DATA SHEET

W24-2Exi
Photoelectric sensors for explosive atmospheres

Safe and reliable switching in Ex-areas (gas)

The W24-2Exi Series has been developed for applications in explosive areas, in order to provide intrinsic safety according to EN 60079-0 (2009), EN 60079-11 (2007) and EN 60079-28 (2007), and EC type examined by the “Physikalisch-Technische Bundesanstalt (PTB)” in Braunschweig, Germany. The switching outputs of the devices are designed according to EN 60947-5-6 (NAMUR).

Therefore, the W24-2Exi Series labelled Ⓔx II 2G Ex ia op is IIC T4 complies with the requirements of Category 2G according to the new Directive 94/9/EC (ATEX) and may be used in the explosive areas “Zone 1 (gas)” and “Zone 2 (gas)”.

The device variants used depend on the specific application:

- the WT24-2Exi photoelectric proximity sensor with an adjustable scanning distance of 100 ... 2,000 mm and background suppression,
- the WL24-2Exi photoelectric reflex sensor has a maximum scanning range up to 22 m/PL80A,
- the WLL24-2Exi fibre-optic cable version which, depending on the type of optical head, can be used in both through-beam and proximity mode whereby the maximum distance to the object is 1,000 mm and 40 mm respectively.

The sturdy zinc die-cast housings with enclosure rating IP 67 (IP 65 with WLL24), the cable glands and plugs that can be rotated towards the bottom and rear of the sensor, and very good insensitivity to ambient light make all of these devices ideally suited for use in industrial environments.

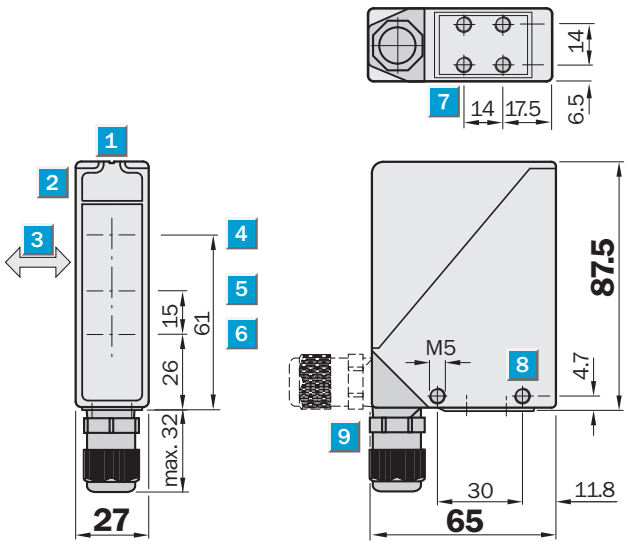
SICK
Sensor Intelligence.

Scanning distance
40 ... 2,000 mm

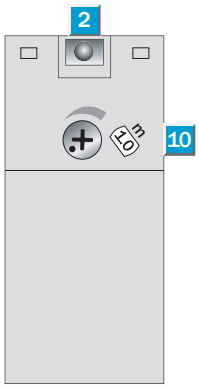
Photoelectric proximity sensors

- Marking:
  Ⓔx II 2G Ex ia op is IIC T4 according to Directive 94/9/EG (ATEX)
- According to category 2G
- Switching output:
  EN 60947-5-6 (NAMUR)
- Background suppression can be set very precisely
- Infrared light

Dimensional drawing



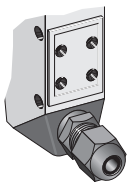
Adjustments



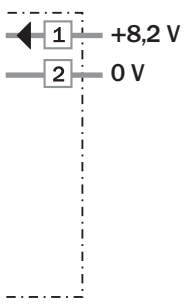
1	Alignment sight
2	LED signal strength indicator
3	Standard direction of the material being scanned
4	Middle of optic axis, sender
5	Middle of optic axis, receiver at close range
6	Middle of optic axis, receiver at long range
7	M5 threaded mounting hole, 6 mm deep
8	M5 threaded mounting hole
9	M16 screw fixing or M12 plug, rotatable by 90°
10	Adjustment of scanning distance: Potentiometer

Connection types

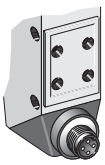
WT24-2X200



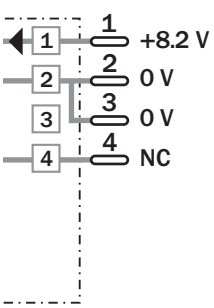
M16, terminals



WT24-2X400



4-pin, M12



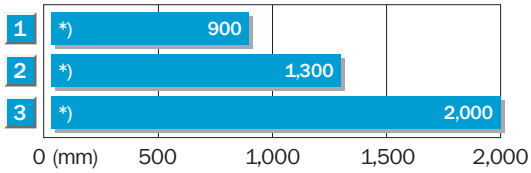
Accessories

Mounting systems
Plug 4-pin, M12
Switching amplifier

Technical data	WT24-2	X200	X400
Scanning distance, typ. max.	40 ... 2,000 mm [1]	■	■
Operating distance	100 ... 2,000 mm [1]	■	■
Adjustment of operating distance	Potentiometer	■	■
Light source [2], light type	LED, infrared light	■	■
Light spot diameter	Approx. 50 mm at 2,000 mm	■	■
Supply voltage V_S [3]	5 ... 15.5 V DC	■	■
Residual ripple [4]	0.4 V_{PP}	■	■
EC-type examination certificate	PTB 03 ATEX 2105	■	■
Input voltage U_i max. [5]	15.5 V	■	■
Input current I_i max. [5]	53 mA	■	■
Input power P_i max. [5]	100 mW	■	■
Internal capacity C_i max. [5]	80 nF	■	■
Internal inductivity L_i max. [5]	≈ 0 µH (negligible small)	■	■
Switching output/current consumption	Control current dependent on switching [6]	■	■
	Object is detected ≥ 2,2 mA	■	■
	Object is not detected ≤ 1 mA	■	■
Switching mode	Light-switching	■	■
Response time [7]	≤ 10 ms	■	■
Max. switching frequency [8]	50 Hz	■	■
Connection types	M16, terminal connection	■	
	Plug 4-pin, M12		■
Protection class [9]	□	■	■
Circuit protection [10]	A, C	■	■
Enclosure rating	IP 67	■	■
Ambient temperature T_A	Operation: –20 °C ... +60 °C	■	■
	Storage: –25 °C ... +70 °C	■	■
Weight	Approx. 330 g	■	■
Housing material	Zinc die-cast housing	■	■

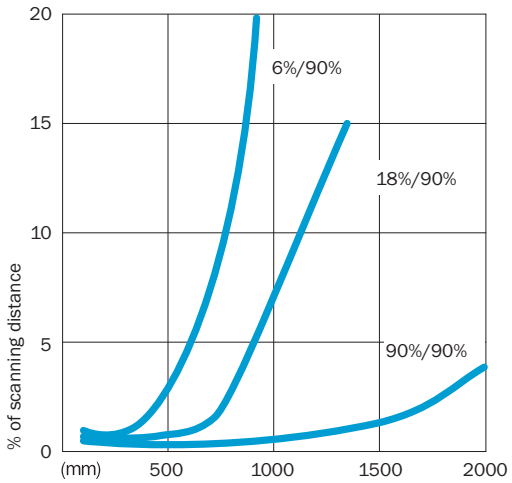
1) Object with 90 % remission (based on standard white to DIN 5033)
2) Average service life 100,000 h at T_A = +25 °C
3) Limit values, Supply with switching amplifier EN2Ex (R_i approx. 1 kΩ)
4) May not exceed or fall short of V_S tolerances
5) For connection to a separately certified intrinsically safe circuit only
6) According to EN 60947-5-6 (NAMUR)
7) Signal transit time with resistive load
8) With light/dark ratio 1:1
9) Reference voltage DC 50 V
10) A = V_S-connections reverse-polarity protected
C = Interference pulse suppression

Scanning distance

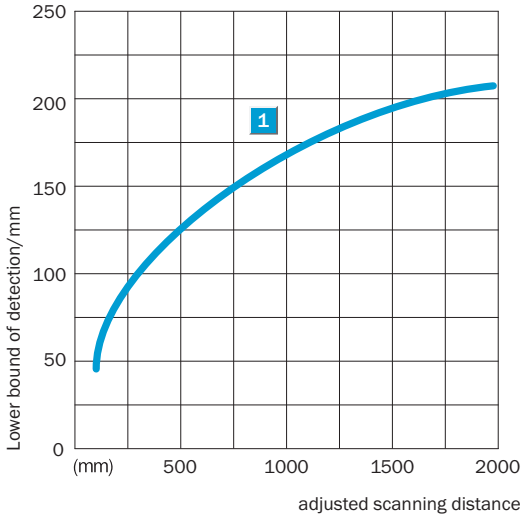


*) Lower bound of detection area depending on the adjusted scanning distance

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



Lower bound of detection



Ordering information

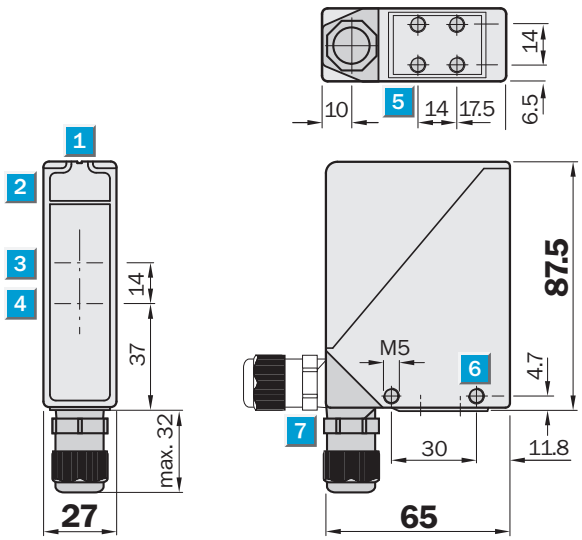
Model name	Part No.
WT24-2X200	1041910
WT24-2X400	1040722

Scanning range
0 ... 22 m

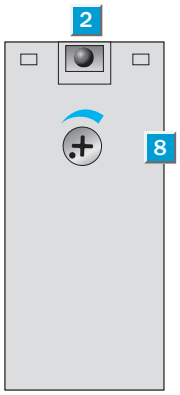
Photoelectric reflex sensors

- Marking:
  Ex II 2G Ex ia op is IIC T4 according to Directive 94/9/EG (ATEX)
- According to category 2G
- Switching output:
  EN 60947-5-6 (NAMUR)
- Red light
- Device plug can be rotated through 90°

Dimensional drawing



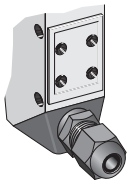
Adjustments



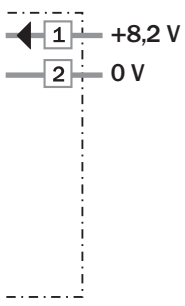
1	Alignment sight
2	LED signal strength indicator
3	Middle of optix axis, sender
4	Middle of optic axis, receiver
5	M5 threaded mounting hole, 6 mm deep
6	M5 threaded mounting hole
7	M16 screw fixing or M12 plug, rotatable by 90°
8	Sensitivity adjustment: Potentiometer

Connection types

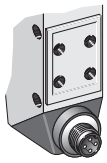
WL24-2X230



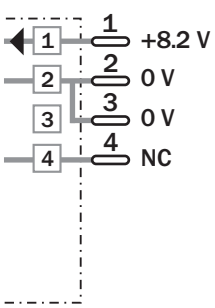
M16, terminals



WL24-2X430



4-pin, M12



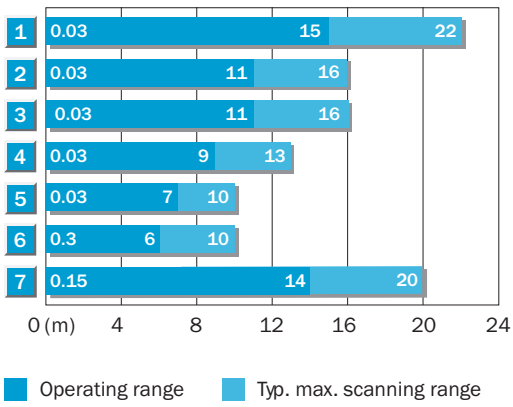
Accessories

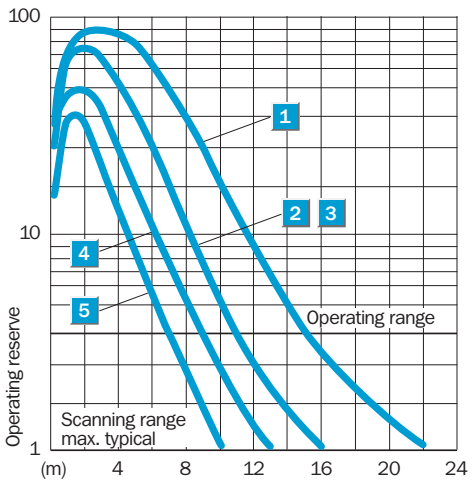
- Mounting systems
- Reflectors
- Plug 4-pin, M12
- Switching amplifier

Technical data	WL24-2	X230	X430
Scanning range typ. max.	0 ... 22 m		
Scanning range, recommended	0 ... 15 m		
Relating to	Reflector PL80A		
Sensivity adjustment	Potentiometer		
Light source [1], light type	LED, red light		
Light spot diameter	250 mm at 15 m		
Supply voltage V_S [2]	5 ... 15.5 V DC		
Residual ripple [3]	0.4 V_{PP}		
EC-type examination certificate	PTB 08 ATEX 2029		
Input voltage U_i max. [4]	15.5 V		
Input current I_i max. [4]	53 mA		
Input power P_i max. [4]	100 mW		
Internal capacity C_i max. [4]	80 nF		
Internal inductivity L_i max. [4]	≈ 0 µH (negligible small)		
Switching output/current consumption	Control current dependent on switching [5]		
	Light beam not interrupted ≥ 2.2 mA		
	Light beam interrupted ≤ 1 mA		
Switching mode	Light-switching		
Response time [6]	≤ 10 ms		
Max. switching frequency [7]	50 Hz		
Connection types	M16, terminal connection		
	Plug 4-pin, M12		
Protection class [8]	□		
Circuit protection [9]	A, C		
Enclosure rating	IP 67		
Ambient temperature T_A	Operation: –20 °C ... +60 °C		
	Storage: –25 °C ... +70 °C		
Weight	Approx. 330 g		
Housing material	Zinc die-cast housing		

1) Average service life 100,000 h at T_A = +25 °C
2) Limit values, Supply with switching amplifier EN2Ex (R_i approx. 1 kΩ)
3) May not exceed or fall short of V_S tolerances
4) For connection to a separately certified intrinsically safe circuit only
5) According to EN 60947-5-6 (NAMUR)
6) Signal transit time with resistive load
7) With light/dark ratio 1:1
8) Reference voltage 50 V DC
9) A = V_S-connections reverse-polarity protected
C = Interference pulse suppression

Scanning range and operating reserve





	Reflector type	Operating range
1	P L80A	0.03 ... 15 m
2	PL50A	0.03 ... 11 m
3	PL40A	0.03 ... 11 m
4	PL30A	0.03 ... 9 m
5	PL20A	0.03 ... 7 m
6	Diamond Grade (20 cm x 20 cm)	0.3 ... 6 m
7	C110	0.15 ... 14 m

Ordering information

Model name	Part No.
WL24-2X230	1026036
WL24-2X430	1026037

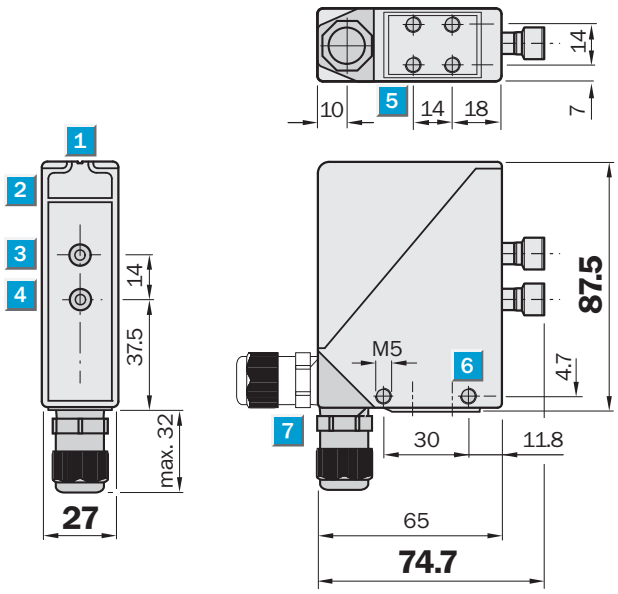
Scanning distance
0 ... 40 mm

Scanning range
0 ... 1,000 mm

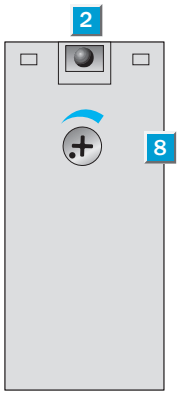
Photoelectric sensors with fibre-optic cable

- Marking:
  Ⓔx II 2G Ex ia op is IIC T4 according to Directive 94/9/EG (ATEX)
- EN 60947-5-6 (NAMUR)
- Red light
- Fibre-optic cable, exchangeable

Dimensional drawing



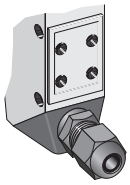
Adjustments



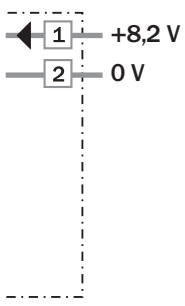
1 Alignment sight
2 LED signal strength indicator
3 Middle of optic axis, sender
4 Middle of optic axis, receiver
5 M5 threaded mounting hole, 6 mm deep
6 M5 threaded mounting hole
7 M16 screw fixing or plug M12, 4-pin, rotatable by 90°
8 Sensitivity adjustment: Potentiometer

Connection types

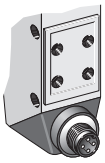
WLL24-2X230



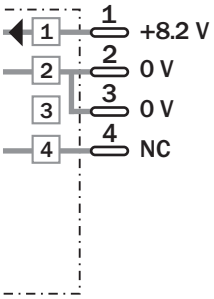
M16, terminals



WLL24-2X430



4-pin, M12



Accessories
Mounting systems
Reflectors
Plug 4-pin, M12
Switching amplifier

2010-06-01
Subject to change without notice

Technical data	WLL24-2	X230	X430
Scanning distance typ. max.	0 ... 40 mm [1]	■	■
Scanning distance	0 ... 25 mm [2]	■	■
Scanning distance	0 ... 10 mm [3]	■	■
Fibre-optic cable (proximity system)	LL3-DB01	■	■
Adjustment of operating distance	Potentiometer	■	■
Scanning range typ. max.	0 ... 1,000 mm	■	■
Fibre-optic cable (Through-beam system)	LL3-TB02 and tip adapter LL3-TA01	■	■
Scanning range, recommended	0 ... 100 mm	■	■
Fibre-optic cable (Through-beam system)	LL3-TB02	■	■
Sensivity adjustment	Potentiometer	■	■
Light source [4], light type	LED, red light	■	■
Supply voltage V_S [5]	5 ... 15.5 V DC	■	■
Residual ripple [6]	0.4 V_{PP}	■	■
EC-type examination certificate	PTB 08 ATEX 2029	■	■
Input voltage U_i max. [7]	15.5 V	■	■
Input current I_i max. [7]	53 mA	■	■
Input power P_i max. [7]	100 mW	■	■
Internal capacity C_i max. [7]	80 nF	■	■
Internal inductivity L_i max. [7]	≈ 0 µH (negligible small)	■	■
Switching outputs/current consumption	Control current dependent on switching [8]	■	■
	Light beam not interrupted ≥ 2.2 mA	■	■
	Light beam interrupted ≤ 1 mA	■	■
Switching mode	Light-switching	■	■
Response time [9]	≤ 10 ms	■	■
Max. switching frequency [10]	50 Hz	■	■
Connection types	M16, terminal connection	■	
	Plug 4-pin, M12		■
Protection class [11]	⧈	■	■
Circuit protection [12]	A, C	■	■
Enclosure rating	IP 65	■	■
Ambient temperature T_A	Operation: –20 °C ... +60 °C	■	■
	Storage: –25 °C ... +70 °C	■	■
Weight	Approx. 330 g	■	■
Housing material	Zinc die-cast housing	■	■

1) Object with 90 % remission (based on standard white to DIN 5033)
2) Object with 18 % remission, gray
3) Object with 6 % remission, black
4) Average service life 100,000 h at T_A = +25 °C
5) Limit values, Supply with switching amplifier EN2Ex (R_i approx. 1 kΩ)
6) May not exceed or fall short of V_S tolerances
7) For connection to a separately certified intrinsically safe circuit only
8) According to EN 60947-5-6 (NAMUR)
9) Signal transit time with resistive load
10) With light/dark ratio 1:1
11) Reference voltage 50 V DC
12) A = V_S-connections reverse-polarity protected
C = Interference pulse suppression

Ordering information	
Model name	**Part No.**
WLL24-2X230	1026038
WLL24-2X430	1026039

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