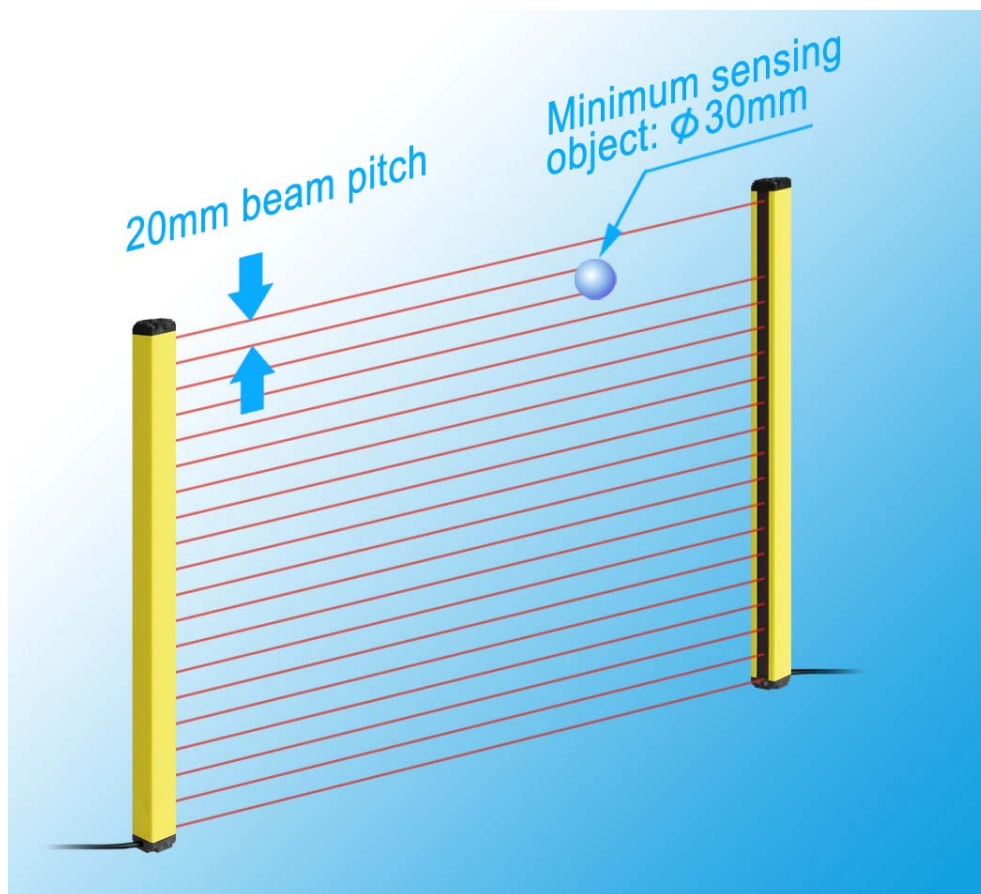


FA SERIES AREA SENSORS

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Note

1. Beam pitch: 20mm
2. Minimum sensing object: ϕ 30mm

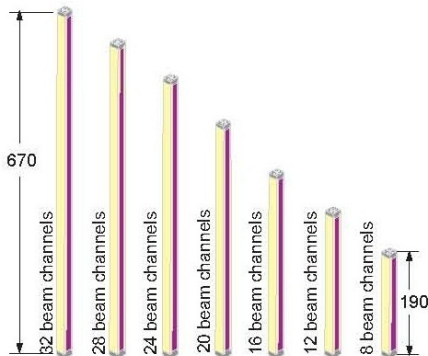


FA SERIES AREA SENSORS

Applications

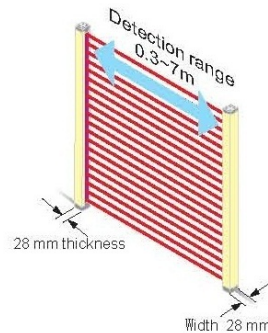
Wide variety

There are eight types of sensors having a sensing height ranging from 190mm (8 beam channels) to 670mm (32 beam channels). The different height between each type is 80mm.



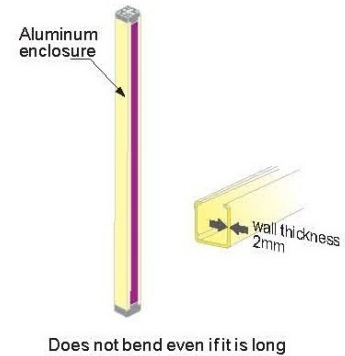
Space-saving design

With its 28 mm width and 28 mm thickness, it is small and requires the least installation space in the industry. It can be installed in small spaces incorporated within equipment.

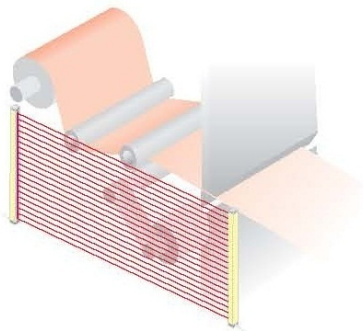


Robust Aluminum Enclosure

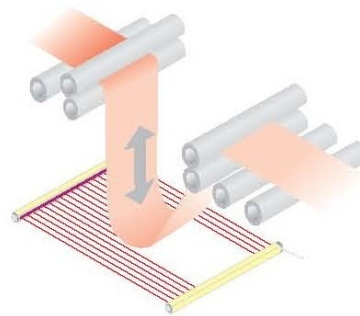
The modules are protected by a robust aluminum enclosure conforming to IP65 protection.



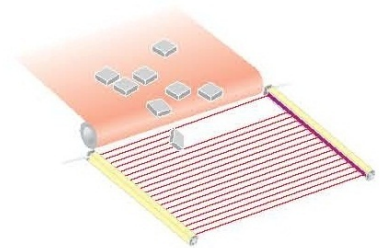
Guard against blade



Detecting a loop



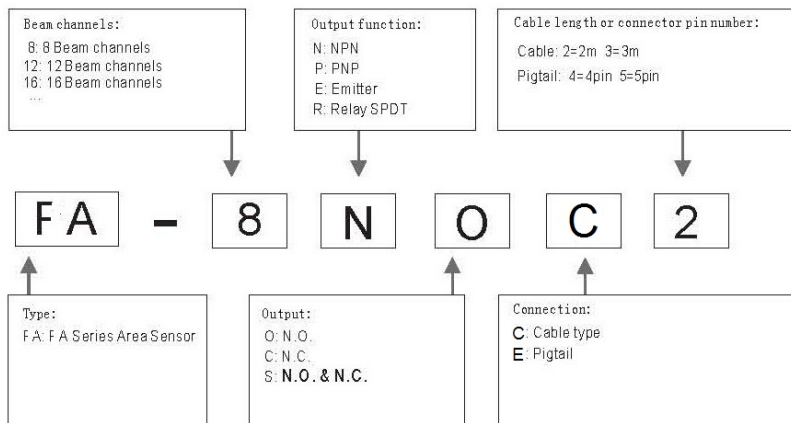
Detecting falling objects whose path is uncertain



WARNING

Never use this product in any personnel safety application. It is a normal object detection sensor

Selection guide



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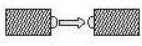
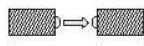
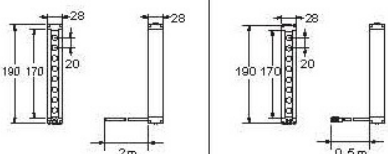
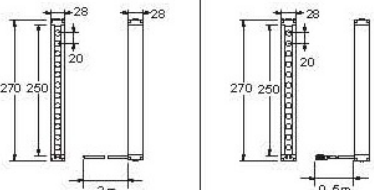
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FA SERIES AREA SENSORS

Type	8 beam channels		12 beam channels	
Sensing mode	Through-beam mode		Through-beam mode	
Picture				
Sensing distance(sn)	0.3 - 7m		0.3 - 7mF	
Picture				
Sensing height	140mm		220mm	
Beam pitch	20mm			
Sensing object	Ø30mm or more opaque object			
Supply voltage	12 to 24V DC 10% Ripple p-p 10% or less			
Current consumption(at DC 24V)	Emitter: 56.7mA, Receiver: 41.1mA		Emitter: 57.2mA, Receiver: 58.2mA	
Output	NPN		NPN open-collector transistor, Max. Load current: 100mA; Voltage Drop: <1.5V	
	PNP		PNP open-collector transistor, Max. load current: 100mA; Voltage Drop: <1.5V	
	Relay		Relay SPDT, 5A/250VAC, 5A/30VDC	
Output operation	ON when all beams are received, OFF when one or more beams are interrupted.			
Short-circuit protection	Incorporated			
Response time for NPN/PNP type	10ms or less			
Indicators	Emitter		Power indicator: green LEDx2(light up when the power is ON; If emitter is off that is indicated by the number of LEDs lighting up) Operation indicator: Red LED(lights up when one or more beams are interrupted), Stable indicator: Green LED(lights up when all beams are stable received)	
	Receiver			
Interference prevention function	Incorporated			
Ambient temperature	-10 to +55 °C, Storage: -10 to +60 °C			
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH			
Ambient illuminance	Sunlight: 10,000lx at the light-receiving face, Incandescent light: 3,000lx at the light-receiving face			
EMC immunity	RFI>10V/m(in 30-1000MHZ), EFT>1KV, ESD>4KV(contact)			
Voltage withstand ability	1,000 V AC for one min. between all supply terminals connected together and enclosure			
Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure			
Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each			
Shock resistance	490m/s², acceleration(50G approx) in X, Y and Z directions for three times each			
Emitting element	Infrared LED			
Material	Enclosure: Aluminum, lens: polyester			
Type	Output connections			
Emitter	Cable Output		Pigtail Output	
	FA-8ESC2		FA-8ESE4	
	FA-8NOC2		FA-8NOE4	
	FA-8NCC2		FA-8NCE4	
	FA-8POC2		FA-8POE4	
	FA-8PCC2		FA-8PCE4	
Receiver	Cable Output		Pigtail Output	
	FA-12ESC2		FA-12ESE4	
	FA-12NOC2		FA-12NOE4	
	FA-12NCC2		FA-12NCE4	
	FA-12POC2		FA-12POE4	
	FA-12PCC2		FA-12PCE4	
Dimensions (unit: mm)				
	Cable or pigtail		Ø5.0 PVC 2m, 4(Ø)x0.5mm²	
	Weigh(approx.)		224g	
			Ø5.0 PVC 0.5m, With Euro Style	
			204g	
			Ø5.0 PVC 2m, 4(Ø)x0.5mm²	
		280g		
		Ø5.0 PVC 0.5m, With Euro Style		
		260g		

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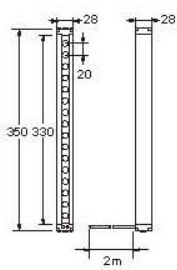
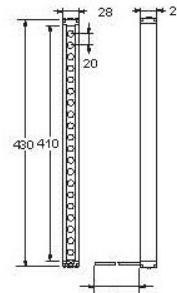
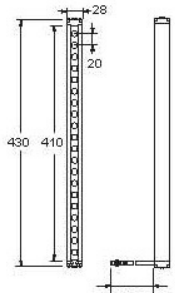
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FA SERIES AREA SENSORS

Type	16 beam channels	20 beam channels
Sensing mode	Through-beam mode	Through-beam mode
Picture		
Sensing distance(sn)	0.3 - 7m	0.3 - 7m
Picture		
Sensing height	300mm	380mm
Beam pitch	20mm	
Sensing object	Ø30mm or more opaque object	
Supply voltage	12 to 24V DC 10% Ripple p-p 10% or less	
Current consumption(at DC 24V)	Emitter: 57.8mA, Receiver: 71.3mA	Emitter: 58.4mA, Receiver: 87.2mA
Output	NPN	NPN open-collector transistor, Max. Load current: 100mA; Voltage Drop: <1.5V
	PNP	PNP open-collector transistor, Max. Load current: 100mA; Voltage Drop: <1.5V
	Relay	Relay SPDT, 5A/250VAC, 5A/30VDC
Output operation	ON when all beams are received, OFF when one or more beams are interrupted.	
Short-circuit ptotecton	Incorporated	
Response time for NPN/PNP type	10ms or less	
Indicators	Emitter	Power indicator: green LEDx2(light up when the power is ON; If emitter is off that is indicated by the number of LEDs lighting up) Operation indicator: Red LED(lights up when one or more beams are interrupted), Stable indicator: Green LED(lights up when all beams are stable received)
	Receiver	
Interference prevention function	Incorporated	
Ambient temperature	-10 to +55 °C, Storage: -10 to +60°C	
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH	
Ambient illuminance	Sunlight: 10,000lx at the light-receiving face, Incandescent light: 3,000lx at the light-receiving face	
EMC immunity	RFI>10V/m(in 30-1000MHZ), EFT>1KV, ESD>4KV(contact)	
Voltage withstand ability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure	
Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each	
Shock resistance	490m/s ² , acceleration(50G approx) in X, Y and Z directions for three times each	
Emitting element	Infrared LED	
Material	Enclosure: Aluminum, lens: polyester	
Type	Output connections	
Emitter	Cable Output	Pigtail Output
Receiver	FA-16ESC2	FA-16ESE4
	FA-16NOC2	FA-16NOE4
	FA-16NCC2	FA-16NCE4
	FA-16POC2	FA-16POE4
	FA-16PCC2	FA-16PCE4
	FA-16RSC2	
Emitter	FA-20ESC2	FA-20ESE4
	FA-20NOC2	FA-20NOE4
	FA-20NCC2	FA-20NCE4
	FA-20POC2	FA-20POE4
	FA-20PCC2	FA-20PCE4
	FA-20RSC2	
Dimensions (unit: mm)		
Cable or pigtail	Ø5.0 PVC 2m, 4(6)x0.5mm ²	Ø5.0 PVC 0.5m, With Euro Style
Weigh(approx.)	337g	317g
		
		Ø5.0 PVC 2m, 4(6)x0.5mm ²
		393g
		Ø5.0 PVC 0.5m, With Euro Style
		373g

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FA SERIES AREA SENSORS

24 beam channels	28 beam channels	32 beam channels			
Through-beam mode	Through-beam mode	Through-beam mode			
0.3 - 7m	0.3 - 7m	0.3 - 7m			
460mm	540mm	620mm			
20mm					
Ø30mm or more opaque object					
12 to 24V DC 10% Ripple p-p 10% or less					
Emitter: 58.9mA, Receiver: 100.2mA	Emitter: 59.4mA, Receiver: 117.3mA	Emitter: 59.9mA, Receiver: 130mA			
NPN open-collector transistor, Max. Load current: 100mA; Voltage Drop: <1.5V					
PNP open-collector transistor, Max. load current: 100mA; Voltage Drop: <1.5V					
Relay SPDT, 5A/250VAC, 5A/30VDC					
ON when all beams are received, OFF when one or more beams are interrupted.					
Incorporated					
10ms or less					
Power indicator: green LEDx2(light up when the power is ON; If emitter is off that is indicated by the number of LEDs lighting up)					
Operation indicator: Red LED(lights up when one or more beams are interrupted), Stable indicator: Green LED(lights up when all beams are stable received)					
Incorporated					
-10 to +55 °C, Storage: -10 to +60°C					
35 to 85 % RH, Storage: 35 to 85 % RH					
Sunlight: 10,000lx at the light-receiving face, Incandescent light: 3,000lx at the light-receiving face					
RFI>10V/m(in 30-1000MHZ), EFT>1KV, ESD>4KV(contact)					
1,000 V AC for one min. between all supply terminals connected together and enclosure					
20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure					
10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each					
490m/s², acceleration(50G approx) in X, Y and Z directions for three times each					
Infrared LED					
Enclosure: Aluminum, lens: polyester					
Cable Output	Pigtail Output	Cable Output	Pigtail Output	Cable Output	Pigtail Output
FA-24ESC2	FA-24ESE4	FA-28ESC2	FA-28ESE4	FA-32ESC2	FA-32ESE4
FA-24NOC2	FA-24NOE4	FA-28NOC2	FA-28NOE4	FA-32NOC2	FA-32NOE4
FA-24NCC2	FA-24NCE4	FA-28NCC2	FA-28NCE4	FA-32NCC2	FA-32NCE4
FA-24POC2	FA-24POE4	FA-28POC2	FA-28POE4	FA-32POC2	FA-32POE4
FA-24PCC2	FA-24PCE4	FA-28PCC2	FA-28PCE4	FA-32PCC2	FA-32PCE4
FA-24RSC2		FA-28RSC2		FA-32RSC2	
Ø5.0 PVC 2m, 4(6)x0.5mm²		Ø5.0 PVC 2m, 4(6)x0.5mm²		Ø5.0 PVC 2m, 4(6)x0.5mm²	
459g		515g		571g	
Ø5.0 PVC 0.5m, With Euro Style		Ø5.0 PVC 0.5m, With Euro Style		Ø5.0 PVC 0.5m, With Euro Style	
439g		495g		551g	

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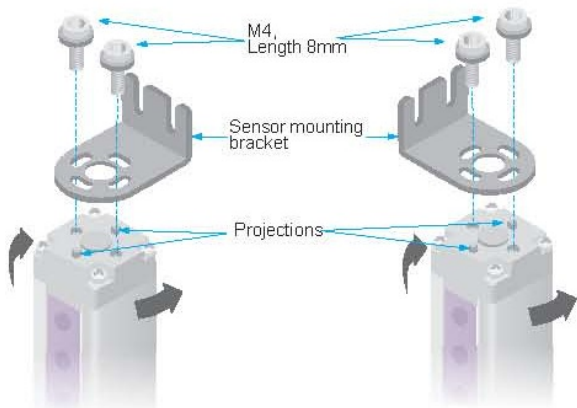
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FA SERIES AREA SENSORS

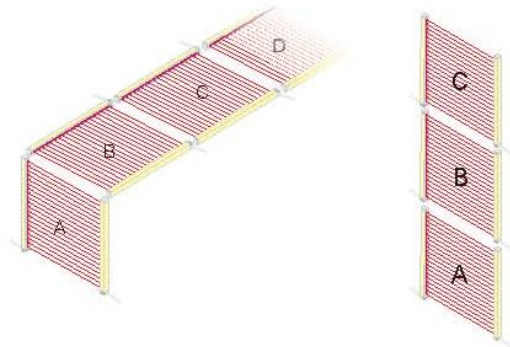
Mounting

Choose the mounting direction for the sensor mounting bracket based on the mounting direction (side or back), and temporarily tighten the brackets with the two hexagon-socket-head bolts for adjusting the mounting angle (M4 length 8mm). Tighten two hexagon-socket-head bolts securely, after beam alignment.



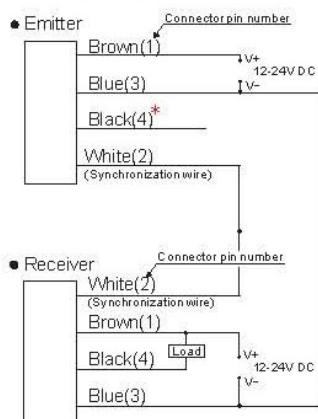
Interference Prevention Function

By synchronous sampling of software and hardware, two or more units of PA can be mounted close together, as shown in the figures below.

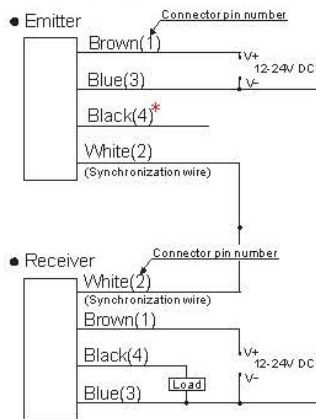


Wiring Diagram

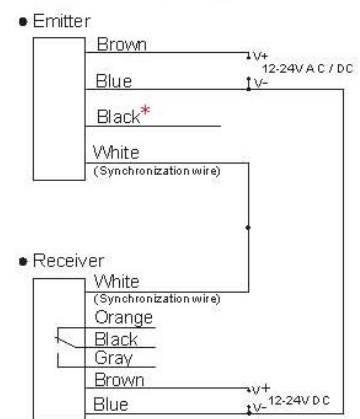
NPN output type



PNP output type



Relay SPDT output type



Pigtail Wiring Diagrams For Dc NPN/PNP Type

Connector face view	Emitter		Receiver	
	1	2	1	2
1	Brown(V+)	White (Synchronization wire)	Brown(V+)	White (Synchronization wire)
2	White (Synchronization wire)	Blue(V-)	White (Synchronization wire)	Blue(V-)
3	Blue(V-)	Black*	Blue(V-)	Black*
4	Black*		output	

* Note: Black wire is connected to V- for emitter off, Black wire is connected to V+ or open for emitter on.

LED indicator:

Emitter ON	Emitter OFF
One LED lights up	Two LEDs light up

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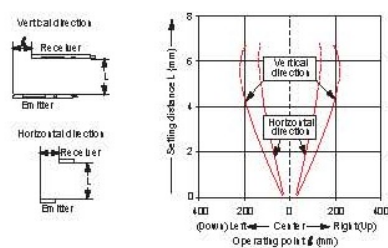
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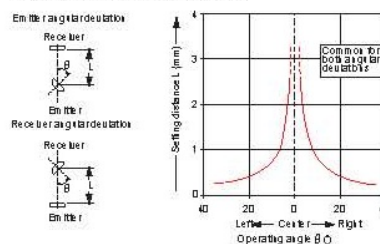
FA SERIES AREA SENSORS

Sensing Characteristics

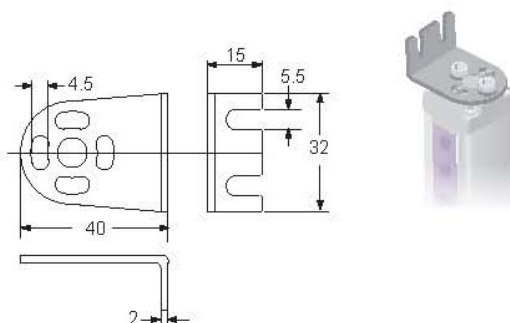
Parallel deviation(all models)



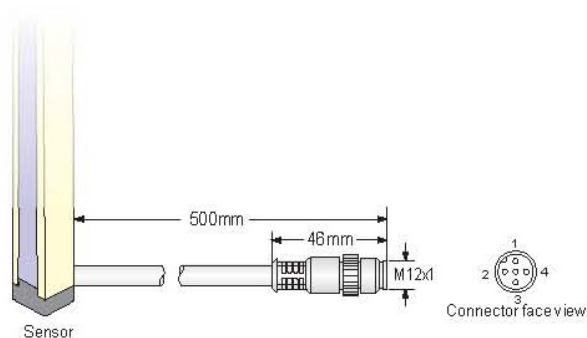
Angular deviation all models



Bracket Dimensions



Diameter for Pigtail Connection



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