

Retro-Reflex Sensor

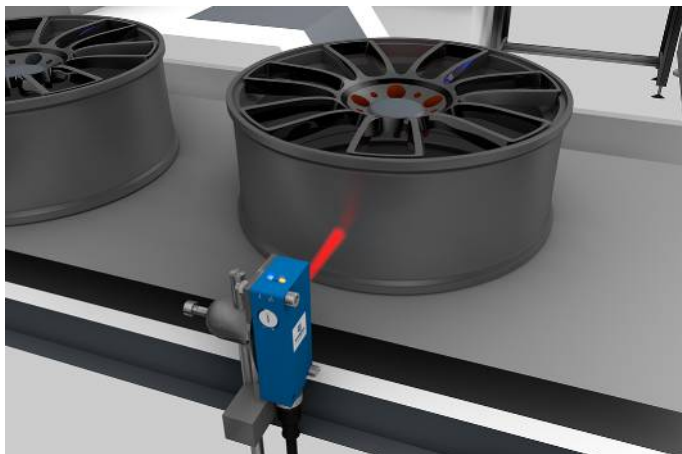
P1NL411 LASER

Part Number



- Condition monitoring
- Detect extremely small parts starting at 0.3 mm
- Focused optics
- High switching frequency
- IO-Link 1.1

The retro-reflex sensor works with a fine laser beam and a reflector. The focused laser beam of laser class 1 detects objects, for instance, when conducting installation, feed or presence controls, starting at a size of 0.3 millimeter over the entire range. 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.

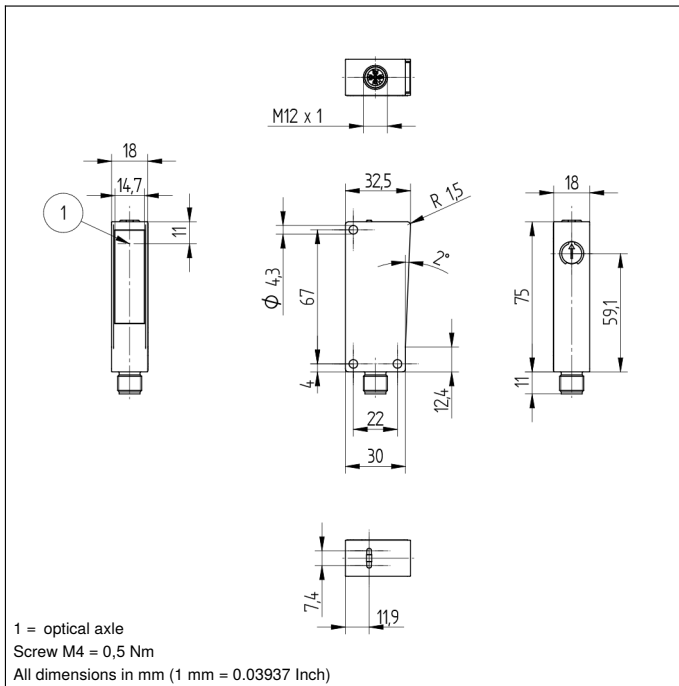


Technical Data

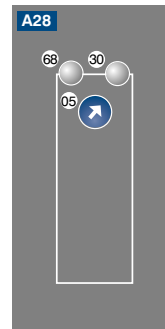
Optical Data	
Range	5000 mm
Reference Reflector/Reflector Foil	RE6151BM
Min. Distance to Reflector	0 mm
Smallest Recognizable Part	0,3 mm
Switching Hysteresis	< 15 %
Light Source	Laser (red), focused
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Light Spot Diameter	1,5 mm
Focus Distance	180...220 mm
Single-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	5000 Hz
Switching Frequency (interference-free mode)	2500 Hz
Response Time	0,1 ms
Response time (interference-free mode)	0,2 ms
On-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
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
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2369,59 a
IO-Link	●
PNP NO	●
Connection Diagram No.	225
Control Panel No.	A28
Suitable Connection Equipment No.	2
Suitable Mounting Technology No.	350

Complementary Products

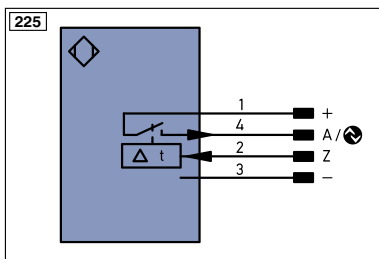
Dust Extraction Tube STAUBTUBUS-03
IO-Link Master
Reflector, Reflector Foil
Set Protective Housing Z1NS001
Software



Ctrl. Panel



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



Legend

+	Supply Voltage +	PT	Platinum measuring resistor	EN ^{A&S42}	Encoder A/Ā (TTL)
-	Supply Voltage 0 V	nc	not connected	EN ^{B&S42}	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)	AWV	Valve Output	OL _T	Brightness output
S	Shielding	a	Valve Control Output +	M	Maintenance reserved
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	S _n R	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	L _a	Emitted Light disengageable	GY	Grey
Bl_D+/-	Ethernet Gigabit bidirect. data line (A-D)	Mag	Magnet activation	WH	White
EN ^{0<sup>S42}	Encoder 0-pulse 0-0̄ (TTL)	RES	Input confirmation	PK	Pink
		EDM	Contactur Monitoring	GN _{YE}	Green/Yellow

Table 1

Working Distance	1 m	2,5 m	5 m
Light Spot Diameter	14 mm	37 mm	77 mm

Feasible reflector distance

Reflector type, mounting distance

RQ100BA	0...6,5 m	Z90R004	0...3 m
RE18040BA	0...4,5 m	Z90R005	0...3,7 m
RQ84BA	0...6 m	ZRAE02B01	0...2,8 m
RR84BA	0...7,8 m	ZRME01B01	0...1 m
RE9538BA	0...2,5 m	ZRME03B01	0...3,3 m
RE6151BM	0...5 m	ZRMR02K01	0...1,3 m
RR50_A	0...5,5 m	ZRMS02_01	0...1,4 m
RE6040BA	0...6,7 m	RF505	0...1,5 m
RE8222BA	0...3,7 m	RF508	0...1,4 m
RR34_M	0...4,2 m	RF258	0...1,5 m
RE3220BM	0...3 m	ZRAF07K01	0...1,3 m
RE6210BM	0...1,8 m	ZRAF08K01	0...1,5 m
RR25_M	0...2,6 m	Z91R001	0...4,2 m
RR25KP	0...1,2 m	ZRDF03K01	0...4,3 m
RR21_M	0...1,5 m	ZRDF10K01	0...4,4 m

