# Encoders

magnetic single-turn absolute Encoder,
SSI Interface with BISS-C Protocol,
4096 steps per revolution

**For combination with**
Brushless DC-Motors

## Series AESM-4096

| | | AESM-4096 | |
|---|---|---|---|
| Steps per revolution | | 4 096 | |
| Single-turn resolution | | 12 Bit | |
| Signal output | | SSI Interface with BISS-C Protocol | |
| Supply voltage | $U_{DD}$ | 4,5 ... 5,5 | V |
| Current consumption, typical[1] | $I_{DD}$ | 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 ... $U_{DD}$ | V |
| Setup time after power on, max. | $t_{setup}$ | 4 | ms |
| Timeout | $t_{timeout}$ | 16 | µs |
| Inertia of sensor magnet | $J$ | 0,007 | gcm² |
| Operating temperature range | | -30 ... +100 | °C |

[1] $U_{DD}$ = 5 V: with unloaded outputs
[2] $U_{DD}$ = 5 V: low logic level < 0,4 V, high logic level > 4,6 V: CMOS- and TTL compatible

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

### Characteristics

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 position information is provided with a resolution of up to 4096 steps per revolution at the signal outputs and communicated via a SSI Interface with BISS-C Protocol.

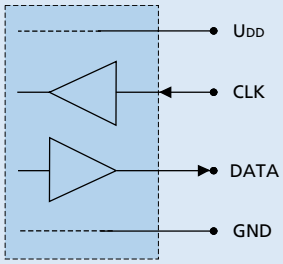
Absolute means, that each shaft position is assigned to an unique angular value within one revolution. This value is already available directly after power-on. The advantages are a reduced torque ripple, a higher efficiency, and reduced electrical noise generation.

Motor and encoder are connected via a common flexboard.

To view our large range of accessory parts, please refer to the “Accessories” chapter.

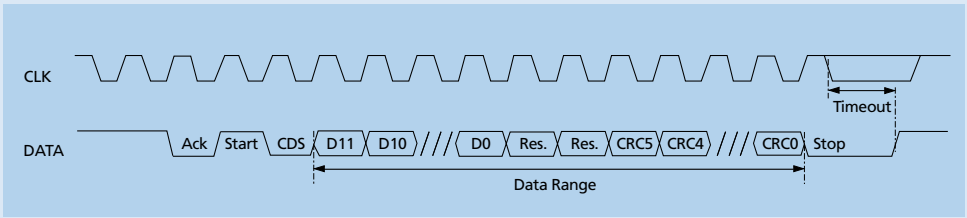
## Circuit diagram / Output signals

**Output circuit**




**Interface Protocol BISS-C**

Angle position values are ascending for clockwise rotation.
Clockwise rotation as seen from the shaft end.



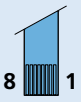

## Connector information / Variants

Example product designation: **0824K006B AESM-4096**

| Option | Type | Description |
|---|---|---|
| | | |

**Connection Encoder and Motor**

| No. | Function |
|---|---|
| 1 | Phase C |
| 2 | Phase B |
| 3 | Phase A |
| 4 | GND |
| 5 | UDD |
| 6 | CLK |
| 7 | N.C. |
| 8 | DATA |

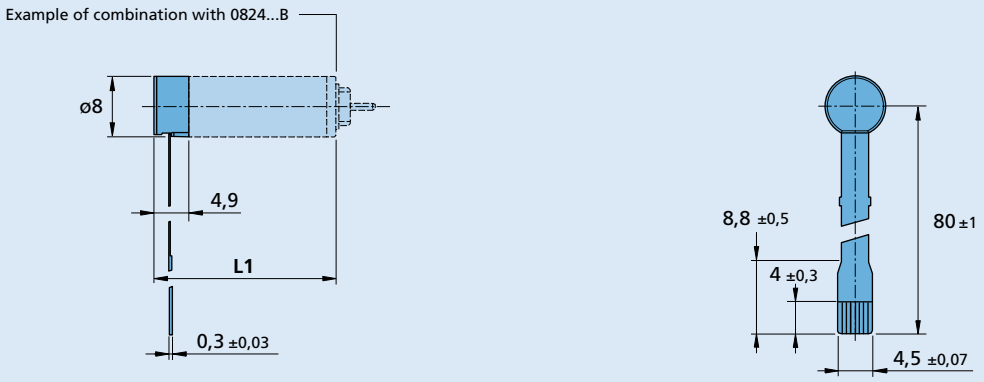



**Flexboard**
8 circuit, 0,5 mm pitch

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

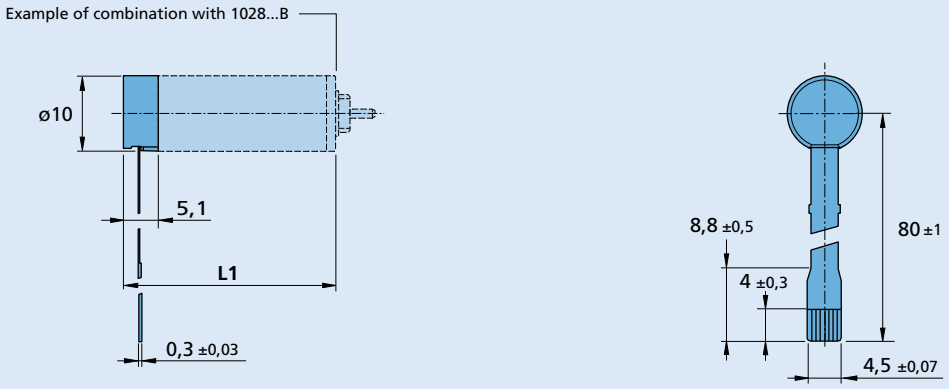
**Caution:** incorrect lead connection will damage the motor electronics!

## Dimensional drawing A




**AESM-4096**

## Dimensional drawing B

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