

# PD30ETR60xxSA



## Photoelectrics, Retro-reflective



### 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 features

- Miniature sensor range
- Sensing range: 6 m
- 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 makes it easy to hide the sensor to avoid vandalism
- Ecolab

### Main functions

- Detects presence or absence of objects that cut off the light from the emitter
- Detects all opaque objects very reliably

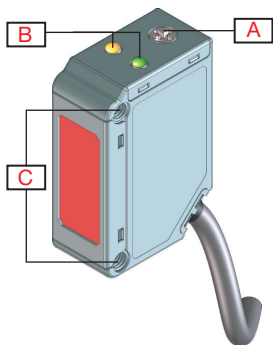


Fig. 1 Cable

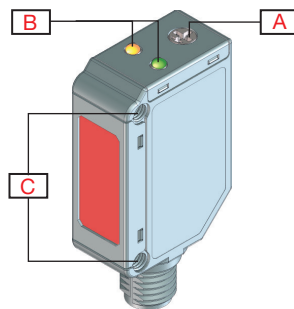


Fig. 2 Plug

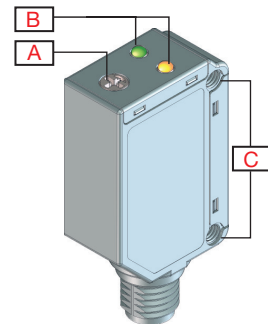


Fig. 3 Back

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

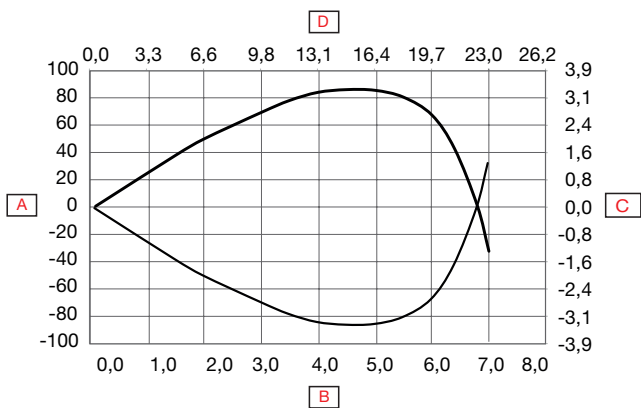
## Detection

Rated operating distance ( $S_n$ )	≤ 6 m	@ Reference target, reflector: ER4 (Ø80 mm)
	≤ 4 m	@ Reference target, reflector: ER4060
Sensitivity adjustment	1.7 ... 6 m	Single turn potentiometer
	210°	Electrical adjustment
	240°	Mechanical adjustment
Blind zone	≤ 100 mm @ $S_n$ max	@ Reference target, reflector: ER4 (Ø80 mm) or ER4060
Hysteresis	3% ... 20%	
Light source	850 nm	Infrared
Light type	Infrared modulated	
Detection angle	± 1.7°	@ 3.0 m (half sensing distance)
Light spot size	4.5 mm	@ 3.0 m (half sensing distance)
Emitter beam angle	± 1.3°	@ 3.0 m (half sensing distance)

## Accuracy

Temperature drift	≤ 0.2%/°C
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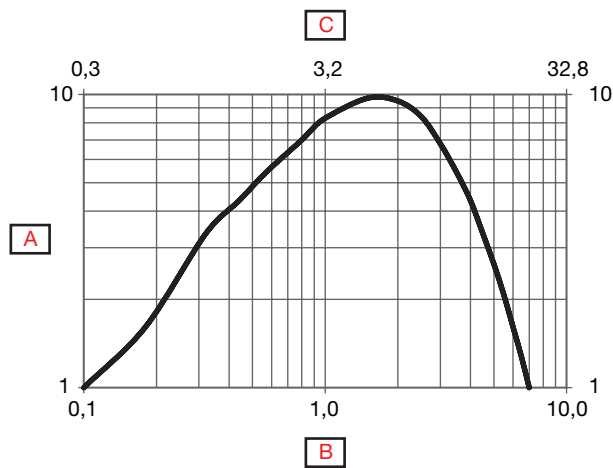
## Detection diagram





<b>A</b>	Detection width (mm)	<b>E</b>	Sensor
<b>B</b>	Sensing range (mm)	<b>F</b>	ER4 reflector
<b>C</b>	Detection width (inches)		
<b>D</b>	Sensing range (feet)		

**Excess gain**



<b>A</b>	Excess gain	<b>C</b>	Distance (feet)
<b>B</b>	Distance (m)		



# Features

## Power Supply

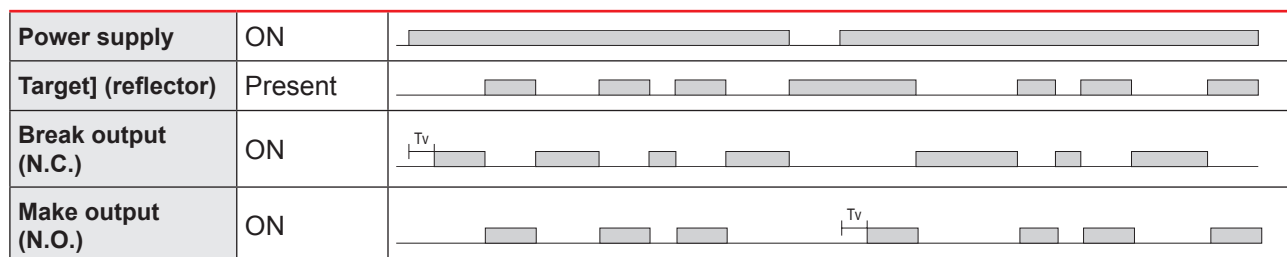
Rated operational voltage ( $U_B$ )	10 ... 30 VDC (ripple included)
Ripple ( $U_{rpp}$ )	$\leq 10\%$
No load supply current ( $I_o$ )	$\leq 25$ mA @ $U_B$ max
Power ON delay ( $t_v$ )	$\leq 30$ ms

## Outputs

Output functions	NPN or PNP by sensor type	Open collector
Output switching function	N.O. and N.C.	
Output current	$< 100$ mA	Continuous( $I_e$ )
	$\leq 100$ mA max. load capacity Load: 100 nF	Short-time (I)
Minimum operational current ( $I_m$ )	0.5 mA	
OFF-state current( $I_r$ )	100 $\mu$ 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





**Response times**

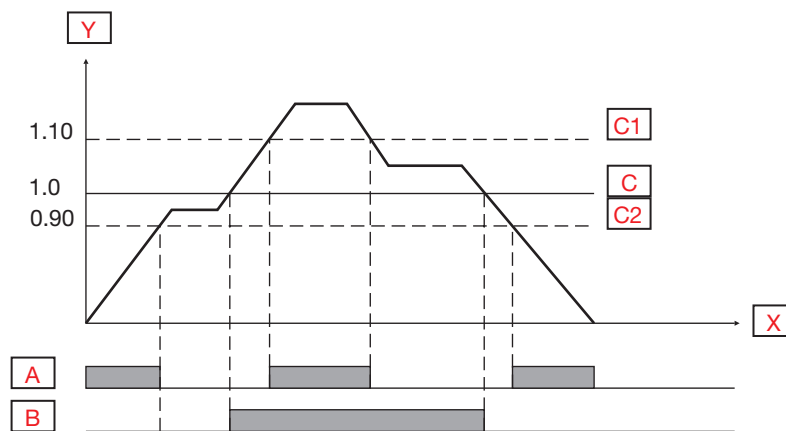
Operating frequency (f)	≤ 1000 Hz	
Response times	≤ 0.5 ms	OFF-ON (t <sub>ON</sub> )
	≤ 0.5 ms	ON-OFF (t <sub>ON</sub> )

**Indication**

Green LED	Yellow LED	Power	Output
ON	OFF	ON	OFF (stable)*
OFF	OFF	ON or OFF	OFF
OFF	ON	ON	ON
ON	ON	ON	ON (stable)*

\*See signal stability curve

**Signal stability indication**



<b>A</b>	Green LED ON	<b>C1</b>	Operation level x 1.10
<b>B</b>	Yellow LED OFF	<b>C</b>	Operation level
<b>X</b>	Time	<b>C2</b>	Operation level x 0.90
<b>Y</b>	Excess gain		



**Environmental**

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

<sup>1)</sup> Do not bend the cable in temperatures below -10°C

<sup>2)</sup> With no icing or condensation

**EMC**

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

## Mechanics/electronics

### Connection

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

### Wiring

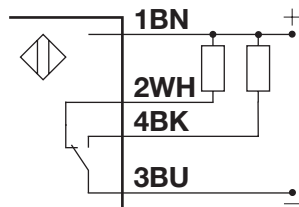


Fig. 4 NPN

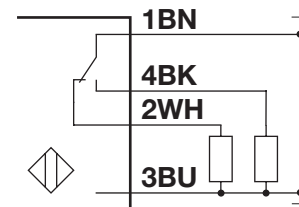


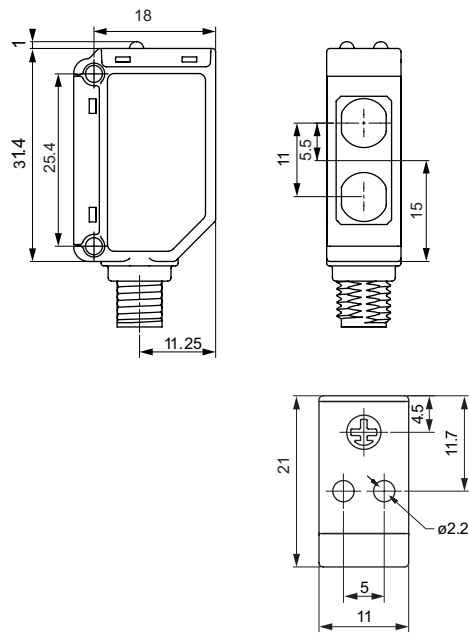
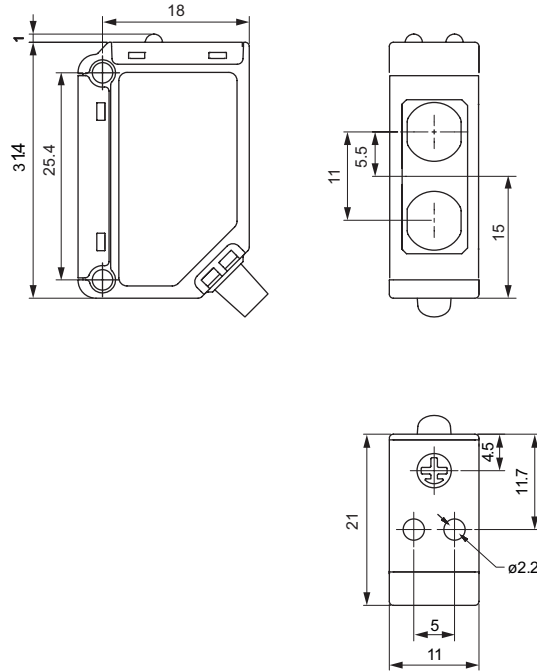
Fig. 5 PNP

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







## Compatibility and conformity

### ▶ Approvals and markings

General reference	Sensor designed according to EN60947-5-2	
MTTF <sub>d</sub>	Emitter: 496.2 years @ 40°C (+104°F)	ISO 13849-1, SN 29500
	Receiver; 171.9 years @ 40°C (+104°F)	
CE-marking		
Approvals	(UL508 + C22.2)	
Other Approvals		Topax 56, Topaz AC1, Topaz MD3, Topaz CL1, Topactiv OKTO, P3-hypochloran



## References

**Product selection key**

PD30ETR60  A  SA

Enter the code entering the corresponding option instead of

Code	Option	Description
P	-	Photoelectric sensor
D	-	Rectangular
30	-	Length of housing
E	-	Stainless steel
T	-	Top trimmer
R	-	Retro-reflective
60	-	Distance [dm]
<input type="checkbox"/>	N	NPN
	P	PNP
A	-	Output: N.O. and N.C.
<input type="checkbox"/>	-	Cable, 2 m
	M5	Connector M8
SA	-	Sensitivity adjustment

**Type selection**

Connec- tion	Output	Code
Cable	NPN	PD30ETR60NASA
	PNP	PD30ETR60PASA
Plug	NPN	PD30ETR60NAM5SA
	PNP	PD30ETR60PAM5SA



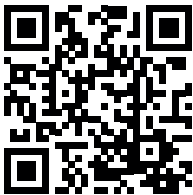
## Delivery contents and accessories

### Delivery contents

- Photoelectric switch: PD30ETR60...
- 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
- ER.. Reflectors to be purchased separately



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