

# Submersible Pump

## SBE 5T

The SBE 5T pump module is a compact unit consisting of a centrifugal pump head and a long-life, brushless, DC, ball-bearing motor contained in a titanium pressure housing useable to 10,500 meters. The pump impeller and electric drive motor are coupled magnetically through the housing, providing high reliability by eliminating moving seals.

### APPLICATIONS

The SBE 5T is a primary component in the SBE *9plus* CTD Underwater Unit and SBE 25 SEALOGGER CTD. It is also used as optional equipment on SBE *16plus*, *16plus-IM*, and *19plus* SEACAT CTDs. The pump flushes water through the conductivity cell at a constant rate, independent of the CTD's motion, improving dynamic performance. The pump may also be suitable for custom applications, where pressure heads are less than 300 cm of water and flow rates are less than 100 ml/sec.



### CONFIGURATION

The SBE 5T is configured for various applications by selecting standard or low voltage options, and one of several motor speed options. Speed options of 1300, 2000, 3000 or 4500 rpm have been established to meet various flow rate requirements. Other speeds can be set by adjusting a potentiometer.

- #3 winding, low voltage, 2000 rpm – typical for SBE 25
- #3 winding, standard voltage, 2000 rpm – typical for SBE *16plus*, *16plus-IM*, or *19plus* with pumped auxiliary sensor(s)
- #3 winding, standard voltage, 3000 rpm – typical for SBE *9plus*

### OPERATION

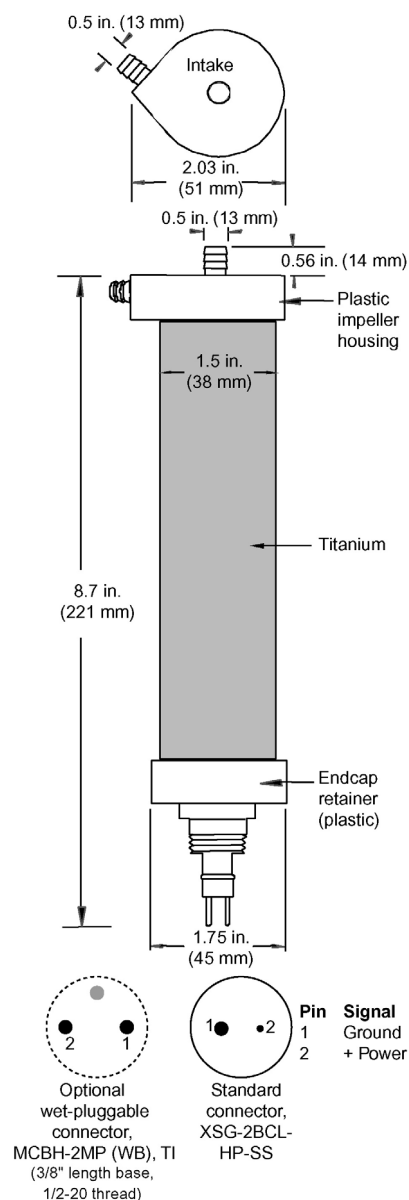
Motor speed and pumping rate remain nearly constant over the entire input voltage range (less than 1% change in speed for a 1 volt change in supply voltage). The unrestricted flow rate with no head is approximately 100 ml/second at 2000 rpm. Flow changes are nearly linear with changes in speed. With unlimited power supply current, turn-on surge is approximately 1.8 amperes (maximum), which drops to steady state in approximately 0.25 seconds. If power supply current is limited to approximately 200 milliamps, the motor comes up to speed in approximately 0.30 seconds. A series diode is installed in the input power line to prevent damage if the wires are accidentally reversed. Pumping rates and motor current for various applications are shown on the next page.

### SPECIFICATIONS

#### Input Voltage:

|                                                           |             |
|-----------------------------------------------------------|-------------|
| Standard input range (#3 winding, 1300 - 3000 RPM):       | 10 - 18 VDC |
| Standard input range (#3 winding, 4500 RPM):              | 13 - 18 VDC |
| Low input range (#3 or #5 winding - 1300, 2000 RPM only): | 6 - 16 VDC  |

**Weight:** 0.7 kg (1.5 lbs) in air, 0.3 kg (0.65 lbs) in water



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