

# DBS60E-TGFZZS169

DBS60

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	part no.
DBS60E-TGFZZS169	1128190

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

### Detailed technical data

#### Features

<b>Special device</b>	✓
<b>Specialty</b>	Cable, with male connector, M23, 0.5 m Customer-specific pin assignment Mating connector delivered with in the box Customized stator coupling compained with anti-rotation pin Customized label Second label included in packaging
<b>Standard reference device</b>	DBS60E-TGFJ02048

#### 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>	2,048
<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>3)</sup>
<b>Load current</b>	≤ 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.

<b>Power consumption</b>	≤ 0.5 W (without load)
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- 2) Valid signals can be read once this time has elapsed.
- 3) Up to 450 kHz on request.

## Electronics

<b>Connection type</b>	Special version
<b>Connection type Detail</b>	Cable, with male connector, M23, 0.5 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>

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

## Mechanics

<b>Mechanical design</b>	Through hollow shaft
<b>Shaft diameter</b>	14 mm Front clamp
<b>Flange type / stator coupling</b>	Special version
<b>Weight</b>	+ 0.25 kg <sup>1)</sup>
<b>Shaft material</b>	Stainless steel
<b>Flange material</b>	Aluminum
<b>Housing material</b>	Aluminum
<b>Material, cable</b>	PVC
<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>	≤ 500,000 rad/s <sup>2</sup>

- 1) Based on encoder with male connector or cable with male connector.
- 2) Not applicable for stator coupling type C and K.
- 3) Allow for self-heating of 2.6 K per 1,000 rpm when designing the operating temperature range.
- 4) 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
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- 1) These values relate to all mechanical versions including recommended accessories unless otherwise noted.

<b>Enclosure rating</b>	IP65, housing side (IEC 60529) 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>1)</sup>
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	250 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> These values relate to all mechanical versions including recommended accessories unless otherwise noted.

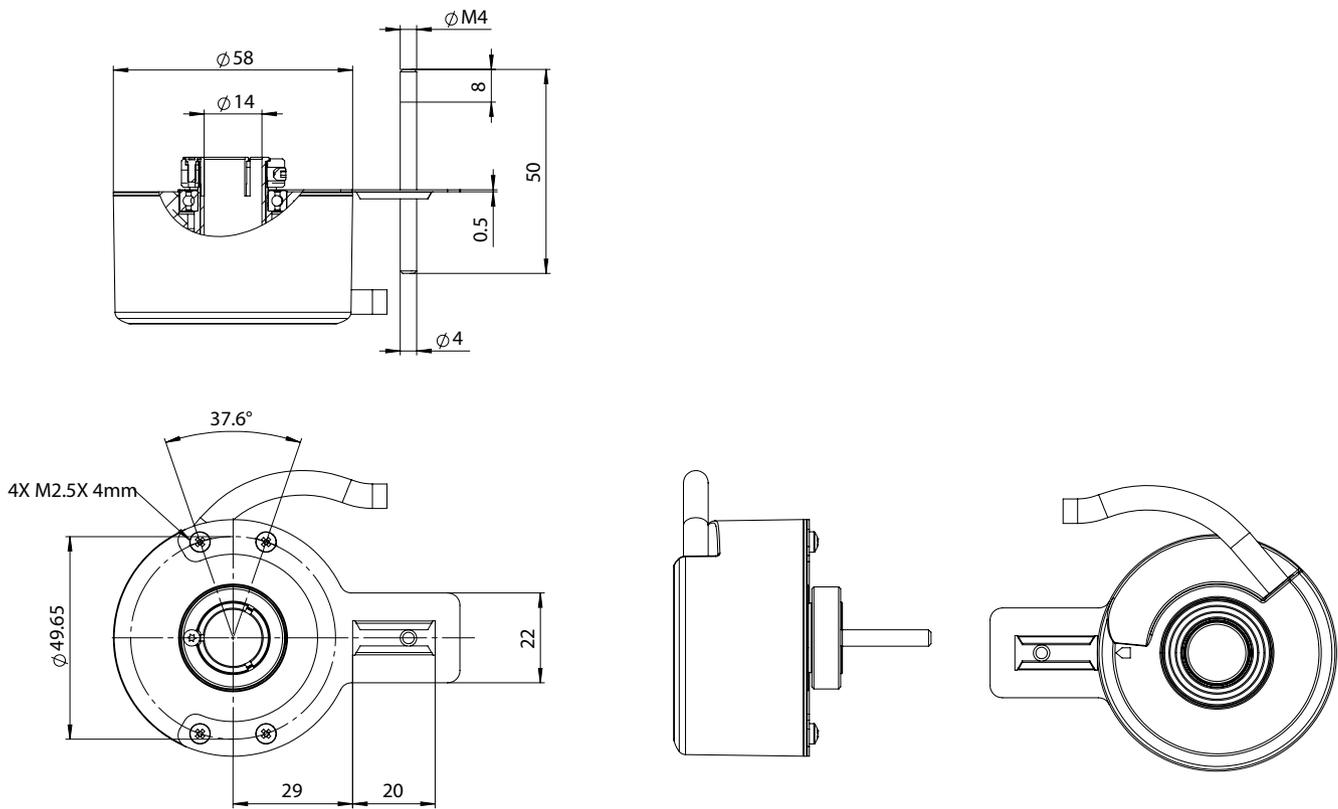
### Certificates

<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

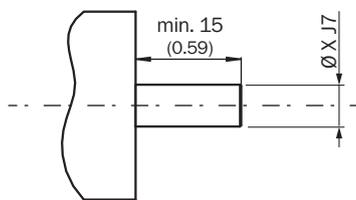
<b>ECLASS 5.0</b>	27270501
<b>ECLASS 5.1.4</b>	27270501
<b>ECLASS 6.0</b>	27270590
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<b>ECLASS 7.0</b>	27270501
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<b>ECLASS 10.0</b>	27270501
<b>ECLASS 11.0</b>	27270501
<b>ECLASS 12.0</b>	27270501
<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



Dimensions in mm (inch)

Attachment specifications Through hollow shaft with front clamping



customer side

Type	Through hollow shaft with front clamping	Shaft diameter xj7
DBS60x-TAxxxxxxx		6 mm
DBS60x-T1xxxxxxx		
DBS60x-TBxxxxxxx		8 mm
DBS60x-T2xxxxxxx		
DBS60x-TCxxxxxxx		3/8"
DBS60x-T3xxxxxxx		
DBS60x-TDxxxxxxx		10 mm
DBS60x-T4xxxxxxx		
DBS60x-TExxxxxxx		12 mm
DBS60x-T5xxxxxxx		
DBS60x-TFxxxxxxx		1/2"
DBS60x-T6xxxxxxx		
DBS60x-TGxxxxxxx		14 mm

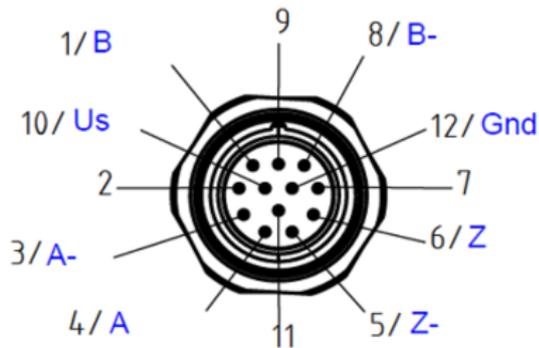
Type	Through hollow shaft with front clamping	Shaft diameter xj7
	DBS60x-T7xxxxxxx	15 mm
	DBS60x-THxxxxxxx	
	DBS60x-T8xxxxxxx	
	DBS60x-TJxxxxxxx	5/8"

### PIN assignment

#### M23 male connector (encoder side)

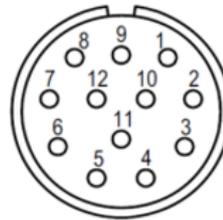
Part no. 6054635

#### Wire-to-M23 connector allocation



#### M23 Female mating connector (accessory)

Part no. 6074644



### Type label

**MODEL NUMBER**  
Incremental Encoder

Product ID  
pid.sick.com/

P/N 1234567/  
S/N SERIALNO

DE-79183 WALDKIRCH

Signal	+US	GND	Z	Z-	A	A-	B	B-
M23 Pin	10	12	6	5	4	3	1	8

LINE Lines      DC VL      VT

Class2

UK  
CA

US

MADE IN MALAYSIA

## Diagrams

Pulses per revolution



## 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 ... 5,5 V	TTL
10 V ... 30 V	TTL
10 V ... 27 V	HTL

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

## 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)