Series 4000B

Description

Series 4000B full size self-contained sensors are designed to operate in a wide range of industrial applications.

A wide selection of plug-in timing modules including On and Off Delay, One-Shot, Delayed One-Shot, Motion Detector and a counting module increase the application solving capability of the Series 4000B sensor.

Models are available with operating voltages from 18-253V AC and 20–32V DC. Easy to wire terminals and alignment test points reduce installation time.

Series 4000B LED sensors can be used outdoors, even in direct sunlight (with some precautions taken to insure proper operation). The sensor lens and reflector should be protected from excessive moisture by use of hoods over both units. Some reduction in the maximum operating distance may be required in areas with adverse weather conditions.

Alignment is simplified on the Series 4000B. A DC voltmeter connected to the (+) and (–) alignment test points (see wiring diagram on page 1–211) on the circuit board of the sensor will serve as an indicator of whether or not ideal alignment is being approached.

General Specifications

Light Source	Infrared LED (880nm), visible red for polarized model
Unit Protection	False pulse protection
Supply Voltage	24V DC, 120V AC, 220V AC (see Selection Guide)
Current Consumption	See Selection Guide
Output Type	EM-relay, TRIAC, FET, NPN/PNP (see Selection Guide)
Output Mode	Light/dark operate selectable
Output Rating	Determined by plug-in module (see Selection Guide)
Response Time	Determined by plug–in module (see Selection Guide)
Housing Material	Noryl
Lens Material	Acrylic (glass for polarized version)
LED Indicators	See User Interface on page 1–211
Connection Types	Screw terminal, nickle-plated
Supplied Accessories	#8–670 DPDT relay module
Optional Accessories	Mounting brackets, reflectors, cordsets
Operating Environment	NEMA 3, 4, 12, 13 (IP66)
Vibration	10–55Hz, 1mm amplitude, Meets or exceeds IEC 60947–5–2
Shock	30g with 1ms pulse duration, Meets or exceeds IEC 60947–5–2
Operating Temperature	–40°C to +57°C (–40°F to +135°F)
Relative Humidity	5…90% maximum
Approvals	UL listed, CSA approved

Features

- Harsh duty package
- Screw terminal connections
- Long-range sensing modes
- Plug-in logic and output modules
- Both DC and AC/DC operation
- Selectable light/dark operation

General Information

Sensing Modes

Accessories

User Interface Panel

Label	Color	State	Status
Power	Yellow	OFF	Sensor not powered
		ON	Sensor powered

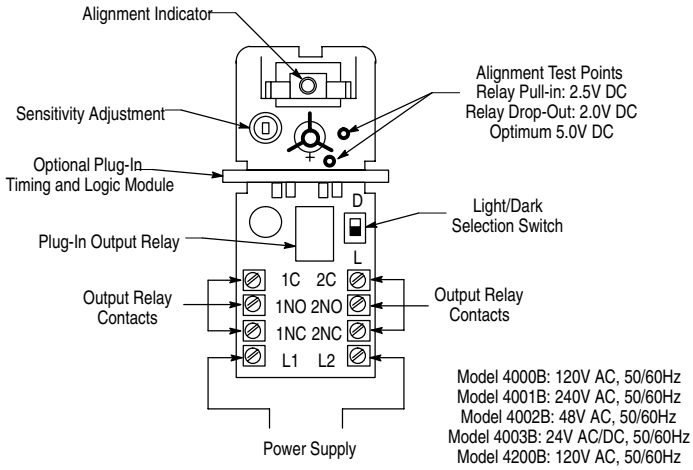
Optional Timing and Logic Modules

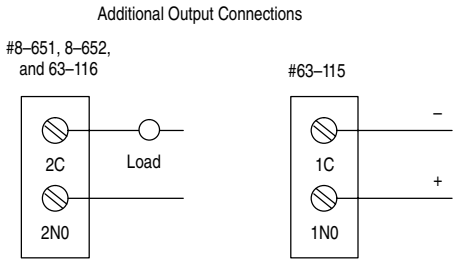
These plug-in modules can be added to any series 4000B Photoelectric sensor.

Function	Adjustable Time Delay (s)		Adjustable Dwell (s)	Catalog Number
	On	Off		
One-shot	—	—	0.040–0.250	**60–1612–1**
			0.5–15	**60–1612–2**
On and/or Off Delay	0.05–1.0	0.05–1.5	—	**60–1613**
	0.5–10	0.5–15		**60–1614**
Delayed One-shot	0.10–1.5	—	0.040–0.250	**60–1625**
	1.0–15		0.040–0.250	**60–1626**
Motion Detector	—	0.05–1.5	—	**60–1660**
		0.5–15		**60–1661**
Preset Counter	2–999 Counts		0.040–0.250	**60–1716**

Wiring Diagrams

All Sensing Modes Except Transmitted Beam Light Source

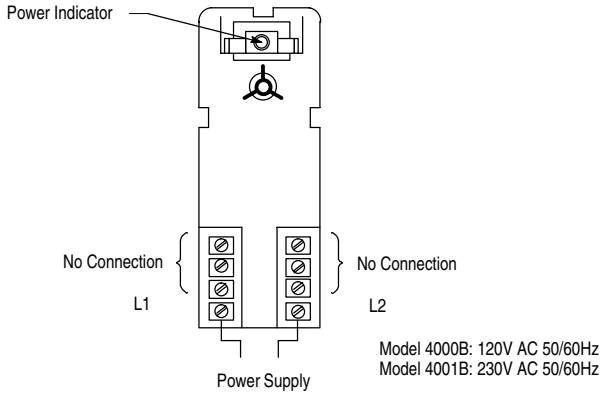




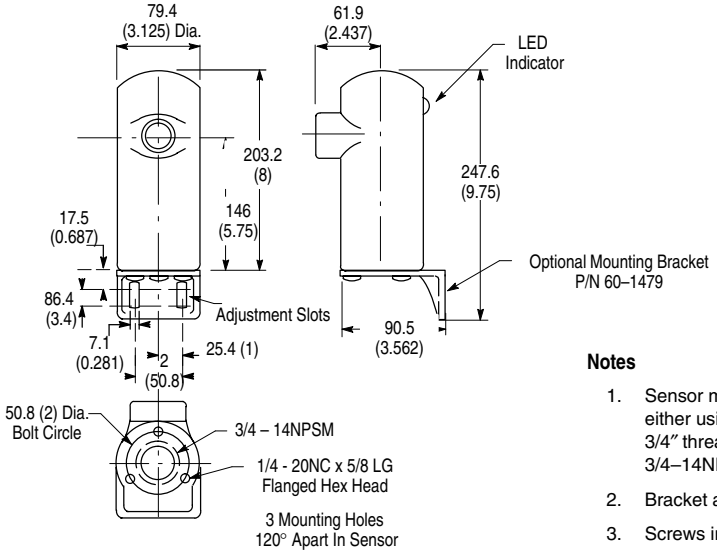
Note: Details regarding connection of Allen-Bradley Series 4000B sensors to Allen-Bradley Programmable Controllers can be found in publication 42-2.0.

Wiring Diagrams (continued)

Transmitted Beam Light Source



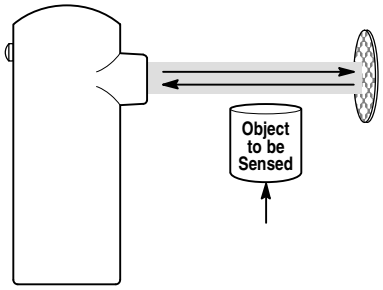
Dimensions— mm (inches)



Notes

1. Sensor may be mounted without bracket, either using 3, 1/4–20NC mtg. holes or on a 3/4″ threaded pipe, thread pitch 3/4–14NPSM.
2. Bracket allows 360-degree adjustment.
3. Screws included with mounting bracket.

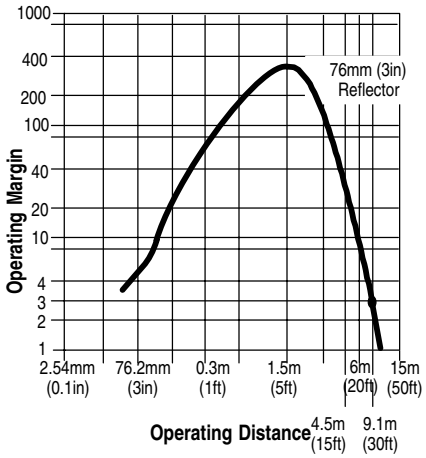
Note: Do not use lockwashers with supplied whiz-lock mounting screws.



Specifications

Field of View	1.5°
Emitter LED	Infrared 940nm

Typical Response Curve



Selection Guide

1. Select sensor.

Operating Voltage/ Power Consumption	Sensing Range	Output Energized	Sensor Response Time❶	Catalog Number
102–132V AC/ 2VA	50.8mm (2in) to 10.6m (35ft)	Light/Dark Selectable	5ms	**42RLU–4000B**
195–253V AC/ 2VA				**42RLU–4001B**
40–58V AC/ 2VA				**42RLU–4002B**
18–28V AC/DC/2VA 20–32V DC				**42RLU–4003B**

2. Select optional plug-in timing and logic module, page 1–211.

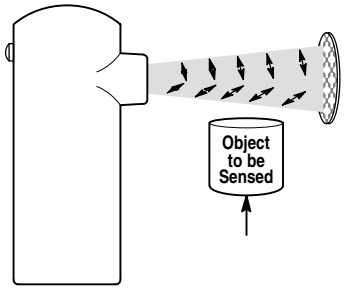
3. Select optional plug-in output module.

Type	Max Load Current	Max Leakage Current	Output Response Time❶	Catalog Number
DPDT EM-Relay (included)	5A, 120V AC 2.5A, 240V AC	—	10ms On 15ms Off	**8–670❷**
SP-N.O. AC TRIAC	1A, 265V AC, 20mA min	2mA	8ms	**8–651**
SP-N.O. AC/DC FET	30mA, 0-120V AC/DC	10µA	1ms	**8–652**
Open Collector NPN	250mA, 30V DC	1µA	1ms	**63–115**
DC Voltage Output Adaptor	30mA, 17V DC	—		**63–116**

❶ Add for total response time.

❷ 8–670 relay output module supplied with sensor.

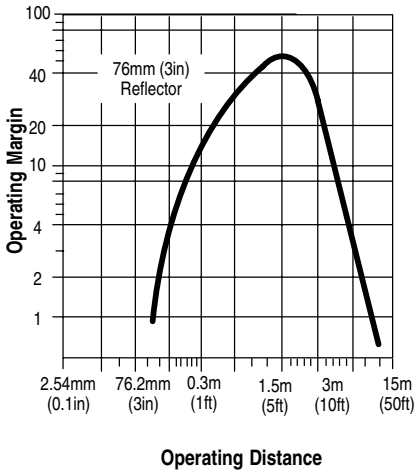
Series 4000B Polarized Retroreflective



Specifications

Field of View	2°
Emitter LED	Visible Red 660nm

Typical Response Curve



Selection Guide

1. Select sensor.

Operating Voltage/ Power Consumption	Sensing Range	Output Energized	Sensor Response Time❶	Catalog Number
102–132V AC/ 2A	50.8 (2in) to 7m (23ft)	Light/Dark Selectable	5ms	**42RLU–4200B**

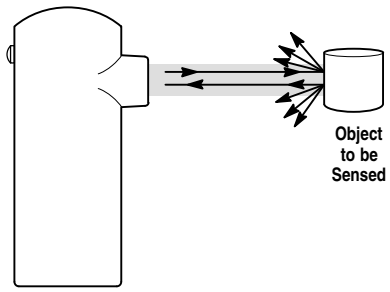
2. Select optional plug-in timing and logic module, page 1–211.

3. Select optional plug-in output module.

Type	Max Load Current	Max Leakage Current	Output Response Time❶	Catalog Number
DPDT EM-Relay (included)	5A, 120V AC 2.5A, 240V AC	—	10ms On 15ms Off	**8–670❷**
SP-N.O. AC TRIAC	1A, 265V AC, (20mA min)	2mA	8ms	**8–651**
SP-N.O. AC/DC FET	30mA, 0-120V AC/DC	10µA	1ms	**8–652**
Open Collector NPN	250mA, 30V DC	1µA	1ms	**63–115**
DC Voltage Output Adaptor	30mA, 17V DC	—		**63–116**

❶ Add for total response time.

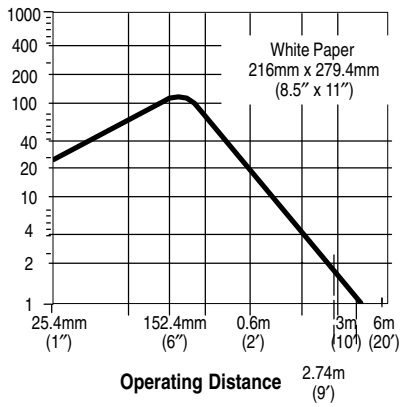
❷ 8–670 relay output module supplied with sensor.



Specifications

Field of View	4°
Emitter LED	Infrared 940nm

Typical Response Curve



Selection Guide

1. Select sensor.

Operating Voltage/ Power Consumption	Sensing Range	Output Energized	Sensor Response Time❶	Catalog Number
102–132V AC/ 2VA	50.8 (2in) to 3.6m (12ft)	Light/Dark Selectable	5ms	**42RLP–4000B**
195–253V AC/ 2VA				**42RLP–4001B**
40–58V AC/ 2VA				**42RLP–4002B**
18–28V AC/DC/2VA 20–32V DC				**42RLP–4003B**

2. Select optional plug-in timing and logic module, page 1–211.

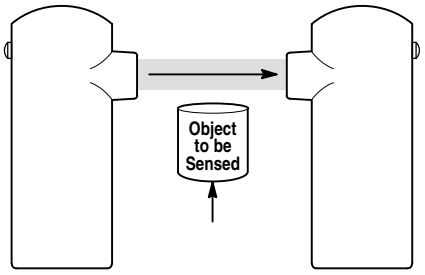
3. Select optional plug-in output module.

Type	Max Load Current	Max Leakage Current	Output Response Time❶	Catalog Number
DPDT EM-Relay (included)	5A, 120V AC 2.5A, 240V AC	—	10ms On 15ms Off	**8–670❷**
SP-N.O. AC TRIAC	1A, 265V AC, 20mA min	2mA	8ms	**8–651**
SP-N.O. AC/DC FET	30mA, 0-120V AC/DC	10µA	1ms	**8–652**
Open Collector NPN	250mA, 30V DC	1µA	1ms	**63–115**
DC Voltage Output Adaptor	30mA, 17V DC	—		**63–116**

❶ Add for total response time.

❷ 8–670 relay output module supplied with sensor.

Series 4000B Transmitted Beam

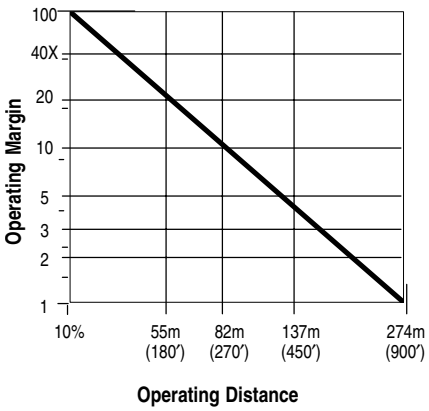


Light sources and receivers must be ordered separately. Any light source is compatible with any receiver.

Specifications

Field of View	3°
Emitter LED	Infrared 940nm

Typical Response Curve



Selection Guide (Order Both Light Source and Receiver)

1. Select light source.

Operating Voltage	Catalog Number
102–132V AC, 50/60Hz	**42RLL-4000B**
195–253V AC, 50/60Hz	**42RLL-4001B**

2. Select receiver.

Operating Voltage/ Power Consumption	Sensing Range	Output Energized	Sensor Response Time❶	Catalog Number
102–132V AC/ 2VA	50.8 (2in) to 274m (900ft)	Light/Dark Selectable	5ms	**42RLR–4000B**
195–253V AC/ 2VA				**42RLR–4001B**

3. Select optional plug-in timing and logic module, page 1–211.

4. Select optional plug-in output module.

Type	Max Load Current	Max Leakage Current	Output Response Time❶	Catalog Number
DPDT EM-Relay (included)	5A, 120V AC 2.5A, 240V AC	—	10ms On 15ms Off	**8–670❷**
SP-N.O. AC TRIAC	1A, 265V AC, 20mA min	2mA	8ms	**8–651**
SP-N.O. AC/DC FET	30mA, 0-120V AC/DC	10µA	1ms	**8–652**
Open Collector NPN	250mA, 30V DC	1µA	1ms	**63–115**
DC Voltage Output Adaptor	30mA, 17V DC	—		**63–116**

❶ Add for total response time.

❷ 8–670 relay output module supplied with sensor.