

TECHNICAL DATA SHEET

SAFETY LIGHT CURTAIN SENSOR Emitter and Receiver QBT series

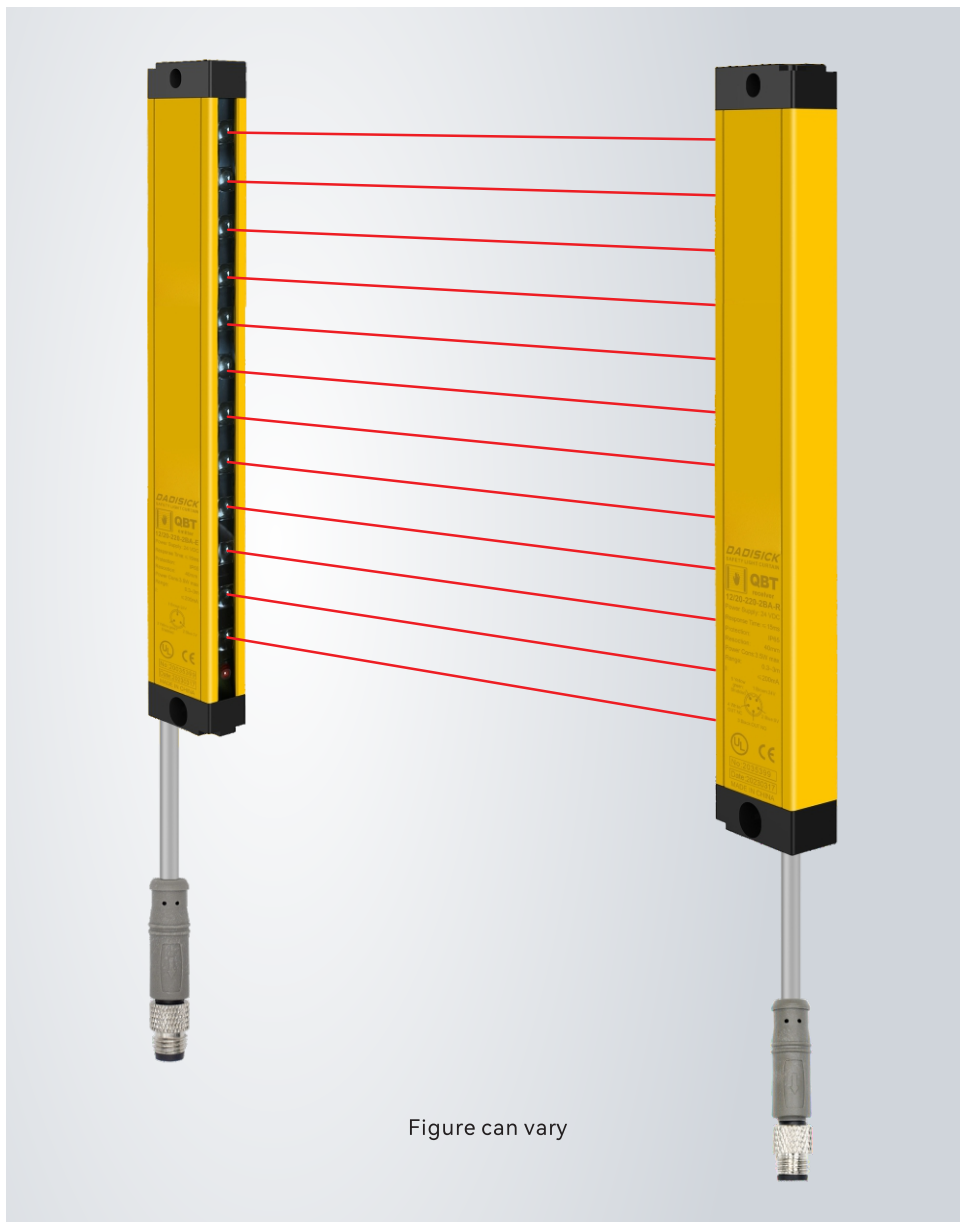


Figure can vary

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Solutions

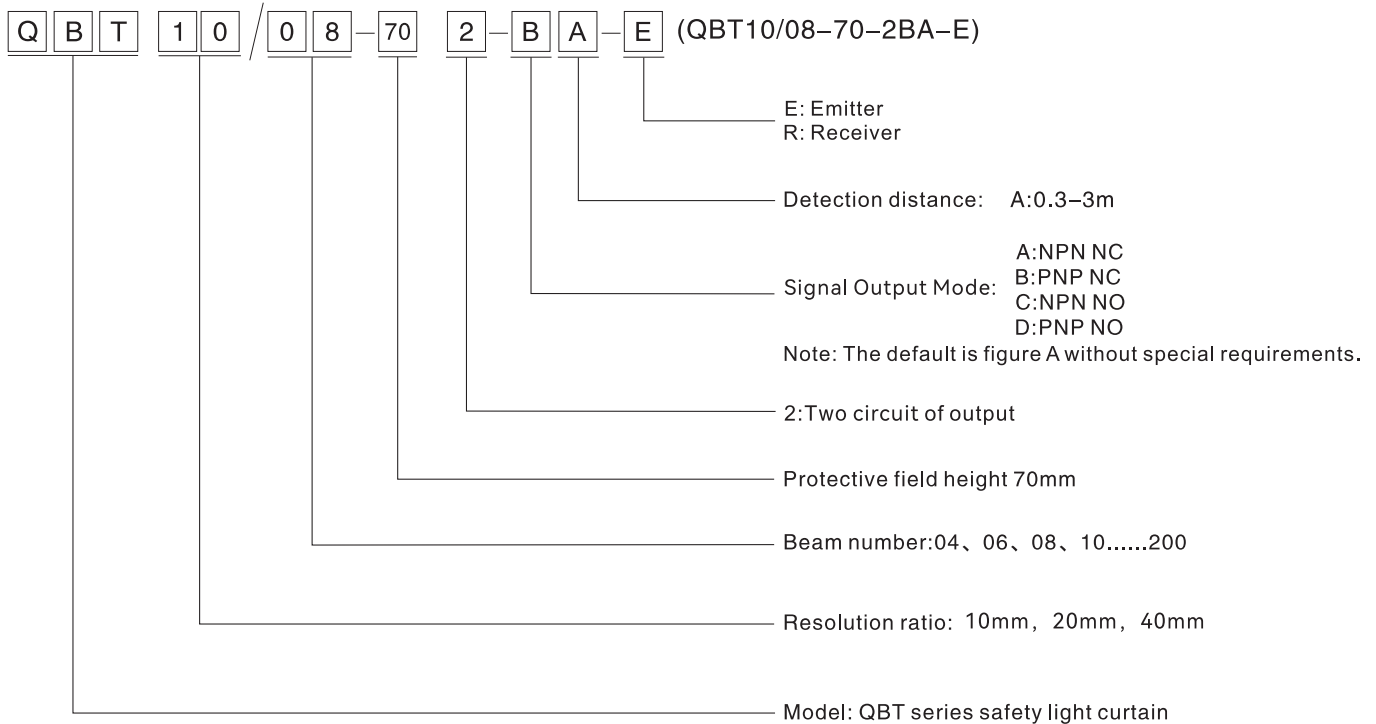


GB/T 19001-2016

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.

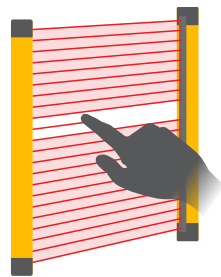
The specifications of QBT type safety light curtain are as follows:



Resolution ratio

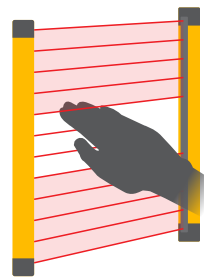
Depending on the usage environment and requirements, it is important to choose the appropriate beam spacing

Finger protection



Detection capability
10/20mm
diameter

Hand protection



Detection capability
40mm
diameter

Technical data

Basic data of Receiver and Emitter

Standard packaging	
Product model	QBT series
Standard configuration	One receiver, one emitter, 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, 40mm
Check the accuracy	18mm, 28mm, 48mm
Number of beams	04、06、08、10.....200
Overall dimension	15mm*30mm*L, L is the length of emitter and receiver.
Detection distance	30-3000mm
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

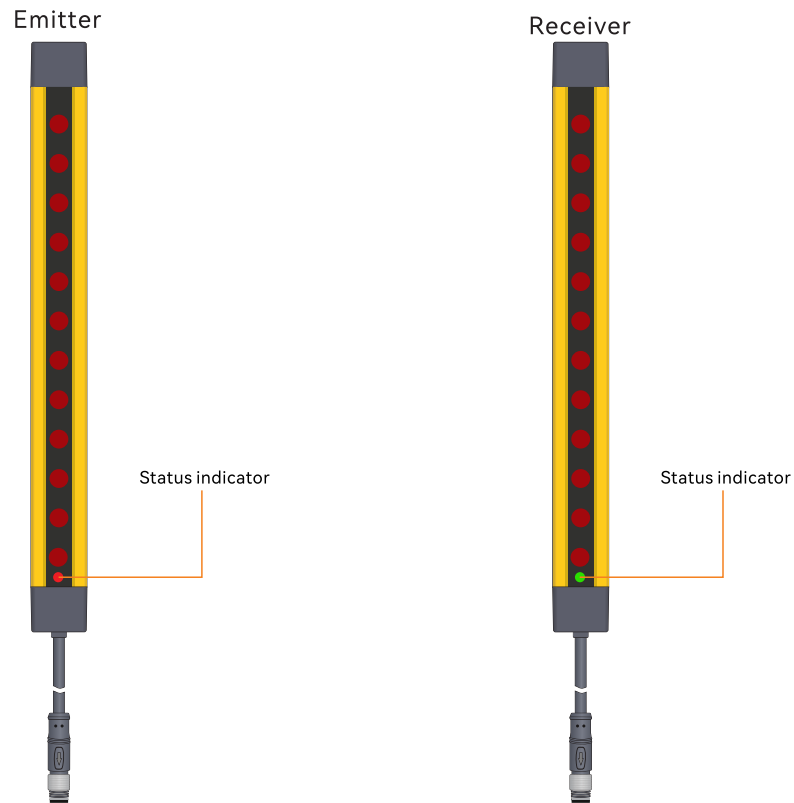
Mechanical data	
Housing material	Metal
Metal shell	Aluminium
Lens front screen material	Acrylic
Upper and lower cover materials	ABS reinforced nylon PA66+30% GF






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	IP65
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 3, BLACK 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/HS221214
UL	No. 4790783741.1-S
GB/T	No. HIC180327 GB/T 19001-2016 idt ISO 9001:2015

Operation and display

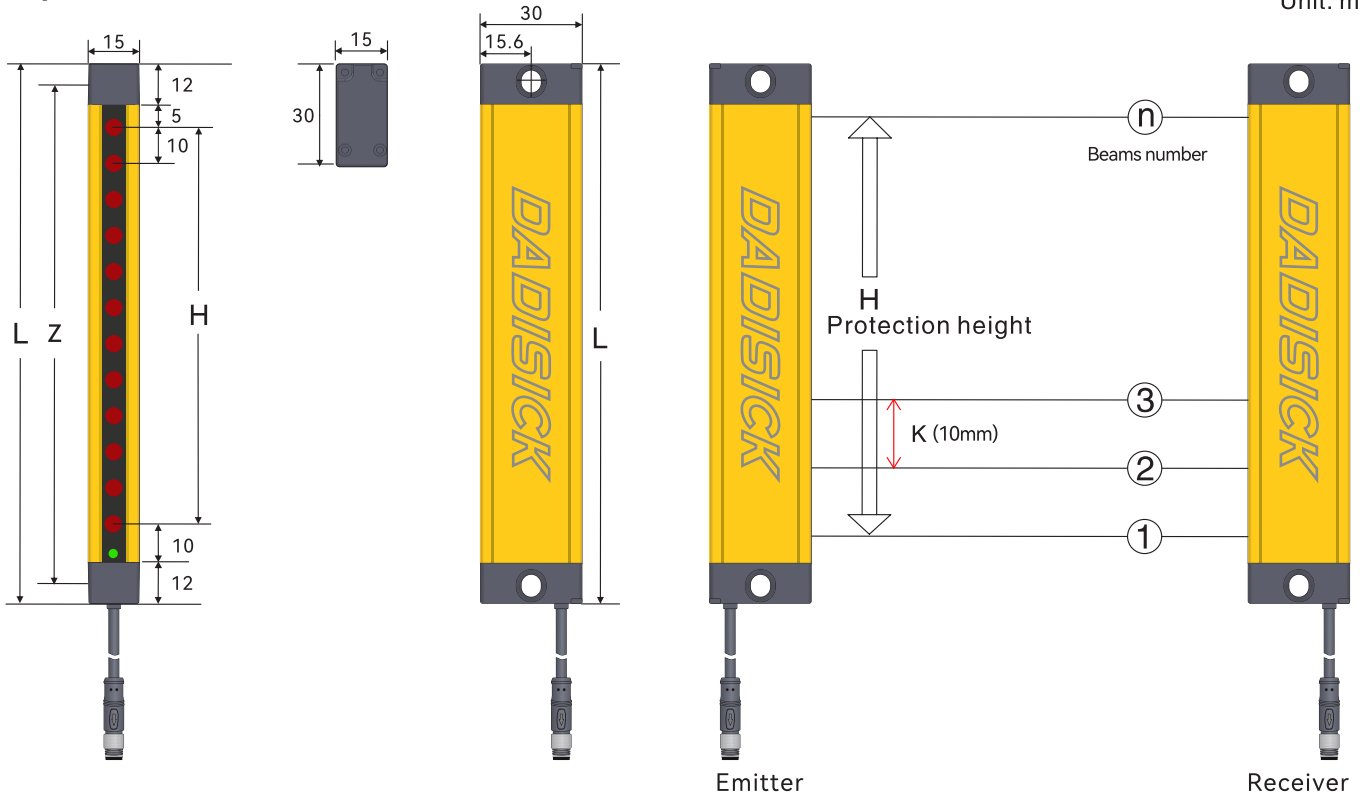


Normal operation of light curtain	LED Indicator status	Explain
Emitter	 Red, always on	Turns on the power
	 Receiver and emitter are red	Receiver and Emitter are not aligned
Receiver	 Green	All light paths are connected
	 Red	Light path shading
	 Lights flashing	Interference or overstep detection range

Dimensioned drawings

1. QBT 10mm series

Unit: mm



Remarks

L: Total length of light screen
 $L = 12 + 5 + H + 10 + 12$

H: Height of protected area
 $H = (n - 1) * 10$

K: Resolution ratio
 $Z = L - 11\text{mm}$

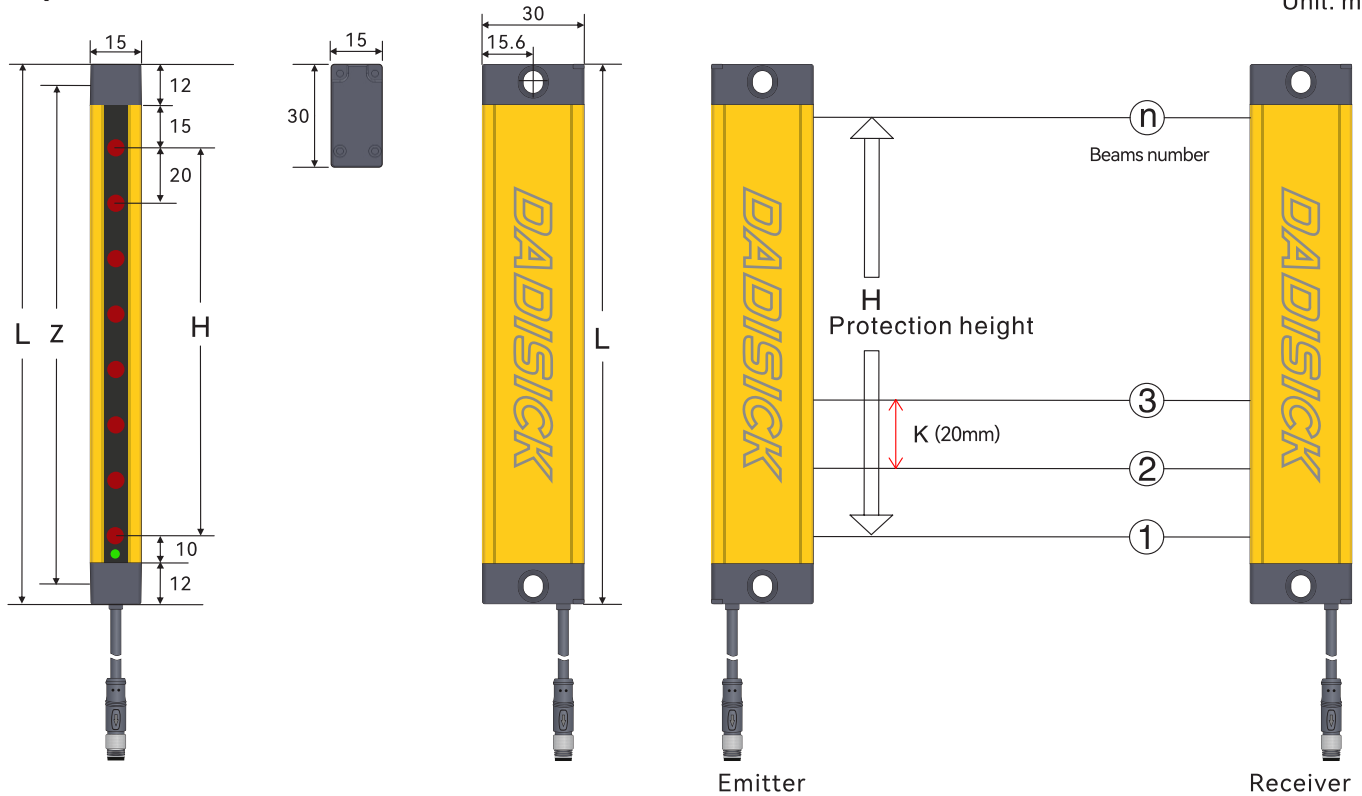
Z: Fixed hole center distance
 n: Beams number

QBT 10mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Outputs	PNP output	
10mm (K)	8	70	109	QBT10-08-70	2	PNP	0.3-3m
	10	90	129	QBT10-10-90	2	PNP	0.3-3m
	12	110	149	QBT10-12-110	2	PNP	0.3-3m
	14	130	169	QBT10-14-130	2	PNP	0.3-3m
	16	150	189	QBT10-16-150	2	PNP	0.3-3m
	18	170	209	QBT10-18-170	2	PNP	0.3-3m
	20	190	229	QBT10-20-190	2	PNP	0.3-3m
	22	210	249	QBT10-22-210	2	PNP	0.3-3m
	24	230	269	QBT10-24-230	2	PNP	0.3-3m
	26	250	289	QBT10-26-250	2	PNP	0.3-3m
	28	270	309	QBT10-28-270	2	PNP	0.3-3m
	30	290	329	QBT10-30-290	2	PNP	0.3-3m
	32	310	349	QBT10-32-310	2	PNP	0.3-3m
	34	330	369	QBT10-34-330	2	PNP	0.3-3m
	36	350	389	QBT10-36-350	2	PNP	0.3-3m
	38	370	409	QBT10-38-370	2	PNP	0.3-3m
	40	390	429	QBT10-40-390	2	PNP	0.3-3m
	42	410	449	QBT10-42-410	2	PNP	0.3-3m
	44	430	469	QBT10-44-430	2	PNP	0.3-3m
	46	450	489	QBT10/46-450	2	PNP	0.3-3m
48	470	509	QBT10/48-470	2	PNP	0.3-3m	
50	490	529	QBT10/50-490	2	PNP	0.3-3m	
52	510	549	QBT10/52-510	2	PNP	0.3-3m	
...	...	...	...	...	2	PNP	0.3-3m
196	1950	1989	QBT10/196-1950	2	PNP	0.3-3m	
198	1970	2009	QBT10/198-1970	2	PNP	0.3-3m	
200	1990	2029	QBT10/200-1990	2	PNP	0.3-3m	

2. QBT 20mm series

Unit: mm



Remarks

L: Total length of light screen
 $L = 12 + 15 + H + 10 + 12$

H: Height of protected area
 $H = (n - 1) * 20$

K: Resolution ratio
 $Z = L - 11\text{mm}$

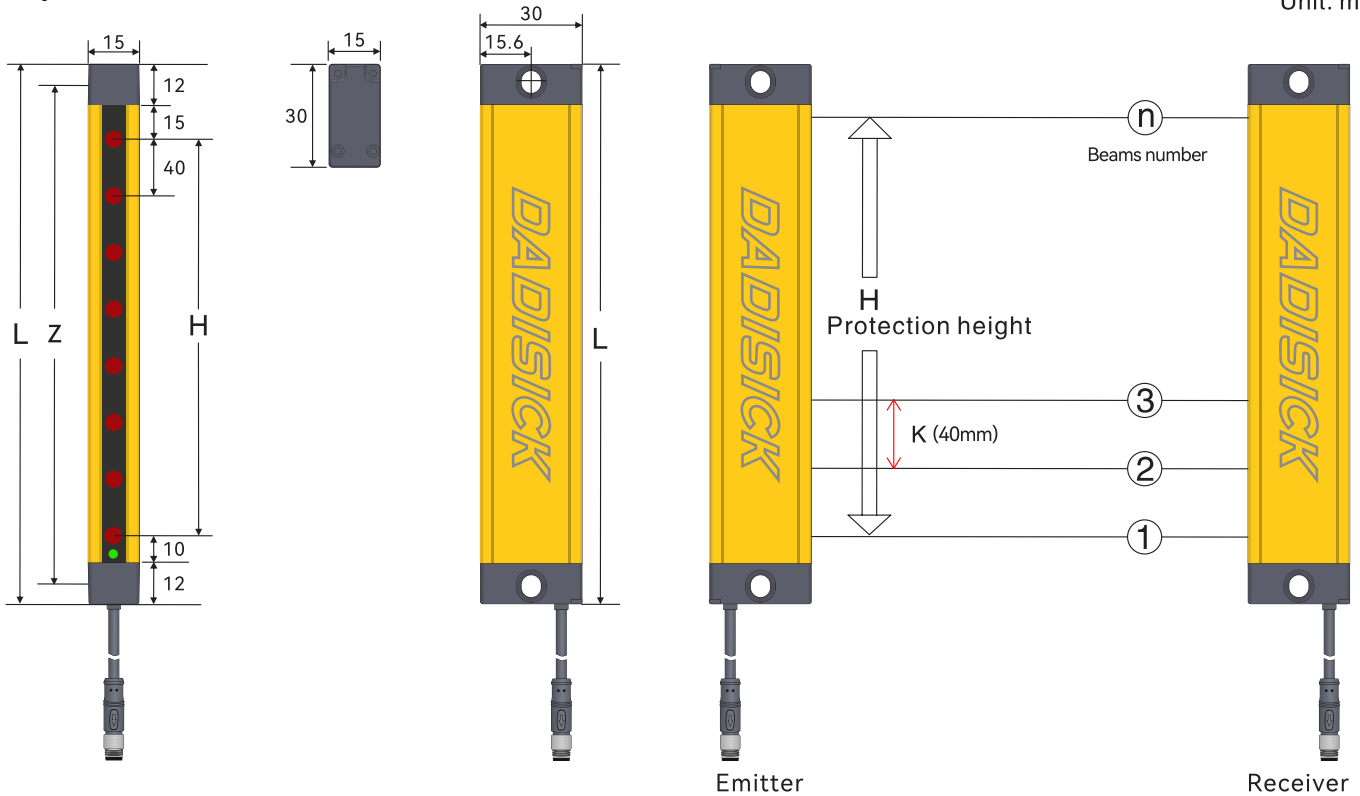
Z: Fixed hole center distance
 n: Beams number

QBT 20mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Outputs	PNP output	
20mm (K)	6	100	149	QBT20-06-100	2	PNP	0.3-3m
	8	140	189	QBT20-08-140	2	PNP	0.3-3m
	10	180	229	QBT20-10-180	2	PNP	0.3-3m
	12	220	269	QBT20-12-220	2	PNP	0.3-3m
	14	260	309	QBT20-14-260	2	PNP	0.3-3m
	16	300	349	QBT20-16-300	2	PNP	0.3-3m
	18	340	389	QBT20-18-340	2	PNP	0.3-3m
	20	380	429	QBT20-20-380	2	PNP	0.3-3m
	22	420	469	QBT20-22-420	2	PNP	0.3-3m
	24	460	509	QBT20/24-460	2	PNP	0.3-3m
	26	500	549	QBT20/26-500	2	PNP	0.3-3m
	28	540	589	QBT20/28-540	2	PNP	0.3-3m
	30	580	629	QBT20/30-580	2	PNP	0.3-3m
	32	620	669	QBT20/32-620	2	PNP	0.3-3m
	34	660	709	QBT20/34-660	2	PNP	0.3-3m
	36	700	749	QBT20/36-700	2	PNP	0.3-3m
	38	740	789	QBT20/38-740	2	PNP	0.3-3m
	40	780	829	QBT20/40-780	2	PNP	0.3-3m
	42	820	869	QBT20/42-820	2	PNP	0.3-3m
	44	860	909	QBT20/44-860	2	PNP	0.3-3m
46	900	949	QBT20/46-900	2	PNP	0.3-3m	
48	940	989	QBT20/48-940	2	PNP	0.3-3m	
50	980	1029	QBT20/50-980	2	PNP	0.3-3m	
52	1020	1069	QBT20/52-1020	2	PNP	0.3-3m	
...	...	...	...	...	2	PNP	0.3-3m
196	3900	3949	QBT20/196-3900	2	PNP	0.3-3m	
198	3940	3989	QBT20/198-3940	2	PNP	0.3-3m	
200	3980	4029	QBT20/200-3980	2	PNP	0.3-3m	

3. QBT 40mm series

Unit: mm



Remarks

L: Total length of light screen
 $L = 12 + 15 + H + 10 + 12$

H: Height of protected area
 $H = (n - 1) * 40$

K: Resolution ratio
 $Z = L - 11\text{mm}$

Z: Fixed hole center distance
 n: Beams number

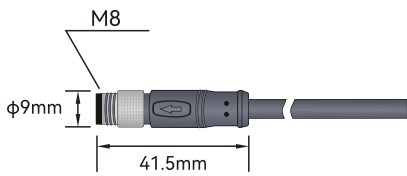
QBT 40mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Outputs	PNP output	
40mm (K)	4	120	169	QBT40/04-120	2	PNP	0.3-3m
	6	200	249	QBT40/06-200	2	PNP	0.3-3m
	8	280	329	QBT40/08-280	2	PNP	0.3-3m
	10	360	409	QBT40/10-360	2	PNP	0.3-3m
	12	440	489	QBT40/12-440	2	PNP	0.3-3m
	14	520	569	QBT40/14-520	2	PNP	0.3-3m
	16	600	649	QBT40/16-600	2	PNP	0.3-3m
	18	680	729	QBT40/18-680	2	PNP	0.3-3m
	20	760	809	QBT40/20-760	2	PNP	0.3-3m
	22	840	889	QBT40/22-840	2	PNP	0.3-3m
	24	920	969	QBT40/24-920	2	PNP	0.3-3m
	26	1000	1049	QBT40/26-1000	2	PNP	0.3-3m
	28	1080	1129	QBT40/28-1080	2	PNP	0.3-3m
	30	1160	1209	QBT40/30-1160	2	PNP	0.3-3m
	32	1240	1289	QBT40/32-1240	2	PNP	0.3-3m
	34	1320	1369	QBT40/34-1320	2	PNP	0.3-3m
	36	1400	1449	QBT40/36-1400	2	PNP	0.3-3m
	38	1480	1529	QBT40/38-1480	2	PNP	0.3-3m
	40	1560	1609	QBT40/40-1560	2	PNP	0.3-3m
	42	1640	1689	QBT40/42-1640	2	PNP	0.3-3m
44	1720	1769	QBT40/44-1720	2	PNP	0.3-3m	
46	1800	1849	QBT40/46-1800	2	PNP	0.3-3m	
48	1880	1929	QBT40/48-1880	2	PNP	0.3-3m	
50	1960	2109	QBT40/50-1960	2	PNP	0.3-3m	
...	...	...	...	...	2	PNP	0.3-3m
96	3800	3849	QBT40/96-3800	2	PNP	0.3-3m	
98	3880	3929	QBT40/98-3880	2	PNP	0.3-3m	
100	3960	4009	QBT40/100-3960	2	PNP	0.3-3m	

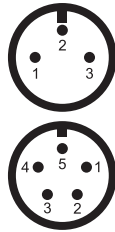
Electrical connection

Electrical interface	
Number of interfaces	2 (receiver and emitter)
Type	Emitter with M8 connector 3-pin, Receiver with M8 connector 5-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:



3-pin and 5-pin M8 cable connector straight
3m waterproof cable

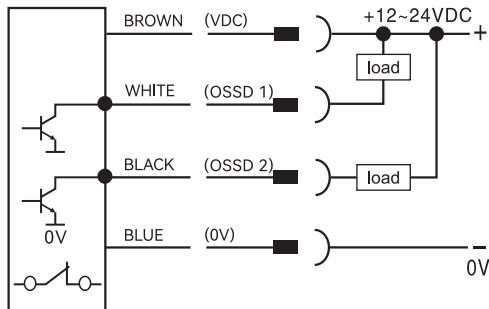


Emitter Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
-	-	-
-	-	-
3	YELLOW	Ground wire

Receiver Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
3	BLACK	OSSD 2
4	WHITE	OSSD 1
5	YELLOW	Ground wire

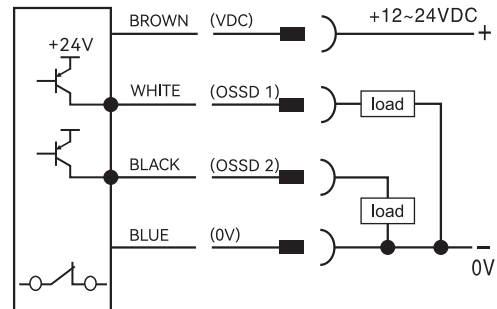
1. QBT signal output selection (actual output of transistor working normally)

NPN NC



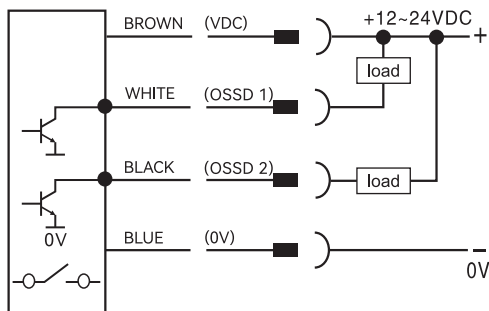
A

PNP NC



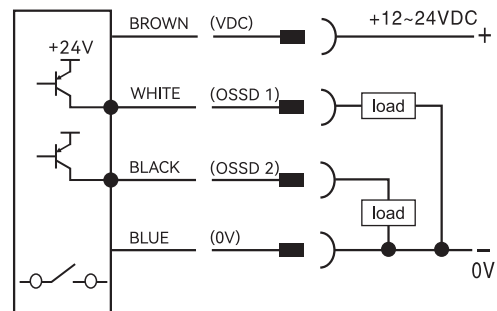
B

NPN NO



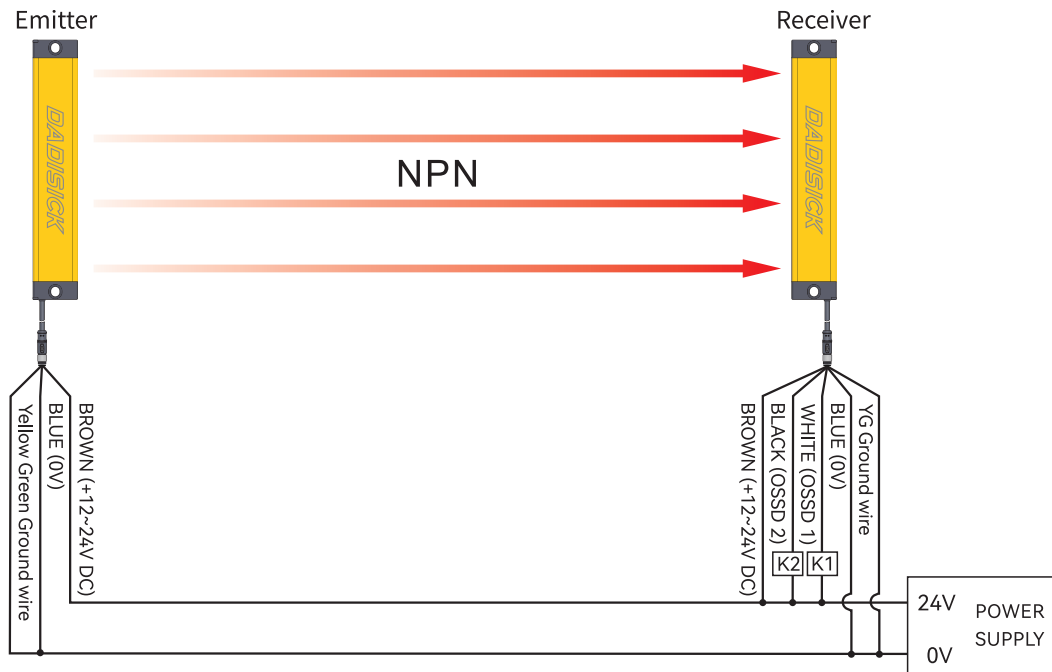
C

PNP NO



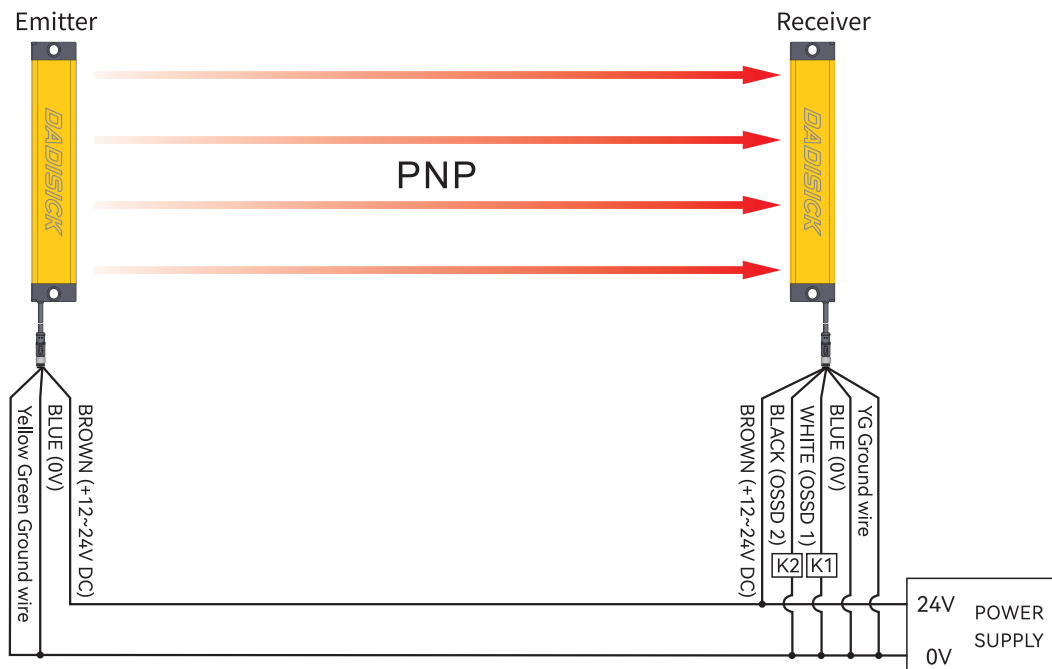
D

2. NPN output wiring diagram








This picture is an example of NPN output wiring

3. PNP output wiring diagram

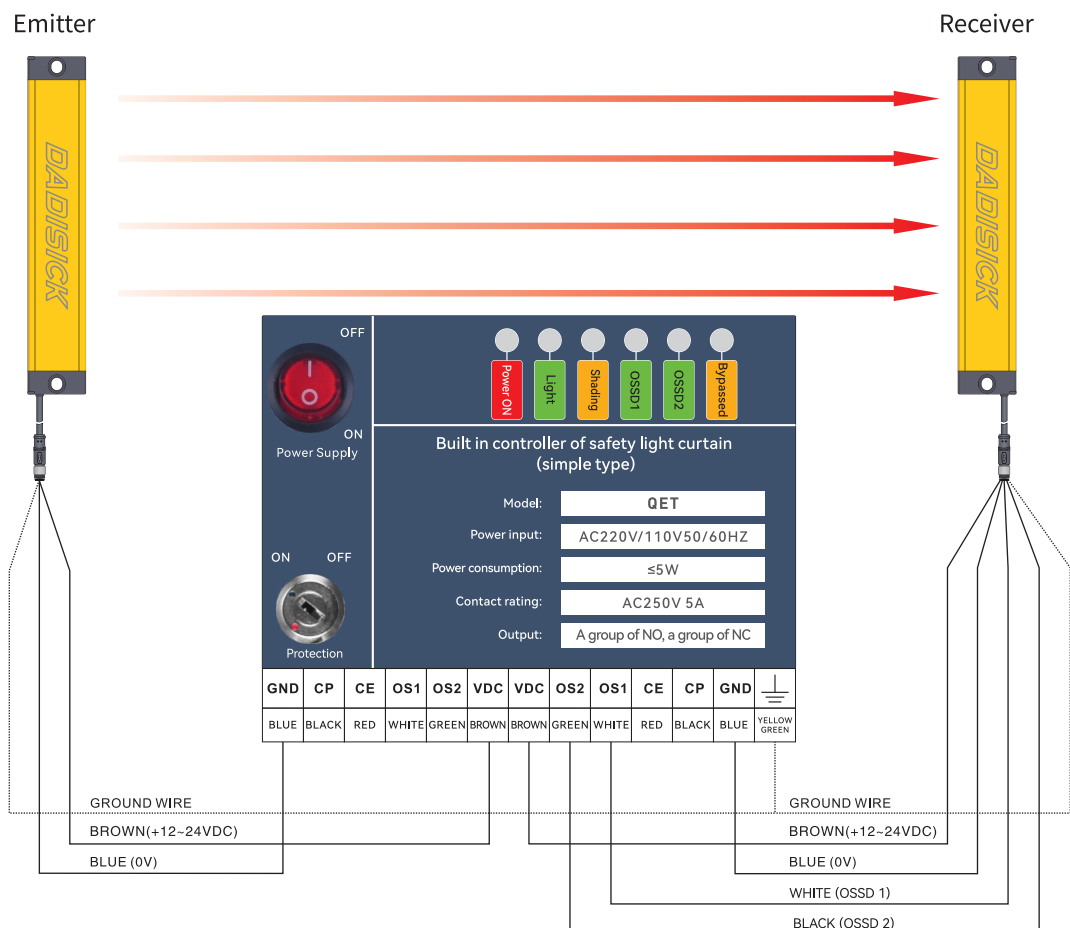


This picture is an example of PNP output wiring

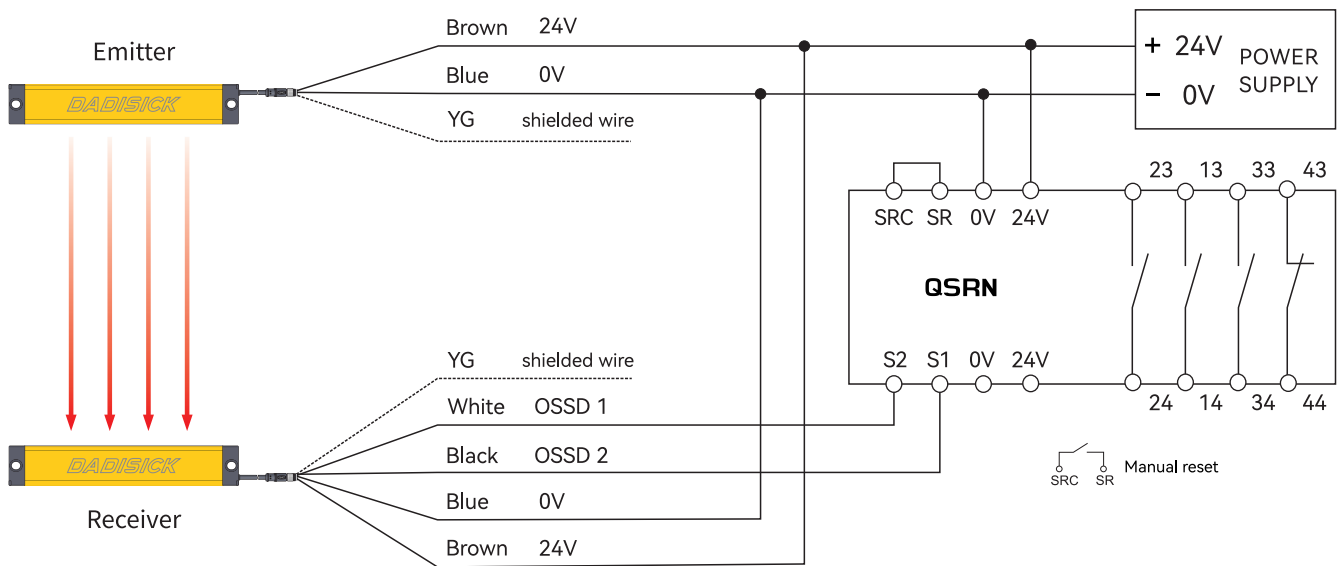
4. Selection of safety light curtain controller

Name	Order separately	Model	Descriptions
Built-in controller		QET	Used to monitor the signal processing of QBT 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	  Multifunctional switching switch	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 QBT series light curtain.

4.1 Wiring diagram of QET built-in controller

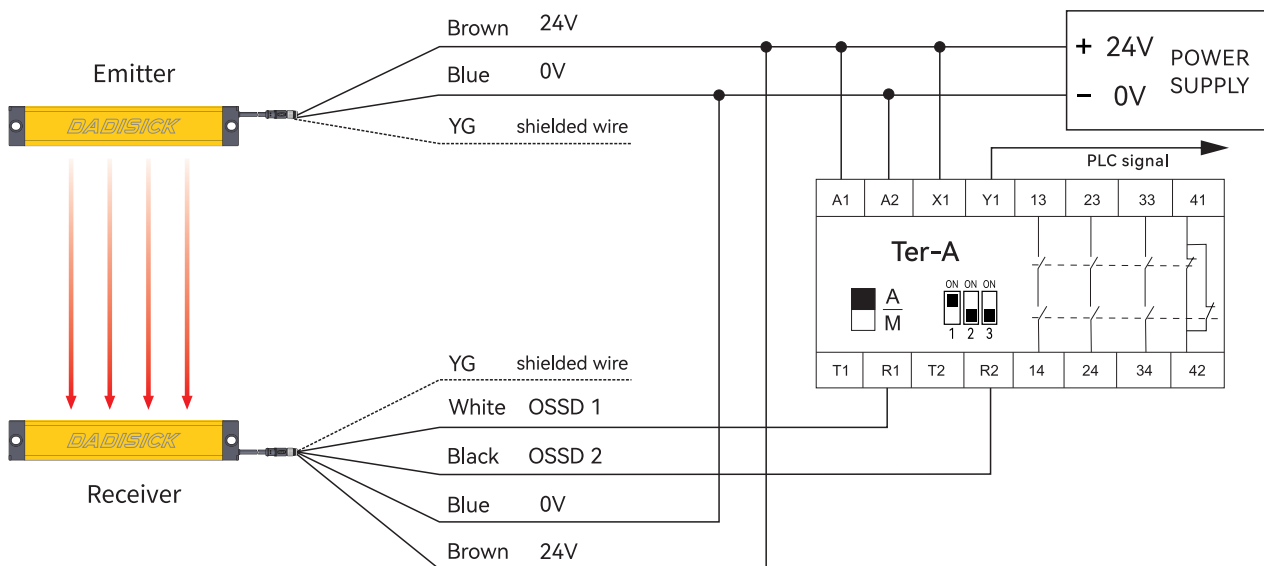


4.2 Wiring diagram of QSRN safety relay

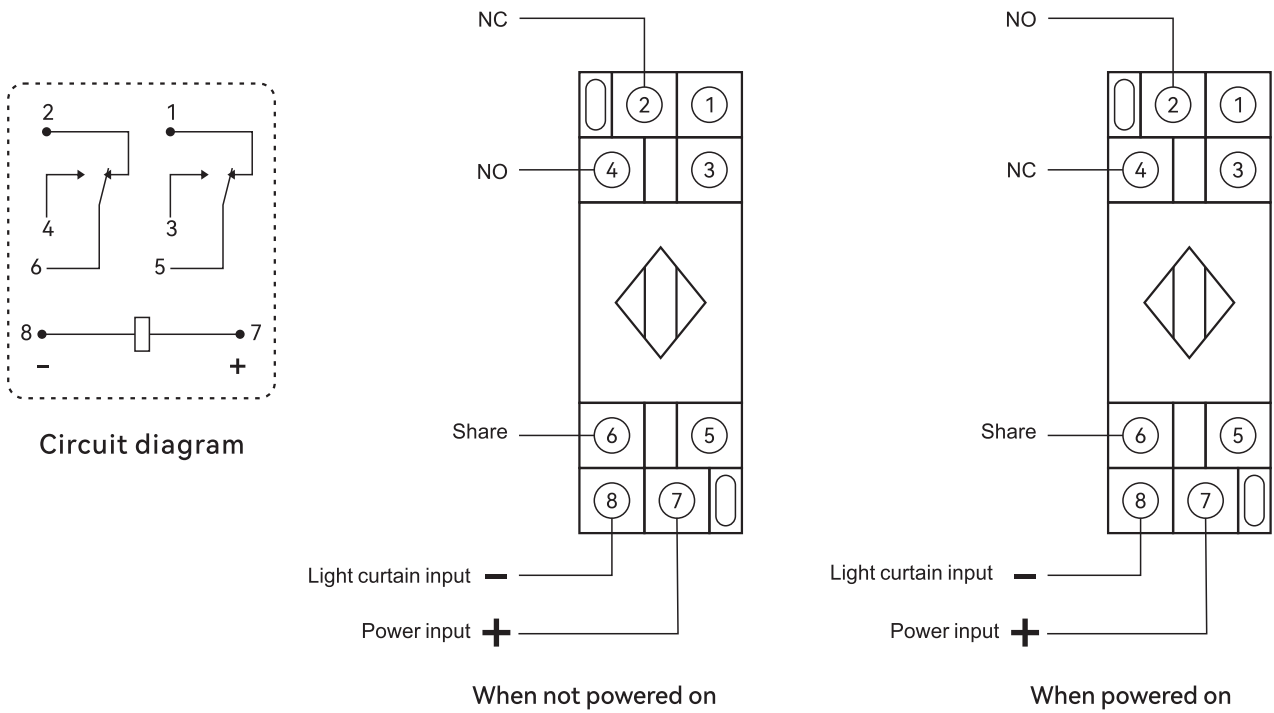


4.3 Wiring diagram of Ter-A safety relay

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

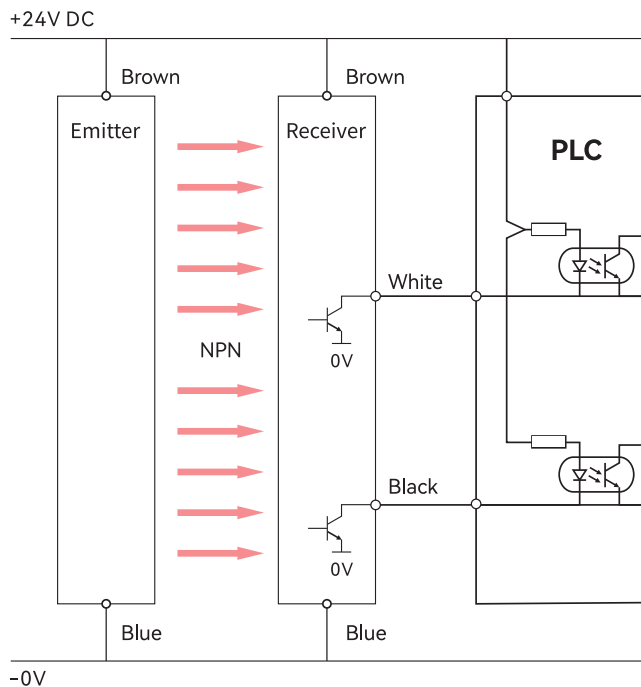


4.4 Wiring diagram of QET-1 light curtain relay

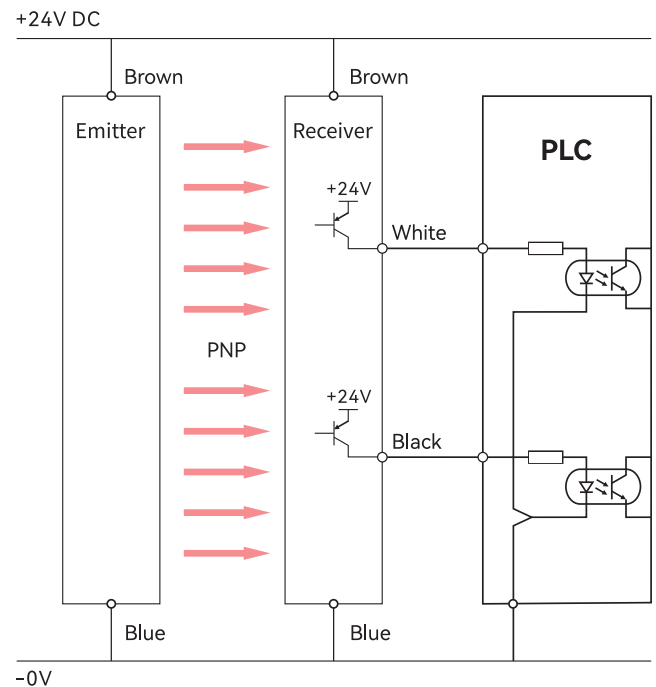


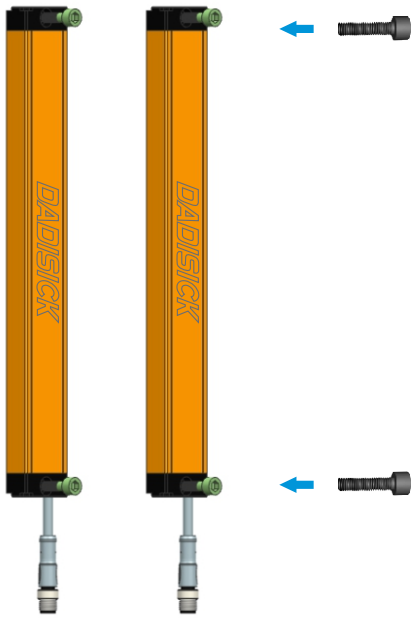
4.5 Wiring between light curtain and PLC and one-chip computer system

NPN wiring:



PNP wiring:



Accessories

Installation method for fixing hole screws
(Original accessories)

Circular screw	Model: QBZ-01
Unit: mm	