



DFS22A-KCAAN002400

DFS2x

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | part no. |
|--------------------|----------|
| DFS22A-KCAAN002400 | 1101843 |

Other models and accessories → www.sick.com/DFS2x

Detailed technical data

Safety-related parameters

| | |
|--|--|
| MTTF_D (mean time to dangerous failure) | 330 years (EN ISO 13849-1) ¹⁾ |
|--|--|

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.

Performance

| | |
|---------------------------------|---------------------------------------|
| Pulses per revolution | 2,400 |
| Measuring step | ± 90°, electric/pulses per revolution |
| Measuring step deviation | ± 0.008° pulses 100 ... 10,000 |
| Error limits | ± 0.03° |

Interfaces

| | |
|--|---|
| Communication interface | Incremental |
| Communication Interface detail | TTL / RS-422 |
| Number of signal channels | 6-channel |
| 0-set function via hardware pin | ✓ |
| 0-SET function | H-active, L = 0 - 3 V, H = 4,0 - U _s V |
| Initialization time | 40 ms ¹⁾ |
| Output frequency | 820 kHz |
| Load current | 30 mA |
| Operating current | 50 mA (without load) |

¹⁾ Valid positional data can be read once this time has elapsed.

Electronics

| | |
|------------------------|----------------------------|
| Connection type | Cable, 9-wire, radial, 5 m |
| Supply voltage | 4.5 ... 5.5 V |

¹⁾ Short-circuit opposite to another channel or GND permissible for maximum 30 s.

| | |
|--|--|
| Reference signal, number | 1 |
| Reference signal, position | 180°, electrical, logically gated with BN2 |
| Code sequence | Counterclockwise |
| Reverse polarity protection | ✓ |
| Short-circuit protection of the outputs | ✓ ¹⁾ |

¹⁾ Short-circuit opposite to another channel or GND permissible for maximum 30 s.

Mechanics

| | |
|---------------------------------------|--|
| Mechanical design | Blind hollow shaft |
| Shaft diameter | 3/8" Front clamp |
| Flange type / stator coupling | 2-point stator coupling |
| Weight | + 0.3 kg ¹⁾ |
| Shaft material | Stainless steel 1,4305 |
| Flange material | Aluminum |
| Housing material | Aluminum |
| Start up torque | 0.8 Ncm (+20 °C) |
| Operating torque | 0.6 Ncm (+20 °C) |
| Permissible movement static | ± 0.3 mm (radial) ± 0.5 mm (axial) |
| Permissible movement dynamic | ± 0.05 mm (radial) ± 0.1 mm (axial) |
| Operating speed | ≤ 6,000 min ⁻¹ |
| Moment of inertia of the rotor | 40 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on encoder with M12 plug.

Ambient data

| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP65, shaft side (IEC 60529) IP67, housing side (IEC 60529) |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -30 °C ... +85 °C |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 11 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

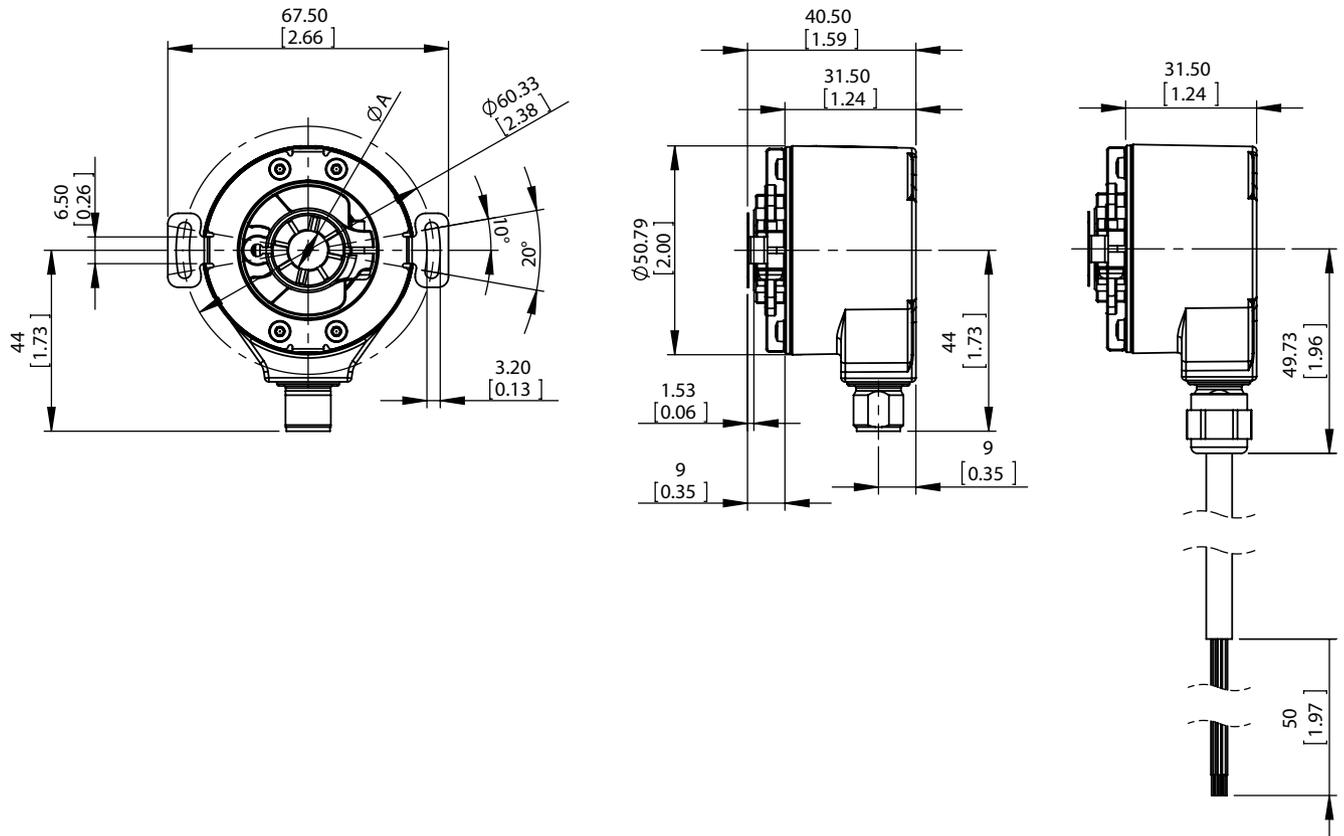
Certificates

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

Classifications

| | |
|-----------------------|----------|
| ECLASS 5.0 | 27270501 |
| ECLASS 5.1.4 | 27270501 |
| ECLASS 6.0 | 27270590 |
| ECLASS 6.2 | 27270590 |
| ECLASS 7.0 | 27270501 |
| ECLASS 8.0 | 27270501 |
| ECLASS 8.1 | 27270501 |
| ECLASS 9.0 | 27270501 |
| ECLASS 10.0 | 27270501 |
| ECLASS 11.0 | 27270501 |
| ECLASS 12.0 | 27270501 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| ETIM 8.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

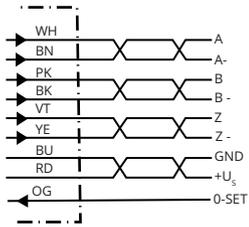
Dimensional drawing DFS22 blind hollow shaft



Dimensions in mm (inch)

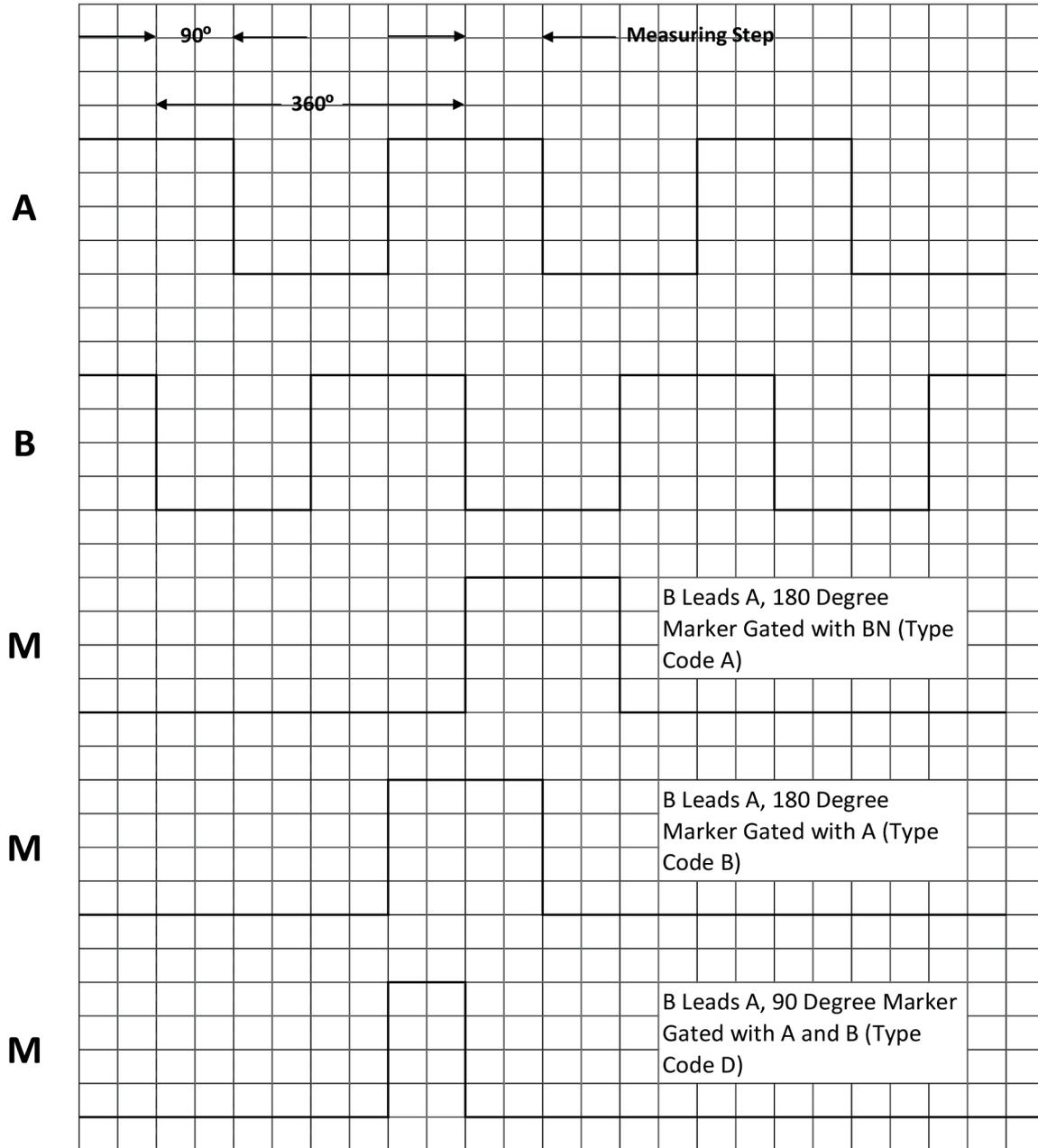
| Type | Shaft diameterA |
|--------------------------------|-----------------|
| DFS2x-x1xxxxxxx | 1/4" |
| DFS2x-x2xxxxxxxDFS2x-xCxxxxxxx | 3/8" |
| DFS2x-xFxxxxxxx | 1/2" |
| DFS2x-x3xxxxxxx | 6 mm |
| DFS2x-x4xxxxxxx | 10 mm |

Anschlussbelegung



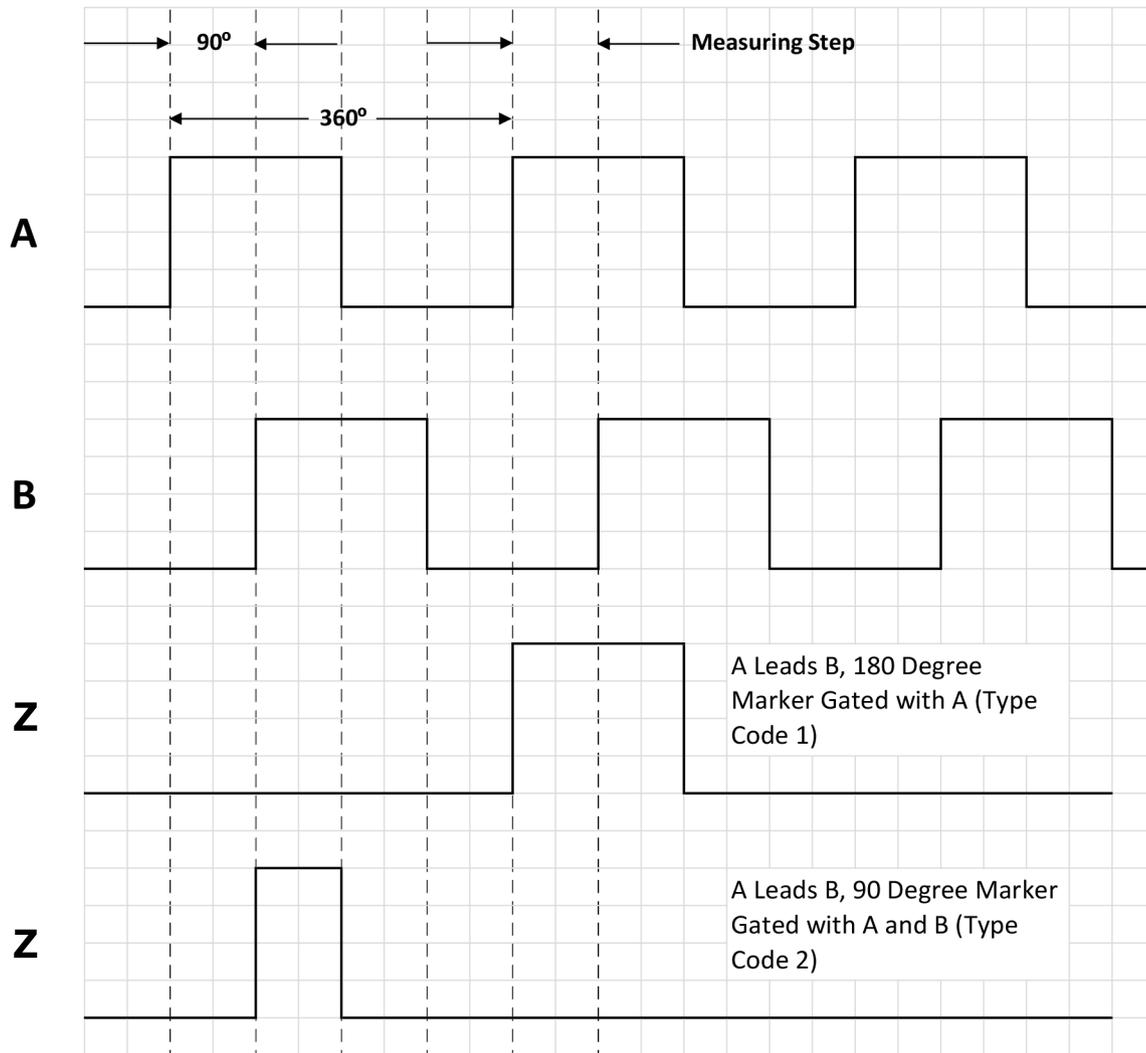
| M12, 8-pin | MS, 10-pin | MS, 7-pin | MS, 6-pin | Cable, 9-wire | Signal | Description |
|------------|------------|-----------|-----------|---------------|------------|---|
| 1 | H | - | - | Brown | \bar{A} | Signal wire |
| 2 | A | A | E | White | A | Signal wire |
| 3 | I | - | - | Black | \bar{B} | Signal wire |
| 4 | B | B | D | Pink | B | Signal wire |
| 5 | J | - | - | Yellow | \bar{Z} | Signal wire |
| 6 | C | C | C | Purple | Z | Signal wire |
| 7 | F | F | A | Blue | GND | GND |
| 8 | D | D | B | Red | Us | Supply voltage |
| - | E | E | - | Orange | 0-SET | Input signal |
| - | G | G | F | - | Housing | Electrically connected to the housing potential |
| - | - | - | - | Blank | Drain wire | Bare wire parallel to the braided screen |
| - | - | - | - | Shielding | Shielding | Screen connected to housing on encoder side |

Diagrams Signal Outputs with Counter Clock-wise Counting Direction Option Selected (B leads A for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



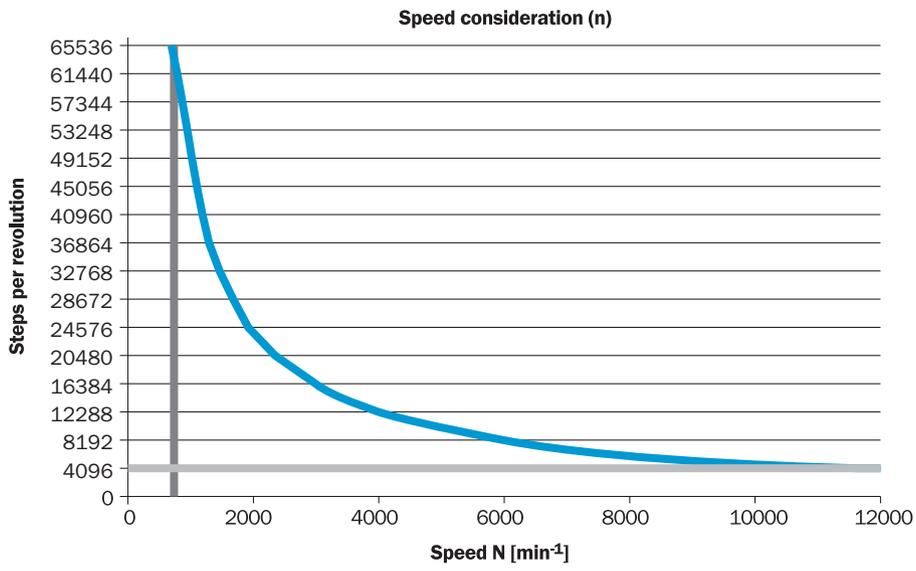
Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

Diagrams Signal Outputs with Clock-wise Counting Direction Option Selected (A leads B for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

maximum revolution range



SICK AT A GLANCE

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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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