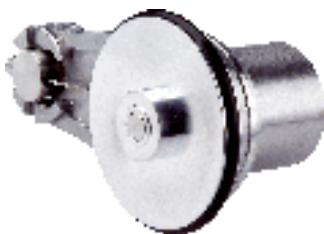


## DBV50E-22GKA2000

DBV50

MEASURING WHEEL ENCODERS

**SICK**  
Sensor Intelligence.



## Ordering information

Type	part no.
DBV50E-22GKA2000	1081174

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

Illustration may differ



## Detailed technical data

## Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	600 years (EN ISO 13849-1) <sup>1)</sup>
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<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.

## Performance

<b>Pulses per revolution</b>	2,000
<b>Resolution in pulses/mm</b>	10
<b>Measuring increment (resolution in mm/pulse)</b>	0.1
<b>Measuring step deviation</b>	± 18° / pulses per revolution
<b>Error limits</b>	± 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>	HTL / Push pull
<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>Power consumption max. without load</b>	≤ 0.5 W
<b>Supply voltage</b>	7 V ... 27 V
<b>Load current max.</b>	30 mA
<b>Maximum output frequency</b>	≤ 300 kHz
<b>Reference signal, number</b>	1

<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.

<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)

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

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

## Mechanical data

<b>Measuring wheel circumference</b>	200 mm
<b>Measuring wheel surface</b>	O-ring NBR70 <sup>1)</sup>
<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>	
Shaft	Stainless steel
Flange	Aluminum
Housing	Aluminum
Cable	PVC
<b>Spring arm mechanism material</b>	
Spring element	Spring steel, anti-corrosive
Measuring wheel, spring arm	Aluminum
<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>2)</sup>
<b>Bearing lifetime</b>	2.0 x 10 <sup>9</sup> revolutions
<b>Maximum travel/deflection of spring arm</b>	14 mm at 14 N spring travel
<b>Recommended pretension</b>	15 N At 10 mm deflection <sup>3)</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>4)</sup>
<b>Mounting position relative to the measuring object</b>	Preferably from above, from below possible <sup>5)</sup>

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

<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
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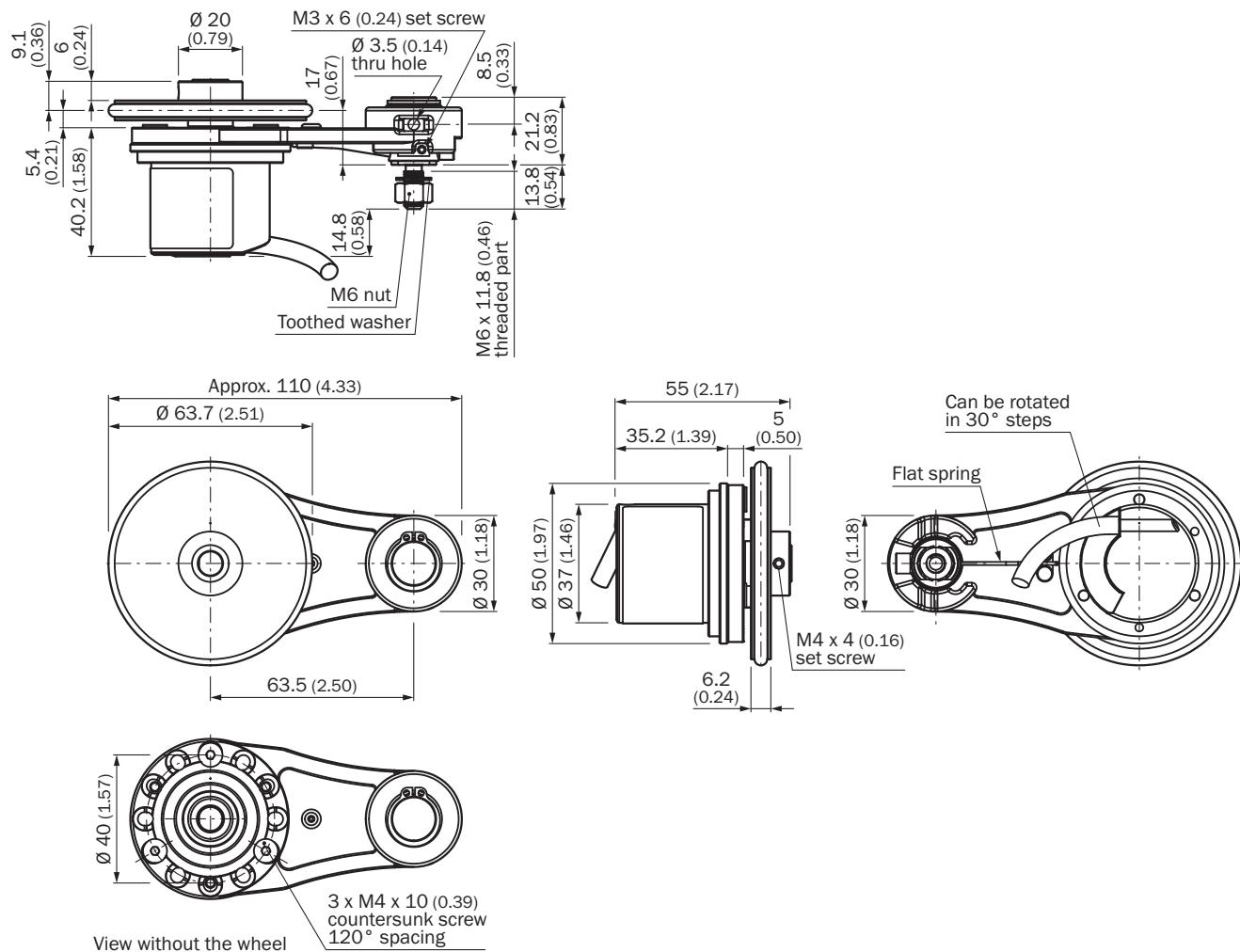
## Certificates

<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>China-RoHS</b>	✓
<b>cRUs certificate</b>	✓
<b>Information according to Art. 3 of Data Act (Regulation EU 2023/2854)</b>	✓

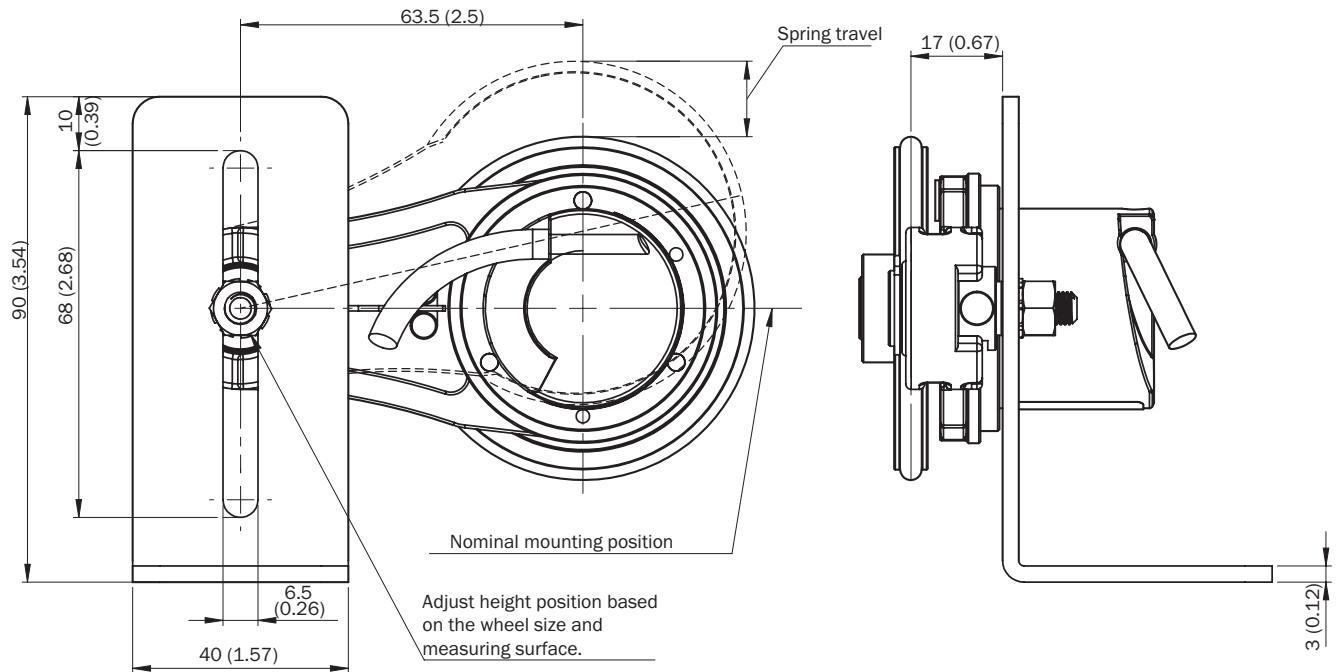
## Classifications

<b>ECLASS 5.0</b>	27270501
<b>ECLASS 5.1.4</b>	27270501
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590
<b>ECLASS 7.0</b>	27270501
<b>ECLASS 8.0</b>	27270501
<b>ECLASS 8.1</b>	27270501
<b>ECLASS 9.0</b>	27270501
<b>ECLASS 10.0</b>	27270790
<b>ECLASS 11.0</b>	27270707
<b>ECLASS 12.0</b>	27270504
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>ETIM 8.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

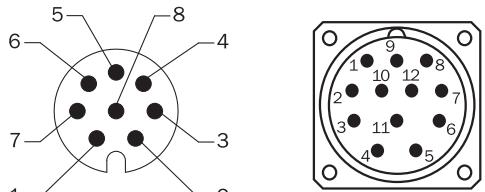
Dimensional drawing 63.5 mm spring arm, encoder on mounting side (left), single wheel



## Attachment specifications

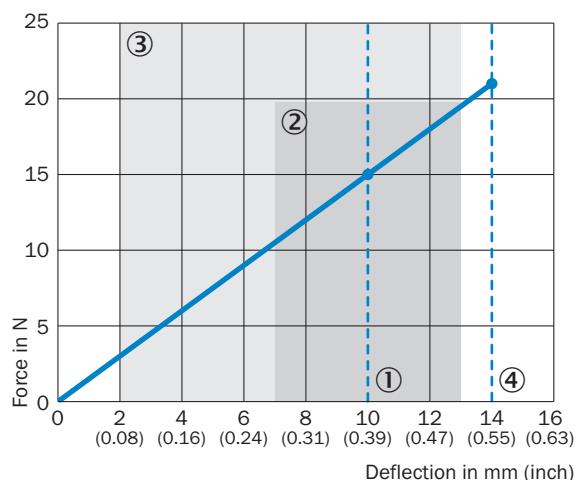


## PIN assignment



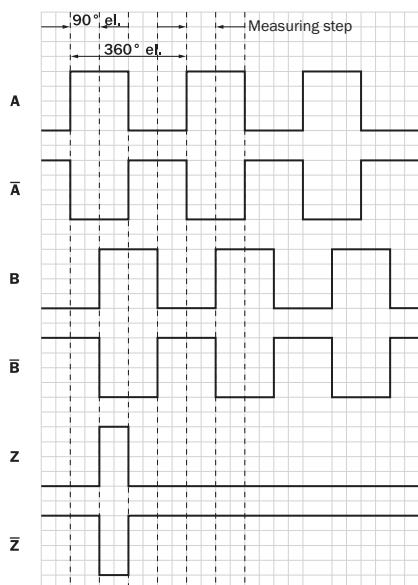
view of M12 male device connector on cable / housing

## 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.

## Recommended accessories

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

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> Flying leads</li> </ul>	DOL-1208-G02MAC1	6032866
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> Flying leads</li> </ul>	DOL-1208-G05MAC1	6032867
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> Flying leads</li> </ul>	DOL-1208-G10MAC1	6032868
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 20 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> Flying leads</li> </ul>	DOL-1208-G20MAC1	6032869
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 25 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> Flying leads</li> </ul>	DOL-1208-G25MAC1	6067859
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Flying leads</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental, HIPERFACE®</li> <li><b>Items supplied:</b> By the meter</li> <li><b>Cable:</b> 8-wire, PUR, halogen-free</li> <li><b>Description:</b> SSI, shielded, Incremental, HIPERFACE®</li> </ul>	LTG-2308-MWENC	6027529
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Flying leads</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental</li> <li><b>Items supplied:</b> By the meter</li> <li><b>Cable:</b> 11-wire, PUR</li> <li><b>Description:</b> SSI, shielded, Incremental</li> </ul>	LTG-2411-MW	6027530
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Flying leads</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental</li> <li><b>Items supplied:</b> By the meter</li> <li><b>Cable:</b> 12-wire, PUR, halogen-free</li> <li><b>Description:</b> SSI, shielded, Incremental</li> </ul>	LTG-2512-MW	6027531
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Flying leads</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, TTL, HTL, Incremental</li> <li><b>Items supplied:</b> By the meter</li> <li><b>Cable:</b> 12-wire, UV and saltwater-resistant, PUR, halogen-free</li> <li><b>Description:</b> SSI, shielded, TTL, HTL, Incremental</li> </ul>	LTG-2612-MW	6028516
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> CAT5, CAT5e</li> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection systems:</b> IDC quick connection</li> <li><b>Permitted cross-section:</b> 0.14 mm² ... 0.34 mm²</li> </ul>	STE-1208-GA01	6044892
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental, RS-422</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncrementalRS-422</li> </ul>	STE-2312-G	6027537

	<b>Brief description</b>	<b>Type</b>	<b>part no.</b>
	<ul style="list-style-type: none"> <li><b>Connection systems:</b> Solder connection</li> <li><b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	STE-2312-G01	2077273
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> CAT5, CAT5e</li> <li><b>Description:</b> Incremental, shieldedSSI</li> <li><b>Connection systems:</b> IDC quick connection</li> <li><b>Permitted cross-section:</b> 0.14 mm<sup>2</sup> ... 0.34 mm<sup>2</sup></li> </ul>	DOS-1208-GA01	6045001
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-G	6027538
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-G02	2077057
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, angled, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-W01	2072580
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M23, 9-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2309-G	6028533

## measuring wheels and measuring wheel mechanics

	<ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Adapter flange for modular measuring wheel system</li> </ul>	BEF-AP-MRS	2084969
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Mounting bracket for encoder with spigot 36 mm</li> </ul>	BEF-WF-MRS	2084709
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminium measuring wheel with O-ring (NBR70) for 8 mm solid shaft, circumference 200 mm</li> </ul>	BEF-MR008020R	2055223
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheel mechanics</li> <li><b>Description:</b> O-ring for measuring wheels (circumference 200 mm)</li> </ul>	BEF-OR-053-040	2064061

## 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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