

GAD Series Safety light curtains (safety light grid)

Circuits Safety Self-Detection Design

Control devices adopt double return circuit to strengthen output signal reliability; circuit system self-detection design ensured the complete systematic safety solution. When Safe Optical Screen Sensor itself has malfunctions in devices or circuits, this design can ensure not to send dangerous failure signal to controlled metal forming machine, and ensure the safe control to controlled equipment.

The controller and light curtain device adopts separation design; this ensures the safety for the sensor single transmission. System checks the final output signal to ensure the whole safe system control and self-detection achievement.

Low Consumption Design

Safe Optical Screen Sensor adopt slow consumption design, can reduce malfunctions to prolong service life, and save energy sources.

Response time

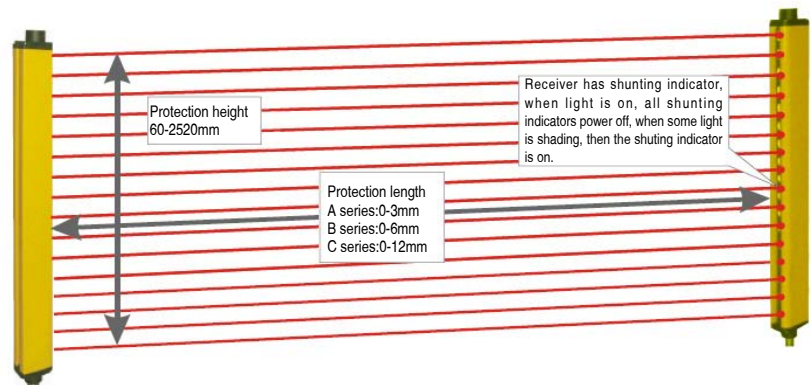
The longest time from the spot of safety light curtain being blocked to the stopping single from device output is the response time of safety light curtain. The response time of GA and GAD series safe optical screen sensor is no more than 15ms.

Various and Convenient installation

The installation type for emitter and receiver are: normal up and down anti-vibration installation, T type trough installation, tubular bracket form installation, floor bracket form installation and shield installation.

Strong ability in Optic Resistance & Electromagnetic Interference Resistance

Safe Optical Screen Sensor work stably and reliably in the environment of frequency conversion electromagnetic wave, strobe light, welding arc, and other light sources, etc.



Easy beam-focusing

Easy beam-focusing in installation and usage, low requirements for security accuracy

Multi-sides area protection

GAD safety light curtain can achieve multi-sides area protection by increasing reflection mirror. After one time reflection, it can achieve double sides protection with total 12m length, after twice, can achieve three sides protection with total 8m length

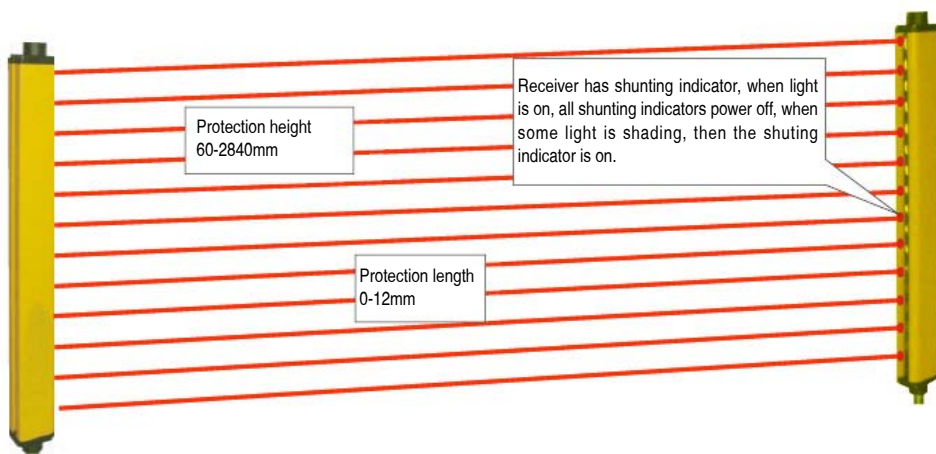


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GAD Series Safety light curtains (safety light grid)

- It is applicable to the safety protection against dangerous mechanical devices such as forging presses, punching machine, welding machine, cutting machine etc. to provide protection. and could also act as signal-collector in automatic industry.
- The optical axis distance is only 10mm which provides a more safe protection for human body, such as fingers.
- Photoreceptors adopt shunting indicator, which can check the normal working on safety light curtains directly.
- Excellent protection of the structural design and vibration-resistant ensure the safety light curtains reliable use in the place of harsh and heavy equipment.
- Output NPN & PNP at the same time, can connect with safety light curtains controller. Or directly connect with PLC,PC and external hang relays directly to make sure the safe reliability of equip follow-up control circuit.
- Red, Green, two-color indicator light, users can detect the possible malfunction correctly, directly, and quickly.
- High response speed, response time only in 15ms.



Safety light curtains controller

SLC-1



SLC-P



GAD type A seires



GAD type B seires



Parameter

■ Controller Way Output

Items	Safety light curtains		
Model	GAD series	GE series	
Detection Way	Trough beam type	Reflection type	
Controller	SLC-1, SLC-P		
Power supply	AC100-260V 50/60Hz DC24V		
Consumption	<10W		
Contact capacity	AC380V 10A		
Relay lifespan	>1,000,000 times		
Response time	<15ms		
Ambient temperature	in operation -10~+55°C; in storage -25~+75°C		
Ambient Humidity	in operation 35~85%RH; in storage 35~95%RH		
Insulation Resistance	DC500V 100mΩ		
Dielectric intensity	AC1500V, 50/60Hz, 1min		
Light resistance	Sunlight 10000Lx, incandescent lamp light 3000Lx		
Optical axis distance	10mm, 20mm, 40mm, 80mm		
Material	Aluminum Alloy for safety light		
Protection class	IP65		
Series model	A series	B series	C series
Protection length	0-3m	0-6m	0-12m

■ NPN, PNP output

Items	Safety light curtains		
Model	GAD series	GE series	
Power supply	DC12-24V		
Consumption	≤10W		
Output way	NPN, PNP double output		
Output Current	≤200mA		

Selection specification

- Application range: GAD-A series safety light curtain is applicable to the protection of machine table or area protection or machine within 3m protection length; GAD-B series safety light curtain is applicable to the protection of machine table or area protection or machine within 6m protection length; GAD-C series safety light curtain is applicable to the protection of machine table or area protection or machine within 12m protection length; GE series reflection safety light curtain is applicable to the protection of machine table or area protection or machine within 3m protection length;
- Protection height should be less than machine:slider trip+ regulating variable
- Controlled can be chosen SLC-1 built-in type or SLC-P built-out type based on the installation convenience. SLC-1 built-in type controller will be provided if there is no special note. Some device can recognize the NPN or PNP transistor signal of safety light curtain output and the voltage is 24VDC, the NPN and PNP output type can be provided to ensure that the subsequent control circuit conforms to standard safety requirements.
- The safety light curtain with 80mm optic axis distance is usually used for equipment or area as personnel area protection; with 40mm optic axis distance is used for general pressure machine and equipment; with 10mm, 20mm optic axis distance is used in the circumstance with high resolution ratio requirements.

Ordering Information

Model	GAD series, GE series			
Voltage	AC100-260V [√]	DC24V []		
Controller type	SLC-1 built-in Controller [√]	P type built-outside Controller []	NPN, PNP output []	
Sensor installation	Normal frontal form [√]	Normal side form []	Tubular bracket form []	Floor bracket form []
P type controller length	1.5m connection length between controller and electric machine			
Cable length	Emitter transmission line for 5m, receiver transmission line for 5m			
Machine table width	2m			
Protection height	300mm			
Return non-protection function achievement way	Machine self-protection [√]	Photoelectric protection device []		
Sensor working way	Trough beam type [√]	Reflection type []	Area protection []	
Machine cam controller type	Mechanical cam [√]	Electronic cam []		
Optic axis distance	10mm []	20mm [√]	40mm []	80mm []
Notes	When choosing installation with shield or customized installation bracket, please specially note in order.			

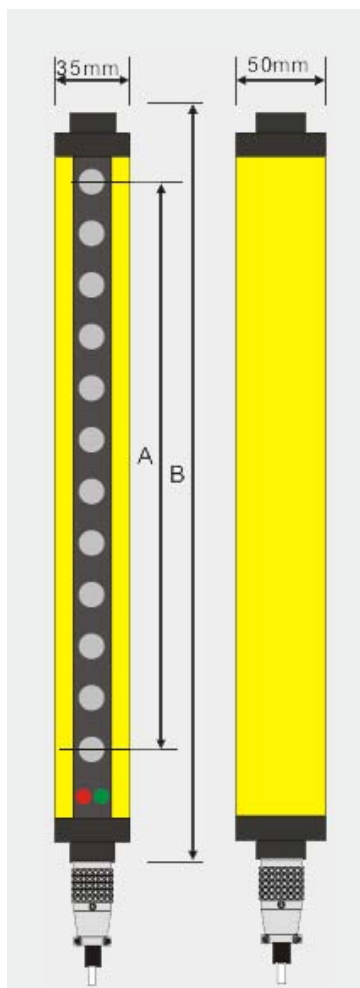
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Model

GAD □ □ - □ □
 1 2 3 4 5

- 1. Model: GAD series
- 2. Optic axis number: 10:10mm 20:20mm 40:40mm 80:80mm
- 3. Detection distance: A:0-3m B:0-6m C:0-12m
- 4. Optic axis distance: 2, 4, 6, 8.....72
- 5. Output way: No: with controller output S: NPN/PNP output

Optical axis number	Optical axis distance 10mm				Optical axis distance 20mm				Optical axis distance 40mm				Optical axis distance 80mm			
	Model			Protection height	Model			Protection height	Model			Protection height	Model			Protection height
	A	B	C		A	B	C		A	B	C		A	B	C	
4					GAD20□-4	60mm		GAD40□-4	120mm		GAD80□-4	280mm				
6					GAD20□-6	100mm		GAD40□-6	200mm							
8	GAD10□-8			70mm	GAD20□-8	140mm		GAD40□-8	280mm		GAD80□-8	560mm				
10					GAD20□-10	180mm		GAD40□-10	360mm							
12					GAD20□-12	220mm		GAD40□-12	440mm		GAD80□-12	880mm				
14					GAD20□-14	260mm		GAD40□-14	520mm							
16	GAD10□-16			150mm	GAD20□-16	300mm		GAD40□-16	600mm		GAD80□-16	1200mm				
18					GAD20□-18	340mm		GAD40□-18	680mm							
20					GAD20□-20	380mm		GAD40□-20	760mm		GAD80□-20	1520mm				
22					GAD20□-22	420mm		GAD40□-22	840mm							
24	GAD10□-24			230mm	GAD20□-24	460mm		GAD40□-24	920mm		GAD80□-24	1840mm				
26					GAD20□-26	500mm		GAD40□-26	1000mm							
28					GAD20□-28	540mm		GAD40□-28	1080mm		GAD80□-28	2160mm				
30					GAD20□-30	580mm		GAD40□-30	1160mm							
32	GAD10□-32			310mm	GAD20□-32	620mm		GAD40□-32	1240mm		GAD80□-32	2480mm				
34					GAD20□-34	660mm		GAD40□-34	1320mm							
36					GAD20□-36	700mm		GAD40□-36	1400mm		GAD80□-36	2800mm				
38					GAD20□-38	740mm		GAD40□-38	1480mm							
40	GAD10□-40			390mm	GAD20□-40	780mm		GAD40□-40	1560mm							
42					GAD20□-42	820mm		GAD40□-42	1640mm							
44					GAD20□-44	860mm		GAD40□-44	1720mm							
46					GAD20□-46	900mm		GAD40□-46	1800mm							
48	GAD10□-48			470mm	GAD20□-48	940mm		GAD40□-48	1880mm							
50					GAD20□-50	980mm		GAD40□-50	1960mm							
52					GAD20□-52	1020mm		GAD40□-52	2040mm							
54					GAD20□-54	1060mm		GAD40□-54	2120mm							
56	GAD10□-56			550mm	GAD20□-56	1100mm		GAD40□-56	2200mm							
58					GAD20□-58	1140mm		GAD40□-58	2280mm							
60					GAD20□-60	1180mm		GAD40□-60	2360mm							
62					GAD20□-62	1220mm		GAD40□-62	2440mm							
64	GAD10□-64			630mm	GAD20□-64	1260mm		GAD40□-64	2520mm							
66					GAD20□-66	1300mm		GAD40□-66	2600mm							
68					GAD20□-68	1340mm		GAD40□-68	2680mm							
70					GAD20□-70	1380mm		GAD40□-70	2760mm							
72	GAD10□-72			710mm	GAD20□-72	1420mm		GAD40□-72	2840mm							



A: secure height of area secure sensor
B: shell overall length of area secure sensor

Outline

Model	A	B
GAD10□-8	70mm	160mm
GAD10□-16	150mm	240mm
GAD10□-24	230mm	320mm
GAD10□-32	310mm	400mm
GAD10□-40	390mm	480mm
GAD10□-48	470mm	560mm
GAD10□-56	550mm	640mm
GAD10□-64	630mm	720mm
GAD10□-72	710mm	800mm

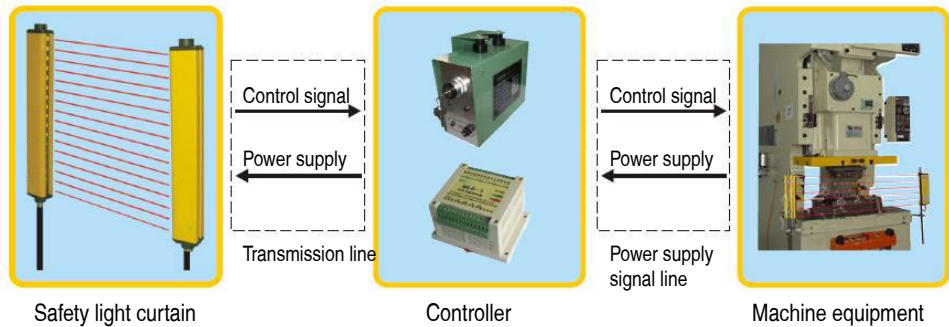
Model	A	B
GAD20□-4	60mm	160mm
GAD20□-6	100mm	200mm
GAD20□-8	140mm	240mm
GAD20□-10	180mm	280mm
GAD20□-12	220mm	320mm
GAD20□-14	260mm	360mm
GAD20□-16	300mm	400mm
GAD20□-18	340mm	440mm
GAD20□-20	380mm	480mm
GAD20□-22	420mm	520mm
GAD20□-24	460mm	560mm
GAD20□-26	500mm	600mm
GAD20□-28	540mm	640mm
GAD20□-30	580mm	680mm
GAD20□-32	620mm	720mm
GAD20□-34	660mm	760mm
GAD20□-36	700mm	800mm
GAD20□-38	740mm	840mm
GAD20□-40	780mm	880mm
GAD20□-42	820mm	920mm
GAD20□-44	860mm	960mm
GAD20□-46	900mm	1000mm
GAD20□-48	940mm	1040mm
GAD20□-50	980mm	1080mm
GAD20□-52	1020mm	1120mm
GAD20□-54	1060mm	1160mm
GAD20□-56	1100mm	1200mm
GAD20□-58	1140mm	1240mm
GAD20□-60	1180mm	1280mm
GAD20□-62	1220mm	1320mm
GAD20□-64	1260mm	1360mm
GAD20□-66	1300mm	1400mm
GAD20□-68	1340mm	1440mm
GAD20□-70	1380mm	1480mm
GAD20□-72	1420mm	1520mm

Model	A	B
GAD80□-4	240mm	400mm
GAD80□-8	560mm	720mm
GAD80□-12	880mm	1040mm
GAD80□-16	1200mm	1360mm
GAD80□-20	1520mm	1680mm
GAD80□-24	1840mm	2000mm
GAD80□-28	2160mm	2320mm
GAD80□-32	2480mm	2640mm
GAD80□-36	2800mm	2960mm

Model	A	B
GAD40□-4	120mm	240mm
GAD40□-6	200mm	320mm
GAD40□-8	280mm	400mm
GAD40□-10	360mm	480mm
GAD40□-12	440mm	560mm
GAD40□-14	520mm	640mm
GAD40□-16	600mm	720mm
GAD40□-18	680mm	800mm
GAD40□-20	760mm	880mm
GAD40□-22	840mm	960mm
GAD40□-24	920mm	1040mm
GAD40□-26	1000mm	1120mm
GAD40□-28	1080mm	1200mm
GAD40□-30	1160mm	1280mm
GAD40□-32	1240mm	1360mm
GAD40□-34	1320mm	1440mm
GAD40□-36	1400mm	1520mm
GAD40□-38	1480mm	1600mm
GAD40□-40	1560mm	1680mm
GAD40□-42	1640mm	1760mm
GAD40□-44	1720mm	1840mm
GAD40□-46	1800mm	1920mm
GAD40□-48	1880mm	2000mm
GAD40□-50	1960mm	2080mm
GAD40□-52	2040mm	2160mm
GAD40□-54	2120mm	2240mm
GAD40□-56	2200mm	2320mm
GAD40□-58	2280mm	2400mm
GAD40□-60	2360mm	2480mm
GAD40□-62	2440mm	2560mm
GAD40□-64	2520mm	2640mm
GAD40□-66	2600mm	2720mm
GAD40□-68	2680mm	2800mm
GAD40□-70	2760mm	2880mm
GAD40□-72	2840mm	2960mm

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Control schematic diagram



Safety light curtain series

Series code	Protection length	Transmission line standard length	Protection height
A series	0-3m	Emitter, receiver 5m length cable	60mm-2840mm
B series	0-6m	Emitter, receiver 8m length cable	
C series	0-12m	Emitter, receiver 15m length cable	

Safety light curtains controller

Voltage	Output voltage	Output type	Installation	Shell material
AC100-260V DC24V	DC12V 200mA	Relay output	Electric din-rail card in the electric cabinet	Engineering plastics
AC100-260V DC24V	DC12V 200mA	Relay output	Controller collet fixed on the machine	Metal shell

Safety light curtains cable

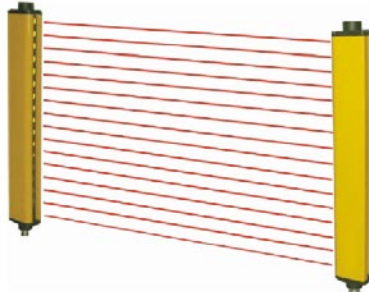
Model	Withstand voltage	Length	Application
SLC-2A/2D controller power supply signal line	RW 300-500V	Standard length 5m, 8m, 15m, cable of other length could be customized	Provide power supply and single transmission for safety light curtain
P type controller double end power supply signal line	RW 300-500V	Standard length 5m, 8m, 15m, cable of other length could be customized	
P type single double end power supply signal line	RW 300-500V	Standard length 1.5m, cable of other length could be customized	



GAD Safety light curtains application

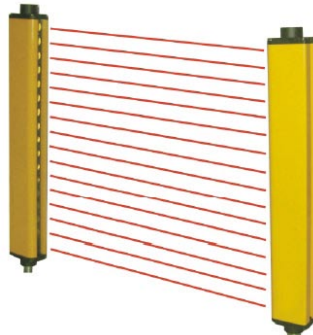
■ **GAD A series Safety light curtains, one-sided protection**

- GAD A series, easy for installation and debug, simple in wiring, stable in structure, close in optical system
- The protection length for GAD A series Safety light curtains is 0-3m, applicable to the protection of machine table or area protection within 3m
- Optic axis distance 10mm, 20mm, 40mm, 80mm are available
- It includes emitter, receiver, controller and signal cable



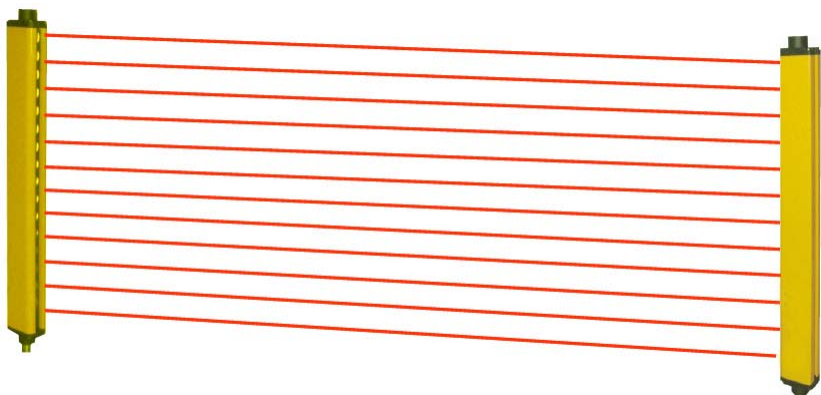
■ **GAD B series Safety light curtains, one-sided protection**

- GAD B series, easy for installation and debug, simple in wiring, stable in structure, close in optical system
- The protection length for GAD A series Safety light curtains is 0-6m, applicable to the protection of machine table or area protection within 6m
- Optic axis distance 10mm, 20mm, 40mm, 80mm are available
- It includes emitter, receiver, controller and signal cable



■ **GAD C series Safety light curtains, one-sided protection**

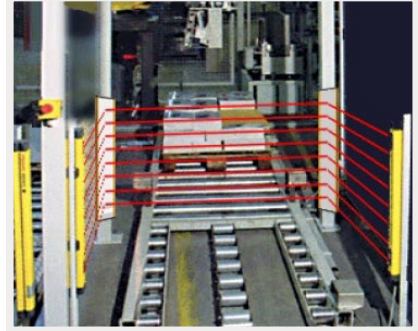
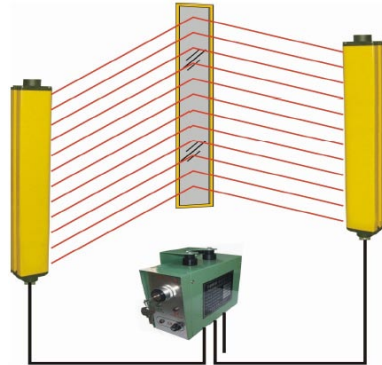
- GAD C series, easy for installation and debug, simple in wiring, stable in structure, close in optical system
- The protection length for GAD A series Safety light curtains is 0-12m
- Optic axis distance 10mm, 20mm, 40mm, 80mm are available
- It includes emitter, receiver, controller and signal cable



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■ **GAD Safety light curtain area protection**

- Easy for installation and debug, simple in wiring, stable in structure, close in optical system
- On the basis of through beam safety light curtain, use mirror to change the transmission direction of protection light, thus form double sides or three sides protection
- Protection length: double sides less than 12m, three sides less than 8m
- It includes emitter, receiver, controller, reflection mirror and signal cable



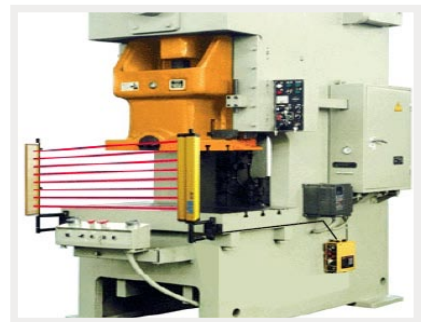
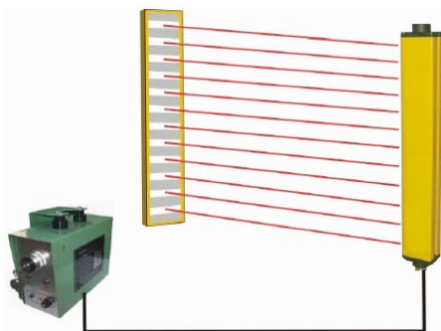
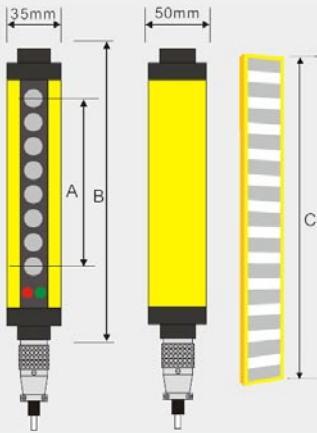
■ **GE Safety light curtains application**

■ **GE Safety light curtain area protection**

- Easy for installation and debug, simple in wiring, stable in structure, close in optical system
- The protection length for GE series reflection safety light curtain is 400-3000mm, applicable to the protection of machine table or area protection within 3m
- Reflect light through reflector to form protection light curtain. Optic axis distance is 40mm
- It includes sensor, controller, reflection mirror and signal cable

■ **Outline**

Model	Optical axis number	Dimension		
		A	B	C
GE40-4	4	120mm	240mm	240mm
GE40-6	6	200mm	320mm	320mm
GE40-8	8	280mm	400mm	400mm
GE40-10	10	360mm	480mm	480mm
GE40-12	12	440mm	560mm	560mm
GE40-14	14	520mm	640mm	640mm
GE40-16	16	600mm	720mm	720mm
GE40-18	18	680mm	800mm	800mm
GE40-20	20	760mm	880mm	880mm
GE40-22	22	840mm	960mm	960mm
GE40-24	24	920mm	1040mm	1040mm
GE40-26	26	1000mm	1120mm	1120mm
GE40-28	28	1080mm	1200mm	1200mm
GE40-30	30	1160mm	1280mm	1280mm
GE40-32	32	1240mm	1360mm	1360mm
GE40-34	34	1320mm	1440mm	1440mm
GE40-36	36	1400mm	1520mm	1520mm
GE40-38	38	1480mm	1600mm	1600mm
GE40-40	40	1560mm	1680mm	1680mm

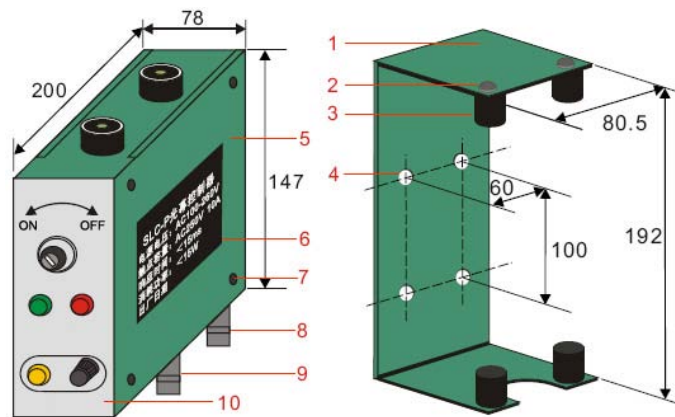




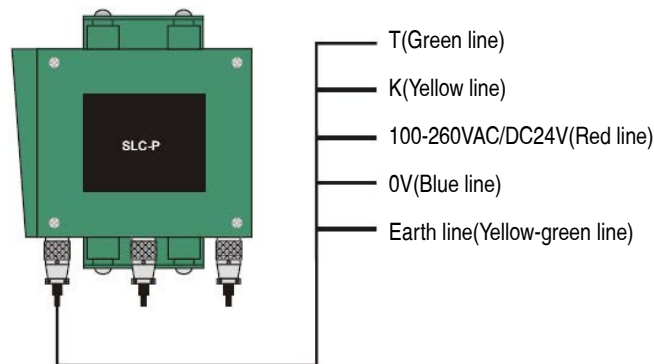
SLC-P

Safety light curtain controller

- Installation: built-out, directly fixed on the machine board
- Material: steel for shell
- Outline: length×width×height =200×78×147
- Controller cable: 1.5m
- Signal cable interface: aviatic plug-in (one piece for reflection, two pieces for through-beam)
- Output type: passive double relay contact safety signal output
- Output contact value:AC 380V 10A
- Power supply: AC100-260V, 50/60Hz or 24VDC
- Power consumption: 15W
- Self-detection: monitor the signal processing circuit and relay contact, lock the output state in malfunction until trouble shoot.
- Self-locking function: set self-locking function on request, reserve reset switch contact
- Return non-protection function: can be connected with machine electrics for security allows to achieve return non-protection function



1. Controller fixation bracket
2. M5×15mm Bolt, shell pad, flat pad
3. Φ20×20mm
4. M6×6mm Bolt, shell pad, flat pad
5. Controller cover
6. Technical signs
7. M6 cover fixed bolt
8. Signal cable plug
9. Control cable plug
10. Control panel



- P type controller power supply factory setting set at 100-260VAC
- AC100-260V(red lead) and 0V(blue lead) is AC power supply lead. For DC24V power supply, please note in the order.
- The yellow-green line is earth wire.
- T (green lead) and K (yellow lead) is output connection point, when the light curtain is on the light: T, K turn on while the light curtain is shading, T,K turn off.

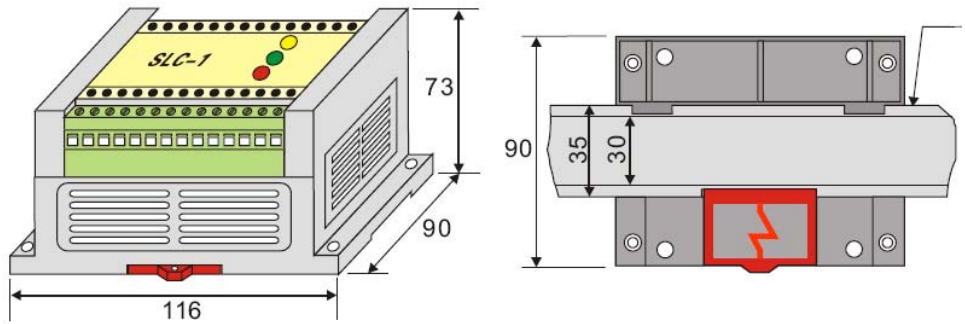
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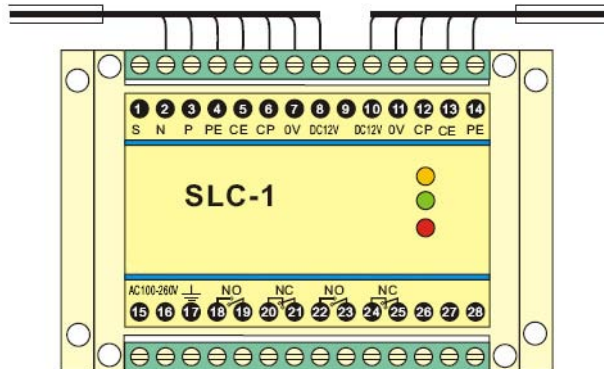
SLC-1

Safety light curtain controller

- Installation: built-in
- Material: Plastic
- Outline: length × width × height = 116 × 90 × 73
- Signal cable interface: aviatric plug-in (one piece for reflection, two pieces for through-beam)
- Output type: passive double relay contact safety signal output
- Output contact value: AC 380V 10A
- Power supply: AC100-260V, 50/60Hz or 24VDC
- Power consumption: 15W
- Self-detection: monitor the signal processing circuit and relay contact, lock the output state in malfunction until trouble shoot.
- Self-locking function: set self-locking function on request, reserve reset switch contact
- Return non-protection function: can be connected with machine electrics for security allows to achieve return non-protection function

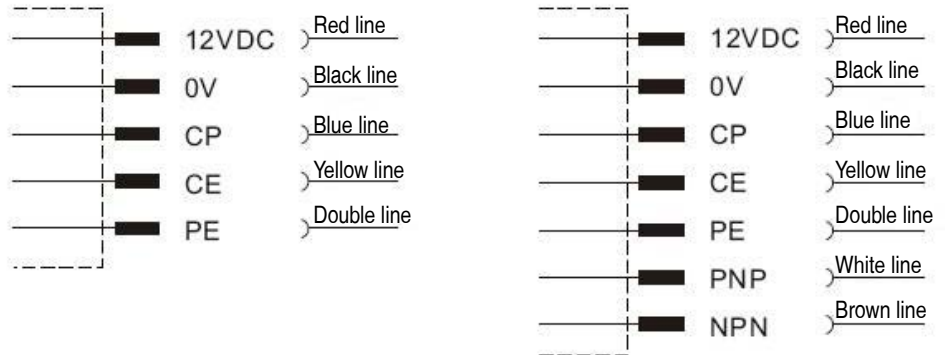


- Number 15 and 16 terminal is AC100-260V power supply input end. For DC24V power supply, please note in order.
- Number 17 is earth terminal
- Number 18, 19 and number 22, 23 is NO output end, 20, 21 and 24, 25 is NC output end (SLC-1 controller provide two sets NC and NO output), choose the wiring based on specific usage.
- Number 2, 3, 4, 5, 6, 7, 8 terminal is connected with receiver of the safety light curtain, 10, 11, 12, 13, 14 terminal is connected with emitter of the safety light curtain.



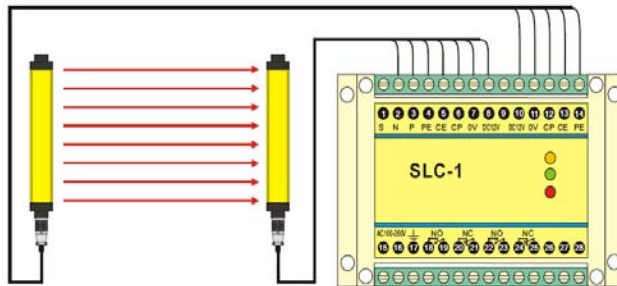
Safety light curtain controller

■ Leads indication



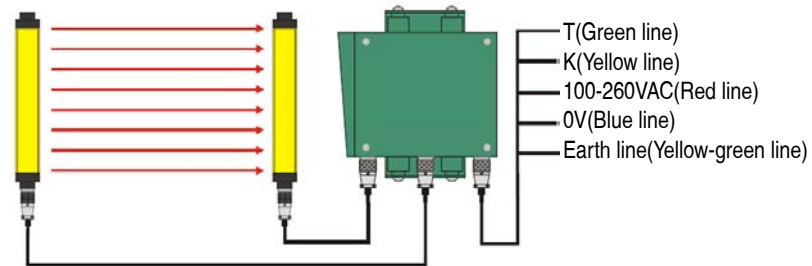
■ GAD safety sensors wire connection

First, separately connect emitter red lead(DC12V), black lead(0V), blue lead(CP), yellow lead (CE), double lead(PE) with controller number 10, 11, 12, 13, 14 terminal. Then separately connect receiver red lead (DC12V), black lead (0V), blue lead (CP), yellow lead (CE), double lead(PE), white lead(PNP), brown lead(NPN) with controller number 7, 6, 5, 4,3, 2 terminal.



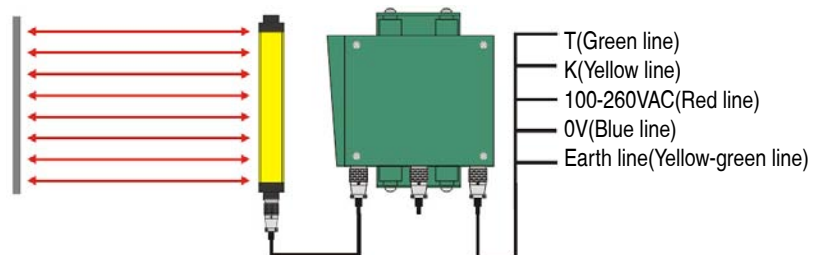
■ Connection figure of SLC_P optical screen controller and GAD area secure sensor

1. Power lead connection: See below, according to the working voltage marked on the SLC-P optical screen controller, AC100-260V.
2. T, K connection: T, K -the output signal connection point of area secure sensor, is the NO contact switch connection point, with load AC380V 10A and overload protection function.



Connection figure of SLC_P optical screen controller and GAD area secure sensor

1. Power lead connection: See below, according to the working voltage marked on the SLC-P optical screen controller, AC100-260V.
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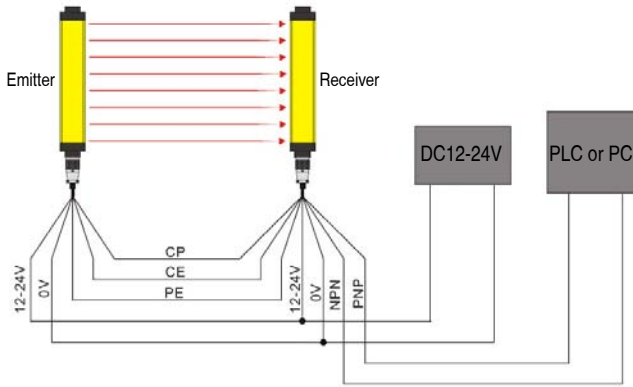


1

Connection of GAD Safety light curtains

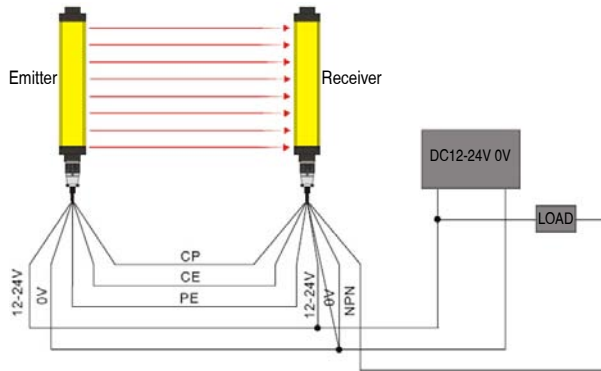
■ **Directly connected to PLC or PC:**

Firstly, connect the emitter red lead (DC-24V), black lead(0V) with DC power supply DC12-24V; then butt connecting blue lead (CP), yellow lead (CE), double lead (PE); finally, connect the receiver white (PNP) or brown(NPN) with PLC or PC signal input terminal.

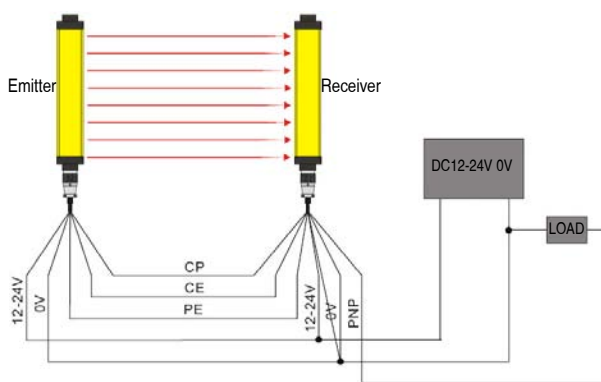


■ **Directly connected to load**

■ **NPN with directly connected to load**



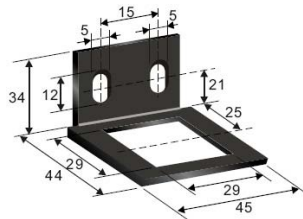
■ **PNP with directly connected to load**



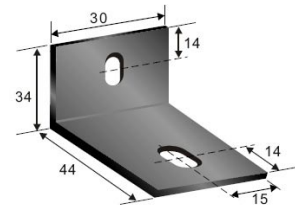
■ **Connection**

- Connect the leads of projector and receiver through aviation connector (note: the leads of projector are five-wire system: red, black, double, yellow, blue; while the leads of receiver are seven-wire system: red, black, double, yellow, blue, brown, white.)
- Connect the red lead to device anode, black lead to cathode; butt connecting double lead, yellow lead, blue lead; connect brown lead to NPN input terminal of controller or connect the brown lead, white lead to double input terminal of relay (DC12-24V)(for polarity require, connect white lead to anode, brown lead to cathode of relay)
- According to your demand, you could select the output form, either NPN output or PNP output, and then cut off the other lead or insulate it in case of any inconvenience.
- In case of large disturbance, it is better to match electric, cabling with input, output lead from cable of high frequency, high voltage, strong current such as power line, pressure line and other signal lead.

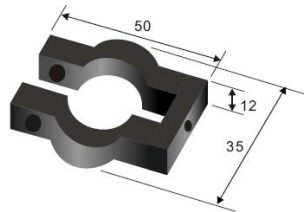
Installation assembly



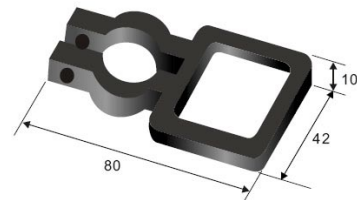
KS type normal frontal bracket



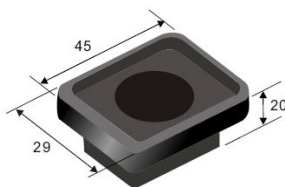
L type bending board



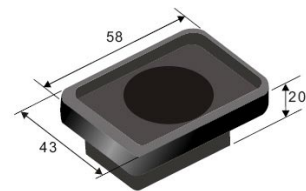
Shield tubular bracket



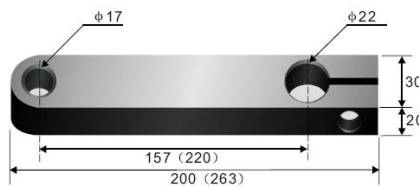
Tubular fix bracket



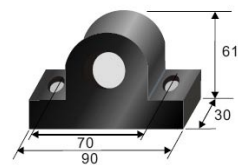
GA light curtain shock absorber



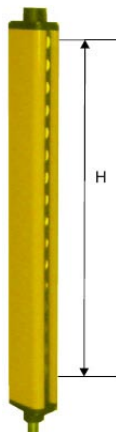
GAD, GE light curtain shock absorber



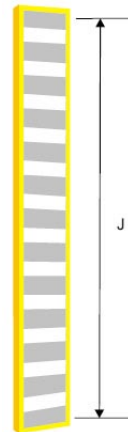
Tubular bracket with rotation arm



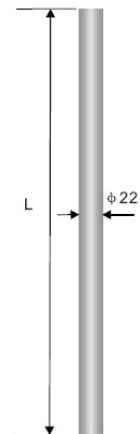
Tubular bracket with rotation arm base



Emitter/receiver

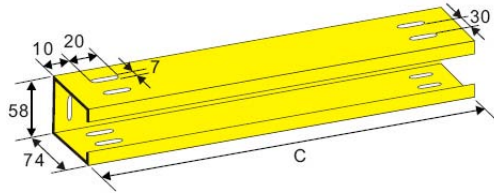


Reflection mirror

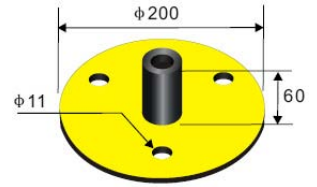


Bracket steel pipe

1



Shield



Floor bracket steel pipe base

Optical axis number	Optical axis distance 20mm				Optical axis distance 40mm			
	H	J	L	C	H	J	L	C
4	60	160	500	220	120	240	500	300
6	100	200	500	260	200	320	500	380
8	140	240	500	300	280	400	750	460
10	180	280	500	340	360	480	750	540
12	220	320	750	380	440	560	1000	620
14	260	360	750	420	520	640	1000	700
16	300	400	750	460	600	720	1000	780
18	340	440	750	500	680	800	1000	860
20	380	480	750	540	760	880	1200	940
22	420	520	750	580	840	960	1200	1020
24	460	560	1000	620	920	1040	1500	1100
26	500	600	1000	660	1000	1120	1500	1180
28	540	640	1000	700	1080	1200	1500	1260
30	580	680	1000	740	1160	1280	1500	1340
32	620	720	1000	780	1240	1360	1750	1420
34	660	760	1000	820	1320	1440	1750	1500
36	700	800	1000	860	1400	1520	1750	1580
38	740	840	1200	900	1480	1600	2000	1660
40	780	880	1200	940	1560	1680	2000	1740

Optical axis number	Optical axis distance 10mm			
	H	J	L	C
8	70	160	500	220
16	150	240	500	300
24	230	320	750	380
32	310	400	750	460
40	390	480	750	540
48	470	560	1000	620
56	550	640	1000	700
64	630	720	1000	780
72	710	800	1000	860

Optical axis number	Optical axis distance 80mm			
	H	J	L	C
4	240	400	750	460
8	560	720	1000	780
12	880	1040	1500	1100
16	1200	1360	1750	1420
20	1520	1680	2000	1740

Installation

■ Main installation way

The installation ways include: normal upper and bottom shock absorber type, T-slot side installation, tubular installation, floor installation, shield installation

- Normal upper and bottom shock absorber type is the main installation, which is easy and reliable, can increase shock absorber by KS fixture bracket to reduce vibration effectively.
- T-slot side installation is easy and practical, can fix the safety light curtain on the device column by two pieces right angle bending board, the disadvantage is hard adjustment, poor anti-vibration, applicable to set in smooth places.
- Tubular bracket with shock absorber, tubular connect with safety light curtain by shock absorber, can reduce vibration effectively. Mainly use in the larger vibration equipment such as punch and press.
- Floor bracket installation generally use for dangerous area protection or equipment working area safety protection.
- Shield installation use in the equipment that the safety light curtain is easy to bump.

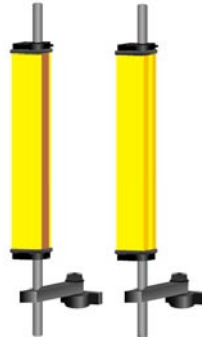
■ Normal frontal shock absorber installation

Directly connect receiver and emitter on the equipment by KS type normal frontal bracket, generally use in fame structure equipments.



■ Normal side installation

Receiver and Emitter are fixed on the equipment by T-nut and L-bending bracket. Generally use in fame structure equipments.



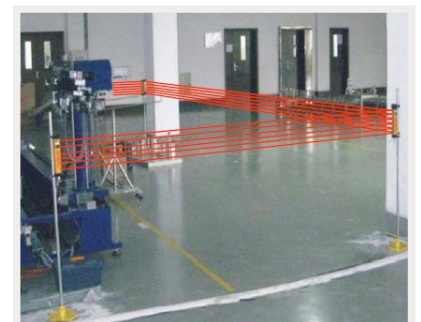
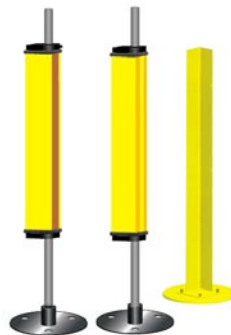
■ Tubular bracket installation

Receiver and Emitter are fixed on the adjustable tubular bracket by KS-tube clamp. Cantilevered base is fixed on the machine bottom base or upright post. Generally use in machine, punch and press.



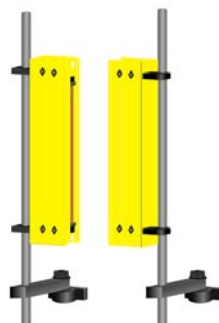
■ Floor bracket installation

Receiver and Emitter are fixed on the adjustable tubular bracket by KS-tube clamp. Floor bracket base is fixed on the protection floor. Generally use for area protection. It can be to minimize the vibration.



■ Shield installation

It can increase shield then the safety light curtain is easy to be bumped so as to protect receiver and emitter.

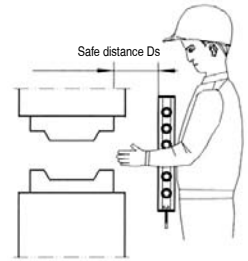


Installation of safety light curtains

■ **Settlement for installation place**

For personnel security assurance, the installation place of safety light curtain should conform to distance and height requirements.

Calculation of safe distance: Safe distance refers to the request minimum distance from screen plane of safety light curtain to dangerous equipments part.



■ For the machine or equipment, machine slider or dangerous parts can have the auto-stop anywhere of the run.

Safety formula: $Ds=K(T+C)$

K: the operator's hands extension speed, generally count in 1600mm/s

T1: response time of safety light curtain, about 0.02s

T2: Maximum braking stop time, that is the time from braking start to slider or dangerous stop, unit in S

■ For the machine or equipment, machine slider or dangerous parts can not have the auto-stop anywhere of the run

Safety formula: $Ds=KT \quad T=(1/2 + 1/N)Tn$

K: the operator's hands extension speed, generally count in 1600mm/s

T: slider or dangerous parts trip down to the dead point, unit in S

N: joint slots number of clutch

Tn: a lap rotation time for crankshaft, unit in S

■ **Calculation of safe height**

Height position refers to screen relative to up and down position of machine dangerous parts. That is on the basis of safe assurance, the undermost beam should not be higher than lower limb of dangerous part, and the topmost beam should not be lower than upper limb of dangerous part. Protection height dangerous part trip+ regulating variable

■ **Schematic diagram of the correct installation**

