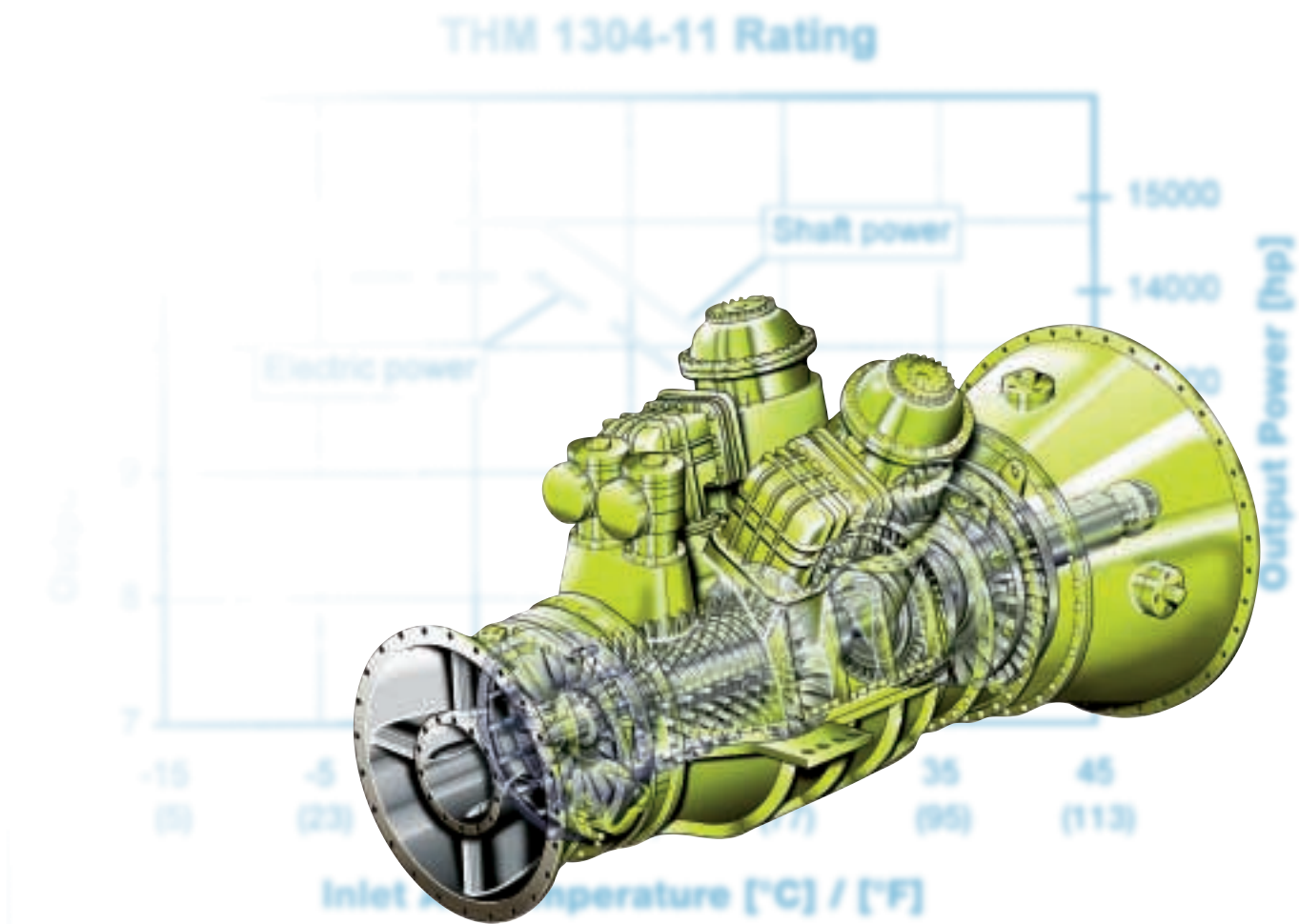


Performance Data



The THM Gas Turbine Range

All THM gas turbines are available either with their standard combustion system for gaseous and liquid fuels (water or steam injection can be used for NO_x control) or with a Dry-Low-NO_x System.

For THM 1304 gas turbines equipped with the Dry-Low-NO_x (DLN) combustion system, NO_x and CO emissions below 25 ppmv (dry, 15% O₂) are achieved on natural gas fuel over a wide load range.

Excellent part load emissions without any efficiency penalty are achieved by using an patented air-bypass system; part of the compressor air bypasses the combustion zone and reenters the process upstream of the turbine section.

Optimum fuel/air ratio in the lean combustion zone is therefore possible over a wide load range without the need to blow off compressor air.

Each THM can, as an option, be equipped with a recuperator heat exchanger where the hot exhaust gas flow heats the compressor discharge air before entering the combustion system.

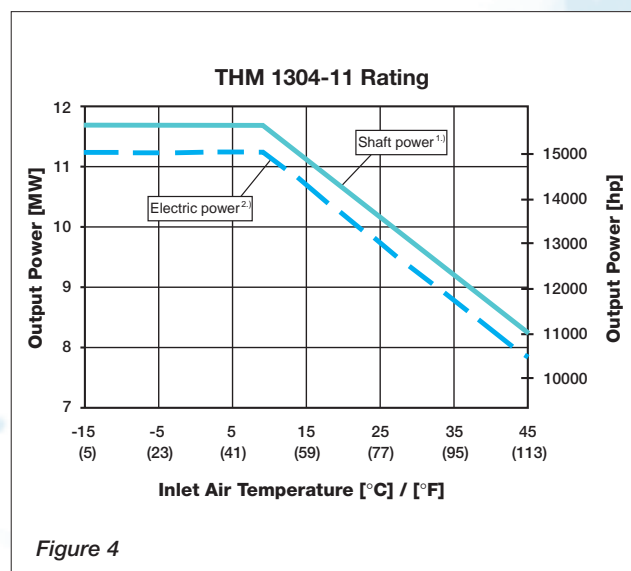
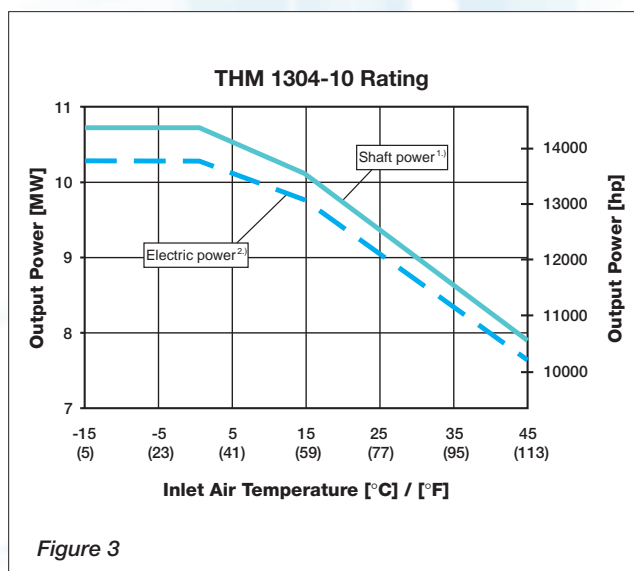
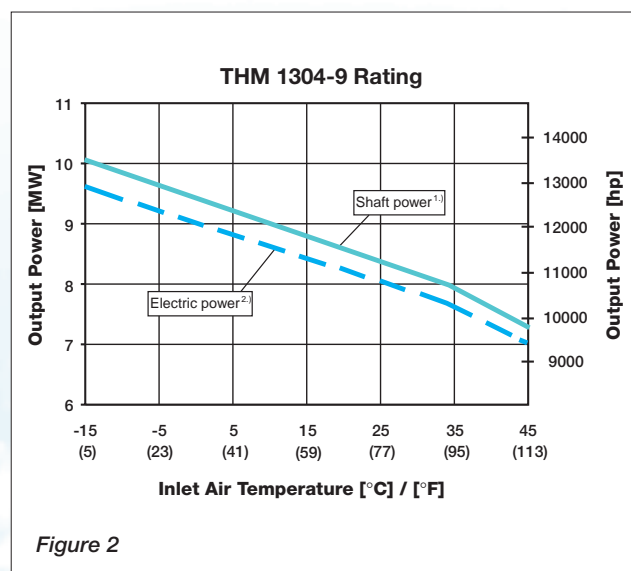
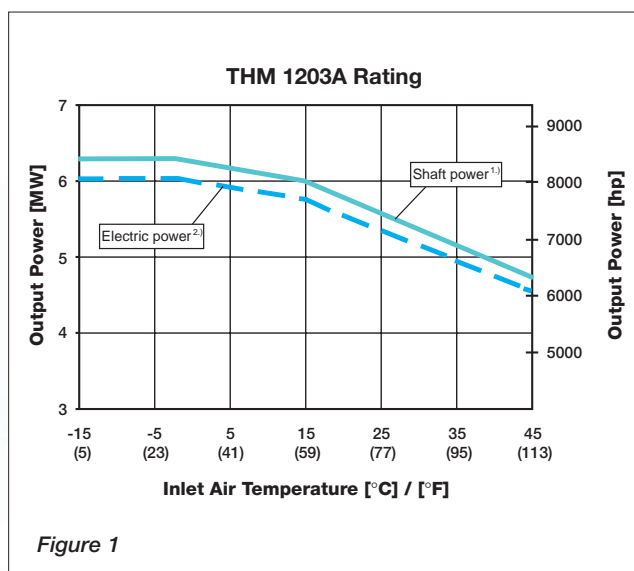
This leads to a significant fuel saving.

Output power rating curves for the THM models 1203A, 1304-9, 1304-10 and 1304-11 are shown in Figures 1 to 4 for mechanical drive and for generator drive applications.

		1203A	1304-9	1304-10	1304-11
<i>Mechanical Drive (at Coupling)</i>					
Power Output	kW	6000	9000	9700	11200
Efficiency	%	23.4	28.8	29.2	31.0
Heat Rate	kJ/kWh	15380	12500	12330	11610
<i>Generator Drive (at Generator Terminals)</i>					
Power Output	kWe	5760	8640	9320	10760
Efficiency	%	22.5	27.7	28.0	29.8
Heat Rate	kJ/kWh	16020	13020	12840	12090
<i>Exhaust Data</i>					
Exhaust Gas Temperature	°C	515	492	500	505
Exhaust Gas Flow	kg/s	35.2	44.9	45.3	49.1

		1203A	1304-9	1304-10	1304-11
<i>Mechanical Drive (at Coupling)</i>					
Power Output	hp	8050	12070	13010	15020
Efficiency	%	23.4	28.8	29.2	31.0
Heat Rate	Btu/hph	10870	8835	8715	8206
<i>Generator Drive (at Generator Terminals)</i>					
Power Output	kWe	5760	8640	9320	10760
Efficiency	%	22.5	27.7	28.0	29.8
Heat Rate	Btu/kWh	15180	12341	12170	11459
<i>Exhaust Data</i>					
Exhaust Gas Temperature	°F	959	918	932	941
Exhaust Gas Flow	lb/s	78	99	100	108

All Data at 15°C (59°F), Sea Level (101.3 kPa), Rel. Humidity 60%, Zero Inlet and Exhaust Pressure Losses.
For Generator Drive: Gearbox Efficiency 98.5%, Generator Efficiency 97.5%.



Power Output vs. Inlet Temperature

Sea Level (101.3 kPa), Rel. Humidity 60%, Zero Inlet and Exhaust Pressure Losses

1.) Power Output on Gas Turbine Shaft

2.) Power Output at Generator Terminals (Generator Efficiency 97.5%, Gearbox Efficiency 98.5%)

Note: Due to the continued upgrading/uprating process of THM turbines performance data are subject to change



MAN Turbomaschinen AG
GHH BORSIG
Steinbrinkstrasse 1
46145 Oberhausen / Germany
Phone +49. 208. 6 92-01
Fax +49. 208. 6 92-20 19
www.manturbo.com

MAN Turbomaschinen AG
GHH BORSIG
Egellsstrasse 21
13507 Berlin / Germany
Phone +49. 30. 43 01-03
Fax +49. 30. 43 01-28 41

In the interests of technical progress,
this publication is subject to revision
without notice.
Printed in Germany.
January 2002
TURBO 922 e 0102 1,5 ba

MAN Turbomaschinen AG
Schweiz
Hardstrasse 319
8023 Zurich / Switzerland
Phone +41. 1. 278-22 11
Fax +41. 1. 278-29 89

MAN Turbomacchine S.r.l.
De Pretto
Via Daniele Manin 16/18
36015 Schio (VI) / Italy
Phone +39. 0445. 6 91-5 11
Fax +39. 0445. 5 11-1 38