

MTR-2000 Underwater Motor



Features

- High-efficiency, low-speed underwater motor for thruster or actuator applications
- Depth-rated to 300 meters
- 100-watt maximum continuous power
- Magnetic shaft coupling eliminates shaft seals
- Brushless motor for long life and high efficiency
- Dual ceramic ball bearings on shaft
- Hard-anodized aluminum housing
- Optional propeller adapter

Description

Blue Trail Engineering's MTR-2000 underwater motor combines high efficiency and reliability in a compact package, making it perfect for small USVs, AUVs, and a wide variety of motorized subsea applications.

The MTR-2000 is designed to produce high torque at low RPM. When used as a thruster motor, it is able to spin a relatively large-diameter propeller without the need for a gearbox. In USV and AUV applications, this translates to much lower power draw than a traditional shrouded ROV thruster.

As a subsea motor, the MTR-2000's low speed, high torque, and flexible mounting options make it suitable for applications such as manipulators, drills, wheels, and brushes.



Unlike many other small underwater motors that utilize rubber shaft seals, the MTR-2000 features a magnetic shaft coupling. A ring of magnets mounted to the motor transmits torque to a matching ring of magnets mounted to the shaft. The two sets of magnets are separated by a solid barrier, eliminating any potential for leakage and eliminating the drag inherent in traditional shaft seals.

Shaft loads are supported by dual corrosion-free ceramic ball bearings, producing drastically lower drag and wear than plastic bearings.

The MTR-2000 is rated to 300 meters depth. Its housing is constructed of hard-anodized aluminum components sealed with redundant O-rings. The MTR-2000 can be mounted using the threaded holes on either end of the motor or by clamping to the outer diameter.

An optional propeller adapter allows the user to attach of a wide variety of off-the-shelf propellers (such as the line of efficient, durable, fiber-reinforced propellers from APC Propellers®) or other components such as wheels or brushes. Contact us for assistance in choosing a propeller to maximize performance in your particular application.

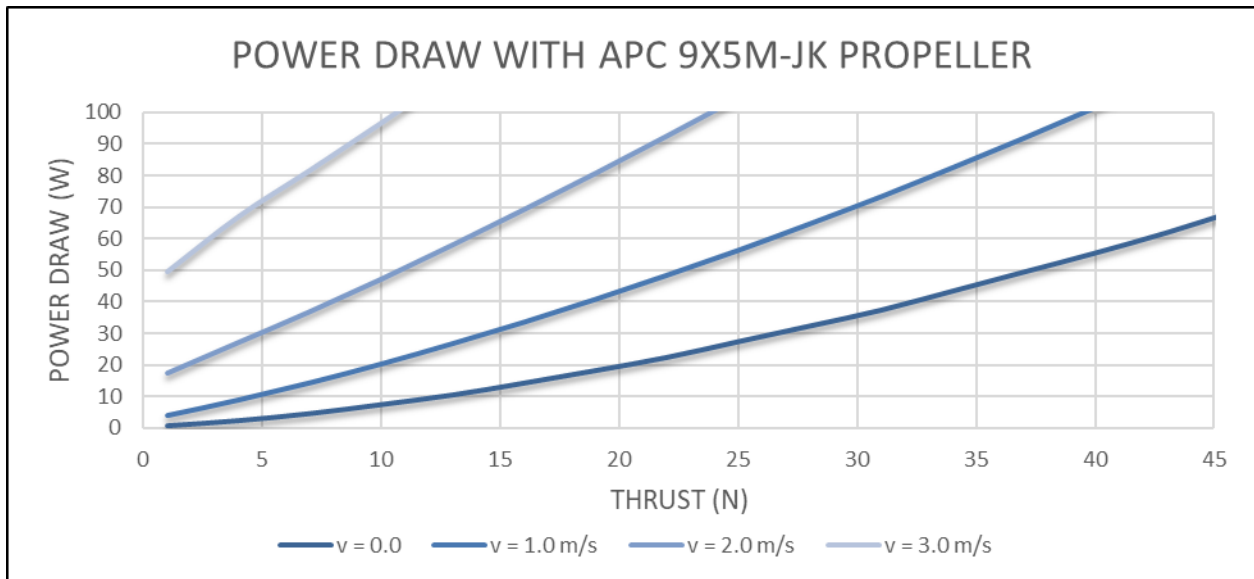
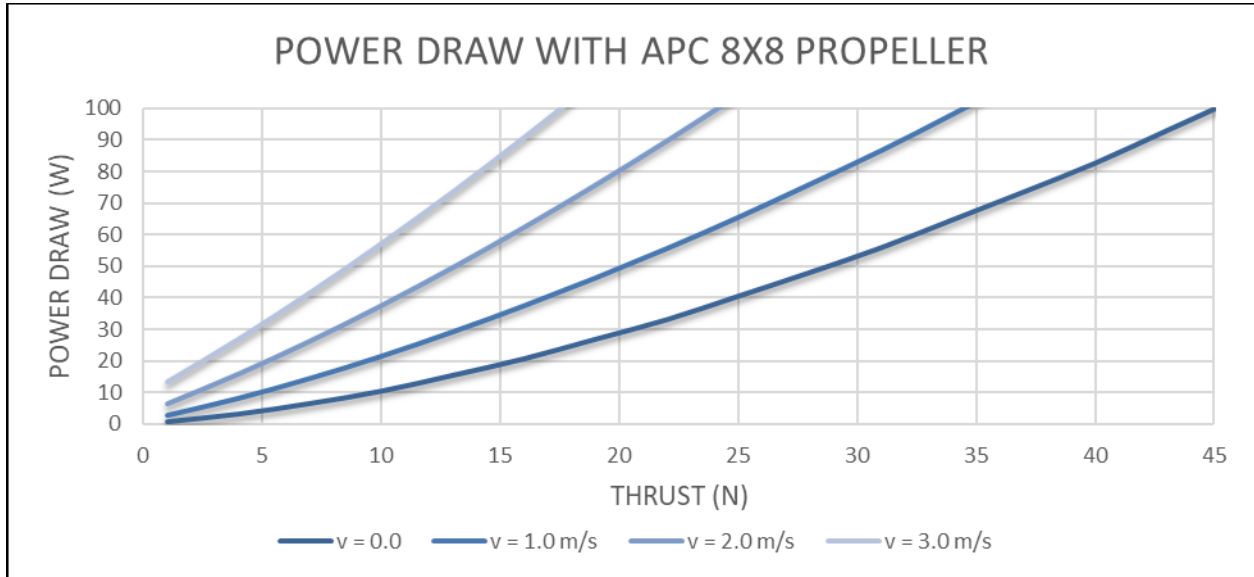
A brushless motor controller (not included) should be housed external to the motor and connected with a standard 3-wire connection. The MTR-2000 has a Blue Trail Engineering Cobalt 3-pin bulkhead connector installed on the housing.

Specifications

Environmental	
Depth rating	300 meters
Operating temperature	-10° C to +50° C
Motor	
Motor type	NeuMotors 3-phase brushless outrunner
Torque constant	0.19 Nm/A
Speed constant	50 RPM/volt
No-load current	0.11 A
Winding resistance	1.1 ohms
Number of poles	22
Maximum continuous current	8 A
Maximum voltage	24 V
Magnetic Coupling	
Breakover torque	2.0 Nm
Maximum RPM	1200
Shaft Loading	
Maximum radial load	250 N (applied to shaft 10 mm from face of motor)
Maximum axial load	450 N
Materials	
Housing	Hard-anodized aluminum
Shaft	316 stainless steel
Shaft bearings	Full ceramic ball bearings
Fasteners	316 stainless steel
Size/Weight	
Dimensions	66 mm OD X 161 mm length
Weight in air	1500 grams
Weight in water	950 grams

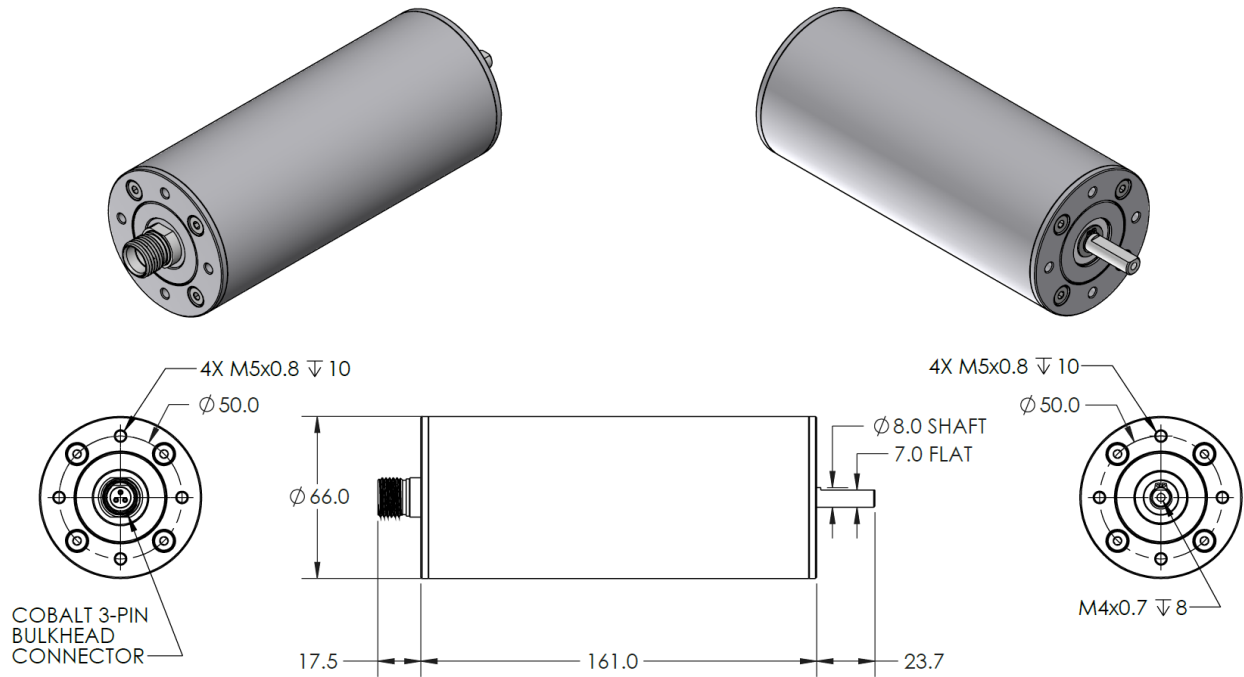
Thruster Performance

The graphs below show power draw as a function of thrust using the APC Propellers® 8x8 propeller (8 inch diameter, 8 inch pitch), which is optimal for a forward speed of approximately 1 m/s, and the APC Propellers® 9x5 marine propeller, which provides better performance at zero forward speed.



Motor Dimensions

All dimensions are in mm.



Optional Propeller Adapter Dimensions

All dimensions are in mm.

