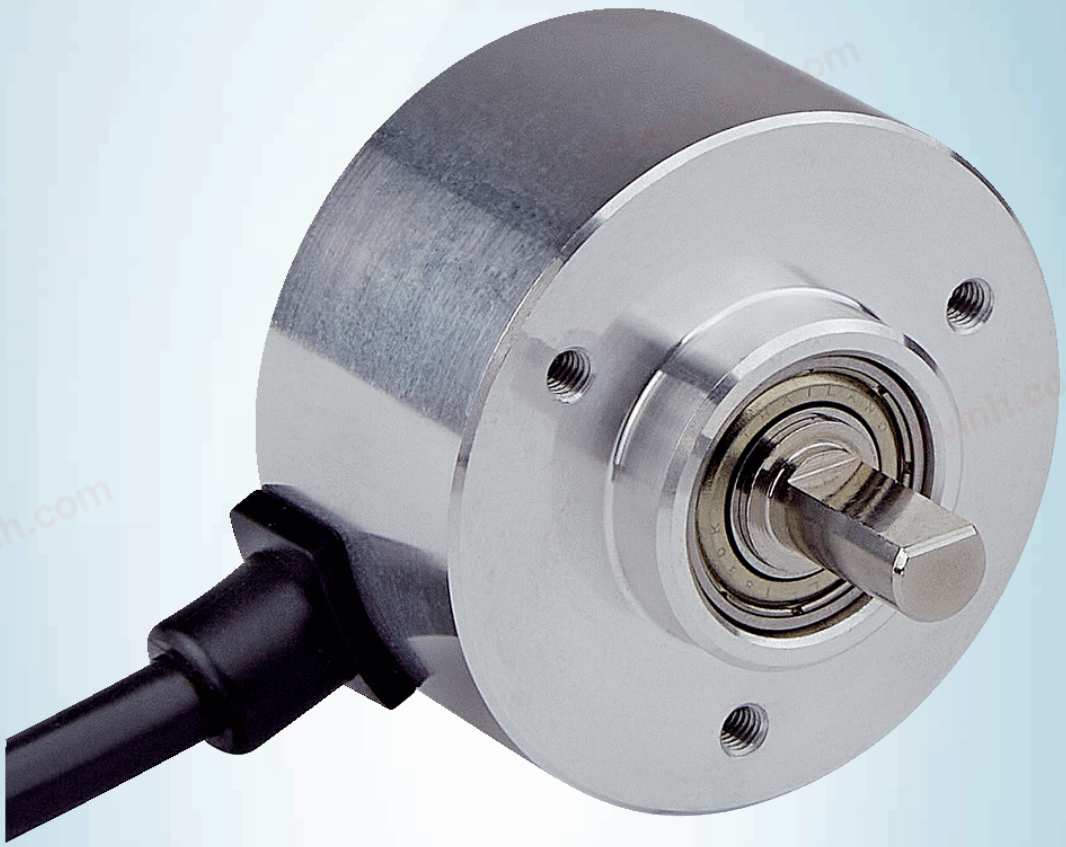
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Product data sheet



DLS40E-S3AV00360

DLS40

INCREMENTAL ENCODERS

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Sensor Intelligence.

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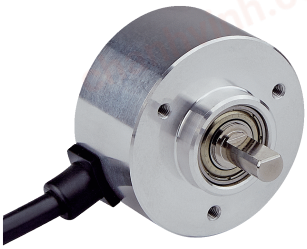


Illustration may differ

Ordering information

Type	Part no.
DLS40E-S3AV00360	1109594

Other models and accessories → www.sick.com/DLS40

Detailed technical data

Performance

Pulses per revolution	360
Measuring step	90°, electric/pulses per revolution
Duty cycle	≤ 0.5 ± 10 %

Interfaces

Communication interface	Incremental
Communication Interface detail	TTL / RS-422
Number of signal channels	6-channel
Output frequency	≤ 150 kHz
Load current	≤ 30 mA
Power consumption	≤ 2 W (without load)

Electrical data

Connection type	Cable, 8-wire, radial, 2 m
Supply voltage	4.5 ... 5.5 V
Reference signal, number	1
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ [1]
MTTFd: mean time to dangerous failure	600 years (EN ISO 13849-1) [2]

[1] Protection against short circuit only to GND. Short-circuit resistance is only guaranteed when GND and U_S are connected correctly.

[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

Mechanical design	Solid shaft, face mount flange
Shaft diameter	6 mm
Shaft length	12 mm

[1] Relates to encoders with 2 m cable connection.

[2] Higher values are possible using limited bearing life.

[3] Allow for self-heating of 1.3 K per 1,000 rpm when designing the operating temperature range.

[4] No permanent operation. Decreasing signal quality.

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Weight	Approx. 130 g [1]
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	0.3 Ncm
Operating torque	0.2 Ncm
Permissible shaft loading	40 N (radial) [2] 20 N (axial)
Operating speed	6,000 min^{-1} [3]
Maximum operating speed	≤ 8,000 min^{-1} [4]
Moment of inertia of the rotor	7.6 gcm^2
Bearing lifetime	2.0 x 10^9 revolutions
Angular acceleration	≤ 500,000 rad/s^2

[1] Relates to encoders with 2 m cable connection.
[2] Higher values are possible using limited bearing life.
[3] Allow for self-heating of 1.3 K per 1,000 rpm when designing the operating temperature range.
[4] No permanent operation. Decreasing signal quality.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP50
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	–10 °C ... +70 °C
Storage temperature range	–25 °C ... +85 °C
Resistance to shocks	100 g, 6 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

Classifications

eCl@ss 5.0	27270501
eCl@ss 5.1.4	27270501
eCl@ss 6.0	27270590
eCl@ss 6.2	27270590
eCl@ss 7.0	27270501
eCl@ss 8.0	27270501
eCl@ss 8.1	27270501
eCl@ss 9.0	27270501
eCl@ss 10.0	27270501
eCl@ss 11.0	27270501
eCl@ss 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486

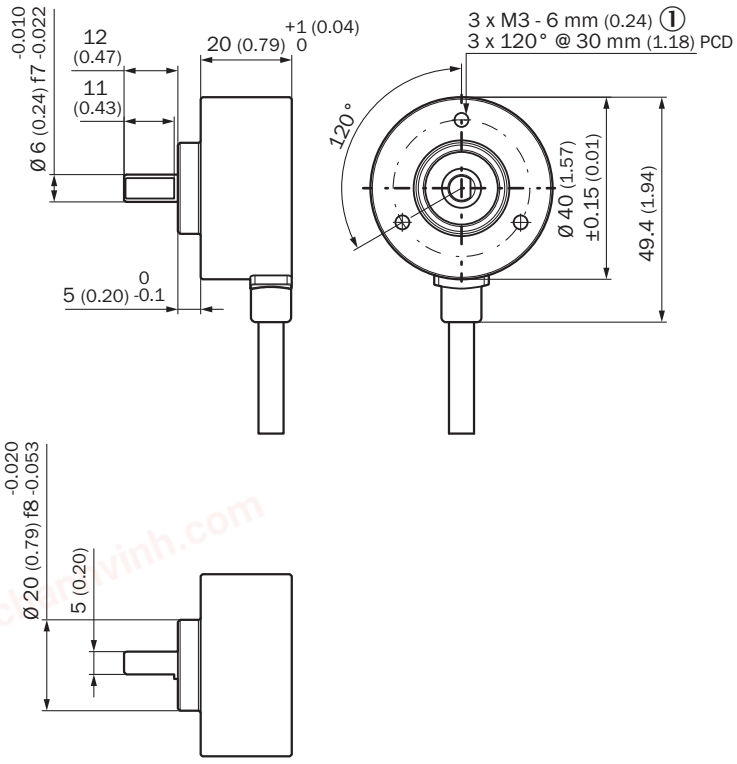
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ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

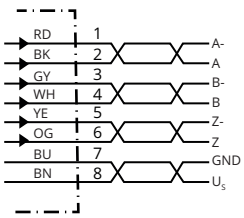
Dimensional drawing (Dimensions in mm (inch))

Solid shaft



① Depth

PIN assignment



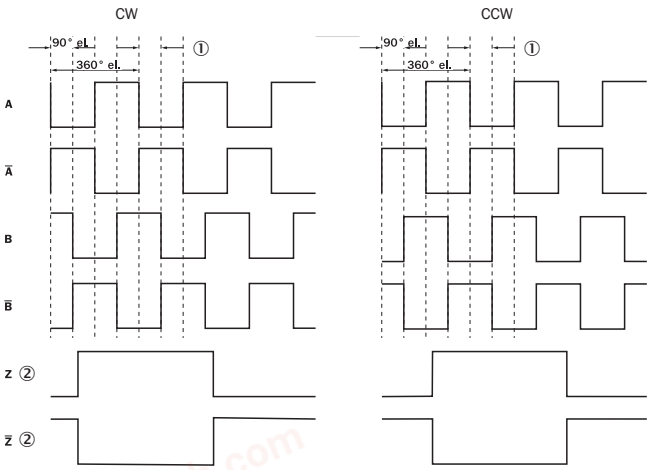
Wire colors (cable connection)	Signal	Description	Type
Brown	U_S	Supply voltage	DLS40E-*
Blue	GND	Ground connection	DLS40E-*
Black	A	Signal cable	DLS40E-*
White	B	Signal cable	DLS40E-*
Orange	Z	Signal cable	DLS40E-*
Red	A-	Signal cable	DLS40E-AV*

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Wire colors (cable connection)	Signal	Description	Type
Gray	B-	Signal cable	DLS40E-AV*
Yellow	Z-	Signal cable	DLS40E-AV*

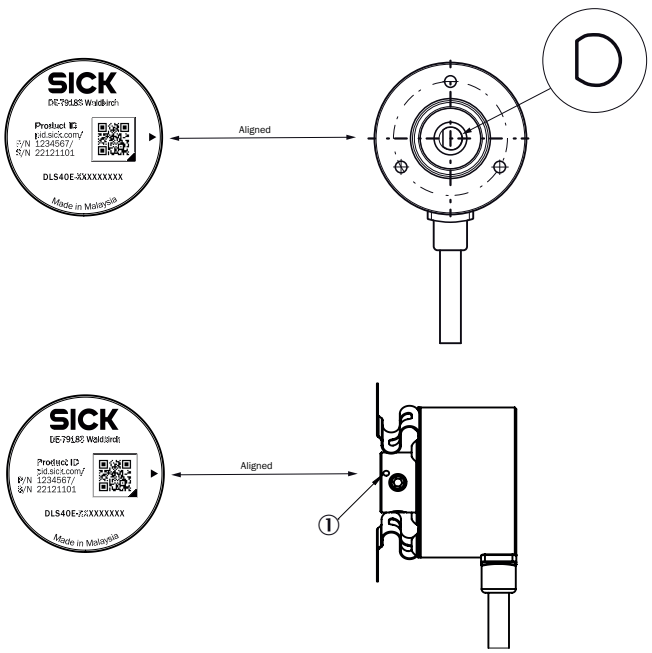
Diagrams

TTL / RS-422



① Measuring step
② Only as reference

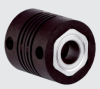
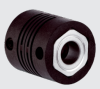
Operation note



You can see the position with the mark on the rear side of the encoder
① Zero pulse mark on housing

Recommended accessories

Other models and accessories ➜ www.sick.com/DLS40

	Brief description	Type	Part no.
Other mounting accessories			
	Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm	BEF-MR006020R	2055222
	Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm	BEF-MR006030R	2055634
	Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 500 mm	BEF-MR006050R	2055225
	Aluminum measuring wheel with cross-knurled surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AK	4084745
	Aluminum measuring wheel with smooth polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AP	4084746
	Aluminum measuring wheel with ridged polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APG	4084748
	Aluminum measuring wheel with studded polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APN	4084747
	O-ring for measuring wheels (circumference 200 mm)	BEF-OR-053-040	2064061
	O-ring for measuring wheels (circumference 300 mm), 2x O-ring	BEF-OR-083-050	2064076
	O-ring for measuring wheels (circumference 500 mm)	BEF-OR-145-050	2064074
Shaft adaptation			
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, –30 °C to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981
	Cross-slotted coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial ± 0.3 mm, axial ± 0.2 mm, angle ± 3°; max. speed 10,000 rpm, –10° to +80 °C, max. torque 80 Ncm; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0606-S	2056406
	Bar coupling, shaft diameter 6 mm /8 mm, maximum shaft offset radial ± 0.3 mm, axial ± 0.2 mm, angle ± 3°, max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0608-S	5314179
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, –30 °C to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Double loop coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radially +/- 2,5 mm, axially +/-3 mm, angle +/- 10 degrees;max. speed 3.000 rpm, –30 to +80 degrees Celsius, torsional spring stiffness of 25 Nm/rad	KUP-0610-D	5326697
	Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, –10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985
	Bar coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, –10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub	KUP-0610-S	2056407

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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."

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