



# WF: Fork sensors for a wide range of applications

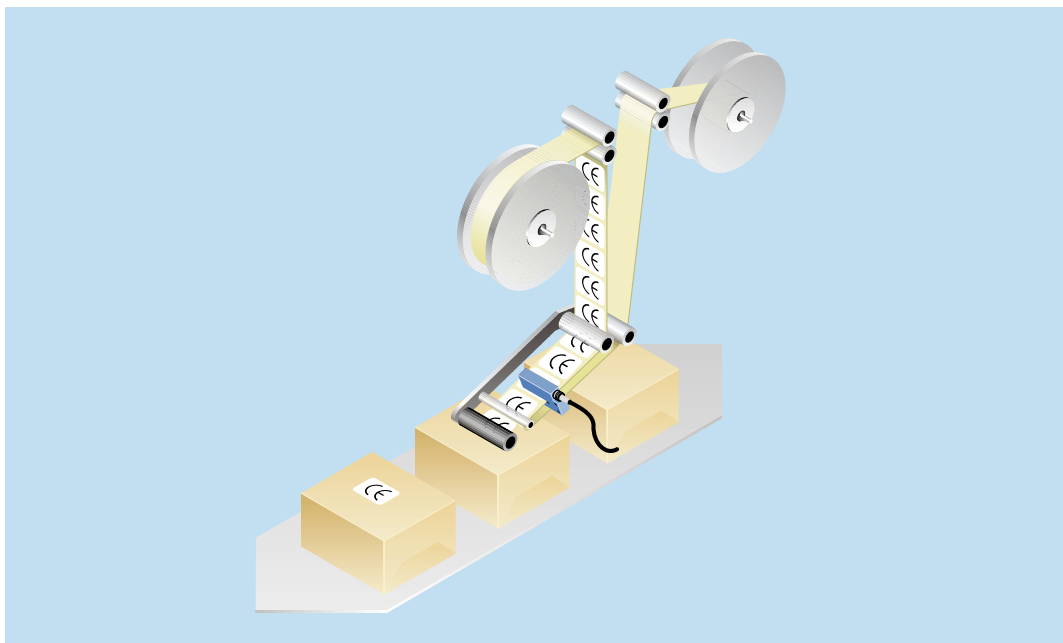


- slot widths between 2 and 120 mm, slot depths of up to 60 mm,
- high-precision adjustment via multiplex potentiometers,
- versions with very short response times (30  $\mu$ s) and high resolution,
- teach-in versions (WF 3 and WF 5),
- universal switching output (PNP or NPN, light- or dark-switching).

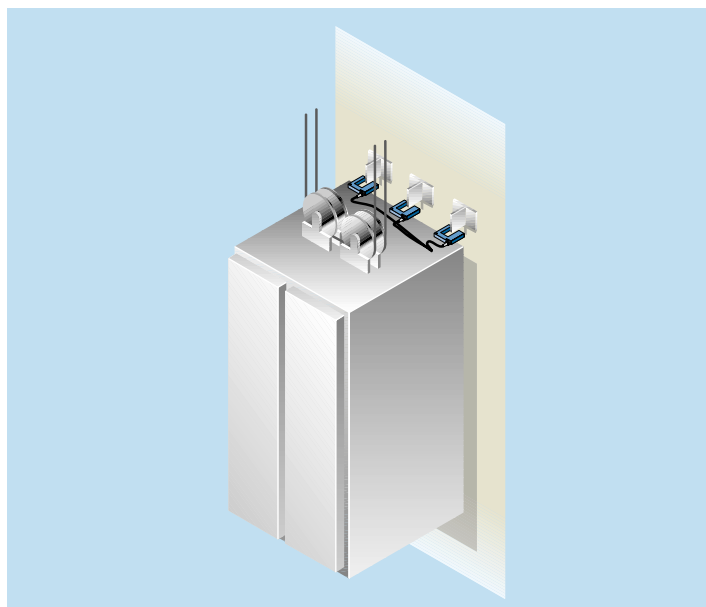
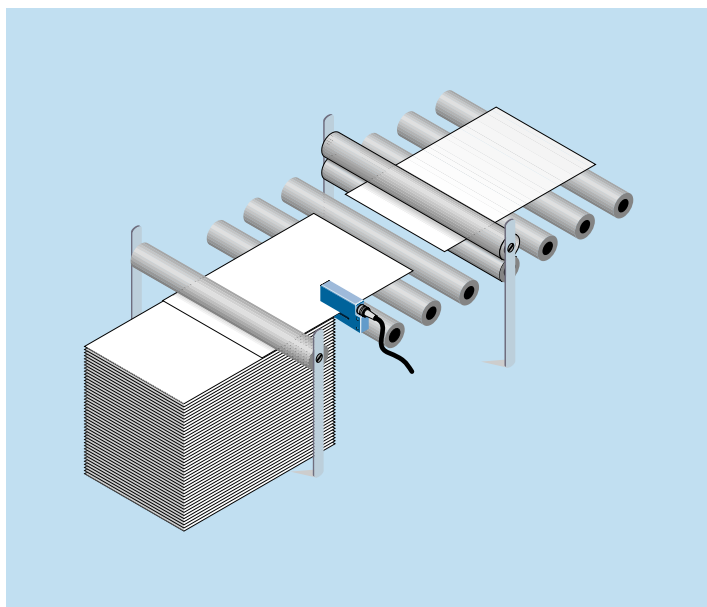
The detection of labels, marks and double sheets, as well as holes and edges are typical applications for WF fork sensors.

A complete range of sensors with the following features is available for a variety of operating conditions:

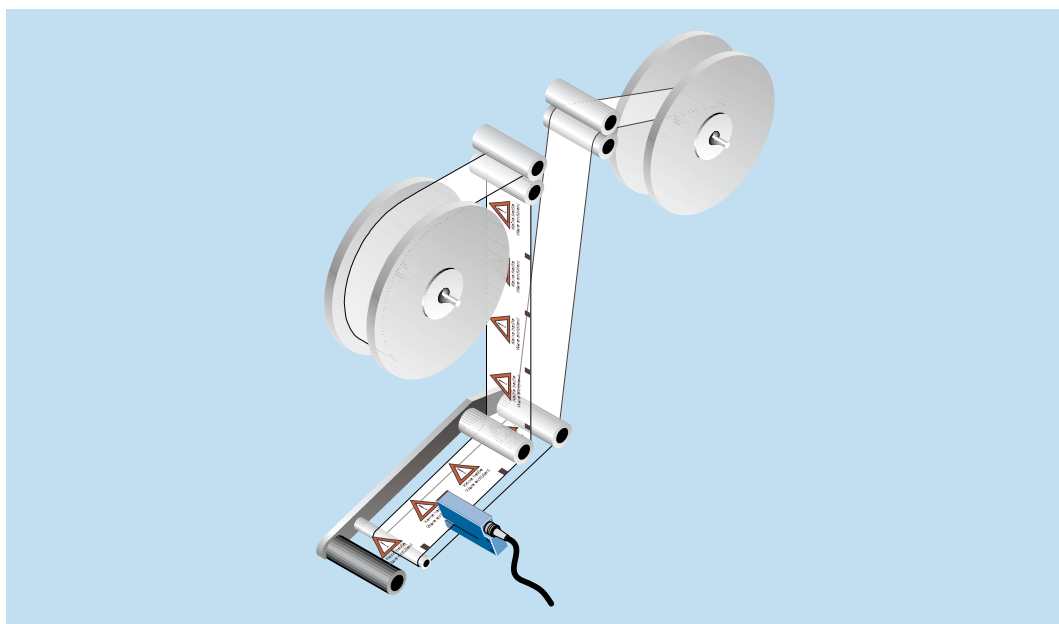
► Fork sensors on a labelling machine monitoring the label strip to ensure that a label is attached to every package.



▼ The fork sensor reliably detects double sheets on conveyor belts carrying material to guillotine cutters.



▲ Checking the position of transport cranes is an ideal application for fork sensors.



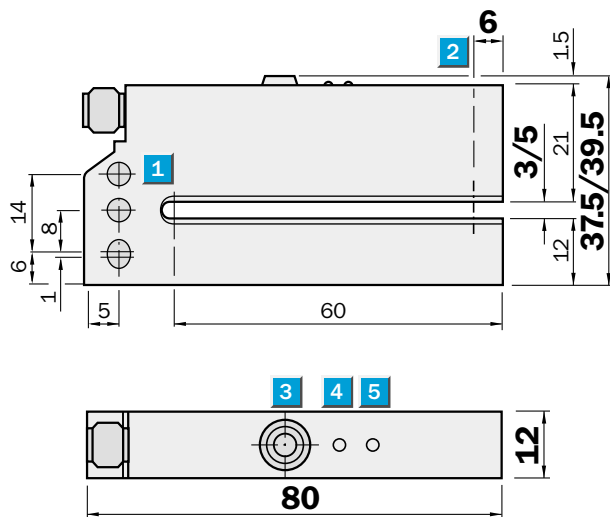
◄ Labels can only be cut and punched if printing and control marks can be accurately detected. Fork sensors are used to ensure that everything runs smoothly and reliably.

**Fork width**  
3 mm / 5 mm

Fork sensors

- 2 setting modes: "standard" and "fine" using teach-in process
- Teach-in: switch on unit or via "ET" control wire
- Universal switching output

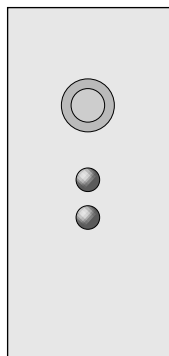
Dimensional drawing



Adjustments possible

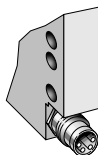
- WF 3T-B 4210
- WF 5T-B 4210

- 1 Mounting holes,  $\phi$  4.2 mm (3x)
- 2 Optical axis
- 3 Teach-in switch
- 4 Function indicator, LED red
- 5 Function indicator, LED yellow, free light path

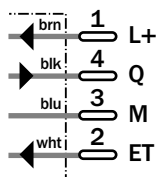


Connection type

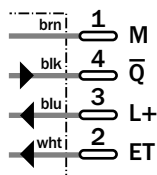
- WF 3T-B 4210
- WF 5T-B 4210



Light-switching 4-pin, M 8



Dark-switching 4-pin, M 8



Accessories	page
Cable receptacles	496



Technical data		WF	3T-B 4210	5T-B 4210										
<b>Fork width</b>	3 mm													
	5 mm													
<b>Light source<sup>1)</sup>, light type</b>	LED, infrared light, incandescent light													
<b>Supply voltage <math>V_S</math><sup>1)</sup></b>	10...30 V DC													
Current consumption <sup>2)</sup>	40 mA													
Ripple <sup>3)</sup>	< 10 %, < 5 $V_S$													
<b>Switching outputs</b>	PNP/NPN, light-/dark-switching													
Signal voltage HIGH at $I_A$ max.	$V_S - (< 2 V)$ PNP, Q													
Signal voltage LOW at $I_A$ max.	Approx. 0 V PNP, Q													
Output current $I_A$ max.	100 mA													
Response time <sup>4)</sup>	50 $\mu$ s													
Max. switching frequency <sup>5)</sup>	10,000/s													
<b>Teach-in through switch</b>														
<b>Teach-in with ET input</b>	ET to $V_S$													
Standard setting	1 pulse 0.3...4 s													
Fine setting	1 pulse 0.3...4 s + pause 0.3...1.3 s													
	+ 1 pulse 0.3...4 s													
<b>Connection type</b>	4-pin, M 8 plug													
<b>Ambient light safety</b>	3,000 lux													
<b>VDE protection class<sup>6)</sup></b>	<input type="checkbox"/>													
<b>Enclosure rating</b>	IP 65													
<b>Circuit protection<sup>7)</sup></b>	B, C													
<b>Ambient temperature</b>	Operation -20 °C...+60 °C													
	Storage -20 °C...+80 °C													
<b>Weight</b>	Approx. 60 g													
<b>Housing material</b>	Aluminium													

1) Limit values  
2) Without load

3) May not exceed or fall short of  
 $V_S$  tolerances

4) Signal transit time with resistive load  
5) With light/dark ratio 1:1; no time delay  
6) Reference voltage 50 V DC

7) B = Outputs short-circuit protected  
C = Interference pulse suppression

Teach-in	Order information						
With these photoelectric fork sensors, the switching threshold is set by a "teach-in" procedure. This can take place via the "ET" wire or by using the teach-in button on the device.	<table border="1"> <thead> <tr> <th>Type</th> <th>Part no.</th> </tr> </thead> <tbody> <tr> <td>WF 3T-B 4210</td> <td>6 020 874</td> </tr> <tr> <td>WF 5T-B 4210</td> <td>6 021 220</td> </tr> </tbody> </table>	Type	Part no.	WF 3T-B 4210	6 020 874	WF 5T-B 4210	6 021 220
Type	Part no.						
WF 3T-B 4210	6 020 874						
WF 5T-B 4210	6 021 220						

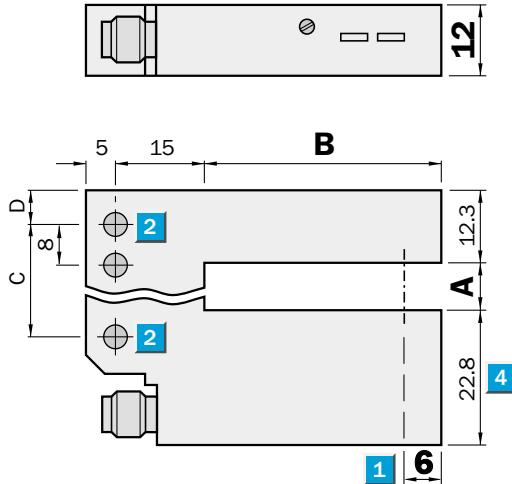
Procedure	Notes
<ul style="list-style-type: none"> <li>Move support material into beam path</li> <li>Activate teach-in using Teach button or via the "ET" wire:           <ul style="list-style-type: none"> <li>(press once): Standard setting with standard switching hysteresis (red LED flashes)</li> <li>(press twice): Fine setting with smaller switching hysteresis (yellow LED flashes)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Block scanner: Press teach-in button for long period (approx. 6 secs.), red LED lights</li> <li>Release scanner: Press teach-in button for long period (approx. 6 secs.), red LED goes out</li> <li>In the event of power failure or when production starts, the unit remembers the last threshold taught-in</li> </ul>

 **Fork width**  
2...120 mm

**Fork sensors**

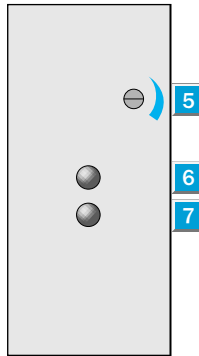
- Simple accurate setting using multi-path potentiometer
- PNP-/NPN-switching output
- Light-/dark-switching
- Robust aluminium housing

### Dimensional drawing



### Adjustments possible

All types

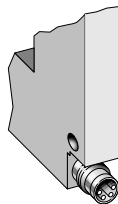


- 1** Mounting holes,  $\phi$  4.2 mm
- 2** Mounting holes,  $\phi$  4.2 mm, not on WF 120
- 3** Optical axis
- 4** With WF-B 4210 = 25.8 mm
- 5** Sensitivity adjustment
- 6** Function indicator (red), uninterrupted light path
- 7** Function indicator (yellow), free light path

	Dimensions A (mm)		C (mm)	D (mm)
	Fork width	Fork depth		
<b>WF 2</b>	<b>2</b>	40	14	6.25
<b>WF 15</b>	<b>15</b>	40	27	6.25
<b>WF 30</b>	<b>30</b>	40	42	6.25
<b>WF 50</b>	<b>50</b>	57	40	17.25
<b>WF 80</b>	<b>80</b>	57	70	17.25
<b>WF 120</b>	<b>120</b>	57	110	17.25

### Connection type

All types

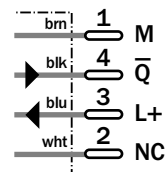
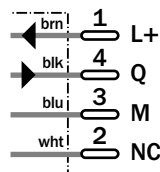


light-switching

4-pin, M 8


dark-switching

4-pin, M 8



Accessories	page
Cable receptacles	496



Technical Data		WF	2-B 4150	15-B 4150	30-B 4150	50-B 4150	80-B 4150	120-B 4150	2-B 4210			
<b>Fork width</b>	2 mm											
	15 mm											
	30 mm											
	50 mm											
	80 mm											
	120 mm											
<b>Light source</b>	LED, infrared light, pulsed											
	LED, infrared light, incandescent light											
<b>Supply voltage <math>V_S</math><sup>1)</sup></b>	10...30 V DC											
<b>Current consumption<sup>2)</sup></b>	30 mA											
	40 mA											
<b>Ripple<sup>3)</sup></b>	< 10 %											
<b>Switching outputs</b>	PNP/NPN, light-/dark-switching											
Signal voltage HIGH at $I_A$ max.	$V_S - (< 2 V)$ PNP, Q											
Signal voltage LOW at $I_A$ max.	Approx. 0 V PNP, Q											
<b>Output current <math>I_A</math> max.</b>	100 mA											
Response time <sup>4)</sup>	1 ms											
Max. switching frequency <sup>5)</sup>	500/s											
Response time <sup>4)</sup>	30 $\mu$ s											
Max. switching frequency <sup>5)</sup>	10,000/s											
<b>Ambient light safety</b>	3,000 Lux											
<b>Connection type</b>	Plug											
<b>VDE protection class</b>												
<b>Circuit protection<sup>6)</sup></b>	B, C											
<b>Enclosure rating</b>	IP 65											
<b>Ambient temperature</b>	Operation -20 °C...+60 °C											
	Storage -20 °C...+80 °C											
<b>Weight</b>	Approx. 36 g to 116 g depending on fork width											
<b>Housing material</b>	Aluminium											

1) Limit values  
2) Without load

3) May not exceed or fall short of  $V_S$  tolerances

4) Signal transit time with resistive load  
5) With light/dark ratio 1:1; no time delay

6) B = Outputs short-circuit protected  
C = Interference pulse suppression

Truth table					Order information	
Switching type:	Light-switching (Q)		Dark-switching ( $\bar{Q}$ )		Type	Part no.
Light path free	Yes	No	Yes	No	WF 2-B 4150	6 012 063
NPN output	LOW	HIGH	HIGH	LOW	WF 15-B 4150	6 012 064
PNP output	HIGH	LOW	LOW	HIGH	WF 30-B 4150	6 012 065
					WF 50-B 4150	6 012 066
					WF 80-B 4150	6 012 067
					WF 120-B 4150	6 012 068
					WF 2-B 4210	6 012 062