THR-100X High-efficiency Thruster

Features

- Highest-efficiency thruster on the market for small ASVs and AUVs
- Depth-rated to 300 meters
- 100-watt maximum continuous power
- Swiss-quality Maxon brushless motor
- Magnetic propeller coupling
- Ceramic ball bearing on propeller shaft
- High-efficiency propeller
- Engineered for months of exposure in seawater or fresh water
- Hard-anodized aluminum and acetal housing
- Connection options include industry-standard Micro Circular and Blue Trail Cobalt Series connectors

Description

Blue Trail Engineering's THR-100X High-efficiency Thruster is a game-changing solution for small Autonomous Surface Vehicles or Autonomous Underwater Vehicles requiring low power draw, high performance, and extreme reliability in the harsh ocean environment.

The THR-100X is built around a Swiss Maxon DC brushless motor designed to produce high torque at low RPM. Because of this, no gearbox is required, yielding higher efficiency, lower noise, and greater reliability than geared thrusters.

The brushless motor is coupled to the propeller magnetically: a ring of magnets mounted on the motor transmits torque to a matching ring of magnets mounted to the propeller 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. Thrust loads are supported with a corrosion-

free ceramic ball bearing on the propeller shaft, producing drastically lower drag and wear than plastic bearings.

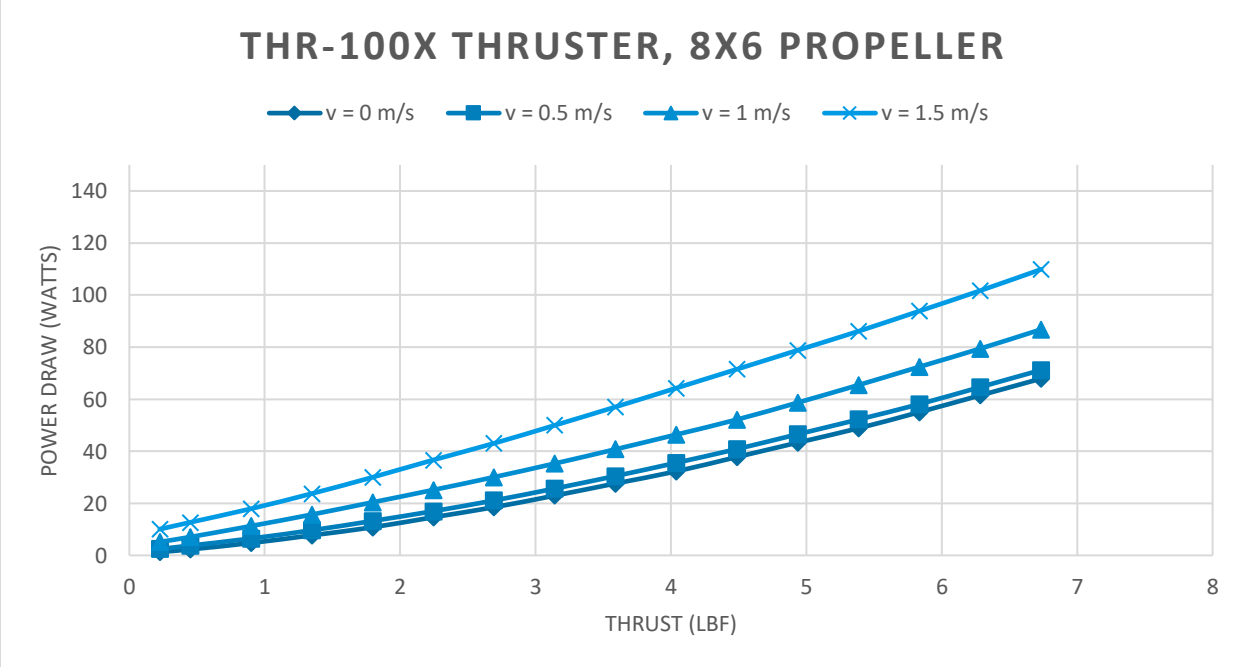
The THR-100X is rated to 300 m depth. Its housing consists of hard-anodized aluminum and acetal components with dual O-rings for reliable sealing.

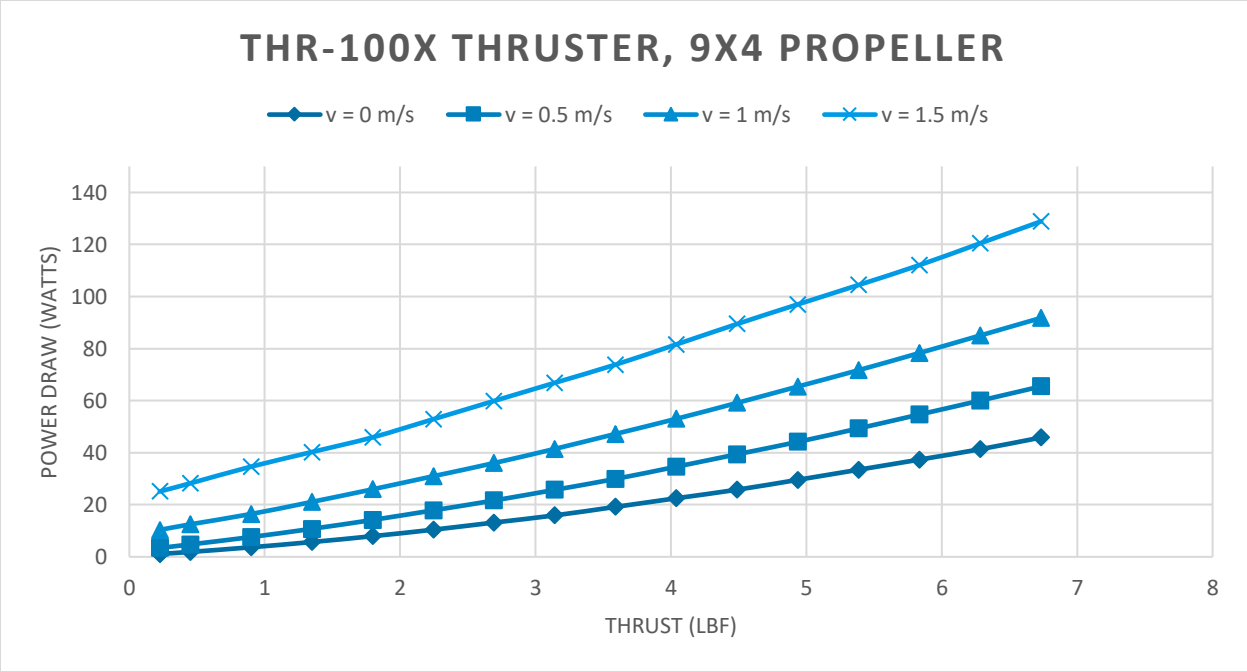
An efficient, durable, fiber-reinforced propeller with 8-inch diameter and 6-inch pitch is standard on the THR-100X, but other sizes are available. Contact Blue Trail Engineering for assistance with choosing a propeller to maximize performance in your particular application.

A brushless motor controller (not included) should be housed external to the thruster and connected with a standard 3-wire connection. The THR-100X is available with two connection options: the Blue Trail Cobalt Series bulkhead connector or the SEACON MCBH-3M wet-mate bulkhead connector.

Performance

The graphs below show power draw as a function of thrust for both the standard 8X6 propeller, which is optimized for a forward speed of approximately 1 m/s, and a 9X4 propeller, which is optimized for zero forward speed.





Specifications

Environmental	
Depth Rating	300 meters
Operating Temperature	0° C to +50° C
Motor	
Motor Type	Maxon 634043 3-phase brushless inrunner
Torque Constant	0.115 Nm/A
Speed Constant	83 RPM/volt
Maximum Voltage	20 V
Maximum Continuous Current	5.4 A
No-load Current	0.4 A
Number of Pole Pairs	8
Materials	
Housing	Hard-anodized aluminum, acetal
Propeller Shaft	316 stainless steel
Propeller Shaft Bearing	Ceramic ball bearing
Propeller	Fiber-reinforced plastic
Size/Weight	
Dimensions	69.5 mm OD X 257 mm length
Weight in Air	2200 grams
Weight in Water	1400 grams

Connection Options

Part Number	Connection Type	Description
THR-1000	Blue Trail Cobalt Series bulkhead connector	Compatible with Cobalt Series underwater cables. Allows easy connection/disconnection at the thruster.
THR-1001	MCBH-3M bulkhead connector	Compatible with industry-standard MCIL 3-position cables. Allows easy connection/disconnection at the thruster, even underwater.

Dimensions

All dimensions are in mm. Shown with Blue Trail Cobalt Series bulkhead connector.