



# DBS60I-BEFM01024

DBS60 Inox

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	Part no.
DBS60I-BEFM01024	1089717

Other models and accessories → [www.sick.com/DBS60\\_Inox](http://www.sick.com/DBS60_Inox)

### Detailed technical data

#### Performance

<b>Pulses per revolution</b>	1,024
<b>Measuring step</b>	90° electric/pulses per revolution
<b>Measuring step deviation</b>	± 18° / pulses per revolution
<b>Error limits</b>	Measuring step deviation x 3
<b>Duty cycle</b>	≤ 0.5 ± 5 %

#### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	TTL / HTL <sup>1)</sup>
<b>Number of signal channels</b>	6-channel
<b>Initialization time</b>	< 5 ms <sup>2)</sup>
<b>Output frequency</b>	≤ 300 kHz <sup>3)</sup>
<b>Load current</b>	≤ 30 mA, per channel
<b>Power consumption</b>	≤ 0.5 W (without load)
<b>4.5 V... 5.5 V, TTL/RS-422</b>	
Load current	≤ 30 mA, per channel
<b>4.5 V ... 5.5 V, Open Collector</b>	
Load current	≤ 30 mA, per channel
<b>TTL/RS-422</b>	
Load current	≤ 30 mA, per channel
Power consumption	≤ 0.5 W (without load)
<b>HTL/Push pull</b>	
Load current	≤ 30 mA, per channel

<sup>1)</sup> Output level depends on the supply voltage.

<sup>2)</sup> Valid signals can be read once this time has elapsed.

<sup>3)</sup> Up to 450 kHz on request.

	Power consumption	≤ 0.5 W (without load)
<b>TTL/HTL</b>	Load current	≤ 30 mA, per channel
	Power consumption	≤ 0.5 W (without load)
<b>Open Collector</b>	Load current	≤ 30 mA, per channel
	Power consumption	≤ 0.5 W (without load)

1) Output level depends on the supply voltage.

2) Valid signals can be read once this time has elapsed.

3) Up to 450 kHz on request.

## Electrical data

<b>Connection type</b>	Cable, 8-wire, radial, 5 m
<b>Supply voltage</b>	4.5 ... 30 V
<b>Reference signal, number</b>	1
<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>	✓ <sup>1)</sup>
<b>MTTFd: mean time to dangerous failure</b>	500 years (EN ISO 13849-1) <sup>2)</sup>

1) Short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

2) 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.

## Mechanical data

<b>Mechanical design</b>	Blind hollow shaft
<b>Shaft diameter</b>	12 mm
<b>Flange type / stator coupling</b>	2-sided stator coupling, slot, screw hole circle 63–83 mm
<b>Weight</b>	0.44 kg <sup>1)</sup>
<b>Shaft material</b>	Stainless steel V2A
<b>Flange material</b>	Stainless steel V2A
<b>Housing material</b>	Stainless steel V2A
<b>Material, cable</b>	PVC
<b>Shaft sealing ring material</b>	FKM80
<b>Material, cable gland</b>	Stainless steel V2A / Nickel-plated brass
<b>Start up torque</b>	2.1 Ncm (+20 °C)
<b>Operating torque</b>	2 Ncm (+20 °C)
<b>Permissible shaft movement, axial static/dynamic</b>	± 0.5 mm / ± 0.2 mm
<b>Permissible shaft movement, radial static/dynamic</b>	± 0.3 mm / ± 0.1 mm
<b>Operating speed</b>	≤ 6,000 min <sup>-1</sup> <sup>2)</sup>

1) Relates to encoders with male connector.

2) Maximum speed which does not cause mechanical damage to the encoder. Impact on the service life and signal quality is possible. Please note the maximum output frequency.

<b>Moment of inertia of the rotor</b>	52 gcm <sup>2</sup>
<b>Bearing lifetime</b>	3.6 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

<sup>1)</sup> Relates to encoders with male connector.

<sup>2)</sup> Maximum speed which does not cause mechanical damage to the encoder. Impact on the service life and signal quality is possible. Please note the maximum output frequency.

### Ambient data

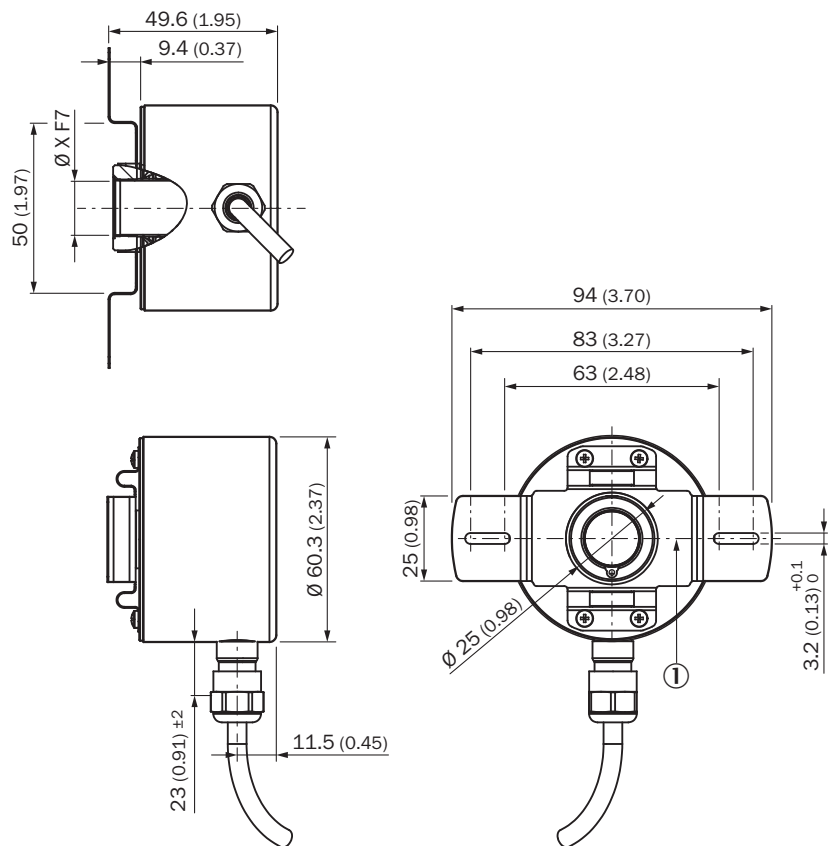
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating</b>	IP67, cable connection (according to IEC 60529)
<b>Permissible relative humidity</b>	90 % (condensation of the optical scanning not permitted)
<b>Operating temperature range</b>	-30 °C ... +100 °C, at maximum 3,000 pulses per revolution
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	100 g, 6 ms (according to EN 60068-2-27)
<b>Resistance to vibration</b>	10 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

### Classifications

<b>ECl@ss 5.0</b>	27270501
<b>ECl@ss 5.1.4</b>	27270501
<b>ECl@ss 6.0</b>	27270590
<b>ECl@ss 6.2</b>	27270590
<b>ECl@ss 7.0</b>	27270501
<b>ECl@ss 8.0</b>	27270501
<b>ECl@ss 8.1</b>	27270501
<b>ECl@ss 9.0</b>	27270501
<b>ECl@ss 10.0</b>	27270501
<b>ECl@ss 11.0</b>	27270501
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

Dimensional drawing (Dimensions in mm (inch))

Blind hollow shaft, cable, 2-sided stator coupling, slot, screw hole circle 63-83 mm

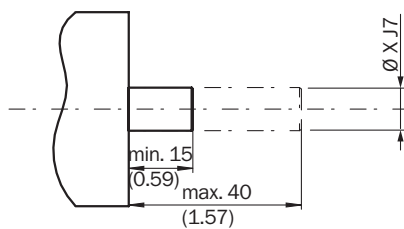


① Zero pulse mark on flange

Type Blind hollow shaft	Shaft diameter XF7
DBS60I-BAxxxxxxx	6 mm
DBS60I-BBxxxxxxx	8 mm
DBS60I-BDxxxxxxx	10 mm
DBS60I-BExxxxxxx	12 mm
DBS60I-BGxxxxxxx	14 mm
DBS60I-BHxxxxxxx	15 mm

Attachment specifications

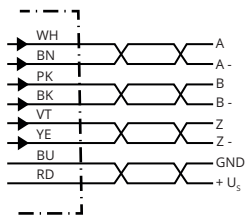
Blind hollow shaft



Customer side

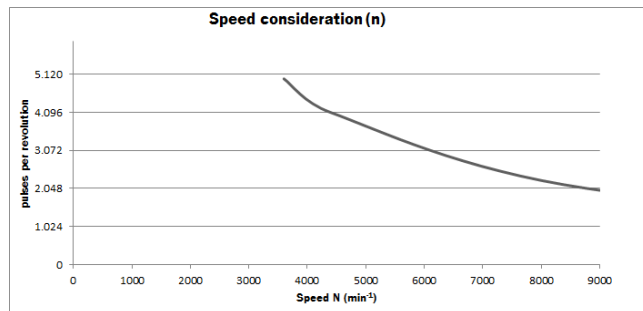
Type Blind hollow shaft	Shaft diameter xj7
DBS60I-BAxxxxxxx	6 mm
DBS60I-BBxxxxxxx	8 mm
DBS60I-BDxxxxxxx	10 mm
DBS60I-BExxxxxxx	12 mm
DBS60I-BGxxxxxxx	14 mm
DBS60I-BHxxxxxxx	15 mm

### PIN assignment



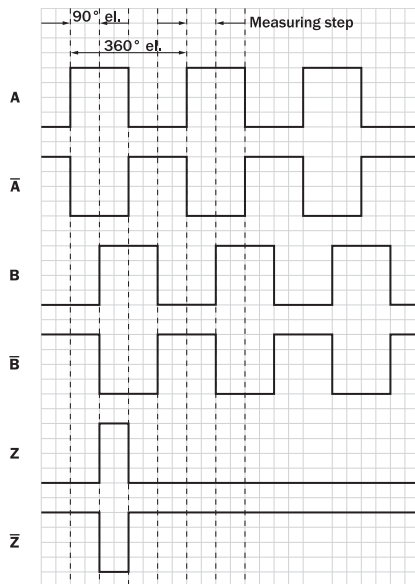
Wire colors (cable connection)	Male connector M12, 8-pin	TTL/HTL signal	Explanation
Brown	1	A-	Signal cable
White	2	A	Signal cable
Black	3	B-	Signal cable
Pink	4	B	Signal cable
Yellow	5	Z-	Signal cable
Purple	6	Z	Signal cable
Blue	7	GND	Ground connection
Red	8	+U <sub>s</sub>	Supply voltage
Screen	Screen	Screen	Screen connected to housing on encoder side

### Maximum revolution range



## Signal outputs

Signal outputs for electrical interfaces TTL and HTL













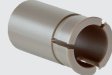
Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

Supply voltage	Output
4,5 V ... 5,5 V	TTL
10 V ... 30 V	TTL
10 V ... 27 V	HTL
4,5 V ... 30 V	TTL/HTL universal
4,5 V ... 30 V	TTL

## Recommended accessories

Other models and accessories → [www.sick.com/DBS60\\_Inox](http://www.sick.com/DBS60_Inox)

	Brief description	Type	Part no.
Flanges			
	<ul style="list-style-type: none"> <li><b>Description:</b> Two-sided stator coupling, screw hole circle diameter 63 mm, slot width 3.2 mm</li> </ul>	BEF-DS-09	2076214
	<ul style="list-style-type: none"> <li><b>Description:</b> Two-sided stator coupling, slot, slot radius 63 mm – 83 mm, slot width 3.2 mm</li> </ul>	BEF-DS-10	2076215
	<ul style="list-style-type: none"> <li><b>Description:</b> One-sided stator coupling, slots, slot radius 32.75 mm – 142.65 mm, slot width 4.5 mm</li> </ul>	BEF-DS-11	2076216
	<ul style="list-style-type: none"> <li><b>Description:</b> Torque support, 1-sided, slotted hole, screw hole radius 31.5 mm - 48.5 mm, hole width 5.1 mm</li> </ul>	BEF-DS-12	2076217
	<ul style="list-style-type: none"> <li><b>Description:</b> One-sided stator coupling, slot, slot radius 32.1 mm – 37.6 mm, slot width 4.5 mm</li> </ul>	BEF-DS-14	2076678

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange</li> <li><b>Material:</b> Stainless steel</li> <li><b>Items supplied:</b> Including 3 countersunk screws with Precote 85-8 coating; M4*12</li> </ul>	BEF-FA-036-050-I	2094778
Plug connectors and cables			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Cable</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental, HIPERFACE®</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> Cable</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental</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> Cable</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, TTL, HTL, Incremental</li> <li><b>Cable:</b> 12-wire, UV and saltwater-resistant, PUR, halogen-free</li> <li><b>Description:</b> SSI, 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 mm<sup>2</sup> + 2 x 0.5 mm<sup>2</sup> + 2 x 0.14 mm<sup>2</sup>, Ø 7.8 mm, 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>Connection type head B:</b> -</li> <li><b>Authorizations:</b> UL</li> <li><b>Description:</b> Shielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.5 mm<sup>2</sup></li> <li><b>Application:</b> Hygienic and washdown zones</li> </ul>	YM12ES8-0050S5586A	2097337
Shaft adaptation			
	<ul style="list-style-type: none"> <li><b>Description:</b> Collet metal for hollow shaft, shaft diameter 12 mm, outer diameter 5/8" (15.875 mm)</li> </ul>	SPZ-58Z-012-M	2076221
	<ul style="list-style-type: none"> <li><b>Description:</b> Collet plastic insulated for hollow shaft, shaft diameter 12 mm, outer diameter 5/8" (15.875 mm)</li> </ul>	SPZ-58Z-012-P	2076231



## 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.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)