



DBS60I-W9FN01024

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|------------------|----------|
| DBS60I-W9FN01024 | 1116971 |

Other models and accessories → www.sick.com/DBS60

Detailed technical data

Performance

| | |
|---------------------------------|-------------------------------------|
| Pulses per revolution | 1,024 |
| Measuring step | 90°, electric/pulses per revolution |
| Measuring step deviation | ± 18° / pulses per revolution |
| Error limits | Measuring step deviation x 3 |
| Duty cycle | ≤ 0.5 ± 5 % |

Interfaces

| | |
|---------------------------------------|-------------------------|
| Communication interface | Incremental |
| Communication Interface detail | TTL / HTL ¹⁾ |
| Number of signal channels | 6-channel |
| Initialization time | < 5 ms ²⁾ |
| Output frequency | ≤ 300 kHz ³⁾ |
| Load current | ≤ 30 mA, per channel |
| Power consumption | ≤ 0.5 W (without load) |

¹⁾ Output level depends on the supply voltage.

²⁾ Valid signals can be read once this time has elapsed.

³⁾ Up to 450 kHz on request.

Electrical data

| | |
|------------------------------------|---|
| Connection type | Cable, 8-wire, radial, 10 m |
| Supply voltage | 4.5 ... 30 V |
| Reference signal, number | 1 |
| Reference signal, position | 90°, electric, logically gated with A and B |
| Reverse polarity protection | ✓ |

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

²⁾ 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 | ✓ ¹⁾ |
| MTTFd: mean time to dangerous failure | 500 years (EN ISO 13849-1) ²⁾ |

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Mechanical data

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 3/8" |
| Shaft length | 19 mm |
| Flange type / stator coupling | Flange with 3 x M3 and 3 x M4 |
| Weight | 0.7 kg (DBS60I-W*) ¹⁾ |
| Shaft material | Stainless steel V4A (316L) |
| Flange material | Stainless steel V4A (316L) |
| Housing material | Stainless steel V4A (316L) |
| Material, cable | TPU |
| Shaft sealing ring material | FKM80 |
| Material, cable gland | Stainless steel V4A (316L) |
| Start up torque | 1 Ncm (+20 °C) |
| Operating torque | 0.9 Ncm (+20 °C) |
| Permissible shaft loading | 80 N (radial) ²⁾ 40 N (axial) ²⁾ |
| Operating speed | ≤ 6,000 min ⁻¹ ³⁾ |
| Moment of inertia of the rotor | 45 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Relates to encoders with 1.5 m cable connection.

²⁾ Higher values are possible using limited bearing life.

³⁾ Maximum speed which does not cause mechanical damage to the encoder. Impact on the service life and signal quality is possible. Please note the maximum output frequency.

Ambient data

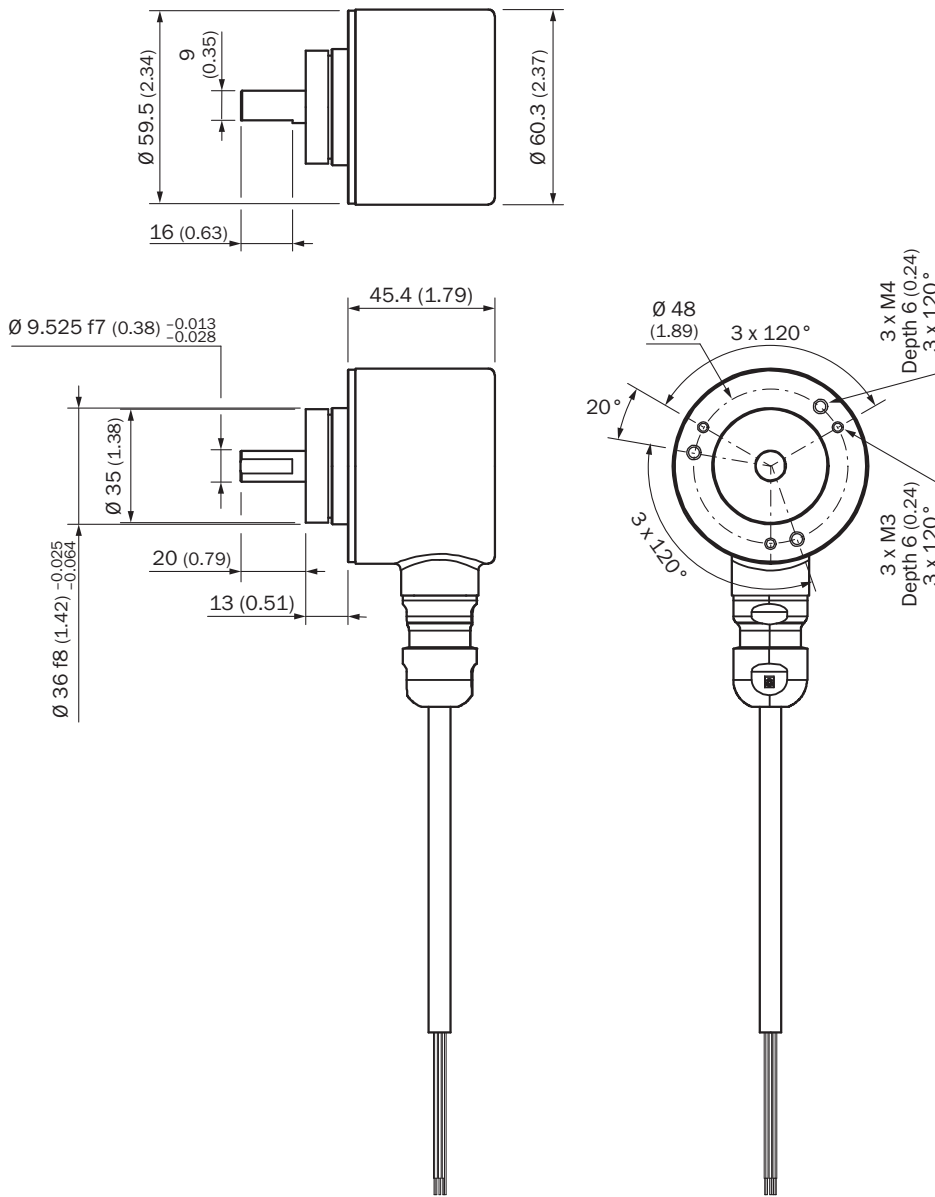
| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP69K (IEC 60529) |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -30 °C ... +100 °C, at maximum 3,000 pulses per revolution |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

Classifications

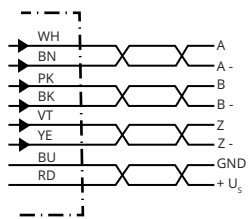
| | |
|---------------------|----------|
| ECLASS 5.0 | 27270501 |
| ECLASS 5.1.4 | 27270501 |
| ECLASS 6.0 | 27270590 |

| | |
|-----------------------|----------|
| 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 (Dimensions in mm (inch))



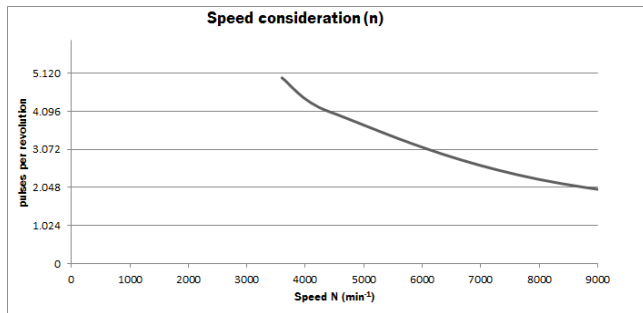
PIN assignment



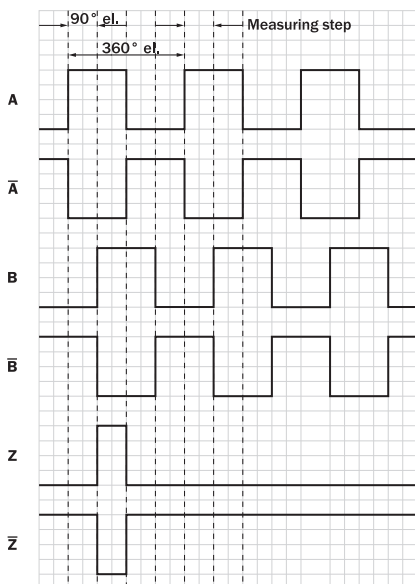
| Wire colors (cable connection) | Male connector M12, 8-pin | TTL/HTL signal | Explanation |
|--------------------------------|---------------------------|----------------|--------------|
| Brown | 1 | A- | Signal cable |

| Wire colors (cable connection) | Male connector M12, 8-pin | TTL/HTL signal | Explanation |
|--------------------------------|---------------------------|-----------------|---|
| 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 |
| Blue | 7 | GND | Ground connection |
| Red | 8 | +U _S | Supply voltage |
| Screen | Screen | Screen | Screen connected to housing on encoder side |

Diagrams



Signal outputs for electrical interfaces TTL and HTL



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

| Supply voltage | Output |
|-----------------|--------|
| 4,5 V ... 5,5 V | TTL |
| 10 V ... 30 V | TTL |
| 10 V ... 27 V | HTL |

| Supply voltage | Output |
|-----------------------|-------------------|
| 4,5 V ... 30 V | TTL/HTL universal |
| 4,5 V ... 30 V | TTL |

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.

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Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

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