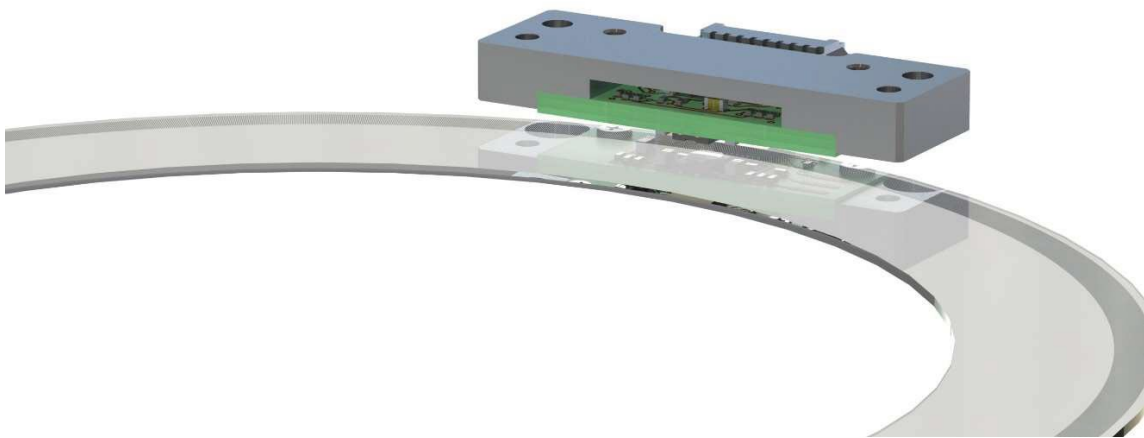


# **Sin/Cos Encoder Kit**

## **Optical reflective**

## **Hollow shaft**

## **High resolution**



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## **Description**

The EBS Head is an optical reflective encoder with analog Sin/Cos output. In combination with the associated code disk, it forms a complete encoder kit system. It can be fixed quickly and easily on different hollow shaft applications and on different mounting situations. Positioning is ensured by 2 dowel pins to guarantee the exact working point from code disk to scanning head. The prescribed air gap between the code disk and the scanning head must be observed.

The encoder is developed for incremental positioning and rotational speed control.

The EBS Head is designed for very high-resolution disk structures. Due to this high native basic resolution of the code disk, very clean ambient conditions are a basic requirement.

Other sizes of code discs are possible on customer request.

On customer request, the code disks can also be provided with an adhesive ring and a protective film (the protective film must be removed before use). Please contact PWB encoders for this.

This allows the code disks to be mounted quickly and easily. A collar on the hub allows the code disc to be centered well over the inside diameter, resulting in low eccentricity.

## **Features**

- Sin/Cos encoder
- Channels: Sin+, Sin-, Cos+, Cos-, I+, I-
- Output frequency: up to 200 kHz
- High native resolution: 20µm pitch
- Power supply: 5 VDC
- Small size: 40.0 mm x 17.0 mm x 5.5mm
- Bearing free
- Operating temperature: -20°C to +85°C
- Compliant EU-directive 2011/65/EU (RoHS)

## **Applications**

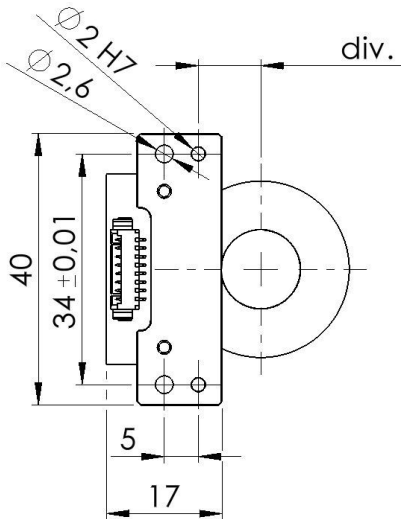
- Motor feedback
- Hollow-shaft
- Torque motor systems

## Recommended operating conditions

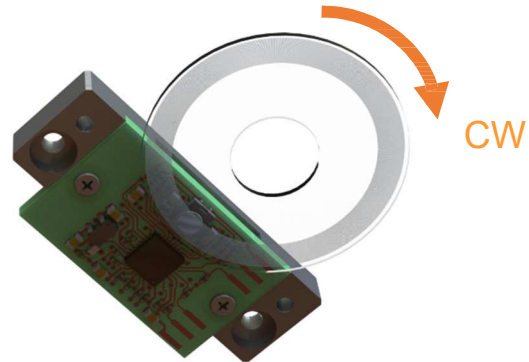
| Parameter                 | Symbol        | Min. | Typ | Max.     | Unit            | Notes                 |
|---------------------------|---------------|------|-----|----------|-----------------|-----------------------|
| Supply voltage            | $U_B$         | 4.75 | 5   | 5.25     | V <sub>DC</sub> |                       |
| Supply current            | $I_{UB}$      | 50   | 70  | 90       | mA              | no Load               |
| Startup time              | $t_{St}$      |      | 20  |          | ms              |                       |
| <b>Signals Sin / Cos</b>  |               |      |     |          |                 |                       |
| Output current            | $I_{out}$     |      |     | ±20      | mA              | per channel           |
| Short circuit current     | $I_{out-max}$ |      |     | ±35      | mA              | per channel           |
| Amplitude voltage (diff.) | $V_A$         | 0.9  | 1.0 | 1.1      | V <sub>DC</sub> | R <sub>L</sub> =470 Ω |
| Offset voltage            | $V_{off}$     | 2.3  | 2.5 | 2.7      | V <sub>DC</sub> | R <sub>L</sub> =470 Ω |
| Phase shift               | $t_{ps}$      | 80   | 90  | 100      | °               | Sin to Cos            |
| Output frequency          | $f_{out}$     |      |     | 200      | kHz             |                       |
| Native Resolution         | $t_{res}$     |      | 20  |          | µm              | Pitch                 |
| <b>Signal Index</b>       |               |      |     |          |                 |                       |
| High level output voltage | $V_{oL}$      | 2.5  | 4.5 | 5.0      | V <sub>DC</sub> | R <sub>L</sub> =470 Ω |
| Low level output voltage  | $V_{oH}$      | 0.0  | 0.2 | 0.7      | V <sub>DC</sub> | R <sub>L</sub> =470 Ω |
| Pulse width               | $t_{Ind}$     | 60   | 180 | 260      | %               | In relation to Sin    |
| <b>Mechanic</b>           |               |      |     |          |                 |                       |
| Radial misalignment       |               |      |     | ±0,15    | mm              |                       |
| Tangential misalignment   |               |      |     | ±0,15    | mm              |                       |
| Air gap                   |               | 0,4  | 0,5 | 0,6      | mm              | (type 04)             |
| <b>Environment</b>        |               |      |     |          |                 |                       |
| Operating temperature     | $T_A$         | -20  | 25  | 85       | °C              |                       |
| Storage temperature       | $T_S$         | -20  |     | 85       | °C              |                       |
| Humidity exposure         |               |      |     | 90       | %RH             | not condensing        |
| <b>System</b>             |               |      |     |          |                 |                       |
| Relative Angular Accuracy |               |      |     | ± 0.0006 | °m              | Code disc             |
| Absolute Angular Accuracy |               |      |     | ± 0.006  | °m              | Code disc             |

**ESD Warning: Normal handling precautions should be taken to avoid static discharge damage to the sensor.**

## Dimensions

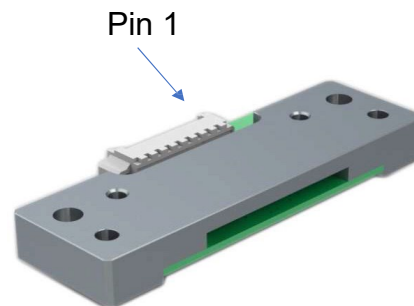


## Direction of rotation



## Pin Description

| Pin | Signal         | Cable color |
|-----|----------------|-------------|
| 1   | Sin+           | Red         |
| 2   | Sin-           | Green       |
| 3   | Cos+           | Blue        |
| 4   | Cos-           | Purple      |
| 5   | I+             | Brown       |
| 6   | I-             | Yellow      |
| 7   | GND            | Orange      |
| 8   | U <sub>B</sub> | Black       |



Connector:  
Molex 53261-0871

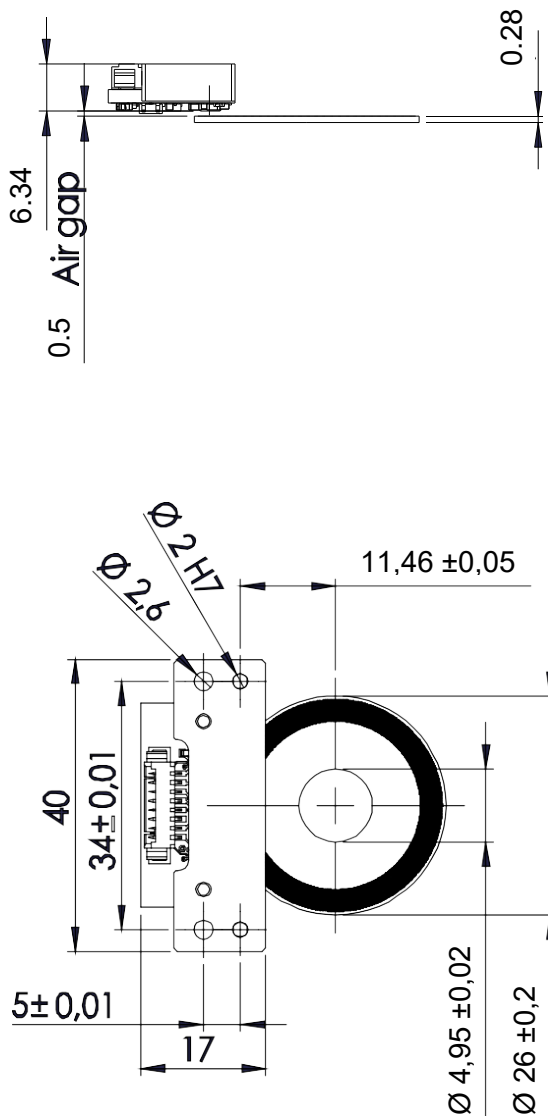
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## Mechanical Dimensions: Type 26

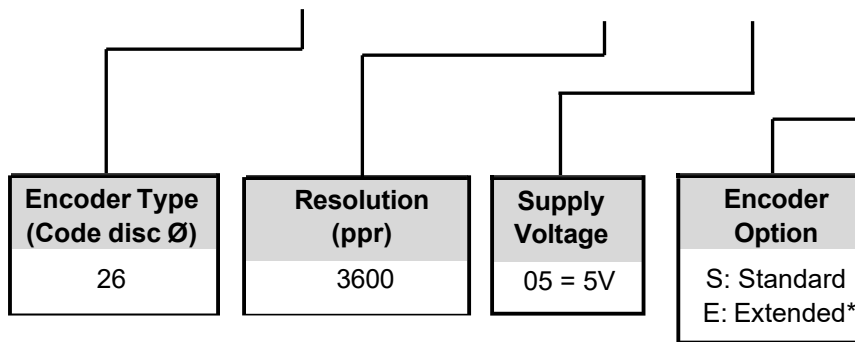
5mm shaft diameter



## Ordering Information

Ordering Code (Complete kit encoder):

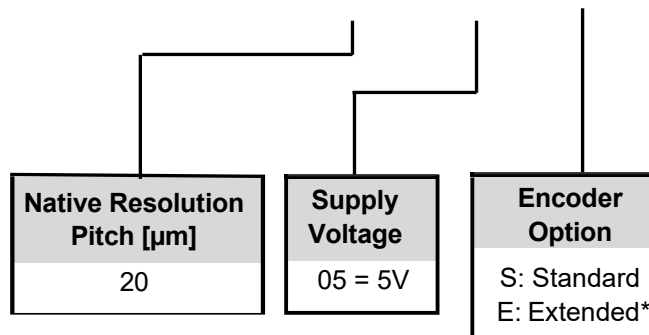
**EBS Head 26 – SIN – 3600 – 05 – S**



\*Customer specific version – feel free to ask us for special solution.

Ordering Code (Only head without code disc):

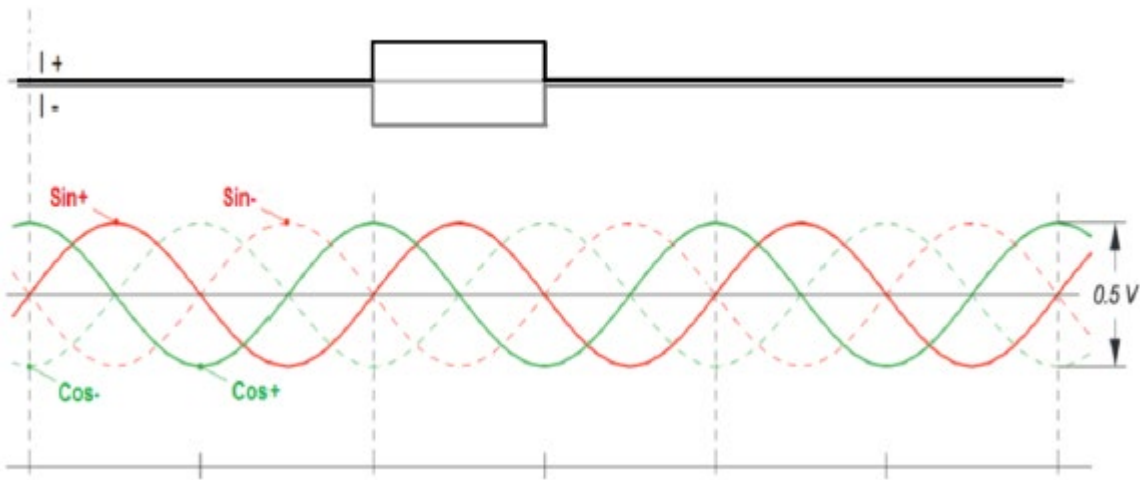
**EBS Head – SIN – 20 – 05 – S**



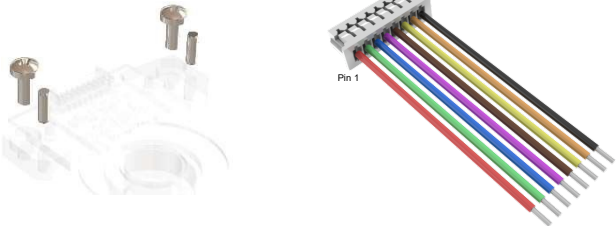
\*Customer specific version – feel free to ask us for special solution.

## Interface

### Sin / Cos



## Necessary accessories

| Description                                                                             | Picture                                                                              | Item number |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------|
| Accessory-Set:<br>Cable 300mm,<br>2 screws M2,5x8,<br>2 cylindrical pins 2x6 (DIN 6325) |  | 108546      |