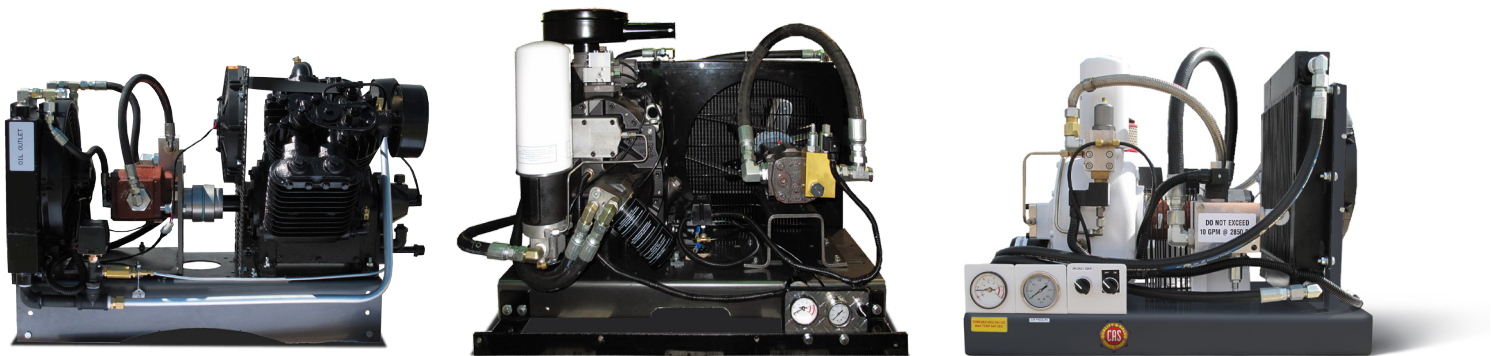


# Hydraulic Driven Reciprocating & Rotary Screw Compressors

## Owners Manual



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### Introduction

Congratulations on the purchase of your new air compressor. The air compressor is precision built from the finest materials using the finest state of the art design, and high tech engineering available today. Quality, performance and trouble free operation will assure you a dependable supply of air power on demand

Check [www.compressed-air-systems.com](http://www.compressed-air-systems.com) for most up to date manual and compressor service and technical information

**CAUTION** READ THIS MANUAL CAREFULLY before operating or servicing this air compressor, to familiarize yourself with the proper safety, operation, and standard operating procedures of this unit. **FAILURE TO COMPLY WITH INSTRUCTIONS IN THIS MANUAL COULD RESULT IN THE VOIDING OF YOUR WARRANTY, AND PERSONAL INJURY, AND/OR PROPERTY DAMAGE. THE MANUFACTURER OF THIS AIR COMPRESSOR WILL NOT BE LIABLE FOR ANY DAMAGE BECAUSE OF FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL.** By following the instructions and recommendations in this manual you will ensure a longer and safer service life of your air compressor.

If you have questions or need clarification about this manual or your compressor call 800-531-9656

***Do not operate compressor outdoors in wet weather***

## Compressed Air Systems

Simplicity. It's What We Do.

[compressed-air-systems.com](http://compressed-air-systems.com) | 1-800-531-9656 | Fax 972-352-6364

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**WARNING:** Read all installation steps in install guide, and compressor package manual prior to un-crating or installing compressor package. Failure to do so can result in personal injury or damage to compressor package.

**NOTICE:** All compressor air receivers should be inspected by a certified pressure vessel technician at least once per year, to check for leaks, weak points in the metal or any other deformity of the air receiver. If at any time a receiver appears out of conformance with ASME/CRN certification or a deformity is believed to have developed no matter how minor it may appear the tank should be locked out of service immediately and replaced with a certified ASME/CRN certified air receiver immediately before the compressor can be put back into service. The receivers should have a general inspection weekly as part of normal service.

### SAFETY PRECAUTIONS AND WARNINGS

Listed are some, but not all safety precautions that must be observed with compressors and compressed air systems. Failure to follow any of these warnings may result in severe personal injury, death, property damage and/or compressor damage.

Air from this compressor will cause severe injury or death if used for breathing or food processing.

Air used for these processes must meet OSHA 29 CFR 1910 or FDA 21 178.3570 regulations.

This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.

Disconnect all power supplies to the compressor plus any remote controllers prior to servicing the unit.

Relieve all pressure internal to the compressor prior to servicing.

Do not depend on check valves to hold system pressure.

A properly sized safety valve must be installed in the discharge piping ahead (upstream) of any shut-off valve (block valve), heat exchanger, orifice or any potential blockage point. Failure to install a safety relief valve could result in rupturing or explosion of some compressor or safety component.

Do not change the pressure setting of the safety relief valve, restrict the function of the safety relief valve, or replace the safety valve with a plug.

Over pressurization of some system or compressor component can occur, resulting in severe personal injury, death and property damage.

Never use plastic pipe, rubber hose, or soldered joints in any part of the compressed air system.

Failure to ensure system compatibility with compressor piping is dangerously unsound.

Never use a flammable or toxic solvent for cleaning the air filter or any parts.

Do not attempt to service any part while the compressor is operating.

Do not operate the compressor at pressures in excess of its rating.

Do not remove any guards while the compressor is operating.

Observe gauges daily to ensure compressor is operating properly.

Follow all maintenance procedures and check all safety devices on schedule.

Compressed air is dangerous, do not play with it.

Use the correct lubricant at all times.

Always wear proper safety equipment when using compressed air.

Always install compressor to all local applicable electric codes.

**WARNING:** Always wear proper protective eyewear, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

**WARNING:** On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

**WARNING:** Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

**WARNING:** Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

**WARNING:** Never apply air pressure to compressor crank case, always make sure crank case vent is clear and free from obstructions. Adding pressure to the crank case can cause serious bodily injury or death.

**WARNING:** Never operate a compressor in a moving vehicle or towable object in motion. Doing so can damage the compressor, compressor drive components, or auxiliary parts on the compressor package. Operating the compressor in a moving vehicle or towable object can cause serious bodily injury or death.

**WARNING:** Check function of safety valves, weekly to insure proper function, replace immediately if faulty or damaged.

**WARNING:** (Compressors Packaged with NEMA 7 Components)

Compressed Air Systems, LLC certifies that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7/hazardous locations. (Only for applicable packages with NEMA7 added components)

Air compressors have multiple moving parts and potential points of contact that could create an ignition source. The compressor pumps are manufactured with ferrous metals and in some cases multiple moving parts can come in contact with one another causing an ignition source. Compressed Air Systems LLC does not guarantee this will not occur. Lack of maintenance or care can result in conditions that could also cause ignition sources.

Compressed Air Systems, LLC only guarantees that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7 hazardous location. Compressed Air Systems LLC accept no other responsibility for the rating of the package.

## Troubleshooting Chart

NOTE: TROUBLESHOOTING PROBLEMS MAY HAVE SIMILAR CAUSES AND SOLUTIONS

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Compressor Stalls	<ul style="list-style-type: none"> <li>Low fluid supply to hydraulic motor</li> <li>Loose compressor coupler</li> <li>Bad check valve</li> <li>Seized compressor pump</li> </ul>	<ul style="list-style-type: none"> <li>Check hydraulic motor fluid supply for adequate flow</li> <li>Inspect check valve for proper operation</li> <li>Inspect compressor coupler</li> <li>Check compressor for proper oil level</li> </ul>
Low Discharge Pressure	<ul style="list-style-type: none"> <li>Air leaks in the system</li> <li>Leaking valves</li> <li>Restricted air intake</li> <li>Blown gaskets/seals</li> <li>Worn piston rings or cylinders</li> <li>Low fluid supply to hydraulic motor</li> <li>Usage exceeds air output</li> </ul>	<ul style="list-style-type: none"> <li>Tighten or replace leaking fittings, or joints</li> <li>Clean or replace air filter</li> <li>Check and repair gaskets</li> <li>Check and replace rings or cylinders</li> <li>Check for adequate fluid supply to hydraulic motor</li> <li>Check total air consumption</li> </ul>
Compressor Pump Knocking	<ul style="list-style-type: none"> <li>Loose motor coupler</li> <li>Low oil level in compressor pump</li> <li>Carbon build up on valve and piston</li> <li>Compressor is not mounted on vibration pads or is not level</li> </ul>	<ul style="list-style-type: none"> <li>Tighten coupler</li> <li>Keep oil level at recommended level for proper operation</li> <li>Only use factory recommended oil</li> <li>Make sure compressor is mounted on vibration pads and is level</li> </ul>

## Troubleshooting Chart (continued)

NOTE: TROUBLESHOOTING PROBLEMS MAY HAVE SIMILAR CAUSES AND SOLUTIONS

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Excessive oil discharge in air (All Compressors have a small amount of oil carry over in compression)	Worn piston rings or cylinder Restricted air intake Oil level to high Compressor has exceeded its duty cycle	Clean or replace air filters  Clean oil return line  Reduce oil level to recommended amount  Reduce compressor duty cycle (repair leaks or add another unit to handle the excess demand)
Compressor Overheating	Poor ventilation Dirty cooling surfaces Compressor is out of its operating duty cycle	Relocate compressor to any area with better ventilation (at least 18 inches from the nearest wall)  Clean all cooling surfaces  Reduce compressor duty cycle (repair leaks or add another unit to handle the excess demand)
Excessive Belt Wear	Pulley out of alignment Improper belt tension	Realign pulley with flywheel  Re adjust belt tension
Compressor won't start in cold weather	Bad check valve Compressor has wrong grade oil Control lines frozen	Use IS 100 (30W) compressor oil for cold weather conditions  Move compressor to a warmer location  Put a heat lamp on compressor to maintain above freezing temperatures

## Troubleshooting Chart (continued)

NOTE: TROUBLESHOOTING PROBLEMS MAY HAVE SIMILAR CAUSES AND SOLUTIONS

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Compressor Will Not Start	No fluid power Fuse blown in control circuit Loose incoming fluid lines Faulty temperature switch Temperature switch tripped High pressure switch tripped	Check for adequate fluid supply Check fuses Make sure fluid lines are tight Check temperature switch for proper reading Check temperature switch for proper operation Check system pressure
Unit starts-them immediately stalls	Unit not receiving enough fluid power Temperature switch activated Loose electrical supply wires High pressure switch tripped Incorrect compressor rotation	Check systems pressure Check temperature switch for reading Check all electrical supply wires Check system pressure Reverse compressor rotation
Compressor Chatters (run and stops in a short period of time)	Compressor belts slipping Compressor fluid supply low	Tighten compressor belts to recommended specifications Check compressor fluid supply

## Troubleshooting Chart (continued)

NOTE: TROUBLESHOOTING PROBLEMS MAY HAVE SIMILAR CAUSES AND SOLUTIONS

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Compressor does not build up to pressure	Air leaks in shop Inlet valve malfunction Compressor belts slipping Air demand exceeds compressor output Pressure switch set to low Solenoid valve malfunction Compressor rotors damaged	Find and fix shop air leaks Check inlet valve for proper function Check air usage requirements on machinery and check for shop air leaks Check pressure switch for proper setting Check solenoid for proper function
Compressor will not load to compress air	Pressure switch set to high Inlet valve malfunction Faulty solenoid	Check pressure switch for proper setting Check inlet valve for proper function Check solenoid for proper function
CFM Flow (air flow) seems low	Restricted air intake filter Inlet valve partially closed Air pressure set to high Insufficient oil flow solenoid valve malfunction	Clean air filter Check inlet valve Check system pressure Check system fluid power Check solenoid valve

## Troubleshooting Chart (continued)

NOTE: TROUBLESHOOTING PROBLEMS MAY HAVE SIMILAR CAUSES AND SOLUTIONS

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Excessive oil consumption	<ul style="list-style-type: none"> <li>Over filled sump</li> <li>Broken oil line</li> <li>Plugged oil return line</li> <li>Damaged or dirty separator</li> <li>Excessive unloaded compressor run time</li> </ul>	<ul style="list-style-type: none"> <li>Check sump for proper oil level</li> <li>Check all lines for cracks</li> <li>Replace separator</li> <li>Add a timer to the system</li> </ul>
High temperature shutdown	<ul style="list-style-type: none"> <li>High ambient air temperature around compressor</li> <li>Low oil level in compressor</li> <li>Plugged oil filter</li> <li>Restricted air flow over cooler</li> <li>Thermal by pass leaking</li> <li>Faulty temperature switch</li> </ul>	<ul style="list-style-type: none"> <li>Lower ambient temperature around compressor</li> <li>Check unit for proper oil level</li> <li>Replace oil filter</li> <li>Clean oil cooler</li> <li>Check thermal bypass for proper operation</li> <li>Check temperature switch for proper operation.</li> </ul>



## Compressor Maintenance Reciprocating

**WARNING:** To avoid personal injury, always shut OFF the main power supply and disconnects to the compressor, relive all air pressure from the system, and check electrical system with electrical probe before starting any service or maintenance on the compressor.

### Daily:

Drain the Receiver- condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eyewear when draining the tank.

Check Pump Oil Level- All units have a sight glass the oil level non running units should be no lower than ½ way on the sight glass if it is lower then you need to add oil until it is at least ½ way up the sight glass.

Check unit for any unusual noise or vibrations

### Weekly:

Clean air filter: this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies

Clean external parts of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts

Check safety Valves: this is don't to ensure they are not stuck in place and operating properly

### Monthly:

Inspect complete air system for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system

Inspect Oil for Contamination: this is done to ensure that harmful deposits do not build up in the oil

Check belt tension: this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip

### Every 3 months:

Change Oil: this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications

Inspect Valve assemblies: this is done to prevent premature failure and clean out and carbon that can form in older valves

### Storage of Compressor:

Before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

## **Normal Operation**

### **Start-Up**

Drain off condensate from the sump and check the oil level. Refill as necessary.

Check for any oil leaks. Correct as necessary.

On water cooled units, turn on the water.

Press the start button.

### **Stopping**

1. Make sure the compressor is fully unloaded before step 2. Unload the compressor by closing the service valve (this is a ball or block valve) placed in the system during compressor installation between the compressor and operating airlines for service and maintenance reasons.
2. After the unit has exhausted its contained pressure (this takes about 30 seconds) push the stop button.

### **Emergency Stopping**

Push the stop button.

Pull the main disconnect, if possible.

### **Air Filter**

The air filter is the primary protection of the compressor from harmful dirt being ingested into the oil system. It needs to be looked at periodically for clogging or holes. The period for these inspections is dependent on the environment the machine is in. For optimum life it is recommended that an air filter restriction indicator be used. Service simply based on hours is not recommended.

### **Element Inspection and Replacement**

Switch off the unit and disconnect the power to prevent accidental starting.

Allow one minute after stopping for the system to settle and the pressure to be relieved.

Loosen the nut that secures the cover and remove the cover.

Remove the element.

Place a bright light inside the element to inspect for damage or leak holes.

Inspect all gaskets and gasket contact surfaces of the housing. Correct any faulty conditions immediately.

Clean the housing with a damp cloth. Do not attempt to blow out dirt with compressed air.

Place a new element in the housing.

Replace the cover and tighten the nut.

Reset the filter indicator and the machine will be ready for operation.

If the compressor is turned off before being fully unloaded it can cause the unit to discharge oil into the air filter housing causing it to stop up or become contaminated.

### **Oil Filter**

The oil filter in the compressor system is a full flow replaceable canister type. Initially the filter should be replaced after 50 hours of operation. Then every 1000 hours or sooner as indicated by a maintenance gauge. This element protects the compressor bearings from grit and dirt ingress throughout the system. A dirty filter will cause an oil flow restriction that can result in high oil temperature and a unit shutdown.



Hot oil under pressure will cause severe injury, death, or property damage. Be sure the compressor is shutdown and pressure relieved before attempting to remove the oil filter, separator, oil fill, or change the oil.

**Oil Filter Replacement**

1. Switch off the unit and disconnect the power to prevent accidental starting.
2. Allow one minute after stopping for the system to settle and the pressure to be relieved.
3. Using a strap wrench, remove the old element and gasket.
4. Clean the gasket surface with a clean rag.
5. Apply a light film of oil to the new gasket.
6. Hand tighten the new element until the new gasket is seated in the gasket groove.
7. Continue tightening by hand an additional ½ to ¾ turn.
8. Reconnect power and restart the machine to check for leaks.

**Air/Oil Separator**

The air/oil separator should be changed every 2000 hours, or when there is excessive oil vapor in the discharge air.

**Separator Element Replacement**

1. Switch off the unit and disconnect the power to prevent accidental starting.
2. Allow one minute after stopping for the system to settle and the pressure to be relieved.
3. Using a strap wrench, remove the old element and gasket.
4. Clean the gasket surface with a clean rag.
5. Apply a light film of oil to the new gasket.
6. Hand tighten the new element until the new gasket is seated in the gasket groove.
7. Continue tightening by hand and additional ½ to ¾ turn.
8. Reconnect power and restart the machine to check for leaks

**Lubricant**

Your compressor has been filled and tested with CAS RS8000, a high quality compressor lubricant. It is a PAO with the advantage of extended service life, high temperature operation, easy start-up when cold, reduced sludge and lacquer buildup, and is completely compatible with all seals, gaskets, and other compressor materials.

**Lubricant Specifications**

If you choose not to use CAS RS8000, for optimum life and warranty service your lubricant must meet the following specification:

Grade ISO	46
Viscosity@100oF,cST	46
Viscosity@210oF,cST	7.93
Viscosity Index	100 or more
Pour Point, F	-20 or less
Flash Point, F	400 or more
Fire Point, F	450 or more
Rust Test ASTM-FG-665 A&B	Pass
Oxidation Test, ASTM0-D943	1500
Emulsion Test, ASTM-D1401	10 Min.
Foam Test, ASTM	Pass

## Compressor Maintenance Rotary Screw

**WARNING:** To avoid personal injury, always shut OFF the main power supply and disconnects to the compressor, relieve all air pressure from the system, and check electrical system with electrical probe before starting any service or maintenance on the compressor.

### Daily:

Drain the Receiver- condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eyewear when draining the tank.

Check Airend Oil Level- remove oil fill cap and check for proper level. Oil should be half way up the at the bottom or half way up the threads on the oil fill

Check Oil Cooler: check cooler for proper air flow to keep unit cool clean if necessary

Check unit for any unusual noise or vibrations

### Weekly:

Clean air filter: this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies

Clean external parts of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts

Check safety Valves: this is don't to ensure they are not stuck in place and operating properly

### Monthly:

Inspect complete air system for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system

Inspect Oil for Contamination: this is done to ensure that harmful deposits do not build up in the oil

Check belt tension: this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip

### Every 3 months (every 500hrs):

Change oil filter: this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications

### Yearly (every 2000 hrs)

Change oil: change with only CAS RS 8000

Clean Oil Cooler: this is done to ensure adequate cooling for the compressor air end.

Storage of Compressor: before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

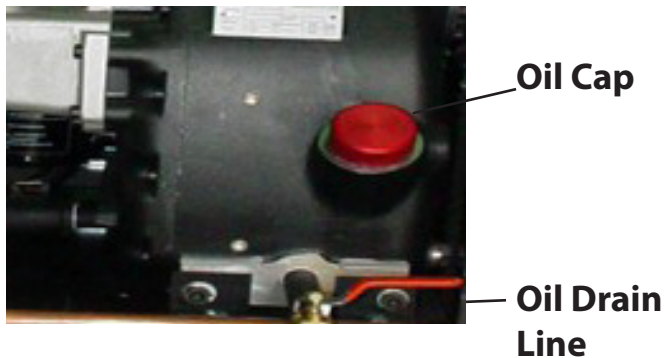
### Oil Analysis

Oil analysis is an excellent tool to add to your compressor maintenance program. At regular intervals you submit lubricant samples to a qualified laboratory. From this you receive a detailed report showing the lubricant condition, wear metals, and contaminants. Changes in this information over time provides the basis for predictive compressor maintenance. Saving you unplanned machine downtime and unnecessary oil changes.

## Compressor Maintenance Rotary Screw

### Checking Oil Level and Adding Compressor Oil

1. Switch off the unit and disconnect the power to prevent accidental restarting.
2. Allow one minute after stopping the compressor for settling and the pressure to relieve.
3. Remove any dirt from around the fill cap, then remove the fill cap.
4. Inspect the o-ring in the cap for damage and cleanliness. Replace if necessary.
5. The oil should be between the bottom of the neck and the o-ring groove.
6. Replace the cap securely. Never put the cap on without tightening immediately.



### Changing Compressor Lubricant

Regular maintenance of the oil filter and the air filter will help prolong the life of the lubricant.

1. Switch off the unit and disconnect the power to prevent accidental restarting.
2. Allow one minute after stopping the compressor for settling and the pressure to relieve.
3. Remove any dirt from around the fill cap, and then remove the fill cap. If the lubricant appears dirty or has a foul smell, it should be replaced.
4. Drain the lubricant from the bottom of the air/oil receiver. Oil will drain more quickly and completely if is warm from operation.
5. Close all drains and replace with fresh CAS RS8000 to the proper level.
6. Replace the fill cap and run the unit.
7. Switch off the unit and disconnect the power to prevent accidental restarting.
8. Allow one minute after stopping the compressor for settling and the pressure to relieve.
9. Remove the fill cap to see if more lubricant should be added and to insure that there are no leaks.

## Oil Recommendations

Compressed Air Systems does not promote specific manufacturers' brands of oil. Recommendations below are guidelines; consult oil manufacturer for exact application needs.

### Viscosity Range:

Viscosity Minimum: 50-60 SUS (7.5-10.5 cS1)

Viscosity Maximum @ Startup: 7500 SUS (1600 cS1)

Aniline Point: 175 Minimum

Maximum Foam Resistance: Recommended

Corrosion Resistance: Recommended

Anti-Wear Additive: .06% Zinc Minimum\*

Viscosity Optimum Continuous: 60-100 SUS (10.5-21.6 cS1)

Viscosity Index: 90 Minimum

Pour Point: 15°F (-10°C)

Rust Resistance Inhibitors: Recommended

Oxidation Stability: Recommended

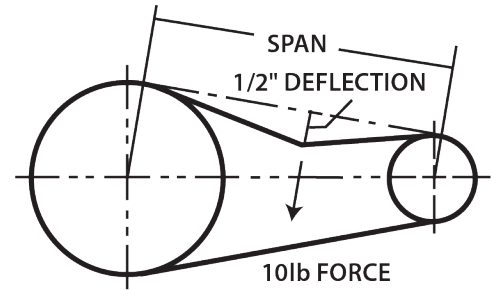
**Note:** Cold weather operation requires special oil considerations. Viscosity should not exceed 7500 SUS (1600 cS1) at lowest startup temperature. Continuous operation should range between 60-1000 SUS (10.5-216 cS1) for all temperature ranges. Never use diesel fuel or kerosene to thin oil.

\*Anti-Wear Additives may be recommended by some motor manufacturers. However, they are optional and typically not required for gear pump or gear motors.

## Adjusting Belt Tension

Proper belt tension and pulley alignment must be maintained for maximum drive efficiency and for maximum belt life. The correct tension exists if a deflection of 1/2 inch occurs by placing 10lbs of force midway between the motor pulley and the compressor flywheel. This deflection can be adjusted by the following procedure. The pulley should be carefully aligned with the flywheel and set screws should be kept tight.

1. Remove the belt guard
2. Loosen the motor mounting bolts
3. Shift the motor to the point where the correct deflection exists
4. Retighten the motor mounting bolts
5. Check to ensure that the tension remain correct after tightening
6. Re-install the belt guard. All moving parts must be guarded

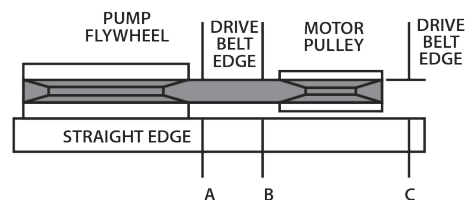
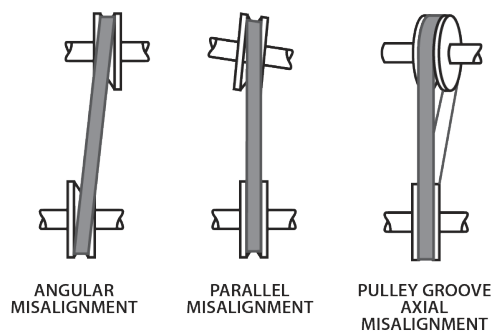


NOTE: Drive belt tension and pulley alignment are done at the same time. They are discussed separately for clarity.

## Pulley Alignment

The figure to the side shows 3 examples of misaligned pulleys. To check pulley alignment, remove the belt guard and place a straightedge against the compressor flywheel, measure and record the distance from the straightedge to the edge of the drive belt. Then measure the distance to the edge of the drive belt on the motor pulley at the same edge. As long as both points measure the same distance the pulleys will be aligned if not you will need to move the pulley until its in alignment this may take a few tries. To re-align the pulley follow the steps below

1. Loosen the motor mounting bolts
2. Remove the belt guard
3. Loosen the set screw on the motor pulley
4. Align the motor pulley with the compressor flywheel
5. Re-tighten the motor pulley set screws
6. Adjust the proper belt tension
7. Re-tighten the motor mounting bolts
8. Re-install the belt guard





## Description of Compressor

### What is a reciprocating compressor?

A reciprocating compressor is a piston type pump which develops pressure from the action of a piston moving through a cylinder. The cylinder, or cylinders, may be vertical, horizontal or angular.

When air is drawn in from the atmosphere and compressed to its final pressure in a single stroke, the compressor is referred to as a "single stage" pump. Single stage units normally are used in the 90 to 125 psi range and are available as single or multi-cylinder (twin cylinder) compressors.

When the air drawn from the atmosphere is compressed first to an intermediate pressure, and then further compressed to a higher pressure, it is done in a "two stage" pump. These cylinders are unequal in size and the first stage always takes place in the larger, low pressure cylinder. From there it passes through the inner cooler to the smaller, high pressure cylinder. The cycle is completed as the air then moves through the after cooler and discharge line into the tank. Two stage compressors are generally used for pressure ranges from 100 to 175 PSI and deliver more air per horsepower at these pressures. This increase in efficiency is partially due to the heat dissipated as the air passes through the inner cooler.

## Description Of Cooling

Our compressors are cooled by fan blades, incorporated into the driven sheave (pulley), blowing air across the intercooler, after cooler, and cylinder head.

## Description Of Controls

Stop/Start Receiver or plant air system pressure is controlled within limits by a pressure switch automatically stopping and starting the compressor as the air pressure reaches a maximum preset pressure (cut out) and then drops to a minimum pressure (cut in).

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**WARNING:** On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

**WARNING:** Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

**WARNING:** Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

## Receiving and Uncrating of your Compressor

Before uncrating the compressor the following steps should be taken.

1. Immediately upon receipt of the equipment, it should be inspected for damage that may have occurred during shipment. If any damage is found, demand an inspection immediately by an inspector from the carrier. Ask him how to file a claim for damages. (See Appendix "A" for Details).
2. Insure that adequate lifting equipment is available for moving the machinery.
3. Read the compressor nameplate to be sure the compressor is the model and size ordered.
4. Read the motor nameplate to be sure the motor is compatible with your electrical conditions. (Volts-Phase-Hertz).

**IMPORTANT:** If voltage supplied to the compressor is below 208 volts the unit need a 200 Volt drive motor and 208-230-460 Volt should not be used below 208 volts.

**NOTE:** Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.

**IMPORTANT:** Compressor drive engine comes with its own manual refer to drive engine manual for any specifications or troubleshooting issues with the drive engine of the air compressor.



**CAUTION**

Improper lifting can result in component or system damage or personal injury.

Follow good shop practices and safety procedures



**CAUTION**

Under no circumstances should a compressor be placed in an area that may be exposed to a flammable, toxic, volatile or corrosive atmosphere nor should flammable, toxic, volatile or corrosive agents be stored near the compressor.



## Compressor Installation

### Location

Locate the compressor in an indoor area that is clean, dry, well lighted, and well ventilated, with sufficient space for safe and proper inspection and maintenance. Ambient temperatures should not exceed 104 degrees F or fall below 30 degrees unless an electric motor rated for a higher temperature is used. Inspection and maintenance checks are required daily, therefore, ample space is required around the compressor.

The compressor must not be installed closer than 24 inches from a wall or from another compressor to allow ample circulation of air across the compressor cylinders and head, and through the coolers if they are part of the system. Additional safety can be achieved by locating the pulley guard next to the wall.

### Mounting

The use of the factory supplied rubber vibration isolation pads, or other factory supplied vibration isolation mounting equipment is required for tank warranty from the original tank manufacturer. The compressor should never be left on original shipping material for installation. If a shim is required to level the unit, place it between the pad and floor. If you bolt the unit to the floor, use the bolts as guide pins and do not tighten the bolts. The rubber pads are used to absorb machine vibration and cannot work effectively if bolted tightly.

### Induction System

Do not locate the compressor where it could ingest or ignite toxic, explosive or corrosive vapors, ambient air temperatures exceeding 110 degrees F, water or extremely dirty air. Ingestion of any of the above noted atmospheres by the compressor could jeopardize the performance of the equipment and all personnel exposed to the total compressed air system.

Destructive pulsations can be induced by reciprocating compressors that will damage walls and break windows. Pulsation can be minimized by adding a pulsation dampener on the inlet side of the compressor.

**For compressor tank to have full manufacturer warranty. The tank must be installed properly on manufacturer supplied vibration pads per compressor manual. Failure to do so can void compressor tank warranty and cause tank cracks or failures.**

**On Electric compressors all electrical connections must be wired and installed per NEC (National Electric Code) (See the back of the manual for NEC code) and all local applicable codes for full electric component warranty. Failure to do so can void compressor electrical warranty.**

### Noise

Noise is a potential health hazard that must be considered. There are local and federal laws specifying maximum acceptable noise levels that must not be exceeded. Most of the noise from a reciprocating compressor originates from the air inlet point. Excessive noise can be greatly reduced by installing an intake noise silencer.

### Piping Fitup

Care must be taken to avoid assembling the piping in a strain with the compressor. It should line up without having to spring or twist into position. Adequate expansion loops or bends should be installed to prevent undue stresses at the compressor resulting from the changes between hot and cold conditions. Pipe support should be mounted independently of the compressor and anchored as necessary to limit vibration and prevent expansion strains.



**Safety valves are to protect system integrity in accordance with ASME Codes and ANSI B19.3 safety standards. Failure to use safety valves of the proper capacity and pressure will cause severe personal injury or death.**

**NOTE:** Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.

**SAFETY VALVES:** Safety valves are pressure relief valves and should be sized and purchased with a pressure setting to protect the weakest link in the system. Never change the pressure setting, only the safety valve manufacturer is qualified to make a change. Safety valves are to be placed ahead of any potential blockage point which included but is not limited to, shutoff valves, heat exchangers, pulsation dampeners, and discharge silencers.

**Failure to properly size, set and install pressure relief valves can be fatal.**



**CAUTION**

ASME coded pressure vessels must not be modified, welded, repaired, reworked or subjected to operation conditions outside the nameplate ratings. Such actions will negate code status, affect insurance status and may cause severe personal injury, death, and property damage.

### Pressure Vessels

Air receiver tanks and other pressure containing vessels such as, but not limited to, pulsation bottles, heat exchangers, moisture separators and traps, shall be in accordance with ASME Boiler and Pressure Vessel Code Section VIII and ANSI B19.3 Safety Standards.




**CAUTION**

The installation, wiring, and all electrical controls must be in accordance with ANSI C1 National Electric Code, ANSE C2 National Electric Safety Code, state and local codes. All electrical work should be performed by a qualified electrician. Failure to abide by the national, state and local codes may result in physical and/or property damage.


### Electrical

Before installation, the electrical supply should be checked for adequate wire size, breaker size, transformer and capacity. During installation a suitable fused or circuit breaker disconnect switch should be provided. Where a 3 phase motor is used to drive a compressor, any unreasonable voltage unbalance between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. Compressors must be equipped with a properly wired magnetic motor starter or a pressure switch rated to carry the full motor current load. The coil which engages and disengages the contact points in the motor starter is controlled by the pressure switch. Never attempt to bypass the pressure switch or adjust it past the factory set pressure range. Improper installation of the electrical system can cause the motor to overheat or a short circuit to occur.

	<p>Electric power always exists inside the pressure switch when there is electric power at the compressor package. Either a qualified electrician should make the pressure adjustments or the electric power supply should be disconnected and locked out before making any adjustment.</p> <p><b>NEVER</b> exceed the designed pressure for the system or overload the motor beyond its service factor.</p> <p><b>FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH, PROPERTY DAMAGE AND/OR MECHANICAL FAILURE</b></p>
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### Pressure Switch

The pressure switch is automatic in operation and is adjusted to start and stop the unit at the minimum and maximum desired air receiver pressure by cutting in and out the power to the electric motor. On some models, the pressure switch incorporates a release valve, which releases air between the check valve located in the receiver and discharge valve in the head of the compressor.

	<p>Relieve compressor and system air pressure by opening the appropriate manual relief valve prior to servicing.</p> <p>Failure to relieve all system pressure may result in severe personal injury, death and property damage.</p>
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### Manual Relief And Shutoff Valves

Install a manual relief valve to vent the compressor to atmosphere. In those instances where the air receiver tank services a single compressor, the manual relief valve can be installed on the receiver. When a manual shut-off valve, and a safety relief valve installed upstream from the manual relief valve. These valves are to be designed and installed as to permit maintenance to be performed in a safe manner. Never substitute a check valve for a manual shut-off valve (block valve) if the purpose is to isolate the compressor from a system for servicing.

	<p>Guards must be fastened in place before starting the compressor and never removed before cutting off and locking out the main power supply.</p>
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### Guards

All mechanical action or motion is hazardous in varying degrees and needs to be guarded. Guarding shall be in compliance with OSHA Safety and Health Standards 29 CFR 1910.219 in OSHA manual 2206 and any state or local code.

	<p>Excessive speed of the compressor or driver can be lethal. Never operate the compressor beyond the manufacturer's recommendation.</p> <p>Bursting of the flywheel may be the greatest threat because the normal guard may not contain all the pieces.</p> <p>Crankshaft and connecting rod breakage is a possibility and compressor efficiency, valve life and bearing life will be abnormally reduced.</p>
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### Drives

It is important that the compressor and motor pulleys are aligned properly and the V belt is correctly tensioned. Improper pulley alignment and belt tension are causes for motor overloading, excessive vibration, and premature belt and/or bearing failure.

<p>Removal or painting over safety labels will result in uninformed conditions. This may result in personal injury or property damage. Warnings signs and labels shall be provided with enough light to read, conspicuously located and maintained for legibility. Do not remove any warning, caution, or instructional material attached!</p> <p>Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If for any reason any part of the manual becomes illegible or if the manual is lost, have it replaced immediately. The instruction manual should be periodically read to refresh one's memory, it may prevent a serious or fatal accident.</p>
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## **Start Up Preparation & Procedures**

The following check list shall be adhered to before putting the compressor into operation.

**FAILURE TO PERFORM THE CHECKS MAY RESULT IN SERIOUS INJURY OR DEATH, PROPERTY DAMAGE AND/OR MECHANICAL FAILURE. DISCONNECT AND LOCK OUT POWER SUPPLY.**

1. Remove all loose pieces and tools around the compressor installation.
2. Check oil level in crankcase, add as necessary.
3. Check all pressure connections for tightness and leaks.
4. Check to make sure all safety relief valves are in place and operational.
5. Check to be sure all guards are in place and securely mounted.
6. Check fuses, circuit breakers and thermal overloads for proper size.
7. Open all manual shut-off valves (block valves) at and beyond the compressor discharge.
8. On all 3 phase units, after all of the above conditions have been satisfied, jog the starter switch button to check the rotational direction of the compressor. It should agree with the rotation arrow on the flywheel/pulley (counter clockwise, facing the shaft).

The following procedures should be followed for start-up of a new installation, or after changes have been made to an existing installation, and/or after service repair work has been performed.

1. Instructions in addition to those contained within this manual, supplied by manufacturers of supporting equipment, must also be read and understood before start-up.
2. Check oil level in crankcase.
3. Drain moisture from air receiver and traps.
4. Start compressor and watch for excessive vibration or strange noises. If either is observed, stop the compressor immediately and correct.
5. Check air receiver or system pressure.
6. Manually activated safety relief valves by pulling ring or lever.
7. Check operation of controls.
8. After two days of operation check belt tension, air piping for leaks, and crankcase oil level.

## Stopping for Maintenance or Service



Never assume the compressor is ready for maintenance or service because it is stopped.

The automatic stop-start control may start the compressor at any time!

The following procedure should be followed to maximize safety when preparing for maintenance or service.

1. Disconnect and lock-out the main power switch and hang a sign at the switch Informing of the unit being serviced.
2. Close shut-off valve (block valve) between receiver and compressor, or receiver and Plant air system, to prevent any back-up of air flow into the area to be serviced.
3. Lock open manual vent valve and wait for the pressure in the area to be serviced (compressor, receiver, etc.) to be completely relieved before starting service. The Manual vent valve may be the drain valve in the receiver. NEVER remove a plug to relieve the pressure.
4. Open all manual drain valves within the area to be serviced.
5. Wait for the unit to cool before starting service, (temperatures at 125 degrees F can burn the skin), some surface temperatures exceed 400 degrees F when the compressor is working).
6. Clean up all oils spills immediately to prevent slipping. (Mark spill area accordingly.)

## Maintenance Procedures Review

**Safety Procedures** Adherence to safe working procedures are important to Service personnel at the time of servicing and to those who may, at a later date be around the compressor and the system it serves. Routine maintenance insures trouble free operation and protects your investment. All warranties are void if maintenance is neglected.

### Daily:

Drain the Receiver- condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eyewear when draining the tank.

Check Airend Oil Level- remove oil fill cap and check for proper level. Oil should be half way up the at the bottom or half way up the threads on the oil fill

Check Oil Cooler: check cooler for proper air flow to keep unit cool clean if necessary

Check unit for any unusual noise or vibrations

### Weekly:

Clean air filter: this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies

Clean external parts of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts

Check safety Valves: this is don't to ensure they are not stuck in place and operating properly

### Monthly:

Inspect complete air system for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system

Inspect Oil for Contamination: this is done to ensure that harmful deposits do not build up in the oil

Check belt tension: this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip

### Every 3 months (every 500hrs):

Change oil filter: this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications

### Yearly (every 2000 hrs)

Change oil: change with only CAS RS 8000

Clean Oil Cooler: this is done to ensure adequate cooling for the compressor air end.

Storage of Compressor: before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

### CERTIFICATE OF LIMITED WARRANTY

All component parts on this compressor are warranted to be free of defects, workmanship and material for a period of one year. Transportation charges are the responsibility of purchaser. This warranty extends to the original purchaser of the compressor only.

There are no express warranties except as contained in this limited warranty statement and implied warranties, including those of merchantability and fitness for a particular purpose, are limited to the period of warranty.

Our liability is limited solely to replacement of nonconforming parts as set forth herein and does not include any liability for any incidental, consequential, or other damages of any kind. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



**WARNING:** Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

**WARNING:** On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

**WARNING:** Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

**WARNING:** Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

## Additional Information

For compressor pump information see pump specific manual.

For installation instructions see Install Guide.

For compressor package wiring diagram contact manufacturer.

For compressor parts breakdown see website ([compressed-air-systems.com](http://compressed-air-systems.com)) or contact compressor manufacturer.

On electric driven compressors always follow NEC (National Electric Code) on any local applicable code that exceeds NEC guidelines.

On gas/diesel engine driven packages follow engine manufacturer guide for proper placement and installation of engine driven equipment.

COMPRESSED AIR SYSTEMS, LLC.

# WARRANTY

## CERTIFICATE OF LIMITED WARRANTY

### Rotary Screw Compressors

All component parts on this compressor installed by the manufacturer are warranted to be free of defects, workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only.

There are NO express warranties except other than those contained in this limited warranty statement

Covered in the one year period of the warranty are defective parts due to defects in the original part only.

The compressor warranty is void in the cases of abuse, lack of proper service, in correct application, in correct installation, and neglect

Standard compressor warranty covers defective parts and labor for the one year period.

Industrial Electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense past 50 miles from the service center.

Gas/Diesel engine driven compressors must be repaired at the closest service center to the compressor. The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center.

ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR

Specialty compressor-any compressor package with options other than those that apply to the standard model number in the catalog

The compressor "airend" is covered by a 2 year warranty to be free from defects from manufacturing. This does not cover abuse, neglect, improper service, misapplication, or improper installation. An oil sample must be submitted with any airend warranty claim for verification. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

### Airend - the rotors and bearings of the compressor

Warranty labor for the first year is only covered for work performed Monday-Friday 8am-5pm excluding all major US holidays

### Optional 5 year "airend" warranty

To be applicable for this option the purchaser must purchase a Full year Rotary Screw compressor service kit at the same time as the compressor and a subsequent kit every year afterwards for a total of 5 kits during the compressor warranty period. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

The warranty covers the "airend" of the compressor for a period of 5 years parts replacement only, from any defect due to manufacturing. The warranty does not cover wear and tear, abuse, neglect, improper service, misapplication, or improper application.

BEFORE WARRANTY SERVICE IS PERFORMED CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION

**All warranty replacement parts must be Compressed Air Systems OEM part unless authorization is given from Compressed Air Systems factory representative.**



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**Simplicity. It's What We Do.**