# Encoder

magnetic absolute Encoder, advanced SSI Interface,
4096 lines per revolution

**FAULHABER**

**For combination with**
Brushless DC-Servomotors

## Series AESM – 4096

| | | AESM – 4096 | |
|---|---|---|---|
| Lines per revolution | N | 4096 | |
| Resolution | | 12 Bit | |
| Signal output | | Advanced Synchronous Serial Interface (SSI) | |
| Supply voltage | $U_{DD\ Enc}$ | 4,5 ... 5,5 | V DC |
| Current consumption, typical [1] | $I_{DD\ Enc}$ | typ. 16, max. 23 | mA |
| Output current, max. (DATA) [2] | | 4 | mA |
| Clock Frequency, max. (CLK) | | 2 | MHz |
| Input low level (CLK) | | 0 ... 0,8 | V |
| Input high level (CLK) | | 2 ... $U_{DD\ Enc}$ | V |
| Setup time after power on, max. | $t_{setup}$ | 4 | ms |
| Timeout | $t_{timeout}$ | 16 | µs |
| Operating temperature range | | – 20 ... + 100 | °C |

[1] $U_{DD\ Enc}$ = 5 V: with unloaded outputs
[2] $U_{DD\ Enc}$ = 5 V: low logic level ≤ 0,4 V, high logic level ≥ 4,6 V

| For combination with motor | | | |
|---|---|---|---|
| **Dimensional drawing A** | **L1** [mm] | | |
| 0824K...B | 24,1 | | |
| **Dimensional drawing B** | **L1** [mm] | | |
| 1028S...B | 28,1 | | |

## Features

The absolute encoder in combination with the Faulhaber motors is ideal for commutation, speed and position control. It can also be used to create a sinusoidal commutation signal.

In the AESM version (absolute encoder), absolute position information is provided with a resolution of up to 4096 steps per revolution at the signal outputs and communicated via a serial (SSI) interface. Absolute means, that each shaft position is assigned to a unique angular value within one revolution. This value is already available directly after power-on.

The advantages are a reduced torque ripple, a higher efficiency, and reduced electrical noise generation. When using sinusodial commutation. It is also especially suitable for slow speed regulation.

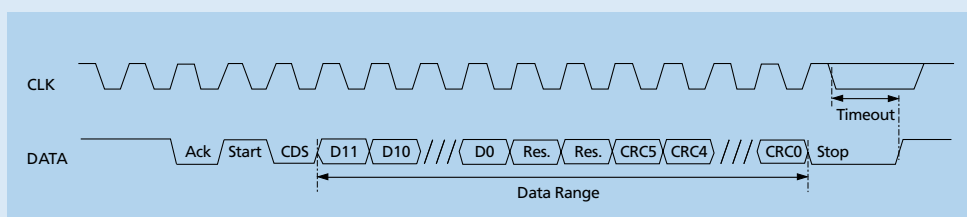Motor and encoder are connected via a common flexboard.

## Circuit diagram / Output signals

**Output circuit**
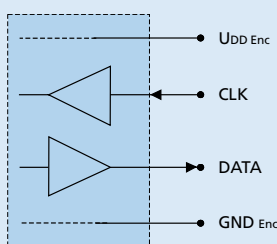
**Interface signals (SSI)**
Angle position values are ascending for clockwise rotation.
Clockwise rotation as seen from the shaft end.

For notes on technical data and lifetime performance refer to "Technical Information".
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## Connector information / Variants

| No. | Function |
|-----|----------|
| 1 | Phase C |
| 2 | Phase B |
| 3 | Phase A |
| 4 | GND Enc |
| 5 | $U_{DD}$ Enc |
| 6 | CLK |
| 7 | Reserved |
| 8 | DATA |

**Connection Encoder and Motor**



8,8 ±0,5
4 ±0,3
8   1
4,5 ±0,07
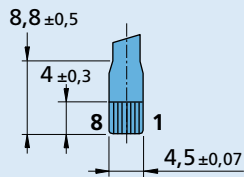
**Flexboard**
8 circuits, 0,5 mm pitch

**Recommended connector**
Top contact style
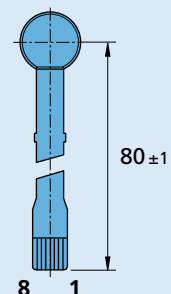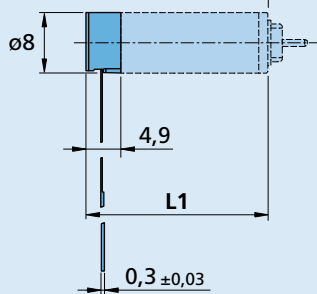8 circuits, 0,5 mm pitch, e.g.:
Molex: 52745-0896/0897

**Full product description**
■ Examples:
   **0824K006B AESM-4096**
   **1028S012B AESM-4096**

**Caution:**
Incorrect lead connection will damage the motor electronics!
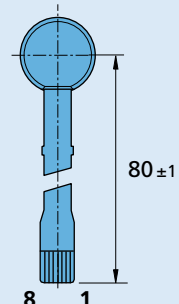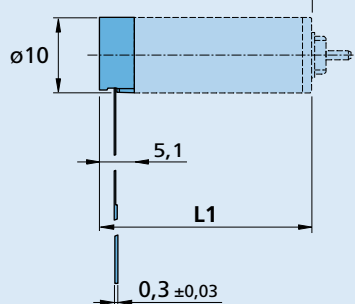
## Dimensional drawing A

Example of combination with 0824...B

ø8
4,9
L1
0,3 ±0,03

80 ±1
8   1

**AESM – 4096**

## Dimensional drawing B

Example of combination with 1028...B

ø10
5,1
L1
0,3 ±0,03

80 ±1
8   1

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