

# Retro-Reflex Sensor

## Universal

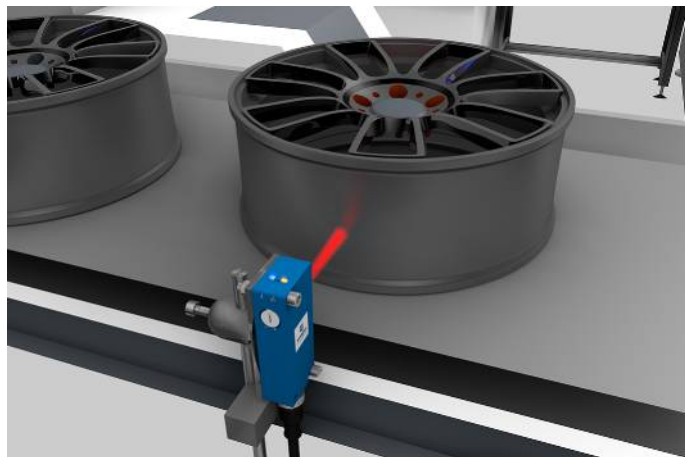
# P1NL409 LASER

Part Number



- Condition monitoring
- Detect extremely small parts starting at 0.75 mm
- High switching frequency

The retro-reflex sensor works with a fine laser beam and a reflector. The laser class 1 collimated laser beam detects objects, for instance, during installation, feed or presence checks, starting at a size of 0.75 mm over the entire range.



## Technical Data

### Optical Data

|                                    |                         |
|------------------------------------|-------------------------|
| Range                              | 9500 mm                 |
| Reference Reflector/Reflector Foil | RE6151BM                |
| Min. Distance to Reflector         | 0 mm                    |
| Smallest Recognizable Part         | see Table 2             |
| Switching Hysteresis               | < 15 %                  |
| Light Source                       | Laser (red), collimated |
| Polarization Filter                | yes                     |
| Service Life (T = +25 °C)          | 100000 h                |
| Laser Class (EN 60825-1)           | 1                       |
| Max. Ambient Light                 | 10000 Lux               |
| Light Spot Diameter                | see Table               |
| Single-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                         | 5000 Hz      |
| Response Time                               | 0,1 ms       |
| On-/Off-Delay                               | 20 ms        |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -25...60 °C  |
| Switching Output Voltage Drop               | < 2 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 50 µA      |
| Short Circuit Protection                    | yes          |
| Reverse Polarity Protection                 | yes          |
| Overload Protection                         | yes          |
| Protection Class                            | III          |
| FDA Accession Number                        | 1911373-000  |

### Mechanical Data

|                      |                |
|----------------------|----------------|
| Setting Method       | Potentiometer  |
| Housing Material     | Plastic        |
| Degree of Protection | IP67/IP68      |
| Connection           | M12 × 1; 4-pin |
| Optic Cover          | PMMA           |

### Safety-relevant Data

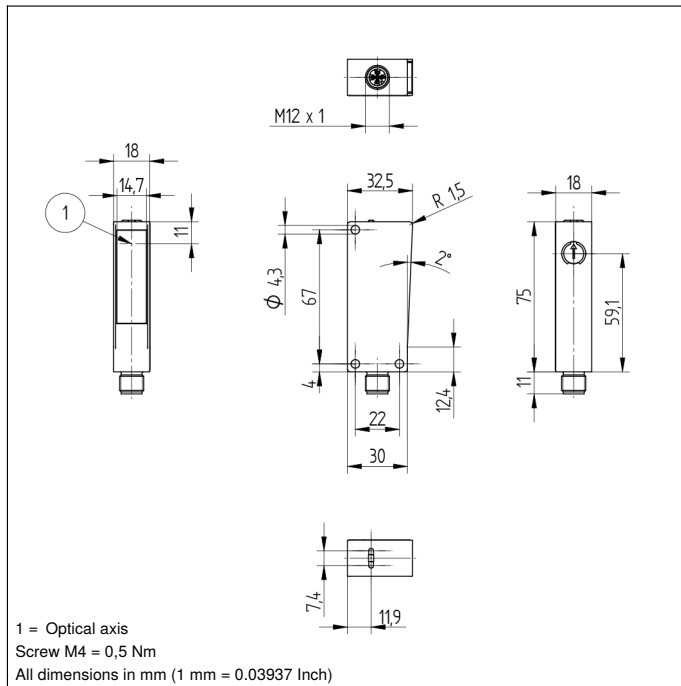
|                        |           |
|------------------------|-----------|
| MTTFd (EN ISO 13849-1) | 2369,59 a |
|------------------------|-----------|

|        |   |
|--------|---|
| NPN NO | ● |
|--------|---|

|                                   |     |
|-----------------------------------|-----|
| Connection Diagram No.            | 230 |
| Control Panel No.                 | A28 |
| Suitable Connection Equipment No. | 2   |
| Suitable Mounting Technology No.  | 350 |

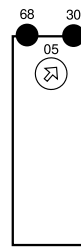
## Complementary Products

|                                    |
|------------------------------------|
| Dust Extraction Tube STAUBTUBUS-03 |
| Reflector, Reflector Foil          |
| Set Protective Housing Z1NS001     |
| Software                           |

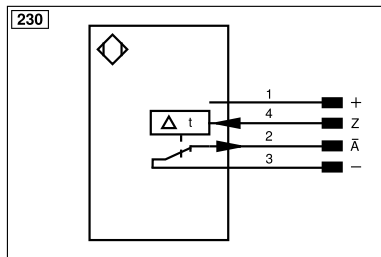


## Ctrl. Panel

A28



01 = Switching Status Indicator  
05 = Switching Distance Adjuster  
68 = supply voltage indicator



| Legend    |                                            |                                        |                                |
|-----------|--------------------------------------------|----------------------------------------|--------------------------------|
| +         | Supply Voltage +                           | nc                                     | Not connected                  |
| -         | Supply Voltage 0 V                         | U                                      | Test Input                     |
| ~         | Supply Voltage (AC Voltage)                | Ů                                      | Test Input inverted            |
| A         | Switching Output (NO)                      | W                                      | Trigger Input                  |
| Ā         | Switching Output (NC)                      | W-                                     | Ground for the Trigger Input   |
| V         | Contamination/Error Output (NO)            | O                                      | Analog Output                  |
| Ȳ         | Contamination/Error Output (NC)            | O-                                     | Ground for the Analog Output   |
| E         | Input (analog or digital)                  | BZ                                     | Block Discharge                |
| T         | Teach Input                                | Amv                                    | Valve Output                   |
| Z         | Time Delay (activation)                    | a                                      | Valve Control Output +         |
| S         | Shielding                                  | b                                      | Valve Control Output 0 V       |
| RxD       | Interface Receive Path                     | SY                                     | Synchronization                |
| TxD       | Interface Send Path                        | SY-                                    | Ground for the Synchronization |
| RDY       | Ready                                      | E+                                     | Receiver-Line                  |
| GND       | Ground                                     | S+                                     | Emitter-Line                   |
| CL        | Clock                                      | ±                                      | Grounding                      |
| E/A       | Output/Input programmable                  | SnR                                    | Switching Distance Reduction   |
| IO-Link   |                                            | Rx+/-                                  | Ethernet Receive Path          |
| PoE       | Power over Ethernet                        | Tx+/-                                  | Ethernet Send Path             |
| IN        | Safety Input                               | Bus                                    | Interfaces-Bus A(+)/B(-)       |
| OSSD      | Safety Output                              | La                                     | Emitted Light disengageable    |
| Signal    | Signal Output                              | Mag                                    | Magnet activation              |
| BI_D+/-   | Ethernet Gigabit bidirect. data line (A-D) | RES                                    | Input confirmation             |
| ENo RS422 | Encoder 0-pulse 0/0 (TTL)                  | EDM                                    | Contact Monitoring             |
| PT        | Platinum measuring resistor                | ENAR422                                | Encoder A/Ā (TTL)              |
|           |                                            | ENBR422                                | Encoder B/B̄ (TTL)             |
|           |                                            | ENA                                    | Encoder A                      |
|           |                                            | ENB                                    | Encoder B                      |
|           |                                            | AMIN                                   | Digital output MIN             |
|           |                                            | AMAX                                   | Digital output MAX             |
|           |                                            | ACK                                    | Digital output OK              |
|           |                                            | SY In                                  | Synchronization In             |
|           |                                            | SY OUT                                 | Synchronization OUT            |
|           |                                            | OLT                                    | Brightness output              |
|           |                                            | M                                      | Maintenance                    |
|           |                                            | rsv                                    | Reserved                       |
|           |                                            | Wire Colors according to DIN IEC 60757 |                                |
|           |                                            | BK                                     | Black                          |
|           |                                            | BN                                     | Brown                          |
|           |                                            | RD                                     | Red                            |
|           |                                            | OG                                     | Orange                         |
|           |                                            | YE                                     | Yellow                         |
|           |                                            | GN                                     | Green                          |
|           |                                            | BU                                     | Blue                           |
|           |                                            | VT                                     | Violet                         |
|           |                                            | GY                                     | Grey                           |
|           |                                            | WH                                     | White                          |
|           |                                            | PK                                     | Pink                           |
|           |                                            | GNYE                                   | Green/Yellow                   |

Table 1

| Working Distance    | 2 m   | 5 m   | 9,5 m |
|---------------------|-------|-------|-------|
| Light Spot Diameter | 20 mm | 50 mm | 70 mm |

Table 2

| Distance, Sensor to Reflector | 2 m     | 5 m  | 9,5 m |
|-------------------------------|---------|------|-------|
| Smallest Recognizable Part    | 0,75 mm | 5 mm | 8 mm  |

## Feasible reflector distance

Reflector type, mounting distance

|           |              |           |              |
|-----------|--------------|-----------|--------------|
| RQ100BA   | 0,07...9,5 m | RR21_M    | 0...1,8 m    |
| RE18040BA | 0,07...6 m   | Z90R004   | 0,15...3,9 m |
| RQ84BA    | 0,07...8 m   | Z90R005   | 0,15...5,5 m |
| RR84BA    | 0,07...9,5 m | ZRAE02B01 | 0,07...4,5 m |
| RE9538BA  | 0...3 m      | ZRME01B01 | 0...1 m      |
| RE6151BM  | 0...9,5 m    | ZRME03B01 | 0...3,8 m    |
| RR50_A    | 0,06...8,5 m | ZRMR02K01 | 0...1,5 m    |
| RE6040BA  | 0,07...9 m   | RF505     | 0...1,5 m    |
| RE8222BA  | 0,06...5 m   | RF508     | 0...1,6 m    |
| RR34_M    | 0...4,5 m    | RF258     | 0...1,5 m    |
| RE3220BM  | 0...5 m      | ZRAF08K01 | 0...1,5 m    |
| RE6210BM  | 0...2 m      | ZRDF03K01 | 0...6 m      |
| RR25_M    | 0...3,3 m    | ZRDF10K01 | 0...6 m      |
| RR25KP    | 0...1,3 m    |           |              |

