

# FARS Series Photoelectric Sensors



## M18 (18mm) plastic -DC

The FARS series is a direct reflection diffuse sensor with adjustable background suppression. By using an embedded linear position sensor and a microprocessor, the FARS sensor has excellent capabilities in sensing targets of all shades of color, from a 90% reflective white target, all the way to a 6% reflective black target. The sensing distance can be adjusted between 30mm and 130mm using the lateral trimmer.

## Features

- 8 models, diffuse with background suppression
- 30/130mm adjustable maximum reading distance
- Axial cable or M12 quick-disconnect
- Plastic or metal housing
- Supply voltage: 10 - 30 VDC, output current: 100 mA
- LED light status indicator
- IP67 housing protection
- Complete protection against electrical damage



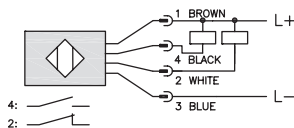
## 18mm Diffuse with Background Suppression Sensors Selection Chart

| Part Number                       | Price   | Voltage Range | Sensing Range                      | Switching Frequency | Sensing Beam       | Through-Beam Component           | Output Type                   | Connection Type                                  | Wiring    |
|-----------------------------------|---------|---------------|------------------------------------|---------------------|--------------------|----------------------------------|-------------------------------|--------------------------------------------------|-----------|
| <a href="#"><u>FARS-BN-0A</u></a> | Retired | 10 to 30 VDC  | 30-130mm [1.18-5.11 in] adjustable | 1kHz                | Red light [660 nm] | N.O./N.C. background suppression | NPN N.O. + N.C. complementary | 2m [6.5 ft] axial cable                          | Diagram 1 |
| <a href="#"><u>FARS-BN-0E</u></a> | Retired |               |                                    |                     |                    |                                  | NPN N.O. + N.C. complementary | M12 quick-disconnect (purchase cable separately) |           |
| <a href="#"><u>FARS-BP-0A</u></a> | Retired |               |                                    |                     |                    |                                  | PNP N.O. + N.C. complementary | 2m [6.5 ft] axial cable                          | Diagram 2 |
| <a href="#"><u>FARS-BP-0E</u></a> | Retired |               |                                    |                     |                    |                                  | PNP N.O. + N.C. complementary | M12 quick-disconnect (purchase cable separately) |           |
| <a href="#"><u>FARS-0N-0A</u></a> | Retired |               |                                    |                     |                    | N.O./N.C. background suppression | NPN N.O./N.C. selectable      | 2m [6.5 ft] axial cable                          | Diagram 3 |
| <a href="#"><u>FARS-0N-0E</u></a> | Retired |               |                                    |                     |                    |                                  | NPN N.O./N.C. selectable      | M12 quick-disconnect (purchase cable separately) |           |
| <a href="#"><u>FARS-0P-0A</u></a> | Retired |               |                                    |                     |                    |                                  | PNP N.O./N.C. selectable      | 2m [6.5 ft] axial cable                          | Diagram 4 |
| <a href="#"><u>FARS-0P-0E</u></a> | Retired |               |                                    |                     |                    |                                  | PNP N.O./N.C. selectable      | M12 quick-disconnect (purchase cable separately) |           |

## Wiring Diagrams

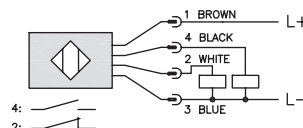
**Diagram 1**

**NPN Output**



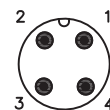
**Diagram 2**

**PNP Output**



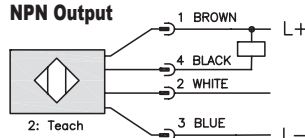
**Connector**

**M12 Connector**



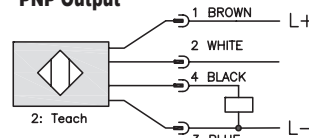
**Diagram 3**

**NPN Output**



**Diagram 4**

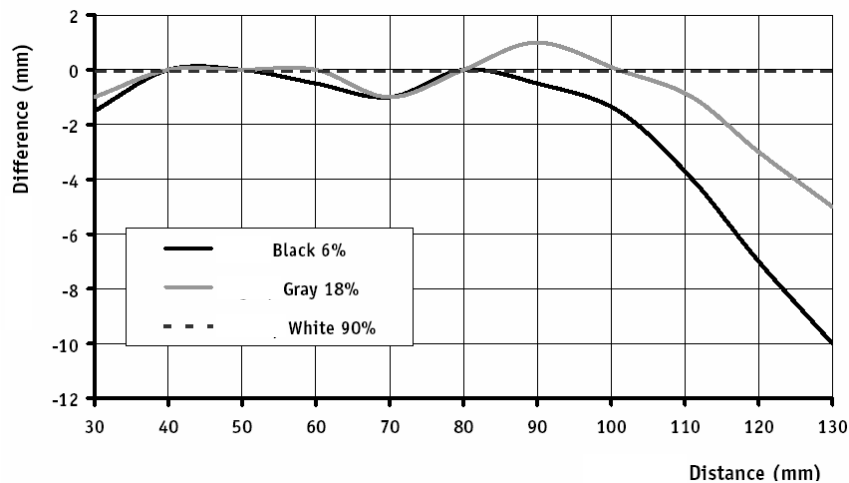
**PNP Output**



|             |          |
|-------------|----------|
| <b>N.O.</b> | Light ON |
| <b>N.C.</b> | Dark ON  |

# FARS Series Photoelectric Sensors

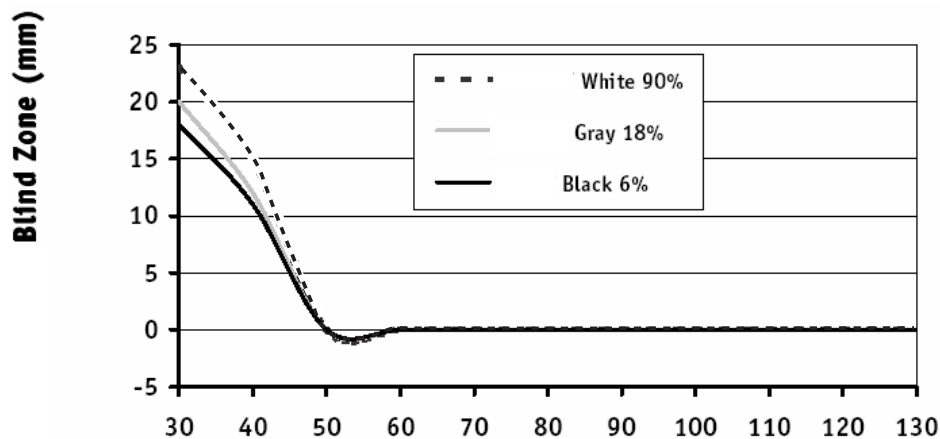
## Black-White Differential Chart



## Black-White Differential Graph

This graph shows the difference in distance between where the FARS series sensors detect a 90% reflective white card, versus a 6% reflective black test card under the same conditions. As the adjoining graph illustrates, the FARS series sensors provide practically a zero millimeter difference between the white and black target at a setup distance of 80mm, 3mm difference at a setup distance of 100mm and 10mm for a setup distance of 130mm.

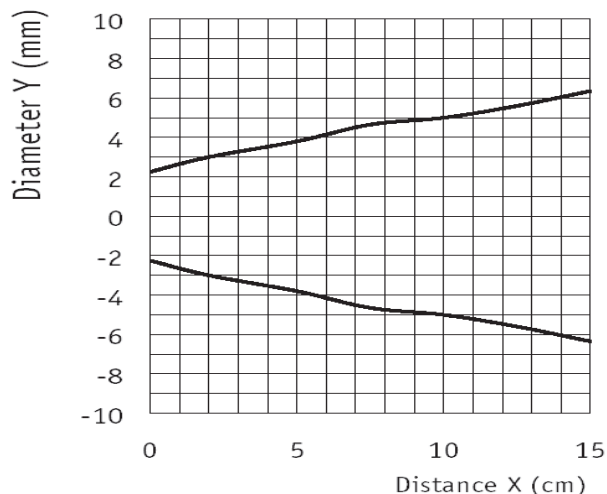
## Blind zone chart



## Blind Zone Graph

This graph shows the blind zone, which is where the FARS series sensors will not detect, depending on the setup distance. For setup sensing distance of 30mm the FARS sensor will have a blind zone of 25mm, so the effective sensing envelope is from 25mm to 30mm; but, as the setup sensing distance is increased, the blind zone decreases. The graph shows that from a setup sensing distance of 60mm to 130mm, the blind zone is zero millimeters.

## Spot dimension chart



## Switching Element Function

|          | Through-beam and Reflective Models | Diffuse Reflective Models |
|----------|------------------------------------|---------------------------|
| Light-on | N.C.                               | N.O.                      |
| Dark-on  | N.O.                               | N.C.                      |

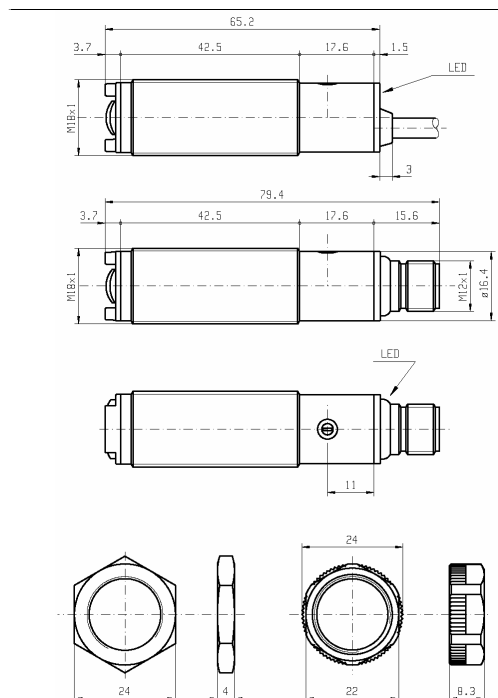
# FARS Series Photoelectric Sensors

| FARS Series Photoelectric Sensors Specifications |                                                              |
|--------------------------------------------------|--------------------------------------------------------------|
| Type                                             | 18mm Diffuse with Background Suppression                     |
| Sensing Distance                                 | 30 - 130mm                                                   |
| Light Spot Diameter                              | 13mm @ 100mm                                                 |
| Emission                                         | Red Light [660nm]                                            |
| Sensitivity                                      | Adjustable                                                   |
| Output Types                                     | NPN / PNP<br>Q/Qnot<br>Light-on / Dark-on, switch-selectable |
| Operating Voltage                                | 10 to 30 VDC                                                 |
| No Load Supply Current                           | 25mA                                                         |
| Operating (Load) Current                         | 100mA                                                        |
| Off-state (Leakage) Current                      | ≤ 10μA @ 30 VDC                                              |
| Voltage Drop                                     | 2V max @ 100mA                                               |
| Switching Frequency                              | 1kHz                                                         |
| Ripple                                           | ≤ 10%                                                        |
| Time Delay Before Availability (tv)              | 200ms                                                        |
| Short-circuit Protection                         | Yes                                                          |
| Operating Temperature                            | -13 to 158°F [-25 to 70°C]                                   |
| Protection Degree(DIN 40050)                     | IP67                                                         |
| LED Indicators- Switching Status                 | Yellow Output/Short Circuit Status                           |
| Housing Material                                 | Polybutylene Terephthalate (PBT)                             |
| Lens Material                                    | Poly methyl methacrylate (PMMA),                             |
| Shock/Vibration                                  | per IEC EN 60947-5-2                                         |
| Tightening Torque                                | 1 N•m [0.74 lb-ft]                                           |
| Weight                                           | 28.576 g [1.008 oz]                                          |
| Connectors                                       | 2m [6.5 ft] axial cable; M12 [12mm] connector                |
| Agency Approvals                                 | UL, CE                                                       |

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

## Dimensions

(mm)



**Warning:** These products are not safety sensors and are not suitable for use in personal safety applications.

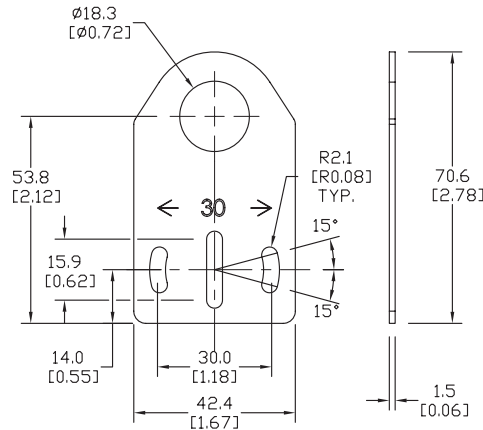
## Axial Mounting Bracket



**ST18A**

| Accessories for 18mm Sensors   |        |                                                                                           |                  |
|--------------------------------|--------|-------------------------------------------------------------------------------------------|------------------|
| Part Number                    | Price  | Description                                                                               | Weight<br>lb [g] |
| <a href="#"><u>ST18A</u></a>   | \$2.00 | Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors.    | 0.06 [27.2]      |
| <a href="#"><u>ST18A7W</u></a> | \$7.25 | Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2]      |

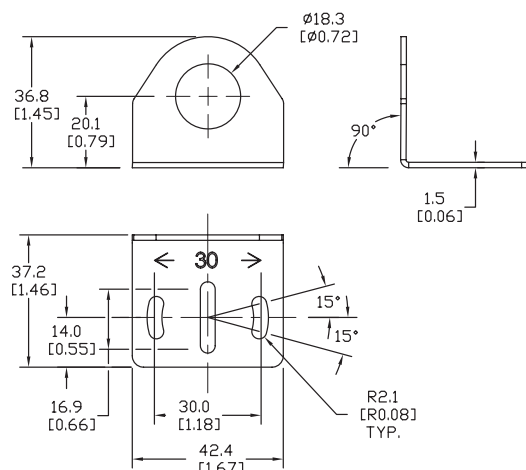
## mm [inches]



**ST18C**

| Accessories for 18mm Sensors |        |                                                                                                 |                  |
|------------------------------|--------|-------------------------------------------------------------------------------------------------|------------------|
| Part Number                  | Price  | Description                                                                                     | Weight<br>lb [g] |
| <u><b>ST18C</b></u>          | \$2.00 | Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.    | 0.06 [27.2]      |
| <u><b>ST18C7W</b></u>        | \$7.25 | Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2]      |

## mm [inches]

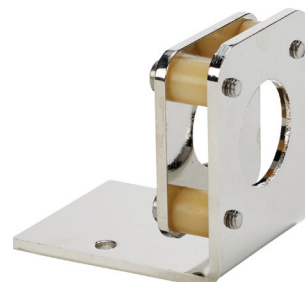


# Accessories for 18mm Sensors

## Right-angle Fine Tune Mounting Bracket

Mounting bracket, right-angle, fine tune vertical and horizontal adjustment, nickel-plated steel. For use with 18mm sensors. Allows for fine tuning vertical and horizontal placement.

| Accessories for 18mm Sensors   |         |                                                                                                                                      |                     |             |
|--------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| Part Number                    | Price   | Description                                                                                                                          | Drawing Link        | Weight [lb] |
| <a href="#"><u>OPT2036</u></a> | \$38.50 | Wenglor mounting bracket, right-angle, fine tune vertical and horizontal adjustment, nickel plated steel. For use with 18mm sensors. | <a href="#">PDF</a> | 0.02        |

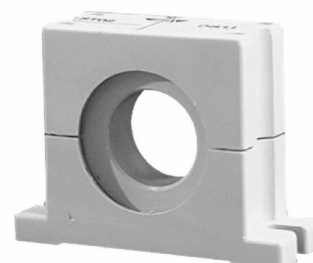


[OPT2036](#)

## Swivel Mounting Bracket

Mounting bracket, ball swivel, plastic. For use with 18mm sensors. Has a ball-joint and set screws to adjust sensor orientation. Allows angular orientation up to 15 degrees (from center) in all directions for photoelectric sensors (Will not work with C18 series).

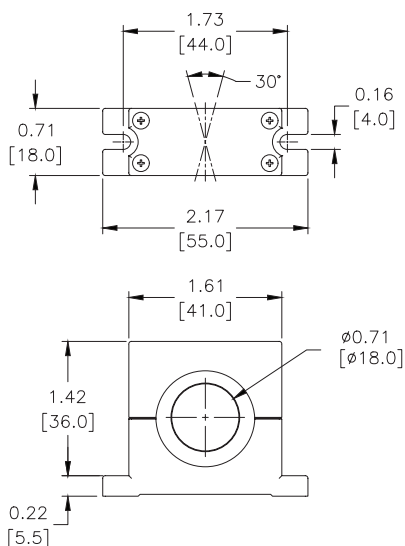
| Accessories for 18mm Sensors |        |                                                                                    |             |
|------------------------------|--------|------------------------------------------------------------------------------------|-------------|
| Part Number                  | Price  | Description                                                                        | Weight [lb] |
| <a href="#"><u>ST02</u></a>  | \$9.50 | Micro Detectors mounting bracket, ball swivel, plastic. For use with 18mm sensors. | 0.06        |



[ST02](#)

## Dimensions

mm [inches]



# Accessories for 18mm Sensors

## Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. Available with or without fixed insertion stop.

| Accessories for 18mm Sensors |         |                                                                                                             |                     |               |
|------------------------------|---------|-------------------------------------------------------------------------------------------------------------|---------------------|---------------|
| Part Number                  | Price   | Description                                                                                                 | Drawing Link        | Weight lb [g] |
| <a href="#">OPT2104</a>      | \$10.50 | Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. | <a href="#">PDF</a> | 0.06 [27.2]   |
| <a href="#">OPT2105</a>      | \$10.50 | Wenglor mounting bracket, right-angle, plastic. For use with 18mm sensors.                                  | <a href="#">PDF</a> | 0.06 [27.2]   |



[OPT2104](#), [OPT2105](#)

## Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with 18mm sensors. Available in all 304 stainless steel or with an aluminum head and a stainless steel mounting plate.

| Accessories for 18mm Sensors |         |                                                                                                                                                              |                     |                     |                     |               |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|---------------|
| Part Number                  | Price   | Description                                                                                                                                                  | Mounting Head       | Mounting Plate      | Drawing Link        | Weight lb [g] |
| <a href="#">OPT2116</a>      | \$11.50 | Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 18mm sensors.            | Aluminum            | 304 Stainless steel | <a href="#">PDF</a> | 0.15 [68.0]   |
| <a href="#">OPT2117</a>      | \$21.00 | Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 18mm sensors. | 304 Stainless steel | 304 Stainless steel | <a href="#">PDF</a> | 0.28 [127.0]  |



[OPT2116](#), [OPT2117](#)

Note: 304 Stainless steel mounting rods sold separately: [OPT2109](#) (200mm [7.87 in] length), [OPT2110](#) (300mm [11.81 in] length), and [OPT2111](#) (500mm [19.69 in] length).

# Mounting Rods and Brackets

## Mounting Rods

304 Stainless steel rods for mounting swivel brackets [OPT2112](#) - [OPT2127](#). Available in three lengths: 200mm, 300mm, and 500mm. 12mm diameter.

| Mounting Rods for OPT2112-2127 Swivel Mounting Brackets |         |                                                                         |                     |                  |
|---------------------------------------------------------|---------|-------------------------------------------------------------------------|---------------------|------------------|
| Part Number                                             | Price   | Description                                                             | Drawing Link        | Weight lb (g)    |
| <a href="#">OPT2109</a>                                 | \$13.00 | Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel. | <a href="#">PDF</a> | 0.41<br>[185.97] |
| <a href="#">OPT2110</a>                                 | \$16.00 | Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel. | <a href="#">PDF</a> | 0.60<br>[272.16] |
| <a href="#">OPT2111</a>                                 | \$21.00 | Wenglor mounting rod, 12mm diameter, 500mm length, 304 stainless steel. | <a href="#">PDF</a> | 0.98<br>[444.52] |



## Right-angle Mounting Bracket

Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods [OPT2109](#), [OPT2110](#) & [OPT2111](#).

| Right-angle Mounting Brackets for 12mm Sensors |         |                                                                                                                         |                     |                |
|------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|
| Part Number                                    | Price   | Description                                                                                                             | Drawing Link        | Weight lb [g]  |
| <a href="#">OPT2108</a>                        | \$16.00 | Wenglor mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111. | <a href="#">PDF</a> | 0.07<br>[31.8] |

