Technical Information

DC Coreless and brushless motors data description (at 25°C)

1. Nominal Voltage [V]
The reference voltage at which all other specifications are measured.

2. Terminal resistance [Ω]
The electrical resistance measured across the motor terminals at room temperature (for coreless motors, contact resistance included). This value fluctuates depending on the brush and commutator segment location. In this catalog the lowest values are indicated.

3. Output power [W]
Max. motor mechanical output power achievable at nominal voltage.

4. Efficiency [%]
Motor converts electrical input power to mechanical output power. This conversion involves energy losses. Efficiency is the percentage indication of the input and output power conversion.

5. No-load speed [rpm]
Number of rotations per minute at no-load condition when the motor is supplied with nominal voltage.

6. No-load current [mA]
Current absorbed under no-load condition. This current is generated by internal mechanical friction losses between brush and commutator segments (coreless motors only), and between the bearings and motor shaft.

7. Stall (starting) torque [mNm]
Torque produced at stall (starting) condition when supplied with nominal voltage.

8. Friction torque [mNm]
Torque caused by friction losses in the bearings and commutation system (for coreless motor only).

9. Back-EMF constant [mV/rpm]
This constant indicated the relationship between the induced voltage in the coil and the shaft speed.

10. Torque constant [mNm/A]
This constant indicate the relationship between the generated output torque and the absorbed current.

11. Slope of N-T curve [rpm/mNm]
This value indicates the relationship between the speed variation and the torque variation. The lower this value is the stronger is the motor.

12. Coil inductance [mH]
The inductance measured across the motor terminals at 1kHz.

13. Mechanical time constant [ms]
This constant indicates the time required by the motor to accelerate from standstill to 63.2% of the no-load speed.

14. Rotor inertia [gcm^2]
Mass moment of inertia of the motor.

15. Speed range [rpm]
The max. permissible speed is the limit that should not be exceeded in continuous operation. For Sensorless Brushless Motors also the min. operating speed is indicated.

16. Max. torque [mNm]
The max. permissible torque is the limit that should not be exceeded in continuous operation.

17. Operating temperature [°C]
The most applicable temperature range.

18. Max. coil temperature [°C]
The max. allowable coil temperature.

19. Thermal resistances (R_{th1} / R_{th2}) [K/W]
The first value, Rth1, corresponds to the thermal resistance between coil and housing while the second, Rth2, between housing and ambient. For brushless motors Rth2 can be substantially reduced, and the motor performance increases, by using a heat sink.

20. Bearing type
Type of bearings used for the motor.

21. Shaft max. radial load [N]
The max. radial load (from the motor flange) is the limit for continuous operation that should not be exceeded if optimal bearing life performance are requested.

22. Shaft max. axial load [N]
The max. axial load is the limit for continuous operation that should not be exceeded if optimal bearing life performance are requested.

23. Shaft max. axial load at standstill [N]
Max. press fit force at stand still when shaft is held.

24. Shaft max. radial play [mm]
Max. shaft radial play measured at the output shaft side.

25. Shaft max. axial play [mm]
Max. shaft axial play measured at the output shaft side.