

## Kawasaki L20A Gas Turbine

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### 1. Introduction

The Kawasaki L20A is a newly developed 20MW class industrial gas turbine, which is particularly suited for use in distributed power generation, co-generation and combined cycle applications.

### 2. Features

The L20A was developed on the well-proven Kawasaki 7MW-class gas turbine M7A. The design maintains the robustness and the low life cycle cost advantages of industrial gas turbines as well as the high efficiency level of the aero-derivative gas turbine. The major features are shown below.

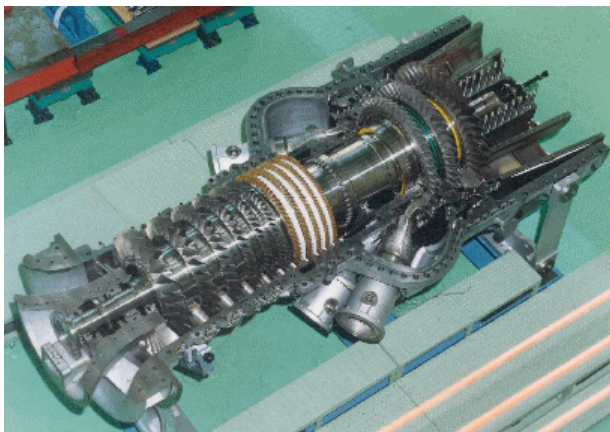
- 1) High Thermal Efficiency
- 2) Low Emission
- 3) High Reliability
- 4) Ease of Maintenance and Inspection
- 5) Low Life Cycle Cost
- 6) Advanced Control and Monitoring System

### 3. Design

L20A specifications are shown in Table 1.

#### 3.1 Performance

At ISO condition, it has a rated output of 18MW, a simple-cycle thermal efficiency of 35% and a relatively



**Fig. 1 L20A Gas Turbine**

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**Table 1.L20A Specifications**

#### Performance

power output	18,000 kW
Thermal efficiency	35 %
Rotating speed	9,420 rpm
Inlet Airflow	57 kg/s
Pressure ratio	18
Turbine inlet temp.	1,250 degC
Exhaust gas temp.	545 degC
Emissions (O <sub>2</sub> =15%)	NO <sub>x</sub> < 23ppm CO < 25ppm

\* ISO condition, Gear box shaft end, natural gas fuel

#### Structure

Type	Open cycle single-shaft
Dimensions	L6.6m × H2.7m × W2.2m
Weight	14 Ton
Compressor	Axial 11 stages
Comubstor	8 cans
Turbine	Axial 3 stages

high exhaust gas temperature of 545degC. These features are suitable for use in co-generation and combined cycle applications. In addition, low emission performance, which is achieved by pre-mixed lean burn combustors, is environment-friendly.

#### 3.2 Structure

L20A is a single-shaft gas turbine aimed for electric power generation with 11-stages axial compressor, 8-cans combustor and 3-stages axial turbine. The horizontal split casings and inspection holes enable easy on-site inspection and maintenance.

### 4. Conclusions

The performance, both mechanically and thermodynamically, was successfully demonstrated by the prototype test. And then, the L20A was launched in 2001 and the first commercial unit has been in operation at Kawasaki's Akashi Works in Japan since October 2001. Furthermore, the CCPP plant with 2 set of L20A started commercial operation in July 2004.