Creating the Future
SATAKE

Estimate the number of viable organism in ballast water

VIABLE ORGANISM ANALYZER

VOA1000K

SATAKE CORPORATION

Satake Corporation's Viable Organism Analyzer can be used for both Port State Control (PSC) indicative analysis and self-inspection.

The number of both large and small size viable organisms can be estimated easily and accurately.

In order to clear the PSC inspection rapidly, the inspection itself needs to be finished quickly. When the inspection is prolonged and ballast water discharge has been delayed, it interfere with the cargo handling work at hand.
Satake's inspection apparatus can provide results within approximately 15 minutes.
Our inspection apparatus meets all requirements of the PSC inspection.

Compact enough to carry onboard.

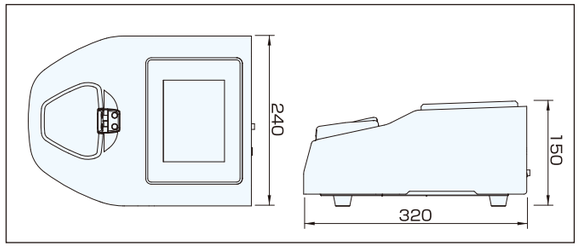
Compact design to carry easily from land to shipboard by backpack.

Suitable for self-inspection

Specifications

Name	VIABLE ORGANISM ANALYZER
Model	VOA1000K
Target Organism	Organisms greater than or equal to 50μm in minimum dimension (Large size) and organisms less than 50μm and greater than or equal to 10μm in minimum dimension (Small size)
Detector	Photomultiplier tube
Measurement Time	Large size: 10 minutes for staining, 1 minute for analysis
	Small size: 15 minutes for staining, 1 minute for analysis
Display Device	Touch panel display
Power Supply	AC100～240V 60W 50Hz/60Hz Single Phase
Weight	Approx. 4.0 kg

Dimensions (Unit:mm)



* Staining reagent is required for analysis.

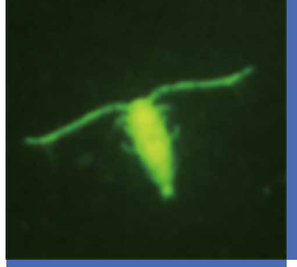
SATAKE CORPORATION

Head Office
2-30, Saijo Nishihonmachi, Higashi-Hiroshima-shi, Hiroshima-ken, 739-8602 JAPAN
TEL: +81-82-420-8558 FAX: +81-82-420-0003
URL: http://www.satake-group.com

Tokyo Office
7-2 Sotokanda 4-chome, Chiyoda-ku, Tokyo, 101-0021 JAPAN
TEL: +81-3-3253-5511 FAX: +81-3-5256-7131
URL: https://satake-group.com

ISO 9001 Certification (Quality Management Systems)	SATAKE CORPORATION has obtained ISO9001 and ISO14001 certification. These international standards for management systems ensure Satake will continue to provide high quality products and services.
ISO 14001 Certification (Environmental Management Systems)	

No. 759-02



New compliance monitoring method

corresponding to ballast water indicative analysis.

PULSE COUNTING FDA

By means of the Ballast water Management Convention, regulation is placed on the discharge of ballast water not meeting the IMO D-2 standard.

To discharge the ballast water that has been treated by ballast water treatment system, you have to meet the following criteria - see table below. Ballast water is examined in accordance with these standards in port state control(PSC).

Estimate the number of both large and small size organisms in one apparatus.

A new instrument has been developed to estimate the number of both large and small size organisms including zooplankton and phytoplankton for indicative analysis, based on ballast water discharge standard (D-2) of the Ballast Water Management Convention. [Formal name: International convention for the control and management of ships' ballast water and sediments]

Satake's inspection apparatus has adopted a recommended indicative analysis method by IMO.

Ballast water discharge standard (D-2)

Organism category	Standard	
Minimum dimension≥ 50 µm (Large size)	<10	viable organisms /1m^3
Minimum dimension 10 µm≤ x< 50 µm (Small size)	<10	viable organisms /1mL
Toxicogenic *Vibrio cholerae (O-1,O-139)*	<1	cfu/100mL (cfu:colony forming unit)
Escherichia coli	<250	
Intestinal Enterococci	<100	

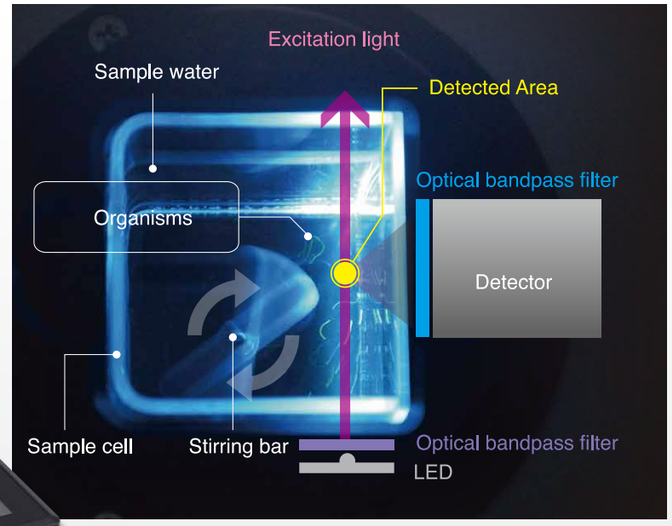
"Pulse counting FDA" makes it possible to estimate the number of both large and small viable organisms, and is recommended by IMO.

■ IMO recommended indicative analysis methods.

Indicator	General approach
Large size	Visual counts or stereo-microscopy
Large size	Visual inspection
Small size	Variable fluorometry
Large and small size	Photometry, nucleic acid, ATP, bulk fluorescein diacetate(FDA), chlorophyll a
Large and small size	Flow cytometry
Large and small size	Pulse counting FDA
Enterococci	Fluorometric diagnostic kit
Escherichia coli	Fluorometric diagnostic kit
Vibrio cholerae (01 and 0139)	Test kits

From "Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2)" (BWM.2/Circ42/Rev.1)

Detection Mechanism

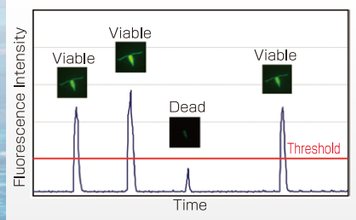


First, pour sampled water into the sample cell and add FDA solution to stain viable organisms.
Next illuminate the excitation light source and rotate sample water with a stirring bar. Fluorescence signals can be continuously detected from stained organisms that go through the detected area.
The pulse signals which exceed the threshold, are counted as viable organisms.

Directly counts the number of viable organism pulses.

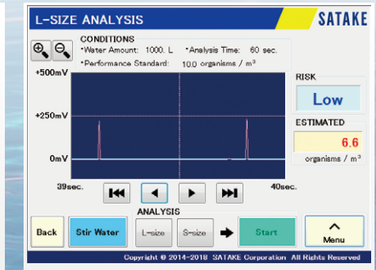
High precision and high sensitivity. A single organism can be detected.

Detected Pulse Signals



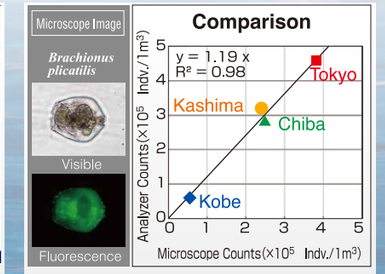
The pulses over threshold level are counted as those from viable organism.

Measurement Image



The number of individuals is displayed in terms of per a predetermined amount of ballast water (Large size: cubic meter, Small size: 1mL). Also, the risk level is shown.

Performance Test



As shown above, highly precise estimations are possible even in differing biota from various waters.

Quick inspection. 15 minutes to getting the result.

Inspection flow

Sampling the ballast water. → Add a stain reagent. → Set the sample cell to start analysis. → Results are displayed on the screen. → Results can be printed.