

Stepper Motors

2,4 mNm

Two phase with Disc Magnet, 20 steps per revolution, microstepping motor

Series DM1220

Values at 20°C	DM1220	0330	0220	0110	0055	
Nominal current per phase (both phases ON)		0,33	0,22	0,11	0,055	A
Boosted current per phase (both phases ON)		0,66	0,44	0,22	0,11	A
Nominal voltage per phase (both phases ON)		2	3	6	12	V
Phase resistance		4,5	10,4	41	168	Ω
Phase inductance (1 kHz)		1,3	3,5	13	57	mH
Holding torque (at nominal current in both phases)		2,4	2,4	2,4	2,4	mNm
Holding torque at boosted current		4,1	4,1	4,1	4,1	mNm
Residual torque, typ.		0,07	0,07	0,07	0,07	mNm
Back-EMF amplitude		1,7	2,6	5	10	V/k step/s
Electrical time constant	0,28					ms
Rotor inertia	18,5 · 10 ⁻⁹					kgm ²
Step angle (full step)	18					°
Angular accuracy	±3					%
Angular acceleration, max.	221 · 10 ³					rad/s ²
Resonance frequency (at no load)	55					Hz
Thermal resistance	11,9 / 46,5					K/W
Thermal time constant	5 / 300					s
Operating temperature range	-35 ... +70					°C
Winding temperature, max.	+130					°C
Shaft bearings ^{1) 2)}	sintered bearing (Bearing code: SB)		ball bearings, preloaded (Bearing code: 2R)			
Shaft load max.:						
– with shaft diameter	1,5		1,5			mm
– radial at 5 000 min ⁻¹ (3 mm from bearing)	0,5		6			N
– axial at 5 000 min ⁻¹	3		3			N
– axial at standstill	3		17			N
Shaft play:						
– radial	0,015		0,012			mm
– axial	0		0			mm
Housing material	aluminium, black anodized					
Mass	9					g
Magnet material	NdFeB					

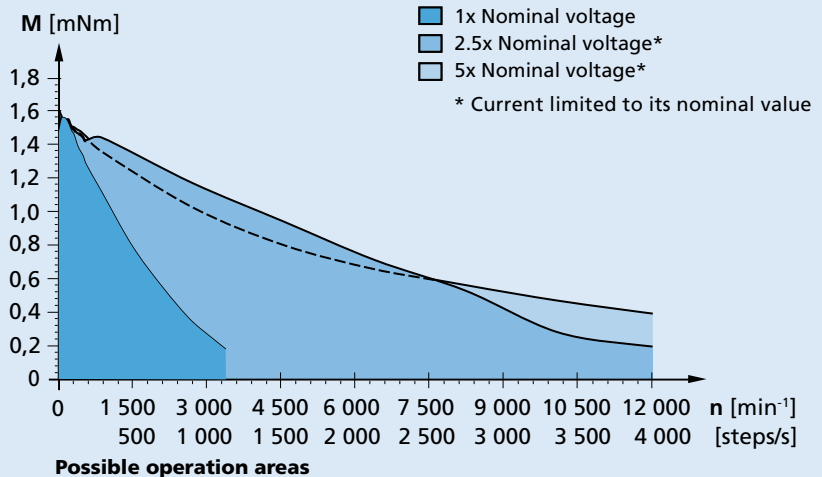
¹⁾ Special lubricant options available on request.

²⁾ 2 preloaded ball bearings available on request for vacuum / low temperature (bearing code: RC).

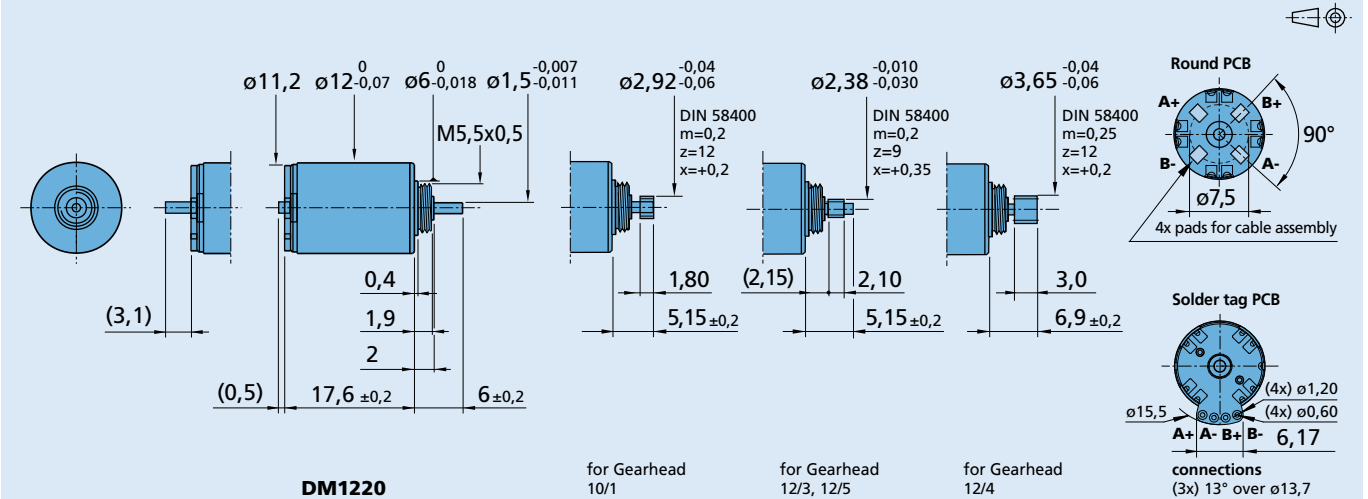
Driver settings

Relevant for 2 phases ON only.
On PWM drivers or chopper (current mode), the current is set to the nominal value and the supply voltage is typically 2.5 to 5x higher than the nominal voltage.

Curves measured with a load inertia of 20 · 10⁻⁹ kgm², in half-step mode for the "1 x nominal voltage" curve, in 1/4 microstepping mode for the other curves.



Dimensional drawing



Options and connection information

Example product designation: **DM12202R033051**

Motor executions		PCB type	Front shaft description	Connection	
front shaft	double shaft			No.	Function
51	50	Round PCB	Plain shaft, for lead screw M3	1	Phase A +
55	56	Round PCB	With pinion for gearheads 10/1	2	Phase A -
57	58	Round PCB	With pinion for gearheads 12/3, 12/5	3	Phase B +
59	60	Round PCB	With pinion for gearheads 12/4	4	Phase B -
83	82	Round PCB	Plain shaft, for lead screw M2		
31	30	Solder tag PCB	Plain shaft, for lead screw M3		
35	34	Solder tag PCB	With pinion for gearheads 10/1		
37	36	Solder tag PCB	With pinion for gearheads 12/3, 12/5		
39	38	Solder tag PCB	With pinion for gearheads 12/4		
53	52	Solder tag PCB	Plain shaft, for lead screw M2		

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
10/1 12/3 12/4 12/5 M2 x 0,2 x L1 M3 x 0,5 x L1 10L ... SL		MCST 3601	List available on request