Photoelectric Applications

- Jam detection and prevention
- Empty line detection
- Counting
- Sorting by size, color or surface
- Automatic routing
- Feed control
- Hopper level control
- Color mark registration
- Edge guiding
- Web break detection
- Positioning
- Cut-off control
- Filling
- Folding and wrapping
- Batch counting
- Missing part detection
- Correct count
- Open flap detection
- Ejected part detection
- Incorrect closure
- Door control
- Sizing

Photoelectric Identification Codes

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O</td>
<td>M</td>
<td>T</td>
<td>R</td>
<td>Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example: O M 1 2 R T — D H T P — 0 2 0 0 — C L

1. O = Photoelectric Sensor
2. M = Metric metal housing
3. T = Metric thermoplastic housing
4. R = Rectangular design
5. Z = Cylindrical design

3/4 Specification of housing dimensions
e.g. 12 = M12
20 = 20 series
90 = 90 series

5/6 ES = Through-beam sensor
EE = Through-beam, receiver only
SE = Through-beam, transmitter only
LC = Fiber optic control
Rh = Diffuse reflective sensor
RS = Retroreflective sensor
RF = Diffuse reflective sensor
PF = Convergent beam sensor, fixed focus
PR = Print registration sensor
PS = Polarized retro sensor

7 Dash

8 Voltage type
A = AC
D = DC
M = Multivoltage, AC/DC, UC
P = Programmable voltage (AC or DC)

10 Output type
A = Analog output
N = NAMUR
O = No output
Q = Triac
S = Others
T = Transistor
Y = Thyristor

11 N = NPN transistor output (switched to negative)
P = PNP transistor output (switched to positive)
G = Push/Pull
S = Through-beam light source
U = Switch selectable

12 Dash

13-16 Sensing distance
Sensing distance specifications are always indicated by 4 digits
- mm: without decimal point
- m: with decimal point
e.g. 06.0 = 6 m
e.g. 15.0 = 15 m
e.g. 0500 = 500 mm

17 Dash

18 Connection type
A = Screw termination
B = Plug with screw terminals
C = Cable (standard C = 2 m or length in m)
S = Plug-in connector

19 Options
C = Control/diagnostic input
D = LED for output indication
E = Adjustable sensitivity
F = Diagnostic circuit with output and LED for indicator
G = LED for output mode, supply voltage and beam control indication
H = LED for supply voltage and output mode indication
L = LED for output indicator
T = Adjustable timer circuit
V = LED for operating voltage indication
X = Customer-specific options
Z = Fixed timer

Truck Height Control

A long range through-beam sensor was positioned at a height just below the overhanging roof and a couple of feet in front, so the breaking of the beam would activate an output wired to an alarm alerting the driver to stop.

Bag Cutting Machine

Basically, with this being a specialized application, there is only one solution and product selection, and that is the MCS 638 Series Color/Print Registration Sensor. These units were designed to solve this application with the sensor being capable of sensing small changes in contrast levels or shade differences.

Object Detection

By placing a diffuse reflective type underneath the conveyor and looking up through the rollers, a safe sensing position has been found for the sensor away from fork lift trucks and other possible damaging actions.

For Application Assistance Call 1-800-451-8279 or Fax 1-815-389-6678
Photoelectric Sensors
OR20 Series

Description

The OR20 Series is a family of self-contained photoelectric sensors, with multi-voltage input and relay output. Standard features include adjustable sensitivity and timing circuits which are easily accessible after removing the “snap cover”. Sensing modes available include: Through-Beam, Retro, Polarized, Diffuse Reflective and Background Suppression.

- Rectangular high impact plastic housing
- LED indication of output
- NEMA 4
- Sensitivity control
- Programmable timing
  Delay or Hold
- Timing range 0.1-10 seconds
- Temperature range -4°F to +158°F
- Multi-voltage 12-265 VAC/DC
- Screw terminals for wiring
- Snap shut hinged back cover
- Relay output - 3A

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Input Voltage</th>
<th>Switching Function</th>
<th>Output Mode</th>
<th>Maximum Cycle Rate</th>
<th>Output Current</th>
<th>Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through-Beam</td>
<td>65 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 ES-MAR5-20.0-ALET</td>
<td>655-1686-103*</td>
<td></td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>26 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 RS-MAR5-08.0-ALET</td>
<td>655-4686-001</td>
<td></td>
</tr>
<tr>
<td>Polarized Retro</td>
<td>19 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 PS-MAR5-06.0-ALET</td>
<td>655-5686-001</td>
<td></td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>4.9 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 RT-MAR5-01.5-ALET</td>
<td>655-7686-003</td>
<td></td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>1.9 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 RT-MAR5-0600-ALET</td>
<td>655-7686-001</td>
<td></td>
</tr>
<tr>
<td>BkGnd Suppression</td>
<td>1.2 ft</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;50 Hz</td>
<td>3A</td>
<td>OR20 RH-MAR5-0400-ALET</td>
<td>655-8686-002</td>
<td></td>
</tr>
</tbody>
</table>

* A Through-Beam Sensor can be supplied as separate pieces
  Projector = Part # 655-1086-001
  Receiver = Part # 655-1686-003

Mechanical Data (Dimensions are in inches)

![Mechanical Diagram]

Notes on operation of OR20 Series Housing types:

1. Snap-cover housings (to be opened with screwdriver)

Operation elements:

3. Sensitivity potentiometer
4. Timer potentiometer
5. Delay-type switch
6. Connection terminals

Wiring Data

![Wiring Diagram]

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflective Disc – 3 1/4&quot; Dia.</td>
<td>610-8002-001</td>
</tr>
<tr>
<td>Mounting Bracket – Fixed</td>
<td>7430-448-005</td>
</tr>
<tr>
<td>Mounting Bracket Adjustable</td>
<td>7430-448-010</td>
</tr>
</tbody>
</table>
Photoelectric Sensors
OR90 Series

Description
The OR90 Series offers a low cost self-contained family of sensors, housed in a high impact rectangular thermoplastic housing. Termination is made via a 6 ft. long 5 conductor integral cable. Features include, multi-voltage input with relay output, and LED indication of output signal. The series includes 3 sensing modes: Retro, Diffuse and Background Suppression. The OR90 is a simple, low maintenance sensor ideal for material handling applications.

- Totally sealed plastic housing
- LED indication of output
- NEMA 1,3,4,12
- Temperature rating -4°F to +158°F
- 6 ft. cable -5 conductor
- Multi-voltage 12-265 VAC/DC

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Input Voltage</th>
<th>Switching Function</th>
<th>Output Mode</th>
<th>Maximum Cycle Rate</th>
<th>Output Current</th>
<th>Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retro-Reflective</td>
<td>26 ft.</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;80 Hz</td>
<td>3A</td>
<td>OR90 RS-MAR5-08.0-CL</td>
<td>655-4696-001</td>
<td></td>
</tr>
<tr>
<td>BkGnd Suppression</td>
<td>3 in.</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;80 Hz</td>
<td>3A</td>
<td>OR90 RH-MAR5-0080-CL</td>
<td>655-8696-001</td>
<td></td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>23.6 in.</td>
<td>12-265 VAC/DC</td>
<td>SPDT Relay</td>
<td>&gt;80 Hz</td>
<td>3A</td>
<td>OR90 RT-MAR5-0600-CL</td>
<td>655-7696-001</td>
<td></td>
</tr>
</tbody>
</table>

(Wiring Data)

Relay Output

Accessories
Reflective Disc – 3 1/4” Dia. Part # 610-8002-001
Mounting Bracket Part # 7430-448-007
Photoelectric Sensors
MCS-144/159/165

Description

This proven range of photoelectric sensors provides the user with a standard self-contained sensor with the possibility of modular expansion with plug-in timer, counter and output modules. A "plug-in" double pole double throw 7 amp relay is supplied with all units. Features include a light activated/dark activated switch, adjustable sensitivity and LED output indication.

- Heavy duty plastic housing
- LED indication of sensing
- Sensitivity control
- Optional timing and counting modules
- Replaceable industrial relay
- Selectable LA/DA operation
- Temperature rating 0°F to 125°F
- Screw terminals for wiring
- NEMA 12
- Screw down back cover

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Input Voltage</th>
<th>Switching Function</th>
<th>Output Mode</th>
<th>Maximum Cycle Rate</th>
<th>Output Current</th>
<th>Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retro-Reflective</td>
<td>30 ft.</td>
<td>110 VAC</td>
<td>DPDT Relay</td>
<td>&gt;25 Hz</td>
<td>7A</td>
<td>MCS-144/814</td>
<td>7120-448-004</td>
<td></td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>15 ft.</td>
<td>110 VAC</td>
<td>DPDT Relay</td>
<td>&gt;25 Hz</td>
<td>7A</td>
<td>MCS-165/814</td>
<td>7120-448-015</td>
<td></td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>6 ft.</td>
<td>110 VAC</td>
<td>DPDT Relay</td>
<td>&gt;25 Hz</td>
<td>7A</td>
<td>MCS-159/814</td>
<td>7100-448-002</td>
<td></td>
</tr>
</tbody>
</table>

MCS-144, 159 – Plug-in Modules (Order Separately)

Timer Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Timing Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-836</td>
<td>7400-448-024</td>
<td>0.4 to 15 seconds</td>
</tr>
<tr>
<td>MCS-836-1</td>
<td>7400-448-029</td>
<td>1 to 30 seconds</td>
</tr>
</tbody>
</table>

Timer Functions (Programmable)

On Delay / Off Delay / Dual Delay / One-Shot
One-Shot Drop / Delayed One-Shot / Delayed One-Shot Drop

Counter Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Counting Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-831</td>
<td>7400-448-019</td>
<td>1 to 99</td>
</tr>
<tr>
<td>MCS-832</td>
<td>7400-448-020</td>
<td>1 to 9999</td>
</tr>
</tbody>
</table>

Output Module (Supplied as Standard)

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Switching Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-814</td>
<td>7410-448-008</td>
<td>DPDT 7 Amp</td>
</tr>
</tbody>
</table>

MCS-165 – Plug-in Modules (Order Separately)

Timer Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Timing Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-830</td>
<td>7400-448-018</td>
<td>0.4 to 15 seconds</td>
</tr>
<tr>
<td>MCS-830-1</td>
<td>7400-448-026</td>
<td>1 to 30 seconds</td>
</tr>
</tbody>
</table>

Timer Functions (Programmable)

On Delay / Off Delay / Dual Delay / One-Shot
One-Shot Drop / Delayed One-Shot / Delayed One-Shot Drop

Counter Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Counting Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-833</td>
<td>7400-448-021</td>
<td>1 to 99</td>
</tr>
<tr>
<td>MCS-834</td>
<td>7400-448-022</td>
<td>1 to 9999</td>
</tr>
</tbody>
</table>

Output Module (Supplied as Standard)

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Switching Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS-814</td>
<td>7410-448-008</td>
<td>DPDT 7 Amp</td>
</tr>
</tbody>
</table>

Mechanical Data (Dimensions are in inches)

Wiring Data

MCS-144, 159

<table>
<thead>
<tr>
<th>Relay Output</th>
<th>110 VAC INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>NC</td>
<td>2</td>
</tr>
<tr>
<td>NC</td>
<td>3</td>
</tr>
<tr>
<td>NO</td>
<td>4</td>
</tr>
<tr>
<td>NO</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
</tr>
<tr>
<td>NC</td>
<td>7</td>
</tr>
<tr>
<td>NC</td>
<td>8</td>
</tr>
</tbody>
</table>

MCS-165

<table>
<thead>
<tr>
<th>Relay Output</th>
<th>110 VAC INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>NC</td>
<td>2</td>
</tr>
<tr>
<td>NC</td>
<td>3</td>
</tr>
<tr>
<td>NO</td>
<td>4</td>
</tr>
<tr>
<td>NO</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
</tr>
<tr>
<td>NC</td>
<td>7</td>
</tr>
<tr>
<td>NC</td>
<td>8</td>
</tr>
</tbody>
</table>

Accessories

Reflective Disc – 3 1/4" Dia. Part # 610-8002-001
Mounting Bracket Part # 7430-448-001

For Application Assistance Call 1-800-451-8279 or Fax 1-815-389-6678
Photoelectric Sensors
MCS-500 Series

Description

The MCS-500 Series is a self-contained modular design with many standard features that include programmable multi-function timing circuits, sensitivity adjustment, and LED output indication. Once installed, the base module will accept any of the 3 sensing control heads, which can provide Retro, Polarized and Diffused Reflective modes of sensing. The MCS-850 relay is a plug-in module and is supplied as a standard component when purchased as a complete sensor.

- High impact plastic housing
- Modular design
- LED indication of sensing status
- Sensitivity control
- NEMA 12
- Two timing ranges
  - Low range 0.5-10 seconds
  - High range 3.0-30 seconds
- Programmable timing
- Temperature range 0°F to 125°F
- Screw terminals for wiring

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Input Voltage</th>
<th>Switching Function</th>
<th>Output Mode</th>
<th>Maximum Cycle Rate</th>
<th>Output Current</th>
<th>Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retro-Reflective</td>
<td>15 ft.</td>
<td>110 VAC</td>
<td>SPDT</td>
<td>Relay</td>
<td>&gt;50 Hz</td>
<td>5A</td>
<td>MCS-500-01</td>
<td>7150-448-004</td>
</tr>
<tr>
<td>Polarized Retro</td>
<td>12 ft.</td>
<td>110 VAC</td>
<td>SPDT</td>
<td>Relay</td>
<td>&gt;50 Hz</td>
<td>5A</td>
<td>MCS-500P-01</td>
<td>7151-448-001</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>6 ft.</td>
<td>110 VAC</td>
<td>SPDT</td>
<td>Relay</td>
<td>&gt;50 Hz</td>
<td>5A</td>
<td>MCS-501-01</td>
<td>7150-448-003</td>
</tr>
</tbody>
</table>

MCS-500 Timing Functions

Switch selectable, multi-function timing is a standard feature on the MCS-500, MCS-500P and MCS-501.

The timing function can be switched from a low timing range of 0.5 to 5.0 seconds to a high timing range of 3.0 to 30 seconds. When no timing is required, the function can be switched off.

On delay, off delay, dual delay, one shot, and delayed one shot functions are quickly achieved by setting the timing switches on the unit. Easy-access timing adjustment controls are accessible from the top of the unit to allow fine tuning during operation.

Timing functions can be employed for light or dark operation.

Timing Ranges

- Low range 0.5 to 5.0 seconds
- High range 3.0 to 30 seconds
- On-Off switch selectable

Ordering Information for Individual modules

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Module</td>
<td>7150-101-004</td>
</tr>
<tr>
<td>Base Module</td>
<td>7150-101-013</td>
</tr>
<tr>
<td>Output Module</td>
<td>7150-101-016</td>
</tr>
</tbody>
</table>

Accessories

- Reflective Disc – 3 1/4” Dia. Part # 610-8002-001
- Mounting Bracket      Part # 7150-101-020
- Cable Gland           Part # 7420-448-029
Photoelectric Sensors
Compact Series

Description
The COMPACT Series of photoelectric sensors are rugged industrial DC voltage input photoelectric sensors with a reliable performance for many general purpose applications. Sensing mode capabilities include: Through-Beam (up to 500 ft.), Retro and Diffuse Reflective. Output standard on all units is light activated/dark activated NPN transistor. LA/DA is selectable at the time of installation by wire selection. All Compact Series of sensors are designed to work with the Warner Electric range of sensor controls.

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Input Voltage</th>
<th>Switching Function</th>
<th>Output Mode</th>
<th>Maximum Cycle Rate</th>
<th>Output Current</th>
<th>Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through-Beam</td>
<td>500 ft.</td>
<td>10-30 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;25 Hz</td>
<td>250 mA</td>
<td>MCS-629</td>
<td>7115-448-005</td>
</tr>
<tr>
<td>Through-Beam</td>
<td>50 ft.</td>
<td>12-18 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-627</td>
<td>7115-448-003</td>
</tr>
<tr>
<td>Through-Beam</td>
<td>50 ft.</td>
<td>22-28 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-637</td>
<td>7115-448-001</td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>15 ft.</td>
<td>12-18 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-625</td>
<td>7125-448-002</td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>15 ft.</td>
<td>22-28 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-635</td>
<td>7125-448-003</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>0 to 1 ft.</td>
<td>12-18 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-626</td>
<td>7105-448-002</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>0 to 1 ft.</td>
<td>22-28 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-636</td>
<td>7105-448-005</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>.1 to 6 ft.</td>
<td>12-18 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-626-2</td>
<td>7105-448-007</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>.1 to 6 ft.</td>
<td>22-28 VDC</td>
<td>LA/DA</td>
<td>NPN</td>
<td>&gt;250 Hz</td>
<td>250 mA</td>
<td>MCS-636-2</td>
<td>7105-448-011</td>
</tr>
</tbody>
</table>

Mechanical Data (Dimensions are in inches)

Wiring Data

Accessories
Reflective Disc – 3 1/4” Dia. Part # 610-8002-001
Mounting Bracket Part # 7430-448-003
Photoelectric Sensors
OT18 Series

Description
This series of 18mm plastic tubular sensors provides the user with a self-contained DC low voltage sensor with NPN or PNP output. Programmable light activated/dark activated output. Modes of sensing include: Through-Beam, Retroreflective, Polarized Retroreflective, Diffuse Reflective and Fixed Focus types.

- 18mm diameter cylindrical plastic housing
- Self-contained with 6.5 ft. cable
- IP 67/NEMA 4
- LED indication of output
- Temperature range –20°C to +70°C (–4°F to +158°F)
- 10–36 VDC input voltage
- No-load supply current ≤15 mA (Emitter ≤20 mA)
- Reverse polarity protection
- Short circuit protected
- 200mA switching current
- Voltage drop ≤2 VDC
- Hysteresis ≤15%
- Repeat accuracy ≤10%
- Switching frequency 500 Hz

Sensor Selection

<table>
<thead>
<tr>
<th>Sensing Principle</th>
<th>Sensing Range</th>
<th>Switching Function</th>
<th>Sensitivity</th>
<th>Model Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through-Beam</td>
<td>26 ft.</td>
<td>NPN</td>
<td>Fixed</td>
<td>OT18ES-DPTN-08.0-CL</td>
<td>655-1219-102</td>
</tr>
<tr>
<td>Through-Beam</td>
<td>26 ft.</td>
<td>PNP</td>
<td>Fixed</td>
<td>OT18ES-DPTP-08.0-CL</td>
<td>655-1819-101</td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>2 in. to 9.5 ft.</td>
<td>NPN</td>
<td>Fixed</td>
<td>OT18RS-DPTN-03.0-CL</td>
<td>655-4219-002</td>
</tr>
<tr>
<td>Retro-Reflective</td>
<td>2 in. to 9.5 ft.</td>
<td>PNP</td>
<td>Fixed</td>
<td>OT18RS-DPTP-03.0-CL</td>
<td>655-4819-003</td>
</tr>
<tr>
<td>Polarized Retro-Reflective</td>
<td>0 in. to 8.2 ft.</td>
<td>NPN</td>
<td>Adjustable</td>
<td>OT18PS-DPTN-02.5-CLE</td>
<td>655-5219-001</td>
</tr>
<tr>
<td>Polarized Retro-Reflective</td>
<td>0 in. to 8.2 ft.</td>
<td>PNP</td>
<td>Adjustable</td>
<td>OT18PS-DPTP-02.5-CLE</td>
<td>655-5819-003</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>19.6 in.</td>
<td>NPN</td>
<td>Adjustable</td>
<td>OT18RT-DPTN-0500-CLE</td>
<td>655-7219-006</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>19.6 in.</td>
<td>PNP</td>
<td>Adjustable</td>
<td>OT18RT-DPTP-0500-CLE</td>
<td>655-7819-006</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>11.8 in.</td>
<td>NPN</td>
<td>Adjustable</td>
<td>OT18RT-DPTN-0300-CLE</td>
<td>655-7219-005</td>
</tr>
<tr>
<td>Diffuse Reflective</td>
<td>11.8 in.</td>
<td>PNP</td>
<td>Adjustable</td>
<td>OT18RT-DPTP-0300-CLE</td>
<td>655-7819-005</td>
</tr>
<tr>
<td>Fixed Focus</td>
<td>1.57 in.</td>
<td>NPN</td>
<td>Fixed</td>
<td>OT18FF-DPTN-0040-CL</td>
<td>655-8219-001</td>
</tr>
<tr>
<td>Fixed Focus</td>
<td>1.57 in.</td>
<td>PNP</td>
<td>Fixed</td>
<td>OT18FF-DPTP-0040-CL</td>
<td>655-8819-001</td>
</tr>
</tbody>
</table>

Through Beam Sensors:
To order separate transmitters and receivers use the following:

Transmitter:
Part Number 655-1019-001
Model: OT18SE-DOOS-08.0-C

Receiver:
Part Number: 655-1219-002
Model: OT18EE-DPTN-08.0-CL
Part Number: 655-1819-001
Model: OT18EE-DPTP-08.0-CL

Accessories

Reflective Disc-3-1/4" Dia.  Part #610-8002-001
Mounting Bracket  Part #7125-101-001

Note: The sensors on this page are also available in nickel-plated brass or stainless steel housings, also available in quick disconnect version. Contact Factory.
Photoelectric Sensors
OT18 Series

Dimensions and Wiring Details

Wire Colors:
Brown = Plus 10 – 36 Volts DC
Blue = Zero Volts Common
Black = Output Wire
White = Control Wire

Note: The LED output indicator is on when the output is active.

Wiring Diagram of the Through-Beam Emitter

Black = Control Input. The emitter will be turned off when the control wire is connected to minus (common). System Test Function.

Normally Off

NPN – sensors

PNP – sensors

Normally On

NPN – sensors

PNP – sensors

With the Control Wire (White) the output function is programmable. A not connected white wire produces a Normally Open function. Diffuse Reflective and Fixed Focus types are usually operated light active (Normally Off) and other sensors like the Retro, Polarized Retro, and the Through-Beam are usually operated Dark Active (Normally On).
Programming

1. Connect the supply voltage to the wires noted in the wiring diagram.

2. Aim the light spot at the target mark. For glossy or reflective surfaces, the sensor should be angled at 10° to 15° off the perpendicular axis from the target.

3. Press the Teach push button on the sensor or apply V+ to the Teach Input for a minimum of 50 milliseconds. The LED should flash slowly (at a rate of approximately 1 Hz).

4. Aim the light spot at the background.

5. Press the Teach push button on the sensor or apply V+ to the Teach Input for a minimum of 50 milliseconds. The LED will now turn on when the target mark is present and off when it is absent after a successful teach. If the teach was not successful or the contrast was not sufficient, the LED flashes quickly (at a rate of approximately 4 Hz). Programming the MCS-638 as indicated above sets the switching threshold exactly in the middle of the target and background values. The above procedure is for Light Operate mode. For Dark Operate mode, reverse steps 2 and 4.

For Application Assistance Call 1-800-451-8279 or Fax 1-815-389-6678