Harmful Plankton Detector

HAI sensor

ISO9001
JQA-0950

Harmful **A**lgal **I**ndication sensor

- Quick assessment on Harmful Algal Bloom occurrence risk
- Compact, robust and portable
- Easy deployment and real time monitoring
- Continuous vertical data sampling at 10 Hz

JFE

JFE Advantech Co., Ltd.

HAI sensor - Harmful Plankton Detector

Model: AHI-CAD

■ Description

he 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 ration 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)

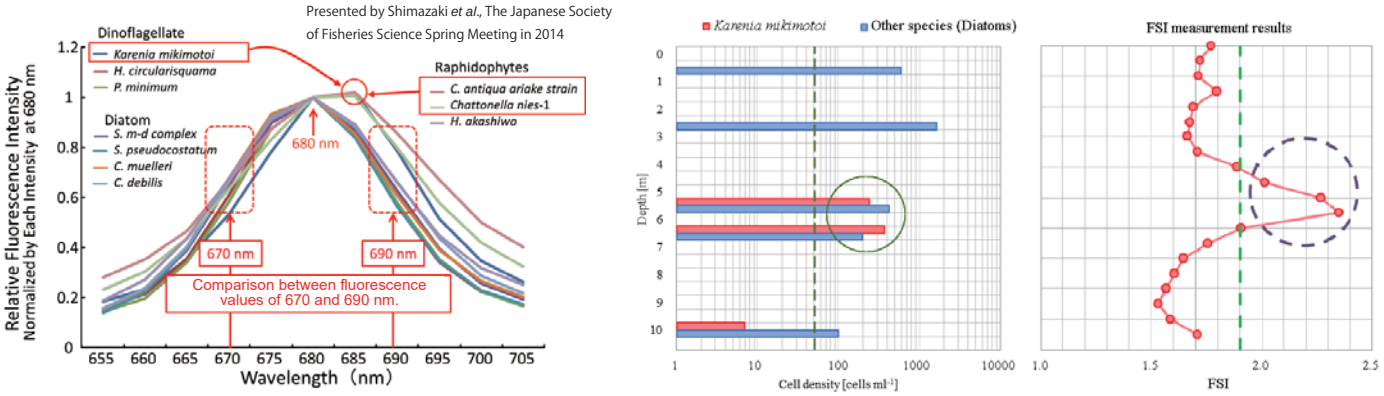
(1) *Non-linear, calibration using Fluorescein Sodium Salt (Uranine)* (2) *Repeatability using Fluorescein Sodium Salt (Uranine)*

■ 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

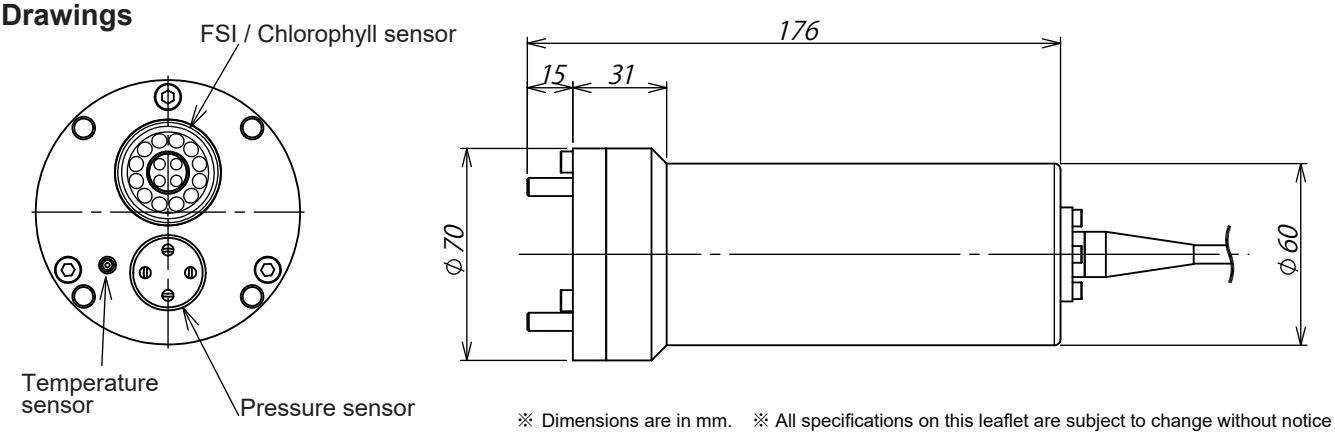
Screen	4 × 20-line LCD
Display information	Chlorophyll, depth, temperature, FSI, time and battery voltage
Sampling rate	Continuous (at 0.1, 0.2, 0.5, 1, 2, 5, 10 s)
Dimensions	85 × 115 × 255 mm
Memory	512 MB CF card
Power source	8 AA alkaline batteries, 100 to 240 V AC, 12 V DC



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** enotes 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

JFE Advantech Co., Ltd.
Ocean & River Instruments Division
URL: http://www.jfe-advantech.co.jp/

Head Office 3-48 Takahata cho, Nishinomiya, Hyogo 663-8202
TEL. +81-798-66-1783 FAX. +81-798-66-1654
Tokyo Sales Office JFE Kuramae Bldg. 2F, 2-17-4 Kuramae, Taito ku, Tokyo 111-0051
TEL. +81-3-5825-5589 FAX. +81-3-5825-5591