

GRSE18-P2421V GR18

PHOTOELECTRIC SENSORS





Ordering information

Туре	part no.
GRSE18-P2421V	1085784

Illustration may differ

Other models and accessories → www.sick.com/GR18



Detailed technical data

Features

Functional principle	Through-beam photoelectric sensor
Dimensions (W x H x D)	18 mm x 18 mm x 73.5 mm
Housing design (light emission)	Cylindrical
Housing length	73.5 mm
Thread length	49.3 mm
Thread diameter (housing)	M18 x 1
Optical axis	Axial
Sensing range max.	0 m 15 m
Sensing range	0 m 10 m
Type of light	Infrared light
Light source	LED ¹⁾
Light spot size (distance)	Ø 420 mm (10 m)
Wave length	850 nm
Adjustment	None
Display	
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object not present Static off: object present
Special applications	Hygienic and washdown zones

 $^{^{1)}}$ Average service life: 100,000 h at $\rm T_U$ = +25 $^{\circ}\rm C.$

Mechanics/electronics

Supply voltage U _B 10 ∨ DC 30 ∨ DC ¹³ Ripple < 5 ∨ V _B 0 ⁻²¹ Current consumption 30 mA Switching output PNP Output function Compenentary Switching mode Light/dark switching ⁵⁰ Signal voltage PNP HIGH/LOW V ₅ · (≤ 3V) / approx. 0 V Output current I _{max} ≤ 100 mA ⁴⁾ Response time < 500 µS ¹⁾ Switching frequency Lood Hz ⁶⁾ Connection type Male connector M12, 4-pin Circuit protection Male connector M12, 4-pin Protection class III Weight 85 g Housing material Metal. Stainless steel V4A (1.4404, 316L) Optics material Metal. Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA Tightening torque, max. Po N m Enclosure rating P67 (P68, ¹⁰⁾ (P69, ¹¹) Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) For 60047-5-2 Test input Sender OFF at Test' O V Ambient temperature, storage -30 ° C.		
Current consumption 30 mA Switching output PNP Output function Complementary Switching mode Light/dark switching ³0 Signal voltage PNP HIGH/LOW V _S - (≤ 3 V) / approx. 0 V Output current I _{max} . ≤ 100 mA ⁴0 Response time < 500 µs ⁵0 Switching frequency 1,000 Hz ⁵0 Connection type Male connector M12, 4-pin Circuit protection A ⁻1 № № № № № № № № № № № № № № № № № №	Supply voltage U _B	10 V DC 30 V DC ¹⁾
Switching output PNP Output function Complementary Switching mode Light/dark switching ³⁾ Signal voltage PNP HIGH/LOW V ₂ - (s 3 V) / approx. 0 V Output current I _{max} . ≤ 100 mA ⁴⁾ Response time < 500 μs ⁵⁾ Switching frequency 1,000 Hz ⁶⁾ Connection type Male connector M12, 4-pin Circuit protection A ⁷⁾ B ⁸⁾ D ⁹⁾ Protection class III Weight 85 g Housing material Metal, Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA Tightening torque, max. 90 Nm Enclosure rating IP67 PR68 ¹⁰⁾ IP69K ¹¹⁾ PR68 ¹⁰⁾ IP69K ¹¹⁾ Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Sender OFF at "Test" 0 V Ambient operating temperature -25 °C +55 °C ¹²⁾ Ambient temperature, storage -30 °C +75 °C UL File No.	Ripple	< 5 V _{pp} ²⁾
Output function Complementary Switching mode Light/dark switching 30 Signal voltage PNP HIGH/LOW Vs - (s 3 V) / approx. 0 V Output current I _{max} . \$ 100 mA 40 Response time \$ 500 µs 50 Switching frequency 1,000 Hz 60 Connection type Male connector M12, 4-pin Circuit protection A 70 R 80 Po Potential B 80 Po Potection class III Weight 85 g Housing material Metal, Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA Tightening torque, max. 90 Nm Enclosure rating Plo7 PERS 100 PE	Current consumption	30 mA
Switching mode Light/dark switching ⁵⁰ Signal voltage PNP HIGH/LOW Vs - (≤ 3 V) / approx. 0 V Output current I _{max.} ≤ 100 mA ⁴⁰ Response time < 500 µs ⁵⁰ Switching frequency 1,000 Hz ⁶⁰ Connection type Male connector M12, 4-pin Circuit protection A ⁷⁰ B ⁸⁰ D ⁹⁰ Protection class III Weight 85 g Housing material Metal, Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA Tightening torque, max. 90 Nm Enclosure rating P67 (P68 ¹⁰⁾ P69K ¹¹⁾ Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Sender OFF at "Test" 0 V Ambient operating temperature -25 °C+55 °C ¹²⁾ Ambient temperature, storage -30 °C+75 °C UL File No. E348498	Switching output	PNP
Signal voltage PNP HIGH/LOW V _S - (≤ 3 V) / approx. O V Output current I _{max.} ≤ 100 mA ⁴⁾ Response time < 500 μs ⁵⁾ Switching frequency 1,000 Hz ⁶⁾ Connection type Male connector M12, 4-pin Circuit protection A ⁷⁾ B ⁸ B P P P P P P P P P P P P P P P P P P	Output function	Complementary
Output current I _{max} . ≤ 100 mA ⁴⁾ Response time < 500 μs ⁵⁾ Switching frequency 1,000 Hz ⁶⁾ Connection type Male connector M12, 4-pin Circuit protection A ⁷⁾	Switching mode	Light/dark switching ³⁾
Response time < 500 μs ⁵⁾ Switching frequency 1,000 Hz ⁶⁾ Connection type Male connector M12, 4-pin Circuit protection A ⁷⁾	Signal voltage PNP HIGH/LOW	V_S - ($\leq 3 \text{ V}$) / approx. 0 V
Switching frequency Connection type Male connector M12, 4-pin Circuit protection A 7 B 8 D D 9) Protection class III Weight Housing material Optics material Optics material Plastic, PMMA Tightening torque, max. Enclosure rating IP67 IP68 10) IP69K 111 Items supplied Electromagnetic compatibility (EMC) Test input Ambient operating temperature Ambient temperature, storage UL File No.	Output current I _{max.}	\leq 100 mA $^{4)}$
Connection type Male connector M12, 4-pin A 7 B B D D 9 Protection class Weight Housing material Optics material Pistic, PMMA Tightening torque, max. Pio8 10 1P69 K 111 Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) Test input Ambient operating temperature Ambient temperature, storage UL File No. Male connector M12, 4-pin A 7 B B B D D N M B B B D D D D D D D D D D D D D D D D	Response time	< 500 μs ⁵⁾
Circuit protection A 7) B 8) D 9) Protection class III Weight 85 g Housing material Metal, Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA Tightening torque, max. Plo7 Plo8 10) Plo9K 11) Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) Test input Ambient operating temperature -25 °C +75 °C UL File No.	Switching frequency	1,000 Hz ⁶⁾
Protection class Weight Housing material Optics material Plastic, PMMA Tightening torque, max. Enclosure rating IP67 IP68 10) IP69K 11) Items supplied Electromagnetic compatibility (EMC) Test input Ambient operating temperature -25 °C +75 °C UL File No.	Connection type	Male connector M12, 4-pin
Weight85 gHousing materialMetal, Stainless steel V4A (1.4404, 316L)Optics materialPlastic, PMMATightening torque, max.90 NmEnclosure ratingIP67 IP68 10) IP69K 11)Items suppliedFastening nuts (4 x)Electromagnetic compatibility (EMC)EN 60947-5-2Test inputSender OFF at "Test" 0 VAmbient operating temperature-25 °C +55 °C 12)Ambient temperature, storage-30 °C +75 °CUL File No.E348498	Circuit protection	B ⁸⁾
Housing material Metal, Stainless steel V4A (1.4404, 316L) Optics material Plastic, PMMA 90 Nm Enclosure rating IP67 IP68 10) IP69K 11) Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Ambient operating temperature -25 °C +55 °C 12) Ambient temperature, storage UL File No. Metal, Stainless steel V4A (1.4404, 316L) Plastic, PMMA 90 Nm EP67 IP67 IP68 10) IP68 11) EN 60947 EN 60947-5-2 Test "Test" 0 V -25 °C +55 °C 12) -30 °C +75 °C E348498	Protection class	III
Optics material Plastic, PMMA 7 ightening torque, max. 90 Nm Ple67 Ple68 10) Ple68 11) Ple69K 11) Plems supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Sender OFF at "Test" 0 V Ambient operating temperature -25 °C +55 °C 12) Ambient temperature, storage UL File No. EN 848498	Weight	85 g
Tightening torque, max. Enclosure rating IP67 IP68 10) IP69K 11) Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) Test input Ambient operating temperature -25 °C +55 °C 12) Ambient temperature, storage UL File No.	Housing material	Metal, Stainless steel V4A (1.4404, 316L)
Enclosure rating IP67 IP68 10) IP69K 11) Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Ambient operating temperature -25 °C +55 °C 12) Ambient temperature, storage UL File No. IP67 IP68 10) IP69K 11) Fastening nuts (4 x) EN 60947-5-2 EN 60947-5-2 Test "Test" 0 V -25 °C +75 °C E348498	Optics material	Plastic, PMMA
IP68 ¹⁰⁾ IP69K ¹¹⁾ Items supplied Fastening nuts (4 x) Electromagnetic compatibility (EMC) EN 60947-5-2 Test input Sender OFF at "Test" 0 V Ambient operating temperature -25 °C +55 °C ¹²⁾ Ambient temperature, storage -30 °C +75 °C UL File No. E348498	Tightening torque, max.	90 Nm
Electromagnetic compatibility (EMC) EN 60947-5-2 Sender OFF at "Test" 0 V Ambient operating temperature -25 ° C +55 ° C ¹²⁾ Ambient temperature, storage UL File No. EN 60947-5-2 Sender OFF at "Test" 0 V -25 ° C +75 ° C E348498	Enclosure rating	IP68 ¹⁰⁾
Test input Sender OFF at "Test" 0 V -25 °C +55 °C ¹²⁾ Ambient temperature, storage -30 °C +75 °C UL File No. Sender OFF at "Test" 0 V -25 °C +55 °C ¹²⁾ -30 °C +75 °C	Items supplied	Fastening nuts (4 x)
Ambient operating temperature $-25 ^{\circ}\text{C} \dots +55 ^{\circ}\text{C}^{12)}$ Ambient temperature, storage $-30 ^{\circ}\text{C} \dots +75 ^{\circ}\text{C}$ UL File No. E348498	Electromagnetic compatibility (EMC)	EN 60947-5-2
Ambient temperature, storage -30 °C +75 °C UL File No. E348498	Test input	Sender OFF at "Test" 0 V
UL File No. E348498	Ambient operating temperature	-25 °C +55 °C ¹²⁾
	Ambient temperature, storage	-30 °C +75 °C
Part number of individual components 2091360 GRS18-D2421V 2091361 GRE18-P2411V	UL File No.	E348498
	Part number of individual components	2091360 GRS18-D2421V 2091361 GRE18-P2411V

 $^{^{1)}\,\}mbox{Limit}$ values. Operated in short-circuit protected network: max. 8 A.

Certificates

EU declaration of conformity	✓
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 $^{^{2)}\,\}mbox{May}$ not fall below or exceed $\mbox{U}_{\mbox{\sc V}}$ tolerances.

 $^{^{3)}}$ Q = light switching; $\bar{\rm Q}$ = dark switching.

 $^{^{4)}}$ At Uv > 24 V or ambient temperature > 49 °C, IA max. = 50 mA.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

 $^{^{7)}}$ A = V_S connections reverse-polarity protected.

 $^{^{8)}}$ B = inputs and output reverse-polarity protected.

 $^{^{9)}}$ D = outputs overcurrent and short-circuit protected.

 $^{^{10)}}$ According to EN 60529 (10 m water depth / 24 h).

 $^{^{11)}}$ According to ISO 20653:2013-03.

 $^{^{12)}}$ At U_{V} <=24V and $\text{I}_{\text{A}}\!\!<\!\!50\text{mA}.$

GRSE18-P2421V | GR18

PHOTOELECTRIC SENSORS

UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
ECOLAB certificate	✓
cULus certificate	✓
Photobiological safety (DIN EN 62471) certificate	✓

Classifications

ECLASS 5.0	27270901
ECLASS 5.1.4	27270901
ECLASS 6.0	27270901
ECLASS 6.2	27270901
ECLASS 7.0	27270901
ECLASS 8.0	27270901
ECLASS 8.1	27270901
ECLASS 9.0	27270901
ECLASS 10.0	27270901
ECLASS 11.0	27270901
ECLASS 12.0	27270901
ETIM 5.0	EC002716
ETIM 6.0	EC002716
ETIM 7.0	EC002716
ETIM 8.0	EC002716
UNSPSC 16.0901	39121528

Connection diagram Cd-072

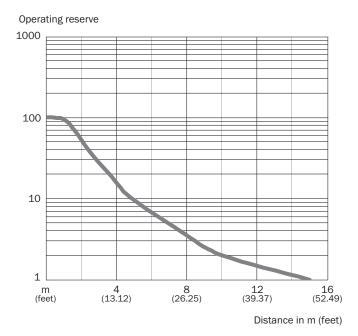
① ②
$$\frac{BN \cdot 1}{\text{MH i 2}} + (L+)$$

$$\frac{WH i 2}{\text{not connected}} \text{ not connected}$$

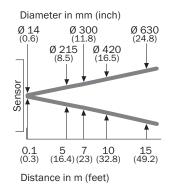
$$\frac{BU \cdot 3}{\text{I - (M)}} - (M)$$

$$\frac{BK \cdot 4}{\text{Test}} \text{ Test}$$
① sender
② receiver

Characteristic curve GRSE18S



Light spot size GRSE18, infrared light

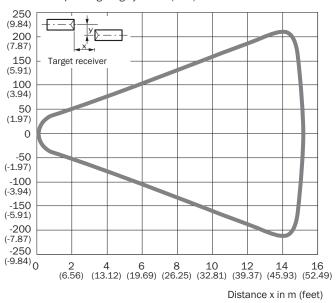


Sensing range diagram GRSE18S

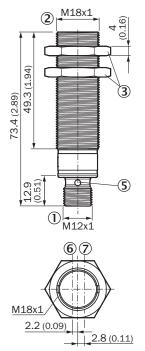


Response range GRSE18S

Parallel operating range y in mm (inch)



Dimensional drawing GR18 Inox, connector, straight



Dimensions in mm (inch)

- ① Connection
- ② Threaded mounting hole M18 x 1
- 3 fastening nuts (2 x); width across 24, stainless steel
- ⑤ LED indicator (4 x)
- 6 optical axis, receiver
- 7 optical axis, sender

Recommended accessories

Other models and accessories → www.sick.com/GR18

	Brief description	Туре	part no.		
Mounting systems					
40	Description: Mounting bracket for M18 sensors Material: Stainless steel Details: Stainless steel Items supplied: Without mounting hardware	BEF-WN-M18N	5320947		
connectors ar	connectors and cables				
	Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones	DOL-1204-G05MNI	6052615		
C	Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones, Drag chain operation	DOL-1204-G05MRN	6058476		

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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For us, that is "Sensor Intelligence."

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