

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



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	10
Resolution in pulses/mm	0.05
Measuring increment (resolution in mm/pulse)	20
Measuring step deviation	± 18° / pulses per revolution
Error limits	± 0.4 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	Open Collector
Number of signal channels	3 channel

Electrical data

Operating power consumption (no load)	50 mA
Connection type	Cable, 5-wire, universal, 1.5 m ¹⁾
Supply voltage	4.5 V ... 30 V
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	2)

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

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

Mechanical data

Measuring wheel circumference	Without measuring wheel								
Spring arm design	63.5 mm spring arm, encoder on mounting side (left), single wheel								
Mass	+ 300 g								
Encoder material	<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								
Cable	PVC								
Spring arm mechanism material									
Spring element	Spring steel, anti-corrosive								
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 1)}								
Bearing lifetime	2.0 x 10 ⁹ revolutions								
Maximum travel/deflection of spring arm	14 mm with 21 N spring travel								
Recommended pretension	15 N At 10 mm deflection ²⁾								
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 ³⁾								
Mounting position relative to the measuring object	Preferably from above, from below possible ⁴⁾								

¹⁾ No permanent operation. Decreasing signal quality.

²⁾ When measured from the top of the measuring surface.

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

⁴⁾ 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 ... +70 °C
Storage temperature range	-40 °C ... +100 °C, without package

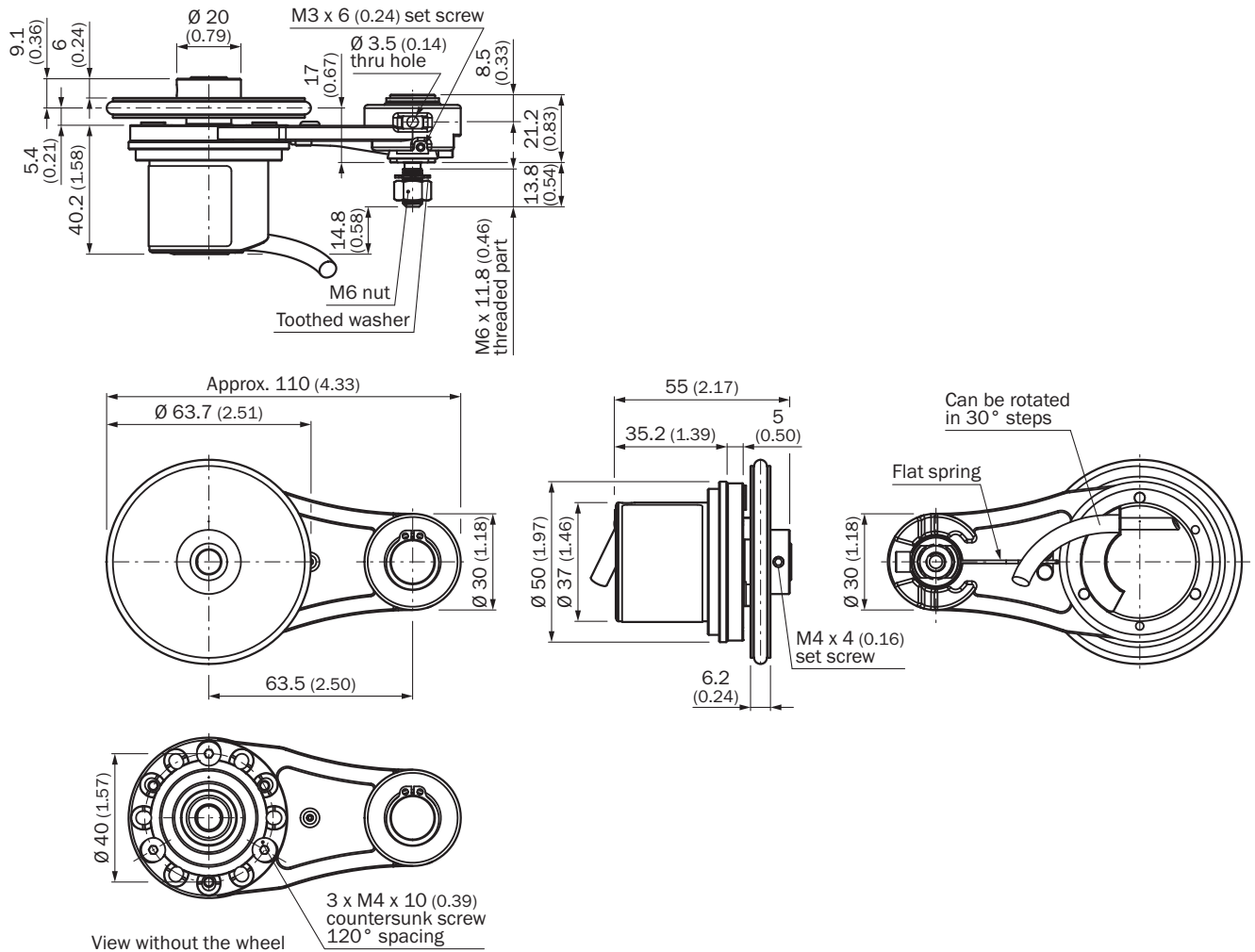
Classifications

ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501

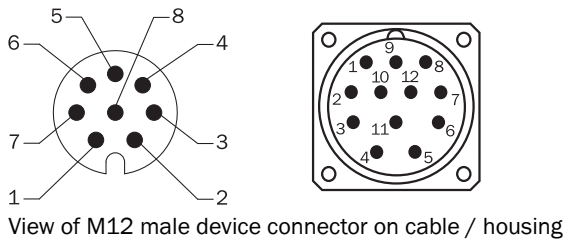
ECLASS 9.0	27270501
ECLASS 10.0	27270790
ECLASS 11.0	27270707
ECLASS 12.0	27270504
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))

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

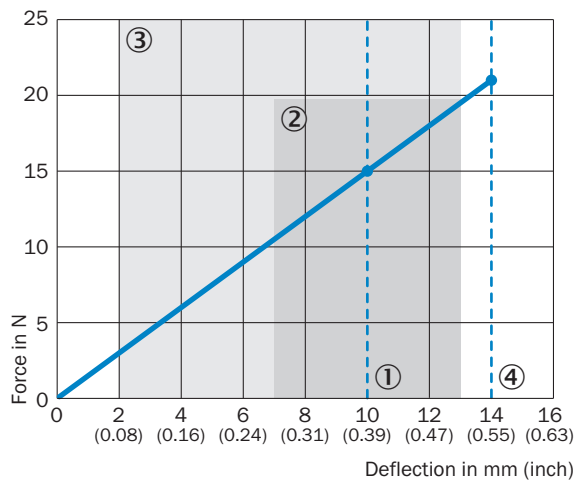


PIN assignment



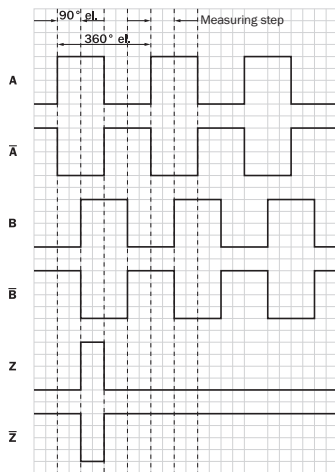
Diagrams

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

	Brief description	Type	Part no.
Flanges			
	Adapter flange for modular measuring wheel system	BEF-AP-MRS	2084969
Mounting brackets and plates			
	Mounting bracket for encoder with spigot 36 mm	BEF-WF-MRS	2084709
Other mounting accessories			
	Aluminium measuring wheel with O-ring (NBR70) for 8 mm solid shaft, circumference 200 mm	BEF-MR008020R	2055223
Others			
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 2 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads 	DOL-1208-G02MAC1	6032866
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 5 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads 	DOL-1208-G05MAC1	6032867
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 10 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads 	DOL-1208-G10MAC1	6032868
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 20 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads 	DOL-1208-G20MAC1	6032869
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 25 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads 	DOL-1208-G25MAC1	6067859

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental, HIPERFACE® • Items supplied: By the meter • Cable: 8-wire, PUR, halogen-free • Description: SSI, Incremental, HIPERFACE®, shielded 	LTG-2308-MWENC	6027529
	<ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 11-wire, PUR • Description: SSI, Incremental, shielded 	LTG-2411-MW	6027530
	<ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 12-wire, PUR, halogen-free • Description: SSI, Incremental, shielded 	LTG-2512-MW	6027531
	<ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, TTL, HTL, Incremental • Items supplied: By the meter • Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free • Description: SSI, TTL, HTL, Incremental, shielded, Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, UV and saltwater resistant, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 2 x 0.14 mm², Ø 7.8 mm 	LTG-2612-MW	6028516
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 8-pin, straight, A-coded • Signal type: Incremental • Cable: CAT5, CAT5e • Description: Incremental, shielded, Head A: male connector, M12, 8-pin, straight, A coded, shielded, for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: -40 °C ... +85 °C • Connection systems: IDC quick connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² 	STE-1208-GA01	6044892
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE®, SSI, Incremental, RS-422 • Description: HIPERFACE®, SSI, Incremental, RS-422, shielded, M23 male connector • Connection systems: Solder connection 	STE-2312-G	6027537
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE®, SSI, Incremental • Description: HIPERFACE®, SSI, Incremental, shielded, Head A: male connector, M23, 12-pin, straight, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: -40 °C ... +125 °C • Connection systems: Solder connection 	STE-2312-G01	2077273
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Signal type: Incremental, SSI • Cable: CAT5, CAT5e • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight, A encoded, shielded, for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: -40 °C ... +85 °C • Connection systems: IDC quick connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² 	DOS-1208-GA01	6045001
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE®, SSI, Incremental • Description: HIPERFACE®, SSI, Incremental, shielded, Head A: female connector, M23, 12-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: Operating temperature: -20 °C ... +130 °C • Connection systems: Solder connection 	DOS-2312-G	6027538

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE[®], SSI, Incremental • Description: HIPERFACE[®], SSI, Incremental, shielded, Head A: female connector, M23, 12-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: -40 °C ... +125 °C • Connection systems: Solder connection 	DOS-2312-G02	2077057
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M23, 12-pin, angled, A-coded • Signal type: HIPERFACE[®], SSI, Incremental • Description: HIPERFACE[®], SSI, Incremental, shielded, Head A: female connector, M23, 12-pin, angled, shielded, for cable diameter 4.2 mm ... 6.6 mm Head B: - Operating temperature: -20 °C ... +130 °C • Connection systems: Solder connection 	DOS-2312-W01	2072580
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M23, 9-pin, straight, A-coded • Signal type: HIPERFACE[®], SSI, Incremental • Description: HIPERFACE[®], SSI, Incremental, shielded, Head A: female connector, M23, 9-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: Operating temperature: -20 °C ... +130 °C • Connection systems: Solder connection 	DOS-2309-G	6028533

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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