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metalrota s.r.l.

BL SERIES MOTORS

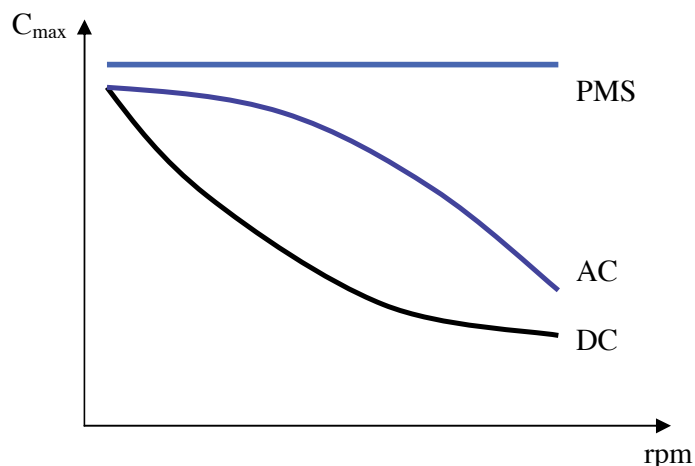
**New range of Metalrota
Brushless AC PMS motors**

**High efficiency
Constant torque
Compact form**



Brushless Motor is a synchronous motor with permanent rare earth magnets on the rotor and has the main advantage of providing a constant torque even at very low speed. Controller supplies the correct current just enough to achieve the required torque, reducing battery consumption

BL Series of PMS motors was born to fulfil customer requirements on improvements of motors efficiency, developing the capabilities of getting an high torque even when motor is running at low speed. This feature is achieved by the synchronism of the rotor, through a sensor such as the resolver (or encoder) which provides an exact angular position. Electronic controller manages this information maintaining the synchronism between rotor and stator on torque's variations.



Energy saving is the main goal for the development and the conversion to the new technology of PMS motors on battery operated machines, which is valid for every application due to its versatility, extending battery duty cycles and life. The higher efficiency compared to DC & AC motors, as an average 93-95%, allows "stops & goes" even on slopes, without using the e/m brake. In case of an assembly system with an hydraulic device the PMS motor can avoid the usage of proportional valves expenses thanks to the speed/position control.

More than above:

- High max torques, as an average 5 times the nominal torque
- Compact dimensions, related to the high power density
- Lower thermal heating
- Longer battery duty cycle
- Absence of components with frictions

The quality of components is of essence:

- On rotors we mount Rare Earth Magnets of 1,2 Tesla magnetic fields, which means 3 times the 0,4 Tesla provided by ferrite magnets. In addition, our Rare Earth Magnets have a Thermal grade of 180°C against the standard 110°C of Ferrites. Magnets are specifically designed for our rotors and matched together with special resins and assemblies which make the rotor very compact and strong to resist at high speeds and shocks



- Special Laminations of BL series are specifically designed for PMS motors and with very low Core Loss of 1,3W/kg and small thickness of 0.35mm in order to increase the efficiency as much as possible
- Copper on stators winding is of Class H Superior, with heating resistance up to 210°C.
- Bearings and sensors are sourced by first class suppliers such as NSK, NTN, and Tamagawa

PMS motors we manufacture are specifically designed for battery operated machines:

- from 24V up to 96V
- From 800W up to 12kW nominal power ($\Delta t=105^{\circ}\text{C}$)
- From 1.5Nm up to 40Nm nominal torque ($\Delta t=105^{\circ}\text{C}$)
- From 17Nm up to 300Nm peak torque
- Speeds available: from 500rpm up to 6000rpm
- Electromagnetic brake: on request, Metalrota PMS motors can be equipped with e/m brakes from 5Nm up to 100Nm
- Motors are usually assembled with an NC 140°C thermal switches. Thermal sensors such as KTY/130, PT100, NTC and PTC are available on request
- Resolver: function of resolver is to detect the angular position of the rotor in order to achieve the best electronic commutation of the driver controller. It also reports the rotor speed and can be used as an encoder. Incremental encoders with sin/cos option and Hall sensors are also available
- Vibration class (EN 60034-14 IEC 60034-14): vibrations are completely cancelled with a precise balancing of the rotors, standard DIN ISO 8821 up to nominal speed
- Metalrota PMS motors are manufactured in conformity with norms IEC BN B5/BN B14 56-100, with aluminium or steel housings. Customized flanges and shafts are available on request.
- Metalrota PMS motors are manufactured in conformity with norms EN 60034, IEC 60034 and REACH 81907/2009/CE, RoHS (95/2002/CE + 65/2011/CE) on environmental protection.



Main advantage of PMS motors against DC motors is the absence of brushes and, as a consequence, lower costs of maintenance; not only, other main features are the constant working torque of PMS motors, working duty which is generating a lower level of noise: 60-70dB compared to 75-85dB of DC motors. Efficiency is also much higher: + 10-15% and, as a consequence, a lower heating and battery consumption.

Main differences between electric motor technologies:

	DC	AC	PMS
CONSTANT TORQUE			X
MAX CONSTANT TORQUE			X
OPTIMAL EFFICIENCY		X	XX
BRUSHES REPLACEMENT	X		
LOW MANUTENTION		X	X
LOW NOISE LEVEL		X	X
DECREASE OF RPM ON INCREASE OF TORQUE	X	X	
SLEEP		X	
HEATING	X	X	



In addition to productions of drivewheels and differentials on our range, we can warranty a proper functioning of four motors matching them with proper electronic controllers, providing a complete and integrated system from a single supplier.





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