

## GSE20M-24112170ZZZ G20



COMPACT PHOTOELECTRIC SENSORS

## GSE20M-24112170ZZZ | G20

COMPACT PHOTOELECTRIC SENSORS



Illustration may differ

#### Ordering information

Туре	Part no.
GSE20M-24112170ZZZ	1119879

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



#### Detailed technical data

#### Features

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°
Indication	
LED green	Operating indicator Static on: power on Static off: object present
LED yellow	Status of received light beam Static on: object not present Static off: object present

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#### Safety-related parameters

MTF₀         548 years           DCove         0%           Electrical data         0 ∨ DC30 ∨ DC. <sup>1</sup> )           Eucrical data         0 ∨ DC30 ∨ DC. <sup>1</sup> )           Supply voltage Us         0 ∨ DC30 ∨ DC. <sup>1</sup> )           Rippe         0 ∨ DC30 ∨ DC. <sup>1</sup> )           Usage category         DC.13 (according to EN 60947.1)           Current consumption         ≤ 30 mA, without load. At Ug = 24 ∨           Protection class         II           Digital output         2 (Complementary)           Number         2 (Complementary)           System         2 (Somplementary)		
Electrical data           Electrical data           Supply voltage Ue         10 V DC 30 V DC <sup>-1</sup> Riple         < 5 V <sub>po</sub> Usage category         DC-13 (according to EN 60947-1)           Current consumption         < 30 mA, without load. At U <sub>g</sub> = 24 V           Protection class         III           Digital output            Voltage VPN PHIGHLOW         2 (Complementary)           Signal voltage NPN HIGHLOW         Vs (< 3 V) / approx. 0 V           Signal voltage NPN HIGHLOW         Vs (< 3 V) / approx. 0 V           Output current I <sub>max</sub> 2 100 mA <sup>-21</sup> Reverse polarity protected Output current I <sub>max</sub> 2 500 µs           Signal voltage NPN HIGHLOW         Solor Jaccurrent protected Short-circuit protected Short-cir	MTTF <sub>D</sub>	548 years
Supply voltage Us10 VDC30 VDC. <sup>1)</sup> Ripple< 5 Vpp	DC <sub>avg</sub>	0%
Ripple         < 5 V <sub>pp</sub> Usage category         DC-13 (according to EN 60947-1)           Current consumption         < 30 mA, without load. At U <sub>B</sub> = 24 V           Protection class         III           Digital output         2 (Complementary)           Protection class         Light/dark switching           Signal voltage PNP HIGH/L00         Vs - (< 3 V) / approx. 0 V           Signal voltage NPN HIGH/L00         Vs - (< 3 V) / approx. 0 V           Output current Imax         ≤ 100 mA <sup>2</sup> Circuit protection output         Reverse polarity protected Overcurrent protected Overcurrent protected Overcurrent protected Switching frequere)           Switching frequere)         1,000 Hz <sup>-3</sup> Pin/Wire assignment, sender         < 100 mA <sup>2</sup> BN 1         + (L+)           Wire assignment, sender            BN 2         -           BN 3         + (L+)           Wire assignment, sender         -           BN 4         -           BN 3         -           BN 4         -           BN 4         -           BN 5         -           BN 6         -           BN 7         -           BN 8         -	Electrical data	
Usage categoryDC-3 (according to EN 60947-1)Current consumption≤ 30 mA, without load. At Ug = 24 VProtection classIIDigital outputIIDigital output(Complementary)Switching2 (Complementary)Switching membraneLight/dark switchingSignal voltage NPN HIGH/L00Vs - (≤ 3 V) / approx. 0 VOutput current ImageEverse polarity protected Short-circuit protec	Supply voltage U <sub>B</sub>	10 V DC 30 V DC <sup>1)</sup>
Current consumption       ≤ 30 mA, without load. At Ug = 24 V         Protection class       II         Digital output       Complementary)         Signal voltage PNP HIGH/LOW       2 (Complementary)         Signal voltage PNP HIGH/LOW       Vs - (≤ 3 V) / approx. 0 V         Signal voltage NPN HIGH/LOW       Vs - (≤ 3 V) / approx. 0 V         Output current Image       ≤ 100 mA <sup>2</sup> )         Circuit protection output       Reverse polarity protected Overcurrent protected Short-circuit	Ripple	< 5 V <sub>pp</sub>
Protection classIIIDigital outputComplementary)Number2 (Complementary)Yush-pull: PNP/NPNVash-pull: PNP/NPNSignal voltage PNP HIGH/D00Vas (S 3 V) approx. 0 VSignal voltage NPN HIGH/D00Vas (S 3 V) approx. 0 VOutput current Ima4 100 mA 20Circuit protection outputReverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Short-circuit protected Der Short - Short APIn/Wire assignment, sender+ (+)BN 1+ (+)BN 2-BU 3-BU 4-BU 5-BU 6-BU 7-BU 7-	Usage category	DC-13 (according to EN 60947-1)
Digital outputComplementaryNumber2 (Complementary)Type9ush-pull: PNP/NPNSwitching modLight/dark switchingSignal voltage PNP HIGH/L00Vs ( S 3 V ) / approx. 0 VSignal voltage NPN HIGH/L00Vs - ( S 3 V ) / approx. 0 VOutput current Imma4 100 mA <sup>2</sup> )Circuit protection outputReverse polarity protected Short-circuit prote	Current consumption	$\leq$ 30 mA, without load. At U_B = 24 V
Number2(Complementary)UpPish-pull: PNP/NPNSwitching modeIght/dark switchingSignal voltage PNP HIGH/L000Vs - (s 3 √) / approx. 0 VSignal voltage NNP HIGH/L000Signal voltage NNP HIGH/L000Output current mage- (a) Oun A <sup>2</sup> Circuit protection output- So OupsSwitching frequore- (a) Oun J <sup>2</sup> Pin/Wire assignment, sender- (b) UpBN 1- (L+)AU 2- (b) UpBN 1- (L+)AU 2- (b) UpBN 1- (b) UpBN 2- (b) UpBN 3- (b) UpBN 4- (b) UpBN 5- (b) UpBN 6- (b) UpBN 7- (b) UpBN 8- (b) UpBN 9- (b) Up<	Protection class	III
Figh       Push-pull: PNP/NPN         Switching       Ligh/dark switching         Signal voltage PNP HIGH/L000       Vs - (≤ 3 V) / approx. 0 V         Signal voltage NPN HIGH/L000       Vs - (≤ 3 V) / approx. 0 V         Output current Imm       ≤ 100 mA <sup>2</sup> )         Circuit protection output       Reverse polarity protected overcurrent protected Short-circuit protected Short-circuit protected         Switching frequeence       ≤ 500 µs         Switching frequeence       1,000 Hz <sup>3</sup> )         Pin/Wire assignment, sender       -         BN 1       + (L+)         MH 2       -         BU 3       -         BU 4       -         BU 5       -         BU 5       -         BU 5       -         BU 6       -         BU 7       -         BU 8       -         BU 9       -     <	Digital output	
Switching modeLight/dark switchingSignal voltage PNP HIGH/L00V5 - (< 3 V) / approx. 0 VSignal voltage NPN HIGH/L00< 300 mA <sup>2</sup> )Output current Imax< 100 mA <sup>2</sup> )Circuit protection outputSeverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Short-circuit protectedSwitching frequere< 500 µSSwitching frequere1,000 Hz <sup>3</sup> )PIn/Wire assignment, senderBN 1< (L+)MH 2BN 3Switching FieldBN 4Switching FieldBN 5Switching FieldSwitching FieldBN 4Switching FieldBN 5Switching FieldSwitching Field <th>Number</th> <th>2 (Complementary)</th>	Number	2 (Complementary)
Signal voltage PNP HIGH/LOW       Vs - (≤ 3 V) / approx. 0 V         Signal voltage NPN HIGH/LOW       Vs - (≤ 3 V) / approx. 0 V         Output current Imax       ≤ 100 mA <sup>2</sup> )         Circuit protection outputs       Reverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected Short-circuit protected         Switching frequency       ≤ 500 µs         Switching frequency       1,000 Hz <sup>3</sup> )         Pin/Wire assignment, sender       =         BN 1       + (L+)         WH 2       -         BU 3       -(M)         BU 3       -(M)         BU 4       Fest -> M         Input, sender off, LOW active       Fest -> M         Pin/Wire assignment, receiver       Event off, LOW active	Туре	Push-pull: PNP/NPN
Signal voltage NPN HIGH/LOBVs - (< 3 V) / approx. 0 V	Switching mode	Light/dark switching
Output current Inax       ≤ 100 mA <sup>2</sup> Circuit protection output       Reverse polarity protected Overcurrent protected Short-circuit protected Short-circuit protected         Response time       ≤ 500 μs         Switching frequee       1,000 Hz <sup>-3</sup> Pin/Wire assignment, sender       × (L+)         BN 1       + (L+)         BN 2       -         BN 3       -         BN 4       -         BN 5       -         BN 6       -         BN 7       -         BN 8       -         BN 9       -         BN 9 <th>Signal voltage PNP HIGH/LOW</th> <th><math>V_{S} - (\leq 3 V) / approx. 0 V</math></th>	Signal voltage PNP HIGH/LOW	$V_{S} - (\leq 3 V) / approx. 0 V$
Circuit protection outputsReverse polarity protected overcurrent protected overcurrent protected short-circuit protected bort-circuit protecte	Signal voltage NPN HIGH/LOW	$V_{S} - (\leq 3 V) / approx. 0 V$
Vercurrent protected         Short-circuit protected         Response time       \$ 500 µs         Switching frequency       1,000 Hz <sup>3</sup> )         Pin/Wire assignment, sender       + (L+)         NH 2       -         BN 1       + (L+)         NH 2       -         BU 3       -         BU 4       -         BU 5       -         BU 4       -         BU 5       -         BU 6       -         BU 7       -         BU 8       -         BU 9       - <th>Output current I<sub>max.</sub></th> <th><math>\leq</math> 100 mA <sup>2)</sup></th>	Output current I <sub>max.</sub>	$\leq$ 100 mA <sup>2)</sup>
Switching frequence     a,000 Hz <sup>3</sup> Pin/Wire assignment, sender     F       SN 1     + (L+)       WH 2     -       BN 3     - (M)       BN 4     - Start -	Circuit protection outputs	Overcurrent protected
Pin/Wire assignment, sender         BN 1         + (L+)           MH 2         -         -           BU 3         - (M)         -           BK 4         Test -> M         -> M           Input, sender off, LOW active         -> M         -> M	Response time	≤ 500 µs
BN 1       + (L+)         WH 2       -         BU 3       - (M)         BK 4       Test -> M         Input, sender off, LOW active	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, sender	
BU 3     - (M)       BK 4     Test -> M       Input, sender off, LOW active	BN 1	+ (L+)
BK 4     Test -> M Input, sender off, LOW active	WH 2	-
Pin/Wire assignment, receiver     Input, sender off, LOW active	BU 3	- (M)
	ВК 4	
BN 1 + (L+)	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	WH 2	Digital output, dark switching, object present $ ightarrow$ output $ar{Q}$ HIGH
BU 3 - (M)	BU 3	- (M)
BK 4 Q Digital output, light switching, object present → output Q LOW The pin 4 function of the sensor can be switched	ВК 4	Digital output, light switching, object present $\rightarrow$ output Q LOW

<sup>1)</sup> Limit values.

<sup>2)</sup> At  $U_B > 24$  V, I max. = 100 mA.

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

#### Mechanical data

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
Material	

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Housing	Plastic, ABS
Front screen	
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

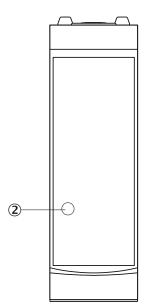
Classifications

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

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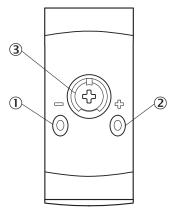
#### Adjustments

Display and adjustment elements



② LED yellow

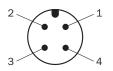
Display and adjustment elements



- LED green
   LED yellow
- ③ Potentiometer

#### Connection type

M12 male connector, 4-pin

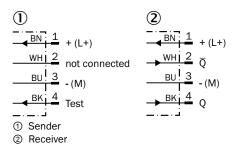


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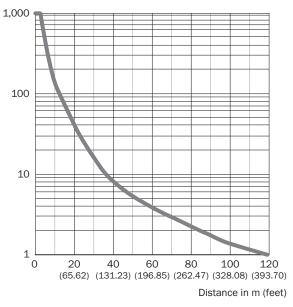
#### **Connection diagram**

Cd-072

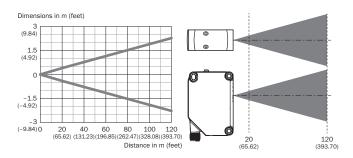


#### Characteristic curve

Operating reserve

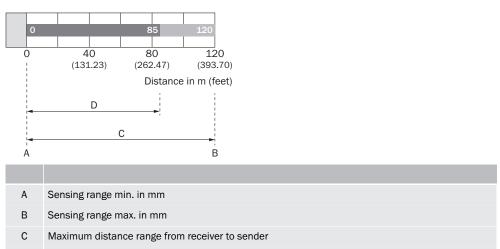


#### Light spot size



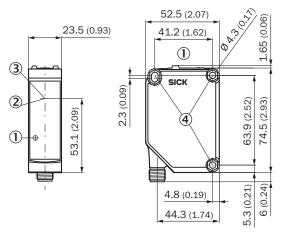
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#### Sensing range diagram



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 brac	ckets and plates		
	Mounting bracket, Stainless steel V2A (1.4301), 2 screws, 2 nuts, 2 circlips, 2 washers for mounting the sensor	BEF-W280	5313885

## 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:

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Online data sheet

