



# Inductive Proximity Sensors PAK Series

## Tubular M18 (18mm) stainless steel – DC

### Features

- Nickel-plated brass construction
- Axial cable or M12 quick-disconnect models
- Complete overload protection
- IP67 rated
- LED status indicator
- Mounting hardware included
- Lifetime warranty



**PAK-AP-1A**



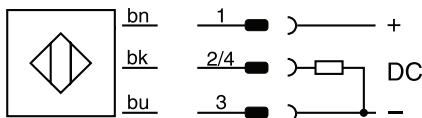
**PAK-AP-2H**

### Tubular M18 DC Inductive Proximity Sensors PAK Series Selection Chart

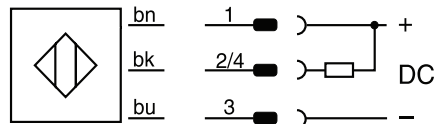
| Part Number               | Price   | Sensing Distance<br>mm [in] | Mounting  | Output<br>State | Logic | Connection  | Weight<br>g [oz] | Body Size<br>mm [in] | Drawing<br>Link     |
|---------------------------|---------|-----------------------------|-----------|-----------------|-------|---|------------------|----------------------|---------------------|
| <a href="#">PAK-AP-1A</a> | \$12.50 | 5mm<br>[0.19]               | Flush     | N.O.            | PNP   | PVC, 3-wire pigtail 2m [6.5 ft], 22AWG                    | 116<br>[4.09]    | 50<br>[1.96]         | <a href="#">PDF</a> |
| <a href="#">PAK-AP-1H</a> | \$12.50 |                             |           |                 |       | 4-pin M12 quick-disconnect<br>[purchase cable separately] | 51<br>[1.79]     | 63.5<br>[2.5]        | <a href="#">PDF</a> |
| <a href="#">PAK-AN-1H</a> | \$12.50 |                             |           |                 | NPN   |   |                  |                      | <a href="#">PDF</a> |
| <a href="#">PAK-AP-2A</a> | \$12.50 | 8mm<br>[0.31]               | Non-flush | N.O.            | PNP   | PVC, 3-wire pigtail 2m [6.5 ft], 22AWG                    | 112<br>[3.95]    | 50<br>[1.96]         | <a href="#">PDF</a> |
| <a href="#">PAK-AP-2H</a> | \$12.50 |                             |           | N.O.            |       | 4-pin M12 quick-disconnect<br>[purchase cable separately] | 49<br>[1.72]     | 63.5<br>[2.5]        | <a href="#">PDF</a> |
| <a href="#">PAK-AN-2H</a> | \$12.50 |                             |           | N.O.            | NPN   |   |                  |                      | <a href="#">PDF</a> |

## Wiring Diagrams

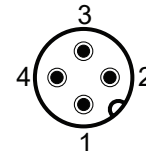
### PNP Cable



### NPN Cable



### M12 Connector





# Inductive Proximity Sensors

## PAK Series Specifications

| Tubular M18 DC Inductive Proximity Sensors PAK Series Specifications |   |                |
|--|---|----------------|
| <b>Mounting Type</b>   | Flush   | Non-Flush      |
| <b>Rated Operating Distance</b>                                      | 5mm [0.19 in]                                     | 8mm [0.31 in]  |
| <b>Assured Operating Distance</b>                                    | $\leq (0.81 \times S_n)$ mm                       |                |
| <b>Repeat Accuracy</b>   | 0.25 mm   | 0.4 mm         |
| <b>Hysteresis</b>  | $\leq 20\% S_r$                                   |                |
| <b>Temperature Drift</b>   | $\leq 10\% S_r$                                   |                |
| <b>Material Correction Factors</b>                                   | See the <a href="#">Material Influence Table</a>  |                |
| <b>Output Type</b>   | PNP or NPN, N.O.                                  |                |
| <b>Operating Voltage</b>   | 10 to 30 VDC                                      |                |
| <b>Residual Ripple</b>   | $\leq 20\% U_B$                                   |                |
| <b>Output Current</b>  | $\leq 200\text{mA}$                               |                |
| <b>Output Voltage Drop</b>   | $\leq 2.0\text{ V @ }200\text{mA}$                |                |
| <b>Power Consumption (no-load)</b>                                   | $\leq 10\text{ mA}$                               |                |
| <b>Residual Current</b>  | $\leq 0.1\text{ mA}$                              |                |
| <b>Switching Frequency</b>   | 2kHz  | 2kHz           |
| <b>Short-Circuit Protection</b>                                      | Yes   |                |
| <b>Reverse Polarity Protection</b>                                   | Yes   |                |
| <b>Operating Temperature</b>   | -25 to 70°C [-13 to 158°F]                        |                |
| <b>Protection Degree (DIN 40050)</b>                                 | IP67  |                |
| <b>Indication/Switch Status</b>                                      | LED, Yellow Sensing state ( $0 \leq s \leq S_r$ ) |                |
| <b>Mounting</b>  | Embeddable  | Non-embeddable |
| <b>Housing Material</b>  | Nickel-plated brass                               |                |
| <b>Sensing Face Material</b>   | PBTP ( polybutylene terephthalate)                |                |
| <b>Shock/Vibration</b>   | IEC 60947-5-2                                     |                |
| <b>Agency Approvals</b>  | cULus File E328811, CE                            |                |

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

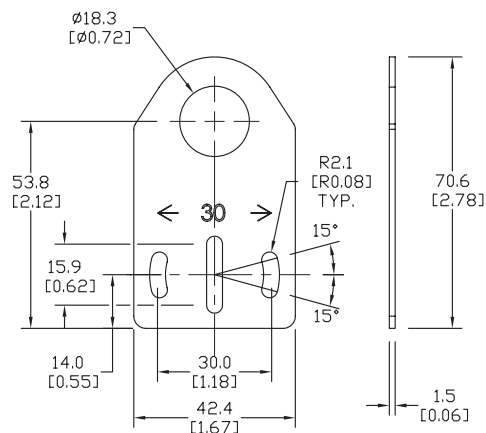
Axial mounting bracket available in zinc plated steel or 316L stainless steel. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adaptor sensors. Hexagonal nuts not included. For use with 18mm sensors.

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



**ST18A**

mm [inches]



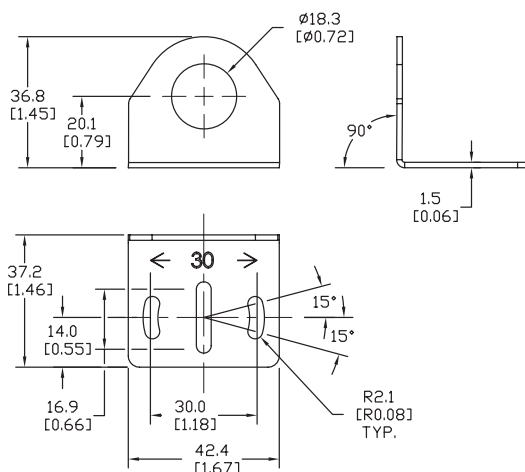
Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

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



**ST18C**

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).