

DC-Micromotors

Precious Metal Commutation

2 mNm
4,5 W

Series 1624 ... S

Values at 22°C and nominal voltage	1624 T	003 S	006 S	009 S	012 S	018 S	024 S		
1 Nominal voltage	U_N	3	6	9	12	18	24	V	
2 Terminal resistance	R	1,6	9,1	14,5	24	42	75	Ω	
3 Efficiency, max.	η_{max}	78	71	75	75	77	76	%	
4 No-load speed	n_0	12 000	10 500	11 500	13 000	13 800	14 400	min ⁻¹	
5 No-load current, typ. (with shaft \varnothing 1,5 mm)	I_0	0,03	0,019	0,012	0,01	0,007	0,006	A	
6 Stall torque	M_H	4,33	3,39	4,46	4,23	5,16	4,91	mNm	
7 Friction torque	M_R	0,07	0,1	0,09	0,09	0,09	0,09	mNm	
8 Speed constant	k_n	4 070	1 800	1 300	1 110	779	611	min ⁻¹ /V	
9 Back-EMF constant	k_E	0,246	0,555	0,767	0,905	1,28	1,64	mV/min ⁻¹	
10 Torque constant	k_M	2,35	5,3	7,33	8,64	12,3	15,6	mNm/A	
11 Current constant	k_I	0,426	0,189	0,136	0,116	0,082	0,064	A/mNm	
12 Slope of n-M curve	$\Delta n / \Delta M$	2 770	3 100	2 580	3 070	2 670	2 930	min ⁻¹ /mNm	
13 Rotor inductance	L	85	200	400	750	1 200	3 000	μ H	
14 Mechanical time constant	τ_m	19	22	19	19	19	24	ms	
15 Rotor inertia	J	0,65	0,68	0,7	0,59	0,68	0,78	gcm ²	
16 Angular acceleration	α_{max}	66	50	63	72	76	63	$\cdot 10^3$ rad/s ²	
17 Thermal resistance	R_{th1} / R_{th2}	8 / 39						K/W	
18 Thermal time constant	τ_{w1} / τ_{w2}	4 / 335						s	
19 Operating temperature range:									
– motor		-30 ... +85 (optional version -55 ... +125)						°C	
– winding, max. permissible		+125						°C	
20 Shaft bearings		sintered bearings			ball bearings, preloaded (optional version)				
21 Shaft load max.:		(standard)			(optional version)				
– with shaft diameter		1,5			1,5				mm
– radial at 3 000 min ⁻¹ (3 mm from bearing)		1,2			5				N
– axial at 3 000 min ⁻¹		0,2			0,5				N
– axial at standstill		20			10				N
22 Shaft play:									
– radial	\leq	0,03			0,015			mm	
– axial	\leq	0,2			0			mm	
23 Housing material		steel, zinc galvanized and passivated							
24 Mass		21						g	
25 Direction of rotation		clockwise, viewed from the front face							
26 Speed up to	n_{max}	17 000						min ⁻¹	
27 Number of pole pairs		1							
28 Magnet material		AlNiCo							

Rated values for continuous operation

29 Rated torque	M_N	1,6	1,8	2	1,8	2	1,9	mNm
30 Rated current (thermal limit)	I_N	0,7	0,37	0,29	0,22	0,17	0,13	A
31 Rated speed	n_N	6 860	3 050	4 680	5 620	6 890	7 240	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.



