

JAPAN SHIP MACHINERY AND EQUIPMENT ASSOCIATION

# JAPANESE MARINE

# ECO PRODUCTS

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## Air Conditioner and Refrigerator

 **USHIO USHIO REINETSU CO., LTD.**

<http://www.ushioreinetsu.co.jp/english/>

### Air Conditioner and Refrigerator



USHIO released R449A (Opteon™ XP40) equipment in its standard lineup of Air conditioning and Refrigeration unit.

R449A is a next-generation HFO-based refrigerant that is non-toxic and non-flammable and has been assigned A1 safety classification under EN 378 and ASHRAE 34 standards. Chlorine is not present in R449A, and consequently, it has zero ozone depletion potential (ODP). Its global warming potential (GWP) is 1397 which is 64% respectively lower than R404A.

R449A is suitable for new installations as well as for retrofit of existing systems using R22/R404A/R407series, offering improved energy efficiency and environmental properties.

### INQUIRIES

5-3, Creative-Hills, Imabari, Ehime, 794-0069, Japan  
Tel : +81-898-34-1203 Fax : +81-898-34-1204  
E-mail : [newship@ushioreinetsu.co.jp](mailto:newship@ushioreinetsu.co.jp)

## Air Conditioners

 **NISSIN REFRIGERATION & ENGINEERING LTD.**

<http://www.nissin-ref.co.jp/english/>

### Heat pump type Ultra compact size Water Chilling Unit



### Ultra compact size Water Chilling and Heat pump Unit

Our heat pump chiller unit has various capabilities by combining each 10 HP (or 5 HP) compressor unit.

Only suitable number of compressor running, also heat pump mode contributes ecological operation.

Every compressor units are independent; hence, even if one unit fails, the operation can be continued with the remaining units.

It's hermetic type compressor benefits maintenance free.

Being lightweight, compact, and reliable, this chiller unit has been widely equipped on government and municipal ships.

### INQUIRIES

1-12-30, Mikuni Hommachi, Yodogawa-ku, Osaka, 532-0005, Japan  
Tel : +81-6-6394-1171 Fax : +81-6-6394-1251  
E-mail : [nre-webmaster@nissin-ref.co.jp](mailto:nre-webmaster@nissin-ref.co.jp)

# Air Conditioning and Refrigeration Equipment

**DAIKIN MR ENGINEERING CO., LTD.**

<http://www.daikin.co.jp/group/dmre/english/>

## R407H introduction



## Retrofit / New Systems

DAIKIN's new refrigerant R407H is a zeotropic blend of R32/R125/R134a and is designed as a retrofit replacement for R22, R404A and R407C in existing systems with limited modifications. It is an A1 refrigerant with a GWP of 1495, compared to R22's GWP of 1810, under the IPCC Fourth Assessment Report AR4, compared to R22's GWP of 1810.

Features of R407H with Lower GWP <1500	
Performance	Equivalent or higher than R404A/R407C
Lower Cost	No need for more expensive HFO based blends
Ease of Retrofit	A drop in solution for many systems

## [AIR CONDITIONER & REFRIGERATION UNIT]

- DECK UNIT
- Packaged air conditioner
- Packaged air conditioner (for galley)
- Small size condensing unit
- Water chilling unit



## INQUIRIES

### MARINE EQUIPMENT DIVISION

Shin-osaka Central-tower 11F, 5-5-15 Nishinakajima, Yodogawa-ku, Osaka, 532-0011, Japan  
 Tel : +81-6-4805-7291 Fax : +81-6-4805-7321  
 E-mail : marine.aircon@daikin.co.jp

Reduces Energy Consumption, Maintenance, and Overall Environmental Impact (Chemical Free)

# Antifouling Device

**Port Enterprise Co., Ltd.**  
*Sailing into the future*

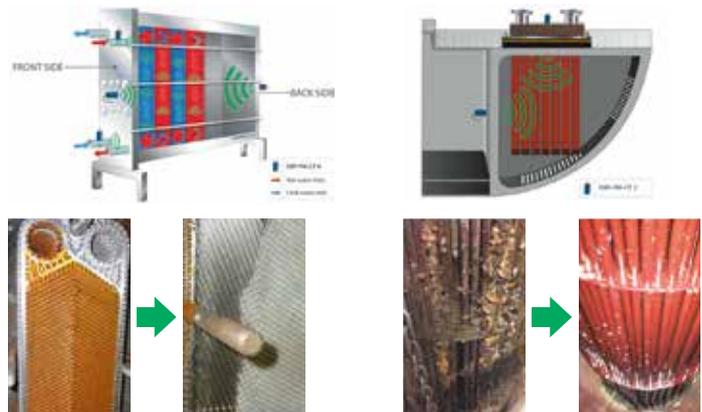
**Port Enterprise Co., Ltd.**

<http://www.portenterprise.com>

## Hasytec Dynamic Biofilm Protection



Hasytec Dynamic Biofilm Protection protects any surface coming in contact with water from marine fouling with its own chemical-free ultrasound technology at really low cost without any maintenance.



The product is well proven, completely safe, consumes very little energy, needs no maintenance, and comes with 5-year warranty.

## INQUIRIES

No. 2-1-28, Chikko, Minato, Osaka, 552-0021, Japan  
 Tel : +81-6-6573-5391 Fax : +81-6-6575-3036  
 E-mail : penterj@penterj.co.jp

# Autopilot

## TOKYO KEIKI TOKYO KEIKI INC.

<https://www.tokyokeiki.jp/e/>

### PR-9000

The model PR-9000 is the latest autopilot system from TOKYO KEIKI. The PR-9000 is designed using the latest technology from a wealth of engineering and manufacturing experience of navigational instruments. Safety, accuracy, and reliability of information have been enhanced in our model lineup thereby significantly improving situational awareness and navigational safety.

An indispensable autopilot system providing effective and safe bridge resource management and energy efficient navigation.



### Repeater Unit with color LCD

Color LCDs are incorporated into each system which enhances reliability of information and improves situational awareness.

### Maintaining Safe Navigation via Guidance Screen

Steering-related monitoring information can be displayed on the monitor screen. If a warning alert is generated, the navigator can simply view the proper guidance procedures on the screen in order to carry out evasive measures.



(Avoidance operating procedures Guidance Screen)

### Route Control function (ACE)

#### Route Control is performed only with Autopilot

Due to reduced route deviation / shorter sailing distance / reduction of wasted rudder, it ultimately contributes to safety and energy efficient navigation.



(ACE Screen)

## INQUIRIES

### Marine Systems Company

2-16-46, Minami-Kamata, Ohta-ku, Tokyo, 144-8551, Japan

Tel : +81-3-3737-8611 Fax : +81-3-3737-8663

Inquiry [https://www.tokyo-keiki.co.jp/form/webform\\_marinee.html](https://www.tokyo-keiki.co.jp/form/webform_marinee.html)

# Autopilot



## YOKOGAWA DENSHIKIKI CO., LTD.

<http://www.yokogawa.com/ydk>

### Next Generation Autopilot PT900



PT900 is the next generation autopilot, modern controlled fuel saving function (BNAAC/E-Course Pilot) is installed. By introducing 7 inches LCD, navigation information and autopilot parameters are confirmed and changed very easily.

## YOKOGAWA "GREEN" PRODUCTS



## INQUIRIES

### Marine Equipment Business Division

Minami Shinjuku Hoshino Bldg,5-23-13, Sendagaya, Shibuya-ku, Tokyo, 151-0051, Japan

Tel : +81-3-3225-5383 Fax : +81-3-3225-5316

E-mail : [navigation\\_info@ydk.yokogawa.co.jp](mailto:navigation_info@ydk.yokogawa.co.jp)

# Ballast Water Inspection Equipment

**MOL** MOL Techno-Trade, Ltd.

[http://www.motech.co.jp/e\\_index.html](http://www.motech.co.jp/e_index.html)

**Viable Organism Analyzer "Ballast EYE" and Viable Organism Sampler "Ballast Catch"**



SATAKE CORPORATION, developed machinery "BALLAST EYE" and "BALLAST CATCH". BALLAST EYE counts the number of viable organisms in the ballast water and can be used easily on board. It can estimate the number of both viable organisms of Large size ( $\geq 50 \mu\text{m}$ ) and Small size ( $10 \mu\text{m} \leq x < 50 \mu\text{m}$ ) including both zooplankton and phytoplankton. BALLAST CATCH is a compact sampler that can concentrate ballast water of both Large size and Small size organisms easily according to IMO ballast water discharge standard, saving time and labor compared to Plankton Net. MOL Techno-Trade, Ltd. is a trading company for domestic and foreign market.

## INQUIRIES

MOL Techno-Trade, Ltd. / Environment and Safety Related Devices Department

Tel : +81-3-6367-5370

E-mail : s-voa@motech.co.jp

Ballast Water Management System, Environment, Energy Saving

# Ballast Water Management System

**KEW** KUNIMORI ENGINEERING WORKS CO., LTD.

<http://www.kunimori.co.jp/en/>

**Enhanced Physical Treatment Technology With No Clogging Filtration Unit.**

[ Hydro Cyclone Filter ]

- No Maintenance
- No Replacement
- No Clogging

[ High reliability ]

- No one think sieve type filter wouldn't clogged.
- Who can assure a life time of filter under Stringent condition?



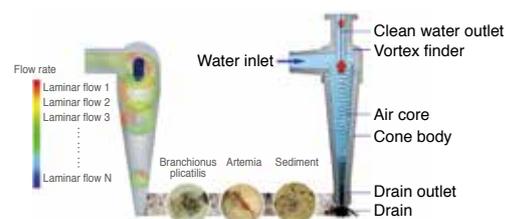
**BSKY**

**Hydrocyclone Prefilter**

- Hydrocyclone technology replaces traditional filters.

**US Prefilter**

- System cleaning
- Particle degradation
- Purifying water quality
- Break biological cell walls



**UV Module**

- The real-time UV Dose tracing sterilization technology saves energy for you.



## INQUIRIES

**CHINA PROJECT OFFICE**

7-12, 5-Chome, Shinbashi, Minato-ku, Tokyo, 105-0004, Japan

Tel : +81-3-3437-5022 Fax : +81-3-3437-5322

E-mail : liu@kunimori.co.jp

# Ballast Water Management System

 **JFE Engineering Corporation**

<https://jfe-ballast-ace.com/>

## JFE BallastAce



## Filtration + Formulated Chemical Injection

JFE BallastAce is a BWMS using a combination of filtration followed by formulated chemical injection on ballast water intake, and controlled neutralization step before ballast discharge.

The system has already delivered to more than 700 vessels, including over 170 retrofits.

### ■ Feature of JFE BallastAce

- Efficient sterilization in a wide range of water quality (turbidity / salinity / water temperature)
- Extremely low power consumption, low impact on the generators
- Flexible layout by each component in limited space
- USCG Type Approved

## INQUIRIES

### Ballast Water Management System Division

2-1, Suehiro-cho, Tsurumi-ku, Yokohama, 230-8611, Japan

Tel : +81-45-505-6538

E-mail : [jfe-bwms@jfe-eng.co.jp](mailto:jfe-bwms@jfe-eng.co.jp)

# Ballast Water Management System

 **MIURA CO.,LTD.**

<http://www.miuraz.co.jp/en/bwts/>



### 【Introduction】

MIURA work towards our mission of "Helping customers all over the world in energy conservation and environmental preservation."

With fifty years of proven result of ship machinery department, utilizing our technology and trust in MIURA, we put all effort to achieve our goal.

### 【Miura BWMS HK-type】

We introduce "Miura Ballast Water Management System (Miura BWMS)" that contribute to marine environment conservation all over the world.

Miura BWMS HK-type adopts filter and UV irradiation method which is environmentally friendly that does not affect natural ecosystem of sea area where water is discharged.

With its uniquely developed filter, system can surely capture organisms larger than 50 $\mu$ m, and multi-stage cleaning function can maintain filter clean.

In addition, operation of UV reactor is controlled to be energy saving. Control panel is operated using touch panel, which has high visibility and operability.

### 【Retrofit】

MIURA supervisors support retrofit engineering work from 3D scanning to installation work, and promote the installation work in accordance with the plan.

## INQUIRIES

7 Horie, Matsuyama, Ehime, 799-2696, Japan

Tel : +81-89-979-7060 Fax : +81-89-979-7082

E-mail : [hakuyo\\_eka@miuraz.co.jp](mailto:hakuyo_eka@miuraz.co.jp)

## Batteries

## BEMAC BEMAC CORPORATION

<https://www.bemac-jp.com/en/>

## Optimizing Electric Power System by Applying Lithium-ion Batteries

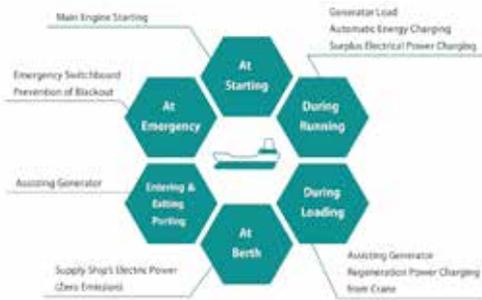


Fig.1 Applications of Li-ion Batteries on Ships



Fig.2 Li-ion Battery system

BEMAC has been introducing application of Lithium-ion batteries on ship's electrical system for electrical power efficient usage.

Ship's electrical energy volumes are consumed according to running mode which also the usages of Lithium-ion batteries' applications depends on (Fig.1). For example, its application to bow thruster during entering / existing the port may be used, and during the voyage, it may be applicable for charging the batteries by surplus electric power. Depending on its running mode, system will control charging and discharging of the Lithium-ion batteries by time shifting the ship's electrical power consumption; thus, to cut down the cost of generators' fuel.

BEMAC could supply Lithium-ion Battery Charging and Discharging equipments, Monitoring system and all necessary equipments (Fig.2).

## INQUIRIES

## Head Office / MIRAI Factory

105 Noma, Imabari-city, Ehime Pref., 794-8582, Japan

Tel : +81-898-25-8282 Fax : +81-898-25-3777

E-mail : sales@bemac-jp.com

High Quality Marine Batteries Class-approved VRLA batteries are safe, simple and reliable. Made in Japan.

## Batteries



## ECO MARINE POWER CO., LTD.

<http://www.ecomarinepower.com/>

## Class-approved batteries and energy storage solutions



In-cooperation with The Furukawa Battery Company of Japan, Eco Marine Power is able to supply a range of energy storage solutions and marine batteries for use on ships or for hybrid marine and offshore applications. Battery technologies include the Furukawa Cycle Power (FCP) series and UltraBattery® series. The high quality and long life batteries from Furukawa Battery can be supplied either as part of an integrated marine or ship renewable energy solution or supplied as stand-alone battery packs (with cables) or individual units

- Energy storage for Aquarius Marine Solar Power
- Energy storage for marine or coastal Photovoltaic (PV) systems.
- Emergency back-up power storage
- Energy storage for offshore renewable energy facilities.
- Land-based renewable energy projects.

## INQUIRIES

Aqua Hakata 5F, 5-3-8, Nakasu, Hakata-ku, Fukuoka, 810-0801, Japan

Tel : +81-92-287-9677 Fax : +81-92-287-9501

E-mail : enquiries@ecomarinepower.com

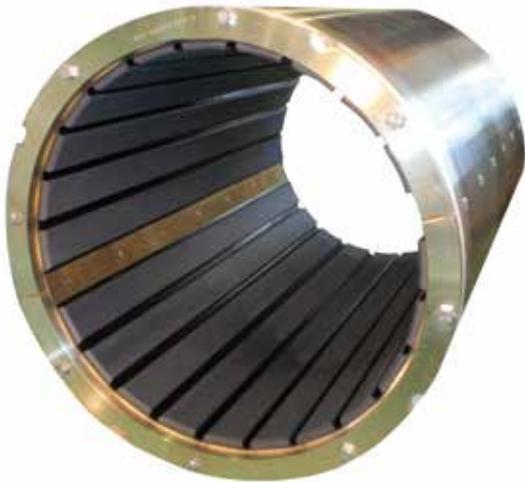
# Bearings, Sterntubes



## MIKASA CORPORATION

<http://www.mikasa-industry.com/en/>

### Water Lubricated Bearing F.F.Bearing (Friction-Free-Bearing)



As a result of pursuing superior low friction property and heavy duty property, we developed combined bearings made of P.T.F.E. and synthetic rubber and metal shell for Water-lubricated stern tube bearing.

F.F. Bearing dramatically minimizes both shaft sleeve and bearing wear.

This is the result of using PTFE of high self-lubricating as the slide member, distributing rubber to the back as the cushion to obtain the self-alignmentability, and decreasing the load by the deflected contact.

It is available water lubricating system as an alternative system of oil lubricating system..

By changing into F.F. Bearing were resulting in:

- Reduced Fuel Consumption
- Lower Vibration
- Lower Noise Levels
- Less Maintenance Cost
- No Possibility of Sea Contamination

## INQUIRIES

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General Manager International Sales Dept., Industrial Products Div.  
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Tel : +81-82-810-3930 Fax : +81-82-837-3947  
E-mail : [hirata@mikasasports.co.jp](mailto:hirata@mikasasports.co.jp)

# Bilge Discharge Monitor

**TAIKO** TAIKO KIKAI INDUSTRIES CO., LTD.

[www.https://www.taiko-kk.com/en](http://www.taiko-kk.com/en)

## BDM-FT1000

Environmental pollution has gone on a global scale, reinforcement of environmental conservation, the monitoring with severer standard was expected worldwide.

Our new "BILGE DISCHARGE MONITOR" can record various data & change, such as condition of pump, bilge water separator, ship location, oil contents, automatic stopping device (3-way valve), discharge rate.

Our visualized monitor is tamper proof in accordance with MARPOL regulations, and is able to reinforce in monitoring, such as, record management of proper operation, and preventing unauthorized discharge. (From oil major requirement)

### System Layout



- Various operating condition can be visually checked on LCD screen (pump operation, separator operation, ship location, oil contents, auto-discharge valve (3-way valve), discharge rate).
  - Simple operation on the LCD screen for touch panel.
  - GPS, bilge monitor, 3-way valve, and flow meters are linked & monitored. This works as a tamper proof.
  - Easy to prove the proper operation to PSC inspectors.
  - Reliable design. In case of emergency, possible to change to emergency mode and conduct a conventional operation acc. to I.M.O. requirement.
  - Record electric data about bilge discharge monitoring.
  - The system data can be used as a supplement against human error, typo-error or injustice in the oil record book.
  - Saved data is stored at internal memory and can be checked any time.
  - Internal memory can save for three years.\*
  - Past operating record can be shown as a chart, easy to check performance.
- \*In standard use

## INQUIRIES

209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi, 742-1598, Japan  
 Tel : +81-820-52-3113 Fax : +81-820-53-1001  
 E-mail : Please contact our website

Bilge Separator/Oily Water Separator/Environment

# Bilge Separator

**TAIKO** TAIKO KIKAI INDUSTRIES CO., LTD.

[www.https://www.taiko-kk.com/en](http://www.taiko-kk.com/en)

## Bilge Separator



TAIKO's USH series of marine bilge separators was developed by combining the technology of our three previous bilge separators when MEPC.107 (49) took effect., The USH series of new and powerful bilge separators is equipped with a high-performance, long-life coalescer capable of dealing not only with high-density and viscosity oil, but also emulsions that previous coalescers could not deal with.

## INQUIRIES

209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi, 742-1598, Japan  
 Tel : +81-820-52-3113 Fax : +81-820-53-1001  
 E-mail : Please contact our website

# Boiler Burners

## **Volcano** VOLCANO CO., LTD.

<http://www.volcano.co.jp/english/index.html>

### Proportional control type oil burner



TYPE: MJII-M

Design and development of “MJII-M” fully automated pressure jet proportional control burner allows energy saving operation with composite boiler. Features are as followings.

- Proportional control (turn down ratio / 3:1) allows for reducing the burner ON / OFF switching and improving the boiler efficiency.
- Combustion of both HFO and MGO fuels without changing atomizers.
- Easy and quick replaceable coupler attached on fuel line allows for less maintenance time.
- “MJII-M” is applied for 1~3t/h boiler.

### INQUIRIES

**Sales Department, Combustion Engineering Division**  
 1-3-38 Nonaka-kita, Yodogawa-ku, Osaka, 532-0034, Japan  
 Tel : +81-6-6392-5541 Fax : +81-6-6396-7609  
 E-mail : info-m@volcano.co.jp

# Bolts, Anti-Corrosion Coating

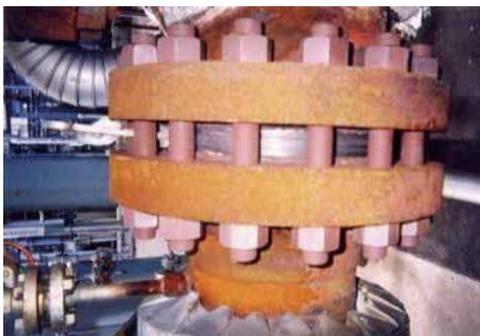
## **TAKENAKA SEISAKUSHO CO., LTD.**

<https://www.takenaka-mfg.co.jp/en/>

### TAKECOAT-1000 & TAKECOAT-CERAMIC1



TAKECOAT-1000



TAKECOAT-CERAMIC1

TAKENAKA has a lot of experience as leading manufacture of Nuts and Bolt since 1935.

#### 【Feature】

- TAKECOAT-1000: ① Resistance to rust and corrosion.  
 ② Remarkable saving life cycle cost for marine safety.
- TAKECOAT-CERAMIC1: ① Excellent heat resistance up to 450°C  
 ② Long-term durability for severe environment

#### TAKENAKA's original two layer coating system



TAKECOAT-1000

TAKECOAT-CERAMIC1

### INQUIRIES

**TAKENAKA SEISAKUSHO CO., LTD. Tokyo Sales Dept.**  
 Tel : +81-3-5643-0780 Fax : +81-3-5643-0781  
 E-mail : fasteners@takenaka-mfg.co.jp

# Cables & Wires, Electrical

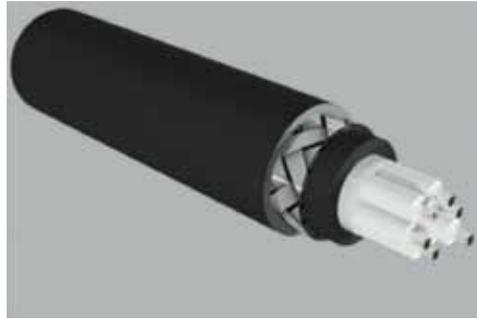


## HIEN ELECTRIC INDUSTRIES, LTD.

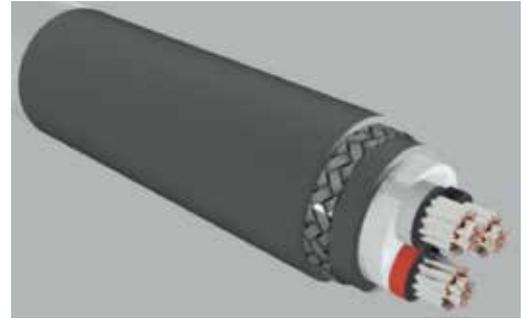
[http://www.hien.co.jp/e/e\\_index](http://www.hien.co.jp/e/e_index)



**For Switchboard wire**  
0.6/1kV SOP



**For Control & Instrumental cable**  
150/250V FA-MPOCO-7



**For Power & Lighting cable**  
0.6/1kV FA-TPOCO

### INQUIRIES

505, Shinshibakawa Bldg., 3-4-11, Dosho-machi, Chuo-ku, Osaka,  
541-0045, Japan  
Tel : +81-6-6226-1501 Fax : +81-6-6226-1507  
E-mail : hien-sales@hien.co.jp

# Clutch



## HITACHI NICO TRANSMISSION CO., LTD.

<http://www.hitachi-nico.jp/en/index.html>

### Large Size Hydraulic Clutch



Large Size Hydraulic Clutch Prototype model



3D model

#### 【Outline】

Large size hydraulic clutch has been developed as the technological development aid project in 2011, 2012 by The Nippon Foundation.

- Selectable for 2 kinds of clutch plate of  $\phi 1100\text{mm}$  and  $\phi 1500\text{mm}$ .
- 6 times of transmitting capacity compared with experienced clutch plate,  $\phi 810\text{mm}$  max.

#### 【Feature】

- Appropriate for 20000kw class of large vessel such as Capesize, Handymax.
- Remote control connected with electric valve enable easy operation for Clutch On-Off.
- Can be used for various layout like Two engine-one shaft vessel, Two engine-two shaft vessel, Hybrid propulsion vessel.

### INQUIRIES

405-3 Yoshinocho 1-chome, Kita-ku, Saitama, 331-0811, Japan  
Tel : +81-48-652-6708 Fax : +81-48-652-8719  
<https://www8.hitachi.co.jp/inquiry/hitachi-nico/en/form.jsp>

# Condensers

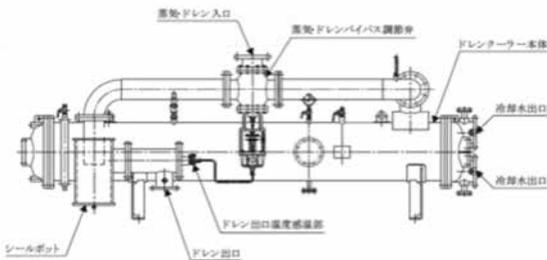
## yasec YAMASHINA SEIKI CO., LTD.

<http://yasec.co.jp/english/>

### e-DRAIN



The boiler efficiency is improved by controlling temperatures of drain at the drain cooler exit at a constant level, instead of wasting heat of steam and drain into seawater.



### INQUIRIES

525, Higashizaka, Ritto-City, Shiga, 520-3031, Japan  
Tel : +81-77-558-2311 Fax : +81-77-558-2319  
E-mail : [info@yasec.co.jp](mailto:info@yasec.co.jp)

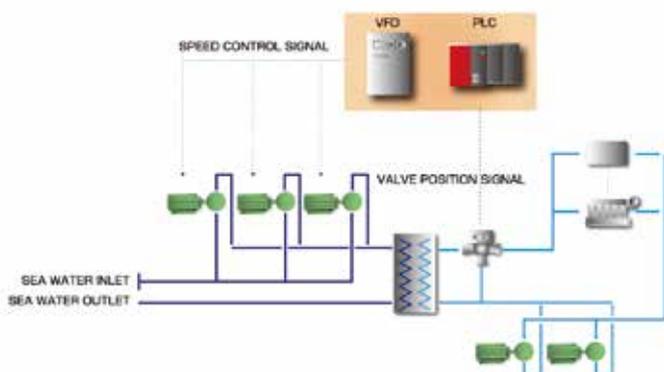
# Control Systems & Equipment

## JRCS JRCS Co. Ltd.

<https://www.jrcs.co.jp/en/>

### J-S/Eco (JRCS Smart Eco system)

J-S/Eco applies a smart frequency drive system which controls the speed of the motor of the main cooling sea water pumps at the most efficient point. It enables to reduce the power consumed by the motors to the minimum level, resulting in reduction of the vessel's fuel consumption. The equipment is specially designed for marine application for its harsh environment with long term guarantee by JRCS making sure that the ship owners recoup the initial investment back as fast as possible.



### INQUIRIES

2155 Kawatana, Toyoura-cho, Shimonoseki, Yamaguchi, 759-6301 Japan  
Tel : +81-83-775-2030  
E-mail : [jrcs@jrcs.co.jp](mailto:jrcs@jrcs.co.jp)

# Control Systems & Equipment

**NSDK** NISHISHIBA ELECTRIC CO., LTD.

<http://www.nishishiba.co.jp/nsdk/index.htm>

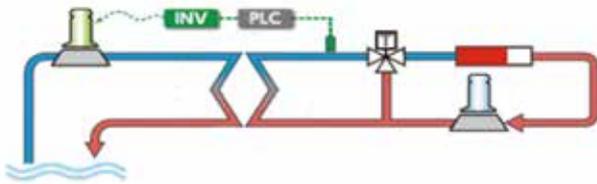
## C.S.W. Pump Motor Inverter Driven System



As the C.S.W. pump usually operates at rated constant speed, it consumes unnecessary electric power by overcooling.

Therefore we propose cost-effective system which could be controlled by inverter and PLC.

It can also apply this system to the ship in service (retro-fit)



## INQUIRIES

### Osaka Branch

29th Fl., Umeda Sky Building West Tower, 1-30 Oyodonaka 1-chome,  
Kita-ku, Osaka, 531-6129, Japan

Tel : +81-6-4797-2451 Fax : +81-6-4797-2453

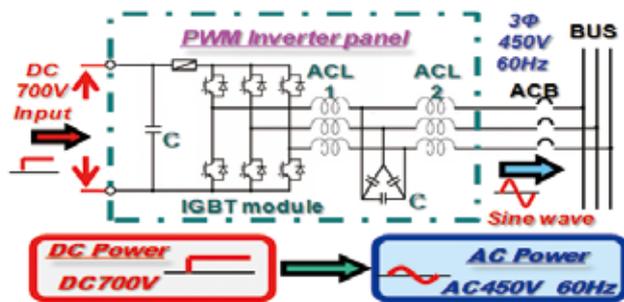
# Control Systems & Equipment



## TAIYO ELECTRIC CO., LTD.

<http://www.taiyo-electric.co.jp/english/index.html>

### Power Supply System



1. Thyristor Inverter Type Shaft Generating System  
SG mode (Generator) /SM mode (M/E boosting) /PM mode (Electric propulsion)
2. PWM Shaft Gen System
3. TC Generating System by PWM Inverter
4. DC Power System by PWM Inverter

This system supplies the stable AC power to the vessel which obtained from the various source.

This system contributes to users energy saving and maintenance cost saving.

Also, the output of this system has same electric characteristic as that of Diesel Generators (DG).

Therefore, it can be operated not only single running but also parallel running with DG.

### INQUIRIES

**Marine Business Division, Overseas Business Dept.**  
1-16-8 Uchikanda, Chiyoda-ku, Tokyo, 101-0047, Japan  
Tel : +81-3-3293-3067 Fax : +81-3-3292-7012  
E-mail : e-mail@taiyo-electric.co.jp

# Control Systems & Equipment



## TAIYO ELECTRIC CO., LTD.

<http://www.taiyo-electric.co.jp/english/index.html>

### Speed Control System by Inverter



1. Electric Propulsion System
2. Cargo Oil Pump
3. Electric Deck Machinery
4. Air Lub. Blower
5. Cool SW Pump
6. Refrigerator Compressor
7. E/R Ventilation Fan

The speed of Induction motor shall be variably controlled by inverter. Energy saving can be achieved by saving consumed power which is done by controlling motor speed properly.

This system also contributes ship's operation by easy maintenance.

### INQUIRIES

**Marine Business Division, Overseas Business Dept.**  
1-16-8 Uchikanda, Chiyoda-ku, Tokyo, 101-0047, Japan  
Tel : +81-3-3293-3067 Fax : +81-3-3292-7012  
E-mail : e-mail@taiyo-electric.co.jp

## Coolers, Oil

 **USHIO REINETSU CO., LTD.**

<http://www.ushioreinetsu.co.jp/english/>

### MGO cooling system



The low viscosity of the sulphur fuels may cause engine troubles. This MGO Cooling System is the best solution to achieve both “low sulphur” and “low viscosity”.

- SOx emission control from ships
- EU Directive / Less than 0.1% sulphur content from 1st January, 2010
- CARB(California Air Resource Board) /Less than0.1% sulphur content from 1st January, 2012
- SECA(Sulfur Emission Control Area)/Less than0.1% sulphur content from 1st January, 2015

### INQUIRIES

5-3, Creative-Hills, Imabari, Ehime, 794-0069, Japan  
Tel : +81-898-34-1203 Fax : +81-898-34-1204  
E-mail : [newship@ushioreinetsu.co.jp](mailto:newship@ushioreinetsu.co.jp)

### Hitz Green SCR (Selective Catalytic Reduction) for 2 stroke engines

## Diesel engine

 Hitachi Zosen

**HITACHI ZOSEN CORPORATION**

<http://www.hitachizosen.co.jp/english/index.html>

### SCR System for 2 stroke engines



Hitachi Zosen has started producing “Hitz Green SCR” compiled with NOx Tier III Regulation in Japan, China and Korea. Shop and sea trial has completed.

The running hour of first Hitz Green SCR is over 11,000 hours. Hitachi Zosen received official production approval from MAN-ES, and full approval is given only to Hitachi Zosen.

Hitachi Zosen has developed 2nd generation HP-SCR in order to minimize weight and maximize cargo space.

### INQUIRIES

**Sales Department Marine Machinery & SCR System Business Unit  
Machinery Business Headquarters**  
Tel : +81-3-6404-0143 Fax : +81-3-6404-0149  
E-mail : [scr-maritime@hitachizosen.co.jp](mailto:scr-maritime@hitachizosen.co.jp)

# Diesel Engine, Propulsion



## AKASAKA DIESELS LIMITED

<http://www.akasaka-diesel.jp/en/>

### Diesel Engine

Akasaka Diesels Limited is one of the leading manufactures of main engine for ship propulsion in Japan. Akasaka has been producing own design low speed 4 stroke engine and 2 stroke UEC engine designed by Japan Engine Corporation.

UEC33LSE & UEC35LSE are super long stroke and great fuel saving engine. Both engine types comply with NOx Tier III by applying SCR.

The following are features of these engines.

#### UEC35LSE-Eco-B2

- Electronically controlled engine (Eco engine)
- Lowest SFOC in the world

#### UEC33LSE-C2

- Mechanical controlled engine.
- In spite of mechanical engine, almost same FOC as other electronically controlled engine.

## INQUIRIES

Tokyo head office, Oversea Sales Dept.

14th floor, south tower Yurakucho Denki Building, 1-7-1 Yurakucho, Chiyoda-Ku, Tokyo Japan.

Tel : +81-3-6860-9085

E-mail : [kaigaieigyou@akasaka.co.jp](mailto:kaigaieigyou@akasaka.co.jp)

### UEC33LSE & 35LSE Specifications

UEC33LSE-C2				
Main data				
Cylinder bore	330mm			
Piston stroke	1,550mm			
Stroke/bore	4.70			
Rated Power/Propulsion engines				
Speed	16.7min <sup>-1</sup>		12.1min <sup>-1</sup>	
Piston Speed	8.6m/s		6.3m/s	
Cyl.	P1	P2	P3	P4
	kW		kW	
5	4,150	3,325	3,000	2,400
6	4,980	3,990	3,600	2,880
7	5,810	4,655	4,200	3,360
B	6,640	5,320	4,800	3,840
Specific fuel oil consumption(SFOC)				
※ SFOC(g/kWh)	P1	P2	P3	P4
	171.0	167.0	170.9	166.9
UEC35LSE-Eco-B2				
Main data				
Cylinder bore	350mm			
Piston stroke	1,550mm			
Stroke/bore	4.43			
Rated Power/Propulsion engines				
Speed	16.7min <sup>-1</sup>		11.8min <sup>-1</sup>	
Piston Speed	8.6m/s		6.1m/s	
Cyl.	P1	P2	P3	P4
	kW		kW	
5	4,350	3,325	3,075	2,350
6	5,220	3,990	3,690	2,820
7	6,090	4,655	4,305	3,290
B	6,960	5,320	4,920	3,760
Specific fuel oil consumption(SFOC)				
※ SFOC(g/kWh)	P1	P2	P3	P4
	167.0	161.0	167.0	160.9

※SFOC showing under TierII mode operation.

# Diesel Engines, Auxiliary

## DAIHATSU DAIHATSU DIESEL MFG. CO., LTD.

<http://www.dhtd.co.jp/en/index.html>

### 8DEL-23



A long-stroke version of the eco-friendly 8DEL-23 (2090 kW) debuts, saving space with greater power and low fuel consumption. With the installation of environmental devices and the increase in electronic equipment, onboard power consumption has been rising in recent years.

In response to this trend, we have incorporated a long-stroke 8DEL-23 design in our 6DE-23 diesel engine for marine use, an engine which has already received wide acclaim since the first deliveries in 2011.

The superb environmental performance remains the same, while achieving space-saving and greatly increased output.

## INQUIRIES

Marine Engine Sales Department

1-30, Oyodo Naka 1-Chome, Kita-ku, Osaka, 531-0076, Japan

Tel : +81-6-6454-2340 Fax : +81-6-6454-2682

E-mail : [products.info@dhtd.co.jp](mailto:products.info@dhtd.co.jp)

# Diesel Engines, Propulsion

## YANMAR YANMAR POWER TECHNOLOGY CO., LTD.

<https://www.yanmar.com/global/marinecommercial/>

### 2-Stage Turbocharging System

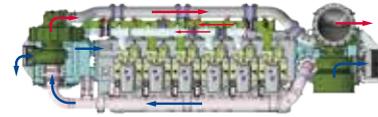


Yanmar has always pursued low fuel consumptions as its corporate creed "Fuel reward to Nation" since foundation.

This time, we developed "2-stage turbocharging system" compliant with IMO Tier2 regulations, further evolving the engine, achieving far superior to the conventional engine.

#### ■ Top view

→ exhaust  
→ Exhaust

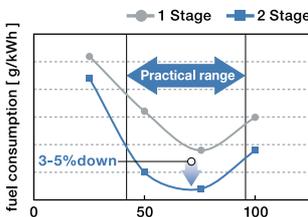


#### Simple system

It has simple system that 2 turbochargers and 2 air coolers are only connected by suction air pipes and exhaust pipe. It enables easy maintenance of the system.

#### Unchanged mountability and Good acceleration

We arranged turbocharger & air cooler unit on both sides of the engine. By this structure, we could achieve the equivalent mountability as the base engine by keeping the height of engine. This engine has good acceleration at low load by adapting dynamic pressure type exhaust manifold.



### Evolution of high pressure Miller Cycle System

We acquired the air by using "2-stage turbocharging system" in spite of advanced closing timing of suction valve to compare with "1 stage turbocharging system". It enabled to achieve the low fuel consumption in wide load.

## INQUIRIES

**Overseas Sales Division**  
**Marine Products Sales and Marketing Division**  
**Large Power Solution Business**

1-1-1, Nagasu Higashidori, Amagasaki, Hyogo, 660-8585, Japan  
Tel : +81-6-6489-8042 Fax : +81-6-6489-1082  
E-mail : vp-marine.sales@yanmar.com

### Reduction of fuel oil consumption

# Diesel Engines, Propulsion



## THE HANSHIN DIESEL WORKS, LTD.

<http://www.hanshin-dw.co.jp/english/product.html>

### Electronically controlled low speed four-stroke diesel engines



We The HANSHIN DIESEL WORKS, LTD. are the general maker of main engines and propulsion systems for ships, and have produced products by our own technology since 1918.

In order to meet the recent environmental requirements, the electronic management of engines is one of the most effective solutions. Electronically controlled two-stroke diesel engines have already been launched in the market. However such kind of Low-Speed four-stroke diesel engine has not been introduced yet.

The HANSHIN DIESEL WORKS, LTD. has newly developed electronically controlled low speed four-stroke diesel engines. One of the most typical features of this type of engine is to save fuel oil consumption by controlling electronically the fuel injection pattern in partial load. This system reduces fuel oil consumption by 3 to 5% in comparison with the conventional mechanically controlled system. This new system is adopted in the engine series of LH46LE, LH41LE, and LA32E.

## INQUIRIES

**Overseas Business Section**

Tel : +81-78-335-6001

Email : overseas-section@hanshin-dw.co.jp

# DRONE

## **KEW** KUNIMORI ENGINEERING WORKS CO., LTD.

<http://www.kunimori.co.jp/en/>

### DRONE 「ELIOS2」

Inspect & explore inaccessible places (Cargo Hold, Tank etc.) safely, quickly and economically using the spherical drone Flyability ELIOS2.



- No-Compass Error because no-GPS Signal is required
- Fly safely thanks to the collision tolerant carbon-fiber guard
- High intensity LED lights (10,000 lumens)
- High-definition visible-light camera and thermal sensor

Elios2 is available for purchase or rental in addition to our inspection services.



### INQUIRIES

#### Overseas sales Group

Tel : +81-78-686-0320 E-mail : [overseas@kunimori.co.jp](mailto:overseas@kunimori.co.jp)

#### Singapore Office

Tel :+ 65-6226-0321 E-mail : [kew-sgp@kunimori.co.jp](mailto:kew-sgp@kunimori.co.jp)

# Dual Fuel Boiler Burners

**Volcano** VOLCANO CO., LTD.

<http://www.volcano.co.jp/english/index.html>

## GAS/OIL Simultaneous Mixed Combustion DF burner



TYPE: Vignis

Gas/Oil simultaneous mixed combustion DF (Dual Fuel) burner for boiler of LNG fueled vessel "Vignis" has Gas/Oil Simultaneous Mixed Combustion mode as well as HFO-mono, MGO-mono and LNG-mono combustion mode.

Gas/Oil simultaneous mixed combustion mode can efficiently utilize BOG as fuel and shortage of calorie can be fulfilled by "Fuel Oil". Because combustion condition is stable even at Gas/Oil simultaneous mixed combustion mode, fuels can be easily changed over, And also it is useful in preventing human error.

"Vignis" equips GCU mode. A boiler which is equipped "Vignis" can be used as GCU(gas combustion unit).Also, the wide range type is possible to process more boil off gases.

"Vignis" is applied for 1~6t/h DF boiler.

### VOLCANO has 90years History.

We have more than 39years experiences of LNG Fuel for marine use.

We have delivery records for more than 200 vessels and have a reputation as safe and secure.

## INQUIRIES

### Sales Department, Combustion Engineering Division

1-3-38 Nonaka-kita, Yodogawa-ku, Osaka, 532-0034, Japan

Tel : +81-6-6392-5541 Fax : +81-6-6396-7609

E-mail : [info-m@volcano.co.jp](mailto:info-m@volcano.co.jp)

# Dual Fuel Boiler Burners

**Volcano** VOLCANO CO., LTD.

<http://www.volcano.co.jp/english/index.html>

## GAS / OIL Simultaneous Mixed Combustion DF burner



TYPE: SFFGII

This DF burner "SFFG II" was designed and developed for the main boiler on LNG carriers and is currently being used by many LNG carriers, FPSO, FSRU. "SFFG II" is also suitable for LNG Fueled Vessels.

Features are as followings.

- "SFFG II", featuring the turndown ratio of 15:1(Oil) and 7:1(Gas) allows for energy-saving operation.
- Equipped with the Gas/Oil Simultaneous Mixed Combustion mode as well as the Gas/Oil Mono-fuel combustion modes, "SFFG II" will allow for energy-saving operation.
- With the Gas/Oil Simultaneous Mixed Combustion mode, the Gas/Oil ratio can be freely set to allow for efficient operation in accordance with each vessel's circumstances.
- "SFFG II" is applied for 7~70t/h boiler.

On LNG Fueled vessels, BOG would be generated. CH<sub>4</sub>, which is main component of BOG, is 25 times more potent than CO<sub>2</sub> for global warming. Gas/Oil Simultaneous Mixed Combustion makes it possible to process CH<sub>4</sub> without emitting into the atmosphere.

### VOLCANO has 90years History.

We have more than 39years experiences of LNG Fuel for marine use.

We have delivery records for more than 200 vessels and have a reputation as safe and secure.

## INQUIRIES

### Sales Department, Combustion Engineering Division

1-3-38 Nonaka-kita, Yodogawa-ku, Osaka, 532-0034, Japan

Tel : +81-6-6392-5541 Fax : +81-6-6396-7609

E-mail : [info-m@volcano.co.jp](mailto:info-m@volcano.co.jp)

## Dual Fuel Engines, Auxiliary

**DAIHATSU** DAIHATSU DIESEL MFG. CO., LTD.

<http://www.dhtd.co.jp/en/index.html>

Dual fuel engines DE20DF / DE28DF / DE35DF



Daihatsu Dual fuel engines have the bore size between 205mm and 350mm, cover the output range of 0.9-4.0MWe. All engines are converted from diesel engines has sufficient reliability and durability.

These engines can be operated by using MGO, MDO, HFO, and LNG as fuel.

Based on the application of gas combustion technology and precise pilot fuel injection control by the common rail on gas mode operation, these engines are applicable to IMO NOx TierIII regulation without any exhaust gas aftertreatment, can also reduce CO<sub>2</sub> of 23%, SOx/PM of over 99%.

These engines have acquired the certification "Shiga Low-Carbon Brand in 2019" from Shiga-Prefecture government in Japan.

The safety concept is in accordance with IGF code. The operation mode can be switched from diesel to gas and vice versa without engine speed fluctuation, therefore the redundancy can be secured. In addition, the variable valve timing system is applied to ensure not only an optimum performance for each engine load, but also an excellent performance for the transient response required for marine engines.

While Daihatsu developed LPG reformer, and these engines can be also operated by using LPG fuel through LPG reformer.

### INQUIRIES

Marine Engine Sales Department

1-30, Oyodo Naka 1-Chome, Kita-ku, Osaka, 531-0076, Japan

Tel : +81-6-6454-2340 Fax : +81-6-6454-2682

E-mail : [products.info@dhtd.co.jp](mailto:products.info@dhtd.co.jp)

## Dual Fuel Engines, Propulsion

**NIIGATA** IHI Power Systems Co., Ltd.

<https://www.ihico.jp/ips/english>

28AHX-DF



Total six (6) Dual Fuel Tugs with NIIGATA 28AHX-DF are now in operation in the world, such as in Japan, Singapore Indonesia, and China.

28AHX-DF is an environmentally friendly engine, satisfying IMO Tier III NOx regulations.

It uses clean gas combustion, making it possible to meet the new regulations without the need for an exhaust gas processing reactor.

28AHX-DF offers both gas and diesel operation modes.

It can be instantly switched at fuel load from gas to diesel operation, ensuring safe ship operation even in emergency situations.

We successfully delivered the world's first 4 stroke Dual Fuel engine direct drive Fixed Pitch Propeller for LNG fueled harbor tugboat.

It offers high dynamic performance equivalent to that of diesel engine mode even during gas mode in tug operation.

Niigata Power Systems Co., Ltd. has integrated all the power systems division of IHI group into one company and newly started as IHI Power Systems Co., Ltd. from July 1st 2019.

### INQUIRIES

14-5, Sotokanda 2-Chome, Chiyoda-ku, Tokyo, 101-0021, Japan

Tel : +81-3-4366-1226 Fax : +81-3-4366-1310

E-mail : [ips-info\\_sales1@ihi-g.com](mailto:ips-info_sales1@ihi-g.com)

# Dual Fuel Engines, Propulsion

## **YANMAR** YANMAR POWER TECHNOLOGY CO., LTD.

<https://www.yanmar.com/global/marinecommercial/>

6EY26DF



The major feature of this engine is the redundancy capability due to the use of dual fuels. This engine is possible to continue operation by changing over to the diesel mode automatically, even when the gas mode operation fail.

In addition, the micro-pilot with its intense energy, ensures stable ignition capability. And the air-flow quantity control system with the bypass and waste-gate improves the engine transient response. These technologies enables adapt the engine as a ship propulsion engine.

Dual fuel engine has the following characteristics.

- Adaption IMO Tier 3 regulation.
- Redundancy by Dual Fuel (LNG and MDO / HFO).
- Stable ignition ability by Micro Pilot.

### INQUIRIES

Overseas Sales Division

Marine Products Sales and Marketing Division

Large Power Solution Business

1-1-1, Nagasu Higashidori, Amagasaki, Hyogo, 660-8585, Japan

Tel : +81-6-6489-8042 Fax : +81-6-6489-1082

E-mail : [vp-marine.sales@yanmar.com](mailto:vp-marine.sales@yanmar.com)

Low pressure, Lean burn, Dual Fuel Engine, Tire III compliance without any additional device

# Dual Fuel Engines, Propulsion (Low-Speed)

## **IHI** IHI Power Systems Co., Ltd.

<https://www.ihl.co.jp/ips/english>



6X72DF

### Low-speed Low-pressure Dual fuel engine "X-DF"

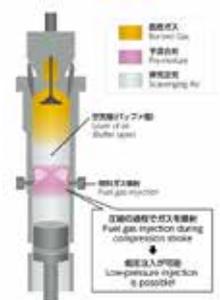
◆X-DF applies the pre-mixed lean burn technology and can meet IMO Tier III requirement without the exhaust gas after-treatment.

◆X-DF has advantages of lower Capex and Opex due to no requirement of a high pressure compressor.

◆For safety concerns, X-DF uses low-pressure LNG. (<13bar)

◆X-DF can switch from gas mode to diesel mode immediately.

◆X-DF is based on the low-speed two-stroke engine which is much proven in marine use.



DU-WinGD X-DF engine is the best eco-friendly solution!

### INQUIRIES

14-5, Sotokanda 2-Chome, Chiyoda-ku, Tokyo, 101-0021, Japan

Tel : +81-3-4366-1228 Fax : +81-3-4366-1310

E-mail : [ips-info\\_sales1@ihl-g.com](mailto:ips-info_sales1@ihl-g.com)

## Eco-Friendly Product



**MEIYO ELECTRIC CO., LTD.**

<https://www.meiyoelc.co.jp/en/>



TF-Detector is one of the best way for monitoring the friction of cylinder liner. The product helps to optimize the usage of lubricant. For example, a bulk carrier consumes several hundred thousand USD for lubricant per year. By using TF-Detector for reducing even few percentage of lubricant can save costs a lot.

By measuring the ferrous powder contained in drain oil, we foresee the disorder of machines caused by friction. Also can help to judge when to maintain the machine or use lubricant.

-Online type: Install on the pipe of drain oil to realize real-time monitoring.

-Portable type: Can test various points by one set.

Easy operation. Data can be saved to PC for analysis.

●Features:

1.High Resolution: The magnetic particle density is test per PPM.

2.No running cost: No consumables happening when testing.

3.Easy to operate: 3 steps to operate the portable type.

-Input test sample to tube

-Insert the tube to machine

-Press one button to start test.

4.Both lubricant oil and grease can be measured.

■Operating video : <https://youtu.be/bAN1ISGnJP8>



### INQUIRIES

MEIYO ELECTRIC Co., Ltd. Sales Department

Tel : +81-54-345-2212

E-mail : sal-shimizu@meiyoelc.co.jp

Eco-Friendly product, Garbage Compactor

## Eco-Friendly Product

**MOL** MOL Techno-Trade, Ltd.

[http://www.motech.co.jp/e\\_index.html](http://www.motech.co.jp/e_index.html)

**AIR GARBAGE COMPACTOR Type AGC- III**



MOL Techno-Trade, Ltd. newly developed air actuate Garbage Compactor AGC-III which can compress various waste materials such as plastic film, bottle and beverage cans by using compression air onboard. Simple design with easy and safe operation will be much effective for organizing waste materials. AGC-III can also reduce the waste disposal cost.

### INQUIRIES

**MOL Techno-Trade, Ltd. / Environment and Safety Related Devices Department**

1-1, 1-Chome, Kyobashi, Chuo-ku, Tokyo, 104-0031, Japan

Tel : +81-3-6367-5370 Fax : +81-3-6367-5515

Email : ship-mach@motech.co.jp

## Eco-Friendly Solar Power



### ECO MARINE POWER CO., LTD.

<http://www.ecomarinepower.com/>

#### Aquarius Marine Solar Power



Aquarius Marine Solar Power is an integrated renewable energy system for ships that includes a computer monitoring system, energy storage & a marine-grade solar power array. The energy collected via the solar panel array or string of photovoltaic (PV) panels can be used to power a DC load, provide back-up power or be connected to an AC load via an inverter. This system allows any type of ship to use solar power as an emissions free source of energy and provide an additional source of back-up power for emergency use.

- Emissions free source of power
- Class-approved high quality batteries supplied by The Furukawa Battery Company.
- System can be installed on any type of ship.
- Low maintenance, reliable and robust.
- Special mounting frames for use on ships available.
- Suitable for retrofitting or new shipbuilding projects.
- System design service available.
- Installation support available world-wide.

#### INQUIRIES

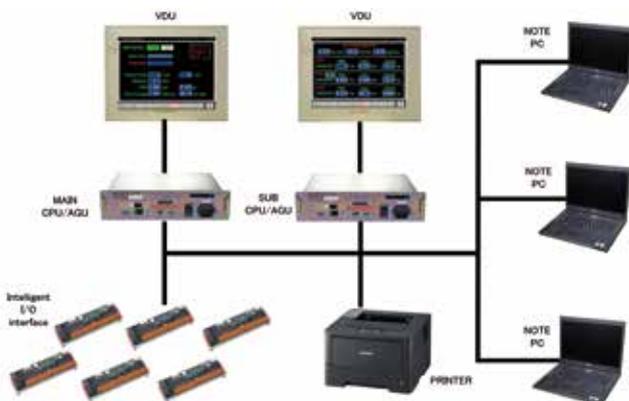
Aqua Hakata 5F, 5-3-8, Nakasu, Hakata-ku, Fukuoka, 810-0801, Japan  
Tel : +81-92-287-9677 Fax : +81-92-287-9501  
E-mail : [enquiries@ecomarinepower.com](mailto:enquiries@ecomarinepower.com)

## Engine Telegraphs & Loggers

### KEI system KEI SYSTEM CO., LTD.

<http://www.kei-system.co.jp/indexe.html>

#### Fuel consumption meter



Our data logger system is possible to display the following information by connecting with GPS by serial communication.

Confirm the fuel cost in real time inboard.

- Fuel consumption rate per day. (Tonnage)
- Distance of cruise per a ton of fuel. (Mile)
- Fuel consumption rate per hour.
- Possible to display and to record the fuel consumption rate etc. per a navigation.

#### INQUIRIES

1-5, 1-Chome, Ikunonishi, Ikuno-Ku, Osaka, 544-0024, Japan  
Tel : +81-6-6712-1151 Fax : +81-6-6712-1311  
E-mail : [info3@kei-system.co.jp](mailto:info3@kei-system.co.jp)

# Fresh Water Generating Plant

## SASAKURA ENGINEERING CO., LTD.

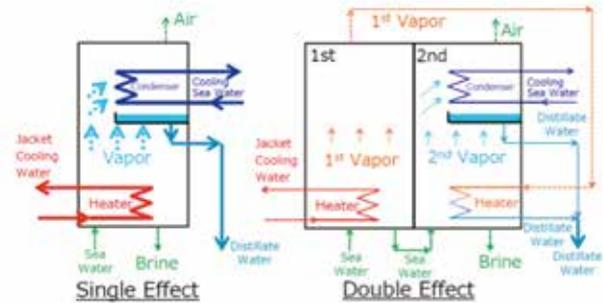
<http://www.sasakura.co.jp/e/index.html>

### Double Effect Fresh Water Generator Series WX



Futures of the series WX.

- ① Almost double the desalination efficiency of the series X  
The same capacity of fresh water with a half energy consumption, compared with the series X (single stage type).
- ② Hinge-type turning heater for easier maintenance & inspection
- ③ Easy replacement from existing unit  
Split Type to carry in the ship easily (option)



### INQUIRIES

7-32, 4-chome, Takejima, Nishiyodogawa-ku, Osaka, 555-0011, Japan  
 Tel : +81-6-6473-2134  
 E-mail : marine@skm.sasakura.co.jp

# Fresh Water Generating Plant

## SASAKURA ENGINEERING CO., LTD.

<http://www.sasakura.co.jp/e/index.html>

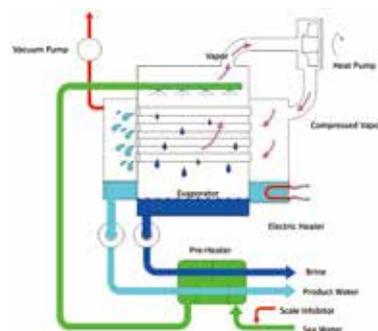
### Vacuum Vapor Compression Shell & Tube Evaporation Type Fresh Water Generator



The VVC distiller system has four main components; a horizontal-tube, thin-film evaporator; a rotary blower and a back-up heater. Vacuum in the unit is maintained by a small vacuum pump.

Features:

- Scale-free horizontal tubular evaporator
- Maintenance-free & compact type heat-pump
- Evaporation can be operated by only electricity.



### INQUIRIES

7-32, 4-chome, Takejima, Nishiyodogawa-ku, Osaka, 555-0011, Japan  
 Tel : +81-6-6473-2134  
 E-mail : marine@skm.sasakura.co.jp

## Galley Relative Equipment

 **HSN-KIKAI KOGYO CO., LTD.**

<https://www.hsn-kikai.com/en/>

### Hydroponic Equipment



1. Easy growing of the vegetables
2. Stable cultivation cycle
3. High durability
4. Expert support by USB data link
5. Easy assembling and an installation

- **160 pots of harvested green vegetable per 1 cycle (80 dishes of 15g"Baby Leaf" salad)**  
"Baby Leaf" grows fast and can be harvested in about 3 weeks.  
Over 20 kinds of green vegetables can be cultivated.
- **Cultivated by auto-control of liquid fertilizer**  
Liquid fertilizer concentration is monitored by sensor and properly adjusted automatically by tube pump.
- **Easy maintenance**  
Urethane coated cultivating tray is hygienical and don't need any special tool for maintenance.
- **LED as light source**  
LED is appropriate to photomorphogenesis and growth promotion.
- **No worry about rolling and pitching**  
Can cultivate onboard without water leak even when vessel is operating.

### INQUIRIES

6F, Taiju-seimei building, 119, Ito-machi, Chuo-ku, Kobe city, Hyogo, 650-0032, Japan  
Tel : +81-78-391-2751 (Sales Dept.)  
E-mail : [overseas@hsn-kikai.com](mailto:overseas@hsn-kikai.com)

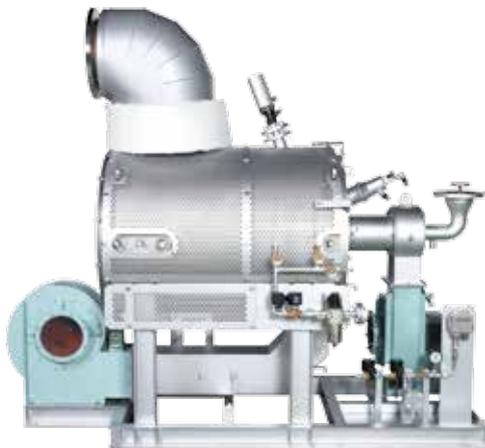
### Energy saving / Environment

## Gas Combustion Unit for LNG Fueled vessel

 **VOLCANO CO., LTD.**

<http://www.volcano.co.jp/english/index.html>

### Gas Combustion Unit for LNG Fueled vessel



TYPE: MECS-GCU

#### **VOLCANO has 90years History.**

We have more than 39years experiences of LNG Fuel for marine use.

We have delivery records for more than 200 vessels and have a reputation as safe and secure.

"MECS-GCU" was expanded product size composition in order to meet the request from actual ship building project of LNG fueled vessel.

The expansion of the product size (combustion rate) composition, has made it possible to respond to a wide range of vessel types, including LNG bunkering vessels (Marine fuel supply ships) of which building plans are increasing.

Features;

- Can be installed even in small vessels  
Has already been successfully installed in LNG fuel tug-boats.
- Combusts gas of any ratio on LNG fueled vessels  
Capable of treatment up to inert gas 100%.
- Combusts even low temperature gas
- Compatible with a wide range of vessels  
Can be used in many types of projects, such as Tag-boats, LNG bunkering vessels, and backups for other treatment devices.

### INQUIRIES

**Sales Department, Combustion Engineering Division**  
1-3-38 Nonaka-kita, Yodogawa-ku, Osaka, 532-0034, Japan  
Tel : +81-6-6392-5541 Fax : +81-6-6396-7609  
E-mail : [info-m@volcano.co.jp](mailto:info-m@volcano.co.jp)

# Gas Engine



## KAWASAKI HEAVY INDUSTRIES, LTD.

<http://global.kawasaki.com/en/mobility/marine/machinery/mge.html>

### Green Gas Engine (L30KG)



In April 2014, Kawasaki Heavy Industries, Ltd. obtained the type approval certificate from DNV-GL for Green Gas Engine L30KG — the main engine for large vessels fueled solely by gas with an output capacity of over 2 MW.

Green Gas Engine L30KG can reduce emissions far below the level set by IMO NOx Tier III regulations without relying on special equipment such as an SCR (Selective Catalytic Reduction) system. Its superior environmental performance also allows significant reduction of CO<sub>2</sub> and SOx emissions compared to diesel engines, thus helping marine vessels comply with various environmental regulations.

### INQUIRIES

#### Marine Machinery Sales Department

1-14-5, Kaigan, Minato-ku, Tokyo, 105-8315, Japan  
 Tel : +81-3-3435-2374 Fax : +81-3-3435-2022  
 E-mail : marine-machinery-sales-e@khi.co.jp

### Energy saving (Low fuel consumption and Low emission)

# Hydraulic Control Valve

## Nabtesco Nabtesco Corporation

<https://www.nabtesco.com/en/>

### Electronically controlled hydraulic valves for ME Engines

Electronically controlled hydraulic valves which controls fuel oil injection timing, quantity and/or exhaust valve actuation timing in order to optimize combustion condition at any load. These are applied to MAN Energy solutions ME (electric controlled) two-stroke engine and installed on each cylinder. That contributes to eco-friendly engine actuation with low fuel consumption and low emissions.

We, Nabtesco, developed our own a high-precision pilot valve and a feedback sensor that bring high-quality and high-reliability. Careful maintenance is necessary to ensure the safe navigation of marine vessel for long period. We offer condition check and over-haul service of these valves as part of maintenance through our world-wide service network to support the safe navigation of vessel 24 hrs a day, 365 days a year.

			
FIVA	ELFI-W	ELFI-B	ELVA
For Fuel injection + Exhaust valve	For Fuel injection + Exhaust valve (with cam)	For Fuel injection	For Exhaust valve
For ME-C S50/60/65/70/80/90 G60/70/8-5/80	For ME-B S30/S54/64/6	For ME-C S50/9-5/9-5/60(10.5)/70(10.5) G45/50/70(10.5)	

<b>Overhaul</b>	<b>On-board Condition check</b>	<b>Remote condition check</b>
SERVICE AVAILABLE in JAPAN / CHINA / KOREA	SERVICE AVAILABLE in ANY PORT when ME Standby condition	SERVICE TO BE LAUNCHED
ORIGINAL HIGH QUALITY COST EFFECTIVE REDUCED DELIVERY TIME	1 day check up by 2 engineer (until 9 cylinders)	Monitoring valve condition always at your hand through the network
		

### INQUIRIES

#### Marketing & Sales Department, Marine Control System Company

1617-1, Fukuyoshidai 1-chome, Nishi-ku, Kobe, Hyogo, 651-2413, Japan  
 Tel : +81-78-967-5361 Fax : +81-78-967-5362  
 E-mail : newbuilding@nabtesco.com

# LNG Pump

**SHINKO IND. LTD.**

<http://www.shinkohir.co.jp/en/>

## LNG Pump



In anticipation of the growing need for safe and clean energies, our company began developing low-temperature liquefied gas pumps in the 1970's.

In 1992, we supplied our first marine LNG pumps to a LNG carrier. Since then, our global market share has increased and now reached over 90%. These LNG pumps have become one of our main products that supports our company, much like our cargo oil pumps. Our LNG pump specifications can adapt to the shale gas energy revolution and other new demands, allowing us to receive a high reputation from customers worldwide.

## INQUIRIES

Department : Business Dept. 1  
 5-7-21 Ohzu, Minami-ku, Hiroshima, 732-0802, Japan  
 Tel : +81-82-508-1000  
 E-mail : master@shinkohir.co.jp

# Monitoring & Control Systems

**HSN-KIKAI KOGYO CO., LTD.**

<https://www.hsn-kikai.com/en/>

## Cooling Sea Water Control System PiVA

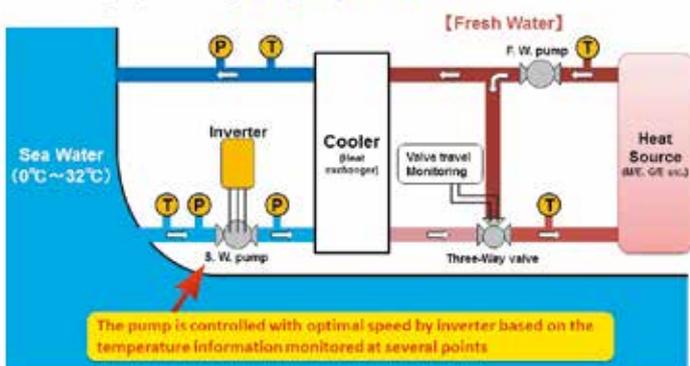
- ◆ Energy saving by pump speed control
- ◆ 84% of fuel cost saving !
- \*Condition: Fuel oil cost: \$0.122kWh, Sea temperature 25°C, Navigation time 5,000 hours/year

## Ship Performance Monitoring System SPM

- ◆ Automatically displays and records;  
 M/E Mileage, Fuel consumption, EEOI, Emission of CO<sub>2</sub>, SO<sub>x</sub> & NO<sub>x</sub>
- ◆ To support making report of MRV.

### HEISHIN Cooling Sea Water Control System PiVA

#### < Cooling System by Pump Speed Control >



## INQUIRIES

6F, Taiju-seimei building, 119, Ito-machi, Chuo-ku, Kobe city, Hyogo, 650-0032, Japan  
 Tel : +81-78-391-2751 (Sales Dept.)  
 E-mail : overseas@hsn-kikai.com

HEISHIN PUMP WORKS CO., LTD.

# Navigation Equipments

 **UTSUKI KEIKI Co., Ltd.**

<http://www.utsukikeiki.co.jp/>

## Electronic Inclinometer

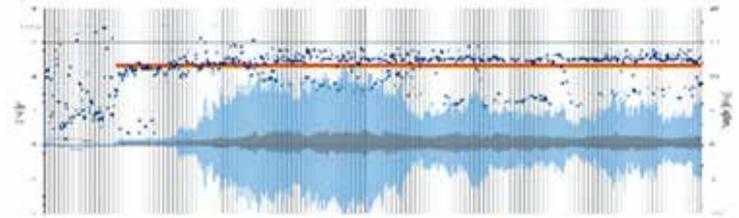
MEMS (Micro Electro Mechanical Systems) sensor enables to provide actual heel angle and time measurement accuracy without being affected by Other linear or rotational movements of the ship or by transverse acceleration.

\*ranging from -0.8G to +0.8G

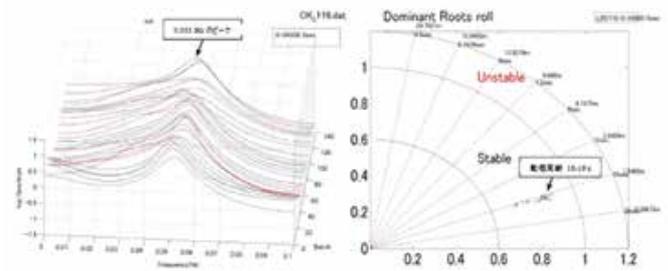
\*IMO standard roll period:4 sec.to 40 sec



//Analysis and logging of hull motion.  
//Calculate stability during navigation.



Time series graph of hull motion



Continuous Spectrum and Dominant Roots roll

## INQUIRIES

### HEAD OFFICE & FACTORY

Tel : +81-45-813-8481

E-mail : sales@utsukikeiki.co.jp

# Navigation Lights

 **NIPPON SENTO CO., LTD.**

<http://www.nipponsento.co.jp/>

## LED Navigation Lights Type NL series



Type Approval  
JG NL series

### Highly reliable design of LED light sources

Conditions of the LED are always monitored. If a problem occurs in the LED, the inner circuit detects it, turns off the LED immediately, and sends an error signal to the control panel.

Both the LED light source and frame are highly-reliable and made in Japan.

### Vibration-proof characteristics

Incandescent lamps burn out when vibrations are applied to them. LED lamps will not burn out.

### Projection-free lamp windows

Lamp windows need no projections, such as Fresnel lenses, owing to superior LED light distribution characteristics of LED light sources.

These characteristics reduce possibility of ice coating and snow accretion and prevent adhesion of dust and stain.

### Power saving and long life

The LED light source reduces power consumption down to 1/6 in comparison with the traditional incandescent lamps and allows remarkable power saving.

The rated life of the LED light source is as long as 50000 hours.

### Replaceable light source unit

The LED light source and power supply are unitized and can be replaced easily. Three types have common units, allowing immediate replacement and recovery from problems with the minimum stocks.

## INQUIRIES

555, Takahisa, Yoshikawa, Saitama, 342-0035, Japan

Tel : +81-48-981-2661 Fax : +81-48-981-2664

E-mail : nissen@nipponsento.co.jp

## Oil Absorbents



**Shimada & Co., Ltd.**

<http://www.shimatonet.co.jp/index-e.htm>

### Blue-sea mat ECO



1. Blue-sea mat ECO is environmental friendly oil absorbents which is mainly made from natural unbleached cotton.
2. Cotton is a natural fiber and it absorbs atmospheric carbon dioxide while it is growing every year and purify the atmosphere. Therefore, even if carbon dioxide is discharged during incineration, it will not be counted as emission amount.
3. Due to superior in absorbent ability, it makes possible low cost and high performance.
4. Due to it has property of absorbing only oil, floating on water after absorbing oil makes easier to collect.
5. Due to using natural fiber, the heating value during incinerating is half of other polypropylene products. Do not worry about the poisonous gas by incinerating.

### INQUIRIES

#### SHIMADA & CO., LTD. SALES DIVISION OVERSEAS SECTION

No.4-2, 3-Chome, Ichioka, Minato-ku, Osaka, 552-0012, Japan

Tel : +81-6-6574-0908 Fax : +81-6-6574-4601

E-mail : y.imamizo@shimatonet.co.jp

## Paints

# CMP CHUGOKU MARINE PAINTS, LTD.

<http://www.cmp.co.jp/global.html>

### SEAFLO NEO CF Z / SEAFLO NEO CF PREMIUM



### PREMIUM ANTIFOULING PERFORMANCE FROM PREMIUM ANTIFOULING TECHNOLOGIES

Since the company establishment in Hiroshima, Japan in 1917, Chugoku Marine Paints, Ltd (CMP). has developed its worldwide network in 35 countries and offer services from more than 105 locations.

SEAFLO NEO CF Z and SEAFLO NEO CF PREMIUM are premium range of the latest antifouling products from CMP, both provide high performance incorporating a new biocide technology combined with a zinc acrylate polymer.

These products have been designed as a premium solution for vessels trading at a wide range of speed and activity, where the main focuses are long term hull performance, reducing hull resistance and fuel saving by maintaining very thin leached layer.

### INQUIRIES

**Chugoku Marine Paints, Ltd.**

**Headquarter**

Tel : +81-3-3506-3951

Contact URL : [https://www.cmp.co.jp/global/contact\\_global.html](https://www.cmp.co.jp/global/contact_global.html)

## Paints

# CMP CHUGOKU MARINE PAINTS, LTD.

<http://www.cmp.co.jp/global.html>

### CMP BIOCLEAN PLUS



Foul-release coating (FRC) is one of the environmental choices of antifouling and has proven application records since 2003.

“CMP BIOCLEAN” is in the CMP’s silicone FRC product range. Its ultra-smooth surface which is regulated by the rheology control technology provides foul-release performance and fuel efficiency.

“CMP BIOCLEAN HB” is silicone finish coating with CMP’s unique technology.

“CMP BIOCLEAN PLUS”, the latest version in the CMP BIOCLEAN series, has been newly developed based on CMP BIOCLEAN HB. It’s added “PLUS Technology” induces resisting and releasing slime.

### INQUIRIES

**Chugoku Marine Paints, Ltd.**

**Headquarter**

Tel : +81-3-3506-3951

Contact URL : [https://www.cmp.co.jp/global/contact\\_global.html](https://www.cmp.co.jp/global/contact_global.html)

## Paints



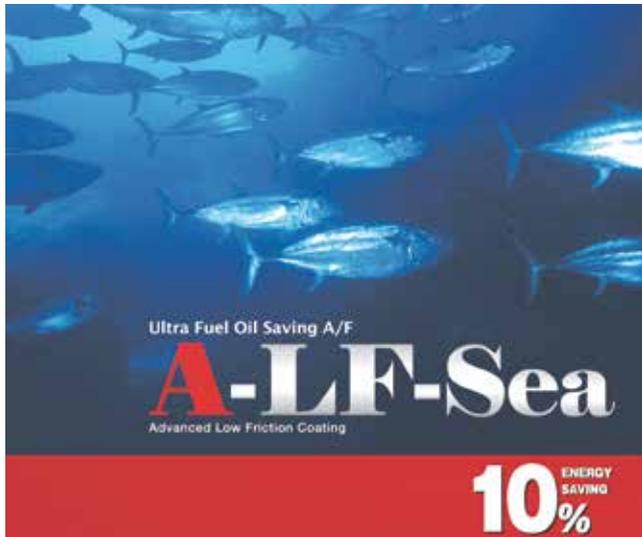
NIPPON PAINT MARINE



**NIPPON PAINT MARINE COATINGS CO., LTD.**

<http://www.nipponpaint-marine.com>

### A-LF-Sea – Ultra Low Friction Underwater Coating System -



A-LF-Sea is an advanced version of our low-friction coating “LF-Sea” delivering further propulsion benefits.

A biomimetic ultra-low-friction antifouling that works using a patented water trapping function to lower the hydrodynamic footprint of the hull.

Stable and long term antifouling is guaranteed by the use of a low friction copper-silyl-acrylate copolymer.

Used in conjunction with Nippon Paint Marine's 'Rheo' anticorrosive systems, fuel-savings can be further enhanced.

A-LF-Sea provides 10% fuel-saving effect in case of new building or full-blasting at M&R and 7~8% fuel-saving effect in case of spot blasting at M&R to be applied A-LF-Sea only without Rheological. Over 1400 ships have already been applied with A-LF-Sea in the world as of June 2019. And the numbers of track record including LF-Sea (First generation of A-LF-Sea) has reached 2900.

### INQUIRIES

**NIPPON PAINT MARINE COATINGS CO., LTD.**

Tel : +81-6-6455-9590

Contact URL : <https://www.nipponpaint-marine.com/en/inquire/index.php>

## Paints



NIPPON PAINT MARINE



**NIPPON PAINT MARINE COATINGS CO., LTD.**

<http://www.nipponpaint-marine.com>

### SI paint NOA – Protective Coating System with SI (Self-Indication) technology



NOA is Nippon's unique technology providing users for the first time with the ability to judge the correct thickness of the paint. NOA's unique patented technology reduces the need for complicated thickness checking by thickness gauge. NOA contributes to reduce workload for (1) coating inspection, (2) physical thickness measurement & marking and (3) post painting repair & touch-up. Furthermore, NOA contributes to secure (a) uniform coating, (b) specified thickness, (c) minimal excessive thickness and (d) corrosion protection for ship's life.

Especially for WBT, NOA has been applied over 1400 newbuildings since 1998. And its 10 year corrosion protection records are recently confirmed on large LNG carriers.

### INQUIRIES

**NIPPON PAINT MARINE COATINGS CO., LTD.**

Tel : +81-6-6455-9590

Contact URL : <https://www.nipponpaint-marine.com/en/inquire/index.php>

## Propeller Boss Cap Fins

**MOL** MOL Techno-Trade, Ltd.

<http://www.pbcf.jp>

### PBCF (Propeller Boss Cap Fins)



PBCF is the pioneer and the best seller in an energy-saving device installed on a propeller to improve propulsive efficiency by eliminating hub-vortex and by reducing torque loss. In consequence, vessel fuel consumption will be reduced by up to 5%. Mitsui O.S.K. Lines (MOL) originally developed PBCF in 1987, and advanced PBCF was released in 2017. The total number of installation is now over 3,400 vessels all over the world.

#### Principal Benefits of PBCF

- Saving fuel up to 5%, the corresponding reduction of NOx, and CO2 emissions.
- Reduces propeller-induced underwater-noise and vibrations.
- Simple and quick installation, just the replacement of the existing propeller boss cap.
- Suitable to both new buildings and retrofit applications.
- Pay-back time is less than 1 year, even at low fuel prices.

### INQUIRIES

**MOL Techno-Trade, Ltd. / Environment and Safety Related Devices Department**

1-1, 1-Chome, Kyobashi, Chuo-ku, Tokyo, 104-0031, Japan

Tel : +81-3-6367-5380 Fax : +81-3-6367-5516

E-mail : [pbcf@motech.co.jp](mailto:pbcf@motech.co.jp)

## Propellers, Controllable



**KAMOME PROPELLER CO., LTD.**

<http://www.kamome-propeller.co.jp/en>

### CP Propeller



As the torque-rich of main engine caused by the fouling of the hull or the effect of waves and wind can be avoidable by adjusting CPP pitch angle and speed properly through ALC or combination control, when building the vessel, the main engine output can be minimized compared with FPP without considering margin to reduce fuel consumption.

The advantage of CPP for large energy saving is exercised by the shaft generator system driven by main engine with constant speed or the hybrid propulsion system where diesel main engine and electric motor/generator are combined as a propulsion prime mover.

### INQUIRIES

**Business Operation Division, International Department**

690 Kamiyabe-cho, Totsuka-ku, Yokohama, 245-8542, Japan

Tel : +81-45-811-2461 Fax : +81-45-811-9444

E-mail : [info@kamome-propeller.co.jp](mailto:info@kamome-propeller.co.jp)

# Propellers, Energy Saving Device



## NAKASHIMA PROPELLER CO., LTD.

<https://www.nakashima.co.jp/eng/>



### ■ GPX Propeller

GPX propeller is Nakashima's new propeller brand and is highly performing propeller by technologies of Non-Hub-Vortex and small blade area. Also Tip rake technology of GPX propeller make it possible to reduce cavitation and pressure amplitude. GPX propellers are adopted various types of ships.

### ■ ECO-Cap

Eco-cap's fins diffuse negative pressure which is generated behind of propeller cap and enable to reduce resistance. Easy installation and being equipped to over 100 ships. Eco-Cap can increase efficiency and improve Fuel Oil Consumption approx. 3 %.

### ■ Ultimate Rudder Bulb

Ultimate Rudder Bulb is a bulb and is connected in a streamlined from the propeller cap to the rudder. In the model test there was more than 3% improvement in efficiency and is adopted from low-speed to high- speed vessel.

### ■ Neighbor Duct

Neighbor duct is mounted near stern to decrease hull resistance. Since lift is generated throughout the duct, house power reduction is more than 4%.



## INQUIRIES

### Sales & Marketing Department

688-1, Joto-Kitagata, Higashi-Ku, Okayama, 709-0625, Japan  
 Tel : +81-86-279-5111 Fax : +81-86-279-3107  
 E-mail : npcwebmaster@nakashima.co.jp



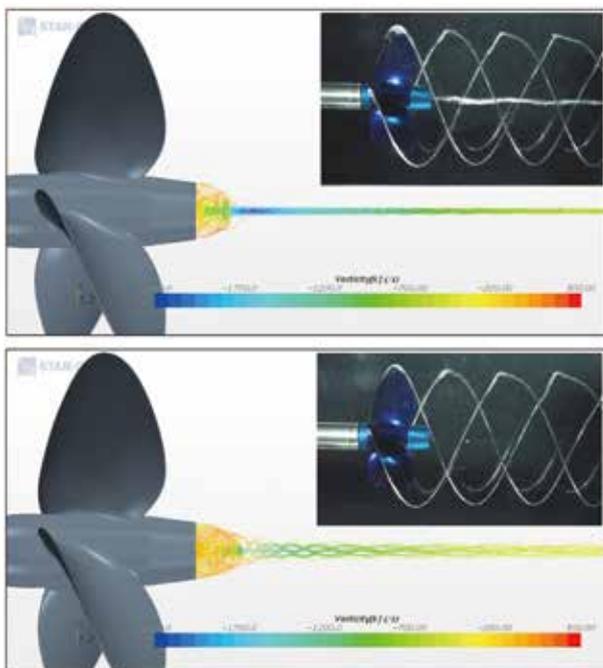
# Propellers, fixed pitch



## KAMOME PROPELLER CO., LTD.

<http://www.kamome-propeller.co.jp/en>

### SG Propeller



The SG propeller applies the reducing technology of the hub vortex strength and the optimization technology of the blade loading distribution and the numerical calculations including the cavitation simulation, the propeller exciting force estimation, etc. are introduced in its design. The reduced hub vortex strength improves the lower pressure region behind the hub which causes the thrust deterioration. The optimized blade loading distribution increases the propeller open water efficiency without deteriorating the cavitation performance.

Accordingly the SG propeller improves the efficiency about 3% than the conventional propeller and has been installed in over 400 vessels.

## INQUIRIES

### Business Operation Division, International Department

690 Kamiyabe-cho, Totsuka-ku, Yokohama, 245-8542, Japan  
 Tel : +81-45-811-2461 Fax : +81-45-811-9444  
 E-mail : info@kamome-propeller.co.jp

# Pump, Inverter Control

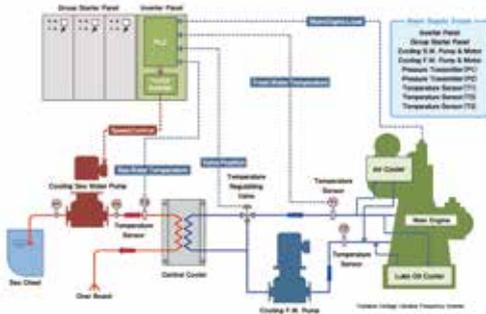


## NANIWA PUMP MFG. CO., LTD.

<http://www.naniwa-pump.co.jp/english/>

### NEO-ME

Diagram for Central Cooling System with NEO-ME series



#### How does NEO-ME affect fuel consumption?

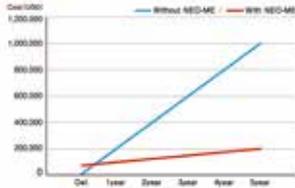
■ Fuel Consumption of Generator Engine

334.8ton/year

86% Less

44.0ton/year

■ Cash Flow



Basic Technical Data

- ① Size type S100 - 4000kW Converter Center
- ② Inverter Drive Main Cool. S. W. Pump
- ③ Size: 1500mmφ x 2000 x 1750mm x 1750mm
- ④ Shaft Horse Power at specific QN point: 1100kW
- ⑤ Average Rotational Speed of the pump: 1700rpm (50% of rated speed assumption)
- ⑥ Shaft Horse Power at 50% of rated speed: 1570kW
- ⑦ Change Data of Rev. Engine
  - Rate of Fuel Consumption: 180g/kWh
  - Efficiency of generator: 94%
- ⑧ Operation time (Assumption): 7,000hours per year
- ⑨ Efficiency of inverter: 96%
- ⑩ Electric Motor
- ⑪ Rating: 1100kW/4P
- ⑫ Efficiency: 96%
- ⑬ Approx. Price: USD 950,000

Naniwa Pump supports customer expectation for “greener ships”, paying close attention to the following parameters.

- Environmental Protection
- Safety of Operation
- Saving Energy

NEO-ME series control rotational speed of Main Cooling Sea Water Pump according to following information.

- Main Engine Load
- Sea Water Temperature
- Temperature Regulation Valve Position
- Fresh Water Temperature

NEO-ME series operate Main Cooling Sea Water Pumps with economy and safety. Its standard features are as following:

- High response performance to main engine load
- 0% Speed at 100% F.W. Circulation
- Adaptive to sea water temperature change
- Based on those features NEO-ME series realizes:
- Full time minimum fuel consumption
- Optimized operation for vessel speed reduction

For safety operation:

- Flushing alert system is incorporated.

### INQUIRIES

Tel : +81-6-6541-6231

E-mail : [info@naniwa-pump.co.jp](mailto:info@naniwa-pump.co.jp)

### Bilge Water Treatment

# Pumps, Bilge



## HEISHIN Ltd.

<http://www.heishin.jp/en/>

### Heishin PC Pump



Heishin PC Pump is capable of handling high-viscosity fluids, high-concentration slurries and fluids containing solids. As conveyed materials move through pipes, practically no unpleasant odors are produced. Also, it is a quiet pump that makes no drive noise aside from the motor. Heishin PC Pump with these features is best suited for conveyance of bilge water.

### INQUIRIES

Nihombashi Kato Bldg. 8F, 2-1-14, Nihombashi, Chuoh-ku, Tokyo 103-0027, Japan

Tel : +81-3-5204-6380 Fax : +81-3-5204-6377

E-mail : [info@mohno-pump.co.jp](mailto:info@mohno-pump.co.jp)

# Pumps, Deep Well

**TAIKO** TAIKO KIKAI INDUSTRIES CO., LTD.

[www.https://www.taiko-kk.com/en](https://www.taiko-kk.com/en)

## Pumps, Deep Well



The MarFlex-Taiko Deep well Cargo Pump has two remarkable features:

- 1) The Pump uses a motor-driven system to solve the problems of noise and power efficiency that are present in conventional, hydraulic-driven, deep-well cargo pumps.
- 2) The Pump has been designed so that bearing lubrication is isolated, providing a much longer service life.

The lubrication of bearings by liquid cargoes has been a trouble-spot in deep-well cargo pump design.

MarFlex solved this problem by designing a forcedfed lubrication of the bearing, passing the driving shaft through a separate support pipe.

## INQUIRIES

209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi, 742-1598, Japan

Tel : +81-820-52-3113 Fax : +81-820-53-1001

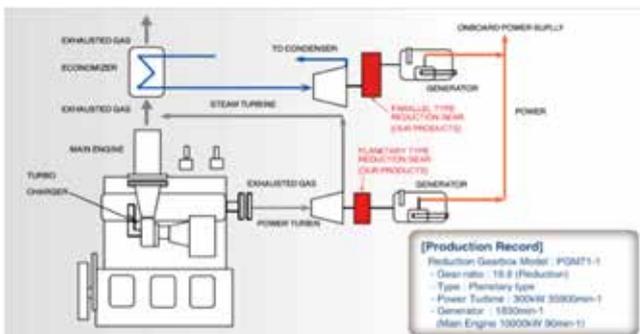
E-mail : Please contact our website

# Reduction Gear

**nico** HITACHI NICO TRANSMISSION CO., LTD.

<http://www.hitachi-nico.jp/en/index.html>

## Reduction Gearbox for Exhaust Power Recovery System



Exhausted gas from marine diesel engine remains much energy to be recovered.

Our reduction gearbox is used in the exhaust power recovery system with power turbine and steam turbine.

- Light weight and compact design.
- High reliability on many production experience for continuous use high speed turbine.
- Two kinds of type are selectable as parallel-type and planetary-type, depend on turbine speed.



Reduction Gearbox (Model : PGM71)

## INQUIRIES

405-3 Yoshinocho 1-chome, Kita-ku, Saitama, 331-0811, Japan

Tel : +81-48-652-6708 Fax : +81-48-652-8719

<https://www8.hitachi.co.jp/inquiry/hitachi-nico/en/form.jsp>

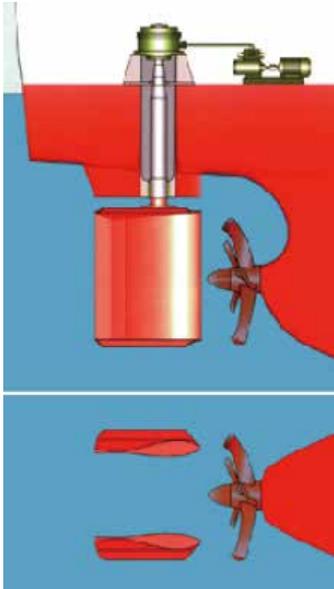
# Rudders



## JAPAN HAMWORTHY & CO., LTD.

<http://www.japanham.com/en>

### Rudders Super VecTwin System



Outline of VecTwin Rudder



Joystick panel



Example of thrust vector

- Excellent maneuvering system with a pair of high lift rudders fixed behind a propeller.
- Safe navigation maneuverability having any operation mode including going-astern with turning capability, hovering, extra dead slow forwarding, and turning port and starboard, with forward direction propeller revolution, which develop thrust in all directions.
- Improved propulsive efficiency with reaction fins and propeller boss cap fins (PBCF) which removes propeller hub vortex.
- Function of easy and short-time approaching to and departing from berth reduces mental and physical hardships of crew, which brings an excellent economical effect.
- An emergency stop which reduces the stopping distance to about a half of that of a conventional ship.

### INQUIRIES

Omodaka Bldg., 1-15-1, Shigino-nishi, Joto-ku, Osaka, 536-0014, Japan  
 Tel : +81-6-6962-8877 Fax : +81-6-6962-8899  
 E-mail : [jhc@japanham.co.jp](mailto:jhc@japanham.co.jp)

# Rudders, High Lift



## KAMOME PROPELLER CO., LTD.

<http://www.kamome-propeller.co.jp/en>

### K-7 Rudder

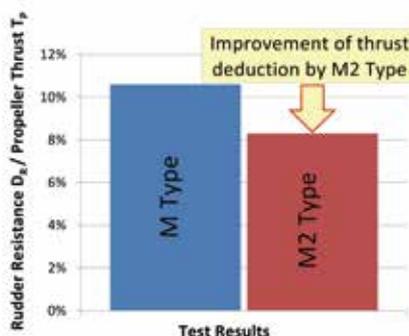


M Type



M2 Type

The K-7 Rudder consists of the main rudder and the flap fitted to the rudder with hinge. As the flap turns more than 2 times of the main rudder angle during steering, the lift generated in the propeller slip stream is higher than the conventional rudder by the effect of the camber composed by the main rudder and the flap. As the K-7 rudder area required to attain the same turning performance becomes smaller than the conventional rudder required for the same ship, K-7 rudder makes the rudder resistance reduced and contributes to the energy saving.



### INQUIRIES

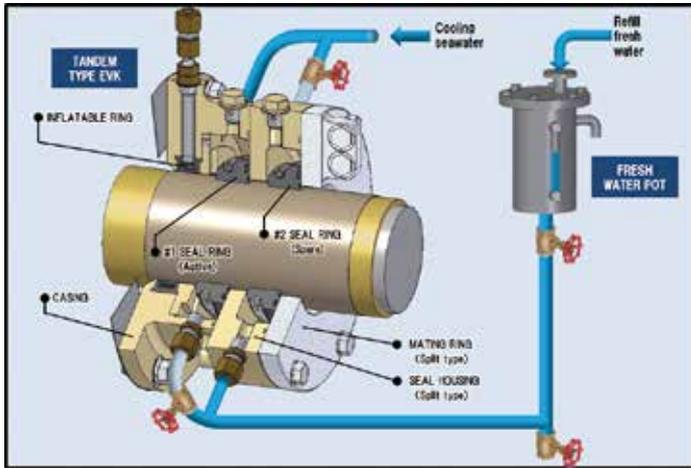
**Business Operation Division, International Department**  
 690 Kamiyabe-cho, Totsuka-ku, Yokohama, 245-8542, Japan  
 Tel : +81-45-811-2461 Fax : +81-45-811-9444  
 E-mail : [info@kamome-propeller.co.jp](mailto:info@kamome-propeller.co.jp)

# Seals, sterntubes

## KEMEL EAGLE INDUSTRY CO., LTD.

<https://http://www.kemel.com/>

### Tandem Type EVK Seal



Utilizing our expertise and know-how built over the years, and as the world leader in innovation, KEMEL has recently launched a new water lubricated stern tube seal called “Tandem Type EVK Seal”. This new product greatly contributes to safe navigation and environmental conservation.

#### FEATURES

- **Improved Wear Resistance**

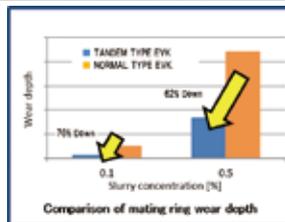
The active #1 seal ring is always lubricated by self-controlled clean fresh water. This results in a significant reduction in wear of the mating ring, seal housing and seal ring.

- **High Operability**

The spare #2 seal ring can be easily activated only by closing the valves without disassembling the seal unit.

- **Easy Upgrade from Existing EVK**

Converting an existing EVK seal into a Tandem type can be easily done just by adding another seal housing. (Ask KEMEL for more details.)



### INQUIRIES

Eagle Industry Co., Ltd. KEMEL Tokyo Branch

Tel : +81-3-3436-4830

E-mail : sales.tokyo@kemel.com, info@ekk.co.jp

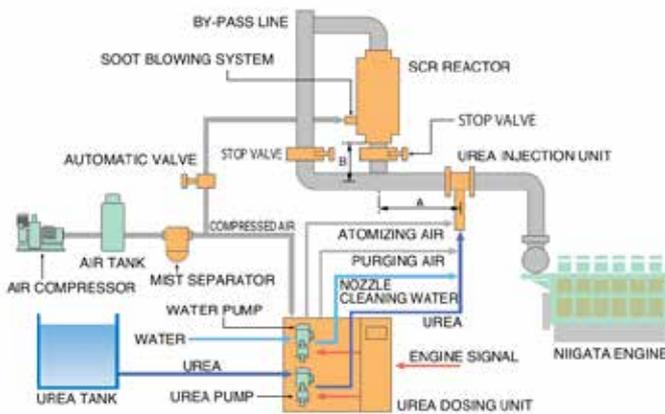
### SCR, NOx, Tier III

# Selective Catalytic Reduction System

## NIIGATA IHI Power Systems Co., Ltd.

<https://www.ihico.jp/ips/english>

### Selective Catalytic Reduction System



#### COMPONENTS OF SCR SYSTEM

[Note 1] Please plan for the straight length of the exhaust pipe from Urea injection unit (A) to be 2000mm or more and total length from Urea injection unit to reactor inlet (A+B) to be 3000mm or more.  
 [Note 2] Please contact NIIGATA if the above exhaust pipe length requirements cannot be met.

- Niigata has developed marine SCR compliant with the NOx Tier III enforced by the IMO, and prepared SCR for each engine (550 to 6600kW) as the line-up.
- Niigata has delivered the first SCR system for the marine propulsion engine in 1995, nearly 20 years ago, which is still working. Based on such experiences, Niigata started to supply SCR which can be apply to not only new building ships but also existing ships.
- Development of this SCR system utilizes the part of technologies and findings for compact design in the research undertaken by Niigata for “Super-clean Marine Diesel” Project of the JSMEA.
- Niigata Power Systems Co., Ltd. has integrated all the power systems division of IHI group into one company and newly started as IHI Power Systems Co., Ltd. from July 1st 2019.

### INQUIRIES

14-5, Sotokanda 2-Chome, Chiyoda-ku, Tokyo, 101-0021, Japan

Tel : +81-3-4366-1226 Fax : +81-3-4366-1310

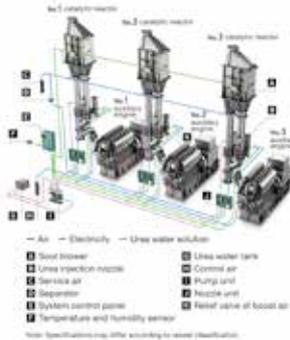
E-mail : ips-info\_sales1@ihi-g.com

# Selective Catalytic Reduction System

**YANMAR** YANMAR POWER TECHNOLOGY CO., LTD.

<https://www.yanmar.com/global/marinecommercial/>

## Selective Catalytic Reduction System



The SCR System with Three Unit Engine Installations



YANMAR developed SCR System that meets to IMO Tier3 regulations.

Making use of our original technology and wealth of experience, we have created a system whose design and functionality are optimized for marine vessels, and which is perfectly matched for use with diesel engines, both in ECA and non-ECA waters. In addition, repeated verification tests have been conducted on ocean-going vessels (equipped with SCR systems for 3 auxiliary engines) to further improve the system.

- The by-pass branching section and catalytic reactor have been integrated into a single unit, achieving high-performance NOx reduction. Engines equipped with our SCR system is obtained NOx certification (Scheme A), whilst maintaining performance onboard.
- Control unit integrates all devices including catalytic reactors mounted to each individual engine. A single pump unit and control panel can manage system for multiple engines, allowing the system to remain compact.

## INQUIRIES

Overseas Sales Division  
Marine Products Sales and Marketing Division  
Large Power Solution Business

1-1-1, Nagasu Higashidori, Amagasaki, Hyogo, 660-8585, Japan  
Tel : +81-6-6489-8042 Fax : +81-6-6489-1082  
E-mail : [vp-marine.sales@yanmar.com](mailto:vp-marine.sales@yanmar.com)

# Sewage Treatment Equipment

**SASAKURA ENGINEERING CO., LTD.**

<http://www.sasakura.co.jp/e/index.html>

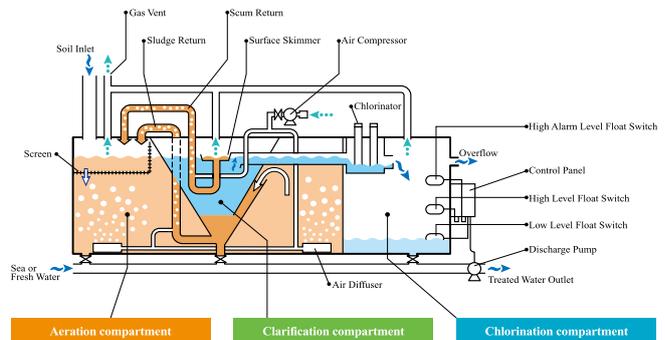
## Biological type Sewage Treatment Plant



The vessel discharge restrictions of the International Convention for the Prevention of Pollution from Ships are not limited to oil, but rather control sewage as well.

Sasakura's Sewage Treatment Plant has met to IMO(International Maritime Organization) regulation, MEPC. 227(64).

### ◆ Flow Diagram



## INQUIRIES

7-32, 4-chome, Takejima, Nishiyodogawa-ku, Osaka, 555-0011, Japan  
Tel : +81-6-6473-2134  
E-mail : [marine@skm.sasakura.co.jp](mailto:marine@skm.sasakura.co.jp)

## Sewage Treatment Equipment

**TAIKO** TAIKO KIKAI INDUSTRIES CO., LTD.

[www.https://www.taiko-kk.com/en](https://www.taiko-kk.com/en)

### Sewage Treatment Equipment



Our SBH series of marine sewage treatment plants are small, high-performance items that were developed by incorporating the sewage treatment technology we developed over many years in the business.

The products in the SBH series can be used on all ships with more than 400 gross tons and a crew of at least 15 as specified in Annex IV of the Marpol 73/78 Treaty.

We've also simplified operation and maintenance.

### INQUIRIES

209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi, 742-1598, Japan

Tel : +81-820-52-3113 Fax : +81-820-53-1001

E-mail : Please contact our website

### Inverter Energy Saving

## Shaft Driven Generating System

**NSDK** NISHISHIBA ELECTRIC CO., LTD.

<http://www.nishishiba.co.jp/nsdk/index.htm>

### Shaft Driven Generating System



The shaft generating system driven by a high-efficiency main engine enables energy saving.

Operation of the shaft generating system reduces the operation time of the diesel generator engine, resulting in maintenance work saving.

### INQUIRIES

**NISHISHIBA ELECTRIC CO., LTD. Osaka Branch**

29th Fl., Umeda Sky Building West Tower, 1-30 Oyodonaka 1-chome, Kita-ku, Osaka, 531-6129, Japan

Tel : +81-6-4797-2451 Fax : +81-6-4797-2453

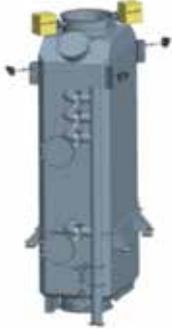
# SOx Scrubber



## Port Enterprise Co., Ltd.

<http://www.portenterprise.com>

### ME Production SOx Scrubber



Jumbo Ferry RoPax  
Main Engine x 2  
Aux Engine x 2  
Open Loop

ME Production SOx scrubber is 100% order made in order to ensure its efficacy as well as easy installation. Both the size and shape can be tailored to match any vessel without compromising its performance.

In addition to that, this award-winning system offers options of Na<sub>2</sub>CO<sub>3</sub> and MgO for alkaline chemical along with conventional NaOH. Both Na<sub>2</sub>CO<sub>3</sub> and MgO can be carried in powder instead of liquid. They are totally safe, easy to handle, and less expensive than NaOH.



ME Production SOx scrubber can also be catered for special needs, such as "Open Loop Plus" with optional active alkaline chemical dosing function to operate in freshwater/low salinity water areas or where strict pH discharge limit applies, containerization of wash water processing system for retrofit projects or vessels with rather limited space, and many more, limited only by your imagination.



Naviera Murueta  
5,600dwt Gen Cargo  
Main Engine x 1  
Hybrid



### INQUIRIES

No. 2-1-28, Chikko, Minato, Osaka, 552-0021, Japan

Tel : +81-6-6573-5391 Fax : +81-6-6575-3036

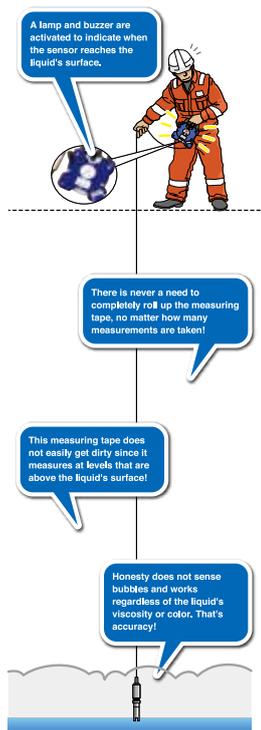
E-mail: [penterj@penterj.co.jp](mailto:penterj@penterj.co.jp)

# Tank Sounding

## SEMCO SEMCO, LTD.

<https://www.semco-ltd.com/en/>

### Sounding Scale with MGO Support Smart Sounding Scale Honesty



Anyone can easily, quickly, and accurately measure liquid fuel with high transparency and low connectivity.

A lamp and buzzer are activated to indicate when the sensor reaches the liquid's surface.

There is never a need to completely roll up the measuring tape, no matter how many measurements are taken.

This measuring tape does not easily get dirty since it measures at levels that are above the liquid's surface.

Honesty does not sense bubbles and works regardless of the liquid's viscosity or color. That's accuracy.



### INQUIRIES

5-4-23 Takatsuka-dai, Nishi-ku Kobe, Hyogo, 651-2271, Japan

Tel : +81-78-992-8361

E-mail : [info@semco-ltd.com](mailto:info@semco-ltd.com)

# Thermal Insulation



<https://www.kobekizai.co.jp/en/>

## ■TEMP SHIELD®

TEMP SHIELD® is a detachable thermal insulation cover which has been developed to our original design and utilizes custom sewing technology using knowledge and experience accumulated over 50 years of providing heat insulation solutions for marine diesel engines.



- Easy installation and detachment: it can shorten the construction period in dock and reduce life time maintenance costs
- The best thermal insulation: it is made-to-order to fit the specific machinery size and shape
- High product availability: Once the first made-to order is completed, then repeat production is simple since each component is manufactured utilizing its own individual drawing

High energy saving effect

Measuring the target properly and directly and by choosing the best material suited to its form and usage, very good energy saving result can be realized.



## INQUIRIES

3-6-10, Nishinagasu cho, Amagasaki, Hyogo, 660-0805, Japan  
Tel : +81-6-6401-4351 Fax : +81-6-6401-3131  
<https://www.kobekizai.co.jp/en/inquiry/>

# Turbochargers



## Turbo Systems United CO., LTD.

<http://www.turbo.co.jp/doc/eng/>

### Power2® 800-M



Power2® 800-M is ABB's second-generation two-stage turbocharging system designed right from the start to deliver all the benefits of a dedicated two-stage turbocharging solution.

Power2® 800-M achieves turbocharging efficiencies of more than 75 percent and provides charge air pressure of up to 12 bar, and that's a new industry benchmark, making it the most powerful turbocharging system available in the market.

This translates to potential for double-digit increases in power output density and six-figure annual fuel savings. At the same time contributing to significantly reduced NOx emissions.

Combining the capability for Valve Control management(VCM®) to control air intake with the increased turbocharging efficiency of a two-stage turbocharging solution, additional engine efficiency gains are possible. The combination of two-stage turbocharging and VCM® ultimately enables higher output and a number of key benefits for operators.

## INQUIRIES

**Turbo Systems United Co., Ltd. Tokyo Office**  
ThinkPark Tower 22F 2-1-1, Osaki, Shinagawa-ku, Tokyo 141-6022  
Tel : +81-3-4523-6900  
E-mail : [tsu\\_general@turbo.co.jp](mailto:tsu_general@turbo.co.jp)

Two-stage turbocharging is a key technology in enabling significantly reduced fuel consumption and emissions, in addition to increased engine power density.

# Turbochargers


<https://www.mhi-mme.com/>

MET Turbochargers are the standard worldwide exhaust gas turbochargers used in large marine and stationary engines.



### NEW Radial Turbocharger MET-ER Series

The MET-ER Series has been developed based on high pressure ratio requirements for turbochargers, in order to improve the performance of and reduce the NOx emissions of four stroke engines. This turbocharger further increases the pressure ratio of the previous MET-SRC Series and can support a maximum compressor pressure ratio of 6.0. The series features seven types, and a single turbocharger can handle engine outputs from approximately 500 kW to 5,800 kW. Furthermore, the series features improved responsiveness and reduces the number of parts to achieve a more compact design and increase maintainability. MET-ER turbochargers will be released to the market after conducting tests with engine manufacturers this year.



### New Axial Turbocharger MET-MBII Series

The new MET-MBII Series launched this year provides turbochargers that are one or two models more compact when compared to previous models with the same engine output, thanks to its larger impeller capacity. In order to maintain high efficiency while achieving a large capacity, a new compressor impeller with an optimized blade count and blade angle distribution has been developed for the MET-MBII Series. Furthermore, the series also adopts a new turbine with optimized turbine blade throat distribution. On the other hand, casing components except for the silencer have not been changed from the previous MET-MB Series, which enables the product to inherit the high reliability and maintainability of that series.

## INQUIRIES

Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.  
Tokyo Branch Office

Tel : +81-50-3848-4400 E-mail: info\_meet@mhi-mme.com

# Underwater Robot

**KEW KUNIMORI ENGINEERING WORKS CO., LTD.**

<http://www.kunimori.co.jp/en/>

### BlueROV2



Product Name: BlueROV2(SBR200S)

The BlueROV2 is a remotely operated vehicle with high scalability that cannot be achieved with underwater drones.

The six thrusters on board realize smooth horizontal movement and are used not only in the sea, but also in rivers, dams, water facilities, plants, etc. in various sites, including underwater structural inspections.

Because it is lightweight, you can conduct underwater surveys anytime, anywhere, and freely.

It is small but stable and smooth with high mobility, enabling the photography required for inspection and investigation.

In addition, the scalable design allows for a variety of options, such as sonar and infrared cameras.

## INQUIRIES

Overseas sales Group

Tel : +81-78-686-0320 E-mail : overseas@kunimori.co.jp

Singapore Office

Tel : + 65-6226-0321 E-mail : kew-sgp@kunimori.co.jp

## Valves, safety



**FUKUI SEISAKUSHO CO., LTD.**

[https://www.fkis.co.jp/eng/e\\_welcome.html](https://www.fkis.co.jp/eng/e_welcome.html)



### Type PSL-MP (Pilot Operated) / REC (Conventional) Pressure Safety Valve for Hydrogen Service

FUKUI PSL-MP and REC type have been installed on LNG and LPG carries to support their safe and secure operation. Although they are certified by major classification societies, the temperature performance needed to be enhanced to meet Hydrogen service which has attracted great attention as a zero-CO<sub>2</sub> emission fuel. The expansion test of the certification scope was conducted, in cooperation with external partners, with helium gas cooled by liquefied hydrogen down to -253 degC for the first time in the world. FUKUI cryogenic knowledge continues to contribute safety and security of the future energy to achieve sustainable development.

## INQUIRIES

### Global Marketing Group

1-6 Shodaitajika, Hirakata, Osaka, 573-1132, Japan

Tel : +81-72-857-4527

E-mail: [stm@fkis.co.jp](mailto:stm@fkis.co.jp)

eco-friendly, deck machinery, winch, windlass, mooring winch, electric

## Winches, mooring, electric & hydraulic



**MANABE ZOKI CO., LTD.**

<http://manabezoki.co.jp/>

### Electric deck machinery driven by Inverter



Our electric deck machinery is driven by inverter system which enables you to operate Windlass and Mooring winch very smoothly and easily. In addition to eco-friendly owing to no use of working oil, by adopting our own sampling-controlled AUTO TENSION system, ship can keep the mooring position in stable condition even though changing marine tide or loading quantity on board. Sampling-controlled AUTO TENSION controls each winch group independently and each winch group works in interval during AUTO TENSION mode. You can also easily adjust output torque from 20% to 100% by torque volume knob according to mooring condition.

## INQUIRIES

2F Ichigo Mita Building 5-13-18 Shiba, Minato-Ku, Tokyo, 108-004, Japan

Tel : +81-3-6435-2966 Fax : +81-3-6435-2015

E-mail : [eigyou\\_2@manabezoki.co.jp](mailto:eigyou_2@manabezoki.co.jp)

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表 3