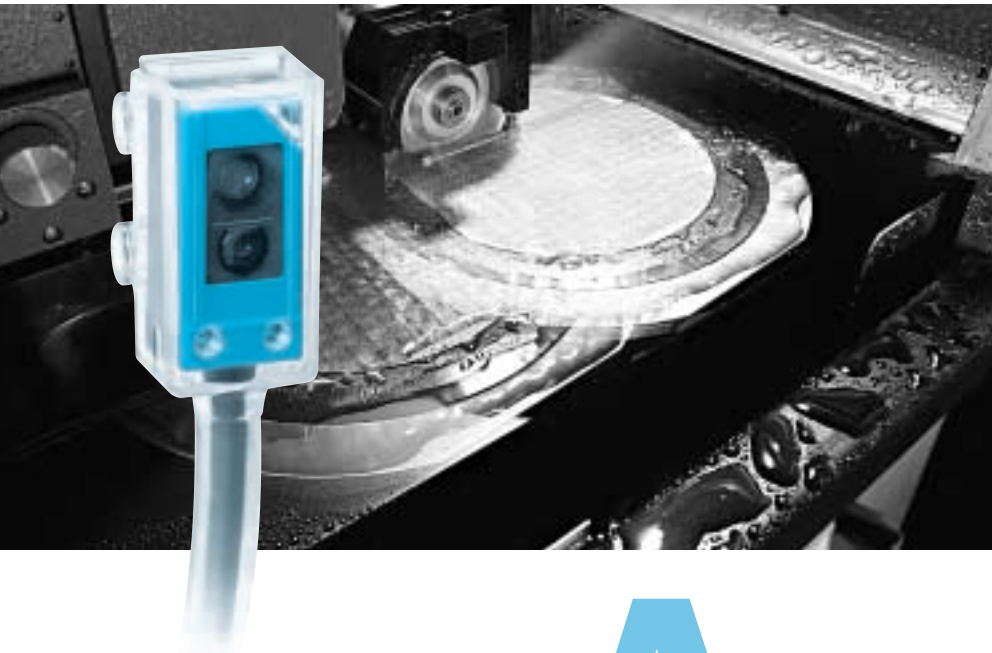


# Miniature photoelectric switch W 4-2 in Teflon housing: Reliable detection in aggressive environments




In the robust Teflon housing of the class IP 68, the most challenging detection tasks can now be handled in the moist and largely aggressive environments of the semi-conductor and food industries too.

The photoelectric proximity switches with a fixed scanning range of 80 mm are distinguished by excellent background suppression, minimum black/white offset and a reliably constant scanning range.

The through-beam photoelectric switch enables detection of wafer carriers in wet cleaning machines and beverage containers in washing and rinsing facilities up to a scanning range of 3.0 m.

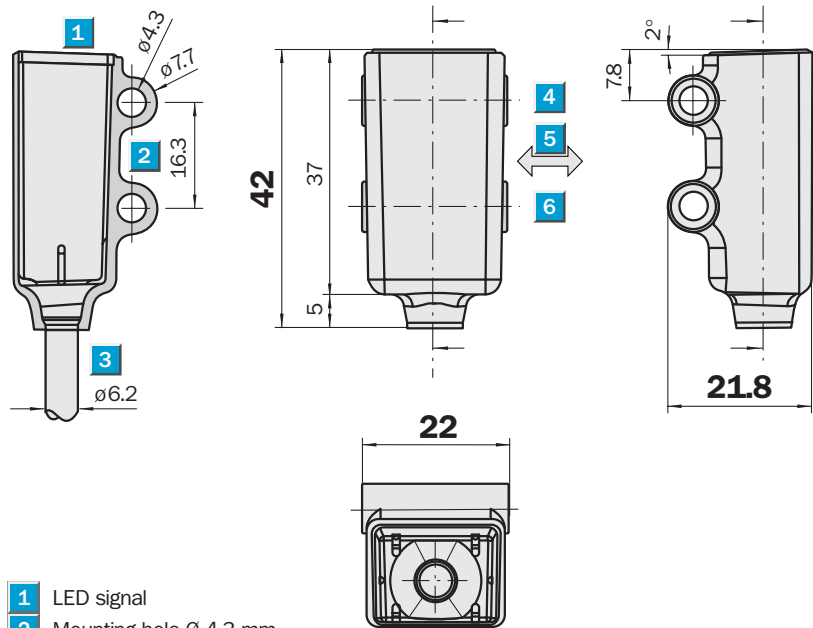
	<b>Photoelectric proximity switches BGS</b>
	<b>Through-beam photoelectric switches</b>

**A**s miniature photoelectric switches, the W 4-2 series demonstrate their strengths in all places where objects such as CDs, electronic boards and transparent beverage containers must be detected reliably. Thanks to the use of intelligent chip logic, the W 4-2 sensors can detect objects of all kinds without interference from external light sources.


**Scanning distance**  
**4... 80 mm**  
**Photoelectric proximity switches**

- Robust Teflon housing for use in moist and aggressive environments
- Insensitive to interference from critical backgrounds
- According to SEMI standards:  
E49.2-0298  
F57-0301
- Intended to contact food complied with  
FDA 21 CFR 177.1550

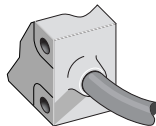
**Dimensional drawing**



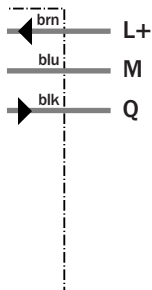
- 1 LED signal
- 2 Mounting hole  $\varnothing$  4.3 mm
- 3 Cable 2 m,  $\varnothing$  4.5 mm, 1.0 m Teflon coated,  $\varnothing$  6.2 mm
- 4 Optical axis, receiver
- 5 Standard direction of the material being scanned
- 6 Optical axis, sender

**Connection types**

- WT 4-2P 132 T01
- WT 4-2N 132 T01



3 x 0.25 mm<sup>2</sup>



Technical data		WT 4-2	P 132 T01	N 132 T01								
<b>Scanning distance</b>	5 ... 80 mm ± 10 %, fixed											
Background suppression	From 95 mm											
<b>Light source <sup>1)</sup>, light type</b>	LED, red light											
Light spot diameter	3 mm at 50 mm											
<b>Supply voltage <math>V_S</math></b>	10 ... 30 V DC <sup>2)</sup>											
Ripple <sup>3)</sup>	< 5 V <sub>PP</sub>											
Current consumption <sup>4)</sup>	< 20 mA											
<b>Switching outputs</b>	Q, PNP											
	Q, NPN											
Switching mode	Light-switching											
Output current $I_A$ max.	< 100 mA											
PNP; signal voltage HIGH	$V_S - (< 2.5 V)$											
PNP; signal voltage LOW	Approx. 0 V											
NPN; signal voltage HIGH	Approx. $V_S$											
NPN; signal voltage LOW	< 1.5 V											
Response time <sup>5)</sup>	> 500 $\mu$ s											
Max. switching frequency <sup>6)</sup>	< 1000/s											
<b>Connection type</b>	Cable <sup>7)</sup> , 2 m											
Minimum bend radius of Teflon cable	$R > 30$ mm											
<b>VDE protection class</b>	⊕											
<b>SEMI standards</b>	SEMI E49.2-0298											
	SEMI F57-0301											
<b>FDA-Regulations</b>	21 CFR 177.1550											
	21 CFR 175.300											
	21 CFR 175.105											
	21 CFR 176.170											
	21 CFR 176.180											
<b>Circuit protection <sup>8)</sup></b>	A, B, C											
<b>Enclosure rating</b>	IP 68											
<b>Ambient temperature <math>T_A</math></b>	Operation - 40 °C...+ 60 °C											
	Storage - 40 °C...+ 75 °C											
<b>Weight</b>	Approx. 80 g											
<b>Housing material</b>												
Sensor coating	DuPont, PFA 940 HP plus											
Cable coating	DuPont, PFA 440 HP											

<sup>1)</sup> Average service life 100,000 h where  $T_A = + 25$  °C

<sup>2)</sup> Limit values

<sup>3)</sup> May not exceed or fall short of  $V_S$  tolerances

<sup>4)</sup> Without load

<sup>5)</sup> Signal transit time with resistive load

<sup>6)</sup> With light/dark ratio 1:1

<sup>7)</sup> Do not bend below 0 °C

<sup>8)</sup> A =  $V_S$  connections reverse-polarity protected


B = Output Q short-circuit protected

C = Interference pulse suppression

Scanning distance		Order information	
Type	Part no.	Type	Part no.
WT 4-2P 132 T01	1 022 966	WT 4-2P 132 T01	1 022 966
WT 4-2N 132 T01	1 023 763	WT 4-2N 132 T01	1 023 763

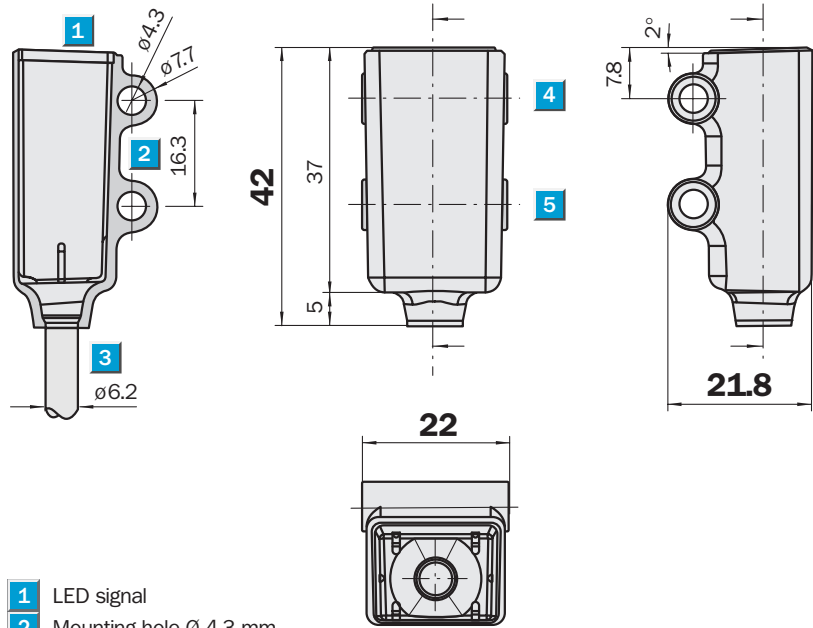
1	Scanning distance on black, 6 % remission
2	Scanning distance on grey, 18 % remission
3	Scanning distance on white, 90 % remission

 **Scanning range**  
3 m

Through-beam photoelectric switches

- Robust Teflon housing for use in moist and aggressive environments
- According to SEMI standards:  
E49.2-0298  
F57-0301
- Test input
- Intended to contact food complied with  
FDA 21 CFR 177.1550

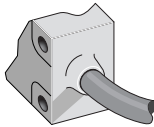
**Dimensional drawing**



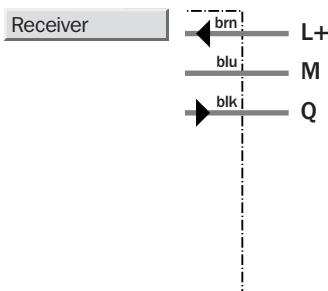
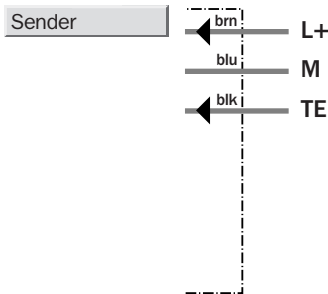
- 1 LED signal
- 2 Mounting hole Ø 4.3 mm
- 3 Cable 2 m, Ø 4.5 mm, 1.0 m Teflon coated, Ø 6.2 mm
- 4 Optical axis, receiver
- 5 Optical axis, sender

**Connection types**

- WS/WE 4-2F T01
- WS/WE 4-2E T01
- WS/WE 4-2PT T01



3 x 0.25 mm<sup>2</sup>



**Technical data** WS/WE 4-2 F T01 E T01 P T01

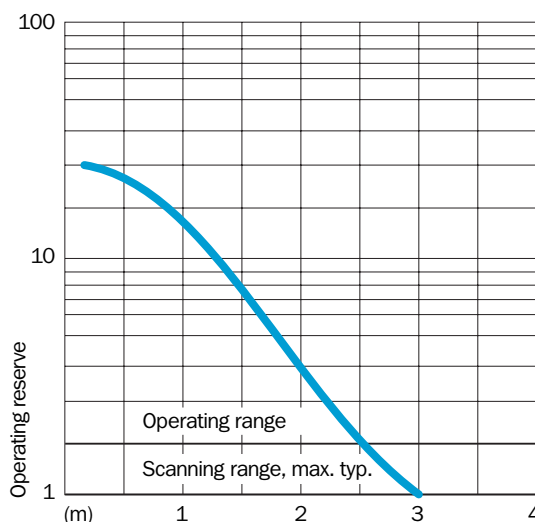
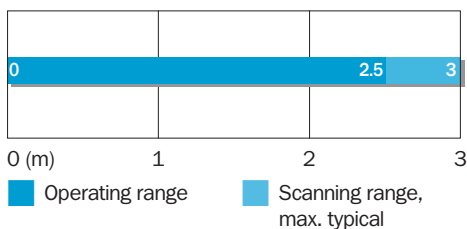
<b>Scanning range</b> , max. typical	0 ... 3 m			
<b>Light source</b> <sup>1)</sup> , <b>light type</b>	LED, red light			
Light spot diameter	Approx. 340 mm at 2 m			
<b>Supply voltage</b> $V_S$	10 ... 30 V DC <sup>2)</sup>			
Ripple <sup>3)</sup>	< 5 $V_{PP}$			
Current consumption <sup>4)</sup>	< 50 mA			
sender	< 20 mA			
receiver	< 30 mA			
<b>Switching outputs</b>	Q, PNP			
	Q, NPN			
Switching mode	Dark-switching			
	Light-switching			
Output current $I_A$ max.	< 100 mA			
PNP; signal voltage HIGH	$V_S - (< 2.5 V)$			
PNP; signal voltage LOW	Approx. 0 V			
NPN; signal voltage HIGH	Approx. $V_S$			
NPN; signal voltage LOW	< 1.5 V			
Response time <sup>5)</sup>	> 500 $\mu s$			
Max. switching frequency <sup>6)</sup>	< 1000/s			
<b>Test input "TE"</b> Sender OFF	TE to 0 V			
<b>Connection type</b>	Cable <sup>7)</sup> , 2 m			
Minimum bend radius of Teflon cable	$R > 30$ mm			
<b>VDE protection class</b>	⚡			
<b>SEMI standards</b>	SEMI E49.2-0298			
	SEMI F57-0301			
<b>FDA-Regulations</b>	21 CFR 177.1550			
	21 CFR 175.300			
	21 CFR 175.105			
	21 CFR 176.170			
	21 CFR 176.180			
<b>Circuit protection</b> <sup>8)</sup>	A, B, C			
<b>Enclosure rating</b>	IP 68			
<b>Ambient temperature</b> $T_A$	Operation - 40 °C...+ 60 °C			
	Storage - 40 °C...+ 75 °C			
<b>Weight</b>	Approx. 160 g			
<b>Housing material</b>				
Sensor coating	DuPont, PFA 940 HP plus			
Cable coating	DuPont, PFA 440 HP			

1) Average service life 100,000 h where  $T_A = + 25$  °C  
 2) Limit values  
 3) May not exceed or fall short of  $V_S$  tolerances

4) Without load  
 5) Signal transit time with resistive load  
 6) With light/dark ratio 1:1  
 7) Do not bend below 0 °C

8) A =  $V_S$  connections reverse-polarity protected  
 B = Output Q short-circuit protected  
 C = Interference pulse suppression

**Operating range and operating reserve**



**Order information**

Type	Part no.
WS/WE 4-2F T01	1 023 764
WS/WE 4-2E T01	1 023 765
WS/WE 4-2P T01	1 023 636

Your contacts:

**Australia**

Phone +61 3 94 97 41 00  
008 33 48 02 – toll free  
Fax +61 3 94 97 11 87

**Austria**

Phone +43 2 23 66 22 88-0  
Fax +43 2 23 66 22 88-5

**Belgium/Luxembourg**

Phone +32 24 66 55 66  
Fax +32 24 63 31 04

**Brazil**

Phone +55 11 55 61 26 83  
Fax +55 11 55 35 41 53

**China**

Phone +8 52 27 63 69 66  
Fax +8 52 27 63 63 11

**Czech Republik**

Phone +42 02 578 10 561  
Fax +42 02 578 10 559

**Denmark**

Phone +45 45 82 64 00  
Fax +45 45 82 64 01

**Finland**

Phone +3 58 9-7288500  
Fax +3 58 9-72885055

**France**

Phone +33 1 64 62 35 00  
Fax +33 1 64 62 35 77

**Germany**

Phone +49 2 11 53 01 0  
Fax +49 2 11 53 01 100

**Great Britain**

Phone +44 17 27-83 11 21  
Fax +44 17 27-85 67 67

**Italy**

Phone +39 02 92 14 20 62  
Fax +39 02 92 14 20 67

**Japan**

Phone +813 33 58 13 41  
Fax +813 33 58 05 86

**Korea**

Tel. +82 27 86 63 21/4  
Fax +82 27 86 63 25

**Netherlands**

Phone +31 30 229 25 44  
Fax +31 30 229 39 94

**Norway**

Phone +47 67 56 75 00  
Fax +47 67 56 66 10

**Poland**

Phone +48 22 8 37 40 50  
Fax +48 22 8 37 43 88

**Singapore**

Phone +65 67 44 37 32  
Fax +65 68 41 77 47

**Spain**

Phone +34 93 4 80 31 00  
Fax +34 93 4 73 44 69

**Sweden**

Phone +46 8 6 80 64 50  
Fax +46 8 7 10 18 75

**Switzerland**

Phone +41 4 16 19 29 39  
Fax +41 4 16 19 29 21

**Taiwan**

Phone +88 62 23 65 62 92  
Fax +88 62 23 68 73 97

**USA**

Phone +1(952) 9 41-67 80  
Fax +1(952) 9 41-92 87

Representatives and agencies  
in all major industrial nations.

