PRODUCT INFORMATION

Fork Sensors

SICK fork sensors: more models, more functionality

SICK
Sensor Intelligence.

Instantly correct

SICK fork sensors operate using the through-beam design. Time-consuming alignment is not necessary since the sender and receiver are combined in the same housing. SICK fork sensors have two principles of operation.

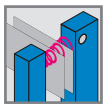
Optical fork sensors

Optical fork sensors detect objects via the interruption of the light beam. Even small differences in light absorption can be reliably detected.

Fields of application

- Label recognition
- Counting and positioning objects
- Process control

Ultrasonic fork sensors



Ultrasonic fork sensors reliably evaluate and detect the material properties (e.g., thickness, adhesion) of an object, rather than its translucency. Thicker materials absorb the sensor's ultrasound better than thin materials. Transparent labels can be detected even on clear backer material.

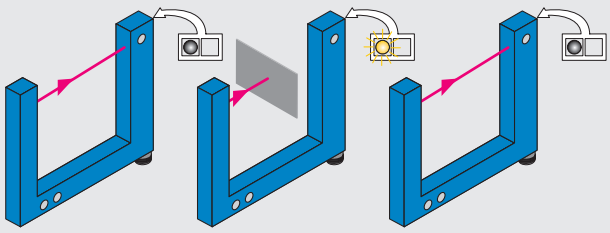
Fields of application

- Label recognition
- Double sheet detection
- Adhesive surface detection

Switching function

Switching output Q = dark switching

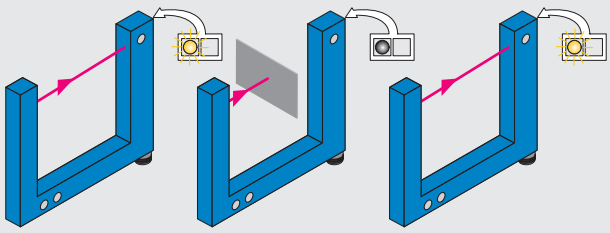
- The switching output is active when the beam path is interrupted, i.e., when there is an object in the beam path



In label recognition, this status corresponds to:
Switching output active on the label.

Switching output $\bar{Q}$ = light switching

- The switching output is active when there is no object in the beam path



In label recognition, this status corresponds to:
Switching output active in a label gap.

Label or double sheet detection

Transparent, shiny, and metallic labels; white, opaque and colored material; thin foils, foil on foil, paper on paper – modern labeling machines are confronted with a variety of materials and surface conditions. SICK fork sensors always offer the right solution. Optical fork sensors can be used for the reliable detection of opaque labels. Ultrasonic fork sensors reliably detect even on clear backer material.

Checking presence of objects on conveyor belts

To control various logistical processes, it is necessary to reliably detect certain objects on the conveyor belts. As soon as an object passes the fork sensor, the object is detected. Due to different transmission sources and sizes, SICK's wide range of fork sensors are able to meet nearly any application requirement. In accordance with the design, the sender and receiver are located in the same housing. And, since no complex, time-consuming alignment is needed, mounting and commissioning are quick and easy.

Product family overview

			
	UF	**WF*next***	
	UF – The clear choice for detecting transparent labels	WF*next* - it's next for high-speed applications	
Technical data overview			
Fork width	3 mm	2 mm / 5 mm / 15 mm / 30 mm / 50 mm / 80 mm / 120 mm	
Fork depth	69 mm	42 mm / 59 mm / 95 mm	
Minimum detectable object (MDO)	Gap between labels: 2 mm Size of labels: 2 mm	0.2 mm	
Light source	–	LED, infrared	
Switching frequency	1.5 kHz	10 kHz	
Response time	250 µs	100 µs	
Switching function	Light/dark switching, selectable via button	Light/dark switching, selectable via button	
Connection type	Connector M8, 4-pin	Connector M8, 4-pin	
At a glance			
	• Detection of transparent, opaque or printed labels • Unaffected by metallic foils and labels • Fast response time of 250 µs • Simple and accurate adjustment via "+"/"–"-buttons or teach-in • Rugged, IP 65 aluminum housing	• Infrared light source • Simple and accurate adjustment via teach-in or manually via "+"/"–" buttons • Fast response time (max. 100 µs) • PNP and NPN switching output • Light/dark switching function • 21 different models with different fork widths and depths • Rugged, IP 65 aluminum housing	
Detailed information	→ 6	→ 12	

			
	WFL	**WFM**	**WFS**
	Get precise detection of small targets with WFL fork sensors	WFM fork sensors – connect and get started	Agile and flexible – ideal mounting for labeling applications
	2 mm / 5 mm / 15 mm / 30 mm / 50 mm / 80 mm / 120 mm	30 mm / 50 mm / 80 mm / 120 mm / 180 mm	3 mm
	42 mm / 59 mm / 95 mm	40 mm / 60 mm / 124 mm	42 mm
	0.05 mm	0.8 mm / 1 mm	2 mm
	Laser, Class 1, 670 nm	LED, red	LED, infrared
	10 kHz	4 kHz	10 kHz
	100 µs	125 µs	50 µs
	Light/dark switching, selectable via button	Dark switching Light switching	Light/dark switching, selectable via button
	Connector M8, 4-pin	Connector M8, 3-pin Cable 2 m, 3-pin	Connector M8, 4-pin
	• 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	• Highly visible red emitted light • No setup, out-of-the-box operation • 360° signal strength indicator • 5 fork sizes: maximum depth 120 mm maximum width 180 mm • Rugged, IP 67 aluminum housing	• Optimized housing with slim fork shape • Dynamic teach-in via teach or control panel and manual fine adjustment with “+”/“–” buttons • Light/dark switching function • Fast response time of 50 µs • PNP or NPN • IP 65 plastic housing • Switching output also during teach-in active
	➜ 20	➜ 28	➜ 34

UF – The clear choice for detecting transparent labels

Product description

The UF ultrasonic sensors reliably detects labels and materials, regardless of printed design, transparency or surface characteristics. Unlike optical sensors, the UF relies on damping – a process where the thickness of a material determines the degree to which the sensor absorbs sound waves. A high level of positioning accuracy and stable response times make the fork sensor suitable for nearly any environment. Due to its small, compact metal housing, the UF can be used in harsh conditions and where space is limited. As a result, the UF can distinguish between labels located just 2 mm apart from one another on an adhesive tape. Applications include detecting transparent labels on transparent substrates, detecting labels with different printed designs or differentiating between single- and two-ply materials.

At a glance

- Detection of transparent, opaque or printed labels
- Unaffected by metallic foils and labels
- Fast response time of 250 µs
- Simple and accurate adjustment via "+"/"–"-buttons or teach-in
- Rugged, IP 65 aluminum housing

Your benefits

- Reliable label detection, regardless if labels are transparent, opaque or have a printed design, ensuring greater flexibility with one sensor
- Fast response times enable precise detection – even at high web speeds
- The aluminum housing meets all requirements for use in harsh industrial conditions
- Setting the switching threshold using the +/- push buttons or teach-in
- Ultrasonic technology prevents false detection, which may be caused by ambient light or shiny surfaces

Additional information

Detailed technical data 7
Ordering information 7
Dimensional drawing 8
Adjustments 8
Connection type and diagram 9
Recommended accessories 9
Setting the switching threshold 10
Dimensional drawings accessories . 39

→ **www.mysick.com/en/UF**

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.

8014860/2013-05-23
Subject to change without notice

Detailed technical data

Features

Functional principle	Ultrasonic detection principle
MDO [1) 2)]	Gap between labels: 2 mm Size of labels: 2 mm
Label detection	✔
Switching function	Light/dark switching, selectable via button

[1)] Minimum detectable object.

[2)] Depends on the label thickness.

Mechanics/electronics

Supply voltage V_S [1)]	DC 10 V ... 30 V
Ripple [2)]	< 1 V
Power consumption [3)]	40 mA
Switching frequency [4)]	1,5 kHz
Response time [5)]	250 µs
Repeat accuracy	± 0,25mm
Switching output voltage	PNP: HIGH = V_S – ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output current $I_{max.}$ [6)]	100 mA
Initialization time	100 ms
Protection class [7)]	III
Circuit protection	Output Q short-circuit protected Interference suppression
Enclosure rating	IP 65
Weight	Approx. 95 g
Housing material	Aluminum

[1)] Limit values, reverse-polarity protected. Operation in short-circuit protected network max. 8 A.

[2)] May not exceed or fall short of V_S tolerances.

[3)] Without load.

[4)] With light/dark ratio 1:1, typical, dependent on material and speed.

[5)] Signal transit time with resistive load.

[6)] Output current minimal 0.03 mA.

[7)] Reference voltage 50 V DC.

Ambient data

Ambient temperature [1)]	Betrieb: –5 °C ... +55 °C Lager: –20 °C ... +70 °C
Shock load	According to IEC 60068
EMV [2)]	EN 60947-5-2

[1)] Do not bend below 0 °C.

[2)] The UFN complies with the Radio Safety Requirements (EMC) for the indus-trial sector (Radio Safety Class A). It may cause radio interference if used in residential areas.

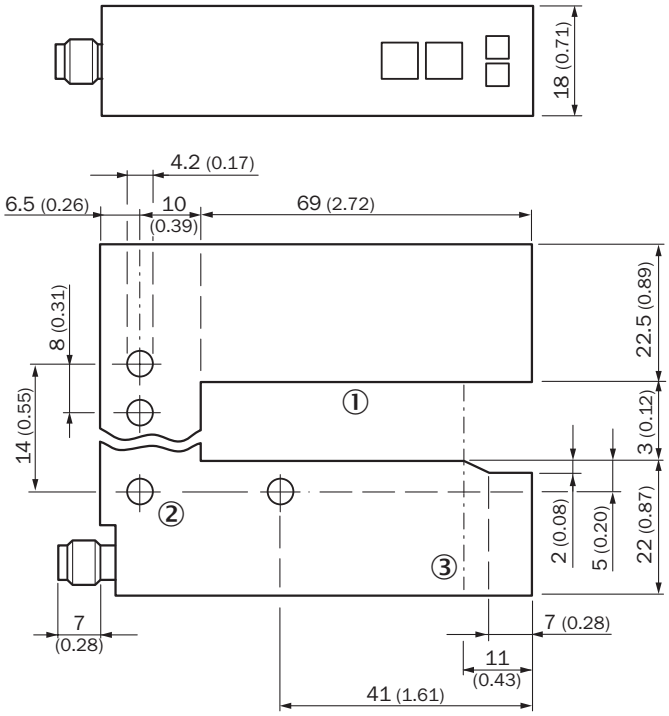
Ordering information

Fork width	Fork depth	Adjustments	Input, teach-in (ET)	Switching output	Model name	Part no.
3 mm	69 mm	Teach-in dynamic Teach -in static	Teach: U > 7 V < U_V Run: U < 2$_V$	PNP	UFN3-70P415	6049679
				NPN	UFN3-70N415	6049680
			–	PNP/NPN	UFN3-70B413	6049678

Dimensional drawing

dimensions in mm

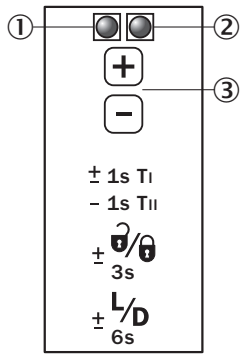
UFN3



① Fork opening: fork width 3 mm, forks depth 69 mm
② Mounting hole, Ø 4.2 mm
③ Detection axis

Adjustments

UFN3

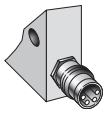


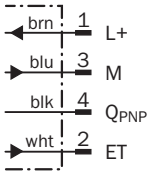
① Function signal indicator (yellow), switching output
② Function indicator (red)
③ "+"-/"–" buttons and function button

Connection type and diagram

UFN3-70Pxxx

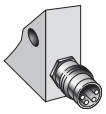
Connector
M8, 4-pin

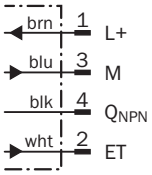




UFN3-70Nxxx

Connector
M8, 4-pin





Recommended accessories

Plug connectors and cables

Connector M8, 4-pin

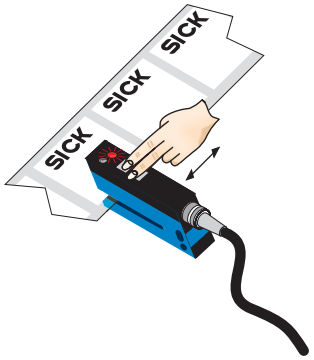
Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.
Female connector	IP 67	Straight	PVC	2 m	DOL-0804-G02M	6009870
				5 m	DOL-0804-G05M	6009872
				10 m	DOL-0804-G10M	6010754
		Angled	PVC	2 m	DOL-0804-W02M	6009871
				5 m	DOL-0804-W05M	6009873
				10 m	DOL-0804-W10M	6010755
		Straight	–	–	DOS-0804-G	6009974
		Angled	–	–	DOS-0804-W	6009975

For dimensional drawings, please see page 39.

For additional accessories, please see www.mysick.com/en/UF

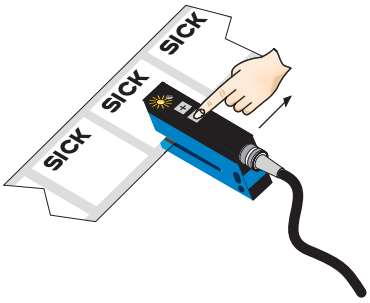
Setting the switching threshold via “+”/“–” buttons: UFN3

1. Position label or substrate in the active area of the fork sensor



Press both the “+” and “–” buttons together, hold > 1 s and than release the teach-in buttons. The red LED flashes.

2. Move multiple labels through the fork sensor



Press “–” button, teach-in process is finished.

Notes

Switching threshold adaptation:
Only, the first teach-in procedure after switching on is permanently stored. Teach-in can be repeated cyclically. Switching output also during teach-in active.

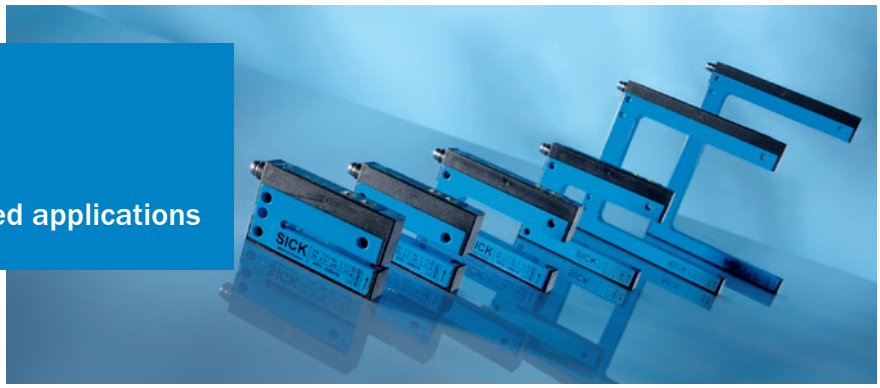
[+] [–] Once teach-in process is complete, the switching threshold can be adjusted at any time using the “+” or “–” button. To make minor adjustments, press the “+” or “–” button once. To configure settings quickly, keep the “+” or “–” button pressed for longer.

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

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

Teach-in (static): Setting the switching threshold without movements of label, cf. operating instruction.

WF*next* - it's next for high-speed applications



Product description

The WF*next* line is ideal for high-speed, accurate label detection. It includes more than 40 fork sensors with a large selection of fork widths and depths to fit any application, such as detecting labels, holes or double sheets. Since the sender and receiver are in one housing, adjustment is not necessary. This easy-to-use sensor line includes fork widths between 2 mm and 120 mm with fork depths of 40 mm, 60 mm and 95 mm. Its fast response time and fine resolution make it possible to detect small and flat objects moving at high speeds. On multiple installations, WF*next* sensors can be installed adjacent to one another with no cross talk.

At a glance

- Infrared light source
- Simple and accurate adjustment via teach-in or manually via "+"/"–" buttons
- Fast response time (max. 100 µs)
- 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

- Fast response time and fine resolution ensure reliable detection even at high speeds
- Infrared light source provides excellent ambient light immunity
- User friendly setting via teach-in or "+"/"–" button
- A wide range of different fork sizes enables flexible installation
- The aluminum housing meets all requirements for use in harsh industrial conditions

Additional information

Detailed technical data 13
Ordering information 14
Dimensional drawing 16
Adjustments 16
Connection type and diagram 17
Recommended accessories 17
Setting the switching threshold 18
Dimensional drawings accessories . 39

→ **www.mysick.com/en/WFnext**

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.

8014860/2013-05-23
Subject to change without notice

Detailed technical data

Features

Functional principle	Optical detection principle
Label detection	✔
Light source	LED, infrared
Switching function	Light/dark switching, selectable via button

Mechanics/electronics

Supply voltage V_S [1]	DC 10 V ... 30 V
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 voltage	PNP: HIGH = V_S – ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output current $I_{max.}$	100 mA
Initialization time	100 ms
Connection type	Connector M8, 4-pin
Ambient light safety	Sunlight: 10,000 lx
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	Aluminum

[1] Limit values, reverse-polarity protected. Operation in short-circuit protected network max. 8 A.
[2] May not exceed or fall short of V_S tolerances.
[3] Without load.
[4] With light/dark ratio 1:1.
[5] Signal transit time with resistive load.
[6] Reference voltage 50 V DC.
[7] Depending on fork width.

Ambient data

Ambient temperature [1]	Operation: –20 °C ... +60 °C Storage: –30 °C ... +80 °C
Shock load	According to IEC 60068

[1] Do not bend below 0 °C.

Specific data

Fork width	Model name	Ordering information
2 mm	WF2	14
5 mm	WF5	14
15 mm	WF15	14
30 mm	WF30	14
50 mm	WF50	15
80 mm	WF80	15
120 mm	WF120	15

Ordering information

WF2

- **Fork width:** 2 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF2-40B410	6028428
			59 mm	WF2-60B410	6028436
			95 mm	WF2-95B410	6028443
		Teach-in	42 mm	WF2-40B416	6028450
			59 mm	WF2-60B416	6028457
			95 mm	WF2-95B416	6028464

[1] Minimum detectable object.

WF5

- **Fork width:** 5 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF5-40B410	6028429
			59 mm	WF5-60B410	6028437
			95 mm	WF5-95B410	6028444
		Teach-in	42 mm	WF5-40B416	6028451
			59 mm	WF5-60B416	6028458
			95 mm	WF5-95B416	6028465

[1] Minimum detectable object.

WF15

- **Fork width:** 15 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF15-40B410	6028430
			59 mm	WF15-60B410	6028438
			95 mm	WF15-95B410	6028445
		Teach-in	42 mm	WF15-40B416	6028452
			59 mm	WF15-60B416	6028459
			95 mm	WF15-95B416	6028466

[1] Minimum detectable object.

WF30

- **Fork width:** 30 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF30-40B410	6028431
			59 mm	WF30-60B410	6028439
			95 mm	WF30-95B410	6028446
		Teach-in	42 mm	WF30-40B416	6028453
			59 mm	WF30-60B416	6028460
			95 mm	WF30-95B416	6028467

[1] Minimum detectable object.

WF50

- **Fork width:** 50 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF50-40B410	6028432
			59 mm	WF50-60B410	6028440
			95 mm	WF50-95B410	6028447
		Teach-in	42 mm	WF50-40B416	6028454
			59 mm	WF50-60B416	6028461
			95 mm	WF50-95B416	6028468

[1] Minimum detectable object.

WF80

- **Fork width:** 80 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF80-40B410	6028433
			59 mm	WF80-60B410	6028441
			95 mm	WF80-95B410	6028448
		Teach-in	42 mm	WF80-40B416	6028455
			59 mm	WF80-60B416	6028462
			95 mm	WF80-95B416	6028469

[1] Minimum detectable object.

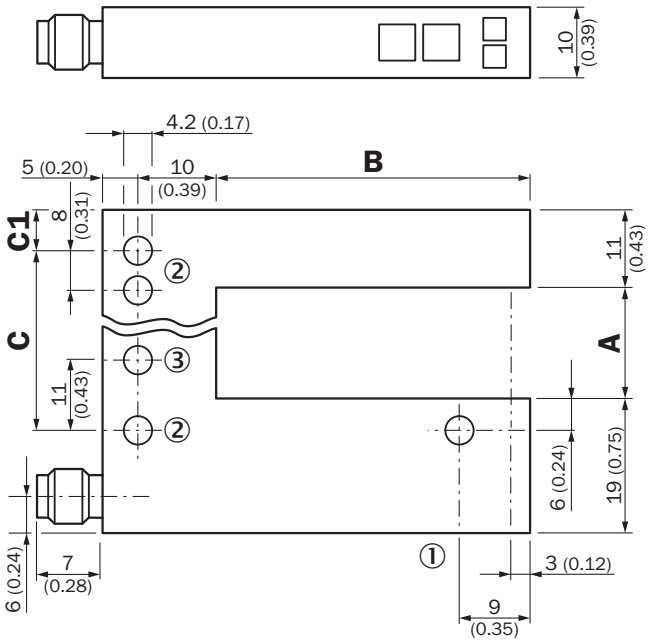
WF120

- **Fork width:** 120 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.2 mm	PNP/NPN	Manual ("+"/"–" button)	42 mm	WF120-40B410	6028435
			59 mm	WF120-60B410	6028442
			95 mm	WF120-95B410	6028449
		Teach-in	42 mm	WF120-40B416	6028456
			59 mm	WF120-60B416	6028463
			95 mm	WF120-95B416	6028470

[1] Minimum detectable object.

Dimensional drawing



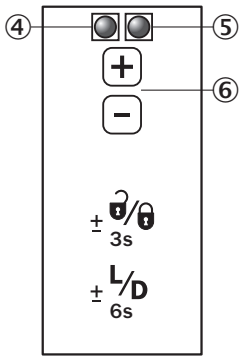
All dimensions in mm (inch)

Dimensions in mm (inch)

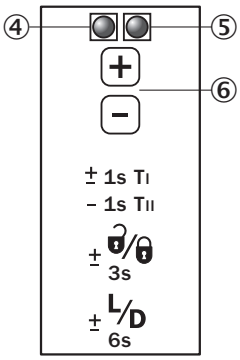
	A Fork width	B Fork depth	C	C1
WF2	2 (0.08)	42/59/95 (1.65/2.32/3.74)	14 (0.55)	5 (0.20)
WF5	5 (0.20)	42/59/95 (1.65/2.32/3.74)	14 (0.55)	6.5 (0.20)
WF15	15 (0.59)	42/59/95 (1.65/2.32/3.74)	27 (1.06)	5 (0.20)
WF30	30 (1.18)	42/59/95 (1.65/2.32/3.74)	42 (1.65)	5 (0.20)
WF50	50 (1.97)	42/59/95 (1.65/2.32/3.74)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

Adjustments

WF*next*
Adjustment: "+"/"–" button



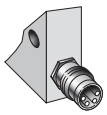
WF*next*
Adjustment: Teach-in

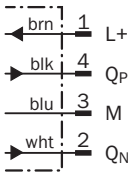


① Optical axis
② Mounting hole, Ø 4.2 mm
③ WF50/80/120 only
④ Function signal indicator (yellow), switching output
⑤ Function indicator (red)
⑥ "+"/"–" buttons and function button

Connection type and diagram

Connector
M8, 4-pin





Recommended accessories

Plug connectors and cables

Connector M8, 4-pin

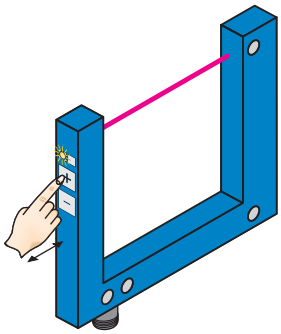
Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.
Female connector	IP 67	Straight	PVC	2 m	DOL-0804-G02M	6009870
				5 m	DOL-0804-G05M	6009872
				10 m	DOL-0804-G10M	6010754
		Angled	PVC	2 m	DOL-0804-W02M	6009871
				5 m	DOL-0804-W05M	6009873
				10 m	DOL-0804-W10M	6010755
		Straight	–	–	DOS-0804-G	6009974
		Angled	–	–	DOS-0804-W	6009975

For dimensional drawings, please see page 39.

For additional accessories, please see www.mysick.com/en/WFnext

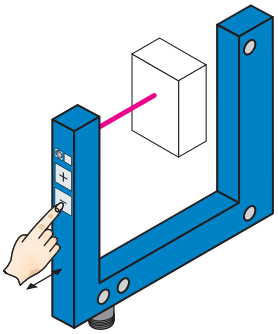
Setting the switching threshold via “+”/“–” buttons (WFxx-B410)

1. No object in the beam path



The yellow function indicator illuminates when the light received is at its optimum level.
If necessary, increase sensitivity using the “+” button.

2. Object in the beam path

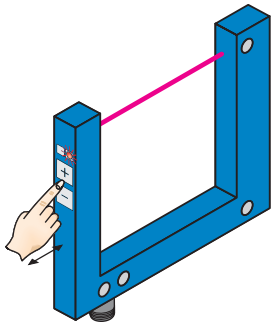


Yellow function indicator goes out.
If necessary, reduce sensitivity using the “–” button.

Setting the switching threshold via teach-in (WFxx-B416)

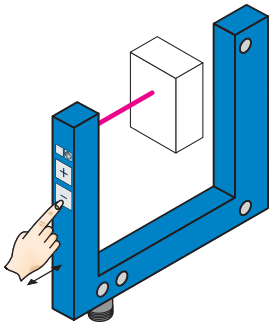
The switching threshold is set automatically. Fine adjustment is possible using the “+”/“–” buttons.

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

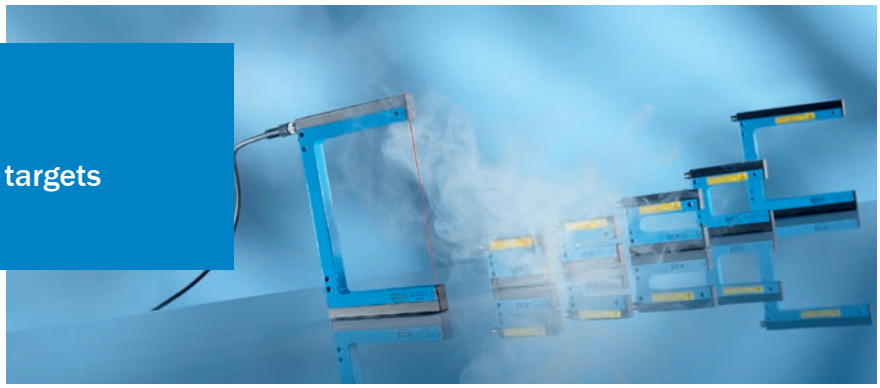
Material speed = 0 (machine at a standstill).

+ / – 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: $\overline{Q}$ = light switching.

Get precise detection of small targets with WFL fork sensors



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

Detailed technical data 21
Ordering information 22
Dimensional drawing 24
Adjustments 24
Connection type and diagram 25
Recommended accessories 25
Setting the switching threshold 26
Dimensional drawings accessories . 39

→ **www.mysick.com/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.

8014860/2013-05-23
Subject to change without notice

Detailed technical data

Features

Functional principle	Optical detection principle
Light source	Laser, Class 1, 670 nm
Switching function	Light/dark switching, selectable via button

Mechanics/electronics

Supply voltage V_S [1]	DC 10 V ... 30 V
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 voltage	PNP: HIGH = V_S – ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output current $I_{max.}$	100 mA
Initialization time	100 ms
Connection type	Connector M8, 4-pin
Ambient light safety	Sunlight: 10,000 lx
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	Aluminum

[1] Limit values, reverse-polarity protected. Operation in short-circuit protected network max. 8 A.
[2] May not exceed or fall short of V_S tolerances.
[3] Without load.
[4] With light/dark ratio 1:1.
[5] Signal transit time with resistive load.
[6] Reference voltage 50 V DC.
[7] Depending on fork width.

Ambient data

Ambient temperature [1]	Operation: –20 °C ... +50 °C Storage: –30 °C ... +80 °C
Shock load	According to IEC 60068

[1] Do not bend below 0 °C.

Specific data

Fork width	Model name	Ordering information
2 mm	WFL2	22
5 mm	WFL5	22
15 mm	WFL15	22
30 mm	WFL30	22
50 mm	WFL50	22
80 mm	WFL80	23
120 mm	WFL120	23

Ordering information

WFL2

- **Fork width:** 2 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL2-40B416	6036821
			59 mm	WFL2-60B416	6036828
			95 mm	WFL2-95B416	6036835

[1] Minimum detectable object.

WFL5

- **Fork width:** 5 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL5-40B416	6036822
			59 mm	WFL5-60B416	6036829
			95 mm	WFL5-95B416	6036836

[1] Minimum detectable object.

WFL15

- **Fork width:** 15 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL15-40B416	6036823
			59 mm	WFL15-60B416	6036830
			95 mm	WFL15-95B416	6036837

[1] Minimum detectable object.

WFL30

- **Fork width:** 30 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL30-40B416	6036824
			59 mm	WFL30-60B416	6036831
			95 mm	WFL30-95B416	6036838

[1] Minimum detectable object.

WFL50

- **Fork width:** 50 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL50-40B416	6036825
			59 mm	WFL50-60B416	6036832
			95 mm	WFL50-95B416	6036839

[1] Minimum detectable object.

WFL80

- **Fork width:** 80 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL80-40B416	6036826
			59 mm	WFL80-60B416	6036833
			95 mm	WFL80-95B416	6036840

[1] Minimum detectable object.

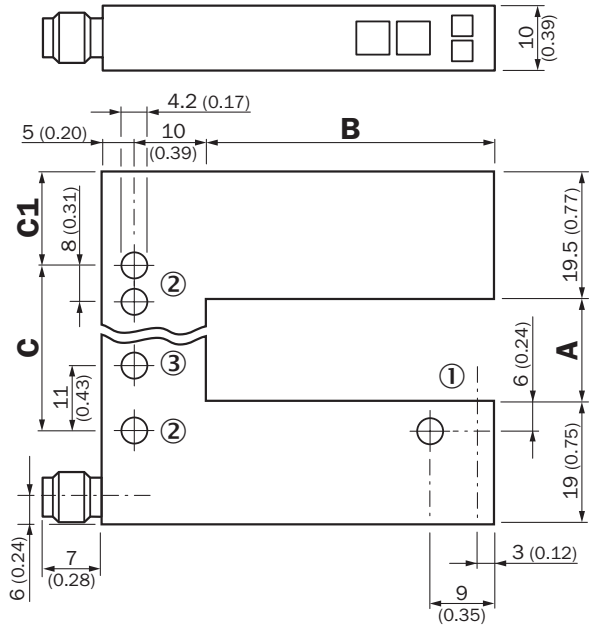
WFL120

- **Fork width:** 120 mm

MDO [1]	Switching output	Adjustment	Fork depth	Model name	Part no.
0.05 mm	PNP/NPN	Teach-in	42 mm	WFL120-40B416	6036827
			59 mm	WFL120-60B416	6036834
			95 mm	WFL120-95B416	6036841

[1] Minimum detectable object.

Dimensional drawing

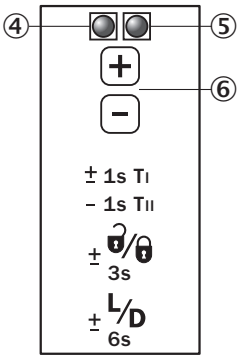


All dimensions in mm (inch)

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)

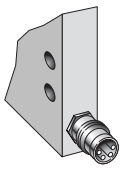
Adjustments

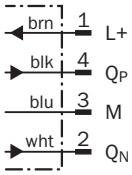


① Optical axis
② Mounting hole, Ø 4.2 mm
③ WFL50/80/120 only
④ Function signal indicator (yellow), switching output
⑤ Function indicator (red)
⑥ "+"/"−" buttons and function button

Connection type and diagram

Connector
M8, 4-pin





Recommended accessories

Plug connectors and cables

Connector M8, 4-pin

Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.
Female connector	IP 67	Straight	PVC	2 m	DOL-0804-G02M	6009870
				5 m	DOL-0804-G05M	6009872
				10 m	DOL-0804-G10M	6010754
		Angled	PVC	2 m	DOL-0804-W02M	6009871
				5 m	DOL-0804-W05M	6009873
				10 m	DOL-0804-W10M	6010755
		Straight	–	–	DOS-0804-G	6009974
		Angled	–	–	DOS-0804-W	6009975

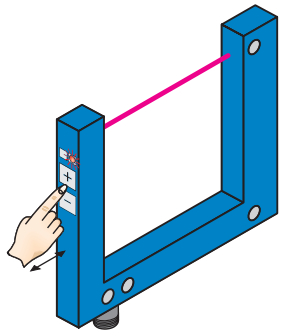
For dimensional drawings, please see page 39.

For additional accessories, please see www.mysick.com/en/WFL

Setting the switching threshold via teach-in (WFxx-B416)

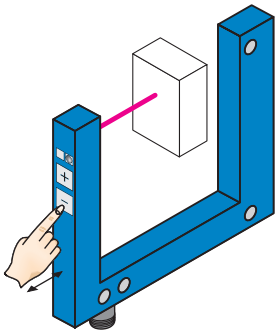
The switching threshold is set automatically. Fine adjustment is possible using the “+”/“–” buttons.

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

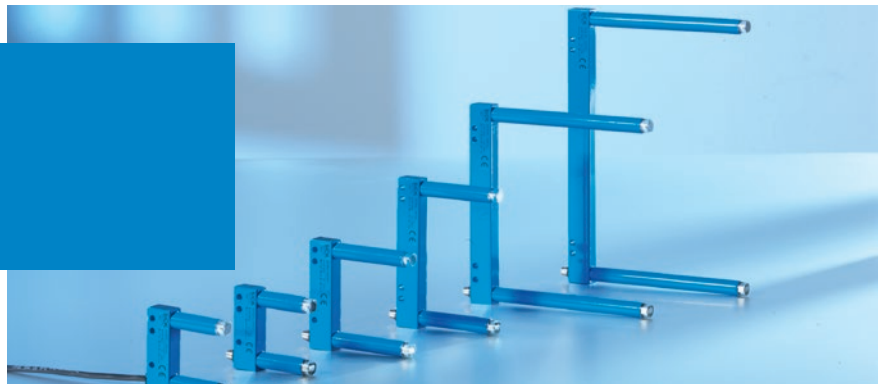
Material speed = 0 (machine at a standstill).

[+] [–] 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: $\overline{Q}$ = light switching.

WFM fork sensors – connect and get started



Product description

WFM fork sensors can be integrated quickly due to Plug and Play installation – no time-consuming alignment is necessary. A 360-degree output indicator makes it easy to see the switching status during the operation. Since the sender and receiver of the sensor are integrated within the same aluminum housing, aligning the sensors is not necessary and detection tasks can be prepared and solved even faster. The WFM line includes five different types with fork widths from 30 to 180 mm and fork depths from 40 to 120 mm, providing greater application flexibility. This new generation of SICK fork sensors is suited for a variety of applications, such as detecting parts in production processes or checking presence when filling bottles.

At a glance

- Highly visible red emitted light
- No setup, out-of-the-box operation
- 360° output indicator
- 5 fork sizes:
  maximum depth 120 mm
  maximum width 180 mm
- Rugged, IP 67 aluminum housing

Your benefits

- Fixed housings guarantee a high level of operational safety with simple commissioning
- A visible red light enables easy alignment and fast adjustment
- The 360-degree yellow output indicator makes continual process control possible
- A wide range of different fork sizes increases installation flexibility
- The aluminum housing meets all requirements for use in harsh industrial conditions

Additional information

Detailed technical data 29
Ordering information 30
Dimensional drawing 31
Connection type and diagram 32
Recommended accessories 32
Dimensional drawings accessories . 39

→ **www.mysick.com/en/WFM**

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.

8014860/2013-05-23
Subject to change without notice

Detailed technical data

Features

Functional principle	Optical detection principle
Light source	LED, red
Adjustment	None

Mechanics/electronics

Supply voltage V_S [1]	DC 10 V ... 30 V
Ripple [2]	< 10 %
Power consumption [3]	< 20 mA
Switching frequency [4]	4 kHz
Response time [5]	125 µs
Stability of response time	± 15 µs
Switching output voltage	PNP: HIGH = V_S – ≤ 1.5 V / LOW = 0 V NPN: HIGH = approx. V_S / LOW ≤ 1.5 V
Output current $I_{max.}$	100 mA
Initialization time	140 ms
Ambient light safety	Sunlight: 10,000 lx
Protection class [6]	III
Circuit protection	V_S connections reverse-polarity protected Output Q short-circuit protected Interference suppression
Enclosure rating	IP 67
Weight [7]	Approx. 80 g ... 190 g
Housing material	Aluminum

[1] Limit values, reverse-polarity protected. Operation in short-circuit protected network max. 8 A.

[2] May not exceed or fall short of V_S tolerances.

[3] Without load.

[4] With light/dark ratio 1:1.

[5] Signal transit time with resistive load.

[6] Reference voltage 50 V DC.

[7] Depending on fork width.

Ambient data

Ambient temperature [1]	Operation: –10 °C ... +60 °C Storage: –40 °C ... +80 °C
Shock load	According to IEC 60068

[1] Do not bend below 0 °C.

Specific data

Fork width	Fork depth	Model name	Ordering information
30 mm	42 mm	WFM30-40	30
50 mm	60 mm	WFM50-60	30
80 mm	60 mm	WFM80-60	30
120 mm	124 mm	WFM120-120	30
180 mm	124 mm	WFM180-120	31

Ordering information

WFM30-40

- **Fork width:** 30 mm
- **Fork depth:** 42 mm

MDO [1]	Connection type	Switching output	Switching function	Model name	Part no.
0.8 mm	Connector M8, 3-pin	PNP	Dark switching	WFM30-40P321	6037819
			Light switching	WFM30-40P311	6037820
		NPN	Dark switching	WFM30-40N321	6037821
			Light switching	WFM30-40N311	6037822
	Cable 2 m, 3-pin	PNP	Dark switching	WFM30-40P121	6037823

[1] Minimum detectable object.

WFM50-60

- **Fork width:** 50 mm
- **Fork depth:** 60 mm

MDO [1]	Connection type	Switching output	Switching function	Model name	Part no.
0.8 mm	Connector M8, 3-pin	PNP	Dark switching	WFM50-60P321	6037824
			Light switching	WFM50-60P311	6037825
		NPN	Dark switching	WFM50-60N321	6037826
			Light switching	WFM50-60N311	6037827

[1] Minimum detectable object.

WFM80-60

- **Fork width:** 80 mm
- **Fork depth:** 60 mm

MDO [1]	Connection type	Switching output	Switching function	Model name	Part no.
0.8 mm	Connector M8, 3-pin	PNP	Dark switching	WFM80-60P321	6037828
			Light switching	WFM80-60P311	6037829
		NPN	Dark switching	WFM80-60N321	6037830
			Light switching	WFM80-60N311	6037831

[1] Minimum detectable object.

WFM120-120

- **Fork width:** 120 mm
- **Fork depth:** 124 mm

MDO [1]	Connection type	Switching output	Switching function	Model name	Part no.
0.8 mm	Connector M8, 3-pin	PNP	Dark switching	WFM120-120P321	6037832
			Light switching	WFM120-120P311	6037833
		NPN	Dark switching	WFM120-120N321	6037834
			Light switching	WFM120-120N311	6037835

[1] Minimum detectable object.

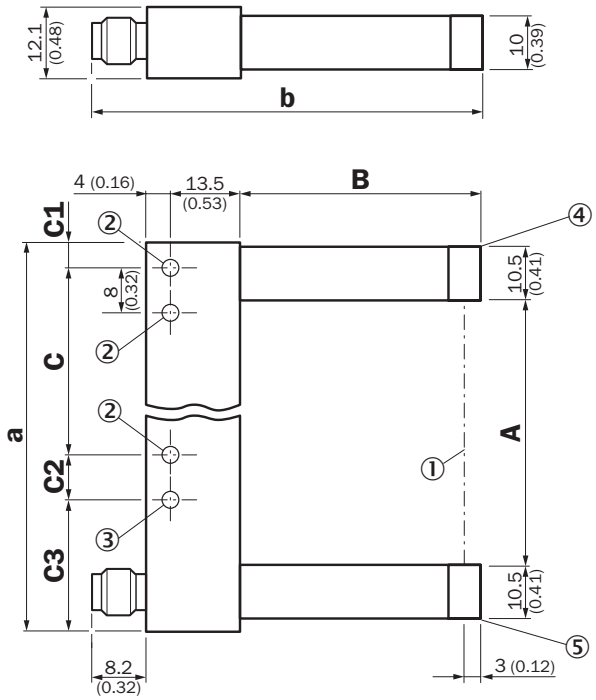
WFM180-120

- **Fork width:** 180 mm
- **Fork depth:** 124 mm

MDO [1]	Connection type	Switching output	Switching function	Model name	Part no.
1 mm	Connector M8, 3-pin	PNP	Dark switching	WFM180-120P321	6037836
			Light switching	WFM180-120P311	6037837
		NPN	Dark switching	WFM180-120N321	6037838
			Light switching	WFM180-120N311	6037839

[1] Minimum detectable object.

Dimensional drawing



All dimensions in mm (inch)

Dimensions in mm (inch)

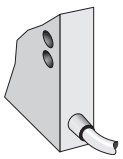
	A Fork width	B Fork depth	C	C1
WFM30	30 (1.18)	42 (1.65)	30 (1.18)	6.5 (0.26)
WFM50	50 (1.97)	60 (2.36)	40 (1.57)	6.5 (0.26)
WFM80	80 (3.15)	60 (2.36)	70 (2.76)	6.5 (0.26)
WFM120	120 (4.72)	124.3 (4.89)	100 (3.94)	17 (0.67)
WFM180	180 (7.09)	124.3 (4.89)	152 (5.98)	22 (0.87)

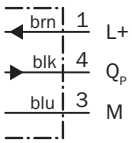
	C2	C3	a	b
WFM30	– (–)	– (–)	54 (2.13)	67.7 (2.67)
WFM50	8 (0.31)	19.5 (0.77)	74 (2.91)	85.7 (3.37)
WFM80	8 (0.31)	19.5 (0.77)	104 (4.09)	85.7 (3.37)
WFM120	10 (0.39)	17 (0.67)	144 (5.67)	150.2 (5.91)
WFM180	8 (0.31)	22 (0.87)	204 (8.03)	150.2 (5.91)

① Optical axis
② Mounting hole, Ø 4.3 mm
③ WFM50/80/120/180
④ Transmitted light (red)
⑤ Function signal indicator (yellow), switching output

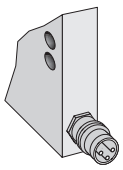
Connection type and diagram

Cable 2 m
3-pin

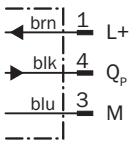




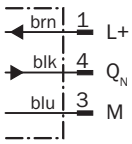
Connector M8
3-pin



WFM PNP



WFM NPN



Recommended accessories

Plug connectors and cables

Connector M8, 3-pin

Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.
Female connector	IP 67	Straight	PVC	2 m	DOL-0803-G02M	6010785
				5 m	DOL-0803-G05M	6022009
				10 m	DOL-0803-G10M	6022011
		Angled	PVC	2 m	DOL-0803-W02M	6008489
				5 m	DOL-0803-W05M	6022010
				10 m	DOL-0803-W10M	6022012
		Straight	–	–	DOS-0803-G	7902077
		Angled	–	–	DOS-0803-W	7902078

For dimensional drawings, please see page 39.

For additional accessories, please see www.mysick.com/en/WFM

Agile and flexible – ideal mounting for labeling applications

Product description

The slim, forked shape of the WFS has been specially developed for the requirements of the labeling process. The design allows the sensor to be mounted directly on the edge of the dispenser.

Difficulty in detecting the label gap is finally eliminated – the sensor's switching threshold can be taught-in while the label strip is running.

The improved operating concept means the sensor can be adjusted to different labels quickly, easily and reliably.

The fast response time guarantees exceptional repeat accuracy.

At a glance

- Optimized housing with slim fork shape
- Dynamic teach-in via teach or control panel and manual fine adjustment with "+"/"–" buttons
- Light/dark switching function
- Fast response time of 50 µs
- PNP or NPN
- IP 65 plastic housing
- Switching output also during teach-in active

Your benefits

- Slim design allows flexible mounting close to the dispenser of the label which ensures higher accuracy in the process
- Compact housing ensures space-saving installation
- User-friendly adjustment allows easy and quick start-up
- External teach-in allows automatic threshold adjustment via the PLC during the process which ensures reliable detection all the time
- Short and fast response times enable precise detection – even at high web speeds

Additional information

Detailed technical data 35
Ordering information 36
Dimensional drawing 36
Adjustments 36
Connection type and diagram 36
Recommended accessories 37
Setting the switching threshold 38
Dimensional drawings accessories . . 39

→ **www.mysick.com/en/WFS**

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.

Detailed technical data

Features

Functional principle	Optical detection principle
MDO [1] [2]	Gap between labels: 2 mm Size of labels: 2 mm
Label detection	✔
Light source	LED, infrared
Switching function	Light/dark switching, selectable via button

[1] Minimum detectable object.

[2] Depends on the label thickness.

Mechanics/electronics

Supply voltage V_S [1]	DC 10 V ... 30 V
Ripple [2]	< 10 %
Power consumption [3]	20 mA
Switching frequency [4]	10 kHz
Response time [5]	50 µs
Stability of response time	± 20 µs
Switching output voltage	PNP: HIGH = V_S – ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output current $I_{max.}$	100 mA
Input, teach-in (ET)	PNP: Teach: U > 5 V ... < U_V Run: U < 4 V NPN: Teach: U < (U_V – 6 V) Run: U > (U_V – 5 V)
Initialization time	20 ms
Ambient light safety	≤ 10,000 lx
Protection class [6]	III
Circuit protection	V_S connections reverse-polarity protected Output Q short-circuit protected Interference suppression
Enclosure rating	IP 65
Weight	Approx. 36 g
Housing material	PA (glass-fiber reinforced)

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

[2] May not exceed or fall short of V_S tolerances.

[3] Without load.

[4] With light/dark ratio 1:1.

[5] Signal transit time with resistive load.

[6] Reference voltage 50 V DC.

Ambient data

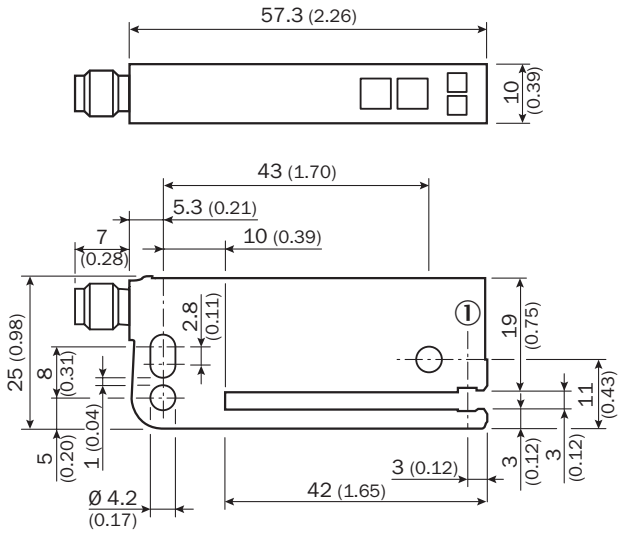
Ambient temperature [1]	Operation: –20 °C ... +60 °C Storage: –30 °C ... +80 °C
Shock load	According to IEC 60068

[1] Do not bend below 0 °C.

Ordering information

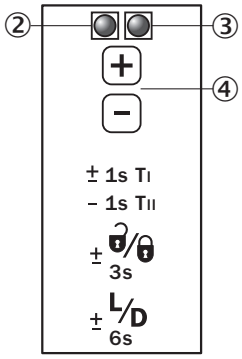
Fork width	Fork depth	Connection type	Switching output	Model name	Part no.
3 mm	42 mm	Connector M8, 4-pin	PNP	WFS3-40P415	6043919
			NPN	WFS3-40N415	6043920

Dimensional drawing



All dimensions in mm (inch)

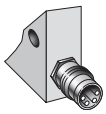
Adjustments



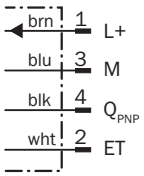
① Optical axis
② Function signal indicator (yellow), switching output
③ Function indicator (red)
④ "+"/"–" buttons and function button

Connection type and diagram

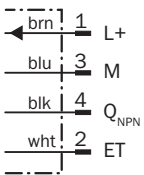
Connector
M8, 4-pin



WFS PNP



WFS NPN



Recommended accessories

Plug connectors and cables

Connector M8, 4-pin

Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.
Female connector	IP 67	Straight	PVC	2 m	DOL-0804-G02M	6009870
				5 m	DOL-0804-G05M	6009872
				10 m	DOL-0804-G10M	6010754
		Angled	PVC	2 m	DOL-0804-W02M	6009871
				5 m	DOL-0804-W05M	6009873
				10 m	DOL-0804-W10M	6010755
		Straight	–	–	DOS-0804-G	6009974
		Angled	–	–	DOS-0804-W	6009975

Terminal and alignment brackets

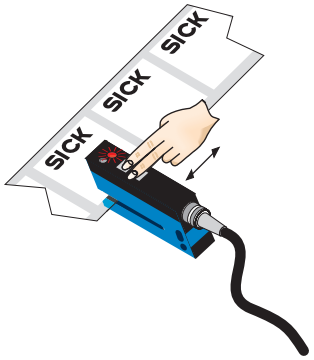
Mounting system type	Description	Material	Model name	Part No.
Universal bar clamp system	Mounting rod straight	Aluminum, anodized	BEF-M12GF-A	2059414

For dimensional drawings, please see page 39.

For additional accessories, please see www.mysick.com/en/WFS

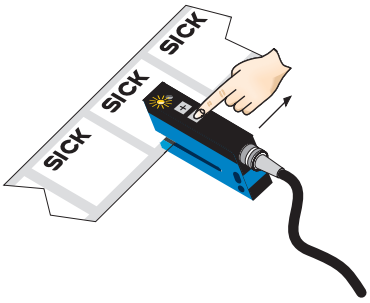
Setting the switching threshold via teach-in (dynamic)

1. Position label or substrate in the active area of the fork sensor



Press both the “+” and “–” buttons together, hold > 1 s and than release the teach-in buttons. The red LED flashes.

2. Move multiple labels through the fork sensor



Press “–” button, teach-in process is finished.

Notes

Switching threshold adaptation:
Only, the first teach-in procedure after switching on is permanently stored. Teach-in can be repeated cyclically. Switching output also during teach-in active.

+ / – 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.

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

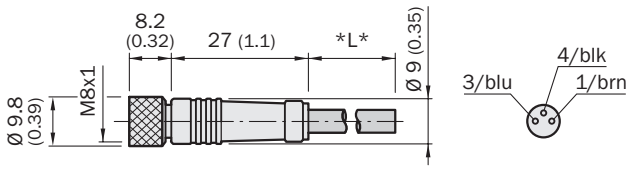
Teach-in (static): Setting the switching threshold without movements of label, cf. operating instruction.

Dimensional drawings accessories

Plug connectors and cables

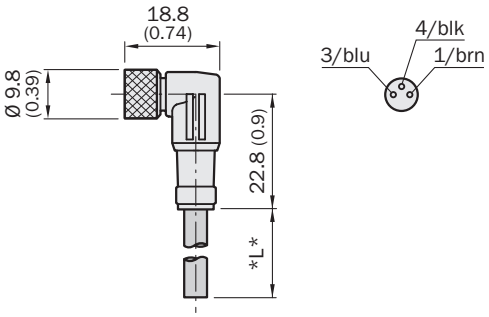
Connector M8, 3-pin

DOL-0803-GxxM



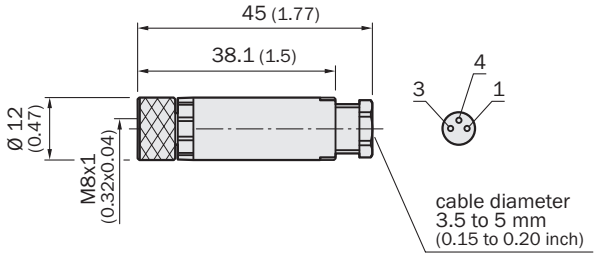
All dimensions in mm (inch)

DOL-0803-WxxM



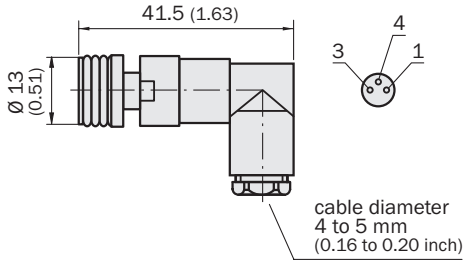
All dimensions in mm (inch)

DOS-0803-G



All dimensions in mm (inch)

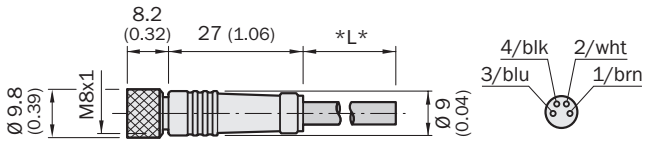
DOS-0803-W



All dimensions in mm (inch)

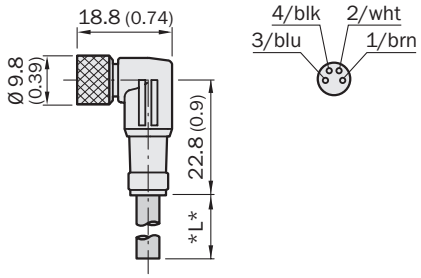
Connector M8, 4-pin

DOL-0804-GxxM



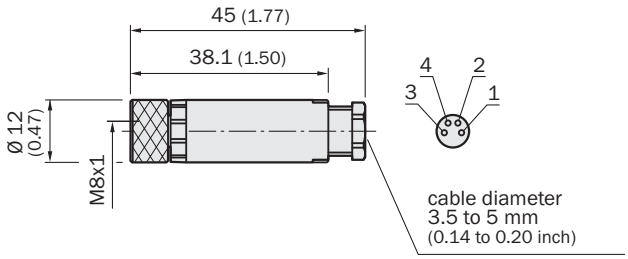
All dimensions in mm (inch)

DOL-0804-WxxM



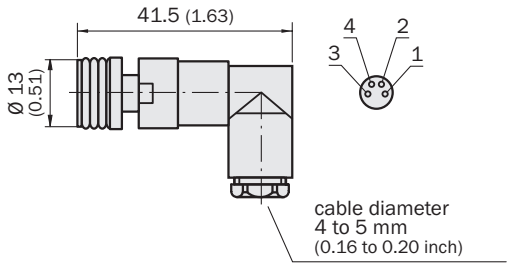
All dimensions in mm (inch)

DOS-0804-G



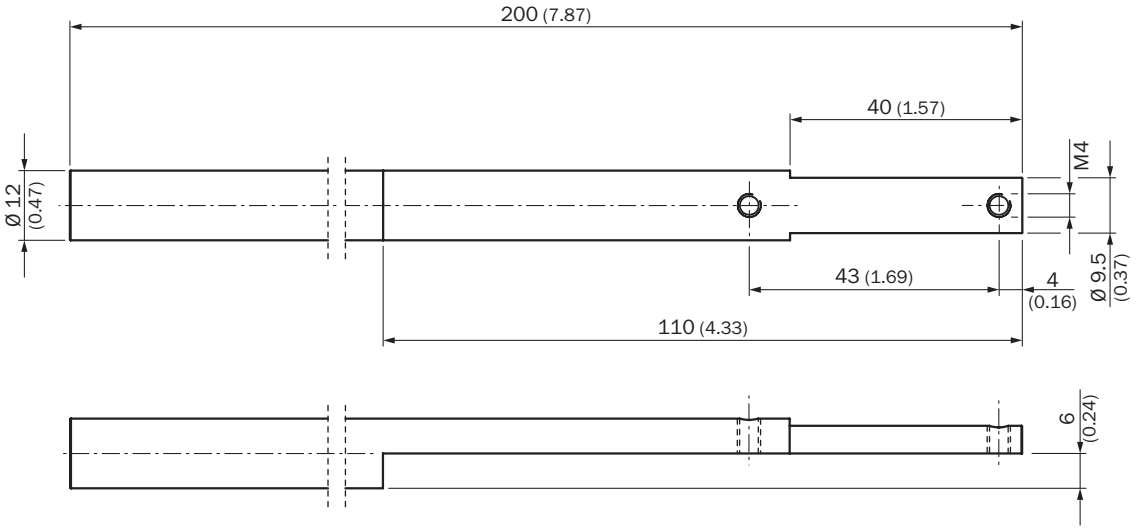
All dimensions in mm (inch)

DOS-0804-W



All dimensions in mm (inch)

BEF-M12GF-A

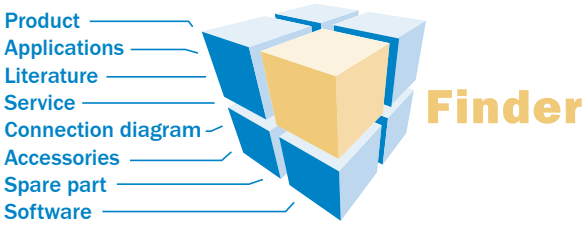


All dimensions in mm (inch)

Notes

www.mysick.com – search online and order

Search online quickly and safely – with the SICK "Finders"



Product Finder: We can help you to quickly target the product that best matches your application.

Applications Finder: Select the application description on the basis of the challenge posed, industrial sector, or product group.

Literature Finder: Go directly to the operating instructions, technical information, and other literature on all aspects of SICK products.

Efficiency – with the e-commerce tools from SICK

Partner Portal
www.mysick.com

Find out prices and availability: Determine the price and possible delivery date of your desired product simply and quickly at any time.

Request or view a quote: You can have a quote generated online here. Every quote is confirmed to you via e-mail.

Order online: You can go through the ordering process in just a few steps.

For safety and productivity: SICK LifeTime Services

SICK LifeTime Services is a comprehensive set of high-quality services provided to support the entire life cycle of products and applications from system design all the way to upgrades. These services increase the safety of people, boost the productivity of machines and serve as the basis for our customers' sustainable business success.

Consulting & Design
Globally available experts for cost-effective solutions

Product & System Support
Fast and reliable, by telephone or on location

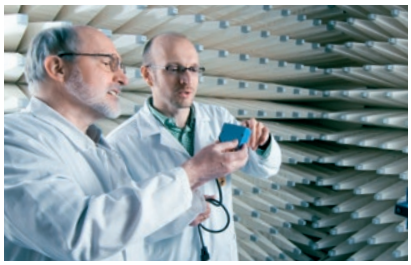
Verification & Optimization
Checks and recommendations for increased availability

Upgrade & Retrofits
Uncovers new potential for machines and systems

Training & Education
Employee qualification for increased competitiveness

8014860/2013-05-23 · RC_1M · Pre USmod int39

SICK at a glance



Leading technologies

With a staff of more than 5,800 and nearly 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.

Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids

Comprehensive services

- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
- E-Business Partner Portal www.mysick.com – price and availability of products, requests for quotation and online orders

Worldwide presence with subsidiaries in the following countries:

Australia
Belgium/Luxembourg
Brasil
Ceská Republika
Canada
China
Danmark
Deutschland
España
France
Great Britain
India
Israel
Italia
Japan
México
Nederland
Norge
Österreich
Polska
România
Russia
Schweiz
Singapore
Slovenija
South Africa
South Korea
Suomi
Sverige
Taiwan
Türkiye
United Arab Emirates
USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at **www.sick.com**

SICK
Sensor Intelligence.