

# DC-Micromotors

## Precious Metal Commutation

# 4,5 mNm

For combination with

Gearheads:  
15/10, 15A, 16/7, 16A, 17/1

Encoders:  
IE2-1024, IE2-16, IEH2-4096

### Series 1724 ... SR

Values at 22°C and nominal voltage	1724 T	003 SR	006 SR	012 SR	018 SR	024 SR	
1 Nominal voltage	$U_N$	3	6	12	18	24	V
2 Terminal resistance	R	0,78	3,41	16,2	32,1	54,6	$\Omega$
3 Output power	$P_{2nom.}$	2,83	2,58	2,17	2,47	2,58	W
4 Efficiency, max.	$\eta_{max.}$	82	81	80	81	81	%
5 No-load speed	$n_0$	8 200	8 600	7 900	8 400	8 600	rpm
6 No-load current, typ. (with shaft $\varnothing$ 1,5 mm)	$I_0$	0,038	0,02	0,009	0,006	0,005	A
7 Stall torque	$M_H$	13,2	11,5	10,5	11,2	11,5	mNm
8 Friction torque	$M_R$	0,13	0,13	0,13	0,12	0,13	mNm
9 Speed constant	$k_n$	2 760	1 450	666	472	362	rpm/V
10 Back-EMF constant	$k_E$	0,362	0,69	1,5	2,12	2,76	mV/rpm
11 Torque constant	$k_M$	3,46	6,59	14,3	20,2	26,3	mNm/A
12 Current constant	$k_I$	0,289	0,152	0,07	0,049	0,038	A/mNm
13 Slope of n-M curve	$\Delta n/\Delta M$	621	748	752	750	748	rpm/mNm
14 Rotor inductance	L	21	75	360	710	1 200	$\mu H$
15 Mechanical time constant	$\tau_m$	8	8	8	8	8	ms
16 Rotor inertia	J	1,2	1	1	1	1	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max.}$	110	110	100	100	100	$\cdot 10^3 \text{rad/s}^2$
18 Thermal resistance	$R_{th1} / R_{th2}$	4 / 24,5					K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	2,6 / 270					s
20 Operating temperature range:							
– motor		-30 ... +85 (optional version -55 ... +125)					°C
– winding, max. permissible		+125					°C
21 Shaft bearings		sintered bearings	ball bearings	ball bearings, preloaded			
22 Shaft load max.:		(standard)	(optional version)	(optional version)			
– with shaft diameter		1,5	1,5	1,5			mm
– radial at 3 000 rpm (3 mm from bearing)		1,2	5	5			N
– axial at 3 000 rpm		0,2	0,5	0,5			N
– axial at standstill		20	10	10			N
23 Shaft play							
– radial	$\leq$	0,03	0,015	0,015			mm
– axial	$\leq$	0,2	0,2	0			mm
24 Housing material		steel, black coated					
25 Mass		27					g
26 Direction of rotation		clockwise, viewed from the front face					
27 Speed up to	$n_{max.}$	10 000					rpm
28 Number of pole pairs		1					
29 Magnet material		NdFeB					
<b>Rated values for continuous operation</b>							
30 Rated torque	$M_N$	2,3	4,2	4,5	4,5	4,5	mNm
31 Rated current (thermal limit)	$I_N$	0,7	0,7	0,35	0,25	0,19	A
32 Rated speed	$n_N$	6 790	4 720	3 430	3 990	4 220	rpm

**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.



