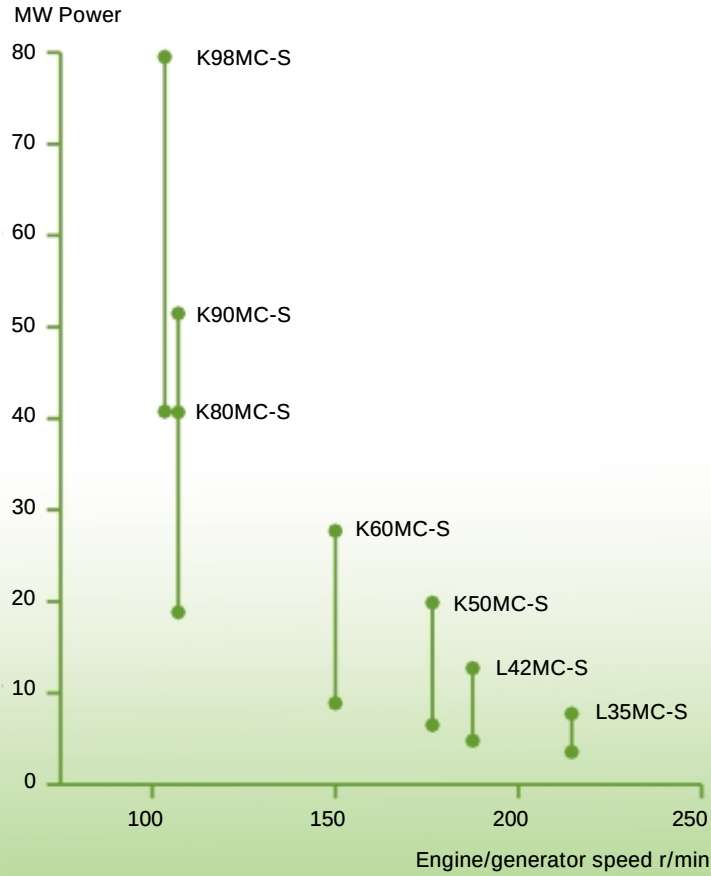
MAN B&W

Two-stroke Low Speed MC-S Diesel Engines Stationary Application

Gambian Utillities Corporation, Gambia, 7 MW

MIndanao, 100 MW power barge, The Philippines

MC-S Two-stroke Engine Programme



GMR, Vasavi Power Corporation, India, 200 MW

General Information

Fuel Oil Engines

Nominal rating (MCR)

The engine ratings quoted remain valid up to tropical conditions:

Blower inlet temperature	45 ºC
Blower inlet pressure	1000 mbar
Charge air coolant temperature	32 ºC

For more demanding ambient conditions, please contact MAN B&W Diesel A/S or the engine builder.

Engine application

The engine ratings and speeds shown are based on generator drive. For other drives, such as mechanical drive of mills, pumps, compressors, etc., please contact MAN B&W Diesel A/S or the engine builder.

Site specified rating

$L_1 \geq$ site specified rating $\geq L_2$

The engine may be operated without restriction at any load up to site specified rating. Operating at overload rating, i.e. 110% of the site specified rating, is permissible for one hour every 12 consecutive hours.

Engine heat rate

The figures specified in the table refer to mechanical output and to ISO 3046/1-1995 ambient conditions:

Blower inlet temperature	25 ºC
Blower inlet pressure	1000 mbar
Charge air coolant temperature	25 ºC

For other ambient conditions, please contact MAN B&W Diesel A/S or the engine builder.

Fuel oil guarantee – MC-S engines

The MCR heat rate guaranteed by MAN B&W Diesel A/S is subject to a tolerance of ±3 % at ISO 3046/1-1995 ambient conditions. For other ambient conditions and for engines with emission control or TCS, please contact MAN B&W Diesel A/S or the engine builder.

Turbo Compound System (TCS)

The TCS, subject to the use of high efficiency turbochargers and gas turbines, can be applied on the K90, K80 and K60MC-S type engines. The use of a TCS system allows a reduction of up to 4% of the heat rate, depending on the site ambient conditions.

For detailed information, please contact MAN B&W Diesel A/S or the engine builder.

600 kW MAN B&W TCS unit for exhaust gas energy recovery

Heavy fuel oil specification

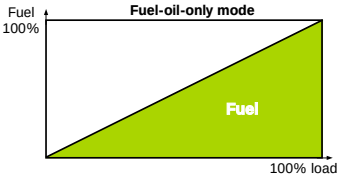
The engine data stated are valid using marine diesel oil or heavy fuel oil. Guiding specification (maximum values):

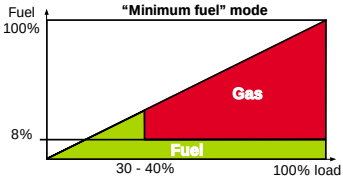
Density at 15 ºC	kg/m^3	991*
Kinematic viscosity at 100 ºC	cSt	55
Kinematic viscosity at 50 ºC	cSt	700
Flash point	ºC	min. 60
Pour point	ºC	30
Carbon residue	% (m/m)	22
Ash	% (m/m)	0.15
Total sediment after ageing	% (m/m)	0.10
Water	% (v/v)	1.0
Sulphur	% (m/m)	5.0
Vanadium	mg/kg	600
Aluminium + silicon	mg/kg	80

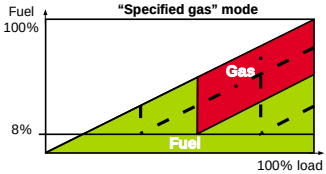
Equal to ISO 8217/CIMAC-H55
*1010 provided automatic modern clarifiers are installed.
For other fuel qualities, please contact MAN B&W Diesel A/S or the engine builder.

Dual Fuel Engines

All large-bore engine types (from 50 to 98 types) mentioned in the programme are available as dual fuel engines under the designation MC-GI-S, with the same power ratings and heat rates as their fuel oil operated counterparts.







Dual fuel engine running modes

Gas data

The engine operates on any high-calorific gas that can be compressed to 250 bar without condensation.

Heat rate guarantee – MC-GI-S engines

The heat rate guaranteed by MAN B&W Diesel A/S is subject to a tolerance of ±5% at ISO 3046/1-1995 ambient conditions.

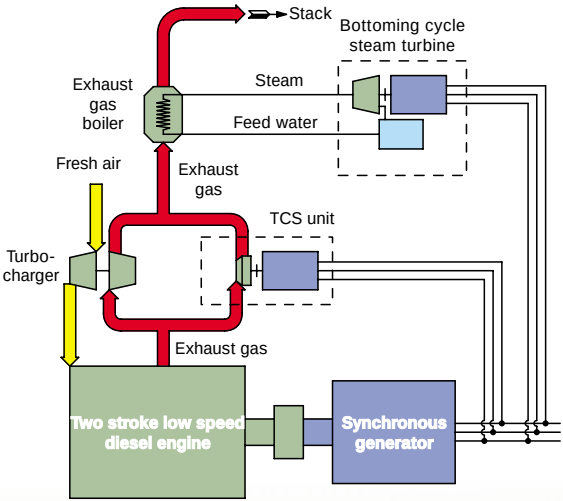
For other ambient conditions and for engines with emission control or TCS, please contact MAN B&W Diesel A/S or the engine builder.

Engine emissions

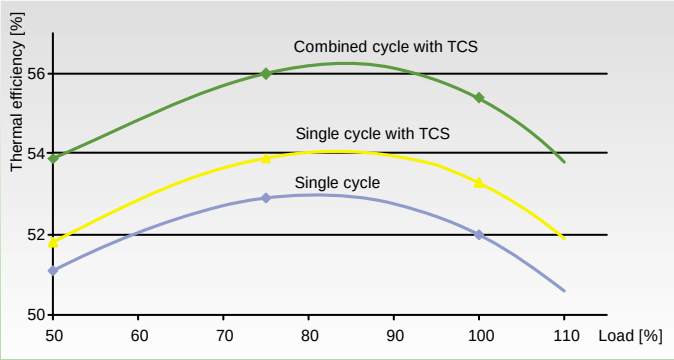
The L35, L42, K50 and K60MC-S/MC-GI-S engines fulfil the World Bank's 1998 guideline of max. 13 g/kWh NO_x emission at 15% O_2, dry gas and are in such case subject to a heat rate guarantee tolerance of ±5% at engine MCR. For larger engines or other limits, please contact MAN B&W Diesel A/S or the engine builder.

All emission-controlled engines are subject to an MCR heat rate guarantee tolerance of ±5%.

Two-stroke Low Speed Diesel Engine of MAN B&W Diesel Design in Combined Cycle

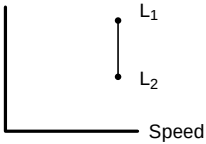


Part Load Behaviour



Power, Speed and Heat Rate

Site rating



K98MC-S

Bore: 980 mm
Stroke: 2 400 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	103.4	103.4	102.9	102.9
Cyl.No.	Power				
9	kW	51 120	41 040	50 850	40 770
10	kW	56 800	45 600	56 500	45 300
11	kW	62 480	50 160	62 150	49 830
12	kW	68 160	54 720	67 800	54 360
14	kW	79 520	63 840	79 100	63 420

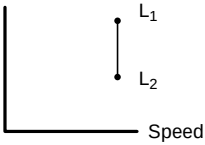
Heat rate at MCR

kJ/kWh	7430	7130	7430	7130

Lubricating oil consumption	0.3 – 0.7 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



K90MC-S

Bore: 900 mm
Stroke: 2 300 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	107.1	107.1	109.1	109.1
Cyl.No.	Power				
7	kW	30 030	23 940	29 820	23 870
8	kW	34 320	27 360	34 080	27 280
9	kW	38 610	30 780	38 340	30 690
10	kW	42 900	34 200	42 600	34 100
11	kW	47 190	37 620	46 860	37 510
12	kW	51 480	41 040	51 120	40 920

Heat rate at MCR

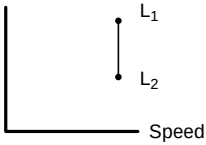
kJ/kWh	7300	6960	7300	6960

With TCS
Up to 4 % heat rate reduction is obtainable depending on actual site ambient conditions

Lubricating oil consumption	0.3 – 0.6 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



K80MC-S

Bore: 800 mm
Stroke: 2 300 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	107.1	107.1	109.1	109.1
Cyl.No.	Power				
7	kW	23 730	18 900	23 520	18 830
8	kW	27 120	21 600	26 880	21 520
9	kW	30 510	24 300	32 240	24 210
10	kW	33 900	27 000	33 600	26 900
11	kW	37 290	29 700	36 960	29 590
12	kW	40 680	32 400	40 320	32 280

Heat rate at MCR

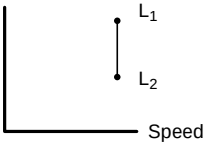
kJ/kWh	7260	6915	7260	6915

With TCS
Up to 4 % heat rate reduction is obtainable depending on actual site ambient conditions

Lubricating oil consumption	0.3 – 0.5 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



K60MC-S

Bore: 600 mm
Stroke: 1 650 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	150	150	150	150
Cyl.No.	Power				
7	kW	13 860	8 890	13 860	8 890
8	kW	15 840	10 160	15 840	10 160
9	kW	17 820	11 430	17 820	11 430
10	kW	19 800	12 700	19 800	12 700
11	kW	21 780	13 970	21 780	13 970
12	kW	23 760	15 240	23 760	15 240
14	kW	27 720	17 780	27 720	17 780

Heat rate at MCR

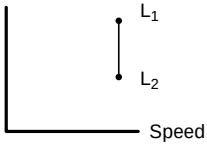
kJ/kWh	7430	6915	7430	6915

With TCS
Up to 4 % heat rate reduction is obtainable depending on actual site ambient conditions

Lubricating oil consumption	0.2 – 0.3 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



K50MC-S

Bore: 500 mm
Stroke: 1 370 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	176.5	176.5	180	180
Cyl.No.	Power				
7	kW	9 940	6 370	10 150	6 510
8	kW	11 360	7 280	11 600	7 440
9	kW	12 780	8 190	13 050	8 370
10	kW	14 200	9 100	14 500	9 300
11	kW	15 620	10 010	15 950	10 230
12	kW	17 040	10 920	17 400	11 160
14	kW	19 880	12 740	20 300	13 020

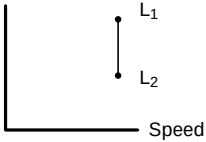
Heat rate at MCR

kJ/kWh	7560	7260	7560	7260

Lubricating oil consumption	0.17 – 0.21 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



L42MC-S

Bore: 420 mm
Stroke: 1 360 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	187.5	187.5	189.5	189.5
Cyl.No.	Power				
7	kW	7 420	4 725	7 490	4 795
8	kW	8 480	5 400	8 560	5 480
9	kW	9 540	6 075	9 630	6 165
10	kW	10 600	6 750	10 700	6 850
11	kW	11 660	7 425	11 770	7 535
12	kW	12 720	8 100	12 840	8 220

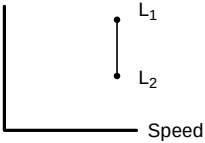
Heat rate at MCR

kJ/kWh	7560	7045	7560	7045

Lubricating oil consumption	0.13 – 0.17 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

Power, Speed and Heat Rate

Site rating



L35MC-S

Bore: 350 mm
Stroke: 1 050 mm

		50 Hz		60 Hz	
		Power optimised (L_1)	Fuel economy optimised (L_2)	Power optimised (L_1)	Fuel economy optimised (L_2)
Speed	r/min	214.3	214.3	211.8	211.8
Cyl.No.	Power				
7	kW	4 515	3 605	4 480	3 570
8	kW	5 160	4 120	5 120	4 080
9	kW	5 805	4 635	5 760	4 590
10	kW	6 450	5 150	6 400	5 100
11	kW	7 095	5 665	7 040	5 610
12	kW	7 740	6 180	7 680	6 120

Heat rate at MCR

kJ/kWh	7515	7260	7515	7260

Lubricating oil consumption	0.08 – 0.13 kg/cyl.h.
Cylinder oil consumption	0.8 – 1.4 g/kWh

List of Licensees

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List of Licensees

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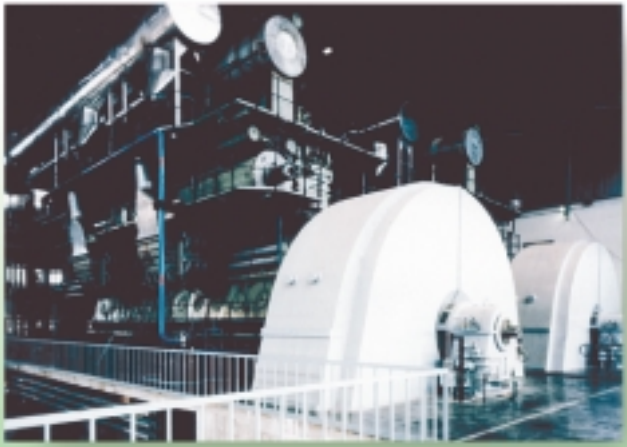
Guam Power Authority Guam, 80 MW



Gas y Electricidad S.A., Ibiza, Spain, 125 MW

Public Power Corporation, Greece, 38 MW

Diesel engines & alternators,
Public Power Corporation, Greece, 38 MW

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