		2.5mm/4mm ± 10%		4mm ± 10%		5mm/8mm ± 10%		5mm/8mm ± 10%	
Housing material		Plastic							
Operating voltage		10~30V DC(Ripple < 10%)							
Voltage drop		< 1.5V							
Load Current, Max		150mA							
Current consumption		< 10mA							
Leakage current		< 0.01mA							
Switch frequency		800Hz/200Hz				1KHz/500Hz			
Repeat accuracy		< 5% (Sr)		< 1% (Sr)					
Hysteresis		< 15% (Sr)							
Sensing surface material		PC							
Operating Temperature		-25℃~+75℃							
Circuit Protection		Short circuit							
Degree of protection		IP67							
Model No.	NPN Normally open	TEN10-2.5NIO/TEN10-04NIO		TEN12-04NIO		TEN15-05NIO/TEN15-08NIO		TEN16-05NIO/TEN16-08NIO	
	Others	NIO: NPN Normally open	NIO: NPN Normally closed	PIO: PNP Normally open	PIO: PNP Normally closed				

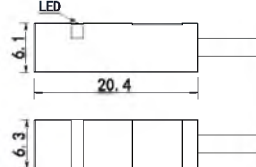
E06

TEN06-01□□



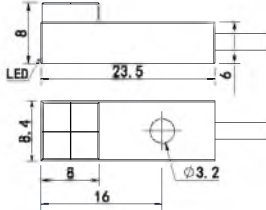
E07

TEN07-01□□



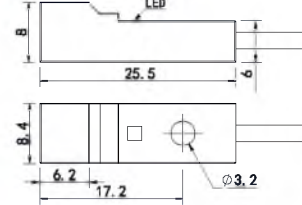
E08

TEN08-2.5/03□□



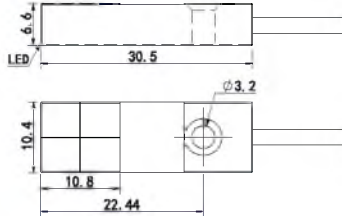
E09

TEN09-2.5/03□□



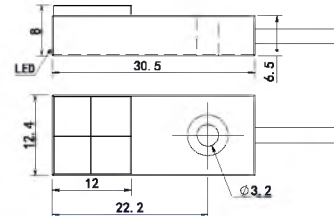
E10

TEN10-2.5/04□□



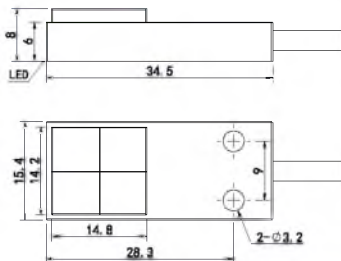
E12

TEN12-04□□



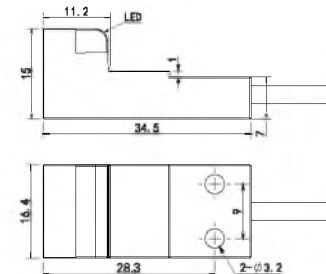
E15

TEN15-05/08□□



E16

TEN16-05/08□□



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Mini-cylindrical

Pre-wired



Appearance

Mounting	Shielded					
Size	φ 3		φ 4			
Sensing distance	0.6mm/0.8mm/1.0mm±10%		0.8mm/1.0mm/1.2mm/1.5mm±10%			
Housing material	Stainless steel					
Operating voltage	10~30V DC(Ripple<10%)					
Voltage drop	<1.5V					
Load Current, Max	100mA		150mA			
Current consumption	<10mA					
Leakage current	<0.01mA					
Switch frequency	2KHz					
Repeat accuracy	<1.0%(Sr)					
Hysteresis	<15%(Sr)					
Sensing surface material	PA66					
Operating Temperature	-25℃~-+75℃					
Degree of protection	IP67					
Model No.	NPN Normally open		TXF03-0.6NO/TXF03-0.8NO/TXF03-01NO		TXF04-0.8NO/TXF04-01NO/TXF04-1.2NO/TXF04-1.5NO	
	Others		NO: NPN Normally open	NC: NPN Normally closed	PO: PNP Normally open	PC: PNP Normally closed

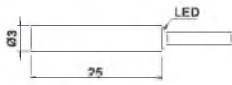


Appearance

Mounting	Shielded			
Size	M4		M5	
Sensing distance	0.6mm/0.8mm/1.0mm ± 10%		0.8mm/1.0mm/1.2mm/1.5mm ± 10%	
Housing material	Stainless steel			
Operating voltage	10~30V DC(Ripple < 10%)			
Voltage drop	< 1.5V			
Load Current, Max	100mA			
Current consumption	< 10mA			
Leakage current	< 0.01 mA			
Switch frequency	2KHz			
Repeat accuracy	< 5.0% (Sr)			
Hysteresis	< 15% (Sr)			
Sensing surface material	PA66			
Operating Temperature	-25℃~-+75℃			
Degree of protection	IP67			
Model No.	NPN Normally open	TXFM4-0.6 / TXFM4-0.8 / TXFM4-01		TXF05-0.8 / TXF05-01 / TXF05-1.2 / TXF05-1.5
	Others	: NPN Normally open	: NPN Normally closed	: PNP Normally open : PNP Normally closed

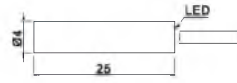
φ3

TXF03-0.6/0.8/01 □□



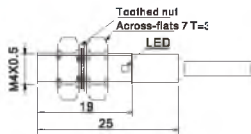
φ4

TXF04-0.8/01/1.2/1.5 □□



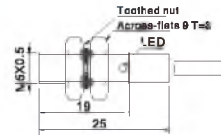
M4

TXFM4-0.6/0.8/01 □□



M5

TXF05-0.8/01/1.2/1.5 □□



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Inductive sensors
- Standard distance
- Extended distance
- Long distance
- Square
- Mini square

Mini-cylindrical

- Short-body
- Ring-type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

Capacitive sensors

- Cylindrical
- Correction
- resistance type
- Flat type
- Level detection

Ultra Short Housing



Appearance

Mounting	Shielded	
Size	φ 6.5	φ 6.5Y
Sensing distance	1mm/2mm ± 10%	
Housing material	Stainless steel	
Operating voltage	10~30V DC(Ripple < 10%)	
Voltage drop	< 1.5V	
Load Current , Max	150mA	
Current consumption	< 10mA	
Leakage current	< 0.01mA	
Switch frequency	2KHz	
Repeat accuracy	< 1.0%(Sr)	
Hysteresis	< 15%(Sr)	
Sensing surface material	PBT	
Operating Temperature	-25℃~+75℃	
Circuit Protection	Short circuit	
Degree of protection	IP67	
Model No.	NPN Normally open TSSF6.5-01 / TSSF6.5-02	
	Others : NPN Normally open : NPN Normally closed : PNP Normally open : PNP Normally closed	



Appearance

Mounting	Shielded	
Size	M8	M12
Sensing distance	1mm/2mm ± 10%	2mm/4mm ± 10%
Housing material	Stainless steel	Nickle plated brass
Operating voltage	10~30V DC(Ripple < 10%)	
Voltage drop	< 1.5V	
Load Current , Max	150mA	
Current consumption	< 10mA	
Leakage current	< 0.01mA	
Switch frequency	2KHz	
Repeat accuracy	< 1.0%(Sr)	
Hysteresis	< 15%(Sr)	
Sensing surface material	PBT	
Operating Temperature	-25℃~+75℃	
Circuit Protection	Short circuit, except TSSF08-02	
Degree of protection	IP67	
Model No.	NPN Normally open TSSF08-01 / TSSF08-02	
	Others : NPN Normally open : NPN Normally closed : PNP Normally open : PNP Normally closed	



Appearance

Mounting	Shielded				
Size	M8	M12	M18	M30	
Sensing distance	1mm/2mm ± 10%	2mm/4mm ± 10%	5mm/8mm ± 10%	10mm/16mm ± 10%	
Housing material	Stainless steel	Nickle plated brass			
Operating voltage	10~30V DC(Ripple < 10%)				
Voltage drop	< 1.5V				
Load Current, Max	150mA				
Current consumption	< 10mA				
Leakage current	< 0.01mA				
Switch frequency	2KHz	2KHz/1KHz	1KHz/500Hz	300Hz/150Hz	
Repeat accuracy	< 1.0%(Sr)				
Hysteresis	< 15%(Sr)				
Sensing surface material	PBT				
Operating Temperature	-25℃~+75℃				
Circuit Protection	Short circuit				
Degree of protection	IP67				
Model No.	NPN Normally open	TSF08-01NIO / TSF08-02NIO	TSF12-02NIO / TSF12-04NIO	TSF18-05NIO / TSF18-08NIO	TSF30-10NIO / TSF30-16NIO
	Others	NIO: NPN Normally open	NIC: NPN Normally closed	PIO: PNP Normally open	PIC: PNP Normally closed



Appearance

Mounting	Unshielded				
Size	M8	M12	M18	M30	
Sensing distance	2mm/4mm ± 10%	4mm/8mm ± 10%	8mm/16mm ± 10%	15mm/25mm ± 10%	
Housing material	Stainless steel	Nickle plated brass			
Operating voltage	10~30V DC(Ripple < 10%)				
Voltage drop	< 1.5V				
Load Current, Max	150mA				
Current consumption	< 10mA	< 20mA			
Leakage current	< 0.01mA				
Switch frequency	2KHz/1KHz	1KHz/500Hz	500Hz/150Hz	150Hz/100Hz	
Repeat accuracy	< 1.0%(Sr)				
Hysteresis	< 15%(Sr)				
Sensing surface material	PBT				
Operating Temperature	-25℃~+75℃				
Circuit Protection	Short circuit				
Degree of protection	IP67				
Model No.	NPN Normally open	TSN08-02NIO / TSN08-04NIO	TSN12-04NIO / TSN12-08NIO	TSN18-08NIO / TSN18-16NIO	TSN30-15NIO / TSN30-25NIO
	Others	NIO: NPN Normally open	NIC: NPN Normally closed	PIO: PNP Normally open	PIC: PNP Normally closed

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction resistance type

Flat type

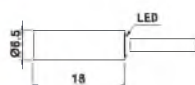
Level detection

Short-body

Extra Shot Outer Casing-Dimensions (Unit:mm)

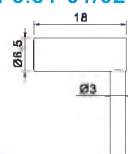
φ6.5

TSSF6.5-01/02 □ □



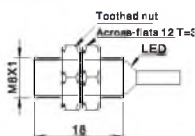
φ6.5Y

TSSF6.5Y-01/02 □ □



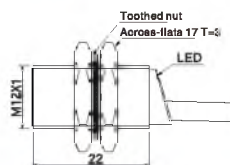
M8

TSSF08-01/02 □ □



M12

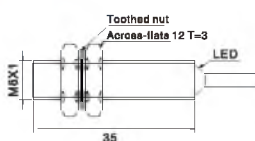
TSSF12-02/04 □ □



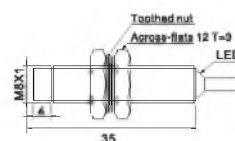
General-Dimensions (Unit:mm)

M8

TSF08-01/02 □ □

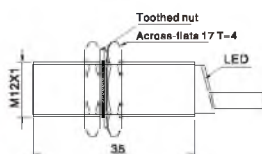


TSN08-02/04 □ □

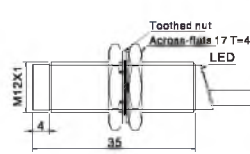


M12

TSF12-02/04 □ □

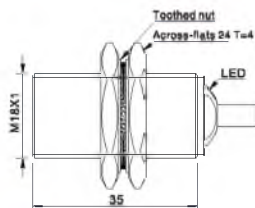


TSN12-04/08 □ □

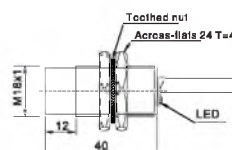


M18

TSF18-05/08 □ □

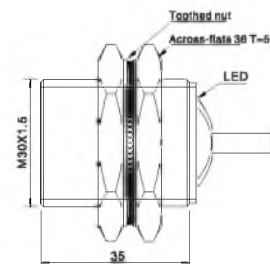


TSN18-08/16 □ □

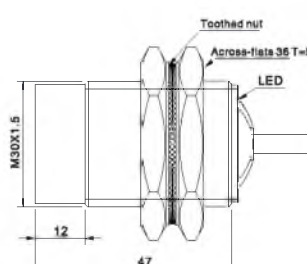


M30

TSF30-10/16 □ □



TSN30-15/25 □ □

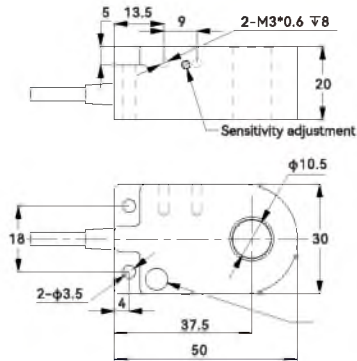


Appearance				
Size	H10	H15	H21	H43
Hole diameter	10.5mm	15.5mm	22.5mm	43.5mm
Hole height	20mm			
Housing material	ABS			
Operating voltage	10~30V DC(Ripple < 10%)			
Voltage drop	< 1.5V			
Load Current, Max	150mA			
Current consumption	< 15mA			
Leakage current	< 10mA			
Switch frequency	2KHz	1.5KHz	1KHz	500Hz
Min. detectable object	D=2.5mm; L=4mm	D=3mm; L=6mm	D=6mm; L=12mm	D=9mm; L=18mm
Repeat accuracy	< 2.0% (Sr)			
Hysteresis	< 15% (Sr)			
Sensing surface material	PBT			
Operating Temperature	-25°C~+75°C			
Circuit Protection	Short circuit; Reverse polarity			
Degree of protection	IP67			
Model No.	TH10-20 	TH15-20 	TH21-20 	TH43-20 
	 : NPN Normally open	 : NPN Normally closed	 : PNP Normally open	 : PNP Normally closed

Dimensions (Unit:mm)

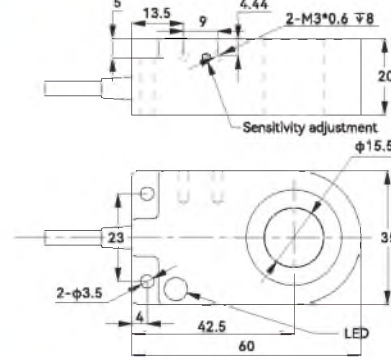
H10

TH10-20



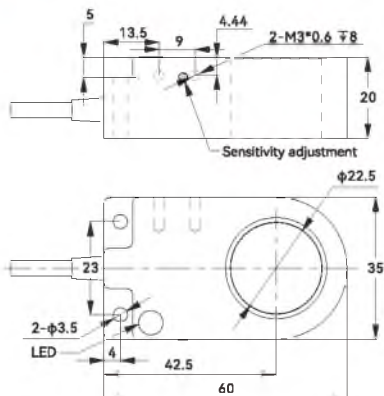
H15

TH15-20



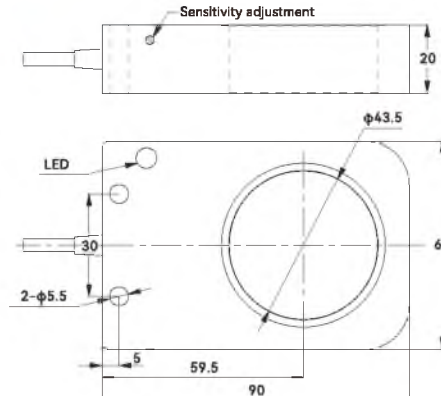
H21

TH21-20



H43

TH43-20



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Inductive sensors
- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini cylindrical
- Short-body
- Ring-type**
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

Capacitive sensors

- Cylindrical
- Correction
- resistance type
- Flat type
- Level detection

Metal Face

Pre-wired



Appearance

Mounting	Shielded				
Size	M8	M12	M18	M30	
Sensing distance	1mm/2mm ± 10%	2mm/4mm ± 10%	5mm/8mm ± 10%	10mm/16mm ± 10%	
Housing material	Stainless steel				
Operating voltage	10~30V DC(Ripple < 10%)				
Voltage drop	< 1.5V				
Load Current, Max	150mA				
Current consumption	< 10mA				
Leakage current	< 0.01mA				
Switch frequency	2KHz/1KHz		1KHz/500Hz	300Hz/150Hz	
Repeat accuracy	< 1.0% (Sr)				
Hysteresis	< 15% (Sr)				
Sensing surface material	Stainless steel				
Operating Temperature	-25℃~+75℃				
Circuit protection	Short circuit				
Degree of protection	IP67				
Model No.	NPN Normally open	TMF08-01NO /TMF08-02NO	TMF12-02NO /TMF12-04NO	TMF18-05NO /TMF18-08NO	TMF30-10NO /TMF30-16NO
	Others	NO:NPN Normally open	NC:NPN Normally closed	PC:PNP Normally open	PC:PNP Normally closed

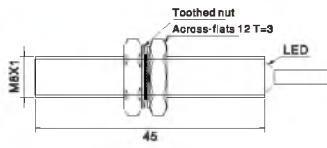


Appearance

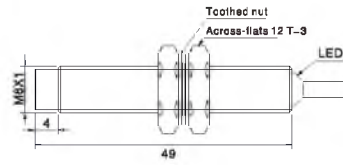
Mounting		Unshielded			
Size		M8	M12	M18	M30
Sensing distance		2mm/3mm ± 10%	4mm/8mm ± 10%	8mm/16mm ± 10%	15mm/25mm ± 10%
Housing material		Stainless steel			
Operating voltage		10~30V DC(Ripple < 10%)			
Voltage drop		< 1.5V			
Load Current, Max		150mA			
Current consumption		< 10mA			
Leakage current		< 0.01mA			
Switch frequency		2KHz/1KHz	1KHz/500Hz	500Hz/150Hz	150Hz/100Hz
Repeat accuracy		< 1.0% (Sr)			
Hysteresis		< 15% (Sr)			
Sensing surface material		Stainless steel			
Operating Temperature		-25℃~+75℃			
Circuit protection		Short circuit			
Degree of protection		IP67			
Model No.	NPN Normally open	TMN08-02  /TMN08-03 	TMN12-04  /TMN12-08 	TMN18-08  /TMN18-16 	TMN30-15  /TMN30-25 
	Others	 :NPN Normally open  :NPN Normally closed	 :PNP Normally open  :PNP Normally closed		

M8

TMF08-01/02 □□

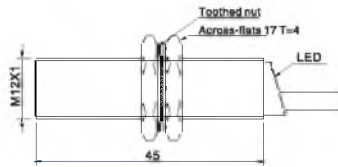


TMN08-02/03 □□

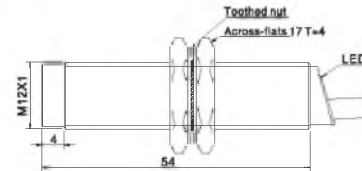


M12

TMF12-02/04 □□

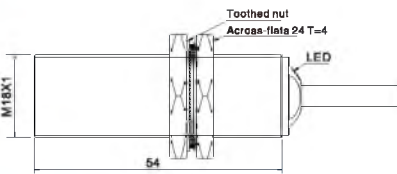


TMN12-04/08 □□

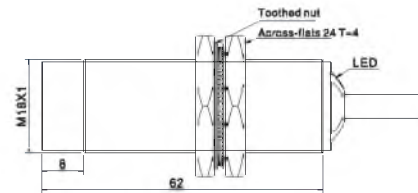


M18

TMF18-05/08 □□

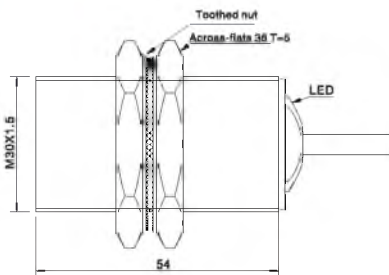


TMN18-08/16 □□

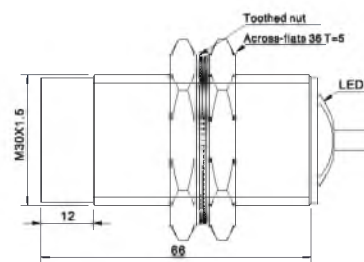


M30

TMF30-10/16 □□



TMN30-15/25 □□



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini-cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

Temperature Resistance

High Temperature (120°C) Resistance Pre-wired Type



Appearance

Mounting	Shielded			Unshielded		
Size	M12	M18	M30	M12	M18	M30
Sensing distance	2mm ± 10%	5mm ± 10%	10mm ± 10%	4mm ± 10%	8mm ± 10%	15mm ± 10%
Housing material	Nickel copper alloy					
Operating voltage	10~30V DC (Ripple < 10%)					
Voltage drop	< 2.5V					
Load Current, Max	100mA					
Current consumption	< 15mA					
Hysteresis	1~20%					
Repeat accuracy	< 5%					
Response frequency	1500Hz	1000Hz	500Hz	1000Hz	800Hz	300Hz
Indicator	Yellow LED					
Ambient temperature	-25°C~+120°C					
Ambient humidity	35~95% RH					
Circuit protection	Reverse polarity; Surge protection					
Degree of protection	IP67					
Model No.	NPN Normally open TGF12-02NIO TGF18-05NIO TGF30-10NIO TGN12-04NIO TGN18-08NIO TGN30-15NIO Others NIO: NPN Normally open NIC: NPN Normally closed PIO: PNP Normally open PIC: PNP Normally closed					

High Temperature (220°C) Resistance Pre-wired Type

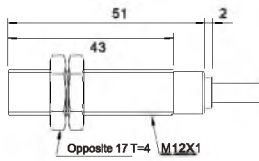


Appearance

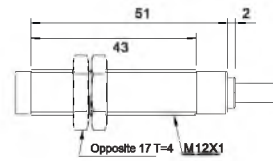
Mounting	Shielded		
Housing size	M12	M18	M30
Sensing distance	2mm ± 10%	5mm ± 10%	10mm ± 10%
Housing material	Nickel copper alloy		
Operating voltage	10~30V DC		
Voltage drop	< 1.8V		
Load current	External		
Current consumption	< 25mA (24V)		
Switch frequency	500Hz/220°C	500Hz/230°C	200Hz/230°C
Repeat accuracy	< 3.0% (Sr)		
Hysteresis	3~15% (Sr)		
Sensing surface material	PEEK		
Ambient temperature	-25~+230°C		
Degree of protection	IP66		
Interface	PTFE Cable/2m; 3*0.34mm ²		
Model No.	NPN Normally open TGF12-02NO2 TGF18-05NO2 TGF30-10NO2 PNP Normally open TGF12-02PO2 TGF18-05PO2 TGF30-10PO2		

M12

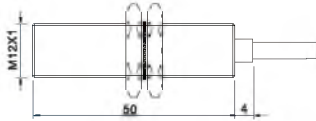
TGF12-02□□



TGN12-04□□

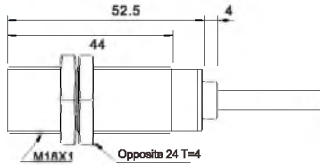


TGF12-02□□2

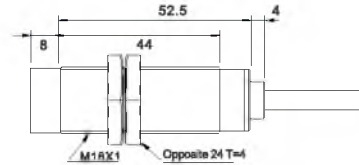


M18

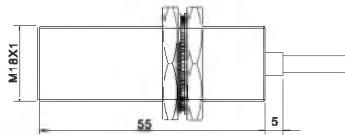
TGF18-05□□



TGN18-08□□

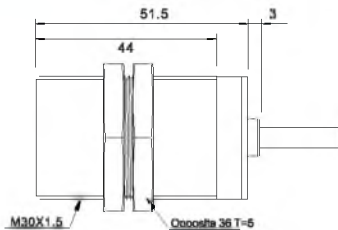


TGF18-05□□2

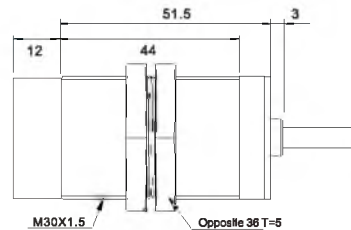


M30

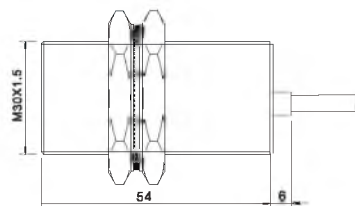
TGF30-10□□



TGN30-15□□



TGF30-10□□2



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

Inductive sensors

- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

Capacitive sensors

- Cylindrical
- Correction resist type
- Flat type
- Level detection

IP69K High Protection

TP Series



Shielded



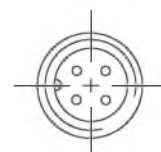
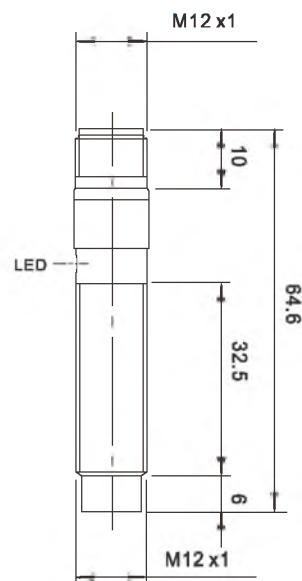
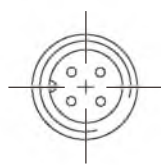
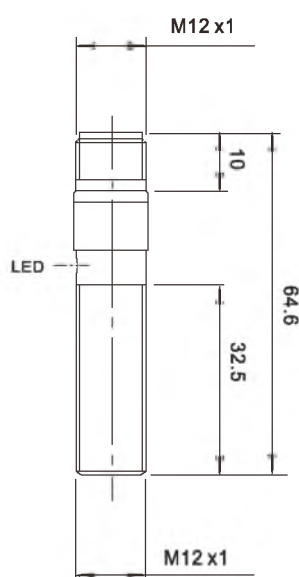
Unshielded

Appearance				
Mounting	Shielded		Unshielded	
Sensing distance	2mm	4mm	4mm	8mm
Working distance	0~1.62mm		0~3.24mm	0~6.5mm
Hysteresis	1~20%			
Standard target	12 x 12mm FE360		24 x 24mm FE360	
Repeatability	5%			
Operating	10~30V DC			
Output type	NPN or PNP-NO+NC or NO			
Maximum ripple content	≤10%			
Output current	≤200mA			
Output voltage drop	≤2V			
No-load current	≤15mA			
Leakage current	≤15uA			
operating frequency	2kHz			
Start delay	50ms			
Ambient temperature range	-40℃~+80℃ in a short time (within 15 seconds) up to 100℃ 10%			
Thermal drift	10%			
Shock and vibration	IEC 60947-5-5/7.4			
Weight	30g			
LEDs	NO output status/without led -25℃~+110℃			
Degree of protection	IP67,IP68(1m,7days);IP69K (in line with DIN 40050-9 standard)			
Electromagnetic compatibility/EMC	Comply with EMC directive requirements and comply with IEC 60947-5-2 specification			
Housing material	Stainless steel			
Sensing surface material	PPS (FDA certification)			
Connection method	M12 connector with gold-plated pins			
Tightening torque	25Nm			
Model No	NPN	TPF12-02NR-E2	TPF12-04NR-E2	TPN12-04NR-E2
	PNP	TPF12-02PR-E2	TPF12-04PR-E2	TPN12-04PR-E2

Dimensions (Unit:mm)

TPF12-02NR-E2(PR)
TPF12-04NR-E2(PR)

TPN12-04NR-E2(PR)
TPN12-08NR-E2(PR)

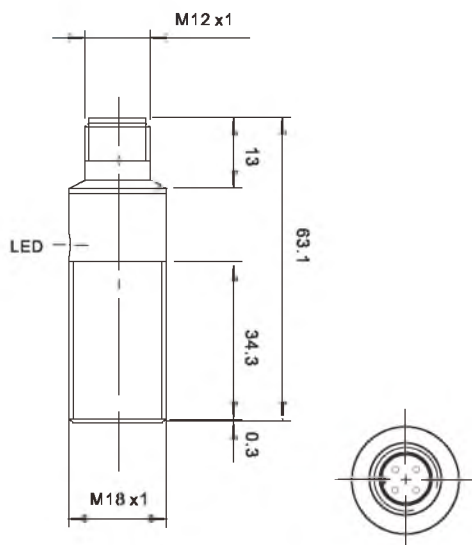




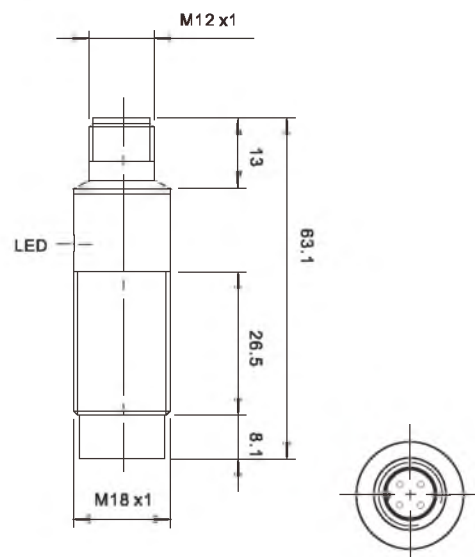
Appearance	Shielded		Unshielded	
Mounting	5mm		8mm	
Sensing distance	0~4mm		0~6.5mm	
Working distance	0~4mm		0~9.72mm	
Hysteresis	1~20%			
Standard target	18 × 18mm FE360		36 × 36mm FE360	
Repeatability	5%			
Operating Voltage	10~30V DC			
Output type	NPN or PNP-NO+NC or NO			
Maximum ripple content	≤10%			
Output current	≤200mA			
Output voltage drop	≤2V			
No-load current	≤15mA			
Leakage current	≤10μA			
Operating frequency	15kHz			
Start delay	50ms			
Ambient temperature range	-40℃~+80℃ in a short time (within 15 seconds) up to 100℃ 10%			
Thermal drift	10%			
Shock and vibration	IEC 60947-5-5/7.4			
Weight	30g			
LEDs	NO output status/without led -25℃~+110℃			
Degree of protection	IP67, IP68(1m, 7days); IP69K (in line with DIN 40050-9 standard)			
Electromagnetic compatibility/EMC	Comply with EMC directive requirements and comply with IEC 60947-5-2 specification			
Housing material	Stainless steel			
Sensing surface material	PPS (FDA certification)			
Connection method	M12 connector with gold-plated pins			
Tightening torque	25Nm			
Model No	NPN	TPF18-05NR-E2	TPF18-08NR-E2	TPN18-08NR-E2
	PNP	TPF18-05PR-E2	TPF18-08PR-E2	TPN18-12PR-E2

Dimensions (Unit:mm)

TPF18-05NR-E2(PR)
TPF18-08NR-E2(PR)



TPN18-08NR-E2(PR)
TPN18-12NR-E2(PR)



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors
Cylindrical
Correction resistant type
Flat type
Level detection

Analog Output

Pre-wired



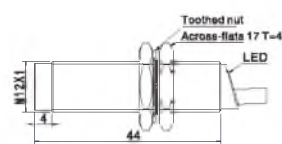
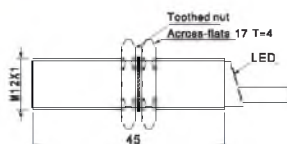
Appearance							
Mounting	Shielded			Unshielded			
Size	M12	M18	M30	M12	M18	M30	
Sensing distance	0.1~3mm ± 10%	1~4mm ± 10%	5~10mm ± 10%	0.1~4mm ± 10%	1~7mm ± 10%	7~14mm ± 10%	
Housing material	Nickel copper alloy						
Operating voltage	18~30V DC(Ripple < 10%)						
Current consumption	< 15mA						
Linear	< 5%						
Switch frequency	100Hz						
Repeat accuracy	0.02mm						
Current output	4~20mA/≤200Ω	0~20mA/≤200Ω		4~20mA/≤400Ω	0~20mA/≤200Ω		
Voltage output	0~10VDC/≥4.7KΩ						
Output type	PNP-Analog						
Sensing surface material	PBT						
Ambient temperature	-25℃~+75℃						
Circuit protection	Reverse polarity						
Degree of protection	IP67						
Model No.	Current output	TAF12-03PA	TAF18-04PA	TAF30-10PA	TAN12-04PA	TAN18-07PA	TAN30-14PA
	Voiage output	TAF12-03PV	TAF18-04PV	TAF30-10PV	TAN12-04PV	TAN18-07PV	TAN30-14PV

Dimensions (Unit:mm)

M12

TAF12-03□□

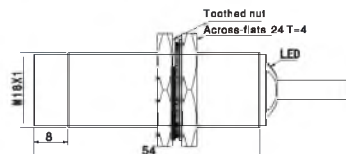
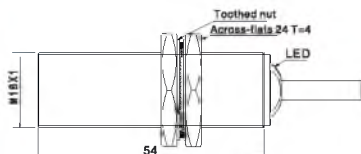
TAN12-04□□



M18

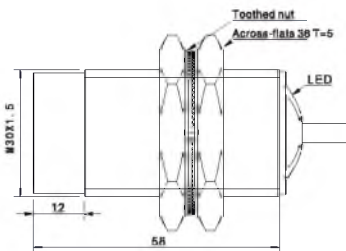
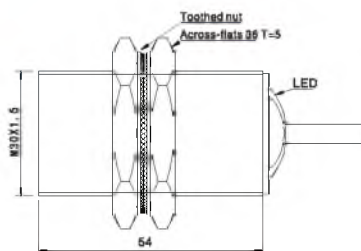
TAF18-04□□

TAN18-07□□



TAF30-10□□

TAN30-14□□



						
Appearance						
Mounting		Shielded				
Size	φ 6.5	M8	M12	M18	M30	
Sensing distance	1 mm/2mm ± 10%	1mm/2mm ± 10%	2mm/4mm ± 10%	5mm/8mm ± 10%	10mm/16mm ± 10%	
Housing material	Stainless steel		Nickel copper alloy			
Operating voltage	10~30V DC(Ripple < 10%)		10~60V DC(Ripple < 10%)			
Operating current			3~100mA			
Leakage current			< 0.8mA			
Voltage drop			< 6V/ < 4V			
Circuit protection			Short circuit			
Over-load current			> 120mA			
Switch frequency	2KHz		1KHz	500Hz		
Hysteresis			15%			
Temperature drift			10%			
Repeat accuracy			< 2%			
Operating Temperature			-25℃~-+75℃			
Sensing surface material			PBT			
Model No.	Normally open	TDF6.5-01HO/TDF6.5-02HO	TDF08-01HO/TDF08-02HO	TDF12-02HO/TDF12-04HO	TDF18-05HO/TDF18-08HO	TDF30-10HO/TDF30-16HO
	Normally close	TDF6.5-01HC/TDF6.5-02HC	TDF08-01HC/TDF08-02HC	TDF12-02HC/TDF12-04HC	TDF18-05HC/TDF18-08HC	TDF30-10HC/TDF30-16HC

						
Appearance						
Mounting		Unshielded				
Size	φ 6.5	M8	M12	M18	M30	
Sensing distance	2mm/4mm±10%	2mm/4mm±10%	4mm/8mm±10%	8mm/16mm±10%	15mm/25mm±10%	
Housing material	Stainless steel			Nickle plated brass		
Operating voltage	10~30V DC(Ripple < 10%)			10~60V DC(Ripple < 10%)		
Operating current				3~100mA		
Leakage current				< 0.8mA		
Voltage drop				< 6V/< 4V		
Circuit protection				Short circuit		
Over-load current				> 120mA		
Switch frequency	2KHz		1KHz	500Hz	200Hz	
Hysteresis				15%		
Temperature drift				10%		
Repeat accuracy				< 2%		
Operating Temperature				-25℃~+75℃		
Sensing surface material				PBT		
Model No.	Normally open	TDN6.5-02HO/TDN6.5-04HO	TDN08-02HO/TDN08-04HO	TDN12-04HO/TDN12-08HO	TDN18-08HO/TDN18-16HO	TDN30-15HO/TDN30-25HO
	Normally close	TDN6.5-02HC/TDN6.5-04HC	TDN08-02HC/TDN08-04HC	TDN12-04HC/TDN12-08HC	TDN18-08HC/TDN18-16HC	TDN30-15HC/TDN30-25HC

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini cylindrical
Short body
Ring type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

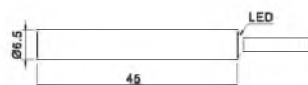
Capacitive sensors
Cylindrical
Correction
resistance type
Flat type
Level detection

DC 2-wire

Dimensions (Unit:mm)

 $\phi 6.5$

TDF6.5-01/02 □ □

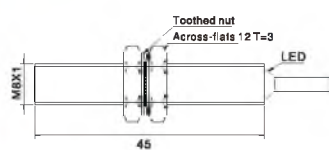


TDN6.5-02/04 □ □

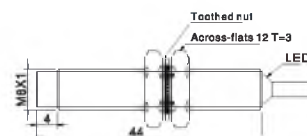


M8

TDF08-01/02 □ □

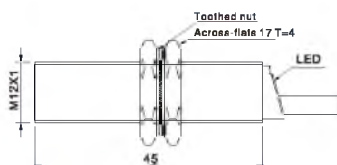


TDN08-02/04 □ □

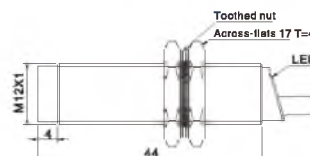


M12

TDF12-02/04 □ □

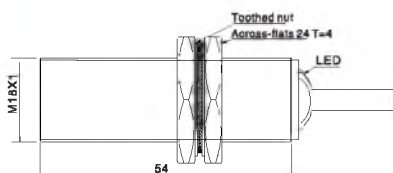


TDN12-04/08 □ □

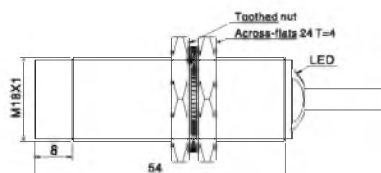


M18

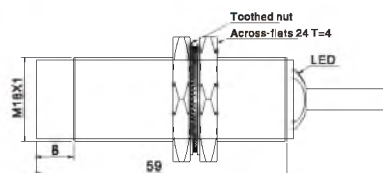
TDF18-05/08 □ □



TDN18-08 □ □

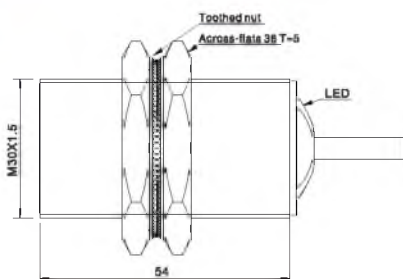


TDN18-16 □ □

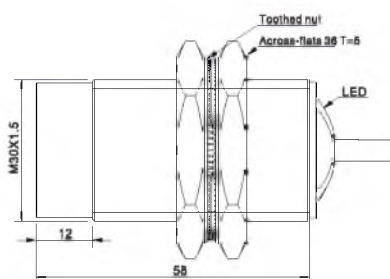


M30

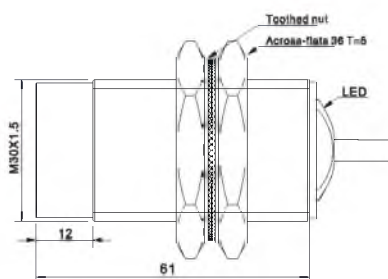
TDF30-10/16 □ □



TDN30-15 □ □



TDN30-25 □ □



Appearance

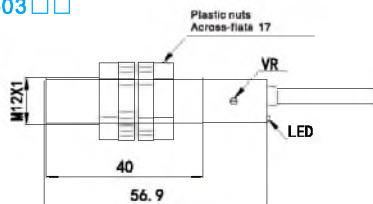


Mounting	Shielded			Unshielded		
Size	M12	M18	M30	M12	M18	M30
Sensing distance	1~3mm adjustable	2~8mm adjustable	2~20mm adjustable	1~6mm adjustable	2~15mm adjustable	2~30mm adjustable
Housing material	PBT					
Operating voltage	10~30V DC(Ripple<10%)					
Voltage drop	<2V					
Load Current, Max	150mA	300mA		150mA	300mA	
Current consumption	<10mA					
Leakage current	<0.01mA					
Switch frequency	100Hz					
Repeat accuracy	<5% (Sr)					
Hysteresis	<15% (Sr)					
Sensing surface material	PBT					
Operating Temperature	-25℃~+75℃					
Circuit protection	Short circuit					
Degree of protection	IP67					
Model No.	NPN Normally open CKF12-03□□□	NPN Normally closed CKF18-08□□□	PNP Normally open CKF30-20□□□	NPN Normally open CKN12-06□□□	NPN Normally closed CKN18-15□□□	PNP Normally closed CKN30-30□□□
Others	□□□:NPN Normally open □□□:NPN Normally closed □□□:PNP Normally open □□□:PNP Normally closed					

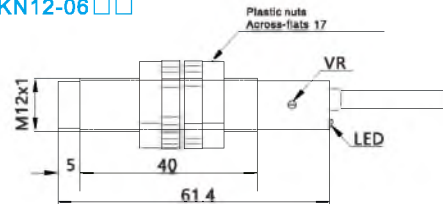
Dimensions-Plastic Shells (Unit:mm)

M12

CKF12-03□□□

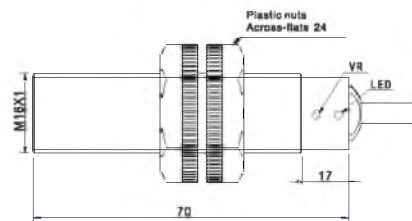


CKN12-06□□□

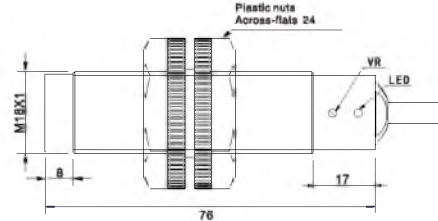


M18

CKF18-08□□□

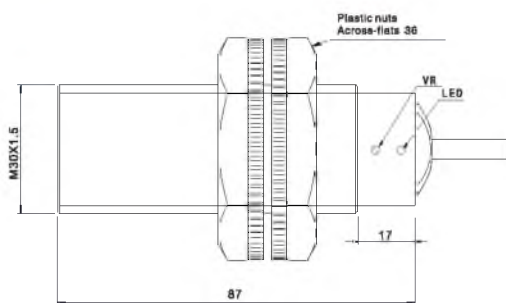


CKN18-15□□□

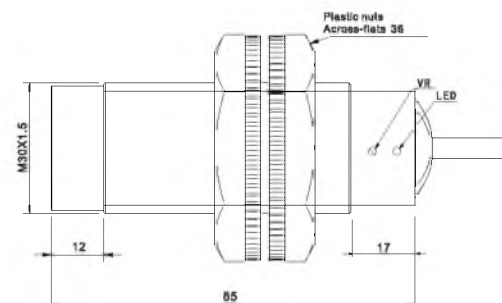


M30

CKF30-20□□□



CKN30-30□□□



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Inductive sensors
Standard distance
Extended distance
Long distance
Square
Mini square
Mini cylindrical
Short-body
Ring-type
Metal face
Temperature
IP69K high protection
Analog output
DC 2 wires

Capacitive sensors

Cylindrical
Correction
resistance type
Flat type
Level detection

Corrosion Resistance

Corrosion resistance

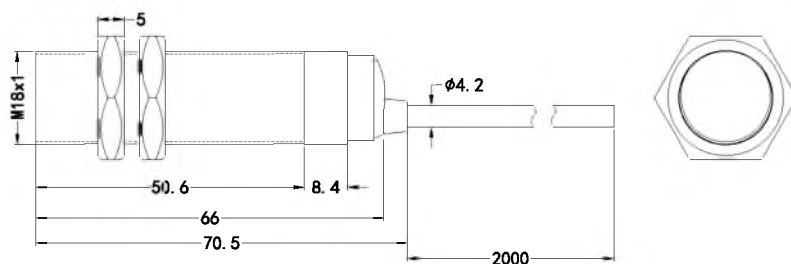


Appearance

Mounting	Shielded
Size	M18
Sensing distance	1~10mm adjustable
Detectable objects	Metal、Water、Oil、Glass、Plastic、Paper
Operating voltage	12~24V DC(Ripple < 10%)
Voltage drop	< 1.5V
Load Current, Max	100mA
Current consumption	< 22mA
Leakage current	< 1.1mA
Response time	≤ 14ms
Isolation impedance	≥ 20M Ω (500V DC)
Hysteresis	< 10% (Sr)
Insulation withstand voltage	AC 1000V 60Hz lasts 60 Sec
Operating temperature	-20℃~+60℃
Degree of protection	IP66
Connection	φ 4.2X2m 4 core cable
Weight	≈ 78g
Model No.	CWF18-10NP (NPN NO/NC PNP PC/PO)

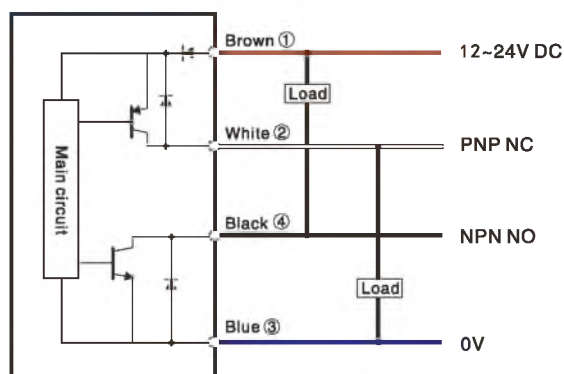
Dimensions

Unit: mm

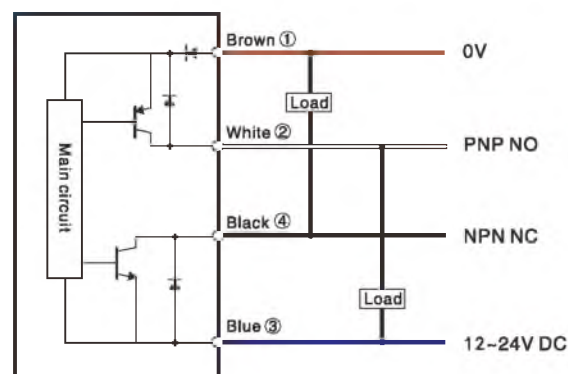


Circuit diagram

Method 1:



Method 2:



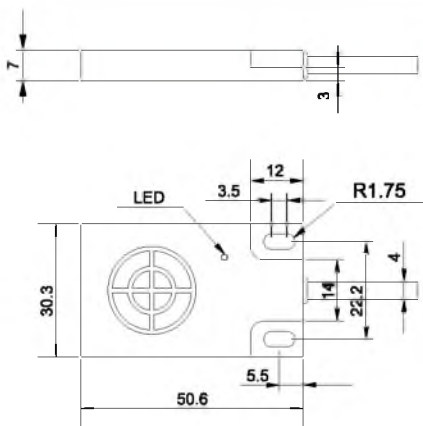


Appearance

Sensing distance	5mm(adjustable)	10mm(adjustable)
Housing material	Plastic, black/blue	
Operating voltage	24V DC(Ripple < 10%)	
Voltage drop	≤1.5V@1L=50mA	
Output type	NPN or PNP – NO/NC	
Load Current, Max	≤50mA	
Current consumption	≤10mA	
Switch frequency	100Hz	
Repeat accuracy	< 5%	
Operating Temperature	0℃~+60℃	
Storage temperature	-30℃~+75℃	
Temperature drift	≤20%	
Circuit protection	Reverse polarity, Over voltage pulse protection, Short circuit	
Degree of protection	IP67	
Model No.	NPN Normally open CQ07-05NNO CQ07-10NNO	
Others	NNO:NPN Normally open NCI:NPN Normally closed PIO:PNP Normally open PIC:PNP Normally closed	

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- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Dimensions (Unit:mm)



Guidance

- Inductive sensors
- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini cylindrical
- Short-body
- Ring type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

- Capacitive sensors
- Cylindrical
- Correction resist type
- Flat type
- Level detection

CQ07 Series



NEW!

Appearance

Sensing distance	8mm adjustable
Mouting	shield
Output Indicator	Red LED
Repetition accuracy	$\leq 1\% S.R$
Hysteresis	$\leq 10\%$
Switching frequency	35Hz
Operating Voltage	10~30V
Residual voltage	$\leq 1.5V$
Current consumption	$\leq 10mA$
Load current	$\leq 150mA$
Leakage current	$< 0.01mA$
Temperature drift	$\leq 20\%$
Circuit protection	Reverse polarity protection, surge protection, short circuit protection
Insulation resistance	$\geq 50M \Omega$
Voltage resistance	AC500V 50/60Hz 1min Between the charging section as a whole and the housing
Housing material	PBT
Protection level	IP66
Operating temperature	$-10 \sim 55^{\circ}C$
Storage temperature	$-20 \sim 75^{\circ}C$
Ambient Humidity	35% ~ 85%
Vibration resistance	10~55Hz Dual Amplitude 1.5mm, 2 hours each in XYZ direction
Impact resistance	10G, 3 times each in XYZ direction
Connection method	2M/3 core cable
Conformity	CE C60947-5-2
Model NO.	NPN normally open CQ07-08N/O
	Others

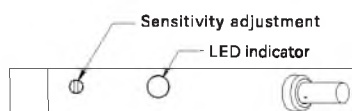
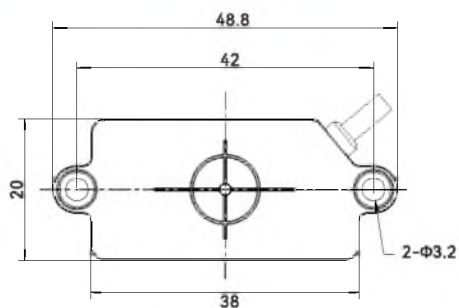
N/O: NPN Normally open

N/C: NPN Normally closed

P/O: PNP Normally open

P/C: PNP Normally closed

Dimensions (Unit:mm)





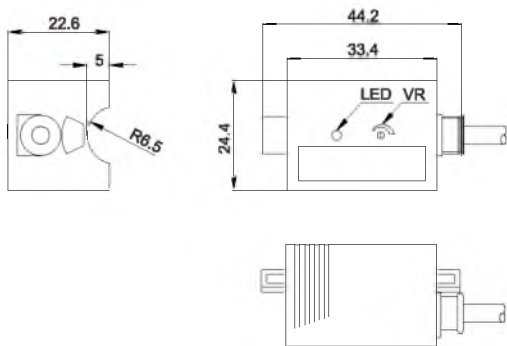
Appearance			
Mounting		Unshielded	
Operating voltage		10~30V DC	
Load Current, Max		150mA	
Voltage drop		< 2.5V	
Current consumption		< 15mA	
Hysteresis		3~20%	
Repeat accuracy		< 3%	
Switch frequency		20Hz	
Indicator		Yellow LED	
Pipeline	Material	Nonmetal	
	External diameter	φ 8~ φ 11	φ 12~ φ 26
	Wall thickness	< 1mm	
Circuit protection		Reverse polarity/Short circuit	
Ambient temperature		-25℃~+75℃	
Degree of protection		IP67	
Housing material		PBT	
Connection		2mPVC Cable	
Model No.	NPN Normally open	CE15-13NNO	CE30-26NNO
	Others		
	NNO: NPN Normally open NNC: NPN Normally closed PNO: PNP Normally open PNC: PNP Normally closed		

- Fiber Optic
- Slot Sensors
- Photoelectric
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- Magnetic
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- Area
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- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Dimensions (Unit:mm)

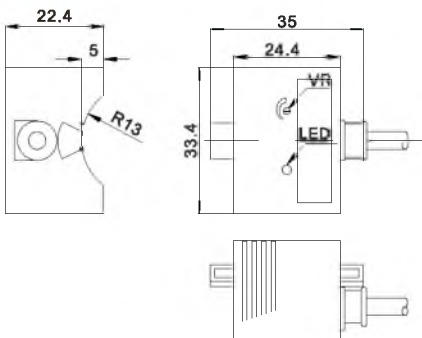
CE1

CE15-13□□



CE3C

CE30-26□□



- Guidance
- Inductive sensors
 - Standard distance
 - Extended distance
 - Long distance
 - Square
 - Mini square
 - Mini-cylindrical
 - Short-body
 - Ring-type
 - Metal face
 - Temperature
 - IP69K high protection
 - Analog output
 - DC 2 wires
- Capacitive sensors
 - Cylindrical
 - Correction resistanc type
 - Flat type
 - Level detection

Communication And Connection



- ◎ Rich communication interfaces, plug-and-play capability, rapid configuration.
- ◎ Data visualization, proactive maintenance.



NEW!

Basic parameters	Shell material	Aluminum alloy	
	Shell color	Metallic silver	
	Protect degree	IP67, Epoxy encapsulation	
	External dimensions	205mm × 60mm × 34.4mm	
	Weight	515g	
	Operating temperature	-25°C~70°C	
	Storage/transport temperature	-40°C~85°C	
	Operating humidity	5%~95%	
	Storage/transport humidity	5%~95%	
	Operating atmospheric pressure	80KPa~106KPa	
	Storage/transport atmospheric pressure	80KPa~106KPa	
	I/O port fastening torque	M12:0.5Nm	
	Application environment	Compliant with EN-61131	
	Vibration testing	Compliant with IEC60068-2	
	Shock testing	Compliant with IEC60068-27	
	Free fall testing	Compliant with IEC60068-32	
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4	
	Certification	CE,RoHS	
	Installation hole specifications	Φ4.5mm × 1 ; Φ5.5mm × 1	
Pinout definition for data port	M12 D-code Female end	Connection method	2 × M12 D-code; 4-pin socket
		Physical layer	Ethernet
		Transmission speed	10/100 Mbps, Full duplex
		Characteristics	Compliant with protocol specifications
		Alarm function	Diagnosis alarm, process alarm
		Minimum cycle time	1 ms
		Communication port fastening torque	M12:0.5Nm
Pinout definition for auxiliary power supply port	Auxiliary power supply port	Power supply connection method	M12, 5-pin, L-code, male/female
		System power supply voltage us	18~30 VDC(type.24VDC)
		Auxiliary power supply voltage ua	18~30 VDC(type.24VDC)
	M12 L-code Female end & Male end	Total current Is	12A
		Total current Ia	12A
		Static operating current Ic	≤150mA
	Pinout definition	Reverse power protection	Have
		Power port fastening torque	M12:0.5Nm
		XF0, XF1 1. TX+ 2. RX+ 3. TX- 4. RX-	
		XP0 XP1 Male Female 1. +24V_Us 2. GND_Ua 3. GND_Us 4. +24V_Ua 5. FE	

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Slot Sensors

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Laser

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RFID

Safety doorlock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

Module main station

CIO 200 Series

IO-Link Master station parameters	The number of ports on the master station	Maximum configurable 8 ports						
	Master station connection method	M12, 5-pin, A-code, female						
	IO-link Version	V1.1.2						
	Communication rate	COM1:4.8KBps;COM2:38.4KBps;COM3:230.4KBps						
	Port voltage L+	type.24VDC (via US)						
	Port current L+	2A(via US)						
	Class A	8 ports, X1~X8						
	Master-slave communication distance	≤20m						
	Master-master communication distance	≤100m						
Digital input Output parameters	Number of inputs	8-channel, adaptive						
	Input port location	X1~X8						
	Input polarity	PNP						
	Signal "0" voltage	-0.3~5VDC						
	Signal "1" voltage	12~30VDC						
	Input current	type.5mA(via US)						
	Number of outputs	8-channel, adaptive						
	Output port location	X1~X8						
	Input polarity	PNP						
	Output current	Single channel 2A (via UA)						
	Port protection	Power supply short-circuit protection, overload protection for power supply port						
Module indicator lights	PWR	Module power normal						
		Red: Module power reverse connection						
	I/O	Green: Channel signal normal						
		Red: Port power short-circuit						
	LINK	Green: Connection normal						
		Yellow flashing: Connection normal, data communication normal						
		Off: No connection established						
		RUN	Green: OP status		SF	Red: module failure	MS	Green: Module status is normal
			Green slow flashing: SAFEOP status					Green flash: module is not configured
			Green fast flashing: Pre-OP status		BF	Red: internal error	NS	Red: module failure
			Off: Init status					Flashing red: Device name/IP address/module group status error	Green: The network status is normal
		ERR	Red flashing: Communication error		Green flash: communication not established			
			Off: module status is normal		Flashing red: communication interrupted			
	IO-LINK	Green: Port operation (running) status						
		Flashing green quickly: port connection process or wrong device						
		Flashing green slowly: The port is in pre-operation state						
		Green off: port is closed						
		Protocol	EtherCat Protocol		ProfiNet Protocol		EtherNet/IP Protocol	
		Model	CIO200-ECIO-8A		CIO200-PNIO-8A		CIO200-EIIO-8A	

I/O Port pin definition

Pin definition		Address distribution	
Port	M12(X1~X8)		
		Byte	0
	Class A	Bit0	X1P2
		Bit1	X2P2
		Bit2	X3P2
M12	1. V+	Bit3	X4P2
A-code	2. In/Output	Bit4	X5P2
female end	3. 0 V	Bit5	X6P2
	4. C/Q	Bit6	X7P2
	5. N/C	Bit7	X8P2

CIO 200 Series

IO-Link Master station parameters	The number of ports on the master station	Maximum configurable 8 ports						
	Master station connection method	M12, 5-pin, A-code, female						
	IO-link Version	V1.1.2						
	Communication rate	COM1:4.8KBps;COM2:38.4KBps;COM3:230.4KBps						
	Port voltage L+	type.24VDC (via US)						
	Port current L+	2A(via US)						
	Class B auxiliary voltage	type.24VDC(via UA)						
	Class B auxiliary current	2A(via UA)						
	Class A	4 ports, X1~X4						
	Class B	4 ports, X5~X8						
	Master-slave communication distance	≤20m						
	Master-master communication distance	≤100m						
	Digital Input Output parameters	Number of inputs	4-channel, adaptive					
Input port location		X1~X4						
Input polarity		PNP						
Signal "0" voltage		-0.3~5VDC						
Signal "1" voltage		12~30VDC						
Input current		type.5mA(via US)						
Number of outputs		4-channel, adaptive						
Output port location		X1~X4						
Input polarity		PNP						
Output current		Single channel 2A (via UA)						
Port protection		Power supply short-circuit protection, overload protection for power supply port						
Module indicator lights	PWR	Module power normal						
		Red: Module power reverse connection						
	I/O	Green: Channel signal normal						
		Red: Port power short-circuit						
	LINK	Green: Connection normal						
		Yellow flashing: Connection normal, data communication normal						
		Off: No connection established						
	RUN	SF	Green: OP status		MS	Green: Module status is normal		
			Green slow flashing: SAFEOP status			Green flash: module is not configured		
			Green fast flashing: Pre-OP status			Red: module failure		
		ERR	BF	Off: Init status		NS	Green: The network status is normal	
				Red flashing: Communication error			Green flash: communication not established	
				Off: module status is normal			Flashing red: communication interrupted	
	IO-LINK	Green: Port operation (running) status						
		Flashing green quickly: port connection process or wrong device						
		Flashing green slowly: The port is in pre-operation state						
		Green off: port is closed						
Protocol	EtherCat Protocol		ProfiNet Protocol		EtherNet/IP Protocol			
Model	C1O200-EC1O-4A4B		C1O200-PN1O-4A4B		C1O200-E11O-4A4B			

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Module main station

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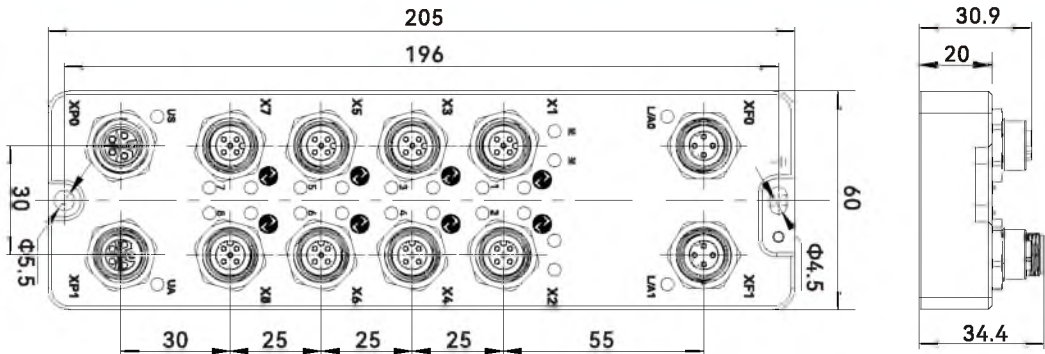
I/O Port pin definition

Pin definition		Address distribution												
Port	M12(X1~X8)  Class A 1. V+ 2.In/Output 3.0V 4. C/Q 5 N/C Class B 1. V+ 2.P24V 3.0V 4. C/Q 5 N24V		<table><tr><td>Byte</td><td>0</td></tr><tr><td>Bit0</td><td>X1P2</td></tr><tr><td>Bit1</td><td>X2P2</td></tr><tr><td>Bit2</td><td>X3P2</td></tr><tr><td>Bit3</td><td>X4P2</td></tr></table>		Byte	0	Bit0	X1P2	Bit1	X2P2	Bit2	X3P2	Bit3	X4P2
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Bit0	X1P2													
Bit1	X2P2													
Bit2	X3P2													
Bit3	X4P2													
M12														
A-code														
female end														

Module main station

Dimensions

Unit: mm



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- Pressure Switch
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- Accessories

IO Bus

- Module main station
- Module Slave

- Controller & Communicator
- Controller
- Communicator



Basic parameters	Shell material	PA6 + GF
	Shell color	Black
	Ptotect degree	IP67 , Epoxy full potting
	External dimensions	155mm × 53mm ×28.7mm
	Weight	217g
	Operating temperature	-25℃~70℃
	Storage/transport temperature	-40℃~85℃
	Operating humidity	5%~95%
	Storage/transport humidity	5%~95%
	Operating atmospheric pressure	80KPa~106KPa
	Storage/transport atmospheric pressure	80KPa~106KPa
	I/O port fastening torque	M12:0.5Nm
	Application environment	Compliant with EN-61131
	Vibration testing	Compliant with IEC60068-2
	Shock testing	Compliant with IEC60068-27
	Free fall testing	Compliant with IEC60068-32
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4
	Certification	CE,RoHS
	Installation hole specifications	Φ4.3mm × 4
Pinout definition for data port	IO-Link	IO-Link M12 MALE
	Pinout definition for port	 1. V+ 2. P24V 3. 0V 4. C/Q 5. N/C

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- IO Bus
- Module main station
- Module Slave
- Controller & Communicator
- Controller
- Communicator

Module slave

CIO 100 Series

IO-Link Master station parameters	IO-Link Number of ports	1 x device	
	IO-Link Handle data length	2 input bytes	2 Output bytes
	Minimum cycle time	3 ms	
Input/Output parameters	Input and output quantity	16 inputs	16 inputs
	Rated working voltage	18~30V DC	
	Maximum load current (sensor)	200 mA	–
	Maximum load current (actuator)	–	500 mA
	Total current UI	< 1.6A	–
	Total current UO	–	< 2.5A
Module indicator lights	IO-LINK RUN	Green: No communication connection	
		Green flash: communication is normal	
		Red: communication interrupted	
	PWR	Green: module power supply is normal	
		Off: module power is not connected	Yellow: Auxiliary power is not connected
	I/O	Green: Channel signal is normal	
		Red: Port failure	
	IO-Link	Class A	
Model	PNP	CIO100-M12-DI16P	CIO100-M12-DO16P
	NPN	CIO100-M12-DI16N	CIO100-M12-DO16N

I/O Port pin definition

	Pin definition	Address distribution																																																
Port M12 A-code female end	M12(J1~J8)  <table> <tr> <th></th><th>PNP</th><th>NPN</th></tr> <tr> <td>Input</td><td></td><td></td></tr> <tr> <td>1.24VDC+</td><td></td><td>1.24VDC+</td></tr> <tr> <td>2. Input</td><td></td><td>2. Input</td></tr> <tr> <td>3.0V</td><td></td><td>3.0V</td></tr> <tr> <td>4. Input</td><td></td><td>4. Input</td></tr> <tr> <td>5.FE</td><td></td><td>5.FE</td></tr> </table>		PNP	NPN	Input			1.24VDC+		1.24VDC+	2. Input		2. Input	3.0V		3.0V	4. Input		4. Input	5.FE		5.FE	<table> <tr> <th>Byte</th><th>1</th><th>0</th></tr> <tr> <td>Bit0</td><td>J1 P4</td><td>J5 P4</td></tr> <tr> <td>Bit1</td><td>J1 P2</td><td>J5 P2</td></tr> <tr> <td>Bit2</td><td>J2 P4</td><td>J6 P4</td></tr> <tr> <td>Bit3</td><td>J2 P2</td><td>J6 P2</td></tr> <tr> <td>Bit4</td><td>J3 P4</td><td>J7 P4</td></tr> <tr> <td>Bit5</td><td>J3 P2</td><td>J7 P2</td></tr> <tr> <td>Bit6</td><td>J4 P4</td><td>J8 P4</td></tr> <tr> <td>Bit7</td><td>J4 P2</td><td>J8 P2</td></tr> </table>	Byte	1	0	Bit0	J1 P4	J5 P4	Bit1	J1 P2	J5 P2	Bit2	J2 P4	J6 P4	Bit3	J2 P2	J6 P2	Bit4	J3 P4	J7 P4	Bit5	J3 P2	J7 P2	Bit6	J4 P4	J8 P4	Bit7	J4 P2	J8 P2
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Port M12 A-code female end	M12(J1~J8)  <table> <tr> <th></th><th>PNP</th><th>NPN</th></tr> <tr> <td>Output</td><td></td><td></td></tr> <tr> <td>1.N/C</td><td></td><td>1.24VDC+</td></tr> <tr> <td>2. Output</td><td></td><td>2. Output</td></tr> <tr> <td>3.0V</td><td></td><td>3.N/C</td></tr> <tr> <td>4. Output</td><td></td><td>4. Output</td></tr> <tr> <td>5.FE</td><td></td><td>5.FE</td></tr> </table>		PNP	NPN	Output			1.N/C		1.24VDC+	2. Output		2. Output	3.0V		3.N/C	4. Output		4. Output	5.FE		5.FE	<table> <tr> <th>Byte</th><th>1</th><th>0</th></tr> <tr> <td>Bit0</td><td>J1 P4</td><td>J5 P4</td></tr> <tr> <td>Bit1</td><td>J1 P2</td><td>J5 P2</td></tr> <tr> <td>Bit2</td><td>J2 P4</td><td>J6 P4</td></tr> <tr> <td>Bit3</td><td>J2 P2</td><td>J6 P2</td></tr> <tr> <td>Bit4</td><td>J3 P4</td><td>J7 P4</td></tr> <tr> <td>Bit5</td><td>J3 P2</td><td>J7 P2</td></tr> <tr> <td>Bit6</td><td>J4 P4</td><td>J8 P4</td></tr> <tr> <td>Bit7</td><td>J4 P2</td><td>J8 P2</td></tr> </table>	Byte	1	0	Bit0	J1 P4	J5 P4	Bit1	J1 P2	J5 P2	Bit2	J2 P4	J6 P4	Bit3	J2 P2	J6 P2	Bit4	J3 P4	J7 P4	Bit5	J3 P2	J7 P2	Bit6	J4 P4	J8 P4	Bit7	J4 P2	J8 P2
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Master station parameters	IO-Link Number of ports	1 × device	
	IO-Link Handle data length	2 input bytes; 2 output bytes	1 input byte; 1 output byte
	Minimum cycle time	3 ms	
Input/Output parameters	Input and output quantity	16-way adaptive	8 inputs 8 outputs
	Rated working voltage	18~30V DC	
	Maximum load current (sensor)	200 mA	
	Maximum load current (actuator)	500 mA	
	Total current UI	< 1.6A	
	Total current UO	< 2.5A	
Module indicator lights	IO-LINK RUN	Green: No communication connection	
		Green flash: communication is normal	
		Red: communication interrupted	
	PWR	Green: module power supply is normal	
		Yellow: Auxiliary power is not connected	
	I/O	Green: Channel signal is normal	
		Red: Port failure	
Model	IO-Link	Class A	
	PNP	CIO100-M12-DIO16P	CIO100-M12-DI8DO8P
	NPN	CIO100-M12-DIO16N	CIO100-M12-DI8DO8N

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I/O Port pin definition

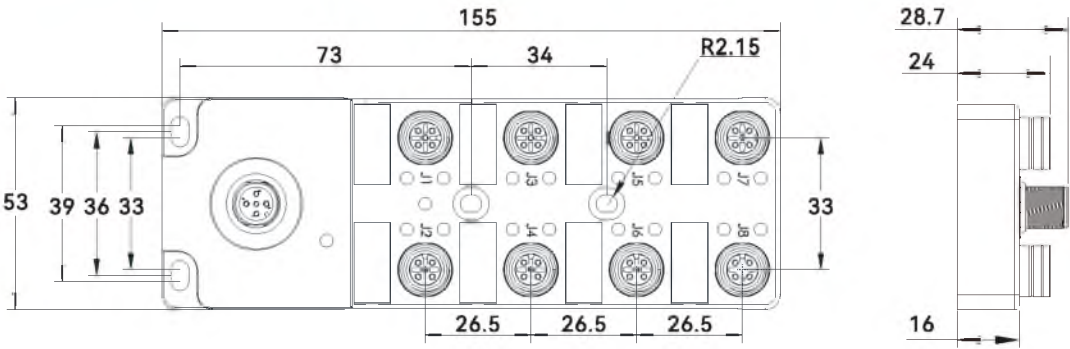
	Pin definition	Address distribution																											
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Bit7	J4P2	J8P2																											
M12 A-code female end	PNP Input/Output 1. 24VDC+ 2. Input/Output 3. 0V 4. Input/Output 5. FE NPN Input/Output 1. 24VDC+ 2. Input/Output 3. 0V 4. Input/Output 5. FE																												

Port	M12(J1~J8) 	<table><tr><th>Byte</th><th>1</th><th>Byte</th><th>0</th></tr><tr><td>Bit0</td><td>J1P4</td><td>Bit0</td><td>J5P4</td></tr><tr><td>Bit1</td><td>J1P2</td><td>Bit1</td><td>J5P2</td></tr><tr><td>Bit2</td><td>J2P4</td><td>Bit2</td><td>J6P4</td></tr><tr><td>Bit3</td><td>J2P2</td><td>Bit3</td><td>J6P2</td></tr><tr><td>Bit4</td><td>J3P4</td><td>Bit4</td><td>J7P4</td></tr><tr><td>Bit5</td><td>J3P2</td><td>Bit5</td><td>J7P2</td></tr><tr><td>Bit6</td><td>J4P4</td><td>Bit6</td><td>J8P4</td></tr><tr><td>Bit7</td><td>J4P2</td><td>Bit7</td><td>J8P2</td></tr></table>	Byte	1	Byte	0	Bit0	J1P4	Bit0	J5P4	Bit1	J1P2	Bit1	J5P2	Bit2	J2P4	Bit2	J6P4	Bit3	J2P2	Bit3	J6P2	Bit4	J3P4	Bit4	J7P4	Bit5	J3P2	Bit5	J7P2	Bit6	J4P4	Bit6	J8P4	Bit7	J4P2	Bit7	J8P2
Byte	1	Byte	0																																			
Bit0	J1P4	Bit0	J5P4																																			
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M12 A-code female end	PNP Input 1. 24VDC+ 2. Input 3. 0V 4. Input 5. FE Output 1. N/C 2. Output 3. 0V 4. Output 5. FE NPN Input 1. 24VDC+ 2. Input 3. 0V 4. Input 5. FE Output 1. 24VDC+ 2. Output 3. N/C 4. Output 5. FE																																					

Module slave

Dimensions

Unit: mm



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety door lock
Pressure Switch
Communication
Accessories
IO Bus
Module main station
Module Slave
Controller & Communicator
Controller
Communicator



Basic parameters	Shell material	PA6 + GF
	Shell color	Black
	Protect degree	IP67 , Epoxy full potting
	External dimensions	140mm × 30mm × 24.8mm
	Weight	180g
	Operating temperature	-25℃~70℃
	Storage/transport temperature	-40℃~85℃
	Operating humidity	5%~95%
	Storage/transport humidity	5%~95%
	Operating atmospheric pressure	80KPa~106KPa
	Storage/transport atmospheric pressure	80KPa~106KPa
	I/O port fastening torque	M12:0.5Nm
	Application environment	Compliant with EN-61131
	Vibration testing	Compliant with IEC60068-2
	Shock testing	Compliant with IEC60068-27
	Free fall testing	Compliant with IEC60068-32
	Electromagnetic compatibility (EMC)	Compliant with IEC61000-4-2,-3,-4
	Certification	CE,RoHS
	Installation hole specifications	Φ4.3mm × 2
Pinout definition for data port	IO-Link	IO-Link M12 MALE
	Pinout definition for port	 1. V+ 2. P24V 3. 0V 4. C/Q 5. N/C

Fiber Optic
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Safety door lock
Pressure Switch
Communication
Accessories

IO Bus
Module main station
Module Slave

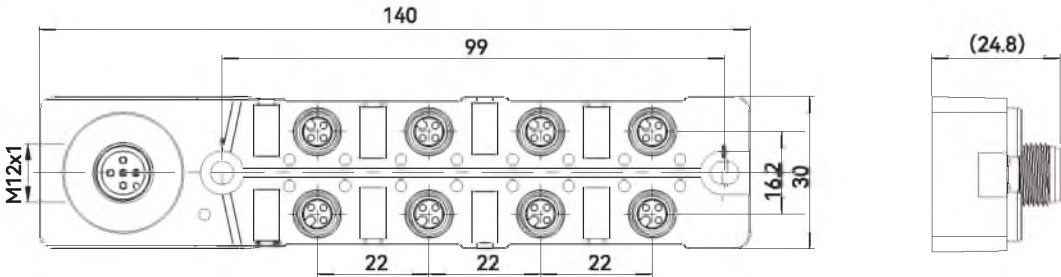
Controller & Communicator
Controller
Communicator

I/O Port pin definition

R-11 AKUSENSE

Unit: mm

Dimensions



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

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Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

Controller & Communicator

Controller

Communicator

Controller

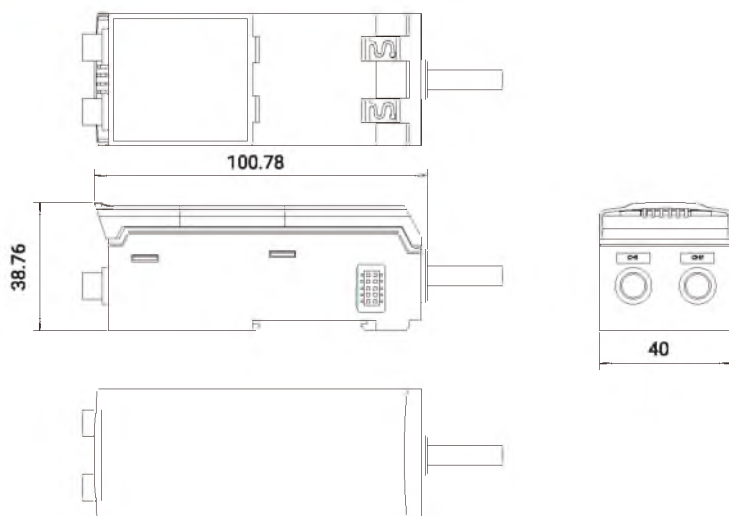
CR-M02



Installation method	DIN rail installation
Operating voltage	+24VDC±10%
Current consumption of a single controller	Under 100mA(When connecting the sensor)
Number of connected sensors	Two pairs of sensors
The communication with sensors	RS485
Number of controllers connected in parallel	Up to 16 controllers can be connected
Display	240*240TFT display
Indicator light	Output 1~3 and function indicator light red
Analog output	Analog output current 4~20mA, voltage 0~5V can be switched
Switching output	3-channel output, NO, NC, PO, PC can be switched
External input	3-channel input, NPN and PNP input optional
Display resolution	1μm
Display range	-99.999mm~99.999mm
Protective structure	IP40
Operating temperature	10°C~+50°C
Working humidity	35%RH~85%RH
Insulation resistance	The resistance of all connecting terminals and shells is above 20MΩ
Withstand voltage	All connection terminals and housing withstand voltage AC 1000V
Vibration resistance	Frequency 10~55HZ, 1.5m double amplitude, two hours each in X, Y and Z directions
Shock proof	98m/s ² (about 10G) 5 times each in X, Y, and Z directions
Model	CR-M02

Dimensions

Unit: mm





NEW!

	Installation method	DIN rail installation		
	Operating voltage	24V DC(10~30V DC)		
	Indicator light	PWR: Power indicator/green RUN: running indicator light/green ERR: Error indicator/red Sensor communication indicator light: red light (RTU communication abnormality) Ethernet port: (green) D-BUS: RTU Communication normal/green light Ethernet port(green): RTU communication abnormality/traffic light alternation of some slave stations No RTU communication activity/off The Ethernet port has established a valid network connection/on. The Ethernet port is in network activity/blinks. The Ethernet port does not establish a network connection or the port is abnormal/off.		
	100M Ethernet port	10/100Base-T (X) RJ45, automatic flow control, full and half-duplex mode, MDI/MDI-X automatic detection		
	Burning port	The software programming port uses 8-bit terminal blocks with a pitch of 2.0mm, occupying 2-5 positions from the left		
	Console port	The CLI command management port uses 8-position terminal blocks with a spacing of 2.0mm, occupying 6-8 positions from the left		
	RS-485 serial port	Supports 2 RS-485 serial ports, one of which is reserved, using 10-bit terminal blocks with a spacing of 2.0mm, and the serial port occupies 4 bits		
	Reset button	Reset button		
	Access terminal,load power consumption at normal temperature	10-position terminal block with a pitch of 2.0mm, 2 positions for power supply, 0.7w@10VDC 0.7w@20VDC 0.7w@30VDC		
	Full-load power consumption at normal temperature	0.7w@10VDC 0.7w@20VDC 0.7w@30VDC		
	High temperature full load power consumption	0.8w@10VDC 0.8w@20VDC 0.8w@30VDC		
	Operating temperature	-40℃~75℃		
	Storage temperature	-40℃~85℃		
	Working humidity	5%~95% (No condensation)		
	Model	CTM01-EC		

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety door lock

Pressure Switch

Communication

Accessories

IO Bus

Module main station

Module Slave

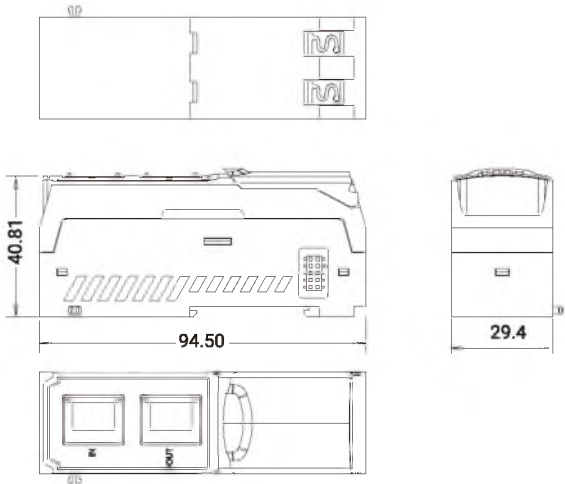
Controller & Communicator

Controller

Communicator

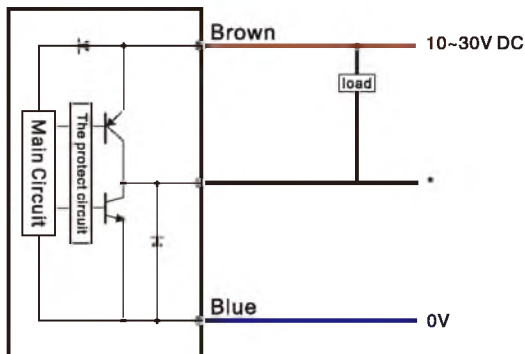
Unit: mm

Dimensions

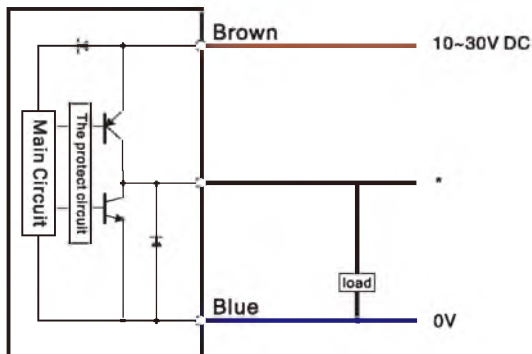


Input circuit diagram

NPN output



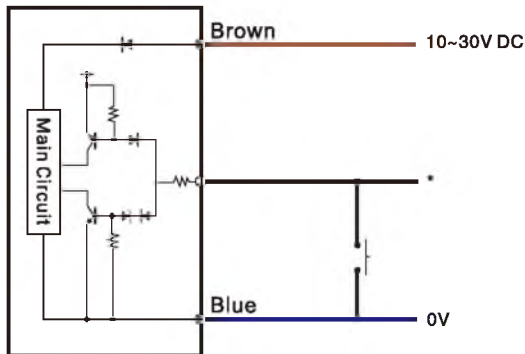
PNP output



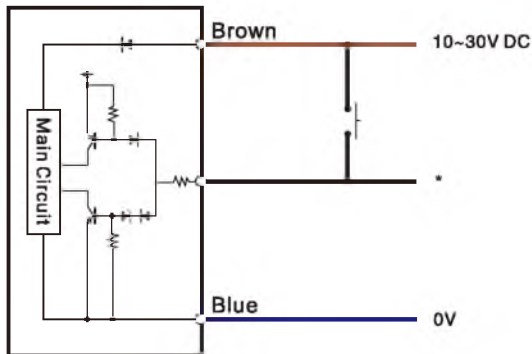
* Black (HIGH judgment output)/white (LOW judgment output)/grey (GO judgment output)/green (verification input)

Output circuit diagram

NPN output



PNP output



* Pink (External input 1)/Yellow (External input 2)/Pink·Purple (External input 3)/Purple (External input 4)

Fiber Optic

Slot Sensors

Photoelectric

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Module Slave

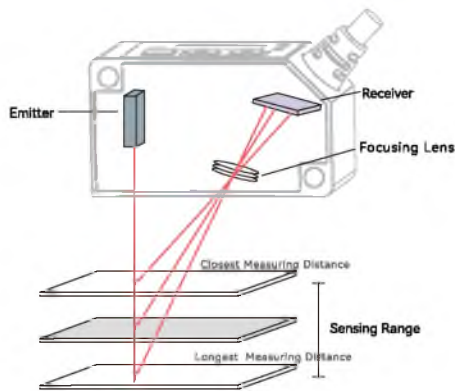
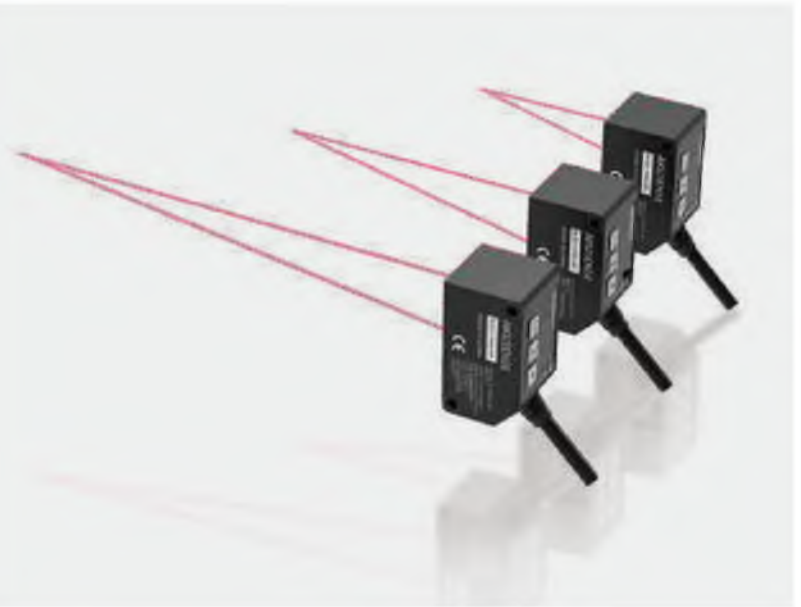
Controller & Communicator

Controller

Communicator

Laser Displacement Sensor

MLD21 Series ▶



CMOS sensor element Highly accurate detection achieved by triangulation principle

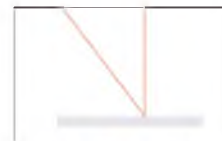
By triangulation principle, the incoming light port on the CMOS of the sensor receiver moves as the object position changes.

And the change of objects can be checked by detecting the incoming light position.

Automatic Exposure Adjustment

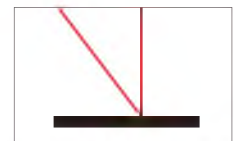
The amount of energy received can be automatically adjusted according to different applications;

Detection remains stable even the color or material of the workpiece changes.



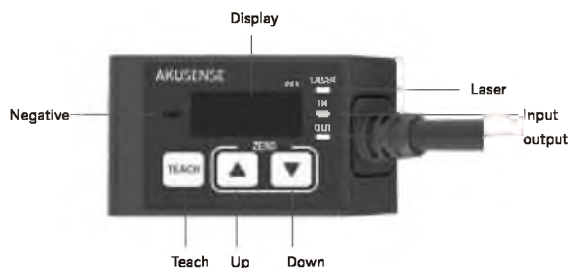
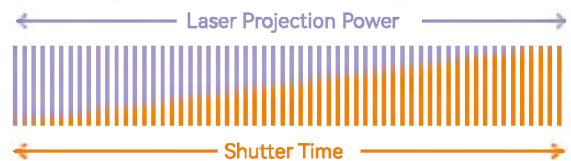
Measuring brighter objects

Laser Weakened



Measuring darker objects

Laser Enhanced



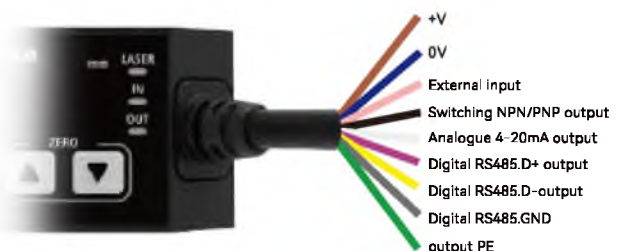
Intuitive digit display on the panel, and button function makes commissioning easy

Equipped with display and function buttons within a mini space;

The opening/closing of the laser, external trigger signal and control output signal status can be intuitively presented; most function settings can be made directly via the sensor panel.

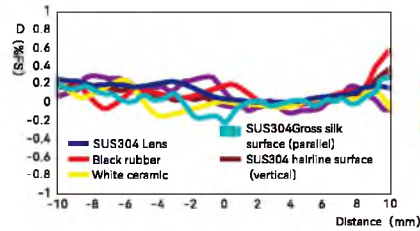
It includes parameter item setting, function item setting and threshold setting.

Integrated output methods; Switching, analogue and digital outputs all in one.

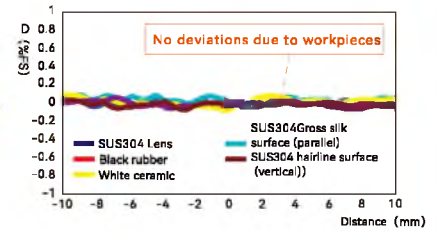


Detection remains stable even the workpiece moves

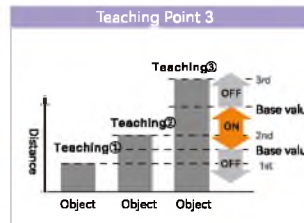
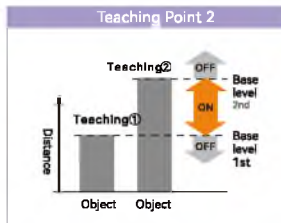
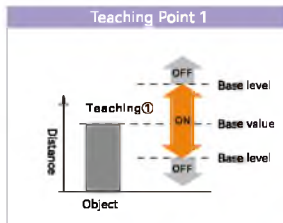
For workpieces with rough surfaces, a linear beam is used to average the amount of reflection. And the amount of light received is corrected at a high speed of 30μs for per measurement cycle to reduce the alteration of the amount of light received caused by workpiece moving. Thus the detection remains stable even when the workpiece is displaced during the process of measurement.



Material-based linear properties of previous products



Material-based linear properties of MLD21



Built-in rich detection modes for greater functionality

In addition to the basic teaching settings, the following three modes have been implemented:
Basic teaching mode for simple setting of the presence or absence of the object to be measured;
A single-point serial comparison mode for deviations from the reference measurement surface;
A two-point teaching serial comparison mode for precise range control.

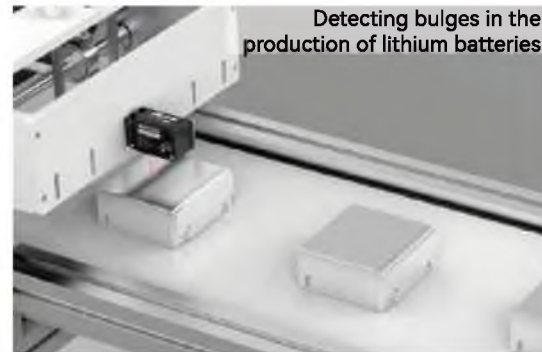
Application

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

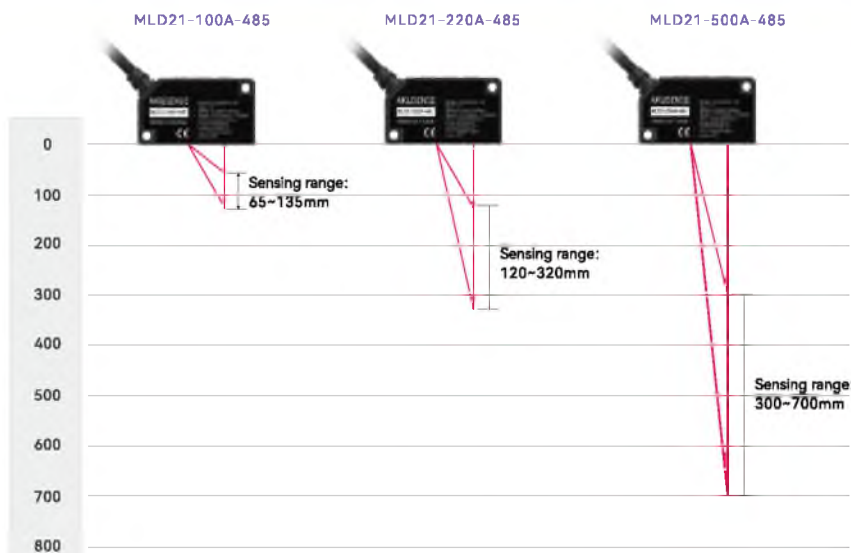
Guidance

Displacement

- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment



Selection table



Model	MLD21-100A-485
Repeat accuracy	70μm
Linearity	±0.1%
Base distance	100mm

Model	MLD21-220A-485
Repeat accuracy	200μm
Linearity	±0.2%
Base distance	220mm

Model	MLD21-500A-485
Repeat accuracy	(300~500mm)300μm (500~700mm)600μm
Linearity	(300~500mm)±0.2% (500~700mm)±0.3%
Base distance	500mm

MLD21 Series

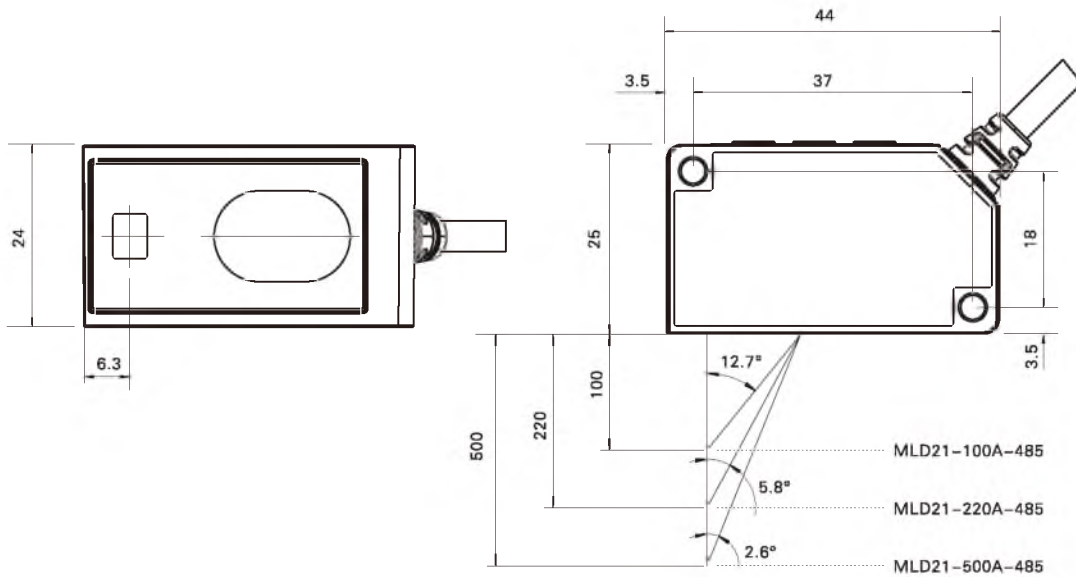


Basic Features	Working principle	Triangulation		
	Housing	Rectangular		
	Optical working principle	Diffuse reflection		
	Reference distance	100mm	220mm	500mm
	Measuring range	65~135mm	120~320mm	300~700mm
	Light source	Red laser, Class 2		
	Spot size	0.14x0.11mm	0.29x0.24mm	0.54x0.33mm
Electrical data	Switching mode	L.on/D.on		
	Output mode	NPN or PNP collector open		
	Response time	1.5ms/ 3ms/5ms (default v: ms)		
	Linearity	± 0.1%	± 0.2%	(300~500mm) ± 0.2% (500~700mm) ± 0.3%
	Repeatability	70μm	200μm	(300~500mm)300μm (500~700mm)600μm
	Temperature drift characteristics	-		
	Operating voltage	12~24VDC ± 10%		
	Current consumption	-		
	Load current	<100mA		
	Insulation resistance	≥ 20MΩ with 500V DC between power terminals and enclosure		
	Dielectric strength	500 VAC, 50/60 Hz for 1 min between power terminals and enclosure		
	Protection circuit	Reverse Polarity Protection/surge protection		
Environmental conditions	Operating temperature	-10~50℃		
	Operating humidity	35~85%RH		
	Ambient illumination	Incandescent ≤ 3000 Lux		
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Enclosure rating	IP67		
Mechanical data	Connection type	2m, 9 core cable		
	Dimension	24,0x44,0x25,0mm		
	Material	Aluminum		
	Weight	0.065kg		
	Accessories	Cable		
	Model	MLD21-100A-485	MLD21-220A-485	MLD21-500A-485

Unit:mm

Dimensions

Displacement



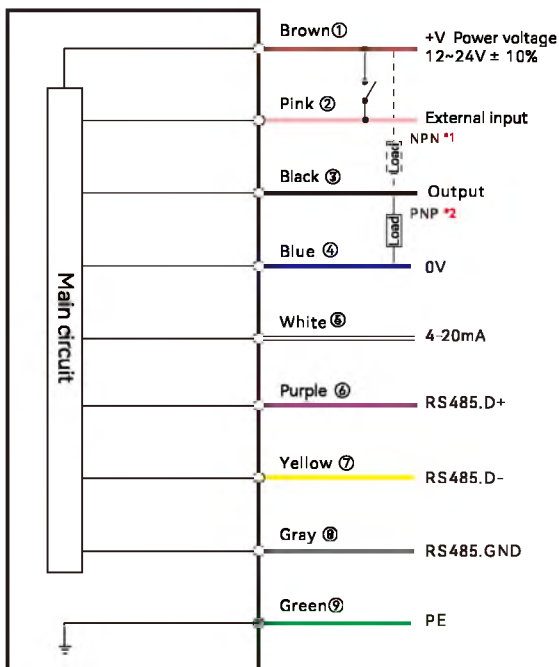
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Guidance

Displacement

Triangulation
TOF Long Range Type
3D Laser Profiler
Contact Displacement
LIDAR Scanner
Color confocal
Laser Alignment

Circuit diagram

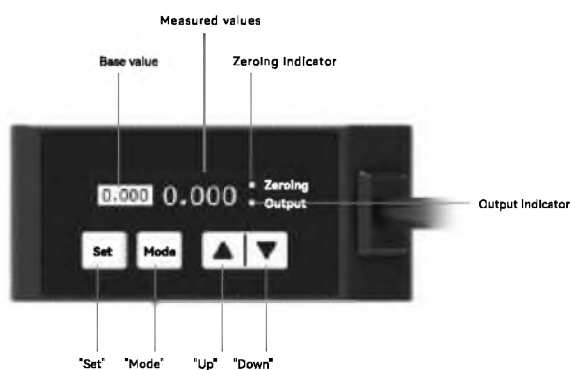


Remark :

1. NPN output connection : Connect Black with Brown (+V)
2. PNP output connection: Connect Black with Blue (0V)

Laser Displacement Sensor

MLD23 Series ▶

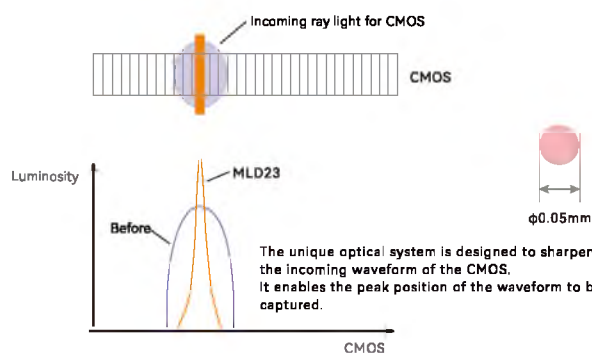


Mini Chinese Display

More Intuitive and Simple for Commissioning

Convergent harnesses for more accurate detection

Akusense has developed its own optical system to significantly converge and improve the beam to 50um; An ultra-small spot size of 0.05mm formed, which detects objects with stability and accuracy.

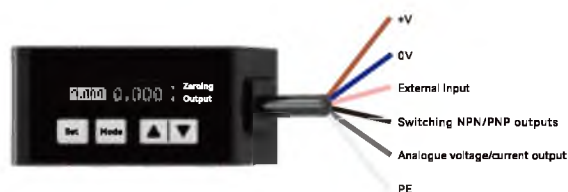


Micron-level linear accuracy

Linear accuracy reaches to 0.01mm for easy inspection with high accuracy

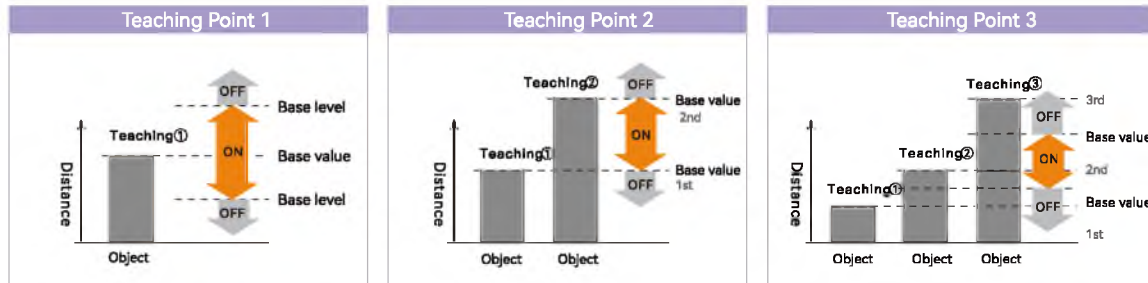
Convenient Installation

Integration of analogue voltage, analogue current and switching



Simple and flexible test patterns

Multiple teaching modes to make testing easier



Faster, more stable, more accurate

Three test modes are for option:
standard, high speed and high accuracy

① Ultra-high speed computing and processing

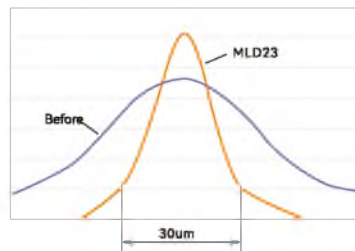
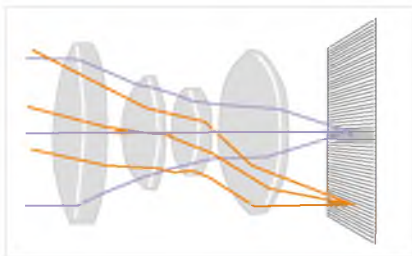
The application of Akusense's advanced IC and algorithm technology has greatly improved the sensor's detection rate and data accuracy, allowing for both high speed transmission and stable detection of measured values.



Max 1.5ms response time

Repeat accuracy up to 10μm

Min ±0.1% F.S linearity

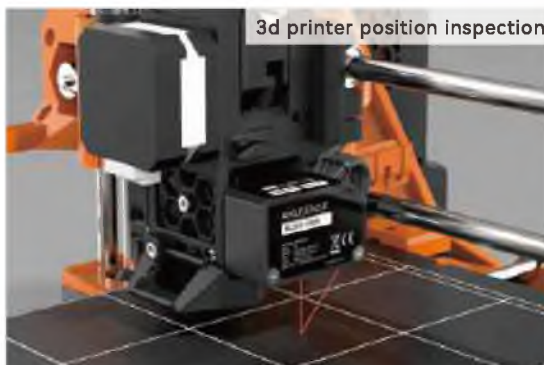


② Achieving greater precision

The new Akusense high-resolution lens design reduces pixel aberration and is assembled with precision.

The small spot of light at any angle can be imaged at the receiving section, resulting in a smaller waveform and higher measurement accuracy.

Application



3d printer position inspection



Detection of stacked and empty material in mobile phone production

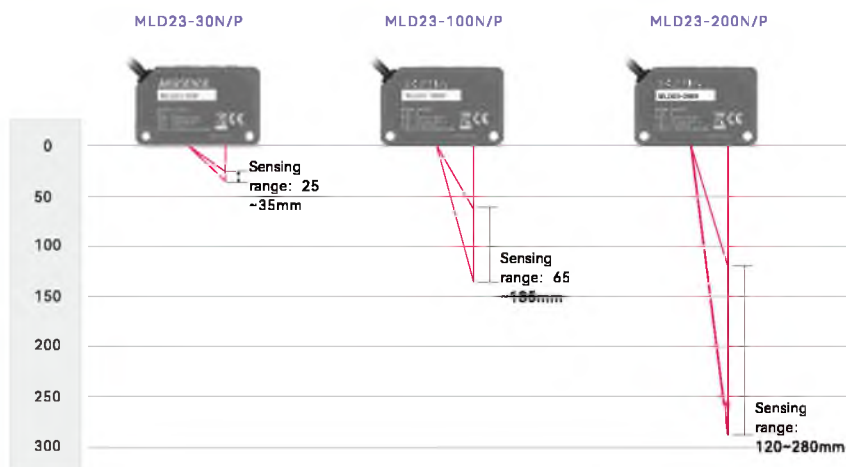
Fiber Optic
Slot Sensors
Photoelectric
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Proximity
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Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety doorlock
Pressure Switch
Communication
Accessories

Guidance

Displacement

Triangulation
TOF Long Range Type
3D Laser Profiler
Contact Displacement
LIDAR Scanner
Color confocal
Laser Alignment

Selection table



Model	MLD23-30N/P
Repeat accuracy	10μm
Linear accuracy	±0.1% F.S.
Base distance	30mm

Model	MLD23-100N/P
Repeat accuracy	70μm
Linear accuracy	±0.1% F.S.
Base distance	100mm

Model	MLD23-200N/P
Repeat accuracy	200μm
Linear accuracy	±0.2% F.S.
Base distance	200mm

Fiber Optic

Slot Sensors

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Displacement

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Accessories

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment

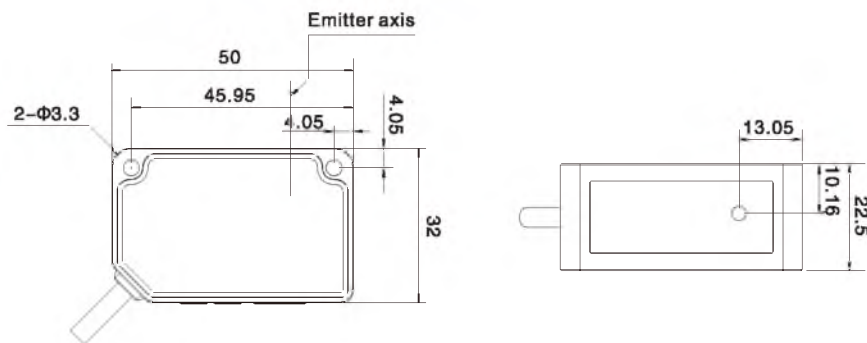


Basic Features	Working principle	Triangulation		
	Housing	Rectangular		
	Optical working principle	Diffuse reflection		
	Reference distance	30mm	100mm	200mm
	Measuring range	25~35mm	65~135mm	120~280mm
	Light source	Red laser, 655nm, Class 2		
	Spot Size	about $\Phi 0.05\text{mm}$	about $\Phi 0.15\text{mm}$	about $\Phi 0.3\text{mm}$
Electrical data	Switching mode	L.on/D.on		
	Output mode	NPN or PNP collector open		
	Response time	1.5ms/5ms/50ms switchable		
	Linearity	$\pm 0.1\%$ F.S.		$\pm 0.2\%$ F.S.
	Repeatability	10 μm	70 μm	200 μm
	Temperature drift characteristics	$\pm 0.03\%/^{\circ}\text{C}$		
	Operating voltage	12~24VDC $\pm 10\%$		
	Current consumption	<60mA(24VDC); <100mA(12VDC)		
	Load current	<50mA		
	Insulation resistance	$\geq 20\text{M}\Omega$ with 500V DC between power terminals and enclosure		
	Dielectric strength	<0.1mA(1000V AC)		
	Protection circuit	Surge protection		
Environmental conditions	Operating temperature	-10~45 $^{\circ}\text{C}$ (No Freezing)		
	Operating humidity	35~85%RH(No Condensation)		
	Ambient illumination	Incandescent Lamp ≤ 3000 Lux; Sunlight ≤ 3000 Lux		
	Vibration resistance	10 to 50 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Enclosure rating	IP66		
Mechanical data	Connection type	2m, 9 core cable		
	Dimension	22.5x50.0x32.0mm		
	Material	Acrylic-based, Aluminum		
	Weight	0.065kg		
	Accessories	Cable		
Model	NPN	MLD23-30N	MLD23-100N	MLD23-200N
	NPN+PNP	MLD23-30NP	MLD23-100NP	MLD23-200NP

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Safety doorlock
Pressure Switch
Communication
Accessories

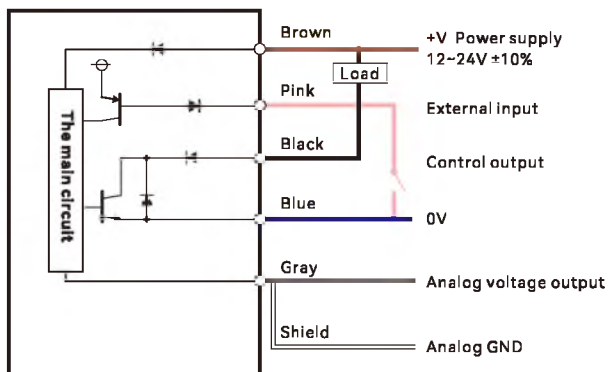
Guidance**Displacement**

Triangulation
TOF Long Range Type
3D Laser Profiler
Contact Displacement
LIDAR Scanner
Color confocal
Laser Alignment

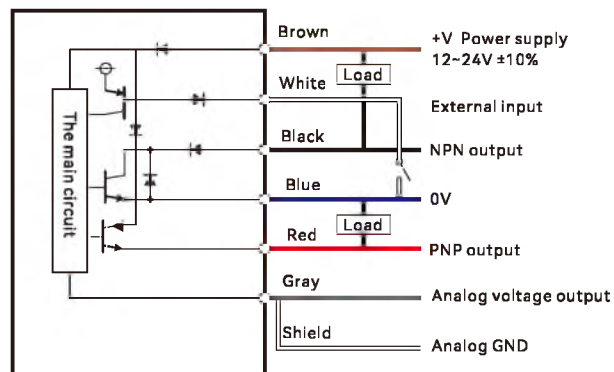


Circuit diagram

NPN



NPN+PNP



Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment



Basic Features	Working principle	Triangulation			
	Housing	Rectangular			
	Optical working principle	Diffuse reflection			
	Reference distance	30mm	50mm	100mm	200mm
	Measuring range	25-35mm	35-65mm	65-135mm	120-280mm
	Light source	Red laser, wavelength:655nm 1mW Class2			
	Spot Size	φ40μm	φ50μm	φ80μm	φ140μm
Electrical data	Switching mode	L on/D.on/Bottom/RS-485 switch			
	Output mode	Switching output (NPN/PNP) / Analog output (Voltage 0-5V / Current 4-20mA)			
	Response time	< 10ms/5ms/1.5ms			
	Linearity	± 0.1% F.S.			± 0.2% F.S.
	Repeatability	10μm	30μm	70μm	200μm
	Temperature drift characteristics	0.03%/°C F.S.			
	Operating voltage	12~24V DC ± 10%			
	Current consumption	< 65mA(12V), < 40mA(24V)			< 40mA(24V), < 80mA(12V)
	Load current	≤100mA			
	Insulation resistance	> 500MΩ(500V DC)			
	Dielectric strength	< 0.1mA(1000V AC)			
	Protection circuit	Reverse polarity protection / short circuit protection / overload protection / surge protection			
Environmental conditions	Operating temperature	-10~+45°C(No freezing)			
	Operating humidity	35~85%RH(no condensation)			
	Ambient illumination	Ambient light: ≤10000 lux without interference; incandescent lamp: ≤3000 lux			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
	Enclosure rating	IP67			
Mechanical data	Connection type	2m 7-pin composite cable			
	Dimension	20x28x45mm			
	Material	Body: die-cast aluminum; Front cover: acrylic-based			
	Weight	90g			
	Accessories	Cable			
Model	NPN	MLD25-30NV	MLD25-50NV	MLD25-100NV	MLD25-200NV
	PNP	MLD25-30PV	MLD25-50PV	MLD25-100PV	MLD25-200PV

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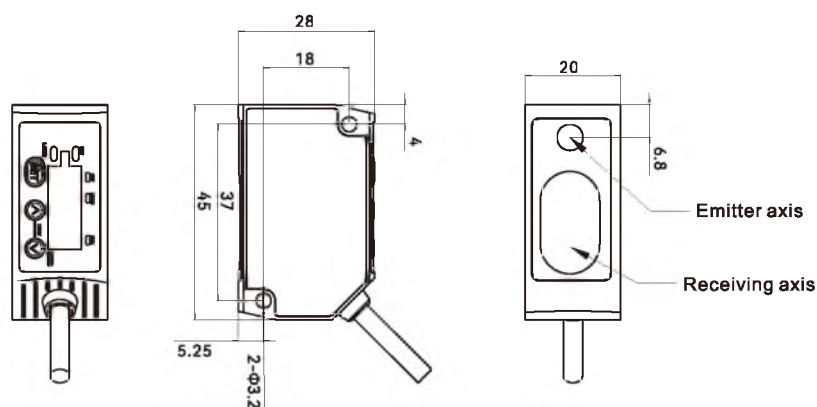
Color confocal

Laser Alignment

Triangulation

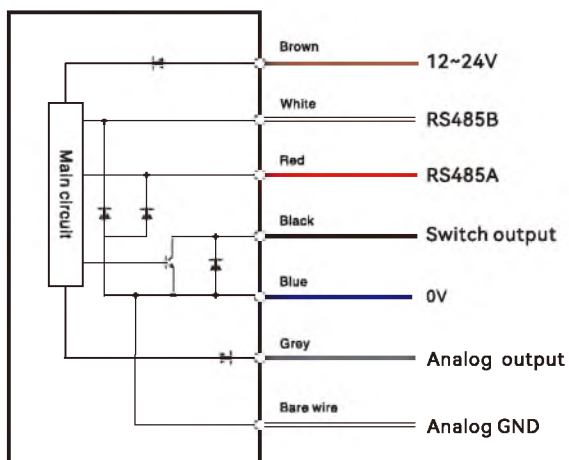
Dimensions

Unit:mm

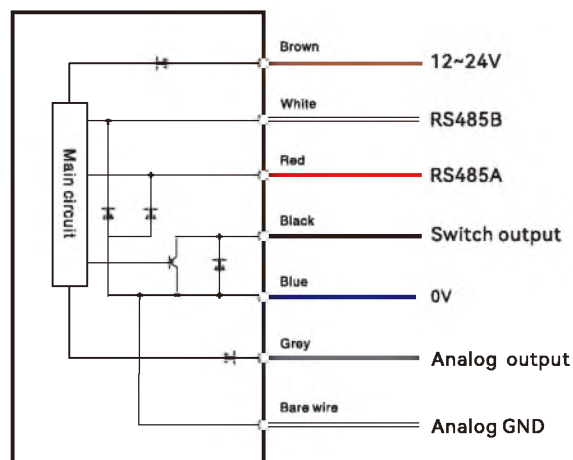


Circuit diagram

NPN Output



PNP Output





Basic Features	Working principle		Laser 3D measurement displacement sensor					
	Housing		Retangular					
	Optical working principle		Reflection					
	Mounting distance (CD)		19mm	22mm	54mm	80mm	100mm	
	Measuring range	Z-axis depth of field (MR)		7mm	11mm	25mm	70mm	200mm
		X-axis width	Near-end FOV	11mm	16mm	28mm	54mm	110mm
			Reference distance	12mm	17mm	31mm	68mm	170mm
			Distal FOV	13mm	18mm	35mm	80mm	230mm
	Contour points		2048					
	Light source	Wavelength		405nm				
Laser class		2M/3R						
Laser output power		10mW						
Reflection angle		50°	45°	30°	30°	27°		
Electrical data	X-direction resolution		5.6/ 6.3µm	7.8~8.9µm	13.4~16.4µm	27.1~40.0µm	54.0~114.2µm	
	Z-axis repeatability		0.1µm	0.2µm	0.3µm	0.8µm	1.2µm	
	Z-direction linearity (+/-% of MR)		0.02%					
	Scanning speed		340 ~ 10000Hz					
	Operating voltage		24V DC±10%					
	Power consumption		11W					
	Communication interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional Ios					
Environmental conditions	Operating temperature		0~50℃					
	Ambient illumination		Incandescent≤10000lux					
	Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions					
	Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock					
	Enclosure rating		IP67					
Mechanical data	Dimension		150x90x54mm	150x100x54mm	160x105x54mm	185x100x54mm		
	Housing material		Aluminum					
	Weight		0.94kg	0.84kg	1.12kg	0.8kg		
	Model		ESX-C10	ESX-C20	ESX-C30	ESX-C100	ESX-C200	

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Color confocal
Laser Alignment

3D Laser Profiler

ESX series



NEW!



Basic Features	Working principle		Laser 3D measurement displacement sensor				
	Housing		Retangular				
	Optical working principle		Reflection				
	Mounting distance (CD)		100mm	330mm	250mm	760mm	
	Measuring range	Z-axis depth of field (MR)		200mm	350mm	490mm	1280mm
		X-axis width	Near-end FOV	110mm	195mm	230mm	700mm
			Reference distance	170mm	262mm	385mm	1095mm
			Distal FOV	230mm	330mm	540mm	1490mm
	Light source	Contour points		2048			
		Wave length		650nm			
		Laser class		2M/3R			
		Laser output power		10mW			
Reflection angle		27°	23.2°	25°	27°		
Electrical data	X-direction resolution		54.0~114.2μm	92.8~164.9μm	115.5~265.1μm	338.8~731.8μm	
	Z-axis repeatability		1.2μm	2μm	6μm	15μm	
	Z-direction linearity (+/-% of MR)		0.02%				
	Scanning speed		340 ~ 10000Hz				
	Operating voltage		24V DC±10%				
	Power consumption		11W				
	Communication interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional Ios				
	Operating temperature		0~50℃				
	Environmental conditions	Ambient illumination		Incandescent≤10000lux			
		Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
		Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock			
		Enclosure rating		IP67			
Mechanical data	Dimension		185x100x54mm	285x100x52.5mm	285x100x52.5mm	690x134.5x58.4mm	
	Housing material		Aluminum				
	Weight		0.8kg	1.62kg	1.44kg	4.44kg	
	Model		ESX-CE200	ESX-CE300	ESX-CE500	ESX-CE1000	



Basic Features	Working principle		Laser 3D measurement displacement sensor				
	Housing		Retangular				
	Optical working principle		Reflection				
	Mounting distance (CD)		18mm	40mm	90mm	140mm	
	Measuring range	Z-axis depth of field (MR)		7mm	24mm	74mm	192mm
		X-axis width	Near-end FOV	14mm	30mm	55mm	100mm
			Reference distance	15mm	33mm	72mm	145mm
			Distal FOV	16mm	36mm	88mm	190mm
	Contour points		4096				
	Light source	Wavelength		405nm		650nm	
Laser class		2M/3R					
Laser output power		10mW					
Reflection angle		41°	38°	30°	24°		
Electrical data	X-direction resolution		6.9~8.4μm	14.6~20.1μm	28.8~47.1μm	51.7~99.6μm	
	Z-axis repeatability		0.2μm	0.4μm	0.6μm	1μm	
	Z-direction linearity (+/-% of MR)		0.02%				
	Scanning speed		1000 (full frame) ~20000Hz				
	Operating voltage		24V DC±10%				
	Power consumption		11W				
	Communication interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional Ios				
Environmental conditions	Operating temperature		0~50°C				
	Ambient illumination		Incandescent≤10000lux				
	Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions				
	Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock				
	Enclosure rating		IP67				
Mechanical data	Dimension		145x95x60mm	160x104.5x60mm	170x105x60mm	190x115x64mm	
	Housing material		Aluminum				
	Weight		1.04kg	1.24kg	1.22kg	1.56kg	
	Model		ESX-G10	ESX-G20	ESX-G100	ESX-GE200	

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Laser Alignment

3D Laser Profiler

ESX series


NEW!

Basic Features	Working principle	Laser 3D measurement displacement sensor		
	Housing	Rectangular		
	Optical working principle	Reflection		
	Mounting distance (CD)	18mm	40mm	90mm
	Measuring range	Z-axis depth of field (MR)	7mm	24mm
		X-axis width	Near-end FOV	13mm
			Reference distance	14.5mm
			Distal FOV	16mm
	Light source	Contour points	1920	
		Wavelength	405nm	
		Laser class	2M/3R	
		Laser output power	10mW	
	Reflection Angle	41°	38°	30°
Electrical data	X-direction resolution	7.0~8.6μm	14.6~20.1μm	28.8~47.1μm
	Z-axis repeatability	0.2μm	0.4μm	0.6μm
	Z-direction linearity (+/-% of MR)	0.02%		
	Scanning speed	2500~56000Hz		
	Operating voltage	24V DC±10%		
	Power consumption	11W		
	Communication Interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional I/Os		
	Operating temperature	0~50℃		
Environmental conditions	Ambient illumination	Incandescent ≤10000lux		
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Shock resistance	Peak acceleration of 15g, duration of 11ms half-sine wave shock		
	Enclosure rating	IP67		
	Dimension	145x95x60mm	160x104.5x60mm	190x115x64mm
Mechanical data	Housing material	Aluminum		
	Weight	0.8kg	1.24kg	1.22kg
	Model	ESX-P10	ESX-P20	ESX-P100



NEW!



NEW!



Basic Features	Working principle		Laser 3D measurement displacement sensor			
	Housing		Retangular			
	Optical working principle		Reflection			
	Mounting distance (CD)		140mm	140mm	235mm	
	Measuring range	Z-axis depth of field (MR)		191mm	191mm	250mm
		X-axis width	Near-end FOV	100mm	100mm	192mm
			Reference distance	145mm	145mm	247mm
			Distal FOV	190mm	190mm	302mm
	Contour Points		1920			
	Light source	Wavelength		405nm	650nm	
Laser class		2M/3R				
Laser output power		10mW				
Reflection angle		24°		23.2°		
Electrical data	X-direction resolution		51.7~99.7μm	51.7~99.7μm	100.7~160.3μm	
	Z-axis repeatability		1μm	1μm	1.5μm	
	Z-direction linearity (+/-% of MR)		0.02%		0.04%	
	Scanning speed		2500~56000Hz			
	Operating voltage		24V DC±10%			
	Power consumption		11W			
	Communication interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional Ios			
Environmental conditions	Operating temperature		0~50℃			
	Ambient illumination		Incandescent≤10000lux			
	Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
	Shock resistance		Peak acceleration of 15g, duration of 11ms half sine wave shock			
	Enclosure rating		IP67			
Mechanical data	Dimension		190x115x64mm		340x115x64.8mm	
	Housing material		Aluminum			
	Weight		1.54kg		2.08kg	
	Model	ESX-P200	ESX-PE200	ESX-PE300		

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Color confocal
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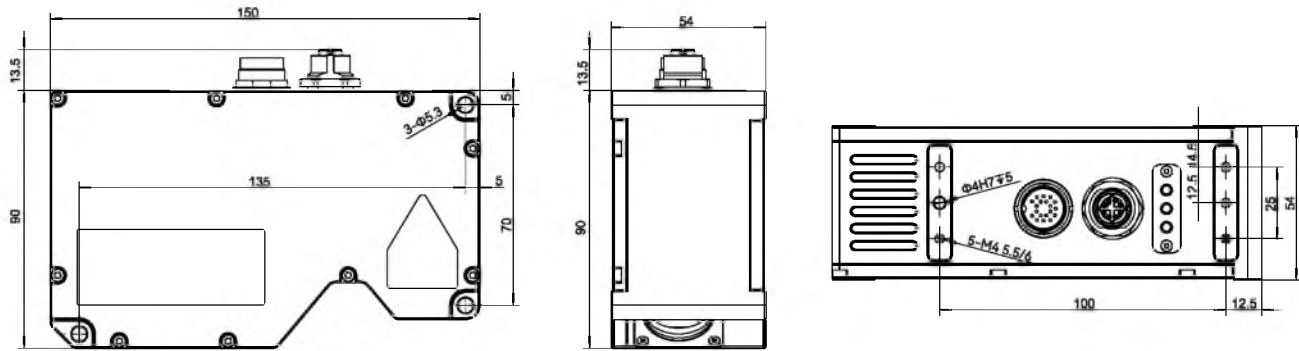
3D Laser Profiler

ESX series

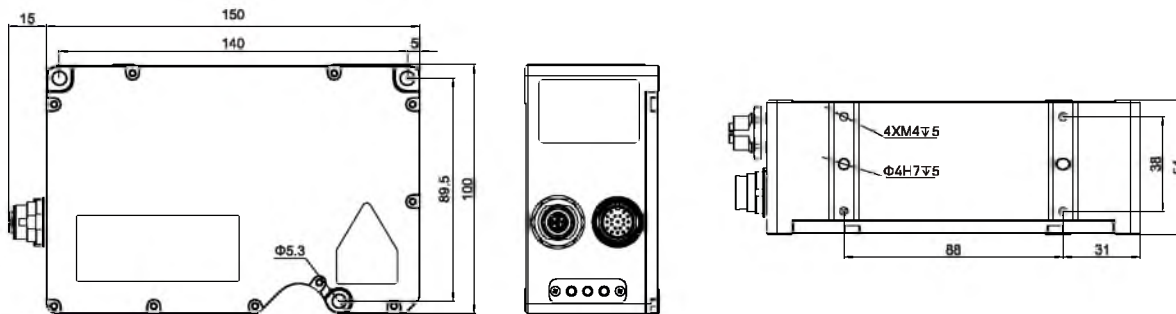


Basic Features	Working principle		Laser 3D measurement displacement sensor		
	Housing		Retangular		
	Optical working principle		Reflection		
	Mounting distance (CD)		30mm	50mm	
	Measuring range	Z-axis depth of field (MR)		6mm	18mm
		X-axis width	Near-end FOV	20mm	45mm
			Reference distance	22mm	51mm
			Distal FOV	24mm	56mm
	Light source	Contour Points		4096	
		Wavelength		405nm	
		Laser class		2M/3R	
		Laser output power		10mW	
Reflection angle		50°	38°		
Electrical data	X-direction resolution		5.1~5.9μm	11.1~13.6μm	
	Z-axis repeatability		0.1μm	0.3μm	
	Z-direction linearity (+/-% of MR)		0.02%		
	Scanning speed		1200~16000Hz		
	Operating voltage		24V DC±10%		
	Power consumption		11W		
	Communication Interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 b'directional I/Os		
Environmental conditions	Operating temperature		0~50℃		
	Ambient Illumination		Incandescent≤10000lux		
	Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock		
	Enclosure rating		IP67		
Mechanical data	Dimension		190x115x80mm		
	Housing material		Aluminum		
	Weight		1.31kg	1.35kg	
	Model		ESX-H10	ESX-H20	

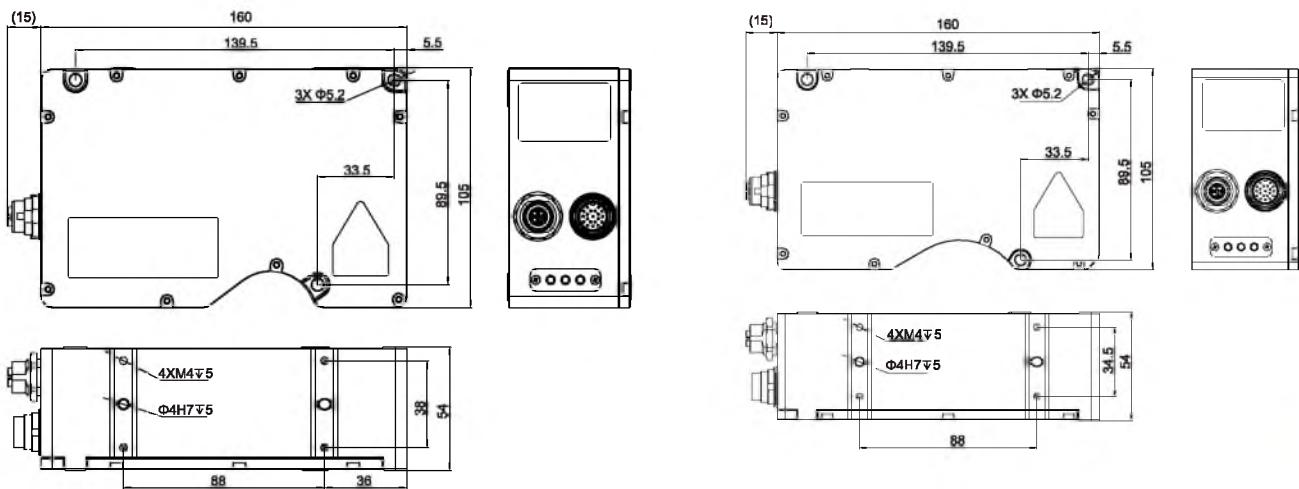
ESX-C10



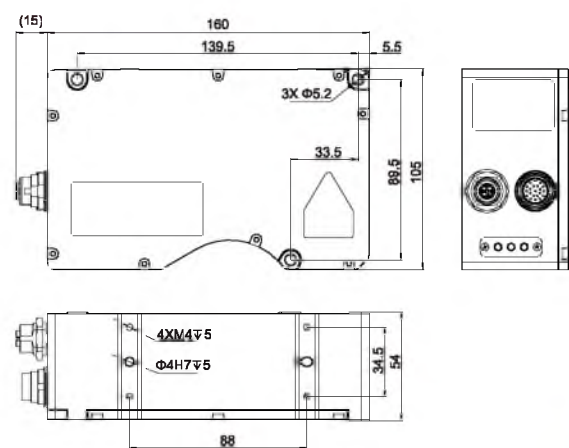
ESX-C20



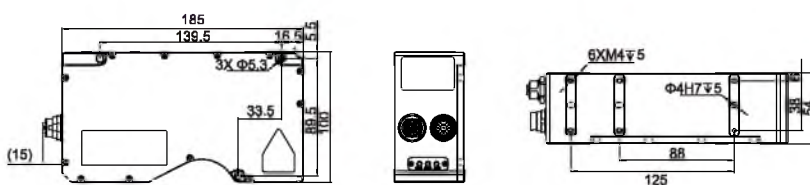
ESX-C30



ESX-C100



ESX-C200/CE200



ESX-CE300



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
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- Displacement**
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Guidance

Displacement

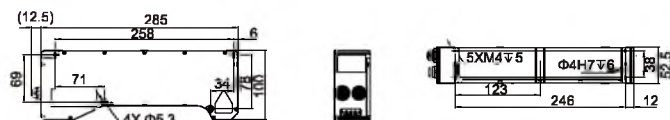
- Triangulation
- TOF Long
- Range Type
- 3D Laser Profiler**
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- Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment

3D Laser Profiler

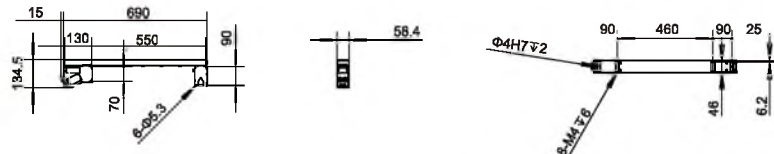
Dimensions

Unit:mm

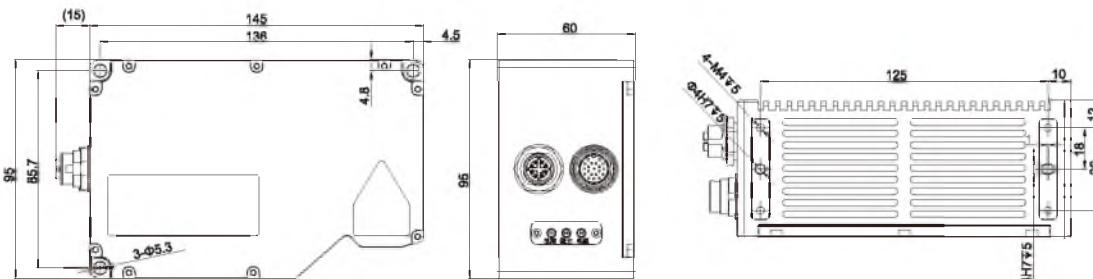
ESX-CE500



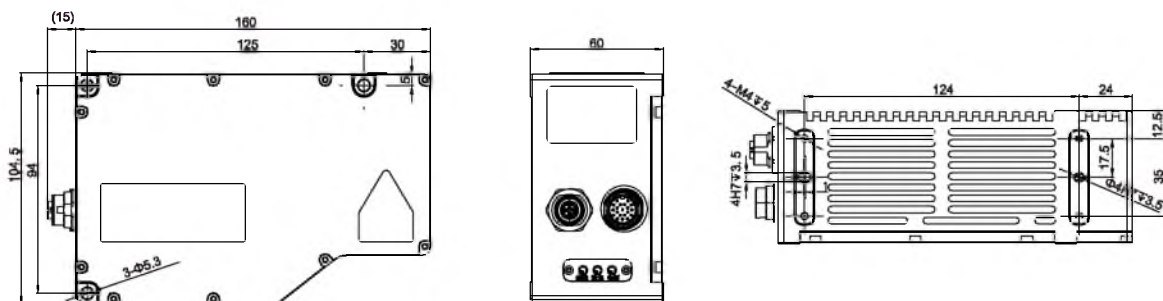
ESX-CE1000



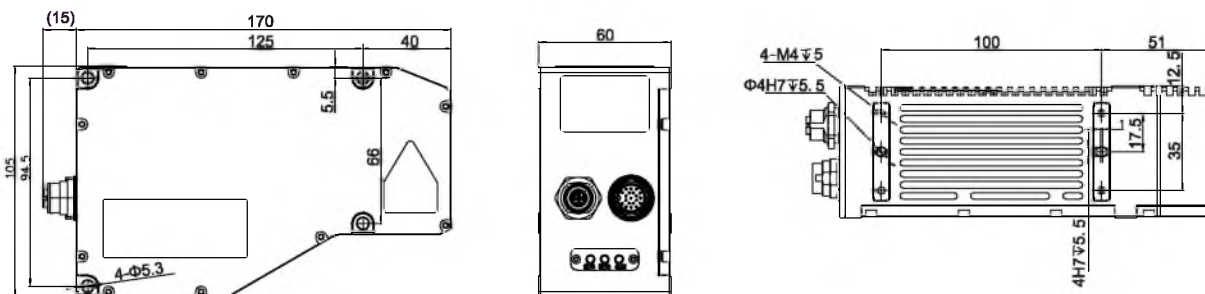
ESX-G10 ESX-P10



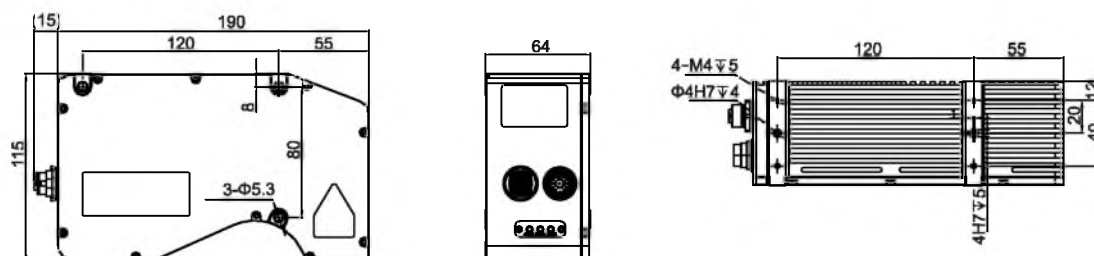
ESX-G20 ESX-P20



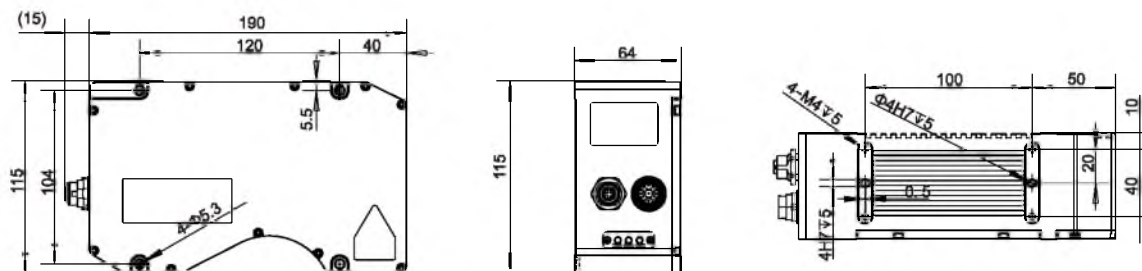
ESX-G100



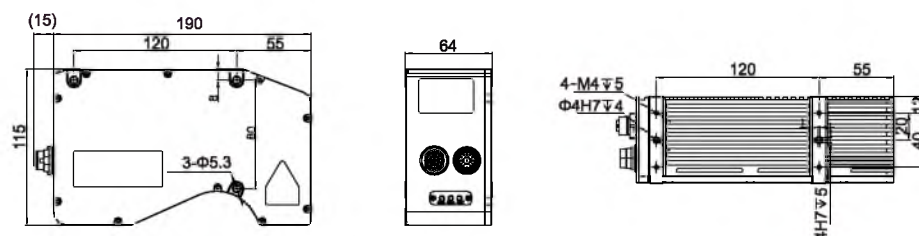
ESX-GE200



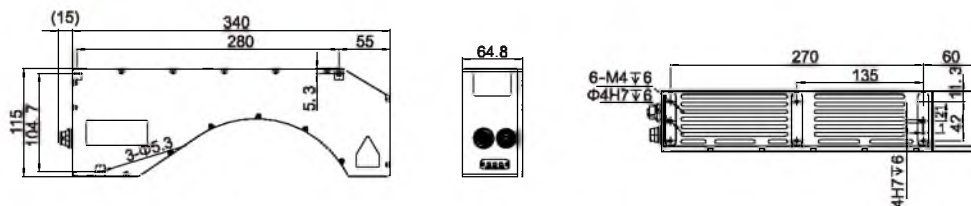
ESX-P100



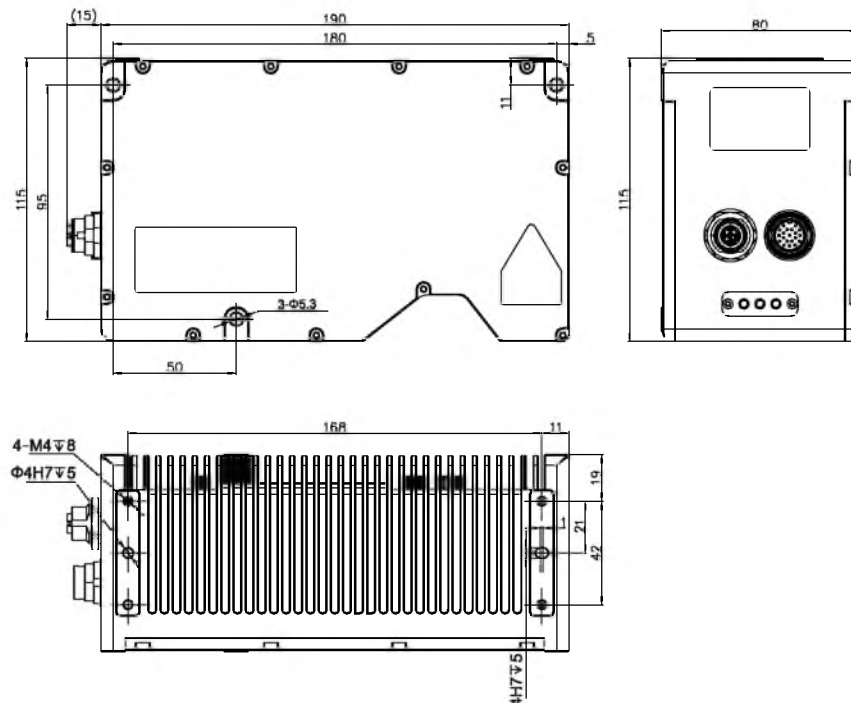
ESX-P200 ESX-PE200



ESX-PE300



ESX-H10 ESX-H20



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3D Laser Profiler

Interface Definitions

Circular connecting pins	Signal definition	Cable color	Feature
C	DIO2+	Orange	Multifunctional difference I/O2
B	DIO2-	Orangish and white	
D	INDEX+	Yellow	Encoder Z-phase input
E	INDEX-	Yellowish and white	
I	A+	Gray	Encoder A-phase input
S	A-	Grayish	
H	B+	Purple	Encoder B-phase input
G	B-	Pure white	
T	DIO1+	Pink	Multifunctional difference I/O2
K	DIO1-	Pink and white	
U	CUT+	Blue	Single-ended output
M	CUT-	Blue and white	
O	TRIG_EN+	Brown	Trigger enable
N	TRIG_EN-	Brown and white	
R	IN+	Green	Single-ended output
P	IN-	greenish white	
A	+24V	Red+red and white two wires	Camera Power
L	GND	Black+black and white two wires	Power ground
F	EARTH_GND	Silver	Grounding

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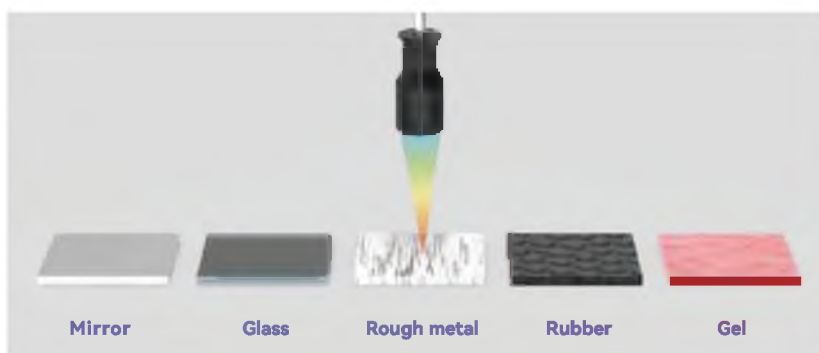
Laser Alignment

Color Confocal Displacement Sensor ACC Series ▶



Stable measurement for any material

Metals, ceramics, mirrors, glass,
transparent and non-transparent materials
can all be detected

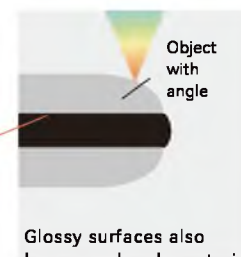
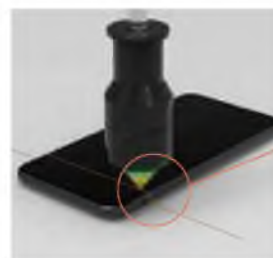


Sub-micron ultra-high measurement accuracy

The maximum resolution is 0.02um, and the
minimum spot size is 2um, for precise
capture of minute details

Tilt angle measurement up to $\pm 60^\circ$

The shape of object with angles can
be accurately tracked, almost no
impact by the shape.

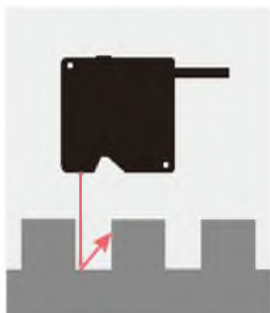


Glossy surfaces also
have angular characteristics

High precision measurement for any surface condition

Stable detection for rough surfaces, mirrors, curved surfaces, inclined surfaces, pits, section differences, etc.

Detection from all directions, even for hollows and segment differences

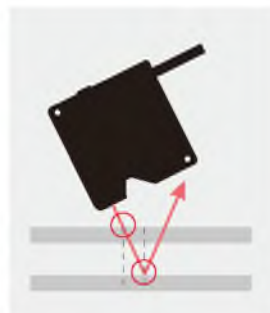


Traditional laser displacement



ACC Series

Transparent and mirror objects can also be correctly measured



Traditional laser displacement



ACC Series

Application fields



Panel/glass industry



PCB board/IC chip industry



Photovoltaic / semiconductor wafer industries



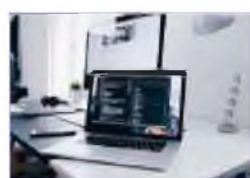
Metal / precision manufacturing industries



Lithium and other industries



Lens industry

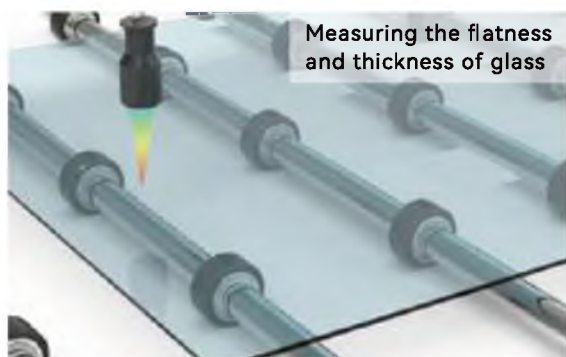


3C electronics and other industries

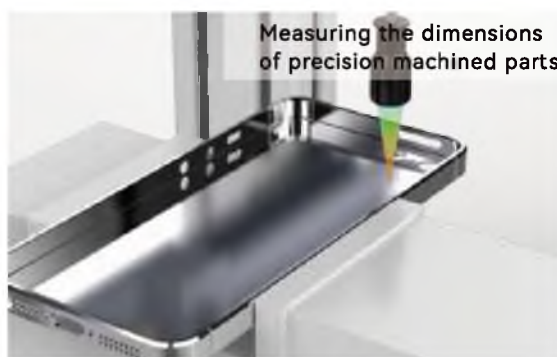


Printing/Ink industry

Applications



Measuring the flatness and thickness of glass



Measuring the dimensions of precision machined parts

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety doorlock
Pressure Switch
Communication
Accessories

Guidance

Displacement

Triangulation
TOF Long
Range Type
3D Laser
Profiler
Contact
Displacement
LIDAR Scanner
Color confocal
Laser Alignment

Selection Guide

Selection table



Model	ACC-008L	ACC-011L	ACC-016L	ACC-018L	ACC-030L	ACC-033L	ACC-040L	ACC-055L
Resolution	0.02μm	0.05μm	0.05μm	0.05μm	0.07μm	0.2μm	0.12μm	0.1μm
Spot size	2μm	16μm	8μm	25μm	9μm	40μm	40μm	45μm
Max. inclination	±40°	±60°	±30°	±22°	±15°	±7°	±15°	±11°

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment



Probe



Basic Features	Working principle	Coaxial	Coaxial	Coaxial	Coaxial
	Housing	Cylindrical	Cylindrical	Cylindrical	Cylindrical
	Reference distance	8mm	11mm	16mm	18mm
	Measuring range	±0.2mm	±1.2mm	±1mm	±1mm
	Spot size* ³	2μm	16μm	8μm	25μm
	Resolution* ¹	0.02μm	0.05μm	0.05μm	0.05μm
	Linearity* ²	±0.15μm	±0.45μm	±0.35μm	±0.3μm
Mechanical data	Maximum tilt angle* ⁴	±40°	±60°	±30°	±22°
	Enclosure rating	IP40	IP40	IP40	IP40
	Dimension	Φ41x99mm	Φ98x266mm	Φ41x159mm	Φ34x75mm
	Weight	220g	3250g	360g	105g
	Probe model	ACC-008L	ACC-011L	ACC-016L	ACC-018L

Probe



Basic Features	Working Principle	Coaxial	Coaxial	Coaxial	Coaxial
	Housing	Cylindrical	Cylindrical	Cylindrical	Cylindrical
	Reference distance	30mm	33mm	40mm	55mm
	Measuring range	±2mm	±2mm	±4mm	±3mm
	Spot size* ³	9μm	40μm	40μm	45μm
	Resolution* ¹	0.07μm	0.2μm	0.12μm	0.1μm
	Linearity* ²	±0.45μm	±2μm	±0.5μm	±0.65μm
Mechanical data	Maximum tilt angle* ⁴	±15°	±7°	±15°	±11°
	Enclosure rating	IP40	IP40	IP40	IP40
	Dimension	Φ38x82mm	Φ18x55mm	Φ54x116mm	Φ33x75mm
	Weight	145g	24g	380g	122g
	Probe model	ACC-030L	ACC-033L	ACC-040L	ACC-055L

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

Guidance

Displacement

- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LIDAR Scanner
- Color confocal**
- Laser Alignment

Color Confocal Displacement Sensor

ACC Series



Controller model



Basic Features	Housing	Rectangular	
	Light source	White LED	
Electrical data	Operating voltage	24V DC	
	Sampling frequency	4K HZ(Max)	2K HZ(Max)
	I/O function	Pulse input, output, encoder trigger input	
	Number of encoder axes	3 axes, incremental (A/B/Z phase)	
Environmental conditions	External communication interface	RS-232:115200 bps(max.) Ethernet:100BASE-TX/10BASE-T	
	Operating temperature	5~40℃	
	Operating humidity	35~80%	
	Ambient illumination	<10000lx	
Mechanical data	Enclosure rating	IP20	
	Fiber optic extension cable	ACC-OF-S(standard); Outer Armor: ACC-OF-M(optional)	
	Length of fiber optic extension cable	2/5/10m, standard 10m	
	Weight of fiber optic extension cable	ACC-OF-S: 23/40/69g; ACC-OF-M: 108/218/396g	
	Minimum bending radius*5	50mm	
	Dimension	140x122x127mm	185x122x127mm
	Weight	1.38kg	
	Accessories	-	
	Connectable channels	-	2
	Controller model	ADV-12CKS	ADV-12CK2

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

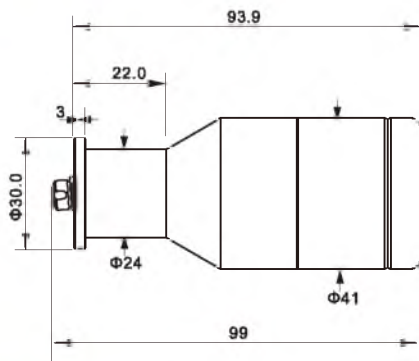
Laser Alignment

Unit:mm

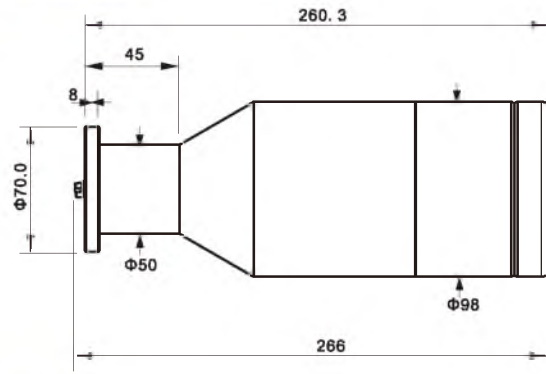
Dimensions

Displacement

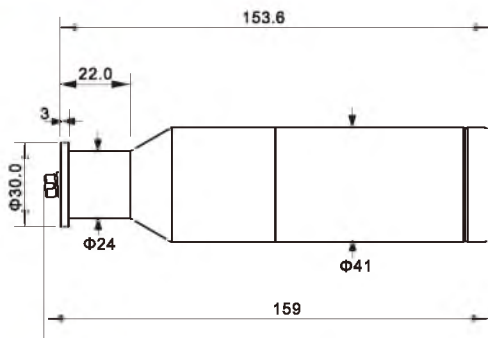
ACC-008L



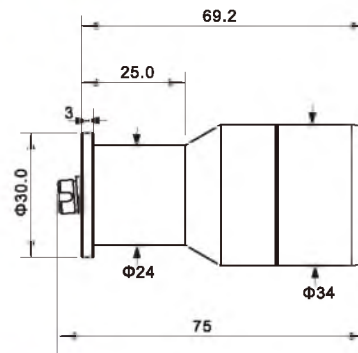
ACC-011L



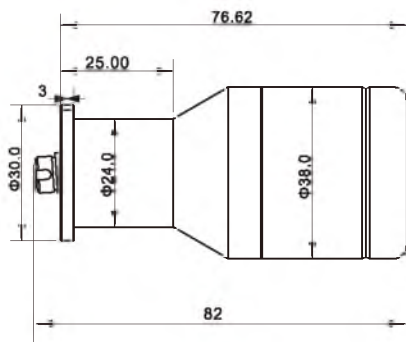
ACC-016L



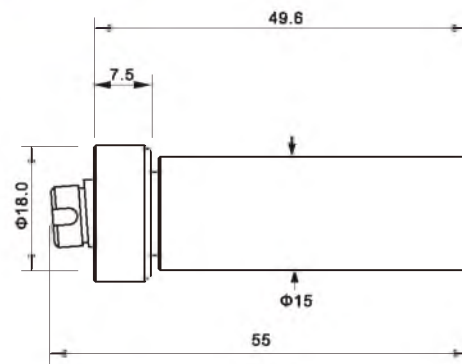
ACC-018L



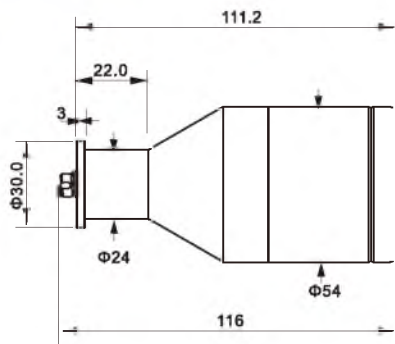
ACC-030L



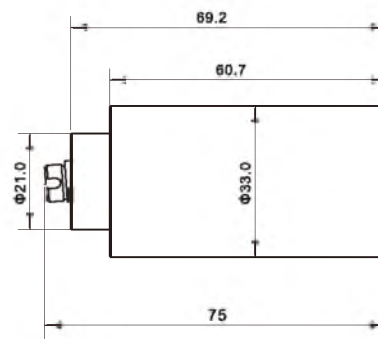
ACC-033L



ACC-040L



ACC-055L



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
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Ultrasonic
AI Image
Code Readers
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Temperature
RFID
Safety doorlock
Pressure Switch
Communication
Accessories

Guidance

Displacement

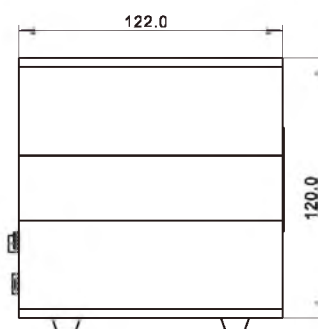
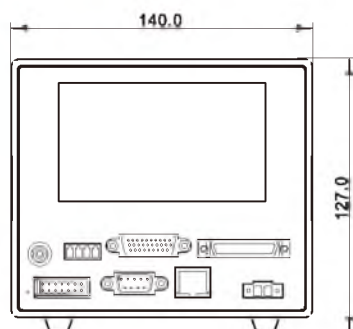
Triangulation
TOF Long
Range Type
3D Laser
Profiler
Contact
Displacement
LIDAR Scanner
Color confocal
Laser Alignment

Color Confocal Displacement Sensor

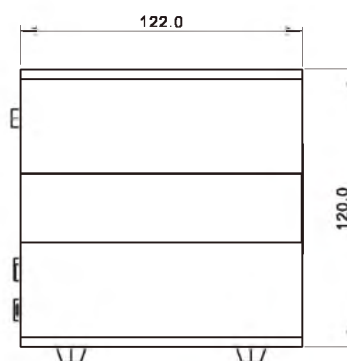
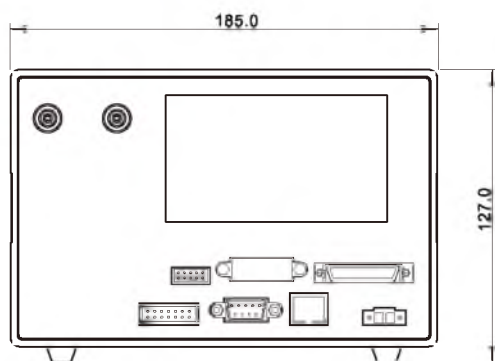
Dimensions

Unit:mm

ADV-12CKS



ADV-12CK2



- *1. Resolution: The average level of noise for the stationary workpiece at the zero center of the range center (opening the light intensity auto adjustment and 256 times averaging function)
- *2. Linearity: Maximum error value for full-scale measurement of mirror standard parts after calibration (opening the light intensity auto adjustment and 256 times averaging function)
- *3. Spot diameter: theoretical spot diameter value at the center of the range
- *4. Maximum inclination: refers to the maximum acceptable optical signal angle under the mirror-reflective material workpiece. The diffuse reflection workpiece usually can reach 80 degrees.
- *5. Minimum bending radius: The minimum radius of curvature that can be received when the fiber is crimped and stored. Below this value, it is easy to break and damage.



Basic features	Working principle	Photoelectric sensor
	Housing	Flat block
	Optical working principle	Thru-beam
	Measuring range	Edge detection mode $\pm 3.25\text{mm}$, Diameter detection mode 6mm
	Sensor head mounting distance	$0\sim 200\text{mm}$
	Light source	Red laser
	Spot size	—
	Indicator	Transmitter (laser emission indicator green); Receiver (optical axis adjustment indicator green, judgment output indicator red)
Electrical data	Linearity	$\pm 0.12\%$ F.S. (when setting distance 20mm); $\pm 0.4\%$ F.S. (when setting distance 100mm)
	Repeatability	$1\mu\text{m}$ (when setting distance 20mm); $3\mu\text{m}$ (when setting distance 100mm); $5\mu\text{m}$ (when setting distance 200mm)
	Sampling period	—
	Operating voltage	$12\sim 24\text{VDC} \pm 10\%$
	Operating current	Emitter: $\leq 10\text{mA}$, Receiver: $\leq 70\text{mA}$
	Communication mode	485 communication hexadecimal
	Temperature drift characteristics	—
	Circuit protection	Reverse connection protection
Environmental conditions	Operating temperature	$-10\sim 45^{\circ}\text{C}$ (no freezing, no condensation)
	Storage humidity	$-20\sim +60^{\circ}\text{C}$
	Operating humidity	$35\sim 85\%\text{RH}$ (no condensation)
	Storage humidity	$35\sim 85\%\text{RH}$ (no condensation)
	Ambient Illumination	Incandescent Lamp $\leq 3000\text{ Lux}$; Sunlight $\leq 10000\text{ Lux}$
	Vibration resistance	$10\text{ to }55\text{ Hz}$, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions
	Enclosure rating	IP67
Mechanical data	Connection type	2x M8/4-pin connector with 0.3m cable
	Dimensions	$2 \times 8.2 \times 60 \times 10.5\text{mm}$
	Material	Aluminum
	Weight	—
	Accessories	Brackets and screws
	Model	ETD-0306

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety door lock

Pressure Switch

Communication

Accessories

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment

Through-beam edge sensor

ETD Series

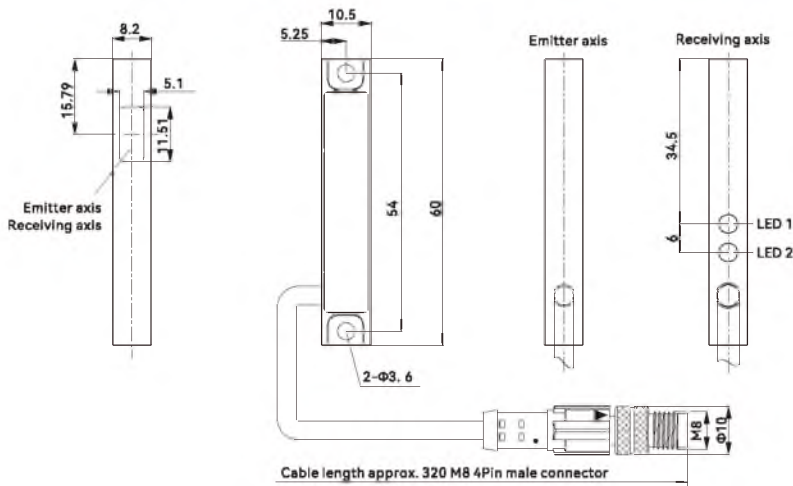


Basic features	Working principle	Photoelectric sensor
	Housing	Flat block
	Optical working principle	Thru-beam
	Measuring range	Edge detection mode $\pm 6\text{mm}$, Diameter detection mode 12mm
	Sensor head mounting distance	0~500mm
	Light source	Red laser, 650nm
	Spot size	13x3.5mm
	Indicator	Transmitter (laser emission indicator green); Receiver (optical axis adjustment indicator green, judgment output indicator red)
Electrical data	Linearity	$\pm 0.12\%$ F.S. (when setting distance 20mm); $\pm 0.4\%$ F.S. (when setting distance 100mm)
	Repeatability	1 μm (when setting distance 20mm); 3 μm (when setting distance 100mm); 5 μm (when setting distance 200mm)
	Sampling period	1ms
	Operating voltage	12~24VDC $\pm 10\%$
	Operating current	Emitter: $\leq 10\text{mA}$, Receiver: $\leq 70\text{mA}$
	Communication mode	485 communication hexadecimal
	Temperature drift characteristics	$\pm 0.03\%/^{\circ}\text{C}$
	Circuit protection	Reverse connection protection
Environmental conditions	Operating temperature	-10~50 $^{\circ}\text{C}$
	Storage humidity	-20~60 $^{\circ}\text{C}$
	Operating humidity	35~85%RH(no condensation)
	Storage humidity	35~85%RH(no condensation)
	Ambient Illumination	Incandescent Lamp $\leq 3000\text{ Lux}$; Sunlight $\leq 10000\text{ Lux}$
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions
	Enclosure rating	IP50
	Connection type	2x M8/4-pin connector with 0.3m cable
Mechanical data	Dimension	2x8.2x60x30mm
	Material	Aluminum
	Weight	0.01 kg
	Accessories	Brackets and screws
	Model	ETD-0612

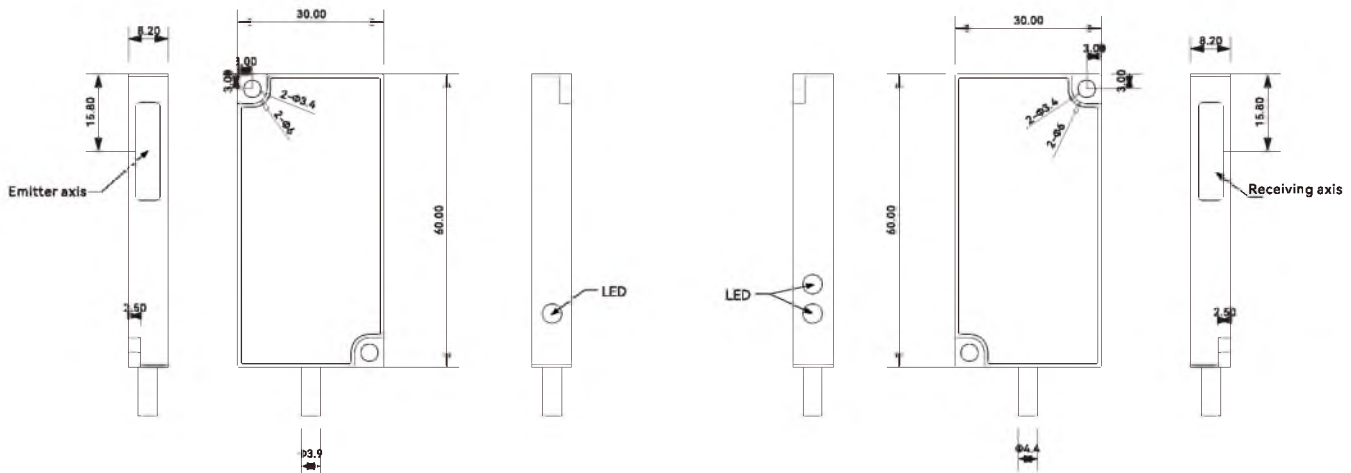
Unit:mm

Dimensions

ETD-0306

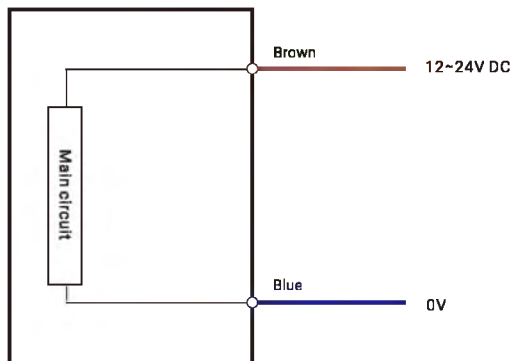


ETD-0612

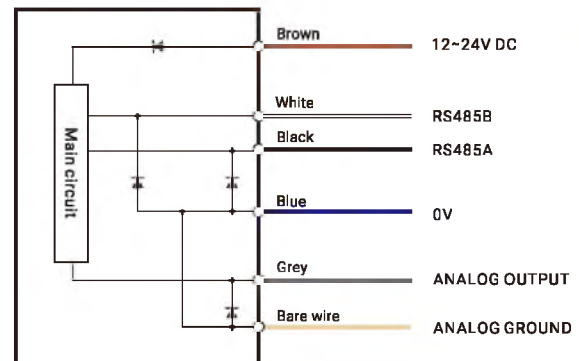


Circuit Diagram

Emitter



Receiver



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
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Ultrasonic
AI Image
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Safety doorlock
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Guidance

Displacement

Triangulation
TOF Long
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Displacement
LIDAR Scanner
Color confocal
Laser Alignment

Controller

CR-M02

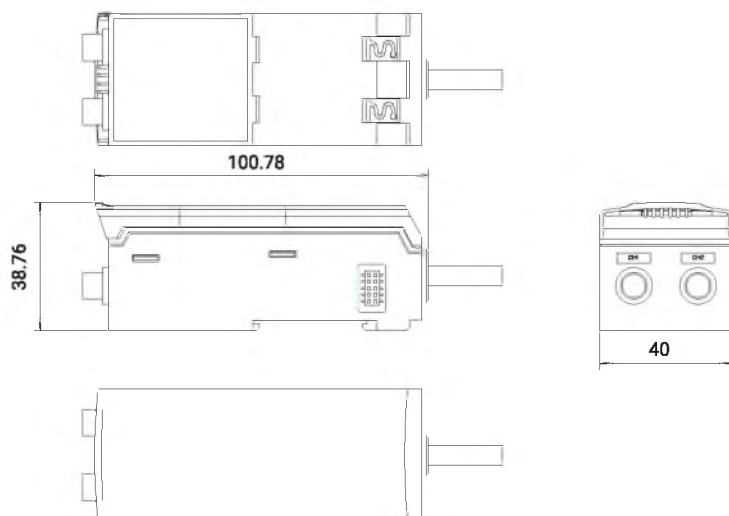


NEW!

Installation method	DIN rail installation
Operating voltage	+24VDC±10%
Current consumption of a single controller	Under 100mA(When connecting the sensor)
Number of connected sensors	Two pairs of sensors
The communication with sensors	RS485
Number of controllers connected in parallel	Up to 16 controllers can be connected
Display	240*240TFT display
Indicator light	Output 1~3 and function indicator light red
Analog output	Analog output current 4~20mA, voltage 0~5V can be switched
Switching output	3-channel output, NO, NC, PO, PC can be switched
External input	3-channel input, NPN and PNP input optional
Display resolution	1μm
Display range	-99.999mm~99.999mm
Protective structure	IP40
Operating temperature	-10°C~+50°C
Working humidity	35%RH~85%RH
insulation resistance	The resistance of all connecting terminals and shells is above 20MΩ
Dielectric strength	All connection terminals and housing withstand voltage AC 1000V
Vibration resistance	Frequency 10~55HZ, 1.5m double amplitude, two hours each in X, Y and Z directions
Shock proof	98m/s ² (about 10G) 5 times each in X, Y, and Z directions
Model	CR-M02

Dimensions

Unit:mm





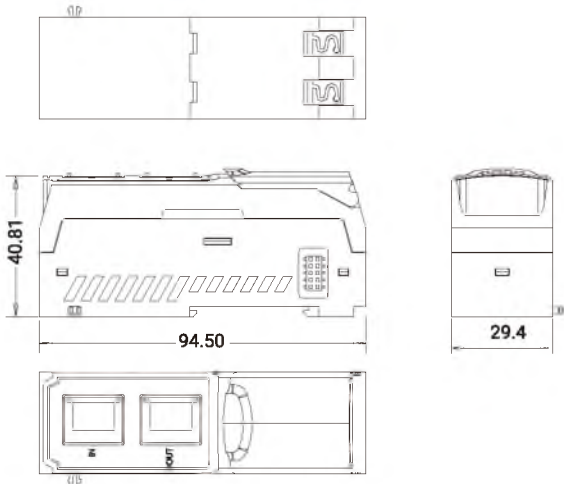
	Installation method	DIN rail installation
	Operating voltage	24V DC(10~30V DC)
	Indicator light	PWR: Power indicator/green RUN: running indicator light/green ERR: Error indicator/red Sensor communication indicator light: red light (RTU communication abnormality) Ethernet port: (green) D-BUS: RTU Communication normal/green light Ethernet port(green): RTU communication abnormality/traffic light alternation of some slave stations No RTU communication activity/off The Ethernet port has established a valid network connection/on. The Ethernet port is in network activity/blinks. The Ethernet port does not establish a network connection or the port is abnormal/off.
	100M Ethernet port	10/100Base-T (X) RJ45, automatic flow control, full and half-duplex mode, MDI/MDI-X automatic detection
	Burning port	The software programming port uses 8-bit terminal blocks with a pitch of 2.0mm, occupying 2-5 positions from the left
	Console port	The CLI command management port uses 8-position terminal blocks with a spacing of 2.0mm, occupying 6-8 positions from the left
	RS-485 serial port	Supports 2 RS-485 serial ports, one of which is reserved, using 10-bit terminal blocks with a spacing of 2.0mm, and the serial port occupies 4 bits
	Reset button	Reset button
	Access terminal, no load power consumption at normal temperature	10-position terminal block with a pitch of 2.0mm, 2 positions for power supply, 0.7w@10VDC 0.7w@20VDC 0.7w@30VDC
	Full-load power consumption at normal temperature	0.7w@10VDC 0.7w@20VDC 0.7w@30VDC
	High temperature full load power consumption	0.8w@10VDC 0.8w@20VDC 0.8w@30VDC
	Operating temperature	-40℃~75℃
	Storage temperature	-40℃~85℃
	Working humidity	5%~95% (No condensation)
	Model	CTM01-EC

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
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- Ultrasonic
- AI Image
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- Temperature
- RFID
- Safety door lock
- Pressure Switch
- Communication
- Accessories

- Guidance
- Displacement
 - Triangulation
 - TOF Long Range Type
 - 3D Laser Profiler
 - Contact Displacement
 - LIDAR Scanner
 - Color confocal
 - Laser Alignment

Dimensions

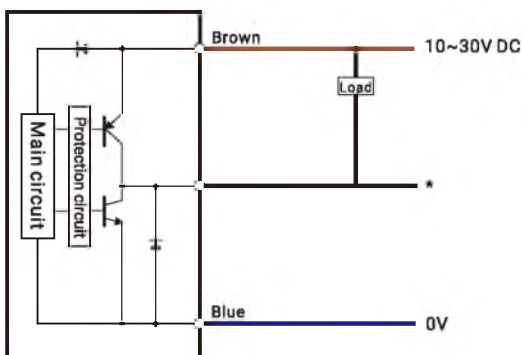
Unit:mm



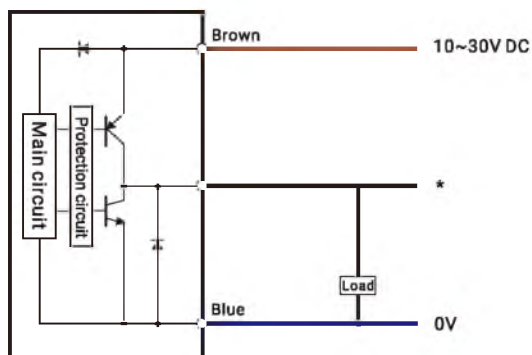
Circuit Diagram

Input Circuit Diagram

NPN Output



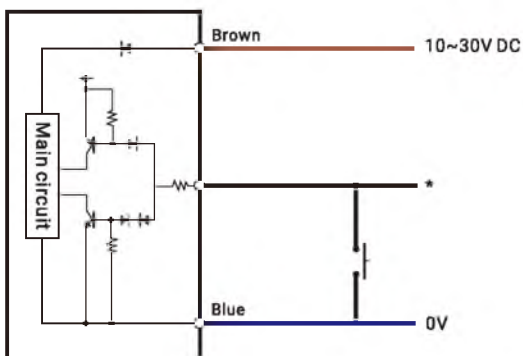
PNP Output



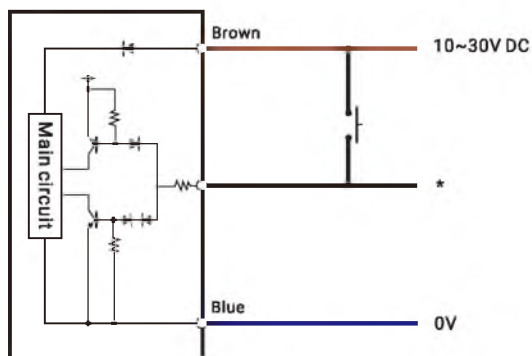
★ Black (HIGH detection output) / White (LOW detection output) / Grey (GO detection output) / Green (Verification input)

Output Circuit Diagram

NPN Output



PNP Output



★ Pink (External Input 1) / Yellow (External Input 2) / Pink Purple (External Input 3) / Purple (External Input 4)



Appearance	
Sectional area	17.2*30mm
NO. beams	6~32
Protection height	50~1240mm
Scanning range	0.3~3m
Resolution	10/14/20/25/30/40mm
Min. sized detectable objects	> ϕ 18/ ϕ 22/ ϕ 33/ ϕ 38/ ϕ 48mm, opaque
Supply voltage	24V DC $\pm$ 10%
Current consumption	<200mA
Power consumption	3~8W
Output type	NPN/PNP
Synchronization type	line synchronization
Response time	$\leq$ 15ms
Light source	Infrared LED (Modulated)
Circuit protection	Reverse polarity, output short circuit protection
Ambient temperature	-10 $^{\circ}$ C~+55 $^{\circ}$ C (No condensation, no freezing)
Ambient humidity	35~85% RH
Anti-interference ability	10000Lux
Insulation resistance	Above 100M Ω (DC 500V megger)
Degree of protection	IP65
Material	Aluminium alloy
Connection	M12 connector
Accessories	3M cable, female (Customization available)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance

BZL10

Resolution	10mm						
Min. sized detectable objects	> ϕ 18, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	50mm	70mm	90mm	110mm	130mm	... ..	310mm
Light curtain height	110mm	130mm	150mm	170mm	190mm	... ..	370mm
Model NO.	NPN NC	BZL10-T0603NC	BZL10-T0803NC	BZL10-T1003NC	BZL10-T1203NC	BZL10-T1403NC	BZL10-T3203NC
	PNP NC	BZL10-T0603PC	BZL10-T0803PC	BZL10-T1003PC	BZL10-T1203PC	BZL10-T1403PC	BZL10-T3203PC

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

BZL14

Resolution	14mm						
Min. sized detectable objects	> ϕ 22, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	70mm	98mm	126mm	154mm	182mm	... ..	434mm
Light curtain height	132mm	160mm	188mm	216mm	244mm	... ..	496mm
Model NO.	NPN NC	BZL14-T0603NC	BZL14-T0803NC	BZL14-T1003NC	BZL14-T1203NC	BZL14-T1403NC	BZL14-T3203NC
	PNP NC	BZL14-T0603PC	BZL14-T0803PC	BZL14-T1003PC	BZL14-T1203PC	BZL14-T1403PC	BZL14-T3203PC

Top-emitting Type

BZL Series

BZL20

Resolution	20mm						
Min. sized detectable objects	> ϕ 28, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	60mm	100mm	140mm	180mm	220mm	... ..	620mm
Light curtain height	119mm	159mm	199mm	239mm	279mm	... ..	679mm
Model NO.	NPN NC	BZL20-T0403NC	BZL20-T0603NC	BZL20-T0803NC	BZL20-T1003NC	BZL20-T1203NC	BZL20-T3203NC
	PNP NC	BZL20-T0403PC	BZL20-T0603PC	BZL20-T0803PC	BZL20-T1003PC	BZL20-T1203PC	BZL20-T3203PC

BZL25

Resolution	25mm						
Min. sized detectable objects	> ϕ 33, opaque						
Scanning range	0.3~3m						
NO. beams	6	8	10	12	14	... ..	32
Protection height	125mm	175mm	225mm	275mm	325mm	... ..	775mm
Light curtain height	186.5mm	236.5mm	286.5mm	336.5mm	386.5mm	... ..	836.5mm
Model NO.	NPN NC	BZL25-T0603NC	BZL25-T0803NC	BZL25-T1003NC	BZL25-T1203NC	BZL25-T1403NC	BZL25-T3203NC
	PNP NC	BZL25-T0603PC	BZL25-T0803PC	BZL25-T1003PC	BZL25-T1203PC	BZL25-T1403PC	BZL25-T3203PC

BZL30

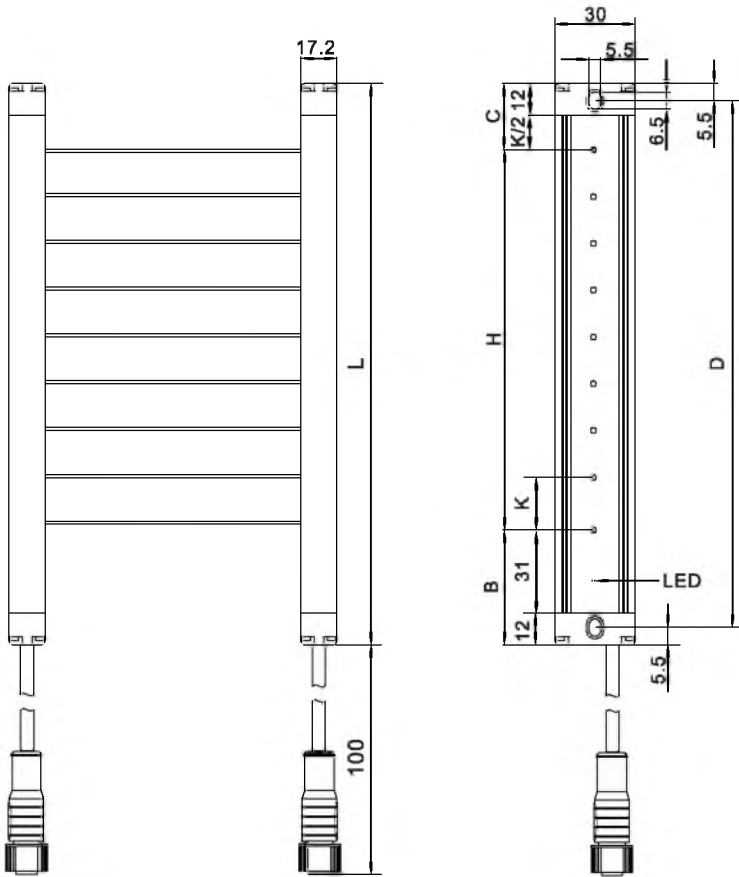
Resolution	30mm						
Min. sized detectable objects	> ϕ 38, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	90mm	150mm	210mm	270mm	330mm	... ..	930mm
Light curtain height	154mm	214mm	274mm	334mm	394mm	... ..	994mm
Model NO.	NPN NC	BZL30-T0403NC	BZL30-T0603NC	BZL30-T0803NC	BZL30-T1003NC	BZL30-T1203NC	BZL30-T3203NC
	PNP NC	BZL30-T0403PC	BZL30-T0603PC	BZL30-T0803PC	BZL30-T1003PC	BZL30-T1203PC	BZL30-T3203PC

BZL40

Resolution	40mm						
Min. sized detectable objects	> ϕ 48, opaque						
Scanning range	0.3~3m						
NO. beams	4	6	8	10	12	... ..	32
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	1240mm
Light curtain height	189mm	269mm	349mm	429mm	509mm	... ..	1309mm
Model NO.	NPN NC	BZL40-T0403NC	BZL40-T0603NC	BZL40-T0803NC	BZL40-T1003NC	BZL40-T1203NC	BZL40-T3203NC
	PNP NC	BZL40-T0403PC	BZL40-T0603PC	BZL40-T0803PC	BZL40-T1003PC	BZL40-T1203PC	BZL40-T3203PC

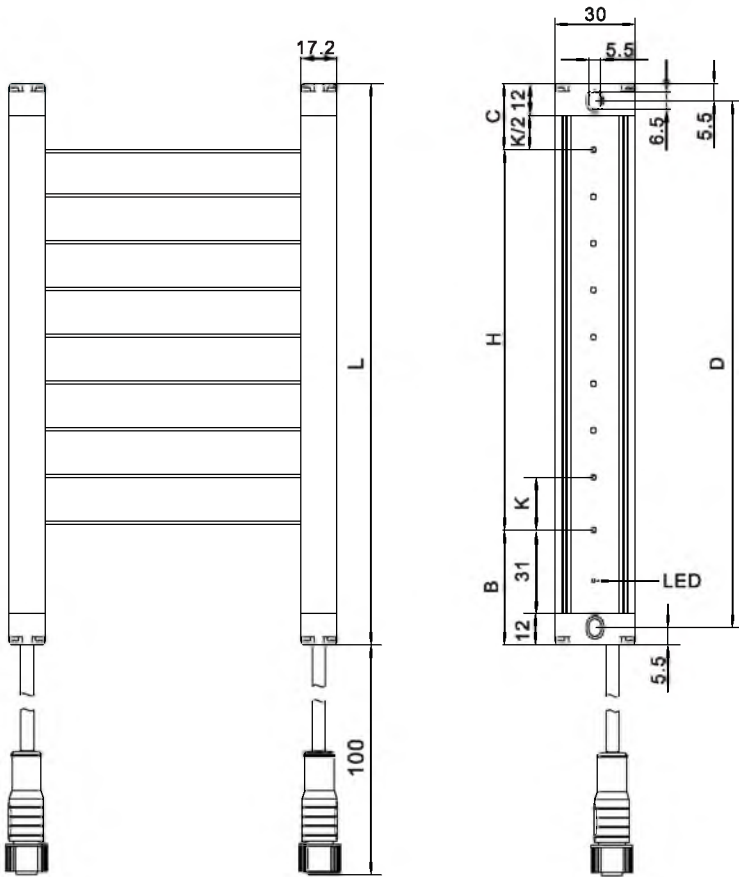
Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance
Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

BZL10



H:Protection Height= (N-1) K
L:Light curtain total height=H+60
N:No. beams
K:Beam pitch=10
B:Lower blind height=43
C:Upper blind height=17
D:Mounting hole spacing= (L-11)

BZL14



H:Protection Height= (N-1) K
L:Light curtain total height=H+62
N:No. beams
K:Beam pitch=14
B:Lower blind height=43
C:Upper blind height=19
D:Mounting hole spacing= (L-11)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

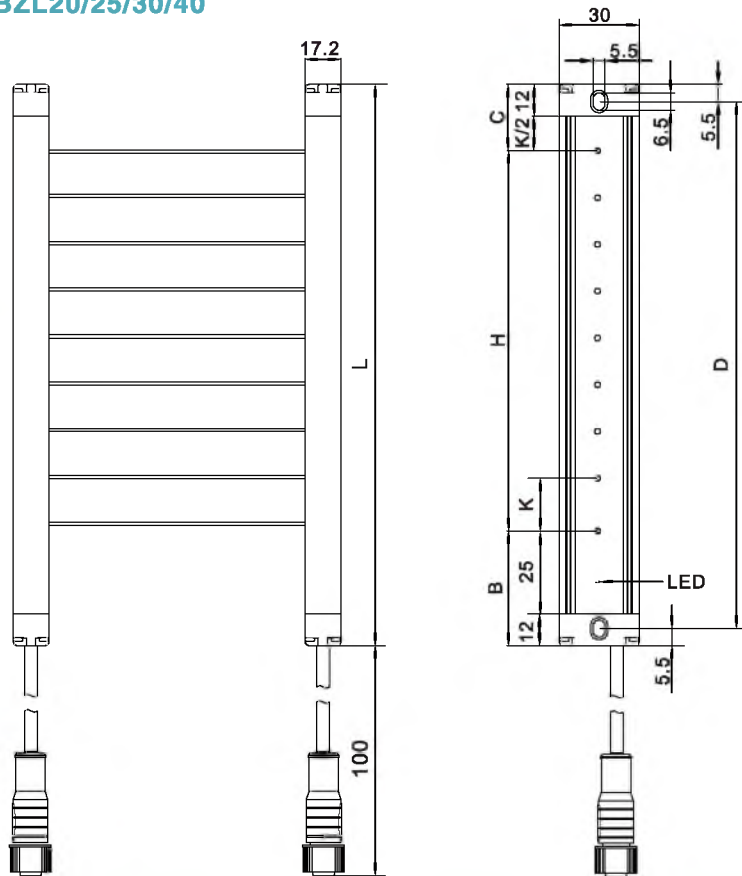
Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Top-emitting Type

BZL Series

BZL20/25/30/40

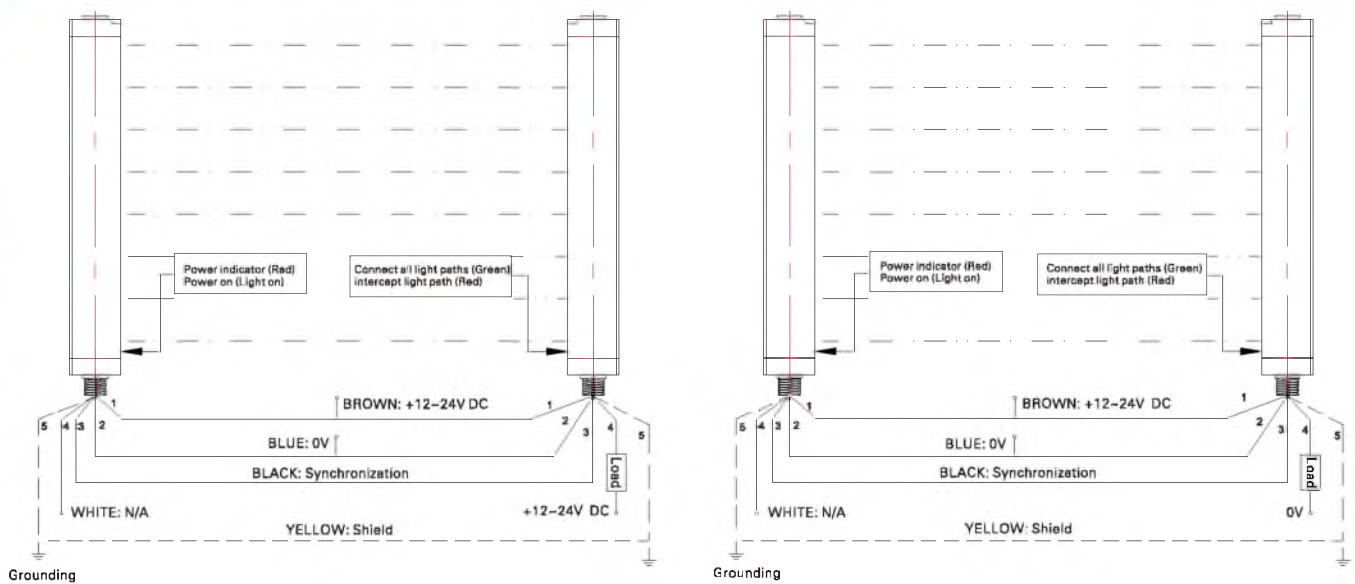


H: Protection Height= (N-1) K
 L: Light curtain total height=(N-1/2)K+49
 N: No. beams
 K: Beam pitch
 B: Lower blind height=37
 C: Upper blind height=K/2+12
 D: Mounting hole spacing= (L-11)

Connection Diagram

NPN

PNP





Basic Features	Working principle	Photoelectric Sensor
	Housing	Array
	Optical working principle	Thru-beam
	Safety class	-
	Standard	-
	Light source	Infrared light (modulation)
	Number of beams	4~32 beams
	Beam pitch	20/40mm
	Protection height	100~1240mm
	Protection distance	0.3~3.0m
	Mini. detectable object	φ28/φ48mm or more opaque object
Electrical data	Output Mode	NPN/PNP
	Synchronization type	Line synchronization
	Response time	≤15ms
	Operating voltage	24VDC ± 10%
	Current consumption	≤200mA
	Power consumption	3~8W
	Residual Voltage	≤3.5V (150mA)
	Load Current	-
	Insulation resistance	≥100MΩ between power terminal and case (500VDC)
	Dielectric strength	1000VAC (50/60Hz), 1 minute between power terminal and case
	Protection circuit	Reverse polarity protection/short circuit protection
Environmental conditions	Operating temperature	-10~55℃(No freezing)
	Storage temperature	-10~55℃(No freezing)
	Operating humidity	35~85%RH(No condensation)
	Storage humidity	35~95%RH(No condensation)
	Ambient Illumination	Incandescent Lamp≤3000Lux;LED≤3000Lux;Sunlight≤10000Lux
	Vibration resistance	10~55Hz, dual amplitude 1.5mm, 2 hours for each X/Y/Z axis
	Protection class	IP65
Mechanical data	Connection type	Cable
	Dimensions	159~1292.5x15x30mm
	Material	Aluminum
	Weight	0.8~8.46kg
	Accessories	Mounting bracket, mounting screws, M12/5-pin plug cablex2

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

Guidance

Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

Side-emitting Type

BCL Series

BCL20

Beam pitch		20mm					
Mini. detectable object		φ28 or more opaque object					
Protection distance		0.3~3m					
Number of beams		6 beams	8 beams	10 beams	12 beams	14 beams	30 beams
Protection height		100mm	140mm	180mm	220mm	260mm	580mm
Length of light curtain		159mm	199mm	239mm	279mm	319mm	639mm
Model	NPN NC	BCL20-T0603NC	BCL20-T0803NC	BCL20-T1003NC	BCL20-T1203NC	BCL20-T1403NC	BCL20-T3003NC
	PNP NC	BCL20-T0603PC	BCL20-T0803PC	BCL20-T1003PC	BCL20-T1203PC	BCL20-T1403PC	BCL20-T3003PC

Remarks: Maximum number of beams is 30.

BCL40

Beam pitch		40mm					
Mini. detectable object		φ48 or more opaque object					
Protection distance		0.3~3m					
Number of beams		4 beams	6 beams	8 beams	10 beams	12 beams	32 beams
Protection height		120mm	200mm	280mm	360mm	440mm	1240mm
Length of light curtain		172.5mm	252.5mm	332.5mm	412.5mm	492.5mm	1292.5mm
Model	NPN NC	BCL40-T0403NC	BCL40-T0603NC	BCL40-T0803NC	BCL40-T1003NC	BCL40-T1203NC	BCL40-T3203NC
	PNP NC	BCL40-T0403PC	BCL40-T0603PC	BCL40-T0803PC	BCL40-T1003PC	BCL40-T1203PC	BCL40-T3203PC

Remarks: Maximum number of beams is 32.

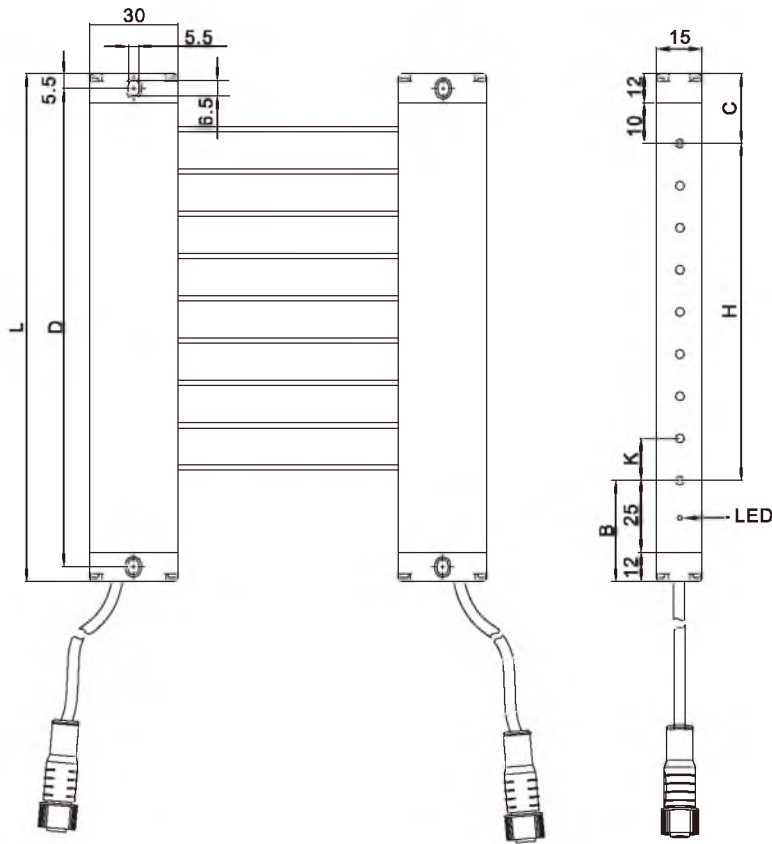
BCL20

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BCL20-T0603NC	BCL20-T0603PC	20	06	100	159
BCL20-T0803NC	BCL20-T0803PC	20	08	140	199
BCL20-T1003NC	BCL20-T1003PC	20	10	180	239
BCL20-T1203NC	BCL20-T1203PC	20	12	220	279
BCL20-T1403NC	BCL20-T1403PC	20	14	260	319
BCL20-T1603NC	BCL20-T1603PC	20	16	300	359
BCL20-T1803NC	BCL20-T1803PC	20	18	340	399
BCL20-T2003NC	BCL20-T2003PC	20	20	380	439
BCL20-T2203NC	BCL20-T2203PC	20	22	420	479
BCL20-T2403NC	BCL20-T2403PC	20	24	460	519
BCL20-T2603NC	BCL20-T2603PC	20	26	500	559
BCL20-T2803NC	BCL20-T2803PC	20	28	540	599
BCL20-T3003NC	BCL20-T3003PC	20	30	580	639

BCL40

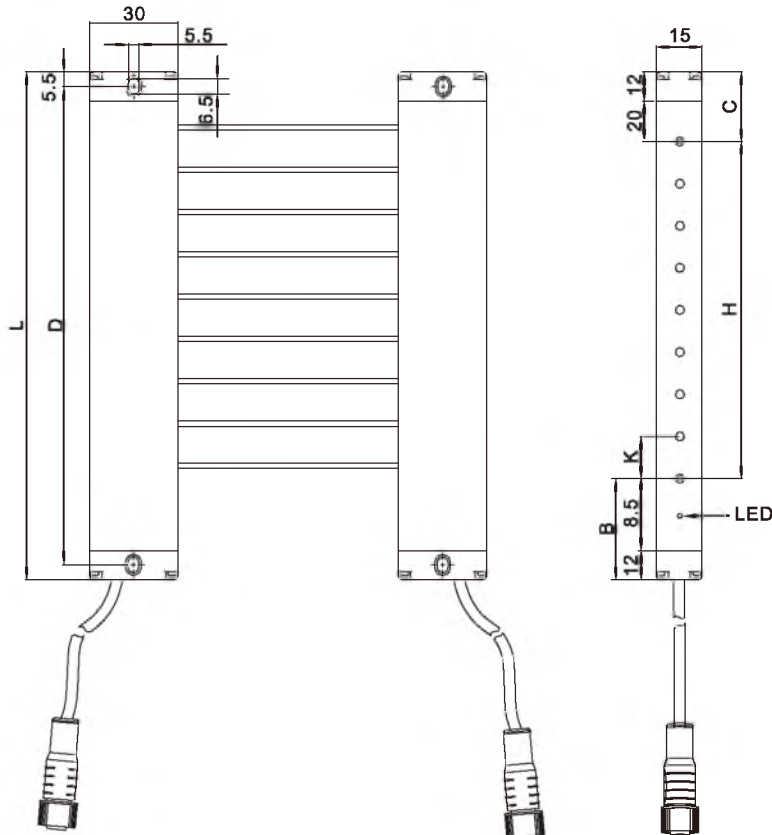
Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BCL40-T0403NC	BCL40-T0403PC	40	04	120	172.5
BCL40-T0603NC	BCL40-T0603PC	40	06	200	252.5
BCL40-T0803NC	BCL40-T0803PC	40	08	280	332.5
BCL40-T1003NC	BCL40-T1003PC	40	10	360	412.5
BCL40-T1203NC	BCL40-T1203PC	40	12	440	492.5
BCL40-T1403NC	BCL40-T1403PC	40	14	520	572.5
BCL40-T1603NC	BCL40-T1603PC	40	16	600	652.5
BCL40-T1803NC	BCL40-T1803PC	40	18	680	732.5
BCL40-T2003NC	BCL40-T2003PC	40	20	760	812.5
BCL40-T2203NC	BCL40-T2203PC	40	22	840	892.5
BCL40-T2403NC	BCL40-T2403PC	40	24	920	972.5
BCL40-T2603NC	BCL40-T2603PC	40	26	1000	1052.5
BCL40-T2803NC	BCL40-T2803PC	40	28	1080	1132.5
BCL40-T3003NC	BCL40-T3003PC	40	30	1160	1212.5
BCL40-T3203NC	BCL40-T3203PC	40	30	1240	1292.5

BCL20



H: Protection Height= (N-1) K
 L: Light curtain total height=H+59
 N: No. of beams
 K: Beam pitch=20
 B: Lower blind height=37
 C: Upper blind height=22
 D: Mounting hole spacing= (L-11)

BCL40



H: Protection Height= (N-1) K
 L: Light curtain total height=H+52.5
 N: No. of beams
 K: Beam pitch=40
 B: Lower blind height=20.5
 C: Upper blind height=32
 D: Mounting hole spacing= (L-11)

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety door lock
Pressure Switch
Communication
Accessories

Guidance

Light curtains

Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner
Mini LIDAR scanner
Navigation LIDAR

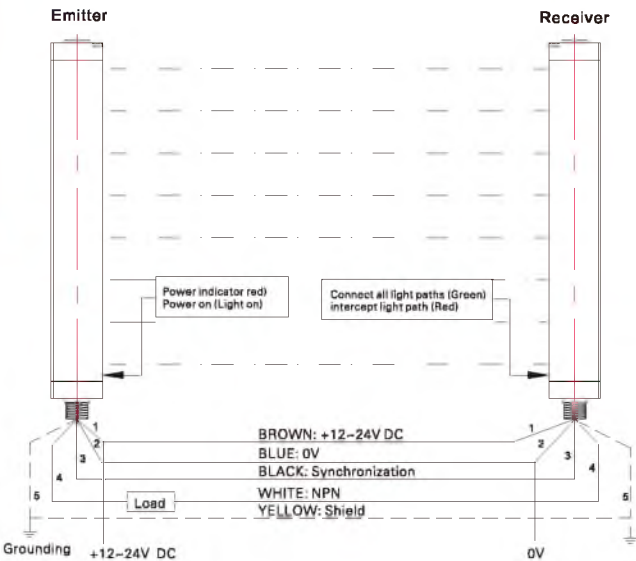
Side-emitting Type

Connection Diagram

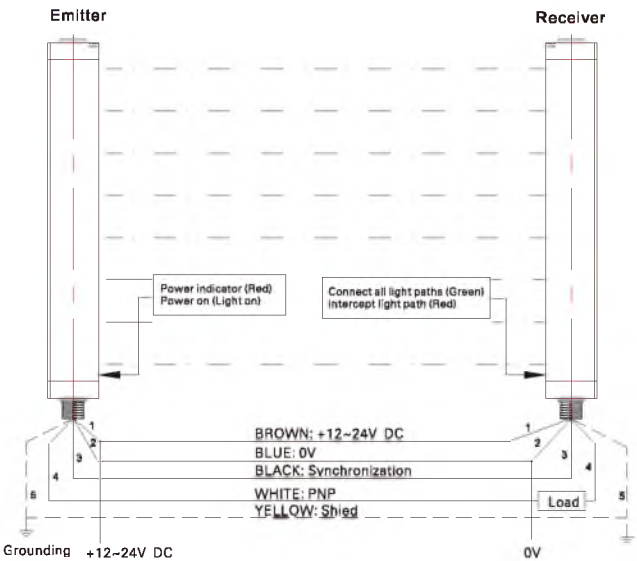
Unit:mm

Area

NPN



PNP



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety door lock
- Pressure Switch
- Communication
- Accessories

Guidance

- Light curtains
 - Standard type
 - Top-emitting type
 - Side-emitting type
 - Waterproof type
 - Measuring type
 - Economical type
- Safety Light Curtain
 - Safety Light Curtain
- LIDAR scanner
 - TOF LIDAR scanner
 - MINI LIDAR scanner
 - Navigation LIDAR



Basic Features	Working principle	Photoelectric Sensor					
	Housing	Array					
	Optical working principle	Thru-beam					
	Safety class	-					
	Standard	-					
	Light source	Infrared light (modulation)					
	Number of beams	4~32beams					
	Beam pitch	10/14/20/25/30/40mm					
	Protection height	50~1240mm					
	Protection distance	0.3~3.0m					
	Mini. detectable object	φ15/φ19/φ25/φ30/φ35/φ45mm or more opaque object					
Electrical data	Output Mode	NPN/PNP					
	Synchronization type	Line synchronization					
	Response time	≤15ms					
	Operating voltage	24VDC±10%					
	Current consumption	≤200mA					
	Power consumption	3~8W					
	Residual Voltage	-					
	Load Current	-					
	Insulation resistance	≥100MΩ between power terminal and case (500VDC)					
	Dielectric strength	-					
	Protection circuit	Reverse polarity protection/short circuit protection					
Environmental conditions	Operating temperature	-10~55℃(No freezing)					
	Storage temperature	-15~60℃(No freezing)					
	Operating humidity	35~85%RH(No condensation)					
	Storage humidity	35~95%RH(No condensation)					
	Ambient Illumination	-					
	Vibration resistance	10~55Hz, dual amplitude 1.5mm, 2 hours for each X/Y/Z axis					
	Protection class	IP68					
Mechanical data	Connection type	Cable					
	Dimensions	118~1317xØ48xØ48mm					
	Material	Aluminum					
	Weight	0.59~6.59kg					
	Accessories	Mounting bracket, mounting screws, M12/5-pin plug cablex2					

BPL10

Beam pitch	10mm						
Mini. detectable object	φ15 or more opaque object						
Protection distance	0.3~3m						
Number of beams	6 beams	8 beams	10 beams	12 beams	14 beams	... ..	32 beams
Protection height	50mm	70mm	90mm	110mm	130mm	... ..	310mm
Length of light curtain	118mm	138mm	158mm	178mm	198mm	... ..	378mm
Model	NPN NC	BPL10-T0603NC	BPL10-T0803NC	BPL10-T1003NC	BPL10-T1203NC	BPL10-T1403NC	BPL10-T3203NC
	PNP NC	BPL10-T0603PC	BPL10-T0803PC	BPL10-T1003PC	BPL10-T1203PC	BPL10-T1403PC	BPL10-T3203PC

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety doorlock
Pressure Switch
Communication
Accessories

Guidance

Light curtains

Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

Waterproof Type

BPL series

BPL14

Beam pitch		14mm					
Mini. detectable object		φ19 or more opaque object					
Protection distance		0.3~3m					
Number of beams		6 beams	8 beams	10 beams	12 beams	14 beams	32 beams
Protection height		70mm	98mm	126mm	154mm	182mm	434mm
Length of light curtain		140mm	168mm	196mm	224mm	252mm	504mm
Model	NPN NC	BPL14-T0603NC	BPL14-T0803NC	BPL14-T1003NC	BPL14-T1203NC	BPL14-T1403NC	BPL14-T3203NC
	PNP NC	BPL14-T0603PC	BPL14-T0803PC	BPL14-T1003PC	BPL14-T1203PC	BPL14-T1403PC	BPL14-T3203PC

BPL20

Beam pitch		20mm					
Mini. detectable object		φ25 or more opaque object					
Protection distance		0.3~3m					
Number of beams		4 beams	6 beams	8 beams	10 beams	12 beams	32 beams
Protection height		60mm	100mm	140mm	180mm	220mm	620mm
Length of light curtain		127mm	167mm	207mm	247mm	287mm	687mm
Model	NPN NC	BPL20-T0403NC	BPL20-T0603NC	BPL20-T0803NC	BPL20-T1003NC	BPL20-T1203NC	BPL20-T3203NC
	PNP NC	BPL20-T0403PC	BPL20-T0603PC	BPL20-T0803PC	BPL20-T1003PC	BPL20-T1203PC	BPL20-T3203PC

BPL25

Beam pitch		25mm					
Mini. detectable object		φ30 or more opaque object					
Protection distance		0.3~3m					
Number of beams		6 beams	8 beams	10 beams	12 beams	14 beams	32 beams
Protection height		125mm	175mm	225mm	275mm	325mm	775mm
Length of light curtain		194.5mm	244.5mm	294.5mm	344.5mm	394.5mm	844.5mm
Model	NPN NC	BPL25-T0603NC	BPL25-T0803NC	BPL25-T1003NC	BPL25-T1203NC	BPL25-T1403NC	BPL25-T3203NC
	PNP NC	BPL25-T0603PC	BPL25-T0803PC	BPL25-T1003PC	BPL25-T1203PC	BPL25-T1403PC	BPL25-T3203PC

BPL30

Beam pitch		30mm					
Mini. detectable object		φ35 or more opaque object					
Protection distance		0.3~3m					
Number of beams		4 beams	6 beams	8 beams	10 beams	12 beams	32 beams
Protection height		90mm	150mm	210mm	270mm	330mm	930mm
Length of light curtain		162mm	222mm	282mm	342mm	402mm	1002mm
Model	NPN NC	BPL30-T0403NC	BPL30-T0603NC	BPL30-T0803NC	BPL30-T1003NC	BPL30-T1203NC	BPL30-T3203NC
	PNP NC	BPL30-T0403PC	BPL30-T0603PC	BPL30-T0803PC	BPL30-T1003PC	BPL30-T1203PC	BPL30-T3203PC

BPL40

Beam pitch		40mm					
Mini. detectable object		φ45 or more opaque object					
Protection distance		0.3~3m					
Number of beams		4 beams	6 beams	8 beams	10 beams	12 beams	32 beams
Protection height		120mm	200mm	280mm	360mm	440mm	1240mm
Length of light curtain		197mm	277mm	357mm	437mm	517mm	1317mm
Model	NPN NC	BPL40-T0403NC	BPL40-T0603NC	BPL40-T0803NC	BPL40-T1003NC	BPL40-T1203NC	BPL40-T3203NC
	PNP NC	BPL40-T0403PC	BPL40-T0603PC	BPL40-T0803PC	BPL40-T1003PC	BPL40-T1203PC	BPL40-T3203PC

BPL10

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BPL10-T0603NC	BPL10-T0603PC	10	06	50	118
BPL10-T0803NC	BPL10-T0803PC	10	08	70	138
BPL10-T1003NC	BPL10-T1003PC	10	10	90	158
BPL10-T1203NC	BPL10-T1203PC	10	12	110	178
BPL10-T1403NC	BPL10-T1403PC	10	14	130	198
BPL10-T1603NC	BPL10-T1603PC	10	16	150	218
BPL10-T1803NC	BPL10-T1803PC	10	18	170	238
BPL10-T2003NC	BPL10-T2003PC	10	20	190	258
BPL10-T2203NC	BPL10-T2203PC	10	22	210	278
BPL10-T2403NC	BPL10-T2403PC	10	24	230	298
BPL10-T2603NC	BPL10-T2603PC	10	26	250	318
BPL10-T2803NC	BPL10-T2803PC	10	28	270	338
BPL10-T3003NC	BPL10-T3003PC	10	30	290	358
BPL10-T3203NC	BPL10-T3203PC	10	32	310	378

BPL14

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BPL14-T0603NC	BPL14-T0603PC	14	06	70	140
BPL14-T0803NC	BPL14-T0803PC	14	08	98	168
BPL14-T1003NC	BPL14-T1003PC	14	10	126	196
BPL14-T1203NC	BPL14-T1203PC	14	12	154	224
BPL14-T1403NC	BPL14-T1403PC	14	14	182	252
BPL14-T1603NC	BPL14-T1603PC	14	16	210	280
BPL14-T1803NC	BPL14-T1803PC	14	18	238	308
BPL14-T2003NC	BPL14-T2003PC	14	20	266	336
BPL14-T2203NC	BPL14-T2203PC	14	22	294	364
BPL14-T2403NC	BPL14-T2403PC	14	24	322	392
BPL14-T2603NC	BPL14-T2603PC	14	26	350	420
BPL14-T2803NC	BPL14-T2803PC	14	28	378	448
BPL14-T3003NC	BPL14-T3003PC	14	30	406	476
BPL14-T3203NC	BPL14-T3203PC	14	32	434	504

BPL20

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BPL20-T0403NC	BPL20-T0403PC	20	04	60	127
BPL20-T0603NC	BPL20-T0603PC	20	06	100	167
BPL20-T0803NC	BPL20-T0803PC	20	08	140	207
BPL20-T1003NC	BPL20-T1003PC	20	10	180	247
BPL20-T1203NC	BPL20-T1203PC	20	12	220	287
BPL20-T1403NC	BPL20-T1403PC	20	14	260	327
BPL20-T1603NC	BPL20-T1603PC	20	16	300	367
BPL20-T1803NC	BPL20-T1803PC	20	18	340	407
BPL20-T2003NC	BPL20-T2003PC	20	20	380	447
BPL20-T2203NC	BPL20-T2203PC	20	22	420	487
BPL20-T2403NC	BPL20-T2403PC	20	24	460	527
BPL20-T2603NC	BPL20-T2603PC	20	26	500	567
BPL20-T2803NC	BPL20-T2803PC	20	28	540	607
BPL20-T3003NC	BPL20-T3003PC	20	30	580	647
BPL20-T3203NC	BPL20-T3203PC	20	32	620	687

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety doorlock

Pressure Switch

Communication

Accessories

Guidance

Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner

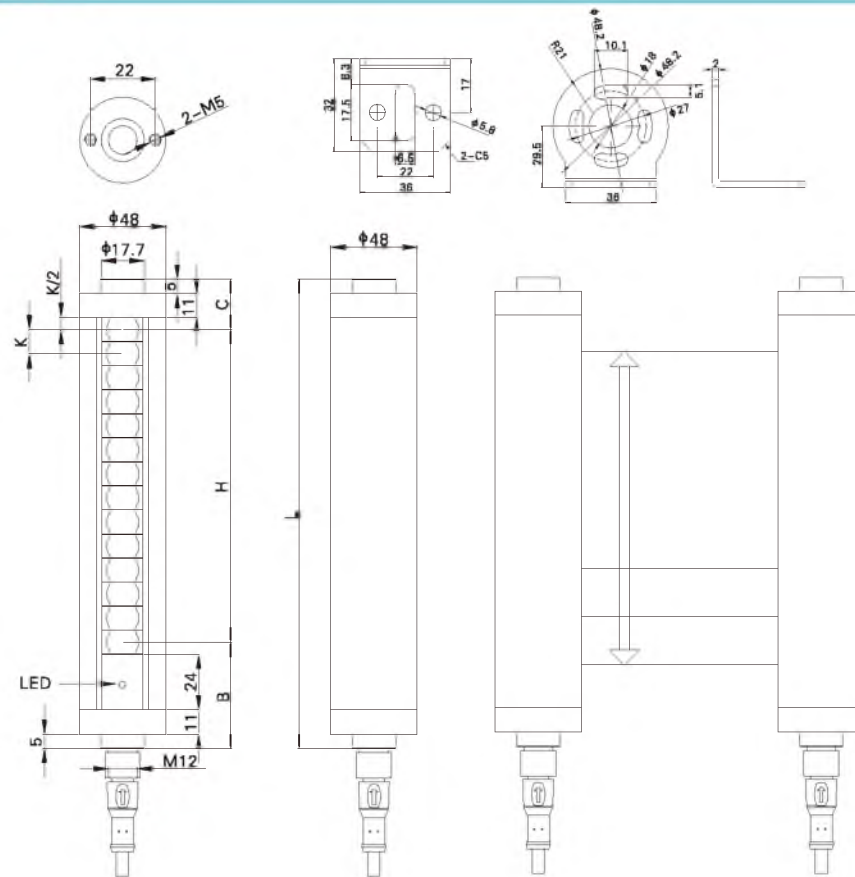
MINI LIDAR scanner

Navigation LIDAR

Unit:mm

Dimensions

Area



BPL10
K: 10
H: (N-1)*10
L: H+68
B: 47
C: 21

BPL25
K: 25
H: (N-1)*25
L: H+69.5
B: 41
C: 28.5

BPL14
K: 14
H: (N-1)*14
L: H+70
B: 47
C: 23

BPL30
K: 30
H: (N-1)*30
L: H+72
B: 41
C: 31

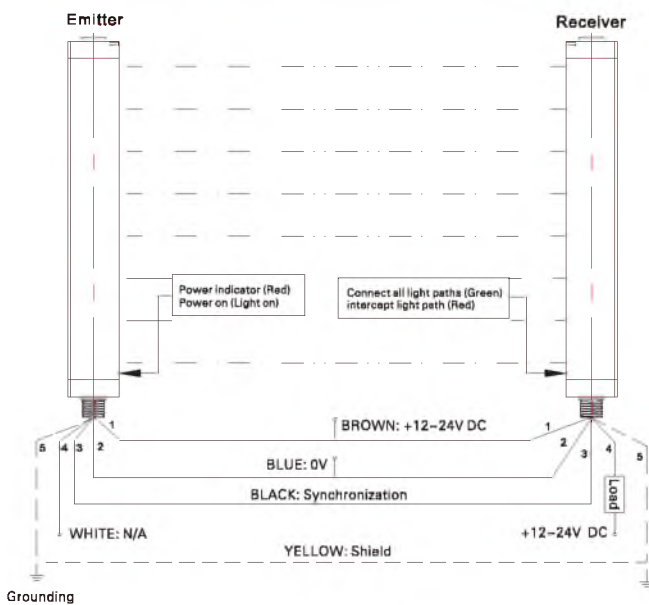
BPL20
K: 20
H: (N-1)*20
L: H+67
B: 41
C: 26

BPL40
K: 40
H: (N-1)*40
L: H+77
B: 41
C: 36

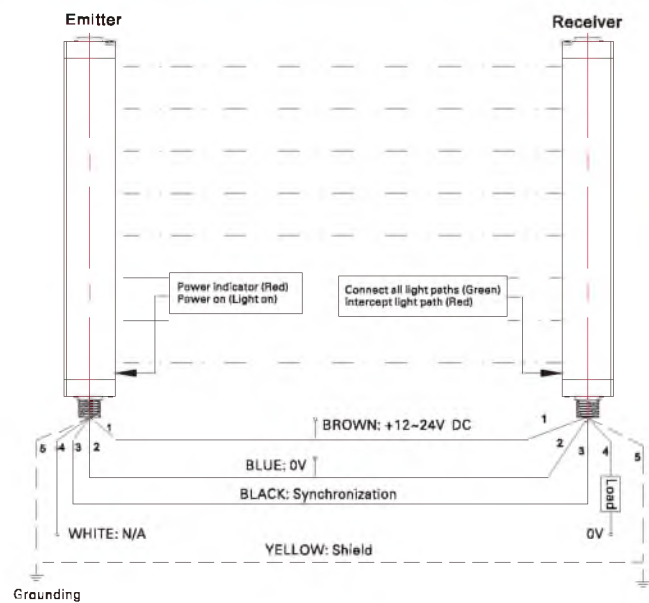
N: No. of beams
K: Beam pitch
H: Protection Height=(N-1)K
L: Light curtain total height=H+B+C
B: Lower blind height
C: Upper blind height=K/2+16

Connection Diagram

NPN



PNP



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
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Contact

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Safety doorlock
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Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain
Safety Light Curtain

LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR



Basic Features	Working principle	Photoelectric Sensor
	Housing	Array
	Optical working principle	Thru-beam
	Safety class	-
	Standard	-
	Light source	Infrared light, 860nm (modulation)
	Number of beams	8~32 beams
	Beam pitch	20/40mm
	Protection height	180~1240mm
	Protection distance	0.1~6.0m
	Mini. detectable object	φ28/φ48mm or more opaque object
Electrical data	Output Mode	NPN/PNP
	Synchronization type	Line synchronization
	Response time	≤20ms
	Operating voltage	12~24VDC ± 10%
	Current consumption	Emitter: ≤200mA, Receiving: ≤200mA
	Power consumption	3~8W
	Residual Voltage	≤2.0V(150mA) / < 2.0V
	Load Current	≤150mA
	Insulation resistance	≥100MΩ between power terminal and case (500VDC) / ± 500V 50/60Hz 60s
	Dielectric strength	500VAC (50/60Hz), 1 minute between power terminal and case / ± 500V 50/60Hz 60s
	Protection circuit	Reverse polarity protection/short circuit protection/surge protection
Environmental conditions	Operating temperature	-10~55℃(No freezing)
	Storage temperature	-10~55℃(No freezing)
	Operating humidity	35~85%RH(No condensation)
	Storage humidity	35~95%RH(No condensation)
	Ambient Illumination	Incandescent Lamp ≤3000Lux; LED ≤3000Lux; Sunlight ≤10000Lux
	Vibration resistance	10~55Hz, dual amplitude 1.5mm, 2 hours for each X/Y/Z axis
	Protection class	IP65
Mechanical data	Connection type	Cable
	Dimensions	214.6~1274.6x30x29.65mm
	Material	Aluminum
	Weight	0.62~6.37kg
	Accessories	Right angle mount: M12/5-pin plug cable x2

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Light curtains

Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

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Navigation LIDAR

Economical Type

BSL Series

BSL20

Beam pitch		20mm				
Mini. detectable object		φ28 or more opaque object				
Protection distance		0.1~6m				
Number of beams		10 beams	12 beams	14 beams	… …	32 beams
Protection height		180mm	220mm	260mm	… …	620mm
Length of light curtain		214.6mm	254.6mm	294.6mm	… …	654.6mm
Model	NPN NC	BSL20-T1006NC	BSL20-T1206NC	BSL20-T1406NC	… …	BSL20-T3206NC
	PNP NC	BSL20-T1006PC	BSL20-T1206PC	BSL20-T1406PC	… …	BSL20-T3206PC

BSL40

Beam pitch		40mm				
Mini. detectable object		φ48 or more opaque object				
Protection distance		0.1~6m				
Number of beams		8 beams	10 beams	12 beams	… …	32 beams
Protection height		280mm	360mm	440mm	… …	1240mm
Length of light curtain		314.6mm	394.6mm	474.6mm	… …	1274.6mm
Model	NPN NC	BSL40-T0806NC	BSL40-T1006NC	BSL40-T1206NC	… …	BSL40-T3206NC
	PNP NC	BSL40-T0806PC	BSL40-T1006PC	BSL40-T1206PC	… …	BSL40-T3206PC

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BSL20

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BSL20-T1006NC	BSL20-T1006PC	20	10	180	214.6
BSL20-T1206NC	BSL20-T1206PC	20	12	220	254.6
BSL20-T1406NC	BSL20-T1406PC	20	14	260	294.6
BSL20-T1606NC	BSL20-T1606PC	20	16	300	334.6
BSL20-T1806NC	BSL20-T1806PC	20	18	340	374.6
BSL20-T2006NC	BSL20-T2006PC	20	20	380	414.6
BSL20-T2206NC	BSL20-T2206PC	20	22	420	454.6
BSL20-T2406NC	BSL20-T2406PC	20	24	460	494.6
BSL20-T2606NC	BSL20-T2606PC	20	26	500	534.6
BSL20-T2806NC	BSL20-T2806PC	20	28	540	574.6
BSL20-T3006NC	BSL20-T3006PC	20	30	580	614.6
BSL20-T3206NC	BSL20-T3206PC	20	32	620	654.6

BSL40

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BSL40-T0806NC	BSL40-T0806PC	40	08	280	314.6
BSL40-T1006NC	BSL40-T1006PC	40	10	360	394.6
BSL40-T1206NC	BSL40-T1206PC	40	12	440	474.6
BSL40-T1406NC	BSL40-T1406PC	40	14	520	554.6
BSL40-T1606NC	BSL40-T1606PC	40	16	600	634.6
BSL40-T1806NC	BSL40-T1806PC	40	18	680	714.6
BSL40-T2006NC	BSL40-T2006PC	40	20	760	794.6
BSL40-T2206NC	BSL40-T2206PC	40	22	840	874.6
BSL40-T2406NC	BSL40-T2406PC	40	24	920	954.6
BSL40-T2606NC	BSL40-T2606PC	40	26	1000	1034.6
BSL40-T2806NC	BSL40-T2806PC	40	28	1080	1114.6
BSL40-T3006NC	BSL40-T3006PC	40	30	1160	1194.6
BSL40-T3206NC	BSL40-T3206PC	40	32	1240	1274.6

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Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

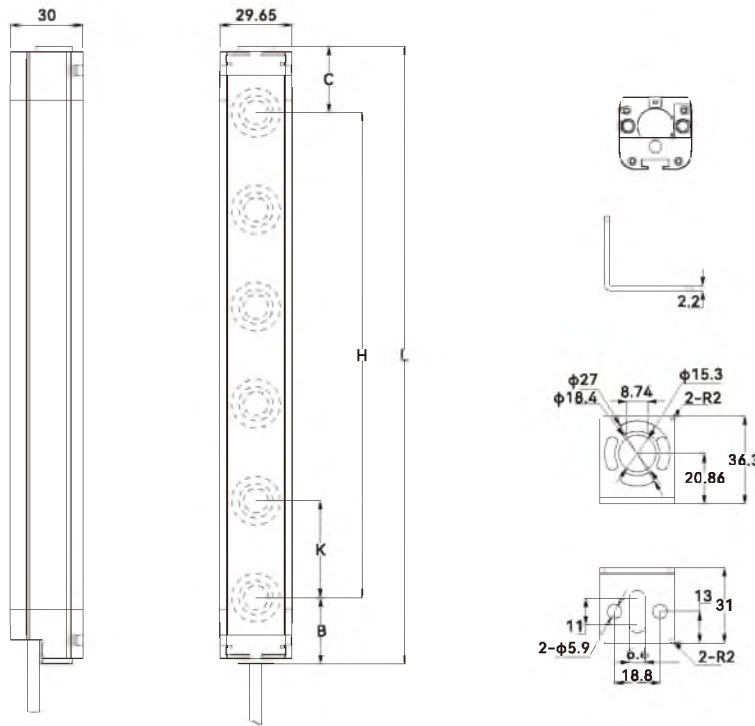
Navigation LIDAR

Economical Type

Dimensions

Unit:mm

Area



$$B=C=17.3\text{mm}$$

$$H=(N-1)*K$$

$$L=H+B+C$$

B : Upper blind height

C : Lower blind height

K : Beam pitch

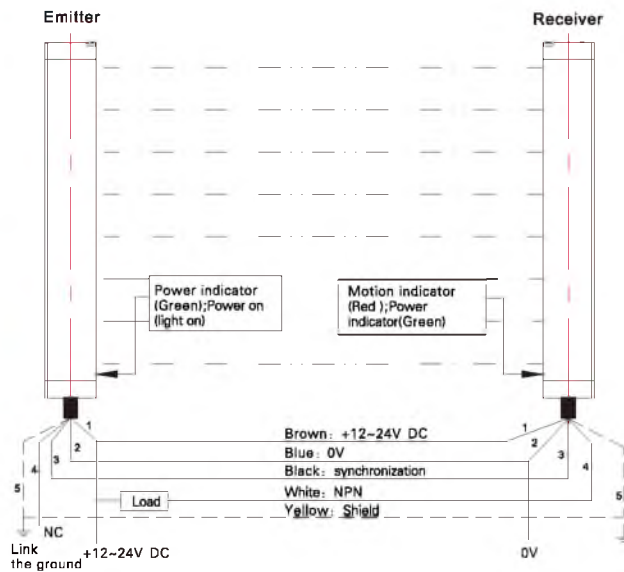
H : Protection height

N : No. of beam

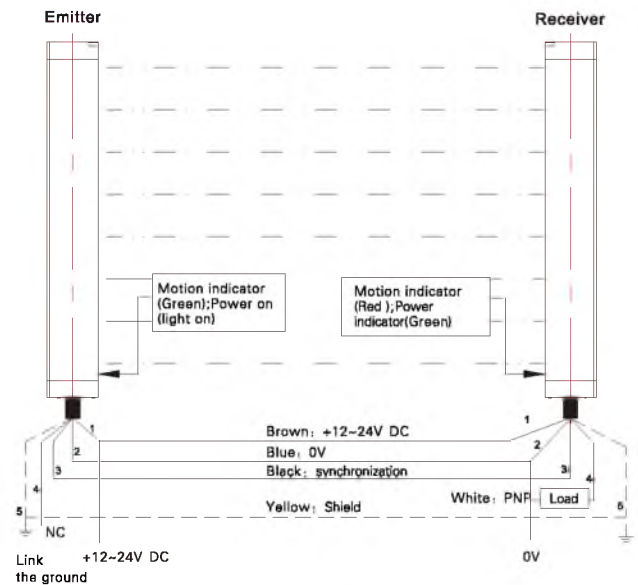
L : Total light curtain height

Connection Diagram

NPN



PNP





Economical Type



Basic Features	Working principle	Photoelectric Sensor
	Housing	Array
	Optical working principle	Thru-beam
	Safety class	—
	Standard	—
	Light source	Infrared light (modulation)
	Number of beams	4~48 beams
	Beam pitch	10/20/40mm
	Protection height	120~1880mm
	Protection distance	0.1~6.0m
	Mini. detectable object	φ14/φ25/φ45mm or more opaque object
Electrical data	Output Mode	NPN/PNP
	Synchronization type	Optical synchronization, Line synchronization
	Response time	≤10ms
	Operating voltage	12~24VDC ± 10%
	Current consumption	≤200mA
	Power consumption	3~8W
	Residual Voltage	≤1.5V (150mA)
	Load Current	—
	Insulation resistance	≥10MΩ between power terminal and case (500VDC)
	Dielectric strength	1000VAC (50/60Hz), 1 minute between power terminal and case
	Protection circuit	Reverse polarity protection/short circuit protection/surge protection
Environmental conditions	Operating temperature	-15~55°C(No freezing)
	Storage temperature	-20~60°C(No freezing)
	Operating humidity	35~85%RH(No condensation)
	Storage humidity	35~95%RH(No condensation)
	Ambient Illumination	Incandescent Lamp ≤3000Lux; LED ≤3000Lux; Sunlight ≤10000Lux
	Vibration resistance	10~150Hz, dual amplitude 1.5mm, 2 hours for each X/Y/Z axis
	Protection class	IP65
Mechanical data	Connection type	Cable
	Dimensions	146~1926x30x30mm
	Material	Aluminum
	Weight	0.75~9.65kg
	Accessories	Mounting bracket, mounting screws, M12/6-pin plug cablex2

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Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

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Safety Light Curtain

Safety Light Curtain

LIDAR scanner

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Navigation LIDAR

BKL Series

Area

BKL10

Beam pitch		10mm					
Mini. detectable object		φ14 or more opaque object					
Protection distance		0.1~6m					
Number of beams		14 beams	16 beams	18 beams	20 beams	22 beams	48 beams
Protection height		130mm	150mm	170mm	190mm	210mm	470mm
Length of light curtain		146mm	166mm	186mm	206mm	226mm	486mm
Model	NPN NC	BKL10-T1406NC	BKL10-T1606NC	BKL10-T1806NC	BKL10-T2006NC	BKL10-T2206NC	BKL10-T4806NC
	PNP NC	BKL10-T1406PC	BKL10-T1606PC	BKL10-T1806PC	BKL10-T2006PC	BKL10-T2206PC	BKL10-T4806PC

Remarks: Maximum number of beams is 64.

BKL20

Beam pitch		20mm					
Mini. detectable object		φ25 or more opaque object					
Protection distance		0.1~6m					
Number of beams		8 beams	10 beams	12 beams	14 beams	16 beams	48 beams
Protection height		140mm	180mm	220mm	260mm	300mm	940mm
Length of light curtain		166mm	206mm	246mm	286mm	326mm	966mm
Model	NPN NC	BKL20-T0806NC	BKL20-T1006NC	BKL20-T1206NC	BKL20-T1406NC	BKL20-T1606NC	BKL20-T4806NC
	PNP NC	BKL20-T0806PC	BKL20-T1006PC	BKL20-T1206PC	BKL20-T1406PC	BKL20-T1606PC	BKL20-T4806PC

Remarks: Maximum number of beams is 128.

BKL40

Beam pitch		40mm					
Mini. detectable object		φ45 or more opaque object					
Protection distance		0.1~6m					
Number of beams		4 beams	6 beams	8 beams	10 beams	12 beams	48 beams
Protection height		120mm	200mm	280mm	360mm	440mm	1880mm
Length of light curtain		166mm	246mm	326mm	406mm	486mm	1926mm
Model	NPN NC	BKL40-T0406NC	BKL40-T0606NC	BKL40-T0806NC	BKL40-T1006NC	BKL40-T1206NC	BKL40-T4806NC
	PNP NC	BKL40-T0406PC	BKL40-T0606PC	BKL40-T0806PC	BKL40-T1006PC	BKL40-T1206PC	BKL40-T4806PC

Remarks: Maximum number of beams is 48.

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MINI LIDAR scanner
Navigation LIDAR

BKL10

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BKL10-T1406NC	BKL10-T1406PC	10	14	130	146
BKL10-T1606NC	BKL10-T1606PC	10	16	150	166
BKL10-T1806NC	BKL10-T1806PC	10	18	170	186
BKL10-T2006NC	BKL10-T2006PC	10	20	190	206
BKL10-T2206NC	BKL10-T2206PC	10	22	210	226
BKL10-T2406NC	BKL10-T2406PC	10	24	230	246
BKL10-T2606NC	BKL10-T2606PC	10	26	250	266
BKL10-T2806NC	BKL10-T2806PC	10	28	270	286
BKL10-T3006NC	BKL10-T3006PC	10	30	290	306
BKL10-T3206NC	BKL10-T3206PC	10	32	310	326
BKL10-T3406NC	BKL10-T3406PC	10	34	330	346
BKL10-T3606NC	BKL10-T3606PC	10	36	350	366
BKL10-T3806NC	BKL10-T3806PC	10	38	370	386
BKL10-T4006NC	BKL10-T4006PC	10	40	390	406
BKL10-T4206NC	BKL10-T4206PC	10	42	410	426
BKL10-T4406NC	BKL10-T4406PC	10	44	430	446
BKL10-T4606NC	BKL10-T4606PC	10	46	450	466
BKL10-T4806NC	BKL10-T4806PC	10	48	470	486

BKL20

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BKL20-T0806NC	BKL20-T0806PC	20	08	140	166
BKL20-T1006NC	BKL20-T1006PC	20	10	180	206
BKL20-T1206NC	BKL20-T1206PC	20	12	220	246
BKL20-T1406NC	BKL20-T1406PC	20	14	260	286
BKL20-T1606NC	BKL20-T1606PC	20	16	300	326
BKL20-T1806NC	BKL20-T1806PC	20	18	340	366
BKL20-T2006NC	BKL20-T2006PC	20	20	380	406
BKL20-T2206NC	BKL20-T2206PC	20	22	420	446
BKL20-T2406NC	BKL20-T2406PC	20	24	460	486
BKL20-T2606NC	BKL20-T2606PC	20	26	500	526
BKL20-T2806NC	BKL20-T2806PC	20	28	540	566
BKL20-T3006NC	BKL20-T3006PC	20	30	580	606
BKL20-T3206NC	BKL20-T3206PC	20	32	620	646
BKL20-T3406NC	BKL20-T3406PC	20	34	660	686
BKL20-T3606NC	BKL20-T3606PC	20	36	700	726
BKL20-T3806NC	BKL20-T3806PC	20	38	740	766
BKL20-T4006NC	BKL20-T4006PC	20	40	780	806
BKL20-T4206NC	BKL20-T4206PC	20	42	820	846
BKL20-T4406NC	BKL20-T4406PC	20	44	860	886
BKL20-T4606NC	BKL20-T4606PC	20	46	900	926
BKL20-T4806NC	BKL20-T4806PC	20	48	940	966

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Light curtains

Standard type
Top-emitting type
Side-emitting type
Waterproof type
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Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

BKL Series

BKL40

Model		Beam pitch	No. Beams	Detection Height	Light Curtain Height
BKL40-T0406NC	BKL40-T0406PC	40	04	120	166
BKL40-T0606NC	BKL40-T0606PC	40	06	200	246
BKL40-T0806NC	BKL40-T0806PC	40	08	280	326
BKL40-T1006NC	BKL40-T1006PC	40	10	360	406
BKL40-T1206NC	BKL40-T1206PC	40	12	440	486
BKL40-T1406NC	BKL40-T1406PC	40	14	520	566
BKL40-T1606NC	BKL40-T1606PC	40	16	600	646
BKL40-T1806NC	BKL40-T1806PC	40	18	680	726
BKL40-T2006NC	BKL40-T2006PC	40	20	760	806
BKL40-T2206NC	BKL40-T2206PC	40	22	840	886
BKL40-T2406NC	BKL40-T2406PC	40	24	920	966
BKL40-T2606NC	BKL40-T2606PC	40	26	1000	1046
BKL40-T2806NC	BKL40-T2806PC	40	28	1080	1126
BKL40-T3006NC	BKL40-T3006PC	40	30	1160	1206
BKL40-T3206NC	BKL40-T3206PC	40	32	1240	1286
BKL40-T3406NC	BKL40-T3406PC	40	34	1320	1366
BKL40-T3606NC	BKL40-T3606PC	40	36	1400	1446
BKL40-T3806NC	BKL40-T3806PC	40	38	1480	1526
BKL40-T4006NC	BKL40-T4006PC	40	40	1560	1606
BKL40-T4206NC	BKL40-T4206PC	40	42	1640	1686
BKL40-T4406NC	BKL40-T4406PC	40	44	1720	1766
BKL40-T4606NC	BKL40-T4606PC	40	46	1800	1846
BKL40-T4806NC	BKL40-T4806PC	40	48	1880	1926

Area

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Safety Light Curtain

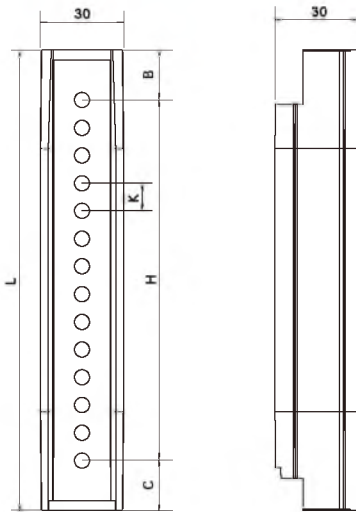
Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR



B: Upper blind
C: Lower blind
K: Beam pitch
H: Protection Height
N: No. of beams
L: Light curtain total height

$$B = 1/2K + 3\text{mm}$$

$$C = 1/2K + 3\text{mm}$$

$$H = (N - 1) * K$$

$$L = H + B + C$$

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Safety Light Curtain

Safety Light Curtain

LIDAR scanner

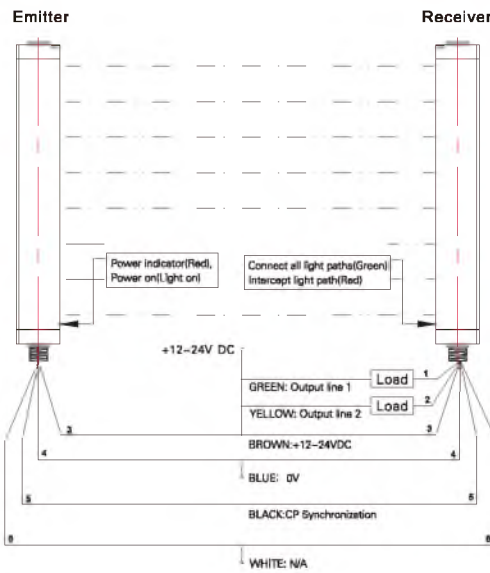
TOF LIDAR scanner

MINI LIDAR scanner

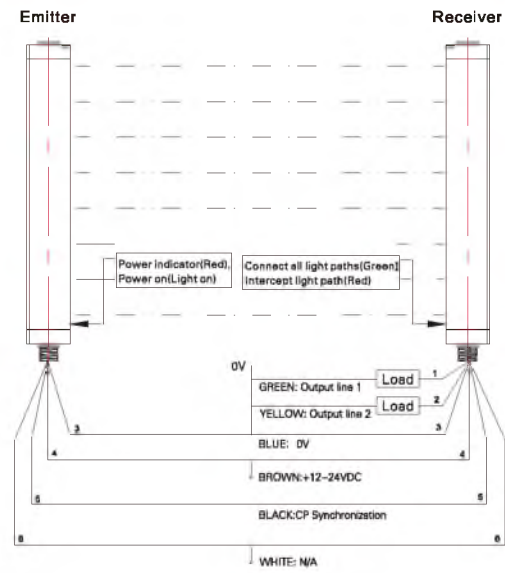
Navigation LIDAR

Connection Diagram

NPN



PNP





Basic Features	Working principle	Photoelectric Sensor
	Housing	Array
	Optical working principle	Thru-beam
	Safety class	Type 4 Cat.4 PLe
	Standard	GB 4584、GB/T 19436.1 (Type 4)、GB/T 19436.2 (Type 4)、IEC 61496-1 (Type 4)、IEC 61496-2 (Type 4)
	Light source	Infrared light,940nm (modulation)
	Number of beams	4~72 beams
	Beam pitch	10/20/40mm
	Protection height	120~2840mm
	Protection distance	0~6m/0~12m/8~20m
	Mini. detectable object	φ18/φ28/φ38/φ48mm or more opaque object
Electrical data	Output Mode	PNP (two groups)
	Synchronization type	Line synchronization
	Response time	≤20ms
	Operating voltage	24VDC±10%
	Current consumption	Emitter: ≤300mA, Receiving: ≤100mA
	Power consumption	3~10W
	Residual Voltage	≤3.5V(300mA)
	Load Current	≤300mA
	Insulation resistance	≥100MΩ between power terminal and case (500VDC)
	Dielectric strength	1000VAC (50/60Hz), 1 minute between power terminal and case
	Protection circuit	Reverse polarity protection/short circuit protection
Environmental conditions	Operating temperature	-10~55℃(No freezing)
	Storage temperature	-40~70℃(No freezing)
	Operating humidity	35~85%RH(No condensation)
	Storage humidity	35~95%RH(No condensation)
	Ambient Illumination	Incandescent Lamp≤3000Lux;LED≤3000Lux;Sunlight≤10000Lux
	Vibration resistance	10~55Hz, dual amplitude 1.5mm, 2 hours for each X/Y/Z axis
	Protection class	IP65
Mechanical data	Connection type	Cable
	Dimensions	239~2959x35x52mm
	Material	-
	Weight	1.2~14.8kg
	Accessories	Mounting bracket, mounting screws, M18/7-pin plug cablex2

Product Description

The safety light curtain integrates the controller and is a photoelectric protection device for risk-assessed equipment that does not require a controller and needs to be controlled by a level signal (e.g. equipment controlled by a PLC, computer), with two safe PNP output signals. It meets the requirements of safety class four. SAF series light curtains can effectively detect any opaque objects that enter the light curtain area beyond the detection accuracy. It is suitable for the safety protection of mechanical presses, hydraulic presses, shearing machines, bending machines, and other hazardous occasions. It can be used for detection and anti-theft.

Product features

- Perfect self-test function, realizing full self-test including output signal;
- Floating shielding function can be realized, which is convenient to realize the processing of long materials;
- Provide two relay passive contact outputs, higher safety performance
- High detection accuracy, up to 18mm, can protect fingers;
- Long detection distance, up to 40m.
- Long detection height, up to 2840mm.
- Wide range of product specifications
- Split indication function can be provided to visualize the state of the beam on and off;
- Good vibration damping performance, suitable for high-speed punch, large tonnage presses, long service life;
- Strong resistance to light interference and electromagnetic interference; more stable work;
- configuring the safety relay module, it can provide two forms of 3 normally open and 1 normally closed outputs and 2 normally open and 1 normally closed outputs.

SAF10

Beam pitch	10mm						
Mini. detectable object	φ18 or more opaque object						
Protection distance	03: 0~3m; 12: 0~12m; 20: 8~20m;						
Number of beams	16 beams	20 beams	24 beams	28 beams	32 beams	... ..	72 beams
Protection height	150mm	190mm	230mm	270mm	310mm	... ..	710mm
Length of light curtain	239mm	279mm	319mm	359mm	399mm	... ..	799mm
Model	PNP NC	SAF10-T16 ⁰³ PC	SAF10-T20 ⁰³ PC	SAF10-T24 ⁰³ PC	SAF10-T28 ⁰³ PC	SAF10-T32 ⁰³ PC	 SAF10-T72 ⁰³ PC
	Other	⁰³ : 0~3m	¹² : 0~12m	²⁰ : 8~20m			

SAF20

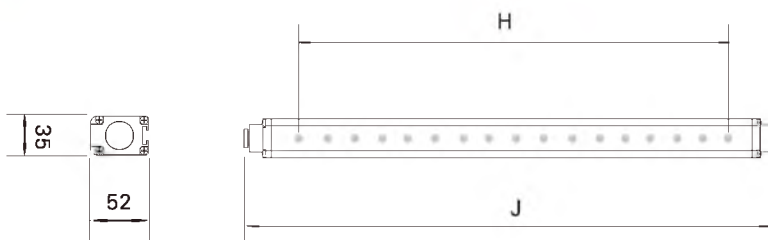
Beam pitch	20mm						
Mini. detectable object	φ28 or more opaque object						
Protection distance	03: 0~3m; 12: 0~12m; 20: 8~20m;						
Number of beams	8 beams	10 beams	12 beams	14 beams	16 beams	... ..	72 beams
Protection height	140mm	180mm	220mm	260mm	300mm	... ..	1420mm
Length of light curtain	239mm	279mm	319mm	359mm	399mm	... ..	1519mm
Model	PNP NC	SAF20-T08 ⁰³ PC	SAF20-T10 ⁰³ PC	SAF20-T12 ⁰³ PC	SAF20-T14 ⁰³ PC	SAF20-T16 ⁰³ PC	 SAF20-T72 ⁰³ PC
	Other	⁰³ : 0~3m	¹² : 0~12m	²⁰ : 8~20m			

SAF40

Beam pitch	40mm						
Mini. detectable object	φ48 or more opaque object						
Protection distance	03: 0~3m; 12: 0~12m; 20: 8~20m;						
Number of beams	4 beams	6 beams	8 beams	10 beams	12 beams	... ..	72 beams
Protection height	120mm	200mm	280mm	360mm	440mm	... ..	2840mm
Length of light curtain	239mm	319mm	399mm	479mm	559mm	... ..	2959mm
Model	PNP NC	SAF40-T04 ⁰³ PC	SAF40-T06 ⁰³ PC	SAF40-T08 ⁰³ PC	SAF40-T10 ⁰³ PC	SAF40-T12 ⁰³ PC	 SAF40-T72 ⁰³ PC
	Other	⁰³ : 0~3m	¹² : 0~12m	²⁰ : 8~20m			

Unit:mm

Dimensions



H: Protection height
J: Length of light emitter and light receiver

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
AI Image
Code Readers
Vibration
Temperature
RFID
Safety doorlock
Pressure Switch
Communication
Accessories

Guidance

Light curtains

Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner
Mini LIDAR scanner
Navigation LIDAR

Safety Light Curtain

SAF Series

SAF10

Model			Beam pitch	No. Beams	Detection Height	Light Curtain Height
SAF10-T1603PC	SAF10-T1612PC	SAF10-T1620PC	10	16	150	500
SAF10-T2003PC	SAF10-T2012PC	SAF10-T2020PC	10	20	190	500
SAF10-T2403PC	SAF10-T2412PC	SAF10-T2420PC	10	24	230	500
SAF10-T2803PC	SAF10-T2812PC	SAF10-T2820PC	10	28	270	750
SAF10-T3203PC	SAF10-T3212PC	SAF10-T3220PC	10	32	310	750
SAF10-T3603PC	SAF10-T3612PC	SAF10-T3620PC	10	36	350	750
SAF10-T4003PC	SAF10-T4012PC	SAF10-T4020PC	10	40	390	750
SAF10-T4403PC	SAF10-T4412PC	SAF10-T4420PC	10	44	430	750
SAF10-T4803PC	SAF10-T4812PC	SAF10-T4820PC	10	48	470	1000
SAF10-T5203PC	SAF10-T5212PC	SAF10-T5220PC	10	52	510	1000
SAF10-T5603PC	SAF10-T5612PC	SAF10-T5620PC	10	56	550	1000
SAF10-T6003PC	SAF10-T6012PC	SAF10-T6020PC	10	60	590	1000
SAF10-T6403PC	SAF10-T6412PC	SAF10-T6420PC	10	64	630	1000
SAF10-T6803PC	SAF10-T6812PC	SAF10-T6820PC	10	68	670	1000
SAF10-T7203PC	SAF10-T7212PC	SAF10-T7220PC	10	72	710	1000

SAF20

Model			Beam pitch	No. Beams	Detection Height	Light Curtain Height
SAF20-T0803PC	SAF20-T0812PC	SAF20-T0820PC	20	08	140	500
SAF20-T1003PC	SAF20-T1012PC	SAF20-T1020PC	20	10	180	500
SAF20-T1203PC	SAF20-T1212PC	SAF20-T1220PC	20	12	220	500
SAF20-T1403PC	SAF20-T1412PC	SAF20-T1420PC	20	14	260	750
SAF20-T1603PC	SAF20-T1612PC	SAF20-T1620PC	20	16	300	750
SAF20-T1803PC	SAF20-T1812PC	SAF20-T1820PC	20	18	340	750
SAF20-T2003PC	SAF20-T2012PC	SAF20-T2020PC	20	20	380	750
SAF20-T2203PC	SAF20-T2212PC	SAF20-T2220PC	20	22	420	750
SAF20-T2403PC	SAF20-T2412PC	SAF20-T2420PC	20	24	460	1000
SAF20-T2603PC	SAF20-T2612PC	SAF20-T2620PC	20	26	500	1000
SAF20-T2803PC	SAF20-T2812PC	SAF20-T2820PC	20	28	540	1000
SAF20-T3003PC	SAF20-T3012PC	SAF20-T3020PC	20	30	580	1000
SAF20-T3203PC	SAF20-T3212PC	SAF20-T3220PC	20	32	620	1000
SAF20-T3403PC	SAF20-T3412PC	SAF20-T3420PC	20	34	660	1000
SAF20-T3603PC	SAF20-T3612PC	SAF20-T3620PC	20	36	700	1000
SAF20-T3803PC	SAF20-T3812PC	SAF20-T3820PC	20	38	740	1200
SAF20-T4003PC	SAF20-T4012PC	SAF20-T4020PC	20	40	780	1200
SAF20-T4203PC	SAF20-T4212PC	SAF20-T4220PC	20	42	820	1200
SAF20-T4403PC	SAF20-T4412PC	SAF20-T4420PC	20	44	860	1200
SAF20-T4603PC	SAF20-T4612PC	SAF20-T4620PC	20	46	900	1200
SAF20-T4803PC	SAF20-T4812PC	SAF20-T4820PC	20	48	940	1500
SAF20-T5003PC	SAF20-T5012PC	SAF20-T5020PC	20	50	980	1500
SAF20-T5203PC	SAF20-T5212PC	SAF20-T5220PC	20	52	1020	1500
SAF20-T5403PC	SAF20-T5412PC	SAF20-T5420PC	20	54	1060	1500
SAF20-T5603PC	SAF20-T5612PC	SAF20-T5620PC	20	56	1100	1500
SAF20-T5803PC	SAF20-T5812PC	SAF20-T5820PC	20	58	1140	1500
SAF20-T6003PC	SAF20-T6012PC	SAF20-T6020PC	20	60	1180	1500
SAF20-T6203PC	SAF20-T6212PC	SAF20-T6220PC	20	62	1220	1750
SAF20-T6403PC	SAF20-T6412PC	SAF20-T6420PC	20	64	1260	1750
SAF20-T6603PC	SAF20-T6612PC	SAF20-T6620PC	20	66	1300	1750
SAF20-T6803PC	SAF20-T6812PC	SAF20-T6820PC	20	68	1340	1750
SAF20-T7003PC	SAF20-T7012PC	SAF20-T7020PC	20	70	1380	1750
SAF20-T7203PC	SAF20-T7212PC	SAF20-T7220PC	20	72	1420	1750

Area

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety door lock

Pressure Switch

Communication

Accessories

Guidance

Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOP LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

SAF40

Model			Beam pitch	No. Beams	Detection Height	Light Curtain Height
SAF40-T0403PC	SAF40-T0412PC	SAF40-T0420PC	40	04	120	239
SAF40-T0603PC	SAF40-T0612PC	SAF40-T0620PC	40	06	200	319
SAF40-T0803PC	SAF40-T0812PC	SAF40-T0820PC	40	08	280	399
SAF40-T1003PC	SAF40-T1012PC	SAF40-T1020PC	40	10	360	479
SAF40-T1203PC	SAF40-T1212PC	SAF40-T1220PC	40	12	440	559
SAF40-T1403PC	SAF40-T1412PC	SAF40-T1420PC	40	14	520	639
SAF40-T1603PC	SAF40-T1612PC	SAF40-T1620PC	40	16	600	719
SAF40-T1803PC	SAF40-T1812PC	SAF40-T1820PC	40	18	680	799
SAF40-T2003PC	SAF40-T2012PC	SAF40-T2020PC	40	20	760	879
SAF40-T2203PC	SAF40-T2212PC	SAF40-T2220PC	40	22	840	959
SAF40-T2403PC	SAF40-T2412PC	SAF40-T2420PC	40	24	920	1039
SAF40-T2603PC	SAF40-T2612PC	SAF40-T2620PC	40	26	1000	1119
SAF40-T2803PC	SAF40-T2812PC	SAF40-T2820PC	40	28	1080	1199
SAF40-T3003PC	SAF40-T3012PC	SAF40-T3020PC	40	30	1160	1279
SAF40-T3203PC	SAF40-T3212PC	SAF40-T3220PC	40	32	1240	1359
SAF40-T3403PC	SAF40-T3412PC	SAF40-T3420PC	40	34	1320	1439
SAF40-T3603PC	SAF40-T3612PC	SAF40-T3620PC	40	36	1400	1519
SAF40-T3803PC	SAF40-T3812PC	SAF40-T3820PC	40	38	1480	1599
SAF40-T4003PC	SAF40-T4012PC	SAF40-T4020PC	40	40	1560	1679
SAF40-T4203PC	SAF40-T4212PC	SAF40-T4220PC	40	42	1640	1759
SAF40-T4403PC	SAF40-T4412PC	SAF40-T4420PC	40	44	1720	1839
SAF40-T4603PC	SAF40-T4612PC	SAF40-T4620PC	40	46	1800	1919
SAF40-T4803PC	SAF40-T4812PC	SAF40-T4820PC	40	48	1880	1999
SAF40-T5003PC	SAF40-T5012PC	SAF40-T5020PC	40	50	1960	2079
SAF40-T5203PC	SAF40-T5212PC	SAF40-T5220PC	40	52	2040	2159
SAF40-T5403PC	SAF40-T5412PC	SAF40-T5420PC	40	54	2120	2239
SAF40-T5603PC	SAF40-T5612PC	SAF40-T5620PC	40	56	2200	2319
SAF40-T5803PC	SAF40-T5812PC	SAF40-T5820PC	40	58	2280	2399
SAF40-T6003PC	SAF40-T6012PC	SAF40-T6020PC	40	60	2360	2479
SAF40-T6203PC	SAF40-T6212PC	SAF40-T6220PC	40	62	2440	2559
SAF40-T6403PC	SAF40-T6412PC	SAF40-T6420PC	40	64	2520	2639
SAF40-T6603PC	SAF40-T6612PC	SAF40-T6620PC	40	66	2600	2719
SAF40-T6803PC	SAF40-T6812PC	SAF40-T6820PC	40	68	2680	2799
SAF40-T7003PC	SAF40-T7012PC	SAF40-T7020PC	40	70	2760	2879
SAF40-T7203PC	SAF40-T7212PC	SAF40-T7220PC	40	72	2840	2959

Area

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

Guidance

Light curtains

- Standard type
- Top-emitting type
- Side-emitting type
- Waterproof type
- Measuring type
- Economical type

Safety Light Curtain

- Safety Light Curtain

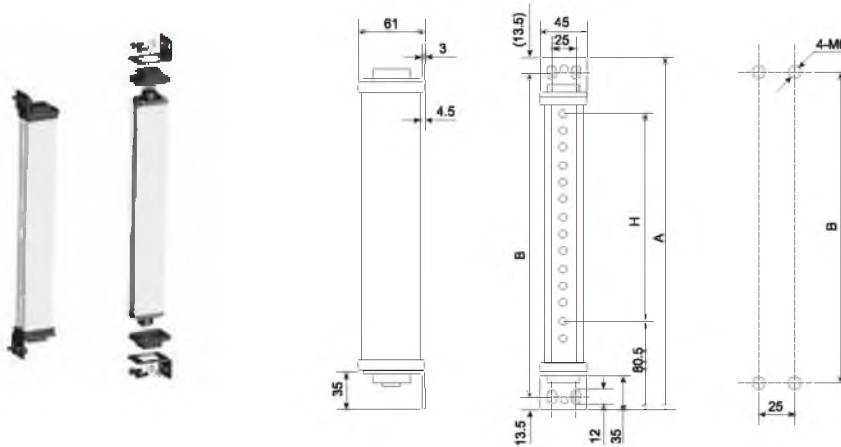
LIDAR scanner

- TOF LIDAR scanner
- MINI LIDAR scanner
- Navigation LIDAR

Safety Light Curtain

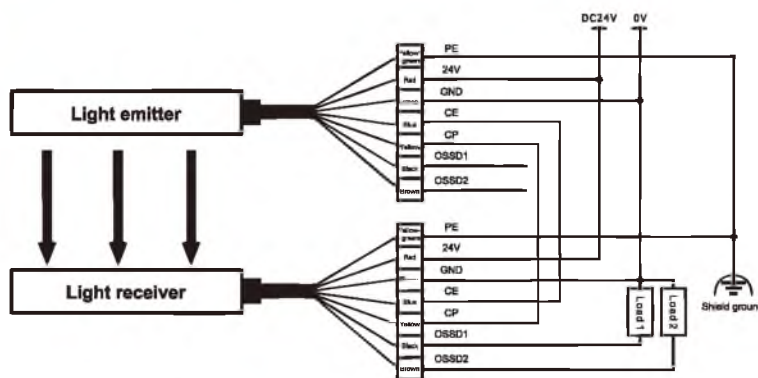
Installation Method

Front and side integrated installation method (ZC)

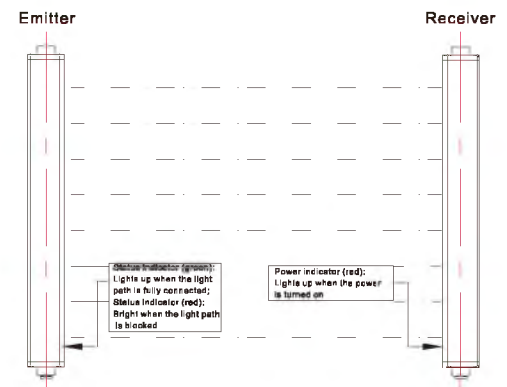


A	Optical axis spacing 10mm	H+131
	Optical axis spacing 20mm	H+141
	Optical axis spacing 30mm	H+131
	Optical axis spacing 40mm	H+161
B	Optical axis spacing 10mm	H+104
	Optical axis spacing 20mm	H+114
	Optical axis spacing 30mm	H+104
	Optical axis spacing 40mm	H+134
H	Protection height	

Connection diagram



Note: The control signal lines OSSD1 and OSSD2 at the light emitter end are floating.



Area

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

Code Readers

Vibration

Temperature

RFID

Safety door lock

Pressure Switch

Communication

Accessories

Guidance

Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Safety Light Curtain

LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

Accessories



Switching Test Box

- Short circuit protection, sleeping mode, silent mode
- 2500mAh battery capacity with mobile power function

P.N-02



Analog Test Box

- Analog current, voltage and switching modes selectable
- Measurement accuracy up to 0.4%
- 4000mAh high-capacity battery, long battery life, can be used as a rechargeable battery

P.N-03



Connecting Cable

- The fastened mechanical connection guarantees the product's seismic performance
- Part of the products support IO-Link/Ethercat/Profibus standard
- Can be customized to anti-slag, oil-proof, IP69K, with LED lights, shielding etc.

P.N-05



NPN-PNP Signal Conversion Cable

- Small size, easy wiring
- NPN to PNP, PNP to NPN are available
- Support NO and NC output

P.N-12

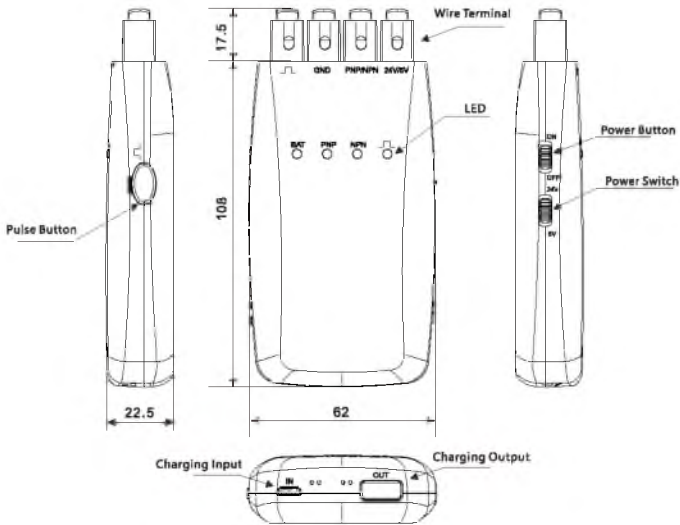


Appearance		
Detection type	NPN/PNP	Auto recognition
Output voltage	4.8~5.2V	5V Output
	19.0~24.0V	24V Output
Output current	≤0.4A	5V Output
	≤0.15A	24V Output
Battery capacity	2500mAh	
Theoretical working time	10h	24V Output 15mA
Charging time	6h	
Output voltage for charging external device	4.8~5.2V	Portable Power Bank
Operating temperature	-10℃~+45℃	
Weight	145g	
Size	125*62*23mm	
Other functions	Mute Mode, Sleep Mode, Output Short-circuit Protection	
Model No.	WT-2	

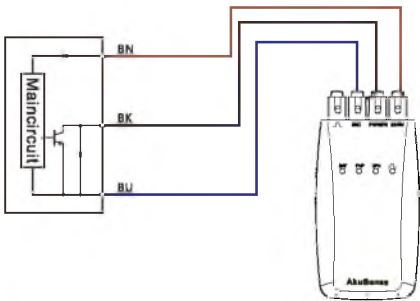
Dimensions

Circuit diagram

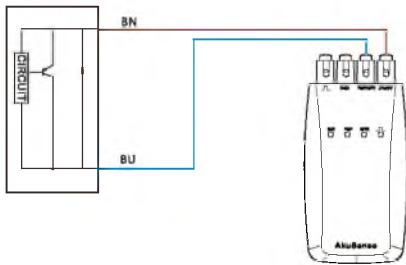
Unit: mm



3-wire:



2-wire:



Accessories



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Sensor tester kit
- Switch Type
- Sensor tester kit

- Connecting Cable
- M8
- M12
- Other

- Signal conversion Cable
- Signal conversion Cable

Analog Type

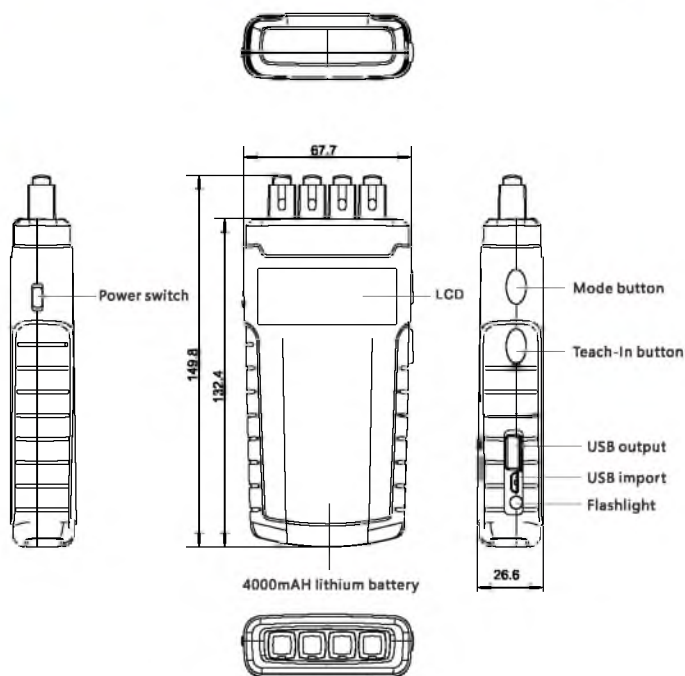


Appearance

Detection type	NPN/PNP	Auto recognition
Measuring range	0~10V 0~20mA	Voltage mode Current mode
Measurement accuracy	$\leq 0.04V$ (Full range) $\leq 0.04mA$ (Full range)	Voltage mode Current mode
Scan cycle	22ms 140ms 140ms	Digital mode Current mode Voltage mode
Output voltage	19V~24V 4.8V~5V	Brown Terminal Output USB Output
Output current	$\leq 160mA$ $\leq 500mA$	Brown Terminal Output USB Output
ADC accuracy	15-bit	
Battery capacity	4000mAh	
Charging time	9h	
Other functions	Power over current protection, sleep function, mute function, flashlight	
Working temperature	$-10^{\circ}C \sim +45^{\circ}C$	
Weight	200g	
Model No.	WD-1	

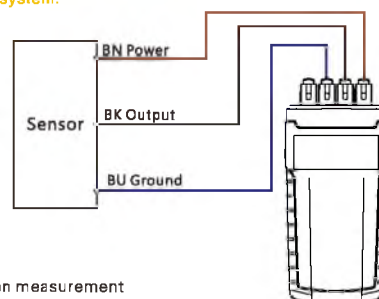
Dimensions

Unit: mm



Circuit diagram

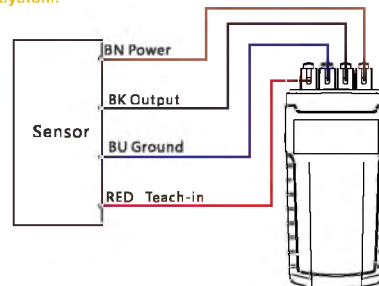
3-wire system:



Common measurement

- 1 Connect the terminals of the corresponding functions and turn on the power.
2. Select the corresponding measurement mode (voltage, current, digital).
3. The measurement results are displayed on the screen.

4-wire system:



Teach-in button

- 1 Connect the corresponding function terminals and turn on the power
- 2 Press the Teach-in button, the screen Teach-in area displays ON, then the red terminal will output high level, release the Teach-in button, the screen Teach-in area displays OFF, then the red terminal will output low level
- 3 Select the corresponding measurement mode (voltage V, current I, switch D)
- 4 The measurement result is displayed on the screen

1.Mode switching

Press the MODE button shortly to switch the test box in three modes: current (I), voltage (V), and switch (D). Customer can select the correct mode and connection according to the sensor type, the test result will be displayed on the screen, and the test box will store the current test mode, and will restore the previous state when it is restarted.

2.Battery

Battery status will be displayed on the upper right corner. The number of grids represents the remaining power. Grids flashing indicates that the power is insufficient and needs to be charged. The flashing during charging indicates the charging progress, when the charging is done, the whole grids will flash.

3.Sleeping mode

If the test box does not operate for more than 10 minutes, the test box automatically enters the sleeping state, the 24V power supply and the screen will be turned off, press the Mode button or the Teach-IN button, and the test box returns to the operable state.

4.Powerbank mode

Press the mode button in the off state, turn on the power button, the buzzer will sound twice, the sleep of the test box function will be invalid, the function has no memory, and the sleep function is enabled by default when it is turned on again.

5.Mute mode

Press and hold Teach-in for more than 6s, the buzzer will sound once, and the test box has entered silent mode. In the same operation, the buzzer will sound twice to indicate that the mute mode has been excited, and the test box will store the state, and will remain in the last state when it is turned on again.

6. Teach-in function

Press the teach button, the Teach-in (red) terminal will output a high level voltage, and the voltage logic will match the brown terminal voltage. When the button is released, the Teach-in (red) terminal will output a low level voltage, and the LCD will display the current Teach-in logic state.

7.Flashlight function

Press and hold the mode button for more than 2s, the light will be on, and the same operation can turn off the light.

8.Short circuit protection

When the output current is too high, short circuit protection will be inspired, and the screen will display 'SCP' during short circuit protection. After the short circuit condition is withdrawn, the test box will automatically return to normal state.

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Sensor tester kit
Switch Type
Sensor tester kit

Connecting Cable
M8
M12
Other

Signal conversion Cable
Signal conversion Cable

M8 Cables



Type

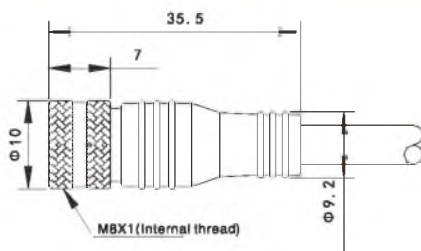
Female, straight	3 Pin		4 Pin	
	2m cable	5m cable	2m cable	5m cable
PVC	CA08-S3F2C	CA08-S3F5C	CA08-S4F2C	CA08-S4F5C
PUR	CA08-S3F2R	CA08-S3F5R	CA08-S4F2R	CA08-S4F5R

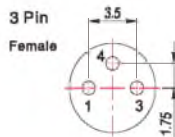
Specifications

Type	M8 straight cable
Coding type	A coding
Rated voltage	60V(3Pin)/30V(4Pin)
Rated current	3A
Pin Material	Gold-plated phosphor copper
Coupling screw	Nickel plated brass

Insulation resistance	$\geq 100M\Omega$
Cable Material	PVC/PUR
Cable length	Standard 2 or 5 m, customizable
Cores	0.25mm ²
Degree of protection	IP67/68
Operating temperature	-25~+ 85℃

Dimensions(Unit:mm)





4 Pin
Female



Type

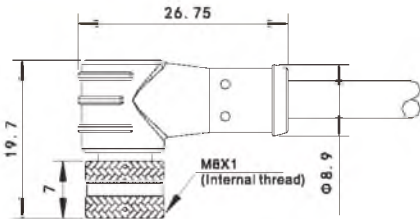
Type	3 Pin		4 Pin	
	2m cable	5m cable	2m cable	5m cable
Female , Right angle	CA08-R3F2C	CA08-R3F5C	CA08-R4F2C	CA08-R4F5C
PVC	CA08-R3F2R	CA08-R3F5R	CA08-R4F2R	CA08-R4F5R

Specifications

Type	M8 Right angle Cable
Coding type	A coding
Rated voltage	60V(3Pin)/30V(4Pin)
Rated current	3A
Pin Material	Gold-plated phosphor copper
Coupling screw	Nickel plated brass

Insulation resistance	≥100MΩ
Cable Material	PVC/PUR
Cable length	Standard 2 or 5 m , customizable
Cores	0.25mm ²
Degree of protection	IP67/68
Operating temperature	-25~+ 85℃

Dimensions(Unit:mm)



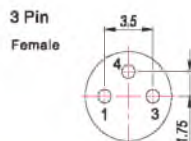
- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

- Guidance
- Sensor tester kit
- Switch Type
- Sensor tester kit

- Connecting Cable
- Isis
- M12
- Other

- Signal conversion Cable
- Signal conversion Cable

M8 Cables



Type

Type	3 Pin		4 Pin	
	Female , Right angle, LED, PNP			
PVC		2m cable CA08-R3F2C-LP	2m cable CA08-R4F2C-LP	5m cable CA08-R4F5C-LP
PUR		5m cable CA08-R3F5R-LP	5m cable CA08-R4F5R-LP	

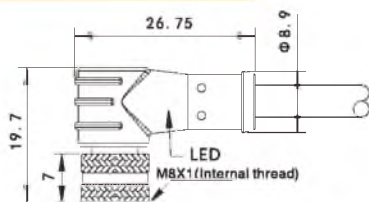
Specifications

Type	Cable with LED
Coding type	A coding
Rated voltage	60V(3Pin)/30V(4Pin)
Rated current	3A
Pin Material	Gold-plated phosphor copper
Coupling screw	Nickel plated brass

Insulation resistance	≥100MΩ
Cable Material	PVC/PUR
Cable length	Standard 2 or 5 m, customizable
Cores	0.25mm ²
Degree of protection	IP67/68
Operating temperature	-25 ~ + 85°C

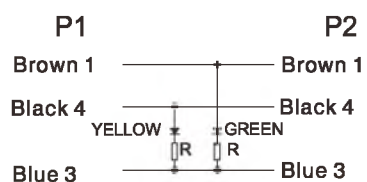
Dimensions(Unit:mm)

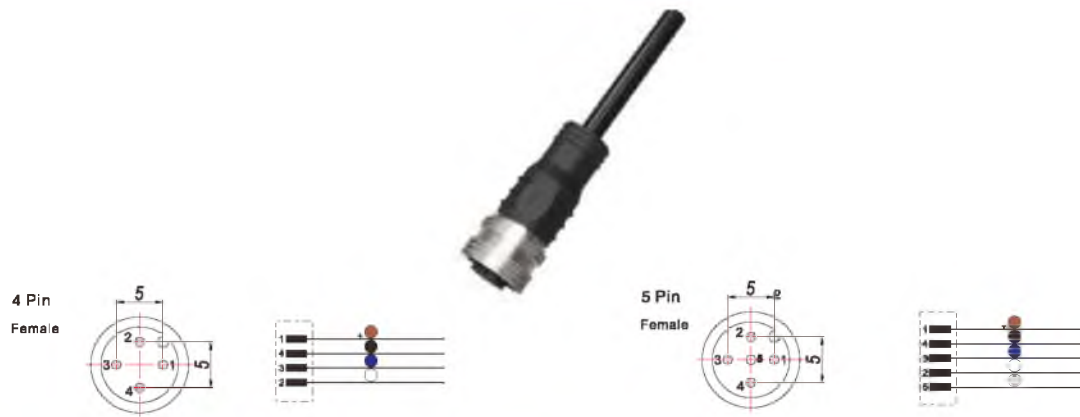
Female , Right angle, LED, PNP



PNP

WIRE LIST





Type

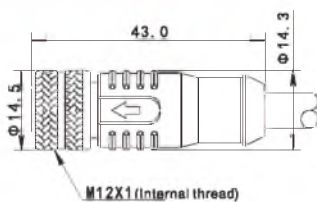
Female, Straight, Shielded	4 Pin		5 Pin	
PVC	2m cable	5m cable	2m cable	5m cable
PUR	CA12-S4F2C-S	CA12-S4F5C-S	CA12-S5F2C-5-S	CA12-S5F5C-5-S
	CA12-S4F2R-S	CA12-S4F5R-S	CA12-S5F2R-5-S	CA12-S5F5R-5-S
Female, Straight	4 Pin		5 Pin	
PVC	2m cable	5m cable	2m cable	5m cable
PUR	CA12-S4F2C	CA12-S4F5C	CA12-S5F2C-5	CA12-S5F5C-5
	CA12-S4F2R	CA12-S4F5R	CA12-S5F2R-5	CA12-S5F5R-5

Specifications

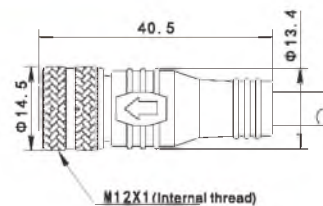
Type	M12 Straight Cable	Insulation resistance	≥100MΩ
Coding type	A coding	Cable Material	PVC/PUR
Rated voltage	250V	Cable length	Standard 2 or 5 m,customizable
Rated current	4A	Cores	0.34mm²
Pin Material	Gold-plated phosphor copper	Degree of protection	IP67/68
Coupling screw	Nickel plated brass	Operating temperature	-25~+85°C

Dimensions(Unit:mm)

M12 Female, Straight, Shielded



M12 Female, Straight



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Sensor tester kit
Switch Type
Sensor tester kit

Connecting Cable
M8
M12
Other

Signal conversion Cable
Signal conversion Cable

M12 Cables



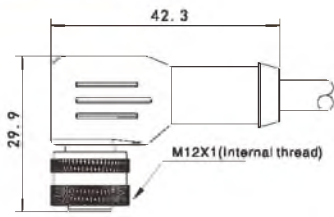
Type	4 Pin		5 Pin	
Female, Right angle	2m cable	5m cable	2m cable	5m cable
PVC	CA12-R4F2C	CA12-R4F5C	CA12-R5F2C-5	CA12-R5F5C-5
PUR	CA12-R4F2R	CA12-R4F5R	CA12-R5F2R-5	CA12-R5F5R-5

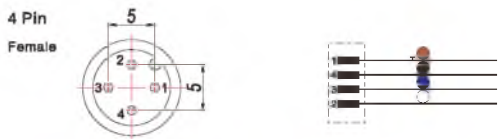
Specifications

Type	M12 Straight, Shielded	Insulation resistance	≥100MΩ
Coding type	A coding	Cable Material	PVC/PUR
Rated voltage	250V	Cable length	Standard 2 or 5 m, customizable
Rated current	4A	Cores	0.34mm²
Pin Material	Gold-plated phosphor copper	Degree of protection	IP67/68
Coupling screw	Nickel plated brass	Operating temperature	-25~+85℃

Dimensions(Unit:mm)

M12 Female, Right angle





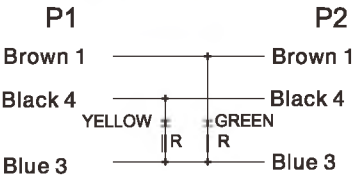
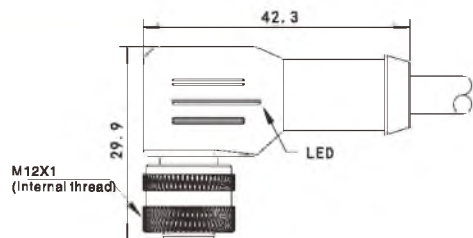
Type	4 Pin
Female, Right angle, LED	
PNP	2m cable CA12-R4F2C-LP
NPN	5m cable CA12-R4F5C-LP

Specifications

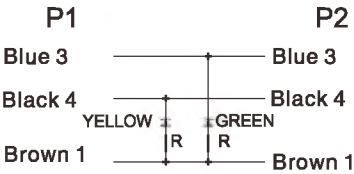
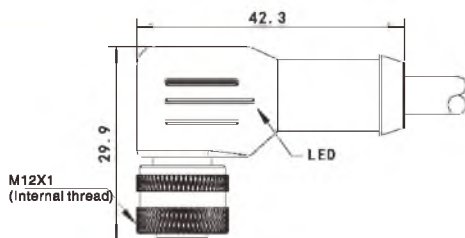
Type	M12 Female, Right angle, LED	Insulation resistance	≥100MQ
Coding type	A coding	Cable Material	PVC/PUR
Rated voltage	250V	Cable length	Standard 2 or 5 m, customizable
Rated current	4A	Cores	0.34mm²
Pin Material	Gold-plated phosphor copper	Degree of protection	IP67/68
Coupling screw	Nickel plated brass	Operating temperature	-25°C~+85°C

Dimensions(Unit:mm)

M12 Female, Right angle, LED, PNP



M12 Female, Right angle, LED, NPN



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

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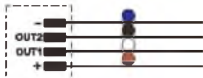
Signal conversion Cable

Signal conversion Cable

Signal conversion Cable

Signal conversion Cable

Other



Type

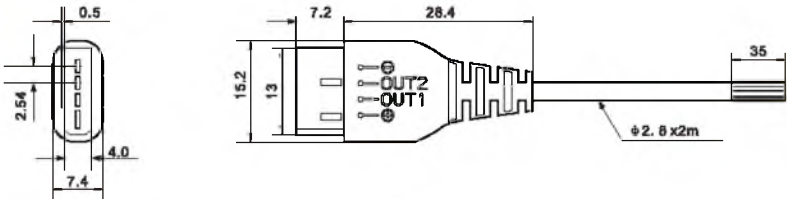
ME-1007

Specifications

Insertion force	<18N
Pull-out force(cover retention)	25N
Cover material	PVC
Contact point	Phosphor bronze

Dimensions(Unit:mm)

ME-1007



Signal Conversion Cable



Type

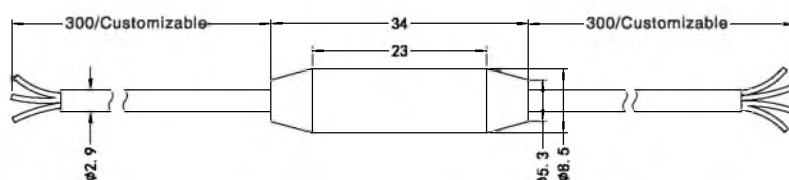
NPN converting to PNP	CTC-N2P
PNP converting to NPN	CTC-P2N

Specifications

Protective circuit	Reverse polarity protection
Operating temperature	-20°C~+60°C
Storage temperature	-40°C~+85°C
Input voltage	8~30V

Load current	≤150mA
Voltage drop	≤1V
Switch output	≤5KHz

Dimensions(Unit:mm)



Wiring diagram



Sensor's output state before converting	Corresponding output state after converting
NO	Black: NO White: NC
NC	Black: NC White: NO

Алматы (727)345-47-04
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 Архангельск (8182)63-90-72
 Астрахань (8512)99-46-04
 Барнаул (3852)73-04-60
 Белгород (4722)40-23-64
 Благовещенск (4162)22-76-07
 Брянск (4832)59-03-52
 Владивосток (423)249-28-31
 Владикавказ (8672)28-90-48
 Владимир (4922)49-43-18
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 Вологда (8172)26-41-59
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 Киров (8332)68-02-04
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 Новосибирск (383)227-86-73
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 Орел (4862)44-53-42
 Оренбург (3532)37-68-04
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 Симферополь (3652)67-13-56
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 Чита (3022)38-34-83
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