Photoelectric sensor

Diffuse-reflective, Background Suppression

PD32CEB25xAx

- Background Suppression (BGS) photoelectric sensors
- Sensing range: 25…250 mm
- Sensitivity adjustment by mechanical spindle
- Modulated, red light 660 nm
- Supply voltage: 10…30 VDC
- Output: NPN or PNP, 4-wire, N.O. + N.C.
- LED indication for output and power ON
- Protection: reverse polarity, short circuit and transients
- Cable and connector versions
- Excellent EMC performance



Description

The PD32CEB25xAx are a family of background suppression sensor based upon differential detection. The sensing distance are set by the 7 multiturn spindle that makes it easy to set the distance accurate.
The sensors have a short blind zone and a narrow red light beam of only 6 mm. The housing is compact, only 12 x 32 x 20.8 mm and the distance between the mounting screws are 25.4 mm. The sensors are available with either connection cable or with a 4 pin M8 connection.

Part selection key

P	-	Photoelectric sensor
D	-	Rectangular housing
32	-	Length of housing
C	-	Plastic housing
E	-	Economical
B	-	Background suppression
25	-	Rated operating distance: 250 mm
X	**P**	PNP
	N	NPN
A	-	Selectable: N.O. or N.C.
X	**A2**	Cable, 2 m
	M5	Connector, M8

Part selection

Connection	Sensing range	Output	Part number
Cable	250 mm	PNP	**PD32CEB25PAA2**
Cable	250 mm	NPN	**PD32CEB25NAA2**
Connector	250 mm	PNP	**PD32CEB25PAM5**
Connector	250 mm	NPN	**PD32CEB25NAM5**

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Features

Main operational data

Functional principle	Photoelectric sensor
Functional principle details	Background Suppression
Switching modes	N.O. and N.C.
Sensing	
Sensing distance	25…250 mm
Rated operating distance (Sn)	≤ 250 mm (White object 90% reflection, 200 x 200 mm)
Maximum detection distance	≤ 250 mm (White object 90% reflection)
Sensitivity adjustment	Multiturn menchanical spindle, 6.5 turns max
Blind zone	≤ 3 mm (White object 90% reflection) ≤ 5 mm (Grey object 18% reflection) ≤ 7 mm (Black object 6% reflection)
Hysteresis	≤ 2% (White object 90% reflection) ≤ 4% (Grey object 18% reflection) ≤ 6% (Black object 6% reflection)
Operating frequency (f)	≤ 250 Hz
Response times t_{ON}	≤ 2 ms
Response times t_{OFF}	≤ 2 ms
Temperature drift	≤ 0.2%/°C
Repeat accuracy (r)	≤ 3%
Optical information	
Light source	660 nm Red Point Spot
Light type	Red light modulated
Light spot size	Ø 6 mm @ 100 mm
Emitter beam angle	± 1.7° @ 100 mm

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Electrical data

Power supply	
Rated operational voltage (U_b)	10…30 VDC (Ripple included)
Ripple (U_{rpp})	≤ 10%
No load supply current (I_o)	≤ 12 mA
Power-ON delay (t_v)	≤ 200 ms
Outputs	
Output functions	NPN or PNP
Output switching function	4 wire, N.O. + N.C.
Rated operational current (I_e)	≤ 100 mA
OFF state current (I_r)	≤ 50 µA
Minimum operational current (I_m)	> 0,5 mA
Voltage drop (U_d)	≤ 2.0 VDC @ I_e max
Capacitive load	100 nF @ 100 mA, 30 VDC

Operation diagram

tv = Power ON delay

Power supply	ON OFF	
Target (object)	Present Not present	
Make output (N.O.)	ON OFF	Tv
Break output (N.C.)	ON OFF	Tv

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Environmental data

Ambient temperatures	
Operating	-25°…+60°C (-13°…+140°F)*
Storage	-40°…+70°C (-40°…+158°F)*
Ambient humidity range	
Operating	35%…95%**
Storage	35%…95%**
Ambient light	≤ 10 000 lux incandenscent or sunlight
Mechanical influences	
Vibration	10…150 Hz,1.0 mm/15 g (EN IEC 60068-2-6)
Shock	30 g_n / 11 ms, 3 pos, 3 neg pr axis (EN IEC 60068-2-27)
Drop test	2 x 1 m and 100 x 0.5 m (EN IEC 60068-2-31)
Categorization	
Pollution degree	3 (EN IEC 60664, 60664A; EN IEC 60947-1)
Overvoltage category	III (EN IEC 60664; EN IEC 60947-1)
Degree of protection	IP67 (EN IEC 60539; EN IEC 60947-1)
Safety (electrical)	
Protections	Short circuits, reverse polarity and transients
Rated insulation voltage (U_i)	50 VDC
Dielectric insulation voltage	≥ 500 VAC rms, 50/60 Hz for 1 min
Rated impulse withstand voltage (U_{imp})	> 1 kV (with 500 Ω)
EMC immunity standard	EN IEC 60947-5-2 / EN IEC 61000-6-2
EMC immunity test	
Electrostatic discharge	± 8 kV @ air discharge (IEC 61000-4-2, EN IEC 60947-1) and ± 4 kV @ contact discharge (IEC 61000-4-2, EN IEC 60947-1)
Electromagnetic field	10 V/m (IEC 61000-4-3, EN IEC 60947-1)
Fast transient	± 2 kV / 5 kHz (IEC 61000-4-4, EN IEC 60947-1)
Wire conducted noise	10 Vrms (IEC 61000-4-6, EN IEC 60947-1)
Magnetic field	30 A/m (IEC 61000-4-8, EN IEC 60947-1)
Conducted emission	Residential standard

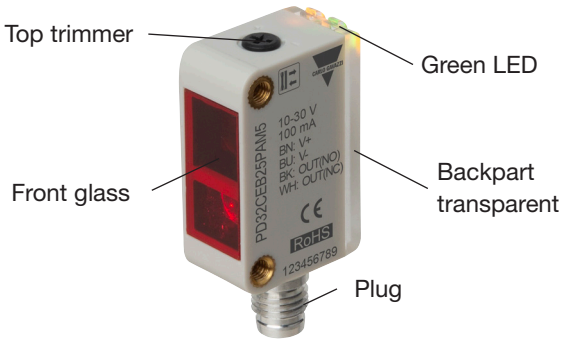
* Do not bend the cable in temperatures below -10°C

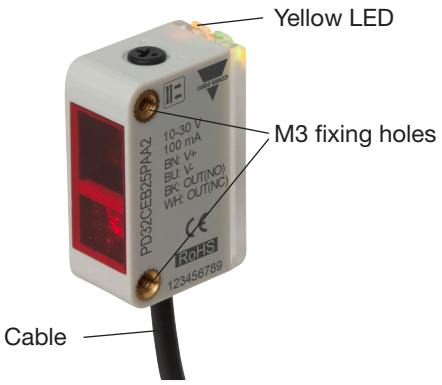
** With no icing or condensation

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Structure

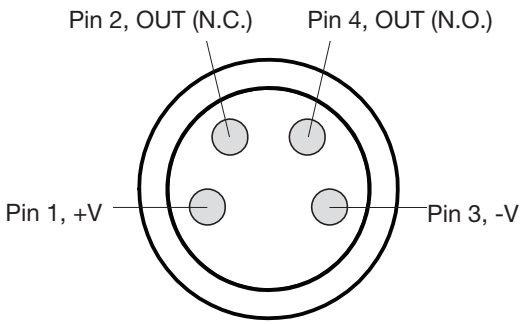
Housing

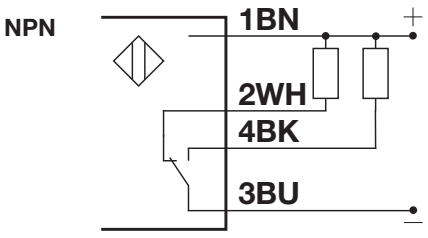


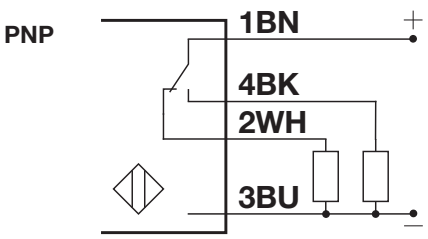


Housing	
Body	ABS Light grey RAL 7035
Front glass	PMMA, red
Trimmer shaft	PA66 Dark Grey RAL 7012 15% Glass reinforced
Backpart	PC Transparent (sparking process)
Indication	2 Light guides integrated in backpart
Dimensions	12 x 32 x 20.8 mm (w x h x d)
Weight	≤ 40 g, cable version ≤ 8.5 g, plug version
Connection	
Cable	2 m, 4 wire, 4 x 0.14 mm², Ø 3.3 mm, PVC, Black
Plug	M8, 4 pin male connector
Tightening torque for fixing screws	Max: 0.7 N.m

Connection and wiring



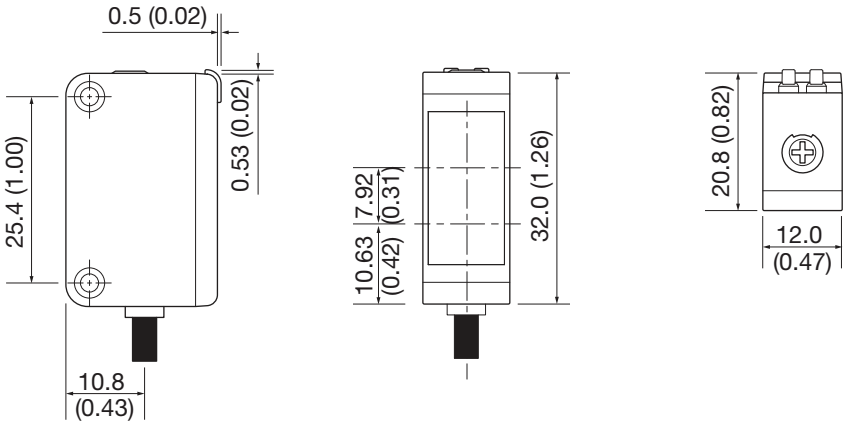




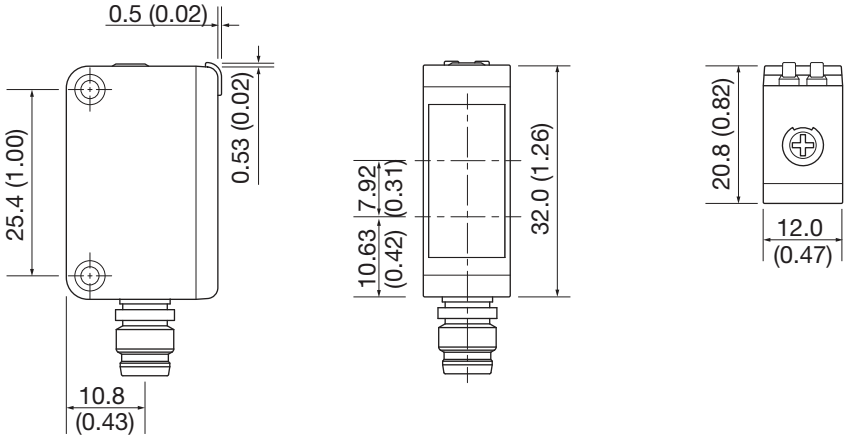
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Dimensions in mm (inches)

Cable



Plug



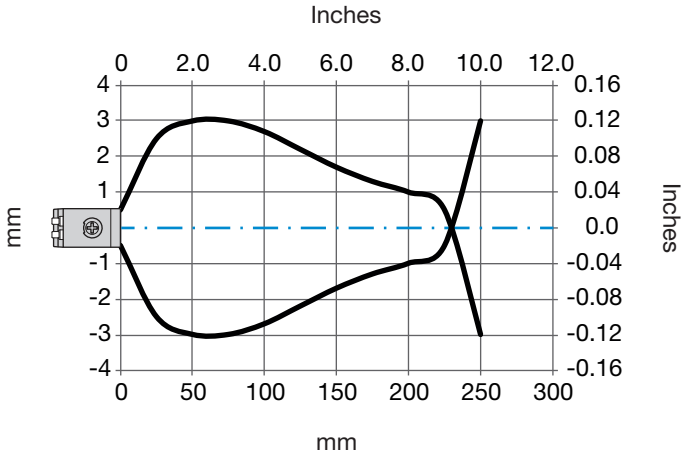
LED indication

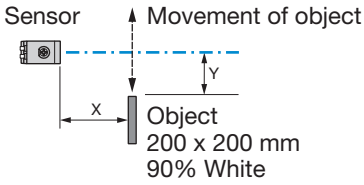
Steady	Yellow LED	ON Target detected
	Green LED	ON Power

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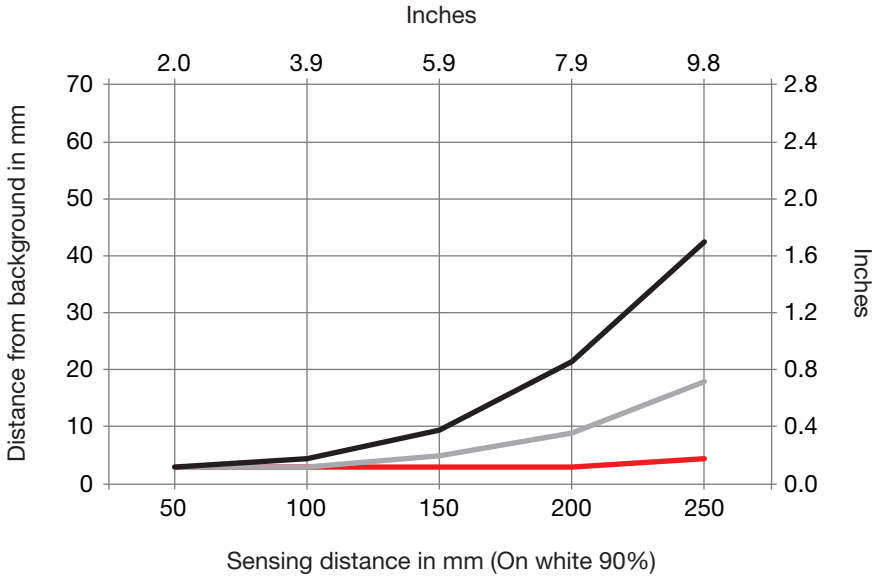
Sensing

Detection diagram





Sensing conditions



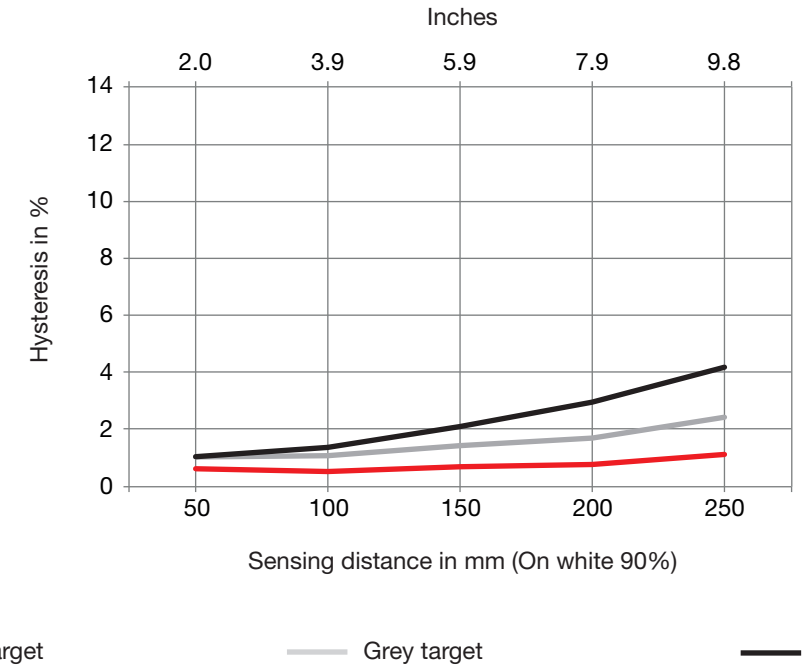
White target on white background (90 % / 90%)

Grey target on white background (18% / 90%)

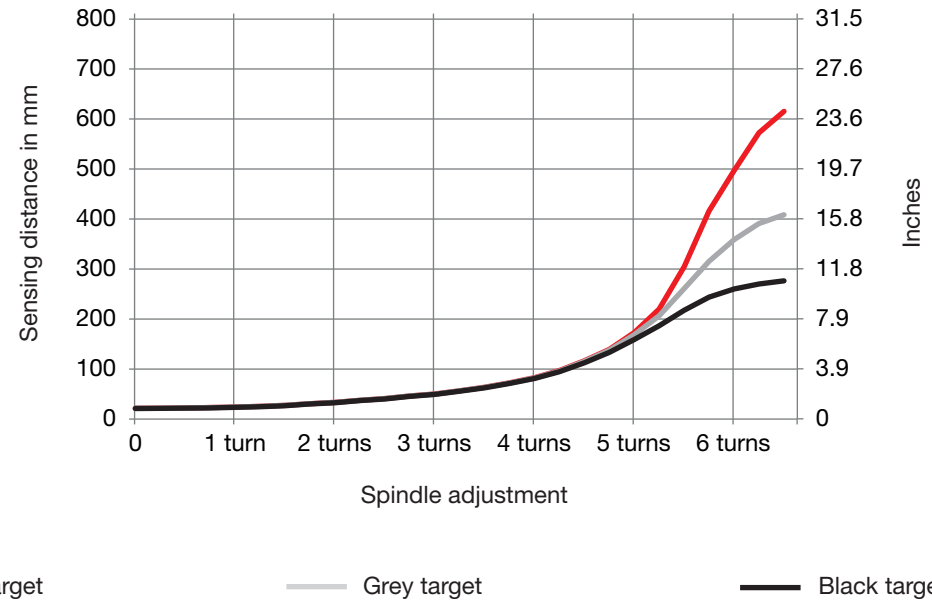
Black target on white background (6% / 90%)

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Hysteresis

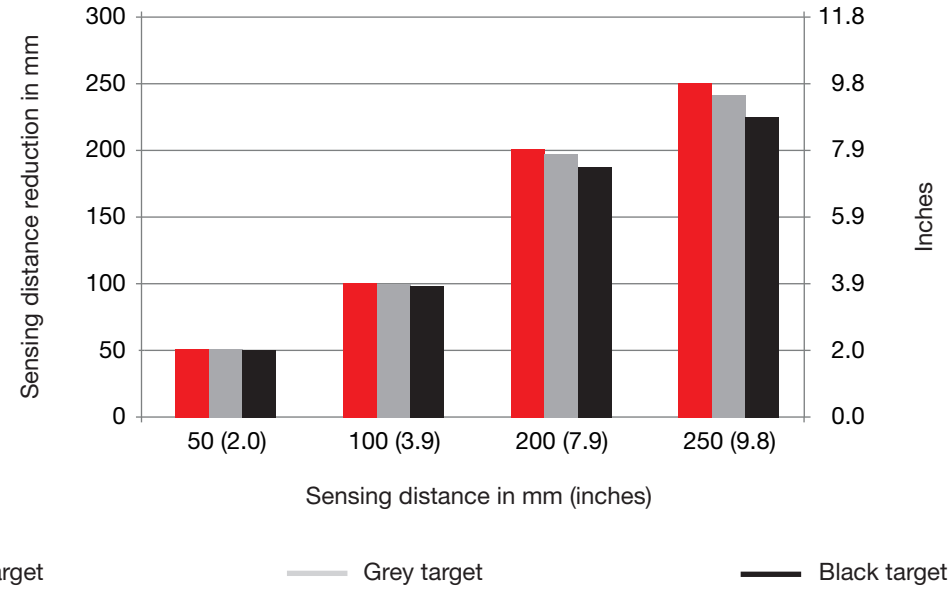


Spindle adjustment vs sensing distance

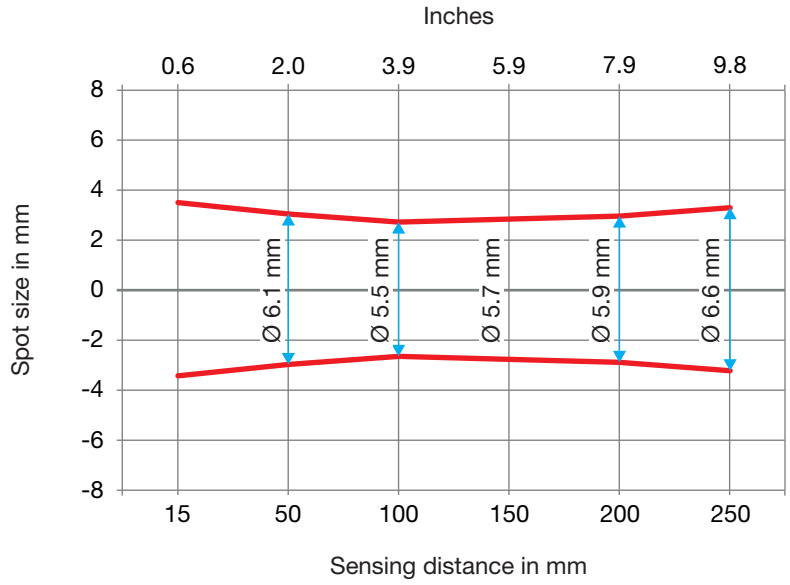


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Sensing distance reduction



Spot size



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Compatibility and conformity

Approvals and markings

General reference	Sensor designed according to EN IEC 60947-5-2
$MTTF_d$	107.8 years (EN ISO 13849-1, SN 29500)
CE-marking	CE

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Delivery contents and accessories

Delivery contents

- Photoelectric switch: PD32CEB25xAx
- Packaging: Plastic bag

Accessories

- Mounting bracket: APD30-MB1 or APD30-MB2 to be purchased separately
- Connector type: CON.54NF... series to be purchased separately

Further information

Mounting brackets	http://cga.pub/?6fa29a	
Connectors	http://cga.pub/?d91364	
Carlo Gavazzi website	www.gavazziautomation.com	

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