Marine Engine

IMO Tier II and Tier III Programme 2018

Engineering the Future – since 1758.

MAN Diesel & Turbo

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Depending on the subsequent specific individual projects, the relevant data may be subject to changes and will be assessed and determined individually for each project. This will depend on the particular characteristics of each individual project, especially specific site and operational conditions.

If this document is delivered in another language than English and doubts arise concerning the translation, the English text shall prevail.

Contents

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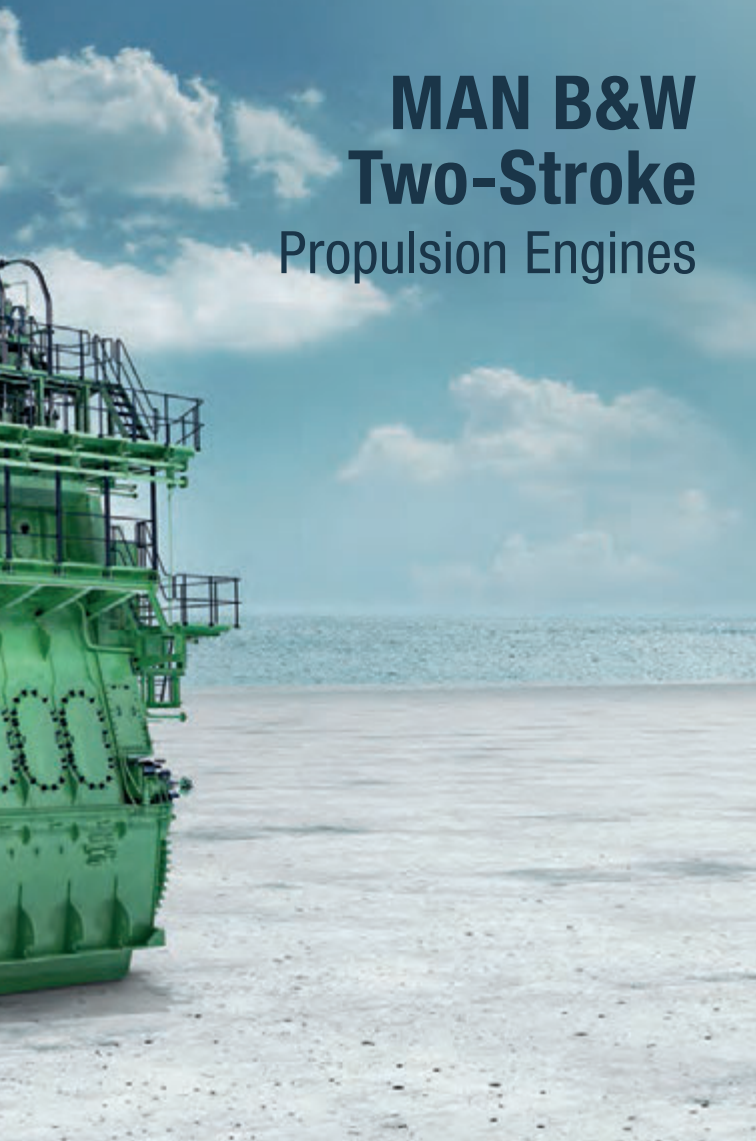

MAN B&W Two-Stroke

Propulsion Engines

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MAN B&W Two-Stroke Propulsion Engines

MAN Diesel & Turbo Tier II and Tier III Engine Programme

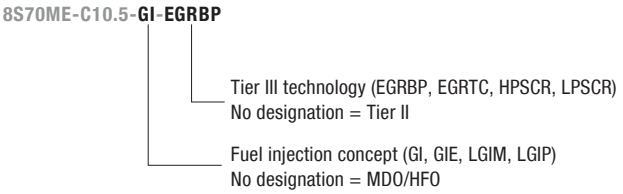
The two-stroke engines in this programme are either:

- Tier II engines complying with IMO Tier II
- Tier III engines complying with Tier II when operated in Tier II mode and with Tier III when operated in Tier III mode

Latest updates on engine development and options are available at:
www.marine.man.eu → Two-Stroke → Market Update Notes (MUN)

Engine Type Designation

To ensure that the engine designation describes the engine with regard to the fuel injection concept and applied Tier III technologies, the engine type designation also includes these concepts as described below (full designation, see page 16):



Tier III technologies and fuel injection concepts are explained in detail on page 11 (GI and LGI Dual Fuel Engines) and page 12 (Tier III Technologies).

ME-C engines

The electronic control of ME engines includes flexible control of the cylinder process, i.e. fuel injection timing and actuation of exhaust valves, starting valves and cylinder lubrication.

ME-B engines

On ME-B engines, the injection timing is electronically controlled whereas actuation of the exhaust valves is camshaft operated, but with electronically controlled variable closing timing.

MAN B&W Two-Stroke Propulsion Engines

CEAS and Turbocharger Selection (TCS)
CEAS and TCS applications include all available Tier II, Tier III technologies and dual fuel options. These applications include all available engines and variants, and specifications can be further investigated with respect to basic data essential for the design and dimensioning of a ship's engine room (CEAS) and applicable turbochargers (TCS).

CEAS and TCS are available at: www.marine.man.eu → Two-Stroke under *CEAS Engine Calculations* and *Turbocharger Selection*.

In CEAS and TCS, all engines in this programme can be selected from the category 'Official Catalogue'.

Earlier versions of this engine programme mention additional engine types. Some of these are still available in CEAS and TCS under the category 'Replaced Catalogue'. New development will only be implemented in these designs to the extent considered necessary based on service experience. New efficiency enhancing features will not be available on older engine types.

Engine Power
The engine brake power is stated in **kW**.
The power values stated in the tables are available up to tropical conditions at sea level, i.e.:
- turbocharger inlet air temperature 45°C
- turbocharger inlet air pressure 1,000 mbar
- cooling water (sea/fresh) temperature 32/36°C

Specific Fuel Oil Consumption (SFOC)
The figures in the two-stroke chapter represent the values obtained when the engine and turbocharger are matched to the lowest possible SFOC values while fulfilling the IMO NO_x Tier II or Tier III emission limits.

The SFOC figures are given in g/kWh and are based on the use of a fuel oil with a lower calorific value (LCV) equal to 42,700 kJ/kg at ISO conditions:
- turbocharger inlet air temperature 25°C
- turbocharger inlet air pressure 1,000 mbar
- cooling water temperature 25°C

Most commercially available HFOs with a viscosity below 700 cSt at 50°C can be used.

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Tolerances

The energy efficiency design index (EEDI) has increased focus on part-load SFOC. Therefore, we offer the option of selecting the SFOC guarantee at a load point in the range from 50% to 100%. It is recommended that the SFOC guarantee point should be limited to the range 50% to 85% for part-load or low-load tuning methods.

All engine design criteria, for example heat load, bearing load and mechanical stress on the construction, are defined at 100% load, independent of the selected guarantee point. This means that turbocharger matching, engine adjustment and engine load calibration must also be performed at 100% load, independent of the guarantee point.

When choosing an SFOC guarantee at or below 100%, the tolerances, adjustment and calibration at 100% will affect engine running at the lower SFOC guarantee load point. This includes tolerances on measurement equipment, engine process control and turbocharger performance.

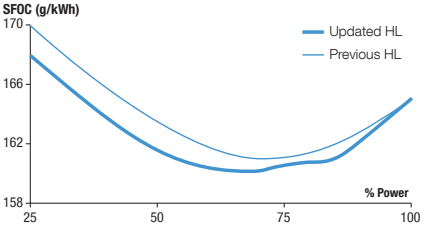
Consequently, SFOC guarantee tolerances are as follows:

- 5% tolerance for 100-85% engine load
- 6% tolerance for <85-65% engine load
- 7% tolerance for <65-50% engine load

Please note that the SFOC guarantee can only be given in one load point for Tier II engines. For Tier III engines see page 12.

Fuel consumption on selected engines

As a result of tests, the fuel consumptions of G95ME-C9.5, G90ME-C10.5, G80ME-C9.5 and S90ME-C10.5 engines have been updated. The graph below shows an example illustrating the improvement for a Tier II, L_1 rated G90ME-C10.5 engine in high-load (HL) optimisation.



MAN B&W Two-Stroke Propulsion Engines

The fuel consumption for Tier III options and dual fuel engines has also been updated. Similar improvements can be realised with part load and low load tuning. A general overview of the changes can be seen on the individual engine pages in this programme. For detailed information, please use the CEAS application

The fuel consumption behavior illustrated in the graph above also applies to the new G70ME-C10.5 and the updated S50ME-C9.6 and G50ME-C9.6 type engines.

Turbocharging System
Two-stroke engines can be delivered with MAN, ABB or MHI turbochargers as standard.

The SFOC figures given in the two-stroke chapter are based on turbocharging with the best possible turbocharging efficiency generally available, which means 67% for all engines with 45-cm bore and larger, and 64% for engine bores smaller than 45 cm. Both efficiency figures refer to 100% SMCR.

There are exceptions to this rule. The G40ME-C9.5 is available as a high-efficiency application offering all Tier II standard tunings and all Tier III options requiring a high-efficiency turbocharger.

The S40ME-B9 and S35ME-B9 type engines are also available as high-efficiency applications offered with high-load tuning and Tier III options with conventional-efficiency turbocharging.

Only engine specifications for which an applicable high-efficiency turbocharger is available are subject to firm order.

All Tier II engines with high-efficiency (67%) turbochargers can be ordered with lower (conventional) turbocharging efficiency. Utilising this possibility will result in higher exhaust gas temperatures, lower exhaust gas amounts, and a slight change in SFOC. It is not possible to apply tuning methods (part- or low-load) when making such a conversion.

Fuel Consumption and Optimisation Possibilities for Tier II Engines
Various optimisation possibilities for improved part-load and low-load SFOC are available for the MAN B&W type engines. High-load optimisation is for best possible SFOC at 100% engine load.

Optimisation of SFOC in the part-load range (50-85%) or low-load range (25-70%) requires selection of the EGB (exhaust gas bypass) tuning method.

MAN B&W Two-Stroke Propulsion Engines

Also high-pressure tuning (HPT) is available on request for ME engines.

The above tuning methods are available for all SMCR points, but cannot be combined. The SFOC reduction potential of each tuning method at L_1 rating can be seen on each individual engine page.

In cases where part-load or low-load EGB tuning is applied, and a higher exhaust gas temperature is needed, a solution exists for additional automatic control of the EGB, the so-called economiser energy control (EEC).

Forcing an open EGB at loads where the EGB is normally closed results in a higher exhaust gas temperature, but with an SFOC penalty. Calculations with this feature are made on request.

GI and LGI Dual Fuel Engines

This engine programme includes a number of engines designed for gas fuel (GI engines) and liquid gas fuel (LGI engines) operation.

Fuel	Fuel designation	LCV [kJ/kg]
Methane	GI	50,000
Ethane	GIE	47,500
Methanol	LGIM	19,900
LPG*	LGIP	46,000

**LPG is a mixture of liquid propane and butane.*

In this engine programme, GI figures are included for engines where GI is applicable. As examples, figures for GIE and LGIP are included for S60ME-C10.5 and G60ME-C9.5 engines, and figures for GIE and LGIM are included for the G50ME-C9.6 engine (see pages 104-117).

SFOC figures are shown for dual fuel mode operation (i.e. operation on gas or liquid gas fuels). Fuel oil mode SFOC is identical to the SFOC for a similar fuel oil engine. Data for both modes can be found in the CEAS report.

Dual fuel engines are available with standard tuning methods for part-load and low-load optimisation in both fuel oil mode and dual fuel mode.

In dual fuel mode for GI, GIE and LGIP, fuel consumption consists of 3%, and 5% for LGIM, mass-based pilot liquid fuel of L_1 rating (SPOC = specific pilot oil consumption) and gas fuel (SGC = specific gas consumption).

All types of GI engines can operate with fuel sharing, also referred to as specified dual fuel (SDF) operation, where the ratio between pilot fuel oil and gas fuel can be selected according to preset values.

MAN B&W Two-Stroke Propulsion Engines

Guarantee figures for dual fuel engines are given for heat rate, which has the same tolerances as SFOC guarantees, i.e. see page 9.
Heat rate is defined as follows [kJ/kWh] (example for methane as dual fuel):
Heat rate (kJ/kWh) = SGC (g/kWh) × 50 kJ/g + SPOC (g/kWh) × 42.7 kJ/g

The pilot oil amount typically accounts for about 5% of the heat rate, and the distribution between SGC and SPOC as well as the heat rate over the load range are available in the CEAS report.

Please note that dual fuel engines must have cylinder lubrication systems capable of supplying both low-BN lubricating oils and high-BN lubricating oils.

Tier III Technologies
To ensure compliance with IMO Tier III regulations, EGR or SCR NO_x reduction technology must be selected. Which technology is preferred depends on market demands, engine size, other requirements and operational pattern.

See our Emission Project Guide for more detailed descriptions of these technologies at www.marine.man.eu → Two-Stroke → Project Guides → Other Guides → Emission Project Guide

All Tier III engines have two operating modes:
- Tier III mode fulfilling the IMO Tier III regulations
- Tier II mode fulfilling the IMO Tier II regulations

Tier III technologies are designed for either low-sulphur fuels (0-0.1%) or high-sulphur fuels (0-3.5%) in Tier III operation. In Tier II operation, the engine is in all cases capable of using fuels with a high sulphur content. The fuel sulphur content must be selected at engine order as it impacts the engine design.

Fuel consumption guarantees can be given for engines for both Tier II and Tier III mode.

EGR
Two EGR-matching concepts are available depending on engine type:
- **EGRTC:** T/C cut-out matching for engines with bores ≥ 80 cm and more than one turbocharger applied
- **EGRBP:** Bypass matching for engines with bores ≤ 70 cm and one high-efficiency turbocharger and for engines with bores ≤ 40 cm and one conventional efficiency turbocharger

EGR operation is possible on ME and ME-B engines, including engine types for dual fuel, except GIE.

MAN B&W Two-Stroke Propulsion Engines

For the smallest bore engines, especially with 5 and 6 cylinders, the availability of applicable turbochargers makes it difficult to apply EGR. Therefore, SCR is recommended for these engines.

SCR

Two SCR concepts are available:

- **HPSCR:** High-pressure SCR with reactor installed upstream the turbocharger(s)
- **LPSCR:** Low-pressure SCR with reactor installed downstream the turbocharger(s)

SCR operation applies to ME and ME-B engines, including engine types with dual fuel. For some large-bore engines (bore ≥ 90 cm) with a high cylinder number, HPSCR is only available on special request.

The SCR system must be supplied by an approved supplier.

Application of High-Sulphur Fuels and SO_x Scrubbers

All two-stroke engines in the MAN Diesel & Turbo marine engine programme are compatible with SO_x scrubbers.

A SO_x scrubber installation will increase the back pressure, thereby affecting engine performance. Accordingly, we require that a SO_x scrubber installation does not increase the back pressure by more than 30 mbar at SMCR.

CEAS is updated with the SO_x scrubber options available.

Fuels After 2020

From 1 January 2020, the global sulphur content for marine fuels must not exceed 0.5%. To ensure compliant operation, one of the following methods must be used:

- Use a compliant fuel:
  Global: max. 0.5% sulphur
  ECA: max. 0.1% sulphur
- Use methane, ethane, methanol or LPG together with compliant pilot fuel
- Use a high-sulphur fuel in combination with a SOx scrubber to obtain an exhaust gas SO_x level equivalent to operation on a compliant fuel

The fuel specification must be selected at engine order as it impacts the engine design.

MAN B&W Two-Stroke Propulsion Engines

Waste Heat Recovery Systems

On engines with high-efficiency turbochargers, waste heat can be economically recovered by installing equipment for waste heat recovery (WHR) and matching the engine for WHR. WHR systems are available for both Tier II and Tier III engines on request.

The following types of WHR systems have been approved for application:

- Power turbines with a power output equal to 3-5% of the engine shaft power at SMCR
- Power turbines and steam turbines with a power output corresponding to 8-10% of the engine shaft power at SMCR
- Steam turbine system – with a power output corresponding to 4-6% of the engine shaft power at SMCR
- Turbochargers with a motor/generator attached to the turbocharger shaft, and with a power output equal to 3-5% of the engine shaft power at SMCR

Lubricating Oil Consumption

The system oil consumption varies according to engine sizes and, operational and maintenance patterns.

Specific Cylinder Oil Consumption

Alpha ACC (Adaptive Cylinder-oil Control) is the lubricating mode for MAN B&W two-stroke engines that involves lube dosing proportional to the engine load and to the sulphur content in the fuel being burned.

Our general strategy is:

- Use low-BN oil for low-sulphur fuels
- Use high-BN oil for high-sulphur fuels

Dosage:

- Low-sulphur fuels: min. 0.6 g/kWh
- High-sulphur fuels: typically 0.3 g/kWh × %S for a 100 BN oil

Our Service Letters SL2014-587 and SL2014-593 offer further information: www.marine.man.eu → Two-Stroke → Service Letters → SL2014-587 and SL2014-593

MAN B&W Two-Stroke Propulsion Engines

Extent of Delivery

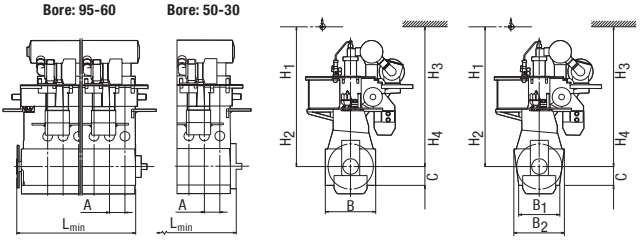
The final and binding extent of delivery of MAN B&W two-stroke engines is to be supplied by our licensee, the engine maker, who should be contacted in order to determine the execution for the actual project.

To facilitate negotiations between the yard, the engine maker and the customer, a set of guiding 'Extent of Delivery' (EoD) forms are available in which MAN Diesel & Turbo's recommended basic and optional executions are specified.

The licensees may select a different extent of delivery as their standard.

Engine Dimensions

The minimum length L_{min} is stated from the aft end of the crankshaft to the fore end of the engine.



L_{min} Minimum length of engine
A Cylinder distance
B Bedplate width
B_1 Bedplate width at foot flange
B_2 Bedplate width at top flange
C Crankshaft to underside of foot flange
H_1 Normal lifting procedure
H_2 Reduced height lifting procedure
H_3 Reduced height lifting procedure with MAN B&W double-jib crane
H_4 Normal lifting procedure with MAN B&W double-jib crane

MAN B&W Two-Stroke Propulsion Engines

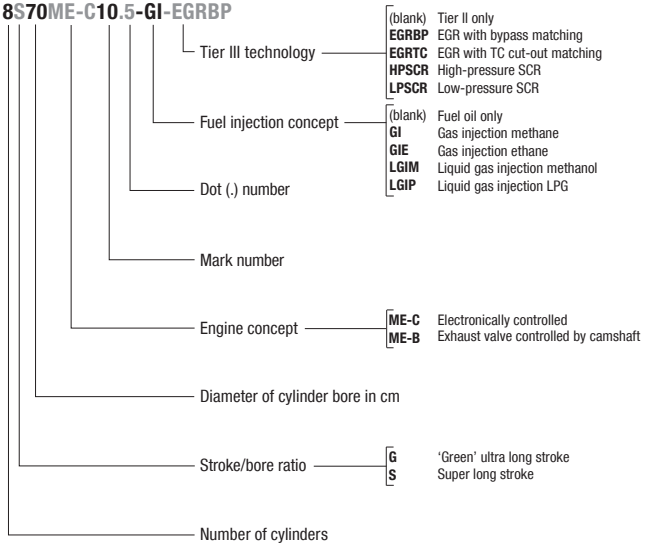
Dry Masses

Dry masses are stated in metric tonnes for engines with MAN turbocharger(s) and a standard turning wheel. Figures will vary depending on the design and options chosen, e.g. moment compensators, tuning wheel, etc.

Dry masses for Tier III engines cover components directly integrated on the engine.

Indicated values are for guidance only and are not binding.

Engine Type Designation

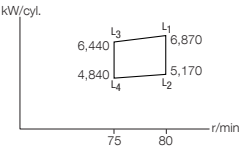


MAN B&W G95ME-C9.6

Tier II

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9	61,830
10	68,700
11	75,570
12	82,440

Stroke: 3,460 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.6

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	161.5	160.5	165.0
Part load	EGB	159.5	159.0	167.5
Low load	EGB	157.5	160.0	167.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.6-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	157.5	156.5	164.0
Part load	EGB	159.5	159.0	167.5
Low load	EGB	157.5	160.0	167.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	127.8 (7.8)	128.7 (6.0)	135.9 (4.9)
Part load	EGB	129.4 (8.0)	130.7 (6.1)	138.8 (5.0)
Low load	EGB	127.7 (8.0)	131.5 (6.1)	138.8 (5.0)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

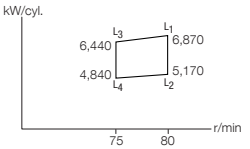
Note: Also available for GIE and LGIP, see page 11.

Tier III

MAN B&W G95ME-C9.6

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9*	61,830
10*	68,700
11*	75,570
12*	82,440

Stroke: 3,460 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.6-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.0
Tier III mode	163.5	163.5	169.0

MAN B&W G95ME-C9.6-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	159.0	161.0	168.0

MAN B&W G95ME-C9.6-LPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	158.5	161.0	168.5

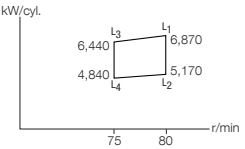
** Available on request for HPSCR.*

MAN B&W G95ME-C9.6

Tier III

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9*	61,830
10*	68,700
11*	75,570
12*	82,440

Stroke: 3,460 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.6-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.0
Tier III mode	163.5	163.5	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	127.6 (8.0)	131.5 (6.1)	138.3 (5.1)
Tier III mode	132.8 (8.0)	134.5 (6.1)	140.0 (5.1)

MAN B&W G95ME-C9.6-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	159.0	161.0	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	127.6 (8.0)	131.5 (6.1)	138.7 (5.0)
Tier III mode	128.9 (8.0)	132.4 (6.1)	139.2 (5.0)

MAN B&W G95ME-C9.6-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	158.5	161.0	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

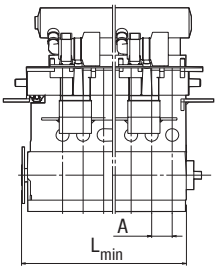
Tier II mode	127.7 (8.0)	131.5 (6.1)	138.7 (5.1)
Tier III mode	128.5 (8.0)	132.4 (6.1)	139.6 (5.1)

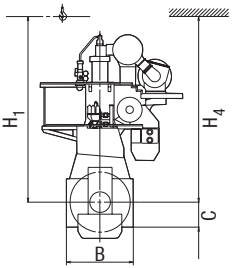
* *Available on request for HPSCR.*

** *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B	C	H_1	H_4
	mm	1,574	5,380	2,060	15,925	15,525
Cyl. distance		*5-9 cyl.*	*10 cyl.*	*11 cyl.*		*12 cyl.*
	mm	*1,574*	*1-6: 1,574*	*1-6: 1,574*		*1-6: 1,574*
	mm		*7-10: 1,670*	*7-11: 1,670*		*7-12: 1,670*

Cylinders:		5	6	7	8	9	10	11	12
L_{min}	mm	11,468	13,042	14,616	16,190	17,804	19,779	21,489	23,159

Dry mass									
Tier II	t	1,080	1,250	1,430	1,625	1,820	2,010	2,210	2,400
Tier III (added)									
EGR	t	18	19	20	22	35	35	37	38
HP SCR	t	10	15	15	15				
LP SCR	t	-	-	-	-	-	-	-	-
Dual fuel (added)									
GI	t	8	9	11	12	13	15	16	17

CEAS

Project Guide

MAN B&W G95ME-C9.5

Tier II

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9	61,830
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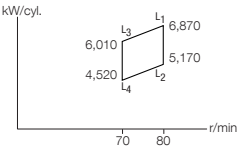
Stroke: 3,460 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	162.5	161.5	166.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	158.5	157.5	165.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	128.6 (7.9)	129.5 (6.0)	136.7 (5.0)
Part load	EGB	130.2 (8.0)	131.5 (6.1)	139.6 (5.1)
Low load	EGB	128.5 (8.0)	132.4 (6.1)	139.6 (5.1)

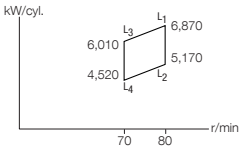
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11.

MAN B&W G95ME-C9.5

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9*	61,830
10*	68,700
11*	75,570
12*	82,440

Stroke: 3,460 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.5-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

MAN B&W G95ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

MAN B&W G95ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

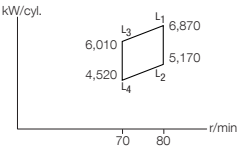
** Available on request for HPSCR.*

MAN B&W G95ME-C9.5

Tier III

Cyl.	L_1 kW
5	34,350
6	41,220
7	48,090
8	54,960
9*	61,830
10*	68,700
11*	75,570
12*	82,440

Stroke: 3,460 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G95ME-C9.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	128.4 (8.1)	132.3 (6.2)	139.1 (5.1)
Tier III mode	133.6 (8.1)	135.3 (6.2)	140.8 (5.1)

MAN B&W G95ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	128.4 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.7 (8.1)	133.2 (6.2)	140.0 (5.1)

MAN B&W G95ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

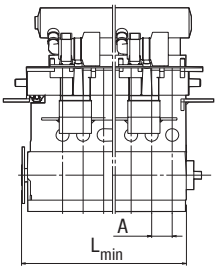
Tier II mode	128.5 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)

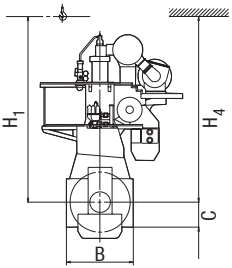
* *Available on request for HPSCR.*

** *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B	C	H_1	H_4
	mm	1,574	5,380	2,060	15,925	15,525
Cyl. distance		*5-9 cyl.*	*10 cyl.*	*11 cyl.*	*12 cyl.*	
	mm	*1,574*	*1-6: 1,574*	*1-6: 1,574*	*1-6: 1,574*	
	mm		*7-10: 1,670*	*7-11: 1,670*	*7-12: 1,670*	

Cylinders:		5	6	7	8	9	10	11	12
L_{min}	mm	11,468	13,042	14,616	16,190	17,804	19,779	21,489	23,159

Dry mass									
Tier II	t	1,080	1,250	1,430	1,625	1,820	2,010	2,210	2,400
Tier III (added)									
EGR	t	18	19	20	22	35	35	37	38
HP SCR	t	10	15	15	15				
LP SCR	t	-	-	-	-	-	-	-	-
Dual fuel (added)									
GI	t	8	9	11	12	13	15	16	17

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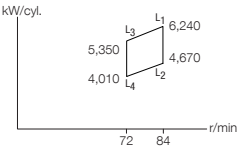
Project Guide

MAN B&W G90ME-C10.5

Tier II

Cyl.	L_1 kW
5	31,200
6	37,440
7	43,680
8	49,920
9	56,160
10	62,400
11	68,640
12	74,880

Stroke: 3,260 mm



Fuel Oil

L_1 MEP: 21.5 bar

MAN B&W G90ME-C10.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	161.5	160.5	165.0
Part load	EGB	159.5	159.0	167.5
Low load	EGB	157.5	160.0	167.5

Dual Fuel Mode for GI (Methane)

MAN B&W G90ME-C10.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	157.5	156.5	164.0
Part load	EGB	159.5	159.0	167.5
Low load	EGB	157.5	160.0	167.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	127.8 (7.8)	128.7 (6.0)	135.9 (4.9)
Part load	EGB	129.4 (8.0)	130.7 (6.1)	138.8 (5.0)
Low load	EGB	127.7 (8.0)	131.5 (6.1)	138.8 (5.0)

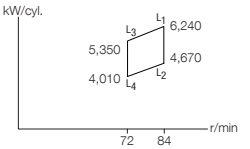
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11.

MAN B&W G90ME-C10.5

Cyl.	L_1 kW
5	31,200
6	37,440
7	43,680
8	49,920
9	56,160
10*	62,400
11*	68,640
12*	74,880

Stroke: 3,260 mm



Fuel Oil

L_1 MEP: 21.5 bar

MAN B&W G90ME-C10.5-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.0
Tier III mode	163.5	163.5	169.0

MAN B&W G90ME-C10.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	159.0	161.0	168.0

MAN B&W G90ME-C10.5-LPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	158.5	161.0	168.5

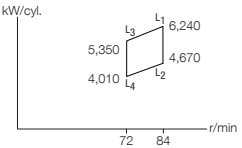
** Available on request for HPSCR.*

MAN B&W G90ME-C10.5

Tier III

Cyl.	L_1 kW
5	31,200
6	37,440
7	43,680
8	49,920
9	56,160
10*	62,400
11*	68,640
12*	74,880

Stroke: 3,260 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.5 bar

MAN B&W G90ME-C10.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.0
Tier III mode	163.5	163.5	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	127.6 (8.1)	131.5 (6.1)	138.3 (5.1)
Tier III mode	132.8 (8.1)	134.5 (6.1)	140.0 (5.1)

MAN B&W G90ME-C10.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	159.0	161.0	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	127.6 (8.1)	131.5 (6.1)	138.7 (5.0)
Tier III mode	128.9 (8.1)	132.4 (6.1)	139.2 (5.0)

MAN B&W G90ME-C10.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	157.5	160.0	167.5
Tier III mode	158.5	161.0	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

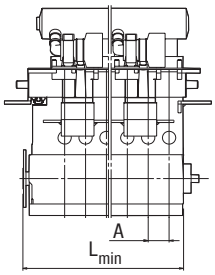
Tier II mode	127.6 (8.0)	131.5 (6.1)	138.7 (5.1)
Tier III mode	128.5 (8.0)	132.4 (6.1)	139.6 (5.1)

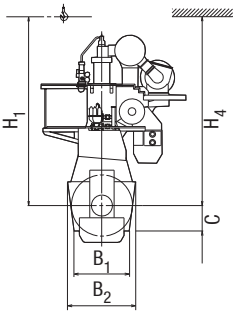
** Available on request for HPSCR.*

*** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_4
	mm	1,490	5,110	5,034	1,885	14,425	13,975

Cylinders:		5	6	7	8	9	10	11	12
L_{min}	mm	10,740	12,040	12,855	14,345*	15,835*	18,040	19,530	21,020

Dry mass

Tier II	t	892	1,034	1,162	1,316	1,477	1,619	1,786	1,915

Tier III (added)

EGR	t	13	15	16	18	16	16	18	20
HP SCR	t	7	10	15	15	15			
LP SCR	t	-	-	-	-	-	-	-	-

Dual fuel (added)

GI	t	7	8	9	10	12	13	14	15

** 8-9-cylinder engines can be ordered with either divided or undivided crankshaft. Data is given for undivided crankshaft.*

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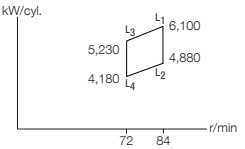
MAN B&W S90ME-C10.5

Tier II

Cyl.	L_1 kW
5	30,500
6	36,600
7	42,700
8	48,800
9	54,900
10	61,000
11	67,100
12	73,200

Stroke: 3,260 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S90ME-C10.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	162.5	161.5	166.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S90ME-C10.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	158.5	157.5	165.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	128.6 (7.9)	129.5 (6.0)	136.7 (5.0)
Part load	EGB	130.2 (8.0)	131.5 (6.1)	139.6 (5.1)
Low load	EGB	128.5 (8.0)	132.4 (6.1)	139.6 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

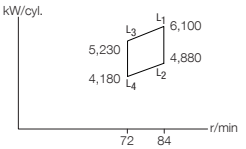
Note: Also available for GIE and LGIP, see page 11.

Tier III

MAN B&W S90ME-C10.5

Cyl.	L_1 kW
5	30,500
6	36,600
7	42,700
8	48,800
9	54,900
10*	61,000
11*	67,100
12*	73,200

Stroke: 3,260 mm



Fuel Oil

MAN B&W S90ME-C10.5-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

MAN B&W S90ME-C10.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

MAN B&W S90ME-C10.5-LPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

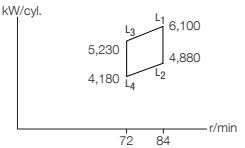
** Available on request for HPSCR.*

MAN B&W S90ME-C10.5

Tier III

Cyl.	L_1 kW
5	30,500
6	36,600
7	42,700
8	48,800
9	54,900
10*	61,000
11*	67,100
12*	73,200

Stroke: 3,260 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S90ME-C10.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	128.4 (8.1)	132.3 (6.2)	139.1 (5.1)
Tier III mode	133.6 (8.1)	135.3 (6.2)	140.8 (5.1)

MAN B&W S90ME-C10.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	128.4 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.7 (8.1)	133.2 (6.2)	140.0 (5.1)

MAN B&W S90ME-C10.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]**

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

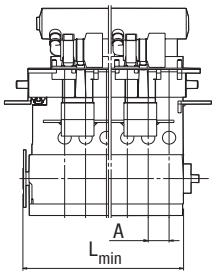
Tier II mode	128.5 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)

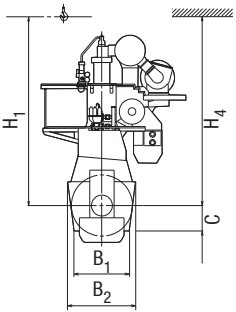
** Available on request for HPSCR.*

*** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H4
	mm	1,590	5,160	5,450	1,900	15,000	14,875

Cylinders:		5	6	7	8	9	10	11	12
L_{min}	mm	10,312	11,902	13,492	16,135	17,725	19,315	20,905	22,495

Dry mass									
Tier II	t	953	1,104	1,255	1,446	1,626	1,771	1,942	2,088
Tier III (added)									
EGR	t	16	18	19	20	21	33	35	37
HP SCR	t	7	10	15	15	15			
LP SCR	t	-	-	-	-	-	-	-	-
Dual fuel (added)									
GI	t	7	9	10	11	12	13	15	16

CEAS

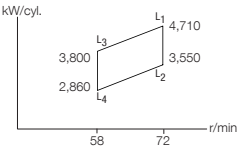
Project Guide

MAN B&W G80ME-C9.5

Tier II

Cyl.	L_1 kW
6	28,260
7	32,970
8	37,680
9	42,390

Stroke: 3,720 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G80ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	162.5	161.5	166.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G80ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	158.5	157.5	165.0
Part load	EGB	160.5	160.0	168.5
Low load	EGB	158.5	161.0	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

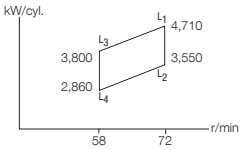
SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	128.7 (7.9)	129.5 (6.0)	136.7 (5.0)
Part load	EGB	130.2 (8.0)	131.5 (6.1)	139.6 (5.1)
Low load	EGB	128.5 (8.0)	132.4 (6.1)	139.6 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11

Cyl.	L_1 kW
6	28,260
7	32,970
8	37,680
9	42,390

Stroke: 3,720 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G80ME-C9.5-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

MAN B&W G80ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

MAN B&W G80ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

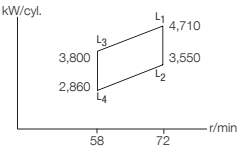
	50%	75%	100%
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

MAN B&W G80ME-C9.5

Tier III

Cyl.	L_1 kW
6	28,260
7	32,970
8	37,680
9	42,390

Stroke: 3,720 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G80ME-C9.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	158.5	161.0	168.0
Tier III mode	164.5	164.5	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	128.5 (8.1)	132.3 (6.2)	139.1 (5.1)
Tier III mode	133.6 (8.1)	135.3 (6.2)	140.8 (5.1)

MAN B&W G80ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	158.5	161.0	168.5
Tier III mode	160.0	162.0	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	128.5 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.7 (8.1)	133.2 (6.2)	140.0 (5.1)

MAN B&W G80ME-C9.5-GI-LPSCR

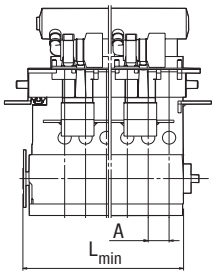
L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	158.5	161.0	168.5
Tier III mode	159.5	162.0	169.5

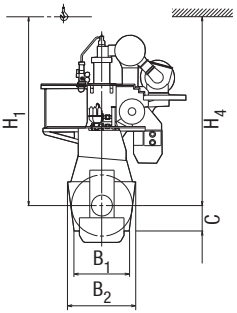
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	128.5 (8.1)	132.3 (6.2)	139.6 (5.1)
Tier III mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_4
	mm	1,400	5,320	5,680	1,960	16,100	15,825

Cylinders:		6	7	8	9
L_{min}	mm	10,735	12,135	13,535*	15,880

Dry mass					
Tier II	t	945	1,055	1,175*	1,350
Tier III (added)					
EGR	t	16	17	18	19
HP SCR	t	6	10	10	15
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	7	8	9	9

** Dry mass and cylinder L_{min} are with undivided crankshaft and chain in aft, with divided crankshaft and chain in mid, dry mass is 1,223 t and cylinder L_{min} is 14,480 mm.*

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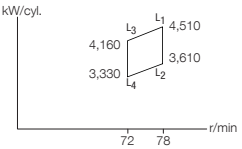
Project Guide

MAN B&W S80ME-C9.5

Tier II

Cyl.	L_1 kW
6	27,060
7	31,570
8	36,080
9	40,590

Stroke: 3,450 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S80ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	166.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S80ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	160.5	158.0	165.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	130.4 (7.9)	129.9 (6.0)	136.7 (5.0)
Part load	EGB	131.1 (8.0)	132.0 (6.1)	138.8 (5.0)
Low load	EGB	129.4 (8.0)	132.8 (6.1)	138.8 (5.0)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

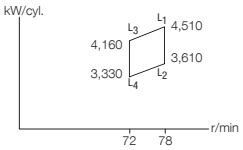
Note: Also available for GIE and LGIP, see page 11

Tier III

MAN B&W S80ME-C9.5

Cyl.	L_1 kW
6	27,060
7	31,570
8	36,080
9	40,590

Stroke: 3,450 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S80ME-C9.5-EGRTC

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	167.0
Tier III mode	166.5	165.0	170.0

MAN B&W S80ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

MAN B&W S80ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

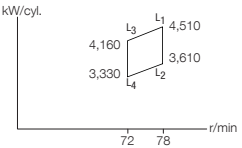
	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

MAN B&W S80ME-C9.5

Tier III

Cyl.	L_1 kW
6	27,060
7	31,570
8	36,080
9	40,590

Stroke: 3,450 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S80ME-C9.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.0
Tier III mode	166.5	165.0	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.1)	132.7 (6.2)	138.3 (5.1)
Tier III mode	135.3 (8.1)	135.7 (6.2)	140.8 (5.1)

MAN B&W S80ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.0)	132.8 (6.1)	138.7 (5.0)
Tier III mode	130.6 (8.0)	133.6 (6.1)	139.2 (5.0)

MAN B&W S80ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

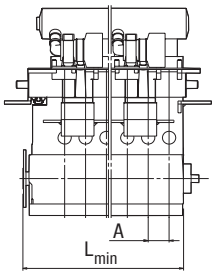
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

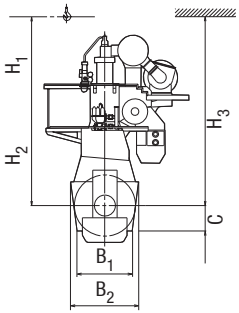
Tier II mode	129.4 (8.0)	132.8 (6.1)	138.7 (5.1)
Tier III mode	130.2 (8.0)	133.6 (6.1)	139.6 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,334	5,180	5,374	1,890	15,175	13,925	13,800

Cylinders:		6	7	8	9
L_{min}	mm	10,100	11,434	12,768	14,102

Dry mass					
Tier II	t	833	933	1,043	1,153
Tier III (added)					
EGR	t	16	17	18	19
HP SCR	t	6	10	10	15
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	7	8	9	10

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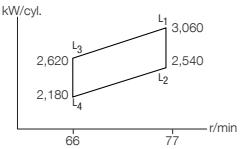
Project Guide

MAN B&W G70ME-C10.5

Tier II

Cyl.	L_1 kW
5	15,300
6	18,360

Stroke: 3,256 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G70ME-C10.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	160.5	158.5	163.0
Part load	EGB	158.5	157.0	165.5
Low load	EGB	156.5	158.0	165.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G70ME-C10.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	156.5	155.0	162.0
Part load	EGB	158.5	157.0	165.5
Low load	EGB	156.5	158.0	165.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	126.3 (8.7)	126.8 (6.6)	133.7 (5.5)
Part load	EGB	127.7 (8.8)	128.4 (6.8)	136.6 (5.6)
Low load	EGB	126.0 (8.8)	129.3 (6.8)	136.6 (5.6)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

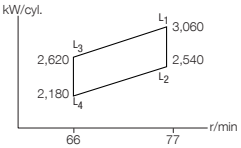
Note: Also available for GIE and LGIP, see page 11.

Tier III

MAN B&W G70ME-C10.5

Cyl.	L_1 kW
5	15,300
6	18,360

Stroke: 3,256 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G70ME-C10.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	156.5	158.0	166.0
Tier III mode	163.5	162.5	168.0

MAN B&W G70ME-C10.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	156.5	158.0	165.5
Tier III mode	158.0	159.0	166.0

MAN B&W G70ME-C10.5-LPSCR

L_1 SFOC [g/kWh]

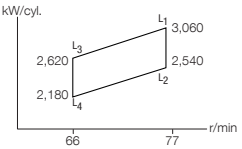
	50%	75%	100%
Tier II mode	156.5	158.0	165.5
Tier III mode	157.5	159.0	166.5

MAN B&W G70ME-C10.5

Tier III

Cyl.	L_1 kW
5	15,300
6	18,360

Stroke: 3,256 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G70ME-C10.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	156.5	158.0	166.0
Tier III mode	163.5	162.5	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	125.9 (9.0)	129.2 (6.9)	136.9 (5.7)
Tier III mode	131.9 (9.0)	133.0 (6.9)	138.6 (5.7)

MAN B&W G70ME-C10.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	156.5	158.0	165.5
Tier III mode	158.0	159.0	166.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	126.0 (8.9)	129.2 (6.8)	136.5 (5.6)
Tier III mode	127.2 (8.9)	130.1 (6.8)	137.0 (5.6)

MAN B&W G70ME-C10.5-GI-LPSCR

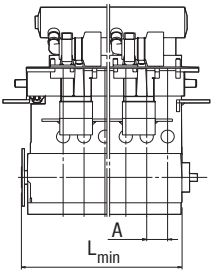
L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	**50%**	**75%**	**100%**
Tier II mode	156.5	158.0	165.5
Tier III mode	157.5	159.0	166.5

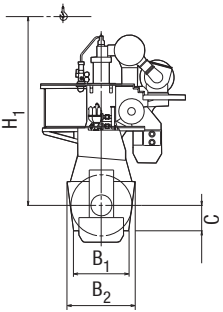
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	126.0 (8.9)	129.2 (6.8)	136.5 (5.6)
Tier III mode	126.8 (8.9)	130.1 (6.8)	137.4 (5.6)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1
	mm	1,044	4,460	4,600	1,750	14,000

Cylinders:		5	6
L_{min}	mm	7,400	8,300

Dry mass			
Tier II	t	521	586
Tier III (added)			
EGR	t	14	16
HP SCR	t	5	5
LP SCR	t	-	-
Dual fuel (added)			
GI	t	5	6

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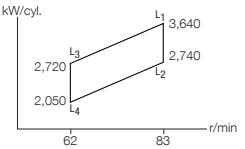
Project Guide

MAN B&W G70ME-C9.5

Tier II

Cyl.	L_1 kW
5	18,200
6	21,840
7	25,480
8	29,120

Stroke: 3,256 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G70ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	165.5	163.0	167.0
Part load	EGB	162.5	161.5	168.5
Low load	EGB	160.5	162.5	168.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G70ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	161.5	159.0	166.0
Part load	EGB	162.5	161.5	168.5
Low load	EGB	160.5	162.5	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

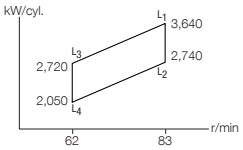
SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	131.2 (7.9)	130.7 (6.0)	137.5 (5.0)
Part load	EGB	131.9 (8.0)	132.8 (6.1)	139.6 (5.1)
Low load	EGB	130.2 (8.0)	133.7 (6.1)	139.6 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11.

Cyl.	L_1 kW
5	18,200
6	21,840
7	25,480
8	29,120

Stroke: 3,256 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G70ME-C9.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	160.5	162.5	169.0
Tier III mode	168.5	167.0	172.0

MAN B&W G70ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	162.0	163.5	169.0

MAN B&W G70ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

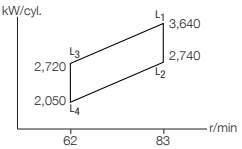
	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	161.5	163.5	169.5

MAN B&W G70ME-C9.5

Tier III

Cyl.	L_1 kW
5	18,200
6	21,840
7	25,480
8	29,120

Stroke: 3,256 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G70ME-C9.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	169.0
Tier III mode	168.5	167.0	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	130.1 (8.2)	133.5 (6.3)	139.9 (5.2)
Tier III mode	136.9 (8.2)	137.4 (6.3)	142.5 (5.2)

MAN B&W G70ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	162.0	163.5	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	130.2 (8.1)	133.6 (6.2)	139.6 (5.1)
Tier III mode	131.4 (8.1)	134.5 (6.2)	140.0 (5.1)

MAN B&W G70ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	161.5	163.5	169.5

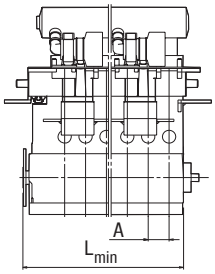
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

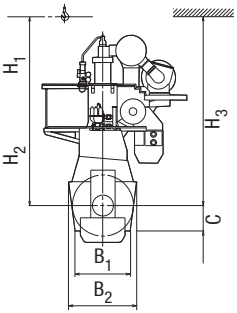
Tier II mode	130.2 (8.1)	133.6 (6.2)	139.6 (5.1)
Tier III mode	131.0 (8.1)	134.5 (6.2)	140.4 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,260	4,760	4,900	1,750	14,225	13,250	12,800

Cylinders:		5	6	7	8
L_{min}	mm	8,486	9,596	10,856	12,116

Dry mass					
Tier II	t	585	665	750	855
Tier III (added)					
EGR	t	14	16	17	18
HP SCR	t	5	5	6	7
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	6	7	8

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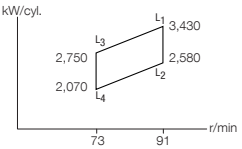
Project Guide

MAN B&W S70ME-C10.5

Tier II

Cyl.	L_1 kW
5	17,150
6	20,580
7	24,010
8	27,440

Stroke: 2,800 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S70ME-C10.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	166.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S70ME-C10.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	160.5	158.0	165.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	130.4 (7.9)	129.9 (6.0)	136.7 (5.0)
Part load	EGB	131.1 (8.0)	132.0 (6.1)	138.8 (5.0)
Low load	EGB	129.4 (8.0)	132.8 (6.1)	138.8 (5.0)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

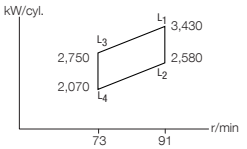
Note: Also available for GIE and LGIP, see page 11

Tier III

MAN B&W S70ME-C10.5

Cyl.	L_1 kW
5	17,150
6	20,580
7	24,010
8	27,440

Stroke: 2,800 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S70ME-C10.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	168.0
Tier III mode	167.5	166.0	171.0

MAN B&W S70ME-C10.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

MAN B&W S70ME-C10.5-LPSCR

L_1 SFOC [g/kWh]

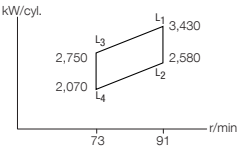
	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

MAN B&W S70ME-C10.5

Tier III

Cyl.	L_1 kW
5	17,150
6	20,580
7	24,010
8	27,440

Stroke: 2,800 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S70ME-C10.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	168.0
Tier III mode	167.5	166.0	171.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.1)	132.7 (6.2)	139.1 (5.1)
Tier III mode	136.1 (8.1)	136.6 (6.2)	141.7 (5.1)

MAN B&W S70ME-C10.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.0)	132.8 (6.1)	138.7 (5.0)
Tier III mode	130.6 (8.0)	133.6 (6.1)	139.2 (5.0)

MAN B&W S70ME-C10.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

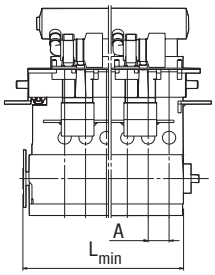
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

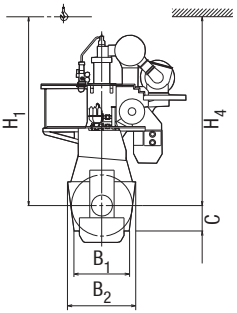
Tier II mode	129.4 (8.0)	132.8 (6.1)	138.7 (5.1)
Tier III mode	130.2 (8.0)	133.6 (6.1)	139.6 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_4
	mm	1,098	4,012	4,140	1,520	12,500	11,750

Cylinders:		5	6	7	8
L_{min}	mm	7,445	8,543	9,641	10,739

Dry mass					
Tier II	t	424	502	563	634
Tier III (added)					
EGR	t	15	16	17	18
HP SCR	t	4	5	6	6
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	6	7	7

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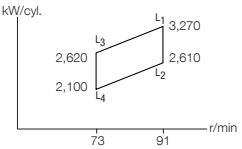
Project Guide

MAN B&W S70ME-C8.5

Tier II

Cyl.	L_1 kW
5	16,350
6	19,620
7	22,890
8	26,160

Stroke: 2,800 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S70ME-C8.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	167.5	165.0	169.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S70ME-C8.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	163.5	161.0	168.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	132.8 (8.0)	132.4 (6.1)	139.2 (5.0)
Part load	EGB	133.6 (8.1)	134.4 (6.2)	141.2 (5.1)
Low load	EGB	131.8 (8.1)	135.3 (6.2)	141.2 (5.1)

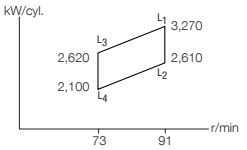
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11

MAN B&W S70ME-C8.5

Cyl.	L_1 kW
5	16,350
6	19,620
7	22,890
8	26,160

Stroke: 2,800 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S70ME-C8.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

MAN B&W S70ME-C8.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

MAN B&W S70ME-C8.5-LPSCR

L_1 SFOC [g/kWh]

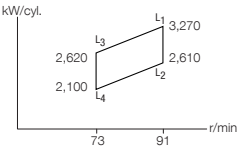
	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

MAN B&W S70ME-C8.5

Tier III

Cyl.	L_1 kW
5	16,350
6	19,620
7	22,890
8	26,160

Stroke: 2,800 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S70ME-C8.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.7 (8.3)	135.2 (6.3)	141.6 (5.2)
Tier III mode	138.5 (8.3)	139.0 (6.3)	144.1 (5.2)

MAN B&W S70ME-C8.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	133.1 (8.2)	136.1 (6.2)	141.7 (5.1)

MAN B&W S70ME-C8.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

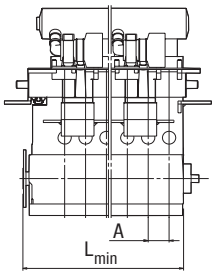
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

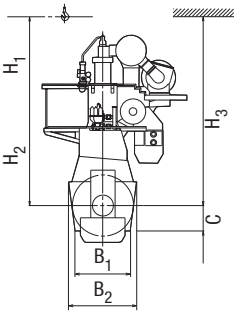
Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	132.7 (8.2)	136.1 (6.2)	142.1 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,190	4,390	4,454	1,521	12,550	11,725	11,500

Cylinders:		5	6	7	8
L_{min}	mm	7,781	8,971	10,161	11,351

Dry mass					
Tier II	t	451	534	605	681
Tier III (added)					
EGR	t	15	16	17	18
HP SCR	t	4	5	6	6
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	6	7	7

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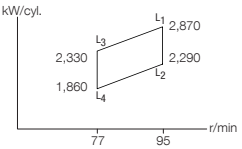
Project Guide

MAN B&W S65ME-C8.5

Tier II

Cyl.	L_1 kW
5	14,350
6	17,220
7	20,090
8	22,960

Stroke: 2,730 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S65ME-C8.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	167.5	165.0	169.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S65ME-C8.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	168.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	133.7 (8.0)	133.2 (6.1)	139.2 (5.0)
Part load	EGB	133.5 (8.1)	134.4 (6.2)	141.2 (5.1)
Low load	EGB	131.8 (8.1)	135.3 (6.2)	141.2 (5.1)

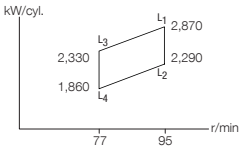
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11

MAN B&W S65ME-C8.5

Cyl.	L_1 kW
5	14,350
6	17,220
7	20,090
8	22,960

Stroke: 2,730 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S65ME-C8.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

MAN B&W S65ME-C8.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

MAN B&W S65ME-C8.5-LPSCR

L_1 SFOC [g/kWh]

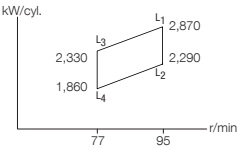
	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

MAN B&W S65ME-C8.5

Tier III

Cyl.	L_1 kW
5	14,350
6	17,220
7	20,090
8	22,960

Stroke: 2,730 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S65ME-C8.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.7 (8.3)	135.2 (6.3)	141.6 (5.2)
Tier III mode	138.5 (8.3)	139.0 (6.3)	144.1 (5.2)

MAN B&W S65ME-C8.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	133.1 (8.2)	136.1 (6.2)	141.7 (5.1)

MAN B&W S65ME-C8.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

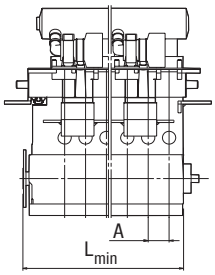
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

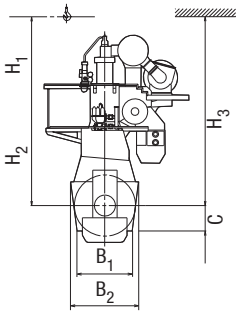
Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	132.7 (8.2)	136.1 (6.2)	142.1 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,084	4,124	4,170	1,410	11,950	11,225	11,025

Cylinders:		5	6	7	8
L_{min}	mm	7,148	8,232	9,316	10,400

Dry mass					
Tier II	t	382	451	512	575
Tier III (added)					
EGR	t	14	15	16	17
HP SCR	t	4	5	6	6
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	5	6	7

CEAS

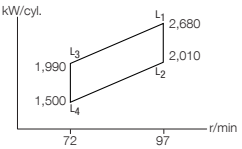
Project Guide

MAN B&W G60ME-C9.5

Tier II

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	165.5	163.0	167.0
Part load	EGB	162.5	161.5	168.5
Low load	EGB	160.5	162.5	168.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	161.5	159.0	166.0
Part load	EGB	162.5	161.5	168.5
Low load	EGB	160.5	162.5	168.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	131.2 (7.9)	130.7 (6.0)	137.5 (5.0)
Part load	EGB	131.9 (8.0)	132.8 (6.1)	139.6 (5.1)
Low load	EGB	130.2 (8.0)	133.7 (6.1)	139.6 (5.1)

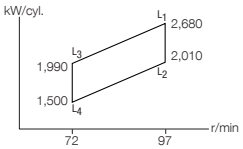
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11

MAN B&W G60ME-C9.5

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	160.5	162.5	169.0
Tier III mode	168.5	167.0	172.0

MAN B&W G60ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	162.0	163.5	169.0

MAN B&W G60ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

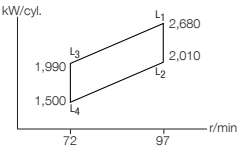
	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	161.5	163.5	169.5

MAN B&W G60ME-C9.5

Tier III

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	169.0
Tier III mode	168.5	167.0	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	130.1 (8.2)	133.5 (6.2)	139.9 (5.2)
Tier III mode	136.9 (8.2)	137.4 (6.2)	142.5 (5.2)

MAN B&W G60ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	162.0	163.5	169.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	130.2 (8.1)	133.6 (6.2)	139.6 (5.1)
Tier III mode	131.4 (8.1)	134.5 (6.2)	140.0 (5.1)

MAN B&W G60ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	161.5	163.5	169.5

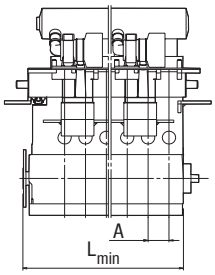
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

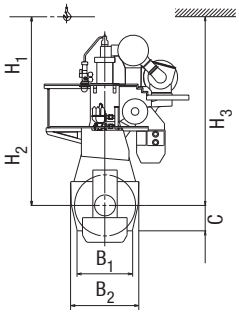
Tier II mode	130.2 (8.1)	133.6 (6.2)	139.6 (5.1)
Tier III mode	131.0 (8.1)	134.5 (6.2)	140.4 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,080	4,090	4,220	1,500	12,175	11,400	11,075

Cylinders:		5	6	7	8
L_{min}	mm	7,390	8,470	9,550	10,630

Dry mass					
Tier II	t	395	439	491	543
Tier III (added)					
EGR	t	14	14	15	16
HP SCR	t	3	4	5	5
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	6	7	7

CEAS

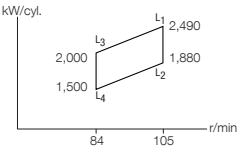
Project Guide

MAN B&W S60ME-C10.5

Tier II

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	166.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	160.5	158.0	165.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	130.4 (7.9)	129.9 (6.0)	136.7 (5.0)
Part load	EGB	131.1 (8.0)	132.0 (6.1)	138.8 (5.0)
Low load	EGB	129.4 (8.0)	132.8 (6.1)	138.8 (5.0)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

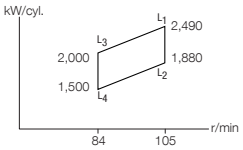
Note: Also available for GIE and LGIP, see page 11

Tier III

MAN B&W S60ME-C10.5

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	168.0
Tier III mode	167.5	166.0	171.0

MAN B&W S60ME-C10.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

MAN B&W S60ME-C10.5-LPSCR

L_1 SFOC [g/kWh]

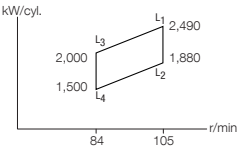
	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

MAN B&W S60ME-C10.5

Tier III

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	168.0
Tier III mode	167.5	166.0	171.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.1)	132.7 (6.2)	139.1 (5.1)
Tier III mode	136.1 (8.1)	136.6 (6.2)	141.7 (5.1)

MAN B&W S60ME-C10.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.0)	132.8 (6.1)	138.7 (5.0)
Tier III mode	130.6 (8.0)	133.7 (6.1)	139.2 (5.0)

MAN B&W S60ME-C10.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

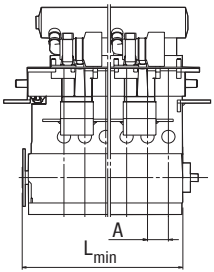
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

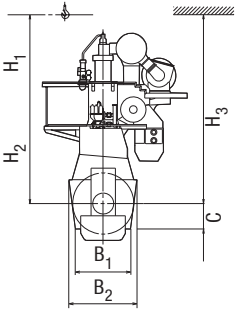
Tier II mode	129.4 (8.0)	132.8 (6.1)	138.7 (5.1)
Tier III mode	130.2 (8.0)	133.7 (6.1)	139.6 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	940	3,440	3,520	1,300	10,500	10,000	9,775

Cylinders:		5	6	7	8
L_{min}	mm	6,440	7,380	8,320	9,260

Dry mass

Tier II	t	293	332	369	425

Tier III (added)

EGR	t	14	14	15	16
HP SCR	t	3	4	5	5
LP SCR	t	-	-	-	-

Dual fuel (added)

GI	t	5	5	6	7

CEAS

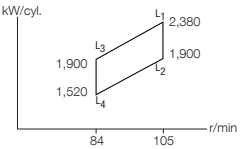
Project Guide

MAN B&W S60ME-C8.5

Tier II

Cyl.	L_1 kW
5	11,900
6	14,280
7	16,660
8	19,040

Stroke: 2,400 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S60ME-C8.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	167.5	165.0	169.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S60ME-C8.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	168.0
Part load	EGB	164.5	163.5	170.5
Low load	EGB	162.5	164.5	170.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	133.7 (8.0)	133.2 (6.1)	139.2 (5.0)
Part load	EGB	133.6 (8.1)	134.4 (6.2)	141.2 (5.1)
Low load	EGB	131.8 (8.1)	135.3 (6.2)	141.2 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

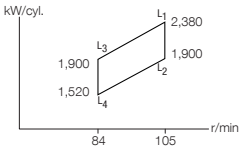
Note: Also available for GIE and LGIP, see page 11

Tier III

MAN B&W S60ME-C8.5

Cyl.	L_1 kW
5	11,900
6	14,280
7	16,660
8	19,040

Stroke: 2,400 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S60ME-C8.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

MAN B&W S60ME-C8.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

MAN B&W S60ME-C8.5-LPSCR

L_1 SFOC [g/kWh]

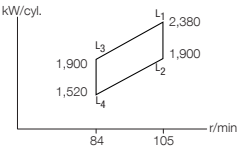
	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

MAN B&W S60ME-C8.5

Tier III

Cyl.	L_1 kW
5	11,900
6	14,280
7	16,660
8	19,040

Stroke: 2,400 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S60ME-C8.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	171.0
Tier III mode	170.5	169.0	174.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.7 (8.3)	135.2 (6.3)	141.6 (5.2)
Tier III mode	138.5 (8.3)	139.0 (6.3)	144.1 (5.2)

MAN B&W S60ME-C8.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	164.0	165.5	171.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	133.1 (8.2)	136.1 (6.2)	141.7 (5.1)

MAN B&W S60ME-C8.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	164.5	170.5
Tier III mode	163.5	165.5	171.5

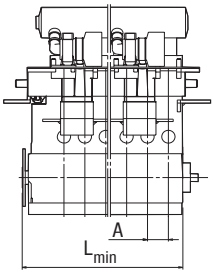
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

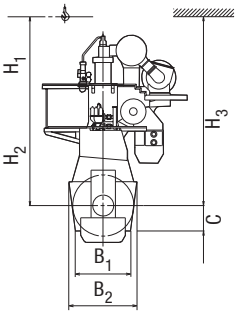
Tier II mode	131.8 (8.2)	135.3 (6.2)	141.2 (5.1)
Tier III mode	132.7 (8.2)	136.1 (6.2)	142.1 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,020	3,770	3,840	1,300	10,800	10,000	9,775

Cylinders:		5	6	7	8
L_{min}	mm	6,668	7,688	8,708	9,728

Dry mass					
Tier II	t	308	350	393	452
Tier III (added)					
EGR	t	14	14	15	16
HP SCR	t	3	4	5	5
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	5	5	6	7

CEAS

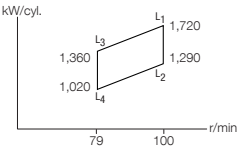
Project Guide

MAN B&W G50ME-C9.6

Tier II

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	163.5	162.5	167.0
Part load	EGB	161.5	161.0	169.5
Low load	EGB	159.5	162.0	169.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

L_1 MEP: 21.0 bar

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	159.5	158.5	166.0
Part load	EGB	161.5	161.0	169.5
Low load	EGB	159.5	162.0	169.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	129.5 (7.9)	130.3 (6.0)	137.5 (5.0)
Part load	EGB	131.0 (8.1)	132.3 (6.2)	140.4 (5.1)
Low load	EGB	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)

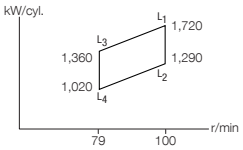
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, see page 11

MAN B&W G50ME-C9.6

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	162.0	170.0
Tier III mode	166.5	166.5	172.0

MAN B&W G50ME-C9.6-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	161.0	163.0	170.0

MAN B&W G50ME-C9.6-LPSCR

L_1 SFOC [g/kWh]

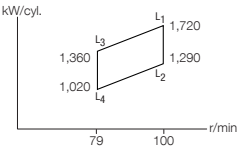
	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	160.5	163.0	170.5

MAN B&W G50ME-C9.6

Tier III

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	162.0	170.0
Tier III mode	166.5	166.5	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.2 (8.2)	133.1 (6.3)	140.8 (5.2)
Tier III mode	135.2 (8.2)	137.0 (6.3)	142.5 (5.2)

MAN B&W G50ME-C9.6-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	161.0	163.0	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)
Tier III mode	130.5 (8.1)	134.0 (6.2)	140.8 (5.1)

MAN B&W G50ME-C9.6-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	160.5	163.0	170.5

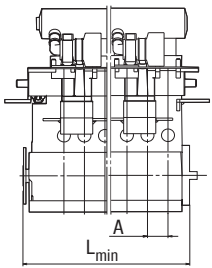
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

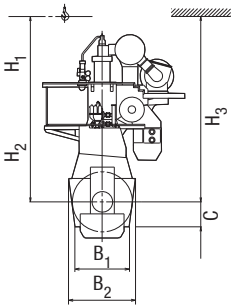
Tier II mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)
Tier III mode	130.1 (8.1)	134.0 (6.2)	141.2 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	872	3,776	3,652	1,205	10,775	10,075	9,775

Cylinders:		5	6	7	8	9
L_{min}	mm	6,260	7,132	8,004	8,876	9,748

Dry mass

Tier II	t	210	245	275	310	345

Tier III (added)

EGR	t	6	8	9	10	12
HP SCR	t	4	4	5	6	6
LP SCR	t	-	-	-	-	-

Dual fuel (added)

GI	t	4	4	5	5	6

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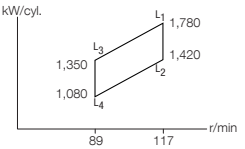
Project Guide

MAN B&W S50ME-C9.6

Tier II

Cyl.	L_1 kW
5	8,900
6	10,680
7	12,460
8	14,240
9	16,020

Stroke: 2,214 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S50ME-C9.6

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	163.5	162.5	167.0
Part load	EGB	161.5	161.0	169.5
Low load	EGB	159.5	162.0	169.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S50ME-C9.6-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	159.5	158.5	166.0
Part load	EGB	161.5	161.0	169.5
Low load	EGB	159.5	162.0	169.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	129.5 (7.9)	130.3 (6.0)	137.5 (5.0)
Part load	EGB	131.0 (8.1)	132.3 (6.2)	140.4 (5.1)
Low load	EGB	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

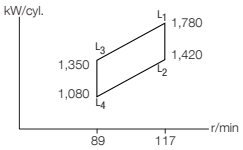
Note: Also available for GIE and LGIP, see page 11.

Tier III

MAN B&W S50ME-C9.6

Cyl.	L_1 kW
5	8,900
6	10,680
7	12,460
8	14,240
9	16,020

Stroke: 2,214 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S50ME-C9.6-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	162.0	170.0
Tier III mode	166.5	166.5	172.0

MAN B&W S50ME-C9.6-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	161.0	163.0	170.0

MAN B&W S50ME-C9.6-LPSCR

L_1 SFOC [g/kWh]

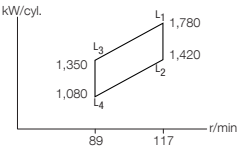
	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	160.5	163.0	170.5

MAN B&W S50ME-C9.6

Tier III

Cyl.	L_1 kW
5	8,900
6	10,680
7	12,460
8	14,240
9	16,020

Stroke: 2,214 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S50ME-C9.6-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	50%	75%	100%
Tier II mode	159.5	162.0	170.0
Tier III mode	166.5	166.5	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	129.2 (8.2)	133.1 (6.3)	140.8 (5.2)
Tier III mode	135.2 (8.2)	137.0 (6.3)	142.5 (5.2)

MAN B&W S50ME-C9.6-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	161.0	163.0	170.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)
Tier III mode	130.5 (8.1)	134.0 (6.2)	140.8 (5.1)

MAN B&W S50ME-C9.6-GI-LPSCR

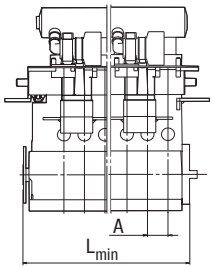
L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	160.5	163.0	170.5

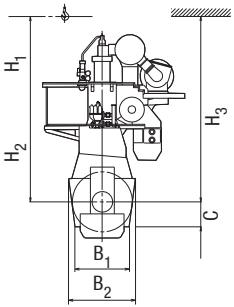
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	129.3 (8.1)	133.2 (6.2)	140.4 (5.1)
Tier III mode	130.1 (8.1)	134.0 (6.2)	141.2 (5.1)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	875	3,350	3,290	1,190	9,875	9,125	8,850

Cylinders:		5	6	7	8	9
L_{min}	mm	6,073	6,948	7,823	8,698	9,573

Dry mass						
Tier II	t	190	220	255	285	315
Tier III (added)						
EGR	t	7	8	9	11	12
HP SCR	t	4	4	5	6	7
LP SCR	t	-	-	-	-	-
Dual fuel (added)						
GI	t	4	4	5	5	6

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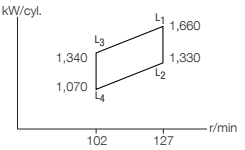
Project Guide

MAN B&W S50ME-C8.5

Tier II

Cyl.	L_1 kW
5	8,300
6	9,960
7	11,620
8	13,280
9	14,940

Stroke: 2,000 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S50ME-C8.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	168.5	166.0	170.0
Part load	EGB	165.5	164.5	171.5
Low load	EGB	163.5	165.5	171.5

Dual Fuel Mode for GI (Methane)

MAN B&W S50ME-C8.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	169.0
Part load	EGB	165.5	164.5	171.5
Low load	EGB	163.5	165.5	171.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	133.6 (8.0)	133.2 (6.1)	140.0 (5.1)
Part load	EGB	134.4 (8.2)	135.3 (6.2)	142.1 (5.1)
Low load	EGB	132.7 (8.2)	136.1 (6.2)	142.1 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

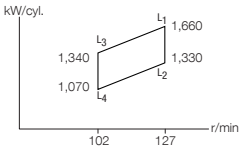
Note: Also available for GIE and LGIP, see page 11.

Tier III

MAN B&W S50ME-C8.5

Cyl.	L_1 kW
5	8,300
6	9,960
7	11,620
8	13,280
9	14,940

Stroke: 2,000 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S50ME-C8.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	163.5	165.5	172.0
Tier III mode	171.5	170.0	175.0

MAN B&W S50ME-C8.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	165.0	166.5	172.0

MAN B&W S50ME-C8.5-LPSCR

L_1 SFOC [g/kWh]

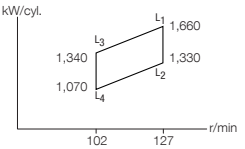
	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	164.5	166.5	172.5

MAN B&W S50ME-C8.5

Tier III

Cyl.	L_1 kW
5	8,300
6	9,960
7	11,620
8	13,280
9	14,940

Stroke: 2,000 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S50ME-C8.5-GI-EGRTC

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	172.0
Tier III mode	171.5	170.0	175.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	132.5 (8.3)	136.0 (6.4)	142.4 (5.3)
Tier III mode	139.3 (8.3)	139.9 (6.4)	145.0 (5.3)

MAN B&W S50ME-C8.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	165.0	166.5	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	132.6 (8.2)	136.1 (6.3)	142.1 (5.2)
Tier III mode	133.9 (8.2)	136.9 (6.3)	142.5 (5.2)

MAN B&W S50ME-C8.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	164.5	166.5	172.5

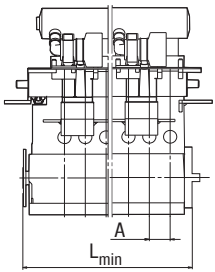
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

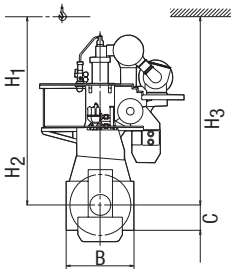
Tier II mode	132.6 (8.2)	136.1 (6.3)	142.0 (5.2)
Tier III mode	133.5 (8.2)	136.9 (6.3)	142.9 (5.2)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE and LGIP, except GIE and EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B	C	H_1	H_2	H_3
	mm	850	3,150	1,085	9,050	8,500	8,250

Cylinders:		5	6	7	8	9
L_{min}	mm	5,924	6,774	7,624	8,474	9,324

Dry mass

Tier II	t	180	210	240	270	295

Tier III (added)

EGR	t	6	7	9	10	11
HP SCR	t	3	4	5	5	6
LP SCR	t	-	-	-	-	-

Dual fuel (added)

GI	t	4	4	5	5	6

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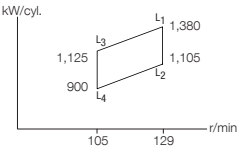
Project Guide

MAN B&W S46ME-B8.5

Tier II

Cyl.	L_1 kW
5	6,900
6	8,280
7	9,660
8	11,040

Stroke: 1,932 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S46ME-B.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	169.5	167.0	170.0
Part load	EGB	166.5	165.5	171.5
Low load	EGB	164.5	166.5	171.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S46ME-B.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	169.5	167.0	170.0
Part load	EGB	166.5	165.5	171.5
Low load	EGB	164.5	166.5	171.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	137.8 (8.1)	137.6 (6.2)	140.8 (5.1)
Part load	EGB	135.2 (8.2)	136.2 (6.2)	142.1 (5.1)
Low load	EGB	133.5 (8.2)	137.1 (6.2)	142.1 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

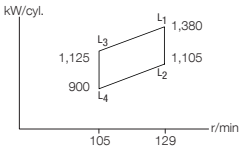
Note: Also available for GIE.

Tier III

MAN B&W S46ME-B8.5

Cyl.	L_1 kW
5	6,900
6	8,280
7	9,660
8	11,040

Stroke: 1,932 mm



Fuel Oil

L_1 MEP: 20.0 bar

MAN B&W S46ME-B.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	164.5	166.5	172.0
Tier III mode	172.5	171.0	175.0

MAN B&W S46ME-B.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	164.5	166.5	171.5
Tier III mode	166.0	167.5	172.0

MAN B&W S46ME-B.5-LPSCR

L_1 SFOC [g/kWh]

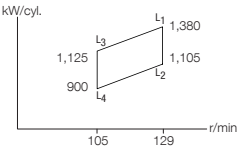
	50%	75%	100%
Tier II mode	164.5	166.5	171.5
Tier III mode	167.5	167.5	172.5

MAN B&W S46ME-B8.5

Tier III

Cyl.	L_1 kW
5	6,900
6	8,280
7	9,660
8	11,040

Stroke: 1,932 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 20.0 bar

MAN B&W S46ME-B.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	164.5	166.5	172.0
Tier III mode	172.5	171.0	175.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	133.4 (8.3)	137.0 (6.4)	142.4 (5.3)
Tier III mode	140.2 (8.3)	140.8 (6.4)	145.0 (5.3)

MAN B&W S46ME-B.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	164.5	166.5	171.5
Tier III mode	166.0	167.5	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	133.4 (8.2)	137.0 (6.3)	142.1 (5.2)
Tier III mode	134.7 (8.2)	137.9 (6.3)	142.5 (5.2)

MAN B&W S46ME-B.5-GI-LPSCR

L_1 MEP: 20.0 bar

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	164.5	166.5	171.5
Tier III mode	167.5	167.5	172.5

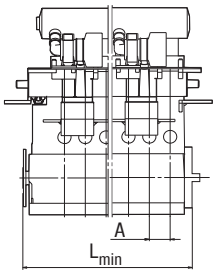
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

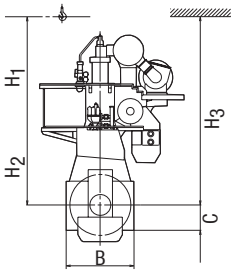
Tier II mode	133.4 (8.3)	137.0 (6.3)	142.0 (5.2)
Tier III mode	135.9 (8.3)	137.9 (6.3)	142.9 (5.2)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE, except GIE with EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B	C	H_1	H_2	H_3
	mm	782	2,924	986	9,000	8,175	7,900

Cylinders:		5	6	7	8
L_{min}	mm	5,528	6,310	7,092	7,874

Dry mass					
Tier II	t	159	177	199	219
Tier III (added)					
EGR	t	5	6	7	8
HP SCR	t	3	3	4	5
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	4	4	5	5

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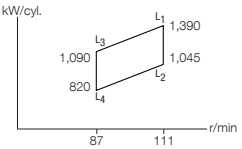
Project Guide

MAN B&W G45ME-C9.5

Tier II

Cyl.	L_1 kW
5	6,950
6	8,340
7	9,730
8	11,120

Stroke: 2,250 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G45ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	168.5	166.0	170.0
Part load	EGB	165.5	164.5	171.5
Low load	EGB	163.5	165.5	171.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G45ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	169.0
Part load	EGB	165.5	164.5	171.5
Low load	EGB	163.5	165.5	171.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	133.6 (8.0)	133.2 (6.1)	140.0 (5.1)
Part load	EGB	134.4 (8.2)	135.3 (6.2)	142.1 (5.1)
Low load	EGB	132.7 (8.2)	136.1 (6.2)	142.1 (5.1)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

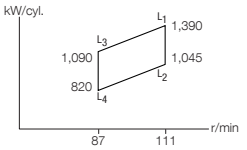
Note: Also available for GIE.

Tier III

MAN B&W G45ME-C9.5

Cyl.	L_1 kW
5	6,950
6	8,340
7	9,730
8	11,120

Stroke: 2,250 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G45ME-C9.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	163.5	165.5	172.0
Tier III mode	171.5	170.0	175.0

MAN B&W G45ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	165.0	166.5	172.0

MAN B&W G45ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

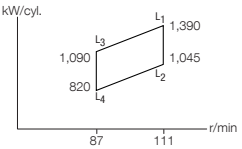
	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	164.5	166.5	172.5

MAN B&W G45ME-C9.5

Tier III

Cyl.	L_1 kW
5	6,950
6	8,340
7	9,730
8	11,120

Stroke: 2,250 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G45ME-C9.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	172.0
Tier III mode	171.5	170.0	175.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	132.5 (8.3)	136.0 (6.4)	142.4 (5.3)
Tier III mode	139.3 (8.3)	139.9 (6.4)	145.0 (5.3)

MAN B&W G45ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	165.0	166.5	172.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	132.6 (8.2)	136.1 (6.3)	142.1 (5.2)
Tier III mode	133.9 (8.2)	136.9 (6.3)	142.5 (5.2)

MAN B&W G45ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	165.5	171.5
Tier III mode	164.5	166.5	172.5

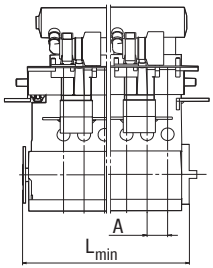
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

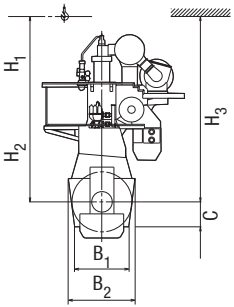
Tier II mode	132.6 (8.2)	136.1 (6.3)	142.0 (5.2)
Tier III mode	133.5 (8.2)	136.9 (6.3)	142.9 (5.2)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE, except GIE with EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	784	3,350	3,260	1,169	9,725	9,525	9,250

Cylinders:		5	6	7	8
L_{min}	mm	5,638	6,464	7,290	8,116

Dry mass					
Tier II	t	163	183	206	234
Tier III (added)					
EGR	t	5	6	7	8
HP SCR	t	3	3	4	5
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	4	4	5	5

CEAS

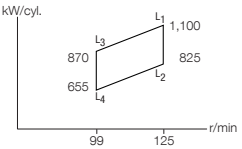
Project Guide

MAN B&W G40ME-C9.5

Tier II

Cyl.	L_1 kW
5	5,500
6	6,600
7	7,700
8	8,800

Stroke: 2,000 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G40ME-C9.5

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	172.5	170.0	174.0
Part load	EGB	169.5	168.5	175.5
Low load	EGB	167.5	169.5	175.5

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G40ME-C9.5-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	168.5	166.0	173.0
Part load	EGB	169.5	168.5	175.5
Low load	EGB	167.5	169.5	175.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	136.9 (8.2)	136.5 (6.3)	143.3 (5.2)
Part load	EGB	137.6 (8.4)	138.6 (6.4)	145.4 (5.3)
Low load	EGB	135.9 (8.4)	139.4 (6.4)	145.4 (5.3)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

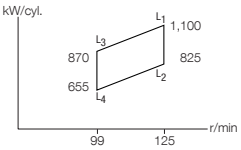
Note: Also available for GIE.

Tier III

MAN B&W G40ME-C9.5

Cyl.	L_1 kW
5	5,500
6	6,600
7	7,700
8	8,800

Stroke: 2,000 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W G40ME-C9.5-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	167.5	169.5	179.0
Tier III mode	175.5	174.0	179.0

MAN B&W G40ME-C9.5-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	167.5	169.5	175.5
Tier III mode	169.0	170.5	176.0

MAN B&W G40ME-C9.5-LPSCR

L_1 SFOC [g/kWh]

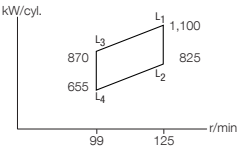
	50%	75%	100%
Tier II mode	167.5	169.5	175.5
Tier III mode	168.5	170.5	176.5

MAN B&W G40ME-C9.5

Tier III

Cyl.	L_1 kW
5	5,500
6	6,600
7	7,700
8	8,800

Stroke: 2,000 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W G40ME-C9.5-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	167.5	169.5	179.0
Tier III mode	175.5	174.0	179.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	135.8 (8.5)	139.3 (6.5)	145.7 (5.4)
Tier III mode	142.6 (8.5)	143.1 (6.5)	148.3 (5.4)

MAN B&W G40ME-C9.5-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	167.5	169.5	175.5
Tier III mode	169.0	170.5	176.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	135.8 (8.4)	139.4 (6.4)	145.4 (5.3)
Tier III mode	137.1 (8.4)	140.2 (6.4)	145.8 (5.3)

MAN B&W G40ME-C9.5-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	167.5	169.5	175.5
Tier III mode	168.5	170.5	176.5

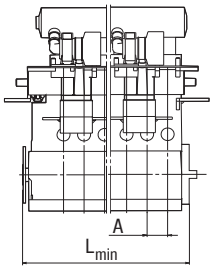
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

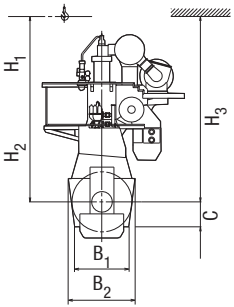
Tier II mode	135.9 (8.4)	139.4 (6.4)	145.4 (5.3)
Tier III mode	136.7 (8.4)	140.2 (6.4)	146.2 (5.3)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE, except GIE with EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	700	3,020	2,942	1,039	8,700	*	*

Cylinders:		5	6	7	8
L_{min}	mm	5,012	5,712	6,412	7,112

Dry mass					
Tier II	t	119	135	153	173
Tier III (added)					
EGR	t	4	5	6	7
HP SCR	t	2	3	3	4
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	3	3	4	4

CEAS

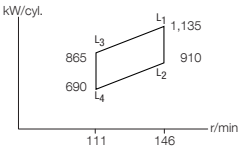
Project Guide

MAN B&W S40ME-B9.5

Tier II

Cyl.	L_1 kW
5	5,675
6	6,810
7	7,945
8	9,080
9	10,215

Stroke: 1,770 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S40ME-B9

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	173.5	171.0	174.0

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S40ME-B9-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	173.5	171.0	174.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	141.1 (8.3)	140.8 (6.3)	144.1 (5.2)

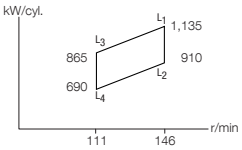
* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE.

MAN B&W S40ME-B9.5

Cyl.	L_1 kW
5	5,675
6	6,810
7	7,945
8	9,080
9	10,215

Stroke: 1,770 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S40ME-B9-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	169.5	172.0	179.0
Tier III mode	176.5	175.0	179.0

MAN B&W S40ME-B9-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	173.5	171.0	174.0
Tier III mode	175.0	172.0	174.5

MAN B&W S40ME-B9-LPSCR

L_1 SFOC [g/kWh]

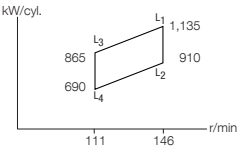
	50%	75%	100%
Tier II mode	173.5	171.0	174.0
Tier III mode	174.0	171.5	174.5

MAN B&W S40ME-B9.5

Tier III

Cyl.	L_1 kW
5	5,675
6	6,810
7	7,945
8	9,080
9	10,215

Stroke: 1,770 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S40ME-B9-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	169.5	172.0	179.0
Tier III mode	176.5	175.0	179.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	137.5 (8.5)	141.5 (6.5)	148.3 (5.4)
Tier III mode	143.5 (8.5)	144.1 (6.5)	148.3 (5.4)

MAN B&W S40ME-B9-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	173.5	171.0	174.0
Tier III mode	175.0	172.0	174.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	141.0 (8.4)	140.8 (6.4)	144.1 (5.2)
Tier III mode	142.3 (8.4)	141.7 (6.4)	144.6 (5.2)

MAN B&W S40ME-B9-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	173.5	171.0	174.0
Tier III mode	174.0	171.5	174.5

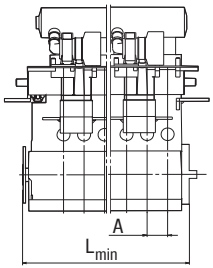
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

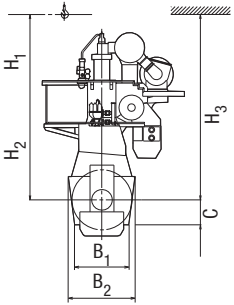
Tier II mode	141.1 (8.3)	140.8 (6.3)	144.1 (5.2)
Tier III mode	141.5 (8.3)	141.3 (6.3)	144.6 (5.2)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE, except GIE with EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	700	2,650	2,610	950	7,800	7,475	7,200

Cylinders:		5	6	7	8	9
L_{min}	mm	5,000	5,700	6,400	7,100	7,800

Dry mass

Tier II	t	112	131	148	163	195

Tier III (added)

EGR	t	4	5	6	7	7
HP SCR	t	2	3	3	4	4
LP SCR	t	-	-	-	-	-

Dual fuel (added)

GI	t	3	3	4	4	5

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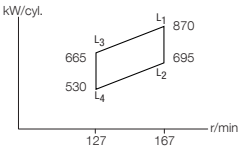
Project Guide

MAN B&W S35ME-B9.5

Tier II

Cyl.	L_1 kW
5	4,350
6	5,220
7	6,090
8	6,960

Stroke: 1,550 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S35ME-B9

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	174.5	172.0	175.0

Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S35ME-B9-GI

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	174.5	172.0	175.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	141.9 (8.3)	141.7 (6.4)	145.0 (5.3)

* *Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

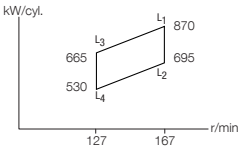
Note: Also available for GIE.

Tier III

MAN B&W S35ME-B9.5

Cyl.	L_1 kW
5	4,350
6	5,220
7	6,090
8	6,960

Stroke: 1,550 mm



Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S35ME-B9-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	170.5	173.0	180.0
Tier III mode	177.5	176.0	180.0

MAN B&W S35ME-B9-HPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	174.5	172.0	175.0
Tier III mode	176.0	173.0	175.5

MAN B&W S35ME-B9-LPSCR

L_1 SFOC [g/kWh]

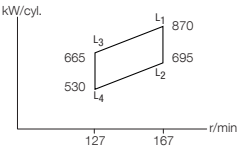
	50%	75%	100%
Tier II mode	174.5	172.0	175.0
Tier III mode	175.0	172.5	175.5

MAN B&W S35ME-B9.5

Tier III

Cyl.	L_1 kW
5	4,350
6	5,220
7	6,090
8	6,960

Stroke: 1,550 mm



Dual Fuel Mode for GI (Methane)

L_1 MEP: 21.0 bar

MAN B&W S35ME-B9-GI-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	170.5	173.0	180.0
Tier III mode	177.5	176.0	180.0

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	138.3 (8.6)	142.4 (6.5)	149.1 (5.4)
Tier III mode	144.3 (8.6)	144.9 (6.5)	149.1 (5.4)

MAN B&W S35ME-B9-GI-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	174.5	172.0	175.0
Tier III mode	176.0	173.0	175.5

L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	141.8 (8.4)	141.6 (6.4)	145.0 (5.3)
Tier III mode	143.1 (8.4)	142.5 (6.4)	145.4 (5.3)

MAN B&W S35ME-B9-GI-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	174.5	172.0	175.0
Tier III mode	175.0	172.5	175.5

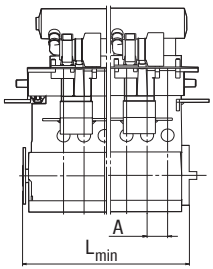
L_1 SGC 50,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

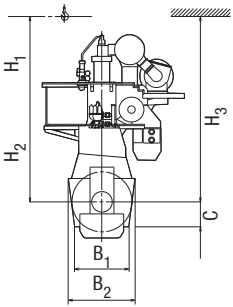
Tier II mode	141.9 (8.4)	141.7 (6.4)	145.0 (5.3)
Tier III mode	142.3 (8.4)	142.1 (6.4)	145.4 (5.3)

** Gas fuel LCV (50,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Note: Also available for GIE, except GIE with EGR, see pages 11-13.

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	612	2,300	2,288	830	6,925	6,625	6,275

Cylinders:		5	6	7	8
L_{min}	mm	4,378	4,990	5,602	6,214

Dry mass					
Tier II	t	81	90	99	111
Tier III (added)					
EGR	t	3	4	5	5
HP SCR	t	2	2	3	3
LP SCR	t	-	-	-	-
Dual fuel (added)					
GI	t	3	3	4	4

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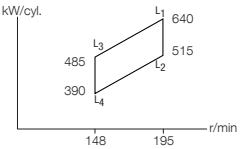
MAN B&W S30ME-B9.5

Tier II Tier III

Cyl.	L_1 kW
5	3,200
6	3,840
7	4,480
8	5,120

Stroke: 1,328 mm



Tier II Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S30ME-B9

L_1 SFOC [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	175.5	173.0	176.0

Tier III Fuel Oil

L_1 MEP: 21.0 bar

MAN B&W S30ME-B9-EGRBP

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	171.5	174.0	181.0
Tier III mode	178.5	177.0	181.0

MAN B&W S30ME-B9-HPSCR

L_1 SFOC [g/kWh]

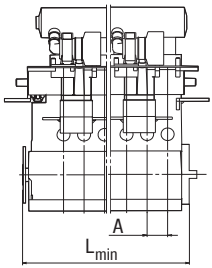
	50%	75%	100%
Tier II mode	175.5	173.0	176.0
Tier III mode	177.0	174.0	176.5

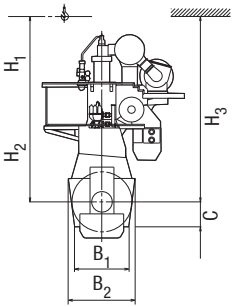
MAN B&W S30ME-B9-LPSCR

L_1 SFOC [g/kWh]

	50%	75%	100%
Tier II mode	175.5	173.0	176.0
Tier III mode	176.0	173.5	176.5

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	538	1,980	2,020	712	6,025	5,950	5,625

Cylinders:		5	6	7	8
L_{min}	mm	4,087	4,625	5,163	5,701

Dry mass					
Tier II	t	61	69	77	86
Tier III (added)					
EGR	t	2	3	3	4
HP SCR	t	1	2	2	2
LP SCR	t	-	-	-	-

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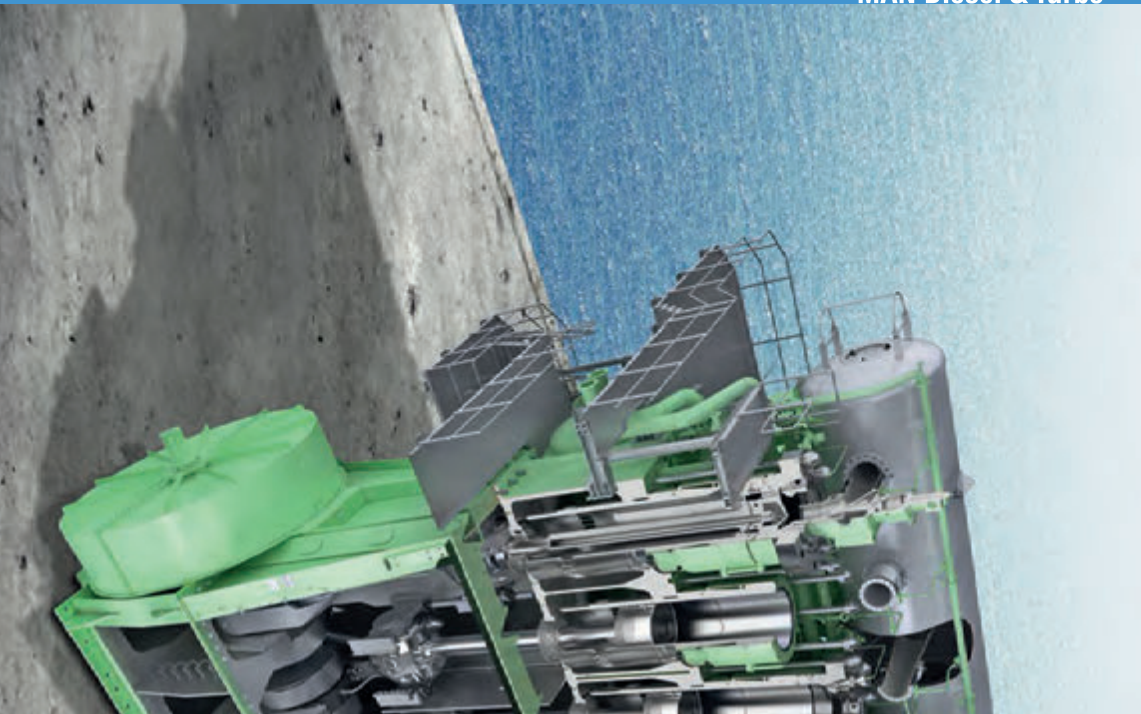


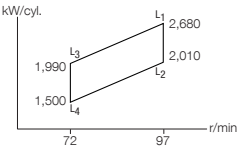
Alternative fuels Tier II and Tier III

MAN B&W G60ME-C9.5

Tier II

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-GIE

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	168.5	168.0	172.0
Part load	EGB	165.5	166.5	173.5
Low load	EGB	163.5	167.5	173.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	144.1 (8.2)	145.5 (6.2)	150.0 (5.2)
Part load	EGB	141.3 (8.3)	144.1 (6.3)	151.3 (5.2)
Low load	EGB	139.5 (8.3)	145.0 (6.3)	151.3 (5.2)

Dual Fuel Mode for LGIP (LPG)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-LGIP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	165.5	163.0	167.0
Part load	EGB	162.5	161.5	168.5
Low load	EGB	160.5	162.5	168.5

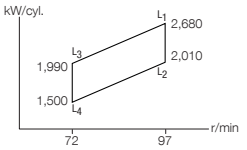
L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	146.2 (8.0)	145.8 (6.1)	150.4 (5.0)
Part load	EGB	143.4 (8.0)	144.3 (6.1)	151.7 (5.1)
Low load	EGB	141.5 (8.0)	145.3 (6.1)	151.7 (5.1)

* *Gas fuel LCV (47,500/46,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-GIE-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	167.5	173.5
Tier III mode	165.0	168.5	174.0

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	139.5 (8.3)	145.0 (6.3)	151.3 (5.2)
Tier III mode	140.8 (8.3)	145.9 (6.3)	151.7 (5.2)

MAN B&W G60ME-C9.5-GIE-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	163.5	167.5	173.5
Tier III mode	164.5	168.5	174.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	139.5 (8.3)	145.0 (6.3)	151.3 (5.2)
Tier III mode	140.4 (8.3)	145.9 (6.3)	152.2 (5.2)

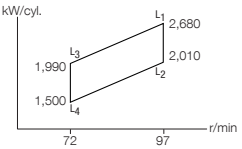
* *Gas fuel LCV (47,500 kJ/kg) is converted to diesel fuel LCV (42,700 kJ/kg) for comparison with a diesel operated engine.*

MAN B&W G60ME-C9.5

Tier III

Cyl.	L_1 kW
5	13,400
6	16,080
7	18,760
8	21,440

Stroke: 2,790 mm



Dual Fuel Mode for LGIP (LPG)

L_1 MEP: 21.0 bar

MAN B&W G60ME-C9.5-LGIP-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	169.0
Tier III mode	168.5	167.0	172.0

L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	141.4 (8.2)	145.2 (6.2)	152.1 (5.2)
Tier III mode	148.8 (8.2)	149.3 (6.2)	154.9 (5.2)

MAN B&W G60ME-C9.5-GI-LGIP-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	162.0	163.5	169.0

L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	141.5 (8.1)	145.2 (6.2)	151.7 (5.1)
Tier III mode	142.9 (8.1)	146.2 (6.2)	152.2 (5.1)

MAN B&W G60ME-C9.5-LGIP-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

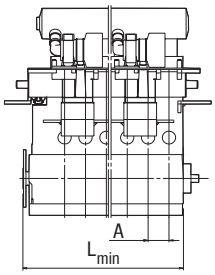
	50%	75%	100%
Tier II mode	160.5	162.5	168.5
Tier III mode	161.5	163.5	169.5

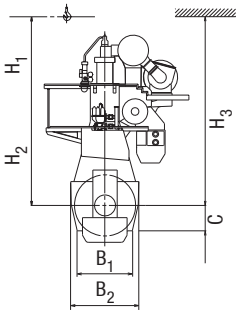
L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	141.5 (8.1)	145.2 (6.2)	151.7 (5.1)
Tier III mode	142.4 (8.1)	146.2 (6.2)	152.6 (5.1)

* *Liquid gas fuel LCV (46,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	1,080	4,090	4,220	1,500	12,175	11,400	11,075

Cylinders:		5	6	7	8
L_{min}	mm	7,390	8,470	9,550	10,630

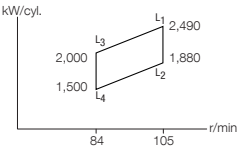
Dry mass					
Tier II	t	395	439	491	543
Tier III (added)					
EGR	t	14	14	15	16
HP SCR	t	3	4	5	5
LP SCR	t	-	-	-	-
Dual fuel (added)					
GIE	t	5	6	7	7

MAN B&W S60ME-C10.5

Tier II

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-GIE

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	167.5	167.0	171.0
Part load	EGB	164.5	165.5	172.5
Low load	EGB	162.5	166.5	172.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	143.3 (8.1)	144.6 (6.2)	149.1 (5.1)
Part load	EGB	140.5 (8.2)	143.3 (6.3)	150.4 (5.2)
Low load	EGB	138.7 (8.2)	144.1 (6.3)	150.4 (5.2)

Dual Fuel Mode for LGIP (LPG)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-LGIP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	164.5	162.0	166.0
Part load	EGB	161.5	160.5	167.5
Low load	EGB	159.5	161.5	167.5

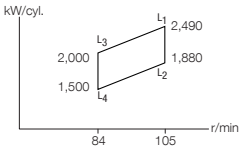
L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	145.4 (7.9)	144.9 (6.0)	149.5 (5.0)
Part load	EGB	142.5 (8.0)	143.4 (6.1)	150.8 (5.0)
Low load	EGB	140.7 (8.0)	144.4 (6.1)	150.8 (5.0)

* *Gas fuel LCV (47,500/46,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-GIE-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	166.5	172.5
Tier III mode	164.5	167.5	173.0

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	138.6 (8.3)	144.1 (6.3)	150.4 (5.2)
Tier III mode	140.4 (8.3)	145.0 (6.3)	150.9 (5.2)

MAN B&W S60ME-C10.5-GIE-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	166.5	172.5
Tier III mode	163.5	167.5	173.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	138.7 (8.3)	144.1 (6.3)	150.4 (5.2)
Tier III mode	139.6 (8.3)	145.0 (6.3)	151.3 (5.2)

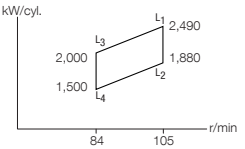
* *Gas fuel LCV (47,500 kJ/kg) is converted to diesel fuel LCV (42,700 kJ/kg) for comparison with a diesel operated engine.*

MAN B&W S60ME-C10.5

Tier III

Cyl.	L_1 kW
5	12,450
6	14,940
7	17,430
8	19,920

Stroke: 2,400 mm



Dual Fuel Mode for LGIP (LPG)

L_1 MEP: 21.0 bar

MAN B&W S60ME-C10.5-LGIP-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	168.0
Tier III mode	167.5	166.0	171.0

L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	140.5 (8.1)	144.3 (6.2)	151.2 (5.1)
Tier III mode	147.9 (8.1)	148.4 (6.2)	154.0 (5.1)

MAN B&W S60ME-C10.5-GI-LGIP-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	161.0	162.5	168.0

L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	140.6 (8.0)	144.3 (6.1)	150.8 (5.0)
Tier III mode	142.0 (8.0)	145.3 (6.1)	151.3 (5.0)

MAN B&W S60ME-C10.5-LGIP-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

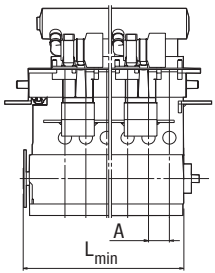
	50%	75%	100%
Tier II mode	159.5	161.5	167.5
Tier III mode	160.5	162.5	168.5

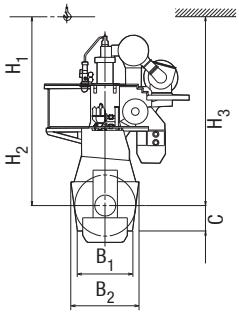
L_1 SGC 46,000 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	140.6 (8.0)	144.3 (6.1)	150.8 (5.1)
Tier III mode	141.5 (8.0)	145.3 (6.1)	151.7 (5.1)

* *Liquid gas fuel LCV (46,000 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	940	3,440	3,520	1,300	10,500	10,000	9,775

Cylinders:		5	6	7	8
L_{min}	mm	6,440	7,380	8,320	9,260

Dry mass

Tier II	t	293	332	369	425

Tier III (added)

EGR	t	14	14	15	16
HP SCR	t	3	4	5	5
LP SCR	t	-	-	-	-

Dual fuel (added)

GIE	t	5	5	6	7

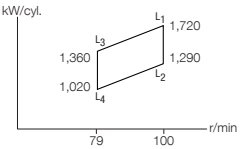
CEAS

MAN B&W G50ME-C9.6

Tier II

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-GIE

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	166.5	167.5	172.0
Part load	EGB	164.5	166.0	174.5
Low load	EGB	162.5	167.0	174.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	142.3 (8.2)	145.1 (6.3)	150.0 (5.2)
Part load	EGB	140.4 (8.3)	143.6 (6.3)	152.2 (5.2)
Low load	EGB	138.6 (8.3)	144.5 (6.3)	152.2 (5.2)

Dual Fuel Mode for LGIM (Methanol)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-LGIM

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	163.5	162.5	167.0
Part load	EGB	161.5	161.0	169.5
Low load	EGB	159.5	162.0	169.5

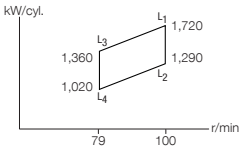
L_1 SGC 19,900 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

SFOC-optimised load range	Tuning	50%	75%	100%
High load	-	322.4 (13.3)	327.2 (10.1)	340.4 (8.4)
Part load	EGB	317.7 (13.5)	323.7 (10.3)	345.5 (8.5)
Low load	EGB	313.4 (13.5)	325.8 (10.3)	345.5 (8.5)

* *Gas fuel LCV (47,500/19,900 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Dual Fuel Mode for GIE (Ethane)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-GIE-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	167.0	174.5
Tier III mode	164.0	168.0	175.0

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	138.5 (8.4)	144.5 (6.4)	152.1 (5.3)
Tier III mode	139.9 (8.4)	145.4 (6.4)	152.6 (5.3)

MAN B&W G50ME-C9.6-GIE-LPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*

	50%	75%	100%
Tier II mode	162.5	167.0	174.5
Tier III mode	163.5	168.0	175.5

L_1 SGC 47,500 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]

Tier II mode	138.6 (8.4)	144.5 (6.4)	152.1 (5.3)
Tier III mode	139.5 (8.4)	145.4 (6.4)	153.0 (5.3)

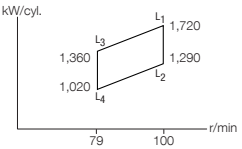
* *Gas fuel LCV (47,500 kJ/kg) is converted to diesel fuel LCV (42,700 kJ/kg) for comparison with a diesel operated engine.*

MAN B&W G50ME-C9.6

Tier III

Cyl.	L_1 kW
5	8,600
6	10,320
7	12,040
8	13,760
9	15,480

Stroke: 2,500 mm



Dual Fuel Mode for LGIM (Methanol)

L_1 MEP: 21.0 bar

MAN B&W G50ME-C9.6-LGIM-EGRBP

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*			
	50%	75%	100%
Tier II mode	159.5	162.0	170.0
Tier III mode	166.5	166.5	172.0

L_1 SGC 19,900 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	312.9 (13.7)	325.5 (10.4)	346.3 (8.6)
Tier III mode	328.0 (13.7)	335.2 (10.4)	350.6 (8.6)

MAN B&W G50ME-C9.6-GI-LGIM-HPSCR

L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*			
	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	161.0	163.0	170.0

L_1 SGC 19,900 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	313.1 (13.6)	325.7 (10.3)	345.5 (8.5)
Tier III mode	316.3 (13.6)	327.8 (10.3)	346.5 (8.5)

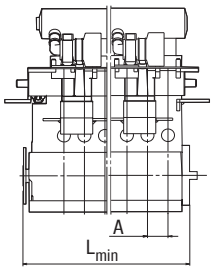
MAN B&W G50ME-C9.6-LGIM-LPSCR

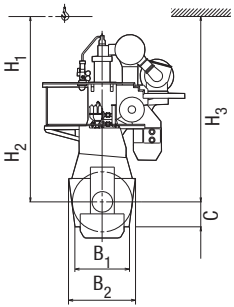
L_1 SFOC equivalent gas + pilot fuel (42,700 kJ/kg) [g/kWh]*			
	50%	75%	100%
Tier II mode	159.5	162.0	169.5
Tier III mode	160.5	163.0	170.5

L_1 SGC 19,900 kJ/kg (SPOC pilot fuel 42,700 kJ/kg) [g/kWh]			
Tier II mode	313.2 (13.5)	325.7 (10.3)	345.4 (8.5)
Tier III mode	315.3 (13.5)	327.8 (10.3)	347.6 (8.5)

* *Liquid gas fuel LCV (19,900 kJ/kg) is converted to fuel oil LCV (42,700 kJ/kg) for comparison with a fuel oil operated engine.*

Engine Dimensions





Specifications

Dimensions:		A	B_1	B_2	C	H_1	H_2	H_3
	mm	872	3,776	3,652	1,205	10,775	10,075	9,775

Cylinders:		5	6	7	8	9
L_{min}	mm	6,260	7,132	8,004	8,876	9,748

Dry mass

Tier II	t	210	245	275	310	345

Tier III (added)

EGR	t	6	8	9	10	12
HP SCR	t	4	4	5	6	6
LP SCR	t	-	-	-	-	-

Dual fuel (added)

GIE	t	5	5	6	6	7
LGIM	t	7	7	8	9	10

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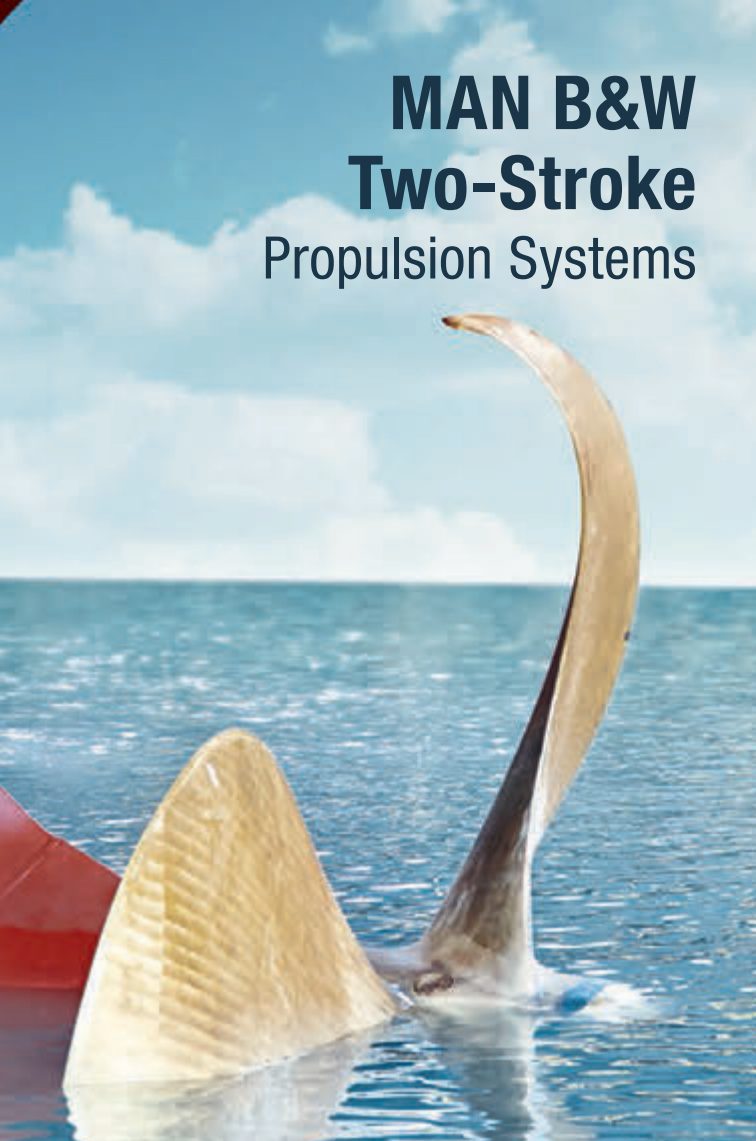
MAN B&W Two-Stroke

Propulsion Systems



MAN Alpha

Propeller Programme – FPP and CPP

6.9-metre MAN Alpha Kappel propeller for a 105,000 dwt crude oil carrier

The MAN Alpha FPP portfolio covers:

- power range of 4-40 MW per shaft
- blade configurations for 3, 4, 5 and 6-bladed propellers
- propellers with integrated shaft line and stern tube solutions
- wide range of stern tube lube and sealing systems – oil, water, biodegradable oils.

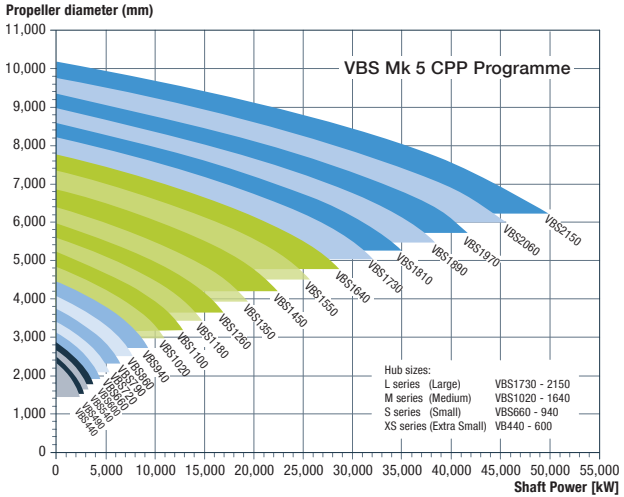
The MAN Alpha FPPs are characterised by the following benefits:

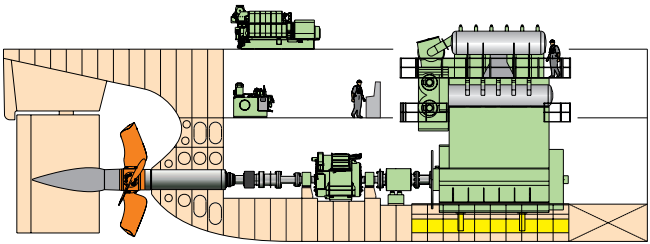
- High-efficient, hydrodynamically optimised blade profiles – Kappel designs available
- High reliability: robust approach with ample mechanical design margins
- High-efficient aft-ship integration with rudder, rudder bulb, ducts, etc.
- Layouts for complete two-stroke propulsion systems, e.g. with PTO solutions
- Plant calculations with upfront consideration to torsional vibration calculation (TVC), alignment and control systems.

MAN B&W Two-Stroke Propulsion Systems

MAN Alpha Controllable Pitch Propeller

- Standard Mk 5 versions are 4-bladed – 3 and 5-bladed propellers are available upon request
- The figures stated after the VBS indicate the propeller hub diameter
- Standard blade/hub materials are Ni-Al-bronze; stainless steel is optional
- Propellers are available up to the highest ice classes; however the below standard programme is based on 'no ice'.





Two-stroke propulsion system installation – complete powertrain with propeller and aft ship equipment

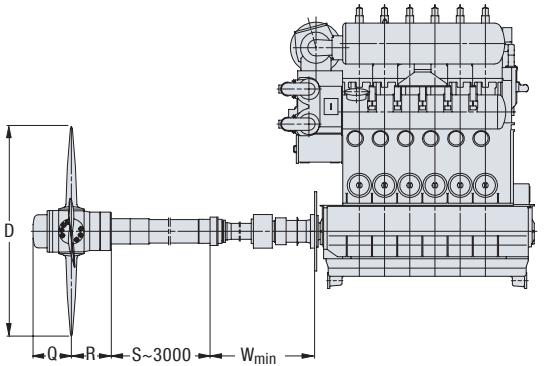
MAN B&W Standard Package Examples

Cyl.	kW	Prop. speed r/min	D [1] mm	Hub VBS mm	Q mm	R mm	Wmin mm	Prop. mass t [2]
G70ME-C9.5/-GI								
5	18,200	83	8,100	1,890	1,436	1,496	3,700	90.0
6	21,840	83	8,450	2,060	1,565	1,593	3,700	93.5
7	25,480	83	8,750	2,150	1,634	1,645	3,700	102.0
8	29,120	83						[3]
S70ME-C8.5/-GI								
5	16,350	91	7,450	1,810	1,375	1,413	3,700	72.8
6	19,620	91	7,750	1,890	1,436	1,500	3,700	84.0
7	22,890	91	8,050	1,970	1,497	1,550	3,700	93.4
8	26,160	91	8,250	2,060	1,565	1,630	3,700	101.3
S65ME-C8.5/-GI								
5	14,350	95	7,150	1,730	1,315	1,339	3,400	66.1
6	17,220	95	7,450	1,810	1,375	1,385	3,400	73.0
7	20,090	95	7,700	1,890	1,436	1,466	3,400	81.2
8	22,960	95	7,900	1,970	1,497	1,512	3,400	89.3

[1] For optimal Kappel blades, the propeller diameter is reduced by an average of 3-10% compared to the listed standard diameters

[2] The masses are stated for 4,000 mm stern tube and 8,000 mm propeller shaft

[3] Available on request



MAN B&W Standard Package Examples

Cyl.	kW	Prop. speed r/min	D [1] mm	Hub VBS mm	Q mm	R mm	Wmin mm	Prop. mass t [2]
G60ME-C9.5/-GI								
5	13,400	97	6,950	1,640	1,246	1,287	3,300	60.0
6	16,080	97	7,250	1,730	1,315	1,339	3,300	64.2
7	18,760	97	7,450	1,810	1,375	1,420	3,300	70.3
8	21,440	97	7,700	1,890	1,436	1,496	3,100	74.6
S60ME-C8.5/-GI								
5	11,900	105	6,500	1,550	1,278	1,289	3,000	53.4
6	14,280	105	6,750	1,640	1,367	1,362	3,000	59.7
7	16,660	105	6,950	1,730	1,367	1,367	3,000	63.2
8	19,040	105	7,150	1,810	1,458	1,450	3,000	72.0
G50ME-C9.6/-GI								
5	8,600	100	6,150	1,450	1,102	1,174	3,100	42.7
6	10,320	100	6,450	1,550	1,178	1,231	3,100	45.1
7	12,040	100	6,650	1,550	1,178	1,231	3,100	48.1
8	13,760	100	6,850	1,640	1,246	1,287	2,900	50.9
9	15,480	100	7,050	1,730	1,315	1,339	3,100	58.1
S50ME-C9.6/-GI								
5	8,900	117	5,650	1,350	1,037	1,096		
6	10,680	117	5,850	1,450	1,114	1,148		
7	12,460	117	6,050	1,450	1,114	1,148		
8	14,240	117	6,200	1,550	1,175	1,256		
9	16,020	117	6,350	1,640	1,260	1,288		
S50ME-C8.5/-GI [3]								
5	8,300	127	5,400	1,350	1,030	1,082	2,690	31.7
6	9,960	127	5,600	1,350	1,100	1,145	2,690	35.4
7	11,620	127	5,800	1,450	1,175	1,233	2,690	39.9
8	13,280	127	5,950	1,450	1,175	1,248	2,690	42.0

[1] For optimal Kappel blades, the propeller diameter is reduced by an average of 3-10% compared to the listed standard diameters

[2] The masses are stated for 4,000 mm stern tube and 8,000 mm propeller shaft

[3] Data for 9 cylinder is available on request

MAN B&W Standard Package Examples

Cyl.	kW	Prop. speed r/min	D [1] mm	Hub VBS mm	Q mm	R mm	Wmin mm	Prop. mass t [2]
S46ME-B8.5/-GI								
5	6,900	129	5,200	1,260	975	1,035	2,650	27.4
6	8,280	129	5,400	1,350	1,030	1,082	2,650	29.9
7	9,660	129	5,550	1,350	1,100	1,145	2,650	34.0
8	11,040	129	5,700	1,450	1,175	1,233	2,650	38.9
G45ME-C9.5/-GI								
5	6,950	111	5,650	1,350	1,026	1,109	2,700	28.8
6	8,340	111	5,900	1,350	1,026	1,109	2,700	30.6
7	9,730	111	6,100	1,450	1,102	1,197	2,700	35.1
8	11,120	111	6,250	1,550	1,178	1,236	2,700	37.6
G40ME-C9.5/-GI								
5	5,500	125	5,000	1,180	897	1,054	2,520	24.1
6	6,600	125	5,250	1,260	975	1,070	2,600	28.0
7	7,700	125	5,400	1,260	975	1,170	2,520	29.7
8	8,800	125	5,550	1,350	1,026	1,138	2,520	32.9
S40ME-B9.5/-GI								
5	5,675	146	4,650	1,100	885	972	2,500	22.1
6	6,810	146	4,800	1,180	957	1,025	2,500	24.6
7	7,945	146	4,950	1,180	957	1,025	2,500	26.0
8	9,080	146	5,050	1,260	975	1,081	2,500	29.8
9	10,215	146	5,550	1,350	1,026	1,140	2,700	34.4
S35ME-B9.5/-GI								
5	4,350	167	4,050	940	821	920	2,500	16.3
6	5,220	167	4,200	1,020	821	920	2,500	16.9
7	6,090	167	4,350	1,100	885	946	2,500	19.4
8	6,960	167	4,450	1,100	885	946	2,500	20.4
S30ME-B9.5/-GI								
5	3,200	195	3,500	860	653	750	2,350	10.5
6	3,840	195	3,600	860	653	750	2,350	11.0
7	4,480	195	3,700	940	714	886	2,350	12.3
8	5,120	195	3,800	940	714	886	2,350	13.0

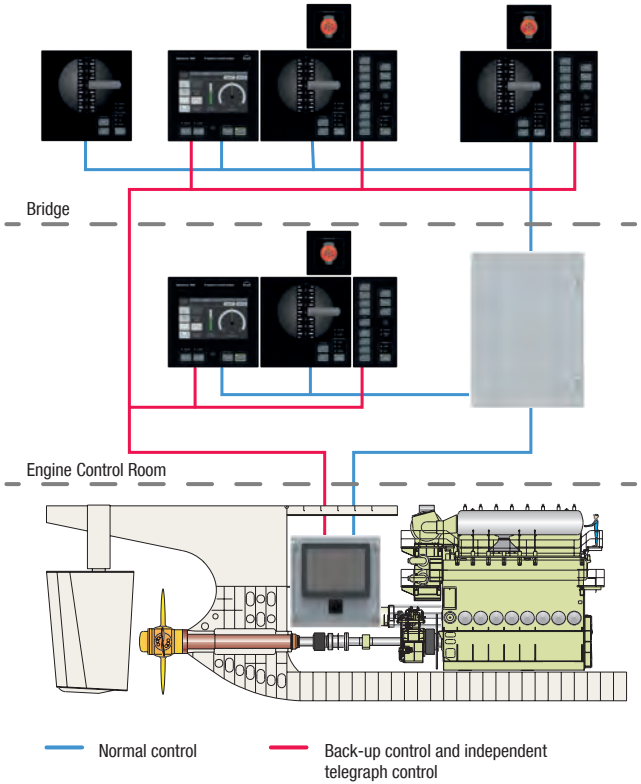
[1] For optimal Kappel blades, the propeller diameter is reduced by an average of 3-10% compared to the listed standard diameters

[2] The masses are stated for 3,000 mm stern tube and 8,000 mm propeller shaft

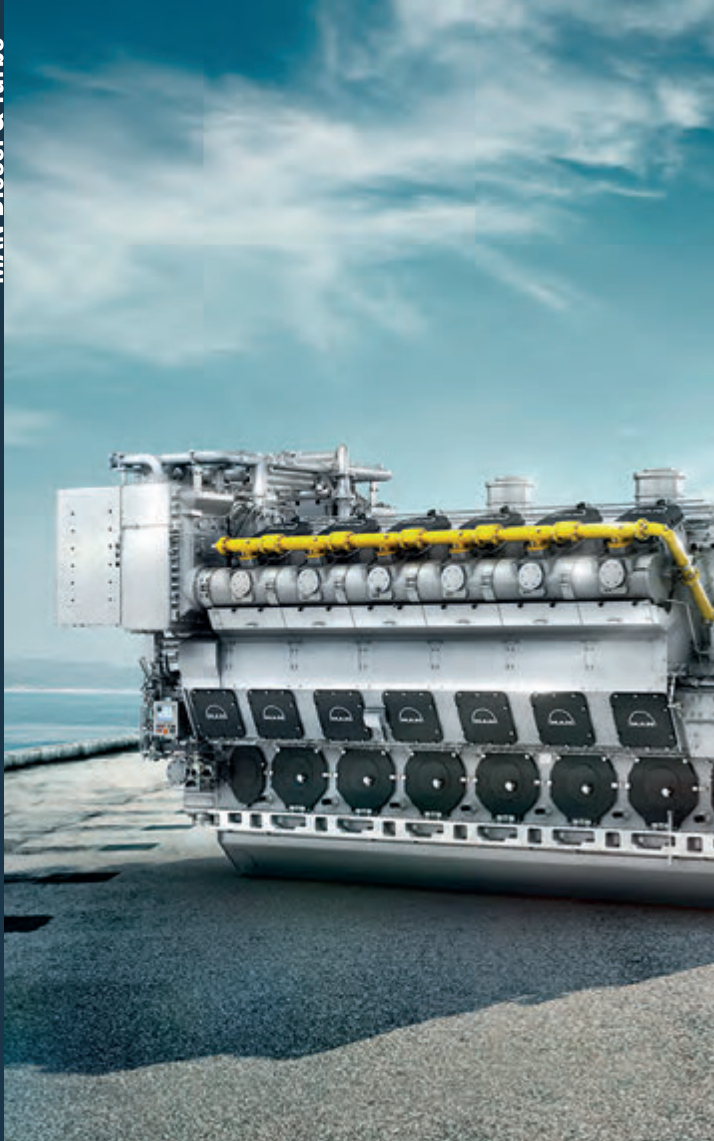
MAN B&W Two-Stroke Propulsion Systems

Alphatronic 3000 Propulsion Control System

A high number of various FPP and CPP propulsion package applications are controlled by the Alphatronic 3000 system – customised for combinations of MAN low and medium speed engines in a wide range of diesel-mechanical, hybrid or diesel-electric propulsion setups.



Simple system architecture for a straightforward two-stroke CPP propulsion plant



MAN Four-Stroke
Propulsion Engines

MAN Four-Stroke Propulsion Engines

MAN Four-Stroke Propulsion Engines – All Emission Requirements
Besides focus on power density and fuel economy, MAN Diesel & Turbo is committed to a steady reduction of the environmental impact of our engines.

IMO Tier II
Applying well-proven methods to achieve a cleaner and more efficient combustion process, MAN Diesel & Turbo has significantly decreased NO_x emissions. Our four-stroke propulsion engines are IMO Tier II compliant with internal engine measures alone.

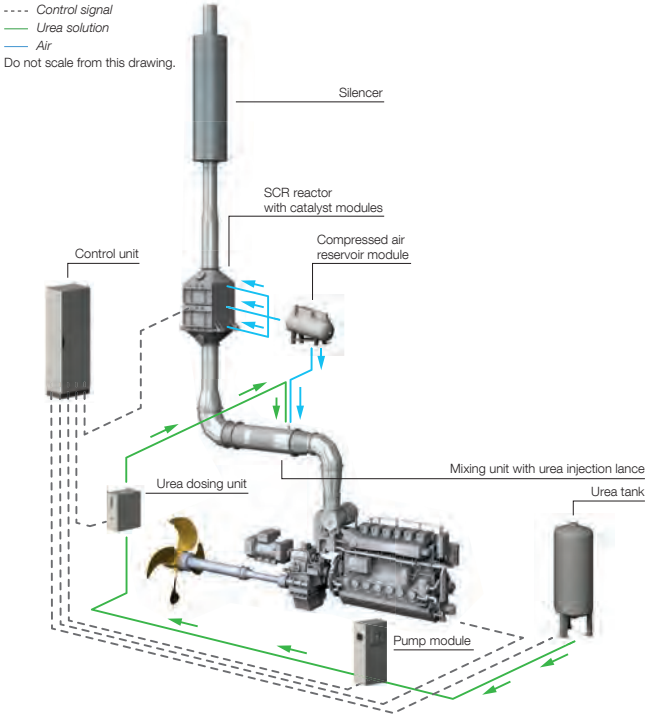
IMO Tier III
For operation in emission control areas (ECA), MAN Diesel & Turbo has developed a comprehensive range of selective catalytic reduction (SCR) systems that tremendously reduce NO_x levels surpassing IMO Tier III requirements.

MAN Diesel & Turbo is the first manufacturer to successfully produce and offer IMO Tier III compliant four-stroke marine engines based on a fully modular SCR kit covering our entire four-stroke engine portfolio. In 2014 MAN Diesel & Turbo was awarded the first IMO Tier III EIAPP certificate together with the classification society DNV-GL.

MAN Four-Stroke Propulsion Engines

MAN Diesel & Turbo's standard SCR system is available in fourteen different sizes covering our entire portfolio of four-stroke engines. Customised SCR systems are offered on demand.

MAN has developed a complete range of SCR systems that work perfectly with our engines for maximum system efficiency. The intelligent exhaust gas temperature control allows for significant savings in fuel consumptions as compared to third-party supplier systems. MAN SCR systems work with MGO, MDO and HFO with up to 3.5% sulphur.



MAN propulsion plant with complete SCR system

MAN Four-Stroke Propulsion Engines

Our modular system comes in 14 different sizes to match all power demands. Some notable benefits of standardisation are significant cost reduction and simplification of installation.

The modular SCR component kit

Urea Consumption

The urea consumption depends on engine type, selected performance characteristics (engine map), in case of an engine with ECOMAP capability, operating profile, fuel type, ambient conditions, type of reduction agent, etc.

For more detailed information on the expected level of urea consumption, please contact MAN Diesel & Turbo with your project specific request.

MAN Four-Stroke Propulsion Engines

Conventional Injection Engines

Our well-established engine types are used in a vast array of applications all over the world. Based on long-term experience of historical proportions, our engines are in continuous development to increase power, reduce emissions, increase reliability, reduce fuel oil consumption, and increase longevity. Our engines are the prime movers of choice in the maritime sector.

Common Rail (CR) Engines

The flexibility of our CR technology enables a substantial improvement of the combustion process that improves the fuel economy and reduces emission levels. It is particularly advantageous in the low-load and mid-load ranges where our unique ECOMAP system applies different engine maps to reduce fuel consumption while observing IMO emission limits. Another feature is our patented Boost Injection. Our engine control system senses a load increase at a very early stage and tremendously improves the load response with the activation of boost injection in our common rail control. In addition, exhaust gas opacity is markedly reduced, far below the visibility limit. Our CR engines run efficiently on liquid fuels complying with ISO 8217-2012 DMA, DMZ, and DMB, and on residual fuels (HFO) up to 700 cSt (in compliance with ISO-F-RMK 700).

MAN Four-Stroke Propulsion Engines

Diesel Oil (D) Engines
The V28/33D STC features very favourable ratios of power-to-weight and power-to-installation space. The combination of low fuel consumption, low emissions and reduced life cycle costs makes this engine the ideal solution for propulsion in high speed ferries, naval and offshore patrol vessels. The V28/33D STC engine operates on distillates according to ISO 8217 DMA or equivalent fuel types.

Sequential Turbocharging (STC)
The MAN Diesel & Turbo sequential turbocharging system operates with two high-efficiency turbochargers. Depending on the amount of charge air required, the second turbocharger is switched on or off. In this way, the engine is operated at its optimum operating point over the whole applicable load range.

The result is an extended operating envelope at low engine speeds, which gives a power reserve for ship acceleration, ship turning, sprints or towing. Furthermore, the STC system is characterised by a low thermal signature, decreased smoke emission, low vibrations and continuous low-load operation with reduced fuel consumption, which makes it the ideal solution for propulsion in naval applications and offshore patrol vessels.

Dual Fuel (DF) Engines
Dual fuel engines from MAN Diesel & Turbo run efficiently on liquid fuels or natural gas with very low emissions that are compliant with IMO limits. On gaseous fuel, the engines comply with IMO Tier III without the need for additional aftertreatment, and on liquid fuel they either fulfill IMO Tier II, or IMO Tier III together with an SCR system. The possibility to switch over seamlessly from gas to HFO or diesel operation and vice versa provides full flexibility in multiple applications.

All dual fuel engines can run on natural gas with a methane number higher than 80 without adjustments. For lower methane numbers, MAN Diesel & Turbo can deliver well-adapted solutions. The optimised combustion chamber ensures very low fuel consumption in both operational modes.

MAN Four-Stroke Propulsion Engines

MAN Cryo Fuel Gas Supply Systems

MAN Cryo fuel gas systems are the world's leading solution for safely storing energy on board gas fuelled ships and reliably providing it to the engines.

After pioneering in the market for LNG-fuelled ships in 1999, MAN Cryo fuel gas systems have since then been installed on a major part of today's gas fuelled ship fleet, either standardised or tailor-made. The references range from passenger ferries to offshore platform supply vessels, tug boats, bunker barges and even ice breakers.

MAN Diesel & Turbo provides one-stop solutions with complete packages consisting of main engines, auxiliary gensets, propulsion train, LNG fuel tank, coldbox, control system and bunkering station.

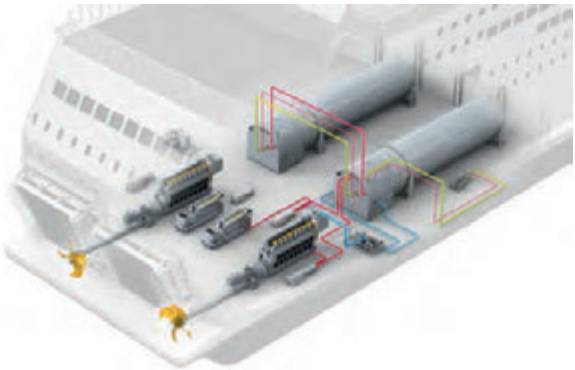
In order to deliver cost-optimised systems with shortest delivery times, MAN Diesel & Turbo offers a broad range of standard cryo packages in all required sizes. Beyond this standard scope and for larger tank sizes, customised solutions are engineered in the most efficient way in order to meet all our customers' demands.

Vacuum-insulated type-C LNG tank including cold box

MAN Four-Stroke Propulsion Engines

MAN Cryo LNG Standard Packages (example sizes)

Geometrical volume [m³]	Net filling volume (95%) [m³]	Outer diameter [m]	Tank length (without TCS) [m]
76	73	3.6	10.9
100	95	3.6	13.9
124	118	3.6	16.9
142	135	4.2	14.0
175	167	4.2	17.0
209	199	4.2	20.0
249	237	5.3	16.4
300	285	5.3	19.4
352	335	5.3	22.4
385	366	6.0	19.8
450	428	6.0	22.5
516	491	6.0	25.8
600	570	6.9	23.2



Dual fuel propulsion package including fuel gas storage and supply system

MAN Four-Stroke Propulsion Engines

Engine Power
Engine brake power is stated in kW.

Ratings are given according to ISO 3046-1:2002.

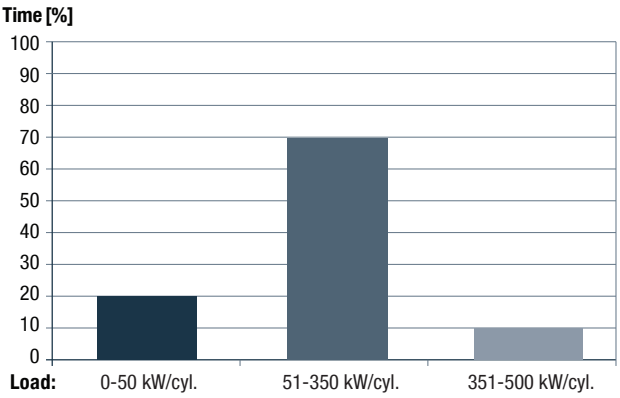
According to ISO 15550:2002, the power figures in the tables are valid within a range of ±3% up to tropical conditions at sea level, i.e.:

- compressor inlet temperature 45 °C
- compressor inlet pressure 1,000 mbar
- sea water temperature 32 °C

For all four-stroke propulsion engines, the power is defined according to the ICN[1] (MCR) definition (ISO 3046-1:2002:ISO standard power) with one exception.

For the load profile type Navy, of the engine types V28/33D STC, the rated power of the engine is stated according to the ICFN[1] power definition (ISO 3046:2002:ISO standard fuel stop power).

Load profile type: Navy (ICFN)



Typical use: fast yachts, corvettes, frigates and OPV

[1] *I = ISO power*
C = continuous power output
[F = fuel stop power]
N = net

MAN Four-Stroke Propulsion Engines

Specific Fuel Oil Consumption (SFOC) and Heat Rate

The stated consumption figures refer to the following reference conditions according to ISO 3046-1:

- ambient air pressure 1,000 mbar
- ambient air temperature 25 °C (77 °F)
- charge air temperature according to engine type, corresponding to 25 °C cooling water temperature before CAC

The figures are given with a tolerance of +5% and without engine driven pumps. Attached pumps and engines running in suction dredger operation will require additional fuel.

In accordance with the NO_x Technical Code 2008 of the International Maritime Organization, DM-grade fuel oil is used as reference fuel oil for engine tests and, thus, also forms the basis for the SFOC figures stated for engines in liquid fuel operation.

Unless otherwise specifically stated, SFOC figures are based on a lower calorific value of the fuel oil of 42,700 kJ/kg and, in addition for engines with common rail injection (CR-engines), on DMA-grade fuel oil (ISO 8217-2012). For engines with conventional fuel injection, SFOC figures are based on DMB-grade fuel oil (ISO 8217-2012). For further details, please refer to our engine specific project guides available from MAN Diesel & Turbo.

Specific Lube Oil Consumption (SLOC)

The specific lube oil consumption is specified at MCR (maximum continuous rating) with a tolerance of 20%.

Blocking of Output

Blocking of output is made for engines driving a propeller at 100% of the rated output. For engines powering an alternator, blocking of output is made at 110%. However, operation above 100% load is only recommended for a short period of time for recovery and prevention of a frequency drop.

MAN Four-Stroke Propulsion Engines

Weights and Dimensions

For marine main engines, the weights stated refer to engines without a flywheel.

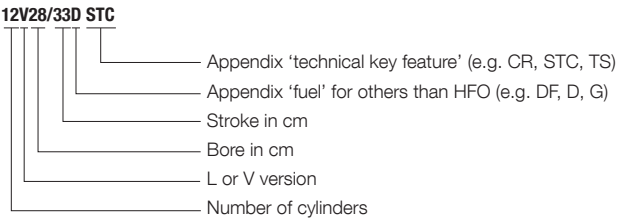
All weights given are without lube oil and cooling water.

For auxiliary engines (GenSets), weights refer to the unit (including alternator). The weight of the GenSet may vary depending on the alternator make.

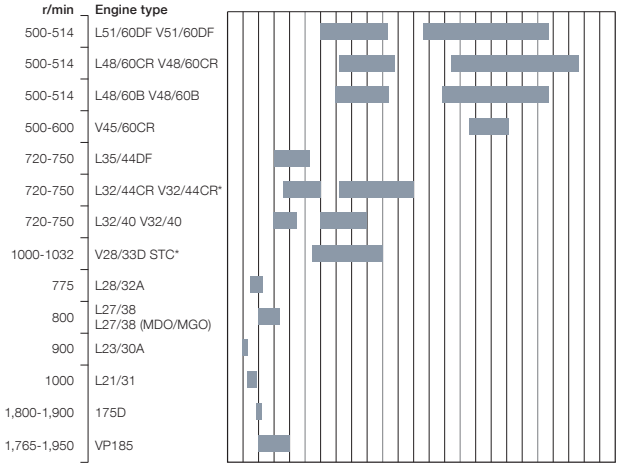
The length of the GenSet unit depends on the alternator make. For a twin engine installation, the centreline distance is stated for each engine type.

The centreline distance for twin engine installation is given as a minimum value. Specific requirements to the passageway (e.g. of classification societies or flag state authority), seating type or a gallery can lead to higher values.

Engine Type Designation



MAN Four-Stroke Propulsion Engines



** The engine complies with EPA Tier 2*

MAN V51/60DF

High efficiency variant

Tier II Tier III

Tier III in gas mode

Bore: 510 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	20.0	20.6
		kW	kW
12V51/60DF		12,600	12,600
14V51/60DF		14,700	14,700
16V51/60DF		16,800	16,800
18V51/60DF		18,900	18,900

LHV of fuel gas ≥ 28,000 kJ/Nm³
(Nm³ corresponds to one cubic meter of gas at 0 °C and 1.013 bar)

Specific Fuel Oil Consumption (SFOC) and Heat Rate to ISO conditions

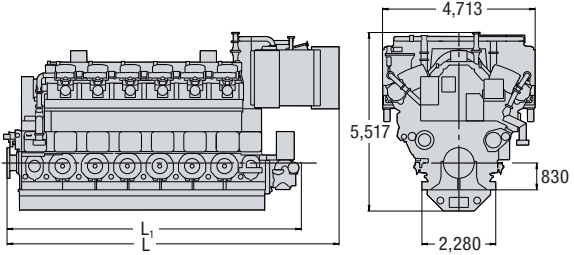
MCR	100%	85%
Specific fuel oil consumption[1)]	179.5 g/kWh	177.0 g/kWh
Heat rate[2)]	7,190 kJ/kWh	7,200 kJ/kWh
Specific lube oil consumption[3)]: 0.38 g/kWh for nominal output 1,050 kW/cyl.		
Engine type specific reference charge air temperature before cylinder 43 °C		

[1)] Liquid fuel operation
[2)] Gas operation (including pilot fuel), gas fuel: methane no. ≥ 80
[3)] Related to 100% actual engine load

Dimensions

Cyl. No.		12	14	16	18
L	mm	10,254	11,254	12,254	13,644
L_1	mm	9,088	10,088	11,088	12,088
Dry mass	t	187	213	240	265

Minimum centreline distance for twin engine installation: 4,800 mm



Project Guide

Bore: 510 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	20.0	20.6
		kW	kW
6L51/60DF		6,000	6,000
7L51/60DF		7,350	7,350
8L51/60DF		8,400	8,400
9L51/60DF		9,450	9,450

LHV of fuel gas ≥ 28,000 kJ/Nm³
(Nm³ corresponds to one cubic meter of gas at 0 °C and 1.013 bar)

Specific Fuel Oil Consumption (SFOC) and Heat Rate to ISO conditions

MCR	100%	85%
L51/60DF[1)]	179.5 g/kWh	177.0 g/kWh
6L51/60DF[1)]	181.0 g/kWh	179.0 g/kWh
L51/60DF[2)]	7,190 kJ/kWh	7,200 kJ/kWh
6L51/60DF[2)]	7,210 kJ/kWh	7,210 kJ/kWh

Specific lube oil consumption[3)]: 0.38 g/kWh for nominal output 1,050 kW/cyl., 0.40 g/kWh for nominal output 1,000 kW/cyl.

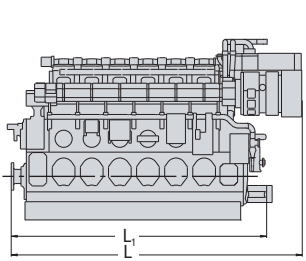
Engine type specific reference charge air temperature before cylinder 43 °C

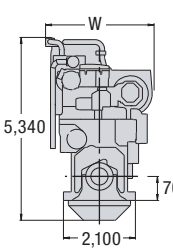
1) Liquid fuel operation
2) Gas operation (including pilot fuel), gas fuel: methane no. ≥ 80
3) Related to 100% actual engine load

Dimensions

Cyl. No.		6	7	8	9
L	mm	8,494	9,314	10,134	11,160
L_1	mm	7,455	8,275	9,095	9,915
W	mm	3,165	3,165	3,165	3,283
Dry mass	t	106	119	135	148

Minimum centreline distance for twin engine installation: 3,200 mm





MAN V51/60DF

High power variant

Tier II Tier III

Tier III in gas mode

Bore: 510 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	21.9	22.5
		kW	kW
12V51/60DF		13,800	13,800
14V51/60DF		16,100	16,100
16V51/60DF		18,400	18,400
18V51/60DF		20,700	20,700

LHV of fuel gas ≥ 28,000 kJ/Nm³
(Nm³ corresponds to one cubic meter of gas at 0 °C and 1.013 bar)

Specific Fuel Oil Consumption (SFOC) and Heat Rate to ISO conditions

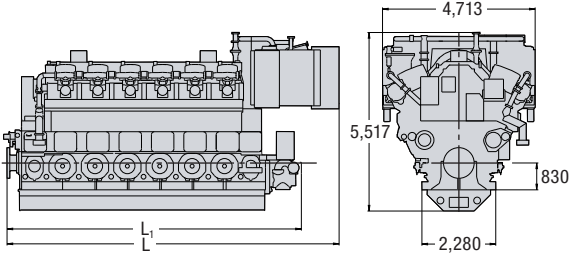
MCR	100%	85%
Specific fuel oil consumption[1)]	187.0 g/kWh	184.0 g/kWh
Heat rate[2)]	7,380 kJ/kWh	7,400 kJ/kWh
Specific lube oil consumption[3)]: 0.35 g/kWh for nominal output 1,150 kW/cyl.		
Engine type specific reference charge air temperature before cylinder 43 °C		

[1)] Liquid fuel operation
[2)] Gas operation (including pilot fuel), gas fuel: methane no. ≥ 80
[3)] Related to 100% actual engine load

Dimensions

Cyl. No.		12	14	16	18
L	mm	10,254	11,254	12,254	13,644
L_1	mm	9,088	10,088	11,088	12,088
Dry mass	t	187	213	240	265

Minimum centreline distance for twin engine installation: 4,800 mm



Project Guide

MAN L51/60DF

High power variant

Bore: 510 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	21.9	22.5
		kW	kW
6L51/60DF		6,900	6,900
7L51/60DF		8,050	8,050
8L51/60DF		9,200	9,200
9L51/60DF		10,350	10,350

LHV of fuel gas ≥ 28,000 kJ/Nm³
(Nm³ corresponds to one cubic meter of gas at 0 °C and 1.013 bar)

Specific Fuel Oil Consumption (SFOC) and Heat Rate to ISO conditions

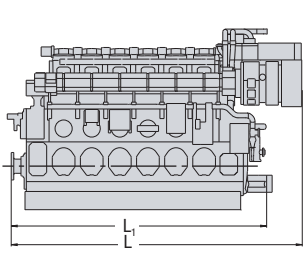
MCR	100%	85%
Specific fuel oil consumption[1)]	187.0 g/kWh	184.0 g/kWh
Heat rate[2)]	7,380 kJ/kWh	7,400 kJ/kWh
Specific lube oil consumption[3)]: 0.35 g/kWh for nominal output 1,150 kW/cyl.		
Engine type specific reference charge air temperature before cylinder 43 °C		

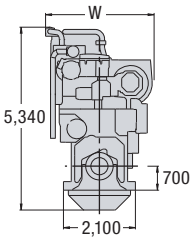
1) Liquid fuel operation
2) Gas operation (including pilot fuel), gas fuel: methane no. ≥ 80
3) Related to 100% actual engine load

Dimensions

Cyl. No.		6	7	8	9
L	mm	8,494	9,314	10,134	11,160
L_1	mm	7,455	8,275	9,095	9,915
W	mm	3,165	3,165	3,165	3,283
Dry mass	t	106	119	135	148

Minimum centreline distance for twin engine installation: 3,200 mm





Project Guide

MAN V48/60CR

Tier II Tier III

Tier III with SCR

Bore: 480 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	25.8	26.5
		kW	kW
12V48/60CR		14,400	14,400
14V48/60CR		16,800	16,800
16V48/60CR		19,200	19,200
18V48/60CR		21,600	21,600

Specific Fuel Oil Consumption (SFOC) to ISO conditions

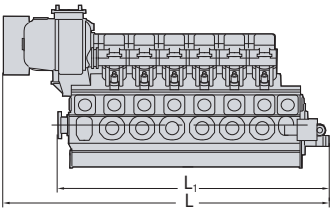
MCR	100%	85%
V48/60CR	181.5 g/kWh	173 g/kWh
Specific lube oil consumption[1]: 0.5 g/kWh for nominal output 1,200 kW/cyl.		
Engine type specific reference charge air temperature before cylinder 37 °C		

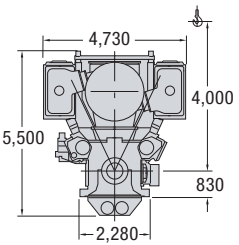
[1] Related to 100% actual engine load

Dimensions

Cyl. No.		12	14	16	18
L	mm	10,790	11,790	13,140	14,140
L_1	mm	9,088	10,088	11,088	12,088
Dry mass	t	189	213	240	265

Minimum centreline distance for twin engine installation: 4,800 mm





Project Guide

MAN L48/60CR

Bore: 480 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	25.8	26.5
		kW	kW
6L48/60CR		7,200	7,200
7L48/60CR		8,400	8,400
8L48/60CR		9,600	9,600
9L48/60CR		10,800	10,800

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
L48/60CR	183.5 g/kWh	175 g/kWh

Specific lube oil consumption[1]: 0.5 g/kWh for nominal output 1,200 kW/cyl.

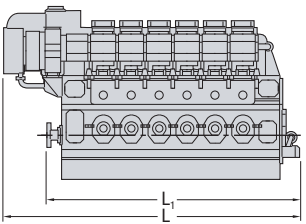
Engine type specific reference charge air temperature before cylinder 37 °C

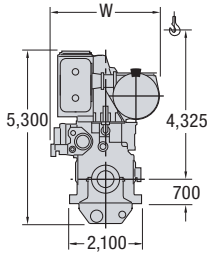
[1] Related to 100% actual engine load

Dimensions

Cyl. No.		6	7	8	9
L	mm	8,760	9,580	10,540	11,360
L_1	mm	7,455	8,275	9,095	9,915
W	mm	3,165	3,165	3,280	3,280
Dry mass	t	106	119	135	148

Minimum centreline distance for twin engine installation: 3,200 mm





Project Guide

MAN V48/60B

Tier II Tier III

Tier III with SCR

Bore: 480 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	24.7	25.4
		kW	kW
12V48/60B		13,800	13,800
14V48/60B		16,100	16,100
16V48/60B		18,400	18,400
18V48/60B		20,700	20,700

Specific Fuel Oil Consumption (SFOC) to ISO conditions

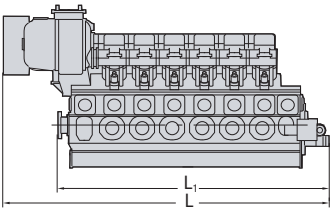
MCR	100%	85%
V48/60B	184 g/kWh	180 g/kWh
Specific lube oil consumption[1]: 0.46 g/kWh for nominal output 1,150 kW/cyl.		
Engine type specific reference charge air temperature before cylinder 37 °C		

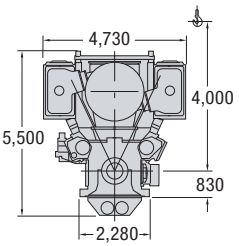
[1] Related to 100% actual engine load

Dimensions

Cyl. No.		12	14	16	18
L	mm	10,790	11,790	13,140	14,140
L_1	mm	9,088	10,088	11,088	12,088
Dry mass	t	186	209	240	259

Minimum centreline distance for twin engine installation: 4,800 mm





Project Guide

MAN L48/60B

Bore: 480 mm, Stroke: 600 mm

Speed	r/min	514	500
mep	bar	24.7	25.4
		kW	kW
6L48/60B		6,900	6,900
7L48/60B		8,050	8,050
8L48/60B		9,200	9,200
9L48/60B		10,350	10,350

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
L48/60B	186 g/kWh	182 g/kWh

Specific lube oil consumption[1]: 0.46 g/kWh for nominal output 1,150 kW/cyl.

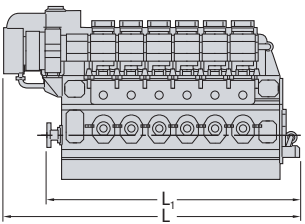
Engine type specific reference charge air temperature before cylinder 37 °C

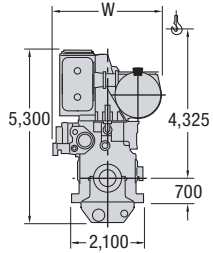
[1] Related to 100% actual engine load

Dimensions

Cyl. No.		6	7	8	9
L	mm	8,760	9,580	10,540	11,360
L_1	mm	7,455	8,275	9,095	9,915
W	mm	3,165	3,165	3,280	3,280
Dry mass	t	104	118	134	146

Minimum centreline distance for twin engine installation: 3,200 mm





Project Guide

MAN V45/60CR

Tier III
with SCR

Bore: 450 mm, Stroke: 600 mm

Speed	r/min	600
mep	bar	27.3
		kW
12V45/60CR		15,600
14V45/60CR		18,200

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
V45/60CR	170.0 g/kWh	166.0 g/kWh

Specific lube oil consumption[1]: 0.5 g/kWh for nominal output 1,300 kW/cyl.

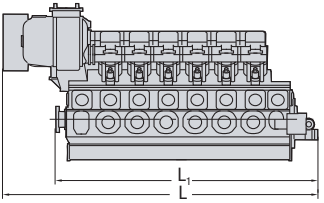
Engine type specific reference charge air temperature before HP TC 43 °C / before cylinder 37 °C

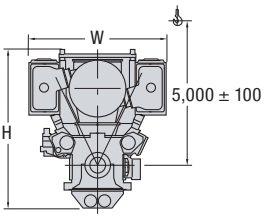
[1] Related to 100% actual engine load

Dimensions

Cyl. No.		12	14
L	mm	10,800	11,800
L_1	mm	7,250	8,230
W	mm	4,960	4,960
H	mm	5,237	5,237
Dry mass	t	217	245

Minimum centreline distance for twin engine installation: 5,050 mm





Project Guide

Bore: 350 mm, Stroke: 440 mm

Speed	r/min	750	720
mep	bar	20.0	20.1
		kW	kW
6L35/44DF		3,180	3,060
7L35/44DF		3,710	3,570
8L35/44DF		4,240	4,080
9L35/44DF		4,770	4,590
10L35/44DF		5,300	5,100

LHV of fuel gas ≥ 28,000 kJ/Nm³
(Nm³ corresponds to one cubic meter of gas at 0 °C and 1.013 bar)

Specific Fuel Oil Consumption (SFOC) and Heat Rate to ISO conditions

MCR	100%	85%
Specific fuel oil consumption[1)]	175.5 g/kWh	175.5 g/kWh
Heat rate[2)]	7,470 kJ/kWh	7,515 kJ/kWh

Specific lube oil consumption[3)]: 0.5 g/kWh for nominal output 530 kW/cyl. or 0.52 g/kWh for nominal output 510 kW/cyl.

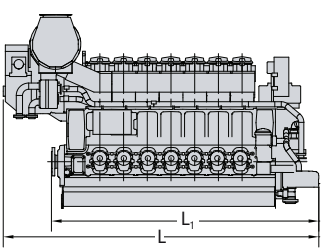
Engine type specific reference charge air temperature before cylinder 40 °C

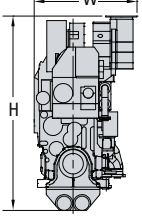
1) Liquid fuel operation
2) Gas operation (including pilot fuel), gas fuel: methane no. ≥ 80
3) Related to 100% actual engine load

Dimensions

Cyl. No.		6	7	8	9	10
L	mm	6,485	7,015	7,545	8,075	8,605
L_1	mm	5,265	5,877	6,407	6,937	7,556
W	mm	2,539	2,678	2,678	2,678	2,678
H	mm	4,163	4,369	4,369	4,369	4,369
Dry mass[4)]	t	43.1	48.2	53.3	57.6	62.3

Minimum centreline distance for twin engine installation: 2,500 mm
4) Including built-on lube oil automatic filter, fuel oil filter and electronic equipment
Speed 720 r/min for generator drive only





MAN V32/44CR

Tier II | Tier III | EPA Tier 2

Tier III with SCR

Bore: 320 mm, Stroke: 440 mm

Speed	r/min	750	720
mep	bar	27.1	28.3
		kW	kW
12V32/44CR		7,200	7,200
14V32/44CR[1)]		8,120	8,120
16V32/44CR		9,600	9,600
18V32/44CR[2)]		10,800	10,800
20V32/44CR		12,000	12,000

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
V32/44CR	175.5 g/kWh	172.0 g/kWh
14V32/44CR	175.5 g/kWh	173.0 g/kWh
V32/44CR FPP	177.0 g/kWh	173.5 g/kWh
14V32/44CR FPP	178.0 g/kWh	175.0 g/kWh

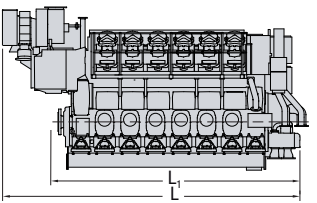
Specific lube oil consumption[3)]: 0.5 g/kWh for nominal output 600 kW/cyl., 0.52 g/kWh for nominal output 580 kW/cyl., 0.55 g/kWh for nominal output 550 kW/cyl.

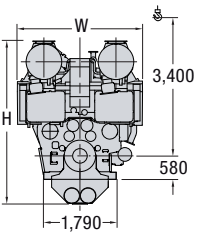
Engine type specific reference charge air temperature before cylinder 40 °C

Dimensions

Cyl. No.		12	14	16	18	20
L	mm	7,195	7,970	8,600	9,230	9,860
L_1	mm	5,795	6,425	7,055	7,685	8,315
W	mm	3,100	3,100	3,100	3,100	3,100
H	mm	4,039	4,262	4,262	4,262	4,262
Dry mass[4)]	t	70	79	87	96	104

Minimum centreline distance for twin engine installation: 4,000 mm
Speed 720 r/min for generator drive/constant speed operation only
1) 580 kW/cyl
2) 18V32/44CR available rigidly mounted only
3) Related to 100% actual engine load
4) Including built-on lube oil automatic filter, fuel oil filter and electronic equipment
Fixed pitch propeller: 550 kW/cyl, 750 r/min
Wet oil sump available upon request





Project Guide

Bore: 320 mm, Stroke: 440 mm

Speed	r/min	750	720
mep	bar	27.1	28.3
		kW	kW
6L32/44CR		3,600	3,600
7L32/44CR[1)]		4,060	4,060
8L32/44CR		4,800	4,800
9L32/44CR		5,400	5,400
10L32/44CR		6,000	6,000

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
L32/44CR	175.5 g/kWh	172.0 g/kWh
7L32/44CR	175.5 g/kWh	173.0 g/kWh
L32/44CR FPP	177.0 g/kWh	173.5 g/kWh
7L32/44CR FPP	178.0 g/kWh	175.0 g/kWh

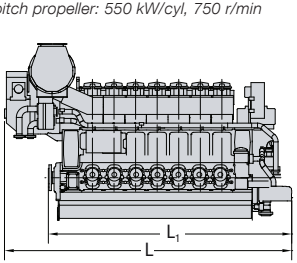
Specific lube oil consumption[2)]: 0.5 g/kWh for nominal output 600 kW/cyl., 0.52 g/kWh for nominal output 580 kW/cyl., 0.55 g/kWh for nominal output 550 kW/cyl.

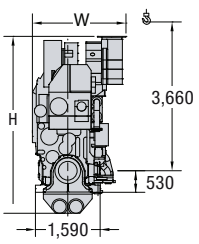
Engine type specific reference charge air temperature before cylinder 40 °C

Dimensions

Cyl. No.		6	7	8	9	10
L	mm	6,312	6,924	7,454	7,984	8,603
L_1	mm	5,265	5,877	6,407	6,937	7,556
W	mm	2,174	2,359	2,359	2,359	2,359
H	mm	4,163	4,369	4,369	4,369	4,369
Dry mass[3)]	t	39.5	44.5	49.5	53.5	58.0

Minimum centreline distance for twin engine installation: 2,500 mm
Speed 720 r/min for generator drive/constant speed operation only
[1)] 580 kW/cyl
[2)] Related to 100% actual engine load
[3)] Including built-on lube oil automatic filter, fuel oil filter and electronic equipment
Fixed pitch propeller: 550 kW/cyl, 750 r/min





Project Guide

MAN V32/40

Tier II Tier III

Tier III with SCR

Bore: 320 mm, Stroke: 400 mm

Speed	r/min	750	720
mep	bar	24.9	25.9
		kW	kW
12V32/40		6,000	6,000
14V32/40		7,000	7,000
16V32/40		8,000	8,000
18V32/40		9,000	9,000

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
V32/40	184 g/kWh	182 g/kWh
V32/40 FPP	187 g/kWh	183 g/kWh

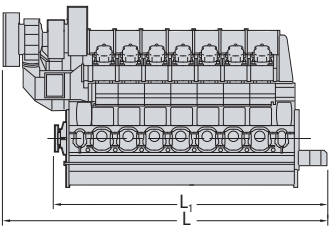
Specific lube oil consumption[1]: 0.5 g/kWh for nominal output 500 kW/cyl., 0.56 g/kWh for nominal output 450 kW/cyl.

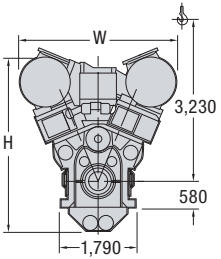
Engine type specific reference charge air temperature before cylinder 43 °C

Dimensions

Cyl. No.		12	14	16	18
L	mm	6,915	7,545	8,365	8,995
L_1	mm	5,890	6,520	7,150	7,780
W	mm	3,140	3,140	3,730	3,730
H	mm	4,100	4,100	4,420	4,420
Dry mass	t	61	68	77	85

Minimum centreline distance for twin engine installation: 4,000 mm
Speed 720 r/min for generator drive/constant speed operation only
Fixed pitch propeller: 450 kW/cyl, 750 r/min
V32/40 as marine main engine to be applied for multi-engine plants only
[1] Related to 100% actual engine load





Project Guide

Bore: 320 mm, Stroke: 400 mm

Speed	r/min	750	720
mep	bar	24.9	25.9
		kW	kW
6L32/40		3,000	3,000
7L32/40		3,500	3,500
8L32/40		4,000	4,000
9L32/40		4,500	4,500

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
L32/40	186 g/kWh	183 g/kWh
L32/40 FPP	189 g/kWh	184 g/kWh

Specific lube oil consumption[1]: 0.5 g/kWh for nominal output 500 kW/cyl., 0.56 g/kWh for nominal output 450 kW/cyl.

Engine type specific reference charge air temperature before cylinder 43 °C

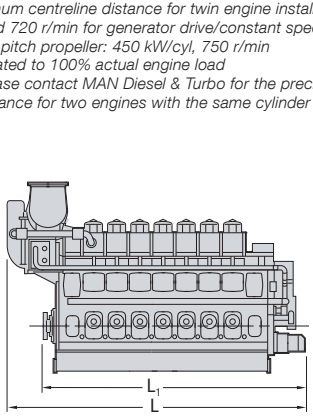
Dimensions

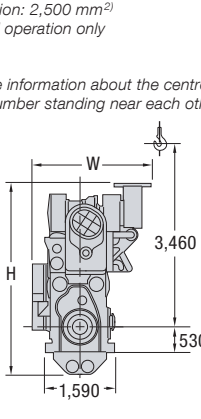
Cyl. No.		6	7	8	9
L	mm	5,940	6,470	7,000	7,530
L_1	mm	5,140	5,670	6,195	6,725
W	mm	2,630	2,630	2,715	2,715
H	mm	4,010	4,010	4,490	4,490
Dry mass	t	38	42	47	51

Minimum centreline distance for twin engine installation: 2,500 mm[2]
Speed 720 r/min for generator drive/constant speed operation only
Fixed pitch propeller: 450 kW/cyl, 750 r/min

[1] Related to 100% actual engine load

[2] Please contact MAN Diesel & Turbo for the precise information about the centreline distance for two engines with the same cylinder number standing near each other





Project Guide

MAN V28/33D STC

Tier II | Tier III | EPA Tier 2

Tier III with SCR

Bore: 280 mm, Stroke: 330 mm

			Load profile 'Navy'
Speed	r/min	1000	1032
mep	bar	26.9	28.6
Rated power output		- ICN (MCR) kW	- ICFN kW
12V28/33D STC		5,460	6,000
16V28/33D STC		7,280	8,000
20V28/33D STC		9,100	10,000

Specific Fuel Oil Consumption (SFOC) to ISO conditions

ICFN fuel stop power	-	194.0 g/kWh
MCR 100%	188.0 g/kWh (193.0 g/kWh[1)])	189.0 g/kWh
MCR 85%	183.0 g/kWh (189.5 g/kWh[1)])	194.5 g/kWh

Specific lube oil consumption[2)]: 0.4 g/kWh for nominal output 455 kW/cyl.

Engine type specific reference charge air temperature before cylinder 40 °C

Figures on theoretical propeller curve for distillates according to ISO 8217 DMA, with all attached pumps

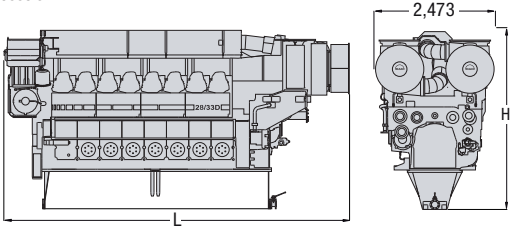
Dimensions

Cyl. No.		12	16	20
L	mm	6,217	7,137	8,057
H [3)]	mm	3,417	3,417	3,417
H [4)]	mm	3,683	3,683	3,683
Dry mass *	t	36.3	43.5	52.3

[1)] Engine is EPA Tier 2 compliant
[2)] Related to 100% actual engine load
[3)] With low oilsump
[4)] With deep oilsump

Weight and performance parameters refer to engine with flywheel, TC silencer, attached pumps, oil filters and lube oil cooler
** Tolerance: 5%*

V28/33D STC as marine main engine to be applied for multi-engine plants only in class-approved vessels



Project Guide

MAN L28/32A

Bore: 280 mm, Stroke: 320 mm

Speed	r/min	775
mep	bar	19.3
		kW
6L28/32A		1,470
7L28/32A *		1,715
8L28/32A		1,960
9L28/32A		2,205

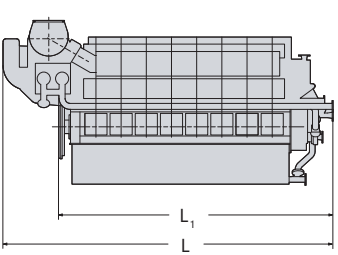
Specific Fuel Oil Consumption (SFOC) to ISO conditions

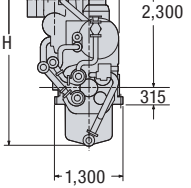
MCR	100%	85%
L28/32A	194 g/kWh	192 g/kWh
L28/32A FPP	194 g/kWh	192 g/kWh
Specific lube oil consumption 1.0 g/kWh		
Engine type specific reference charge air temperature before cylinder 40 °C		

Dimensions

Cyl. No.		6	7	8	9
L	mm	5,330	5,810	6,290	6,770
L_1	mm	4,340	4,750	5,230	5,780
W	mm	1,732	1,732	1,732	1,844
H	mm	3,186	3,186	3,186	3,242
Dry mass	t	18.0	20.5	23.0	25.5

Minimum centreline distance for twin-engine installation: 2,000 mm
** Not available for fixed pitch propeller (FPP)*





MAN L27/38

Tier II Tier III

Tier III with SCR

Bore: 270 mm, Stroke: 380 mm

Speed	r/min	800	800 (MDO*/MGO)
mep	bar	23.5	25.2
		kW	kW
6L27/38		2,040	2,190
7L27/38		2,380	2,555
8L27/38		2,720	2,920
9L27/38		3,060	3,285

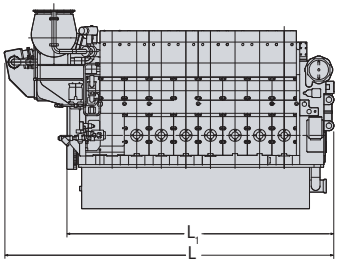
Specific Fuel Oil Consumption (SFOC) to ISO conditions

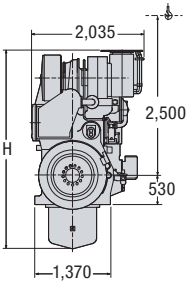
MCR	100%		85%	
kW	340 kW	365 kW	340 kW	365 kW
L27/38	188 g/kWh	191 g/kWh	185 g/kWh	186 g/kWh
L27/38 FPP	187 g/kWh	191 g/kWh	181 g/kWh	185 g/kWh
Specific lube oil consumption 0.8 g/kWh				
Engine type specific reference charge air temperature before cylinder 40 °C				

Dimensions

Cyl. No.		6	7	8	9
L	mm	5,070	5,515	5,960	6,405
L_1	mm	3,962	4,407	4,852	5,263
H	mm	3,555	3,687	3,687	3,687
Dry mass	t	29.0	32.5	36.0	39.5

Minimum centreline distance for twin engine installation: 2,500 mm
** MDO viscosity must not exceed 6 mm2/s = cSt at 40 °C.*





MAN L23/30A

Bore: 225 mm, Stroke: 300 mm

Speed	r/min	900
mep	bar	17.1
		kW
6L23/30A		960
8L23/30A		1,280

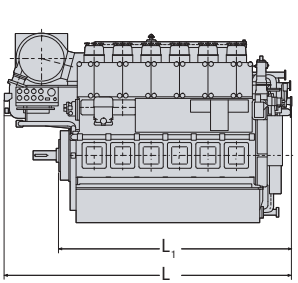
Specific Fuel Oil Consumption (SFOC) to ISO conditions

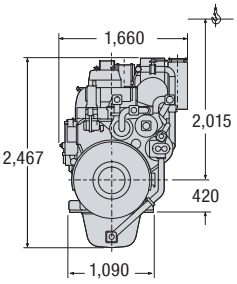
MCR	100%	85%
L23/30A	194 g/kWh	193 g/kWh
L23/30A FPP	194 g/kWh	193 g/kWh
Specific lube oil consumption 1.0 g/kWh		
Engine type specific reference charge air temperature before cylinder 40 °C		

Dimensions

Cyl. No.		6	8
L	mm	3,737	4,477
L_1	mm	3,062	3,802
Dry mass	t	11.0	13.5

Minimum centreline distance for twin engine installation: 1,900 mm





MAN L21/31

Tier II Tier III

Tier III with SCR

Bore: 210 mm, Stroke: 310 mm

Speed	r/min	1000
mep	bar	24.0
		kW
6L21/31		1,290
7L21/31		1,505
8L21/31		1,720
9L21/31		1,935

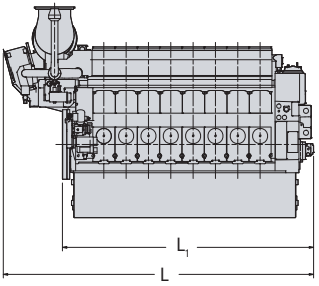
Specific Fuel Oil Consumption (SFOC) to ISO conditions

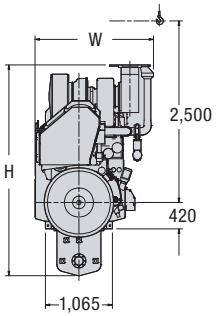
MCR	100%	85%
L21/31	195 g/kWh	192 g/kWh
Specific lube oil consumption 0.8 g/kWh		
Engine type specific reference charge air temperature before cylinder 40 °C		

Dimensions

Cyl. No.		6	7	8	9
L	mm	4,544	4,899	5,254	5,609
L_1	mm	3,424	3,779	4,134	4,489
H	mm	3,113	3,267	3,267	3,267
W	mm	1,695	1,695	1,820	1,820
Dry mass	t	16.0	17.5	19.0	20.5

Minimum centreline distance for twin engine installation: 2,400 mm





Engineering the Future – since 1758.

MAN Diesel & Turbo

MAN VP185

Tier II

Bore: 185 mm, Stroke: 196 mm

Engine Model	Rating Definition	kW	rpm	SFOC at 100% MCR	SFOC at 75% MCR
12VP185TM	B: Unrestricted Marine	2,000	1,765	208 g/kWh	202 g/kWh
12VP185TM	A2: Unrestricted Marine	2,300	1,860	211 g/kWh	203 g/kWh
12VP185TM	A1: Limited Time	2,720	1,950	216 g/kWh	205 g/kWh
18VP185TM	B: Unrestricted Marine	3,000	1,765	208 g/kWh	202 g/kWh
18VP185TM	A2: Unrestricted Marine	3,500	1,860	211 g/kWh	203 g/kWh
18VP185TM	A1: Limited Time	4,000	1,950	216 g/kWh	205 g/kWh

Specific fuel oil consumption according to ISO3046-1:2002 based on a lower calorific value of fuel of 42,700 kJ/kg with all driven lube oil, HT and LT water pumps attached, fulfilling IMO Tier II emissions limitations of +5% SFOC tolerance. 45ºC ambient 32ºC sea water.

Rating definitions:

A1 Rating

For fast patrol craft where the rated power is only required for approximately 15% of the operating profile.

A2 Rating

For fast patrol or displacement craft where 90% to 100% of rated power is likely to be used for 70% of the operating profile.

B Rating

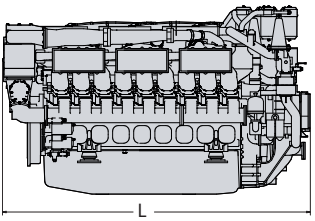
Typically for longer range displacement vessels where 70% to 100% of the rated power is likely to be used for >70% of the operating profile.

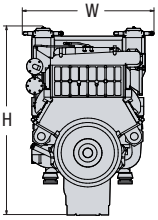
Dimensions

Cyl. No.		12	18
L	mm	3,200	4,039
H	mm	2,312	2,447
W	mm	1,692	1,692
Dry mass*	t	7.8	11.1

** Approximately*

Engine dry weight includes the engine mounted sea water heat exchanger and oil cooler. The dimensions given are for guidance only.





MAN 175D

Bore: 175 mm, Stroke: 215 mm

Engine Model	Rating Definition	kW	rpm	SFOC at 100% MCR Tier II / Tier III	SFOC at 75% MCR Tier II / Tier III
12V175D-MH	Heavy Duty	1,740	1,800	-	-
12V175D-MM	Medium Duty	2,220	1,900	199/202 g/kWh	203/201 g/kWh

For multi-engine arrangement only.
SFOC figures for distillates according to ISO 8217 DMA, with attached lube oil, HT and LT-cooling water pumps.

Rating definitions:

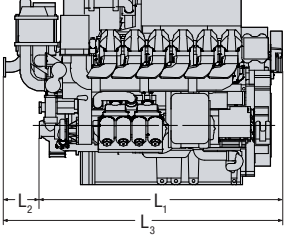
Marine Heavy Duty
- Recommended for vessels with an annual operating time of up to 5,000 hours
- Typical applications include, but are not limited to, work boats, offshore vessels and ferries
- Average load: up to 85%

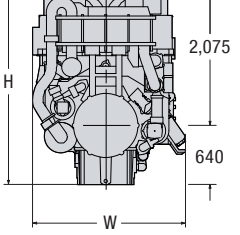
Marine Medium Duty
- Recommended for vessels with an annual operating time of up to 3,000 hours
- Typical applications include, but are not limited to, work boats, offshore vessels, patrol boats and yachts
- Average load: up to 65%

Dimensions

L_1	mm	2,678
L_2	mm	334
L_3	mm	3,012
H	mm	2,115
W	mm	1,633
Dry weight*	t	8.5

** Approximately*
Engine dry weight does not include optional sea water cooler and may vary due to various configurations. The dimensions given are for guidance only.





MAN Four-Stroke

Marine GenSets

MAN Four-Stroke Marine GenSets

MAN Four-Stroke Marine GenSets – All Emission Requirements
Besides focus on power density and fuel economy, MAN Diesel & Turbo is committed to a steady reduction of the environmental impact of our engines.

IMO Tier II
MAN Diesel & Turbo has decreased NO_x emissions significantly by applying well-proven methods that ensure a cleaner and more efficient combustion process. Our four-stroke propulsion engines are IMO Tier II compliant by internal engine measures alone.

IMO Tier III
For operation in emission control areas (ECA), MAN Diesel & Turbo has developed a comprehensive range of selective catalytic reduction (SCR) systems that provides a tremendous reduction in NO_x levels surpassing IMO Tier III requirements.

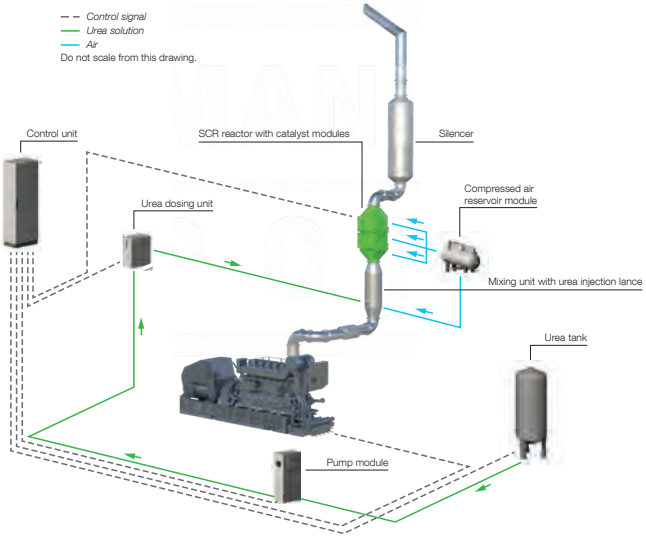
MAN Diesel & Turbo is the first manufacturer to successfully produce and offer IMO Tier III compliant four-stroke marine engines based on a fully modular SCR kit covering our entire four-stroke engine portfolio.

In 2014 MAN Diesel & Turbo was awarded the first IMO Tier III EIAPP certificate together with the classification society DNV-GL.

MAN Four-Stroke Marine GenSets

MAN Diesel & Turbo's standard SCR system is available in fourteen different sizes covering our entire portfolio of four-stroke engines. Customised SCR systems are offered on demand.

MAN has developed a complete range of SCR systems that work perfectly with our engines for maximum system efficiency. The intelligent exhaust gas temperature control enables significant savings in fuel consumption as compared to third party supplier systems. MAN SCR systems work with MGO, MDO and HFO with up to 3.5% sulphur.



MAN GenSet plant with complete SCR system

MAN Four-Stroke Marine GenSets

100% MCR PTO-solutions for L21/31 and L27/38 GenSets
Optimised for both new and existing ship designs

PTO on alternator – external pump

Pump on alternator – common base frame

PTO on front end – external pump (new feature)

Pump on front end – common base frame (new feature)

MAN Four-Stroke Marine GenSets

Fuel oil saving for small bore GenSet (part load optimised)
GenSets can be delivered with improved fuel oil consumption at low load and part load. The penalty will be higher SFOC at high load. The part-load optimised engine complies with the IMO Tier II limit.

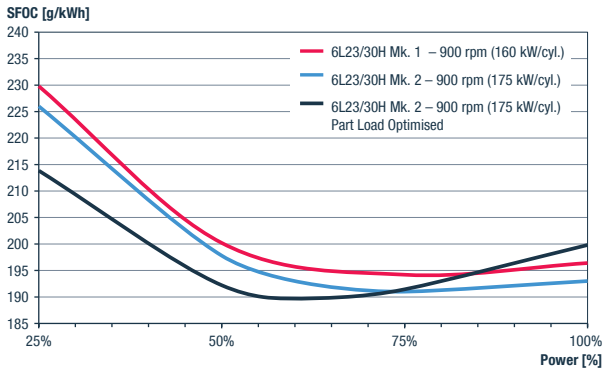
The new tuning method, referred to as part-load optimisation, optimises the engine performance at approx. 60-65% MCR, as this is often the load range in which the GenSet is operating, but it can also be customised to other specific operating conditions.

With part load optimisation, fuel oil savings of up to 12 g/kWh can be obtained, depending on the engine type/model and load point.

Traditionally, GenSets are optimised at 85% MCR, because the power management system will engage additional GenSets when more power is needed.

With part-load optimisation, there is a fuel oil penalty when the load exceeds approx. 80% MCR, but this has no practical consequence as the GenSet rarely exceeds 85% MCR.

This is illustrated in the figure below. For further information, please contact MAN Diesel & Turbo.



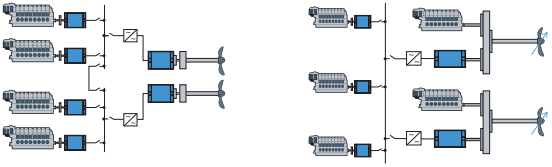
Based on Project Guide figures for IMO Tier II engines – 60Hz:
ISO reference condition, HFO/MDO, without pumps, tolerance +5% (not included)

MAN Four-Stroke Marine GenSets

Diesel-Electric and Hybrid Propulsion Power Trains (HyProp ECO)
MAN Diesel & Turbo offers a full range of diesel-electric and hybrid propulsion power trains. Our solutions are designed and optimised to meet the highest efficiencies of a complete propulsion plant system covering the complete operational profile of the vessel. Our propulsion systems provide a well-balanced and tailormade solution with emphasis on flexibility and performance.

Our comprehensive propulsion packages include the complete array of required components from GenSets to propulsors, including switchboards, variable speed drives and propulsion motors. Full diesel-electric propulsion power trains as well as hybrid systems ensure the optimal technical and economical solution while maximising power demand flexibility.

With HyProp ECO, a new hybrid propulsion system has been developed combining the best propulsion performance with low investment costs.



High-efficient and customised power trains for diesel-electric and hybrid propulsion applications

HyProp ECO: Hybrid propulsion system

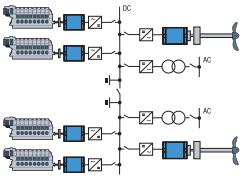
MAN Four-Stroke Marine GenSets

Energy Saving Electric Propulsion (EPROX)

Recent developments in diesel-electric propulsion have resulted in electric systems where engines can operate at variable speed. The "classic" constant speed operation of GenSets is no longer a constraint. Utilising an enlarged engine operation map with a speed range of 60% to 100% paves the way to a high potential in fuel oil savings. Each speed set point of the engines can be adjusted independently in order to achieve a minimum fuel oil consumption according to the system load. The electric system using DC distribution enables a decoupled operation of the engines, propulsion drives, and other consumers of energy.

Another major advantage is the possible integration of energy storage sources, like batteries. They can reduce the transient loads on the engines and improve the dynamic response of the propulsion system. Fast load application is removed from the engines and load peaks are shaved. Also, emission free propulsion can be realized when running on the batteries. In addition, the energy storage sources will have a positive effect on engine maintenance.

MAN Diesel & Turbo offers this advanced package solution in close cooperation with leading E-suppliers.



EPROX energy-saving diesel electric propulsion plant

EPROX propulsion solution on anchor handling tug supply vessel

MAN Four-Stroke Marine GenSets

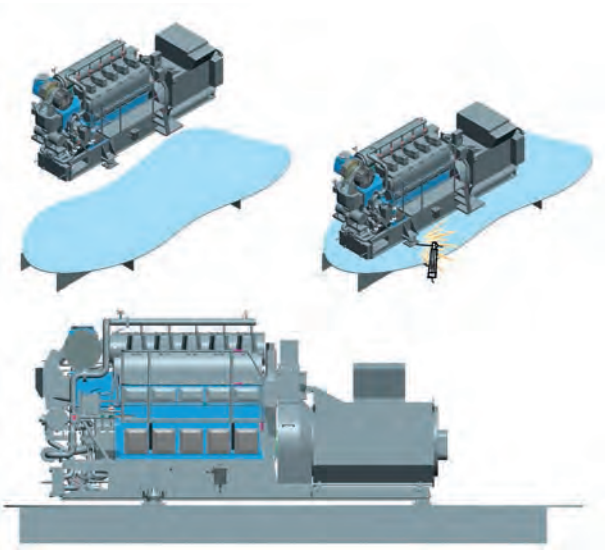
MAN L23/30H Monocoque GenSet – Continued development

The monocoque GenSet includes several updates of the tried and tested L23/30H engine, which are focused on weight reduction, vibration optimisation and simplified installation.

The most significant update is that the alternator is now a load-bearing component, with a 'top brace' connection to the engine. This enables up to 63% weight reduction of the base frame, which again results in weight reduction of up to 13% of the GenSet and a lower vibration level.

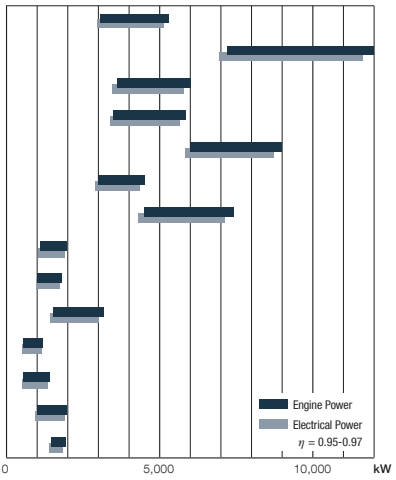
The three and four point 'deck-level' supports significantly simplify the GenSet installation process. This design is installed on a flat deck, which is a major reduction of the vessels foundation structure. Furthermore, applying only three conicals makes the GenSets self-leveling.

The monocoque GenSet application is available for all variants of the L23/30H engine.



MAN Four-Stroke Marine GenSets

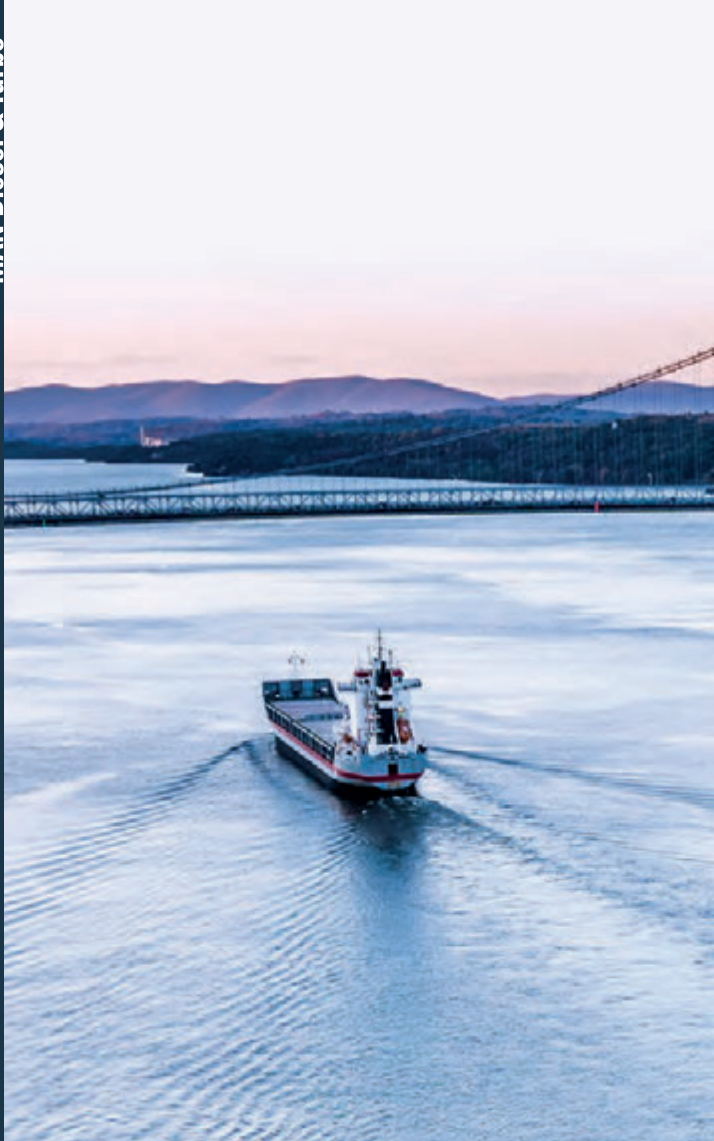
r/min	Engine type
720-750	L35/44DF
720-750	V32/44CR
720-750	L32/44CR
720-750	L32/44
720-750	V32/40
720-750	L32/40
1,000-900	PA6 B OG
720-750	L28/32H
720-750	L28/32DF
720-750	L27/38/ L27/38 (MDO/MGO)
720-900	L23/30DF
720-900	L23/30H Mk 2
900-1,000	L21/31
1,500-1,800	175D



GenSets
GenSets can be applied as auxiliary GenSets, GenSets for diesel-electric propulsion or for offshore applications.

Project specific demands can be clarified at an early project stage.

Tier III GenSets
Four-stroke GenSets are Tier III compatible when a downstream SCR is added to clean the exhaust gas on a Tier II engine. The additional SCR will only have an impact on SFOC if the backpressure is increased.



MAN L35/44DF

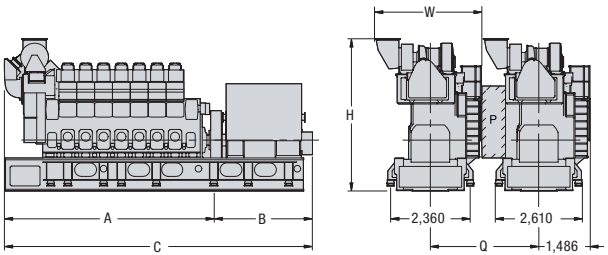
Bore: 350 mm, Stroke: 440 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
6L35/44DF		3,180	3,069	3,060	2,953
7L35/44DF		3,710	3,580	3,570	3,445
8L35/44DF		4,240	4,092	4,080	3,937
9L35/44DF		4,770	4,603	4,590	4,429
10L35/44DF		5,300	5,115	5,100	4,922

Dimensions***

Cyl. No.		6	7	8	9	10
A	mm	6,270	6,900	7,480	8,110	8,690
B**	mm	3,900	4,100	4,400	4,600	4,800
C**	mm	10,170	11,000	11,880	12,710	13,490
W	mm	2,958	3,108	3,108	3,108	3,108
H	mm	4,631	4,867	4,867	4,867	4,867
Dry mass**	t	85	94	103	110	118

* *Based on nominal generator efficiencies of 96.5%*
** *Depending on alternator applied*
*** *Dimensions are not finally fixed*



P Free passage between the engines, width 600 mm and height 2,000 mm
Q Minimum distance between centre of engines: ~3,400 mm (with gallery)

MAN V32/44CR

Tier II Tier III EPA Tier 2

Tier III with SCR

Bore: 320 mm, Stroke: 440 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW[1)]	Eng. kW	Gen. kW[1)]
12V32/44CR		7.200	6.984	7.200	6.984
14V32/44CR[2)]		8.120	7.876	8.120	7.876
16V32/44CR		9,600	9,312	9,600	9,312
18V32/44CR[3)]		10,800	10,476	10,800	10,476
20V32/44CR		12,000	11,640	12,000	11,640

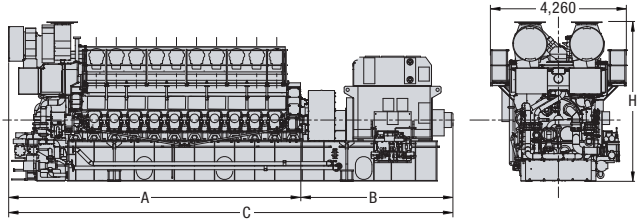
Dimensions

Cyl. No.		12	14	16	18	20
A	mm	5,382	6,012	6,642	7,272	7,902
B	mm	4,201	4,201	4,201	4,201	4,201
C	mm	11,338	11,968	12,598	13,228	13,858
H	mm	5,014	5,014	5,014	5,014	5,014
Dry mass	t	117	131	144	159	172

1) Based on nominal generator efficiencies of 97%

2) 580 kW/cyl

3) 18V32/44CR available rigidly mounted only



MAN L32/44CR

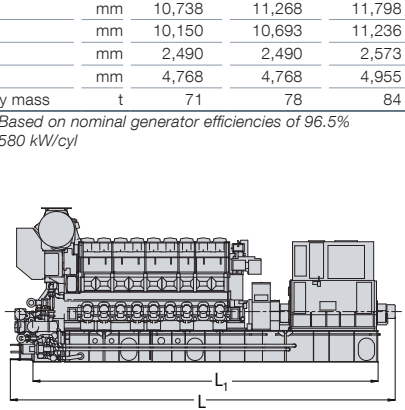
Bore: 320 mm, Stroke: 440 mm

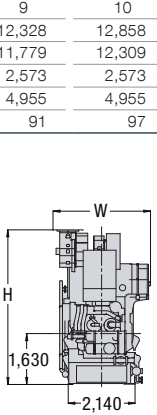
Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW[1)]	Eng. kW	Gen. kW[1)]
6L32/44CR		3,600	3,474	3,600	3,474
7L32/44CR[2)]		4,060	3,918	4,060	3.918
8L32/44CR		4,800	4,632	4,800	4,632
9L32/44CR		5,400	5,211	5,400	5,211
10L32/44CR		6,000	5,790	6,000	5,790

Dimensions

Cyl. No.		6	7	8	9	10
L	mm	10,738	11,268	11,798	12,328	12,858
L_1	mm	10,150	10,693	11,236	11,779	12,309
W	mm	2,490	2,490	2,573	2,573	2,573
H	mm	4,768	4,768	4,955	4,955	4,955
Dry mass	t	71	78	84	91	97

1) Based on nominal generator efficiencies of 96.5%
2) 580 kW/cyl





Free passage between the engines, width 600 mm and height 2,000 mm
Minimum distance between centre of engines: ~2,835 mm (without gallery) ~3,220 mm (with gallery)

MAN L32/44

Exclusively for auxiliary GenSet operation. High power density and space saving GenSet with conventional injection and optimised SFOC for part-load operation.

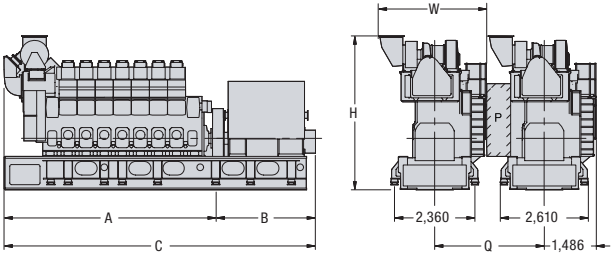
Bore: 320 mm, Stroke: 440 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW[1)]	Eng. kW	Gen. kW[1)]
6L32/44		3,498	3,375	3,498	3,375
8L32/44		4,664	4,500	4,664	4,500
9L32/44		5,247	5,063	5,247	5,063
10L32/44		5,830	5,625	5,830	5,625

Dimensions

Cyl. No.		6	8	9	10
A	mm	6,470	7,531	8,061	8,590
B	mm	3,990	4,229	4,529	4,530
C	mm	10,460	11,760	12,590	13,120
W	mm	2,845	3,054	3,105	3,105
H	mm	4,701	4,887	4,887	4,887
Dry mass	t	82	98	107	113

1) Based on nominal generator efficiencies of 96.5%



P Free passage between the engines, width 600 mm and height 2,000 mm
Q Minimum distance between centre of engines: ~2,835 mm (with gallery)

Project Guide

MAN V32/40

Tier II Tier III

Tier III with SCR

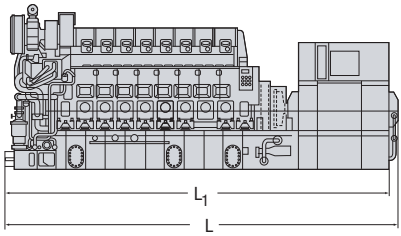
Bore: 320 mm, Stroke: 400 mm

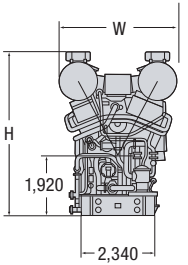
Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
12V32/40		6,000	5,820	6,000	5,820
14V32/40		7,000	6,790	7,000	6,790
16V32/40		8,000	7,760	8,000	7,760
18V32/40		9,000	8,730	9,000	8,730

Dimensions

Cyl. No.		12	14	16	18
L	mm	11,045	11,710	12,555	13,185
L_1	mm	10,450	11,115	11,950	12,580
W	mm	3,365	3,365	3,730	3,730
H	mm	4,850	4,850	5,245	5,245
Dry mass	t	101	113	126	138

* *Based on nominal generator efficiencies of 97%*





MAN L32/40

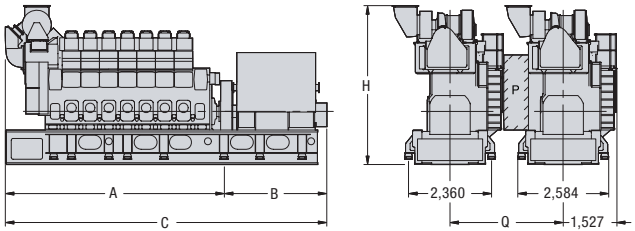
Bore: 320 mm, Stroke: 400 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
6L32/40		3,000	2,895	3,000	2,895
7L32/40		3,500	3,380	3,500	3,380
8L32/40		4,000	3,860	4,000	3,860
9L32/40		4,500	4,345	4,500	4,345

Dimensions

Cyl. No.		6	7	8	9
A	mm	6,340	6,870	7,400	7,930
B	mm	3,415	3,415	3,635	3,635
C	mm	9,755	10,285	11,035	11,565
H	mm	4,622	4,622	4,840	4,840
Dry Mass	t	75.0	79.0	87.0	91.0

** Based on nominal generator efficiencies of 96.5%*



Free passage between the engines, width 600 mm and height 2,000 mm
Minimum distance between centre of engines: ~2,835 mm (without gallery) ~3,220 mm (with gallery)

MAN PA6 B OG

Tier II Tier III

Tier III with SCR

Bore 280 mm, Stroke 330 mm

Speed	r/min	1,000		900	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
12PA6 B		4,440	4,307	4,200	4,074
16PA6 B		5,920	5,742	5,600	5,432
18PA6 B		6,660	6,460	6,300	6,111
20PA6 B		7,400	7,178	7,000	6,790

Dimensions**

Cyl. No.		12	16	18	20
A	mm	4,370	4,727	4,732	4,770
B	mm	4,600	5,637	6,097	6,557
C	mm	9,287	10,583	11,048	11,547
H	mm	3,695	3,695	3,695	3,695
E	mm	2,670	2,670	2,670	2,670
Dry mass***	t	60	72	80	85

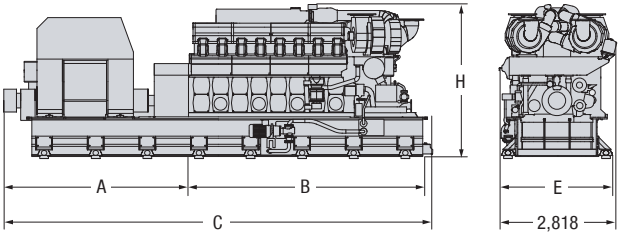
** Nominal generator efficiencies: 97%*

*** Dimensions are based on operation under inclination up to 25 degrees in any direction*

****Incl. 5% tolerance, weight may vary due to different configurations*

Engine fuel: Distillate according to ISO 8217 DMA and DMZ

Permissible overload of 10% for 1 hour every other 12 hours of operation



MAN L28/32H

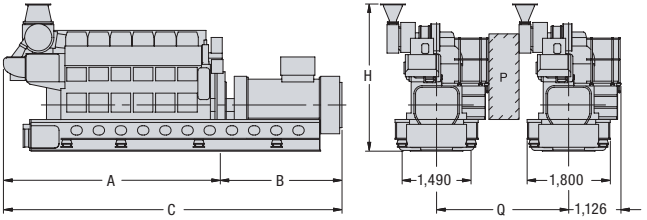
Bore: 280 mm, Stroke: 320 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L28/32H		1,100	1,045	1,050	1,000
6L28/32H		1,320	1,255	1,260	1,200
7L28/32H		1,540	1,465	1,470	1,400
8L28/32H		1,760	1,670	1,680	1,600
9L28/32H		1,980	1,880	1,890	1,800

Dimensions

Cyl. No.		5	6	7	8	9
A	mm	4,279	4,759	5,499	5,979	6,199
B	mm	2,400	2,510	2,680	2,770	2,690
C	mm	6,679	7,269	8,179	8,749	8,889
H	mm	3,184	3,184	3,374	3,374	3,534
Dry Mass	t	32.6	36.3	39.4	40.7	47.1

* *Based on nominal generator efficiencies of 95%*



P Free passage between the engines, width 600 mm and height 2,000 mm
Q Minimum distance between centre of engines: ~2,655 mm (without gallery) ~2,850 mm (with gallery)

Project Guide

MAN L28/32DF

Tier II Tier III

Tier III with SCR

Bore: 280 mm, Stroke: 320 mm

Speed	r/min	750		720	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L28/32DF		1,000	950	1,000	950
6L28/32DF		1,200	1,140	1,200	1,140
7L28/32DF		1,400	1,330	1,400	1,330
8L28/32DF		1,600	1,520	1,600	1,520
9L28/32DF		1,800	1,710	1,800	1,710

Dimensions

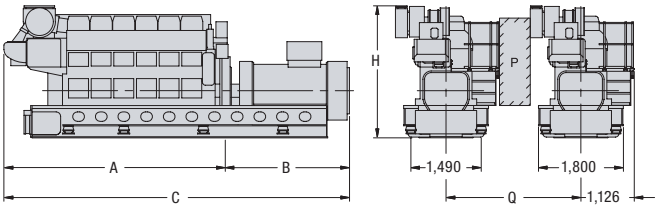
Cyl. No.		5	6	7	8	9
A	mm	4,321	4,801	5,281	5,761	6,241
B	mm	2,400	2,510	2,680	2,770	2,690
C	mm	6,721	7,311	7,961	8,531	8,931
H	mm	2,835	3,009	3,009	3,009	3,009
Dry Mass	t	32.6	36.3	39.4	40.7	47.1

** Based on nominal generator efficiencies of 95%*

Gas / fuel ratio:

- *at load: 20-100% 93 / 7 (Tier II)*
- *at load: 20-100% 99 / 1 (Tier III)*

Gas methane number ≥ 80



P Free passage between the engines, width 600 mm and height 2,000 mm

Q Minimum distance between centre of engines: ~2,655 mm (without gallery) ~2,850 mm (with gallery)

Project Guide

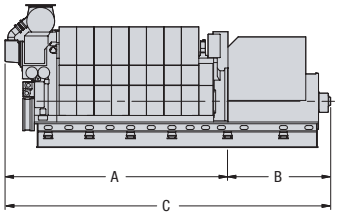
Bore: 270 mm, Stroke: 380 mm

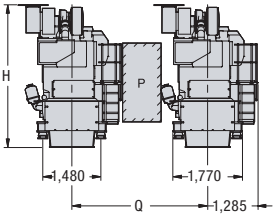
Speed	r/min	750/720		750/720 (MDO**/MGO)	
Frequency	Hz	50/60		50/60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L27/38		1,600/1,500	1,536/ 1,440	-	-
6L27/38		1,980	1,900	2,100	2,016
7L27/38		2,310	2,218	2,450	2,352
8L27/38		2,640	2,534	2,800	2,688
9L27/38		2,970	2,851	3,150	3,024

Dimensions

Cyl. No.		5	6	7	8	9
A	mm	4,346	4,791	5,236	5,681	6,126
B	mm	2,486	2,766	2,766	2,986	2,986
C	mm	6,832	7,557	8,002	8,667	9,112
H	mm	3,712	3,712	3,899	3,899	3,899
Dry Mass	t	40.0	44.5	50.4	58.2	64.7

** Based on nominal generator efficiencies of 96%*
*** MDO viscosity must not exceed 6 mm2/s = cSt @ 40 °C*





P Free passage between the engines, width 600 mm and height 2,000 mm
Q Minimum distance between centre of engines: ~2,900 mm (without gallery) ~3,100 mm (with gallery).

Project Guide

MAN L23/30H Mk 2

Tier II Tier III

Tier III with SCR

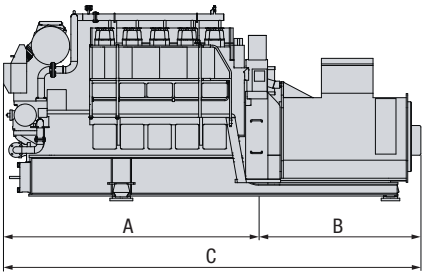
Bore: 225 mm, Stroke: 300 mm

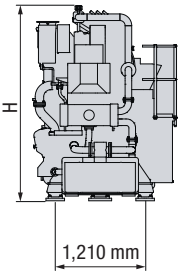
Speed r/min	750		720		900	
Frequency Hz	50		60		60	
	Eng. kW	Gen. kW*	Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L23/30H ECR	525	500	525	500	-	-
5L23/30H	675/740	641/703	650/710	618/675	-	-
6L23/30H	888	844	852	809	1,050	998
7L23/30H	1,036	984	994	944	1,225	1,164
8L23/30H	1,184	1,125	1,136	1,079	1,400	1,330

Dimensions

Cyl. No.		5	6	6	7	7	8	8
	r/min	720/750	720/750	900	720/750	900	720/750	900
A	mm	3,415	3,785	3,785	4,155	4,276	4,525	4,896
B	mm	2,130	2,130	2,130	2,130	2,130	2,130	2,130
C	mm	5,545	5,915	5,915	6,285	6,406	6,655	7,025
H	mm	2,625	2,625	2,625	2,625	2,625	2,625	2,625
Dry Mass	t	16.8	18.3	18.3	20.1	20.1	21.4	21.4

* *Based on nominal generator efficiencies of 95%*





Free passage between the engines, width 600 mm and height 2,000 mm
Minimum distance between centre of engines: ~2,250 mm (without gallery) ~2,600 mm (with gallery)

Project Guide

Bore: 225 mm, Stroke: 300 mm

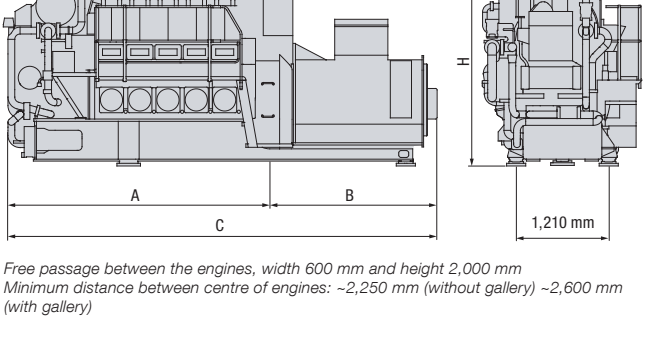
Speed	r/min	750		720		900	
Frequency	Hz	50		60		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L23/30DF		625	590	625	590	-	-
6L23/30DF		750	710	750	710	900	855
7L23/30DF		875	830	875	830	1,050	995
8L23/30DF		1,000	950	1,000	950	1,200	1,140

Dimensions

Cyl. No.		5	6	6	7	7	8	8
	r/min	720/750	720/750	900	720/750	900	720/750	900
A	mm	3,469	3,839	3,839	4,209	4,276	4,579	4,896
B	mm	2,202	2,252	2,252	2,302	2,302	2,352	2,352
C	mm	5,671	6,091	6,091	6,511	6,578	6,931	7,241
H	mm	2,749	2,749	2,749	2,749	2,749	2,749	2,749
Dry Mass	t	17.3	19.0	19.2	21.4	21.4	23.3	23.4

** Based on nominal generator efficiencies of 95%*
Gas / fuel ratio:
- *at load: 20-100% 99 / 1 (Tier III)*

Gas methane number ≥ 80



Free passage between the engines, width 600 mm and height 2,000 mm
Minimum distance between centre of engines: ~2,250 mm (without gallery) ~2,600 mm (with gallery)

Project Guide

MAN L21/31

Tier II Tier III

Tier III with SCR

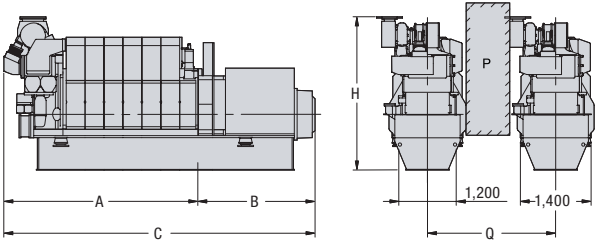
Bore: 210 mm, Stroke: 310 mm

Speed	r/min	1,000		900	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
5L21/31		1,000	950	1,000	950
6L21/31		1,320	1,254	1,320	1,254
7L21/31		1,540	1,463	1,540	1,463
8L21/31		1,760	1,672	1,760	1,672
9L21/31		1,980	1,881	1,980	1,881

Dimensions

Cyl. No.		5	6	7	8	9
A	mm	3,959	4,314	4,669	5,572	5,927
B	mm	1,870	2,000	1,970	2,110	2,135
C	mm	5,829	6,314	6,639	7,682	8,062
H	mm	3,183	3,183	3,289	3,289	3,289
Dry Mass	t	22.5	26.0	29.5	33.0	36.5

** Based on nominal generator efficiencies of 95%*



P Free passage between the engines, width 600 mm and height 2,000 mm
Q Minimum distance between centre of engines: ~2,400 mm (without gallery) ~2,600 mm (with gallery).

Project Guide

MAN 175D

Bore: 175 mm, Stroke: 215 mm

Engine Model	Rating Definition	kWm	kWe*	rpm (freq.)	SFOC at 100% MCR Tier II/Tier III g/kWh	SFOC at 75% MCR Tier II/Tier III g/kWh
12V175D-MEM	Diesel-Electric Medium Duty	1,440	1,376	1,500 (50 Hz)	188/198	194/201
		1,800	1,720	1,800 (60 Hz)	195/203	203/207
12V175D-MEL	Diesel-Electric Light Duty	1,620	1,548	1,500 (50 Hz)	188/194	193/199
		1,920	1,834	1,800 (60 Hz)	195/202	201/205
12V175D-MA	Auxiliary Duty	1,620	1,548	1,500 (50 Hz)	188/194	193/199
		1,920	1,834	1,800 (60 Hz)	195/202	201/205

** 3-phase, 0.8 p.f., assumes alternator efficiency of 95.5%.*
SFOC figures related to mechanical output and for distillates according to ISO 8217 DMA, with attached lube oil, HT and LT-cooling water pumps.

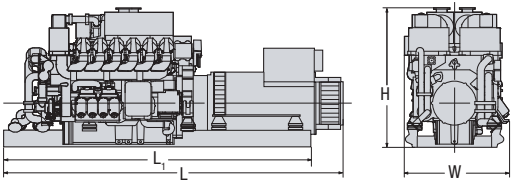
Rating definitions:

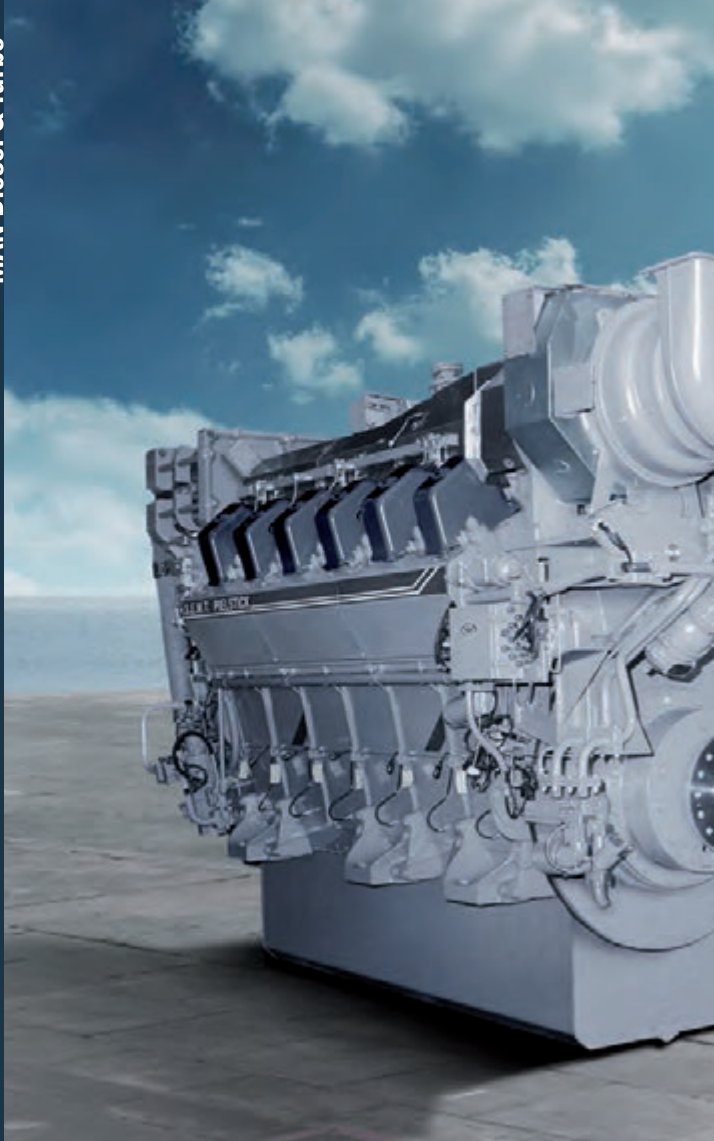
Marine Diesel-Electric Medium Duty	▪ For continuous power generation with variable load aboard vessels for diesel-electric drives ▪ Typical applications include, but are not limited to navy, offshore vessels and ferries ▪ Average load: up to 75%
Marine Diesel-Electric Light Duty	▪ For continuous power generation with variable load aboard vessels for diesel-electric drives ▪ Typical applications include, but are not limited to navy, offshore vessels and yachts ▪ Average load: up to 50%
Marine Auxiliary	▪ For continuous power generation with variable load aboard vessels for auxiliary use ▪ Average load: up to 50%

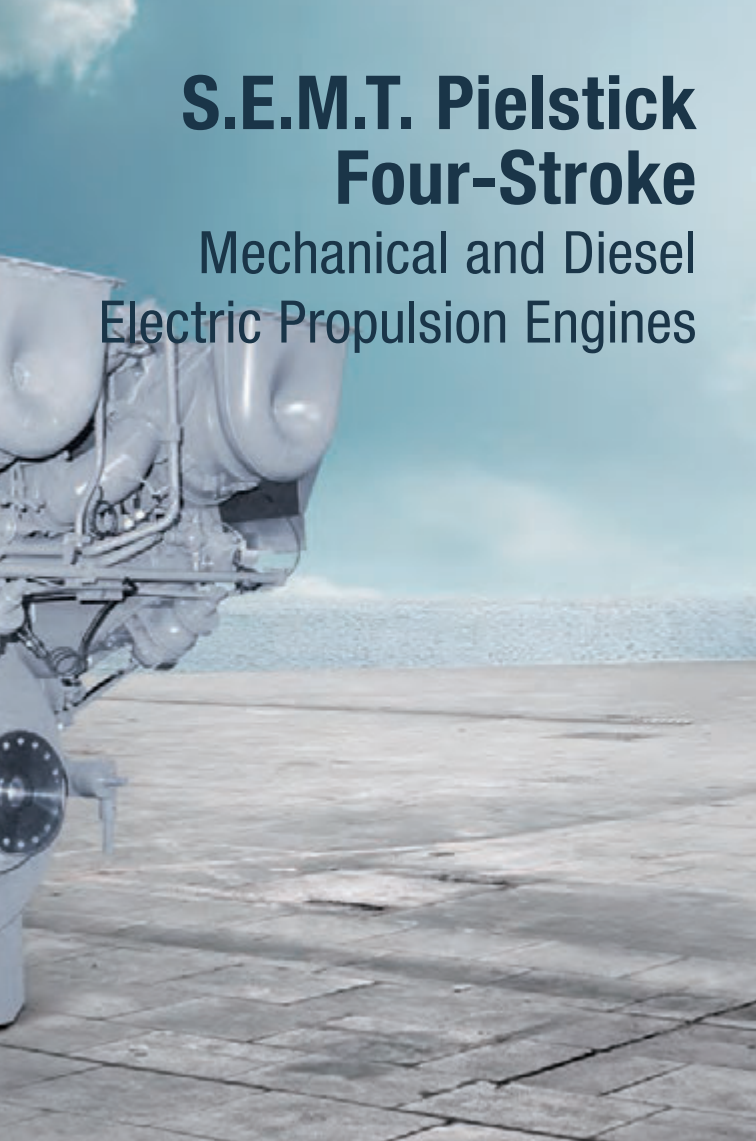
Dimensions

L_1	mm	5,350
L	mm	5,530
W	mm	1,641
H	mm	2,365
Dry weight	t	15.95

GenSet dimensions and weight shown are for guidance only. Details may vary due to different configurations.







S.E.M.T. Pielstick Four-Stroke

Mechanical and Diesel Electric Propulsion Engines

S.E.M.T. Pielstick PA6 B STC

Tier II Tier III

Tier III with SCR

Bore: 280 mm, Stroke: 330 mm

Speed	r/min	1,050
mep	bar	22.8
		kW*
12PA6 B STC		4,860
16PA6 B STC		6,480
20PA6 B STC		8,100

Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
PA6 B STC	-1)	-1)

Dimensions

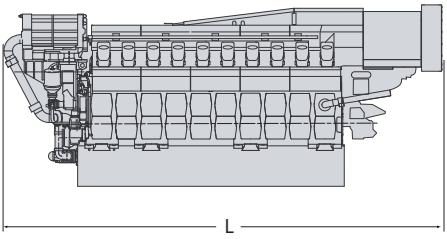
Cyl. No.		12	16	20
L	mm	5,830	6,780	7,960
W	mm	2,340	2,340	2,640
H	mm	3,124	3,124	3,166
Dry mass	t	31	37	43

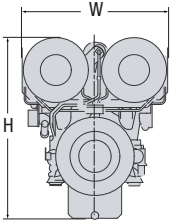
Engine fuel: distillate according to ISO 8217 DMA

Engine rating: engine rating according to ISO 3046 conditions

* *110% load for one in six operating hours on navy vessels, with approval according to HSVR from DNV, available on special request*

1) *SFOC values are project specific. Please contact MAN Diesel & Turbo for further information.*





S.E.M.T. Pielstick PA6 B

GenSet for diesel electric propulsion.

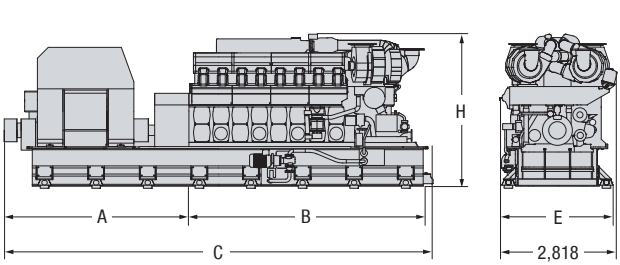
Bore 280 mm, Stroke 330 mm

Speed	r/min	1,000		900	
Frequency	Hz	50		60	
		Eng. kW	Gen. kW*	Eng. kW	Gen. kW*
12PA6 B		4,440	4,307	4,200	4,074
16PA6 B		5,920	5,742	5,600	5,432
18PA6 B		6,660	6,460	6,300	6,111
20PA6 B		7,400	7,178	7,000	6,790

Dimensions**

Cyl. No.		12	16	18	20
A	mm	4,370	4,727	4,732	4,770
B	mm	4,600	5,637	6,097	6,557
C	mm	9,287	10,583	11,048	11,547
H	mm	3,695	3,695	3,695	3,695
E	mm	2,670	2,670	2,670	2,670
Dry mass***	t	60	72	80	85

** Nominal generator efficiencies: 97%*
*** Dimensions are based on operation under inclination up to 25 degrees in any direction*
****Incl. 5% tolerance, weight may vary due to different configurations*
Engine fuel: Distillate according to ISO 8217 DMA and DMZ
Permissible overload of 10% for 1 hour every other 12 hours of operation



S.E.M.T. Pielstick PC2.6 B

Tier II Tier III

Tier III with SCR

Bore: 400 mm, Stroke: 500 mm

Speed	r/min	600
mep	bar	23.9
		kW
12PC2.6 B		9,000
14PC2.6 B		10,500
16PC2.6 B		12,000

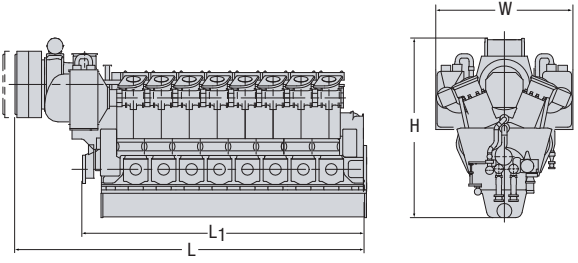
Specific Fuel Oil Consumption (SFOC) to ISO conditions

MCR	100%	85%
PC2.6 B	-[1)]	-[1)]

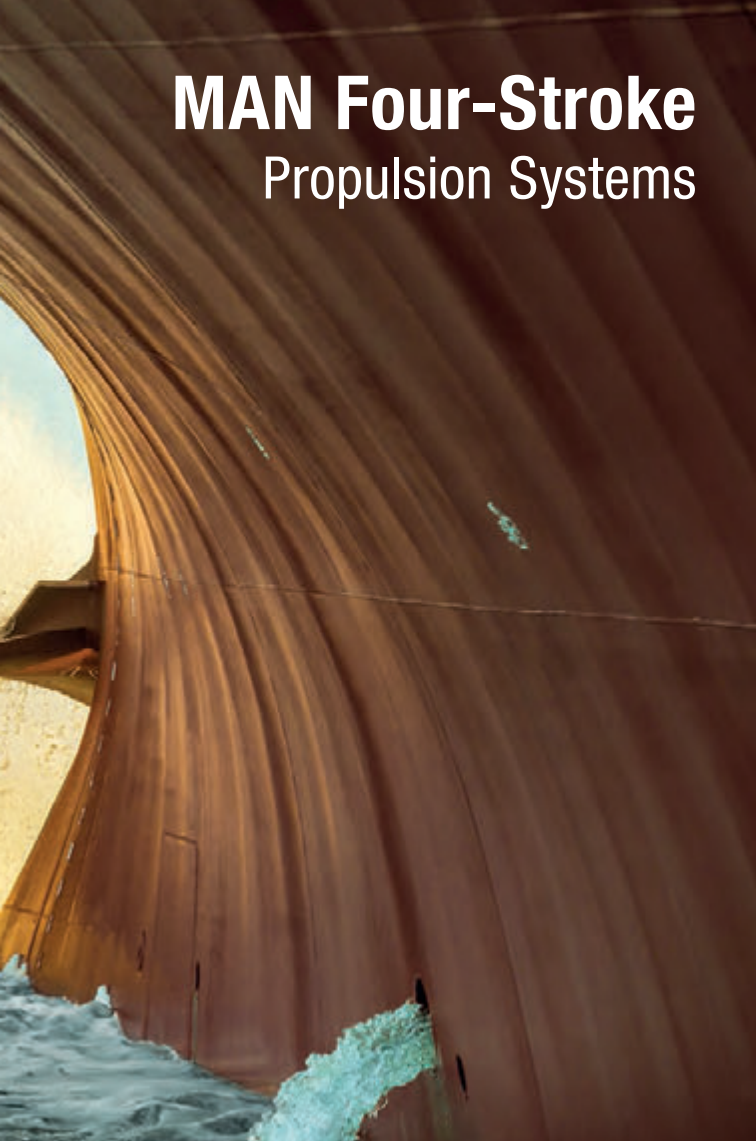
Dimensions

Cyl. No.		12	14	16
L	mm	9,100	9,840	10,580
L_1	mm	5,960	6,700	7,440
W	mm	3,780	3,780	3,780
H	mm	4,800	4,800	4,800
Dry mass	t	94	104	114

[1)] SFOC values are project specific. Please contact MAN Diesel & Turbo for further information.



MAN Four-Stroke
Propulsion Systems



MAN Alpha

Propeller Programme – FPP and CPP

MAN Alpha Kappel propeller – four-bladed CP with fairing cone for rudder bulb

The MAN Alpha FPP portfolio covers:

- power range of 4-40 MW per shaft
- blade configurations for 3, 4, 5 and 6-bladed propellers
- propellers with integrated shaft line and stern tube solutions
- a wide range of stern tube lube and sealing systems
  – oil, water, biodegradable oils.

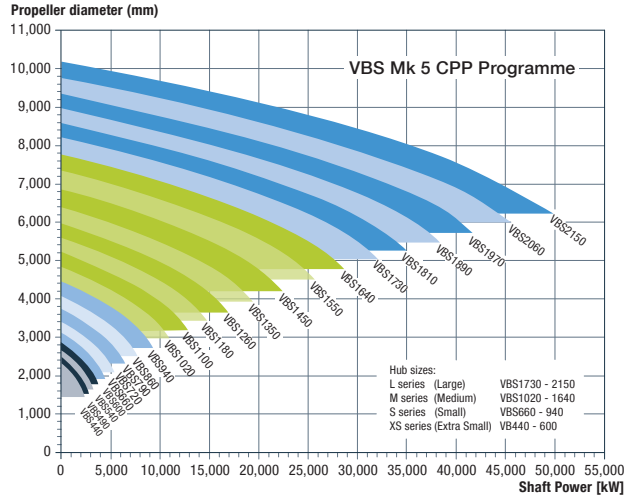
The MAN Alpha FPPs are characterised by the following benefits:

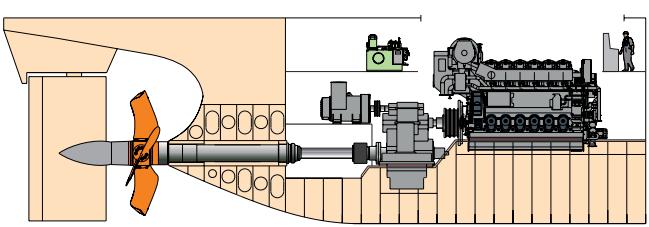
- High-efficient hydrodynamically optimised blade profiles
  – Kappel designs available
- High reliability: robust approach with ample mechanical design margins
- High-efficient aft ship integration with rudder, rudder bulb, ducts, etc.
- Layouts for complete propulsion systems
- Plant calculations with upfront consideration to torsional vibration calculation (TVC), alignment and control systems.

MAN Four-Stroke Propulsion Systems

MAN Alpha Controllable Pitch Propeller

- As standard Mk 5 versions are 4-bladed – optionally 3- and 5-bladed propellers are available on request
- The figures stated after VBS indicate the propeller hub diameter
- Standard blade/hub materials are Ni-Al-bronze, stainless steel is optional
- The propellers are available up to the highest ice classes. However the below standard programme, is based on 'no ice'.





Four-stroke propulsion system installation – complete powertrain with propeller and aft ship equipment

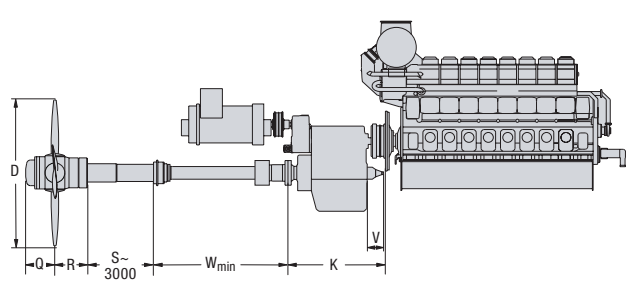
MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
L51/60DF										
6	6,900	162	4,400	1,100	851	920				
6	6,900	133	5,000	1,180	914	989				
6	6,900	103	5,850	1,350	1,037	1,096				
7	8,050	160	4,550	1,180	914	989				
7	8,050	133	5,150	1,260	975	1,036				
7	8,050	104	6,000	1,450	1,114	1,148				
8	9,200	157	4,700	1,180	914	989				
8	9,200	132	5,300	1,350	1,037	1,096				
8	9,200	103	6,200	1,450	1,114	1,148				
9	10,350	155	4,850	1,260	975	1,036				
9	10,350	131	5,450	1,350	1,037	1,096				
9	10,350	102	6,400	1,550	1,175	1,213				
V48/60CR										
12	14,400	160	4,950	1,350	1,037	1,096	1,800	2,620		26.7
12	14,400	130	5,600	1,450	1,114	1,163	1,850	2,770		33.2
12	14,400	100	6,600	1,640	1,260	1,256	1,900	3,140		42.2
14	16,800	160	5,100	1,450	1,114	1,163	1,850	2,775		31.7
14	16,800	130	5,850	1,550	1,187	1,208	1,900	2,905		38.1
14	16,800	100	6,850	1,730	1,330	1,307	1,950	3,355		48.5
16	19,200	160	5,260	1,450	1,114	1,163	1,850	2,805		32.9
16	19,200	130	6,050	1,640	1,260	1,256	1,950	3,155		43.9
16	19,200	100	7,100	1,730	1,330	1,367	2,000	3,455		56.3
18	21,600	160	5,400	1,550	1,187	1,213	1,900	2,905		37.3
18	21,600	130	6,200	1,640	1,260	1,266	1,950	3,155		45.5
18	21,600	100	7,300	1,810	1,390	1,420	2,000	3,655		61.4
L48/60CR										
6	7,200	172	4,250	1,100	851	970	1,700			19.1
6	7,200	143	4,800	1,180	914	989	1,700			23.0
6	7,200	112	5,600	1,350	1,037	1,096	1,700			29.9
7	8,400	169	4,400	1,100	851	995	1,700			21.4
7	8,400	141	5,000	1,260	975	1,036	1,700			26.4
7	8,400	110	5,850	1,350	1,037	1,096	1,750			32.3
8	9,600	166	4,550	1,180	914	989	1,700			24.2
8	9,600	139	5,150	1,260	975	1,036	1,700			28.2
8	9,600	110	6,000	1,450	1,114	1,148	1,800			37.9
9	10,800	163	4,700	1,260	975	1,036	1,700			27.2
9	10,800	137	5,300	1,350	1,037	1,096	1,800			33.2
9	10,800	108	6,200	1,450	1,114	1,163	1,800			40.2

MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
V48/60B										
12	13,800	162	4,950	1,350	1,027	1,100	1,800		876	31.5
12	13,800	135	5,600	1,450	1,122	1,197	1,900		876	39.0
12	13,800	106	6,600	1,640	1,260	1,256	1,900		876	51.2
14	16,100	163	5,100	1,450	1,122	1,197	1,800		876	36.6
14	16,100	131	5,850	1,550	1,175	1,225	1,900		876	45.4
14	16,100	99	6,850	1,730	1,330	1,339	1,950		TBS	55.8
16	18,400	162	5,250	1,450	1,122	1,197	1,900		876	39.2
16	18,400	129	6,050	1,550	1,175	1,225	1,950		876	50.0
16	18,400	97	7,100	1,810	1,390	1,300	2,000		TBS	61.0
18	20,700	161	5,400	1,550	1,175	1,225	1,900		876	44.7
18	20,700	128	6,200	1,640	1,260	1,256	1,950		876	54.7
18	20,700	96	7,300	1,890	1,450	1,370	2,000		TBS	63.3
L48/60B										
6	6,900	170	4,250	1,100	851	920	1,700		739	18.5
6	6,900	142	4,800	1,180	914	1,004	1,700		739	22.5
6	6,900	111	5,600	1,350	1,027	1,096	1,700		876	28.9
7	8,050	167	4,400	1,100	851	945	1,700		739	20.7
7	8,050	139	5,000	1,260	972	1,036	1,700		739	25.7
7	8,050	109	5,850	1,350	1,027	1,035	1,750		876	31.6
8	9,200	165	4,550	1,180	914	1,004	1,700		739	23.2
8	9,200	138	5,150	1,260	972	1,036	1,700		739	27.2
8	9,200	109	6,000	1,450	1,122	1,197	1,800		876	36.6
9	10,350	162	4,700	1,260	972	1,036	1,700		739	25.9
9	10,350	136	5,300	1,350	1,027	1,096	1,750		876	31.0
9	10,350	107	6,200	1,450	1,122	1,163	1,800		876	39.1

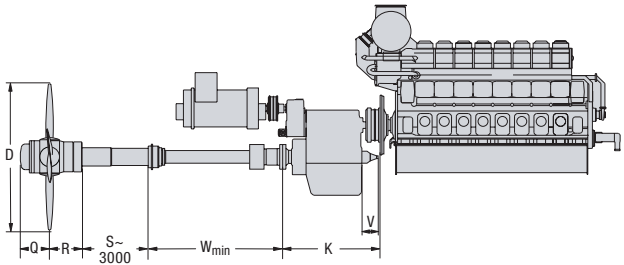
[1] Smin and propeller mass are based on 6,000 mm propeller shaft and 3,000 mm stern tube



MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
V45/60CR										
12	15,600	161	5,100	1,450	1,122	1,197	1,800			
12	15,600	133	5,750	1,550	1,175	1,236	1,900			
12	15,600	106	6,750	1,640	1,260	1,288	1,950			
14	18,200	164	5,200	1,450	1,122	1,227	1,800			
14	18,200	131	5,950	1,550	1,175	1,256	1,900			
14	18,200	104	7,000	1,730	1,330	1,339	3,000			
L35/44DF										
6	3,180	208	3,300	790	600	692	1,400			6.4
6	3,180	167	3,800	940	714	886	1,530			8.7
6	3,180	130	4,400	1,020	775	896	1,530			10.9
7	3,710	198	3,500	860	653	750	1,530			7.9
7	3,710	161	4,000	940	714	886	1,530			9.5
7	3,710	128	4,600	1,100	836	1,001	1,560			12.7
8	4,240	197	3,600	860	653	750	1,530			8.4
8	4,240	165	4,050	940	714	886	1,530			10.0
8	4,240	127	4,750	1,100	836	1,001	1,560			13.6
9	4,770	202	3,600	940	714	886	1,530			9.3
9	4,770	167	4,100	1,020	775	896	1,560			11.9
9	4,770	130	4,800	1,100	836	1,001	1,630			14.7
10	5,300	199	3,700	940	714	886	1,560			10.2
10	5,300	166	4,200	1,020	775	896	1,560			12.5
10	5,300	126	5,000	1,180	897	1,004	1,630			16.8

[1] *Smin and propeller mass are based on 6,000 mm propeller shaft and 3,000 mm stern tube*



MAN Standard Package Examples

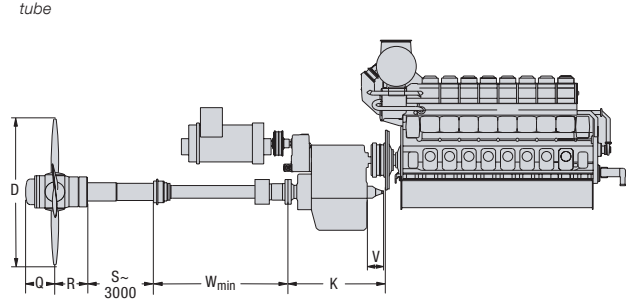
Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
V32/44CR										
12	7,200	207	3,800	1,020	795	879	1,650			14.4
12	7,200	167	4,400	1,100	851	920	1,700			17.4
12	7,200	128	5,250	1,260	975	1,036	1,700			22.9
14	8,120	202	3,950	1,020	795	879	1,650			15.2
14	8,120	164	4,550	1,180	914	989	1,700			19.7
14	8,120	127	5,400	1,260	975	1,036	1,700			24.4
16	9,600	205	4,050	1,100	851	945	1,700			18.1
16	9,600	165	4,650	1,180	914	989	1,700			21.8
16	9,600	127	5,550	1,350	1,037	1,096	1,750			28.2
18	10,800	205	4,150	1,180	914	989	1,700			20.2
18	10,800	164	4,750	1,260	975	1,036	1,700			24.2
18	10,800	126	5,700	1,450	1,114	1,148	1,800			32.7
20	12,000	204	4,250	1,180	914	989	1,700			21.2
20	12,000	163	4,850	1,260	975	1,036	1,750			25.8
20	12,000	124	5,850	1,450	1,114	1,163	1,800			34.7
L32/44CR										
6	3,600	206	3,350	860	653	750	1,400			8.9
6	3,600	170	3,800	940	714	886	1,520			10.4
6	3,600	130	4,450	1,020	775	896	1,520			12.4
7	4,060	202	3,500	860	653	750	1,520			9.7
7	4,060	168	3,950	940	714	886	1,520			11.2
7	4,060	131	4,600	1,100	836	1,001	1,550			14.3
8	4,800	199	3,600	940	714	886	1,520			10.9
8	4,800	167	4,050	1,020	775	896	1,520			12.5
8	4,800	129	4,750	1,100	836	1,001	1,630			16.2
9	5,400	200	3,650	940	714	886	1,520			11.3
9	5,400	166	4,150	1,020	775	896	1,550			13.6
9	5,400	128	4,900	1,180	897	1,004	1,630			17.9
10	6,000	201	3,700	940	714	886	1,550			12.3
10	6,000	164	4,250	1,020	775	896	1,630			15.1
10	6,000	128	5,000	1,180	897	1,004	1,650			18.9

[1] Smin and propeller mass are based on 6,000 mm propeller shaft and 3,000 mm stern tube

MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
V32/40										
12	6,000	187	3,950	1,020	775	896	1,560			15.2
12	6,000	159	4,400	1,100	836	970	1,630			18.3
12	6,000	128	5,050	1,180	914	989	1,700			22.6
14	7,000	183	4,100	1,020	775	901	1,630			17.1
14	7,000	158	4,550	1,100	836	970	1,650			19.8
14	7,000	127	5,250	1,260	975	1,036	1,700			26.1
16	8,000	183	4,200	1,100	836	970	1,650			19.3
16	8,000	155	4,700	1,180	914	989	1,700			23.6
16	8,000	126	5,400	1,260	975	1,036	1,700			27.8
18	9,000	181	4,300	1,100	836	995	1,700			21.0
18	9,000	153	4,850	1,260	975	1,036	1,700			26.2
18	9,000	123	5,600	1,350	1,037	1,096	1,740			31.6
L32/40										
6	3,000	205	3,300	790	639	692	1,400			8.8
6	3,000	171	3,700	860	653	745	1,400			9.9
6	3,000	137	4,200	940	714	886	1,520			12.0
7	3,500	199	3,450	860	653	745	1,400			9.8
7	3,500	168	3,850	940	714	886	1,520			11.8
7	3,500	134	4,400	1,020	775	896	1,520			13.9
8	4,000	198	3,550	860	653	745	1,400			10.3
8	4,000	165	4,000	940	714	906	1,520			12.5
8	4,000	133	4,550	1,100	836	1,001	1,560			16.3
9	4,500	195	3,650	940	714	906	1,520			12.2
9	4,500	164	4,100	1,020	775	896	1,520			14.1
9	4,500	134	4,650	1,100	836	1,006	1,560			17.1

[1] Smin and propeller mass are based on 6,000 mm propeller shaft and 3,000 mm stern tube



MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
V28/33D STC										
12	6,000	187	3,700	940	735	828	1,600			10.9
12	6,000	155	4,000	1,020	795	879	1,650			13.1
12	6,000	140	4,300	1,100	851	920	1,650			14.5
16	8,000	211	3,700	1,020	795	879	1,650			13.1
16	8,000	184	4,000	1,100	851	920	1,650			14.7
16	8,000	159	4,300	1,100	851	945	1,700			16.2
20	10,000	228	3,700	1,100	851	920	1,650			14.6
20	10,000	199	4,000	1,100	851	945	1,700			16.3
20	10,000	176	4,300	1,180	914	989	1,700			18.3

[1] Smin and propeller mass are based on 6,000 mm propeller shaft and 3,000 mm stern tube

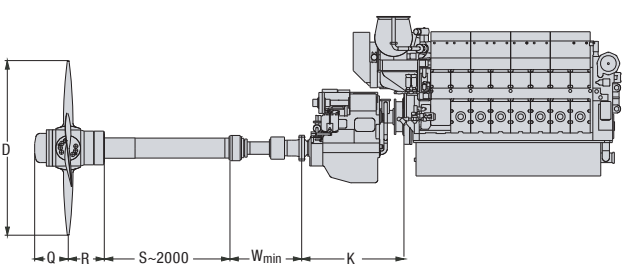
L27/38										
6	2,040	258	2,650	660	501	631	1,320			4.9
6	2,040	218	2,950	720	547	650	1,350			5.7
6	2,040	191	3,200	790	639	692	1,350			6.6
6	2,040	163	3,500	790	639	692	1,350			7.0
6	2,040	152	3,650	860	653	745	1,350			7.8
7	2,380	247	2,800	720	547	513	1,350			5.7
7	2,380	211	3,100	720	547	513	1,350			6.1
7	2,380	186	3,350	790	639	692	1,350			7.0
7	2,380	161	3,650	860	653	745	1,400			8.1
7	2,380	150	3,800	860	653	745	1,400			8.4
8	2,720	242	2,900	720	547	513	1,350			6.1
8	2,720	209	3,200	790	639	692	1,350			6.9
8	2,720	186	3,450	790	639	692	1,400			7.5
8	2,720	173	3,600	860	653	745	1,400			8.3
8	2,720	147	3,950	940	714	886	1,400			9.7
9	3,060	243	2,950	720	547	513	1,350			6.3
9	3,060	206	3,300	790	639	692	1,400			7.5
9	3,060	184	3,550	860	653	745	1,400			8.5
9	3,060	172	3,700	860	653	745	1,400			8.7
9	3,060	147	4,050	940	714	886	1,530			10.5

[1] Smin and propeller mass are based on 4,000 mm propeller shaft and 2,000 mm stern tube for 21/31, 27/38 and 6,000 mm propeller shaft and 3,000 mm stem tube for the other types

MAN Standard Package Examples

Cyl.	kW	Prop. speed r/min	D mm	Hub VBS mm	Q mm	R mm	Wmin mm	K mm	V mm	Prop. mass t [1]
L21/31										
6	1,290	274	2,350	600	456	566	1,320			3.8
6	1,290	232	2,600	600	456	566	1,320			4.1
6	1,290	205	2,800	660	501	631	1,320			4.4
6	1,290	181	3,000	660	501	631	1,320			4.7
7	1,505	260	2,500	600	456	566	1,320			4.1
7	1,505	223	2,750	660	501	631	1,320			4.6
7	1,505	198	2,950	660	501	631	1,320			4.8
7	1,505	176	3,150	720	547	650	1,320			5.4
8	1,720	261	2,550	600	456	581	1,320			4.4
8	1,720	219	2,850	660	501	631	1,320			4.8
8	1,720	196	3,050	720	547	650	1,320			5.1
8	1,720	176	3,250	720	547	650	1,350			5.6
9	1,935	262	2,600	660	501	631	1,320			4.7
9	1,935	221	2,900	720	547	650	1,320			5.4
9	1,935	199	3,100	720	547	650	1,350			5.9
9	1,935	188	3,200	720	547	650	1,350			6.0

[1] Smin and propeller mass are based on 4,000 mm propeller shaft and 2,000 mm stern tube for 21/31, 27/38 and 6,000 mm propeller shaft and 3,000 mm stem tube for the other types

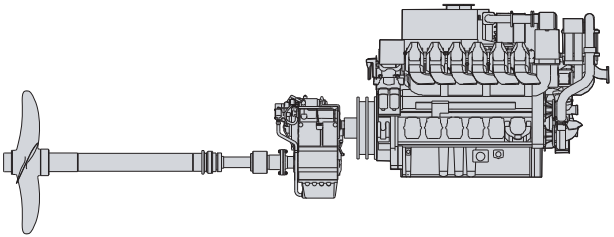


MAN Alpha FPP solutions for MAN 175D

Engine rating [1]	Engine power	Engine speed	Propeller speed	Propeller diameter	Propeller 4-bladed	Shaft diameter	Design speed
12V175D	kW	r/min	r/min	mm	type	mm	knots
MH	1,740	1,800	884	1,300	FPP	175	25
MH	1,740	1,800	702	1,400	FPP	175	25
MH	1,740	1,800	620	1,450	FPP	175	25
MH	1,740	1,800	523	1,600	FPP	175	25
MH	1,740	1,800	450	1,750	FPP	175	20
MH	1,740	1,800	400	1,850	FPP	205	20
MH	1,740	1,800	360	2,000	FPP	205	20
MH	1,740	1,800	331	2,100	FPP	205	20
MH	1,740	1,800	302	2,250	FPP	205	15
MH	1,740	1,800	288	2,300	FPP	205	15
MH	1,740	1,800	261	2,450	FPP	225	15
MH	1,740	1,800	247	2,500	FPP	225	15
MM	2,220	1,900	741	1,300	FPP	175	25
MM	2,220	1,900	654	1,450	FPP	175	25
MM	2,220	1,900	552	1,550	FPP	205	25
MM	2,220	1,900	475	1,750	FPP	205	20
MM	2,220	1,900	422	1,850	FPP	205	20
MM	2,220	1,900	380	2,000	FPP	205	20
MM	2,220	1,900	350	2,100	FPP	205	20
MM	2,220	1,900	319	2,200	FPP	225	15
MM	2,220	1,900	304	2,250	FPP	225	15
MM	2,220	1,900	275	2,500	FPP	225	15

[1] Engine rating designations: MH = Marine 'Heavy Duty' and MM = Marine 'Medium Duty'

Propellers for the MAN 12V175D engines are optimized for a diesel-mechanical twin screw vessel operating at 85% engine rating. The standard propeller programme is dimensioned according to Lloyd's Register No Ice.

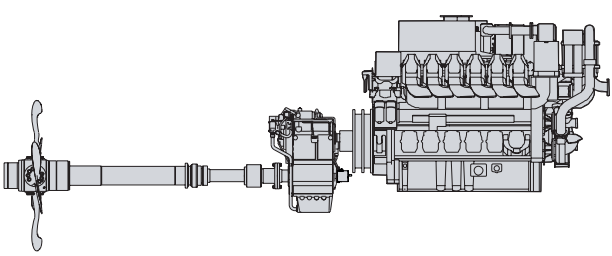


MAN Alpha CPP solutions for MAN 175D

Engine rating [1]	Engine power	Engine speed	Propeller speed	Propeller diameter	Propeller hub diam.	Shaft diameter	Design speed
12V175D	kW	r/min	r/min	mm	mm	mm	knots
MH	1,740	1,800	884	1,250	440	175	25
MH	1,740	1,800	702	1,350	440	175	25
MH	1,740	1,800	620	1,450	440	175	25
MH	1,740	1,800	523	1,600	490	175	25
MH	1,740	1,800	450	1,750	490	175	20
MH	1,740	1,800	400	1,850	490	205	20
MH	1,740	1,800	360	2,000	540	205	20
MH	1,740	1,800	331	2,100	540	205	20
MH	1,740	1,800	302	2,200	540	205	15
MH	1,740	1,800	288	2,300	600	205	15
MH	1,740	1,800	261	2,450	600	225	15
MH	1,740	1,800	247	2,500	600	225	15
MM	2,220	1,900	741	1,350	440	175	25
MM	2,220	1,900	654	1,450	440	175	25
MM	2,220	1,900	552	1,550	490	205	25
MM	2,220	1,900	475	1,750	490	205	20
MM	2,220	1,900	422	1,850	540	205	20
MM	2,220	1,900	380	2,000	540	205	20
MM	2,220	1,900	350	2,100	600	205	20
MM	2,220	1,900	319	2,250	600	225	15
MM	2,220	1,900	304	2,300	600	225	15
MM	2,220	1,900	275	2,500	660	225	15

[1] Engine rating designations: MH = Marine 'Heavy Duty' and MM = Marine 'Medium Duty'

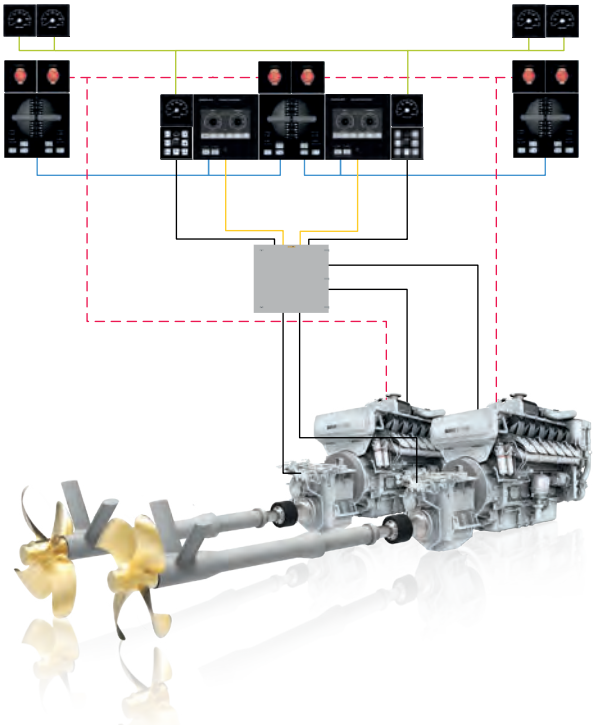
Propellers for the MAN 12V175D engines are optimized for a diesel-mechanical twin screw vessel operating at 85% engine rating. The standard propeller programme is dimensioned according to Lloyd's Register No Ice.



MAN Four-Stroke Propulsion Systems

Alphatronic 3000 Propulsion Control System

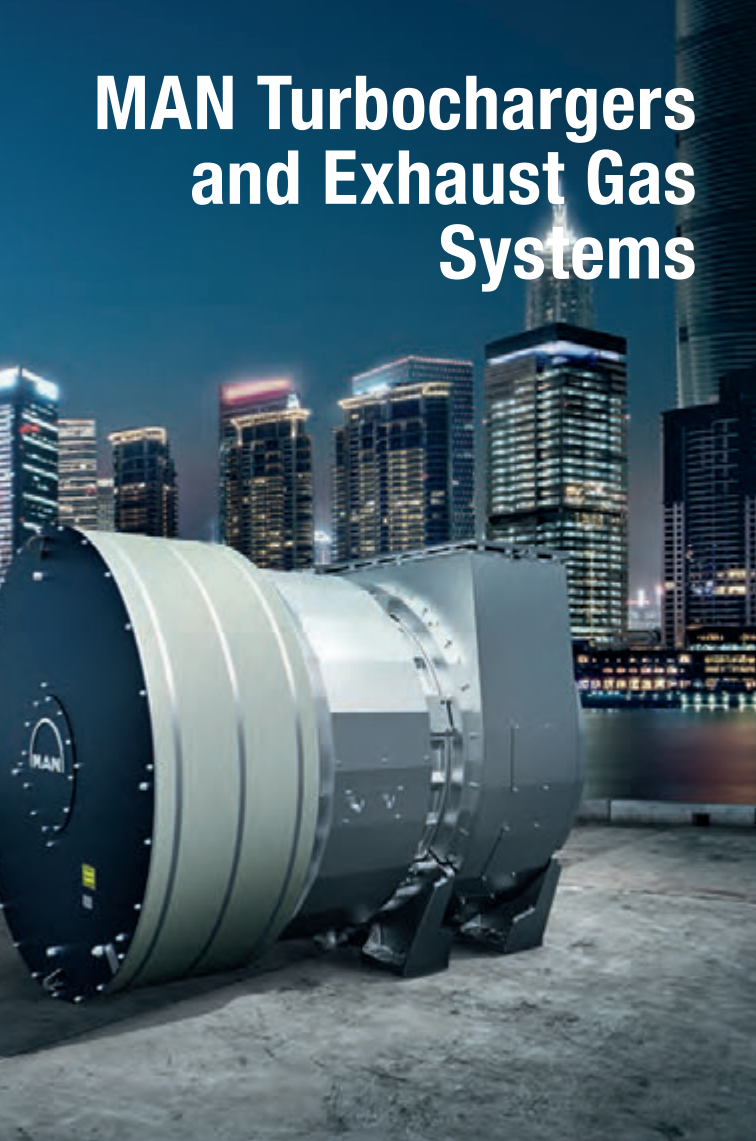
A high number of various FPP and CPP propulsion package applications are controlled by the Alphatronic 3000 system – customised for combinations of MAN medium and high speed engines in a wide range of diesel-mechanical, hybrid or diesel-electric propulsion setups.



Simple system architecture for a straightforward twin MAN 175D FPP plant.

Alphatronic 3000 at your finger tips: Safe and accurate propulsion control all the way – from the navigator's finger tips to the propeller tips. Any manoeuvring order given is translated into electrical speed setting-, pitch- or clutch signals, governing the hydraulic servo circuits of the gearbox and propeller system. Swift and reliable vessel manoeuvres are ensured due to quick and stable system response.

MAN Turbochargers and Exhaust Gas Systems



MAN Turbochargers and Exhaust Gas Systems

MAN Diesel & Turbo has a long and successful track record in the development of exhaust gas turbochargers for low, medium and high-speed diesel and gas engines. Drawing on its unrivalled expertise in the design and manufacture of this crucial engine component, MAN Diesel & Turbo can offer you world-leading technology that helps you maximise the efficiency of your operations.

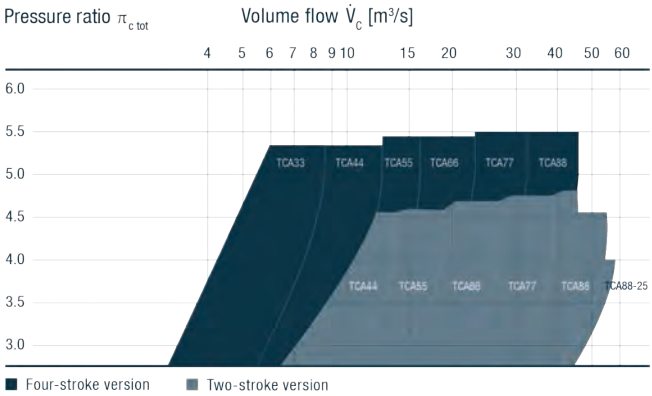
MAN turbochargers are designed to deliver peak performance throughout their working lives – in some of the harshest conditions encountered anywhere in the world. This is achieved by combining three elements: simplicity, flexibility and reliability. For example, we develop and build our turbochargers to make installation, operation, servicing and maintenance as easy and efficient as possible. This reduces your initial capital investment and results in lower lifecycle costs.

Applications

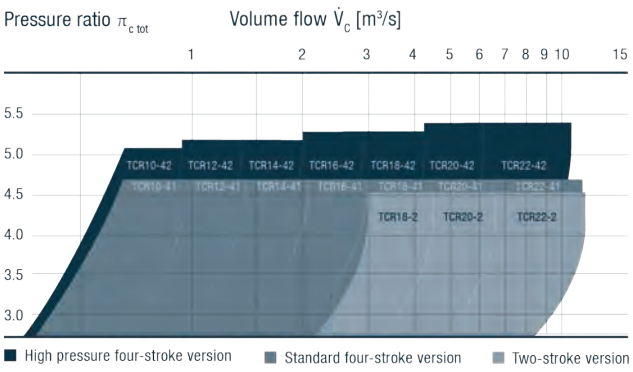
- Marine propulsion
- Marine gensets
- Power generation
- Excavators
- Mining
- Off-road vehicles
- Locomotives
- Industrial
- Offshore

MAN Turbochargers and Exhaust Gas Systems

TCA application range



TCR application range



MAN TCA Series

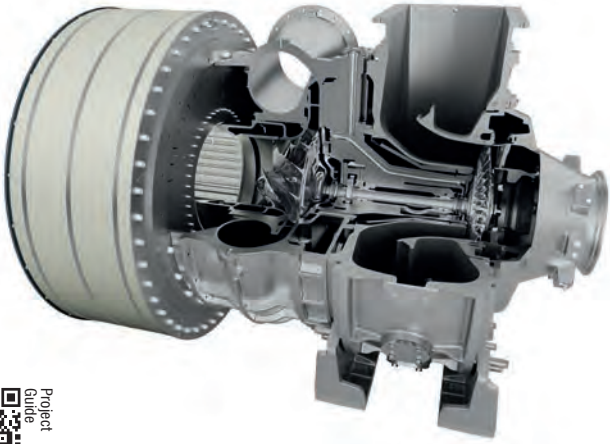
Technical data

Turbine type	Axial flow turbine
Max. permissible temp.	500 °C two-stroke / 650 °C four-stroke
Pressure ratio	up to 5.5
Suitable for HFO, MDO, gas	

Turbocharger programme

	Max. supercharged engine output kW		Max. permissible	
Type	Two-stroke	Four-stroke	Speed	Mass
	le* = 8.0 kg/kWh	le* = 6.5 kg/kWh	rpm	kg
TCA33	-	5,400	27,800	1,370
TCA44	7,000	7,900	22,500	1,950
TCA55	9,600	10,400	20,000	3,200
TCA66	13,700	14,800	16,900	5,300
TCA77	19,400	21,000	14,200	8,330
TCA88	30,000	30,000	12,000	14,000

** Specific air consumption*



Project Guide

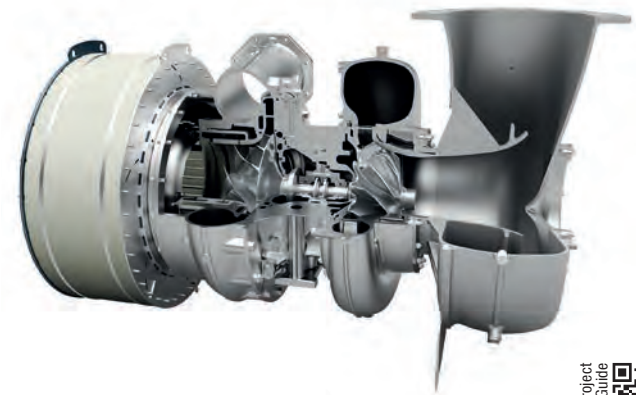
Technical data

Turbine type	Radial flow turbine
Max. permissible temp.	650 °C
Pressure ratio	up to 5.4
Suitable for HFO, MDO, gas	

Turbocharger programme

	Max. supercharged engine output kW		Max. permissible	
Type	Two-stroke	Four-stroke	Speed	Mass
	le* = 7.0 kg/kWh	le* = 6.5 kg/kWh	rpm	kg
TCR10	-	600	85,000	50
TCR12	-	880	70,900	100
TCR14	-	1,300	58,700	110
TCR16	-	1,850	48,800	180
TCR18	2,700	2,750	40,300	300
TCR20	4,000	4,000	33,400	500
TCR22	7,000	6,850	25,600	1,050

** Specific air consumption*



Project Guide

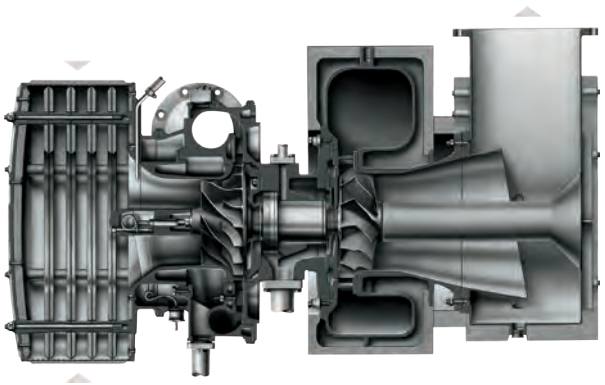
Technical data

Turbine type	Radial flow turbine
Max. permissible temp.	650 °C (opt. 720 °C)
Pressure ratio	up to 4.5
Suitable for HFO, MDO, gas	

Turbocharger programme

Type	Max. supercharged engine output kW	Max. permissible speed rpm	Mass kg
NR12/S	670	75,000	155
NR14/S	950	64,000	190
NR17/S	1,350	52,600	260
NR20/S	1,870	44,700	350
NR24/S	2,690	37,300	505
NR29/S	3,820	31,300	780
NR34/S	5,400	26,300	1,450

Specific air consumption Ie = 7 kg/kWh

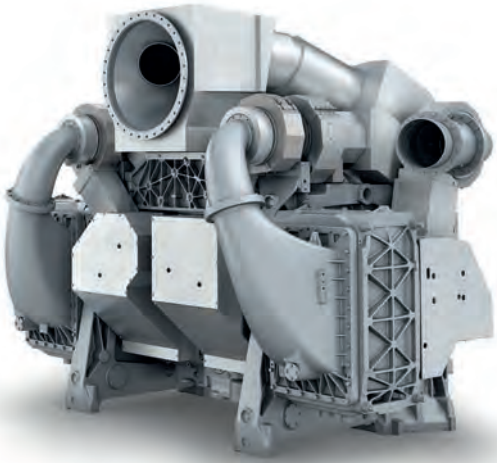


Project Guide

MAN ECOCHARGE

MAN ECOCHARGE two-stage turbocharging is suitable for high and medium-speed engines of all fuel types and for application in all engine power ranges. Extremely high efficiencies and pressure ratios enable increased power density and improved key engine parameters. For example, it is possible to use a smaller engine for the same required power output or to achieve lower NO_X emissions and lower specific fuel oil consumptions (SFOC).

As a compact two-stage unit, the MAN ECOCHARGE delivers outstanding turbocharging efficiency. A variety of product types and sizes are available, ensuring the perfect turbocharger-to-engine-fit. MAN ECOCHARGE always consists of a clever combination of high and low-pressure turbochargers. While MAN TCX has been specifically designed for high-pressure applications, MAN TCA and MAN TCR round up the package as low-pressure turbochargers.



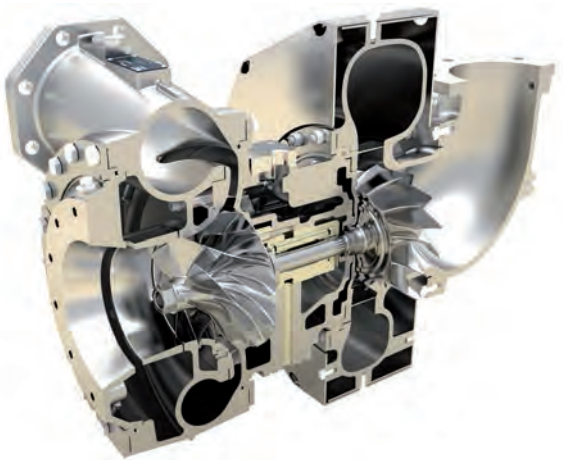
Technical data

Turbine type	Mixed flow turbine
Max. permissible temp.	650 °C
Pressure ratio (two stages)	up to 10.5
Suitable for HFO, MDO, gas	

TCX turbocharger programme

Type	Max. engine output* kW	Max. permissible speed rpm	Mass kg
TCX17	8,500	40,980	470
TCX19	11,900	34,550	785
TCX21	16,900	29,000	1,325
TCX23	23,900	24,390	2,230

** le = 6 kg/kWh; pHPCin = 3 bar; THPCin = 45 °C*

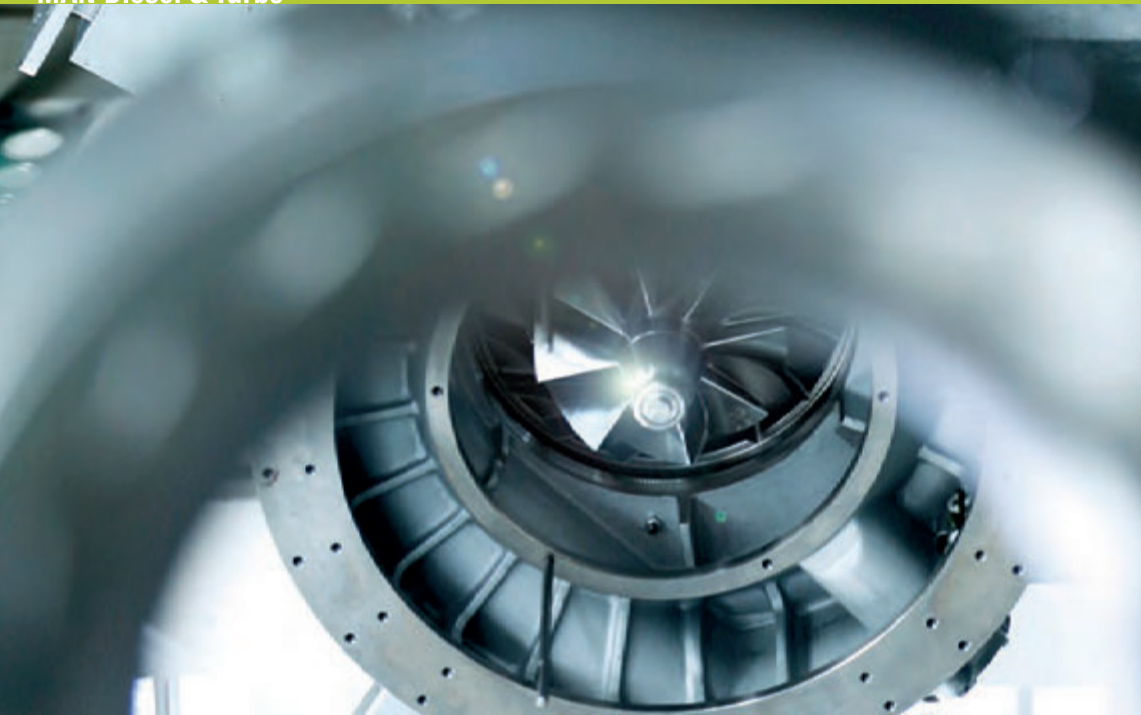


Project Guide

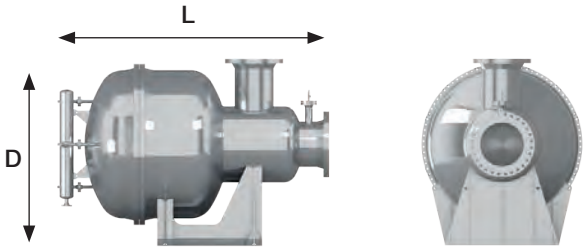
MAN ETB

The EGR blower MAN ETB is suitable for exhaust gas recirculation (EGR) engines of all fuel types in all application ranges. Specifically designed for EGR systems, the MAN ETB's active control plays an important role in enabling these systems to reach IMO Tier III emission standards. The required EGR operating conditions are achieved by using a high-speed electric motor directly coupled to the compressor wheel and controlled by a frequency converter.

The MAN ETB features a highly efficient blower wheel, optimised for low-pressure ratios. The materials used are designed to withstand corrosive agents. High blower availability and variable speed operation ensure IMO Tier III compliance in emission controlled areas (ECAs).



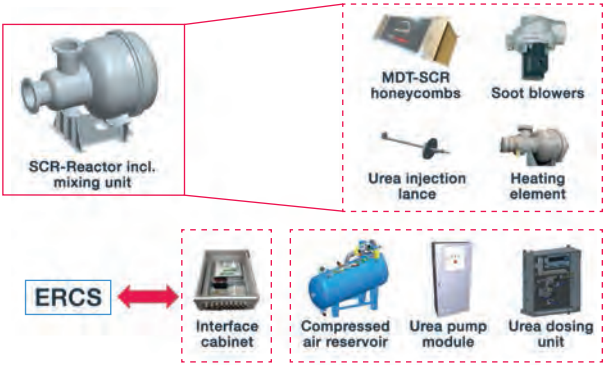
MAN SCR-HP



Product Range

Cluster	Reactor Diameter (D)	< 0.1% Sulphur Reactor Length (L)	< 3.5% Sulphur Reactor Length (L)	Exhaust massflow
-	(mm)	(mm)	(mm)	(t/h)
1	1,900	3,500	4,500	28
2	2,300	3,800	4,800	28 - 45
3	2,800	4,000	5,000	45 - 69
4	3,100	4,200	5,200	69 - 86
5	3,800	4,800	5,800	86 - 131
6	4,500	5,400	6,400	131 - 188

Preliminary clustering on exhaust mass flow basis. Final clustering depends on specific engine data, which must be confirmed by MAN Diesel & Turbo.



Scope of supply of MAN SCR-HP is illustrated. Piping and connection of SCR to the engine to be done by shipyard.

MAN SCR-HP

The MAN SCR-HP is a small and compact NO_x emission reduction system. The compact design allows for easy integration, and the few frame sizes will cover the entire two-stroke portfolio up to 25 MW per SCR reactor.

The integrated mixing unit reduces the overall length and volume. The specific honeycombs ensure a compact design.

The MAN SCR-HP can be mounted in all positions and is capable of running on all fuels.

Auxiliary components like the urea injection lance, urea dosing unit and urea pump module are from MAN's well-proven SCR-LP system.

SCR-HP system

Please note that MAN SCR-HP has passed the two-stroke provisional approval test on testbed and will after successful service test obtain full approval. Accordingly, MAN SCR-HP is ready for service test and appliance.

MAN PrimeServ

MAN | PrimeServ

Service with Passion
MAN Diesel & Turbo is offering a strong after sales service with a clear performance commitment, qualified and reliable experts and tailor-made solutions – all combined in our global service brand MAN PrimeServ.
Our approach is simple, yet effective: Premium service performed with passion meeting **every customer's needs**. We take the best people, qualify them professionally, listen to our customers, and provide optimum flexibility and reliability in the services we offer.

We provide our customers with outstanding services, we apply the three MAN PrimeServ key-concepts in everything we do: Customer Proximity, Solution Orientation and Technical Competence.

Customer Proximity
MAN PrimeServ provides excellent global support through a worldwide network of service facilities. Our local presence ensures the best possible customer proximity. Our aim is to consistently meet and exceed your expectations. Whenever you require spares, technical expertise or qualified repair assistance, feel free to contact your nearest MAN PrimeServ partner.

Solution Orientation
For more than one hundred years, MAN PrimeServ has been a reliable partner for service solutions. We offer tailor-made service and first class technical support for every customer – 365 days a year, 24 hours per day. Your requirements are the benchmark for our activities. Furthermore, we are committed to qualify our customers in the best way possible, so that the equipment and installations we supply can be operated and maintained in the most efficient and safest way.

Technical Competence
Our global network consists of highly-skilled experts using state-of-the-art technology. Performance according to the highest safety and quality standards has caused our technology-leadership as OEM.
Our unique efficiency in service and technical competence shows that we know how to keep our products reliable and productive.

Environment
Environmental protection plays a crucial role to us – as it does for our customers. Our engineers develop technologies to reduce emissions and are working on new ways to increase the efficiency of your installations. MAN PrimeServ provides integral solutions to encounter and embrace complex regulations. We sharply focus on fulfilling all emission standards. Integration comes into play when existing engines need to be retrofitted to modern and clean dual fuel engines.

MAN | PrimeServ

MAN Diesel & Turbo provides dual-fuel retrofit solutions based on the latest state-of-the-art technology.

Our Heritage Brands

MAN PrimeServ is our brand label for high quality after sales support for the complete product portfolio of MAN Diesel & Turbo. Through refinements to our products and repair techniques, we ensure and build on our technological leadership and technical expertise as an original equipment manufacturer (OEM) for the brands united under MAN Diesel & Turbo. Our aim is to consistently meet and exceed your expectations with innovative solutions tailored to your needs. We are the OEM for all MAN Diesel & Turbo brands and heritage brands such as:

- Burmeister & Wain (B&W)
- Mirrlees
- Paxman
- Ruston
- Pielstick
- Alpha Diesel
- Holeby GenSets

MAN | PrimeServ HOMEPAGE

MAN | PrimeServ LOCATION FINDER

Contacts

Headquarters

Germany
Four-stroke Propulsion Engines, Propulsion Systems and Exhaust Gas Turbochargers:
MAN Diesel & Turbo SE
Stadtbachstrasse 1
D-86153 Augsburg
Tel.: +49 821 322 0
Fax: +49 821 322 3382
info-aug@mandieselturbo.com
www.dieselturbo.man.eu

Germany
Turbomachine development, production and maintenance
MAN Diesel & Turbo SE
Steinbrinkstraße 1
D-46145 Oberhausen
Tel.: +49 208 692 1
turbomachinery@mandieselturbo.com

Denmark
Two-stroke Engines and Marine GenSets:
MAN Diesel & Turbo
Teglholmsgade 41
DK-2450 Copenhagen SV
Tel.: +45 3385 1100
Fax +45 3385 1030
info-cph@mandieselturbo.com

Propellers, Aft Ship and Propulsion Control Systems:
MAN Diesel & Turbo
Niels Juels Vej 15
DK-9900 Frederikshavn
Tel.: +45 9620 4100
Fax: +45 9620 4030
info-frh@mandieselturbo.com

Czech Republic
Exhaust Gas Turbochargers:
PBS Turbo s.r.o.
Velká Bíteš
Vlkovská 279
CZ-595 01 Velká Bíteš
Tel.: +420 566 822 201
Fax: +420 566 822 272
pbst_sales@pbsvb.cz

France
Four-stroke Propulsion Engines, Propulsion Systems and Marine GenSets:
MAN Diesel & Turbo France SAS
Avenue de Chatonay Porte n° 7
BP 427
F-44615 Saint-Nazaire
Tel.: +33 2 40 90 65 00
Fax: +33 2 40 90 65 89
info-fr@mandieselturbo.com

Four-stroke Propulsion Engines, Propulsion Systems and Marine GenSets:
MAN Diesel & Turbo France SAS
Bâtiment Luminis
91 Rue Jean Jaurès
92800 Puteaux
Tel.: +33 1 48 17 63 00
Fax: +33 1 48 17 63 49
info-fr@mandieselturbo.com

United Kingdom
Highspeed Engines (Original Brands of: Mirrlees Blackstone; Ruston and Paxman):
MAN Diesel & Turbo UK Ltd.
1 Mirrlees Drive,
Hazel Grove
UK-Stockport, SK7 5BP
Tel.: +44 161 483 1000
Fax: +44 161 487 1465
primeserv-uk@mandieselturbo.com

Switzerland
Turbomachine development, production and maintenance
Diesel & Turbo Schweiz AG
Hardstraße 319
8005 Zürich
Tel. +41 44 278 20 71
Fax: +41 44 278 22 61
info-zur@mandieselturbo.com

Worldwide Offices

Argentina
MAN Diesel & Turbo Argentina S.A.
Mariano Moreno 4476
CP B1605BOH - Munro,
Prov. Buenos Aires,
Tel.: +54 11 5236 6006/07
Fax: +54 11 5353 0279
guillermo.lemo@ar.man.eu

Australia
MAN Diesel & Turbo Australia Pty., Ltd.
Building 2,
202 Fairfield Road Yennora NSW 2161
Sydney
Tel.: +61 2 8874 0700
Fax: +61 2 9889 5337
jeffrey.moloney@au.man.eu

Bangladesh
MAN Diesel & Turbo Bangladesh Ltd.
Crystal Palace, 9th Floor
SE (D) 22, Road 140
Gulshan South Avenue, Gulshan-1
Dhaka-1212
Tel.: +880 96 12112211
atif.siddique@bd.man.eu

Belgium
MAN Diesel & Turbo Benelux N.V.
Noorderlaan 181
2030 Antwerpen
Tel.: +32 3 543 8500
Fax: +32 3 541 7508
dirk.willems@man.eu

Brazil
MAN Diesel & Turbo Brasil Ltda.
General José Cristino, 31
São Cristóvão
BR-20921-400 Rio de Janeiro, RJ
Tel.: +55 21 3506 2151
Fax: +55 21 3506 2150
gerson.sonego@br.man.eu

Bulgaria
MAN Diesel & Turbo Bulgaria EOOD
7 Al. Dyakovich, Floor 5, Office 1
9000 Varna
Tel.: +359 52 33 59 60
valentin.yankov@man.eu

Canada
MAN Diesel & Turbo Canada Ltd.
708-1111 West Hastings Street
Vancouver, British Columbia Y6E 3T5
Tel.: +1 905 842 2020
Fax: +1 604 684 1132
christian.h.mueller@ca.man.eu

Chile
MAN Diesel & Turbo Chile Ltda.
Parcela 291
- sector Placilla de Peñuelas
Ruta 68 - Km. 98
Valparaíso
Tel.: +56 32 235 1500
gabriel.guevara@cl.man.eu

China
MAN Diesel & Turbo Shanghai Logistics Co.; Ltd.
Zhangjiang Hi-Tech Park, East Area,
No 279 Ren Qing Road
Heqing - Pudong
201201 Shanghai
Tel.: +86 21 3891 9600
Fax: +86 21 5897 6552
jeffrey.ang@cn.man.eu

China
MAN Diesel & Turbo Shanghai Co. Ltd.
Branch Office Dalian
Rm1806
Pearl River Internatioal Building
No.99 Xinkai Rd
Dalian 116011
Tel.: +86 411 3967 6780
Fax: +86 411 3967 6700
yan.guiwang@cn.man.eu

China
MAN Diesel & Turbo Shanghai Co. Ltd.
Branch Office Zhejiang
Liuheng Putuo, Zhoushan,
Zhejiang 316131
Tel: +86 0580 6189 520
Fax: +86 0580 6189 520
peter.zhang@cn.man.eu

China
MAN Diesel & Turbo Shanghai Co. Ltd.
Branch Office Guangzhou
No. 828 Mao Gang Road,
Huangpu District
Guangzhou 510700
Tel.: +86 20 3238 7997
Fax: +86 20 3238 7997
jane.tan@hk.man.eu

Colombia
MAN Diesel & Turbo Colombia
Branch Office of Chile
Av. Cra. 7 No. 127-48, Oficina 1009
Centro Empresarial 128
Bogotá D.C.
Tel.: +57 312 432 5521
gabriel.guevara@co.man.eu

Cyprus
MAN Diesel & Turbo Cyprus
Office 403, Taitou Court
2M Koutsofta Str.
3031 Limassol
Tel.: +357 25 342 379/746/082
Fax: +357 25 746 083
hans.odgaard@man.eu

Ecuador
MAN Diesel & Turbo Ecuador
Branch office of Chile
Edificio Ambar, Piso 10 Oficina 1002
Av. Portugal E10-77 y República del Salvador
Quito
Tel.: +593 233 31344
carlos.solano@ec.man.eu

France
MAN Diesel & Turbo France SAS
Bâtiment Luminis
91, rue Jean Jaurès
92800 Puteaux
olivier.condemine@man.eu

Germany
MAN Diesel & Turbo SE
Representative Office
Roßweg 6
20457 Hamburg
Tel.: +49 40 7409 360
Fax: +49 40 7409 366
ruediger.schmidt@man.eu

Greece
MAN Diesel & Turbo Hellas Ltd.
Akti Miaouli 89
185 38 Piraeus
Tel.: +30 210 45 87 900
Fax: +30 210 45 87 928/29
dionissis.christodoulopoulos@man.eu

Guatemala
MAN Diesel & Turbo Guatemala Ltda.
6a. avenida 1-36 Zona 14
Edificio Plaza Los Arcos Of. 4B
Guatemala City, C.A.
Tel.: +502 2368 2744
Fax: +502 2366 2836
abner.aguilar@gt.man.eu

Worldwide Offices

Hong Kong
MAN Diesel & Turbo Hong Kong Ltd.
5/F, No. 1-7, Sai Tso Wan Road
Tsing Yi Island, N.T.
Hong Kong SAR
Tel.: +852 2527 1368
Fax: +852 2861 2594
jeffrey.ang@cn.man.eu

India
MAN Diesel & Tubo India Private Ltd.
402, 4th Floor, Building No. 2
Star Hub, Sahar Road
Andheri (E), Mumbai - 400159
Tel.: +91 265 3016 400
umesh.upadhye@in.man.eu

India
MAN Diesel & Tubo India Private Ltd.
Branch Office Aurangabad
E-73, MIDC Waluj 431 136
Aurangabad
Maharashtra
Tel.: +91 240 2566 700
Fax: +91 240 2554 621
umesh.upadhye@in.man.eu

India
MAN Diesel & Tubo India Private Ltd.
Branch Office New Delhi
407. DLF Tower-B
Jasola
New Delhi-110025
Tel.: +919 5604 32555
sandeep.chowdhury@in.man.eu

Italy
MAN Diesel & Turbo s.r.l.
Via dei Pescatori - Porto Antico
16129 Genova (GE)
Tel.: +39 010 209 1637
Fax: +39 010 251 6588
marco.colombo@man.eu

Japan
MAN Diesel & Turbo Japan Ltd.
PMO Nihonbashi-Odemmma Bldg. 5F
6-8 Nihonbashi-Odemmma-cho,
Chuo-ku
Tokyo 103-0011
Tel.: +81 3 6667 2461
kimihiko.sugiura@jp.man.eu

Malaysia
MAN Diesel & Turbo Malaysia Sdn Bhd
Branch office of Singapore
Suite 3.01, 3rd Floor Kenanga
International
Jalan Sultan Ismail
50250 Kuala Lumpur, Malaysia
Tel.: + 603 2162 0410
Fax: + 603 2162 0411
ernst.geyer@my.man.eu

Mexico
MAN Diesel & Turbo Mexico
Sierra Candela #111
Floor 4 int. 414-415
Col Lomas de Chapultepec
CP. 11000 Mexico, D.F.
Tel.: +52 1 55 1333 1906
jaime.zubillaga@mx.man.eu

Netherlands
MAN Diesel & Turbo Benelux B.V.
Schiekade 36
3125 KJ Schiedam (Port of Rotterdam)
Tel.: +31 10 272 4500
Fax: +31 10 437 6115
dirk.willems@man.eu

New Zealand
MAN Diesel & Turbo
New Zealand Ltd.
Naval Dockyard PO Box 32-061
Queens Parade, Devonport
Auckland 0744
Tel.: +61 2 8874 0701
Fax +61 2 9889 5337
jeffrey.moloney@au.man.eu

Norway
MAN Diesel & Turbo
Norge A/S
Haakon VII's gate 1
0161 Oslo
Tel.: +47 2201 7190
Fax: +47 2283 2416
merete.hallien@man.eu

Pakistan
MAN Diesel & Turbo Operations
Pakistan,
Private Limited
6-Km Raiwind Road
Lahore-55150
Tel.: +92 42 3533 0091 3
Fax: +92 42 3533 0094
imran.ghani@mandiesel.com.pk

Panama
MAN Diesel & Turbo
Panama Enterprises Inc
Calle Arturo del Valle,
Final Local 0-02
Urb. La Loceria
Tel.: +507 236 1594
Fax: +507 236 8229
oscar.martinez@man.eu

Peru
MAN Diesel & Turbo
Peru S.A.C.
Centro Empresarial Burgos
Av. Enrique Palacios 335, oficina 604
Miraflores, Lima 18
Tel.: +51 1 6284756
carlos.constante@pe.man.eu

Philippines
MAN Diesel & Turbo
Philippines Inc.
Km. 17, West Service Road
Cervantes Compound Brgy.
Marcelo Green
South Superhighway
Paranaque City, 1700
Tel.: +63 2 776 3369/3347
Fax: +63 2 776 3384
sebastien.marchand@man.eu

Poland
MAN Diesel & Turbo
Poland Sp. z o.o.
ul. Lubowidzka 43
80-174 Gdansk
Tel.: +48 58 325 33 90
Mob: +48 502 536 800
andrzej.krupa@man.eu

Portugal
MAN Diesel & Turbo
Portugal, Unipessoal, Lda.
Avenida do Rio Tejo, lote 3
Parque Industrial Sapec Bay
2910-440 Setúbal
Tel.: +351 265 799 500
Fax: +351 265 751 460
antonio.penaforte@man.eu

Qatar
MAN Diesel & Turbo
Qatar LLC
P.O Box 153
23rd floor, Al Jazeera Tower, West Bay
State of Doha, Qatar
Tel.: +974 4015 9150
oleb.nielsen.a@man.eu

Worldwide Offices

Russia
MAN Diesel & Turbo
Russia Ltd.
Preobrazhenskaya square 8,
block A, 13 floor
107061 Moskow
Tel.: +7 495 258 36 70
Fax: +7 495 258 36 71
enrico.enghardt@man.eu

Russia
MAN Diesel & Turbo
Russia Ltd.
Branch Office St. Petersburg
Vozdukhoplavatelnaya dom 19
196084 St. Petersburg
Tel.: +7 812 449 2655
Fax: +7 812 449 2645
alexander.danilenko@man.eu

Saudi Arabia
MAN Diesel & Turbo
Saudi Arabia LLC
Madina Road,
Al Thinayyan Building
P.O.Box: 55990
Jeddah 21544
Tel.: +966 2 639 4346
Fax: +966 2 639 5482
abdullah.kuzkaya@man.eu

Senegal
MAN Diesel & Turbo
Senegal SARL
Bd de la République, 2eme étage
Cabinet Géni & Kébé
Dakar-47
Tel.: +221 33 867 79 77
abdou.fofana@man.eu

Singapore
MAN Diesel & Turbo
Singapore Pte. Ltd.
29 Tuas Avenue 2
Singapore 639460
Tel.: +65 6349 1600
Fax: +65 6862 1409
olaf.gunia@sg.man.eu

South Africa
MAN Diesel & Turbo
South Africa (Pty) Ltd.
14 North Reef Road,
Elandsfontein, 1406
PostNet Suite 233, Private Bag X19
Gardenview, 2047
Tel.: +27 11 842 0700
Fax: +27 86 506 8878
robin.watson@za-man.co.za

South Africa
MAN Diesel & Turbo
South Africa (Pty) Ltd.
Branch Office Durban
14 Hopson Avenue
Glenwood 3630
Durban
Tel.: +27 31 301 2999
Fax: +27 31 201 0854
derick.swanepoel@za.man.eu

South Africa
MAN Diesel & Turbo
South Africa (Pty) Ltd.
Branch Office Cape Town
1 Table Bay Industrial Park, Milner St.
Paarden Eiland 7405
Cape Town
Tel.: +27 21 514 3360
Fax: +27 21 510 0174
norman.hall@za.man.eu

South Korea
MAN Diesel & Turbo
Korea Ltd.
54, Noksansandan 261-ro 74beon-gil,
GangSeo-Gu,
Busan 46754
Tel.: +82 51 635 6644
Fax: +82 51 635 4004
tommyr.rasmussen@man.eu

Spain
MAN Diesel & Turbo Espana, S.A.U.
Calle Pedro Teixeira 8, 10th floor
28020 Madrid
Tel.: +34 91 411 1413
Fax: +34 91 411 7276
pablo.montes@man.eu

Spain
MAN Diesel & Turbo Canarias, S.L.
Branch Office Gran Canaria
Muelle Reina Sofia s/n
Puerto de Las Palmas
Las Palmas de Gran Canaria
35008
Tel.: +34928 935 959
Fax: +34928 494 199
pablo.montes@man.eu

Sri Lanka
MAN Diesel & Turbo Lanka (Pvt) Ltd.
No. 57/8, Sir Ernest De Silva Mawatha
Colombo 00700
Tel.: +94 11 2678930
Fax: +94 11 2678810
karthik.nithiyanandam@man.eu

Sweden
MAN Diesel & Turbo Sverige AB
Importgatan 15F
422 46 Hisings Backa
Tel.: +46 31 176 295
Fax: +46 31 131 564
roger.goethberg@man.eu

Taiwan
MAN Diesel & Turbo Singapore Pte. Ltd.
Branch Office Taipei
8F-1, No. 15, Sec. 2, Tiding Blvd.
Nei-Hu District, Taipei 11493
Tel.: +886 2 8752 4043
Fax: +886 2 8752 4053
lance.phang@tw.man.eu

Turkey
MAN Diesel ve Turbo Satis Servis Limited Sirketi
(Hizmetleri Limited Sirketi)
Orhanli Deri Org. Yan San
Sitesi YB-25
34956 Tuzla – Istanbul
Tel.: +90 4444 5 626
Fax: +90 216 591 0854
timur.iyi@man.eu

Turkey
MAN Diesel ve Turbo Satis Servis Limited Sirketi
Akaretler Mahallesi,
Süleyman Seba Cd. No 48
BJK Plaza A-Blok D.38
34357 Besiktas - Istanbul
Tel.: +90 4444 5 626
Fax: +90 212 296 5506
timur.iyi@man.eu

United Arab Emirates
MAN Diesel & Turbo Middle East LLC
Jumeira Beach road
at Dry docks World Dubai
P.O. BOX 57091
Dubai, U.A.E
Tel.: +971 4 345 40 45
Fax: +971 4 345 40 48
patrice.mauger@ae.man.eu

United Kingdom
MAN Diesel & Turbo UK Ltd.
Hythe Hill
Colchester
Essex, CO1 2HW
Tel.: +44 1206 795 151
Fax: +44 1206 794 325
adam.green@man.eu

Worldwide Offices

United Kingdom
MAN Diesel & Turbo UK Ltd.
Branch Office Redhill
Betchworth House
57-65 Station Road
Redhill
Surrey, RH 1 1 DL
Tel.: +44 1737 779 429
Fax: +44 1737 781 299
richard.guest@man.eu

USA
MAN Diesel & Turbo North America Inc.
Branch Office Ft. Lauderdale
551 S.W. 13th Terrace
Pompano Beach, FL 33069
Tel.: +1 954 960 6700
Fax: +1 954 782 5426
angel.colon-perez@us.man.eu

USA
MAN Diesel & Turbo North America Inc.
Branch Office Houston
1600A Brittmoore Road
Houston, TX 77043
Tel.: +1 832 209 3400
Fax: +1 713 939 0105
anthony.ruegger@us.man.eu

Vietnam
MAN Diesel & Turbo Singapore Pte. Ltd.
Branch Office Hanoi
Unit 9, Second Floor,
International Central
17 Ngo Quyen, Hoan Kiem
Hanoi
Tel.: +84 4 3936 9728
Fax: +84 4 3936 9727
hoanghai.tran@man.eu

Symbols used:
T: MAN Diesel & Turbo Two-stroke licence
F: MAN Diesel & Turbo Four-stroke licence
FS: MAN Diesel & Turbo Four-stroke SEMT Pielstick licence
TC: MAN Diesel & Turbo Turbocharger licence

China, The People's Republic of

China Shipbuilding Industry Corporation Diesel Engine Co., Ltd.
Tel: +86 532 86708080 6908
Fax: +86 532 86708080 788

CNPC Jichai Power Equipment Company (F)
Tel.: +86 (531) 8742 2692
Fax: +86 (531) 8742 3189
xuchuanguo@cnpc.com.cn

CSSC Marine Power Co., Ltd. (T, F)
Tel.: +86 (511) 845 11 273
Fax: +86 (511) 845 10 033
cssc-cmp@cssc-cmp.cn

CSSC-MES Diesel Co., Ltd. (T)
Tel.: +86 (21) 6118 6666
Fax: +86 (21) 6118 8088
+86 (21) 6118 6655
market@shcmd.com.cn

Dalian Marine Diesel Co. Ltd. (T)
Tel.: +86 (411) 8441 7273
Fax: +86 (411) 8441 7499
dmd@online.in.cn

Hefei Rong An Power Machinery Co., Ltd. (T, F)
Tel.: +86 (551) 87 88888-9977
Fax: +86 (551) 87 88888-1001

Henan Diesel Engine Industry Co., Ltd. (F)
Tel.: +86 (379) 6407 6724
Fax: +86 (379) 6422 5395
cys@hnd.com.cn

Hudong Heavy Machinery Co., Ltd. (T, F, FS)
Tel.: +86 (21) 51 31 00 00
+86 (21) 58 71 30 07
Fax: +86 (21) 58 46 20 23
hhm@hhm.com.cn

List of Licensees

China, The People's Republic of

JingJiang Dingkun Machinery Co. Ltd. (T)
Tel: + 86 523 82355998
Fax: + 86 523 82355955

Qingdaohaixi Marine Diesel Co., Ltd. (T)
Tel.: +86 (532) 8670 8080
Fax: +86 (532) 8670 8080-788
sales@qmdltd.com.cn

Shaanxi Diesel Engine Heavy Industry Co., Ltd. (F, FS)
Tel.: +86 (29) 3831 3596
+86 (29) 3831 4380
Fax: +86 (29) 3831 4626
sxd408@sxdinfo.com.cn

Shanghai Qiyao Engine Co., Ltd. (SQE) (F, TC)
Tel.: +86 (21) 3131 0648
Fax: +86 (21) 3131 0150
sqe-tech@csic711.com

Weichai Heavy Machinery Co., Ltd. (F)
Tel.: +86 (536) 209 8105
Fax: +86 (536) 209 8138
julidj@weichai.com

Yichang Marine Diesel Engine Co., Ltd. (T)
Tel.: +86 (717) 646 86 89
Fax: +86 (717) 646 91 52
market@ymd.com.cn

Yuchai Marine Power Co. Ltd. (T)
Tel: + 86 756 5888600
Fax: + 86 756 5888985
sales@ycmp.com.cn

Croatia

Brodosplit – Diesel Engine Factory d.o.o. (T, F)
Tel.: +385 (21) 382 863
Fax: +385 (21) 382 323
strobrod@brodost.tel.hr

Uljanik Strojogradnja d.d. (T)
Tel.: +385 (52) 373 309
Fax: +385 (52) 373 821
diesel@uljanik.hr

Czech Republic
PBS Turbo s.r.o. (TC)
Tel.: +420 (566) 822 201
Fax: +420 (566) 822 272

India
MAN Diesel & Turbo India Ltd. (F)
Tel.: +91 (240) 2566 700
Fax: +91 (240) 2554 621

Japan
Hitachi Zosen Corporation (T)
Tel: +81 (3) 6404 0141
de-info@hitachizosen.co.jp

JFE Engineering Corporation (FS)
Tel: +81 (45) 505 7914
hoshino-minoru@jfe-eng.co.jp

Kawasaki Heavy Industries Ltd. (T, F, TC, FS)
Tel: +81 (3) 3435 2313
hashimoto_h@khi.co.jp / takano_hi@khi.co.jp

Kawasaki Sub-licensee:
The Hanshin Diesel Works Ltd. (T)
Tel: +81 (78) 332 2081
overseas-section@hanshin-dw.co.jp

Mitsubishi Heavy Industries, Ltd. (F)
Tel: +81 (42) 763 1594
gmmp383621b10g04@mhiet.mhi.co.jp

Mitsui Engineering & Shipbuilding Co., Ltd. (T, TC)
Tel: +81 (3) 3544 3475
meseba99@mu.mes.co.jp

Mitsui Sub-Licensee:
Makita Corporation (T)
Tel: +81 (87) 821 5501
webmaster@makita-corp.com

Mitsui Sub-Licensee:
Diesel United, Ltd. (T)
Tel: +81 (3) 3257 8222
info@du.ihi.co.jp / saburo_aiso@du.ihi.co.jp

List of Licensees

Japan

Niigata Power Systems Co., td. (FS)
Tel: +81 (3) 4366 1200 / +81 (3) 4366 1203
webmaster1@niigata-power.com / naofumi_murakami@niigata-power.com

Diesel United, Ltd. (FS)
Tel: +81(3)3257-8222
info@du.ihi.co.jp / saburo_aiso@du.ihi.co.jp

Poland

H. Cegielski - Poznan S.A. (T)
Tel.: +48 (61) 831 1958
Fax: +48 (61) 831 1391

H. Cegielski - Fabryka Silników (F)
Agregatowych i Trakcyjnych Sp z o.o.
Tel.: +48 (61) 831 1941
Fax: +48 (61) 831 1757

South Korea

Doosan Engine Co., Ltd. (T, F, FS)
Tel.: +82 (55) 260 6154
Fax: +82 (55) 260 6381
sangsoo1.lee@doosan.com

Hyundai Heavy Industries Co., Ltd. (T)
Engine & Machinery Division
Tel.: +82 (52) 202 7281
Fax: +82 (52) 202 7300
enginesales@hhi.co.kr

STX Engine Co., Ltd. (F, T)
Tel.: +82 (55) 280 0568
Fax: +82 (55) 280 0539
sowy@onestx.com

STX Heavy Industries Co., Ltd. (T)
Tel.: +82 (55) 280 0609
Fax: +82 (55) 278 9500
sangeui.kim@onestx.com

STX Heavy Industries Co., Ltd. (TC)
Tel.: +82 (55) 280 0715
Fax: +82 (55) 282 1938
hsk@onestx.com

Spain
Navantia S.A. (F)
Fábrica De Motores Cartagena
Tel.: +34 (968) 128 200
Fax: +34 (968) 500 902
navantia@navantia.es

USA
Fairbanks Morse Engine (F, FS)
Tel.: +1 (608) 364 8119
Fax: +1 (608) 364 8444
patrick.bussie@fairbanksmorse.com

Notes

Notes

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MAN Diesel & Turbo – a member of the MAN Group