Specifications model

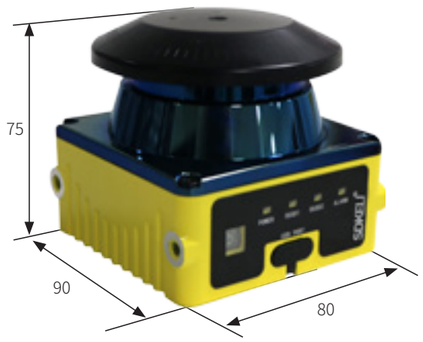
Product series	Protection radius	Scanning angle	output	Installation
KLMs—	□□	□□	□□ /	□□

Model	Protection radius	Scanning angle	Output
KLMs-0327PE	3m@1.8%Reflectivity	276°	PNP+Ethernet
KLMs-0327BP	3m@1.8%Reflectivity	276°	PNP
KLMs-0427PE	4m@1.8%Reflectivity	276°	PNP+Ethernet
KLMs-0427BP	4m@1.8%Reflectivity	276°	PNP

Installation method: regular horizontal installation and special customized installation can be provided

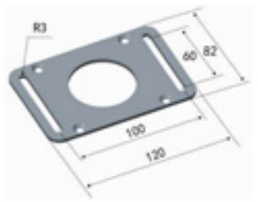
Dimensions

（unit：mm）



Horizontal installation

horizontal installation（KLMs-SZ）



SZ bracket

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KLMS Safety Lidar

IEC 61496-1:2020 (TYPE 3 ESPE)
IEC 61496-3:2018 (TYPE 3 AOPDDR)
IEC 61508-1～7:2010 (SIL 2)
EN ISO 13849-1:2015 (CAT. 3、PL d)
EN ISO 13849-2:2012 (CAT. 3、PL d)
EN 61326-1:2013 EN 60825-1:2014（Class 1 laser products)
EN 61000-4-2:2009
EN 61000-4-3:2006+A1:2009+A2:2010
EN 61000-4-4:2004+A1:2010
EN 61000-4-6:2009 EN 61000-4-8:2010
EN 61000-4-11:2004

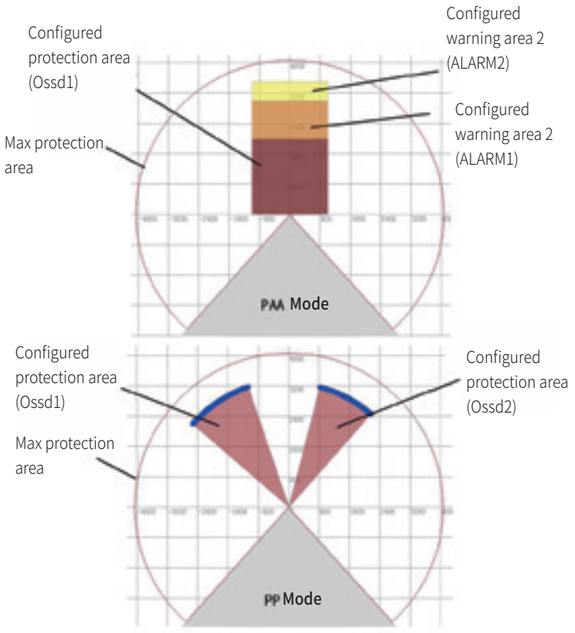
German TUV functional safety certificationz

Product description

KLMs safety lidar is electrical sensitive protective equipment (ESPE). It is designed based on the principle of pulsed laser ranging. It can realize two-dimensional area protection with angle of 276°， radius of 4m (1.8% reflectivity) by rotating scanning. Functional safety output and measurement output are available. User’s need for safety obstacle avoidance and measurement can be met at the same time.

Features

- SIL2, PL d, Type 3, TÜV Rheinland certified, compliant with standards IEC 61508, ISO 13849, and IEC 61496；
- The measurement accuracy is not affected by the change of target reflectivity. Stable and consistent measurement result in any complex application scenarios and among several lidars.；
- Support static and dynamic input free transformation and 64 protection zone settings, which can be combined freely to adapt to complex and variable application scenarios；
- The window adopts a stepped structure design to achieve super dirt resistance performance, which greatly reduces the number of maintenance。



Work pattern

Through the upper computer software, the detection area of the radar can be set to the PAA mode (protection zone+alarm 1+alarm zone 2) or PP mode (protection zone 1+protectionZone 2) to meet different forms of protection needs.

In PAA or PP mode, KLMs can set up to 64 area groups with different shapes. Users can assign different area groups to different Monitoring Cases based on their needs, and configure the conditions for implementing the protection of the area group. When the conditions are met, they will automatically switch to the corresponding area group.

The conditions for achieving region group switching include static control input, dynamic control input, and contour recognition input. The three conditions can be configured individually or in combination as conditions for activation of an area group.

Technical parameters

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)
Average hourly hazardous failure rate	1.67×10^{-8}
Safety state in case of failure	At least one OSSD is in the OFF state
Detection parameters	
Laser light source	Wavelength 905 nm, class 1 laser products
Scanning angle range	276° (–48°～ 228°)
Maximum protection radius	4m@1.8% reflectivity
Maximum detection distance	50m@90%reflectivity
Angle resolution	0.12°
Scan cycle	40ms
Multiple sampling	2~16
Response time	Default value 100 ms (configurable)
Minimum detected object	70mm@At the maximum radius of the protected area
Tolerance zone（TZ）	65mm
ZR Additional extension distance	350mm（Measurement error caused by reflection）
Electrical parameters and interfaces	
Working voltage	DC24V±20%
Consumption	＜ 10W（no load at output end）
Safety output (OSSD1)	PNP × 2 (ON state: maximum Iout=200mA, Vout ⩾ Vcc-2V, OFF state: Iout<1mA, Vout<2V), Overcurrent protection, capacitive load ⩽ 100nF. The protection area is in the ON state when there are no objects, and in the OFF state when there are objects or faults.
Input interfaces	A total of 8 input interfaces, with an input impedance of 3.3K Ω, can be configured as static or dynamic input: ● Static input, input high level 24V (11V-28V),Input low level 0V (<2V). The sampling time (shake elimination) is 10ms. Dynamic input (encoder input), input high level 24V (11V-28V), input low level 0V (<2V). Input frequency<100KHz. Encoder type, dual channel, 90 ° phase difference.
Universal input/output interface	There are four in total, of which General I/O 1 and 4 can be configured as static inputs or alarm outputs, and General I/O 2 and 3 can be configured as static inputs or OSSD2 outputs. ● Static input, input impedance 4.7K Ω, input high level 24V (11V-28V), input low level 0V (<2V). The sampling time (shake elimination) is 10ms. ● The OSSD2 output is the same as the secure output OSSD1. ● Alarm output, PNP (ON state: maximum Iout=200mA, Vout ⩾ Vcc-2V, OFF state: Iout<1mA, Vout<2V), in the OFF state when there is an object in the alarm area.
Allowable cable resistance between load and OSSD	⩽ 4 Ω
Data output interface	Ethernet
Configure Interface	microUSB
Power-on start time	Typical value 10s
Mechanical parameters	
Dimensions	80×90×75mm
Cable length	⩽ 1m
Environmental parameters	
Ambient temperature	Working temperature：-10°C～ 50°C，storage temperature：-40°C～ 70°C，no frost and condensation fog
Ambient humidity	Operating：35%RH ～ 85%RH，storage：35% ～ 95%RH
Anti light interference	80000Lux*
Anti vibration	Frequency：10Hz ～ 55Hz，1 octave /min，amplitude：0.35 mm /1g，20 vibrations in X, Y, and Z directions
	Frequency：5Hz ～ 200Hz，amplitude：1.5 mm /0.5g，10 vibrations in X, Y, and Z directions
Anti collision	Acceleration10g，pulse duration：16ms：16ms，bidirectional impact in X, Y, and Z directions: 1000 times each
	Acceleration5g，pulse duration：16ms：11ms，bidirectional impact in X, Y, and Z directions: 3 times each
Protection level	IP65

*For ambient light sources that directly enter the scanning plane (according to IEC 61496-3): ⩽ 1500Lux