

9 MW Generator Sets

Manufacturer MAN Diesel & Turbo, type 18V32/40 – 4 stroke, unused
Each unit consists of motor, generator, rack / base-frame

Motor:

Speed	750 rpm
Power at crankshaft	9,000 kWm
Emission	WB 1998
Power-to-weight ratio (MCR)	
In-line engine	11.3 – 12.7 kg/kW
V-engine	9.4 – 10.2 kg/kW
Cylinder output (MCR) at 750/720*) rpm	500 kW
Cooling	
Cylinder cooling	Fresh water
Charge-air cooler (two-stage)	Fresh water
Fuel injector cooling	Fresh water, only when running on HFO
Starting method	Compressed air

Generator:

	50 Hz or 60 Hz
Voltage	11 kV
Output approx.	10,940 kVA
Alternator efficiency	97,24%

Generator-Unit:

Continuous power output		8,752 kWel
Specific fuel consumption	at 100% load	190,35 g/kWel
lube oil consumption	(+ 20% tolerance)	4,5 kg/h
Weight	per Unit	151 ton
Parameters according to		ISO condition

Please note:

The Generator Set is highest quality and must be overhauled after 45,000 working hours.

Options:	The following services can be organized and arranged at the customer's request, the costs being covered by the purchaser.
Transport:	Transport of the generator sets to the destination.
Engineering:	Planning of the power plant site, buildings as well as infrastructure and grid connection.
Construction services:	Construction services and site management of the buildings and infrastructure.
Power plant:	Construction, erection and commissioning of the generators and other power plant components.
Warranty:	1 (one) year warranty will be given, if the Generator sets are assembled and commissioned by a MAN certified company.

Subjects to Prior Sale. Technical dates and statements with reservations of error.

Calculation of approx. consumption for a power plant consisting of 8 Gensets:

With eight engines and a maximum output of 72 MW, like 720,000 kW / h, this results in an output of 8,640,000 kW / h with a daily runtime of 12 hours per day under full load.

This takes about 3 hours to diesel operation, about one hour to start and two hours for internal cleaning of the engines before the standstill.

The remaining 9 hours, the engines are operated with heavy oil.

However, these values must be determined and depend on the purchased quality of the fuels. It is therefore only a rough calculation.

This results in a daily consumption for 8 engines of approx. 43.2 t Diesel.

Please find on the following pages photos and further descriptions

2.3.2 Engine designations – Design parameters

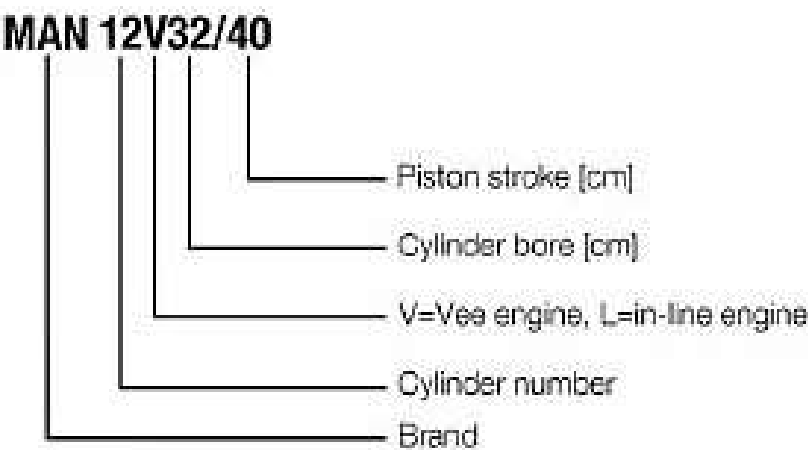


Figure 9: Example to declare engine designations

Parameter	Value	Unit
Number of cylinders	6, 7, 8, 9, 12, 14, 16, 18	-
Cylinder bore	320	mm
Piston stroke	400	
Displacement per cylinder	32.17	litre
Distance between cylinder centres, in-line engine	530	mm
Distance between cylinder centres, vee engine	630	
Vee engine, vee angle	45	°
Crankshaft diameter at journal, in-line engine	290	mm
Crankshaft diameter at journal, vee engine	320	
Crankshaft diameter at crank pin, vee engine	290	

Table 1: Design parameters

2.3.3 Turbocharger assignments

No. of cylinders, config.	CPP/GenSet/electric propulsion	FPP/dredger
	500 kW/cyl., 720/750 rpm	450 kW/cyl., 750 rpm
6L	NR29/S	NR29/S
7L	NR29/S	NR29/S
8L	NR34/S	NR34/S
9L	NR34/S	NR34/S
12V	2x NR29/S	2x NR29/S
14V	2x NR29/S	2x NR29/S

2.11 GenSet operation

2.11.1 Operating range for GenSet/electric propulsion

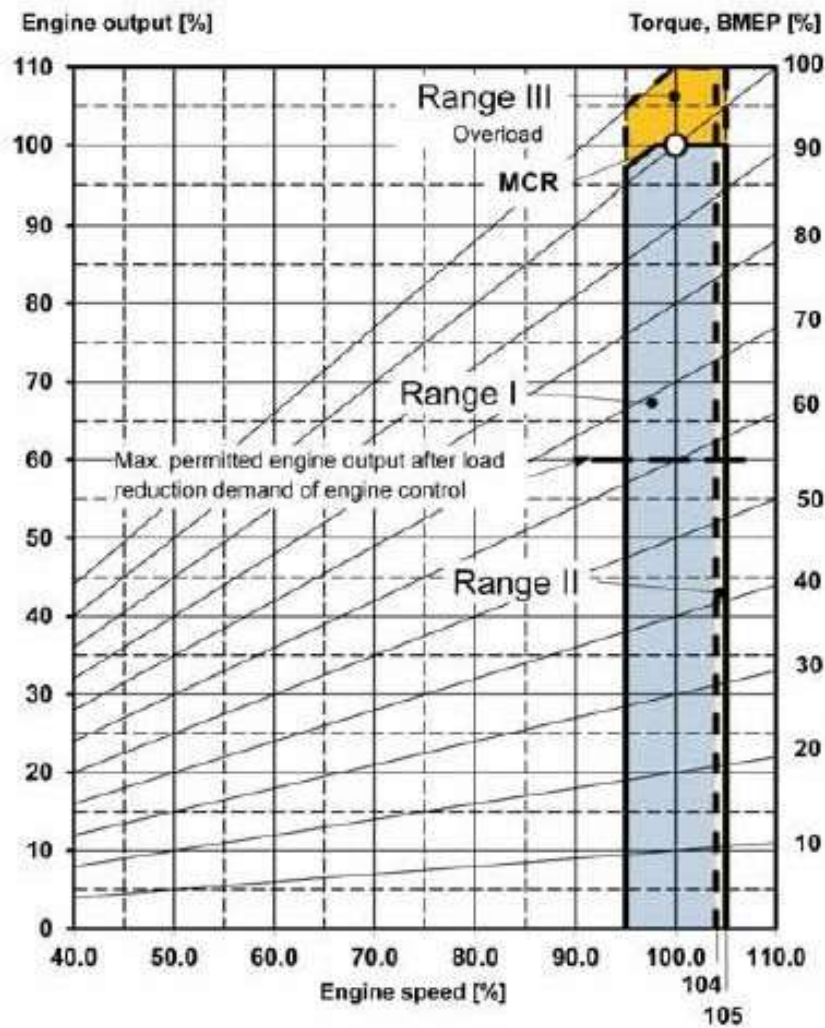


Figure 28: Operating range for GenSet/electric propulsion

- MCR
Maximum continuous rating.
- Range I
Operating range for continuous service.
- Range II
No continuous operation permissible.
Maximum operating time less than 2 minutes.
- Range III

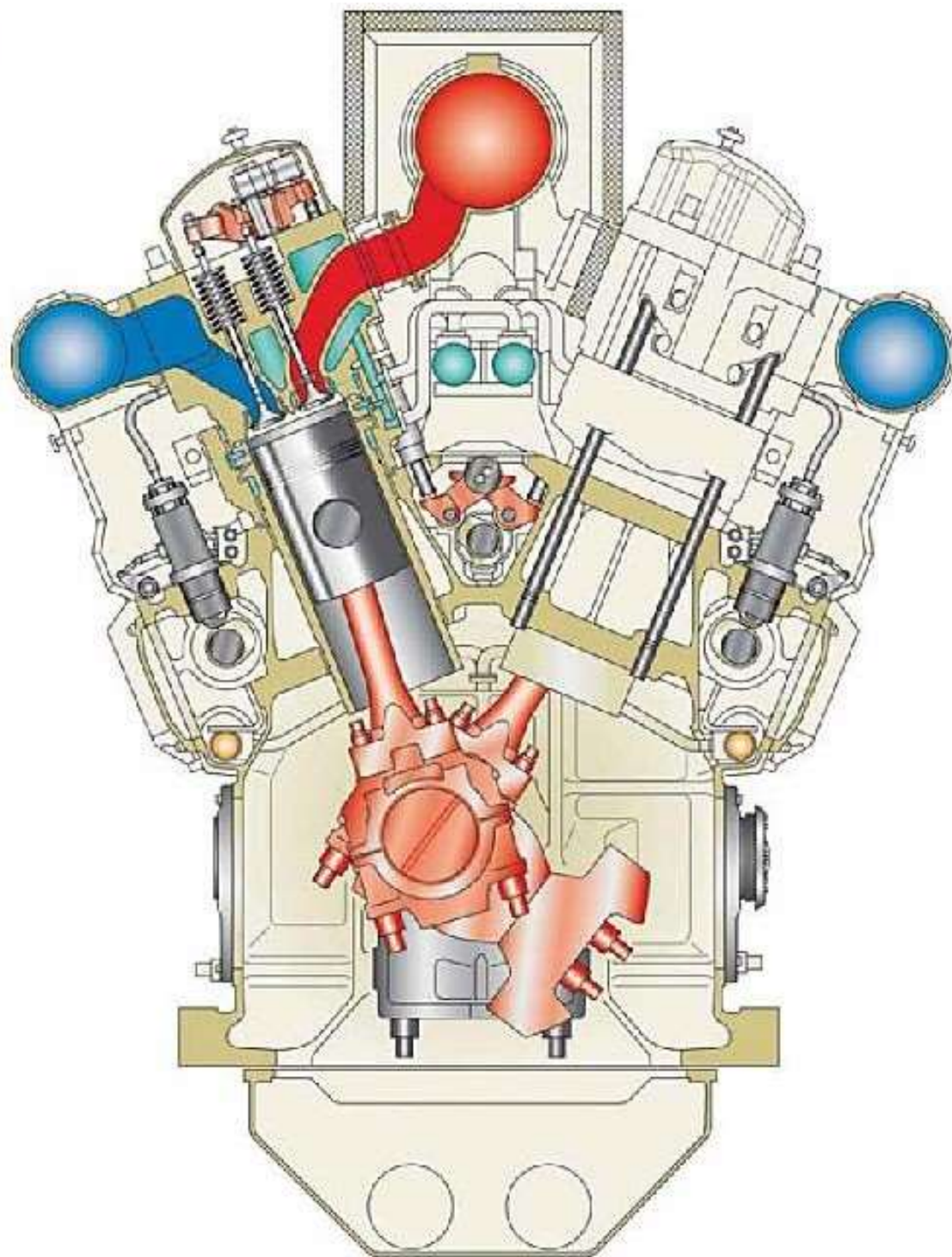


Figure 11: Cross section, view on coupling side – V engine

