SULLAIR TWO-STAGE

Rotary Screw Air Compressors
Constant Speed and Variable Speed Drives (VSD)
112–450 kW | 150–600 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, the Sullair Suzhou facility is ISO14001 and OHSAS 18001 certified.

Sullair is a Hitachi Group Company.

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 legendary 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 COMPRESSION ADVANTAGES**

**AT FULL-LOAD**

**Up to 15% power savings**
Compared to equally sized single-stage compressors, two-stage compressors offer a 12–15%* power advantage.

**Why?**
- Compression is divided between two stages resulting in power savings
- Reduced differential pressure across each stage minimizes internal leakage losses

**Example:** A single-stage compressor located at sea level and operating at 100 psig has a 7.9 to 1 compression ratio (in absolute terms).

A two-stage compressor operating at the same altitude and pressure has a 2.1 to 1 compression ratio per stage.

**Setting the industry standard since 1984 with a superior end-to-end design**
- Unique rotor arrangement engineered for maximum efficiency compared to other two-stage configurations
- Unmatched full-load efficiency—energy savings investment payback in a quickly as two years compared to single-stage compressors

**Rotary Screw Reliability**
Two-Stage Series tandem compressors use a two-stage rotary screw air end, featuring the Sullair rugged bearing design:
- Tapered roller bearings on the discharge end
- Cylindrical roller bearings on the inlet for high load carrying capacity

**Dividing compression across two stages also extends bearing life.**

**Capacity Control Options**
Match compressed air supply with demand.
- Spiral Valve
- Variable Speed Drive (VSD)

**Broad Operating Range**
- **Power:** 150–600 hp (112–450 kW)
- **Delivery:** 590–3000 acfm (16.7–84.9 m³/min)
- **Pressure:** 100–175 psi (6.8–12 bar)

**Two-Stage Extreme Pressure models available**
- **Power:** 200–500 hp (149–373 kW)
- **Delivery:** 500–1350 acfm (14.2–37.8 m³/min)
- **Pressure:** 225–500 psi (15.5–34.5 bar)

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*S Compressed Air and Gas Handbook [Sixth Edition]*
POWER SAVINGS PER 1000 CFM ON TS-32

Two-Stage Tandem vs Single-Stage Rotary Screw

At Full-Load

At a power cost of $.08/kW/hr, the black dotted line illustrates a tandem two-stage compressor will save $14,373 per 1000 cfm over a typical single-stage compressor operating for 8000 hours at 100 psig.

At a power cost of $.12/kW/hr, the green dotted line shows a $21,560 savings per 1000 cfm over a typical single-stage compressor operating for 8000 hours at 100 psig.

Potential savings may be significantly higher for larger capacity compressors.

LEGENDARY SULLAIR AIR END

Decades of proven reliability are a testament 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 effectively maintain capacity and 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 (99.95%+ overall efficiency/0.4 micron)
   - 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 Supervisor™ Controller
- Computer-compatible microprocessor 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
The Sullair 10-Year Diamond Warranty provides comprehensive protection for Sullair lubricated rotary screw air compressors. This program distinguishes itself by covering all major components for new air compressors (with discharge pressures up to 150 psig):
- 10 years on the air end
- 5 years on the main motor, fan motor, aftercooler, oil cooler, separator vessel, variable speed drive (if equipped)

Maintaining the Sullair 10-Year Diamond Warranty requires using Genuine Sullair parts, Sullube® and participation in the oil sampling program. Restrictions apply.
PART-LOAD SAVINGS WITH SULLAIR SPIRAL VALVE

Fact: When running an air compressor continuously for one year, the cost of electric power is often two to three times greater than the initial compressor price.

Sullair Two-Stage Series with Spiral Valve
By combining two-stage compression and a spiral valve, the TS performs with unmatched full-load and part-load efficiency — often providing a two-year energy savings payback compared to a single-stage compressor.

Spiral Valve Saves You Power
Compressor displacement is matched to the output need. Spiral Valve technology assures precise operation for virtually any part load point. Thus providing significant power savings at part load conditions compared to compressors using suction throttling or load/no load control.

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

Built-in Energy Savings
- 13% more efficient at full-load operation compared to single-stage screw compressors
- 30% savings at 60% load compared to single-stage screw compressors

How It Works
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.

Match Supply with Demand
By activating automatically when the unit is operating under partial load. This allows compression of only the required quantity of air — allowing greater compression efficiency and reduced power consumption.
Compressors with Sullair Smart Technology

- Excellent energy savings
- Helps prevent potential peak demand charges
- Sullair Two-Stage Series provides highest power factor over the frequency range — helping avoid utility company penalties
- Potential utility company rebate
- 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

Reliability

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

VSD — SUPERIOR CAPACITY CONTROL

- Stabilizes system pressure — improving process consistency and reducing product rejects
- Increased margins from energy savings

Maxium Energy Efficiency with Sullair Two-Stage Series

- Legendary air end with low restriction inlet valve
- Optimized fluid system — reducing fluid temperatures
- Premium efficiency motors
- Low pressure drop air-fluid separation system
- High-efficiency fan

Considering 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 flexibility to vary both capacity and pressure — allowing you to grow your air system without adding another compressor.
Sullair offers total compressed air systems to help you reduce energy costs and improve productivity by analyzing, managing and controlling your 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

#### Air Compressor Life Cycle Costs
According to *Best Practices for Compressed Air Systems, Compressed Air Challenge* (Second Edition, 2007) energy costs now represent 82% of total operating expenses. Energy savings from Sullair Two-Stage compressors can significantly reduce life cycle costs.

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

Extend component life with improved air filtration
- Extended separator life
- Improved fluid filter life
- Less lubricant contamination

### Fluid matters
Genuine Sullube® 10,000-hour fluid helps reduce fluid disposal costs.
TWO-STAGE EXTREME PRESSURE
HIGH PRESSURE PERFORMANCE. SULLAIR DURABILITY.
200–500 hp | 225–500 psi

Dependable, high-performance two-stage air end for maximum power savings

460v motor coupled to air end via non-lubricated, flexible coupling
- Allows use of Standard NEMA frame motor
- Flange-mounted for positive alignment

Sullair Supervisor Controller
- Easy pressure adjustment
- Capacity modulation range 100 to 40%

Heavy-duty inlet air filter
- Two-stage, dry type
  - Inside safety element
  - Differential pressure indicator

Air-fluid separation
- ASME psi rated tank
- ASME pressure relief valve
- Pleated air-fluid separator element for lower initial pressure drop

Cooling
- Air-cooled units use mounted and piped aftercooler with quiet fan
- Water-cooled units feature an air-in-shell, water-in-tube aftercooler design
- LS-20TS are equipped with Remote Coolers

Options
- Magnetic starter
- Solid state starter
- Sound attenuating enclosure with removable panels
- 575v
### 60Hz Motor Two-Stage

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<th>6.8 bar m³/min</th>
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<th>8.6 bar m³/min</th>
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* Capacity per CAGI / PNEUROP PN20PTC2 (Annex C to ISO 1217)

Information and data are subject to change without notice.
## TECHNICAL SPECIFICATIONS
### TWO-STAGE EXTREME PRESSURE

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For more information, contact your local authorized Sullair distributor.