

# Submersible Pump

# SBE 5T (titanium) & SBE 5P (plastic)



The pump module is a compact unit consisting of a centrifugal pump head and a long-life, brushless, DC, ball-bearing motor. The pump impeller and electric drive motor are coupled magnetically through the housing, providing high reliability by eliminating moving seals. The **5T** has a 10,500-meter (34,400-ft) titanium housing; the **5P** has a 600-meter (1960-ft) plastic housing. The operational characteristics of the 5T and 5P are identical.



## APPLICATIONS

The pump is a primary component in the SBE *9plus* CTD and *25 / 25plus* Sealogger CTD. It is also used as optional equipment on SBE *16plus* V2, *16plus-IM* V2, and *19plus* V2 Seacat CTDs. The pump flushes water through the conductivity cell at a constant rate, independent of the CTD's motion, improving dynamic performance. It 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 pump is configured by selecting standard or low voltage, and one of several motor speed options. Speed options of 1300, 2000, 3000, or 4500 rpm have been established to meet various flow 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* V2, *16plus-IM* V2, or *19plus* V2 with pumped auxiliary sensor(s), and for SBE *25plus*
- #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 supply voltage change). The unrestricted flow rate with no head is 100 ml/second \* at 2000 rpm. Flow changes are nearly linear with speed changes. With unlimited supply current, turn-on surge is 1.8 Amps \* (maximum), dropping to steady state in 0.25 seconds \*. If power supply current is limited to 200 milliAmps \*, the motor comes up to speed in 0.30 seconds \*. A series diode is installed in the input power line to prevent damage if wires are accidentally reversed. Pumping rates and motor current for various applications are shown on the next page.

\* approximate

## SPECIFICATIONS

### Input Voltage:

Standard input range (#3 winding; 1300 - 3000 RPM): 10 - 18 VDC

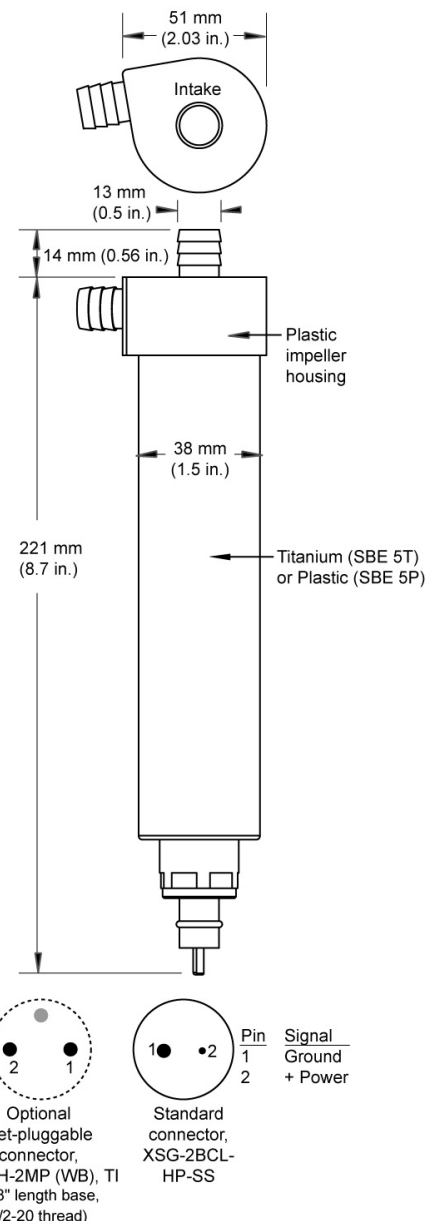
Standard input range (#3 winding; 4500 RPM): 12 - 18 VDC

Low input range (#3 or #5 winding; 1300, 2000 RPM only): 6 - 16 VDC

### Weight:

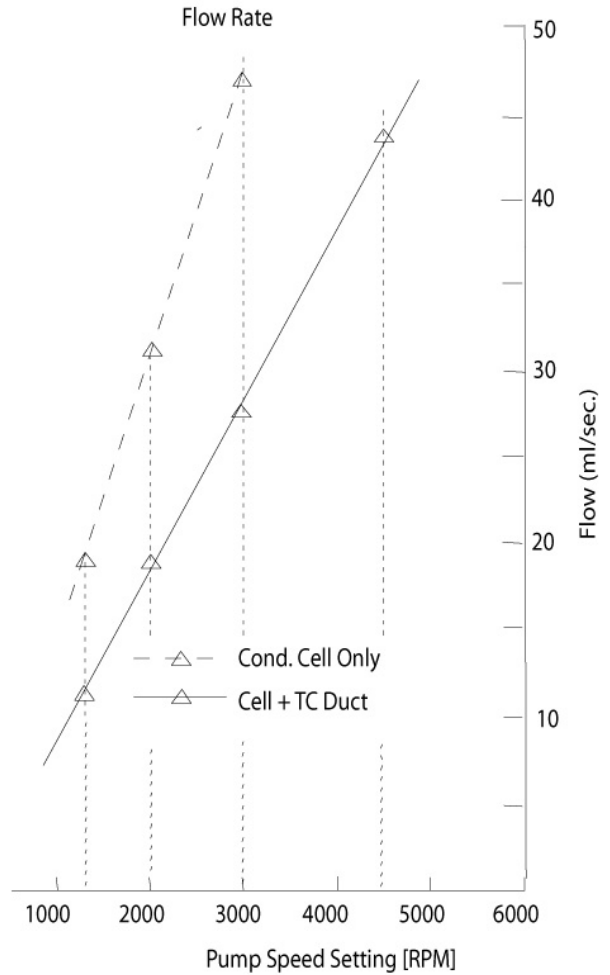
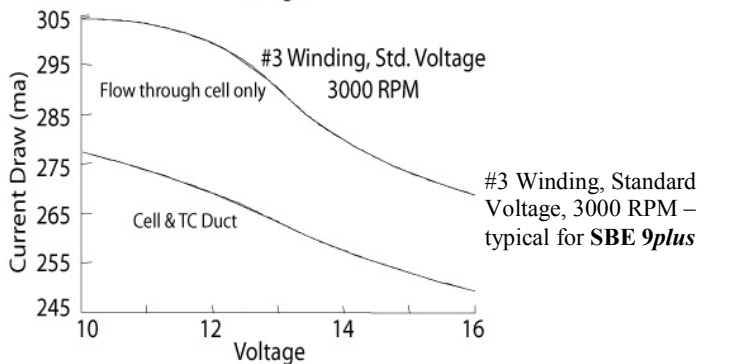
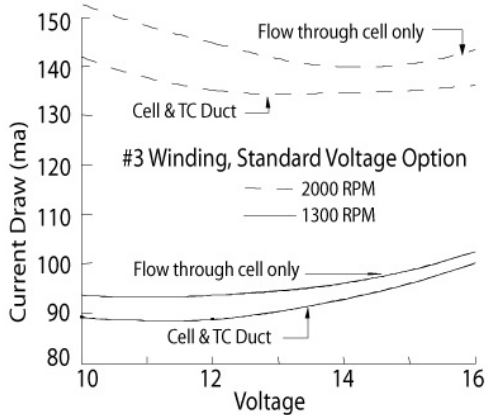
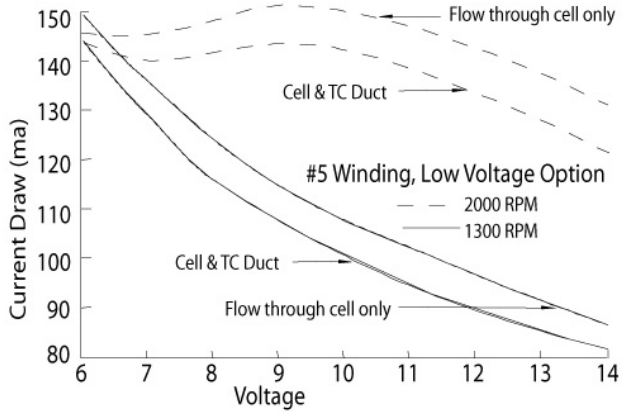
SBE 5T - 0.7 kg (1.5 lbs) in air, 0.3 kg (0.7 lbs) in water;

SBE 5P - 0.5 kg (1.0 lb) in air, 0.1 kg (0.2 lbs) in water



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#3 Winding, Standard Voltage, 4500 RPM, flow through cell only:

Voltage (V)	Current Draw (ma)
12	640
15	585

