

# DC-Micromotors

## Precious Metal Commutation

### 1 mNm

For combination with  
Gearheads:  
10/1, 12/3, 12/4, 12/5  
Encoders:  
30B

### Series 1224 ... S

	1224 N	006 S	012 S	015 S	
1 Nominal voltage	$U_N$	6	12	15	Volt
2 Terminal resistance	R	6,6	26,8	42,3	$\Omega$
3 Output power	$P_2 \text{ max.}$	1,3	1,3	1,3	W
4 Efficiency	$\eta \text{ max.}$	78	78	78	%
5 No-load speed	$n_o$	12 700	13 100	12 400	rpm
6 No-load current (with shaft $\varnothing$ 1,0 mm)	$I_o$	0,013	0,006	0,005	A
7 Stall torque	$M_H$	3,69	3,60	3,62	mNm
8 Friction torque	$M_R$	0,05	0,05	0,05	mNm
9 Speed constant	$k_n$	2 318	1 173	923	rpm/V
10 Back-EMF constant	$k_E$	0,431	0,852	1,084	mV/rpm
11 Torque constant	$k_M$	4,12	8,14	10,35	mNm/A
12 Current constant	$k_I$	0,243	0,123	0,097	A/mNm
13 Slope of n-M curve	$\Delta n/\Delta M$	3 713	3 862	3 771	rpm/mNm
14 Rotor inductance	L	65	250	450	$\mu\text{H}$
15 Mechanical time constant	$\tau_m$	7	7	7	ms
16 Rotor inertia	J	0,18	0,18	0,18	$\text{gcm}^2$
17 Angular acceleration	$\alpha \text{ max.}$	205	200	201	$\cdot 10^3 \text{ rad/s}^2$
18 Thermal resistance	$R_{th 1} / R_{th 2}$	22 / 45			K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	6,5 / 392			s
20 Operating temperature range:					
- motor		- 30 ... + 85			$^{\circ}\text{C}$
- rotor, max. permissible		+ 85			$^{\circ}\text{C}$
21 Shaft bearings		sintered bronze sleeves			
22 Shaft load max.:					
- with shaft diameter		1,0			mm
- radial at 3 000 rpm (1,5 mm from bearing)		0,5			N
- axial at 3 000 rpm		0,1			N
- axial at standstill		20			N
23 Shaft play:					
- radial	$\leq$	0,03			mm
- axial	$\leq$	0,2			mm
24 Housing material		steel, nickel plated			
25 Weight		13			g
26 Direction of rotation		clockwise, viewed from the front face			
<b>Recommended values - mathematically independent of each other</b>					
27 Speed up to	$n_e \text{ max.}$	12 000	12 000	12 000	rpm
28 Torque up to	$M_e \text{ max.}$	1	1	1	mNm
29 Current up to (thermal limits)	$I_e \text{ max.}$	0,330	0,165	0,130	A

