

DBS36E-S3AQ02500

DBS36 Core

INCREMENTAL ENCODERS





Ordering information

Туре	Part no.
DBS36E-S3AQ02500	1088014

Other models and accessories → www.sick.com/DBS36_Core



Illustration may differ

Detailed technical data

Performance

Pulses per revolution	2,500
Measuring step	90° electric/pulses per revolution
Measuring step deviation	± 18° / pulses per revolution
Error limits	± 54° / pulses per revolution
Duty cycle	≤ 0.5 ± 5 %

Interfaces

Communication interface	Incremental
Communication Interface detail	TTL / RS-422
Number of signal channels	6-channel
Initialization time	< 3 ms
Output frequency	≤ 300 kHz
Load current	≤ 30 mA
Operating current	≤ 50 mA (without load)
4.5 V 5.5 V, TTL/RS-422	
Load current	≤ 30 mA
Operating current	≤ 50 mA (without load)
4.5 V 5.5 V, Open Collector	
Load current	≤ 30 mA
Operating current	≤ 50 mA (without load)
TTL/RS-422	
Load current	≤ 30 mA
HTL/Push pull	
Load current	≤ 30 mA
TTL/HTL	
Load current	≤ 30 mA
Open Collector	
Load current	≤ 30 mA

Electrical data

Connection type	Cable, 8-wire, with male connector, M23, 12-pin, universal, 0.5 m ¹⁾
Supply voltage	4.5 5.5 V
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Short-circuit protection of the outputs	✓ ²⁾
MTTFd: mean time to dangerous failure	600 years (EN ISO 13849-1) 3)

¹⁾ M23 male connector for central mounting.

Mechanical data

Mechanical design	Solid shaft, face mount flange
Shaft diameter	6 mm
Wavelength	12 mm
Weight	+ 150 g (with connecting cable)
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	+ 0.5 Ncm (+20 °C)
Operating torque	0.4 Ncm (+20 °C)
Permissible shaft loading radial/axial	40 N (radial) ¹⁾ 20 N (axial)
Operating speed	6,000 min ^{-1 2)}
Maximum operating speed	≤ 8,000 min ^{-1 3)}
Moment of inertia of the rotor	0.6 gcm ²
Bearing lifetime	2 x 10^9 revolutions
Angular acceleration	≤ 500,000 rad/s²

¹⁾ Higher values are possible using limited bearing life.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 (class A)
Enclosure rating	IP65
Permissible relative humidity	90 % (condensation of the optical scanning 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)

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

³⁾ 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.

 $^{^{2)}}$ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

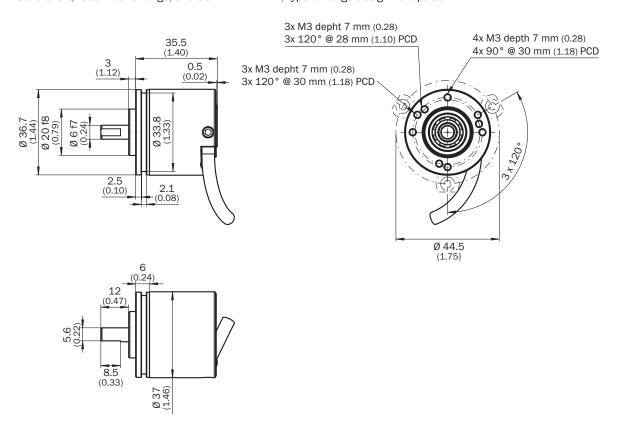
 $^{^{}m 3)}$ No permanent operation. Decreasing signal quality.

Classifications

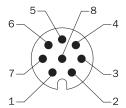
ECI@ss 5.0	27270501
ECI@ss 5.1.4	27270501
ECI@ss 6.0	27270590
ECI@ss 6.2	27270590
ECI@ss 7.0	27270501
ECI@ss 8.0	27270501
ECI@ss 8.1	27270501
ECI@ss 9.0	27270501
ECI@ss 10.0	27270501
ECI@ss 11.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
UNSPSC 16.0901	41112113

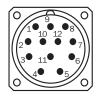
Dimensional drawing (Dimensions in mm (inch))

Solid shaft, face mount flange, shaft 6 mm x 12 mm, type 0 flange design hole pattern



PIN assignment



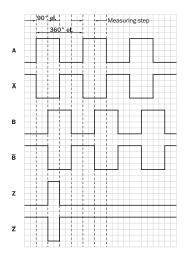


View of M12 / M23 male device connector on cable / housing

Wire colors (ca- ble connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	HTL/OC 3- channel signal	TTL/HTL 6- channel signal	Explanation
Brown	1	6	N.C.	Α-	Signal wire
White	2	5	A	Α	Signal wire
Black	3	1	N.C.	B-	Signal wire
Pink	4	8	В	В	Signal wire
Yellow	5	4	N.C.	Z-	Signal wire
Purple	6	3	Z	Z	Signal wire
Blue	7	10	GND	GND	Ground connection
Red	8	12	U _S	Us	Supply voltage
-	-	9	N.C.	N.C.	Not assigned
-	-	2	N.C.	N.C.	Not assigned
-	-	11	N.C.	N.C.	Not assigned
-	-	7	N.C.	N.C.	Not assigned
Screen	Screen	Screen	Screen	Screen	Screen connected to encoder housing

Diagrams

Signal outputs for electrical interfaces TTL and HTL



Cw with view on the encoder shaft in direction "A", compare dimensional drawing. ① Interfaces G, P, R only for channels A, B, Z.

Supply voltage	Output
4.5 V5.5 V	TTL/RS422

Supply voltage	Output	
7 V30 V	TTL/RS422	
7 V30 V	HTL/Push Pull	
7 V27 V HTL/push pull, 3 channel		
4.5 V5.5 V	Open Collector NPN, 3 channel	
4.5 V30 V	Open Collector NPN, 3 channel	

Recommended accessories

Other models and accessories → www.sick.com/DBS36_Core

	Brief description	Туре	Part no.		
Flanges	Flanges				
0,=	Flange adapter, adapts face mount flange with 20 mm centering collar to 33 mm servo flange, Aluminum	BEF-FA-020-033	2066312		
Other mount	ing accessories				
	Aluminium measuring wheel with 0-ring (NBR70) for 6 mm solid shaft, circumference 200 mm $$	BEF-MR006020R	2055222		
	Measuring wheel with 0-ring (NBR70) for 6 mm solid shaft, circumference 300 mm	BEF-MR006030R	2055634		
	Aluminium measuring wheel with 0-ring (NBR70) for 6 mm solid shaft, circumference 500 mm $$	BEF-MR006050R	2055225		
	Aluminum measuring wheel with cross-knurled surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AK	4084745		
	Aluminum measuring wheel with smooth polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AP	4084746		
	Aluminum measuring wheel with ridged polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APG	4084748		
	Aluminum measuring wheel with studded polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APN	4084747		
	O-ring for measuring wheels (circumference 200 mm)	BEF-OR-053-040	2064061		
	0-ring for measuring wheels (circumference 300 mm)	BEF-0R-083-050	2064076		
	O-ring for measuring wheels (circumference 500 mm)	BEF-OR-145-050	2064074		
Shaft adapta	tion				
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial \pm 0.25 mm, axial \pm 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981		
	Cross-slotted coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial \pm 0.3 mm, axial \pm 0.2 mm, angle \pm 3°; max. speed 10,000 rpm, –10° to +80 °C, max. torque 80 Ncm; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0606-S	2056406		
	Bar coupling, shaft diameter 6 mm /8 mm, maximum shaft offset radial \pm 0.3 mm, axial \pm 0.2 mm, angle \pm 3°, max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0608-S	5314179		

	Brief description	Туре	Part no.
	Bellows coupling, shaft diameter 6 mm $/$ 10 mm, maximum shaft offset: radial \pm 0.25 mm, axial \pm 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Double loop coupling, shaft diameter 6 mm $/$ 10 mm, max. shaft offset: radially $+/$ -2,5 mm, axially $+/$ -3 mm, angle $+/$ -10 degrees;max. speed 3.000 rpm, $-$ 30 to $+$ 80 degrees Celsius, torsional spring stiffness of 25 Nm/rad	KUP-0610-D	5326697
(°	Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, -10° to +80 $^\circ$ C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985
0	Bar coupling, shaft diameter 6 mm $/$ 10 mm, max. shaft offset: radial \pm 0,3 mm, axial \pm 0,3 mm, angular \pm 3°; max. speed 10.000 rpm, -10 ° to $+80$ °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub	KUP-0610-S	2056407
Plug connecto	ors and cables		
<u></u>	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
<u></u>	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, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 2 m	DOL-2312-G02MLA3	2030682
->	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 3 m	DOL-2312- G03MMA3	2029213
	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 5 m	DOL-2312- G05MMA3	2029214
	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 7 m	DOL-2312-G07MLA3	2030685
	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 10 m	DOL-2312-G10MLA3	2030688
->	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 10 m	DOL-2312- G10MMA3	2029215
	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 15 m	DOL-2312-G15MLA3	2030692
->	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 1.5 m	DOL-2312- G1M5MA3	2029212
->	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 20 m	DOL-2312-G20MLA3	2030695

DBS36E-S3AQ02500 | DBS36 Core INCREMENTAL ENCODERS

	Brief description	Туре	Part no.
-	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 20 m	DOL-2312- G20MMA3	2029216
-	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 25 m	DOL-2312-G25MLA3	2030699
	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 30 m	DOL-2312-G30MLA3	2030702
-	Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 30 m	DOL-2312- G30MMA3	2029217
	Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE [®] , SSI, Incremental, shielded	DOS-2312-G02	2077057
(H-0)	Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE [®] , SSI, Incremental, shielded	DOS-2312-W01	2072580

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