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# SDKELI®

## Active Opto-electronic Protective Devices




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Machinery Safety APP

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

CE

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**“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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## East China Sales Area

Responsible areas:Shanghai City, Jiangsu Province (except Xuzhou City), Anhui Province, Zhejiang Province, Fujian Province, Jiangxi Province

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Mobile phone: 13706203961

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**Shanghai Office** (including areas: Shanghai)

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## North China Sales Area

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## Southwest S ales Area

Responsible areas: Henan Province, Hubei Province, Sichuan Province, Chongqing City, Yunnan Province, Guizhou Province, Shaanxi Province, Gansu Province, Qinghai Province, Xinjiang, Ningxia, Tibet

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# About KELI


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 |



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# Enterprise honors


国家级火炬计划项目证书

项目名称：光电保护装

承担单位：济宁科力光电产业有限责任公司

项目编号：2004EB010801

批准机关：中华人民共和国科学技术部

颁证机关：科学技术部火炬高技术产业开发中心

颁证日期：二〇〇四年五月


发明专利证书


发明专利证书


高新技术企业

证书

企业名称：济宁科力光电产业有限责任公司　　证书编号：GR201437000611

发证时间：2014 年 10 月 31 日　　有 效 期：三年

批准机关：


安全生产科技成果优秀推广项目

证　书

为表彰在促进安全生产科学技术进步工作中做出突出贡献的单位，特颁发此证书。

项 目 名 称：红外传感全自检光电保护装置

推广项目等级：A

完 成 单 位：山东省科学院激光研究所

证 书 号：AQT-4-4-08


EC-Type Examination Certificate

Holder of Certificate: Shandong Kuli Opto-electronic Technology Co., Ltd.

Product: Electro-Sensitive Protective Equipment Safety Light Curtain

Model(s): Tri-Series For nomenclature see attachment

Parameters:


CERTIFICATE

Holder of Certificate: Shandong Kuli Opto-electronic Technology Co., Ltd.

Testing base:

Certification Mark:

Product: Electro-Sensitive Protective Equipment Safety Light Curtain

Model(s): Tri-Series For nomenclature see attachment

Parameters:

Tested according to:


GB

中华人民共和国国家标准

压力机用光电保护装置技术条件

Specification of active opto-electronic protective devices for presses


济宁市科学技术奖

证 书

为表彰济宁市科学技术奖获得者，特颁发此证书。

项目名称：ESKT 型（地面用）光电保护装置

奖励等级：二等

获 奖 者：济宁科力光电产业有限责任公司[集体]

备　　注：科技进步类

2014 年 12 月

证书号：JS2014-2-3-1D


济宁市科学技术奖

证 书

为表彰济宁市科学技术奖获得者，特颁发此证书。

项目名称：智能化多工位弧面安全冲压式光电共振型在线监测系统

奖励等级：三 等

获 奖 者：济宁科力光电产业有限责任公司

备　　注：科技进步类

2016 年 12 月

证书号：JS2016-2-4-09D


质量管理体系认证证书

济宁科力光电产业有限责任公司

GB/T 19001-2008 / ISO 9001:2008

• 光电保护装置的设计、生产和服务 •


GB

中华人民共和国国家标准

机械电气安全　电敏保护设备
第 1 部分：一般要求和试验

Electrical safety of machinery—Electro-sensitive protective equipment—Part 1:General requirements and tests


GB

中华人民共和国国家标准

机械电气安全　电敏保护设备
第 2 部分：使用有源光电保护装置（AOPDs）设备的特殊要求

Electrical safety of machinery—Electro-sensitive protective equipment—Part 2:Particular requirements for equipment using active opto-electronic protective devices (AOPDs)


GB

中华人民共和国国家标准

机械电气安全　电敏保护设备
第 4 部分：使用视觉保护装置（VBPD）设备的特殊要求

Electrical safety of machinery—Electro-sensitive protective equipment—Part 4:Particular requirements for equipment using vision based protective devices (VBPD)



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# 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.

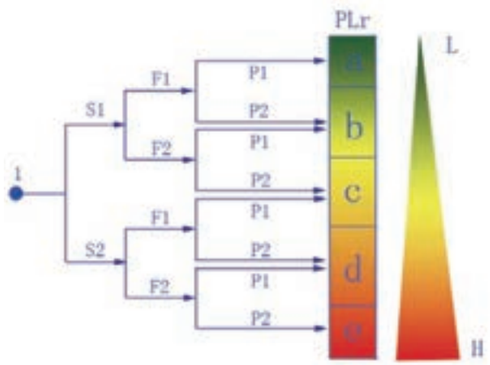
In August 2017, LS laser radarwas promoted to the market.

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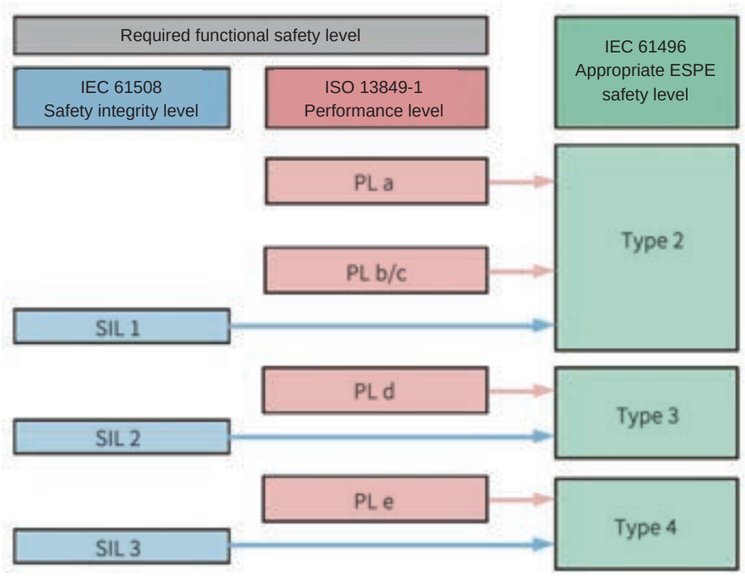
# Risk assessment

**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(normallyreverbleinjury);
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<br><br>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<br><br>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.<br><br>- When sensitive functions are triggered<br>- If equipped, start interlocking or restart interlocking reset<br><br>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<br><br>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<br><br>A single failure that results in loss of detection capability should cause ESPE to go into the locking state within response time<br><br>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.<br><br>- When sensitive functions are triggered<br>- If equipped, start interlocking or restart interlocking reset<br><br>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<br><br>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 |

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# 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



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# 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

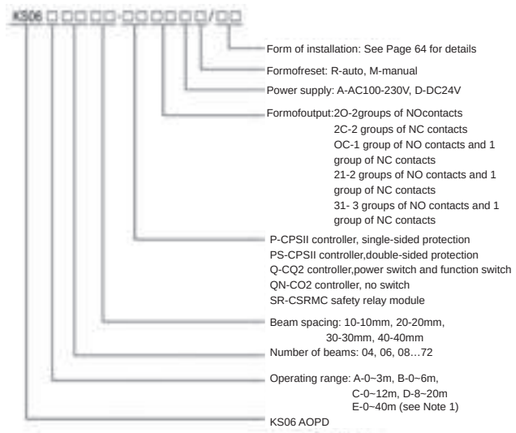
It is composed of controller, emitter, receiver, transmission cable and power line.

## Product features

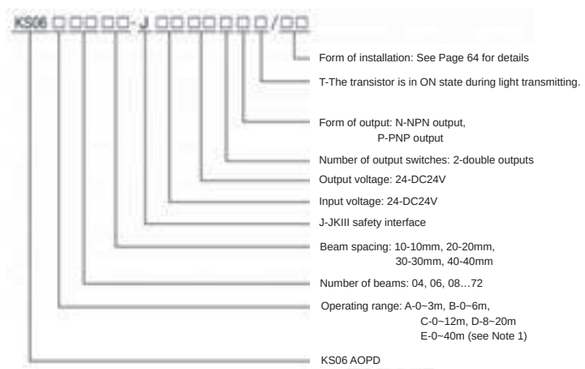
- With perfect self-test function, it can realize the full-test including output signal;
- It can serve floating shielding function to process long materials;
- It provides the passive contact output of two-way relay, with higher safety performance;
- The detection accuracy can be up to 18mm to protect 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 | | | | | |

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## 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 |

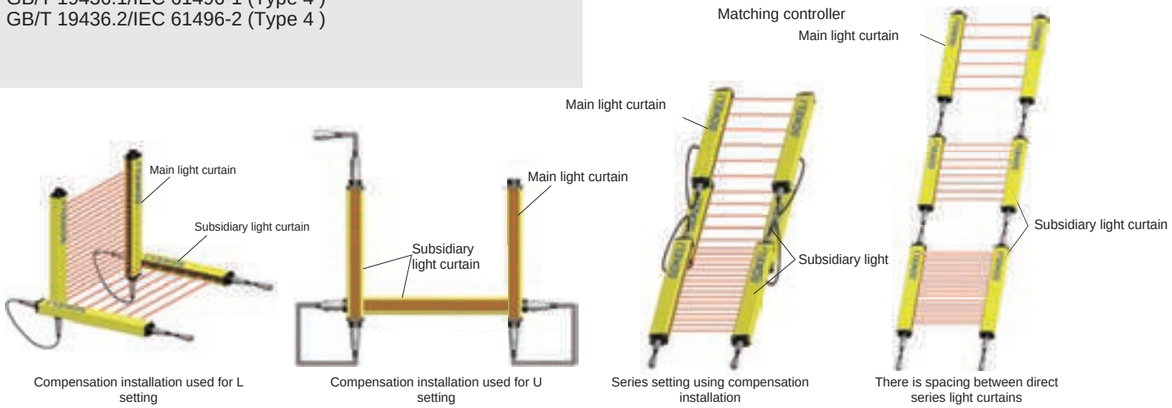
Note: E series only provide the products with the specifications and models in yellow; double-armpipe length (L) is not more than1.5 m.

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# 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.

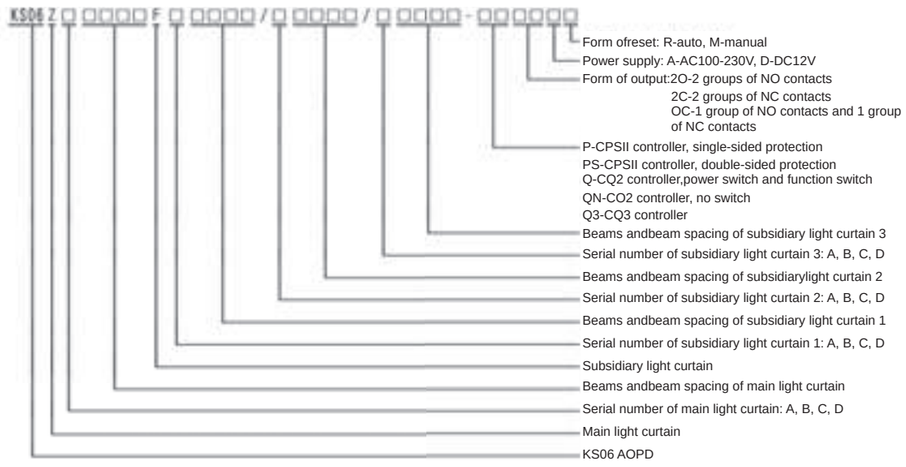
**Product components**

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 | |

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## 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—

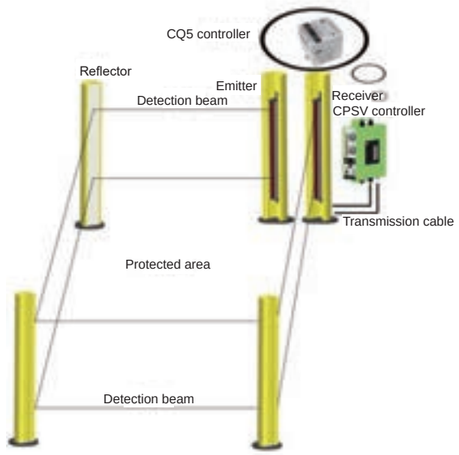
| Number of beams | Beam spacing: 10 | | | | | Beam spacing: 20 | | | | | Beam spacing: 40 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Detection capability 18 | | | | | Detection capability 28 | | | | | Detection capability 48 | | | | |
| | H | Main light curtain J1 | 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.

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# 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

KS06Q □ □□□ □□ - □ □□□□/□□

- Form of installation: FL-Ground installation of scatter shield
- Form of reset: R-automatic reset, M-manual resetting
- 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 contacts
- II-CPSII controller, 2CQ2 controller; V-CPSV controller, 5-CQ5 controller (CPSV and CQ5 are only used for T series)
- Beam spacing: 04-40mm, 08-80mm, 16-160mm (see Table 9)
- Number of beams: A/B series: 4, 6…16, T series: 2-8
- 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, T: single protection zone 150m
- KS06Q area AOPD

## Technical parameters

—Table 9—

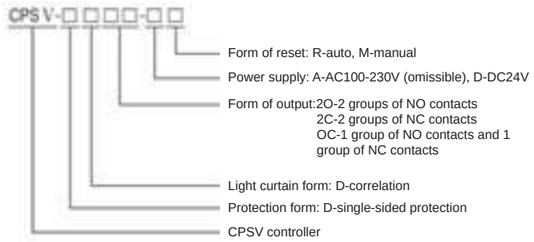
| | | | | | |
|---|---|---|---|---|---|
| Safety level | Type 4（GB/T19436） | | | | |
| Standards | GB/T19436.1；GB/T19436.2；GB4584-2007 | | | | |
| Optical characteristics | | | | | |
| Light curtain series | | | | | Laser：KS06QT |
| Beam spacing | 40mm | 80mm | 160mm | 320mm | Minimum: 200mm, which can 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<br>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 |

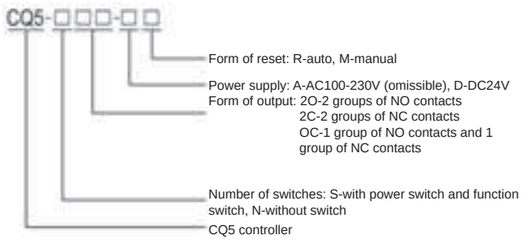
* The beam spacing of KS06QA and KS06QB series can be customized: 40×N (N is an integer) .



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## Specificationsof controller



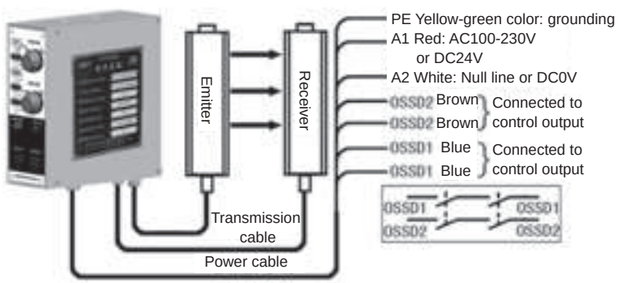




## Technical parameters of controller

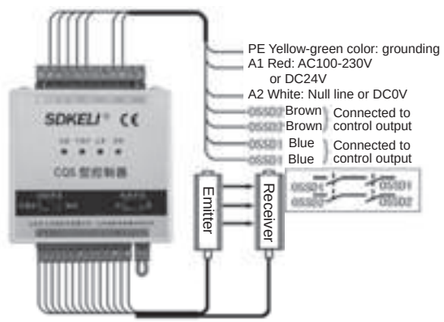
—Table10—

| | | | |
|---|---|---|---|
| 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.

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# 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.

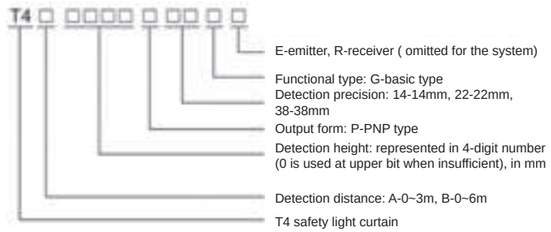
**Product components**

It is composed of emitter, receiver and transmission cable.

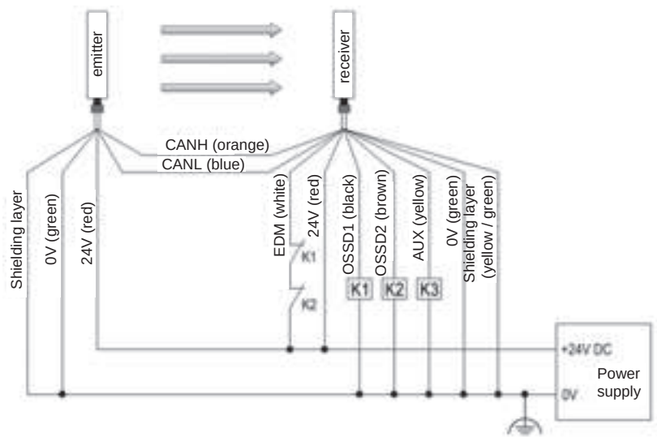
**Product features:**

- 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)<br>2006/42/EC (Mechanical Safety Command)<br>EN/IEC 61496-1/-2 Type 4<br>ESPE EN/IEC 61326-1<br>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<br>In ON state, load current: ≤200mA, output voltage: ≥Vcc-3V<br>In OFF state, leakage current: ≤ 1mA, residual voltage: ≤ 1V (excluding the impact of lead extension)<br>Capacitive load: ≤47000pF<br>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<br>In ON state, input voltage: 9V ~ 24V<br>In OFF state, input voltage: 0 ~ 7V or open circuit | |

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## 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 |



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# 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.

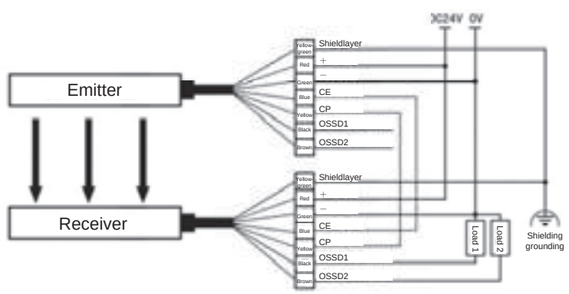
**Specifications and model**

KS06 □□□□□ G - □□ □ /□□

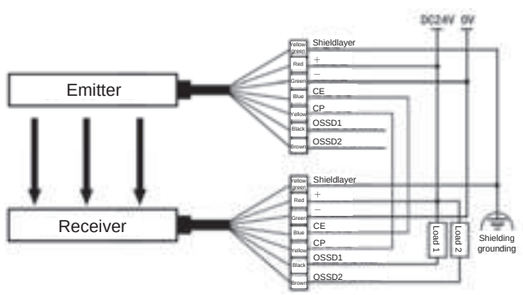
- Form of installation: See Page 64 for details
- T-transistorturns onwhenlight curtainis unblocked<br>Z-transistor turns on when light curtain is blocked
- Form of output: N-NPN output,<br>P-PNPoutput
- Number of output switches: 2-two-way output
- G-safety light curtain
- Beam spacing: 10-10mm, 20-20mm,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

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## 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 —

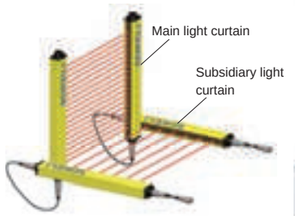
| Number of beams | Beam spacing 10 | | | | Beam spacing 20 | | | | Beam spacing 30 | | | | Beam spacing 40 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Detection capability 18 | | | | Detectioncapability28 | | | | Detection capability 38 | | | | Detection capability 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.

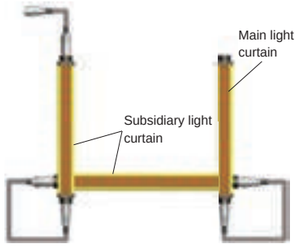
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# KS06G cascaded safety light curtain

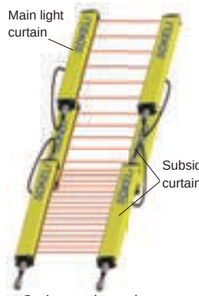
GB/T 19436.1/IEC 61496-1 (Type 4)
GB/T 19436.2/IEC 61496-2 (Type 4)



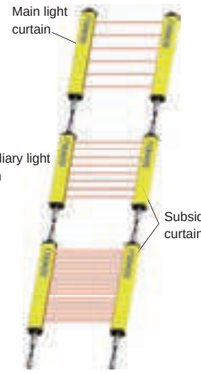

Compensation installation used for L setting




Compensation installation used for U setting




Series setting using compensation installation

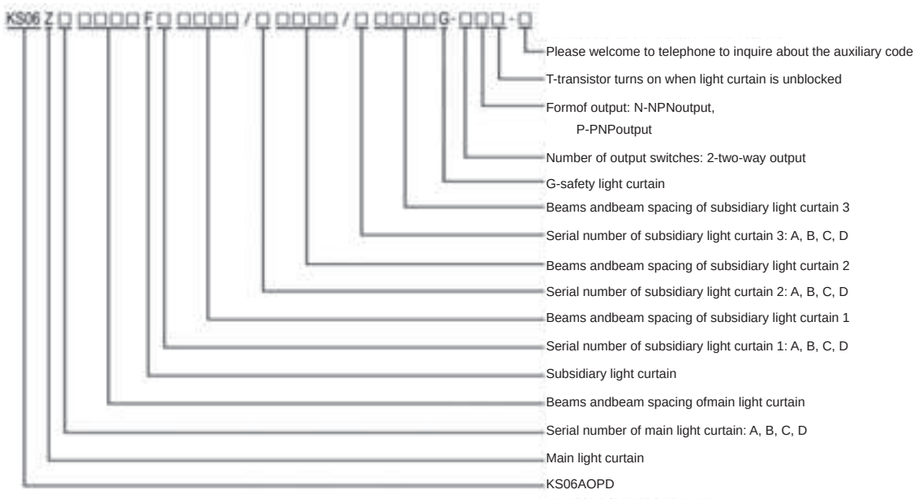



There is spacing between direct series light curtains

**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.

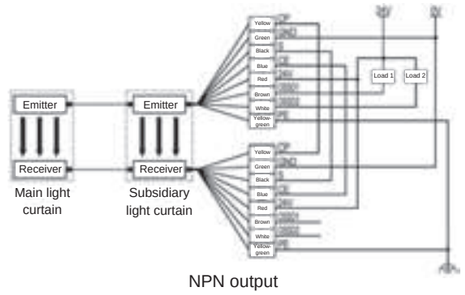
**Product components** It is composed of 1 set of main light curtain, 1-3 sets of subsidiary light curtain and transmission cable.

**Specifications and model**

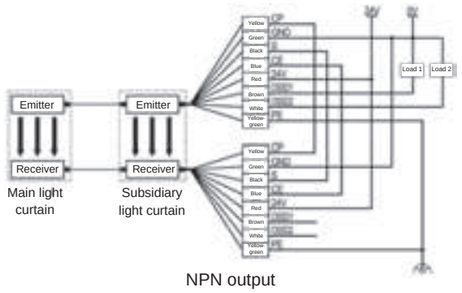



Note: Please specify the mounting brackets of safety light curtain when ordering.

## 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 | |





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## 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—

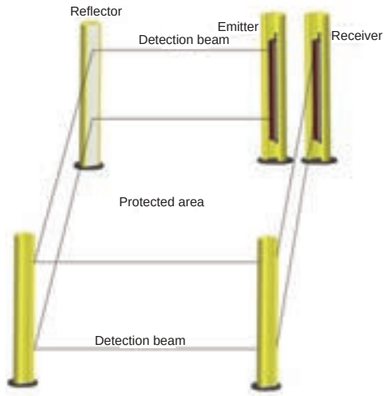
| Number of beams | Beam spacing 10 | | | | | Beam spacing 20 | | | | | Beam spacing 40 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Detection capability 18 | | | | | Detectioncapability28 | | | | | Detection capability 48 | | | | |
| | H | Main light curtain J1 | Subsidiarylight 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.

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# KS06 Qarea protective safety light curtain

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



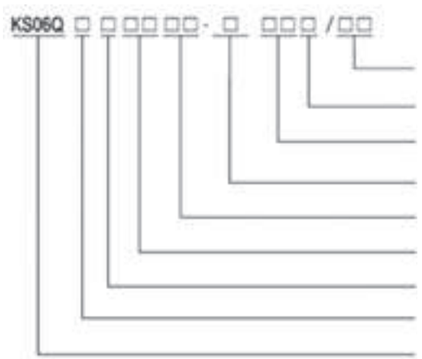

**Product introduction** KS06Qarea protective safety light curtain are divided into KS06QA series and KS06QB series. KS06Qarea safety light curtain does not require controller, and it can provide two ways of PNP or NPN transistor output signal.

**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)

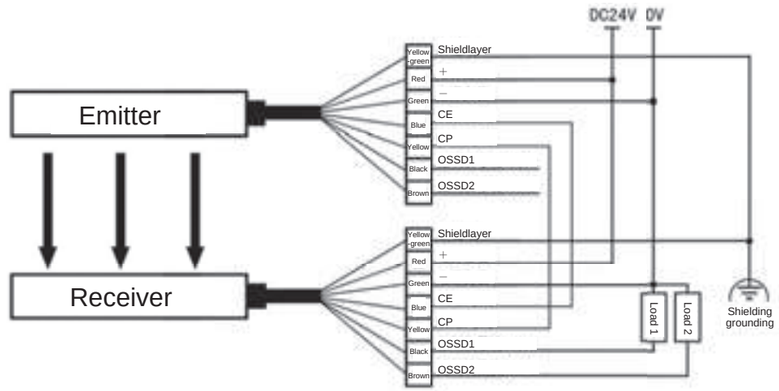
Number of beams: 4, 6…16

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

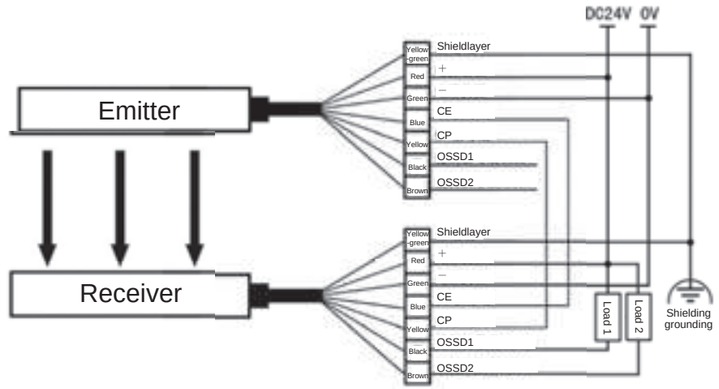
Light curtain series: A: single protection zone 20m, B: single protection zone 40m

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.

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## 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<br>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 | | | | | | |

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# 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**

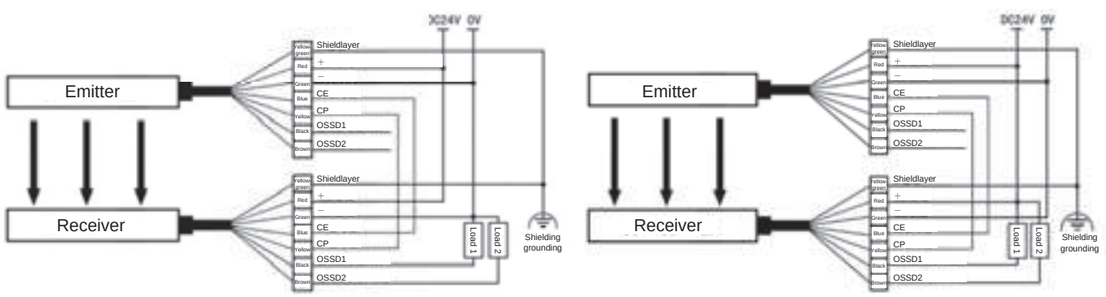
It is composed of emitter, receiver, and transmission cable.

**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 | | |



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## 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 | |

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# LCS Illight curtain



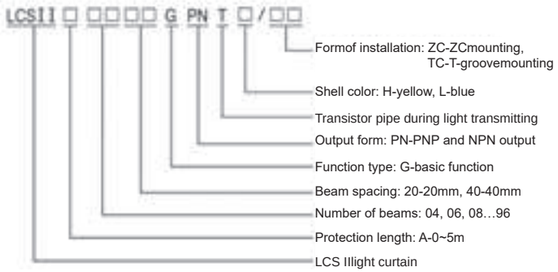
**Product introduction** LCS Illight curtain is designed for the automation field, with small size, compact structure and strong anti-interference ability, and the product meets IEC 61496-1 and IEC 61496-2 standards.

**Product features**

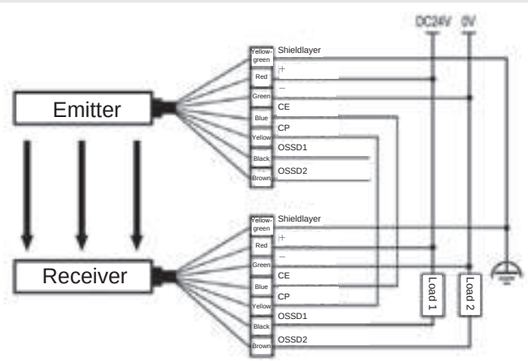
- High-security miniaturized light curtain is researched and developed using TUV-proven light curtain technology platform;
- High-reliability miniaturized light curtain has small size and internal skeleton support, so the structure is stable and reliable;
- Miniaturized light curtain features high cost 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. |

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## 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—

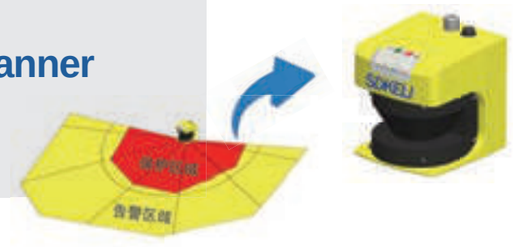
| Beam spacing 20 | | | Beam spacing 40 | | |
|---|---|---|---|---|---|
| Detection capability 30 | | | Detection capability 50 | | |
| Number of beams | H | J | Number of beams | H | J |
| 8 | 140 | 190 | 4 | 140 | 190 |
| 12 | 220 | 270 | 6 | 220 | 270 |
| 16 | 300 | 350 | 8 | 300 | 350 |
| 20 | 380 | 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 |



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# LSPD safety laser scanner

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

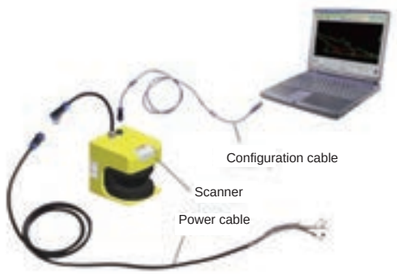



**Product introduction**

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.



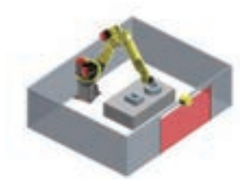

**Product features**

- 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

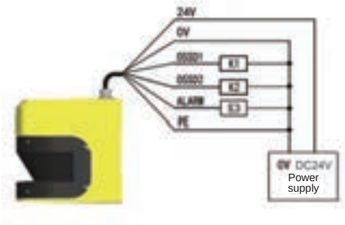


Access protection

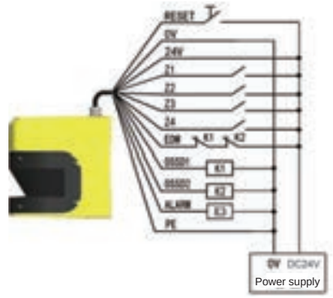


Mobile hazardous area protection

## Typical wiring diagram

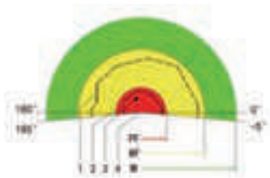



Single zone group, automatic resetting, wiring diagram when EDM is disabled




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

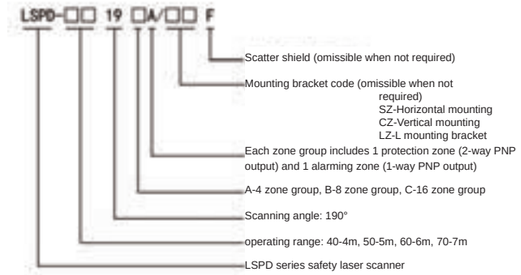
## Introduction of protection / alarming zone



—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<br>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<br>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 | | | | |



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# LS laser radar



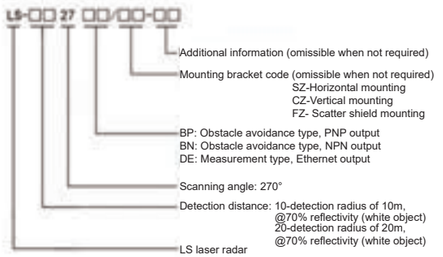
**Product introduction** LS laser radar can achieve the two-dimensional zone detection and profile scanning with a range of 270° and a radius of 10m, featuring small size, high flexibility, good capability and reliability and high cost performance, so it is the ideal choice for the obstacle avoidance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

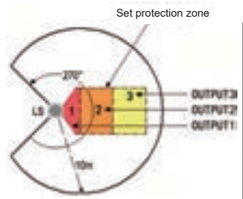
**Product features**

- 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



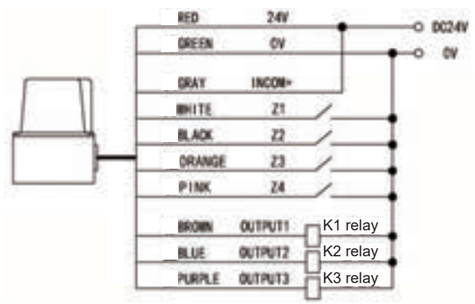

## Introduction of protection zone configuration



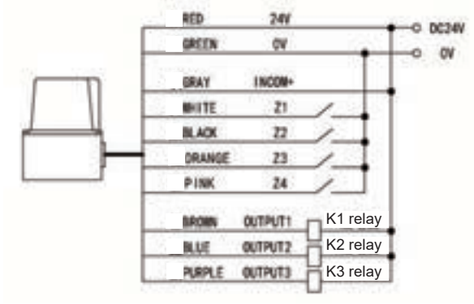

—Table 33—

| 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



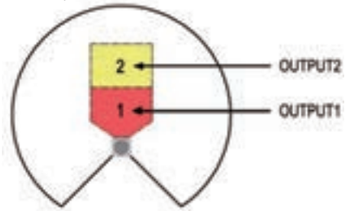

PNP output type



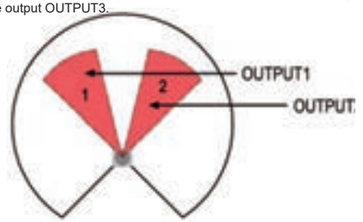

NPN output type

## Operating mode

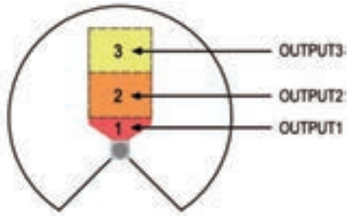
Mode 1: User can configure 2 protection zones from far and near corresponding to OUTPUT2 and OUTPUT1; meanwhile, provide system failure output OUTPUT3.



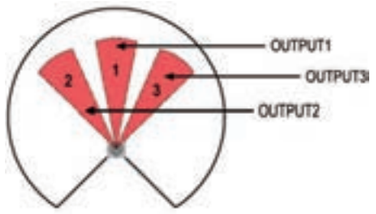

Mode 2: User can configure two independent protection zones corresponding to OUTPUT1 and OUTPUT2; meanwhile, provide system failure output OUTPUT3.




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)<br>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<br>EN61000-4-3: 2006 + A1: 2008 + A2: 2010 EN61000-4-4: 2012<br>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) | | |

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# 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.

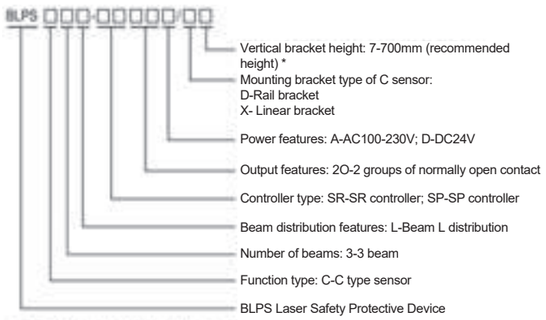
**Product features**

- 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**

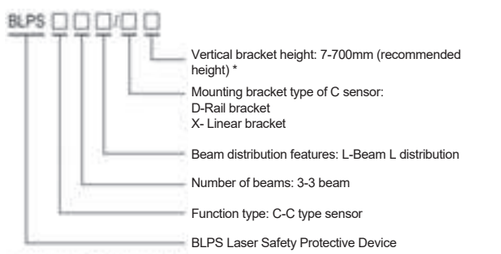
The sensor can be used alone with the bending machine system. 3 laser beams corresponds to 6 OSSD outputs, and each laser beam can provide two ways of independent safety output, and the output form is PNP.
It is in ON state during light transmitting to output a high level; during light shading, it is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

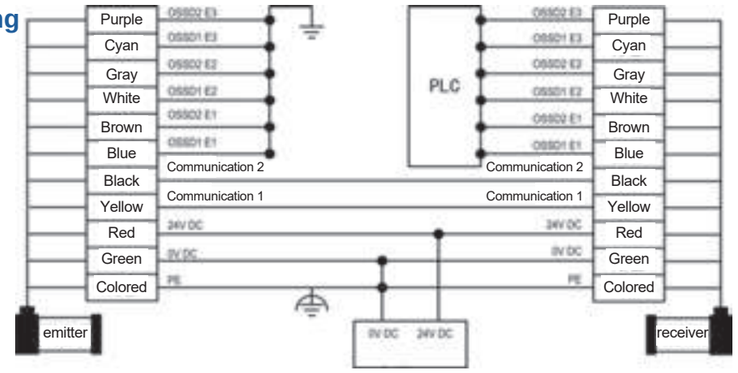
## Specifications of sensor




*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. |



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# SR/SP controller



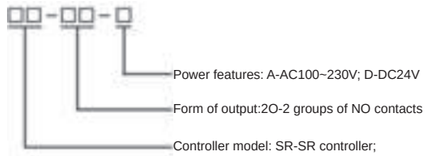
**Production introduction**

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

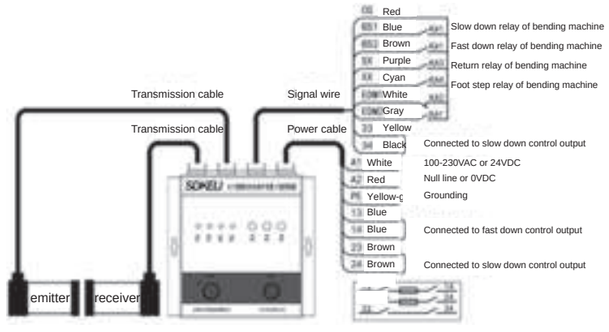
—Table 36—

| 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



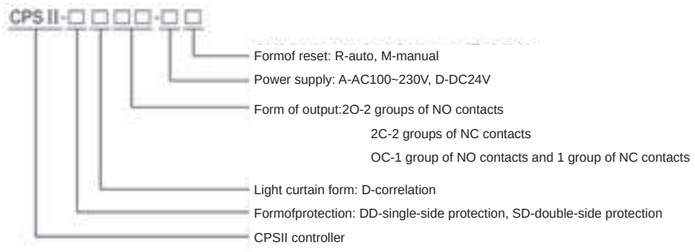
**Production introduction**

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**

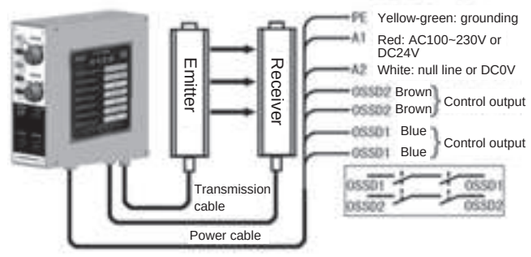



## Technical parameters

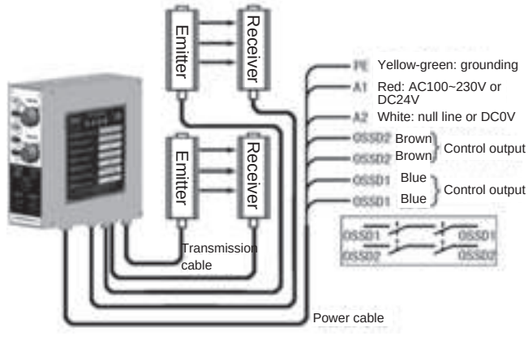
—Table 37—

| 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



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# 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-□ □ □ □-□ □

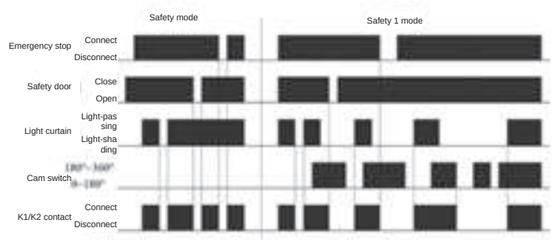
- Formofreset: R-auto, M-manual
- Powersupply: A-AC100~230V, D-DC24V
- Output form: 10- normally open contact output of one group of relay
- Formofpotection: DD-single-side protection
- CPSIII controller

## Technical parameters

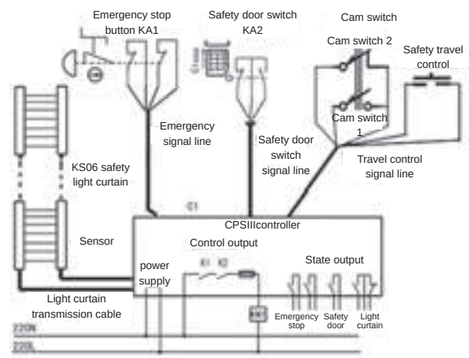
– Table 38 –

| 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 –

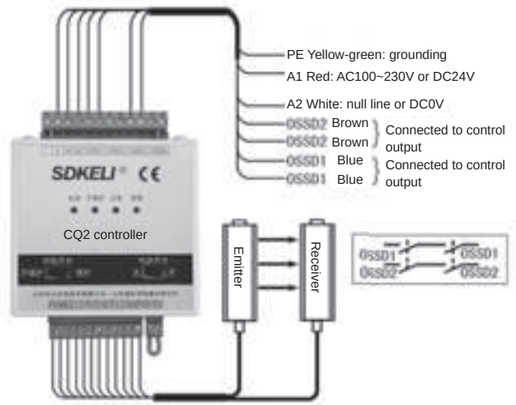
| Environmental characteristics | | | |
|---|---|---|---|
| Environment temperature | Operating | -10℃～55℃ (No frost or fog) | |
| | Storage | -40℃～70℃ | |
| Environment humidity | Operating | 35%RH～85%RH | |
| | Storage | 35%RH～95%RH | |
| IP code | | IP20 | |
| Dimensions | | 90×90×105mm | |
| **Electrical 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




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# CQ3 controller

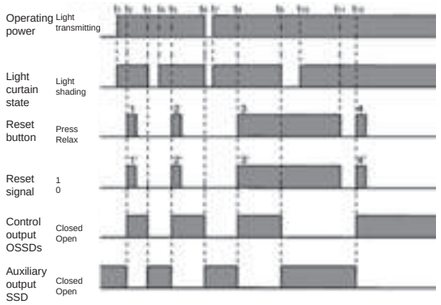


**Product introduction**

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.

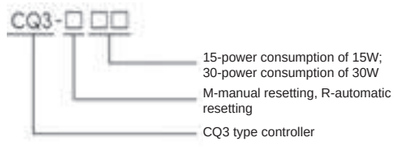



## Technical parameters

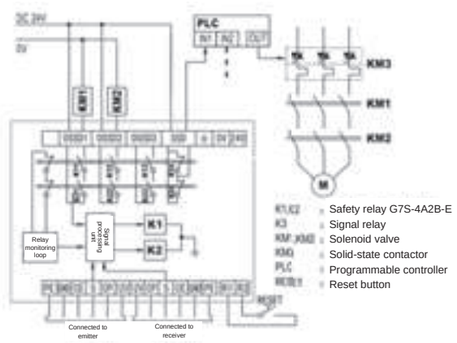
—Table 40—

| | | |
|---|---|---|
| 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**

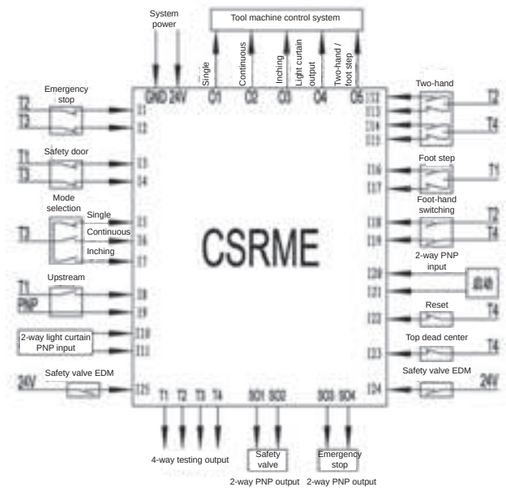
- With small size and rich IO interfaces, it can realize a comprehensive monitoring for the safety components of machine tool;
- It has limited programmable functions, and the logic can be customized according to user needs;
- With pluggable terminals, the wiring and installation is easy.

## 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






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# CSRM series safety relay module

**ISO 13849-1（PLe）**



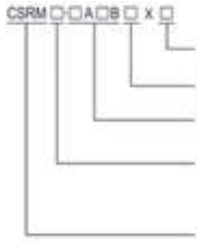
**Product introduction**

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**




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

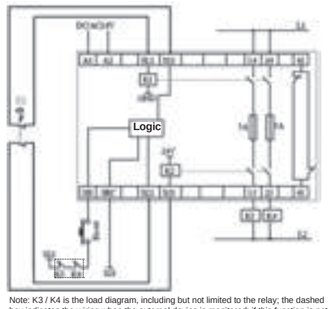
- ●Monitor the safety light curtain output signal with pulse signal output;
- ●With narrow wave band filter design and center frequency of 4KHz, it can effectively avoid the false triggering of other interference signals;
- ●It adapts to Keli active opto-electronic KS02H and KS06 safety light curtain;
- ●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.

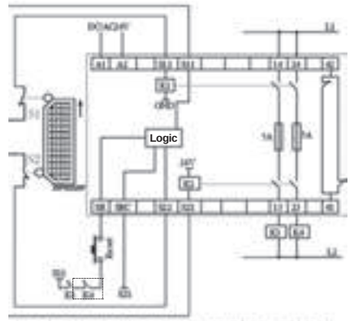


## Typical wiring diagram (2A1B module)



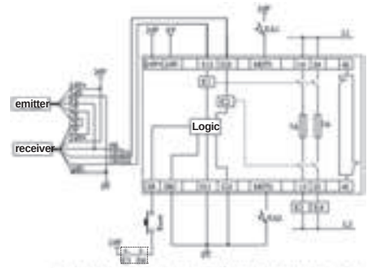

Note: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.

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



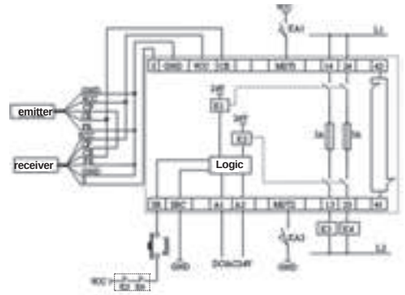

Note 1: K3 / K4 is the load diagram, including but not limited to the relay; the dashed box indicates the wiring when the external device is monitored; if this function is not used, it can be directly shorted.
Note 2: KA1/KA2 is the travel switch diagram, and inhibition function is started when KA1 and 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

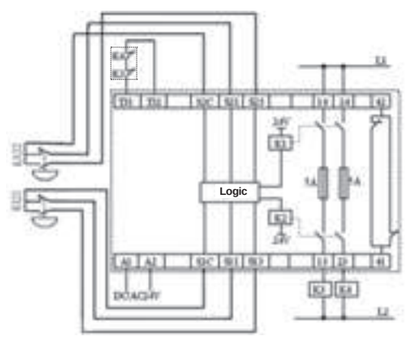
—Table 42—

| | | |
|---|---|---|
| Standards | | ISO 13849-1 (PLe)<br>2004/108/EC (EMC Command)<br>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



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## 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

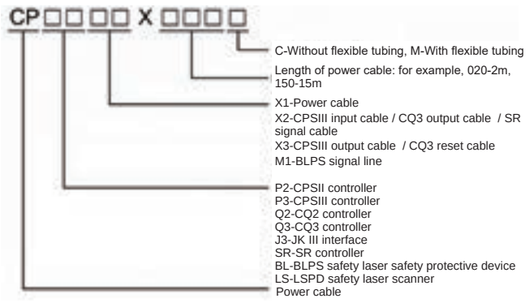
—Table44—

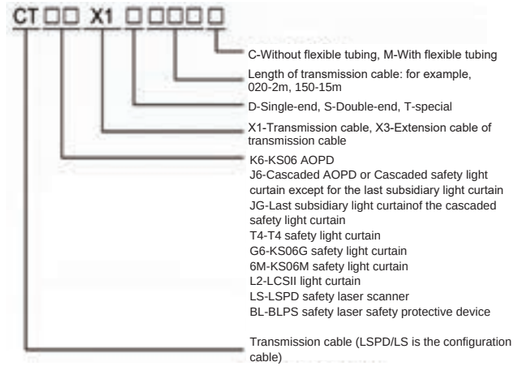
| Name | Picture | Specifications | Standard length | Function |
|---|---|---|---|---|
| Double-end transmission cable of KS06 AOPD |  | RVVP5×0.3 | A series: single-side: 2m/4m, double-side: 2m/4m and 3m/8m<br>B series: single-side: 2m/8m, double-side: 2m/8m and 4m/10m<br>C series: single-side: 3m/14m, 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)<br>B series: 3m/8m<br>C series: 3m/14m<br>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 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)<br>B series: 3m/8m<br>C series: 3m/14m<br>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 |



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## 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 | | | | ● | | | | | | | ● | | | | | | |



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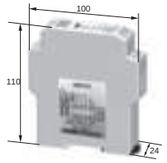
## Dimensions



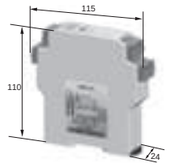

CPSII/ CPSIII / CPSV controller




CQ2/CQ3/CQ5 controller




Using locking screw plug wiring terminal




Using lock-free screw sealing and plug terminal block



CSRME safety controller

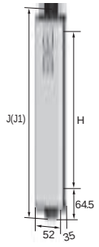
CSRM safety relay module



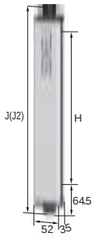
T4 safety light curtain



LCSII light curtain




Emitter / receiver / cascaded Main light curtain




Cascaded Subsidiary light curtain




KS06M emitter / receiver




LSPD safety laser scanner



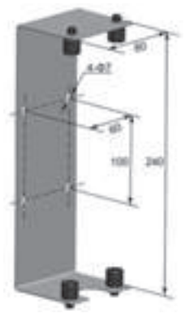

LS laser radar




BLPS sensor




SR/SP controller




Controller Support



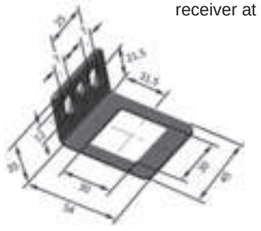

Dimensions of light curtain plug-in and maximum bending radius of cable

## Installation and accessories

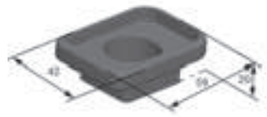



ZC-mounting (ZC)

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.

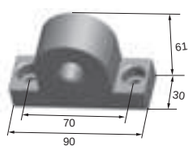



Double-bracket arm mounting (G1)

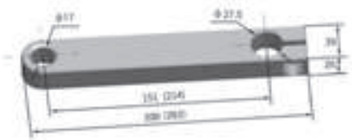
It is the installation method to directly fix the emitter / receiver at steel pipe through KS pipe-mounting fixing clamp, and bracket seat at the machine tool base or column. The double-bracket arm can effectively increase the anti-vibration performance.




KS pipe-mounting fixing clamp




Bracket seat




Bracket arm




Steel pipe

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## 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.

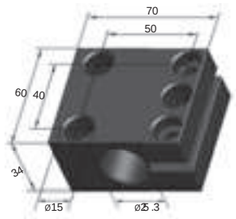


Double-arm side mounting –T-groove (SCT)

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



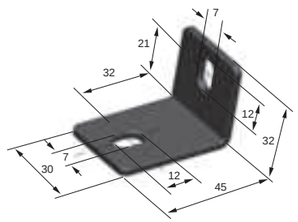
Magnetic attachment mounting (CX)

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)



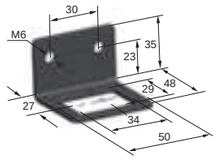
Scatter shield side mounting (FC)



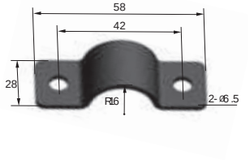
Scatter shield pipe mounting (GF)



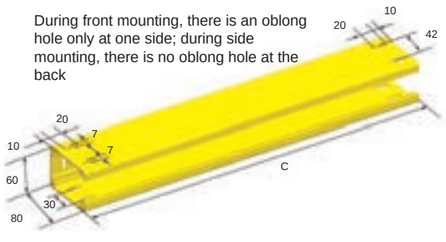
Scatter shield double-arm mounting(SF)




KS shield-mounting bracket




Ω-clamp




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.

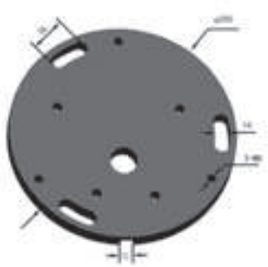



Plate support with magnet mounting (BC)

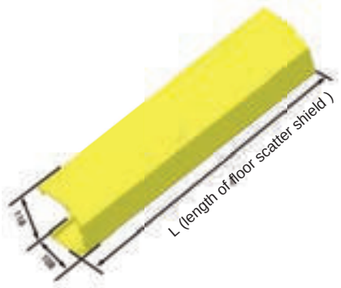
Emitter / receiver is installed at the magnetic support plate by magnet installation method, and support plate is attached at the operation table of machine tool by using strong magnet. Special safety management personnel should be assigned to be responsible for management when this installation method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



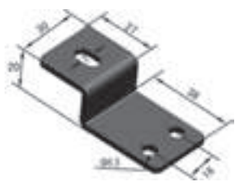
T4 adjusting bracket



T4 reducer connecting plate



T4 vibration-reducer (60×52×22mm)



Reflector common front-mounting bracket



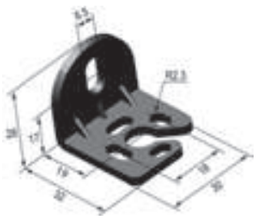
LCSII ZC mounting (ZC)

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.



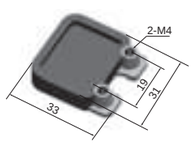
KS06M clamping mounting (JZ)

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

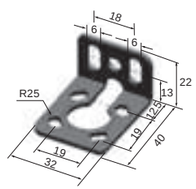


KS06M pipe mounting (GZ)

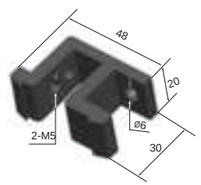
It is the installation method to fix the emitter / receiver of KS06M light curtain at the adjustable pipe-mounted bracket through pipe-mounting fixing clamp and bracket seat at the machine tool base or column.



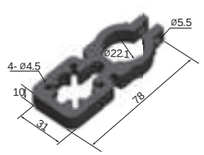

LCS vibration-reducer




LCS vibration-mounting bracket




LCS clamping bracket




LCS pipe-mounting fixing clamp

## Installation and accessories



Horizontal mounting (SZ)



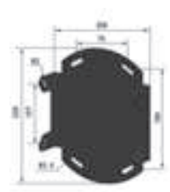
Vertical mounting (CZ)



L-bracket mounting (LZ)



LSPD adjustable horizontal-bracket



LSPD adjustable vertical-bracket



LSPD L-bracket



LSPD adapter bracket



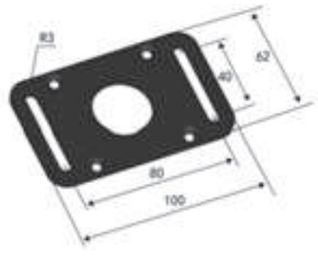
Horizontal mounting (SZ)



Vertical mounting (CZ)



Scatter shield mounting (FZ)




LS horizontal bracket




LS vertical bracket

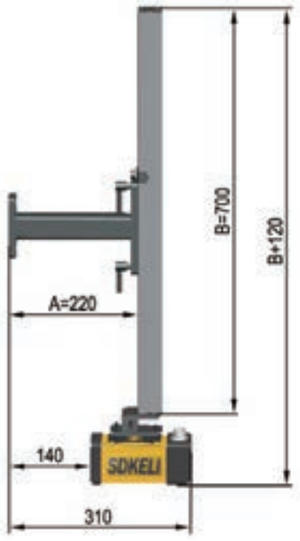



LS scatter shield bracket

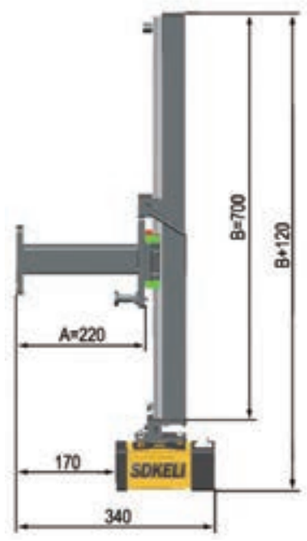


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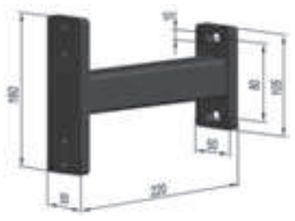
## Installation and accessories



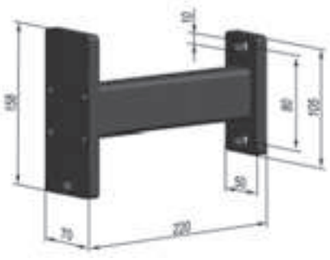

Linear horizontal mounting (X7)




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 |



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## 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 □ |

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