



GE Power

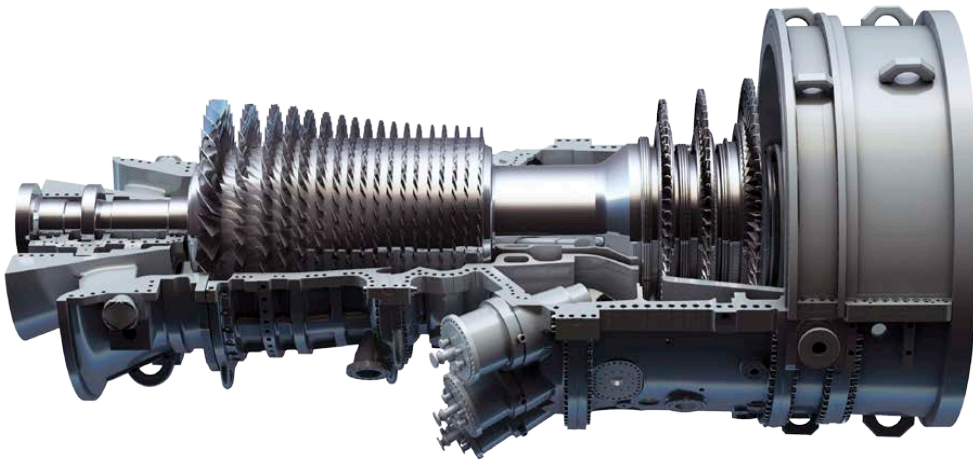
F-CLASS

9F.03/.04 GAS TURBINE (50 Hz)

PROVEN SOLUTION TO MEET GROWING POWER DEMAND

For more than 15 years, GE's rugged 9F.03 heavy duty gas turbine has delivered industry leading reliability across a fleet of more than 250 units boasting millions of hours of operation. Our 9F.03 units have been installed with a variety of operating profiles under a wide range of ambient conditions. They operate in diverse applications ranging from power generation to combined heat and power (CHP). The 9F.03 gas turbine delivers extended maintenance inspection intervals, fuel flexibility, low NO_x emissions, low CO emission compliant turndown, and fast start options.

265-281 MW
SIMPLE CYCLE OUTPUT
>59% COMBINED
CYCLE EFFICIENCY



Lowest Life Cycle Cost in its Class

- Combustion and hot gas path inspection intervals have been extended to 32,000 hours, with parts lasting multiple cycles to increase availability.
- Mark* Vle control system real-time, physics-based modeling increases overall performance, operability, and reliability.
- OpFlex AutoTune software improves DLN system capability, allowing operation on a wide range of natural gas compositions.

9F.04... Enhancing the 9F.03 with the Proven 7F Advanced Gas Path

- 9F.04 technology is built on more than 140 F-class Advanced Gas Path (AGP) installations and over 500,000 operating hours.
- AGP uses improved materials and cooling/sealing technology to provide enhanced performance with reliable, cost-effective operation.
- Power augmentation options are available to meet peak generation requirements up to 300 MW.

Quick and Efficient Response When Needs Change

- Average start-up reliability is greater than 97 percent.
- Low cumulative NO_x emissions meet annual tonnage limits even while operating in cyclic duty.
- Fast start option provides flexibility to shorten time required to produce power.



		9F.03	9F.04
SC Plant Performance	SC Net Output (MW)	265	281
	SC Net Heat Rate (Btu/kWh, LHV)	9,020	8,830
	SC Net Heat Rate (kJ/kWh, LHV)	9,517	9,316
	SC Net Efficiency (% , LHV)	37.8%	38.6%
Gas Turbine Parameters	Exhaust Temperature (°F)	1,104	1,127
	Exhaust Temperature (°C)	596	608
	Exhaust Energy (MM Btu/hr)	1,458	1,498
	Exhaust Energy (MM kJ/hr)	1,538	1,581
	GT Turndown Minimum Load (%)	35%	35%
	GT Ramp Rate (MW/min)	22	23
	NO _x (ppmvd) at baseload (@15% O ₂)	15	15
	CO (ppm) at Min. Turndown w/o Abatement	24	24
	Wobbe Variation (%)	+/-15%	+/-15%
	Startup Time (Conventional/Peaking, Minutes)	23/20	23/20
	1x CC Plant Performance	CC Net Output (MW)	405
CC Net Heat Rate (Btu/kWh, LHV)		5,840	5,740
CC Net Heat Rate (kJ/kWh, LHV)		6,162	6,056
CC Net Efficiency (% , LHV)		58.4%	59.4%
Plant Turndown – Minimum Load (%)		46%	45%
Ramp Rate (MW/min)		22	22
Startup Time (RR Hot, Minutes)		30	30
2x CC Plant Performance	CC Net Output (MW)	815	861
	CC Net Heat Rate (Btu/kWh, LHV)	5,810	5,710
	CC Net Heat Rate (kJ/kWh, LHV)	6,130	6,024
	CC Net Efficiency (% , LHV)	58.7%	59.8%
	Plant Turndown – Minimum Load (%)	22%	22%
	Startup Time (RR Hot, Minutes)	39	39



Efficient, Flexible, Reliable Power

GE's portfolio of heavy duty and aeroderivative gas turbines helps provide a sense of certainty in an uncertain world, delivering operational flexibility and performance needed to adapt to a rapidly evolving power generation environment. With gas turbine products ranging in individual output from 22 MW to 519 MW, GE has a solution to reliably and efficiently deliver the power needed by utility power generators, industrial operators, and communities. Even in remote locations and harsh conditions, you can count on GE to deliver a gas turbine that will meet your needs.

All of our gas turbines share the common heritage of jet engine technology pioneered by GE in the first half of the 20th century. They are typically categorized as either heavy duty (sometimes also called "frame") or aeroderivative gas turbines, although some turbines recently have adopted features of both design types. In general, the differences between the aeroderivative and heavy duty gas turbines are weight, size, combustor type, and turbine design. Heavy duty gas turbines are usually field constructed and maintained in place, whereas aeroderivative gas turbines are designed to allow for quick replacement of the entire engine when maintenance is required.

50 Hz Portfolio by Rating

