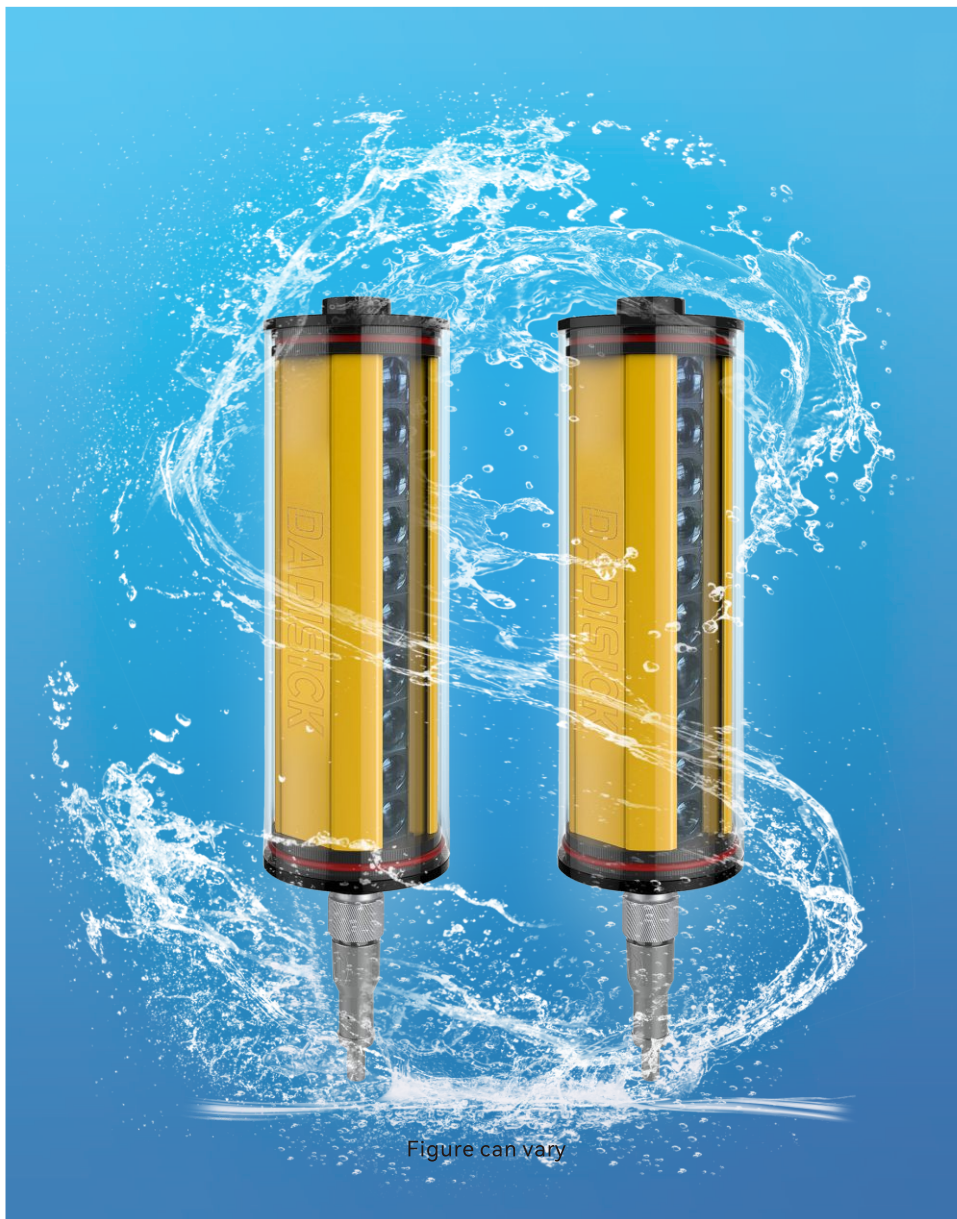


TECHNICAL DATA SHEET

SAFETY LIGHT CURTAIN SENSOR Emitter and Receiver **QRF series**



Contents

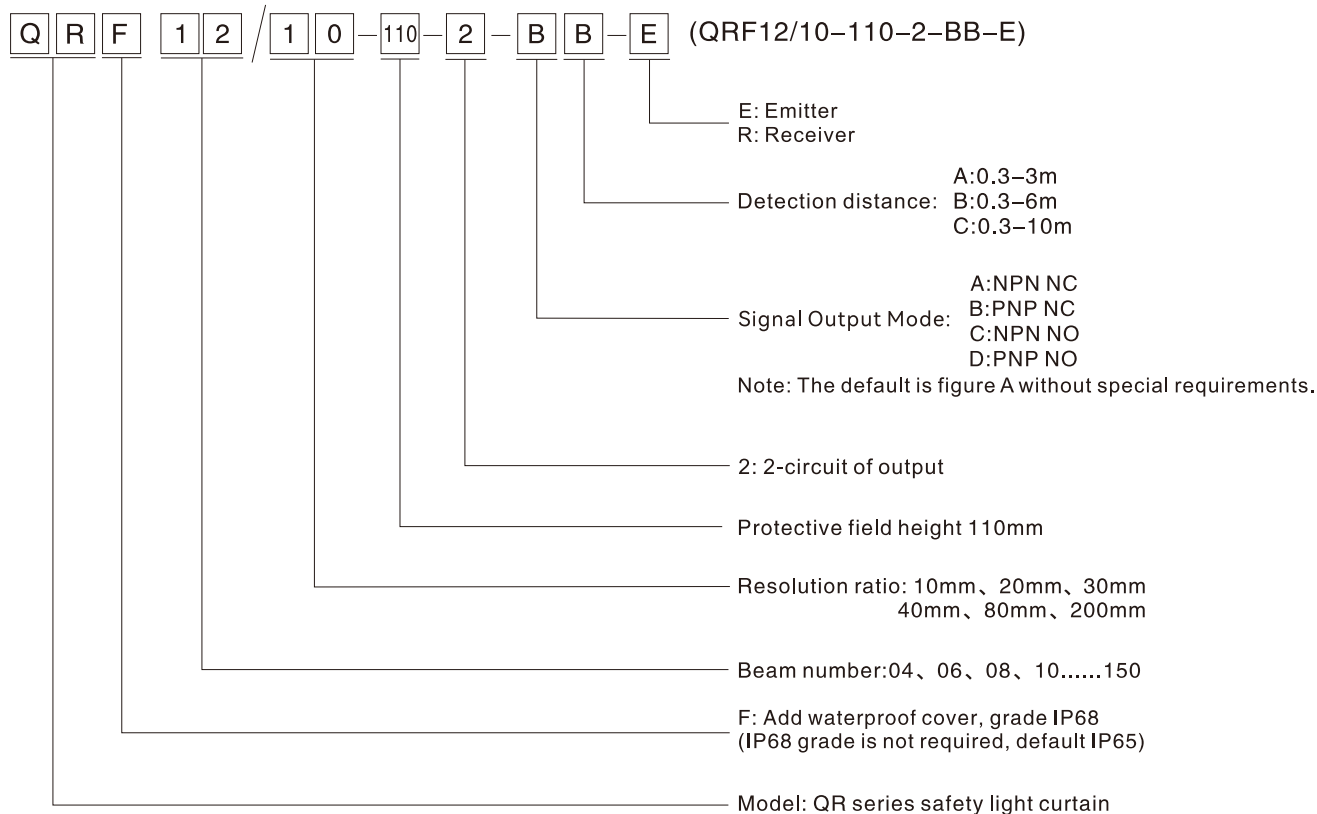
- Product application
- Resolution ratio
- Technical data
- Operation and display
- Dimensioned drawings
- Electrical connection
- Wiring diagram
- Accessories

**Solutions****GB/T 19001-2016**

Product application

- A. Light curtain can achieve full protection for the slider can be stopped at any position on the press machine.
- B. The light curtain can only achieve upper dead point protection if the slider can not be stopped at any position on the press machine.
- C. Realize the regional protection for the industry manipulator, injection molding machines, packaging equipment, automation equipment, assembly wires and other dangerous work area.
- D. Used to detect and alarm object.

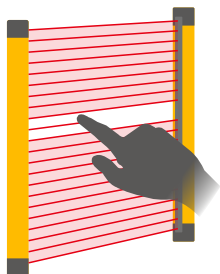
The specifications of QRF type safety light curtain are as follows:



Resolution ratio

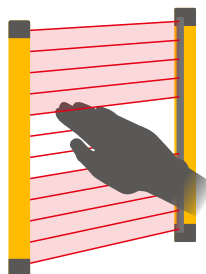
Depending on the usage environment and requirements, it is important to choose the appropriate beam spacing

Finger protection



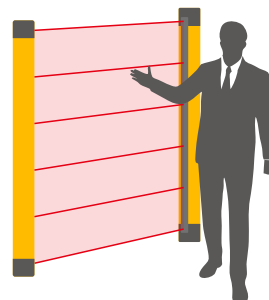
Detection capability
10/14/20mm
diameter

Hand protection



Detection capability
30/40mm
diameter

Arm/body protection



Detection capability
80/200mm
diameter

Technical data

Basic data of Receiver and Emitter

Standard packaging	
Product model	QRF series
Standard configuration	One receiver, one transmitter, two data lines, one right-angle rack, and one t-shaped screw
Light curtain form	Infrared radiation type
Application	Standard industrial environment

Features	
Resolution ratio	10mm, 20mm, 30mm, 40mm, 80mm
Check the accuracy	18mm, 28mm, 38mm, 48mm, 88mm
Number of beams	04、06、08、10.....150
Overall dimension	φ50mm*L, L is the length of emitter and receiver.
Detection distance	30-6000mm
Response time	≤15ms

Synchronization	
Consumption current	≤200mA
Output mode	2-circuit of PNP, with current of 500mA and voltage below 1.5V, polarity, short circuit and over-cutting protection
Output status	ON (receiving indicator green light)
Indicator light	Transmitter: power indicator light (red); receiver: output indicator light on (green), blackout (red)
Wavelength	850nm
Type of light	Infrared light (NIR), invisible
Function	Automatic reset

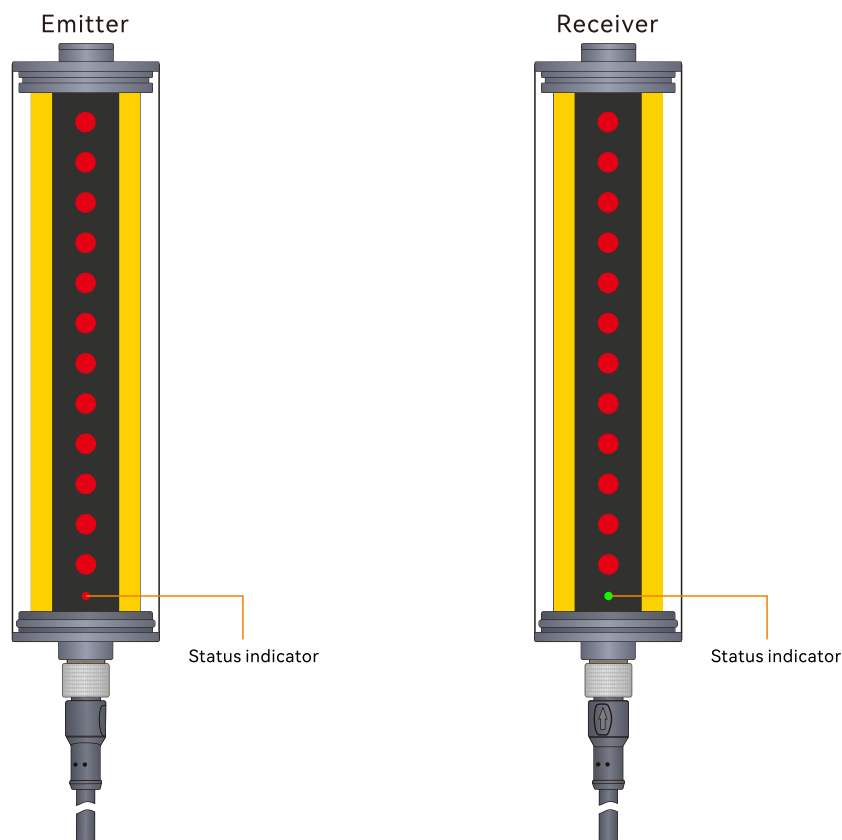
Mechanical data	
Housing material	Metal
Metal shell	Aluminium
Lens front screen material	Acrylic
Upper and lower cover materials	ABS reinforced nylon PA66+30% GF

Performance data	
Protection circuit	Short circuit protection Overvoltage protection
Supply voltage	24VDC,-20...20%
Maximum current consumption	150mA
Fuse	2A half time interval

Environmental data	
Protection grade	IP68
Resistance to ambient light	Incandescent light: illumination of light-receiving surface 3000Lx; Sunlight: illumination of light-receiving surface 10000Lx
Ambient temperature	Working temperature: - 10~+40 °C (but not frozen), storage temperature: - 25 ~+55 °C
Ambient humidity	Working time: 35~85% RH, saving time: 35~95% RH

Output	
Number of safe output circuits (OSSD)	2-circuit
Type	Safety circuit output circuit OSSD
Minimum switch voltage high	18V
Minimum switch voltage low	2.5V
Typical switching voltage	22.5V
Voltage type	DC
Maximum current load	380mA
Load inductance	two thousand
Load capacity	zero point three
Maximum residual current	0.2mA
Typical residual current	0.002MA
Voltage drop	1.5V
Safety switch output 1	Connection pin 4, WHITE OSSD1
Switching element	Transistor PNP
Safety switch output 2	Connection pin 5, GREEN OSSD2
Switching element	Transistor PNP
Certificate	
CE TÜV	No.E8A 104143 0001 Rev.00
ROHS certification	No.BSTDG180811032001CC
CE TYPE 4	No.ICR Polska/VC/HS221222
UL	No. 4790783741.1-S
ISO	No. HIC180327 GB/T 19001-2016 / ISO 9001:2015

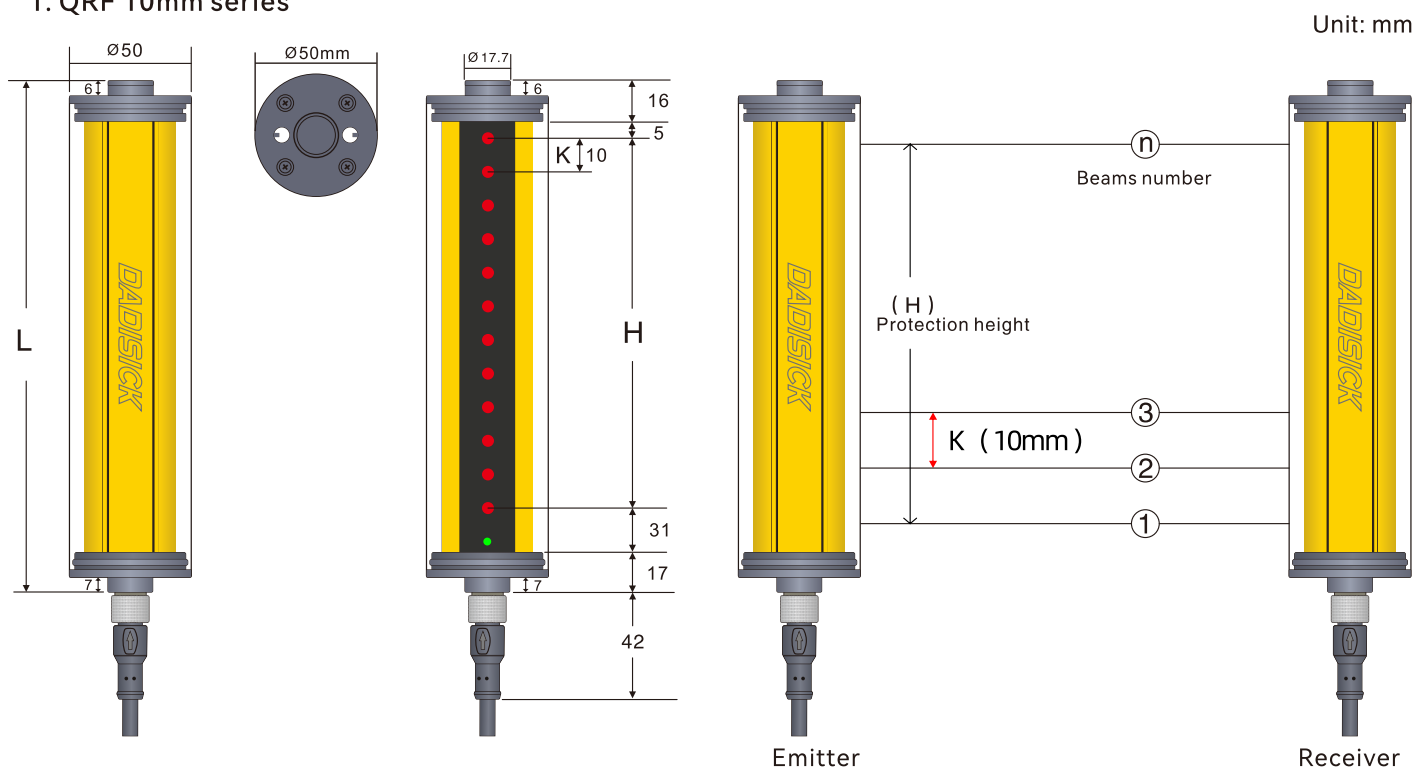
Operation and display



Normal operation of light curtain	LED Indicator status		Explain
Emitter		Red, always on	Turns on the power
		Receiver and emitter are red	Receiver and Emitter are not aligned
Receiver		Green	All light paths are connected
		Red	Light path shading
		Lights flashing	Interference or overstep detection range

Dimensioned drawings

1. QRF 10mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

n: Beams number

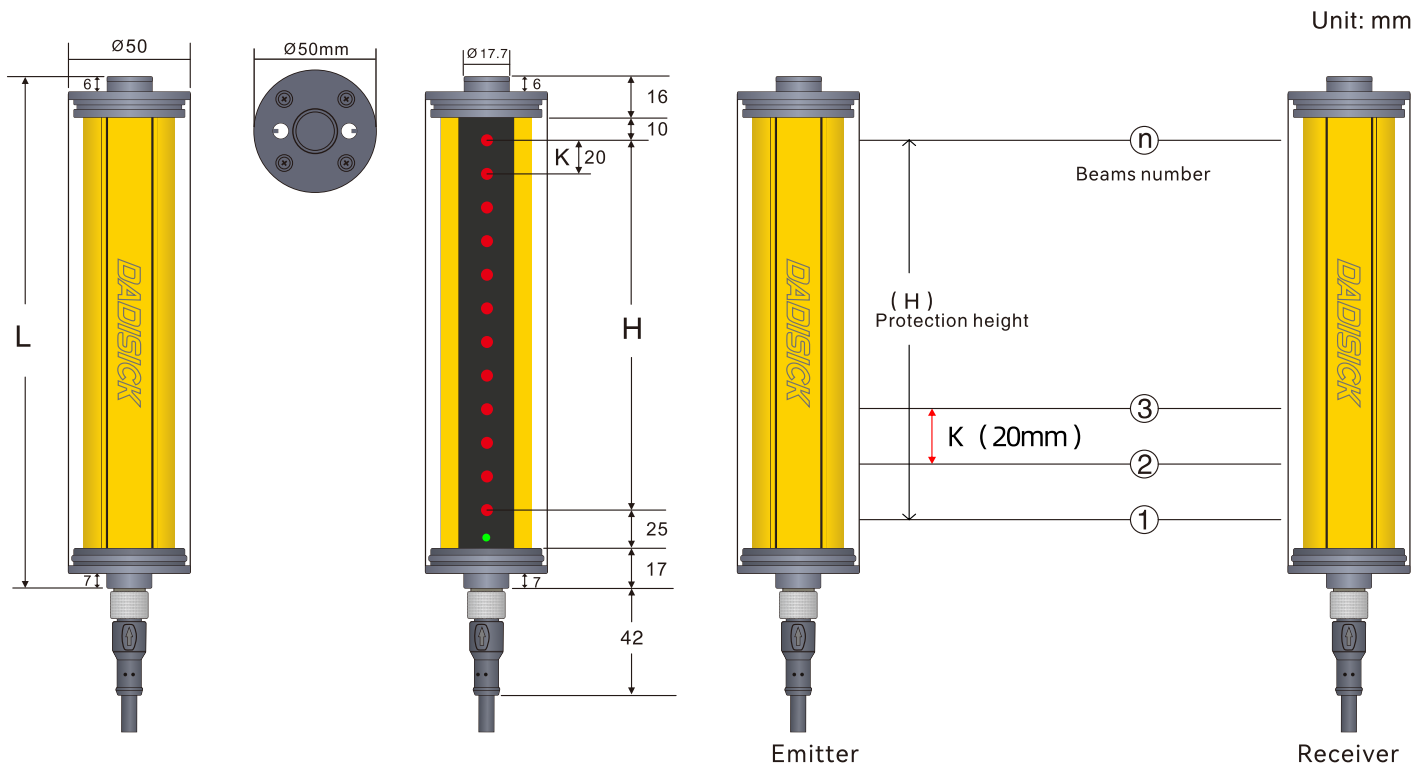
$L = 16 + 5 + H + 31 + 17$

$H = (n - 1) * 10$

QRF 10mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
10mm (K)	6	50	119	QRF06/10-50	2	PNP	0.3-6m
	8	70	139	QRF08/10-70	2	PNP	0.3-6m
	10	90	159	QRF10/10-90	2	PNP	0.3-6m
	12	110	179	QRF12/10-110	2	PNP	0.3-6m
	14	130	199	QRF14/10-130	2	PNP	0.3-6m
	16	150	219	QRF16/10-150	2	PNP	0.3-6m
	18	170	239	QRF18/10-170	2	PNP	0.3-6m
	20	190	259	QRF20/10-190	2	PNP	0.3-6m
	22	210	279	QRF22/10-210	2	PNP	0.3-6m
	24	230	299	QRF24/10-230	2	PNP	0.3-6m
	26	250	319	QRF26/10-250	2	PNP	0.3-6m
	28	270	339	QRF28/10-270	2	PNP	0.3-6m
	30	290	359	QRF30/10-290	2	PNP	0.3-6m
	32	310	379	QRF32/10-310	2	PNP	0.3-6m
	34	330	399	QRF34/10-330	2	PNP	0.3-6m
	36	350	419	QRF36/10-350	2	PNP	0.3-6m
	38	370	439	QRF38/10-370	2	PNP	0.3-6m
	40	390	459	QRF40/10-390	2	PNP	0.3-6m
	42	410	479	QRF42/10-410	2	PNP	0.3-6m
	44	430	499	QRF44/10-430	2	PNP	0.3-6m
	46	450	519	QRF46/10-450	2	PNP	0.3-6m
	48	470	539	QRF48/10-470	2	PNP	0.3-6m
	50	490	559	QRF50/10-490	2	PNP	0.3-6m
	52	510	579	QRF52/10-510	2	PNP	0.3-6m
	...	...	...	...	2	PNP	0.3-6m
	146	1450	1519	QRF56/10-1450	2	PNP	0.3-6m
	148	1470	1539	QRF58/10-1470	2	PNP	0.3-6m
	150	1490	1559	QRF60/10-1490	2	PNP	0.3-6m

2.QRF 20mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

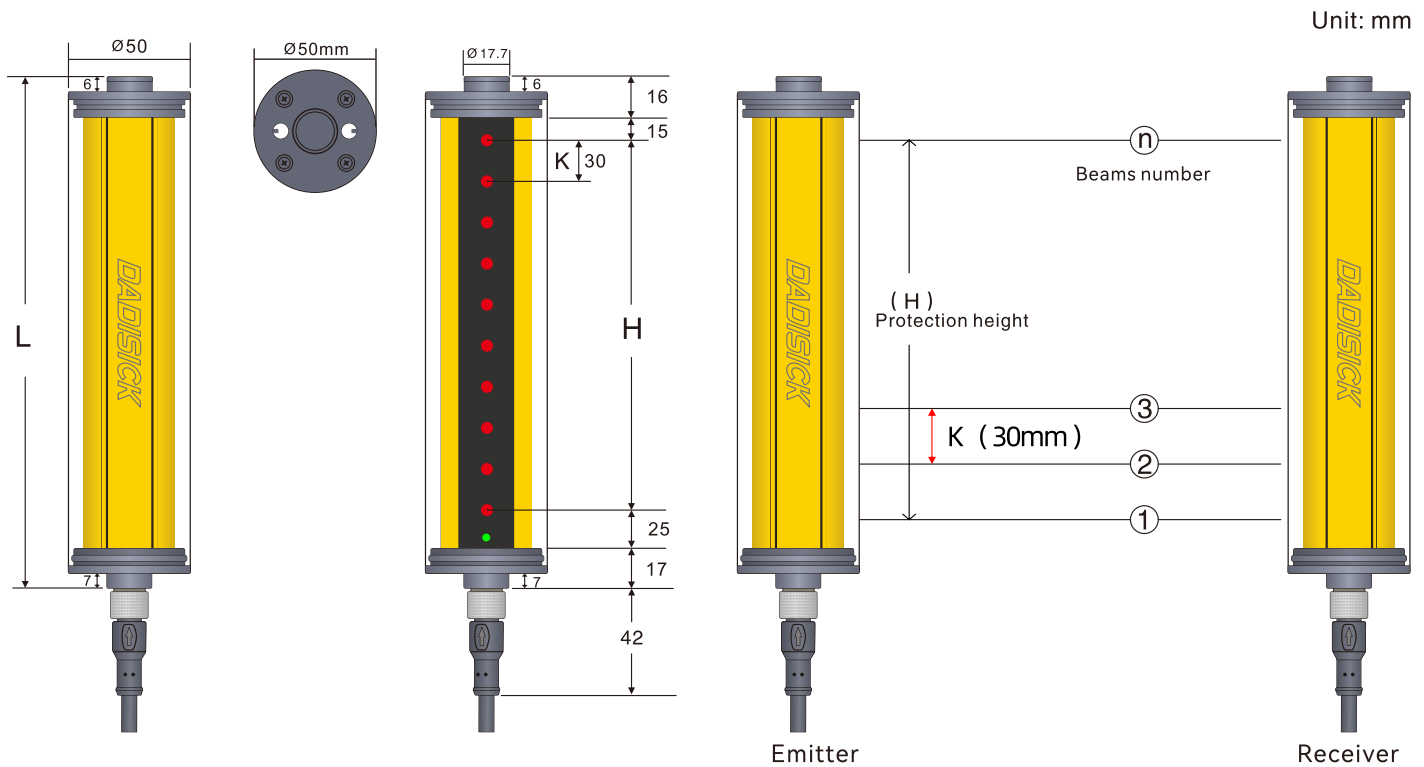
n: Beams number

 $L = 16 + 10 + H + 25 + 17$ $H = (n - 1) \times 20$

QRF 20mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
20mm (K)	4	60	128	QRF04/20-60	2	PNP	0.3-6m
	6	100	168	QRF06/20-100	2	PNP	0.3-6m
	8	140	208	QRF08/20-140	2	PNP	0.3-6m
	10	180	248	QRF10/20-180	2	PNP	0.3-6m
	12	220	288	QRF12/20-220	2	PNP	0.3-6m
	14	260	328	QRF14/20-260	2	PNP	0.3-6m
	16	300	368	QRF16/20-300	2	PNP	0.3-6m
	18	340	408	QRF18/20-340	2	PNP	0.3-6m
	20	380	448	QRF20/20-380	2	PNP	0.3-6m
	22	420	488	QRF22/20-420	2	PNP	0.3-6m
	24	460	528	QRF24/20-460	2	PNP	0.3-6m
	26	500	568	QRF26/20-500	2	PNP	0.3-6m
	28	540	608	QRF28/20-540	2	PNP	0.3-6m
	30	580	648	QRF30/20-580	2	PNP	0.3-6m
	32	620	688	QRF32/20-620	2	PNP	0.3-6m
	34	660	728	QRF34/20-660	2	PNP	0.3-6m
	36	700	768	QRF36/20-700	2	PNP	0.3-6m
	38	740	808	QRF38/20-740	2	PNP	0.3-6m
	40	780	848	QRF40/20-780	2	PNP	0.3-6m
	42	820	888	QRF42/20-820	2	PNP	0.3-6m
	44	860	928	QRF44/20-860	2	PNP	0.3-6m
	46	900	968	QRF46/20-900	2	PNP	0.3-6m
	48	940	1008	QRF48/20-940	2	PNP	0.3-6m
	50	980	1048	QRF50/20-980	2	PNP	0.3-6m
	...	...	...	...	2	PNP	0.3-6m
	68	1340	1408	QRF68/20-1340	2	PNP	0.3-6m
	70	1380	1448	QRF70/20-1380	2	PNP	0.3-6m
	72	1420	1488	QRF72/20-1420	2	PNP	0.3-6m

3. QRF 30mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

n: Beams number

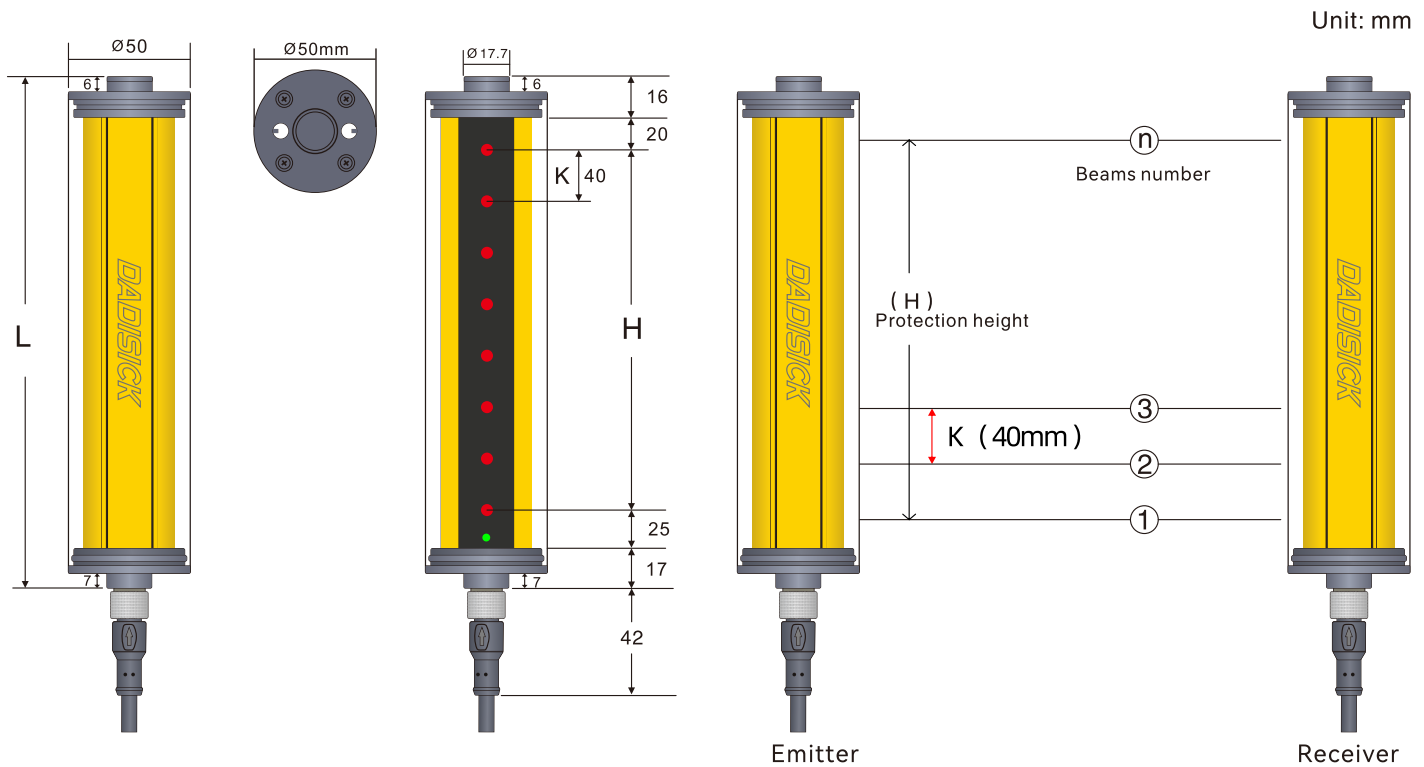
$L = 16 + 15 + H + 25 + 17$

$H = (n - 1) \times 30$

QRF 30mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
30mm (K)	4	90	163	QRF04/30-90	2	PNP	0.3-6m
	6	150	223	QRF06/30-150	2	PNP	0.3-6m
	8	210	283	QRF08/30-210	2	PNP	0.3-6m
	10	270	343	QRF10/30-270	2	PNP	0.3-6m
	12	330	403	QRF12/30-330	2	PNP	0.3-6m
	14	390	463	QRF14/30-390	2	PNP	0.3-6m
	16	450	523	QRF16/30-450	2	PNP	0.3-6m
	18	510	583	QRF18/30-510	2	PNP	0.3-6m
	20	570	643	QRF20/30-570	2	PNP	0.3-6m
	22	630	703	QRF22/30-630	2	PNP	0.3-6m
	24	690	763	QRF24/30-690	2	PNP	0.3-6m
	26	750	823	QRF26/30-750	2	PNP	0.3-6m
	28	810	883	QRF28/30-810	2	PNP	0.3-6m
	30	870	943	QRF30/30-870	2	PNP	0.3-6m
	32	930	1003	QRF32/30-930	2	PNP	0.3-6m

4. QRF 40mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

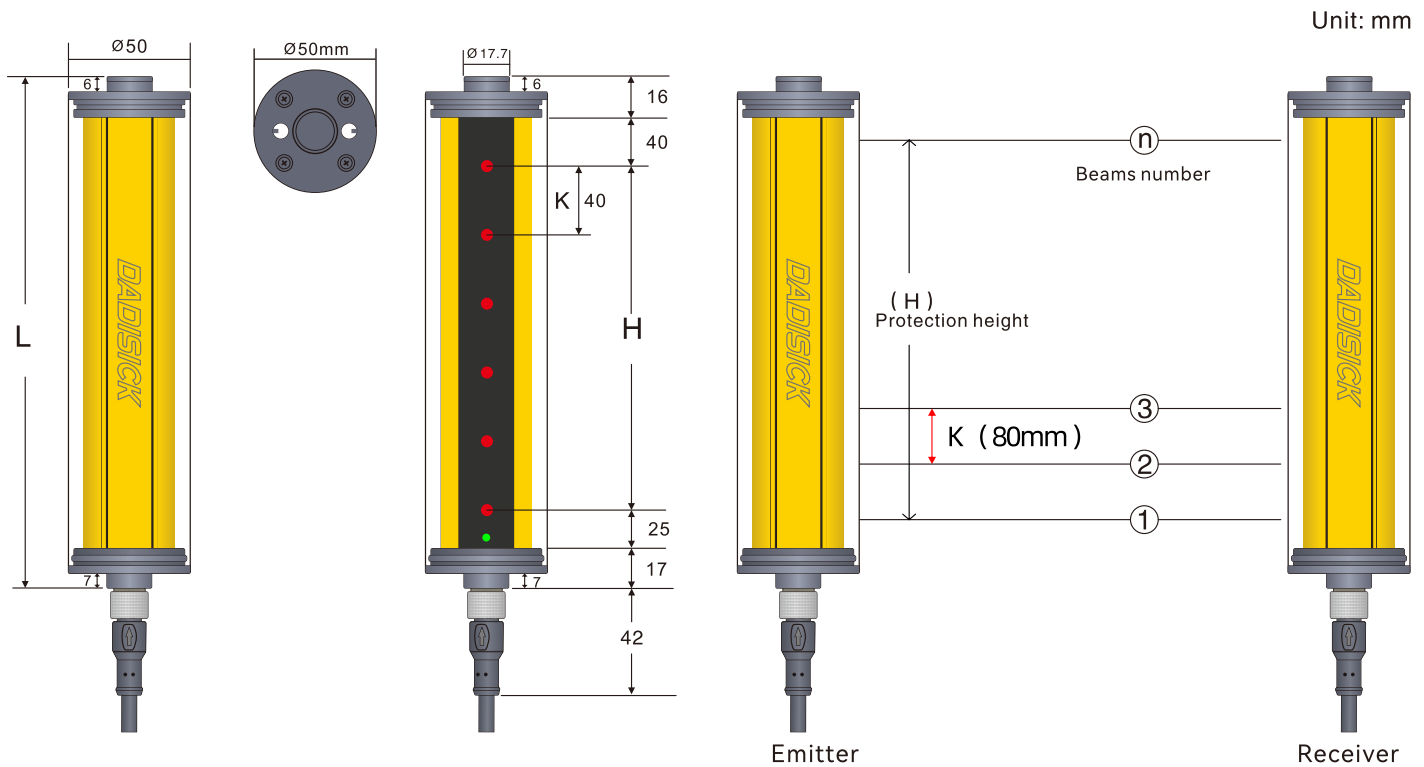
n: Beams number

 $L = 16 + 20 + H + 25 + 17$ $H = (n - 1) \times 40$

QRF 40mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
40mm (K)	4	120	198	QRF04/40-120	2	PNP	0.3-6m
	6	200	278	QRF06/40-200	2	PNP	0.3-6m
	8	280	358	QRF08/40-280	2	PNP	0.3-6m
	10	360	438	QRF10/40-360	2	PNP	0.3-6m
	12	440	518	QRF12/40-440	2	PNP	0.3-6m
	14	520	598	QRF14/40-520	2	PNP	0.3-6m
	16	600	678	QRF16/40-600	2	PNP	0.3-6m
	18	680	758	QRF18/40-680	2	PNP	0.3-6m
	20	760	838	QRF20/40-760	2	PNP	0.3-6m
	22	840	918	QRF22/40-840	2	PNP	0.3-6m
	24	920	998	QRF24/40-920	2	PNP	0.3-6m
	26	1000	1078	QRF26/40-1000	2	PNP	0.3-6m
	28	1080	1158	QRF28/40-1080	2	PNP	0.3-6m
	30	1160	1238	QRF30/40-1160	2	PNP	0.3-6m
	32	1240	1318	QRF32/40-1240	2	PNP	0.3-6m
	34	1320	1398	QRF34/40-1320	2	PNP	0.3-6m
	36	1400	1478	QRF36/40-1400	2	PNP	0.3-6m
	38	1480	1558	QRF38/40-1480	2	PNP	0.3-6m
	40	1560	1638	QRF40/40-1560	2	PNP	0.3-6m
	42	1640	1718	QRF42/40-1640	2	PNP	0.3-6m
	44	1720	1798	QRF44/40-1720	2	PNP	0.3-6m
	46	1800	1878	QRF46/40-1800	2	PNP	0.3-6m
	48	1880	1958	QRF48/40-1880	2	PNP	0.3-6m
	50	1960	2038	QRF50/40-1960	2	PNP	0.3-6m
	...	...	...	...	2	PNP	0.3-6m
	68	2680	2758	QRF28/40-2680	2	PNP	0.3-6m
	70	2760	2838	QRF30/40-2760	2	PNP	0.3-6m
	72	2840	2918	QRF32/40-2840	2	PNP	0.3-6m

5. QRF 80mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

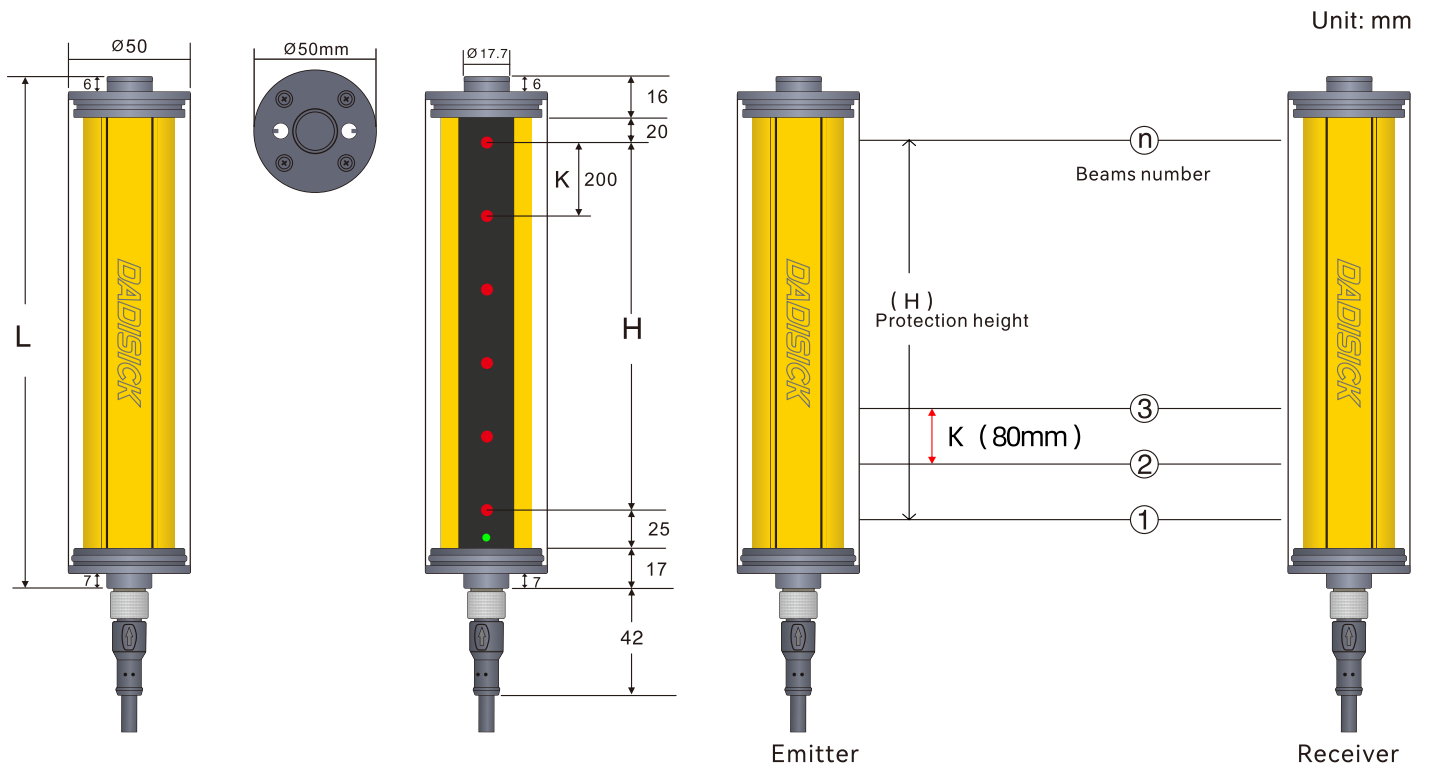
n: Beams number

 $L = 16 + 40 + H + 25 + 17$ $H = (n - 1) \times 80$

QRF 80mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
80mm (K)	4	240	338	QRF04/80-240	2	PNP	0.3-6m
	6	400	498	QRF06/80-400	2	PNP	0.3-6m
	8	560	658	QRF08/80-560	2	PNP	0.3-6m
	10	720	818	QRF10/80-720	2	PNP	0.3-6m
	12	880	978	QRF12/80-880	2	PNP	0.3-6m
	14	1040	1138	QRF14/80-1040	2	PNP	0.3-6m
	16	1200	1298	QRF16/80-1200	2	PNP	0.3-6m
	18	1360	1458	QRF18/80-1360	2	PNP	0.3-6m
	20	1520	1618	QRF20/80-1520	2	PNP	0.3-6m
	22	1680	1778	QRF22/80-1680	2	PNP	0.3-6m
	24	1840	1938	QRF24/80-1840	2	PNP	0.3-6m
	26	2000	2098	QRF26/80-2000	2	PNP	0.3-6m
	28	2160	2258	QRF28/80-2160	2	PNP	0.3-6m
	30	2320	2418	QRF30/80-2320	2	PNP	0.3-6m
	32	2480	2578	QRF32/80-2480	2	PNP	0.3-6m

6. QRF 200mm series



Remarks

L: Total length of light screen

H: Height of protected area

K: Resolution ratio

n: Beams number

 $L = 16 + 20 + H + 25 + 17$ $H = (n - 1) \times 80$

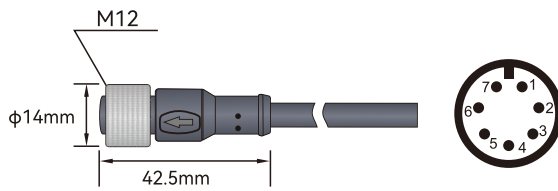
QRF 200mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Two outputs	PNP output	
200mm (K)	4	600	678	QRF04/200-600	2	PNP	0.3-6m
	6	1000	1078	QRF06/200-1000	2	PNP	0.3-6m
	8	1400	1478	QRF08/200-1400	2	PNP	0.3-6m
	10	1800	1878	QRF10/200-1800	2	PNP	0.3-6m
	12	2200	2278	QRF12/200-2200	2	PNP	0.3-6m
	14	2600	2678	QRF14/200-2600	2	PNP	0.3-6m
	16	3000	3078	QRF16/200-3000	2	PNP	0.3-6m
	18	3400	3478	QRF18/200-3400	2	PNP	0.3-6m

Electrical connection

Electrical interface	
Number of interfaces	2 (receiver and transmitter)
Type	M12 connector, 7-pin
Interface metal	Copper nickel plating
Plug material	GY384 gray 30P
Allowable typical conductor section	0.25mm ²
Maximum link cable	100m
Maximum allowable cable load	4.9A
Cable material	PVC

Cable description:



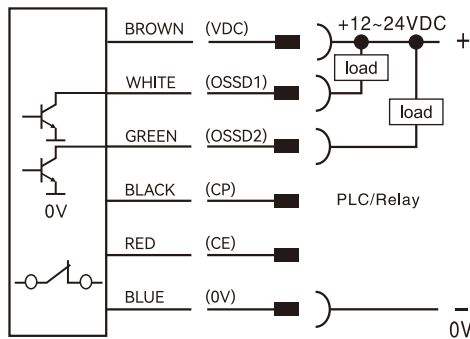
7-pin M12 cable connector straight
3m waterproof cable

Emitter Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
3	BLACK	CP
4	WHITE	NC
5	GREEN	NC
6	RED	CE
7	YELLOW	Ground wire

Receiver Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
3	BLACK	CP
4	WHITE	OSSD1
5	GREEN	OSSD2
6	RED	CE
7	YELLOW	Ground wire

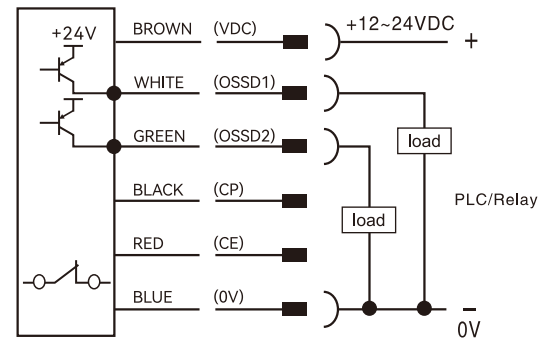
1. QRF signal output selection (actual output of transistor working normally)

NPN NC



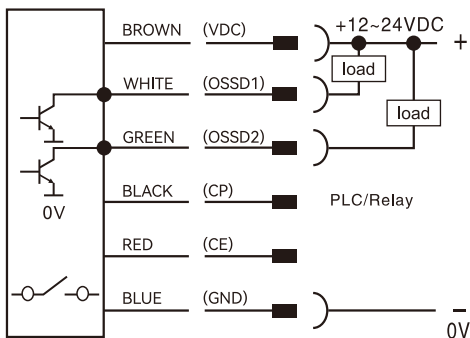
A

PNP NC



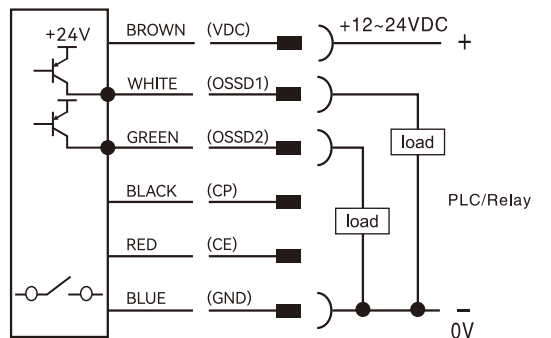
B

NPN NO



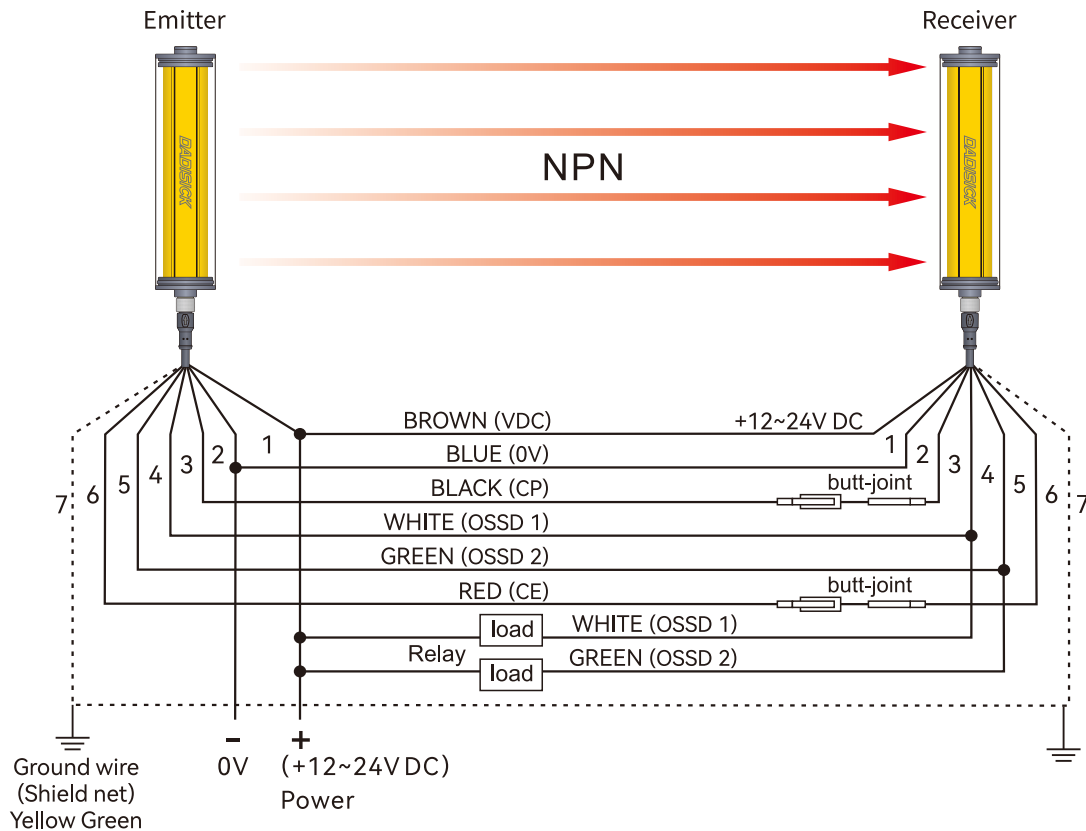
C

PNP NO



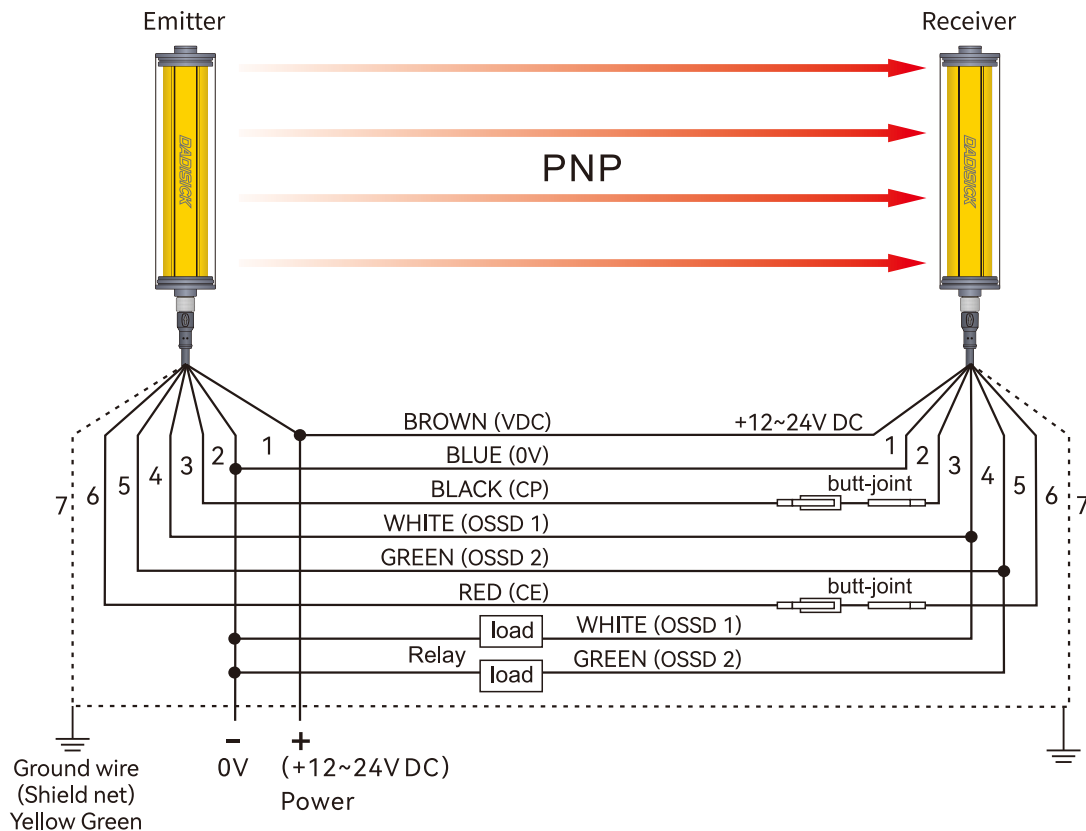
D

2. NPN output wiring diagram



This figure is an example of NPN double output 7-pin wiring.

3. PNP output wiring diagram

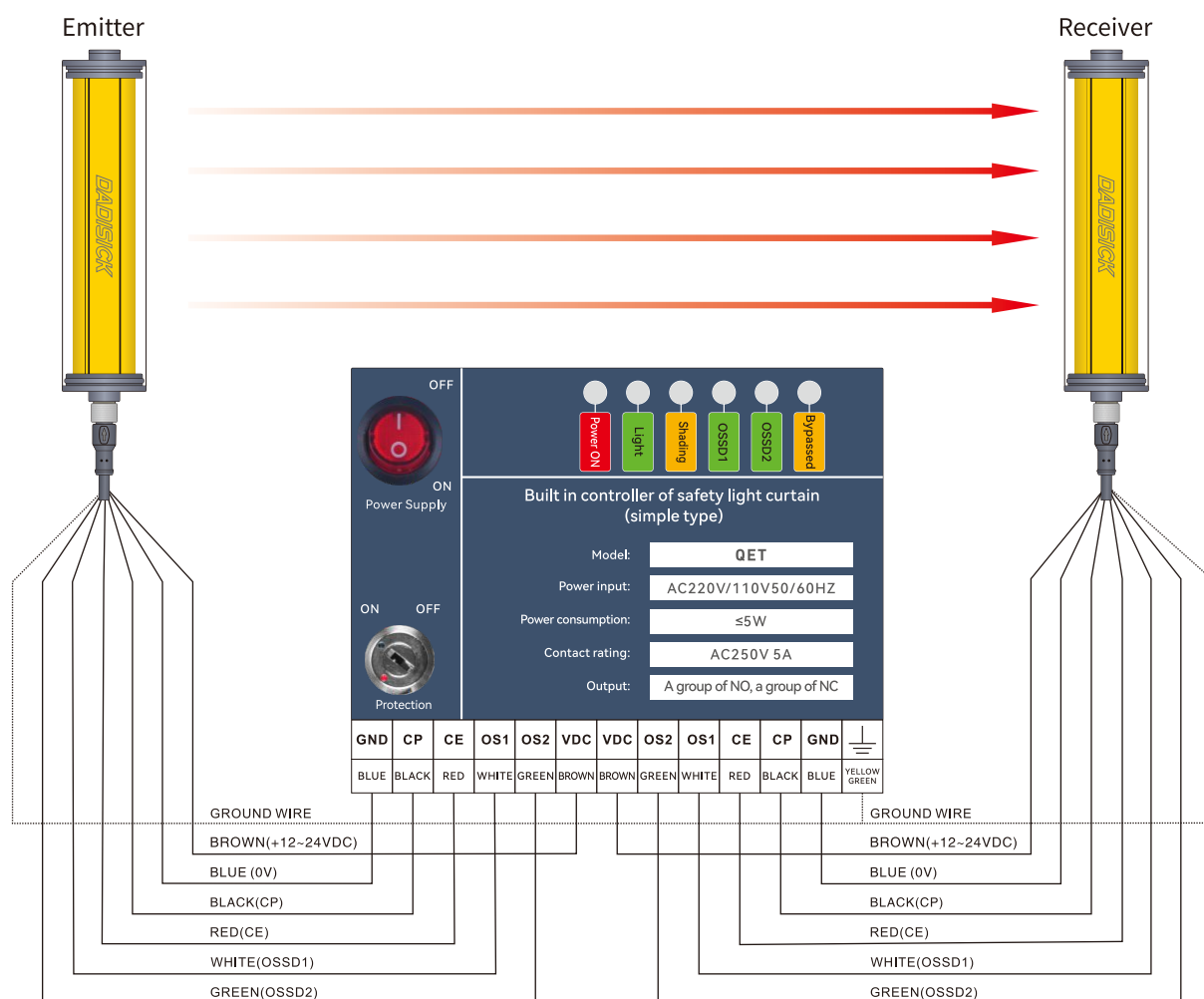


This figure is an example of PNP double output 7-pin wiring.

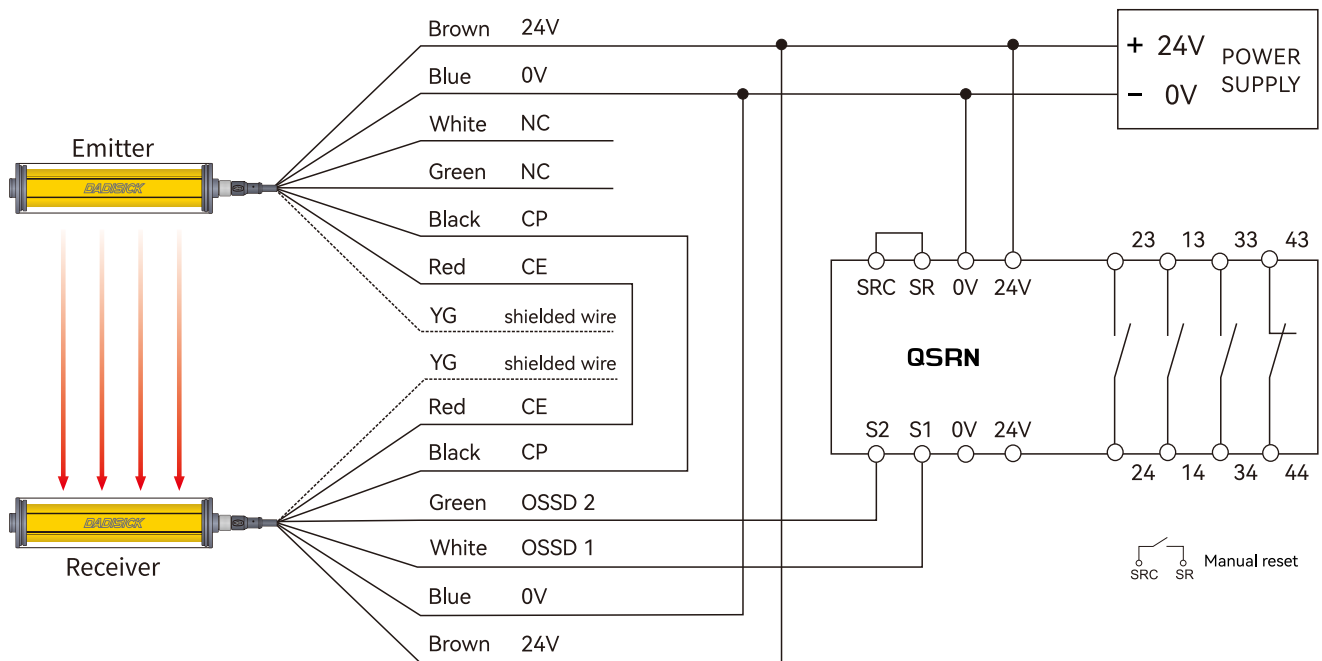
4. Selection of safety light curtain controller

Name	Order separately	Model	Descriptions
Built-in controller		QET	Used to monitor the signal processing of QRF series light curtain, and output one group of NO and one group of NC.
Safety relay		QSRN	QSRN safety relays have three groups of NO and one group of NC, with strong control capabilities. They are suitable for various signal monitoring in industrial places with high safety requirements, including emergency stop signals, safety door opening and closing signals, safety light curtain signals, and two-handed button signals.
Safety relay		Ter-A	Equipped with a mode switch, it can be used for most safety components, such as light curtains, safety switches, carpet contacts, two handed switches, etc. Automatic/manual reset paddles for quick configuration. Dual channel monitoring circuit, safe and reliable.
Light curtain relay		QET-1	Output conversion between NC and NO for QRF series light curtain.

4.1 Wiring diagram of QET built-in controller

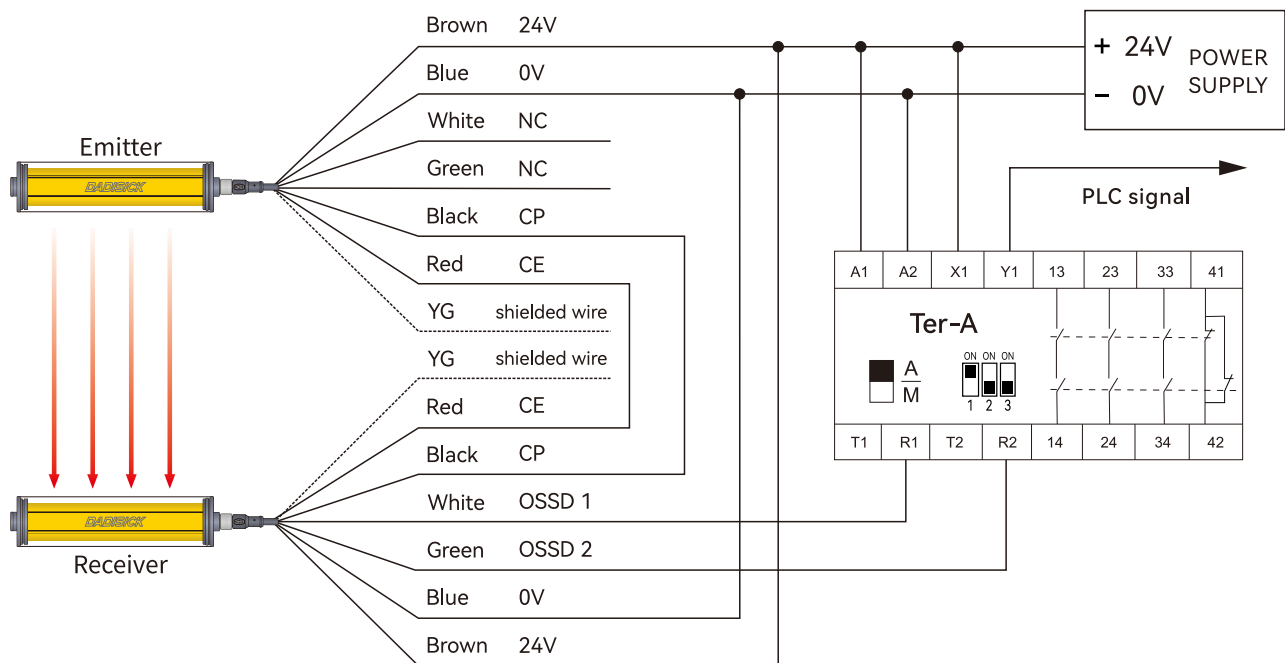


4.2 Wiring diagram of QSRN safety relay

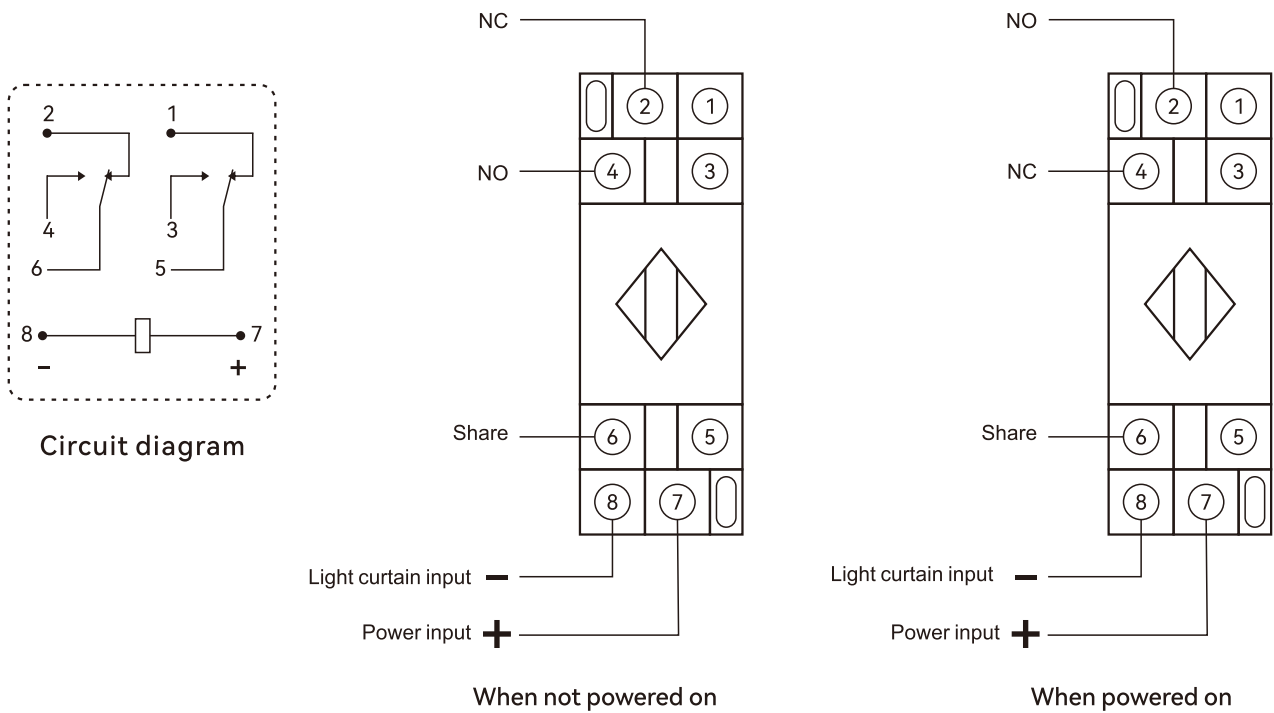


4.3 Wiring diagram of Ter-A safety relay

Dual channel light curtain PNP switch safety input, with automatic reset and PLC signal output.

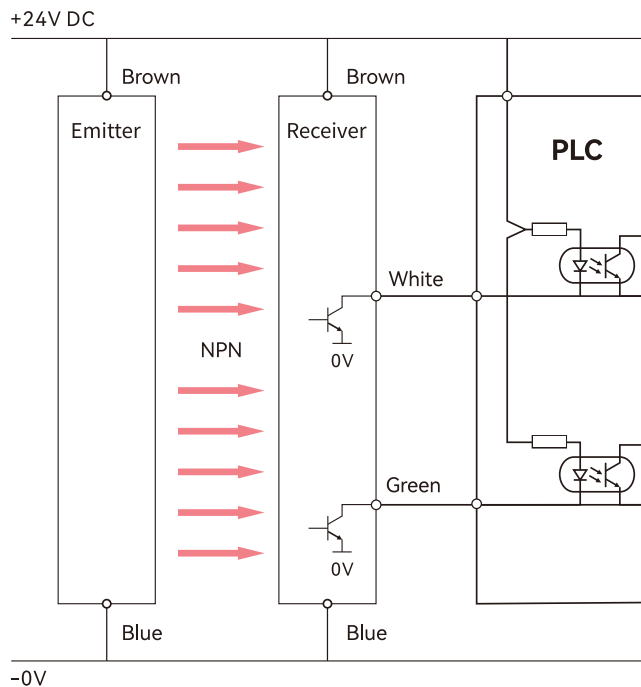


4.4 Wiring diagram of QET-1 light curtain relay

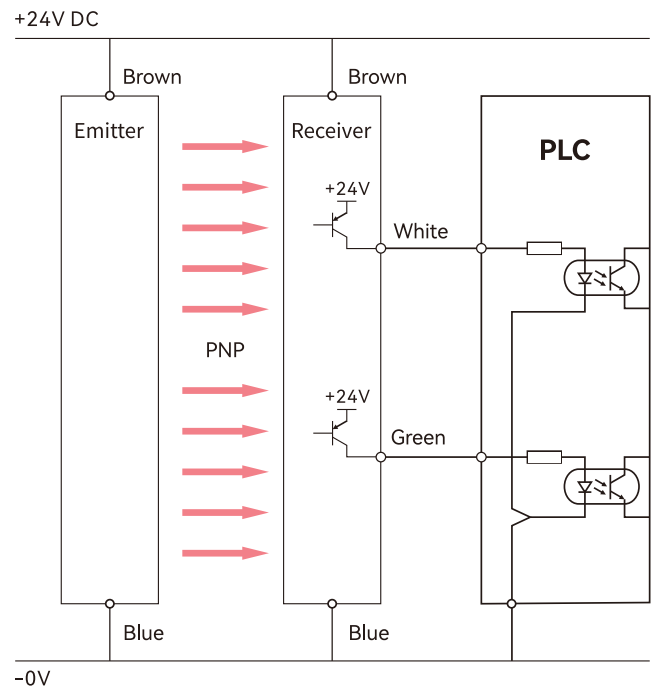


4.5 Wiring between light curtain and PLC and one-chip computer system

NPN wiring:



PNP wiring:



Accessories

Metal angled fixing bracket installation method
(Original accessories)

