



# DKV60E-21AKA0020

DKV60

MEASURING WHEEL ENCODERS

**SICK**  
Sensor Intelligence.

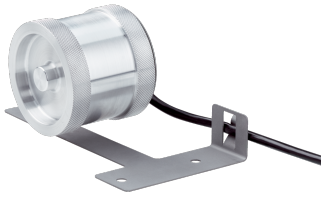


Illustration may differ



### Ordering information

Type	part no.
DKV60E-21AKA0020	1115129

Other models and accessories → [www.sick.com/DKV60](http://www.sick.com/DKV60)

### 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>	20
<b>Resolution in pulses/mm</b>	0.1
<b>Measuring increment (resolution in mm/pulse)</b>	10
<b>Measuring step deviation</b>	± 18° / pulses per revolution
<b>Error limits</b>	± 0.5 mm/m, subject to the measuring wheel (wheel + surface)
<b>Duty cycle</b>	≤ 0.5 ± 5 %
<b>Initialization time</b>	≤ 3 ms

#### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	TTL / RS-422
<b>Number of signal channels</b>	6-channel

#### Electronics

<b>Operating power consumption (no load)</b>	50 mA
<b>Connection type</b>	Cable, 8-wire, universal, 1.5 m
<b>Supply voltage</b>	4.5 V ... 5.5 V
<b>Load current max.</b>	30 mA
<b>Maximum output frequency</b>	≤ 300 kHz
<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>Measuring wheel circumference</b>	200 mm
<b>Measuring wheel surface</b>	Cross knurled aluminium <sup>1)</sup>
<b>Spring arm design</b>	69.5 mm spring arm
<b>Mass</b>	420 g
<b>Encoder material</b>	
Shaft	Stainless steel
Flange	Aluminum
Housing	Aluminum
Cable	PVC
<b>Spring arm mechanism material</b>	
Spring element	Spring steel, anti-corrosive
Measuring wheel core	Spring steel, anti-corrosive
<b>Start up torque</b>	0.9 Ncm (at 20 °C)
<b>Operating torque</b>	0.6 Ncm (at 20 °C)
<b>Operating speed</b>	≤ 1,000 min <sup>-1</sup>
<b>Maximum operating speed</b>	1,500 min <sup>-1</sup>
<b>Bearing lifetime</b>	2 x 10 <sup>9</sup> revolutions
<b>Maximum travel/deflection of spring arm</b>	8 mm at 14 N spring travel
<b>Recommended pretension</b>	8 N at 4 mm deflection <sup>2)</sup>
<b>Max. permissible working area for the spring (continuous operation)</b>	± 1.5 mm
<b>Recommended spring deflection</b>	2 mm ... 8 mm
<b>Mounted encoder</b>	DBS50 Core, DBS50E-SKAKA0020

<sup>1)</sup> The surface of a measuring wheel is subject to wear. This depends on contact pressure, acceleration behavior in the application, traversing speed, measurement surface, mechanical alignment of the measuring wheel, temperature, and ambient conditions. We recommend you regularly check the condition of the measuring wheel and replace as required.

<sup>2)</sup> When measured from the top of the measuring surface.

## Ambient data

<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3 (class A)
<b>Enclosure rating</b>	IP65
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-20 °C ... +60 °C -35 °C ... +95 °C (on request)
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	50 g, 7 ms (DIN/EN 60068-2-27)
<b>Resistance to vibration</b>	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

## Classifications

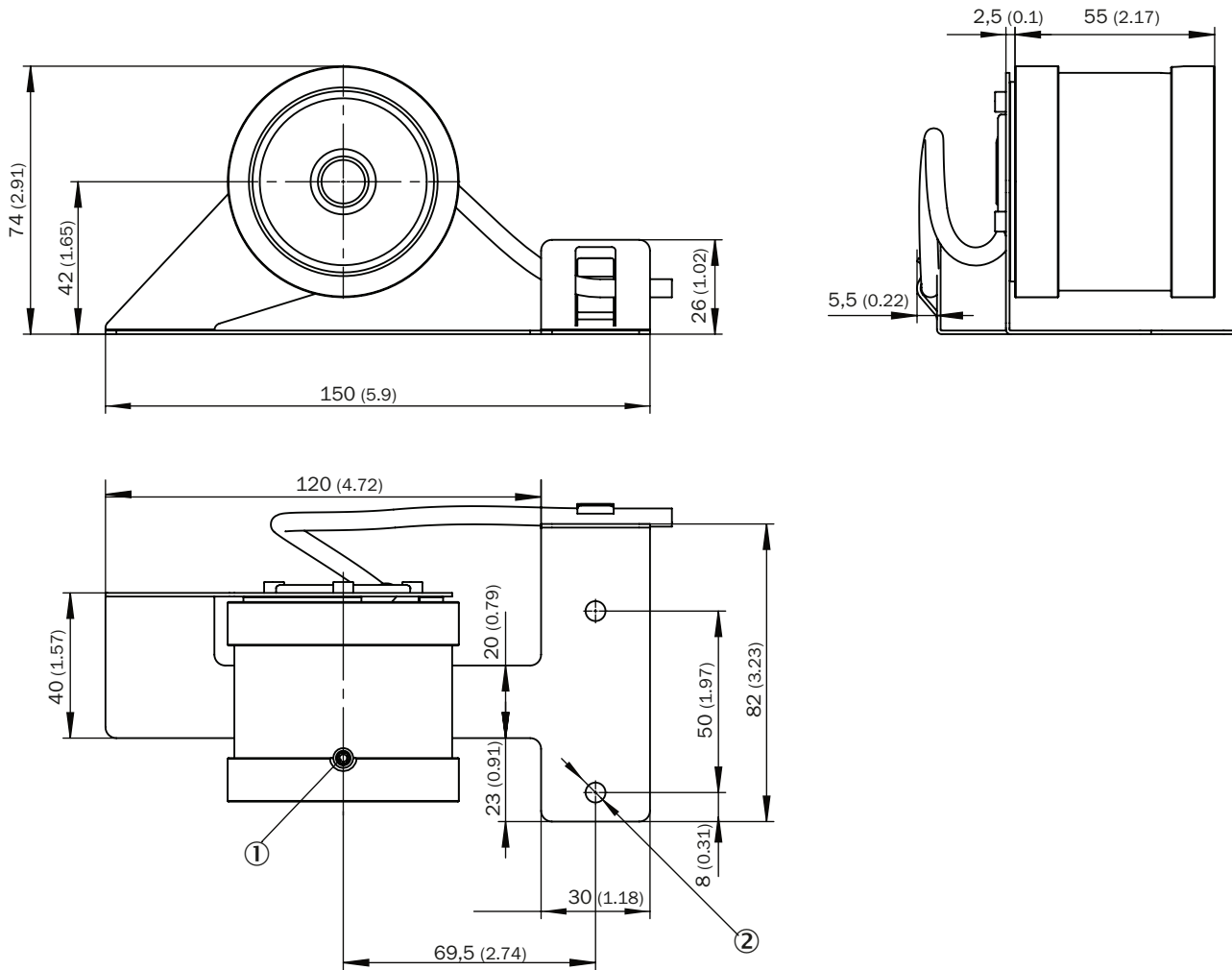
<b>ECLASS 5.0</b>	27270501
<b>ECLASS 5.1.4</b>	27270501
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590
<b>ECLASS 7.0</b>	27270501

<b>ECLASS 8.0</b>	27270501
<b>ECLASS 8.1</b>	27270501
<b>ECLASS 9.0</b>	27270501
<b>ECLASS 10.0</b>	27270790
<b>ECLASS 11.0</b>	27270707
<b>ECLASS 12.0</b>	27270504
<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

### Certificates

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

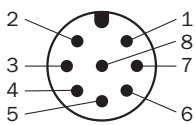
Dimensional drawing



Dimensions in mm (inch)

- ① M4 x 20 set screw
- ② 2 x Ø 5.5

Anschlussbelegung

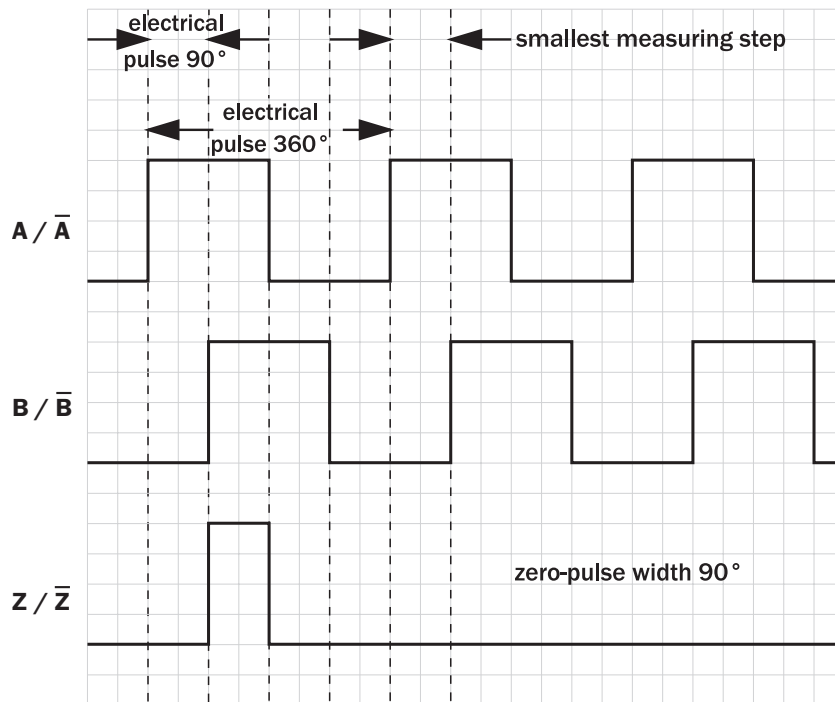


view of M12 male device connector on cable / housing

Wire colors (cable connection)	Male connector M12, 8-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	A-	Signal cable
White	2	A	Signal cable
Black	3	B-	Signal cable
Pink	4	B	Signal cable
Yellow	5	Z-	Signal cable
Purple	6	Z	Signal cable

Wire colors (cable connection)	Male connector M12, 8-pin	TTL/HTL 6-channel signal	Explanation
Blue	7	GND	Ground connection
Red	8	+U <sub>s</sub>	Supply voltage
Shielding	Shielding	Shielding	Shielding connected to encoder housing

### Diagrams



## Recommended accessories

Other models and accessories → [www.sick.com/DKV60](http://www.sick.com/DKV60)

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 2 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G02MLA3	2030682
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 7 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G07MLA3	2030685
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 10 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G10MLA3	2030688
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 15 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G15MLA3	2030692
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 20 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G20MLA3	2030695
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 25 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G25MLA3	2030699
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 30 m, 11-wire, PUR</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G30MLA3	2030702
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 1.5 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G1M5MA3	2029212
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 3 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G03MMA3	2029213
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 5 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G05MMA3	2029214
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> </ul>	DOL-2312-G10MMA3	2029215

	Brief description	Type	part no.
	<ul style="list-style-type: none"> <li><b>Cable:</b> 10 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>		
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 20 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G20MMA3	2029216
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 30 m, 12-wire, PUR, halogen-free</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-2312-G30MMA3	2029217
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded, SSI</li> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Connection systems:</b> Flying leads</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	DOL-1208-G02MAC1	6032866
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded, SSI</li> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li> <li><b>Connection systems:</b> Flying leads</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	DOL-1208-G05MAC1	6032867
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded, SSI</li> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Connection systems:</b> Flying leads</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	DOL-1208-G10MAC1	6032868
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded, SSI</li> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 20 m, 8-wire, PUR, halogen-free</li> <li><b>Connection systems:</b> Flying leads</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	DOL-1208-G20MAC1	6032869
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded, SSI</li> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Cable:</b> 25 m, 8-wire, PUR, halogen-free</li> <li><b>Connection systems:</b> Flying leads</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	DOL-1208-G25MAC1	6067859

## 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)