

# MGT6000

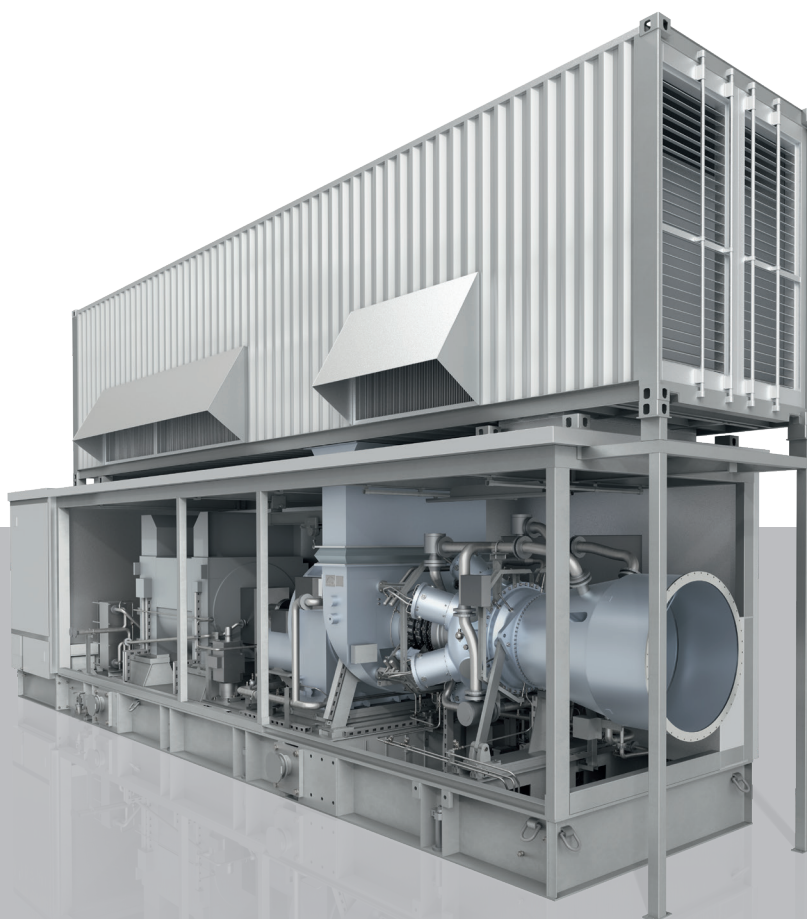
## Single Shaft

Decades of industrial gas turbine experience and profound application knowledge have led to an evolution in small industrial gas turbines – the MGT family.

The single shaft turbine MGT6000 is developed purely for power generation applications – high efficiency combined with a compact package design.

### Benefits at a glance

- Modular design for easy and fast installation
- High efficiency
- Low emissions
- Low operating costs
- Low life cycle costs

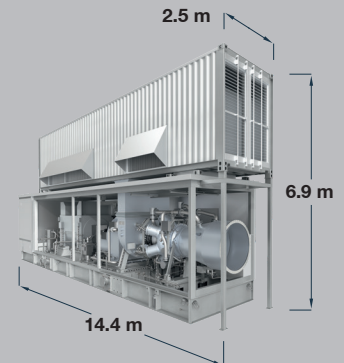


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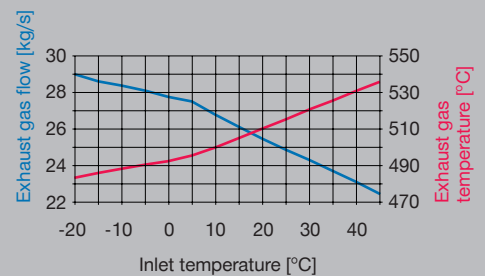
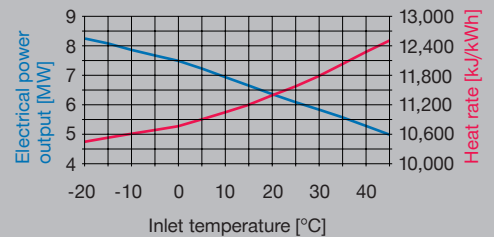
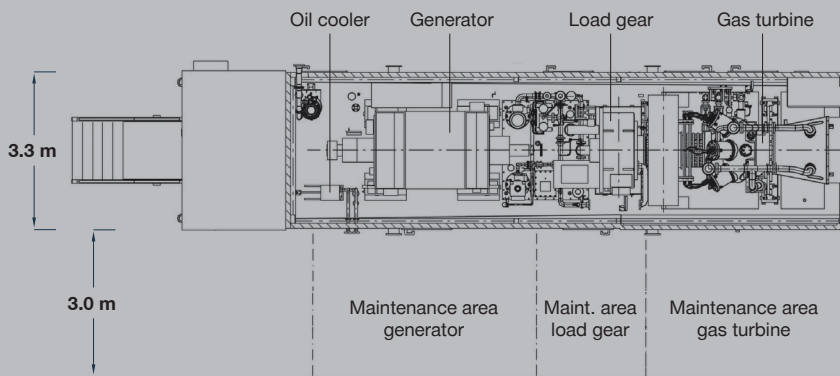
## Technical data

### Performance at ISO conditions\*

MGT6000 Single Shaft			
Power output	kW <sub>el</sub>	6,630 – 7,800	
Heat rate	kJ/kWh <sub>el</sub>	11,190 – 10,840	
Efficiency	% <sub>el</sub>	32.2 – 33.2	
Exhaust gas flow	kg/s	26.1 – 29.4	
Exhaust gas temperature	°C	490 – 505	
Generator speed (50 Hz/60 Hz)	rpm	1,500/1,800	
NO <sub>x</sub> emissions (ref. to 15 % O <sub>2</sub> , dry)	mg/Nm <sup>3</sup>	30	
	ppm	15	
CO emissions (ref. to 15 % O <sub>2</sub> , dry)	mg/Nm <sup>3</sup>	30	
	ppm	24	



\*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 1 kPa) and exhaust pressure loss (0.9 % per 1 kPa)



## Typical applications

Gas turbine generator units are operated for e.g. emergency and black start applications, on off-shore platforms (with adapted package design) mainly in simple cycle mode.

For CHP<sup>1</sup>) applications (most common) gas turbine generator units are operated in combination with a heat recovery unit for different heat processes, resulting in e.g.

- Power, Steam Generation
- Power, Hot Water Generation
- Power, Steam & Chilled Water
- Power, Steam & Hot Water

CHP applications are beneficial for various industries such as food processing, pulp & paper, breweries, automotive, etc. having demand for Heat and Power. CHP processes provide increased efficiencies and reduced CO<sub>2</sub> emissions compared to conventional power & heat generation. Overall CHP efficiencies reach 90% and higher depending on the heat process.

## Gas turbine

- Heavy duty, single shaft
- 11 stage air compressor
- 6 combustion chambers multi-can, ACC<sup>2)</sup> combustors
- 3 stage turbine

## Load gear

- Planetary gear type
- Speed reduction to 1,500 rpm (for 50Hz) or 1,800 rpms (for 60Hz)<sup>3)</sup>
- Drive for main lube oil pump
- Torque transmission of electric starter motor for gas turbine start-up

## Generator

- 4 pole, 3 phase, synchronous generator with built-in exciter, rotating rectifier and permanent magnet pilot generator (PMG)
- Direct air cooled
- Insulation class F / temperature rise class B

## Package

- Fully-integrated for outdoor installation
- Noise emission
  - All equipment is designed for  $L_{pA} = 85$  dB(A) measured in 1 m distance and 1.5 m height
  - $L_{pA} = 80^{3)}$ ,  $75^{3)}$ ,  $70^{3)}$  dB(A)
- Single-lift base frame
  - With integrated lube oil and fuel system
- Starting system
  - Variable frequency drive for gas turbine starter motor
- Integrated lube oil system
  - Main lube oil pump driven via load gear
  - Standby lube oil pump (AC motor driven)
  - Emergency lube oil pump (DC motor driven)
  - Water to oil cooler
  - Air to oil cooler<sup>3)</sup> (free standing)
  - Integrated lube oil tank
  - Lube oil tank heater
  - Lube oil filter
  - Control valves
  - Oil mist separator
- Fuel system
  - Fuel gas system
  - Double block and bleed valves
  - Control valves
  - Dual fuel system<sup>3)</sup>
- Air inlet system
  - Static depth loading cartridges
  - Filtration class:
    - Pre-filter: G4,
    - Fine-filter: F9 (E11<sup>3)</sup>)
  - Static filter<sup>3)</sup> with anti-icing<sup>3)</sup>
  - Free standing filter house<sup>3)</sup>
- Exhaust system
  - Transition duct up to interface at enclosure for connection to optional downstream exhaust system
- Enclosure
  - Complete package for outdoor installation
  - Fire detection and CO<sub>2</sub> fire-fighting system
  - Water-mist fire-fighting system<sup>3)</sup>
  - Gas leakage detection
  - Maintenance cranes
- Turbine compressor cleaning system
  - Offline and online washing
  - Mobile wash trolley<sup>3)</sup>

## Controls

- All electrical cabinets installed on skid in air-conditioned control compartment
- Gas turbine control system
  - Gas turbine control & protection
  - Unit sequencing
  - Human machine interface (HMI)
  - Alarm management
- Generator control & protection system
  - Automatic synchronization
  - Automatic voltage regulator (AVR)
  - Generator protection relay
- Low voltage distribution system
  - AC power supply for all electrical consumers
- Turbine starting system
  - Variable frequency drive (VFD)
- Uninterruptable power supply system
  - Buffered with batteries
  - DC supply for emergency lube oil pump
  - AC supply for electrical panels
- Data storage system
  - Long term data archive
  - Event logger
- Plant control system interface
  - Modbus TCP interface
  - Others optional

## Documentation

- Engineering documents
- Installation manual
- Operating instructions
- Quality documentation

## Factory acceptance test of turbine

- Core engine full-speed, full-load

## Complete unit test<sup>3)</sup>

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

<sup>1)</sup> CHP = Combined Heat and Power

<sup>2)</sup> ACC = Advanced Can Combustor (Dry Low Emission (DLE) Technology)

<sup>3)</sup> can be offered as option