

TECHNICAL DATA SHEET

MEASURING LIGHT CURTAINS SENSOR Emitter and Receiver DK-QL series

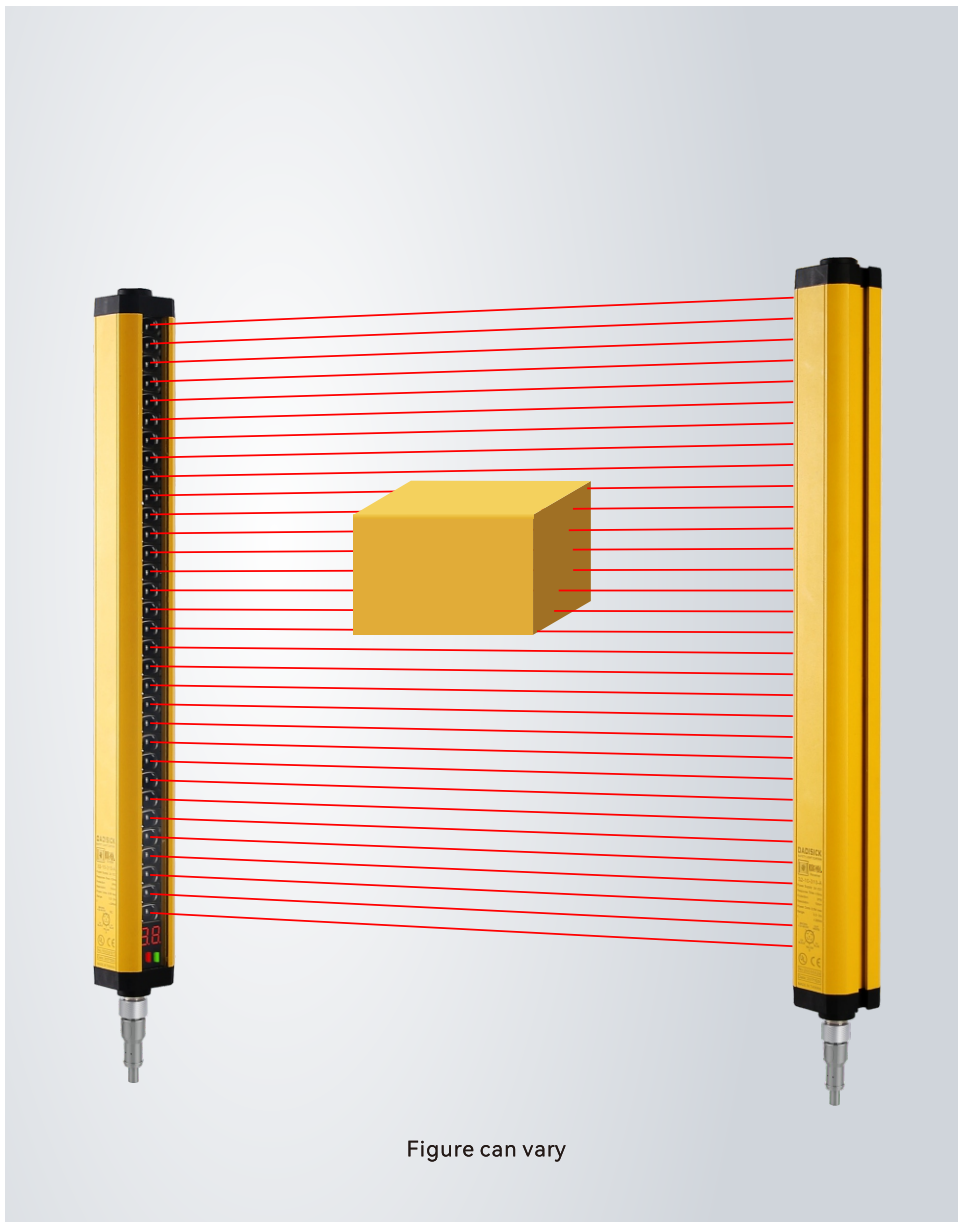


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Contents

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

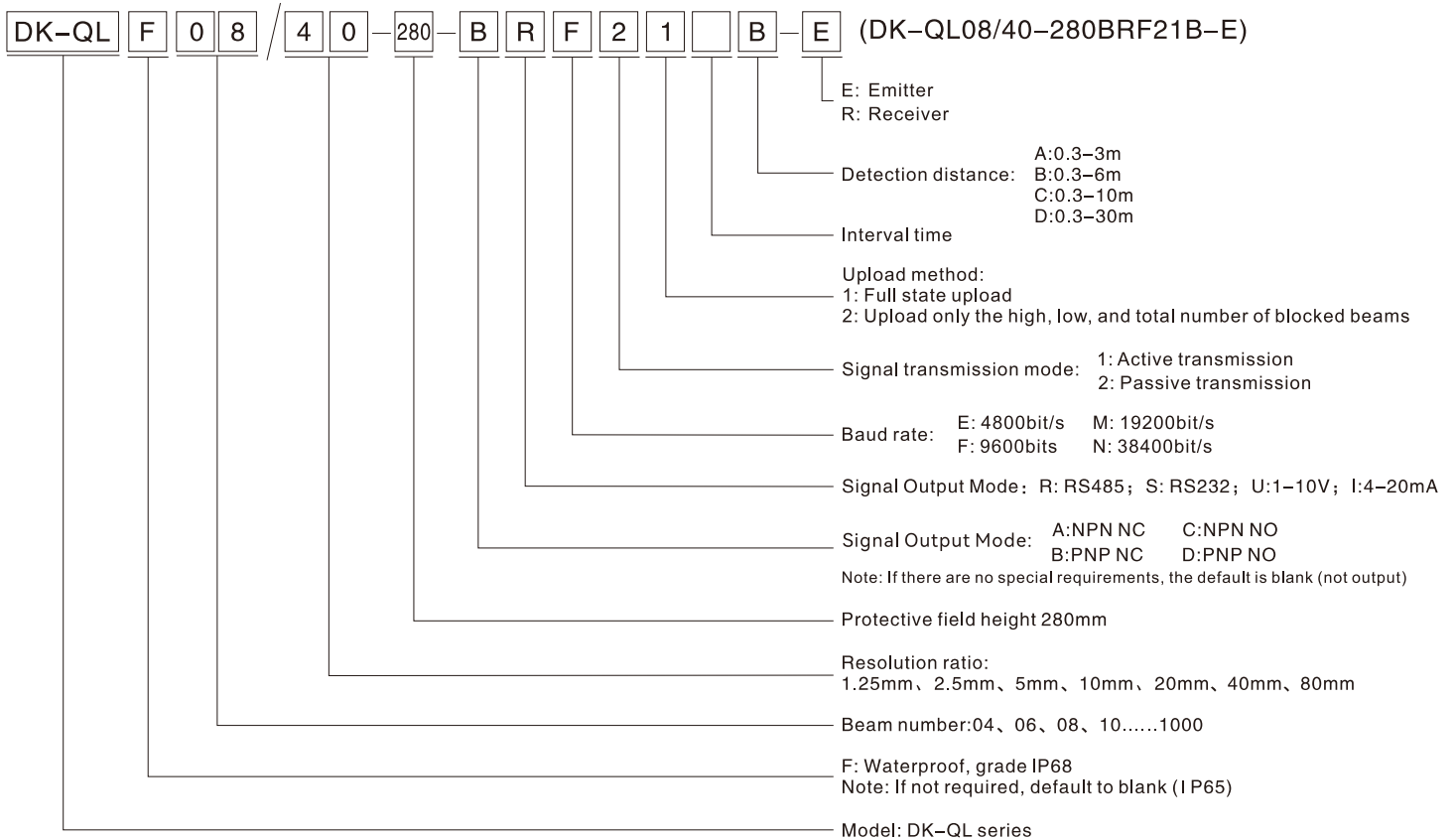
Product application

A. Conveying Systems: Light curtains are used in conveying systems to monitor the movement of objects or materials. They can detect blockages, misalignments, or obstructions on the conveyor belt and trigger corrective actions to maintain smooth operation.

B. Robots: Widely applicable to complex online inspection and measurement tasks such as spray positioning, volume measurement, precision correction, intelligent sorting, high-speed inspection, and parts counting.

C. Assembly Lines: Light curtains are used to optimize assembly line operations. They can accurately detect the position and movement of parts, ensuring precise alignment and preventing errors during manufacturing.

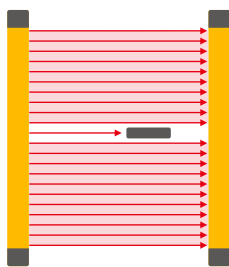
The specifications of DK-QL type measuring light curtain are as follows:



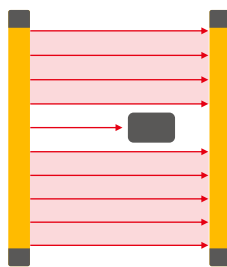
Resolution ratio

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

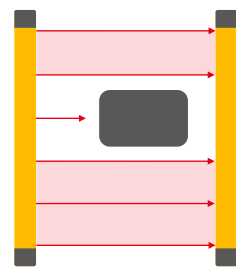
Opaque object detection:



Detection capability
1.25/2.5/5/10/20mm
diameter



Detection capability
40mm
diameter



Detection capability
80mm
diameter

Technical data

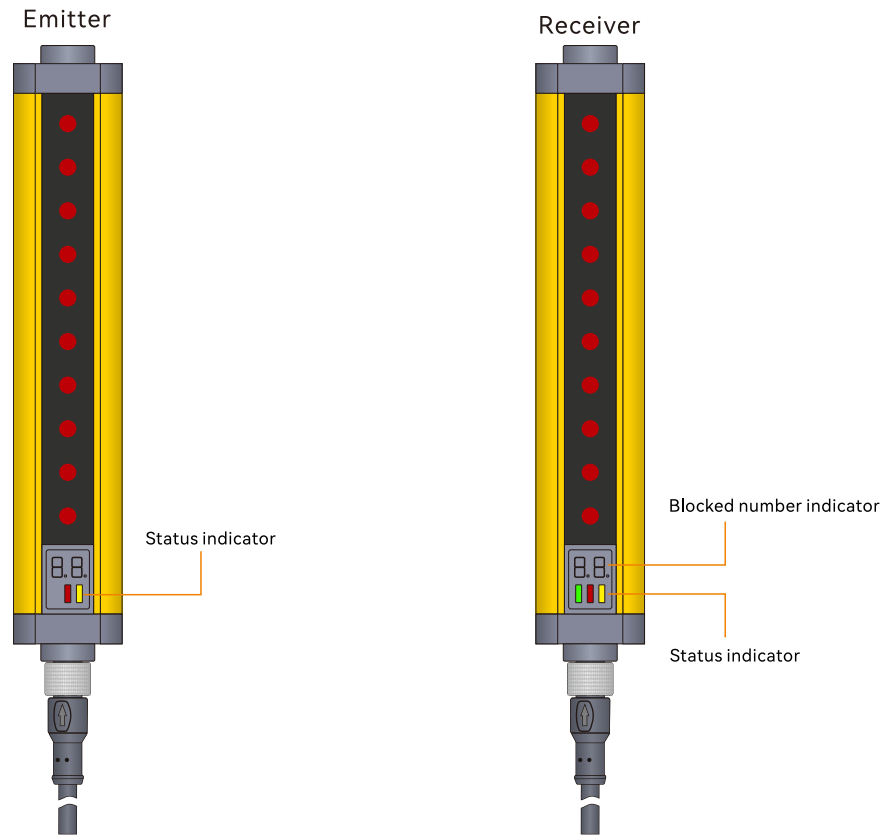
Basic data of Receiver and Emitter


Standard packaging	
Product model	DK-QL 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	1.25mm, 2.5mm, 5mm, 10mm, 20mm, 40mm, 80mm
Check the accuracy	2mm, 3.75mm, 6.5mm, 15mm, 25mm, 45mm, 85mm
Number of beams	04、06、08、10.....1000
Overall dimension	36mm*36mm*L, L is the length of emitter and receiver.
Detection distance	30-3000mm、30-6000mm、30-10000mm
Response time	≤15ms
Synchronization	
Consumption current	≤200mA
Output mode	RS485/RS232 output or analog voltage U: 1-10V/analog current I: 4-20mA output, with 1 circuit of PNP output
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)	1-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 output	Connection pin 4, WHITE OSSD NPN/PNP
Communication protocol	Connection pin 5, RED RS485A; Connection pin 6, GREEN RS485B

Certificate	
CETÜV	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

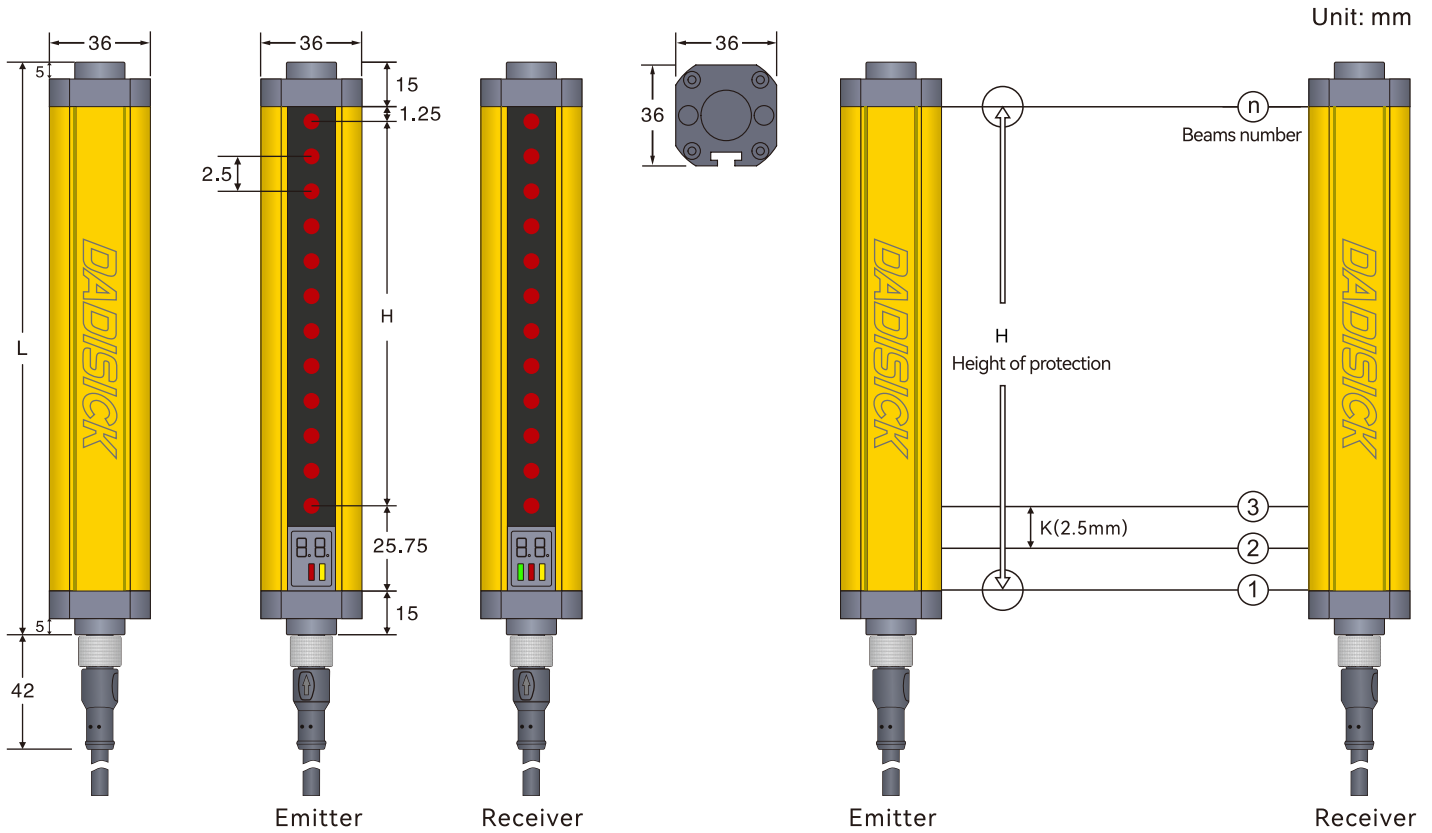
Operation and display



Status indicator	LED status Indicator	Explain
Emitter	 Red and Yellow, always on	Turns on the power

Status indicator	LED status Indicator	Explain
Receiver	 Red, always on	Turns on the power
	 Green and Red	All light paths are connected
	 Red and Yellow	The light is blocked or misaligned
	 Lights flashing	Interference or overstep detection range

2. DK-QL 2.5mm series



Remarks

L: Total length of light screen
 $L = 15 + 1.25 + H + 25.75 + 15$

H: Height of protected area
 $H = (n - 1) * 2.5$

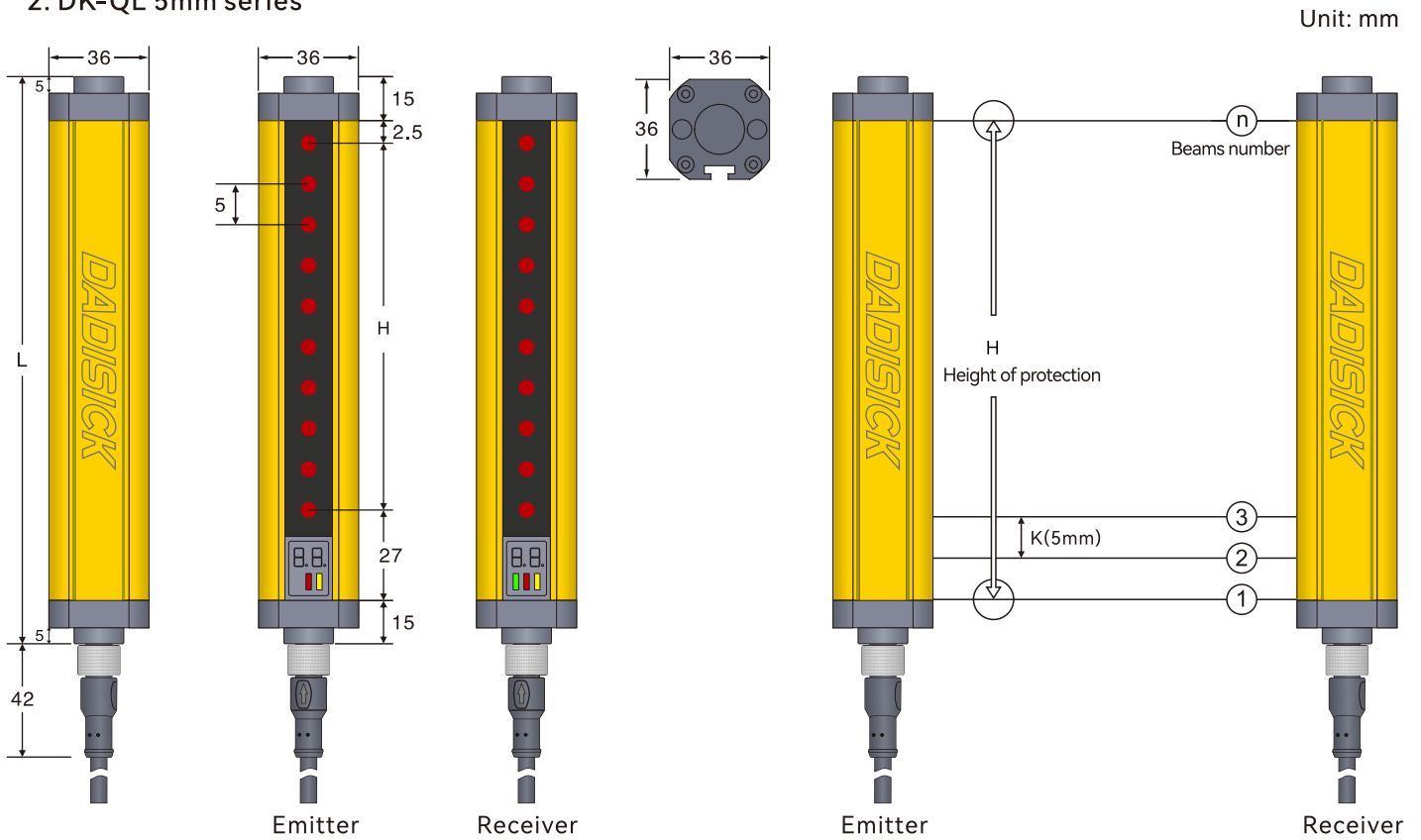
K: Resolution ratio

n: Beams number

DK-QL 2.5mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
2.5mm (K)	32	77.5	134.5	DK-QL32/2.5-77.5	R	I	U	0.3-3m
	40	97.5	154.5	DK-QL40/2.5-97.5	R	I	U	0.3-3m
	48	117.5	174.5	DK-QL48/2.5-117.5	R	I	U	0.3-3m
	56	137.5	194.5	DK-QL56/2.5-137.5	R	I	U	0.3-3m
	64	157.5	214.5	DK-QL64/2.5-157.5	R	I	U	0.3-3m
	72	177.5	234.5	DK-QL72/2.5-177.5	R	I	U	0.3-3m
	80	197.5	254.5	DK-QL80/2.5-197.5	R	I	U	0.3-3m
	88	217.5	274.5	DK-QL88/2.5-217.5	R	I	U	0.3-3m
	96	237.5	294.5	DK-QL96/2.5-237.5	R	I	U	0.3-3m
	104	257.5	314.5	DK-QL104/2.5-257.5	R	I	U	0.3-3m
	112	277.5	334.5	DK-QL112/2.5-277.5	R	I	U	0.3-3m
	120	297.5	354.5	DK-QL120/2.5-297.5	R	I	U	0.3-3m
	128	317.5	374.5	DK-QL128/2.5-317.5	R	I	U	0.3-3m
	136	337.5	394.5	DK-QL136/2.5-337.5	R	I	U	0.3-2m
	144	357.5	414.5	DK-QL144/2.5-357.5	R	I	U	0.3-2m
	152	377.5	434.5	DK-QL152/2.5-377.5	R	I	U	0.3-2m
	160	397.5	454.5	DK-QL160/2.5-397.5	R	I	U	0.3-2m
	168	417.5	474.5	DK-QL168/2.5-417.5	R	I	U	0.3-2m
	176	437.5	494.5	DK-QL176/2.5-437.5	R	I	U	0.3-2m
	184	457.5	514.5	DK-QL184/2.5-457.5	R	I	U	0.3-2m
	192	477.5	534.5	DK-QL192/2.5-477.5	R	I	U	0.3-2m
	200	497.5	554.5	DK-QL200/2.5-497.5	R	I	U	0.3-2m
	208	517.5	574.5	DK-QL208/2.5-517.5	R	I	U	0.3-2m
	216	537.5	594.5	DK-QL216/2.5-537.5	R	I	U	0.3-2m
	224	557.5	614.5	DK-QL224/2.5-557.5	R	I	U	0.3-2m
	232	577.5	634.5	DK-QL232/2.5-577.5	R	I	U	0.3-2m
	240	597.5	654.5	DK-QL240/2.5-597.5	R	I	U	0.3-2m
	248	617.5	674.5	DK-QL248/2.5-617.5	R	I	U	0.3-2m
...	...	...	...	...	R	I	U	0.3-2m
464	1157.5	1214.5	DK-QL464/2.5-1157.5	R	I	U	0.3-2m	
472	1177.5	1234.5	DK-QL472/2.5-1177.5	R	I	U	0.3-2m	
480	1197.5	1254.5	DK-QL480/2.5-1197.5	R	I	U	0.3-2m	

2. DK-QL 5mm series



Remarks

L: Total length of light screen
 $L = 15 + 2.5 + H + 27 + 15$

H: Height of protected area
 $H = (n - 1) * 5$

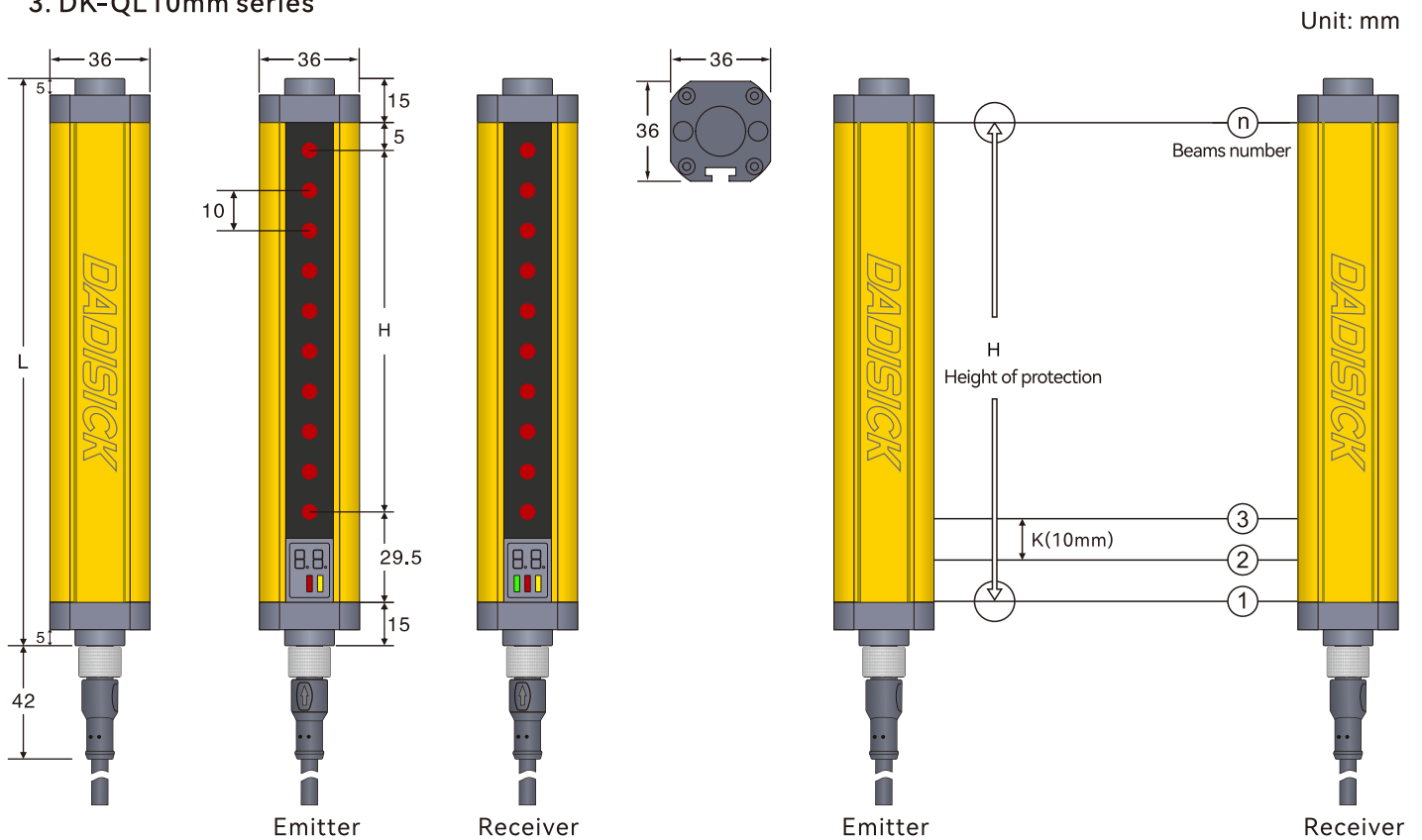
K: Resolution ratio

n: Beams number

DK-QL 5mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
5mm (K)	16	75	134.5	DK-QL16/5-75	R	I	U	0.3-3m
	24	115	174.5	DK-QL24/5-115	R	I	U	0.3-3m
	32	155	214.5	DK-QL32/5-155	R	I	U	0.3-3m
	40	195	254.5	DK-QL40/5-195	R	I	U	0.3-3m
	48	235	294.5	DK-QL48/5-235	R	I	U	0.3-3m
	56	275	334.5	DK-QL56/5-275	R	I	U	0.3-3m
	64	315	374.5	DK-QL64/5-315	R	I	U	0.3-3m
	72	355	414.5	DK-QL72/5-355	R	I	U	0.3-3m
	80	395	454.5	DK-QL80/5-395	R	I	U	0.3-3m
	88	435	494.5	DK-QL88/5-435	R	I	U	0.3-3m
	96	475	534.5	DK-QL96/5-475	R	I	U	0.3-3m
	104	515	574.5	DK-QL104/5-515	R	I	U	0.3-2m
	112	555	614.5	DK-QL112/5-555	R	I	U	0.3-2m
	120	595	654.5	DK-QL120/5-595	R	I	U	0.3-2m
	128	635	694.5	DK-QL128/5-635	R	I	U	0.3-2m
	136	675	734.5	DK-QL136/5-675	R	I	U	0.3-2m
	144	715	774.5	DK-QL144/5-715	R	I	U	0.3-2m
	152	755	814.5	DK-QL152/5-755	R	I	U	0.3-2m
	160	795	854.5	DK-QL160/5-795	R	I	U	0.3-2m
	168	835	894.5	DK-QL168/5-835	R	I	U	0.3-2m
	176	875	934.5	DK-QL176/5-875	R	I	U	0.3-2m
	184	915	974.5	DK-QL184/5-915	R	I	U	0.3-2m
	192	955	1014.5	DK-QL192/5-955	R	I	U	0.3-2m
	200	995	1054.5	DK-QL200/5-995	R	I	U	0.3-2m
	208	1035	1094.5	DK-QL208/5-1035	R	I	U	0.3-2m
	216	1075	1134.5	DK-QL216/5-1075	R	I	U	0.3-2m
	224	1115	1174.5	DK-QL224/5-1115	R	I	U	0.3-2m
	232	1155	1214.5	DK-QL232/5-1155	R	I	U	0.3-2m
...	...	...	...	...	R	I	U	0.3-2m
480	2395	2454.5	DK-QL480/5-2395	R	I	U	0.3-2m	
488	2435	2494.5	DK-QL488/5-2435	R	I	U	0.3-2m	
496	2475	2534.5	DK-QL496/5-2475	R	I	U	0.3-2m	

3. DK-QL10mm series



Remarks

L: Total length of light screen
 $L = 15 + 5 + H + 29.5 + 15$

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

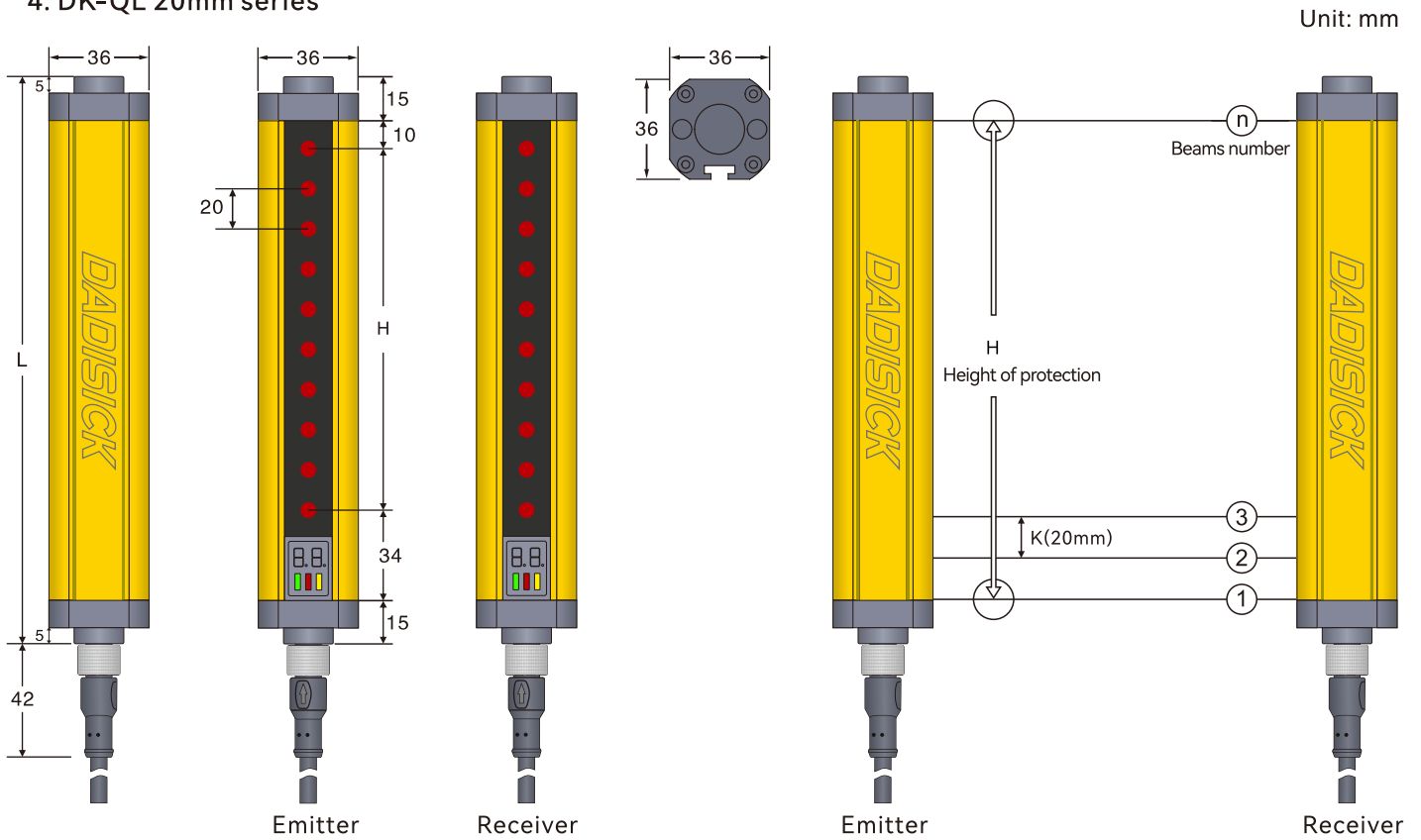
K: Resolution ratio

n: Beams number

DK-QL 10mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
10mm (K)	8	70	134.5	DK-QL08/10-70	R	I	U	0.3-6m
	10	90	154.5	DK-QL10/10-90	R	I	U	0.3-6m
	12	110	174.5	DK-QL12/10-110	R	I	U	0.3-6m
	14	130	194.5	DK-QL14/10-130	R	I	U	0.3-6m
	16	150	214.5	DK-QL16/10-150	R	I	U	0.3-6m
	18	170	234.5	DK-QL18/10-170	R	I	U	0.3-6m
	20	190	254.5	DK-QL20/10-190	R	I	U	0.3-6m
	22	210	274.5	DK-QL22/10-210	R	I	U	0.3-6m
	24	230	294.5	DK-QL24/10-230	R	I	U	0.3-6m
	26	250	314.5	DK-QL26/10-250	R	I	U	0.3-6m
	28	270	334.5	DK-QL28/10-270	R	I	U	0.3-6m
	30	290	354.5	DK-QL30/10-290	R	I	U	0.3-6m
	32	310	374.5	DK-QL32/10-310	R	I	U	0.3-6m
	34	330	394.5	DK-QL34/10-330	R	I	U	0.3-6m

4. DK-QL 20mm series


Remarks

L: Total length of light screen
 $L = 15 + 10 + H + 34 + 15$

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

K: Resolution ratio

n: Beams number

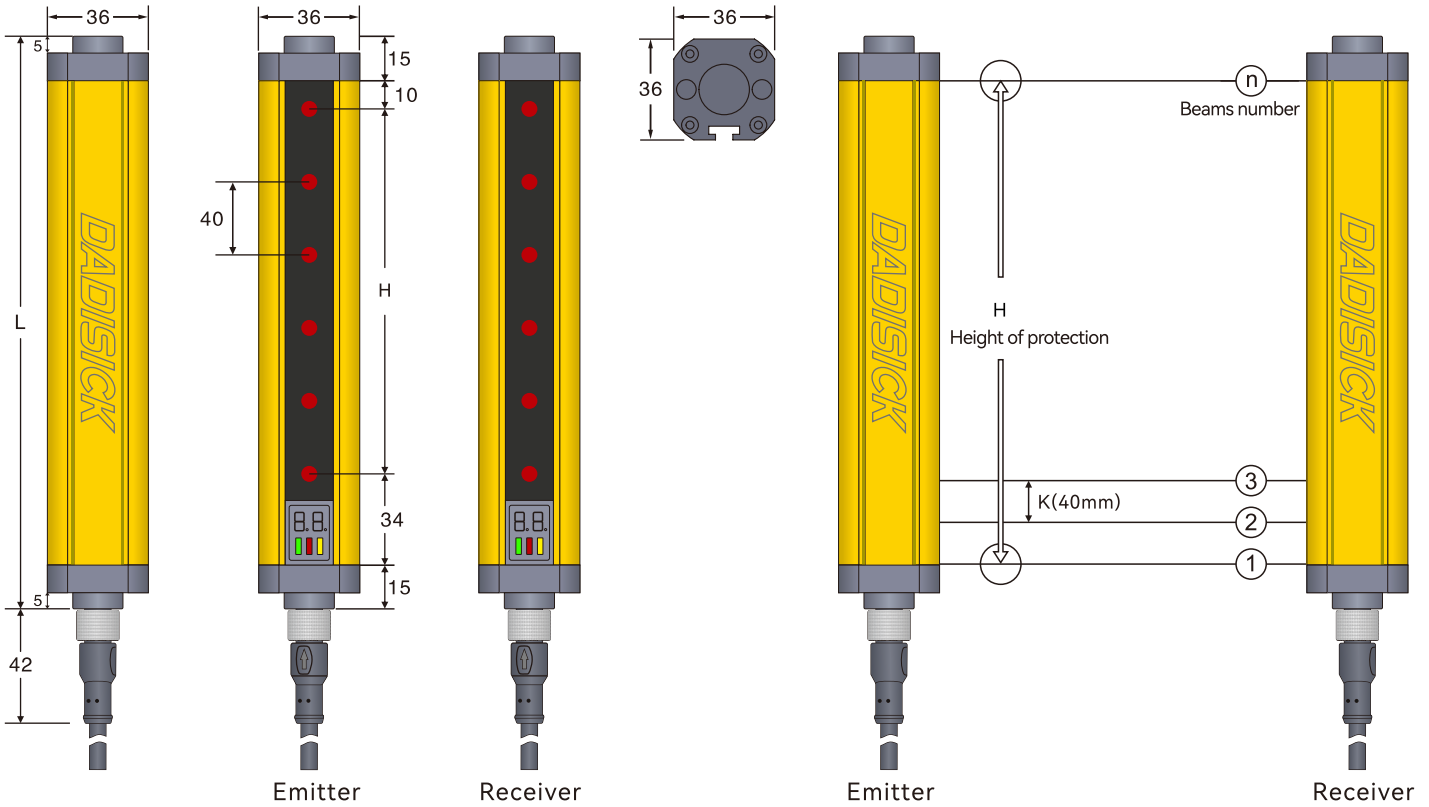
DK-QL 20mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
20mm (K)	4	60	134	DK-QL04/20-60	R	I	U	0.3-6m
	6	100	174	DK-QL06/20-100	R	I	U	0.3-6m
	8	140	214	DK-QL08/20-140	R	I	U	0.3-6m
	10	180	254	DK-QL10/20-180	R	I	U	0.3-6m
	12	220	294	DK-QL12/20-220	R	I	U	0.3-6m
	14	260	334	DK-QL14/20-260	R	I	U	0.3-6m
	16	300	374	DK-QL16/20-300	R	I	U	0.3-6m
	18	340	414	DK-QL18/20-340	R	I	U	0.3-6m
	20	380	454	DK-QL20/20-380	R	I	U	0.3-6m
	22	420	494	DK-QL22/20-420	R	I	U	0.3-6m
	24	460	534	DK-QL24/20-460	R	I	U	0.3-6m
	26	500	574	DK-QL26/20-500	R	I	U	0.3-6m
	28	540	614	DK-QL28/20-540	R	I	U	0.3-6m
	30	580	654	DK-QL30/20-580	R	I	U	0.3-6m
32	620	694	DK-QL32/20-620	R	I	U	0.3-6m	

Note: The sensing distance can reach up to 30m. For more information, please contact customer service

5. DK-QL 40mm series

Unit: mm



Remarks

L: Total length of light screen
 $L = 15 + 10 + H + 34 + 15$

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

K: Resolution ratio

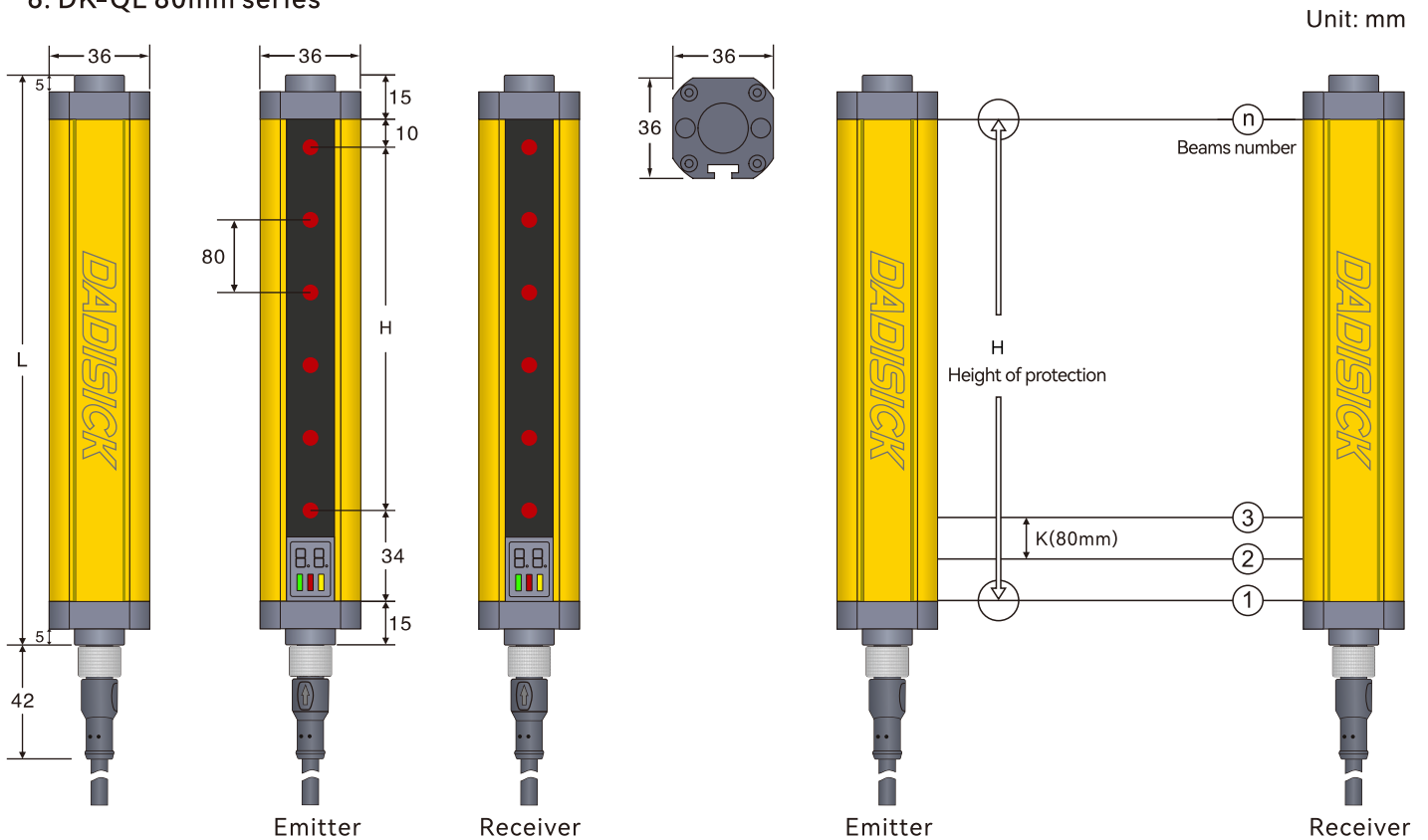
n: Beams number

DK-QL 40mm specification list

Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
40mm (K)	4	120	194	DK-QL04/40-120	R	I	U	0.3-6m
	6	200	274	DK-QL06/40-200	R	I	U	0.3-6m
	8	280	354	DK-QL08/40-280	R	I	U	0.3-6m
	10	360	434	DK-QL10/40-360	R	I	U	0.3-6m
	12	440	514	DK-QL12/40-440	R	I	U	0.3-6m
	14	520	594	DK-QL14/40-520	R	I	U	0.3-6m
	16	600	674	DK-QL16/40-600	R	I	U	0.3-6m
	18	680	754	DK-QL18/40-680	R	I	U	0.3-6m
	20	760	834	DK-QL20/40-760	R	I	U	0.3-6m
	22	840	914	DK-QL22/40-840	R	I	U	0.3-6m
	24	920	994	DK-QL24/40-920	R	I	U	0.3-6m
	26	1000	1074	DK-QL26/40-1000	R	I	U	0.3-6m
	28	1080	1154	DK-QL28/40-1080	R	I	U	0.3-6m
	30	1160	1234	DK-QL30/40-1160	R	I	U	0.3-6m
	32	1240	1314	DK-QL32/40-1240	R	I	U	0.3-6m
	34	1320	1394	DK-QL34/40-1320	R	I	U	0.3-6m
	36	1400	1474	DK-QL36/40-1400	R	I	U	0.3-6m
	38	1480	1554	DK-QL38/40-1480	R	I	U	0.3-6m
	40	1560	1634	DK-QL40/40-1560	R	I	U	0.3-6m
	42	1640	1714	DK-QL42/40-1640	R	I	U	0.3-6m
	44	1720	1794	DK-QL44/40-1720	R	I	U	0.3-6m
	46	1800	1874	DK-QL46/40-1800	R	I	U	0.3-6m
	48	1880	1954	DK-QL48/40-1880	R	I	U	0.3-6m
	50	1960	2034	DK-QL50/40-1960	R	I	U	0.3-6m
	52	2040	2114	DK-QL52/40-2040	R	I	U	0.3-6m
	54	2120	2194	DK-QL54/40-2120	R	I	U	0.3-6m
	56	2200	2274	DK-QL56/40-2200	R	I	U	0.3-6m
	58	2280	2354	DK-QL58/40-2280	R	I	U	0.3-6m
60	2360	2434	DK-QL60/40-2360	R	I	U	0.3-6m	
62	2440	2514	DK-QL62/40-2440	R	I	U	0.3-6m	
64	2520	2594	DK-QL64/40-2520	R	I	U	0.3-6m	
66	2600	2674	DK-QL66/40-2600	R	I	U	0.3-6m	
68	2680	2754	DK-QL68/40-2680	R	I	U	0.3-6m	
70	2760	2834	DK-QL70/40-2760	R	I	U	0.3-6m	
72	2840	2914	DK-QL72/40-2840	R	I	U	0.3-6m	

Note: The sensing distance can reach up to 30m. For more information, please contact customer service

6. DK-QL 80mm series



Unit: mm

Remarks

L: Total length of light screen
 $L = 15 + 10 + H + 34 + 15$

H: Height of protected area
 $H = (n - 1) * 80$

K: Resolution ratio

n: Beams number

DK-QL 80mm specification list

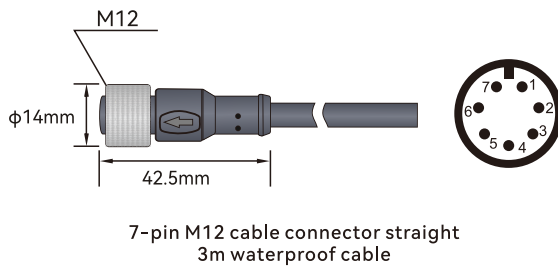
Resolution	Light beam	Protection height (H)	Total height (L)	Product model	Signal output mode			Detection range
					RS485	4-20mA	0-10V	
80mm (K)	4	240	314	DK-QL04/80-240	R	I	U	0.3-6m
	6	400	474	DK-QL06/80-400	R	I	U	0.3-6m
	8	560	634	DK-QL08/80-560	R	I	U	0.3-6m
	10	720	794	DK-QL10/80-720	R	I	U	0.3-6m
	12	880	954	DK-QL12/80-880	R	I	U	0.3-6m
	14	1040	1114	DK-QL14/80-1040	R	I	U	0.3-6m
	16	1200	1274	DK-QL16/80-1200	R	I	U	0.3-6m
	18	1360	1434	DK-QL18/80-1360	R	I	U	0.3-6m
	20	1520	1594	DK-QL20/80-1520	R	I	U	0.3-6m
	22	1680	1754	DK-QL22/80-1680	R	I	U	0.3-6m
	24	1840	1914	DK-QL24/80-1840	R	I	U	0.3-6m
	26	2000	2074	DK-QL26/80-2000	R	I	U	0.3-6m
	28	2160	2234	DK-QL28/80-2160	R	I	U	0.3-6m
	30	2320	2394	DK-QL30/80-2320	R	I	U	0.3-6m
	32	2480	2554	DK-QL32/80-2480	R	I	U	0.3-6m
	34	2640	2714	DK-QL34/80-2640	R	I	U	0.3-6m
36	2800	2874	DK-QL36/80-2800	R	I	U	0.3-6m	
38	2960	3034	DK-QL38/80-2960	R	I	U	0.3-6m	
40	3120	3194	DK-QL40/80-3120	R	I	U	0.3-6m	

Note: The sensing distance can reach up to 30m. For more information, please contact customer service

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:



Emitter Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
3	BLACK	CP
4	WHITE	-
5	RED	RS485A
6	GREEN	RS485B
7	YELLOW	Ground wire

Receiver Wiring diagram		
Pin number	Line color	Name
1	BROWN	24V DC
2	BLUE	0V
3	BLACK	CP
4	WHITE	OSSD
5	RED	RS485A
6	GREEN	RS485B
7	YELLOW	Ground wire

1. Frame format

- Reference to Modbus RTU protocol customization, using RS485 communication;
- Baud rate 4800 bit / s, 9600 bit / s, 19200 BOT / s, 38400 bit / s, default 9600 bit / s;
- Data 8 bit; no parity check; 1 bit stop bit; 16 bit CRC check.

2. Active transmission mode of RS485/232 signal

Active access: By default, data is automatically uploaded to the host computer every 100 ms (speed and time can be set).

3. Passive transmission mode of RS485/232 signal

Passive access mode: multiple sets of light curtains are connected in parallel at the same time, and the upper computer sends instructions before uploading data. The address code can be modified arbitrarily.

4. RS485/232 Communication Protocol (Mode 1)

The communication mode uploads the status of all light points directly to the upper computer, which processes data directly according to the requirements of use.

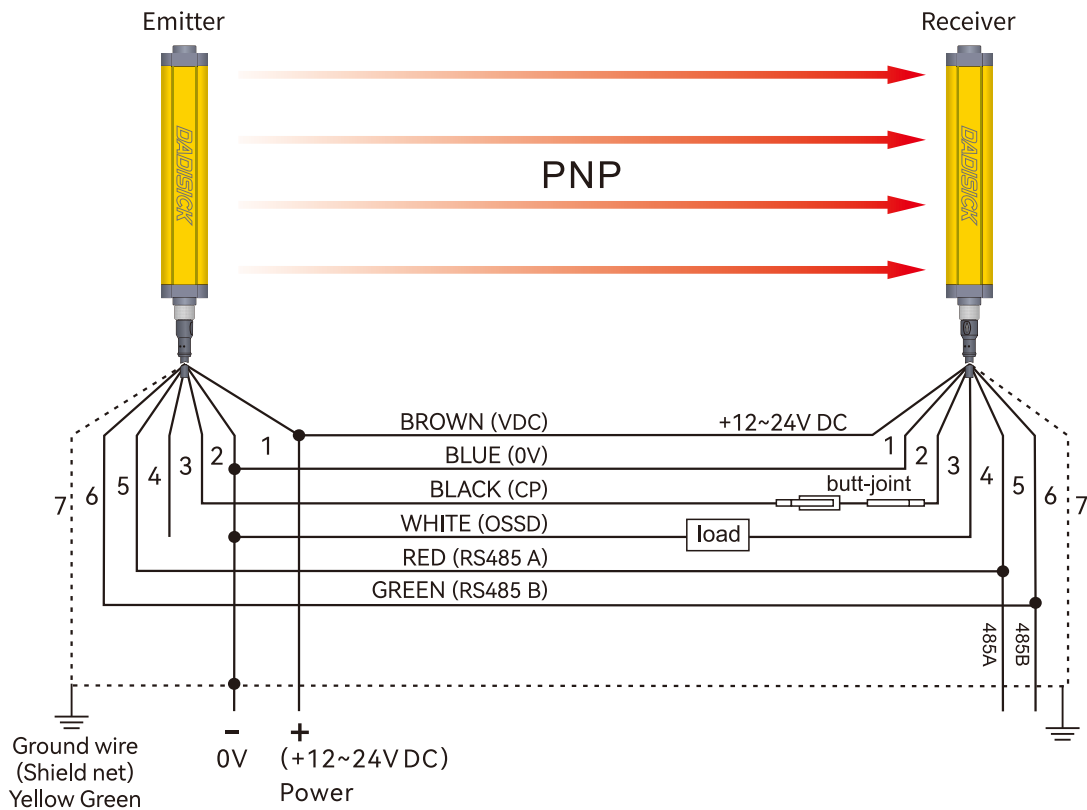
Free	0	1	2	3	---	N	N+1	N+2	Free
Starting position ≥10ms	Starting position 0x03H	Total number of spots	Single frame data volume	Data 1	---	Data N	CRC Check High Bytes	CRC Check Low Bytes	Stop bit ≥10ms

5. RS485/232 Communication Protocol (Mode 2)

The communication mode only uploads the data of the highest point, the lowest point and the total number of photovoltaic shielded to the upper computer directly, and the upper computer processes the data directly according to the use requirements.

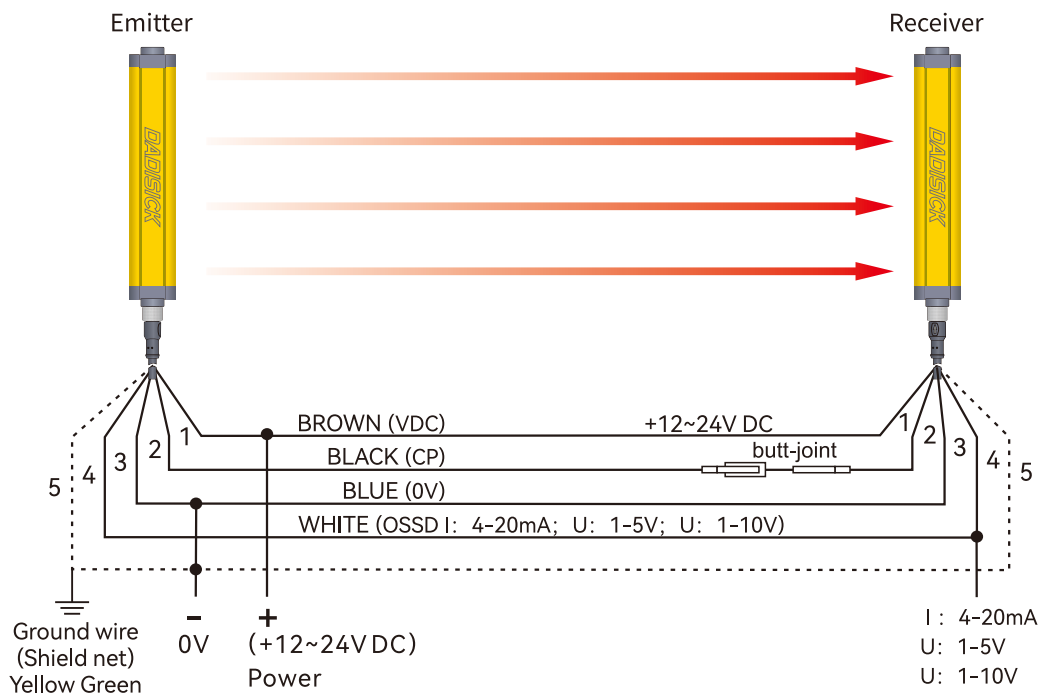
Free	First place	Second place	Third place	Fourth place	Fifth place	Sixth place	Seventh place	Free
Starting position ≥10ms	Starting position 0x03H	Total number of spots	Single frame data volume 0x07	The highest point of light screen occlusion	The lowest point of light screen occlusion	Total number of light screens	Check code	Stop bit ≥10ms

6. DK-QL series RS485/RS232 wiring diagram

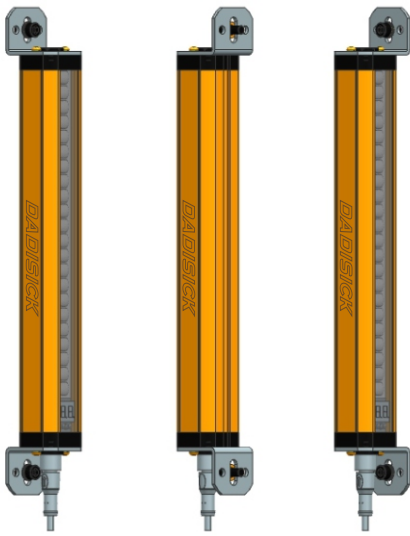


This diagram shows an example of a 7-pin RS485+PNP output connection.

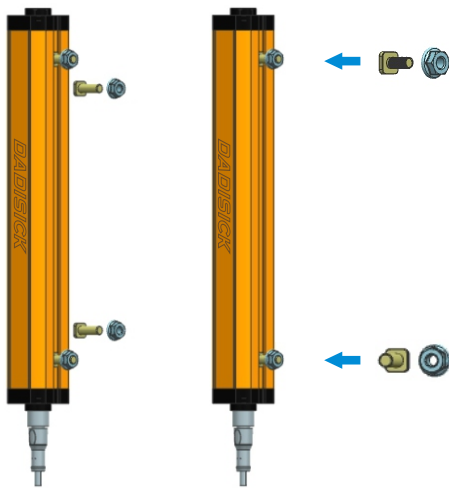
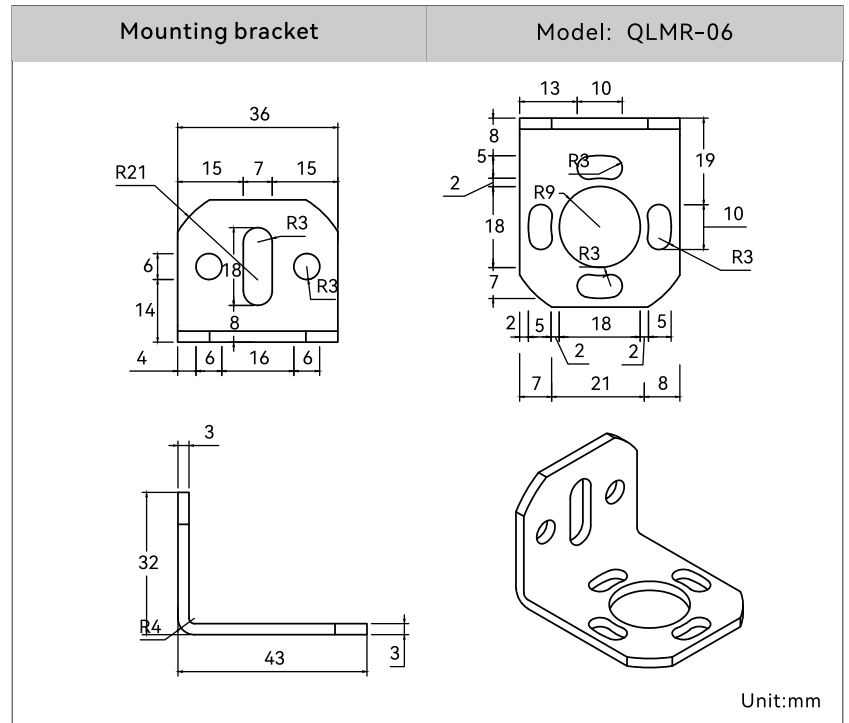
7. DK-QL series 5-pin analog U/I wiring diagram



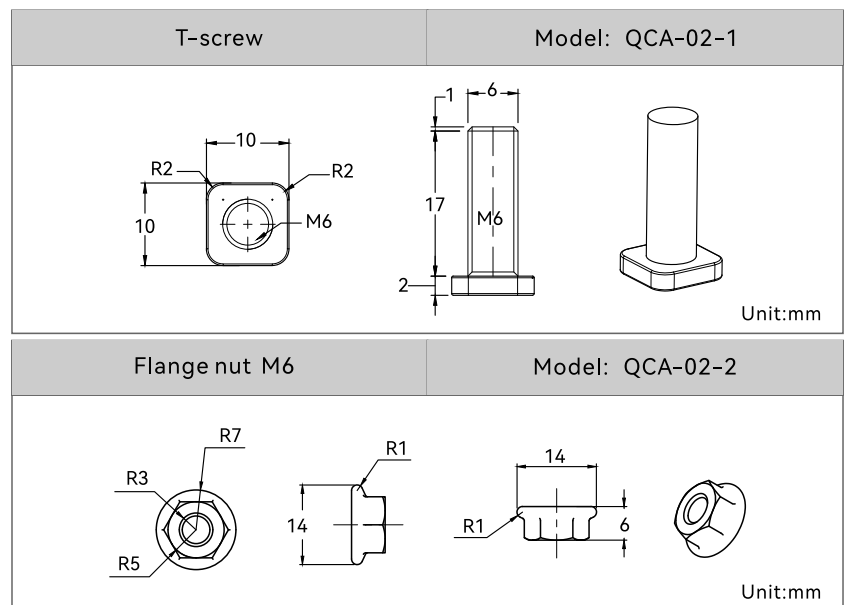
Accessories

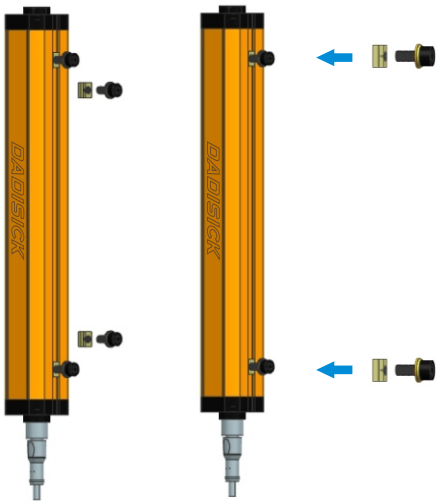


1. Installation of right angle brackets at both ends
(Original accessories)



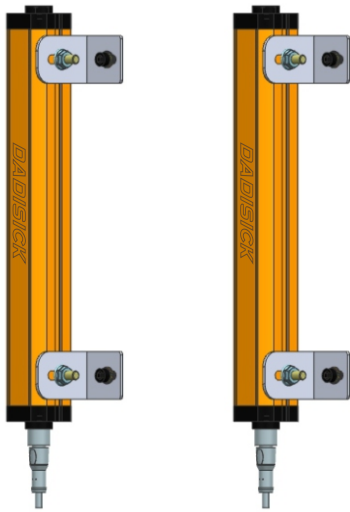
2. Installation method of T-shaped screws on the back
(Original accessories)





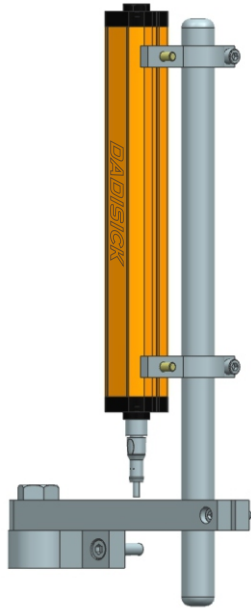
3. Installation method of convex nut
(Optional accessories)

Raised nut	Model: QCA-03-1
	<p style="text-align: right;">Unit:mm</p>
M5 screw	Model: QCA-03-2
	<p style="text-align: right;">Unit:mm</p>



4. Installation method of side right angle bracket
(Optional accessories)

Side mounting bracket	Model: QCA-05
	<p style="text-align: right;">Unit:mm</p>



5. Stainless steel bracket installation
(Order separately)

Stainless steel bracket installation	Model: QCA-01
<p>Clip:</p>	
<p>Aluminum round:</p>	
<p>Aluminum arm:</p>	
<p>Steel pipe:</p> <p>Length: 400/500/600/700/800/1000 optional</p> <p style="text-align: right;">Unit:mm</p>	