



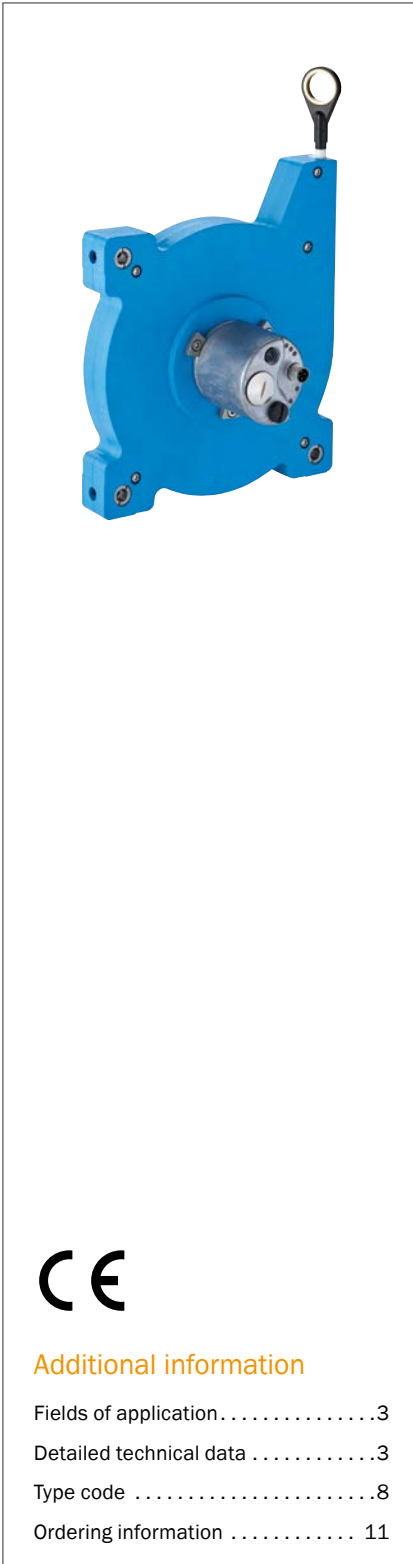
# EcoLine

MODULAR WIRE DRAW ENCODER IN MINIATURE DESIGN

Wire draw encoders

**SICK**  
Sensor Intelligence.

# MODULAR WIRE DRAW ENCODER IN MINIATURE DESIGN



## Additional information

Fields of application . . . . .	3
Detailed technical data . . . . .	3
Type code . . . . .	8
Ordering information . . . . .	11

## Product description

The slim design of the EcoLine family is ideal for applications with limited space. Its modularity makes it suitable for a large selection of measuring lengths, interfaces and encoders. Due to the into the drum integrated spring as well as the

adaption without coupling, it is possible to achieve high precision and stability. The special nozzle serves to protect the measuring wire from damage caused by vibration. The intuitive teach-in function provided in analog options also enables easy system integration.

## At a glance

- Measured lengths: 1.25 m ... 10 m
- Modular measuring system with a wide selection of interfaces/measuring lengths
- Very small, slim housing (55 mm ... 190 mm) with spring integrated in the measurement drum
- Light yet shock-proof and temperature-resistant plastic housing
- Analog interface with teach-in function at the encoder

## Your benefits

- Space- and cost-saving design thanks to slimline mechanics
- Numerous possible combinations of interfaces and measuring lengths
- Advanced programming options lead to a reduction in the amount of variants, save costs, and reduce storage
- Analog interface speeds up commissioning and cost-effective interface card can be used

→ [www.sick.com/EcoLine](http://www.sick.com/EcoLine)

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Fields of application

- Measuring height and tilt of automated guided systems
- Height measurement in small warehouse systems
- Applications in medical technology (operating tables, MRT)
- Height measurement of scissors lifting platforms
- Height measurement of overhead conveyors in the automotive industry

## Detailed technical data

### Performance

#### BCG

<b>Measurement range</b>	0 m ... 1.25 m 0 m ... 3 m 0 m ... 5 m 0 m ... 10 m
<b>Encoder</b>	Absolute encoders
<b>Resolution (wire draw + encoder)</b>	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).
<b>Repeatability</b>	≤ 0.2 mm <sup>1)</sup>
<b>Linearity</b>	≤ ± 2 mm <sup>1)</sup>
<b>Hysteresis</b>	≤ 0.4 mm <sup>1)</sup>

<sup>1)</sup> Value applies to wire draw mechanism.

#### PFG

<b>Measurement range</b>	0 m ... 3 m 0 m ... 5 m 0 m ... 10 m 0 m ... 1.25 m
<b>Encoder</b>	Incremental encoders
<b>Resolution (wire draw + encoder)</b>	Example calculation based on the PFG08 with HTL Push Pull: 230 mm (wire draw length per revolution - see Mechanical data): 16,384 (pulses per revolution) = 0.014 mm (resolution of wire draw + encoder combination).
<b>Repeatability</b>	≤ 0.2 mm <sup>1)</sup>
<b>Linearity</b>	≤ ± 2 mm <sup>1)</sup>
<b>Hysteresis</b>	≤ 0.4 mm <sup>1)</sup>

<sup>1)</sup> Value applies to wire draw mechanism.

## Interfaces

#### BCG

<b>Communication interface</b>	IO-Link / V1.1 / COM3 (230,4 kBaud) CANopen SSI PROFINET EtherCAT® EtherNet/IP™ DeviceNet™ PROFIBUS DP Analog / Current / 4...20 mA Analog / Voltage / 0...10 V
<b>Programmable/configurable</b>	✓ -

PFG

<b>Communication interface</b>	Incremental / TTL / RS-422 Incremental / HTL / Push pull Incremental / TTL / HTL
<b>Programmable/configurable</b>	- ✓

Electrical data

BCG

<b>Connection type</b>	
AHM36 IO-Link Basic	Male connector, M12, 4-pin, universal
AHM36 IO-Link Advanced	Male connector, M12, 4-pin, universal
AHM36 CANopen	Male connector, M12, 5-pin, universal
AHM36 SSI	Male connector, M12, 8-pin, universal
AFM60 SSI	Male connector, M23, 12-pin, radial Male connector, M12, 8-pin, radial
AFM60 PROFINET	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial
AFM60 EtherCAT®	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial
AFM60 EtherNet/IP	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial
ATM60 DeviceNet	Connection adapter for DeviceNet <sup>1)</sup>
ATM60 CANopen	Connection adapter for CANopen <sup>1)</sup>
A3M60 PROFIBUS	Male connector, 2 x M12, 5-pin, axial Female connector, 1 x M12, 5-pin, axial
ACM36	Cable, radial, 1.5 m
ACM60	Male connector, M12, 5-pin, radial
<b>Supply voltage</b>	
AHM36 IO-Link Basic	18 V ... 30 V
AHM36 IO-Link Advanced	18 V ... 30 V
AHM36 CANopen	10 V ... 30 V
AHM36 SSI	4.5 V DC ... 32 V DC
AFM60 SSI	4.5 V DC ... 32 V DC
AFM60 PROFINET	10 V DC ... 30 V DC
AFM60 EtherCAT®	10 V DC ... 30 V DC
AFM60 EtherNet/IP	10 V DC ... 30 V DC
ATM60 DeviceNet	10 V ... 32 V
ATM60 CANopen	10 V ... 32 V
A3M60 PROFIBUS	10 V ... 32 V
ACM36	19 V DC ... 33 V DC
ACM60	18 V DC ... 33 V DC
<b>Operating current</b>	≤ 80 mA
<b>Power consumption</b>	
AHM36 IO-Link Basic	≤ 1.5 W
AHM36 IO-Link Advanced	≤ 1.5 W
AHM36 CANopen	≤ 1.5 W (without load)

<sup>1)</sup> Please order the bus adaptor separately.

<sup>2)</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.

AHM36 SSI	≤ 1.5 W (without load)
AFM60 SSI	≤ 0.7 W (without load)
AFM60 PROFINET	≤ 3 W (without load)
AFM60 EtherCAT®	≤ 3 W (without load)
AFM60 EtherNet/IP	≤ 3 W (without load)
ATM60 DeviceNet	≤ 2 W (without load)
ATM60 CANopen	≤ 2 W (without load)
A3M60 PROFIBUS	≤ 1.5 W (without load)
<b>MTTFd: mean time to dangerous failure</b>	
AHM36 IO-Link Basic	240 years (EN ISO 13849-1) <sup>2)</sup>
AHM36 IO-Link Advanced	240 years (EN ISO 13849-1) <sup>2)</sup>
AHM36 CANopen	270 years (EN ISO 13849-1) <sup>2)</sup>
AHM36 SSI	230 years (EN ISO 13849-1) <sup>2)</sup>
AFM60 SSI	250 years (EN ISO 13849-1) <sup>2)</sup>
AFM60 PROFINET	80 years (EN ISO 13849-1) <sup>2)</sup>
AFM60 EtherCAT®	80 years (EN ISO 13849-1) <sup>2)</sup>
AFM60 EtherNet/IP	80 years (EN ISO 13849-1) <sup>2)</sup>
ATM60 DeviceNet	150 years (EN ISO 13849-1) <sup>2)</sup>
ATM60 CANopen	150 years (EN ISO 13849-1) <sup>2)</sup>
A3M60 PROFIBUS	60 years (EN ISO 13849-1) <sup>2)</sup>
ACM36	850 years (EN ISO 13849-1) <sup>2)</sup>
ACM60	600 years (EN ISO 13849-1) <sup>2)</sup>

<sup>1)</sup> Please order the bus adaptor separately.

<sup>2)</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.

## PFG

<b>Connection type</b>	
DFS60	Male connector, M23, 12-pin, radial Male connector, M12, 8-pin, radial
DBS36 Core	Cable, 8-wire, universal, 1.5 m Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m Cable, 8-wire, universal, 5 m
<b>Supply voltage</b>	
DFS60	4.5 V ... 5.5 V 10 V ... 32 V 4.5 V ... 32 V
DBS36 Core	4.5 V ... 5.5 V 7 V ... 30 V
<b>Operating current</b>	
≤ 50 mA (without load)	
<b>Power consumption</b>	
DFS60	≤ 0.5 W (without load) ≤ 0.7 W (without load)
DBS36 Core	≤ 0.5 W (without load)
<b>MTTFd: mean time to dangerous failure</b>	
DFS60	300 years (EN ISO 13849-1) <sup>1)</sup>
DBS36 Core	600 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

BCG

	0 m ... 1.25 m	0 m ... 3 m	0 m ... 5 m	0 m ... 10 m
<b>Measuring wire material</b>	Highly flexible stranded steel 1,4401 stainless steel V4A/PA 12-sheathed	Highly flexible stranded steel 1,4401 stainless steel V4A		
<b>Weight (measuring wire)</b>	0.58 g/m	1.2 g/m		7.1 g/m
<b>Housing material, wire draw mechanism</b>	Plastic, Noryl			
<b>Spring return force</b>	1 N ... 1.4 N <sup>1)</sup>	3.3 N ... 4.4 N <sup>1)</sup>	4.5 N ... 7 N <sup>1)</sup>	9 N ... 12 N <sup>1)</sup>
<b>Length of wire pulled out per revolution</b>	150 mm	230 mm	385 mm	555 mm
<b>Life of wire draw mechanism</b>	Typ. 1,000,000 cycles <sup>2) 3)</sup>			
<b>Actual wire draw length</b>	1.45 m	3.2 m	5.2 m	10.2 m
<b>Wire acceleration</b>	10 m/s <sup>2</sup>		4 m/s <sup>2</sup>	8 m/s <sup>2</sup>
<b>Operating speed</b>	6 m/s		3 m/s	
<b>Mounted encoder</b>	AHM36 IO-Link Basic AHM36 IO-Link Advanced AHM36 CANopen AHM36 SSI ACM36	AHM36 IO-Link Basic AHM36 IO-Link Advanced AHM36 CANopen AHM36 SSI AFM60 SSI AFM60 PROFINET AFM60 EtherCAT® AFM60 EtherNet/IP ATM60 DeviceNet ATM60 CANopen A3M60 PROFIBUS ACM36		AHM36 IO-Link Basic AHM36 IO-Link Advanced AHM36 CANopen AHM36 SSI AFM60 SSI AFM60 PROFINET AFM60 EtherCAT® AFM60 EtherNet/IP ATM60 DeviceNet ATM60 CANopen A3M60 PROFIBUS ACM60
<b>Mounted mechanic</b>	MRA-G055-101D4, 5324019	MRA-G080-103D3, 5322778	MRA-G130-105D3, 5322779	MRA-G190-110D3, 5326242

<sup>1)</sup> These values were measured at an ambient temperature of 25 °C. There may be variations at other temperatures.

<sup>2)</sup> 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.

PFG

	0 m ... 1.25 m	0 m ... 3 m	0 m ... 5 m	0 m ... 10 m
<b>Measuring wire material</b>	Highly flexible stranded steel 1,4401 stainless steel V4A/PA 12-sheathed	Highly flexible stranded steel 1,4401 stainless steel V4A		
<b>Weight (measuring wire)</b>	0.58 g/m	1.2 g/m		7.1 g/m
<b>Housing material, wire draw mechanism</b>	Plastic, Noryl			
<b>Spring return force</b>	1 N ... 1.4 N <sup>1)</sup>	3.3 N ... 4.4 N <sup>1)</sup>	4.5 N ... 7 N <sup>1)</sup>	9 N ... 12 N <sup>1)</sup>
<b>Length of wire pulled out per revolution</b>	150 mm	230 mm	385 mm	555 mm
<b>Life of wire draw mechanism</b>	Typ. 1,000,000 cycles <sup>2) 3)</sup>			
<b>Actual wire draw length</b>	1.45 m	3.2 m	5.2 m	10.2 m
<b>Wire acceleration</b>	10 m/s <sup>2</sup>		4 m/s <sup>2</sup>	8 m/s <sup>2</sup>
<b>Operating speed</b>	6 m/s		3 m/s	
<b>Mounted encoder</b>	DBS36 Core	DFS60		
<b>Mounted mechanic</b>	MRA-G055-101D4, 5324019	MRA-G080-103D3, 5322778	MRA-G130-105D3, 5322779	MRA-G190-110D3, 5326242

<sup>1)</sup> These values were measured at an ambient temperature of 25 °C. There may be variations at other temperatures.

<sup>2)</sup> 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.

## Ambient data

## BCG

<b>EMC</b>		
	AHM36 IO-Link Basic	According to EN 61000-6-2, EN 61000-6-3 and EN 61131-9
	AHM36 IO-Link Advanced	According to EN 61000-6-2, EN 61000-6-3 and EN 61131-9
	AHM36 CANopen	According to EN 61000-6-2 and EN 61000-6-3
	AHM36 SSI	According to EN 61000-6-2 and EN 61000-6-3
	AFM60 SSI	According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>
	AFM60 PROFINET	According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>
	AFM60 EtherCAT®	According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>
	AFM60 EtherNet/IP	According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>
	ATM60 DeviceNet	According to EN 61000-6-2 and EN 61000-6-3
	ATM60 CANopen	According to EN 61000-6-2 and EN 61000-6-3
	A3M60 PROFIBUS	According to EN 61000-6-2 and EN 61000-6-3
	ACM36	According to EN 61000-6-2 and EN 61000-6-4
	ACM60	According to EN 61000-6-2 and EN 61000-6-4
<b>Enclosure rating</b>		IP50
<b>Operating temperature range</b>		
	AHM36 IO-Link Basic	-20 °C ... +70 °C
	AHM36 IO-Link Advanced	-20 °C ... +70 °C
	AHM36 CANopen	-30 °C ... +70 °C
	AHM36 SSI	-30 °C ... +70 °C
	AFM60 SSI	0 °C ... +70 °C -30 °C ... +70 °C
	AFM60 PROFINET	-30 °C ... +70 °C
	AFM60 EtherCAT®	-30 °C ... +70 °C
	AFM60 EtherNet/IP	-30 °C ... +70 °C
	ATM60 DeviceNet	-20 °C ... +70 °C
	ATM60 CANopen	-20 °C ... +70 °C
	A3M60 PROFIBUS	-10 °C ... +70 °C
	ACM36	-30 °C ... +70 °C
	ACM60	-30 °C ... +70 °C

<sup>1)</sup> EMC according to the standards quoted is achieved if shielded cables are used.

## PFG

<b>EMC</b>		
	DFS60	According to EN 61000-6-2 and EN 61000-6-3 According to EN 61000-6-2 and EN 61000-6-4
	DBS36 Core	According to EN 61000-6-2 and EN 61000-6-3 (class A)
<b>Enclosure rating</b>		IP50
<b>Operating temperature range</b>		
	DFS60	-30 °C ... +70 °C
	DBS36 Core	-20 °C ... +70 °C

Type code

Absolute

Construction size		
0	5	55 mm <sup>1)</sup>
0	8	80 mm <sup>2)</sup>
1	3	130 mm <sup>3)</sup>
1	9	190 mm <sup>4)</sup>

Communication interface

A	SSI
C	CANopen <sup>5)</sup>
D	DeviceNet <sup>5)</sup>
E	EtherCAT®
H	HIPERFACE® (on request)
I	EtherNet/IP
K	SSI + SinCos (on request)
L	SSI + Incremental HTL (on request)
N	PROFINET
P	PROFIBUS
Q	IO-Link
R	SSI + Incremental programmable (on request)
S	SSI + SinCos programmable (on request)
T	SSI + Incremental TTL (on request)

Connection type

A	Male connector, M23, 12-pin, radial <sup>6)</sup>
B	Male connector, 3 x M12, axial <sup>7)</sup>
C	Male connector, M12, 8-pin, radial <sup>6)</sup>
H	Male connector for field bus adapter <sup>5) 8)</sup>
K	Cable, 8-wire, universal, 1.5 m (on request)
L	Cable, 8-wire, universal, 3 m (on request)
M	Cable, 8-wire, universal, 5 m (on request)
N	Male connector, M12, 8-pin, universal <sup>9)</sup>
P	Male Connector, M12, 4-pin, universal <sup>10)</sup>
Q	Male connector, M12, 5-pin, universal <sup>11)</sup>

Measuring length

0	1	1.25 meters
0	3	3 meters
0	5	5 meters
1	0	10 meters

resolution coefficient

5	5	A = SSI singleturn resolution 8,192 steps / measuring length 1.25 m
1	8	A = SSI singleturn resolution 4,096 steps / measuring length 3 m
3	6	A = SSI singleturn resolution 8,192 steps / measuring length 3 m
1	1	A = SSI singleturn resolution 4,096 steps / measuring length 5 m
2	1	A = SSI singleturn resolution 8,192 steps / measuring length 5 m
0	7	A = SSI singleturn resolution 4,096 steps / measuring length 10 m
1	5	A = SSI singleturn resolution 8,192 steps / measuring length 10 m
3	6	C = CANopen with connection type H; D = DeviceNet; P = PROFIBUS / measuring length 3 m
2	1	C = CANopen with connection type H; D = DeviceNet; P = PROFIBUS / measuring length 5 m
1	5	C = CANopen with connection type H; D = DeviceNet; P = PROFIBUS / measuring length 10 m
9	9	C = CANopen with connection type Q / measuring length 1.25 m
7	1	C = CANopen with connection type Q / measuring length 3 m
4	3	C = CANopen with connection type Q / measuring length 5 m
2	9	C = CANopen with connection type Q / measuring length 10 m
9	9	I = EtherNet/IP; E = EtherCAT®; N = PROFINET / measuring length 3 m
9	9	I = EtherNet/IP; E = EtherCAT®; N = PROFINET / measuring length 5 m
9	9	I = EtherNet/IP; E = EtherCAT®; N = PROFINET / measuring length 10 m
6	1	Q = IO-Link / Basic
6	2	Q = IO-Link / Advanced

B	C	G			-		1	M				
---	---	---	--	--	---	--	---	---	--	--	--	--

<sup>1)</sup> Only in combination with measuring length 01.

<sup>2)</sup> Only in combination with measuring length 03.

<sup>3)</sup> Only in combination with measuring length 05.

<sup>4)</sup> Only in combination with measuring length 10.

<sup>5)</sup> Field bus adapter for CANopen, DeviceNet, and PROFIBUS please order separately.

<sup>6)</sup> Only in combination with communication interface A and construction size 08, 13 and 19.

<sup>7)</sup> Only in combination with communication interfaces E, I, N and P and construction size 08, 13 and 19.

<sup>8)</sup> Only in combination with communication interfaces C and D.

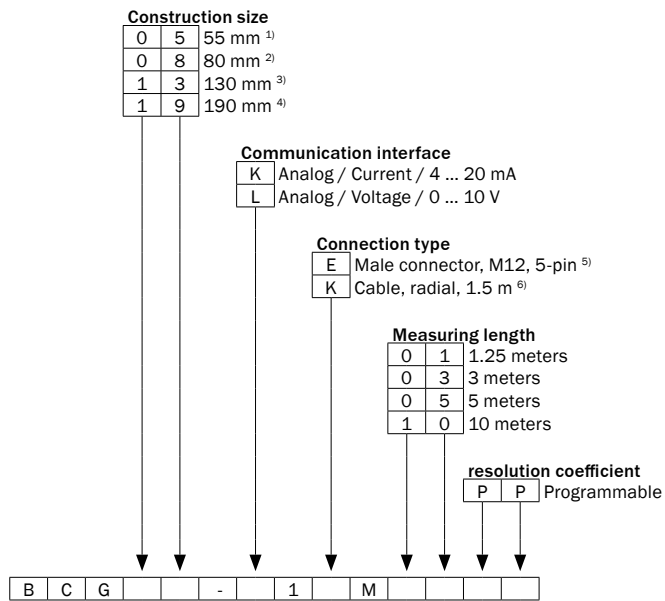
<sup>9)</sup> Only in combination with communication interface A.

<sup>10)</sup> Only in combination with communication interface Q.

<sup>11)</sup> Only in combination with communication interface C.



## Analog



<sup>1)</sup> Only in combination with connection type K and measuring length 01.

<sup>2)</sup> Only in combination with connection type K and measuring length 03.

<sup>3)</sup> Only in combination with connection type K and measuring length 05.

<sup>4)</sup> Only in combination with connection type E and measuring length 10.

<sup>5)</sup> Only in combination with construction size 19.

<sup>6)</sup> Only in combination with construction size 05, 08 an 13.

Incremental

**Construction size**

5	5	55 mm <sup>1)</sup>
8	8	80 mm <sup>2)</sup>
1	3	130 mm <sup>3)</sup>
1	9	190 mm <sup>4)</sup>

**Communication interface**

A	4.5 V ... 5.5 V, TTL/RS422
E	HTL/push pull (volts depending on the encoder)
P	4.5 V ... 32 V, TTL/HTL, programmable (on request)

**Connection type**

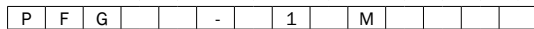
A	Male connector, M23, 12-pin, radial
B	Male connector, M23, 12-pin, axial (on request)
C	Male connector, M12, 8-pin, radial
J	Cable, 8-wire, universal, 0.5 m (on request) <sup>5)</sup>
K	Cable, 8-wire, universal, 1.5 m <sup>5)</sup>
L	Cable, 8-wire, universal, 3.0 m (on request)
M	Cable, 8-wire, universal, 5.0 m (on request)
P	Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m <sup>6)</sup>
Q	Cable, 8-wire, with male connector, M23, 12-pin, universal, 0.5 m (on request) <sup>6)</sup>

**Measuring length**

0	1	1.25 meters
0	3	3 meters
0	5	5 meters
1	0	10 meters

**resolution coefficient**

6	0	A = 4.5 ... 5.5 V, TTL/RS422, 6 channel / measuring length 1.25 m
7	1	A = 4.5 ... 5.5 V, TTL/RS422, 6 channel / measuring length 3 m
4	4	A = 4.5 ... 5.5 V, TTL/RS422, 6 channel / measuring length 5 m
2	9	A = 4.5 ... 5.5 V, TTL/RS422, 6 channel / measuring length 10 m
P	P	4.5 ... 32 V, TTL/HTL, programmable / measuring length 3 m, 5 m and 10 m



<sup>1)</sup> Only in combination with communication interface A or E and measuring length 01.

<sup>2)</sup> Only in combination with measuring length 03.

<sup>3)</sup> Only in combination with measuring length 05.

<sup>4)</sup> Only in combination with measuring length 10.

<sup>5)</sup> Only in combination with measuring length 01.

<sup>6)</sup> Only in combination with communication interface A and E.

## Ordering information

- **Measuring range:** 0 m ... 1.25 m
- **Mounted mechanic:** MRA-G055-101D4, 5324019

Communication interface	Connection type	Resolution (wire draw + encoder)	Mounted encoder	Type	Part no.
Analog / Current / 4...20 mA	Cable, radial, 1.5 m	0.05 mm	ACM36, ACM36-K1K0-K01, 6039751	BCG05-K1KM01PP	6039745
Analog / Voltage / 0...10 V	Cable, radial, 1.5 m	0.04 mm	ACM36, ACM36-L1K0-K01, 6039752	BCG05-L1KM01PP	6039746
CANopen	Male connector, M12, 5-pin, universal	0.01 mm	AHM36 CANopen, AHM36A-SDCC014x12, 1067977	BCG05-C1QM0199	1068865
IO-Link / V1.1 / COM3 (230,4 kBaud)	Male connector, M12, 4-pin, universal	0.009 mm	AHM36 IO-Link Advanced, AHM36A-SDQC014X12, 1101538	BCG05-Q1PM0162	1110588
		0.04 mm	AHM36 IO-Link Basic, AHM36B-SDQC012X12, 1092035	BCG05-Q1PM0161	1097278
Incremental / HTL / Push pull	Cable, 8-wire, universal, 1.5 m	0.06 mm	DBS36 Core, DBS36E-SDEK02500, 1064246	PFG05-E1KM0160	1060971
	Cable, 8-wire, universal, 5 m	0.06 mm	DBS36 Core, DBS36E-SDEM02500, 1072518	PFG05-E1MM0160	1072541
Incremental / TTL / RS-422	Cable, 8-wire, universal, 1.5 m	0.06 mm	DBS36 Core, DBS36E-SDAK02500, 1064245	PFG05-A1KM0160	1060972
	Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m	0.06 mm	DBS36 Core, DBS36E-SDAP02500, 1095510	PFG05-A1PM0160	1102769
SSI	Male connector, M12, 8-pin, universal	0.02 mm	AHM36 SSI, AHM36A-SDPC013X12, 1068328	BCG05-A1NM0155	1068864

- **Measuring range:** 0 m ... 3 m
- **Mounted mechanic:** MRA-G080-103D3, 5322778

Communication interface	Connection type	Resolution (wire draw + encoder)	Mounted encoder	Type	Part no.
Analog / Current / 4...20 mA	Cable, radial, 1.5 m	0.08 mm	ACM36, ACM36-K1K0-K01, 6039751	BCG08-K1KM03PP	6039747
Analog / Voltage / 0...10 V	Cable, radial, 1.5 m	0.06 mm	ACM36, ACM36-L1K0-K01, 6039752	BCG08-L1KM03PP	6039748
CANopen	Connection adapter for CANopen <sup>1)</sup>	0.03 mm	ATM60 CANopen, ATM60-C1H13X13, 1030025	BCG08-C1HM0336	1061026
	Male connector, M12, 5-pin, universal	0.01 mm	AHM36 CANopen, AHM36A-S3CC014x12, 1065999	BCG08-C1QM0371	1068867
DeviceNet™	Connection adapter for DeviceNet <sup>1)</sup>	0.03 mm	ATM60 DeviceNet, ATM60-D1H13X13, 1030018	BCG08-D1HM0336	1061027
EtherCAT®	Male connector, 1 x M12, 4-pin, axial	0.001 mm	AFM60 EtherCAT®, AFM60A-S1EB018x12, 1059061	BCG08-E1BM0399	1061030
EtherNet/IP™	Female connector, 2 x M12, 4-pin, axial	0.001 mm	AFM60 EtherNet/IP, AFM60A-S1B018x12, 1055331	BCG08-I1BM0399	1061029
IO-Link / V1.1 / COM3 (230,4 kBaud)	Male connector, M12, 4-pin, universal	0.014 mm	AHM36 IO-Link Advanced, AHM36A-S3QC014X12, 1101532	BCG08-Q1PM0362	1110589
		0.06 mm	AHM36 IO-Link Basic, AHM36B-S3QC012X12, 1092014	BCG08-Q1PM0361	1097274
Incremental / HTL / Push pull	Male connector, M12, 8-pin, radial	0.01 mm	DFS60, DF-S60A-S1EC16384, 1037616	PFG08-E1CM0371	1060979
	Male connector, M23, 12-pin, radial	0.01 mm	DFS60, DF-S60A-S1EA16384, 1037615	PFG08-E1AM0371	1060981
Incremental / TTL / HTL	Male connector, M12, 8-pin, radial	0.0035 mm	DFS60, DF-S60A-S1PC65536, 1036761	PFG08-P1CM03PP	1060984
	Male connector, M23, 12-pin, radial	0.0035 mm	DFS60, DF-S60A-S1PA65536, 1036760	PFG08-P1AM03PP	1075495
Incremental / TTL / RS-422	Male connector, M12, 8-pin, radial	0.01 mm	DFS60, DF-S60A-S1AC16384, 1037566	PFG08-A1CM0371	1060974
	Male connector, M23, 12-pin, radial	0.01 mm	DFS60, DF-S60A-S1AA16384, 1037565	PFG08-A1AM0371	1060977
PROFIBUS DP	Male connector, 2 x M12, 5-pin, axial Female connector, 1 x M12, 5-pin, axial	0.03 mm	A3M60 PROFIBUS, A3M60B-S1PB013X13, 1051018	BCG08-P1BM0336	1052618
PROFINET	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial	0.001 mm	AFM60 PROFINET, AFM60A-S1NB018x12, 1059040	BCG08-N1BM0399	1061028
SSI	Male connector, M12, 8-pin, radial	0.03 mm	AFM60 SSI, AFM60B-S1AC008192, 1037863	BCG08-A1CM0336	1054131
		0.06 mm	AFM60 SSI, AFM60E-S1AC004096, 1037649	BCG08-A1CM0318	1054129
	Male connector, M12, 8-pin, universal	0.03 mm	AHM36 SSI, AHM36A-S3P-C013X12, 1068330	BCG08-A1NM0336	1068866
	Male connector, M23, 12-pin, radial	0.06 mm	AFM60 SSI, AFM60E-S1AA004096, 1037438	BCG08-A1AM0318	1061025

<sup>1)</sup> Please order the bus adaptor separately.

- **Measuring range:** 0 m ... 5 m
- **Mounted mechanic:** MRA-G130-105D3, 5322779

Communication interface	Connection type	Resolution (wire draw + encoder)	Mounted encoder	Type	Part no.
Analog / Current / 4...20 mA	Cable, radial, 1.5 m	0.1 mm	ACM36, ACM36-K1K0-K01, 6039751	BCG13-K1KM05PP	6039749
Analog / Voltage / 0...10 V	Cable, radial, 1.5 m	0.1 mm	ACM36, ACM36-L1K0-K01, 6039752	BCG13-L1KM05PP	6039750
CANopen	Connection adapter for CANopen <sup>1)</sup>	0.05 mm	ATM60 CANopen, ATM60-C1H13X13, 1030025	BCG13-C1HM0521	1061034
	Male connector, M12, 5-pin, universal	0.02 mm	AHM36 CANopen, AHM36A-S3CC014x12, 1065999	BCG13-C1QM0543	1068869
DeviceNet™	Connection adapter for DeviceNet <sup>1)</sup>	0.05 mm	ATM60 DeviceNet, ATM60-D1H13X13, 1030018	BCG13-D1HM0521	1061035
EtherCAT®	Male connector, 1 x M12, 4-pin, axial	0.001 mm	AFM60 EtherCAT®, AFM60A-S1EB018x12, 1059061	BCG13-E1BM0599	1061038
EtherNet/IP™	Female connector, 2 x M12, 4-pin, axial	0.001 mm	AFM60 EtherNet/IP, AFM60A-S1IB018x12, 1055331	BCG13-I1BM0599	1061037
IO-Link / V1.1 / COM3 (230,4 kBaud)	Male connector, M12, 4-pin, universal	0.02 mm	AHM36 IO-Link Advanced, AHM36A-S3QC014X12, 1101532	BCG13-Q1PM0562	1110590
		0.09 mm	AHM36 IO-Link Basic, AHM36B-S3QC012X12, 1092014	BCG13-Q1PM0561	1097306
Incremental / HTL / Push pull	Male connector, M12, 8-pin, radial	0.02 mm	DFS60, DF-S60A-S1EC16384, 1037616	PFG13-E1CM0544	1061017
	Male connector, M23, 12-pin, radial	0.02 mm	DFS60, DF-S60A-S1EA16384, 1037615	PFG13-E1AM0544	1061018
Incremental / TTL / HTL	Male connector, M12, 8-pin, radial	0.0058 mm	DFS60, DF-S60A-S1PC65536, 1036761	PFG13-P1CM05PP	1061019
	Male connector, M23, 12-pin, radial	0.0058 mm	DFS60, DF-S60A-S1PA65536, 1036760	PFG13-P1AM05PP	1075498
Incremental / TTL / RS-422	Male connector, M12, 8-pin, radial	0.02 mm	DFS60, DF-S60A-S1AC16384, 1037566	PFG13-A1CM0544	1061015
	Male connector, M23, 12-pin, radial	0.02 mm	DFS60, DF-S60A-S1AA16384, 1037565	PFG13-A1AM0544	1061016
PROFIBUS DP	Male connector, 2 x M12, 5-pin, axial Female connector, 1 x M12, 5-pin, axial	0.05 mm	A3M60 PROFIBUS, A3M60B-S1PB013X13, 1051018	BCG13-P1BM0521	1052619
PROFINET	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial	0.001 mm	AFM60 PROFINET, AFM60A-S1NB018x12, 1059040	BCG13-N1BM0599	1061036
SSI	Male connector, M12, 8-pin, radial	0.05 mm	AFM60 SSI, AFM60B-S1AC008192, 1037863	BCG13-A1CM0521	1061032
		0.09 mm	AFM60 SSI, AFM60E-S1AC004096, 1037649	BCG13-A1CM0511	1061031
	Male connector, M12, 8-pin, universal	0.05 mm	AHM36 SSI, AHM36A-S3P-C013X12, 1068330	BCG13-A1NM0521	1068868
	Male connector, M23, 12-pin, radial	0.09 mm	AFM60 SSI, AFM60E-S1AA004096, 1037438	BCG13-A1AM0511	1061033

<sup>1)</sup> Please order the bus adaptor seperately.

- **Measuring range:** 0 m ... 10 m
- **Mounted mechanic:** MRA-G190-110D3, 5326242

Communication interface	Connection type	Resolution (wire draw + encoder)	Mounted encoder	Type	Part no.
Analog / Current / 4...20 mA	Male connector, M12, 5-pin, radial	0.05 mm	ACM60, ACM60B-S1KE13X06, 6045312	BCG19-K1EM10PP	6048294
Analog / Voltage / 0...10 V	Male connector, M12, 5-pin, radial	0.04 mm	ACM60, ACM60B-S1LE13X06, 6045313	BCG19-L1EM10PP	6048295
CANopen	Connection adapter for CANopen <sup>1)</sup>	0.07 mm	ATM60 CANopen, ATM60-C1H13X13, 1030025	BCG19-C1HM1015	1061041
	Male connector, M12, 5-pin, universal	0.03 mm	AHM36 CANopen, AHM36A-S3CC014x12, 1065999	BCG19-C1QM1029	1068871
DeviceNet™	Connection adapter for DeviceNet <sup>1)</sup>	0.07 mm	ATM60 DeviceNet, ATM60-D1H13X13, 1030018	BCG19-D1HM1015	1061042
EtherCAT®	Male connector, 1 x M12, 4-pin, axial	0.002 mm	AFM60 EtherCAT®, AFM60A-S1EB018x12, 1059061	BCG19-E1BM1099	1061045
EtherNet/IP™	Female connector, 2 x M12, 4-pin, axial	0.002 mm	AFM60 EtherNet/IP, AFM60A-S1IB018x12, 1055331	BCG19-I1BM1099	1061044
IO-Link / V1.1 / COM3 (230,4 kBaud)	Male connector, M12, 4-pin, universal	0.03 mm	AHM36 IO-Link Advanced, AHM36A-S3QC014X12, 1101532	BCG19-Q1PM1062	1110591
		0.14 mm	AHM36 IO-Link Basic, AHM36B-S3QC012X12, 1092014	BCG19-Q1PM1061	1097277
Incremental / HTL / Push pull	Male connector, M12, 8-pin, radial	0.03 mm	DFS60, DF-S60A-S1EC16384, 1037616	PFG19-E1CM1029	1061022
	Male connector, M23, 12-pin, radial	0.03 mm	DFS60, DF-S60A-S1EA16384, 1037615	PFG19-E1AM1029	1061023
Incremental / TTL / HTL	Male connector, M12, 8-pin, radial	0.008 mm	DFS60, DF-S60A-S1PC65536, 1036761	PFG19-P1CM10PP	1061024
	Male connector, M23, 12-pin, radial	0.008 mm	DFS60, DF-S60A-S1PA65536, 1036760	PFG19-P1AM10PP	1075581
Incremental / TTL / RS-422	Male connector, M12, 8-pin, radial	0.03 mm	DFS60, DF-S60A-S1AC16384, 1037566	PFG19-A1CM1029	1061020
	Male connector, M23, 12-pin, radial	0.03 mm	DFS60, DF-S60A-S1AA16384, 1037565	PFG19-A1AM1029	1061021
PROFIBUS DP	Male connector, 2 x M12, 5-pin, axial Female connector, 1 x M12, 5-pin, axial	0.07 mm	A3M60 PROFIBUS, A3M60B-S1PB013X13, 1051018	BCG19-P1BM1015	1052620
PROFINET	Male connector, 1 x M12, 4-pin, axial Female connector, 2 x M12, 4-pin, axial	0.002 mm	AFM60 PROFINET, AFM60A-S1NB018x12, 1059040	BCG19-N1BM1099	1061043
SSI	Male connector, M12, 8-pin, radial	0.07 mm	AFM60 SSI, AFM60B-S1AC008192, 1037863	BCG19-A1CM1015	1061040
		0.14 mm	AFM60 SSI, AFM60B-S1AC004096, 1037869	BCG19-A1CM1007	1061039
	Male connector, M12, 8-pin, universal	0.07 mm	AHM36 SSI, AHM36A-S3PC013X12, 1068330	BCG19-A1NM1015	1068870
	Male connector, M23, 12-pin, radial	0.14 mm	AFM60 SSI, AFM60B-S1AA004096, 1037868	BCG19-A1AM1007	1056983

<sup>1)</sup> Please order the bus adaptor separately.

## REGISTER AT WWW.SICK.COM TO TAKE ADVANTAGE OF OUR FOLLOWING SERVICES FOR YOU






- ✔ Access information on net prices and individual discounts.
- ✔ Easily order online and track your delivery.
- ✔ Check your history of all your orders and quotes.
- ✔ Create, save, and share as many wish lists as you want.
- ✔ Use the direct order to quickly order a big amount of products.
- ✔ Check the status of your orders and quotes and get information on status changes by e-mail.
- ✔ Save time by using past orders.
- ✔ Easily export orders and quotes, suited to your systems.



## SERVICES FOR MACHINES AND PLANTS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.



- 
**Consulting and design**  
 Safe and professional
- 
**Product and system support**  
 Reliable, fast, and on-site
- 
**Verification and optimization**  
 Safe and regularly inspected
- 
**Upgrade and retrofits**  
 Easy, safe, and economical
- 
**Training and education**  
 Practical, focused, and professional



## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

**That is “Sensor Intelligence.”**

### **Worldwide presence:**

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → [www.sick.com](http://www.sick.com)