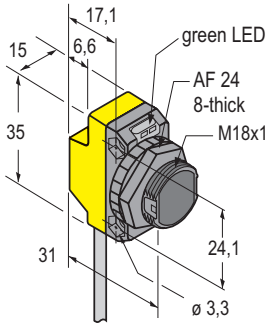
QS186LE Series Laser Emitter – Class 1 & 2

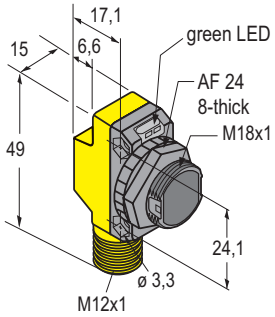
more sensors, more solutions

Dimensions [mm]

● Cable

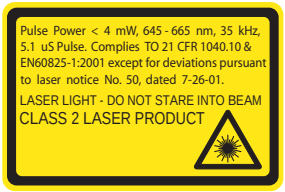


● Connector

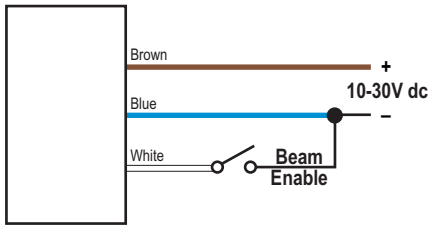


Class 1 Laser

Class 2 Laser



Wiring



☛ **Cable and QD connections are functionally identical.**

Laser Protection Class (EN 60825-1 Amend. 2)

	Laser Class 1 Models	Laser Class 2 Models
Laser Characteristics		
Delay at Power Up:	250 ms	10 ms
Wave length:	650 nm visible red (temp. coefficient 0,2 nm/°C)	650 nm visible red (temp. coefficient 0,25 nm/°C)
Pulse width:	5 µs	5 µs
Repetition rate:	27 µs	27 µs
Pulse output power:	< 1,9 milliwatts	< 4,8 milliwatts
Laser Control		
	Apply 0 VDC to white wire to enable beam Apply +10 VDC to 30 VDC to white wire to inhibit beam Enable time: 240 ms Disable time: 100 ms	Apply 0 VDC to white wire to enable beam Apply +10 VDC to 30 VDC to white wire to inhibit beam Enable time: 8 ms Disable time: 1 ms
Supply		
Supply voltage U_B:	10 VDC...30 VDC	10 VDC...30 VDC
Ripple V_{pp}:	< 10 %	< 10 %
Typical current I_0:	< 35 mA	< 35 mA
Delay upon power up:	1,5 s	1,5 s
Protection		
	Reverse polarity	Reverse polarity
Material		
	Housing: ABS (3 mm mounting hardware included)	ABS (3 mm mounting hardware included)
Protection class (IEC 60529/EN 60529):	IP67	IP67
Temperature range:	-10 °C…+50 °C	-10 °C…+50 °C
Cable:	2 m, PVC 3 x 0,5 mm²	2 m, PVC 3 x 0,5 mm²
Connector:	4-pin M12x1 Euro-style	4-pin M12x1 Euro-style
Indicator LEDs		
Green:	Supply voltage	Supply voltage

Accessories

Brackets

SMB18A	34 702 00	90˚ bracket, stainless steel
SMBQS18A	30 697 21	wrap-around bracket, stainless steel
SMB312S	37 092 00	2-axis, side-mounting bracket, stainless steel
SMB46A	30 525 18	adjustable, 2-piece, stainless steel bracket assembly for precision alignment with 2-mm hex key
SMBQS18Y	30 688 65	bracket, die-cast for 18 mm hole mountings including nut and lock washer

Connectors

MQDC-406	30 451 36	4-pin M12x1 Euro-style straight
MQDC-406RA	30 471 04	4-pin M12x1 Euro-style 90˚

Retroreflective tape (for alignment)

BRT-THG-18X36	34 172 00	457 x 914 mm
BRT-THG-4X4-5	37 195 00	100 x 100 mm
BRT-THG-8.5X11-2*	34 133 00	216 x 280 mm

*maximum temperature 60˚C

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Models*	Laser Class	Laser Spot Shape	Supply Voltage	Excess Gain** at 15 m
QS186LE#	Class 1	Small Spot	10 to 30 VDC	**With receiver SM31RL:** 340 **With receiver QS18VN6R:** 4500 **With receiver VS3AN5R:** 2100 **With receiver VS2AN5R:** 1100
QS186LE10		Circle		—
QS186LE11		Vertical Line		—
QS186LE12		Horizontal Line		—
QS186LE14		Cross		—
QS186LE2	Class 2	Small Spot		**With receiver SM31RL:** 1200 **With receiver QS18VN6R:** 7000 **With receiver VS3AN5R:** 5500 **With receiver VS2AN5R:** 3600
QS186LE210		Circle		—
QS186LE211		Vertical Line		—
QS186LE212		Horizontal Line		—
QS186LE214		Cross		—

*Standard 2 m cable models are listed.
- 9 m cable: add suffix "**W/30**" to the model number (e.g., **QS18LE W/30**).
- 4-pin Pico-style pigtail QD models: add suffix "**Q**" (e.g., **QS18LEQ**).
- 4-pin integral Pico-style QD models: add suffix "**Q7**" (e.g., **QS18LEQ7**).
- 4-pin Euro-style pigtail QD models: add suffix "**Q5**" (e.g., **QS18LEQ5**).
- 4-pin integral Euro-style QD models: add suffix "**Q8**" (e.g., **QS18LEQ8**).

QD models require a mating cordset; see page 1.

**Not recommended for dusty or dirty environments; the scattered light would greatly reduce excess gain.

Typical Beam Size vs. Distance, Class 1 Lasers

Small Spot (Model QS186LE)							
Distance	1.5 m	3 m	6 m	15 m	30 m	—	—
Spot Size	3.5 mm	5 mm	7.5 mm	16 mm	26 mm	—	—
Circle* (Model QS186LE10)							
Distance	0.4 m	0.8 m	1 m	2 m	3 m	4 m	5 m
Circle Diameter	16 mm	32 mm	40 mm	82 mm	120 mm	158 mm	196 mm
Vertical Line (Model QS186LE11)**							
Distance	0.2 m	0.4 m	0.6 m	0.8 m	1 m	1.5 m	2 m
Line Size	80 x 3 mm	145 x 3 mm	210 x 3 mm	270 x 3 mm	330 x3 mm	480 x 3 mm	600 x 3 mm
Horizontal Line (Model QS186LE12)**							
Distance	0.2 m	0.4 m	0.6 m	0.8 m	1 m	1.5 m	2 m
Line Size	95 x 2 mm	175 x 2 mm	252 x 2 mm	333 x 2.5 mm	418 x 2.5 mm	613 x 3 mm	765 x 3 mm
Cross* (Model QS186LE14)							
Distance	0.4 m	0.8 m	1 m	2 m	3 m	4 m	5 m
Line Size	60 mm	125 mm	155 mm	310 mm	460 mm	615 mm	760 mm

*May contain a small collimated spot in the center of the pattern. For best focus, view circle at distances greater than 1 meter and cross at distances greater than 0.3 m (image is not crisp at closer distances).

**Light distribution is non-uniform, having less light at ends. The horizontal line is more uniform than the vertical line.

QS186LE Series Laser Emitter – Class 1 & 2

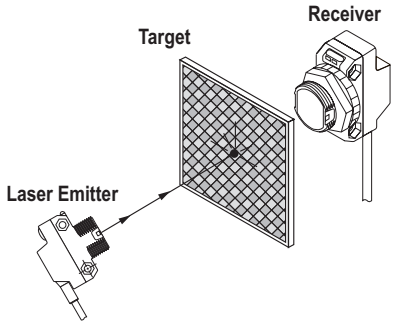
Typical Beam Size vs. Distance, Class 2 Lasers

Small Spot (Model QS186LE2)							
Distance	1.5 m	3 m	6 m	15 m	30 m	—	—
Spot Size	3.8 mm	5.1 mm	10.2 mm	17.8 mm	30.5 mm	—	—
Circle* (Model QS186LE210)							
Distance	0.4 m	0.8 m	1 m	2 m	3 m	4 m	5 m
Circle Diameter	17.8 mm	33 mm	41.9 mm	82.3 mm	122 mm	160 mm	198 mm
Vertical Line (Model QS186LE211)**							
Distance	0.2 m	0.4 m	0.6 m	0.8 m	1 m	1.5 m	2 m
Line Size	72.1 x 2.5 mm	150 x 2.5 mm	208 x 2.5 mm	284 x 2.5 mm	350 x 2.5 mm	502 x 2.5 mm	660 x 2.5 mm
Horizontal Line (Model QS186LE212)**							
Distance	0.2 m	0.4 m	0.6 m	0.8 m	1 m	1.5 m	2 m
Line Size	74 x 2.5 mm	159 x 2.5 mm	224 x 2.5 mm	330 x 2.5 mm	406 x 2.5 mm	610 x 2.5 mm	800 x 2.5 mm
Cross* (Model QS186LE214)							
Distance	0.4 m	0.8 m	1 m	2 m	3 m	4 m	5 m
Line Size	61 mm	125 mm	155 mm	312 mm	467 mm	620 mm	760 mm

*May contain a small collimated spot in the center of the pattern. For best focus, view circle at distances greater than 1 meter and cross at distances greater than 0.3 m (image is not crisp at closer distances).

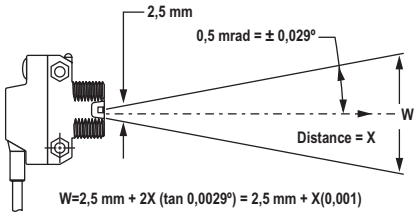
**Light distribution is non-uniform, having less light at ends. The horizontal line is more uniform than the vertical line.

At long distances, use retroreflective tape to locate the beam at the desired location.



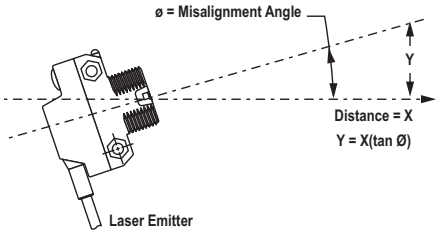
☛ **Never use a mirror as an alignment target.**

QS186LE laser emitter beam divergence at 25ºC



Opposed Distance (X)	Beam Width (W)
1.5 m	3.5 mm
3 m	5 mm
6 m	7.5 mm
15 m	16 mm
30 m	26 mm

Beam displacement per degree of misalignment



Opposed Distance (X)	Beam Displacement (Y) for 1° of Misalignment
1.5 m	25 mm
3 m	50 mm
6 m	100 mm
15 m	250 mm
30 m	500 mm

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Subject to changes without notice • Edition 01.09 • P/N ED104

IMPORTANT SAFETY WARNING! These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can result in either an energised or de-energised output condition. These products should not be used as sensing devices for personnel safety.