PD45 Series PicoDot®

Polarized Retroreflective and Convergent Laser Sensors

Features

- Compact and lightweight; ideal for use on robotic end effectors

- Class 2 laser diode light source.

- Convergent beam models have precise, high-energy sensing spot at focus, available in four focal lengths: 50 mm (2"), 100 mm (4"), 200 mm (8"), and 300 mm (12").

- Retroreflective models have precise, narrow beam; excellent for sensing the presence of tiny parts at close range, small parts at medium ranges and for accurate sensing over long distances.

- 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 m (6.5') or 9 m (30') unterminated cable, or with 150 mm (6") Euro-style pigtail quick-disconnect (QD) connector

NOTE: CE certification applies to all models except PD45V..C300 Series

Excellent for applications where high sensing power and small beam size are important. Operates over sensing ranges typically accomplished only by conventional opposed-mode photoelectrics; uses a special filter to polarize the emitted light, filtering out unwanted reflections from shiny objects.

Visible Red; Class 2 laser; 650 nm

Retroreflective-Mode Models

| Models	Range**	Cable*	Supply Voltage	Output Type	Excess Gain
					Performance based on BRT-36X40BM retro target
PD45VN6LLP		2 m (6.5') cable		NPN	
PD45VN6LLPQ	0.2 to 10.6 m (8" to 35')	5-pin QD 150 mm (6") pigtail	10-30V dc		
PD45VP6LLP		2 m (6.5') cable		PNP	
PD45VP6LLPQ		5-pin QD 150 mm (6") pigtail			

*9 m (30') cables are available by adding the suffix "**W/30**" to the model number of any cabled sensor (e.g., **PD45VN6LLP W/30**). Models with QD connectors require an optional mating cable; see page 6.

**Tested using a BRT-36x40BM retro target (included with each sensor). Actual range depends on the efficiency and size of the retroreflective target used. Some targets have produced ranges up to 39.6 m (130'); see page 8.

PD45 Series PicoDot® Sensors
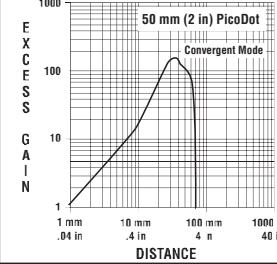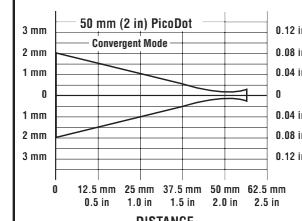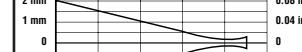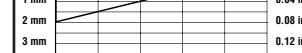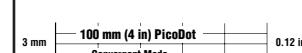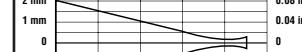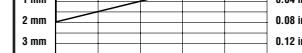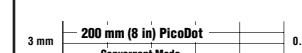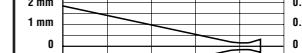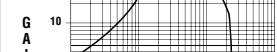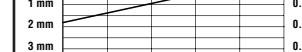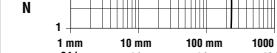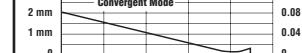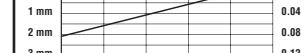
Excels at sensing small parts and profiles and uses fixed-field technology to ignore objects beyond the maximum sensing distance.
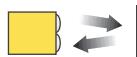
Visible Red; Class 2 laser; 650 nm

Convergent-Mode Models

Models	Focus	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Width
					Performance based on 90% white test card	
PD45VN6C50	50 mm (2.0")	2 m (6.5') cable	10-30V dc	NPN	*50 mm (2 in) PicoDot — Convergent Mode*	*50 mm (2 in) PicoDot — Convergent Mode*
PD45VN6C50Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VP6C50		2 m (6.5') cable		PNP		
PD45VP6C50Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VN6C100	102 mm (4.0")	2 m (6.5') cable	10-30V dc	NPN	*100 mm (4 in) PicoDot — Convergent Mode*	*100 mm (4 in) PicoDot — Convergent Mode*
PD45VN6C100Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VP6C100		2 m (6.5') cable		PNP		
PD45VP6C100Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VN6C200	203 mm (8.0")	2 m (6.5') cable	10-30V dc	NPN	*200 mm (8 in) PicoDot — Convergent Mode*	*200 mm (8 in) PicoDot — Convergent Mode*
PD45VN6C200Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VP6C200		2 m (6.5') cable		PNP		
PD45VP6C200Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VN6C300	305 mm (12.0")	2 m (6.5') cable	10-30V dc	NPN	*300 mm (12 in) PicoDot — Convergent Mode*	*300 mm (12 in) PicoDot — Convergent Mode*
PD45VN6C300Q		5-pin Euro-style QD 150 mm (6") pigtail				
PD45VP6C300		2 m (6.5') cable		PNP		
PD45VP6C300Q		5-pin Euro-style QD 150 mm (6") pigtail				

*9 m (30') cables are available by adding the suffix "**W/30**" to the model number of any cabled sensor (e.g., **PD45VN6C100 W/30**). Models with QD connectors require an optional mating cable; see page 6.

Specifications

Sensing Beam	Visible red Class 2 laser, 650 nm
Supply Voltage	10 to 30V dc (10% max ripple) at less than 20 mA, exclusive of load
Beam Size at Aperture	3.75 mm x 1.85 mm (0.15" x 0.07") (Retroreflective Models)
Beam Divergence	Approximately 1 milliradian (Retroreflective Models)
Supply Voltage	10 to 30V dc (10% maximum ripple) at less than 20 milliamps, exclusive of load
Laser Classification	Class 2 safety (CDRH (FDA) 1040.10 and IEC 60875-1)
Supply Protection Circuitry	Protected against reverse polarity, over voltage, and transient voltages
Delay at Power Up	< 1 second
Output Configuration	SPDT (complementary) solid-state switch; choose NPN (current sinking) or PNP (current sourcing) models **Light operate:** Normally-open output conducts when the sensor sees its own modulated light **Dark operate:** Normally-closed output conducts when the sensor sees dark
Output Rating	150 mA maximum (each output) **OFF-state leakage current:** < 1 microamp at 30V dc **ON-state saturation voltage:** < 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_{supply} -4.0V dc (< 30V dc) or disconnect wire; 100 ms delay upon enable

Indicators	Two LEDs: Green and Yellow
	    Green glowing steadily: power to sensor is ON
	    Yellow glowing steadily: light is sensed; normally open output is conducting
	    Green blinking: output overloaded
	    Yellow blinking: marginal excess gain

Construction	Housings are heat-resistant ABS alloy, 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 (see page 6).
Operating Conditions	**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 **(all models except** **PD45V..C300 Series)**	C E

PD45 Series PicoDot® Sensors

Dimensions

12.7 mm
(0.50")

6.4 mm
(0.25")

9.1 mm
(0.36")

Emitter Axis

40.6 mm
(1.60")

R2.5 mm (0.10")
(5 places)

4.3 mm
(0.17")

4.3 mm (0.17")

45.6 mm (1.80")

32.0 mm
(1.26")

4.3 mm
(0.17")

35.8 mm
(1.41")

4.3 mm
(0.17")

37.0 mm
(1.46")

M3 (#4) Screw Clearance (2 Places)
Hardware Included with sensor
C'sink both sides (4 places):

6.2 mm (0.25") dia.
1.8 mm (0.07") deep

30.9 mm
(1.22")

Sensitivity
Adjustment

Power Indicator
Signal Indicator