DADISICK®

TECHNICAL DATA SHEET

SAFETY LIGHT CURTAIN SENSOR
Emitter and Receiver
DK-QBT series

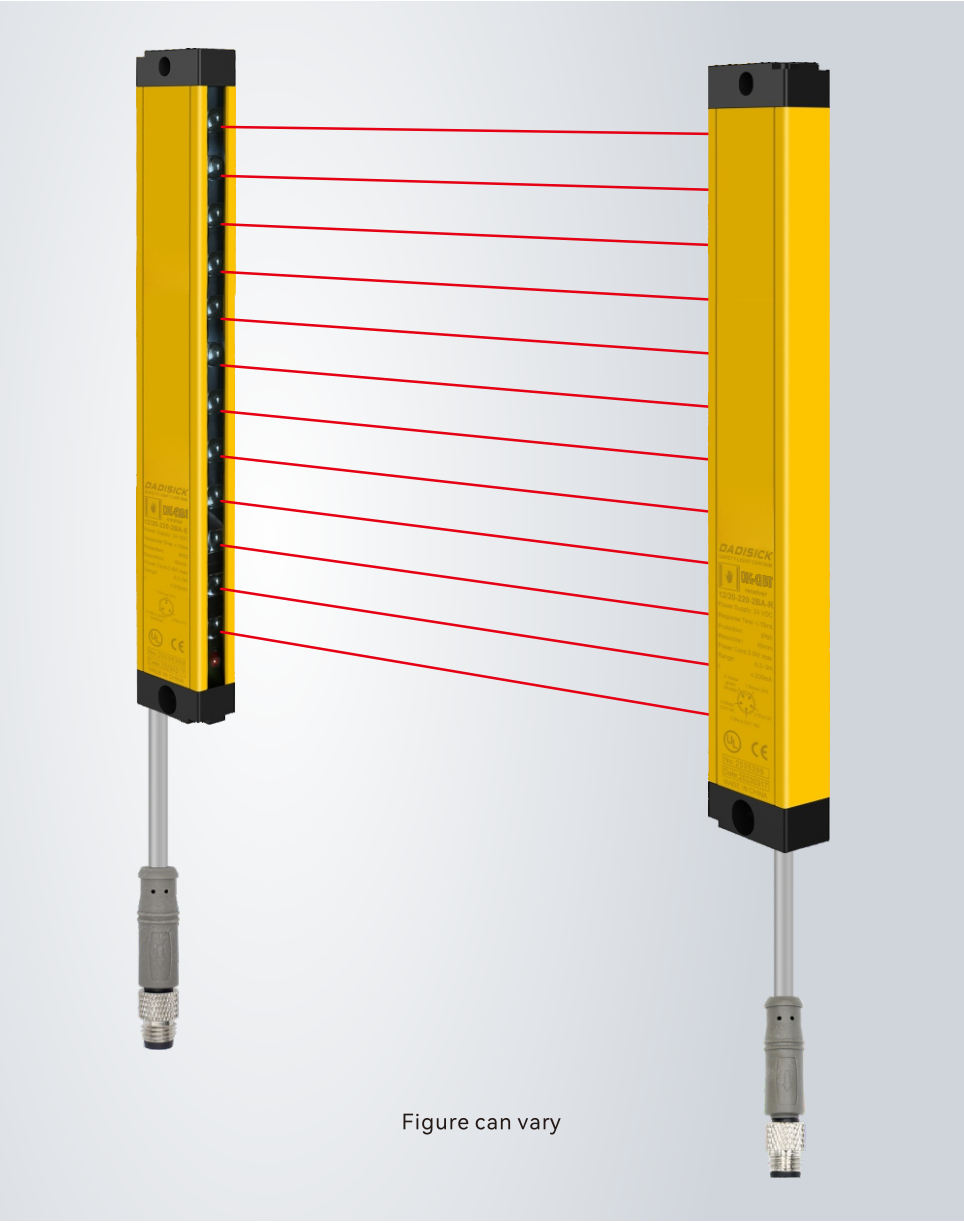

Figure can vary

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GB/T 19001-2016

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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 DK-QBT type safety light curtain are as follows:

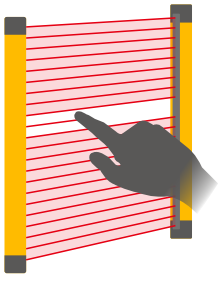
DK-QBT 1 0 / 0 8 – 70 2 – B A – E (DK–QBT10/08–70–2BA–E)

- E: Emitter
  R: Receiver
- Detection distance: A:0.3–3m
- Signal Output Mode: A:NPN NC B:PNP NC C:NPN NO D:PNP NO N:NPN NO+NC P:PNP NO+NC
  Note: The default is figure A without special requirements.
- 2:Two circuit of output
- Protective field height 70mm
- Beam number:04、06、08、10.....200
- Resolution ratio: 10mm, 20mm, 40mm
- Model: DK–QBT series safety light curtain

Resolution ratio

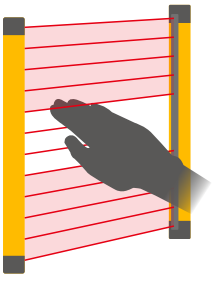
Depending on the usage environment and requirements, it is important to choose the appropriate beam spacing

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	**DK-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	Optical 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

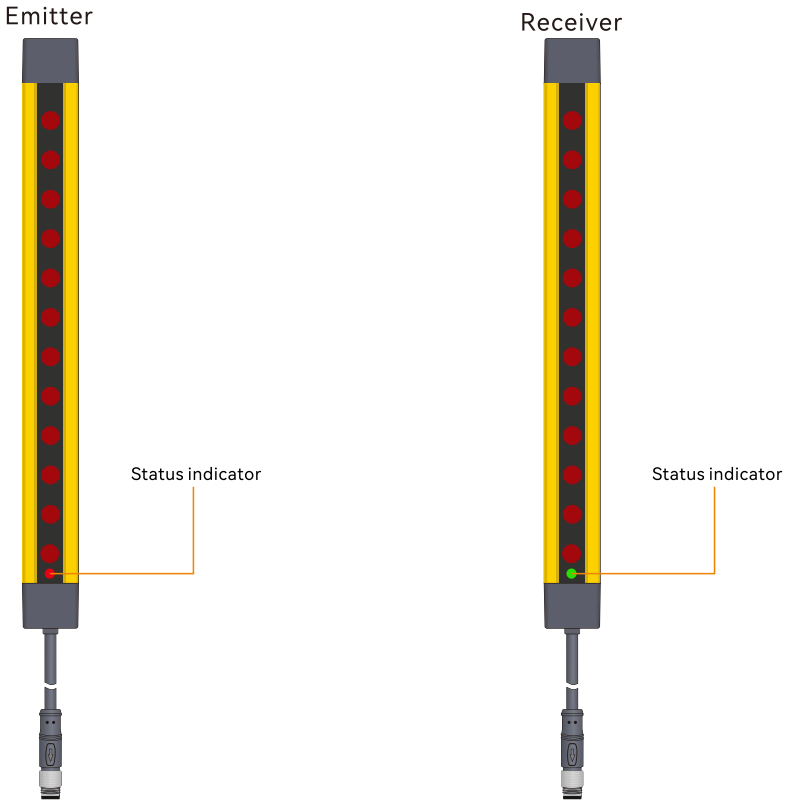
Environmental data	
Protection grade	IP65
Resistance to ambient light	Incandescent light: illumination of light-receiving surface 3000Lx; Sunlight: illumination of light-receiving surface 10000Lx
Ambient temperature	Working temperature: - 10~+40 ℃ (but not frozen), storage temperature: - 25 -+55 ℃
Ambient 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

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

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

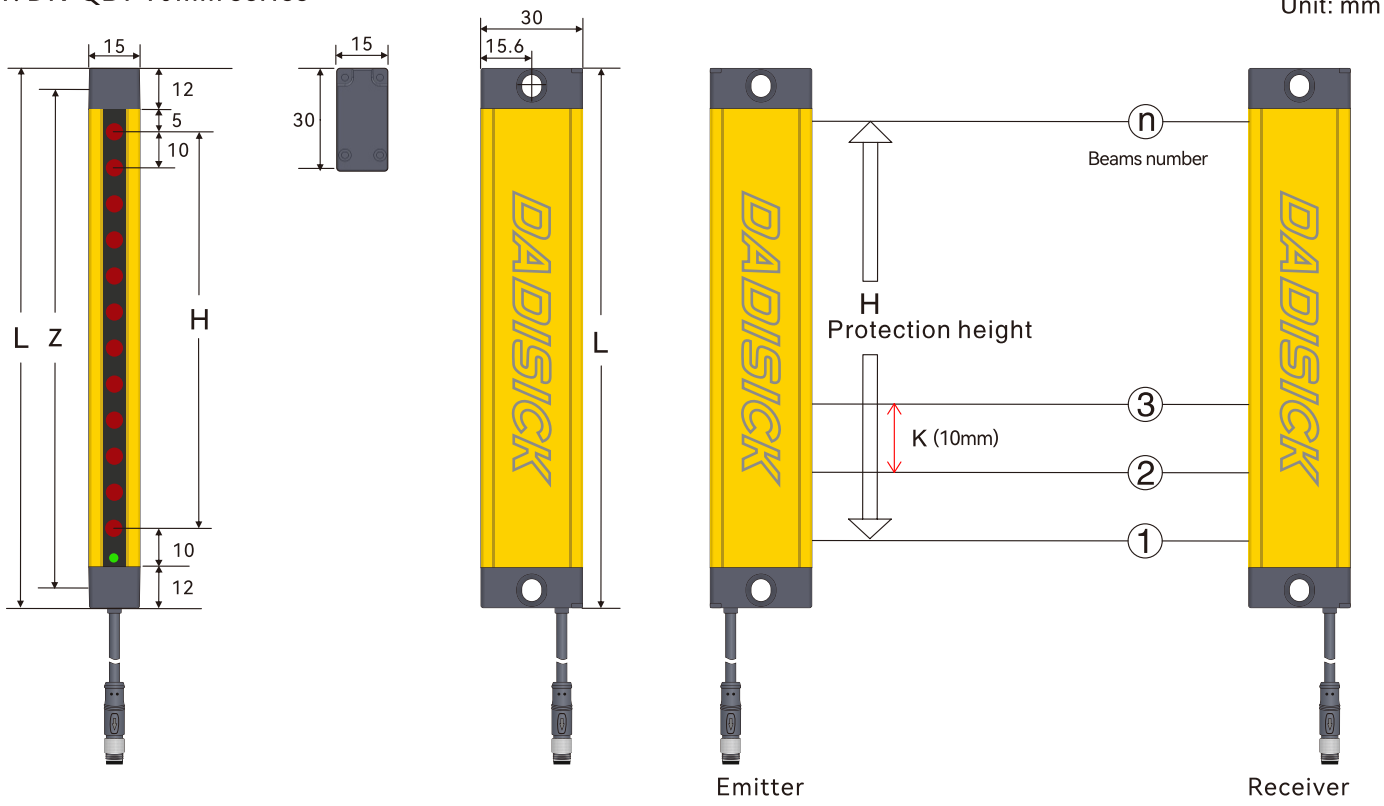


Normal operation of light curtain	LED Indicator status	Explain
Emitter	Red, always on	Turns on the power
	Receiver and emitter are red	Receiver and Emitter are not aligned
Receiver	Green	All light paths are connected
	Red	Light path shading
	Lights flashing	Interference or overstep detection range

Dimensioned drawings

1. DK-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-11mm

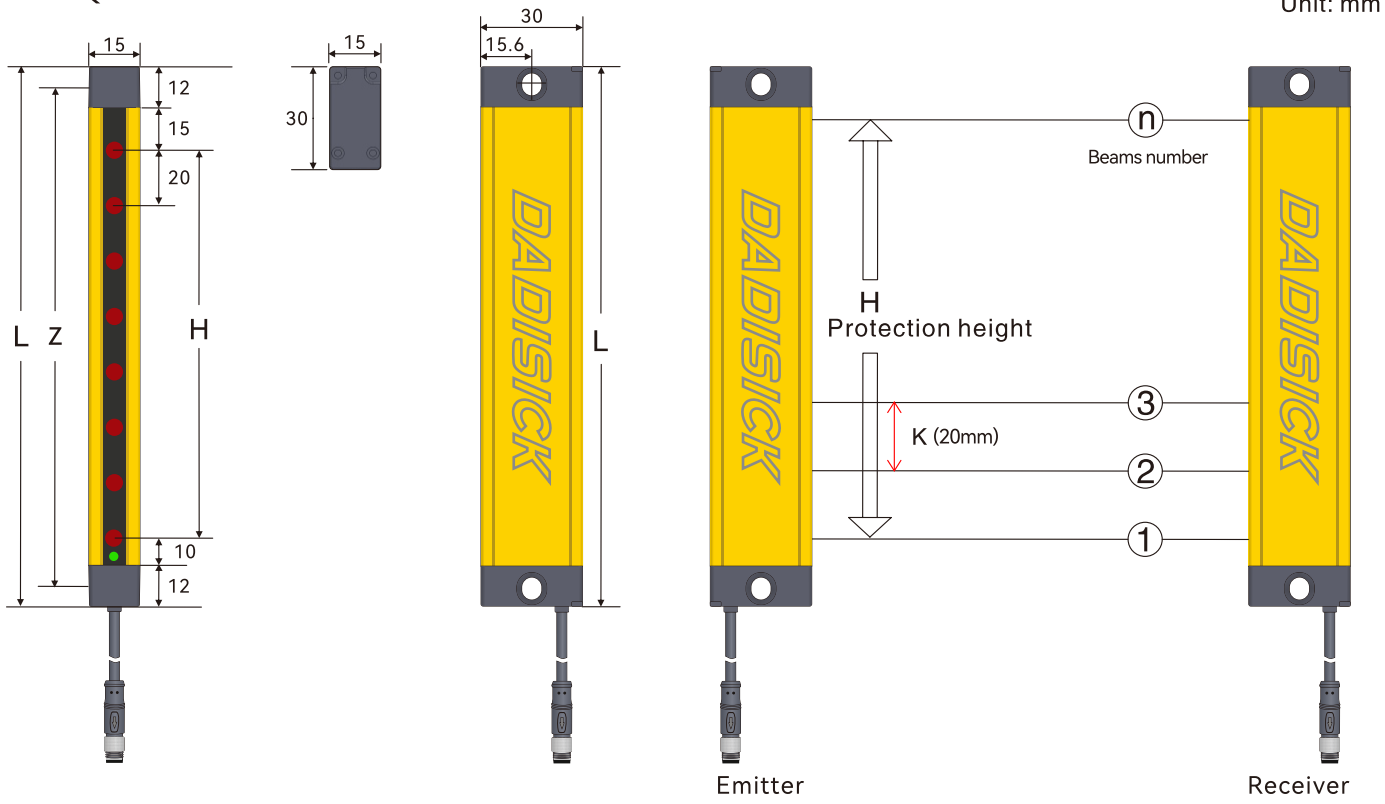
Z:Fixed hole center distance
n:Beams number

DK-QBT 10mm specification list

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

2. DK-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-11mm

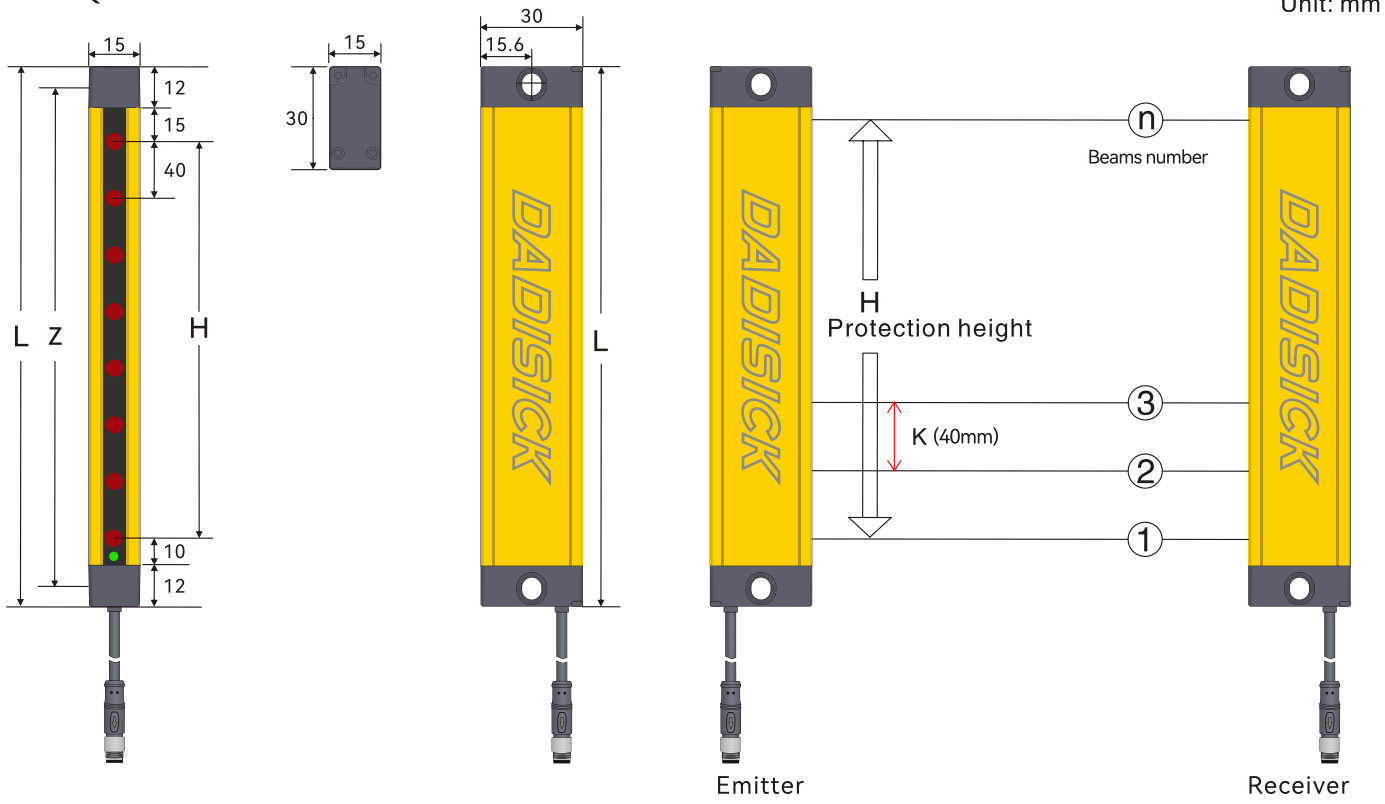
Z:Fixed hole center distance
n:Beams number

DK-QBT 20mm specification list

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

3. DK-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-11mm

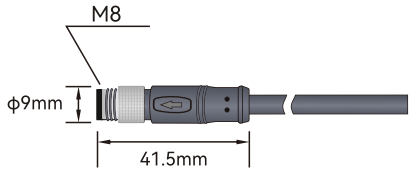
Z:Fixed hole center distance
n:Beams number

DK-QBT 40mm specification list

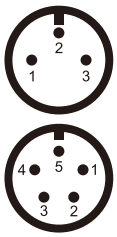
Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode		Detection range
					Outputs	NPN / PNP	
40mm (K)	4	120	169	DK–QBT40/04–120	2	PNP	0.3–3m
	6	200	249	DK–QBT40/06–200	2	PNP	0.3–3m
	8	280	329	DK–QBT40/08–280	2	PNP	0.3–3m
	10	360	409	DK–QBT40/10–360	2	PNP	0.3–3m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

Electrical connection

Cable description:



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

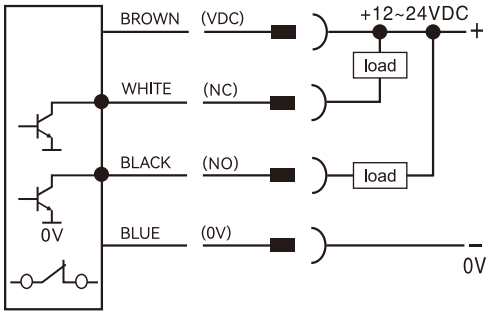


Emitter Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
-	-	-
-	-	-
3	YELLOW	Ground wire

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

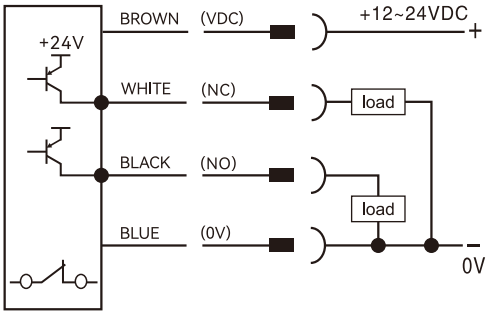
1. DK-QBT signal output selection (actual output of transistor working normally)

NPN NO+NC



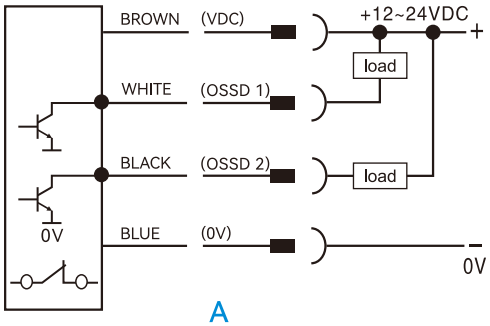
N

PNP NO+NC



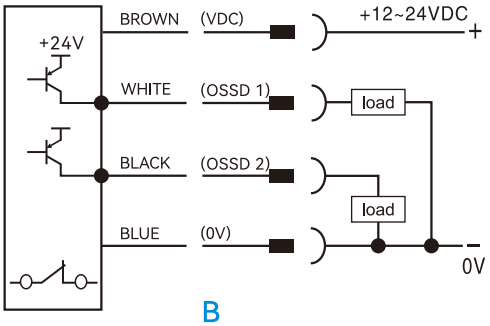
P

NPN NC



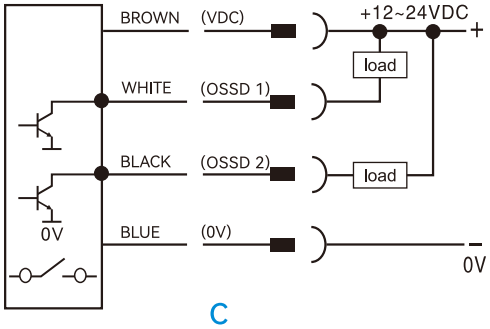
A

PNP NC



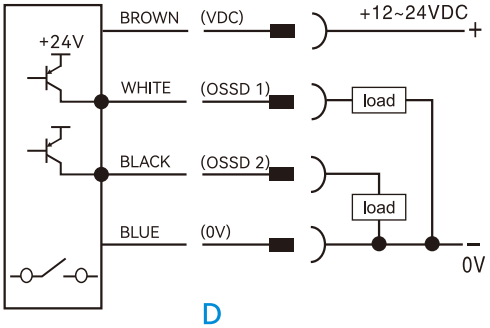
B

NPN NO



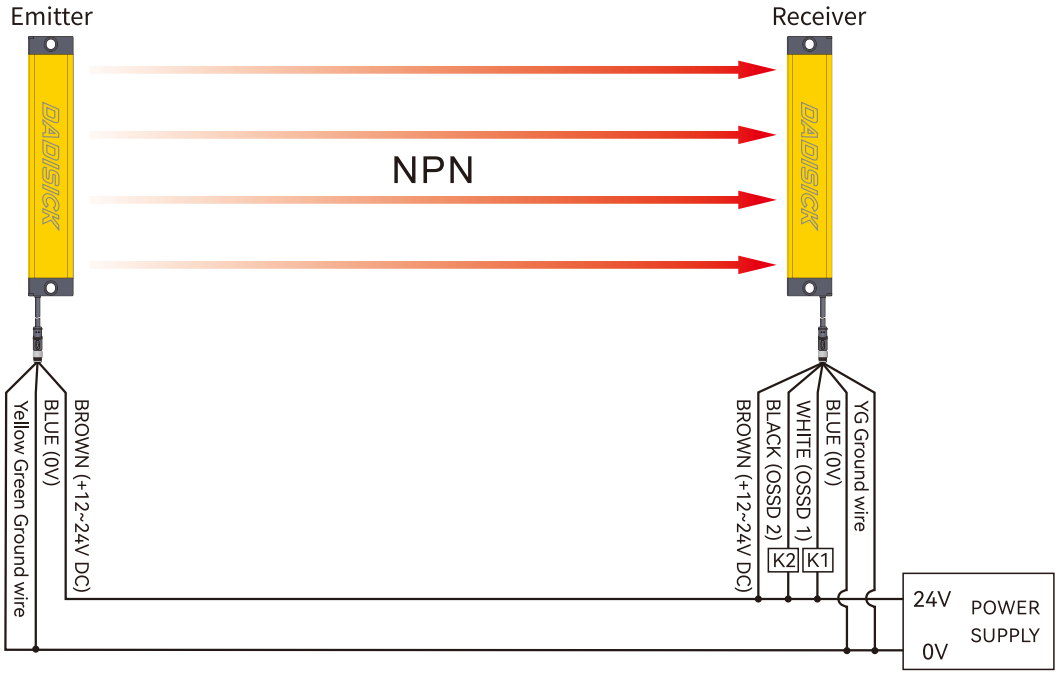
C

PNP NO



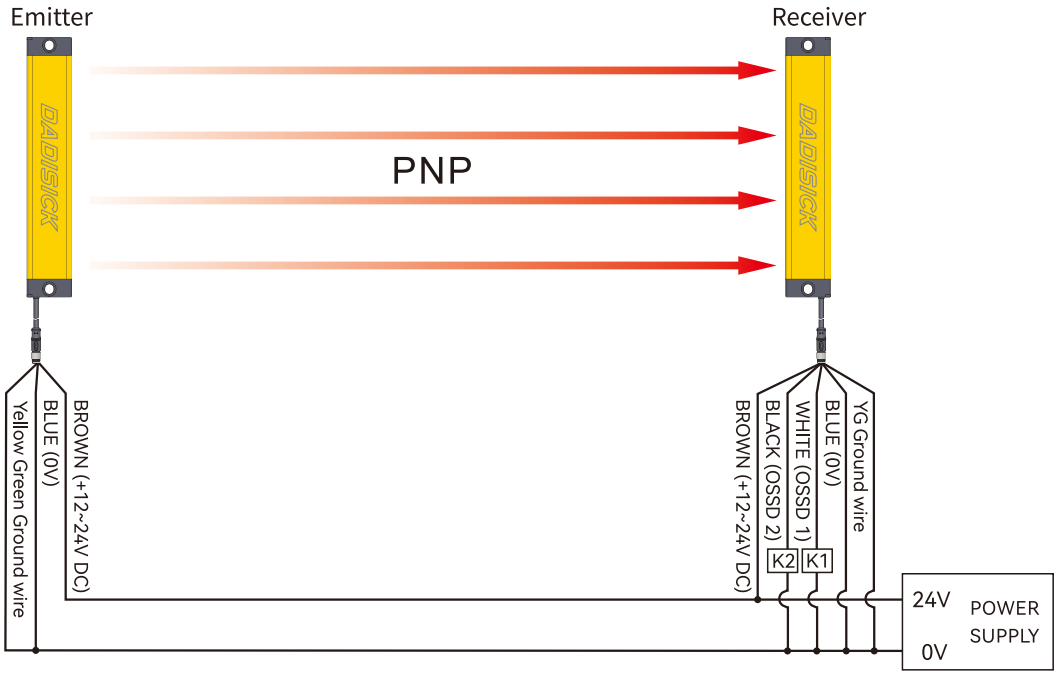
D

2. NPN output wiring diagram



This picture is an example of NPN output wiring

3. PNP output wiring diagram

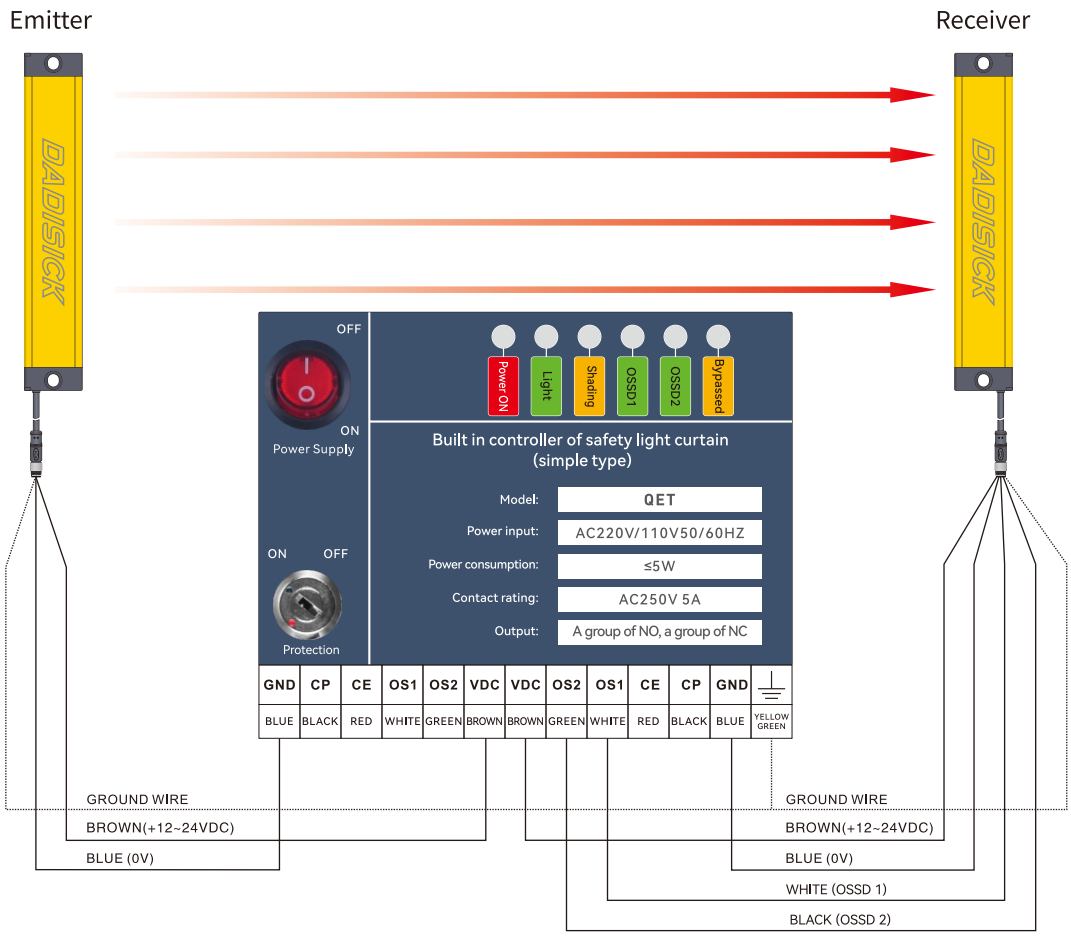


This picture is an example of PNP output wiring

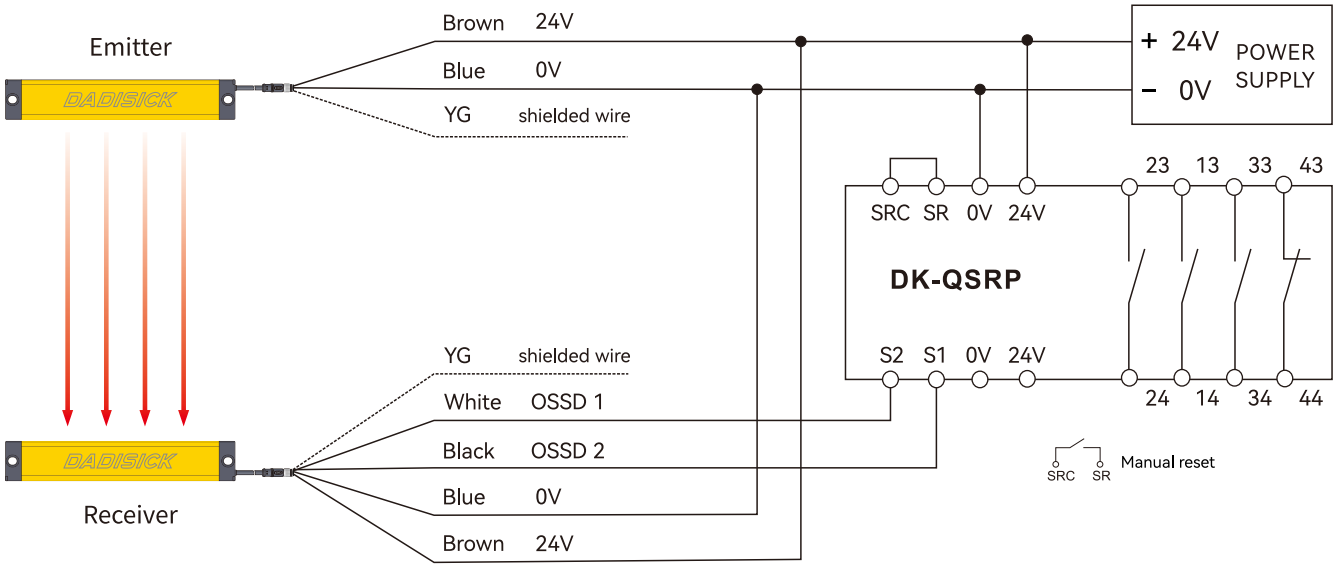
4. Selection of safety light curtain controller

Name	Order separately	Model	Descriptions
Built-in controller		QET	Used to monitor the signal processing of DK-QBT series light curtain, and output one group of NO and one group of NC.
Safety relay		DK-QSRP	DK-QSRP 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	DK-Ter-AP	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 DK-QBT series light curtain.

4.1 Wiring diagram of QET built-in controller

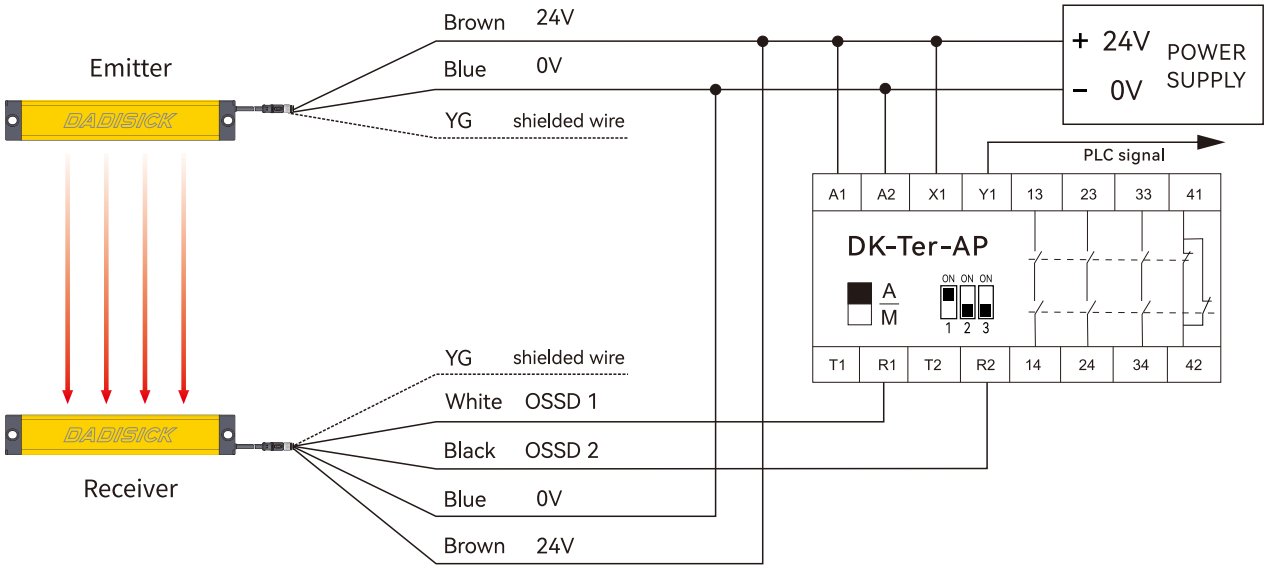


4.2 Wiring diagram of DK-QSRP safety relay

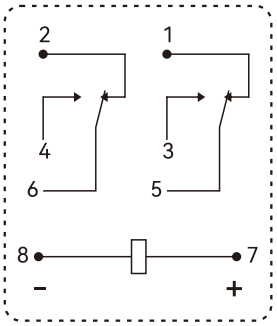


4.3 Wiring diagram of DK-Ter-AP safety relay

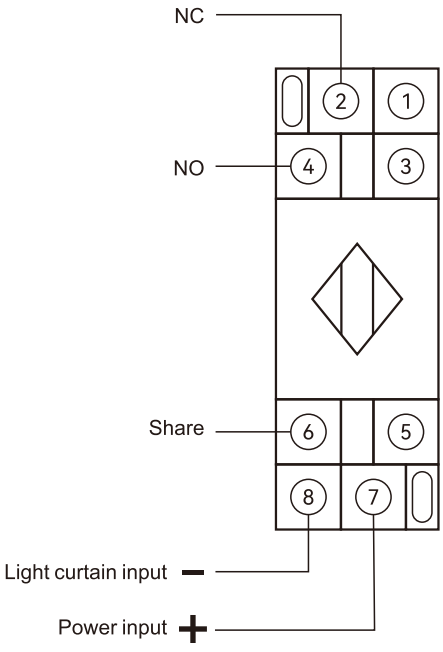
Dual channel light curtain PNP switch safety input, with automatic reset and PLC signal output.



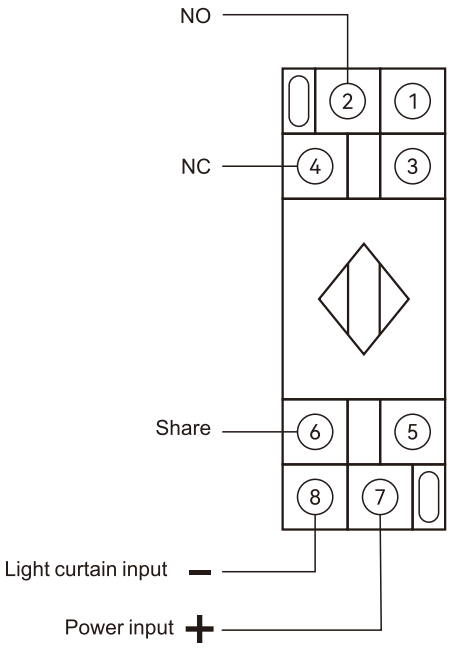
4.4 Wiring diagram of QET-1 light curtain relay



Circuit diagram



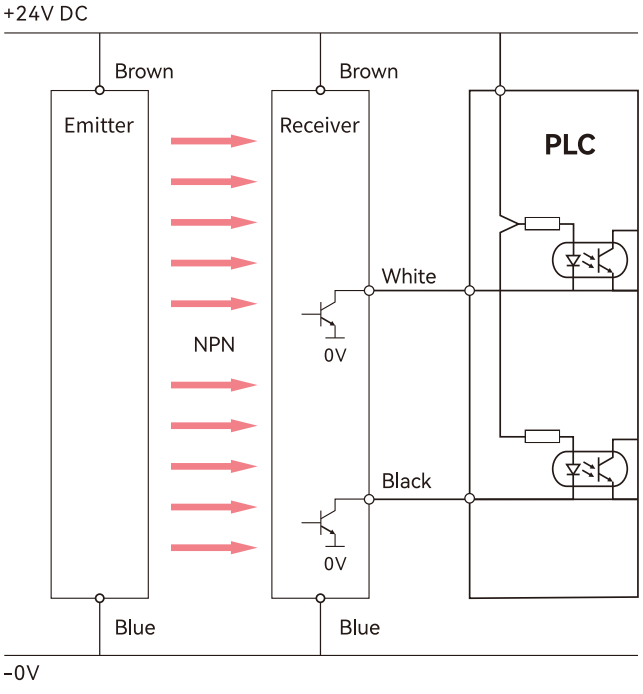
When not powered on



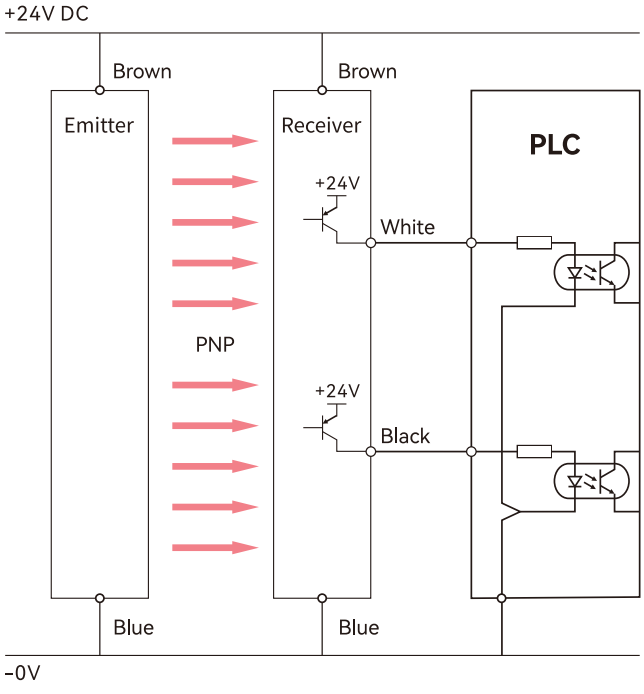
When powered on

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

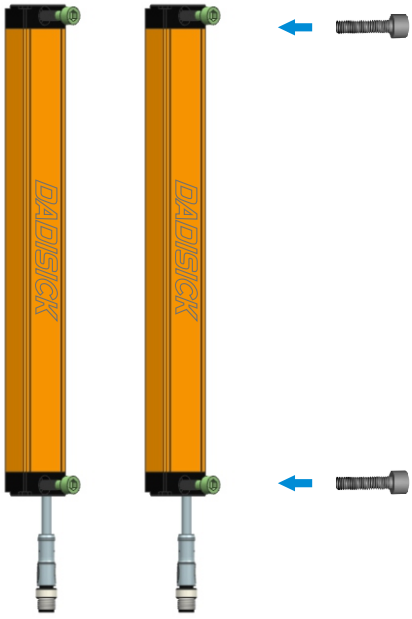
NPN wiring:



PNP wiring:

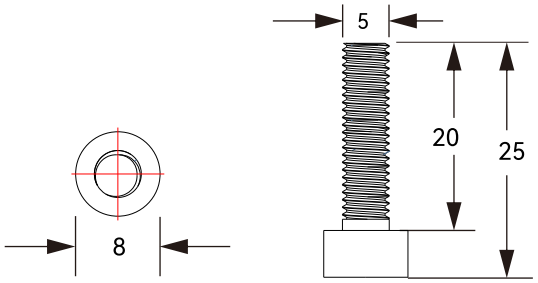


Accessories



Installation method for fixing hole screws
(Original accessories)

Circular screw	Model: QBZ-01



Unit: mm