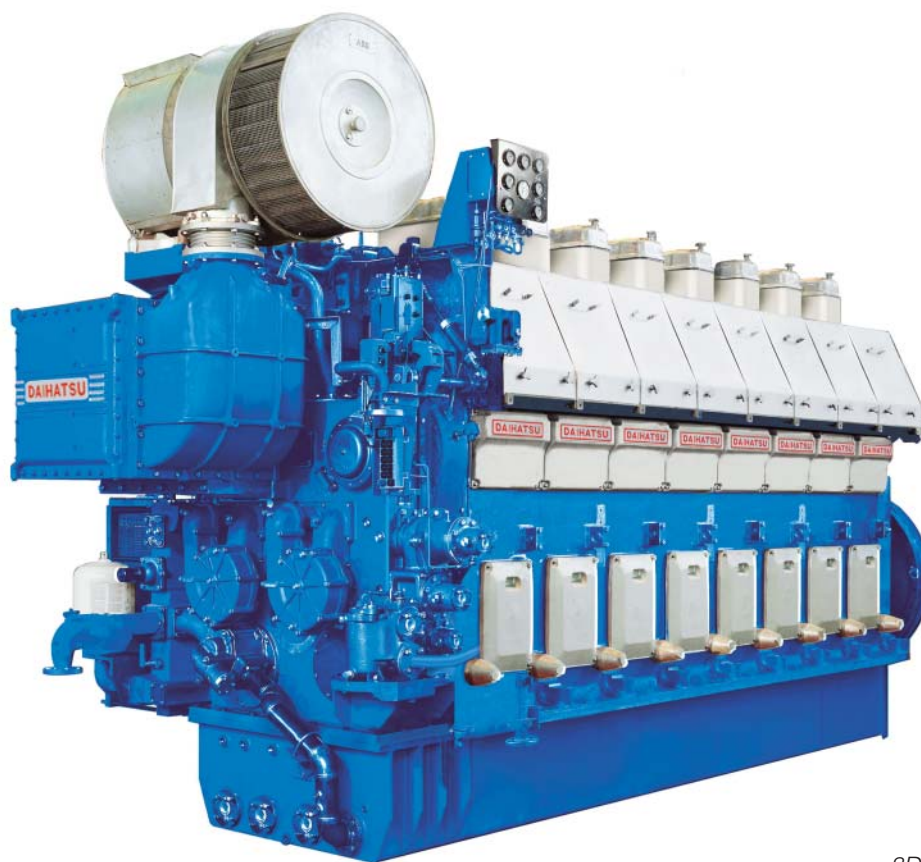


Jsmea News

Large Medium-Speed Diesel Engine Developed



8DC-32 type engine

Daihatsu Diesel Mfg. Co., Ltd. has added the newly developed large medium-speed diesel engine DC-32 to its traditional DK series and thereby further strengthened this product line. The new type, measuring 320 mm in cylinder bore and 400 mm in piston stroke, is available in six-cylinder and eight-cylinder models. At revolutions of 720 min⁻¹, DC-32 covers a power output range of 2,905 to 3,844 kW, broad enough to meet customers' diverse needs for the generating sets and

main engines of containerships.

The reliability aspect of technology has been further advanced by capitalizing on the experience built up through the delivery of many DK engines in the past. The engines not only reflect full consideration for environmental conservation and friendliness but also are easy to use, designed with emphasis on the ease of handling and maintenance.

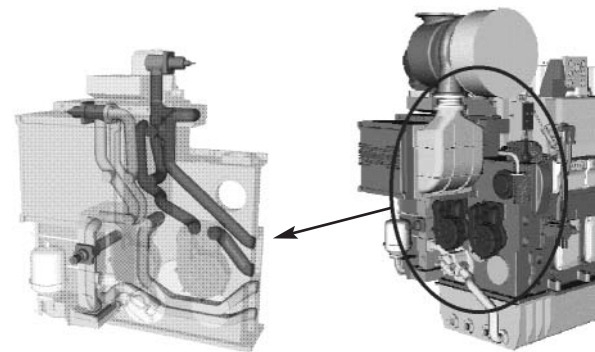
Main Particulars

Engine type		6DC-32	8DC-32
No. of cylinders		6	8
Cylinder bore x piston stroke	mm	320 x 400	
Revolutions	min ⁻¹	720	
Engine output	kWm	2905	3844
Generator output	kWe	2760	3690
Break mean effective pressure	MPa	2.51	2.49

Simple structure comprising reduced number of parts

The number of external piping units has been substantially reduced by redesigning the pipe routing within the engine. The turbocharger, air cooler, cooling water pump, lubricating oil pump, lubricating oil cooler, lubricating oil filter and other auxiliaries are concentrated in the fore part of the engine to structurally facilitate maintenance and inspection.

The cooling water passage is built into the gear case. The lubricating oil passage is also formed within the block unit for fitting the lubricating oil cooler integrated with the gear case. Therefore, the connecting part between the lubricating oil pump and the cooler-fitting block unit and that between the lubricating oil filter and the frame are securely connected by the block, resulting in a simple structure having no piping.



Cooling water and lubricating oil passages built into gear case

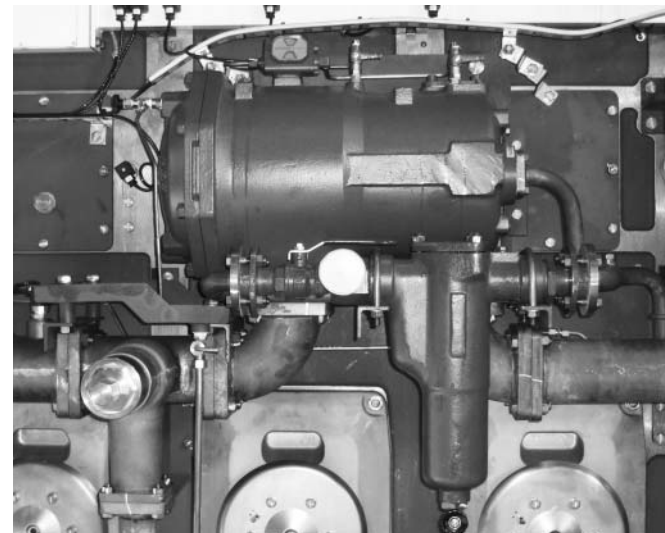
Structure facilitating maintenance and inspection

As the air intake and exhaust lines are arranged in the same direction and the inspecting

side is concentrated on the fuel pump side, various procedures of inspection and disassembling can be easily accomplished.

Use of non-cooled fuel nozzles in place of conventional cooled fuel nozzles as standard equipment has dispensed with piping for cooling, resulting in increased reliability as well as a reduction in the number of parts. Piping around cylinder heads is also dispensed with to make the structure easier to handle and the maintenance work more reliable.

A locally installed automatic backwash filter is used for lubricating oil as a standard item. It serves to not only enhance the filtering performance but also eliminate clogging and thereby help reduce the routine maintenance needs substantially.



Automatic backwash filter for lubricating oil

Compactness

Efficient incorporation of large auxiliaries and related items including the turbocharger, air cooler and lubricating oil cooler into the block unit makes the new type engine more compact and lighter than conventional engines of the same output class besides contributing to reducing the number of parts. In the aspect of engine room planning, it also helps more effective use of the available space, and the functional piping arrangement concentrated at the fore end serves to reduce the out-fitting and piping tasks inboard.

Exhaust Dust Cleaner for Marine Use

Daiwa Kogyo Co., Ltd. (DKC) has developed jointly with Monohakobi Technology Institute (MTI, headquartered in Tokyo), a member company of the NYK group, an exhaust dust cleaner for use with marine diesel generators. Patent is pending for this product.

Electric power required for the operation of a ship and the handling of its cargo is supplied by a diesel generator on board, and the recently developed exhaust dust cleaner is intended for removal of soot dust contained in the exhaust gas of the diesel generator.

DKC in 2003 installed a test device for cleaning exhaust gas from an 800-kilowatt (kW) class diesel generator in an existing car carrier, and in 2006 installed exhaust dust cleaners for cleaning exhaust gas from 1,200-kW class diesel generators in two newly built car carriers. The devices were tested for durability when used with A heavy oil and C heavy oil, and have since been improved in many respects.

The recently developed improved version of the exhaust dust cleaner is capable of cleaning exhaust gas from two diesel generators, and installed in car carriers completed in September and October 2007.

This exhaust dust cleaner is reduced in size and weight by improving the internal structure and the arrangement of constituent elements, and capable of removing exhaust dust from the combustion of heavy oil mainly for marine use to 40% of or below the maximum permissible level under the Air Pollution Control Law. Another major feature of the exhaust dust cleaner is its significantly reduced need for maintenance achieved by automating the washing of filters.

DKC will continue to develop new technologies friendly to the global environment and actively promote the use of such latest technologies aboard newly built vessels.

Outline of Exhaust Dust Cleaner

Specification	Specification for use with C heavy oil (equivalent to 380 cSt) Applicable to 1,200 kW class diesel generators
Exhaust treating capacity	About 8,000 Nm ³ /hr X 2 sets
Approximate dimensions	1,300 mm (width) X 1,200 mm (length) X 2,600 mm (height)
Soot dust removing	Concentration of soot dust in exhaust gas
Capability	Suppressed to 0.03 to 0.04 g/ Nm ³

Function and characteristics

- **It copes with a big capacity generator, too**
It has coped with the generator (800kW~1200kW) of the car ship.

It can cope with big capacity from the small capacity at the request, too.

- **It copes with C heavy oil & A heavy oil**
It can use not only during the anchorage but also during the voyage as well.
- **The exit dust concentration which became stable**
That it is decided by the kind of the fuel, a load is, exit concentration 0.03g/m³N~0.04g/m³N.
- **Maintenance by the combination of the special metal filter becomes free**
The filter made of the stainless steel metal which is good at the corrosion and which is never damaged is adopted.
- **Variouly, safety due to the inter-lock**
- **Automatic reverse cleaning by the compressed air**
By the back pressure to the generator and the difference pressure of the device entrance, jet pulse jetting.
- **The soot which has collected , in the bottom part of the device, throw it away after having saved**
- **Easy operation by the touch panel ceremony control board**
- **Exhaust gas fan**
To keep the back pressure to the generator in the constant, with an exhaust gas fan, compulsory exhaust.
- **Light weight & is compact**



Exhaust dust cleaner installed inboard



External view of exhaust dust cleaner



Daihatsu Diesel Mfg. Co., Ltd.

Address: 1-30, Oyodonaka 1-chome, Kita-ku, Osaka 531-0076, Japan
Tel: +81-6-6454-2331 Fax: +81-6-6454-2750
URL: http://www.dhtd.co.jp



Daiwa Kogyo Co., Ltd.

Address: 3-11-21, Tsugiyu, Amagasaki, Hyogo 661-0965, Japan
Tel: +81-6-6499-3428 Fax: +81-6-6499-2336
E-mail: sato@dkc-japan.com URL: http://www.dkc-japan.co.jp/

Pulse Lubricating System Developed

The ongoing steep rise of cylinder oil price is making shipowners' and shipmanagers' requirements for reduced cylinder oil consumption even more stringent.

Wärtsilä Switzerland Ltd. (WCH), the licensor of two-stroke diesel engines built by Diesel United Ltd. (DU), has developed a pulse lubricating system, which can help substantially reduce the required volume of lubricating oil, compared with the conventional accumulator type lubricating system. WCH has already started application of the new system on newly built engines.

1) Notable features of the pulse lubricating system are described below.

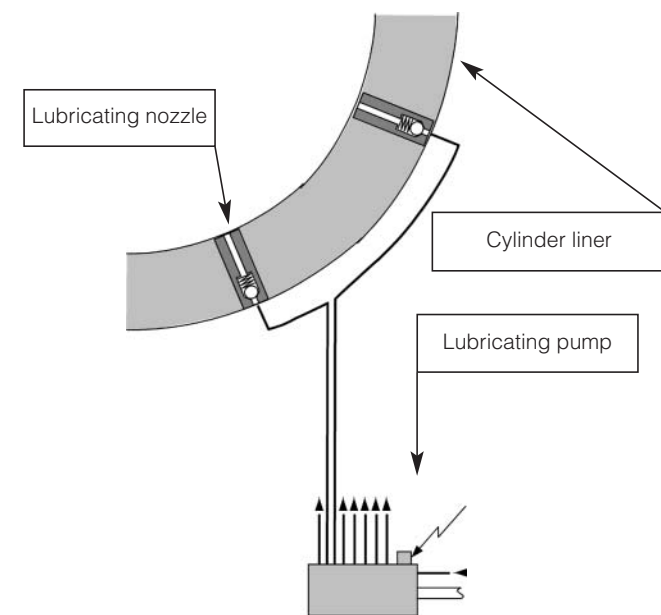
Functional characteristics include:

- Lubrication at the optimal timing under electronic control.
- Distribution over the liner-sliding surface by drip spraying of cylinder oil (without being sprayed in a mist form, there is neither loss nor flowing out during scavenging).
- Proper lubrication even under low load.
- Highly reliable lubricating nozzle (simply structured).

These features make it possible to further reduce the volume of lubricating oil consumed.

Structural characteristics include:

- Driving of the lubricating pump with servo oil.



- No need for temperature (viscosity) control of cylinder oil.
- Double wall piping of servo oil line.
- Detection of abnormality with various sensors.

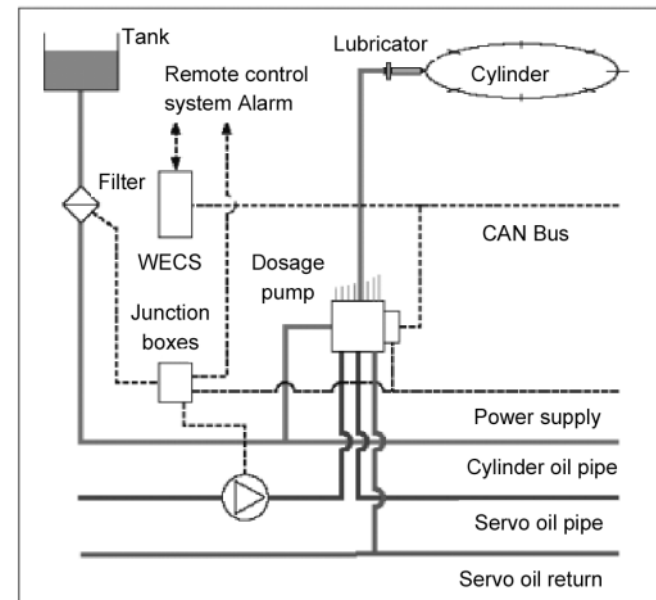
2) Results of field tests

The results of field tests WCH has conducted since 2004 (on small bore engines) and 2005 (on large bore engines) are summarized below.

- The minimum lubricating rate of 0.6 g/kWh (0.44 g/bhph) has been achieved during the tests on both large bore engines (960 in bore) and small bore engines (580 in bore).
- Both cylinder liners and piston rings maintained satisfactory conditions.

3) Application to newly built ships

- In South Korea, a vessel mounted with the first engine in which every cylinder is equipped with the pulse lubricating system, entered service in 2006.
- In Japan, DU is scheduled to deliver an engine equipped with this system in 2007.



For details of this system and the retrofit pulse lubricating system intended for ships already in service, please access DU's Web site at <<http://www.ihl.co.jp/du/>>.

INMARSAT Fleet Broadband FB250 JUE-250

Outline

JUE-250 produced by Japan Radio Co. Ltd. (JRC) is a compact maritime mobile earth station compatible with the fourth-generation satellites of INMARSAT.

JUE-250 allows not only packet data service (at a maximum speed of 284 Kbps) and streaming packet service (32 Kbps, 64 Kbps or 128 Kbps) for data communication and speech or G3 facsimile, but also handling of short messages of up to 160 characters (alphabetical letters and numerals) each. It can provide these services at the same time*.

Replacing the inboard unit of JRC's earlier model INMARSAT F33 JUE-33 with this product would make it possible to upgrade to FB250.

* Simultaneous use of speech and G3 facsimile is not possible.

Features

- Simple Internet access with a launch pad*
- Easy operation with a dedicated handset (multifunctional telephone)
- Permits connection to the inboard network and operation by multiple users.
- Compatibility with a variety of interfaces (Ethernet, RS-232C and USB)
- Function of gyro-less tracking

* Launch pad: Common software for INMARSAT Fleet Broadband

General Specifications (the specifications are subject to change without prior notice):

- Communication functions
 - Speech communication: 4 Kbps (AMBE+2)
 - Facsimile: G3 (3.1 K audio)
 - Packet data communication: 284 Kbps at maximum
 - Streaming data communication:
 - Selectable from 32 Kbps, 64 Kbps and 128 Kbps
 - Short message: Up to 160 characters (alphabetical letters and numerals)
- Frequency bands:
 - For transmission: 1626.5 MHz to 1660.5 MHz
 - For reception: 1525.0 MHz to 1559.0 MHz
- EIRP:
 - +15.1 dBW + 1/-2 dB to +5 dBW + 1/-2 dB
- Modulation system:
 - TX: $\pi/4$ -QPSK/16QAM
 - RX: QPSK/16QAM
- Operating voltage: 24 V D.C.

External shape (The external shape is subject to change without prior notice.)



Onboard unit



Inboard unit



Handset



Diesel United, Ltd.

Address: 8, Kanda Suda-cho 2-chome, Chiyoda-ku, Tokyo 101-0041, Japan
 Tel: +81-3-3257-8222 Fax: +81-3-3257-8220
 E-mail: info@du.ihl.co.jp URL: <http://www.ihl.co.jp/du/english/home/home.html>



Japan Radio Co., Ltd.

Marine Electronics Business Department
 Address: Nittochi Nishi-Shinjuku bldg. 10-1, Nishi-Shinjuku 6-chome, Shinjuku-ku, Tokyo 160-8328, Japan
 Tel: +81-3-3348-4099 Fax: +81-3-3348-4139 URL: <http://www.jrc.co.jp>

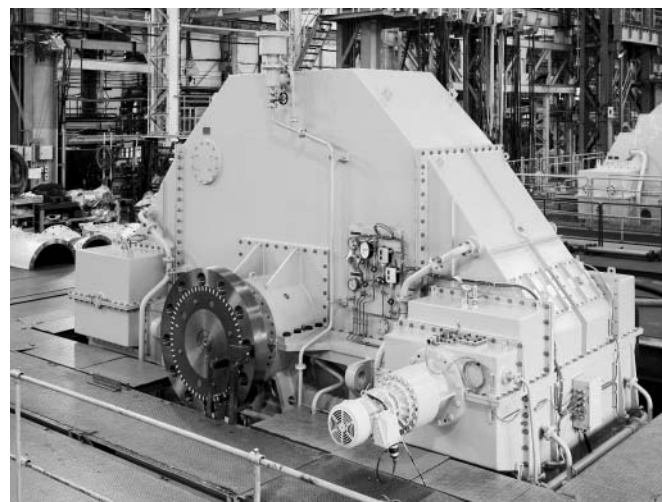
Kawasaki Develops Gearbox for DFDE Propelled LNG carriers

Kawasaki Heavy Industries Ltd. (KHI) has developed a gearbox for marine use, specifically intended for use with dual-fuel diesel electric (DFDE) propulsion systems for LNG carriers. In launching the development project, the manufacturer adopted the same design philosophy, materials and fabrication method as for the UA-type gearbox for LNG carriers' main steam turbines, of which more than 100 units had been delivered, with a view to achieving the high level of reliability and durability required for LNG carriers. As the DFDE propulsion system uses medium-speed motors, the gearbox reduces the speed with single reduction stage, and its maximum gear ratio is 11. It is adaptable to both twin-motor single-propeller and single-motor single-propeller systems. The first unit of the new product, an M2H-350 model, was shipped on June 5, 2007 for installation in a twin-motor single-propeller DFDE-driven 155,000 m3 LNG carrier.

Principal particulars of this gearbox are listed in the table below.

The newly developed gearbox has the following notable features.

- (1) It has an adjusting mechanism to achieve a good tooth contact after its installation on board. Whereas a good tooth contact is essential for trouble-free use for a long period, KHI's gearbox permits adjustment of the tooth contact even after its installation on board. This is one of the reasons for the high reliability of Kawasaki's gearbox.
- (2) The use of double helical gears enables the thrust force generated by the helix angle to be set off and thereby dispenses with the thrust bearing for positioning. This results in a compact structure, and the



reduction in the number of bearings used contributes to higher efficiency. The inclination of gear shafts due to the thrust force generated by the helix angle is not occur, and this also contributes to a good tooth contact. Furthermore, double helical gears permit the use of a greater helix angle than single helical gears. The high overlap ratio deriving from this advantage serves to suppress the vibration and noise of the gears.

- (3) Upon introduction in October 2006 of an ultra precision gear grinding machine which permits grinding of gear wheels measuring up to 5,000 mm in diameter, KHI has become able to finish-grind both pinions and gear wheels. This has made it possible for more accurate and uniform finishing of tooth surfaces. Kawasaki has achieved a level of gear machining accuracy of the ISO accuracy class 4 or even above.

- (4) The M2H gearbox has attained a high efficiency represented by a mechanical loss of 1% or even less. KHI's high efficiency marine gearbox contributes to reducing the running cost and the environmental load by suppressing the consumption of propulsion fuel.

Kawasaki has already received orders for 15 DFDE gearbox for installation aboard LNG carriers, reflecting the customers' appreciation of the performance records of its gearbox for use with steam turbines. The manufacturer will continue to develop and supply propulsion system for LNG carrier, which will have to meet further diversified needs, to the greatest possible satisfaction of its customers.

Principal particulars

M2H-350 type gearbox	
Type	Dual input / Single output Single reduction Double-Helical gear
Output power	24,950 kW
Revolution	87.5 rpm
Gear material (pinion / wheel)	Ni-Cr-steel / Ni-Cr-Mo-steel
Heat treatment (pinion / wheel)	Carburizing / Through hardening
Tooth surface finish (pinion / wheel)	Grinding / Grinding
Tooth surface modification (pinion / wheel)	Ultra precision modification
Main thrust bearing	Built-in, fwd side of gear casing

Kawasaki

Kawasaki Heavy Industries, Ltd. Marine Machinery Sales Department
Address: 4-1, Hamamatsu-cho 2-chome, Minato-ku, Tokyo 105-6116, Japan
Tel: +81-3-3435-2374 Fax: +81-3-3435-2022
E-mail: hashimoto_h@khi.co.jp URL: http://www.khi.co.jp

Middle Depth Water Thermometer SBT-500 for Fishery Use

Introduction

Instruments for measuring the water temperature of the middle depth layer (from 100 meters to 500 meters from the sea's surface) for use in net fishing and long-line fishing were already available from many suppliers including Murayama Denki Ltd. But they involved a number of problems, including too large of a sensor, inadequate waterproofing or battery life and, particularly for tuna fishing boats that might spend two years out at sea, water leaks.

The SBT-500 thermometer, jointly developed by Murayama Denki Ltd. and the National Research Institute of Far Seas Fisheries, is intended to overcome these problems.

Its features include:

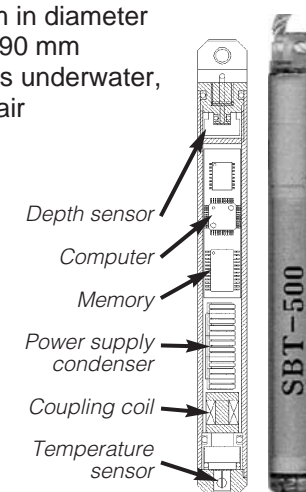
- ① Small size: 18 millimeters (mm) in diameter, 190 mm in overall length and 35 grams in underwater weight
- ② Waterproofing: Fully sealed resin-filled structure
- ③ Long battery life: Use of a condenser instead of a chemical battery.
- ④ No connector used: Communication and charging rely on electromagnetic coupling
- ⑤ 24-Hour operation: Capable of operating for 44 consecutive hours and keeping data for three days or even longer

Internal Structure

The thermometer consists of a depth sensor, a temperature sensor, a measuring circuit, a computer, a power supply unit and a communication circuit, and developmental efforts were focused on the measuring circuit and the communication circuit.

Diameter: 18 mm in diameter
Overall length: 190 mm
Weight: 35 grams underwater,
75 grams in the air

The CPU is a dual clock type unit, designed not to consume a current of more than 5 uA on the average including the consumption of the measuring circuit and other related items. A long testing time was consumed to ensure satisfactory reproduction and reliability at the time of instantaneous actuation of the measuring circuit.

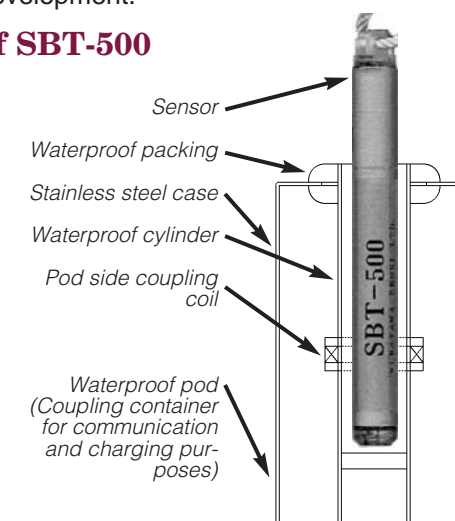


(The illustration shows a trial product, which is different from the production model.)

As the thermometer is to be fitted in the bait position of the tuna longline, it should be small and cylindrical shaped and, as temperature and depth sensors are positioned at front and rear, the electromagnetic coupling with the interface - called the pod - posed a bottleneck in development.

Realities of SBT-500

The inside of the relatively thick polycarbonate cylinder is a fully sealed structure filled with resin, and experience has demonstrated that it can still operate even if the external wall cracked and allowed water to leak in.



The electromagnetic coupling via waterproof structures on both the sensor and the pod sides are very inefficient, but as the charge to be stored is very small, it can be fully useful for practical purposes.

As both the sensor and the pod are sealed and waterproof, drawing or inserting them while wet with seawater poses no problem, and therefore there is no fear of being affected by smear. This ease in operation is well liked by fishing vessel owners.

Often a deepsea tuna-fishing vessel that is launched on a fishing voyage is away from the homeland for a year or even two years, and some owners may have the crews return home by air, leaving the vessels overseas.

This operational practice makes the fully waterproof feature, which frees the thermometer from maintenance care other than due to breakage, an element of vital importance.

Although the limitation of available space allows no detailed description, data management for the SBT-500 system was at first accomplished with a personal computer, a dedicated reader with a built-in graphic printer providing B5 size printed sheets was introduced to the market in 2006, and taken up in a TV program.

A function to save data into a memory card has been added this year, representing an aspect of further development of this product.



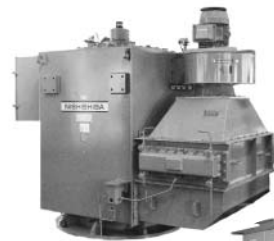
Murayama Denki Ltd.

Address: 13-1, Gohongi 2-chome, Meguro-ku, Tokyo 153-0053, Japan
Tel: +81-3-3711-5201 Fax: +81-3-3719-3600
E-mail: info@murayama-denki.co.jp URL: http://www.jsmea.or.jp/kaiin-e/murayama/indexE.html

Nishishiba Develops New Integrated Control System used Multiple Inverters for Electrical Propulsion of Coastal Vessel

Nishishiba Electric Co. Ltd. has developed, jointly with the New Energy and Industrial Technology Development Organization (NEDO), Integrated Control System used Multiple Inverters for electrical propulsion of Coastal Vessel.

The system can also serve as an inverter for driving the propulsion motor by integrated control of small multi-purpose inverters for driving the propulsion motor. The use of this system eliminates the need for a dedicated inverter to drive the propulsion motor, and thereby enables the reduction of the total inverter capacity on board. This feature substantially improves space efficiency, economy, reliability and maneuverability of the vessel.



Multi-winding propulsion motor



Multi-inverter integrated control board

Background

A vessel would be equipped with, in addition to a system for regular propulsion, various power systems including a thruster system to support its operation in port, cargo system for use in cargo handling while in berth and engine room auxiliaries required while at sea. In an electric propulsion vessel, electrification of all these power systems and variable speed control achieved by the use of inverters make possible environmentally friendly operation at high efficiency.

However, not all these power systems work at the same time when the ship is in operation, but only a limited number of inverters are used at any one time. In view of this circumstance, Nishishiba has developed the Integrated Control System used Multiple Inverters, which runs the propulsion motor by operating in parallel small inverter devices that are not used while at sea, such as cargo handling equipment and the thruster system.

A line chart of the conventional inverter control system (the driving motor and the inverter device are controlled on a one-to-one basis) is shown as Fig. 1, and a similar chart of the Integrated Control System used Multiple Inverters, as Fig. 2.

Features of Integrated Control System

The Integrated Control System used Multiple Inverters has the following notable features.

- 1) Its use in combination with auxiliaries enables the equipment to be utilized more effectively.
- 2) The installation space of inboard systems can be substantially reduced.
- 3) Individual inverters can be cut off to achieve integrated control of any desired combination of inverters.
- 4) Cut out operation matching the number of active inverters is possible.

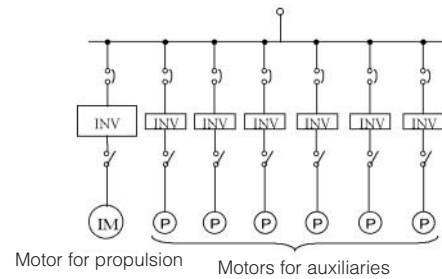


Fig. 1 Line chart of conventional inverter control system

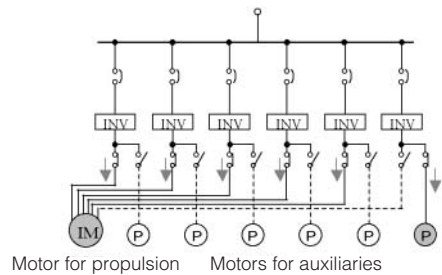


Fig. 2 Line chart of Integrated Control System used Multiple Inverters

- 5) The propulsion motor and the motors for auxiliaries can be operated simultaneously.
- 6) Overload of the inverters can be prevented by cut out (reduced output) operation.
- 7) The current balancing of motor windings can be achieved by synchronous operation and constant current control of individual inverters.
- 8) Operation with any abnormal inverter being cut out enables redundancy and safety to be secured.

Operation of Integrated Control System

The system in which multiple small inverters are used in parallel and each inverter is connected to each winding of a multi-winding propulsion motor is operated in the following manner.

- 1) Some inverters are subjected to constant current control of each winding while being synchronously operated to achieve current balancing of individual windings of motor.
- 2) At sea, the propulsion motor is operated with multiple inverters. At port, each individual inverter, whose connection is switched to one auxiliary or another, is independently operated.
- 3) Any of the inverters operated in parallel can be cut out as desired. When any inverter is cut out, the setting of current limitation for each inverter is automatically changed, and the output of the propulsion motor is reduced, and operation is thereby kept stable without suffering any over current.
- 4) When any inverter is intentionally cut out during operation, change-over to other auxiliaries while at sea makes possible simultaneous operation of the propulsion motor and the auxiliaries. When the propulsion load is low in entering or leaving a port, simultaneous operation of the bow thruster is also made possible.

MF/HF Radio Apparatus TRM-1500

Outline

TRM-1500 manufactured by TOKIMEC INC. is a compact high-performance radio apparatus meeting the installation requirements of GMDSS.

This apparatus, having a transmitting/receiving function, a digital selective calling (DSC) function, a digital selective calling/listening (WK) function and a narrow band direct printing (NBDP) function, permits communication by telephone, DSC and NBDP.

A duplicated INMARSAT C is accommodated into a self-supporting type communication console compactly with a view of operating convenience in addition to an MF/HF transceiver unit, a GMDSS unit, an MF/HF controller, an RO printer, a meter unit, an emergency lamp and a power supply unit.

The apparatus is in a two-unit configuration coupled with an antenna-matching device, resulting in more efficient fit for work and space savings.

Features

Fully Automatic Matching

A fully automatic antenna matching device is used to enable the full band of transmission frequencies to be preset.

Centralized Control

Every operation related to MF/HF band GMDSS can be accomplished from the MF/HF controller. The continuity test of DSC can be easily performed on the display screen.

Table of Stations

By registering frequency information on shore stations and individual sea routes in a table of stations in advance, frequency setting can be easily accomplished when initiating communication.

Function for Scheduled Communication

Scheduled communication is possible in every mode of communication. Available ways of schedule registration include daily registration to be presented every day and date registration to designate dates and hours.

Self-Diagnosing Function

A simulated radio system is automatically created on a system diagnostic screen to allow for self-diagnosis every function.

Energy-Efficient Design

Power consumption is approximately 1/2 of a

comparable conventional type (TOKIMEC product).

Specifications

Frequency range:	1.6 to 27.5 MHz
Electric wave types:	J3E, F1B and H3E for reception alone)
Frequency setting:	Free setting Presetting ITU setting (ITU channel incorporated)
Temperature range:	-15°C to 55°C
Humidity:	93%, +40°C
Power supply voltage:	AC 100 V to 220 V ±10%, 1ø, 60 Hz and DC 24 V
Power consumption:	AC 1.5 kVA or below, DC 40A or below
Antenna power:	1.6 to 4 MHz, 100 W/*75 W (PEP) 4 to 26.175 MHz, 150 W/*75 W (PEP)

* When operating on an auxiliary power source.

External appearance



Communication console

Nishishiba Electric Co., Ltd.

Address: Shin-Osaka Iida Bldg., 5-33, Nishimiyahara 1-chome, Yodogawa-ku, Osaka 532-0004, Japan
Tel: +81-6-6397-3461 Fax: +81-6-6397-3475
Contact: <https://www.nishishiba.co.jp/nsdk/english/contact/contact.htm> URL: <http://www.nishishiba.co.jp/>



TOKIMEC Inc.

Address: 2-16-46 Minami-Kamata, Ohta-ku, Tokyo 144-8551, Japan
Tel: +81-3-3737-8631 Fax: +81-3-3737-8666
URL: <http://www.tokimec.co.jp/marine/>

Four-Stroke Outboard Motors F20B and F15C

Yamaha Motor Co., Ltd. introduced the four-stroke outboard motors F20B and F15C in September 2006 and they enjoy high reputation in the market.

1. Overview

Upon the achievement of marketing the four-stroke outboard motors since 1984, Yamaha attempted to provide more mature and refined products to differentiate them from the existing four-stroke outboard motor models. The development efforts were focused on the following aspects:

1) Conservation of Global Environment

To meet all emission requirements of U.S. EPA, CARB (California Air Resources Board) 2008, and Europe's EU1 for contributing to create a cleaner environment.

2) Ultimate Shape of Light Weight and Compactness

"Weight" and "Cowling dimensions" affect the boat's running performance and the ease of carriage on shore. By the accomplishment of further weight reduction and compactness, the new F20B and F15C can be used in wider range of applications and boat types, and are more suitable as a replacement for not only the four-stroke outboard motors, but also the two-stroke counterparts.

3) Enhancement of Easy Handling and Reliability

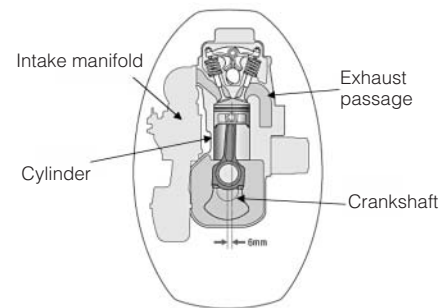
To seek for the handling ease and reliability that exceeds the conventional models of both four-strokes and two-strokes.

2. Features

● Thorough Weight Reduction

The following measures were taken to cut down the weight:

- 1) Use of aluminum connecting rod
- 2) Reduction of cowling wall thickness by utilizing casting analysis
- 3) Reduction of mounting bracket thickness by utilizing strength analysis



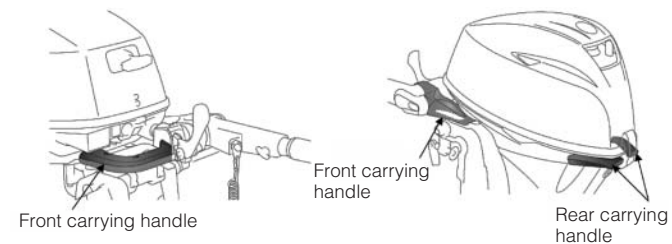
Four-Stroke Outboard Motors F20B/F15C

● Offset Cylinders

Engine cylinders are offset from the crankshaft centerline toward the exhaust passage. The resistance in the intake passage is reduced and the cowling becomes more slender to have the equivalent width to the previous 15ps model.

● Larger Carrying Handles

In order to facilitate the carriage on shore and the rigging on the moored boat at the marina, the carrying handle grips provided in the front and in the rear of the body are the largest in the smaller sized outboard motor class. The shape of the grip is optimized as well.



● Improved startability

Quick starting, one of the essential requirements for the outboard motors is assured by the newly employed water-cooled fuel pump, along with the existing decompression mechanism and carburetor auto-starter (prime start) system.

3. Summary

We believe the new F20B and F15C have embodied "low emission performance", "light weight and compactness", and "enhancement of easy handling" to the extent that meets our objectives, and they can satisfy the expectations of the users in various applications. We are committed to serve every need of our customers and will continue to provide the best choice for the users.

	F20B	F15C
Engine type	Four-stroke two-cylinder SOHC 4-valves	
Displacement	362cm ³	
Bore x Stroke	63.0mm X 58.1mm	
Propeller shaft output	14.7kW(20ps)/5500rpm	11.0kW(15ps)/5500rpm
Reduction gear ratio	2.08	
Overall height	1078mm (S), 1205mm (L)	
Overall length	1048mm	
Overall width	420mm	
Dry weight	51.7kg (F15MHS)	

CMZ900 Series of Gyrocompasses Featuring Long Life and High Reliability

Outline

A gyrocompass detects the rotation of the Earth by utilizing characteristics of a high-spinning rotor, and transmits as well as accurately displays ship's heading at various locations in the ship.

The CMZ900 series supplied by Yokogawa Denshikiki Co., Ltd. has passed type approval tests under the resolution A.424 (XI) of the International Maritime Organization (IMO).



(Control box) (Master compass)

Fig. 1 - CMZ900 Gyrocompass

Basic Structure (see Fig. 2)

The CMZ900 series falls within the category of gyrosphere type gyrocompasses. A gyrosphere is a capsule with high-spinning rotors built in it and, by being suspended in water (supporting liquid) the gyrosphere is able to freely incline and turn in azimuth without friction.

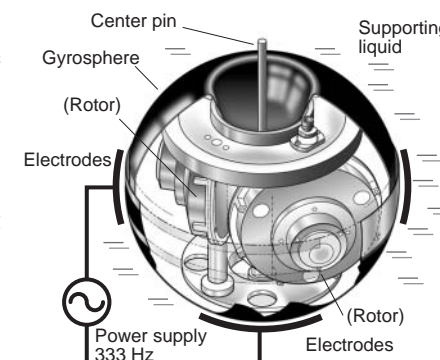


Fig. 2 - Gyrosphere and Power Feed

This supporting liquid is an electrolyte containing benzoic acid. When gravity is influent and electricity is fed to the gyrosphere via electrodes which are mutually opposed and allocated at the surface of the gyrosphere, the direction of rotor shaft automatically points and settles to north.

Although a single rotor is sufficient in principle to detect the north, two rotors mechanization is much efficient to ensure accuracy and avoid ballistic deflection error due to ship's motion at sea.

While the gyrosphere is settling to north, the Wheatstone bridge senses the electrical resistance value of supporting liquid, and then a digital servo technique and latest electronic technology detect the ship's heading. The ship's heading is transmitted to various locations in the ship by means such as serial signal, stepper signal and analog voltage signal.

System Configuration

The CMZ900 series consists of three types depend-

ing on different requirements for functionality, the number of signal outputs and redundancy (the model shown in Fig. 3 is CMZ900S).

- CMZ900B: A system suitable for small vessels limited in bridge space.
- CMZ900S: A system which implements various signal outputs for all types of merchant vessels.
- CMZ900D: A dual-unit system further enhanced in reliability.

Features

- 1) Modular design: The master compass and the control box are incorporated into the autopilot stand for space efficiency.
- 2) Manual and automatic correction for speed error
- 3) An external heading sensor enables backup outputting of heading signals.
- 4) Heading deviation alarm function
- 5) Steering mode input inhibits the unusual operation of Master compass and secure the safety voyage during auto-steering mode.
- 6) High-speed serial communication output (IEC 61162-2) is provided as default.
- 7) The velocity damping effect of high viscous oil strengthens the performance of the anti-vibration mechanism. Shock (of collision against waves) and vibration are dramatically dampened to ensure satisfactory performance even at rough sea.
- 8) Smooth and fast follow-up speed without delay even an abrupt course change
- 9) Easy maintenance and long maintenance periods:
 - Pure titanium is used for the capsule (lower hemisphere) of the gyrosphere and electrodes. The inside of the container is kept clean for a long period, and maintenance interval is longer-dated.
 - The container is divided into two pieces at bottom when overhauled. The crew can replace the gyrosphere in a emergency.

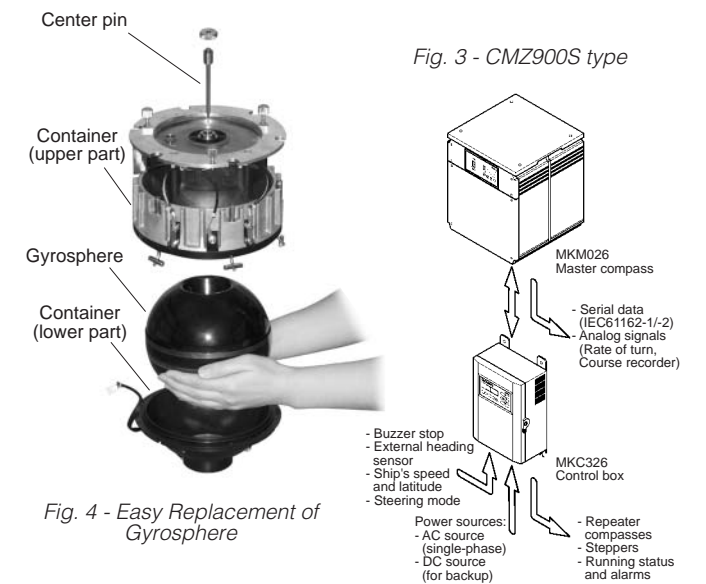


Fig. 4 - Easy Replacement of Gyrosphere

Fig. 3 - CMZ900S type

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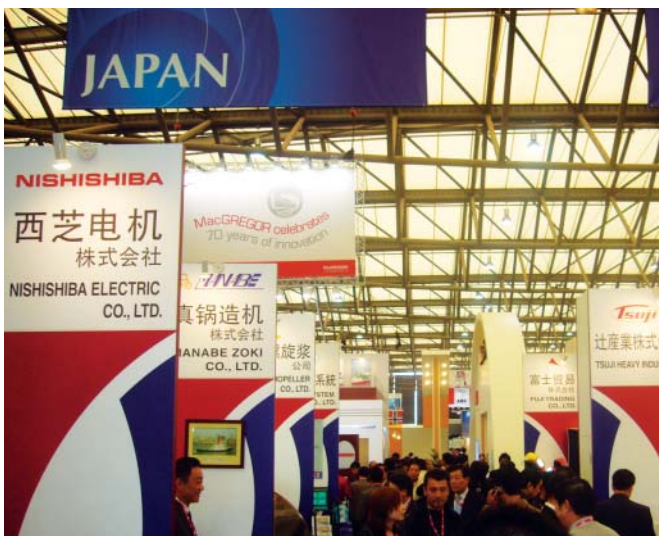
Marintech China 2007

The 14th Marintech China international maritime exhibition was held Nov. 27-30 in 2007 at the Shanghai New International Expo Centre in Shanghai, China.

Marintech China 2007, one of the largest maritime exhibitions in Asia, hosted by more than 1,100 companies from 30 countries, and was visited by a record 35,309 guests.

With support from The Nippon Foundation, the Japan Marine Equipment Association (JSMEA), together with 35 of its members, was given a 541-square-meter space in the W1-M1 hall, close to the main entrance of the center.

The event ended successfully on a high note, during which the 35 JSMEA members gave briefings on their respective new products, and promoted the excellence and reliability of Japan-made marine equipment.



Participation in NOR-SHIPPING 2007

The 21st NOR-SHIPPING international maritime exhibition was held for four days from June 12 through June 15 in 2007, in an exhibition hall near Oslo, the capital of the Kingdom of Norway. The exhibition is well known for the large number of shipowners that it attracts from Scandinavia and the rest of Europe. This year again, 828 companies from 42 countries around the world participated as exhibitors in the event, which enjoyed its largest ever tally of visitors -- 13,745.

Under a grant from The Nippon Foundation, JSMEA took part in the exhibition along with 12 member companies.



JSMEA

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