# PD30ETD02xxWE

## Photoelectrics, Extreme wide angle - Diffuse reflective




### Main features

- Miniature sensor range
- Sensing 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 extremely wide-angled light beam eliminates false detection due to e.g. large holes in a PCB
- Ecolab

### Main functions

- Detects presence or absence of objects by detecting reflected light energy from the object

### 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 sensor housing has the IP69K rating as well as approval by ECOLAB for cleaning and disinfection agents.
The compact sensor design is ideally suited to confined spaces.

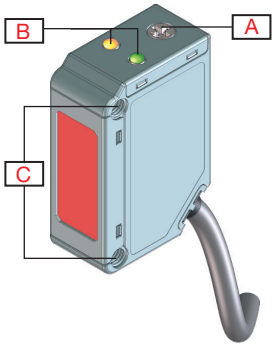



**Fig. 1** *Cable*

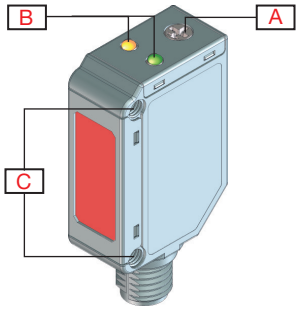



**Fig. 2** *Plug*

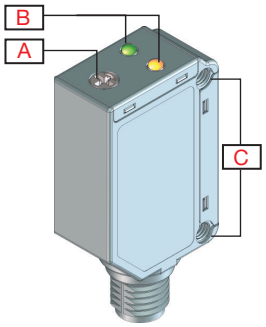



**Fig. 3** *Back*



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# PD30ETD02xxWE

| 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 |



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# Sensing

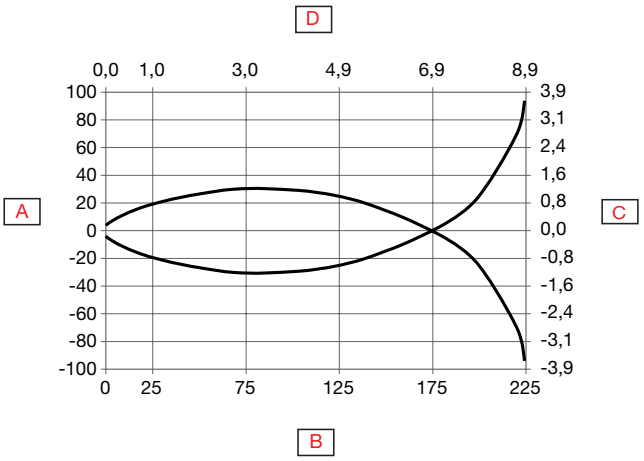
## Detection

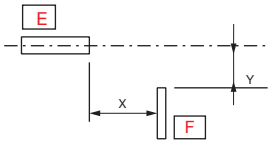
| | | |
|---|---|---|
| **Rated operating distance ($S_n$)** | ≤ 200 mm | Reference target, white paper with 90 % reflectivity, Size 200x200 mm |
| **Sensitivity adjustment** | 20 mm ... 200 mm | Single-turn potentiometer |
| | 210° | Electrical adjustment |
| | 240° | Mechanical adjustment |
| **Blind zone** | ≤ 0 mm @ $S_n$ max | Reference target, white paper with 90 % reflectivity, Size 200x200 mm |
| **Hysteresis** | 5% ... 20% | |
| **Light source** | 850 nm | Infrared |
| **Light type** | Infrared modulated | |
| **Detection angle** | ± 20° | @ 100 mm (half sensing distance) |
| **Light spot size** | 85 mm | @ 100 mm (half sensing distance) |
| **Emitter beam angle** | ± 23.0° | @ 100 mm (half sensing distance) |

## Accuracy

| | |
|---|---|
| **Temperature drift** | ≤ 0.2%/ºC |

## Detection diagram



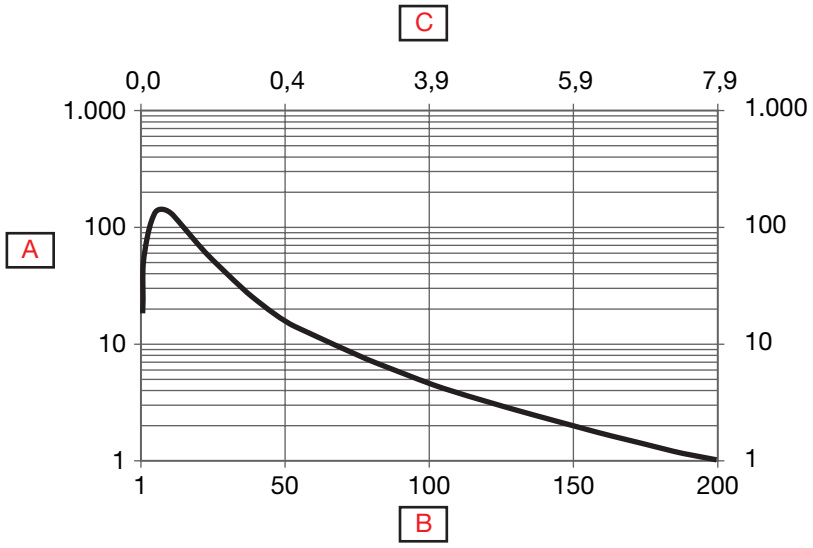




| | | | |
|---|---|---|---|
| **A** | Detection width (mm) | **E** | Sensor |
| **B** | Distance (mm) | **F** | Object |
| **C** | Detection width (inches) | | |
| **D** | Distance (inches) | | |



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## Excess gain




| | | | |
|---|---|---|---|
| **A** | Excess gain | **C** | Distance (inches) |
| **B** | Distance (mm) | | |



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# Features

## Power Supply

| | |
|---|---|
| **Rated operational voltage ($U_B$)** | 10 ... 30 VDC (ripple included) |
| **Ripple ($U_{rpp}$ )** | ≤ 10% |
| **No load supply current ($I_o$)** | ≤ 25 mA @ $U_B$ max |
| **Power-ON delay ($t_v$)** | ≤ 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($I_e$) |
| | ≤ 100 mA @ Load: 100 nF | Short-time (I) |
| **Minimum operational current ($I_m$)** | 0.5 mA | |
| **OFF-state current($I_r$)** | 100 µA | |
| **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

Tv = Power-ON delay

| | | |
|---|---|---|
| **Power supply** | ON |  |
| **Target (Object** | Present |  |
| **Break output (N.C.)** | ON |   |
| **Make output (N.O.)** | ON |   |

## Response times

| | | |
|---|---|---|
| **Operating frequency (f)** | ≤ 1000 Hz | |
| **Response times** | ≤ 0.5 ms | OFF-ON ($t_{ON}$) |
| | ≤ 0.5 ms | ON-OFF ($t_{ON}$) |



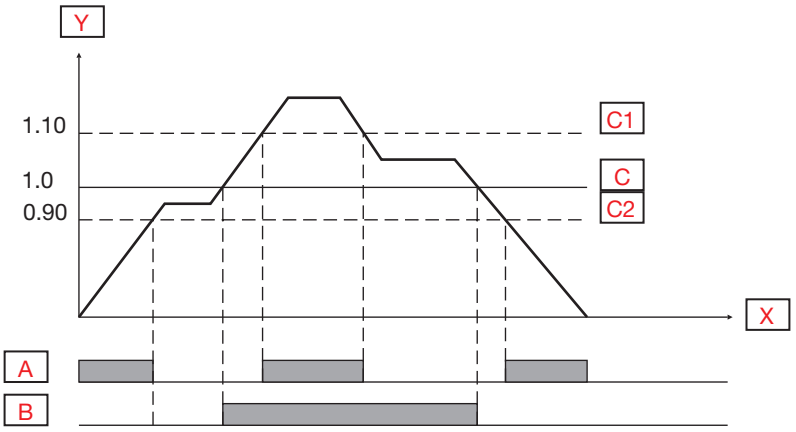
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## Indication

| 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




| | | | |
|---|---|---|---|
| **A** | Green LED ON | **C1** | Operation level x 1.10 |
| **B** | Yellow LED OFF | **C** | Operation level |
| **X** | Time | **C2** | Operation level x 0.90 |
| **Y** | Excess gain | | |

## Environmental

| | | |
|---|---|---|
| **Ambient temperature** | -25°... +60°C (-13°... +140°F) | Operating, Cable version [1] |
| | -40° ... +60°C (-40° ... +140°F) | Storage Plug version [1] |
| | -40° ... +70°C (-40° ... +158°F) | Storage |
| **Ambient light** | ≤ 10 000 lux | @ 3000 … 3200 °K |
| **Vibration** | 10 ...150 Hz, 1.0 mm/15 g | EN 60068-2-6 |
| **Shock** | 30 $g_n$ / 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] |



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[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<br>± 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<br>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 |



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# Mechanics/electronics

## Connection

| | |
|---|---|
| **Cable** | 2 m, 4-wire 4 x 0.14 mm², Ø = 3.3 mm, PVC, Black |
| **Plug** | M8, 4-pin, male |

## Wiring

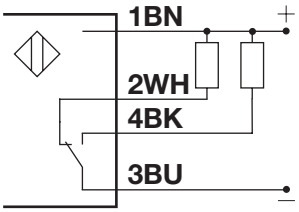



**Fig. 4** *NPN*

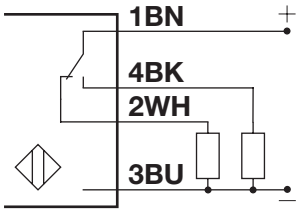



**Fig. 5** *PNP*

| BN | WH | BK | BU |
|---|---|---|---|
| Brown | White | Black | 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 |



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## Dimensions

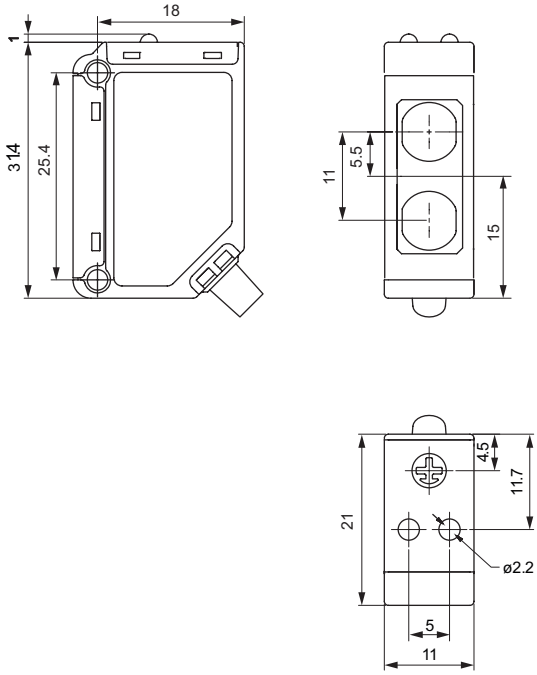



**Fig. 6** *Cable*

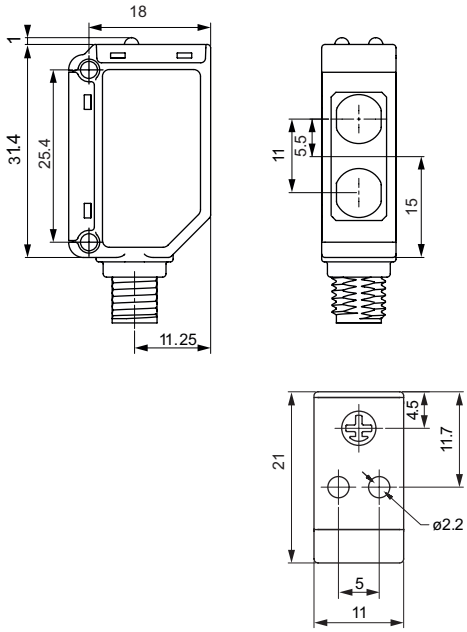



**Fig. 7** *Plug*



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# Compatibility and conformity

## Approvals and markings

| | | |
|---|---|---|
| **General reference** | Sensor designed according to EN60947-5-2 | |
| **MTTF$_d$** | 176.5 years @ 40°C (+104°F) | ISO 13849-1, SN 29500 |
| **CE-marking** | CE | |
| **Approvals** | c UL us (UL508 + C22.2) | |
| **Other Approvals** | ECOLAB | Topax 56, Topaz AC1, Topaz MD3, Topaz CL1, Topactiv OKTO, P3-hypochloran |



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# References

## Product selection key

**PD30ETD02 ☐ A ☐ WE**

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 |
| D | - | Diffuse reflective |
| 02 | - | Distance [dm] |
| ☐ | N | NPN |
| | P | PNP |
| A | - | Output: N.O. and N.C. |
| ☐ | - | Cable, 2 m |
| | M5 | Connector M8 |
| WE | - | Extreme wide angle |

## Type selection

| Connec-tion | Output | Code |
|---|---|---|
| Cable | NPN | **PD30ETD02NAWE** |
| | PNP | **PD30ETD02PAWE** |
| Plug | NPN | **PD30ETD02NAM5WE** |
| | PNP | **PD30ETD02PAM5WE** |



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# Delivery contents and accessories

## Delivery contents

- Photoelectric switch: PD30ETD02…
- Screwdriver
- Packaging: Carton box
- Mounting bracket: APD30-MB1

## Accessories

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

## Further information

| Information | Where to find it | QR |
|---|---|---|
| Mounting brackets | http://cga.pub/?6fa29a | |
| Connectors | http://cga.pub/?3abadc | |

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