MARINE MACHI-NERY

COMPANY PROFILE

PRODUCT INFORMATION

— ENGLISH —

MOVE THE WORLD FORWARD

MITSUBISHI HEAVY INDUSTRIES GROUP

Mitsubishi Heavy Industries Marine Machinery & Equipment is the leading provider of advanced marine machinery around the world. Our expertise is based on Mitsubishi Heavy Industries Group's reputation as a trusted shipbuilder.

Toshiaki Hori

President & CEO

My first, as President and CEO of Mitsubishi Marine Machinery & Equipment Co.,Ltd.(MHI-MME), I want to take this opportunity to reach out and let each of all associates with our business look back over the trail of MHI-MME and future managerial strategies.

The first objective of launching MHI-MME was to attain outstanding competitive strength and high-end customer satisfaction by quicker and more flexible business management.
Aiming to receive satisfaction from customers, we established a strategy to enhance solution providing business which combines strengths in our product portfolio and technical background. Furthermore, we also heighten global after sales network as well as licensees aiming to accomplish the objective.

We have a certain confidence that our strategical movement have gained positive feedbacks from our customers, especially in terms of quick response to cope with their demands which come from fab-less business style and further concentration of R&D and sales activity.

Besides, we enhance global offices, intensify solution service menus and make organizational improvement and it resulted in rising business result.

Our good licensees in Korea and China proceed with step especially in terms of improving their quality as well as production efficiency in the present market environment which is less unfavorable and we expect that their sales will be extended once the market turns to positive.

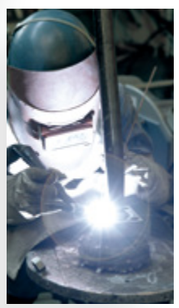
Our two main business division, Marine Machinery and Turbocharger, have each own task.

In addition to our traditional product, Marine Machinery business has a task to provide new solution product like waste heat recovery systems so as to enhance our competitive strength in terms of technological innovation and reliability, quality of lifecycle services and cost aspects.

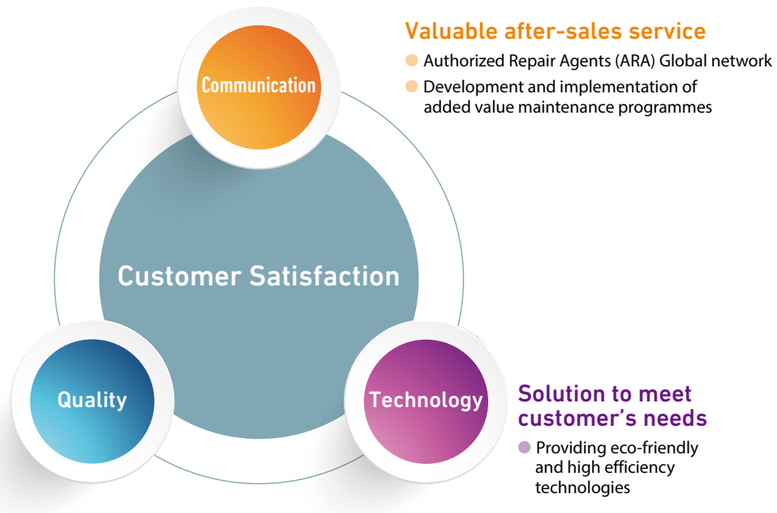
Turbocharger business which main market is for 2 stroke engine and we have already got more than one-third(1/3) share in the market and also have a new challenge to increase the market for 4stroke main engines, auxiliary engines and also land use engines.

We will keep design concept of easy maintainability and structure, which are well received by our customers. In addition to providing high efficient and reliable products, we will enhance more our after sales service activities, to provide more reliability to our customers.

Through the foreseeable future, the economic environment is not expected to be very favorable. We strongly believe that customer comes first and we are obligated to be an innovative partner as well as a reliable provider of good products and sophisticated service. This is not only to sustain in our own corporate growth but, more importantly, to continue contributing to all clients and market development.

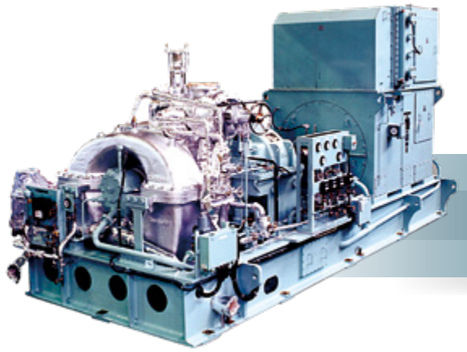


Mitsubishi Heavy Industries Marine Machinery & Equipment creates customer's value through:



A varied product line-up that meets the diverse needs of our customers.

Mitsubishi Heavy Industries, Ltd. offers a varied product line up made possible through proprietary design, cutting-edge technology and the fusion of the trust and track record nurtured over more than 130 years. The marine products offered by MHI-MME are characterized by the reliability, high performance and superior maintainability that only MHI and its long history can provide. They bring together MHI's advanced technology to turbochargers, boilers, turbines and propellers, deck cranes and even winches. These products are manufactured at the Nagasaki Shipyard, the cradle of Japanese shipbuilding, and other production bases, and are being actively used worldwide.



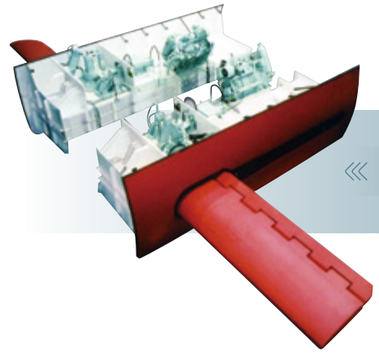
Turbines

MET Turbochargers

WHRS

Boilers

Propellers

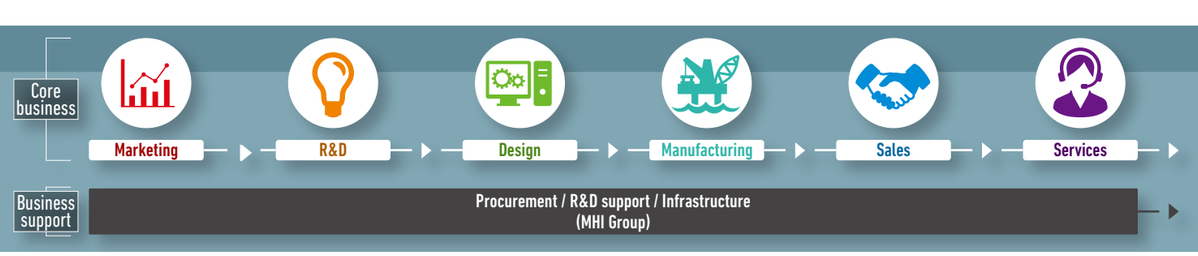


Fin Stabilizers

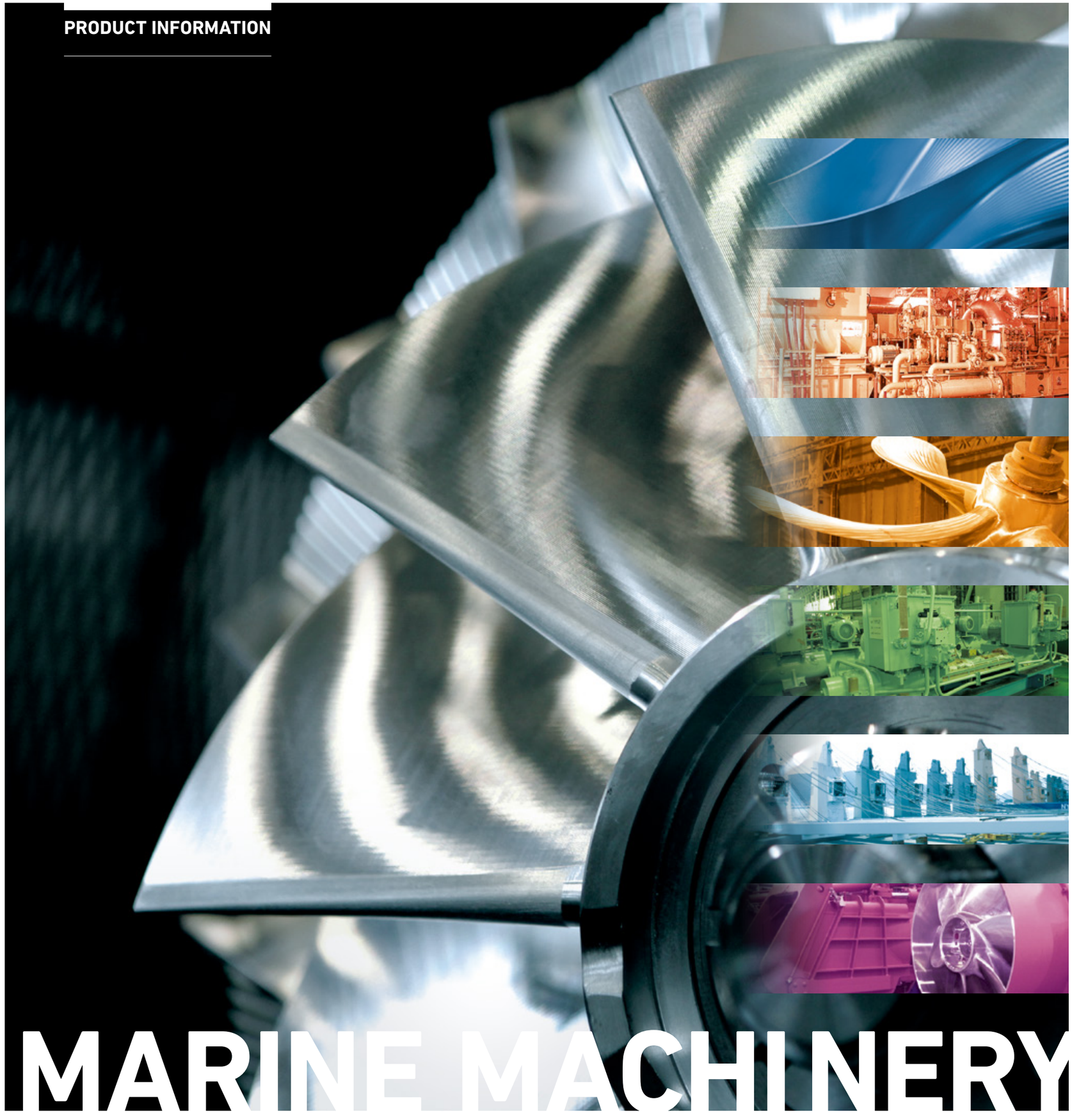
Steering Gear

High-quality products and services provided through collaboration with MHI Group.

MHI Group is not only a leading Japanese heavy industries manufacturer, but also a leading company in the global arena. MHI Group manufacture many types of world-class products across a broad range of fields, from launch vehicles and aircraft, to power generators, ships, industrial machinery and even household electrical goods. We at MHI-MME provide high quality, valuable products and services to our customers through close mutual collaboration with MHI Group in product development, manufacturing, sales and marketing, procurement and services.



High quality products and services



MARINE MACHINERY

MET Turbochargers

Global standard exhaust gas turbochargers used widely for marine and stationary engines.

Features

- Applicable to all major engines (MAN ES, WinGD and J-ENG)
- Advanced aerodynamic design based on numerous tests and analysis results
- Long lifetime and High reliability
- Low noise silencer application
- Simple and compact
- High robustness of bearing pedestal type structure

MET Turbochaegers Option

MET-VTI Also Available for Retrofitting

Improve engine performance at low load operation by changing the nozzle area.

Features

Economical
- Improve the engine performance at low loads
- Reduce the operating time of auxiliary blowers
- Almost no increase in maintenance costs and time compared with standard turbochargers - no sealing air or cooling air required
- Highly reliable butterfly valve

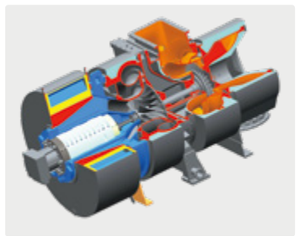
Easy maintenance

Simple design
- Two step open-close control
- Fixed-pitch nozzle ring with inner gas flow control passage

Retrofit ready
- Use the same gas inlet interface as standard turbochargers
- Gas inlet casing interchangeable with standard products

Hybrid Turbochargers (MET66MBG/MET83MBG)

Generate electric power from turbocharger's rotational energy in addition to supplying supercharged air.



Features

Economical
- Reduce diesel generator fuel consumption

High reliability

Simple and compact design

Easy maintenance

Reliable cutting-edge technology
- Highly efficient high-speed permanent magnet-typesynchronous generator coupled with turbocharger rotor
- State-of-the-art power electronics used to supply stable electric power to the ship's grid
- Functions as a motor to assist the turbocharger in providing more air to the diesel engine

Integrated EGB Turbochargers Also Available for Retrofitting

Ordinary, exhaust bypass line has been installed between exhaust gas receiver and exhaust gas duct of the engine. Integrated EGB enables to bypass the exhaust gas by integrating the bypass pipe and open/close valve on turbocharger in between gas inlet casing and outlet gas casing. Integrated EGB is also available by retrofitting from standard MET turbocharger by just changing several parts. Also, this system could be applicable to temperature increment procedure at 2-stroke engine with Low Pressure SCR system.

Features

- Connected directly to turbocharger
- No EGB pipe (engine side)

MET-MBII Series

MET-MBII Series, a new type of axial turbocharger for achieving a further increase in air flow volume while maintaining the reliability and ease of maintenance of the MET-MB turbocharger.
The MBII turbocharger provides 16% larger air flow volume than the MET-MB Series, which leads one or two models more compact compared to previous models.

Features

- MET-MBII takes advantage of MET-MB features
- Increased air-flow rate by 16%
- Downsizing by increasing air flow

Type		MET33MBII	MET37MBII	MET42MBII	MET48MBII	MET53MBII	MET60MBII	MET66MBII	MET71MBII	MET83MBII	MET90MBII
Max. Pressure Ratio	-	5.0									
Engine Output Range per Turbocharger	kW	3,400 - 6,000	4,600 - 7,600	5,600 - 9,300	7,200 - 11,900	9,000 - 14,900	11,200 - 18,400	14,000 - 23,100	16,400 - 27,100	22,500 - 37,100	27,400 - 45,200
Maximum Continuous Gas Temperature before Turbine	°C	580									
Momentary Maximum Gas Temperature before Turbine	°C	610									
Length	mm	1,870	2,080	2,190	2,400	2,610	2,960	3,200	3,290	3,940	4,440
Breadth	mm	899	998	1,094	1,255	1,390	1,530	1,718	1,820	2,233	2,465
Height	mm	945	1,095	1,171	1,330	1,439	1,570	1,780	1,865	2,225	2,410

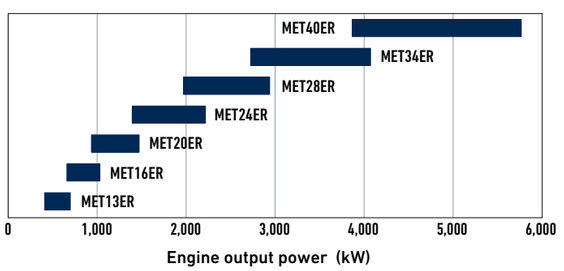
∗ Engine Output Range is the reference values subject to pressure ratio 4.0.

MET-ER Series

MET-ER Series, a new type of radial turbocharger succeed the high reliability and maintainbility of MET-SRC series. This new turbocharger has improved it's responsiveness and reduces the number of parts to achieve a more compact design and high maintainability.
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 engines.

Features

- MET-ER takes advantage of MET-SCR features
- Compact design (about 40%)
- Optimized to engine power range
- Applicable to high pressure ratio
- Reduced number of parts by 30%
- Excellent performance and better transient response



MET Turbo

MET-MB Series

Global standard turbochargers for marine and stationary engines for MAN Energy Solutions, WinGD and J-ENG.

Features

- Applicable to all major engines(MAN ES, WinGD, J-ENG)
- Advanced aerodynamic design based on numerous tests and analysis results
- Easy overhaul
- Crew-maintainable design
- Condition based maintenace
- High reliability
- High efficiency
- Applicable to heavy fuel oil

Type		MET33MB	MET37MB	MET42MB	MET48MB	MET53MB	MET60MB	MET66MB	MET71MB	MET83MB	MET90MB
Max. Pressure Ratio	-	5.0									
Engine Output Range per Turbochaeger	kW	2,600 - 4,600	3,800 - 6,300	4,700 - 7,700	6,000 - 10,000	7,500 - 12,500	9,300 - 15,500	11,700 - 19,400	13,700 - 22,700	18,800 - 31,100	22,900 - 37,900
Maximum Continuous Gas Temperature before Turbine	℃	580									
Momentary Maximum Temperature before Turbine	℃	610									
Length	mm	1,661	1,851	1,944	2,280	2,504	2,825	3,065	3,143	3,771	4,241
Breadth	mm	899	998	1,134	1,255	1,417	1,530	1,785	1,820	2,233	2,465
Height	mm	945	1,095	1,155	1,330	1,435	1,540	1,720	1,865	2,180	2,410

∗ Engine Output Range is the reference values subject to pressure ratio 4.0.

MET-SRC Series

Developed to meet the demand for higher performance and reliability, well proven by the excellent service records of axial type MET turbochargers.

Features

- Applicable to high pressure ratio
- Non-water cooling
- Easy overhaul
- Crew-maintainable design
- Condition based maintenace
- High reliability
- High efficiency
- Applicable to heavy fuel oil

Type		MET18SRC	MET22SRC	MET26SRC	MET30SRC	MET37SRC
Max. Pressure Ratio	-	5.5				
Engine Output Range per Turbochaeger	kW	400 - 1,100	650 - 1,600	850 - 2,200	1,150 - 3,300	2,000 - 4,400
Maximum Continuous Gas Temperature before Turbine	℃	610				
Momentary Maximum Temperature before Turbine	℃	640				
Length	mm	712	835	1,075	1,368	1,661
Breadth	mm	510	605	735	860	1,070
Height	mm	510	605	735	860	1,070

∗ Engine Output Range is the reference values subject to pressure ratio 3.5.

WHRS (Waste Heat Recovery System)

WHRS is a revolutionary energy-saving power generation system that recovers and reuses energy from the main engine's exhaust gas. WHRS optimizes thermal efficiency by automatically adjusting the output according to on-board electricity demand.

Features

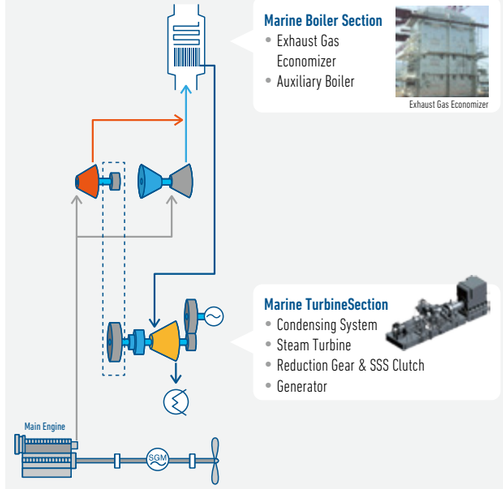
Easy operation
- Fully remote automation

Easy installation
- Packaged unit arranged on a common bed

High reliability
- Plant monitoring system
- Performance diagnosis

Compact design

Economical and environmentally friendly
- Reduces diesel generator fuel consumption and in some cases allows diesel generators to be stopped
- Optimizes thermal efficiency by controlling the output and load balance of the steam and power turbines

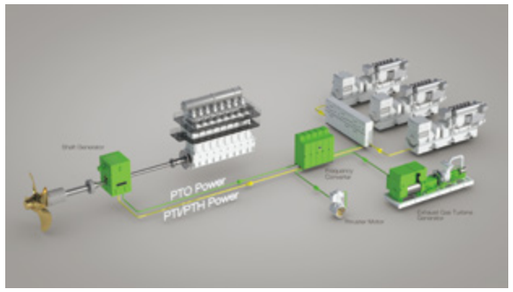


Integration of shaft generation and WHRS

This solution combines MHI-MME's energy-saving power generation system with Wärtsilä SAM Electronics's operational control technology for shaft generator systems.

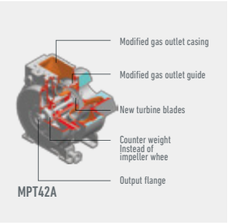
Features

- Shaft generator output is amplified by integration with WHRS.
- This solution enable to produce greater power generation capacity and higher propeller propulsion and improve Energy Efficiency Design Index (EEDI).



Power Turbine

Type	Max. output
MPT26R	800kW
MPT30R	1,200kW
MPT33A	1,400kW
MPT42A	2,200kW
MPT48R	3,000kW
MPT53A	3,500kW



Economizers

Steam Pressure	Single Pressure	0.6 ～ 2.2MPa
	Dual Pressure	0.6 ～ 2.2MPa、0.3 ～ 1.0MPa
Steam Temperature		Saturated ～ 400℃

Type		system
1	Single Pressure Type	Superheater + Evaporator
2		Superheater + Evaporator + Preheater
3	Dual Pressure Type	Superheater + HP Evaporator + LP Evaporator
4		Superheater + HP Evaporator + LP Evaporator + Preheater
5		HP Superheater + HP Evaporator + LP Superheater + LP Evaporator + Preheater

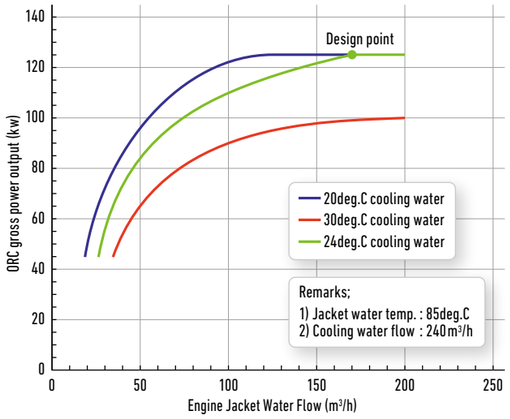
Organic Rankin Cycle (ORC)

Mitsubishi new waste heat recovery system uses synthetic organic working fluid, instead of water, and it has low flush point of 15 degree C. Therefore, the working fluid can be vaporized by waste heat from engine room, and can drive turbine generator to make electric power.

Features

- Rated Power 125kW (gross)
- no lubricating device / no external cooling device
- Unique Integrated Power Module
- Optimized Layout
- Excellent Peformance / High reliability / Safety

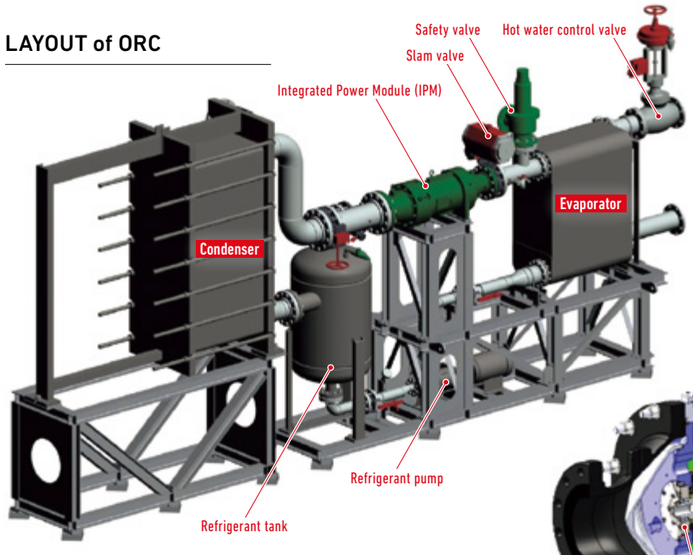
ESTIMATED OUTPUT POWER



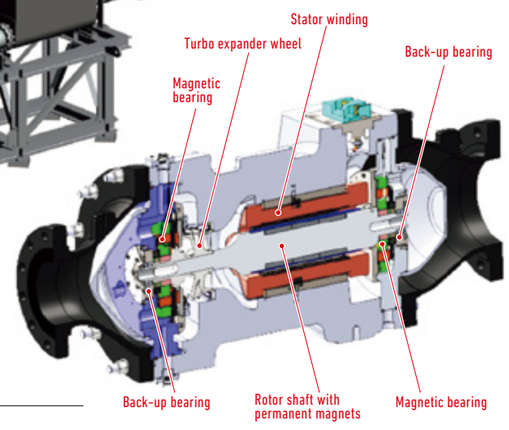
PARTICULARS

Rated power (kW)	125 (gross)
Output voltage (V)	380 to 480
Frequency (Hz)	50/60
Width x Length x Height (m)	1.3 x 7.3 x 3.5
Dry weight (kg)	8,000
Cooling water	Sea water or fresh water
Working fluid (Refrigerant)	R245fa
Hot water temperature (°C)	75 to 95
Hot water amount (t/h)	150 to 200
Cooling water temperature (°C)	5 to 30
Cooling water amount (t/h)	150 to 250
Rated alternator speed (rpm)	24,500
Bearing type	Active controlled magnetic
Alternator type	Permanent magnet synchronous
Expander type	Single stage radial

LAYOUT of ORC

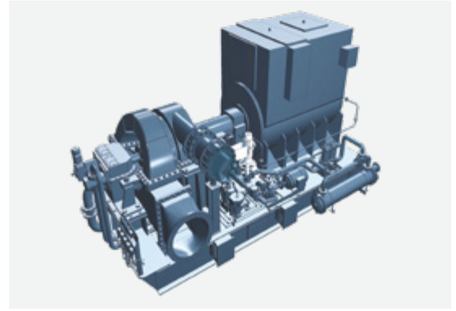


Cross section of IPM



Turbine Generator for Cryogenic Power Generation System

One of FSRU(Floating Storage & Regasfication Unit) roll is to regasify minus 160 degree C liquified natugal gas (LNG) through heat exchange. Cryogenic power generation system is a new initiative that aims to reduce the environmental impact of FSRU by utilizing LNG cold energy – which up to now has been dumped into the ocean – for power generation. The new technology is expected to significantly reduce the fuel consumption and CO_2 emissions of FSRU during regasification.



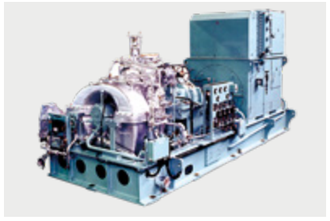
Particulars	Specifications
Expander type	Axial impulse turbine
Turbine driving medium	Organic heating medium
Output range	Up to 4,000 kW
Turbine speed	1,800 rpm
Seal structure	Mechanical seal

Steam Turbine Generators (AT-Type)

Highly reliable AT-type steam turbine generators have been developed using our original and innovative technology, and feature excellent durability and cost performance.

Features

- High reliability and durability
- Environmentally friendly
- Easy operation and maintenance
- Compact design

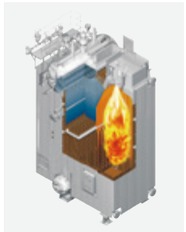


Particulars		AT34C	AT42C	AT52C	AT64C	AT76C	AT92C / AT100C	AT112C
Turbines	Type	Horizontal, multi-stage impulse condensing turbine						
	No. of stages	4 to 8 Rateau			4 to 14 Rateau			12 to 16 Rateau
	Power range (kW)	200~2,000	1,000~4,000	1,500~6,000	3,000~15,000	5,000~18,000	15,000~27,000	20,000~50,000
	Speed range (rpm)	11,000~15,000	8,500~11,700	6,500~9,500	5,000~7,500	5,000~6,000	4,000~4,500	3,600
	Steam inlet pressure (MPa)	0.4 to 12.3						
	Steam inlet temperature (°C)	Saturated temperature to 540						
	Exhaust pressure (mmHgv)	400 to 722						
Reduction gears	Type	Single or Double helical, single reduction gear						
	Output shaft speed (rpm)	1,800 to 3,600						
Dimensions	Width (mm)	1,600	1,800	2,000	2,300	4,000	4,000	5,600
	Length (mm)	3,785	4,075	4,390	4,750	6,800	7,400	8,500
	Height (mm)	1,635	1,890	2,185	2,500	3,000	3,100	4,500
Approximate weights (kg) (excluding driven equipment)		6,000	7,100	8,400	10,500	30,000	38,000	60,000

PRODUCT INFORMATION
WHRS / ORC / BOILERS / TURBINES 02

Auxiliary Boilers MAC-B/SB/HB/BF SERIES

These are two-drum water tube boilers that supply steam for driving cargo oil pump turbines and inert gas for tanks. High pressure and a wide variety of burners are used to save fuel consumption. In addition, MAC-BF type is compatible with fuel oil and gas.
In addition, the high-efficiency MAC-HB series is also available in the evaporation rate range of 35 -60 ton/h.



MAC-B

Boiler Type		MAC-20B	MAC-25B	MAC-30B	MAC-35B	MAC-40B	MAC-45B	MAC-50B	MAC-55B	MAC-60B	MAC-70B	MAC-80B	MAC-90B	MAC-100B
Evaporation	kg/h	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000	70,000	80,000	90,000	100,000
Boiler design Press.	MPa	1.77												
Working steam pressure	MPa	1.57												
Weight	ton	28	34	36	42	44	50	52	58	67	76	77	78	95
Water content	ton	10	11	12	13	19	20	21	22	30	31	34	35	40
Width (W)	mm	3,880	4,160	4,540	4,610	5,000	5,000	5,000	5,350	5,810	5,810	5,530	5,530	5,810
Depth (D)	mm	3,410	3,410	3,600	3,800	4,520	4,520	4,520	4,710	6,250	6,252	6,820	6,820	7,250
Height (H)	mm	6,140	6,520	6,850	7,320	7,670	8,170	8,970	9,210	8,510	9,210	7,980	8,280	8,910

MAC-SB

Boiler Type		MAC-S25B	MAC-S30B	MAC-S35B	MAC-S40B	MAC-S45B	MAC-S50B
Evaporation	kg/h	25,000	30,000	35,000	40,000	45,000	50,000
Boiler design Press.	MPa	2.20					
Working steam pressure	MPa	1.57~2.0					
Weight	ton	26	29	32	37	44	46
Water content	ton	10	11	12	12	18	18
Width (W)	mm	6,340	7,040	7,740	8,440	8,400	8,900
Depth (D)	mm	4,360	4,360	4,360	4,360	5,190	5,190
Height (H)	mm	3,460	3,460	3,460	3,460	4,400	4,400

MAC-HB

Boiler Type		MAC-H35B	MAC-H40B	MAC-H45B	MAC-H50B	MAC-H55B	MAC-H60B
Evaporation	kg/h	35,000	40,000	45,000	50,000	55,000	60,000
Boiler design Press.	MPa	2.2					
Working steam pressure	MPa	1.57~2.0					
Weight	ton	42	47	50	54	56	62
Water content	ton	9.9	10.4	11.4	12.7	19.1	19.7
Width (W)	mm	4,682	5,013	5,013	5,013	5,013	5,386
Depth (D)	mm	3,800	4,445	4,445	4,822	4,822	4,947
Height (H)	mm	7,440	7,950	8,350	8,750	9,150	9,450

MAC-BF

Boiler Type		MAC-20BF	MAC-25BF	MAC-30BF	MAC-35BF	MAC-40BF	MAC-45BF	MAC-55BF	MAC-60BF	MAC-70BF	MAC-80BF	MAC-90BF	MAC-100BF
Evaporation	kg/h	20,000	25,000	30,000	35,000	40,000	45,000	55,000	60,000	70,000	80,000	90,000	100,000
Boiler design Press.	MPa	2.2											
Working steam pressure	MPa	2.0											
Weight	ton	30	32	34	39	47	49	62	80	81	81	82	83
Water content	ton	10	11	12	13	19	20	24	31	35	35	36	40
Width (W)	mm	3,872	4,300	4,585	4,682	5,013	5,013	5,385.8	5,783.6	5,524	5,564	5,564	5,897
Depth (D)	mm	2,454	2,454	2,639	2,847	3,063.2	3,063.2	3,249.6	4,318	4,895	4,955	4,955	5,324
Height (H)	mm	6,740	7,090	7,340	8,040	8,200	8,600	9,700	9,210	8,280	8,930	9,230	9,730

02_WHRS, ORC, BOILERS, TURBINES

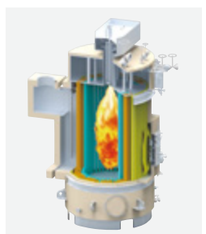
Auxiliary Boilers MAC-D/DS SERIES

MAC-D is a cylindrical boiler that supplies steam for driving cargo oil pump turbines and inert gas for tanks. MAC-DS is a cylindrical low-pressure boiler mainly used on tankers such as product carriers.

Boiler Type		MAC-20D	MAC-25D	MAC-30D	MAC-35D	MAC-20DS	MAC-25DS
Evaporation	kg/h	20,000	25,000	30,000	35,000	20,000	25,000
Boiler design Press.	MPa	1.8				1.0-1.8	
Working steam pressure	MPa	1.6				0.7-1.6	
Weight	ton	30	34	41	46	26	30
Water content	ton	16	18	22	23	16	18
Width (W)	mm	3,448	3,448	3,770	3,884	3,448	3,448
Depth (D)	mm	5,371	5,371	5,822	5,869	5,371	5,371
Height (H)	mm	6,782	7,582	7,724	8,392	6,782	7,582

Auxiliary Boilers MC-EF SERIES

MC-EF is water tube type boiler for containers, bulk and LNG carriers. It has a simple structure and uses a bare tube for easy maintenance. MC-EF is compatible with fuel oil and gas.



Boiler Type		MC-50EF	MC-60EF	MC-70EF	MC-80EF
Evaporation	kg/h	5,000	6,000	7,000	8,000
Boiler design Press.	MPa	0.9			
Working steam pressure	MPa	0.7			
Weight	ton	16	17	18	19
Water content	ton	8	9	10	10
Width (W)	mm	3,977	3,977	4,177	4,177
Depth (D)	mm	2,490	2,490	2,690	2,690
Height (H)	mm	5,100	5,500	5,642	6,042

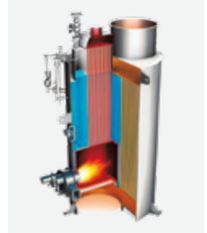
Auxiliary Boilers MC-D SERIES

MC-D is water tube type boiler that supplies general service steam for containers, bulk and LNG carriers. The furnace is completely water-cooled, highly reliable and requires little maintenance.

Boiler Type			MC-20D	MC-30D	MC-45D
Evaporation	Integrates oil firing section	kg/h	2,000	3,000	4,500
	exhaust gas economizer section	kg/h	-		
Boiler design Press.		MPa	0.69-0.98		
Working steam pressure		MPa	0.59-0.88		
Weight		ton	7	8	11
Water content		ton	5	7	12
Width (W)		mm	2,395	2,730	3,175
Depth (D)		mm	1,730	1,970	2,320
Height (H)		mm	4,371	4,420	4,850

Auxiliary Boilers MJC SERIES

MJC is a composite boiler that integrates oil firing section and exhaust gas economizer section for container and bulk carriers.
Simple smoke tube type and compact for easy installation.
Waste heat from multiple engines can be recovered by a single composite boiler.



Boiler Type			MJC-210	MJC-250	MJC-280	MJC-340	MJC-360
Evaporation	Integrates oil firing section	kg/h	2,000	2,000	20,000	3,000	5,000
	exhaust gas economizer section	kg/h	According to exhaust gas condition				
Boiler design Press.		MPa	0.69-0.98				
Working steam pressure		MPa	0.59-0.88				
Weight		ton	18	21	27	41	45
Water content		ton	9	12	15	22	25
Width (W)		mm	2,290	2,700	2,990	3,630	3,790
Depth (D)		mm	2,290	2,700	2,990	3,630	3,790
Height (H)		mm	5,500	5,400	5,500	6,000	5,500

Auxiliary Boilers MJE SERIES

MJE is smoke tube type exhaust economizer that generates steam using waste heat from engine exhaust gas. Used to supply general service steam.
Waste heat from multiple engines can be recovered by one economizer.

Boiler Type		MJE-B300	MJE-E250	MJE-E300
Evaporation	kg/h	According to exhaust gas condition		
Boiler design Press.	MPa	1.0		
Working steam pressure	MPa	0.8		
Weight	ton	32	21	32
Water content	ton	17	12	17
Width (W)	mm	3,210	2,720	3,210
Depth (D)	mm	3,210	2,720	3,210
Height (H)	mm	5,300	4,900	5,300

UST Series (for Steam Propulsion Vessels)

Using the latest reheat-regenerative cycle system and state-of-the art technologies to improve plant efficiency, our Ultra-Steam Turbine Plant (UST) delivers the best economic and environmental performance to all customers. UST, the environmental-friendly propulsion system, contributes to our customers' good service with high reliability and safety.

UST Turbine

UST Boiler

Features

Greater plant efficiency
- Higher plant efficiency which achieves about 15% reduction in fuel oil consumption compared with CST (Conventional Steam Turbine plant) series

High reliability and safety
- Proven design based on established marine and land technologies

Environmentally friendly
- Low NOx, SOx and CO_2 emissions

Flexibility of fuel selection
- Oil, gas and dual firing

Extremely long life
- Extremely long life due to the robust design and appropriate safety margins

Main Boiler(UST)

Series No.		MBR-1E	MBR-2E	MBR-3E	MBR-4E	MBR-5E	MBR-6E	MBR-7E
Maximum evaporation	kg/h	40,000	45,000	50,000	55,000	60,000	65,000	70,000
Firing System	-	Roof firing for Main Burner, Horizontal firing for RH Burner						
Furnace construction	-	Welded wall						
Steam Press. at S.H.O	MPa	10						
Steam Temp. at S.H.O	℃	560						
Feed water temp.	℃	138						
Boiler design Press.	MPa	12						
Boiler efficiency	%	88.5 based on the H.H.V. of fuel						
Air Heater	-	Steam air heater						
Number of burners	NOS.	2			3			

Main Turbine(UST)

Output in MW	13~15 MW (18~20kps)	15~18 MW (20~24kps)	18~23 MW (24~32kps)	23~26 MW (32~36kps)	26~30 MW (36~40kps)	30~33 MW (40~45kps)	33~37 MW (45~50kps)
Main Frame	MR21- II	MR24- II	MR32- II	MR36- II	MR40- II	MR45- II	MR50- II
HP/IP Turbine Frame	HR-20			HR-22		HR-26	HR-28
LP Turbine Frame	LR-14		LR-16	LR-18		LR-20	LR-23
Reduction Gear Frame	Single Tandem Articulated Type			Single Tandem Articulated Type/ Dual Tandem Articulated Type		Dual Tandem Articulated Type	
Main Thrust Frame	T-8	T-9	T-11	T-13	T-15	T-17	T-19

HR-22: High-intermediate pressure turbine with 20- to 22-inch base-diameter
LR-18: Low pressure turbine with 18-inch last blade
T-13: Main thrust bearing with 13 × 10^3 cm^2 nominal surface areas

Deck Boilers and Steam Turbine Generators for FPSO/FSO/FSRU/FLNG

Our deck boilers and steam turbine generator are compact size and low maintenance cost.
And we have a lot of reference records. In addition, we can propose and supply the best heat efficiency combination unit according to the plant operation requirement.

Features

High reliability and availability
- Robust and proven design with experiences of marine and land use application

Fuel flexibility
- Associated gas, VOC (Volatile Organic Compounds) gas, heavy fuel, diesel oil and crude oil is available

Low maintenance cost
- No hot parts overhaul is required for both boiler and turbine

Easy installation
- Equipment is supplied as module unit for easy installation and this meets the project requirement tight schedule

Automatically operation
- Safely and user friendly operation is available with our automatic control system

1.6MPa Class Boiler

Type		MAC-40BF	MAC-50BF	MAC-60BF	MAC-70BF	MAC-80BF	MAC-90BF	MAC-100BF
Maximum evaporation	kg/h	40,000	50,000	60,000	70,000	80,000	90,000	100,000
Steam pressure	MPa	1.6 (up to 2.5)						
Steam temperature	℃	Saturated temperature to 280						

Deck Boiler

6MPa Class Large Size Boiler

Type		MBF-120	MBF-160	MBF-220
Maximum evaporation	kg/h	120,000	160,000	220,000
Steam pressure	MPa	6.0		
Steam temperature	℃	Up to 515		

Steam turbine

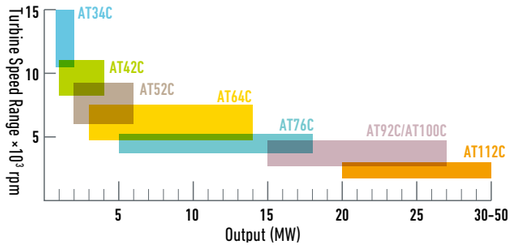
6MPa Class Medium Size Boiler

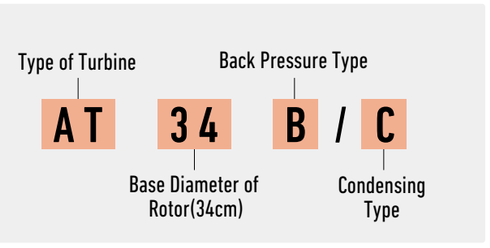
Type		MB-1E	MB-2E	MB-3E	MB-4E-NS	MB-4E	MB-4E-KS
Maximum evaporation	kg/h	36,000	45,000	55,000	60,000	65,000	70,000
Steam pressure	MPa	6.0					
Steam temperature	℃	Up to 515					

Selection of Turbine Frames

CONDENSING TYPE

Main Steam: 12.3 MPa x 540°C max.
Exhaust Vacuum: 722 mm Hgvac max.





Propeller MAP Mark-W

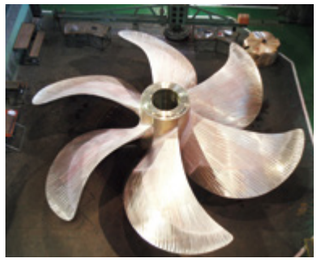
MAP Mark-W (Mitsubishi Advanced Propeller Mark-W) is designed with latest Mitsubishi technology and has outstanding advantage in both superior cavitation performance and improved propeller efficiency. It is not only for delivery to new ships but also for retrofit purpose to vessels in service and contributs to reducing fuel consumption and environmental impact.

Features

Economical
- High propulsion efficiency

Compact design
- Lower propeller mass and moment of inertia

High reliability
- Maintains excellent propeller strength
- Excellent cavitation performance with streamlined tips and reduced blade area



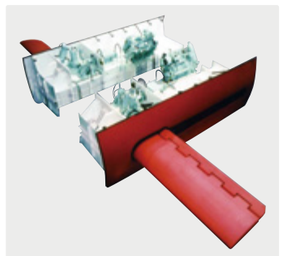
MAP Mark-W

Propeller Retrofit

Slow steaming of ships are widly adopted for energy saving and replacing to retrofit propeller re-designed optimally for slow steaming condition will improve fuel efficiency significantly. It is also useful when engine power limitation is necessary to comply with EEXI. More than 8% fuel efficiency improvement could be measured by propeller retrofit to some container vessels in our past reference. Value of propeller originally equipped with vessel is refunded to ship owner and it leads to minimize initial cost and enhance investment effect.

Retractable Fin Stabilizers

This is highly reliable anti-rolling system backed with plenty delivery reference records mainly for ferries and RORO vessels. Renewing interface to touch screen panel and new funtionality such as data storage was added to control system by upgrading done in 2021.



Features

High reliability
- High sealing properties
- Excellent anti-rolling performance
- Highly responsive hydraulic system

Easy maintenance
- High maintainability due to hydraulic cylinder drive and simple onboard layout

New control system
- Touch screeen interface on control panel making available both less space and data enrichment
- Full of useful data recording function
- Simplification of electrical wiring

Type		MR-S	MR-1	MR-2	MR-3	MR-4
Fin area	m²/side	3	5	7	9	12
Weight	ton/side	15	26	39	56	77
Motor output	kW/side	15	22	37	45	75

Steering Gear

Our electro-hydraulic steering gear has a simple, compact design and employs an extremely responsive hydraulic system, with high reliability and durability fitling to a wide range of vessels, including commercial ships, naval ships and specialized ships.

Features

High reliability and durability
- Employ a Rapson slide type actuator and streamlined pump
- Excellent reliability due to hydraulic locking alarm

Excellent response

Simple and compact design
- Hydraulic pump attached to oil tank on cylinder
- Pipeless configuration

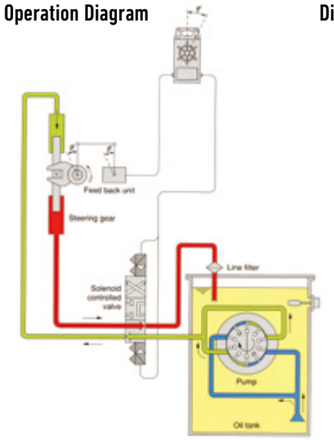
Easy operation
- Can be operated both manually and remotely

Safe
- Dual control system
- Higher safety through an automatic isolating control system

ACTUATOR TYPE		CONTROL METHODS		TYPE	TORQUE (kN-m)
Rapson Slide Type S:1 RAM, 2 CYLINDER D:2 RAM, 4 CYLINDER	Fork Type	Single Loop Control	Solenoid Control Valve:C	SFC	314 to 1,030
			Torquue Motor : T	SFT DFT	706 to 1,726 726 to 11,307

SFC type

Operation Diagram



Dimensions

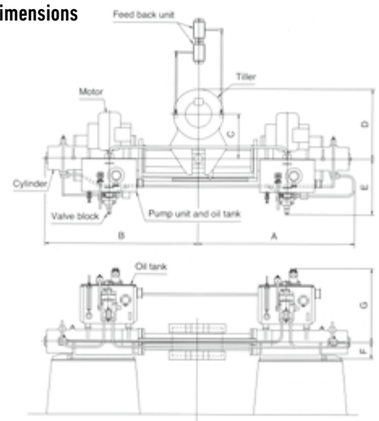


FIG.1

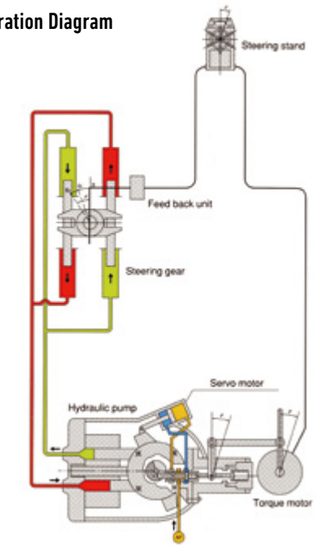
	Type			SFC-30	SFC-40	SFC-50	SFC-60	SFC-80		SFC-105
	Torque at maximum working oil pressure		kN-m	314	441	520	618	706	844	1,030
	Rudder turning speed		deg/sec	65/28						
With main and auxiliary pumps	Motor	Output × number	kW	11×2	15×2		18.5×2	22×2	25×2	32×2
		number of revolution	min^{-1}	1,800						
		Overload	%/sec	200/60						
	Pump type × Number			T6C-B06×2	T6C-B10×2		T6C-B14×2	T6C-B17×2		T6C-B25×2
Without auxiliary pumps	Motor	Output × number	kW	—	7.5×2		11×2			—
		number of revolution	min^{-1}	—	1,800					—
		Overload	%/sec	—	200/60					—
	Pump type × Number			—	T6C-B05×2		T6C-B06×2	T6C-B08×2		—
Dimensions		A	mm	1,716	1,860	1,945	2,080	2,260		2,475
		B	mm	1,685	1,845	1,945	2,020	2,225		2,475
		C	mm	470	520	560	580	650		690
		D	mm	740	815	880	910	1,015		390
		E	mm	815	815	815	1,000	1,000		825
		F	mm	190	205	215	220	240		255
		G	mm	1,030	1,040	1,050	1,200	1,220		1,540
Attached figure				FIG.1						

NOTE: The above list is complied for rudder turning angle of ±35 deg. and electric source of 60Hz. Steering geers for special particulars are available with us under high workmanship design.

PRODUCT INFORMATION
STEERING GEAR 04

SFT type / DFT type

Operation Diagram



Dimensions

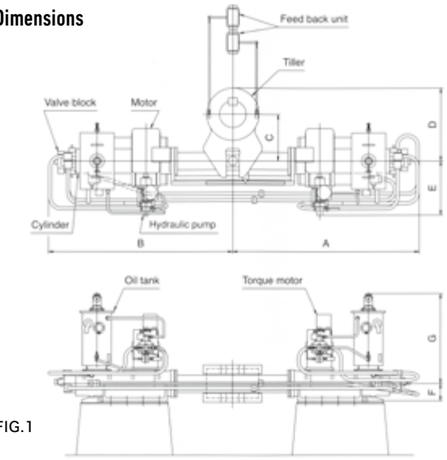


FIG.1

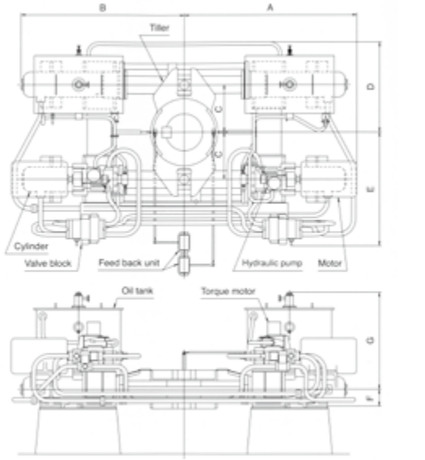


FIG.2

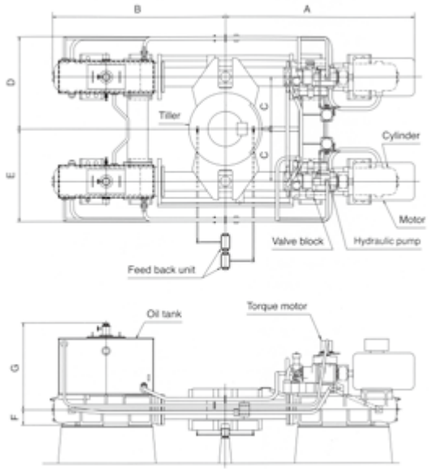


FIG.3

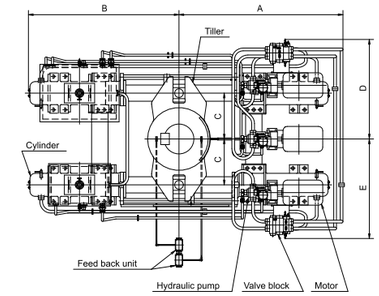


FIG.4

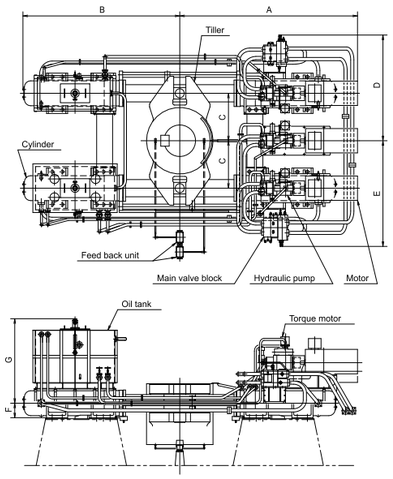


FIG.5

	Type		SFT-80		SFT-125		SFT-170	
	Torque at maximum working oil pressure	kN-m	706	844	1,030	1,196	1,402	1,726
	Rudder turning speed	deg/sec	65/28					
With main and auxiliary pumps	Motor: Output × number	kW	22×2	25×2	30×2	37×2	45×2	50×2
	Motor: number of revolution	min^{-1}	1,800					
	Motor: Overload	%/sec	200/60					
	Pump type × Number		06V-FH2MK×2		1V-FH2MK×2			
Without auxiliary pumps	Motor: Output × number	kW	15×2		15×2	18.5×2	22×2	25×2
	Motor: number of revolution	min^{-1}	1,800					
	Motor: Overload	%/sec	200/60					
	Pump type × Number		06V-FH2MK×2					
Dimensions	A	mm	2,600		2,900		3,225	
	B	mm	2,565		2,865		3,200	
	C	mm	650		730		850	
	D	mm	1,015		1,140		1,315	
	E	mm	760		910		910	
	F	mm	240		260		285	
	G	mm	1,260		1,395		1,415	
Attached figure			FIG.1					

DFT-80		DFT-125		DFT-170		DFT-200	DFT-250	DFT-300	DFT-335	DFT-400	DFT-475	DFT-530	DFT-600	DFT-670	DFT-760	DFT-870	DFT-1000	DFT-1150
726	892	1,030	1,236	1,373	1,687	2,030	2,393	2,854	3,442	3,923	4,756	5,394	6,031	6,721	7,532	8,552	9,807	11,307
65/28						65/28												
22×2	25×2	30×2	37×2	45×2	50×2	55×2	75×2	80×2	90×2	110×2	160×2		—	—	—	—	—	—
1,800						1,200							—	—	—	—	—	—
200/60						200/60							—	—	—	—	—	—
06V-FH2MK×2		1V-FH2MK×2				3V-FH2MK×2				6V-FH2MK×2			—	—	—	—	—	—
11×2	15×2	15×2	18.5×2	22×2	25×2	30×2	37×2	45×2	50×2	55×2	75×2	75×2	90×3	100×3	110×3	125×3	150×3	160×3
1,800						1,800				1,200								
200/60						200/60												
06V-FH2MK×2						06V-FH2MK×2	1V-FH2MK×2			3V-FH2MK×2			3V-FH2MK×3		6V-FH2MK×3			
2,000	2,190		2,380			2,580	2,650	2,920	2,990	3,265	3,460	3,505	3,665	3,825	4,120	4,240	4,400	4,600
1,845	2,020		2,225			2,390	2,505	2,655	2,845	2,970	3,125	3,230	3,325	3,480	3,645	3,740	4,040	4,140
520	580		650			715	730	780	850	900	940	970	1,000	1,060	1,100	1,130	1,180	1,240
970	1,080		1,150			1,375	1,385	1,440	1,510	1,645	1,685	1,715	2,240	2,300	2,570	2,520	2,530	2,630
1,625	1,715		1,800			1,870	1,885	1,935	2,005	1,645	1,685	1,715	2,240	2,300	2,570	2,520	2,530	2,630
205	220		240			255	260	275	285	260	275	285	325	330	335	345	355	365
1,370	1,370		1,370			1,480	1,500	1,510	1,540	1,585	1,600	1,610	1,705	1,730	2,000	2,010	2,030	2,045
FIG.2						FIG.2				FIG.3			FIG.4		FIG.5			

NOTE: The above list is complied for rudder turning angle of ±35 deg. and electric source of 60Hz. Steering geers for special particulars are available with us under high workmanship design.

Deck Cranes

The SMART UP-GRADE menu helps clients respond to diversifying risks while actualizing stable management and a reduction of lifecycle costs. Mitsubishi Heavy Industries Machinery Systems, Ltd. (MHI-MS) deck cranes contribute to global marine transport through achievement of both high functionality and economic efficiency.

SMART UP-GRADE

Next-generation cranes with **Data Logging Functions** × Responding to individual needs (also available for retrofitting) **Proposal of Optimal Customization**

Synchronized Crane (50tons × 3)

Electric Hydraulic Deck Crane

Features

High reliability and Easy Maintenance

- Uses a mechanical link control system, with main equipment placed at the base of the crane in a simple yet easy-to-maintain design
- All component devices and parts used have been carefully checked for quality, ensuring high reliability

Reliable cutting-edge technology

- A programmable logic controller (PLC) offers a flexible control program. The alarm display function has also been enhanced
- A data logging system automatically records, on an SD card, a history of the alarm being triggered as well as operation modes, hours of operations and other information
- Equipped with an overload test mode for overload testing
- Synchronized-control deck cranes, which enable multiple cranes to be operated simultaneously, are also available

Standard crane

Type	Hoisting load (t)	Working radius Max. (m)	Working radius Mim. (m)	Winding height (m)	Hoisting Load (t) Speed(m/min.)	Lowering Load (t) Speed(m/min.)	Luffing time (sec.)	Slewing speed (rpm)	Electric motor for pump unit (kW) Cont.	Electric motor for pump unit (kW) Intermittent	Total weight (t)
3020	30	20	4	35	30/12/5 18.5/37/63	30/12/5 63	41	0.75	105	240 ED 15%	34
3022		22	4				41	0.75			35
3024		24	4.5				48	0.7			36
3026		26	4.5		* 30/12/5 25/50/63	* 30/12/5 63	49	0.6	* 132	* 320 ED 15%	40
3028		28	5				50	0.55			45
3030		30	5				52	0.5			48
3620	36	20	4	35	36/14/5 16/32/55	36/14/5 55	43	0.7	105	240 ED 15%	40
3622		22	4				48	0.65			41
3624		24	4.5				51	0.6			43
3626		26	4.5		* 36/14/5 22/44/55	* 36/14/5 55	54	0.6	* 132	* 320 ED 15%	45
3628		28	5				55	0.55			47
3630		30	5				58	0.5			50
4020	40	20	4	35	40/16/5 12.5/25/42	40/16/5 42	56	0.65	105	240 ED 15%	45
4022		22	4				59	0.6			46
4024		24	4.5				63	0.55			48
4026		26	4.5		* 40/16/5 18.5/37/42	* 40/16/5 42	67	0.5	* 132	* 320 ED 15%	51
4028		28	5				72	0.45			53
4030		30	5				80	0.4			56

＊: High speed type (Optional item)

Heavy duty crane

Type	Hoisting load (t)	Working radius Max. (m)	Working radius Mim. (m)	Winding height (m)	Hoisting Load (t) Speed(m/min.)	Lowering Load (t) Speed(m/min.)	Luffing time (sec.)	Slewing speed (rpm)	Electric motor for pump unit (kW) Cont.	Electric motor for pump unit (kW) Intermittent	Total weight (t)
MHD5028	50	28	5	35	50/20/5 15/30/38	50/20/5 38	95	0.4	132	320 ED 15%	69
MHD5030		30	5				100	0.35			72.5
MHD5032		32	5				110	0.35			73
MHD10028	100	28	6	35	100/40 10/20	100/40 20	135	0.2	132 ×2	240 ED 25% ×2	122
MHD10030		30	6				145	0.2			127

＊ MHI-MME is sales representation in Japanese domestic market.

Standard Crane(30t)

Heavy duty Crane(100t)

Load meter in the operator cab

Offline filter unit

Sample image recorded by the surveillance camera

Extensive UP-GRADE Item

SMART UP-GRADE

Upgrade Menu Examples

- Data Logging Advance (DLA)
  Adds on pressure and speed sensors and enables the regular monitoring of equipment performance (self-test mode) and the swift identification of causes when problems occur
- Load meter in the operator cab
- Offline filter unit
- Surveillance camera

A diverse menu that offers many other customizations is available

Electric Deck Crane

Newly Developed

The clean and green electric deck crane merges the expertise accumulated through many years of experience in electro-hydraulic deck cranes with regenerative power and other energy-saving technologies in the newly developed next-generation deck crane. It contributes to global marine transport through high functionality, economic efficiency and environmental performance.

Features

High Efficiency

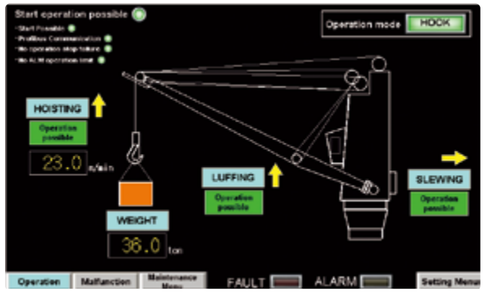
- Uses the variable frequency drive (VFD) system and high-efficiency motor and invertor
- Regenerative power supply reduces consumed power by about 40% as compared with electro-hydraulic deck cranes

High Reliability and Easy Maintenance

- The optimal layout of the electric motor and reducer, and the placement of main equipment at the base of the crane achieve a simple yet easy-to-maintain superior design
- All component devices and parts used have been carefully checked for quality, ensuring high reliability

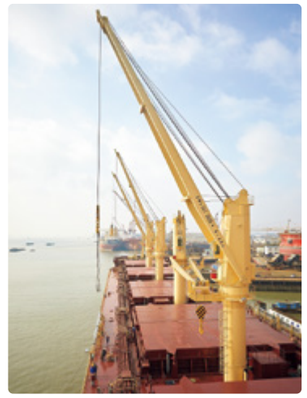
User Friendly

- The operator cab is equipped with a touchscreen display that has excellent visibility and operability.
  Combined with the data logging function,
  it allows crane operating data and the status of the crane to be confirmed at hand if problems occur



Example of content shown on the touchscreen sensor display

Operator cab interior



Electric Crane (36t)

Deck Machinery

MHI-MS has been delivering hydraulic deck machinery to satisfied customers for more than half a century. MHI-MS provide a wide range of windlasses, winches and pumps that are highly reliable, durable, and high performing, making marine operations both faster and safer.

Features

High Reliability

- Its highly reliable design leverages more than a half-century of experience in in-house electro-hydraulic deck cranes

High Efficiency

- Utilizes a compact and highly efficient high-pressure hydraulic system

Extensive Line-up

Extensive lineup for various ship types and applications

- Mooring winch lated load: 100kN ～250kN
- Windlass chain diameter: φ 60MM ～ over φ 100MM
- Central circuit and Series circuit are supported

Windlass

Mooring winch

＊ MHI-MME is sales representation in Japanese domestic market.

WATER JET PROPULSION SYSTEM

Water Jet Propulsion System (MWJ-A Model Series)

Water Jet Propulsion System is installed as a part of fast vessel for express marine transportation. Mitsubishi Heavy Industries, Ltd. has been a leader in this field and has a good track records in delivery. Mitsuibishi Water Jet was developed based on the experience of the design and manufacturing of Pumps
which have a considerable number of delivery records with a long history as well as the know-how established as a ship building manufacturer. Using the strength of such integrated technical capabilities Mitsuibishi Water Jet can contribute to the performance of vessels in all aspects such as acceleration, downsized design, durability and so on.

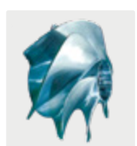
Features

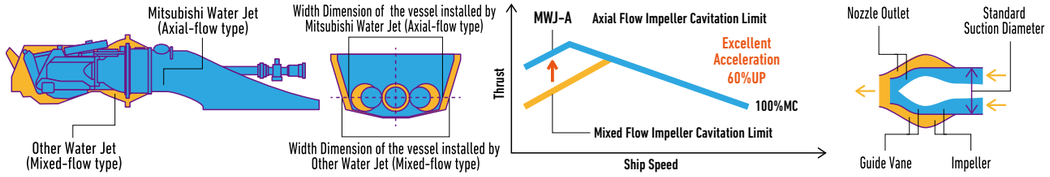
Lightweight & Compact Design
- Adopting axial flow impeller for smaller and ligher in design
- Simplified structure at mechanical portion
- Much further lightweight solution can be proposed (ex.Double-Stage Blade Impeller)

Excellent Acceleration & Propulsion Performance
- MHI Axial-flow type impeller enables high efficiency and superior performance against cavitation

High Performance in Ship Maneuverability
- Flexible handling by quick and smooth astern performance
- Applicable to Dynamic Positioning System (DPS)

Provide Good After-sales Service
- Short delivery of the parts for maintenance
- Skillful engineers, Technical Advisors, and organized support





Range of Output Power

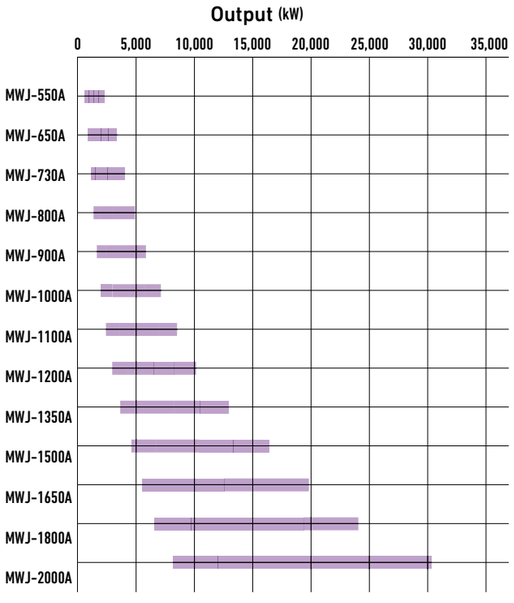
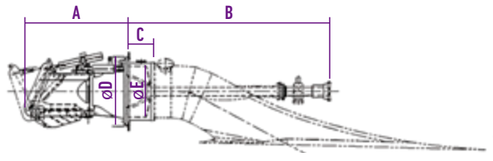


Table for Major Dimensions



Type	Dimensions (mm)				
	A	B	C	D	E
MWJ-550A	1,300	2,350	300	ϕ 820	ϕ 550
MWJ-650A	1,500	2,800	355	ϕ 950	ϕ 650
MWJ-730A	1,640	3,150	400	ϕ 1,050	ϕ 730
MWJ-800A	1,760	3,450	435	ϕ 1,130	ϕ 800
MWJ-900A	2,000	3,850	490	ϕ 1,230	ϕ 900
MWJ-1000A	2,200	4,300	550	ϕ 1,375	ϕ 1,000
MWJ-1100A	2,500	4,900	580	ϕ 1,470	ϕ 1,100
MWJ-1200A	2,660	5,160	660	ϕ 1,630	ϕ 1,200
MWJ-1350A	2,950	5,750	750	ϕ 1,850	ϕ 1,350
MWJ-1500A	3,300	6,400	830	ϕ 2,050	ϕ 1,500
MWJ-1650A	3,600	7,050	910	ϕ 2,250	ϕ 1,650
MWJ-1800A	3,950	7,700	990	ϕ 2,350	ϕ 1,800
MWJ-2000A	4,400	8,600	1,100	ϕ 2,600	ϕ 2,000

∗ MHI-MME is sales representation in Japanese domestic market.

AFTER-SALES SERVICE / LICENSEES

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  E-mail:afterservice.me@mhi.com
- Overseas bases listed on page 27

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MET Turbochargers, Propellers, Boilers and Turbines, Steering Gear – Spare parts and service engineers

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Fin Stabilizers, Deck Cranes, Deck Machinery, Water-Jet Propulsion Unit – Spare parts and service engineers

- Samayu Co., Ltd.
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  URL:http://www.samayu.co.jp/english/index.html

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URL:http://www.hsd.com

Hyundai Heavy Industries Co., Ltd.

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URL:https://english.hhi.co.kr

STX Heavy Industries Co., Ltd.

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URL:http://www.stxhi.com

Auxiliary Boilers

CSSC Jiujiang Boiler Co., Ltd.

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URL:http://www.csscboiler.com

Turbines

Mitsubishi Hitachi Power Systems Jieneng(Qingdao) Steam Turbine Co., Ltd.

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Tel:+86-532-5573-0797
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Propellers

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Authorized Representative Technical Consultant

Denmark

Turbo Marine Consult Aps

Service Partners

Europe

Denmark

Harris Pye Scandinavia	B

Italy

SAMOS s.r.l.	FS

Netherlands

Fuji Trading (Marine) B.V.	SG
IHI Marine B.V.	SG

Portugal

Harris Pye Portugal	B

United Kingdom

Harris Pye United Kingdom Ltd.	B
Naiad Dynamics UK Ltd.	FS

Germany

Taknas Marine Engineering GmbH	B
Turbo-Technik GmbH & Co.KG	T

Asia

China

IMCS Marine(Shanghai)Co., Ltd.	SG
Shanghai Fance Jidian Shebei Gongcheng Co.,Ltd.	T
Suzhou Harris Pye Equipment Repair Co., Ltd.	B

Japan

AMCO Engineering Corporation		B
Harris Pye Japan Co., Ltd.		B
Toyo Dengyo Co., Ltd.		B
Samayu Co., Ltd.	FS	SG
General Engineering Co., Ltd.		FS
Tamoto Corporation		FS
Sansei Service		FS

South Korea

DINTEC Co.,Ltd.	T
Jonghap Maritime Engineering Inc.	T

Singapore

AC Marine Pte Ltd.		T
Daikai Engineering Pte Ltd.		SG
Harris Pye Singapore Pte Ltd.		B
Shinsei Engineering Pte Ltd.		SG
Samayu Co., Ltd.	FS	SG
Polestar Marine Engineering Pte Ltd.		T
Taknas Engineering Pte. Ltd.		B

Middle East

UAE

Harris Pye Gulf L.L.C.	B
Middle East Fuji L.L.C.	SG

North America

United States of America

Far East Marine Service Inc.	SG

South America

Brazil

Harris Pye Brasil LTDA	B
Fuji Metalock Brasil Ltda	SG

Oceania

Australia

Hydraulic Distributors Pty Ltd	SG
Harris Pye Australia Pty	B

T Turbine　B Bolier
FS Fin Stabilizer　SG Steering Gear

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(as of Mar. 2022)

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(as of Mar. 2022)

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E-mail: thai.sales@techno-pacific.com

Unithai Shipyard and Engineering Ltd.
25 Alma Link Building, Soi Chidlom, Ploenchit Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Tel:+66-2-2548400 Fax:+66-2-2551155
E-mail: kondosan@unithai.com

Orient Technical Marine Co., Ltd.
No.A14, Tan Thuan Nam Area, Phu Thuan Street, District 7, Ho Chi Minh City, Vietnam
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E-mail: orientmarine@hcm.fpt.vn

Oceania

BaxtersMTQ
111 Beenleigh Road, Acacia Ridge, QLD 4110, Australia
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E-mail: brisbane@baxters.com.au

NZ Marine Turbochargers Ltd.
136 Vanguard Street, Nelson 7010, New Zealand
Tel:+64-3-5466188 Fax:+64-3-5480974
E-mail: service@turbocharger.co.nz

North America

Motor-Services Hugo Stamp, Inc.
3190 SW 4th Ave., Fort Lauderdale, Florida 33315, U.S.A.
Tel:+1-954-763-3660 Fax:+1-954-763-2872
E-mail: turbo@mshs.com

MAN Energy Solutions USA Inc., MAN Prime Serv Los Angels
1152 E Dominguez Street Carson, CA 90746, U.S.A.
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Baron de Juras Reales nr 5050, Conchali, Santiago, Chile
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COMPANY DATA

Corporate Overview

Trade Name	Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.
Head Office	1-1 Akunoura-Machi, Nagasaki, 850-8610, Japan TEL.+81-95-828-7185 FAX.+81-95-828-6633 URL:http://mhimme.mhi.com/ Email: info-meet@mhi.com
President	Toshiaki Hori
Capital	1 billion Japanese Yen
No. of Employees	198 (As of Jan 2022)
Business Activities	Development, design, manufacture, marketing, after-sales service and licensing of marine machinery

Corporate History

July 1884	Yataro Iwasaki, founder of Mitsubishi, leased the Nagasaki Shipyard owned by the Japanese Ministry of Industry. Naming it the Nagasaki Shipyard & Machinery Works it began full-scale shipbuilding work.
1885	Completed production of its first marine boiler. Since then, it has successively expanded manufacturing activities to include engines, turbines, turbochargers, propellers, fin stabilizers, steering gears, deck cranes and deck machinery.
	Manufactured first marine boiler
1904	Manufactured first propeller
1908	Manufactured first marine turbine
1920	Manufactured first fin-type stabilizer
1935	Manufactured first electro-hydraulic steering gear
1953	Manufactured first steam winch
1965	Manufactured first non-water cooled exhaustgas turbocharger
1972	Manufactured first electro-hydraulic deck crane and electric crane
October 1977	Established MHI Diesel Service Co., Ltd. as a wholly owned subsidiary of MHI Group, with a capital of 25 million yen, to handle the design of MHI marine engines, etc., as well as carry out after-sales services.
April 2011	The Marine Machinery & Engine Division was established within the Power Systems Headquarters consolidating MHI's marine machinery and engine businesses.
October 2013	Successfully accomplished the development, design, sales, after-sales service and licensing of MHI's marine machinery and engines. Capital increased to 1 billion yen, and the trade name changed to Mitsubishi Heavy Industries Marine Machinery & Engine Co.,Ltd.
April 2017	Transferred engine business to Kobe Diesel Co.,Ltd, which changed their name to Japan Engine Corporation. Company name changed to Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.

Contacts

Product Purchase

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2-3 Marunouchi 3-chome, Chiyoda-Ku, Tokyo, 100-8332, Japan
TEL. +81-80-8959-5559 FAX. +81-3-6275-6484

Kansai Branch Office
1-3-20 Tosabori, Nishi-ku, Osaka, 550-0001, Japan
TEL. +81-80-8959-5471 FAX. +81-6-6446-4025

Overseas Bases

London Branch
Mitsubishi Heavy Industries Europe, Ltd. (MHIE)
Building 11, Chiswick Park, 566 Chiswick High Road,
London, W4 5YA, United Kingdom
TEL:+44-0-203-480 7582 FAX:+44-0-203-480-7501
Mobile:+44-75-2733-7413
E-mail:london-mme@mhie.com URL:http://www.mhie.com

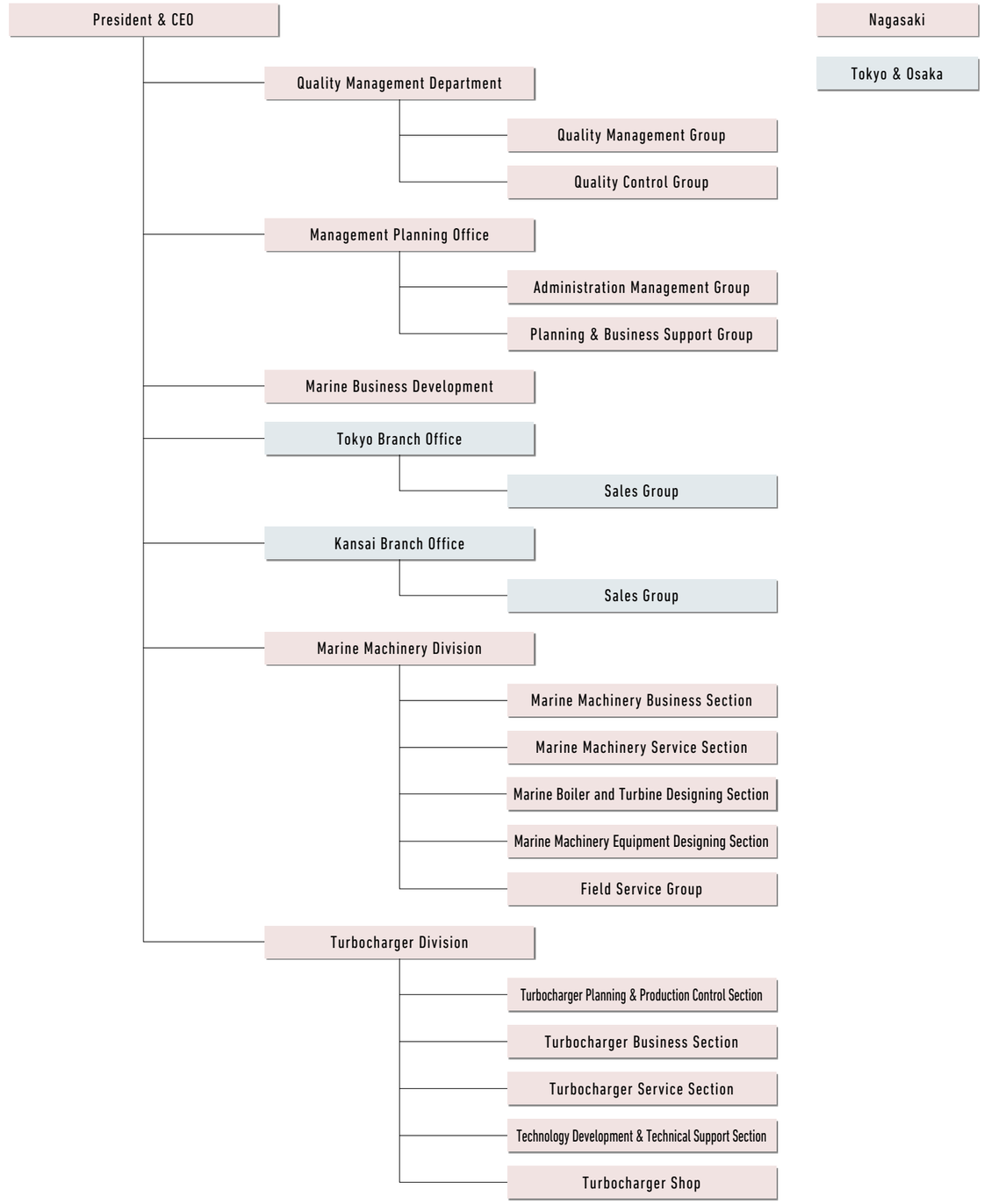
Singapore Branch
Mitsubishi Heavy Industries Asia Pacific Pte. Ltd. (MHI-AP)
150 Beach Road, #33-05/08 Gateway West, Singapore 189720
TEL:+65-6305-5470 FAX:+65-6396-5905
Mobile:+65-9237-8565
URL:http://www.mhiap.com

Shanghai Branch
Mitsubishi Heavy Industries (Shanghai) Co., Ltd. (MHISH)
22th Floor, Raffles City Tower-1, 1133 Lujiazui Ring Road,
Shanghai 200120, China
TEL:+86-21-6841-3030 Fax:+86-21-6841-5222
URL:http://www.mhi.com.cn/

Busan Branch
MH Power Systems Korea, Ltd. (Busan)
16F, Centum Science Park B/D, 79, Centum Jungang-ro,
Haeundae-gu, Busan, 48058, Korea
TEL: +82-51-442-5901 FAX: +82-51-462-7317
Mobile:+82-10-4483-2616
URL: https://www.mhps.com/index.html

Structure of MHI-MME

(as of Jan 1, 2022)



Contact for Mitsubishi Marine Machinery of Group Company

SOx Scrubber

Mitsubishi Shipbuilding Co., Ltd.
Marine Engineering Center

Address: Mitsubishijuko Yokohama Bldg., 3-1
Minatomirai 3-chome, Nishi-ku, Yokohama,
Kanagawa, 220-8401, Japan
URL:http://www.mhi.com/products/ship/dia-sox.html

4st Marine High Speed Engines

Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.
Engine Sales Department Engine & Energy Division

Address: 3000 Tana Chuo-ku, Sagamihara, Kanagawa 252-5293 Japan
Tel: +81-42-763-7854 Fax:+81-42-761-1994
URL:http://www.mhi.com/group/mhiet/

SR Series

SA Series

TD / TF Type Turbocharger

Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.
Sales Department of Turbo Division

Address: 3000 Tana Chuo-ku, Sagamihara, Kanagawa 252-5293 Japan
Tel: +81-42-763-1685
URL:http://www.mhi.com/group/mhiet/

Cargo Oil Pumps and Turbines

Mitsubishi Heavy Industries, Ltd.
Hydranlic & Energy Department

Address: 2-1-1 Shinhama Arai-cho, Takasago, Hyogo, 676-8686, Japan
Tel:+81-79-445-9827 Fax:+81-79-445-9935
E-mail:F_contact.pump@mhi.com
URL:http://www.mhi.com

Cargo oil pump

Cargo oil pump turbine

Contact for Other Product

In April 2017, our 2 stroke engine business and Kobe Diesel Co., Ltd. were consolidated as Japan Engine Corporation.

2st Marine Low Speed Engine

Japan Engine Corporation (Headquarters)

Address: 1, Minamifutami, Futami-cho, Akashi, Hyogo 674-0093
[Main] Tel:+81-78-949-0800 Fax: +81-78-949-0810
[Engine sales] Tel:+81-78-672-3794
[After-sales sales service] Tel:+81-78-949-0801
[After-sales technical service] Tel:+81-78-672-3819
Email: (Sales) sales@j-eng.co.jp
(After-sales service) service@j-eng.co.jp
URL:http://www.j-eng.co.jp/

Japan Engine Corporation (Tokyo Branch Office)

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Japan Engine Corporation (Imabari Branch Office)

Address: 2-1, Kitahorai-cho 2-chome, Imabari, Ehime 794-0028
Tel:+81-898-32-7588 Fax:+81-898-36-1223

MITSUBISHI
HEAVY
INDUSTRIES
GROUP

Mitsubishi Marine Machinery & Equipment Co., Ltd.

1-1, Akunoura-Machi, Nagasaki, 850-8610, Japan Tel.+81-95-828-7185 URL. https://mhimme.mhi.com/

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