

Elliott Group Overview





■ THE WORLD TURNS TO ELLIOTT

Companies around the world choose Elliott Group to design, manufacture and service their critical turbomachinery. For more than 100 years, Elliott has been synonymous with innovative engineering, highly reliable products and unwavering commitment to customer satisfaction. Since 2000, Elliott Group has encompassed the global turbomachinery operations of its corporate parent, Ebara Corporation, headquartered in Tokyo, Japan.

Elliott's engineering and manufacturing centers in Sodegaura, Chiba, Japan and in Jeannette, Pennsylvania, USA produce efficient and reliable rotating equipment, including steam turbines, power recovery expanders, and centrifugal and axial compressors. Elliott's global network of full-service repair centers, field service teams, and sales and support offices extends throughout North and South America, Europe, the Middle East and Asia.

All of Elliott's more than 2,900 employees worldwide recognize the critical importance of each customer's requirements and are dedicated to each customer's total satisfaction. We engage only in ethical and compliant business practices. We have the technical expertise and competence to deliver high-value solutions. We deploy our service and support resources where they can best meet customer needs. We keep our promises in terms of delivery and performance. We integrate and coordinate our global operations and processes so that customers have the same satisfying experience each time they interact with us, everywhere in the world.

At Elliott Group, we are committed to providing each customer with the best possible solution to the challenges they face.



Elliott's manufacturing facility on Tokyo Bay, Sodegaura-shi, Chiba-ken, Japan.



Elliott's manufacturing facility in Jeannette, Pennsylvania, USA.





■ INDUSTRIES & APPLICATIONS

Elliott Group plays a key role in supplying and servicing turbomachinery for the industries that are the foundation of the global economy and of the increasingly productive and rewarding lives of the world's population.

Oil & Gas

Elliott understands the challenges that oil and gas producers face. We've delivered hundreds of compressors that offer the superior performance, flexibility, availability and reliability that oil and gas producers demand. The production applications supported by our API-compliant compression solutions include:

- ♦ Off Shore
- ♦ Well Head/Booster Stations
- ♦ Enhanced Oil Recovery: gas lift, injection and reinjection
- ♦ Gas Gathering
- ♦ Gas/Oil Separation
- ♦ Gas Treatment & Processing



LNG

Elliott has been a leading supplier of refrigeration compressors for baseload LNG plants since the beginning of the commercial market for liquefied natural gas in 1964. Today, Elliott is a key partner in several of the world's largest LNG projects in the Middle East, Russia, Asia and the US. Elliott's LNG experience includes over 100 compressors producing over 70 million tons per annum of LNG capacity.





■ INDUSTRIES & APPLICATIONS

Petrochemicals

For 50 years Elliott has been the world leader in centrifugal compressors for ethylene production. Nearly 50 percent of the world's ethylene production capability uses Elliott compressors. Over 700 Elliott compressors are installed in ethylene service in more than 100 plants and more than 60 countries throughout the world. As petrochemical production plants grow ever larger in size and capacity, custom-engineered cracked gas, propylene and ethylene compression trains from Elliott continue to meet the demand for increased throughput and reliability.



Refining

Elliott compressors have been used in critical refinery processes for more than 70 years. As the refining industry has grown and evolved, Elliott's compressors and steam turbine drivers have grown and evolved with it. The latest example is Elliott's new high-speed, multivalve steam turbine that delivers high efficiency and direct compressor drive in a smaller footprint. Elliott compressors and steam turbine drivers are used worldwide in refinery applications such as hydroprocessing, catalytic cracking and reforming, coking, and alkylation. Thousands of Elliott single-valve turbines also drive machinery such as pumps and blowers in refineries everywhere.

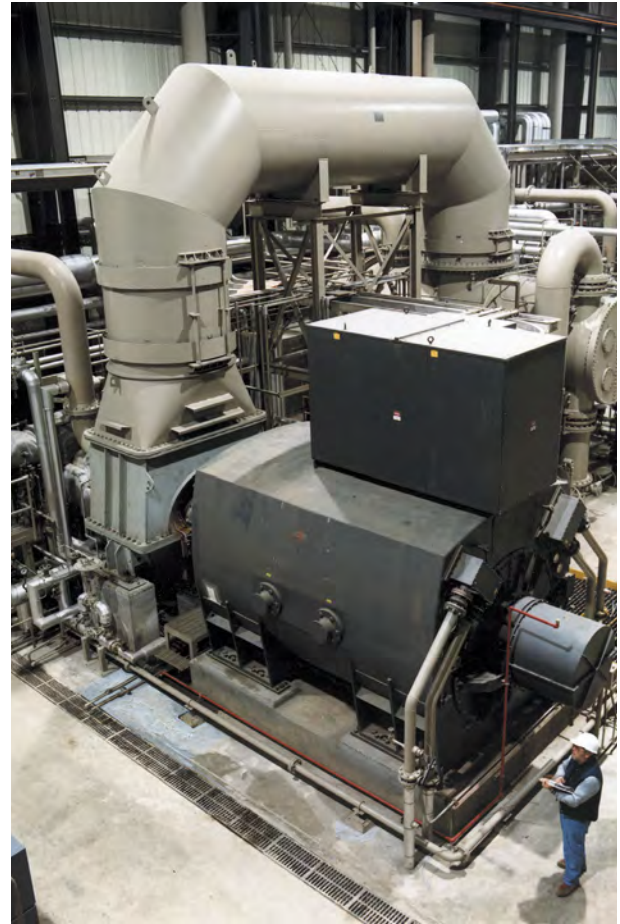




■ INDUSTRIES & APPLICATIONS

Power Generation

Elliott steam turbine generator (STG) sets provide 50 kW to 50 MW of renewable, cost-effective power from existing steam systems or alternative fuels such as biomass in completely integrated packages. A typical synchronous STG package includes a steam turbine, gear, couplings, generator, baseplate, control systems and lube console. We can also provide auxiliary systems such as electrical switch gear and condensers. Elliott has designed and manufactured steam turbines for 100 years. The tens of thousands of Elliott turbines and turbine-generator sets in operation today enjoy an unmatched reputation for high reliability and efficiency.



Process Industries

Many of the industries that produce the world's energy, materials and goods employ steam and steam turbines in their processes. In addition to the applications discussed above, thousands of Elliott turbines, compressors, equipment and systems are used as mechanical drives and in other applications by a wide range of industries, including:

- ♦ Food processing
- ♦ Palm oil
- ♦ Pharmaceuticals
- ♦ Pulp and paper
- ♦ Steel
- ♦ Sugar



■ GLOBAL SERVICE

Comprehensive Quality Service

With a century of turbomachinery experience and a tradition of excellence, Elliott Group offers comprehensive service and support for all types of rotating equipment. Customers everywhere turn to Elliott because our resources are global and our response is local. We know what it takes to keep equipment performance high and maintenance costs low.

Elliott provides:

- ♦ Service for all types of turbomachinery, regardless of manufacturer
- ♦ Installation and start-up, maintenance, overhauls and repairs
- ♦ Full-service repair facilities throughout the world
- ♦ Rerates and upgrades for Elliott and non-Elliott equipment
- ♦ Genuine Elliott parts

We support our customers through a global network of service centers and field service operations. Elliott service centers are registered to ISO 9001 or have structured quality management systems.

Elliott is accredited by the American Society of Mechanical Engineers (ASME), holding both U and R boiler and pressure vessel certifications. Nondestructive Examination (NDE) and welder qualifications are important parts of our quality control system. Elliott qualifies its NDE personnel in accordance with American Society of Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A or country-specific equivalent based on ISO 9712. Elliott qualifies its welders in accordance with ASME Boiler and Pressure Vessel Code Section IX. Project-specific compliance with other industry standards includes: ANSI, API, CRN, CSA, and CE/PED.



Repair Centers

Elliott's global network of full-service repair centers provide a complete range of service for Elliott and non-Elliott rotating equipment. Our service teams include experienced, dedicated engineers, metallurgists, technicians, welders, machinists and mechanics. Standard service procedures include:

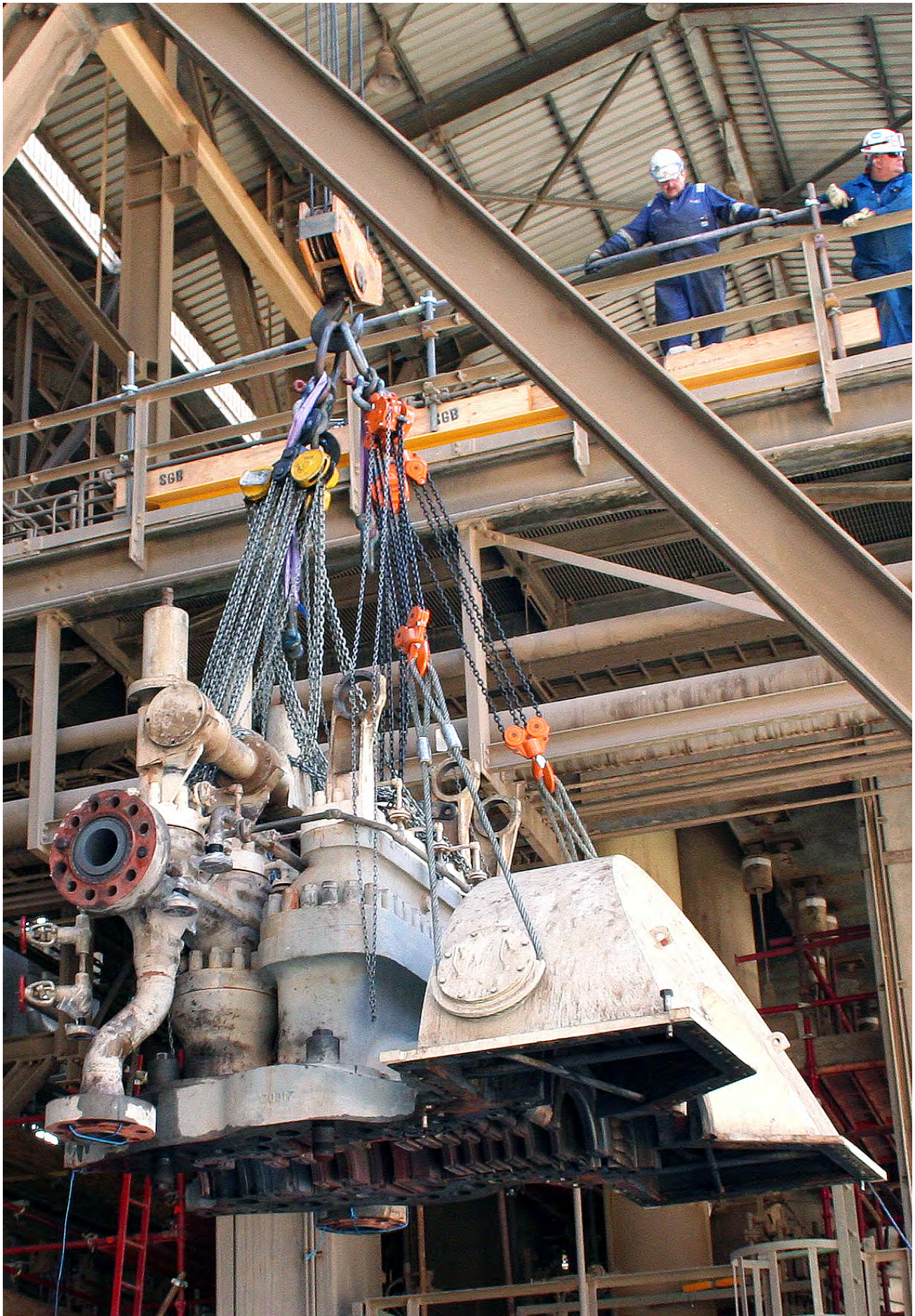
- ♦ Repair and remanufacture of all rotating and stationary components, including blades, impellers, diaphragms, shafts, seals, and bearings.
- ♦ Weld repair, including sub arc, TIG, MIG, flux core, and stick
- ♦ Machine overhauls
- ♦ Rotor balance & storage



Field Service

Elliott Field Service is recognized throughout the world for technical expertise and hands-on experience with all types of turbomachinery. Our dedicated field service teams routinely provide on-site services such as:

- ♦ Installation and commissioning
- ♦ Emergency call-out service
- ♦ Troubleshooting analysis and technical advice
- ♦ Repair: machining, weld repair, balancing
- ♦ Overhauls and project management



■ GLOBAL SERVICE

Technical Service

Elliott Technical Service supports customers and Elliott service teams with state-of-the-art engineering expertise to solve complex turbomachinery problems with practical, timely and cost-effective solutions.

Technical Service capabilities include:

- ♦ Assisting customers with technical issues on installed equipment
- ♦ Assisting field service with technical issues on new installations
- ♦ Root cause analysis of equipment failures
- ♦ Development of repair procedures
- ♦ Finite element analysis
- ♦ Remote condition monitoring

Quality Elliott Parts

We supply high-quality, original Elliott parts, delivered on time, when and where they are needed. Our ISO 9001 registered Service Parts organization is available 24 hours a day, 7 days a week to support customers with:



- ♦ Quick action machining center to produce urgent parts
- ♦ Same-day shipment on most stock items
- ♦ Parts management programs and customer inventories
- ♦ Technical manuals and engineering files on every unit we manufacture
- ♦ Parts and service for non-Elliott equipment

Engineered Solutions



Elliott Engineered Solutions, maximize the return on your investment in rotating equipment, whether manufactured by Elliott or any other OEM. Even well maintained turbomachinery in good operating condition can be made obsolete by advances in technology, design, materials or plant capacity. Replacing this equipment with new machines is costly and requires long lead-times. Drawing upon 100 years of engineering, manufacturing and service experience, Elliott modernizes and rerates rotating equipment anywhere in the world to improve operating efficiency, reduce operating costs and support increased plant capacity.

Elliott Engineered Solutions offers customers the following services for Elliott and non-Elliott equipment:

- ♦ Site audits focusing on reliability, efficiency and return on investment (ROI)
- ♦ Engineered modifications
- ♦ Engineered rerates and equipment reapplication
- ♦ Reverse engineering

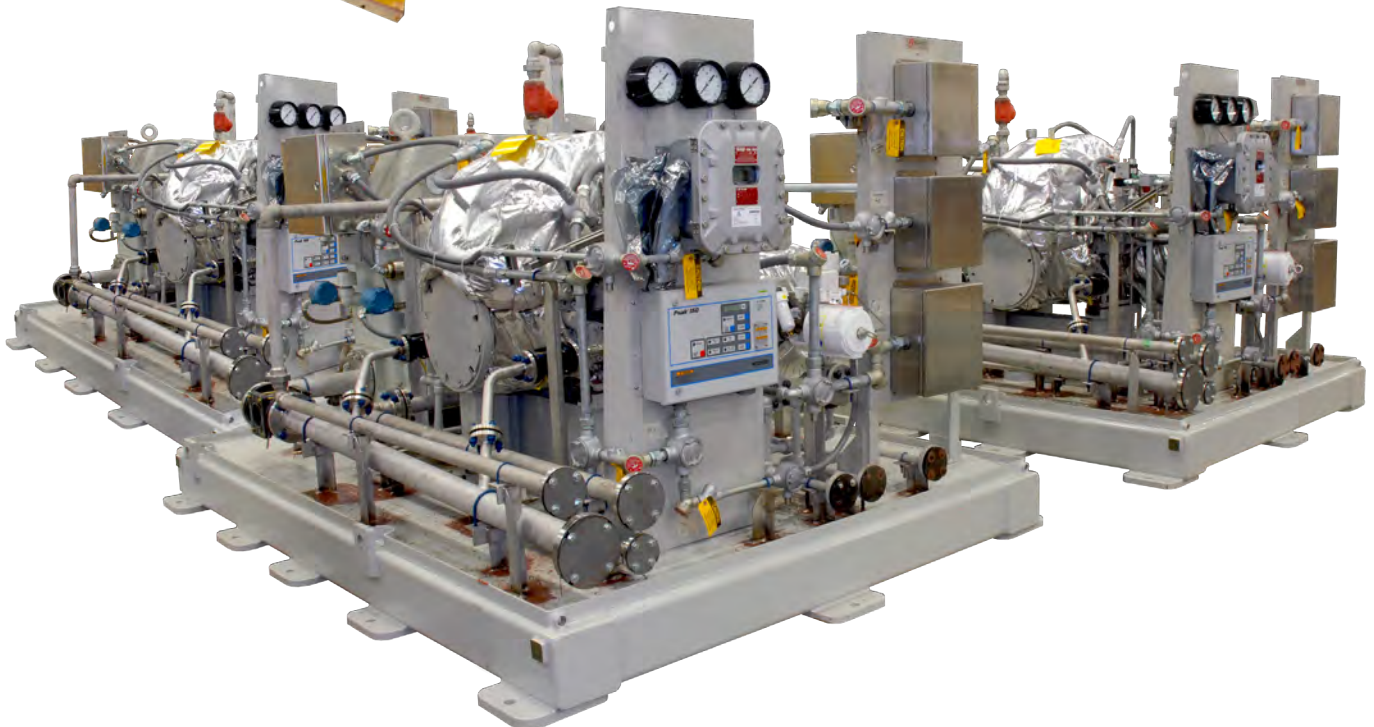


■ PACKAGING SOLUTIONS

Elliott Packaging Solutions is a global leader in the design, manufacture and packaging of lubrication, sealing, and fueling systems for a wide range of industries, including power generation and nuclear, oil & gas, steel, chemicals, and air separation.

At our modern, dedicated packaging facility in southwestern Pennsylvania, experienced designers, fabricators, welders, and service personnel produce and install systems engineered to meet customers' precise needs. We routinely fabricate high specification piping systems such as:

- ♦ Integrated lube and seal oil systems
- ♦ Dry gas seal and buffer gas seal packages
- ♦ Gas turbine fuel forwarding packages
- ♦ Manifold assemblies
- ♦ Steam turbine generator sets

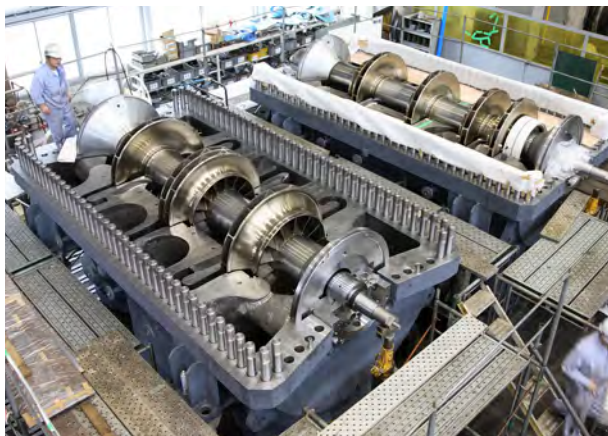




■ PRODUCT LINES

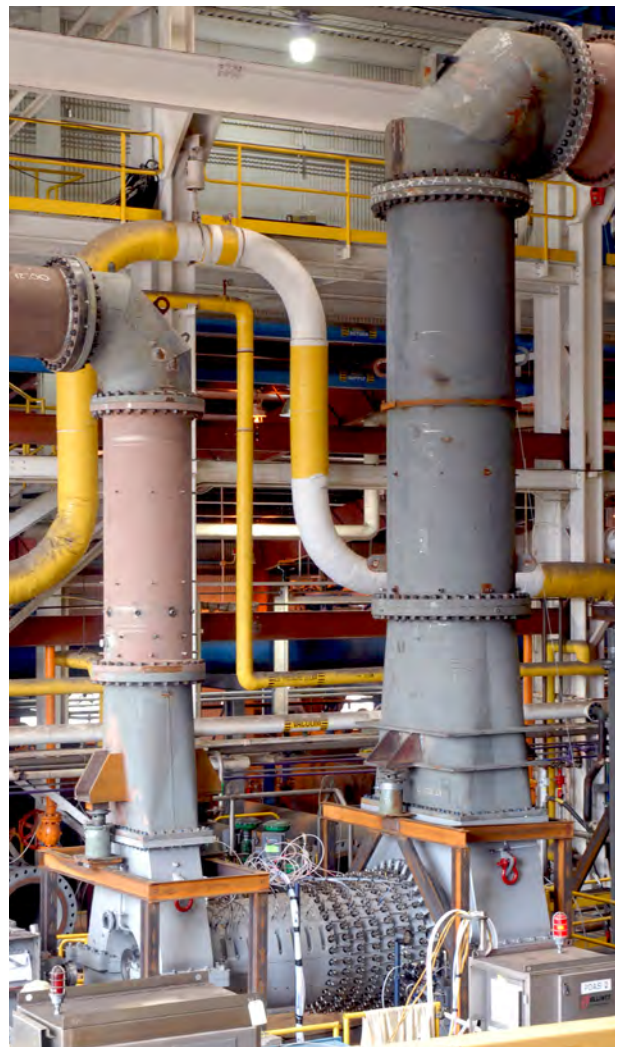
Centrifugal Compressors

Elliott Group offers a wide range of multistage centrifugal compressors in horizontally split and vertically split “barrel” configurations with pressure ratings up to 10,000 psig and flow ranges as high as 458,700 meters³ per hour. All Elliott centrifugal compressors are designed using Elliott’s scalable EDGE technology that results in improved aerodynamic performance, reduced power consumption, increased process flexibility and reduced capital cost. Elliott leads the industry in optimizing compressor performance over a broad range of pressure and flow applications through the use of aerodynamic design and analysis resulting in advanced impeller design, flow channel optimization, and rotor stability enhancements.



Axial Compressors

Elliott’s axial compressors are often paired with power recovery expanders to supply combustion air in the FCC process. These highly efficient machines are well suited for high-flow, medium-pressure applications beyond the flow capacity of centrifugal compressors. Elliott’s reliable axial compressors are also used in air separation plants, blast furnaces, nitric acid plants, synthetic fuel processing and aerodynamic testing.





■ PRODUCT LINES

Steam Turbines

Elliott steam turbines provide the proven reliability and high efficiencies that make them the preferred choice for mechanical and power generation services. Designed and manufactured in compliance with API 611 or API 612 specifications, Elliott steam turbines can be matched to the most demanding processes and applications. Elliott's product line includes single-valve single-stage, single-valve multistage, and multivalve multistage turbines with powers up to 140,000 HP and speeds up to 16,000 rpm.

Power Recovery Expanders

In 1963, Elliott manufactured the first hot gas expander for capturing waste flue gas energy from the fluid catalytic cracking (FCC) process. In the decades since this engineering breakthrough, Elliott has continued to lead in the development of new alloys, metallurgical treatments and design innovations that result in the most highly reliable and easily maintained expanders available. In several instances, Elliott expanders have remained in operation for more than seven years with the original set of blades. Elliott's TH expanders are available in four frame sizes and produce up to 60,000 HP (45 MW) from the thermal energy in the FCC flue gas stream.





Elliott Group is a global leader in the design, manufacture, and service of technically advanced centrifugal compressors, steam turbines, power recovery expanders, cryogenic pumps and expanders, and axial compressors used in the petrochemical, refining, oil & gas, liquefied gas, and process industries, as well as in power applications.

Elliott Group is a wholly owned subsidiary of Ebara Corporation, a major industrial conglomerate headquartered in Tokyo, Japan.



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T H E W O R L D T U R N S T O E L L I O T T



COMPRESSORS ■ TURBINES ■ CRYODYNAMICS ■ GLOBAL SERVICE