# WF50-40B41CA71

WF

**FORK SENSORS**

# WF50-40B41CA71 | WF

## FORK SENSORS



Illustration may differ

## Ordering information

| Type | part no. |
|---|---|
| WF50-40B41CA71 | 6059834 |

Other models and accessories ➜ www.sick.com/WF

## Detailed technical data

### Features

| | |
|---|---|
| **Functional principle** | Optical detection principle |
| **Dimensions (W x H x D)** | 10 mm x 80 mm x 57 mm |
| **Fork width** | 50 mm |
| **Fork depth** | 42 mm |
| **Minimum detectable object (MDO)** | 0.2 mm |
| **Label detection** | ✓ |
| **Light source** | LED, infrared, Infrared light |
| **Adjustment** | Teach-in button, cable (Teach-in, sensitivity, light/dark switching, key lock, Teach-in dynamic) |
| **Teach-in mode** | 1-point teach-in<br>2-point teach-in<br>Teach-in dynamic |
| **Output function** | Light/darkswitching, selectable via button |

### Mechanics/electronics

| | |
|---|---|
| **Supply voltage** | 10 V DC ... 30 V DC |
| **Ripple** | < 10 % |
| **Current consumption** | 20 mA [1] |
| **Switching frequency** | 15 kHz |

[1] Without load.
[2] Signal transit time with resistive load.
[3] Reference voltage DC 50 V.
[4] Depending on fork width.

| | |
|---|---|
| **Response time** | ≤ 46 µs [2] |
| **Stability of response time** | ± 20 µs |
| **Jitter** | 17 µs |
| **Switching output** | Push-pull: PNP/NPN |
| **Switching output (voltage)** | Push-pull: PNP/NPN High = $U_V$ - < 2 V/Low: ≤ 2 V |
| **Switching mode** | Light/dark switching |
| **Output current $I_{max.}$** | 100 mA |
| **Input, teach-in (ET)** | Teach: U > 5 V ... < $U_V$<br>Run: U < 4 V |
| **Initialization time** | 40 ms |
| **Time delay** | Switch-off delay, 0 ms / 8 ms / 16 ms / 32 ms / 65 ms / 130 ms / 260 ms / 520 ms, adjustable via IO-Link (0 ms = default) |
| **Connection type** | Male connector M8, 4-pin |
| **Protection class** | III [3] |
| **Circuit protection** | $U_V$ connections, reverse polarity protected<br>Output Q short-circuit protected<br>Interference pulse suppression |
| **Enclosure rating** | IP65 |
| **Weight** | Approx. 36 g ... 160 g [4] |
| **Housing material** | Aluminum |

[1] Without load.

[2] Signal transit time with resistive load.

[3] Reference voltage DC 50 V.

[4] Depending on fork width.

## Safety-related parameters

| | |
|---|---|
| **$MTTF_D$** | 97 years |
| **$DC_{avg}$** | 0 % |

## Communication interface

| | |
|---|---|
| **IO-Link** | ✔ , IO-Link V1.1 |
| VendorID | 26 |
| DeviceID HEX | 8000B0 |
| DeviceID DEC | 8388784 |
| **Cycle time** | 2.3 ms |
| **Process data structure A** | Bit 0 = switching signal $Q_{L1}$<br>Bit 1 = switching signal $Q_{L2}$<br>Bit 2 = not used<br>Bit 3 = Teach busy<br>Bit 4 ... 15 = empty |
| **Process data structure B** | Bit 0 = switching signal $Q_{L1}$<br>Bit 1 = Quality of Run Alarm<br>Bit 2 = not used<br>Bit 3 = Teach busy<br>Bit 4 ... 15 = empty |
| **Process data structure C** | Bit 0 = switching signal $Q_{L1}$<br>Bit 1 = switching signal $Q_{L2}$<br>Bit 2 = not used<br>Bit 3 = Teach busy |

| | |
|---|---|
| | Bit 4 ... 5 = empty<br>Bit 6 ... 15 = measuring value |
| Process data structure D | Bit 0 = switching signal $Q_{L1}$<br>Bit 1 = Quality of Run Alarm<br>Bit 2 = not used<br>Bit 3 = Teach busy<br>Bit 4 ... 5 = empty<br>Bit 6 ... 15 = measuring value |
| Process data structure E | Bit 0 = switching signal $Q_{L1}$ (AFC Q1 Output)<br>Bit 1 = switching signal $Q_{L2}$ (AFC Q2 Output)<br>Bit 2 ... 15 = counting value |

## Ambient data

| | |
|---|---|
| Ambient operating temperature | –20 °C ... +60 °C [1] |
| Ambient temperature, storage | –30 °C ... +80 °C |
| Ambient light immunity | ≤ 10,000 lx |
| Shock load | According to EN 60068-2-27 |
| UL File No. | NRKH.E191603 |

[1] Do not bend below 0 °C.

## Smart Task

| | |
|---|---|
| Smart Task name | Counter + debouncing |

## Certificates

| | |
|---|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| Moroccan declaration of conformity | ✓ |
| China-RoHS | ✓ |
| cULus certificate | ✓ |
| IO-Link | ✓ |
| Photobiological safety (IEC EN 62471) | ✓ |

## Classifications

| | |
|---|---|
| ECLASS 5.0 | 27270909 |
| ECLASS 5.1.4 | 27270909 |
| ECLASS 6.0 | 27270909 |
| ECLASS 6.2 | 27270909 |
| ECLASS 7.0 | 27270909 |
| ECLASS 8.0 | 27270909 |
| ECLASS 8.1 | 27270909 |
| ECLASS 9.0 | 27270909 |
| ECLASS 10.0 | 27270909 |
| ECLASS 11.0 | 27270909 |
| ECLASS 12.0 | 27270909 |
| ETIM 5.0 | EC002720 |
| ETIM 6.0 | EC002720 |

| ETIM 7.0 | EC002720 |
|---|---|
| ETIM 8.0 | EC002720 |
| UNSPSC 16.0901 | 39121528 |

## Dimensional drawing



Dimensions in mm (inch)
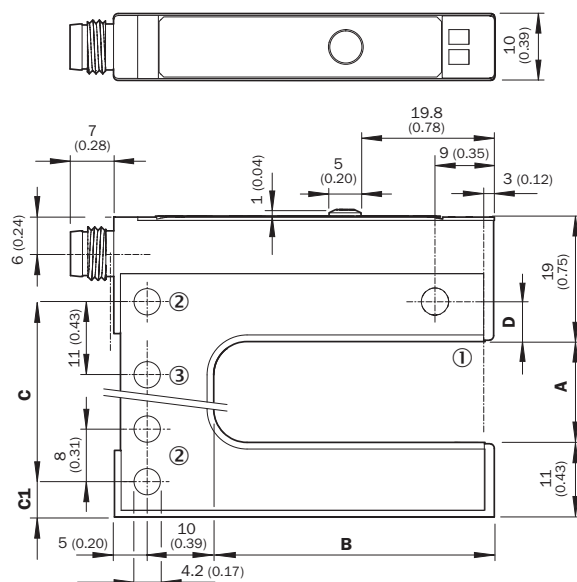
**Dimensions in mm (inch)**

| | A | B | C | C1 | D |
|---|---|---|---|---|---|
| | Gabelweite/Fork width | Gabeltiefe/Fork depth | | | |
| WF2 | 2 (0.08) | 42/59/95 (1.65/2.32/3.74) | 14 (0.55) | 5 (0.20) | 6 (0.24) |
| WF5 | 5 (0.20) | 42/59/95 (1.65/2.32/3.74) | 14 (0.55) | 6.5 (0.26) | 4.5 (0.17) |
| WF15 | 15 (0.59) | 42/59/95 (1.65/2.32/3.74) | 27 (1.06) | 5 (0.20) | 6 (0.24) |
| WF30 | 30 (1.18) | 42/59/95 (1.65/2.32/3.74) | 42 (1.65) | 5 (0.20) | 6 (0.24) |
| WF50 | 50 (1.97) | 42/59/95 (1.65/2.32/3.74) | 51 (2.01) | 16 (0.63) | 6 (0.24) |
| WF80 | 80 (3.15) | 42/59/95 (1.65/2.32/3.74) | 81 (3.19) | 16 (0.63) | 6 (0.24) |
| WF120 | 120 (4.72) | 42/59/95 (1.65/2.32/3.74) | 121 (4.76) | 16 (0.63) | 6 (0.24) |

## Adjustments Adjustment: teach-in via Teach-in button (WFxx-B41Cxx)
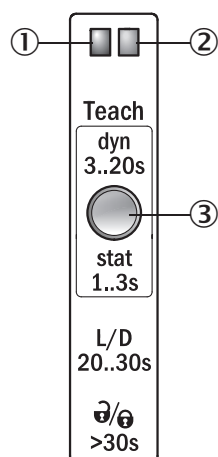


① Function signal indicator (yellow), switching output
② Function signal indicator (green)
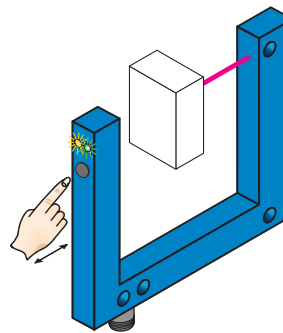③ Teach-in button and function button

## Connection diagram Cd-273



| | | |
|---|---|---|
| BN | 1 | + (L+) |
| BK | 4 | $Q_1$/C |
| WH | 2 | MF |
| BU | 3 | – (M) |
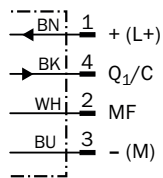
## Concept of operation Teach-in via Teach-in button (WFxx-B41Cxx)

**1. Start teach-in: Position the background or object between the fork**
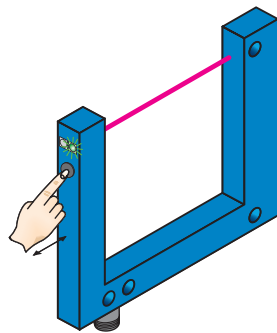


Press the teach-in button for 3 - 20 s. With the pushbutton pressed down, move several objects with carrier material (label objects to be detected) through the sensor. The yellow LED flashes at 3 Hz during the teach-in procedure. Recommendation: Move at least 3 objects through the sensor.

**2. End teach-in:**



Release the teach-in button for < 20 s. If teach-in is suc-cessful, the function indicator (yellow LED) directly indicates the output state of the sensor. The switching threshold is now optimally set between background and object. The best possible operational safety is provided.

## Note

### Fine adjustment

In order to obtain a higher operating reserve, a fine adjustment can be carried out after successful teach-in. For this purpose, the switching threshold is set close to the taught-in object. The teach-in button must be pressed and released within 10 s of successful teach-in. Successful setting is signaled by flashing twice at 1 Hz.

### Light/dark switching

You can change between light switching and dark switching by pressing the teach-in button for 20 - 30 s.

### Pushbutton lock

The device can be locked against unintended operation by pressing the teach-in button for > 30 s. The device can be unlocked by pressing the teach-in button again for > 30 s.

## Recommended accessories

Other models and accessories ➜ www.sick.com/WF

| | Brief description | Type | part no. |
|---|---|---|---|
| connectors and cables | | | |
| | • **Connection type head A:** Male connector, M8, 4-pin, straight, A-coded<br>• **Description:** Unshielded<br>• **Connection systems:** Screw-type terminals<br>• **Permitted cross-section:** 0.14 mm² ... 0.5 mm² | STE-0804-G | 6037323 |
| | • **Connection type head A:** Female connector, M8, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PVC<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Zones with chemicals, Uncontaminated zones | YF8U14-050VA3XLEAX | 2095889 |
| | • **Connection type head A:** Female connector, M8, 4-pin, straight, A-coded<br>• **Connection type head B:** Male connector, M12, 4-pin, straight, A-coded<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PVC<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Zones with chemicals, Uncontaminated zones | YF8U14-050VA3M2A14 | 2096609 |
| network devices | | | |
| | | IOLA2US-01101<br>(SiLink2 Master) | 1061790 |
| | | SIG200-0A0412200 | 1089794 |
| | | SIG200-0A0G12200 | 1102605 |

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