

# DBV50E-00RKA0010

DBV50

MEASURING WHEEL ENCODERS

**SICK**  
Sensor Intelligence.

Illustration may differ

### Ordering information

Type	Part no.
DBV50E-00RKA0010	1122415

Other models and accessories → [www.sick.com/DBV50](http://www.sick.com/DBV50)



### Detailed technical data

#### Performance

<b>Pulses per revolution</b>	10
<b>Resolution in pulses/mm</b>	0.05
<b>Measuring increment (resolution in mm/pulse)</b>	20
<b>Measuring step deviation</b>	± 18° / pulses per revolution
<b>Error limits</b>	± 0.4 mm/m, subject to the measuring wheel (wheel + surface)
<b>Duty cycle</b>	≤ 0.5 ± 5 %
<b>Initialization time</b>	< 3 ms

#### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	Open Collector
<b>Number of signal channels</b>	3 channel

#### Electrical data

<b>Operating power consumption (no load)</b>	50 mA
<b>Connection type</b>	Cable, 5-wire, universal, 1.5 m <sup>1)</sup>
<b>Supply voltage</b>	4.5 V ... 30 V
<b>Load current max.</b>	30 mA
<b>Maximum output frequency</b>	≤ 300 kHz
<b>Reference signal, number</b>	1
<b>Reference signal, position</b>	90°, electric, logically gated with A and B
<b>Reverse polarity protection</b>	-
<b>Short-circuit protection of the outputs</b>	2)
<b>MTTFd: mean time to dangerous failure</b>	600 years (EN ISO 13849-1) <sup>3)</sup>

<sup>1)</sup> Number of wires depending on electrical interface: Interface A, C, E: 8-wire; Interface G, P, R: 5-wire.

<sup>2)</sup> The short-circuit rating is only given if Us and GND are connected correctly.

<sup>3)</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

<b>Measuring wheel circumference</b>	Without measuring wheel								
<b>Spring arm design</b>	63.5 mm spring arm, encoder on mounting side (left), single wheel								
<b>Mass</b>	+ 300 g								
<b>Encoder material</b>	<table border="0"> <tr> <td style="padding-right: 20px;">Shaft</td> <td>Stainless steel</td> </tr> <tr> <td>Flange</td> <td>Aluminum</td> </tr> <tr> <td>Housing</td> <td>Aluminum</td> </tr> <tr> <td>Cable</td> <td>PVC</td> </tr> </table>	Shaft	Stainless steel	Flange	Aluminum	Housing	Aluminum	Cable	PVC
Shaft	Stainless steel								
Flange	Aluminum								
Housing	Aluminum								
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<b>Spring arm mechanism material</b>	<table border="0"> <tr> <td style="padding-right: 20px;">Spring element</td> <td>Spring steel, anti-corrosive</td> </tr> </table>	Spring element	Spring steel, anti-corrosive						
Spring element	Spring steel, anti-corrosive								
<b>Start up torque</b>	0.9 Ncm (at 20 °C)								
<b>Operating torque</b>	0.6 Ncm (at 20 °C)								
<b>Operating speed</b>	1,500 min <sup>-1</sup>								
<b>Maximum operating speed</b>	3,000 min <sup>-1</sup> <sup>1)</sup>								
<b>Bearing lifetime</b>	2.0 x 10 <sup>9</sup> revolutions								
<b>Maximum travel/deflection of spring arm</b>	14 mm with 21 N spring travel								
<b>Recommended pretension</b>	15 N At 10 mm deflection <sup>2)</sup>								
<b>Max. permissible working area for the spring (continuous operation)</b>	± 3 mm								
<b>Recommended spring deflection</b>	2 mm ... 13 mm								
<b>Service life of spring element</b>	> 1.4 million cycles <sup>3)</sup>								
<b>Mounting position relative to the measuring object</b>	Preferably from above, from below possible <sup>4)</sup>								

<sup>1)</sup> No permanent operation. Decreasing signal quality.

<sup>2)</sup> When measured from the top of the measuring surface.

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

<sup>4)</sup> When mounted from below, the encoder weight during spring pretensioning must be taken into account.

## Ambient data

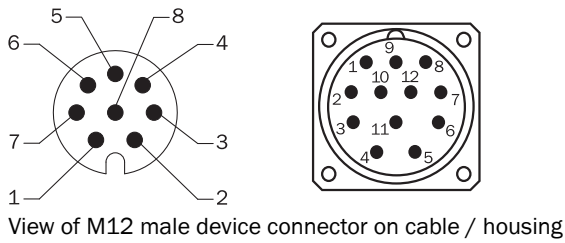
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3 (class A)
<b>Enclosure rating</b>	IP65
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-20 °C ... +70 °C
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package

## Classifications

<b>eCl@ss 5.0</b>	27270501
<b>eCl@ss 5.1.4</b>	27270501
<b>eCl@ss 6.0</b>	27270590
<b>eCl@ss 6.2</b>	27270590
<b>eCl@ss 7.0</b>	27270501
<b>eCl@ss 8.0</b>	27270501
<b>eCl@ss 8.1</b>	27270501

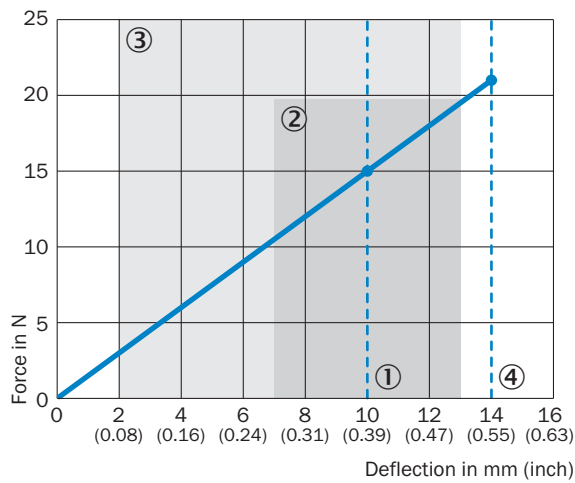


### PIN assignment



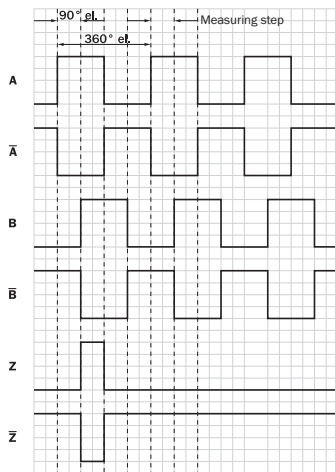
### Diagrams

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

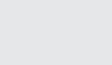
Signal outputs for electrical interfaces TTL and HTL






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

### Recommended accessories

Other models and accessories → [www.sick.com/DBV50](http://www.sick.com/DBV50)

	Brief description	Type	Part no.
<b>Flanges</b>			
	Adapter flange for modular measuring wheel system	BEF-AP-MRS	2084969
<b>Mounting brackets and plates</b>			
	Mounting bracket for encoder with spigot 36 mm	BEF-WF-MRS	2084709
<b>Other mounting accessories</b>			
	Aluminium measuring wheel with O-ring (NBR70) for 8 mm solid shaft, circumference 200 mm	BEF-MR008020R	2055223
<b>Plug connectors and cables</b>			
	Head A: cable Head B: Flying leads Cable: SSI, Incremental, HIPERFACE®, PUR, halogen-free, shielded	LTG-2308-MWENC	6027529
	Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, shielded	LTG-2411-MW	6027530
	Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded	LTG-2512-MW	6027531
	Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, Incremental, PUR, halogen-free, shielded	LTG-2612-MW	6028516
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 2 m	DOL-1208-G02MAC1	6032866
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 5 m	DOL-1208-G05MAC1	6032867
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 10 m	DOL-1208-G10MAC1	6032868
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 20 m	DOL-1208-G20MAC1	6032869
	Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 25 m	DOL-1208-G25MAC1	6067859
	Head A: female connector, M12, 8-pin, straight, A-coded Cable: Incremental, SSI, shielded	DOS-1208-GA01	6045001
	Head A: female connector, M23, 9-pin, straight Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2309-G	6028533
	Head A: female connector, M23, 12-pin, straight Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-G	6027538
		DOS-2312-G02	2077057
	Head A: female connector, M23, 12-pin, angled Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-W01	2072580

	Brief description	Type	Part no.
	Head A: male connector, M12, 8-pin, straight, A-coded Cable: Incremental, shielded	STE-1208-GA01	6044892
	Head A: male connector, M23, 12-pin, straight Cable: HIPERFACE <sup>®</sup> , SSI, Incremental, RS-422, shielded	STE-2312-G	6027537
	Head A: male connector, M23, 12-pin, straight Cable: HIPERFACE <sup>®</sup> , SSI, Incremental, shielded	STE-2312-G01	2077273

## 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](http://www.sick.com)