

PD30ETB20xxIS



Photoelectrics, Background Suppression reflective with IR light



Main features

- Miniature sensor range
- Range: 200 mm
- Sensitivity adjustment by potentiometer
- Modulated, infrared light 850 nm
- Supply voltage: 10 to 30 VDC
- Output: 100 mA, NPN or PNP preset
- Make and break switching function
- LED indication for output, stability and power ON
- Protection: reverse polarity, short circuit and transients
- Cable and plug versions
- Excellent EMC performance
- The invisible infrared light beam eliminates discomfort for people working near the sensor
- Power supply necessary only on one side of the application
- Ecolab

Description

The PD30ET... stainless steel sensors are built with high-quality materials and designed for harsh environments.

They are designed for use in environments where high-pressure cleaning, cleaning agents and disinfectants are used on a daily basis.

The strong stainless steel (AISI316L) together with high-quality plastic materials like PEEK, PPSU, and PES sealings of FKM ensure a safe and excellent mechanical resistance.

The compact sensor design is ideally suited to confined spaces.

Main functions

- Detects presence or absence of objects by cutting off the background information.
- The detection distance is very independent of the colour of the object to detect.

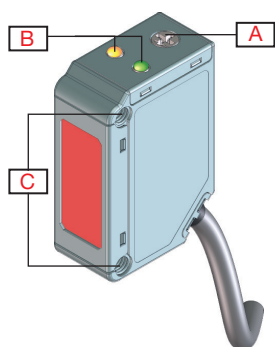


Fig. 1 Cable

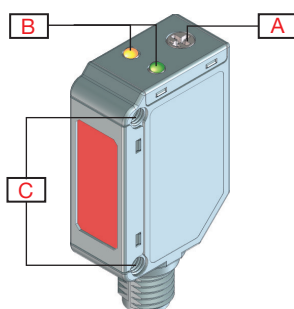


Fig. 2 Plug

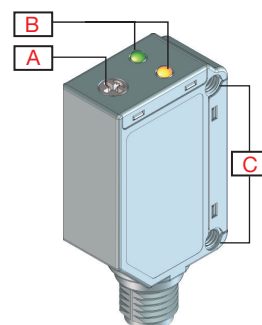


Fig. 3 Back

Element	Component	Function
A	Potentiometer	Adjustment
B	2 LEDs	Green LED: Power ON / Signal stability. Yellow LED: Output
C	2 M3	Fixing holes for sensor mounting

Sensing

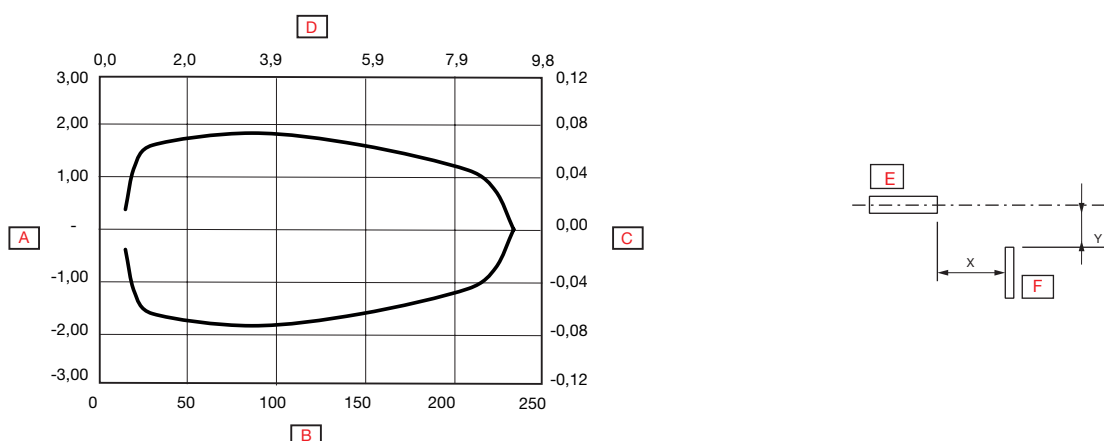
Detection

Rated operating distance (S_n)	≤ 200 mm	Reference target, white paper with 90 % reflectivity, Size 200x200 mm
Maximum detection distance	< 200 mm	White object 90% reflection
	< 200 mm	Grey object 18% reflection
	< 200 mm	Black object 6% reflection
Sensitivity adjustment	25 mm ... 200 mm	Single-turn potentiometer
	210°	Electrical adjustment
	240°	Mechanical adjustment
Blind zone	≤ 10 mm	White object 90% reflection
	≤ 12 mm	Grey object 18% reflection
	≤ 14 mm	Black object 6% reflection
Hysteresis	$\leq 10\%$	
Light source	850 nm	Infrared
Light type	Infrared modulated	
Detection angle	$\pm 1.1^\circ$	@100 mm (half sensing distance)
Light spot size	4.5 mm	@100 mm (half sensing distance)
Emitter beam angle	$\pm 1.3^\circ$	@100 mm (half sensing distance)

Accuracy

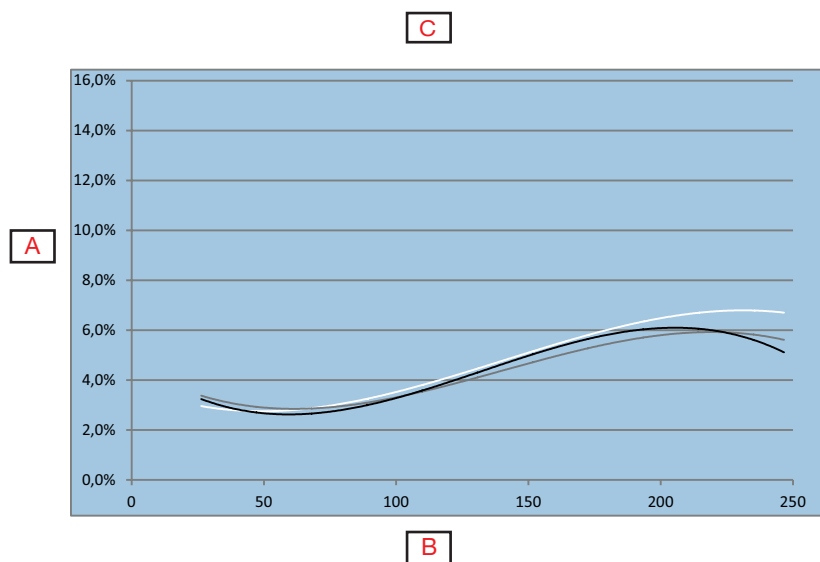
Temperature drift	$\leq 0.05\%/^\circ\text{C}$
--------------------------	------------------------------

Detection diagram



A	Detection width (mm)	E	Sensor
B	Sensing range (mm)	F	Object
C	Detection width (inches)		
D	Sensing range (inches)		

Sensing conditions



A	Distance from background (%)		Poly. (Black on white 6%/90%)
B	White background 90% (mm)		Poly. (Grey on white 18%/90%)
C	White background 90% (inches)		Poly. (White on white 90%/90%)

Features

Power Supply

Rated operational voltage (U_B)	10 ... 30 VDC (ripple included)
Ripple (U_{rpp})	$\leq 10\%$
No load supply current (I_o)	≤ 40 mA @ U_B min ≤ 20 mA @ U_B max
Power-ON delay (t_v)	≤ 200 ms

Outputs

Output functions	NPN or PNP by sensor type	Open collector
Output switching function	N.O. and N.C.	
Output current	< 100 mA	Continuous(I_e)
	≤ 100 mA @ 100 nF load	Short-time (I)
Minimum operational current (I_m)	0.5 mA	
OFF-state current(I_r)	100 μ A	
Voltage drop (U_d)	2 VDC @ (I_e) max.	
Protection	Short circuit, reverse polarity and transients	
Utilization category	DC-12	Control of resistive loads and solid-state loads with optical isolation
	DC-13	Control of electromagnets

Operation diagram

T_v = Power-ON delay

power supply	ON	
Target (Object)	Present	
Break output (N.C.)	ON	
Make output (N.O.)	ON	

Response times

Operating frequency (f)	≤ 500 Hz	
Response times	≤ 1.0 ms	OFF-ON (t_{ON})
	≤ 1.0 ms	ON-OFF (t_{ON})

Indication

Green LED	Yellow LED	Power	Output
ON	OFF	ON	OFF
OFF	OFF	OFF	-
ON	ON	ON	ON

Environmental

Ambient temperature	-25° ... +60°C (-13° ... +140°F)	Operating ¹⁾
	-40° ... +70°C (-40° ... +158°F)	Storage ¹⁾
Ambient light	≤ 65 000 lux	@ 3000 ... 3200 °K
Vibration	10 ... 150 Hz, 1.0 mm/15 g	EN 60068-2-6
Shock	30 gn / 11ms, 6 pos, 6 neg per axis	EN60068-2-27
Drop test	2 x 1 m and 100 x 0.5 m	EN 60068-2-31
Rated insulation voltage (U _i)	50 VDC	
Dielectric insulation voltage	≥ 500 VAC rms	50/60 Hz for 1 min.
Rated impulse withstand voltage	1 kV	1.2/50 μs
Pollution degree	3	EN60947-1
Overvoltage category	III	IEC60664; EN60947-1
Degree of protection	IP68 @ 2m and 20 h	IEC60539; EN60947-1
	IP69K	DIN 40050-9
NEMA Enclosure Types	1, 2, 4, 4x, 5, 6, 6P	NEMA 250
Ambient humidity range	35% ... 95%	Operating ²⁾
	35% ... 95%	Storage ²⁾

¹⁾ Do not bend the cable in temperatures below -10°C

²⁾ With no icing or condensation

EMC

Electrostatic discharge immunity test	± 8 kV @ air discharge or ± 4 kV @ contact discharge	IEC 61000-4-2
Radiated radio-frequency electromagnetic field immunity test (80 MHz ... 1 GHz and 1..4 GHz ... 2 GHz)	10 V/m	IEC 61000-4-3
Electrical fast transient/Burst immunity test	2 kV / 5 kHz using the capacitive coupling clamp	IEC 61000-4-4
Conducted disturbances induced by radio-frequency fields immunity test (150 kHz ... 80 MHz)	10 Vrms	IEC 61000-4-6
Power frequency magnetic field immunity test	30 A/m 38 μT	IEC 61000-4-8

Mechanics/electronics

Connection

Cable	2 m, 4-wire 4 x 0.14 mm ² , Ø = 3.3 mm, PVC, Black
Plug	M8, 4-pin, male

Wiring

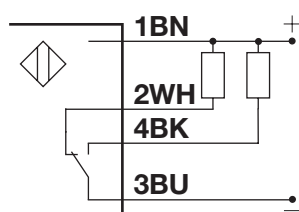


Fig. 4 NPN

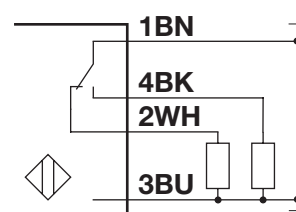


Fig. 5 PNP

Colour code							
BN	Brown	WH	White	BK	Black	BU	Blue

Housing

Body	Stainless steel, AISI316L	
Front glass	PPSU, Red	
Trimmer shaft	PEEK, Light grey	
Indication	PES, Transparent	Polyethersulfone
Sealing	FKM	Fluoroelastomer
Cable gland	FKM	Fluoroelastomer
Dimensions	11 x 31.5 x 21 mm	
Weight	≤ 100 g	Cable version
	≤ 65 g	Plug version

Dimensions

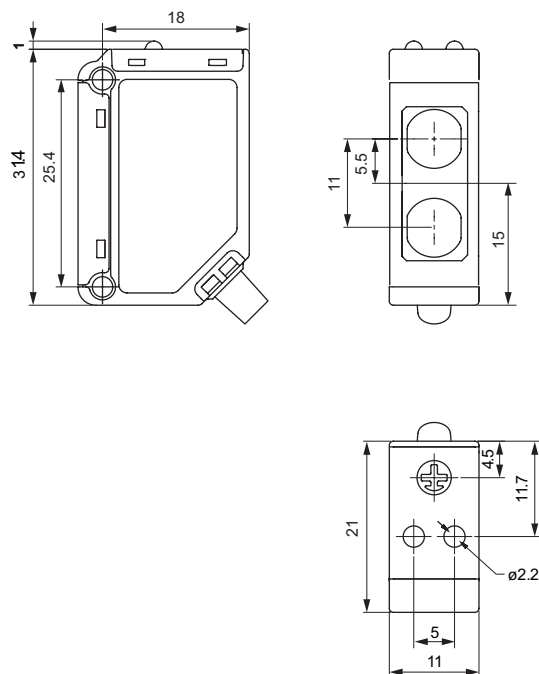


Fig. 6 Cable

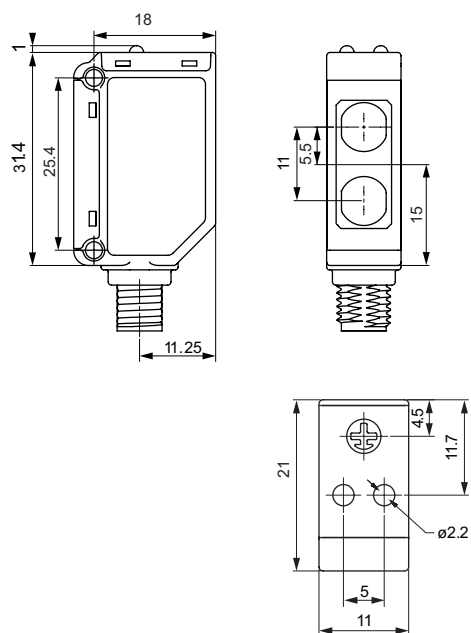


Fig. 7 Plug



Compatibility and conformity

Approvals and markings

General reference	Sensor designed according to EN60947-5-2	
MTTF _d	180.8 years @ 40°C (+104°F)	ISO 13849-1, SN 29500
CE-marking		
Approvals	 (UL508 + C22.2)	
Other Approvals		Topax 56, Topaz AC1, Topaz MD3, Topaz CL1, Topactiv OKTO, P3-hypochloran

References

Product selection key



PD30ETB20 ☐ A ☐ IS

Enter the code option instead of ☐

Code	Option	Description
P	-	Photoelectric sensor
D	-	Rectangular housing
30	-	Length of housing
E	-	Stainless steel
T	-	Top trimmer
B	-	Diffuse reflective, Background suppression
20	-	Distance [cm]
☐	N	NPN
	P	PNP
A	-	Output: N.O. and N.C.
☐	-	Cable, 2 m
	M5	Connector M8
IS	-	Sensitivity adjustment and infrared light

Type selection

Connec- tion	Output	Code
Cable	NPN	PD30ETB20NAIS
	PNP	PD30ETB20PAIS
Plug	NPN	PD30ETB20NAM5IS
	PNP	PD30ETB20PAM5IS

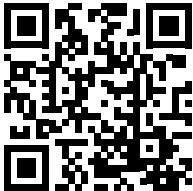
Delivery contents and accessories

Delivery contents

- Photoelectric switch: PD30ETB20...
- Screwdriver
- Packaging: Carton box
- Mounting bracket: APD30-MB1

Accessories

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



COPYRIGHT ©2016
Content subject to change. Download the PDF: www.productselection.net