FAULHABER

6,29 mNm
7,83 W

DC-Micromotors
Precious Metal Commutation

Series 2224 ... SR

Values at 22°C and nominal voltage	2224 U	003 SR	006 SR	012 SR	018 SR	024 SR	036 SR	
Nominal voltage	U_N	3	6	12	18	24	36	V
Terminal resistance	R	0,564	1,95	8,77	17,6	36,1	90,3	Ω
Rotor inductance	L	11,5	46	203	421	791	1 810	µH
Efficiency, max.	$\eta_{max.}$	79	82	81	81	81	79	%
No-load current, typ.	I_0	0,0665	0,0289	0,0138	0,01	0,007	0,0051	A
No-load speed	n_0	8 180	8 200	7 810	8 130	7 890	7 820	min⁻¹
Stall torque	M_H	18,2	21,1	19,8	21,2	19	17,2	mNm
Rotor inertia	J	2,4	2,7	2,7	2,8	2,6	2,3	gcm²
Friction torque	M_R	0,23	0,2	0,2	0,21	0,2	0,22	mNm
Torque constant	k_M	3,47	6,95	14,6	21	28,8	43,6	mNm/A
Speed constant	k_n	2 750	1 370	655	454	331	219	min⁻¹/V
Slope of n-M curve	$\Delta n/\Delta M$	447	386	393	381	415	454	min⁻¹/mNm
Thermal resistance:								
– winding to housing	R_{th1}	8,4						K/W
– housing to ambient (external plastic flange)	$R_{th2\,p}$	22						K/W
– housing to ambient (external metal flange)	$R_{th2\,m}$	1,5						K/W
Thermal time constant:								
– winding	τ_{w1}	12						s
– housing (external plastic flange)	$\tau_{w2\,p}$	430						s
– housing (external metal flange)	$\tau_{w2\,m}$	30						s
Operating temperature range:								
– motor		-30 ... +85 (optional version -30 ... +125)						°C
– winding, max. permissible		+125						°C
Shaft bearings		sintered bearings			ball bearings, preloaded			
Shaft diameter		2			2			mm
Radial shaft load max.:								
– dynamic at 3 000 min⁻¹ (4 mm from mounting flange)		1,5			8			N
Axial shaft load max.:								
– dynamic at 3 000 min⁻¹		0,2			0,8			N
– static (shaft unsupported)		20			10			N
Shaft play, max.:								
– radial		0,03			0,015			mm
– axial		0,2			0			mm
Speed up to	$n_{max.}$	9 000						min⁻¹
Number of pole pairs		1						
Mass		46						g
Housing material		steel, nickel plated						
Magnet material		NdFeB						

Rated values for continuous operation								
Rated torque	M_N	2,17	4,47	6,21	6,29	6,04	5,78	mNm
Rated current (thermal limit)	I_N	0,7	0,7	0,485	0,341	0,239	0,152	A
Rated speed	n_N	7 210	6 350	4 560	4 990	4 550	4 270	min⁻¹

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

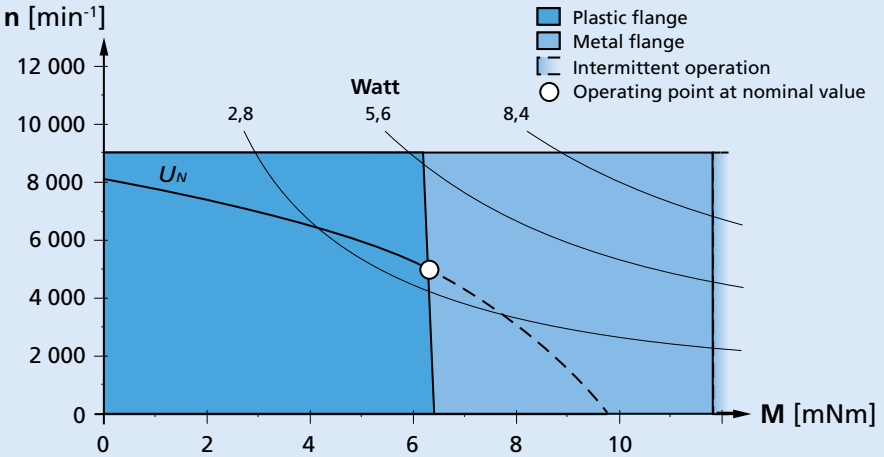
Note:

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 different conditions of thermal coupling, i.e. mounted respectively on a plastic flange and a metal flange.

The nominal voltage (U_N) curve shows, up to the thermal limit, the operating point at nominal voltage for the motor mounted on a plastic flange. Higher torque can be achieved by further reducing the thermal resistance.

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.



Recommended operation areas (example: nominal voltage 18V)

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

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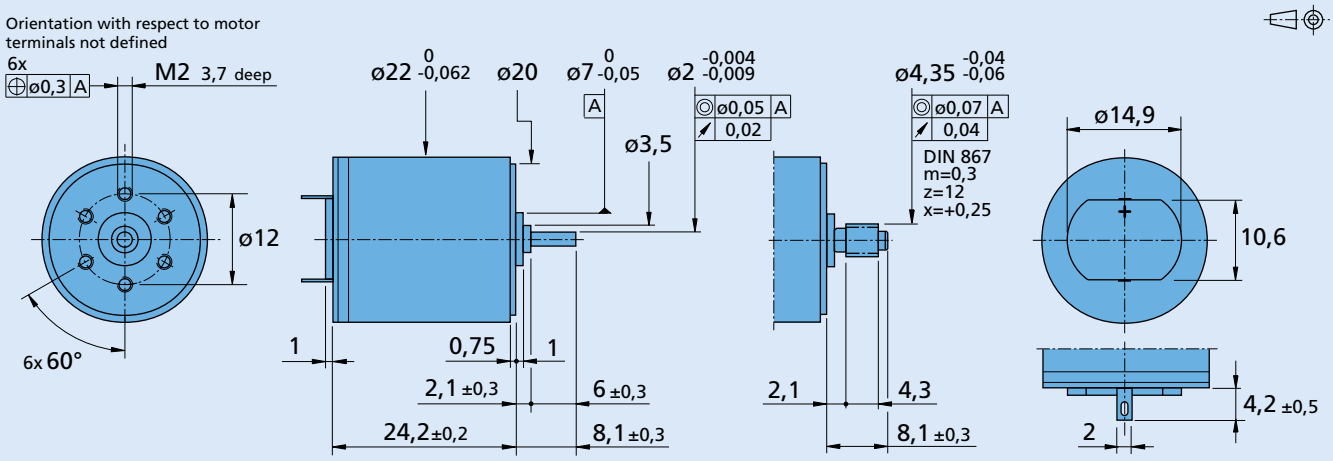
Dimensional drawing



Options

Example product designation: **2224U012SR-277**

Option	Type	Description
L	Twin Leads	For motors with twin leads (PVC), length 150 mm, red (+) / black (-)
4924	Twin Leads	For motors with twin leads (PVC), length 300 mm, red (+) / black (-)
X4924	Twin Leads	For motors with twin leads (PVC), length 600 mm, red (+) / black (-)
4925	Twin Leads	For motors with twin leads (PVC), length 150 mm, red (+) / black (-), with connector AMP 179228-2
X4925	Twin Leads	For motors with twin leads (PVC), length 300 mm, red (+) / black (-), with connector AMP 179228-2
Y4925	Twin Leads	For motors with twin leads (PVC), length 600 mm, red (+) / black (-), with connector AMP 179228-2
F	Single Leads	For motors with single leads (PTFE), length 150 mm, red (+) / black (-)
277	Bearings	2 preloaded ball bearings

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
20GPT 20/1R 22E 22EKV 22GPT 22GPT LN 22/2 22/5 22/7 23/1	IE2-1024 IEH2-4096 IEH3-4096 IEH3-4096L	SC 1801 P SC 1801 S SC 2402 P SC 2804 S MC 3001 B MC 3001 P MC 3602 B MC 3603 S MC 5004 P	To view our large range of accessory parts, please refer to the “Accessories” chapter.

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