GE Transportation
a Wabtec company

Selection Guide

Diesel Engines for
Marine & Stationary Power

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A History of Performance

GE Transportation, now a Wabtec company, has been designing and building high-performance diesel engines for more than 50 years, serving the locomotive, marine and stationary power generation industry. Our world class engine manufacturing facilities in Pennsylvania are among the largest in the world for medium-speed engines.

With more than 22,000 engines in service worldwide in some of the most challenging industrial environments, GE Transportation's medium-speed engines are proven to be among the most dependable, durable and fuel-efficient engines available in the market. Our engines are supported by an extensive global parts distribution and service network.

About GE Transportation's Engines

GE Transportation's family of medium-speed diesel engines includes both inline and V models. Our marine engine series delivers continuous power ranging from 1,498 bkW to 4,700 bkW (2,009 bhp to 6,303 bhp) and can be configured to meet U.S. EPA Tier 4 as well as IMO MARPOL Annex VI Tier II and Tier III emissions levels.

Our stationary engine series delivers continuous power ranging from 1,961 bkW to 4,442 bkW (2,630 bhp to 5,957 bhp) and emergency standby power ranging from 3,544 bkW to 5250 bkW (4,752 bhp to 7,040 bhp).

Each engine features high-capacity turbochargers, efficient combustion design, electronic fuel injection (EFI) or Common Rail (CR) and can be integrated into marine and stationary systems to meet strict emissions levels.


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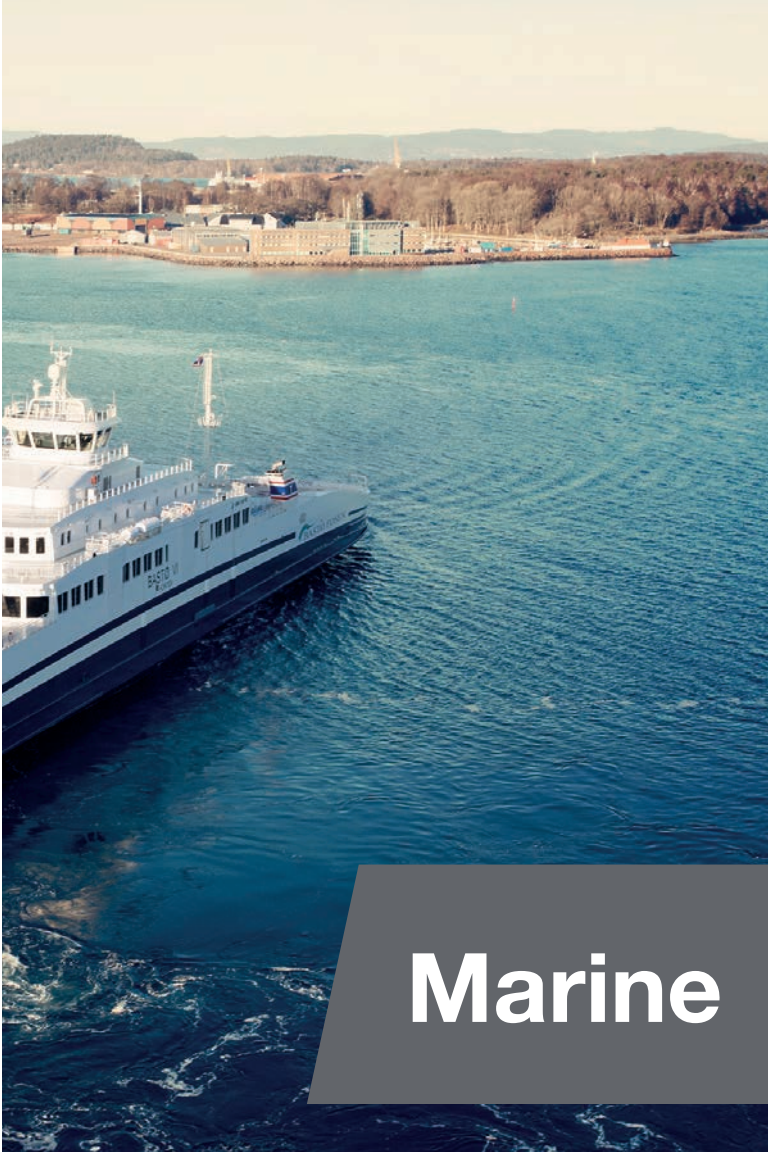


Marine

250MDC EPA Tier 4/IMO Tier III compliant series

The 250MDC EPA T4 / IMO III emissions compliant engine series is the most technologically advanced and fuel-efficient medium speed diesel engine ever built by GE Transportation. The 250MDC marine diesel engines meet EPA Tier 4 and IMO III emissions standards with advanced exhaust gas recirculation that requires no urea-based aftertreatment. This advanced technology limits the formation of NOx in cylinder as opposed to removing NOx from the exhaust through an aftertreatment system, while maintaining world class fuel efficiency.

Our proven solution is less complex to install and operate, produces practically no visible smoke, has world class fuel efficiency and load response, and avoids the hassle of planning urea replenishment and onboard handling of urea.

Key Benefits

- Eliminates the need for space and weight provisions for an SCR system and urea storage tanks, preserving valuable cargo, accommodation, and tank space
- No additional operating expenses from urea use and catalyst replacements
- No hassle associated with planning for urea replenishment and handling urea onboard
- Reducing ship design complexity and shipyard installation time and cost compared to an engine with an SCR after treatment solution
- Robust and proven design, simple to operate
- World-class fuel efficiency and load response with practically no visible smoke
- High engine energy efficiency with more heat recovery available in jacket water system from EGR
- Narrow footprint allows ease of maintenance and packaging advantage

L250MDC EPA Tier 4/IMO Tier III

Engine Specifications

	8L250MDC	*6L250MDC*
Number of cylinders	8	6
Stroke cycle	4	4
Cylinder arrangement	inline	inline
Bore	250 mm (9.84 in)	250 mm (9.84 in)
Stroke	320 mm (12.60 in)	320 mm (12.60 in)
Compression ratio	15.0:1	15.0:1
Height w/ deep sump	2,785 mm (109.6 in)	2,785 mm (109.6 in)
Length	5,875 mm (231 in)	4,880 mm (192 in)
Width	2,087 mm (82 in)	1,995 mm (78.5 in)
Crankshaft center line marine sump	940 mm (37 in)	940 mm (37 in)
Crankshaft center line to mounting feet	308 mm (12.13 in)	308 mm (12.13 in)
Exhaust diameter	260 mm (10.2 in)	260 mm (10.2 in)
Dry weight w/flywheel	24,766 kg (54,600 lbs)	21,137 kg (46,600 lbs)

Engine dimensions and weights provided are approximate.
For detailed dimensions and weights reference application drawings.

L250MDC EPA Tier 4/IMO Tier III

MCR Engine Ratings

Rated speed	bkW	bhp	Hz	kWe (96% eff.)
8L250MDC				
1000	2,500	3,353	50	2,400
900	2,250	3,018	60	2,160
6L250MDC				
1000	1,900	2,548	50	1,824
900	1,700	2,280	60	1,632

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year.

Recommended Match Points

Application types	Rated speed	Rpm	*8L250MDC*		*6L250MDC*	
			900	**1000**	**900**	**1000**
FPP	**Propeller Match Power**	bkW	2,025	2,250	1,530	1,710
		bhp	2,716	3,017	2,052	2,294
FPP-HT		bkW	1,913	2,125	1,145	1,615
		bhp	2,565	2,850	1,938	2,166
CPP/EPP-VS		bkW	2,250	2,500	1,700	1,900
		bhp	3,018	3,353	2,280	2,548
CPP/EPP-CS		bkW	2,250	2,500	1,700	1,900
		bhp	3,018	3,353	2,280	2,548

FPP = Fixed pitch propeller
FPP-HT = Fixed pitch propeller – high torque
CPP/EPP-VS = Variable speed CPP or gen set
CPP/EPP-CS = Constant speed CPP or gen set

Expanded definitions can be found in Appendix on page 33.

V250MDC EPA Tier 4/IMO Tier III

Engine Specifications

	16V250MDC	*12V250MDC*
Number of cylinders	16	12
Stroke cycle	4	4
Cylinder arrangement	V	V
Bore	250 mm (9.8 in)	250 mm (9.8 in)
Stroke	320 mm (12.6 in)	320 mm (12.6 in)
Compression ratio	15.0:1	15.0:1
Height*	3,721 mm (147 in)	3,636 mm (143 in)
Length	6,285 mm (247 in)	5,209 mm (205 in)
Width	2,778.5 mm (109.4 in)	2,730 mm (107 in)
Crankshaft center line marine sump	1,161 mm (45.8 in)	1,077 mm (42.4 in)
Crankshaft center line to mounting feet	536 mm (21.1 in)	536 mm (21.1 in)
Exhaust diameter	610 mm (24 in)	610 mm (24 in)
Dry weight	34,350 kg (75,728 lbs)	28,667 kg (63,200 lbs)

*includes the exhaust stack and bellows

Engine dimensions and weights provided are approximate.
For detailed dimensions and weights reference application drawings.

V250MDC EPA Tier 4/IMO Tier III

MCR Engine Ratings

Rated speed	bkW	bhp	Hz	kWe (96% eff.)
16V250MDC				
1000	4,700	6,303	50	4,512
900	4,200	5,632	60	4,032
12V250MDC				
1000	3,500	4,693	50	3,360
900	3,150	4,225	60	3,024

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year

Recommended Match Points

Application types	Rated speed	Rpm	*16V250MDC*		*12V250MDC*	
			900	1000	900	1000
FPP	Propeller Match Power	bkW	3,780	4,230	2,835	3,150
		bhp	5,069	5,673	3,802	4,224
FPP-HT		bkW	3,570	3,995	2,678	2,975
		bhp	4,787	5,358	3,591	3,989
CPP/EPP-VS		bkW	4,200	4,700	3,150	3,500
		bhp	5,632	6,303	4,225	4,693
CPP/EPP-CS		bkW	4,200	4,700	3,150	3,500
		bhp	5,632	6,303	4,225	4,693

FPP = Fixed pitch propeller
FPP-HT = Fixed pitch propeller – high torque
CPP/EPP-VS = Variable speed CPP or gen set
CPP/EPP-CS = Constant speed CPP or gen set

Expanded definitions can be found in Appendix on page 33.

250MDA/MDB IMO Tier II compliant series

The 250MDA/MDB IMO II emissions compliant marine engine series includes both inline and V models and delivers a continuous power range from 1,498 bkW to 4,239 bkW (2,009 bhp to 5,685 bhp). The engines are based on a rugged one-piece iron casting mainframe for excellent vibration dampening characteristics and long-term stability to minimize bore distortion. Our easy to service unitized cylinder assembly concept enables quick change outs for increased engine uptime. A high capacity turbocharger, electronic fuel injection and efficient combustion management by our EC2+ engine controller make fuel and lube-oil consumption among the lowest in the industry.

Our marine diesel engines have been deployed in some of the world's most challenging industrial environments and proven to be among the most dependable, durable and fuel-efficient engines available in the market.

Key Benefits

- Durable engine design to support extended maintenance and overhaul intervals
- Easy to service through large doors on mainframe to access crankcase; camshafts that are arranged in individual sections; a sectional exhaust manifold and a unitized cylinder assembly concept
- Reliable engines with rugged construction and quality assured parts
- Fuel efficient through a high capacity turbocharger, electronic fuel injection and efficient combustion management by our EC2+ engine controller

L250 IMO Tier II

Engine Specifications

	8L250MDA	6L250MDA
Number of cylinders	8	6
Stroke cycle	4	4
Cylinder arrangement	inline	inline
Bore	250 mm (9.84 in)	250 mm (9.84 in)
Stroke	320 mm (12.60 in)	320 mm (12.60 in)
Compression ratio	16.8:1	16.8:1
Height w/ deep sump	2,962 mm (116 in)	2,962 mm (116 in)
Length	5,949 mm (234 in)	5,138 mm (202 in)
Width	1,950 mm (77 in)	1,950 mm (77 in)
Crankshaft center line marine sump	940 mm (37 in)	940 mm (37 in)
Crankshaft center line to mounting feet	308 mm (12.13 in)	308 mm (12.13 in)
Exhaust diameter	457 mm (18 in)	457 mm (18 in)
Dry weight	20,856 kg (45,980 lbs)	17,295 kg (38,129 lbs)

Engine dimensions and weights provided are approximate.
For detailed dimensions and weights reference application drawings.

L250 IMO Tier II

Engine Ratings

Rated speed	bkW		bhp		Hz
	MCR	Overload	MCR	Overload	
8L250MDA					
1050	2,330	2,564	3,125	3,438	NA
1000	2,219	2,441	2,976	3,274	50
900	1,998	2,198	2,679	2,947	60
6L250MDA					
1050	1,748	1,922	2,344	2,578	NA
1000	1,664	1,831	2,232	2,455	50
900	1,498	1,648	2,009	2,210	60

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year.

Overload Power is power which an engine may be permitted to deliver, with a duration and frequency of use depending on the service application, at stated ambient conditions, immediately after operating at the continuous power restricted to 1 hour in a 12 hour time span.

V250 IMO Tier II

Engine Specifications

	16V250MDB	*12V250MDB*
Number of cylinders	16	12
Stroke cycle	4	4
Cylinder arrangement	V	V
Bore	250 mm (9.84 in)	250 mm (9.84 in)
Stroke	320 mm (12.60 in)	320 mm (12.60 in)
Compression ratio	16.8:1	16.8:1
Height	3,275 mm (129 in)	3,190 mm (126 in)
Length	5,684 mm (224 in)	4,808 mm (189 in)
Width	2,468 mm (97 in)	2,468 mm (97 in)
Crankshaft center line marine sump	1,162 mm (46 in)	1,077 mm (42 in)
Crankshaft center line to mounting feet	536 mm (21 in)	536 mm (21 in)
Exhaust diameter	610 mm (24 in)	610 mm (24 in)
Dry weight	30,844 kg (68,000 lbs)	23,400 kg (51,600 lbs)

Engine dimensions and weights provided are approximate and based on B-series. For detailed dimensions and weights reference application drawings.

V250 IMO Tier II

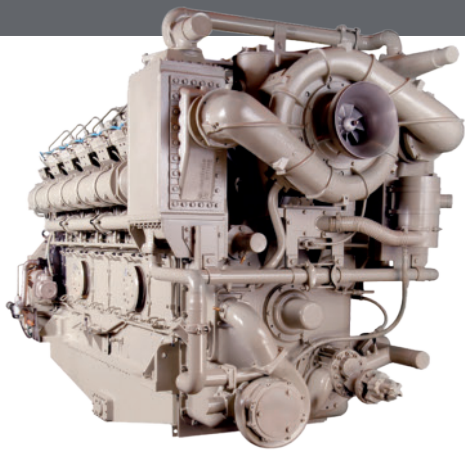
Engine Ratings

Rated speed	bkW		bhp		Hz
	MCR	Overload	MCR	Overload	
16V250MDB					
1050	4,239	4,664	5,685	6,254	NA
1000	4,038	4,442	5,415	5,957	50
900	3,632	3,995	4,870	5,357	60
12V250MDB					
1050	3,180	3,499	4,265	4,692	NA
1000	3,028	3,330	4,060	4,466	50
900	2,726	2,998	3,655	4,021	60

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year.

Overload Power is power which an engine may be permitted to deliver, with a duration and frequency of use depending on the service application, at stated ambient conditions, immediately after operating at the continuous power restricted to 1 hour in a 12 hour time span.

V228 IMO Tier II compliant series



The V228 IMO II emissions compliant engine series delivers a continuous power range from 1,961 bkW at 900 rpm to 3,051 bkW at 1050 rpm (2,630 bhp to 4,091 bhp) for marine applications. Our easy to service unitized cylinder assembly concept enables quick change outs for increased engine uptime. A high capacity turbocharger, electronic fuel injection and efficient combustion management by our engine controller make fuel and lube-oil consumption among the lowest in the industry.

Our V228 diesel engines have been deployed in some of the world's most challenging industrial environments and proven to be among the most dependable, durable and fuel-efficient engines available in the market.

Key Benefits

- Durable engine design to support extended maintenance and overhaul intervals
- Easy to service through a modularized construction; large doors on mainframe to access crankcase; camshafts that are arranged in individual sections; a sectional exhaust manifold and a unitized cylinder assembly concept
- Reliable engines with rugged construction and quality assured parts
- Fuel efficient through a high capacity turbocharger, electronic fuel injection and efficient combustion management by our EC2+ engine controller

V228 IMO Tier II

Engine Specifications

	16V228	*12V228*
Number of cylinders	16	12
Stroke cycle	4	4
Cylinder arrangement	45-degree V	45-degree V
Bore	228.6 mm (9 in)	228.6 mm (9 in)
Stroke	266.7 mm (10.5 in)	266.7 mm (10.5 in)
Compression ratio	15.7:1	15.7:1
Height	3,010 mm (118 in)	2,734 mm (108 in)
Length	5,560 mm (219 in)	4,687 mm (185 in)
Width	2,200 mm (87 in)	2,121 mm (84 in)
Crankshaft center line marine sump	1,221 mm (48 in)	950 mm (37 in)
Crankshaft center line to mounting feet	480 mm (19 in)	480 mm (19 in)
Exhaust diameter	610 mm (24 in)	508 mm (20 in)
Dry weight	22,038 kg (48,585 lbs)	18,942 kg (41,760 lbs)

Engine dimensions and weights provided are approximate.
For detailed dimensions and weights reference application drawings.

V228 IMO Tier II

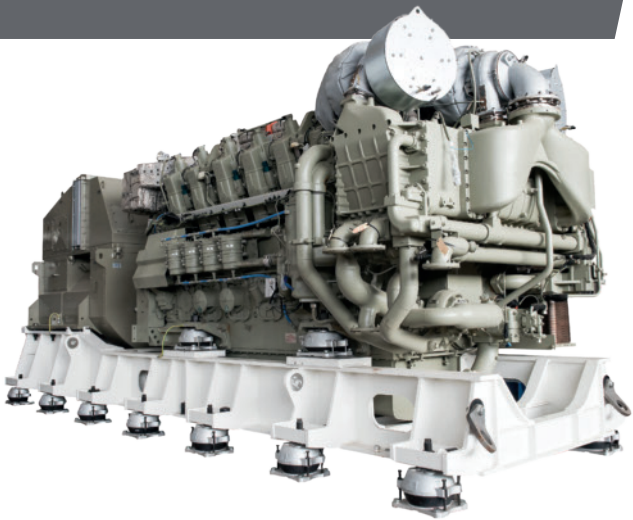
Engine Ratings

Rated speed	bkW		bhp		Hz
	MCR	Overload	MCR	Overload	
16V228					
1050	3,051	3,356	4,091	4,500	NA
1000	2,905	3,196	3,896	4,286	50
900	2,614	2,876	3,506	3,857	60
12V228					
1050	2,289	2,518	3,070	3,377	NA
1000	2,179	2,397	2,922	3,214	50
900	1,961	2,157	2,630	2,893	60

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year.

Overload Power is power which an engine may be permitted to deliver, with a duration and frequency of use depending on the service application, at stated ambient conditions, immediately after operating at the continuous power restricted to 1 hour in a 12 hour time span.

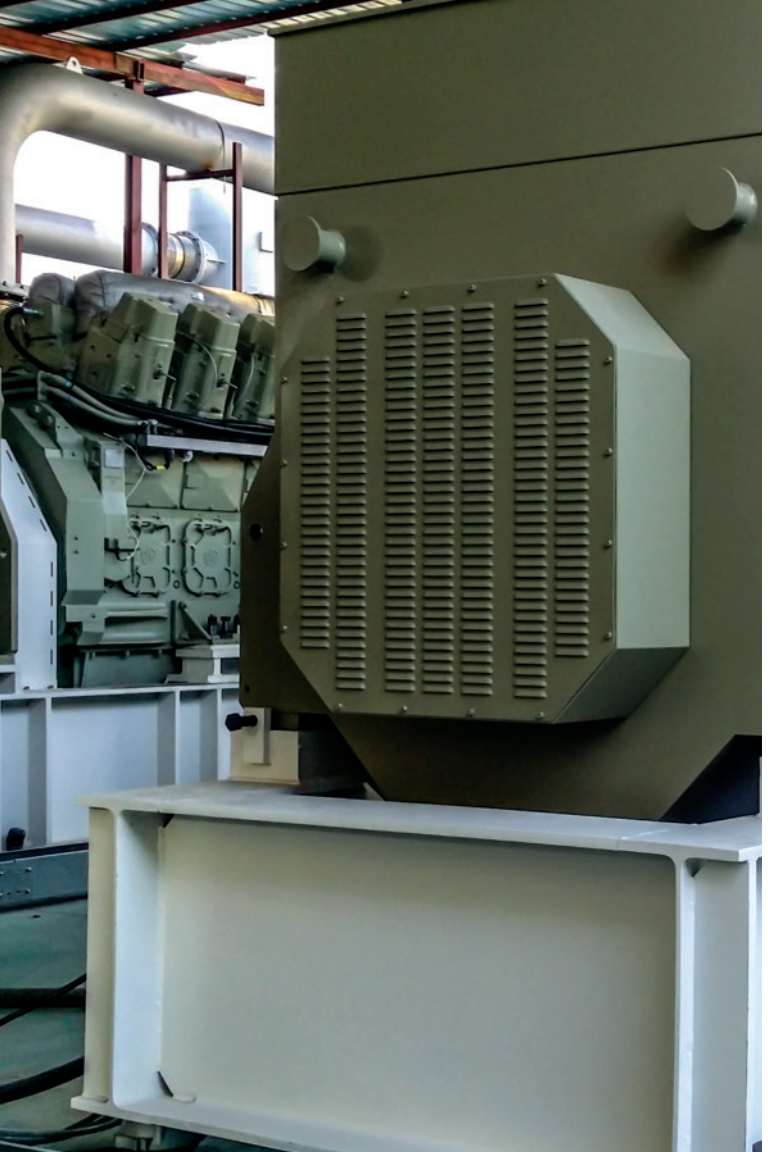
Marine Gensets



Drawing on our experience as a leader in medium-speed engine design and manufacturing, we offer marine genset solutions that provide efficient, cost-effective service in some of the world's harshest marine environments. Powering these gensets are our reliable V250MDC series engines, offering high fuel efficiency and low life-cycle costs, in 12 and 16 cylinder configurations and L250MDC series engines in 6 and 8 cylinder inline configurations. Power solutions range from 1.6 to 4.5 eMW with voltage up to 13.8 kV (50/60 Hz).

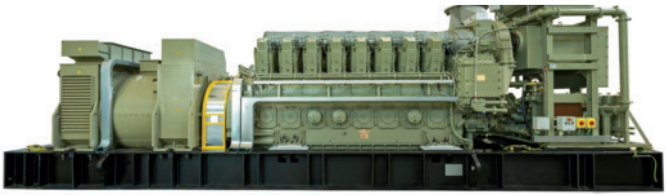
For marine genset ratings please refer to the marine engine rating tables

Notes



Stationary Power

Stationary Power Engines and Gensets



GE Transportation's experience and proven technology deliver dependable, long lasting, and fuel-efficient power solutions in some of the world's harshest operating environments. GE Transportation's V228 and V250 series diesel engines and generator sets offer continuous, prime and standby power worldwide in skid mounted or enclosed configurations. Our stand-alone power generation units contain all necessary equipment and can operate in island, load-share, black-start and utility-parallel modes.

The stationary power genset product line includes generator drive engines, unenclosed gensets and gensets in walk-in enclosures. Powering these products are our reliable V228 and V250 series engines offering high durability, high reliability and best in class fuel efficiency for the lowest life-cycle costs. Power solutions range from 1,883 ekW to 5,065 ekW and are available with a broad range of low and medium voltage alternators.

Emissions

GE Transportation offers stationary gensets optimized for a variety of emissions requirements. For North America, U.S. EPA Tier 2 and Tier 3 (ESP rating only) configurations are available. Fuel optimized or World Bank emissions configurations are also available.

World Bank engine configurations are capable of meeting the NOx and particulates emissions levels specified in the World Bank Emissions Guidelines for Small Combustion Facilities[1]. SOx emissions vary with fuel sulfur content.

[1] International Finance Corporation "Environmental, Health, and Safety (EHS) Guidelines" April 30, 2007

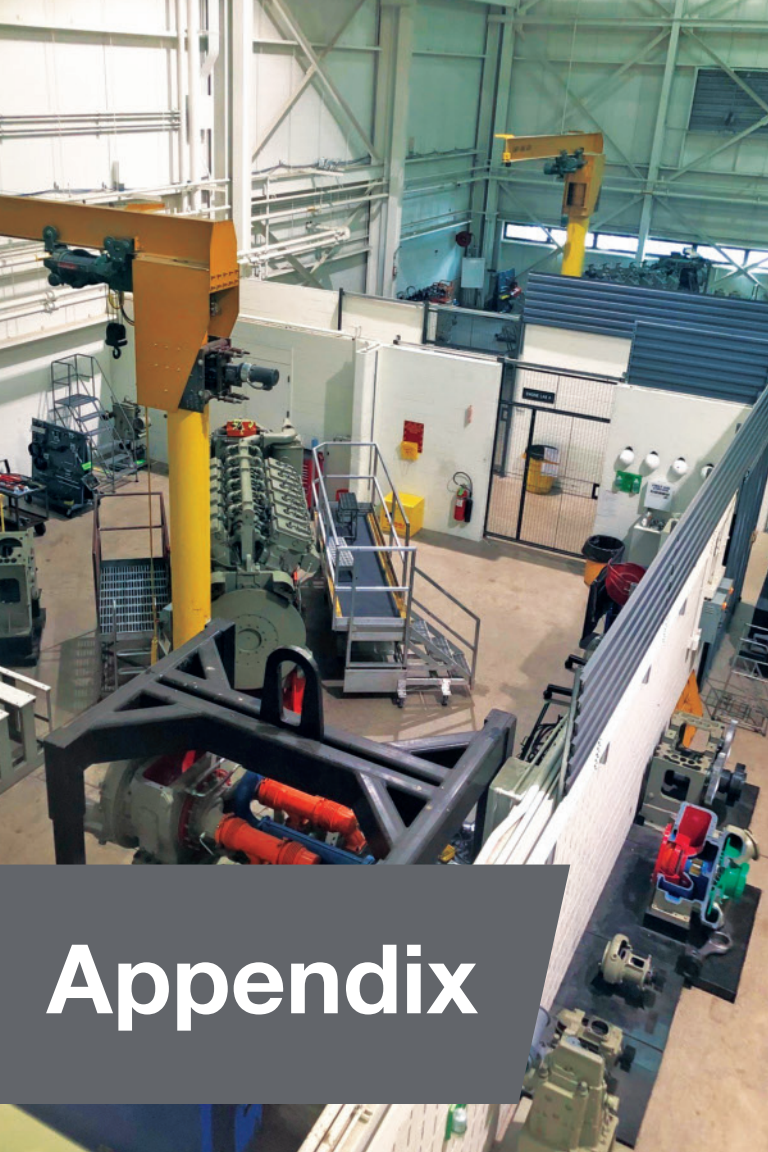
Stationary Power Engines and Gensets

Power Ratings

Engine Model		bkW				bhp			
Speed, RPM	Elec. freq., Hz	Continuous power	Prime power	Limited time running power	Emergency standby power	Continuous power	Prime power	Limited time running power	Emergency standby power
16V250									
1000	50	4,442	4,846	N/A	5,250	5,957	6,498	N/A	7,040
900	60	3,995	4,358		4,721	5,357	5,844		6,331
12V250									
1000	50	3,330	3,633	N/A	3,936	4,466	4,872	N/A	5,278
900	60	2,999	3,271		3,544	4,021	4,386		4,752
16V228									
1000	50	2,905	3,196	3,486	N/A	3,896	4,286	4,675	N/A
900	60	2,614	2,876	3,137		3,506	3,857	4,207	
12V228									
1000	50	2,179	2,397	2,614	N/A	2,922	3,214	3,506	N/A
900	60	1,961	2,157	2,353		2,630	2,893	3,156	

Genset Power Ratings based on ISO 8258-1: 2005

Notes



Appendix

Learn from the diesel engine experts.

In addition to product and service support, we provide comprehensive instruction in diesel engine maintenance. Our learning facility in Erie, Pennsylvania, features classrooms, computer-simulated training and an engine laboratory. Our instructors also provide on-site training at customer locations around the world. We offer custom-designed instructional courses, computer-based learning aids, expert technical advisors, training videos and train-the-trainer programs.

Marine class certifications:

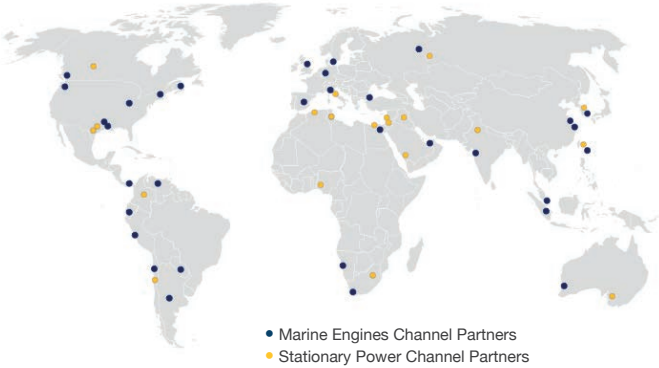
- KR
- ABS
- DNV
- LR
- BV
- GL
- RINA

Quality certifications:

- ISO 9001
- Six Sigma

Global Distribution Network

GE Transportation's Marine & Stationary Power Channel Partners



The right support right when you need it.

With more than 22,000 medium-speed engines in service worldwide, it's critical we have parts and service to support them. And we do — through a network of parts distribution centers and service representatives available 24/7 around the globe. We are a leader in the on-time delivery of parts and services.

Appendix

Definitions

Maximum continuous rating (MCR) Maximum speed and load conditions at which the engine is capable of operating continuously for an unlimited number of hours per year.

Overload Power is power which an engine may be permitted to deliver, with a duration and frequency of use depending on the service application, at stated ambient conditions, immediately after operating at the continuous power restricted to 1 hour in a 12 hour time span.

Continuous power (COP) The maximum power which the generating set is capable of delivering continuously while supplying a constant electrical load when operated for an unlimited number of hours per year.

Prime power (PRP) The maximum power which a generating set is capable of delivering continuously while supplying a variable electrical load when operated for an unlimited number of hours per year. Load factor over a 24-hour period is less than 70%.

Limited-time running power (LTP) The maximum power available for which the generating set is capable of delivering for up to 500 hours of operation per year. Load factor may be up to 100%.

Emergency standby power (ESP) The maximum power available during a variable electrical power sequence for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 hours of operation per year.

FPP A vessel where the engine powers a fixed pitch propeller.
Examples: tug boats, cargo vessels, fishing vessels

FPP-HT A vessel where the engine powers a fixed pitch propeller which demands extended maximum engine torque.
Examples: river push boats, tow boats, dredge pumps

CPP/EPP-VS A vessel where the engine operates at a variable speed to power a controllable pitch or an electrically powered propeller

CPP/EPP-CS A vessel where the engine operates at a constant speed to power a controllable pitch or an electrically powered propeller

Wabtec is a diversified, global leader in equipment, components, services, software and systems for the transportation industry. Drawing on nearly four centuries of collective experience across Wabtec, GE Transportation and Faiveley Transport, the company is paving the way in safety, efficiency, reliability and productivity.

To learn more, contact us:
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