

Pre-programmed autonomous water samplers with CTD

CTD with water samplers

Depth Temperature Conductivity Chlorophyll Turbidity Salinity

■Description

The system is an autonomous water sampler based on Chlorotech CTD control, and serves as a compact CTD system with 10 sampling bottles. The system measures five parameters, including temperature, salinity (conductivity), depth, chlorophyll and turbidity, with a rechargeable battery and a memory. The system can be pre-programmed to close sampling bottles at the desired depths so that it does not require any special winches and real-time communication cables. The system design is small and light. The CTD with water samplers can be operated by a small boat with a winch of a capacity of approximately 150kg or greater.

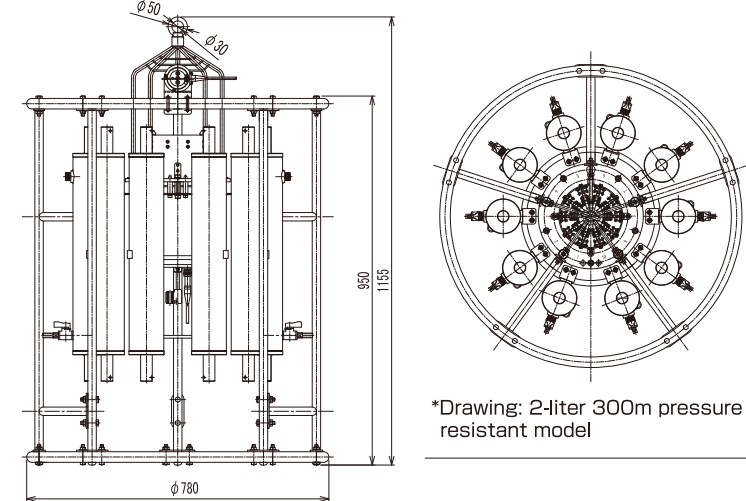
■Sensor Specifications

Parameter	Principle	Range	Resolution	Accuracy
Depth	Semiconductor pressure sensor	0 to 300m/1,000m	0.01m/0.02m	±0.3%FS
Temperature	Thermistor	−3 to 45°C	0.001°C	±0.01°C(0 to 35°C)
Salinity (conductivity)	PSS-78 (7 in-vitro electrode type)	2 to 40 2 to 70mS/cm	0.001 0.001mS/cm	±0.02(2 to 40) ±0.01mS/cm(2 to 65mS/cm)
Turbidity	Infrared backscattering	0 to 1,000FTU (Formazin reference)	0.03FTU	Measured value ±2% Zero drift ±0.3FTU
Chlorophyll	Fluorescence intensity	0 to 400μg/l (Uranine reference)	0.01μg/l	Non-linearity ±1% Zero drift±0.1μg/l

■Memory Specifications

Measuring mode	Depth trigger	Time trigger
Measuring interval	0.1, 0.2, 0.5, 1m	0.1, 0.2, 0.5, 1 sec
Memory medium	2MB flash memory	
Data capacity	Approx. 77,786 data sets (300m at 0.1m pitch, 25 times)	Approx. 77,786 data sets
Recorded parameters	Depth, temperature, salinity, chlorophyll, turbidity	
Recorded information	Date, depth, temperature, salinity, chlorophyll, turbidity, water sampling depth	

■Drawing



*Drawing: 2-liter 300m pressure resistant model



■Sampling Bottle Specifications

Sampling method	Electronic-type electromagnetic solenoid method	
No. of sampling bottles	10	
Sampling bottle volume	2 liters/bottle, 3 liters/bottle, 5 liters/bottle	
Simultaneous sampling	Simultaneous sampling of 3 bottles possible	
Sampling mode	Depth trigger mode	Time trigger mode
	1m interval, minimum	1 sec interval, minimum
Material	Sampling bottle material: PVC *Interior: Teflon coated Internal rubber: Silicon rubber tube Sampling control area: Stainless steel Protective housing: Stainless steel (partially titanium)	
Weight	Not during sampling: Approx. 56kg, During sampling: Approx. 76kg (two liter model) Not during sampling: Approx. 65kg, During sampling: Approx. 95kg (three liter model) Not during sampling: Approx. 73kg, During sampling: Approx. 128kg (five liter model)	
Power	Rechargeable lithium ion battery Approx. 8 hours of observation possible when used continually	
Dimensions	H:1,155mm, φ780mm(two liter model) H:1,150mm, φ880mm(three liter model) H:1,150mm, φ930mm(five liter model)	
Depth rating	300m depth equivalent, 1,000m depth equivalent	

Sampling depth set in program



Sampling bottle easily inserted



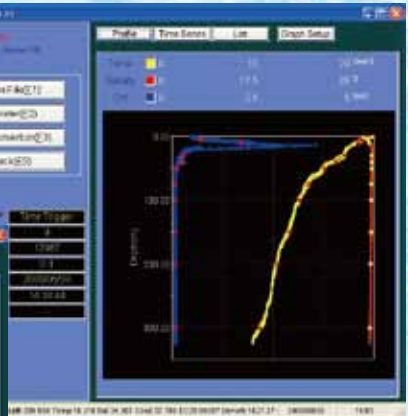
Data processing program

Observation setting screen



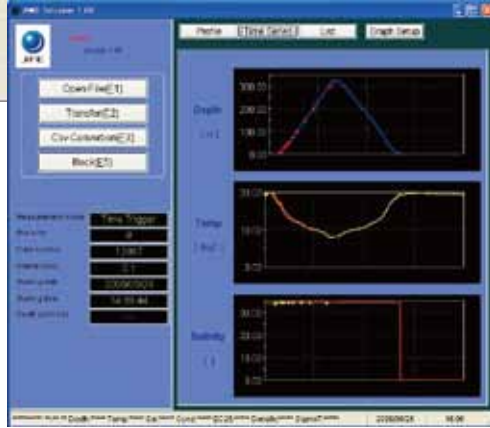
Vertical graph display screen

The sampled layer is indicated by points.



Time series graph display screen

The sampled layer is indicated by points.



Data transfer screen



List display screen

The sampled layer is indicated by markers.