



WFL5-60B41CA00

WFL

FORK SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|----------------|----------|
| WFL5-60B41CA00 | 6058628 |

Other models and accessories → www.sick.com/WFL

Detailed technical data

Features

| | |
|--|---|
| Functional principle | Optical detection principle |
| Dimensions (W x H x D) | 10 mm x 43.5 mm x 74 mm |
| Housing design (light emission) | Fork shaped |
| Fork width | 5 mm |
| Fork depth | 59 mm |
| Minimum detectable object (MDO) | 0.05 mm |
| Light source | Laser, visible red light |
| Laser class | I |
| Wave length | 670 nm |
| Adjustment | Teach-in button (Teach-in, sensitivity, light/dark switching, key lock) Cable (Teach-in dynamic) |
| Teach-in mode | 1-point teach-in 2-point teach-in Teach-in dynamic |

Mechanics/electronics

| | |
|-----------------------|-----------------------------------|
| Supply voltage | 10 V DC ... 30 V DC ¹⁾ |
| Ripple | < 10 % ²⁾ |

¹⁾ Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

²⁾ May not exceed or fall below U_V tolerances.

³⁾ Without load.

⁴⁾ With light/dark ratio 1:1.

⁵⁾ Signal transit time with resistive load.

⁶⁾ Reference voltage DC 50 V.

⁷⁾ Depending on fork width.

| | |
|--|---|
| Current consumption | 40 mA ³⁾ |
| Switching frequency | 11 kHz ⁴⁾ |
| Response time | 60 µs ⁵⁾ |
| Stability of response time | ± 20 µs |
| Jitter | 22 µs |
| Switching output | PUSH/PULL |
| Switching output (voltage) | Push/Pull: High = $V_S - < 2 V$ / Low: $\leq 2 V$ |
| Switching mode | Light/dark switching |
| Output current I_{max} | 100 mA |
| Input, teach-in (ET) | Teach: $U > 5 V \dots < U_V$ 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 (0 ms = default) |
| Connection type | Male connector M8, 4-pin |
| Protection class | III ⁶⁾ |
| Circuit protection | U_V connections, reverse polarity protected Output Q short-circuit protected Interference pulse suppression |
| Enclosure rating | IP65 |
| Weight | Approx. 36 g ... 160 g ⁷⁾ |
| Housing material | Metal, Aluminum |

1) Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

2) May not exceed or fall below U_V tolerances.

3) Without load.

4) With light/dark ratio 1:1.

5) Signal transit time with resistive load.

6) Reference voltage DC 50 V.

7) Depending on fork width.

Communication interface

| | |
|---------------------------------|--|
| Communication interface | IO-Link |
| Cycle time | 2.3 ms |
| Process data length | 16 Bit |
| Process data structure A | Bit 0 = switching signal Q_{L1} Bit 1 = switching signal Q_{L2} Bit 2 = not used Bit 3 = Teach busy Bit 4 ... 15 = empty |
| Process data structure B | Bit 0 = switching signal Q_{L1} Bit 1 = Quality of Run Alarm Bit 2 = not used Bit 3 = Teach busy Bit 4 ... 15 = empty |
| Process data structure C | Bit 0 = switching signal Q_{L1} Bit 1 = switching signal Q_{L2} Bit 2 = not used Bit 3 = Teach busy Bit 4 ... 5 = empty |

| | |
|---------------------------------|---|
| | Bit 6 ... 15 = measuring value |
| Process data structure D | Bit 0 = switching signal Q _{L1} Bit 1 = Quality of Run Alarm Bit 2 = not used Bit 3 = Teach busy Bit 4 ... 5 = empty Bit 6 ... 15 = measuring value |
| VendorID | 26 |
| DeviceID HEX | 8000AE |
| DeviceID DEC | 8388782 |

Ambient data

| | |
|--------------------------------------|---------------------------------|
| Ambient operating temperature | -20 °C ... +50 °C ¹⁾ |
| Ambient storage temperature | -30 °C ... +80 °C |
| Ambient light immunity | ≤ 10,000 lx |
| Shock load | According to EN 60068-2-27 |

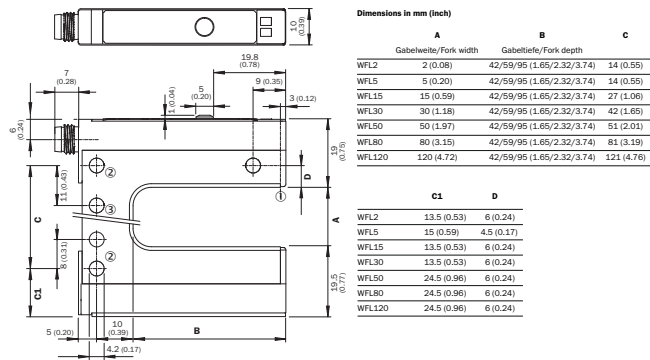
¹⁾ Do not bend below 0 °C.

Classifications

| | |
|-----------------------|----------|
| ECl@ss 5.0 | 27270909 |
| ECl@ss 5.1.4 | 27270909 |
| ECl@ss 6.0 | 27270909 |
| ECl@ss 6.2 | 27270909 |
| ECl@ss 7.0 | 27270909 |
| ECl@ss 8.0 | 27270909 |
| ECl@ss 8.1 | 27270909 |
| ECl@ss 9.0 | 27270909 |
| ECl@ss 10.0 | 27270909 |
| ECl@ss 11.0 | 27270909 |
| ETIM 5.0 | EC002720 |
| ETIM 6.0 | EC002720 |
| ETIM 7.0 | EC002720 |
| UNSPSC 16.0901 | 39121528 |

Dimensional drawing (Dimensions in mm (inch))

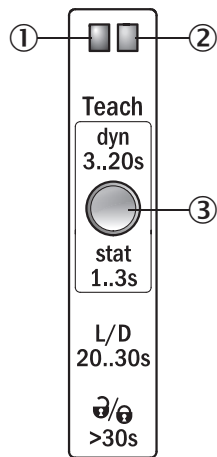
WFL teach-in button



- ① Optical axis
- ② Mounting hole, \varnothing 4.2 mm
- ③ WFL50/80/120 only

Adjustments

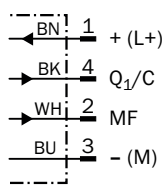
Adjustment: teach-in via Teach-in button (WFxx-B41Cxx)



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

Connection diagram

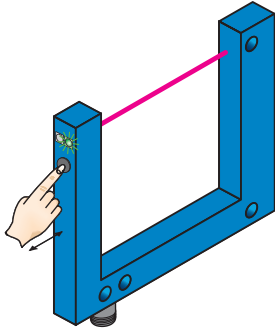
Cd-273



Concept of operation

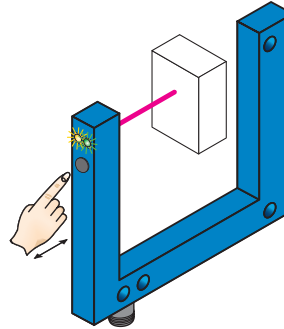
Teach-in via Teach-in button (WFxx-B41Cxx)

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 successful, 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/WFL

| | Brief description | Type | Part no. |
|---|--|-----------------------------------|----------|
| Modules and gateways | | | |
|  | IO-Link version V1.1, Port class 2, PIN 2, 4, 5 galvanically connected. Supply voltage 18 V DC ... 32 V DC (limit values, operation in short-circuit protected network max. 8 A) | IOLP2ZZ-M3201 (SICK Memory Stick) | 1064290 |

| | Brief description | Type | Part no. |
|---|---|--------------------------------------|----------|
|  | IO-Link V1.1 Class A port, USB2.0 port, optional external power supply 24V / 1A | IOLA2US-01101 (SiLink2 Master) | 1061790 |
|  | EtherCAT IO-Link Master, IO-Link V1.1, Port Class A, power supply via 7/8" cable 24 V / 8 A, fieldbus connection via M12 cable | IOLG2EC-03208R01 (IO-Link Master) | 6053254 |
| Plug connectors and cables | | | |
|  | Head A: female connector, M8, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 5 m | YF8U14-050VA3XLEAX | 2095889 |
|  | Head A: female connector, M8, 4-pin, straight, A-coded Head B: male connector, M12, 4-pin, straight, A-coded Cable: Sensor/actuator cable, PVC, unshielded, 5 m | YF8U14-050VA3M2A14 | 2096609 |
|  | Head A: male connector, M8, 4-pin, straight Head B: - Cable: unshielded | STE-0804-G | 6037323 |
| SIG200 | | | |
|  | | SIG200-0A0412200 | 1089794 |
|  | | SIG200-0A0G12200 | 1102605 |

Recommended services

Additional services → www.sick.com/WFL

| | Type | Part no. |
|---|------------------------|------------|
| Function Block Factory | | |
| <ul style="list-style-type: none"> Description: The Function Block Factory supports common programmable logic controllers (PLCs) from various manufacturers, such as Siemens, Beckhoff, Rockwell Automation and B&R. More information on the FBF can be found <a _blank"="" href="https://fbf.cloud.sick.com target=">here. | Function Block Factory | On request |

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

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