# Reflex Sensor
## with Background Suppression

# P1PH303
Part Number

- **Condition monitoring**
- **IO-Link 1.1**
- **Low switching distance deviation for black/white**
- **Reliably detect objects against any background**

The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. The sensor detects minimal height differences and, for example, differentiates reliably various parts from each other. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.
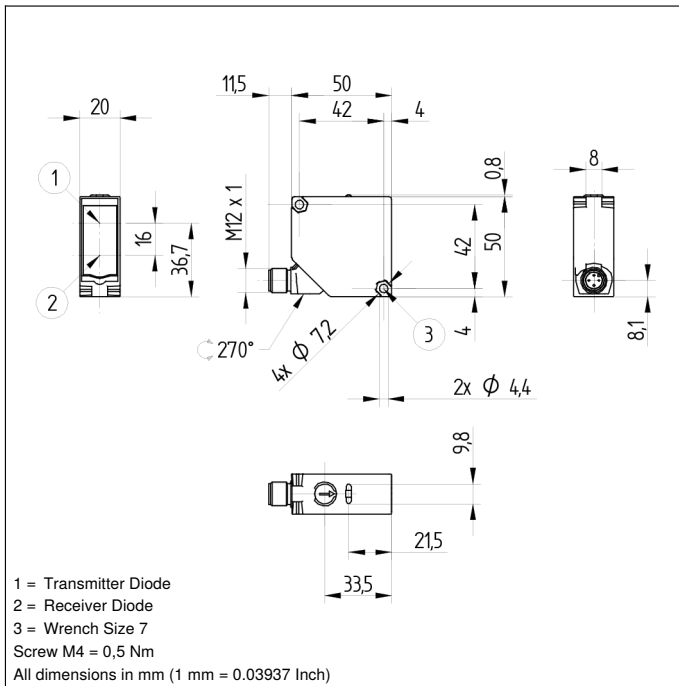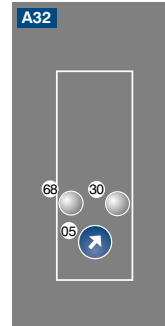
## Technical Data

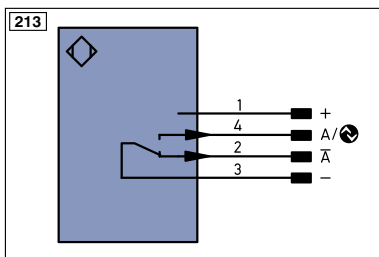| Optical Data | |
| --- | --- |
| Range | 500 mm |
| Adjustable Range | 50...500 mm |
| Switching Hysteresis | < 5 % |
| Light Source | Red Light |
| Service Life (T = +25 °C) | 100000 h |
| Max. Ambient Light | 10000 Lux |
| Light Spot Diameter | see Table 1 |
| **Electrical Data** | |
| Supply Voltage | 15...30 V DC |
| Supply Voltage with IO-Link | 18...30 V DC |
| Current Consumption (Ub = 24 V) | < 20 mA |
| Switching Frequency | 800 Hz |
| Switching Frequency (interference-free mode) | 500 Hz |
| Response Time | 1,25 ms |
| Response time (interference-free mode) | 2 ms |
| Temperature Drift | < 5 % |
| Temperature Range | -40...60 °C |
| Switching Output Voltage Drop | < 2 V |
| Switching Output/Switching Current | 100 mA |
| Short Circuit Protection | yes |
| Reverse Polarity Protection | yes |
| Overload Protection | yes |
| Interface | IO-Link V1.1 |
| Protection Class | III |
| **Mechanical Data** | |
| Setting Method | Potentiometer |
| Housing Material | Plastic |
| Degree of Protection | IP67/IP68 |
| Connection | M12 × 1; 4-pin |
| Optic Cover | PMMA |
| NPN NO/NC antivalent | ● |
| IO-Link | ● |
| Connection Diagram No. | 213 |
| Control Panel No. | A32 |
| Suitable Connection Equipment No. | 2 |
| Suitable Mounting Technology No. | 380 |

## Complementary Products

| |
| --- |
| IO-Link Master |
| Set Protective Housing Z1PS001 |
| Software |

**Photoelectronic Sensors**

1 = Transmitter Diode
2 = Receiver Diode
3 = Wrench Size 7
Screw M4 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

## Ctrl. Panel

**A32**



05 = Switching Distance Adjuster
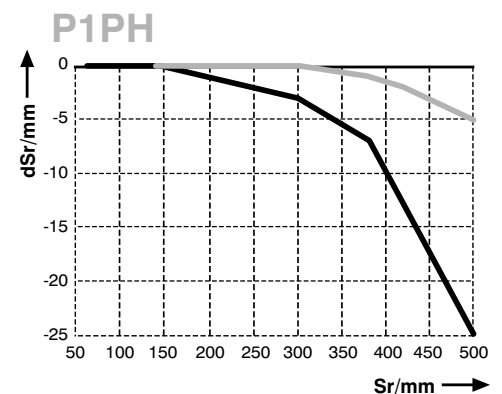30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

**213**



| | |
|---|---|
| 1 | + |
| 4 | A/⊘ |
| 2 | Ā |
| 3 | − |

### Legend

| | | | | | |
|---|---|---|---|---|---|
| + | Supply Voltage + | PT | Platinum measuring resistor | EN_AR5422 | Encoder A/Ā (TTL) |
| − | Supply Voltage 0 V | nc | not connected | EN_BR5422 | Encoder B/B̄ (TTL) |
| ~ | Supply Voltage (AC Voltage) | U | Test Input | EN_A | Encoder A |
| A | Switching Output (NO) | Ū | Test Input inverted | EN_B | Encoder B |
| Ā | Switching Output (NC) | W | Trigger Input | A_MIN | Digital output MIN |
| V | Contamination/Error Output (NO) | W− | Ground for the Trigger Input | A_MAX | Digital output MAX |
| V̄ | Contamination/Error Output (NC) | O | Analog Output | A_OK | Digital output OK |
| E | Input (analog or digital) | O− | Ground for the Analog Output | SY In | Synchronization In |
| T | Teach Input | BZ | Block Discharge | SY OUT | Synchronization OUT |
| Z | Time Delay (activation) | A_WV | Valve Output | 0_LT | Brightness output |
| S | Shielding | a | Valve Control Output + | M | Maintenance |
| RxD | Interface Receive Path | b | Valve Control Output 0 V | rsv | reserved |
| TxD | Interface Send Path | SY | Synchronization | | Wire Colors according to IEC 60757 |
| RDY | Ready | SY− | Ground for the Synchronization | BK | Black |
| GND | Ground | E+ | Receiver-Line | BN | Brown |
| CL | Clock | S+ | Emitter-Line | RD | Red |
| E/A | Output/Input programmable | ⏚ | Grounding | OG | Orange |
| ⊘ | IO-Link | SnR | Switching Distance Reduction | YE | Yellow |
| PoE | Power over Ethernet | Rx+/− | Ethernet Receive Path | GN | Green |
| IN | Safety Input | Tx+/− | Ethernet Send Path | BU | Blue |
| OSSD | Safety Output | Bus | Interfaces-Bus A(+)/B(−) | VT | Violet |
| Signal | Signal Output | La | Emitted Light disengageable | GY | Grey |
| BI_D+/− | Ethernet Gigabit bidirect. data line (A-D) | Mag | Magnet activation | WH | White |
| EN_0R5422 | Encoder 0-pulse 0-0̄ (TTL) | RES | Input confirmation | PK | Pink |
| | | EDM | Contactor Monitoring | GNYE | Green/Yellow |

## Table 1

| | 60 mm | 250 mm | 500 mm |
|---|---|---|---|
| **Detection Range** | 60 mm | 250 mm | 500 mm |
| **Light Spot Diameter** | 11 mm | 13 mm | 15 mm |

### Switching Distance Deviation

Typical characteristic curve based on white, 90 % remission



Sr = Switching Distance
dSr = Switching Distance Change

black 6 % remission
grey 18 % remission