



# LS4, LS4\_K, LS4\_H series

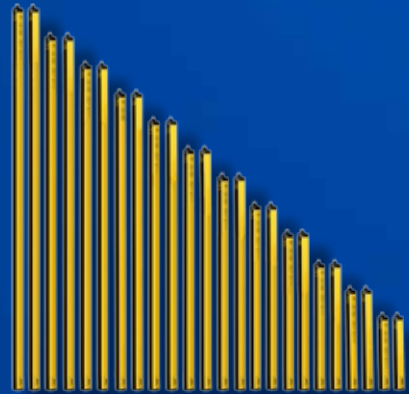
Light Curtains

Type 4 according to IEC 61496-1 and IEC 61496-2



## features

- Compact housing (28 x 30 mm) and no dead zone on cap side
- Resolution 14 mm for finger protection, 20, 30, 40 mm for hand protection, 50, 90 mm for presence control and 2, 3, 4 beams for body protection/access control
- Controlled distance up to: 3, 4, 6, 10, 12 m
- Base, Standard versions and Master, Slave version to connect up to 3 sets in cascade configuration
- Selectable Automatic/Manual Restart and EDM integrated functions (Standard models)
- Selectable controlled distance
- IP69K protection models (LS4\_K) and models with integrated heating system to reach -25°C operating temperature (LS4\_H)
- Standard M12 da 5 and 8 poles connectors



## web contents

- Application notes
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Light Curtains  
Type 4

## code description

LS4 ER / 30 - 015

series	LS4	Type 4 safety light curtains 28 x 30 mm compact housing
E/R	ER	Emitter / Receiver couple
beams	14	Light grid, 14 mm resolution, finger protection
	20	Light grid, 20 mm resolution, hand protection
	30	Light grid, 30 mm resolution, hand protection
	40	Light grid, 40 mm resolution, hand protection
	50	Light grid, 50 mm resolution, presence control
	90	Light grid, 90 mm resolution, presence control
	0A	2 beams; body protection, 500 mm resolution
	0B	3 beams; body protection, 400 mm resolution
	0C	4 beams; body protection, 300 mm resolution
area	015-180	Protected height from 150 to 1,800 mm (light grids)
	050-090	Protected height 500, 800, 900 mm (multiple light beams)
model		Standard model with selectable MANUAL/AUTOMATIC Restart and EDM functions
	B	Base model with integrated AUTOMATIC Restart
	M	Master Model with selectable functions
	S	Intermediate Slave model
	F	Final Slave model
distance		Controlled distance
	L	Extended range
models		IP65 and IP67 protection, 10° ... 55 °C operating temperature
	K	Models in transparent cylindrical housing, IP69K, suitable for applications in the food industry. Resistance to washing with water at 100 bar, 80 ° C Housing in PMMA, caps in POM C with silicone seals. Brackets in stainless steel AISI 316L. Operating temperature -10 ... 55 ° C
	H	Models in transparent cylindrical casing, IP69K protection, thermostated, suitable for applications in the food industry. Resistance to washing with water at 100 bar, 80 ° C Housing in PMMA, POM C caps and silicone seals. Brackets in stainless steel AISI 316L. Operating temperature -25 ... 55 ° C

LS4; LS4\_K;  
LS4\_H

## available models

14 mm resolution; 0...3 / 1...6 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
144	15	4	LS4ER/14-015B
			LS4ER/14-015
			LS4ER/14-015F
294	30	5.5	LS4ER/14-030B
			LS4ER/14-030
			LS4ER/14-030M
			LS4ER/14-030F
			LS4ER/14-030S
			LS4ER/14-045B
444	45	7.5	LS4ER/14-045
			LS4ER/14-045M
			LS4ER/14-045F
			LS4ER/14-045S
594	60	9	LS4ER/14-060B
			LS4ER/14-060
			LS4ER/14-060M
			LS4ER/14-060F
			LS4ER/14-060S
744	75	11	LS4ER/14-075B
			LS4ER/14-075
			LS4ER/14-075M
			LS4ER/14-075F
			LS4ER/14-075S
894	90	13	LS4ER/14-090B
			LS4ER/14-090
			LS4ER/14-090M
			LS4ER/14-090F
			LS4ER/14-090S
1,044	105	14.5	LS4ER/14-105B
			LS4ER/14-105
			LS4ER/14-105M
			LS4ER/14-105F
			LS4ER/14-105S
1,194	120	16.5	LS4ER/14-120B
			LS4ER/14-120
			LS4ER/14-120M
			LS4ER/14-120F
			LS4ER/14-120S
1,344	135	18	LS4ER/14-135B
			LS4ER/14-135
			LS4ER/14-135M
			LS4ER/14-135F
			LS4ER/14-135S
1,494	150	20	LS4ER/14-150B
			LS4ER/14-150
			LS4ER/14-150M
			LS4ER/14-150F
			LS4ER/14-150S

## available models

20 mm resolution; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
144	15	4	LS4ER/20-015BL
			LS4ER/20-015BL
294	30	5.5	LS4ER/20-030BL
			LS4ER/20-030L
444	45	7.5	LS4ER/20-045BL
			LS4ER/20-045L
594	60	9	LS4ER/20-060BL
			LS4ER/20-060L
744	75	11	LS4ER/20-075BL
			LS4ER/20-075L
894	90	13	LS4ER/20-090BL
			LS4ER/20-090L
1,044	105	14.5	LS4ER/20-105BL
			LS4ER/20-105L
1,194	120	16.5	LS4ER/120BL
			LS4ER/120L
1,344	135	18	LS4ER/135BL
			LS4ER/135L
1,494	150	20	LS4ER/150BL
			LS4ER/150L

## available models

30 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	8	4	LS4ER/30-015B
			LS4ER/30-015
			LS4ER/30-015F
310	16	5.5	LS4ER/30-030B
			LS4ER/30-030
			LS4ER/30-030M
			LS4ER/30-030F
			LS4ER/30-030S
			LS4ER/30-045B
460	23	7.5	LS4ER/30-045
			LS4ER/30-045M
			LS4ER/30-045F
			LS4ER/30-045S
			LS4ER/30-060B
610	31	9	LS4ER/30-060
			LS4ER/30-060M
			LS4ER/30-060F
			LS4ER/30-060S
			LS4ER/30-075B
			LS4ER/30-075
760	38	10.5	LS4ER/30-075M
			LS4ER/30-075F
			LS4ER/30-075S
			LS4ER/30-090B
			LS4ER/30-090
910	46	12.5	LS4ER/30-090M
			LS4ER/30-090F
			LS4ER/30-090S
			LS4ER/30-105B
			LS4ER/30-105
1,060	53	14	LS4ER/30-105M
			LS4ER/30-105F
			LS4ER/30-105S
			LS4ER/30-120B
1,210	61	15.5	LS4ER/30-120
			LS4ER/30-120M
			LS4ER/30-120F
			LS4ER/30-120S
			LS4ER/30-135B
1,360	68	17	LS4ER/30-135
			LS4ER/30-135M
			LS4ER/30-135F
			LS4ER/30-135S
			LS4ER/30-150B
1,510	76	19	LS4ER/30-150
			LS4ER/30-150M
			LS4ER/30-150F
			LS4ER/30-150S
1,660	83	20.5	LS4ER/30-165
1,810	91	22	LS4ER/30-180

## available models

30 mm resolution; 0...10 / 0...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	8	3	LS4ER/30-015BL
			LS4ER/30-015L
310	16	4	LS4ER/30-030BL
			LS4ER/30-030L
460	23	5	LS4ER/30-045BL
			LS4ER/30-045L
610	31	6	LS4ER/30-060BL
			LS4ER/30-060L
760	38	6.5	LS4ER/30-075BL
			LS4ER/30-075L
910	46	7.5	LS4ER/30-090BL
			LS4ER/30-090L
1,060	53	8.5	LS4ER/30-105BL
			LS4ER/30-105L
1,210	61	9.5	LS4ER/30-120BL
			LS4ER/30-120L
1,360	68	10	LS4ER/30-135BL
			LS4ER/30-135L
1,510	76	11	LS4ER/30-150BL
			LS4ER/30-150L
1,660	83	12	LS4ER/30-165L
1,810	91	13	LS4ER/30-180L

## available models

40 mm; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	6	3.5	LS4ER/40-015B
			LS4ER/40-015
			LS4ER/40-015M
			LS4ER/40-015F
			LS4ER/40-015S
310	11	4.5	LS4ER/40-030B
			LS4ER/40-030
			LS4ER/40-030M
			LS4ER/40-030F
			LS4ER/40-030S
460	16	5.5	LS4ER/40-045B
			LS4ER/40-045
			LS4ER/40-045M
			LS4ER/40-045F
			LS4ER/40-045S

## available models

40 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
610	21	7	LS4ER/40-060B
			LS4ER/40-060
			LS4ER/40-060M
			LS4ER/40-060F
			LS4ER/40-060S
760	26	8	LS4ER/40-075B
			LS4ER/40-075
			LS4ER/40-075M
			LS4ER/40-075F
			LS4ER/40-075S
910	31	9	LS4ER/40-090B
			LS4ER/40-090
			LS4ER/40-090M
			LS4ER/40-090F
			LS4ER/40-090S
1,060	36	10	LS4ER/40-105B
			LS4ER/40-105
			LS4ER/40-105M
			LS4ER/40-105F
			LS4ER/40-105S
1,210	41	11	LS4ER/40-120B
			LS4ER/40-120
			LS4ER/40-120M
			LS4ER/40-120F
			LS4ER/40-120S
1,360	46	12.5	LS4ER/40-135B
			LS4ER/40-135
			LS4ER/40-135M
			LS4ER/40-135F
			LS4ER/40-135S
1,510	51	13.5	LS4ER/40-150B
			LS4ER/40-150
			LS4ER/40-150M
			LS4ER/40-150F
			LS4ER/40-150S

## available models

40 mm resolution; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	6	3	LS4ER/40-015BL
			LS4ER/40-015L
310	11	3.5	LS4ER/40-030BL
			LS4ER/40-030L
460	16	4	LS4ER/40-045BL
			LS4ER/40-045L
610	21	4.5	LS4ER/40-060BL
			LS4ER/40-060L
760	26	5	LS4ER/40-075BL
			LS4ER/40-075L
910	31	6	LS4ER/40-090BL
			LS4ER/40-090L
1,060	36	6.5	LS4ER/40-105BL
			LS4ER/40-105L
1,210	41	7	LS4ER/40-120BL
			LS4ER/40-120L
1,360	46	7.5	LS4ER/40-135BL
			LS4ER/40-135L
1,510	51	8	LS4ER/40-150BL
			LS4ER/40-150L

## available models

50 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	4	3	LS4ER/50-015B
			LS4ER/50-015
			LS4ER/50-015M
			LS4ER/50-015F
			LS4ER/50-015S
310	8	4	LS4ER/50-030B
			LS4ER/50-030
			LS4ER/50-030M
			LS4ER/50-030F
			LS4ER/50-030S

## available models

50 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
460	12	4.5	LS4ER/50-045B
			LS4ER/50-045
			LS4ER/50-045M
			LS4ER/50-045F
			LS4ER/50-045S
610	16	5.5	LS4ER/50-060B
			LS4ER/50-060
			LS4ER/50-060M
			LS4ER/50-060F
			LS4ER/50-060S
760	20	6.5	LS4ER/50-075B
			LS4ER/50-075
			LS4ER/50-075M
			LS4ER/50-075F
			LS4ER/50-075S
910	24	7.5	LS4ER/50-090B
			LS4ER/50-090
			LS4ER/50-090M
			LS4ER/50-090F
			LS4ER/50-090S
1,060	28	8.5	LS4ER/50-105B
			LS4ER/50-105
			LS4ER/50-105M
			LS4ER/50-105F
			LS4ER/50-105S
1,210	32	9.5	LS4ER/50-120B
			LS4ER/50-120
			LS4ER/50-120M
			LS4ER/50-120F
			LS4ER/50-120S
1,360	36	10	LS4ER/50-135B
			LS4ER/50-135
			LS4ER/50-135M
			LS4ER/50-135F
			LS4ER/50-135S
1,510	40	11	LS4ER/50-150B
			LS4ER/50-150
			LS4ER/50-150M
			LS4ER/50-150F
			LS4ER/50-150S

## available models

50 mm resolution; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	4	2.5	LS4ER/50-015BL
			LS4ER/50-015L
310	8	3	LS4ER/50-030BL
			LS4ER/50-030L
460	12	3.5	LS4ER/50-045BL
			LS4ER/50-045L
610	16	4	LS4ER/50-060BL
			LS4ER/50-060L
760	20	4.5	LS4ER/50-075BL
			LS4ER/50-075L
910	24	5	LS4ER/50-090BL
			LS4ER/50-090L
1,060	28	5.5	LS4ER/50-105BL
			LS4ER/50-105L
1,210	32	6	LS4ER/50-120BL
			LS4ER/50-120L
1,360	36	6.5	LS4ER/50-135BL
			LS4ER/50-135L
1,510	40	7	LS4ER/50-150BL
			LS4ER/50-150L

## available models

90 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
310	4	3	LS4ER/90-030B
			LS4ER/90-030
			LS4ER/90-030M
			LS4ER/90-030F
			LS4ER/90-030S
460	6	3.5	LS4ER/90-045B
			LS4ER/90-045
			LS4ER/90-045M
			LS4ER/90-045F
			LS4ER/90-045S
610	8	4	LS4ER/90-060B
			LS4ER/90-060
			LS4ER/90-060M
			LS4ER/90-060F
			LS4ER/90-060S

## available models

90 mm resolution; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
760	10	4.5	LS4ER/90-075B
			LS4ER/90-075
			LS4ER/90-075M
			LS4ER/90-075F
			LS4ER/90-075S
910	12	5	LS4ER/90-090B
			LS4ER/90-090
			LS4ER/90-090M
			LS4ER/90-090F
			LS4ER/90-090S
1,060	14	5.5	LS4ER/90-105B
			LS4ER/90-105
			LS4ER/90-105M
			LS4ER/90-105F
			LS4ER/90-105S
1,210	16	5.5	LS4ER/90-120B
			LS4ER/90-120
			LS4ER/90-120M
			LS4ER/90-120F
			LS4ER/90-120S
1,360	18	6	LS4ER/90-135B
			LS4ER/90-135
			LS4ER/90-135M
			LS4ER/90-135F
			LS4ER/90-135S
1,510	20	6.5	LS4ER/90-150B
			LS4ER/90-150
			LS4ER/90-150M
			LS4ER/90-150F
			LS4ER/90-150S

## available models

90 mm resolution; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
310	4	2.5	LS4ER/90-030BL
			LS4ER/90-030L
460	6	3	LS4ER/90-045BL
			LS4ER/90-045L
610	8	3	LS4ER/90-060BL
			LS4ER/90-060L
760	10	3.5	LS4ER/90-075BL
			LS4ER/90-075L
910	12	3.5	LS4ER/90-090BL
			LS4ER/90-090L
1,060	14	3.5	LS4ER/90-105BL
			LS4ER/90-105L
1,210	16	4	LS4ER/90-120BL
			LS4ER/90-120L
1,360	18	4	LS4ER/90-135BL
			LS4ER/90-135L
1,510	20	4.5	LS4ER/90-150BL
			LS4ER/90-150L

## available models

resolution 2,3,4 beams; 0...4 / 0...12 m controlled distance

protected height (mm)	n° of beams	distance betw. beams (mm)	response time (ms)	series
510	2	500	2.5	LS4ER/0A-050B
				LS4ER/0A-050
				LS4ER/0A-050M
				LS4ER/0A-050F
				LS4ER/0A-050S
810	3	800	3	LS4ER/0B-080B
				LS4ER/0B-080
				LS4ER/0B-080M
				LS4ER/0B-080F
				LS4ER/0B-080S
910	4	900	3	LS4ER/0C-090B
				LS4ER/0C-090
				LS4ER/0C-090M
				LS4ER/0C-090F
				LS4ER/0C-090S

## available models

resolution 2,3,4 beams; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	distance betw. beams (mm)	response time (ms)	series
510	2	500	2.5	LS4ER/0A-050BL
				LS4ER/0A-050L
810	3	800	2.5	LS4ER/0B-080BL
				LS4ER/0B-080L
910	4	900	2.5	LS4ER/0C-090BL
				LS4ER/0C-090L

## available models

14 mm resolution; 0...3 / 1...5 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
144	15	4	LS4ER/14-015K
294	30	5.5	LS4ER/14-030K
444	45	7.5	LS4ER/14-045K
594	60	9	LS4ER/14-060K
744	75	11	LS4ER/14-075K
894	90	13	LS4ER/14-090K
1,044	105	14.5	LS4ER/14-105K
1,194	120	16.5	LS4ER/14-120K
1,344	135	18	LS4ER/14-135K
1,494	150	20	LS4ER/14-150K

## available models

30 mm resolution; 0...8 / 3...17 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
160	8	3	LS4ER/30-015LK
310	16	4	LS4ER/30-030LK
460	23	5	LS4ER/30-045LK
610	31	6	LS4ER/30-060LK
760	38	6.5	LS4ER/30-075LK
910	46	7.5	LS4ER/30-090LK
1,060	53	8.5	LS4ER/30-105LK
1,210	61	9.5	LS4ER/30-120LK
1,360	68	10	LS4ER/30-135LK
1,510	76	11	LS4ER/30-150LK

## available models

14 mm resolution; 0...3 / 1...5 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
144	15	4	LS4ER/14-015H
294	30	5.5	LS4ER/14-030H
444	45	7.5	LS4ER/14-045H
594	60	9	LS4ER/14-060H
744	75	11	LS4ER/14-075H
894	90	13	LS4ER/14-090H
1,044	105	14.5	LS4ER/14-105H
1,194	120	16.5	LS4ER/14-120H
1,344	135	18	LS4ER/14-135H
1,494	150	20	LS4ER/14-150H

## available models

30 mm resolution; 0...8 / 3...17 m controlled distance

protected height (mm)	n° of beams	response time (ms)	serie
160	8	3	LS4ER/30-015LH
310	16	4	LS4ER/30-030LH
460	23	5	LS4ER/30-045LH
610	31	6	LS4ER/30-060LH
760	38	6.5	LS4ER/30-075LH
910	46	7.5	LS4ER/30-090LH
1,060	53	8.5	LS4ER/30-105LH
1,210	61	9.5	LS4ER/30-120LH
1,360	68	10	LS4ER/30-135LH
1,510	76	11	LS4ER/30-150LH

## available models

resolution 2,3,4 beams; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
510	2	2.5	LS4ER/0A-050LK
810	3		LS4ER/0B-080LK
910	4		LS4ER/0C-090LK

## available models

resolution 2,3,4 beams; 0...10 / 3...20 m controlled distance

protected height (mm)	n° of beams	response time (ms)	series
510	2	2.5	LS4ER/0A-050LH
810	3		LS4ER/0B-080LH
910	4		LS4ER/0C-090LH

# technical specifications

Light Curtains  
Type 4

		LS4ER/**-*** _	
operating voltage	19.2...28.8	PELV power supplier according to EN 60204-1 Cap. 6.4	
power consumption, Receiver	2 W	no load	
power consumption, Emitter	1 W		
power consumption, heater	2...10 W	H models, IP69K with heater	
output type	2 x PNP	OSSD safety outputs	
output current	400 mA	higher values are considered overload	
equivalent resistive load	60 Ω	lower values are considered short circuit	
capacitive load	0.82 μF	lower values may be considered short circuit	
recovery time	2 s		
response time	2.5...20 ms		
effective aperture angle	≤ ± 2.5°	IEC 61496-1	
artificial light rejection	according to IEC 61496-2	according to the reported standards	
ambient light rejection	according to IEC 61496-2		
IP mechanical protection (standard models)	IP65 e IP67	without any additional precaution the device can't be used for outdoor applications	
IP mechanical protection (special models)	IP65, IP67 and IP69K	external transparent tube resistant against 100 bar water jets	
operating temperature	-10...+55°C	no condensation	
operating temperature, K models	-10...+55°C	no condensation, models without internal heater	
operating temperature, H models	-25...+55°C	models with internal heater	
storage temperature	-25...+70°C	to be respected also during transportation	
humidity	95%	no condensation	
vibrations	according to IEC 61496-1	according to the reported standards	
shocks	according to IEC 61496-1		
cable length (power supply/outputs)	100 m	cable section 0.34 mm <sup>2</sup> (to respect max length)	
max cable length for Master Slave interconnections	50 m		
dimension (IP67 models)	28 (front) x 30 mm	painting aluminium RAL 1012	
tube (IP69K models)	ø 56 mm		
connectors models LS4ER/**-***B	Emitter 1 x M12, 5p, male Receiver 1 x M12, 5p male	nichel plated brass	
connectors models LS4ER/**-***	Emitter 1 x M12, 5p, male Receiver 1 x M12, 8p male		
connectors models LS4ER/**-***M	Emitter 2 x M12, 5p, male Receiver 1 x M12, 8p male + 1 x M12, 5p male		
connectors models LS4ER/**-***S	Emitter 2 x M12, 5p, male Receiver 2 x M12, 5p male		
connectors models LS4ER/**-***F	Emitter 1 x M12, 5p, male Receiver 1 x M12, 5p male		
connectors models LS4ER/**-***K	Emitter 5 wires Receiver 8 wires	PVC sheath, ø 5.5 mm L 10 m, 0.34 mm	
connectors models LS4ER/**-***H	Emitter 8 wires Receiver 10 wires		

LS4; LS4\_K;  
LS4\_H



# safety parameters

LS4ER/14-***_	015	030	045	060	075	090	105	120	135	150
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	15	30	45	60	75	90	105	120	135	150
response time (ms)	4	5.5	7.5	9	11	13	14.5	16.5	18	20
response time Master + Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Master) + 0.9636] * 2 \quad (Master + 1\ Slave)$									
response time Master + 2 Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0036] * 2 \quad (Master + 2\ Slave)$									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	1.03E-08	1.27E-08	1.52E-08	1.75E-08	2.00E-08	2.24E-08	2.49E-08	2.73E-08	2.98E-08	3.22E-08
DCavg	95.40%	94.90%	94.50%	94.10%	93.80%	93.60%	93.30%	93.10%	92.90%	92.80%
MTTFd	100									
CFF	80%									

LS4ER/30-***_	015	030	045	060	075	090	105	120	135	150	165	180
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510	1,660	1,810
number of beams	8	16	23	31	38	46	53	61	68	76	83	91
response time (ms)	4	5.5	7.5	9	10.5	12.5	14	15.5	17	19	20.5	22
response time Master + Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Master) + 0.9376] * 2 \quad (Master + 1\ Slave)$											
response time Master + 2 Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0508] * 2 \quad (Master + 2\ Slave)$											
Type <sup>(1)</sup>	4											
SIL <sup>(2)</sup>	3											
SILCL <sup>(3)</sup>	3											
PL <sup>(4)</sup>	e											
PFHd	7.08E-09	8.20E-09	9.45E-09	1.06E-08	1.19E-08	1.30E-08	1.43E-08	1.54E-08	1.67E-08	1.78E-08	1.90E-08	2.02E-08
DCavg	96.60%	97.00%	97.20%	97.30%	97.40%	97.50%	97.70%	97.60%	97.70%	97.70%	97.70%	97.80%
MTTFd	100											
CFF	80%											

LS4ER/40-***_	015	030	045	060	075	090	105	120	135	150
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	6	11	16	21	26	31	36	41	46	51
response time (ms)	3.5	4.5	5.5	7	8	9	10	11	12.5	13.5
response time Master + Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Master) + 0.9376] * 2 \quad (Master + 1\ Slave)$									
response time Master + 2 Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0508] * 2 \quad (Master + 2\ Slave)$									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	6.82E-09	7.76E-09	8.58E-09	9.52E-09	1.03E-08	1.13E-08	1.21E-08	1.30E-08	1.38E-08	1.48E-08
DCavg	96.40%	96.70%	96.90%	97.10%	97.20%	97.30%	97.40%	97.40%	97.50%	97.50%
MTTFd	100									
CFF	80%									

<sup>(1)</sup> ref. CEI EN 61496-1; CEI EN 61496-2 <sup>(2)</sup> ref. CEI EN 61508 <sup>(3)</sup> ref. CEI EN 62061 + CEI EN 62061/EC2<sup>(4)</sup> ref. UNI EN ISO 13849-1

# safety parameters

Light Curtains  
Type 4

LS4ER/50-***_	015	030	045	060	075	090	105	120	135	150
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	4	8	12	16	20	24	28	32	36	40
response time (ms)	3	4	4.5	5.5	6.5	7.5	8.5	9	10	11
response time Master + Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Master) + 0.9376] * 2$ (Master + 1 Slave)									
response time Master + 2 Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0508] * 2$ (Master + 2 Slave)									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	6.53E-09	7.16E-09	7.85E-09	8.48E-09	9.17E-08	9.80E-08	1.05E-08	1.11E-08	1.18E-08	1.24E-08
DCavg	96.50%	96.80%	96.90%	97.10%	97.20%	97.30%	97.40%	97.50%	97.50%	97.50%
MTTFd	100									
CFF	80%									

LS4ER/90-***_	030	045	060	075	090	105	120	135	150	
height (mm)	310	460	610	760	910	1,060	1,210	1,360	1,510	
number of beams	4	6	8	10	10	12	14	16	20	
response time (ms)	3	3.5	4	4.5	4.5	5	5.5	5.5	6.5	
response time Master + Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Master) + 0.9376] * 2$ (Master + 1 Slave)									
response time Master + 2 Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0508] * 2$ (Master + 2 Slave)									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	6.79E-09	7.16E-09	7.85E-09	8.48E-09	9.17E-08	9.80E-08	1.05E-08	1.11E-08	1.18E-08	
DCavg	96.50%	96.60%	96.70%	96.80%	96.90%	96.90%	97.00%	97.10%	97.10%	
MTTFd	100									
CFF	80%									

LS4ER/**-***_	0A-050	0B-080	0C-090
height (mm)	500	800	900
number of beams	2	3	4
response time (ms)	2,5	3	3
response time Master + Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Master) + 0.9376] * 2$ (Master + 1 Slave)		
response time Master + 2 Slave (ms)	$T_{tot} = [0.11 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0508] * 2$ (Master + 2 Slave)		
Type <sup>(1)</sup>	4		
SIL <sup>(2)</sup>	3		
SILCL <sup>(3)</sup>	3		
PL <sup>(4)</sup>	e		
PFHd	6.89E-09	7.55E-08	8.21E-08
DCavg	96.20%	96.20%	96.10%
MTTFd	100		
CFF	80%		

<sup>(1)</sup> ref. CEI EN 61496-1; CEI EN 61496-2 <sup>(2)</sup> ref. CEI EN 61508 <sup>(3)</sup> ref. CEI EN 62061 + CEI EN 62061/EC2<sup>(4)</sup> ref. UNI EN ISO 13849-1

LS4ER/20-***_L	015	030	045	060	075	090	105	120	135	150
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	15	30	45	60	75	90	105	120	135	150
response time (ms)	4	5.5	7.5	9	11	13	14.5	16.5	18	20
response time Master + Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Master) + 0.9636] * 2 (Master + 1 Slave)									
response time Master + 2 Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Slave2 + Nr Master) + 1.0036] * 2 (Master + 2 Slave)									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	1.03E-08	1.27E-08	1.52E-08	1.75E-08	2.00E-08	2.24E-08	2.49E-08	2.73E-08	2.98E-08	3.22E-08
DCavg	95.40%	94.90%	94.50%	94.10%	93.80%	93.60%	93.30%	93.10%	92.90%	92.80%
MTTFd	100									
CFF	80%									

LS4ER/30-***_	015	030	045	060	075	090	105	120	135	150	165	180
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510	1,660	1,810
number of beams	8	16	23	31	38	46	53	61	68	76	83	91
response time (ms)	3	4	5	6	6.5	7.5	8.5	9.5	10	11	12	13
response time Master + Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Master) + 0.9636] * 2 (Master + 1 Slave)											
response time Master + 2 Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Slave2 + Nr Master) + 1.0036] * 2 (Master + 2 Slave)											
Type <sup>(1)</sup>	4											
SIL <sup>(2)</sup>	3											
SILCL <sup>(3)</sup>	3											
PL <sup>(4)</sup>	e											
PFHd	9.13E-09	1.04E-08	1.16E-08	1.28E-08	1.41E-08	1.53E-08	1.66E-08	1.78E-08	1.91E-08	2.03E-08	2.16E-09	2.29E-08
DCavg	95.70%	95.40%	95.10%	94.90%	94.70%	94.50%	94.30%	94.10%	93.90%	93.80%	93.70%	93.60%
MTTFd	100											
CFF	80%											

LS4ER/40-***_L	015	030	045	060	075	090	105	120	135	150
height	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	6	11	16	21	26	31	36	41	46	51
response time (ms)	3	3,5	4	4.5	5	6	6.5	7	7.5	8
response time Master + Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Master) + 0.9636] * 2 (Master + 1 Slave)									
response time Master + 2 Slave (ms)	Ttot = [0.06 * (Nr Slave1 + Nr Slave2 + Nr Master) + 1.0036] * 2 (Master + 2 Slave)									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	8.84E-09	9.85E-09	1.06E-09	1.16E-09	1.23E-08	1.34E-08	1.41E-08	1.51E-08	1.59E-08	1.69E-08
DCavg	95.80%	95.50%	95.30%	95.10%	95.00%	94.80%	94.70%	94.50%	94.40%	94.20%
MTTFd	100									
CFF	80%									

<sup>(1)</sup>ref. CEI EN 61496-1; CEI EN 61496-2 <sup>(2)</sup>ref. CEI EN 61508 <sup>(3)</sup>ref. CEI EN 62061 + CEI EN 62061/EC2<sup>(4)</sup> ref. UNI EN ISO 13849-1

# safety parameters

Light Curtains  
Type 4

LS4ER/50-***_L	015	030	045	060	075	090	105	120	135	150
height (mm)	160	310	460	610	760	910	1,060	1,210	1,360	1,510
number of beams	4	8	12	16	20	24	28	32	36	40
response time (ms)	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7
response time Master + Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Master) + 0.9636] * 2 \quad (Master + 1\ Slave)$									
response time Master + 2 Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0036] * 2 \quad (Master + 2\ Slave)$									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	8.50E-09	9.11E-09	9.82E-09	1.4E-09	1.11E-08	1.18E-08	1.25E-08	1.31E-08	1.38E-08	1.44E-08
DCavg	95.90%	95.70%	95.50%	95.40%	95.20%	95.10%	94.90%	94.80%	94.70%	94.60%
MTTFd	100									
CFF	80%									

LS4ER/90-***_L	030	045	060	075	090	105	120	135	150	
height (mm)	310	460	610	760	910	1,060	1,210	1,360	1,510	
number of beams	4	6	8	10	12	14	16	18	20	
response time (ms)	2.5	3	3	3.5	3.5	3.5	4	4	4.5	
response time Master + Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Master) + 0.9636] * 2 \quad (Master + 1\ Slave)$									
response time Master + 2 Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0036] * 2 \quad (Master + 2\ Slave)$									
Type <sup>(1)</sup>	4									
SIL <sup>(2)</sup>	3									
SILCL <sup>(3)</sup>	3									
PL <sup>(4)</sup>	e									
PFHd	8.71E-09	9.23E-09	9.64E-09	1.02E-09	1.06E-08	1.11E-08	1.20E-08	1.31E-08	1.24E-08	
DCavg	95.80%	95.70%	95.60%	95.40%	95.30%	95.10%	95.00%	94.80%	95.00%	
MTTFd	100									
CFF	80%									


LS4ER/**-***_L	0A-050		0B-080		0C-090	
height (mm)	500		800		900	
number of beams	2		3		4	
response time (ms)	2.5		2.5		2.5	
response time Master + Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Master) + 0.9636] * 2 \quad (Master + 1\ Slave)$					
response time Master + 2 Slave (ms)	$T_{tot} = [0.06 * (Nr\ Slave1 + Nr\ Slave2 + Nr\ Master) + 1.0036] * 2 \quad (Master + 2\ Slave)$					
Type <sup>(1)</sup>	4					
SIL <sup>(2)</sup>	3					
SILCL <sup>(3)</sup>	3					
PL <sup>(4)</sup>	e					
PFHd	9.15E-09		9.99E-09		1.08E-08	
DCavg	95.80%		95.60%		95.40%	
MTTFd	100					
CFF	80%					

<sup>(1)</sup>ref. CEI EN 61496-1; CEI EN 61496-2 <sup>(2)</sup>ref. CEI EN 61508 <sup>(3)</sup>ref. CEI EN 62061 + CEI EN 62061/EC2<sup>(4)</sup> ref. UNI EN ISO 13849-1

LS4; LS4\_K;  
LS4\_H

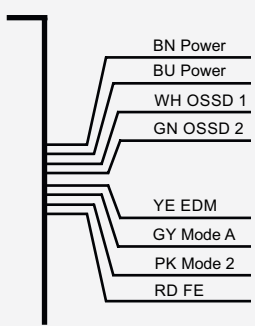
## LS4 series receiver

M12  
(8 poles male)



LS4ER / \*\*-\*\*\*  
LS4ER / \*\*-\*\*\*M

8 poles male



LS4ER / \*\*-\*\*\*K

pin	color	signal	type	description
1	WH	OSSD1	OUT	irst safety static output (PNP)
2	BN	24V <sub>DC</sub>	POWER	power supply input
3	GN	OSSD2	OUT	second safety static output (PNP)
4	YE	EDM	IN	connection to Restart and/or external control contacts (EDM)
5	GY	Mode_A	IN	selection of the Start/Restart/EDM mode
6	PK	Mode_B	IN	selection of the Start/Restart/EDM mode
7	BU	0V	POWER	supply voltage reference
8	RD	FE	GND	functional earth

possible combinations			
pin4 (YE)	pin5 (GY)	pin6 (RK)	function
24V <sub>DC</sub>	24V <sub>DC</sub>	0V	AUTO
K1 + K2 + 24V <sub>DC</sub>	24V <sub>DC</sub>	0V	AUTO + EDM
restart + 24V <sub>DC</sub>	0V	24V <sub>DC</sub>	MANUAL
K1 + K2 + restart + 24V <sub>DC</sub>	0V	24V <sub>DC</sub>	MANUAL + EDM

BK	black	OG	orange
BN	brown	GN	green
RD	red	BU	blue
YE	yellow	GY	grey
WH	white	VT	violet
PK	pink		

NOTE: On these Standard and Master models it is possible to choose the operating modes by changing the wiring. By using the EDM function it is possible to extend the safety control to the contactors controlled downstream, that must be the type with guided contacts and approved for safety applications. With this model of curtain you can use the relay module SB300, but the EDM input must be connected.

M12  
(5 poles male)



LS4ER / \*\*-\*\*\*B

pin	color	signal	type	description
1	BN	24V <sub>DC</sub>	POWER	power supply input
2	WH	OSSD1	OUT	irst safety static output (PNP)
3	BU	0V	POWER	supply voltage reference
4	BK	OSSD2	OUT	second safety static output (PNP)
5	GY	FE	GND	functional earth

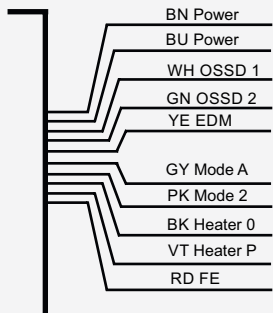
NOTE: These Base models with automatic restart do not have the EDM function, the device downstream must therefore be able to control its own safety integrity independently. With this model of curtain you can not use the relay module SB300, because the EDM input is not available.

# electrical diagrams of the connections

Light Curtains  
Type 4

## LS4 series receiver

10 poles cable  
(IP69K with heater receiver unit)



LS4ER / \*\*-\*\*\*H

color	signal	type	description
BN	24V <sub>DC</sub>	POWER	power supply input
BU	0v	POWER	supply voltage reference
WH	OSSD1	OUT	irst safety static output (PNP)
GN	OSSD2	OUT	second safety static output (PNP)
YE	EDM	IN	connection to restart and/or external control contacts (EDM)
GY	Mode_A	IN	selection of the Start/Restart/EDM mode
PK	Mode_B	IN	selection of the Start/Restart/EDM mode
BK	Heater 0	POWER	heater supply common
PK	Heater p	POWER	heater supply 24V DC or AC
BK	FE	GND	functional earth

### possible combinations

YE	GY	PK	function
24V <sub>DC</sub>	24V <sub>DC</sub>	0V	AUTO
K1 + K2 + 24V <sub>DC</sub>	24V <sub>DC</sub>	0V	AUTO + EDM
restart + 24V <sub>DC</sub>	0V	24V <sub>DC</sub>	MANUAL
K1 + K2 + restart + 24V <sub>DC</sub>	0V	24V <sub>DC</sub>	MANUAL + EDM
x	0V	0V	NOT ADMITTED
x	24V <sub>DC</sub>	24V <sub>DC</sub>	NOT ADMITTED

black orange  
brown green  
red blue  
yellow grey  
white violet  
pink

NOTE: On these Standard models it is possible to choose the operating modes by changing the wiring. By using the EDM function it is possible to extend the safety control to the contactors controlled downstream, that must be the type with guided contacts and approved for safety applications. The supply voltage of the thermostated heater can be indifferently 24 V<sub>DC</sub> or 24 V<sub>AC</sub>. With this model of curtain you can use the relay module SB300, but the EDM input must be connected.

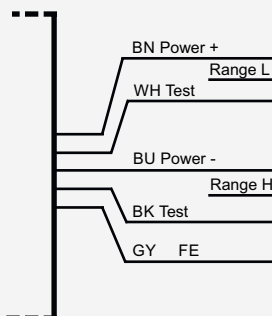
## LS4 series emitter unit

M12  
(5 poles male connector)



LS4ER / \*\*-\*\*\*  
LS4ER / \*\*-\*\*\*M

5 poles cable



LS4ER / \*\*-\*\*\*K

pin	color	signal	type	description
1	BN	POWER	OUT	power supply input
2	WH	IN	POWER	range or test selection input
3	BU	POWER	OUT	supply voltage reference
4	BK	IN	IN	range or test selection input
5	GY	IN	IN	functional earth

### possible combinations

pin2 (WH)	pin6 (BK)	function
LO	LO	test
LO	HI	high range
HI	LO	low range
HI	HI	NOT ADMITTED

black orange  
brown green  
red blue  
yellow grey  
white violet  
pink

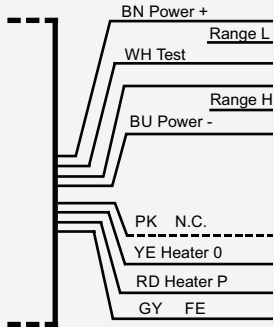
Levels: LO = < 5V or open; HI = 11 to 30V

NOTE: The Test contact is necessary only if the safety chain of the receiver downstream must be periodically checked. If the Test is not necessary (the safety light curtain has already been tested independently) replace the contact with direct wiring at +24 V<sub>DC</sub>.

LS4; LS4\_K;  
LS4\_H

LS4 series IP69K with heater Emitter unit

8 poles cable  
(IP69K with heater emitter unit)



LS4ER / \*\*-\*\*\*H

color	signal	type	description
BN	24 <sub>CC</sub>	POWER	power supply input
WH	Range L/Test	IN	range or test selection input
BU	0V	POWER	supply voltage reference
GN	Range H/Test	IN	range or test selection input
PK	not connected	N.C.	not connected
YE	heater 0	POWER	heater supply common
RD	heater P	POWER	heater supply 24V DC or AC
GY	FE	GND	functional earth

possible combinations

WH	GN	function
LO	LO	test
LO	HI	high range
HI	LO	low range
HI	HI	not admitted

BK	black	OG	orange
BN	brown	GN	green
RD	red	BU	blue
YE	yellow	GY	grey
WH	white	VT	violet
PK	pink		

levels: LO = <5V or open; HI = 11 to 30V

NOTE The Test contact is necessary only if the safety chain of the receiver downstream must be periodically checked. If the Test is not necessary (the safety light curtain has already been tested independently) replace the contact with direct wiring at +24VDC. The supply voltage of the thermostated heater can be indifferently 24 V<sub>DC</sub> or 24 V<sub>AC</sub>. The PK cable is not connected internally

LS4 series emitter and receiver unit : master slave secondary connectors

M12  
(5 poles male)



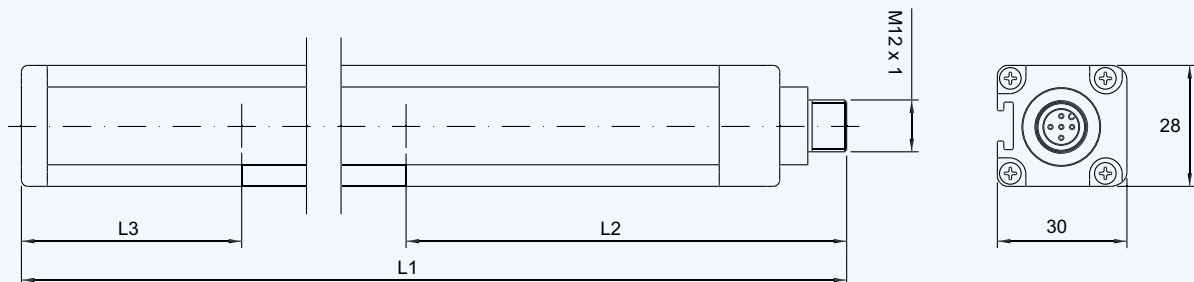
LS4ER / \*\*-\*\*\*M  
LS4ER / \*\*-\*\*\*S  
LS4ER / \*\*-\*\*\*F

pin	color	signal	type	description
1	BN	24V <sub>CC</sub>	POWER	power supply (supply line for the upstream device)
2	WH	Line 1	IN/OUT	communication line 1
3	BU	0V	POWER	power supply reference (supply line for the upstream device)
4	BK	Line 2	IN/OUT	communication line 2
5	GY	FE	GND	functional earth

NOTE: Preferably use Female/Female pre-wired extension cables (it is not permitted to access the connection lines).

dimensions (mm)

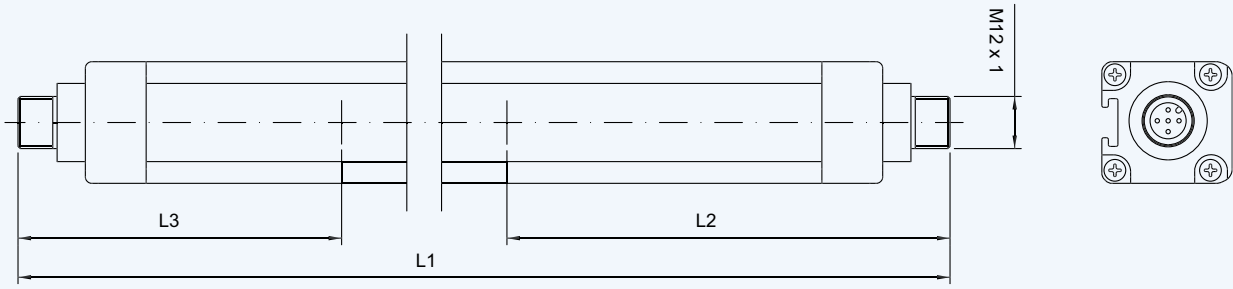
dimensions of Standard, Base, Final models; view of the base and head with relevant connectors; see Tab.: 1 and 3



# dimensions (mm)

Light Curtains  
Type 4

Dimensions of Master and Slave models; view of the base and head with relevant connectors; see Tab.: 2 and 3



TAB.1

LS4 series		***										dimensions (mm)
paired models		015	030	045	060	075	090	105	120	135	150	L1
LS4ER/**-*** LS4ER/**-***B LS4ER/**-***F	standard, base, inal	213	363	513	663	813	963	1,113	1,263	1,413	1,563	L2 (bottom-most beam)
		61,5										L3 (top-most beam)
		11										L4
LS4ER/**-***M LS4ER/**-***S	master and slave	236.5	386.5	536.5	686.5	836.5	986.5	1,136.5	1,286.5	1,436.5	1,586.5	L5 (bottom-most beam)
		61.5										L6 (top-most beam)
		34.5										

TAB.2

LS4 series		***			dimensions (mm)
paired models		0A-050	0B-080	0C-090	
LS4ER/**-*** LS4ER/**-***B LS4ER/**-***F	standard, base, inal	653	953	1,053	L1
		102			L2 (bottom-most beam)
		51			L3 (top-most beam)
LS4ER/**-***M LS4ER/**-***S	master and slave	677	977	1,077	L4
		102			L5 (bottom-most beam)
		75			L6 (top-most beam)


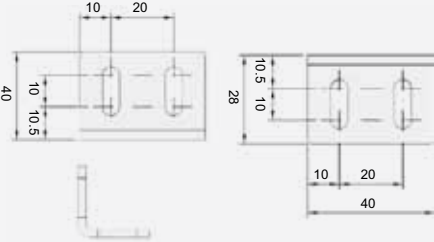

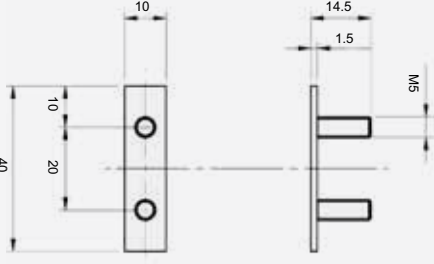
TAB.3

LS4 series		LS4R (receiver)				LS4R (emitter)			
models		base view	connector	base view	connector	base view	connector	base view	connector
LS4ER/**-***	standard	C	M12, 8p, M	A	-	B	M12, 5p, M	A	-
LS4ER/**-***B	base	B	M12, 5p, M	A	-	B	M12, 5p, M	A	-
LS4ER/**-***F	inal	B <sup>(1)</sup>	M12, 5p, M	A	-	B <sup>(1)</sup>	M12, 5p, M	A	-
LS4ER/**-***M	master	F	M12, 8p, M	D <sup>(1)</sup>	M12, 5p, M	E	M12, 5p, M	D <sup>(1)</sup>	M12, 5p, M
LS4ER/**-***S	slave	E <sup>(1)</sup>	M12, 5p, M	D <sup>(1)</sup>	M12, 5p, M	E <sup>(1)</sup>	M12, 5p, M	D <sup>(1)</sup>	M12, 5p, M

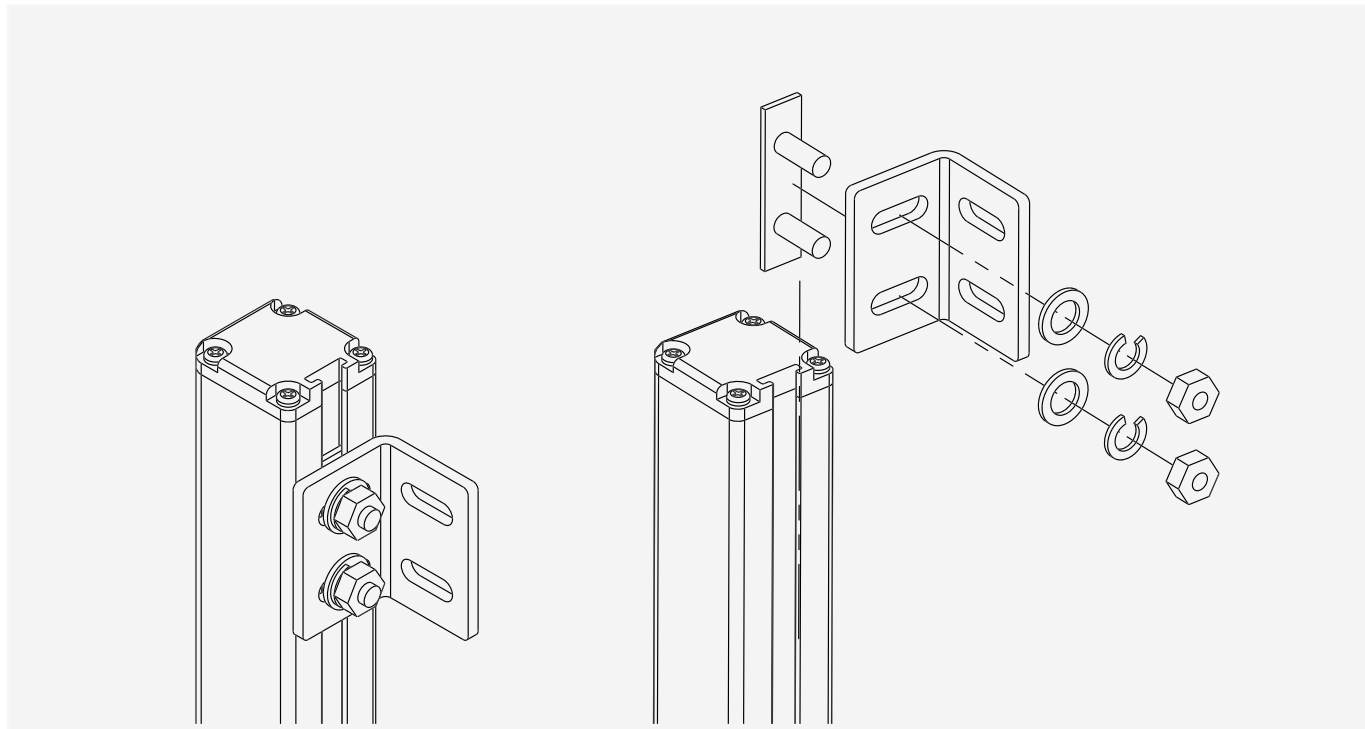
NOTE: These connectors are dedicated to a communication BUS of the Master/ Slave chain, it is not permissible to access the lines, always use cord sets.

LS4\_H  
LS4\_K



ST204* / outfit mounting accessories			
product	to used with	dimensions (mm)	description / installation
	LS4 series		<p><b>L Bracket</b></p> <p>Supplied as standard, 4 pieces to couple to the length from 300 to 1,050, 6 pieces for the length from 1,200 to 1,500.</p>
	LS4 series		<p>Insert with threaded bolts and nuts</p> <p>Supplied as standard, in a number corresponding to the brackets.</p>

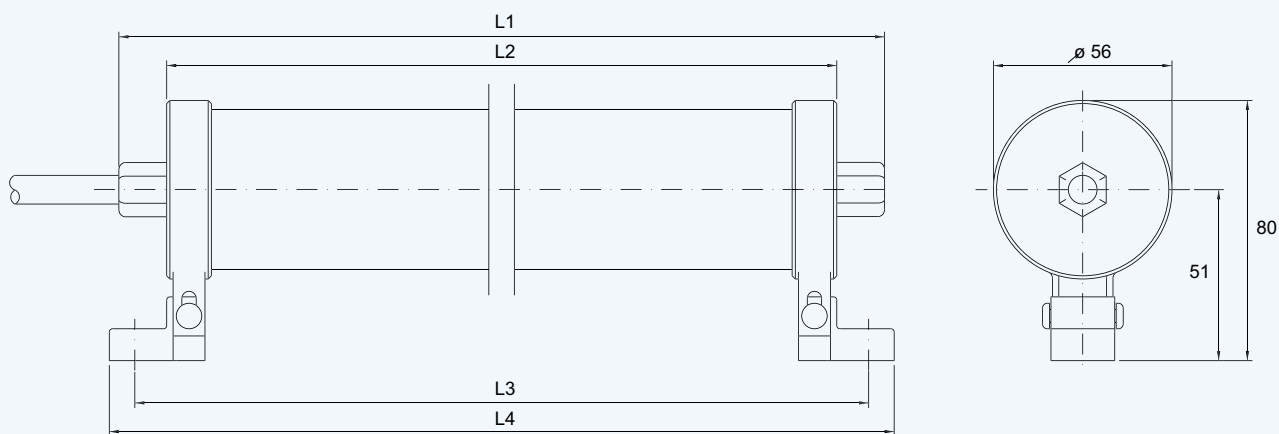
outfit brackets mounting



# dimensions (mm)

Light Curtains  
Type 4

IP69K



The light Curtain is supplied already fitted inside the transparent housing.  
The power cord has a standard length of 10 meters and a maximum diameter of 6 mm. The brackets are included.

models	150	300	450	600	750	900	1,050	1,200	1,350	1,500	2B	3B	4B
L1 dimensions	320	470	620	770	920	1,070	1,220	1,370	1,520	1,670	760	1,060	1,160
L2 dimensions	290	440	620	740	890	1,040	1,190	1,340	1,490	1,640	730	1,030	1,130
L3 dimensions (± 3) (mm)	315	465	590	765	915	1,065	1,215	1,365	1,515	1,665	755	1,055	1,155
L4 dimensions (mm)	337	487	637	787	937	1,087	1,237	1,387	1,537	1,687	777	1,077	1,177

LS4; LS4\_K;  
LS4\_H



# Safety light Curtains


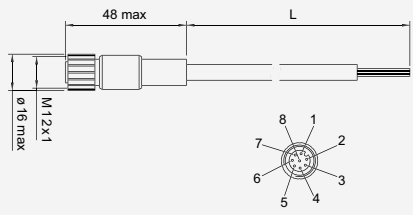
## Accessories




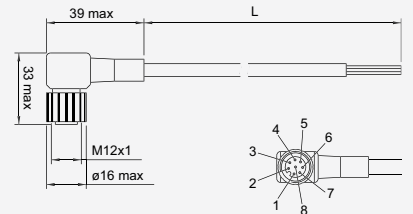
Safety  
Accessories

### connectors


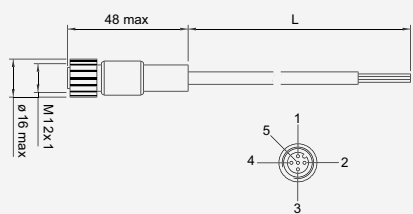
#### CD12M/0E-\*\*\*A1 / M12 8 poles axial female connector with PVC cable

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2 STANDARD (TX)</li> <li>• LS4 STANDARD (TX)</li> <li>• LP4ER/0*-***L12 (RX)</li> <li>• LP4PF</li> </ul> <p>Safety Sensors</p> <ul style="list-style-type: none"> <li>• SH e TH</li> <li>• SH-IC e TH-IC</li> </ul>		<p>M12 8 poles axial female connector with PVC cable. Cable length is represented by *** digits:</p> <p>050 : 5 m 100 : 10 m 150 : 15 m 250 : 25 m 400 : 40 m</p>


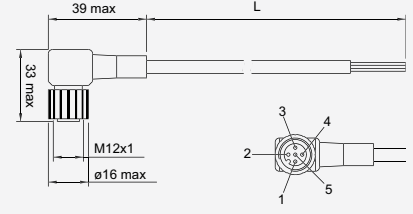
#### CD12M/0E-\*\*\*C1 / M12 8 poles 90° female connector with PVC cable

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2 STANDARD (RX)</li> <li>• LS4 STANDARD (RX)</li> <li>• LP4ER/0*-***L12 (RX)</li> <li>• LP4PF</li> </ul>		<p>M12 8 poles 90° female connector with PVC cable. Cable length is represented by *** digits:</p> <p>050 : 5 m 100 : 10 m 150 : 15 m</p>

#### CD12M/0H-\*\*\*A3 / M12 5 poles axial female connector with PVC cable


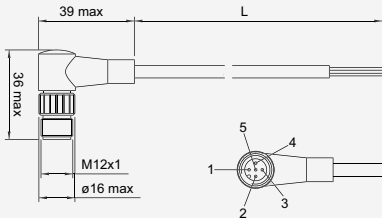
product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2 BASE (TX e RX)</li> <li>• LS2 STANDARD (TX)</li> <li>• LS4 BASE (TX e RX)</li> <li>• LS4 STANDARD (TX)</li> </ul> <p>Safety Sensors</p> <ul style="list-style-type: none"> <li>• SH e TH</li> <li>• SH-IC e TH-IC</li> </ul>		<p>M12 5 poles axial female connector with PVC cable. Cable length is represented by *** digits:</p> <p>050 : 5 m 100 : 10 m 150 : 15 m 250 : 25 m 500 : 50 m</p>

#### CD12M/0H-\*\*\*C3 / M12 5 poles 90° female connector with PVC cable


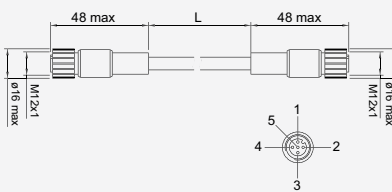
product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2 BASE (TX e RX)</li> <li>• LS2 STANDARD (TX)</li> <li>• LS4 BASE (TX e RX)</li> <li>• LS4 STANDARD (TX)</li> </ul> <p>Safety Sensors</p> <ul style="list-style-type: none"> <li>• SH e TH</li> <li>• SH-IC e TH-IC</li> </ul>		<p>M12 5 poles 90° female connector with PVC cable. Cable length is represented by *** digits:</p> <p>050 : 5 m 100 : 10 m 150 : 15 m</p>

Accessories  
Safety


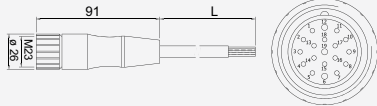
CD12M/0H-050D1 / M12 5 poles axial female connector

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4ER_M</li> <li>• LP4PT</li> </ul> <p>To be used for Muting</p>	 <p>39 max 36 max L M12x1 ø16 max 1 2 3 4 5</p>	M12 5 poles axial female connector


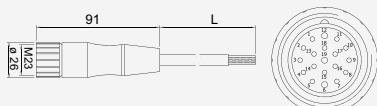
CDP12/0H-\*\*\*AC / M12 5 poles axial female female plug

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2_M, LS2_S, LS2_F (MASTER-SLAVE)</li> <li>• LS4_M, LS4_S, LS2_F (MASTER-SLAVE)</li> <li>• LP4ER, LP4ER_M: connection TX alla LP/BOX-1</li> </ul>	 <p>48 max L 48 max M12x1 ø16 max 1 2 3 4 5</p>	<p>M12 5 poles axial female female plug.</p> <p>Cable length is represented by *** digits:</p> <p>003 : 0.3 m 030 : 3 m 050 : 5 m</p>


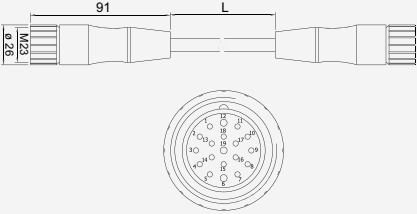
CD23M/0R-\*\*\*A1 / M23 19 poles axial connector with PVC cable

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4ER/40_L</li> <li>• LP4ER_M (RX)</li> <li>• LP4PT (Unità attiva)</li> </ul>	 <p>91 L M23 ø26 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19</p>	<p>M23 19 poles axial connector with PVC cable.</p> <p>Cable length is represented by *** digits:</p> <p>030 : 3 m 050 : 5 m 100 : 10 m 150 : 15 m 200 : 20 m 300 : 30 m</p>

CD23M/0R-\*\*\*A1LM / M23 19 poles axial connector with PVC cable and external Muting Lamp wire


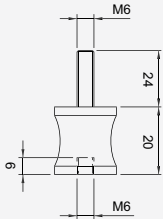
product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4ER_M;</li> <li>• LP4_PT;</li> </ul>	 <p>91 L M23 ø26 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19</p>	<p>M23 19 poles axial connector with PVC cable and external Muting Lamp wire.</p> <p>Cable length is represented by *** digits:</p> <p>200 : 20 m 300 : 30 m</p>

CDP23/0R-\*\*\*AC / M23 19 poles axial female female plug


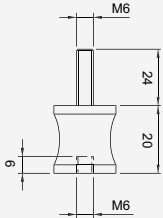
product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4ER/40_L</li> <li>• LP4ER_M (RX)</li> <li>• LP4PT (active unit)</li> </ul> <p>To connect RX or Active Unit to LP/BOX-1</p>		<p>M12 5 poles axial female female plug.</p> <p>Cable length is represented by *** digits:                      030 : 3 m                      050 : 5 m                      100 : 10 m</p>

mounting brackets and anti-vibrating bumpers


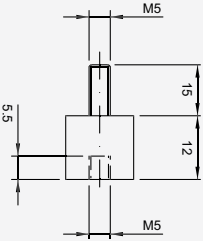
ST VP 4 / 4 pieces anti-vibrating bumpers kit

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4</li> </ul>		<p>4 pieces anti-vibrating bumpers kit for LP4 Safety light Curtains</p>

ST VP 6 / 6 pieces anti-vibrating bumpers kit

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LP4</li> </ul>		<p>6 pieces anti-vibrating bumpers kit for LP4 Safety light Curtains</p>


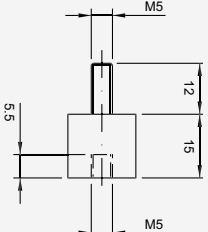
ST 4V S / 4 pieces anti-vibrating bumpers kit

product	to be used with	dimensions (mm)	description / installation
	<p>Safety light Curtains</p> <ul style="list-style-type: none"> <li>• LS2</li> <li>• LS4</li> </ul>		<p>4 pieces anti-vibrating bumpers kit for LS4 Safety light Curtains 150 mm protected height models</p>


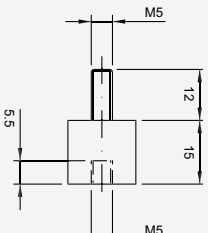


Safety  
Accessories


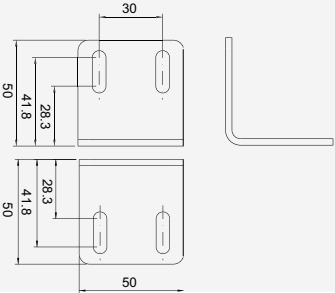
ST 8V S / 8 pieces anti-vibrating bumpers kit

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		8 pieces anti-vibrating bumpers kit for LS4 Safety light Curtains 150...1,050 mm protected height models


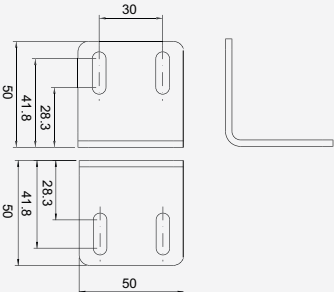
ST 12V S / 12 pieces anti-vibrating bumpers kit for LS4 Safety light Curtains

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		12 pieces anti-vibrating bumpers kit for LS4 Safety light Curtains 1,200...1,800 mm protected height models

ST 201 4 / 4 pieces L short mounting brackets kit


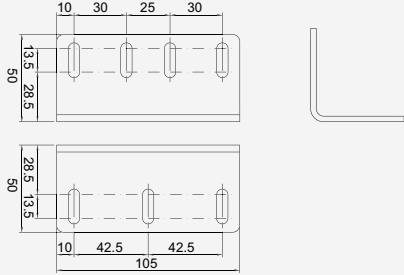
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4		4 pieces L short mounting brackets kit for LP4 Safety light Curtains

ST 201 6 / 6 pieces L short mounting brackets kit


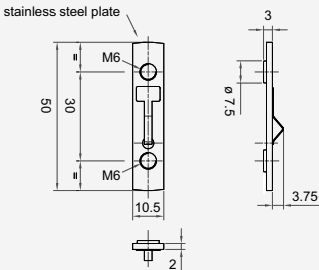
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4		6 pieces L short mounting brackets kit for LP4 Safety light Curtains

Accessories  
Safety


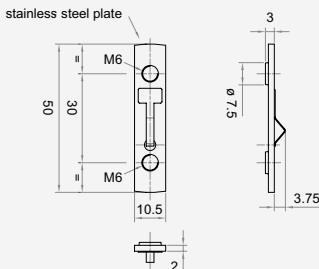
ST 202 4 / 4 pieces L curved mounting brackets for passive element

product	to be used with	dimensions (mm)	description / installation
			4 pieces L curved mounting brackets for passive element of LP4PF and LP4PT series


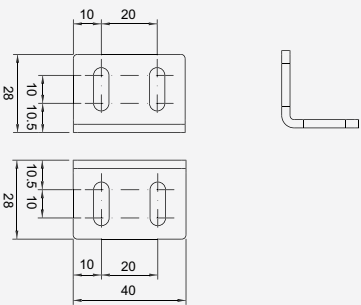
ST 203 4 / 4 pieces mounting nuts kit for LP4 Safety light Curtains

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4		4 pieces mounting nuts kit for LP4 Safety light Curtains


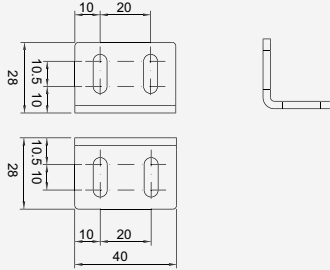
ST 203 6 / 6 pieces mounting nuts kit for LP4 safety light curtains

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4		6 pieces mounting nuts kit for LP4 Safety light Curtains


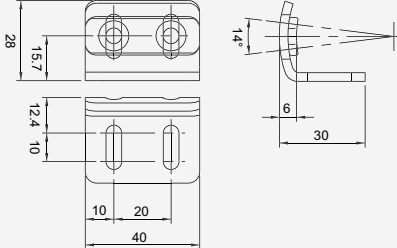
ST 204 4S / 4 pieces mounting brackets kit

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		4 pieces mounting brackets kit for LS2/LS4 Safety light Curtains


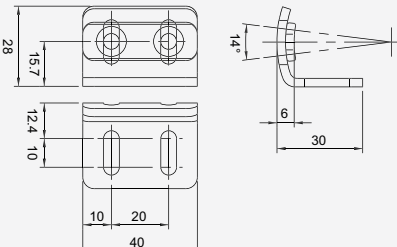
ST 204 6S / 6 pieces mounting brackets kit

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		6 pieces mounting brackets kit for LS2/LS4 Safety light Curtains


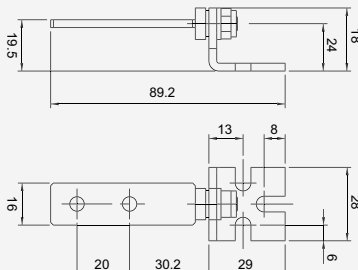
ST 206 4S / 4 pieces L curved mounting brackets kit

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		4 pieces L curved mounting brackets and nuts kit for LS2/LS4 Safety light Curtains to ease mechanical installation

ST 206 6S / 6 pieces L curved mounting brackets kit


product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		6 pieces L curved mounting brackets and nuts kit for LS2/LS4 Safety light Curtains to ease mechanical installation

ST 207 S / 4 pieces rotating brackets kit

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		4 pieces rotating brackets and nuts kit for LS2/LS4 Safety light Curtains


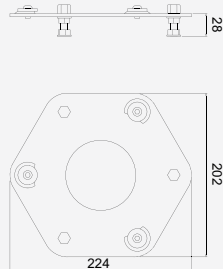



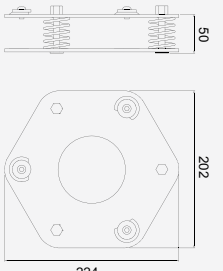
# test rod

ST 2214 / 2220 / 2230 / 2240 / 2250			
product	to be used with	dimensions (mm)	description / installation
	Safety light curtains • LS4ER/14 • LS4ER/20 • LS2ER/30 • LS4ER/30 • LS2ER/40 • LS4ER/40 • LP4ER/40		14 - 20 - 30 - 40 - 50 mm resolution test rod

model	BLACK painted aluminum pipe	
	Dim. "A" (mm)	Dim. "A" (mm)
ST 2214	∅ 14	1
ST 2220	∅ 20	1
ST 2230	∅ 30	1
ST 2240	∅ 40	1
ST 2250	∅ 50	1,5

# protective columns for safety light curtains

ST F FIX / standard column base			
product	to be used with	dimensions (mm)	description / installation
	Columns for Safety series • ST CL*** • ST CLS***		Standard column base

ST FLEX / column base with load springs			
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • ST CL*** • ST CLS***		Column base with load springs



Safety  
Accessories

product	to be used with	dimensions (mm)	description / installation																									
ST CL A	2 beams LP4 Safety light Curtains		Column for LP 2 beams light curtain																									
ST CL B	3 beams LP4 Safety light Curtains		Column for LP 3 beams light curtain																									
ST CL C	4 beams LP4 Safety light Curtains		Column for LP 4 beams light curtain																									
ST CL 17	LP4 Safety light Curtains h ≤ 1,700 mm		Column for h=1,700 mm LP light curtains																									
ST CL 20	LP4 Safety light Curtains h ≤ 2,000 mm		Column for h=2,000 mm LP light curtains																									
ST CL AP	Safety light Curtains LP4 2 beams		Column for 2 beams LP light curtains, with PG11 connection																									
ST CL BP	Safety light Curtains LP4 3 beams		Column for 3 beams LP light curtains, with PG11 connection																									
ST CL CP	Safety light Curtains LP4 4 beams		Column for 4 beams LP light Curtains, with PG11 connection																									
ST CL 17P	Safety light Curtains LP4 h ≤ 1,700 mm		<table border="1"> <thead> <tr> <th>models</th> <th>ST CL A</th> <th>ST CL B</th> <th>ST CL C</th> <th>ST CL 17</th> <th>ST CL 20</th> </tr> </thead> <tbody> <tr> <td></td> <td>ST CL AP</td> <td>ST CL BP</td> <td>ST CL CP</td> <td>ST CL 17P</td> <td>ST CL 20P</td> </tr> <tr> <td>QUOTE 'L' [mm]</td> <td>1,000</td> <td>1,200</td> <td>1,330</td> <td>1,700</td> <td>1,970</td> </tr> <tr> <td>QUOTE 'B' [mm]</td> <td colspan="5">55</td> </tr> </tbody> </table>	models	ST CL A	ST CL B	ST CL C	ST CL 17	ST CL 20		ST CL AP	ST CL BP	ST CL CP	ST CL 17P	ST CL 20P	QUOTE 'L' [mm]	1,000	1,200	1,330	1,700	1,970	QUOTE 'B' [mm]	55					Column for LP light curtains h = 1,700 mm, with PG11 connection
models	ST CL A		ST CL B	ST CL C	ST CL 17	ST CL 20																						
	ST CL AP		ST CL BP	ST CL CP	ST CL 17P	ST CL 20P																						
QUOTE 'L' [mm]	1,000		1,200	1,330	1,700	1,970																						
QUOTE 'B' [mm]	55																											
ST CL 17P	Safety light Curtains LP4 h ≤ 1,700 mm	Column for LP light Curtains h = 2,000 mm, with PG11 connection																										

product	to be used with	dimensions (mm)	description / installation
ST AX	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2</li> <li>• LS4</li> <li>• LP4</li> </ul>		"Simple" Column for LP and LS light curtains

Accessories  
Safety



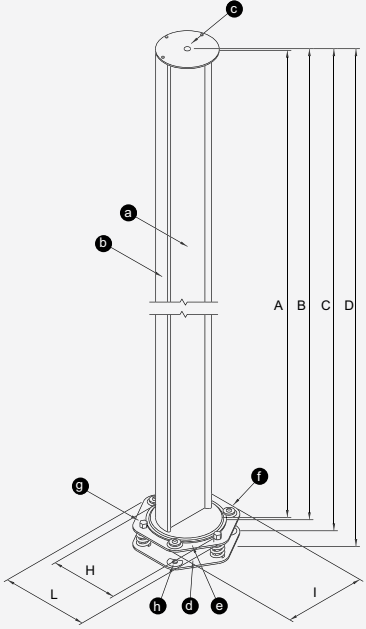
Safety  
Accessories

product	to be used with	dimensions (mm)	description / installation																				
ST CLS B	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/0A</li> <li>• LS4 ER/0A</li> <li>• LS2ER/**-030(045)(060)</li> <li>• LS4ER/**-030(045)(060)</li> </ul>		Column for LS 2 beams light Curtain																				
ST CLS C	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/0B(0C)</li> <li>• LS4 ER/0B(0C)</li> <li>• LS2ER/**-075 (090)(105)</li> <li>• LS4ER/**-075 (090)(105)</li> </ul>		Column for LS 3 and 4 beams light Curtain																				
ST CLS 17	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/**-120 (135)</li> <li>• LS4ER/**-120 (135)</li> </ul>		Column for LS h = 1,700 mm																				
ST CLS 20	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/**-150</li> <li>• LS4ER/**-150</li> </ul>		Column for LS h = 2,000 mm																				
ST CLS BP	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/0A</li> <li>• LS4 ER/0A</li> <li>• LS2ER/**- 030 (045)(060)</li> <li>• LS4ER/**- 030 (045)(060)</li> </ul>		Column for LS 2 beams light Curtain, with PG11 connection																				
ST CLS CP	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/0B(0C)</li> <li>• LS4 ER/0B(0C)</li> <li>• LS2ER/**- 075 (090)(105)</li> <li>• LS4ER/**- 075 (090)(105)</li> </ul>		Column for LS 3 and 4 beams light Curtain, with PG11 connection																				
ST CLS 17P	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/**- 120 (135)</li> <li>• LS4ER/**- 120 (135)</li> </ul>		Column h=1,700 mm for LS light Curtain, with PG11 connection																				
ST CLS 20P	Safety light Curtains <ul style="list-style-type: none"> <li>• LS2ER/**- 150</li> <li>• LS4ER/**- 150</li> </ul>	<table border="1"> <thead> <tr> <th>model</th> <th>ST CLS B</th> <th>ST CLS C</th> <th>ST CLS 17</th> <th>ST CLS 20</th> </tr> </thead> <tbody> <tr> <td>QUOTE L' [mm]</td> <td>1,000</td> <td>1,330</td> <td>1,660</td> <td>1,970</td> </tr> <tr> <td>QUOTE B' [mm] with ST FLEX base</td> <td colspan="4">55</td> </tr> <tr> <td>QUOTE B' [mm] with ST FIX base</td> <td colspan="4">34</td> </tr> </tbody> </table>	model	ST CLS B	ST CLS C	ST CLS 17	ST CLS 20	QUOTE L' [mm]	1,000	1,330	1,660	1,970	QUOTE B' [mm] with ST FLEX base	55				QUOTE B' [mm] with ST FIX base	34				Column h=2,000 mm for LS light Curtain, with PG11 connection
model	ST CLS B	ST CLS C	ST CLS 17	ST CLS 20																			
QUOTE L' [mm]	1,000	1,330	1,660	1,970																			
QUOTE B' [mm] with ST FLEX base	55																						
QUOTE B' [mm] with ST FIX base	34																						

Accessories  
Safety

# deviating mirrors or columns with integrated mirrors

Safety Accessories

product	to be used with	dimensions (mm)	description / installation
SLA CL	Safety light Curtains • LS2 • LS4 • LP4	 <ul style="list-style-type: none"> <li>Ⓐ b profile height and corresponding a mirror height</li> <li>Ⓑ Total SL X CL height (without ST FIX or ST FLEX base)</li> <li>Ⓒ Total SL X CL height with ST FIX base</li> <li>Ⓓ Total SL X CL height with ST FLEX base</li> <li>Ⓔ Max ST FLEX height from loor (load springs height)</li> <li>Ⓕ Max ST FIX height from loor (blocks height)</li> <li>Ⓖ Upper plate thickness including level ball</li> <li>Ⓗ SL X CL base diameter</li> <li>Ⓙ ST FIX or ST FLEX amount of space</li> <li>Ⓛ ST FIX or ST FLEX amount of space</li> <li>ⓐ Mirror</li> <li>ⓑ Column housing</li> <li>ⓒ Vertical level ball</li> <li>ⓓ Lower ixing plate for ST FLEX base</li> <li>ⓔ Upper ixing plate for ST FLEX where to mount SL X CL column or ST FIX ground ixing plate</li> <li>ⓕ Column ixing screws and orientating reference rings</li> <li>ⓖ ST FLEX inclination adjusting nuts or ST FIX reference plane inclination adjusting double nuts</li> <li>ⓓ Floor ixing nuts place</li> </ul>	Column with mirrors for 2 beams safety light curtain
SLB CL			Column with mirrors for 3 beams safety light curtain
SLC CL			Column with mirrors for 4 beams safety light curtain
SL 17 CL			Column with mirrors h = 1,700 mm
SL 20 CL			Column with mirrors h = 2,000 mm

model	QUOTE A <sup>(1)</sup>	QUOTE B <sup>(2)</sup>	QUOTE C <sup>(3)</sup>	QUOTE D <sup>(4)</sup>	application
SL A CL	1,000	1,016	1,036	1,066	2 beams perimetral protection
SL B CL	1,200	1,216	1,246	1,256	3 beams perimetral protection
SL C CL	1,330	1,346	1,366	1,386	4 beams perimetral protection
SL 17 CL	1,700	1,716	1,736	1,756	Perimetral protection with height up to 1,360 mm
SL 20 CL	1,970	1,986	2,006	2,026	Perimetral protection with height up to 1,660mm

<sup>(1)</sup> Housing or mirror height <sup>(2)</sup> Total column height without base  
<sup>(3)</sup> Total height with ST FIX base <sup>(4)</sup> Total height with ST FLEX base

Safety Accessories



Safety  
Accessories


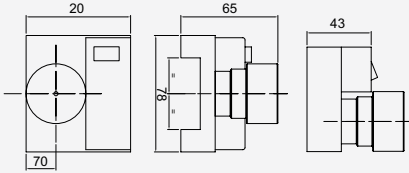
product	to be used with	dimensions (mm)	description / installation
SL 015	Safety light Curtains • LS2 • LS4 • LP4		Mirror for 160 mm protected height
SL 030			Mirror for 310 mm protected height
SL 045			Mirror for 460 mm protected height
SL 060			Mirror for 610 mm protected height
SL 075			Mirror for 760 mm protected height
SL 090			Mirror for 910 mm protected height
SL 105			Mirror for 1,060 mm protected height
SL 120			Mirror for 1,210 mm protected height
SL 135			Mirror for 1,360 mm protected height
SL 150			Mirror for 1,510 mm protected height
SL 165			Mirror for 1,660 mm protected height
SL 180			Mirror for 1,810 mm protected height

model	mirror	Safety light Curtain	
	H	protected height	type
SL 015	250	160	light Curtain
SL 030	400	310	
SL 045	540	460	
SL 060	715	610	2 beams
SL 075	885	760	light Curtain
SL 090	1,060	910	3 beams
SL 105	1,230	1,060	4 beams
SL 120	1,400	1,210	light Curtain
SL 135	1,450	1,360	
SL 150	1,600	1,510	
SL 165	1,750	1,660	
SL 180	1,900	1,810	


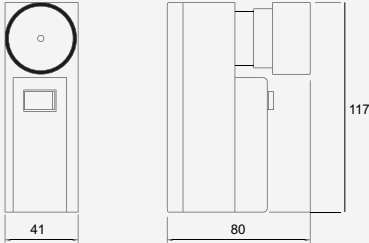
Accessories  
Safety

## laser pointer

### STL 01 P


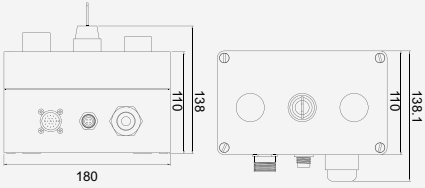
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4		Laser pointer for LP safety light Curtain

### STL 01 S

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		Laser pointer for LS safety light Curtain


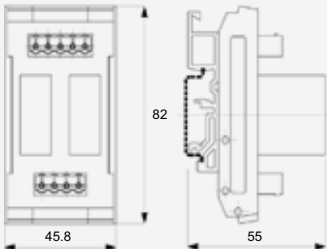
## box d'interconnexion

### LP / BOX - 1


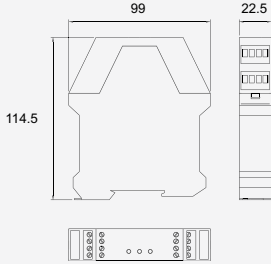
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LP4ER_M • LP4PT		Control box: Start, Override, Muting Lamp, M12 and M23 connectors, 2 NO + 1 NC Relay

## relay modules / safety modules


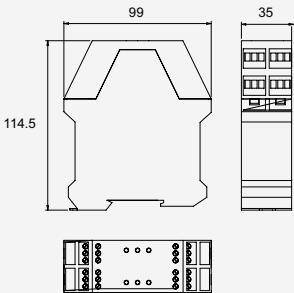
### SB 300

product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4 • LP4		Force guided relay module

SB 400


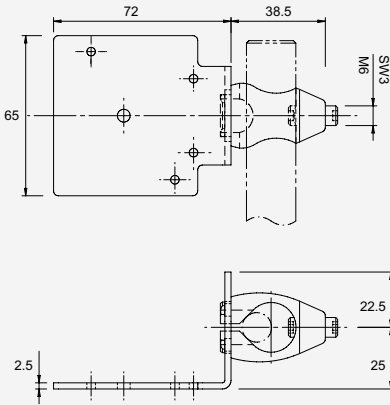
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4 • LP4		Cat. 4 Safety Module

SB 400M


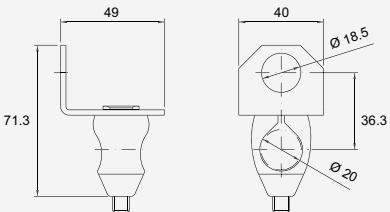
product	to be used with	dimensions (mm)	description / installation
	Safety light Curtains • LS2 • LS4		Cat. 4 Safety Module with integrated Muting function

SBCR03 and SH-IA/IC TH-IA/IC accessories series

STC 00

product	to be used with	dimensions (mm)	description / installation
	RL110,116,113G relectors		RL110,116,113G bracket for cylindrical rod

STC 18

product	to be used with	dimensions (mm)	description / installation
	SH-IA/IC, TH-IA/IC safety photocells		SH-IA/IC, TH-IA/IC bracket for cylindrical rod