

- ▲ Sets a new industry standard for ultra-miniature photoelectric sensors
- ▲ Delivers powerful sensing performance in extremely confined areas

小型光電傳感器
15mm~2M規格群

WORLD-BEAM®

http://www.e-sensors.com.tw



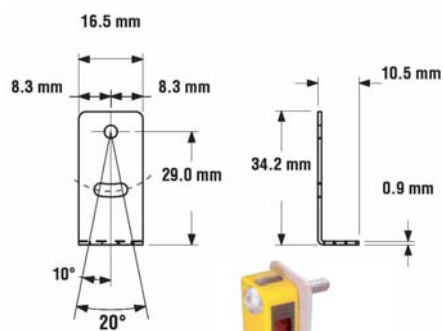
the Q12

技術規格

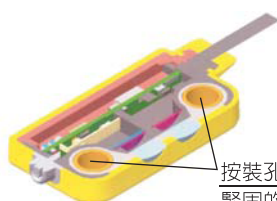
Model NO	Range/Sensing Model	Power	Output
Q126E(Emitter)	對照型 2M OPPOSED	10-30v dc	None
Q12AB6R(Receiver)			Bipolar Lo
Q12RB6R(Receiver)			Bipolar Do
Q12AB6LV	鏡片反射式 1.5M PETRO	10-30v dc	Bipolar Lo
Q12RB6LV			Bipolar Do
Q12AB6LP	偏振鏡片式 1M POLAR RETRO	10-30v dc	Bipolar Lo
Q12RB6LP			Bipolar Do
Q12AB6FF15	固定區域式 (背景遮蔽型) FIXED-FILED (Background Suppression) 15mm Cutoff	10-30v dc	Bipolar Lo
Q12RB6FF15			Bipolar Do
Q12AB6FF30	固定區域式 (背景遮蔽型) FIXED-FILED (Background Suppression) 30mm Cutoff	10-30v dc	Bipolar Lo
Q12RB6FF30			Bipolar Do
Q12AB6FF50	固定區域式 (背景遮蔽型) FIXED-FILED (Background Suppression) 50mm Cutoff	10-30v dc	Bipolar Lo
Q12RB6FF50			Bipolar Do

- 註: 1. 規格後+Q為接頭型規格,
另→代表為可見光(Visible Red LED)
2. 上述商品為DC-4Wire4線式商品
(對照型Emitter為DC-2Wire2線式)

選購支架/MOUNTING BRACKETS



SMBQ12A



IP67級

按裝孔為金屬套孔及
緊固的迴路及本體設計

尺寸/DIMENSION



ABS本體

應用例/APPLICATIONS

FIXED-FILED



檢測瓶蓋的存在 - 可靠的檢測瓶蓋是否
上封存在或是封蓋確實平整。

POLAR RETRO



檢測金屬環 - 以偏振鏡片型可靠的檢測
輸送帶上金屬環或其他物件。

FIXED-FILED



檢測各種IC卡 - 可靠的檢測細小的被測
物, 如IC卡、SIM卡。

FIXED-FILED



檢測多彩瓶蓋 - 可靠的檢測瓶蓋到到, 即
便是多彩瓶蓋亦因限定距離內可一樣確認。

OPPOSED



狹小空間檢測IC - 以對照型產品, 可置
於狹小空間可靠的檢測扁平或細小的被
測物, 如半導體元件。

WORLD-BEAM[®] Q12

Miniature self-contained photoelectric sensors in universal housing

Features



Standard
Model

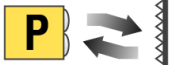


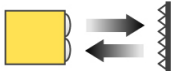
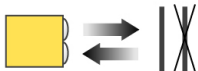
Chemical-Resistant
Model



- Bright, visible red (640 nm) light source
- Standard models available with 4-wire 2 m (6.5') or 9 m (30') cable or 3 or 4-wire 150 mm (6") pigtail with Pico-style M8 threaded connector
- Solid-state, bipolar outputs: one current sourcing (PNP) and one current sinking (NPN) standard on 4-wire models
- Single output solid-state PNP or NPN standard on Q3 models
- Light Operate (L.O.) or Dark Operate (D.O.), depending on model
- Models available with PFA chemical-resistant jacket (1200 psi washdown rated) for use in harsh environments (see [Chemical-Resistant Models](#) on page 3).
- Compact 8 mm (0.31") housing mounts almost anywhere
- Crosstalk-avoidance circuitry for multiple-sensor applications
- LED status indicators for Power ON, Output Overload, Signal Received, and Marginal Signal

Standard Models

Sensing Mode		Model*	Range	Output
Opposed	640 nm Visible Red	Q126E (emitter)	2 m (6.5')	N/A
	Effective Beam: 5.7 mm (0.22") 	Q12AB6R		Bipolar LO
		Q12RB6R		Bipolar DO
		Q12AP6RQ3		1 PNP LO
		Q12RP6RQ3		1 PNP DO
		Q12AN6RQ3		1 NPN LO
		Q12RN6RQ3		1 NPN DO
Polarized Retro	640 nm Visible Red 	Q12AB6LP	1 m** (40")	Bipolar LO
		Q12RB6LP		Bipolar DO
		Q12AP6LPQ3		1 PNP LO
		Q12RP6LPQ3		1 PNP DO
		Q12AN6LPQ3		1 NPN LO
		Q12RN6LPQ3		1 NPN DO

Sensing Mode		Model*	Range	Output
Retro	640 nm Visible Red 	Q12AB6LV	1.5 m** (59")	Bipolar LO
		Q12RB6LV		Bipolar DO
		Q12AP6LVQ3		1 PNP LO
		Q12RP6LVQ3		1 PNP DO
		Q12AN6LVQ3		1 NPN LO
		Q12RN6LVQ3		1 NPN DO
		Performance based on use of 90% reflectance white test card.		
Fixed-Field	640 nm Visible Red 	Q12AB6FF15	15 mm (0.6") cutoff; 10 mm (0.4") focus	Bipolar LO
		Q12RB6FF15		Bipolar DO
		Q12AP6FF15Q3		1 PNP LO
		Q12RP6FF15Q3		1 PNP DO
		Q12AN6FF15Q3		1 NPN LO
		Q12RN6FF15Q3		1 NPN DO
		Q12AB6FF30		30 mm (1.2") cutoff; 16 mm (0.63") focus
		Q12RB6FF30	Bipolar DO	
		Q12AP6FF30Q3	1 PNP LO	
		Q12RP6FF30Q3	1 PNP DO	
		Q12AN6FF30Q3	1 NPN LO	
		Q12RN6FF30Q3	1 NPN DO	
		Q12AB6FF50	50 mm (2") cutoff 16 mm (0.63") focus	
		Q12RB6FF50		Bipolar DO
		Q12AP6FF50Q3		1 PNP LO
		Q12RP6FF50Q3		1 PNP DO
		Q12AN6FF50Q3		1 NPN LO
		Q12RN6FF50Q3		1 NPN DO

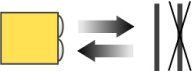
* **Q3 models:** 3-pin Pico-style (M8 threaded) 150 mm (6") pigtail QD. Not available for bipolar models.

Models with no suffix have standard 2 m (6.5') cables.

- For 9 m (30') cable, add suffix "**W/30**" to the model number (e.g., **Q126E W/30**).
- For 4-pin Pico-style (M8 threaded) 150 mm (6") pigtail QD, add suffix **Q** to the model number (e.g. **Q126EQ**).
- For 4-pin Euro-style (M12 threaded) 150 mm (6") pigtail QD, add suffix **Q5** to the model number (e.g. **Q126EQ5**).

Retroreflective range is specified using one model **BRT-60X40C retroreflector. Actual sensing range may be more or less than specified, depending upon efficiency and reflective area of the retroreflector(s) used.

Chemical-Resistant Models

Sensing Mode		Model*	Range	Output
Opposed	640 nm Visible Red	Q126ECR	1.5 m (4.9')	N/A
	Effective Beam: 5.7 mm (0.22") 	Q12AB6RCR		Bipolar LO
		Q12RB6RCR		Bipolar DO
Fixed-Field	Performance based on use of 90% reflectance white test card.			
	640 nm Visible Red 	Q12AB6FF15CR	13 mm (0.5") cutoff; 8 mm (0.3") focus	Bipolar LO
		Q12RB6FF15CR		Bipolar DO
		Q12AB6FF30CR	28 mm (1.1") cutoff; 14 mm (0.6") focus	Bipolar LO
		Q12RB6FF30CR		Bipolar DO
		Q12AB6FF50CR	48 mm (1.9") cutoff; 14 mm (0.6") focus	Bipolar LO
		Q12RB6FF50CR		Bipolar DO

*Only standard 2 m (6.5') cables are available for chemical-resistant models.

Indicator Features

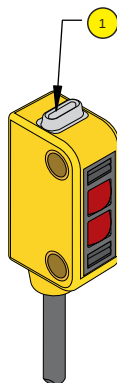


Figure 1. Features

- 1. Yellow and Green LEDs
- Green ON steady: power to sensor is ON
- Green flashing: output is overloaded
- Yellow ON steady: received signal
- Yellow flashing: marginal signal

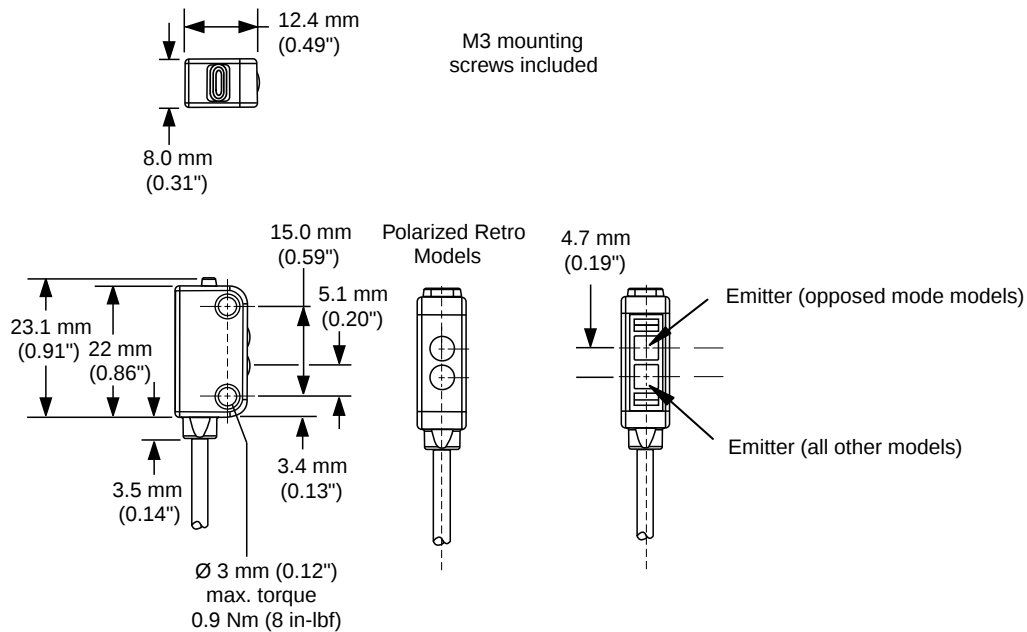
Chemical-Resistant models: LEDs are visible through translucent PFA jacket. Rated to 1200 psi washdown.

Specifications

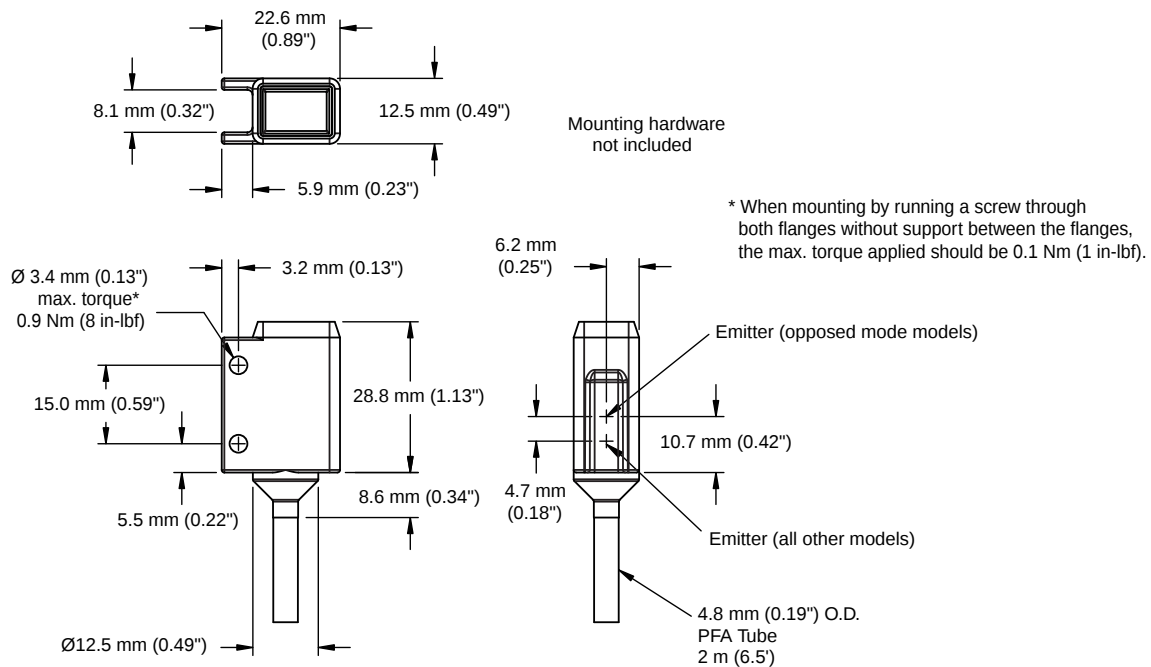
Feature	Description
Sensing Beam	640 nm visible red
Supply Voltage and Current	10 to 30V dc (10% max. ripple) @ 20 mA max current
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Bipolar (1 NPN and 1 PNP) solid-state output or Single output (PNP or NPN), LO or DO, depending on model
Output Ratings	50 mA total across all output(s) with overload and short circuit protection
	OFF-state leakage current: NPN: 200 μ A PNP: 10 μ A
	ON-state saturation voltage: NPN: 1.25V @ 50 mA PNP: 1.45V @ 50 mA
Output Protection Circuitry	Protected against false pulse on power-up, short-circuit protected
Output Response Time	Opposed Mode: 1.3 ms ON; 900 μ s OFF
	All Other Modes: 700 μ s ON/OFF
	NOTE: 120 ms delay on power-up; outputs do not conduct during this time.
Repeatability	175 microseconds
Switching Frequency	Opposed Mode: 385 Hz
	All Other Modes: 715 Hz
Indicators	One Yellow and one Green LED (see Figure 1)
Construction	Polarized Retro Models: Thermoplastic elastomer housing with glass lens
	All Other Standard Models: Thermoplastic elastomer housing with polycarbonate lens
	Chemical-Resistant Models: Housing encased in PFA jacket; cable encased in 3/16" O.D. PFA tubing
Environmental Rating	Standard Models: IEC IP67
	Chemical-Resistant Models: IEC IP67 (NEMA6) and PW12 1200 psi washdown per NEMA ICS5, Annex F-2002
Connections	Standard Models: 2 m (6.5') or 9 m (30') attached PVC cable, or 150 mm (6") pigtail with M8 or M12 threaded connection
	Chemical-Resistant Models: 2 m (6.5') cable encased in 3/16" O.D. PFA tubing
Operating Conditions	Operating temperature: -20° to +55° C (-4° to +131° F)
	Storage temperature: -30° to +75° C (-22° to +167° F)
	Relative humidity: 95% max @ +50° C (+122° F) non-condensing
Certifications	 

Dimensions

Standard Models



Chemical-Resistant Models



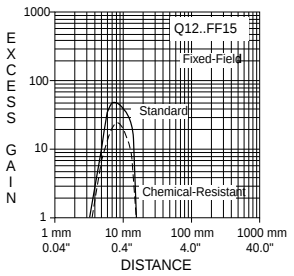
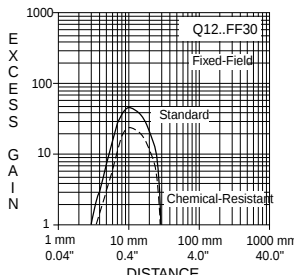
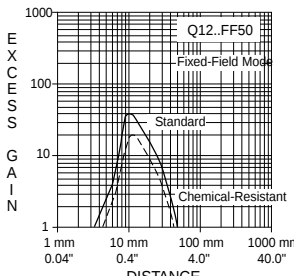
Performance Curves - Opposed Mode

	Excess Gain	Beam Pattern
Opposed		

Performance Curves - Retro Mode

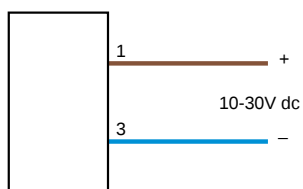
	Excess Gain	Beam Pattern
Polarized Retro	Performance based on use of a model BRT-60X40C retroreflector.	
Retro		

Performance Curves - Fixed-Field

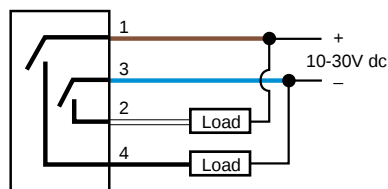
	Excess Gain
	Performance based on use of 90% reflectance white test card.*
Fixed-Field – 15 mm	 Standard Models: • Ø 0.4 mm spot size @ 10 mm focus • Ø 1.5 mm spot size @ 15 mm cutoff Chemical-Resistant Models: • Ø 0.4 mm spot size @ 8 mm focus • Ø 1.5 mm spot size @ 13 mm cutoff * Using 18% gray test card: cutoff distance will be 95% of value shown. * Using 6% black test card: cutoff distance will be 90% of value shown.
Fixed-Field – 30 mm	 Standard Models: • Ø 0.5 mm spot size @ 16 mm focus • Ø 3.0 mm spot size @ 30 mm cutoff Chemical-Resistant Models: • Ø 0.5 mm spot size @ 14 mm focus • Ø 3.0 mm spot size @ 28 mm cutoff * Using 18% gray test card: cutoff distance will be 90% of value shown. * Using 6% black test card: cutoff distance will be 80% of value shown.
Fixed-Field – 50 mm	 Standard Models: • Ø 0.5 mm spot size @ 16 mm focus • Ø 6.5 mm spot size @ 50 mm cutoff * Using 18% gray test card: cutoff distance will be 80% of value shown. * Using 6% black test card: cutoff distance will be 60% of value shown. Chemical-Resistant Models: • Ø 0.5 mm spot size @ 14 mm focus • Ø 6.5 mm spot size @ 48 mm cutoff * Using 18% gray test card: cutoff distance will be 70% of value shown. * Using 6% black test card: cutoff distance will be 50% of value shown.
Focus and spot sizes are typical.	
Legend:	——— Standard models - - - - - Chemical-Resistant models

Hookups

Emitters



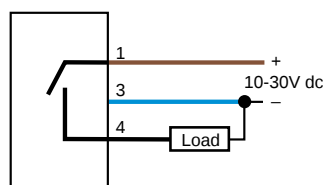
Bipolar Models



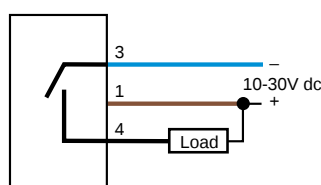
Wiring Key:

- 1 = Brown
- 2 = White
- 3 = Blue
- 4 = Black

PNP Models



NPN Models



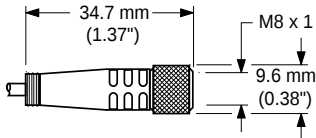
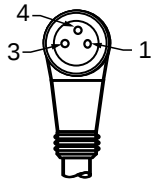
Cabled hookups only are shown. Hookups for QD models are functionally identical. (Emitters have no connection to black and white.)

NOTE: Please observe proper ESD precautions (grounding) when connecting QD models.

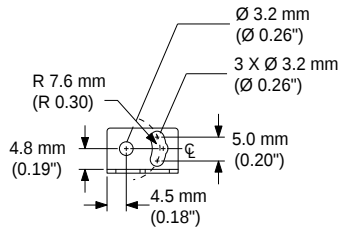
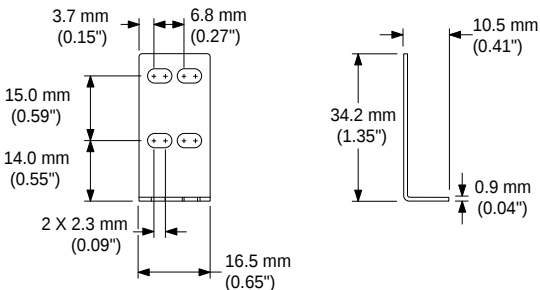
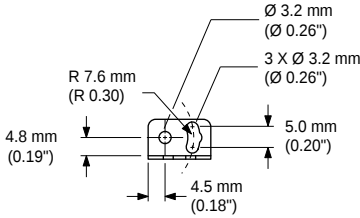
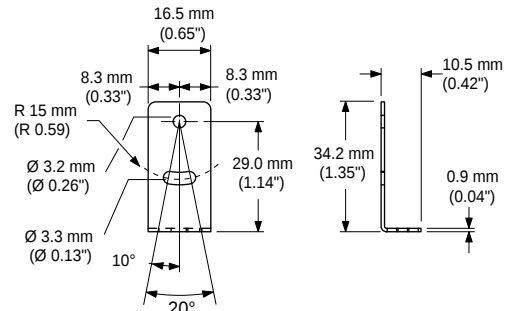
Quick-Disconnect (QD) Cordsets

Style	Model	Length	Dimensions	Pinout
4-pin Pico-style straight with M8 threads	PKG4M-2 PKG4M-9	2 m (6.5') 9 m (30')		Female
				Wiring Key: 1 = Brown 2 = White 3 = Blue 4 = Black

Quick-Disconnect (QD) Cordsets

Style	Model	Length	Dimensions	Pinout
3-pin Pico-style straight with M8 threads	PKG3M-2 PKG3M-9	2 m (6.5') 9 m (30')		Female
				
				Wiring Key: 1 = Brown 3 = Blue 4 = Black

Mounting Brackets

SMBQ12T		SMBQ12A	
- Right-angle bracket for use with standard Q12 models 300 series stainless steel, 20 gauge		- Adjustable right-angle bracket for use with standard Q12 models 300 series stainless steel, 20 gauge	
 		 	

Apertures

Opposed-mode Q12 sensors (standard models only) may be fitted with apertures to narrow or shape the sensor's effective beam to more closely match the size or profile of the objects being sensed. A common example is the use of "line" (or "slot") type apertures to sense thread.

NOTE: The use of apertures will reduce the sensing range (see table below).

Model	Description		Reduced Sensor Range (Two Apertures Used)
APQ12-.5		0.5 mm (0.02") diameter – 10 each	60 mm (2.4")
APQ12-1		1 mm (0.04") diameter – 10 each	190 mm (7.5")
APQ12-1.5		1.5 mm (0.06") diameter – 10 each	400 mm (15.7")
APQ12-2		2 mm (0.08") diameter – 10 each	725 mm (28.5")
APQ12-.5H		0.5 mm (0.02") – 10 each	350 mm (13.8")
APQ12-1H		1 mm (0.04") – 10 each	725 mm (28.5")
APQ12-.5V		0.5 mm (0.02") – 10 each	450 mm (17.7")
APQ12-1V		1 mm (0.04") – 10 each	900 mm (35.4")
APQ12-4S		4 mm (0.16") square – 10 each	2000 mm (78.7")
APKQ12	Kit containing two of each aperture above – 18 total		—



WARNING . . . Not To Be Used for Personnel Protection

Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death

This product does NOT include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or deenergized sensor output condition. Consult your Banner Safety Products catalog for safety products that meet OSHA, ANSI and IEC standards for personnel protection.