

# DC-Micromotors

# 3 mNm

## Precious Metal Commutation

For combination with

Gearheads:

20/1, 22/2, 22/5, 22/7, 22E, 22EKV, 23/1, 38/3

Encoders:

HEDL 5540, HEDM 5500, HEDS 5500, HEDS 5540

### Series 2233 ... S

	2233 T	4,5 S	006 S	012 S	018 S	024 S	030 S	
1 Nominal voltage	$U_N$	4,5	6	12	18	24	30	V
2 Terminal resistance	R	1,3	2,9	9,7	25	57	105	$\Omega$
3 Output power	$P_{2 \max}$	3,85	3,06	3,66	3,18	2,47	2,08	W
4 Efficiency, max.	$\eta_{\max}$	86	85	84	82	80	79	%
5 No-load speed	$n_0$	8 000	8 000	8 500	8 700	8 800	9 300	rpm
6 No-load current (with shaft $\varnothing$ 1,5 mm)	$I_0$	0,02	0,013	0,009	0,007	0,005	0,004	A
7 Stall torque	$M_H$	18,4	14,6	16,4	13,9	10,7	8,56	mNm
8 Friction torque	$M_R$	0,11	0,09	0,12	0,14	0,13	0,12	mNm
9 Speed constant	$k_n$	1 790	1 340	714	488	371	314	rpm/V
10 Back-EMF constant	$k_E$	0,559	0,745	1,4	2,05	2,69	3,18	mV/rpm
11 Torque constant	$k_M$	5,34	7,12	13,4	19,6	25,7	30,4	mNm/A
12 Current constant	$k_i$	0,187	0,141	0,075	0,051	0,039	0,033	A/mNm
13 Slope of n-M curve	$\Delta n/\Delta M$	435	548	518	626	822	1 090	rpm/mNm
14 Rotor inductance	L	70	130	400	600	1 600	2 200	$\mu$ H
15 Mechanical time constant	$\tau_m$	12	11	12	14	11	12	ms
16 Rotor inertia	J	2,6	1,9	2,2	2,1	1,3	1,1	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{\max}$	70	76	74	65	84	81	$\cdot 10^3$ rad/s <sup>2</sup>
18 Thermal resistance	$R_{th1} / R_{th2}$	4 / 27						K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	4 / 660						s
20 Operating temperature range:		-30 ... +85 (optional version -55 ... +125)						°C
- motor								
- rotor, 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		2		2		mm
- radial at 3 000 rpm (3 mm from bearing)		1,2		8		8		N
- axial at 3 000 rpm		0,2		0,8		0,8		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, zinc galvanized and passivated						
25 Weight		61						g
26 Direction of rotation		clockwise, viewed from the front face						

### Recommended values - mathematically independent of each other

27 Speed up to	$n_{e \max}$	8 000	8 000	8 000	8 000	8 000	8 000	rpm
28 Torque up to	$M_{e \max}$	3	3	3	3	3	3	mNm

Orientation with respect to motor terminals not defined

