

Photoelectric Sensors



Photoelectric sensors

Diffused
Retro-reflective
Thru-beam
Fiber-optic



10

General information

Diffused mode

- Sensing distances up to 800mm
- Subcompact, compact and cylindrical models
- Choice of quick disconnect, cable or terminal connection
- Light on or dark on operation

Retro-reflective mode

- Sensing distances up to 5 m
- Subcompact, compact and cylindrical models
- Choice of quick disconnect, cable or terminal connection
- Light on or dark on operation

Thru-beam

- Sensing distances up to 20m
- Compact models
- Terminal connection
- Light-on or dark-on operation
- Two different housings (Emitter/Receiver)

Fiber-optic cable for use with small objects

- Retro-reflective and thru-beam

Applications

Photoelectric sensors cover a broad range of applications owing to three operating principles:

- Diffuse reflective sensors detect light-reflecting objects.
- Retro-reflective sensors with reflector detect opaque objects as the result of an obstruction in the light beam.
- Thru-beam photoelectric sensors detect opaque objects similarly to retro-reflective photoelectric sensors.

Accessories extend the scope of possible applications. Fiber-optic waveguides, as an add-on, detect extremely small objects and operate at high ambient temperature or under cramped installation conditions. Depending on design, they operate as diffuse reflective sensors or as thru-beam photoelectric sensors. A dust free, clean environment ensures reliable operating.

General information

Catalog number explanation



10

SO **D** **2000** **M18** **N** **C1** **PO**

Sensor class

SO = Photoelectric (Optical)

Application

- R** = Retro-reflective
- D** = Diffused
- T** = Thru-beam
- L** = Fiber optic

Sensing range

Distance in mm

Housings

- M** = Metric thread 18mm diameter
- B** = Block 26, 40, 50, 75mm
- N** = Normal case

Outputs

- PO** = 24VDC, 3-wire PNP, NO
- POS** = 24VDC, 4 wire PNP, NO
Special "Weak Signal" output
- KK** = 24VAC – 240 VAC or
12VDC – 240VDC, Relay, NO

Connection

- V2** = cable PVC insulated, length 2m
- U2** = cable PUR insulated, length 2m
- C1** = Connector M12, 3 poles, standard
- C8** = Connector M8, 3 poles, standard
- T** = Terminals

Length

- N** = Normal case

General information

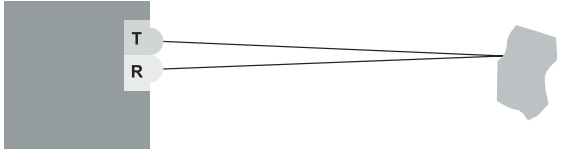
Description

Basic modes of operation

Basic mode of operation

Diffuse reflective sensors

These receive the light reflected back from the object. If a defined quantity of light is detected, the output signal is tripped. The nominal operating distances extend up to 2000mm depending on type. The achievable sensing distance depends on the size of the object to be detected, its color, and its condition, such as surface roughness.

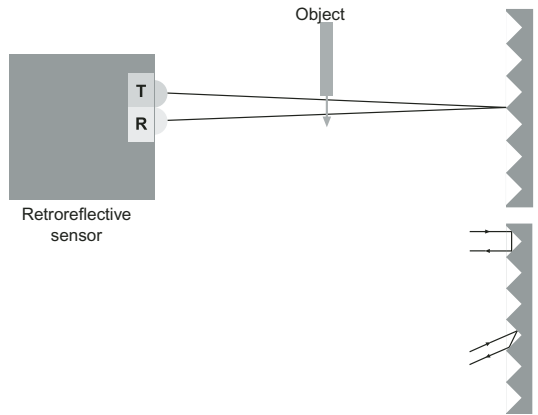


Example of reflection factors on level, aligned surfaces:

• Standard white test card	90%	• Aluminum, black anodized	115%
• Standard gray test card	18%	• Aluminum, bare	140%
• White paper	80%	• Car tires	1.5%
• Wooden boards	20%	• Transparent plastic bottles	40%
• Beer froth	70%		

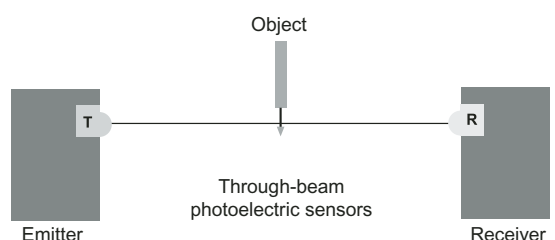
Retro-reflective sensors

These are used for larger distances to be monitored. The emitted light beam is reflected by a reflector positioned on the other side of the object. If the light path is interrupted, the signal is tripped. The design of the reflector ensures reliable operating even if the object is imprecisely aligned. The sensor distances extend up to 5000mm depending on type.



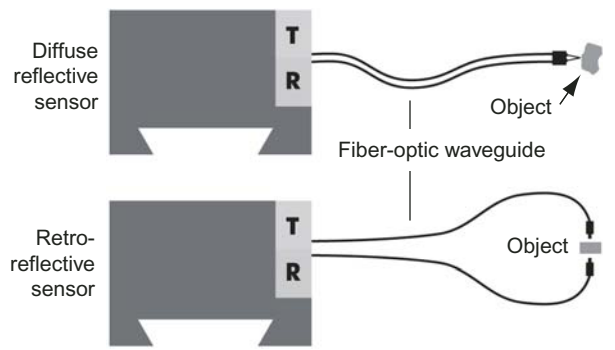
Thru-beam photo-electric sensors

These sensors have a separate light source and receiver.

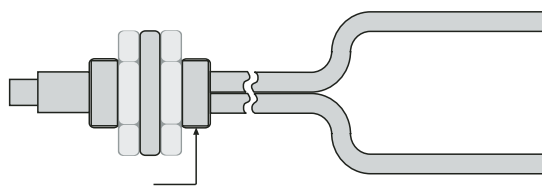


Fiber-optic waveguides

These extend the range of possible applications of photoelectric fiber sensors with important additional fields of application. The upstream fiber optic waveguides define whether the sensor is to operate as a thru-beam photoelectric sensor or as a diffuse reflective photoelectric sensor. Sensors with fiber-optic waveguides are used, primarily, to detect small objects, even under cramped conditions. Depending on the design of the fiber-optic waveguide and fiber head, it is also possible to use these systems at high temperatures. Plastic fiber-optic waveguides can be shortened by the user to appropriate length with the supplied tools.

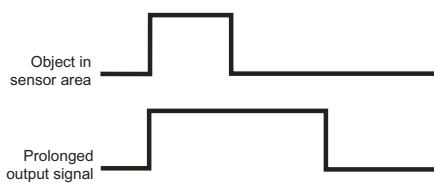


Fiber-optic waveguide head for direct detection mode.



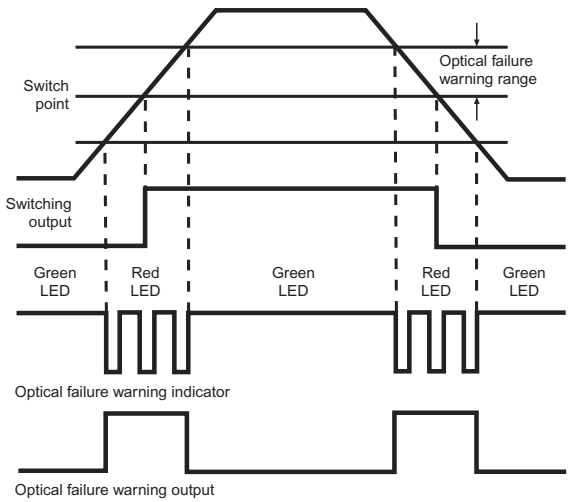
Pulse prolongation

This allows even very quickly moving objects to be detected; i.e., an adequately long signal to be sent to a downstream control.



Safety reserve and optical failure warning indicator

These are used primarily to ensure the long term, trouble-free operating of the sensor and to detect measurement failures at an early stage. Owing to the environments in which photoelectric sensors are used, contamination of the lenses may occur over the course of time so that the light detected by the receiver is reduced. The optical failure warning indicator allows the user to set the receive level with an adequate safety reserve during installation. If the light receive level drops to the optical failure warning range, the sensor does still operate but the user is informed that reliable operating is no longer guaranteed in the long term.



Sensor parameters

Outputs

The two outputs are selectable:

- Antivalent - dual switch outputs, N.O./N.C. (default)
- *N.O. + failure* – one switch output, N.O. and the failure warning output (Alarm)
- *N.C. + failure* – one switch output, N.C. and the failure warning output (Alarm)

Weak signal indicator (Optical failure control)

The weak signal indicator provides a signal (flashing red LED) to indicate the receiver is picking up less light than intended. The cause of this could be a dirty lens or misalignment.

If *N.O. + failure* or *N.C. + failure* mode is selected, the failure warning output will also switch along with the LED. The failure warning output always operates as an N.O. function.

The sensor can be programmed for either static or dynamic (default) failure indication.

Static – This mode should be chosen for applications that have a fixed sensing distance and position. The static failure warning indicator can also be used as an adjustment aid for the sensor.

Dynamic – This mode should be chosen for use with targets that have variable sensing distances or high switching frequencies.

10 Operating frequency

The switching frequency can be set to one of five options: 1kHz (default), 500 Hz, 250 Hz, 100 Hz, 50 Hz and 25 Hz. The switching frequency influences the interference signal filter. Lower switching frequencies increase the amount of filtering. With greater filtering, a larger number of interference pulses are suppressed.

Hysteresis

The sensor can be programmed for one of three settings: small, standard (default) and large to optimize the sensor to the application. If the target object has positional tolerances close to the switch point (e.g. movement of a liquid surface), a large hysteresis setting will prevent continuous switching back and forth of the output.

Timer function

The sensor operates with four timer functions: one ON delay and three OFF delay functions.

Timer function 1

- Switch-on delay

The ON delay requires a sensing event to last for at least the ON delay time period (0.1 – 25.5 sec) before the output will energize.

Timer function 2

- Switch-off delay

The OFF delay function holds the output for a preset time (0.1 – 25.5 sec) after the input signal is removed.

- Pulse lengthening (pulse expansion)

The status of the output remains constant for at least a time period (0.1 – 255 ms) regardless of what the sensor detects during this time period.

- One-shot function

The output is activated for a fixed time period (1 – 255 ms) regardless of how long the sensor detects its target.

The default setting for both timer functions is none.

Input functions

There is a choice of four input functions that can be set on the sensor:

Self-test

- N.O./N.C. switch-over
- AND logic operation
- OR logic operation
- XOR logic operation

The input function can also be inverted, which means the function is active when the input signal is < 2 VDC. On the thru-beam model the emitter also has a control input which, when set high, turns the emitter off.

During the self-test, the sensor's transmitting LED is turned off. The sensor checks for proper operation of the internal circuitry.

If the N.O./N.C. Switch-over option is active, the switch outputs reverse their functions: N.O. becomes N.C. and N.C. becomes N.O. The weak signal indicator output cannot change its function, it is always N.O.

If the logic operations are active, the switch output is as follows:

AND *The sensor changes state when the input function is active **and** the sensor detects an object.*

OR *The sensor changes state when the input function is active **or** the sensor detects an object.*

XOR *The sensor changes state under two circumstances:
The input function is active and the sensor does not detect an object.*

or

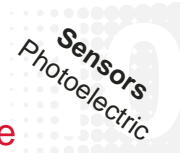
The input function is not active and the sensor detects an object.

The default setting for the input function is None.

General information

B45 Programming

Programming sensor parameters with OPUS software



Tamper protection (parameterization disable)

This feature prevents the sensor's parameters from being accidentally changed. Once the disable has been activated, it can only be removed by resetting the sensor to its default settings. During this resetting sequence, the sensor runs a self-test where it emits a light beam and looks for its return. Therefore, the diffused mode sensor requires that a target be placed in front of it. The retro-reflective sensor requires that a reflector be placed in front of it. The thru-beam sensor requires that the emitter/receiver pair are properly aligned.

In order to reset the sensor:

- Turn power off.
- Depress and hold the push buttons (+/-) simultaneously.
- While holding push buttons down, turn power back on. If the self-test fails, the sensor will respond with a flashing red LED. If the red LED is flashing, switch power on and off again to reset.

Pulse frequency

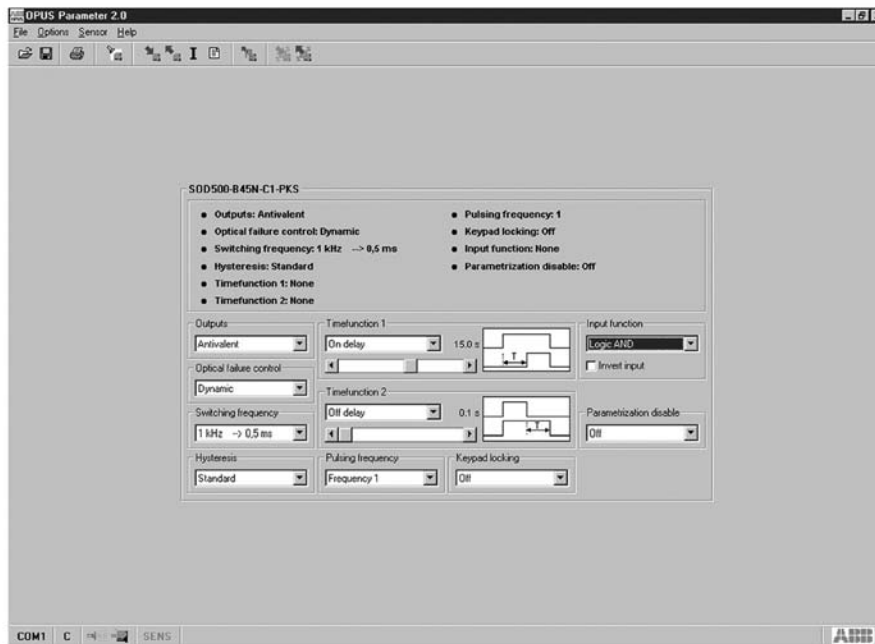
The pulse frequency at which the sensor transmits light can be selected for one of three frequencies (Frequency 1 is the default) to prevent mutual interference between closely spaced sensors.

Keypad lock

This function allows the sensor push buttons to be locked. There are three options for this function:

- Off
- Automatic (default)
- Constant

The default setting is Automatic. In this mode, the pushbuttons lock four minutes after the last button is pushed. To unlock, press both pushbuttons (+/-) simultaneously and hold for five seconds. The green LED will flash briefly when the sensor is unlocked.



General information

B45 Programming

Programming sensor parameters manually

Setting sensor switch point

There are three ways to set the switch point of the sensor:

- Manual mode
- Automatic mode (Static operation)
- Automatic mode (Dynamic operation)

Manual setting

1. If sensor pushbuttons are locked (usually when sensor is first powered up), simultaneously press "+" and "-" for five seconds (until green LED flashes once). The sensor is now unlocked.

NOTE: If green LED is flashing continuously, the sensor is in the automatic "teach" mode. Press either "+" or "-" to reset sensor to manual setting mode.

2. Place the target at the required distance within the sensing range. Use the "+" and "-" buttons to set the switch point. The red LED will flash every time a button is pushed. The push buttons can be held down for repeated actuation. The yellow LED indicates switch status.

NOTE: If the red LED does not flash when a button is pushed, the end of the adjustable range has been reached or the keypad is locked. If pressing either the "+" or "-" button doesn't cause the red LED to flash, the keypad is locked. Go to Step 1.

Automatic Setting – Static Mode (for stationary targets)

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1. If sensor push buttons are locked (usually when sensor is powered up), simultaneously press "+" and "-" for five seconds (until green LED flashes once). The sensor is now unlocked.

NOTE: If the green LED is flashing continuously, sensor is already "teach" mode. Go to Step 3.

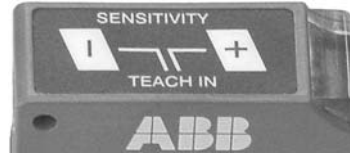
2. Press "+" and "-" simultaneously for one second, until the red LED turns off. The green LED will be flashing at 2 Hz which indicates the sensor is in "teach" mode.

3. Place the target at the desired sensing distance. The green LED will flash briefly at a higher frequency (4 Hz).^① Once the green LED flashes at 2 Hz again the sensor is out of "teach" mode.

4. Press either one of the push buttons to store the switch point. The green LED will be lit continuously and the yellow LED will indicate switch status.

NOTE: If the red LED is lit, there is an error. Go to Step 2.

Automatic Setting – Dynamic Mode (for moving targets)



1. If sensor push buttons are locked (usually when sensor is powered up), simultaneously press "+" and "-" for five seconds (until green LED flashes once briefly). The sensor is now unlocked.

NOTE: If the green LED is flashing continuously, sensor is already "teach" mode. Go to Step 3.

2. Press "+" and "-" simultaneously for one second, until the red LED turns off. The green LED will be flashing at 2 Hz which indicates the sensor is in "teach" mode.

3. Move the target perpendicularly past the sensor at the desired sensing distance. The green LED will flash briefly at a higher frequency (4 Hz).^① Once the green LED flashes at 2 Hz again, the sensor is out of "teach" mode.

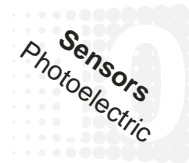
4. Press either one of the push buttons to store the switch point. The green LED will be lit continuously and the yellow LED will indicate switch status.

NOTE: If the red LED is lit, there is an error. Go to Step 2.

^① The time the green LED is flashing at a higher frequency may be too short to be observed.

Diffused

Sensing range: 200mm

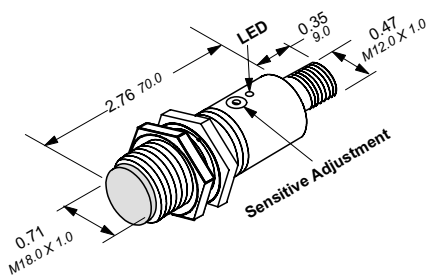


Sensing range	200mm	
Catalog number	SOD200M18NC1PO	
List price	\$ 82.00	
Output	PNP, Sourcing, Normally Open	
Reference	200mm X 200mm white target	
Detectable object	Opaque and transparent	
Switching frequency	Hz	300
Response time	ms	1.5
Readiness delay	ms	50
Operating mode	Light/dark ON, wiring dependent	
LEDs	Output status	
Yellow	IR light 940	
Type of light	nm	IR light 940
Ambient light limit		
Daylight	Lux	10,000
Halogen	Lux	3000
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	20
Load current	mA	100
Voltage drop	VDC	1
Short circuit and overload protection		yes
Reverse polarity protection		yes
Mechanical specifications		
Protection IEC		IP66
Housing		Nickel-plated brass
Housing diameter	mm	18
Optical		PMMA lens
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +158
Approvals		
CE		yes
UL listed		yes
CSA		yes
Weight	g	45
Connection		Connector M12

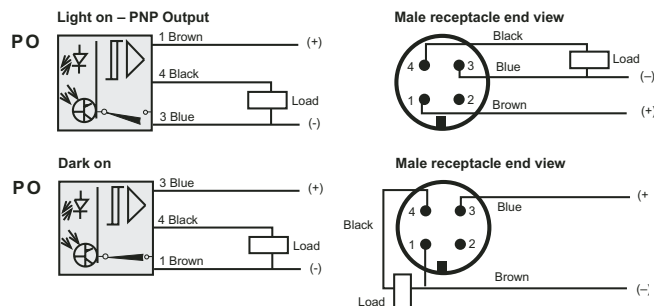


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Approximate dimensions



Wiring diagrams



Diffused

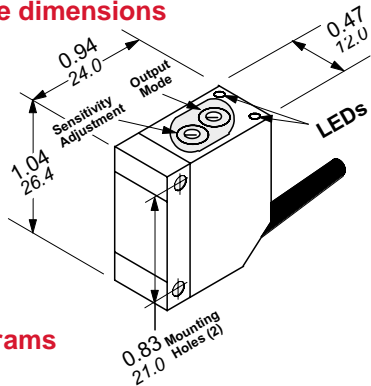
Sensing range: 400mm

Sensing range	400mm	
Catalog number	SOD400B26NU2PO	
List price	\$ 129.00	
Output	PNP, Sourcing, Normally Open	
Reference	100mm x 100mm white target	
Detectable object	Opaque and transparent	
Switching frequency	Hz	500
Response time	ms	1
Readiness delay	ms	30
Operating mode	Light/dark ON, selectable	
LEDs		
Yellow	Output status	
Red	Signal strength	
Type of light	nm	IR light 950
Ambient light limit		
Daylight	Lux	20,000
Halogen	Lux	5000
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	30
Load current	mA	300
Voltage drop	VDC	2.5
Short circuit and overload protection	yes	
Reverse polarity protection	yes	
Mechanical specifications		
Protection IEC	IP67	
Housing	Polycarbonate	
Optical	PMMA lens	
Operating temperature	°F	-13 ... +158
Storage temperature	°F	-40 ... +176
Approvals		
CE	yes	
UL listed	yes	
CSA	yes	
Weight	g	20
Connection	2m cable, #22 AWG, PUR black	

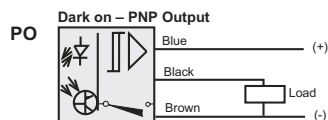
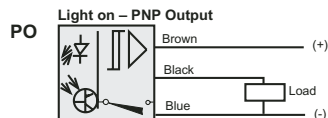


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Approximate dimensions



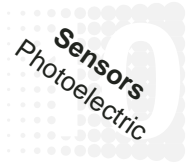
Wiring diagrams



Mounting bracket is included with sensor.

Diffused

Sensing range: 500mm

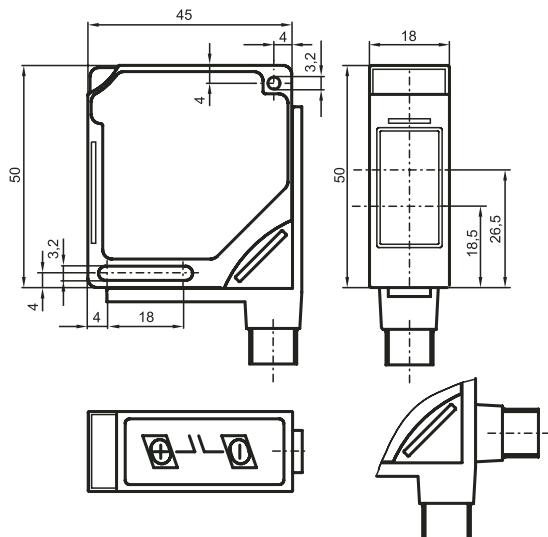


Sensing range		500mm	500mm
Catalog number		SOD500B45NC1PKS	SOD500B45NC1NKS
List price		\$ 155	\$ 155
Output		PNP, Sourcing Programmable: • Switch output (NO/NC) • Antivalent • Pre-fault indicator	NPN, Sinking Programmable: • Switch output (NO/NC) • Antivalent • Pre-fault indicator
Reference		Std. White card 100mm x 100mm	Std. White card 100mm x 100mm
Detectable object		Clear or opaque	Clear or opaque
Switching frequency	KHz	1	1
Response time	ms	<3	<3
Readiness delay	ms	<80	<80
Operating mode			
LED's			
Yellow		Switch status	Switch status
Red		Pre-fault indicator flashing at 2 Hz	Pre-fault indicator flashing at 2 Hz
		Key stroke response 65ms	Key stroke response 65ms
		Error display in "Teach-in" mode 1.5s	Error display in "Teach-in" mode 1.5s
Green		Power on	Power on
		Indicator in teach mode flashing	Indicator in teach mode flashing at 2 Hz or 4 Hz
Type of light		Visible red, 660 nm	Visible red, 660 nm
Ambient light limit			
Daylight	lux	<10,000	<10,000
Halogen light	lux	<7,500	7,500
Electrical specifications			
Supply voltage	VDC	10-30	10-30
Current consumption	mA	<25	<25
Load current	mA	200	200
Voltage drop	VDC	2.5	2.5
Short circuit and overload protection		Yes	Yes
Reverse polarity protection		Yes	Yes
Mechanical specifications			
Protection IEC		IP 67	IP 67
Housing		PBT	PBT
Optical		Scratch resistant plastic	Scratch resistant plastic
Operating temperature	°F	-13... +158	-13... +158
Storage temperature	°F	-40... +167	-40... +167
Approvals			
CE		Yes	Yes
UL Listed		Yes	Yes
CSA		Yes	Yes
Weight	g	60	60
Connection		Connector M12	Connector M12
Programming		via hand held unit or PC	via hand held unit or PC

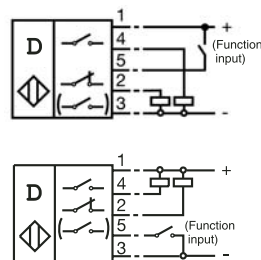


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Approximate dimensions



Wiring diagrams



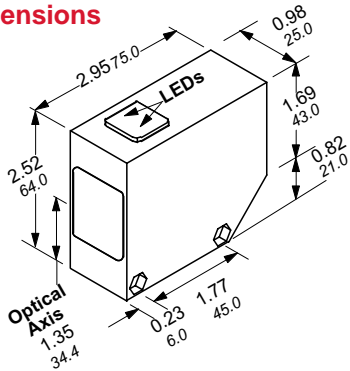
Diffused
Sensing range: 800mm

Sensing range		800mm
Catalog number		SOD800B75NTPOS
List price		\$ 107.00
Output		PNP, Sourcing, Normally Open
Reference		200mm x 200mm white target
Detectable object		Opaque and transparent
Switching frequency	Hz	300
Response time	ms	1.5
Readiness delay	ms	50
Operating mode		Light/dark ON, selectable
LEDs		
Yellow		Output status
Red		Weak signal
Type of light	nm	IR light 940
Ambient light limit		
Daylight	Lux	10,000
Halogen	Lux	7500
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	40
Load current	mA	200
Voltage drop	VDC	3
Short circuit and overload protection		yes
Reverse polarity protection		yes
Mechanical specifications		
Protection IEC		IP66
Housing		Crastin
Optical		PMMA lens
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +131
Approvals		
CE		yes
UL listed		yes
CSA		yes
Weight	g	100
Connection		Terminal

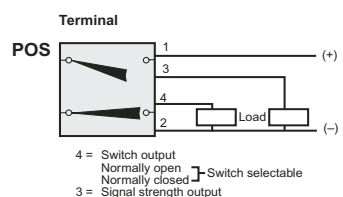


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Approximate dimensions



Wiring diagrams



Mounting bracket is included with sensor.

Diffused Sensing range: 2m

Sensors
Photoelectric

Sensing range		2m
Catalog number		SOD2000B75NTKK
List price		\$ 125.00
Output		Relay, Normally Open
Reference		200mm x 200mm white target
Detectable object		Light reflecting objects
Switching frequency	Hz	25
Response time	ms	20
Readiness delay	ms	50
Operating mode		Light ON/dark ON, selectable
LEDs		
Yellow		Output status
Red		Weak signal
Type of light	nm	IR light 940
Ambient light limit		
Daylight	Lux	10,000
Halogen	Lux	7500
Electrical specifications		
Supply voltage		12 – 240VDC or 24 – 240VAC
Power consumption	mA	3
Load current	mA	3
Voltage drop	VDC	
Short circuit		
and overload protection		Yes
Reverse polarity protection		Yes
Mechanical specifications		
Protection IEC		IP66
Housing		Crastin
Optical		PMMA lens
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +158
Approvals		
CE		yes
UL listed		no
CSA		no
Connection		Terminal



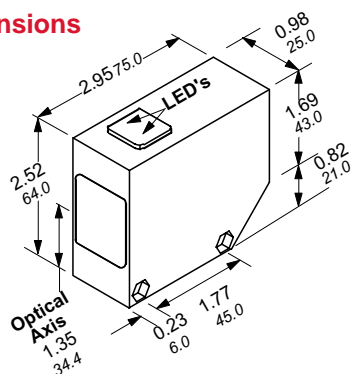
SOD2000B75NTKK



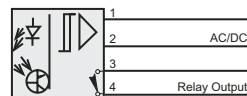
SOD2000B75NTKK Bracket

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Approximate dimensions



Wiring diagrams



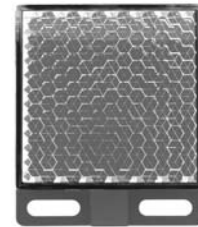
Retro-reflective

Sensing range: 1.5m

Sensing range	1.5m	
Catalog number	SOR1500M18NC1PO	
List price	\$ 82.00	
Output	PNP, Sourcing, Normally Open	
Polarized	Yes	
Reference	50mm x 50mm Reflector	
Detectable object	Opaque and mirror objects	
Switching frequency	Hz	300
Response time	ms	1.5
Readiness delay	ms	50
Operating mode	Light On/Dark On, Wiring dependent	
LEDs	Output status	
Yellow	Visible red light	
Type of light	nm	
Ambient light limit		
Daylight	Lux	10,000
Halogen	Lux	3000
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	20
Load current	mA	100
Voltage drop	VDC	2.5
Short circuit and overload protection	yes	
Reverse polarity protection	yes	
Mechanical specifications		
Protection IEC	IP67	
Housing	Nickel-plated brass	
Housing diameter	mm	18
Optical	PMMA lens	
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +158
Approvals		
CE	yes	
UL listed	yes	
CSA	yes	
Weight	g	45
Connection	Connector M12	



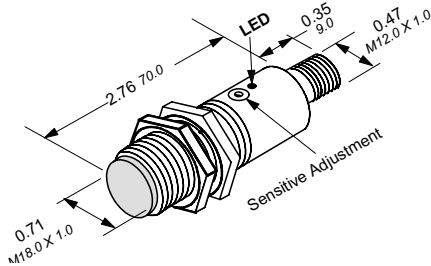
SOR1500M18NC1PO



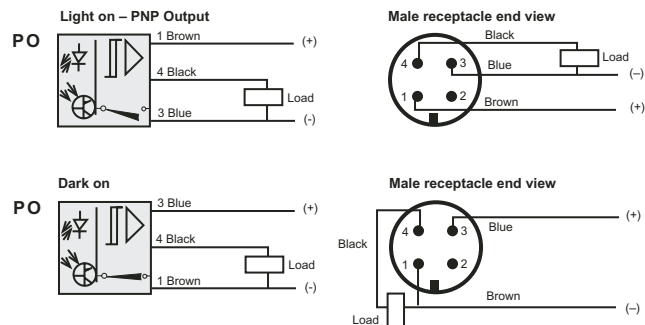
RFL1 Reflector

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Approximate dimensions



Wiring diagrams



Retro-reflective

Sensing range: 2m

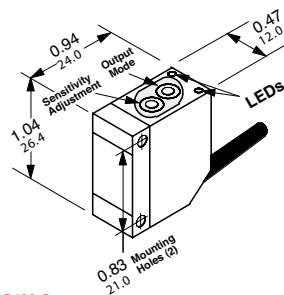
Sensors
Photoelectric

Sensing range		2m
Catalog number	SOR2000B26NU2PO ^①	
List price	\$ 129.00	
Output	PNP, Sourcing, Normally Open	
Polarized	No	
Reference	50mm x 50mm Reflector	
Detectable object	Opaque	
Switching frequency	Hz	500
Response time	ms	1.0
Readiness delay	ms	30
Operating mode	Light On/Dark On, Selectable	
LEDs	Output status	
Yellow	Weak signal indication	
Red	IR light 950	
Type of light	nm	
Ambient light limit		
Daylight	Lux	20,000
Halogen	Lux	5000
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	30
Load current	mA	300
Voltage drop	VDC	2.5
Short circuit		
and overload protection	yes	
Reverse polarity protection	yes	
Mechanical specifications		
Protection IEC	IP67	
Housing	Polycarbonate	
Optical	PMMA lens	
Operating temperature	°F	-13 ... +158
Storage temperature	°F	-40 ... +176
Approvals		
CE	yes	
UL listed	yes	
CSA	yes	
Weight	g	20
Connection	2m cable, #22 AWG, PUR	

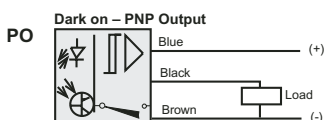
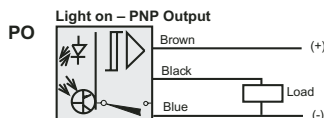


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Approximate dimensions



Wiring diagrams



① Mounting bracket and reflector are included with sensor.

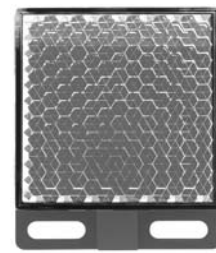
Retro-reflective

Sensing range: 3m

Sensing range	3m	
Catalog number	SOR3000M18NC1PO ①	
List price	\$ 82.00	
Output	PNP, Sourcing, Normally Open	
Polarized	No	
Reference	50mm x 50mm Reflector	
Detectable object	Opaque	
Switching frequency	Hz	300
Response time	ms	1.5
Readiness delay	ms	50
Operating mode	Light On/Dark On, Wiring dependent	
LEDs	Output status	
Yellow	IR LED 880	
Type of light	nm	IR LED 880
Ambient light limit		
Daylight	Lux	10,000
Halogen	Lux	3000
Electrical specifications		
Supply voltage	VDC	10 – 30
Current consumption	mA	40
Load current	mA	100
Voltage drop	VDC	1
Short circuit and overload protection	yes	
Reverse polarity protection	yes	
Mechanical specifications		
Protection IEC	IP66	
Housing	Nickel-plated brass	
Housing diameter	mm	18
Optical	PMMA lens	
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +158
Approvals		
CE	yes	
UL listed	yes	
CSA	yes	
Weight	g	45
Connection	Connector M12	



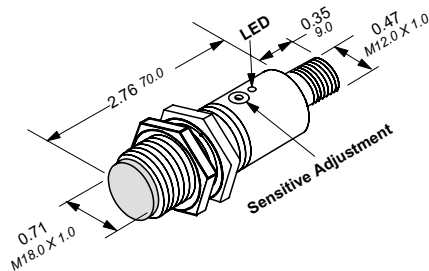
SOR3000M18NC1PO



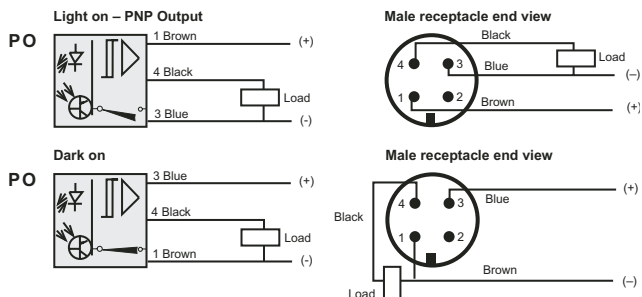
RFL1 Reflector

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Approximate dimensions



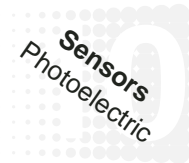
Wiring diagrams



① Reflector is included with sensor.

Retro-reflective

Sensing range: 5m

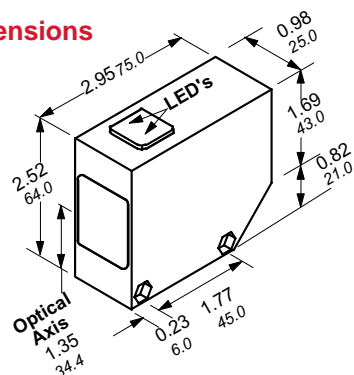


Sensing range	5m	5m
Catalog number	SOR5000B75NTPOS ①	SOR5000B75NTKK
List price	\$ 107.00	\$ 125.00
Output	PNP, Sourcing, Normally Open	Relay, Normally Open
Polarized	Yes	Yes
Reference	50mm x 50mm Reflector	50mm x 50mm Reflector
Detectable object	Opaque and mirror objects	Opaque and mirror objects
Switching frequency	Hz	25
Response time	ms	20
Readiness delay	ms	50
Operating mode	Light On/dark On, selectable	Light On/dark On, selectable
LEDs		
Yellow	Output status	Output status
Red	Weak signal	Weak signal
Type of light	nm	nm
Ambient light limit		
Daylight	Lux	10,000
Halogen light	Lux	7500
Electrical specifications		
Supply voltage	VDC	12 – 30
Current consumption	mA	35
Load current	mA	200
Voltage drop	VDC	3
Short circuit and overload protection	yes	yes
Reverse polarity protection	yes	yes
Mechanical specifications		
Protection IEC	IP66	IP66
Housing	Crastin	Crastin
Optical	PMMA lens	PMMA lens
Operating temperature	°F	-13 ... +131
Storage temperature	°F	-40 ... +131
Approvals		
CE	yes	yes
UL listed	yes	no
CSA	yes	no
Weight	g	100
Connection	Terminal	Terminal

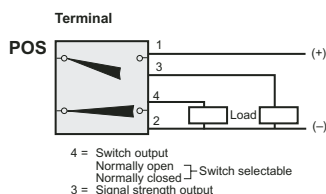


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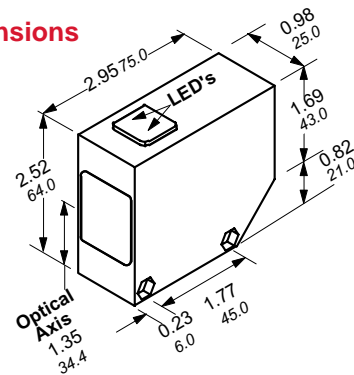
Approximate dimensions



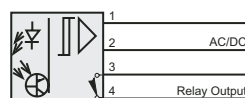
Wiring diagrams



Approximate dimensions



Wiring diagrams



① Mounting bracket and reflector are included with sensor.