



DUS60E-S4KF0ACA

DUS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|-----------------|----------|
| DUS60E-S4KF0ACA | 1084491 |

Other models and accessories → www.sick.com/DUS60

Detailed technical data

Performance

| | |
|---------------------------------|-------------------------------------|
| 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⁾ |
| Parameterising data | DIP switch, selectable output |
| Output function | A and B output |
| Initialization time | < 5 ms ²⁾ |
| Output frequency | + 60 kHz |
| Load current | ≤ 30 mA, per channel |
| Operating current | ≤ 120 mA (without load) |
| Power consumption | ≤ 1.25 W (without load) |
| DIP switch parameters | |
| Pulses per revolution | ✓ |
| Output voltage | ✓ |
| Direction of rotation | ✓ |
| Configuration switches | 1800 PPR values, direction selection, TTL/HTL selectable |

¹⁾ The output is not selectable for DIP switch configurations E, F, and G. The output voltage value is dependent on the supply voltage.

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

Electrical data

| | |
|--|---|
| Connection type | Male connector, M12, 4-pin, universal ¹⁾ |
| Supply voltage | 4.75 ... 30 V |
| Reference signal, number | 1 |
| Reference signal, position | 180°, electric, gated with A |
| Reverse polarity protection | ✓ |
| Short-circuit protection of the outputs | ✓ |
| MTTFd: mean time to dangerous failure | 275 years (EN ISO 13849-1) ²⁾ |

¹⁾ The universal connection is rotatable so that it is possible to position the connector in the radial or axial direction.

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.

Mechanical data

| | |
|---------------------------------------|--------------------------------------|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm |
| Shaft length | 19 mm |
| Flange type / stator coupling | Face mount flange with 3 x M3 3 x M4 |
| Weight | 0.3 kg ¹⁾ |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Housing material | Aluminum |
| Material, cable | PVC |
| Start up torque | 1.2 Ncm (+20 °C) |
| Operating torque | 1.1 Ncm (+20 °C) |
| Permissible shaft loading | 100 N (radial) 50 N (axial) |
| Operating speed | 1,500 min ⁻¹ |
| Moment of inertia of the rotor | 33 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on encoder with male connector.

Ambient data

| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP65 ¹⁾ |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -30 °C ... +90 °C |
| Storage temperature range | -40 °C ... +75 °C |
| Resistance to shocks | 100 g (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

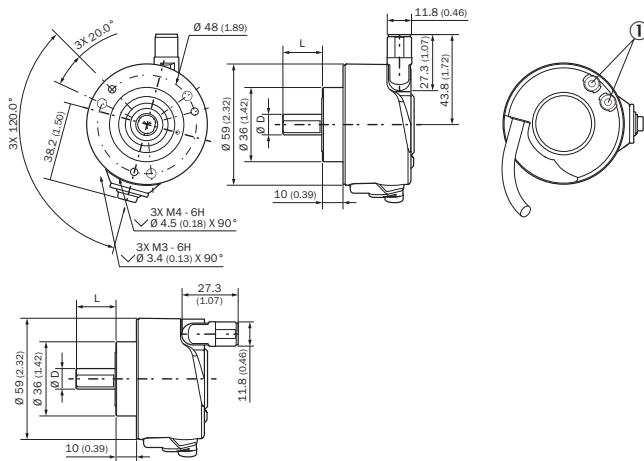
¹⁾ When the mating connector is installed and the DIP switch door is sealed with the encoder housing.

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 | 27270501 |
| eCl@ss 11.0 | 27270501 |
| eCl@ss 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))

Solid shaft

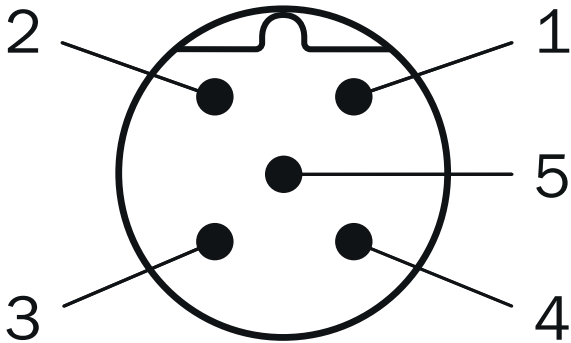


① Status indicators

| Type Solid shaft | Shaft Diameter D | Shaft length L |
|---------------------|------------------|----------------|
| DUS60x-S3xxxxxxx | 6 mm | 10 mm |
| DUS60x-S4xxxxxxx | 10 mm | 19 mm |
| DUS60x-S7xxxxxxx | 3/8" | 19 mm |
| DUS60x-S8xxxxxxx | 1/4" | 10 mm |

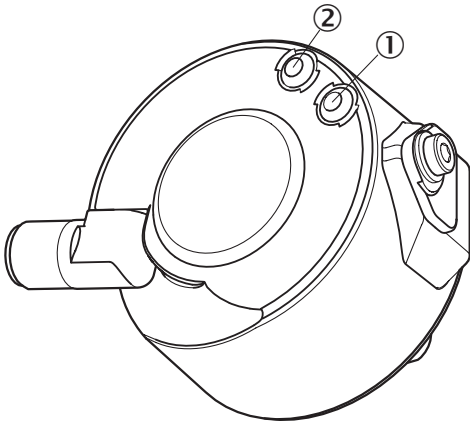
PIN assignment

View of M12 male device connector on encoder



| Wire colors (cable connection) | Male connector M12, 4-pin | Male connector M12, 8-pin | Output function | | | | Explanation |
|--------------------------------|---------------------------|---------------------------|-----------------|----------------|----------------|---|------------------------|
| | | | A | B | C | D | |
| Brown | - | 1 | A- | CW- | A- | A- | Signal |
| White | 4 | 2 | A | CW | A | A | Signal |
| Black | - | 3 | B- | CCW- | Direction- | B- | Signal |
| Pink | 2 | 4 | B | CCW | Direction | Fault (M12, 4-pin) B (M12, 8-pin and cable connection) | Signal |
| Yellow | - | 5 | Z- | Fault- | Fault- | Fault- | Signal |
| Violet | - | 6 | Z | Fault | Fault | Fault | Signal |
| Blue | 3 | 7 | GND | GND | GND | GND | Ground connection |
| Red | 1 | 8 | U _S | U _S | U _S | U _S | Supply voltage |
| - | - | - | Case | Case | Case | Case | Earth fault protection |
| Shielding | - | - | Shielding | Shielding | Shielding | Shielding | Shielding |




Adjustments











| DIP switch configuration C – 1800 pulses | | | | | |
|--|---|----|-----|-----|------|
| Pulses per revolution | 1 | 9 | 30 | 120 | 600 |
| | 2 | 10 | 36 | 150 | 900 |
| | 3 | 12 | 40 | 180 | 1800 |
| | 4 | 15 | 60 | 200 | |
| | 5 | 18 | 72 | 300 | |
| | 6 | 20 | 75 | 360 | |
| | 8 | 24 | 100 | 450 | |

Recommended accessories

Other models and accessories → www.sick.com/DUS60

| | Brief description | Type | Part no. |
|---|---|--------------------|----------|
| Plug connectors and cables | | | |
|  | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, shielded, 2 m | YF2A24-020UB4XLEAX | 2105499 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, shielded, 5 m | YF2A24-050UB4XLEAX | 2095729 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, shielded, 10 m | YF2A24-100UB4XLEAX | 2095730 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, shielded, 20 m | YF2A24-200UB4XLEAX | 2105497 |
|  | Head A: female connector, M12, 5-pin, straight Cable: CANopen, DeviceNet™, shielded | DOS-1205-GA | 6027534 |
| Shaft adaptation | | | |
|  | Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub | KUP-0610-B | 5312982 |

| | Brief description | Type | Part no. |
|---|---|------------|----------|
|  | Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, -10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin | KUP-0610-F | 5312985 |
|  | Bar coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub | KUP-0610-S | 2056407 |
|  | Bar coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub | KUP-0810-S | 5314178 |
|  | Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs | KUP-1010-B | 5312983 |
|  | Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin | KUP-1010-F | 5312986 |
|  | Bar coupling, shaft diameter 10 mm / 10 mm; maximum shaft offset: radial ± 0.3 mm, axial ± 0.2 mm, angular ± 3°; speed 10,000 rpm, -10° to +80° Celsius, max. torque 80 Ncm; material: glass fiber-reinforced polyamide, aluminum hub | KUP-1010-S | 2056408 |
|  | Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin | KUP-1010-W | 5319914 |
|  | 10 mm / 12 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs | KUP-1012-B | 5312984 |

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