

# DBV50E-22ALA2500

DBV50

**MEASURING WHEEL ENCODERS** 





## Ordering information

Туре	part no.
DBV50E-22ALA2500	1092640

Other models and accessories → www.sick.com/DBV50

Illustration may differ



## Detailed technical data

## Safety-related parameters

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

Pulses per revolution	2,500
Resolution in pulses/mm	12.5
Measuring increment (resolution in mm/ pulse)	0.08
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	TTL / RS-422
Number of signal channels	6-channel

#### **Electronics**

Operating power consumption (no load)	50 mA
Connection type	Cable, 8-wire, universal, 3 m <sup>1)</sup>
Supply voltage	4.5 V 5.5 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

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

 $<sup>^{\</sup>rm 2)}$  The short-circuit rating is only given if Us and GND are connected correctly.

Reverse polarity protection	-
Short-circuit protection of the outputs	<b>✓</b> <sup>2)</sup>

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

### Mechanics

Measuring wheel circumference	200 mm	
Measuring wheel surface	O-ring NBR70 <sup>1)</sup>	
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, spring arm	Aluminum	
Start up torque	0.9 Ncm (at 20 °C)	
Operating torque	0.6 Ncm (at 20 °C)	
Operating speed	1,500 min <sup>-1</sup>	
Maximum operating speed	3,000 min <sup>-1 2)</sup>	
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 <sup>3)</sup>	
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 <sup>4)</sup>	
Mounting position relative to the measuring object	Preferably from above, from below possible <sup>5)</sup>	

<sup>1)</sup> 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.

#### 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

 $<sup>^{\</sup>rm 2)}$  The short-circuit rating is only given if Us and GND are connected correctly.

<sup>&</sup>lt;sup>2)</sup> No permanent operation. Decreasing signal quality.

 $<sup>^{\</sup>rm 3)}$  When measured from the top of the measuring surface.

 $<sup>^{4)}</sup>$  One cycle corresponds to an upward and downward movement of  $\pm$  3 mm from the recommended pretension position.

 $<sup>^{5)}</sup>$  When mounted from below, the encoder weight during spring pretensioning must be taken into account.

# DBV50E-22ALA2500 | DBV50

## MEASURING WHEEL ENCODERS

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)

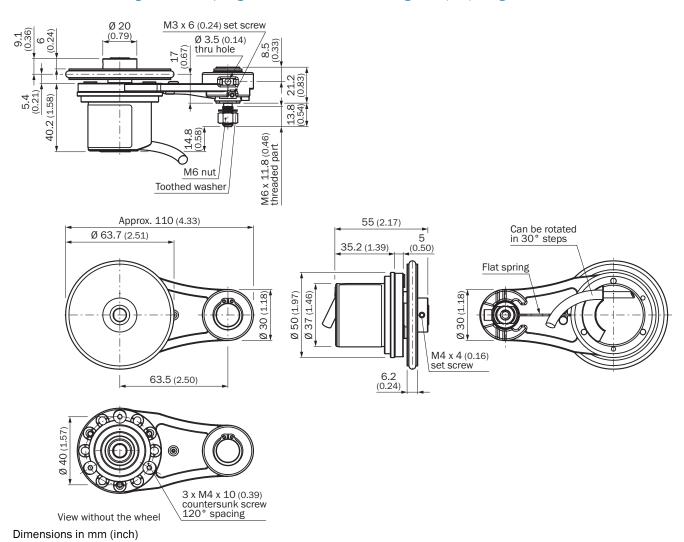
## Certificates

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

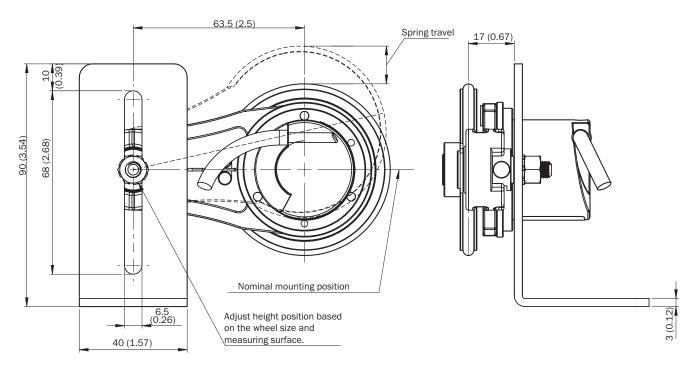
## Classifications

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

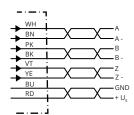
## Dimensional drawing 63.5 mm spring arm, encoder on mounting side (left), single wheel



## Attachment specifications

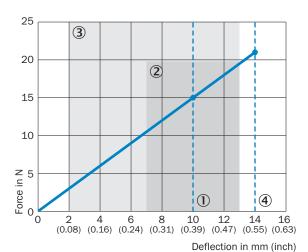


## Anschlussbelegung



Wire colors (ca- ble 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	Α	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	В	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
Red	8	12	+U <sub>s</sub>	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



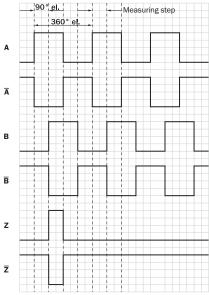
① Proposed Pre-tension: 10 mm

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.

## Recommended accessories

Other models and accessories → www.sick.com/DBV50

	Brief description	Туре	part no.
onnectors a	nd cables		
	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, shielded, SSI Connection systems: Flying leads	DOL-1208-G02MAC1	6032866
TO STATE OF THE ST	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, shielded, SSI Connection systems: Flying leads	DOL-1208-G05MAC1	6032867
TO STATE OF THE ST	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, shielded, SSI Connection systems: Flying leads	DOL-1208-G10MAC1	6032868
10	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, shielded, SSI Connection systems: Flying leads	DOL-1208-G20MAC1	6032869
	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, shielded, SSI Connection systems: Flying leads	DOL-1208-G25MAC1	6067859
<u></u>	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, shielded, Incremental, HIPERFACE®	LTG-2308-MWENC	6027529
<u></u>	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, shielded, Incremental	LTG-2411-MW	6027530
_	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, shielded, Incremental	LTG-2512-MW	6027531
	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, shielded, TTL, HTL, Incremental	LTG-2612-MW	6028516
	Connection type head A: Male connector, M12, 8-pin, straight, A-coded Signal type: Incremental Cable: CAT5, CAT5e Description: Incremental, shielded Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² 0.34 mm²	STE-1208-GA01	6044892
	<ul> <li>Connection type head A: Male connector, M23, 12-pin, straight, A-coded</li> <li>Signal type: HIPERFACE<sup>®</sup>, SSI, Incremental, RS-422</li> <li>Description: HIPERFACE<sup>®</sup>, shieldedSSIIncrementalRS-422</li> </ul>	STE-2312-G	6027537

	Brief description	Туре	part no.
	Connection systems: Solder connection		
	Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection	STE-2312-G01	2077273
	Connection type head A: Female connector, M12, 8-pin, straight, A-coded Signal type: Incremental, SSI Cable: CAT5, CAT5e Description: Incremental, shieldedSSI Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² 0.34 mm²	DOS-1208-GA01	6045001
	Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE <sup>®</sup> , SSI, Incremental Description: HIPERFACE <sup>®</sup> , shieldedSSIIncremental Connection systems: Solder connection	DOS-2312-G	6027538
	Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection	DOS-2312-G02	2077057
(H)=()	<ul> <li>Connection type head A: Female connector, M23, 12-pin, angled, A-coded</li> <li>Signal type: HIPERFACE<sup>®</sup>, SSI, Incremental</li> <li>Description: HIPERFACE<sup>®</sup>, shieldedSSIIncremental</li> <li>Connection systems: Solder connection</li> </ul>	DOS-2312-W01	2072580
	<ul> <li>Connection type head A: Female connector, M23, 9-pin, straight, A-coded</li> <li>Signal type: HIPERFACE<sup>®</sup>, SSI, Incremental</li> <li>Description: HIPERFACE<sup>®</sup>, shieldedSSIIncremental</li> <li>Connection systems: Solder connection</li> </ul>	DOS-2309-G	6028533
measuring wh	neels and measuring wheel mechanics		
	<ul> <li>Product segment: Measuring wheels and measuring wheel mechanics</li> <li>Product family: Measuring wheels</li> <li>Description: Adapter flange for modular measuring wheel system</li> </ul>	BEF-AP-MRS	2084969
	<ul> <li>Product segment: Measuring wheels and measuring wheel mechanics</li> <li>Product family: Measuring wheels</li> <li>Description: Mounting bracket for encoder with spigot 36 mm</li> </ul>	BEF-WF-MRS	2084709
	Product segment: Measuring wheels and measuring wheel mechanics Product family: Measuring wheels Description: Aluminium measuring wheel with 0-ring (NBR70) for 8 mm solid shaft, circumference 200 mm	BEF-MR008020R	2055223
	<ul> <li>Product segment: Measuring wheels and measuring wheel mechanics</li> <li>Product family: Measuring wheel mechanics</li> <li>Description: O-ring for measuring wheels (circumference 200 mm)</li> </ul>	BEF-OR-053-040	2064061

## SICK AT A GLANCE

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For us, that is "Sensor Intelligence."

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