IDRONAUT OCEAN SEVEN 303 BOREHOLE PROBE

CTD, O2, pH, ORP - DEEP GROUNDWATER, HOT SPRING
FAST SAMPLING RATE: 12 Hz

The OCEAN SEVEN 303 multiparameter CTD is the result of IDROANUT's 35-year-old experience in the design and manufacturing of high-technology borehole probes for deep groundwater profiling. The 303 CTD multiparameter probe, which presents very small size (diameter of only 43 mm), has been specifically designed for groundwater investigations through "boreholes" and uses very reliable, accurate and drift-free high-quality sensors, associated with advanced and miniaturized electronics.
The OCEAN SEVEN 303 multiparameter CTD offers a combination of 16-bit high resolution data accuracy, with long-term sensor stability, making this probe the best choice for profiling applications. The OS303 multiparameter CTD is equipped with the well-known IDRONAUT full ocean depth, pump-free and long-term stability sensors. Central to which, is the high accuracy seven-platinum-ring quartz conductivity cell (patented), which can be cleaned in the field without the need for re-calibration. The OS303 multiparameter CTD does not require pumps or any other external device to flush the sensors. The OS303 multiparameter CTD continuously transmits acquired data converted into engineering units via telemetry. Calibration coefficients and probe configuration are stored in the internal non-volatile memory.
The OS303 multiparameter CTD allows the operator to select the proper conductivity range for salt or fresh water, making this probe a very advanced tool for investigation of ground-water influenced by salt-water intrusion.

SENSOR SPECIFICATIONS

The OCEAN SEVEN 303 multiparameter CTD can be equipped with the following sensors to measure:

	Range	Initial Accuracy	Resolution	Response Time
Pressure	0.. 1000 dbar (1)	0.05 % full scale	0.0015 % full scale	50 ms
Temperature	-1.. +50 °C	0.005 °C	0.001 °C	50 ms
Conductivity				
Salt water	0.. 70 mS/cm	0.007 mS/cm	0.001 mS/cm	50 ms (2)
Fresh water	0..7000 µS/cm	5 µS/cm	0.1 µS/cm	50 ms (2)
Oxygen	0.. 50 ppm	0.1 ppm	0.01 ppm	3 s (3)
	0.. 500 % sat.	1 % sat.	0.1 % sat.	3 s (3)
pH	0.. 14 pH	0.01 pH	0.001 pH	3 s
Redox	-/+1000 mV	1 mV	0.1 mV	3 s

(1) At 1 m/second flow rate.
(2) From nitrogen to air.
(3) Other standard pressure transducers available, have : 10, 40, 100, 200, 500, 2000, 3000 dbar ranges.
In addition to pH and redox, one Ion Selective Electrodes (I.S.E.) can be installed for fresh water application and for 1000 m max depth operation only.
The fundamental properties of seawater, like: **Salinity, Sound Speed, Water Density, Oxygen ppm** are obtained using the algorithms described in the UNESCO technical papers in marine science no. 44 "Algorithms for computation of fundamental properties of sea water".
The freshwater properties like: **TDS (Total Dissolved Solids), Fresh Water Conductivity** corrected at 20°C and 25°C are automatically calculated.

IDRONAUT REDAS-5 Windows Software

REDAS-5 software, through a simplified and friendly operator interface, allows taking full control of the OCEAN SEVEN 303 multi parameter CTD and facilitates real-time data acquisitions, configuration of unattended acquisition cycles and uploading of data stored in the probe memory. REDAS-5 program is a true 32-bit Windows application, which flawlessly runs on any Windows. REDAS-5 shows the acquired data graphically and numerically thus allowing the operator to dynamically change the graphical and numerical set-up during data acquisition. Post-processing functions and data extraction procedures, in function of time, pressure or numerical intervals can be applied to acquire data in real time or on data retrieved from the probe memory. Among the operations that REDAS-5 can perform, it is worth mentioning: automatic start and stop of data acquisition; management of the bottle sampling (Rosette); processing and filtering of acquired data in real time (time lag compensation, smoothing etc.); acquisition of geographical coordinates from a GPS device; acquired data conversion into text files; automatic scaling of the graphical window X and Y axis. **REDAS-5 software allows 12 Hz sampling rate.**

ELECTRONIC SPECIFICATIONS

Sampling rate:	8 Hz (conversion into engineering units takes place using the probe internal resources); 12 Hz using REDAS5 software;.
Communication:	Telemetry, RS232C, Asynchronous TTL (0..5VDC).
Baud Rate:	9600 bps.
Protocol:	**[Verbose]** friendly operator interface with built-in help. **[Non Verbose]** binary and/or ASCII data transmission.
A/D converter:	16-bit, resolution, range 0..2.5 VDC, 12 multiplexed analogue inputs.
Supply Voltage:	9..30 VDC, nominal 12 VDC.
Supply Current:	50 mA @ 12 V DC.
Cable:	The OCEAN SEVEN 303 multiparameter CTD operates with the standard Rochester coaxial armored cables (1/10, 1/8, 1/4, 1/2 inch) present in oceanographic vessels having a total resistance up to 250 ohms.

PHYSICAL CHARACTERISTICS

Housing	**1500 dbar**	**3000 dbar**
Diameter	43 mm	48 mm
Length	700 mm	705 mm
Weight in air	1,6 kg	3,7 kg
Weight in water	0,8 kg	2,8 kg
Materials	AISI 316L	TITANIUM

TELEMETRY PORTABLE DECK UNIT

The Telemetry Portable Deck Unit powers and interfaces, by coaxial oceanographic cables, the OCEAN SEVEN 303 multiparameter CTD with a personal computer. The portable deck unit is equipped with a transceiver (modem) which allows half-duplex communication with the probe. The portable deck unit is housed in a waterproof plastic case and is provided with an internal mains rechargeable lead battery (12V DC, 7 A/h) which permits probe operation even in the absence of the mains supply.
The internal battery guarantees up to 20 hours of continuous probe and deck unit operation.
The portable deck unit comes complete with an international battery charger: 115/220VAC +/-10%, 50-60 Hz +/-5%.
Telemetry power supply: 30V DC (max 0.3A@12 V).
Dimensions: 340 x 300 x 160 mm. Weight: 6.5 kg.

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