



## DLS40E-BDAV00400

DLS40

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ

## Ordering information

Type	part no.
DLS40E-BDAV00400	On request

Other models and accessories → [www.sick.com/DLS40](http://www.sick.com/DLS40)

## Detailed technical data

## Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	600 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>	400
<b>Measuring step</b>	90 °, electric/pulses per revolution
<b>Duty cycle</b>	≤ 0.5 ± 10 %

## Interfaces

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

## Electronics

<b>Connection type</b>	Cable, 8-wire, radial, 2 m
<b>Supply voltage</b>	4.5 ... 5.5 V
<b>Reference signal, number</b>	1
<b>Reverse polarity protection</b>	✓
<b>Short-circuit protection of the outputs</b>	✓ <sup>1)</sup>

<sup>1)</sup> Protection against short circuit only to GND. Short-circuit resistance is only guaranteed when GND and U<sub>S</sub> are connected correctly.

## Mechanics

<b>Mechanical design</b>	Blind hollow shaft
<b>Shaft diameter</b>	10 mmFront clamp
<b>Weight</b>	Approx. 170 g <sup>1)</sup>
<b>Shaft material</b>	Stainless steel
<b>Flange material</b>	Aluminum

<sup>1)</sup> Relates to encoders with 2 m cable connection.

<sup>2)</sup> Allow for self-heating of 1.3 K per 1,000 rpm when designing the operating temperature range.

<sup>3)</sup> No permanent operation. Decreasing signal quality.

<b>Housing material</b>	Aluminum
<b>Material, cable</b>	PVC
<b>Start up torque</b>	0.5 Ncm
<b>Operating torque</b>	0.3 Ncm
<b>Permissible movement static</b>	± 0.3 mm (radial) ± 0.5 mm (axial)
<b>Permissible movement dynamic</b>	± 0.1 mm (radial) ± 0.2 mm (axial)
<b>Operating speed</b>	6,000 min <sup>-1</sup> <sup>2)</sup>
<b>Maximum operating speed</b>	≤ 8,000 min <sup>-1</sup> <sup>3)</sup>
<b>Moment of inertia of the rotor</b>	24.6 gcm <sup>2</sup>
<b>Bearing lifetime</b>	2.0 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

<sup>1)</sup> Relates to encoders with 2 m cable connection.

<sup>2)</sup> Allow for self-heating of 1.3 K per 1,000 rpm when designing the operating temperature range.

<sup>3)</sup> No permanent operation. Decreasing signal quality.

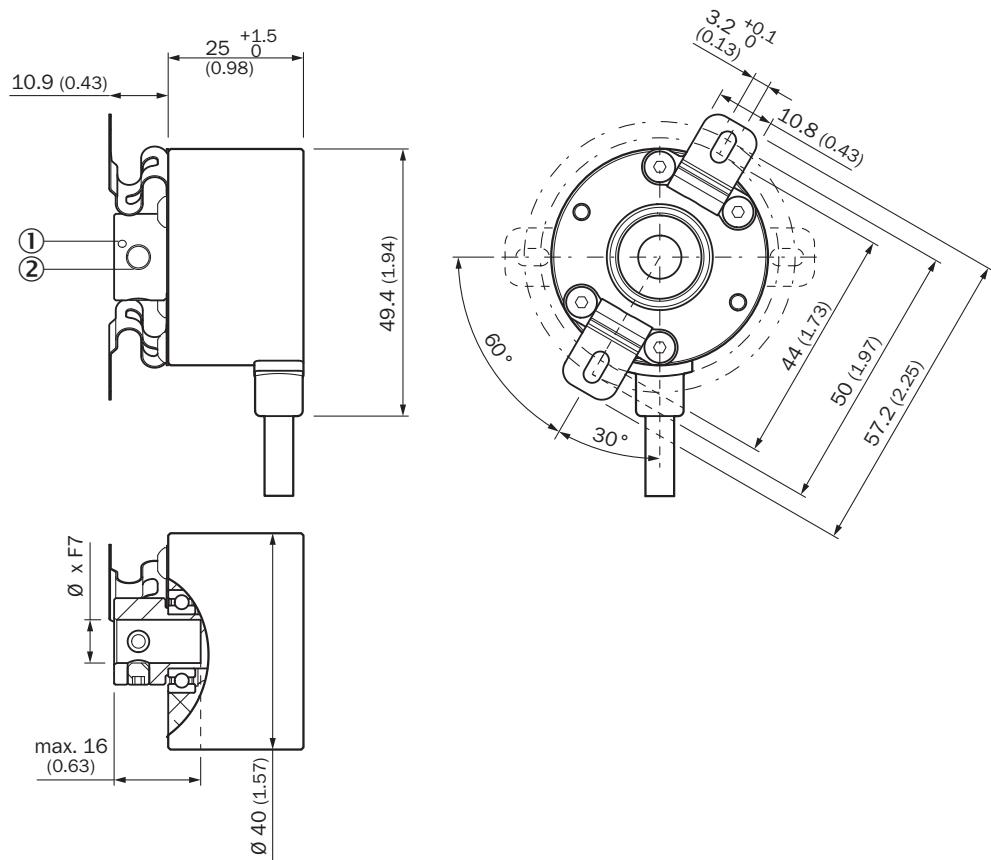
## Ambient data

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

## 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



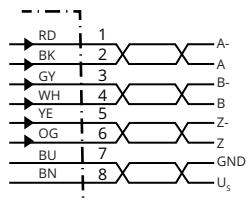
Dimensions in mm (inch)

① Start position of the Z-pulse

② 2x M4 threaded pin hex key screw size 2.0

Type	Blind hollow shaft	Shaft diameter XF7
DLS40E-BAxxxxxx		6 mm
DLS40E-BBxxxxxx		8 mm
DLS40E-BDxxxxxx		10 mm
DLS40E-BExxxxxx		12 mm

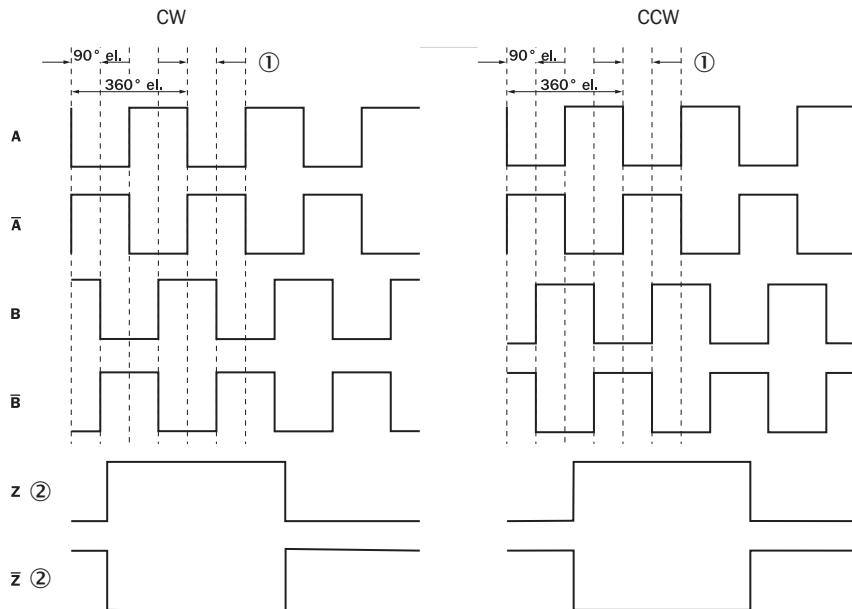
## PIN assignment



Wire colors (cable connection)	Signal	Description
Brown	U <sub>S</sub>	Supply voltage
Blue	GND	Ground connection
Black	A	Signal cable

Wire colors (cable connection)	Signal	Description
White	B	Signal cable
Orange	Z	Signal cable
Red	A-	Signal cable
Gray	B-	Signal cable
Yellow	Z-	Signal cable

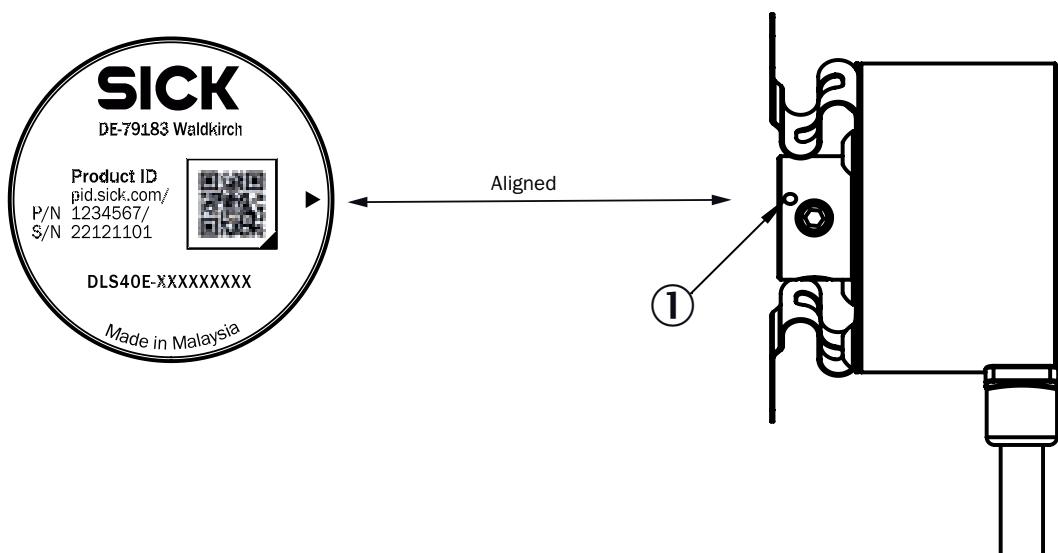
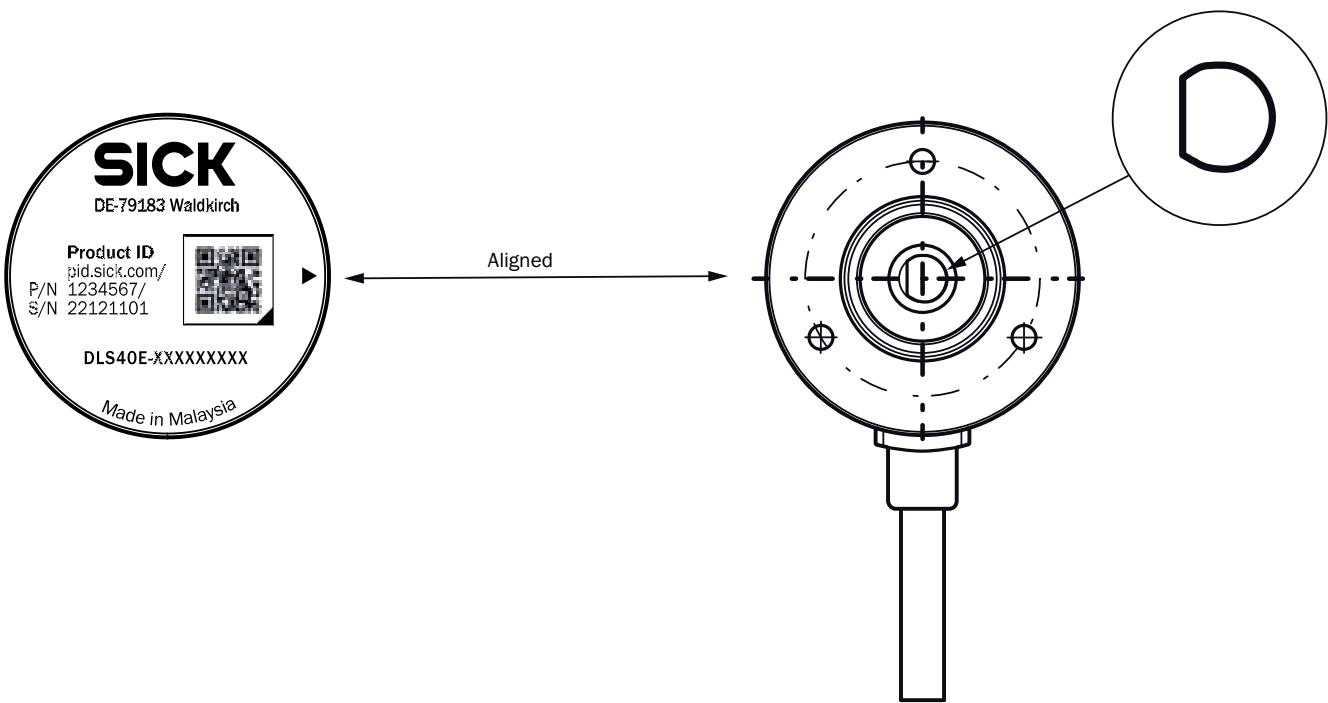
## Diagrams TTL / RS-422



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

## 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)