

EFP Series

No-dead Zone Type 4 Safety Light Curtain



Product Introduction

EFP Series is a no dead zone safety light curtain in accordance with EU type 4 safety standards, which adopt internal MCU redundancy design, periodic self-diagnoses & cross-diagnosis, independent loop to ensure high safety performance.

Product Feature

- Design according to IEC61496 type 4 standard;
- Self-diagnosis and cross-diagnosis to improve safety;
- Independent and redundancy dual OSSD output prevent safety hazards caused by failure of a single circuit;
- Wire-syn to against interference of external infrared light.

Product Parameter

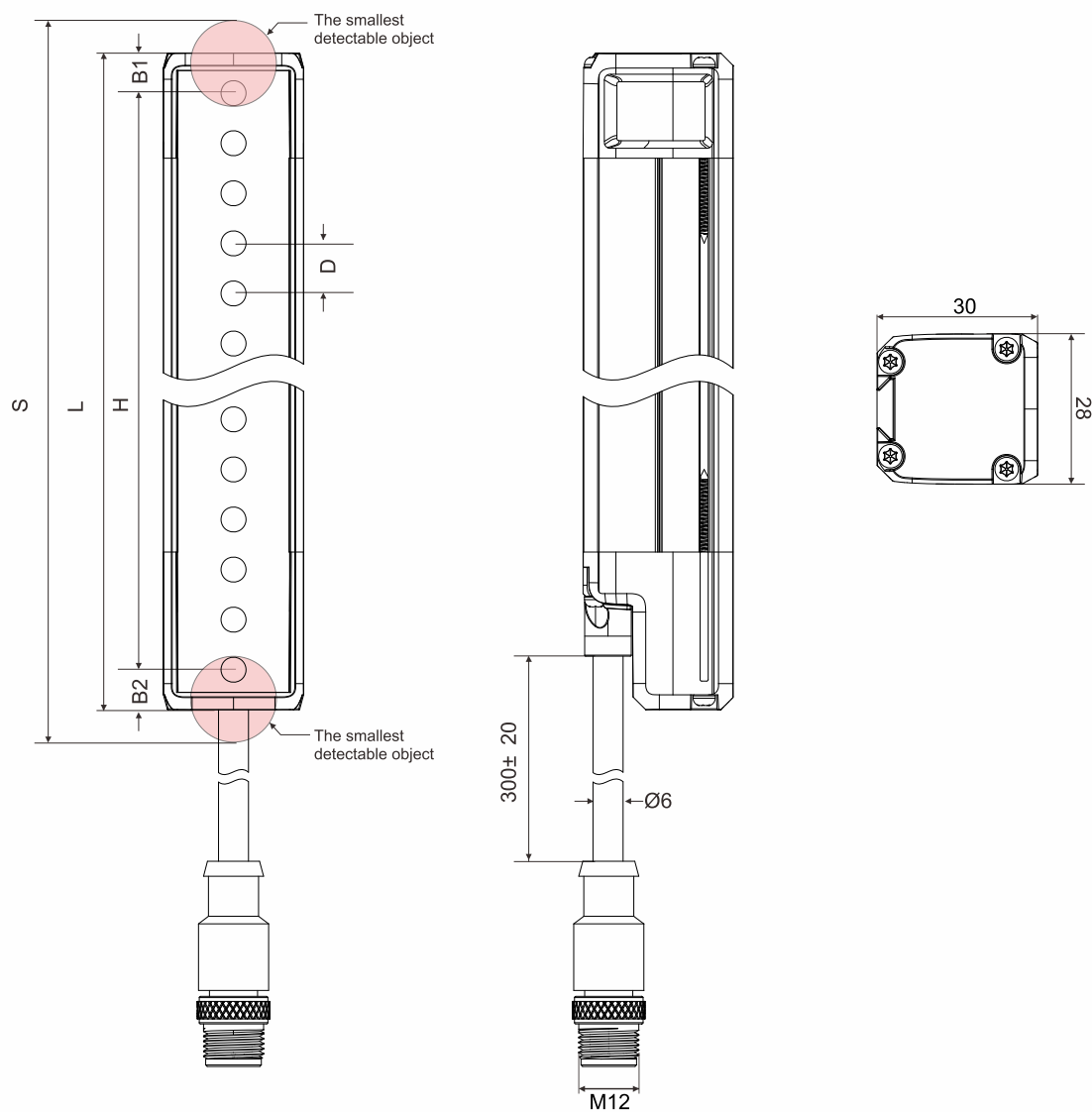
Safety Standard	Type 4 (IEC 61496-1/-2) Cat.4, PL e (ISO 13849-1)
Power Supply	DC24V±20%
Capacity	<5W
Beam Space	10mm,20mm,40mm
Resolution	15mm,25mm,45mm
Beams	10mm:16,20.....160
	20mm:8,10.....80
	40mm:4,6.....40
Protective Height	S=N×Beam space+Resolution,N=Beams
Light Wavelength	940nm infrared light
Response Time	≤2×(N×0.1+3)ms(N is beams)
Safety Output (OSSD)	PNP or NPN Load current≤500mA (Temperature exceed 40℃≤400 mA), residual voltage≤1V (any voltage drop caused by cable extension is excepted.), voltage leakage≤0.1mA.
Protective Circuit	Overvoltage protection, power supply reverse protection and overcurrent protection.
Sensing Distance	0.1~5m,0.2~12m
Against Optical Interference	10000 Lux (angle>2.5°)
Sensing Method	Thru-beam
Synchronization	Optical-syn/ Wire-syn
Enclosure Material	Aluminum alloy
Enclosure Protection Rate	IP65
Sectional Size	30*28mm
Vibration Resistance	Frequency 10Hz-55Hz, amplitude 0.35±0.05mm, 20time each X, Y and Z direction.
Shock Resistance	100/s ² (10G), 1000 times each at X, Y, Z directions.
Ambient Operating Temperature	-10℃~55℃(no freezing)
Storage Temperature	-30℃~70℃(no freezing)
Ambient Operating Humidity	When temperature 20℃, the humidity max. 85%
T (Operation time)	(ISO 13849-1)

Model Selection (e.g.:EFP1620NL-5)

Product Series	Beams	Beam Space	Output	Installation	Sensing Distance
EFP	16	20	N	L	5
	04,06,08.....	10mm 20mm 40mm	N: NPN*2 P: PNP*2	L: side mounting H4: H4 end mounting LD2: LD2 up & bottom rotate bracket	5:0.2~5m 12:0.6~12m

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Product Size



$D=10\text{mm}; B1=8\text{mm}, B2=8\text{mm}$
 $D=20\text{mm}; B1=8\text{mm}, B2=8\text{mm}$
 $D=40\text{mm}; B1=18\text{mm}, B2=18\text{mm}$
 $H=(N-1) \times \text{Beam space}, N=\text{Beams}$
 $S=N \times \text{Beam space} + \text{Resolution}, N=\text{Beams}$
 $L=B1+H+B2$

EFP Model Selection Table

- Beam space 10mm, resolution 15mm

Beams	Response Time (ms)	Protection Height (mm)	Detection Height (mm)	Total Height (mm)	Model
16	≤9.2	175	150	166	EFP1610
20	≤10	215	190	206	EFP2010
24	≤10.8	255	230	246	EFP2410
28	≤11.6	295	270	286	EFP2810
32	≤12.4	335	310	326	EFP3210
36	≤13.2	375	350	366	EFP3610
40	≤14	415	390	406	EFP4010
44	≤14.8	455	430	446	EFP4410
48	≤15.6	495	470	486	EFP4810
52	≤16.4	535	510	526	EFP5210
56	≤17.2	575	550	566	EFP5610
60	≤18	615	590	606	EFP6010
64	≤18.8	655	630	646	EFP6410
68	≤19.6	695	670	686	EFP6810
72	≤20.4	735	710	726	EFP7210
76	≤21.2	775	750	766	EFP7610
80	≤22	815	790	806	EFP8010
84	≤22.8	855	830	846	EFP8410
88	≤23.6	895	870	886	EFP8810
92	≤24.4	935	910	926	EFP9210
96	≤25.2	975	950	966	EFP9610
100	≤26	1015	990	1006	EFP10010
104	≤26.8	1055	1030	1046	EFP10410
108	≤27.6	1095	1070	1086	EFP10810
112	≤28.4	1135	1110	1126	EFP11210
116	≤29.2	1175	1150	1166	EFP11610
120	≤30	1215	1190	1206	EFP12010
124	≤30.8	1255	1230	1246	EFP12410
128	≤31.6	1295	1270	1286	EFP12810
132	≤32.4	1335	1310	1326	EFP13210
136	≤33.2	1375	1350	1366	EFP13610
.....
160	≤38	1615	1590	1606	EFP16010

Remark: Besides above model, other curtains can be customized.

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EFP Model Selection Table

- Beam space 20mm, resolution 25mm

Beams	Response Time (ms)	Protection Height (mm)	Detection Height (mm)	Total Height (mm)	Model
8	≤7.2	185	140	156	EFP0820
10	≤8	225	180	196	EFP1020
12	≤8.4	265	220	236	EFP1220
14	≤8.8	305	260	276	EFP1420
16	≤9.2	345	300	316	EFP1620
18	≤9.6	385	340	356	EFP1820
20	≤10	425	380	396	EFP2020
22	≤10.8	465	420	436	EFP2220
24	≤10.8	505	460	476	EFP2420
26	≤11.2	545	500	516	EFP2620
28	≤11.6	585	540	556	EFP2820
30	≤12	625	580	596	EFP3020
32	≤12.4	665	620	636	EFP3220
34	≤12.8	705	660	676	EFP3420
36	≤13.2	745	700	716	EFP3620
38	≤13.6	785	740	756	EFP3820
40	≤14	825	780	796	EFP4020
42	≤14.4	865	820	836	EFP4220
44	≤14.8	905	860	876	EFP4420
46	≤15.2	945	900	916	EFP4620
48	≤15.6	985	940	956	EFP4820
50	≤16	1025	980	996	EFP5020
52	≤16.4	1065	1020	1036	EFP5220
54	≤16.8	1105	1060	1076	EFP5420
56	≤17.2	1145	1100	1116	EFP5620
58	≤17.6	1185	1140	1156	EFP5820
60	≤18	1225	1180	1196	EFP6020
62	≤18.4	1265	1220	1236	EFP6220
64	≤18.8	1305	1260	1276	EFP6420
66	≤19.2	1345	1300	1316	EFP6620
68	≤19.6	1385	1340	1356	EFP6820
.....
80	≤22	1625	1580	1596	EFP8020

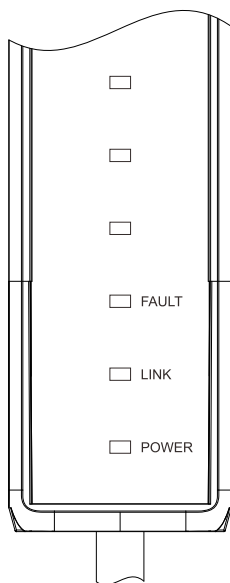
Remark: Besides above model, other curtains can be customized.

- Beam space 40mm, resolution 45mm

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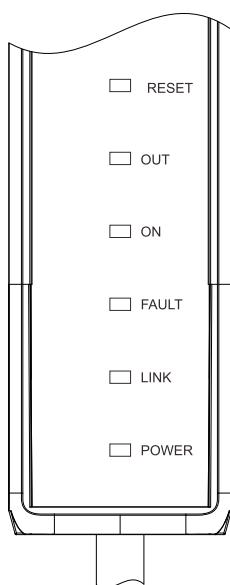
Remark: Besides above model, other curtains can be customized.

Indicator Light



Emitter

Emitter working state description			
POWER	LINK	FAULT	Description
Green ON	Green ON	OFF	Normal working
Green ON	GREEN(1Hz)	OFF	Initializing
Green ON	GREEN(2Hz)	OFF	Wire-syn poor connection or broken
GREEN(1Hz)	OFF	RED	Undervoltage, Please check
GREEN(2Hz)	OFF	RED	Overvoltage, please check
Green ON	OFF	RED	Internal failure, repair or replace
OFF	OFF	OFF	Internal failure, repair or replace



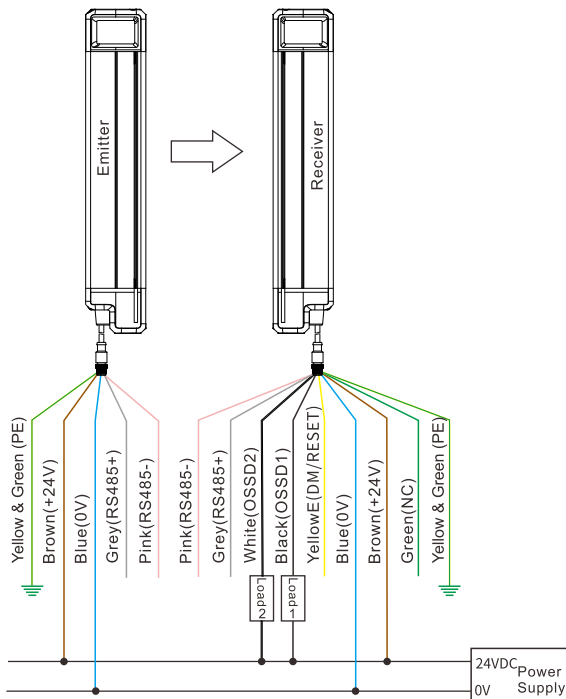
Receiver

Receiver Indicator Specification						
POWER	LINK	FAULT	ON	OUT	RESET	Function
Green ON	Green ON	OFF	Green ON	Green ON	OFF	Normal working
Green ON	Green (1Hz)	OFF	OFF	Red ON	OFF	Initializing
Green ON	Green (2Hz)	OFF	OFF	Red ON	OFF	Not synchronized with the light
Green ON	Green ON	OFF	Green ON	Red ON	YELLOW ON	RESET
Green (1Hz)	OFF	Red	OFF	Red ON	OFF	Undervoltage, please check power supply
Green (2Hz)	OFF	Red	OFF	Red ON	OFF	Overvoltage , please check power supply
Green ON	OFF	Red(1Hz)	OFF	Red ON	OFF	EDM fault
Green ON	OFF	Red(2Hz)	OFF	Red ON	OFF	2 Output Short-Circuit
Green ON	OFF	Red(4Hz)	OFF	Red ON	OFF	Output Overload
Green ON	OFF	Red	OFF	Red ON	OFF	Internal failure, repair or replace
OFF	OFF	OFF	OFF	Red ON	OFF	Internal failure, repair or replace

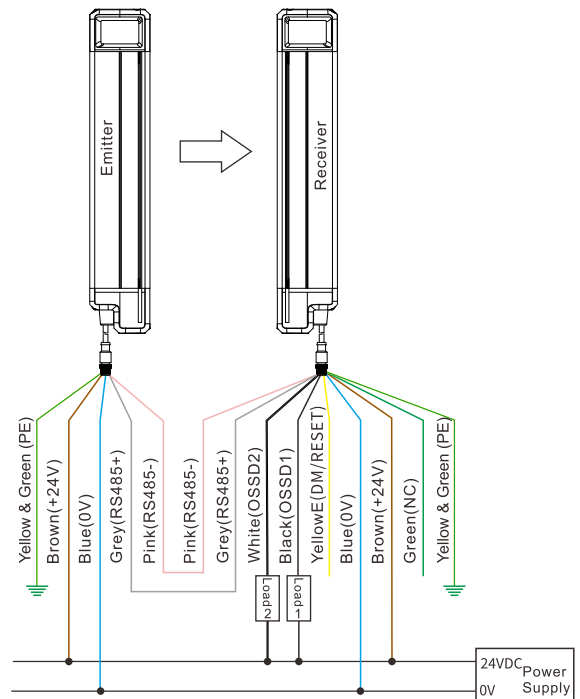
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Wire Diagram

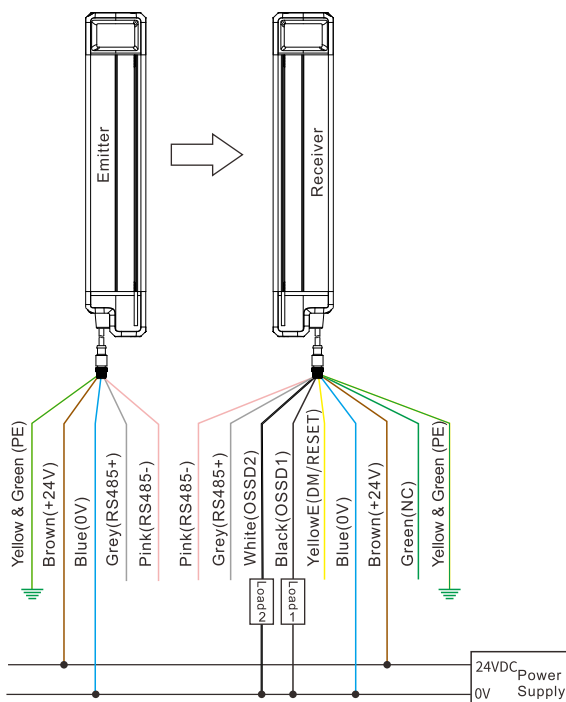
Optical synchronization NPN (No EDM, automatic reset)



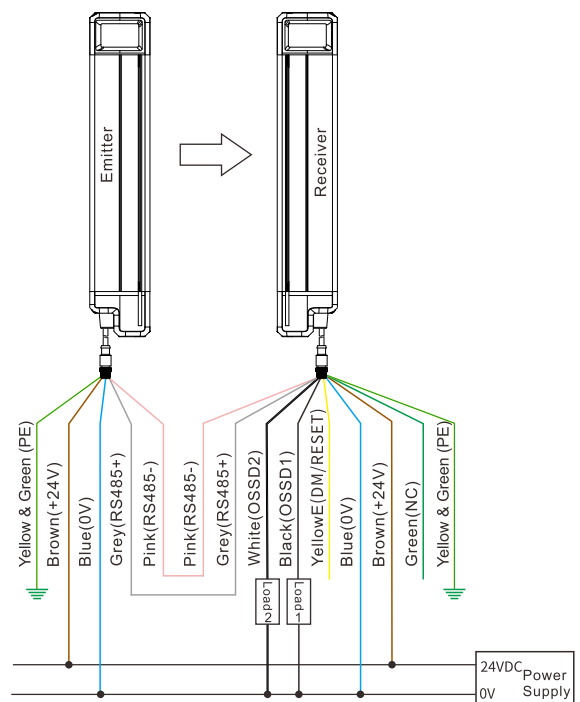
Wire connection NPN (No EDM, automatic reset)



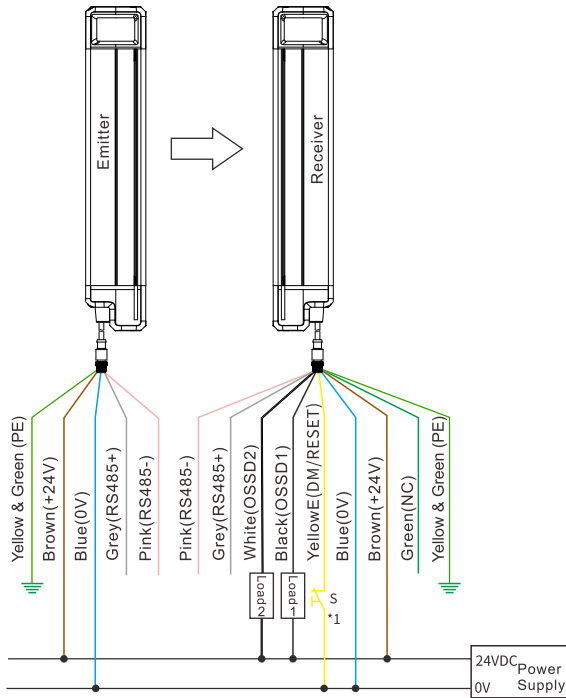
Optical synchronization PNP (No EDM, automatic reset)



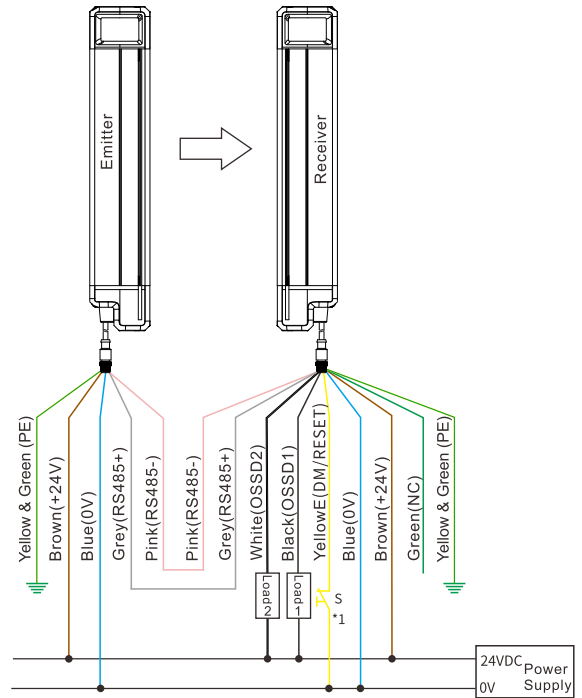
Wire connection PNP (No EDM, automatic reset)



Optical synchronization NPN (No EDM, manual reset)

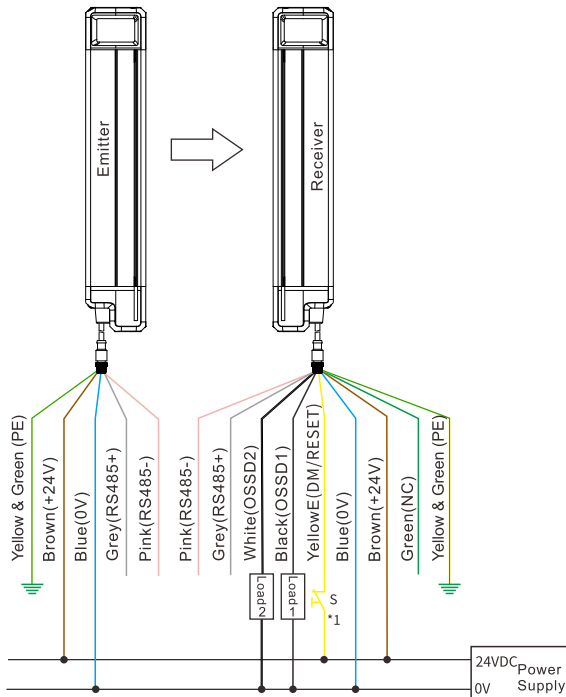


Wire connection NPN (No EDM, manual reset)

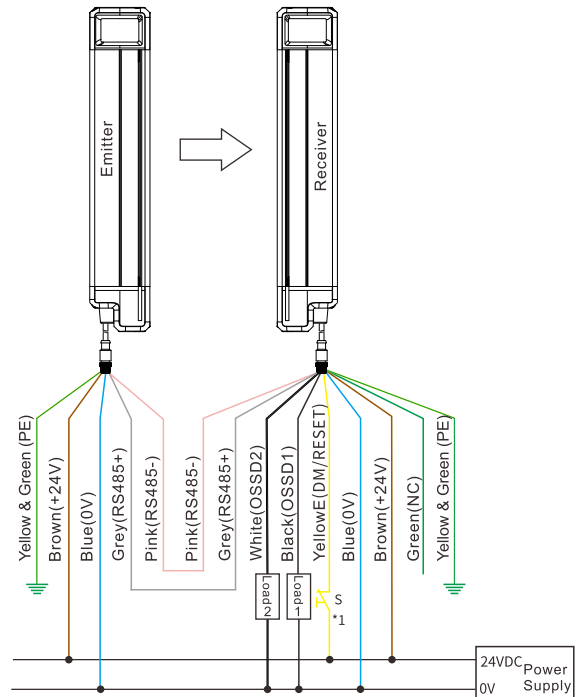


*1RESET: Once safety device triggered, reset interlock avoid machine restarting. Operator need to push restart safety device. Then machine start to work.

Optical synchronization PNP (No EDM, manual reset)



Wire connection PNP (No EDM, manual reset)

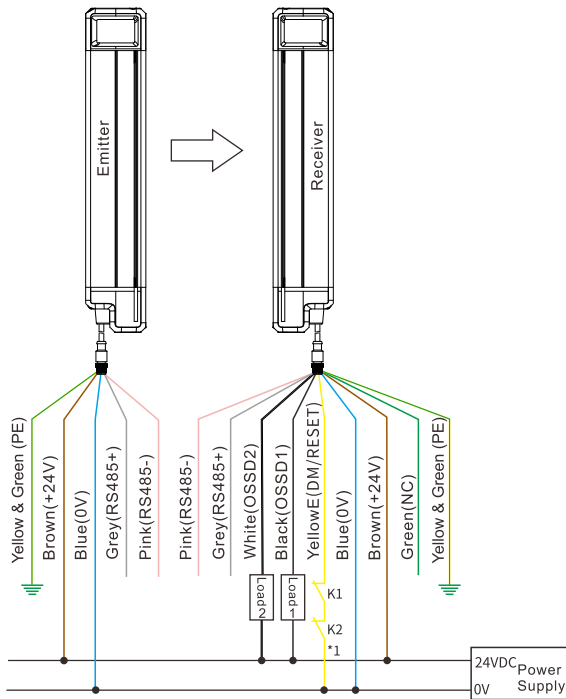


*1RESET: Once safety device triggered, reset interlock avoid machine restarting. Operator need to push restart safety device. Then machine start to work.

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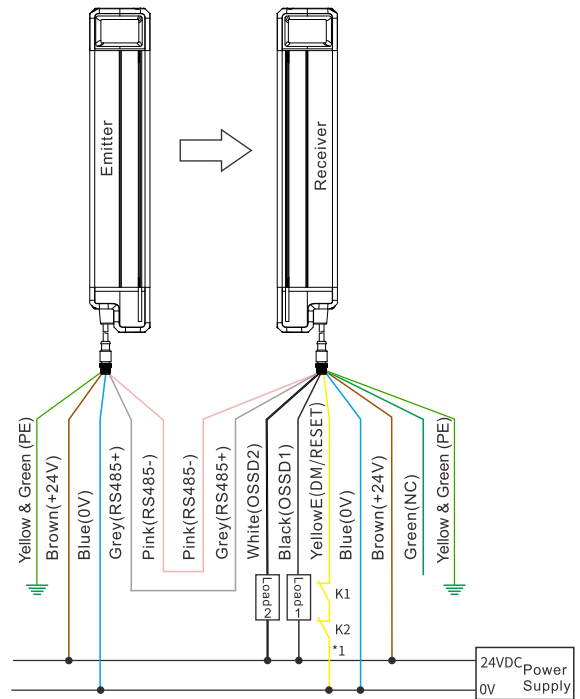
Wire Diagram

Optical synchronization NPN (With EDM & Automatic Reset)



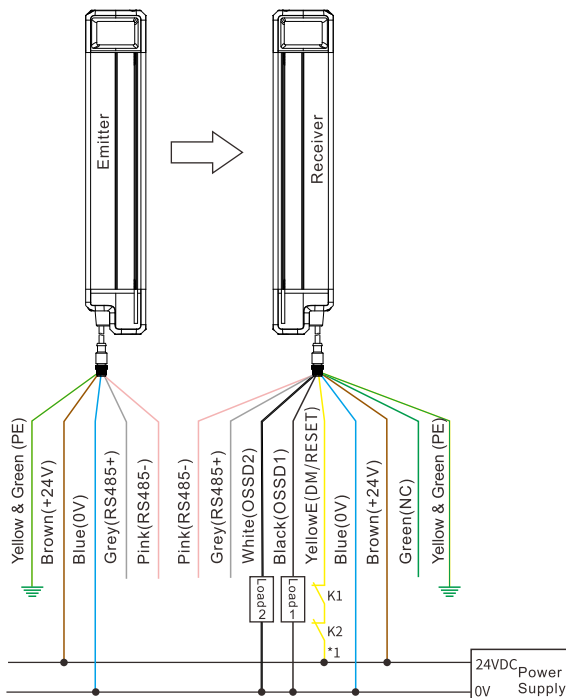
1 EDM: Monitor external device state

Wire connection NPN (With EDM & Automatic Reset)



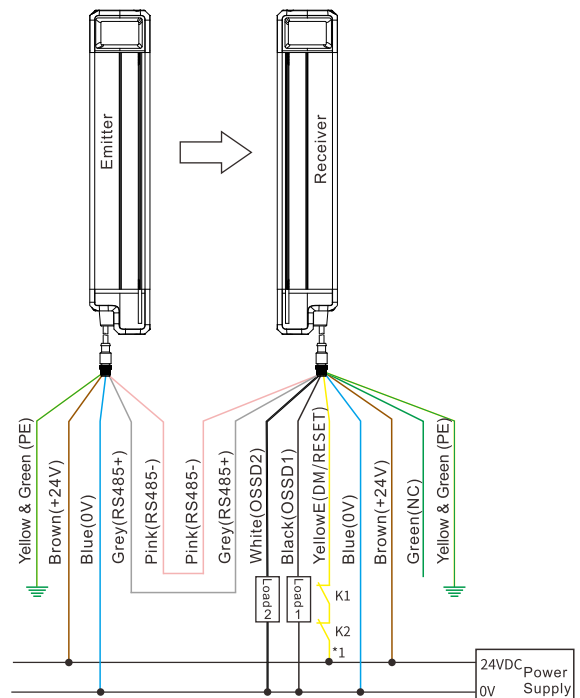
1 EDM: Monitor external device state

Optical synchronization PNP (With EDM & Automatic Reset)



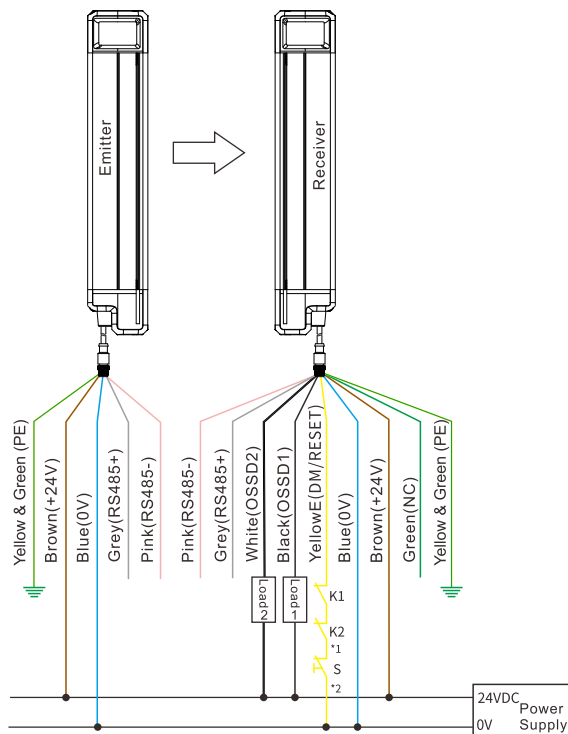
1 EDM: Monitor external device state

Wire connection PNP (With EDM & Automatic Reset)



1 EDM: Monitor external device state

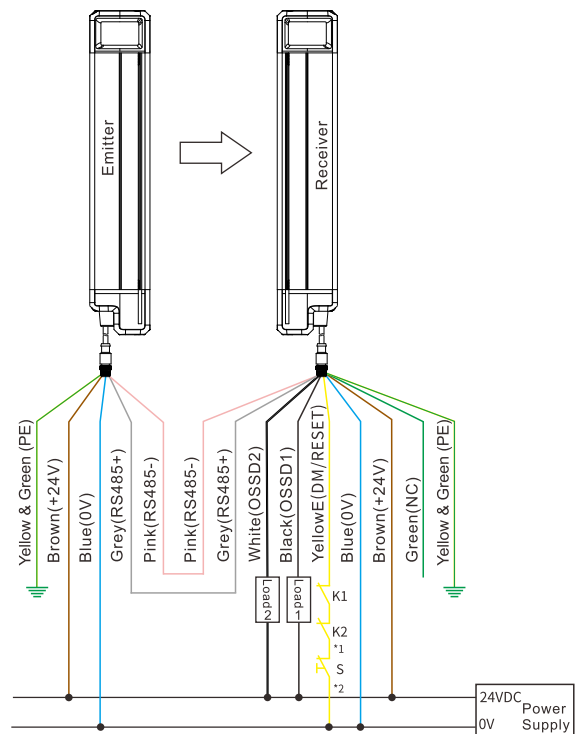
Optical synchronization NPN (With EDM & manual reset)



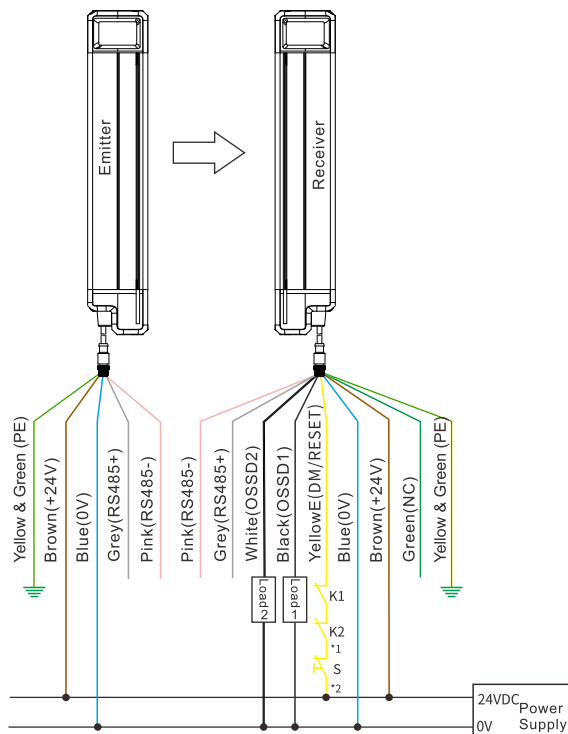
1 EDM: Monitor external device state

*2 Reset: Once safety device triggered, reset interlock avoid machine restarting.Operator need to push restart safety device. Then machine start to work.

Wire connection NPN (With EDM & manual reset)



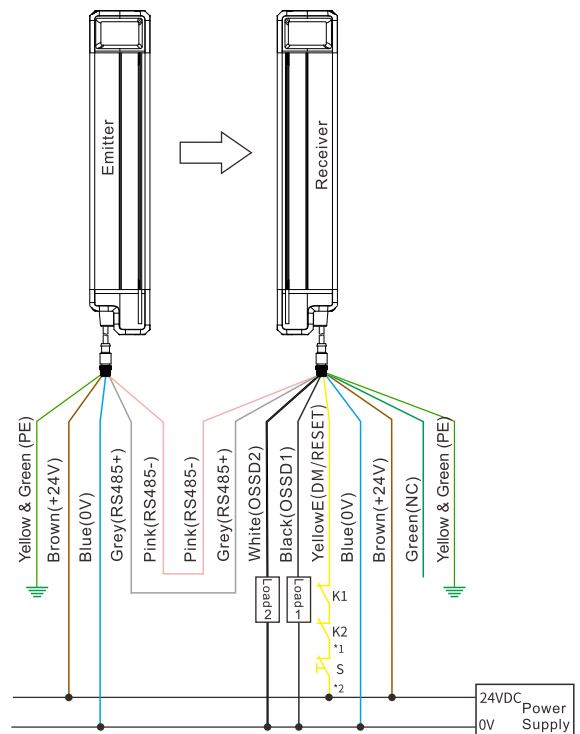
Optical synchronization PNP (With EDM & manual reset)



1 EDM: Monitor external device state

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Wire connection PNP (With EDM & manual reset)



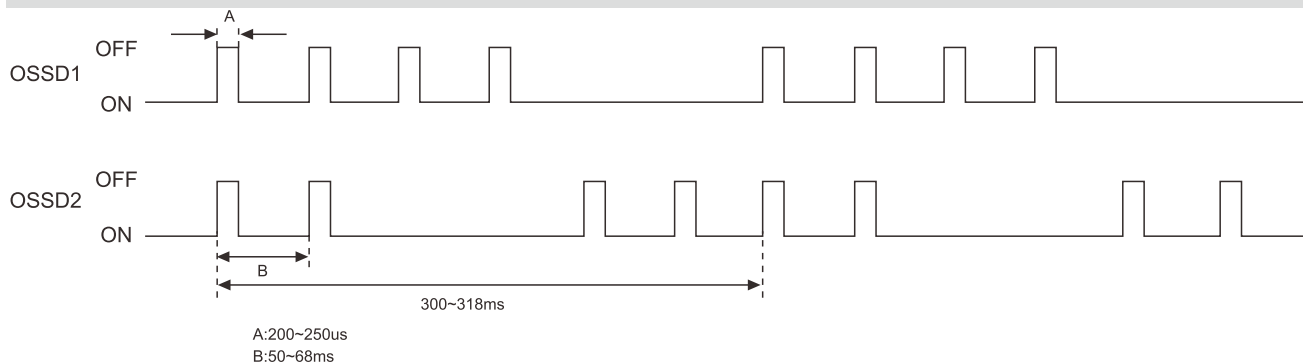
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Wire Specification

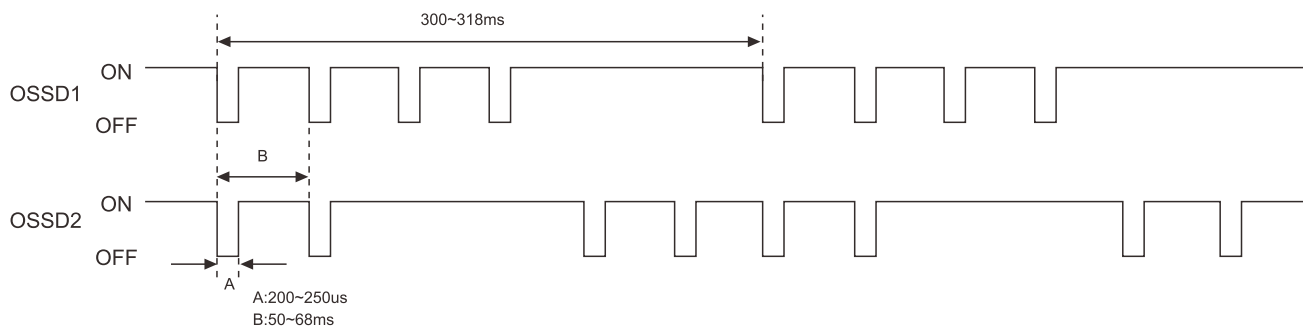
Barrier	Color	Wire Mark	Function
Emitter	Brown	24VDC	Positive of power
	Blue	0V	Negative of power
	Grey	RS485+	Configure RS485/ Syn RS485+
	Pink	RS485-	Configure RS485/ Syn RS485+
	Yellow & Green	PE	Shielding wire
Receiver	Brown	24VDC	Positive of power
	Blue	0V	Negative of power
	Grey	RS485+	Configure RS485/ Syn RS485+
	Pink	RS485-	Configure RS485/ Syn RS485+
	Yellow & Green	PE	Shielding wire
	Yellow	EDM/RESET	EDM detection and RESET reset input
	Black	OSSD1	Safety output 1
	White	OSSD2	Safety output 2
	Green	NC	Vacant Line

Sequence Diagram


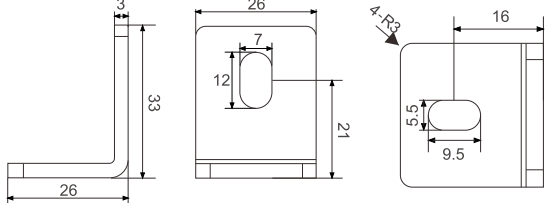

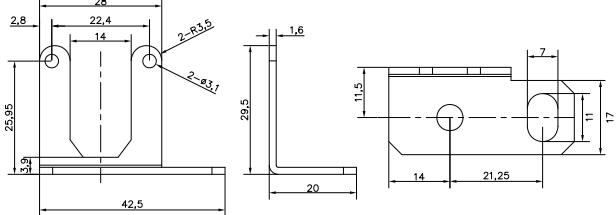
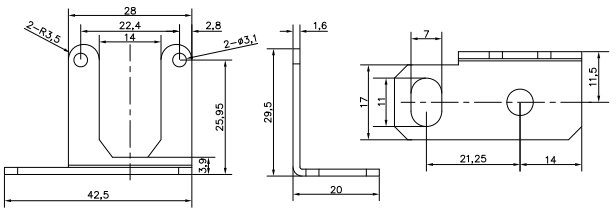

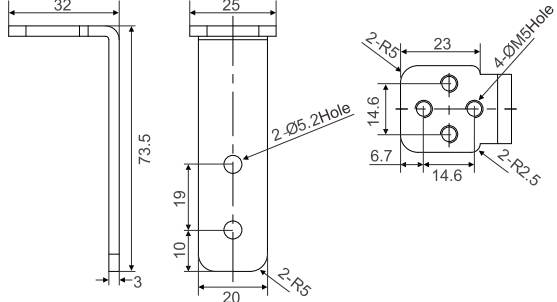
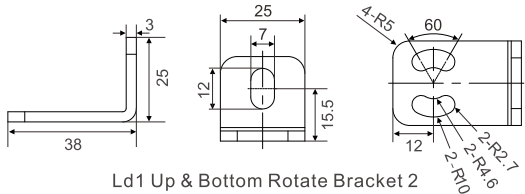
NPN OSSD



PNP OSSD

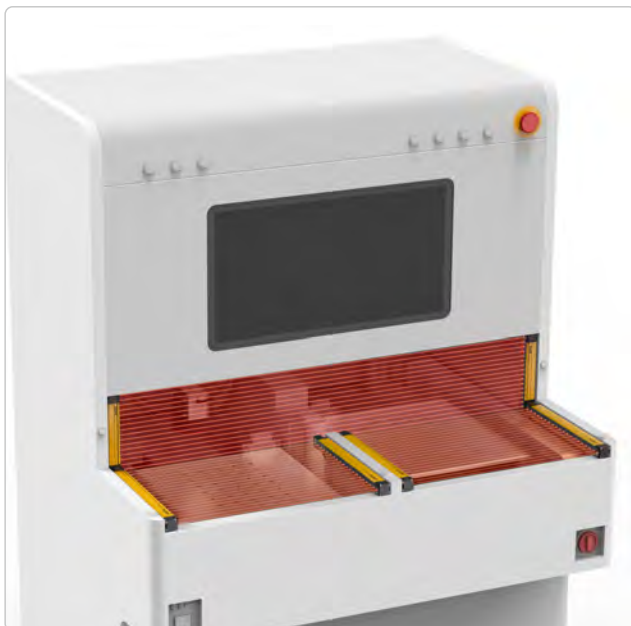


Option of Bracket

Picture	Name	Accessories	Size
	L side mounting bracket	L1 bracket (4pcs) M5 Slider (4pcs) M6 gasket (4pcs) M6 spring washer (4pcs) M6*16 screw (4pcs) M6*8 screw (4pcs)	
	H4 up & bottom mounting bracket	Up & bottom bracket (4pcs) M6 pad (4pcs) M6 spring washer (4pcs) M3*6 screw (4pcs)	<p>H4 Up Bracket Size</p>  <p>H4 Bottom Bracket Size</p> 
	LD1 up & bottom rotate bracket	LD1 rotate brackets 1 (4pcs) LD1 rotate brackets 2 (4pcs) M5 slider (8pcs) M5 gasket (4pcs) M6 spring washer (4pcs) M6*16 screw (4pcs) M5*6 screw (16pcs)	<p>LD1 Up & Bottom Rotate Bracket 1</p>  <p>LD1 Up & Bottom Rotate Bracket 2</p> 

Type 4 Safety Light Curtain

Application



Certificate

