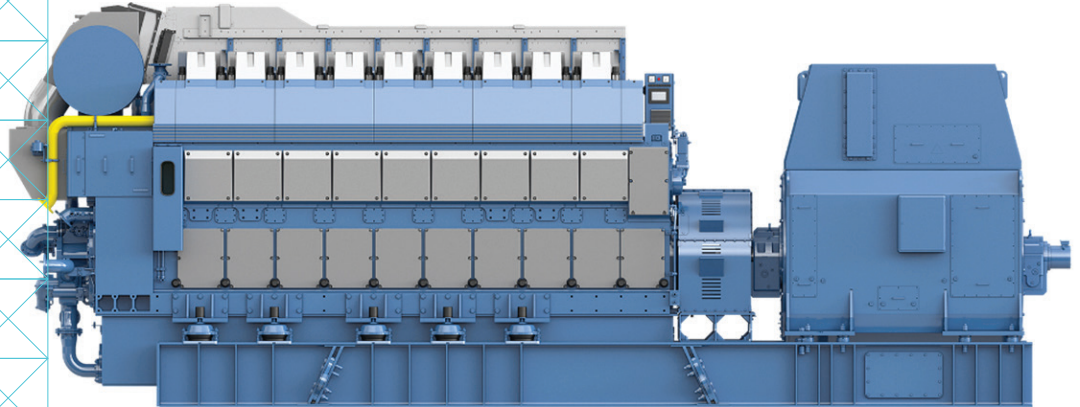


ROLLS-ROYCE BERGEN ENGINES

Kongsberg Maritime is the exclusive distributor of Rolls-Royce medium speed engines for commercial marine applications



KONGSBERG



MARINE GAS ENGINE

Bergen B36:45L generating set

Choose Rolls-Royce Bergen engines for cost-effective operation

The Bergen B-series is based on a modular design, which gives a flexible platform and at the same time carries forward the Bergen traditional values as a robust and reliable engine. The selection of technology was done after consulting a broad range of operators, designers and shipbuilders, to establish the qualities they prize in an engine. This engine series was first introduced to the market in 2014 as a diesel engine, and the gas version followed in 2018. It is available in several in-line or Vee cylinder variants for both diesel and gas, and is equally suitable for mechanical transmission or as a marine generating set.

Main benefits for ship yards:

- Easy installation
- Aligned piping at pump-end for easy connection
- New resilient mounting (no need of welding brackets)

Main benefits for ship owners:

- IMO Tier III compliant without SCR
- Single fuel = single bunkering
- No lubricating oil separator needed
- Fast load response
- Cleaner engine room and no smoke emission
- Extremely low methane slip at all engine loads
- Cylinder Pressure Monitoring (CPM) for improved load control, and possibility for diagnostics per cylinder
- Exceptionally low emissions of NOx, CO2, SOx and particulate
- No "switch over" problems - ref ECA or port regulations
- Long-term compliance with local port regulations and potential benefits from taxation/green port dues
- VVT - Variable Valve Timing for optimum response and load increase
- Gas safe (double wall piping)
- Possible conversion from gas to diesel and vice versa
- Wastegate turbocharger to ensure optimised fuel/air ratio at varying ambient conditions for lean-burn operation

MOST TYPICAL APPLICATIONS

- Cargo vessel
- Cruise
- RoPax
- Ferry
- LNG tanker
- Fish feed vessel
- Offshore
- Tugs

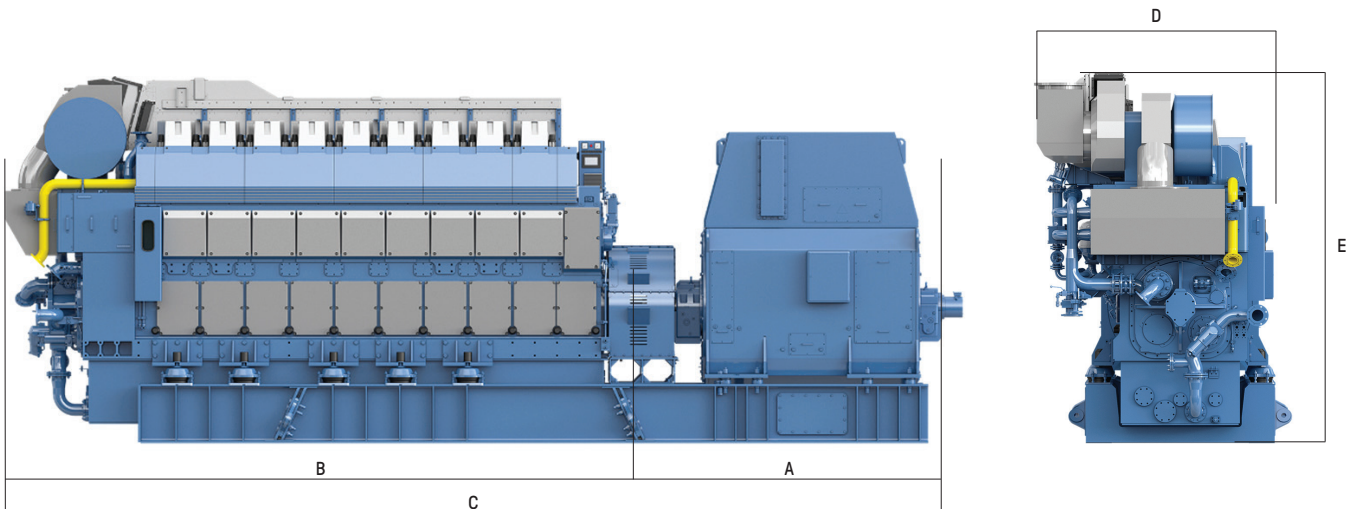
TECHNICAL DATA

ENGINE TYPE		B36:45L6A	B36:45L8A	B36:45L9A
Number of cylinders		6	8	9
Engine speed	r/min	720/750	720/750	720/750
Mean piston speed	m/s	10.8/11.2	10.8/11.2	10.8/11.2
Max.cont rating (MCR)	kW	3450/3600	4600/4800	5175/5400
Max.cont rating altern, (h=0.97)	kWe1	3347/3492	4462/4656	5020/5238
Max.cont rating altern, (Cos f=0.8)	kVa	4184/4365	5576/5820	6275/6548
Max.cont rating altern, (Cos f=0.9)	kVa	3833/4000	4958/5173	5578/5820
Mean effective pressure (BMEP)	bar	21	21	21
Specific energy consumption	kJ/kWh	7420	7420	7420
Specific lubricating oil consumption	g/kWh	0.4	0.4	0.4
Cooling water temp. engine outlet	°C	90	90	90

The performance data is based on: Marine gas engine ratings are according to ISO 3046-1, at maximum 45°C ambient air temperature and maximum 32°C sea water temperature. Specific fuel gas consumption given at 100% load and no engine driven pumps, running on natural gas with Methane number above 70 and net calorific value of 36 MJ/nm³. To include 3 engine driven pumps, add 1.3%. Gas feed temperature is 20-40°C. Minimum gas feed pressure to Gas Regulating Unit to be 5,5 barg.

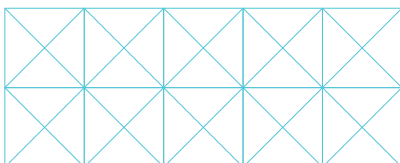
Waste heat recovery: Necessary data for arranging waste heat recovery plants (exhaust gas and cooling water) are available upon request.

Note: Due to continuous development, some data may be changed without notice.



ENGINE TYPE	A	B	C	D	E	WEIGHT DRY ENGINE	WEIGHT GENERATOR
B36:45L6A	3700	5700	9400	2840	4100	48300 kg	17000 kg
B36:45L8A	3800	6600	10400	3045	4400	60600 kg	20700 kg
B36:45L9A	3850	7050	10900	3045	4400	62400 kg	21600 kg

Weight dry engine excludes generator.



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