



Visible Red; Class 2 laser; 650 nm

## Features

- Compact and lightweight; ideal for use on robotic end effectors
- Precise 0.25 mm (0.01") beam width at the convergent focus
- Provides the ultimate sensing solution for semiconductor wafer mapping
- Excels at sensing small parts and profiles and uses fixed-field technology to ignore objects beyond the maximum sensing distance
- Fast, 0.2 millisecond sensing response for high-speed sensing or counting
- 10 to 30V dc operation; choice of NPN (sinking) or PNP (sourcing) complementary solid state output
- Choose models with 2 meter (6.5') or 9 meter (30') integral cable, or with Euro-style pigtail quick disconnect QD connector

## Features

Models*	Focus	Cable	Supply Voltage	Output Type	Excess Gain	Beam Width
					Performance based on 90% reflectance white test card	
PD45VN6C50 PD45VN6C50Q	50 mm (2.0")	2 m (6.5') 5-pin Euro QD 150 mm (6") pigtail	10 to 30V dc	NPN		
PD45VP6C50 PD45VP6C50Q	Spot Size at Focus: 0.25 mm	2 m (6.5') 5-pin Euro QD 150 mm (6") pigtail		PNP		

**\*NOTE:**

- 9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., PD45VN6C50 W/30).
- A model with a QD connector requires an optional mating cable.



**WARNING . . . Not To Be Used for Personnel Protection**

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

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 energized or a de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA and ANSI machine safety standards for personnel protection.

# PicoDot™ — 50 mm Convergent

Specifications	
Sensing Beam	Visible red Class 2 laser, 650 nm
Sensing Range	25 to 58 millimeters (1" to 2.5"); Focus at 50 ±5 millimeters (2.0" ± 0.2")
Supply Voltage	10 to 30V dc (10% maximum ripple) at less than 20 milliamps, exclusive of load
Supply Protection Circuitry	Protected against reverse polarity, over voltage, and transient voltages
Output Configuration	SPDT (complementary) solid-state switch; Choose NPN (current sinking) or PNP (current sourcing) models <b>Light operate:</b> Normally-open output conducts when the sensor sees its own modulated light <b>Dark operate:</b> Normally-closed output conducts when the sensor sees dark
Output Rating	150 mA maximum (each output) <b>Off-state leakage current</b> < 1 microamp at 30V dc; <b>On-state saturation voltage</b> < 0.3V at 10 mA dc; < 0.8V at 150 mA dc
Output Protection	Protected against continuous overload or short-circuit of outputs; Overload trip point ≥ 220 milliamps
Output Response Time	0.2 milliseconds (200 microseconds) ON and OFF
Repeatability	50 microseconds
Adjustments	12-turn slotted brass GAIN (sensitivity) adjustment potentiometer (clutched at both ends of travel)
Extinguishing Wire	Gray wire held "low" for laser operation; "high" to turn laser off; Low = ≤ 1.0V dc; High = ≥ +V - 4.0V dc (< 30V dc) or disconnect wire
Indicators	Two LEDs: Green and Yellow <b>Green ON steady</b> = power to sensor is ON <b>Yellow ON steady</b> = light is sensed; normally open output is conducting <b>Green flashing</b> = power overloaded <b>Yellow flashing</b> = marginal return signal
Construction	Housings are Cyclocac® KJB heat-resistant ABS, UL94-VO rated; acrylic lens cover
Environmental Rating	NEMA 3; IEC IP54
Connections	2 m (6.5') or 9 m (30') attached cable, or 5-pin Euro-style 150 mm (6") pigtail quick-disconnect fitting; mating cables for QD models are ordered separately
Operating Temperature	-10° to +45°C (+14° to 113°F); Maximum relative humidity 90% at 50°C (non-condensing)
Weight	Sensor only: 22g (0.8 oz) Sensor plus 2 m cable: 62g (2.2 oz)
Application Notes	False pulse may occur < 1 second after power-up
Certifications	Approvals in process

## Class 2 Safety Notes

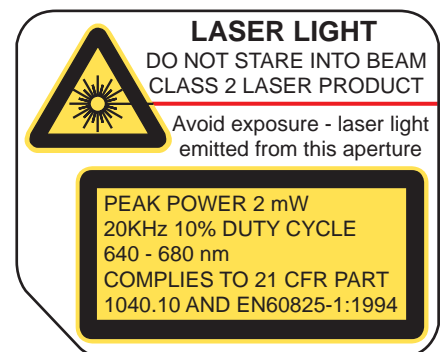
Low-power lasers are by definition incapable of causing eye injury within the duration of the blink, or aversion response of 0.25 seconds. They must also emit only visible wavelengths (400 - 700 nm). Therefore, an ocular hazard can only exist if an individual overcomes their natural aversion to bright light and stares directly into the laser beam. The product requirements for these lasers are to have a [hazard] label and to have an indicator light to indicate laser emission.

The two operational safety rules are:

- Do not permit a person to stare at the laser from within the beam
- Do not point the laser at a person's eye at close range

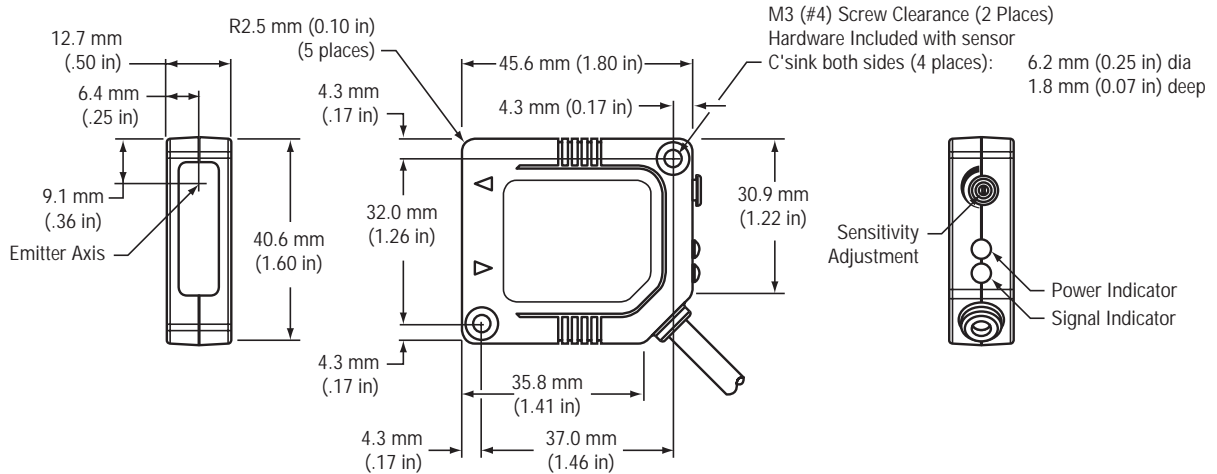
### Beam Paths:

The beam emitted by a Class 2 laser product should be terminated at the end of its useful path. Open laser beam paths should be located above or below eye level where practical.



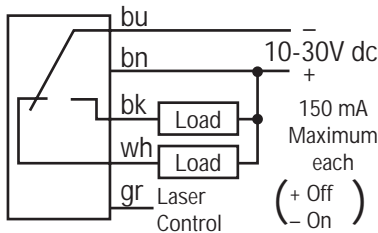
# PicoDot™ — 50 mm Convergent

## Dimensions

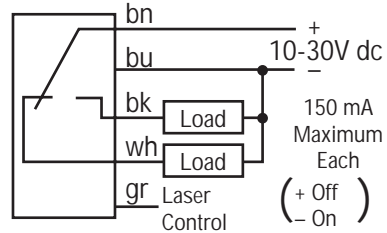


## Hookups

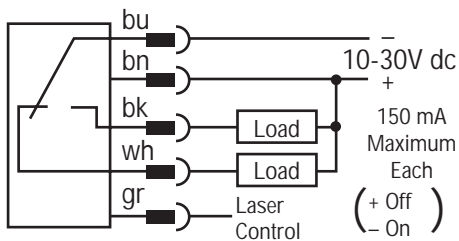
### NPN Cabled Hookup



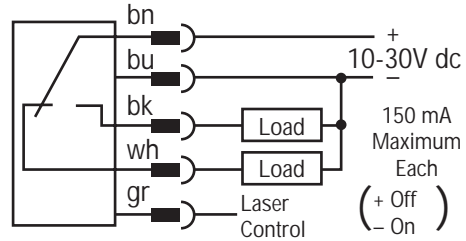
### PNP Cabled Hookup



### NPN QD Hookup



### PNP QD Hookup

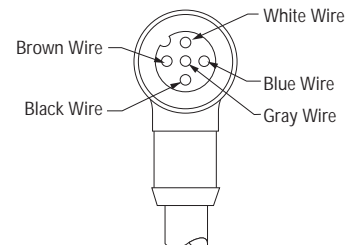


## Quick Disconnect (QD) Option

PicoDot sensors are sold with either a 2 meter (6.5 ft) attached PVC-covered cable, or with a 5-pin euro-style QD cable fitting.

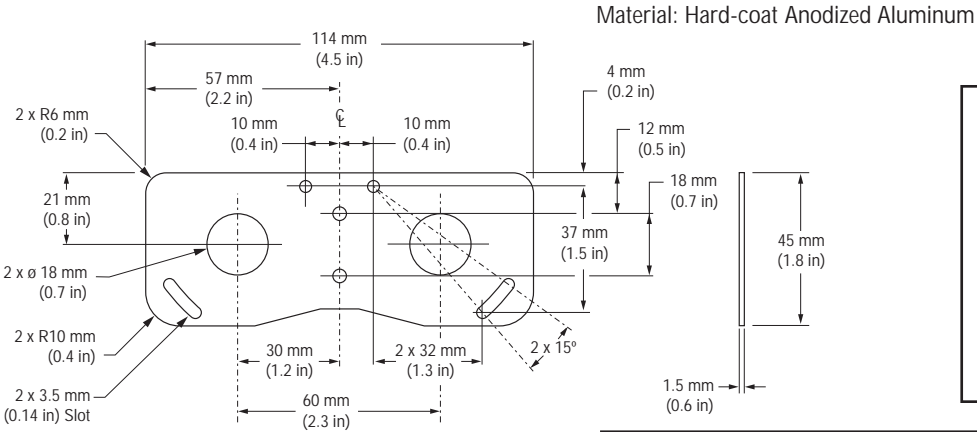
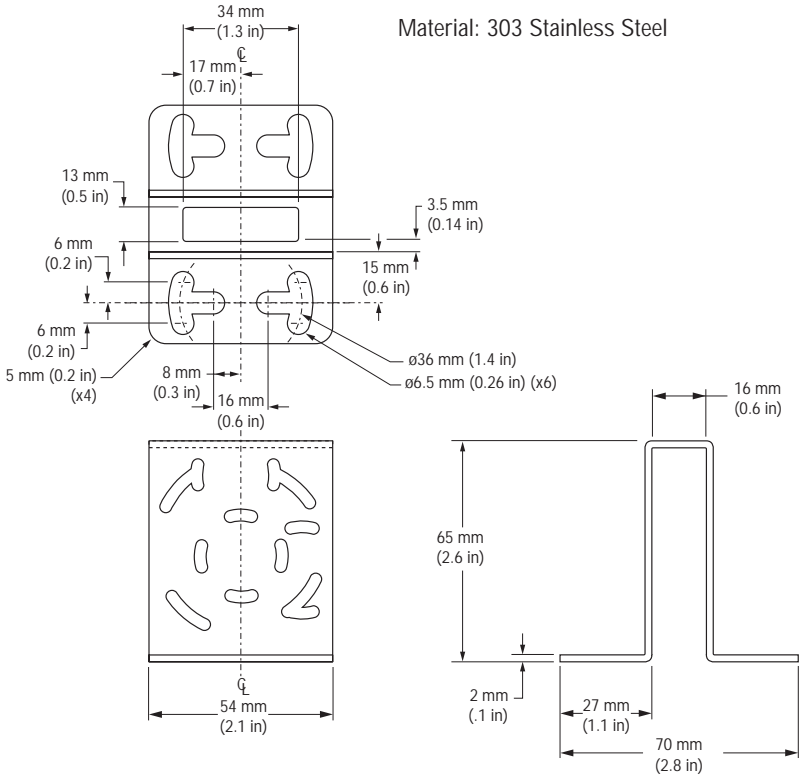
PicoDot QD sensors are identified by the letter "Q" in their model number suffix. Mating cables for QD PicoDot sensors are model MQDC1-5xx (straight connector) or MQDC1-5xxRA (right-angled connector). Cables are supplied in two lengths, 5 meters (15 ft) or 10 meters (30 ft). For more information on QD cables see page 6.

## 5-Pin Euro-Style Pin-out (Mating Cable Connector Shown)





## Mounting Bracket Information



# PicoDot™ — 50 mm Convergent

## Euro-Style Quick Disconnect Cables

**Cable:** PVC jacket, polyurethane connector body, chrome-plated brass coupling nut  
**Conductors:** 22 or 20 AWG high-flex stranded, PVC insulation, gold-plated contacts  
**Temperature:** -40° to +90°C (-40° to +194°F)  
**Voltage Rating:** 250V ac/300V dc

Style	Model	Length	Dimensions	Pin-out
5-Pin Straight	MQDC1-506 MQDC1-515 MQDC1-530	2 m (6.5') 5 m (15') 10 m (30')		
5-Pin Right-angle	MQDC1-506RA MQDC1-515RA MQDC1-530RA	2 m (6.5') 5 m (15') 10 m (30')		



### CAUTION . . . Hazardous Radiation

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure; per EN 60825. **Do NOT attempt to disassemble this sensor for repair.** A defective unit must be returned to the manufacturer.

**WARRANTY:** Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.