

1624H0013

(1624E006S Motor)
(16/5AC 141:1 Gearhead)
(HEM-16 Encoder)

Assembly features a Coreless, 16mm dia, 6.0V coil, silver metal commutated micro motor with a HEM, 2 channel encoder built-in and a 16/5, 17mm dia. precision spur gearhead (141:1 ratio).

DC-Micromotor Precious Metal Commutation

2 mNm 4,5 W

Series 1624 ... S

Values at 22°C and nominal voltage	1624 T	006 S	
1 Nominal voltage	U_N	6	V
2 Terminal resistance	R	9,1	Ω
3 Output power	$P_{znom.}$	0,93	W
4 Efficiency, max.	$\eta_{max.}$	71	%
5 No-load speed	n_0	10 500	min^{-1}
6 No-load current, typ. (with shaft \varnothing 1,5 mm)	I_0	0,019	A
7 Stall torque	M_H	3,39	mNm
8 Friction torque	M_R	0,1	mNm
9 Speed constant	k_n	1 800	min^{-1}/V
10 Back-EMF constant	k_E	0,555	mV/min^{-1}
11 Torque constant	k_M	5,3	mNm/A
12 Current constant	k_I	0,189	A/mNm
13 Slope of n-M curve	$\Delta n/\Delta M$	3 100	min^{-1}/mNm
14 Rotor inductance	L	200	μH
15 Mechanical time constant	τ_m	22	ms
16 Rotor inertia	J	0,68	gcm^2
17 Angular acceleration	$\alpha_{max.}$	50	$\cdot 10^3 rad/s^2$
18 Thermal resistance	R_{th1} / R_{th2}	8 / 39	K/W
19 Thermal time constant	τ_{w1} / τ_{w2}	4 / 335	s
20 Operating temperature range:			
- motor		-30 ... +85 (optional version -55 ... +125)	$^{\circ}C$
- winding, max. permissible		+125	$^{\circ}C$
21 Shaft bearings		sintered bearings (standard)	
22 Shaft load max.:			
- with shaft diameter		1,5	mm
- radial at 3 000 min^{-1} (3 mm from bearing)		1,2	N
- axial at 3 000 min^{-1}		0,2	N
- axial at standstill		20	N
23 Shaft play			
- radial	Δr	0,03	mm
- axial	Δa	0	mm
24 Housing material		steel, zinc galvanized and passivated	
25 Mass		21	g
26 Direction of rotation		clockwise, viewed from the front face	
27 Speed up to	$n_{max.}$	17 000	min^{-1}
28 Number of pole pairs		1	
29 Magnet material		AlNiCo	
Rated values for continuous operation			
30 Rated torque	M_N	1,8	mNm
31 Rated current (thermal limit)	I_N	0,37	A
32 Rated speed	n_N	3 050	min^{-1}

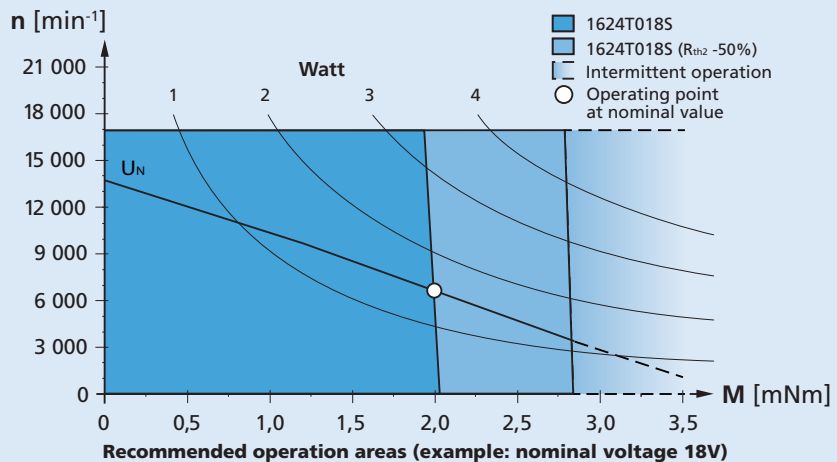
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 0%.

Note:

The diagram indicates the recommended speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

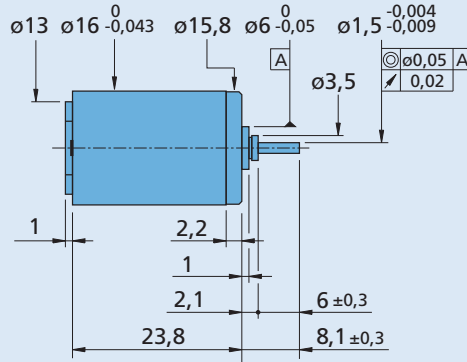
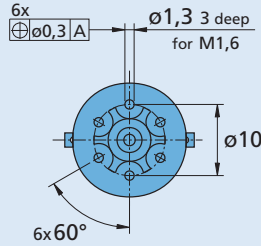
The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.

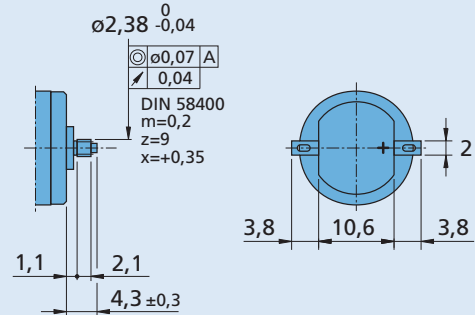


Dimensional drawing

Orientation with respect to motor terminals not defined



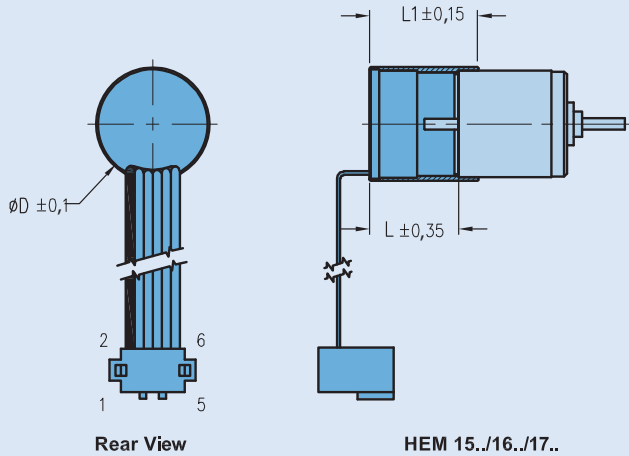
1624 T ... S



1624 E ... S for use with Gearhead

Product Combination Dimensional drawing

DC-Micromotor 15, 16, 17mm diameter series with HEM encoder



MODEL	ØD	L1	L
HEM 1516	16	15,25	12,45
HEM 1616	17	15,25	12,45
HEM 1524	16	23,00	12,40
HEM 1624	17	23,00	12,50
HEM 1717	17	19,10	13,10
HEM 1724	17	19,10	13,10
HEM 1727	17	19,10	13,60

Series HEM Magnetic Encoder

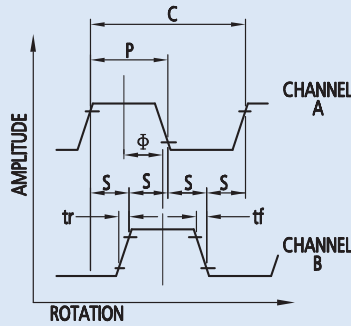
- Features:**
 16 Lines per revolution
 2 Channels
 Digital output

Encoder Specification Information	Encoder Ø 16 ... 17 mm	
Lines per resolution	N	16
Signal output, square wave		2
Supply voltage	V _{CC}	3,0 ... 15,0
Current consumption, typical (V _{CC} = 5 V DC)	I _{CC}	5 ¹⁾
Pulse width	P	180 ± 45
Phase shift, channel A to B	Φ	90 ± 45
Logic state width	S	90 ± 45
Cycle	C	360 ± 30
Signal rise/fall time, typical	tr/tf	5 / 0,2
Frequency range up to	f	7,2
Inertia of code disc	J	0,040
Operating temperature range		-20 ... +85

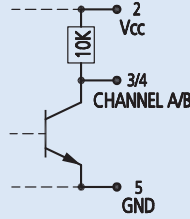
¹⁾ current consumption for 1 ppr encoder = 11mA (typical at V_{CC} = 5 V DC) HEM-Q

Series HEM Encoder

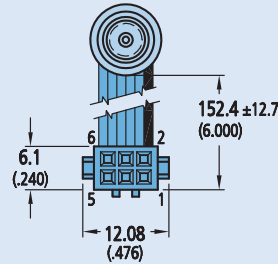
Encoder Information



OUTPUT SIGNALS
with clockwise rotation as seen from the shaft end
exceptions indicated by note 2



OUTPUT CIRCUIT
* Motors 2342 and larger have separate motor connections



Shown with optional 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 (-)

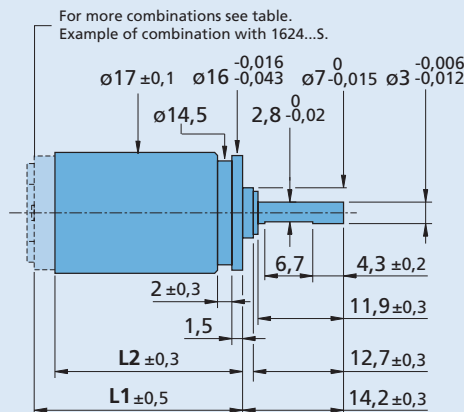
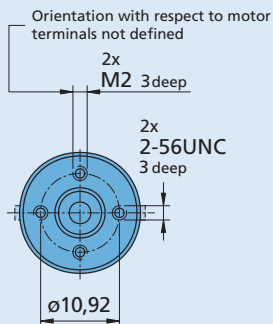
Series 16/5 Spur Gearhead

0,1 Nm For combination with DC-Micromotors

		16/5
Housing material		metal
Geartrain material ¹⁾		plastic/steel
Recommended max. input speed for:		
– continuous operation		5 000 rpm
Backlash, at no-load		≤ 3°
Bearings on output shaft		ball bearings, preloaded
Shaft load, max.:		
– radia (6,5 mm from mounting face)		≤ 25 N
– axia		≤ 5 N
Shaft press fit force, max.		≤ 5 N
Shaft play		
– radia (6,5 mm from mounting face)		≤ 0,03 mm
– axia		= 0 mm
Operating temperature range		- 30 ... + 100 °C

Specifications		
Number of gear stages		4
Continuous torque	mNm	100
Intermittent torque	mNm	150
Mass without motor, ca.	g	21
Efficiency, max.	%	66
Direction of rotation, drive to output		=
Reduction ratio ²⁾ (rounded)		141:1
L2 [mm] = length without motor		32,0
L1 [mm] = length with motor 1624E...S		42,9

Dimensional drawing



16/5

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