



Ocean & River Instruments Products Guide

Vol.4

Ocean & River Instruments Division



JFE Advantech Co., Ltd.

Water Sampler *Pre-programmed autonomous water sampler*

AWS1000



The system has a built-in pressure sensor, but it was also designed to be equipped with our CTDs from ASTD series. This feature allows for more options of sensors to be used and simplifies upgrades.

- 10 water sampling bottles (2 L and/or 5 L)
- Lightweight and compact frame
- Suitable for small vessels
- Easily detachable bottles and CTD

Model name	AWS1000	
Water sampling	1 or 2 bottles simultaneously	
Minimum depth	1 m	
Bottle volume	2 L	5 L
Weight (*)	Approx. 65 kg in air	Approx. 75 kg in air
Number of bottles	10	
Sampling mode	Depth trigger or Time trigger	
Depth Rating	1000 m depth equivalent	
Minimum interval	Depth trigger : 0.5 m Time trigger : 1 s for 1 bottle 2 s for 2 bottles	

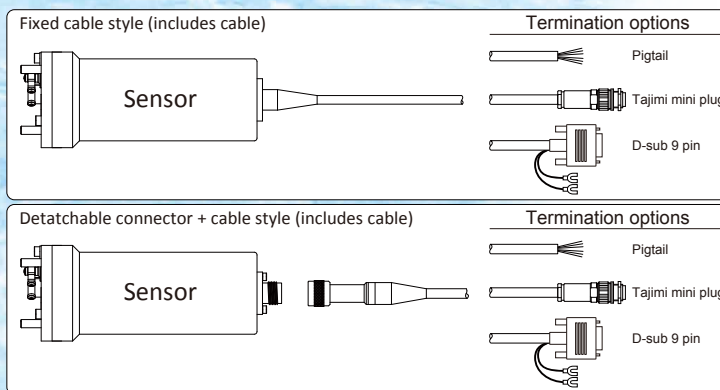
(*) weight considering 10 empty units of 5 L bottles.

Real-time data *For easy integration onto platforms*

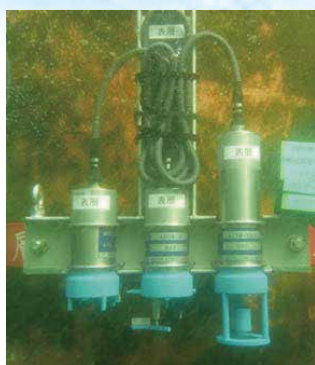
The digital output wired sensors are available, and the model name termination CAR and CAD indicates RS-232C or RS-485 communication protocol, respectively.

Features

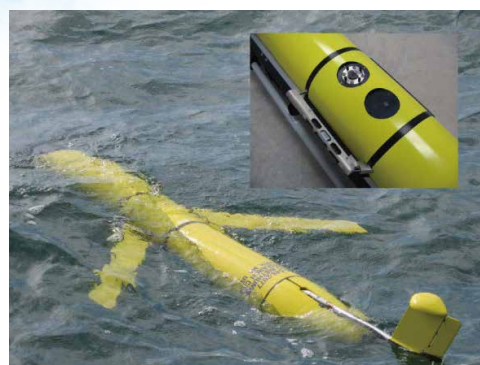
- RS-232C or RS-485 communication
- Operating with DC 12 V
- Cable with D-sub 9pin connector
- Anti-biofouling wiper



ACTW digital output version with D-sub connector



ACTW and ACLW2 on a light buoy (Ise Bay, Japan).



ACTW integrated on the VENUS platform (Courtesy of VENUS project)

RINKO series

Optical DO sensors



DO meter w/ wiper
RINKO W
AROW2-USB/CAR/CAD
Durable



DO logger
RINKO I/ID
ARO-USB
ARO1-USB
Fast response



Digital output DO meter
RINKO II/II
ARO-CAR/CAD
ARO1-CAR/CAD
Fast response



Analog output DO meter
RINKO III
ARO-CAV
Fast response

Features

- Fast response DO sensor: RINKO I/ID, II/II, III (90%: < 1 s, at 25 °C in air)
- Increased durability DO sensor: RINKO W (90%: < 30 s, at 25 °C in air)
- Anti-biofouling wiper: RINKO W

Parameter	Temperature	DO	Depth (for ID and IID)
Range	-3 to 45 °C	Air saturation: 0 to 200%	0 to 500 m ⁽¹⁾
Accuracy ⁽²⁾	±0.02 °C	±2% FS	±0.3% FS
Power consumption	-CAR/CAD/CAV: < 35 mA (at 12 VDC) ⁽²⁾		

⁽¹⁾ Depth sensor range option: 50 m, 100 m, 200 m, 500 m
⁽²⁾ AROW2-CAR/CAD: < 40 mA (at 12 VDC)
⁽³⁾ at 25 °C, typical



Fast optical DO sensor for microscale measurements

RINKO EC
ARO-EC

- Eddy covariance measurements of temperature and DO
- Analog output (0 - 5 V)
- Easy integration
- Easy user DO sensing foil replacement

Parameter	Temperature	DO
Range	-3 to 45 °C	Air saturation: 0 to 200%
Repeatability	—	Air saturation: ±1%
Accuracy	±0.02 °C	—
Response time	90%: < 0.5 s (from air to water at 25 °C)	
Power consumption	< 20 mA (at 12 VDC)	

Portable optical DO meter

RINKO PR
ARO-PR

- Data sample directly from BOD bottles
- Accurate calibration using certified traceable gases
- Less calibration cycles



Photo courtesy of JAMSTEC

Fast optical DO sensor for integration

RINKO FT
ARO-FT
AROD-FT

- Long-term stability
- Accurate calibration using certified traceable gases
- Easy installation for various platforms
- Deep sea model available: AROD-FT (6700 m, MCBH connector)



ARO-FT integrated on MRV S3A float



ARO-FT

AROD-FT

Parameter	Temperature	DO
Range	-3 to 45 °C	0 to 625 µmol L ⁻¹
Initial accuracy	±0.01 °C	±1% MV or ±1.5 µmol L ⁻¹
Repeatability ⁽¹⁾	±0.002 °C	±0.1% FS
Response time ⁽¹⁾	99%: < 2 s	99%: < 7 s (from air to water at 25 °C)

⁽¹⁾ at 25 °C, typical

Parameter	Temperature	DO
Range	-3 to 45 °C	0 to 425 µmol L ⁻¹
Initial accuracy	±0.01 °C	±2% MV or ±2.0 µmol L ⁻¹
Response time ⁽¹⁾	63%: < 1 s (at 25 °C in water)	
Power consumption	< 30 mA (at 12 VDC)	

⁽¹⁾ at 25 °C, typical

RINKO-Profiler

Multi-parameter CTD
with fast optical DO sensor

The RINKO-Profiler is a CTD with a fast-responding DO sensor as standard configuration. Fast responsivity reduces observation time, while achieving a detailed DO vertical distribution. The 1 GB internal memory allows for recording up to 1000 profiles (of 100 m depth at 0.1 m of sampling rate) and the internal rechargeable lithium battery allows continuous use up to 10 h.



Parameter	Range	Accuracy	Response time
Temperature	-3 to 45 °C	±0.01 °C	0.2 s
DO	Air saturation: 0 to 200%	±2% FS	0.4 s ⁽²⁾
Depth	0 to 600 m ⁽¹⁾	±0.3% FS	0.2 s
Conductivity	0.5 to 70 mS cm ⁻¹	±0.01 mS cm ⁻¹	0.2 s
Salinity	2 to 42	—	0.2 s
Turbidity	0 to 1,000 FTU	±2% MV or ±0.3 FTU	0.2 s
Chlorophyll	0 to 400 ppb	±1% FS	0.2 s

⁽¹⁾ Standard depth range. 1000m depth version is available upon request.

⁽²⁾ 63% response time (at 25°C in air)

	Temperature	DO	Depth	Conductivity	Salinity	Turbidity	Chlorophyll
ASTD100/150	●		●	●	●		
ASTD101/151	●		●	●	●	●	●
ASTD102/152	●	●	●	●	●	●	●
ASTD103/153	●	●	●	●	●	●	●



Available processing unit

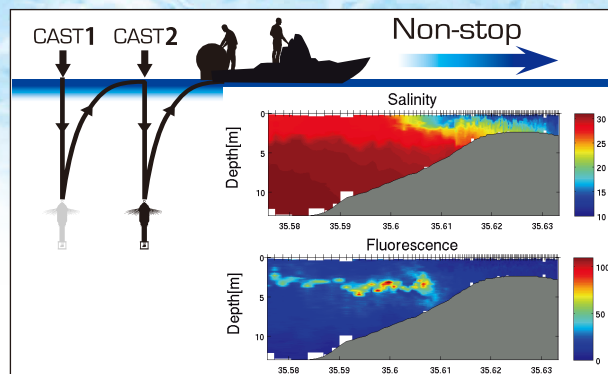


Interface Unit

RINKO-Profiler variations

YODA Profiler

The YODA profiler (“Yoing” Ocean Data Acquisition Profiler) is a “tow-yo” instrument to profile the water column with high spatial resolution from small boats without occupying much space. The brush at the top of the instrument allows for a stabilizing effect on the free-fall sinking speed, which is approximately constant at 0.2 m s⁻¹.



Masunaga and Yamazaki (2014): A new tow-yo instrument to observe high-resolution coastal phenomena. Journal of Marine Systems, 129, 425 - 436.

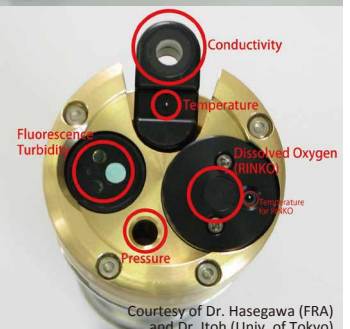
Winch system



Courtesy of Prof. Yamazaki (TUMSAT)

Customized version

Specially designed for off-shore tow-yo winch system.



Courtesy of Dr. Hasegawa (FRA) and Dr. Itoh (Univ. of Tokyo)

AAQ-RINKO

Realtime water quality profiler
with fast optical DO sensor

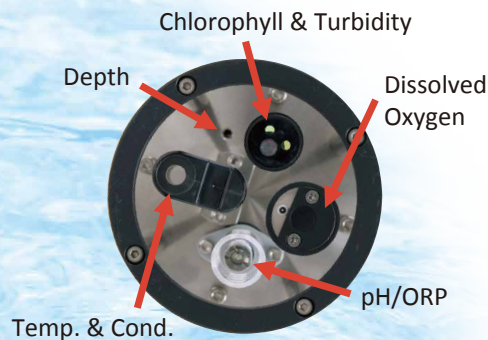
Realtime water quality profiler AAQ-RINKO is equipped with a fast optical DO sensor RINKO. AAQ-RINKO makes vertical measurements possible with a profiling speed of 0.5 m/s.

Parameter	Range	Accuracy	Response time
Temperature	-3 to 45°C	±0.01°C	0.2 s
DO	Air saturation: 0 to 200%	±2% FS	0.4 s ⁽¹⁾
Depth	0 to 100 m	±0.3% FS	0.2 s
Conductivity	0.5 to 70 mS cm ⁻¹	±0.01 mS cm ⁻¹	0.2 s
Salinity	2 to 42	—	0.2 s
Turbidity	0 to 1000 FTU	±2% MV or ±0.3 FTU	0.2 s
Chlorophyll	0 to 400 ppb	±1% FS	0.2 s
PAR	0 to 5000 μmol m ⁻² s ⁻¹	±4% FS	0.2 s
pH	0 to 14	±0.2 pH	10 s
ORP	0 to ±1000 mV	—	10 s

⁽¹⁾ 63% response time (25°C at 1 atm in air)



Underwater cable specifications	
Material	Polyurethane (reinforced with 5-core Kevlar® fiber)
Length	50 m or 100 m
Outside diameter	6.1 mm
Tensile strength	30 kg



	Temperature	DO	Depth	Conductivity	Salinity	Turbidity	Chlorophyll	PAR	pH	ORP
AAQ170	●	●	●	●	●	●	●			
AAQ171	●	●	●	●	●	●	●		●	
AAQ172	●	●	●	●	●	●	●		●	●
AAQ175	●	●	●	●	●	●	●		●	
AAQ176	●	●	●	●	●	●	●		●	●
AAQ177	●	●	●	●	●	●	●		●	●

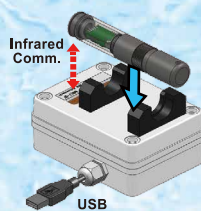
Available processing units



DEFI series

Pocket-size data loggers

- Small and light weight
- Infrared communication
- Flashing LED light for activation check
- Powered by AA or AAA batteries



DEFI2-IF
Interface



DEFI2-L
PAR

Parameter	PAR
Range	0 to 5000 μmol m ⁻² s ⁻¹
Accuracy	±4% FS



DEFI2-CT
Conductivity and Temperature

Parameter	Conductivity	Temperature
Range	2 to 70 mS cm ⁻¹	-3 to 45 °C
Accuracy	±0.05 mS cm ⁻¹	±0.05 °C
Response time ⁽¹⁾	1 s (63%)	10 s (63%)

⁽¹⁾ at 25 °C, typical



DEFI2-D /DHG
Pressure

Parameter	Pressure
Range	0 to 5 MPa
Accuracy	±1% FS ⁽¹⁾
Response time ⁽²⁾	0.05 s (90%)

⁽¹⁾ DEFI2-DHG: ±0.3% FS
⁽²⁾ at 25 °C, typical



DEFI2-T
Temperature

Parameter	Temperature
Range	-3 to 45 °C
Accuracy	±0.01 °C
Response time ⁽¹⁾	12 s (90%)

⁽¹⁾ at 25 °C, typical

INFINITY series

Compact and robust sensors

The INFINITY series has compact and robust sensors controlled by a high-performance 16-bit MCU and allows you to obtain reliable data.



Conductivity & temperature

INFINITY-CT/CTW

ACTW-USB/CAR/CAD
A7CT-USB/CAR/CAD
A7CT2-USB/CAR/CAD

- 7-electrode conductivity sensor
- Compact design
- Wiper to prevent bio-fouling (ACTW)

Parameter	Conductivity	Temperature
Range	0.5 to 70 mS cm ⁻¹	-3 to 45 °C
Accuracy	±0.01 mS cm ⁻¹ (1)	±0.01 °C (2)
Power consumption	-CAR/CAD: < 50 mA (at 12 VDC)	

(1) A7CT2-USB: ±0.05 mS cm⁻¹

(2) A7CT2-USB: ±0.05 °C



Chlorophyll & turbidity

INFINITY-CLW

ACLW2-USB/CAR/CAD

- Suitable for coastal environmental monitoring
- Less influence from particle color and CDOM
- Wiper to prevent bio-fouling

Parameter	Chlorophyll	Turbidity	Temperature
Range	0 to 400 ppb	0 to 1000 FTU	-3 to 45 °C
Accuracy	±1% FS	±2% MV or ±0.3 FTU	±0.02 °C
Power consumption	-CAR/CAD: < 30 mA (at 12 VDC)		



Dual range turbidity

INFINITY-Turbi

ATU75W2-USB/CAR/CAD

- Medium and high density turbidity
- Suitable for long-term measurement
- Wiper to prevent bio-fouling

Parameter	Mid concentration turbidity	High concentration turbidity	Depth	Temperature
Range	0 to 1000 FTU	0 to 100000 ppm	0 to 25 m (1)	-3 to 45 °C
Accuracy	±2% MV or ±0.3 FTU	±5% MV or ±10 ppm	±0.14% FS	±0.02 °C
Power consumption	-CAR/CAD: < 40 mA (at 12 VDC)			

(1) Depth sensor range option: 40 m, 100 m, 200 m



Turbidity and temperature sensor for the deep ocean

ATUD-USB

- Long-term deployment in deep water
- Compact design
- 6000 m depth rating

Parameter	Turbidity	Temperature
Range	0 to 1000 FTU	-3 to 45 °C
Accuracy	±2% MV or ±0.3 FTU	±0.02 °C
Power consumption	approx. 110 mA	



Wave height

INFINITY-WH

AWH-USB/CAR/CAD

- High sampling rate up to 10 Hz
- Wave analysis software (optional)

Parameter	Depth
Range	0 to 25 m
Accuracy	±0.14% FS
Power consumption	-CAR/CAD: < 20 mA (at 12 VDC)



Multi-frequency fluorescence

INFINITY-ME

MFLW-USB/CAD

- 9 wavelength LED excitation
- Algae classification
- Wiper to prevent bio-fouling

Parameter	Excitation spectra	Turbidity	Temperature	Depth
Range	0 to 400 ppb	0 to 1000 FTU	-3 to 45°C	0 to 500 m (1)
Accuracy	±2% FS	±5%	±0.02°C	±0.3% FS
Power consumption	-CAD: Approx. 900 mW			

(1) Depth sensor range option: 50 m, 100 m, 500 m (500m is only available for -USB)

Electromagnetic Current meters

Handy and reliable
single point current measurements



EM current meter INFINITY-EM

AEM-USB/CAR/CAD

- Compact design
- Mooring line attachable



EM current meter INFINITY-Deep

AEMD-USB

- 6000 m depth rated
- No particle required for measurements

Parameter	Velocity	Direction	Temperature
Range	0 to ± 500 cm s ⁻¹	0 to 360 °	-3 to 45 °C
Accuracy	$\pm 2\%$ MV or ± 1 cm s ⁻¹	± 2 °	± 0.02 °C
Power consumption	-CAR/CAD: < 50 mA (at 12 VDC)		

Parameter	Velocity	Direction	Temperature	Pressure	Tilt
Range	0 to ± 100 cm s ⁻¹	0 to 360 °	-3 to 45 °C	0 to 60 MPa	0 to ± 30 °
Accuracy	$\pm 2\%$ MV or ± 1 cm s ⁻¹	± 2 °	± 0.02 °C	$\pm 0.3\%$ FS	± 1 °



Single axis hand-held EM

AEM1-DA

- Robust design
- No moving mechanical parts
- Real time data reading

Parameter	Velocity
Range	0 to 500 cm s ⁻¹
Accuracy	$\pm 2\%$ MV or ± 0.5 cm s ⁻¹
Power	C size alkaline battery



2-axis hand-held EM

AEM213-D

- No moving mechanical parts
- Depth and temperature sensor
- Real time data reading

Parameter	Velocity	Direction	Temperature	Depth
Range	0 to ± 250 cm s ⁻¹	0 to 360 °	-3 to 40 °C	0 to 50 m
Accuracy	$\pm 2\%$ MV or ± 1 cm s ⁻¹	± 2 °	± 0.02 °C	$\pm 0.3\%$ FS
Power	C size alkaline battery or 12 VDC			

ACM2-RS
2-axis



ACM3-RS
3-axis

Laboratory electromagnetic current meter

ACM series

- High sampling rate up to 70Hz
- Connect up to 4 sensors
- Analog and digital output

Parameter	Velocity
Range	± 250 cm s ⁻¹
Accuracy	$\pm 2\%$ MV or ± 0.5 cm s ⁻¹
Sampling rate	15 to 70 Hz ⁽¹⁾

⁽¹⁾ ACM3-RS: 15 to 60 Hz



ACM-4IF Interface unit



OEM Single Axis Electromagnetic Speed Sensor

AEM1-G

- Direct measurement of vehicle axial speed
- Digital (RS-232C) and analog (0 to 5V) output
- Easy integration on various underwater vehicles

Parameter	Velocity
Range	0 to 500 cm s ⁻¹
Accuracy	$\pm 2\%$ MV or ± 0.5 cm s ⁻¹
Communication	RS-232C
Operating voltage	DC 4.75 to 5.25 V
Power consumption	85 to 95mA





Ocean & River Instruments Division



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JFE

EPSA-CLW

Chlorophyll and Turbidity Logger with Wiper



ACLW-WFX

ACLW-WFX-L

JFE Advantech Co., Ltd.

Brochure Download



EPSA-CLW

Model: ACLW-WFX / ACLW-WFX-L

■ Description

EPSA-CLW is an autonomously deployable data logger for long-term chlorophyll and turbidity measurements. The light sources (LEDs) of chlorophyll and turbidity sensors are highly stable, minimizing the change over time. The instrument has a mechanical wiper that periodically sweeps the optical window to prevent biological growth on it. The turbidity sensor has a good correlation with SS (Suspended Solid) over the range. EPSA-CLW provides highly accurate and long-term stable chlorophyll and turbidity data in oceans, rivers and freshwater.

■ Sensor specifications

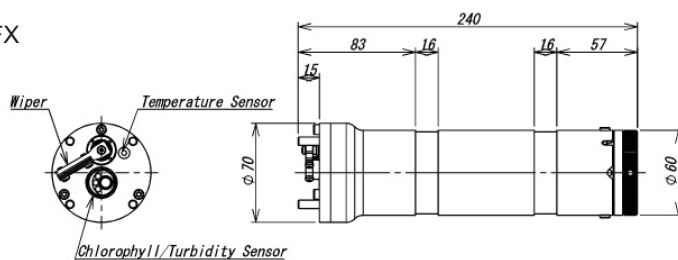
Parameter	Chlorophyll	Turbidity	Temperature
Principle	Fluorescent measurement	IR Backscattering	Thermistor
Range	0 to 400 ppb (Uranine reference)	0 to 1,000 FTU (Formazin reference)	-3 to 45 °C
Resolution	0.01 ppb	0.03 FTU	0.001 °C
Accuracy	Non-linearity ±1 % FS (0 to 200 ppb)	±0.3 FTU or ±2 %	±0.02 °C (3 to 31 °C)

■ Instrument specifications

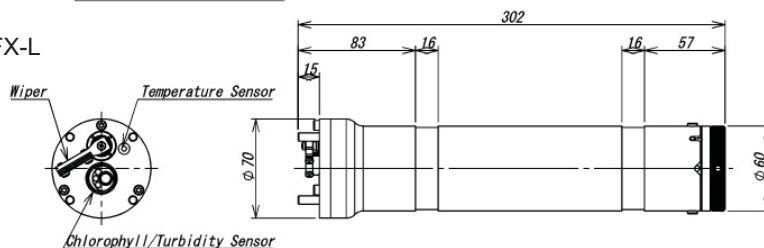
Model	ACLW-WFX	ACLW-WFX-L
Memory medium	1 GB built-in Flash memory	
Maximum data recordable	Approx. 15 million readings	
Measuring mode	Continuous, Burst	
Measuring interval	0.1 to 1 sec. (0.1 sec. increment) / 1 to 600 sec. (1 sec. increment)	
Burst sampling interval	1 to 1,440 min. (1 min. increment)	
Number of samples	1 to 18,000	
Power source	1.5 V AA alkaline battery / 1.5 V or 3.6 V (SAFT) AA lithium battery	
Number of batteries	Max. 6	Max. 12
Communication	USB 2.0 (ver. 1.1 compatible) / Connector: USB-C	
Housing material	Titanium (grade 2)	
Dimensions	Φ70 mm x 240 mm	Φ70 mm x 302 mm
Weight	Approx. 1.4 kg in air, 0.8 kg in water	Approx. 1.8 kg in air, 1.0 kg in water
Depth rating	200 m equivalent	

■ Drawing

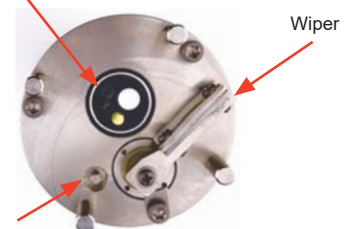
ACLW-WFX



ACLW-WFX-L



Chlorophyll/Turbidity sensor



Temperature sensor

Bio-foul inside the cell is removed by the wiper



※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice.



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EPSA-CTW

Conductivity and Temperature Logger with Wiper



ACTW-WFX

ACTW-WFX-L

JFE Advantech Co., Ltd.

Brochure Download



EPSA-CTW

Model: ACTW-WFX / ACTW-WFX-L

■ Description

EPSA-CTW is an accurate conductivity and temperature meter making use of 7-electrode sensor with an enhanced double wiper to avoid bio-fouling. This 7-electrode generates an electric current only inside of the conductivity cell, minimizing external influences improving data quality. Thus, precise salinity measurements are possible under bio-foul forming conditions. The compact design is suitable to be deployed/integrated with various sites/platforms.

■ Sensor specifications

Parameter	Temperature	Conductivity
Principle	Thermistor	7-electrode
Range	-3 to 45 °C	0.5 to 70 mS cm ⁻¹ *
Resolution	0.001 °C	0.001 mS cm ⁻¹
Accuracy	±0.01 °C (0 to 35 °C)	±0.01 mS cm ⁻¹ (28 to 65 mS cm ⁻¹)

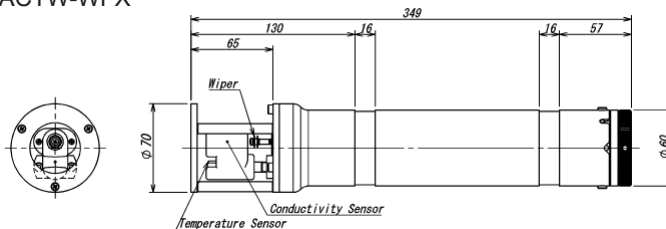
* Please contact us for fresh water conductivity measurements.

■ Instrument specifications

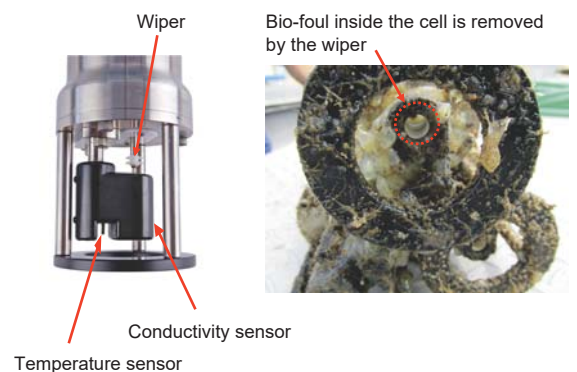
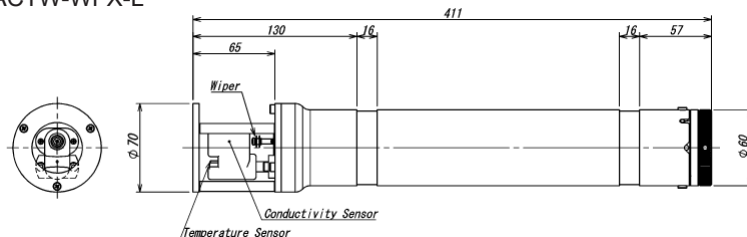
Model	ACTW-WFX	ACTW-WFX-L
Memory medium	1 GB built-in Flash memory	
Maximum data recordable	Approx. 15 million readings	
Measuring mode	Continuous, Burst	
Measuring interval	0.1 to 1 sec. (0.1 sec. increment) / 1 to 600 sec. (1 sec. increment)	
Burst sampling interval	1 to 1,440 min. (1 min. increment)	
Number of samples	1 to 18,000	
Power source	1.5 V AA alkaline battery / 1.5 V or 3.6 V (SAFT) AA lithium battery	
Number of batteries	Max. 6	Max. 12
Communication	USB 2.0 (ver. 1.1 compatible) / Connector: USB-C	
Housing material	Titanium (grade 2)	
Dimensions	Φ70 mm x 349 mm	Φ70 mm x 411 mm
Weight	Approx. 1.7 kg in air, 0.9 kg in water	Approx. 2.2 kg in air, 1.2 kg in water
Depth rating	500 m equivalent	

■ Drawing

ACTW-WFX



ACTW-WFX-L



※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice.



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JFE

EPSA-RINKO

Optical Dissolved Oxygen Logger with Wiper



AROW-WFX

AROW-WFX-L

JFE Advantech Co., Ltd.

Brochure Download



EPSA-RINKO

Model: AROW-WFX / AROW-WFX-L

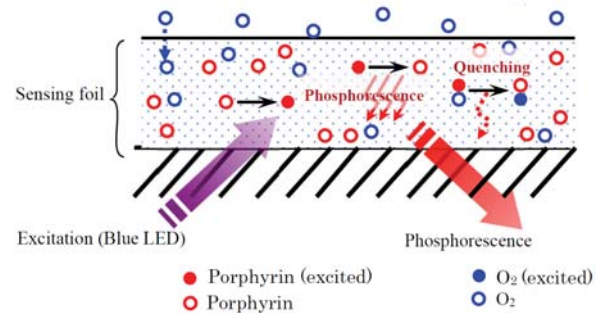
■ Description

EPSA-RINKO is an autonomously deployable data logger for long-term DO measurements. In order to protect the sensing foil against accumulating bio-fouling, the instrument has a mechanical wiper to sweep the optical window. The sensor is coated with photostimulable phosphor (PSP) on the outside of the pressure-resistant acrylic optical window, measuring the phase difference between phosphorescent time lengths. The excitation blue LED pulse generates a red phosphorescence pulse, which in turn has an inverse correlation with the oxygen partial pressure in the water (DO concentration). Phosphorescent time lengths under oxygen-free conditions are long. However, under high DO concentration conditions, the time length shortens. Since the method does not consume oxygen, there is no need for stirring.

■ Sensor specifications

Parameter	DO	Temperature
Principle	Phosphorescence (Optical)	Thermistor
Range	0 to 200 %	-3 to 45 °C
Resolution	0.01 %*	0.001 °C
Accuracy	Non-linearity ±2 % FS	±0.02 °C (3 to 31 °C)

*Standard value near 100% saturation

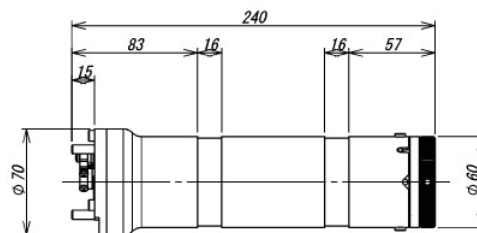
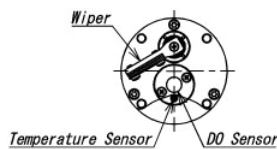


■ Instrument specifications

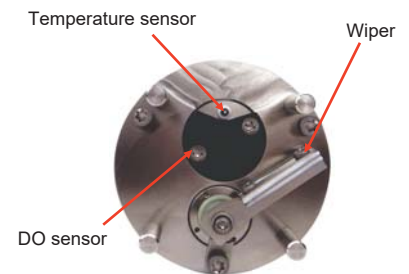
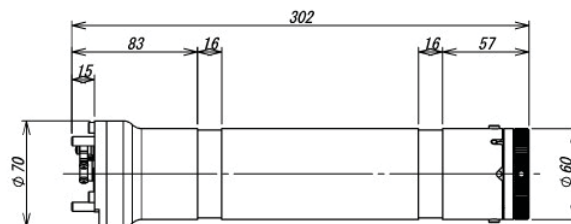
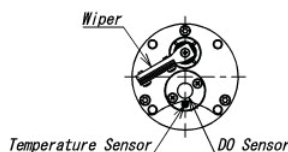
Model	AROW-WFX	AROW-WFX-L
Memory medium	1 GB built-in Flash memory	
Maximum data recordable	Approx. 15 million readings	
Measuring mode	Continuous, Burst	
Measuring interval	0.5 sec. or 1 to 600 sec. (1 sec. increment)	
Burst sampling interval	1 to 1,440 min. (1 min. increment)	
Number of samples	1 to 18,000	
Power source	1.5 V AA alkaline battery / 1.5 V or 3.6 V (SAFT) AA lithium battery	
Number of batteries	Max. 6	Max. 12
Communication	USB 2.0 (ver. 1.1 compatible) / Connector: USB-C	
Housing material	Titanium (grade 2)	
Dimensions	Φ70 mm x 240 mm	Φ70 mm x 302 mm
Weight	Approx. 1.4 kg in air, 0.8 kg in water	Approx. 1.8 kg in air, 1.0 kg in water
Depth rating	200 m equivalent	

■ Drawing

AROW-WFX



AROW-WFX-L



※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice.



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EPSA-Turbi

Wide Range Turbidity Logger with Wiper



ATU75W-WFX



ATU75W-WFX-L

JFE Advantech Co., Ltd.

Brochure Download



EPSA-Turbi

Model: ATU75W-WFX / ATU75W-WFX-L

■ Description

EPSA-Turbi is a reliable sensor for long time monitoring of extremely turbid waters. The dual sensors enables both medium (0 to 1,000 FTU) and high (0 to 100,000 ppm) turbidity measurements. With its mechanical wiper, the sensor surface is kept clean throughout the long-term observation period. This instrument is equipped with temperature and pressure sensor as standard set-up which is useful on focusing on tidal events and surrounding water masses.

■ Sensor specifications

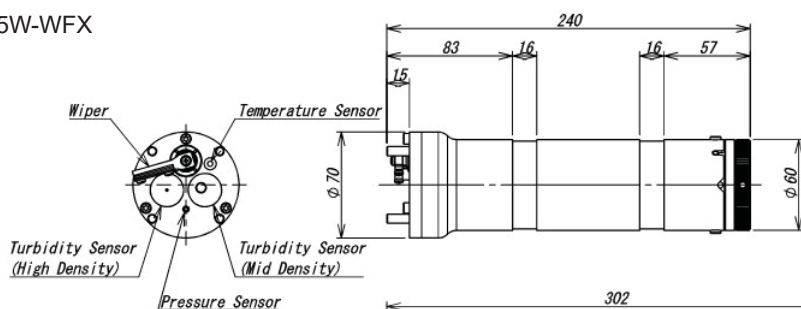
Parameter	Medium density turbidity sensor	High density turbidity sensor	Pressure	Temperature
Principle	IR Backscattering	IR Backscattering (Optical fiber)	Semiconductor	Thermistor
Range	0 to 1,000 FTU (Formazin reference)	0 to 100,000 ppm (Kaolin reference)	0 to 0.5 MPa	-3 to 45 °C
Resolution	0.03 FTU	2 ppm	0.00001 MPa	0.001 °C
Accuracy	±0.3 FTU or ±2 %	±10 ppm or ±5 %	Non-linearity ±0.05 % FS ±0.1 % FS (Repeatability)	±0.02 °C (3 to 31 °C)

■ Instrument specifications

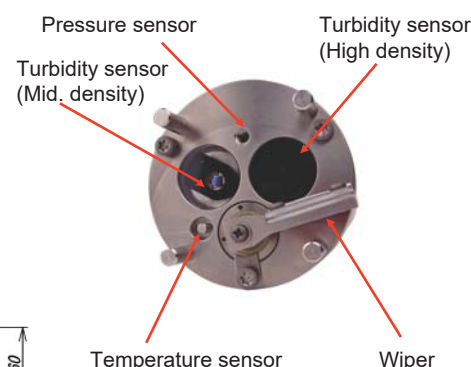
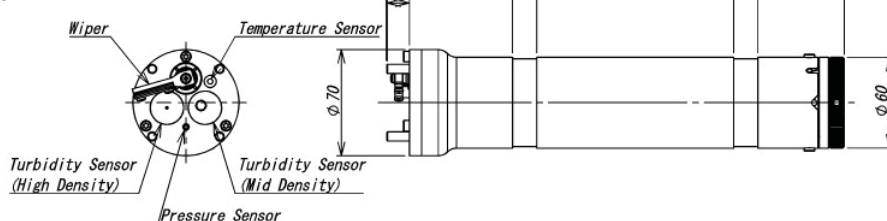
Model	ATU75W-WFX	ATU75W-WFX-L
Memory medium	1 GB built-in Flash memory	
Maximum data recordable	Approx. 15 million readings	
Measuring mode	Continuous, Burst	
Measuring interval	0.1 to 1 sec. (0.1 sec. increment) / 1 to 600 sec. (1 sec. increment)	
Burst sampling interval	1 to 1,440 min. (1 min. increment)	
Number of samples	1 to 18,000	
Power source	1.5 V AA alkaline battery / 1.5 V or 3.6 V (SAFT) AA lithium battery	
Number of batteries	Max. 6	Max. 12
Communication	USB 2.0 (ver. 1.1 compatible) / Connector: USB-C	
Housing material	Titanium (grade 2)	
Dimensions	Φ70 mm x 240 mm	Φ70 mm x 302 mm
Weight	Approx. 1.4 kg in air, 0.8 kg in water	Approx. 1.8 kg in air, 1.0 kg in water
Depth rating	50 m equivalent	

■ Drawing

ATU75W-WFX



ATU75W-WFX-L



※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice.



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Harmful Plankton Detector

HAI sensor



Harmful Algal Indication sensor



JFE Advantech Co., Ltd.

HAI sensor - Harmful Plankton Detector

Model: AHl-CAD

■ Description

The HAI sensor (Harmful Algal Indication sensor) is designed to identify two phytoplankton species that are well-known to cause harmful blooms: *Karenia mikimotoi* and *Chattonella antiqua*. The instrument takes advantage of the Fluorescence spectral Shift Index (FSI)* of these two species that is relatively high when compared to other species.

*Fluorescence spectral Shift Index (FSI) is the ratio of fluorescence intensity at 690 nm to that at 670 nm in wavelength.

■ Sensor Specifications

Sensor	Chlorophyll	Temperature	FSI	Pressure
Measurement range	0 to 400 ppb	-3 to 45 °C	-	0 to 50 dbar
Accuracy	± 1% FS (0 to 200 ppb) ⁽¹⁾	±0.02 °C (3 to 31 °C)	±0.05 (0 to 200 ppb) ⁽²⁾	±0.3% FS (Repeatability) ±0.1% FS (Non-linearity)

⁽¹⁾ Non-linear, calibration using Fluorescein Sodium Salt (Uranine)

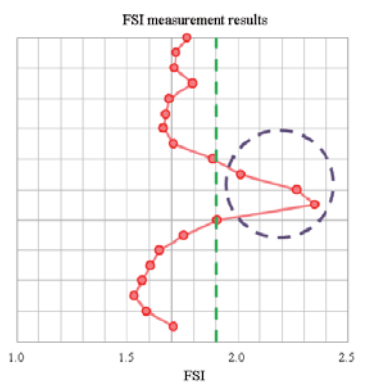
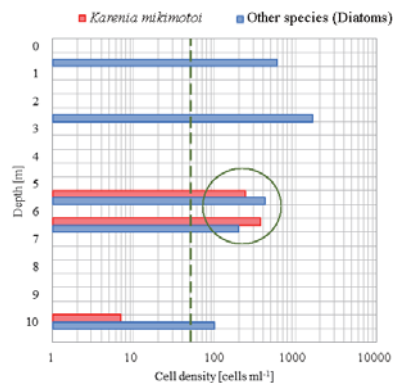
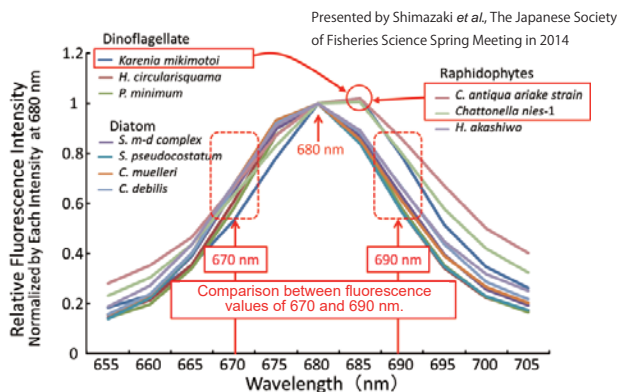
⁽²⁾ Repeatability using Fluorescein Sodium Salt (Uranine)

■ Instrument Specifications

Communication	RS-485 (through Hand-held unit)
Weight	0.8 kg (in air and excluding cable)
Depth rating	50 m depth equivalent
Dimensions	Φ70 mm × 176 mm (excluding cable)
Power consumption	less than 120 mA (using DC12 V)
Materials	Titanium (grade 2)
Cable length	30 m (maximum of 50 m)

■ Hand-held unit

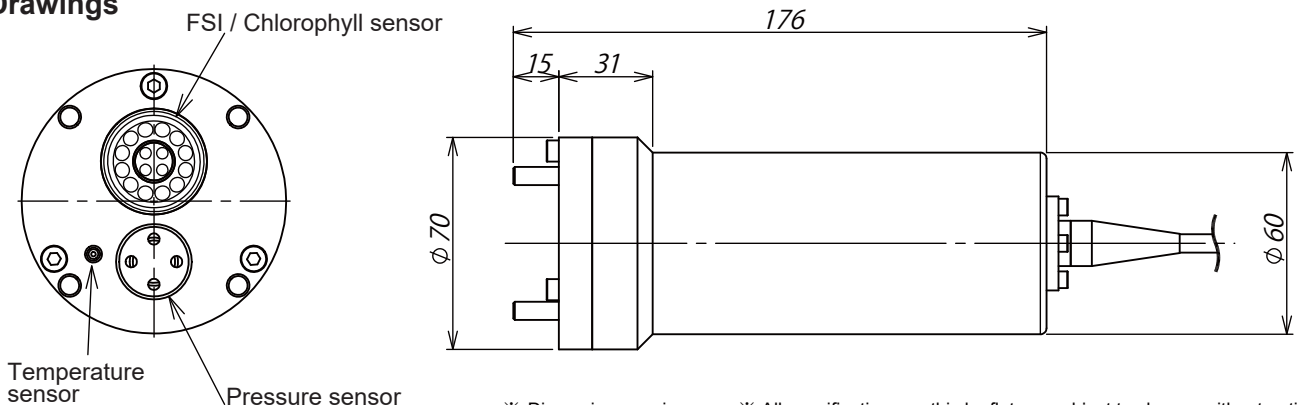
Screen	4 × 20-line LCD
Display information	Chlorophyll, depth, temperature, FSI, time and battery voltage
Sampling rate	Continuous (at 0.1, 0.2, 0.5, 1, 2, 5, 10 s)
Dimensions	85 × 115 × 255 mm
Memory	512 MB CF card
Power source	8 AA alkaline batteries, 100 to 240 V AC, 12 V DC



The left panel shows relative fluorescence intensity for various phytoplankton species. The mid panel shows an example of species composition estimated by water sampling and microscope analysis: a bloom of *Karenia mikimotoi* in the mid water column (green circle), where the dark green dashed line denotes 50 cells/ml threshold. The right panel shows the FSI estimated using HAI sensor for the same period. The light green dashed line notes the FSI threshold of approximately 1.9 and the purple dashed circle denotes the FSI estimated when concentration of *Karenia mikimotoi* surpasses 50 cells/ml indicating a possible harmful algal bloom is on its way.

**Depending on conditions such as density of other dominant species, the fluorescence spectral characteristics may not be detected well due to the influence of other species.

■ Drawings



※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice

UV Anti-Biofouling UV-C LED

AUL-BAT / CA



Only wiper

Wiper+UV-C

Overview

The UV-C LED is ultraviolet light (UV-C) irradiation equipment that can be attached to INFINITY-EPSA and INFINITY series (cable type). One of the major drawbacks of sensors in natural water is occurrence of biofouling – a phenomenon consisting of aggregation and adherence of organisms onto the sensing parts. This can negatively affect measurement accuracy.

UV-C is a non-toxic biofouling control for oceanographic sensors which is very effective to eliminate biofouling. Application of UV-C together with a mechanical wiper will not only keep sensors free of biofouling for a longer time, but it will also protect sensors from being covered by inorganics during long term observations.

Important Note

- 1) The UV-C LEDs can be only used with sensors that are treated against UV light degradation. If you wish to add UV-C LEDs to your existing instruments, please contact us in advance.
- 2) Do not look at the UV-C lighting part directly. Also, do not light the irradiated UV-C to your skin.

UV-C light Specifications

Peak wavelength	265 nm
Current consumption	Approx. 2 W (when irradiating)
Dimension	φ28 mm × 66 mm
Risk group	3 (IEC62471)
Depth rating	Equivalent to 200 m depth
Irradiation duty ^{*1}	Approx. 2 % (standard setting)

*1 Pulsed light is irradiated continuously at regular intervals. The irradiation interval is set at 2 % as default. However, the setting can be changed at our factory if requested.

Battery unit Specifications

Dimension	φ45 mm × 250 mm
Weight	Approx. 0.58 kg (excluding batteries)
Battery	3 D-cell lithium batteries (SAFT: LS33600STD)
Battery life ^{*2}	Approx. 6 months
Depth rating	Equivalent to 200 m depth

*2 Irradiation duty 2 % (at 25 °C at 1 atm in air)



After 1 month

After 3 months

After 1 month

After 3 months

Compatible Models and Attachment Examples

Compatible models

- ACLW-WFU/WFUX
- ACLW-WFU/WFUX-L
- AROW-WFU/WFUX
- AROW-WFU/WFUX-L

UV-C light
+
Battery unit

Compatible models

- ACTW-WF/WFX
- ACTW-WF/WFX-L

2×UV-C lights
+
Battery unit
+
Junction box

Compatible models

- ACTW-WF/WFX
- ACTW-WF/WFX-L

2×UV-C lights
+
2×Battery units

Compatible models

- ACLW2-CARU/CADU
- AROW2-CARU/CADU

UV-C light
+
Junction box

Compatible models

- ACLW2-CARU/CADU
- AROW2-CARU/CADU

UV-C light
+
20 m pigtailed cable

Compatible models

- ACTW-CAR/CAD

2×UV-C lights
+
Junction box

Compatible models

- ACTW-CAR/CAD

2×UV-C lights
+
2×20 m pigtailed cables

Note: The actual connector type and cable length may differ from the illustrations.

Yoing Ocean Data Acquisition Profiler

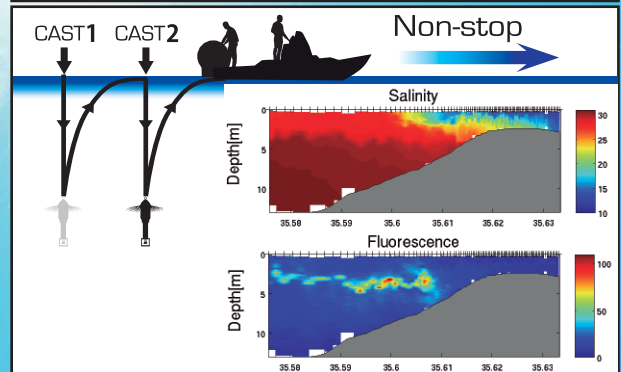
YODAPProfiler

ISO9001



JQA0950

Tow-yo CTD system for coastal monitoring



Masunaga, E., & Yamazaki, H. (2014). A new tow-yo instrument to observe high-resolution coastal phenomena. *Journal of Marine Systems*, 129, 425-436.

- Repetitive vertical CTD profiling during cruising
- Brush attachment for constant free-falling speed
- Built-in memory and rechargeable batteries
- Fast-response DO sensor (90%: less than 1 s in air)

YODAPProfiler developed by Prof. Hidekatsu Yamazaki
Tokyo University of Marine Science and Technology



JFE Advantech Co., Ltd.

YODAP Profiler



■ Description

The YODA profiler ("Yoing" Ocean Data Acquisition Profiler) is a "tow-yo" instrument to profile the water column with high spatial resolution from small boats without occupying much space. The instrument is provided with a deployment winch and sensors measuring conductivity, temperature, pressure, chlorophyll, turbidity and dissolved oxygen. The brush at the top of the instrument allows for a stabilizing effect on the free-fall sinking speed, which is approximately constant at 0.2 m/s. All data are stored internally and downloaded into a PC through a wet-connector and interface.

■ Sensor specification

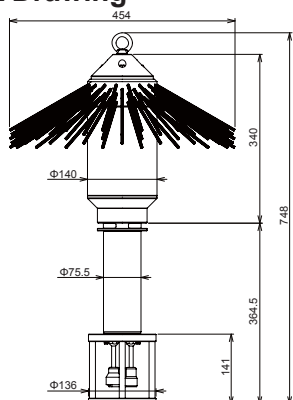
Parameters	Method	Range	Accuracy	Resolution	Response time *1
Depth	semiconductor	0 to 600m	±0.3%FS	0.01m	0.2s
Temperature	thermistor	-3 to 45°C	±0.01°C (0 to 35°C)	0.001°C	0.2s
Conductivity	7 electrodes	0.5 to 70mS cm ⁻¹	±0.01mS cm ⁻¹ (28 to 65mS cm ⁻¹)	0.001mS cm ⁻¹	0.2s
Salinity	PSS-78	2 to 42		0.001	0.2s
DO	phosphorescence	0 to 20mg L ⁻¹ (0 -200%)	±2%FS	0.001 to 0.004 mg L ⁻¹ (0.01 to 0.04%)	0.4s (in air, 1atm, 25°C)
Chlorophyll	fluorescence	0 to 400 ppb (Uranine)	±1%FS (0 drift ±0.1ppb)	0.01ppb	0.2s
Turbidity	backscatter	0 to 1000 FTU	±0.3 FTU or ±2%	0.03FTU	0.2s

*1. Response time: 63%

■ Instrument specification

Measurement mode	Depth trigger	Time trigger
Interval	0.1, 0.2, 0.5 and 1.0 m	0.1 to 1.0 s (0.1 s increment), 1 to 600 s (1 s increment)
Storage medium	1GB internal flash memory	
Recording capacity	1000 profiles (100m, 0.1m interval)	Approx. 8.000.000 samples
Power	Rechargeable lithium-ion battery (available 10-hour operation)	
Material	Titanium (grade 2)	
Dimensions	Φ454mm×748mm (including flange and floatation)	
Weight	6kg (in air)	
Depth rating	600m equivalent	
Accessories	Ballast for falling speed adjustment	

■ Drawing



■ Interface (ASTD-IF)

Power	AC 100 to 240V or 4 AA Alkaline batteries
Dimension	W170mm×H66mm×D169mm
Weight	Approx. 1kg



ASTD-IF



Winch system

■ Winch system

Components	Main body, controller and bobbin
Load	Max. 30kg
Rewind Speed	100 to 160r.p.m
Power	DC 24V
Material	Stainless steel
Weight	approx. 15kg
Dimension	W360mm×H(max.)480mm×D430mm
Rope	φ3mm×300m (polyethylene)

※ Dimensions are in mm. ※ All specifications on this leaflet are subject to change without notice.



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