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
- A wide range of different fork sizes increases installation flexibility
- The aluminum housing meets all requirements for use in harsh industrial conditions

CDRH

Additional information

→ www.sick.com/de/en/WFL

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

8013816/2015-08-01
Subject to change without notice

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/darkswitching, selectable via button

Mechanics/electronics

Supply voltage [1]	10 V DC ... 30 V DC
Ripple [2]	< 10 %
Power consumption [3]	40 mA
Switching frequency [4]	10 kHz
Response time [5]	100 µs
Stability of response time	± 20 µs
Switching output	PNP: HIGH = V_S– ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output type	PNP/NPN
Output current $I_{max.}$	100 mA
Initialization time	100 ms
Connection type	Connector M8, 4-pin
Ambient light safety	Sunlight: ≤ 10,000 klx
Protection class [6]	III
Circuit protection	V_S connections reverse-polarity protected, Output Q short-circuit protected, Interference suppression
Enclosure rating	IP 65
Weight [7]	Approx. 36 g ... 160 g
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.

Ambient data

Ambient operating temperature [1]	–20 °C ... +50 °C
Ambient storage temperature	–30 °C ... +80 °C
Shock load	According to EN 60068-2-27
UL File No.	NRKH.E191603 & NRKH7.E191603, CDRH-conform

[1] Do not bend below 0 °C.

Ordering information

Other models ➜ www.sick.com/de/en/WFL

Teach-in

WFL2

- **Fork width:** 2 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL2-40B416	6036821
			59 mm	WFL2-60B416	6036828
			95 mm	WFL2-95B416	6036835

WFL5

- **Fork width:** 5 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL5-40B416	6036822
			59 mm	WFL5-60B416	6036829
			95 mm	WFL5-95B416	6036836

WFL15

- **Fork width:** 15 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL15-40B416	6036823
			59 mm	WFL15-60B416	6036830
			95 mm	WFL15-95B416	6036837

WFL30

- **Fork width:** 30 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL30-40B416	6036824
			59 mm	WFL30-60B416	6036831
			95 mm	WFL30-95B416	6036838

WFL50

- **Fork width:** 50 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL50-40B416	6036825
			59 mm	WFL50-60B416	6036832
			95 mm	WFL50-95B416	6036839

WFL80

- **Fork width:** 80 mm

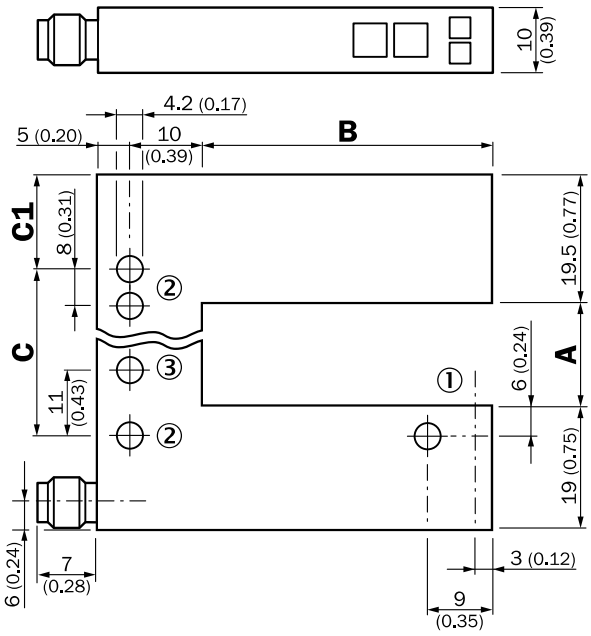
MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL80-40B416	6036826
			59 mm	WFL80-60B416	6036833
			95 mm	WFL80-95B416	6036840

WFL120

- **Fork width:** 120 mm

MDO	Switching output	Adjustment	Fork depth	Type	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL120-40B416	6036827
			59 mm	WFL120-60B416	6036834
			95 mm	WFL120-95B416	6036841

Dimensional drawing (Dimensions in mm (inch))



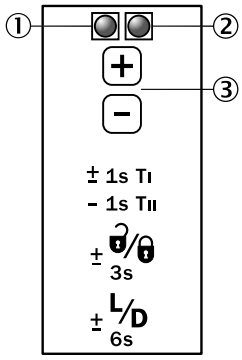
① Optical axis
② Mounting hole, Ø 4.2 mm
③ WFL50/80/120 only

Dimensions in mm (inch)

	A Fork width	B Fork depth	C	C1
WFL2	2 (0.08)	42/59/95 (1.65/2.32/3.74)	14 (0.55)	13.5 (0.53)
WFL5	5 (0.20)	42/59/95 (1.65/2.32/3.74)	14 (0.55)	15 (0.59)
WFL15	15 (0.59)	42/59/95 (1.65/2.32/3.74)	27 (1.06)	13.5 (0.53)
WFL30	30 (1.18)	42/59/95 (1.65/2.32/3.74)	42 (1.65)	13.5 (0.53)
WFL50	50 (1.97)	42/59/95 (1.65/2.32/3.74)	51 (2.01)	24.5 (0.96)
WFL80	80 (3.15)	42/59/95 (1.65/2.32/3.74)	81 (3.19)	24.5 (0.96)
WFL120	120 (4.72)	42/59/95 (1.65/2.32/3.74)	121 (4.76)	24.5 (0.96)

F

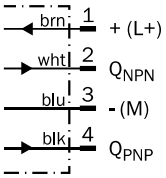
Adjustments



① Function signal indicator (yellow), switching output
② Function indicator (red)
③ “+”/“–” buttons and function button

Connection diagram

Cd-086

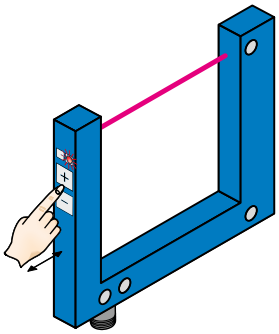


Setting the switching threshold

Teach-in

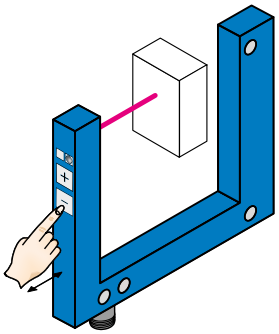
The switching threshold is set automatically. Fine adjustment is possible using the “+”/“–” buttons.

1. No object or substrate in the beam path



Press the “+” and “–” buttons together and hold for 1 second.
The red function indicator flashes slowly.

2. Object or label in the beam path



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. To make minor adjustments, press the “+” or “–” button once. To configure settings quickly, keep the “+” or “–” button pressed for longer.

± 3s Press both the “+” and “–” buttons together (3 seconds) to lock the device and prevent unintentional actuation.

± L/D 6s Press both the “+” and “–” buttons together (6 seconds) to define the switching function (light/dark switching). Standard setting: $\bar{Q}$ = light switching.

Recommended accessories

Plug connectors and cables

Connecting cables with female connector

M8, 4-pin, PVC, chemical resistant

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M8, 4-pin, straight, unshielded	Cable, open conductor heads	2 m, 4-wire	DOL-0804-G02M	6009870
			5 m, 4-wire	DOL-0804-G05M	6009872
			10 m, 4-wire	DOL-0804-G10M	6010754
	Female connector, M8, 4-pin, angled, unshielded	Cable, open conductor heads	2 m, 4-wire	DOL-0804-W02M	6009871
			5 m, 4-wire	DOL-0804-W05M	6009873
			10 m, 4-wire	DOL-0804-W10M	6010755

→ For additional accessories, please see page K-240

F