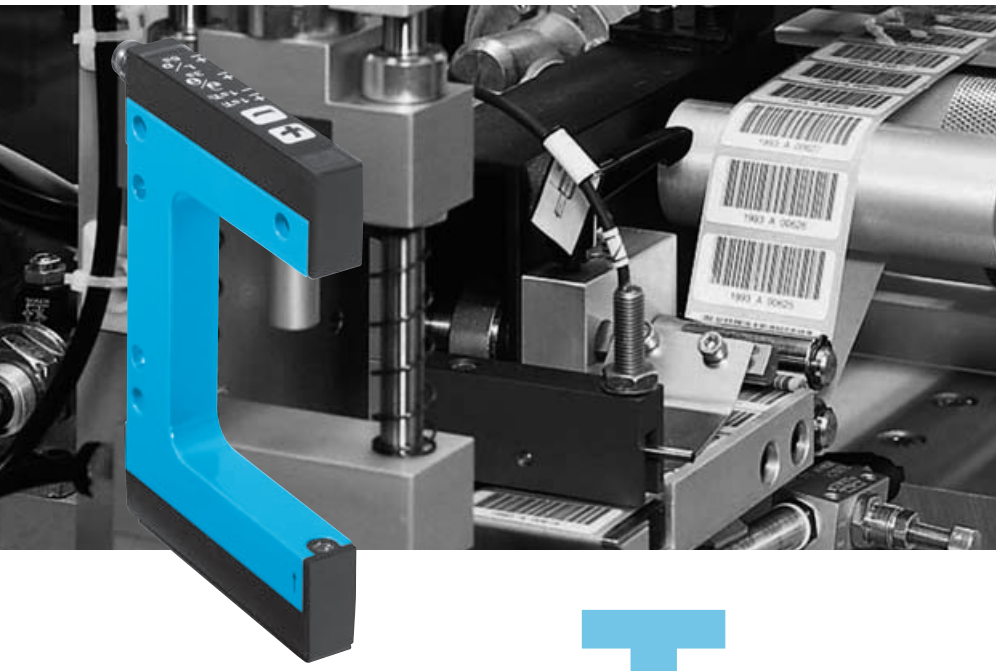
WFL: Laser fork sensors

DATA SHEET



A complete range of 21 sensors with the following features is available:

- fork widths between 2 and 120 mm, fork depths of 40, 60 and 95 mm,
- simple and quick adjustment via Teach-in,
- switching output PNP and NPN,
- L/D adjustable via button,
- rugged metal housing with glass optics,
- shortest response time,
- very high resolution.

Laser fork sensors

The prime features of the laser fork sensor family are very high speed response time and also an extremely accurate focused laser beam. Sender and receiver are fitted into the same housing, thereby operating on the through-beam sensor principle. This allows and guarantees the highest positional accuracy.

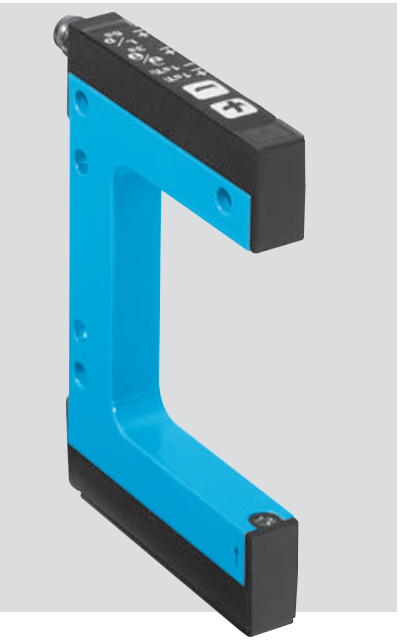
Due to the extremely fast response times and very high resolution, the sensors are particularly suitable for detecting very small objects, such as needles. Additionally, they can be used for the detection of transparent objects.

SICK

Fork width
2 ... 120 mm

Fork sensors

- Very high resolution
- Simple setting using 2-point Teach-in
- Rugged aluminium housing
- High switching frequency for accurate positioning
- Precise and thin laser spot



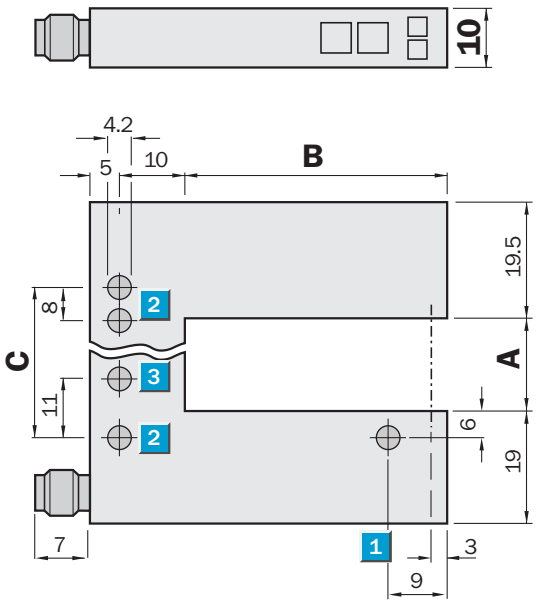
CE CDRH

Laser class 1

Accessories
Cables and connectors

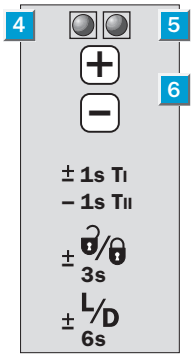
Dimensional drawing

All types



Adjustments possible

All types



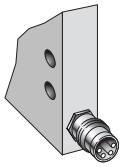
1 Optical axis
2 Mounting holes, Ø 4.2 mm
3 WFL50/80/120 only
4 Function indicator (red)
5 Function indicator (yellow), switching output
6 "+"/"–" buttons and function button

Dimensions

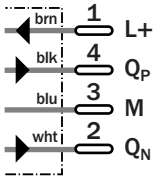
Dimensions (mm)	A Fork width	B Fork depth	C
WFL2	**2**	42/59/95	14
WFL5	**5**	42/59/95	14
WFL15	**15**	42/59/95	27
WFL30	**30**	42/59/95	42
WFL50	**50**	42/59/95	51
WFL80	**80**	42/59/95	81
WFL120	**120**	42/59/95	121

Connection types

All types



4-pin, M8



Technical data	WFL	2-XX[1] B416	5-XX[1] B416	15-XX[1] B416	30-XX[1] B416	50-XX[1] B416	80-XX[1] B416	120-XX[1] B416			
Fork width	2 mm	■									
	5 mm		■								
	15 mm			■							
	30 mm				■						
	50 mm					■					
	80 mm						■				
	120 mm							■			
Fork depth	40, 60 or 95 mm	■	■	■	■	■	■	■			
Light source	Laser, modulated, 670 nm, class 1	■	■	■	■	■	■	■			
Minimum detectable object size	0.05 mm	■	■	■	■	■	■	■			
Supply voltage V_S	10 ... 30 V DC [2]	■	■	■	■	■	■	■			
Current consumption [3]	40 mA	■	■	■	■	■	■	■			
Residual ripple [4]	< 10 %	■	■	■	■	■	■	■			
Switching output	PNP and NPN	■	■	■	■	■	■	■			
	Light/dark adjustable via button	■	■	■	■	■	■	■			
Signal voltage		■	■	■	■	■	■	■			
PNP	HIGH = V_S – (< 2 V)/LOW = 0 V	■	■	■	■	■	■	■			
NPN	HIGH = V_S/LOW = < 2 V	■	■	■	■	■	■	■			
Output current I_A	100 mA	■	■	■	■	■	■	■			
Stability of response time [5]	± 20 µs	■	■	■	■	■	■	■			
Response time [5], switching frequency [6]	Max. 100 µs; 10,000/s	■	■	■	■	■	■	■			
Teach-in via button		■	■	■	■	■	■	■			
Initialisation time	100 ms	■	■	■	■	■	■	■			
Ambient light safety											
Incandescent lamp	5,000 Lux	■	■	■	■	■	■	■			
Sunlight	10,000 Lux	■	■	■	■	■	■	■			
VDE protection class [7]	⧫	■	■	■	■	■	■	■			
Enclosure rating	IP 65	■	■	■	■	■	■	■			
Circuit protection [8]	A, B, C	■	■	■	■	■	■	■			
Ambient temperature [9]	Operation –20 °C ... +50 °C	■	■	■	■	■	■	■			
	Storage –30 °C ... +80 °C	■	■	■	■	■	■	■			
Housing	Aluminium	■	■	■	■	■	■	■			
Weight	Approx. 36 g to 160 g [10]	■	■	■	■	■	■	■			

1) XX = Fork depth (E.g. 40 = fork depth equivalent to 40 mm)
2) Limit values, reverse-polarity protected
3) Without load
4) May not exceed or fall short of V_S tolerances
5) Signal transit time with resistive load
6) With light/dark ratio 1:1; no time delay
7) Reference voltage 50 V DC
8) A = V_S connections reverse-polarity protected
B = Outputs short-circuit protected
C = Interference pulse suppression
9) Do not bend below 0 °C
10) Depending on fork width

Truth table

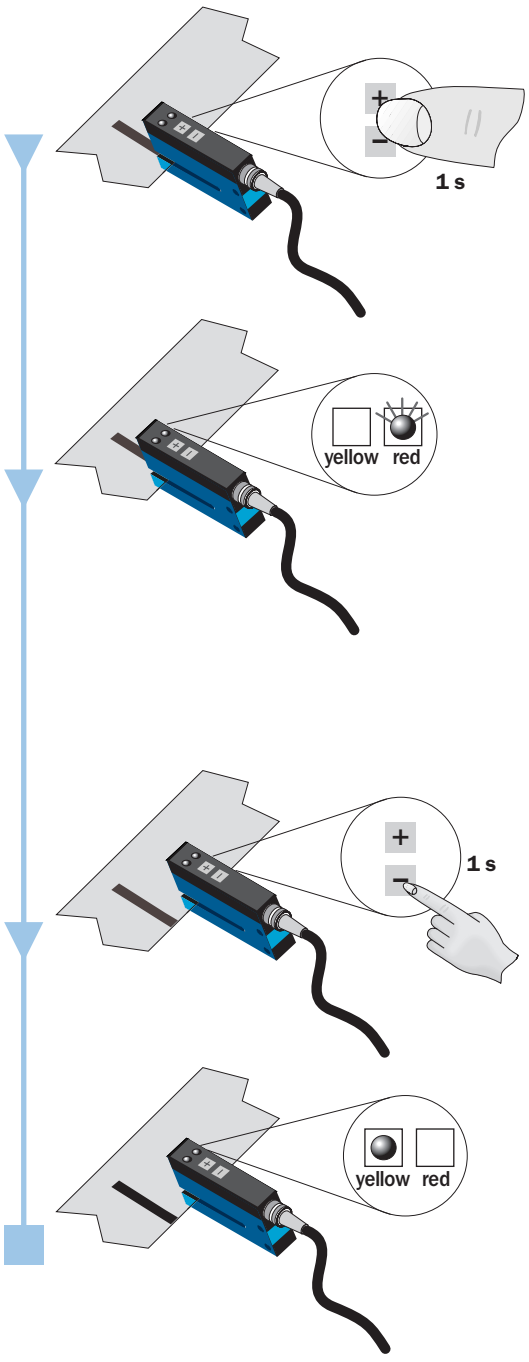
Switching type	Light-switching (Q)		Dark-switching ($\bar{Q}$)	
Light path free	Yes	No	Yes	No
PNP/NPN output	HIGH	LOW	LOW	HIGH
Function indicator (yellow)	On	Off	Off	On

Order information

Fork depth 40 mm		Fork depth 60 mm		Fork depth 95 mm	
Type	**Order no.**	**Type**	**Order no.**	**Type**	**Order no.**
WFL2-40B416	6036821	WFL2-60B416	6036828	WFL2-95B416	6036835
WFL5-40B416	6036822	WFL5-60B416	6036829	WFL5-95B416	6036836
WFL15-40B416	6036823	WFL15-60B416	6036830	WFL15-95B416	6036837
WFL30-40B416	6036824	WFL30-60B416	6036831	WFL30-95B416	6036838
WFL50-40B416	6036825	WFL50-60B416	6036832	WFL50-95B416	6036839
WFL80-40B416	6036826	WFL80-60B416	6036833	WFL80-95B416	6036840
WFL120-40B416	6036827	WFL120-60B416	6036834	WFL120-95B416	6036841

Teach-in: adjusting the switching threshold

- The material speed during Teach-in must equal zero (machine stationary).



1st operation

- To enter Teach Mode push both buttons (“+” and “–”) for 1 second (no object).
- After the first Teach-in operation, the red function indicator flashes slowly and signals that the second Teach-in operation must now be initiated.

2nd operation

- Briefly operate the “–” button (on carrier material or without scanned object).
- After the second Teach-in operation, the red function indicator extinguishes.
- The Teach-in operation was unsuccessful if the red function indicator flashes.

Notes

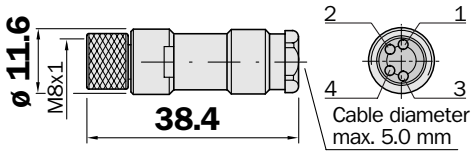
- + / – Following completion of the Teach-in operation, the switching threshold can be further adjusted by the “+” or “–” button at any time. For slower adjustment, press the “+” or “–” button once. For faster adjustment, the finger remains on the “+” or “–” button.
- ± 3s By simultaneously pressing the “+” and “–” buttons (3 seconds), the unit can be locked against unintentional adjustment.
- ± L/D 6s By simultaneously pressing the “+” and “–” buttons (6 seconds), the switching function (light/dark) can be inrated. Default setting: light switching.

Dimensional drawings and order information

SENSICK screw-in system M8, 4-pin, enclosure rating IP 67

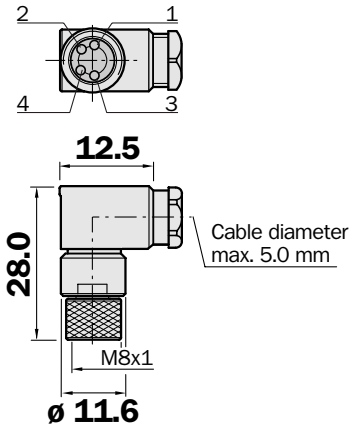
Female connector M8, 4-pin, straight

Type	Order no.
DOS-0804-G	6009974



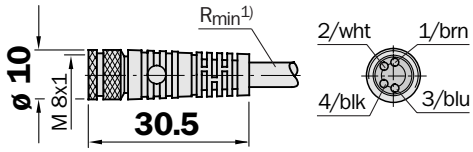
Female connector M8, 4-pin, right angle

Type	Order no.
DOS-0804-W	6009975



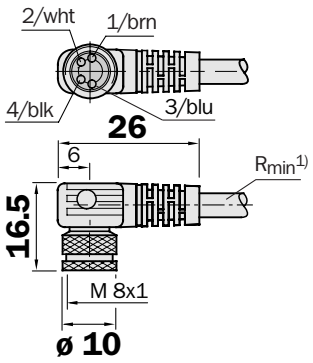
Female connector M8, 4-pin, straight
Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

Type	Order no.	Cable length
DOL-0804-G02M	6009870	2 m
DOL-0804-G05M	6009872	5 m
DOL-0804-G10M	6010754	10 m



Female connector M8, 4-pin, right angle
Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

Type	Order no.	Cable length
DOL-0804-W02M	6009871	2 m
DOL-0804-W05M	6009873	5 m
DOL-0804-W10M	6010755	10 m



1) Minimum bend radius in dynamic use
R_{min} = 20 x cable diameter

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