

Encoders

Magnetic Encoders

Features:
 10, 12, 15 or 16 Cycles per revolution
 2 Channels
 Digital output

HE

		10 mm technology ³⁾	15 mm technology	
Signal output (quadrature)		2	2	channels
Supply voltage	V	4.5 to 15.0	4.5 to 15.0	V DC
Current consumption, typical (V _{CC} = 5 V DC)	I _{CC}	5	5 ¹⁾	mA
Pulse width	P	180 ± 45	180 ± 45	°e
Phase shift, channel A to B	Φ	90 ± 45	90 ± 45	°e
Logic state width	S	90 ± 45	90 ± 45	°e
Cycle	C	360 ± 30	360 ± 30	°e
Signal rise/fall time, typical	tr/tf	5 / 0.2	5 / 0.2	µs
Frequency range	f	up to 7.2	up to 7.2	khz
Inertia of code disc	J	2,83 · 10 ⁻⁷	5,79 · 10 ⁻⁶	oz-in-sec ²
Operating temperature range		-20 to +85 (-4 to +185)	-20 to +85 (-4 to +185) ²⁾	°C (°F)

¹⁾ current consumption for 1 ppr encoder = 11mA (typical at V_{CC} = 5 V DC)

²⁾ operating temperature range for 1 ppr encoder is -20 to 85°C (-4 to 185°F), -40°C operating temperature available on request

³⁾ not recommended for use with PWM drives

Encoder type	number of channels	Cycles per revolution Ø 10 technology	Ø 15 technology	in combination with DC-Micromotors and DC-Motor-Tacho units
HEM 0816	2	10, 12		series 0816
HEM 1016, 1219, 1224	2	10, 12		series 1016, 1219, 1224
HEM 1319, 1331, 1336	2		1, 10, 12, 15, 16	series 1319, 1331, 1336
HEM 1516, 1524, 1624, 1841	2		1, 10, 12, 15, 16	series 1516, 1524, 1624, 1841
HEM 1717, 1724, 1727	2		1, 10, 12, 15, 16	series 1717, 1724, 1727
HEM 2230, 2233, 2251	2		1, 10, 12, 15, 16	series 2230, 2233, 2251
HEM 2338, 2342	2		1, 10, 12, 15, 16	series 2342
HEM 2842, 3042	2		1, 10, 12, 15, 16	series 2642, 2657, 2842, 3042
HEM 3557	2		1, 10, 12, 15, 16	series 3557

Phase Relationship (with clockwise motor shaft rotation as seen from the shaft end)

HEM1016 thru HEM12.. 10 or 12 CPR

Channel A leads channel B

HEM1319 thru HEM35.. with 15 CPR

Channel A leads channel B

HEM1319 thru HEM35.. with 1, 10, 12 or 16 CPR

Channel B leads channel A

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.

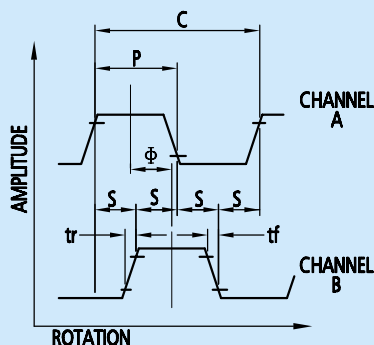
Solid state Hall sensors and a low inertia magnetic disc provide two channels with 90° phase shift.

The supply voltage for the encoder and the DC-Micromotor as well as the two channel output signals are interfaced with a ribbon cable to a 6-pin connector on motors ≤ 22mm in diameter.

Motors ≥ 23mm in diameter the motor voltage is supplied separately.

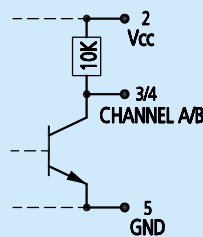
Details for the DC-Micromotors and suitable reduction gearheads are on separate catalog pages.

Please note: Velocity (rpm) = f (Hz) x 60/N



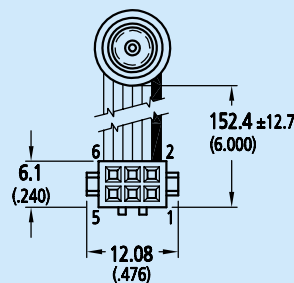
OUTPUT SIGNALS

with clockwise rotation as seen from the shaft end



OUTPUT CIRCUIT

+ Motors 2342 and larger have separate motor connections



STANDARD CONNECTOR (-6P)

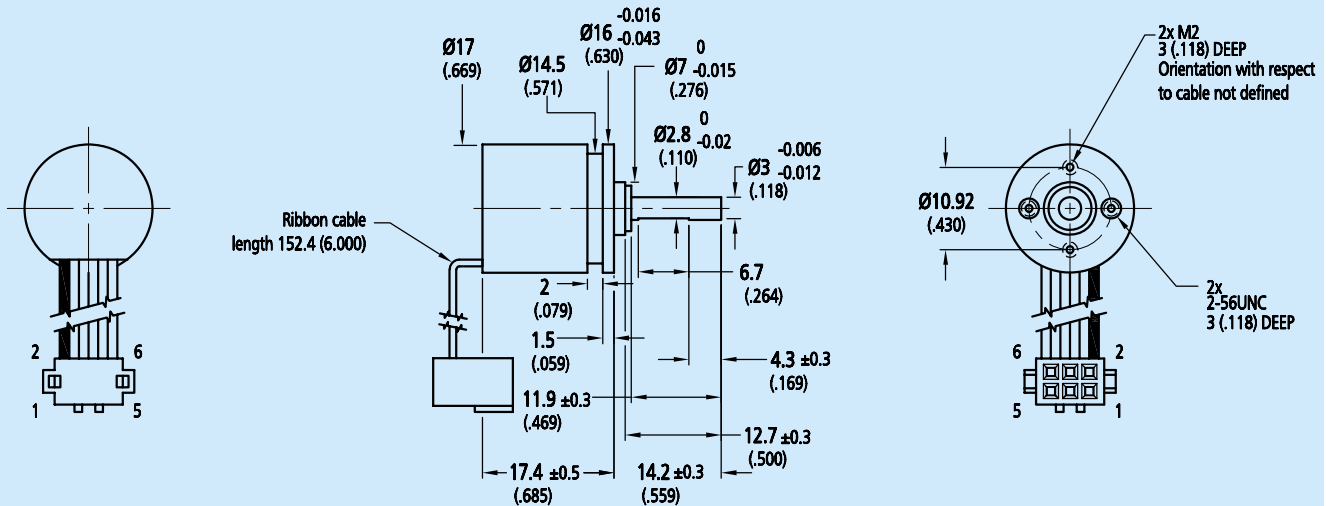
(Berg / FCI 71601-106)
 Polarized
 .050" Ribbon cable - PVC
 6 conductors - 28 AWG
 Mating connector:
 Header / FCI 75869-131

PIN FUNCTION

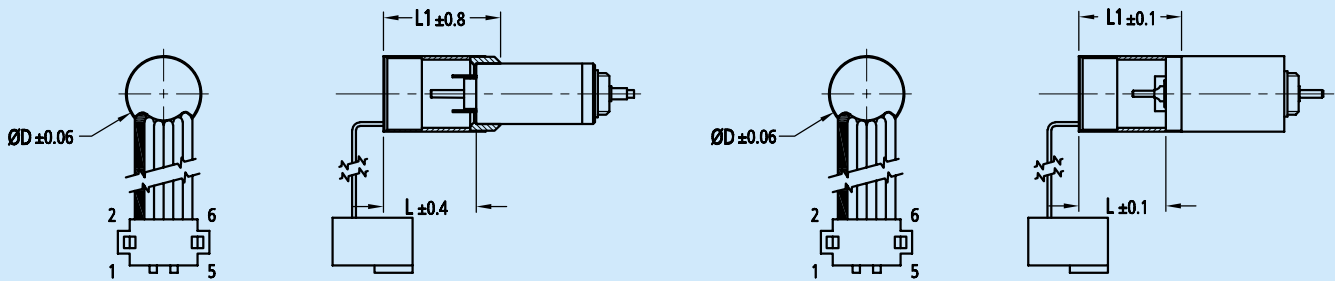
- 1 + MOTOR (+)
- 2 Vcc
- 3 CHANNEL A
- 4 CHANNEL B
- 5 GND
- 6 - MOTOR (-)

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Encoder HEF Free standing



Encoder HEM 1016 & HEM 12...



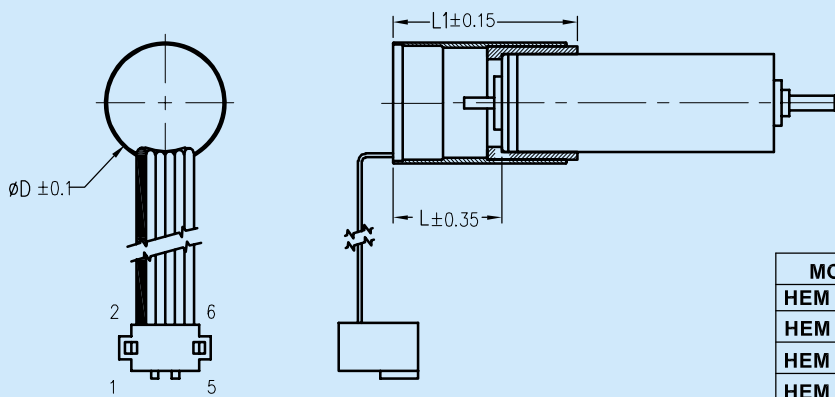
MODEL	$\varnothing D$	L	L1
HEM 0816	10 (.394)	12.3 (.453)	15.5 (.650)

HEM 0816

MODEL	$\varnothing D$	L	L1
HEM 1016	10 (.394)	11.5 (.453)	13.5 (.531)
HEM 12..	12 (.472)	11.5 (.453)	11.5 (.453)

HEM 10../12..

Encoder HEM 13...



Rear View

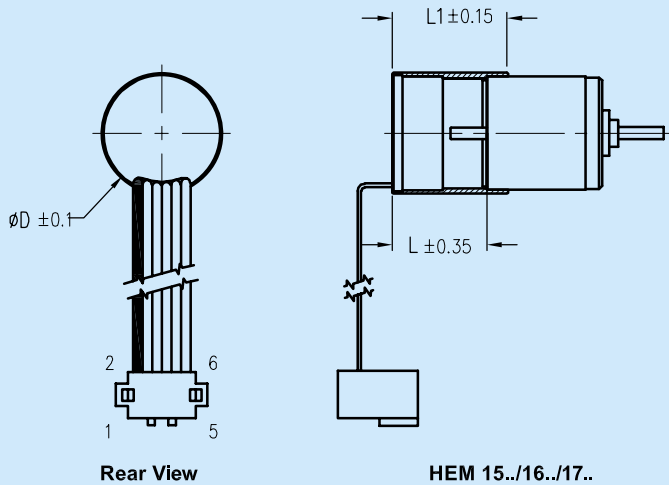
HEM 13..

MODEL	$\varnothing D$	L1	L
HEM 1319	16 (.630)	20.5 (.807)	14.4 (.567)
HEM 1331E	16 (.630)	32.69(1.287)	14.5 (.571)
HEM 1331T	16 (.630)	23 (.906)	14.4 (.567)
HEM 1336	16 (.630)	23 (.906)	14.4 (.567)

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MMME0506

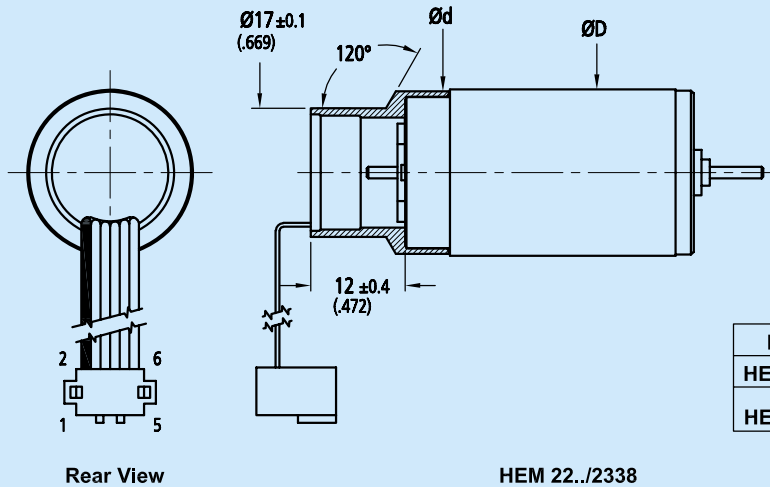
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Encoder HEM 15... & HEM 16... & HEM 17...



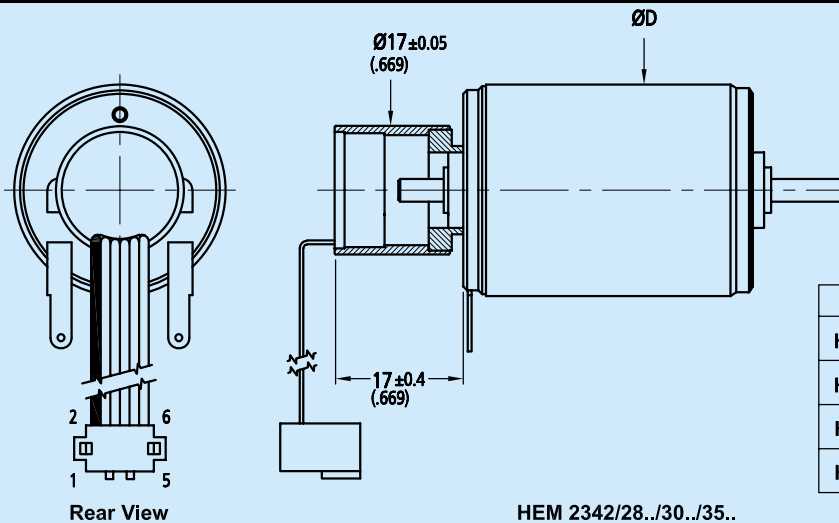
MODEL	$\varnothing D$	L1	L
HEM 1516	16 (.630)	15.25 (.600)	12.45 (.490)
HEM 1616	17 (.669)	15.25 (.600)	12.45 (.490)
HEM 1524	16 (.630)	23.00 (.906)	12.40 (.488)
HEM 1624	17 (.669)	23.00 (.906)	12.50 (.492)
HEM 1717	17 (.669)	19.10 (.752)	13.10 (.516)
HEM 1724	17 (.669)	19.10 (.752)	13.10 (.516)
HEM 1727	17 (.669)	19.10 (.752)	13.60 (.535)

Encoder HEM 22...



MODEL	$\varnothing d$	$\varnothing D$
HEM 22..	21.5 ± 0.1 (.846)	22 (.866)
HEM 2338	22 $\begin{smallmatrix} 0 \\ -0.12 \end{smallmatrix}$ (.866)	23 (.906)

Encoder HEM 2342 & HEM 28... & HEM 30... & HEM 35...



MODEL	$\varnothing D$
HEM 2342	23 (.906)
HEM 28..	28 (1.102)
HEM 30..	30 (1.181)
HEM 35..	35 (1.378)

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MME0506