

Underwater Servo SER-120X



Features

- Submersible up to 100 meters
- Programmable up to 7 turns of rotation or continuous rotation
- High torque
- Brushless motor
- Magnetic encoder
- Compact size
- Low power draw
- Engineered for months of exposure in seawater or fresh water
- Corrosion-resistant titanium output shaft, Delrin® enclosure
- Standard R/C PWM interface

Description

Blue Trail Engineering's SER-120X is the ultimate underwater servo for small robotic applications. Unlike any other servo in its class, it can be programmed to provide up to 7 turns of rotation with position control or continuous rotation with speed control. The SER-120X features a brushless motor and magnetic encoder, eliminating the most common causes of servo failure. Ideal for Autonomous Surface Vehicles as well as Remotely Operated Vehicles, the SER-120X provides reliable, long-term actuation at depths up to 100 meters.

The SER-120X is based on the Hitec HSR-M9382TH digital servo. Blue Trail integrates a modified HSR-M9382TH into a corrosion-resistant, depth-rated Delrin® housing with a ball-bearing-supported titanium output shaft and nitrile quad-ring shaft seal.

The SER-120X utilizes the compact and reliable Cobalt 3-pin dry-mate bulkhead connector, compatible with Cobalt Series cables from Blue Trail Engineering. Custom connection options are also available.

Specifications

Environmental	
Depth Rating	100 meters
Operating Temperature	-10° C to +50° C
Performance	
Torque	34.0 kg-cm / 470 oz-in
Speed	0.17 seconds/60 deg. @ 6.0 V 0.14 seconds/60 deg. @ 7.4 V
Travel Angle	up to 7 turns
Programmable Features (requires Hitec DPC-11 programmer with BLDC_HSR User interface_Ver 3.1 software)	amount of rotation (end point adjustment) direction speed fail-safe position deadband width soft start rate
Electrical	
Operating Voltage	6.0 V - 7.4 V
Idle Current	0.03 A
No-load Current	0.25 A
Stall Current	2.7 A
Motor Type	BLDC
Feedback Type	magnetic encoder
Materials	
Gears	steel/titanium
Output Shaft	titanium
Case	Delrin®
Size/Weight	
Dimensions	56 mm X 82 mm X 29 mm
Weight in Air	180 grams
Weight in Water	65 grams
Interface	
Connector	Blue Trail Engineering Cobalt 3-pin dry-mate bulkhead connector
PWM Range	800µs - 2100µs
PWM Voltage Range	3 - 5 V

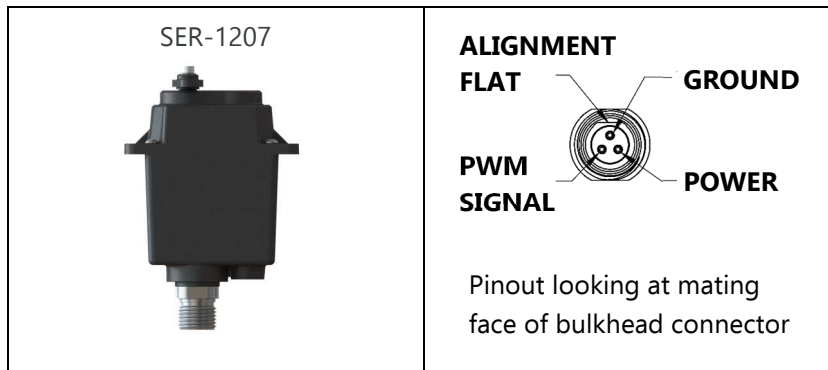
Electrical and Command Interface

The SER-120X features a Cobalt 3-pin dry-mate bulkhead connector as the standard connection option. Matching waterproof cables, with connectors on one end or both ends, are available from Blue Trail Engineering. Custom connection options are also available.

Part Number	Connection Type	Description
SER-1207	Blue Trail Cobalt 3-pin dry-mate bulkhead connector	Compatible with Cobalt Series underwater cables. Allows easy connection/disconnection at the servo.
Custom	Custom	Options include 1-meter unterminated cable, Micro-Circular bulkhead connector, and others. Contact Blue Trail Engineering for details.

The SER-120X requires a DC power input between 6.0 and 7.4 volts.

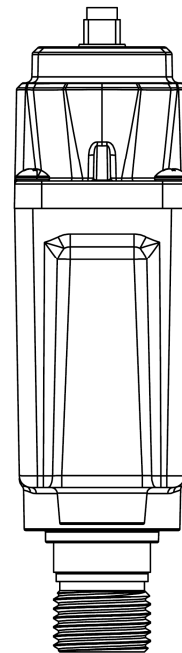
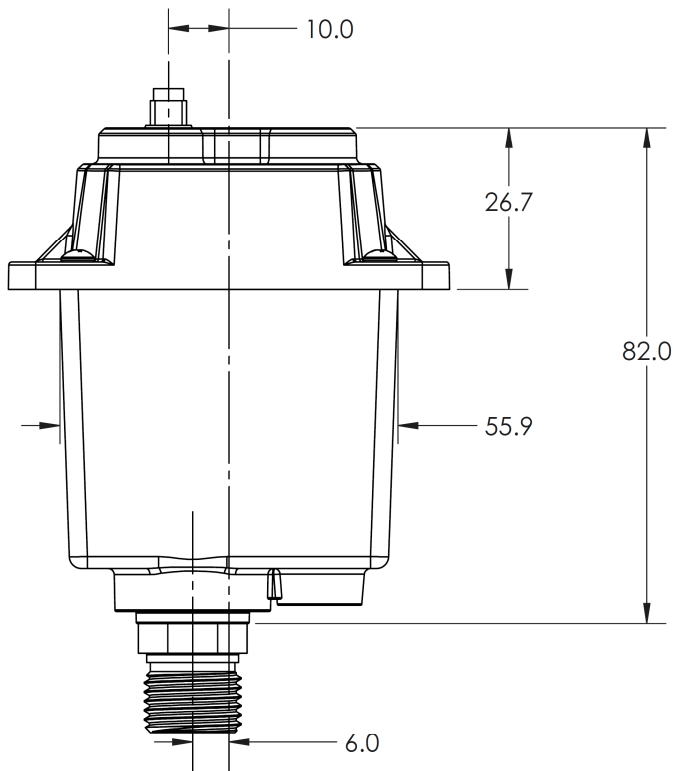
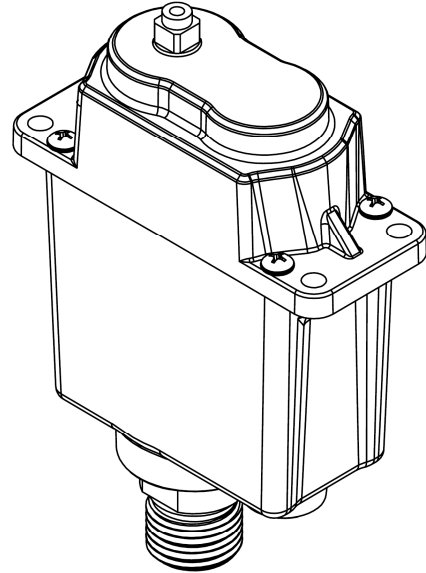
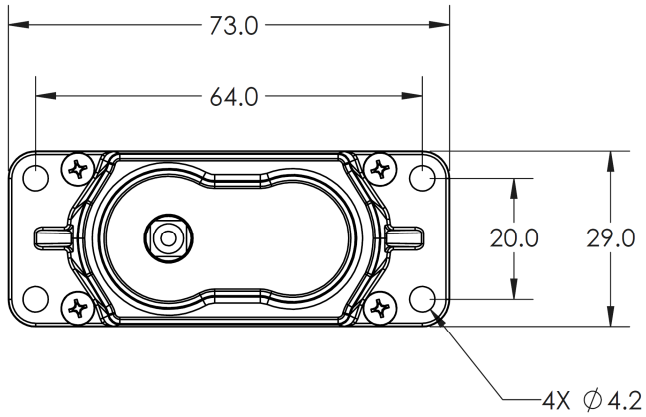
For control, the SER-120X requires a standard R/C input signal. This consists of a PWM signal between 3 and 5 volts, typically at 50 Hz. The pulse width is varied within the range of 800 – 2100 microseconds to control the position of the servo.



NOTE: Because this servo is capable of more than 1 full turn, it does not have an absolute encoder on the output shaft and does not remember its absolute position when power is cycled. This can be problematic if the servo is being used in a multi-turn application. For example, if the servo is moved 2 turns clockwise and power is then cycled, the servo will move another 2 turns clockwise (it does not remember that it had already moved 2 turns before the power was cycled). The best way to handle this is to center the servo before turning it off.

Dimensions

All dimensions are in mm.



Output Shaft Detail

