



Incremental encoders DBS50 Core

DBS50E-S5AP02500



Model Name > **DBS50E-S5AP02500**
Part No. > **1064841**



Illustration may differ

At a glance

- Connection with universal cable outlet
- Face mount flange with 8 mm solid shaft
- Face mount flange with 2 mounting hole patterns and servo groove
- "Compact housing diameter of 37 mm, flange diameter: 50 mm"
- Various electrical interfaces: TTL/RS-422, HTL/push pull and Open Collector NPN
- Available PPR from 10 up to 2,500
- Working temperature range: -20 °C ... +85 °C
- Enclosure rating: IP 65

Your benefits

- The universal cable outlet allows use in tight spaces and makes flexible cable routing possible
- Face mount flange with various mounting hole patterns for easy device replacement without changing the application
- Face mount flange with servo groove makes mounting with servo clamps possible
- The high flexibility of the encoders' mechanical interface and the available accessories make it possible to use one design in many applications
- The compact housing diameter saves valuable space



Performance

| | |
|---------------------------|---------------------------------|
| Error limits: | ± 54 ° (/pulses per revolution) |
| Measuring step deviation: | ± 18 ° /impulses per revolution |
| Measuring step: | 90 ° /electronically/pulses |
| Initialization time: | < 3 ms |
| Pulses per revolution: | 2,500 |
| Duty cycle: | ≤ 0.5 ± 5 % |

Mechanical data

| | |
|---------------------------------|---------------------------------|
| Mechanical interface: | Solid shaft, Face mount flange |
| Shaft diameter: | 8 mm x 15.5 m |
| Mass: | 180 g |
| Start up torque: | 0.9 Ncm (+20 °C) |
| Operating torque: | 0.6 Ncm (+20 °C) |
| Maximum operating speed: | 8,000 U/min ¹⁾ |
| Moment of inertia of the rotor: | 0.65 gcm ² |
| Bearing lifetime: | 2 x 10 ⁹ revolutions |

| | |
|---|-----------------------------|
| Max. angular acceleration: | 500,000 rad/s ² |
| Permissible shaft loading radial/axial: | 30 N (axial), 50 N (radial) |
| Shaft material: | Stainless steel |
| Operating speed: | 6,000 /min ²⁾ |
| Flange material: | Aluminum |
| Housing material: | Aluminum |
| Material, cable: | PVC |

¹⁾ No permanent operation. Decreasing signal quality. ²⁾ Self warming of 3.3 K per 1000 revolutions/min when applying note working temperature range

Electrical data

| | |
|--|--|
| Electrical interface: | 4.5 V ... 5.5 V, TTL/RS422 |
| Connection type: | Cable, 8-pin with male connector M12, universal, 0.5 m |
| Operating power consumption (no load): | 50 mA |
| Maximum output frequency: | 300 kHz |
| Reference signal, number: | 1 |
| Reference signal, position: | 90 °, electronically, gated with A and B |
| Operating voltage range: | 4.5 V ... 5.5 V |
| Load current max.: | 30 mA |
| MTTFd: mean time to dangerous failure: | 600 a (EN ISO 13849-1) ¹⁾ |
| Power consumption max. without load: | Without load |
| Short-circuit protection of the outputs: | 1 ²⁾ |
| Reverse polarity protection: | 0 |

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. ²⁾ The short-circuit rating is only given if Us and GND are connected correctly.

Ambient data

| | |
|--------------------------------|---|
| EMC: | (according to EN 61000-6-2 and EN 61000-6-4 (class A)) |
| Working temperature range: | -20 °C ... +85 °C |
| Storage temperature range: | -40 °C ... +100 °C, without package |
| Resistance to shocks: | 100 g (EN 60068-2-27) |
| Resistance to vibration: | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |
| Enclosure rating: | IP 65 |
| Permissible relative humidity: | 90 % (condensation of the optical scanning not permitted) |

Dimensional drawing



PIN assignment

8-core cable

View of M12 device connector on cable



View of M23 device connector on cable



| PIN, 8-pole in M12 | PIN, 12-pole in M23 | Color of wires | Signal OC | Signal TTL, HTL | Explanation |
|--------------------|---------------------|----------------|-----------------|-----------------|-------------------------------------|
| 1 | 6 | Brown | Not connected | \bar{A} | Signal line |
| 2 | 5 | White | A | A | Signal line |
| 3 | 1 | Black | Not connected | \bar{B} | Signal line |
| 4 | 8 | Pink | B | B | Signal line |
| 5 | 4 | Yellow | Not connected | \bar{Z} | Signal line |
| 6 | 3 | Lilac | Z | Z | Signal line |
| 7 | 10 | Blue | GND | GND | Ground connection of the encoder |
| 8 | 12 | Red | +U _v | +U _v | Supply voltage |
| - | 9 | - | Not connected | Not connected | Not connected |
| - | 2 | - | Not connected | Not connected | Not connected |
| - | 11 | - | Not connected | Not connected | Not connected |
| - | 7 | - | Not connected | Not connected | Not connected |
| Screen | Screen | Screen | Screen | Screen | Screen connected to encoder housing |

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