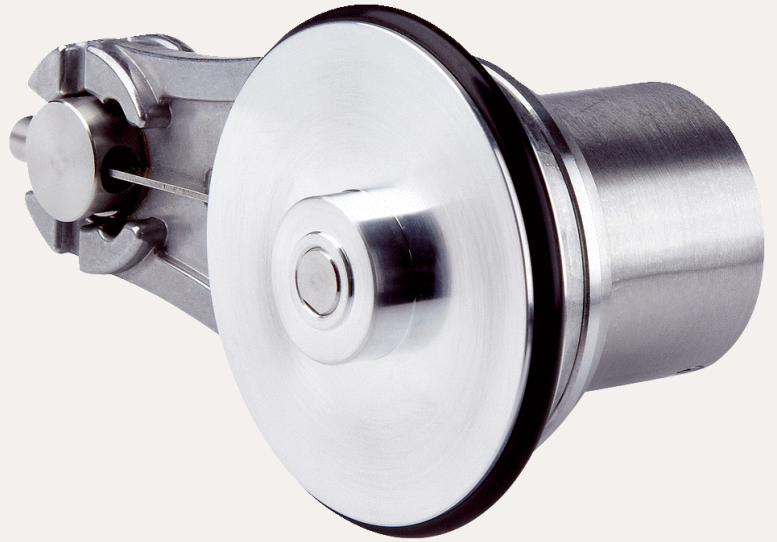




DATA SHEET

DBV50E-22EPA0020

DBV50
Measuring wheel encoders

SICK

Sensor Intelligence



Illustration may differ

MEASURING WHEEL ENCODERS

DBV50E-22EPA0020

ORDERING INFORMATION

Type	part no.
DBV50E-22EPA0020	1098748

Further device versions and accessories at www.sick.com/DBV50



DETAILED TECHNICAL DATA

SAFETY-RELATED PARAMETERS

MTTF _D (mean time to dangerous failure)	600 years (EN ISO 13849-1) ¹⁾
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¹⁾ 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.

PERFORMANCE

Pulses per revolution	20
Resolution in pulses/mm	0.01
Measuring increment (resolution in mm/pulse)	10
Measuring step deviation	± 18° / pulses per revolution
Error limits	± 4 mm/m, subject to the measuring wheel (wheel + surface)
Duty cycle	≤ 0.5 ± 5 %
Initialization time	< 3 ms

INTERFACES

Communication interface	Incremental
Communication Interface detail	HTL / Push pull
Number of signal channels	6-channel

ELECTRONICS

Operating power consumption (no load)	50 mA
Connection type	Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m
Power consumption max. without load	≤ 0.5 W
Supply voltage	7 V ... 30 V

¹⁾ The short-circuit rating is only given if Us and GND are connected correctly.

Load current max.	30 mA
Maximum output frequency	≤ 300 kHz
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ¹⁾

¹⁾ The short-circuit rating is only given if Us and GND are connected correctly.

MECHANICS

Measuring wheel circumference	200 mm
Measuring wheel surface	O-ring NBR70 ¹⁾
Spring arm design	63.5 mm spring arm, encoder on mounting side (left), single wheel
Mass	+ 300 g
Encoder material	Shaft Stainless steel Flange Aluminum Housing Aluminum Cable PVC
Spring arm mechanism material	Spring element Spring steel, anti-corrosive Measuring wheel core Aluminum
Start up torque	0.9 Ncm (at 20 °C)
Operating torque	0.6 Ncm (at 20 °C)
Operating speed	1,500 min ⁻¹
Maximum operating speed	3,000 min ⁻¹ ²⁾
Bearing lifetime	2.0 x 10 ⁹ revolutions
Maximum travel/deflection of spring arm	14 mm at 14 N spring travel
Recommended pretension	15 N At 10 mm deflection ³⁾
Max. permissible working area for the spring (continuous operation)	± 3 mm
Recommended spring deflection	2 mm ... 13 mm
Service life of spring element	> 1.4 million cycles ⁴⁾
Mounting position relative to the measuring object	Preferably from above, from below possible ⁵⁾

¹⁾ The surface of a measuring wheel is subject to wear. This depends on contact pressure, acceleration behavior in the application, traversing speed, measurement surface, mechanical alignment of the measuring wheel, temperature, and ambient conditions. We recommend you regularly check the condition of the measuring wheel and replace as required.

²⁾ No permanent operation. Decreasing signal quality.

³⁾ When measured from the top of the measuring surface.

⁴⁾ One cycle corresponds to an upward and downward movement of ± 3 mm from the recommended pretension position.

⁵⁾ When mounted from below, the encoder weight during spring pretensioning must be taken into account.

AMBIENT DATA

EMC	According to EN 61000-6-2 and EN 61000-6-3 (class A)
Enclosure rating	IP65
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-20 °C ... +85 °C -35 °C ... +95 °C (on request)
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	100 g, 6 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

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Technical drawing of the 3D printer's extruder assembly, showing side, top, and front views with dimensions in mm and inches.

Side View (Top):

- Ø 20 (0.79)
- M3 x 6 (0.24) set screw
- Ø 3.5 (0.14) thru hole
- 8.5 (0.33)
- 17 (0.67)
- 5.4 (0.21)
- 6 (0.24)
- 9.1 (0.36)
- 40.2 (1.58)
- 14.8 (0.58)
- M6 nut
- Toothed washer
- M6 x 11.8 (0.46) threaded part
- 13.8 (0.54)
- 21.2 (0.83)

Top View:

- Approx. 110 (4.33)
- Ø 63.7 (2.51)
- Ø 30 (1.18)
- 63.5 (2.50)

Front View (Bottom):

- Ø 40 (1.57)
- 3 x M4 x 10 (0.39) countersunk screw 120° spacing

Side View (Bottom):

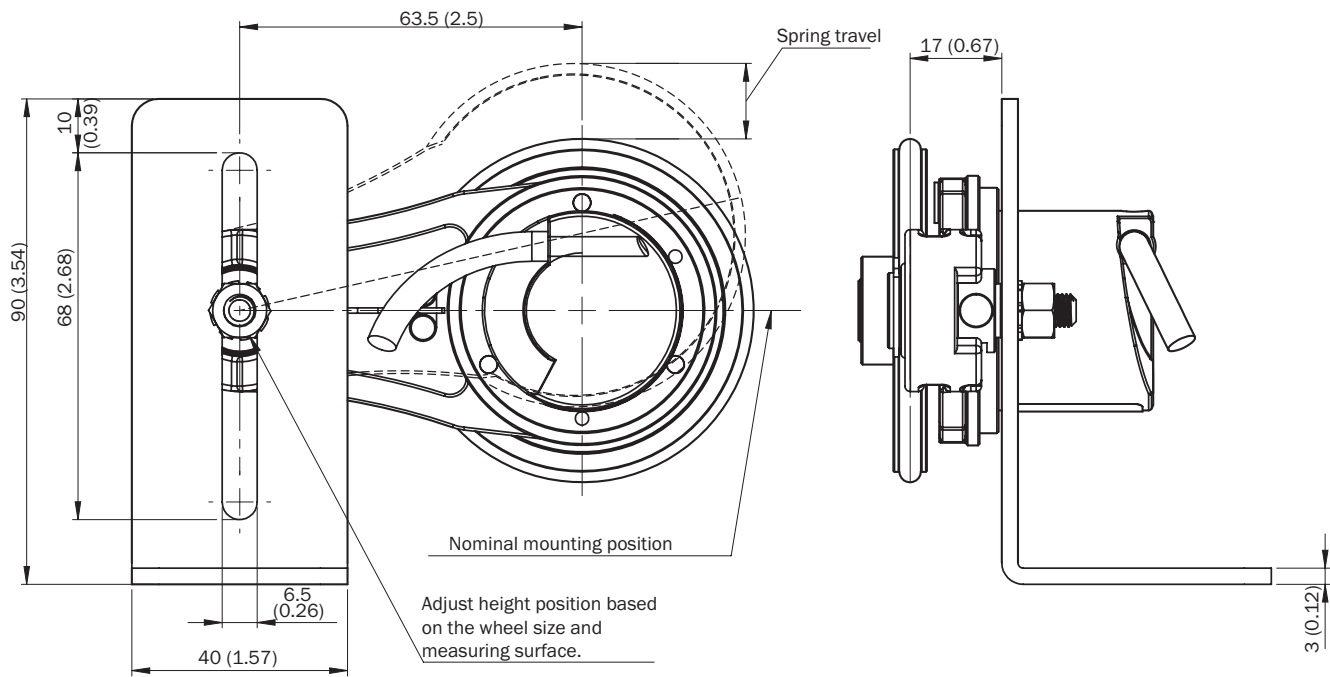
- 55 (2.17)
- 35.2 (1.39)
- 5 (0.50)
- Ø 50 (1.97)
- Ø 37 (1.46)
- 6.2 (0.24)
- M4 x 4 (0.16) set screw

Front View (Right):

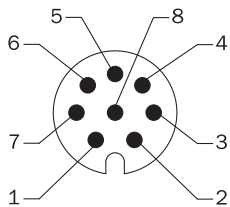
- Can be rotated in 30° steps
- Flat spring
- Ø 30 (1.18)

Dimensions in mm (inch)

ATTACHMENT SPECIFICATIONS

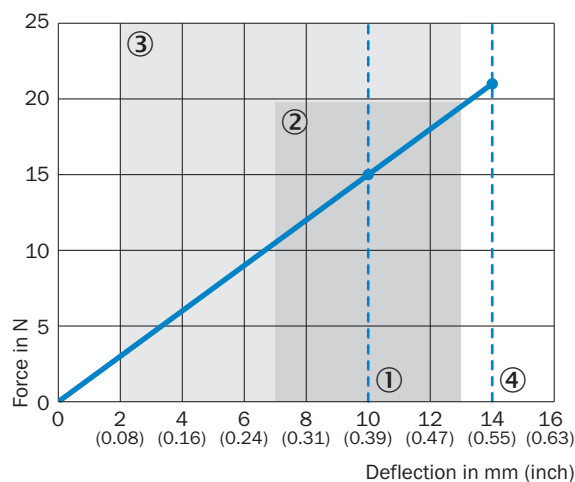


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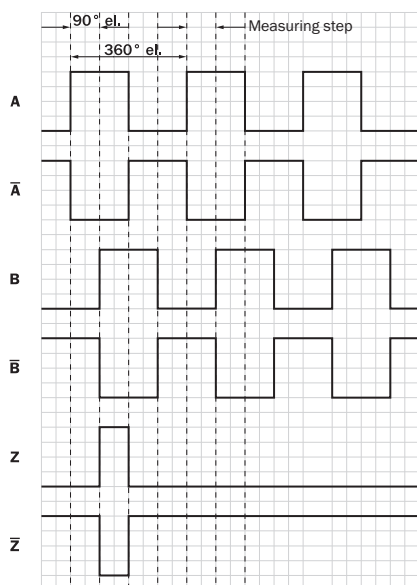
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
Red	8	12	+U _s	Supply voltage
-	-	9	Not assigned	Not assigned
-	-	2	Not assigned	Not assigned
-	-	11	Not assigned	Not assigned
-	-	7	Not assigned	Not assigned

DIAGRAMS FORCE DEFLECTION CHART WITH WORKING RANGE



- ① Proposed Pre-tension: 10 mm
- ② Allowed operating travel (continuous operation) +/- 3 mm
- ③ Proposed spring deflection: 2 - 13 mm
- ④ Maximum spring travel: 14 mm

DIAGRAMS SIGNAL OUTPUTS FOR ELECTRICAL INTERFACES TTL AND HTL



CW with view on the encoder shaft , compare dimensional drawing.
Interfaces G, P, R perform only the channels A, B, Z.

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1098748



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SICK AT A GLANCE

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SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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