

# DFV60B-22EZ0-S01

DFV60

**MEASURING WHEEL ENCODERS**

**SICK**  
Sensor Intelligence.

Illustration may differ

### Ordering information

Type	Part no.
DFV60B-22EZ0-S01	1051284

DFV60 spring arm (part number: 2056155) not included with delivery

Other models and accessories → [www.sick.com/DFV60](http://www.sick.com/DFV60)



### Detailed technical data

#### Features

<b>Special device</b>	✓
<b>Specialty</b>	M12 male connector, 5-pin
<b>Items supplied</b>	DFV60 spring arm (part number: 2056155) not included with delivery

#### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	300 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>	30
<b>Resolution in pulses/mm</b>	0.1 Pulses/mm <sup>1)</sup>
<b>Measuring increment (resolution in mm/pulse)</b>	10 mm/pulse <sup>2)</sup>
<b>Measuring step deviation</b>	± 0.04° <sup>3)</sup>
<b>Error limits</b>	± 0.03°, ± 4 mm/m, subject to measuring wheel (measuring wheel surface + measuring surface + ambient conditions)
<b>Initialization time</b>	30 ms

<sup>1)</sup> Calculation example: Pulses per revolution / measuring wheel circumference = 16,384 pulses per revolution / 200 mm = 81.92 pulses/mm.

<sup>2)</sup> Calculation example: Circumference of wheel / pulses per revolution = 200 mm / 16384 pulses per revolution = 0,012mm/pulse.

<sup>3)</sup> Value refers to the mounted encoder.

#### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	HTL / Push pull

#### Electrical data

<b>Connection type</b>	Male connector, M12, 5-pin, radial
<b>Power consumption max. without load</b>	≤ 30 mA
<b>Supply voltage</b>	10 V ... 32 V
<b>Load current max.</b>	30 mA
<b>Maximum output frequency</b>	820 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>	✓

## Mechanical data

<b>Measuring wheel circumference</b>	300 mm
<b>Measuring wheel surface</b>	O-ring NBR70 <sup>1)</sup>
<b>Mass</b>	+ 420 g
<b>Encoder material</b>	
Shaft	Stainless steel
Flange	Aluminum
Housing	Aluminum
Cable	PUR
<b>Spring arm mechanism material</b>	
Spring element	Not contained in the scope of delivery of the system
Measuring wheel, spring arm	Aluminum
<b>Start up torque</b>	0.8 Ncm (at 20 °C)
<b>Operating torque</b>	0.6 Ncm (at 20 °C)
<b>Operating speed</b>	1,500 min <sup>-1</sup>
<b>Maximum operating speed</b>	3,000 min <sup>-1</sup> <sup>2)</sup>
<b>Bearing lifetime</b>	3 x 10 <sup>9</sup> revolutions
<b>Maximum travel/deflection of spring arm</b>	40 mm
<b>Recommended pretension</b>	20 Nm
<b>Max. permissible working area for the spring (continuous operation)</b>	± 10 mm
<b>Recommended spring deflection</b>	20 mm ... 40 mm
<b>Mounting position relative to the measuring object</b>	Preferably from above, from below possible

<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> Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

## Ambient data

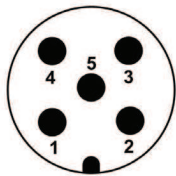
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-4
<b>Enclosure rating</b>	IP65
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-20 °C ... +100 °C
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package

## 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

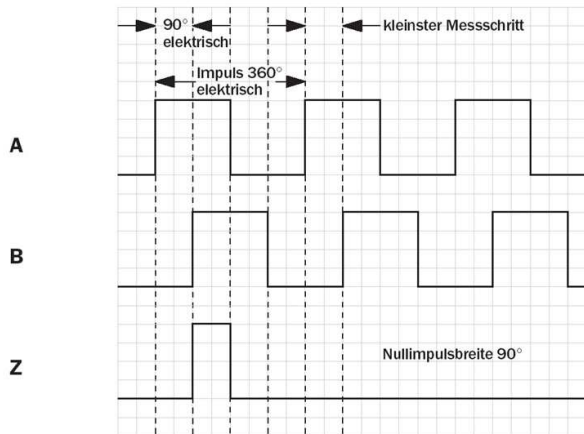
### PIN assignment



View to the connector M12 fitted to the encoder body

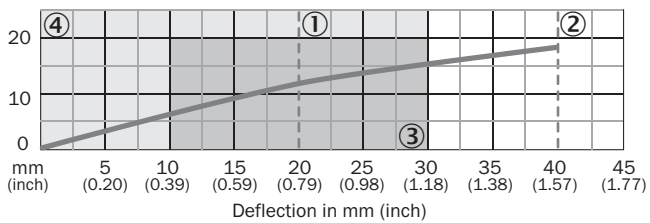
PIN	Signal	Description
1	Us	Supply voltage (potential free to housing)
2	B	Signal line
3	GND	Ground connection of the encoder
4	A	Signal line
5	Z	Signal line for zero pulse

## Diagrams



Dual wheel, spring tension, yoke mount

Force in N



- ① Recommended pre-tension (20 mm)
- ② Maximum deflection (40 mm)
- ③ Recommended deflection range (10 - 30 mm)
- ④ Permissible working area (0 - 30 mm)

## 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)