Manufacturer: Jining Keli Photoelectronic Industrial Co., Ltd.

ADD：Building E2, Laser Research Institute Park No. 46, Haichuan Road, Jining High-tech Zone, Shandong Province

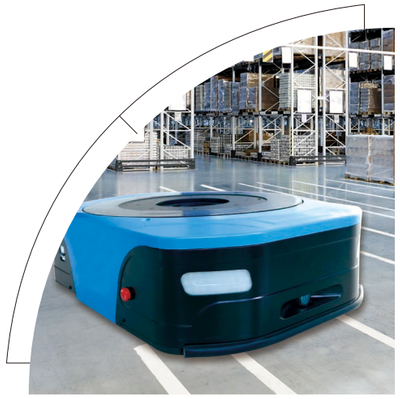
TEL: +86-(0)537-2168110　2338345
FAX: +86-(0)537-2331667
ZIP: 272000
E-mail: sale@sdkeli.com
Https://www.sdkelien.com
service line: 400-666-0416

Version: September 2026

KELi 科力

Management System ISO 9001:2015
TÜVRheinland CERTIFIED
www.tuv.com ID 9108650782

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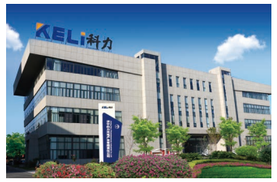


Leader of smart sensor in China

Jining Keli Photoelectronic Industrial Co., Ltd.

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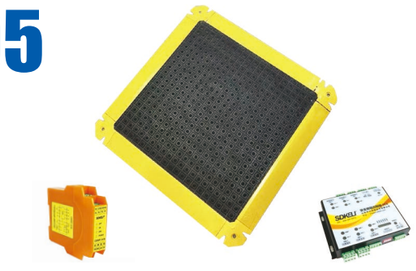
To be a qualified supplier of world-class intelligent sensing and safety control products

04



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Development History

In 1994, the Optoelectronic Industry Company of Laser Research Institute of Shandong Academy of Sciences was founded. In November, LDKS-I photoelectric protection device was put on the market.

In 1997, the company was restructured and renamed Jining Keli Photoelectronic Industrial Co., Ltd.

In May 1995, LDKS-I photoelectric protection device was appraised as a National New Product. In December, the company was recognized as a High-Tech Enterprise for the first time.

In 1998, the company obtained ISO 9000 quality system certification.

In 2006, KS06 series photoelectric protection devices were launched, which won the Work Safety Science and Technology Achievement Award and Grade A Excellent Promotion Project issued by the State Administration of Work Safety.

In 2007, the national standard GB/T 4584 Technical Requirements for Photoelectric Protection Devices for Presses, drafted under the leadership of our company, was issued.

In 2008, KS06T series photoelectric protection devices for subways were launched, receiving support from the National Technology Innovation Fund for Small and Medium-sized Enterprises.

In 2009, the Working Group for Electro-sensitive Devices (Photoelectric Protection Devices) under the National Technical Committee for Standardization of Industrial Machinery Electrical Systems was established, with our company as the leading unit.

In 2010, Shandong Keli Photoelectronic Industrial Co., Ltd. was founded.

In May 2013, T4 series photoelectric protection devices (safety light curtains with SIL 4 certification) were launched and obtained certification from TÜV SÜD. In August, BLPS laser safety protection devices dedicated to bending machines were launched and obtained certification from an authoritative European laboratory.

In 2015, LSPD safety laser scanner was put on the market and obtained certification from an authoritative European laboratory.

In 2016, the mini pulsed TOF coaxial LiDAR of LS series was launched, mainly applied to robot obstacle avoidance and navigation, and obtained European N5A certification from TÜV SÜD.

In January 2017, LSPD mini safety laser scanner was launched. In October, the company obtained quality system certification from TÜV Rheinland Group and signed a strategic cooperation agreement with the group.

In 2018, KLM type LiDAR was launched and obtained functional safety certification from TÜV Rheinland Group.

In March 2019, CT4 series safety light curtains were launched and obtained functional safety certification from TÜV Rheinland Group. In September, SMT series safety light curtains were launched and obtained SIL 4 certification from TÜV Rheinland Group. In December, the company was incorporated into Shandong Sci-Tech Innovation Group.

In July 2020, LS series LiDAR obtained North American cTUVus certification from TÜV Rheinland Group. In October, the company passed the assessment of Integration of Informatization and Industrialization Management System.

In August 2021, Shanghai Enboyou Technology Co., Ltd. was founded. In September, high-power servo drives dedicated to servo presses were launched, and the company won the Excellence Award in the “Entrepreneurship in Qilu, Win-Win Future” High-Level Talent Entrepreneurship Competition of Shandong Province. In October, the company was recognized as a Shandong Gazelle Enterprise. In November, we launched LSE type LiDAR, which obtained European N5A certification from TÜV SÜD.

In May 2022, the company was recognized as Shandong Provincial Engineering Research Center. In August, we were awarded the title of “Specialized, Refined, Distinctive and Innovative Little Giant Enterprise”.

In March 2023, the company launched the KLMs series safety LiDAR, which obtained functional safety certification from TÜV Rheinland Group. The company also obtained certifications for environmental management system and occupational health and safety management system. In July, we launched multi-axis drive servo motors and drive systems for hydraulic presses.

In July 2024, CT4, KS06 and SMT series safety light curtains passed functional safety certification of TÜV Rheinland. In December, the company was recognized as Shandong Provincial Single Champion Enterprise in Manufacturing Industry.

In May 2025, SPC series programmable safety controllers obtained authoritative functional safety certification by TÜV. In September, LCSII and LCS3 series light curtains were certified for EMC compliance by TÜV SÜD. In December, SPC series programmable safety controllers obtained North American safety certification.

In May 2026, CT6 series safety light curtains obtained functional safety certification issued by TÜV Rheinland. In the same month, LS3 series LiDAR passed EMC certification from TÜV SÜD.

COMPANY PROFILE

Specialized in R&D of Opto-Mechatronic Integration Technology
Leading Enterprise of Optoelectronic Safety Protection Technology in China

Jining Keli Photoelectronic Industrial Co., Ltd., a subsidiary of Shandong Sci-Tech Innovation Group Co., Ltd., focuses on industrial safety protection and intelligent sensor control. Our main products include safety light curtains, automatic light grids, LiDAR, programmable safety controllers, laser detection systems for rail transit, and laser safety protection devices for press brakes. We provide professional on-site risk assessment and visual safety solutions, serving personnel safety protection scenarios in forging machinery, automation, logistics warehousing, rail transit and other industries.

Our company has long been engaged in technological R&D and industrial transformation. We began to layout LiDAR technology in 2008 and realized industrialization in 2015, launching self-developed safety LiDAR with independent intellectual property rights. In 2016, we launched LiDAR for logistics navigation and obstacle avoidance, and now we have become an excellent supplier of 2D LiDAR in China.

Our company attaches great importance to quality and system construction. We passed ISO 9000 system certification in 1998, obtained TÜV SÜD functional safety certificate for light curtain products in 2013, established strategic cooperation with TÜV Rheinland in 2018, and passed ISO 9001:2015 certification. We always adhere to the quality policy of "Customer Satisfaction, Striving for Perfection, Abiding by Laws and Regulations, Continuous Improvement", and provide customers with high-quality products and professional services.



Chairman Unit of the Electric Sensitive Device (Photoelectric Protection Device) Working Group of the National Technical Committee for Standardization of Industrial Mechanical Electrical Systems

Leading Drafting Unit of current national standards for photoelectric protection devices: GB/T 4584, GB/T 19436.1, GB/T 19436.2, GB/T 19436.4, GB/T 29483-2013

Shandong Provincial Engineering and Technology Research Center for Optoelectronic Detection and Safety Control

Shandong Provincial Industrial Enterprise "One Enterprise One Technology" R&D Center

Shandong Provincial Engineering Research Center for High-Safety Intelligent Optoelectronic Sensing and Safety Control Technology

Shandong Provincial Enterprise Technology Center

1

Company Values

Customer-centric, continuously improve technology, quality and service, enhance customer value, and achieve common development of customers and Keli.

2

Company Mission

Improve the intelligence level of domestic sensors, enhance the safety guarantee capability of industrial automation, become a builder of a harmonious society and a trusted safety partner for customers.

3

Company Vision

To be a qualified supplier of world-class intelligent sensing and safety control products.

Main Production and Testing Equipment

Imported SMT Placement Production Line	Automatic Conformal Coating Production Line	Waterproof Performance Test Equipment
Informatized Intelligent Manufacturing System	Electrostatic Protection System	High-temperature Aging Test Chamber
LiDAR AA Alignment & Calibration System	Programmable Temp-Humidity Test Chamber	Auto 2.5D Vision Measuring Machine
Mechanical Shock Test Bench	EMC Comprehensive Test Laboratory	Automatic Wire Harness Stripping Machine
3D Automated Optical Inspection (AOI)	Precision Optical Inspection Platform	Three-in-one Environmental Test Bench
Dry Ice Cleaning Machine	CNC Aluminum Profile Cutting Machine	AMR Material Transport Vehicle

ENTERPRISE HONORS















































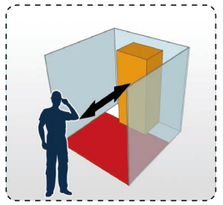


LASER LIDAR

- KLMs Safety LiDAR
- LSPD Mini Safety Laser Scanner
- LS2 Series LiDAR
- LS3 Series LiDAR
- KLM Safety LiDAR
- KLM LiDAR
- LSE LiDAR

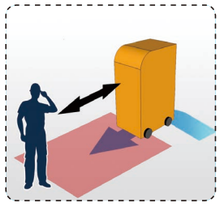
Primary Functions

Hazard Zone Protection



Fixed Hazard Zone Protection

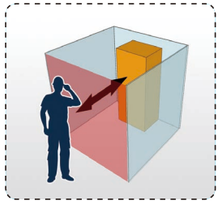
When the LiDAR detects an object in the set warning zone, it will output an alarm signal. When an object is detected in the set protection zone, it will output a stop signal to shut down equipment operation and prevent hazards.



Moving Hazard Zone Protection

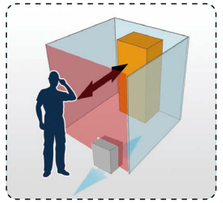
During equipment movement, the LiDAR monitors the hazard zone in real time. When an object is detected in the set protection zone, it will output a stop signal. The LiDAR can switch freely among multiple protection zones according to external signals.

Access Prevention



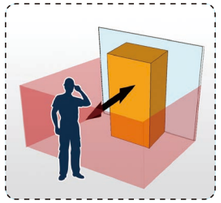
Access Control Protection

When the LiDAR detects someone crossing the protective gate, it will output a stop signal. Controlled equipment halts operation to prevent hazards.



Material-Discriminating Access Protection

The LiDAR can distinguish between personnel and materials through detection. The opening size of the protection zone will switch to the allowable shape for material passage; if a person enters, the equipment will stop running.



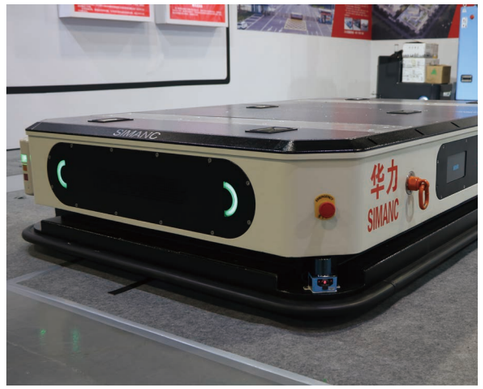
Multi-Side Intrusion Protection

When the LiDAR detects someone entering the protected zone, it will output a stop signal to shut down the controlled equipment and prevent risks.

Typical Application Cases







Product Series

Name	KLMs Safety LiDAR	KLM Safety LiDAR	LSPD mini Safety Laser Scanner	KLM LiDAR	LS2 LiDAR	LSE LiDAR	LS3 LiDAR
Product							
Functional Safety Certification	Type 3，SIL 2，PL d	Type 3，SIL 2，PL d	Type 3，PL d	——	——	——	——
Maximum Detection Radius	50 m @ 90% reflectivity	80 m @ 90% reflectivity	25 m @ 90% reflectivity	90 m @ 90% reflectivity	23 m @ 90% reflectivity	23 m @ 90% reflectivity	45 m @ 90% reflectivity
Maximum Protection Zone Radius	4 m @ 1.8% reflectivity	8 m @ 1.8% reflectivity	3 m @ 1.8% reflectivity	——	——	——	——
Maximum Warning Zone Radius	16 m	27 m	8 m	——	——	——	——
Scanning Angle	276°	276°	270°	276°/360°	270°	270°	270°
Angular Resolution	0.12°	0.12°	0.5°	Default: 0.12° @ 25 Hz (configurable); Min.: 0.06° @ 10 Hz	Obstacle Avoidance: 0.5° ; Measurement: 0.33°	Obstacle Avoidance: 0.5°; Measurement: 0.33°	Default: 0.1° @ 15 Hz
Ambient Light Immunity	80,000 lux	80,000 lux	80,000 lux	80,000 lux	15,000 lux	80,000 lux	100,000 lux
Scanning Period	40ms/scan	40ms/scan	40ms/ scan	Default: 40 ms/scan (configurable)	36ms/scan	36ms/scan	Default: 66 ms/scan (configurable)
Overall Dimensions	80×90×75 mm	100×100×115 mm	80×80×95 mm	100×100×115 mm	62×64×84 mm	64×62×83 mm	64×62×84.5 mm
Protection level	IP65	IP65	IP65	IP67	IP65	IP65	IP65
Output Type	Obstacle Avoidance: PNP Dual Output: PNP + Ethernet	Obstacle Avoidance: PNP Dual Output: PNP + Ethernet	Obstacle Avoidance: PNP	Measurement: Ethernet	Obstacle Avoidance: NPN/ PNP Measurement: Ethernet/ RS-232	Obstacle Avoidance: NPN/ PNP Measurement: Ethernet	Obstacle Avoidance: NPN/ PNP/RS-485 Measurement: Ethernet/ RS-232 Dual Output: PNP + Ethernet

KLMs Safety LiDAR





EC Type-Examination Certificate

TÜVRheinland

according to Directive 2006/42/EC Article 12(3)(b) and Article 12(4)(a) on safety of machinery referred to in Annex IV

Certificate No.: M3 69266538 0001

Test Report No.: H023IWVW 001

Certificate holder: Jining KeLi Photoelectronic Industrial Co. Ltd. Building E2, Laser Research Institute Park, No. 46 Saichuan Road, High-tech Zone, Jining City, Shandong Province 272000, P.R. China

Product: Lidar Family (Active Opto-electronic Protective Device responsive to Diffuse Reflection)

Identification: Tested type(s): KLMs-0327BP, KLMs-0327PE, KLMs-0427BP, KLMs-0427PE KLM-0627BF, KLM-0627PE, KLM-0627BP, KLM-0627PE

For type nomenclature, ratings and firmware/software see Annex of this certificate.

Trade Mark: KUKELI®

Tested according to: 2006/42/EC - Annex I EN IEC 61496-1:2020 EN IEC 61496-3:2019 EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN 61508-1:2010 EN 61508-2:2010 EN 61508-3:2010

Valid until: 2028-03-05

This type-examination certificate refers to the above mentioned product. This is to certify that the test sample is in conformity with the requirements of Annex I of the Directive. The Certificate Holder is entitled to use this certificate in connection with the EC Declaration of Conformity in accordance with Annex X of the Directive. This certificate does not imply assessment of the series production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The certificate is valid up to the date of validity provided that the test specifications and construction of the product remain unchanged during the period of validity.

Certification Body

Date of issue: Budapest, 2023-03-06

Tamás László Tóth

TÜV Rheinland InterCert Kft. – Product Certification Body — H-1143 Budapest, Gizella út 51-57. — www.tuv.com Notified under No. 1008 in EU

Validity of certificate can be checked on www.CERTIPEDIA.com

TÜV Functional Safety Certified LiDAR

- SIL 2, PL d, Type 3, certified by TÜV Rheinland, complying with standards IEC 61508, ISO 13849 and IEC 61496.

TÜVRheinland CERTIFIED Type Approved Safety Regular Production Surveillance www.tuv.com ID 1111266608

TÜVRheinland ID 72227250 01

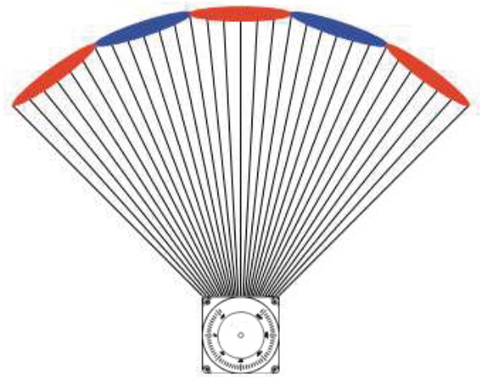
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Overview

KLMs Safety LiDAR is an electrically sensitive protective equipment (ESPE). Based on pulsed laser ranging principle, it adopts rotational scanning to realize 2D area protection within 276° scanning angle and 4 m @ 1.8% reflectivity detection radius. It provides both functional safety output and measurement data output, meeting user demands for safety obstacle avoidance and measurement simultaneously.

Advantages

- Measurement accuracy is unaffected by target reflectivity variation, delivering stable and consistent results in complex application scenarios and multi-LiDAR networking.



- Supports free switching between static and dynamic inputs and setting of up to 64 protection zones, which can be combined arbitrarily to adapt to complex and changeable application scenarios.



- The optical window adopts an innovative structural design with excellent dirt resistance, greatly reducing maintenance frequency. It is also equipped with dirt detection and alarm function, ensuring safe and worry-free operation.

Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Mounting Method
KLMs—	□□	□□	□□ /	□□

Model	Maximum Protection Zone Radius	Scanning Angle	Output Type
KLMs-0327PE	3 m @1.8% reflectivity	276°	PNP+Ethernet
KLMs-0327BP	3 m @1.8% reflectivity	276°	PNP
KLMs-0427PE	4 m @1.8% reflectivity	276°	PNP+Ethernet
KLMs-0427BP	4 m @1.8% reflectivity	276°	PNP

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	KLMs-SZ

Cables

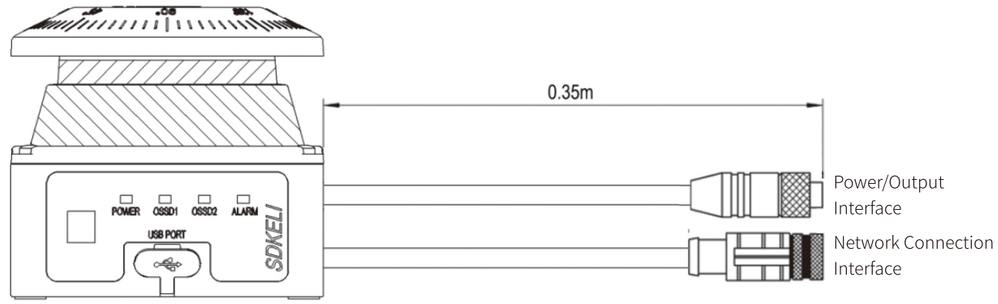
Name	Diagram	Type	Model
KLMs Obstacle Avoidance Power Extension Cable		Power Cable	CPKSX1X□□□C
KLMs M12 Network Extension Cable		Network Extension Cable	CTKMX3S□□□C

Technical Specifications

Safety Level Parameters	
Type	Type 3 (IEC 61496)
Safety Integrity Level	SIL 2 (IEC 61508)
Category	Cat. 3 (ISO 13849-1)
Performance Level	PL d (ISO 13849-1)
PFH	1.34× 10^{-7}
Safety State on Failure	At least one OSSD is in OFF state.
Optical Characteristics	
Laser Source	Wavelength: 905 nm, Class 1 Laser Product
Scanning Angle	276° (–48°～ 228°)
Maximum Protection Zone Radius	4 m@1.8% reflectivity
Maximum Detection Radius	50 m@90% reflectivity
Angular Resolution	0.12°
Scanning Period	40 ms
Multiple Sampling	2~16
Response Time	Default: 100 ms (configurable)
Minimum Detectable Object	70 mm @ maximum protection zone radius
Tolerance Zone (TZ)	65 mm
Additional Extension Range (ZR)	350 mm (for measurement errors caused by reflection)
Repeatability	±6 mm@1sigma
Electrical Characteristics and Interfaces	
Operating Voltage	DC24V±20%
Power Consumption	＜ 10W (no load at output)
Safety Output (OSSD1)	PNP × 2 (ON state: max. Iout = 200 mA, Vout ⩾ Vcc-2V; OFF state: Iout < 1 mA, Vout < 2V) Overcurrent protection, capacitive load ⩽ 100 nF. ON state when no object in the protection zone; OFF state when object is present or in case of failure.
Input Interfaces	Total of 8 inputs with an input impedance of 3.3 kΩ, configurable as static or dynamic inputs: • Static input: High level input: 24 V (11V~28V), Low level input: 0V (<2V). Sampling time (debounce): 10 ms. • Dynamic input (encoder input): High level input: 24 V (11V~28V), Low level input: 0V (<2V). Input frequency < 100 kHz. Encoder type: dual-channel, 90° phase difference.
General I/O Interfaces	Total of 4 channels: - General I/O 1 & 4: Configurable as static input or warning output - General I/O 2 & 3: Configurable as static input, OSSD2 output, or warning output • Static input: Input impedance: 4.7 kΩ; High level input: 24 V (11V~28V); Low level input: 0V (<2V). Sampling time (debounce): 10 ms. • OSSD2 output: Identical to safety output OSSD1. • Warning output (PNP): ON state: max. Iout = 200 mA, Vout ⩾ Vcc-2V; OFF state: Iout < 1 mA, Vout < 2V. Switches to OFF state when an object is present in the warning zone.
Permissible Cable Resistance Between Load and OSSD	⩽ 4 Ω
Data Output Interface	Ethernet
Configuration Interfaces	microUSB/ Ethernet
Power-up Time	Typical value: 10 s
Mechanical Parameters	
Dimensions	80×90×75 mm
Cable Length	⩽ 1m
Environmental Characteristics	
Ambient Temperature	Operating: -30 ° C ~ 50 ° C (no frost and condensation); Storage: -40 °C ~ 70 °C
Ambient Humidity	Operating: 35% RH ～ 85% RH; Storage: 35% RH ～ 95% RH
Ambient Light Immunity	80,000Lux*
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, 1 octave/min, amplitude: 0.35 mm / 1 g, 20 cycles in X, Y, Z directions
	Frequency: 5 Hz ~ 200 Hz, amplitude: 1.5 mm / 0.5 g, 10 cycles in X, Y, Z directions
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, 1000 bi-directional shocks in X, Y, Z directions
	Acceleration: 5 g, pulse duration: 11 ms, 3 bi-directional shocks in X, Y, Z directions
Protection level	IP65

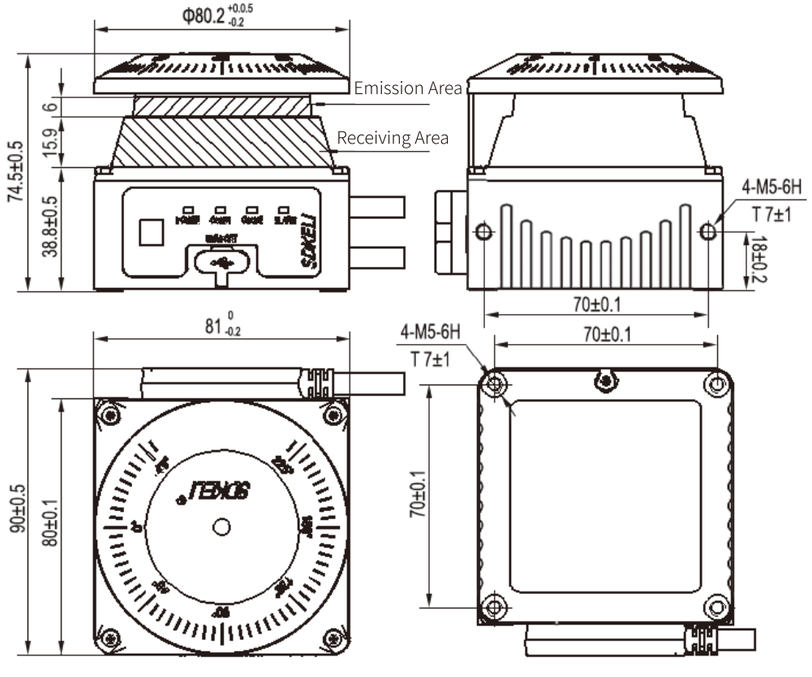
* For ambient light directly entering the scanning plane (per IEC 61496-3): ⩽ 1,500 lux

Output Interface



Power/Output Interface: M12 17-pin male connector; Cable Length: 0.35 m

Dimensions



KLM Safety LiDAR





TÜV Functional Safety Certified LiDAR

- SIL 2, PL d, Type 3, certified by TÜV Rheinland, complying with standards IEC 61508, ISO 13849 and IEC 61496.

TÜVRheinland CERTIFIED Type Approved Safety Regular Production Surveillance www.tuv.com ID 111266608

TÜVRheinland c us ID 72227250 01

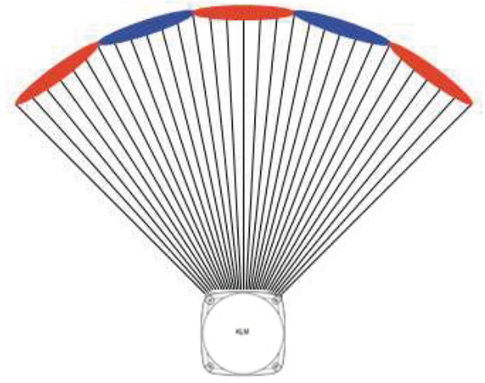
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Overview

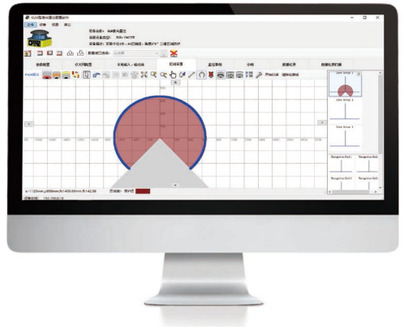
KLM Safety LiDAR is an electrically sensitive protective equipment (ESPE). Based on pulsed laser ranging principle, it adopts rotational scanning to realize 2D area protection within 276° scanning angle and 8 m @ 1.8% reflectivity detection radius. It provides both functional safety output and measurement data output, meeting user demands for safety obstacle avoidance and measurement simultaneously.

Advantages

- Measurement accuracy is unaffected by target reflectivity variation, delivering stable and consistent results in complex application scenarios and multi-LiDAR networking.



- Supports free switching between static and dynamic inputs and setting of up to 64 protection zones, which can be combined arbitrarily to adapt to complex and changeable application scenarios.



- The optical window adopts an innovative structural design with excellent dirt resistance, greatly reducing maintenance frequency. It is also equipped with dirt detection and alarm function, ensuring safe and worry-free operation.

Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Mounting Method
KLMs—	□□	□□	□□ /	□□

Model	Maximum Protection Zone Radius	Scanning Angle	Output Type
KLM-0627PE	6m@1.8% reflectivity	276°	PNP+Ethernet
KLM-0627BP	6m@1.8% reflectivity	276°	PNP
KLM-0827PE	8m@1.8% reflectivity	276°	PNP+Ethernet
KLM-0827BP	8m@1.8% reflectivity	276°	PNP

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	KLM-SZ
Vertical Mounting Bracket		Mounting Bracket	KLM-CZ

Cables

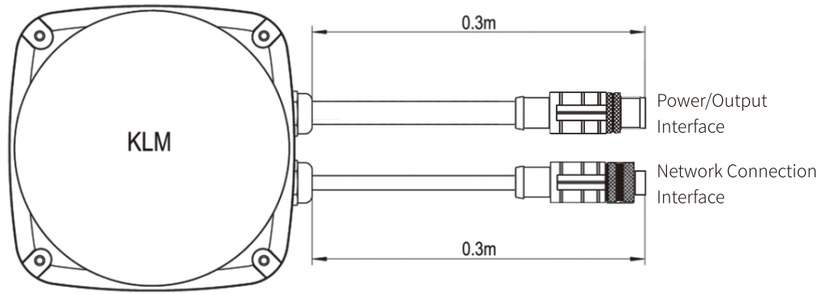
Name	Diagram	Type	Model
KLM Measurement Power Cable		Power Cable	CPKMX2X□□□C

Technical Specifications

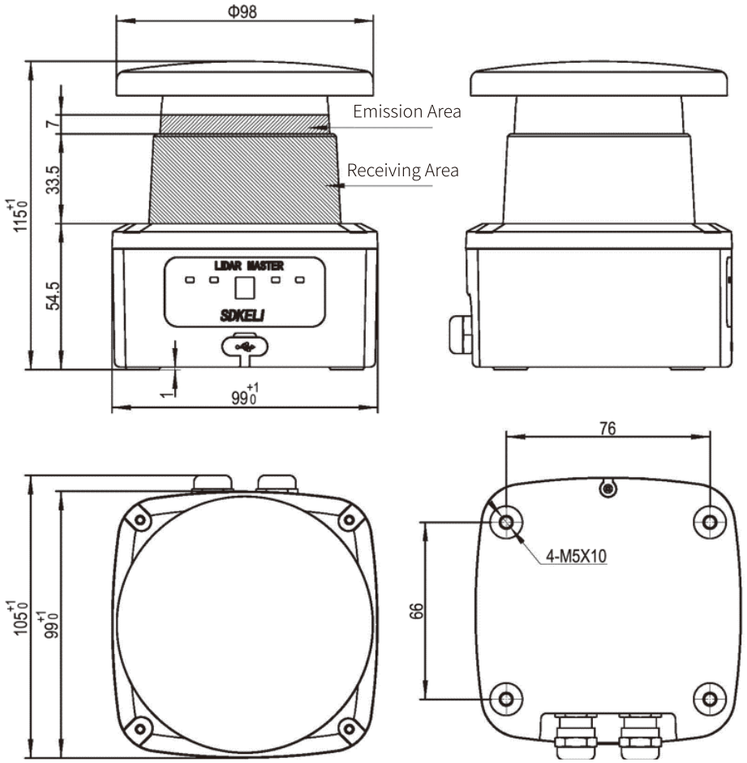
Safety Level Parameters	
Type	Type 3 (IEC 61496)
Safety Integrity Level	SIL 2 (IEC 61508)
Category	Cat. 3 (ISO 13849-1)
Performance Level	PL d (ISO 13849-1)
PFH	1.34×10^{-7}
Safety State on Failure	At least one OSSD is in OFF state
Optical Characteristics	
Laser Source	Wavelength: 905 nm, Class 1 Laser Product
Scanning Angle	276° (–48°～ 228°)
Maximum Protection Zone Radius	8m@1.8% reflectivity
Maximum Detection Radius	80m@90% reflectivity
Angular Resolution	0.12°
Measurement Accuracy	±20mm
Scanning Period	40ms
Multiple Sampling	2~16
Response Time	Default: 100 ms (configurable)
Minimum Detectable Object	70 mm @ maximum protection zone radius
Tolerance Zone (TZ)	65mm
ZR Additional Extension Range (ZR)	350 mm (for measurement errors caused by reflection)
Electrical Characteristics and Interfaces	
Operating Voltage	DC24V±20%
Power Consumption	< 10 W (no load at output)
Safety Output (OSSD1)	PNP × 2 (ON state: max. Iout = 200 mA, Vout ⩾ Vcc-2V; OFF state: Iout < 1 mA, Vout < 2V) Overcurrent protection, capacitive load ⩽ 100 nF. ON state when no object in the protection zone; OFF state when object is present or in case of failure.
Input Interface	Total of 8 inputs with an input impedance of 3.3 kΩ, configurable as static or dynamic inputs: • Static input: High level input: 24 V (11V~28V), Low level input: 0V (<2V). Sampling time (debounce): 10 ms. • Dynamic input (encoder input): High level input: 24 V (11V~28V), Low level input: 0V (<2V). Input frequency < 100 kHz. Encoder type: dual-channel, 90° phase difference.
General I/O Interface	Total of 4 channels: - General I/O 1 & 4: Configurable as static input or warning output - General I/O 2 & 3: Configurable as static input, OSSD2 output, or warning output • Static input: Input impedance: 4.7 kΩ; High level input: 24 V (11V~28V); Low level input: 0V (<2V). Sampling time (debounce): 10 ms. • OSSD2 output: Identical to safety output OSSD1. • Warning output (PNP): ON state: max. Iout = 200 mA, Vout ⩾ Vcc-2V; OFF state: Iout < 1 mA, Vout < 2V. Switches to OFF state when an object is present in the warning zone.
Permissible Cable Resistance Between Load and OSSD	⩽ 4 Ω
Data Output Interface	Ethernet
Configuration Interface	microUSB/ Ethernet
Power-up Time	Typical value: 10 s
Mechanical Characteristics	
Dimensions	100×100×115mm
Cable Length	⩽ 1m
Environmental Characteristics	
Ambient Temperature	Operating: -30 ° C ~ 50 ° C (no frost and condensation); Storage: -30 °C ~ 70 °C
Ambient Humidity	Operating: 35% RH ～ 85% RH; Storage: 35% RH ～ 95% RH
Ambient Light Immunity	80,000Lux*
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, 1 octave/min, amplitude: 0.35 mm / 1 g, 20 cycles in X, Y, Z directions
	Frequency: 5 Hz ~ 200 Hz, amplitude: 1.5 mm / 0.5 g, 10 cycles in X, Y, Z directions
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, 1000 bi-directional shocks in X, Y, Z directions
	Acceleration: 5 g, pulse duration: 11 ms, 3 bi-directional shocks in X, Y, Z directions
Protection level	IP65

*For ambient light directly entering the scanning plane (per IEC 61496-3): ⩽ 1500 lux

Output Interface



Dimensions



LSPD Mini Safety Laser Scanner





- Complies with IEC 61496 Type 3 and ISO 13849 PLd safety requirements.

Overview

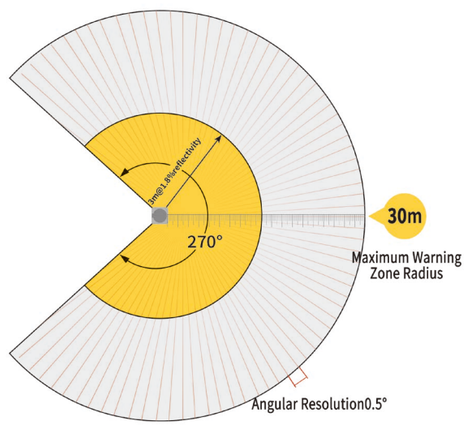
LSPD Mini Safety Laser Scanner realizes 2D area detection and contour scanning with 270° scanning angle and 3 m detection radius. Featuring compact size, flexible installation, high precision, high reliability and cost performance, it is an ideal solution for obstacle avoidance and navigation of mobile robots.

Advantages

- Safety LiDAR with overall dimensions of 80 × 80 × 95 mm.



- Protection zone includes safety zone and warning zone, safety zone radius: 3 m @ 1.8% reflectivity.



- Class 1 laser product, safe to human eyes.
- Window dirt detection function: when the actual detection distance is lower than the rated protection distance, the output will be cut off to achieve safe state.

Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Measurement Accuracy	Angular Resolution	Mounting Method
LSPDM —	□□	27（270°）	□□/	□	□□/	□□

Model	Maximum Protection Zone Radius	Output Type	Measurement Accuracy	Angular Resolution	Scanning Angle
LSPDM-0227BP/M05	2 m @1.8% reflectivity	PNP	Standard Type: ±4cm@1sigma	0.5°	270°
LSPDM-0327BP/M05	3 m @1.8% reflectivity	PNP	Standard Type: ±4cm@1sigma	0.5°	270°

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	LSPDM-SZ
Vertical Mounting Bracket		Mounting Bracket	LSPDM-CZ
Protective Cover Mounting Bracket		Mounting Bracket	LSPDM-FZ

Cables

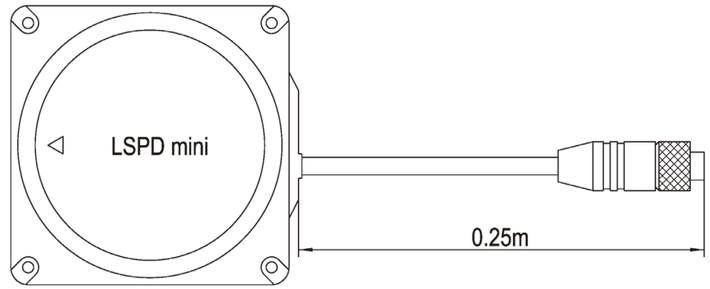
Name	Diagram	Type	Model
LSPDmini Obstacle Avoidance Power Cable		Power Cable	CPLMX1X□□□C

Technical Specifications

Safety Level Parameters		
Type	Type 3 (IEC61496), PL d (ISO13849)	
Optical Characteristics		
Laser Source	Wavelength 905 nm, Class 1 Laser Product	
Maximum Protection Zone Radius	3m@1.8%reflectivity	
Scanning Angle	270°	
Angular Resolution	0.5°	
Measurement Accuracy	Typical value: ±4 cm @ 1σ	
Environmental Characteristics		
Ambient Temperature	Operating	-10°C～55°C(no frost and condensation)
	Storage	-40°C～70°C
Ambient Humidity	Operating	35%RH～85%RH
	Storage	35%RH～95%RH
Ambient Light Immunity	80,000Lux*	
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 ± 0.05 mm, scanning cycles: 20 cycles per axis, 3 axes	
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, shock cycles: 1000±10 shocks per axis, 3 axes	
Executive Standards	2006/42/EC (Machinery Directive), 2004/108/EC (EMC Directive), IEC 61496-1, IEC 61496-3, ISO 13849-1	
	GB/T19436.1, GB19436.3, GB4208(IP65), EN60825-1(Class 1 Laser Product)	
Zone Group Switching	4 external input signals (Z1, Z2, Z3, Z4) for switching between 16 zone groups	
Protection level	IP65	
Dimensions	80×80×95mm	
Electrical Characteristics		
Operating Voltage	DC9V~ DC30V	
Power Consumption	< 5 W (No load at output terminal)	
Output Type	PNP Output	
Response Time	Default: 80 ms (configurable)	
Power-up Time	Typical value: 8 s	

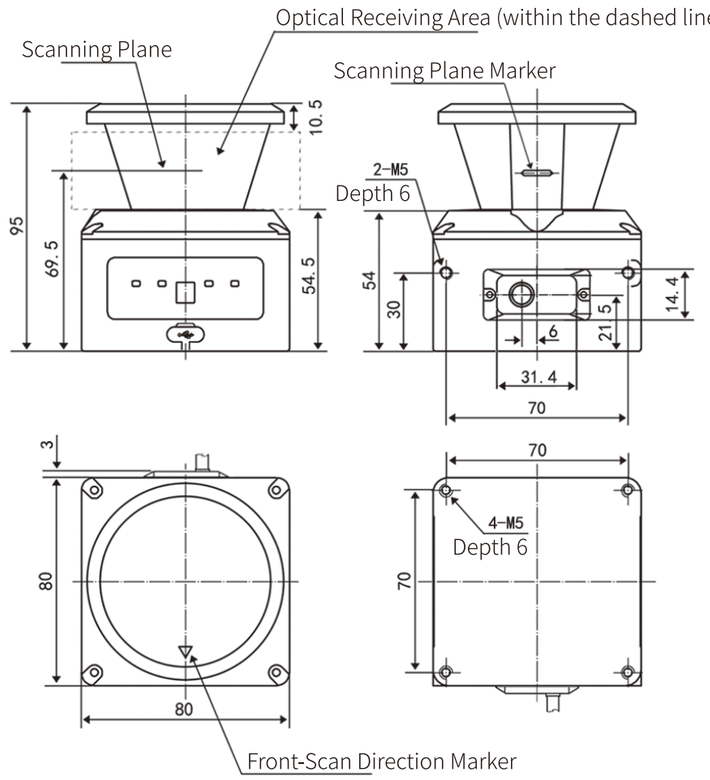
* For ambient light directly entering the scanning plane (per IEC 61496-3): ⩽ 1,500 lux

Output Interface



Power/Control Interface: M12 17-pin female connector; Cable Length: 0.25 m

Dimensions



KLM LiDAR

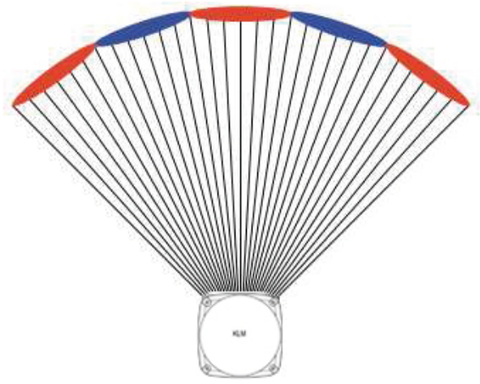


Overview

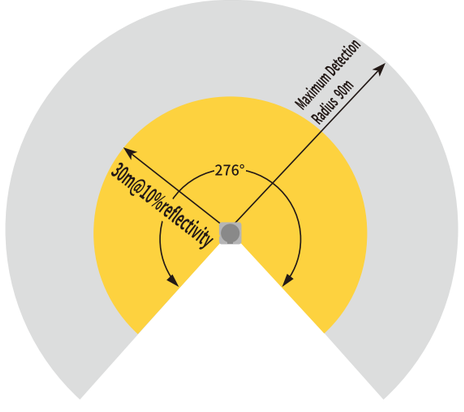
The KLM Type LiDAR achieves two-dimensional area detection with an angle of 276 ° (or 360 °) and a radius of 30 m @ 10% reflectivity through rotational scanning, based on the principle of pulsed laser ranging. It can provide measurement data output, meeting users' needs for measurement applications.

Advantages

- Measurement accuracy is unaffected by target reflectivity variation, delivering stable and consistent results in complex application scenarios and multi-LiDAR networking.



- Supports accurate identification of small targets at long distances; maximum detection radius up to 90 m.



- The window adopts stepped structure design with excellent dirt resistance, effectively reducing maintenance frequency and extending maintenance cycle.
- Stable optical performance, especially suitable for reflector navigation applications.
- Zero blind zone design.
- Multi-echo pulse processing technology ensures excellent performance in rainy and foggy environments.

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Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Mounting Method
KLM—	□□	□□	□□ /	□□

Model	Maximum Detection Radius	Scanning Angle	Output
KLM-2027DE	8m@1.8%reflectivity；20m@10%reflectivity；60m@90%reflectivity	276°	Ethernet
KLM-3027DE	12m@1.8% reflectivity；30m@10% reflectivity；90m@90% reflectivity	276°	Ethernet
KLM-2036DE	8m@1.8% reflectivity；20m@10% reflectivity；60m@90% reflectivity	360°	Ethernet
KLM-3036DE	12m@1.8% reflectivity；30m@10% reflectivity；90m@90% reflectivity	360°	Ethernet

Note: If the above products cannot meet your requirements, customized solution is available. Please contact local sales manager for details.

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	KLM-SZ
Vertical Mounting Bracket		Mounting Bracket	KLM-CZ

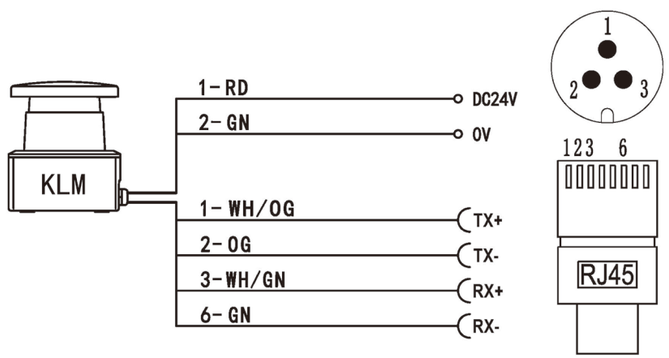
Cables

Name	Diagram	Type	Model
KLM Measurement Power Cable		Power Cable	CPKMX2X□□□C

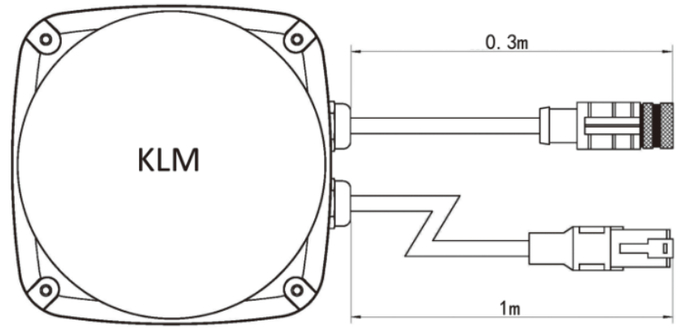
Technical Specifications

Optical Characteristics			
Laser Source	Wavelength 905 nm, Class 1 Laser Product		
Maximum Detection Radius	12 m @ 1.8% reflectivity, 30 m @ 10% reflectivity, 90 m @ 90% reflectivity		
Scanning Angle	276°/360°	Angular Resolution	Default: 0.12° @ 25 Hz (configurable); Min.: 0.06° @ 10 Hz
Refresh Rate	Default: 25 Hz (configurable)		
Measurement Accuracy	Typical value: ⩽ 25 mm	Repeatability	±6mm@1sigma
Electrical Characteristics			
Operating Voltage	DC11V～DC28V		
Power-up Time	Typical value: 8 W		
Power Consumption	Typical value: 8 s		
Output Type	Ethernet Output		
Dimensions	100×100×115mm		
Environmental Characteristics			
Ambient Temperature	Operating: -30 °C ~ 50 °C, (no frost and condensation); Storage: -40 °C ~ 70 °C		
Ambient Humidity	Operating: 35% RH ～ 85% RH; Storage: 35% RH ～ 95% RH		
Ambient Light Immunity	80,000 lux		
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, shock cycles: 1000±10 shocks per axis, 3 axes		
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 ± 0.05 mm, scanning cycles: 20 cycles per axis, 3 axes		
Protection level	IP67		
Electromagnetic Compatibility (EMC)	EMI	EN61326-1：2013 EN55011：2009 + A1：2010	
	EMS	EN61326-1：2013 EN61000-4-2：2009 EN61000-4-3：2006+A1:2008+A2:2010 EN61000-4-4：2004+A1:2010 EN61000-4-6：2009 EN61000-4-8：2010 EN61000-4-11：2004	

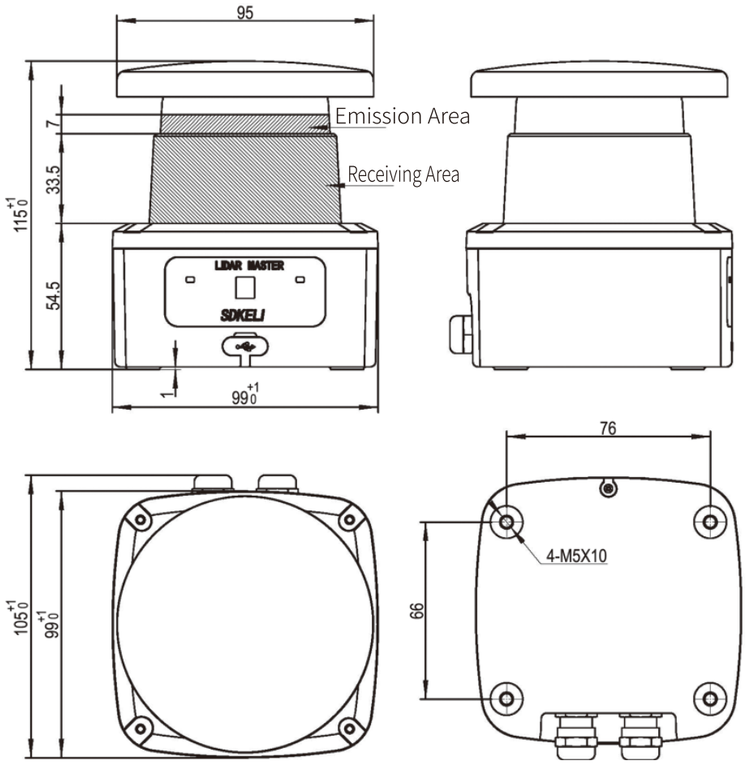
Typical Wiring Diagram



Output Interface



Dimensions



LS2 Series LiDAR



• Industrial-grade design for stable and reliable performance: IP65 rating, dedicated temperature drift compensation design, professional EMC design and rigorous tests including ambient light, shock and vibration resistance.

TÜVRheinland CERTIFIED Management System ISO 9001:2015 www.tuv.com ID 9108650782

TÜVRheinland c us ID 72202582 03 CE

Overview

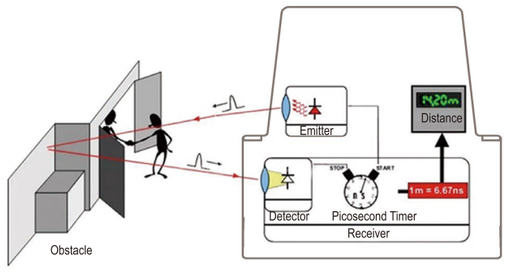
LS2 Series LiDAR realizes 2D area detection and contour scanning with 270° scanning angle and 20 m detection radius. Featuring compact size, flexible installation, high precision, high reliability and cost performance, it is an ideal solution for obstacle avoidance and navigation of mobile robots.

Advantages

● Domestic pulsed LiDAR with compact overall dimensions of 62 × 64 × 84 mm, easy for user integration.



● Adopts pulsed laser ranging technology. The pulse energy is 1000 times higher than continuous light source, ensuring stable and reliable measurement. Combined with nanosecond narrow pulse technology, it is certified as Class 1 laser product, safe to human eyes.



● Ultra-fast scanning speed, up to 25,000 measurements per second; single scan cycle: 40 ms.

● Detachable window design, convenient for maintenance, lowering maintenance cost and prolonging service life.

● Supports up to 16 user-definable detection zones, which can be set as any complex and irregular shape according to user demands.

Selection Steps

LiDAR Selection Method:

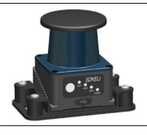
1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Measurement Accuracy	Angular Resolution	Mounting Method
LS2 —	□□	27（270°）	□□/	□	□□/	□□

Model	Maximum Detection Radius	Output Type	Measurement Accuracy	Angular Resolution
LS2-0627BP/M05	2m@10%reflectivity.6m@70% reflectivity.7m@90%reflectivity.	PNP	Standard type, ±4 cm @ 1σ	0.5°
LS2-0627BN/M05	2m@10%reflectivity.6m@70% reflectivity.7m@90%reflectivity.	NPN	Standard type, ±4 cm @ 1σ	0.5°
LS2-1027BP/M05	4m@10%reflectivity.10m@70% reflectivity.11m@90%reflectivity.	PNP	Standard type, ±4 cm @ 1σ	0.5°
LS2-1027BN/M05	4m@10%reflectivity.10m@70% reflectivity.11m@90%reflectivity.	NPN	Standard type, ±4 cm @ 1σ	0.5°
LS2-1027DE/H03	4m@10%reflectivity.10m@70% reflectivity.11m@90%reflectivity.	Ethernet, with ROS, Windows, Linux drivers available	High-precision type, ±2 cm @ 1σ	0.33°
LS2-2027DE/H03	8m@10%reflectivity.20m@70% reflectivity.23m@90%reflectivity.	Ethernet, with ROS, Windows, Linux drivers available	High-precision type, ±2 cm @ 1σ	0.33°
LS2-0627D2/H05	2m@10%reflectivity.6m@70% reflectivity.7m@90%reflectivity.	RS232 Output	High-precision type, ±2 cm @ 1σ	0.5°

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Mounting Bracket		Horizontal Mounting Bracket	LS2-SZ
Mounting Bracket		Vertical Mounting Bracket	LS2-CZ
Mounting Bracket		Protective Cover Mounting Bracket	LS2-FZ
Mounting Bracket		Shock-Absorbing Mounting Bracket	LS2-JZ

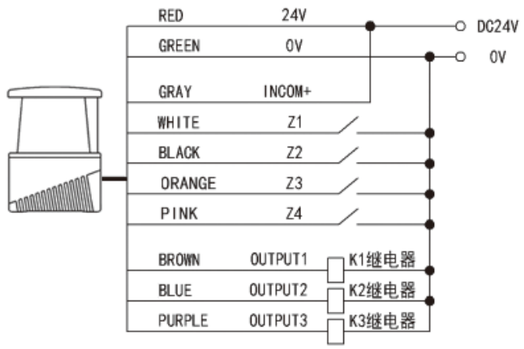
Cables

Name	Diagram	Type	Model
LS Obstacle Avoidance M12 Male Power Cable		Power Cable	CPLSX2D□□□C

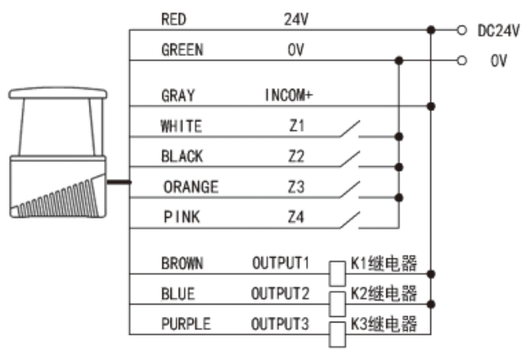
Technical Specifications

Optical Characteristics				
Laser Source	Wavelength 905 nm, Class 1 Laser Product			
Maximum Detection Radius	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity			
Scanning Angle	270°			
Angular Resolution	Obstacle Avoidance Type: 0.5°		Measurement Type: 0.33°	
Measurement Accuracy	Standard Type: ±4 cm @ 1σ (Typical value)		High-Precision Type: ±2 cm @ 1σ (Typical value)	
Environmental Characteristics				
Ambient Temperature	Operating	-10°C～55°C (no frost and condensation)		
	Storage	-40°C～70°C		
Ambient Humidity	Operating	35%RH～85%RH		
	Storage	35%RH～95%RH		
Ambient Light Immunity	15000 Lux			
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 ± 0.05 mm, scanning cycles: 20 cycles per axis, 3 axes			
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, shock cycles: 1000±10 shocks per axis, 3 axes			
Electromagnetic Compatibility (EMC)	EMI	EN61326-1：2013　EN55011：2009 + A1：2010		
	EMS	EN61326-1：2013　EN61000-4-2：2009 EN61000-4-3：2006 + A1：2008 + A2：2010 EN61000-4-4：2012　EN61000-4-6：2009 EN61000-4-8：2010		
Zone Group Switching	4 external input signals (Z1, Z2, Z3, Z4) for switching between 16 zone groups			
Protection level	IP65			
Dimensions	62×64×84mm，62×64×81mm（excluding cap dimensions）			
Electrical Characteristics				
Operating Voltage	DC9V~ DC30V			
Power Consumption	3W (Typical value)			
Response Time	Obstacle Avoidance Type: 80 ms (default, configurable)			
	Measurement type: 36 ms/scan (high-precision type)		Measurement Type: 36 ms/scan (standard type)	
Output Type	BP: PNP Output	BN: NPN Output	DE: Ethernet output	D2: RS232

Typical Wiring Diagram

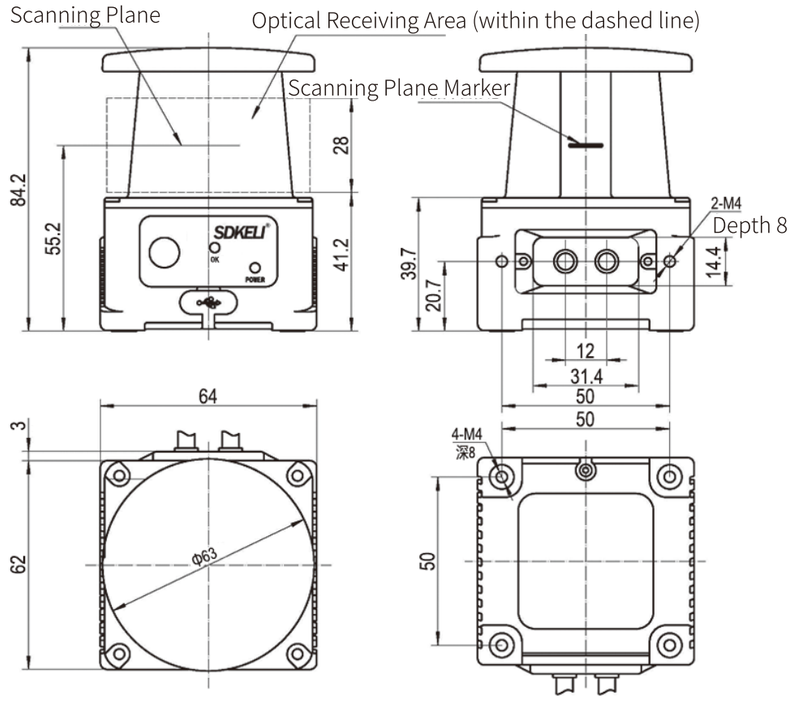


PNP Output Type



NPN Output Type

Dimensions



LSE LiDAR



TOF

TOF Pulse Ranging

$

More Cost-Effective

Easier Maintenance

Quieter Operation

More Stable Performance

270° 扫描角度

270° Scanning Angle

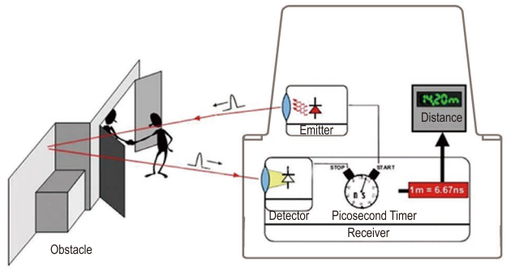
- Adopts premium imported scanning motor with noise lower than 30 dB, more stable and quieter operation.
- Detachable window design, convenient for maintenance, lowering maintenance cost and prolonging service life.

Overview

Inheriting excellent performance of LS series, LSE LiDAR is developed as a high cost-performance domestic product. With 20 m scanning radius and 270° horizontal viewing angle, it is an ideal choice for mobile robot navigation and obstacle avoidance.

Advantages

● Adopts pulsed laser ranging technology. The pulse energy is 1000 times higher than continuous light source, ensuring stable and reliable measurement. Combined with nanosecond narrow pulse technology, it is certified as Class 1 laser product, safe to human eyes.



● IP65 rating, dedicated temperature drift compensation design, professional EMC design and professional anti-ambient light interference design, suitable for complex industrial environments.



● Wide dynamic range echo signal processing technology enables accurate detection of targets with any reflectivity and position within ranging scope, ensuring stability in complex dynamic environments and consistency among multiple LiDAR units.

Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Measurement Accuracy	Angular Resolution	Mounting Method
LSE —	□□	27（270°）	□□/	□	□□/	□□

Model	Maximum Detection Radius	Output Type	Measurement Accuracy	Angular Resolution
LSE-1027DE/H03	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	Ethernet output	±3cm@1sigma	0.33°
LSE-2027DE/H03	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity	Ethernet output	±3cm@1sigma	0.33°
LSE-0627BP/H05	2 m @ 10% reflectivity, 6 m @ 70% reflectivity, 7 m @ 90% reflectivity	PNP	±3cm@1sigma	0.5°
LSE-0627BN/H05		NPN	±3cm@1sigma	
LSE-1027BP/H05	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	PNP	±3cm@1sigma	0.5°
LSE-1027BN/H05		NPN	±3cm@1sigma	

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	LSE-SZ
Protective Cover Mounting Bracket		Mounting Bracket	LSE-FZ
Shock-Absorbing Mounting Bracket		Mounting Bracket	LSE-JZ

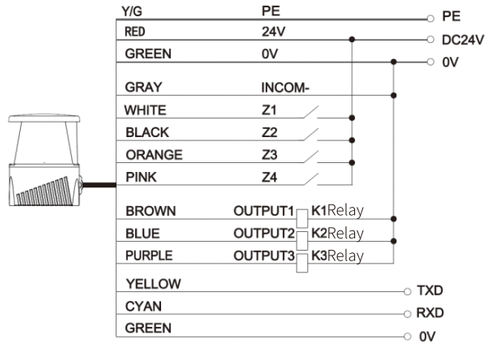
Cables

Name	Diagram	Type	Model
LSE Obstacle Avoidance M12 Male Power Cable		Power Cable	CPLEX1X***C
LSE Obstacle Avoidance LiDAR Configuration Cable		Configuration Cable	LSE-PZX

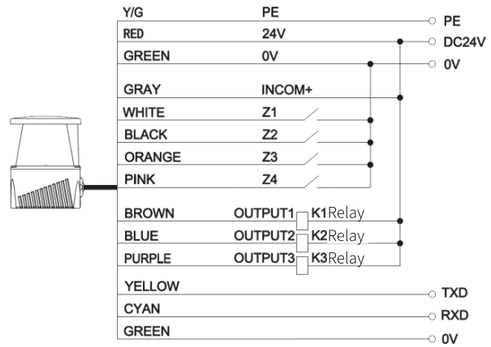
Technical Specifications

Optical Characteristics		
Laser Source	Wavelength 905 nm, Class 1 Laser Product	
Maximum Detection Radius	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity	
Scanning Angle	270°	
Angular Resolution	Obstacle Avoidance Type: 0.5°	Measurement Type: 0.33°
Pitch Angle	±1°	
Response Time	Obstacle Avoidance Type: 80 ms (default, configurable)	
	Measurement Type: 36 ms/scan	
Measurement Accuracy	Typical value: ±3 cm	
Electrical /Environmental Characteristics		
Operating Voltage	DC9V～ DC28V	
Power-up Time	Typical value: 8 s	
Power Consumption	< 3 W (No load at output terminal)	
Output Type	Ethernet Output, PNP, NPN	
Dimensions	64mm×62mm×83mm	
Cable Length	Standard: 1 m	
Environmental Characteristics		
Ambient Temperature	Operating: -10 °C ~ 50 °C, (no frost and condensation); Storage: -40 °C ~ 70 °C	
Ambient Humidity	Operating: 35% RH ～ 85% RH; Storage: 35% RH ～ 95% RH	
Ambient Light Immunity	80,000 lux	
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, shock cycles: 1000±10 shocks per axis, 3 axes	
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 ± 0.05 mm, scanning cycles: 20 cycles per axis, 3 axes	
Protection level	IP65	
Electromagnetic Compatibility (EMC)	EMI	EN61326-1:2013; EN55011:2009+A1:2010
	EMS	EN61326-1:2013; EN61000-4-2:2009; EN61000-4-3:2006+A1:2008+A2:2010; EN61000-4-4:2004+A1:2010 EN61000-4-6:2009; EN61000-4-8:2010; EN61000-4-11:2004

Typical Wiring Diagram

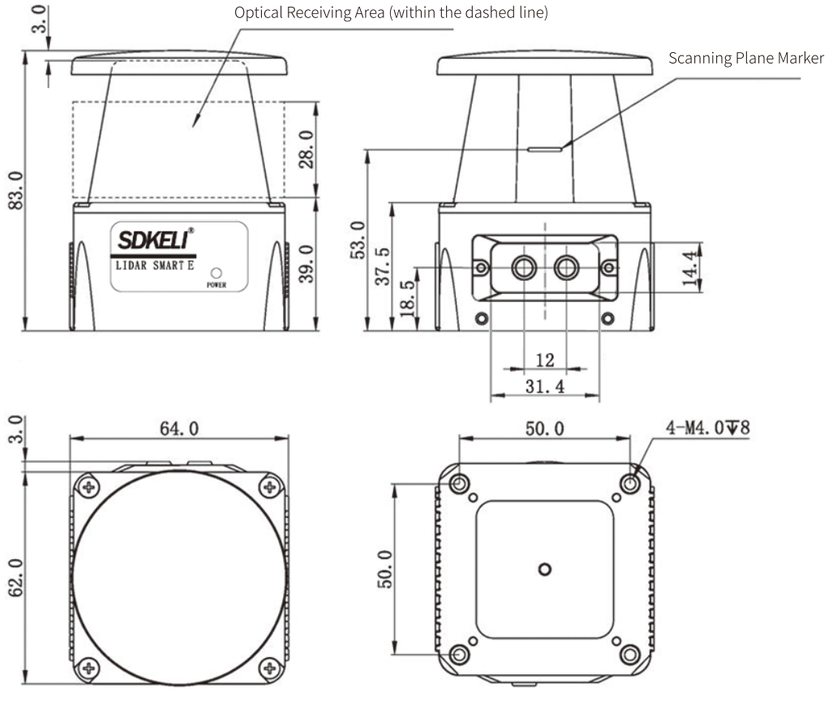


PNP Output Type



NPN Output Type

Dimensions



LS3 Series LiDAR



Overview

LS3 Series LiDAR. Based on the pulsed laser ranging principle, it adopts rotational scanning to realize 2D area detection and protection within 270° scanning angle and maximum radius of 40 m @ 70% reflectivity. Featuring compact size, flexibility, high precision, reliability and cost performance, it is an ideal choice for obstacle avoidance and navigation of mobile robots.

Advantages

● Adopts pulsed TOF nanosecond narrow pulse technology for stable and consistent measurement results. Complies with national Class 1 laser safety standard and causes no harm to human eyes.

● Minimum Angular Resolution up to 0.1° , enabling clear detection of tiny targets; ranging accuracy up to ±2 cm, ensuring accurate and reliable data.

● Overall dimensions only 62 × 64 × 84.5 mm, lightweight and easy to embed into various equipment and systems, greatly simplifying installation and integration.



● IP65 rating, built-in temperature drift compensation mechanism, professional EMC design, and rigorous ambient light, shock and vibration tests, ensuring stable operation in complex industrial environments.



● Supports up to 64 independent detection zones, which can be freely defined as any complex and irregular polygon to meet diverse monitoring requirements.

● Standard equipped with multiple output interfaces including PNP, NPN, Ethernet, RS485 and RS232, fully covering industrial communication standards for easy connection to various control systems.

Selection Steps

LiDAR Selection Method:

1 Step Select LiDAR Model → 2 Step Select Protection Radius → 3 Step Select Output Type → 4 Step Select Mounting Method → 5 Step Select Cable

Specifications

Product Series	Maximum Protection Zone Radius	Scanning Angle	Output Type	Measurement Accuracy	Angular Resolution	Mounting Method
LS3 —	□□	27（270°）	□□/	□	□□/	□□

Model	Maximum Detection Radius	Output Type	Measurement Accuracy	Angular Resolution
LS3-1027BP/H01	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	PNP	±2cm@1sigma	0.1°
LS3-1027BN/H01		NPN		
LS3-2027BP/H01	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity	PNP		
LS3-2027BN/H01		NPN		
LS3-3027BP/H01	11 m @ 10% reflectivity, 30 m @ 70% reflectivity, 34 m @ 90% reflectivity	PNP		
LS3-3027BN/H01		NPN		
LS3-4027BP/H01	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity	PNP		
LS3-4027BN/H01		NPN		
LS3-1027B4/H01	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	RS-485	±2cm@1sigma	0.1°
LS3-2027B4/H01	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity			
LS3-3027B4/H01	11 m @ 10% reflectivity, 30 m @ 70% reflectivity, 34 m @ 90% reflectivity			
LS3-4027B4/H01	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity			
LS3-1027DE/H01	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	Ethernet	±2cm@1sigma	0.1°
LS3-2027DE/H01	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity			
LS3-3027DE/H01	11 m @ 10% reflectivity, 30 m @ 70% reflectivity, 34 m @ 90% reflectivity			
LS3-4027DE/H01	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity			
LS3-1027D2/H01	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	RS-232	±2cm@1sigma	0.1°
LS3-2027D2/H01	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity			
LS3-3027D2/H01	11 m @ 10% reflectivity, 30 m @ 70% reflectivity, 34 m @ 90% reflectivity			
LS3-4027D2/H01	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity			
LS3-1027PE/H01	4 m @ 10% reflectivity, 10 m @ 70% reflectivity, 11 m @ 90% reflectivity	PNP+Ethernet	±2cm@1sigma	0.1°
LS3-2027PE/H01	8 m @ 10% reflectivity, 20 m @ 70% reflectivity, 23 m @ 90% reflectivity			
LS3-3027PE/H01	11 m @ 10% reflectivity, 30 m @ 70% reflectivity, 34 m @ 90% reflectivity			
LS3-4027PE/H01	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity			

* Angular Resolution: Factory-set at 0.1° , with configurable options of 0.25° , 0.33° , 0.5° and 1° .

Mounting Bracket (Optional)

Name	Diagram	Type	Model
Horizontal Mounting Bracket		Mounting Bracket	LS3-SZ
Protective Cover Mounting Bracket		Mounting Bracket	LS3-FZ

Cables

Name	Diagram	Type	Model
LS Obstacle Avoidance M12 Male Power Cable		Power Cable	CPLSX2D□□□C
LS3 Configuration Cable		Configuration Cable	LS3-PZX

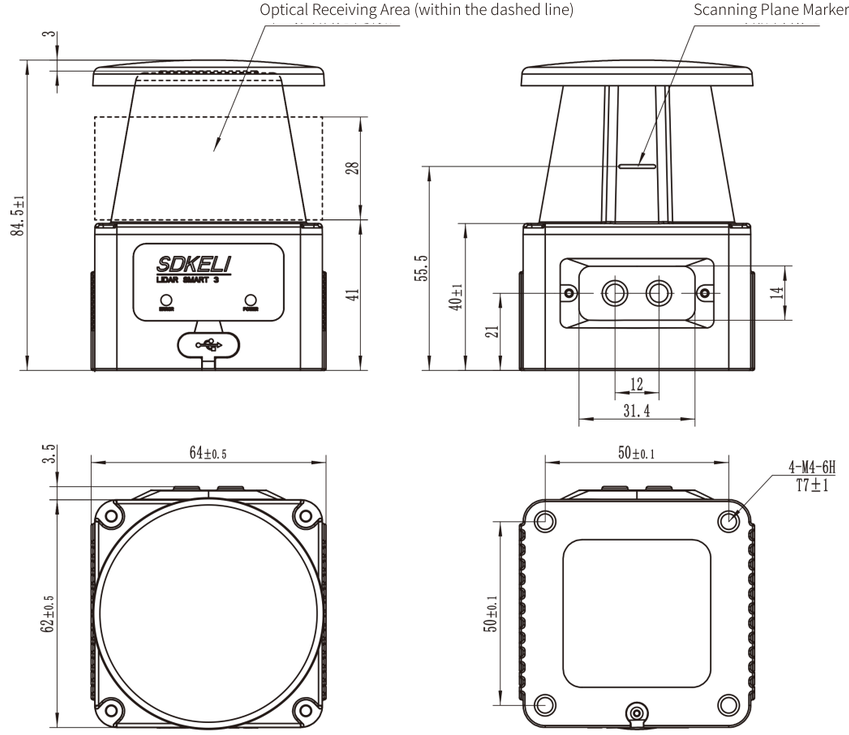
Technical Specifications

Optical Characteristics	
Laser Source	Wavelength 905 nm, Class 1 Laser Product
Maximum Detection Radius	15 m @ 10% reflectivity, 40 m @ 70% reflectivity, 45 m @ 90% reflectivity
Scanning Angle	270°
Angular Resolution	Default: 0.1° @ 15 Hz (Supports: 0.25° @ 15 Hz / 28 Hz / 40 Hz, 0.33° @ 15 Hz / 28 Hz / 40 Hz, 0.5° @ 15 Hz / 28 Hz / 40 Hz, 1° @ 15 Hz / 28 Hz / 40 Hz)
Pitch Angle	±0.5°
Scan Period	Default: 66 ms @ 15 Hz (Supports: 35 ms @ 28 Hz, 25 ms @ 40 Hz)
Multi-Sampling	2～8
Response Time	Default: 152 ms @ 15 Hz (Supports: 90 ms @ 28 Hz, 70 ms @ 40 Hz)
Filter Diameter	30mm～200mm (configurable)
Electrical Characteristics	
Operating Voltage	DC9V～DC28V
Power-up Time	Typical value: 8 s
Power Consumption	< 3 W (No load at output terminal)

Output Type	BP Type	BN Type	B4 Type	DE Type	D2 Type	PE Type
	PNP Output	NPN Output	RS-485	Ethernet	RS-232	PNP+Ethernet
Configuration Interface	Type-C					
Dimensions	64mm×62mm×84.5mm					
Cable Length	Standard: 1 m					
Environmental Characteristics						
Ambient Temperature	Operating：-20 °C ~ 50 °C (no frost and condensation)，Storage：-40 °C ~ 70 °C					
Ambient Humidity	Operating：35%RH～85%RH，Storage：35%RH～95%RH					
Ambient Light Immunity	100,000 lux					
Shock Resistance	Acceleration: 40 g, pulse duration: 6 ms, shock cycles: 4000 shocks per bidirectional direction on each of the 3 axes					
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 mm/1g, scanning cycles: 20 cycles per axis, 3 axes					
Protection level	IP65					
Electromagnetic Compatibility (EMC)	EMI	EN 61326-1:2013, EN 55011:2009 + A1:2010				
	EMS	EN 61326-1:2013, EN 61000-4-2:2009, EN 61000-4-3:2006 + A1:2008 + A2:2010, EN 61000-4-4:2004 + A1:2010, EN 61000-4-6:2009, EN 61000-4-8:2010				

Note: Parameters such as scan period, multi-sampling, response time and filter diameter are only applicable to the LiDAR models below: Obstacle Avoidance Type, Obstacle Avoidance B4 Type and Dual-output PE Type.

Dimensions





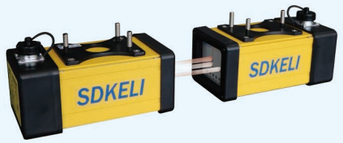
BENDING MACHINE PROTECTION

- BLPS Laser Safety Protection Device
- SR/SP Controller
- ST Controller
- ST-HMI Controller

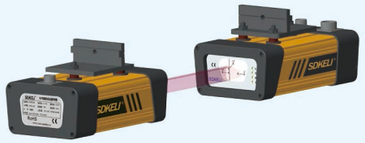
Product Series

Product Name	Type C Sensor	Type D Sensor
Appearance		
Safety Level	Type 4 (IEC61496); PL e (ISO13849)	
Applicable Standards	2006/42/EC (Machinery Safety Directive); 2004/108/EC (EMC Directive); IEC 61496-1; IEC 61496-2; ISO 13849-1	
Optical Characteristics		
Laser Source	Wavelength 635 nm, Class 1 Laser Product	
Detection Distance	0 ~ 20 m	Series A: 0 ~ 10 m; Series B: 0 ~ 20 m
Effective Aperture Angle	⩽1.5 mrad	
Environmental Characteristics		
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)
	Storage	-40 °C ~ 70 °C
Ambient Humidity	Operating	35% RH ~ 85% RH
	Storage	35% RH ~ 95% RH
Ambient Light Immunity	Incandescent Light Source	3000 Lux
	Fluorescent Light Source	3000 Lux
	Solar Light Source	10000 Lux
EMC	EMS	Complies with GB/T 19436-1 and GB/T 4584 for Type 4 safety light curtains
	EMI	Complies with EN 61326-1 and EN 55011 for electromagnetic radiation in industrial environments
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Vibration Cycles: 20 Cycles per Axis (X, Y, Z Axes)	
Shock Resistance	Acceleration: 10 g; Pulse Duration: 16 ms; Impact Cycles: 1,000 ± 10 Cycles per Axis (X, Y, Z Axes)	
Protection level	IP65	
Dimensions	170 × 92 × 90 mm	202 × 120 × 110 mm
Electrical Characteristics		
Power Supply Voltage	DC 24 V ± 20% (Ripple ± 5%)	
Power Consumption	⩽ 3.5 W	
Current Consumption	Emitter	⩽20mA / ⩽50mA
	Receiver	⩽ 100 mA (No load) / ⩽ 100 mA (No load)
Response Time	⩽ 20 ms (Whole machine, including controller)	
Safety Output (OSSD)	PNP output, two control signals per detection beam: ON state: Iout ⩽ 200 mA, Vout ⩾ Vcc - 2 V OFF state: Iout ⩽ 1 mA, Vout ⩽ 2 V	PNP output, two control signals per detection beam: ON state: Iout ⩽ 200 mA, Vout ⩾ Vcc - 2 V OFF state: Iout ⩽ 1 mA, Vout ⩽ 2 V Protective area is always ON when light is received, OFF when light is blocked
Anti-Mutual Interference Function	Avoidance light interference algorithm	

BLPS Laser Safety Protection Device



Type C Sensor



Type D Sensor



Safenet Limited
Denford Garage, Denford, Kettering, Northants., NN14 4EQ, U.K.
Tel: +44 1832 732174 e-mail: office@safenet.co.uk
European Notified Body 1674
Certificate of Conformity
This is to certify that
Shandong Keli Opto-Electronic Technology Co., Ltd.
620#, Qilu Soft Park Building, South Head Of Xinyu Road, Jinan High-Tech Zone, Jinan City, Shandong Province, China
Has had a BLPS Laser Safety Protective Device examined with regards to the Electromagnetic Compatibility Directive 2004/108/EC.
With reference to model BLPS
Manufactured by:
Jining Keli Photoelectronic Industrial Co., Ltd.
A3 Industry Education&Research Base Of Jining National High-Tech Zone, Shandong, China
1. The technical construction file contains all the relevant information.
2. Having verified that the appropriate tests have been conducted, with regard to the BLPS:
2.1. The example has been manufactured in accordance with the technical construction file and may be used under the intended conditions.
2.2. The standards and transposed standards as the case may be, have been applied correctly.
2.3. The example has conformity with the protection requirements of Electromagnetic Compatibility Directive 2004/108/EC.
Certificate Number: 3154030913
Date: 13/09/2013
Signed for Safenet Limited
Technical Manager
EMC Directive Number 1674
This Document remains the property of Safenet Ltd and will be returned to them if so requested. Safenet will review the continued compliance of the machinery on a 3 yearly cycle to check for changes in the state of the art.

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

Overview

The BLPS Series Laser Safety Protection Device is a Type 4 safety optoelectronic protection device specifically designed to protect the personal safety of press brake operators. It adopts dynamic detection technology, has passed the TÜV functional safety assessment for Type 4, and has obtained a national invention patent. The product has also passed EU EMC and LVD certifications, fully reaching the advanced level of similar international products.

The BLPS Series sets up a protective area near the upper and lower dies of the press brake, providing effective safety protection for the operator's arms and fingers when approaching the dangerous area. It balances operator safety and production efficiency, making it the most effective safety solution currently available.

The BLPS Series sensors are available in Type C and Type D:

•Type C sensors: Compact in size, suitable for installation in space-constrained scenarios.

•Type D sensors: Strong vibration resistance, with simple and quick optical alignment.

Advantages

The sensor can be used independently with press brake systems. Each detection unit provides two independent safety outputs (PNP type): When light is received, the status displays "ON" with high-level output; when light is blocked, the status displays "OFF" with low-level output. After the obstructing object is removed, the OSSD automatically returns to the "ON" state. Three receiving units correspond to six OSSD outputs.

Based on different press brake systems, the sensor can be configured with different controllers to achieve various application functions.

•Class 1 laser source, eye-safe, capable of detecting 4 mm objects and tolerating vibration deviations.

•Redundant design with dual-channel output, ensuring safety and reliability.

•Forms a protective area near the upper die tip and moves synchronously with it to achieve real-time monitoring.

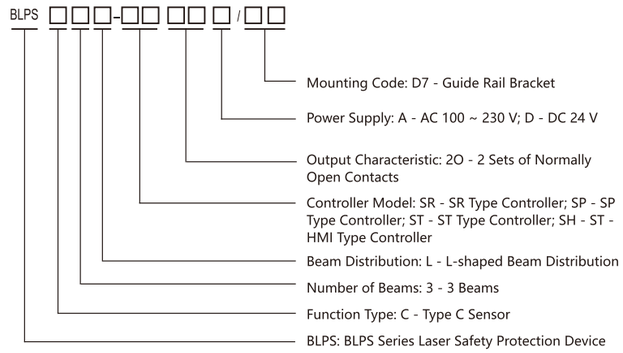
•Provides comprehensive functional design with multiple operating modes: "Normal Mode", "Box Bending Mode" and "Inhibition Mode", meeting the safety protection requirements for processing parts of different shapes.

•Configurable with an independent controller system, suitable for press brakes without built-in programming capabilities.

•Strong resistance to electromagnetic interference and optical interference.

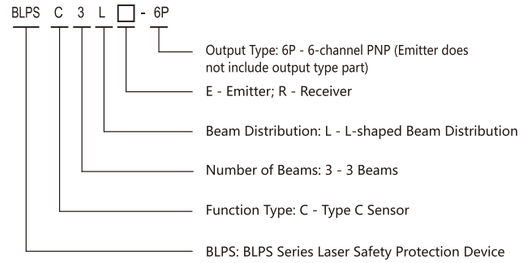
•The Type D laser protection device features enhanced EMC performance and vibration resistance, simplified wiring, and is equipped with a portable magnetic alignment aid for easier optical calibration.

Specification Model



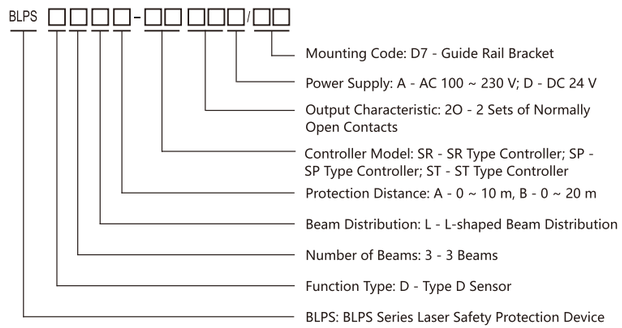
* Bracket length is customizable. The customized length shall be increased or decreased by 60 mm based on 700 mm, e.g. 820, 760, 640, 580, 520 mm.
ST type controller only supports DC 24 V power supply.

Type C Sensor Complete Machine Model



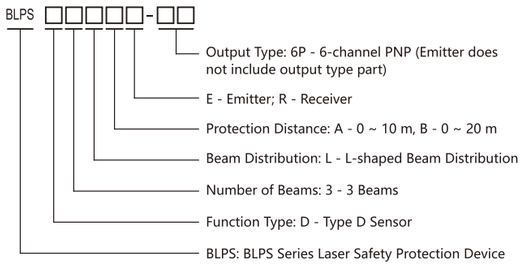
* Bracket length is customizable. The customized length shall be increased or decreased by 60 mm based on 700 mm, e.g. 820, 760, 640, 580, 520 mm.

Type C Sensor Model



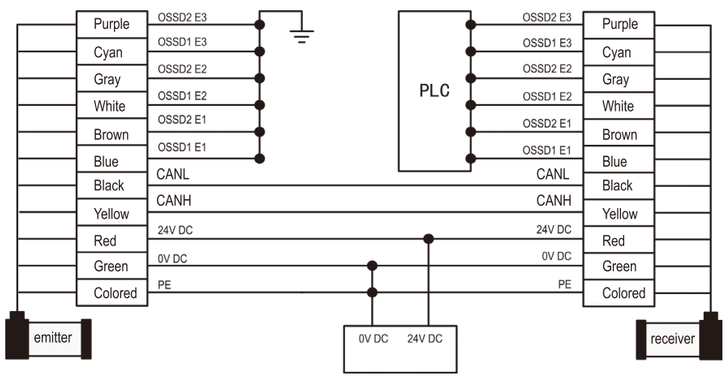
* ST type controller only supports DC 24 V power supply.

Type D Sensor Complete Machine Model

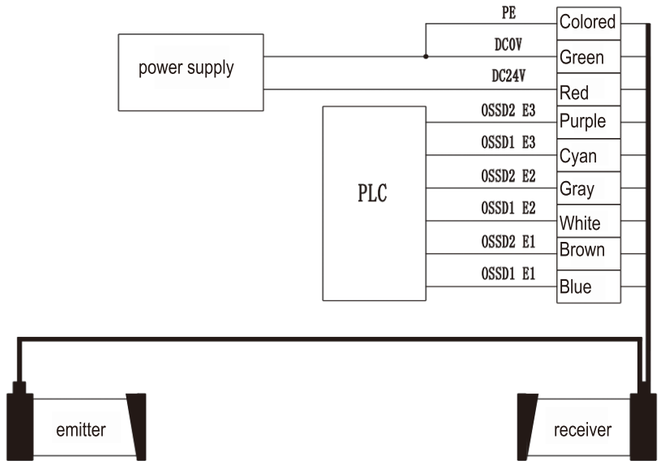


Type D Sensor Model

Typical Wiring Diagram



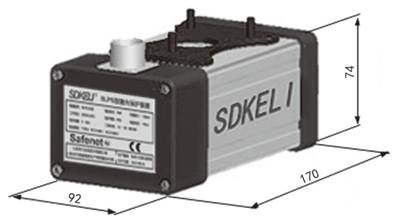
Type C Sensor Independent Wiring Diagram



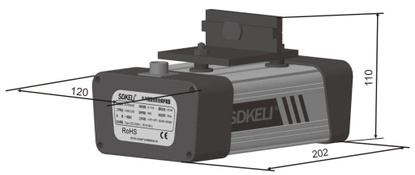
Type D Sensor Independent Wiring Diagram

Dimensions

Unit: mm

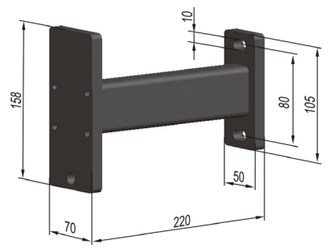


Type C Sensor Overall Dimensions

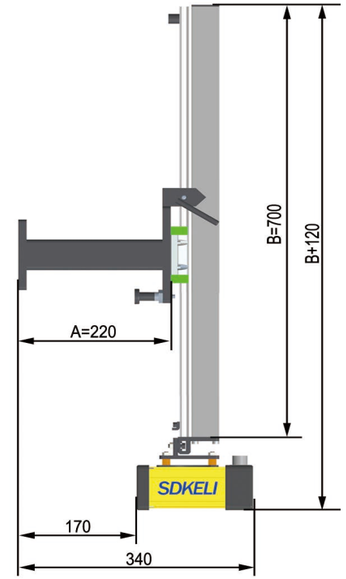


Type D Sensor Overall Dimensions

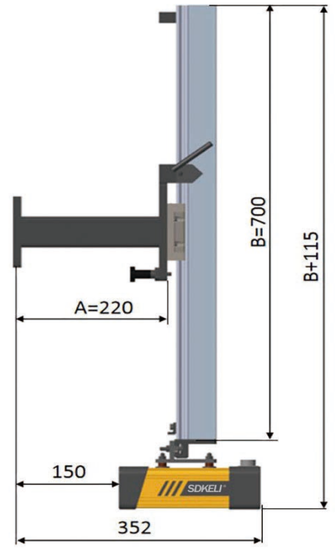
Mounting Method



Guide Rail Horizontal Bracket



Type C Sensor Guide Rail Horizontal Bracket Mounting (D7)



Type D Sensor Guide Rail Horizontal Bracket Mounting (D7)

* The standard length of the guide rail bracket is 700 mm. The bracket length is customizable, and shall be increased or decreased by 60 mm based on 700 mm, such as 820 mm, 760 mm, 640 mm, 580 mm, 520 mm. The length of the horizontal bracket can be customized according to actual requirements.

Product Series

Product Name		SR/SP Controller	ST Controller	ST-HMI Controller
Appearance				
Operating Voltage		AC220V/DC24V	DC 24 V ± 10% (Ripple ± 5%)	
Overall Power Consumption		⩽8.5W	⩽15W	⩽10W
Output Type	OSSD1/ OSSD2	Two sets of relay normally open contacts (main control output)		Two sets of relay normally open contacts (control output)
	ALARM	×	PNP alarm output	PNP alarm output, load current ⩽ 200 mA
Output Capacity		Contact: 5 A, AC 250 V / 5 A, DC 24 V		
Input Signal Type		Relay dry contact		
Response Time		⩽20ms		
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)		
	Storage	-40 °C ~ 70 °C		
Ambient Humidity	Operating	35% RH ~ 85% RH		
	Storage	35% RH ~ 95% RH		
Insulation Resistance		> 100 MΩ		
Dielectric Strength		AC 1500 V, no breakdown or flashover within 60 s		
Relay Service Life		⩾ 1,000,000 cycles		
Dimensions		190 × 150 × 58 mm	195 × 180 × 82 mm	210 × 195 × 102 mm

SR/SP Controller



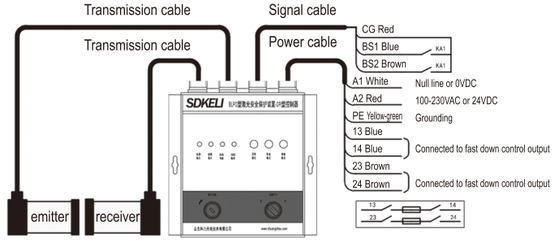
Overview

The SR/SP type controller is installed on the upper slide of the press brake at a position convenient for operation. It is used together with the BLPS series sensors, providing multi-channel relay dry contact outputs and a variety of operating mode selections.

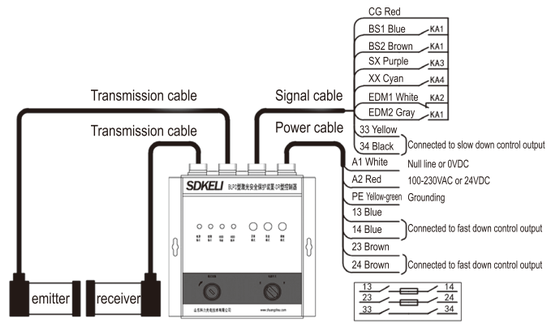
According to the characteristics of processed materials, both SR and SP type controllers offer three operating modes: Normal Mode, Box Bending Mode, and Muting Mode. Normal Mode monitors all detection beams of the sensor, Box Bending Mode monitors the beams below the die edge, and Muting Mode does not monitor the sensor signals.

The SP type controller monitors the upward signal, downward signal, speed change signal, normally closed contact of the fast-down relay, and normally open contact of the slow-down relay. It outputs two sets of normally open OSSD contacts and one set of normally open auxiliary contacts. This controller fully monitors the press brake signals and can realize relatively complex functions. The SR type controller monitors the speed change signal and outputs two sets of normally open OSSD contacts. This model only monitors the speed change signal, featuring simpler wiring and strong adaptability.

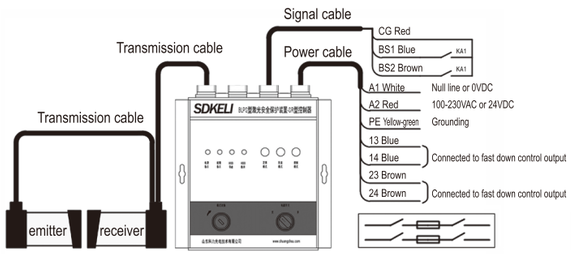
Typical Wiring Diagram



SR Controller (C type)

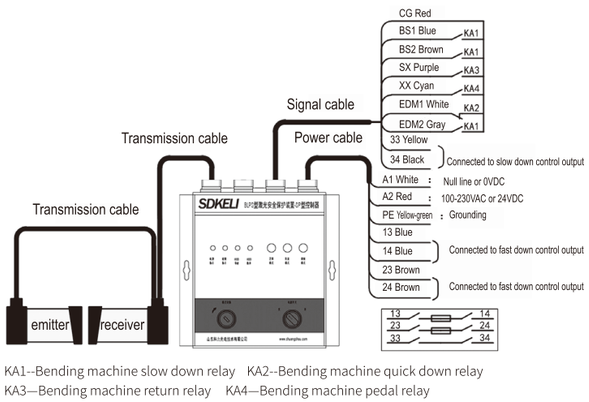


SP Controller (C type)



KA1--Bending machine slow down relay KA2--Bending machine quick down relay

SR controller (D type)



KA1--Bending machine slow down relay KA2--Bending machine quick down relay
KA3—Bending machine return relay KA4—Bending machine pedal relay

SP controller (D type)

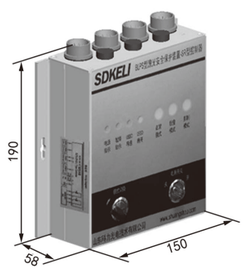
Specification Model

□□-□□-□

- Power Supply: A - AC 100 ~ 230 V; D - DC 24 V
- Output Characteristic: 2O - 2 Sets of Normally Open Contacts
- Controller Model: SR - SR Type Controller; SP - SP Type Controller

Dimensions

Unit: mm



ST Controller



Overview

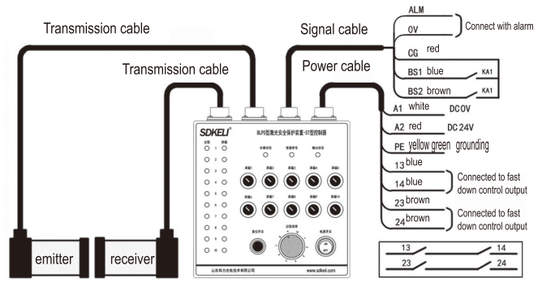
The ST type controller is installed on the upper die slide of the press brake at a position convenient for operation. It is used together with BLPS sensors and provides multi-channel relay dry contact outputs and multiple working process selections.

Due to the different bending processes of different workpieces, the light-blocking status of the sensor during bending is uncertain. When a workpiece requires multiple bending processes from the initial flat plate to final forming, the ST type controller can divide different working processes according to the number of bending processes of the workpiece. Each process controls the sensor independently (Normal/Muting). For processes where the sensor cannot work normally due to workpiece shading, the muting function can be set in advance in the working process. In this way, all processes can be completed without restarting the controller, which not only ensures safe production but also improves production efficiency.

The ST type controller is equipped with an alarm lamp. When the muting function is selected, the corresponding muting indicator lights up. When the muting function is active, the alarm lamp lights up with a buzzer sound.

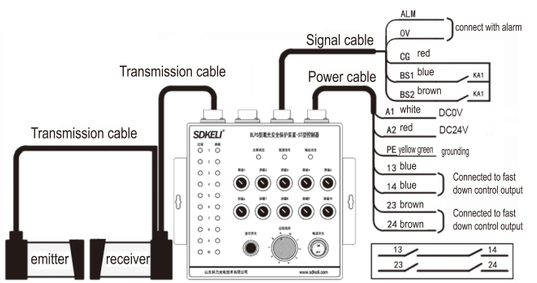
The ST type controller is compatible with SR and SP type controllers and can be replaced simply by changing the signal cable.

Typical Wiring Diagram



KA1--Bending machine slow down relay

ST Controller（C）



KA1--Bending machine slow down relay

ST controller（D）

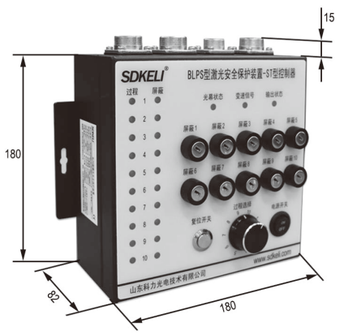
Specification Model

ST – 2O – D

- Power supply: DC24V
- Output features: 2O-2 groups of normally open contact
- ST Controller

Dimensions

Unit: mm



ST-HMI Controller

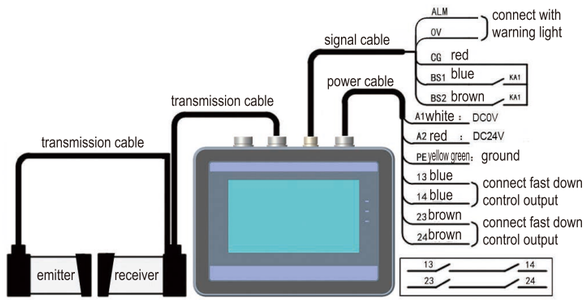


Overview

Due to the different bending processes of different workpieces, the light-blocking status of the sensor during bending is uncertain. According to the number of bending processes for each workpiece, the controller is divided into different working processes, and each process independently controls the sensor (Normal/Muting), so as to achieve the goals of ensuring safe production and improving production efficiency.

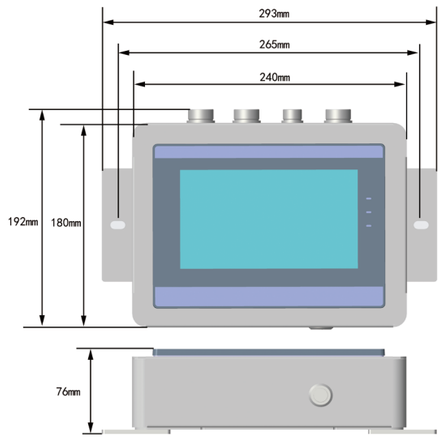
Based on the safety integration requirements of such multi-process bending systems, the BLPS laser safety protection device is equipped with the BLPS-ST-HMI type controller. The ST-HMI type controller is compatible with SR and SP type controllers and can be replaced simply by changing the signal cable.

Typical Wiring Diagram



Dimensions

Unit: mm



Specification Model

SH – 2O – D

- Operating Voltage: DC 24 V
- Output Type: 2O - 2 Sets of Relay Normally Open Contacts
- Controller Model: SH - ST-HMI Controller



SAFETY LIGHT CURTAIN

- CT6 Safety Light Curtain
- SMT Safety Light Curtain
- SMT4 Safety Light Curtain
- LCS3 Light Curtain
- SMTC Measuring Light Curtain

Typical Application Cases

Hazard Point Protection



Personnel Detection

Detects fingers, palms, and arms, and prevents machine activation when personnel enter the hazardous area.

Access Protection



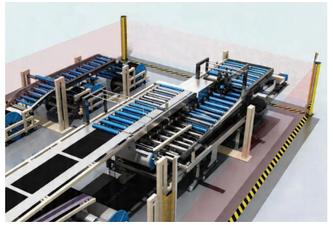
Single-Side Access Protection

Detects approaching personnel by identifying the human body.



Differentiating Personnel and Materials

Detects approaching personnel by identifying the human body, and can distinguish between personnel and materials.



Multi-Side Access Protection

Detects approaching personnel by identifying the human body.

Typical Application Cases



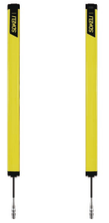




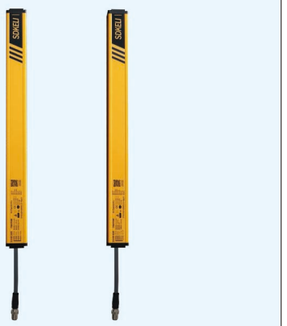




Product Comparison Table

Item	CT6 Safety Light Curtain	SMT Safety Light Curtain	SMT4 Safety Light Curtain	KS06G Safety Light Curtain	LCS3 Light Curtain
Appearance					
Safety Class	Type 4, Cat. 4, PL e, SIL 3	Type 4, Cat. 4, PL e	Type 4, Cat. 4, PL e	Type 4, Cat. 4, PL e	——
Detection Distance	Type A: 0 ~ 2 m; Type B: 0 ~ 5 m; Type C: 0 ~ 8 m; Type D: 0 ~ 15 m	Type A: 0 ~ 8 m; Type B: 0 ~ 15 m; Type D: 0 ~ 2 m; Type E: 0 ~ 5 m	Type A: 0 ~ 5 m; Type B: 0 ~ 8 m; Type C: 0 ~ 15 m; Type D: 0 ~ 30 m	Type A: 0 ~ 6 m; Type B: 0 ~ 12 m; Type D: 0 ~ 20 m	Type A: 0 ~ 5 m; Type B: 0 ~ 15 m
Detection Resolution	14/30/46 mm	14/30/46 mm	14/30/46 mm	18/28/48 mm	14/30/46 mm
Detection Height	232 mm ~ 2872 mm	112 mm ~ 2872 mm	112 mm ~ 2872 mm	120 mm ~ 2840 mm	112 mm ~ 2872 mm
Synchronization Mode	RS485 wire synchronization, optical synchronization	CAN wire synchronization, optical synchronization	RS485 wire synchronization, optical synchronization	CP/CE wire synchronization	RS485 wire synchronization, optical synchronization
Output Type	Dual PNP	Dual PNP or dual NPN	Dual PNP or dual NPN	Dual PNP or dual NPN	One PNP and one NPN
Extended Functions	EDM, manual reset, cascading, host computer configuration, configurable fixed/ floating blanking	SMT1 includes EDM, manual reset	Cascading, host computer configuration, configurable fixed/ floating blanking	Cascading, area protection	——
Protection level	IP65/IP67 (IEC 60529)	IP65/IP67 (IEC 60529)	IP65/IP67 (IEC 60529)	IP65	IP54
Advantages	1. TÜV certified, meeting safety levels of Type 4, Cat. 4, PL e, SIL 3. 2. Supports both wire and optical synchronization modes with excellent resistance to optical and electromagnetic interference.	1. Supports both wire and optical synchronization. 2. Compact size for easy installation. 3. Strong anti-electromagnetic interference capability.	1. Reliable long-distance alignment, with an alignment distance of up to 30 m. 2. Supports both wire and optical synchronization modes with excellent resistance to optical and electromagnetic interference.	1. Widely used in forging industry, good shock resistance, stable anti-interference especially with controller. 2. Excellent alignment effect, easy alignment, long distance; Type D supports 20m alignment. 3. Optional beam indication function.	1. Supports both wire and optical synchronization. 2. Compact size for easy installation. 3. Strong anti-electromagnetic interference capability. 4. Cost-effective.

CT6 Safety Light Curtain





EC Type-Examination Certificate

according to Directive 2006/42/EC Article 12(3)(b) and Article 12(4)(a) on safety of machinery referred to in Annex IV

Certificate No.: 01 450671 67 0001
Test Report No.: 80224MMD 001
Certificate holder: Jining KeLi Photoelectronic Industrial Co., Ltd. Building E7, Laser Research Institute Park, No. 66 Dalchuan Road, High-tech Zone, Jining City, Shandong Province 272000, P.R. China
Product: Safety Light Curtain
Identification: Model / Type reference: SMT Safety Light Curtain series
For details see Annex of this certificate.
Ratings: 24V DC, IP65/IP67, Type 4, Category 4, PL e
Trademark: SOKELI
Remark: Product certification body accredited by NAA under No NAA-E-0035/2019/K, the below directive 2006/42/EC is within the scope of accreditation.
Note 1: This Certificate verifies that the product fulfils the requirements of EN IEC 61496-1:2020 standards.
Tested according to: 2006/42/EC - Annex I. EN IEC 61496-1:2020
Valid until: 2029-06-16
This type-examination certificate refers to the above mentioned product. This is to certify that the test sample is in conformity with the requirements of Annex I of the Directive. The Certificate Holder is entitled to use this certificate in connection with the EC Declaration of Conformity in accordance with Annex II of the Directive. This certificate does not guarantee that the series production is manufactured and does not permit the use of a TÜV Rheinland mark of conformity. The certificate is valid up to the date of validity provided that the test specifications and construction of the product remain unchanged during the period of validity.
Certification Body
Date of issue: Budapest, 2024-06-17
Tamás László Tóth
TÜV Rheinland InterCert Kft. – Product Certification Body — H-1143 Budapest, Gizella út 51-57. — www.tuv.com Notified under No. 1808 in EU
Validity of certificate can be checked on www.CERTIPEDIA.com

TÜV Functional Safety Certification

- Certified by TÜV, the product achieves the highest safety levels of Type 4, Cat. 4, PL e and SIL 3, meeting the most stringent international safety standards to provide extremely reliable protection for personnel and equipment.
- The product is eligible to bear the official TÜV MARK. Authoritative certification ensures global compliance and reliable safety performance, delivering compliant and dependable personnel safety protection for industrial automation equipment.

TÜVRheinland CERTIFIED — Management System ISO 9001:2015 — www.tuv.com ID 9106650782

CE

Overview

The CT6 Safety Light Curtain is certified by TÜV and complies with international machinery safety standards including EN/IEC 61496-1/-2 and ISO 13849-1/-2, achieving safety levels of Cat. 4, Type 4, PL e and SIL 3. It supports the official TÜV MARK, providing authoritative certification, global compliance, and reliable safety protection for industrial automation equipment. The CT6 series supports both optical synchronization and wire synchronization to adapt to complex on-site requirements, and enables convenient host computer configuration via RS485 communication. By connecting expansion modules, up to 4 sets of light curtains can be cascaded, supporting "serial configuration" for increased detection height, as well as "L-shaped configuration" and "U-shaped configuration" for multi-sided protection. This simplifies installation and wiring while reducing costs for users.

Advantages

Dual-Mode Synchronization for Enhanced Noise Immunity: Supports both wire synchronization and optical synchronization modes. With excellent resistance to optical and electromagnetic interference, it operates reliably in complex industrial environments.

Smart Communication & Flexible Configuration: Equipped with a stable and reliable RS485 industrial communication interface and a visual host computer software. Configurable floating and fixed blanking functions enable precise adaptation to complex scenarios such as material pass-through and tooling avoidance.

Efficient Cascading & Cost-Effective Design: Supports cascading of up to 4 sets of light curtains via expansion modules. Simple cascading operation greatly simplifies installation and wiring, saves on-site space, and effectively reduces procurement and deployment costs in multi-device applications.

Light Intensity Indication: Directly displays the received light signal strength to accurately feedback the optical path status. Enables fast alignment, optical path anomaly warnings, and visual troubleshooting, significantly improving installation efficiency and operational reliability.

Industrial-Grade Mechanical Reliability: Built with reinforced frame support for high mechanical strength. Offers excellent shock and vibration resistance to withstand harsh industrial environments.

High-level Protection Performance: Achieves IP65/IP67 ratings with outstanding water and dust resistance, ensuring reliable performance in demanding conditions.

Flexible Installation Compatibility: Includes high-strengthmounting brackets supporting multiple installation methods. Quickly adapts to different equipment and space layouts for fast and efficient deployment.

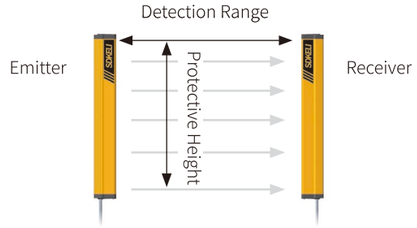
Quantifiable Safety: Supported by robust MTTFD and MTTF data, enabling "visible safety" to provide quantifiable reliability assurance for long-term stable equipment operation.

Selection Guide for Safety Light Curtains

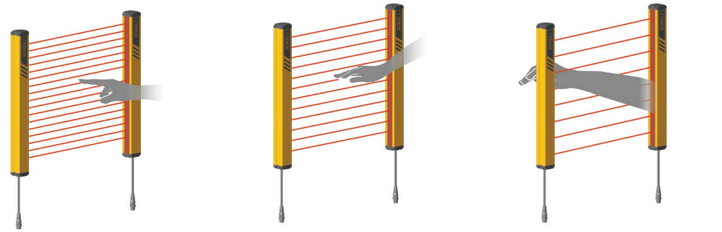
Follow the steps below to select the appropriate CT6 safety light curtain for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Select Mounting Method → 5 Step Select Cable

1 Step / 2 Step



3 Step



Resolution: 14 mm (Finger Detection)

Resolution: 30 mm (Palm Detection)

Resolution: 46 mm (Arm, Foot & Body Detection)

4 Step



Integrated Front/Side Mounting (ZC)

T-slot Mounting (TC)

5 Step



CT6 Safety Light Curtain Transmission Cable - Single-ended

CT6 Safety Light Curtain Transmission Extension Cable - Double-ended

Specification Model

CT6 □ □□□□ □ □□ □ □

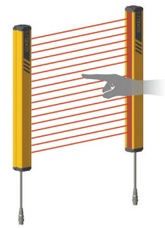
- E - Emitter; R - Receiver (If omitted, it represents the system number)
- Function Type: G - Standard Type M - EDM Type
- Resolution: 14 - 14 mm, 30 - 30 mm, 46 - 46 mm
- Output Type: P - PNP
- Protective Height: 4-digit number (pad with leading zeros if insufficient), unit: mm
- Detection Range: A - 0 ~ 2 m, B - 0 ~ 5 m, C - 0 ~ 8 m, D - 0 ~ 15 m
- CT6 Safety Light Curtain

Cable specifications

Sensor Model	Name	Model	Single/Double-ended	Length
M Type	CT6M Safety Light Curtain Transmission Cable - Single-ended, 3 m	CTMTX1D030C	Single-ended	3 m
	CT6M Safety Light Curtain Transmission Cable - Single-ended, 5 m	CTMTX1D050C	Single-ended	5 m
	CT6M Safety Light Curtain Transmission Cable - Single-ended, 10 m	CTMTX1D100C	Single-ended	10 m
	CT6M Safety Light Curtain Transmission Cable - Single-ended, 20 m	CTMTX1D200C	Single-ended	20 m
	CT6M Safety Light Curtain Transmission Extension Cable - Double-ended, 5 m	CTC4X2S050C	Double-ended	5 m
	CT6M Safety Light Curtain Transmission Extension Cable - Double-ended, 10 m	CTC4X2S100C	Double-ended	10 m
	CT6M Safety Light Curtain Transmission Extension Cable - Double-ended, 20 m	CTC4X2S200C	Double-ended	20 m
G Type	CT6G Safety Light Curtain Transmission Cable - Single-ended, 3 m	CTL2X1D030C	Single-ended	3 m
	CT6G Safety Light Curtain Transmission Cable - Single-ended, 5 m	CTL2X1D050C	Single-ended	5 m
	CT6G Safety Light Curtain Transmission Cable - Single-ended, 10 m	CTL2X1D100C	Single-ended	10 m
	CT6G Safety Light Curtain Transmission Cable - Single-ended, 20 m	CTL2X1D200C	Single-ended	20 m
	CT6G Safety Light Curtain Transmission Extension Cable - Double-ended, 5 m	CT6MX3S050C	Double-ended	5 m
	CT6G Safety Light Curtain Transmission Extension Cable - Double-ended, 10 m	CT6MX3S100C	Double-ended	10 m
	CT6G Safety Light Curtain Transmission Extension Cable - Double-ended, 20 m	CT6MX3S200C	Double-ended	20 m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 14 mm (Finger Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	CT6 □ 0232P14 △	30	232	260	500	330	＜ 15	364	6.44E-09	43
	CT6 □ 0272P14 △	35	272	300	750	370	＜ 17	332	7.04E-09	42
	CT6 □ 0312P14 △	40	312	340	750	410	＜ 19	305	7.76E-09	41
	CT6 □ 0352P14 △	45	352	380	750	450	＜ 21	282	8.67E-09	40
	CT6 □ 0392P14 △	50	392	420	750	490	＜ 23	263	8.67E-09	39
	CT6 □ 0432P14 △	55	432	460	750	530	＜ 25	246	9.81E-09	38
	CT6 □ 0472P14 △	60	472	500	750	570	＜ 27	231	1.08E-08	37
	CT6 □ 0512P14 △	65	512	540	1000	610	＜ 29	218	1.08E-08	36
	CT6 □ 0552P14 △	70	552	580	1000	650	＜ 31	206	1.19E-08	36
	CT6 □ 0592P14 △	75	592	620	1000	690	＜ 33	195	1.19E-08	35
	CT6 □ 0632P14 △	80	632	660	1000	730	＜ 35	186	1.33E-08	34
	CT6 □ 0672P14 △	85	672	700	1000	770	＜ 37	177	1.33E-08	33
	CT6 □ 0712P14 △	90	712	740	1000	810	＜ 39	169	1.50E-08	33
	CT6 □ 0752P14 △	95	752	780	1000	850	＜ 41	162	1.50E-08	32
	CT6 □ 0792P14 △	100	792	820	1200	890	＜ 43	155	1.61E-08	32
	CT6 □ 0832P14 △	105	832	860	1200	930	＜ 45	149	1.61E-08	31
	CT6 □ 0872P14 △	110	872	900	1200	970	＜ 47	143	1.61E-08	30
	CT6 □ 0912P14 △	115	912	940	1200	1010	＜ 49	138	1.87E-08	30
	CT6 □ 0952P14 △	120	952	980	1200	1050	＜ 51	133	1.87E-08	29
	CT6 □ 0992P14 △	125	992	1020	1500	1090	＜ 53	129	1.87E-08	29
	CT6 □ 1032P14 △	130	1032	1060	1500	1130	＜ 55	124	2.03E-08	28
	CT6 □ 1072P14 △	135	1072	1100	1500	1170	＜ 57	120	2.03E-08	28
	CT6 □ 1112P14 △	140	1112	1140	1500	1210	＜ 59	117	2.03E-08	27
	CT6 □ 1152P14 △	145	1152	1180	1500	1250	＜ 61	113	2.23E-08	27
	CT6 □ 1192P14 △	150	1192	1220	1500	1290	＜ 63	110	2.23E-08	27
	CT6 □ 1232P14 △	155	1232	1260	1500	1330	＜ 65	107	2.23E-08	26
	CT6 □ 1272P14 △	160	1272	1300	1750	1370	＜ 67	104	2.47E-08	26
	CT6 □ 1312P14 △	165	1312	1340	1750	1410	＜ 69	101	2.47E-08	25
	CT6 □ 1352P14 △	170	1352	1380	1750	1450	＜ 71	98	2.47E-08	25
	CT6 □ 1392P14 △	175	1392	1420	1750	1490	＜ 73	96	2.47E-08	25
	CT6 □ 1432P14 △	180	1432	1460	1750	1530	＜ 75	94	2.74E-08	24
	CT6 □ 1472P14 △	185	1472	1500	1750	1570	＜ 77	91	2.74E-08	24
	CT6 □ 1512P14 △	190	1512	1540	2000	1610	＜ 79	89	2.74E-08	24
	CT6 □ 1552P14 △	195	1552	1580	2000	1650	＜ 81	87	3.08E-08	23
	CT6 □ 1592P14 △	200	1592	1620	2000	1690	＜ 83	85	3.08E-08	23
	CT6 □ 1632P14 △	205	1632	1660	2000	1730	＜ 85	83	3.08E-08	23
	CT6 □ 1672P14 △	210	1672	1700	2000	1770	＜ 87	81	3.08E-08	22
	CT6 □ 1792P14 △	225	1792	1820		1890	＜ 93	80	3.08E-08	22
	CT6 □ 1912P14 △	240	1912	1940		2010	＜ 99	78	3.41E-08	22
	CT6 □ 2032P14 △	255	2032	2060		2130	＜ 105	76	3.41E-08	21
	CT6 □ 2152P14 △	270	2152	2180		2250	＜ 111	68	3.80E-08	20
	CT6 □ 2272P14 △	285	2272	2300		2370	＜ 117	61	4.22E-08	19
	CT6 □ 2392P14 △	300	2392	2420		2490	＜ 123	56	4.73E-08	17
	CT6 □ 2512P14 △	315	2512	2540		2610	＜ 129	47	5.76E-08	15
	CT6 □ 2632P14 △	330	2632	2660		2730	＜ 135	45	6.37E-08	15
	CT6 □ 2752P14 △	345	2752	2780		2850	＜ 141	42	7.11E-08	15
	CT6 □ 2872P14 △	360	2872	2900		2970	＜ 147	39	7.11E-08	14

Note: " □ " = detection range code: A: 0 ~ 2 m, B: 0 ~ 5 m, C: 0 ~ 8 m, D: 0 ~ 15 m; " △ " = function type: G - Standard, M - EDM.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
Resolution: 30 mm (Palm Detection)	CT6 □ 0232P30 △	11	232	260	500	330	＜ 8	439	5.38E-09	44
	CT6 □ 0272P30 △	13	272	300	750	370	＜ 9	420	5.38E-09	44
	CT6 □ 0312P30 △	15	312	340	750	410	＜ 9	411	5.38E-09	44
	CT6 □ 0352P30 △	16	352	380	750	450	＜ 10	394	5.94E-09	43
	CT6 □ 0392P30 △	18	392	420	750	490	＜ 11	378	5.94E-09	42
	CT6 □ 0432P30 △	20	432	460	750	530	＜ 11	364	6.44E-09	42
	CT6 □ 0472P30 △	21	472	500	750	570	＜ 12	357	6.44E-09	42
	CT6 □ 0512P30 △	23	512	540	1000	610	＜ 13	344	6.44E-09	41
	CT6 □ 0552P30 △	25	552	580	1000	650	＜ 13	332	7.04E-09	41
	CT6 □ 0592P30 △	26	592	620	1000	690	＜ 14	326	7.04E-09	41
	CT6 □ 0632P30 △	28	632	660	1000	730	＜ 15	315	7.04E-09	40
	CT6 □ 0672P30 △	30	672	700	1000	770	＜ 15	305	7.76E-09	39
	CT6 □ 0712P30 △	31	712	740	1000	810	＜ 16	300	7.76E-09	39
	CT6 □ 0752P30 △	33	752	780	1000	850	＜ 17	291	7.76E-09	39
	CT6 □ 0792P30 △	35	792	820	1200	890	＜ 17	282	8.67E-09	38
	CT6 □ 0832P30 △	36	832	860	1200	930	＜ 18	278	8.67E-09	38
	CT6 □ 0872P30 △	38	872	900	1200	970	＜ 19	270	8.67E-09	37
	CT6 □ 0912P30 △	40	912	940	1200	1010	＜ 19	263	8.67E-09	37
	CT6 □ 0952P30 △	41	952	980	1200	1050	＜ 20	259	9.81E-09	37
	CT6 □ 0992P30 △	43	992	1020	1500	1090	＜ 21	252	9.81E-09	36
	CT6 □ 1032P30 △	45	1032	1060	1500	1130	＜ 21	246	9.81E-09	36
	CT6 □ 1072P30 △	46	1072	1100	1500	1170	＜ 22	243	9.81E-09	36
	CT6 □ 1112P30 △	48	1112	1140	1500	1210	＜ 23	237	9.81E-09	35
	CT6 □ 1152P30 △	50	1152	1180	1500	1250	＜ 23	231	1.08E-08	35
	CT6 □ 1192P30 △	51	1192	1220	1500	1290	＜ 24	228	1.08E-08	35
	CT6 □ 1232P30 △	53	1232	1260	1500	1330	＜ 25	223	1.08E-08	34
	CT6 □ 1272P30 △	55	1272	1300	1750	1370	＜ 25	218	1.08E-08	34
	CT6 □ 1312P30 △	56	1312	1340	1750	1410	＜ 26	215	1.08E-08	34
	CT6 □ 1352P30 △	58	1352	1380	1750	1450	＜ 27	210	1.19E-08	33
	CT6 □ 1392P30 △	60	1392	1420	1750	1490	＜ 27	206	1.19E-08	33
	CT6 □ 1432P30 △	61	1432	1460	1750	1530	＜ 28	203	1.19E-08	33
	CT6 □ 1472P30 △	63	1472	1500	1750	1570	＜ 29	199	1.19E-08	33
	CT6 □ 1512P30 △	65	1512	1540	2000	1610	＜ 29	195	1.19E-08	32
	CT6 □ 1552P30 △	66	1552	1580	2000	1650	＜ 30	193	1.19E-08	32
	CT6 □ 1592P30 △	68	1592	1620	2000	1690	＜ 31	189	1.33E-08	32
	CT6 □ 1632P30 △	70	1632	1660	2000	1730	＜ 31	186	1.33E-08	32
	CT6 □ 1672P30 △	71	1672	1700	2000	1770	＜ 32	184	1.33E-08	31
	CT6 □ 1792P30 △	76	1792	1820		1890	＜ 34	180	1.33E-08	31
	CT6 □ 1912P30 △	81	1912	1940		2010	＜ 36	177	1.33E-08	31
	CT6 □ 2032P30 △	86	2032	2060		2130	＜ 38	175	1.50E-08	31
	CT6 □ 2152P30 △	91	2152	2180		2250	＜ 40	160	1.50E-08	29
	CT6 □ 2272P30 △	96	2272	2300		2370	＜ 42	148	1.61E-08	28
	CT6 □ 2392P30 △	101	2392	2420		2490	＜ 44	137	1.87E-08	27
	CT6 □ 2512P30 △	106	2512	2540		2610	＜ 46	120	2.03E-08	25
	CT6 □ 2632P30 △	111	2632	2660		2730	＜ 48	109	2.47E-08	23
	CT6 □ 2752P30 △	116	2752	2780		2850	＜ 50	100	2.47E-08	21
	CT6 □ 2872P30 △	121	2872	2900		2970	＜ 52	91	2.74E-08	20

Note: " □ " = detection range code: A: 0 ~ 2 m, B: 0 ~ 5 m, C: 0 ~ 8 m, D: 0 ~ 15 m; " △ " = function type: G - Standard, M - EDM.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

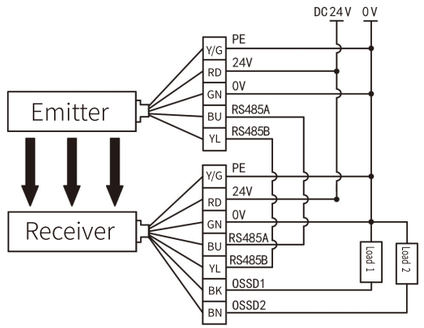
Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
Resolution: 46 mm (Arm, Foot & Body Detection)	CT6 □ 0232P46 △	7	232	260	500	330	＜ 6	461	4.91E-09	45
	CT6 □ 0272P46 △	8	272	300	750	370	＜ 7	450	4.91E-09	44
	CT6 □ 0312P46 △	9	312	340	750	410	＜ 7	439	5.38E-09	44
	CT6 □ 0352P46 △	10	352	380	750	450	＜ 7	429	5.38E-09	44
	CT6 □ 0392P46 △	11	392	420	750	490	＜ 8	420	5.38E-09	43
	CT6 □ 0432P46 △	12	432	460	750	530	＜ 8	411	5.38E-09	43
	CT6 □ 0472P46 △	13	472	500	750	570	＜ 9	402	5.94E-09	43
	CT6 □ 0512P46 △	14	512	540	1000	610	＜ 9	394	5.94E-09	42
	CT6 □ 0552P46 △	15	552	580	1000	650	＜ 9	386	5.94E-09	42
	CT6 □ 0592P46 △	16	592	620	1000	690	＜ 10	378	6.44E-09	42
	CT6 □ 0632P46 △	17	632	660	1000	730	＜ 10	371	6.44E-09	41
	CT6 □ 0672P46 △	18	672	700	1000	770	＜ 11	364	6.44E-09	41
	CT6 □ 0712P46 △	19	712	740	1000	810	＜ 11	357	6.44E-09	41
	CT6 □ 0752P46 △	20	752	780	1000	850	＜ 11	350	6.44E-09	40
	CT6 □ 0792P46 △	21	792	820	1200	890	＜ 12	344	7.04E-09	40
	CT6 □ 0832P46 △	22	832	860	1200	930	＜ 12	338	7.04E-09	40
	CT6 □ 0872P46 △	23	872	900	1200	970	＜ 13	332	7.04E-09	39
	CT6 □ 0912P46 △	24	912	940	1200	1010	＜ 13	326	7.04E-09	39
	CT6 □ 0952P46 △	25	952	980	1200	1050	＜ 13	321	7.04E-09	39
	CT6 □ 0992P46 △	26	992	1020	1500	1090	＜ 14	315	7.76E-09	38
	CT6 □ 1032P46 △	27	1032	1060	1500	1130	＜ 14	310	7.76E-09	38
	CT6 □ 1072P46 △	28	1072	1100	1500	1170	＜ 15	305	7.76E-09	38
	CT6 □ 1112P46 △	29	1112	1140	1500	1210	＜ 15	300	7.76E-09	38
	CT6 □ 1152P46 △	30	1152	1180	1500	1250	＜ 15	296	7.76E-09	37
	CT6 □ 1192P46 △	31	1192	1220	1500	1290	＜ 16	291	7.76E-09	37
	CT6 □ 1232P46 △	32	1232	1260	1500	1330	＜ 16	287	7.76E-09	37
	CT6 □ 1272P46 △	33	1272	1300	1750	1370	＜ 17	282	8.67E-09	37
	CT6 □ 1312P46 △	34	1312	1340	1750	1410	＜ 17	278	8.67E-09	36
	CT6 □ 1352P46 △	35	1352	1380	1750	1450	＜ 17	274	8.67E-09	36
	CT6 □ 1392P46 △	36	1392	1420	1750	1490	＜ 18	270	8.67E-09	36
	CT6 □ 1432P46 △	37	1432	1460	1750	1530	＜ 18	266	8.67E-09	36
	CT6 □ 1472P46 △	38	1472	1500	1750	1570	＜ 19	263	8.67E-09	35
	CT6 □ 1512P46 △	39	1512	1540	2000	1610	＜ 19	259	9.81E-09	35
	CT6 □ 1552P46 △	40	1552	1580	2000	1650	＜ 19	256	9.81E-09	35
	CT6 □ 1592P46 △	41	1592	1620	2000	1690	＜ 20	252	9.81E-09	34
	CT6 □ 1632P46 △	42	1632	1660	2000	1730	＜ 20	249	9.81E-09	34
	CT6 □ 1672P46 △	43	1672	1700	2000	1770	＜ 21	246	9.81E-09	34
	CT6 □ 1792P46 △	46	1792	1820		1890	＜ 22	243	9.81E-09	34
	CT6 □ 1912P46 △	49	1912	1940		2010	＜ 23	240	9.81E-09	34
	CT6 □ 2032P46 △	52	2032	2060		2130	＜ 24	237	1.08E-08	34
	CT6 □ 2152P46 △	55	2152	2180		2250	＜ 25	220	1.08E-08	32
	CT6 □ 2272P46 △	58	2272	2300		2370	＜ 27	206	1.19E-08	31
	CT6 □ 2392P46 △	61	2392	2420		2490	＜ 28	193	1.19E-08	30
	CT6 □ 2512P46 △	64	2512	2540		2610	＜ 29	172	1.50E-08	28
	CT6 □ 2632P46 △	67	2632	2660		2730	＜ 30	161	1.50E-08	27
	CT6 □ 2752P46 △	70	2752	2780		2850	＜ 31	150	1.61E-08	26
	CT6 □ 2872P46 △	73	2872	2900		2970	＜ 33	139	1.87E-08	26

Note: " □ " = detection range code: A: 0 ~ 2 m, B: 0 ~ 5 m, C: 0 ~ 8 m, D: 0 ~ 15 m; " △ " = function type: G - Standard, M - EDM.

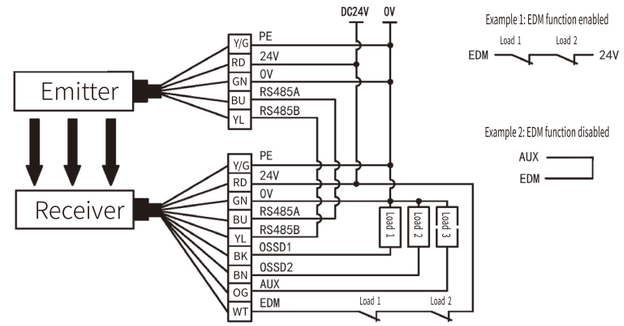
Technical Specifications

Applicable Standards	2014/30/EU (EMC Directive), 2006/42/EC (Machinery Directive), EN/IEC 61496-1/-2 Type 4 ESPE; EN ISO 13849-1/-2 Cat. 4, PL e; EN/IEC 61326-1, ISO 13855		
Safety Classification			
Safety Level	Type 4 Cat. 4 PL e SIL 3		
DCavg	99%		
CCF	100		
$MTTF_D$ /PFH_D	(Refer to CT6 specification table)		
Optical Characteristics			
Resolution	14 mm	30 mm	46 mm
Protective Height	232 mm ～ 2872 mm		
Detection Range	A: 0 ~ 2 m; B: 0 ~ 5 m; C: 0 ~ 8 m; D: 0 ~ 15 m		
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m		
Light Source	Infrared LED (Wavelength: 850 nm)		
Environmental Characteristics			
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	
	Storage	-40°C～70°C	
Ambient Humidity	Operating	35% RH ~ 85% RH	
	Storage	35% RH ~ 95% RH	
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux	
	Fluorescent Light Source	3,000 lux	
	Solar Light Source	10,000 lux	
Co-source Light Interference	Same-design emitter interference light will not cause dangerous failure of CT6 unit		
Protection level	IP65/IP67		
Vibration Resistance	Frequency: 5 Hz ~ 150 Hz, amplitude: 3.5 mm ± 0.05 mm, 10 times in X, Y and Z directions respectively		
Shock Resistance	Acceleration: 15 g, pulse duration: 6 ms, 100 times in X, Y and Z directions respectively		
Dimensions	J×33×38mm (J: Length of Emitter/Receiver)		
Electrical Characteristics			
Power Supply Voltage	DC 24 V ± 20% (Ripple ± 5%)		
Current Consumption (No load)	Emitter	＜200 mA	
	Receiver	＜200 mA	
Response Time	6 ms ～ 147 ms		
Synchronization Mode	Compatible with optical synchronization and wire synchronization		
Safety Output (OSSD)	2 × PNP transistor output; ON: Load current ⩽ 300 mA, Output ⩾ Vcc-2 V; OFF: Leakage ⩽ 1 mA, Residual voltage ⩽ 1 V (exclude cable extension); Capacitive load: 0.9 μF; Inductive load: 2 H		
Start-up Time	＜ 2s		
Diagnostic Function	Power-on self-test + Real-time runtime self-test		
Protection Circuit	Overvoltage, Overcurrent & Output short-circuit protection		
Anti-interference Function	Anti-light-interference algorithm; unique optical coding for adjacent units under optical sync		
M-Type Additional Functions			
Auxiliary Output (AUX)	Non-safety output, 1 × PNP output, inverse to OSSD; Light-blocked state: Output current ⩽ 300 mA, Voltage ⩾ Vcc-2 V; Light-transmitted state: Output current < 2 mA, Voltage < 2 V		
External Device Monitoring (EDM)	When connected to external relay or contactor loads, it monitors the status of the load’s normally closed contact. ON status: input voltage 0 ~ 7 V or open circuit; OFF status: input voltage 9 ~ 24 V. For optical synchronization: Optical communication code 2 follows the same specification as wired synchronization. For optical communication code 1: ON status: input voltage 9 ~ 24 V; OFF status: input voltage 0 ~ 7 V or open circuit.		
Manual Reset	A normally open contact wired into the EDM circuit under wire synchronization enables manual reset function.		
Extra Optional Functions			
Host Configuration	It communicates with upper computer via RS485 communication cable to realize functions of fixed muting and floating muting.		
Cascading Function	Up to 4 sets of light curtains can be cascaded; standard light curtains achieve cascading by adding expansion modules.		

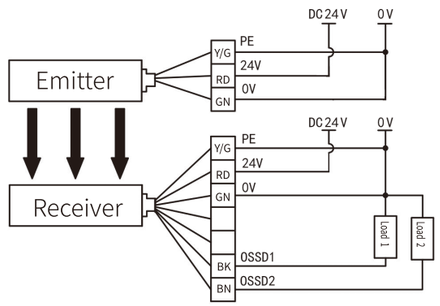
Typical Wiring Diagram



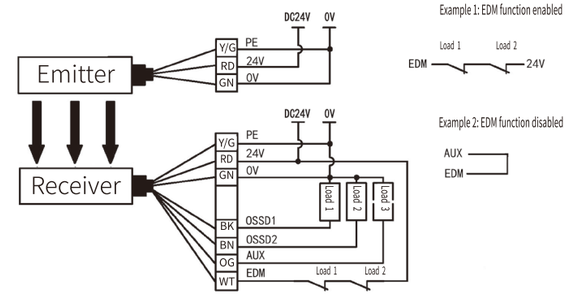
Type G, Wire Synchronization Wiring Diagram



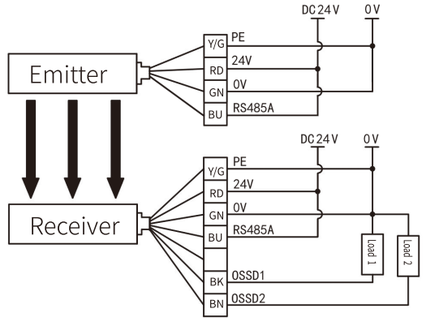
Type M, Wire Synchronization Wiring Diagram



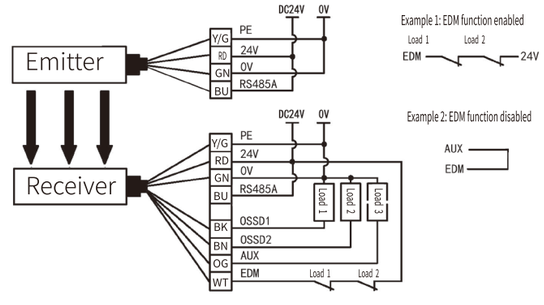
Type G, Optical Sync Code 1 Wiring Diagram



Type M, Optical Sync Code 1 Wiring Diagram



Type G, Optical Sync Code 2 Wiring Diagram

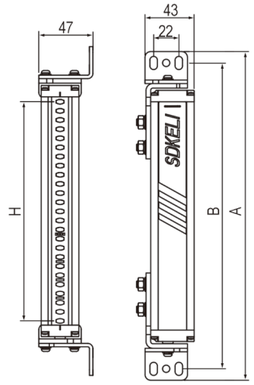


Type M, Optical Sync Code 2 Wiring Diagram

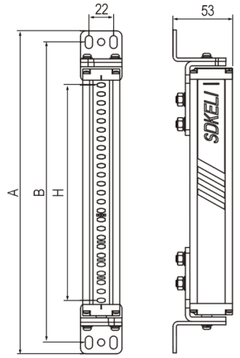
Load 1/2: Relays or other devices that control hazardous machine components.
Load 3: Load or PLC for monitoring purpose. CT6 safety light curtain works normally with AUX terminal left open when Load 3 is not applied.

Mounting Method

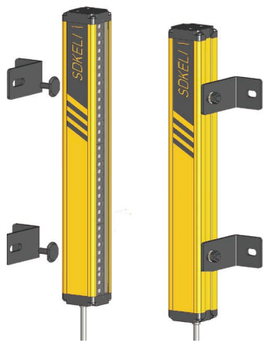


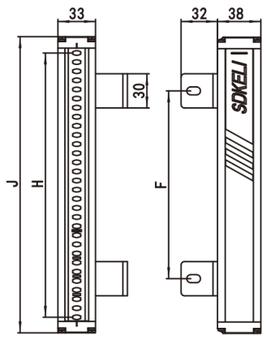






Integrated Front/Side Mounting (ZC)





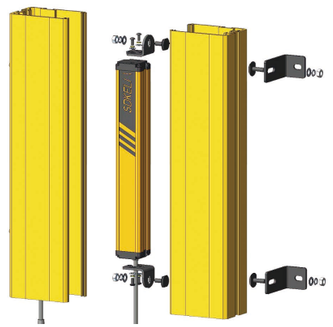
T-slot Mounting (TC)

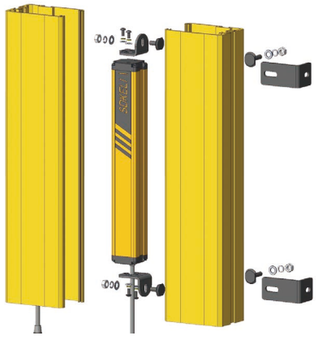


Pipe Mounting (GC)



Pipe Bracket with Protective Cover (GF)



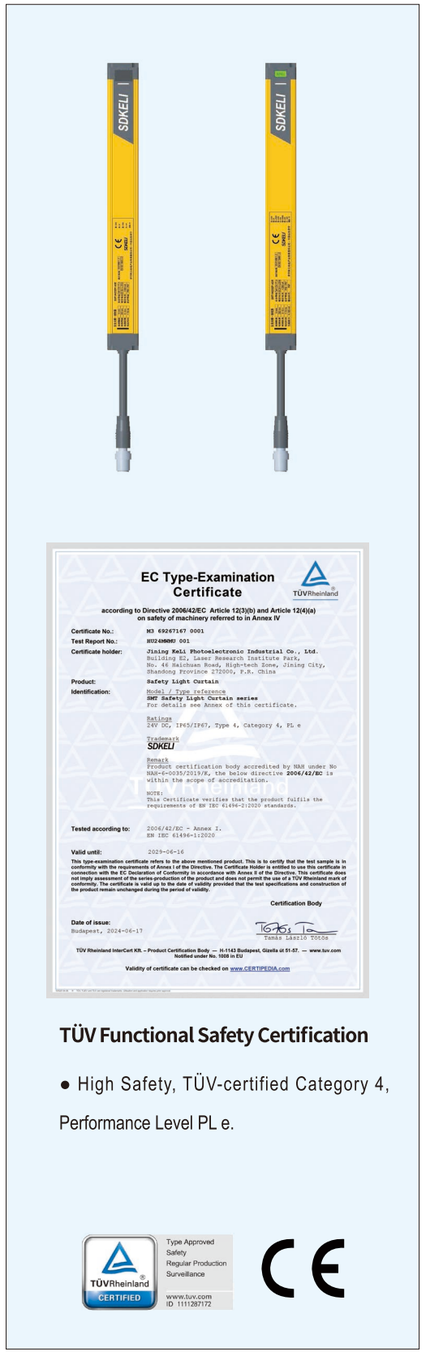


Protective Cover Front/Side Mounting (FZC)



Double-arm Side T-slot Mounting (SCT)

SMT Safety Light Curtain



EC Type-Examination Certificate

TÜVRheinland

according to Directive 2006/42/EC Article 12(3)(b) and Article 12(4)(a) on safety of machinery referred to in Annex IV

Certificate No.: M3 69267167 0001
Test Report No.: HU24080M0 001
Certificate holder: Jining KeLi Photoelectronic Industrial Co., Ltd. Building B2, Laser Research Institute Park, No. 46 Baichuan Road, High-tech Zone, Jining City, Shandong Province 272000, P.R. China
Product: Safety Light Curtain
Identification: Model / Type reference: SMT Safety Light Curtain series
For details see Annex of this certificate.
Ratings: 24V DC, IP65/IP67, Type 4, Category 4, PL e
Trademark: SDKELI
Remark: Product certification body accredited by NAB under No NAB-6-0035/2019/N, the below directive 2006/42/EC is within the scope of accreditation.
NOTE: This Certificate verifies that the product fulfils the requirements of EN IEC 61496-1:2020 standards.
Tested according to: 2006/42/EC - Annex I, EN IEC 61496-1:2020
Valid until: 2029-06-16
This type-examination certificate refers to the above mentioned product. This is to certify that the test sample is in conformity with the requirements of Annex I of the Directive. The manufacturer may affix the CE marking in connection with the EC Declaration of Conformity in accordance with Annex II of the Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The certificate is valid up to the date of validity provided that the test specifications and construction of the product remain unchanged during the period of validity.
Certification Body
Date of issue: Budapest, 2024-06-17
Tamás László Tóth
TÜV Rheinland InterCert Kft. – Product Certification Body — H-1143 Budapest, Gizella út 51-57. — www.tuv.com Notified under No. 1008 in EU
Validity of certificate can be checked on www.CERTIPEDIA.com

TÜV Functional Safety Certification

- High Safety, TÜV-certified Category 4, Performance Level PL e.

TÜVRheinland CERTIFIED — Type Approved Safety Regular Production Surveillance — www.tuv.com ID 1111287172

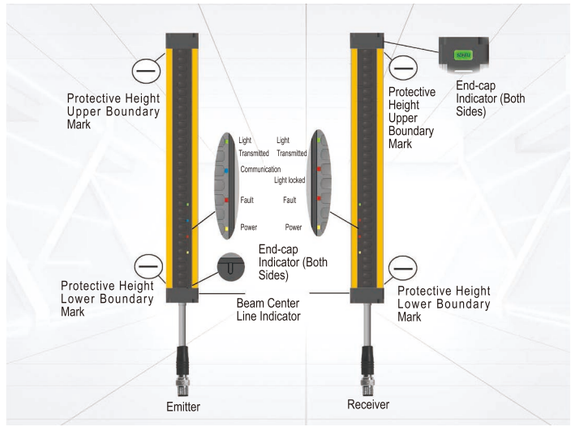
CE

Overview

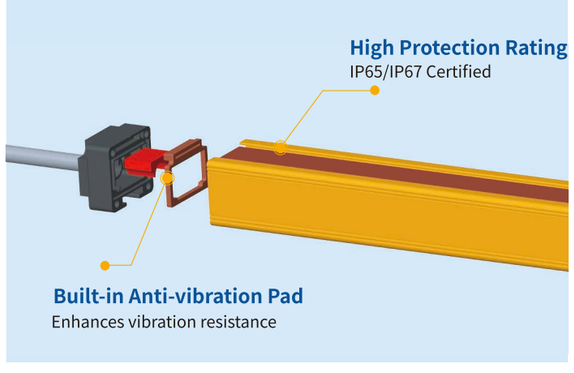
The SMT Safety Light Curtain is certified by TÜV, achieving safety levels of Type 4 and PL e. It supports both optical and wire synchronization. With its compact size, elegant appearance and outstanding performance, it is suitable for safety protection in hazardous applications such as automation systems, mechanical presses, hydraulic presses, shears, and press brakes.

Advantages

- Two synchronization modes: Optical synchronization and wire synchronization, simplifying wiring and improving installation efficiency.
- Abundant status indicators: End-cap LEDs allow clear identification of the light curtain's working status from a long distance.



- Compact size, exquisite structure, and flexible & diverse mounting methods.
- Ultra-large protection height up to 2872 mm, with stable alignment distance over 15 m.
- High protection rating: IP65/IP67.
- Strong resistance to optical interference and electromagnetic interference, ensuring more stable performance.
- Unique built-in anti-vibration design, excellent vibration resistance.

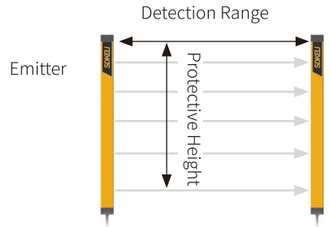


Selection Guide for Safety Light Curtains

Follow the steps below to select the appropriate SMT safety light curtain for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Output Type → 5 Step Select Mounting Method → 6 Step Select Cable

1 Step / 2 Step



3 Step



Resolution: 14 mm (Finger Detection)

Resolution: 30 mm (Palm Detection)

Resolution: 46 mm (Arm, Foot & Body Detection)

4 Step

NPN Output

PNP Output

5 Step



Integrated Front/Side Mounting (ZC)

T-slot Mounting (TC)

6 Step



SMT Transmission Cable - Single-ended

SMT Transmission Extension Cable - Double-ended

Specification Model

SMT □ □□□□ □ □□ G /□□

- Mounting Bracket Code
- Function Type: G - Basic Safety Type
- Resolution: 14 - 14 mm 30 - 30 mm 46 - 46 mm
- Output Type: P - PNP, N - NPN
- Protective Height: Represented by 4 digits (pad with leading zeros if insufficient), unit: mm
- Detection Distance: A - 0 ~ 8 m, B - 0 ~ 15 m, D - 0 ~ 2 m, E - 0 ~ 5 m
- SMT Safety Light Curtain

Cable Specifications

Name	Model	Single/Double-ended	Length
SMT Transmission Cable - Single-ended, 2 m	CTSTX1D020C	Single-ended	2m
SMT Transmission Cable - Single-ended, 3 m	CTSTX1D030C	Single-ended	3m
SMT Transmission Cable - Single-ended, 4 m	CTSTX1D040C	Single-ended	4m
SMT Transmission Cable - Single-ended, 5 m	CTSTX1D050C	Single-ended	5m
SMT Transmission Cable - Single-ended, 10 m	CTSTX1D100C	Single-ended	10m
SMT Transmission Cable - Single-ended, 15 m	CTSTX1D150C	Single-ended	15m
SMT Transmission Cable - Single-ended, 20 m	CTSTX1D200C	Single-ended	20m
SMT Transmission Extension Cable - Double-ended, 5 m	CTSTX3S050C	Double-ended	5m
SMT Transmission Extension Cable - Double-ended, 10 m	CTSTX3S100C	Double-ended	10m
SMT Transmission Extension Cable - Double-ended, 20 m	CTSTX3S200C	Double-ended	20m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 14 mm (Finger Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
14 mm	SMT □ 0112 △ 14G	15	112	150	500	220	＜ 16	364	6.44E-09	43
	SMT □ 0152 △ 14G	20	152	190	500	260	＜ 18	332	7.04E-09	42
	SMT □ 0192 △ 14G	25	192	230	500	300	＜ 19	305	7.76E-09	41
	SMT □ 0232 △ 14G	30	232	270	500	340	＜ 21	282	8.67E-09	40
	SMT □ 0272 △ 14G	35	272	310	750	380	＜ 23	263	8.67E-09	39
	SMT □ 0312 △ 14G	40	312	350	750	420	＜ 25	246	9.81E-09	38
	SMT □ 0352 △ 14G	45	352	390	750	460	＜ 27	231	1.08E-08	37
	SMT □ 0392 △ 14G	50	392	430	750	500	＜ 28	218	1.08E-08	36
	SMT □ 0432 △ 14G	55	432	470	750	540	＜ 30	206	1.19E-08	36
	SMT □ 0472 △ 14G	60	472	510	750	580	＜ 32	195	1.19E-08	35
	SMT □ 0512 △ 14G	65	512	550	1000	620	＜ 34	186	1.33E-08	34
	SMT □ 0552 △ 14G	70	552	590	1000	660	＜ 36	177	1.33E-08	33
	SMT □ 0592 △ 14G	75	592	630	1000	700	＜ 37	169	1.50E-08	33
	SMT □ 0632 △ 14G	80	632	670	1000	740	＜ 39	162	1.50E-08	32
	SMT □ 0672 △ 14G	85	672	710	1000	780	＜ 41	155	1.61E-08	32
	SMT □ 0712 △ 14G	90	712	750	1000	820	＜ 43	149	1.61E-08	31
	SMT □ 0752 △ 14G	95	752	790	1000	860	＜ 45	143	1.61E-08	30
	SMT □ 0792 △ 14G	100	792	830	1200	900	＜ 46	138	1.87E-08	30
	SMT □ 0832 △ 14G	105	832	870	1200	940	＜ 48	133	1.87E-08	29
	SMT □ 0872 △ 14G	110	872	910	1200	980	＜ 50	129	1.87E-08	29
	SMT □ 0912 △ 14G	115	912	950	1200	1020	＜ 52	124	2.03E-08	28
	SMT □ 0952 △ 14G	120	952	990	1200	1060	＜ 54	120	2.03E-08	28
	SMT □ 0992 △ 14G	125	992	1030	1500	1100	＜ 55	117	2.03E-08	27
	SMT □ 1032 △ 14G	130	1032	1070	1500	1140	＜ 57	113	2.23E-08	27
	SMT □ 1072 △ 14G	135	1072	1110	1500	1180	＜ 59	110	2.23E-08	27
	SMT □ 1112 △ 14G	140	1112	1150	1500	1220	＜ 61	107	2.23E-08	26
	SMT □ 1152 △ 14G	145	1152	1190	1500	1260	＜ 63	104	2.47E-08	26
	SMT □ 1192 △ 14G	150	1192	1230	1500	1300	＜ 64	101	2.47E-08	25
	SMT □ 1232 △ 14G	155	1232	1270	1500	1340	＜ 66	98	2.47E-08	25
	SMT □ 1272 △ 14G	160	1272	1310	1750	1380	＜ 68	96	2.47E-08	25
	SMT □ 1312 △ 14G	165	1312	1350	1750	1420	＜ 70	94	2.74E-08	24
	SMT □ 1352 △ 14G	170	1352	1390	1750	1460	＜ 72	91	2.74E-08	24
	SMT □ 1392 △ 14G	175	1392	1430	1750	1500	＜ 73	89	2.74E-08	24
	SMT □ 1432 △ 14G	180	1432	1470	1750	1540	＜ 75	87	3.08E-08	23
	SMT □ 1472 △ 14G	185	1472	1510	1750	1580	＜ 77	85	3.08E-08	23
	SMT □ 1512 △ 14G	190	1512	1550	2000	1620	＜ 79	83	3.08E-08	23
	SMT □ 1552 △ 14G	195	1552	1590	2000	1660	＜ 81	81	3.08E-08	22
	SMT □ 1592 △ 14G	200	1592	1630	2000	1700	＜ 82	80	3.08E-08	22
	SMT □ 1632 △ 14G	205	1632	1670	2000	1740	＜ 84	78	3.41E-08	22
	SMT □ 1672 △ 14G	210	1672	1710	2000	1780	＜ 86	76	3.41E-08	21
30 mm	SMT □ 1912 △ 14G	240	1912	1950		2020	＜ 97	68	3.80E-08	20
	SMT □ 2152 △ 14G	270	2152	2190		2260	＜ 108	61	4.22E-08	19
	SMT □ 2392 △ 14G	300	2392	2430		2500	＜ 118	56	4.73E-08	17
	SMT □ 2872 △ 14G	360	2872	2910		2980	＜ 140	47	5.76E-08	15

Note: " □ " = detection range code: A: 0 ~ 8 m, B: 0 ~ 15 m, D: 0 ~ 2 m, E: 0 ~ 5 m; " △ " = output type: P - PNP, N - NPN

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 30 mm (Palm Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	SMT □ 0112 △ 30G	6	112	150	500	220	< 13	439	5.38E-09	44
	SMT □ 0152 △ 30G	8	152	190	500	260	< 13	420	5.38E-09	44
	SMT □ 0192 △ 30G	9	192	230	500	300	< 14	411	5.38E-09	44
	SMT □ 0232 △ 30G	11	232	270	500	340	< 14	394	5.94E-09	43
	SMT □ 0272 △ 30G	13	272	310	750	380	< 15	378	5.94E-09	42
	SMT □ 0312 △ 30G	15	312	350	750	420	< 16	364	6.44E-09	42
	SMT □ 0352 △ 30G	16	352	390	750	460	< 16	357	6.44E-09	42
	SMT □ 0392 △ 30G	18	392	430	750	500	< 17	344	6.44E-09	41
	SMT □ 0432 △ 30G	20	432	470	750	540	< 17	332	7.04E-09	41
	SMT □ 0472 △ 30G	21	472	510	750	580	< 18	326	7.04E-09	41
	SMT □ 0512 △ 30G	23	512	550	1000	620	< 19	315	7.04E-09	40
	SMT □ 0552 △ 30G	25	552	590	1000	660	< 19	305	7.76E-09	39
	SMT □ 0592 △ 30G	26	592	630	1000	700	< 20	300	7.76E-09	39
	SMT □ 0632 △ 30G	28	632	670	1000	740	< 21	291	7.76E-09	39
	SMT □ 0672 △ 30G	30	672	710	1000	780	< 21	282	8.67E-09	38
	SMT □ 0712 △ 30G	31	712	750	1000	820	< 22	278	8.67E-09	38
	SMT □ 0752 △ 30G	33	752	790	1000	860	< 22	270	8.67E-09	37
	SMT □ 0792 △ 30G	35	792	830	1200	900	< 23	263	8.67E-09	37
	SMT □ 0832 △ 30G	36	832	870	1200	940	< 23	259	9.81E-09	37
	SMT □ 0872 △ 30G	38	872	910	1200	980	< 24	252	9.81E-09	36
	SMT □ 0912 △ 30G	40	912	950	1200	1020	< 25	246	9.81E-09	36
	SMT □ 0952 △ 30G	41	952	990	1200	1060	< 25	243	9.81E-09	36
	SMT □ 0992 △ 30G	43	992	1030	1500	1100	< 26	237	9.81E-09	35
	SMT □ 1032 △ 30G	45	1032	1070	1500	1140	< 26	231	1.08E-08	35
	SMT □ 1072 △ 30G	46	1072	1110	1500	1180	< 27	228	1.08E-08	35
	SMT □ 1112 △ 30G	48	1112	1150	1500	1220	< 28	223	1.08E-08	34
	SMT □ 1152 △ 30G	50	1152	1190	1500	1260	< 28	218	1.08E-08	34
	SMT □ 1192 △ 30G	51	1192	1230	1500	1300	< 29	215	1.08E-08	34
	SMT □ 1232 △ 30G	53	1232	1270	1500	1340	< 30	210	1.19E-08	33
	SMT □ 1272 △ 30G	55	1272	1310	1750	1380	< 30	206	1.19E-08	33
	SMT □ 1312 △ 30G	56	1312	1350	1750	1420	< 31	203	1.19E-08	33
	SMT □ 1352 △ 30G	58	1352	1390	1750	1460	< 31	199	1.19E-08	33
	SMT □ 1392 △ 30G	60	1392	1430	1750	1500	< 32	195	1.19E-08	32
	SMT □ 1432 △ 30G	61	1432	1470	1750	1540	< 32	193	1.19E-08	32
	SMT □ 1472 △ 30G	63	1472	1510	1750	1580	< 33	189	1.33E-08	32
	SMT □ 1512 △ 30G	65	1512	1550	2000	1620	< 34	186	1.33E-08	32
	SMT □ 1552 △ 30G	66	1552	1590	2000	1660	< 34	184	1.33E-08	31
	SMT □ 1592 △ 30G	68	1592	1630	2000	1700	< 35	180	1.33E-08	31
	SMT □ 1632 △ 30G	70	1632	1670	2000	1740	< 35	177	1.33E-08	31
	SMT □ 1672 △ 30G	71	1672	1710	2000	1780	< 36	175	1.50E-08	31
	SMT □ 1912 △ 30G	81	1912	1950		2020	< 40	160	1.50E-08	29
	SMT □ 2152 △ 30G	91	2152	2190		2260	< 43	148	1.61E-08	28
	SMT □ 2392 △ 30G	101	2392	2430		2500	< 47	137	1.87E-08	27
	SMT □ 2872 △ 30G	121	2872	2910		2980	< 54	120	2.03E-08	25

Note: " □ " = detection range code: A: 0 ~ 8 m, B: 0 ~ 15 m, D: 0 ~ 2 m, E: 0 ~ 5 m; " △ " = output type: P - PNP, N - NPN

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 46 mm (Arm, Foot & Body Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	SMT □ 0112 △ 46G	4	112	150	500	220	< 12	461	4.91E-09	45
	SMT □ 0152 △ 46G	5	152	190	500	260	< 12	450	4.91E-09	44
	SMT □ 0192 △ 46G	6	192	230	500	300	< 13	439	5.38E-09	44
	SMT □ 0232 △ 46G	7	232	270	500	340	< 13	429	5.38E-09	44
	SMT □ 0272 △ 46G	8	272	310	750	380	< 13	420	5.38E-09	43
	SMT □ 0312 △ 46G	9	312	350	750	420	< 14	411	5.38E-09	43
	SMT □ 0352 △ 46G	10	352	390	750	460	< 14	402	5.94E-09	43
	SMT □ 0392 △ 46G	11	392	430	750	500	< 14	394	5.94E-09	42
	SMT □ 0432 △ 46G	12	432	470	750	540	< 15	386	5.94E-09	42
	SMT □ 0472 △ 46G	13	472	510	750	580	< 15	378	6.44E-09	42
	SMT □ 0512 △ 46G	14	512	550	1000	620	< 16	371	6.44E-09	41
	SMT □ 0552 △ 46G	15	552	590	1000	660	< 16	364	6.44E-09	41
	SMT □ 0592 △ 46G	16	592	630	1000	700	< 16	357	6.44E-09	41
	SMT □ 0632 △ 46G	17	632	670	1000	740	< 17	350	6.44E-09	40
	SMT □ 0672 △ 46G	18	672	710	1000	780	< 17	344	7.04E-09	40
	SMT □ 0712 △ 46G	19	712	750	1000	820	< 17	338	7.04E-09	40
	SMT □ 0752 △ 46G	20	752	790	1000	860	< 18	332	7.04E-09	39
	SMT □ 0792 △ 46G	21	792	830	1200	900	< 18	326	7.04E-09	39
	SMT □ 0832 △ 46G	22	832	870	1200	940	< 18	321	7.04E-09	39
	SMT □ 0872 △ 46G	23	872	910	1200	980	< 19	315	7.76E-09	38
	SMT □ 0912 △ 46G	24	912	950	1200	1020	< 19	310	7.76E-09	38
	SMT □ 0952 △ 46G	25	952	990	1200	1060	< 19	305	7.76E-09	38
	SMT □ 0992 △ 46G	26	992	1030	1500	1100	< 20	300	7.76E-09	38
	SMT □ 1032 △ 46G	27	1032	1070	1500	1140	< 20	296	7.76E-09	37
	SMT □ 1072 △ 46G	28	1072	1110	1500	1180	< 21	291	7.76E-09	37
	SMT □ 1112 △ 46G	29	1112	1150	1500	1220	< 21	287	7.76E-09	37
	SMT □ 1152 △ 46G	30	1152	1190	1500	1260	< 21	282	8.67E-09	37
	SMT □ 1192 △ 46G	31	1192	1230	1500	1300	< 22	278	8.67E-09	36
	SMT □ 1232 △ 46G	32	1232	1270	1500	1340	< 22	274	8.67E-09	36
	SMT □ 1272 △ 46G	33	1272	1310	1750	1380	< 22	270	8.67E-09	36
	SMT □ 1312 △ 46G	34	1312	1350	1750	1420	< 23	266	8.67E-09	36
	SMT □ 1352 △ 46G	35	1352	1390	1750	1460	< 23	263	8.67E-09	35
	SMT □ 1392 △ 46G	36	1392	1430	1750	1500	< 23	259	9.81E-09	35
	SMT □ 1432 △ 46G	37	1432	1470	1750	1540	< 24	256	9.81E-09	35
	SMT □ 1472 △ 46G	38	1472	1510	1750	1580	< 24	252	9.81E-09	34
	SMT □ 1512 △ 46G	39	1512	1550	2000	1620	< 25	249	9.81E-09	34
	SMT □ 1552 △ 46G	40	1552	1590	2000	1660	< 25	246	9.81E-09	34
	SMT □ 1592 △ 46G	41	1592	1630	2000	1700	< 25	243	9.81E-09	34
	SMT □ 1632 △ 46G	42	1632	1670	2000	1740	< 26	240	9.81E-09	34
	SMT □ 1672 △ 46G	43	1672	1710	2000	1780	< 26	237	1.08E-08	34
	SMT □ 1912 △ 46G	49	1912	1950		2020	< 28	220	1.08E-08	32
	SMT □ 2152 △ 46G	55	2152	2190		2260	< 30	206	1.19E-08	31
	SMT □ 2392 △ 46G	61	2392	2430		2500	< 32	193	1.19E-08	30
	SMT □ 2872 △ 46G	73	2872	2910		2980	< 37	172	1.50E-08	28

Note: " □ " = detection range code: A: 0 ~ 8 m, B: 0 ~ 15 m, D: 0 ~ 2 m, E: 0 ~ 5 m; " △ " = output type: P - PNP, N - NPN

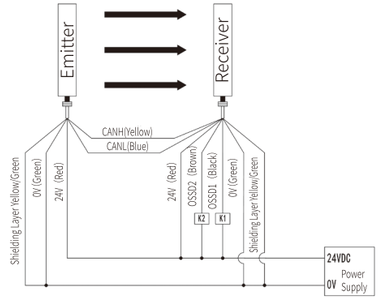
Technical Specifications

Compliance Standards	EN 61496-1(Type 4 ESPE)　EN 61496-2 (Type 4 AOPD) EN ISO 13849-1 (Cat. 4、PL e)　EN 61326-1　IEC 61496-1 (Type 4 ESPE), IEC 61496-2 (Type 4 AOPD)　IEC 61326-1　ISO 13855			
Reference Standards	2014/35/EU (Low Voltage Directive), EN/IEC 61508, EN/IEC 61010-1, EN 60204-1, EN/IEC 62061			
Safety Category				
Safety Level	Type 4　Cat. 4　PL e			
DCavg	99%			
CCF	100			
$MTTF_D$ /PFH_D	(Refer to SMT specification table)			
Optical Characteristics				
Resolution	14 mm		30 mm	46 mm
Detection Range	Type A: 0 ~ 8 m; Type B: 0 ~ 15 m; Type D: 0 ~ 2 m; Type E: 0 ~ 5 m			
Protective Height	112 mm ~ 2872 mm (Refer to SMT specification table)			
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m			
Light Source	Infrared LED (Wavelength: 850 nm)			
Environmental Characteristics				
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	Storage	-40 °C ~ 70 °C
Ambient Humidity	Operating	35% RH ~ 85% RH	Storage	35% RH ~ 95% RH
Anti-ambient Light Interference	Incandescent Light Source：⩾3,000 lux；Fluorescent Light Source：⩾3,000 lux；Solar Light Source：⩾10,000 lux			
Co-source Light Interference	Same-design emitter interference light will not cause dangerous failure of SMT unit			
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 mm ± 0.05 mm, 20 times in X, Y and Z directions respectively			
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, 1000 times in X, Y and Z directions respectively			
Protection level	IP65/IP67 (IEC 60529)			
Dimensions	33×28×Jmm (J: Length of Emitter/Receiver)			
Electrical Characteristics				
Power Supply Voltage	DC 24 V ± 20% (Ripple ± 5%)			
Current Consumption (No load)	Emitter：＜200 mA；Receiver：＜200 mA			
Response Time	12 ms ~ 140 ms (Refer to SMT specification table)			
Synchronization Mode	Compatible with optical synchronization and wire synchronization			
Safety Output (OSSD)	PNP	2 × PNP transistor output; ON: Load current ⩽ 300 mA, Output ⩾ Vcc-2 V; OFF: Leakage ⩽ 1 mA, Residual voltage ⩽ 1 V (exclude cable extension); Capacitive load: 0.9 μF; Inductive load: 2 H		
	NPN	2 × NPN transistor output; ON: Load current ⩽ 300 mA, Output ⩽ 2 V; OFF: Leakage ⩽ 1 mA, Residual voltage ⩽ 2 V (exclude cable extension); Capacitive load: 0.9 μF; Inductive load: 2 H		
Start-up Time	＜2s			
Diagnostic Function	Power-on self-test + Real-time runtime self-test			
Protection Circuit	Overvoltage, Overcurrent & Output short-circuit protection			
Anti-interference Function	Anti-light-interference algorithm; unique optical coding for adjacent units under optical sync			

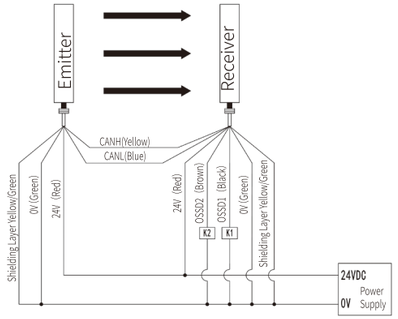
★ SMT1 is optional if External Device Monitor (EDM) and Auxiliary Output (AUX) functions are required.

Typical Wiring Diagram

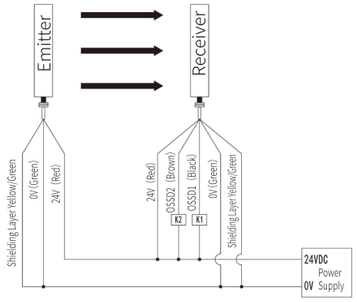
Optical synchronization wiring is recommended when the site suffers severe EMC interference or wiring layout is difficult; when two sets of optically synchronized light curtains are installed in parallel, different optical communication codes shall be adopted to improve anti-light-interference capability. Wire synchronization wiring is recommended if strong light interference exists on site or optical interference occurs between two adjacent light curtains.



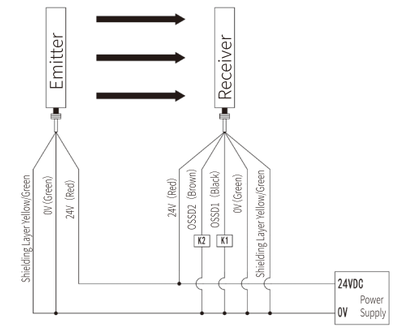
NPN，wire synchronization



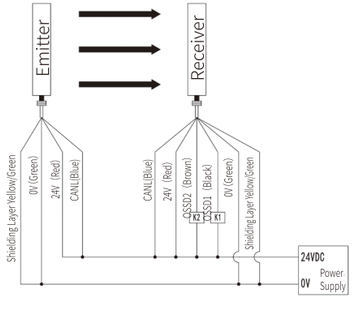
PNP，wire synchronization



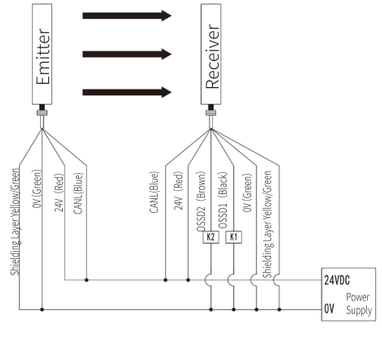
NPN, optical synchronization, optical communication code 1



PNP，optical synchronization, optical communication code 1



NPN, optical synchronization, optical communication code 2

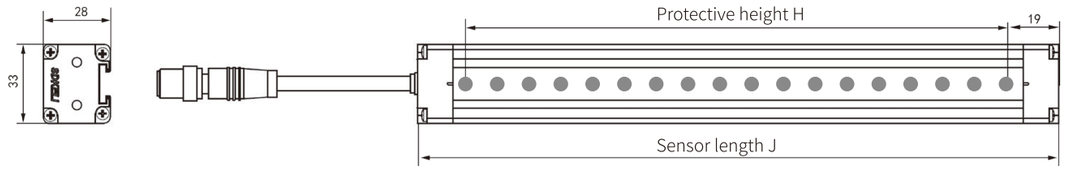


PNP，optical synchronization, optical communication code 2

1. K1, K2: Relays or other devices controlling hazardous parts of the machine;
2. All unconnected signal wires must be insulated individually;
3. Optical communication code is selected via CANL wiring. Power cycle is required when switching optical communication codes.

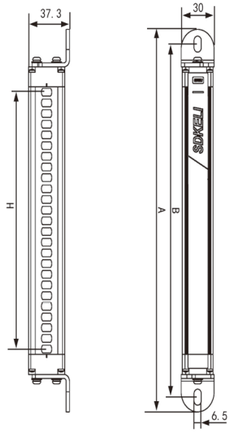
Dimensions

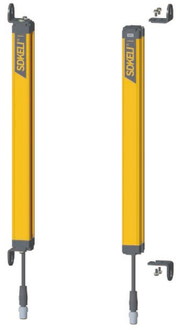
unit: mm

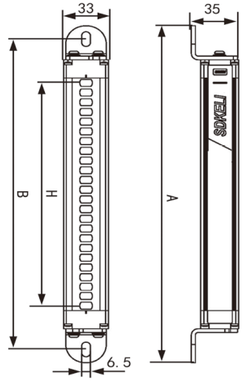


Mounting Method

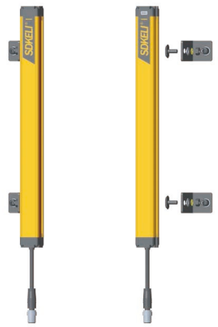


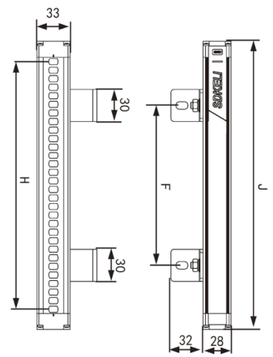






Integrated Front/Side Mounting (ZC)

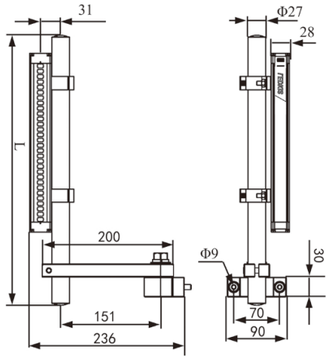




T-slot Mounting (TC)

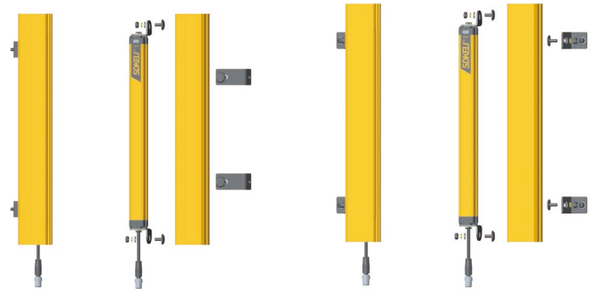


Pipe Mounting (GC)



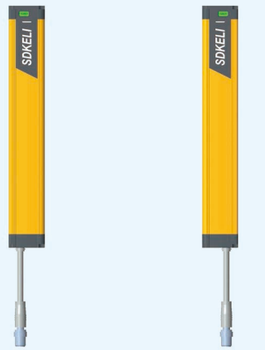


Pipe Bracket with Protective Cover (GF)



Protective Cover Front/Side Mounting (FZC)

SMT4 Safety Light Curtain



• Dual-mode Synchronization Anti-interference Design: Supports two operating modes (wire synchronization and optical synchronization). It delivers outstanding resistance to optical and electromagnetic interference, enabling stable operation in complex industrial environments.

• Reliable Long-distance Alignment: Combines long-distance alignment capability with high anti-interference performance. It not only provides wide-range safety coverage, but also prevents optical path failures caused by environmental factors, delivering more reliable and hassle-free safety protection for long-distance operation scenarios.

Management System ISO 9001:2015 TÜVRheinland CERTIFIED www.tuv.com ID 9108650782

CE

Overview

The SMT4 Safety Light Curtain is a professional and reliable safety protection product designed for harsh industrial environments. Certified by TÜV, it achieves safety levels of Type 4, Cat. 4 and PL e. It supports both optical synchronization and wire synchronization to adapt to complex on-site requirements, and enables convenient host computer configuration via RS-485 communication. By connecting expansion modules, up to 4 sets of light curtains can be cascaded, supporting "serial configuration" for increased detection height, as well as "L-shaped configuration" and "U-shaped configuration" for multi-sided protection. This simplifies installation and wiring while reducing costs. The optimized optical system ensures stable alignment even in complex industrial environments, with an alignment distance exceeding 30 m, meeting the safety protection needs for long-distance and large-span applications.

Advantages

Intelligent Communication & Flexible Configuration: Equipped with stable and reliable RS485 industrial communication interface and visual upper computer software. It supports flexible switching between PNP and NPN output types to improve compatibility with external control systems. Configurable floating blanking and fixed blanking functions are available to precisely adapt to complex working conditions such as material passing and tool avoidance.

Efficient Cascading & Cost-Effective Design: Supports cascading of up to 4 sets of light curtains via expansion modules. Simple cascading operation greatly simplifies installation and wiring, saves on-site space, and effectively reduces procurement and deployment costs in multi-device applications.

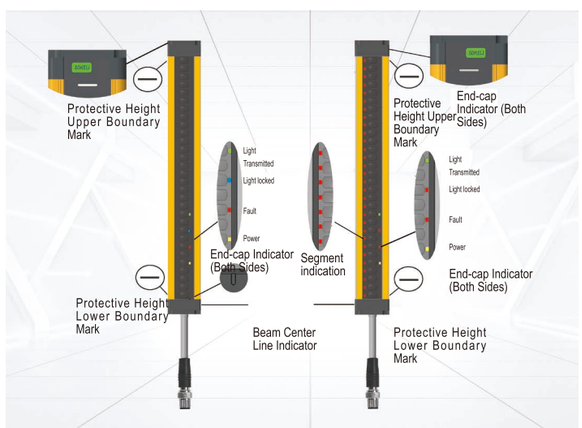
Industrial-Grade Mechanical Reliability: Built with reinforced frame support for high mechanical strength. Offers excellent shock and vibration resistance to withstand harsh industrial environments.

High-level Protection Performance: Achieves IP65/IP67 ratings with outstanding water and dust resistance, ensuring reliable performance in demanding conditions.

Flexible Installation Compatibility: Includes high-strength mounting brackets supporting multiple installation methods. Quickly adapts to different equipment and space layouts for fast and efficient deployment.

Quantifiable Safety: Supported by robust MTTFD and MTTF data, enabling "visible safety" to provide quantifiable reliability assurance for long-term stable equipment operation.

Multi-dimensional Status Indication: Integrated end-cap status indicators and segmented beam status indicators with long-distance visibility, which feed back real-time operating status and greatly boost the efficiency of on-site alignment debugging and maintenance.

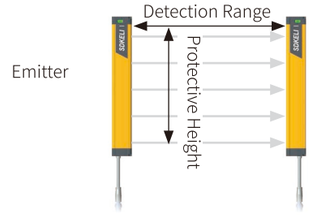


Selection Guide for Safety Light Curtains

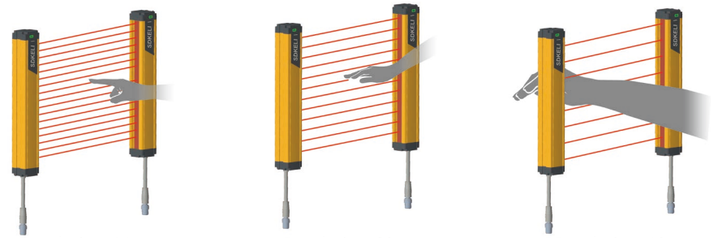
Follow the steps below to select the appropriate SMT4 safety light curtain for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Output Type → 5 Step Select Mounting Method → 6 Step Select Cable

1 Step / 2 Step



3 Step



Resolution: 14 mm (Finger Detection)

Resolution: 30 mm (Palm Detection)

Resolution: 46 mm (Arm, Foot & Body Detection)

4 Step

NPN Output

PNP Output

5 Step



Integrated Front/Side Mounting (ZC)



T-slot Mounting (TC)

6 Step



SMT Transmission Cable - Single-ended



SMT Transmission Extension Cable - Double-ended

Specification Model

SMT4 □ □□□□ □ □□ □ / □□

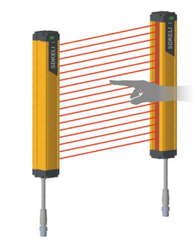
- Mounting Bracket Code
- Function Type: G - Basic Safety Type
- Resolution: 14 - 14 mm 30 - 30 mm 46 - 46 mm
- Output Type: P - PNP, N - NPN
- Protective Height: Represented by 4 digits (pad with leading zeros if insufficient), unit: mm
- Detection Distance: A - 0 ~ 5 m, B - 0 ~ 8 m, C - 0 ~ 15 m, D - 0 ~ 30 m
- SMT4 Safety Light Curtain

Cable Specifications

Name	Model	Single/Double-ended	Length
SMT Transmission Cable - Single-ended, 2 m	CTSTX1D020C	Single-ended	2m
SMT Transmission Cable - Single-ended, 3 m	CTSTX1D030C	Single-ended	3m
SMT Transmission Cable - Single-ended, 4 m	CTSTX1D040C	Single-ended	4m
SMT Transmission Cable - Single-ended, 5 m	CTSTX1D050C	Single-ended	5m
SMT Transmission Cable - Single-ended, 10 m	CTSTX1D100C	Single-ended	10m
SMT Transmission Cable - Single-ended, 15 m	CTSTX1D150C	Single-ended	15m
SMT Transmission Cable - Single-ended, 20 m	CTSTX1D200C	Single-ended	20m
SMT Transmission Extension Cable - Double-ended, 5 m	CTSTX3S050C	Double-ended	5m
SMT Transmission Extension Cable - Double-ended, 10 m	CTSTX3S100C	Double-ended	10m
SMT Transmission Extension Cable - Double-ended, 20 m	CTSTX3S200C	Double-ended	20m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 14 mm (Finger Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	SMT4 □ 0112 △ 14G	15	112	150	500	220	＜ 16	364	6.44E-09	43
	SMT4 □ 0152 △ 14G	20	152	190	500	260	＜ 18	332	7.04E-09	42
	SMT4 □ 0192 △ 14G	25	192	230	500	300	＜ 19	305	7.76E-09	41
	SMT4 □ 0232 △ 14G	30	232	270	500	340	＜ 21	282	8.67E-09	40
	SMT4 □ 0272 △ 14G	35	272	310	750	380	＜ 23	263	8.67E-09	39
	SMT4 □ 0312 △ 14G	40	312	350	750	420	＜ 25	246	9.81E-09	38
	SMT4 □ 0352 △ 14G	45	352	390	750	460	＜ 27	231	1.08E-08	37
	SMT4 □ 0392 △ 14G	50	392	430	750	500	＜ 28	218	1.08E-08	36
	SMT4 □ 0432 △ 14G	55	432	470	750	540	＜ 30	206	1.19E-08	36
	SMT4 □ 0472 △ 14G	60	472	510	750	580	＜ 32	195	1.19E-08	35
	SMT4 □ 0512 △ 14G	65	512	550	1000	620	＜ 34	186	1.33E-08	34
	SMT4 □ 0552 △ 14G	70	552	590	1000	660	＜ 36	177	1.33E-08	33
	SMT4 □ 0592 △ 14G	75	592	630	1000	700	＜ 37	169	1.50E-08	33
	SMT4 □ 0632 △ 14G	80	632	670	1000	740	＜ 39	162	1.50E-08	32
	SMT4 □ 0672 △ 14G	85	672	710	1000	780	＜ 41	155	1.61E-08	32
	SMT4 □ 0712 △ 14G	90	712	750	1000	820	＜ 43	149	1.61E-08	31
	SMT4 □ 0752 △ 14G	95	752	790	1000	860	＜ 45	143	1.61E-08	30
	SMT4 □ 0792 △ 14G	100	792	830	1200	900	＜ 46	138	1.87E-08	30
	SMT4 □ 0832 △ 14G	105	832	870	1200	940	＜ 48	133	1.87E-08	29
	SMT4 □ 0872 △ 14G	110	872	910	1200	980	＜ 50	129	1.87E-08	29
	SMT4 □ 0912 △ 14G	115	912	950	1200	1020	＜ 52	124	2.03E-08	28
	SMT4 □ 0952 △ 14G	120	952	990	1200	1060	＜ 54	120	2.03E-08	28
	SMT4 □ 0992 △ 14G	125	992	1030	1500	1100	＜ 55	117	2.03E-08	27
	SMT4 □ 1032 △ 14G	130	1032	1070	1500	1140	＜ 57	113	2.23E-08	27
	SMT4 □ 1072 △ 14G	135	1072	1110	1500	1180	＜ 59	110	2.23E-08	27
	SMT4 □ 1112 △ 14G	140	1112	1150	1500	1220	＜ 61	107	2.23E-08	26
	SMT4 □ 1152 △ 14G	145	1152	1190	1500	1260	＜ 63	104	2.47E-08	26
	SMT4 □ 1192 △ 14G	150	1192	1230	1500	1300	＜ 64	101	2.47E-08	25
	SMT4 □ 1232 △ 14G	155	1232	1270	1500	1340	＜ 66	98	2.47E-08	25
	SMT4 □ 1272 △ 14G	160	1272	1310	1750	1380	＜ 68	96	2.47E-08	25
	SMT4 □ 1312 △ 14G	165	1312	1350	1750	1420	＜ 70	94	2.74E-08	24
	SMT4 □ 1352 △ 14G	170	1352	1390	1750	1460	＜ 72	91	2.74E-08	24
	SMT4 □ 1392 △ 14G	175	1392	1430	1750	1500	＜ 73	89	2.74E-08	24
	SMT4 □ 1432 △ 14G	180	1432	1470	1750	1540	＜ 75	87	3.08E-08	23
	SMT4 □ 1472 △ 14G	185	1472	1510	1750	1580	＜ 77	85	3.08E-08	23
	SMT4 □ 1512 △ 14G	190	1512	1550	2000	1620	＜ 79	83	3.08E-08	23
	SMT4 □ 1552 △ 14G	195	1552	1590	2000	1660	＜ 81	81	3.08E-08	22
	SMT4 □ 1592 △ 14G	200	1592	1630	2000	1700	＜ 82	80	3.08E-08	22
	SMT4 □ 1632 △ 14G	205	1632	1670	2000	1740	＜ 84	78	3.41E-08	22
	SMT4 □ 1672 △ 14G	210	1672	1710	2000	1780	＜ 86	76	3.41E-08	21
	SMT4 □ 1912 △ 14G	240	1912	1950		2020	＜ 97	68	3.80E-08	20
	SMT4 □ 2152 △ 14G	270	2152	2190		2260	＜ 108	61	4.22E-08	19
	SMT4 □ 2392 △ 14G	300	2392	2430		2500	＜ 118	56	4.73E-08	17
	SMT4 □ 2872 △ 14G	360	2872	2910		2980	＜ 140	47	5.76E-08	15

Note: " □ " = detection range code: A: 0 ~ 5 m, B: 0 ~ 8 m, C: 0 ~ 15 m, D: 0 ~ 30 m; " △ " = output type: P - PNP, N - NPN

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



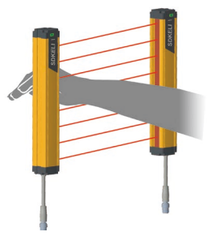
Resolution: 30 mm (Palm Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	SMT4 □ 0112 △ 30G	6	112	150	500	220	< 13	439	5.38E-09	44
	SMT4 □ 0152 △ 30G	8	152	190	500	260	< 13	420	5.38E-09	44
	SMT4 □ 0192 △ 30G	9	192	230	500	300	< 14	411	5.38E-09	44
	SMT4 □ 0232 △ 30G	11	232	270	500	340	< 14	394	5.94E-09	43
	SMT4 □ 0272 △ 30G	13	272	310	750	380	< 15	378	5.94E-09	42
	SMT4 □ 0312 △ 30G	15	312	350	750	420	< 16	364	6.44E-09	42
	SMT4 □ 0352 △ 30G	16	352	390	750	460	< 16	357	6.44E-09	42
	SMT4 □ 0392 △ 30G	18	392	430	750	500	< 17	344	6.44E-09	41
	SMT4 □ 0432 △ 30G	20	432	470	750	540	< 17	332	7.04E-09	41
	SMT4 □ 0472 △ 30G	21	472	510	750	580	< 18	326	7.04E-09	41
	SMT4 □ 0512 △ 30G	23	512	550	1000	620	< 19	315	7.04E-09	40
	SMT4 □ 0552 △ 30G	25	552	590	1000	660	< 19	305	7.76E-09	39
	SMT4 □ 0592 △ 30G	26	592	630	1000	700	< 20	300	7.76E-09	39
	SMT4 □ 0632 △ 30G	28	632	670	1000	740	< 21	291	7.76E-09	39
	SMT4 □ 0672 △ 30G	30	672	710	1000	780	< 21	282	8.67E-09	38
	SMT4 □ 0712 △ 30G	31	712	750	1000	820	< 22	278	8.67E-09	38
	SMT4 □ 0752 △ 30G	33	752	790	1000	860	< 22	270	8.67E-09	37
	SMT4 □ 0792 △ 30G	35	792	830	1200	900	< 23	263	8.67E-09	37
	SMT4 □ 0832 △ 30G	36	832	870	1200	940	< 23	259	9.81E-09	37
	SMT4 □ 0872 △ 30G	38	872	910	1200	980	< 24	252	9.81E-09	36
	SMT4 □ 0912 △ 30G	40	912	950	1200	1020	< 25	246	9.81E-09	36
	SMT4 □ 0952 △ 30G	41	952	990	1200	1060	< 25	243	9.81E-09	36
	SMT4 □ 0992 △ 30G	43	992	1030	1500	1100	< 26	237	9.81E-09	35
	SMT4 □ 1032 △ 30G	45	1032	1070	1500	1140	< 26	231	1.08E-08	35
	SMT4 □ 1072 △ 30G	46	1072	1110	1500	1180	< 27	228	1.08E-08	35
	SMT4 □ 1112 △ 30G	48	1112	1150	1500	1220	< 28	223	1.08E-08	34
	SMT4 □ 1152 △ 30G	50	1152	1190	1500	1260	< 28	218	1.08E-08	34
	SMT4 □ 1192 △ 30G	51	1192	1230	1500	1300	< 29	215	1.08E-08	34
	SMT4 □ 1232 △ 30G	53	1232	1270	1500	1340	< 30	210	1.19E-08	33
	SMT4 □ 1272 △ 30G	55	1272	1310	1750	1380	< 30	206	1.19E-08	33
	SMT4 □ 1312 △ 30G	56	1312	1350	1750	1420	< 31	203	1.19E-08	33
	SMT4 □ 1352 △ 30G	58	1352	1390	1750	1460	< 31	199	1.19E-08	33
	SMT4 □ 1392 △ 30G	60	1392	1430	1750	1500	< 32	195	1.19E-08	32
	SMT4 □ 1432 △ 30G	61	1432	1470	1750	1540	< 32	193	1.19E-08	32
	SMT4 □ 1472 △ 30G	63	1472	1510	1750	1580	< 33	189	1.33E-08	32
	SMT4 □ 1512 △ 30G	65	1512	1550	2000	1620	< 34	186	1.33E-08	32
	SMT4 □ 1552 △ 30G	66	1552	1590	2000	1660	< 34	184	1.33E-08	31
	SMT4 □ 1592 △ 30G	68	1592	1630	2000	1700	< 35	180	1.33E-08	31
	SMT4 □ 1632 △ 30G	70	1632	1670	2000	1740	< 35	177	1.33E-08	31
	SMT4 □ 1672 △ 30G	71	1672	1710	2000	1780	< 36	175	1.50E-08	31
	SMT4 □ 1912 △ 30G	81	1912	1950		2020	< 40	160	1.50E-08	29
	SMT4 □ 2152 △ 30G	91	2152	2190		2260	< 43	148	1.61E-08	28
	SMT4 □ 2392 △ 30G	101	2392	2430		2500	< 47	137	1.87E-08	27
	SMT4 □ 2872 △ 30G	121	2872	2910		2980	< 54	120	2.03E-08	25

Note: " □ " = detection range code: A: 0 ~ 5 m, B: 0 ~ 8 m, C: 0 ~ 15 m, D: 0 ~ 30 m; " △ " = output type: P - PNP, N - NPN

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



Resolution: 46 mm (Arm, Foot & Body Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)	$MTTF_D$ (Year)	PFH_D(1/h)	MTTF (Year)
	SMT4 □ 0112 △ 46G	4	112	150	500	220	< 12	461	4.91E-09	45
	SMT4 □ 0152 △ 46G	5	152	190	500	260	< 12	450	4.91E-09	44
	SMT4 □ 0192 △ 46G	6	192	230	500	300	< 13	439	5.38E-09	44
	SMT4 □ 0232 △ 46G	7	232	270	500	340	< 13	429	5.38E-09	44
	SMT4 □ 0272 △ 46G	8	272	310	750	380	< 13	420	5.38E-09	43
	SMT4 □ 0312 △ 46G	9	312	350	750	420	< 14	411	5.38E-09	43
	SMT4 □ 0352 △ 46G	10	352	390	750	460	< 14	402	5.94E-09	43
	SMT4 □ 0392 △ 46G	11	392	430	750	500	< 14	394	5.94E-09	42
	SMT4 □ 0432 △ 46G	12	432	470	750	540	< 15	386	5.94E-09	42
	SMT4 □ 0472 △ 46G	13	472	510	750	580	< 15	378	6.44E-09	42
	SMT4 □ 0512 △ 46G	14	512	550	1000	620	< 16	371	6.44E-09	41
	SMT4 □ 0552 △ 46G	15	552	590	1000	660	< 16	364	6.44E-09	41
	SMT4 □ 0592 △ 46G	16	592	630	1000	700	< 16	357	6.44E-09	41
	SMT4 □ 0632 △ 46G	17	632	670	1000	740	< 17	350	6.44E-09	40
	SMT4 □ 0672 △ 46G	18	672	710	1000	780	< 17	344	7.04E-09	40
	SMT4 □ 0712 △ 46G	19	712	750	1000	820	< 17	338	7.04E-09	40
	SMT4 □ 0752 △ 46G	20	752	790	1000	860	< 18	332	7.04E-09	39
	SMT4 □ 0792 △ 46G	21	792	830	1200	900	< 18	326	7.04E-09	39
	SMT4 □ 0832 △ 46G	22	832	870	1200	940	< 18	321	7.04E-09	39
	SMT4 □ 0872 △ 46G	23	872	910	1200	980	< 19	315	7.76E-09	38
	SMT4 □ 0912 △ 46G	24	912	950	1200	1020	< 19	310	7.76E-09	38
	SMT4 □ 0952 △ 46G	25	952	990	1200	1060	< 19	305	7.76E-09	38
	SMT4 □ 0992 △ 46G	26	992	1030	1500	1100	< 20	300	7.76E-09	38
	SMT4 □ 1032 △ 46G	27	1032	1070	1500	1140	< 20	296	7.76E-09	37
	SMT4 □ 1072 △ 46G	28	1072	1110	1500	1180	< 21	291	7.76E-09	37
	SMT4 □ 1112 △ 46G	29	1112	1150	1500	1220	< 21	287	7.76E-09	37
	SMT4 □ 1152 △ 46G	30	1152	1190	1500	1260	< 21	282	8.67E-09	37
	SMT4 □ 1192 △ 46G	31	1192	1230	1500	1300	< 22	278	8.67E-09	36
	SMT4 □ 1232 △ 46G	32	1232	1270	1500	1340	< 22	274	8.67E-09	36
	SMT4 □ 1272 △ 46G	33	1272	1310	1750	1380	< 22	270	8.67E-09	36
	SMT4 □ 1312 △ 46G	34	1312	1350	1750	1420	< 23	266	8.67E-09	36
	SMT4 □ 1352 △ 46G	35	1352	1390	1750	1460	< 23	263	8.67E-09	35
	SMT4 □ 1392 △ 46G	36	1392	1430	1750	1500	< 23	259	9.81E-09	35
	SMT4 □ 1432 △ 46G	37	1432	1470	1750	1540	< 24	256	9.81E-09	35
	SMT4 □ 1472 △ 46G	38	1472	1510	1750	1580	< 24	252	9.81E-09	34
	SMT4 □ 1512 △ 46G	39	1512	1550	2000	1620	< 25	249	9.81E-09	34
	SMT4 □ 1552 △ 46G	40	1552	1590	2000	1660	< 25	246	9.81E-09	34
	SMT4 □ 1592 △ 46G	41	1592	1630	2000	1700	< 25	243	9.81E-09	34
	SMT4 □ 1632 △ 46G	42	1632	1670	2000	1740	< 26	240	9.81E-09	34
	SMT4 □ 1672 △ 46G	43	1672	1710	2000	1780	< 26	237	1.08E-08	34
	SMT4 □ 1912 △ 46G	49	1912	1950		2020	< 28	220	1.08E-08	32
	SMT4 □ 2152 △ 46G	55	2152	2190		2260	< 30	206	1.19E-08	31
	SMT4 □ 2392 △ 46G	61	2392	2430		2500	< 32	193	1.19E-08	30
	SMT4 □ 2872 △ 46G	73	2872	2910		2980	< 37	172	1.50E-08	28

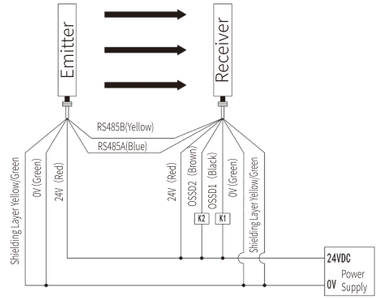
Note: " □ " = detection range code: A: 0 ~ 5 m, B: 0 ~ 8 m, C: 0 ~ 15 m, D: 0 ~ 30 m; " △ " = output type: P - PNP, N - NPN

Technical Specifications

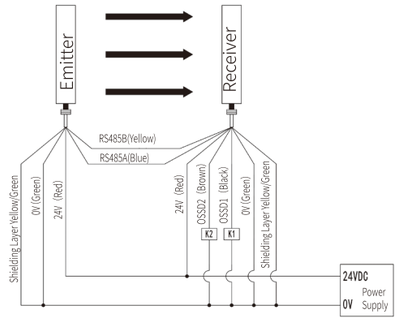
Safety Category				
Safety Level	Type 4 Cat. 4 PL e			
DCavg	99%			
CCF	100			
$MTTF_D$ /PFH_D	(Refer to SMT4 specification table)			
Optical Characteristics				
Resolution	14 mm	30 mm	46 mm	
Detection Range	Type A: 0 ~ 5 m; Type B: 0 ~ 8 m; Type C: 0 ~ 15 m; Type D: 0 ~ 30 m			
Protective Height	112 mm ~ 2872 mm (Refer to SMT4 specification table)			
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m			
Light Source	Infrared LED (Wavelength: 850nm)			
Environmental Characteristics				
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	Storage	-40 °C ~ 70 °C
Ambient Humidity	Operating	35% RH ~ 85% RH	Storage	35% RH～95%RH
Anti-ambient Light Interference	Incandescent Light Source：⩾3,000 lux；Fluorescent Light Source：⩾3,000 lux；Solar Light Source：⩾10,000 lux			
Co-source Light Interference	Same-design emitter interference light will not cause dangerous failure of SMT4 unit			
Vibration Resistance	Frequency: 5 Hz ~ 150 Hz, amplitude: 3.5 mm ± 0.05 mm, 10 times in X, Y and Z directions respectively			
Shock Resistance	Acceleration: 15 g, pulse duration: 16 ms, 100 times in X, Y and Z directions respectively			
Protection level	IP65/IP67			
Dimensions	J×35×40mm (J: Length of Emitter/Receiver)			
Electrical Characteristics				
Power Supply Voltage	24V DC±20% (纹波±5%)			
Current Consumption (No load)	Emitter：＜200 mA；Receiver：＜200 mA			
Response Time	12 ms ~ 140 ms (Refer to SMT4 specification table)			
Synchronization Mode	Compatible with optical synchronization and wire synchronization			
Safety Output (OSSD)	PNP	2 × PNP transistor output; ON: Load current ⩽ 300 mA, Output ⩾ Vcc-2 V; OFF: Leakage ⩽ 1 mA, Residual voltage ⩽ 1 V (exclude cable extension); Capacitive load: 0.9 μF; Inductive load: 2 H		
	NPN	2 × NPN transistor output; ON: Load current ⩽ 300 mA, Output ⩽ 2 V; OFF: Leakage ⩽ 1 mA, Residual voltage ⩽ 2 V (exclude cable extension); Capacitive load: 0.9 μF; Inductive load: 2 H		
Start-up Time	＜2s			
Diagnostic Function	Power-on self-test + Real-time runtime self-test			
Protection Circuit	Overvoltage, Overcurrent & Output short-circuit protection			
Anti-interference Function	Anti-light-interference algorithm; unique optical coding for adjacent units under optical sync			
Optional Functions				
Host Configuration	It communicates with upper computer via RS485 communication cable to realize functions of fixed muting and floating muting.			
Cascading Function	Up to 4 sets of light curtains can be cascaded; standard light curtains achieve cascading by adding expansion modules.			

Typical Wiring Diagram

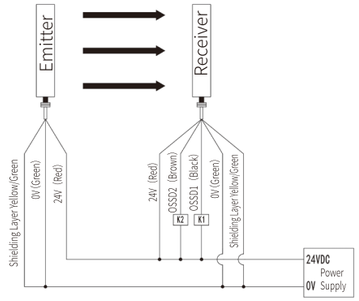
Optical synchronization wiring is recommended when the site suffers severe EMC interference or wiring layout is difficult; when two sets of optically synchronized light curtains are installed in parallel, different optical communication codes shall be adopted to improve anti-light-interference capability. Wire synchronization wiring is recommended if strong light interference exists on site or optical interference occurs between two adjacent light curtains.



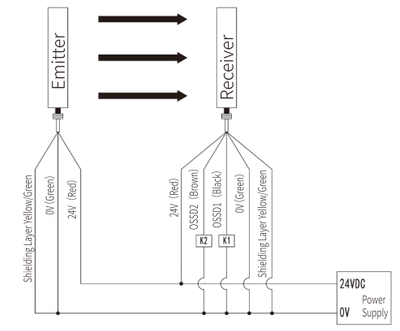
NPN，wire synchronization



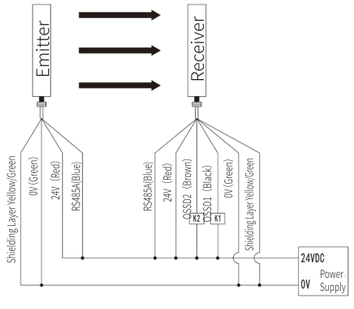
PNP，wire synchronization



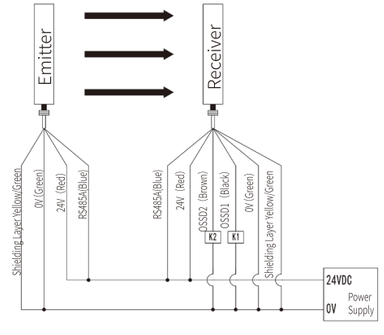
NPN, optical synchronization, optical communication code 1



PNP，optical synchronization, optical communication code 1



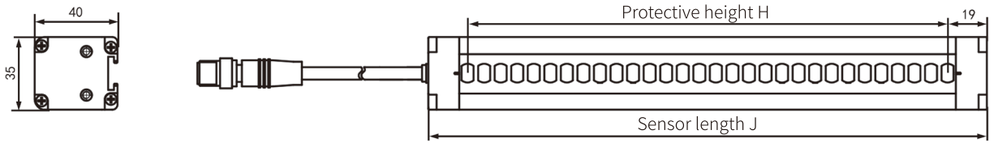
NPN, optical synchronization, optical communication code 2



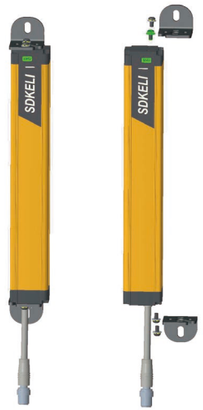
PNP，optical synchronization, optical communication code 2

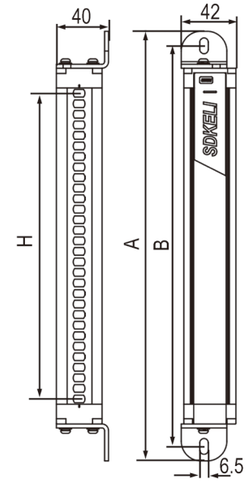
1. K1, K2: Relays or other devices controlling hazardous parts of the machine;
2. All unconnected signal wires must be insulated individually;
3. Optical communication code is selected via RS485A wiring. Power cycle is required when switching optical communication codes.

Dimensions



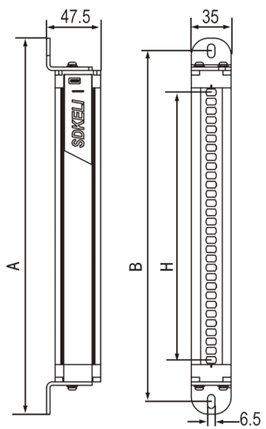
Mounting Method





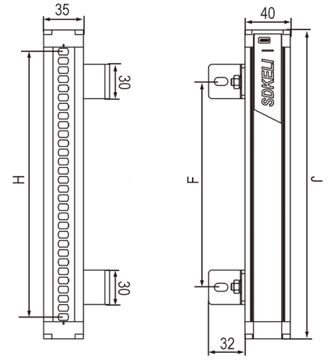


Integrated Front/Side Mounting (ZC)



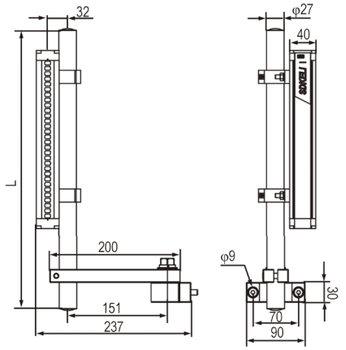


T-slot Mounting (TC)



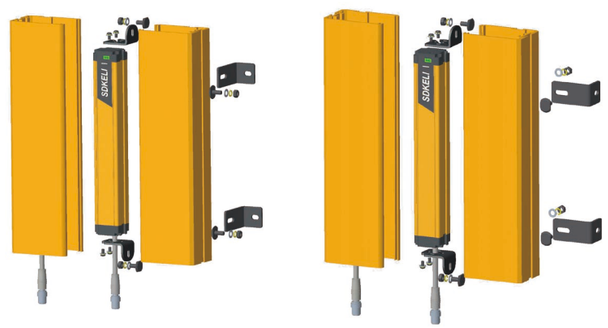


Pipe Mounting (GC)



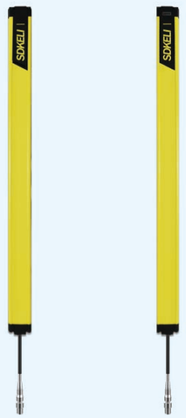


Pipe Bracket with Protective Cover (GF)

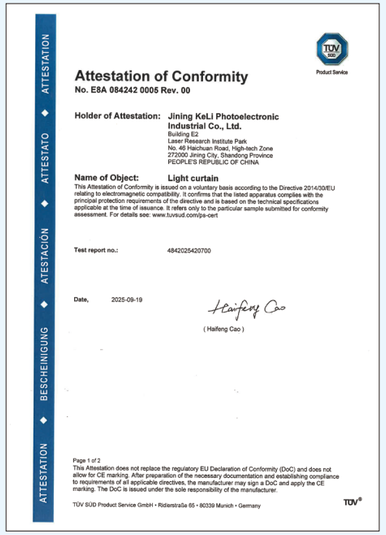


Protective Cover Front/Side Mounting (FZC)

LCS3 Light Curtain



• Adopts a TÜV-certified safety light curtain technical platform, complies with international safety standards to deliver reliable protection.



ATTESTATION ◆ BESCHEINIGUNG ◆ ATTESTACION ◆ ATTESTATO ◆ ATTESTATION

TÜV Product Service

Attestation of Conformity
No. E8A 084242 0005 Rev. 00

Holder of Attestation: **Jining KeLi Photoelectronic Industrial Co., Ltd.**
Building E2
Laser Research Institute Park
No. 46 Haichuan Road, High-tech Zone
272000 Jining City, Shandong Province
PEOPLE'S REPUBLIC OF CHINA

Name of Object: **Light curtain**
This Attestation of Conformity is issued on a voluntary basis according to the Directive 2014/30/EU relating to electromagnetic compatibility. It confirms that the listed apparatus complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for conformity assessment. For details see: www.tuvsud.com/ps-cert

Test report no.: 4842025420700

Date, 2025-09-19

(Haifeng Cao)

Page 1 of 2
This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing corrolance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.

TÜV SÜD Product Service GmbH • Ridlerstraße 65 • 80339 Munich • Germany

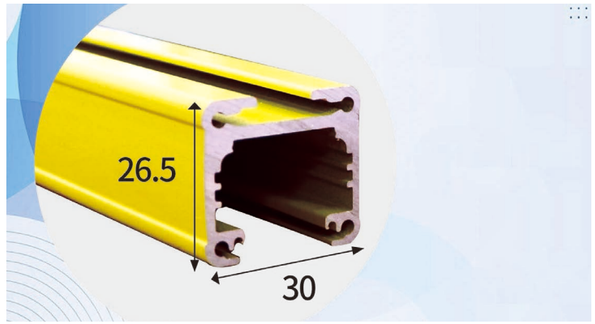
TÜV EMC Certificate

Overview

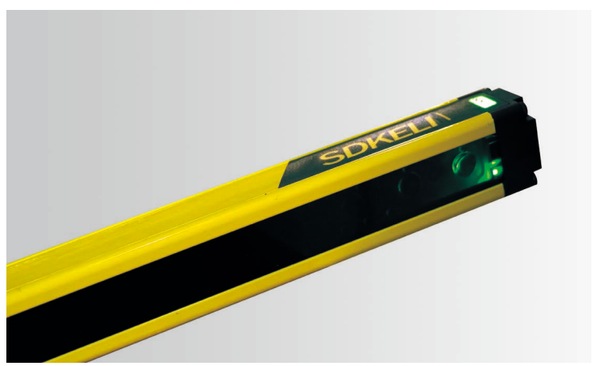
The LCS3 Light Curtain is developed based on a TÜV-certified safety light curtain technology platform. It features a compact size and exquisite structure, supporting both wire synchronization and optical synchronization modes for strong anti-interference performance. With a maximum protection height of 2872 mm and a stable alignment distance exceeding 15 m, it is widely used in the field of industrial automation.

Advantages

•Built-in reinforced frame support delivers high mechanical strength, excellent shock and vibration resistance, and enables stable operation under harsh industrial environments.



•Balances high performance and low cost to satisfy both reliability and cost-effectiveness requirements.
•Supports both wire synchronization and optical synchronization modes with outstanding resistance to optical and electromagnetic interference for more stable operation.
•Integrated NPN/PNP output interface features strong compatibility and facilitates rapid on-site deployment.
•High-brightness status indicators are integrated on the receiver end cap with long-distance visibility to feedback the operating status of the light curtain in real time.
•Compact body supports multiple mounting methods including front mounting, side mounting and T-slot mounting to adapt to complex space layouts.
•Flexible cable outlet design saves installation space and simplifies wiring procedures.

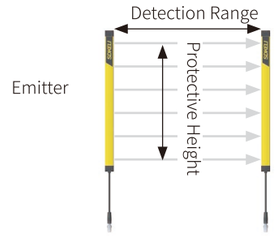


Selection Guide for Safety Light Curtains

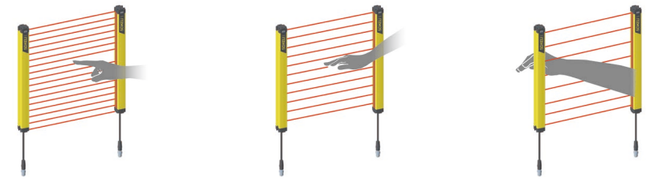
Follow the steps below to select the appropriate LCS3 light curtain for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Select Mounting Method → 5 Step Select Cable

1 步骤 / 2 步骤



3 步骤

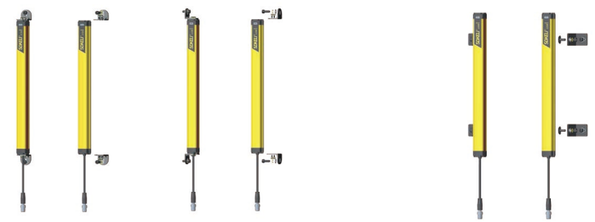


Resolution: 14 mm (Finger Detection)

Resolution: 30 mm (Palm Detection)

Resolution: 46 mm (Arm, Foot & Body Detection)

4 步骤



Integrated Front/Side Mounting (ZC)

T-slot Mounting (TC)

5 步骤



LCSII Transmission Cable - Single-ended

LCSII Transmission Extension Cable - Double-ended

Specification Model

LCS3 □ □□□□ PN □□ G / □□

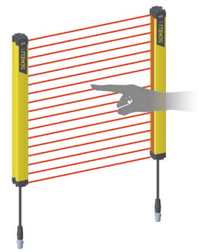
- Mounting Bracket Code
- Function Type: G - Basic Safety Type
- Resolution: 14 - 14 mm 30 - 30 mm 46 - 46 mm
- Output Type: PN - PNP and NPN output
- Protective Height: Represented by 4 digits (pad with leading zeros if insufficient), unit: mm
- Detection Distance: A - 0 ~ 5 m, B - 0 ~ 15 m
- LCS3 Light Curtain

Cable specifications

Name	Model	Single/Double-ended	Length
LCSII Transmission Cable - Single-ended, 3 m	CTL2X1D030C	Single-ended	3 m
LCSII Transmission Cable - Single-ended, 5 m	CTL2X1D050C	Single-ended	5 m
LCSII Transmission Cable - Single-ended, 10 m	CTL2X1D100C	Single-ended	10 m
LCSII Transmission Cable - Single-ended, 20 m	CTL2X1D200C	Single-ended	20 m
LCSII Transmission Extension Cable - Double-ended, 5 m	CTL2X3S050C	Double-ended	5 m
LCSII Transmission Extension Cable - Double-ended, 10 m	CTL2X3S100C	Double-ended	10 m
LCSII Transmission Extension Cable - Double-ended, 20 m	CTL2X3S200C	Double-ended	20 m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

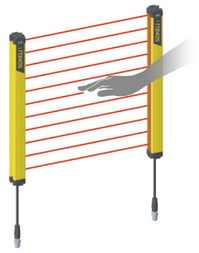


Resolution: 14 mm (Finger Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)
	LCS3 □ 0112PN14G	15	112	150	500	220	<8
	LCS3 □ 0152PN14G	20	152	190	500	260	<9
	LCS3 □ 0192PN14G	25	192	230	500	300	<11
	LCS3 □ 0232PN14G	30	232	270	500	340	<12
	LCS3 □ 0272PN14G	35	272	310	750	380	<14
	LCS3 □ 0312PN14G	40	312	350	750	420	<15
	LCS3 □ 0352PN14G	45	352	390	750	460	<17
	LCS3 □ 0392PN14G	50	392	430	750	500	<18
	LCS3 □ 0432PN14G	55	432	470	750	540	<20
	LCS3 □ 0472PN14G	60	472	510	750	580	<21
	LCS3 □ 0512PN14G	65	512	550	1000	620	<23
	LCS3 □ 0552PN14G	70	552	590	1000	660	<24
	LCS3 □ 0592PN14G	75	592	630	1000	700	<26
	LCS3 □ 0632PN14G	80	632	670	1000	740	<27
	LCS3 □ 0672PN14G	85	672	710	1000	780	<29
	LCS3 □ 0712PN14G	90	712	750	1000	820	<30
	LCS3 □ 0752PN14G	95	752	790	1000	860	<32
	LCS3 □ 0792PN14G	100	792	830	1200	900	<33
	LCS3 □ 0832PN14G	105	832	870	1200	940	<35
	LCS3 □ 0872PN14G	110	872	910	1200	980	<36
	LCS3 □ 0912PN14G	115	912	950	1200	1020	<38
	LCS3 □ 0952PN14G	120	952	990	1200	1060	<39
	LCS3 □ 0992PN14G	125	992	1030	1500	1100	<41
	LCS3 □ 1032PN14G	130	1032	1070	1500	1140	<42
	LCS3 □ 1072PN14G	135	1072	1110	1500	1180	<44
	LCS3 □ 1112PN14G	140	1112	1150	1500	1220	<45
	LCS3 □ 1152PN14G	145	1152	1190	1500	1260	<47
	LCS3 □ 1192PN14G	150	1192	1230	1500	1300	<48
	LCS3 □ 1232PN14G	155	1232	1270	1500	1340	<50
	LCS3 □ 1272PN14G	160	1272	1310	1750	1380	<51
	LCS3 □ 1312PN14G	165	1312	1350	1750	1420	<53
	LCS3 □ 1352PN14G	170	1352	1390	1750	1460	<54
	LCS3 □ 1392PN14G	175	1392	1430	1750	1500	<56
	LCS3 □ 1432PN14G	180	1432	1470	1750	1540	<57
	LCS3 □ 1472PN14G	185	1472	1510	1750	1580	<59
	LCS3 □ 1512PN14G	190	1512	1550	2000	1620	<60
	LCS3 □ 1552PN14G	195	1552	1590	2000	1660	<62
	LCS3 □ 1592PN14G	200	1592	1630	2000	1700	<63
	LCS3 □ 1632PN14G	205	1632	1670	2000	1740	<65
	LCS3 □ 1672PN14G	210	1672	1710	2000	1780	<66
	LCS3 □ 1912PN14G	240	1912	1950		2020	<75
	LCS3 □ 2152PN14G	270	2152	2190		2260	<84
	LCS3 □ 2392PN14G	300	2392	2430		2500	<93
	LCS3 □ 2872PN14G	360	2872	2910		2980	<111

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

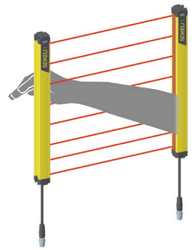


Resolution: 30 mm (Palm Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)
	LCS3 ☐ 0112PN30G	6	112	150	500	220	<5
	LCS3 ☐ 0152PN30G	8	152	190	500	260	<5
	LCS3 ☐ 0192PN30G	9	192	230	500	300	<6
	LCS3 ☐ 0232PN30G	11	232	270	500	340	<6
	LCS3 ☐ 0272PN30G	13	272	310	750	380	<7
	LCS3 ☐ 0312PN30G	15	312	350	750	420	<8
	LCS3 ☐ 0352PN30G	16	352	390	750	460	<8
	LCS3 ☐ 0392PN30G	18	392	430	750	500	<8
	LCS3 ☐ 0432PN30G	20	432	470	750	540	<9
	LCS3 ☐ 0472PN30G	21	472	510	750	580	<9
	LCS3 ☐ 0512PN30G	23	512	550	1000	620	<10
	LCS3 ☐ 0552PN30G	25	552	590	1000	660	<11
	LCS3 ☐ 0592PN30G	26	592	630	1000	700	<11
	LCS3 ☐ 0632PN30G	28	632	670	1000	740	<11
	LCS3 ☐ 0672PN30G	30	672	710	1000	780	<12
	LCS3 ☐ 0712PN30G	31	712	750	1000	820	<12
	LCS3 ☐ 0752PN30G	33	752	790	1000	860	<13
	LCS3 ☐ 0792PN30G	35	792	830	1200	900	<14
	LCS3 ☐ 0832PN30G	36	832	870	1200	940	<14
	LCS3 ☐ 0872PN30G	38	872	910	1200	980	<14
	LCS3 ☐ 0912PN30G	40	912	950	1200	1020	<15
	LCS3 ☐ 0952PN30G	41	952	990	1200	1060	<15
	LCS3 ☐ 0992PN30G	43	992	1030	1500	1100	<16
	LCS3 ☐ 1032PN30G	45	1032	1070	1500	1140	<17
	LCS3 ☐ 1072PN30G	46	1072	1110	1500	1180	<17
	LCS3 ☐ 1112PN30G	48	1112	1150	1500	1220	<17
	LCS3 ☐ 1152PN30G	50	1152	1190	1500	1260	<18
	LCS3 ☐ 1192PN30G	51	1192	1230	1500	1300	<18
	LCS3 ☐ 1232PN30G	53	1232	1270	1500	1340	<19
	LCS3 ☐ 1272PN30G	55	1272	1310	1750	1380	<20
	LCS3 ☐ 1312PN30G	56	1312	1350	1750	1420	<20
	LCS3 ☐ 1352PN30G	58	1352	1390	1750	1460	<20
	LCS3 ☐ 1392PN30G	60	1392	1430	1750	1500	<21
	LCS3 ☐ 1432PN30G	61	1432	1470	1750	1540	<21
	LCS3 ☐ 1472PN30G	63	1472	1510	1750	1580	<22
	LCS3 ☐ 1512PN30G	65	1512	1550	2000	1620	<23
	LCS3 ☐ 1552PN30G	66	1552	1590	2000	1660	<23
	LCS3 ☐ 1592PN30G	68	1592	1630	2000	1700	<23
	LCS3 ☐ 1632PN30G	70	1632	1670	2000	1740	<24
	LCS3 ☐ 1672PN30G	71	1672	1710	2000	1780	<24
	LCS3 ☐ 1912PN30G	81	1912	1950		2020	<27
	LCS3 ☐ 2152PN30G	91	2152	2190		2260	<30
	LCS3 ☐ 2392PN30G	101	2392	2430		2500	<33
	LCS3 ☐ 2872PN30G	121	2872	2910		2980	<39

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)



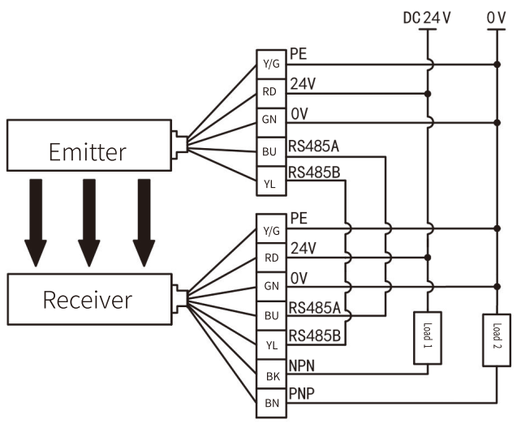
Resolution: 46 mm (Arm, Foot & Body Detection)

Resolution	Model	Beam Quantity	H	J	L	C	Response Time (ms)
	LCS3 ☐ 0112PN46G	4	112	150	500	220	<4
	LCS3 ☐ 0152PN46G	5	152	190	500	260	<5
	LCS3 ☐ 0192PN46G	6	192	230	500	300	<5
	LCS3 ☐ 0232PN46G	7	232	270	500	340	<5
	LCS3 ☐ 0272PN46G	8	272	310	750	380	<5
	LCS3 ☐ 0312PN46G	9	312	350	750	420	<6
	LCS3 ☐ 0352PN46G	10	352	390	750	460	<6
	LCS3 ☐ 0392PN46G	11	392	430	750	500	<6
	LCS3 ☐ 0432PN46G	12	432	470	750	540	<7
	LCS3 ☐ 0472PN46G	13	472	510	750	580	<7
	LCS3 ☐ 0512PN46G	14	512	550	1000	620	<7
	LCS3 ☐ 0552PN46G	15	552	590	1000	660	<8
	LCS3 ☐ 0592PN46G	16	592	630	1000	700	<8
	LCS3 ☐ 0632PN46G	17	632	670	1000	740	<8
	LCS3 ☐ 0672PN46G	18	672	710	1000	780	<8
	LCS3 ☐ 0712PN46G	19	712	750	1000	820	<9
	LCS3 ☐ 0752PN46G	20	752	790	1000	860	<9
	LCS3 ☐ 0792PN46G	21	792	830	1200	900	<9
	LCS3 ☐ 0832PN46G	22	832	870	1200	940	<10
	LCS3 ☐ 0872PN46G	23	872	910	1200	980	<10
	LCS3 ☐ 0912PN46G	24	912	950	1200	1020	<10
	LCS3 ☐ 0952PN46G	25	952	990	1200	1060	<11
	LCS3 ☐ 0992PN46G	26	992	1030	1500	1100	<11
	LCS3 ☐ 1032PN46G	27	1032	1070	1500	1140	<11
	LCS3 ☐ 1072PN46G	28	1072	1110	1500	1180	<11
	LCS3 ☐ 1112PN46G	29	1112	1150	1500	1220	<12
	LCS3 ☐ 1152PN46G	30	1152	1190	1500	1260	<12
	LCS3 ☐ 1192PN46G	31	1192	1230	1500	1300	<12
	LCS3 ☐ 1232PN46G	32	1232	1270	1500	1340	<13
	LCS3 ☐ 1272PN46G	33	1272	1310	1750	1380	<13
	LCS3 ☐ 1312PN46G	34	1312	1350	1750	1420	<13
	LCS3 ☐ 1352PN46G	35	1352	1390	1750	1460	<14
	LCS3 ☐ 1392PN46G	36	1392	1430	1750	1500	<14
	LCS3 ☐ 1432PN46G	37	1432	1470	1750	1540	<14
	LCS3 ☐ 1472PN46G	38	1472	1510	1750	1580	<14
	LCS3 ☐ 1512PN46G	39	1512	1550	2000	1620	<15
	LCS3 ☐ 1552PN46G	40	1552	1590	2000	1660	<15
	LCS3 ☐ 1592PN46G	41	1592	1630	2000	1700	<15
	LCS3 ☐ 1632PN46G	42	1632	1670	2000	1740	<16
	LCS3 ☐ 1672PN46G	43	1672	1710	2000	1780	<16
	LCS3 ☐ 1912PN46G	49	1912	1950		2020	<18
	LCS3 ☐ 2152PN46G	55	2152	2190		2260	<20
	LCS3 ☐ 2392PN46G	61	2392	2430		2500	<21
	LCS3 ☐ 2872PN46G	73	2872	2910		2980	<25

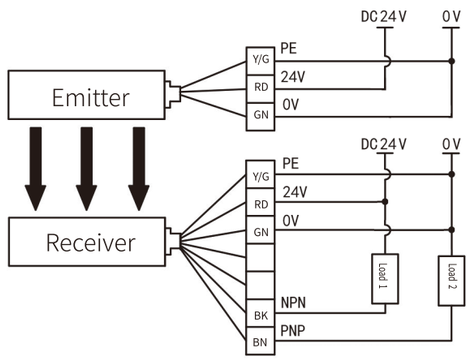
Technical Specifications

Optical Characteristics			
Light Source	Infrared LED (Wavelength: 850nm)		
Optical Axis Pitch	8 mm	24 mm	40 mm
Resolution	14 mm	30 mm	46 mm
Detection Range	Type A: 0 ~ 5 m, Type B: 0 ~ 15 m		
Protective Height	112 mm ~ 2872 mm (Refer to LCS3 specification table)		
Environmental Characteristics			
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	
	Storage	-40°C～70°C	
Ambient Humidity	Operating	35% RH～85% RH	
	Storage	35% RH～95% RH	
Protection level	IP54		
Anti-ambient Light Interference	10,000 lux		
EMC	Complies with Type 4 safety light curtain standard		
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 mm ± 0.05 mm, 20 times in X, Y and Z directions respectively		
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, 1000 ± 10 times in X, Y and Z directions respectively		
Dimensions	26.5×30×Jmm (J: Length of Emitter/Receiver)		
Electrical Characteristics			
Power Supply Voltage	DC 24 V ± 20% (Ripple ± 5%)		
Current Consumption	Emitter	≤200 mA	
	Receiver	≤200 mA (No load)	
Response Time	Varies by beam quantity, refer to the specification table		
Output Characteristics	NPN	NPN transistor output; Transistor ON when beam unobstructed, load capacity ≤ 200 mA, output voltage ≤ 2 V; Transistor OFF when beam blocked, output voltage ≥ VCC-2 V	
	PNP	PNP transistor output; Transistor ON when beam unobstructed, load capacity ≤ 200 mA, output voltage ≥ VCC-3 V; Transistor OFF when beam blocked, output voltage ≤ 2 V	
Start-up Time	＜2s		
Diagnostic Function	Power-on self-test + Real-time runtime self-test		
Protection Circuit	Overvoltage, Overcurrent & Output short-circuit protection		

Typical Wiring Diagram

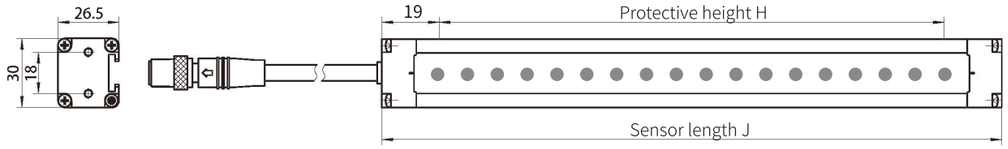


Wire Synchronization Wiring Diagram



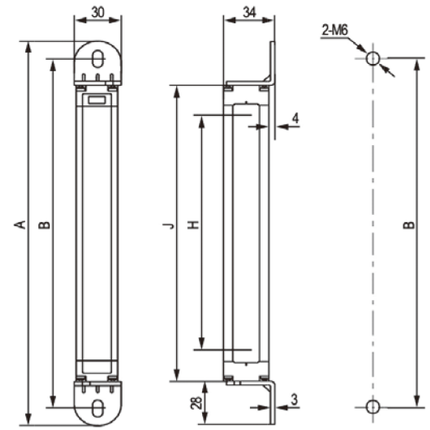
Optical Synchronization Wiring Diagram

Dimensions

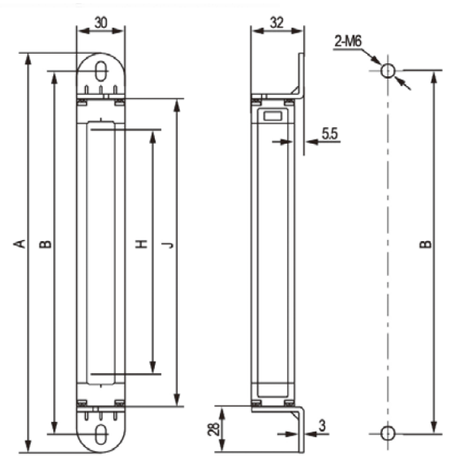


Mounting Method



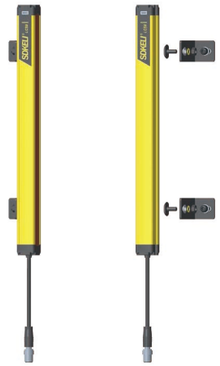


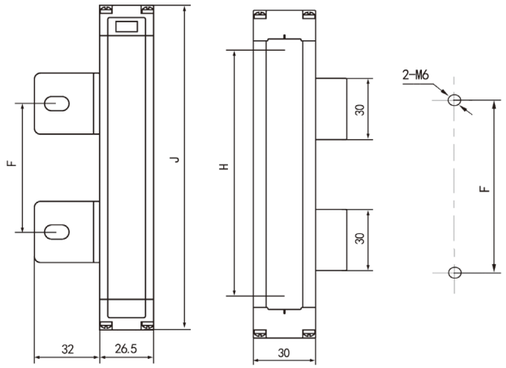




Integrated Front/Side Mounting (ZC)

A mounting method for fixing LCS3 light curtain to machine tool bed by integrated front/side mounting bracket.



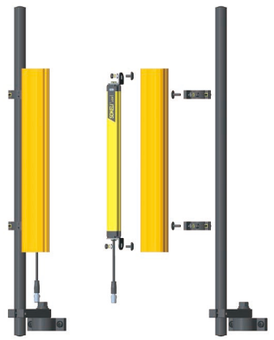


T-slot Mounting (TC)

A mounting method for fixing LCS3 light curtain to machine tool bed by T-bolts and L-angle brackets.



Protective Cover Front/Side Mounting (FZC)



Pipe Bracket with Protective Cover (GF)



Double-arm Bracket with Protective Cover (SF)

SMTC Measuring Light Curtain



Overview

The SMTC series measuring light curtain realizes non-contact measurement via infrared. It supports length/width measurement, area measurement, volume measurement, and direction detection in various applications. It can read the light-on/light-block status of each beam for flexible data processing according to on-site requirements, and supports multiple interface outputs.

Primary Applications:

Warehousing & Storage Systems: Material positioning, direction identification, and height-limiting system integration.

Spray Painting Equipment: Real-time tracking of object shapes and contours for paint-saving, eco-friendly spraying.

Logistics Equipment: Profile measurement and volume detection of items on conveyor channels.

Advantages

- Ultra-long detection range with simple alignment;
- Easy and flexible installation;
- Strong resistance to electromagnetic interference and optical interference;
- Excellent vibration resistance, waterproof, and dustproof performance;
- Supports Modbus 485-RTU communication interface;
- Maximum detection height up to 2.8 m.

Specification Model

SMTC □ □□ □□□□ □□ □□ □

- E - Emitter; R - Receiver (If omitted, it represents the system number)
- Function Code: 00
- Output Type: 4P - RS485 + PNP 4N - RS485 + NPN
- Protective Height: 4-digit representation (padded with leading zeros) in mm
- Optical Axis Pitch: 08 - 8 mm
- Detection Distance: A - 0 ~ 3 m B - 0 ~ 6 m C - 0 ~ 15 m
- SMTC Safety Light Curtain

Application Scenarios

Model 4P00
Basic General Type

It integrates all standard functions of SMTC measuring light curtains, supporting data output, floating blanking, fixed blanking and other basic operation functions to meet the demands of most dimensional measurement applications.

Application Scenarios:
General material dimension detection, passage height limit detection, regular contour scanning, standard logistics sorting.

Model 4P02/4P05
Direction Detection Type

It is dedicated to object travel direction detection. The direction from the first beam to the last beam at the cable outlet is defined as the forward direction, with clear output logic corresponding to each passing status:
•Object passes forward: OSSD1 ON, OSSD2 OFF
•Object passes backward: OSSD1 OFF, OSSD2 ON
•No object passing (4P02): OSSD1 & OSSD2 both OFF

> Model 4P05 also supports direction detection function. Unlike Model 4P02, both OSSD1 and OSSD2 stay ON when no detected object passes through.

Application Scenarios:
Warehouse entrance & exit access control, incoming/outgoing direction judgment for automated production lines, equipment safety standby monitoring.

Model 4P06
Shaded Beam Count & Fault Monitoring Type

It features dual core functions: shaded beam quantity output and fault status monitoring. The measuring light curtain actively uploads data at an upload cycle of 100 ms per frame, with data transmitted in a 2-byte hexadecimal format to output detected shaded beam quantity and fault signals.
•1st byte: Indicates the quantity of shaded beams (expressed in hexadecimal);
•2nd byte: Indicates fault output status (01 = no fault, 02 = fault present).
Matching output logic: When beams are blocked, OSSD1 is ON; when beams are clear, OSSD1 is OFF. When no fault occurs, OSSD2 is ON; when a fault occurs, OSSD2 is OFF.

Application Scenarios:
Online statistics of material thickness/width, production line status monitoring, equipment fault early warning.

Model 4P07
High-precision General Type

It is upgraded from Model 4P00 with improved resolution up to 6 mm, while retaining standard functions including data output, floating blanking and fixed blanking. It is suitable for general applications requiring higher measurement precision.

Application Scenarios:
Precision workpiece dimension inspection, small material sorting, high-precision contour measurement.

Model 4P08
Current Output Type

It must be used with a dedicated current module. Its core function is current output, where the output current has a linear correlation with the number of unobstructed beams. The calculation formula is as follows:

$$\text{Output Current} = 4\text{mA} + \frac{\text{Number of unobstructed beams}}{\text{Total number of beams}} \times 16\text{mA}$$

Where: fully unobstructed beams output 20 mA, fully blocked beams output 4 mA, half-blocked beams output 12 mA.

Application Scenarios:
General material dimension detection, analog quantity transmission in industrial environments.

Model 4P09
Basic Person-Material Separation Type

It features core person-material separation function (MUTING function), which can effectively distinguish personnel from materials to ensure safety on production sites.

Application Scenarios:
Machine tool loading & unloading, robot workstation, safety protection for loading/unloading ports.

Model 4P10
Enhanced Person-Material Separation Type

It also supports the person-material separation function (MUTING function). Its core difference from Model 4P09 is that the detection area of the measuring light curtain allows two objects with preset dimensional specifications to pass through simultaneously, making it suitable for scenarios with multiple materials passing at the same time.

Application Scenarios:
Dual-station loading, parallel conveying of multiple materials.

Model 4P11
Peak Height Detection Type

It is dedicated to object peak height detection. Data output complies with the standard MODBUS-RTU protocol. The beams from the first to the last at the cable outlet are defined in ascending order from the lowest point to the highest point. The measuring light curtain actively uploads data indicating the exact position of the currently highest shaded beam.

Application Scenarios:
Cargo stacking height measurement, vehicle height limit detection, material height grading, top positioning.

Model 4P12
Multi-function Type with MODBUS Protocol

It supports data output via standard MODBUS-RTU protocol with comprehensive and flexible functions, realizing the following core operations:
•Query the total number of beams of the measuring light curtain;
•Query the blocked/unblocked status of each beam;
•Query multi-segment shaded beam information (up to 15 segments available);
•Query the moving direction of passing objects;
•Modify the sensor baud rate (adjustable from 9600 bps to 115200 bps);
•Modify the address of the measuring light curtain (address range: 0 × 41 – 0 × 5A).

Application Scenarios:
Intelligent warehousing, industrial IoT, centralized upper computer monitoring, multi-axis linkage measurement.

Model 4P16
Special Type for Hole Detection

It is specially designed for hole detection applications with defined detection parameters: detectable hole size ≥ 1 mm, compatible object moving speed ≤ 2 m/s. The output logic is as follows:
•Fully blocked beams: OSSD1 & OSSD2 both OFF;
•Partially blocked beams & fully unobstructed beams: OSSD1 & OSSD2 both ON.

Application Scenarios:
Plate punching inspection, film/cardboard hole leakage detection, appearance defect screening for small workpieces.

Note: All the above output logic takes PNP output as an example.

Specification Table

SMTC measuring light curtain specification table (optical axis pitch: 8 mm)

Model	Beam Quantity	H	J	L	C	Scan time (ms)
SMTC □ 080232- △ 00	30	232	270	500	340	＜ 8
SMTC □ 080272- △ 00	35	272	310	750	380	＜ 8
SMTC □ 080312- △ 00	40	312	350	750	420	＜ 9
SMTC □ 080352- △ 00	45	352	390	750	460	＜ 9
SMTC □ 080392- △ 00	50	392	430	750	500	＜ 9
SMTC □ 080432- △ 00	55	432	470	750	540	＜ 10
SMTC □ 080472- △ 00	60	472	510	750	580	＜ 10
SMTC □ 080512- △ 00	65	512	550	1000	620	＜ 11
SMTC □ 080552- △ 00	70	552	590	1000	660	＜ 11
SMTC □ 080592- △ 00	75	592	630	1000	700	＜ 11
SMTC □ 080632- △ 00	80	632	670	1000	740	＜ 12
SMTC □ 080672- △ 00	85	672	710	1000	780	＜ 12
SMTC □ 080712- △ 00	90	712	750	1000	820	＜ 13
SMTC □ 080752- △ 00	95	752	790	1000	860	＜ 13
SMTC □ 080792- △ 00	100	792	830	1200	900	＜ 13
SMTC □ 080832- △ 00	105	832	870	1200	940	＜ 14
SMTC □ 080872- △ 00	110	872	910	1200	980	＜ 14
SMTC □ 080912- △ 00	115	912	950	1200	1020	＜ 15
SMTC □ 080952- △ 00	120	952	990	1200	1060	＜ 15
SMTC □ 080992- △ 00	125	992	1030	1500	1100	＜ 15
SMTC □ 081032- △ 00	130	1032	1070	1500	1140	＜ 16
SMTC □ 081072- △ 00	135	1072	1110	1500	1180	＜ 16
SMTC □ 081112- △ 00	140	1112	1150	1500	1220	＜ 17
SMTC □ 081152- △ 00	145	1152	1190	1500	1260	＜ 17
SMTC □ 081192- △ 00	150	1192	1230	1500	1300	＜ 17
SMTC □ 081232- △ 00	155	1232	1270	1500	1340	＜ 18
SMTC □ 081272- △ 00	160	1272	1310	1750	1380	＜ 18
SMTC □ 081312- △ 00	165	1312	1350	1750	1420	＜ 19
SMTC □ 081352- △ 00	170	1352	1390	1750	1460	＜ 19
SMTC □ 081392- △ 00	175	1392	1430	1750	1500	＜ 19
SMTC □ 081432- △ 00	180	1432	1470	1750	1540	＜ 20
SMTC □ 081472- △ 00	185	1472	1510	1750	1580	＜ 20
SMTC □ 081512- △ 00	190	1512	1550	2000	1620	＜ 21
SMTC □ 081552- △ 00	195	1552	1590	2000	1660	＜ 21
SMTC □ 081592- △ 00	200	1592	1630	2000	1700	＜ 21

" □ " = detection distance series code: A: 0 ~ 3 m, B: 0 ~ 6 m, C: 0 ~ 15 m; " △ " = output type: 4P - RS485 + PNP, 4N - RS485 + NPN

Specification Table

SMTC measuring light curtain specification table (optical axis pitch: 8 mm)

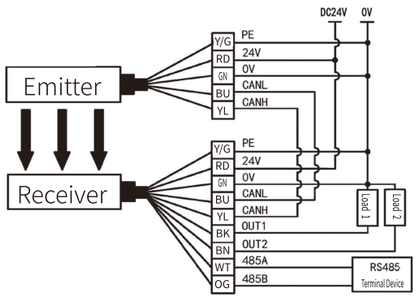
Model	Beam Quantity	H	J	L	C	Scan time (ms)
SMTC □ 081632- △ 00	205	1632	1670	2000	1740	＜ 22
SMTC □ 081672- △ 00	210	1672	1710	2000	1780	＜ 22
SMTC □ 081712- △ 00	215	1712	1750		1820	＜ 23
SMTC □ 081752- △ 00	220	1752	1790		1860	＜ 23
SMTC □ 081792- △ 00	225	1792	1830		1900	＜ 23
SMTC □ 081832- △ 00	230	1832	1870		1940	＜ 24
SMTC □ 081872- △ 00	235	1872	1910		1980	＜ 24
SMTC □ 081912- △ 00	240	1912	1950		2020	＜ 25
SMTC □ 081952- △ 00	245	1952	1990		2060	＜ 25
SMTC □ 081992- △ 00	250	1992	2030		2100	＜ 25
SMTC □ 082032- △ 00	255	2032	2070		2140	＜ 26
SMTC □ 082072- △ 00	260	2072	2110		2180	＜ 26
SMTC □ 082112- △ 00	265	2112	2150		2220	＜ 27
SMTC □ 082152- △ 00	270	2152	2190		2260	＜ 27
SMTC □ 082192- △ 00	275	2192	2230		2300	＜ 27
SMTC □ 082232- △ 00	280	2232	2270		2340	＜ 28
SMTC □ 082272- △ 00	285	2272	2310		2380	＜ 28
SMTC □ 082312- △ 00	290	2312	2350		2420	＜ 29
SMTC □ 082352- △ 00	295	2352	2390		2460	＜ 29
SMTC □ 082392- △ 00	300	2392	2430		2500	＜ 29
SMTC □ 082432- △ 00	305	2432	2470		2540	＜ 30
SMTC □ 082472- △ 00	310	2472	2510		2580	＜ 30
SMTC □ 082512- △ 00	315	2512	2550		2620	＜ 31
SMTC □ 082552- △ 00	320	2552	2590		2660	＜ 31
SMTC □ 082592- △ 00	325	2592	2630		2700	＜ 31
SMTC □ 082632- △ 00	330	2632	2670		2740	＜ 32
SMTC □ 082672- △ 00	335	2672	2710		2780	＜ 32
SMTC □ 082712- △ 00	340	2712	2750		2820	＜ 33
SMTC □ 082752- △ 00	345	2752	2790		2860	＜ 33
SMTC □ 082792- △ 00	350	2792	2830		2900	＜ 33
SMTC □ 082832- △ 00	355	2832	2870		2940	＜ 34
SMTC □ 082872- △ 00	360	2872	2910		2980	＜ 34

" □ " = detection distance series code: A: 0 ~ 3 m, B: 0 ~ 6 m, C: 0 ~ 15 m; " △ " = output type: 4P - RS485 + PNP, 4N - RS485 + NPN

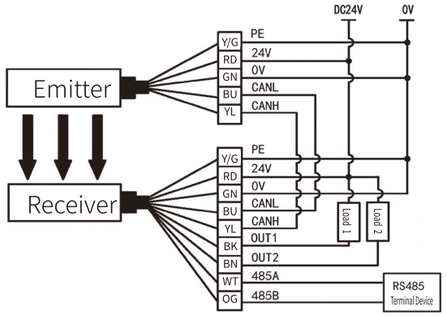
Technical Specifications

Optical characteristics		
Optical Axis Pitch	8 mm	
Detection Range	Type A: 0 ~ 3 m; Type B: 0 ~ 6 m; Type C: 0 ~ 15 m	
Detection Height (mm)	232 mm ~ 2872 mm (Refer to SMTC specification table)	
Effective Aperture Angle (EAA)	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m	
Light Source	Infrared LED (Wavelength: 850 nm)	
Environmental Characteristics		
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)
	Storage	-40°C～ 70°C
Ambient Humidity	Operating	35% RH ~ 85% RH
	Storage	35% RH ~ 95% RH
Anti-ambient Light Interference	Incandescent Light Source	⩾ 3,000 lux
	Fluorescent Light Source	⩾ 3,000 lux
	Solar Light Source	⩾ 10,000 lux
Co-source Light Interference	Same-design emitter interference light will not cause dangerous failure of SMTC unit	
Protection level	IP65/IP67	
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz, amplitude: 0.35 mm ± 0.05 mm, 20 times in X, Y and Z directions respectively	
Shock Resistance	Acceleration: 10 g, pulse duration: 16 ms, 1000 times in X, Y and Z directions respectively	
Electrical Characteristics		
Power Supply Voltage	DC 24 V ± 20% (Ripple ± 5%)	
Current Consumption (No load)	Emitter	＜200 mA
	Receiver	＜200 mA
Scan Time	8 ms ~ 34 ms (Refer to SMTC specification table)	
Synchronization Mode	Wire synchronization	
Start-up Time	＜ 2s	
Diagnostic Function	Power-on self-test + Real-time runtime self-test	
Protection Circuit	Overvoltage, Overcurrent & Output short-circuit protection	
Basic Functions		
Transistor Output Function	OUT1	ON when all beams are unobstructed; OFF under other conditions
	OUT2	ON when all beams are blocked; OFF under other conditions
Data Output Function	Query Beam Quantity	Query total beam channels of the sensor
	Query All Optical Channel Status	Query block/unblock status of each channel in the previous cycle
	Query Multi-segment Shaded Beam Information	Query start position and channel count of each shaded segment in the previous cycle; up to 15 segments available
	Configure Baud Rate	Set baud rate: 9600, 19200, 38400, 57600, 115200
	Configure Sensor Address	Set sensor address, address range: 0 × 41 – 0 × 5A

Typical Wiring Diagram



RS485,PNP



RS485,NPN



KS06 AOPD

- KS06 AOPD
- KS06 Cascaded AOPD
- KS06Q Area AOPD
- KS06 Safety Light Curtain
- KS06 Cascaded Safety Light Curtain
- KS06Q Area Protection Safety Light Curtain

KS06 AOPD



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



CPS II



CSRM



CQ2

Matching Controller

Management System ISO 9001:2015
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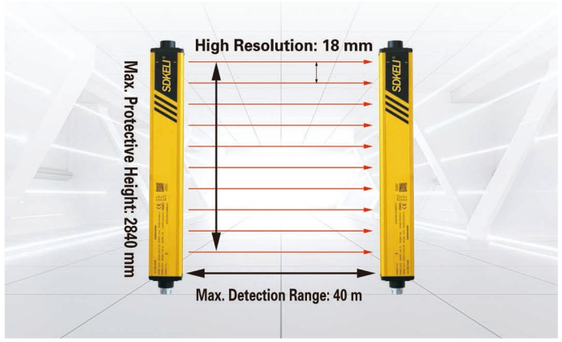
CE

Overview

The KS06 AOPD complies with Type 4 safety category requirements. It effectively detects any opaque objects
opaque object larger than the rated resolution that enters the protected light field.
exceeding the specified detection accuracy that enter the protected area. It is suitable for safety protection in hazardous applications such as mechanical presses, hydraulic presses, shears, and press brakes. The KS06 series is compatible with CPS II, CPS III, CQ2 controllers and CSRMC safety relay modules. When integrated with machine tool control systems, it enables automatic machine stop control in hazardous situations.

Advantages

- Comprehensive self-test function covering full diagnostics including output signal circuits.
- Supports floating muting to enable continuous processing of long workpieces.
- Dual-channel relay dry contact outputs for enhanced safety performance.
- High resolution performance, long detection range and large protective height.
- Individual beam status indicators for clear visual feedback of beam block/unblock status.
- Excellent vibration resistance, suited for high-speed stamping and large-tonnage presses with extended service life.
- Superior immunity to optical and electromagnetic interference for stable operation.
- When fitted with a safety relay module, two contact configurations are available: 3 normally open + 1 normally closed contacts, and 2 normally open + 1 normally closed contacts.

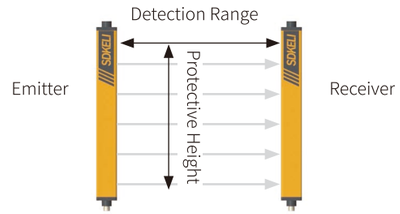


Selection Guide for AOPD (Safety Light Curtains)

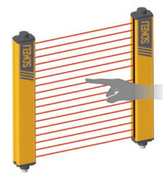
Follow the steps below to select the appropriate KS06 AOPD for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Select Mounting Method → 5 Step Select Controller → 6 Step Select Cable

1 Step / 2 Step



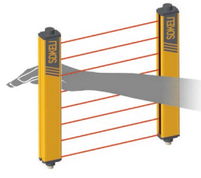
3 Step



Resolution: 18 mm
(Finger Detection)

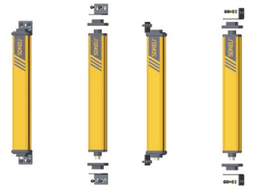


Resolution: 28 mm
(Palm Detection)



Resolution: 48 mm
(Arm, Foot & Body Detection)

4 Step



Integrated Front/Side Mounting (ZC)



T-slot Mounting (TC)

5 Step



CPS II



CQ2



CSRM

6 Step



KS06 Transmission Cable - Double-ended



KS06 Transmission Cable - Single-ended

Specification Model

Full specifications of AOPD with relay contact outputs are shown below:

KS06 □ □□ □□ I - □□ □□ □ □ / □□

- □□: Mounting Bracket
- □: Reset Mode: R - Automatic Reset, M - Manual Reset
- □: Operating Voltage: A - AC 100 ~ 230 V, D - DC 24 V
- □□: Output Type: 2O - 2 sets of relay normally open contact outputs; 2C - 2 sets of relay normally closed contact outputs; OC - 1 set normally open + 1 set normally closed relay contact outputs; 21 - 2 sets normally open + 1 set normally closed relay contact outputs; 31 - 3 sets normally open + 1 set normally closed relay contact outputs
- □□: P - CPS II controller, single-sided protection; PS - CPS II controller, double-sided protection; Q - CQ2 controller with power & function switches; QN - CQ2 controller without switches; SR - CSRMC Safety Relay Module
- I: I - Individual beam indicator (Omitted if not equipped)
- □□: Optical axis pitch: 10 - 10 mm, 20 - 20 mm, 40 - 40 mm
- □□: Beam Quantity: 04, 06, 08.....72
- □: Detection range code: A - 0 ~ 6 m, B - 0 ~ 12 m, D - 0 ~ 20 m, E - 0 ~ 40 m (Note 1)
- KS06: KS06 AOPD

Note 1: Beam quantity of type E light curtain: 04, 06, 08 ····· 40, the optical axis pitch is fixed at 40 mm; Detection range: 0 ~ 40 m for 4 ~ 16 beams; 0 ~ 30 m for 18 ~ 40 beams

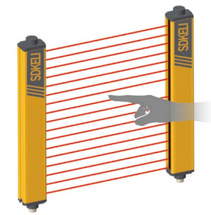
Cable Specifications

Name	Model	Single/Double End	Length
KS06 Transmission Cable - Double-ended, 2 m	CTK6X1S020C	Double-ended	2 m
KS06 Transmission Cable - Double-ended, 3 m	CTK6X1S030C	Double-ended	3 m
KS06 Transmission Cable - Double-ended, 4 m	CTK6X1S040C	Double-ended	4 m
KS06 Transmission Cable - Double-ended, 8 m	CTK6X1S080C	Double-ended	8 m
KS06 Transmission Cable - Double-ended, 10 m	CTK6X1S100C	Double-ended	10 m
KS06 Transmission Cable - Double-ended, 14 m	CTK6X1S140C	Double-ended	14 m
KS06 Transmission Cable - Double-ended, 17 m	CTK6X1S170C	Double-ended	17 m
KS06 Transmission Cable - Single-ended, 3 m	CTK6X1D030C	Single-ended	3 m
KS06 Transmission Cable - Single-ended, 8 m	CTK6X1D080C	Single-ended	8 m
KS06 Transmission Cable - Single-ended, 14 m	CTK6X1D140C	Single-ended	14 m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 10						
Resolution	Model	Beam Quantity	H	J	L	C
Resolution: 18 mm (Finger Detection)	KS06*1210	12	110	199	500	260
	KS06*1610	16	150	239	500	300
	KS06*2010	20	190	279	500	340
	KS06*2410	24	230	319	500	380
	KS06*2810	28	270	359	750	420
	KS06*3210	32	310	399	750	460
	KS06*3610	36	350	439	750	500
	KS06*4010	40	390	479	750	540
	KS06*4410	44	430	519	750	580
	KS06*4810	48	470	559	1000	620
	KS06*5210	52	510	599	1000	660
	KS06*5610	56	550	639	1000	700
	KS06*6010	60	590	679	1000	740
	KS06*6410	64	630	719	1000	780
	KS06*6810	68	670	759	1000	820
	KS06*7210	72	710	799	1000	860



Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 20						
Resolution	Model	Beam Quantity	H	J	L	C
	KS06*0620	6	100	199	500	260
	KS06*0820	8	140	239	500	300
	KS06*1020	10	180	279	500	340
	KS06*1220	12	220	319	500	380
	KS06*1420	14	260	359	750	420
	KS06*1620	16	300	399	750	460
	KS06*1820	18	340	439	750	500
	KS06*2020	20	380	479	750	540
	KS06*2220	22	420	519	750	580
	KS06*2420	24	460	559	1000	620
	KS06*2620	26	500	599	1000	660
	KS06*2820	28	540	639	1000	700
	KS06*3020	30	580	679	1000	740
	KS06*3220	32	620	719	1000	780
	KS06*3420	34	660	759	1000	820
	KS06*3620	36	700	799	1000	860
	KS06*3820	38	740	839	1200	900
	KS06*4020	40	780	879	1200	940
	KS06*4220	42	820	919	1200	980
	KS06*4420	44	860	959	1200	1020
	KS06*4620	46	900	999	1200	1060
	KS06*4820	48	940	1039	1500	1100
	KS06*5020	50	980	1079	1500	1140
	KS06*5220	52	1020	1119	1500	1180
	KS06*5420	54	1060	1159	1500	1220
	KS06*5620	56	1100	1199	1500	1260
	KS06*5820	58	1140	1239	1500	1300
	KS06*6020	60	1180	1279	1500	1340
	KS06*6220	62	1220	1319	1750	1380
	KS06*6420	64	1260	1359	1750	1420
	KS06*6620	66	1300	1399	1750	1460
	KS06*6820	68	1340	1439	1750	1500
	KS06*7020	70	1380	1479	1750	1540
	KS06*7220	72	1420	1519	1750	1580



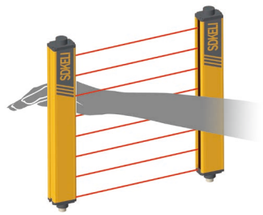
Resolution: 28 mm (Palm Detection)

Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 40						
Resolution	Model	Beam Quantity	H	J	L	C
	KS06*0440	4	120	239	500	300
	KS06*0640	6	200	319	500	380
	KS06*0840	8	280	399	750	460
	KS06*1040	10	360	479	750	540
	KS06*1240	12	440	559	1000	620
	KS06*1440	14	520	639	1000	700
	KS06*1640	16	600	719	1000	780
	KS06*1840	18	680	799	1000	860
	KS06*2040	20	760	879	1200	940
	KS06*2240	22	840	959	1200	1020
	KS06*2440	24	920	1039	1500	1100
	KS06*2640	26	1000	1119	1500	1180
	KS06*2840	28	1080	1199	1500	1260
	KS06*3040	30	1160	1279	1500	1340
	KS06*3240	32	1240	1359	1750	1420
	KS06*3440	34	1320	1439	1750	1500
	KS06*3640	36	1400	1519	1750	1580
	KS06*3840	38	1480	1599	2000	1660
	KS06*4040	40	1560	1679	2000	1740
	KS06*4240	42	1640	1759	2000	1820
	KS06*4440	44	1720	1839		1900
	KS06*4640	46	1800	1919		1980
	KS06*4840	48	1880	1999		2060
	KS06*5040	50	1960	2079		2140
	KS06*5240	52	2040	2159		2220
	KS06*5440	54	2120	2239		2300
	KS06*5640	56	2200	2319		2380
	KS06*5840	58	2280	2399		2460
	KS06*6040	60	2360	2479		2540
	KS06*6240	62	2440	2559		2620
	KS06*6440	64	2520	2639		2700
	KS06*6640	66	2600	2719		2780
	KS06*6840	68	2680	2799		2860
	KS06*7040	70	2760	2879		2940
	KS06*7240	72	2840	2959		



Resolution: 48 mm (Arm, Foot & Body Detection)

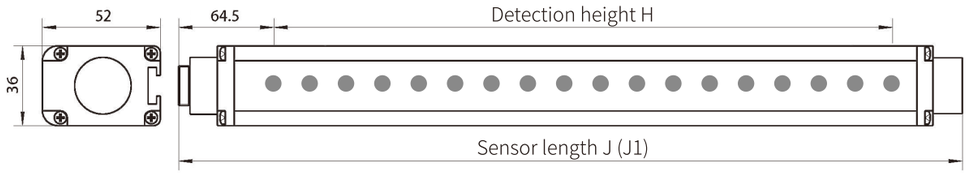
Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

Specification Table

Safety Level	Type 4 Cat. 4 PL e				
Executive Standards	GB/T 19436.1; GB/T 19436.2; GB/T 4584; IEC 61496-1; IEC 61496-2				
Optical Characteristics					
Light Source	Infrared LED (Center Wavelength: 940 nm)				
Optical Axis Pitch	10 mm	20 mm	40 mm		
Resolution	18 mm	28 mm	48 mm		
Beam Quantity	12、16、20…72	6、8、10…72	4、6、8…72	4、6、8…16	18、20、22…40
Detection Range	Type A: 0 ~ 6 m; Type B: 0 ~ 12 m; Type D: 0 ~ 20 m			Type E: 0 ~ 40 m	Type E: 0 ~ 30 m
Protective Height	Optical Axis Pitch × (Beam Quantity - 1)				
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m				
Environmental Characteristics					
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)			
	Storage	-40°C～70°C			
Ambient Humidity	Operating	35% RH ～ 85% RH			
	Storage	35% RH ～ 95% RH			
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux			
	Fluorescent Light Source	3,000 lux			
	Solar Light Source	10,000 lux			
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584			
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011			
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis				
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis				
Protection level	IP65				
Dimensions	52×36×Jmm (J: Length of Emitter/Receiver)				
Electrical Characteristics					
Power Supply Voltage	DC12V±10%				
Current Consumption	Emitter	⩽300mA			
	Receiver	⩽100mA			
Response Time	＜18ms				
Output Characteristics	Outputs square wave signal at 4 kHz when light path is unobstructed				
Matching Controllers	CPS II, CPS III, CQ2, CSRMC				

Dimensions

(unit: mm)



Mounting Method

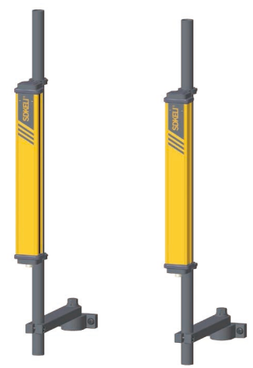


Integrated Front/Side Mounting (ZC)

Mount the emitter and receiver of KS06/KS06G series directly on the machine tool bed via KS-type front/ side mounting brackets.

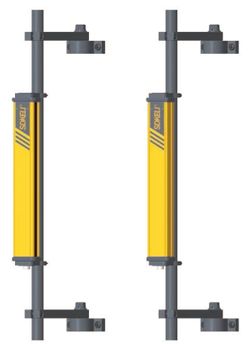
T-Slot Side Mounting (TC)

Secure the emitter and receiver to the machine tool wall via T-bolts and L-shaped bracket.



Pipe Mount Side Mounting (GC)

Fix the emitter and receiver on steel pipe brackets with KS-type pipe clamps, and mount the swivel base on the machine base or column.



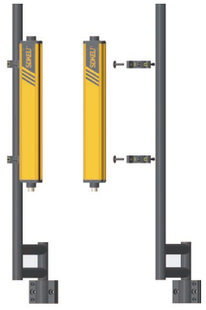
Dual Swivel Arm Side Mounting (G1)

Fix the emitter and receiver on steel pipe brackets with KS-type pipe clamps, and mount the swivel base on the machine base or column. Dual swivel arms effectively enhance vibration resistance.



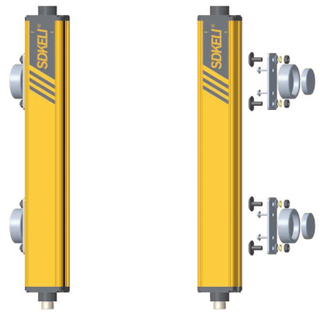
Dual Arm Side Mounting with Shock Absorber (SCJ)

Mount the emitter and receiver on the dual-arm pipe bracket with KS-type pipe clamps, and fix the bracket base on the machine base or column.



Dual Arm Side Mounting - T-Slot Type (SCT)

Secure the emitter and receiver on the dual-arm pipe bracket with Q-type pipe clamps, and fix the bracket base on the machine base or column.



Magnetic Mounting (CX)

Mount the emitter and receiver on the machine wall with strong magnets.

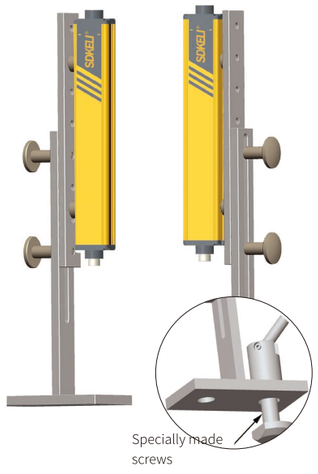


Plate Bracket Screw Mounting (BL)

Mount the emitter and receiver on the plate bracket via magnetic mounting, then fix the plate bracket on the machine worktable with screws. A dedicated safety manager is required for this mounting method.

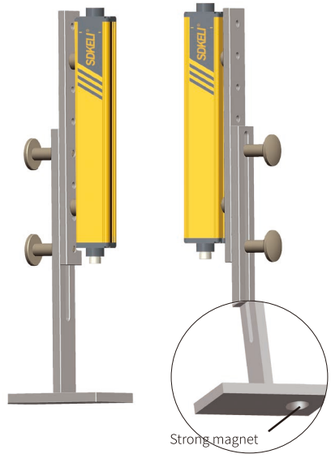
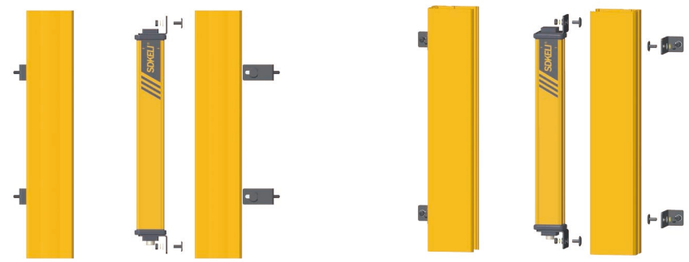


Plate Bracket Magnetic Mounting (BC)

Mount the emitter and receiver on the plate bracket via magnetic mounting, then attach the plate bracket to the machine worktable with strong magnets. A dedicated safety manager is required for this mounting method.

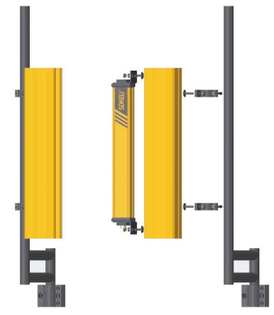
When the AOPD is vulnerable to collision during operation, a protective cover can be installed to protect the emitter and receiver. There are four mounting types available: Front/Side Mounted Protective Cover (FZC) Pipe Bracket with Protective Cover (GF) Dual Arm Bracket with Protective Cover (SF) Floor-mounted Protective Cover (FL)



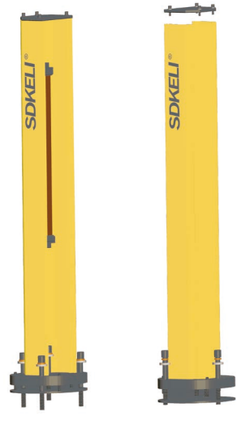
Front/Side Mounted Protective Cover (FZC)



Pipe Bracket with Protective Cover (GF)



Dual Arm Bracket with Protective Cover (SF)



Floor-mounted Protective Cover (FL)

KS06 Cascaded AOPD

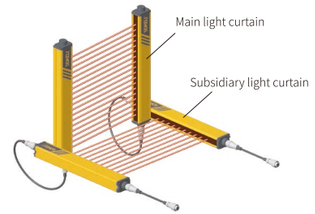
GB/T 19436.1/IEC 61496-1 (Safety Category 4)
GB/T 19436.2/IEC 61496-2 (Safety Category 4)

Overview

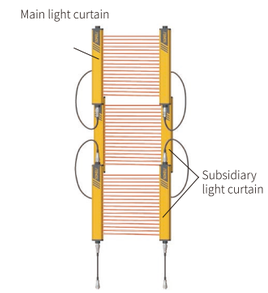
The KS06 cascade photoelectric protection device can connect four sets of light curtains in series, with a total of up to 288 light beams. It can also realize "serial setting" with increased protection height, "L-shaped setting" and "U-shaped setting" for multi faceted protection, simplifying installation and wiring space while saving costs for users.
The 4 connected light curtains can share a single controller, compatible with the CPS II, CPS III and CQ2 controller models.

Advantages

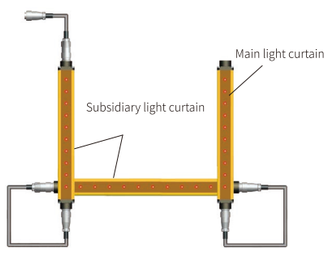
- Features a branch indicator function, visually displaying the on/off status of the light beam.
- Multiple light curtains share a single controller, simplifying wiring.



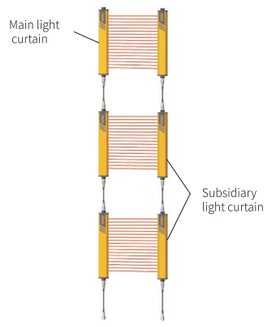
Compensation installation used for L setting



Series setting using compensation installation

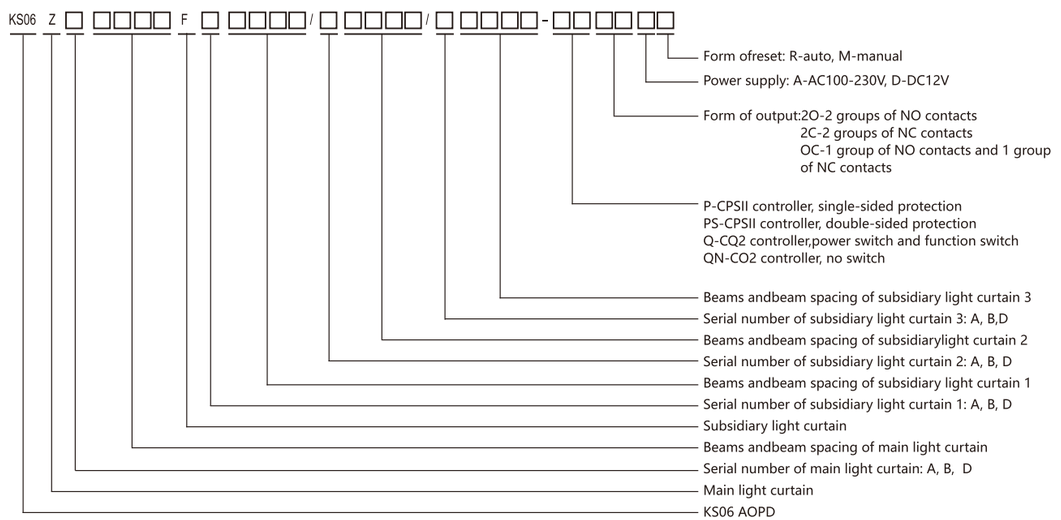


Compensation installation used for U setting



There is spacing between direct series light curtains

Specification Model



Note 1: For cascaded light curtains with 4 sets in cascade or total beam quantity over 144, a controller with 30 W power consumption must be selected.
Note 2: The complete machine specifications of cascaded photoelectric safety device do not include mounting brackets. Please specify them separately when placing orders.

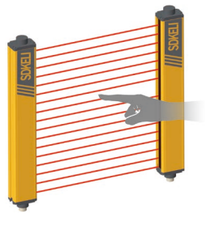
Cable Specifications

Name	Model	Single/Double End	Length
KS06 Transmission Cable - Double-ended, 2 m	CTK6X1S020C	Double-ended	2 m
KS06 Transmission Cable - Double-ended, 3 m	CTK6X1S030C	Double-ended	3 m
KS06 Transmission Cable - Double-ended, 4 m	CTK6X1S040C	Double-ended	4 m
KS06 Transmission Cable - Double-ended, 8 m	CTK6X1S080C	Double-ended	8 m
KS06 Transmission Cable - Double-ended, 10 m	CTK6X1S100C	Double-ended	10 m
KS06 Transmission Cable - Double-ended, 14 m	CTK6X1S140C	Double-ended	14 m
KS06 Transmission Cable - Double-ended, 17 m	CTK6X1S170C	Double-ended	17 m
KS06 Transmission Cable - Single-ended, 3 m	CTK6X1D030C	Single-ended	3 m
KS06 Transmission Cable - Single-ended, 8 m	CTK6X1D080C	Single-ended	8 m
KS06 Transmission Cable - Single-ended, 14 m	CTK6X1D140C	Single-ended	14 m

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 10							
Resolution	Model	Beam Quantity	H	Main light curtainJ1	Subsidiaryl ight curtainJ2	L	C
	KS06 () *1610	16	150	239	259	500	300
	KS06 () *2010	20	190	279	299	500	340
	KS06 () *2410	24	230	319	339	500	380
	KS06 () *2810	28	270	359	379	750	420
	KS06 () *3210	32	310	399	419	750	460
	KS06 () *3610	36	350	439	459	750	500
	KS06 () *4010	40	390	479	499	750	540
	KS06 () *4410	44	430	519	539	750	580
	KS06 () *4810	48	470	559	579	1000	620
	KS06 () *5210	52	510	599	619	1000	660
	KS06 () *5610	56	550	639	659	1000	700
	KS06 () *6010	60	590	679	699	1000	740
	KS06 () *6410	64	630	719	739	1000	780
	KS06 () *6810	68	670	759	779	1000	820
	KS06 () *7210	72	710	799	819	1000	860



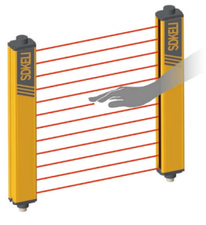
Resolution: 18 mm
(Finger Detection)

Note: () indicates the master/slave light curtain ID: Z stands for master light curtain, F1/F2/F3 stand for slave light curtain; * indicates the detection range series code: A: 0 ~ 6 m, B: 0 ~ 12 m, D: 0 ~ 20 m. The protective cover length for slave light curtains with 10 mm optical axis pitch shall be increased by 10mm.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 20							
Resolution	Model	Beam Quantity	H	Main light curtainJ1	Subsidiaryl ight curtainJ2	L	C
	KS06 () *0820	8	140	239	249	500	300
	KS06 () *1020	10	180	279	289	500	340
	KS06 () *1220	12	220	319	329	500	380
	KS06 () *1420	14	260	359	369	750	420
	KS06 () *1620	16	300	399	409	750	460
	KS06 () *1820	18	340	439	449	750	500
	KS06 () *2020	20	380	479	489	750	540
	KS06 () *2220	22	420	519	529	750	580
	KS06 () *2420	24	460	559	569	1000	620
	KS06 () *2620	26	500	599	609	1000	660
	KS06 () *2820	28	540	639	649	1000	700
	KS06 () *3020	30	580	679	689	1000	740
	KS06 () *3220	32	620	719	729	1000	780
	KS06 () *3420	34	660	759	769	1000	820
	KS06 () *3620	36	700	799	809	1000	860
	KS06 () *3820	38	740	839	849	1200	900
	KS06 () *4020	40	780	879	889	1200	940
	KS06 () *4220	42	820	919	929	1200	980
	KS06 () *4420	44	860	959	969	1200	1020
	KS06 () *4620	46	900	999	1009	1200	1060
	KS06 () *4820	48	940	1039	1049	1500	1100
	KS06 () *5020	50	980	1079	1089	1500	1140
	KS06 () *5220	52	1020	1119	1129	1500	1180
	KS06 () *5420	54	1060	1159	1169	1500	1220
	KS06 () *5620	56	1100	1199	1209	1500	1260
	KS06 () *5820	58	1140	1239	1249	1500	1300
	KS06 () *6020	60	1180	1279	1289	1500	1340
	KS06 () *6220	62	1220	1319	1329	1750	1380
	KS06 () *6420	64	1260	1359	1369	1750	1420
	KS06 () *6620	66	1300	1399	1409	1750	1460
	KS06 () *6820	68	1340	1439	1449	1750	1500
	KS06 () *7020	70	1380	1479	1489	1750	1540
	KS06 () *7220	72	1420	1519	1529	1750	1580



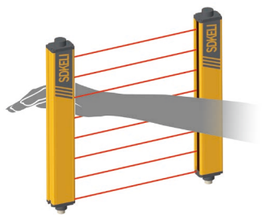
Resolution: 28 mm
(Palm Detection)

Note: () indicates the master/slave light curtain ID: Z stands for master light curtain, F1/F2/F3 stand for slave light curtain; * indicates the detection range series code: A: 0 ~ 6 m, B: 0 ~ 12 m, D: 0 ~ 20 m. The protective cover length for slave light curtains with 10 mm optical axis pitch shall be increased by 10mm.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 40							
Resolution	Model	Beam Quantity	H	Main light curtainJ1	Subsidiaryl ight curtainJ2	L	C
	KS06（）*0440	4	120	239	249	500	300
	KS06（）*0640	6	200	319	329	500	380
	KS06（）*0840	8	280	399	409	750	460
	KS06（）*1040	10	360	479	489	750	540
	KS06（）*1240	12	440	559	569	1000	620
	KS06（）*1440	14	520	639	649	1000	700
	KS06（）*1640	16	600	719	729	1000	780
	KS06（）*1840	18	680	799	809	1000	860
	KS06（）*2040	20	760	879	889	1200	940
	KS06（）*2240	22	840	959	969	1200	1020
	KS06（）*2440	24	920	1039	1049	1500	1100
	KS06（）*2640	26	1000	1119	1129	1500	1180
	KS06（）*2840	28	1080	1199	1209	1500	1260
	KS06（）*3040	30	1160	1279	1289	1500	1340
	KS06（）*3240	32	1240	1359	1369	1750	1420
	KS06（）*3440	34	1320	1439	1449	1750	1500
	KS06（）*3640	36	1400	1519	1529	1750	1580
	KS06（）*3840	38	1480	1599	1609	2000	1660
	KS06（）*4040	40	1560	1679	1689	2000	1740
	KS06（）*4240	42	1640	1759	1769	2000	1820
	KS06（）*4440	44	1720	1839	1849		1900
	KS06（）*4640	46	1800	1919	1929		1980
	KS06（）*4840	48	1880	1999	2009		2060
	KS06（）*5040	50	1960	2079	2089		2140
	KS06（）*5240	52	2040	2159	2169		2220
	KS06（）*5440	54	2120	2239	2249		2300
	KS06（）*5640	56	2200	2319	2329		2380
	KS06（）*5840	58	2280	2399	2409		2460
	KS06（）*6040	60	2360	2479	2489		2540
	KS06（）*6240	62	2440	2559	2569		2620
	KS06（）*6440	64	2520	2639	2649		2700
	KS06（）*6640	66	2600	2719	2729		2780
	KS06（）*6840	68	2680	2799	2809		2860



Resolution: 48 mm (Arm, Foot & Body Detection)

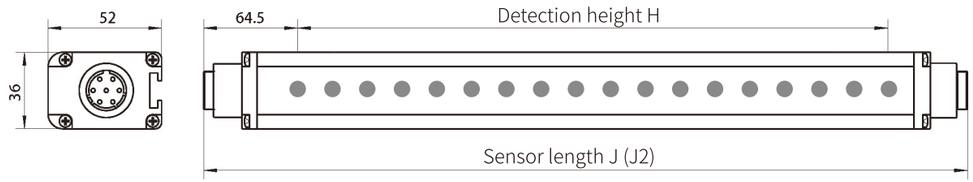
Note: () indicates the master/slave light curtain ID: Z stands for master light curtain, F1/F2/F3 stand for slave light curtain; * indicates the detection range series code: A: 0 ~ 6 m, B: 0 ~ 12 m, D: 0 ~ 20 m. The protective cover length for slave light curtains with 10 mm optical axis pitch shall be increased by 10mm.

Specification Table

Safety Level	Type 4 Cat. 4 PL e		
Executive Standards	GB/T 19436.1；GB/T19436.2；GB/T 4584；IEC 61496-1；IEC 61496-2		
Optical Characteristics			
Light Source	Infrared LED (Center Wavelength: 940 nm)		
Optical Axis Pitch	10 mm	20 mm	40 mm
Resolution	18 mm	28 mm	48 mm
Beam Quantity	16、20…72	8、10…72	4、6…68
Detection Range	Type A: 0 ~ 6 m; Type B: 0 ~ 12 m; Type D: 0 ~ 20 m		
Protective Height	Optical Axis Pitch × (Beam Quantity - 1)		
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m		
Environmental Characteristics			
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	
	Storage	-40°C～70°C	
Ambient Humidity	Operating	35% RH～85% RH	
	Storage	35% RH～95% RH	
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux	
	Fluorescent Light Source	3,000 lux	
	Solar Light Source	10,000 lux	
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584	
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011	
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis		
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis		
Protection level	IP65		
Dimensions	52×36×J1/J2mm(J: Length of Emitter/Receiver)		
Electrical Characteristics			
Power Supply Voltage	DC12V±10%		
Current Consumption	Emitter	⩽300mA	
	Receiver	⩽100mA	
Output Characteristics	Outputs square wave signal at 4 kHz when light path is unobstructed		
Matching Controllers	CPS II /CPSIII/CQ2		

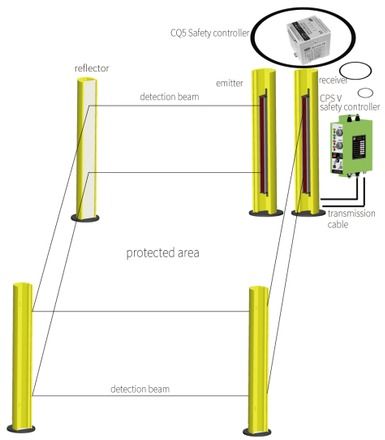
Dimensions

(unit：mm)



KS06Q Area AOPD

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



Overview

The KS06Q Area AOPD consists of three series: KS06QA, KS06QB and KS06QT. Among them, the KS06QT series adopts a specially customized light curtain that uses Class 1 laser as detection beam. The detection beam is emitted by the emitter, reflected by the reflector and then received by the receiver. The light path between the emitter, receiver and reflector forms the protected zone.

The KS06QA/KS06QB Area AOPD can be matched with either the CPS II Controller (mounted outside the user's electrical cabinet) or the CQ2 Controller (installed inside the user's electrical cabinet).

The KS06QT Area AOPD supports configuration with either the CPS V Controller (mounted outside the user's electrical cabinet) or the CQ5 Controller (installed inside the user's electrical cabinet). Both CPS V and CQ5 Controllers are equipped with an alignment switch to activate the alignment beam of KS06QT light curtain, facilitating on-site beam alignment adjustment. Both controller types can output two sets of relay contact signals to users.

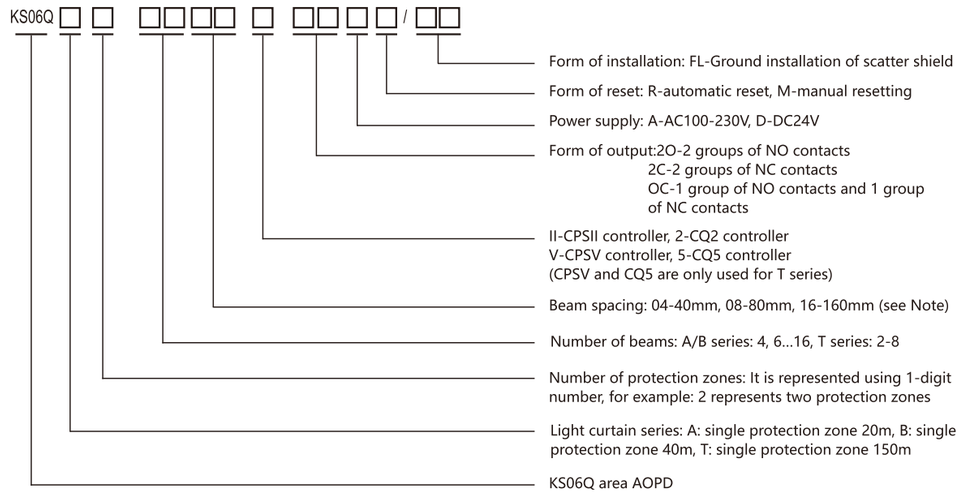
The controller supports two operation modes: automatic reset and manual reset. Manual reset mode is recommended when the photoelectric safety device is applied for area guarding.

The CPS II and CPS V Controllers are fitted with a test button for system self-test function verification. In addition, the function switches of CPS II and CPS V Controllers adopt a dual-lock design to eliminate potential safety hazards caused by misoperation or lock switch failure.

Advantages

- Long detection range, capable of single, dual, triple, and quad-zone protection.
- The T series uses Class 1 lasers, ensuring eye safety.
- Provides four-sided area protection, simplifying wiring and reducing costs.
- Strong resistance to electromagnetic and optical interference.

Specification Model



Note: The optical axis spacing of the T series is at least 200mm, and can be increased by 50mm in turn; the standard configuration of the optical axis spacing of the A/B series is 40mm, 80mm, 160mm, and 320mm.

Specification Table

KS06QA Series/KS06QB Series

Optical Axis Pitch 40					Optical Axis Pitch 80				
Beam Quantity	Model	H	J	L	Beam Quantity	Model	H	J	L
4	KS06Q*0404	120	239	400	4	KS06Q*0408	240	399	560
6	KS06Q*0604	200	319	480	6	KS06Q*0608	400	559	720
8	KS06Q*0804	280	399	560	8	KS06Q*0808	560	719	880
10	KS06Q*1004	360	479	640	10	KS06Q*1008	720	879	1040
12	KS06Q*1204	440	559	720	12	KS06Q*1208	880	1039	1200
14	KS06Q*1404	520	639	800	14	KS06Q*1408	1040	1199	1360
16	KS06Q*1604	600	719	880	16	KS06Q*1608	1200	1359	1520
Optical Axis Pitch 160					Optical Axis Pitch 320				
Beam Quantity	Model	H	J	L	Beam Quantity	Model	H	J	L
4	KS06Q*0416	480	639	800	3	KS06Q*0332	640	799	960
5	KS06Q*0516	640	799	960	4	KS06Q*0432	960	1119	1280
6	KS06Q*0616	800	959	1120	5	KS06Q*0532	1280	1439	1600
7	KS06Q*0716	960	1119	1280					
8	KS06Q*0816	1120	1279	1440					

Note: * in the model number indicates the light curtain series and the number of protection zones, refer to the complete machine model number for details.

The KS06QT Area AOPD has a minimum optical axis pitch of 200 mm with incremental steps of 50 mm, and supports 2 to 8 detection beams.

Specification Table

Safety Level	Type 4（GB/T 19436，IEC 61496）				
Executive Standards	GB/T 19436.1；GB/T 19436.2；GB/T 4584；IEC 61496-1；IEC 61496-2				
KS06Q Area AOPD					
Light Curtain Series	Infrared: KS06QA, KS06QB				Laser: KS06QT
Optical Axis Pitch	40mm	80mm	160mm	320mm	Minimum 200 mm, with incremental steps of 50 mm
Beam Quantity	4、6、8…16	4、6、8…16	4、5、6、7、8	3、4、5	2～8
Protective Range	KS06QA: Single zone: 20 m; Dual zones: 14 m; Triple zones: 10 m; Four zones: 8 m KS06QB: Single zone: 40 m; Dual zones: 30 m; Triple zones: 20 m; Four zones: 16 m				KS06QT: Single zone: 150m; Dual zones: 120 m; Triple zones: 80 m; Four zones: 60 m
Detection Height	Optical Axis Pitch × (Beam Quantity - 1)				
EAA	＜5°				
Environmental Characteristics					
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)			
	Storage	-40°C～70°C			
Ambient Humidity	Operating	35%RH～85%RH			
	Storage	35%RH～95%RH			
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux			
	Fluorescent Light Source	3,000 lux			
	Solar Light Source	10,000 lux			
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584			
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011			
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis				
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis				
Protection level	IP65				
Electrical Characteristics					
Power Supply Voltage	DC12V±10%				
Current Consumption	Emitter	≤300mA			
	Receiver	≤100mA			
Response Time	＜18 ms				
Output Characteristics	Outputs square wave signal at 4 kHz when light path is unobstructed				
Matching Controllers	CPS Ⅱ, CPS Ⅲ, CQ2, CSRMC				CPSV, CQ5

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

Controller Technical Specifications

Environmental Characteristics		
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)
	Storage	-40°C～70°C
Ambient Humidity	Operating	35%RH～85%RH
	Storage	35%RH～95%RH
Protection level	CPS V Controller: IP54	CQ5 Controller: IP20
Dimensions	CPS V Controller: 216 × 82 × 215 mm	CQ5 Controller: 90 × 90 × 105 mm
Electrical Characteristics		
Power Supply Voltage	AC100V～230V±15%，50/60Hz ； DC24V±10%	
Overall Power Consumption	＜15W	
Output Type	Relay contact output	
Output Contact Rating	5 A, AC 250 V/DC 30 V (Resistive load)	
Response Time	≤ 20ms	
Insulation Resistance	＞100MΩ	
Dielectric Strength	no breakdown or flashover within 60 s	
Relay Life	≥ 1,000,000 cycles (Electrical service life)	

Specification Model

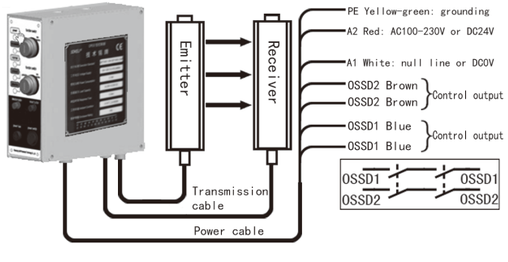
CPSV -□ □ □□ - □ □

- Form of reset: R-auto, M-manual
- Power supply: A-AC100-230V (omissible), 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
- Light curtain form: D-correlation
- Protection form: D-single-sided protection
- CPSV controller

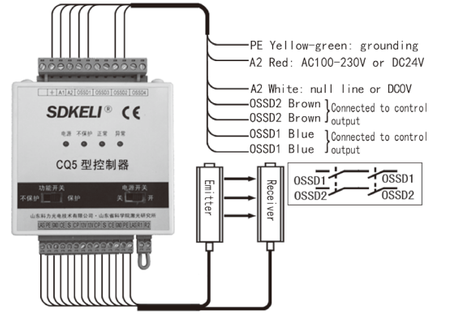
CQ5 - □ □□ - □ □

- Form of reset: R-auto, M-manual
- Power supply: A-AC100-230V (omissible), 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
- Number of switches: S-with power switch and function switch, N-without switch
- CQ5 controller

Typical Wiring Diagram



CPS Ⅴ



CQ5

Product Series

Product Name		CPS Ⅱ Controller	CPS Ⅲ Controller	CQ2 Controller
Appearance				
Environmental Characteristics				
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)		
	Storage	-40°C～70°C		
Ambient Humidity	Operating	35% RH～85% RH		
	Storage	35% RH～95% RH		
Protection level		IP54		IP20
Dimensions		216×82×215 mm		90×90×105 mm
Electrical Characteristics				
Power Supply Voltage		AC 100 V～230 V ± 15%, 50/60 Hz; DC 24 V ± 10% (for cascade)		
Overall Power Consumption		＜15 W	⩽ 15 W (⩽ 30 W with cascaded light curtains)	＜15 W
Output Contact Rating		5 A, AC 250 V/DC 30 V (Resistive load)		
Response Time		＜18 ms	⩽20 ms	＜18 ms
Insulation Resistance		＞100 MΩ		
Dielectric Strength		AC 1500 V, no breakdown or flashover within 60 s		
Relay Life		⩾ 1,000,000 cycles (Electrical service life)		
Output Type	OSSD1/OSSD2	2 channels of relay normally open (NO) contact outputs		
	OSSD3/OSSD4	2 channels of relay normally closed (NC) contact outputs		
E-Stop Button Auxiliary Output		×	E-Stop button auxiliary output: safety relay contact output, 2 channels of NO signals	×
Safety Gate Auxiliary Output		×	Safety gate auxiliary output: safety relay contact output, 1 channel of NO signal	×
Safety Light Curtain Auxiliary Output		×	Safety relay contact output, 2 channels of signals (1 NO + 1 NC)	×
Compatible Light Curtains		KS06 AOPD/KS06 cascaded AOPD		

Overview



CPS Ⅱ Controller

The CPS Ⅱ Controller is installed outside the machine tool electrical cabinet, compatible with KS06 AOPD or KS06 cascaded AOPD. It provides 2 sets of relay passive contact outputs, with 2 sets of normally open (NO) outputs as standard configuration.

The CPS Ⅱ Controller is equipped with a test button to check the self-diagnosis function of the system.

The function switch of the CPS Ⅱ Controller adopts a double-lock design to avoid potential safety hazards caused by misoperation or lock switch failure. The controller supports two protection modes: single-sided protection and double-sided protection, and can provide two operating modes: automatic reset and manual reset according to user requirements.



CPS Ⅲ Controller

The CPS Ⅲ Controller is installed outside the machine tool electrical cabinet, compatible with KS06 AOPD or KS06 cascaded AOPD, and monitors the status of external emergency stop button and safety gate switch signals. The three input signals correspond to independent safety relay passive contact output signals respectively, and the safety relay passive contact signal is output only when all three conditions are met.

The CPS Ⅲ Controller identifies the safety stroke signal and selects safety mode or safety Ⅰ working mode. In safety stroke mode, the light curtain realizes full-range protection; in safety Ⅰ mode, the cam switch signal shields the light curtain signal to realize no protection during return stroke.

The CPS Ⅲ Controller has no function switch, realizing power-off protection and power-on forced protection, avoiding potential safety hazards caused by not using the photoelectric protection device.



CQ2 Controller

The CQ2 Controller is installed inside the machine tool electrical cabinet, compatible with KS06 AOPD or KS06 cascaded AOPD. It provides 2 sets of relay passive contact outputs, with 2 normally open (NO) outputs as standard configuration, and can provide 2 operating modes: automatic reset and manual reset according to user requirements.

Specification Model

CPSII -□□ □□-□□

- Reset Mode: R – Automatic Reset, M – Manual Reset
- Operating Voltage: A – AC 100 ~ 230 V, D – DC 24 V
- Output Type:
  2O: 2 sets of relay normally open contact outputs
  2C: 2 sets of relay normally closed contact outputs
  OC: 1 set normally open + 1 set normally closed relay contact outputs
- Light Curtain Type: D – Through-beam type
- Protection Type: D – Single-sided protection, S – Double-sided protection
- CPS II Controller

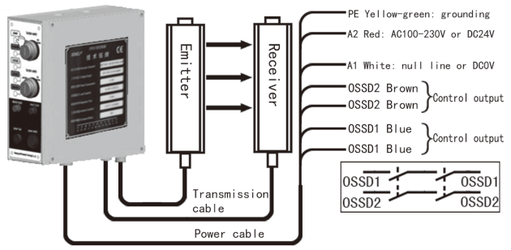
CQ2 -□ □□-□□

- Reset Mode: R – Automatic Reset, M – Manual Reset
- Operating Voltage: A – AC 100 ~ 230 V, D – DC 24 V
- Output Type:
  2O: 2 sets of relay normally open contact outputs
  2C: 2 sets of relay normally closed contact outputs
  OC: 1 set normally open + 1 set normally closed relay contact outputs
- Switch Configuration: S – Equipped with power switch and function switch; N – Without switches
- CQ2 Controller

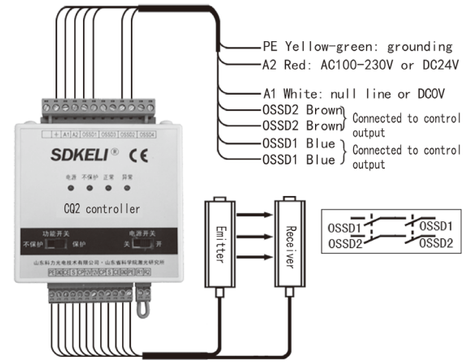
CPSIII -□□ □□-□□

- Reset Mode: R – Automatic Reset, M – Manual Reset
- Operating Voltage: A – AC 100 ~ 230 V, D – DC 24 V
- Output Type:1O: 1 set of relay normally open contact outputs
- Light Curtain Type: D - Through-beam type
- Protection Type: D - Single-sided protection
- CPS III Controller

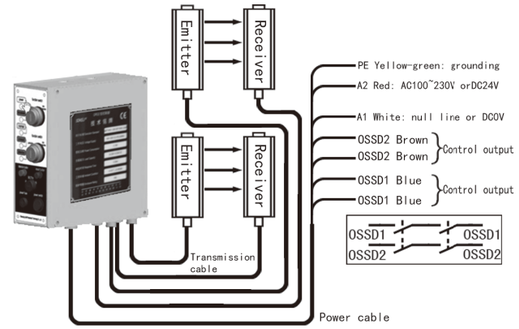
Typical Wiring Diagram



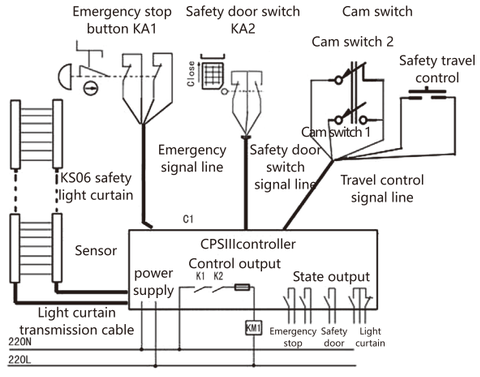
Single-side correlation type



CQ2



Double-side correlation type



Wiring example

CPS III

KS06 Safety Light Curtain

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



Overview

The KS06G safety light curtain integrates the controller function into the sensor itself. It is a photoelectric protection device specially designed for equipment that has undergone risk assessment and does not require a separate controller, and needs level signal control (such as equipment controlled by PLC or computer). It can output two sets of safe PNP or NPN signals.

Specification Model

KS06 □ □□□□ G I -□ □ □ / □□

- Mounting Bracket
- T-Transistor ON when light transmitted
Z-Transistor ON when light blocked
- Output Type: N – NPN transistor output;
P – PNP transistor output
- Number of Output Switches: 2 – Dual-channel output
- I – Zone segmentation indicator (omitted if no zone segmentation indicator)
- G – Safety Light Curtain
- Optical Axis Pitch: 10 - 10 mm, 20 - 20 mm, 40 - 40 mm
- Beam Quantity: 04, 06, 08 72
- Detection Range: A – 0 ~ 6 m, B – 0 ~ 12 m;
D – 0 ~ 20 m, E – 0 ~ 40 m (See Note 1)
- KS06G Safety Light Curtain

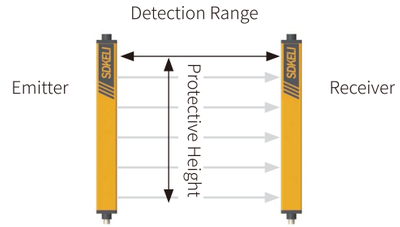
Note 1: Model E light curtain beam quantity: 04, 06, 08 ····· 40; optical axis pitch is only 40 mm. Detection range: 0 ~ 40 m for 4 to 16 beams, 0 ~ 30 m for 18 to 40 beams.

Selection Guide for Safety Light Curtains

Follow the steps below to select the appropriate KS06G safety light curtain for your application.

1 Step Select Detection Range → 2 Step Select Protective Height → 3 Step Select Resolution → 4 Step Output Characteristics → 5 Step Select Mounting Method → 6 Step Select Controller

1 Step / 2 Step



3 Step



Resolution: 18 mm (Finger Detection)

Resolution: 28 mm (Palm Detection)

Resolution: 48 mm (Arm, Foot & Body Detection)

4 Step

NPN Output PNP Output

5 Step



Integrated Front/Side Mounting (ZC)

T-slot Mounting (TC)

6 Step



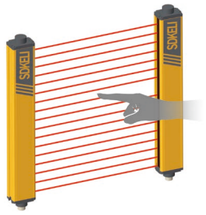
KS06 Transmission Cable - Double-ended

KS06 Transmission Cable - Single-ended

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 10									
Resolution	Model	Beam Quantity	H	J	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
	KS06*1610G2#T	16	150	239	500	300	311	7.76E-09	59
	KS06*2010G2#T	20	190	279	500	340	292	7.76E-09	56
	KS06*2410G2#T	24	230	319	500	380	275	8.67E-09	54
	KS06*2810G2#T	28	270	359	750	420	260	8.67E-09	52
	KS06*3210G2#T	32	310	399	750	460	246	9.81E-09	49
	KS06*3610G2#T	36	350	439	750	500	234	9.81E-09	48
	KS06*4010G2#T	40	390	479	750	540	223	1.08E-08	46
	KS06*4410G2#T	44	430	519	750	580	213	1.08E-08	44
	KS06*4810G2#T	48	470	559	1000	620	204	1.19E-08	43
	KS06*5210G2#T	52	510	599	1000	660	195	1.19E-08	41
	KS06*5610G2#T	56	550	639	1000	700	188	1.33E-08	40
	KS06*6010G2#T	60	590	679	1000	740	180	1.33E-08	39
	KS06*6410G2#T	64	630	719	1000	780	174	1.33E-08	38
	KS06*6810G2#T	68	670	759	1000	820	168	1.50E-08	36
	KS06*7210G2#T	72	710	799	1000	860	162	1.50E-08	35



Resolution: 18 mm (Finger Detection)

Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 20									
Resolution	Model	Beam Quantity	H	J	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
	KS06*0820G2#T	8	140	239	500	300	358	6.44E-09	65
	KS06*1020G2#T	10	180	279	500	340	345	7.04E-09	63
	KS06*1220G2#T	12	220	319	500	380	333	7.04E-09	62
	KS06*1420G2#T	14	260	359	750	420	321	7.04E-09	60
	KS06*1620G2#T	16	300	399	750	460	311	7.76E-09	59
	KS06*1820G2#T	18	340	439	750	500	301	7.76E-09	57
	KS06*2020G2#T	20	380	479	750	540	292	7.76E-09	56
	KS06*2220G2#T	22	420	519	750	580	283	8.67E-09	55
	KS06*2420G2#T	24	460	559	1000	620	275	8.67E-09	54
	KS06*2620G2#T	26	500	599	1000	660	267	8.67E-09	53
	KS06*2820G2#T	28	540	639	1000	700	260	8.67E-09	52
	KS06*3020G2#T	30	580	679	1000	740	253	9.81E-09	50
	KS06*3220G2#T	32	620	719	1000	780	246	9.81E-09	49
	KS06*3420G2#T	34	660	759	1000	820	240	9.81E-09	49
	KS06*3620G2#T	36	700	799	1000	860	234	9.81E-09	48
	KS06*3820G2#T	38	740	839	1200	900	228	1.08E-08	47
	KS06*4020G2#T	40	780	879	1200	940	223	1.08E-08	46
	KS06*4220G2#T	42	820	919	1200	980	218	1.08E-08	45
	KS06*4420G2#T	44	860	959	1200	1020	213	1.08E-08	44
	KS06*4620G2#T	46	900	999	1200	1060	208	1.19E-08	43
	KS06*4820G2#T	48	940	1039	1500	1100	204	1.19E-08	43
	KS06*5020G2#T	50	980	1079	1500	1140	199	1.19E-08	42
	KS06*5220G2#T	52	1020	1119	1500	1180	195	1.19E-08	41
	KS06*5420G2#T	54	1060	1159	1500	1220	191	1.19E-08	41
	KS06*5620G2#T	56	1100	1199	1500	1260	188	1.33E-08	40
	KS06*5820G2#T	58	1140	1239	1500	1300	184	1.33E-08	39
	KS06*6020G2#T	60	1180	1279	1500	1340	180	1.33E-08	39
	KS06*6220G2#T	62	1220	1319	1750	1380	177	1.33E-08	38
	KS06*6420G2#T	64	1260	1359	1750	1420	174	1.33E-08	38
	KS06*6620G2#T	66	1300	1399	1750	1460	171	1.33E-08	37
	KS06*6820G2#T	68	1340	1439	1750	1500	168	1.50E-08	36
	KS06*7020G2#T	70	1380	1479	1750	1540	165	1.50E-08	36
	KS06*7220G2#T	72	1420	1519	1750	1580	162	1.50E-08	35



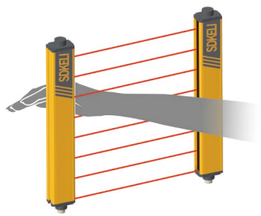
Resolution: 28 mm (Palm Detection)

Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 40									
Resolution	Model	Beam Quantity	H	J	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
	KS06*0440G2#T	4	120	239	500	300	387	5.94E-09	69
	KS06*0640G2#T	6	200	319	500	380	372	6.44E-09	67
	KS06*0840G2#T	8	280	399	750	460	358	6.44E-09	65
	KS06*1040G2#T	10	360	479	750	540	345	7.04E-09	63
	KS06*1240G2#T	12	440	559	1000	620	333	7.04E-09	62
	KS06*1440G2#T	14	520	639	1000	700	321	7.04E-09	60
	KS06*1640G2#T	16	600	719	1000	780	311	7.76E-09	59
	KS06*1840G2#T	18	680	799	1000	860	301	7.76E-09	57
	KS06*2040G2#T	20	760	879	1200	940	292	7.76E-09	56
	KS06*2240G2#T	22	840	959	1200	1020	283	8.67E-09	55
	KS06*2440G2#T	24	920	1039	1500	1100	275	8.67E-09	54
	KS06*2640G2#T	26	1000	1119	1500	1180	267	8.67E-09	53
	KS06*2840G2#T	28	1080	1199	1500	1260	260	8.67E-09	52
	KS06*3040G2#T	30	1160	1279	1500	1340	253	9.81E-09	50
	KS06*3240G2#T	32	1240	1359	1750	1420	246	9.81E-09	49
	KS06*3440G2#T	34	1320	1439	1750	1500	240	9.81E-09	49
	KS06*3640G2#T	36	1400	1519	1750	1580	234	9.81E-09	48
	KS06*3840G2#T	38	1480	1599	2000	1660	228	1.08E-08	47
	KS06*4040G2#T	40	1560	1679	2000	1740	223	1.08E-08	46
	KS06*4240G2#T	42	1640	1759	2000	1820	218	1.08E-08	45
	KS06*4440G2#T	44	1720	1839		1900	213	1.08E-08	44
	KS06*4640G2#T	46	1800	1919		1980	208	1.19E-08	43
	KS06*4840G2#T	48	1880	1999		2060	204	1.19E-08	43
	KS06*5040G2#T	50	1960	2079		2140	199	1.19E-08	42
	KS06*5240G2#T	52	2040	2159		2220	195	1.19E-08	41
	KS06*5440G2#T	54	2120	2239		2300	191	1.19E-08	41
	KS06*5640G2#T	56	2200	2319		2380	188	1.33E-08	40
	KS06*5840G2#T	58	2280	2399		2460	184	1.33E-08	39
	KS06*6040G2#T	60	2360	2479		2540	180	1.33E-08	39
	KS06*6240G2#T	62	2440	2559		2620	177	1.33E-08	38
	KS06*6440G2#T	64	2520	2639		2700	174	1.33E-08	38
	KS06*6640G2#T	66	2600	2719		2780	171	1.33E-08	37
	KS06*6840G2#T	68	2680	2799		2860	168	1.50E-08	36
	KS06*7040G2#T	70	2760	2879		2940	165	1.50E-08	36
	KS06*7240G2#T	72	2840	2959			162	1.50E-08	35



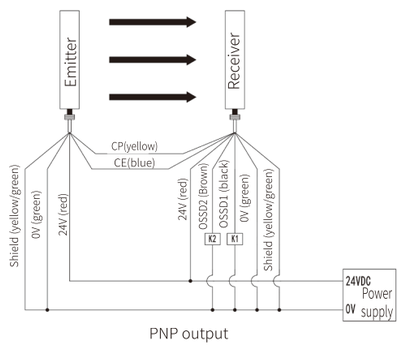
Resolution: 48 mm (Arm, Foot & Body Detection)

Note: The symbol * in the model code stands for detection range series code. A: 0 ~ 6 m; B: 0 ~ 12 m; D: 0 ~ 20 m; E: 0 ~ 40 m (4 ~ 16 beams), 0 ~ 30 m (for 18 ~ 40 beams); Only the model codes marked with yellow background are available for Series E.

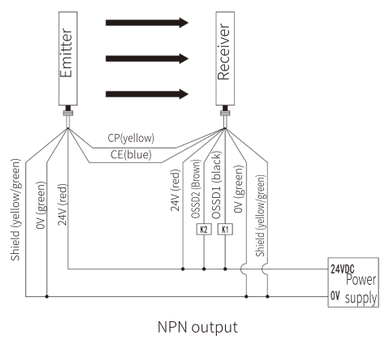
Technical Specifications

Executive Standards	GB/T 19436.1；GB/T 19436.2；GB/T 4584；IEC 61496-1；IEC 61496-2				
Safety Category					
Safety Level	Type 4 Cat. 4 PL e				
DCavg	99%				
CCF	100				
$MTTF_D$ /PFH_D	(Refer to KS06G specification table)				
Optical Characteristics					
Light Source	Infrared LED (Center Wavelength: 940 nm)				
Optical Axis Pitch	10mm	20mm	40mm		
Resolution	18mm	28mm	48mm		
Beam Quantity	16、20、24 …72	8、10、12 …72	4、6、8 …72	4、6、8 …16	18、20、22 …40
Detection Range	Type A: 0 ~ 6 m; Type B: 0 ~ 12 m; Type D: 0 ~ 20 m			Type E: 0 ~ 40 m	Type E: 0 ~ 30 m
Protective Height	Optical Axis Pitch × (Beam Quantity - 1)				
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m				
Environmental Characteristics					
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)			
	Storage	-40°C～70°C			
Ambient Humidity	Operating	35% RH～85% RH			
	Storage	35% RH～95% RH			
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux			
	Fluorescent Light Source	3,000 lux			
	Solar Light Source	10,000 lux			
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584			
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011			
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis				
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis				
Protection level	IP65				
Dimensions	52×36×Jmm (J: Length of Emitter/Receiver)				
Electrical Characteristics					
Power Supply Voltage	DC24V±10%				
Current Consumption	Emitter	⩽300mA			
	Receiver	⩽100mA (No load)			
Response Time	＜18ms				
Output Characteristics	NPN Output	NPN transistor outputs × 2 (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the influence of excessively long wires)			
	PNP Output	PNP transistor outputs × 2 (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the influence of excessively long wires)			
Matching Controllers	No matching controllers; or equipped with CSRMB module to output relay passive contact signals				

Typical Wiring Diagram



PNP output



NPN output

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

KS06 Cascaded Safety Light Curtain

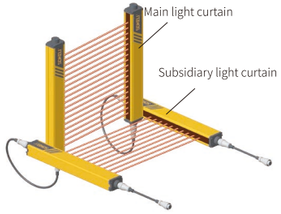
GB/T 19436.1/IEC 61496-1 (Safety Category 4)

GB/T 19436.2/IEC 61496-2 (Safety Category 4)

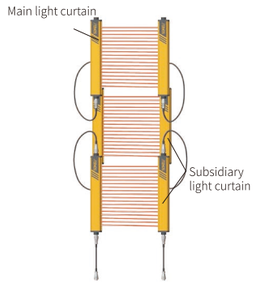
Overview

The KS06G cascaded safety light curtain supports series connection of up to 4 sets of light curtains, with a maximum total of 288 beams. It also enables "serial setting" for increased detection height, "L-shaped setting" and "U-shaped setting" for multi-sided protection, simplifying installation and wiring space while saving costs for users.

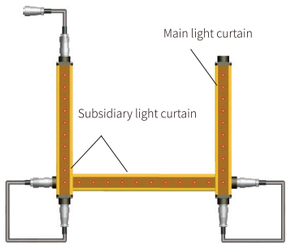
If, after risk assessment, a separate controller is not required and level signal control is needed, the KS06G cascaded safety light curtain can be used, which integrates the controller function into the sensor itself and directly outputs two sets of safe PNP or NPN signals.



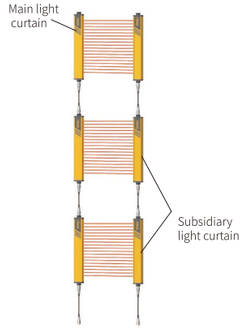
Compensation installation used for L setting



Series setting using compensation installation

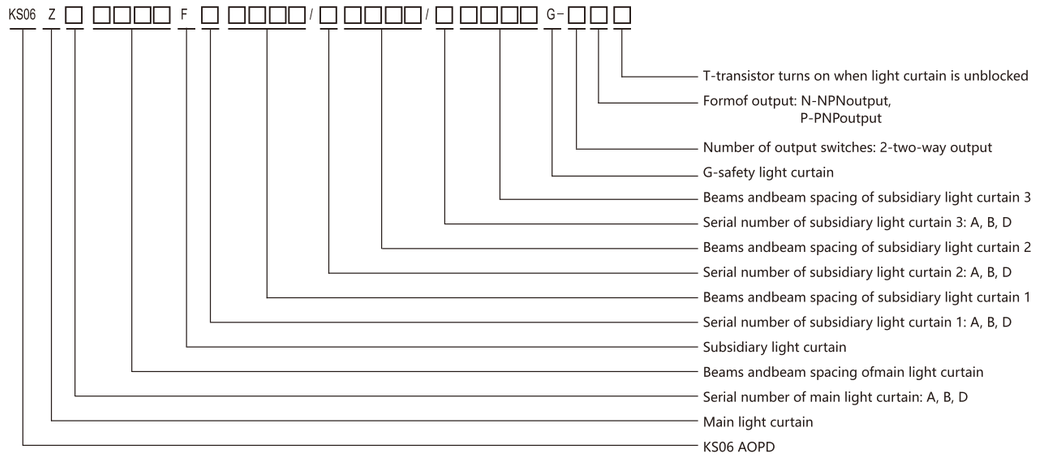


Compensation installation used for U setting



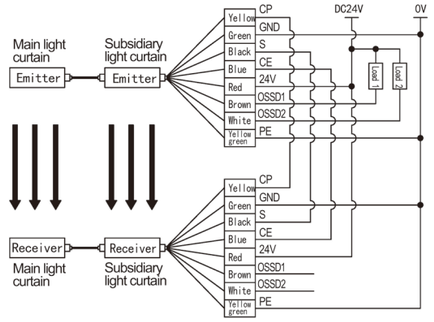
There is spacing between direct series light curtains

Specification Model

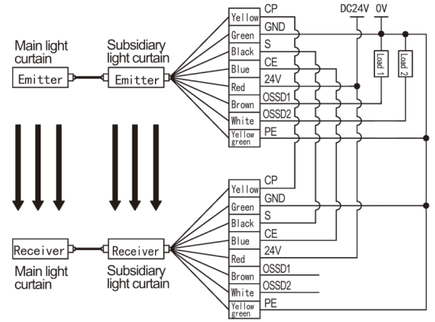


Note: Please specify the mounting brackets of safety light curtain when ordering.

Typical Wiring Diagram



NPN output



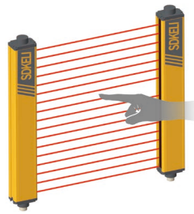
PNP output

Note 1: K1, K2: Relays or other devices controlling hazardous parts of the machine

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 10										
Resolution	Model	Beam Quantity	H	Master Light Curtain J1	Slave Light Curtain J2	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
	KS06 () *1610G2#T	16	150	239	259	500	300	311	7.76E-09	59
	KS06 () *2010G2#T	20	190	279	299	500	340	292	7.76E-09	56
	KS06 () *2410G2#T	24	230	319	339	500	380	275	8.67E-09	54
	KS06 () *2810G2#T	28	270	359	379	750	420	260	8.67E-09	52
	KS06 () *3210G2#T	32	310	399	419	750	460	246	9.81E-09	49
	KS06 () *3610G2#T	36	350	439	459	750	500	234	9.81E-09	48
	KS06 () *4010G2#T	40	390	479	499	750	540	223	1.08E-08	46
	KS06 () *4410G2#T	44	430	519	539	750	580	213	1.08E-08	44
	KS06 () *4810G2#T	48	470	559	579	1000	620	204	1.19E-08	43
	KS06 () *5210G2#T	52	510	599	619	1000	660	195	1.19E-08	41
	KS06 () *5610G2#T	56	550	639	659	1000	700	188	1.33E-08	40
	KS06 () *6010G2#T	60	590	679	699	1000	740	180	1.33E-08	39
	KS06 () *6410G2#T	64	630	719	739	1000	780	174	1.33E-08	38
	KS06 () *6810G2#T	68	670	759	779	1000	820	168	1.50E-08	36
	KS06 () *7210G2#T	72	710	799	819	1000	860	162	1.50E-08	35



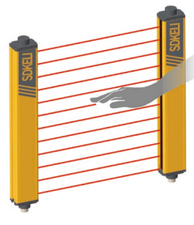
Resolution: 18 mm (Finger Detection)

Note: () represent the serial number of Master/Slave light curtain; Z stands for Master light curtain, F1/F2/F3 stand for serial numbers of Slave light curtains; * indicates the detection distance series: Series A: 0 ~ 6 m, Series B: 0 ~ 12 m, Series D: 0 ~ 20 m; # indicates the output type: P stands for PNP output, N stands for NPN output.
For slave light curtains with 10mm optical axis pitch, the protective cover length shall be increased by 10mm.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 20										
Resolution	Model	Beam Quantity	H	Master Light Curtain J1	Slave Light Curtain J2	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
	KS06 () *0820G2#T	8	140	239	249	500	300	358	6.44E-09	65
	KS06 () *1020G2#T	10	180	279	289	500	340	345	7.04E-09	63
	KS06 () *1220G2#T	12	220	319	329	500	380	333	7.04E-09	62
	KS06 () *1420G2#T	14	260	359	369	750	420	321	7.04E-09	60
	KS06 () *1620G2#T	16	300	399	409	750	460	311	7.76E-09	59
	KS06 () *1820G2#T	18	340	439	449	750	500	301	7.76E-09	57
	KS06 () *2020G2#T	20	380	479	489	750	540	292	7.76E-09	56
	KS06 () *2220G2#T	22	420	519	529	750	580	283	8.67E-09	55
	KS06 () *2420G2#T	24	460	559	569	1000	620	275	8.67E-09	54
	KS06 () *2620G2#T	26	500	599	609	1000	660	267	8.67E-09	53
	KS06 () *2820G2#T	28	540	639	649	1000	700	260	8.67E-09	52
	KS06 () *3020G2#T	30	580	679	689	1000	740	253	9.81E-09	50
	KS06 () *3220G2#T	32	620	719	729	1000	780	246	9.81E-09	49
	KS06 () *3420G2#T	34	660	759	769	1000	820	240	9.81E-09	49
	KS06 () *3620G2#T	36	700	799	809	1000	860	234	9.81E-09	48
	KS06 () *3820G2#T	38	740	839	849	1200	900	228	1.08E-08	47
	KS06 () *4020G2#T	40	780	879	889	1200	940	223	1.08E-08	46
	KS06 () *4220G2#T	42	820	919	929	1200	980	218	1.08E-08	45
	KS06 () *4420G2#T	44	860	959	969	1200	1020	213	1.08E-08	44
	KS06 () *4620G2#T	46	900	999	1009	1200	1060	208	1.19E-08	43
	KS06 () *4820G2#T	48	940	1039	1049	1500	1100	204	1.19E-08	43
	KS06 () *5020G2#T	50	980	1079	1089	1500	1140	199	1.19E-08	42
	KS06 () *5220G2#T	52	1020	1119	1129	1500	1180	195	1.19E-08	41
	KS06 () *5420G2#T	54	1060	1159	1169	1500	1220	191	1.19E-08	41
	KS06 () *5620G2#T	56	1100	1199	1209	1500	1260	188	1.33E-08	40
	KS06 () *5820G2#T	58	1140	1239	1249	1500	1300	184	1.33E-08	39
	KS06 () *6020G2#T	60	1180	1279	1289	1500	1340	180	1.33E-08	39
	KS06 () *6220G2#T	62	1220	1319	1329	1750	1380	177	1.33E-08	38
	KS06 () *6420G2#T	64	1260	1359	1369	1750	1420	174	1.33E-08	38
	KS06 () *6620G2#T	66	1300	1399	1409	1750	1460	171	1.33E-08	37
	KS06 () *6820G2#T	68	1340	1439	1449	1750	1500	168	1.50E-08	36
	KS06 () *7020G2#T	70	1380	1479	1489	1750	1540	165	1.50E-08	36
	KS06 () *7220G2#T	72	1420	1519	1529	1750	1580	162	1.50E-08	35



Resolution: 28 mm (Palm Detection)

Note: () represent the serial number of Master/Slave light curtain; Z stands for Master light curtain, F1/F2/F3 stand for serial numbers of Slave light curtains; * indicates the detection distance series: Series A: 0 ~ 6 m, Series B: 0 ~ 12 m, Series D: 0 ~ 20 m; # indicates the output type: P stands for PNP output, N stands for NPN output.
For slave light curtains with 10mm optical axis pitch, the protective cover length shall be increased by 10mm.

Specification Table

H: Protective Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

Optical Axis Pitch 40										
Resolution	Model	Beam Quantity	H	Master Light Curtain J1	Slave Light Curtain J2	L	C	$MTTF_D$ (Year)	PFH_D (1/h)	MTTF (Year)
Resolution: 48 mm (Arm, Foot & Body Detection)	KS06（）*0440G2#T	4	120	239	249	500	300	387	5.94E-09	69
	KS06（）*0640G2#T	6	200	319	329	500	380	372	6.44E-09	67
	KS06（）*0840G2#T	8	280	399	409	750	460	358	6.44E-09	65
	KS06（）*1040G2#T	10	360	479	489	750	540	345	7.04E-09	63
	KS06（）*1240G2#T	12	440	559	569	1000	620	333	7.04E-09	62
	KS06（）*1440G2#T	14	520	639	649	1000	700	321	7.04E-09	60
	KS06（）*1640G2#T	16	600	719	729	1000	780	311	7.76E-09	59
	KS06（）*1840G2#T	18	680	799	809	1000	860	301	7.76E-09	57
	KS06（）*2040G2#T	20	760	879	889	1200	940	292	7.76E-09	56
	KS06（）*2240G2#T	22	840	959	969	1200	1020	283	8.67E-09	55
	KS06（）*2440G2#T	24	920	1039	1049	1500	1100	275	8.67E-09	54
	KS06（）*2640G2#T	26	1000	1119	1129	1500	1180	267	8.67E-09	53
	KS06（）*2840G2#T	28	1080	1199	1209	1500	1260	260	8.67E-09	52
	KS06（）*3040G2#T	30	1160	1279	1289	1500	1340	253	9.81E-09	50
	KS06（）*3240G2#T	32	1240	1359	1369	1750	1420	246	9.81E-09	49
	KS06（）*3440G2#T	34	1320	1439	1449	1750	1500	240	9.81E-09	49
	KS06（）*3640G2#T	36	1400	1519	1529	1750	1580	234	9.81E-09	48
	KS06（）*3840G2#T	38	1480	1599	1609	2000	1660	228	1.08E-08	47
	KS06（）*4040G2#T	40	1560	1679	1689	2000	1740	223	1.08E-08	46
	KS06（）*4240G2#T	42	1640	1759	1769	2000	1820	218	1.08E-08	45
	KS06（）*4440G2#T	44	1720	1839	1849		1900	213	1.08E-08	44
	KS06（）*4640G2#T	46	1800	1919	1929		1980	208	1.19E-08	43
	KS06（）*4840G2#T	48	1880	1999	2009		2060	204	1.19E-08	43
	KS06（）*5040G2#T	50	1960	2079	2089		2140	199	1.19E-08	42
	KS06（）*5240G2#T	52	2040	2159	2169		2220	195	1.19E-08	41
	KS06（）*5440G2#T	54	2120	2239	2249		2300	191	1.19E-08	41
	KS06（）*5640G2#T	56	2200	2319	2329		2380	188	1.33E-08	40
	KS06（）*5840G2#T	58	2280	2399	2409		2460	184	1.33E-08	39
	KS06（）*6040G2#T	60	2360	2479	2489		2540	180	1.33E-08	39
	KS06（）*6240G2#T	62	2440	2559	2569		2620	177	1.33E-08	38
	KS06（）*6440G2#T	64	2520	2639	2649		2700	174	1.33E-08	38
	KS06（）*6640G2#T	66	2600	2719	2729		2780	171	1.33E-08	37
	KS06（）*6840G2#T	68	2680	2799	2809		2860	168	1.50E-08	36

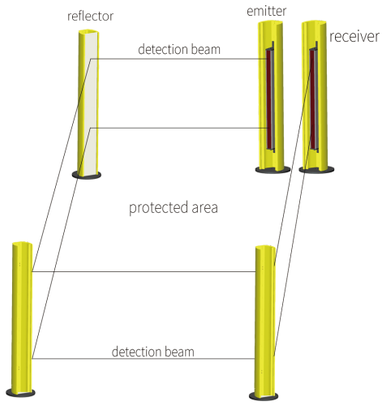
Note: () represent the serial number of Master/Slave light curtain; Z stands for Master light curtain, F1/F2/F3 stand for serial numbers of Slave light curtains; * indicates the detection distance series: Series A: 0 ~ 6 m, Series B: 0 ~ 12 m, Series D: 0 ~ 20 m; # indicates the output type: P stands for PNP output, N stands for NPN output.
For slave light curtains with 10mm optical axis pitch, the protective cover length shall be increased by 10mm.

Technical Specifications

Safety Level	Type 4 Cat. 4 PL e		
Executive Standards	GB/T 19436.1；GB/T 19436.2；GB/T 4584；IEC 61496-1；IEC 61496-2；		
Optical Characteristics			
Light Source	Infrared LED (Center Wavelength: 940 nm)		
Optical Axis Pitch	10 mm	20 mm	40 mm
Resolution	18 mm	28 mm	48 mm
Beam Quantity	16、20…72	8、10…72	4、6…68
Detection Range	Type A: 0 ~ 6 m; Type B: 0 ~ 12 m; Type D: 0 ~ 20 m		
Protective Height	Optical Axis Pitch × (Beam Quantity - 1)		
EAA	Complies with IEC 61496-2; EAA < 2.5° at range > 3 m		
Environmental Characteristics			
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)	
	Storage	-40 °C ~ 70 °C	
Ambient Humidity	Operating	35% RH～85% RH	
	Storage	35% RH～95% RH	
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux	
	Fluorescent Light Source	3,000 lux	
	Solar Light Source	10,000 lux	
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584	
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011	
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis		
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis		
Protection level	IP 65		
Dimensions	52×36×J1/J2mm (J1 is the length of the master light curtain emitter/receiver; J2 is the length of the slave light curtain emitter/receiver.)		
Electrical Characteristics			
Power Supply Voltage	DC24V±10%		
Current Consumption	Emitter	⩽300 mA	
	Receiver	⩽100 mA	
Output Characteristics	NPN Output	2 x NPN transistor outputs (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the impact of extended wiring)	
	PNP Output	2 x PNP transistor outputs (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the impact of extended wiring)	

KS06Q Area Protection Safety Light Curtain

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



Overview

The KS06Q area protection safety light curtain consists of two series KS06QA series and KS06QB series. The KS06Q area safety light curtain does not require a separate controller and can provide two sets of PNP or NPN transistor output signals.

Advantages

- Long detection range, capable of single, dual, triple, and quad-zone protection.
- Single-zone detection range: Series A: 20 m, Series B: 40 m.
- Provides four-sided area protection, simplifying wiring and reducing costs.
- Strong resistance to electromagnetic and optical interference.

Specification Model

KS06Q □□ □□□□ – □ □□□ / □□

- Form of installation: FL-Ground installation of scatter shield
- T-transistor turns onwhenlightcurtainisunblocked
- Form of output:2N-2channels NPN output
  2P-2channels PNP output
- G-safety light curtain
- Beamspacing: 04-40mm, 08-80mm, 16-160mm
- 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
- KS06 Qarea protective safety light curtain

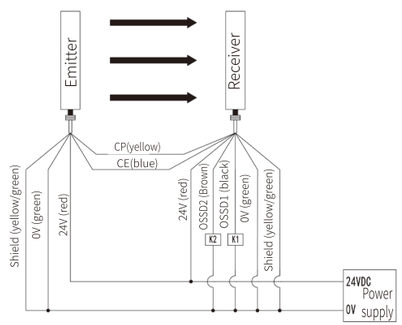
Specification Table

H: Detection Height, J: Length of Emitter/Receiver, L: Length of Steel Tube, C: Length of Protective Cover (Unit: mm)

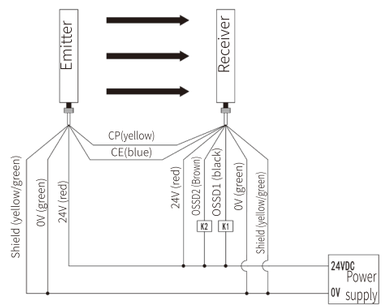
KS06QA Series/KS06QB Series									
Optical Axis Pitch 40					Optical Axis Pitch 80				
Beam Quantity	Model	H	J	L	Beam Quantity	Model	H	J	L
4	KS06Q*0404G2#T	120	239	400	4	KS06Q*0408G2#T	240	399	560
6	KS06Q*0604G2#T	200	319	480	6	KS06Q*0608G2#T	400	559	720
8	KS06Q*0804G2#T	280	399	560	8	KS06Q*0808G2#T	560	719	880
10	KS06Q*1004G2#T	360	479	640	10	KS06Q*1008G2#T	720	879	1040
12	KS06Q*1204G2#T	440	559	720	12	KS06Q*1208G2#T	880	1039	1200
14	KS06Q*1404G2#T	520	639	800	14	KS06Q*1408G2#T	1040	1199	1360
16	KS06Q*1604G2#T	600	719	880	16	KS06Q*1608G2#T	1200	1359	1520
Optical Axis Pitch 160					Optical Axis Pitch 320				
Beam Quantity	Model	H	J	L	Beam Quantity	Model	H	J	L
4	KS06Q*0416G2#T	480	639	800	3	KS06Q*0332G2#T	640	799	960
5	KS06Q*0516G2#T	640	799	960	4	KS06Q*0432G2#T	960	1119	1280
6	KS06Q*0616G2#T	800	959	1120	5	KS06Q*0532G2#T	1280	1439	1600
7	KS06Q*0716G2#T	960	1119	1280					
8	KS06Q*0816G2#T	1120	1279	1440					

Note: * in the model number indicates the light curtain series and the number of protection zones, refer to the complete machine model number for details.
indicates the output type: P stands for PNP output, N stands for NPN output.

Typical Wiring Diagram



PNP output



NPN output

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

Technical Specifications

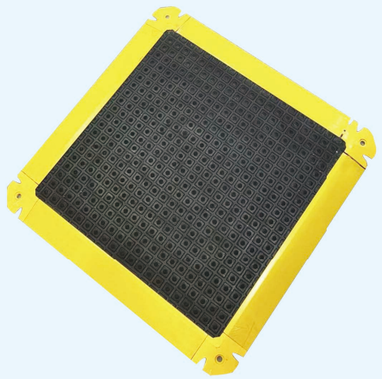
Safety Level	Type 4 (GB/T 19436, IEC 61496)			
Executive Standards	GB/T 19436.1; GB/T 19436.2; GB/T 4584; IEC 61496-1; IEC 61496-2			
Optical Characteristics				
Light Curtain Series	KS06QA、KS06QB			
Optical Axis Pitch	40mm	80mm	160mm	320mm
Beam Quantity	4、6、8…16	4、6、8…16	4、5、6、7、8	3、4、5
Protective Range	KS06QA: Single zone: 20 m; Dual zones: 14 m; Triple zones: 10 m; Four zones: 8 m KS06QB: Single zone: 40 m; Dual zones: 30 m; Triple zones: 20 m; Four zones: 16 m			
Detection Height	Optical Axis Pitch × (Beam Quantity - 1)			
EAA	＜5°			
Environmental Characteristics				
Ambient Temperature	Operating	-10 °C ~ 55 °C (no frost and condensation)		
	Storage	-40°C～70°C		
Ambient Humidity	Operating	35% RH～85% RH		
	Storage	35% RH～95% RH		
Anti-ambient Light Interference	Incandescent Light Source	3,000 lux		
	Fluorescent Light Source	3,000 lux		
	Solar Light Source	10,000 lux		
EMC	EMS	Complies with requirements for Category 4 safety light curtains specified in GB/T 19436-1 and GB/T 4584		
	EMI	Complies with industrial site electromagnetic emission requirements of EN 61326-1 and EN 55011		
Vibration Resistance	Frequency: 10 Hz ~ 55 Hz; Amplitude: 0.35 mm ± 0.05 mm; Scanning cycles: 3 axes, 20 cycles per axis			
Shock Resistance	Acceleration: 10 g; Pulse duration: 16 ms; Shock cycles: 3 axes, 1000 ± 10 cycles per axis			
Protection level	IP65			
Electrical Characteristics				
Power Supply Voltage	DC 12 V ± 10%			
Current Consumption	Emitter	⩽ 300 mA		
	Receiver	⩽ 100 mA (No load)		
Response Time	＜18ms			
Output Characteristics	NPN Output	2 x NPN transistor outputs (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the impact of extended wiring)		
	PNP Output	2 x PNP transistor outputs (ON when light transmitted), load current ⩽ 300 mA, residual voltage ⩽ 3 V (excluding the impact of extended wiring)		
Matching Controllers	No matching controllers; or equipped with CSRMB module to output relay passive contact signals			



SAFETY MAT

- MAT4 Safety Mat
- CSRM Safety Mat Controller
- SC6 Safety Mat Controller

MAT4 Safety Mat







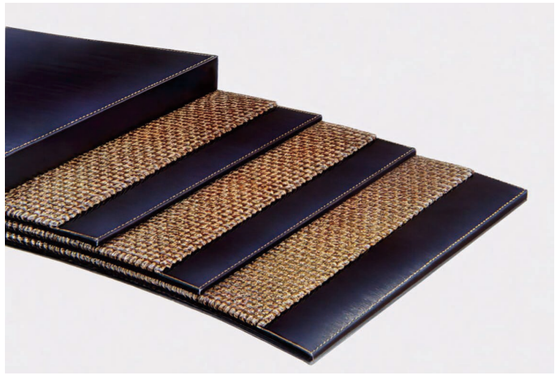
Optional Controller

Overview

The MAT-type safety mat is a safety solution that ensures applicability across work areas. By precisely installing safety mats in areas inaccessible to other sensors, on-site safety performance is significantly enhanced. Typical applications for MAT-type safety mats include: welding robots, rubber/plastics machinery, assembly machinery, material handling, packaging machinery, stamping machinery, pressure machinery, automotive manufacturing, steel and metallurgy industries, and other industrial fields.

Advantages

- Nitrile Rubber (NBR) Base: High wear resistance and superior corrosion resistance.
- Internal Nylon Wire Reinforcement: Significantly reduces mat deformation.
- Multi-layer Nylon Reinforced Rubber: Enhances toughness, minimizes deformation, and extends service life by up to 200%.



- Imported Galvanized Woven Mesh: Offers high pressure resistance, wear resistance, and aging resistance.
- Modular Design: Supports custom splicing and assembly for various sizes to meet specific on-site protection requirements.



- Controller Options: Available in two models: CSRMF and SC6.
- EMC Certification: Complies with EMC safety certifications.

Standard Selection

No.	Model	Actual Dimensions (L × W)
1	0250-0250	250x250 mm （Minimum single unit size）
2	0500-0250	500x250 mm
3	0500-0500	500x500 mm
4	1000-0500	1000x500 mm
5	1000-0750	1000x750 mm
6	1000-1000	1000x1000 mm
7	1500-1000	1500x1000 mm
8	2000-1000	2000x1000 mm （Maximum single unit size）

Note 1: Each edge pressing width is 49 mm with 5 mm installation margin, resulting in a total reserved installation margin of 50 mm. For example, to install the safety mat in a 2 m × 1 m space, the selected model shall be 1900-0900.
Note 2: The standard cable length of the mat transmission cable is 2.5 m; custom lengths are available upon request.

Technical Specifications

Model	MAT4	
Standards	GB/T 17454.1-2017 / ISO 13856-1:2013	
Material	Nitrile Rubber (NBR)	
Protection level	IP67	
Operating Environment	Temperature: -30 °C ~ 55 °C (No condensation)	Humidity: 35% ~ 85%
Maximum Allowable Load	2000 N	
Detection Weight	> 30 kg	
Detection Method	Pressure sensing	
Response Time	⩽ 20 ms	
Mechanical Service Life	1,000,000 operations	
Matching Controllers	CSRMF Controller	SC6 Controller

Specification Model

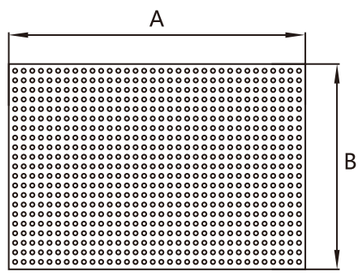
MAT4 – □□□□ – □□□□ – □ □□ / □

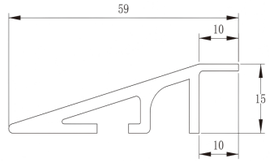
- MAT4 Safety Mat Protection Device
- Mat Length Dimension: Represented by 4 digits, unit: mm (e.g., 1000 = 1000 mm length)
- Mat Width Dimension: Represented by 4 digits, unit: mm (e.g., 0500 = 500 mm width)
- Controller Model: F - CSRMF Safety Mat Controller; S - SC6 Safety Mat Controller
- Output Type:2O - 2 sets of relay normally open contact outputs
  OC - 1 set normally open + 1 set normally closed relay contact outputs
- Mounting Method: P - Expansion Bolt Fixing; N - Hex Socket Screw Fixing

Note: The CSRMF controller only supports the "2O" output type, and the SC6 controller only supports the "OC" output type.

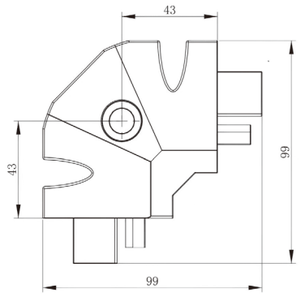
Dimensions

Unit: mm





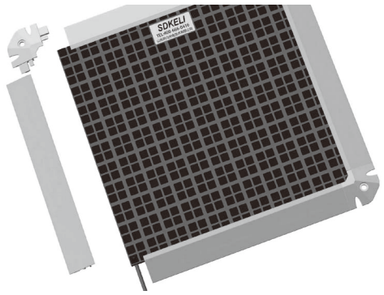
Border Frame



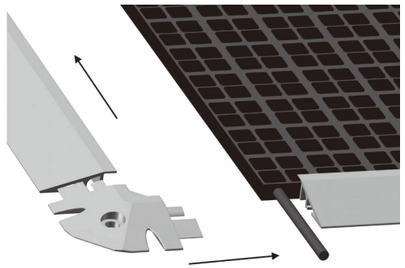
Corner Fitting

Note: Custom model dimensions exclude the frame. A = Length, B = Width. Custom sizes available upon request, unit: mm.

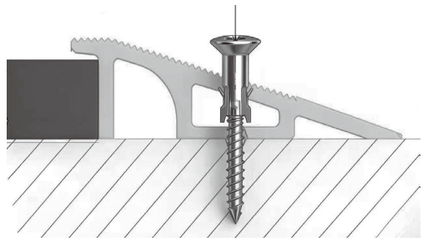
Installation Method



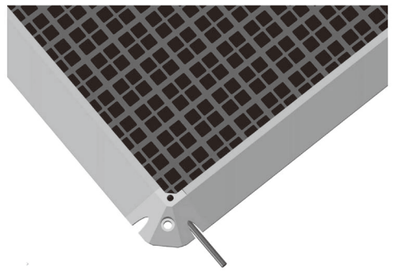
1、Place the safety mat in the designated installation area.



2、Install the aluminum alloy edge trims and connecting corners.



3、After confirming the final position, mark the mounting holes on the corners, drill the holes, and install the fixing screws.

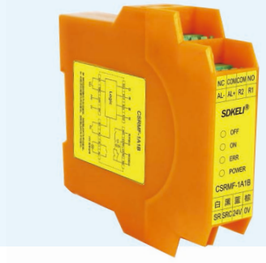


4、Connect the mat's signal cable to the control cabinet.

Mat Controller

Controller	CSRMF Safety Mat Controller		SC6 Safety Mat Controller	
Appearance				
Executive Standards	ISO 13849-1 (Cat. 4), 2014/30/EU (EMC Directive), 2006/42/EC (Machinery Directive)		ISO 13849-1 (Cat. 4), 2014/108/EU (EMC Directive), 2006/42/EC (Machinery Directive)	
Reference Standards	EN/IEC61496-1（Type 4 ESPE）			
Ambient Temperature	Operating	-10 ～ 55°C	Storage	-30 ～ 70°C
Ambient Humidity	Operating	35% ～ 85% RH	Storage	35% ～ 95% RH
Protection level	IP50			
Vibration Resistance	Frequency 10 Hz ~ 55 Hz, Amplitude 0.35 mm ± 0.05 mm, 20 times in X, Y, Z directions			
Shock Resistance	Acceleration: 100 m/s^2, Pulse duration 16 ms, 1000 times in X, Y, Z directions			
Power Supply Voltage	DC 24 V ± 10%			
Power Consumption	⩽ 3 W			
Response Time	＜ 20 ms			
Safety Output	2 sets of relay normally open contacts		1 normally open & 1 normally closed passive contact	
Load Capacity	AC 15: 5 A / 250 V			
	DC 13: 5 A / 24 V			
Power-up Time	＜ 1 s			
Detection Function	Power-on self-test + Real-time runtime self-test			
Protection Circuit	Overvoltage & Overcurrent Protection			
Status Indication	POWER: Yellow, lit when powered on		POWER: Red, lit when powered on	
	ERR: Red, lit when mat fault occurs		ERR: Red, lit when mat fault occurs	
	ON: Green, lit when output relay energizes			
	OFF: Red, lit when output relay de-energizes			
Dielectric Strength	AC 1500 V, no breakdown or flashover within 60 s			
Functions	Real-time monitoring of safety mat		Real-time monitoring of safety mat	
	Reset mode configuration for control output; Reset mode configuration for alarm output		Reset mode configuration for control output	
			Muting function	
Relay Service Life	Electrical Service Life: ⩾ 1,000,000 cycles			
	Mechanical Service Life: ⩾ 10,000,000 cycles			
Dimensions	110 × 100 × 24 mm (110 × 115 × 24 mm when equipped with screw-locked pluggable terminal base)		156 × 142 × 32 mm	

CSRM Safety Mat Controller



Overview

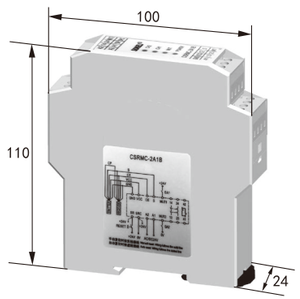
The CSRMF Safety Mat Controller is designed for industrial safety systems. Used in conjunction with safety mats, it enhances the reliability of equipment safety systems and forms a more secure protection system.

Advantages

- DC 24 V Power Supply: Adopts industrial standard DC 24 V power supply.
- Dual NO Outputs: Equipped with 2 sets of normally open relay contacts.
- Dual-Channel Operation: Supports self-diagnosis for both the mat and controller during operation.
- Integrated Indicators: Features power status indicator and output status indicator for real-time visual feedback.
- Expandable Design: Supports adding extra safety contacts via expansion modules.
- Dual Reset Modes: Manual or Automatic reset mode is switchable to suit different application needs.
- 24VDC Alarm Output: One channel of DC 24 V active alarm output is available, with switchable output modes.
- Redundant Monitoring Circuitry: Built-in self-monitoring redundant circuitry for high reliability and fail-safe operation.

Dimensions

Unit: mm



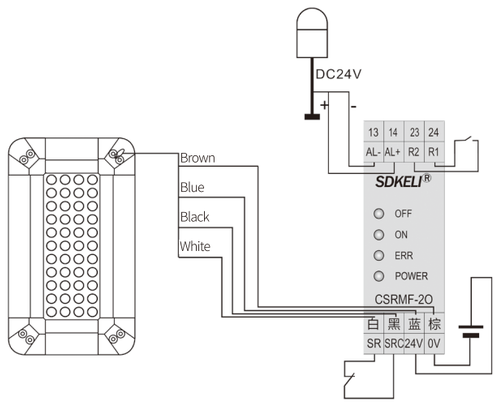
Specification Model

CSRM □ – □□

- Output Type: 2O - 2 sets of relay normally open contact outputs
- F - Monitors safety mat output signals
- CSRM Series Safety Mat Controller

Wiring Method

Connect the four carpet wires (White, Black, Blue, Brown) to the four corresponding terminals (White, Black, Blue, Brown) on the controller as shown in the figure. Terminals 13 & 14, 23 & 24 are normally open contacts. The standard length of the 2-core power cable is 1.5 m, and the standard length of the 4-core output cable is 2 m.



Short-circuit SR and SRC for automatic reset; connect an NO contact between SR and SRC for manual reset.
When R1 and R2 are open, the alarm operates with automatic reset; connect an NC contact between R1 and R2 for manual reset.

SC6 Safety Mat Controller



Overview

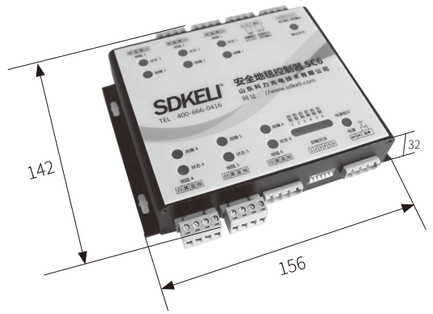
The SC6 Safety Mat Controller is designed for industrial safety systems. Used in conjunction with safety mats, it enhances the reliability of equipment safety systems and forms a more secure protection solution.

Advantages

- Designed for safety mat interlocking, supports connection of up to 6 mats.
- Each input channel is equipped with an independent enable/ inhibit switch (muting).
- LED indicators display the operating status of each mat, including normal operation and fault.
- Features power indicator and output status indicators.
- Powered by DC 24 V industrial standard power supply.
- 1 set of normally closed contact + 1 set of normally open contact output.
- Dual-channel operation with self-diagnosis for both mats and controller.
- Switchable manual / automatic reset modes.
- Equipped with 1 channel of DC 24 V active alarm output, monitors the status of any mat in the system.
- Built-in self-monitoring redundant circuitry.

Dimensions

Unit: mm

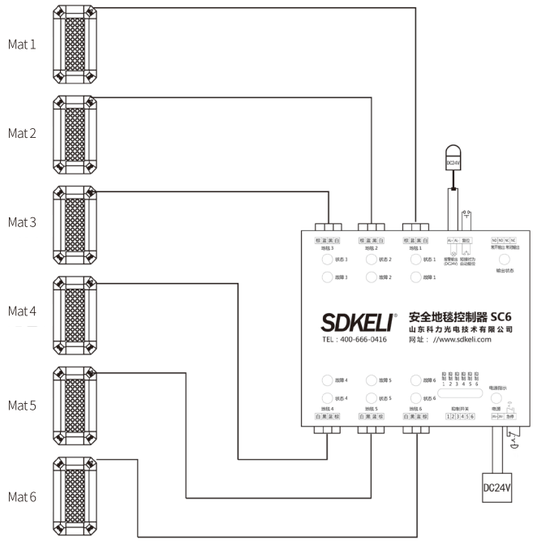


Specification Model

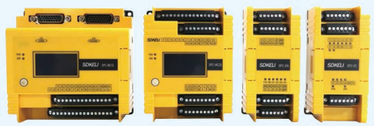
SC6 OC

- Output Type: OC - 1 set of normally open relay contact + 1 set of normally closed relay contact output
- SC6 Safety Mat Controller

Connect the four core wires (White, Black, Blue, Brown) of each mat to the corresponding terminals (White, Black, Blue, Brown) of the controller as shown in the diagram. Connect the positive and negative poles of the 24 V power supply to the 24 V+ and 24 V- terminals of the controller, respectively. NO and NO are normally open outputs, NC and NC are normally closed outputs, and AL+ and AL- are connected to the positive and negative poles of the 24 V alarm, respectively.
Reset mode: Shorting the reset pin enables automatic reset. To switch to manual reset, an automatic-reset/normally-open reset button must be added.
Cable specification: The 2-core power cable has a standard length of 1.5 m, and the 4-core output cable has a standard length of 2 m.



SPC Series Programmable Safety Controller





TÜV Authoritative Certification:

Safety level: SIL 3, PL e, Cat. 4.

Overview

The SPC series safety programmable controller consists of an upper computer and a lower computer.

The upper computer adopts graphical programming, a rich set of functional blocks, simple configuration, and convenient debugging.

The lower computer is the master-slave architecture, and the main module is equipped with safety I/O and communication ports, which can run independently; The expansion module includes I/O and EN, which enable the expansion of interfaces and functions.

Main Application Scenarios:

Industrial Safety System Solution: Monitors various electrical equipment, robotic arms, industrial robots, logistics equipment, and safety interlocking devices. Performs safe stop in case of abnormality, and visualizes safety information.

AGV Motion Solution: Provides speed monitoring and automatic radar zone switching functions.

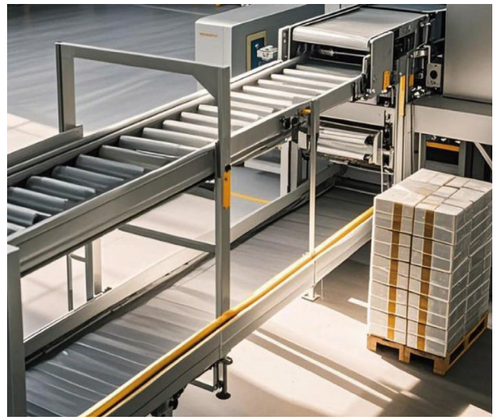
Forging Industry Solution: Enables safe start/stop, flexible personnel detection, and reduces downtime.

Muting Solution: Combines efficiency and safety to ensure safe entry and exit of goods.

Advantages

- Rich External Interfaces: Integrates mechanical switches, photoelectric sensors, encoders (TTL, HTL, RS422, IVSS), laser scanners, safety relays, motor contactors, etc.
- Powerful Data Interaction: Supports 4 communication protocols: CAN, RS485, Ethernet, Type-C, with standardized protocols.
- 1.54" OLED Display: Real-time access to system status, interface information, fault information, etc.
- Flexible Configuration Software: Easy to use, with abundant function blocks to meet different user needs. Custom logic can be compiled according to application scenarios to simplify engineering design.
- Compact Structure: Extremely compressed vertical height, suitable for height-limited applications such as horizontal AGVs.
- Flexible Installation: Supports DIN rail mounting and screw mounting.

Typical Applications



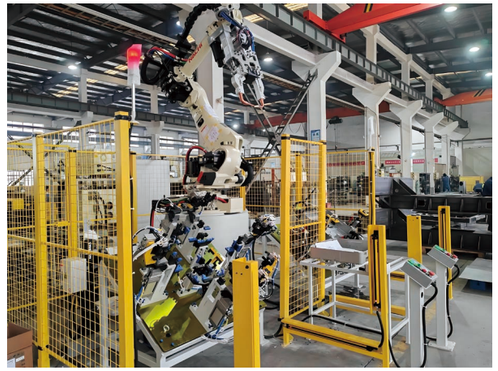
Automatic Packaging Production Line

Safety Equipment:

Safety controller (control core); Safety light curtain (detect personnel entering hazardous zones) E-stop button (emergency shutdown); Safety relay (cut off motor power supply)

Functions:

1. Hazardous Area Monitoring: Safety light curtains are installed at key positions such as packaging line conveyors and robot operation areas to form protective barriers. When personnel or foreign objects enter the hazardous area, the light curtain signal is blocked, triggering the safety controller to execute a shutdown command.
2. Muting Function: Photoelectric switches are arranged in the material passing area to trigger temporary muting of the light curtain. This allows materials to pass through while preventing personnel from intruding, ensuring reliable safety logic.



Robot Welding Workstation

Safety Equipment:

Safety controller; Safety light curtain; Safety door switch; Safety relay

Functions:

1. Zone Isolation: Area-type light curtains are deployed around the robot motion trajectory to build a three-dimensional protective space. Once the light curtain is triggered, the controller immediately stops robot movement and locks the welding gun power supply.
2. Safety Door Interlock: A safety door switch is installed at the workstation entrance. The controller allows or prohibits the welding program startup after detecting the door status.
3. Multi-level access control is realized via the safety controller.



Press Machine Safety Protection

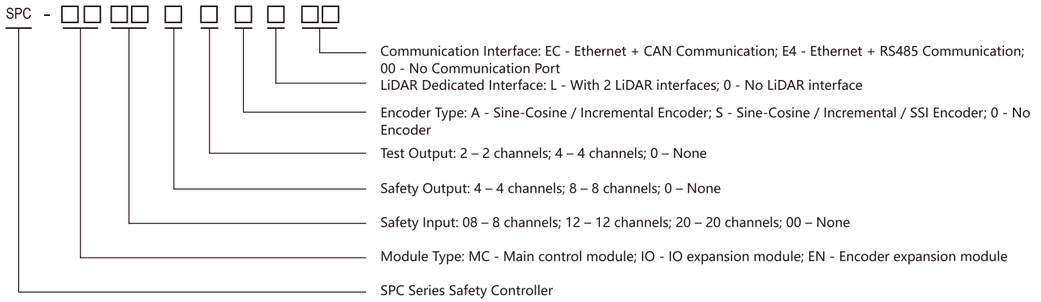
Safety Equipment:

Safety controller; Safety light curtain; Two-hand button; Safety relay

Functions:

1. Mold Area Protection: High-resolution light curtains are installed at the mold zone of the press machine. Once the controller detects a blockage signal, it immediately cuts off the power supply and stops the slide from descending.
2. Two-Hand Operation: Equipped with two-hand start buttons. The controller allows stamping action only after verifying synchronous dual-channel signals, preventing accidental single-hand operation.

Specification Model



Module	Model	Safety Input	Safety Output	Test Output	Encoder Interface①	LiDAR Interface	Communication Interface	Abbreviation
Main Control Module	SPC-MC1284ALEC	12	8	4	4	2	ETH+CAN	MC12
	SPC-MC208400E	20	8	4			ETH+RS485	MC20
Expansion Module	SPC-IO08420000	8	4	2				IO
	SPC-EN0000S000				2+2			EN

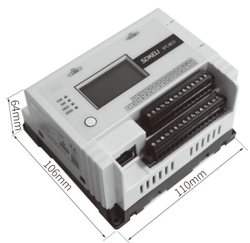
① Note: The encoder interface of MC12 main control module supports AB incremental encoders and sine/cosine encoders. For the encoder interface of EN expansion module, 2 interfaces support SSI encoders, and the other 2 interfaces support AB incremental encoders and sine/cosine encoders.

Technical Specifications

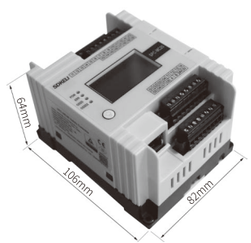
Safety Level Parameters	
Safety Integrity Level	SIL 3（IEC 61508、IEC 62061）
Performance Level	PL e（ISO 13849-1）
Category	Cat. 4（ISO 13849-1）
PFH_D	$<10^{-7}$
T_M(Mission Time)	20 years (ISO 13849-1)
Electrical Parameters	
System Power Supply (V+, V-)	DC24V（70%~125%）
Output Power Supply (DC 24 V, 0 V)	DC24V（70%~125%）
Power Consumption (No Load)	MC12：5.5W　MC20：3.5W　IO：2.5W　EN：3W
Overvoltage Category	Class II (EN 61131-2)
Power-up Time	⩽15s
Response Time	Tmin = 4 ms, see hardware manual for details
Safety Input	ON state: Input voltage 13 ~ 28 V; OFF state: Input voltage 0 ~ 5 V
Safety Output	Output type: PNP semiconductor ON state: Output voltage DC 24 V, rated current 300 mA, voltage drop ⩽ 2 V OFF state: Residual voltage ⩽ 1 V, leakage current ⩽ 0.5 mA Max capacitive load: 0.9 μF
Data Communication	CAN, RS485, Ethernet communication
Configuration Interface	Type C, ETH
Display Screen	1.54-inch OLED
Environmental Parameters	
Operating Temperature & Humidity	Open environment: -25 °C ~ 60 °C, relative humidity 10% ~ 95 %, non-condensing
Storage Temperature & Humidity	-25 °C ~ 70 °C, relative humidity 10% ~ 95%, non-condensing
Shock Resistance	15 g, 11 ms half-sine wave (EN 61131-2)
Vibration Resistance	5 Hz ~ 8.4 Hz, 3.5 mm displacement, constant amplitude; 8.4 Hz ~ 150 Hz, 1 g acceleration, constant amplitude (EN 61131-2)
Protection level	IP20 (EN 60529)
Insulation Protection	Class III (SELV) (EN 61131-2)
EMC	EN 61131-2, IEC 61326-3-1
Environmental Compliance	RoHS 10-substances
Flame Retardancy	UL94-V1
Mounting Method	Supports 35 mm DIN rail mounting and screw fixing

Dimensions

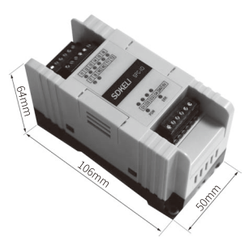
Unit: mm



Main Module：SPC-MC12



Main Module：SPC-MC20



Expansion Module：SPC-IO/EN

CSRM Series Safety Relay Module

ISO 13849-1 (PL e)



Overview

The CSRM relay module complies with the safety requirements of EN/ISO 13849-1 Cat. 4/PL e, and is suitable for monitoring various signals in industrial sites with high safety requirements, including E-stop signals, safety door switch signals, safety light curtain signals, safety light curtain signals with pulse output, and two-hand button signals.

Advantages

●Forced-guided relay contacts enable more effective and safer monitoring.

●The CSRM features compact overall dimensions and pluggable terminals for easy installation.

●The CSRM provides two output configurations: 3 normally open + 1 normally closed contacts, and 2 normally open + 1 normally closed contacts, delivering stronger control capacity.

Specification Model

CSRM □ – □ A □ B – □ X □

- Language Version: C – Chinese, E – English
- Operating Voltage: X – AC/DC 24 V, D – DC 24 V
- Output Type: 3A1B – 3 sets of normally open contacts + 1 set of normally closed contacts output
  2A1B – 2 sets of normally open contacts + 1 set of normally closed contacts output
- Application Scenario:
  A – Monitor 2-channel normally closed contact signals
  B – Monitor safety light curtain signals with level output
  C – Monitor safety light curtain signals with square wave output
  D – Monitor two-hand button signals
- CSRM Series Safety Relay Module

CSRMA – Dual Normally Closed Switch Monitoring

•Monitors dual normally closed switch signals, such as E-stop buttons and safety door switches.
•Monitors short circuits between the two signal lines.
•Monitors short circuits and open circuits of any single switch, and locks output when switch states are inconsistent.
•Switchable between automatic and manual reset modes. For the 2A1B module under manual reset mode, the reset button can be detected to enforce single reset operation; the reset button must be released before the next reset can be performed.
•Equipped with external device monitoring function to detect faults (e.g., contact welding) of relays that control hazardous machine components.

CSRMC - Pulse Signal Monitoring

•Monitors output signals of safety light curtains with pulse signal output.
•Adopts narrow-band filtering design with a center frequency of 4 kHz, effectively preventing false triggering caused by other interference signals.
•Compatible with SDKELI KS06 series safety light curtains.
•Switchable between automatic and manual reset modes. For the 2A1B module under manual reset mode, the reset button can be detected to enforce single reset operation; the reset button must be released before the next reset can be performed.
•The 2A1B module supports suppression function.
•Equipped with external device monitoring function to detect faults (e.g., contact welding) of relays that control hazardous machine components.

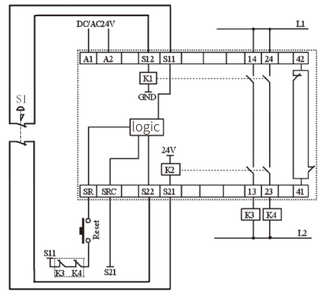
CSRMB - Dual Transistor Signal Monitoring

•Monitors dual transistor signals, such as photoelectric switches and safety light curtains.
•With peripheral circuits, it can also realize monitoring of dual normally closed switch signals.
•Full-circuit self-check; the output will be locked when the two signals are inconsistent.
•It features wide adaptability to residual voltage of light curtain signals and can operate stably with residual voltage above 10 V.
•Compatible with both NPN and PNP signals for stronger adaptability.
•Switchable between automatic and manual reset modes. For the 2A1B module under manual reset mode, the reset button can be detected to enforce single reset operation; the reset button must be released before the next reset can be performed.
•The 2A1B module supports suppression function.
Equipped with external device monitoring function to detect faults (e.g., contact welding) of relays that control hazardous machine components.

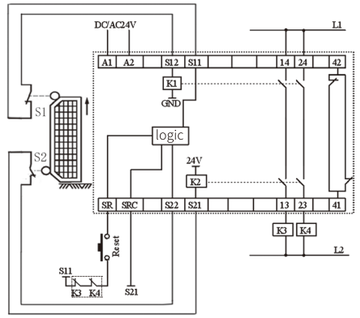
CSRMD - Two-Hand Button Monitoring

•Monitors two-hand button signals.
•Performs signal consistency detection for buttons; any trigger with a time difference greater than 0.5 seconds between the two-hand buttons is deemed an invalid trigger.
•Operates with independent dual circuits and full-circuit self-check; the output locks when the two signals are inconsistent.
•The 2A1B module supports external device monitoring function to detect faults (e.g., contact welding) of relays that control hazardous machine components.

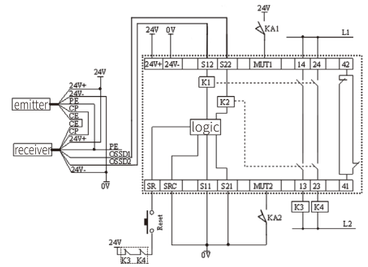
Typical Wiring Diagram



Monitoring emergency button-manual reset (CSRMA2A1B)



Monitoring safety door switch-manual reset (CSRMA2A1B)



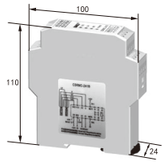
Monitoring PNP light curtain-manual reset (CSRMB2A1B)

Technical Specifications

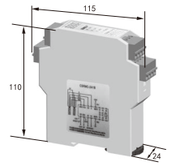
Executive Standards		ISO 13849-1 (PL e) 2004/108/EC (EMC Directive) 2006/42/EC (Machinery Directive)
Environmental Characteristics		
Ambient Temperature	Operating	-10°C～55°C(No frost or condensation)
	Storage	-40°C～70°C
Ambient Humidity	Operating	35% RH ~ 85% RH
	Storage	35% RH ~ 95% RH
Protection level		IP50
Dimensions		110×100×24mm (110 × 115 × 24 mm when equipped with screw-locked pluggable terminal base)
Electrical Characteristics		
Power Supply Voltage		AC 20.4 V ~ 26.4 V or DC 24 V ±10% (3A1B modules and Type B modules only support DC power supply)
Power Consumption		⩽ 3 W (For Type C modules, the module supplies power to the matched light curtain, total power consumption ⩽ 10 W)
Load Capacity		AC 15: 5 A/250 V
		DC 13: 5 A/24 V
Response Time		< 10 ms
Dielectric Strength		AC 1500 V, no breakdown or flashover within 60 seconds
Relay Service Life		⩾ 1,000,000 times (electrical service life)

Dimensions

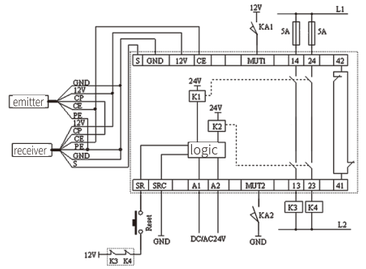
Unit: mm



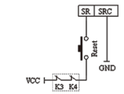
Equipped with screw-locked pluggable wiring terminals



Equipped with screw-locked sealed pluggable terminal base



Example 1: Manual Reset

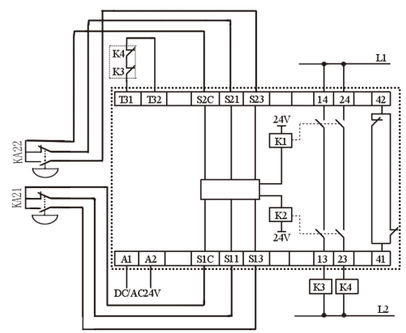


Example 2: Automatic Reset



Note 1: K3/K4 are load examples, including but not limited to relays. The dashed box shows wiring for external device monitoring function; short the terminals directly if this function is not used.
Note 2: KA1/KA2 are travel switch examples. The suppression function will be activated when both KA1 and KA2 are closed.
Note 3: This diagram shows wiring example for KS06 AOPD. When other models of light curtains are adopted, wiring shall be implemented in accordance with the requirements specified in the light curtain manual.

Monitor AOPD Signal – Manual Reset (CSRMC2A1B)



Note 1: K3/K4 are load examples, including but not limited to relays. The dashed box shows wiring for external device monitoring function; short the terminals directly if this function is not used.

Monitor Two-Hand Buttons (CSRMD2A1B)

RISK ASSESSMENT

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:

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

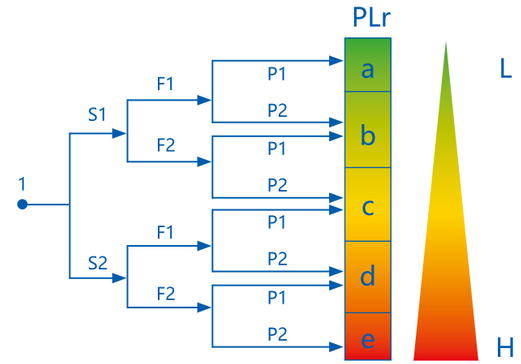
Safety standard

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

International standard	IEC 61496-1　IEC 61496-2　ISO 13849-1
National standard	GB/T 4584　GB/T 19436.1　GB/T 19436.2　GB/T 19436.3

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
Point for evaluation of safety function'scontribution to risk reduction;
L - Low contribution to risk reduction;
H - High contribution to risk reduction;
PLr - Required performance level;
S-Severity of injury;
S1 - Slight(normally reveribleinjury);
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 - Possibility of avoiding hazardor limiting harm;
P1 - Possible under specific conditions;
P2 - Scarcely possible.



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.

