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HYUNDAI HiMSEN

HYUNDAI | ENGINE & MACHINERY
HEAVY INDUSTRIES

HYUNDAI HiMSEN ENGINE

PROGRAMME 2018 2nd

HI-OPTIMIZED POWER SOLUTIONS

Hi-touch Marine & Stationary ENgine
Marine & Offshore GenSets

HYUNDAI | ENGINE & MACHINERY
HEAVY INDUSTRIES

HIMSEN

Introduction

As one of the leading engine builders in the world, the Engine & Machinery Division of Hyundai Heavy Industries Co., Ltd. (HHI-EMD) has enjoyed its reputation since its beginning in 1978. HHI-EMD has taken up 35 % of the world's market share in 2-stroke engines covering marine and stationary purposes.

This shows that the superior quality of HYUNDAI engines has been recognized by customers all over the world. HHI-EMD developed its own specially designed HiMSEN engine as part of ongoing efforts to provide the most practical and highest quality engines to its customers.

Key advantages of the HiMSEN engine include reliability, durability, long service intervals, easy maintenance, operational economy, and environmental friendliness.

Based on its leading position in engine production, HHI-EMD has become the forerunner in the sector of engine power generation as well. A great number of its domestic and overseas engine power plants have shown superb performance, adding to the HYUNDAI reputation.

The business activities of HHI-EMD have been further expanded into diverse fields of Marine Pumps, Turbines, Ballast Water Treatment System, Hi-GAS, Hi-ReGAS, Hi-ERS, Hi-EMS and NoNOx System.

ENGINE &
MACHINERY DIVISION

Marine Propulsion System

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HiMSEN propulsion system Department	1000, Bangeojinsunhwan-doro, Dong-gu, Ulsan, Korea (Zip code : 44032)	Tel. : +82-52-202-7293 e-Mail : k110@hhi.co.kr

Marine Engine & Eco-Machinery

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Power Plant

108

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Customer Service

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Hyundai Global Service Co. Ltd	Centum Science Park 6F 79, Centum jungang-ro, Haeundae-gu, Busan, Korea (Zip code : 48058)	Tel: +82-52-204-7760/7887 (for Warranty Service) Tel: +82-52-204-7718/7742 (for Parts Sales) e-Mail: service@hyundai-gs.com / sales@hyundai-gs.com

Marine Engine & Machinery

Hyundai Heavy Industries Co., Ltd.

HYUNDAI HiMSEN Family

Design Philosophy
Hyundai's HiMSEN Family have simple and smart design suitable for marine applications with high reliability and performance.
The key features are:

Heavy Fuel Engine with same fuel of main engine (Uni-Fuel concept). Hence, the diesel fuel and heavy fuel oil of the viscosity of upto 700cSt at 50 °C is acceptable.

Economical and Ecological Engine with low fuel consumption, NOx emission, and Smoke, etc. , which is based on the below specific designs;
- Optimized Supercharging with Miller Cycle
- High Fuel Injection Pressure

Reliable and Practical Engine with simple, smart and robust structure.
- Number of engine components are minimized with Pipe-Free design
- Most of the components are directly accessible for easier maintenance
- 'Individual Part' maintenance concept is provided
- Feed System is fully modularized with direct accessibility

Earth-Friendly Engine

Main Features

Performance characteristics
- High output in the similar range engines
- Low fuel oil consumption
- Quick acceleration & load response

Maintenance
- Easier maintenance by modularized design
- Minimal number and kind of components

Earth-friendly engine
- Low NOx emissions
- Compliance with IMO NOx Tier II, Tier III
- Low vibration & noise

Jack-up Platform/Drilling Rig

FPSO

Drillship

Major Application

Marine
- Propulsion system
- Generating sets

Offshore
- Drill ship
- FPSO

Stationary
- Power plants
- Packaged power stations
- Gas engine power plants
- Pre-fabricated power plants
- Barge-mounted diesel power plants
- Emergency diesel generator (EDG) for nuclear power plants

Emergency GenSets for Nuclear Power Plant

Power Plant

Car Ferry & Passenger Vessel

Container ship

HYUNDAI HiMSEN

HiMSEN ENGINE

Introduction

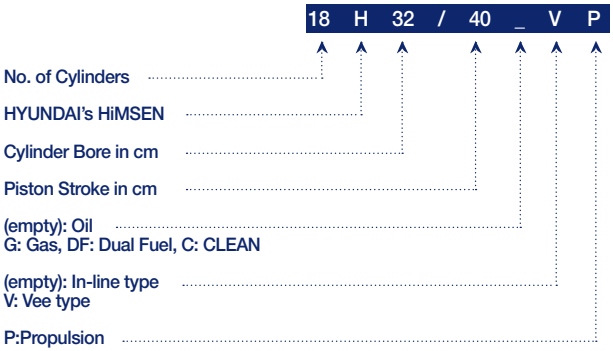
General

This programme provides necessary information and recommendations for the application of HYUNDAI's HiMSEN engines.

'HiMSEN'® is the registered brand name of HYUNDAI's own design engine and the abbreviation of 'Hi-touch Marine & Stationary ENgine'.

Please note that all data and information prepared in this programme are for guidance only and subject to change without notice. Therefore, please contact Hyundai Heavy Industries Co., Ltd.
before actual applications of the data. Hyundai Heavy Industries Co., Ltd.
will always provide the data for the installation of specific project.

Engine Model Designation



Engine Operation

Reference Condition

General definition of diesel engine rating is specified in accordance with ISO 3046/1:2002, ISO 15550:2002.
However the engine outputs are available within tropical conditions without de-rating.

Tropical Conditions

- Turbocharger air inlet pressure: 1,000 mbar
- Turbocharger air inlet temperature: 318 K (45 °C)
- Charge air coolant temperature: 309 K (36 °C)*

* Valid for central cooling system up to 36 °C normally, 38 °C specially.

Specific Fuel Oil Consumption (SFOC) & Heat Rate

The stated consumption figures refer to the following ISO reference conditions:
- Turbocharger air inlet pressure: 1,000 mbar
- Turbocharger air inlet temperature: 298 K (25 °C)
- Charge air coolant temperature: 298 K (25 °C)
- Lower calorific value of fuel 42,700 kJ/kg
- Without engine driven pumps
- Tolerance +5 %
- At 100 % load

Specific Lube Oil Consumption (SLOC)

The stated consumption is given with a tolerance of +25 %
depending on the operating conditions.

HiMSEN ENGINE

Engine Operation

Engine Power

The engine brake power is stated in kW. For conversion between kW and metric horsepower, please note that 1 bhp = 75 kg·m/s = 0.7355 kW.
Ratings are given according to ISO 3046/1:2002, ISO 15550:2002.

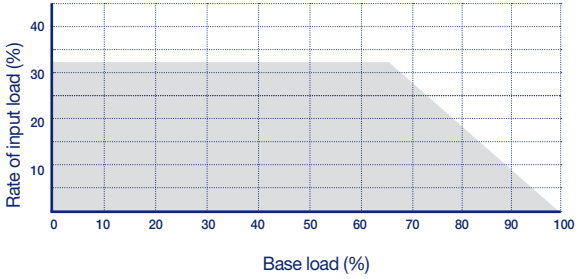
In case of HR (Higher Rating) version, no overload is permissible except for 10 % overload during official factory test.

Power Management of Gensets

When making power management system of multi-Gensets for marine application, a proper load balance is to be considered by shipyard.

In case of a failure of one engine, its output has to be made up for by the remaining engines or by reducing/switching off electric consumers.

No overload of remaining engine is allowed for such a case and the electric power scheme of the ship can be derived from the following load characteristics.



Continuous Load-Up

The quickest way to load-up from 0 % to 100 % load can be achieved by increasing the load continuously and gradually.

Step by Step Load-Up

Considering the time required for stabilizing the frequency deviation due to sudden load-up, it is recommended to load up from idle to full load by more than three steps IACS (especially for GenSets of 720rpm or 900rpm due to higher BMEP of over 24 bar).

HiMSEN GenSets except gas engine fulfill the requirements of classification societies concerning the frequency deviation and recovery time when loading up by 3 steps from 0 % to 100 %.

HiMSEN GenSets gas engine fulfill the requirements, considering the time and safety required for stabilizing the frequency due to sudden load up,
it is recommended to load up from idle to full load by more six steps.

HYUNDAI HiMSEN

HiMSEN ENGINE

Engine Operation

Information for Fuel oil control by EU Directive 2005-33-EC and California Code of Regulations

All HiMSEN engines are suitable and developed for continuous operation on HFO as well as MDO/MGO. There is no lower limit for the sulfur content of fuel oil. In connection to the low viscosity of MGO, (Marine Gas Oil, DMA as defined in ISO 8217) the viscosity at engine inlet should be kept within the value of 2 ~ 14 cSt in order to avoid possible wear or sticking of fuel injection pump due to low lubricity and in order to maintain the suitable hydrodynamic film between fuel injection pump plunger and barrel.

- Recommended stable viscosity at engine inlet: Min. 3 cSt
- Recommended minimum viscosity at engine inlet: Min. 2 cSt

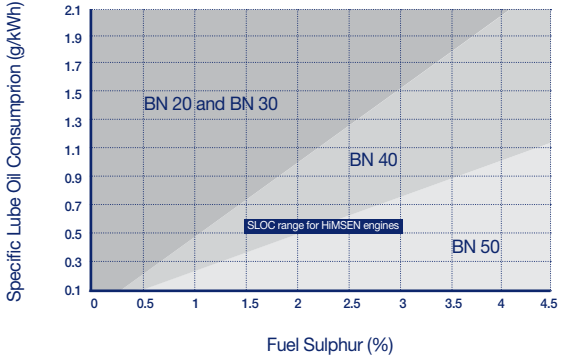
So, a proper cooling device (D.O cooler or chiller etc.) is to be considered, if needed, to keep the above mentioned viscosity (2 ~ 14 cSt) at engine inlet.

When the MGO is to be used only for temporary engine operation (e.g. in port), higher BN lube oil used for residual fuel (HFO) should not present any problems in case of short periods of running.
When engine is not operated continuously with low sulfur fuel such as MGO, lube oil should be chosen according to the highest sulfur contents of the fuel with normal operation.

Guideline for Lube Oil

Base Number (BN) must be carefully selected depending on fuel grade and sulfur contents.
Following are guidance values for initial filling.

Typical recommended BN depending on the fuel sulfur contents and SLOC (g/kWh)



Reference: CIMAC recommendation number 29/2008 'Guidelines for the lubrication of medium speed diesel engine'

Engine Operation

IMO NOx EMISSION AND HiMSEN ENGINES

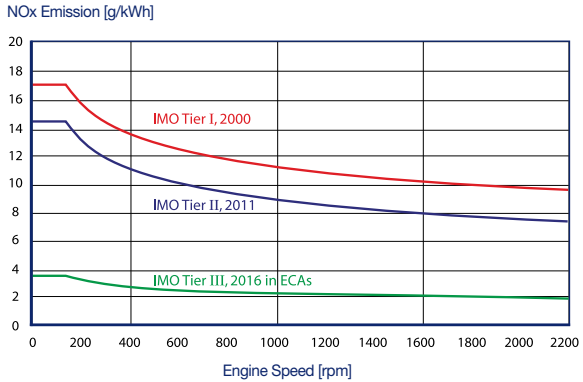
Annex VI of the MARPOL 73/78 convention entered into force 12 May 2005. All HiMSEN engines included in this booklet comply with the NOx Limits specified in the IMO regulation.

The exhaust emission regulations in Annex VI were referred to as IMO Tier I, MARPOL Annex VI regulations were amended at the MEPC (Marine Environment Protection Committee) in October 2008. These specify further NOx emission limits to be known as IMO Tier II and Tier III.

IMO Tier II regulations were entered into force on 1 January 2011 based on keel laying, according to a speed dependent function, with reduction of about 20 % in comparison with IMO Tier I (refer to chart).

Under IMO Tier III, the NOx emission limits for marine engines become effective on 1 January 2016 based on keel laying, according to a speed dependent function, with reduction of 80 % in comparison with IMO Tier I when the ship is operated in a designated Emission Control Areas (so called ECAs).

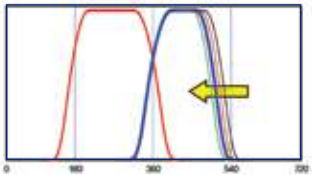
All types of HiMSEN engine are complied with the new upcoming NOx emission regulations, and do its best to satisfy further request if any from customers.



HYUNDAI ENVIRONMENTAL TECHNOLOGIES against IMO Tier II, Tier III

HYUNDAI is introducing technologies to meet IMO Tier II, Tier III regulation with internal engine measures only such as:

- Miller valve timing requiring increased charger air pressure by applying the high pressure ratio turbocharger
- Optimised combustion by applying the combustion control technologies with optimising the piston bowl shape and the fuel injection valve nozzle etc.

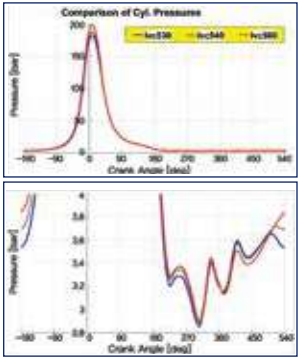


Various Intake Valve Closing Timing for 1-D Cycle Simulation

Miller valve timing

This technology is very useful to reduce the NOx emission by optimising the intake valve's closing timing especially, result in changing the effective compression and expansion ratio.

In order to apply this technology, the high pressure ratio turbocharger is required to increase the charge air pressure and new devel oped T/C with high pre ssure ratio is mounted on HiMSEN engine.



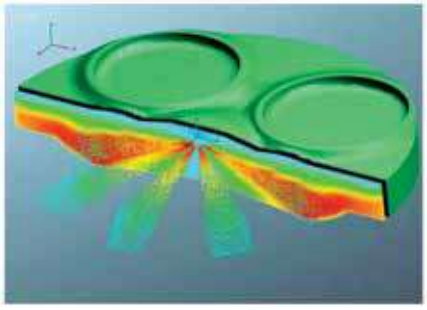
Combustion pressure depending on IVC timing from 1-D Cycle Simulation

HiMSEN ENGINE

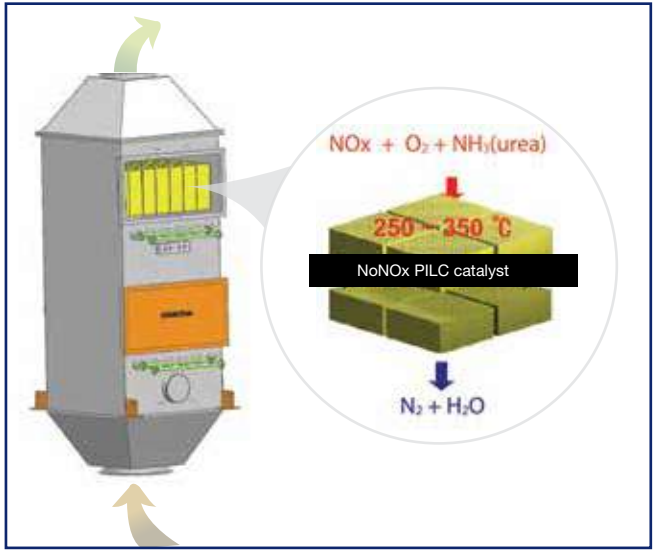
Engine Operation

Optimized combustion

The NOx emission can be reduced by the combustion control technologies with the optimum combination of the piston bowl shape and the fuel injection valve nozzle etc.
The piston bowl shape and the fule injection valve nozzle's specification are optimized to meet the IMO Tier Ⅱ, Tier Ⅲ regulation, which are evaluated by 3-D combustion analysis and verified by the measurement at HiMSEN Techno Center.



3-D Combustion Analysis



HYUNDAI ENVIRONMENTAL TECHNOLOGIES against IMO Tier III

As one of solutions, NoNOx™ SCR (Selective Catalytic Reduction) system

HYUNDAI can offer NoNOx™ SCR technology that can reduce NOx emissions by 95 %, designed for Tier Ⅲ limits. HYUNDAI is optimizing the whole installation, performance and engine in order to achieve low cost of production and give benefits to the customers.

HYUNDAI HiMSEN

HiMSEN...

The best solution for all types of marine vessels and offshore applications with proven reliability, low emission, low operation cost, multi-fuel capability...Our extensive R&D facilities enable HHI to provide the customers with high quality and excellent services in all phases of designing, production, as sembly and commis s ioning of HiMSEN propulsion packaged system.

Marine Propulsion System

Long Term Commitment...

To provide the market with reliable, cost effective and earth-friendly solution

Optimized Matching of HiMSEN Propulsion Package

- HiMSEN Diesel or Dual fuel engines
- C.P/F.P Propeller with shafting, Azimuth thruster
- Pitch and speed control
- Load control
- Reduction gear
- Shaft generator
- Auxiliary machinery

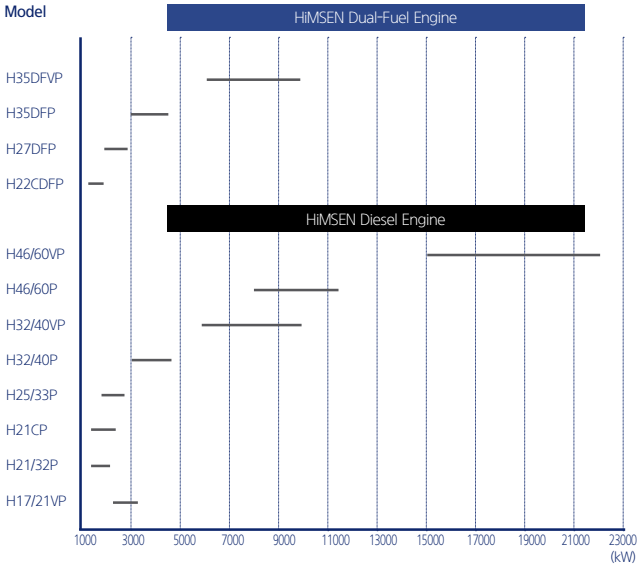
Application

- Controllable pitch propulsion
- Fixed pitch propulsion
- Azimuth thruster propulsion
- Pump drive

Excellent Performance of HiMSEN Propulsion Engine

- Improved transient operation with pulse charging turbocharger
- Invisible smoke
- Lower thermal load engine
- Low fuel consumption
- Low NOx emission

Power range for HiMSEN Propulsion engines



Power Range

H22CDFP	1,100~1,980kW
H27DFP	1,860~2,790kW
H35DFP	3,000~4,500kW
H35DFVP	6,000~10,000kW

H17/21VP	1,920~3,200kW
H21/32P	1,200~1,800kW
H21CP	1,200~2,160kW
H25/33P	1,740~2,610kW
H32/40P	3,000~4,500kW
H32/40VP	6,000~10,000kW
H46/60P	7,500~11,250kW
H46/60VP	15,000~22,500kW

HiMSEN Dual Fuel Engines for Propulsion

Model			H22CDFP	H27DFP	H35DFP	H35DFVP
Bore		mm	220	270	350	350
Stroke		mm	330	330	400	400
Speed		r/min.	1,000	1,000	750	750
Cylinder output		kW/cyl.	220	310	500	500
Rated output #)		cyl.	kW			
		5	1,100			
		6	1,320	1,860	3,000	
		7	1,540	2,170	3,500	
		8	1,760	2,480	4,000	
		9	1,980	2,790	4,500	
		12				6,000
		14				7,000
		16				8,000
		18				9,000
		20				10,000
SFOC *) on Diesel mode	at 100% MCR	g/kWh	192.0	186.0	185.0	185.0
	at 85% MCR		196.0	185.0	184.0	184.0
Heat rate *) on Gas mode	at 100% MCR	kJ/kWh	8,079	7,728	7,270	7,270

*) Note :
1) Reference condition based on ISO 3046/1
2) Fuel oil based on LCV(Lower Calorific Value) 42,700kJ/kg
3) Gas operation : Including pilot fuel oil and fuel gas based on LHV(Lower Heating Value) 35MJ/Nm^3, MN80
4) Tolerance +5% and without engine driven pumps
5) NOx Emission limitation : IMO Tier II on Diesel mode, IMO Tier III on Gas mode

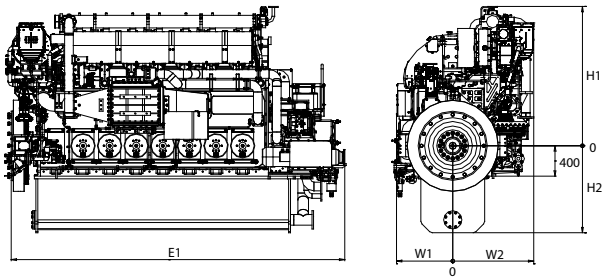
#) Based on the CPP Constant speed operation
(For FPP : Please contact HHI EMD)

Marine Propulsion System

Tier II, Tier III

H22CDFP I Bore: 220 mm, Stroke: 330 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.



Dimensions

1000 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	5	1,100	3,680	1,825	1,145	737	1,015	16.0
	6	1,320	4,030	1,825	1,145	737	1,060	18.0
	7	1,540	4,380	1,825	1,145	737	1,060	20.0
	8	1,760	4,730	1,825	1,145	737	1,150	22.0
	9	1,980	5,080	1,825	1,145	737	1,150	24.0

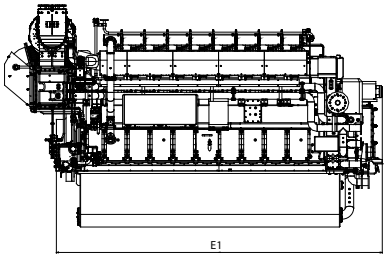
E1 : Dimension between eng. flywheel to eng. free end.
In case of dry sump, the weight and height will be reduced.

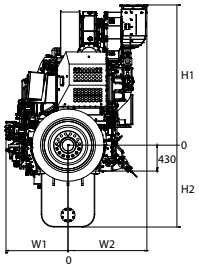
Marine Propulsion System

Tier II, Tier III

H27DFP I Bore: 270 mm, Stroke: 330 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.





Dimensions

1000 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	6	1,860	4,060	2,199	1,360	1,030	1,214	24.2
	7	2,170	4,440	2,199	1,360	1,030	1,214	26.5
	8	2,480	4,820	2,199	1,360	1,030	1,214	28.1
	9	2,790	5,200	2,329	1,360	1,030	1,214	30.2

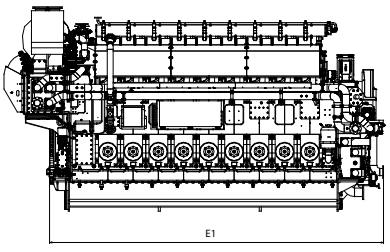
E1 : Dimension between eng. flywheel to eng. free end.
In case of dry sump, the weight and height will be reduced.

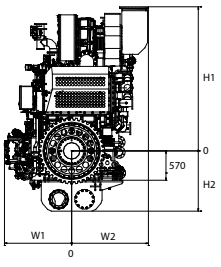
Marine Propulsion System

Tier II, Tier III

H35DFP I Bore: 350 mm, Stroke: 400 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.





Dimensions

750 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	6	3,000	5,007	2,381	1,170	1,304	1,373	36.7
	7	3,500	5,497	2,473	1,170	1,304	1,430	41.6
	8	4,000	6,009	2,799	1,170	1,304	1,490	44.5
	9	4,500	6,477	2,799	1,170	1,304	1,490	47.6

E1 : Dimension between eng. flywheel to eng. free end.

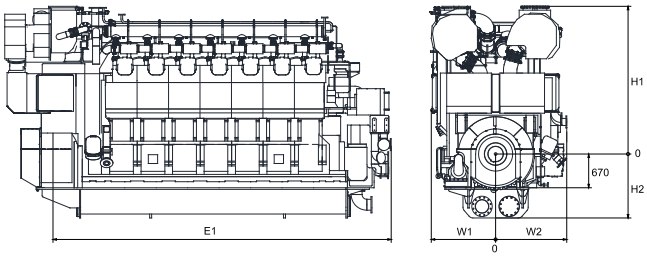
HYUNDAI HiMSEN

Marine Propulsion System

Tier II, Tier III

H35DFVP I Bore: 350 mm, Stroke: 400 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.



Dimensions

750 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	12	6,000	6,092	2,933	1,192	1,277	1,412	60.0
	14	7,000	6,717	2,933	1,192	1,277	1,412	67.3
	16	8,000	7,342	2,933	1,192	1,277	1,412	73.1
	18	9,000	7,967	2,933	1,192	1,277	1,412	80.3
	20	10,000	8,592	2,933	1,192	1,277	1,412	88.0

E1 : Dimension between eng. flywheel to eng. free end.

HiMSEN Diesel Engines for Propulsion

Model			H21/32P	H21CP	H25/33P	H32/40P	H46/60P
Bore		mm	210	210	250	320	460
Stroke		mm	320	330	330	400	600
Speed		r/min.	900	900	900	750	600
Cylinder output		kW/cyl.	200	240	290	500	1,250
Rated output #)		cyl.	kW				
		5		1,200			
		6	1,200	1,440	1,740 / 1,800	3,000	7,500
		7	1,400	1,680	2,030	3,500	8,750
		8	1,600	1,920	2,320	4,000	10,000
		9	1,800	2,160	2,610	4,500	11,250
SFOC *)	at 100% MCR	g/kWh	183.0	183.0	181.0	184.0	177.0
	at 85% MCR		183.0	179.0	181.0	181.0	174.0

Model			H17/21VP	H32/40VP	H46/60VP
Bore		mm	170	320	460
Stroke		mm	210	400	600
Speed		r/min.	1,800	750	600
Cylinder output		kW/cyl.	160	500	1,250
Rated output #)		cyl.	kW		
		12	1,920	6,000	15,000
		14		7,000	
		16	2,560	8,000	20,000
		18	2,880	9,000	22,500
		20	3,200	10,000	
SFOC *)	at 100% MCR	g/kWh	199.0	186.0	177.0
	at 85% MCR		196.0	181.0	174.0

*) Note :
1) Reference condition based on ISO 3046/1
2) Fuel oil based on LCV(Lower Calorific Value) 42,700kJ/kg
3) Tolerance +5% and without engine driven pumps
4) NOx Emission limitation : IMO Tier II
5) H17/21VP Model:Only applicable on MGO operation

#) Based on the CPP Constant speed operation (For FPP : Please contact HHI EMD)

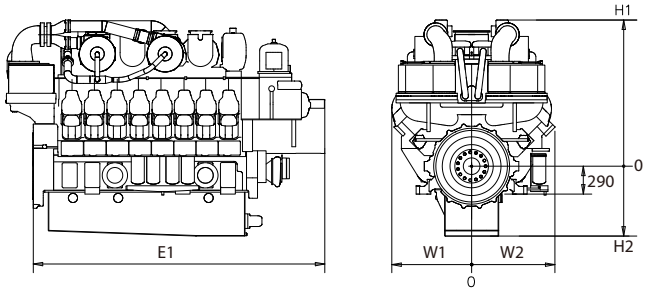
Marine Propulsion System

Tier II, Tier III (with SCR)

H17/21VP I Bore: 170 mm, Stroke: 210 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

1800 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	12	1,920	2,559	1,373	726	830	865	8.7
	16	2,560	3,029	1,373	726	830	865	10.5
	18	2,880	3,264	1,373	726	830	865	11.4
	20	3,200	3,499	1,373	726	830	865	12.2

E1 : Dimension between eng. flywheel to eng. free end.

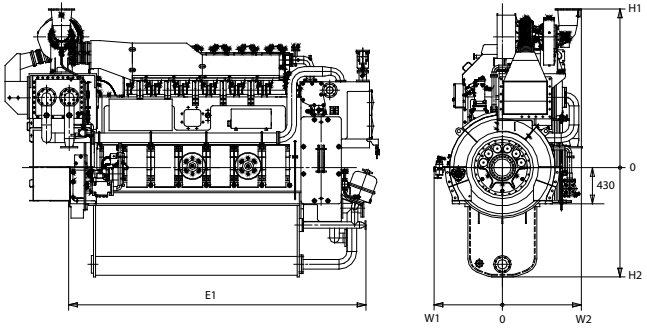
Marine Propulsion System

Tier II, Tier III (with SCR)

H21/32P I Bore: 210 mm, Stroke: 320 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

900 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	6	1,200	3,535	1,885	1,300	812	939	18.0
	7	1,400	3,865	1,885	1,300	812	939	20.0
	8	1,600	4,195	2,059	1,355	812	1,005	21.0
	9	1,800	4,525	2,059	1,355	812	1,005	23.0

E1 : Dimension between eng. flywheel to eng. free end.
In case of dry sump, the weight and height will be reduced.

HYUNDAI HiMSEN

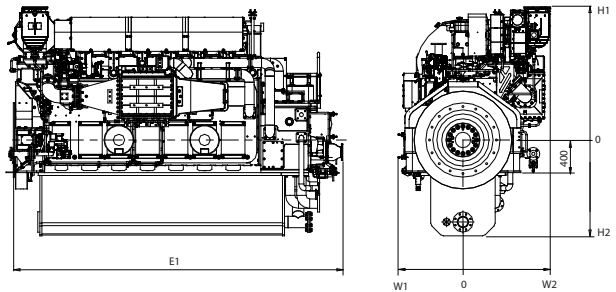
Marine Propulsion System

Tier II, Tier III (with SCR)

H21CP I Bore: 210 mm, Stroke: 330 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

900 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	5	1,200	3,688	1,620	1,175	798	1,065	15.0
	6	1,440	4,038	1,620	1,175	798	1,065	17.0
	7	1,680	4,388	1,620	1,175	798	1,065	19.0
	8	1,920	4,738	1,620	1,175	798	1,065	20.0
	9	2,160	5,088	1,620	1,175	798	1,065	22.0

E1 : Dimension between eng. flywheel to eng. free end.
In case of dry sump, the weight and height will be reduced.

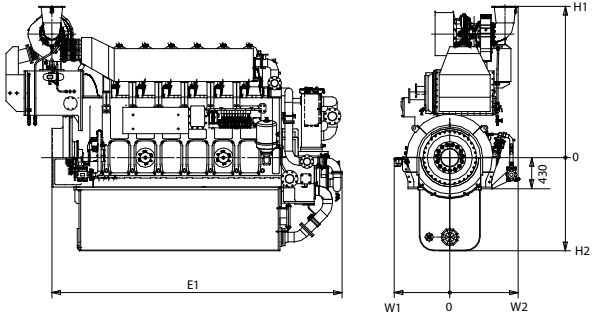
Marine Propulsion System

Tier II, Tier III (with SCR)

H25/33P I Bore: 250 mm, Stroke: 330 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

900 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	6	1,740	4,238	2,209	1,360	812	998	23.0
	7	2,030	4,618	2,209	1,360	812	998	25.0
	8	2,320	4,998	2,331	1,360	812	1,068	26.9
	9	2,610	5,378	2,331	1,360	812	1,068	29.3

E1 : Dimension between eng. flywheel to eng. free end.
In case of dry sump, the weight and height will be reduced.

HYUNDAI HiMSEN

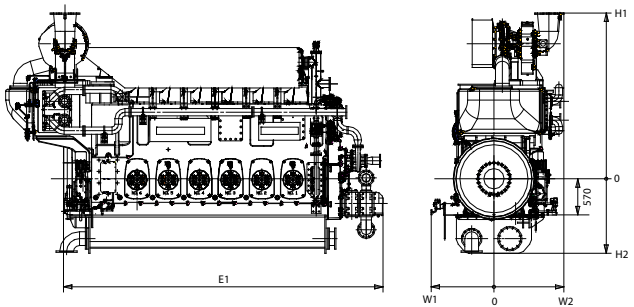
Marine Propulsion System

Tier II, Tier III (with SCR)

H32/40P I Bore: 320 mm, Stroke: 400 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

750 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	6	3,000	5,021	2,602	1,170	986	1,100	35.7
	7	3,500	5,511	2,602	1,170	986	1,100	39.6
	8	4,000	6,079	2,734	1,170	986	1,100	43.5
	9	4,500	6,569	2,734	1,170	986	1,100	46.6

E1 : Dimension between eng. flywheel to eng. free end.

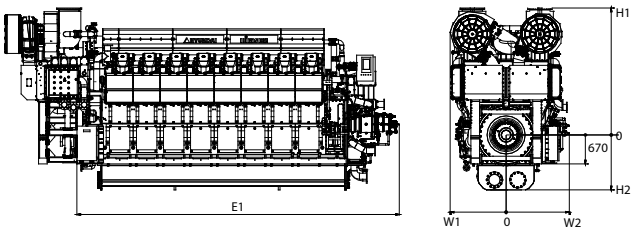
Marine Propulsion System

Tier II, Tier III (with SCR)

H32/40VP I Bore: 320 mm, Stroke: 400 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

750 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	W1	W2	Dry Weight
	12	6,000	6,208	2,749	1,270	1,294	1,462	58.0
	14	7,000	6,833	2,933	1,270	1,294	1,462	65.3
	16	8,000	7,458	2,933	1,270	1,294	1,462	71.1
	18	9,000	8,083	2,933	1,270	1,294	1,462	78.3
	20	10,000	8,708	2,933	1,270	1,294	1,462	86.0

E1 : Dimension between eng. flywheel to eng. free end.

HYUNDAI HiMSEN

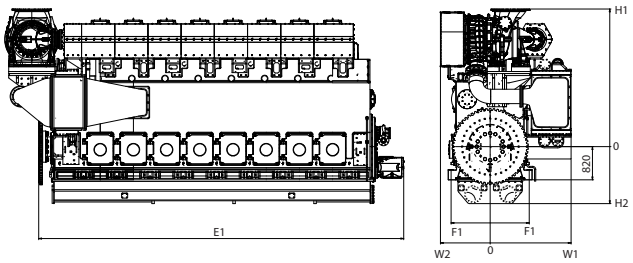
Marine Propulsion System

Tier II, Tier III (with SCR)

H46/60P I Bore: 460 mm, Stroke: 600 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

600 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)						
			E1	H1	H2	F1	W1	W2	Dry Weight
	6	7,500	7,376	3,300	1,408	965	1,999	1,228	111
	7	8,750	8,196	3,400	1,408	965	1,999	1,228	126
	8	10,000	9,016	3,400	1,408	965	1,999	1,228	140
	9	11,250	9,836	3,400	1,408	965	1,999	1,228	154

E1 : Dimension between eng. flywheel to eng. free end.

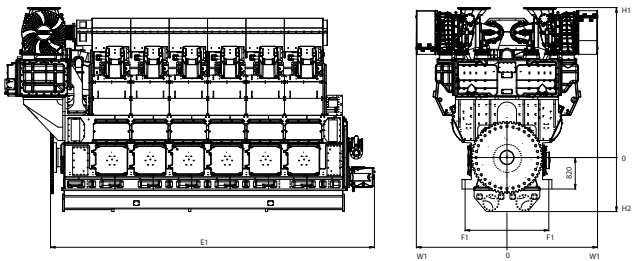
Marine Propulsion System

Tier II, Tier III (with SCR)

H46/60VP I Bore: 460 mm, Stroke: 600 mm

Controllable Pitch Propeller
Permit high skew angles to minimize noise and vibration.

Fixed Pitch Propeller
Guarantee optimum thrust, minimal noise and vibration level.



Dimensions

600 rpm	cyl.	Rated Output at Engine (kW)	Engine dimension (mm) & dry weight (ton)					
			E1	H1	H2	F1	W1	Dry Weight
	12	15,000	8,436	3,906	1,408	1,100	2,359	196
	16	20,000	10,436	4,006	1,408	1,100	2,668	244
	18	22,500	11,436	4,006	1,408	1,100	2,668	268

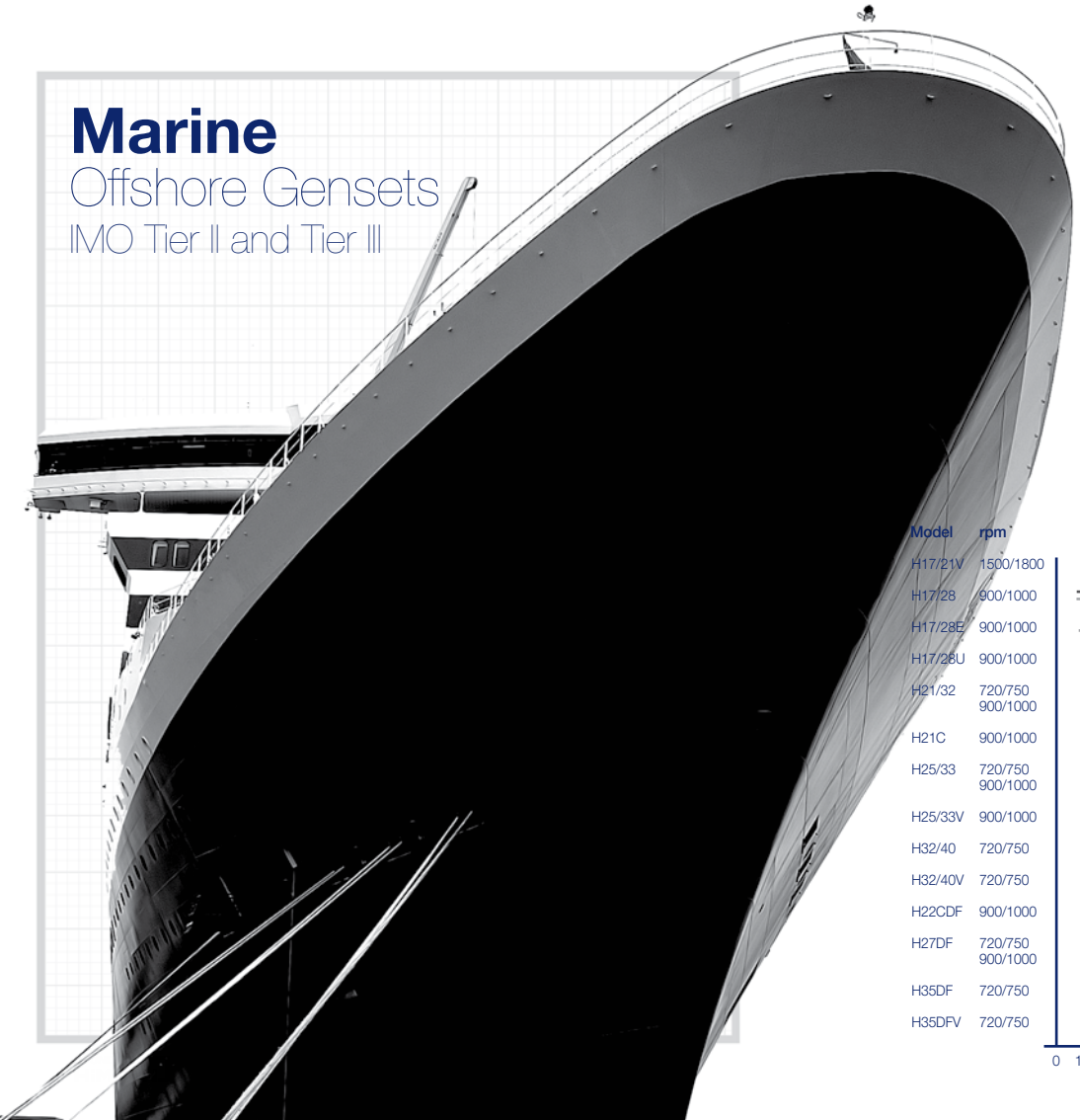
E1 : Dimension between eng. flywheel to eng. free end.

HYUNDAI HiMSEN

Marine

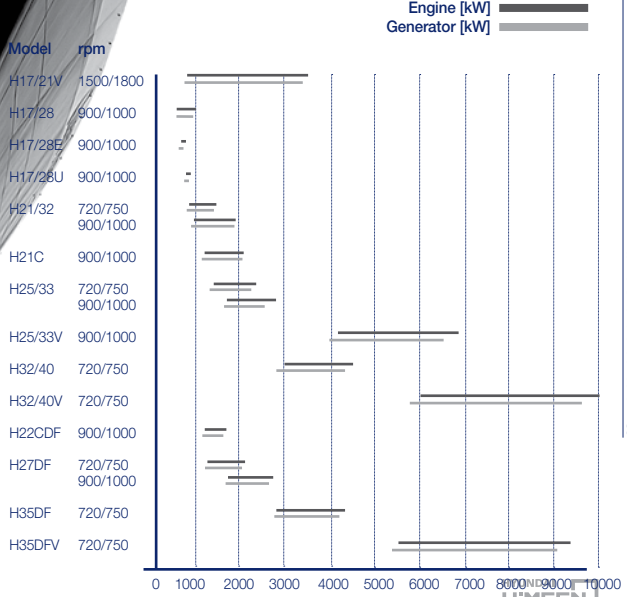
Offshore Gensets

IMO Tier II and Tier III



Power Range

H17/21V	756~3,520 kW
H17/28	575~1,000 kW
H17/28E	660 kW
H17/28U	805 kW
H21/32	800~1,980 kW
H21C	1,200~2,160 kW
H25/33	1,440~2,970 kW
H25/33V	4,080~6,800 kW
H32/40	3,000~4,500 kW
H32/40V	6,000~10,000 kW
H22CDF	1,075~1980 kW
H27DF	1,368~2,790 kW
H35DF	2,880~4,320 kW
H35DFV	5,760~9,600 kW



Marine Offshore Gensets

H17/21V I Bore: 170 mm, Stroke: 210 mm

Tier II, Tier III (with SCR)

Main Data

Speed	1500 rpm		1800 rpm	
Frequency	50 Hz		60 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
	Continuous power			
6H17/21V	756	722	864	825
8H17/21V	1,008	963	1,152	1,100
10H17/21V	1,260	1,203	1,440	1,375
12H17/21V	1,512	1,444	1,728	1,650
16H17/21V	2,016	1,925	2,304	2,200
18H17/21V	2,268	2,166	2,592	2,475
20H17/21V	2,520	2,407	2,880	2,750
	Prime power			
6H17/21V	840	802	960	917
8H17/21V	1,120	1,070	1,280	1,222
10H17/21V	1,400	1,337	1,600	1,528
12H17/21V	1,680	1,604	1,920	1,834
16H17/21V	2,240	2,139	2,560	2,445
18H17/21V	2,520	2,407	2,880	2,750
20H17/21V	2,800	2,674	3,200	3,056
	Standby power			
6H17/21V	924	882	1,050	1,003
8H17/21V	1,232	1,177	1,408	1,345
10H17/21V	1,540	1,471	1,760	1,681
12H17/21V	1,848	1,765	2,112	2,017
16H17/21V	2,464	2,353	2,816	2,689
18H17/21V	2,772	2,647	3,168	3,025
20H17/21V	3,080	2,941	3,520	3,362

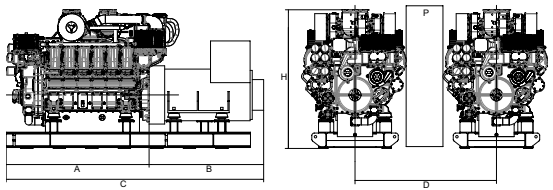
Based on alternator efficiency of 96 %.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
1500 rpm / 1800 rpm	6	1,495	1,986	3,481	2,100	4.0	8.6
	8	1,730	1,993	3,723	2,100	4.9	9.6
	10	1,965	2,050	4,015	2,100	5.8	11.2
	12	2,200	2,050	4,250	2,100	6.7	13.2
	16	2,600	2,050	4,650	2,100	8.0	15.2
	18	2,800	2,680	5,480	2,100	8.9	16.8
	20	3,100	2,680	5,780	2,100	9.8	18.0



Remarks

1) Depending on alternator.
2) Without common bed.
3) With Generator & Common bed (Maker : HHI-EES)

D: Min distance between engines – 2,305 mm
P: Free passage between the engines, width 600 mm and height 2,000 mm
Note) All dimensions and weight are approximate value and subject to change without notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H17/28 I Bore: 170 mm, Stroke: 280 mm

Tier II, Tier III (with SCR)

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
5H17/28	575	538	600	561
6H17/28	690	645	720	673
7H17/28	805	757	840	790
8H17/28	920	865	960	902

Based on alternator efficiency of 93.5 ~ 94 %.

Specific Fuel Oil Consumption

Load	900 rpm	1000 rpm
100%	188 g/kWh	188 g/kWh

Main Data (for Higher Power Rating)

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H17/28	750	701	750	701
7H17/28	875	823	875	823
8H17/28	1,000	940	1,000	940

Based on alternator efficiency of 93.5 ~ 94 %.

Specific Fuel Oil Consumption (for Higher Power Rating)

Load	900 rpm	1000 rpm
100%	191 g/kWh	191 g/kWh

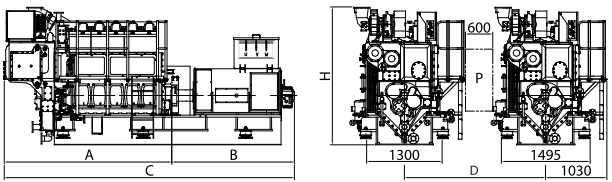
Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 rpm	5	2,791	2,200	4,991	2,314	7.7	13.6
	6	3,071	2,200	5,271	2,314	8.5	14.5
	7	3,351	2,200	5,551	2,314	9.4	15.6
	8	3,631	2,320	5,951	2,314	10.4	16.7

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
1000 rpm	5	2,791	2,200	4,991	2,314	7.7	13.6
	6	3,071	2,200	5,271	2,314	8.5	14.5
	7	3,351	2,200	5,551	2,314	9.4	15.6
	8	3,631	2,320	5,951	2,314	10.4	16.7



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,552 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H17/28U(E) I Bore: 170 mm, Stroke: 280 mm

Tier II, Tier III (with SCR)

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H17/28E	660	618	660	618
6H17/28U	805	750	805	750

Based on alternator efficiency of 93.2 ~ 94 %.

Specific Fuel Oil Consumption

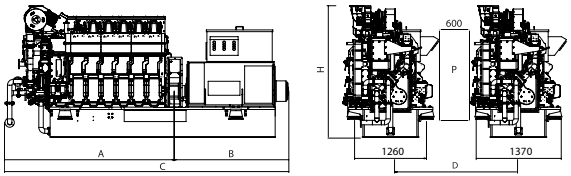
	Load	900 rpm	1000 rpm
6H17/28E	100%	189 g/kWh	190 g/kWh
6H17/28U	100%	191 g/kWh	191 g/kWh

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 rpm	6H17/28E	2,774	1,939	4,713	2,323	6.9	13.0
	6H17/28U	2,774	2,069	4,843	2,393	7.1	13.8



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min distance between engines 2,445 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

This type of engine is optimized as planning products.

1. Optimized capacity for front module (pump, cooler, filter, valve, etc) .
2. Only 6cyl. for pump cover.
3. Optimized design for crankshaft, engine module.
4. Reducing of weight, simplification, etc.

Marine Offshore Gensets

H21/32 I Bore: 210 mm, Stroke: 320 mm

Tier II, Tier III (with SCR)

Main Data

Speed	720 rpm		750 rpm		900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz		60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW
5H21/32	800	752	800	752	960	910	-	-
6H21/32	960	902	960	902	1,200	1,140	1,200	1,140
7H21/32	1,120	1,064	1,120	1,064	1,400	1,330	1,400	1,330
8H21/32	1,280	1,216	1,280	1,216	1,600	1,520	1,600	1,520
9H21/32	1,440	1,368	1,440	1,368	1,800	1,710	1,800	1,710

Based on alternator efficiency of 94 ~ 95 %.

Specific Fuel Oil Consumption

Load	720 rpm	750 rpm	900 rpm	1000 rpm
100 %	182 g/kWh	182 g/kWh	183 g/kWh	185 g/kWh

Exceptionally, 5H21/32 × 900 rpm is 190 g/kWh

Main Data (for Higher Power Rating)

Speed	720 rpm		750 rpm		900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz		60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H21/32	1,050	987	1,050	987	1,320	1,254	1,320	1,254
7H21/32	1,225	1,164	1,225	1,164	1,540	1,463	1,540	1,463
8H21/32	1,400	1,330	1,400	1,330	1,760	1,672	1,760	1,672
9H21/32	1,575	1,496	1,575	1,496	1,980	1,881	1,980	1,881

Based on alternator efficiency of 94 ~ 95 %.

Specific Fuel Oil Consumption (for Higher Power Rating)

Load	720 rpm	750 rpm	900 rpm	1000 rpm
100 %	184 g/kWh	184 g/kWh	185 g/kWh	187 g/kWh

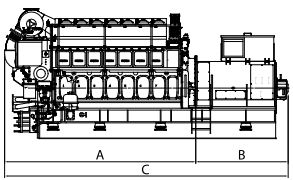
Specific Lub Oil Consumption (for Higher Power Rating)

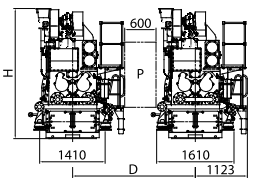
Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 / 750 rpm	5	3,405	1,926	5,331	2,712	13.4	22.4
	6	3,781	2,009	5,790	2,712	15.1	24.5
	7	4,111	2,092	6,203	2,781	16.7	26.5
	8	4,453	2,175	6,628	2,781	18.4	29.1
	9	4,783	2,265	7,048	2,911	19.8	31.7

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	5	3,411	2,097	5,508	2,712	13.4	22.9
	6	3,781	2,180	5,961	2,781	15.1	25.1
	7	4,111	2,263	6,374	2,781	16.7	27.5
	8	4,453	2,345	6,798	2,911	18.4	29.9
	9	4,783	2,423	7,206	2,911	19.8	31.9





Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,613 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H21C I Bore: 210 mm, Stroke: 330 mm

Tier II, Tier III (with SCR)

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
5H21C	1,200	1,140	1,200	1,140
6H21C	1,440	1,368	1,440	1,368
7H21C	1,680	1,596	1,680	1,596
8H21C	1,920	1,824	1,920	1,824
9H21C	2,160	2,052	2,160	2,052

Based on alternator efficiency of 94 ~ 95 %.

Specific Fuel Oil Consumption

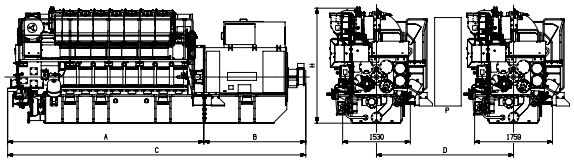
Load	900 rpm	1000 rpm
85 %	180 g/kWh	

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	5	3,735	2,249	5,984	2,600	14.3	22.1
	6	4,085	2,249	6,334	2,600	16.0	24.9
	7	4,435	2,305	6,740	2,600	17.8	28.3
	8	4,785	2,305	7,090	2,653	19.4	30.2
	9	5,135	2,450	7,585	2,653	21.0	33.6



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,990 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H25/33 I Bore: 250 mm, Stroke: 330 mm

Tier II, Tier III (with SCR)

Main Data

Speed	720 rpm		750 rpm		900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz		60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H25/33	1,440	1,368	1,500	1,425	1,800	1,710	1,800	1,710
7H25/33	1,680	1,596	1,750	1,663	2,100	1,995	2,100	1,995
8H25/33	1,920	1,824	2,000	1,900	2,400	2,280	2,400	2,280
9H25/33	2,160	2,052	2,250	2,138	2,700	2,565	2,700	2,565

Based on alternator efficiency of 95 %.

Specific Fuel Oil Consumption

Load	720 rpm	750 rpm	900 rpm	1000 rpm
100 %	180 g/kWh	180 g/kWh	181 g/kWh	181 g/kWh

Main Data (for Higher Power Rating)

Speed	720 rpm		750 rpm		900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz		60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H25/33	1,560	1,482	1,650	1,568	1,890	1,796	1,980	1,881
7H25/33	1,820	1,729	1,925	1,829	2,205	2,095	2,310	2,195
8H25/33	2,080	1,976	2,200	2,090	2,520	2,394	2,640	2,508
9H25/33	2,340	2,223	2,475	2,351	2,835	2,693	2,970	2,822

Based on alternator efficiency of 95 %.

Specific Fuel Oil Consumption (for Higher Power Rating)

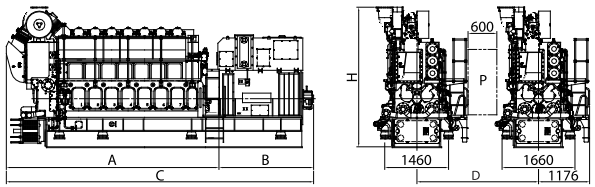
Load	720 rpm	750 rpm	900 rpm	1000 rpm
100 %	182 g/kWh	182 g/kWh	183 g/kWh	183 g/kWh

Specific Lubricating Oil Consumption
Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 / 750 rpm	6	4,414	2,262	6,676	2,961	20.2	29.8
	7	4,797	2,262	7,059	2,961	22.5	32.3
	8	5,311	2,262	7,573	3,241	24.1	34.1
	9	5,691	2,262	7,953	3,371	26.2	36.4

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	6	4,414	2,262	6,676	2,961	20.2	30.2
	7	4,797	2,262	7,059	3,241	22.5	32.7
	8	5,311	2,340	7,651	3,371	24.1	34.9
	9	5,691	2,490	8,181	3,371	26.2	37.2



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,844 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H25/33V I Bore: 250 mm, Stroke: 330 mm

Tier II, Tier III (with SCR)

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H25/33V	4,080	3,917	4,080	3,917
14H25/33V	4,760	4,570	4,760	4,570
16H25/33V	5,440	5,222	5,440	5,222
18H25/33V	6,120	5,875	6,120	5,875
20H25/33V	6,800	6,528	6,800	6,528

Based on alternator efficiency of 96 %.

Specific Fuel Oil Consumption

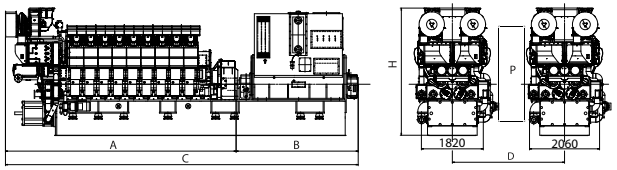
Load	900 rpm	1000 rpm
100 %	183 g/kWh	183 g/kWh

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	12	5,524	3,334	8,858	3,750	33.5	58.2
	14	5,944	3,504	9,448	3,750	36.5	63.4
	16	6,364	3,682	10,046	3,750	39.5	69.6
	18	6,784	3,772	10,556	3,750	42.5	77.5
	20	7,204	3,727	10,931	3,750	45.5	79.5



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 3,840 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Marine Offshore Gensets

H32/40 I Bore: 320 mm, Stroke: 400 mm

Tier II, Tier III (with SCR)

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H32/40	3,000	2,880	3,000	2,880
7H32/40	3,500	3,360	3,500	3,360
8H32/40	4,000	3,840	4,000	3,840
9H32/40	4,500	4,320	4,500	4,320

Based on alternator efficiency of 96 %.

Specific Fuel Oil Consumption

Load	720 rpm	750 rpm
100 %	179 g/kWh	181 g/kWh

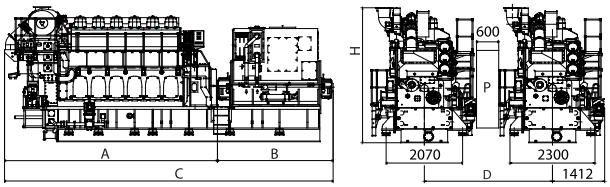
Specific Lubricating Oil Consumption

Lub. Oil: 0.5 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	6	5,760	3,130	8,890	3,959	33.7	68.6
	7	6,112	3,374	9,486	4,130	38.6	77.1
	8	6,602	3,594	10,196	4,130	41.5	82.0
	9	7,092	4,097	11,189	4,130	44.6	89.1

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	6	5,760	3,130	8,890	3,959	33.7	68.6
	7	6,112	3,374	9,486	4,130	38.6	77.1
	8	6,602	3,594	10,196	4,130	41.5	82.0
	9	7,092	4,097	11,189	4,130	44.6	89.1



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 3,408 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

H32/40V I Bore: 320 mm, Stroke: 400 mm

Tier II, Tier III (with SCR)

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H32/40V	6,000	5,760	6,000	5,760
14H32/40V	7,000	6,720	7,000	6,720
16H32/40V	8,000	7,680	8,000	7,680
18H32/40V	9,000	8,640	9,000	8,640
20H32/40V	10,000	9,600	10,000	9,600

Based on alternator efficiency of 96 %.

Specific Fuel Oil Consumption

Load	720 rpm	750 rpm
100 %	179 g/kWh	181 g/kWh

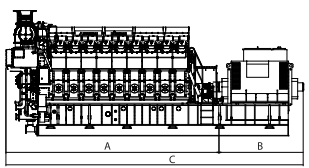
Specific Lubricating Oil Consumption

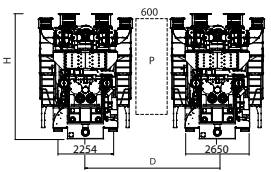
Lub. Oil: 0.5 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	12	6,624	3,760	10,384	4,723	56.0	108.8
	14	7,295	3,860	11,155	4,723	63.3	121.3
	16	7,914	3,479	11,393	4,723	69.1	130.9
	18	8,585	3,859	12,444	4,794	76.3	141.2
	20	9,344	3,659	13,003	4,794	84.0	153.9

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	12	6,624	3,760	10,384	4,723	56.0	108.8
	14	7,295	3,860	11,155	4,723	63.3	121.3
	16	7,914	3,479	11,393	4,723	69.1	130.9
	18	8,585	3,859	12,444	4,794	76.3	141.2
	20	9,344	3,659	13,003	4,794	84.0	153.9





Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 4,405 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

Dual Fuel Engine
Tier II, Tier III

H22CDF I Bore: 220mm, Stroke: 330mm

Main Data

Speed	900 rpm		1,000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
5H22CDF	1,075	1,011	1,100	1,034
6H22CDF	1,290	1,220	1,320	1,248
7H22CDF	1,505	1,423	1,540	1,463
8H22CDF	1,720	1,634	1,760	1,672
9H22CDF	1,935	1,839	1,980	1,881

Based on alternator efficiency of 94~95 %.

Heat Rate & SFOC (100% Load)

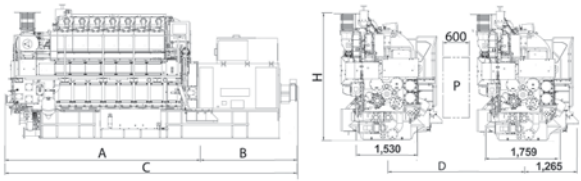
Load	900 rpm	1,000 rpm
Heat Rate@Gas mode	8,049 kJ/kWh	8,079kJ/kWh
SFOC@Diesel mode	192 g/kWh	192 g/kWh

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1,000 rpm	5	3,735	2,249	5,984	2,946	15.3	23.1
	6	4,085	2,249	6,334	2,946	17.0	25.9
	7	4,435	2,305	6,740	2,946	18.8	29.3
	8	4,785	2,305	7,090	2,946	20.4	31.2
	9	5,135	2,450	7,585	2,946	22.0	34.6



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,990 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Marine Offshore Gensets

Dual Fuel Engine
Tier II, Tier III

H27DF I Bore: 270 mm, Stroke: 330 mm

Main Data

Speed	720 rpm		750 rpm		900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz		60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H27DF	1,368	1,300	1,422	1,351	1,710	1,625	1,860	1,767
7H27DF	1,596	1,516	1,659	1,576	1,995	1,895	2,170	2,062
8H27DF	1,824	1,733	1,896	1,801	2,280	2,166	2,480	2,356
9H27DF	2,052	1,949	2,133	2,026	2,565	2,437	2,790	2,651

Based on alternator efficiency of 95 %.

Heat Rate & SFOC (100% Load)

Load	720 rpm	750 rpm	900 rpm	1000 rpm
Heat rate @ Gas mode		7,729 kJ/kWh		
SFOC @ Diesel mode		186 g/kWh		

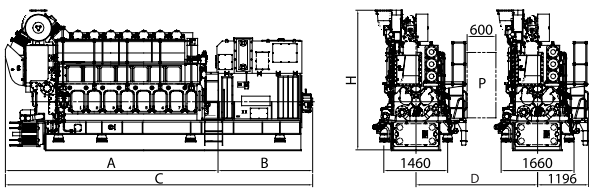
Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 / 750 rpm	6	4,414	2,262	6,676	3,103	23.5	33.3
	7	4,797	2,262	7,059	3,241	27.7	37.3
	8	5,311	2,262	7,573	3,241	34.0	44.0
	9	5,691	2,262	7,953	3,371	36.2	46.4

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	6	4,414	2,262	6,676	3,103	23.5	33.7
	7	4,797	2,262	7,059	3,241	27.7	37.3
	8	5,311	2,340	7,651	3,371	34.0	44.8
	9	5,691	2,490	8,181	3,371	36.2	47.2



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,844 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

Dual Fuel Engine
Tier II, Tier III

H35DF I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H35DF	2,880	2,779	2,880	2,779
7H35DF	3,360	3,242	3,360	3,242
8H35DF	3,840	3,706	3,840	3,706
9H35DF	4,320	4,169	4,320	4,169

Based on alternator efficiency of 96.5 %.

Heat Rate & SFOC (100% Load)

	720 rpm / 60 Hz	750 rpm / 50 Hz
Heat rate @ Gas mode	7,270 kJ/kWh	7,270 kJ/kWh
SFOC @ Diesel mode	183 g/kWh	185 g/kWh

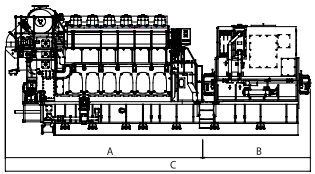
Specific Lubricating Oil Consumption

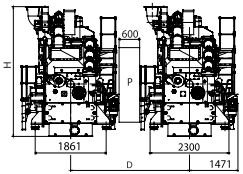
Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	6	5,760	3,130	8,890	4,367	34.7	69.6
	7	6,112	3,374	9,486	4,538	39.6	78.1
	8	6,602	3,594	10,196	4,538	42.5	83.0
	9	7,092	4,097	11,189	4,538	45.6	90.1

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	6	5,760	3,130	8,890	4,367	34.7	69.6
	7	6,112	3,374	9,486	4,538	39.6	78.1
	8	6,602	3,594	10,196	4,538	42.5	83.0
	9	7,092	4,097	11,189	4,538	45.6	90.1





Remarks

1) Depending on alternator.
2) Weight included a standard alternator (Maker : HHI-EES)
3) With Common base frame

D: Min. distance between engines : 3,037 mm (with gallery).
P: Free passage between the engines : 600 mm x 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Marine Offshore Gensets

Dual Fuel Engine

Tier II, Tier III

H35DFV I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H35DFV	5,760	5,587	5,760	5,587
14H35DFV	6,720	6,518	6,720	6,518
16H35DFV	7,680	7,449	7,680	7,449
18H35DFV	8,640	8,380	8,640	8,380
20H35DFV	9,600	9,312	9,600	9,312

Based on alternator efficiency of 97 %.

Heat Rate & SFOC (100% Load)

	720 rpm / 60 Hz	750 rpm / 50 Hz
Heat rate @ Gas mode	7,270 kJ/kWh	7,270 kJ/kWh
SFOC @ Diesel mode	183 g/kWh	185 g/kWh

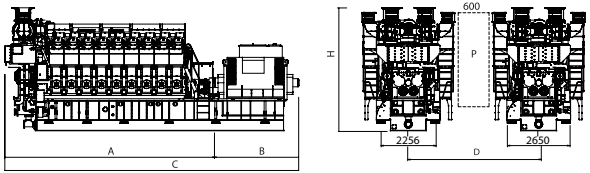
Specific Lubricating Oil Consumption

Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	12	6,624	3,760	10,384	4,723	58.0	110.8
	14	7,295	3,860	11,155	4,723	65.3	123.3
	16	7,914	3,479	11,393	4,723	71.1	132.9
	18	8,585	3,859	12,444	4,794	78.3	143.2
	20	9,344	3,659	13,003	4,794	86.0	155.9

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	12	6,624	3,760	10,384	4,723	58.0	110.8
	14	7,295	3,860	11,155	4,723	65.3	123.3
	16	7,914	3,479	11,393	4,723	71.1	132.9
	18	8,585	3,859	12,444	4,794	78.3	143.2
	20	9,344	3,659	13,003	4,794	86.0	155.9



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 4,405 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

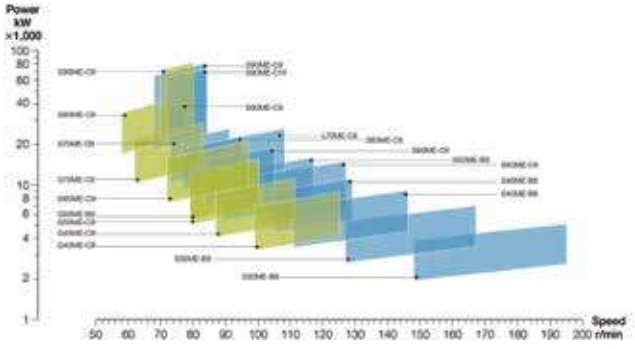
HYUNDAI HiMSEN

Marine 2-Stroke Engine

Products

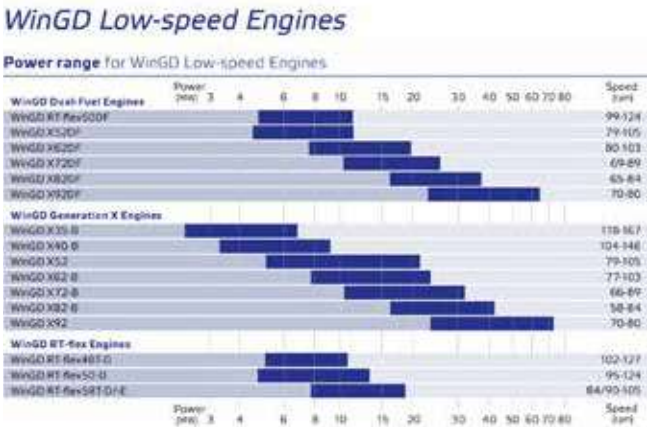
HYUNDAI-MAN B&W / HYUNDAI-WÄRTSILÄ / Engine Components

HYUNDAI-MAN B&W



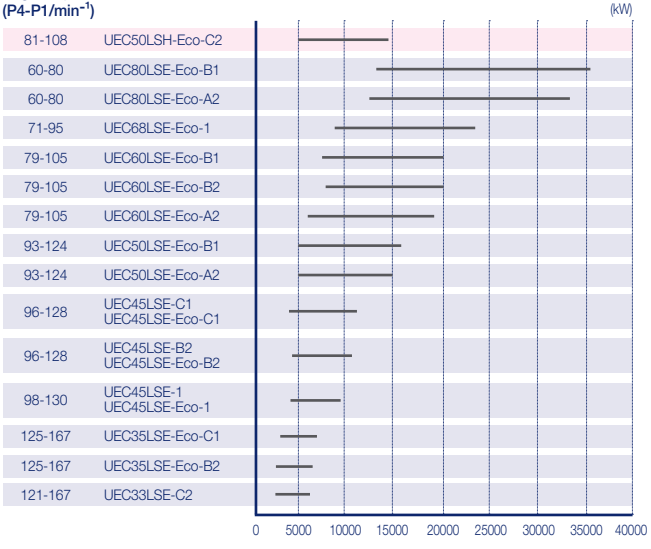
2-Stroke Engine

HHI-EMD has been supplying "One out of Three" of the world's 2-stroke engines for marine propulsion and power generation in pursuit of providing our valuable customers with high quality and more economical products.
HHI-EMD's established reputation is supported by its superb performance in marine and stationary engines along with its state-oftheart facilities such as foundry, forging, machining, crankshaft, and assembly & test shops specializing in manufacturing engines.

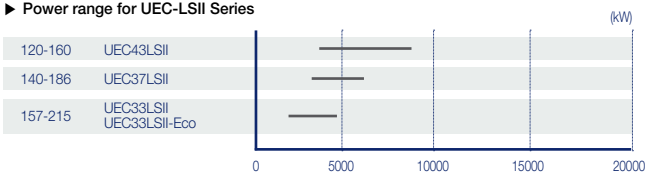


UE Engine

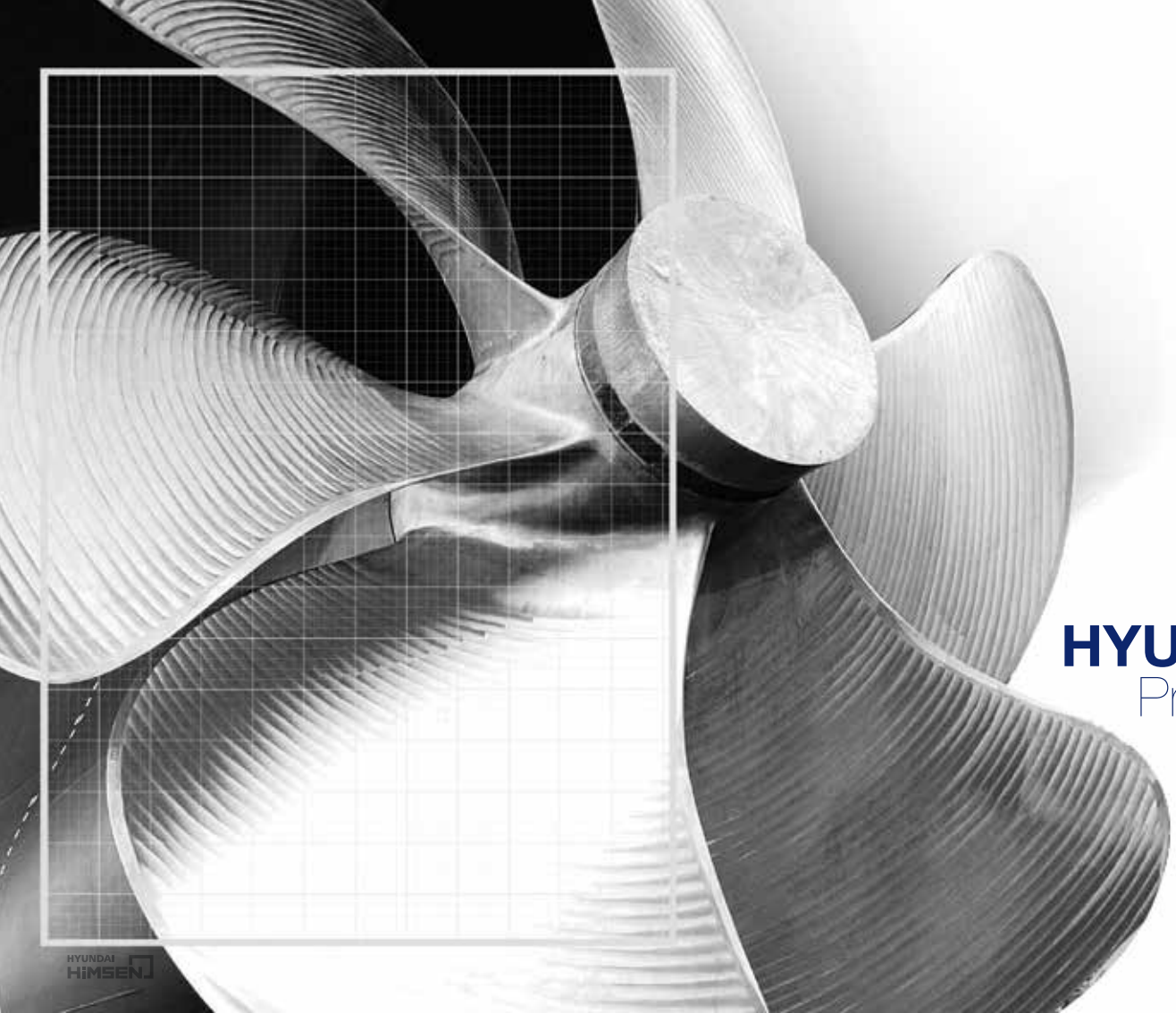
▶ Power range for UEC-LSE/H Series



▶ Power range for UEC-LSII Series



HYUNDAI HiMSEN



HYUNDAI
Propeller

HYUNDAI HiMSEN

HYUNDAI PROPELLER

Propeller shop

HHI produces a wide variety of marine propellers. Our propellers have a diameter up to 11,000 mm, with maximum unit weight of 114,000 kg, and are typically made of manganese bronze and nickel-aluminum bronze.
We employ a comprehensively computerized design, manufacturing, and inspection system for these products.

Production Capacity

Max. | 114 ton in Weight, 11 m in Diameter
Min. | 10 ton in Weight, 3 m in Diameter

World's Largest Propeller
Weight 110.2 ton
Diameter 10.4 m
Blade 5
Ship type 18,800 TEU Container

Shaft Propeller Shaft / Intermediate
Shaft Rudder Stock Straight Type

Production Capacity

Max. | 120 ton in Weight
| 2,200 mm in Diameter
| 18,000 mm in Length

Min. | 300 mm in Diameter
| 2,000 mm in Length

Turbocharger

Based on the most up-to-date technology accumulated through its wealth of experience in manufacturing diesel engines and a wide variety of precision machinery, HHI-EMD produces exhaust gas turbochargers : ABB's TPL and A type, and MHI's MET type for turbocharging diesel engines under a technical tie-up with ABB Turbo Systems Ltd. of Switzerland and Mitsubishi Heavy Industries Ltd. of Japan, respectively who themselves have more than 40 years' experience in the field of designing and manufacturing turbochargers.

Products

- A165 / A265 / A270 / A175 / A275 / A180 / A280 / A185 / A190
- MET66MB / MET71MB / MET83MB /

Marine Eco Machinery

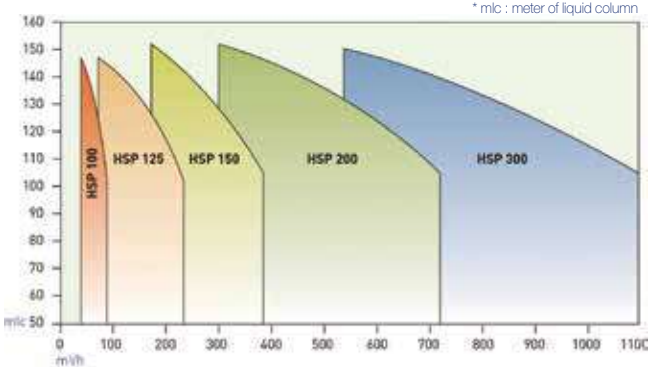
Hyundai Heavy Industries Co., Ltd.

Hi-Well
Cargo Pump

Pump Selection Chart

Optimum pump capacities are achieved by selecting high efficiency models for the customer's requirements of flow rates, heads and others.
We provide customers with a proposal for a complete **Hi-Well Cargo Pumping System** based on customer's information about total tank volume, total discharge rates, total head and others.

* mlc : meter of liquid column



Hi-Well Cargo Pump

Hyundai Hydraulic Hi-Well Cargo Pumping System

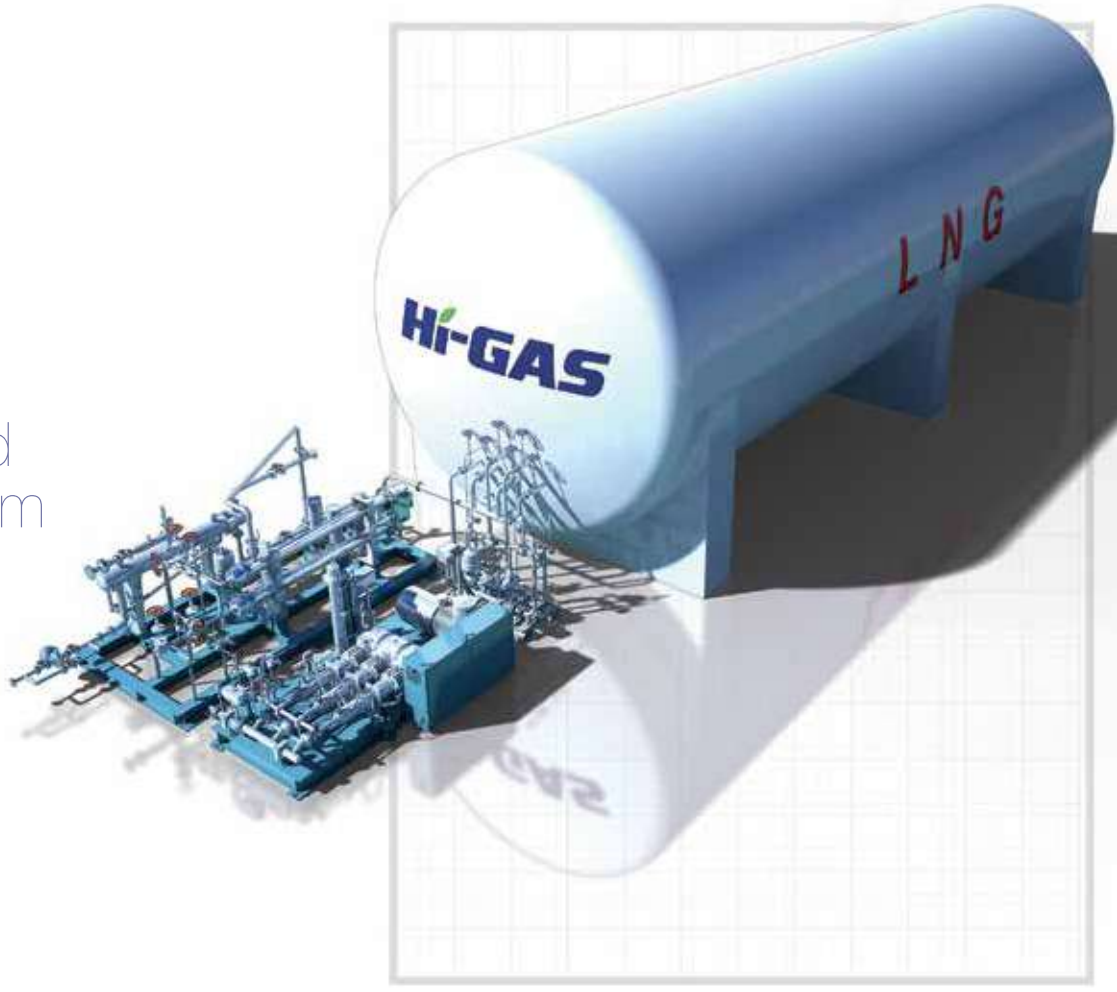
Major Supply Equipment
- Submerged cargo pump
- Hydraulic power package
- Control system
- Ballast pump
- Portable pump with winch
- Tank cleaning pump
- Hydraulic oil transfer pump

Optional Equipmentv
- Cargo heater
- Diffuser
- Hydraulic piping and fittings
- Side thruster

HYUNDAI HiMSEN

Hi-GAS

Hyundai integrated
GAs Supply system



Hi-GAS

Hi-GAS Package solution LNG Fuel Gas Supply System

The LNG market is developing rapidly, and the demand for LNG carriers and LNG fueled ships is increasing because LNG is a very attractive solution from an emission and economic point of view. The high efficiency of dual fuel engines has made the engine market the preferred prime mover choice for new projects. HHI-EMD has rich experience in manufacturing both the ME-GI engine and the 4-stroke dual fuel engine HiMSEN. The HiMSEN GenSet can use both diesel and LNG on LNG carriers and conventional LNG fueled ships. One of the key components for LNG fueled ships is the LNG fuel gas supply system for both dual fuel engine types.
Hi-GAS is a remarkable design of the LNG fuel gas supply system for dual fuel engines based on high and low pressure supply. This means that Hi-GAS can effectively supply high pressure CNG to the ME-GI engine while also supplying low pressure CNG to the 4-stroke DF GenSet, essentially doing the work of two fuel supply systems.

Application

HHI-EMD can supply complete
LNG package solutions
for LNG carriers and LNG-fuelled ships.

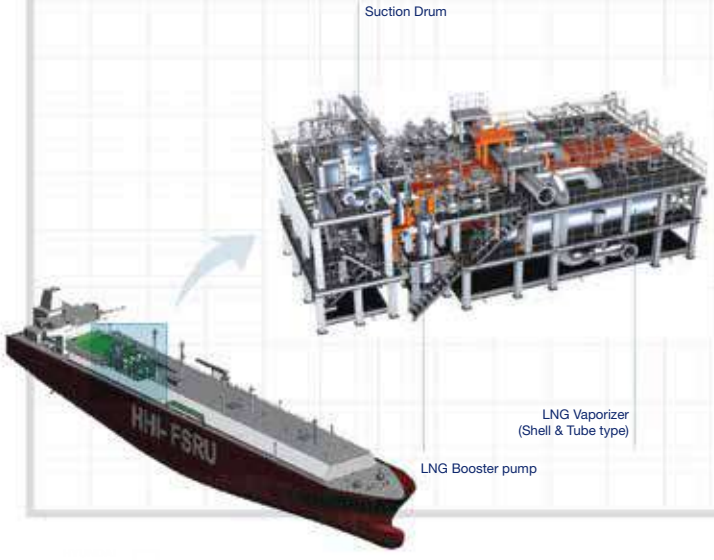
Hi-GAS

HHI-EMD can supply complete LNG package solutions for LNG carriers and LNG-fuelled ships.

Hi-ReGAS

Hyundai integrated ReGASification system

Hi-ReGAS system for LNG to vaporize the natural gas aboard the LNG carrier before off-loading into onshore pipelines considering location (land or port not required, shorter overall time to market), delivery (less effective of weather condition), and safety. It is more advantageous to use seawater as the direct heating method to vaporize LNG. This is attractive for energy, space savings, easy operation and fast start-up / shut down.



Hi-ReGAS

Suction Drum

Suction Drum is provided for the whole system to play a role of a buffering tank for the LNG Booster Pumps. In order to avoid the wave motion within the Suction Drum due to ship motion, internal baffles are installed and the liquid level is maintained high.
The required discharge pressure of the Cargo Pumps installed in the LNG storage tanks should increase with the operating pressure of the Suction Drum. In consequence, the operating pressure of the Suction Drum is determined as the lowest pressure satisfying the following requirements.
The internal pressure should be greater than the pressure at the cargo tank bottom in order to remove the possibility to generating flashed gas.
The internal pressure should be greater than the NPSH-required of the LNG Booster Pumps with the pressure drop taken into account.
The internal pressure should be high enough for the vent gas from the Suction Drum to reach the Vent Mast.

LNG Booster Pump

One LNG Booster Pump of 1x100% is installed for each Train, which has the rated capacity of 125 MMSCFD at 100 bar head. The pumps are of multi-stage, vertical, submerged, pot mounted type. Due to the significant pressure difference, the density of the LNG is different between the suction and discharge sides.
LNG Booster Pumps run at a constant speed. The discharge flow rate from the pumps is determined from the flow control valve between the pump and the LNG Vaporizer. The pump discharges about 40% of its maximum discharge flow at the minimum export case. In consequence, the recycle valve of the pump is not activated for the capacity control. The recycle valve acts only in the case of start-up, normal shutdown, emergency shutdown, and pump protection.

LNG Vaporizer

One LNG Vaporizer is installed for each Train to vaporize the pressurized LNG.
The shell & tube type heat exchanger is to heat LNG by sea water. Means shall be provided to detect leakage of high pressure LNG/NG into the heating fluid and to prevent overpressure in the heating system.

Hi-ERS

Hyundai innovative Economical Re-liquefaction System

Hyundai Heavy Industries' Engine & Machinery Division (HHI-EMD) has developed Hi-ERS (Hyundai innovative Economical Re-liquefaction System) that is capable of partially liquefying the boil-off gas (BOG) of LNG carriers by combining the high pressure compressor for ME-GI engines.

Hi-ERS is characterized by simple configuration, robust operation, reliable components, and high safety system satisfying the requirements of customers.

Hi-ERS

For the purpose of the energy recovery for ERS system, the BOG heat exchanger is installed between the cargo tank and the suction of high pressure compressor.

The temperature of the cold BOG from LNG cargo tank will be approximately between -120°C and -90°C. The pressure of the compressed BOG is approximately 300bar required by ME-GI engine. The cold BOG from the LNG cargo tanks is sufficient to make the compressed BOG cool down for partial re-liquefaction. The flash gas to be vented from the gas separator which is a part of Hi-ERS is passed through the BOG heat exchanger again and transfers its cold heat to the compressed BOG via the BOG heat exchanger to improve the system efficiency of Hi-ERS, and then finally to be sent to other consumers.
If the compressed BOG in its cold state is expanded through the Joule-Thomson valve to a targeted low pressure, then it can be simultaneously decreased to the condensing temperature of BOG by Joule-Thomson effect.

By using Hi-ERS, simple and economical re-liquefaction of BOG can be achieved.

Main equipment of Hi-ERS

BOG heat exchanger

Joule-Thomson valve (J-T valve)

LNG separator

NoNOx
Hyundai SCR System

HYUNDAI ENVIRONMENTAL TECHNOLOGIES against IMO NOx Tier III as one of solutions, NoNOx™ SCR (Selective Catalytic Reduction) system

HYUNDAI can offer NoNOx™ SCR technology that can reduce NOx emissions by 95 %, designed for Tier III limits. HYUNDAI is optimizing the whole installation, performance and engine in order to achieve low cost of production and give benefits to the customers.

• SCR principal

SCR is a well proven technology in the various industries, which can reduce NOx in exhaust gas by a chemical reaction process.
Urea solution is commonly adopted as reductant, and it is decomposed into ammonia and carbon dioxide in hot gas stream.

$(NH_2)_2CO + H_2O \rightarrow 2NH_3 + CO_2$
[Urea] [Water] [Ammonia] [Carbon dioxide]

The ammonia decomposed from urea, is chemically re-acted with NOx at the surface of catalyst, which is converted to molecular nitrogen and water.

$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$
$6NO_2 + 8NH_3 \rightarrow 7N_2 + 12H_2O$

For proper working of SCR, temperature of flue gas before catalyst is maintained within working range specified. Otherwise, ammonia bisulphate called as ABS can be condensed and accumulated on catalyst, which makes not only decrease of NOx reduction but also damage of catalyst after all. Same risk at all exhaust pipe downstream of SCR system is expected in particular conditions.

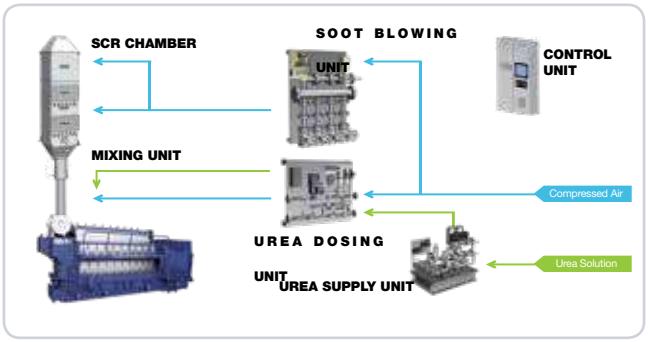
• Certification of NoNOx SCR System

SCR system and relevant certification procedure for marine application is defined by IMO. According to resolution MEPC.198(62), SCR system is considered as an engine component. Therefore, instead of separate certification of SCR system, IMO NOx verification in combination with engine is required according to Scheme A and Scheme B. NoNOx SCR system can be verified and receive IMO NOx Tier III certification at HHI-EMD test-bed according to Scheme A.

Resolution MEPC.198(62)

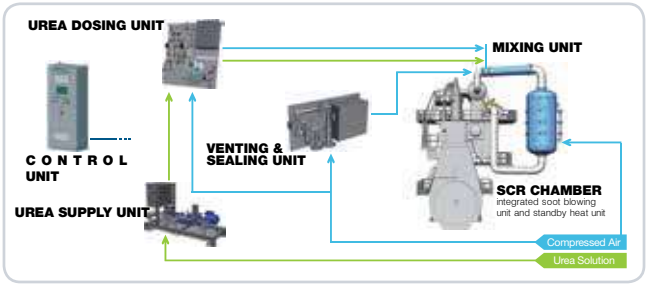
• Main Components of NoNOx SCR System

▶ LP SCR for 4-stroke engine

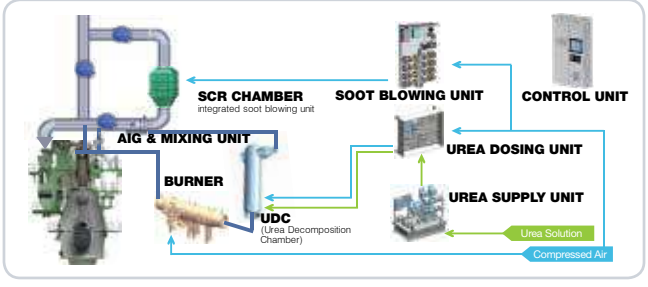


NoNOx
Hyundai SCR System

▶ HP SCR for 2-stroke engine

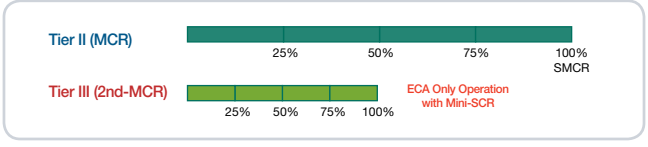


▶ LP SCR for 2-stroke engine



• NoNOx Mini-SCR

NoNOx Mini-SCR technology can offer more compact size and lower cost compared to the original SCR. The Mini-SCR is designed considering essential minimized engine load called 2nd-MCR only for Tier Ⅲ mode because the engine generally would not run at high load in ECA(Emission Control Area). The engine load will be limited according to operating mode (Tier Ⅱ or Tier Ⅲ). Size of the Mini-SCR can decrease approx. 70~85% of original one, hence CAPEX and OPEX can be reduced.

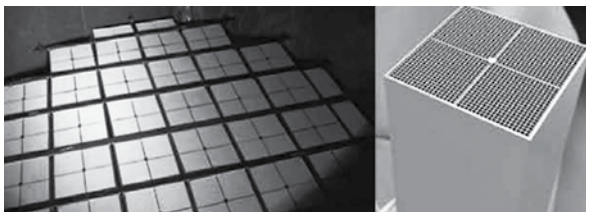


HYUNDAI HiMSEN

HYUNDAI NoNOx SCR System

NoNOx™ SCR system designed by Hyundai Heavy Industries

NoNOx™ is brand name of HYUNDAI SCR system, aimed to reduce NOx in exhaust gases. SCR (Selective Catalyst Reduction) is proven technology, which can reduce NOx up to 95% and meet IMO Tier III regulation by itself.
PILC(Pillared Inter-Layered Clay) catalyst, specially designed for marine application is adopted, which makes higher de-NOx efficiency and stronger resistance against thermal stresses comparing to conventional type of catalyst.
The state of the art control system is provided based on ACONIS(Advanced CONtrol & Integration System designed by Hyundai Heavy Industries) hardware platform, which makes full automatic control and perfect interface with other system. Control system can be fully integrated to hull AMS(Alarm Monitoring System) if it were based on ACONIS.



Size & Weight of NoNOx™ standard SCR Chamber

2-Stroke HP SCR(MGO 0.1% S)

Engine power[kW]	Dimension of SCR chamber		Weight of SCR chamber Incl. Catalyst[kg]
	Diameter(Ø)[mm]	H[mm]	
~5,220	1,940	5,500	11,200
~8,340	2,340	5,800	15,100
~10,320	2,540	5,900	17,000
~16,080	3,040	6,300	25,500
~21,840	3,240	6,700	30,300
~28,260	3,540	7,000	35,900
~33,500	3,840	7,200	41,000

4-Stroke SCR(HFO 3.5% S)

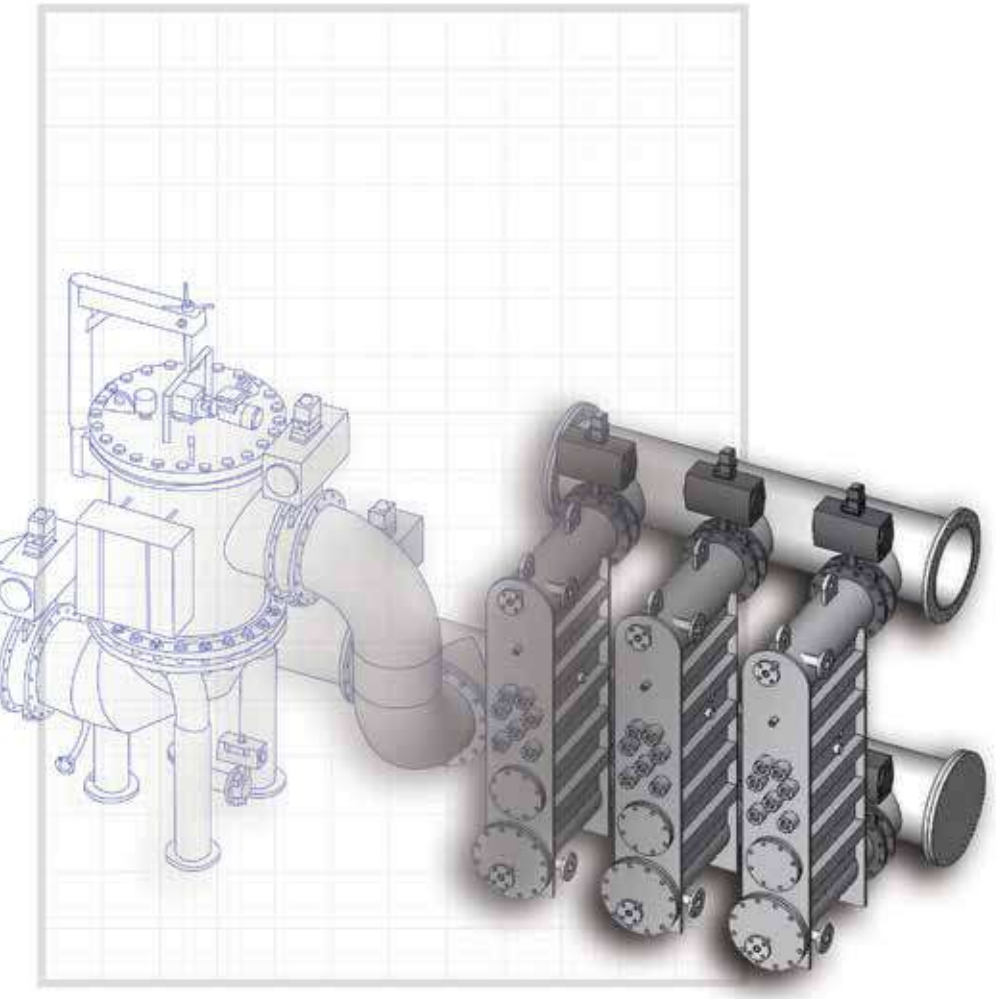
Engine power[kW]	Dimension of SCR chamber			Weight of SCR chamber Incl. Catalyst[kg]
	D[mm]	W[mm]	H[mm]	
~850	1,100	800	3,700	2,200
~1,270	1,100	1,100	3,700	2,600
~1,700	1,400	1,100	3,900	3,400
~2,760	1,400	1,400	4,800	4,500
~4,320	1,700	1,700	5,100	6,200
~6,220	2,100	2,100	5,400	8,600
~8,460	2,400	2,400	5,600	10,800
~11,050	2,700	2,700	5,900	13,400

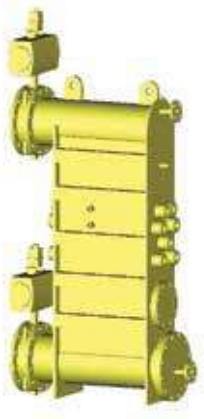
NoNOx™ can meet customer's requirement for tailor made of SCR chamber if optimized size of chamber is required, besides standard dimension shown above table. Please contact us for more information.

HYUNDAI HiMSEN

Ballast Water
Treatment System

HiBallast & EcoBallast





Ballast Water Treatment System

HiBallast

How HiBallast works?

HiBallast is a disinfection system by electrolysis of sea water

HiBallast System is composed of three main units ; Filter, Electrolysis and a Neutralization unit. The system is controlled by a PLC(programmable logic controller) installed in the control panel. During ballasting operation, filter unit remove particles or organisms larger than 50㎛ and disinfectant produced by Electrolysis Unit is injected to the main ballast pipe to kill microorganisms in ballast water

EcoBallast

How EcoBallast works?

EcoBallast is a ultra violet disinfection system

EcoBallast is composed of two main units: a filter and a UV reactor. The system is controlled by a programmable logic controller installed in the control panel.
The filter significantly reduces the sediment load and removes large organisms in the ballast water.
The UV reactor is specially designed for the ballast water treatment application to maximize the efficiency of the system.

HiEMS

Hyundai intelligent Engine Management Solution

Introduction

Hyundai intelligent Engine Management Solution, HiEMS, offers a real-time engine status monitoring, troubleshooting guidance to marine engineers and provides connectivity between engines and on shore monitoring center.
With HiEMS, HiMSEN customers can get our experts of engine and service close to you.
with intuitive UI, engine operators can figure out the root cause of a certain alarm and get the technical advice and trouble shooting guide.
When detecting the abnormalities in engine, HiEMS transfers alarm/fault information and sensor data to the onshore monitoring center for the detail analysis.
Also, HiEMS keeps long term data for fleet and engine managements

Main features

On Ship,
Current Status Monitoring of the HiMSEN engine
- status of sub systems and surveillance with FAT data

Self Trouble Shooting Guidance based on the decision tree
- Decision Tree, Alarm Management, Maintenance Management

Analysis tools for engine data
- Performance, Deviation, Correlation Analysis and Statistics

On Shore,
Status Monitoring of the Fleet of HiMSEN engines
- Overall status of alarm and running hour
- Long Term Data management and CBM Reporting service

Benefits

On ship, HiEMS provides guidance for the engine operator, self-diagnostic tool with engineering based decision tree and integrated trouble shooting guide, which enables engine operators to run and maintain HiMSEN Engine at optimal condition.

On shore, Ship managers can manage the Fleet of HiMSEN engines with HiEMS, accessible 24*7 through the Monitoring Center of HGS (Hyundai Global Service). Ship managers can get real-time remote diagnostics, qualified advices and services from our engineers and service experts.

Regular CBM reporting service is also available through HGS with HHI.

License Policy

Standard License and Advanced License are available. contact to HHI for further information.

Monitoring

Current Status Monitoring of the HiMSEN engine
- status of sub systems and surveillance with FAT data

Fleet managemet

On Shore, Status Monitoring of the Fleet of HiMSEN engines
- Overall status of alarm, running hour and CBM-Reporting

Maintenance

Self Trouble Shooting Guidance based on the decision tree
- Decision Tree, Alarm Management, MaintenanceManagement

Analysis

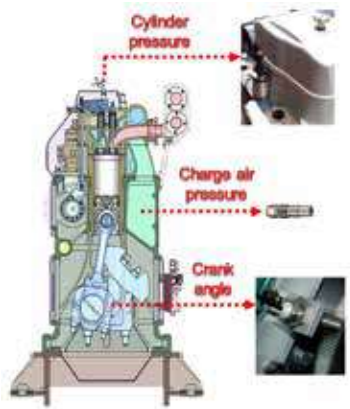
Analysis tools for engine data
- Performance, Deviation, Correlation Analysis and Statistics

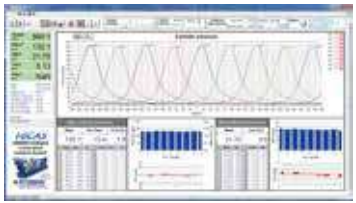
HYUNDAI HiMSEN

HiCAS Hyundai Intelligent Combustion Analysis System

Introduction

The analysis of in-cylinder pressure trace provides an important insight to quantify combustion progress of internal combustion engine.
HiCAS is an on-line engine indicating system to acquire and process in-cylinder pressure data referenced to crank angle. Once data has
been loaded into the analysis software, thermodynamic cycle of engine is analyzed based on cycle-to-cycle and cylinder-to-cylinder.

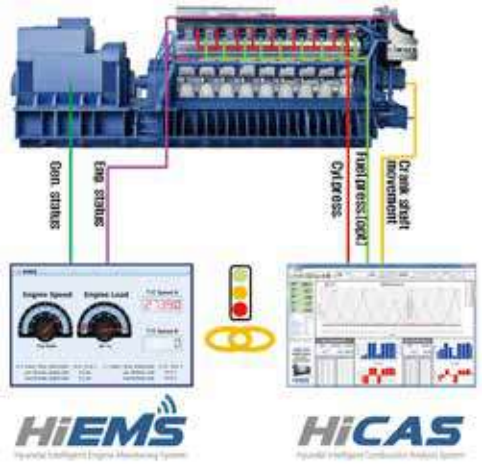




Main feature

- In-cylinder peak pressure & IMEP monitoring.
- Cycle-to-cycle variation.
- Cylinder-to-cylinder distribution.
- Fault diagnosis of cyclic moving parts.

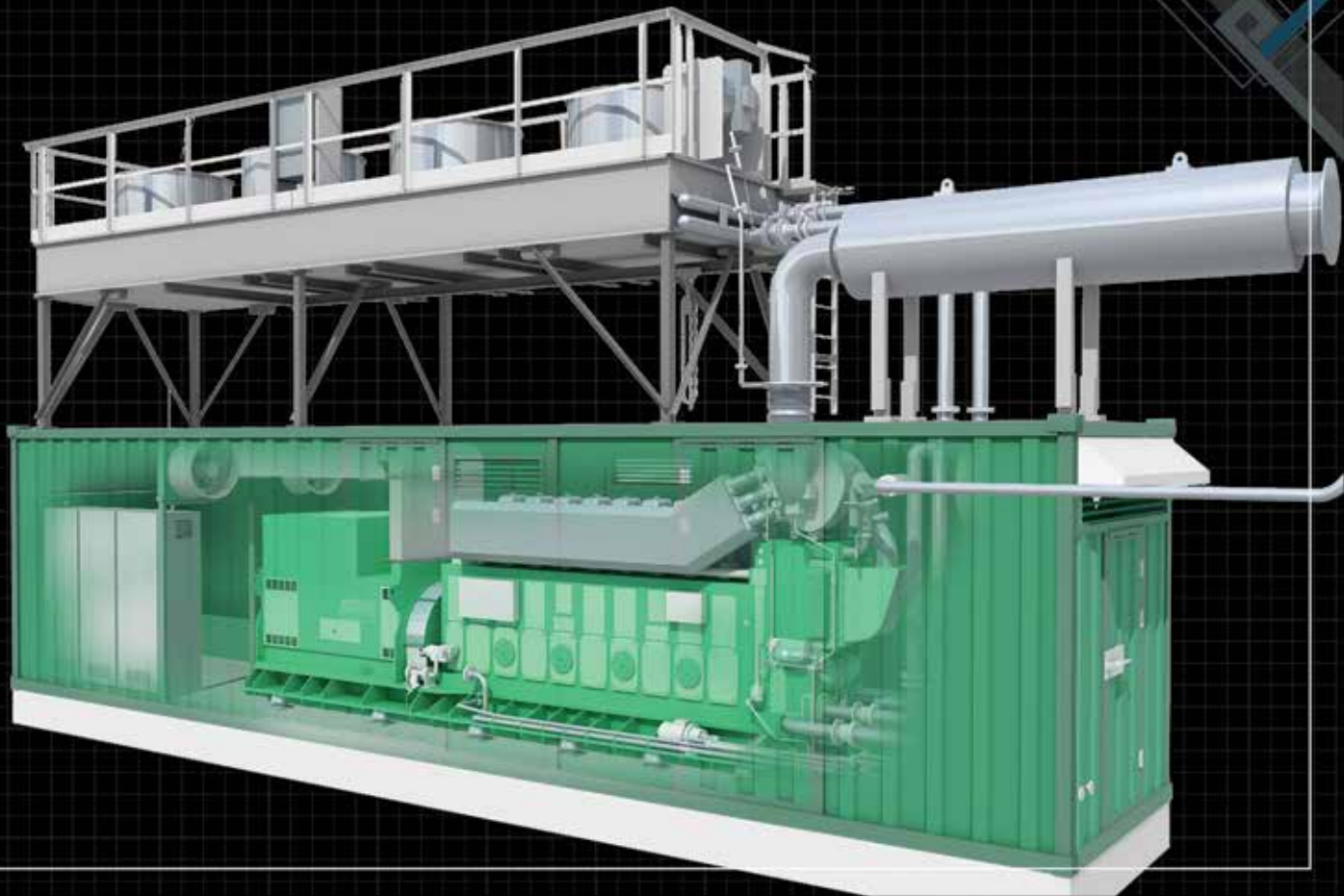
To achieve optimum thermodynamic and mechanical engine behavior during entire engine life cycle, HiMSEN engine gives two kinds of on-line monitoring application. This diagnostic
package helps detect engine abnormalities more quickly.
And also it will give you more opportunities to save maintenance cost.



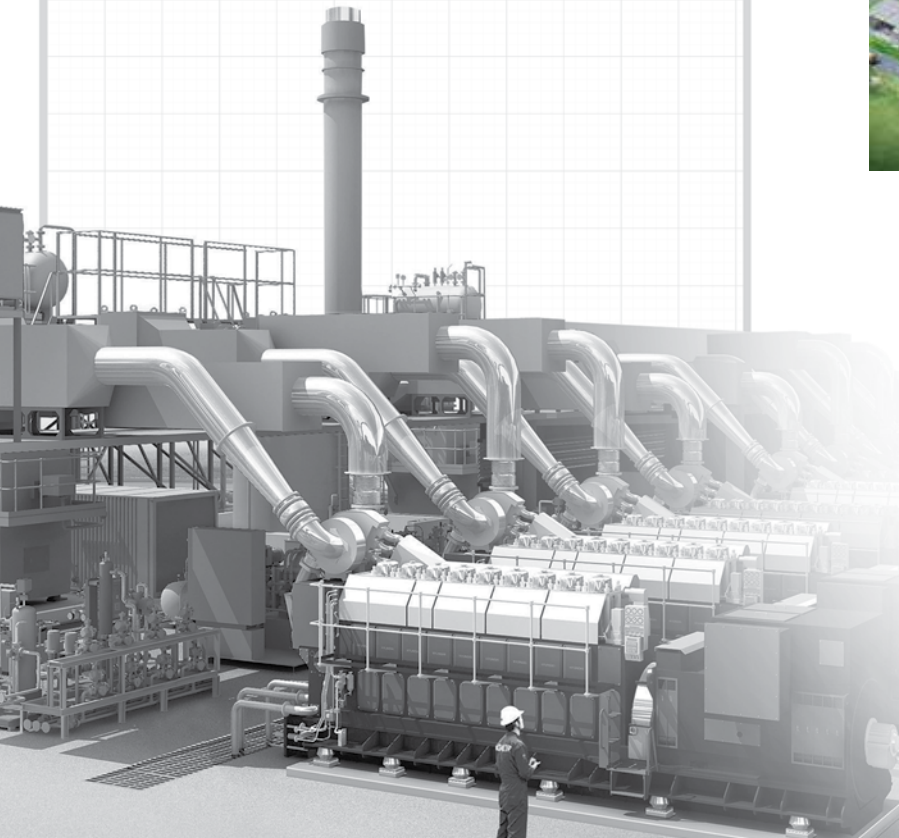
HYUNDAI HiMSEN

HYUNDAI POWER PLANT

Hyundai Heavy Industries Co., Ltd.

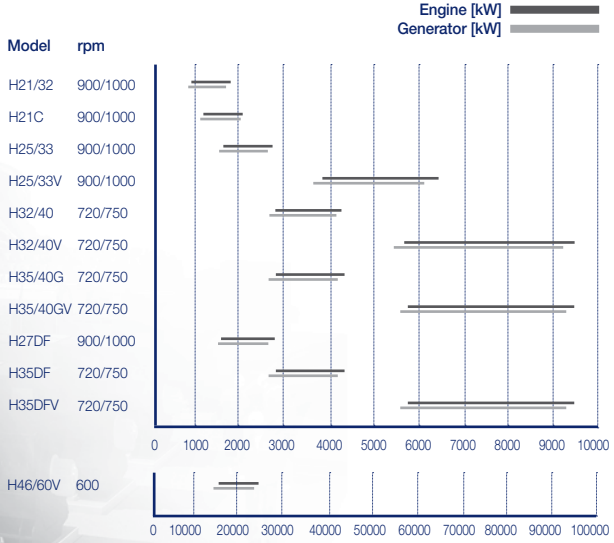


Stationary GenSets



Power Range

H21/32	1,200~1,800 kW
H21C	1,200~2,160 kW
H25/33	1,740~2,700 kW
H25/33V	3,840~6,400 kW
H32/40	2,850~4,275 kW
H32/40V	5,700~9,500 kW
H35/40G	2,880~4,320 kW
H35/40GV	5,760~9,600 kW
H27DF	1,710~2,790 kW
H35DF	2,880~4,320 kW
H35DFV	5,760~9,600 kW
H46/60V	14,400~22,500 kW



Stationary Gensets

H21/32 I Bore: 210 mm, Stroke: 320 mm

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H21/32	1,200	1,128	1,200	1,128
8H21/32	1,600	1,512	1,600	1,512
9H21/32	1,800	1,710	1,800	1,710

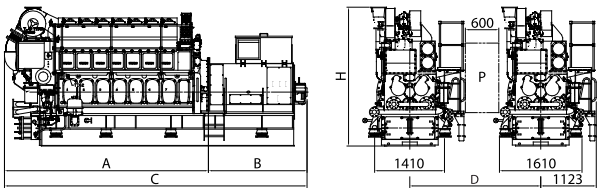
Based on alternator efficiency of 94~95%.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	6	3,781	2,180	5,961	2,781	15.1	25.1
	8	4,453	2,345	6,798	2,911	18.4	29.9
	9	4,783	2,423	7,206	2,911	19.8	31.9



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,613 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H21C I Bore: 210 mm, Stroke: 330 mm

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
5H21C	1,200	1,128	1,200	1,128
6H21C	1,440	1,353	1,440	1,353
7H21C	1,680	1,587	1,680	1,587
8H21C	1,920	1,824	1,920	1,824
9H21C	2,160	2,052	2,160	2,052

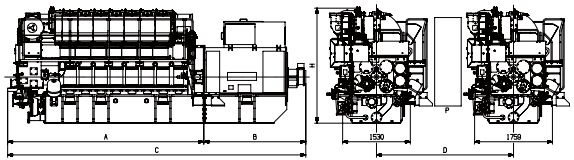
Based on alternator efficiency of 94~95 %.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	5	3,735	2,249	5,984	2,600	14.3	22.1
	6	4,085	2,249	6,334	2,600	16.0	24.9
	7	4,435	2,305	6,740	2,600	17.8	28.3
	8	4,785	2,305	7,090	2,653	19.4	30.2
	9	5,135	2,450	7,585	2,653	21.0	33.6



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,990 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H25/33 I Bore: 250 mm, Stroke: 330 mm

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H25/33	1,740	1,653	1,800	1,710
7H25/33	2,030	1,928	2,100	1,995
8H25/33	2,320	2,215	2,400	2,292
9H25/33	2,610	2,505	2,700	2,592

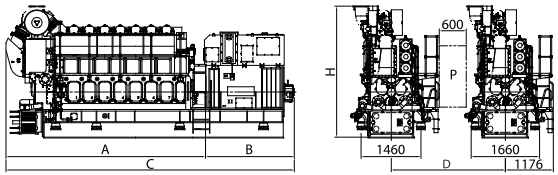
Based on alternator efficiency of 95~96 %.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	6	4,414	2,262	6,676	2,961	20.2	30.2
	7	4,797	2,262	7,059	3,241	22.5	32.7
	8	5,311	2,340	7,651	3,371	24.1	34.9
	9	5,691	2,490	8,181	3,371	26.2	37.2



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,844 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H25/33V I Bore: 250 mm, Stroke: 330 mm

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H25/33V	3,840	3,686	3,840	3,686
14H25/33V	4,480	4,300	4,480	4,300
16H25/33V	5,120	4,915	5,120	4,915
18H25/33V	5,760	5,558	5,760	5,558
20H25/33V	6,400	6,208	6,400	6,208

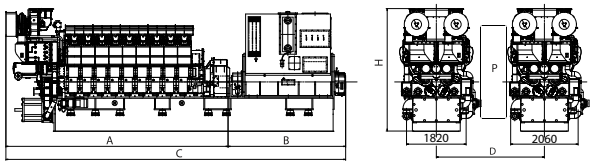
Based on alternator efficiency of 96~97 %.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	12	5,524	3,334	8,858	3,750	33.5	58.2
	14	5,944	3,504	9,448	3,750	36.5	63.4
	16	6,364	3,682	10,046	3,750	39.5	69.6
	18	6,784	3,772	10,556	3,750	42.5	77.5
	20	7,204	3,727	10,931	3,750	45.5	79.5



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 3,840 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H32/40 I Bore: 320 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H32/40	2,850	2,736	2,850	2,736
7H32/40	3,325	3,192	3,325	3,192
8H32/40	3,800	3,648	3,800	3,648
9H32/40	4,275	4,104	4,275	4,104

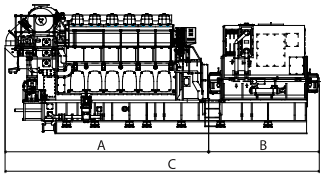
1) Based on alternator efficiency of 96 %.
2) In case of diesel oil (Distillate Fuels ISO 8217 DM Grade) operation continuously, 500 kW/cyl, is available.

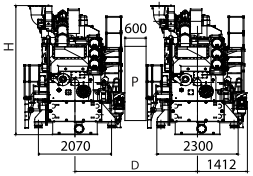
Specific Lubricating Oil Consumption

Lub. Oil: 0.5 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 / 750 rpm	6	5,760	3,130	8,890	3,959	33.7	68.6
	7	6,112	3,374	9,486	4,130	38.6	77.1
	8	6,602	3,594	10,196	4,130	41.5	82.0
	9	7,092	4,097	11,189	4,130	44.6	89.1





Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 3,408 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H32/40V I Bore: 320 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H32/40V	5,700	5,500	5,700	5,500
14H32/40V	6,650	6,450	6,650	6,450
16H32/40V	7,600	7,372	7,600	7,372
18H32/40V	8,550	8,293	8,550	8,293
20H32/40V	9,500	9,262	9,500	9,262

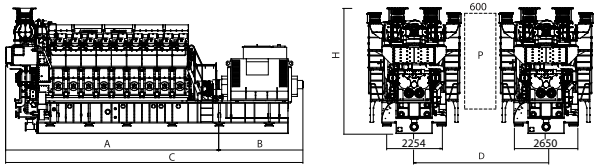
1) Based on alternator efficiency of 96.5~97.5 %.
2) In case of diesel oil (Distillate Fuels ISO 8217 DM Grade) operation continuously, 500 kW/cyl, is available.

Specific Lubricating Oil Consumption

Lub. Oil: 0.5 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 / 750 rpm	12	6,624	3,760	10,384	4,723	56.0	108.8
	14	7,295	3,860	11,155	4,723	63.3	121.3
	16	7,914	3,479	11,393	4,723	69.1	130.9
	18	8,585	3,859	12,444	4,794	76.3	141.2
	20	9,344	3,659	13,003	4,794	84.0	153.9



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 4,405 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H46/60V I Bore: 460 mm, Stroke: 600 mm

Main Data

Speed	600 rpm		600 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H46/60V	14,400	14,040	14,400	14,040
16H46/60V	19,200	18,720	19,200	18,720
18H46/60V	21,610	21,060	21,600	21,060

1) Based on alternator efficiency of 97.5 %.
2) In case of diesel oil(Distillate Fuels ISO8217 DM Grade) operation continuously, 1,200 kW/cyl. Is available.

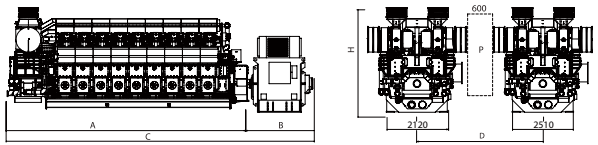
Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),2)
600 rpm (60 Hz)	12	10,410	3,627	14,037	4,975	205.3	256.4
	16	12,410	3,724	16,134	4,975	227.8	286.6
	18	13,410	3,625	17,035	5,288	239.0	313

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),2)
600 rpm (50 Hz)	12	10,410	3,474	13,884	4,975	205.3	256.2
	16	12,410	3,724	16,134	4,975	227.8	289.3
	18	13,410	3,625	17,035	5,288	239.0	313



Remarks

1) Depending on alternator.
2) Without common base frame.

D : Min. distance between engines 6,000 mm (with gallery)
P : Min. Turbo Charger distance : Min. 215mm. (Recommand 500 mm)
Note) All dimensions and weight are approximate value

Stationary Gensets

H35/40G I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H35/40G	2,880	2,764	2,880	2,764
7H35/40G	3,360	3,225	3,360	3,225
8H35/40G	3,840	3,686	3,840	3,686
9H35/40G	4,320	4,147	4,320	4,147

Based on alternator efficiency of 96 %.

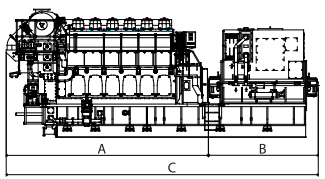
Specific Lubricating Oil Consumption

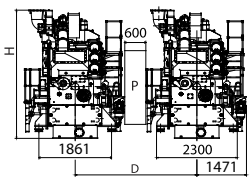
Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	6	5,760	3,130	8,890	3,959	33.7	68.6
	7	6,112	3,374	9,486	4,130	38.6	77.1
	8	6,602	3,594	10,196	4,130	41.5	82.0
	9	7,092	4,097	11,189	4,130	44.6	89.1

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	6	5,760	3,130	8,890	3,959	33.7	68.6
	7	6,112	3,374	9,486	4,130	38.6	77.1
	8	6,602	3,594	10,196	4,130	41.5	82.0
	9	7,092	4,097	11,189	4,130	44.6	89.1





Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 3,037 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Stationary Gensets

H35/40GV I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H35/40GV	5,760	5,558	5,760	5,558
14H35/40GV	6,720	6,518	6,720	6,518
16H35/40GV	7,680	7,449	7,680	7,449
18H35/40GV	8,640	8,380	8,640	8,380
20H35/40GV	9,600	9,360	9,600	9,360

Based on alternator efficiency of 96.5~97.5 %.

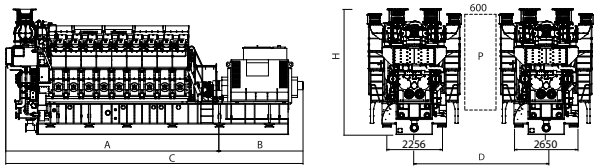
Specific Lubricating Oil Consumption

Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	12	6,624	3,760	10,384	4,723	56.0	108.8
	14	7,295	3,860	11,155	4,723	63.3	121.3
	16	7,914	3,479	11,393	4,723	69.1	130.9
	18	8,585	3,859	12,444	4,794	76.3	141.2
	20	9,344	3,659	13,003	4,794	84.0	153.9

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	12	6,624	3,760	10,384	4,723	56.0	108.8
	14	7,295	3,860	11,155	4,723	63.3	121.3
	16	7,914	3,479	11,393	4,723	69.1	130.9
	18	8,585	3,859	12,444	4,794	76.3	141.2
	20	9,344	3,659	13,003	4,794	84.0	153.9



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 4,405 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Stationary Gensets

H27DF I Bore: 270 mm, Stroke: 330 mm

Main Data

Speed	900 rpm		1000 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H27DF	1,710	1,624	1,860	1,767
7H27DF	1,995	1,895	2,170	2,061
8H27DF	2,280	2,177	2,480	2,368
9H27DF	2,565	2,462	2,790	2,678

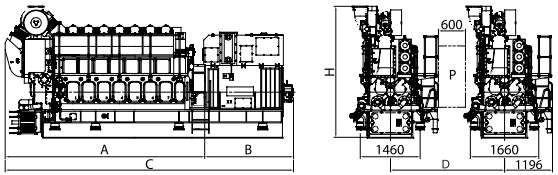
Based on alternator efficiency of 95~96 %.

Specific Lubricating Oil Consumption

Lub. Oil: 0.6 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
900 / 1000 rpm	6	4,414	2,262	6,676	3,103	23.5	33.7
	7	4,797	2,262	7,059	3,241	27.7	37.7
	8	5,311	2,340	7,651	3,371	34.0	44.8
	9	5,691	2,490	8,181	3,371	36.2	47.2



Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 2,844 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Stationary Gensets

H35DF I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
6H35DF	2,880	2,764	2,880	2,764
7H35DF	3,360	3,225	3,360	3,225
8H35DF	3,840	3,686	3,840	3,686
9H35DF	4,320	4,147	4,320	4,147

Based on alternator efficiency of 96 %.

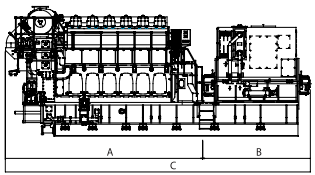
Specific Lubricating Oil Consumption

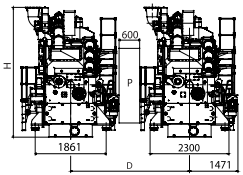
Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	6	5,760	3,130	8,890	4,367	34.7	69.6
	7	6,112	3,374	9,486	4,538	39.6	78.1
	8	6,602	3,594	10,196	4,538	42.5	83.0
	9	7,092	4,097	11,189	4,538	45.6	90.1

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	6	5,760	3,130	8,890	4,367	34.7	69.6
	7	6,112	3,374	9,486	4,538	39.6	78.1
	8	6,602	3,594	10,196	4,538	42.5	83.0
	9	7,092	4,097	11,189	4,538	45.6	90.1





Remarks

1) Depending on alternator.
2) Weight included a standard alternator (Maker : HHI-EES)
3) With Common base frame

D: Min distance between engines : 3,408 mm (with gallery).
P: Free passage between the engines : 600 mm x 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

HYUNDAI HiMSEN

Stationary Gensets

H35DFV I Bore: 350 mm, Stroke: 400 mm

Main Data

Speed	720 rpm		750 rpm	
Frequency	60 Hz		50 Hz	
	Eng.kW	Gen.kW	Eng.kW	Gen.kW
12H35DFV	5,760	5,558	5,760	5,558
14H35DFV	6,720	6,518	6,720	6,518
16H35DFV	7,680	7,449	7,680	7,449
18H35DFV	8,640	8,380	8,640	8,380
20H35DFV	9,600	9,360	9,600	9,360

Based on alternator efficiency of 96.5~97.5 %.

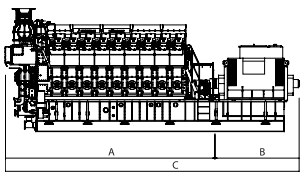
Specific Lubricating Oil Consumption

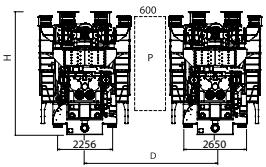
Lub. Oil: 0.4 g/kWh

Dimensions

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
720 rpm	12	6,624	3,760	10,384	4,723	58.0	110.8
	14	7,295	3,860	11,155	4,723	65.3	123.3
	16	7,914	3,479	11,393	4,723	71.1	132.9
	18	8,585	3,859	12,444	4,794	78.3	143.2
	20	9,344	3,659	13,003	4,794	86.0	155.9

Speed	cyl.	Dimension (mm)				Dry Mass (ton)	
		A	B 1)	C 1)	H	Engine 2)	GenSet 1),3)
750 rpm	12	6,624	3,760	10,384	4,723	58.0	110.8
	14	7,295	3,860	11,155	4,723	65.3	123.3
	16	7,914	3,479	11,393	4,723	71.1	132.9
	18	8,585	3,859	12,444	4,794	78.3	143.2
	20	9,344	3,659	13,003	4,794	86.0	155.9





Remarks

1) Depending on alternator.
2) Without common base frame.
3) With common base frame & alternator (Maker: HHI-EES).

D: Min. distance between engines 4,405 mm (with gallery).
P: Free passage between the engines, width 600 mm and height 2,000 mm.
Note) All dimensions and weight are approximate value and subject to change without prior notice.

Packaged Power Station

Santa-Elena

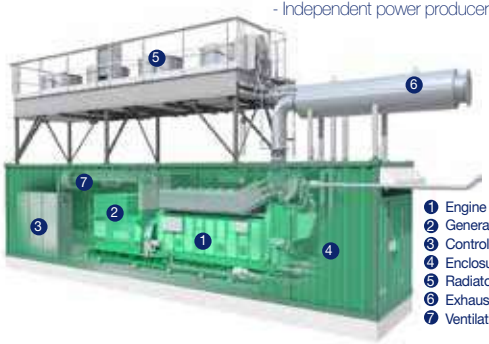
Santa-Elena 90 MW PPS in Ecuador
(HYUNDAI - HiMSEN 9H21/32 x 53 Sets)

Features

- Base load operation
- Diesel oil / Heavy fuel oil
- Compact 40-feet container size
- Mobile type (option)
- Environmentally comfortable
- Low cost of operating and maintenance

Application

- Captive power
- Construction site
- Isolated area
- Rental business
- Pumping station
- Independent power producer



1. Engine
2. Generator
3. Control panel
4. Enclosure
5. Radiator
6. Exhaust gas silencer
7. Ventilation air exhaust fan

General Specifications

Engine Model	6H21/32	8H21/32	9H21/32
Engine (kW)	1,200	1,600	1,800
Generator (kW)	1,128	1,512	1,710
Total Weight (ton)	42	48	50
Dimension (W × H × L)	2.4 m × 3.4 m × 12 m (Container Size)		
Cooling Method	Radiator / Cooling Tower		
Speed	900 rpm / 1,000 rpm		
Fuel	Diesel oil / Heavy fuel oil		

HiMSEN Engine for Pump Station

Earth-Friendly Engine

Design Philosophy

Hyundai's HiMSEN Family has simple and smart design suitable for pumping applications with high reliability and performance. HHI Engines can run on liquid fuel such as Heavy Fuel Oil (HFO) and Diesel Oil (DO) or natural gas. The key features are:

Economical and Ecological Engine

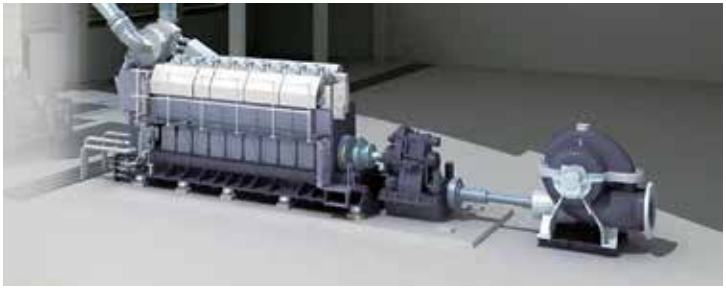
It is designed with low fuel consumption, NOx emission, and Smoke, etc. which is based on the following specific designs:

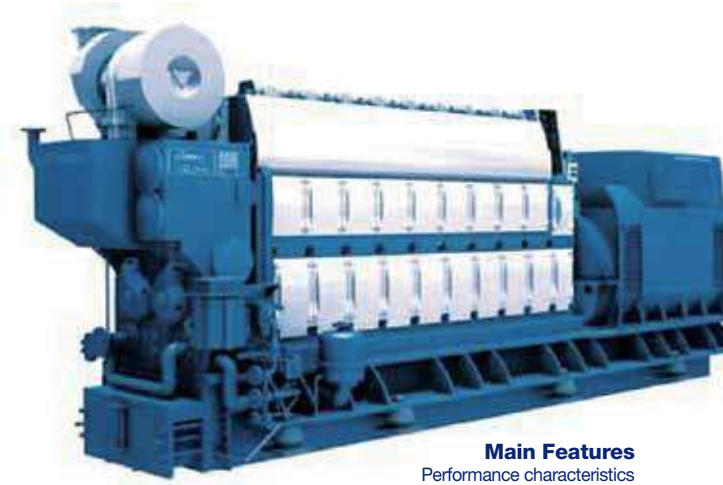
- Optimized Supercharging with Miller Cycle
- High Fuel Injection Pressure

Reliable and Practical Engine

It is designed with simple, smart and robust structure.

- Number of engine components are minimized with Pipe-Free design.
- Most of the components are directly accessible for easier maintenance.
- Feed System is fully modularized with direct access.





Main Features

Performance characteristics

- Higher output in the similar range engines
- Low fuel consumption
- Quick acceleration & load response

Maintenance

- Easier maintenance through modularized design
- Minimal number of components

Earth-friendly engine

- Low NOx emissions
- Complies with IMO NOx Tier II
- Low Vibration & Noise

HYUNDAI HiMSEN

Quality Management

Approval Status of Quality Management System

Product or Service Ranges		Certifying Agency
Design and Manufacture of Two & Four-Stroke Marine and Stationary Diesel & Gas Engine and Engine Power with Components (Turbochargers, Blocks, Crankshafts, Cylinder Liners, Propellers, Forged Steel and Shafting etc.), Marine and Industrial Equipment, BWTS, SCR, Hydraulic Machinery (Pumps, Valves, Compressors, Steam & Gas Turbines, etc.), Industrial Machinery (Conveyors, Presses etc.)		DNV·GL • ISO 9001:2008 KS Q ISO 9001:2009 • ISO 14001:2004 KS I ISO 14:001:2009 • OHSAS 18001:2007
Nuclear Diesel Generator (Class 1E), Pump (Class 2, 3)		KEPIC-MNVEN
Forging Shop	Works Approval	ABS, BV, CCS, DNV·GL, KR, LR, NK, RINA
Casting Shop		ABS, BV, CCS, DNV·GL, KR, LR, RINA
Propeller		ABS, BV, CCS, DNV·GL, KR, LR, NK, RINA, RS
Crankshaft		ABS, BV, CCS, DNV·GL, KR, LR, NK, RINA
The Classification Approval of Quality Assurance System		DNV·GL-MSA, KR-QAS, LR-QAM

Global Network

Hyundai Global Service Co., Ltd

Total Solution Provider, One Stop Service

Hyundai Global Service Co.,Ltd

HHI is set to embark on a new journey by setting up an integrated A/S unit to fulfill for shipbuilding, engine and marine electric products.

The new entity named "Hyundai Global Service Co.,Ltd" is launched in Dec. 2016. also offer technical support to maintain and improve the vessel performance based data.

Moreover, the company seeks to establish a prompt A/S system and deliver ecoharnessing state-of-the-art ICT, to encourage our clients to come back for

In particular, Hyundai Global Service will leverage on the proprietary supply chain of company so it can provide one-stop services and total solutions.

By launching the new entity, the right of service business including global service network of Industries Co.,Ltd (HHI)s is authorized to Hyundai Global Service Co.,Ltd (HGS)

Hi-Service

Engine Hi-service system setup

Our target is to provide quickest and most precious technical support and parts supply towards the customers.

We do utmost to minimize the trouble and inconvenience from the ship owners which might be occurred due to the damage caused by the accident.

Easy Access to Hyundai Global Service

Regardless of the guarantee period whether it is over or not, Hyundai Global Service (HGS) will make it a rule to support the clients with immediate service in the order of the receipt by e-mail or through homepage. But, considering its seriousness of the damage or the schedule of the vessel, the provision timing of our technical support including repair may be adjusted.

Genuine Spare Parts Purchase Guide

HGS's authorized sales agents will supply the clients with the original genuine spare parts at the competitive condition in aspect of price, delivery time and quality etc. Please do not hesitate to contact our sales agent with the inquiry or questionnaire.

Technical Support

After the guarantee period is expired or in case that the free support is limited even during the guarantee period due to special reason, we also provide the technical support including supervision, reconditioning, conversion, retrofit of alpha cylinder lubricator and technical consultancy etc.

Global Service Network

HGS is very proud of its well organized global service network which is efficiently and systematically designed to meet every requirement of the clients. HGS's direct service centers are established at Rotterdam, Singapore, Dubai, Athens and Houston in U.S.A.

HYUNDAI HiMSEN

Head Quarter of Hyundai Global Service

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(82) 52-204-7887 (4-stroke Marine)
(82) 52-204-7742 (Stationary)
FAX: (82) 52-204-7801
E-mail: service@hyundai-gs.com

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HYUNDAI HiMSEN

Global Service Network

Authorized Repairer

*Cooperative repairer : HGS-designated Repair Supplier
*Authorized repairer : HGS-authorized Repair Supplier
(Granted to the best supplier that has been servicing for more than 1 year)

Authorized Repairer

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Global Service Network

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Authorized Repairer / Asia

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Global Service Network

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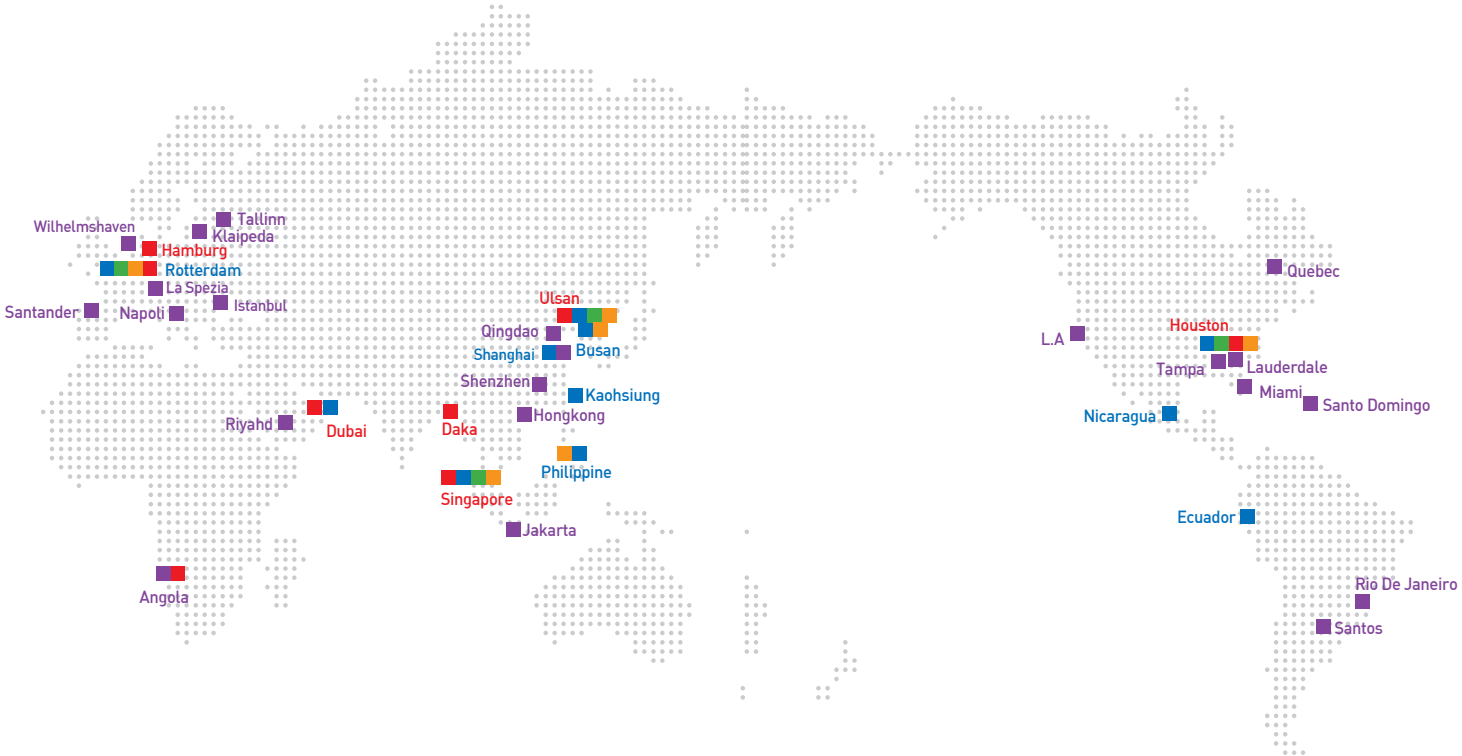
HYUNDAI HiMSEN



World Wide HYUNDAI

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- Authorized Repairer
- Cooperative Repairer
- Spare Parts Depot
- Parts Sales Agent

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