

# GSE20M-24112170ZZZ

**PHOTOELECTRIC SENSORS** 







#### Ordering information

Туре	part no.
GSE20M-24112170ZZZ	1119879

Other models and accessories → www.sick.com/G20

Illustration may differ



#### Detailed technical data

#### Features

Teatures	
Functional principle	Through-beam photoelectric sensor
Sensing range	
Sensing range min.	0 m
Sensing range max.	120 m
Maximum distance range from receiver to sender (operating reserve 1)	0 m 120 m
Recommended distance range from receiver to sender (operating reserve 2)	0 m 85 m
Emitted beam	
Light source	LED
Type of light	Infrared light
Shape of light spot	Rectangular
Light spot size (distance)	Ø 800 mm (20,000 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at Ta = +23 °C)
Key LED figures	
Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
LED risk group marking	Free group
Wave length	850 nm
Average service life	100,000 h at T <sub>a</sub> = +25 °C
Adjustment	
Potentiometer	For sensitivity adjustment, 270°
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

## Safety-related parameters

MTTF <sub>D</sub>	548 years
DC <sub>avg</sub>	0%

#### Electronics

Supply voltage Ua       10 ∨ DC 30 ∨ DC ¹¹         Ripple       5 V Np         Current consumption       ≤ 30 mA, without load. At Ua = 24 ∨         Protection class       III         Number 2 (Complementary)         Type       2 (Complementary)         Type       Push-puli: PNP/NPN         Switching mode       Light/dark switching         Signal voltage PNP HIGH/LOW       Vs - (s 3 V) / approx. 0 V         Signal voltage NPN HIGH/LOW       Ys - (s 3 V) / approx. 0 V         Output current I <sub>max</sub> 4 100 mA ²¹         Reverse polarity protected       Overcurrent protected         Switching frequency       2 500 µs         Switching frequency       1,000 Hz ³¹         Pin/Wire assignment, sender       BN 1       + (L+)         BN 1       + (L+)         WH 2       0       No         BN 1       + (L+)         Wire assignment, receiver       BN 1       + (L+)         BN 1       + (L+)         W1 2       Objetal output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched         Pin/Wire assignment, receiver       BU 3       + (M)         BU 3       + (M)       - (M)         BU 3       +		
Usage category  Current consumption  Protection class  Digital output  Number Type Puspult: PNP/NPN  Switching mode Signal voltage PNP HIGH/LOW Current I <sub>max</sub> Circuit protection outputs Response time Switching frequency Plin/Wire assignment, sender  BN 1 BY 4	Supply voltage U <sub>B</sub>	10 V DC 30 V DC <sup>1)</sup>
Current consumption     s 30 mA, without load. At UB = 24 V       Protection class     III       Digital output     (Complementary)       Type     Push-pull: PNP/NPN       Switching mode     Upftydark switching       Signal voltage NPN HIGH/LOW     Vs - (3 3 V) / approx. 0 V       Signal voltage NPN HIGH/LOW     vs - (3 3 V) / approx. 0 V       Output current I <sub>max</sub> s 100 mA <sup>20</sup> Circuit protection outputs     Reverse polarity protected       Overcurrent protected     Overcurrent protected       Switching frequency     1,000 Hz <sup>3)</sup> Pin/Wire assignment, sender     BN 1     + (L+)       WH 2     -       BN 3     - (M)       BN 4     Test > M       Input, sender off, LOW active       Pin/Wire assignment, receiver     BN 1     + (L+)       WH 2     Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched       BU 3     - (M)       Oligital output, light switching, object present → output Q LOW	Ripple	< 5 V <sub>pp</sub>
Protection class  Digital output  Number Type Push-pull: PNP/NPN  Switching mode Signal voltage PNP HiGH/LOW Output current l <sub>max</sub> 100 mA <sup>2)</sup> Circuit protection outputs Response time Switching frequency Switching frequency Switching frequency Switching frequency Switching frequency Flin/Wire assignment, sender  BN 1 H (L+) WH 2 BU 3 I (M) BK 4 Test.> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 H (L+) WH 2 Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched Output, sender oft, coupput, output, output of Light witching, object present → output Q LOW Digital output, light switching, object present → output Q LOW	Usage category	DC-13 (according to EN 60947-1)
Number Type Switching mode Signal voltage PNP HIGH/LOW Output current I <sub>max</sub> Circuit protection outputs Response time Switching frequency  1,000 Hz Signal voltage NPN HIGH/LOW Output current I <sub>max</sub> Circuit protection outputs Response time Switching frequency Switching frequency Ambure assignment, sender  Pin/Wire assignment, receiver  BN 1 H(L+)  BU 3 H(L+)  BU 3 - (M)  BK 4 Test-> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 H(L+)  BN 1 H(L+)  BN 1 Fet-> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 H(L+)  BN 2 Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched Digital output, light switching, object present → output Q LOW	Current consumption	$\leq$ 30 mA, without load. At U <sub>B</sub> = 24 V
Number Type Switching mode Signal voltage PNP HIGH/LOW Signal voltage NPN HIGH/LOW Output current I <sub>max</sub> . Circuit protection outputs Response time Switching frequency 1,000 Hz ³)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 ∇ Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Protection class	III
Type Push-pull: PNP/NPN  Switching mode Light/dark switching  Signal voltage PNP HIGH/LOW Vs - (≤ 3 V) / approx. 0 V  Signal voltage NPN HIGH/LOW Output current I <sub>max.</sub> Circuit protection outputs  Reverse polarity protected Overcurrent protected Short-circuit protecte	Digital output	
Switching mode Signal voltage PNP HIGH/LOW Signal voltage NPN HIGH/LOW Output current I <sub>max.</sub> Circuit protection outputs Response time Switching frequency PIn/Wire assignment, sender  BN 1 H(L+) WH 2 BN 3 -(M) BK 4 Digital output, dark switching. object present → output Q LOW BK 4 Output current I <sub>max.</sub> Light/dark switching Vs - (≤ 3 V) / approx. 0 V Vs - (≤ 100 mA 2) Vs - (S - (5 S V) / approx. 0 V Vs - (5 S V) / approx	Number	2 (Complementary)
Signal voltage PNP HIGH/LOW Signal voltage NPN HIGH/LOW V <sub>S</sub> -(≤ 3 V) / approx. 0 V  Output current I <sub>max</sub> Circuit protection outputs Reverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Switching frequency Switching frequency Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Туре	Push-pull: PNP/NPN
Signal voltage NPN HIGH/LOW  Output current I <sub>max</sub> ≤ 100 mA <sup>2)</sup> Reverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Short-circuit protected Short-circuit protected Switching frequency 1,000 Hz <sup>3)</sup> Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Switching mode	Light/dark switching
Output current I <sub>max.</sub> Circuit protection outputs Reverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Short-circuit protected Short-circuit protected  Response time Switching frequency 1,000 Hz ³)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 -(M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 O Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 -(M) BK 4 Q Digital output, light switching, object present → output Q LOW	Signal voltage PNP HIGH/LOW	$V_S$ - ( $\leq 3 V$ ) / approx. $0 V$
Circuit protection outputs Reverse polarity protected Overcurrent protected Short-circuit protected  Short-circuit protected  ≤ 500 μs  Switching frequency 1,000 Hz ³)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Ö Digital output, dark switching, object present → output ♥ HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) Digital output, light switching, object present → output ♥ LOW	Signal voltage NPN HIGH/LOW	$V_S$ - ( $\leq 3 V$ ) / approx. $0 V$
Overcurrent protected Short-circuit protected  Response time Switching frequency 1,000 Hz ³)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Output current I <sub>max.</sub>	$\leq$ 100 mA $^{2)}$
Response time Switching frequency Switching frequency 1,000 Hz ³)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Circuit protection outputs	Reverse polarity protected
Response time Switching frequency 1,000 Hz 3)  Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 -(M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 -(M) BK 4 Q Digital output, light switching, object present → output Q LOW		Overcurrent protected
Pin/Wire assignment, sender  BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW		Short-circuit protected
Pin/Wire assignment, sender  BN 1 + (L+)  WH 2 -  BU 3 - (M)  BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+)  WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M)  BK 4 Q Digital output, light switching, object present → output Q LOW	Response time	≤ 500 µs
BN 1 + (L+) WH 2 - BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Switching frequency	1,000 Hz <sup>3)</sup>
WH 2 BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	Pin/Wire assignment, sender	
BU 3 - (M) BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M) BK 4 Q Digital output, light switching, object present → output Q LOW	BN 1	+ (L+)
BK 4 Test -> M Input, sender off, LOW active  Pin/Wire assignment, receiver  BN 1 + (L+)  WH 2 Q  Digital output, dark switching, object present → output Q  HIGH  The pin 2 function of the sensor can be switched  BU 3 -(M)  BK 4 Q  Digital output, light switching, object present → output Q LOW		
Pin/Wire assignment, receiver  BN 1 + (L+) WH 2 Q Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 -(M) BK 4 Q Digital output, light switching, object present → output Q LOW	BU 3	- (M)
BN 1 + (L+)  WH 2 Q  Digital output, dark switching, object present → output Q  HIGH  The pin 2 function of the sensor can be switched  BU 3 - (M)  BK 4 Q  Digital output, light switching, object present → output Q LOW	BK 4	
WH 2	Pin/Wire assignment, receiver	
Digital output, dark switching, object present → output Q HIGH The pin 2 function of the sensor can be switched  BU 3 - (M)  BK 4 Q Digital output, light switching, object present → output Q LOW	BN 1	+ (L+)
BK 4 Q Digital output, light switching, object present → output Q LOW	WH 2	Digital output, dark switching, object present $\rightarrow$ output $\bar{Q}$ HIGH
Digital output, light switching, object present → output Q LOW	BU 3	- (M)
	BK 4	Digital output, light switching, object present → output Q LOW

#### Mechanics

Housing	Rectangular
Dimensions (W x H x D)	23.5 mm x 74.5 mm x 52.5 mm
Connection	Male connector M12, 4-pin

 $<sup>^{1)}</sup>$  Limit values.  $^{2)}$  At U  $_{\rm B}$  > 24 V, I max. = 100 mA.

<sup>3)</sup> With light/dark ratio 1:1.

# **GSE20M-24112170ZZZ | G20**

PHOTOELECTRIC SENSORS

Material	
Н	ousing Plastic, ABS
Front	screen Plastic, PMMA
Weight	Approx. 105 g

#### Ambient data

Enclosure rating	IP67 (EN 60529)
Ambient operating temperature	-30 °C +60 °C
Ambient temperature, storage	-40 °C +70 °C
Typ. Ambient light immunity	Sunlight: ≤ 20,000 lx
Shock resistance	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
Vibration resistance	10 Hz 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
Air humidity	35 % 95 %, relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
UL File No.	NRKH.E348498 & NRKH7.E348498

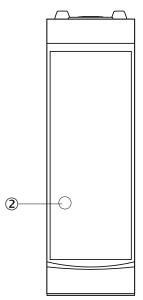
#### Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓
Photobiological safety (IEC EN 62471)	✓

#### Classifications

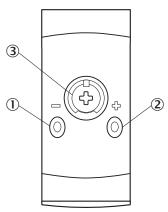
ECLASS 5.0	27270901
ECLASS 5.1.4	27270901
ECLASS 6.0	27270901
ECLASS 6.2	27270901
ECLASS 7.0	27270901
ECLASS 8.0	27270901
ECLASS 8.1	27270901
ECLASS 9.0	27270901
ECLASS 10.0	27270901
ECLASS 11.0	27270901
ECLASS 12.0	27270901
ETIM 5.0	EC002716
ETIM 6.0	EC002716
ETIM 7.0	EC002716
ETIM 8.0	EC002716
UNSPSC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

## display and adjustment elements



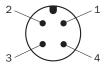
② LED yellow

## display and adjustment elements



- 1 LED green 2 LED yellow
- 3 Potentiometer

## Connection type M12 male connector, 4-pin



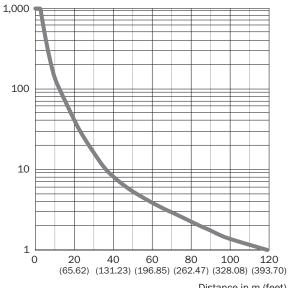
#### Connection diagram Cd-072

1	2
± + (L+)	BN 1 + (L+)
$\frac{\text{WH}}{2}$ not connected	$\rightarrow WHI \frac{2}{Q} \overline{Q}$
BU! 3 - (M)	BU 3 - (M)
→ BK 4 Test	$\rightarrow$ BK $\frac{4}{}$ Q
① sender	

2 receiver

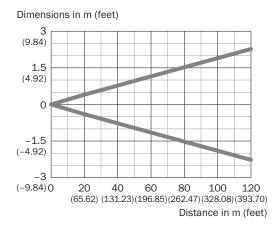
#### Characteristic curve

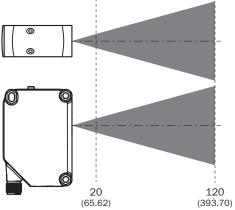
#### Operating reserve



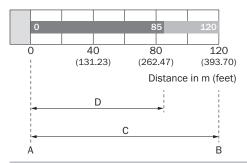
Distance in m (feet)

## Light spot size



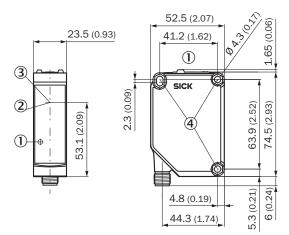


#### Sensing range diagram



A	Sensing range min. in mm	
В	Sensing range max. in mm	
С	Maximum distance range from receiver to sender	
D	Recommended distance range from receiver to sender	

#### Dimensional drawing



Dimensions in mm (inch)

- ① display and adjustment elements
- ② Center of optical axis, sender
- 3 Center of optical axis, receiver
- 4 Fixing hole ø 4.3 mm, both sides for hexagon nut M4

#### Recommended accessories

Other models and accessories → www.sick.com/G20

	Brief description	Туре	part no.
Mounting syst	tems		
	<ul> <li>Description: Mounting bracket</li> <li>Material: Stainless steel</li> <li>Details: Stainless steel V2A (1.4301)</li> <li>Items supplied: 2 screws, 2 nuts, 2 circlips, 2 washers for mounting the sensor</li> <li>Suitable for: W280-2, G20</li> </ul>	BEF-W280	5313885
connectors ar	nd cables		
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, A-coded</li> <li>Description: Unshielded</li> <li>Connection systems: Screw-type terminals</li> <li>Permitted cross-section: ≤ 0.75 mm²</li> </ul>	STE-1204-G	6009932
No.	<ul> <li>Connection type head A: Female connector, M12, 4-pin, straight, A-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>	YF2A14-050UB3XLEAX	2095608
No.	<ul> <li>Connection type head A: Female connector, M12, 4-pin, straight, A-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with chemicals, Uncontaminated zones</li> </ul>	YF2A14-050VB3XLEAX	2096235

## 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.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is "Sensor Intelligence."

## **WORLDWIDE PRESENCE:**

Contacts and other locations -www.sick.com

