



GE Power Systems
Oil & Gas

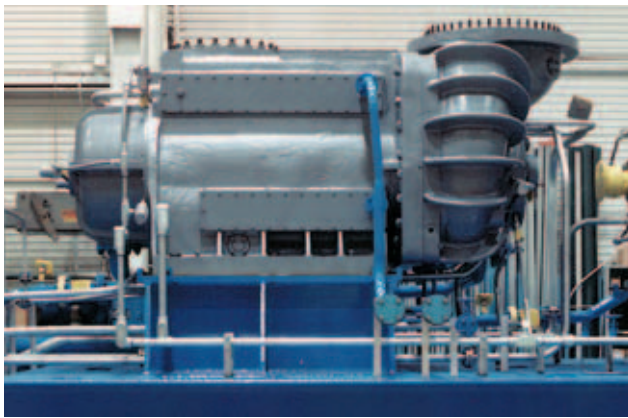
A-C Compressor



Positive Displacement Compressors

Oil Free Rotary Screw

Compressors Engineered for Time-Tested Tough Performance in a Variety of Demanding Applications



Experience and proven competence — for more than 40 years, the people of A-C Compressor have been working with customers in an unceasing effort to build cost-effective equipment that works better and lasts longer.

Our company is 100% focused on compressors and compressor systems. The heart of our business is the design and construction of compressors that work — and work notably well — in applications that require long-term, dependable performance. Users in the petrochemical, refining and natural gas industries have come to rely on our reputation for quality.

We design our systems and manufacture our compressors in our plant using the latest in computerized design tools, computer-aided drafting systems and numerically controlled machine tools. We understand the systems and compressors we build. Our customers depend on that process knowledge and professional support.

At A-C Compressor, we provide the compressors and accessories you need... and the specialized service you want.

- Exceptional expertise — We provide top-quality engineering talent, resources and advice from project start to project finish. Our engineering team will work to understand your specifications and meet them with cost-effective, creative expertise.
- Custom engineering — Our compressors are carefully engineered for your specific application needs. To make sure you get the unit suited to your application and operating conditions, our experienced engineering staff carefully reviews every specification.
- World class production cycle time — We provide personal service that concentrates on your needs and deadlines. Fast-track projects are not a problem for us.
- Single-source responsibility — A single project manager is responsible for your entire project. This individual coordinates all the of design/build work and helps you put the system into operation.
- Complete testing and review — From our computer-based project management system to our aggressive compressor component testing program, quality is our priority.
- Help you can rely on — Our experienced field service technicians are available for supervision of the installation and start-up of your unit, and will provide maintenance instruction and training. We can support your operation with the highest quality replacement parts and/or repairs.

Precise Rotors and Shafts

- Machined from carbon steel forgings and special use rotor materials
- Optimized rotor profile
- Critical internal clearances maintained by seal strips machined on each rotor lobe tip
- Dynamically balanced rotors

Shaft Seals that Isolate and Protect

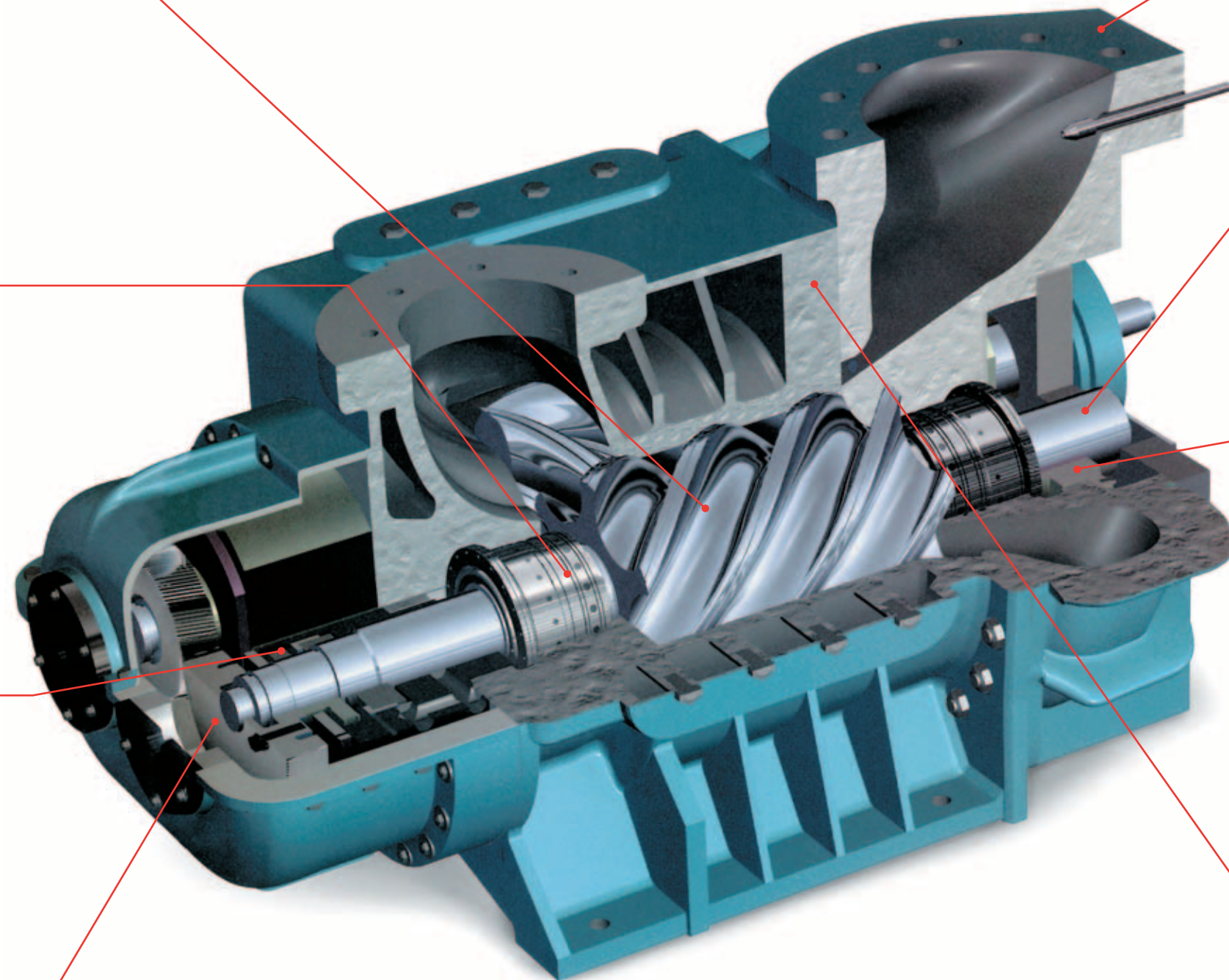
- Each of four journal bearings is isolated from compression chamber
- Seals prevent outward leakage of process gas, inward leakage of lubricant
- Space for floating carbon ring, labyrinth, dry gas or mechanical contact seals (with or without buffer)
- Seals carefully selected to properly handle type/quality of gas to be compressed at the process operating pressures

Dependable Thrust Bearings

- Positive axial rotor position ensured
- Thrust loads transmitted to “tilting pad” type thrust bearings via hardened steel, removable thrust collars
- Tapered land-type bearing faces on the inactive side

Timing Gears Design for Consistent Clearances

- Synchronized rotation of rotors
- Proper rotor-to-rotor clearances maintained
- Single helical gears, precision ground, AGMA class 12 (or better) quality
- Separate female rotor gear and hub controls pitch line run-out and timing clearance in assembly



Choice of Nozzle Locations

- Top inlet with top discharge for installation on grade
- Top inlet with bottom discharge to maximize casing drainage

No Leak Drive Shaft Seal

- Tandem metallic floating ring or labyrinth design prevents bearing housing oil leaks
- Air buffering capabilities

Heavy Wall Radial Bearings for Extra Support

- Pressure-lubricated, sleeve-type bearings support radial loads on rotors
- 360 degree type with heavy wall construction, steel backing and babbitted rubbing surface
- Computer analysis dictates bearing design (oil film thickness and operating temperature are evaluated in selecting proper lateral and torsional rotor stiffness)
- Pivoted-shoe type radial bearings are available for maximum rotor stability in applications with relatively low radial loads

Strong, Stable Compressor Frame

- Vertically split, two-piece, cast construction for dimensional stability
- Water-jacketed housing castings for high-temperature operation
- For flammable or toxic gases, cast steel, ASTM A216 WBC-grade construction is standard
- Special-application materials available

Outstanding Features Designed for Top Performance and Minimal Maintenance

Factory-Assembled Support Systems Manufactured to Meet Specific Requirements

A-C Compressor products are built to meet the unique system and specification requirements of each user.

Compressor Packages

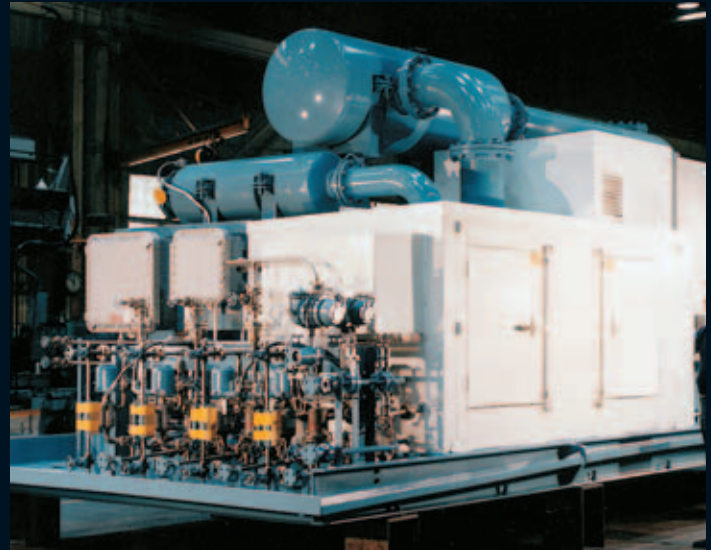
- Oil free screw compressor packages include a steel baseplate with machined mounting pads to precisely align all rotating components. Baseplate options include continuous nonskid decking and a perimeter drip lip with low-point drain.
- Driver is typically an electric motor or steam turbine, with or without speed change gear. For special applications, gas turbines, gas expanders or reciprocating engines are available.
- Couplings with guards are provided to connect the compressor and driver. Couplings are nonlubricated with OSHA-type guards.
- Locally or gauge board mounted instrumentation, with tubing and electrical wiring between the instruments and on-skid sensing points, ensures reliable performance.
- Header piping for lubrication oil, seal oil, buffering gas, cooling water, and liquid injection is connected to convenient interface connection points at the edge of the baseplate.

Oil Systems

Designed to exacting standards as an integral part of each compressor package, an oil system provides clean, cool, pressurized lubricant to the compressor and drive bearings. It also can provide oil to the seals.

Pulsation Dampeners

Multichamber silencers meet API 619 specifications, as dictated by process conditions. The lagging material is mounted on the exterior, away from the process gas steam, and is covered with a metallic jacket.



Control Panel

Panel enclosures typically include instrumentation designed to integrate the compressor into the specific installation's operating philosophy. Monitoring equipment measures shaft vibration and bearing temperature to provide continuous protection. Push-button controls govern local start and emergency stop.

Optional Equipment

- Vibration and Axial Position Detectors — Monitor radial vibration and the axial position of the rotors. All probes are noncontacting and may be adjusted externally.
- Bearing Temperature Detectors — Are embedded beneath the surface of the radial and thrust bearings to sense bearing metal temperature. A variety of thermocouples or RTDs are available.
- Injection Connections and Atomizing Nozzles — Available for use with liquid coolant or flushing fluids.

Rugged Design, Broad Application, Proven Performance

A-C Compressor has combined the positive displacement traits of a reciprocating compressor with the rotary motion of a centrifugal compressor allowing us to provide you with the advantages of both. With 12 basic models and a range of flow and pressure configurations, A-C Compressor's oil free rotary screw compressor is the unit of choice in hundreds of applications. The process gas industry has long recognized the advantages of positive displacement combined with rotary motion.

The Positive Displacement Advantage

Because of its positive displacement characteristics, the A-C Compressor oil free rotary screw compressor smoothly handles gases with varying molecular weights, pressures and temperatures. It has been matched with all driver types including: electric motors, gas engines, gas and steam turbines and expanders. With no valves or rings to plug or wear, the A-C Compressor oil free rotary screw compressor easily handles dirty, wet and polymer-forming gases. It's less likely to sustain erosion damage because its rotative tip speed is in the moderate range (150 to 500 fps, 45 to 152 m/s).

Operating Characteristics

Without the surge limit typical of centrifugal compressors, a positive displacement compressor easily provides the desired process flow at the required discharge pressure — no matter the variation in gas pressure, temperature and composition.

- Compressor efficiency actually goes up and internal clearances are reduced when polymerizing or tar-forming gases are ingested.
- Rotors are less sensitive to imbalance because of their high weight-to-speed ratio.
- Liquid solvent may be injected during operation to remove excessive polymer buildup.
- Discharge gas temperatures also may be controlled with liquid injection, thereby controlling polymer formation at elevated temperatures.

Installation Flexibility

Discharge connections are located vertically on the casing and may be set in an "up" or "down" position. When both connections are in a vertically "up" position, the compressor/driver may be located on grade, reducing foundation costs and facilitating service access. In the vertically "down" position, casing drainage is maximized.

Meets Demanding Standards

To give you the quality and reliability you need, our oil free rotary screw compressors meet the requirements of API Standard 619, "Rotary-Type Positive Displacement Compressors for General Refinery Services". In fact, we not only comply with API, we helped write the specification.

Maintenance and Service

All major wearing parts may be inspected without disturbing the main compressor casing joint (parts include radial bearings, thrust bearings, shaft seals and timing gears.)

Complete access to the rotors and inner casing is possible through a single vertical casing joint.

Proven Experience, Proven Applications

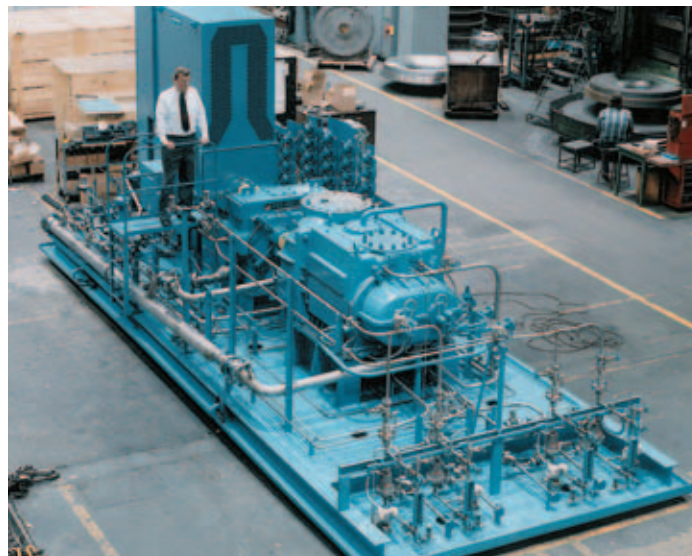
A-C Compressor products are hard at work around the world. Industry leaders depend on the cost-effective quality of our equipment. For more than 40 years, oil free rotary screw compressors from A-C Compressor have met the toughest demands of a variety of industries. We are proud of our reputation, which speaks for itself.

Installations

Type: 105L Volume: 2136 acfm
RPM: 6720 Inlet: 72.5 psia
Discharge: 140.7 psia Driver: 1250 hp
Application: Aniline reactor recycle in petrochemical plant



Type: 200L Volume: 7822 acfm
RPM: 2832 Inlet: 19.5 psia
Discharge: 86.4 psia Driver: 1555 hp
Application: Butadiene recycle service



Type: 250L Volume: 18,228 acfm
RPM: 3518 Inlet: 4 psia
Discharge: 27 psia Driver: 1138 hp
Application: Styrene off gas



Type: 200L Volume: 7439 acfm
RPM: 3596 Inlet: 4 psia
Discharge: 28.5 psia Driver: 631 hp
Application: Petrochemical plant

Comprehensive Testing Before Installation Ensures Peak Performance in the Field

Every oil-free screw compressor we manufacture must pass our stringent testing and inspection procedures. Each component is thoroughly tested individually, then the entire assembled compressor goes through a comprehensive testing and inspection process.

Rotating Elements

Each rotor is assembled with the timing gear and thrust collar sub-assemblies, then dynamically balanced to ensure top performance at installation.

Rotors

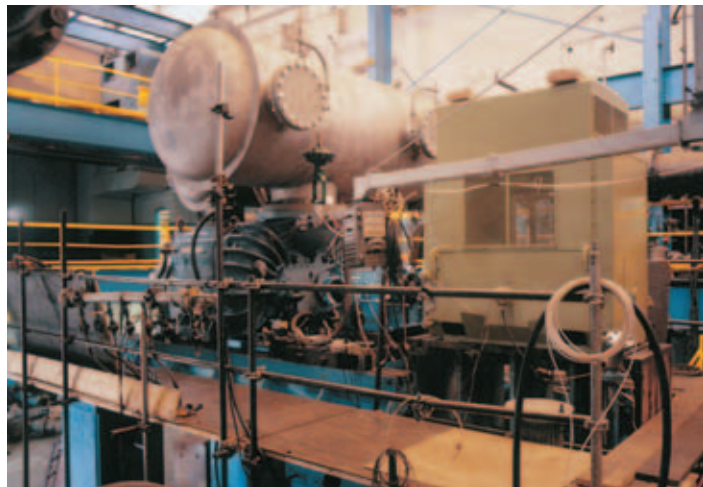
- Physical and chemical properties are verified prior to start of manufacture.
- Full material traceability and unique identification for rotors.
- Latest generation high-efficiency rotor profile is available.
- All rotor tooling is verified against design values on in-house coordinate measuring.
- Optimized rotor to rotor clearances are verified on precision rotor checking fixtures after machining.
- Dye penetrant or MPI check of all finish machined rotors.
- Mechanical and electrical run out checked and minimized for each rotor.
- Mechanical integrity ensured via API 619 mechanical run test.

Casings

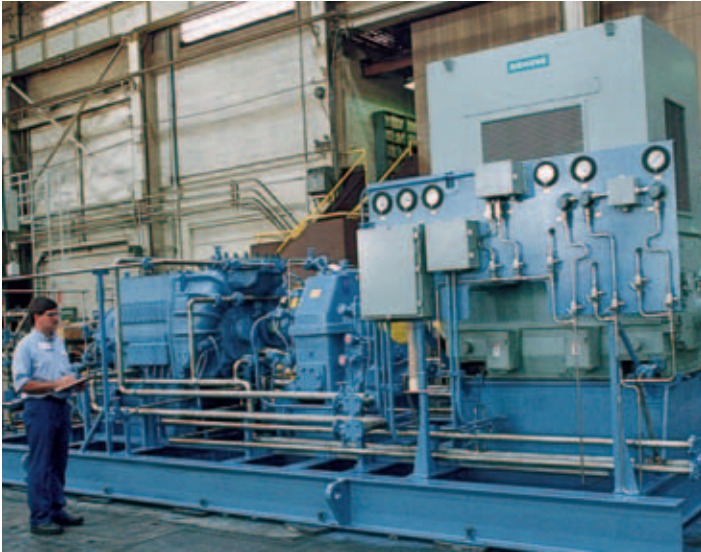
Each casing undergoes hydrostatic testing to 150% of maximum application pressure. Physical and chemical properties are verified as well.

Assembled Compressors

Every compressor is fully assembled and mechanically tested with the same clearances required for field operation. All operational data is recorded for future reference. To confirm design standards have been met, vibration, bearing performance, oil temperatures, flows, and pressures are checked.



Oil Free Rotary Screw Compressor Details



Standard Design Parameters

- Internal pressure ratio: 1.5 to 5
- Pressure Differential:
 - L models, 10 to 150 psi (0.7 to 10.3 bar)
 - S models, 10 to 250 psi (0.7 to 17.2 bar)
- Casing design pressure:
 - Cast steel, 225 & 600 psig (15.5 to 41.4 bar)
- Molecular weights: 2 to 140
- Inlet temperature:
 - 50 to 250 degrees Fahrenheit
 - (-45.5 to 121 degrees Celsius)
- Discharge temperature:
 - 550 degrees Fahrenheit
 - (288 degrees Celsius)
- Rotor-tip speed: 150 to 550 fps (45 to 152 m/s)

Optional Design Parameters

- Multistaging compressor frames can increase overall pressure ratios to more than 25:1
- Parallel operation of compressor frames offer multiple capacity increases without sacrificing plant performance
- Liquid injection can flush gas streams contaminated with polymers, or cool gases where discharge gas temperature is critical
- Alternate materials of construction ensure long life in corrosive gas applications.

Typical Applications

For chemical, petrochemical and refining industries, services includes:

- Styrene
- Acetylene
- Propylene
- Synthetic gas
- Soda ash
- Hydrogen recycling
- Nitric acid
- Phthalic anhydride
- Vinyl chloride
- Acrylonitrile
- Phenol
- Butadiene
- Isoprene ethylene
- Polypropylene
- Urea
- Alkylation
- Ammonia
- Maleic anhydride
- Vinyl acetate
- Phosgene (TDI)
- Normal paraffins
- Delayed coker

For steel industries, services such as:

- Coke oven injection
- Process gas
- Recycle gas
- Process air

For pollution control and energy industries, applications include:

- Flare gas recovery
- Natural gas boosting
- Flue gas recovery
- Geothermal energy
- Fuel gas boosting
- Tank farm vapor recovery
- Coal gasification
- Steam recompression

For clean gas requirements, we handle:

- Food and drug processing
- Hydrogen peroxide
- Oxidation
- Helium
- Cryogenic processes
- Fermentation
- Enzyme production
- Argon

Quality and Service for Industries Around the World

The GE Oil & Gas Group

Nuovo Pignone
Florence, Italy

Thermodyn
La Creusot, France

Rotoflow
Gardena, CA, USA

Gemini
Corpus Christi, TX, USA

A-C Compressor
Appleton, WI, USA

CONMEC
Bethlehem, PA, USA

Packaged Power-Odessa
Odessa, TX, USA

Customer Support

1-800-577-5155

24-Hour Emergency Service

920-380-8000

Industries

We offer a broad range of experience earned through meeting the needs of a diverse customer base including:

- Chemical and petrochemical
- Petroleum refining and production
- Food processing
- Pulp and paper
- Cogeneration
- Government/military
- Natural gas
- Synthetic fuels production

Applications

We have a proven record of performance in applications as tough as:

- Acetylene production
- Process gas recirculation
- Styrene production
- Coke oven gas
- Chlorinated hydrocarbons
- Low temperature

Environmental

We help the world meet the environmental challenges of the future through processes such as:

- Water purification
- Sewage treatment
- Recompression evaporation
- Solvent recovery
- Flare gas recovery

The information contained herein is general in nature and is not intended for specific construction, installation or application purposes. GE Power Systems Oil & Gas A-C Compressor reserves the right to make changes in specifications shown herein or add improvements at any time without notice or obligation.



GE Power Systems

Oil & Gas

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