**Encoders**

magnetic Encoder, digital outputs, 3 channels, 32 - 256 lines per revolution

For combination with DC-Micromotors

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### Series HEM3-256 W

<table>
<thead>
<tr>
<th>Lines per revolution</th>
<th>HEM3-32 W</th>
<th>HEM3-64 W</th>
<th>HEM3-128 W</th>
<th>HEM3-256 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>32</td>
<td>64</td>
<td>128</td>
<td>256</td>
</tr>
</tbody>
</table>

**Frequency range, up to** \(^{1)}\)

\(f\) | 16 | 32 | 64 | 128 | kHz

**Signal output, square wave**

2+1 Index Channels

**Supply voltage** \(^{2)}\)

\(U_{cc}\) | 3 ... 3.6 | V

**Current consumption, typical** \(^{3)}\)

\(I_{cc}\) | 16 | mA

**Output current, max.** \(^{4)}\)

\(I_{out}\) | 2 | mA

**Pulse width**

\(P\) | 180 ± 45 | °

**Phase shift, channel A to B**

\(\Phi\) | 90 ± 45 | °

**Logic state width**

\(S\) | 90 ± 45 | °

**Signal rise/fall time, max.** \((C_{load} = 50 \, pF)\)

\(tr/\tau_f\) | 0,1 / 0,1 | µs

**Inertia of sensor magnet**

\(J\) | 0,02 | gcm\(^2\)

**Operating temperature range**

-30 ... +85 °C

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\(^{1)}\) Velocity \((\text{min}^{-1}) = f \times 60 / N\)

\(^{2)}\) \(U_{cc} = 3,3\) V: connect Pin 3 and 4 to 3,3 V, \(U_{cc} = 5\) V: connect Pin 3 to 5 V, Pin 4 open

\(^{3)}\) \(U_{cc} = 3,3\) or 5 V: with unloaded outputs

\(^{4)}\) \(U_{cc} = 5\) V: low logic level < 0,5 V, high logic level > 4,5 V: CMOS- and TTL compatible

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### For combination with Motor

<table>
<thead>
<tr>
<th>Dimensional drawing A</th>
<th>&lt;L1 [mm]</th>
<th>0816 ... SR - K2566</th>
<th>24,4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensional drawing B</td>
<td>&lt;L1 [mm]</td>
<td>1016 ... SR - K2566</td>
<td>24,4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1024 ... SR - K2566</td>
<td>32,4</td>
</tr>
<tr>
<td>Dimensional drawing C</td>
<td>&lt;L1 [mm]</td>
<td>1224 ... SR - K1707</td>
<td>31,1</td>
</tr>
</tbody>
</table>

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### Characteristics

These incremental shaft encoders in combination with the FAULHABER DC-Micromotors are designed for indication and control of both shaft velocity and direction of rotation as well as for positioning.

Solid state sensors and a low inertia magnetic disc provide two channels with 90° phase shift and one index channel.

The nominal supply voltage for the encoder is selectable and either 3,3 VDC or 5,0 VDC. The supply voltage for the encoder and the DC-Micromotor as well as the output signals are interfaced with discrete wires and an 8-pin Molex crimp style connector.

Details for the DC-Micromotors and suitable reduction gearheads are on separate catalog pages.

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

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### Circuit diagram / Output signals

**Output circuit**

- Ucc
- A, B, I
- GND

**Output signals**

with clockwise rotation as seen from the shaft end

- Amplitude
- \(P\)
- \(\Phi\)

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For notes on technical data and lifetime performance refer to "Technical Information".

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Specifications subject to change without notice.

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Connector information / Variants

<table>
<thead>
<tr>
<th>No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Motor +</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>Uso lv</td>
</tr>
<tr>
<td>4</td>
<td>Uso lv</td>
</tr>
<tr>
<td>5</td>
<td>Channel A</td>
</tr>
<tr>
<td>6</td>
<td>Channel B</td>
</tr>
<tr>
<td>7</td>
<td>Channel I</td>
</tr>
<tr>
<td>8</td>
<td>Motor +</td>
</tr>
</tbody>
</table>

Connection Encoder and Motor

Cable
Wire: Tefzel MIL-W-22759/32, 30AWG

Recommended connector
8 circuits, 1.25 mm pitch, e.g.:
Molex: 51021-0800

Full product description
Examples:
1016N012SR-K2566 HEM3-32
1224N012SR-K1707 HEM3-256

Dimensional drawing A

Example of combination with 0816...SR

HEM3-256 W

Dimensional drawing B

Example of combination with 1016...SR

HEM3-256 W
Dimensional drawing C

Example of combination with 1224...SR

HEM3-256 W