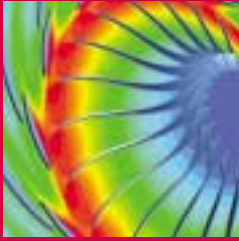


Plant Air Centrifugal Compressors

TURBO AIR™ SERIES FEATURING OIL-FREE AIR





**You have many distinct advantages when you partner with
Cooper Compression for your centrifugal compressor needs.**

Cooper Compression manufactures centrifugal air and gas compressors and provides aftermarket products and services for a broad customer base around the world. The cutting edge solutions we deliver for plant air requirements are made possible by the unique blend of product quality, engineering talent and dedicated teamwork we bring to every customer.

CENTRIFUGAL COMPRESSORS

With our main manufacturing facility in Buffalo, NY, USA, located near Niagara Falls, and distribution in more than 80 sales and service locations worldwide, Cooper Compression is a global company with a singular commitment – meeting your needs with superior centrifugal compressor technology while meeting your expectations with unequaled service and support.



Turbo Air® Series Compressors

The following pages highlight our TA (Turbo Air) Compressor series for plant air applications which offer outstanding performance and design flexibility for plant and process air applications.

The TA compressors are completely packaged on a common base for easy installation and are available in a number of capacities from 150 to 2250 HP (112 kW to 1680 kW).

Industries worldwide depend on Cooper Compression for efficient and reliable oil-free air. Plant Air applications include:

- Textiles
- Food and Beverage
- Automotive
- Pharmaceuticals
- Chemicals
- Electronics
- Aerospace
- Industrial Gases
- Oil and Gas Refineries
- Water Treatment
- Snowmaking
- Power Generation
- General Industrial
- Petrochemical



COOPER COMPRESSION – A HISTORY OF INNOVATION




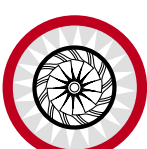

- 1955** – Joy Manufacturing Co. established facility in Buffalo, NY USA
- 1960** – First small integral gear centrifugal compressor introduced
- 1965** – Introduced the first packaged centrifugal compressor
- 1971** – First 4-stage, nitrogen recycle machine for liquefaction of industrial gases
- 1980** – Introduced the first microprocessor controlled compressor
- 1987** – Purchased by Cooper Industries, Inc. – major capital investments made
- 1988** – First 7-stage dual service machine with three pinions in each gear box
- 1994** – Introduced the Turbo Air 2000 incorporating the fourth generation of microprocessor-based control
- 1995** – Cooper Cameron Corporation established
- 1997** – Introduced Turbo Air 3000 – major capital investments made
- 1999** – TA-6000 introduced
- 2001** – Introduced Turbo Air Cooled 2000
 - Entered gas process market
 - Introduced TA-11000
 - Introduced Turbo Dry Pak
 - Introduced Vantage Control Panel
- 2004** – Introduced MSG Alpha Centrifugal Gas Compressor
- 2004** – Introduced Maestro Series of Control Systems
- 2005** – Introduced Turbo Air 2020
 - Introduced Turbo Air 9000

THE ADVANTAGES OF CENTRIFUGAL COMPRESSOR TECHNOLOGY

Integral gear centrifugal compressors represent the latest technology offering significant advantages over outdated, less efficient and more costly compressor designs. These advantages are inherent in the centrifugal design and enhanced even further by Cooper Compression's more than 50 years of centrifugal expertise.



Compare Cooper Compression's innovative centrifugal compressor technology with other machines such as rotary screw compressors and the advantages are clear:

	Cooper Compression Centrifugal Compressors	Other Compressors
<p>LOW MAINTENANCE</p> 	<ul style="list-style-type: none"> No wearing parts requiring regular replacement Oil filter elements and seal gas filter elements are easily replaced 	<ul style="list-style-type: none"> Requires regular maintenance and periodic replacement of air ends Results in high operating expenses and significant machine downtime
<p>OIL-FREE AIR</p> 	<ul style="list-style-type: none"> 100% oil free Prevents contamination of system 	<ul style="list-style-type: none"> Oil filters must be installed at discharge Potential for oil carryover that foul the process
<p>NO PULSATION</p> 	<ul style="list-style-type: none"> Pulsation free and require no dampers 	<ul style="list-style-type: none"> Require the use of pulsation dampers to reduce pressure fluctuations
<p>OPTIMUM CONTROL</p> 	<ul style="list-style-type: none"> Automatic operation for any operating condition State-of-the-art Maestro Suite of controls PLC control available 	<ul style="list-style-type: none"> Limited control capability Costly, high maintenance variable speed available
<p>NO VIBRATION</p> 	<ul style="list-style-type: none"> Essentially vibration-free No special foundation is required 	<ul style="list-style-type: none"> Require a large and deep foundation to handle heavy weight and unbalanced forces Precautions must be taken to prevent transmission of vibration to other equipment



CCV 5 Year Warranty Program

- ADDED PROTECTION
- DEFINED COSTS
- PEACE OF MIND

CCV is a no up-front-cost extended 5-year air end warranty for Plant Air products. Simply perform the recommended maintenance outlined in the Owner's Manual using Cooper Compression authorized service representatives. All maintenance will be logged every quarter by your service representative on our easy-to-use online CCV maintenance log tool.

SIMPLE INSTALLATION

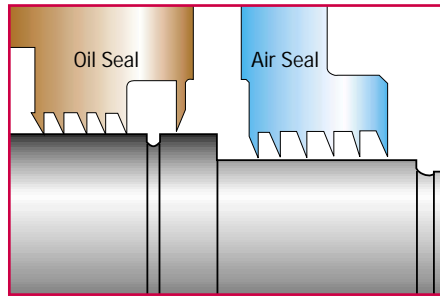
- Compressor, lubrication system, intercoolers, shaft coupling, coupling guard, interconnecting piping, etc. all on a common base
- Easy component accessibility
- Great flexibility to tailor a machine to your needs
- Minimizes required floor space
- Pulsation free

INHERENT VARIABLE LOAD CAPABILITY

Cooper Compression's state-of-the-art control systems give our centrifugal compressors inherent variable load capability without high maintenance, variable speed drivers. This distinctive feature results in:

- Higher efficiency
- Lower maintenance
- Easier operation

OIL-FREE AIR



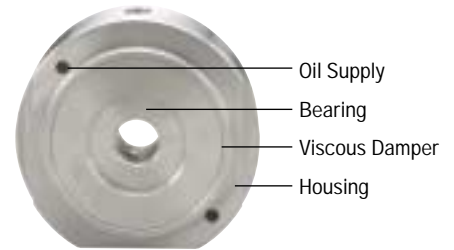
Seals – Non-contact, non-wearing labyrinth air and oil seals. No buffer air required for oil-free air. Eliminates the need for periodic replacement of carbon seals.

- Prevents contamination of your system
- Removes the potential for compressed air pipeline fires caused by oil carryover
- Eliminates costly waste disposal problems associated with oil-laden condensate
- Eliminates the expense and maintenance of oil removal filters

HIGH RELIABILITY

Cooper Compression's centrifugal compressors are extremely reliable due to features such as:

- Thrust loads absorbed at low speed
- Stainless steel compression elements
- Conservative high quality gear design
- Unlimited life pinion bearing design
- Non-contact air and oil seals



Superior Pinion Bearing Design – For unlimited life and operation at any load.

EASY OPERATION/MAINTENANCE



Intercoolers – Water-in-tube intercooler and aftercooler bundles slide out for easy inspection and cleaning.

- State-of-the-art controls with a choice of exclusive control systems
- Totally automatic operation for any operating condition
- Self diagnostics
- No wearing parts requiring periodic changes or replacement in the compression elements
- No oil removal filters to clean
- Intercooler and aftercooler bundles easily removed for cleaning
- Accessible horizontally split gear box for quick inspection
- Water in the tube design intercoolers allow simple mechanical cleaning



Horizontal Split Gear Box – Allows for easy access when customer's maintenance policy requires periodic inspection.

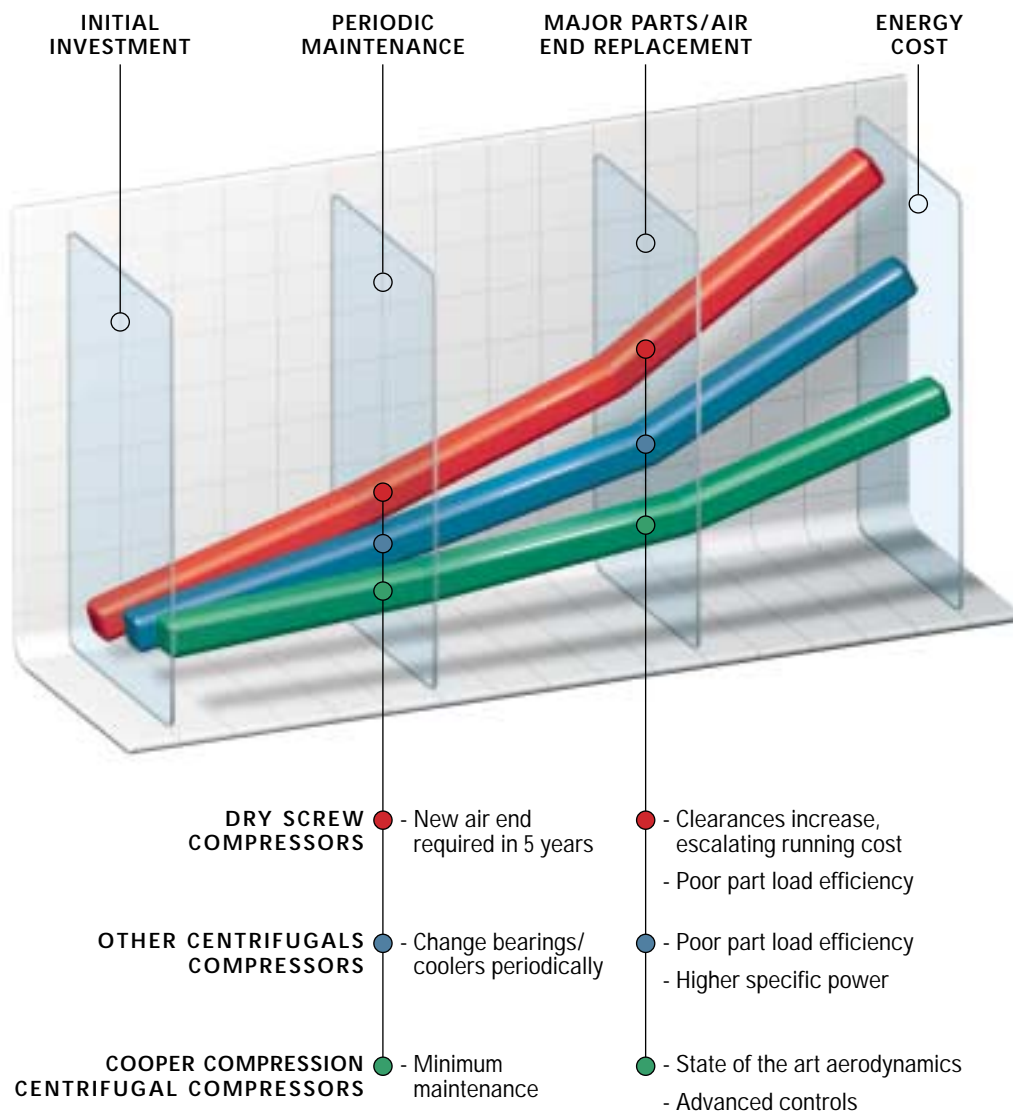
THE LOWEST COMPRESSOR OPERATING LIFE CYCLE COST

Cooper Compression systems provide much better operating economy than rotary screw or other centrifugal compressors.

Compared to other machines of similar capacity, our centrifugal compressors have the best specific power for ultimate power savings.

- Excellent efficiencies at full load, part load and no load
- Low maintenance cost
- Robust design for high reliability
- No sliding or rubbing parts in the compression process causing wear and thereby efficiency loss

COST OF OWNERSHIP



VARIABLE INLET GUIDE VANES



- Variable inlet guide vanes can offer power savings of up to 9%
- Inlet vanes impart a whirling motion to the inlet air flow in the same direction as the impeller operation, reducing the work input
- Net power savings at reduced flow or on days colder than the design temperature
- Inlet vanes are positioned close to the impeller to achieve maximum benefit

THE RIGHT COMPRESSOR FOR YOUR NEEDS

No matter what your application, there is a centrifugal compressor from Cooper Compression to meet your exact requirements. With over 9,000 installations worldwide, on nearly every continent, Cooper Compression products are proven in a wide variety of industries. Plant Air applications include:

- Textiles
- Food and Beverage
- Automotive
- Pharmaceuticals
- Chemicals
- Electronics
- Aerospace
- Industrial Gases
- Oil & Gas Refineries
- Water Treatment
- Snowmaking
- Power Generation
- General Industrial
- Petrochemical



150 HP (112 kW) Air Cooled Turbo Drypak Compressor installed in manufacturing plant. Hot air from air coolers used to heat factory.



700 HP (520 kW) Turbo Air® Compressors installed at plastics processing facility.



Three 200 HP (150 kW) Turbo Air® Compressors installed at an electronics facility.



300 HP (225 kW) Turbo Air® Compressor installed at a semiconductor facility.



One 300 HP (225 kW) Turbo Air® Compressor installed at a major university for instrument air.



350 HP (260 kW) Turbo Air® Compressors installed at an automotive facility.



One 500 HP (375 kW) Turbo Air® Compressor compliant to API 672 for oil refinery.

Cooper Compression centrifugal compressors are superior by design

Turbo Air Series compressors offer the most advanced package available for easy, low-cost installation and operation.

MAESTRO™ SUITE OF CONTROLS

Maestro is the new suite of control systems from Cooper Compression. The Maestro suite contains a model that is sure to be in tune to your needs.



MAESTRO LEGEND

- Provides comprehensive control of your centrifugal compressor and can be configured to coordinate the operation of multiple compressors
- Maintain plant pressure to within 1-2 PSI, which allows overall pressure reduction to improve efficiency and reduce air leakage losses saving energy dollars



MAESTRO PLC

- Utilizes an open architecture Allen Bradley PLC which enables you to use off-the-shelf components that match other panels in your plant
- Available in three control methods: Constant Pressure, Auto/Dual, and Mass Flow



MAESTRO EZ

- An economical control system for basic compressor operation
- A standardized PLC solution with broad built-in capability designed for easy use

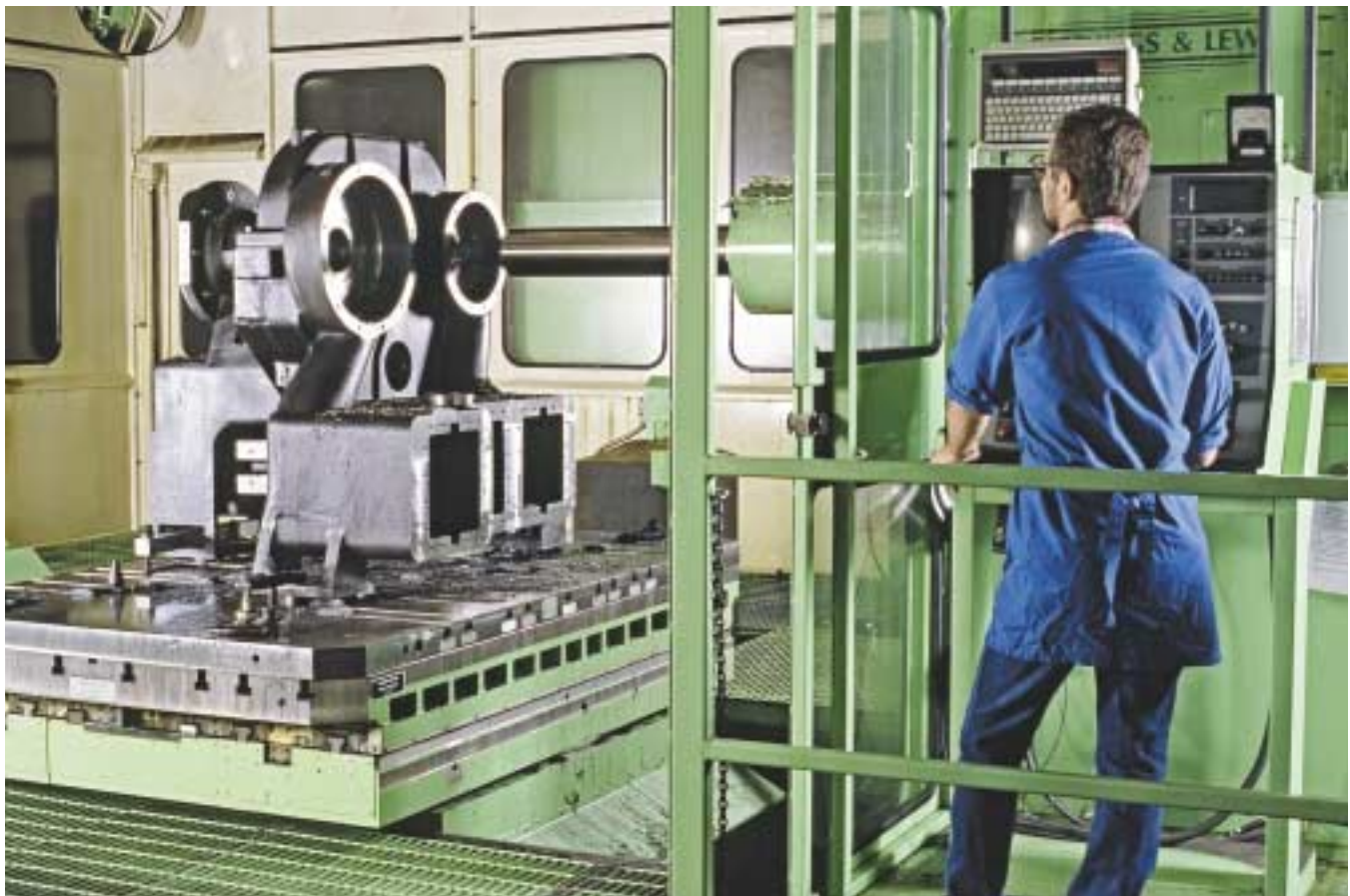


Dedicated Manufacturing Capabilities

Cooper Compression's manufacturing facilities are among the most advanced in the industry, utilizing leading technology operated by an experienced and skilled workforce. Everything we do at our ISO-9001:2000 facilities is aimed at improving quality and shortening delivery times.

MANUFACTURING TECHNOLOGY HIGHLIGHTS

- CAD/CAM systems
- Vertical turning centers
- Impeller milling centers – 5-axis
- Horizontal boring centers
- Cell manufacturing and work team techniques
- State-of-the-art testing facilities



TURBO AIR® SERIES COMPRESSOR MODELS



Cooper Compression's revolutionary Turbo Air® centrifugal compressor offers an advanced, state-of-the-art source of oil-free air for plant air and other applications.



TURBO AIR® 2000

150 to 350 HP (112-260 kW) and 550 to 1700 CFM (15.6-47.9 m³/min)

TURBO AIR® 2020

Two-stage 250 to 400 HP (187-298 kW) and 1000-2000 CFM (28-57 m³/min) offering best specific power of any two-stage compressor

TURBO AIR® 3000

400 to 800 HP (298-597 kW) and 2000 to 4000 CFM (57-113 m³/min)

TURBO AIR® 6000

900 to 1500 HP (670-1120 kW) and 4000 to 8000 CFM (113-226 m³/min)

TURBO AIR® 9000

1500 to 2250 HP (1120-1680 kW) and 6500 to 11800 CFM (184-334 m³/min)

TURBO AIR COOLED™ 2000

Designed for applications where there is a limited supply or no water available. 150 to 350 HP (110-260 kW) and 550 to 1700 CFM (930-2890 m³/hr) range.

TWINTURBO

Combined service compressor for dual process air and booster applications

TURBO DRYPAK™

Patented dryer and compressor package featuring adjustable dew point performance

**API 672/TA-3000**

Cooper Compression provides a complete line of centrifugal compressors that meet API 672 requirements. Shown is an API 672 compliant unit for an oil refinery in Texas, USA – 2300 CFM, 500 HP, 150 PSI (65 m³/min, 375 kW, 10.3 bar).

**TURBO DRYPAK™ COMPRESSED AIR DRYER**

Cooper Compression's patented dryer and compressor package utilizes the heat-of-compression as the regenerating power to remove moisture without heaters or blowers. Turbo DryPak features adjustable dew point performance.

**TURBO AIR COOLED™ 2000**

Cooper Compression's Turbo Air Cooled 2000 centrifugal compressor is designed for applications where there is a limited supply or no water available for cooling. It features innovative air to air cooling technology in a reliable centrifugal design.

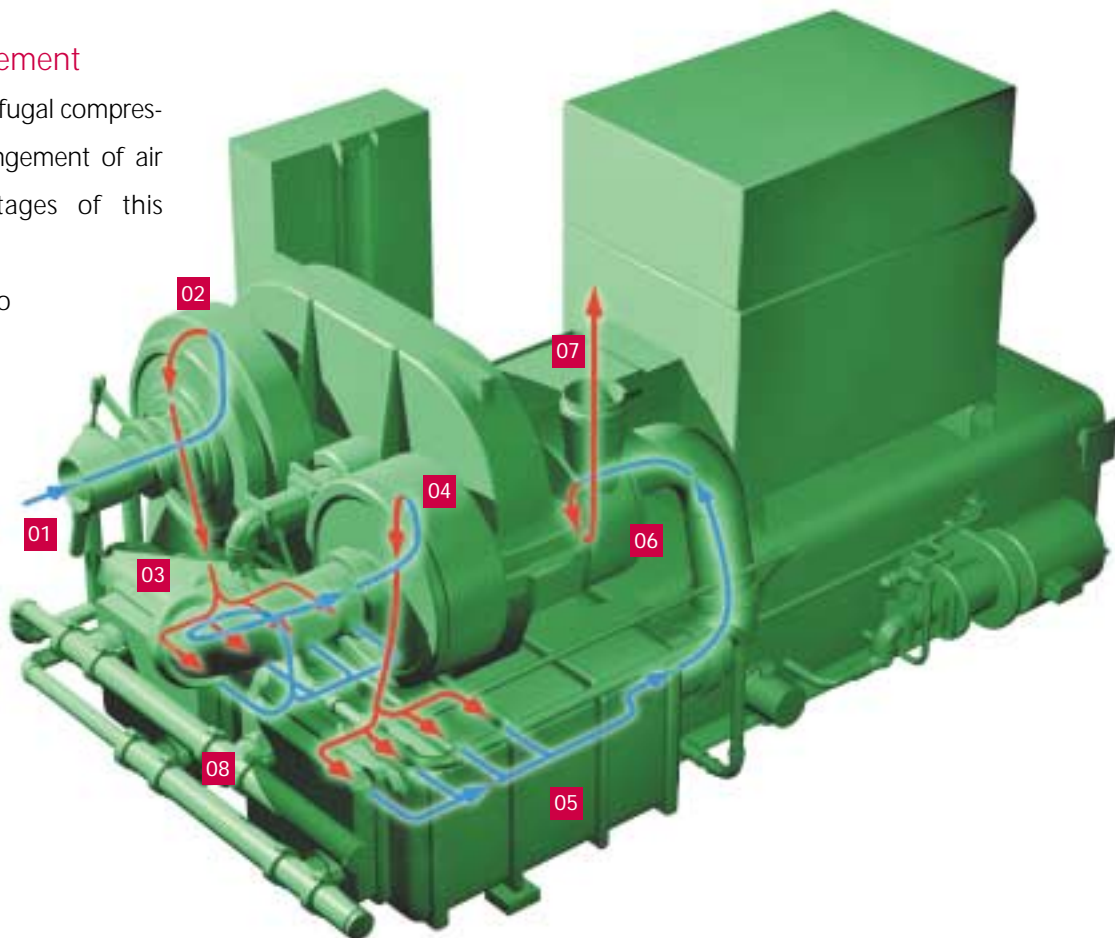
**TWINTURBO COMBINED SERVICE COMPRESSOR**

The TwinTurbo Combined Service Compressor delivers the proven solution for dual process air and booster applications, eliminating a compressor and reducing installation and maintenance costs.

Typical Air Flow Arrangement

Cooper Compression's centrifugal compressors feature a superior arrangement of air flow components. Advantages of this arrangement include:

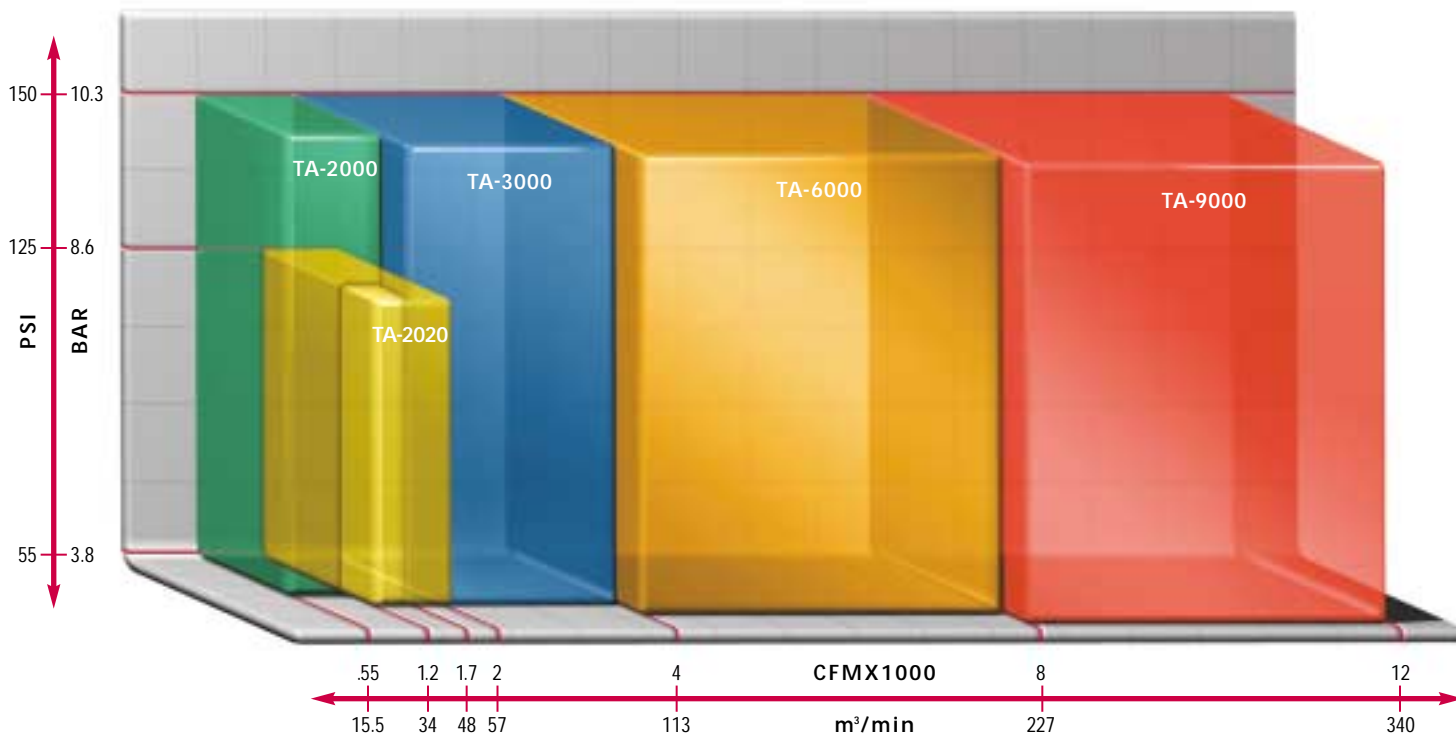
- Air movement is directed so turbulence-induced friction is reduced
- Air is cooled after every stage to assure a high isothermal efficiency



Turbo Air®

- 01: Compressor Inlet
- 02: 1st Stage Compressor Scroll
- 03: 1st Stage Intercooler
- 04: 2nd Stage Compressor Scroll
- 05: 2nd Stage Intercooler
- 06: 3rd Stage Compressor Scroll
- 07: Compressor Discharge
- 08: Water Manifold (optional)

Pressure / Flow Schematic



Note: This chart represents a typical flow chart schematic. For greater pressure or flow requirements, consult Cooper Compression.

COMPREHENSIVE QUALITY

From start to finish, from the factory to the field, in every area, for every employee, quality is the rule. You would expect that from a world class manufacturer such as Cooper Compression. Our objective is to exceed your expectations.



Our Quality Policy

The key elements of Cooper Compression's quality policy are:

- Fully meeting customer expectations and requirements
- Providing products that equal or exceed industry and government standards
- Providing our customers with the best value delivered
- Focusing on long term customer satisfaction
- Striving for continuous improvement
- Understanding quality is everyone's job

Our Quality Program

ISO-9001:2000 CERTIFIED QUALITY MANAGEMENT SYSTEM

- Systematic approach to continuous improvement
- 15 Trained ISO Internal Auditors

ISO-14001:1996 CERTIFIED ENVIRONMENTAL MANAGEMENT SYSTEM

- Dedication to reducing and eliminating waste
- Providing a healthy and safe work environment for all employees
- Meeting or exceeding all environmental, health, and safety regulatory requirements

SIX SIGMA TRAINING

- Addressing customer Critical To Quality issues
- Process and product improvements most beneficial to our customers
- Training in sophisticated problem-solving tools



SUPPLIER QUALITY MANAGEMENT

- Maintain an Approved Vendors List
- New suppliers reviewed and evaluated prior to being added
- Supplier quality performance tracked through the non-conforming product data base within our business system
- Periodic supplier performance evaluations

CE MARK CERTIFICATION

- TAC2000 family of compressors was first to be certified
- All plant air units are certified

PRESSURE EQUIPMENT DIRECTIVE – PED

- Equipment meets the PED requirements for the design and manufacture of pressure equipment and assemblies

CHINA PRESSURE VESSEL CODE CERTIFICATION

- Key suppliers have been certified to meet the China Pressure Vessel Code
- Multiple units have been shipped meeting these requirements



Added Quality Assurance from Advanced Testing Facilities

To guarantee performance to both customer and manufacturer specifications, every Cooper Compression design is fully tested for aerodynamic and mechanical performance by highly skilled technicians before it leaves the factory.

NINE TEST STANDS

Our test facility in Buffalo, New York includes nine test stands.

- Variable speed drives to simulate actual operating speed and meet the speed requirements of the ASME PTC-10 type 2 test
- Package testing of machines up to 11,000 HP (8,200 kW)
- The test stands are separated into three separate bays allowing one machine to be set-up while another is tested
- Computer controlled cooling towers are used to simulate actual coolant conditions

TEST CENTER COMPUTERIZED CONTROL ROOM

Cooper Compression's test center control room provides computer control of cooling water, input speed and lubricating oil supply.

- Aerodynamic testing through use of finely calibrated pressure and temperature instruments
- Vibration monitoring
- Vibration frequency analysis

TESTING OBSERVATION AND DOCUMENTATION

Upon request, you are welcome to observe testing of your compressor and complete test documentation is available.

- Documentation can be provided for full operating tests to identify air capacity, pressure, temperature and horsepower
- Vibration data for both steady state and coast down operation is recorded to verify rotor critical speed and response



Cooper Compression's test center control room provides computer control of cooling water, input speed and lubricating oil supply.



Standard package test of Turbo Air® 2000 in Cooper Compression test center.

AFTERMARKET SERVICES AND SUPPORT



How else can we prove our commitment to your total satisfaction? By providing the industry's most comprehensive resource for top-notch aftermarket products, engineering solutions and field service: COOPERSERV. If you ever have a question or problem, COOPERSERV is at your service.





WORLDWIDE CUSTOMER SUPPORT ORGANIZATION

Cooper Compression has over 80 representatives and distributors worldwide to service your needs wherever your application is located. We keep life-cycle records on every unit we manufacture enabling us to be a partner with you, now and in the future.

EXCEPTIONAL PARTS

- Genuine parts produced in the same facility for more than 50 years
- Extensive inventory in strategic locations around the world backed by our written warranty
- Cross-checked against unit maintenance records to ensure correctness

ELITE TECHNICAL SUPPORT

Our goal, like yours, is to keep your unit running. Our Technical Support is geared to do just that.

INSTALLATION AND START UP

- Concierge preventive maintenance programs
- Diagnostic and troubleshooting services
- Vibration analysis and trending
- Remote monitoring

REPAIR EXPERTISE

- State-of-the-art-equipment for turnkey repairs
- Complete documentation package
- Strategic locations to serve a broad customer base including Houston, TX, Los Angeles (Garden Grove), CA and Buffalo, NY

FACTORY TRAINING

- Comprehensive, on-site training seminars for you and your personnel
- Instruction on a variety of topics including Level II courses offering hands-on training
- Courses can be tailored to your needs at our Buffalo, NY training center



SMART PRODUCT UPGRADES

Cooper Compression is constantly striving to improve efficiency and enhance performance. We incorporate these advances into retrofit kits that enable you to keep your equipment up to date.

CONTROLS RETROFITS

- Re-aero kits to improve efficiency or match changing conditions
- Oil and cooling water system enhancements
- Motor upgrades

COOPER COMPRESSION OFFERS MORE

In addition to our Turbo Air Series products, Cooper Compression offers engineered air, industrial and process gas centrifugal compressors, designed for specific applications with a wide range of capacities and power ranges.

Our MSG (Multi-Stage Geared) compressors are application engineered with a number of available configurations for flow requirements from 2100 CFM (3570 m³/hr) to 90,000 CFM (153000 m³/hr) to over 25,000 HP (18650 kW) and 1200 psig (83 bar g).



4MSG-16/15 AIR COMPRESSOR

Application: Located in China, used as main air compressor for air separation plant.

Specifications: Flow = 59,000 Nm³/hr,
Discharge Pressure = 1241 kPaA



3R2MSGPB-5G/30 GAS COMPRESSOR

Application: Located in Algeria, used as boil off compressor. API 617.

Specifications: 20,000 kg/hr,
Discharge Pressure = 7.47 kg/cm²A



TAE-55 AIR COMPRESSOR

Application: Oil refinery in Texas. Powered by a Dresser Rand steam turbine. Used as an air compressor for the Olefins Plant. API 672 special service.

Specifications: Flow = 6700 SCFM,
Pout = 125 psig



FUEL GAS BOOSTER SKID

Two compressors packaged with gas scrubbers, Allen Bradley ContoLogix PLC, seal rack, motors, by-pass and recirculation piping.

Specifications: Flow = 69864 MMSCFD,
Pout = 710 psia



COOPER COMPRESSION

Locations to Serve You Worldwide

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