

# Retro-Reflex Sensor

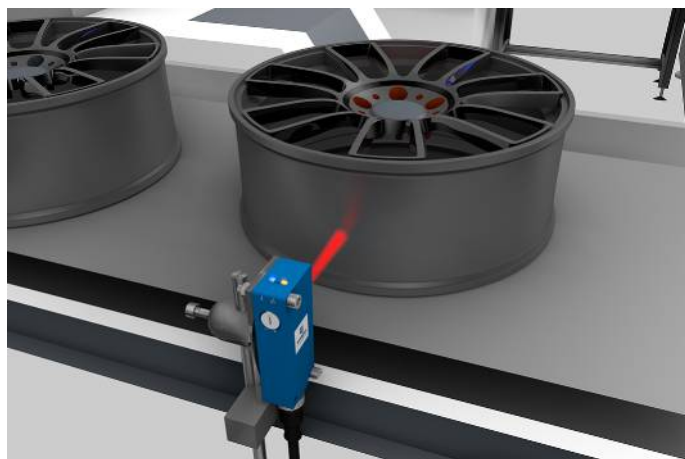
## P1NL409 LASER

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 collimated laser beam of laser class 1 detects objects, for instance, when conducting installation, feed or presence controls, starting at a size of 0.75 millimeter over the entire range.

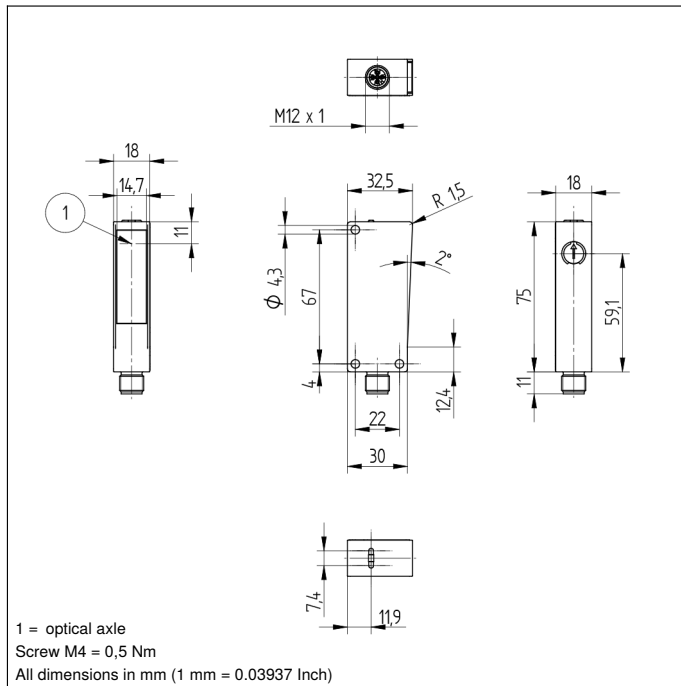


### Technical Data

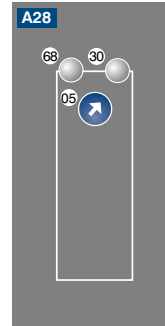
Optical Data	
Range	9500 mm
Reference Reflector/Reflector Foil	RE6151BM
Min. Distance to Reflector	0 mm
Smallest Recognizable Part	see Table 2
Switching Hysteresis	< 15 %
Light Source	Laser (red), collimated
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Light Spot Diameter	see Table 1
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
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 NC	●
Connection Diagram No.	230
Control Panel No.	A28
Suitable Connection Equipment No.	2
Suitable Mounting Technology No.	350

### Complementary Products

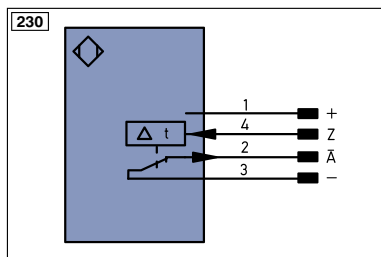
Dust Extraction Tube STAUBTUBUS-03
Reflector, Reflector Foil
Set Protective Housing Z1NS001
Software



## Ctrl. Panel



01 = Switching Status Indicator  
05 = Switching Distance Adjuster  
68 = Supply Voltage Indicator



### Legend

+	Supply Voltage +
-	Supply Voltage 0 V
~	Supply Voltage (AC Voltage)
A	Switching Output (NO)
Ā	Switching Output (NC)
V	Contamination/Error Output (NO)
Ṽ	Contamination/Error Output (NC)
E	Input (analog or digital)
T	Teach Input
Z	Time Delay (activation)
S	Shielding
RxD	Interface Receive Path
TxD	Interface Send Path
RDY	Ready
GND	Ground
CL	Clock
E/A	Output/Input programmable
	IO-Link
PoE	Power over Ethernet
IN	Safety Input
OSSD	Safety Output
Signal	Signal Output
BI_D+/-	Ethernet Gigabit bidirect. data line (A-D)
EN0-5A2Z	Encoder 0-pulse 0-0 (TTL)

PT	Platinum measuring resistor
nc	not connected
U	Test Input
Ū	Test Input inverted
W	Trigger Input
W-	Ground for the Trigger Input
O	Analog Output
O-	Ground for the Analog Output
BZ	Block Discharge
AWV	Valve Output
a	Valve Control Output +
b	Valve Control Output 0 V
SY	Synchronization
SY-	Ground for the Synchronization
E+	Receiver-Line
S+	Emitter-Line
±	Grounding
SnR	Switching Distance Reduction
Rx+/-	Ethernet Receive Path
Tx+/-	Ethernet Send Path
Bus	Interfaces-Bus A(+)/B(-)
La	Emitted Light disengageable
Mag	Magnet activation
RES	Input confirmation
EDM	Contactur Monitoring

EN0-5A2Z	Encoder A/Ā (TTL)
EN0-5B2Z	Encoder B/B̄ (TTL)
ENa	Encoder A
ENb	Encoder B
AMIN	Digital output MIN
AMAX	Digital output MAX
AOK	Digital output OK
SY_in	Synchronization In
SY_OUT	Synchronization OUT
OLT	Brightness output
M	Maintenance
rsv	reserved
Wire Colors according to 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	RR25KP	0...1,3 m
RE18040BA	0,07...6 m	RR21_M	0...1,8 m
RQ84BA	0,07...8 m	ZRAE02B01	0,07...4,5 m
RR84BA	0,07...9,5 m	ZRME01B01	0...1 m
RE9538BA	0...3 m	ZRME03B01	0...3,8 m
RE6151BM	0...9,5 m	ZRMR02K01	0...1,5 m
RR50_A	0,06...8,5 m	RF505	0...1,5 m
RE6040BA	0,07...9 m	RF508	0...1,6 m
RE8222BA	0,06...5 m	RF258	0...1,5 m
RR34_M	0...4,5 m	ZRAF08K01	0...1,5 m
RE3220BM	0...5 m	ZRDF03K01	0...6 m
RE6210BM	0...2 m	ZRDF10K01	0...6 m
RR25_M	0...3,3 m		

