Reflex Sensor
with Background Suppression

P1PH701   LASER

Part Number

- **Data storage**
- **High-end**
- **IO-Link 1.1**
- **Teach-in**
- **Two independent switching outputs**
- **Wireless settings via NFC**

The reflex sensor with background suppression works with laser light according to the angle measurement principle. It has a IO-Link interface with a data storage function as well as additional configuration and diagnostic options. The interface can also be used to configure the sensors (PNP/NPN, NC/NO, switching distance, error output), as well as for reading out switching statuses and distance values. The teach-in function also provides another configuration option. Two independent switching outputs can be used, for instance, to monitor minimum and maximum values of distances or fill levels and stack heights.
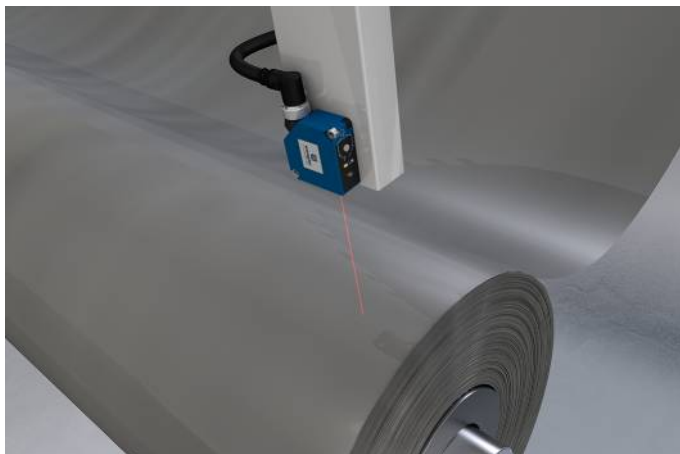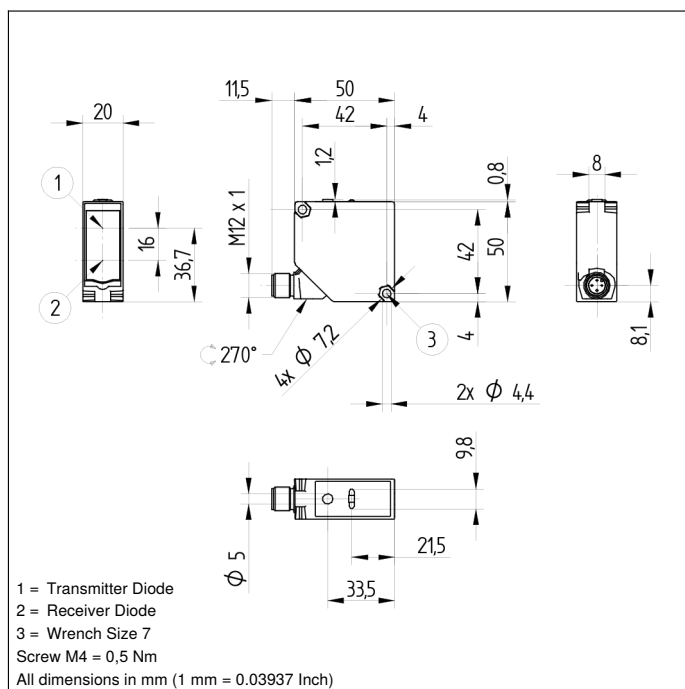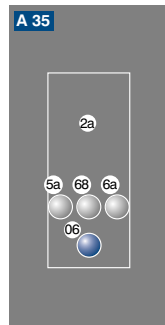
Technical Data

Optical Data	
Range	300 mm
Adjustable Range	65...300 mm
Switching Hysteresis	< 2 %
Light Source	Laser (red)
Wavelength	655 nm
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
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	150 Hz
Switching Frequency (1 Switching Output)	800 Hz
Response Time	3,3 ms
Response time (1 switching output)	1,25 ms
Temperature Drift	< 3 %
Temperature Range	-25...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	Teach-in/NFC
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M12 × 1; 4-pin
Optic Cover	PMMA

PNP NO	●
IO-Link	●
NFC interface	●

Connection Diagram No.	221
Control Panel No.	A35
Suitable Connection Equipment No.	2
Suitable Mounting Technology No.	380

Complementary Products

IO-Link Master
Set Protective Housing Z1PS001
Software

Photoelectronic Sensors

20

11,5 50 42 4

1

16 36,7

M12 x 1

1,2 0,8

2

270° 4x Ø 7,2 3

42 50 4

8

2x Ø 4,4

8,1

9,8

Ø 5 21,5

33,5

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

A 35

06 = Teach Button
2a = NFC interface
5a = Switching Status Display, O1
68 = Supply Voltage Indicator
6a = Switching Status Display, O2

221

NPN
PNP
PUSH-PULL

NO/NC

1 +
4 A1/⊘
2 E/A2
3 −
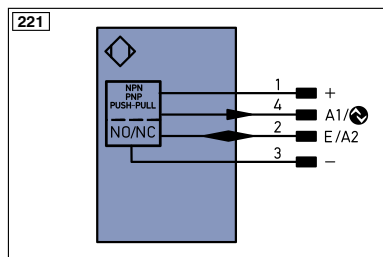
Legend

+	Supply Voltage +	PT	Platinum measuring resistor	EN~ARS422~	Encoder A/Ā (TTL)	
−	Supply Voltage 0 V	nc	not connected	EN~BRS422~	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~MW~	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~0RS422~	Encoder 0-pulse 0-0̄ (TTL)	RES	Input confirmation	PK	Pink	
		EDM	Contactor Monitoring	GNYE	Green/Yellow	

Table 1

Detection Range	65 mm	150 mm	300 mm
Light Spot Diameter	3 mm	2,5 mm	2 mm

Switching Distance Deviation

Typical characteristic curve based on white, 90 % remission

P1PH

Sr = Switching Distance
dSr = Switching Distance Change

━━ black 6 % remission
━━ grey 18 % remission

Specifications are subject to change without notice