SULLAIR TWO-STAGE

Rotary Screw Air Compressors
Constant Speed and Variable Speed Drives (VSD)
75–450 kW  |  100–600 hp
ABOUT SULLAIR

For more than 50 years, Sullair has been on the leading edge of compressed air solutions. We were one of the first to execute rotary screw technology in our air compressors. And our machines are famous all over the world for their legendary durability. As the industry moves forward, Sullair will always be at the forefront with quality people, innovative solutions, and air compressors that are built to last.

Sullair was founded in Michigan City, Indiana in 1965, and has since expanded with a broad international network to serve customers in every corner of the globe. Sullair has offices in Chicago and manufacturing facilities in the United States and China — all ISO 9001 certified to assure the highest quality standards in manufacturing. In addition, Sullair Suzhou and Shenzhen facilities are ISO9001, ISO14001 and OHSAS 18001 certified.

SULLAIR CAPABILITIES

SULLAIR LEADERSHIP
Since 1965, Sullair has been recognized around the world as an innovator and a leader in rotary screw compression and vacuum technology. For more than 50 years, Sullair has designed and manufactured its own rotors and air end assemblies in Michigan City, Indiana.

The award-winning rotary screw design sets the industry standards and delivers the quality and reliability one expects from a leader.

SULLAIR TECHNOLOGY
Utilizing the most modern technologies, equipment and advanced manufacturing techniques, Sullair designs, manufactures, assembles, and tests the most innovative compressed air and vacuum products in the industry. Sullair products are known around the world for their universally applicable design, outstanding craftsmanship and superior quality.

STATISTICAL PROCESS CONTROL
The Sullair Statistical Process Control (SPC) system monitors rotor quality standards to assure consistent compressor and vacuum performance.

COMMITMENT TO INNOVATION
Underlying leadership at Sullair is a dedication to excellence and a commitment to innovation. Sullair constantly explores new ideas and seeks new ways to meet the industry’s need for increasingly energy efficient compressed air and vacuum solutions.
Two-stage compressors have a power advantage of approximately 12-15%* over equivalent sized single-stage compressors for two key reasons:

**Compression is Divided Between the Two Stages**
In a single-stage compressor operating at 100 psig at sea level, the compression ratio is 7.9 to 1 (in absolute terms). A two-stage compressor operating at the same pressure will have a compression ratio of 2.8 to 1 in each stage (2.8 is the square root of 7.9) achieving the compressor’s power savings.

**Reduced Internal Leakage Losses**
Reduced pressure difference across each stage facilitates reduction in leakage losses.

*S Compressed Air and Gas Handbook [Sixth Edition]

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**Superior End-to-End Design**
Sullair Two-Stage Series tandem compressors use two sets of rotors arranged in a unique end-to-end design that achieve higher efficiencies than other two-stage rotor arrangements. This design is based on proven Sullair technology used in its single-stage units, which has set the standards for efficiency and reliability in single-stage compressors for more than five decades.

The industry standard since its introduction in 1984, the TS Series tandem compressors offer unmatched full-load efficiency; often providing a two-year payback in energy savings compared with single-stage compressors. With the tandem’s variable capacity control, featuring spiral valve technology, further operating efficiencies can be achieved during part-load operation.

**Rotary Screw Reliability**
Sullair TS tandem models use a two-stage rotary screw air end, featuring Sullair rugged bearing design: tapered roller bearings on the discharge end and cylindrical roller bearings on the inlet for high load carrying capacity.

**Broad Operating Range**
These compressors are available in 100 to 600 horsepower, with capacities from 457 to 3000 acfm and pressure ratings of 100 to 175 psig.

**Extended Bearing Life**
By dividing the compression ratio across two stages, the two-stage tandem will significantly exceed the life of the average single-stage compressor.
Power Savings per 1000 cfm
Two-stage tandem vs. single-stage rotary screw at full-load. At a power cost of $.08/kW/hr, the black dotted line shows that a tandem two-stage compressor will save $14,373 per 1,000 cfm over a single-stage compressor operating for 8,000 hours at 100 psig. At a power cost of $.12/kW/hr, the green dotted line shows a saving of $21,560 per 1,000 cfm over a single-stage compressor operating for 8,000 hours at 100 psig. The savings will be significantly greater for higher capacity compressors.

The Proven Sullair Air End
Decades of proven reliability are testimony to the quality of the Sullair air end. Although the principle of rotary screw compression remains the same, Sullair continually improves materials, engineering and design of its air ends and compressor packages.

Longer Air End Life
Sullair air ends have only two moving parts: the asymmetrical profile rotors. Contact occurs only on a lubricated pitchline, so wear is virtually eliminated. As a result, Sullair compressors do not lose capacity or efficiency.

No Loss of Capacity or Efficiency
Controlled pressure lubrication and Bearing Fluid Reservoirs (BFR) assure a reliable supply of fluid to rotating elements.

Lower Operating Costs
Discharge port matches ratios of volume and operating pressure for maximum efficiency. Axial air inlet avoids preheating inlet air for further savings.
1. Multi-Stage Air-Fluid Separation
   - Dual nested Optimizer™ separator elements, reduce fluid carryover to a maximum of 1 ppm
   - Reduced carryover lowers make-up fluid costs
   - Pleated Optimizer elements lower initial pressure drop for greater efficiency and extends element life
   - Easy to change with built-in lid lifting device

2. Fiberglass Fluid Filter
   - Aircraft-quality media provides better filtration
   - Up to 20% more efficient than conventional paper elements
   - Lengthens life of the compressor

3. Optimalair® Heavy-Duty Air Intake Filter
   - Includes remote air intake connection
   - Provides finest inlet filtration in the industry (0.4 microns using Fine Fiber Technology)
   - Keeps fluid clean and extends life of other internal components
   - Reduces pressure drop throughout the operating life, resulting in energy savings

4. Two-Stage Compressor Air End
   - Delivers more air
   - Reduces power consumption
   - Extends air end bearing life

5. Enhanced Serviceability for Air-Cooled Oil Cooler and Aftercoolers
   - Easy to remove panels provide access for cleaning coolers

6. Motor Coupled to Air End Through Non-Lubricated, Flexible Coupling
   - Allows use of standard NEMA frame motor
   - Simplifies installation and start-up

7. Variable Capacity Control System Featuring Spiral Valve Technology
   - Lowers part-load operating costs
   - Reduces cycling duty on package
   - Maintains consistent plant pressure
   - Simple control
   - Reduces bearing load

SULLAIR
TWO-STAGE COMPRESSORS
TS-20, TS-32 AND TS-32S
**Sullair Supervisor™ Controller**
- Computer-compatible micro-processor controller has simple graphic illustration of monitored functions and an easy-to-read keypad
- Constant readout of pressure and temperature
- On-demand readout of all operating and maintenance conditions
- Monitors key functions and safety shutdowns
- Power failure auto restart
- Dual control, provides automatic start-stop operation
- Lead-lag and sequencing with multiple compressors
- Service and preventive maintenance schedule
- Hours are recorded for “Run,” “Loaded” and “Consumable Parts”
- Fault history with sensor readings
- “Help” key provides built-in troubleshooting

**Easy Maintenance**
- Access to all critical components even with a sound enclosure installed

**Time Proven End-to-End Design**
- Reduces pressure drop through stages
- Easy serviceability

**NEMA 4**
- Wye Delta starter for softer start

**Bearing Fluid Reservoirs**
- Ensure that fluid is available at start-up
- Extend air end life

**SELECT A LONG-LIFE FLUID**

**Genuine Sullube® Factory Fill**
- A 10,000-hour extended-life synthetic fluid powered by Dow technology. Sullube has been used in more than 50,000 compressors worldwide

**Optional PristineFG™**
- Food Grade Designed specifically for compressors used in food, beverage and pharmaceutical applications and meets FDA and USDA H-1 requirements

**Sullair 10-Year Diamond Warranty**
Confirming our rugged design and commitment to customer satisfaction, Sullair Two-Stage air compressors with discharge pressures up to 150 psig include the exclusive 10-year Diamond Warranty. The comprehensive warranty covers:
- 10 years on the air end
- 5 years on the motor, VSD, air/fluid receiver, oil cooler and aftercooler

Maintaining the Sullair 10-Year Diamond Warranty requires using Genuine Sullair parts and fluids, as well as the oil sampling program.
TWO-STAGE TANDEM COMPRESSOR
PART-LOAD SAVINGS

Fact: the electric power cost to run an air compressor continuously for one year is often two to three times greater than the purchase price of the compressor itself.

Hence, Sullair developed the two-stage tandem compressor. By combining two-stage compression and a spiral valve, the TS performs with unmatched full-load and part-load efficiency and often provides a two-year payback in energy savings compared to a single-stage compressor.

Built In Energy Savings
Sullair two-stage tandem compressors have been proven to be 13% more efficient than single-stage screw compressors at full-load operation. At 60% load, the Sullair two-stage tandems provide up to 30% savings over single-stage compressors.

How It Works
The compression volume varies to suit the air demand by progressively opening or closing internal bypass ports on the air end.

Capacity is matched to system demand, reducing cycling time and extending component life.

Part-load capacity and efficiency can produce energy savings up to 17%.

Spiral Valve Saves You Power
The compressor displacement is matched to the output need. Spiral Valve technology assures precision operation for virtually any part load point. It provides significant power savings at part load conditions, compared to compressors using suction throttling, or load/no load control.

Increases Capacity Control Efficiency
By activating automatically when the unit is operating under partial load, and allowing the compression of only the required quantity of air, the spiral valve increases the efficiency of the compression process. The ultimate result is greater compression efficiency and reduced power consumption.

Sullair Smart Technology Gives You:
- Simplicity
- Flexibility
- Reliability
- System protection

Variable Speed Drive Helps Prevent Potential Peak Demand Charges
The Sullair Two-Stage Series compressors provide the highest power factor over the entire frequency range, often avoiding utility company penalties.

Reliability
- Designed from the frame up as a complete package — not built with a variety of off-the-shelf components
- Serial communication between the Supervisor™ Controller and VSD eliminates the need for hard wired relays

Compressors with Sullair Smart Technology Provide
- Excellent energy savings
- Relief from potential peak demand charges
- DC link choke or 3% line reactor included (model/voltage specific)
- Stable system pressure
- Consistent product quality
- Reduced storage requirements
- Flexibility for future growth
- Lowest five-year life cycle cost
- Potential utility company rebate

Variable Speed Drive is the superior alternative to other compressor control systems.

Variable Speed Drive is the Superior Alternative
The chart above is a representation of nominal control systems for generic comparative purposes. A detailed and accurate comparison of specific compressor models is available from your Sullair representative or authorized distributor.

Energy Efficient
This compressor series is more energy efficient than similar compressors, thanks to:
- Proven air end with low restriction inlet valve
- Optimized fluid system that reduces fluid temperatures
- Premium efficient motors
- Low pressure drop air-fluid separation system
- High efficiency fan

Considering that energy costs represent 82% of the total cost of owning compressors, these savings significantly reduce total life cycle costs.

Total Compressor Flexibility
Sullair Variable Speed Drive compressors provide the flexibility to vary both capacity and pressure. This flexibility makes it possible to "grow" your air system without adding another compressor.
Sullair offers total compressed air systems to help compressed air users reduce energy costs and improve productivity by analyzing, managing and controlling their compressed air systems.

Sullair air systems include: plant air audits, energy efficient products, compressed air system controls, equipment to monitor and manage systems, air distribution products, and after-purchase support.

Each component of the system is carefully matched for capacity and pressure to provide maximum performance and energy efficiency.

**The system includes:**
- Rotary screw compressor
- Wet storage
- Refrigerated dryer or desiccant dryer
- Filters to meet your requirement
- Dry storage
- Flow controller
- Drains
- Oil/water separator

**Sullair Reduces Your Life Cycle Costs**


Sullair compressors significantly reduce operating and energy costs over the entire compressor life cycle. Contributing to the energy savings are:
- Proven Sullair air end with a low restriction inlet valve
- High efficiency fan
- Low pressure drop air-fluid separation system to prevent energy loss

Sullair designs deliver cost savings for the life of the product. Improved air filtration translates into:
- Extended separator life
- Improved fluid filter life
- Less lubricant contamination

To reduce fluid disposal costs, we offer our Genuine Sullube® 10,000-hour fluid.
## Technical Specifications

### 60Hz Motor Two-Stage

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*Capacity per CAGI / PNEUROP PN2OCTC2 (Annex C to ISO 1217)*

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* Capacity per CAGI / PNEUROP PN2CPTC2 (Annex C to ISO 1217)

Information and data are subject to change without notice.
For more information, contact your local authorized Sullair distributor.