

# Retro-Reflex Sensor

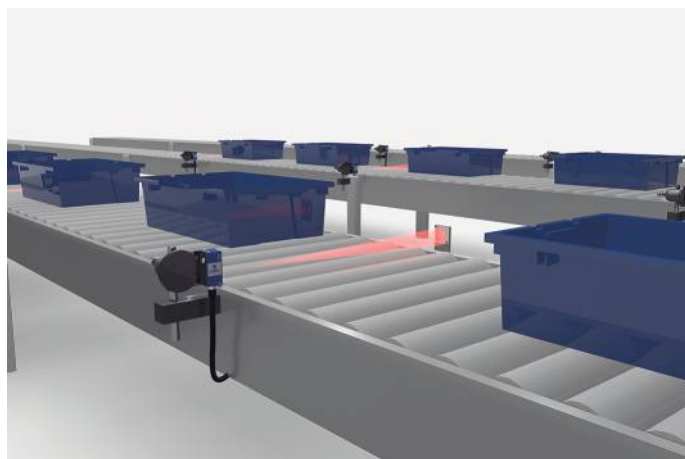
## P1KL009

Part Number



- Also suitable for glossy and reflective objects
- Condition monitoring
- High switching frequency
- IO-Link 1.1

The retro-reflex sensor works with red light and a reflector. It also reliably detects objects with reflective or glossy surfaces at high speeds. Thanks to its great range, the sensor can, for example, be used to manage feed and presence controls as well as to detect objects on wide feed belts. The IO-Link interface can be used to configure retro-reflective barriers (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



### Technical Data

| Optical Data                       |             |
|------------------------------------|-------------|
| Range                              | 5000 mm     |
| Reference Reflector/Reflector Foil | RQ100BA     |
| Smallest Recognizable Part         | see Table 2 |
| Switching Hysteresis               | < 10 %      |
| Light Source                       | Red Light   |
| Polarization Filter                | yes         |
| Service Life (T = +25 °C)          | 100000 h    |
| Max. Ambient Light                 | 10000 Lux   |
| Light Spot Diameter                | see Table 1 |
| Two-Lens Optic                     | yes         |

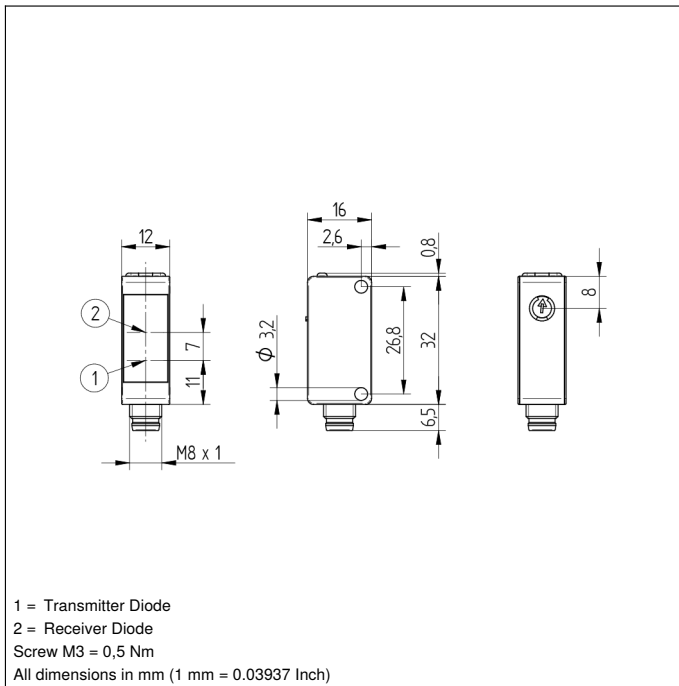
| Electrical Data                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Supply Voltage with IO-Link                 | 18...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 20 mA      |
| Switching Frequency                         | 2000 Hz      |
| Switching frequency (speed mode)            | 3500 Hz      |
| Response Time                               | 0,25 ms      |
| Response time (speed mode)                  | 0,14 ms      |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...60 °C  |
| Switching Output Voltage Drop               | < 2 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 50 µA      |
| Short Circuit and Overload Protection       | yes          |
| Reverse Polarity Protection                 | yes          |
| Lockable                                    | yes          |
| Interface                                   | IO-Link V1.1 |
| Protection Class                            | III          |

| Mechanical Data      |               |
|----------------------|---------------|
| Setting Method       | Potentiometer |
| Housing Material     | Plastic       |
| Degree of Protection | IP67/IP68     |
| Connection           | M8 × 1; 4-pin |
| Optic Cover          | PMMA          |

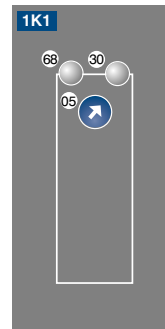
| Safety-relevant Data              |           |
|-----------------------------------|-----------|
| MTTFd (EN ISO 13849-1)            | 2808,97 a |
| IO-Link                           | ●         |
| NPN NO/NC antivalent              | ●         |
| Connection Diagram No.            | 213       |
| Control Panel No.                 | 1K1       |
| Suitable Connection Equipment No. | 7         |
| Suitable Mounting Technology No.  | 400       |

### Complementary Products

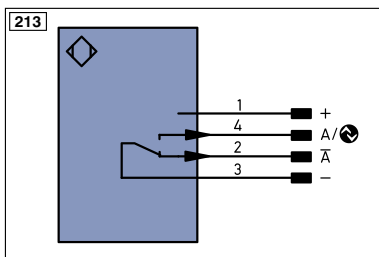
|                           |
|---------------------------|
| IO-Link Master            |
| Reflector, Reflector Foil |
| Software                  |



## Ctrl. Panel



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



## Legend

|          |                                            |       |                                |                                    |                     |
|----------|--------------------------------------------|-------|--------------------------------|------------------------------------|---------------------|
| +        | Supply Voltage +                           | PT    | Platinum measuring resistor    | ENAR542Z                           | Encoder A/Ä (TTL)   |
| -        | Supply Voltage 0 V                         | nc    | not connected                  | ENB542Z                            | Encoder B/B̄ (TTL)  |
| ~        | Supply Voltage (AC Voltage)                | U     | Test Input                     | ENa                                | Encoder A           |
| A        | Switching Output (NO)                      | U     | Test Input inverted            | ENb                                | Encoder B           |
| Ä        | Switching Output (NC)                      | W     | Trigger Input                  | AMIN                               | Digital output MIN  |
| V        | Contamination/Error Output (NO)            | W-    | Ground for the Trigger Input   | AMAX                               | Digital output MAX  |
| Ṽ        | Contamination/Error Output (NC)            | O     | Analog Output                  | AOK                                | 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)                    | AWV   | Valve Output                   | OLT                                | 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  | 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               |
| EN0.542Z | Encoder 0-pulse 0-0̄ (TTL)                 | RES   | Input confirmation             | PK                                 | Pink                |
|          |                                            | EDM   | Contactur Monitoring           | GNYE                               | Green/Yellow        |

**Table 1**

|                     |       |        |        |
|---------------------|-------|--------|--------|
| Working Distance    | 0,2 m | 2 m    | 5 m    |
| Light Spot Diameter | 30 mm | 180 mm | 400 mm |

**Table 2**

|                               |       |       |       |
|-------------------------------|-------|-------|-------|
| Distance, Sensor to Reflector | 1 m   | 2,5 m | 5 m   |
| Smallest Recognizable Part    | 10 mm | 20 mm | 30 mm |

## Feasible reflector distance

Reflector type, mounting distance

|           |              |           |               |
|-----------|--------------|-----------|---------------|
| RQ100BA   | 0,01...5 m   | RR21_M    | 0,01...1,1 m  |
| RE18040BA | 0,01...4,5 m | Z90R004   | 0,15...1,65 m |
| RQ84BA    | 0,01...4,5 m | Z90R005   | 0,15...2,3 m  |
| RR84BA    | 0,01...4,5 m | ZRAE02B01 | 0,01...2 m    |
| RE9538BA  | 0,01...2 m   | ZRME01B01 | 0,01...0,9 m  |
| RE6151BM  | 0,01...3,5 m | ZRME03B01 | 0,01...1,6 m  |
| RR50_A    | 0,01...3 m   | ZRMR02K01 | 0,01...1 m    |
| RE6040BA  | 0,01...3,5 m | ZRMS02_01 | 0,01...1 m    |
| RE8222BA  | 0,01...2,5 m | RF505     | 0,02...1,9 m  |
| RR34_M    | 0,01...0,6 m | RF508     | 0,02...1,7 m  |
| RE3220BM  | 0,01...1,5 m | RF258     | 0,02...1,4 m  |
| RE6210BM  | 0,01...1,5 m | ZRDF03K01 | 0,03...3 m    |
| RR25_M    | 0,01...1,3 m | ZRDF10K01 | 0,03...3,5 m  |
| RR25KP    | 0,01...0,8 m |           |               |

