## Features

- Wide selection for increased application flexibility
- Quick-disconnect design reduces down time
  - No disruption of alignment or wiring
- Three power base styles:
  - Terminal base can eliminate need for separate junction box
  - 3 m (10 ft) cable base for lower profile (red and blue line only)
  - Pre-wired mini-style quick-disconnect (green line only)
- False turn-on pulse protection
- Switch selectable light or dark operating mode
- Adjustable sensitivity
- Choice of relay or solid-state outputs
- Highly visible LED output indicator

## Specifications

| | Red Line | Blue Line | Green Line | Analog Output |
|---|---|---|---|---|
| **Environmental** | | | | |
| Certifications | UL Listed, CSA Approved, and CE Marked for all applicable directives | | | |
| Operating Environment | NEMA 3, 4, 12, 13; IP66 | | | |
| Operating Temperature [C (F)] | -40…+52° (-40…+125°) for TRIAC output<br>-40…+65° (-40…+150°) for all others | -40…+65° (-40…+150°) | -40…+65° (-40…+150°) for EM relay<br>-40…+52° (-40…+125°) for solid state | -40…+65° (-40…+150°) |
| Vibration | 10…55 Hz, 1 mm amplitude, meets or exceeds IEC 60947-5-2 | | | |
| Shock | 30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2 | | | |
| Relative Humidity | 90% max | | | |
| Ambient Light Immunity | Incandescent light: 5000 lux | | | |
| **Optical** | | | | |
| Sensing Modes | Retroreflective, diffuse, long range diffuse, fiber optic, background suppression, transmitted beam (see Product Selection table on page 1-220) | | | |
| Sensing Range | See Product Selection table on page 1-220 | | | |
| Field of View | See Product Selection table on page 1-220 | | | |
| Light Source | Visible red LED (660 nm), infrared LED (880 nm) | | | |
| **Electrical** | | | | |
| Voltage | 12…30V DC, 120V AC (see Product Selection table on page 1-220) | | | |
| Current Consumption | Depends on power base (see Product Selection table on page 1-220) | | | |
| Sensor Protection | False pulse | Reverse polarity and false pulse | False pulse | False pulse, short circuit |
| **Outputs** | | | | |
| Response Time | 1…8 ms | 1 ms | Determined by plug-in module | 100 ms |
| Output Type | PNP and NPN, FET,SPDT relay,TRIAC, analog output (see Product Selection table on page 1-220) | | | |
| Output Mode | Light or dark operate selectable, selectable positive or negative slope for analog models (see Product Selection table on page 1-220) | | | |
| Output Current | 30 mA…2A max | 100 mA | Determined by plug-in module | See Product Selection table |
| Output Leakage Current | 1mA max | 1 µA | — | 10 µA |
| **Mechanical** | | | | |
| Housing Material | Valox® | | | |
| Lens Material | Acrylic (glass on polarized models) | | | |
| Connection Types | See Product Selection table on page 1-220 | | | |
| Supplied Accessories | None | | | |
| Optional Accessories | See mounting brackets, reflectors, and cordsets on page 1-226 | | | |

## User Interface Panel

| Label | Color | State | Status |
|---|---|---|---|
| Output | Red | OFF | Sensor output de-activated |
| | | ON | Sensor output activated |

## Plug-In Output Module (required for green line only)

| Output Type Capacity | Max Leakage Current | Output Response Time❶ | Cat. No. |
|---|---|---|---|
| SPDT EM-Relay 2 A, 120V AC/1 A, 240V AC | — | 10 ms On 15 ms Off | 8-590 |
| | | | 8-594❷ |
| SP-N.O. FET SS Relay 30 mA Cont./0…120V AC/DC | 10 mA | 1 ms | 8-591 |
| SP-N.O. AC Power TRIAC SS Relay 0.75 A Cont. 10 A Inrush/24…240V AC | 1 mA | 8 ms | 8-592 |
| NPN and PNP 100 mA 30V DC | 1 µA | 1 ms | 8-593❷ |

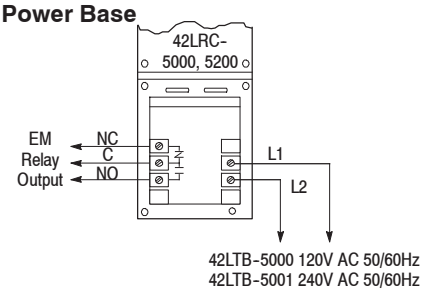
## Plug-In Control Function Module (optional for green line only)

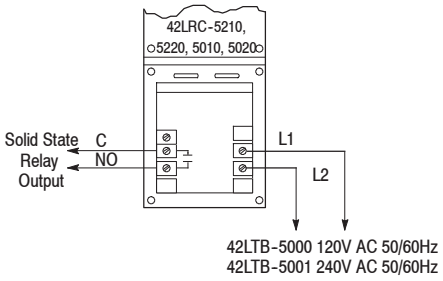
| Function | Adjustable Time Delay (s) | | Adjustable Dwell (s) | Cat. No. |
|---|---|---|---|---|
| | On | Off | | |
| On and/or Off Delay | 0.05…1.0 | 0.05…1.5 | — | 60-1790 |
| | 0.5…10 | 0.5…15 | | 60-1791 |
| | 2…4.0 | 2…6.0 | | 60-1798 |
| One-Shot | — | — | 0.005…0.5 | 60-1792 |
| | | | 0.5…15 | 60-1793 |
| Motion Detector | — | 0.05…1.5 | | 60-1796 |
| | | 0.5…15 | | 60-1797 |

❷ Add sensor and output response time for total response time.
❷ Use with 42MTB-5004 base ONLY. Other output modules will not function with 5004 base.

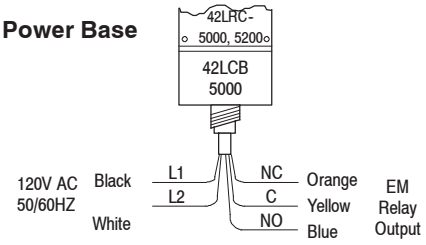
## Red Line Wiring Diagrams

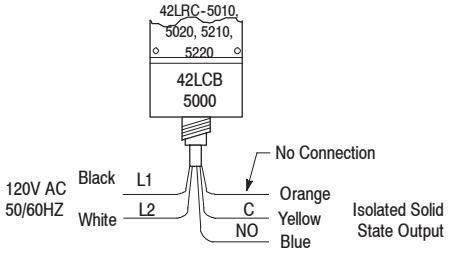
### With Terminal Style Power Base




### With Cable Style Power Base

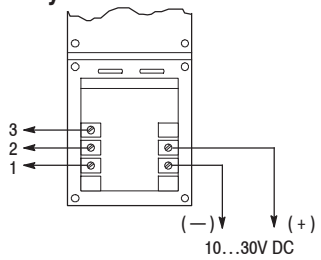


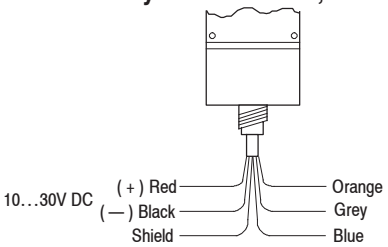

**Note:** Details of connection of Allen-Bradley Series 5000 photoelectric sensors to Allen-Bradley Programmable Controllers can be found in publication 42-2.0. Refer to *www.ab.com/literature* for more information.

## Blue Line Wiring Diagrams

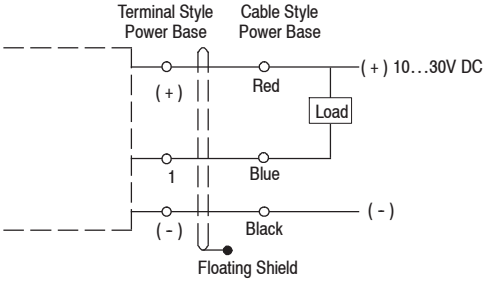
### Terminal Style Power Base. DTB-5000



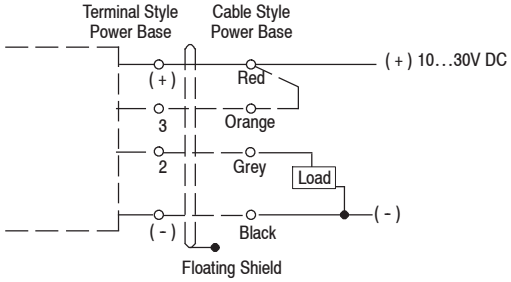

### Cable Style Power Base, DCB-5000




### NPN Output Connection (Sinking)

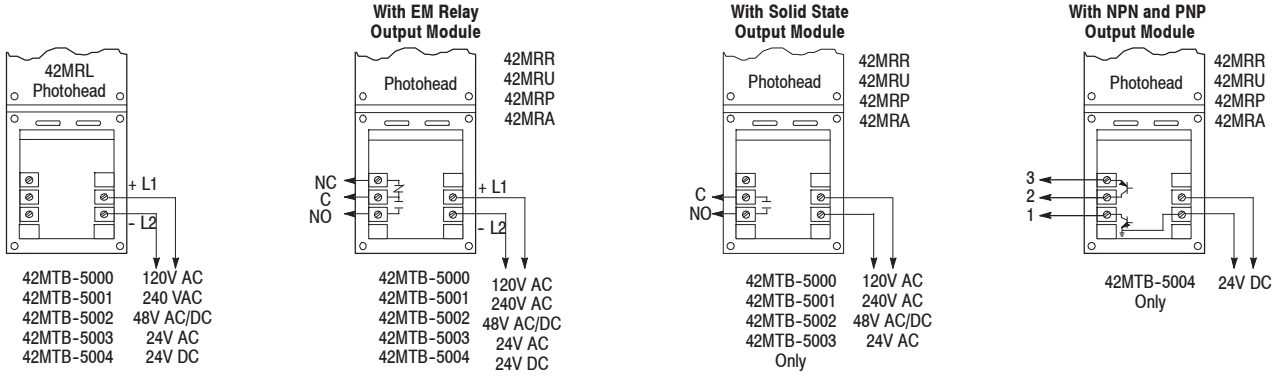



### PNP Output Connection (Sourcing)



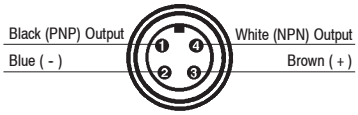

## Green Line Wiring Diagrams

### With Terminal Style Power Base

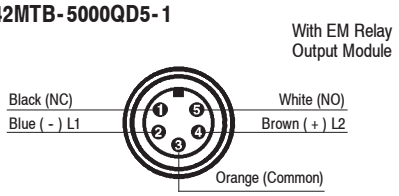



### With Mini Quick-Disconnector Style Power Base

**42MTB-5004QD4-1**



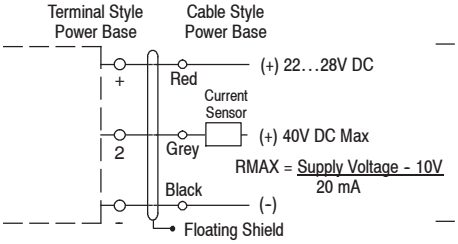

**42MTB-5000QD5-1**



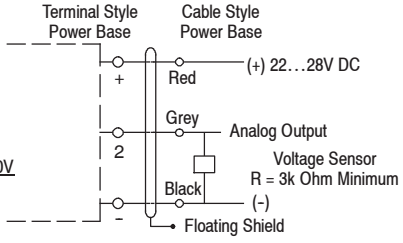

**Note:** Details of connection of Allen-Bradley Series 5000 photoelectric sensors to Allen-Bradley Programmable Controllers can be found in publication 42-2.0.
Wire colors shown refer to Allen-Bradley quick-disconnect cables.

## Analog Output Wiring Diagrams

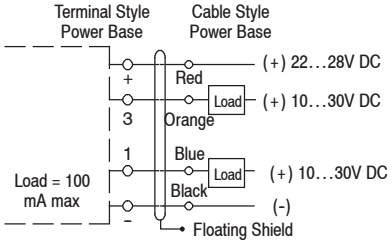
### Current Output Connections




### Voltage Output Connections



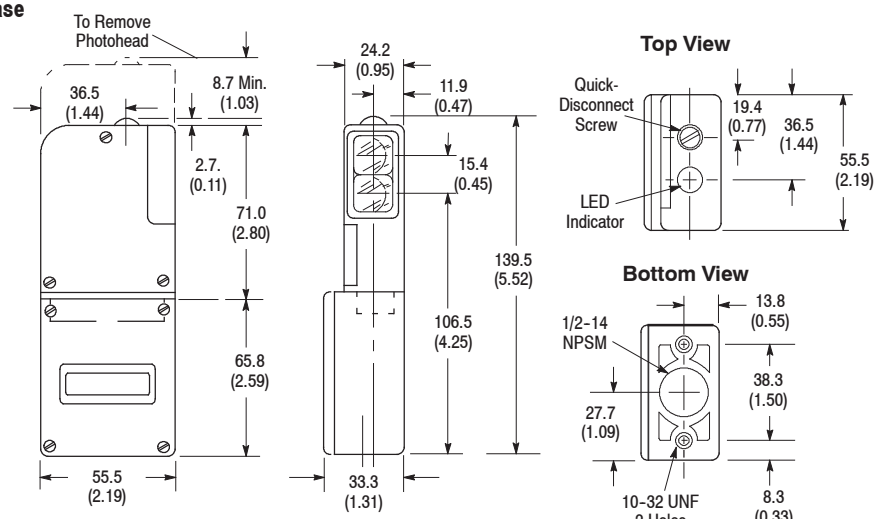

### NPN Set Point Output Connections




**Note:** Details of connection of Allen-Bradley Series 5000 Photoelectric sensors to Allen-Bradley Programmable Controllers can be found in publication 42-2.0.

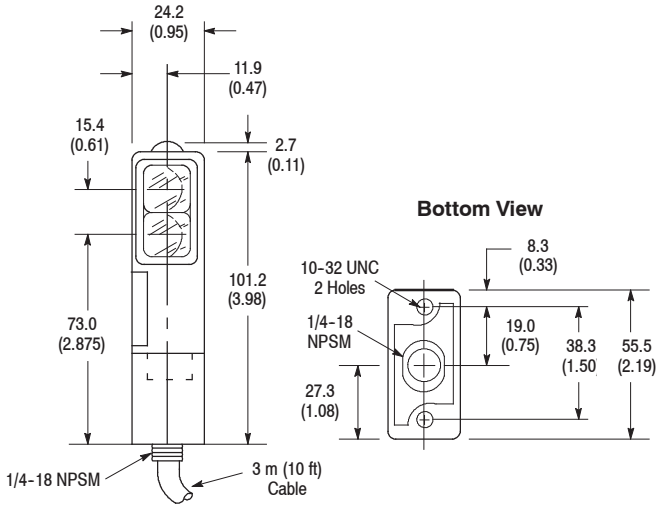
## Approximate Dimensions (Applies to all versions) [mm (in.)]

### Terminal Style Power Base



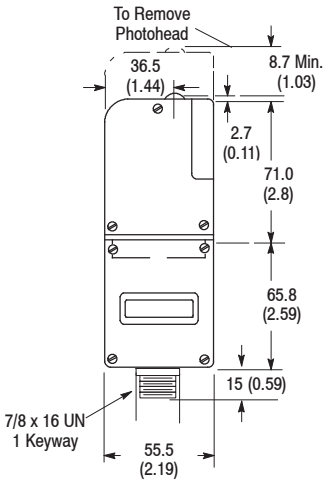

**Note**: Hardware included with sensor: two (2) nickel plated 10–32 mounting screws.

### Cable Style Power Base



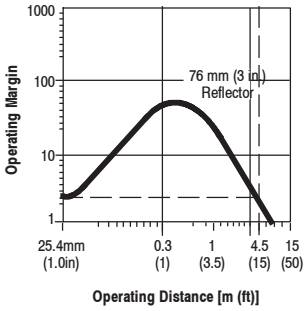
## Approximate Dimensions (Applies to all versions) [mm (in.)] (continued)

### Quick-Disconnect Style Power Base

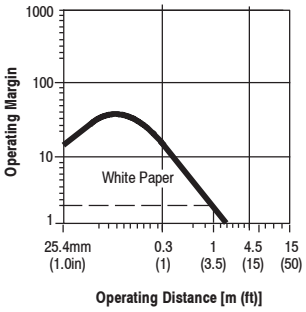



## Red Line Typical Response Curve

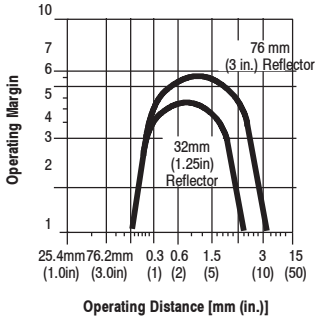
### Retroreflective




### Standard Diffuse

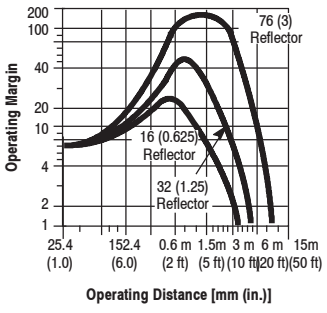



### Polarized Retroreflective

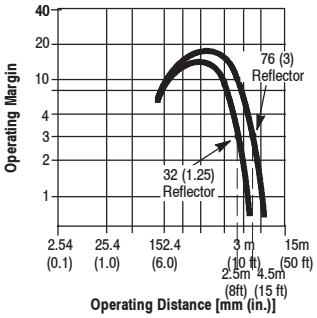



## Blue Line Typical Response Curve

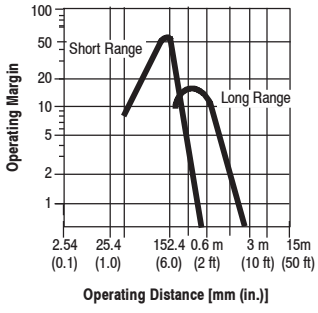
### Retroreflective



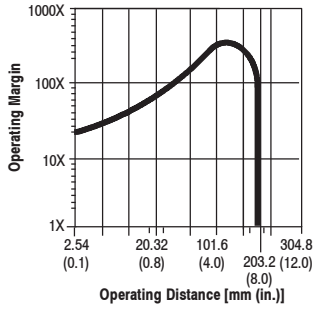

### Polarized Retroreflective




### Standard Diffuse

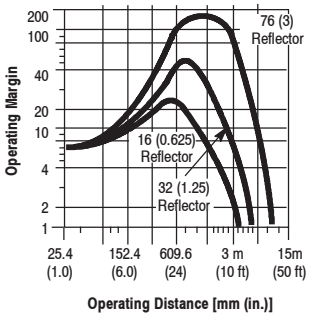



### Background Suppression❶

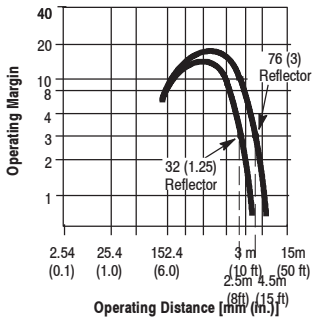


## Green Line Typical Response Curve

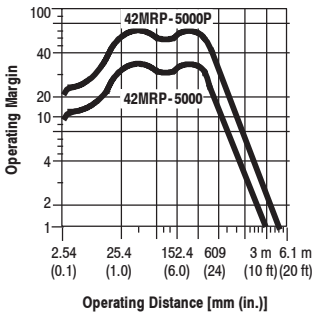
### Retroreflective



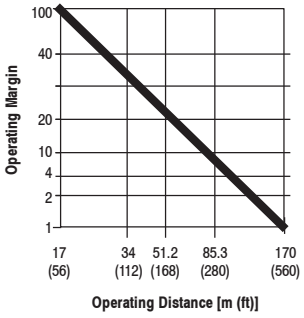

### Polarized Retroreflective



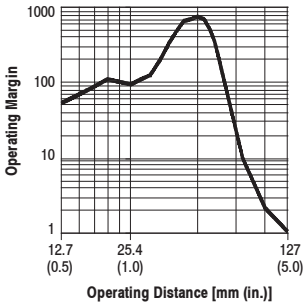

### Standard Diffuse



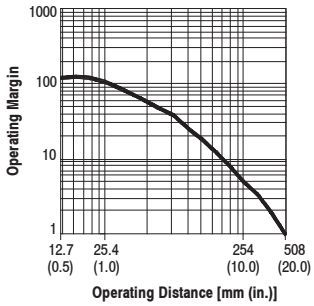

### Transmitted Beam



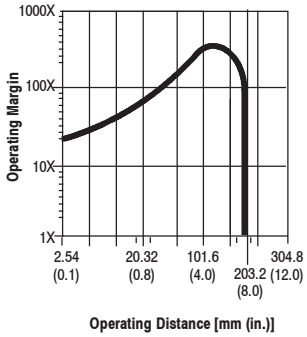

### Fixed Focus Lens




### Wide Angle Lens




### Background Suppression❶

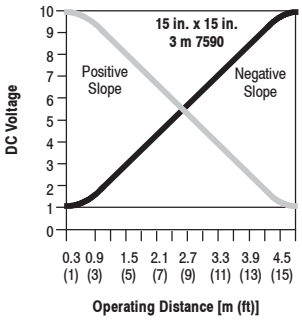



❶ Example: Operating distance set at 203.2 mm (8 in.).

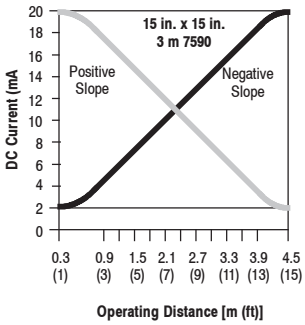
## Analog Output Typical Response Curve

### Retroreflective

**Voltage Output Slope**

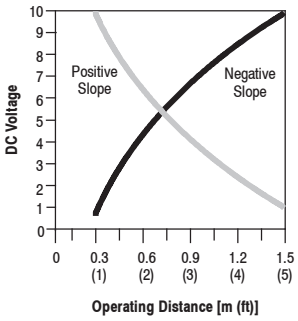



**Current Output Slope**

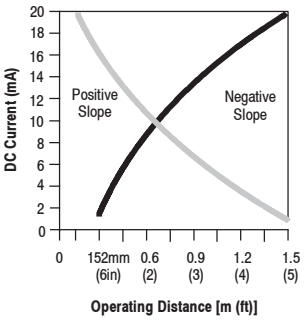



### Standard Diffuse

**Voltage Output**

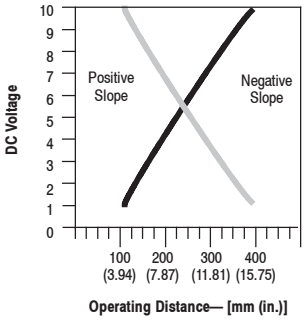



**Current Output**

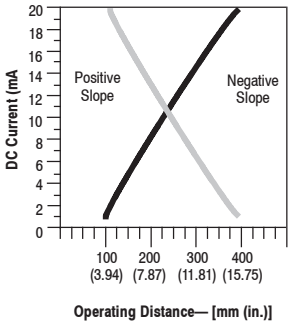



### Infrared Glass FO/Fixed Focus/Wide Angle Diffuse

**Voltage Output**




**Current Output**




## Product Selection Guidelines

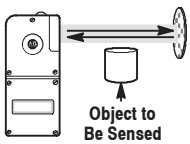
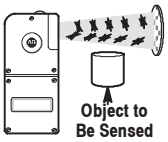
1. Select photohead (see pages 1-220 to 1-225).
2. Select power base (see page 1-226).
3. Select output module for green line models only (see page 1-226).
4. Select plug-in control function optional module on page 1-226 (green models only).

# Series 5000

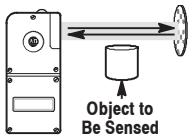
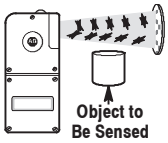
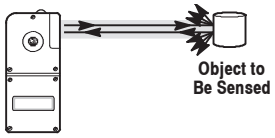
## Red Line/Blue Line

### Red Line Product Selection [mm (in.)]

**1. Select Photohead.**

| Sensing Mode | Sensing Distance [mm (in.)] | Output Energized | Output Type Capacity | Response Time❶ | | Cat. No. |
|---|---|---|---|---|---|---|
| | | | | Sensor | Output | |
|  *Red Line—Retroreflective/Standard Diffuse* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | 50.8 mm…6 m (2 in…20 ft) with 76 (3) Reflector<br>50.8 mm…1.5 m (2 in…5 ft) with White Paper | Light/Dark Selectable | EM Relay (SPDT) 2.0 A-120V AC 1.0 A-240V AC | 5 ms | On 10 ms Off 15 ms | **42LRC-5000** |
| | | | AC/DC Solid State FET (SP-N.O.) 30 mA 0…120V AC/DC | | 1 ms | 42LRC-5010 |
| | | | AC Solid State TRIAC (SP-N.O.) 0.75 A 240V AC cont. | | 8 ms | 42LRC-5020 |
|  *Red Line—Polarized Retroreflective* **Field of View:** 3° **Emitter LED:** Visible Red 660 nm | 50.8 mm…6 m (2 in…20 ft) with 76 (3) Reflector | Light/Dark Selectable | EM-Relay (SPDT) 2.0 A-120V AC 1.0 A-240V AC | 5 ms | On 10 ms Off 15 ms | **42LRC-5200** |
| | | | AC/DC Solid State FET (SP-N.O.) 30 mA 0…120V AC/DC | | 1 ms | 42LRC-5210 |
| | | | AC Solid State TRIAC (SP-N.O.) 0.75 A 240V AC cont. | | 8 ms | 42LRC-5220 |

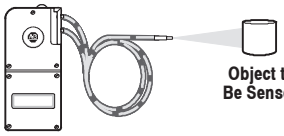
### Blue Line Product Selection [mm (in.)]

| | | | | | | |
|---|---|---|---|---|---|---|
|  *Blue Line—Retroreflective* **Field of View:** 2.5° **Emitter LED:** Infrared 880 nm | 50.8 mm…10 m (2 in…33 ft) with 76 (3) Reflector | Light/Dark Selectable | NPN and PNP 100 mA | 1 ms | | 42DRU-5000 |
|  *Blue Line—Polarized Retroreflective* **Field of View:** 2.5° **Emitter LED:** Visible Red 660 nm | 50.8 mm…6 m (2 in…20 ft) with 76 (3) Reflector | Light/Dark Selectable | NPN and PNP 100 mA | 1 ms | | **42DRU-5200** |
|  *Blue Line—Standard Diffuse* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Long Range: 50.8 mm…2.1 m (2 in…7 ft) with White Paper | Light/Dark Selectable | NPN and PNP 100 mA | 1 ms | | 42DRP-5000 |

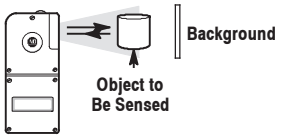
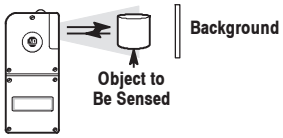
❶ Add Sensor and Output for total response time.

**Refer to page 1-226 for cordsets and accessories.**

## Blue Line Product Selection [mm (in.)] (continued)

| Sensing Mode | Sensing Distance | Output Energized | Output Type Capacity | Response Time | Cat. No. |
|---|---|---|---|---|---|
|  *Blue Line—Large Aperture Fiber Optic* **Field of View:** Depends on fiber optics or lens selected or lens type **Emitter LED:** Infrared 880 nm | Depends on Fiber Optic selected. | Light/Dark Selectable | NPN and PNP 100 mA | 1 ms | 42DRA-5000FO |

## Blue Line Product Selection [mm (in.)] (continued)

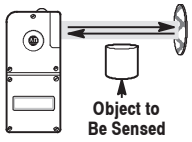
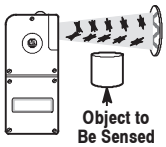
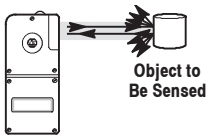
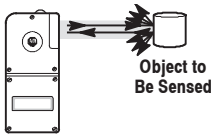
| Sensing Mode | Sensing Distance [mm (in.)] | Output Energized | Output | Timing | | Response Time | Cat. No. |
|---|---|---|---|---|---|---|---|
| | | | | Function | Range | | |
|  *Blue Line—Background Suppression without Timing* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Suppression Point Adjustment Range 50.8 (2) to 63.5…304.8 (2.5…12) | Light/Dark Selectable | NPN & PNP | — | — | 5 ms | 42DBS-5000 |
|  *Blue Line—Background Suppression with Timing* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Suppression Point Adjustment Range 50.8 (2) to 63.5…304.8 (2.5…12) | Light/Dark Selectable | NPN & PNP | Selectable On Delay Off Delay On & Off Delay Delayed One-shot One-shot | 0…1.5 s 0…15 s Selectable | | 42DBS-5100 |

**Refer to page 1-226 for cordsets and accessories.**

# Series 5000

## Green Line

### Green Line Product Selection [mm (in.)]

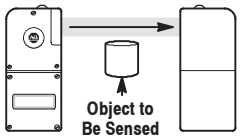
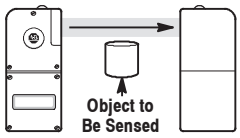
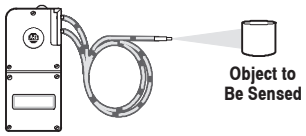
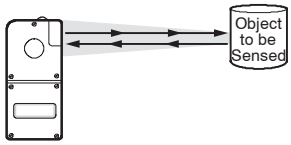
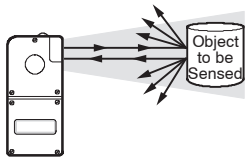
| Sensing Mode | Sensing Distance [mm (in.)] | Output Energized | Sensor Response Time❶ | Cat. No. |
|---|---|---|---|---|
|  *Green Line—Retroreflective* **Field of View:** 2.5° **Emitter LED:** Infrared 880 nm | 50.8 mm…10 m (2 in…33 ft) with 76 (3) Reflector | Light/Dark Selectable | 1 ms | **42MRU-5000** |
|  *Green Line—Polarized Retroreflective* **Field of View:** 2.5° **Emitter LED:** Visible Red 660 nm | 50.8 mm…6 m (2 in…20 ft) with 76 (3) Reflector | Light/Dark Selectable | 2.5 ms | **42MRU-5200** |
|  *Green Line—Standard Diffuse* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Short Range: 50.8 mm… 3 m (2 in.…10 ft) with White Paper | Light/Dark Selectable | 2.5 ms | **42MRP-5000** |
|  *Green Line—Long Range Diffuse* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Long Range: 50.8 mm… 4.8 m (2 in…16 ft) with White Paper | Light/Dark Selectable | 2.5 ms | 42MRP-5000P |

❶ Add Sensor and Output for total response time.

**Refer to page 1-226 for cordsets and accessories.**

## Green Line Product Selection [mm (in.)] (continued)

**1. Select Photohead (continued).**

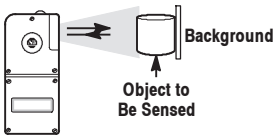
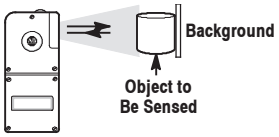
| Sensing Mode | Sensing Distance [mm (in.)] | Output Energized | Sensor Response Time❶ | Cat. No. |
|---|---|---|---|---|
|  *Green Line—Transmitted Beam Receiver* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | 25.4 mm…171 m (1 in…560 ft) | Light/Dark Selectable | 5 ms | **42MRR-5000** Order one receiver and one light source |
|  *Green Line—Transmitted Beam Light Source* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | 25.4 mm…171 m (1 in…560 ft) | — | N/A | **42MRL-5000** Order one receiver and one light source |
|  *Green Line—Large Aperture Fiber Optic* **Field of View:** Determined by fiber optics or lens type **Emitter LED:** Infrared 880 nm | Depends on Fiber Optic selected. | Light/Dark Selectable | 2.5 ms | 42MRA-5000FO |
|  *Green Line—Fixed Focus* **Emitter LED:** Infrared 880 nm | 5.08 mm…172 m (0.2 in…564 ft ) | Light/Dark Selectable | 2.5 ms | 42MRA-5000FF |
|  *Green Line—Wide Angle Diffuse* **Emitter LED:** Infrared 880 nm | 5.08 (0.2)…508 (20) | Light/Dark Selectable | 2.5 ms | 42MRA-5000WA |

❶ Prewired for use with output 8-593 only.

**Refer to page 1-226 for cordsets and accessories.**

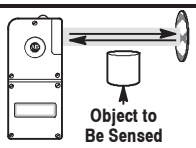
## Green Line Product Selection [mm (in.)] (continued)

**1. Select Photohead (continued).**

| Sensing Mode | Sensing Distance [mm (in.)] | Output Energized | Timing | | Sensor Response Time❶ | Cat. No. |
|---|---|---|---|---|---|---|
| | | | Function | Range | | |
|  *Green Line—Background Suppression without Timing* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Suppression Point Adjustment Range 50.8 (2) to 63.5…304.8 (2.5…12) | Light/Dark Selectable | — | — | 5 ms | **42MBS-5000** |
|  *Green Line—Background Suppression with Timing* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | Suppression Point Adjustment Range 50.8 (2) to 63.5…304.8 (2.5…12) | Light/Dark Selectable | Selectable On Delay<br>Off Delay<br>On & Off Delay<br>One-shot<br>Delayed One-shot | 0…1.5 s<br>0…15 s<br>Selectable | 5 ms | 42MBS-5100 |

## Analog Output Product Selection [mm (in.)]

**1. Select Photohead.**

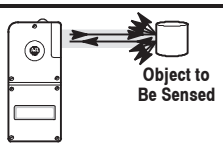
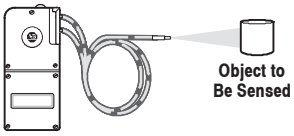
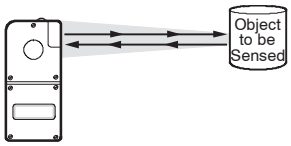
| Sensing Mode | Supply Current | Sensing Distance | Analog Output | Output Type Capacity | Response Time❷ | Slope | Cat. No. |
|---|---|---|---|---|---|---|---|
|  *Analog Output—Retroreflective* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | 70 mA | 600 mm (2 ft)… Total: 4.6 m (15 ft) Linear 4.0 m (13 ft) | Voltage 1…10V DC<br>Current 1…20 mA | Two Adjustable Set Points NPN 100 mA (30V Max) | 100 ms | Selectable Positive or Negative | 42DRU-5400 |

❶ Prewired for use with output 8-593 only.

❷ Time needed for full analog swing.

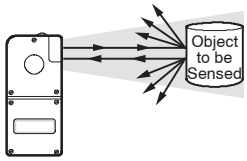
**Refer to page 1-226 for cordsets and accessories.**

## Analog Output Product Selection [mm (in.)] (continued)

| Sensing Mode | Sensing Distance [mm (in.)] | Analog Output | Output Type Capacity | Response Time❶ | Slope | Cat. No. |
|---|---|---|---|---|---|---|
|  *Analog Output—Standard Diffuse* **Field of View:** 3° **Emitter LED:** Infrared 880 nm | 150 (6)… Total: 1.5 m (5 ft) Linear: 1.2 m (4 ft) | Voltage 1…10V DC Current 1…20 mA | Two Adjustable Set Points NPN 100 mA (30V max) | 100 ms | Selectable Positive or Negative | 42DRP-5400 |
|  *Analog Output—Large Aperture Fiber Optic* **Field of View:** Depends on fiber optics (refer to fiber optic section) or lens type **Emitter LED:** Infrared 880 nm | Depends on Fiber Optic selected. | Voltage 1…10V DC Current 1…20 mA | Two Adjustable Set Points NPN 100 mA (30V max) | 100 ms | Selectable Positive or Negative | 42DRA-5400FO |
|  *Analog Output—Fixed Focus* **Emitter LED:** Infrared 880 nm | 5.08…101 (0.2…4) | Voltage 1…10V DC Current 1…20 mA | Two Adjustable Set Points NPN 100 mA (30V max) | 100 ms | Selectable Positive or Negative | 42DRA-5400FF |

## Analog Output Product Selection [mm (in.)] (continued)

**1. Select Photohead.**

| Sensing Mode | Sensing Distance | Analog Output | Output Type Capacity | Response Time | Slope | Cat. No. |
|---|---|---|---|---|---|---|
|  *Analog Output—Wide Angle Diffuse* **Emitter LED:** Infrared 880 nm | 5.08 (0.2 in.)… 152 mm (6 in.) | Voltage 1…10V DC Current 1…20 mA | Two Adjustable Set Points NPN 100 mA (30V max) | 100 ms | Selectable Positive or Negative | 42DRA-5400WA |

❶ Time needed for full analog swing.

**Refer to page 1-226 for cordsets and accessories.**

# Series 5000

## Power Base

### Power Base Product Selection [mm (in.)]

**2. Select Power Base.**

| Style | Operating Voltage | Supply Current | Cat. No. |
|---|---|---|---|
| **Red Line** | | | |
| Terminal | 120V AC, 50/60 Hz | 2V A | 42LTB-5000 |
| | 240V AC, 50/60 Hz | 4V A | 42LTB-5001 |
| Cable | 120V AC, 50/60 Hz | 2V A | 42LCB-5000 |
| **Blue Line** | | | |
| Terminal | 10…30V DC | 35 mA | 42DTB-5000 |
| Cable | | | 42DCB-5000 |

| Operating Voltage | Supply Current | Cat. No. | |
|---|---|---|---|
| | | Terminal Style | Mini QD Style |
| **Green Line** | | | |
| 102…132V AC, 50/60 Hz | 2V A | 42MTB-5000 | **42MTB-5000QD5-1** |
| 204…254V AC, 50/60 Hz | 4V A | 42MTB-5001 | — |
| 40…54V AC/DC, 50/60 Hz | 1V A | 42MTB-5002 | — |
| 20…30V AC, 50/60 Hz | | 42MTB-5003 | — |
| 20…30V DC | | 42MTB-5004 | **42MTB-5004QD4-1** ❶ |

| | Operating Voltage | Supply Current | Connection Type | Cat. No. |
|---|---|---|---|---|
| **Analog Output Line** | | | | |
| All sensing modes | 22…28V DC | 70 mA maximum | Screw Terminal | 42DTB-5000 |
| | | 70 mA maximum | 3 m 300V Cable | 42DCB-5000 |

**3. Select Output module (green line models only) (required).**

**4. Select plug-in control function optional module (green line models only).**

### Cordsets and Accessories

| Description | Cat./Page No. | Description | Cat. No. | Description | Cat. No. |
|---|---|---|---|---|---|
| Terminal Chambers | 8-1 | Right Angle Bracket | 60-1785 | 76 mm (3 in.) Diameter Reflector | 92-39 |
| Screw Terminal | 42MTB-5000 | Conduit Adaptor 1/2 inch NPT | 60-2213 | 32 mm (1.25 in.) Diameter Reflector | 92-47 |
| 5-pin DC Mini QD | 42MTB-5000-QD5-1 | Armored Cable Adaptor | 60-1577 | Heavy Duty Protective Guard | 60-2083 |
| Flexi-mount Mounting Assembly | 60-2014 | Limit Switch Type Mounting Assembly | 60-2230 | Heavy Duty Mounting Assembly | 60-1748 |

❶ Prewired for use with output 8-593 only.