

SULLAIR TWO-STAGE

Rotary Screw Air Compressors

Constant Speed and Variable Speed Drives (VSD)

75–450 kW | 100–600 hp



 **SULLAIR**[®]
Always air. Always there.[®]

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, China and India — 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.

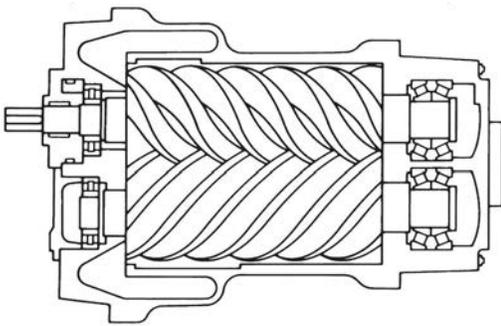
STATISTICAL PROCESS CONTROL

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

COMMITMENT TO INNOVATION

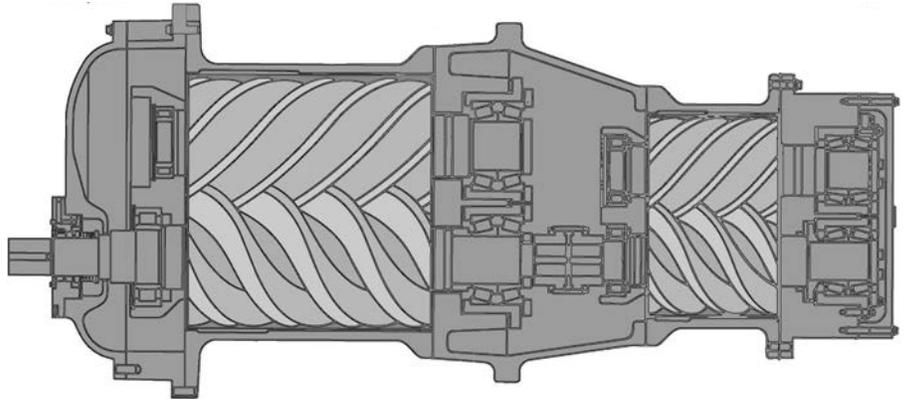
Underlying leadership at Sullair is a dedication to excellence and a commitment to innovation. Sullair constantly explores new ideas and seeks new ways to meet the industry's need for increasingly energy efficient compressed air and vacuum solutions.

ADVANTAGE OF TWO-STAGE COMPRESSION AT FULL-LOAD



Intake 14.5 psia	Compression Ratio 7.9 to 1	Discharge 114.5 psia
---------------------	-------------------------------	-------------------------

SINGLE-STAGE



Intake 14.5 psia	Compression Ratio 2.8 to 1	Interstage 41 psia	Compression Ratio 2.8 to 1	Discharge 114.5 psia
---------------------	-------------------------------	-----------------------	-------------------------------	-------------------------

TWO-STAGE

Two-stage compressors* have a power advantage of 11-13% 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.

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 125 to 350 horsepower, with capacities from 457 to 1615 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.

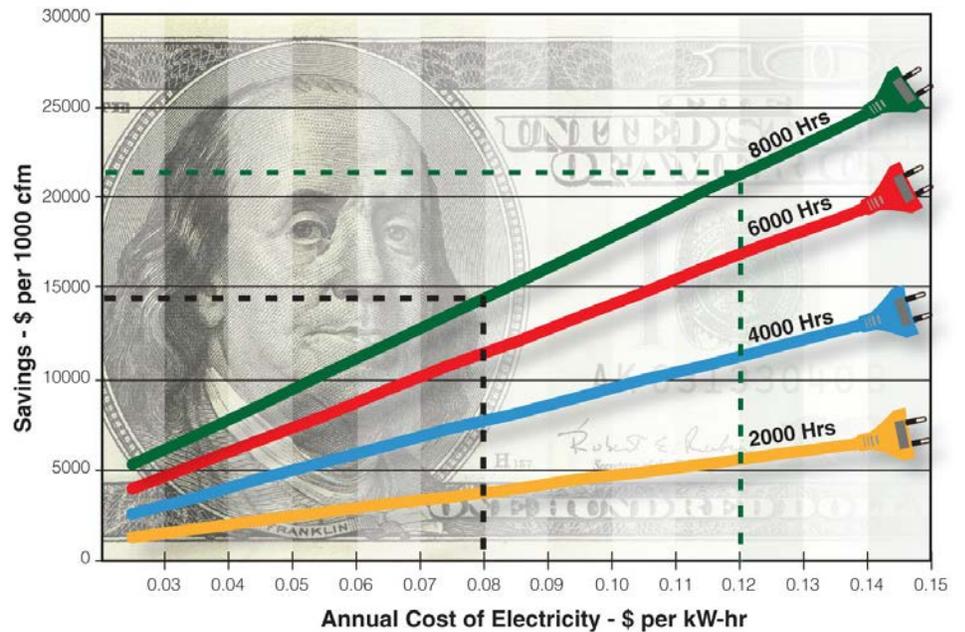
* Compressed Air and Gas Handbook [Sixth Edition]

POWER SAVINGS PER 1000 CFM ON TS-32

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.

Energy Savings Two-Stage Over Single-Stage, Full-Load



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.

SULLAIR TWO-STAGE COMPRESSORS

TS-20, TS-32 AND TS-32S

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 on models TS-32 and TS-32S

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 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
- Standard on TS-20, 250 hp and TS-32
- Optional on TS-20, 100 to 200 hp

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

Optional 24KT®

- Silicone-based structure that does not break down at normal operating temperatures and is ideal for compressors running 24/7



10-year Diamond Warranty

Confirming our rugged design and commitment to customer satisfaction, all new Sullair S-energy® stationary air compressors plus select other models (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

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.

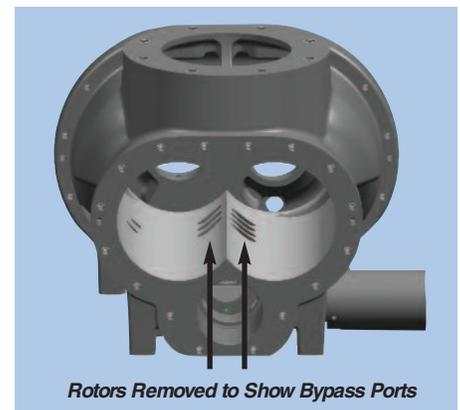
Part-load capacity and efficiency can produce energy savings up to 17%.

Variable Capacity Control Saves You Power

The compressor displacement is matched to the output need. The VCC 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.

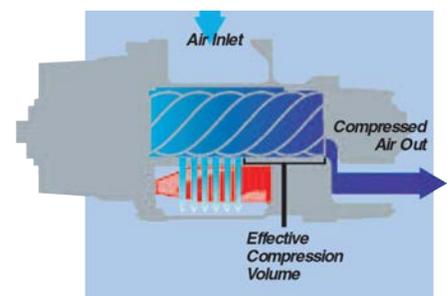
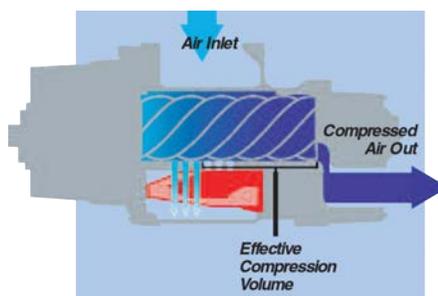
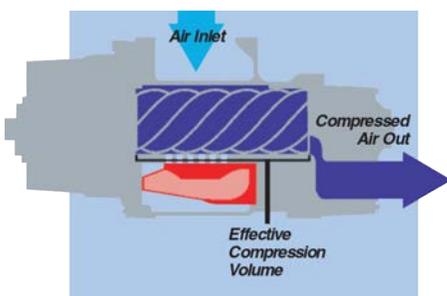


BYPASS PORTS IN STATOR

CLOSED BYPASS PORTS

PARTIALLY OPEN BYPASS PORTS

OPEN BYPASS PORTS



SULLAIR VSD COMPRESSORS WITH SMART TECHNOLOGY

Sullair Smart Technology Gives You:

- Simplicity
- Reliability
- Flexibility
- 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

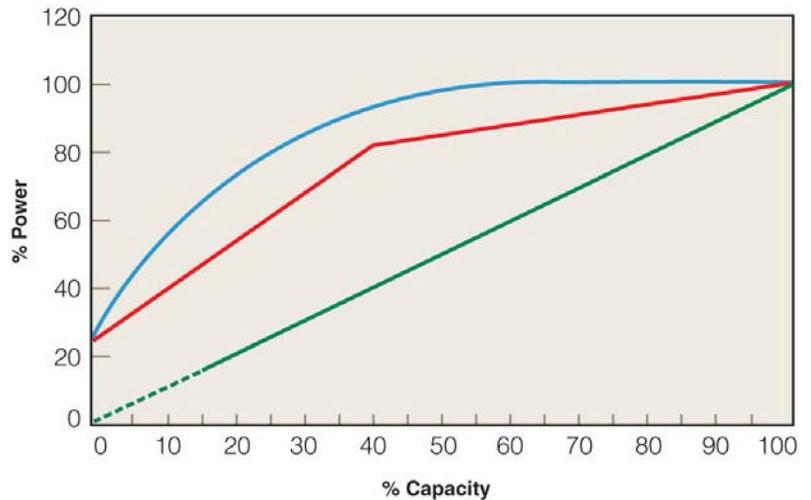
Compressors with Sullair Smart Technology Provide

- 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.

Stable system pressure improves the consistency of your process reducing product rejects. Maximizing energy savings means increased profits.

PART LOAD PERFORMANCE ASSESSMENT



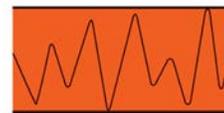
- Single-Stage Lubricated Load/Unload (The graph represents one gallon of storage per cfm.)
- Single-Stage Lubricated Inlet Modulation with Blowdown
- Single-Stage Lubricated Variable Speed



Reference: Compressed Air and Gas Handbook, 6th Edition, pages 221-223.

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.



Conventional System Pressure



Sullair Smart Technology System Pressure

Energy Efficient

This compressor series is more energy efficient than similar compressors, thanks to:

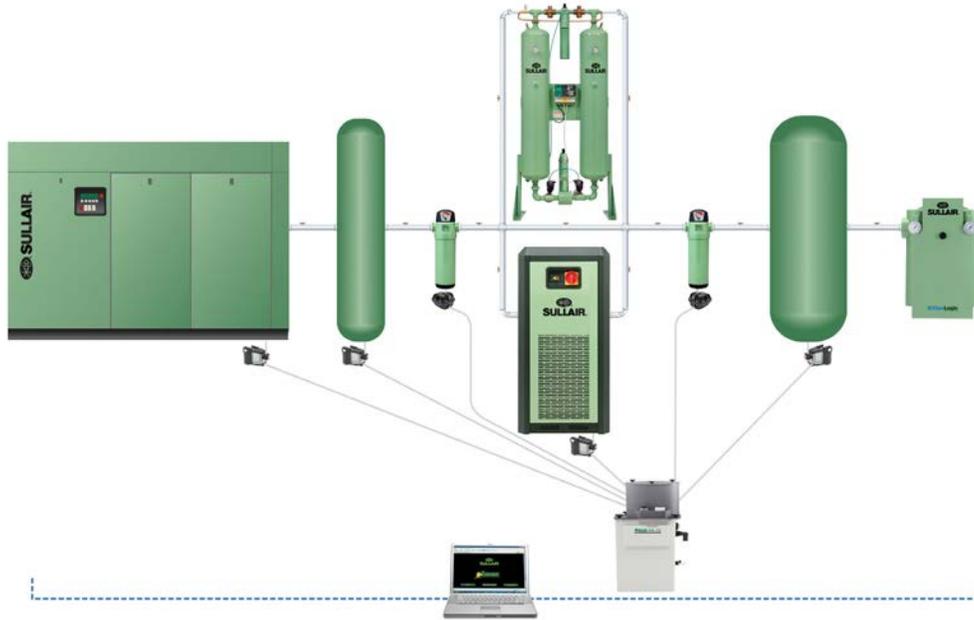
- Proven air end with low restriction inlet valve
- Optimized fluid system that reduces fluid temperatures
- Premium efficient motors
- Low pressure drop air-fluid separation system
- High efficiency fan

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 STATIONARY AIR POWER SYSTEMS



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.

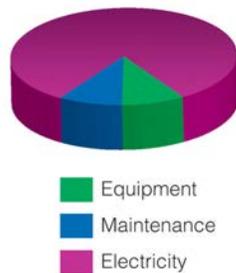
Sullair air systems include: plant air audits, energy efficient products, compressed air system controls, equipment to monitor and manage systems, air distribution products, and after-purchase support.

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
- Ethernet-based eConnect™ to monitor and control the entire system

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 the total operating expenses. Energy savings from Sullair S-energy® compressors can significantly reduce life cycle costs.

The Sullair S-energy 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, or 24KT®, a long-life fluid that never needs changing.

TECHNICAL SPECIFICATIONS

60HZ MOTOR TWO-STAGE	MOTOR		CONSTANT SPEED DRIVE FULL-LOAD CAPACITY™								LENGTH		WIDTH		HEIGHT		WEIGHT	
			100 PSI acfm	6.8 bar m³/min	125 PSI acfm	8.6 bar m³/min	150 PSI acfm	10.3 bar m³/min	175 PSI acfm	12 bar m³/min	in	mm	in	mm	in	mm	lbs	kg
Model	hp	kW																
TS-20-100	100	75	575	16.2	500	14.1	-	-	-	-	120	3048	72	1828	68	1727	7350	3334
TS-20-125	125	93	680	19.2	615	17.4	575	16.2	500	14.1	120	3048	72	1828	68	1727	7350	3334
TS-20-150	150	112	826	23.3	763	21.6	680	19.2	616	17.4	120	3048	72	1828	68	1727	7350	3334
TS-20-200*	200	149	1051	29.7	960	27.1	868	24.5	820	23.2	120	3048	72	1828	68	1727	7350	3334
TS-20-250*	250	186	1200	33.9	1132	32.0	1035	29.3	960	27.1	120	3048	72	1828	68	1727	7350	3334
TS-32-200	200	149	1105	31.2	-	-	-	-	-	-	154	3911	78	1981	86	2184	12,720	5770
TS-32-250	250	186	1335	37.8	1240	35.1	1100	31.1	-	-	154	3911	78	1981	86	2184	12,720	5770
TS-32-300	300	224	1640	46.4	1440	40.7	1330	37.6	1240	35.1	154	3911	78	1981	86	2184	12,720	5770
TS-32-350	350	261	1875	53.01	1733	49.0	1575	44.6	1440	40.7	154	3911	78	1981	86	2184	12,720	5770
TS-32S-400	400	298	2220	62.8	1943	55.0	1681	47.6	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-450	450	336	2350	66.5	2135	60.4	1943	55.0	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-500	500	373	2530	71.6	2350	66.5	2220	62.8	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-600	600	447	3000	84.9	2700	76.4	2530	71.6	-	-	175	4445	84	2134	92	2337	15,900	7212
60HZ MOTOR TWO-STAGE	MOTOR		VARIABLE SPEED DRIVE FULL-LOAD CAPACITY™								LENGTH		WIDTH		HEIGHT		WEIGHT	
Model			hp	kW	100 PSI acfm	6.8 bar m³/min	125 PSI acfm	8.6 bar m³/min	150 PSI acfm	10.3 bar m³/min	175 PSI acfm	12 bar m³/min	in	mm	in	mm	in	mm
V-200TS-100*	100	75	550	15.5	495	14.0	-	-	-	-	120	3048	72	1828	68	1727	7350	3334
V-200TS-125	125	93	680	19.2	606	17.1	550	15.5	515	14.5	120	3048	72	1828	68	1727	7350	3334
V-200TS-150	150	112	800	22.6	720	20.3	653	18.4	610	17.2	120	3048	72	1828	68	1727	7350	3334
V-200TS-200*	200	149	1000	28.3	918	25.9	815	23.0	750	21.2	120	3048	72	1828	68	1727	7350	3334
V-320TS-200	200	149	1110	31.2	945	26.7	-	-	-	-	154	3911	78	1981	86	2184	12,720	5770
V-320TS-250	250	186	1300	36.8	1180	33.4	1050	29.7	-	-	154	3911	78	1981	86	2184	12,720	5770
V-320TS-300	300	224	1550	43.8	1400	39.6	1250	35.4	-	-	154	3911	78	1981	86	2184	12,720	5770
V-320TS-350	350	261	1800	50.9	1645	46.5	1480	41.9	-	-	154	3911	78	1981	86	2184	12,720	5770
V-320TS-400	400	298	2075	58.7	1870	52.9	1695	48.0	-	-	175	4445	84	2134	92	2337	15,900	7212
V-320TS-450	450	336	2310	65.4	2100	59.4	1900	53.8	-	-	175	4445	84	2134	92	2337	15,900	7212

50HZ MOTOR TWO-STAGE	MOTOR		CONSTANT SPEED DRIVE FULL-LOAD CAPACITY**								LENGTH		WIDTH		HEIGHT		WEIGHT	
			Model	hp	kW	100 PSI acfm	6.8 bar m ³ /min	125 PSI acfm	8.6 bar m ³ /min	150 PSI acfm	10.3 bar m ³ /min	175 PSI acfm	12 bar m ³ /min	in	mm	in	mm	in
TS-20-100*	100	75	555	15.7	500	14.2	434	12.3	-	-	120	3048	72	1828	68	1727	7350	3334
TS-20-125	125	93	680	19.3	593	16.8	555	15.7	500	14.2	120	3048	72	1828	68	1727	7350	3334
TS-20-150	150	112	786	22.3	720	20.4	647	18.3	590	16.7	120	3048	72	1828	68	1727	7350	3334
TS-20-200	200	149	990	28.0	927	26.3	847	24.0	778	22.0	120	3048	72	1828	68	1727	7350	3334
TS-32-200	200	149	1090	30.9	-	-	-	-	-	-	154	3911	78	1981	86	2184	12,720	5770
TS-32-250	250	186	1357	38.4	1183	33.5	1090	30.9	1021	28.9	154	3911	78	1981	86	2184	12,720	5770
TS-32-300	300	224	1660	47.0	1430	40.5	1300	36.8	1183	33.5	154	3911	78	1981	86	2184	12,720	5770
TS-32-350	350	261	1845	52.3	1660	47.0	1556	44.1	1430	40.5	154	3911	78	1981	86	2184	12,720	5770
TS-32S-400	400	298	2100	59.5	1942	55.0	-	-	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-450	450	336	2240	63.4	2100	59.5	1942	55.0	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-500	500	373	2480	70.2	2240	63.4	2100	59.5	-	-	175	4445	84	2134	92	2337	15,900	7212
TS-32S-600	600	447	2900	82.1	-	-	2480	70.2	-	-	175	4445	84	2134	92	2337	15,900	7212

* A remote cooler must be used with 200 hp and 250 hp (149 kW and 186 kW) compressors using 24KT®

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

24KT available for 100 and 125 psig — 6.8 bar and 8.6 bar offerings.

Information and data are subject to change without notice.



For more information, contact your local authorized Sullair distributor.