# DFS60B-TZAZS49

DFS60

**INCREMENTAL ENCODERS**

**SICK**
Sensor Intelligence.

# DFS60B-TZAZS49 | DFS60
## INCREMENTAL ENCODERS

Illustration may differ

## Ordering information

| Type | part no. |
|------|----------|
| DFS60B-TZAZS49 | 1072429 |

Other models and accessories ➜ www.sick.com/DFS60

## Detailed technical data

### Features

| | |
|---|---|
| **Special device** | ✔ |
| **Specialty** | Cable, with male connector, MS, 10-pin, 1.5 m (6 inch)<br>The connection wiring offers counterclockwise counting (B-before-A when shaft turns clockwise)<br>2079275 tether (compatible with DGS35 T1 tether) premounted to encoder |
| **Standard reference device** | DFS60B-TJAK08192, 1072095 |

### Safety-related parameters

| | |
|---|---|
| **MTTF$_D$ (mean time to dangerous failure)** | 300 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** | 8,192 [1] |
| **Measuring step** | 90°, electric/pulses per revolution |
| **Measuring step deviation at binary number of lines** | ± 0.008° |
| **Error limits** | ± 0.05° |

[1] See maximum revolution range.

### Interfaces

| | |
|---|---|
| **Communication interface** | Incremental |
| **Communication Interface detail** | TTL / RS-422 |
| **Number of signal channels** | 6-channel |
| **Initialization time** | 40 ms |
| **Output frequency** | ≤ 600 kHz |
| **Load current** | ≤ 30 mA |
| **Operating current** | 40 mA (without load) |

### Electronics

| | |
|---|---|
| **Connection type** | Special version |

[1] Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

| | |
|---|---|
| **Connection type Detail** | Cable, with male connector, MS, 10-pin, 1.5 m (6 inch) |
| **Supply voltage** | 4.5 … 5.5 V |
| **Reference signal, number** | 1 |
| **Reference signal, position** | 90°, electric, logically gated with A and B |
| **Code sequence** | B-leads-A when shaft rotated clockwise |
| **Short-circuit protection of the outputs** | ✓ [1] |

[1] Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

## Mechanics

| | |
|---|---|
| **Mechanical design** | Through hollow shaft |
| **Shaft diameter** | 5/8″ <br> Front clamp |
| **Weight** | + 0.2 kg |
| **Shaft material** | Stainless steel |
| **Flange material** | Aluminum |
| **Housing material** | Aluminum die cast |
| **Start up torque** | 0.8 Ncm (+20 °C) |
| **Operating torque** | 0.6 Ncm (+20 °C) |
| **Permissible movement static** | ± 0.3 mm (radial) <br> ± 0.5 mm (axial) |
| **Permissible movement dynamic** | ± 0.1 mm (radial) <br> ± 0.2 mm (axial) |
| **Operating speed** | $\leq 6{,}000$ min$^{-1}$ [1] |
| **Moment of inertia of the rotor** | 40 gcm² |
| **Bearing lifetime** | 3.6 x 10^10 revolutions |
| **Angular acceleration** | $\leq 500{,}000$ rad/s² |

[1] 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 61000-6-3 |
| **Enclosure rating** | IP65, housing side, cable connection (IEC 60529) <br> IP65, shaft side (IEC 60529) |
| **Permissible relative humidity** | 90 % (Condensation not permitted) |
| **Operating temperature range** | –40 °C … +100 °C [1] <br> –30 °C … +100 °C [2] |
| **Storage temperature range** | –40 °C … +100 °C, without package |
| **Resistance to shocks** | 70 g, 6 ms (EN 60068-2-27) |
| **Resistance to vibration** | 30 g, 10 Hz … 2,000 Hz (EN 60068-2-6) |

[1] Stationary position of the cable.
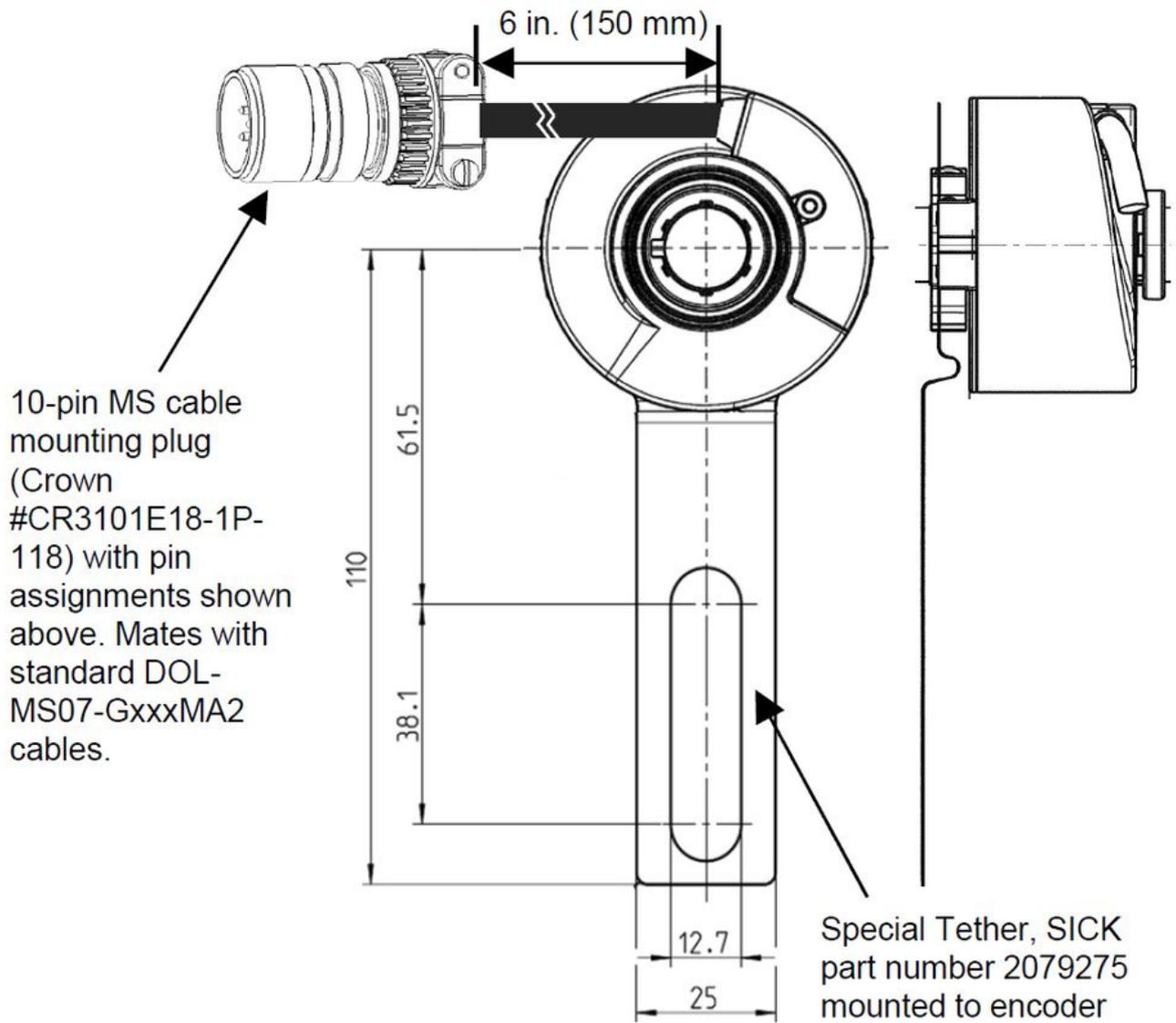[2] Flexible position of the cable.

## Certificates

| | |
|---|---|
| **EU declaration of conformity** | ✓ |
| **UK declaration of conformity** | ✓ |
| **ACMA declaration of conformity** | ✓ |

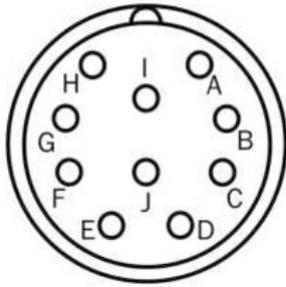| | |
|---|---|
| **Moroccan declaration of conformity** | ✓ |
| **China RoHS** | ✓ |
| **cULus certificate** | ✓ |
| **Information according to Art. 3 of Data Act (Regulation EU 2023/2854)** | ✓ |

## 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



6 in. (150 mm)

10-pin MS cable mounting plug (Crown #CR3101E18-1P-118) with pin assignments shown above. Mates with standard DOL-MS07-GxxxMA2 cables.

61.5

110

38.1

12.7

25

Special Tether, SICK part number 2079275 mounted to encoder

Dimensions in mm (inch)

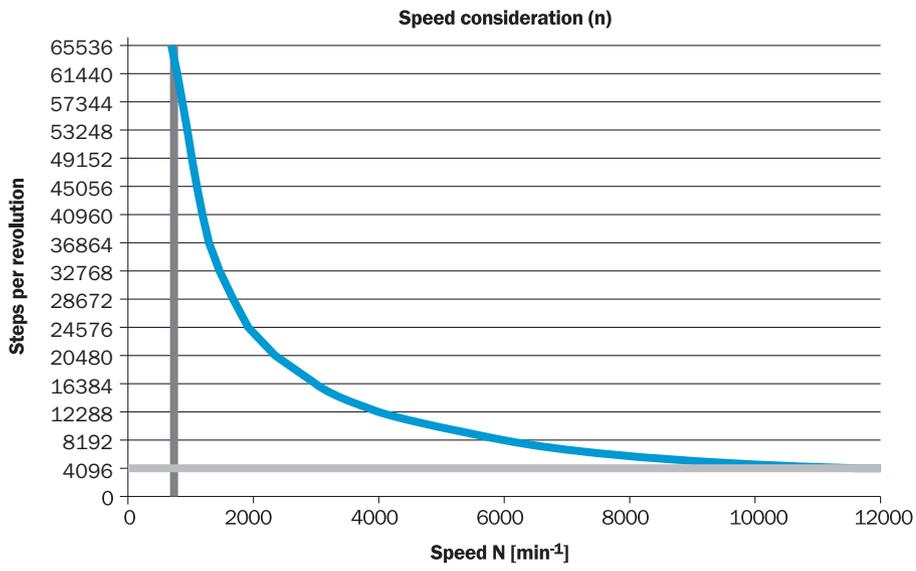## PIN assignment



10-pin MS cable
mounting plug pin locations

| MS 10-Pin | Signal | Explanation |
|---|---|---|
| H | AN | Output Signal |
| A | A | Output Signal |
| I | BN | Output Signal |
| B | B | Output Signal |
| J | ZN | Output Signal |
| C | Z | Output Signal |
| F | GND | Us Return (-) |
| D | Us | Supply Voltage (+) |
| - | Zero Set | Input Signal |
| G | Case | Housing Potential |
| - | Drain | Drain Wire |
| - | Shield | Cable shield |

## maximum revolution range

**Speed consideration (n)**



*Y-axis: Steps per revolution (0, 4096, 8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152, 53248, 57344, 61440, 65536)*

*X-axis: Speed N [min⁻¹] (0, 2000, 4000, 6000, 8000, 10000, 12000)*

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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.

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