Gas Turbines
Reliability, innovation and a Customer Oriented Approach
Ansaldo Energia manufactures a complete range of heavy duty gas turbines for power generation applications, allowing customers to equip their combined-cycle and open-cycle power plants with gas turbines that are competitive in terms of all market drivers: efficiency, power output, reliability, operational and fuel flexibility, emission levels and cost-effectiveness.

Dedicated R&D and Service organizations assist customers with continuous product improvements, combined with the traditional reliability and robustness of Ansaldo Energia products: the result is a unique and balanced value package based on innovation and reliability.

Ansaldo Energia gas turbines combine the company’s proven designs, manufacturing capabilities and commissioning skills with its well known flexibility in matching customer needs with tailored solutions.

### Ansaldo Energia Gas Turbines: history and future

With an industrial legacy stretching back over 160 years, Ansaldo Energia has focused on gas turbines since 1991. In 2007 the 100th gas turbine manufactured by Ansaldo Energia came into operation, while in 2014 the 200th gas turbine that will be manufactured by Ansaldo Energia was awarded. Over the years, Ansaldo Energia has installed and operated gas turbines with a total installed capacity of over 35,000 MW in many countries globally, achieving an excellent reliability record as a result close to 10 million operating hours.

Since 2004, Ansaldo Energia has been technologically independent and has focused its own R&D activities on market requirements.

In particular, the main goal of Ansaldo Energia’s innovation and technology plan is to keep its products on the leading edge of the gas turbine market. A continuous, “step by step” improvement process allows us to manufacture gas turbines of proven design and so avoid risks deriving from prototypical solutions.

### A wide and complete product range

The Ansaldo Energia product portfolio, which includes both E-Class and F-Class gas turbines, covers all power generation applications in order to meet customer requirements:

- turn-keyopen and combined cycle power plants
- integrated thermal cycles for power islands
- stand-alone units (equipped with electrical generator, turboset auxiliaries and control system), as a package for industrial Companies or EPC contractors.

#### Performance (ISO base load)

<table>
<thead>
<tr>
<th></th>
<th>AE64.3A</th>
<th>AE94.2</th>
<th>AE94.3A</th>
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</thead>
<tbody>
<tr>
<td>Power output at generator terminals [MW]</td>
<td>78</td>
<td>185</td>
<td>310</td>
</tr>
<tr>
<td>Efficiency at generator terminals [%]</td>
<td>36.1</td>
<td>36.2</td>
<td>39.8</td>
</tr>
<tr>
<td>Exhaust gas mass flow [kg/s]</td>
<td>215</td>
<td>556</td>
<td>750</td>
</tr>
<tr>
<td>Exhaust gas temperature [°C]</td>
<td>580</td>
<td>541</td>
<td>576</td>
</tr>
</tbody>
</table>
Our gas turbines are installed worldwide in about 30 countries and have an excellent track record of robustness, operational flexibility and durability.

Their distinctive characteristics are:
- compressor cold-end drive
- disk-type rotor with two bearings
- axial exhaust
- compressor with variable inlet guide vanes
- easy maintenance (all blades and vanes are replaceable with rotor in place and the hot gas path can be inspected with no need to open the turbine)

Customer oriented services:
commissioning and after sales
Ansaldo Energia offers a full range of services and qualified personnel for erection and/or supervision, start-up and testing. The availability of standard arrangements and in some cases packaged solutions ensures rapid, problem-free erection, start-up and commissioning.

The Ansaldo Energia Service Organisation provides technical assistance services worldwide, available 24 hours a day, 7 days a week, in the fields of maintenance, spare parts supply and preventive maintenance programs, so ensuring that customers are in the best position to achieve optimum operation.

Continuous process improvements guarantee the best assistance for our customers: for example, the latest maintenance procedures include extended spare parts stocks and streamlined logistics.

Cumulated Equivalent Operating Hours (@ Dec. 2014)

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Green Energy: advanced, low-emission Gas Turbines
Over the past years, increasingly stringent environmental constraints set by international and local regulators have induced gas turbine manufacturers to develop innovative solutions.

Ansaldo Energia has successfully designed upgrades that reduce emissions significantly and guarantee the same reliability and availability.

Expressly designed by Ansaldo Energia to reduce NOx emissions, VeLoNOx™ burners achieve NOx emissions levels lower than 30 mg/Nm³ for all its gas turbine models in an extended load range.

In addition, Ansaldo Energia advanced low-NOx burners achieve excellent operational flexibility, thanks to fast load ramps and low minimum environmental load.

State-of the-art manufacturing technology
In order to meet the challenge of increasing market competitiveness, the company has invested heavily in human resources, advanced technology and new products. A significant portion of the investment has been spent on consolidating and upgrading manufacturing facilities.

Full supply chains have been developed for all components, including high technology ones, to deliver manufacturing process excellence.

A customised Gas Turbine control system
The control system has been designed by Ansaldo Energia specifically to meet the stringent requirements of new generation, advanced performance gas turbines, while at the same time offering customers familiarity and ease of maintenance. System development has drawn on know-how gathered during the implementation of hundreds of fossil and industrial steam turbine applications.

Before release, the system was tested extensively at Ansaldo Energia production facilities with the support of dynamic real time simulators for the fuel controller, sequence controller and protection system.

A modular architecture makes it possible to accommodate the full range of customer requirements by adding pre-assembled hardware and software modules.

Control, protection and sequence functions are handled separately, but created using the same functional blocks and uniform technology.
Our gas turbines are installed worldwide in about 30 countries and have an excellent track record of robustness, operational flexibility and durability. Their distinctive characteristics are:

- compressor cold-end drive
- disk-type rotor with two bearings
- axial exhaust
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All Ansaldo Energia products are subject to continuous improvement, in line with the challenges posed by the energy market evolution:

- environmental sustainability
- flexibility increase
- operating life extension
- performance optimization

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Ansaldo Energia Gas Turbines

Reference in the World

Our Plants are our References
Proud of our worldwide decades of experience

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