

DBS60E-TGANE1024

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

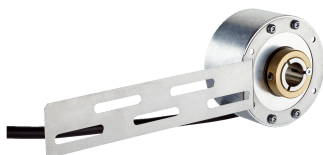


Illustration may differ

Ordering information

Type	part no.
DBS60E-TGANE1024	1081648

Other models and accessories → www.sick.com/DBS60



Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	500 years (EN ISO 13849-1) ¹⁾
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¹⁾ 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

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

Interfaces

Communication interface	Incremental
Communication Interface detail	TTL / RS-422
Number of signal channels	6-channel
Initialization time	< 5 ms ¹⁾
Output frequency	+ 300 kHz ²⁾
Load current	≤ 30 mA, per channel
Operating current	≤ 50 mA (without load)

¹⁾ Valid signals can be read once this time has elapsed.

²⁾ Up to 450 kHz on request.

Electronics

Connection type	Cable, 8-wire, universal, 10 m ¹⁾
Supply voltage	4.5 ... 5.5 V
Reference signal, number	1
Reference signal, position	90 °, electric, logically gated with A and B
Reverse polarity protection	✓

¹⁾ The universal cable connection is positioned so that it is possible to lay it without bends in a radial or axial direction.

²⁾ Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against U_S.

Short-circuit protection of the outputs ✓ ²⁾

¹⁾ The universal cable connection is positioned so that it is possible to lay it without bends in a radial or axial direction.

²⁾ Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against U_S .

Mechanics

Mechanical design	Through hollow shaft
Shaft diameter	14 mm Front clamp
Flange type / stator coupling	One-sided stator coupling, slots, slot radius 32.25–142.55 mm, slot width 4.5 mm
Weight	+ 0.25 kg ¹⁾
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 movement static	± 0.3 mm (radial) ± 0.5 mm (axial) ²⁾
Permissible movement dynamic	± 0.1 mm (radial) ± 0.2 mm (axial) ²⁾
Operating speed	6,000 min ⁻¹ ³⁾
Maximum operating speed	9,000 min ⁻¹ ⁴⁾
Moment of inertia of the rotor	50 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²

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

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65, housing side (IEC 60529) IP65, shaft side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	–20 °C ... +85 °C ¹⁾
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	250 g, 3 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

¹⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓

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

Classifications

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

Technical drawing of a mechanical part, showing three views: front view, side view, and top view. Dimensions are provided in millimeters (mm) and inches (in).

Front View:

- Overall length: 150 (5.91)
- Distance from center to first hole: 120.25 (4.73)
- Distance between holes: 98.75 (3.89)
- Distance from center to second hole: 76.25 (3.00)
- Distance from center to third hole: 54.75 (2.16)
- Distance from center to fourth hole: 32.25 (1.27)
- Distance from center to fifth hole: 54.25 (2.14)
- Distance from center to sixth hole: 76.75 (3.02)
- Distance from center to seventh hole: 98.25 (3.87)
- Distance from center to eighth hole: 120.75 (4.75)
- Radius: 37.6°
- Radius: 37.6°
- Radius: 37.6°
- Callout 2 points to the eighth hole.

Side View:

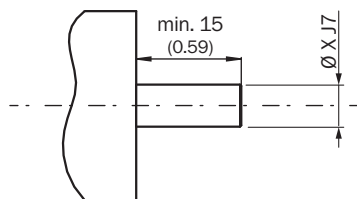
- Overall length: 179 (7.05)
- Distance from center to first hole: 41.8 (1.65)
- Distance from center to second hole: 9.4 (0.37)
- Distance from center to third hole: 26.7 (1.05)
- Distance from center to fourth hole: 26.7 (1.05)
- Distance from center to fifth hole: 26.7 (1.05)
- Distance from center to sixth hole: 26.7 (1.05)
- Distance from center to seventh hole: 26.7 (1.05)
- Distance from center to eighth hole: 26.7 (1.05)
- Distance from center to ninth hole: 26.7 (1.05)
- Distance from center to tenth hole: 26.7 (1.05)
- Distance from center to eleventh hole: 26.7 (1.05)
- Distance from center to twelfth hole: 26.7 (1.05)
- Distance from center to thirteenth hole: 26.7 (1.05)
- Distance from center to fourteenth hole: 26.7 (1.05)
- Distance from center to fifteenth hole: 26.7 (1.05)
- Distance from center to sixteenth hole: 26.7 (1.05)
- Distance from center to seventeenth hole: 26.7 (1.05)
- Distance from center to eighteenth hole: 26.7 (1.05)
- Distance from center to nineteenth hole: 26.7 (1.05)
- Distance from center to twentieth hole: 26.7 (1.05)
- Distance from center to twenty-first hole: 26.7 (1.05)
- Distance from center to twenty-second hole: 26.7 (1.05)
- Distance from center to twenty-third hole: 26.7 (1.05)
- Distance from center to twenty-fourth hole: 26.7 (1.05)
- Distance from center to twenty-fifth hole: 26.7 (1.05)
- Distance from center to twenty-sixth hole: 26.7 (1.05)
- Distance from center to twenty-seventh hole: 26.7 (1.05)
- Distance from center to twenty-eighth hole: 26.7 (1.05)
- Distance from center to twenty-ninth hole: 26.7 (1.05)
- Distance from center to thirtieth hole: 26.7 (1.05)
- Distance from center to thirty-first hole: 26.7 (1.05)
- Distance from center to thirty-second hole: 26.7 (1.05)
- Distance from center to thirty-third hole: 26.7 (1.05)
- Distance from center to thirty-fourth hole: 26.7 (1.05)
- Distance from center to thirty-fifth hole: 26.7 (1.05)
- Distance from center to thirty-sixth hole: 26.7 (1.05)
- Distance from center to thirty-seventh hole: 26.7 (1.05)
- Distance from center to thirty-eighth hole: 26.7 (1.05)
- Distance from center to thirty-ninth hole: 26.7 (1.05)
- Distance from center to fortieth hole: 26.7 (1.05)
- Distance from center to forty-first hole: 26.7 (1.05)
- Distance from center to forty-second hole: 26.7 (1.05)
- Distance from center to forty-third hole: 26.7 (1.05)
- Distance from center to forty-fourth hole: 26.7 (1.05)
- Distance from center to forty-fifth hole: 26.7 (1.05)
- Distance from center to forty-sixth hole: 26.7 (1.05)
- Distance from center to forty-seventh hole: 26.7 (1.05)
- Distance from center to forty-eighth hole: 26.7 (1.05)
- Distance from center to forty-ninth hole: 26.7 (1.05)
- Distance from center to fiftieth hole: 26.7 (1.05)
- Distance from center to fifty-first hole: 26.7 (1.05)
- Distance from center to fifty-second hole: 26.7 (1.05)
- Distance from center to fifty-third hole: 26.7 (1.05)
- Distance from center to fifty-fourth hole: 26.7 (1.05)
- Distance from center to fifty-fifth hole: 26.7 (1.05)
- Distance from center to fifty-sixth hole: 26.7 (1.05)
- Distance from center to fifty-seventh hole: 26.7 (1.05)
- Distance from center to fifty-eighth hole: 26.7 (1.05)
- Distance from center to fifty-ninth hole: 26.7 (1.05)
- Distance from center to sixtieth hole: 26.7 (1.05)
- Distance from center to sixty-first hole: 26.7 (1.05)
- Distance from center to sixty-second hole: 26.7 (1.05)
- Distance from center to sixty-third hole: 26.7 (1.05)
- Distance from center to sixty-fourth hole: 26.7 (1.05)
- Distance from center to sixty-fifth hole: 26.7 (1.05)
- Distance from center to sixty-sixth hole: 26.7 (1.05)
- Distance from center to sixty-seventh hole: 26.7 (1.05)
- Distance from center to sixty-eighth hole: 26.7 (1.05)
- Distance from center to sixty-ninth hole: 26.7 (1.05)
- Distance from center to seventieth hole: 26.7 (1.05)
- Distance from center to seventy-first hole: 26.7 (1.05)
- Distance from center to seventy-second hole: 26.7 (1.05)
- Distance from center to seventy-third hole: 26.7 (1.05)
- Distance from center to seventy-fourth hole: 26.7 (1.05)
- Distance from center to seventy-fifth hole: 26.7 (1.05)
- Distance from center to seventy-sixth hole: 26.7 (1.05)
- Distance from center to seventy-seventh hole: 26.7 (1.05)
- Distance from center to seventy-eighth hole: 26.7 (1.05)
- Distance from center to seventy-ninth hole: 26.7 (1.05)
- Distance from center to eightieth hole: 26.7 (1.05)
- Distance from center to eighty-first hole: 26.7 (1.05)
- Distance from center to eighty-second hole: 26.7 (1.05)
- Distance from center to eighty-third hole: 26.7 (1.05)
- Distance from center to eighty-fourth hole: 26.7 (1.05)
- Distance from center to eighty-fifth hole: 26.7 (1.05)
- Distance from center to eighty-sixth hole: 26.7 (1.05)
- Distance from center to eighty-seventh hole: 26.7 (1.05)
- Distance from center to eighty-eighth hole: 26.7 (1.05)
- Distance from center to eighty-ninth hole: 26.7 (1.05)
- Distance from center to ninetieth hole: 26.7 (1.05)
- Distance from center to ninety-first hole: 26.7 (1.05)
- Distance from center to ninety-second hole: 26.7 (1.05)
- Distance from center to ninety-third hole: 26.7 (1.05)
- Distance from center to ninety-fourth hole: 26.7 (1.05)
- Distance from center to ninety-fifth hole: 26.7 (1.05)
- Distance from center to ninety-sixth hole: 26.7 (1.05)
- Distance from center to ninety-seventh hole: 26.7 (1.05)
- Distance from center to ninety-eighth hole: 26.7 (1.05)
- Distance from center to ninety-ninth hole: 26.7 (1.05)
- Distance from center to one hundred hole: 26.7 (1.05)
- Distance from center to one hundred and first hole: 26.7 (1.05)
- Distance from center to one hundred and second hole: 26.7 (1.05)
- Distance from center to one hundred and third hole: 26.7 (1.05)
- Distance from center to one hundred and fourth hole: 26.7 (1.05)
- Distance from center to one hundred and fifth hole: 26.7 (1.05)
- Distance from center to one hundred and sixth hole: 26.7 (1.05)
- Distance from center to one hundred and seventh hole: 26.7 (1.05)
- Distance from center to one hundred and eighth hole: 26.7 (1.05)
- Distance from center to one hundred and ninth hole: 26.7 (1.05)
- Distance from center to one hundred and tenth hole: 26.7 (1.05)
- Distance from center to one hundred and eleventh hole: 26.7 (1.05)
- Distance from center to one hundred and twelfth hole: 26.7 (1.05)
- Distance from center to one hundred and thirteenth hole: 26.7 (1.05)
- Distance from center to one hundred and fourteenth hole: 26.7 (1.05)
- Distance from center to one hundred and fifteenth hole: 26.7 (1.05)
- Distance from center to one hundred and sixteenth hole: 26.7 (1.05)
- Distance from center to one hundred and seventeenth hole: 26.7 (1.05)
- Distance from center to one hundred and eighteenth hole: 26.7 (1.05)
- Distance from center to one hundred and nineteenth hole: 26.7 (1.05)
- Distance from center to one hundred and twentieth hole: 26.7 (1.05)
- Distance from center to one hundred and twenty-first hole: 26.7 (1.05)
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- Distance from center to one hundred and twenty-ninth hole: 26.7 (1.05)
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- Distance from center to one hundred and thirty-first hole: 26.7 (1.05)
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- Distance from center to one hundred and thirty-fourth hole: 26.7 (1.05)
- Distance from center to one hundred and thirty-fifth hole: 26.7 (1.05)
- Distance from center to one hundred and thirty-sixth hole: 26.7 (1.05)
- Distance from center to one hundred and thirty-seventh hole: 26.7 (1.05)
- Distance from center to one hundred and thirty-eighth hole: 26.7 (1.05)
- Distance from center to one hundred and thirty-ninth hole: 26.7 (1.05)
- Distance from center to one hundred and fortieth hole: 26.7 (1.05)
- Distance from center to one hundred and forty-first hole: 26.7 (1.05)
- Distance from center to one hundred and forty-second hole: 26.7

② zero pulse mark on flange under stator coupling

Type	Through hollow shaft with front clamping	Shaft diameter XF7
	DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
	DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
	DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8"

TypeThrough hollow shaft with front clamping	Shaft diameter XF7
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
DBS60x-TExxxxxxx DBS60x-T5xxxxxxx	12 mm
DBS60x-TFxxxxxxx DBS60x-T6xxxxxxx	1/2"
DBS60x-TGxxxxxxx DBS60x-T7xxxxxxx	14 mm
DBS60x-THxxxxxxx DBS60x-T8xxxxxxx	15 mm
DBS60x-TJxxxxxxx	5/8"
-	

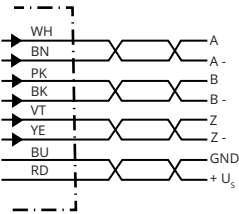
Attachment specifications Through hollow shaft with front clamping



customer side

TypeThrough hollow shaft with front clamping	Shaft diameter xj7
DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8"
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
DBS60x-TExxxxxxx DBS60x-T5xxxxxxx	12 mm
DBS60x-TFxxxxxxx DBS60x-T6xxxxxxx	1/2"
DBS60x-TGxxxxxxx DBS60x-T7xxxxxxx	14 mm
DBS60x-THxxxxxxx DBS60x-T8xxxxxxx	15 mm
DBS60x-TJxxxxxxx	5/8"
-	

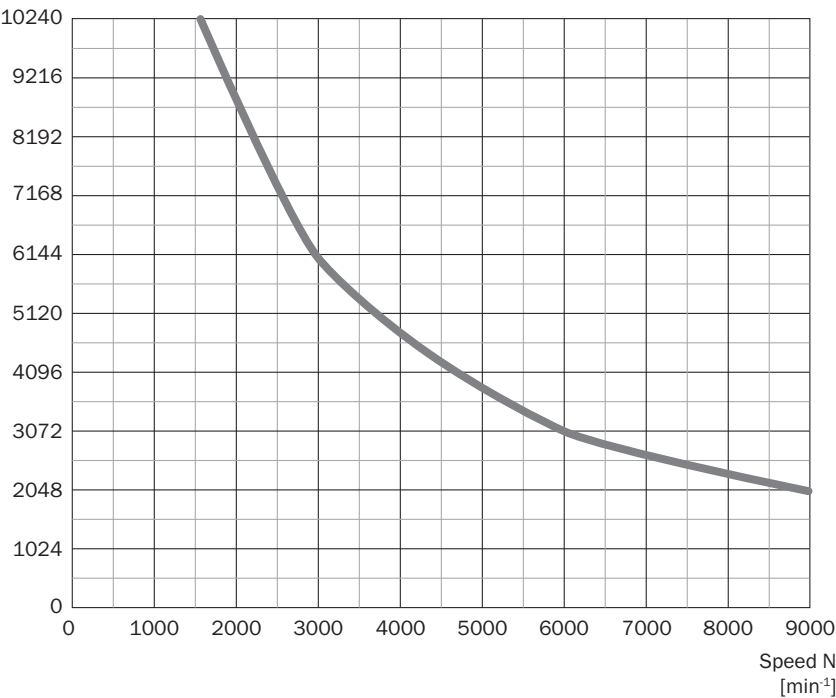
PIN assignment



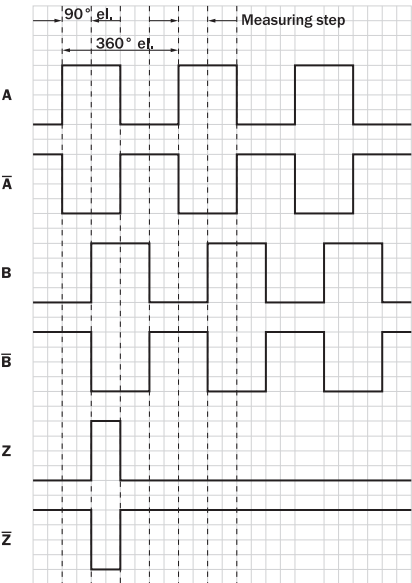
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
Red	8	12	+U _s	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	Screen connected to encoder housing

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

Recommended accessories

Other models and accessories → www.sick.com/DBS60

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental, HIPERFACE® Items supplied: By the meter Cable: 8-wire, PUR, halogen-free Description: SSI, shielded, Incremental, HIPERFACE® 	LTG-2308-MWENC	6027529
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 11-wire, PUR Description: SSI, shielded, Incremental 	LTG-2411-MW	6027530
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 12-wire, PUR, halogen-free Description: SSI, shielded, Incremental 	LTG-2512-MW	6027531
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, TTL, HTL, Incremental Items supplied: By the meter Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free Description: SSI, shielded, TTL, HTL, Incremental 	LTG-2612-MW	6028516
	<ul style="list-style-type: none"> Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	STE-2312-G01	2077273
	<ul style="list-style-type: none"> Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	STE-2312-GX	6028548
	<ul style="list-style-type: none"> Connection type head A: Male connector, M12, 8-pin, straight, A-coded Signal type: Incremental Cable: CAT5, CAT5e Description: Incremental, shielded Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² ... 0.34 mm² 	STE-1208-GA01	6044892

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