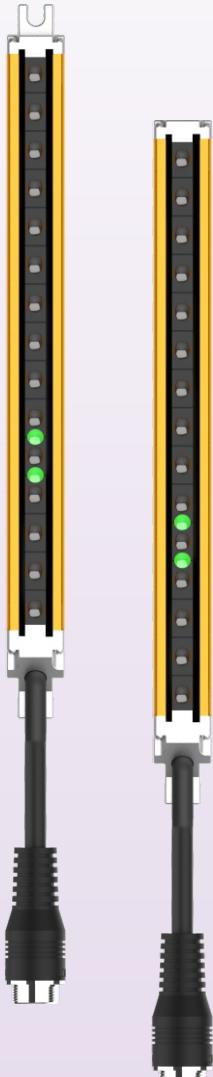




# LCS series miniature safety light curtains



## ➤ LCS performance characteristics

LCS series safety light curtains is a new type of through-beam safety photoelectric protection device developed and developed by using the current international advanced technology, with the smallest cross-section of 15×15mm in the industry. It has passed ISO13849-1PLe and EN61496-1/2Type4 certification, which has the characteristics of high safety and high reliability.

The following features:

- ◆ Dual-channel design, reduce the probability of dangerous failure of safety light grid, improve safety performance;
- ◆ Light curtain resolution 14mm, 25mm, 45mm optional;
- ◆ Adopts the most advanced infrared light synchronization technology, which is simple to install and easy to use;
- ◆ C-type light curtain realize single-ended without blind zone;
- ◆ Has good on-site applicability and strong anti-optical interference and anti-electromagnetic interference ability;
- ◆ Pulse test, self-diagnosis of output circuit, short circuit fault detection and other means to ensure functional safety;
- ◆ Small size, section size is only 15×15mm;
- ◆ Comes with two-end installation, no installation bracket, easy to use;

## ➤ Product structure model description

<b>10</b>	<b>LCS</b>	<b>0120</b> - <b>E</b>	<b>004</b>	<b>A</b>	<b> </b>
Optical axis spacing 10: 10mm 20: 20mm 40: 40mm	Raster type LCS:safety light curtain	Protection height: 0120 0160 0200 0240 0320 .....	Functional features: E: Emitting PR: PNP type reception NR: NPN type reception P: A pair of PNP types N: A pair of NPN types	Optical axis points: 004 006 008 016 .....	Through-firing distance: None: 3 meters (default)
					Appearance mnemonic (end cap) A: One end is out, both ends are installed C: One end is outlined, one end is installed

\*Appearance mnemonic type C requires additional purchase of "LCS back mounting bracket"

## ➤ Light curtain model example

Emitting



Receiver



## LCS SERIES MINIATURE SAFETY LIGHT CURTAINS

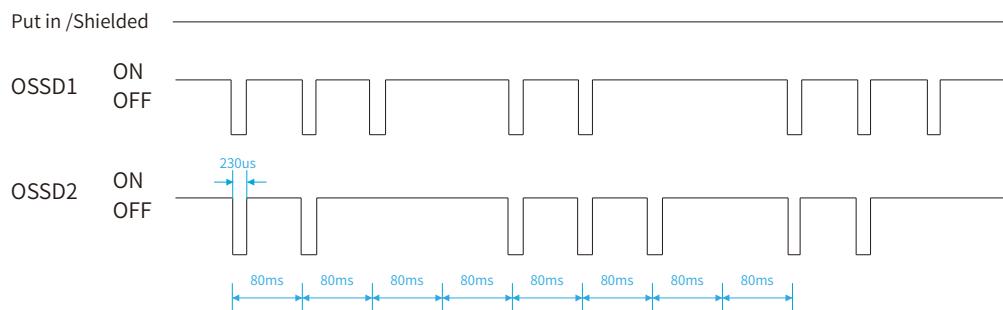
## ➤ Technical parameters

LCS series miniature safety light curtains(10/20/40 mm series)			
Safety standards	ISO13849-1 (Ple,Cat.4) IEC61496-1/2(Type4)	Max capacitive load	0.1uF
Optical axis spacing	10mm (14mm) 20mm (25mm) 40mm(45mm)	Supply voltage	+24V±10%
Detection distance	0.1-1m,0.1-3m	Max power	<3W
Optical axes points	4-191	Protection degree	IP65 (Customized IP67)
Protection height	100-1910mm	Operating temp	-10~55°C
Light source waves	940nm	Storage temp	-20°C~70°C
Response time	Reference selection table	Humidity	15%~85%
Output type	NPN/PNP	Impact	10g/20ms
Max output current	200mA	Vibration	0.35mm/10~55Hz
PFHd	<2.1x10 <sup>-8</sup>	MTTFd	288 years

## ➤ LCS series miniature safety light curtain OSSD outputs self-diagnostic timing

The LCS series miniature safety light curtain have OSSD output self-diagnosis function. During the normal on-OSSD output of the lightcurtain, the internal control timing control unit of the lightcurtain periodically and actively turns off the OSSD1 and OSSD2 outputs in turn. During the short shutdown of OSSD1 or OSSD2, the internal timing control unit of the light curtain detects whether the OSSD1 or OSSD2 level is consistent with the expected result, and if so, the OSSD switch is in the E normal working state; If it is inconsistent with the desired result, the OSSD fails, and the system will immediately shut down both OSSDs to ensure functional safety, at which point the receiving raster red LED flashes to indicate the fault. Therefore, when the LCS safety light grid connection load is PLC or a fast smart device with MCU control, it is necessary to filter out the self-test pulse in the program (suggested 1ms) to prevent the PLC or MCU from detecting this waveform and causing the machine to stop.

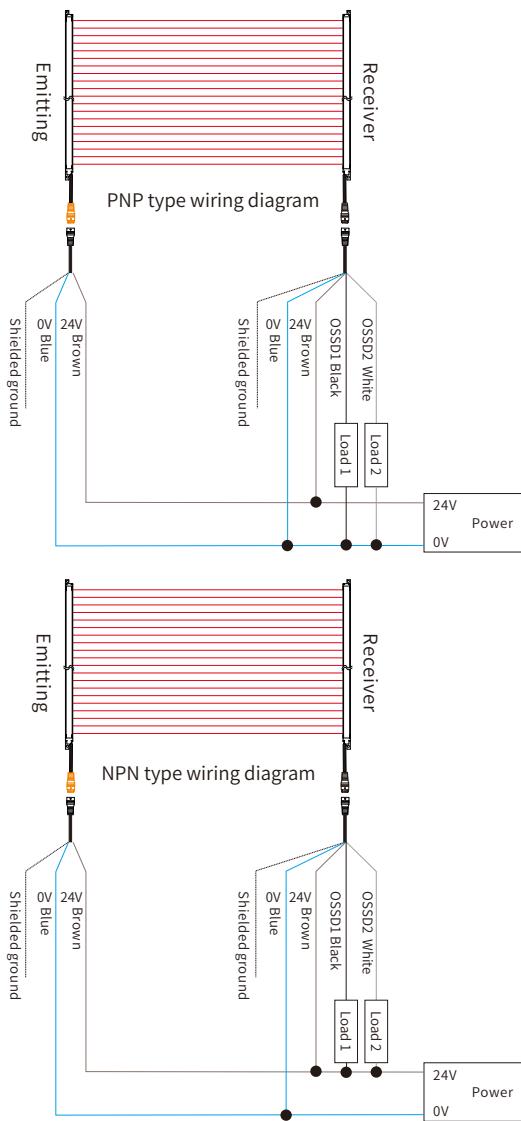
The figure below is the timing diagram of the PNP type light curtain self-diagnostic output waveform:



## ➤ Common troubleshooting of LCS series miniature safety light curtain

LED indicator light		Description	LED indicator light		Description
Launcher	Green on	Works fine	Green on	Red on	All beams on
	1Hz red flashing	Launch tube failure	Red on	Red on	Beam blocking (not good light)
	2Hz red flashing	Power failure	Green on	1Hz green flashing	Interference
	2Hz red green flash alternately	Circuit Fault	Green on	2Hz red flashing	Power abnormal
	2Hz green flashing	Software failure	Red on	1HZ red flashing	Output error, overload, short circuit, etc
Receiver	Green on	Works fine	Green on	2Hz green flashing	Software failure
	2Hz red green flash alternately	Circuit Fault	Red on	2Hz red green flash alternately	Circuit Fault
	1Hz red green flash alternately	Communication error between main and auxiliary MCUs	Red on	1Hz red green flash alternately	Communication error between main and auxiliary MCUs

## Signal interface definition and application wiring diagram

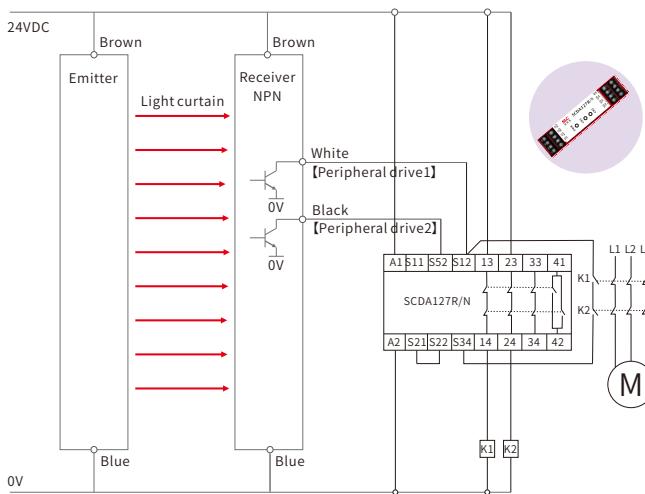


Item	Color	Description
Emitting	Brown+24VDC	Supply voltage, DC24V
	Blue GND	Power supply 0V
Receiver	Brown+24VDC	Supply voltage, DC24V
	Blue GND	Power supply 0V
Black OSSD1	Black OSSD1	Safety output 1: NPN/PNP (can be directly into PLC, safety relay)
	White OSSD2	Safety output 2: NPN/PNP (can be directly into PLC, safety relay)

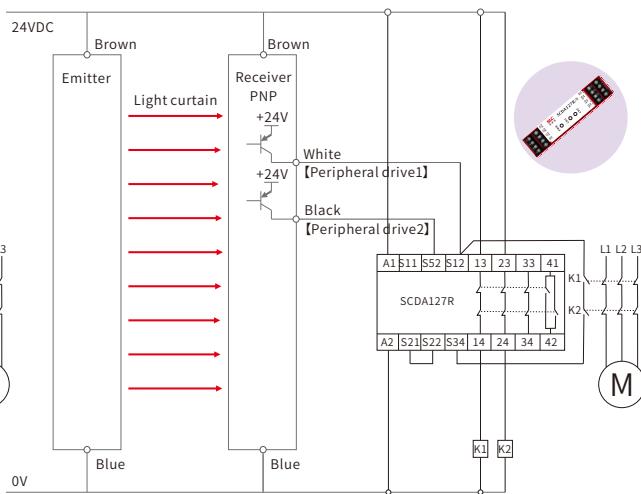
**Caution**

- ◆ Please connect the dual outputs to the control safety system of the device, if the der output will not reach the safety level.
- ◆ Make sure the wiring is performed when the power is off.
- ◆ Make sure that the power supply voltage does not change beyond the rated range.
- ◆ Do not run the wire with or within the same line with the high voltage or power line, which may cause failure due to induction.
- ◆ Do not use for a short period (2s) after the power is turned on.
- ◆ Avoid dust, dirt and water vapor. Do not come into direct contact with water, oil, grease or organic solutions such as thinners.
- ◆ Do not expose the light curtain directly to the fluorescence of a quick-start lamp or high-frequency lighting equipment, which can affect detection performance.
- ◆ If possible, the light curtain is installed insulated as much as possible.

LCS (NPN) with SCDA127R/N application wiring diagram

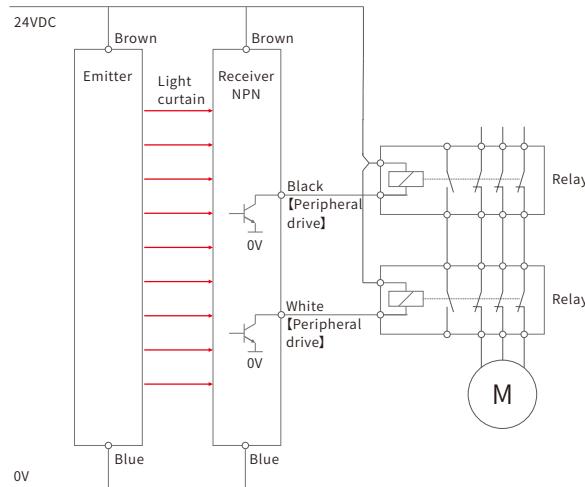


LCS (PNP) with SCDA127R application wiring diagram

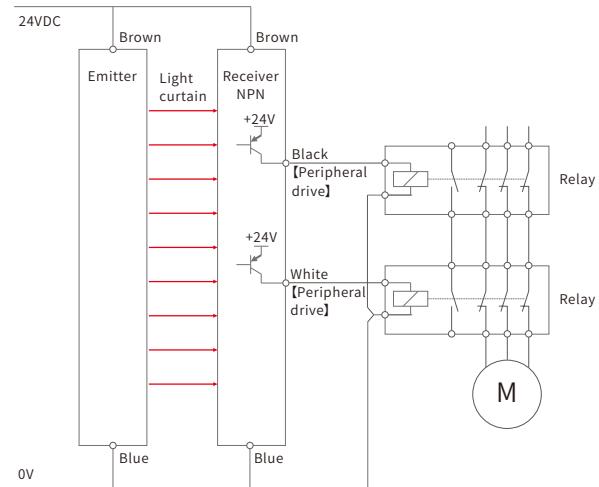


## LCS SERIES MINIATURE SAFETY LIGHT CURTAINS

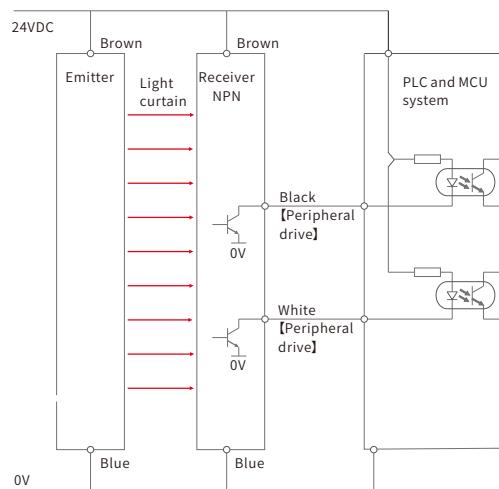
LCS (NPN) with application wiring diagram with relays



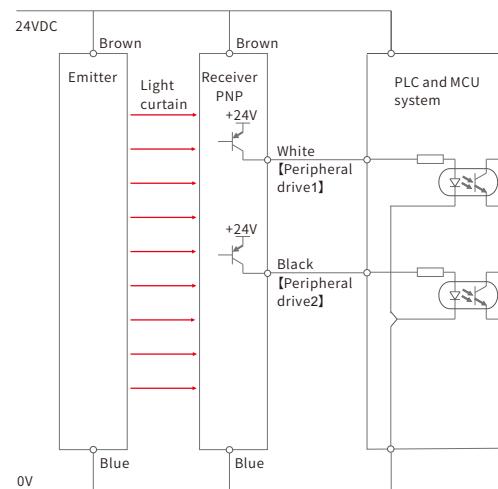
LCS (PNP) with application wiring diagram with relays



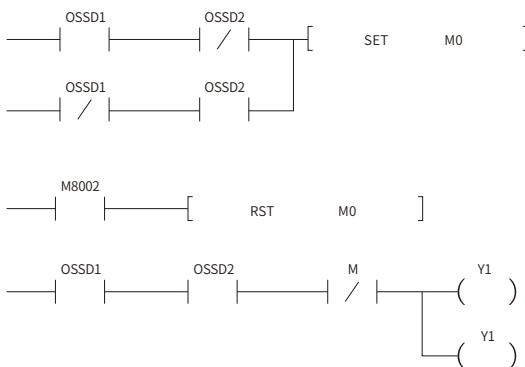
LCS (NPN) with PLC application wiring diagram



LCS (PNP) with PLC application wiring diagram



### LCS series miniature safety light curtain connected to PLC (Mitsubishi) programming reference program



PLC signal logic status truth table

OSSD1 Input	OSSD2 Input	Y1 Output	Y2 Output	Light curtains working state
0	0	0	0	Light curtains shading, Normal working
0	1	0	0	Fault
1	0	0	0	Fault
1	1	1	1	light curtain light, normal operation

\* OSSD1/2 input refers to the light curtain output to the PLC signal

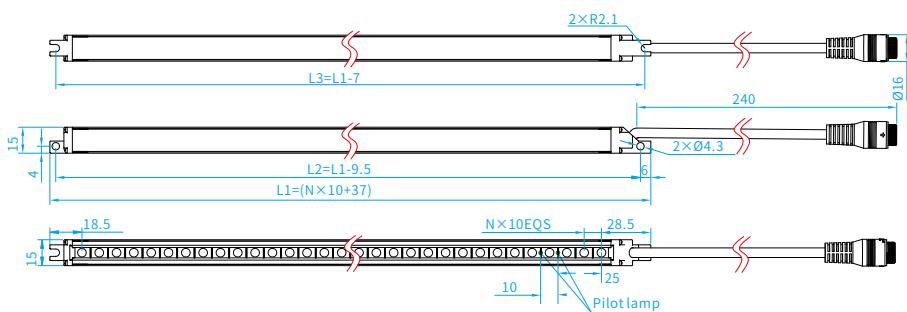
Y1/Y2 refers to the output signal after PLC processing OSSD1/2;

0 indicates Off, and 1 indicates On-on.

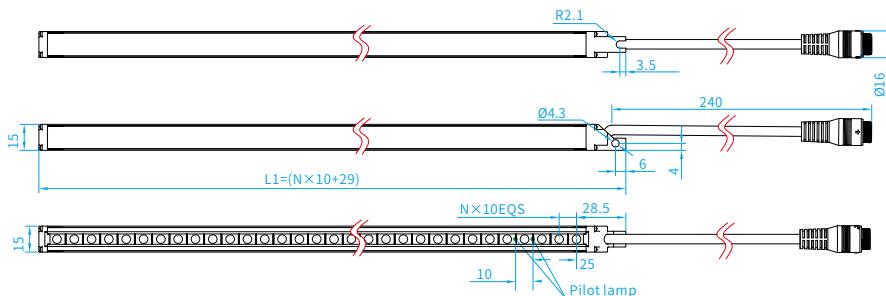
## LCS light curtain selection and installation size

### ◆ 10 series installation and dimensional drawing

- Two-end installation: 10LCS□□□□-□□□□A



- Back mounting (optional back mounting bracket): 10LCS□□□□-□□□□C



Subject to product configuration and manufacturing process, the actual product size and weight may be different, please refer to the actual product

## LCS SERIES MINIATURE SAFETY LIGHT CURTAINS

## ◆ 10 Series (Optical Axis Spacing: 10mm, Resolution: 14mm)

10LCS Safety light curtain: A- double end mounting (standard) C- Back bracket mounting (custom)			Number of optical axes	Response time (ms)	Protection height (mm)	A-type overall dimensions (mm)	C-shaped overall length (mm)
Emitter	PNP type reception	NPN type reception					
10LCS0120-E011A□□	10LCS0120-PR011A□□	10LCS0120-NR011A□□	11	7	120	15×15×147	139
10LCS0160-E015A□□	10LCS0160-PR015A□□	10LCS0160-NR015A□□	15	9	160	15×15×187	179
10LCS0200-E019A□□	10LCS0200-PR019A□□	10LCS0200-NR019A□□	19	10	200	15×15×227	219
10LCS0240-E023A□□	10LCS0240-PR023A□□	10LCS0240-NR023A□□	23	11	240	15×15×267	259
10LCS0280-E027A□□	10LCS0280-PR027A□□	10LCS0280-NR027A□□	27	12	280	15×15×307	299
10LCS0320-E031A□□	10LCS0320-PR031A□□	10LCS0320-NR031A□□	31	13	320	15×15×347	339
10LCS0360-E035A□□	10LCS0360-PR035A□□	10LCS0360-NR035A□□	35	14	360	15×15×387	379
10LCS0400-E039A□□	10LCS0400-PR039A□□	10LCS0400-NR039A□□	39	15	400	15×15×427	419
10LCS0440-E043A□□	10LCS0440-PR043A□□	10LCS0440-NR043A□□	43	16	440	15×15×467	459
10LCS0480-E047A□□	10LCS0480-PR047A□□	10LCS0480-NR047A□□	47	17	480	15×15×507	499
10LCS0520-E051A□□	10LCS0520-PR051A□□	10LCS0520-NR051A□□	51	18	520	15×15×547	539
10LCS0560-E055A□□	10LCS0560-PR055A□□	10LCS0560-NR055A□□	55	19	560	15×15×587	579
10LCS0600-E059A□□	10LCS0600-PR059A□□	10LCS0600-NR059A□□	59	20	600	15×15×627	619
10LCS0640-E063A□□	10LCS0640-PR063A□□	10LCS0640-NR063A□□	63	21	640	15×15×667	659
10LCS0680-E067A□□	10LCS0680-PR067A□□	10LCS0680-NR067A□□	67	23	680	15×15×707	699
10LCS0720-E071A□□	10LCS0720-PR071A□□	10LCS0720-NR071A□□	71	24	720	15×15×747	739
10LCS0760-E075A□□	10LCS0760-PR075A□□	10LCS0760-NR075A□□	75	25	760	15×15×787	779
10LCS0800-E079A□□	10LCS0800-PR079A□□	10LCS0800-NR079A□□	79	26	800	15×15×827	819
10LCS0840-E083A□□	10LCS0840-PR083A□□	10LCS0840-NR083A□□	83	27	840	15×15×867	859
10LCS0880-E087A□□	10LCS0880-PR087A□□	10LCS0880-NR087A□□	87	28	880	15×15×907	899
10LCS0920-E091A□□	10LCS0920-PR091A□□	10LCS0920-NR091A□□	91	29	920	15×15×947	939
10LCS0960-E095A□□	10LCS0960-PR095A□□	10LCS0960-NR095A□□	95	30	960	15×15×987	979
10LCS1000-E099A□□	10LCS1000-PR099A□□	10LCS1000-NR099A□□	99	31	1000	15×15×1027	1019
10LCS1040-E103A□□	10LCS1040-PR103A□□	10LCS1040-NR103A□□	103	32	1040	15×15×1067	1059
10LCS1080-E107A□□	10LCS1080-PR107A□□	10LCS1080-NR107A□□	107	33	1080	15×15×1107	1099
10LCS1120-E111A□□	10LCS1120-PR111A□□	10LCS1120-NR111A□□	111	34	1120	15×15×1147	1139
10LCS1160-E115A□□	10LCS1160-PR115A□□	10LCS1160-NR115A□□	115	36	1160	15×15×1187	1179
10LCS1200-E119A□□	10LCS1200-PR119A□□	10LCS1200-NR119A□□	119	37	1200	15×15×1227	1219
10LCS1240-E123A□□	10LCS1240-PR123A□□	10LCS1240-NR123A□□	123	38	1240	15×15×1267	1259
10LCS1280-E127A□□	10LCS1280-PR127A□□	10LCS1280-NR127A□□	127	39	1280	15×15×1307	1299
10LCS1320-E131A□□	10LCS1320-PR131A□□	10LCS1320-NR131A□□	131	40	1320	15×15×1347	1339
10LCS1360-E135A□□	10LCS1360-PR135A□□	10LCS1360-NR135A□□	135	41	1360	15×15×1387	1379
10LCS1400-E139A□□	10LCS1400-PR139A□□	10LCS1400-NR139A□□	139	42	1400	15×15×1427	1419
10LCS1440-E143A□□	10LCS1440-PR143A□□	10LCS1440-NR143A□□	143	43	1440	15×15×1467	1459
10LCS1480-E147A□□	10LCS1480-PR147A□□	10LCS1480-NR147A□□	147	44	1480	15×15×1507	1499
10LCS1520-E151A□□	10LCS1520-PR151A□□	10LCS1520-NR151A□□	151	45	1520	15×15×1547	1539
10LCS1560-E155A□□	10LCS1560-PR155A□□	10LCS1560-NR155A□□	155	46	1560	15×15×1587	1579
10LCS1600-E159A□□	10LCS1600-PR159A□□	10LCS1600-NR159A□□	159	47	1600	15×15×1627	1619
10LCS1640-E163A□□	10LCS1640-PR163A□□	10LCS1640-NR163A□□	163	48	1640	15×15×1667	1659
10LCS1680-E167A□□	10LCS1680-PR167A□□	10LCS1680-NR167A□□	167	50	1680	15×15×1707	1699
10LCS1720-E171A□□	10LCS1720-PR171A□□	10LCS1720-NR171A□□	171	51	1720	15×15×1747	1739
10LCS1760-E175A□□	10LCS1760-PR175A□□	10LCS1760-NR175A□□	175	52	1760	15×15×1787	1779
10LCS1800-E179A□□	10LCS1800-PR179A□□	10LCS1800-NR179A□□	179	53	1800	15×15×1827	1819
10LCS1840-E183A□□	10LCS1840-PR183A□□	10LCS1840-NR183A□□	183	54	1840	15×15×1867	1859
10LCS1880-E187A□□	10LCS1880-PR187A□□	10LCS1880-NR187A□□	187	55	1880	15×15×1907	1899
10LCS1920-E191A□□	10LCS1920-PR191A□□	10LCS1920-NR191A□□	191	56	1920	15×15×1947	1939

n Number of light spots

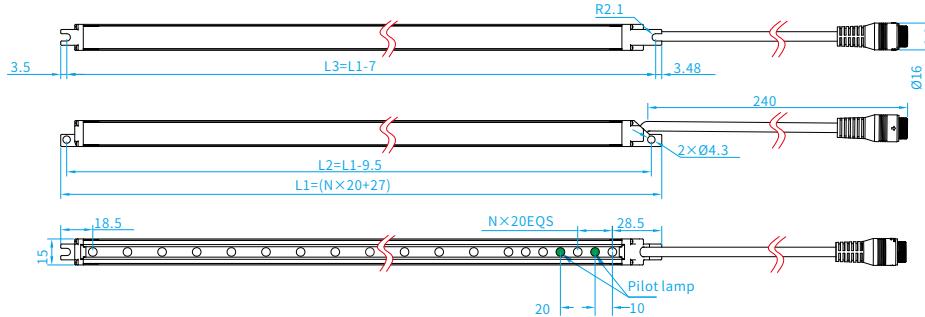
The above specifications are some of the models

Protection height: the effective height of the test rod (diameter is the degree of spacing) = (n+1) × optical axis spacing can be detected

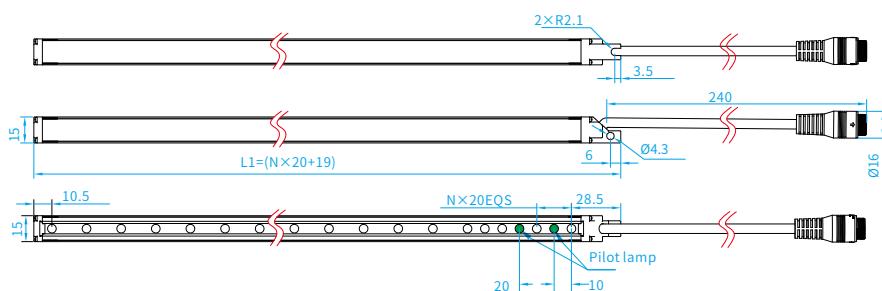
The cable needs to be purchased separately, and the standard delivery is 3M, and other degrees 4.5M, 6M, and 10M need to be remarked.

### ◆ 20 series installation and dimensional drawing

- Two-end installation: 20LCS□□□□-□□□□A



- Back mounting (optional back mounting bracket): 20LCS□□□□-□□□□C



### ◆ 20 Series (Optical Axis Spacing: 20mm, Resolution: 25mm)

20LCS Safety light curtain: A- double end mounting (standard) C- Back bracket mounting (custom)			Number of optical laxes	Response time (ms)	Protection height (mm)	A-type overall dimensions (mm)	C-shaped overall length (mm)
Emitter	PNP type reception	NPN type reception					
20LCS0180-E008A□□	20LCS0180-PR008A□□	20LCS0180-NR008A□□	8	7	180	15×15×187	179
20LCS0260-E012A□□	20LCS0260-PR012A□□	20LCS0260-NR012A□□	12	8	260	15×15×267	259
20LCS0340-E016A□□	20LCS0340-PR016A□□	20LCS0340-NR016A□□	16	9	340	15×15×347	339
20LCS0420-E020A□□	20LCS0420-PR020A□□	20LCS0420-NR020A□□	20	10	420	15×15×427	419
20LCS0500-E024A□□	20LCS0500-PR024A□□	20LCS0500-NR024A□□	24	11	500	15×15×507	499
20LCS0580-E028A□□	20LCS0580-PR028A□□	20LCS0580-NR028A□□	28	12	580	15×15×587	579
20LCS0660-E032A□□	20LCS0660-PR032A□□	20LCS0660-NR032A□□	32	13	660	15×15×667	659
20LCS0740-E036A□□	20LCS0740-PR036A□□	20LCS0740-NR036A□□	36	14	740	15×15×747	739
20LCS0820-E040A□□	20LCS0820-PR040A□□	20LCS0820-NR040A□□	40	15	820	15×15×827	819
20LCS0900-E044A□□	20LCS0900-PR044A□□	20LCS0900-NR044A□□	44	16	900	15×15×907	899
20LCS0980-E048A□□	20LCS0980-PR048A□□	20LCS0980-NR048A□□	48	17	980	15×15×987	979
20LCS1060-E052A□□	20LCS1060-PR052A□□	20LCS1060-NR052A□□	52	19	1060	15×15×1067	1059
20LCS1140-E056A□□	20LCS1140-PR056A□□	20LCS1140-NR056A□□	56	20	1140	15×15×1147	1139
20LCS1220-E060A□□	20LCS1220-PR060A□□	20LCS1220-NR060A□□	60	21	1220	15×15×1227	1219
20LCS1300-E064A□□	20LCS1300-PR064A□□	20LCS1300-NR064A□□	64	22	1300	15×15×1307	1299
20LCS1380-E068A□□	20LCS1380-PR068A□□	20LCS1380-NR068A□□	68	23	1380	15×15×1387	1379
20LCS1460-E072A□□	20LCS1460-PR072A□□	20LCS1460-NR072A□□	72	24	1460	15×15×1467	1459
20LCS1540-E076A□□	20LCS1540-PR076A□□	20LCS1540-NR076A□□	76	25	1540	15×15×1547	1539
20LCS1620-E080A□□	20LCS1620-PR080A□□	20LCS1620-NR080A□□	80	26	1620	15×15×1627	1619
20LCS1700-E084A□□	20LCS1700-PR084A□□	20LCS1700-NR084A□□	84	27	1700	15×15×1707	1699
20LCS1780-E088A□□	20LCS1780-PR088A□□	20LCS1780-NR088A□□	88	28	1780	15×15×1787	1779
20LCS1860-E092A□□	20LCS1860-PR092A□□	20LCS1860-NR092A□□	92	29	1860	15×15×1867	1859
20LCS1940-E096A□□	20LCS1940-PR096A□□	20LCS1940-NR096A□□	96	30	1940	15×15×1947	1939

n Number of light spots

The above specifications are some of the models

Protection height: the effective height of the test rod (diameter is the degree of spacing) = (n+1) × optical axis spacing can be detected

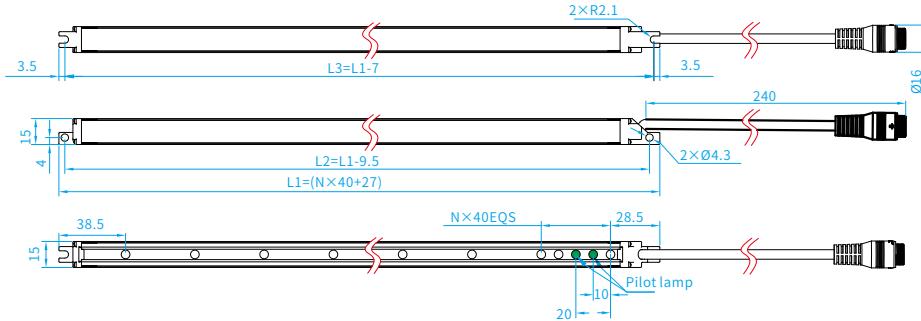
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\*Subject to product configuration and manufacturing process, the actual product size and weight may be different, please refer to the actual product

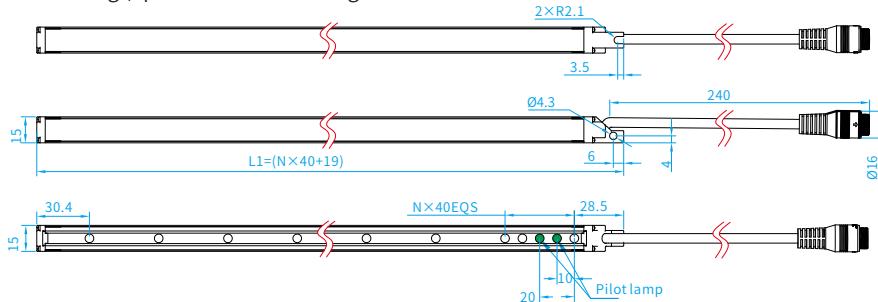
## LCS SERIES MINIATURE SAFETY LIGHT CURTAINS

## ◆ 40 series installation and dimensional drawing

- Two-end installation: 40LCS□□□□-□□□□A



- Back mounting (optional back mounting bracket): 40LCS□□□□-□□□□C



## ◆ 40 Series (Optical Axis Spacing: 40mm, Resolution: 45mm)

40LCS Safety light curtain: A- double end mounting (standard) C- Back bracket mounting (custom)			Number of optical axes	Response time (ms)	Protection height (mm)	A-type overall dimensions (mm)	C-shaped overall length (mm)
Emitter	PNP type reception	NPN type reception					
40LCS0200-E004A□□	40LCS0200-PR004A□□	40LCS0200-NR004A□□	4	6	200	15×15×187	179
40LCS0280-E006A□□	40LCS0280-PR006A□□	40LCS0280-NR006A□□	6	6	280	15×15×267	259
40LCS0360-E008A□□	40LCS0360-PR008A□□	40LCS0360-NR008A□□	8	7	360	15×15×347	339
40LCS0440-E010A□□	40LCS0440-PR010A□□	40LCS0440-NR010A□□	10	7	440	15×15×427	419
40LCS0520-E012A□□	40LCS0520-PR012A□□	40LCS0520-NR012A□□	12	8	520	15×15×507	499
40LCS0600-E014A□□	40LCS0600-PR014A□□	40LCS0600-NR014A□□	14	8	600	15×15×587	579
40LCS0680-E016A□□	40LCS0680-PR016A□□	40LCS0680-NR016A□□	16	9	680	15×15×667	659
40LCS0760-E018A□□	40LCS0760-PR018A□□	40LCS0760-NR018A□□	18	9	760	15×15×747	739
40LCS0840-E020A□□	40LCS0840-PR020A□□	40LCS0840-NR020A□□	20	10	840	15×15×827	819
40LCS0920-E022A□□	40LCS0920-PR022A□□	40LCS0920-NR022A□□	22	10	920	15×15×907	899
40LCS1000-E024A□□	40LCS1000-PR024A□□	40LCS1000-NR024A□□	24	11	1000	15×15×987	979
40LCS1080-E026A□□	40LCS1080-PR026A□□	40LCS1080-NR026A□□	26	12	1080	15×15×1067	1059
40LCS1160-E028A□□	40LCS1160-PR028A□□	40LCS1160-NR028A□□	28	12	1160	15×15×1147	1139
40LCS1240-E030A□□	40LCS1240-PR030A□□	40LCS1240-NR030A□□	30	13	1240	15×15×1227	1219
40LCS1320-E032A□□	40LCS1320-PR032A□□	40LCS1320-NR032A□□	32	13	1320	15×15×1307	1299
40LCS1400-E034A□□	40LCS1400-PR034A□□	40LCS1400-NR034A□□	34	14	1400	15×15×1387	1379
40LCS1480-E036A□□	40LCS1480-PR036A□□	40LCS1480-NR036A□□	36	14	1480	15×15×1467	1459
40LCS1560-E038A□□	40LCS1560-PR038A□□	40LCS1560-NR038A□□	38	15	1560	15×15×1547	1539
40LCS1640-E040A□□	40LCS1640-PR040A□□	40LCS1640-NR040A□□	40	15	1640	15×15×1627	1619
40LCS1720-E042A□□	40LCS1720-PR042A□□	40LCS1720-NR042A□□	42	16	1720	15×15×1707	1699
40LCS1800-E044A□□	40LCS1800-PR044A□□	40LCS1800-NR044A□□	44	16	1800	15×15×1787	1779
40LCS1880-E046A□□	40LCS1880-PR046A□□	40LCS1880-NR046A□□	46	17	1880	15×15×1867	1859
40LCS1960-E048A□□	40LCS1960-PR048A□□	40LCS1960-NR048A□□	48	17	1960	15×15×1947	1939

n Number of light spots

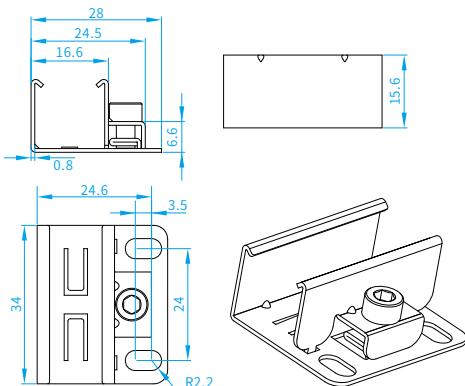
The above specifications are some of the models

Protection height: the effective height of the test rod (diameter is the degree of spacing) = (n+1) × optical axis spacing can be detected

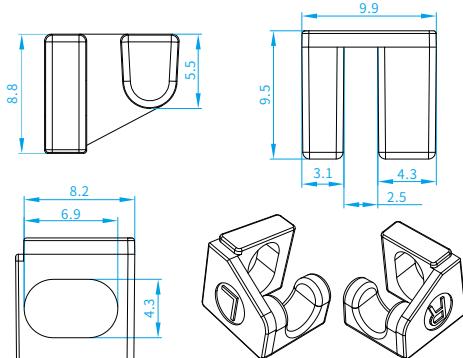
The cable needs to be purchased separately, and the standard delivery is 3M, and other degrees 4.5M, 6M, and 10M need to be remarked

Subject to product configuration and manufacturing process, the actual product size and weight may be different, please refer to the actual product

◆ LCS series back mounting bracket size



◆ Dimensions of the LCS end cover support block



\*The left and right support blocks are the same size

LCS safety light curtain accessories selection table

Parets name	Type	Picture/order number	Dimension	Qty	Naming rules for cable models
LCS back mounting bracket	LCSZJ-S1	LCS253424-S1	See above	Optional	
LCS end cover support block(L)	LCSZJ-BL	LCS089908-BL	See above	2	
LCS end cover support block(R)	LCSZJ-BR	LCS089908-BR	See above	2	
LCS receiving end 5-core cable	LCS4035			1	Product Series: LCS Number of cores: 20:3-core with shielding Length: 35:3.5m 100:10m
LCS receiving end 3-core cable	LCS2035			1	

Note: Accessories need to be purchased, cable length can be customized according to actual requirements

Subject to product configuration and manufacturing process, the actual product size and weight may be different, please refer to the actual product

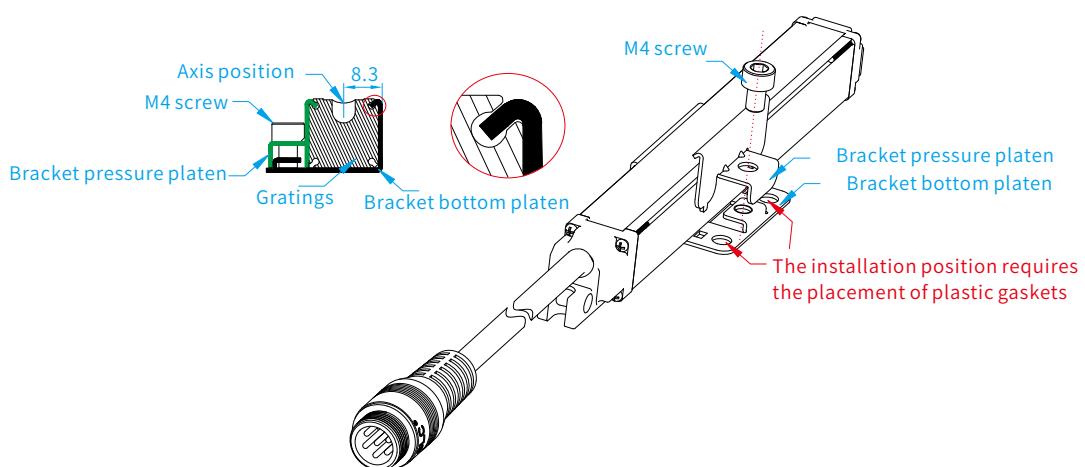
## ➤ LCS series safety light curtain back mounting bracket installation method

Hang the bracket bottom plate hook into the groove on the upper edge of the light curtain hell on one side, and attach it to the light curtain shell;

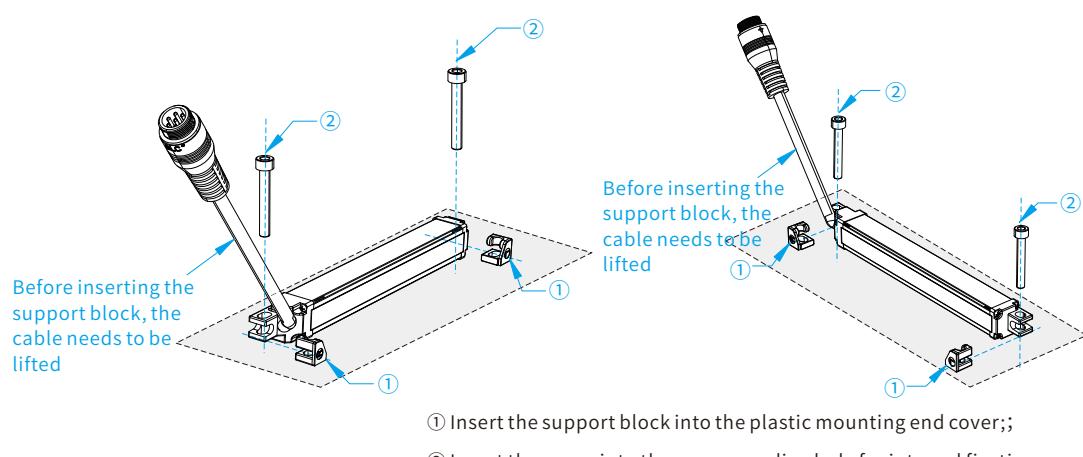
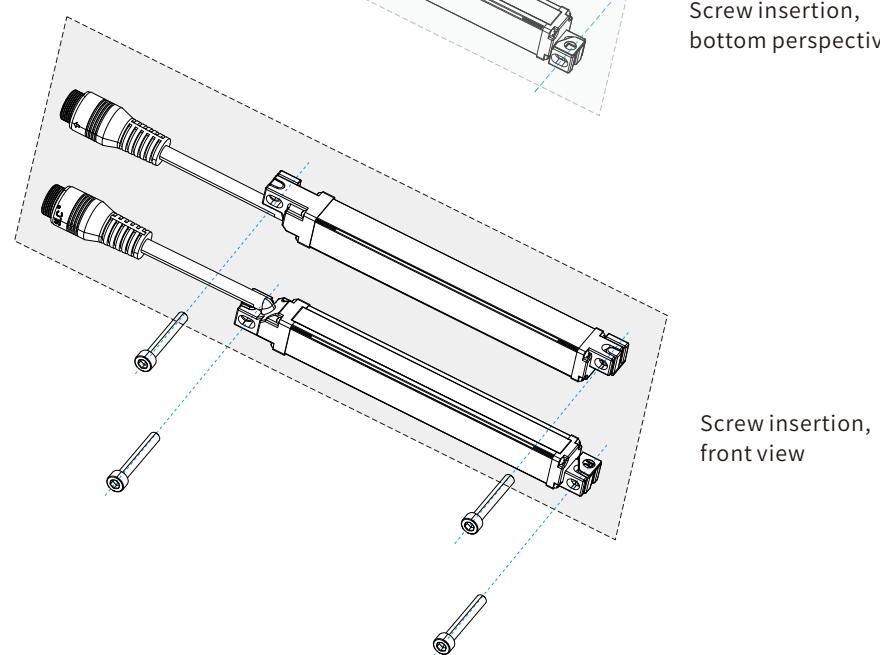
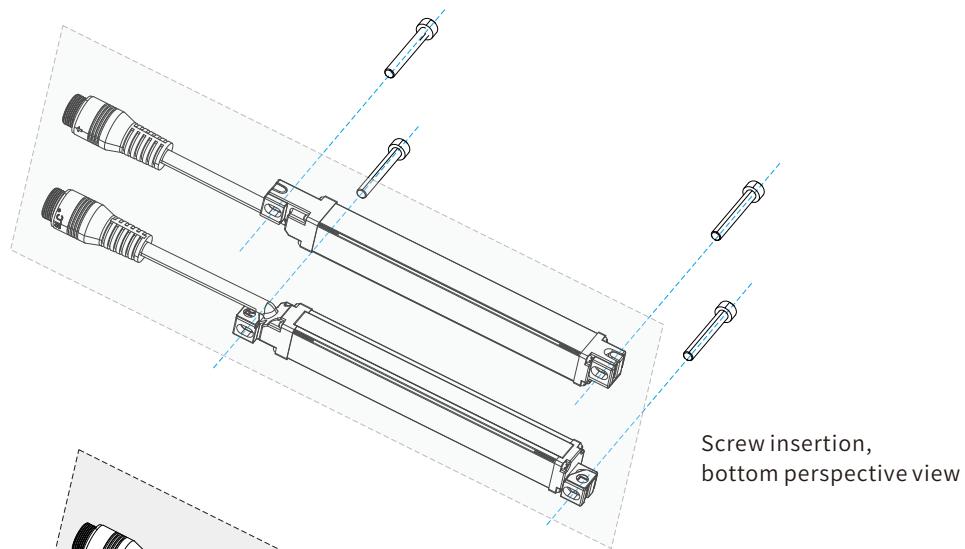
Hang the bracket pressure plate hook into the groove on the upper edge of the other side of the grating shell, stick to the light curtain shell, and insert the lower two bosses into the corresponding holes of the bracket bottom plate;

Use the matching M4 screw to lock the bracket pressure plate and the bracket bottom plate firmly;

Finally, use the self-provided M4 or M3 screws and the matching M4 plastic gasket to fix the installed light curtain and bracket assembly into the use environment through the two Ø4.3 holes of the bracket bottom plate.



## > LCS series safety light curtain end cover support block use instructions



\*LCS support block is limited to the use of □□LCS□□□□-□□□□A model plastic end cover safety light curtain.