

# SBE 35RT

## Digital Reversing Thermometer

The SBE 35RT is an accurate, ocean-range temperature sensor that is capable of measuring temperature in the ocean to depths of 6800 meters. The SBE 35RT can be used with a CTD / Water Sampler system, eliminating the need for reversing thermometers and providing higher accuracy temperature readings at lower cost.

The SBE 35RT is externally powered, and communicates via a standard RS-232 interface. Measurements are output as raw data or in engineering units (°C).

## Features

- The SBE 35RT can be used with the SBE 32 Carousel Water Sampler and one of the following CTD systems:
    - Real-time (bottles closed by command from ship) - SBE 9plus CTD with SBE 11plus Deck Unit; or SBE 19, 19plus, 19plus V2, 25, or 25plus CTD with SBE 33 Deck Unit.
    - Autonomous (bottles closed based on programmed pressures or times) - SBE 9plus CTD with SBE 17plus V2 Searam; or SBE 19, 19plus, 19plus V2, 25, or 25plus CTD with Auto Fire Module (AFM).
- The SBE 35RT makes a measurement each time a bottle fire confirmation is received, and stores the time, bottle position, and temperature, allowing comparison with CTD and water bottle data.

- RS-232 output at 300 baud, 8 data bits, no parity.
- Aluminum housing; depths to 6800 m.
- Seasoft® V2 Windows software package (instrument setup, data display, and data upload).
- Five-year limited warranty.

### Real-Time Operation:

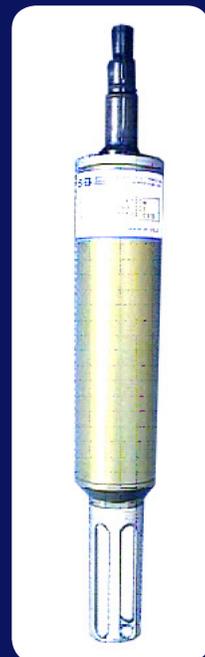
11plus—9plus CTD—Carousel  
35RT

33—Carousel—19/19plus/19plus V2/25/25plus CTD  
35RT

### Autonomous Operation:

9plus CTD—17plus—Carousel  
35RT

19/19plus/19plus V2/25/25plus CTD—AFM—Carousel  
35RT



## Options

- XSG or wet-pluggable MCBH connector.
- Interface Box to connect SBE 35RT to a computer for setup and lab use (100-240 VAC powered, provides 15 VDC to SBE 35RT, and buffers communication lines to minimize interference from external noise).

## Measurement Method

Temperature is determined by applying an AC excitation to reference resistances and an ultrastable aged thermistor with a drift rate < 0.001 °C/year. Each of the resulting outputs is digitized by a 20-bit A/D converter. The reference resistor is a hermetically sealed, temperature-controlled VISHAY. The switches are mercury wetted reed relays with a stable contact resistance. AC excitation and ratiometric comparison using a common processing channel removes measurement errors due to parasitic thermocouples, offset voltages, leakage currents, and gain errors. Maximum power dissipated in the thermistor is 0.5 μWatts, and contributes < 200 μK of overheat error.

Sensor Output (raw counts) =  $1048576 * (NT - NZ) / (NR - NZ)$   
 where NR is reference resistor output, NZ is zero ohms output, NT is thermistor output.

Each measurement acquisition cycle takes 1.1 sec. The number of cycles per measurement is programmable. Increasing the cycles increases acquisition time while reducing RMS temperature noise. In a thermally quiet environment, the temperature noise standard deviation is  $82 * \text{sqrt}(1/n \text{ cycles})$  [μK].

## Performance

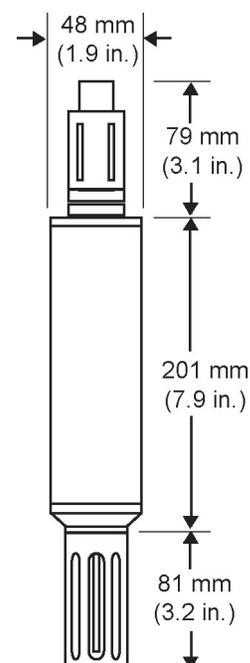
Measurement Range	-5 to +35 °C
Initial Accuracy	± 0.001 °C
Typical Stability	0.001 °C per year
Resolution	0.000025 °C
Calibration	-1.5 to + 32.5 °C
Memory	179 samples
Real-Time Clock	Watch-crystal type

## Electrical

Input Power	9 - 16 VDC. On power application (≈ 1 minute) 140 to 160 mA; Operating 60 to 70 mA.
Output Signal	RS-232 (300 baud, 8 data bits, no parity)

## Mechanical

Housing & Depth rating	Aluminum, 6800 m
Weight	0.7 kg in air, 0.3 kg in water



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