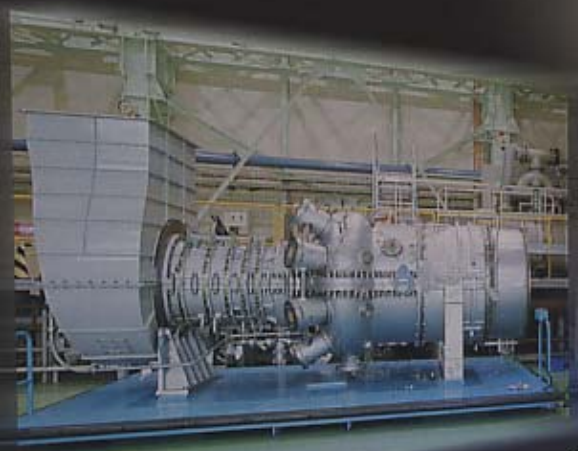
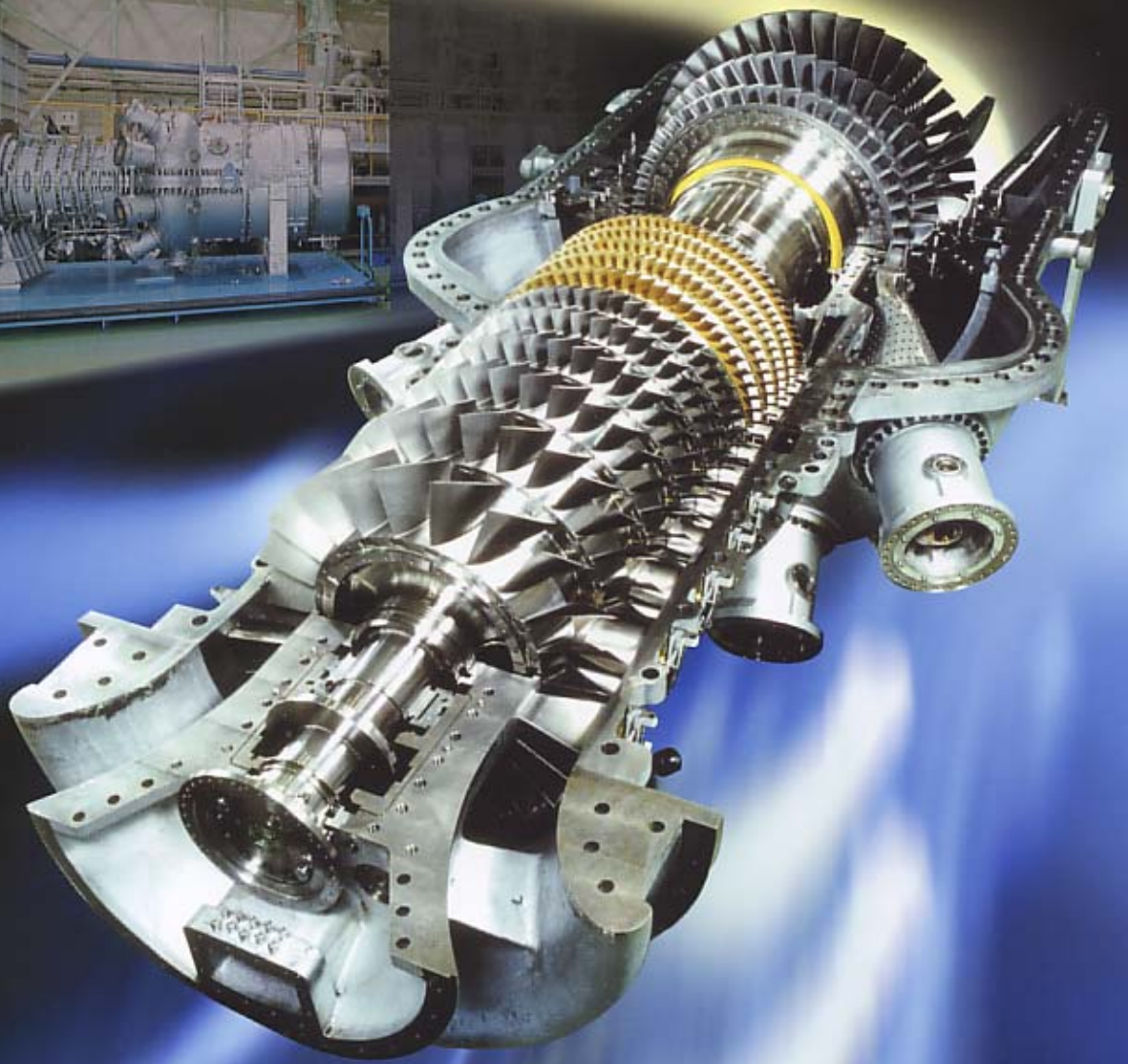
Kawasaki

Kawasaki L20A

HIGHLY-EFFICIENT 20MW GAS TURBINE





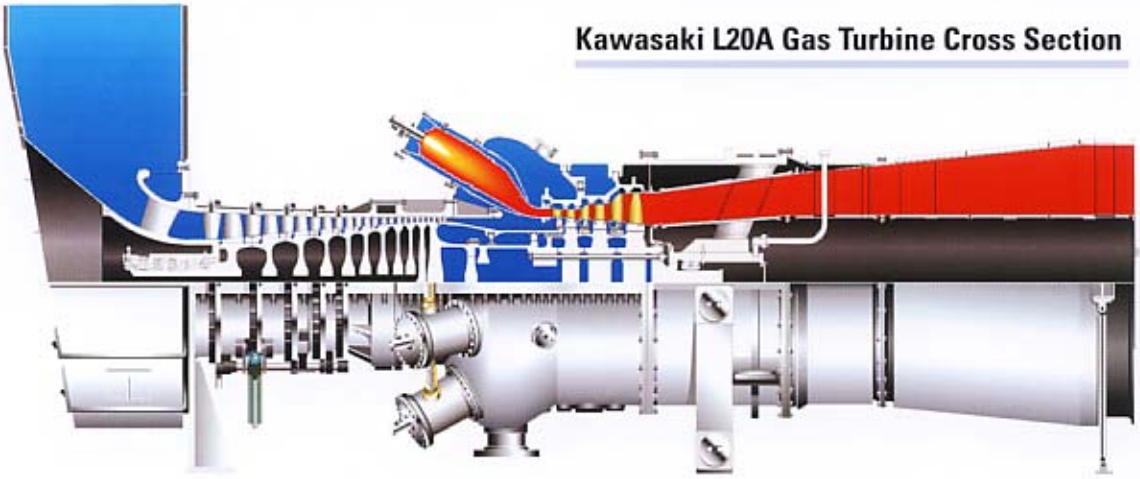
KAWASAKI
HEAVY INDUSTRIES, LTD.

Lower Lifecycle Cost for Cogeneration and Combined -

Kawasaki's L20A Gas Turbine is the optimum choice for today's power-generation plants – offering enhanced operations and environmental compliance.

The L20A is based on Kawasaki's M7A Gas Turbine technology and its extensive industry experience. Designed to minimize lifecycle and component costs, it also boosts industry-leading levels of efficiency, reliability and heat recovery. Equipped with the latest advances, the gas turbine features 11 stages (including five variable stator vanes with inlet guide vanes), a high-pressure axial flow compressor, a three-stage heavy-duty air-cooled turbine and eight can combustors.

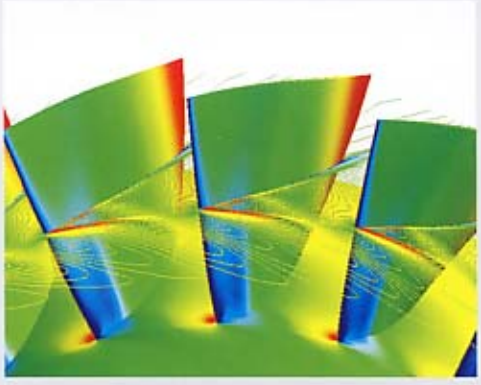
Kawasaki L20A Gas Turbine Cross Section



Technical Features

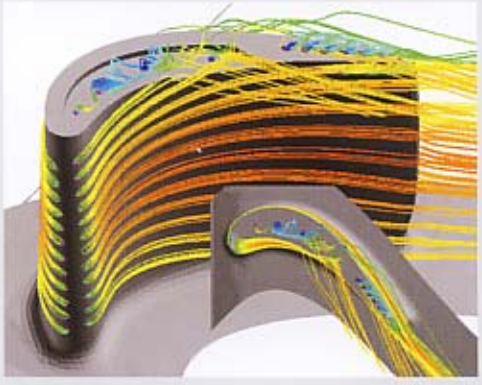
■ Enhanced Efficiency

Optimally designed, the L20A achieves high load and high efficiency.



■ Longer Life for Hot Section Parts

The L20A's optimum cooling design prolongs the life of hot-section parts.



Cycle Plants:Boosts Efficiency and Energy Conservation

World-class Advances

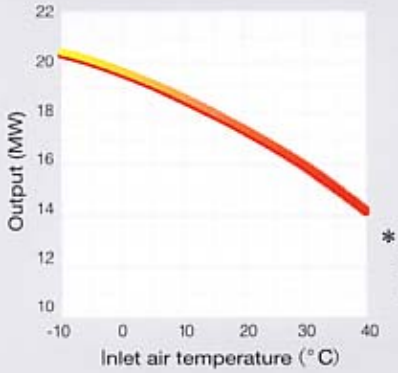
1 Greater Efficiency
A cogeneration system based on the L20A can boost total thermal efficiency to over 80 percent, while a combined-cycle power plant (CCPP) with the L20A and a steam turbine will realize electrical efficiency of over 48 percent.

2 Improved RAM
The design assures better RAM (Reliability, Availability, Maintainability) and greater durability, with 40,000 TBO (time between overhauls) hours. The horizontal split casing and bore-scope inspection holes also ease inspection and maintenance.

3 Increased Heat Recovery
Exhaust gas temperature has been raised to the optimum 545°C, increasing heat recovery.

4 Reduced Emissions
Kawasaki's Dry Low Emissions (DLE) combustor, with a lean premix multi-burner, reduced NOx emissions to <23 ppm at O_2 = 15%.

Power Output Curve



* Graph based on:
- ISO conditions
- Fuel: natural gas
- Output at reduction gear shaft

Specifications

Rated output	18,000 kW
Thermal efficiency	35%
Exhaust gas flow	57.8 kg/sec.
Exhaust gas temp.	545°C

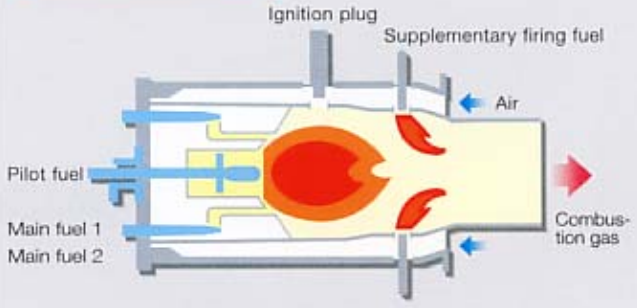
* Specs are based on ISO conditions, natural gas and output at reduction gear shaft.

Type	Open cycle, single shaft
Compressor	11-stage axial
Combustor	8 cans
Turbine	3-stage axial

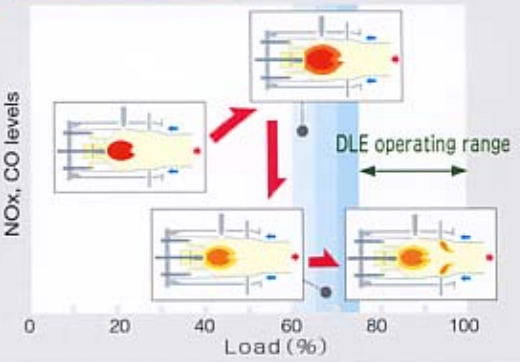
■ Improved Exhaust Gas Emissions

With the adoption of the proven DLE combustor, NOx emissions have been slashed to <23 ppm at O_2 = 15%.

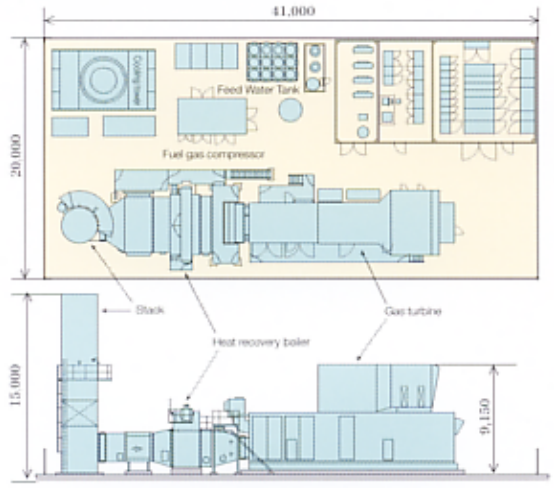
DLE Combustor



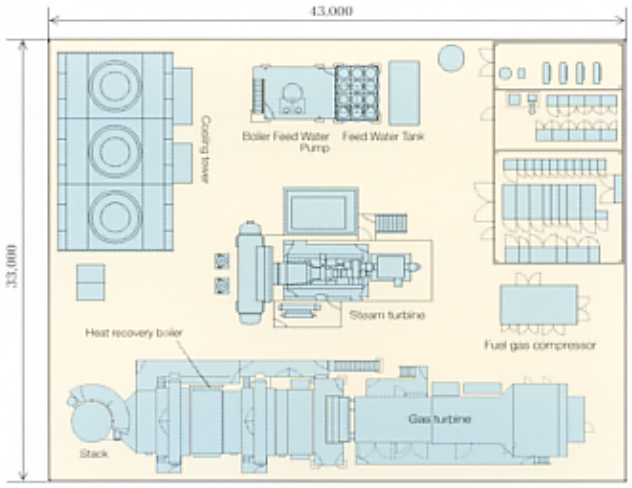
DLE Burner Control



■ Typical Plant Layout



Cogeneration Plant



Combined Cycle Plant

■ System Performance (gas fired under ISO conditions)

Power Generation System	Generator Output (MW)	Generator Efficiency (%, LHV)	Steam Production (tons/hour)
1. Simple cycle	17	34	—
2. Cogeneration	17	81 (Overall efficiency)	36
3. Combined cycle			
1 gas turbine + 1 steam turbine	25	48.6	—
2 gas turbines + 1 steam turbine	51	49.1	—

※ Specifications are subject to change without notice.

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