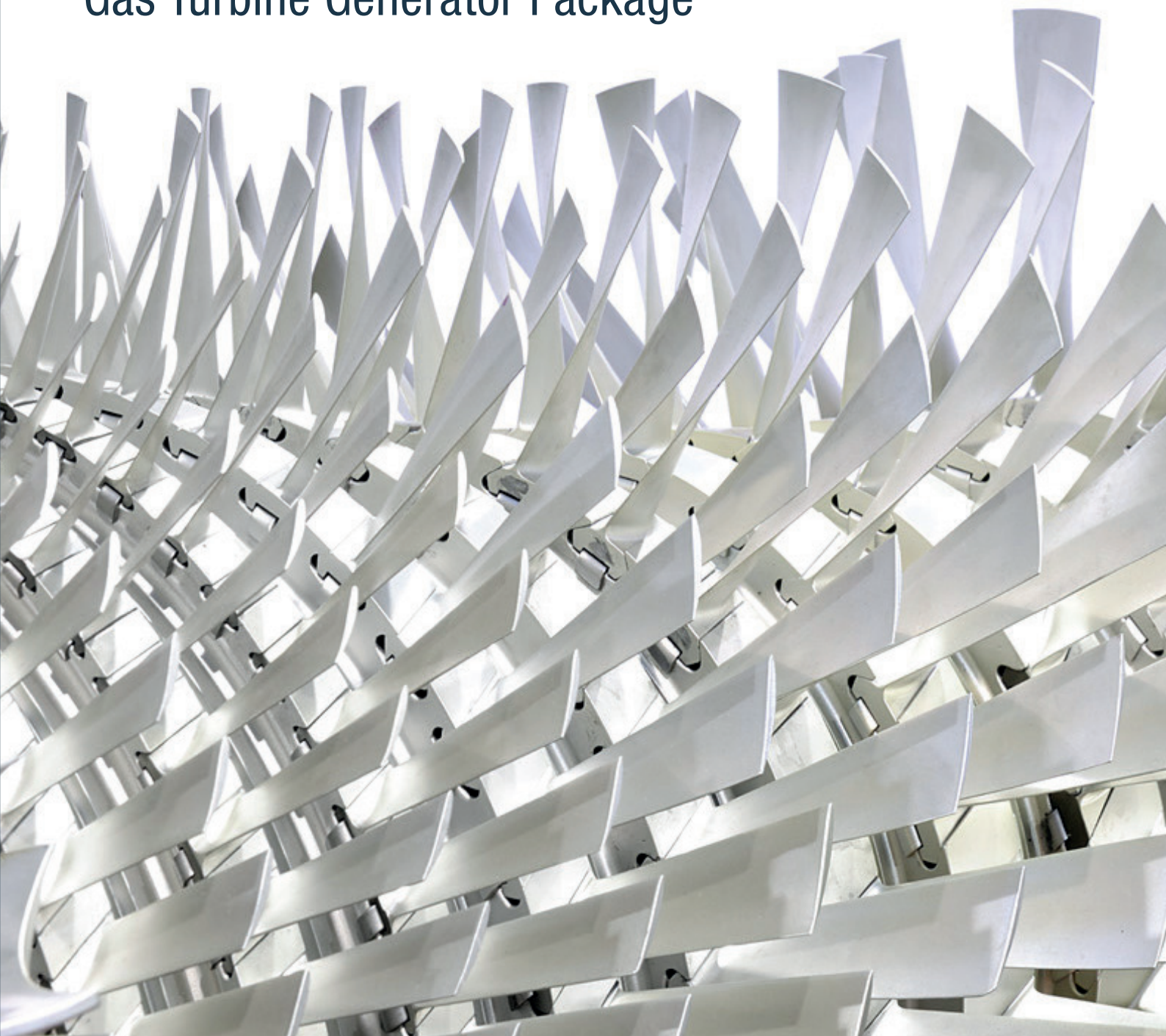


THM 1304-10N & -12N

Gas Turbine Generator Package



Engineering the Future – since 1758.

MAN Diesel & Turbo



THM 1304-10N & -12N

Gas Turbine Generator Package

General Specifications

Gas Turbine

- Heavy duty, two shaft
- 2 combustion chambers in V arrangement

Combustion Systems

- Standard
- High fuel flexibility
- Dual Fuel compatible
- Low Emission
- Dry Low NO_x

Load-gear

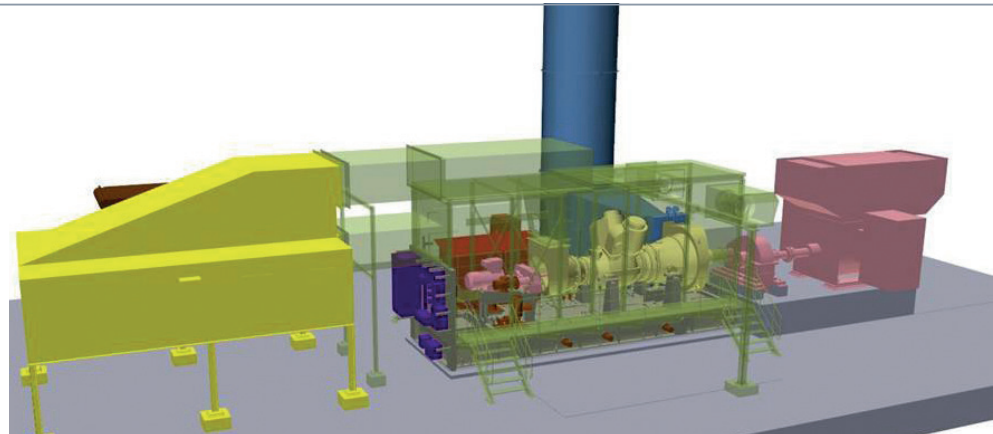
- Speed reduction to 1500 rpm (for 50 Hz) or 1800 rpm (for 60 Hz)

Generator

- 4 pole, 3 phase, synchronous with built-in exciter, rotating rectifier and permanent magnetic pilot generator (PMG)
- Air-cooled
- Water-cooled*
- Insulation Class F / temperature rise class B
- According IEC 60034-1/3

Gas Turbine Package

- Base frame with integrated lube oil tank including
 - Gas turbine
 - On-skid lube oil system
 - On-skid starting system
 - On-skid fuel system
- Enclosure
- Complete package for outdoor installation
 - Fire detection
 - CO₂ fire-fighting system
 - Water-mist fire-fighting system*
 - Gas leakage detection
 - Maintenance cranes
- Turbine compressor cleaning system
 - Offline washing / online washing*
 - Mobile wash trolley*



Lubrication oil cooling system

- 1x100% heat exchanger with 2x50% fans
- 1x150% heat exchanger with 3x50% fans*
- Water cooler*

Fuel Systems

- Natural gas system
- Liquid fuel system*
- Dual Fuel system*

Air inlet system

- Table type filter with depth loading cartridges
- Filtration class: Pre-filter: F6, Fine-filter: F9
- Static filter including anti-icing*
- Pulse type filter in table or down flow arrangement*

Exhaust system

- Expansion joint
- Transition duct
- Free-standing stack with internal insulation
- Free-standing stack with double shell design*
- Exhaust gas duct for connection to waste-heat-recovery boiler*

Noise Emission

- All equipment is designed for Lp 85 dB(A) measured in 1 m distance and 1.5 m height
- Lp = 80*, 75*, 70* dB(A)

Electrical & Control System

- For installation in control room
- SIMATIC based automation system for control, operation & monitoring
- Data recording system:
 - for recording and storage of engine parameters
 - online data access if required
- Control and protection for generator including Voltage regulator (AVR)
- Variable speed drive for gas turbine starter motor
- Low voltage switchgear for motor controls (MCC)
- Battery system / UPS*
 - for emergency lube oil pump
 - for unit control system emergency power supply

Documentation

- Engineering documents
- Installation manual
- Operating instructions
- I&C documentation
- Site manual
- Quality documentation
- Inspection and test plan

Factory acceptance test of turbine

- Full-speed, full-load

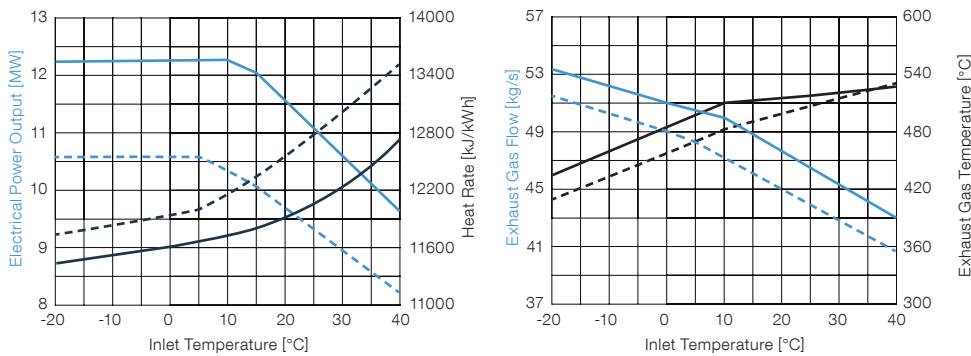
Complete unit test*

- Full-speed, full-load
- Full-speed, no-load

Performance at ISO Conditions**

		1304-10N	1304-12N
Power Output	kW _{el}	10,080	12,000
Heat Rate	kJ/kWh _{el}	12,330	11,790
Efficiency	% _{el}	29.2	30.5
Exhaust Gas Flow	kg/s	46.5	49.1
Exhaust Gas Temperature	°C	490	515
Generator Speed (50 Hz / 60 Hz)	rpm	1,500/1,800	1,500/1,800
NOx Emissions	mg/Nm ³	50	50
(ref. to 15% O ₂ , dry)	ppm	25	25
CO Emissions	mg/Nm ³	< 10	< 10
(ref. to 15% O ₂ , dry)	ppm	< 8	< 8
Saturated Steam (unfired) 10 bar	t/h	26.5	30.6
Saturated Steam (fired) 10 bar	t/h	132.3	137.0

**all data valid for sea level, 15°C, no inlet and exhaust pressure losses, 60% rel. humidity, natural gas. Power output will decrease with increase of site altitude (1.1% per 100 m), inlet pressure loss (1.9% per 1kPa) and exhaust pressure loss (0.9% per 1kPa)



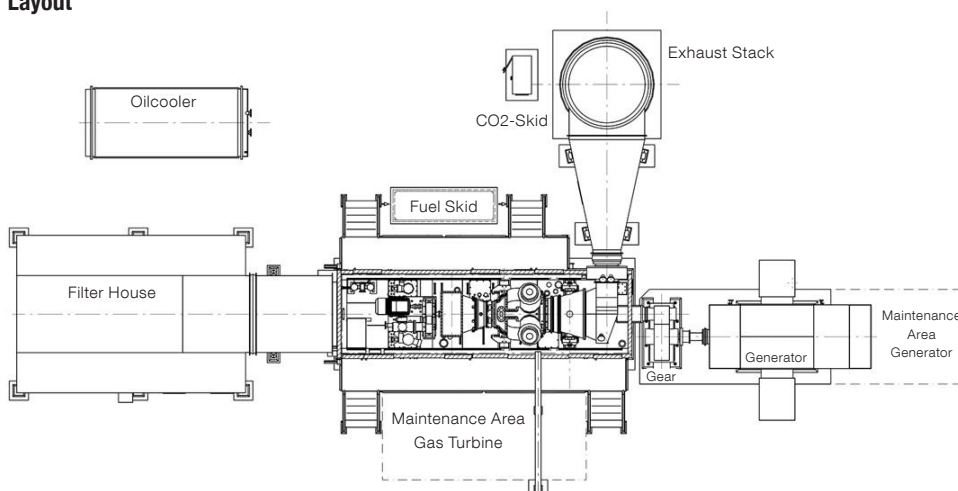
Required space

- Length 31 m
- Width 18 m
- Height 11 m

Weights

- GT Package 32 t
- Gear Box 7 t
- Generator 35 t
- Filterhouse 10 t
- Exhaust system 16 t
- Lubrication Oil cooler 9 t
- External Fuel skid 1 t
- CO2 fire fighting skid 1.2 t

Layout



THM
Gas Turbines
overview



All data provided in this document is non-binding. This data serves informational purposes only and is not guaranteed in any way. 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. Copyright © MAN Diesel & Turbo. Printed in Germany GGKMS09150.5

MAN Diesel & Turbo

Steinbrinkstr. 1

46145 Oberhausen,

Germany

Phone +49 208 692-9552

Fax +49 208 692-2644

konstantin.divivier@man.eu

www.turbomachinery.man.eu