

# PFK Series IP69K-rated Proximity Sensors

## 18mm Stainless Steel - DC



**PFK1-BN-1H**

- 18mm diameter
- 316 L stainless steel housing
- M12 quick-disconnect plug with gold-plated pins (purchase cable separately)
- Complete overload protection
- IP69K rated for food and beverage applications
- M18 mounting hex nuts included
- Lifetime warranty



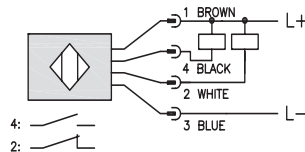
### PFK Series Food and Beverage DC Inductive Proximity Selection Chart

| Part Number                | Price   | Sensing Range                 | Mounting  | Output State | Logic | Connection           | Wiring               | Dimensions |
|----------------------------|---------|-------------------------------|-----------|--------------|-------|----------------------|----------------------|------------|
| Standard                   |         |                               |           |              |       |                      |                      |            |
| <a href="#">PFK1-BN-1H</a> | \$50.00 | 0 to 5 mm<br>[0 to 0.197 in]  | Flush     | N.O./N.C.    | NPN   | M12 [12mm] connector | Diagram 1            | Figure 3   |
| <a href="#">PFK1-BP-1H</a> | \$50.00 |                               |           |              | PNP   | M12 [12mm] connector | Diagram 2            | Figure 3   |
| <a href="#">PFK1-BN-2H</a> | \$50.00 | 0 to 8 mm<br>[0 to 0.315 in]  | Non-flush | N.O./N.C.    | NPN   | M12 [12mm] connector | Diagram 1            | Figure 3   |
| <a href="#">PFK1-BP-2H</a> | \$50.00 |                               |           |              | PNP   | M12 [12mm] connector | Diagram 2            | Figure 3   |
| Extended                   |         |                               |           |              |       |                      |                      |            |
| <a href="#">PFK1-BN-3H</a> | \$50.00 | 0 to 8 mm<br>[0 to 0.315 in]  | Flush     | N.O./N.C.    | NPN   | M12 [12mm] connector | Diagram 1            | Figure 3   |
| <a href="#">PFK1-BP-3H</a> | \$50.00 |                               |           |              | PNP   | M12 [12mm] connector | Diagram 2            | Figure 3   |
| <a href="#">PFK1-BN-4H</a> | \$50.00 | 0 to 12 mm<br>[0 to 0.472 in] | Non-flush | N.O./N.C.    | NPN   | M12 [12mm] connector | Diagram 1            | Figure 3   |
| <a href="#">PFK1-BP-4H</a> | \$50.00 |                               |           |              | PNP   | M12 [12mm] connector | Diagram 2            | Figure 3   |
| <a href="#">PFK1-AP-4H</a> | Retired |                               |           |              | N.O.  | PNP                  | M12 [12mm] connector | Diagram 3  |

## Wiring Diagrams

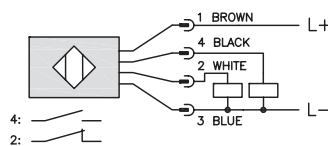
**Diagram 1**

**NPN Output**



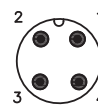
**Diagram 2**

**PNP Output**



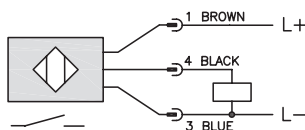
**Connector**

**M12 connector**



**Diagram 3**

**PNP Output**



Note: Class 2 power supply required

# PFK Series IP69K-rated Proximity Sensors

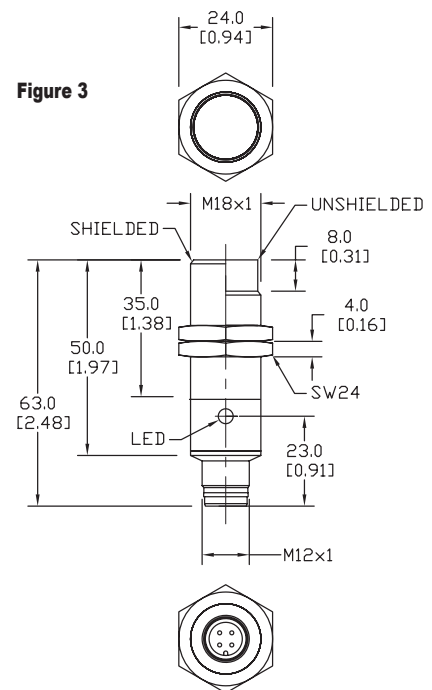
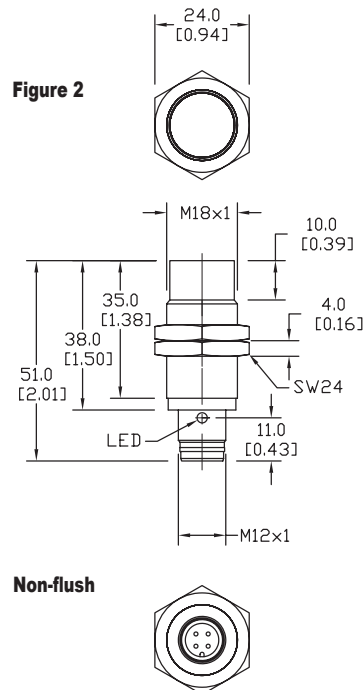
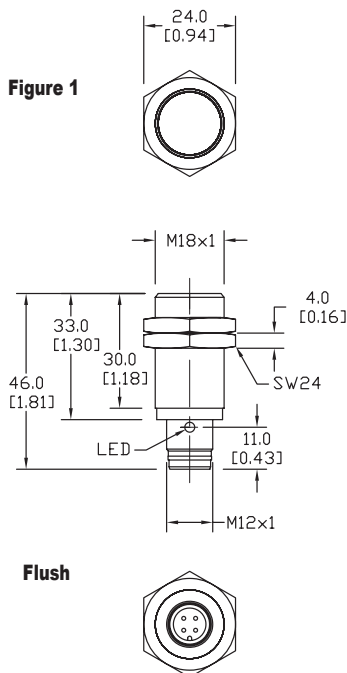
| PFK Series Specifications                   | Standard                                                                                           |                | Extended       |                 |                                   |                 |
|---------------------------------------------|----------------------------------------------------------------------------------------------------|----------------|----------------|-----------------|-----------------------------------|-----------------|
| Mounting Type                               | Flush                                                                                              | Non-flush      | Flush          | Non-flush       | Flush*                            | Non-flush*      |
| Nominal Sensing Distance                    | 5mm [0.196 in]                                                                                     | 8mm [0.315 in] | 8mm [0.315 in] | 12mm [0.472 in] | 8mm [0.315 in]                    | 12mm [0.472 in] |
| Operating Distance                          | NA                                                                                                 |                |                |                 |                                   |                 |
| Material Correction Factors                 | See the <a href="#">Material influence table</a>                                                   |                |                |                 |                                   |                 |
| Output Type                                 | NPN or PNP/4-wire, N.O./N.C.                                                                       |                |                |                 | PNP, N.O. only                    |                 |
| Operating Voltage                           | 10 - 30 VDC                                                                                        |                |                |                 | 10 - 36 VDC                       |                 |
| No-load Supply Current                      | ≤ 15mA                                                                                             |                |                |                 | ≤10mA                             |                 |
| Operating (Load) Current                    | ≤200mA                                                                                             |                |                |                 | ≤ 100mA                           |                 |
| Off-state (Leakage) Current                 | ≤10 µA                                                                                             |                |                |                 | NA                                |                 |
| Voltage Drop                                | ≤2.0 V                                                                                             |                |                |                 | ≤ 2.5 V                           |                 |
| Switching Frequency                         | 1500Hz                                                                                             |                |                |                 | 600Hz                             | 300Hz           |
| Differential Travel (% of Nominal Distance) | 1 - 20%                                                                                            |                |                |                 |                                   | 3 - 15%         |
| Repeat Accuracy                             | 5%                                                                                                 |                |                |                 | 10%                               |                 |
| Ripple                                      | ≤10%                                                                                               |                |                |                 | NA                                |                 |
| Time Delay Before Availability (tv)         | 50ms                                                                                               |                |                |                 | 30ms                              |                 |
| Reverse Polarity Protection                 | Yes                                                                                                |                |                |                 |                                   |                 |
| Short-Circuit Protection                    | Yes (switch auto-resets after overload is removed)                                                 |                |                |                 |                                   |                 |
| Operating Temperature                       | -40 to 80°C [-40 to 176°F], Short exposure (15 minutes) to 100°C [212°F] during cleaning processes |                |                |                 | 0 to 100°C [32 to 212°F]          |                 |
| Protection Degree (DIN 40050)               | IEC IP67, IP68, IP69K                                                                              |                |                |                 | IEC IP68, IP69K                   |                 |
| Indication/Switch Status                    | Normally Open output energized - Yellow                                                            |                |                |                 |                                   |                 |
| Housing Material                            | 316 L stainless steel                                                                              |                |                |                 |                                   |                 |
| Sensing Face Material                       | PPS (FDA certified)                                                                                |                |                |                 | PEEK (Polyether Ether Ketone)     |                 |
| Shock/Vibration                             | See <a href="#">Proximity Sensor Terminology</a>                                                   |                |                |                 |                                   |                 |
| Tightening Torque                           | 107 Nm [79 lb-ft]                                                                                  |                |                |                 | 50 Nm [37 lb-ft]                  |                 |
| Weight                                      | 35g [1.23 oz]                                                                                      |                |                |                 | 45g [1.587 oz]                    |                 |
| Connection                                  | M12 plug with gold-plated pins                                                                     |                |                |                 |                                   |                 |
| Agency Approvals                            | UL file E187310, CE, ECOLAB, RoHS                                                                  |                |                |                 | UL file E187310, CE, ECOLAB, RoHS |                 |

\* Part number PFK1-AP-4H have N.O. PNP outputs only.

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

## Dimensions

mm [inches]



# Accessories for 18mm Sensors

## Axial Mounting Bracket

Axial mounting bracket available in zinc plated steel or 316L stainless steel. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adaptor sensors. Hexagonal nuts not included. For use with 18mm sensors.

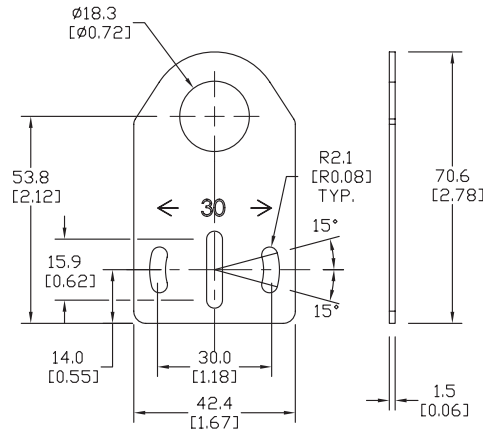
| Accessories for 18mm Sensors   |        |                                                                                           |               |
|--------------------------------|--------|-------------------------------------------------------------------------------------------|---------------|
| Part Number                    | Price  | Description                                                                               | Weight 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]   |



**ST18A**

## Dimensions

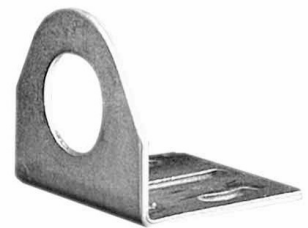
mm [inches]



## Right-angle Mounting Bracket

Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

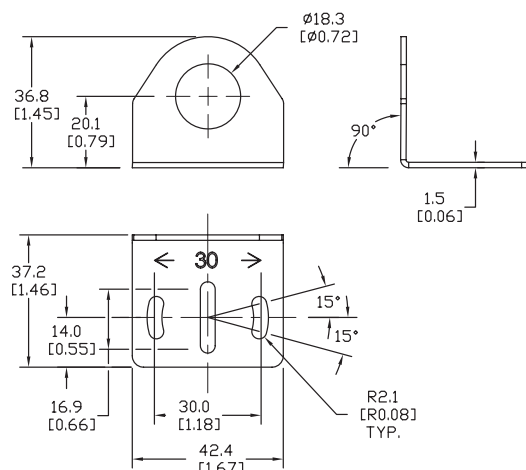
| Accessories for 18mm Sensors   |        |                                                                                                 |               |
|--------------------------------|--------|-------------------------------------------------------------------------------------------------|---------------|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



**ST18C**

## Dimensions

mm [inches]

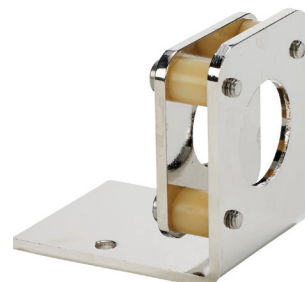


# Accessories for 18mm Sensors

## 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="#"><u>PDF</u></a> | 0.02        |

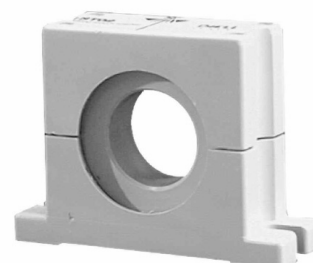


[OPT2036](#)

## 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).

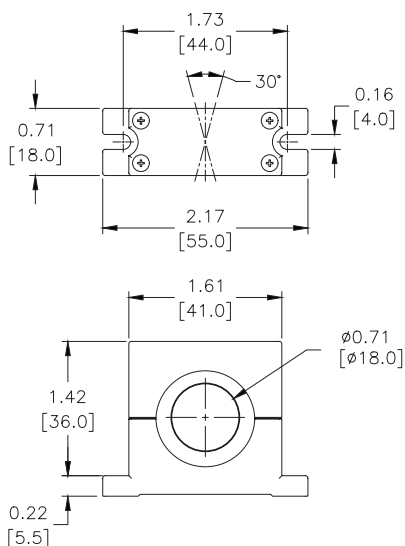
| Accessories for 18mm Sensors |        |                                                                                    |             |
|------------------------------|--------|------------------------------------------------------------------------------------|-------------|
| Part Number                  | 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] |

