WFL FORK SENSORS

GET PRECISE DETECTION OF SMALL TARGETS WITH WFL

Product description
The WFL laser fork sensor family is characterized by fast response times and a highly focused visible laser beam. The sender and receiver, which operate using the through-beam principle, are combined in a single housing. This enables maximum positioning accuracy. Due to extremely fast response times and high resolutions, these sensors are ideal for detecting very small objects, such as needles, and transparent objects. With more than 20 sensors available, this line of fork sensors can be used for a wide variety of applications.

At a glance
- Very precise laser beam (Class 1 laser)
- Simple and accurate adjustment via teach-in
- Fast response time (max. 100 µs)
- Minimum detectable object size of 0.05 mm
- PNP and NPN switching output
- Light/dark switching function
- 21 different models with different fork widths and depths
- Rugged, IP 65 aluminum housing

Your benefits
- A highly precise laser beam ensures consistent measurement accuracy along the entire measuring range and reliable detection of the smallest objects
- A visible laser light spot enables easy alignment and fast adjustment
- Reliable and simple setting via teach-in ensures high process reliability
- The aluminum housing meets all requirements for use in harsh industrial conditions

Detailed technical data

Features

- Functional principle: Optical detection principle
- Housing design (light emission): Fork shaped
- Fork width: 2 mm ... 120 mm (depending on type)
- Fork depth: 42 mm ... 95 mm (depending on type)
- Minimum detectable object (MDO): 0.05 mm
- Light source: Laser
- Type of light: Visible red light
- Wave length: 670 nm
- Laser class: I
- Adjustment: Teach-in
- Output function: Light/dark switching, selectable via button

Mechanics/electronics

- Supply voltage: 10 V DC ... 30 V DC
- Ripple: < 10 %
- Power consumption: 40 mA
- Switching frequency: 10 kHz
- Response time: 100 µs
- Stability of response time: ± 20 µs
- Switching output: PNP: HIGH = VS
- Output current: 100 mA
- Output current: 100 mA
- Initialization time: 100 ms
- Connection type: Connector M8, 4-pin
- Ambient light safety: Sunlight ≤ 50,000 lx
- Circuit protection: Vc connections reverse-polarity protected, Output Q short-circuit protected, Interference suppression
- Enclosure rating: IP 65
- Weight: Approx. 36 g ... 160 g
- Housing material: Metal, aluminum

Ambient data

- Ambient operating temperature: -20 °C ... +50 °C
- Ambient storage temperature: -30 °C ... +80 °C
- Shock load: According to EN 60068-2-27
- UL File No.: NKRE.E191603 & NKRE7.E191603, CDRH-conform

- Do not bend below 0 °C.
## Ordering information

<table>
<thead>
<tr>
<th>Fork width</th>
<th>WFL2</th>
<th>WFL5</th>
<th>WFL15</th>
<th>WFL30</th>
<th>WFL50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MDQ</td>
<td>Switching output</td>
<td>Adjustment</td>
<td>Fork depth</td>
<td>Type</td>
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<tr>
<td>2 mm</td>
<td>0.05 mm</td>
<td>PNP/NPN</td>
<td>Teach-in</td>
<td>42 mm</td>
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<tr>
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<td>PNP/NPN</td>
<td>Teach-in</td>
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<td></td>
<td></td>
<td></td>
<td>95 mm</td>
<td>WFL50-958416</td>
</tr>
</tbody>
</table>

## Teach-in

- **WFL2**
  - Fork width: 2 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Fork depths: 42 mm, 59 mm, 95 mm

- **WFL5**
  - Fork width: 5 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Fork depths: 42 mm, 59 mm, 95 mm

- **WFL15**
  - Fork width: 15 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Fork depths: 42 mm, 59 mm, 95 mm

- **WFL30**
  - Fork width: 30 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Fork depths: 42 mm, 59 mm, 95 mm

- **WFL50**
  - Fork width: 50 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Fork depths: 42 mm, 59 mm, 95 mm

## MDQ Switching output Adjustment Fork depth Type Part no.

- **WFL80**
  - Fork width: 80 mm
  - Fork depth: 42 mm, 59 mm, 95 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Type: WFL80
  - Part nos: 6036826, 6036833, 6036840

- **WFL120**
  - Fork width: 120 mm
  - Fork depth: 42 mm, 59 mm, 95 mm
  - MDQ: 0.05 mm
  - Switching output: PNP/NPN
  - Adjustment: Teach-in
  - Type: WFL120
  - Part nos: 6036827, 6036834, 6036841

## Dimensional drawing

- **Dimensions in mm (inch)**

  - **WFL2**
    - Fork width: 42 mm, 59 mm, 95 mm
    - Fork depth: 14, 15 (0.55), 15.5 (0.61)

  - **WFL5**
    - Fork width: 42 mm, 59 mm
    - Fork depth: 14, 15 (0.55), 15 (0.59)

  - **WFL15**
    - Fork width: 42 mm, 59 mm
    - Fork depth: 27, 1.06 (1.06), 13.5 (0.53)

  - **WFL30**
    - Fork width: 42 mm, 59 mm
    - Fork depth: 42 (1.65), 13.5 (0.53)

  - **WFL50**
    - Fork width: 42 mm, 59 mm
    - Fork depth: 81, 4.76 (1.86), 24.5 (0.96)

  - **WFL80**
    - Fork width: 42 mm, 59 mm, 95 mm
    - Fork depth: 81, 4.76 (1.86), 24.5 (0.96)

  - **WFL120**
    - Fork width: 42 mm, 59 mm, 95 mm
    - Fork depth: 162, 6.38 (2.50), 24.5 (0.96)

- **Optical axis**
- **Mounting hole, Ø 4.2 mm**
- **WFL50/80/120 only**
Adjustments

Function signal indicator (yellow), switching output
Function indicator (red)
"+"/"-" buttons and function button

Connection diagram

Function signal indicator (yellow), switching output
Function indicator (red)
"+"/"-" buttons and function button

Setting the switching threshold

Teach-in

The switching threshold is set automatically. Fine adjustment is possible using the "+"/"-" buttons.

1. No object or substrate in the beam path

2. Object or label in the beam path

Press the "+" and "-" buttons together and hold for 1 second. The red function indicator flashes slowly.

Press the "-" button for 1 second. Red function indicator goes out.

Notes

Material speed = 0 (machine at a standstill).

Once teach-in process is complete, the switching threshold can be adjusted at any time using the "+" or "-" button. Make minor adjustments, press the "+" or "-" button once.

To configure settings quickly, keep the "+" or "-" button pressed for longer.

Press both the "+" and "-" buttons together (3 seconds) to lock the device and prevent unintentional actuation.

Press both the "+" and "-" buttons together (6 seconds) to define the switching function (light/dark switching). Standard setting: Q = light switching.

Recommended accessories

Plug connectors and cables

Connecting cables with female connector M8, 4-pin, PVC, chemical resistant

<table>
<thead>
<tr>
<th>Figure</th>
<th>Connection type head A</th>
<th>Connection type head B</th>
<th>Connecting cable</th>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female connector, M8, 4-pin, straight, unshielded</td>
<td>Cable, open conductor heads</td>
<td>2 m, 4-wire</td>
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* For additional accessories, please see page K-240.