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Machinery Safety APP

SDKELI®

Active Opto-electronic Protective Devices

Shandong Keli Active opto-electronic Technology Co., Ltd.

“Keli” pursues excellence and guarantees security with “two hands”

Directory of Offices of Keli Active Opto-electronic Technology in China

South China Sales Area

Responsible areas: Guangdong Province, Guangxi Province, Hunan Province, Hainan Province

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North China Sales Area

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SDKELI 科力光电

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科力办公环境实景拍摄

About KELI

Specializing in the research and development of light-machine-electricity integration technology, Keli is the leader of China's AOPD technology.

It is the leader unit of working group of electro-sensitive devices (Active Opto-electronicProtective Devices) in National Technical Committee for Standardization of Industrial Mechanical and Electrical System, and the main drafting unit of current national standards for AOPDs, including GB4584-2007, GB/T19436.1, GB/T19436.2, GB/T19436.4, GB/T29483-2013.
Shandong Photoelectric Detection Safety Control Engineering Technology Research Center
Metalforming MachineryProtectionTechnology Research Center
Jining Municipal EnterpriseTechnology Center

Shandong Keli Opto-electronic Technology Co., Ltd. is affiliated to Laser Research InstituteShandong Academy of Sciences. The Company's leading products include activeopto-electroinicprotectivedevice, safety light curtain, automatic light curtain, laser radar and laser safety protective device for bending machine, which are mainly used for the personal safety protection in the fields of forging machinery, automation, logistics and warehousing, rail transportation and so on. The Company's products are listed as outstanding promotion projects with scientific and technological achievements in safe production by the State Administration of Work Safety.

The Company was certified by ISO9001: 1994 quality system in 1998. The Company's products: T4 safety light curtain has passed EU SUD TUV certification, BLPS laser safetyprotective device for bending machine has passed Level 4 safety certification by EU institutions, KS06AOPD has passed Level 4 safety certification.

The Company has adhered to the quality policy of "Maintaining safety, keep improving, obtaining client satisfaction and winning with Quality". We will work hard to provide our clients with better products and services.

Corporate values:

Focus on clients, strive to enhance client value through the continuous improvement of technical quality and services, and thus achieve the common development of clients and Keli.

Corporate missions:

Enhance the intelligence level of domestic sensors and enhance the safety guarantee ability of industrial automation to become a builder of a harmonious society and a safety partner trusted by clients.

Corporate vision:

To be a world-class qualified supplier of smart sensor and safety control products.


Technology Department


Production Workshop


SMT site


Electromagnetic radiation test


Surge and pulse group test site


Vibration test site

Main production equipments:

Imported SMT production line	Imported wave soldering	Gas phase cleaner
Printed plate welding production line	Antistatic device	High temperature aging laboratory
Anechoic chamber	Temperature and humidity control test chamber	Vibration table
Shock table	Immunity test integrated instrument	Automatic wire harness peeling machine

Enterprise honors

Development history

In November 1994, LDKS- IAOPDwas launched to the market.

In May 1995, LDKS-IAOPD was rated as a national new product.

In May 1995, AOPD item was rated as a national “Torch Plan” project.

In June 2007, the national standard GB4584-2007Specificationofactiveopto-electronicprotective devices for pressesdrafted by the company was released.

In February 2009, infrared sensor self-inspection AOPD (KS06 series) became the scientific and technological achievements in safe production and Level A excellent promotion project approved by the fourth State Administration of Work Safety.

In November 2009, the WorkingGroup 6onelectro-sensitive equipmentNational Technical Committee231onElectrical SystemsofIndustrial Machineryof StandardizationAdministrationofChinawas established, and thecompany as selected as the leader unit.

In March 2012, the Company was approved by Shandong Provincial Department of Science and Technology as “Shandong Photoelectric Detection Safety Control Engineering Technology Research Center”.

In October 2012, CSRM series safety relay module passed the certification by the European authoritative laboratory and received the EU Level 4 certificate.

In February 2013, the national standard GB/T29483-2013Electrical safety ofmachinery—Application of protective equipment to detect the presence of personsdrafted by the Company was approved and officially released by General Administration of Quality Supervision and Standardization Administration of China.

In May 2013, T4 series safety light curtains passed the TUV certification of TUV SUD, an international authoritative certification body.

In August 2013, BLPSlasersafetyprotective devicesuccessfully passed the certification by the European authoritative laboratory and obtained the EU Level 4 certificate.

In October 2013, national standards GB / T19436.1-2013 and GB/T19436.2-2013 revised by the company was approved and officially released by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of Chinaand Standardization Administration of China. The two national standards were officially promulgated on February 1, 2014.

In September 2014, KS06 series AOPDs passed the certification by the European authoritative laboratory and received the EU Level 4 certificate.

In December 2014, KS06T (for subway) AOPD project won the second prize of scientific and technological progress in Jining City.

In June 2015, CSRME series controller passed safety certification by casting and forging institution.

In July 2015, the first LSPD safety laser scanner in China was introduced into the market and passed the certification by the European authoritative laboratory.

In September 2016, the national standard GB / T19436.4-2016 Electro-sensitive Protective device for Mechanical and Electrical Safety- Part 4: Special Requirements for the Equipment with Visual Protective Device (VBPD) drafted by it was approved and officially released by General Administration of Quality Supervision and National Standardization Committee.

In December 2016, the online monitoring system of intelligent industrial site safety distributed activeopto-electronic sensor won the second prize of scientific and technological progress in Jining City.

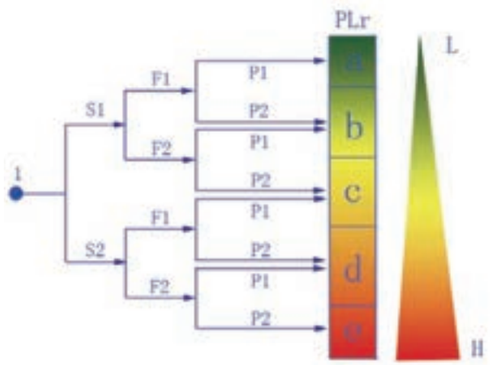
In July 2017, LCSII series light curtain passed the safety certifications by European certification authority and casting and forging institution.

In August 2017, LS laser radarwas promoted to the market.

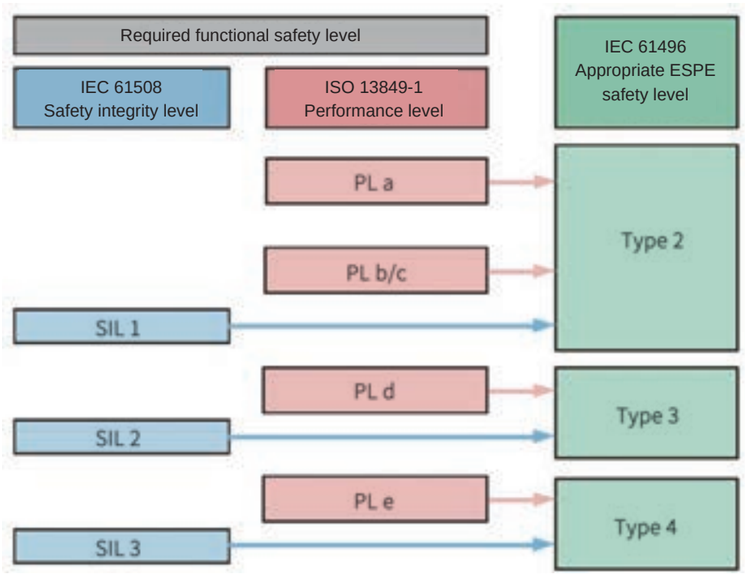
Risk assessment

The performance level standards specified in ISO 9001-1/ISO 13849-1 use a risk map to determine the necessary safety function level. Various safety functions should be considered as shown in the figure below.

1- Starting pointforevaluationofsafetyfunction'scontributio n toriskreduction;
L-Lowcontribution to risk reduction;
H- High contribution to risk reduction;
PLr -Required performance level;
S-Severityofinjury;
S1 - Slight(normallyreveribleinjury);
S2- Serious (normally irreverible injuryor death);
F - Frequency and/or exposure to hazard;
F1 -Seldom-to-less-oftenand/orexposure timeis short;
F2-Frequent-to-continuous and/or exposure time is long;
P - Possibilityof avoidinghazardorlimitingharm;
P1 - Possibleunderspecific conditions;
P2 -Scarcelypossible.



After determining the required performance level through risk assessment, it is required to take a series of measures to reduce the risk, such as: structure of control system, increase of safety precautions, reliability of components, resistance to multiple common cause failures in multi-channel control system; in addition, additional measures should be taken to avoid design defects.



Safety level

For the applications in industrial hazardous places, the electro-sensitive protection device should meet the three levels (2, 3 and 4) of the standard GB/T 19436-1/IEC 61496-1. The specific description of these safety levels is as follows:

— Table 1 —

Safety level	Requirements	Functional safety
2	The means of periodic defection should be provided to display danger and failure, and the duration of periodic defection should be able to ensure that the intended safety functions are not affected In normal operation, when its sensitive function is triggered or its power is cut off, at least one OSSD output circuit should go into the "Off" state When one or more OSSDs of ESPE cannot enter the "Off" state, locking state should be triggered	Single fault; safety functions can maintain the danger and failure of periodic detection
3	In normal operation, when its sensitive function is triggered, or when its power is cut off, at least two OSSD output circuits should go into the "Off" state, which may lead to failure of detection capabilities or cause response time extension to exceed the specified value, or result in the single fault that prevents one or more OSSDs from entering the "Off" state. ESPE should within the time specified in relevant part of GB/T 19436 immediately enter the locking state in the following states to be changed for detecting fault. - When sensitive functions are triggered - If equipped, start interlocking or restart interlocking reset When the single fault that may not cause danger and failure cannot be detected, another failure should not result in danger and failure.	The fault that may result in danger can be detected timely, to prevent danger and failure Accumulate two independent faults that
4	In normal operation, when its sensitive function is triggered, or when its power is cut off, at least two OSSD output circuits go into the "Off" state A single failure that results in loss of detection capability should cause ESPE to go into the locking state within response time For the single fault that causes the response time extension to exceed the specified value, or prevents one or more OSSDs from entering the "Off" state, ESPE should immediately (i.e., within the response time or under any case of detecting the fault under the following change state) enter the locking state. - When sensitive functions are triggered - If equipped, start interlocking or restart interlocking reset When a single fault that will not lead to danger and failure cannot be detected, the further superimposed faults will not result in danger and fault	The fault that may result in danger can be detected timely, to prevent danger and failure Accumulate three independent faults that have not been detected and the safety functions can be maintained

Safety standards

The safety light curtain that meets the latest safety standards is applicable to the complex industrial environment.

— Table 2 —

International standard	IEC 61496-1 IEC 61496-2 ISO 13849-1
National standard	GB 4584-2007 GB/T 19436.1 GB/T 19436.2

Product center

Service fields

Thecompany integrates the design, manufacturing and services of active opto-electronic safety protection technology into one, takes it as its own duty to promote safety awareness, and takes the creation of safe production environment as the goal, to promote the products to various fields of social production and life. The Company mainly serves the forging industry, automobile manufacturing, electronic appliances manufacturing, hardware appliance manufacturing and subway screen door system.

Product application

The products support machinery and device to protect the personal safety of operators. Such as:

- ■ Stamping machine
- ■ Cutting machine
- ■ Bending machine
- ■ Welding assembly line
- ■ Automated warehousing device
- ■ Three-dimensional garage
- ■ Filter pressing machinery
- ■ Molding machinery
- ■ Lifting control machine
- ■ Automated assembly line
- ■ Woodworking machinery
- ■ Paper cutting machinery
- ■ Injection molding machine
- ■ Other places with danger

The products supportsubway screen door system to protect the personal safety of travelers.

Cooperative partner

KS06 AOPD

GB/T 19436.1/IEC 61496-1(Type 4)
GB/T 19436.2/IEC 61496-2(Type 4)

Matching controller

Product introduction

The product meets the requirements for safety Level 4. KS06 AOPD can effectively detect all opaque objects in the light curtain area that exceed the detection accuracy. It is applicable to the safety protection for mechanical presses, hydraulic machines, shears, bending machines and other dangerous places.
KS06 AOPD supports CPSII controller, CPSIII controller, CQ2 controller, CQ3 controller, CSRMC safety relay module or JK III type safety interface, and it can control the automatic shutdown in dangerous situations with the machine control system.

Product components

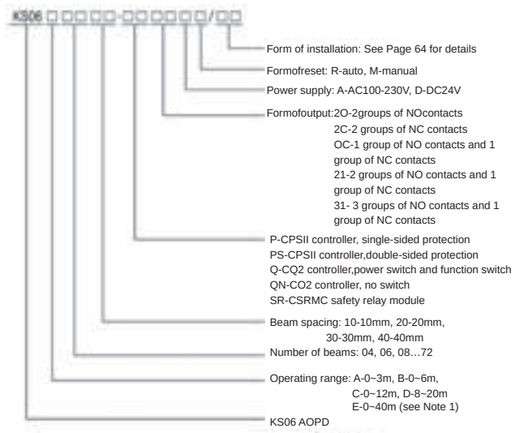
It is composed of controller, emitter, receiver, transmission cable and power line.

Product features

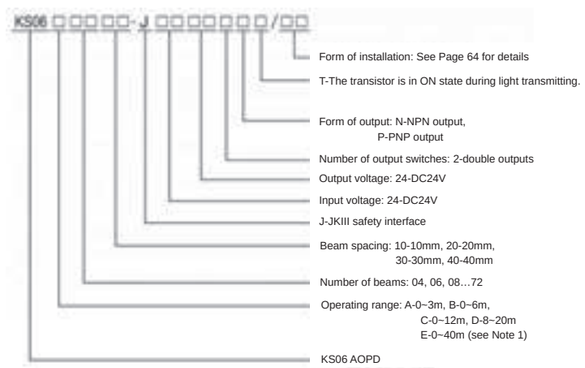
- With perfect self-test function, it can realize the full-test including output signal;
- It can serve floating shielding function to process long materials;
- It provides the passive contact output of two-way relay, with higher safety performance;
- The detection accuracy can be up to 18mm to protect your fingers.
- Theoperating rangecan be up to 40m;
- The protection height can be up to 2,840mm;
- There are many product specifications, with a wide range of applications;
- It can provide shunt instruction function, to intuitively display the On/OFF state of light beam;
- With good vibration damping performance, it is applicable to the presses with high speed and large tonnage, featuring a long servicelife;
- The ability to resist light interference and electromagnetic interference is strong and the operation is more stable;
- When configuring the safety relay module, it can provide two forms, namely 3 normally open and 1 normally closed output and 2 normally open and 1 normally closed output.

Specifications

The specifications of AOPD with relay contact output are as follows:



The specifications of AOPD with transistor output are as follows:



Note 1: Number of beams of E light curtain: 04, 06, 08 … 40, with a beam spacing of only 40mm; Protection length: 0~40m for 4 ~ 16 beam, and 0 ~ 30m for 18 ~ 40 beam

Technical parameters

— Table 3—

Safety level	Type 4（GB/T19436）					
Standards	GB/T19436.1；GB/T19436.2；GB4584-2007					
Optical characteristics						
Detection light source	Infrared LED (central wavelength of 940nm)					
Beam spacing	10mm	20mm	30mm	40mm		
Detection capability	18mm	28mm	38mm	48mm		
Number of beams	12、16、20...72	6、8、10、12…72	6、8、10…72	4、6、8 ...72	4, 6, 8 ...16	18, 20, 22 ...40
Oprating range	A: 0～3m, B: 0～6m, C: 0～12m, D: 8～20m				E: 0～40m	E: 0～30m
Protective height	Beam spacing × (number of beams-1)					
EAA	＜5°					
Environmental characteristics						
Environment temperature	Operating					
	Storage	-40℃～70℃				
Environment humidity	Operating	35%RH～85%RH				
	Storage	35%RH～95%RH				
Light interference resistance	Incandescent lamp	3000 Lux				
	Fluorescent lamp	3000 Lux				
	Sun light source	10000 Lux				
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007				
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011				
Vibration resistance	Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis					
Shock resistance	Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis					
IPcode	IP65					
Dimensions	52×35×Jmm (J is the length of emitter/receiver)					
Electrical characteristics						
Power supply	DC12V±10%					
Consumption current	Emitter	≤300mA				
	Receiver	≤100mA				
Response time	≤20ms(whole machine, including the controller)					
Output characteristics	The square wave signal with a frequency of 4kHz is output during light transmitting					
Supporting controller	CPSⅡ/CPSⅢ/CQ2/CQ3/JKⅢ/CSRMC					

Specifications of KS06 AOPD

(Unit: mm) —Table 4 —

Number of beams	Beam spacing: 10		Beam spacing: 20		Beam spacing: 30		Beam spacing: 40	
	Detection capability 18		Detection capability 28		Detection capability 38		Detection capability 48	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
4							KS06*0440	120
6			KS06*0620	100	KS06*0630	150	KS06*0640	200
8			KS06*0820	140	KS06*0830	210	KS06*0840	280
10			KS06*1020	180	KS06*1030	270	KS06*1040	360
12	KS06*1210	110	KS06*1220	220	KS06*1230	330	KS06*1240	440
14			KS06*1420	260	KS06*1430	390	KS06*1440	520
16	KS06*1610	150	KS06*1620	300	KS06*1630	450	KS06*1640	600
18			KS06*1820	340	KS06*1830	510	KS06*1840	680
20	KS06*2010	190	KS06*2020	380	KS06*2030	570	KS06*2040	760
22			KS06*2220	420	KS06*2230	630	KS06*2240	840
24	KS06*2410	230	KS06*2420	460	KS06*2430	690	KS06*2440	920
26			KS06*2620	500	KS06*2630	750	KS06*2640	1000
28	KS06*2810	270	KS06*2820	540	KS06*2830	810	KS06*2840	1080
30			KS06*3020	580	KS06*3030	870	KS06*3040	1160
32	KS06*3210	310	KS06*3220	620	KS06*3230	930	KS06*3240	1240
34			KS06*3420	660	KS06*3430	990	KS06*3440	1320
36	KS06*3610	350	KS06*3620	700	KS06*3630	1050	KS06*3640	1400
38			KS06*3820	740	KS06*3830	1110	KS06*3840	1480
40	KS06*4010	390	KS06*4020	780	KS06*4030	1170	KS06*4040	1560
42			KS06*4220	820	KS06*4230	1230	KS06*4240	1640
44	KS06*4410	430	KS06*4420	860	KS06*4430	1290	KS06*4440	1720
46			KS06*4620	900	KS06*4630	1350	KS06*4640	1800
48	KS06*4810	470	KS06*4820	940	KS06*4830	1410	KS06*4840	1880
50			KS06*5020	980	KS06*5030	1470	KS06*5040	1960
52	KS06*5210	510	KS06*5220	1020	KS06*5230	1530	KS06*5240	2040
54			KS06*5420	1060	KS06*5430	1590	KS06*5440	2120
56	KS06*5610	550	KS06*5620	1100	KS06*5630	1650	KS06*5640	2200
58			KS06*5820	1140	KS06*5830	1710	KS06*5840	2280
60	KS06*6010	590	KS06*6020	1180	KS06*6030	1770	KS06*6040	2360
62			KS06*6220	1220	KS06*6230	1830	KS06*6240	2440
64	KS06*6410	630	KS06*6420	1260	KS06*6430	1890	KS06*6440	2520
66			KS06*6620	1300	KS06*6630	1950	KS06*6640	2600
68	KS06*6810	670	KS06*6820	1340	KS06*6830	2010	KS06*6840	2680
70			KS06*7020	1380	KS06*7030	2070	KS06*7040	2760
72	KS06*7210	710	KS06*7220	1420	KS06*7230	2130	KS06*7240	2840

Note: * in the specificationsindicates the operating rangeserial number, A series: 0 ~ 3m, B series: 0 ~ 6m, C series: 0 ~ 12m, D series: 8 ~ 20m, E series: 0 ~ 40m (4 ~ 16 beams) / 0~30m (18 ~ 40 beams); E series only provides the products with the specifications and modes in yellow.

Dimensions of KS06 AOPD

H represents protection height, J represents the length of emitter / receiver, L represents steel pipe length, C represents the length of scatter shield (unit: mm)

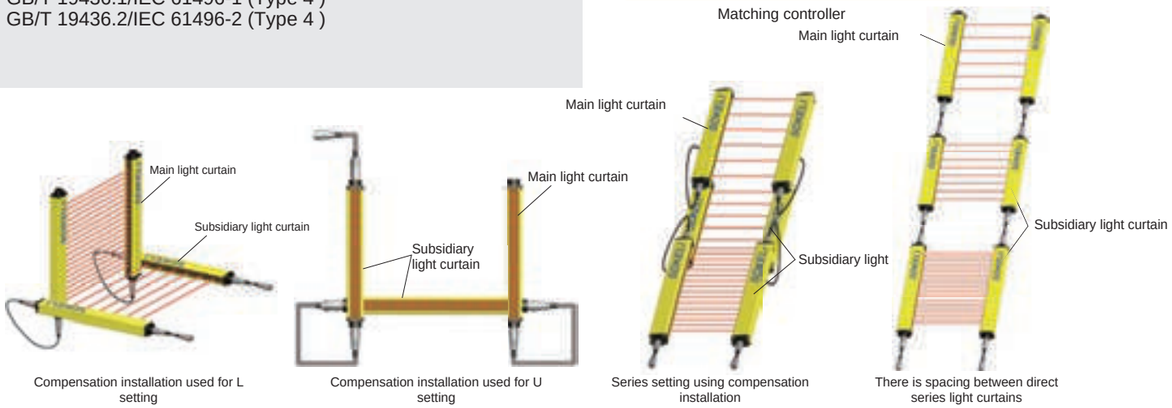
—Table5—

Number of beams	Beam spacing: 10				Beam spacing: 20				Beam spacing: 30				Beam spacing: 40			
	Detection capability 18				Detection capability 28				Detection capability 38				Detection capability 48			
	H	J	L	C	H	J	L	C	H	J	L	C	H	J	L	C
4																
6					100	199	500	260	150	239	500	300	200	319	500	380
8					140	239	500	300	210	299	500	360	280	399	750	460
10					180	279	500	340	270	359	750	420	360	479	750	540
12	110	199	500	260	220	319	500	380	330	419	750	480	440	559	1000	620
14					260	359	750	420	390	479	750	540	520	639	1000	700
16	150	239	500	300	300	399	750	460	450	539	750	600	600	719	1000	780
18					340	439	750	500	510	599	1000	660	680	799	1000	860
20	190	279	500	340	380	479	750	540	570	659	1000	720	760	879	1200	940
22					420	519	750	580	630	719	1000	780	840	959	1200	1020
24	230	319	500	380	460	559	1000	620	690	779	1000	840	920	1039	1500	1100
26					500	599	1000	660	750	839	1200	900	1000	1119	1500	1180
28	270	359	750	420	540	639	1000	700	810	899	1200	960	1080	1199	1500	1260
30					580	679	1000	740	870	959	1200	1020	1160	1279	1500	1340
32	310	399	750	460	620	719	1000	780	930	1019	1500	1080	1240	1359	1750	1420
34					660	759	1000	820	990	1079	1500	1140	1320	1439	1750	1500
36	350	439	750	500	700	799	1000	860	1050	1139	1500	1200	1400	1519	1750	1580
38					740	839	1200	900	1110	1199	1500	1260	1480	1599	2000	1660
40	390	479	750	540	780	879	1200	940	1170	1259	1500	1320	1560	1679	2000	1740
42					820	919	1200	980	1230	1319	1750	1380	1640	1759	2000	1820
44	430	519	750	580	860	959	1200	1020	1290	1379	1750	1440	1720	1839		1900
46					900	999	1200	1060	1350	1439	1750	1500	1800	1919		1980
48	470	559	1000	620	940	1039	1500	1100	1410	1499	1750	1560	1880	1999		2060
50					980	1079	1500	1140	1470	1559	2000	1620	1960	2079		2140
52	510	599	1000	660	1020	1119	1500	1180	1530	1619	2000	1680	2040	2159		2220
54					1060	1159	1500	1220	1590	1679	2000	1740	2120	2239		2300
56	550	639	1000	700	1100	1199	1500	1260	1650	1739	2000	1800	2200	2319		2380
58					1140	1239	1500	1300	1710	1799	2000	1860	2280	2399		2460
60	590	679	1000	740	1180	1279	1500	1340	1770	1859		1920	2360	2479		2540
62					1220	1319	1750	1380	1830	1919		1980	2440	2559		2620
64	630	719	1000	780	1260	1359	1750	1420	1890	1979		2040	2520	2639		2700
66					1300	1399	1750	1460	1950	2039		2100	2600	2719		2780
68	670	759	1000	820	1340	1439	1750	1500	2010	2099		2160	2680	2799		2860
70					1380	1479	1750	1540	2070	2159		2220	2760	2879		2940
72	710	799	1000	860	1420	1519	1750	1580	2130	2219		2280	2840	2959		3020

Note: E series only provide the products with the specifications and models in yellow; double-armpipe length (L) is not more than1.5 m.

KS06 cascaded AOPD

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)



Compensation installation used for L setting

Compensation installation used for U setting

Series setting using compensation installation

There is spacing between direct series light curtains

Product introduction

KS06 cascaded AOPD can achieve 4 sets of light curtains in series, the total number of beams is up to 288; meanwhile, it can also realize “serial settings” with increased protection height, “L setting” and “U setting” with multi-sided protection, thus saving costs for users while simplifying installation and wiring space.
The 4 sets of light curtains of KS06 cascaded AOPD can share 1 set of controllers, and they are matched with CPSII controller, CPSIII controller, CQ2 controller or CQ3 controller.

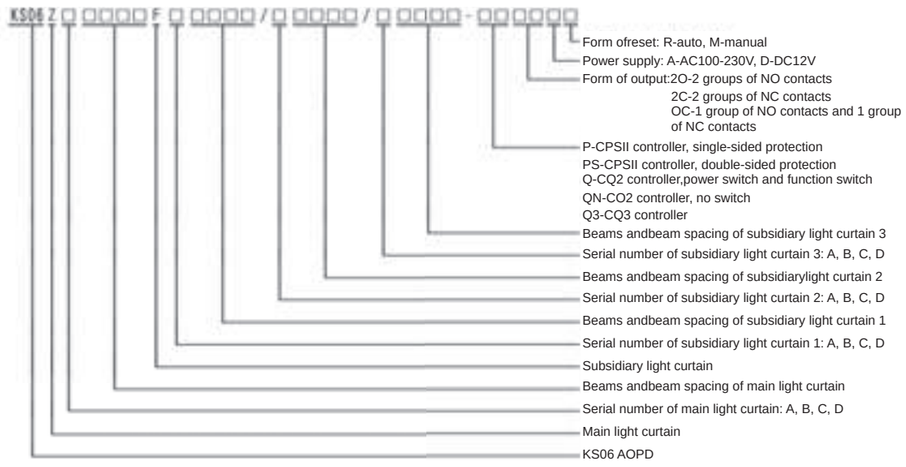
Product components

It is composed of controller, 1 set of main light curtain and 1 - 3 sets of subsidiary light screen, transmission cable, and power cable.

Product features

- It supports CQ3 controller and provides a total of 4 outputs, including 3 normally open outputs and 1 normally closed output;
- It can provide shunt instruction function, to intuitively display the On/OFF state of light beam;
- Multiple sets of light curtain share a controller, with simple wiring.

Specifications



Note: 1.CPSII / CQ2 controller provides two-way output in automatic reset mode; if you need to use other operating modes, please specifywhen ordering;
2. For the mounting bracket of AOPD, please specify when ordering.

Technical parameters

—Table 6—

Safety level	Type 4 (GB/T19436)		
Standards	GB/T19436.1; GB/T19436.2; GB4584-2007		
Optical characteristics			
Detection light source	Infrared LED (central wavelength of 940nm)		
Beam spacing	10mm	20mm	40mm
Detection capability	18mm	28mm	48mm
Number of beams	16, 20…72	8、12…72	4、6…72
Operatingrange	A: 0～3m, B: 0～6m, C: 0～12m, D: 8～20m (special custom-made)		
Protective height	Beam spacing × (number of beams-1)		
EAA	＜5°		
Environmental			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
Light interference resistance	Incandescent lamp	3000 Lux	
	Fluorescent light lamp	3000 Lux	
	Sun light source	10000 Lux	
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007	
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011	
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis;frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis	
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis	
IP code		IP65	
Dimensions		52×35×J1/J2mm (J1 is the length of emitter/ receiver of main light curtain; J2 is the length of emitter/ receiver of subsidiary light curtain)	
Electrical characteristics			
Power supply		DC12V±10%	
Consumption current	Emitter	≤300mA	
	Receiver	≤100mA	
Response time		It is ≤25ms when two sets of light curtain are connected; it is ≤38ms when three sets of light curtain are connected; it is ≤50ms when four sets of light curtain are connected; (whole machine, including the controller)	
Output characteristics		The square wave signal with a frequency of 4kHz is output during light transmitting	
Supporting controller		CPS Ⅱ/CPSⅢ/CQ2/CQ3	

Specifications of KS06 cascaded AOPD

(Unit: mm) —Table 7 —

Number of beams	Beam spacing: 10		Beam spacing: 20		Beam spacing: 40	
	Detection capability 18		Detection capability 28		Detection capability 48	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
4					KS06（）*0440	120
6					KS06（）*0640	200
8			KS06（）*0820	140	KS06（）*0840	280
10					KS06（）*1040	360
12			KS06（）*1220	220	KS06（）*1240	440
14					KS06（）*1440	520
16	KS06（）*1610	150	KS06（）*1620	300	KS06（）*1640	600
18					KS06（）*1840	680
20	KS06（）*2010	190	KS06（）*2020	380	KS06（）*2040	760
22					KS06（）*2240	840
24	KS06（）*2410	230	KS06（）*2420	460	KS06（）*2440	920
26					KS06（）*2640	1000
28	KS06（）*2810	270	KS06（）*2820	540	KS06（）*2840	1080
30					KS06（）*3040	1160
32	KS06（）*3210	310	KS06（）*3220	620	KS06（）*3240	1240
34					KS06（）*3440	1320
36	KS06（）*3610	350	KS06（）*3620	700	KS06（）*3640	1400
38					KS06（）*3840	1480
40	KS06（）*4010	390	KS06（）*4020	780	KS06（）*4040	1560
42					KS06（*） 4240	1640
44	KS06（）*4410	430	KS06（）*4420	860	KS06（*） 4440	1720
46					KS06（）*4640	1800
48	KS06（）*4810	470	KS06（）*4820	940	KS06（）*4840	1880
50					KS06（）*5040	1960
52	KS06（）*5210	510	KS06（）*5220	1020	KS06（）*5240	2040
54					KS06（）*5440	2120
56	KS06（）*5610	550	KS06（）*5620	1100	KS06（）*5640	2200
58					KS06（）*5840	2280
60	KS06（）*6010	590	KS06（）*6020	1180	KS06（*） 6040	2360
62					KS06（）*6240	2440
64	KS06（）*6410	630	KS06（）*6420	1260	KS06（）*6440	2520
66					KS06（）*6640	2600
68	KS06（）*6810	670	KS06（）*6820	1340	KS06（*） 6840	2680
70					KS06（）*7040	2760
72	KS06（）*7210	710	KS06（）*7220	1420	KS06（*） 7240	2840

Note: In the specifications and model, () represents the number of main / subsidiary light curtain, Z represents main light curtain, F1/F2/F3 represents the number of subsidiary light curtain; * representsoperating rangeserial length, 0~3m for A series, 0~6m for B series, 0~12m for C series and 8~20m for D series.

Dimensions of KS06 cascaded AOPD

H represents protection height, J represents the length of emitter / receiver, L represents steel pipe length,
C represents the length of scatter shield (unit: mm)

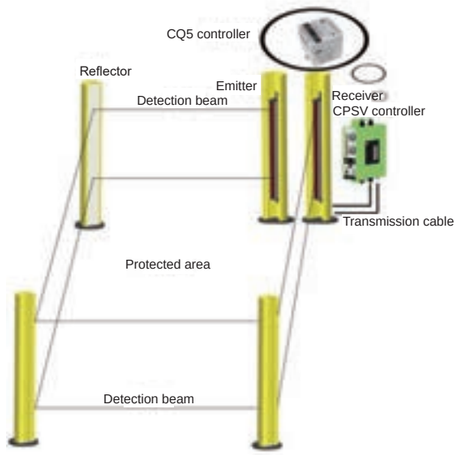
—Table8—

Number of beams	Beam spacing: 10					Beam spacing: 20					Beam spacing: 40				
	Detection capability 18					Detection capability 28					Detection capability 48				
	H	Main light curtain J1	Subsidiaryl ight curtain J2	L	C	H	Mainlight curtain J1	Subsidiary light curtain J2	L	C	H	Main light curtain J1	Subsidiaryli ght curtain J2	L	C
4											120	239	249	500	300
6											200	319	329	500	380
8						140	239	249	500	300	280	399	409	750	460
10											360	479	489	750	540
12						220	319	329	500	380	440	559	569	1000	620
14											520	639	649	1000	700
16	150	239	259	500	300	300	399	409	750	460	600	719	729	1000	780
18											680	799	809	1000	860
20	190	279	299	500	340	380	479	489	750	540	760	879	889	1200	940
22											840	959	969	1200	1020
24	230	319	339	500	380	460	559	569	1000	620	920	1039	1049	1500	1100
26											1000	1119	1129	1500	1180
28	270	359	379	750	420	540	639	649	1000	700	1080	1199	1209	1500	1260
30											1160	1279	1289	1500	1340
32	310	399	419	750	460	620	719	729	1000	780	1240	1359	1369	1750	1420
34											1320	1439	1449	1750	1500
36	350	439	459	750	500	700	799	809	1000	860	1400	1519	1529	1750	1580
38											1480	1599	1609	2000	1660
40	390	479	499	750	540	780	879	889	1200	940	1560	1679	1689	2000	1740
42											1640	1759	1769	2000	1820
44	430	519	539	750	580	860	959	969	1200	1020	1720	1839	1849		1900
46											1800	1919	1929		1980
48	470	559	579	1000	620	940	1039	1049	1500	1100	1880	1999	2009		2060
50											1960	2079	2089		2140
52	510	599	619	1000	660	1020	1119	1129	1500	1180	2040	2159	2169		2220
54											2120	2239	2249		2300
56	550	639	659	1000	700	1100	1199	1209	1500	1260	2200	2319	2329		2380
58											2280	2399	2409		2460
60	590	679	699	1000	740	1180	1279	1289	1500	1340	2360	2479	2489		2540
62											2440	2559	2569		2620
64	630	719	739	1000	780	1260	1359	1369	1750	1420	2520	2639	2649		2700
66											2600	2719	2729		2780
68	670	759	779	1000	820	1340	1439	1449	1750	1500	2680	2799	2809		
70											2760	2879	2889		
72	710	799	819	1000	860	1420	1519	1529	1750	1580	2840	2959	2969		

Note: The length of the scatter shield for thesubsidiary light curtain with beam spacing of 10mm is increased by 10mm; double-arm steel pipe (L) should not be more than 1.5m.

KS06Q area AOPD

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)



Product introduction

KS06Q area AOPD are divided into KS06QA series, KS06QB series and KS06QT series. Among them, KS06QT series is equipped with the specially customized light curtain which takes Class I laser as the detection beam. Detection beam is given out by the emitter and then received by receiver after being reflected by the reflector. The light that goes through emitter, receiver and reflector constitutes a protection zone.
KS06QA/KS06QBarea protective device can be installed at the CPSII controller outside the user's electrical cabinet or CQ2 controller inside the user's electrical cabinet.
KS06QTarea protective device can be installed at the CPSV controller outside the user's electrical cabinet or CQ5 controller inside the user's electrical cabinet. CPSV and CQ5 controllers are equipped with collimation switches to turn on the collimating beam of KS06T light curtain for on-site light debugging. They can provide users with two sets of relay contact signal.
The controller has two operating modes, namely automatic resetting and manual resetting. When the AOPD is used in area protection, it is recommended to use manual resetting operating mode.
Among them, CPSII/CPSV controller is equipped with detection button to detect the self-test function of system. In addition, double lock design is used for the function switch of CPSII / CPSV controller, to avoid the security risks caused by misoperation or lock switch failure.

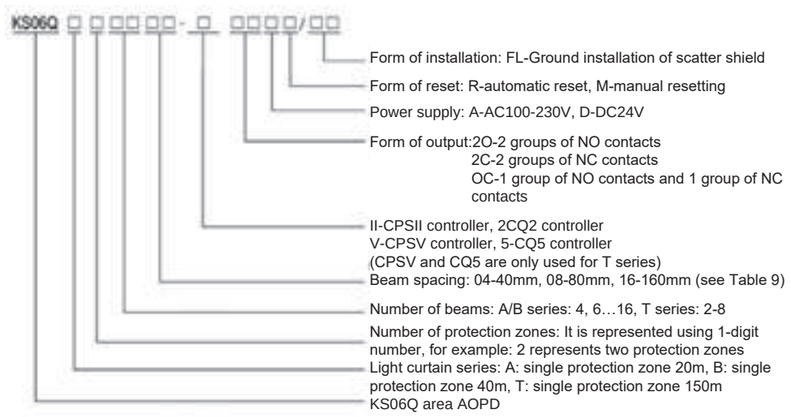
Product components

It is composed of controller, emitter, receiver, reflector, power cable and transmission cable.

Product features

- With long detection distance, it can achieve a variety of production, including single protection zone, two protection zones, three protection zones and four protection zones;
- Class 1 laser products are used for T series, which is safe to human eyes;
- It can provide 4-sidearea protection, so as to simplify wiring and save costs.
- With strong ability to resist electromagnetic interference and light interference.

Specificationof entire machine



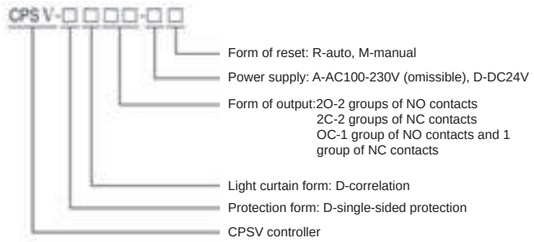
Technical parameters

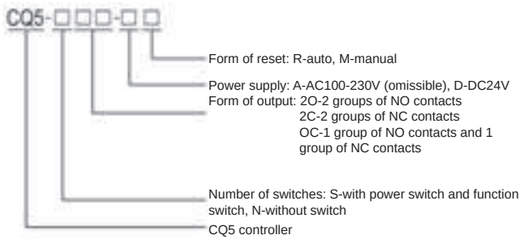
—Table 9—

Safety level	Type 4（GB/T19436）				
Standards	GB/T19436.1；GB/T19436.2；GB4584-2007				
Optical characteristics					
Light curtain series					Laser：KS06QT
Beam spacing	40mm	80mm	160mm	320mm	Minimum: 200mm, which can be increased by 50mm in proper order
Number of beams	4、6、8...16	4、6、8...16	4、5、6、7、8	3、4、5	2～8
Operating range	KS06QA: single protection zone: 20m; two protection zones: 14m; three protection zones: 10m; four protection zones: 8m KS06QB: single protection zone: 40m; two protection zones: 30m; three protection zones: 20m; four protection zones: 16m				KS06QT:single protection zone: 150m;two protection zones: 120m;three protection zones: 80m; four protection zones: 60m
Protective height	Beam spacing × (number of beams-1)				
EAA	＜5°				
Environmental characteristics					
Environment temperature	Operating	-10℃～55℃ (No frost or fog)			
	Storage	-40℃～70℃			
Environment humidity	Operating	35%RH～85%RH			
	Storage	35%RH～95%RH			
Light interference resistance	Incandescent lamp	3000 Lux			
	Fluorescent light lamp	3000 Lux			
	Sun light source	10000 Lux			
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007			
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011			
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis			
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis			
IPcode		IP65			
Electrical characteristics					
Power supply		DC12V±10%			
Consumption current	Emitter	≤300mA			
	Receiver	≤100mA			
Response time		≤20ms (whole machine, including the controller)			
Output characteristics		The square wave signal with a frequency of 4kHz is output during light transmitting			
Supporting controller		CPS Ⅱ、CPS Ⅲ、CQ2、CSRMC			CPSV、CQ5

* The beam spacing of KS06QA and KS06QB series can be customized: 40×N (N is an integer) .

Specificationsof controller



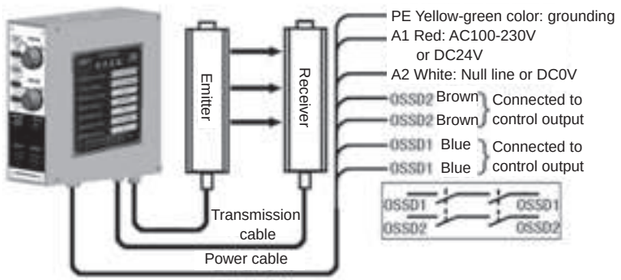


Technical parameters of controller

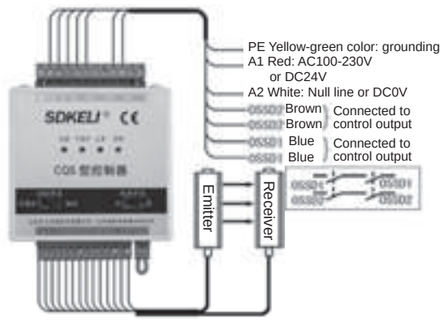
—Table10—

Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
IPcode		CPSV controller: IP54	CQ5 controller: IP20
Dimensions		CPSV controller: 216×82×215mm	CQ5 controller: 90×90×105mm
Electrical characteristics			
Power supply		AC100V～230V±15%, 50/60Hz	DC24V±10%
Power consumption		＜15W(entire machine)	
Output form		Relay contact output	
Output contact capacity		5A, AC250V/DC30V (Resistive load)	
Response time		≤ 20ms	
Insulation resistance		＞100MΩ	
Dielectric strength		AC1500V, No breakdown or flashover for 60s	
Relay life		≥ 10^6 times (Electrical life)	

Typical wiring diagram



CPS V



CQ5

Specifications of KS06Q area AOPD

(Unit: mm) —Table 11 —

Number of beams	KS06QA /KS06QB							
	Beam spacing: 40		Beam spacing: 80		Beam spacing: 160		Beam spacing: 320	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
3							KS06Q*0332	640
4	KS06Q*0404	120	KS06Q*0408	240	KS06Q*0416	480	KS06Q*0432	960
5					KS06Q*0516	640	KS06Q*0532	1280
6	KS06Q*0604	200	KS06Q*0608	400	KS06Q*0616	800		
7					KS06Q*0716	960		
8	KS06Q*0804	280	KS06Q*0808	560	KS06Q*0816	1120		
10	KS06Q*1004	360	KS06Q*1008	720				
12	KS06Q*1204	440	KS06Q*1208	880				
14	KS06Q*1404	520	KS06Q*1408	1040				
16	KS06Q*1604	600	KS06Q*1608	1200				

Note: In the specifications, * represents light curtain series and number of protection zones, and see Specificationsfor details.

Dimensions of KS06Q area AOPD

H represents protection height, J represents the length of emitter / receiver, L represents steel pipe length,
C represents the length of scatter shield (unit: mm)

(Unit: mm) —Table12—

Number of beams	KS06QA /KS06QB											
	Beam spacing: 40			Beam spacing: 80			Beam spacing: 160			Beam spacing: 320		
	H	J	L	H	J	L	H	J	L	H	J	L
3										640	1039	1200
4	120	239	400	240	399	560	480	719	880	960	1359	1520
5							640	879	1040	1280	1679	1840
6	200	319	480	400	559	720	800	1039	1200			
7							960	1199	1360			
8	280	399	560	560	719	880	1120	1359	1520			
10	360	479	640	720	879	1040						
12	440	559	720	880	1039	1200						
14	520	639	800	1040	1199	1360						
16	600	719	880	1200	1359	1520						

The minimum beam spacing of KS06TareaAOPD is 200mm, which can be increased by 50mm in proper order; meanwhile, 2-8 detection beams are provided.

T4 safety light curtain

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)

Product introduction

As the first safety Level 4 light curtain product that has passed TUV certification, it can be used to integrate the controller functions into the sensor. It is the safety light curtain provided to the device that does not require a controller but requires level signal control through risk assessment (eg, device controlled by PLC and computer) and it can output two-way safe PNP signals.

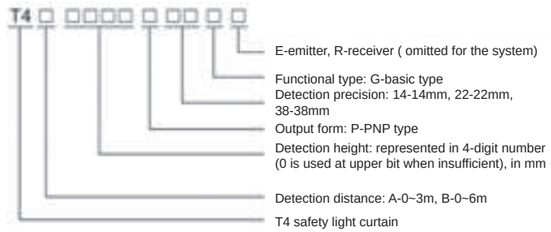
Product components

It is composed of emitter, receiver and transmission cable.

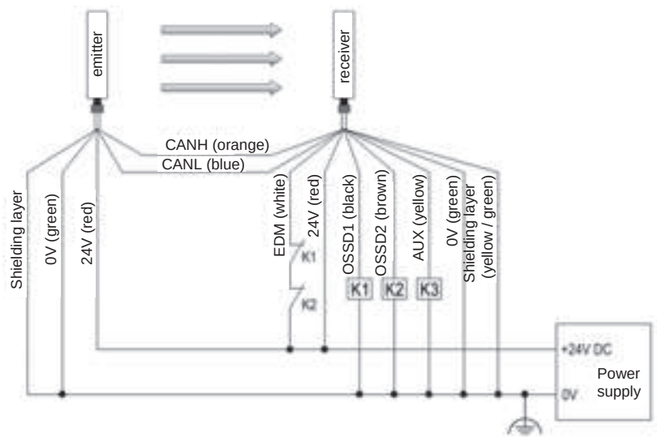
Product features:

- Dual independent OSSD output;
- External relay contact monitoring (EDM) function;
- Provide two-way PNP signal output, with higher safety performance;
- The detection capability is up to 14mm, suitable for protecting fingers;
- The maximum operating rangeis up to 6m;
- With good vibration damping performance, it is applicable to the presses with high speed and large or small tonnage, featuring a long service life;
- Output overload and short circuit protection;
- Infrared light communication and special optical system;
- The ability to resist light interference and electromagnetic interference is strong and the operating is more stable;

Specifications



Typical wiring diagram



Technical parameters

—Table 13—

Safety level	Type 4（IEC 61496-1/-2）		
Standards	2004/108/EC (EMC Command) 2006/42/EC (Mechanical Safety Command) EN/IEC 61496-1/-2 Type 4 ESPE EN/IEC 61326-1 ISO13855		
Optical characteristics			
Detection light source	Infrared LED (central wavelength of 850nm)		
Detection capability	14mm	22mm	38mm
Operating range	Type A: 0～3m	Type B: 0～6m	
Protective height	184～952mm		
EAA	Meet IEC61496-2 requirements; when the detection distance is above 3m, EAA＜2.5°		
Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
Light interference resistance	Incandescent lamp	3000 Lux	
	Fluorescent lamp	3000 Lux	
	Sun light source	10000 Lux	
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis	
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis	
IP code		IP65	
Dimensions		53×45×Jmm (J is the length of emitter/receiver)	
Electrical characteristics			
Power supply		DC24V±10% (ripple wave±5%)	
Consumption current (without load)	Emitter	≤200mA	
	Receiver	≤200mA	
Response time		14 ms～65 ms	
Safety output (OSSD)		PNP transistor output × 2 In ON state, load current: ≤200mA, output voltage: ≥Vcc-3V In OFF state, leakage current: ≤ 1mA, residual voltage: ≤ 1V (excluding the impact of lead extension) Capacitive load: ≤47000pF Inductive load: 2H at 4Hz, which can be increased when the frequency is reduced	
Auxiliary output (AUX)		Non-safety output, one way of PNP output, opposite to OSSD; in shading state, output current: ≤200mA, voltage: ≥Vcc-3V; in light transmitting state, output current: <2mA, voltage: <2V	
External device monitoring (EDM)		When connected to relay or contactor load, monitor the state of normally closed contact of load In ON state, input voltage: 9V ~ 24V In OFF state, input voltage: 0 ~ 7V or open circuit	

Specifications of T4 safety light curtain

(Unit: mm) —Table 14 —

Detection capability: 14			Detection capability: 22			Detection capability: 38		
Number of beams	Specifications	Protective height	Number of beams	Specifications	Protective height	Number of beams	Specifications	Protective height
24	T4 □ 0184P14G	184	12	T4 □ 0176P22G	176	6	T4 □ 0160P38G	160
32	T4 □ 0248P14G	248	16	T4 □ 0240P22G	240	8	T4 □ 0224P38G	224
40	T4 □ 0312P14G	312	20	T4 □ 0304P22G	304	10	T4 □ 0288P38G	288
48	T4 □ 0376P14G	376	24	T4 □ 0368P22G	368	12	T4 □ 0352P38G	352
56	T4 □ 0440P14G	440	28	T4 □ 0432P22G	432	14	T4 □ 0416P38G	416
64	T4 □ 0504P14G	504	32	T4 □ 0496P22G	496	16	T4 □ 0480P38G	480
72	T4 □ 0568P14G	568	36	T4 □ 0560P22G	560	18	T4 □ 0544P38G	544
80	T4 □ 0632P14G	632	40	T4 □ 0624P22G	624	20	T4 □ 0608P38G	608
88	T4 □ 0696P14G	696	44	T4 □ 0688P22G	688	22	T4 □ 0672P38G	672
96	T4 □ 0760P14G	760	48	T4 □ 0752P22G	752	24	T4 □ 0736P38G	736
104	T4 □ 0824P14G	824	52	T4 □ 0824P22G	816	26	T4 □ 0800P38G	800
112	T4 □ 0888P14G	888	56	T4 □ 0880P22G	880	28	T4 □ 0864P38G	864
120	T4 □ 0952P14G	952	60	T4 □ 0944P22G	944	30	T4 □ 0928P38G	928

Note: “□” represents the operating range of light curtain: the operating range of A series is 0～3m, and the operating range of B series is 0-6m.

Dimensions of T4 safety light curtain

H represents protection height, and J represents the length of emitter / receiver (Unit: mm) —Table 15—

Detection capability: 14			Detection capability: 22			Detection capability: 38		
Number of beams	H	J	Number of beams	H	J	Number of beams	H	J
24	184	300	12	176	300	6	160	300
32	248	364	16	240	364	8	224	364
40	312	428	20	304	428	10	288	428
48	376	492	24	368	492	12	352	492
56	440	556	28	432	556	14	416	556
64	504	620	32	496	620	16	480	620
72	568	684	36	560	684	18	544	684
80	632	748	40	624	748	20	608	748
88	696	812	44	688	812	22	672	812
96	760	876	48	752	876	24	736	876
104	824	940	52	816	940	26	800	940
112	888	1004	56	880	1004	28	864	1004
120	952	1068	60	944	1068	30	928	1068

KS06G safety light curtain

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)

Product introduction KS06G safety light curtain can be used to integrate the controller functions into the sensor. It is provided to the device that does not require a controller but requires level signal control through risk assessment (e.g., device controlled by PLC and computer) and it can output twochannels safe PNP or NPN signals.

Product components It is composed of emitter, receiver and transmission cable.

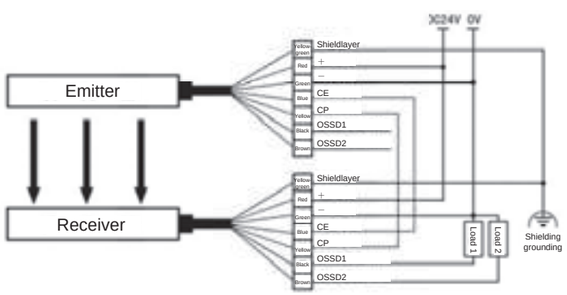
Specifications and model

KS06 □□□□□ G - □□ □ /□□

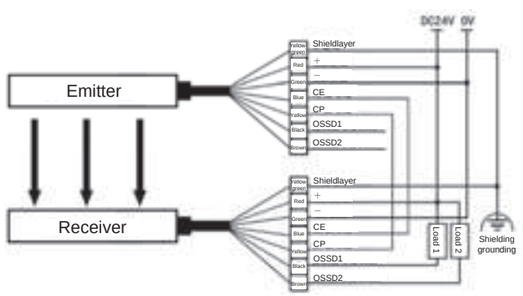
- Form of installation: See Page 64 for details
- T-transistorturns onwhenlight curtainis unblocked
Z-transistor turns on when light curtain is blocked
- Form of output: N-NPN output,
P-PNPoutput
- Number of output switches: 2-two-way output
- G-safety light curtain
- Beam spacing: 10-10mm, 20-20mm,
30-30mm, 40-40mm
- Number of beams: 04, 06, 08…72
- Operating range: A-0~3m, B-0~6m,
C-0~12m, D-8~20m
E-0~40m (see Note 1)
- KS06G safety light curtain

Note: 1: Number of beams of E light curtain: 04, 06, 08…40, Beam spacing: only 40mm;
Operating range: 0~40m for 4~16 beams, 0~30m for 18-40 beams

Typical wiring diagram



PNP output



NPN output

Note: The control signal wires OSSD1 and OSSD2 at the end of emitter are overhead.

Technical parameters

—Table 16—

Safety level	Type 4（GB/T19436）					
Standards	GB/T19436.1；GB/T19436.2；GB4584-2007					
Opticalcharacteristics						
Detection light source	Infrared LED (central wavelength of 940nm)					
Beam spacing	10mm	20mm	30mm	40mm		
Detection capability	18mm	28mm	38mm	48mm		
Number of beams	16、24 …72	8、10、12 …72	6、8、10 …72	4、6、8 …72	4、6、8 …16	18、20、22 …40
Operating range	Type A: 0～3m, Type B: 0～6m, Type C: 0～12m, Type D: 8～20m				Type E: 0～40m	Type E: 0～30m
Protective height	Beam spacing × (Number of beams-1)					
EAA	＜5°					
Environmental characteristics						
Environment temperature	Operating	-10 55 (No frost orcondensation fog)				
	Storage	-40 70				
Environment humidity	Operating	35%RH 85%RH				
	Storage	35%RH 95%RH				
Light interference resistance	Incandescent lamp	3000 Lux				
	Fluorescent lamp	3000 Lux				
	Sun light source	10000 Lux				
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007				
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011				
Vibration resistance	Frequency 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis					
Shock resistance	Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis					
IP code	IP65					
Dimensions	52×35×Jmm (J is the length of emitter/receiver)					
Electrical characteristics						
Power supply	DC24V±10%					
Consumption current	Emitter	≤300mA				
	Receiver	≤100mA (no load)				
Response time	≤20ms					
Output characteristics	NPN output	NPN transistor output × 2 (OSSDisinON-statewhenlight curtain is unblocked); load current ≤ 300mA;residual voltage≤3.5V (exceptforvoltagedropdue tocable extension)				
	PNP output	PNP transistor output × 2 (OSSD is in ON-state when light curtain is unblocked); load current ≤ 300mA;residual voltage≤4V (except for voltage drop due to cable extension)				
Supporting controller	Controller is not configured; or CSRMB module is configured to output the passive contact signal of relay					

Specifications of KS06G safety light curtain

(Unit: mm) —Table 17 —

Number of beams	Beam spacing 10		Beam spacing 20		Beam spacing 30		Beam spacing 40	
	Detection capability 18		Detectioncapability28		Detection capability 38		Detection capability 48	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
4							KS06*0440G2#T	120
6					KS06*0630G2#T	150	KS06*0640G2#T	200
8			KS06*0820G2#T	140	KS06*0830G2#T	210	KS06*0840G2#T	280
10			KS06*1020G2#T	180	KS06*1030G2#T	270	KS06*1040G2#T	360
12			KS06*1220G2#T	220	KS06*1230G2#T	330	KS06*1240G2#T	440
14			KS06*1420G2#T	260	KS06*1430G2#T	390	KS06*1440G2#T	520
16	KS06*1610G2#T	150	KS06*1620G2#T	300	KS06*1630G2#T	450	KS06*1640G2#T	600
18			KS06*1820G2#T	340	KS06*1830G2#T	510	KS06*1840G2#T	680
20	KS06*2010G2#T	190	KS06*2020G2#T	380	KS06*2030G2#T	570	KS06*2040G2#T	760
22			KS06*2220G2#T	420	KS06*2230G2#T	630	KS06*2240G2#T	840
24	KS06*2410G2#T	230	KS06*2420G2#T	460	KS06*2430G2#T	690	KS06*2440G2#T	920
26			KS06*2620G2#T	500	KS06*2630G2#T	750	KS06*2640G2#T	1000
28	KS06*2810G2#T	270	KS06*2820G2#T	540	KS06*2830G2#T	810	KS06*2840G2#T	1080
30			KS06*3020G2#T	580	KS06*3030G2#T	870	KS06*3040G2#T	1160
32	KS06*3210G2#T	310	KS06*3220G2#T	620	KS06*3230G2#T	930	KS06*3240G2#T	1240
34			KS06*3420G2#T	660	KS06*3430G2#T	990	KS06*3440G2#T	1320
36	KS06*3610G2#T	350	KS06*3620G2#T	700	KS06*3630G2#T	1050	KS06*3640G2#T	1400
38			KS06*3820G2#T	740	KS06*3830G2#T	1110	KS06*3840G2#T	1480
40	KS06*4010G2#T	390	KS06*4020G2#T	780	KS06*4030G2#T	1170	KS06*4040G2#T	1560
42			KS06*4220G2#T	820	KS06*4230G2#T	1230	KS06*4240G2#T	1640
44	KS06*4410G2#T	430	KS06*4420G2#T	860	KS06*4430G2#T	1290	KS06*4440G2#T	1720
46			KS06*4620G2#T	900	KS06*4630G2#T	1350	KS06*4640G2#T	1800
48	KS06*4810G2#T	470	KS06*4820G2#T	940	KS06*4830G2#T	1410	KS06*4840G2#T	1880
50			KS06*5020G2#T	980	KS06*5030G2#T	1470	KS06*5040G2#T	1960
52	KS06*5210G2#T	510	KS06*5220G2#T	1020	KS06*5230G2#T	1530	KS06*5240G2#T	2040
54			KS06*5420G2#T	1060	KS06*5430G2#T	1590	KS06*5440G2#T	2120
56	KS06*5610G2#T	550	KS06*5620G2#T	1100	KS06*5630G2#T	1650	KS06*5640G2#T	2200
58			KS06*5820G2#T	1140	KS06*5830G2#T	1710	KS06*5840G2#T	2280
60	KS06*6010G2#T	590	KS06*6020G2#T	1180	KS06*6030G2#T	1770	KS06*6040G2#T	2360
62			KS06*6220G2#T	1220	KS06*6230G2#T	1830	KS06*6240G2#T	2440
64	KS06*6410G2#T	630	KS06*6420G2#T	1260	KS06*6430G2#T	1890	KS06*6440G2#T	2520
66			KS06*6620G2#T	1300	KS06*6630G2#T	1950	KS06*6640G2#T	2600
68	KS06*6810G2#T	670	KS06*6820G2#T	1340	KS06*6830G2#T	2010	KS06*6840G2#T	2680
70			KS06*7020G2#T	1380	KS06*7030G2#T	2070	KS06*7040G2#T	2760
72	KS06*7210G2#T	710	KS06*7220G2#T	1420	KS06*7230G2#T	2130	KS06*7240G2#T	2840

Note: In the specifications, * represents operatingrange serial number, 0~3m for A series, 0~6m for B series, 0~12m for C series, 8~20m for D series, 0~40m (4~16 beams) / 0~30m (18~40 beams) for E series;
represents output form, P represents PNP output, N represents NPN output; E series only provides the products with the Specifications in yellow.

Dimensions of KS06G safety light curtain

H represents protection height, J represents the length of emitter /receiver, L represents steel pipe length, C represents the length of scatter shield (unit: mm)

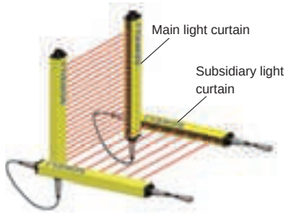
—Table 18 —

Number of beams	Beam spacing 10				Beam spacing 20				Beam spacing 30				Beam spacing 40			
	Detection capability 18				Detectioncapability28				Detection capability 38				Detection capability 48			
	H	J	L	C	H	J	L	C	H	J	L	C	H	J	L	C
4													120	239	500	300
6									150	239	500	300	200	319	500	380
8					140	239	500	300	210	299	500	360	280	399	750	460
10					180	279	500	340	270	359	750	420	360	479	750	540
12					220	319	500	380	330	419	750	480	440	559	1000	620
14					260	359	750	420	390	479	750	540	520	639	1000	700
16	150	239	500	300	300	399	750	460	450	539	750	600	600	719	1000	780
18					340	439	750	500	510	599	1000	660	680	799	1000	860
20	190	279	500	340	380	479	750	540	570	659	1000	720	760	879	1200	940
22					420	519	750	580	630	719	1000	780	840	959	1200	1020
24	230	319	500	380	460	559	1000	620	690	779	1000	840	920	1039	1500	1100
26					500	599	1000	660	750	839	1200	900	1000	1119	1500	1180
28	270	359	750	420	540	639	1000	700	810	899	1200	960	1080	1199	1500	1260
30					580	679	1000	740	870	959	1200	1020	1160	1279	1500	1340
32	310	399	750	460	620	719	1000	780	930	1019	1500	1080	1240	1359	1750	1420
34					660	759	1000	820	990	1079	1500	1140	1320	1439	1750	1500
36	350	439	750	500	700	799	1000	860	1050	1139	1500	1200	1400	1519	1750	1580
38					740	839	1200	900	1110	1199	1500	1260	1480	1599	2000	1660
40	390	479	750	540	780	879	1200	940	1170	1259	1500	1320	1560	1679	2000	1740
42					820	919	1200	980	1230	1319	1750	1380	1640	1759	2000	1820
44	430	519	750	580	860	959	1200	1020	1290	1379	1750	1440	1720	1839		1900
46					900	999	1200	1060	1350	1439	1750	1500	1800	1919		1980
48	470	559	1000	620	940	1039	1500	1100	1410	1499	1750	1560	1880	1999		2060
50					980	1079	1500	1140	1470	1559	2000	1620	1960	2079		2140
52	510	599	1000	660	1020	1119	1500	1180	1530	1619	2000	1680	2040	2159		2220
54					1060	1159	1500	1220	1590	1679	2000	1740	2120	2239		2300
56	550	639	1000	700	1100	1199	1500	1260	1650	1739	2000	1800	2200	2319		2380
58					1140	1239	1500	1300	1710	1799	2000	1860	2280	2399		2460
60	590	679	1000	740	1180	1279	1500	1340	1770	1859		1920	2360	2479		2540
62					1220	1319	1750	1380	1830	1919		1980	2440	2559		2620
64	630	719	1000	780	1260	1359	1750	1420	1890	1979		2040	2520	2639		2700
66					1300	1399	1750	1460	1950	2039		2100	2600	2719		2780
68	670	759	1000	820	1340	1439	1750	1500	2010	2099		2160	2680	2799		2860
70					1380	1479	1750	1540	2070	2159		2220	2760	2879		2940
72	710	799	1000	860	1420	1519	1750	1580	2130	2219		2280	2840	2959		3020

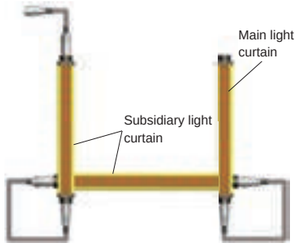
Note: E series only provides the products with the Specifications in yellow; the length of double-arm steel pipe (L) is not more than 1.5m.

KS06G cascaded safety light curtain

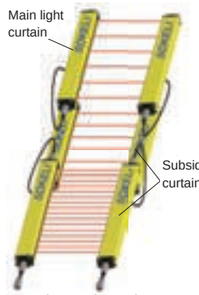
GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)



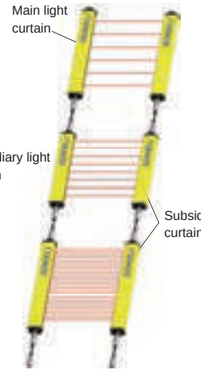
Compensation installation used for L setting



Compensation installation used for U setting



Series setting using compensation installation



There is spacing between direct series light curtains

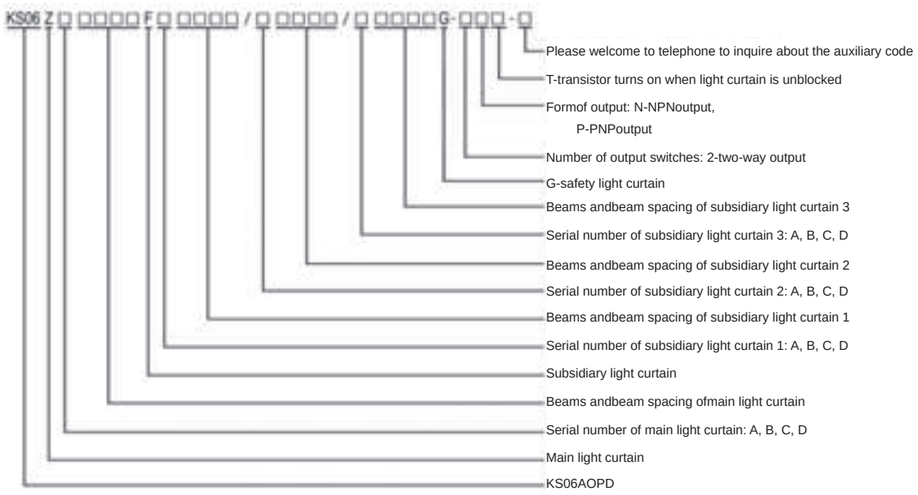
Product introduction

KS06G cascaded safety light curtain can achieve 4 sets of light curtains in series, the total number of beams is up to 288; meanwhile, it can also realize “serial settings” with increased protection height, “L setting” and “U setting” with multi-sided protection, thus saving costs for users while simplifying installation and wiring space.
After risk assessment, if a controller is not required and level signal control is required, KS06G cascaded safety light curtain can be used to integrate the controller functions into the sensor and directly output two-way safe PNP or NPN signals.

Product components

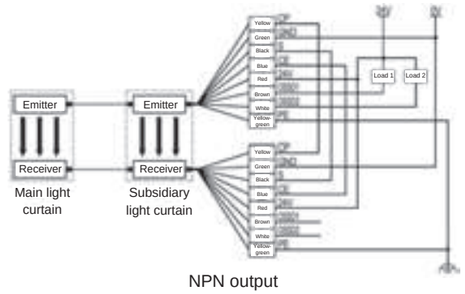
It is composed of 1 set of main light curtain, 1-3 sets of subsidiary light curtain and transmission cable.

Specifications and model

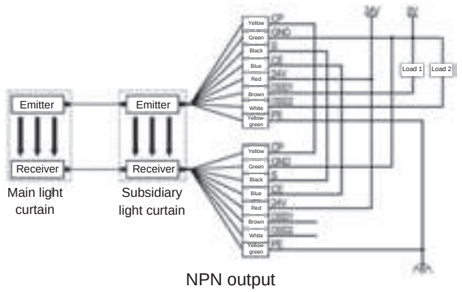


Note: Please specify the mounting brackets of safety light curtain when ordering.

Typical wiring diagram



NPN output



NPN output

Technical parameters

—Table19—

Safety level	Type 4（GB/T19436）		
Standards	GB/T19436:1 GB/T19436:2 GB4584-2007		
Optical characteristics			
Detection light source	Infrared LED (central wavelength of 940nm)		
Beam spacing	10mm	20mm	40mm
Detection capability	18mm	28mm	48mm
Number of beams	16、20…72	8、12…72	4、6…72
Operating range	A: 0～3m, B: 0～6m, C: 0～12m, D: 8～20m (specially customized)		
Protective height	Beam spacing × (Number of beams-1)		
EAA	＜5°		
Environmental characteristics			
Environment temperature	Operating	-10 55 (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
Light interference resistance	Incandescent lamp	3000 Lux	
	Fluorescent lamp	3000 Lux	
	Sun light source	10000 Lux	
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007	
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011	
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis	
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis	
IP code		IP65	
Dimensions		(J1 is the length of emitter/receiver ofmain light curtain; J2 is the length of emitter/receiver of subsidiarylight curtain)	
Electrical characteristics			
Power supply		DC24V±10%	
Consumption current	Emitter	≤300mA	
	Receiver	≤100mA	
Response time		≤20ms	
Output characteristics	PNP	Light-passing state: 300mA, DC20V～24V; light-shading state: OPEN, DC0V	
	NPN	Light-passing state: 300mA, DC0V～4V; light-shading state: OPEN,DC24V	

Specifications of KS06G cascaded safety light curtain

(Unit: mm) —Table 20 —

Number of beams	Beam spacing 10		Beam spacing 20		Beam spacing 40	
	Detection capability 18		Detectioncapability28		Detection capability 48	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
4					KS06（）*0440G2#T	120
6					KS06（）*0640G2#T	200
8			KS06（）*0820G2#T	140	KS06（）*0840G2#T	280
10					KS06（）*1040G2#T	360
12			KS06（）*1220G2#T	220	KS06（）*1240G2#T	440
14					KS06（）*1440G2#T	520
16	KS06（）*1610G2#T	150	KS06（）*1620G2#T	300	KS06（）*1640G2#T	600
18					KS06（）*1840G2#T	680
20	KS06（）*2010G2#T	190	KS06（）*2020G2#T	380	KS06（）*2040G2#T	760
22					KS06（）*2240G2#T	840
24	KS06（）*2410G2#T	230	KS06（）*2420G2#T	460	KS06（）*2440G2#T	920
26					KS06（）*2640G2#T	1000
28	KS06（）*2810G2#T	270	KS06（）*2820G2#T	540	KS06（）*2840G2#T	1080
30					KS06（）*3040G2#T	1160
32	KS06（）*3210G2#T	310	KS06（）*3220G2#T	620	KS06（）*3240G2#T	1240
34					KS06（）*3440G2#T	1320
36	KS06（）*3610G2#T	350	KS06（）*3620G2#T	700	KS06（）*3640G2#T	1400
38					KS06（）*3840G2#T	1480
40	KS06（）*4010G2#T	390	KS06（）*4020G2#T	780	KS06（）*4040G2#T	1560
42					KS06（）*4240G2#T	1640
44	KS06（）*4410G2#T	430	KS06（）*4420G2#T	860	KS06（）*4440G2#T	1720
46					KS06（）*4640G2#T	1800
48	KS06（）*4810G2#T	470	KS06（）*4820G2#T	940	KS06（）*4840G2#T	1880
50					KS06（）*5040G2#T	1960
52	KS06（）*5210G2#T	510	KS06（）*5220G2#T	1020	KS06（）*5240G2#T	2040
54					KS06（）*5440G2#T	2120
56	KS06（）*5610G2#T	550	KS06（）*5620G2#T	1100	KS06（）*5640G2#T	2200
58					KS06（）*5840G2#T	2280
60	KS06（）*6010G2#T	590	KS06（）*6020G2#T	1180	KS06（）*6040G2#T	2360
62					KS06（）*6240G2#T	2440
64	KS06（）*6410G2#T	630	KS06（）*6420G2#T	1260	KS06（）*6440G2#T	2520
66					KS06（）*6640G2#T	2600
68	KS06（）*6810G2#T	670	KS06（）*6820G2#T	1340	KS06（）*6840G2#T	2680
70					KS06（）*7040G2#T	2760
72	KS06（）*7210G2#T	710	KS06（）*7220G2#T	1420	KS06（）*7240G2#T	2840

Note: In the specifications, () represents the number of main / subsidiary light curtain, Z represents mainlight curtain, F1/F2/F3 represents the number of subsidiary light curtain; * represents operating rangeserial length, 0~3m for A series, 0~6m for B series, 0~12m for C series and 8~20m for D series.
represents output form, P represents PNP output, N represents NPN output. The yellow part shows that the cascaded safety light curtain does not provide the subsidiary light curtain with this specificationat the last level.

Dimensions of KS06G cascaded safety light curtain

H represents protection height, J represents the length of emitter /receiver, L represents steel pipe length, C represents the length of scatter shield (unit: mm)

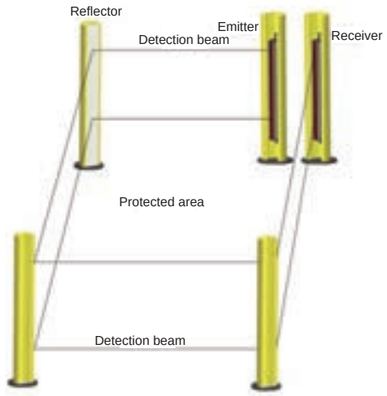
—Table 21—

Number of beams	Beam spacing 10					Beam spacing 20					Beam spacing 40				
	Detection capability 18					Detectioncapability28					Detection capability 48				
	H	Main light curtain J1	Subsidiarylight curtain J2	L	C	H	Main light curtain J1	Subsidiarylight curtain J2	L	C	H	Main light curtain J1	Subsidiarylight curtain J2	L	C
4											120	239	249	500	300
6											200	319	329	500	380
8						140	239	249	500	300	280	399	409	750	460
10											360	479	489	750	540
12						220	319	329	500	380	440	559	569	1000	620
14											520	639	649	1000	700
16	150	239	259	500	300	300	399	409	750	460	600	719	729	1000	780
18											680	799	809	1000	860
20	190	279	299	500	340	380	479	489	750	540	760	879	889	1200	940
22											840	959	969	1200	1020
24	230	319	339	500	380	460	559	569	1000	620	920	1039	1049	1500	1100
26											1000	1119	1129	1500	1180
28	270	359	379	750	420	540	639	649	1000	700	1080	1199	1209	1500	1260
30											1160	1279	1289	1500	1340
32	310	399	419	750	460	620	719	729	1000	780	1240	1359	1369	1750	1420
34											1320	1439	1449	1750	1500
36	350	439	459	750	500	700	799	809	1000	860	1400	1519	1529	1750	1580
38											1480	1599	1609	2000	1660
40	390	479	499	750	540	780	879	889	1200	940	1560	1679	1689	2000	1740
42											1640	1759	1769	2000	1820
44	430	519	539	750	580	860	959	969	1200	1020	1720	1839	1849		1900
46											1800	1919	1929		1980
48	470	559	579	1000	620	940	1039	1049	1500	1100	1880	1999	2009		2060
50											1960	2079	2089		2140
52	510	599	619	1000	660	1020	1119	1129	1500	1180	2040	2159	2169		2220
54											2120	2239	2249		2300
56	550	639	659	1000	700	1100	1199	1209	1500	1260	2200	2319	2329		2380
58											2280	2399	2409		2460
60	590	679	699	1000	740	1180	1279	1289	1500	1340	2360	2479	2489		2540
62											2440	2559	2569		2620
64	630	719	739	1000	780	1260	1359	1369	1750	1420	2520	2639	2649		2700
66											2600	2719	2729		2780
68	670	759	779	1000	820	1340	1439	1449	1750	1500	2680	2799	2809		
70											2760	2879	2889		
72	710	799	819	1000	860	1420	1519	1529	1750	1580	2840	2959	2969		

Note: The yellow part shows that the cascaded safety light curtain does not provide the subsidiary light curtain with this specificationat the last level; the length of scatter shield for the subsidiary light curtain with anBeam spacing of 10mm is increased by10mm; the length of double-arm steel pipe (L) is not more than 1.5m.

KS06 Qarea protective safety light curtain

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)



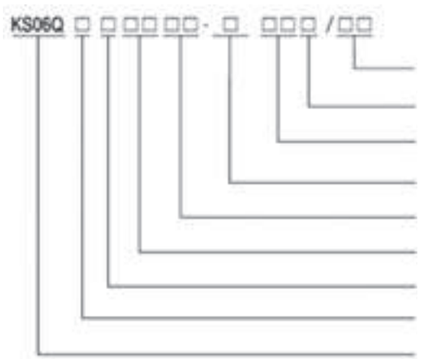
Product introduction KS06Qarea protective safety light curtain are divided into KS06QA series and KS06QB series. KS06Qarea safety light curtain does not require controller, and it can provide two ways of PNP or NPN transistor output signal.

Product components It is composed of emitter, receiver, reflector, and transmission cable.

Product features

- With long detection distance, it can achieve a variety of production, including single protection zone, two protection zones, three protection zones and four protection zones;
- Protective distance for single protection zone: -20 m for A series and -40 m for B series;
- It can provide 4-sided area protection, so as to simplify wiring and save costs.
- With strong ability to resist electromagnetic interference and light interference.

Specifications of complete machine



Formof installation: FL-Ground installation of scatter shield

T-transistor turns onwhenlightcurtainisunblocked

Form ofoutput:2N-2channels NPN output
2P-2channels PNP output

G-safety light curtain

Beamspacing: 04-40mm, 08-80mm, 16-160mm (see Table 22)

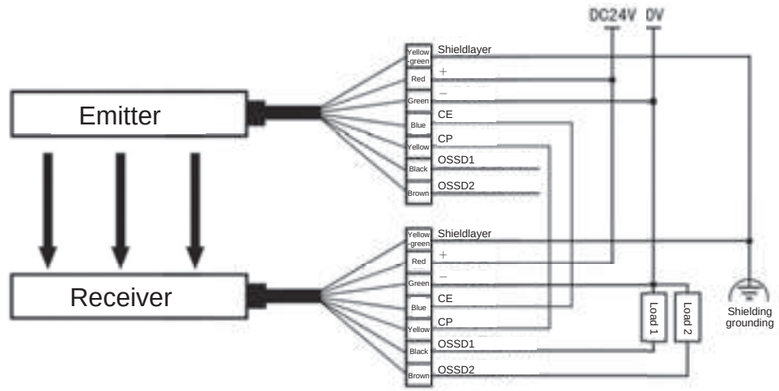
Number of beams: 4, 6…16

Number of protection zones: It is represented using 1-digit number, for example: 2 represents two protection zones

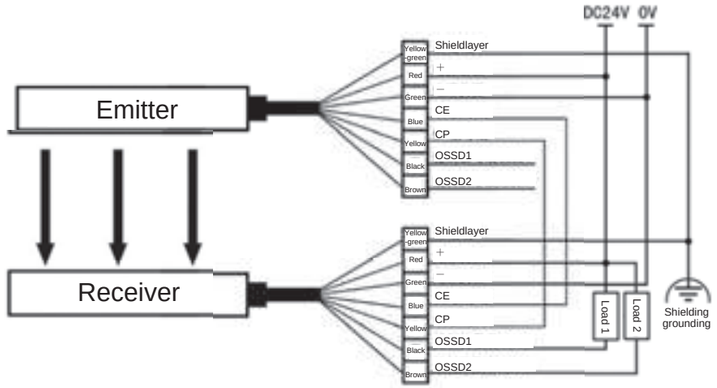
Light curtain series: A: single protection zone 20m, B: single protection zone 40m

KS06Qarea protective safety light curtain

Typical wiring diagram



PNP output



NPN output

Note: The control signal wires OSSD1 and OSSD2 at the end of emitter are overhead.

Technical parameters

—Table 22—

Safety level	Type 4（GB/T19436）			
Standards	GB/T19436.1；GB/T19436.2；GB4584-2007			
Optical characteristics				
Light curtain series	KS06QA、KS06QB			
Beamspacing	40mm	80mm	160mm	320mm
Number of beams	4、6、8…16	4、6、8…16	4、5、6、7、8	3、4、5
Operating range	KS06QA: single protection zone: 20m; two protection zones: 14m; three protection zones: 10m; four protection zones: 8m KS06QB: single protection zone: 40m; two protection zones: 30m; three protection zones: 20m; four protection zones:16m			
Protective height	Beam spacing × (Number of beams-1)			
EAA	＜5°			
Environmental characteristics				
Environment temperature	Operating	-10 55 (No frost or fog)		
	Storage	-40℃～70℃		
Environment humidity	Operating	35%RH～85%RH		
	Storage	35%RH～95%RH		
Light interference resistance	Incandescent lamp	3000 Lux		
	Fluorescentlamp	3000 Lux		
	Sun light source	10000 Lux		
EMC	EMS	Meet the requirements for Type 4 safety light curtain in GB/T19436-1 and GB4584-2007		
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011		
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis		
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis		
IP code		IP65		
Electrical characteristics				
Power supply		DC24V±10%		
Consumption current	Emitter	≤300mA		
	Receiver	≤100mA (without load)		
Response time		≤20ms		
Output characteristics	NPN output	NPN transistor output × 2 (OSSD is in ON-state when light curtain is unblocked); load current ≤300mA; residual voltage≤3.5V (except for voltage drop due to cable extension)		
	PNP output	PNP transistor output × 2 (OSSD is in ON-state when light curtain is unblocked); load current ≤300mA; residual voltage≤4V (except for voltage drop due to cable extension)		
Supporting controller		Controller is not configured; or CSRMB module is configured to output the passive contact signal of relay		

Specifications of KS06Q area protective safety light curtain

(Unit: mm) —Table 23 —

Number of beams	KS06QA /KS06QB							
	Beam spacing 40		Beam spacing 80		Beam spacing 160		Beam spacing 320	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
3							KS06Q*0332G2#T	640
4	KS06Q*0404G2#T	120	KS06Q*0408G2#T	240	KS06Q*0416G2#T	480	KS06Q*0432G2#T	960
5					KS06Q*0516G2#T	640	KS06Q*0532G2#T	1280
6	KS06Q*0604G2#T	200	KS06Q*0608G2#T	400	KS06Q*0616G2#T	800		
7					KS06Q*0716G2#T	960		
8	KS06Q*0804G2#T	280	KS06Q*0808G2#T	560	KS06Q*0816G2#T	1120		
10	KS06Q*1004G2#T	360	KS06Q*1008G2#T	720				
12	KS06Q*1204G2#T	440	KS06Q*1208G2#T	880				
14	KS06Q*1404G2#T	520	KS06Q*1408G2#T	1040				
16	KS06Q*1604G2#T	600	KS06Q*1608G2#T	1200				

Note: In the specifications, * represents light curtain series and number of protection zones, see the specification ofthe entire machine for details.
represents the output form, P represents PNP output, and N represents NPN output.

Dimensions of KS06Q area protective safety light curtain

H represents protection height, J represents the length of emitter /receiver, L represents the length of floorscatter shield(unit: mm) —Table 24—

Number of beams	KS06QA/KS06QB											
	Beam spacing 40			Beam spacing 80			Beam spacing 160			Beam spacing 320		
	H	J	L	H	J	L	H	J	L	H	J	L
3										640	1039	1200
4	120	239	400	240	399	560	480	719	880	960	1359	1520
5							640	879	1040	1280	1679	1840
6	200	319	480	400	559	720	800	1039	1200			
7							960	1199	1360			
8	280	399	560	560	719	880	1120	1359	1520			
10	360	479	640	720	879	1040						
12	440	559	720	880	1039	1200						
14	520	639	800	1040	1199	1360						
16	600	719	880	1200	1359	1520						

KS06M safety light curtain

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)

Product introduction

KS06M safety light curtain is designed for personal safety and protection, and the product meets the requirements of GB / T 19436.1, GB / T 19436.2 and GB4584-2007. It features high security, small size, no dead zone for detection and high detection capability (it can be up to 14mm for finger protection). It is applicable to the personal safety protection in the automation field and at hazardous machinery processing site.

KS06M safety light curtain can provide protection to the hazardous areas which are 3m, 6m and 9m away from it, and the user can choose the appropriate light curtain specifications according to the actual table.

KS06M safety light curtain provides two ways of PNP and NPN control signals, and it can be used with CSRMB safety relay module when relay signal is required at the user site for control.

Product components

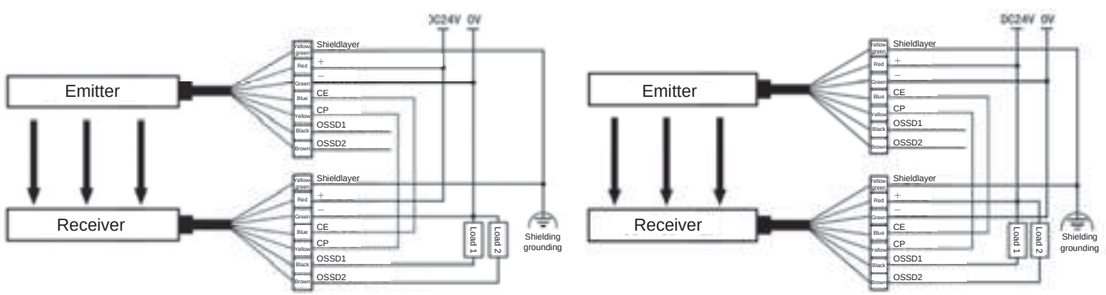
It is composed of emitter, receiver, and transmission cable.

Specifications and model

KS06M □ □□ □□ G 2 □ T /□□

- Formof installation: See Page 64 for details
- T-transistorturns onwhenlight curtainis unblocked
- Formofoutput: N-NPNoutput, P-PNPoutput
- 2channels outputs
- G-basic function
- Beam spacing: 10-10mm, 15-15mm, 25-25mm, 35-35mm
- Number of beams: 06, 08…72
- Operating: A-0~3m, B-0~6m, C-2-9m
- KS06M safety light curtain

Typical wiring diagram



PNP output NPN output

Note: The control signal wires OSSD1 and OSSD2 at the end of emitter are overhead.

Technical parameters

—Table 25—

Safety level	Type 4（GB/T19436）			
Standards	GB/T19436.1；GB/T19436.2；GB4584-2007			
Opticalcharacteristics				
Detection light source	Infrared LED (central wavelength of 850nm)			
Beam spacing	10mm	15mm	25mm	35mm
Detection capability	14mm	20mm	30mm	40mm
Number of beams	16、20、24…72	12、14、16…72	8、10、12…72	6、8、10…72
Operating range	A: 0～3m, B: 0～6m, C: 2～9m (specially customized)			
Protective height	Beam spacing × (Number of beams-1)			
EAA	＜5°			
Environmental characteristics				
Environment temperature	Operating	-10℃～55℃ (No frost or fog)		
	Storage	-40℃～70℃		
Environment humidity	Operating	35%RH～85%RH		
	Storage	35%RH～95%RH		
Light interference resistance	Incandescent lamp	3000 Lux		
	Fluorescent lamp	3000 Lux		
	Sun light source	10000 Lux		
EMC	EMS	Meet the requirements for Type 4 safety light curtain in GB/T19436-1 and GB4584-2007		
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011		
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis		
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis		
IP code		IP65		
Dimensions		25×30×Jmm (J is the length of emitter/receiver)		
Electrical characteristics				
Power supply		DC24V±10%		
Consumption current	Emitter	≤120mA		
	Receiver	≤120mA		
Response time		≤10ms		
Output characteristics	NPN output	NPN transistor output×2;transistor turnsonwhen light curtan is unblocked, load capacity≤ 200mA, output voltage≤ 4V. Transistor turns offwhen light curtan is blocked, output voltage≥VCC－1V, leakage current<2mA.		
	PNP output	PNP transistor output×2; transistor turns on when light curtan is unblocked,load capacity≤200mA, output voltage≥VCC－4V.Transistor turns off when light curtan is blocked, output voltage≤ 1V,leakage current<2mA.		
Supporting controller		Dynamical self-test		

Specifications of KS06M safety light curtain

(Unit: mm) —Table 26 —

Number of beams	Beam spacing 10		Beam spacing 15		Beam spacing 25		Beam spacing 35	
	Detection capability 14		Detection capability 20		Detection capability 30		Detection capability 40	
	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height	Specifications	Protective height
6							KS06M*0635G2#T	175
8					KS06M*0825G2#T	175	KS06M*0835G2#T	245
10					KS06M*1025G2#T	225	KS06M*1035G2#T	315
12			KS06M*1215G2#T	165	KS06M*1225G2#T	275	KS06M*1235G2#T	385
14			KS06M*1415G2#T	195	KS06M*1425G2#T	325	KS06M*1435G2#T	455
16	KS06M*1610G2#T	150	KS06M*1615G2#T	225	KS06M*1625G2#T	375	KS06M*1635G2#T	525
18			KS06M*1815G2#T	255	KS06M*1825G2#T	425	KS06M*1835G2#T	595
20	KS06M*2010G2#T	190	KS06M*2015G2#T	285	KS06M*2025G2#T	475	KS06M*2035G2#T	665
22			KS06M*2215G2#T	315	KS06M*2225G2#T	525	KS06M*2235G2#T	735
24	KS06M*2410G2#T	230	KS06M*2415G2#T	345	KS06M*2425G2#T	575	KS06M*2435G2#T	805
26			KS06M*2615G2#T	375	KS06M*2625G2#T	625	KS06M*2635G2#T	875
28	KS06M*2810G2#T	270	KS06M*2815G2#T	405	KS06M*2825G2#T	675	KS06M*2835G2#T	945
30			KS06M*3015G2#T	435	KS06M*3025G2#T	725	KS06M*3035G2#T	1015
32	KS06M*3210G2#T	310	KS06M*3215G2#T	465	KS06M*3225G2#T	775	KS06M*3235G2#T	1085
34			KS06M*3415G2#T	495	KS06M*3425G2#T	825	KS06M*3435G2#T	1155
36	KS06M*3610G2#T	350	KS06M*3615G2#T	525	KS06M*3625G2#T	875	KS06M*3635G2#T	1225
38			KS06M*3815G2#T	555	KS06M*3825G2#T	925	KS06M*3835G2#T	1295
40	KS06M*4010G2#T	390	KS06M*4015G2#T	585	KS06M*4025G2#T	975	KS06M*4035G2#T	1365
42			KS06M*4215G2#T	615	KS06M*4225G2#T	1025	KS06M*4235G2#T	1435
44	KS06M*4410G2#T	430	KS06M*4415G2#T	645	KS06M*4425G2#T	1075	KS06M*4435G2#T	1505
46			KS06M*4615G2#T	675	KS06M*4625G2#T	1125	KS06M*4635G2#T	1575
48	KS06M*4810G2#T	470	KS06M*4815G2#T	705	KS06M*4825G2#T	1175	KS06M*4835G2#T	1645
50			KS06M*5015G2#T	735	KS06M*5025G2#T	1225	KS06M*5035G2#T	1715
52	KS06M*5210G2#T	510	KS06M*5215G2#T	765	KS06M*5225G2#T	1275	KS06M*5235G2#T	1785
54			KS06M*5415G2#T	795	KS06M*5425G2#T	1325	KS06M*5435G2#T	1855
56	KS06M*5610G2#T	550	KS06M*5615G2#T	825	KS06M*5625G2#T	1375	KS06M*5635G2#T	1925
58			KS06M*5815G2#T	855	KS06M*5825G2#T	1425	KS06M*5835G2#T	1995
60	KS06M*6010G2#T	590	KS06M*6015G2#T	885	KS06M*6025G2#T	1475	KS06M*6035G2#T	2065
62			KS06M*6215G2#T	915	KS06M*6225G2#T	1525	KS06M*6235G2#T	2135
64	KS06M*6410G2#T	630	KS06M*6415G2#T	945	KS06M*6425G2#T	1575	KS06M*6435G2#T	2205
66			KS06M*6615G2#T	975	KS06M*6625G2#T	1625	KS06M*6635G2#T	2275
68	KS06M*6810G2#T	670	KS06M*6815G2#T	1005	KS06M*6825G2#T	1675	KS06M*6835G2#T	2345
70			KS06M*7015G2#T	1035	KS06M*7025G2#T	1725	KS06M*7035G2#T	2415
72	KS06M*7210G2#T	710	KS06M*7215G2#T	1065	KS06M*7225G2#T	1775	KS06M*7235G2#T	2485

Note: * represents the operating range of light curtain. The operating range of A series is 0～3m, the operating range of B series is 0～6m, and the operating range of C series is 2～9m;
represents output mode, P represents PNP output, and N represents NPN output.

Dimensions of KS06M safety light curtain

H represents protection height, J represents the length of emitter /receiver, L represents bracket steel pipe length (unit: mm) —Table 27—

Number of beams	Beam spacing 10			Beam spacing 15			Beam spacing 25			Beam spacing 35		
	Detection capability 14			Detection capability 20			Detection capability 30			Detection capability 40		
	H	J	L	H	J	L	H	J	L	H	J	L
6										175	190	500
8							175	190	500	245	260	500
10							225	240	500	315	330	500
12				165	180	500	275	290	500	385	400	750
14				195	210	500	325	340	750	455	470	750
16	150	165	500	225	240	500	375	390	750	525	540	750
18				255	270	500	425	440	750	595	610	1000
20	190	205	500	285	300	500	475	490	750	665	680	1000
22				315	330	500	525	540	750	735	750	1000
24	230	245	500	345	360	750	575	590	1000	805	820	1000
26				375	390	750	625	640	1000	875	890	1200
28	270	285	500	405	420	750	675	690	1000	945	960	1200
30				435	450	750	725	740	1000	1015	1030	1200
32	310	325	500	465	480	750	775	790	1000	1085	1100	1500
34				495	510	750	825	840	1200	1155	1170	1500
36	350	365	750	525	540	750	875	890	1200	1225	1240	1500
38				555	570	750	925	940	1200	1295	1310	1500
40	390	405	750	585	600	1000	975	990	1200	1365	1380	1750
42				615	630	1000	1025	1040	1500	1435	1450	1750
44	430	445	750	645	660	1000	1075	1090	1500	1505	1520	1750
46				675	690	1000	1125	1140	1500	1575	1590	2000
48	470	485	750	705	720	1000	1175	1190	1500	1645	1660	2000
50				735	750	1000	1225	1240	1500	1715	1730	2000
52	510	525	750	765	780	1000	1275	1290	1500	1785	1800	2000
54				795	810	1000	1325	1340	1750	1855	1870	
56	550	565	750	825	840	1200	1375	1390	1750	1925	1940	
58				855	870	1200	1425	1440	1750	1995	2010	
60	590	605	1000	885	900	1200	1475	1490	1750	2065	2080	
62				915	930	1200	1525	1540	1750	2135	2150	
64	630	645	1000	945	960	1200	1575	1590	2000	2205	2220	
66				975	990	1200	1625	1640	2000	2275	2290	
68	670	685	1000	1005	1020	1200	1675	1690	2000	2345	2360	
70				1035	1050	1500	1725	1740	2000	2415	2430	
72	710	725	1000	1065	1080	1500	1775	1790	2000	2485	2500	

LCS Illight curtain

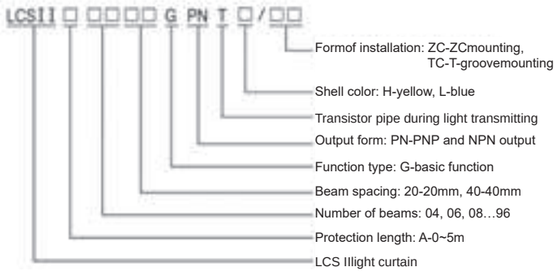
Product introduction LCS Illight curtain is designed for the automation field, with small size, compact structure and strong anti-interference ability, and the product meets IEC 61496-1 and IEC 61496-2 standards.

Product features

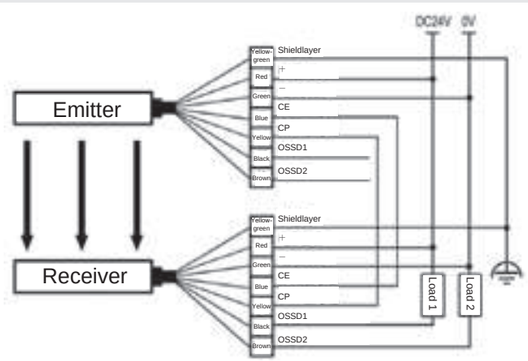
- High-security miniaturized light curtain is researched and developed using TUV-proven light curtain technology platform;
- High-reliability miniaturized light curtain has small size and internal skeleton support, so the structure is stable and reliable;
- Miniaturized light curtain features high cost performance, superior performance and high reliability and low cost;
- CAN bus communication is used to ensure the security and anti-interference ability of system;
- It is equipped with NPN and PNP integrated output to achieve flexible wiring and easy field applications;
- It is equipped with end cap integrated status indication to clearly identify theoperating status of light curtain from a far distance;
- Small size, nice structure, and flexible installation (front-mounted, side-mounted and T-slot installation);
- Flexible cable swinging output mode is used, which can save mounting space.

Product components It is composed of emitter, receiver and transmission cable.

Specifications



Typical wiring diagram



Technical parameters

—Table 28—

Optical characteristics		
Detection light source	Infrared LED (central wavelength of 850nm)	
Beam spacing	20mm	40mm
Detection capability	30mm	50mm
Number of beams	8、12、16…96	4、6、8…48
Operating range	0～5m	
Protective height	20 spacing: 20× (Number of beams-1) Unit: mm	
	40 spacing: 40× (Number of beams-1)+20 Unit: mm	
EAA	＜5°	
Environmental characteristics		
Environment temperature	Operating	-10℃～55℃ (No frost or fog)
	Storage	-40℃～70℃
Environment humidity	Operating	35%RH～85%RH
	Storage	35%RH～95%RH
Light interference resistance		10000 Lux
EMC		Meet Type 4 light curtain standards
Vibration resistance		Frequency: 10Hz～55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis
IP code		IP54
Dimensions		26.5×30×Jmm (J is the length of emitter/receiver)
Electrical characteristics		
Power supply		DC24V±10%
Consumption current	Emitter	≤30mA
	Receiver	≤80mA (No-load)
Response time		8.4～84ms (With the progressive increase of protection height, the response time is increased)
Output characteristics	NPN output	NPN transistor output;transistor turns on when light curtan is unblocked, load capacity≤ 200mA, output voltage≤ 2V. Transistor turns off when light curtan is blocked, output voltage≥VCC－2V.
	PNP output	PNP transistor output; transistor turns on when light curtan is unblocked,load capacity≤200mA, output voltage≥VCC－2V.Transistor turns off when light curtan is blocked, output voltage≤2V.

Specifications of LCS Illight curtain

(Unit: mm) —Table 29 —

Beam spacing 20			Beam spacing 40		
Detection capability 30			Detection capability 50		
Number of beams	Specifications	Protective height	Number of beams	Specifications	Protective height
8	LCSIIA0820GPNT	140	4	LCSIIA0440GPNT	140
12	LCSIIA1220GPNT	220	6	LCSIIA0640GPNT	220
16	LCSIIA1620GPNT	300	8	LCSIIA0840GPNT	300
20	LCSIIA2020GPNT	380	10	LCSIIA1040GPNT	380
24	LCSIIA2420GPNT	460	12	LCSIIA1240GPNT	460
28	LCSIIA2820GPNT	540	14	LCSIIA1440GPNT	540
32	LCSIIA3220GPNT	620	16	LCSIIA1640GPNT	620
36	LCSIIA3620GPNT	700	18	LCSIIA1840GPNT	700
40	LCSIIA4020GPNT	780	20	LCSIIA2040GPNT	780
44	LCSIIA4420GPNT	860	22	LCSIIA2240GPNT	860
48	LCSIIA4820GPNT	940	24	LCSIIA2440GPNT	940
52	LCSIIA5220GPNT	1020	26	LCSIIA2640GPNT	1020
56	LCSIIA5620GPNT	1100	28	LCSIIA2840GPNT	1100
60	LCSIIA6020GPNT	1180	30	LCSIIA3040GPNT	1180
64	LCSIIA6420GPNT	1260	32	LCSIIA3240GPNT	1260
68	LCSIIA6820GPNT	1340	34	LCSIIA3440GPNT	1340
72	LCSIIA7220GPNT	1420	36	LCSIIA3640GPNT	1420
86	LCSIIA7620GPNT	1500	38	LCSIIA3840GPNT	1500
80	LCSIIA8020GPNT	1580	40	LCSIIA4040GPNT	1580
84	LCSIIA8420GPNT	1660	42	LCSIIA4240GPNT	1660
88	LCSIIA8820GPNT	1740	44	LCSIIA4440GPNT	1740
92	LCSIIA9220GPNT	1820	46	LCSIIA4640GPNT	1820
96	LCSIIA9620GPNT	1900	48	LCSIIA4840GPNT	1900

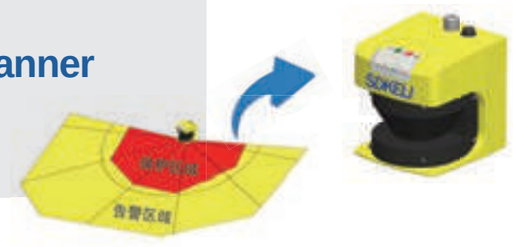
Dimensions of LCS Illight curtain

H represents protection height, J represents the length of emitter /receiver (unit: mm) —Table 30—

Beam spacing 20			Beam spacing 40		
Detection capability 30			Detection capability 50		
Number of beams	H	J	Number of beams	H	J
8	140	190	4	140	190
12	220	270	6	220	270
16	300	350	8	300	350
20	380	430	10	380	430
24	460	510	12	460	510
28	540	590	14	540	590
32	620	670	16	620	670
36	700	750	18	700	750
40	780	830	20	780	830
44	860	910	22	860	910
48	940	990	24	940	990
52	1020	1070	26	1020	1070
56	1100	1150	28	1100	1150
60	1180	1230	30	1180	1230
64	1260	1310	32	1260	1310
68	1340	1390	34	1340	1390
72	1420	1470	36	1420	1470
86	1500	1550	38	1500	1550
80	1580	1630	40	1580	1630
84	1660	1710	42	1660	1710
88	1740	1790	44	1740	1790
92	1820	1870	46	1820	1870
96	1900	1950	48	1900	1950

LSPD safety laser scanner

IEC 61496-1 (Type 3)
IEC 61496-3 (Type 3)
ISO 13849-1 (PLd)

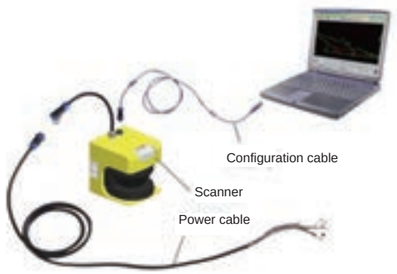


Product introduction

LSPD safety laser scanner is designed based on optical two-dimensional scanning and laser ranging principle to realize the two-dimensional zone protection with a maximum radius of 15m and angle of 190°. The protection zones of scanner include protection zones and alarming zones. The maximum radiuses of protection zones are divided into four models, namely 4m, 5m, 6m and 7m, so as to reliably detect the dark black objects with a reflectivity of as low as 1.8%; the maximum radius of alarming zone is 15m, so as to reliably detect the objects with a reflectivity of 20% or more.
Users can configure the protection / alarming zones of scanner into any complex and irregular shapes based on actual protection requirements. Users can set up 16 zone groups at most, and realize the switching among multiple zone groups through the external input signal.

Product components

LSPD system is composed of scanner, power cable, configuration cable and configuration software.

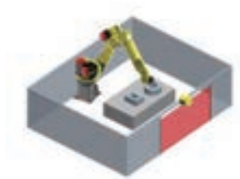


Product features

- As the first domestic safety laser scanner, its performance has reached the international advanced level;
- It meets the safety requirements of IEC 61496 Type3 and ISO 13849 PLd;
- The maximum scanning radius is 15m and the angle is 190°;
- The user can configure the protection zone of scanner into the desired shape by connecting to the computer;
- It is Class 1 laser products, being safe to human eyes.
- With fast response, it can complete 25000 times of measurement within 1 second, and the default response time is 80ms;
- The detection capability is high, the angle resolution is 0.36°, and the objects with a diameter of 7cm can be reliably detected in the protection zone;
- With narrow-band filter technology, its light interference resistance ability is strong;
- Professional EMC design and rigorous testing are conduced to ensure that the product can stably and reliably work in a complex and harsh electromagnetic environment.

Production applications

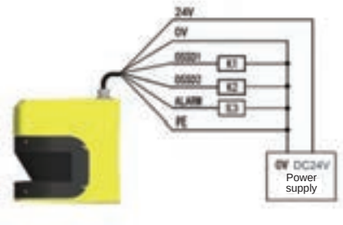
Fixed hazardous zone protection



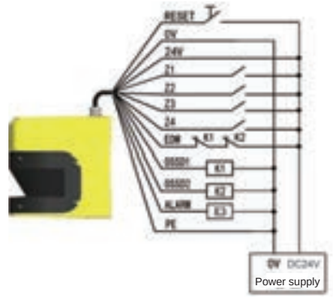
Access protection

Mobile hazardous area protection

Typical wiring diagram

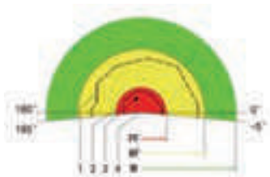


Single zone group, automatic resetting, wiring diagram when EDM is disabled



Multiple zone group, manual resetting, wiring diagram when EDM is enabled

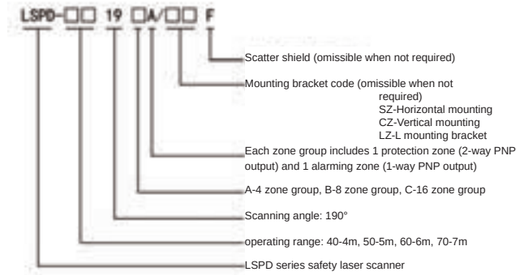
Introduction of protection / alarming zone



—Table 31—

Identification	Meaning	Remarks
1	Configured alarming zone profile	Configured through configuration software
2	Configured protection zone profile	Configured through configuration software
3	Obstacles or persons in the protection zone	Diameter of smallest detectable object: 7cm
4	LSPD safety laser scanner	
PF	Maximum protection zone	7m@1.8%: reflectivity
WF	Maximum alarming zone	15m@20%: reflectivity
M	Maximum measurement range	50m@100%: reflectivity

Specifications



Technical parameters

—Table 32—

Safety level	Type3 (IEC 61496) , PLd (ISO 13849)			
Standards	2006/42/EC (Mechanical safety command), 2004/108/EC (EMC command IEC61496-1	IEC61496-3	ISO13849-1	
Optical characteristics				
Scanning angle range	190°	Angle resolution	0.36°	
Maximum radius of protection zone	4m/5m/6m/7m (1.8% reflectivity)	Maximum radius of alarming zone	15m (20% reflectivity)	
Smallest detectable object	7cm in protection zone 15cm in alarming zone	Maximum measurement error	10cm*	
Laser light source	Wavelength of 905nm, Class 1 laser product			
Environmental characteristics				
Environment temperature	Operating	-10℃～ 55℃ (No frost or fog)		
	Storage	-40℃～ 70℃		
Environment humidity	Operating	35%RH ～ 85%RH		
	Storage	35%RH ～ 95%RH		
Light interference resistance	Incandescent light: 1500Lux at most, the included angle between light source and scanning plate: ＞ ±5°			
Vibration resistance	Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis			
Shock resistance	Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis			
IP code	IP65			
Electrical characteristics				
Operating voltage	DC24V±20%	Power consumption	＜ 10W (No load on the output terminal)	
Response time	80ms (2 scans) ～ 640ms (16 scans), 80ms by default			
Safety output (OSSD)	PNP×2 (load capacity: ≤200mA, residual voltage: ＜2V), over-current protection, capacitive load: ≤ 22nF			
Alarming output (ALARM)	PNP×2 (load capacity: ≤200mA, residual voltage: ＜2V), over-current protection,			
Power-on time	Typical value: 10s	Cable length	≤ 50m	
Additional functions				
External device monitoring (EDM)	Monitor the state of normally closed contact of load when connected to relay or contactor load			
Zone group switching	Four groups of external input signal (Z1, Z2, Z3, Z4) can realize the switching among multiple zone groups			
Resetting function	Automatic or manual resetting can be configured, and it is automatic resetting by default			

* The additional error of background in strong reflectivity is 20cm

LS laser radar

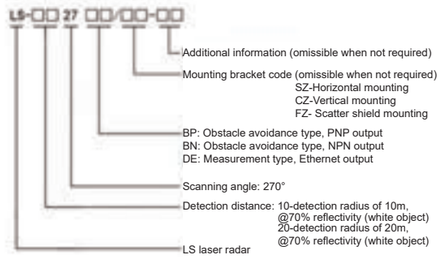
Product introduction LS laser radar can achieve the two-dimensional zone detection and profile scanning with a range of 270° and a radius of 10m, featuring small size, high flexibility, good capability and reliability and high cost performance, so it is the ideal choice for the obstacle avoidance and navigation of mobile robot.

Product components The LS system is composed of one laser radar, one distribution line and configuration software. Users can use the configuration cable to connect the radar with the computer, and configure the protection zone and other related parameters through the configuration software.

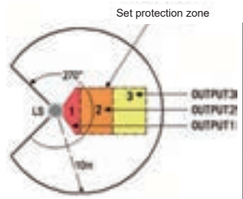
Product features

- It is the current smallest domestic pulse laser radar on the market, with dimensions of 6cm×6cm×8cm, thus facilitating user integration;
- Based on pulse laser ranging technology, the pulse light energy value is 1000 times higher than that of a continuous constant light source, thus ensuring the stability and reliability of measurement. Meanwhile, combined with nanosecond narrow pulse technology, it is Class 1 laser product which is safe to human eyes;
- With very fast scanning speed, it can complete 25000 times of measurement within 1s, and the scanning time of single turn is 40ms;
- With industrial design, it is stable and reliable. IP65, dedicated temperature drift error elimination design, professional EMC design and harsh testing, environmental light, shock and vibration and other tests;
- The detachable window design can facilitate maintenance, reduce maintenance costs and improve the service life of product;
- There are 16 groups of definable detection zones at most. The detection zones can be defined as any complex and irregular shapes according to user needs.

Specifications of entire machine



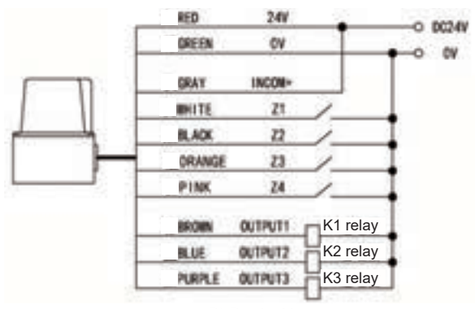
Introduction of protection zone configuration



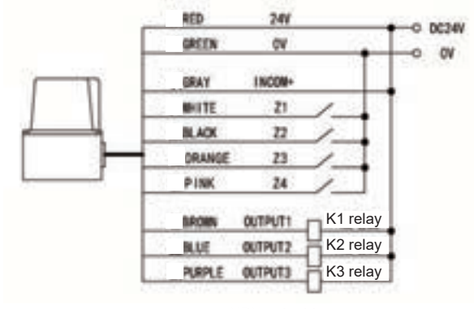
—Table 33—

Identification	Meaning	Description
3	Protection zone 3 configured by the user	OUTPUT3 will enter OFF state when obstacle is detected
2	Protection zone 2 configured by the user	OUTPUT2 will enter OFF state when obstacle is detected
1	Protection zone 1 configured by the user	OUTPUT1 will enter OFF state when obstacle is detected
LS	LS laser radar	At the scanning angle is 270°, when the radius is 20m, the reflectivity is @70%; when the radius is 8m, the reflectivity is @10%

Typical wiring diagram



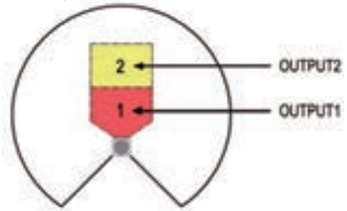
PNP output type



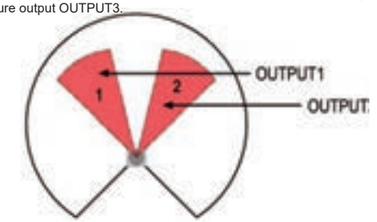
NPN output type

Operating mode

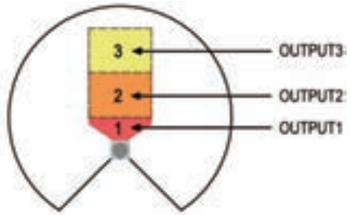
Mode 1: User can configure 2 protection zones from far and near corresponding to OUTPUT2 and OUTPUT1; meanwhile, provide system failure output OUTPUT3.



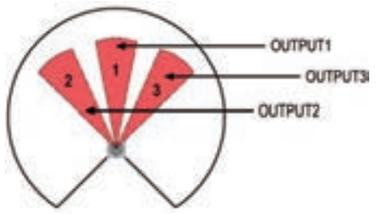
Mode 2: User can configure two independent protection zones corresponding to OUTPUT1 and OUTPUT2; meanwhile, provide system failure output OUTPUT3.



Mode 3: User can configure 3 protection zones from far and near corresponding to OUTPUT3, OUTPUT2 and OUTPUT1; not provide system failure output.



Mode 4: User can configure 3 independent protection zones corresponding to OUTPUT1, OUTPUT2 and OUTPUT3; not provide system failure output.



Technical parameters

—Table 34—

Optical characteristics				
Detection light source	Wavelength of 905nm, Class 1 laser product			
Maximum detection radius	20m @70% reflectivity (white object) 8m @10% reflectivity (black object)		Scanning angle range	270°
Angle resolution	Obstacle avoidance type: 0.5°		Measurement type: 0.33°	Measurement error: 4cm
Environmental characteristics				
Environment temperature	Operating	-10℃～55℃ (No frost or fog)		
	Storage	-40℃～70℃		
Environment humidity	Operating	35%RH～85%RH		
	Storage	35%RH～95%RH		
Light interference resistance		15000 Lux		
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis		
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 100 times per axis		
Electromagnetic compatibility (EMC)		EMI	EN61326-1: 2013 EN55011: 2009 + A1: 2010	
		EMS	EN61326-1: 2013 EN61000-4-2: 2009 EN61000-4-3: 2006 + A1: 2008 + A2: 2010 EN61000-4-4: 2012 EN61000-4-6: 2009 EN61000-4-8: 2010	
Zone group switching		4 groups of external input signals (Z1, Z2, Z3, Z4) can realize the switching am 16 zone groups		
IP code		IP65		
Dimensions		62×62×80mm		
Electrical characteristics				
Power supply		DC9V~ DC30V	Power consumption	＜3W (no load at the output terminal)
Response time		80ms (2 scans)～640ms (16 scans)		

BLPS Laser Safety Protective Device

GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)
ISO 13849-1 (PLe)

Product introduction

BLPSsafety laser scanner is the Type 4 AOPD that is designed and developed for the personal safety protection of hydraulic bending machine. Its dynamic detection technology has passed the TUV functional Type 4 assessment and won the national invention patents.
The product has fully reached the international advanced level of similar products.
The BLPSsafety laser scanner provides a protective near the upper die tip on the bending machine, so as to provide operators with effective safety protection in the arms and fingers near the upper die tip zone. It takes into account the operator's safety and machine productivity, so it is the most effective solution currently.

Product components

It is composed of transmitter, receiver, controller, transmission cable, signal cableand power cable.

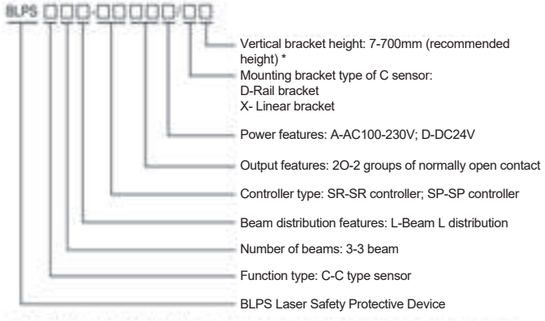
Product features

- As a Class 1 laser product, it is safe to human eyes;
- L-type protection beam is set up near the upper die tip on the bending machine, and the beam should move in parallel to the upper die tip;
- It provides a complete functional design to meet the safety protection requirements of bending machine for processing parts in different shapes;
- It has a independent controller system, which is also applicable to the bending machine without editing ability;
- Its has a high anti-electromagnetic interference, light interference ability.

Product features

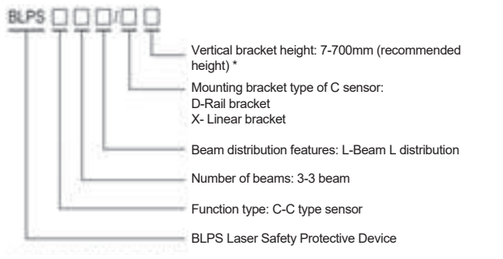
The sensor can be used alone with the bending machine system. 3 laser beams corresponds to 6 OSSD outputs, and each laser beam can provide two ways of independent safety output, and the output form is PNP.
It is in ON state during light transmitting to output a high level; during light shading, it is in OFF state to output a low level. After removing the light shading object, OSSD will automatically enter the ON state.

Specifications of entire machine



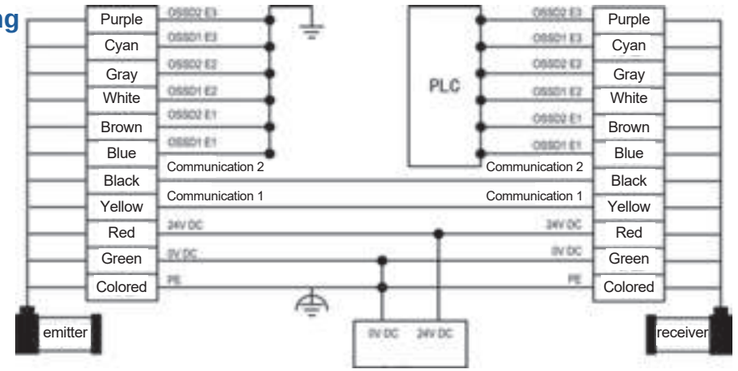
*For special lengths, please contact the local dealer. The customized length should be increased or decreased at the tolerance of 60mm based on 700mm, such as 820, 760, 640, 580, 520mm.

Specifications of sensor



*For special lengths, please contact the local dealer. The customized length should be increased or decreased at the tolerance of 60mm based on 700mm, such as 820, 760, 640, 580, 520mm.

Typical wiring diagram



Technical parameters

—Table 35—

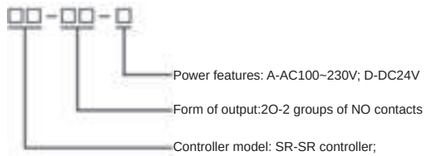
Safety level		Type 4 (IEC61496) ； PLe (ISO13849)
Standards		2006/42/EC (Mechanical Safety Command) ; 2004/108/EC (EMC Command); IEC61496-1 ; IEC61496-2; ISO13849-1
Optical characteristics		
Detection light source		Class 1 laser, wavelength of 635nm
Detection distance		0～20m
EAA		1.5mrad
Environmental characteristics		
Environment temperature	Operating	-10℃～55℃ (No frost or fog)
	Storage	-40℃～70℃
Environment humidity	Operating	35%RH～85%RH
	Storage	35%RH～95%RH
Light interference resistance	Incandescent lamp	3000 Lux
	Fluorescent lamp	3000 Lux
	Sun light source	10000 Lux
EMC	EMS	Meet the requirements for Level 4 safety light curtain in GB/T19436-1 and GB4584-2007
	EMI	Meet the requirements for the electromagnetic radiation at the industrial site in EN61326-1 and EN55011
Vibration resistance		Frequency: 10Hz ~ 55Hz; amplitude: 0.35 ± 0.05 mm; number of scans: three axes, 20 times per axis
Shock resistance		Acceleration: 10g; pulse duration: 16 ms; number of collisions: three axes, 1000 ± 10 times per axis
IP code		IP65
Dimensions		170×92×90mm
Electrical characteristics		
Power supply		DC10.8V～26.4V
Power consumption		≤5W
Consumption current	Emitter	≤50mA
	Receiver	≤100mA (without load)
Response time		≤8ms
Safety output (OSSD)		PNP output; each beam of detection light can output two ways of control singles; in ON state, load current ≤50mA, output voltage ≥Vcc—3V; in OFF state, leakage current ≤1mA, residual voltage ≤1V.

SR/SP controller

Production introduction

SR / SP controller is installed at the upper die slider at the bending machine for easy manual operation. It is used with BLPS sensor to provide multicircuit relay passive contact output and a variety of Operating modes.
According to the characteristics of processing materials, SR / SP controller provides three Operating modes: normal mode, folding mode and inhibition mode. In normal mode, it can monitor all detection beams of sensor; in folding mode, it can monitor the beam below the knife edge of die; in inhibition mode, it will not monitor sensor signal.
SP controller can monitor the uplink signal, downlink signal, variable speed signal, normally closed contact of Fast down relay, normally open contact of Slow down relay, to output two groups of normally open contact OSSD and one group of normally open contact for auxiliary output. This model of controller can fully monitor the bending machine signals to achieve complex functions. SR controller can monitor the variable speed signal to output two groups of normally open contact OSSD. This model can only monitor the variable speed signal, featuring simple wiring and strong adaptability.

Specifications of controller



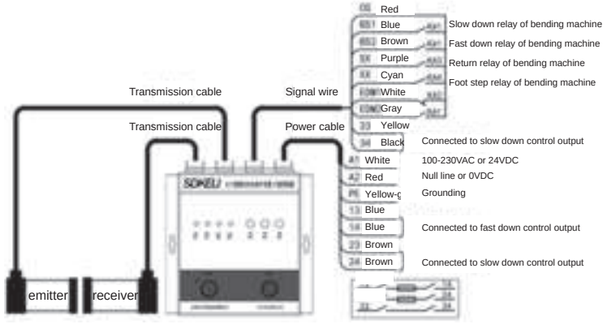
Technical parameters

—Table 36—

Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
IP code		IP54	
Dimensions		190×150×58mm	
Electrical characteristics			
Power supply		AC100V ～ 230V±15%, 50/60 Hz	DC24V±10%
Power consumption		＜ 8.5W	
Output form		Relay contact signal	
Output contact capacity		Contact capacity: 5A, 250VAC/5A, 24VDC	
Start time		＜ 3s	
Detection function		Real-time self-inspection	
Protection circuit		Overvoltage and overcurrent protection; output short-circuit protection	

Typical wiring diagram

SR controller



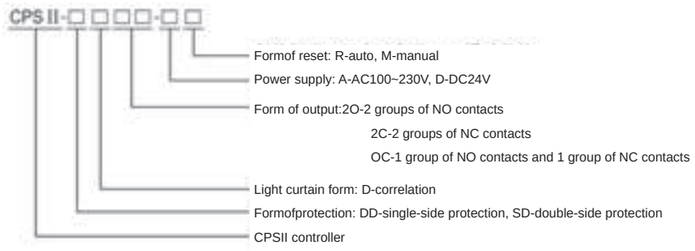
SP controller

CPSII controller

Production introduction

CPSII controller is installed at the outside of the electrical cabinet of machine tool, and supports KS06AOPD or KS06 cascaded AOPD to provide two ways of relay passive contact output, and the standard configuration is two-way normally open output.
CPSII controller is equipped with test button to detect the self-test function of system.
Double lock design is used for the function switch of CPSII controller, to avoid the security risks caused due to misoperation or lock switch failure. Controller can provide two forms of single-sided protection and double-sided protection, and two operating modes of automatic resetting and manual resetting according to user requirements.

Specifications and model

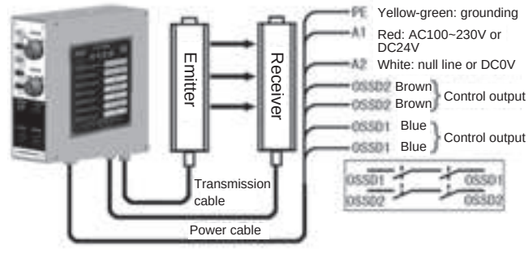


Technical parameters

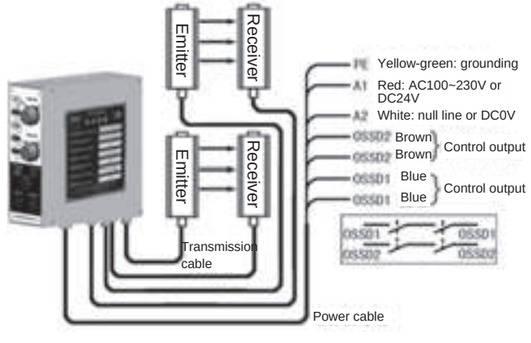
—Table 37—

Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
IP code		IP54	
Dimensions		216×82×215mm	
Electrical characteristics			
Power supply		AC100V ～ 230V±15%, 50/60 Hz	DC24V±10%
Power consumption		＜ 15W(entire machine)	
Output form	OSSD1/ OSSD2	Normally open contact output of two-way relay (standard configuration)	
	OSSD3/ OSSD4	Normally closed contact output of two-way relay (optional configuration)	
Output contact capacity		5A, AC250V/DC30V(Resistive load)	
Response time		The response time of complete machine is not more than 20ms (see Page 18 for cascaded type)	
Insulation resistance		＞ 100MΩ	
Dielectric strength		AC1500V, no breakdown or flashover for 60s	
Service life of relay		≥ 1 million times (electrical life)	
Supporting light curtain		KS06AOPD	KS06 cascaded AOPD

Typical wiring diagram



Single-side correlation type



Double-side correlation type

CPSIII controller

Production introduction

CPSIII controller is installed at the outside of the electrical cabinet of machine tool, and supports KS06AOPD or KS06 cascaded AOPD to monitor the external emergency stop button and safety door switch signal state. The three input signals respectively correspond to the passive contact output signal of independent safety relay, meanwhile, their conditions meet the requirements for passive contact signal of output safety relay.
CPSIII controller can be used to identify the safety travel signal, and choose safety or safety 1 operating mode. In the safe travel mode, the light curtain can achieve full-range protection; in the safety 1 mode, the cam switch signal can shield light screen signal to not protect the return signal.
CPSIII controller is not equipped with function switch, and it can achieve power-off protection and power-on compulsory protection, to avoid the security risks caused due to not using AOPD.

Specifications

CPSIII-□ □ □ □-□ □

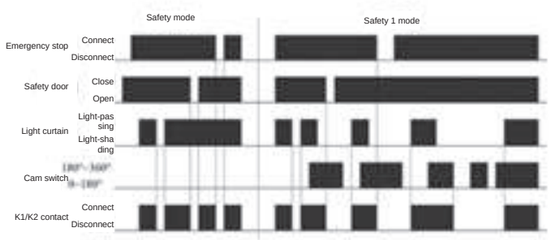
- Formofreset: R-auto, M-manual
- Powersupply: A-AC100~230V, D-DC24V
- Output form: 10- normally open contact output of one group of relay
- Formofpotection: DD-single-side protection
- CPSIII controller

Technical parameters

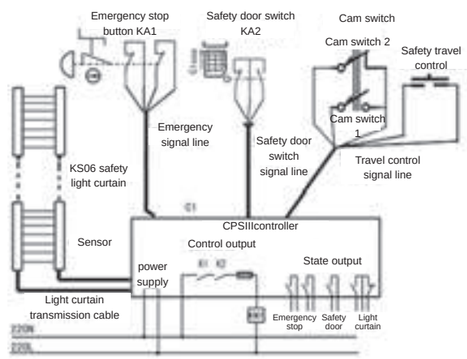
– Table 38 –

Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
IP code		IP54	
Dimensions		216×82×215mm	
Electrical characteristics			
Power supply		AC100V~230V±15% 50/60HZ	DC24V±10% (cascaded)
Power consumption of complete machine		≤ 15W; ≤ 30W when cascaded light curtain is used	
Master control output (OSSD)		Series connection of normally open contacts of two groups ofsafety relay	
Output contact capacity		5A, AC250V/DC30V (Resistive load)	
Auxiliary output of emergency stop button		Auxiliary output of emergency stop button; safety relay contact output, two-way normally open signal	
Auxiliary output of safety door		Auxiliary output of safety door; safety relay contact output, one-way normally open signal	
Auxiliary output of safety light curtain		Safety relay contact output, two-way output signals, one is normally open and the other is normally closed	
Response time		The response time of complete machine (including light curtain part) is not more than 20ms (see 18 for details of cascaded type)	
Insulation resistance		＞ 100MΩ	
Dielectric strength		AC1500V, No breakdown or flashover for 60s	
Electrical life of relay		≥ 10^6 times	
Mechanical life of relay		≥ 10^6 times (The information comes from the operation instructions of relay)	
Supporting light curtain		KS06AOPD	KS06 cascaded AOPD

Wiring example and action relationship



Action relationship



Wiring example

CQ2 controller

Product introduction

CQ2 controller is installed inside the electrical cabinet of tool machine, and supports KS06AOPD or KS06 cascaded AOPD to provide two-way relay passive contact output, and the standard configuration is two-way normally open output. Two operating modes of automatic resetting and manual resetting can be provided according to user requirements.

Technical parameters

– Table 39 –

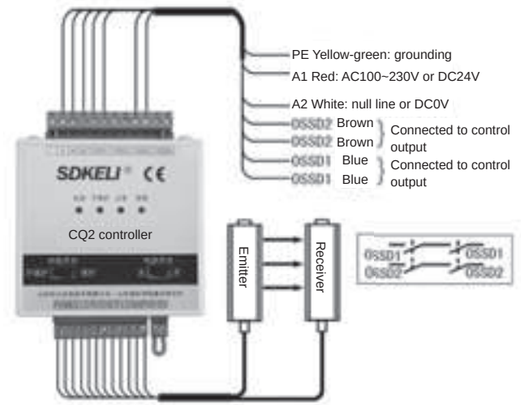
Environmental characteristics			
Environment temperature	Operating	-10℃～55℃ (No frost or fog)	
	Storage	-40℃～70℃	
Environment humidity	Operating	35%RH～85%RH	
	Storage	35%RH～95%RH	
IP code		IP20	
Dimensions		90×90×105mm	
Electrical characteristics			
Power supply		AC100V ～ 230V±15% 50/60 Hz	DC24V±10%
Power consumption		＜ 15W (entire machine)	
Output form	O S S D 1 / OSSD2	Two-way normally open contact output of relay (standard configuration)	
	O S S D 3 / OSSD4	Two-way normally closed contact output of relay (optional configuration)	
Output contact capacity		5A, AC250V/DC30V(Resistive load)	
Response time		The response time of complete machine is not more than 20ms	
Insulation resistance		＞ 100MΩ	
Dielectric strength		AC1500V, no breakdown or flashover for 60s	
Service life of relay		≥ 1 million times (electrical life)	
Supporting light curtain		KS06AOPD	KS06 cascaded AOPD

Specifications

CQ2-□ □ □-□ □

- Formofreset: R-auto, M-manual
- Power supply: A-AC100~230V, D-DC24V
- Form of output:2O-2 groups of NO contacts
  2C-2 groups of NC contacts
  OC-1 group of NO contacts and 1 group of NC contact
- Switch configuration: S-power switch and function switch, N-no switch
- CQ2 controller

Typical wiring diagram



CQ3 controller

Product introduction

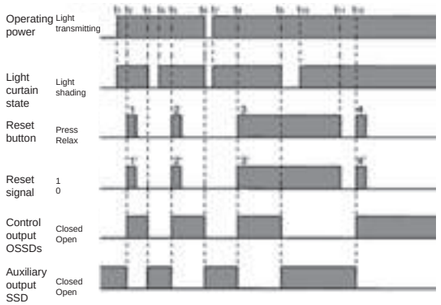
G7S-4A2B-E, OMRON relay is used as the final signal output device, three-way control output OSSD1, OSSD2 and OSSD3 can directly drive the mechanical master control unit (such as solenoid valve), and auxiliary output SSD is connected to programmable controller.

Self-locking function is set to provide reset signal input interfaces R1 and R2, locking state: The AOPD will enter the locking state after start, restart and light shading.

At this moment, the AOPD is in “Abnormal” state, its control outputs OSSD1, OSSD2, and OSSD3 is “OFF”, the auxiliary output SSD is “ON” and the “Abnormal” indicator is on. CQ3 controller (CQ3-M □□) has a self-locking function, and R1.R2 is provided as a reset signal input interface. When used, R1 and R2 should be connected to a pair of normally open contacts of the reset button. When the CQ3 controller goes into the locking state, you can press the reset button to release the locking state due to start, restart and light shading. For safety reasons, the reset signal is triggered by the rising edge of pulse signal. Each time the reset button is pressed, an effective reset can be made. (See the Operating state diagram of CQ3 controller) The insulation between the input and output of safety relay is strengthened, and excellent electrical isolation performance can effectively prevent the impact of relay contact ignition on the internal circuit, so as to improve the service life of device at the same time of ensuring safety.

Operating state

Effective reset: Each time the reset button is pressed, R1 and R2 are turned on to generate a jump rising edge from 0V to 24VDC inside the controller. At this moment, if the light curtain is in the light transmitting state, the control output, auxiliary output and status indicator of controller will respond immediately to enter the “Normal” state. After the AOPD is started and restarted and the light curtain is shaded, light transmission will be restored. The control outputs OSSD1, OSSD2 and OSSD3 are in “OFF” state and the SSD is in “ON” state; if and only if a valid reset is completed, the control output will go into the “ON” state, and the auxiliary output will go into “OFF” state.

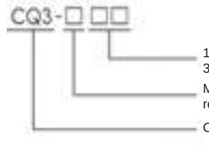


Technical parameters

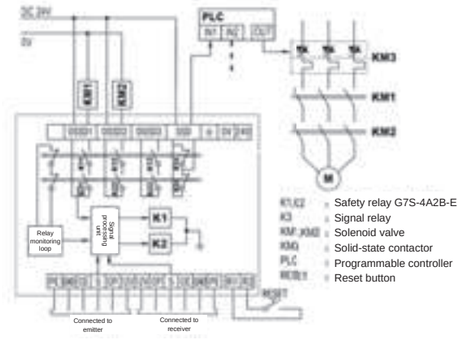
—Table 40—

Power supply		DC24V±10%
Power consumption of complete machine		≤ 15W (conventional way);≤ 30W (cascaded way)
Insulation resistance		＞ 100MΩ
Dielectric strength		AC 1500V, no breakdown or flashover for 60s
Operating environment		-10℃ ~55℃ (no frost or fog), 35%RH~85%RH
IP code		IP20
Response time		Complete machine (including light curtain part) ≤ 20ms
Control output OSSD1/SSD2/ OSSD3	Output form	Three-way relay normally open contact output
	Resistive load	AC250V/10A, DC30V/10A
	Inductive load	AC240V/5A, DC24V/2A
Auxiliary output SSD	Output form	One-way relay normally closed contact output
	Resistive load	AC250V/6A, DC30V/6A
	Inductive load	AC240V/3A, DC24V/2A
Relay life	Mechanical life	≥ 10 million times (switching frequency: 18000 times / h)
	Electrical life	≥100,000 times (rated load, switching frequency: 1800 times / h)
Dimensions		90×90×105mm
Supporting light curtain		KS06AOPD / KS06 cascaded AOPD

Specifications



Typical wiring diagram



CSRME safety controller

ISO 13849-1 (PLe)

Product introduction

CSRME is designed based on the standard GB 27607, and it ensures that the safety of tool machine control system meets the requirements of GB 27607 by means of monitoring machine tool safety-related device. The safety of this product meets the requirements of ISO 13849-1 (PLe) and IEC 61508 (SIL3).

With rich interfaces, CSRME has limited programmable function. It can simultaneously replace many different types of safety control modules or safety PLCs, thus greatly simplifying the safety design of machine control systems and reducing costs.

Product features

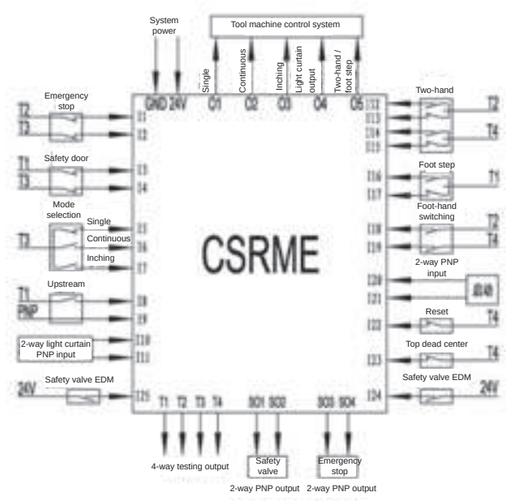
- With small size and rich IO interfaces, it can realize a comprehensive monitoring for the safety components of machine tool;
- It has limited programmable functions, and the logic can be customized according to user needs;
- With pluggable terminals, the wiring and installation is easy.

Technical parameters

—Table 41—

Safety level		PLe (ISO 13849)		
Environmental characteristics				
Environment temperature	Operating	-10℃～55℃ (No frost or fog)		
	Storage	-40℃～70℃		
Environment humidity	Operating	35%RH～85%RH		
	Storage	35%RH～95%RH		
IP code		IP20		
Dimensions		115×110×45mm		
Electrical characteristics				
Power supply		DC20.4~28.8V (ripple wave±5%)		
Consumption power		≤6W (without load)		
I/O port	Input features	5mA/24V		
	Output capacity	Safety output (PNP)×4	200mA per way at most	Output residual voltage:＜3V; total output capacity: ≤1A
		Standard output(PNP)×6	200mA per way at most	
		Testing output (PNP)×4	100mA per way at most	
Response time		＜20ms		
Controller status indicator		ON (green): Safety output So1 and So2 (safety valve control output) Output ON state		
		OFF (red): Safety output So1 and So2 (safety valve control output) Output OFF state		
		SYS_ERR (red): system failure: IN_ERR (red): input failure		
Port status indicator		Yellow: It is on when there is high-level input at the power or input port		
		Green: It is on when there is high-level input at the output port		
External device monitoring		Monitor the state of normally closed contact of safety valve		

Typical wiring diagram



CSRM series safety relay module

ISO 13849-1（PLe）

Product introduction

CSRM relay modules comply with EN/ISO 13849-1Cat.4/PLe safety requirements and are suitable for monitoring various signals at the industrial sites with high safety requirements—including emergency stop signals, safety door switch signals, safety light curtain signals, safety light curtain signals using pulse output and two-hand button signals.

Product features

- ●With forced guiding of relay contact, the monitoring is more effective and safer;
- ●CSRM has smaller external dimensions, and it is connected using pluggable terminal for easy installation;
- ●CSRM has two forms, namely 3 NO (normally open) and 1 NC (normally closed) outputs, and 2 NO (normally open) and 1 NC (normally closed) outputs, so its control ability is stronger.

Specifications

CSRM □-□A□B□X□

- Operationg panel: C-Chinese, E-English
- Power supply: X-AC/DC24V, D-DC24V
- Output form:
  - 3A1B-3 NO and 1 NC contacts
  - 2A1B-2 NO and 1 NC contacts
- Applications: A-Monitoring 2 NC contacts signal
  - B-Monitoring level signal output of safety light curtain
  - C-Monitoring square wave signal output of AOPD
  - D-Monitoring two-hands button signal
- CSRM series safety relay module

CSRMA – Two-way normally closed switch monitoring

- ●Monitor two-way normally closed switch signal - emergency button, safety door switch;
- ●Monitor the short circuit between two ways of signals;
- ●Monitor the short circuit and open circuit of single switch, and lock it when the switches are inconsistent with each other;
- ●Automatic and manual resetting are adjustable. 2A1B module can detect the reset button in the manual reset mode and force single reset, and reset button must be disconnected before the next reset operation;
- ●With external device monitoring function, it can be used to monitor the failure state of relay that controls the hazardous parts of machine, such as contact adhesion.

CSRMB-two-way transistor signal monitoring

- ●Monitor two-way transistor signals - photoelectric switch, safety light curtain, etc.;
- ●With the peripheral circuits, it can also be used to monitor the two ways of normally closed switch signals;
- ●With full-loop self-test, it can be locked when the two ways of signals are inconsistent with each other;
- ●It has a wider adaptability for the residual voltage of light curtain signal, and it can work stably when the residual voltage is greater than 10V;
- ●It can be used to monitor NPN signals and PNP signals, with a stronger adaptability;
- ●Automatic and manual resetting are adjustable. 2A1B module can detect the reset button in the manual reset mode and force single reset, and reset button must be disconnected before the next reset operation;
- ●2A1B module can achieve inhibition function;
- ●With external device monitoring function, it can be used to monitor the failure state of relay that controls the hazardous parts of machine, such as contact adhesion.

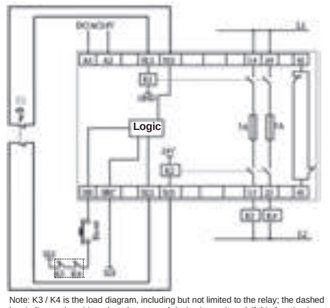
CSRMC- pulse signal monitoring

- ●Monitor the safety light curtain output signal with pulse signal output;
- ●With narrow wave band filter design and center frequency of 4KHz, it can effectively avoid the false triggering of other interference signals;
- ●It adapts to Keli active opto-electronic KS02H and KS06 safety light curtain;
- ●Automatic and manual resetting are adjustable. 2A1B module can detect the reset button in the manual reset mode and force single reset, and reset button must be disconnected before the next reset operation;
- ●2A1B module can achieve inhibition function;
- ●With external device monitoring function, it can be used to monitor the failure state of relay that controls the hazardous parts of machine, such as contact adhesion.

CSRMD - Two-hand button monitoring

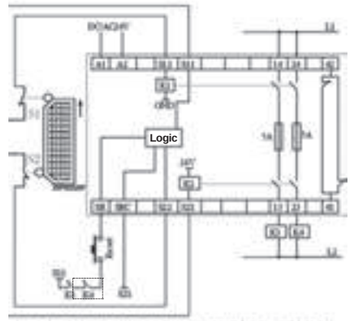
- ●Monitor two-hand button signal;
- ●Button signal consistency detection. When the two-hand button triggering time difference is greater than 0.5s, it is regarded as invalid trigger;
- ●With independent dual-loop work and full-loop self-test, it can be locked when the two ways of signals are inconsistent with each other;
- ●2A1B module can achieve external device monitoring function, and it can be used to monitor the failure state of relay that controls the hazardous parts of machine, such as contact adhesion.

Typical wiring diagram (2A1B module)



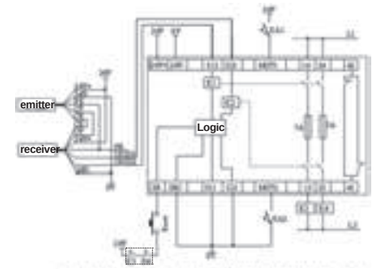
Note: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.

Monitoring emergency button-manual reset



Note: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.

Monitoring safety door switch-manual reset



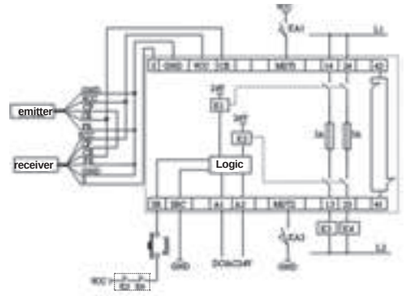
Note 1: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.
Note 2: KA1/KA2 is the travel switch diagram, and inhibition function is started when KA1 and KA2 are closed.
Note 3: This figure is the wiring example of KS06 light curtain. When other model of light curtain is used, wiring should be conducted according to the operation instructions of light curtain

Monitoring PNP light curtain-manual reset

Technical parameters

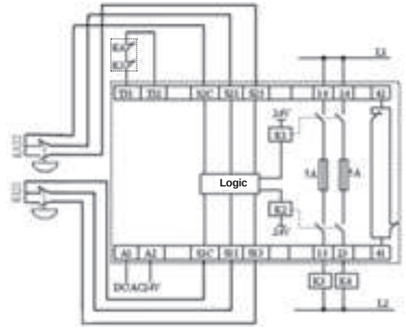
—Table 42—

Standards		ISO 13849-1 (PLe) 2004/108/EC (EMC Command) 2006/42/EC (Mechanical Safety Command)
Environmental characteristics		
Environment temperature	Operating	-10℃～55℃ (No frost or fog)
	Storage	-40℃～70℃
Environment humidity	Operating	35%RH～85%RH
	Storage	35%RH～95%RH
IP code		IP50
Dimensions		110×100×24mm (The dimensions are 110×115×24mm when no-lock screw sealing and plug terminal block)
Electrical characteristics		
Power supply		AC20.4V～26.4V or DC24V±10% (can only DC power supply can be used for 3A1B module and B module)
Power consumption		≤ 3W (the power supply of supporting light curtain of C module is provided by the module; total power consumption: ≤ 10W)
Load capacity		AC15: 5A/250V
		DC13: 5A/24V
Response time		＜10ms
Dielectric strength		AC1500V, No breakdown or flashover for 60s
Relay life		≥ 1 million times (electrical life)



Note 1: Note 1: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.
Note 2: KA1/KA2 is the travel switch diagram, and inhibition function is started when KA1 and KA2 are closed.
Note 3: This figure is the wiring example of KS06 AOPD. When other model of AOPD is used, wiring should be conducted according to the operation instructions of light curtain.

Monitoring light curtain signal – manual reset



Note 1: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.

Monitoring two-hand button

Power cable

—Table43—

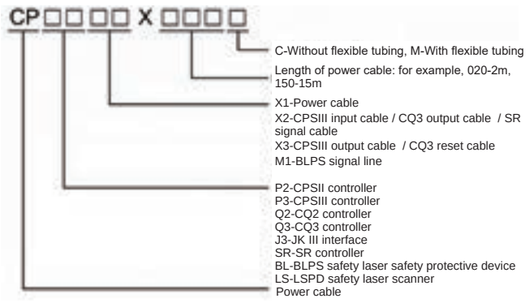
Name	Picture	Specifications	Standard length	Function
CPSII controller power cable		RVV 6×0.5+1×1	2.5m	Used to connect the controller with the light curtain, to provide power for the light curtain and transmit the light curtain signal
CQ2 controller power cable		RVV 6×0.5+1×1	1.5m	
CPSIII controller power cable		RVV 2×0.5+1×1	2.5m	Provide power for the light curtain
CPSIII controller input signal cable		RVV 14×0.3	2.5m	Provide input signal for the controller
CPSIII controller output signal cable		RVV 3×0.5+9×0.4	2.5m	Output control signal
CQ3 controller power cable		RVV 4×0.5+1×1	1.5m	Provide power for the controller and output auxiliary control signals
LSPD power cable		RVVP11×0.3	3m	Provide power for the LSPD safety laser scanner
LSPD configuration cable		RVVP4×28AWG	1.5m	Connect LSPD safety laser scanner and computer to configure a protection zone
LS configuration cable		MicoUSB	1.5m	Connect LS laser radar and computer to configure a protection zone
SR controller power cable		RVV6×0.5+1×1	5m	Provide power for the controller and output control signal
SR controller signal cable		RVVP10×24AWG	5m	Provide input signal for the controller

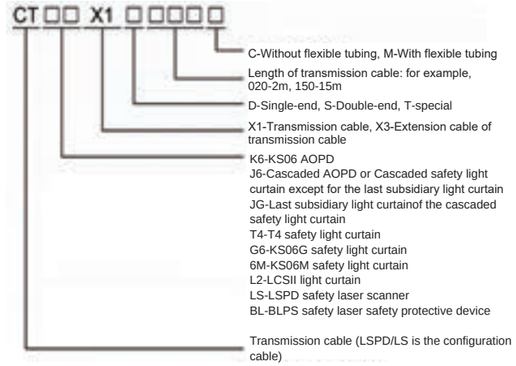
Transmission cable

—Table44—

Name	Picture	Specifications	Standard length	Function
Double-end transmission cable of KS06 AOPD		RVVP5×0.3	A series: single-side: 2m/4m, double-side: 2m/4m and 3m/8m B series: single-side: 2m/8m, double-side: 2m/8m and 4m/10m C series: single-side: 3m/14m, double-side: 3m/14m and 6m/17m	Connect controller and light curtain to provide power to light curtain and transmit light curtain signal
Single-end transmission cable of KS06 active opto-electronic protective d device		RVVP5×0.3	A series: 2m/4m (when the protection height is greater than 200mm, 3m/5m) B series: 3m/8m C series: 3m/14m D and E series: Customized according to actual needs	
Single-end transmission cable of T4 light curtain		RVVP4×24AWG	8m	Provide power to the emitter and output level control signal
		RVVP8×24AWG	2m	Provide power to receiver and output level control control signal
Single-end transmission cable of KS06G light curtain		RVVP6×0.3	A series: 2m/4m (when the protection height is greater than 200mm, 3m/5m) B series: 3m/8m C series: 3m/14m D and E series: Customized according to actual needs	Provide power to light curtain and output level control signal
Single-end transmission cable of KS06M/LCSII light curtain		RVVP6×0.3	2m/3m/4m/5m	
Extension line of KS06M/LCSII light curtain transmission cable		RVVP6×0.3	5m/10m/20m	When standard transmission cable length cannot meet the on-site application requirements, it is connected to light curtain and transmission cable to extend signal transmission distance
Single-end transmission cable of BLPS		RVVP10×22AWG	5m/9m	Connect to the control system of machine tool to output control signal
Double-end transmission cable of BLPS type		RVVP10×22AWG	5m/9m	Connect the controller and sensor to provide power and output control signal

Specifications of cable





Product installation methods

There are many applications of AOPD and safety light curtain. In order to ensure that they can be effectively used in various a pplications, we have designed the following installation methods, and other installation methods can be customized according to site condit ions.

—Table45—

No.	Installation method	Installation code	Applicable modes							
			KS06	KS06Q	T4	KS06M	LCSⅡ	LSPD	LS	BLPS
1	ZC mounting	ZC	●		●	●	●			
2	Pipe mounting	GC	●							
3	Double-arm side mounting –with reducer	SCJ	●							
4	Double-arm side mounting – T-groove	SCT	●							
5	Double-bracket arm mounting	G1	●							
6	Scatter shield front mounting	FZ	●						●	
7	Scatter shield side mounting	FC	●							
8	Scatter shield column mounting	FL		●						
9	Scatter shield pipe mounting	GF	●							
10	Scatter shield double-arm mounting	SF	●							
11	Scatter shield magnet mounting	CF	●							
12	T-groove mounting	TC	●		●		●			
13	Magnetic attachment mounting	CX	●							
14	Plate support with bolt mounting	BL	●							
15	Plate support with magnet mounting	BC	●							
16	Clamping mounting	JZ				●				
17	Pipe mounting	GZ				●				
18	Horizontal mounting	SZ						●	●	
19	Vertical mounting	CZ						●	●	
20	L-bracket mounting	LZ						●		
21	Linear horizontal mounting	X7								●
22	Guide rail horizontal mounting	D7								●

Product accessory code

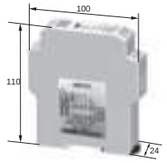
—Table46—

No.	Name	Installation code															
		ZC	GC	SCJ	SCT	G1	FZ	FC	FL	GF	SF	CF	TC	CX	BL	BC	JZ	GZ
1	ZC-mounting bracket	●																
2	KS pipe-mounting fixing clamp		●	●		●												
3	KS shield-mounting bracket						●	●		●	●	●						
4	T4 adjusting bracket	●																
5	T4 reducer connecting plate																	
6	KS06 upper vibration-reducer	●	●	●		●	●	●		●	●	●						
7	KS06 lower vibration-reducer	●	●	●		●	●	●		●	●	●						
8	T4 vibration-reducer	●																
9	Bracket seat		●			●				●								●
10	Bracket arm		●			●				●								●
11	Steel pipe		●			●				●								●
12	Support seat			●	●						●							
13	Double-arm pipe			●	●						●							
14	Q-clamp				●						●							
15	Shield pipe fixing plate									●								
16	Ω-clamp									●								
17	L-bracket											●						
18	Floor column base								●									
19	Floor column base plate								●									
20	Floor column cover plate								●									
21	LCSII ZC-mounting bracket	●																
22	LCS vibration-reducer	●																
23	LCS vibration-mounting bracke	●																
24	LCS JZ-mounting bracket																●	
25	LCS pipe-mounting fixing clamp																	●
26	Magnetic support plate															●		
27	Bolt support plate														●	●		
28	KS-magnet										●		●		●	●		
29	KS-magnet seat										●		●		●	●		
30	T-nut										●		●		●	●		
31	T-bolt				●							●						

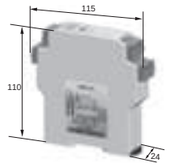
Dimensions

CPSII/ CPSIII / CPSV controller

CQ2/CQ3/CQ5 controller



Using locking screw plug wiring terminal



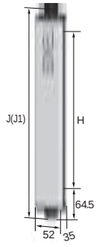
Using lock-free screw sealing and plug terminal block

CSRME safety controller

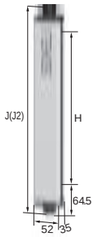
CSRM safety relay module

T4 safety light curtain

LCSII light curtain



Emitter / receiver / cascaded Main light curtain



Cascaded Subsidiary light curtain

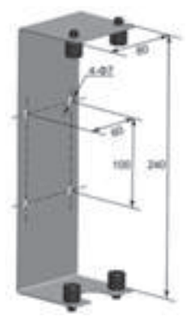
KS06M emitter / receiver

LSPD safety laser scanner

LS laser radar

BLPS sensor

SR/SP controller



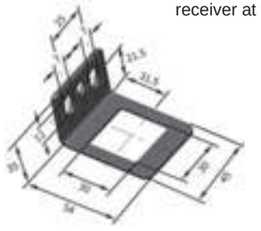
Controller Support

Dimensions of light curtain plug-in and maximum bending radius of cable

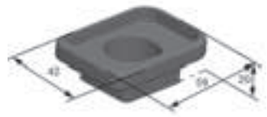
Installation and accessories

ZC-mounting (ZC)

It is the installation method to directly install the KS06/KS06G emitter / receiver at the body of machine tool through KS ZC-mounting bracket.



KS ZC-mounting bracket



KS06 upper vibration-reducer

KS06 lower vibration-reducer

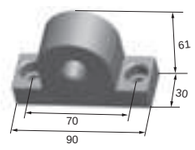
Pipe mounting (GC)

It is the installation method to directly fix the emitter / receiver at steel pipe through KS pipe-mounting fixing clamp, and bracket seat at the machine tool base or column.

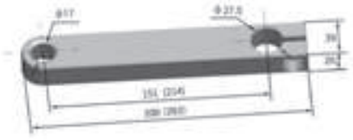
Double-bracket arm mounting (G1)

It is the installation method to directly fix the emitter / receiver at steel pipe through KS pipe-mounting fixing clamp, and bracket seat at the machine tool base or column. The double-bracket arm can effectively increase the anti-vibration performance.

KS pipe-mounting fixing clamp



Bracket seat



Bracket arm

Steel pipe

Installation and accessories

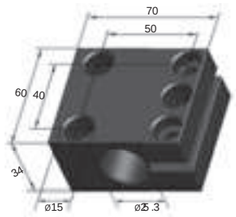
Double-arm side mounting –with reducer (SCJ)

It is the installation method to fix the emitter / receiver at double-arm pipe-mounted bracket through KS pipe-mounting fixing clamp, and support seat at the machine tool base or column.

Double-arm side mounting –T-groove (SCT)

It is the installation method to fix the emitter / receiver at double-arm pipe bracket through Q-clamp, and support seat at the machine tool base or column.

Q-clamp



Support seat

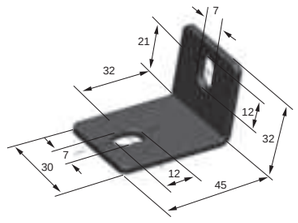
Double-arm pipe

Magnetic attachment mounting (CX)

It is the installation method to fix the emitter / receiver at the wall of machine tool through strong magnet.

Side-mounted method of T groove (TC)

It is the installation method to fix the emitter / receiver at the wall of machine tool through T bolt and L bending plate bracket.



L-bracket

Installation and accessories

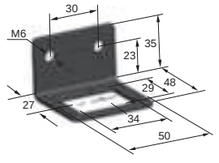
When the AOPD may be damaged during use, you can install a scatter shield to protect the emitter / receiver. There are mainly five installation methods: scatter shield front mounting (FZ), scatter shield side mounting (FC), scatter shield pipe mounting (GF), scatter shield double-arm mounting (SF) and scatter shield column mounting (FL).

Scatter shield front mounting (FZ)

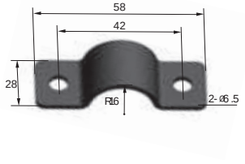
Scatter shield side mounting (FC)

Scatter shield pipe mounting (GF)

Scatter shield double-arm mounting(SF)

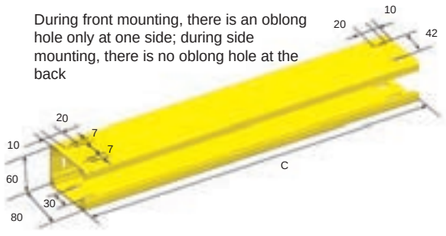


KS shield-mounting bracket



Ω-clamp

During front mounting, there is an oblong hole only at one side; during side mounting, there is no oblong hole at the back



KS scatter shield

Installation and accessories

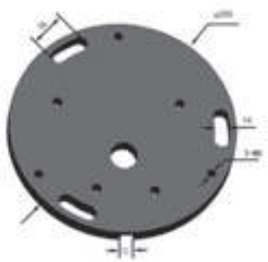
Plate support with bolt mounting (BL)

Emitter / receiver is installed at the bolt support plate by magnet installation method, and support plate is installed at the operation table of machine tool by bolt installation method. Special safety management personnel should be assigned to be responsible for management when this installation method is used.

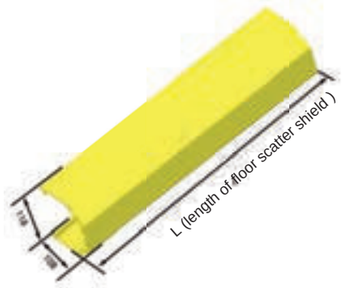
Plate support with magnet mounting (BC)

Emitter / receiver is installed at the magnetic support plate by magnet installation method, and support plate is attached at the operation table of machine tool by using strong magnet. Special safety management personnel should be assigned to be responsible for management when this installation method is used.

Scatter shield column mounting (FL)



KS06Q floor column base



KS06Q floor scatter shield

Installation and accessories

T4 ZC mounting (ZC)

It is the installation method to fix T4 light curtain at the body of machine tool through adjusting bracket, reducer connecting plate and vibration-reducer .

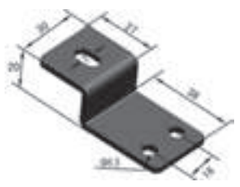
T-groove mounting (TC)

It is the installation method to fix common front-mounted bracket and double-hole T-nut at the body of machine tool through the reflector common front-mounting bracket.

T4 adjusting bracket

T4 reducer connecting plate

T4 vibration-reducer (60×52×22mm)



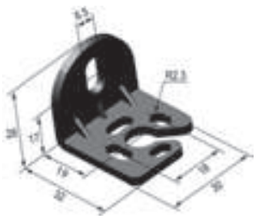
Reflector common front-mounting bracket

LCSII ZC mounting (ZC)

It is the installation method to fix LCSII light curtain at the body of machine tool through LCSII ZC-mounting bracket

T groove mounting (TC)

It is the installation method to fix LCSII light curtain at the body of machine tool through T-bolt and L-bracket.



LCSII ZC-mounting bracket

Installation and accessories

KS06M ZC mounting (ZC)

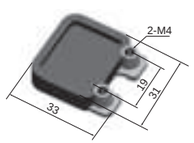
It is the installation method to directly install KS06M light curtain at the body of machine tool through vibration-mounting bracket.

KS06M clamping mounting (JZ)

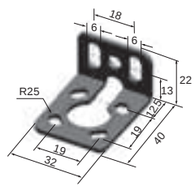
It is the installation method to directly install the emitter/receiver of KS06M light curtain at the body of machine tool through clamping bracket.

KS06M pipe mounting (GZ)

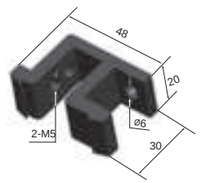
It is the installation method to fix the emitter / receiver of KS06M light curtain at the adjustable pipe-mounted bracket through pipe-mounting fixing clamp and bracket seat at the machine tool base or column.



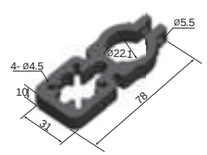
LCS vibration-reducer



LCS vibration-mounting bracket



LCS clamping bracket



LCS pipe-mounting fixing clamp

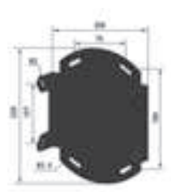
Installation and accessories

Horizontal mounting (SZ)

Vertical mounting (CZ)

L-bracket mounting (LZ)

LSPD adjustable horizontal-bracket



LSPD adjustable vertical-bracket

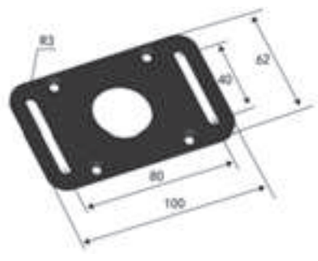
LSPD L-bracket

LSPD adapter bracket

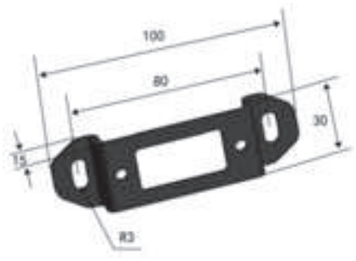
Horizontal mounting (SZ)

Vertical mounting (CZ)

Scatter shield mounting (FZ)



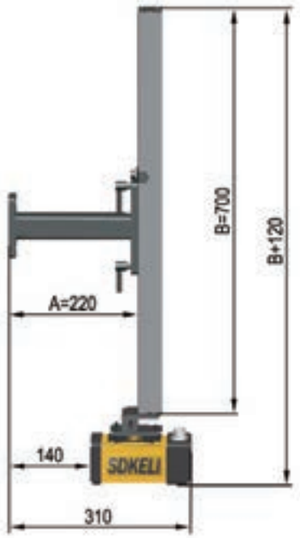
LS horizontal bracket



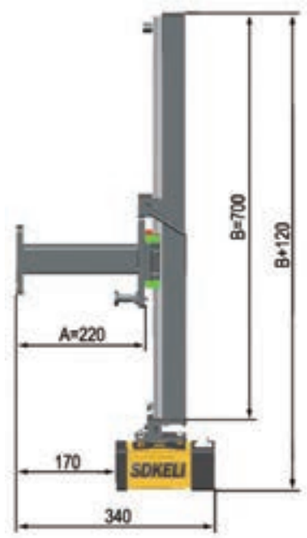
LS vertical bracket

LS scatter shield bracket

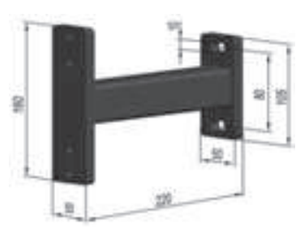
Installation and accessories



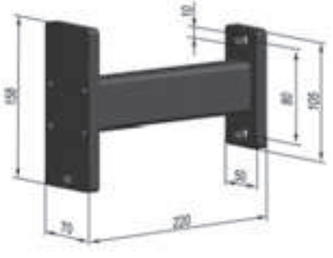
Linear horizontal mounting (X7)



Guide rail horizontal mounting (D7)



Linear horizontal bracket



Guide rail horizontal bracket

I. Select the type to be protected (select different types according to actual needs)

Protection type	Protection needs	Product series
Personal protection in dangerous occasions	Single-sided protection and double-sided protection	KS06/T4/KS06M/LCSII
	Double-sided, three-sided and four-sided protection	KS06 cascaded
	Long distance protection and area protection	KS06Q

II. Select Operating range(determine to use different series of AOPD according to the width of machine tool table)

Width of machine tool table	Product series
Below 2m	KS06A/T4A
Below 3m	KS06A /T4A/ KS06MA
Below 5m	LCSII
Below 6m	KS06B/ T4B/KS06MB
Below 9m	KS06MC
Below 12m	KS06C
Below 2m	KS06D
Above 20m.	KS06Q

III. Select protective height (protective height should meet the safety standards for relevant applications)

Maximum protective height	Beam spacing									
	10mm		15mm	20mm		25mm	30mm	35mm	40mm	
	Product series									
	KS06	KS06M	KS06M	KS06	LCSII	KS06M	KS06	KS06M	KS06	LCSII
Below620mm	●	●	●	●	●	●	●	●	●	●
Below710 mm	●	●	●	●	●	●	●	●	●	●
Below 930 mm			●	●	●	●	●	●	●	●
Below 1065 mm			●	●	●	●	●	●	●	●
Below 1240mm				●	●	●	●	●	●	●
Below 1420mm				●	●	●	●	●	●	●
Below 1775 mm					●	●	●	●	●	●
Below 2130mm							●	●	●	
Below 2485 mm								●	●	
Below 2840mm									●	

Note: KS06 series include: KS06 AOPD, KS06 cascaded AOPD, KS06G safety light curtain and KS06 cascaded safety light curtain

IV. Select protection object and beam spacing (determine to use different detection capability according to the distance from the light curtain plane of AOPD and the cutting edge of die)

Protection object	Beam spacing	Product series
Finger protection	10mm	KS06/ KS06M
Palm protection	15mm	KS06M
	20mm	KS06M
	25mm	KS06/LCSII
Arm and body protection	30mm	KS06/LCSII
	35mm	KS06
	40mm	KS06M
Human body protection	Customized	KS06Q

V. Select controller (T4, KS06G, KS06M and LCSII series are not involved)

Determine the controller type according to the placement position, the number of intervals to be protected, as well as the form and quantity of output signals (see Page 55-61) .

VI. Select installation method

According to the specific information of machine tool, see product installation method and accessories in Page 64-74. They can be customized according to the specific conditions of machine tool. The Specifications of support plate are selected from the table below:

No.	Specifications		Adjusting height limit			Height of movable plate for adjusting height
	Magnetic support plate	Bolt support plate	HMax	HMin	KS06/KS06G	
1	ZBC-4C	ZBL □□ -4C	500mm	340mm	150mm	300mm
2	ZBC-6C	ZBL □□ -6C	690mm	430mm	230mm	400mm
3	ZBC-6F	ZBL □□ -6F	550mm	360mm	190mm	330mm
4	ZBC-8C	ZBL □□ -8C	790mm	500mm	310mm	430mm
5	ZBC-8F	ZBL □□ -8F	720mm	460mm	270mm	400mm
6	ZBC-10C	ZBL □□ -10C	970mm	580mm	390mm	530mm
7	ZBC-12C	ZBL □□ -12C	1120mm	660mm	470mm	600mm
8	ZBC-16C	ZBL □□ -16C	1370mm	820mm	630mm	690mm

Note: 1. When bolt support plate and magnetic support plate are used, you must pay attention to the height of installation space after die assembly of punching machinery, and the space height after die assembly should not be smaller than the dimensions in HMax column of the table above. In the case of seriously insufficient installation space height, please contact the Technology Department and handle it in accordance with special contracts. 2. For bolt plate bracket, you must pay attention to the specifications of T bolt selected. M24 T bolt is used for bolt plate bracket with standard configuration, and the model of complete set of plate frame is ZBL24- □□. If the width of T groove at the guide rail of machine tool is large (bottom width is greater than 56mm, and groove width is greater than 32mm), please select M30 T screw; the specifications of complete set of plate frame is ZBL30-□□.

VII. Select transmission cable

See the transmission cable part in Page 63 for standard line length; it can be customized according to the specific conditions of machine tool.

VIII. Select power cable (T4, KS06G, KS06M and LCSII series are not involved)

See the power cable part in Page 62 for power cable length; it can be customized according to the specific conditions of machine tool.

Ordering instructions for AOPD

1	Product Series	KS06□	KS06 cascaded□	KS06Q □	T4 □	KS06G □	KS06M □	LCSII □	LSPD □	LS □	BLPS □
2	Product Specifications(for KS06 cascaded, please fill in the main and subsidiary light curtains)	See the specifications of AOPD									
		Main light curtain:		Subsidiary light curtain:			Subsidiary light curtain:			Subsidiary light curtain:	
3	Controller	CPS Ⅰ □		CPS Ⅱ □		CPS Ⅲ □		CPS Ⅴ □		JK III interface□□	SR □
		CQ1 □	CQ2 □	CQ3 □	CQ5 □		CSRMB □		CSRMC □		SP □
4	Power supply	AC100～230V [ ]					DC24V [ ]				
5	Operating range	According to the standards □					Special requirements□: ____m				
6	Protective height	____mm (the protection height meet the safety standards for relevant applications)									
7	Beam spacing	10mm [ ]		20mm [ ]		30mm [ ]		40mm [ ]		Other [ ] mm	
8	Individual indication	Not required (standard configuration) □					Required □				
9	Transmission cable	Single-end □					Standard cable length □		Special cable length □: __ m		Flexible metal tubing□
10	Power cable	Seven-core		Standard cable length □ (2.5m □ 1.5m □)			Special cable length □: ____m			Flexible metal tubing□: ____m	
		Five-core		Standard cable length □ (2.5m □ 1.5m □)			Special cable length □: ____m			Flexible metal tubing□: ____m	
11	Installation method	PZ □	PC □	GC □	G1 □	SC □	FZ □	FC □	FL □	GF □	X7 □	D7 □
		SF □	CF □	TC □	CX □	BL □	BC □	JZ □	GZ □	SZ □	CZ □	LZ □