



WIRE DRAW ENCODERS



#### **Ordering information**

Туре	Part no.
BCG13-I1BM0599	1061037

#### Included in delivery: AFM60A-S1IB018x12 (1), MRA-G130-105D3 (1)

Product is supplied fully assembled. See individual components for further technical data

Other models and accessories -> www.sick.com/EcoLine

# CE

#### Detailed technical data

#### Performance

Measurement range	0 m 5 m
Encoder	Absolute encoders
Resolution (wire draw + encoder)	0.001 mm <sup>1) 2)</sup>
Repeatability	≤ 0.2 mm <sup>3)</sup>
Linearity	$\leq \pm 2 \text{ mm}^{3)}$
Hysteresis	≤ 0.4 mm <sup>3)</sup>

<sup>1)</sup> The values shown have been rounded.

<sup>2)</sup> Example calculation based on the BCG08 with PROFINET: 230 mm (wire draw length per revolution - see Mechanical data): 262,144 (number of steps per revolution) = 0.001 mm (resolution of wire draw + encoder combination).

<sup>3)</sup> Value applies to wire draw mechanism.

#### Interfaces

Communication interface	EtherNet/IP <sup>TM</sup>
Programmable/configurable	1
Electrical data	
Connection type	Male connector, Female connector, 1x, 2x, M12, M12, 4-pin, 4-pin, axial, axial
Supply voltage	10 V DC 30 V DC
Power consumption	≤ 3 W (without load)
MTTFd: mean time to dangerous failure	80 years (EN ISO 13849-1) <sup>1)</sup>

<sup>1)</sup> This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

#### Mechanical data

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 $^{(1)}$  These values were measred at an ambient temperature of 25 °C. There may be variations at other temperatures.

 $^{\mbox{2})}$  Average values, which depend on the application.

<sup>3)</sup> The service life depends on the type of load. This is influenced by environmental conditions, the installation location, the measuring range in use, the traversing speed, and acceleration.

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Measuring wire material	Highly flexible stranded steel 1,4401 stainless steel V4A
Measuring wire diameter	0.55 mm
Weight (measuring wire)	1.2 g/m
Housing material, wire draw mechanism	Plastic, Noryl
Spring return force	4.5 N 7 N <sup>1)</sup>
Length of wire pulled out per revolution	385 mm
Life of wire draw mechanism	Typ. 1,000,000 cycles <sup>2) 3)</sup>
Actual wire draw length	5.2 m
Wire acceleration	4 m/s <sup>2</sup>
Operating speed	3 m/s
Mounted encoder	AFM60 EtherNet/IP, AFM60A-S1IB018x12, 1055331
Mounted mechanic	MRA-G130-105D3, 5322779

 $^{(1)}$  These values were measred at an ambient temperature of 25  $\,^{\circ}\text{C}.$  There may be variations at other temperatures.

 $^{2)}\ensuremath{\,\text{Average}}\xspace$  values, which depend on the application.

<sup>3)</sup> The service life depends on the type of load. This is influenced by environmental conditions, the installation location, the measuring range in use, the traversing speed, and acceleration.

#### Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 1)
Enclosure rating	IP50, mounted mechanic IP67, Encoder (IEC 60529) <sup>2)</sup>
Operating temperature range	-30 °C +70 °C

 $^{1)}$  EMC according to the standards quoted is achieved if shielded cables are used.

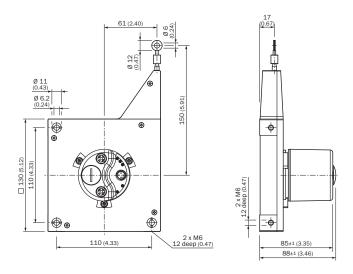
<sup>2)</sup> For devices with male connector: with mounted mating connector.

#### Classifications

ECLASS 5.0	27270590
ECLASS 5.1.4	27270590
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270590
ECLASS 8.0	27270590
ECLASS 8.1	27270590
ECLASS 9.0	27270590
ECLASS 10.0	27270613
ECLASS 11.0	27270503
ECLASS 12.0	27270503
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

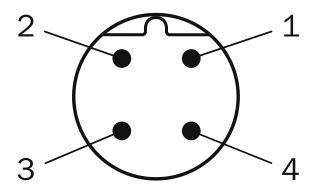
WIRE DRAW ENCODERS

#### Dimensional drawing (Dimensions in mm (inch))



#### **PIN** assignment

Male connector



#### Supply voltage

PIN	Signal
1	10 V 30 V
2	Not assigned
3	GND
4	Not assigned

Female connector

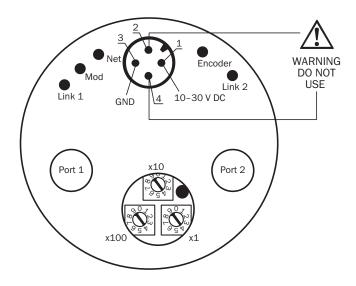


Port 1, Port 2		
PIN	Signal	
1	T x D+	

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PIN	Signal
2	R x D+
3	T x D-
4	R x D-

### Connection diagram



#### **Recommended accessories**

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

	Brief description	Туре	Part no.
Flanges			
	Flange adapter for EcoLine wire draw mechanisms, adaption of face mount flange with centering hub 20 mm to 50 mm servo flange, Aluminum, including 3 countersunk screws M3 x 10 $$	BEF-FA-020-050-007	2073774
Plug connecto	rs and cables		
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 2 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded straight to open end</li> </ul>	STL-1204-G02ME90	6045284
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 5 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded straight to open end</li> </ul>	STL-1204-G05ME90	6045285
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 10 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded straight to open end</li> </ul>	STL-1204-G10ME90	6045286

	Brief description	Туре	Part no.
G	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 2 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded angled to open end</li> </ul>	STL-1204-W02ME90	6047912
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 10 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded angled to open end</li> </ul>	STL-1204-W10ME90	6047914
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet</li> <li>Cable: 25 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, M12 male connector D-coded angled to open end</li> </ul>	STL-1204-W25ME90	6047915
<b>N</b> O	<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: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A14- 020UB3XLEAX	2095607
	<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: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A14- 050UB3XLEAX	2095608
	<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: 10 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A14- 100UB3XLEAX	2095609
	<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: 25 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A14- 250UB3XLEAX	2095615
>	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled, A-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG2A14- 020UB3XLEAX	2095766
	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled, 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: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG2A14- 050UB3XLEAX	2095767
	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled, A-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 10 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG2A14- 100UB3XLEAX	2095768

	Brief description	Туре	Part no.
	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled, A-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 25 m, 4-wire, PUR, halogen-free</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Application: Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG2A14- 250UB3XLEAX	2095771
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 5 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24- 050PN1XLEAX	2106175
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, M12, 4-pin, straight, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: 5 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, 5 m cable, M12 male connector straight to M12 male connector straight</li> </ul>	SSL-1204-G05ME90	6045277
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, M12, 4-pin, straight, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: 10 m, 4-wire, CAT5, CAT5e, PUR, halogen-free</li> <li>Description: Ethernet, shielded, 10 m cable, M12 male connector straight to M12 male connector straight</li> </ul>	SSI-1204-G10ME90	6045279
<i>d</i>	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, M12, 4-pin, straight, D-coded</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2D24- 020PN1M2D24	2106159
\$ \$	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2D24- 020PN1MRJA4	2106182
1000	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, RJ45, 8-pin, straight</li> <li>Signal type: Ethernet</li> <li>Cable: 5 m, 4-wire, AWG26, PUR, halogen-free</li> <li>Description: Ethernet, twisted pair, shielded</li> </ul>	YM2D24- 050EA1MRJA4	6034415
9	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 5 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2D24- 050PN1MRJA4	2106184
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 10 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2D24- 100PN1MRJA4	2106185
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24- 020PN1MRJA4	2106162

	Brief description	Туре	Part no.
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Male connector, M12, 4-pin, angled, D-coded</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 2 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24- 020PN1N2D24	2106168
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 5 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24- 050PN1MRJA4	2106163
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Connection type head B: Male connector, RJ45, 4-pin, straight</li> <li>Signal type: Ethernet, PROFINET</li> <li>Cable: 10 m, 4-wire, PUR, halogen-free</li> <li>Description: Ethernet, PROFINET, shielded</li> <li>Application: Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24- 100PN1MRJA4	2106164
(16)	<ul> <li>Connection type head A: Female connector, M12, 4-pin, straight, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: CAT5, CAT5e</li> <li>Description: Ethernet, shielded, Head A: female connector, M12, 4-pin, straight, D-coded, shielded, for cable diameter 4 mm 8 mm Head B: -</li> <li>Connection systems: IDC quick connection</li> <li>Permitted cross-section: 0.14 mm<sup>2</sup> 0.34 mm<sup>2</sup></li> </ul>	D0S-1204-GE	6048153
A.	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled</li> <li>Description: Unshielded, Head A: female connector, M12, 4-pin, angled, unshielded, for power supply, for cable diameter 3 mm 6.5 mm Head B: -</li> <li>Connection systems: Screw-type terminals</li> <li>Permitted cross-section: ≤ 0.75 mm<sup>2</sup></li> </ul>	DOS-1204-W	6007303
	<ul> <li>Connection type head A: Female connector, M12, 4-pin, angled, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: CAT5, CAT5e</li> <li>Description: Ethernet, shielded, Head A: female connector, M12, 4-pin, angled, D-coded, shielded, for cable diameter 4 mm 8 mm Head B: -</li> <li>Connection systems: IDC quick connection</li> <li>Permitted cross-section: 0.14 mm<sup>2</sup> 0.34 mm<sup>2</sup></li> </ul>	DOS-1204-WE	6048154
	<ul> <li>Connection type head A: Male connector, RJ45, 8-pin, straight</li> <li>Signal type: EtherNet/IP<sup>™</sup></li> <li>Cable: CAT5, CAT5e</li> <li>Description: EtherNet/IP<sup>™</sup>, shielded, Head A: male connector, RJ45, 8-pin, straight, shielded, EtherNet/IP, for cable diameter 4.5 mm 8 mm Head B: -</li> <li>Connection systems: IDC quick connection</li> <li>Permitted cross-section: 0.13 mm<sup>2</sup> 0.23 mm<sup>2</sup></li> </ul>	STE-0J08-GE	6048150
CC.	<ul> <li>Connection type head A: Male connector, M12, 4-pin, straight, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: CAT5, CAT5e</li> <li>Description: Ethernet, shielded, Head A: male connector, M12, 4-pin, straight, D coded, shielded, for cable diameter 4 mm 8 mm Head B: -</li> <li>Connection systems: IDC quick connection</li> <li>Permitted cross-section: 0.14 mm<sup>2</sup> 0.34 mm<sup>2</sup></li> </ul>	STE-1204-GE01	6048151
	<ul> <li>Connection type head A: Male connector, M12, 4-pin, angled, D-coded</li> <li>Signal type: Ethernet</li> <li>Cable: CAT5, CAT5e</li> <li>Description: Ethernet, shielded, Head A: male connector, M12, 4-pin, angled, D coded, shielded, for cable diameter 4 mm 8 mm Head B: -</li> <li>Connection systems: IDC quick connection</li> <li>Permitted cross-section: 0.14 mm<sup>2</sup> 0.34 mm<sup>2</sup></li> </ul>	STE-1204-WE	6048152

	Brief description	Туре	Part no.
00 🗊	<ul> <li>Connection type head A: Female connector, M12, 4-pin, D-coded</li> <li>Connection type head B: Female connector, RJ45, 8-pin</li> <li>Signal type: Ethernet</li> <li>Cable: CAT5, CAT5e</li> <li>Description: Ethernet, shielded</li> <li>Note: Cabinet through</li> </ul>	Feedthrough fe- male connector Ethernet RJ45	6048180

# 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.

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Online data sheet

