

# DBS60E-B4FA0S115

DBS60

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	part no.
DBS60E-B4FA0S115	1105585

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

### Detailed technical data

#### Features

<b>Special device</b>	✓
<b>Specialty</b>	Stator coupling (2076215) premounted, no SICK logo on packaging and operating instruction, customized label with Mita logo instead of SICK, no operating instruction in the packaging SICK will inform customer Mita if any technical data need to be changed or if any hardware or software is changed
<b>Standard reference device</b>	DBS60E-B4FA01024, 1094491

#### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	500 years (EN ISO 13849-1) <sup>1)</sup>
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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

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

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

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

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

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

## Electronics

<b>Connection type</b>	Male connector, M23, 12-pin, radial
<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>

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

## Mechanics

<b>Mechanical design</b>	Blind hollow shaft
<b>Shaft diameter</b>	10 mm Front clamp
<b>Flange type / stator coupling</b>	2-sided stator coupling, slot, screw hole circle 63–83 mm
<b>Weight</b>	+ 0.25 kg <sup>1)</sup>
<b>Shaft material</b>	Stainless steel with plastic collet
<b>Flange material</b>	Alu Alloy EN AW 6061-T6
<b>Housing material</b>	Aluminum die cast
<b>Start up torque</b>	+ 0.5 Ncm (+20 °C)
<b>Operating torque</b>	0.4 Ncm (+20 °C)
<b>Permissible movement static</b>	± 0.3 mm (radial) ± 0.5 mm (axial) <sup>2)</sup>
<b>Permissible movement dynamic</b>	± 0.1 mm (radial) ± 0.2 mm (axial) <sup>2)</sup>
<b>Operating speed</b>	6,000 min <sup>-1</sup> <sup>3)</sup>
<b>Maximum operating speed</b>	9,000 min <sup>-1</sup> <sup>4)</sup>
<b>Moment of inertia of the rotor</b>	50 gcm <sup>2</sup>
<b>Bearing lifetime</b>	3.6 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 200,000 rad/s <sup>2</sup>

<sup>1)</sup> Based on encoder with male connector.

<sup>2)</sup> Not applicable for stator coupling type C and K.

<sup>3)</sup> Allow for self-heating of 2.6 K per 1,000 rpm when designing the operating temperature range.

<sup>4)</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, housing side (IEC 60529) <sup>1)</sup>

<sup>1)</sup> With mating connector fitted.

<sup>2)</sup> These values relate to all mechanical versions including recommended accessories unless otherwise noted.

	IP65, shaft side (IEC 60529)
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-30 °C ... +100 °C, at maximum 3,000 pulses per revolution <sup>2)</sup>
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	200 g, 3 ms (EN 60068-2-27)
<b>Resistance to vibration</b>	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

<sup>1)</sup> With mating connector fitted.

<sup>2)</sup> These values relate to all mechanical versions including recommended accessories unless otherwise noted.

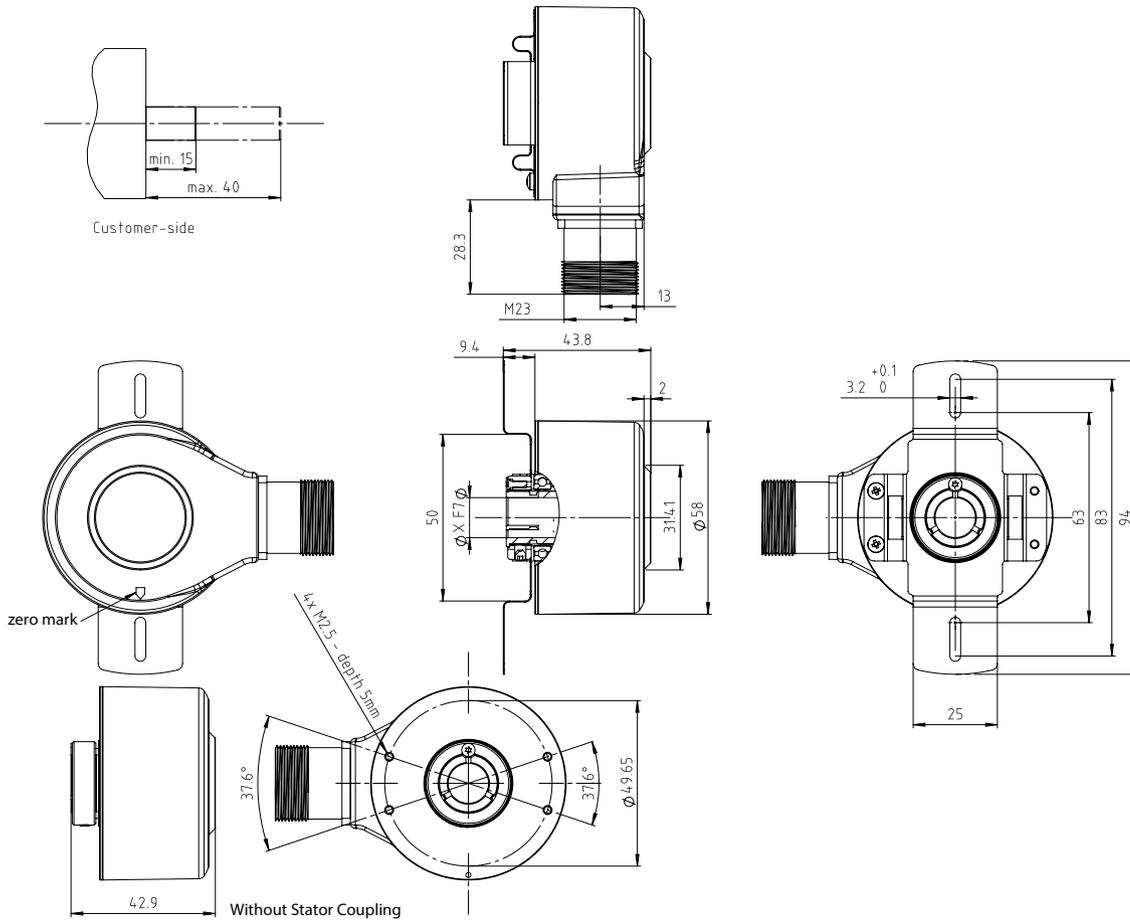
### Certificates

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

### Classifications

<b>ECLASS 5.0</b>	27270501
<b>ECLASS 5.1.4</b>	27270501
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590
<b>ECLASS 7.0</b>	27270501
<b>ECLASS 8.0</b>	27270501
<b>ECLASS 8.1</b>	27270501
<b>ECLASS 9.0</b>	27270501
<b>ECLASS 10.0</b>	27270501
<b>ECLASS 11.0</b>	27270501
<b>ECLASS 12.0</b>	27270501
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>ETIM 8.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

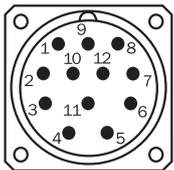
Dimensional drawing Blind hollow shaft, male connector, 2-sided stator coupling, slot, screw hole circle 63–83 mm



Dimensions in mm (inch)

Type Blind hollow shaft	Shaft diameter XF7
DBS60x-B4xxxxxxx	10 mm

PIN assignment



view of M23 male device connector on cable / housing

Wire colors (cable connection)	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	6	A-	Signal wire
White	5	A	Signal wire
Black	1	B-	Signal wire
Pink	8	B	Signal wire

Wire colors (cable connection)	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Yellow	4	Z-	Signal wire
Purple	3	Z	Signal wire
Blue	10	GND	Ground connection
Red	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
Screen	Screen	Screen	Screen connected to encoder housing

Type label Packaging label



Type label Customized Encoder Label



# Mita-Teknik

Incr.Encoder  
**MODEL NUMBER**  
 Ident. Nr. YYWW - cn  
**1234567 SERIALNO**



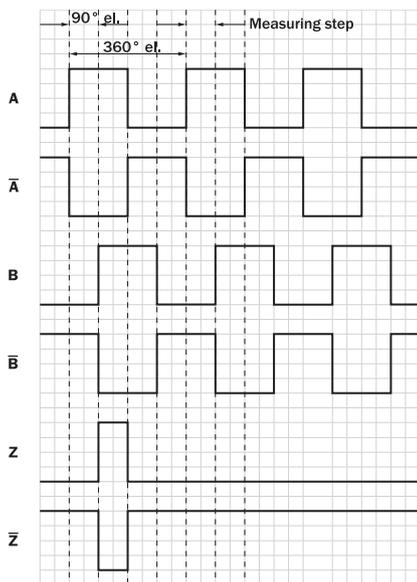
Made in Malaysia

Lines LINE  
 VDC VL  
 VT

Signal	Pin Number
+ US	12
GND	10
Z	3
Z-	4
A	5
A-	6
B	8
B-	1



Diagrams 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 ... 30 V	TTL/HTL universal

## 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)