



DFV60A-22PC65536

DFV60

MEASURING WHEEL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|------------------|----------|
| DFV60A-22PC65536 | 1051309 |

Other models and accessories → www.sick.com/DFV60

Detailed technical data

Performance

| | |
|---|---|
| Pulses per revolution | 65,536 |
| Resolution in pulses/mm | 218.45 Pulses/mm ¹⁾ |
| Measuring increment (resolution in mm/pulse) | 0.005 mm/pulse ²⁾ |
| Measuring step deviation | ± 0.002 ° ³⁾ |
| Error limits | ± 4 mm/m, subject to measuring wheel (measuring wheel surface + measuring surface + ambient conditions) |
| Initialization time | 30 ms |

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

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

³⁾ Value refers to the mounted encoder.

Interfaces

| | |
|---------------------------------------|-------------|
| Communication interface | Incremental |
| Communication Interface detail | TTL / HTL |
| Programmable/configurable | ✓ |

Electrical data

| | |
|--|---|
| Connection type | Male connector, M12, 8-pin, radial |
| Power consumption max. without load | ≤ 30 mA |
| Supply voltage | 4.5 V ... 32 V |
| Load current max. | 30 mA |
| Maximum output frequency | 820 kHz |
| Reference signal, number | 1 |
| Reference signal, position | 90°, electric, logically gated with A and B |
| Reverse polarity protection | ✓ |

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.

| | |
|--|--|
| Short-circuit protection of the outputs | ✓ |
| MTTFd: mean time to dangerous failure | 300 years (EN ISO 13849-1) ¹⁾ |

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Mechanical data

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

¹⁾ 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.

²⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

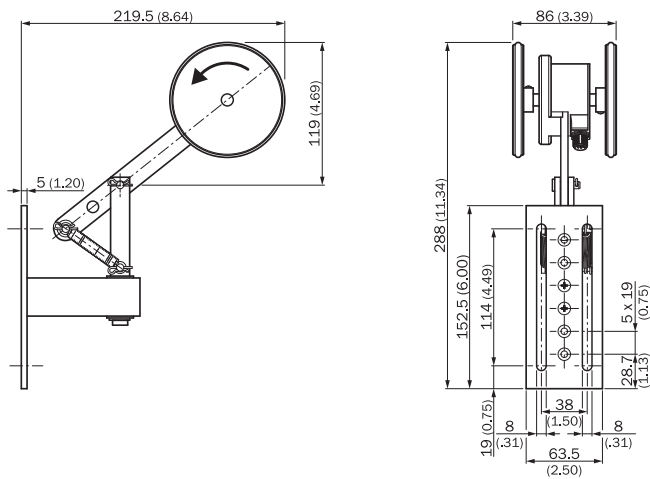
| | |
|--------------------------------------|---|
| EMC | According to EN 61000-6-2 and EN 61000-6-4 |
| Enclosure rating | IP65 |
| Permissible relative humidity | 90 % (condensation of the optical scanning not permitted) |
| Operating temperature range | -20 °C ... +100 °C |
| Storage temperature range | -40 °C ... +100 °C, without package |

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 | 27270790 |
| ECl@ss 11.0 | 27270707 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

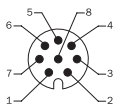
Dimensional drawing (Dimensions in mm (inch))



PIN assignment

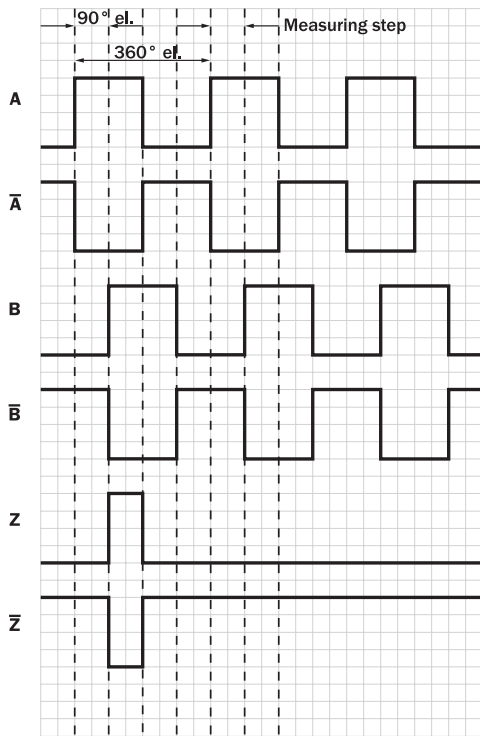
Cable 8-core

View to the connector M12 fitted to the encoder body



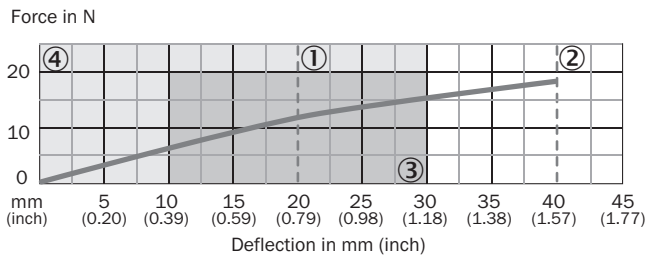
| PIN, 8-pin, connector M12 | Color of wires for encoders with cable outlet | Signal TTL, HTL | Explanation |
|---------------------------|---|-----------------|--|
| 1 | Brown | -A | Signal line |
| 2 | White | A | Signal line |
| 3 | Black | - B | Signal line |
| 4 | Pink | B | Signal line |
| 5 | Yellow | -Z | Signal line |
| 6 | Lilac | Z | Signal line |
| 7 | Blue | GND | Ground connection of the encoder |
| 8 | Red | +U _s | Supply voltage (potential free to housing) |
| Screen | Screen | Screen | Screen connected to encoder housing, On the control side connected to earth. |

Signal outputs



Diagrams

Dual wheel, spring tension, yoke mount




- 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)

Recommended accessories

Other models and accessories → www.sick.com/DFV60

| | Brief description | Type | Part no. |
|---|---|------------------|----------|
| Mounting brackets and plates | | | |
|  | Spring arm / mounting arm for DFV60 | DFV60 sprung arm | 2056155 |
| Other mounting accessories | | | |
|  | Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm | BEF-MR010030R | 2049278 |
| | O-ring for measuring wheels (circumference 300 mm) | BEF-OR-083-050 | 2064076 |
| Programming and configuration tools | | | |
|  | USB programming unit, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoders | PGT-08-S | 1036616 |
|  | Programming unit display for programmable SICK DFS60, DFV60, AFS/AFM60, AHS/AHM36 encoders, and wire draw encoder with DFS60, AFS/AFM60 and AHS/AHM36. Compact dimensions, low weight, and intuitive operation. | PGT-10-Pro | 1072254 |
| Plug connectors and cables | | | |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, HIPERFACE®, PUR, halogen-free, shielded | LTG-2308-MWENC | 6027529 |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, shielded | LTG-2411-MW | 6027530 |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded | LTG-2512-MW | 6027531 |
|  | Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, Incremental, PUR, halogen-free, shielded | LTG-2612-MW | 6028516 |
|  | Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 0.5 m | DOL-0J08-G0M5AA3 | 2046873 |
| | Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 10 m | DOL-0J08-G10MAA3 | 2046877 |
| | Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 1.5 m | DOL-0J08-G1M5AA3 | 2046874 |
| | Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded, 1.5 m | DOL-0J08-G1M5AA6 | 2048590 |
| | Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded, 3 m | DOL-0J08-G3M0AA6 | 2048591 |
|  | Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 2 m | DOL-1208-G02MAC1 | 6032866 |
| | Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 5 m | DOL-1208-G05MAC1 | 6032867 |

| | Brief description | Type | Part no. |
|---|---|------------------|----------|
|  | Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 10 m | DOL-1208-G10MAC1 | 6032868 |
| | Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 20 m | DOL-1208-G20MAC1 | 6032869 |
| | Head A: female connector, M12, 8-pin, straight Head B: Flying leads Cable: Incremental, SSI, PUR, halogen-free, shielded, 25 m | DOL-1208-G25MAC1 | 6067859 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 2 m | DOL-2312-G02MLA3 | 2030682 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 3 m | DOL-2312-G03MMA3 | 2029213 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 5 m | DOL-2312-G05MMA3 | 2029214 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 7 m | DOL-2312-G07MLA3 | 2030685 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 10 m | DOL-2312-G10MLA3 | 2030688 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 10 m | DOL-2312-G10MMA3 | 2029215 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 15 m | DOL-2312-G15MLA3 | 2030692 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 1.5 m | DOL-2312-G1M5MA3 | 2029212 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 20 m | DOL-2312-G20MLA3 | 2030695 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 20 m | DOL-2312-G20MMA3 | 2029216 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 25 m | DOL-2312-G25MLA3 | 2030699 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, shielded, 30 m | DOL-2312-G30MLA3 | 2030702 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: Incremental, PUR, halogen-free, shielded, 30 m | DOL-2312-G30MMA3 | 2029217 |
|  | Head A: female connector, terminal box, 8-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: SSI + incremental, PVC, shielded, 0.5 m Programming adapter cable for programming tool PGT-10-Pro and PGT-08-S | DSL-0D08-G0M5AC3 | 2061739 |
|  | Head A: female connector, M12, 8-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: Incremental, shielded, 0.5 m Programming adapter cable for programming tool PGT-10-Pro and PGT-08-S | DSL-2D08-G0M5AC3 | 2046579 |

| | Brief description | Type | Part no. |
|---|--|------------------|----------|
|  | Head A: female connector, M23, 12-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: Incremental, shielded, 0.5 m Programming adapter cable for programming tool PGT-10-Pro and PGT-08-S | DSL-3D08-GOM5AC3 | 2046580 |

SICK AT A GLANCE

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