



MSS 90

Microstructure/Turbulence Profiler



Main Features

- multiparameter measurements
- microstructure, turbulence and standard CTD Sensors
- additional optical sensors
- depth range 500 m
- free sinking or rising operation
- adjustable sinking or rising velocity
- 16 channels
- resolution 16 bit
- 1024 scans/s
- baud rate 614 kb
- easy data acquisition and evaluation software

Materials

- titanium
- stainless steel

Dimensions and Weights

L (housing)	800 mm
Ø (housing)	89 mm
L (overall)	1200 mm
W (in air)	approx. 8 kg

The MSS 90 is a multiparameter probe for measuring micro-scale water stratification as well as the intensity of small scale turbulence in water down to approx. 500m. The microstructure measuring system comprises the MSS profiler, a special winch, a probe interface and a data acquisition computer. The probe interface is adapted to the PC (laptop or desktop) via USB port.

The MSS is equipped with high resolution micro-structure and turbulence sensors (temperature, current shear) and standard CTD sensors (temperature, electrical conductivity, pressure). Additional sensors, e.g. oxygen, and light scattering, can be attached. Maximum 9 sensors can be plugged to the profiler. House keeping sensors control disturbing vibrations and tilt of the profiler itself.

The MSS 90 can be used to carry out free sinking or rising measurements. Its sinking or rising velocity can be adjusted by a combination of weights and buoyancy elements.

For measurements in shallow water (lakes, rivers, coastal waters) a mini version of the MSS is available (MSS 60). For measurement down to approx. 2000m, a deep water version of the MSS can be offered.

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MSS 90 standard sensor equipment

Sensors	Principle	Range	Accuracy	Resolution	Response time
Microstructure Turbulence	PNS airfoil shear probe	Dissipation rate $10^{-2} \dots 10^{-11}$ W/kg	not specified	10^{-11} W/kg	4 ms
Microstructure Temperature	FP07 micro-thermistor	-2 ... + 32 °C	± 0.02 °C	0.002 °C	10 ms
Pressure	piezo-resistive	10, 20, 50 bar	± 0.1 % fs	0.002 % fs	30 ms
Precision Temperature	Pt 100	-2 ... +32 °C	± 0.01 °C	0.001 °C	150 ms at 1 m/s
Precision Conductivity	7-pole cell	0 ... 6 mS/cm 0 ... 60 mS/cm	± 0.005 mS/cm ± 0.010 mS/cm	0.0001 mS/cm 0.001 mS/cm	50 ms at 1m/s

Optional sensors:
Oxygen, light scattering, fluorescence



The data acquisition and evaluation software run under Windows 95/98/2000/XP. Graphical quick-look functions are integrated into the data acquisition program. The data evaluation software has the structure of a tool-box. It consists of a management program and modules to perform various steps of computations. A hierarchy of different levels of data validation, parameter computation and data visualisation can be carried out. Parameters like dissipation rate, Cox number, Thorpe scale and others can be calculated, which give information on occurrence and intensity of micro-scale stratification, mixing, and transport processes.

For near to surface measurements, e.g. to carry out surface flux investigations, the MSS 90 can be operated as an uprising instrument. In this case, it is balanced with a positive buoyancy.

Depending on local conditions, the profiler can be operated via an under-water winch, a ship winch or directly from shore with a guide pulley at the bottom. A buoyancy body prevents the transmission of cable generated vibrations to the profiler.