

ONLINE DATA SHEET
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Incremental encoders
DBS60 Core, Rotary

DBS60E-S4AK02000



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DBS60 Core, Rotary

Model Name	**> DBS60E-S4AK02000**
Part No.	**> 1069720**





Illustration may differ

At a glance

- Face mount flange, servo flange, blind and through hollow shaft
- Housing unit: Ø58 mm; compact mounting depth, large bearing distance
- Flange and stator couplings enable diverse mounting options
- Resolution: up to 5,000 pulses
- Cable outlet, radial M23 or M12 connector
- TTL/RS-422 and HTL/push-pull, universal TTL/HTL interface with 4.5 V DC to 30 V DC
- Hollow shafts: metal up to Ø5/8", insulated up to Ø15 mm; front and rear clamping

Your benefits

- Diverse installation options due to different flange and shaft versions
- The universal cable outlet and radial connector allow use in tight spaces and makes flexible cable routing possible
- Compact housing dimensions save valuable space. The optional hollow shaft clamp on the back facilitates mounting.
- Protection of the encoder against high shaft temperatures and currents through optional isolated shafts
- Flanges and stator couplings with different mounting holes allow diverse mounting options with one encoder version
- Rugged design with large bearing distance allows high shaft loads and a longer service life
- The TTL/HTL combination interface enables less product variety and reduces storage costs

Performance

Error limits:	Measuring step deviation x 3
Measuring step deviation:	± 18 °/impulses per relovution
Measuring step:	90 °/electronically/pulses per revolution
Initialization time:	< 5 ms [1)]
Pulses per revolution:	2,000 [2)]
Duty cycle:	≤ 0.5 ± 5 %

[1)] Valid signals can be read once this time has elapsed [2)] Available pulses per revolution see type code

Mechanical data

Mechanical interface:	Solid shaft, Face mount flange
Shaft diameter:	10 mm x 19 mm [1)]

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Mass:	0.3 kg [2]
Start up torque:	1.2 Ncm (+20 °C)
Operating torque:	1.1 Ncm (+20 °C)
Maximum operating speed:	9,000 /min [3]
Moment of inertia of the rotor:	33 gcm²
Bearing lifetime:	3.6 x 10^9 revolutions
Max. angular acceleration:	500,000 rad/s²
Permissible shaft loading radial/axial::	100 N (radial), 50 N (axial) [4] [5]
Shaft material:	Stainless steel
Operating speed:	6,000 /min [6]
Flange material:	Aluminum
Housing material:	Aluminum
Material, cable:	PVC

[1] Others on request [2] For an encoder with connector outlet or cable with connector outlet [3] Maximum speed where no mechanical damage on the encoder will happen. Reduced life time and lower signal quality possible. Note max. output frequency. [4] [5] Higher values are possible using limited bearing life [6] Self warming of 3.2 K per 1000 revolutions/min when applying note working temperature range

Electrical data

Electrical interface:	4.5 V ... 5.5 V, TTL/RS422 [1]
Electrical connection:	Cable, 8-wire, universal, 1.5 m [2]
Operating power consumption (no load):	≤ 50 mA
Output current:	≤ 30 mA, per channel
Maximum output frequency:	300 kHz [3]
Reference signal, number:	1
Reference signal, position:	90 °, electronically, gated with A and B
MTTFd: mean time to dangerous failure:	500 a (EN ISO 13849-1) [4]
Short-circuit protection of the outputs:	1 [5]
Reverse polarity protection:	1

[1] With 6-channels unless noted [2] The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it [3] Up to 450 kHz on request [4] 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. [5] Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against U_S.

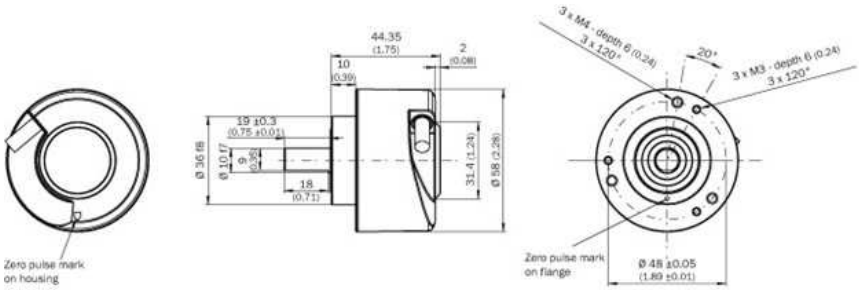
Ambient data

EMC:	(according to EN 61000-6-2 and EN 61000-6-3)
Working temperature range:	-20 °C ... +85 °C [1]
Storage temperature range:	-40 °C ... +100 °C, without package
Resistance to shocks:	250 g, 3 ms (according to EN 60068-2-27)
Resistance to vibration:	30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)
Enclosure rating:	IP 65 (according to IEC 60529), shaft side, IP 67 (according to IEC 60529), housing side [2]
Permissible relative humidity:	90 % (condensation of the optical scanning not permitted)

[1] These values relate to all mechanical versions including recommended accessories unless otherwise noted. [2] With mating connector fitted

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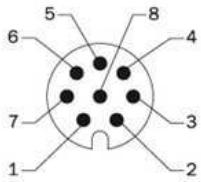
Dimensional drawing



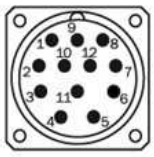
PIN assignment

8-core cable

View of M12 device connector on cable



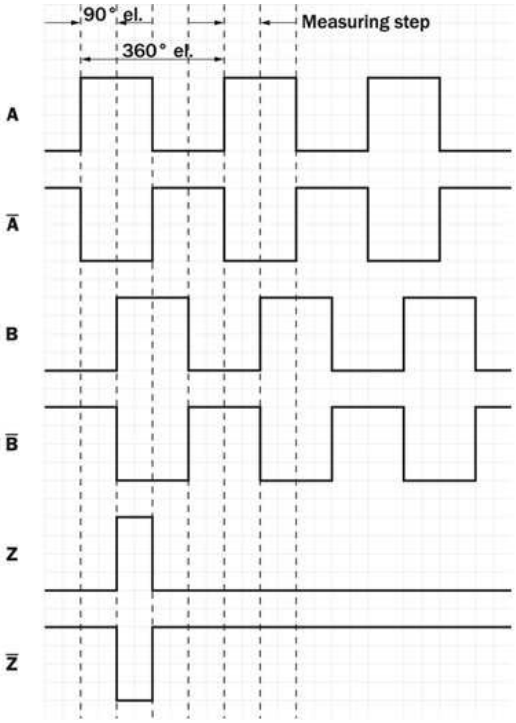
View of M23 device connector on cable



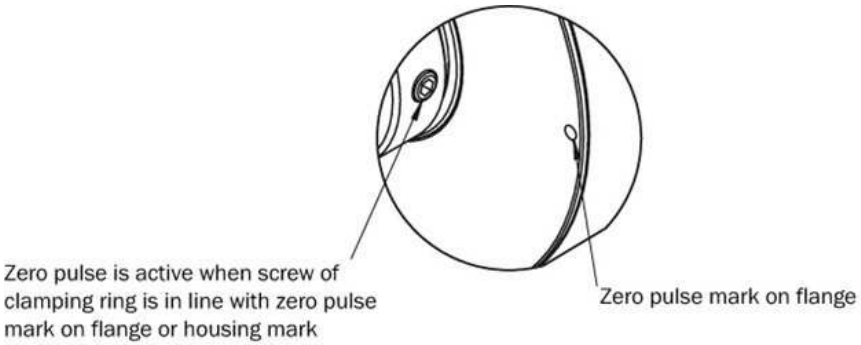
Colour of wires	Pin 12-pole in M12	Pin 12-pole in M23	Signal OC	Signal TTL; HTL	Explanation
Brown	1	6	Not connected	A-	Signal line
White	2	5	A	A	Signal line
Black	3	1	Not connected	B-	Signal line
Pink	4	8	B	B	Signal line
Yellow	5	4	Not connected	Z-	Signal line
Lilac	6	3	Z	Z	Signal line
Blue	7	10	GND	GND	Ground connection of the Encoder
Red	8	12	+Us	+Us	Supply voltage
-	-	9	Not connected	Not connected	Not connected
-	-	2	Not connected	Not connected	Not connected
-	-	11	Not connected	Not connected	Not connected
-	-	7	Not connected	Not connected	Not connected
Screen	Screen	Screen	Screen	Screen	Screen (Screen connected to Encoder housing.

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Signalausgänge

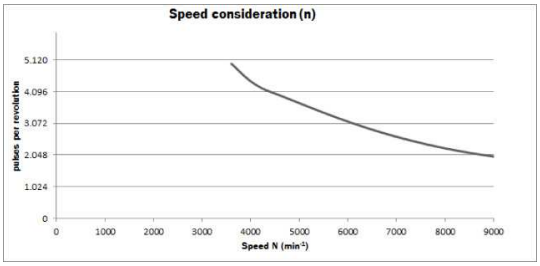


Zero pulse explanation



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Drehzahlbetrachtung



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