

# Encoders

## Magnetic Encoders

**Features:**  
 32, 64, 128, 256 Lines per revolution  
 3 Channels  
 Digital output  
 Flex circuit

### HEM3-256-F

Signal output, square wave		3	channels
Supply voltage <sup>1)</sup>	V <sub>DD</sub>	3,0 ... 3,6	V DC
Supply voltage <sup>2)</sup>	V <sub>DD</sub>	4,5 ... 5,5	V DC
Current consumption, typical (V <sub>DD</sub> = 3,3 or 5 V DC)	I <sub>DD</sub>	16	mA
Output current, max. <sup>3)</sup> (V <sub>DD</sub> = 3,3 / 5 V DC)	I <sub>OUT</sub>	2 / 4	mA
Pulse width	P	180 ± 45	°e
Phase shift, channel A to B	Φ	90 ± 45	°e
Logic state width	S	90 ± 45	°e
Signal rise/fall time, max (C <sub>LOAD</sub> = 50 pF)	tr/tf	0,1 / 0,1	µs
Rotational speed up to	n <sub>max.</sub>	30 000	rpm
Inertia of code disc	J	0,02	gcm <sup>2</sup>
Operating temperature range		-30 ... +85	°C

<sup>1)</sup> V<sub>DD</sub> = 3,3 V DC: Connect pin 4 and 5 to 3,3 V DC

<sup>2)</sup> V<sub>DD</sub> = 5 V DC: Connect pin 4 to 5 V DC, Do not connect pin 5

<sup>3)</sup> V<sub>DD</sub> = 5 V DC: Low logic level < 0,5 V, high logic level > 4,5 V: CMOS and TTL compatible

### Ordering information

	of channels	per revolution	for combination with:
HEM3-032-F	3	32	} DC-Micromotors series 0816 ... S 1016 ... G, 1024 ... S 1224 ... SR
HEM3-064-F	3	64	
HEM3-128-F	3	128	
HEM3-256-F	3	256	

Note: Lines per revolution refers to pre-quadrature resolution and equals the cycles per revolution

### Features

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.

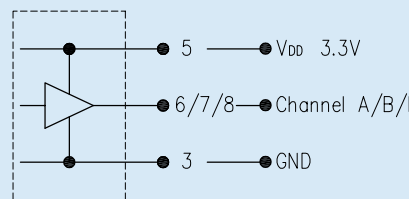
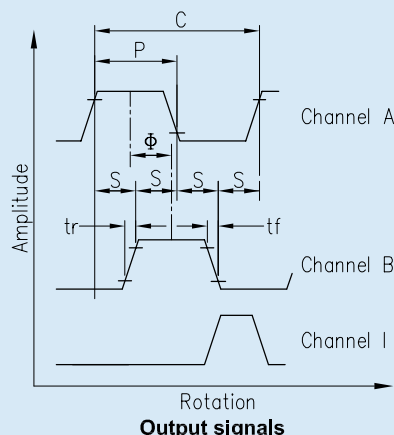
The nominal supply voltage for the encoder is selectable and either 3,3 VDC or 5,0 VDC.

The supply voltage for the encoder and the DC-Micromotor as well as the output signals are interfaced with a flexible printed circuit (FPC) for connection to an 8-pin 0,5 mm pitch Molex ZIF connector.

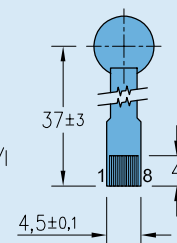
Details for the DC-Micromotors and suitable reduction gearheads are on separate catalog pages.

Optional interface board available for hook-up to encoder.

### Output signals / Circuit diagram / Connector information



Output circuit



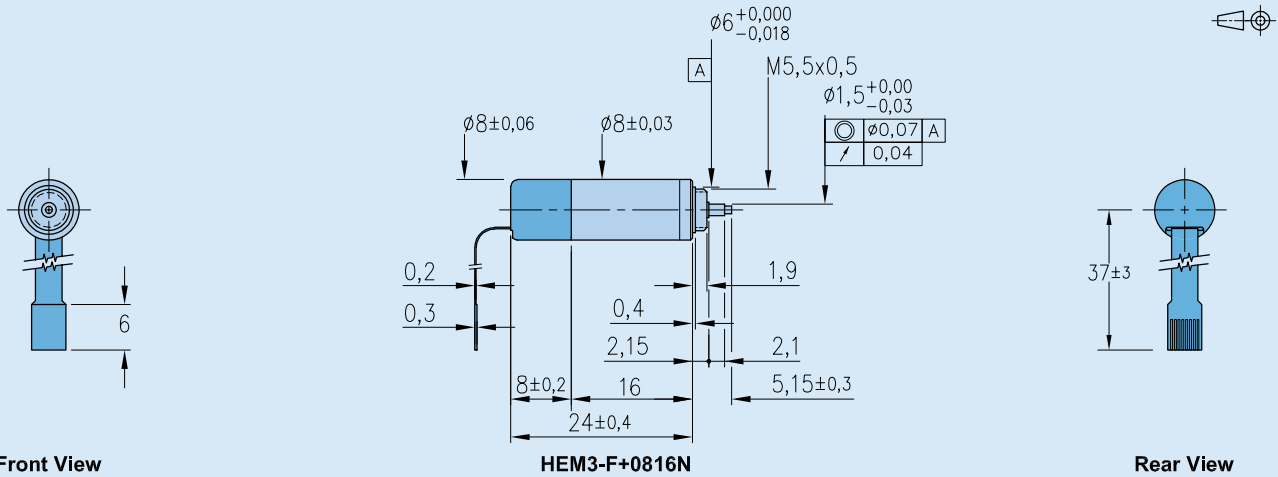
Contact Side

### Pin Function

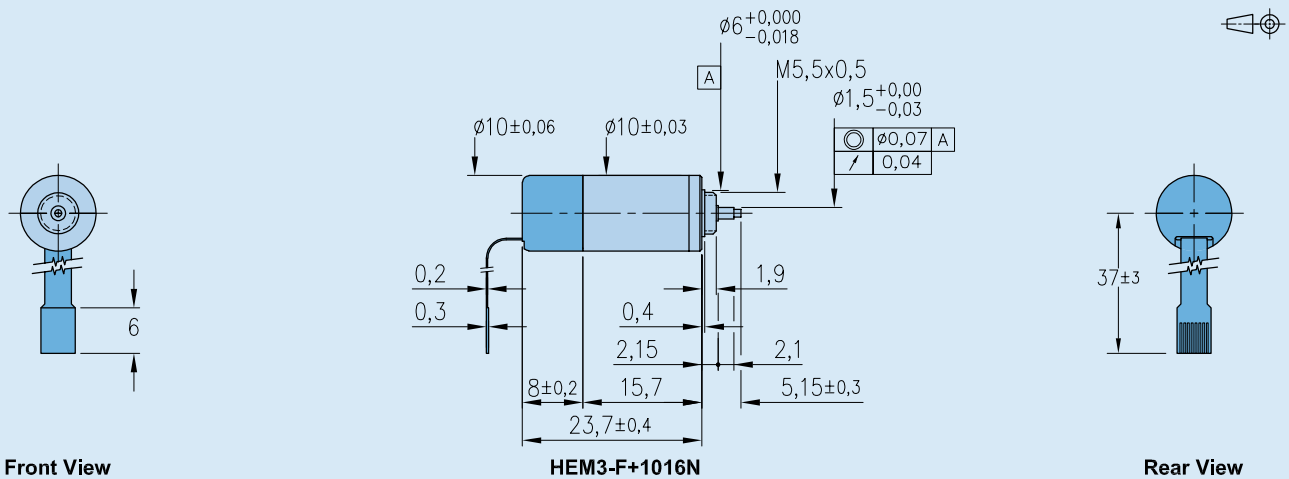
- 1 Motor -
- 2 Motor +
- 3 GND
- 4 V<sub>DD</sub>\_5V
- 5 V<sub>DD</sub>\_3.3V
- 6 Channel A
- 7 Channel B
- 8 Index

**Suggested Connector:**  
 Molex 52745 series  
 PITCH 0,5mm  
 FPC/FFC, 8 circuits

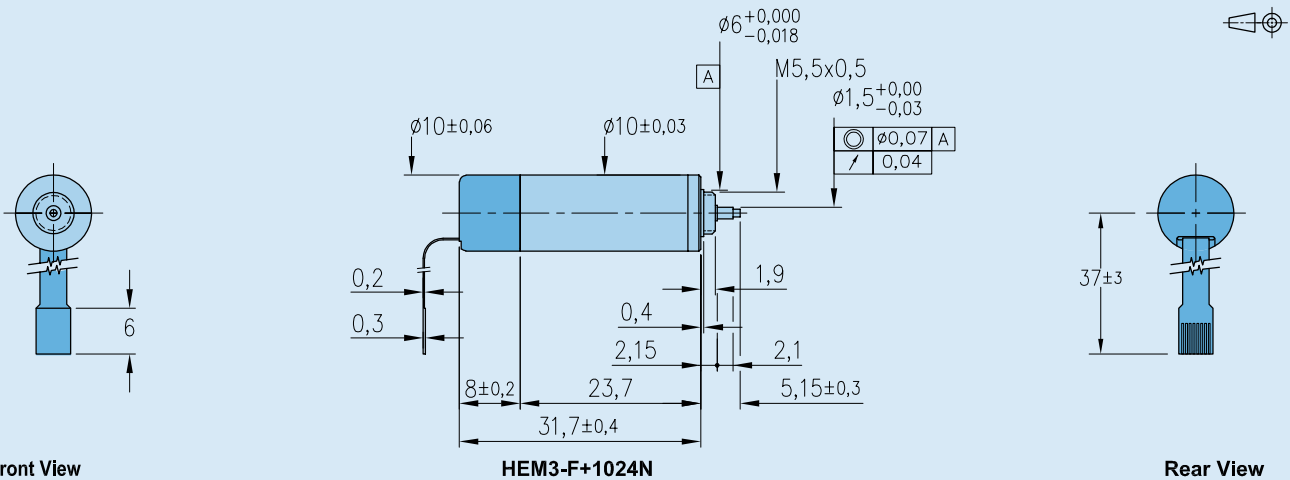
**DC Micromotor 0816 N ... S - K1707 with Encoder HEM3-XXX-F**



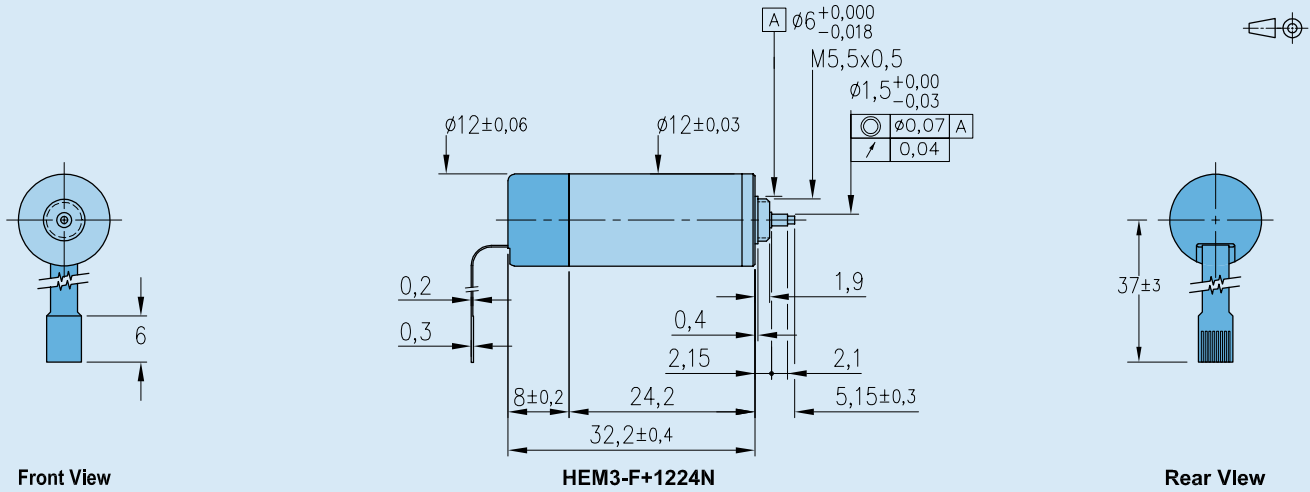
**DC Micromotor 1016 N ... G - K1707 with Encoder HEM3-XXX-F**



**DC Micromotor 1024 N ... S - K1707 with Encoder HEM3-XXX-F**



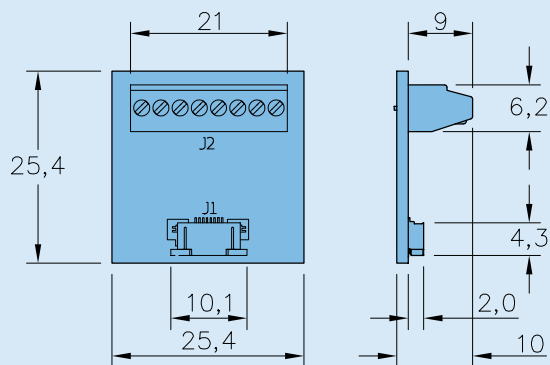
**DC Micromotor 1224 N ... SR - K1707 with Encoder HEM3-XXX-F**



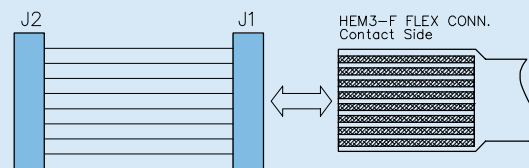
## How to Order a HEM3-256-F

Part number	Description	Stocked items
HEM3-032-F	3 channel, 32 line encoder with flex cable	yes
HEM3-064-F	3 channel, 64 line encoder with flex cable	yes
HEM3-128-F	3 channel, 128 line encoder with flex cable	yes
HEM3-256-F	3 channel, 256 line encoder with flex cable	yes
D100308900	Interface board for hook-up to encoder	yes

### Optional interface board D100308900



**Interface Board (HEM3-F)**  
p/n D100308900



**Connector:**  
J1 - Molex 52745-0896  
J2 - Phoenix 1725711

**Schematic**  
(8 Circuits)

