

User's manual

Manual del usuario

Manuel de l'utilisateur

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(No Tank) Rotary Screw Air Compressor 1-Phase

Models: (5 HP) B2811233 / (7.5 HP) B2811238 / (10 HP) B2811237



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1 GENERAL

1.1 Foreword

The manufacturer combines quality, reliability, and availability with 50 years of experience and delivers its customers the best machine it has developed.

Thank you for choosing our product.

These operating instructions contain all the information related to the installation, maintenance, and safe use of your product.

Please read this manual. Do not use your product before reading.

1.2 Cautions

The compressor must be used only by authorized individuals who have read and understand the manual.

Please follow all safety measures and instructions for operation set forth herein. To do so will not only minimize the risk of potential accidents, but also prolong the usable life of your machine.

1.3 Copyright

All rights of these operating instructions are reserved by the manufacturer. The manual may not be entirely or partially reproduced, changed, and distributed in any manner.

1.4 Warranty and Liability

Before installation and operation of the compressor, be sure that this manual has been duly read by all authorized personnel (mechanics, maintenance staff and all other users).

Due to the complex nature of the compressor, its operation by unauthorized individuals may result in accidents, injuries and possibly void the warranty.

The compressor warranty will be void if:

- There is any change or modification to the compressor or control unit without the prior consent of the manufacturer.
- Operation or maintenance by unauthorized people individuals.
- Use of any spare parts not approved by the manufacturer,
- Improper installation, or disabling of any preinstalled safety and security devices,
- Operation of the compressor in contradiction with the instructions for use and safety measures.

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1.5 Type Approval and Genuine Spare Parts

All the parts and components of the E-Series rotary belt drive compressors are certified to all local standards and will satisfy all applicable standards.

The manufacturer may not be held responsible for any accidents and damages that arise due to the use of non-approved spare parts.



Only use approved parts and components.

1.6 Technical Service

Please do not hesitate to contact our technical service for any concerns, issues, or problems with your compressor.

1.7 Descriptions and Warnings

Table 1 Descriptions and Warnings

Symbols	Descriptions
	High risks and important warnings.
●	Explanations on specific cases.
➤	Overall comments and general listing.

2 SAFETY

2.1 Operating Conditions

- Ensure the compressor and its components are used and maintained by authorized personnel only.
- Do not use your compressor until these operating instructions have been read and understood.
- Do not neglect the maintenance of your compressor.
- Only air and inert gases can be used with this compressor (for more detail, please contact your authorized service representative).
- Do not use your compressor in environments with temperatures less than 35 °F (+2 °C) and greater than 110 °F (+43 °C).
- For other operating conditions not specified in the operating instructions please note that the written consent of the manufacturer is required.
- Failure to comply with the instructions and guidelines described in this manual may lead to accidents where personnel and/or property may be severely damaged/ and/or fatally injured.

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- If you think that there is a security breach or fault related to the compressor:
 - Do not start your compressor.
 - Lock out/Tag out the machine.
 - Report to the authorized person as soon as possible.
 - Hang a warning sign related to the situation on a clearly visible area of the compressor that can be easily seen.
 - Make sure that all power is removed from the compressor so that your compressor can not be powered on or used.

2.2 Unauthorized Modifications/Changes

- Do not make any modification/change on your compressor without consent of the manufacturer.
- Unauthorized changes may cause malfunction and a reduction in the life of your compressor as well as serious injury.



Warranty will be void as a result of any changes made without the consent of the manufacturers.

2.3 Compressed Air Line Connections

- To obtain maximum efficiency and safety; ensure that you are using equipment that meets or exceeds the specifications of your compressor.
- Ensure that compressed air lines are connected properly, sealed and that the line(s) are not exposed to high temperatures. Also keep fasteners away from environments with dust, chemical fumes, moisture and/or corrosion.
- Stop your compressor before you remove or replace compressed air line components (filters, etc.). Make sure that the compressed air within the compressor is discharged prior to any work.
- Ensure personnel **CANNOT** approach and/or reach the compressed air line outlet of the compressor and take the necessary security measures to prevent access.
- Do not use the compressed air for cleaning, horseplay, etc. on any living thing.
- The air produced by this compressor is not designed for respiration or ventilation.
- Do not change safety and/or pressure switch settings.
- Do not close the outlet valve while the compressor is running and do not operate the compressor when the outlet valve is closed. The compressor will shut down with a high-pressure error.

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2.4 Fire and Explosion Risk

- Do not keep any flammable chemicals around or on top of your compressor. If you see such an item around or on the compressor, remove this item immediately.
- In any fire related situation, turn off the compressor and ensure the main switch is turned off. Eliminate any and all factors that may cause fire. Do not allow combustible materials next to the compressor.
- Do not allow oil residue to build up on the outside of the compressor cabinet. If necessary, clean these areas with special non-combustible cleaning materials.
- During maintenance, cleaning, or other operations such as these; ensure all power is removed and/or locked out to prevent the compressor from energizing.
- Make sure that your compressor's electrical and pressure connections remain in good condition. When you identify damaged cable or pipes, turn off the compressor immediately, take steps to remove power from the unit and change the damaged items. Check these connections frequently.
- Always keep a filled, properly maintained, and serviceable fire extinguisher next to the compressor.
- Be sure that all the electrical cables running to compressor are installed correctly and there is no excess slack and or cracks/damage/splits. Replace any damaged and/or loose cables immediately.
- Do not place combustible materials around/on or near your compressor.
- Do not operate compressor without adequate ventilation.

2.5 Moving Parts

- Do not operate the compressor while the coupling and/or fan casings are removed.
- Keep your hands, arms, and clothes away from rotating parts as much as possible. When there is a situation that requires you to approach rotating parts, be sure that you are not wearing baggy clothing.
- Make sure that the main power cord is disconnected and the unit is locked out in advance so that your compressor is not unintentionally started during maintenance or repair.
- During operation be sure to keep unauthorized personnel away from the compressor to protect them from possible injury that may be caused by compressed air jetting and/or exploding.
- If the compressor is used in a remote control set up, ensure that there are warning indicators in place to show the units status in a way that personnel near the compressor are also made aware of the status of the unit.
- In order to prevent accidents that may occur due to lubricants such as oil, water etc. always keep the area around your compressor clean.

2.6 Combustible and Sharp Surfaces

- Some parts in your compressor (screw unit, radiator, separator tank, oil filter, etc.) can reach high temperatures during operation and can cause burns if contacted. Do not touch these surfaces.
- Oil used in the system while the compressor is running may reach high temperatures.
- In the event of oil leakage from your compressor, disconnect the main power by pressing/engaging the emergency stop button.

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- Stay away from all air outlets of the compressor (safety and relief valves, nozzles, etc.). The air discharged from these air outlets is hot and may cause injury.
- Authorized personnel doing any work related to the compressor, must always wear the correct personal protective equipment or PPE.
- Always keep a first aid kit in the area around the compressor and consult medical professionals for even the slightest injury.

2.7 Combustible and Irritant Substances

- Never inhale air produced by this compressor. This could cause serious injury and/or death.
- Never connect compressed air to respiratory equipment or devices.
- Never discharge compressed air into an environment where living things are present.
- Run the compressor only in properly ventilated environments.
- Install your compressor away from combustive, dusty, humid, or chemical environments such as those near sandblasting machinery, ovens and/or any chemical processing equipment.
- Industrial machine oil is used in the compressor. Avoid any contact with eyes and skin. In any case of contact, rinse/flush immediately with water.

2.8 Electrical Accidents

- In addition to the advice and information in this guide, you must install your compressor in accordance with all pertinent standards. All electrical wiring and/or connections must be installed by a qualified technician.
- Make sure that your compressor is grounded properly. Ensure that the grounding cable is connected to the point marked as the figure on the right in the electrical panel of the compressor.
- Keep your body, hand tools and conductive materials away from electrical components of the compressor where current passes through.
- When performing any maintenance, repair or adjustment associated with electrical components, ensure that your feet are not on a wet or damp surface, and you are working from an insulated mat.
- Attempt to do all work associated with electrical components with a single, right hand. This will reduce the risk of any current reaching the heart in any possible electrical leakage situation.
- Repairs and corrective actions should be performed in a dry, clean, ventilated environment on an insulating layer or mat.
- While the compressor is running, keep the doors of the electrical cabinet completely shut. If you need to open the door, stop your compressor and power off via the main switch.
- Check all connections carefully after the installation and prior to the first run of your compressor.

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2.9 Important Points Before You Begin

- Thoroughly check your compressor before starting it up. If you think that something is wrong with your compressor, do not start it and/or shut it down immediately.
- Make sure that all protection and security devices are in place. Do not start your compressor with damaged or missing parts.
- Do not close the doors of the compressor if personnel are inside performing maintenance. Do not run the compressor with anyone inside the unit.
- Ensure that there is no one inside before closing the doors of the compressor.

2.10 Compressor and Environmental Cleaning

- Ensure to stop the compressor and cut the energy completely before cleaning your compressor.
- To prevent a possible fire, keep your compressor away from the dust, oil, garbage, and other flammable materials. Keep flammable liquids away from sparks, heat and store them in a separate approved container.
- If there is any leakage from the compressor, have it repaired immediately.

2.11 Personal Protection and Safety

Ensure that all required standards and rules are complied with on the use of the compressor.

- Do not approach the compressor with damaged and loose clothing. The clothing may become caught on moving parts and may cause serious injury.
- Do not operate the compressor when under the effects of drugs, certain prescription medication, alcohol, or any other illegal substance.
- Do not wear any item that can lessen your ability to hear the compressor such as headphones, Bluetooth headsets, etc. this does not pertain to hearing protection.
- Keep your hands and body away from any moving parts in the compressor. This could lead to fatal/serious incidents which may cause serious injury/death.
- Do not operate the compressor without installing the shields.



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2.12 Safety and Warnings

Safety precautions are described as "danger or warning" in necessary conditions.

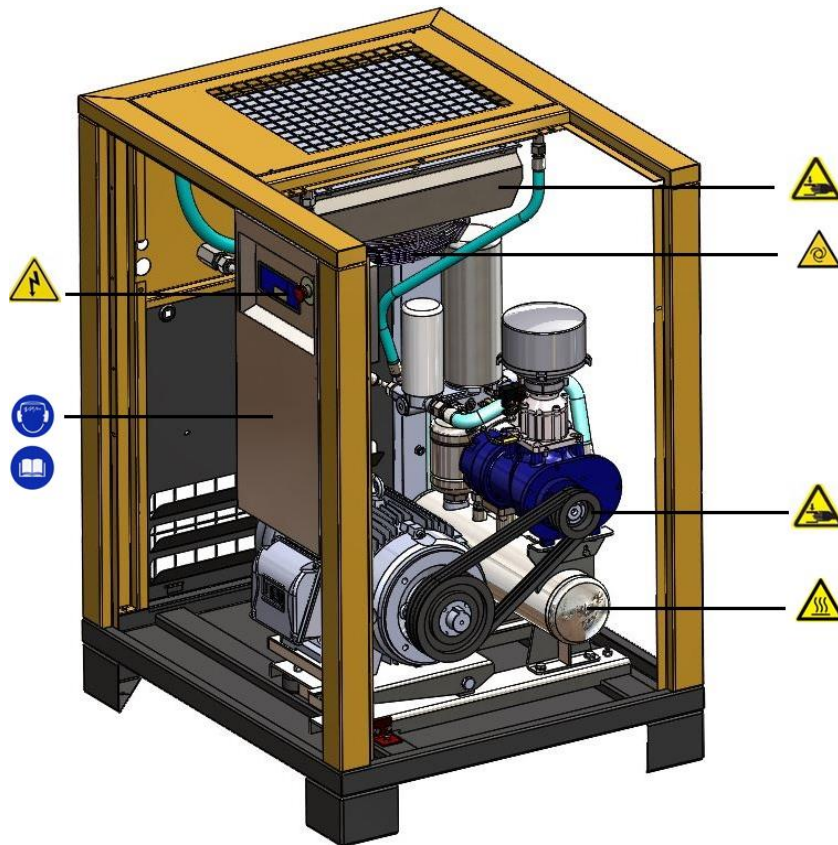








Figure 1 Safety and Warnings

Safety Sign	Description
	Rotating Parts!
	Hot Surface!
	High voltage!
	Equipment starts automatically

Safety Sign	Description
	Wear ear protection!
	Read the operating instructions!

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Read the safety and protection precautions before starting the compressor.

- Keep any/all warning signs clean, and make sure that they are readily visible on the compressor.
- Clean the warning signs with soapy water and dry with a soft cloth.
- Replace any damaged warning signs.
- After removal of any part or component with warning sign posted, ensure that the warning sign is replaced/replicated on the new component.



Place the new warning signs on clean and dry surfaces. Make sure that no air bubbles are left between the sign and the surface.

2.13 Recommendations

- Make sure that the shields are installed after any repair, maintenance and adjustment done on your compressor.
- After any repair, maintenance and adjustment on the compressor be sure that there are no parts, components, cleaning materials, and/or hand tools left around the compressor.
- Be sure that all the electrical wires are properly connected to correct terminals on the compressor.
- When the compressor will not be used for a long time, make sure to store it in a dry and warm place.

2.14 Air Filter

- The air filter is exclusively for the air intake and may not be used for any other purpose.
- Do not attempt any modification of the air filter.
- Avoid damaging the filter in the course of filter maintenance.

2.15 Safety and Protection Systems

- Motor over current control system
- Fan motor over current control system
- Phase order, shortage, and imbalance control system
- Main motor PTC relay
- Screw high temperature control system
- High pressure control system
- Separator cleanliness warning system
- Air filter dirtiness warning system
- High pressure safety valve
- Emergency stop button
- Service warning system
- Alarm warning system

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3 COMPRESSOR OPERATON

3.1 General View of Belt Drive Rotary

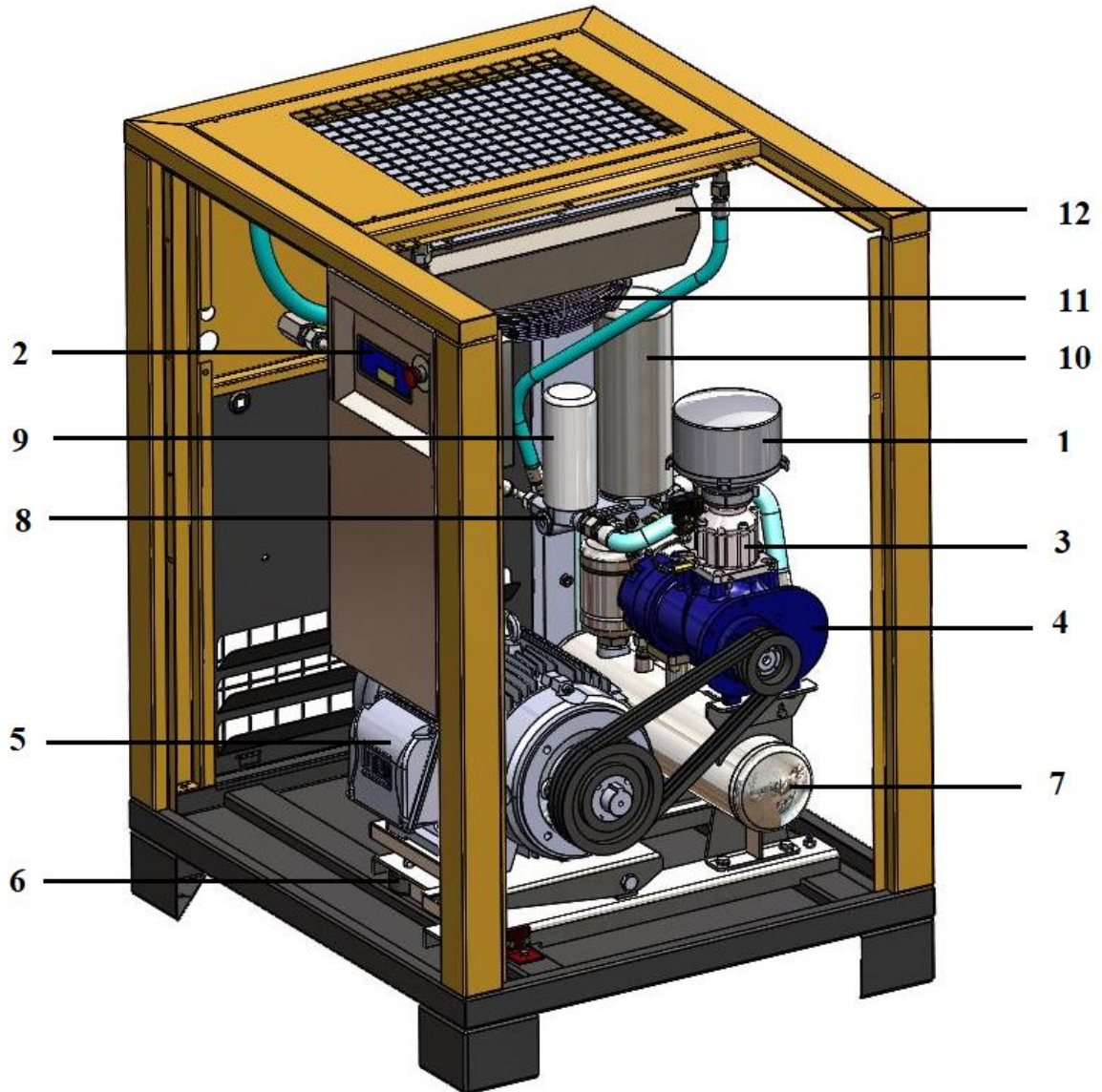


Figure 2 Belt Drive Model

Table 2 Main Parts of Belt Drive Model

REF	PART NAME	REF	PART NAME
1	Air Filter	7	Air-Oil Separator Tank
2	Controller	8	Multiblock
3	Intake Valve	9	Oil Filter
4	Air End	10	Oil Separator
5	Motor	11	Fan
6	Vibration Pad	12	Fan Housing

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3.2 Compressor Operation

The belt drive series, which is one of the rotary screw style air compressors, is built with quality components and long lasting durability that has been proven for years.

3.2.1 Drive and Control

Belt drive series compressors are powered by an electric motor which provides the mechanical drive force required for the screw unit to produce compressed air. This system is comprised of a frame, motor, screw unit, pulley and belt.

This belt drive series compressor is operated and regulated by an electronic control system. Satisfying any applicable legal conditions, this control system is under the liability of the manufacturer.

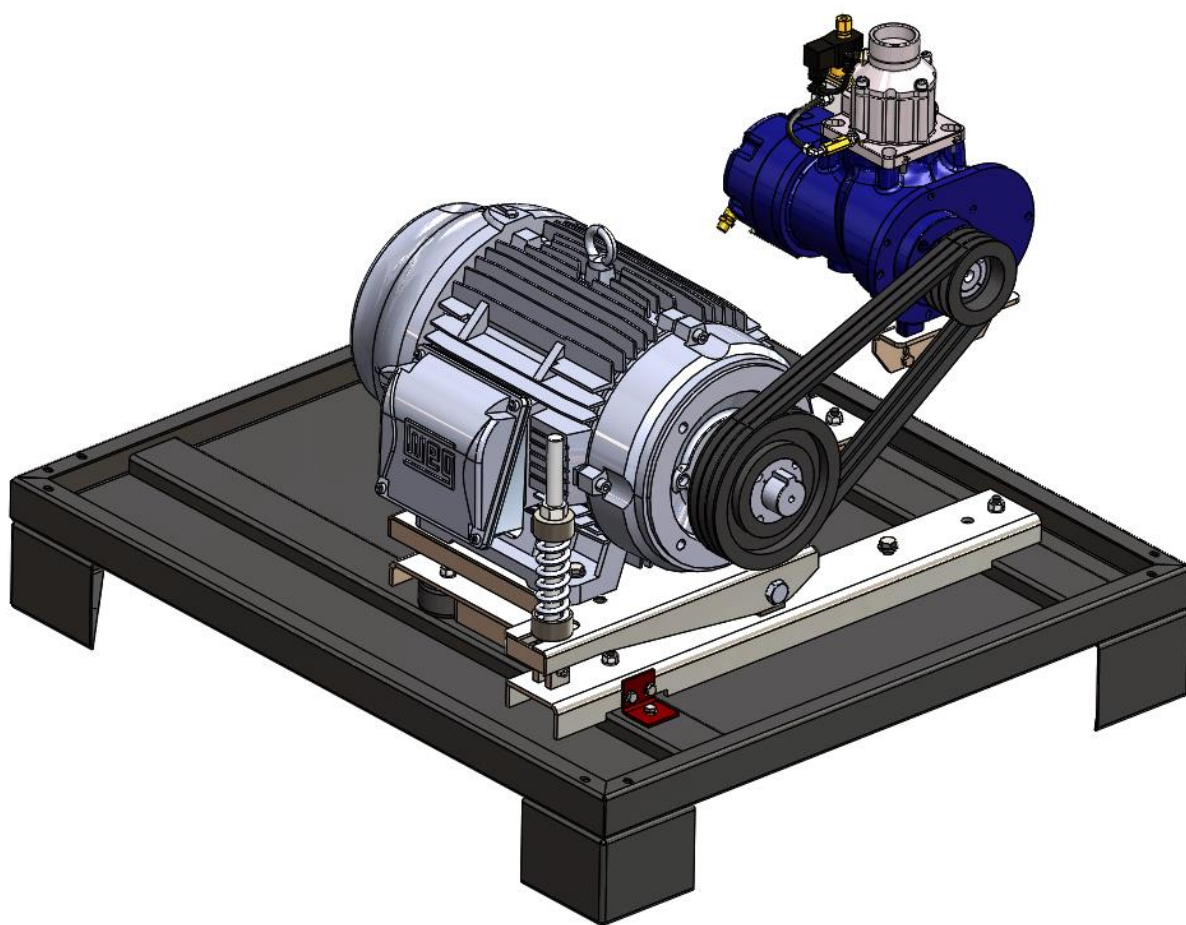


Figure 3 Belt Drive System

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3.2.2 Pressure System

The pressure system comprises of a screw unit, separator, tank, separator, minimum pressure valve, and oil return (scavenge) line circuit.



If there is pressure inside the compressor, DO NOT attempt to remove any cover or part. First stop the compressor and be sure that the unit is free of pressure.

- The air – oil mixture received from the screw unit is delivered to the separator tank.
- The separator tank has been designed to reduce airborne oil.

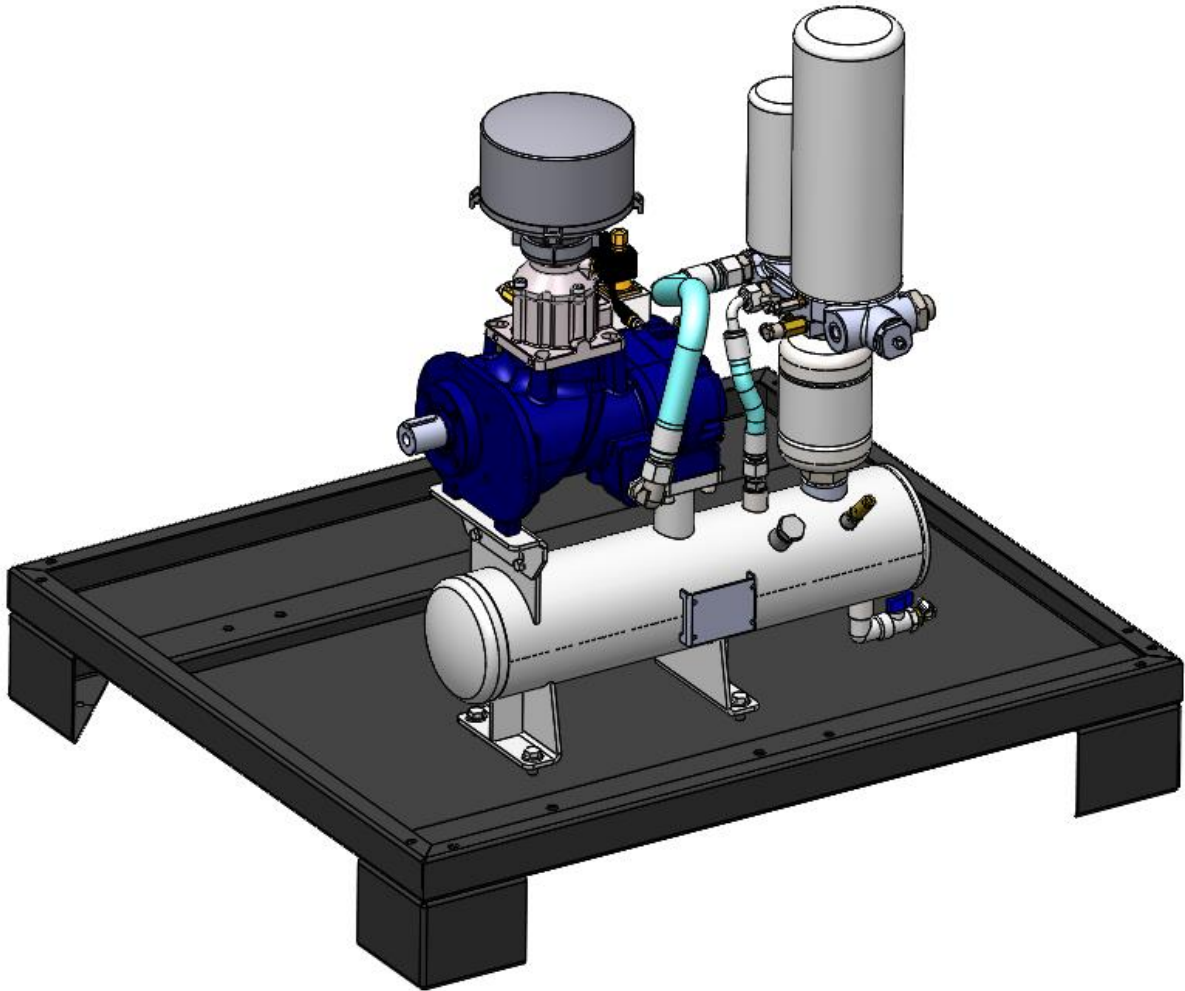


Figure 4 Pressure System

- The air-oil mixture in the separator tank then goes to the separator filter. The specially designed separator filter keeps airborne oil particles outside, so that only pure air can pass through.
- During the filtering process, a negligible amount of oil penetrates into the separator, and accumulates under the filter.

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- The oil at the bottom of the separator is returned to the screw unit by passing through the oil return (scavenge) line with the aid of the pressure difference between the tank and the screw unit. This prevents the compressor from pushing oil into the system.
- The minimum pressure valve in the separator tank keeps the pressure in the tank until it reaches 43-58 psig (3 - 4 bar) with the compressor under load. This pressure value is required for a proper air-oil separation and oil circulation.
- The minimum pressure valve does not allow the compressed air in use to return to the separator tank when the compressor is shut down or shifted in idle. In cases where the pressure of utility line (outside pressure) is less than 58 psig (4 bar) at the initial start of the compressor, the minimum pressure valve does not allow any air intake until the pressure in the separator tank becomes equivalent to the outside pressure.
- There is a safety valve present to prevent any hazard from forming due to excessive pressure increase in the separator tank in the case of any failure and/or blockage.
- If the screw unit temperature passes 226 °F (108°C) , the temperature sensor would detect this, whereupon the electronic control module would stop the compressor before a failure occurs.

3.3 Intake and Control System

Filters any harmful particles that may be sucked into the compressor from the environment, so that the compressor continues to work at the preset pressure interval. This system comprises of two subassemblies: the intake system and the intake control system.

3.3.1 Intake System

Any abrasives in the air are drawn in by the compressor and will enter any point where the oil penetrates in the compressor and abrades any surface it contacts. The bearing life, O-rings and seals are rapidly deteriorated due to the increased friction. Furthermore, filters clogged by dust pull less air. Due to this blockage, both the cooling and intake air amounts are reduced, this leads to the compressor capacity being diminished due to operating temperature increase. The higher operating temperature has adverse effects on all internal parts and components of the compressor. The hoses are hardened, the bearings are worn, and the oil is degraded much faster. Failure to change the filters at regular intervals can lead to excess wear and tear on the entire unit. The intake system comprises of a panel filter outside the compressor, and an air filter and connection hoses inside the compressor.

3.3.2 Intake Control System

The intake control system is comprised of an intake regulator, solenoid valves, control airline hoses and safety pressure switch. It uses the pressure switch to be able to obtain pressure information from systems with electronic control modules and inverters.

The intake control system is designed for operating the compressor in the most cost-efficient manner.

- The intake system remains closed during compressor start-up, so that overloading is prevented also ensuring a smooth start.
- Ensures the compressor motor will rotate with very low power requirements by re-closing the intake when the desired pressure values are reached. Instead of frequent stop-and-start, air intake by the compressor is prevented during this time to promote a more economic system.
- Depending on the pressure of your utility line, the electronic control module or pressure switch controls the intake regulator, so that the compressor air intake is opened and closed by the intake regulator.
- When the compressor is stopped, the residual pressure in the separator tank acts in reverse direction to try and force the screw to turn in reverse direction. At that time, the intake regulator acts as a check valve to close the intake, so that both the screws reverse turning and oil backflow are prevented.

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3.4 Cooling and Lubrication System

The compressor cooling system comprises of a radiator, cooling fan, oil filter, separator tank, connection hoses and piping. Some models are optionally equipped with thermostatic valves.

- The pressure in the separator tank diverts the oil first towards the radiator, and then to the oil filter, and finally to the low-pressure side of the screw unit.
- The oil passes through the oil filter to eliminate any harmful particles before entering the screw unit.
- The high amount of oil sprayed over the rotors rapidly turning inside the screw unit squeezes the air in the rotors and adheres to the rotor surface for increased sealing. Furthermore, it uses the same oil to lubricate the roller bearings that support the rotors.

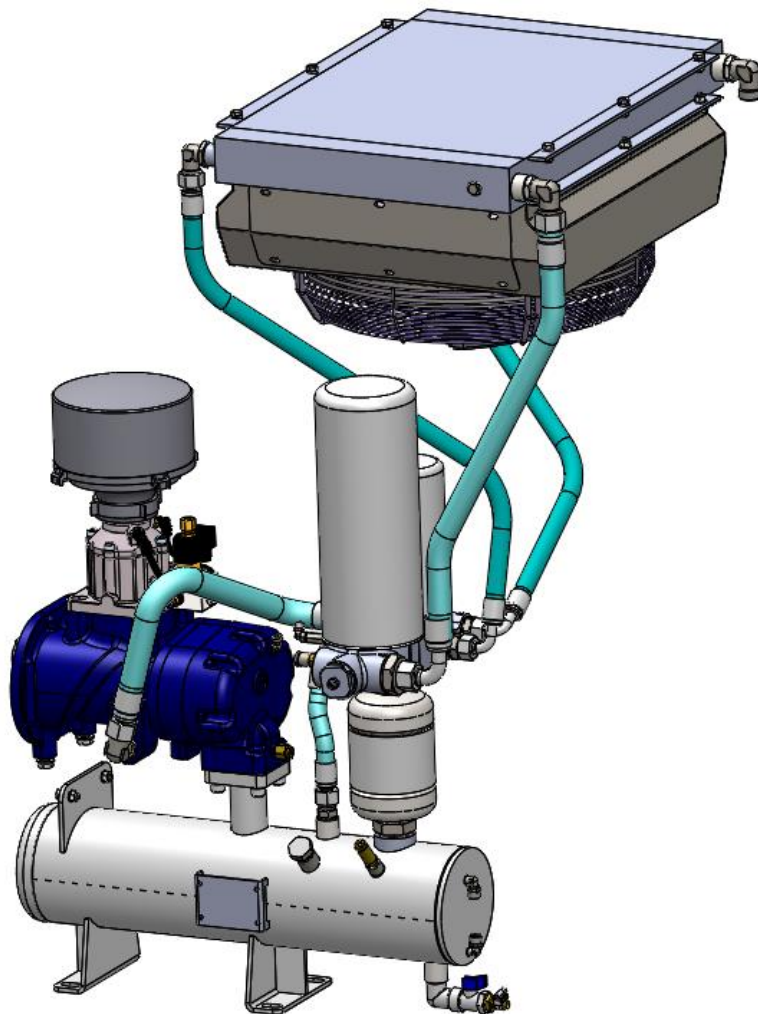


Figure 5 Pressure System

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The oil has three basic functions in screw compressors:

- To take heat created by rotor friction and air compression inside the screw unit, and transfer the same heat to the cooling components to be dissipated through the radiator and water exchanger.
 - To form a film layer for sealing the stator and the rotors.
 - To lubricate the rotors and the bearings that support the rotors.
- The air-oil mixture is sprayed from the screw unit into the separator tank. Thanks to the special design of the separator tank, the air flow formed inside the tank ensures that the oil particles in the air-oil mixture become heavier by combining and then they are diverted onto the inner surface of the tank. In this way, the oil does not entirely attach onto the separator. This way the separator operates smoothly for extended amounts of time.
- The oil particles in the air are contained when passing through the filter.
- The oil separated air passes through the minimum pressure valve, then the cooling radiator, and finally is dispatched into the airline.
- Oil remaining in the separator tank is cooled down in the cooling radiator, and then re-introduced to the oil filter.

The separator tank has three functions:

To perform the oil pre-separation process with its special design,

- To maintain the compressor oil and
- To protect the separator filter.

4 TECHNICAL DATA

4.1 Technical Specifications of the Compressor

Table 3 Technical Specifications of the Compressor

Compressor Models	Nominal Pressure Psig (Bar)	Capacity cfm (m ³ /min)	Operating Voltage V	Operating Frequency Hz	Ambient Temperature °F (°C)	Oil Capacity Gallon (l)
B2811233	100 (6.9)	20.8 (0.59)	230	60	35°F to 110°F (+2 °C to 43°C)	
	125 (8.6)	18.7 (0.53)	230	60		
	150 (10.3)	17.3 (0.49)	230	60		
B2811238	100 (6.9)	29.0 0.82	230	60		
	125 (8.6)	27.6 0.78	230	60		
	150 (10.3)	24.7 0.70	230	60		
B2811237	100 (6.9)	43.8 1.24	23	60		
	125 (8.6)	39.2 1.11	230	60		
	150 (10.3)	33.90 0.96	230	60		

*The above information is for description purposes specifically and the company reserves the right to change it. For failures, spare parts/components and ordering refer to the diagram and parts list at the end of this manual. Having the type and serial number of your compressor when ordering will help expedite both the ordering and technical assistance process.

Rotary Screw Air Compressor

4.2 E Series Technical Values

Table 4 E Series Technical Data

MODEL	MOTOR POWER (HP)	AIR RECIEVER TANK SIZE Gal (l)	DIMENSIONS DxWxH (mm)	DIMENSIONS DxWxH (in)	AIR OUTPUT PIPE DIAMETER (in)	WEIGHT (kg)	WEIGHT (lbs)
B2811233	5		1925x730x1480*	75.8x28.7x58.3*	NPT (1/2")		
			1925x655x1480**	75.8x25.8x58.3**	NPT (1/2")		
			875x550x860***	34.4x21.6x33.8***	NPT (1/2")		
B2811238	7.5		1995x740x1595*	78.5x29.1x62.8*	NPT (1/2")		
			1950x655x1595**	76.8x25.8x52.7**	NPT (1/2")		
			1025x550x835***	40.4x21.6x32.8***	NPT (1/2")		
B2811237	10		1995x740x1595*	78.5x29.1x62.8*	NPT (3/4")		
			1950x655x1595**	76.8x25.8x52.7**	NPT (3/4")		
			1025x550x835***	40.4x21.6x32.8***	NPT (3/4")		

* With dryer, ** With tank, *** Without tank

5 TRANSPORTATION, HANDLING, INSTALLATION

5.1 Transportation and Handling

5.1.1 Transportation

- Be sure to check the compressor for any possible damage and/or deficient parts at the time of delivery.
- In case of damage on the compressor and/or packaging, notify your logistics company first and then the manufacturer.

5.1.2 Handling

- Use a forklift to lift the compressor.
- Before lifting the compressor, be sure that the forklift supports are properly adjusted, and the forklift weight capacity is not exceeded.
- While the compressor is being moved via forklift, ensure to carry it no higher than absolutely necessary.
- Before lifting a compressor on a pallet by a forklift, be sure that the compressor has been safely and securely mounted onto the pallet. Otherwise, the compressor may tip over off the pallet, possibly resulting in damages and/or injuries to personnel or property.
- If there is not a proper forklift available, you may use a crane and hanger lift the compressor into place.
- Inspect screws and bolts that may have loosened and/or backed out during transit.
- Be sure that all ropes, hooks and similar lifting equipment are inspected for quality and strength as they will be supporting the compressor. If you do not know the exact weight the compressor before transportation and handling, do not attempt carrying/moving it before learning its actual weight.

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- Move slowly and carefully when carrying the compressor. Any impact/dropping may result in damages that may jeopardize proper operation of the internal parts and components of the compressor.
- Be sure that there are no personnel standing under the compressor when lifting and/or moving the unit.
- The compressor should be placed on a surface capable of supporting the total unit weight.

5.1.3 Storage

If the compressor is to be stored before installation, do not open its packaging, and check for the following conditions:

- The storage area temperature should be between 35 °F (+2 °C) and 110 °F (+43 °C).
- The storage area should be dry, covered, insulated for any electrical shortages, and resistant to weather conditions.
- The compressor can be safely stored for a maximum of six months. If you are storing for greater than six months, apply long term storage procedures.

5.1.4 Long Term Storage Procedure

5.1.4.1 Storage Preparation

- Remove air intake filter and store in a clean and secure area.
- Drain oil from sump tank and plug.
- Fill air end with the original lubricant as indicated by decals on the sump tank. Plug or blind flange the inlet connection.
- On water cooled packages, drain water from all coolers and piping and fill with 50/50 Glycol/Water solution. Plug inlet and outlet connections. (Not required for air cooled machines).
- On the air side of the coolers, blow out moisture separators and traps with dry air to remove moisture. Plug connections.
- Blow out control air lines with dry air to remove moisture. Seal or plug openings on blow-down valve and relief valves.
- Tag all plugs that must be removed before start-up.
- Place desiccant material in the starter/control box. If the box has a gasket door – check the integrity for proper for sealing; correct if necessary. If the box does not have a gasket door, seal the box seams with moisture resistant tape to prevent moisture ingress.
- Meg the motor. Record and place reading on a tag secured to the motor eye bolt.
- Grease motor bearings.
- Complete any additional storage requirements per the motor manufacturers recommendations.
- Tape a copy of storage instructions in a plastic-envelope to outside of package or cover in plain view.

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5.1.4.2 Storage

- It is preferred that the unit be stored in a controlled environment. If this is not possible, as a minimum it should be protected from the elements with adequate cover which will not allow condensation to collect within the compressor.
- Monthly during prolonged storage, rotate the drive shaft 1 1/2 turns in the opposite direction to normal rotation.
- Maintain the motor in accordance with the motor manufacturers recommendations during the storage period.

5.1.4.3 Start up

- Meg the motor. Compare the reading with the original tag on the motor eyebolt taken at the time of storage. See motor manufacturers recommendations for reference.
- If the unit is water cooled, remove the glycol from coolers and associated piping.
- Remove all plugs that were tagged.
- Manually rotate the motor shaft in the direction of rotation to remove fluid from the air end.
- Drain the sump and plug.
- Check minimum pressure valve for free movement.
- Fill the sump with a fresh charge of compressor fluid.
- Install air filter, blowdown valve, relief valve, and any other components that were removed in preparation of, or during, storage.
- Remove desiccant from starter/control box.
- Follow the compressor manual for normal start-up procedure.

5.2 Compressor Placement and Connections

- The compressor should be placed on a level and smooth surface of adequate capacity to support the compressor weight. When the compressor is placed on such a surface, even though it is not necessary, we recommend anchoring the machine to the surface.
- The location of the compressor/compressor room should be easily accessible and well illuminated.
- Leave an adequate service area around the compressor with clearance from all lateral walls and the ceiling (See *Page 32-33* for all dimensions).
- All necessary actions should be taken to eliminate fire and corrosion hazards in and around the operating site.
- No piping load (tensions caused by tight connections or seasonal temperature differences) should be transferred onto the compressor through external connections. Mount flexible line from the compressor prior to running rigid piping.
- If the air installation takes place above the compressor level, do not install the compressor connection pipe below the main pipeline, as the water will accumulate at the compressor outlet which could flow backward during normal stopping operation, this will cause the O-rings and gaskets in the valves to be damaged.

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- Be sure that your air installation equipment, pipes, and fittings meet or exceed the operating pressure, and are free from any damage or defect.
- Select the air installation pipe diameter, dryer and line filters in compliance with your air utility capacity. (It would be appropriate to use larger capacity pipes for your installation in consideration of future growth and capacity increase of your company).
- Install a separate line (water discharge line) for the condensate discharge of the filter, dryer and air tank, so that the floor of the compressor room will not be wet.
- The compressor has been designed for indoor use. Available room layout and arrangement pattern are as shown in Figure 14.
- Get in contact with authorized service or sales representatives for any requirements not stated herein regarding the compressor or air system.
- Preferably install a loop system instead of a straight one. The pressure loss will increase depending on the pipe cross-section at the end of straight lines. If there is a receiver that has high interim consumption or periodical shock consumption, pressure losses could be experienced.
- Use the below formula to calculate the ideal pipe diameter for your air installation:
The valves, reducers, elbows, fittings etc. used in the air installation can result in pressure loss in the air system. The installation must account for the pressure loss of each connection element. You can see on the following table of equivalent pipe lengths how many feet of pipe are approximately needed for each element.

Table 5 Schedule of Equivalent Pipe Lengths

Equivalent Pipe Lengths							
	Pipe Diameter (ft)						
TYPE	1"	1 1/2"	2"	3"	4"	5"	6"
Stop Valve	0.98	1.64	2.29	3.28	4.92	6.56	8.20
Angled Elbow	4.92	8.2	11.48	16.4	22.96	32.8	49.2
Elbow	0.984	1.64	1.968	3.28	4.92	6.56	8.2
Large Elbow	0.492	0.82	0.984	1.64	2.624	3.28	4.92
T-bar	6.56	9.84	13.12	22.96	32.8	49.2	65.6
Reducer (2/1)	1.64	2.296	3.28	6.56	8.2	11.48	13.12

Example: Using the same installation, where the pipe length was found to be 328 ft on *Table 5*, when you use 8 pieces of elbows of the same internal diameter of 1" , and 6 pieces of T-bar, and 2 stop valves, to keep the pressure loss at the same level, you would use the following formula:

$(8 \times 0.98) + (6 \times 6.56) + (2 \times 0.98) = 49.82\text{ft}$, and $328 - 49.82 = 278.18$ feet max pipeline, using the above components.

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5.3 Compressor Room Ventilation

- To keep the operating temperature at a certain value, place the compressor in an area with adequate air flow. The temperature of the compressor operating room should be no less than 35 °F (2 °C), or higher than 104 °F (40 °C). Do not place the compressor in any area where the temperature is less than 35 °F (+2 °C). Heat the compressor room if necessary.
- There must be appropriate room ventilation, or a discharge system for the hot air emitted from the compressor vented to outside the compressor room. In this arrangement, the hot air emitted from the compressor cannot be returned to the compressor room. The hot air discharge and the room air inlet should not be placed on the same side/wall.
- The hot air outlet duct should be larger than compressor's hot air outlet cover and should not be long or winding as this will create flow blockage for the hot exhaust air.
- For expedited venting of hot exhaust air, the user may install an exhaust fan. The fan must be equivalent or greater cfm than the capacity of the fan on the compressor. Place this fan as near as possible to the hot air outlet of the compressor.
- The surface area of clean air intake should be roughly 1.5 to 2 times that of the compressor intake grill area.
- The compressor hot air outlet should not be placed on the same wall where there are windows that can open to the outside as to not allow hot vented air back into the compressor area.
- Ensure to keep the compressor cooling radiator away from direct sunlight or strong winds.
- The compressor cannot be placed in a room that is exposed to hazardous gas, steam, excess heat, or any form of abrasive dust (granite, wood, sand, etc.). Do not place the compressor near any HVAC equipment, boilers, or generator set ups. Doing so will void your warranty.

5.4 Electrical Connection

Have the electrical connections of the compressor made by a qualified electrician. Electrical diagrams and spare parts lists of your compressor can be provided.

Your compressor has been designed to work in three-phase systems. Voltage and frequency information is located on the data plate of the compressor. The specifications for the supply cable are shown on the following table.

Incorrectly setting the control transformer poses a risk to the trouble-free operating of the system. Checking the setting of the control transformer is part of commissioning and part of regular inspection/maintenance because the supply voltage can change.

The correct setting should be checked by measuring the control transformers output voltage while the system is running with a load.

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5.4.1 E Series Cable Section

- It is however highly recommended to keep the voltage drop over the supply cables at nominal current below 5% of the nominal voltage.
- Branch circuit breaker must be installed on site. It is suggested on electrical wiring diagram.
- Calculation method according to UL 508A, table 28.1 column 5: allowable ampacities of insulated copper conductors (167 °F (75 °C)).
- The gauges named in the table correspond to those in UL508A. (Rubber sheathed cable at 86 °F and max. 50 FT cable length, FOR LENGTHS LONGER THAN 50FT CONSULT A CERTIFIED ELECTRICIAN).



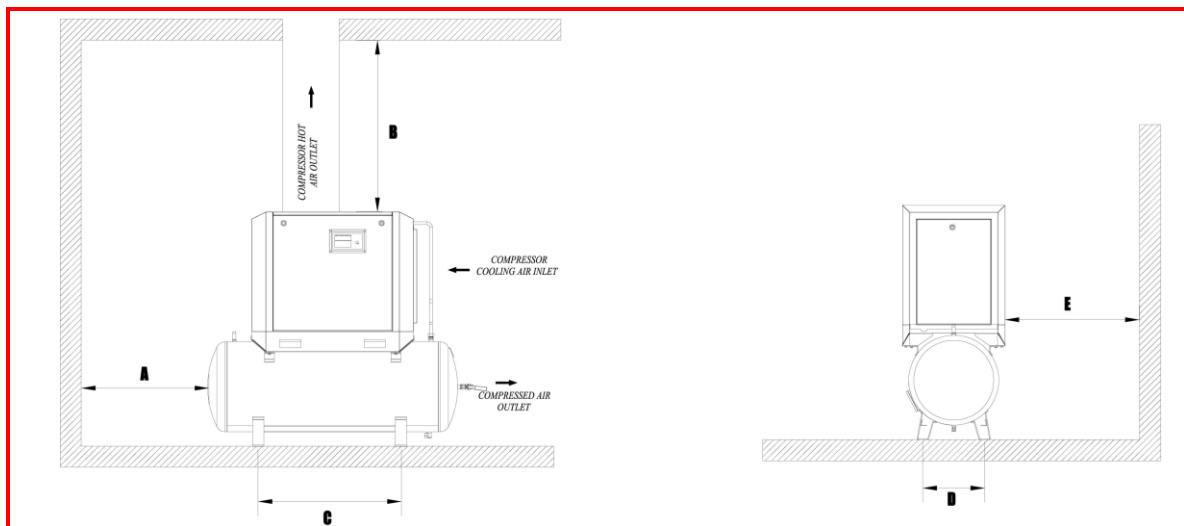
Local regulations remain applicable if they are stricter than the values proposed ON TABLE 6.1.

Table 6.1 EC-L Cable Sections

MODEL	CABLE SECTION(AWG) 230V SINGLE PHASE 50FT OR LESS	CABLE SECTION(AWG) 208-460V 3 PHASE 50FT OR LESS
B2811233	2XAWG8+AWG8-COMMON GROUND	3XAWG10+AWG10-COMMON GROUND
B2811238	2XAWG6+AWG6-COMMON GROUND	3XAWG8+AWG8-COMMON GROUND
B2811237	2XAWG4+AWG4-COMMON GROUND	3XAWG6+AWG6-COMMON GROUND

* Power supply cables to be sized and installed by a qualified electrician. If different length of power cable is required, the cross-section of the power cable may need to be changed. In this case please contact your local service organization.

5.5 Compressor Layout Plans



Compressor Model	A (inch/mm)	B (inch/mm)	C (inch/mm)	D (inch/mm)	E (inch/mm)
B2811233	39.37(1000)	39.37 (1000)	31.49(800)	14.56(370)	39.37(1000)
B2811238			39.96(1015)	17.32(440)	
B2811237					

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6 OPERATION

6.1 General

The system has been provided with an electronic control module to easily monitor the operating and setting values of the compressor. All necessary electrical and mechanical measures have been taken for safe operation. Listed below are some components with descriptions.

6.2 Compressor Components

- **Control Module:** It is an electronic unit on which all the alarms, failures, maintenance times and intervals can be monitored.
- **Screw Unit:** Compressor unit that produces compressed air.
- **Motor:** Provides the mechanical power required to turn the screw unit.
- **Coupling:** Transfers the mechanical drive force from the motor to the machine.
- **Intake regulator:** Located on the screw unit. It controls the compressor air intake loaded and unloaded conditions.
- **Control Solenoid Valve:** Placed on the block connected to the intake regulator. It delivers air to the intake regulator to shift the compressor into loaded or idle position.
- **Safety Valve:** It is located on the compressor oil tank. When the pressure inside the compressor oil tank increases due to a failure, it safely releases excess pressure.
- **Minimum Pressure Valve:** Installed on the separator tank cap in the compressor. From the beginning of the loading operation, it is designed to keep the compressor internal pressure at a minimum 29-43.5 psig (2 – 3 bar) for oil circulation. The valve also prevents pressure backlash from transferring from the air tank into the compressor during idle operations and during shutdown.
- **Radiator:** Cools down the oil circulating inside the compressor oil circuit and also the air generated by the compressor.
- **Emergency Stop Button:** Press it to stop the compressor in case of emergency. The button has been designed to keep locked when pressed. Turn slightly clockwise to return it too normal.
- **Gauge:** Shows the gas pressure.
- **Pressure Sensor:** Electronically converts the pressure data into an analog signal that communicates to the control module.
- **Temperature Sensor:** Electronically converts the temperature data into an analog signal that communicates to the control module.
- **PTC:** Embedded between the motor windings. It stops the compressor when the windings are over heated and prevents the motor windings from burning.
- **Pressure Switch:** The safety pressure switch stops the compressor in the event that the internal pressure exceeds the set value.

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6.3 Start-up Procedure

- Check all power and air connections before starting the compressor.
- Check all the internal parts and connections of the compressor. Ensure that it was not damaged in transit.
- Be sure that the cooling air inlet and exhaust outlet of the compressor are not blocked or closed. Do not cover the compressor with cloth, nylon, etc. If it is covered, do not attempt starting the compressor prior to removing the cover.
- Inside the power board of the compressor is a “phase control relay” that continuously controls the power phases. If you connect the phases in the wrong order or there is any voltage imbalance or even a lack of connection, the phase control unit will not allow the compressor to start, and you will see a visual sign stating phase error on the control panel display. In case of the reverse connection of phase ends, cut the power to the compressor and reverse the two-phase cable connections at the compressor main electrical line. If there is a phase failure or imbalance, the problem is related to the electrical main network, in this case you should report it to the authorized electrical staff or competent authorities.
- Check oil level. A transparent hose is connected to the separator tank body to easily monitor the oil level. Check the oil level when the compressor is in stop mode. The oil level may change in the course of operation.
- If the oil level is low, fill it to full line.
- Energize the compressor. However, be sure to check if the compressor turns in the correct direction. **The compressor’s rotational direction should be checked at start-up.** Remove any necessary covers prior to engaging the compressor.
- Inspect the air end drive, and press the “**Start**” button, allow the compressor to run for a short time (1-2 sec), and then immediately press the “**Emergency Stop**” button to shut down the compressor. It should rotate in the direction the arrow points when viewing from the screw shaft side (see the arrow direction is located just above the screw).
- If the turning direction is correct, open the compressor output valve, and restart the compressor.
- Shut down the valve at the air tank outlet to fill up the tank.
- Check the pressure rise on the compressor control unit display or on the gauge on the control panel.
- Check if the pressure reaches the preset value, and the compressor switches to idle position.
- If the air pressure in the tank does not decrease, the compressor will automatically stop after a certain time after it reaches idle position. Wait for a few moments, and then open the tank outlet valve to verify that the compressor switches into the load position at the preset pressure value.
- Approximately 10-15 minutes later, check the operating temperature of the compressor, and be sure that it is normal 176-194°F (80-90°C). Stop the compressor, de-energize it, and visually inspect the internal parts and components of the compressor. This check is important due to possible oil leaks or loosening or fittings or hoses.
- If you do not detect any problems by the end of all the checks, you can start up the compressor.

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6.4 Daily Start Procedure

Perform a few simple daily checks prior to starting up the compressor under normal conditions. The daily maintenance procedure is described in detail in the 9th chapter.

- Check if there is any failure signal on the compressor panel.
- Inspect the internal parts and components for oil leaks or any possible damages.
- Start up the compressor and monitor its operation for a short time.
- Check the front panel to see that there is no sign of failure, and that the operating pressure and temperature values are normal.
- When the compressor is working under normal load, check to see that the oil is flowing into the separator and oil return line (scavenge line).

These simple checks would allow you to detect any possible errors easily and readily and/or failures on the compressor. This will help prevent any time loss due to unnecessary failures or shutdowns.

6.5 Compressor Start-up in cold and after long shutdowns



Please contact your authorized service representative.

6.6 Break In

Your rotary screw compressor is shipped with break in oil. To ensure your compressor warranty is maintained and the unit functions at peak performance please change out the break in oil once the unit reaches 600 hours. DO NOT change the break in oil prior to 500 hours as this can lead to oil leaks.

7 FAILURES

7.1 General

The information in this section has been compiled based on the experiences gained during field service operations and factory tests.

The failure signs, symptoms and causes are listed by the frequency of feedback from the service technicians.

As the systems and failures are usually related, it is a must to clearly understand the actual cause of the failure before attempting any repair or part replacement.

You must perform a comprehensive visual inspection prior to taking any action regarding the experienced problems.

Good monitoring and record keeping will be an aid in monitoring for break downs and recurring issues.

In particular:

- Unless otherwise stated, perform all checks when the compressor power is completely disconnected.
- Check all power connections for any possible backing out of connections due to vibration or loosening of connections.
- Check any parts and components that may be affected by short circuits or temperature fluctuations.
- Check for any possible damage and loose points on the hoses, pipes, and/or connections in the air and oil circuits.

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If the problem persists despite all actions taken per this manual or for any other issue, please contact our service department.



Any attempt to repair or replace parts without sound knowledge may create adverse effects and result in the unnecessary shutdown of your plant/facility and increased cost due to possible damages.

7.2 Failures, Reasons and Solutions

Table 7 Failures and Solutions

FAULT	CAUSE	REMEDY
Compressor does not TURN ON.	No power.	Check the voltage at the main fuse input.
	Control and input fuse blown.	Check the fuses.
	Main voltage low, imbalanced or the phases are reversed.	Check the warning message on the control panel.
	The compressor stopped for any failure.	Check the warning message on the control panel.
	The compressor has started without discharging the internal pressure.	The compressor does not start for 1 minute once it is stopped in order to release the internal pressure. Try to start the compressor again 1 minute later.
Compressor does not operate due to shut down.	Insufficient section of the input feeder cable	This problem is observed on installations where cables of improper thickness are being used. With the compressor being in STOP position, measure the input voltage while continuing to measure. If the voltage reduces to less than 5% (460>437 or 230>218) of the required voltage level, it means that the cable section is insufficient. Use cables of appropriate gauge and length.
	Low voltage.	If the main voltage is 10% plus or minus of the measured line voltage, the problem is caused by the main voltage or the installed power of your facility.
	Low ambient temperature.	If the ambient temperature is less than 35 °F (0°C), the oil will be too thick, so the compressor will start harder due to the thickness of the oil and possibly trip the overloads.
	Mechanical problem in the motor or screw	De-energize the compressor and check if the pulleys and belts easily rotate. If it turns abnormally difficult, it means that there is a mechanical failure in the motor or screw; de-energize and lock out the machine. Immediately call the authorized service representative.
	Intake regulator failure.	The intake valve is closed at the time of start-up; if it remains open under start up there is a mechanical problem. The compressor tries to start against load. With the compressor in STOP position with no internal pressure, check that the intake valve is fully closed. The intake valve might be stuck in an open position. Call the authorized service representative.

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FAULT	CAUSE	REMEDY
Compressor doesn't generate air.	Air filter clogged.	Check the air filter and replace if necessary.
	Compressor does not shift from star to delta	The star-delta setting may be changed. Check the setting (4-8 seconds). Turn on the compressor and follow the contactors on the input controller. It should release K3 contactor and pull in K2 contactor at the end of the preset period of time. If not, the contactor coil terminals may be loose, or the coil on the contactor may be burnt.
	Intake regulator failure.	The intake regulator valve may be stuck, and can't open completely and cause a restriction in the intake air flow to the pump. Call the authorized service representative.
	Minimum pressure check valve fails	The minimum pressure check valve O-ring and gaskets may be damaged, and therefore cannot hold the internal pressure that is required. If the internal pressure does not rise, the intake valve will not open. This keeps the compressor in an unloaded state and is not switching to the load position due to lack of internal pressure in the air/oil separator tank. Replace the gasket and O-rings. The internal check valve is associated with the lubrication of the compressor pump with a bad minimum pressure check valve it can cause the compressor pump to overheat.
	Intake valve solenoid failure.	Check the control power voltage supply to the solenoid valve (in loaded operating mode). If the power supply is normal; it means that the solenoid coil is burnt and not opening the solenoid valve. Replace the coil.
	Rapid discharge solenoid valve failure.	Check the control power supply to the solenoid valve (during operation of the compressor). If the power supply is normal; it means that the solenoid coil is burnt. Replace the coil.
	There is leak in the air line connections.	Check the connections of the hoses and pipes for loose connections. Replace any damaged connections.
Set PSI of the compressor exceeds the set value.	Pressure setting changed.	Check the pressure settings.
	Intake regulator failure.	The intake regulator valve may be stuck in an opened position. Call the authorized service representative.
	Intake regulator solenoid failure.	If the solenoid valve is energized normally, the solenoid valve might be stuck. Call the authorized service representative.

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FAULT	CAUSE	REMEDY
Compressor cannot reach the maximum pressure.	The system air consumption is higher than the compressor capacity.	Close the tank outlet valve to see that the compressor can reach the maximum pressure; and observe that the pressure rises and the compressor STOPS at the set pressure value. If the pressure does not rise, there must be another failure. Call the authorized service representative.
	There is leak in the air line connections.	Check your airline and connections.
	Excessive dirt in the air filter.	Stop the compressor and check the air filter, replace it if it is dirty.
	Intake regulator failure.	The intake regulator valve may be stuck and cannot open fully. Call the authorized service representative.
	Screw unit failure.	If the screw unit is damaged, a loud running screw sound is heard. Call the authorized service representative.
Compressor consumes excessive oil.	Scavenge orifice clogged.	While the compressor is running, check the oil flowing through the scavenge monitoring hose. If you cannot see the oil flowing, stop the compressor. Clean the scavenge orifice with a thin wire or compressed air. Start the compressor and check the oil flow; top up the oil if necessary.
	Separator element damaged	If you detect oil leaking from the compressor discharge at the time of water discharge, replace the separator element.
	Oil leak in the compressor body.	Oil accumulation is seen on the ground under the leaking part. Check and tighten the connections in the oil circulation system. If the oil leak persists, call the service representative.
	The compressor is exposed to excessive heat.	Where the ambient temperature is over <u>104°F (+40 °C)</u> and the compressor unit is exposed to direct sunlight, oil loss may increase since the expansion will increase and the oil will become thinner than usual due to high oil temps.
	Recommended oil is not used.	Use of oil of a different type or with different specifications might result in damages over the course of time; use the recommended oil.

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FAULT	CAUSE	REMEDY
Safety valve opens.	Operating pressure settings changed.	Check the pressure settings and/or the safety pressure switch settings.
	Separator clogged.	Check the internal pressure gauge while the compressor is running at full load or a value close to it. If the internal-external pressure difference is close 21.7 psig (1.5 Bar), then your separator is clogged. Replace the separator.
	Intake regulator failure.	The intake regulator valve may be stuck in opened position. Call the authorized service representative.
	Intake regulator solenoid failure.	Check the control power supply to the solenoid valve (in loaded operating mode). If the power supply is normal; it means that the solenoid coil is burnt. Replace the coil.
	Safety valve settings changed.	If the safety valve opens earlier than the set value although it is set properly, replace the valve.
The main motor thermal switch stops the compressor.	Thermal switch fails, or settings are wrong.	Use a clamp-on amp meter (with the compressor in full load) to check if the current passing through the thermal switch on the magnetic starter overload to make sure it is balanced and in normal limits (current difference less than 10% between phases). If the thermal switch opens before the preset current value, the overload is faulty or not adjusted at a high enough amp setting. Check to ensure the overload on the contactor is set to a high enough value or replace the overload switch.
	Low voltage.	If the main voltage is 10% or less below the set voltage value, check the main or facility installed power.
	Compressor passes over the pressure settings.	Take the measures mentioned above.
	Separator clogged.	Check the internal pressure gauge while the compressor is running at full load or a value close to it. If the internal-external pressure difference is close 21.7 psig (1.5 Bar), then your separator is clogged. Replace the separator.
	Screw unit failure.	Diagnosed via the extremely loud operation of the compressor. Call the authorized service representative.
	Problem in the main motor.	When operating currents exceed normal limits, the motor may overload. With the covers open, start the compressor for a short time and listen to the motor. The motor may be damaged or may have bearing problems. Call the authorized service representative.

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FAULT	CAUSE	REMEDY
<p>The operation temperature increases when the compressor switches to idle.</p>	<p>Blockage in the oil filter or in the oil circuit.</p>	<p>If any debris or foreign objects have made it into the separator tank during maintenance, they can cause blockages in the oil circuit. Be cautious of this during maintenance. Blockages prevent proper oil circulation. If there is fine dust or abrasive gas in the environment, the oil, oil filter and separator will be adversely affected.</p>
<p>The compressor does not automatically STOP at idle</p>	<p>Idle waiting time setting was changed</p>	<p>Check the idle waiting time setting and adjust accordingly.</p>
	<p>The compressor switches to load again before the set duration.</p>	<p>If the idle duration of the compressor is shorter than the set waiting time, the compressor will not stop since it will switch to load again. This is normal.</p>
<p>The fan motor thermal switch stops the compressor.</p>	<p>Thermal switch fails, or settings are wrong.</p>	<p>Use a clamp-on amp meter (with the compressor in full load) to check if the current passing through the thermal switch is balanced and in normal limits (current difference less than 10% between phases). If the thermal switch opens before the preset current value, it is faulty. Replace the switch.</p>
	<p>The panel filter or radiator cores are clogged; hot air outlet is blocked.</p>	<p>Make sure that the compressor is adequately ventilated. Replace the clogged air filters. Use pressurized air to clean the radiator fins; blow the opposite direction of the cooling fan air flow to not force dirt deeper into the radiator. Do not block the hot air outlet and do not narrow the outlet section if ducts are used.</p>
	<p>There is a problem in the fan motor.</p>	<p>When operating currents exceed normal limits, the motor may overload. With the covers open, start the compressor for a short time and listen to the motor. The motor may be damaged or may have bearing problems also verify the dual voltage cooling fan label matches the voltage for the compressor. Call the authorized service representative.</p>

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FAULT	CAUSE	REMEDY
Pressure safety switch stops the compressor.	Operating pressure settings changed.	Check the pressure settings.
	Separator clogged.	Check the internal pressure gauge while the compressor is running at full load or a value close to it. If the internal-external pressure difference is close to 21.7 psig (1.5 Bar), then your separator is clogged. Replace the separator.
Compressor operating noise is higher than the normal limits.	Mechanical connections are loose	Check that all mechanical connections are properly tightened. (Tightness of motor, screw, coupling and fan connections is imperative to proper operation)
	There is a problem in the motor bearings.	Operate the compressor for some time with the cabinet doors open and listen to the sound of the motor DO NOT remove belt side covers due to moving parts and safety concerns. If there is an abnormal noise coming from the bearings, call the service representative.
	Mechanical problem in the screw unit.	A loud noise is heard during operation, which is easily distinguishable. Call the authorized service representative.
Compressor operating temperature is higher than the normal limits.	Low oil level.	Check the oil level and add more if low. DO NOT overfill with oil it will cause excessive oil carry over into the outlet air stream.
	High ambient temperature.	Check the ambient temperature.
	Ventilation problem in the compressor room.	When the compressor is mounted in a room the exhaust vent must match the exhaust vent on the compressor. It is recommended that the exhaust heat be vented out of the compressor room through a plenum mounted on top of the compressor exhaust. Be sure that the plenum is not smaller than the exhaust port on top of the cabinet. The intake room vent must be the same size or larger as the exhaust port on top of the compressor.
	Radiator slices or fan blades dirty/clogged.	It is very important that the radiator be inspected and cleaned weekly especially in dusty environments. This dust will accumulate in the radiator ventilation holes and build up over time. This will inhibit the air flow through the radiator causing inadequate air flow to the compressor oil and air this will lead to overheating of the compressor. In some cases, the radiator should be removed, and pressure washed too thoroughly clean.
	Air filter dirty/clogged.	Check and replace.
	Mechanical problem in the screw unit.	In cases where the unit is operating extremely loud call the authorized service representative.

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FAULT	CAUSE	REMEDY
Oil degrades quickly; separator clogged in a short time.	Failed to use the recommended oil, or the original OEM separator.	Use the recommended oil and the genuine OEM separator.
	Very high ambient humidity	Take measures for decreasing the humidity.
	Fine dust, gas etc. degrading the oil features in the working environment	In sanding, casting, chemical and paint / finishing facilities, compressor rooms should be installed away from these environmental factors.
	Compressor continuously works in high ambient temperature	Working temperature of the compressors that operate near the boiler room, generating set room or any other rooms of inadequate ventilation would adversely affect the separator life. In the case of boiler rooms with excessive humidity this can cause condensation in the compressor oil. This mixture of water and oil will cause bearing failure. Call an authorized service representative.
Contactors contacts are quickly worn (frequent sticking)	Low voltage.	If the mains voltage is 10% plus or minus the preset voltage setting of the compressor, it is understood that the problem is caused by the mains voltage or the installed power of your facility.
	Very short star-delta switchover	If the start-delta switchover time is set too short, the motor is loaded before full cycle, so that the contactor contacts are exposed to current extremely higher than the normal limits. In such cases, the contacts may be stuck or weld together from excessive heat. The star-delta switchover time is 4-8 seconds (depending on the compressor type). DO NOT set a shorter time. The old contact sets should always be replaced with genuine parts.
	Contact set used is not original OEM.	Non-OEM contact sets have very low electrical continuity causing contactor points to overheat. Call the service representative for the supply of genuine spare parts.

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FAULT	CAUSE	REMEDY
Compressor stops due to high temperature.	Temperature settings changed.	Check the temperature settings.
	High ambient temperature.	Check the ambient temperature in the compressor room and take any necessary measures to reduce the high ambient temperature.
	Insufficient ventilation.	When the compressor is mounted in a room the exhaust vent must match the exhaust vent on the compressor. It is recommended that the exhaust heat be vented out of the compressor room through a plenum mounted on top of the compressor exhaust. Be sure that the plenum is not smaller than the exhaust port on top of the cabinet. The intake room vent must be the same size or larger as the exhaust port on top of the compressor.
	Low oil level.	Check the oil level and add more if low. DO NOT overfill with oil it will cause excessive oil carry over into the outlet air stream.
	Oil filter clogged.	Replace the oil filter. Be sure to use OEM parts.
	Expired oil.	The oil with a darker color than usual means it has expired. Replace the oil. If you have to perform this task frequently check the operating conditions. Oil that is milky or white in color is contaminated with condensation. WARNING: This condensation will cause bearing failure! Contact authorized service representative.
	Air filter dirty/clogged.	Replace the air filter.
	Panel filter dirty/clogged.	Check and clean or replace.
	Radiator slices and/or fan blades dirty/clogged.	Check and clean.
	Outlet vent is too long or gets narrow.	Take any necessary measures.
	Covers/doors open.	Close the covers/doors as the unit will not cool correctly with these open.
The compressor operates excessively loud as it approaches upper pressure limits	There is a problem in the motor bearings.	Check and replace the motor bearings.
	Mechanical problem in the screw.	The bearing in the rotary screw pump are failing. Call the authorized service representative.
The belts wear prematurely	Pulley settings are incorrect	Check and correct the pulley alignment. Pulley alignment is critical to long belt life. Call the authorized service representative.
	Operates continuously in high temperature and corrosive environment	Call the authorized service station.
	Belt tension is less or more than usual	The belt tension should have ¼" deflection. Incorrect tension or deflection will cause belts to squeal from slipping while the motor and compressor are running. Call the authorized service representative.

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8 MAINTENANCE

Be sure to carefully read the user manual before performing any maintenance. Regular maintenance will prolong the useful life of your compressor. Before maintenance, make sure to remove all power to the compressor, relieve the system of all pressure, and lockout and tagout the power supply to the compressor before removing any valves, caps, plugs, fittings, bolts and/or filters.



The air compressor is a complex machine; any maintenance to be carried out must be accomplished by authorized and trained individuals. Not abiding by this recommendation may render the entire warranty void and could result in damage to property and/or injury to personnel.



Please call manufacturer customer service for any compressor maintenance.

8.1 Safety during maintenance

Place a warning sign, plate etc. in a visible place on the compressor to show that the maintenance work is in progress along with all steps from section 8.

- After shutting down the compressor, allow it to reach a safe temperature. Touching hot points on the compressor will result in injuries.
- Be sure that all pressurized air is discharged from the compressor prior to maintenance.
- Check the current in the circuit prior to maintenance. Current can still pass through the main switch even when it is off and can still provide current.
- Unless you turn off the main power supply, there is high voltage in the compressor power system, even if the compressor is not in operation.
- After maintenance, be sure that all the safety measures are restored.
- Only authorized staff should be allowed to handle the maintenance of the compressor.

8.2 Periodical Maintenance Check List

8.2.1 Daily Maintenance

- Check the oil level of the compressor, add oil if required (*See, Figure17*).

A transparent hose is connected on the separator tank body to easily monitor the oil level. Check the oil level when the compressor is in stop mode. (The oil level may change in the course of operation.) If the oil is low, fill it to top of fill line. If you add oil frequently, it means that there is problem in your compressor. Review the failures section.

- During the course of operation, check for warning signs and operating values on the control panel.
- Check discharge pressure and temperature.

8.2.2 Every 125 hours operation

- Clean the compressor panel filter with pressurized air.
- Use pressurized air to clean the radiator. The cleaning operation will keep the exterior cooling surfaces clean and ensure effective heat dissipation.
- Check the compressors internal parts and components for oil leaks and/or damage.

Rotary Screw Air Compressor

8.2.3 Every 2000 hours operation or 6 months

- As indicated by the controller, replace the oil filter element (*See, Figure 18*). If it does not reach 2000 hours within 6 months, replace it once every 6 months regardless of hours.
- Clean or replace the control box filter.
- As indicated by the controller, replace the air filter element (*See, Figure 20-21*). If it does not reach 2000 hours within 6 months, replace it once 6 months at any rate. Operating conditions determine the frequency of service.

8.2.4 Every 4000 hours operation or 12 months

- Visually check for leakage on the shaft seal, replace as required.
- Replace the panel filter element (*See, Figure 19*). If it does not reach 4000 hours within 12 months, replace it once 12 months at any rate.
- Replace Air/Oil Separator, separator element if spin-on type.

If it does not reach 4000 hours within 12 months, replace it once 12 months at any rate. Operating conditions determine the frequency of service (*See, Figure 22*). If you detect a differential pressure of 1,5 bar (21.7 psig) between the internal and external pressures, the separator must be replaced even if the replacement time is not over.

- Check the scavenge line, replace the check valve, if necessary clean the scavenge line.
- Check the relief valve.
- Check the condensate drain.

8.2.5 Every 8000 hours operation or 12 months

- Replace lubricant oil and oil filter. If it does not reach 8000 hours within 12 months, replace it once every 12 months regardless. Operating conditions determine the frequency of service (*See, Figure 17-18*).
- Check the inlet valve, service if necessary; replace repair kit parts.
- Check minimum pressure valve, service if necessary; replace repair kit parts.
- Check thermostatic valve operation, service if necessary; replace repair kit parts.

8.2.6 Every 16000 hours operation or 24 months

- Replace Belts
- Check solenoid valves / vacuum switch operation, replace if necessary.
- Check blow-down valve operation, replace if necessary.
- Check thermistor probes operation, replace if necessary.
- Check control valves and pressure regulator, replace if necessary.
- Check hoses, replace if necessary.

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8.3 Maintenance Instructions

8.3.1 Compressor Oil

Your compressor uses OILROT103G full synthetic compressor oil. As can be seen below, these are special lubricants produced in consideration of the compressor operation mode.

- As the oils and lubricants of different type and characteristics also differ regarding chemical composition and additives, mixing them with each other or the use of different types of oils in the compressor can cause costly damages.
- Do not add any oil additive in the compressor oil, it is done in some engine oils. As the oil used is a special recipe for this compressor, it already includes any necessary additives.
- Only use approved compressor oil, when two oils are mixed with each other; it turns and damages all the filters in the compressor. If you go on using the compressor in this condition, permanent damages will occur in the screw unit within a few days.
- To avoid any improper use, do not keep other types of oils and lubricants beside the compressor.
- Please call our service or sales department for your inquiries of to fit your specific needs and lubricants.

OILROT103G

Is a superior quality oil specially designed for screw compressors. It is the most ideal choice for use in the compressors with its extraordinary resistance with advanced water-air separation feature.

- **Oxidation Resistance:**
The air compression releases high temperatures. The oil not properly protected against oxidation is rapidly oxidized and starts accumulating some points. It in turn results in lower performance, wears and increased maintenance costs. OILROT103G prevents or minimizes the oxidation thanks to its additive contents.
- **Component Protection Against Corrosion:**
It protects the parts and components against corrosion, so that they would have a longer service life.
- **Good Air Separation:**
It rapidly separates from air to prevent cavitation, so that it enhances compression.
- **Sealing Compatibility:**
It has an excellent compliance with all the gaskets and seals used in the compressors.
- **Health and Labor Safety:**
It must be avoided particularly for the used oils and lubricants to get contact with the skin, and the affected area should be washed with abundant water and soap.

Rotary Screw Air Compressor

- **Typical Physical Data:**

OILROT103G	
ISO Viscosity	46
Kinematic Viscosity@ 40 °C cSt.	46
Viscosity Index	135
Density @ 15 °C kg/l	0,843
Yield point °C	<-45
Flashing Point °C	230

8.3.2 Oil Replacement

Replace the oil in the compressor at suitable intervals for the oil type used.

- Shut down the compressor.
- If the compressor is cold (not working), first operate it for 5 to 10 minutes to warm the oil, and then switch off it.
- Allow 3-5 minutes for the internal pressure to be discharged and the oil to settle downwards.
- Remove the oil filler plug and oil filter.
- Open the oil discharge valve under the separator tank to completely discharge the oil. Upon full discharge of the oil flow, close the oil discharge valve.
- If oil filter mounted upside-down, fill the new oil filter with clean oil and install filter. If oil filter mounted upside, install without filling oil.
- Fill the oil up to top level of your compressor while the compressor is NOT running. Allow time for the oil to settle before attempting to add.
- Replace the oil filling plug and complete all the connections.
- Operate the compressor for a few minutes to check any possible oil leaks from the internal parts and components.
- Stop the compressor, and wait for the oil to settle, and check the oil level, and complete if necessary.

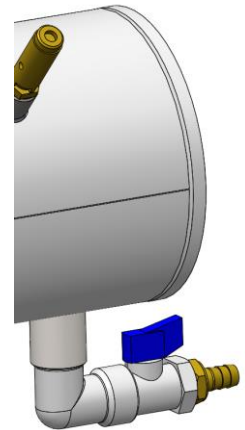


Figure 6 Oil Discharge

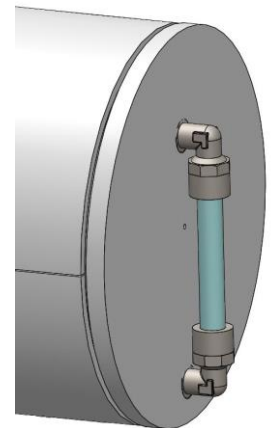


Figure 7 Oil Level

Rotary Screw Air Compressor

8.3.3 Oil Filter Replacement

Replace the oil filter at each oil replacement.

To replace the oil filter:

Stop the compressor and wait for the internal pressure to be released.

- Use the filter wrench to remove the old filter.
- Clean the surface on which the filter gasket seats.
- If oil filter mounted upside-down, fill the new filter element with oil, and slightly grease the gasket. If oil filter mounted upside, install without filling oil.
- Place the filter, and thoroughly tighten it by hand.
- Avoid any attempt to damage the filter cartridge.
- Restart the compressor and check it for leaks.

Figure 8 Oil Filter Replacement



Always use the genuine OEM spare parts to minimize the risk of damage on the oil filter element and compressor. The other brand filter elements may not have satisfactory maximum pressure values.

8.3.4 Panel Filter Replacement

- The ventilation fan of your compressor needs high amount of free air. The operation of this filter causes the compressor to take in the dust of working environment. Depending on the degree of dustiness in the operating space, the panel filter may be rapidly clogged.
- When the panel filter is clogged, the air intake is reduced, resulting in increase of the compressor operating temperature. Furthermore, as the intake speed would reduce with the filter clogging, it would be harder for the dust particles to pass through the filter.

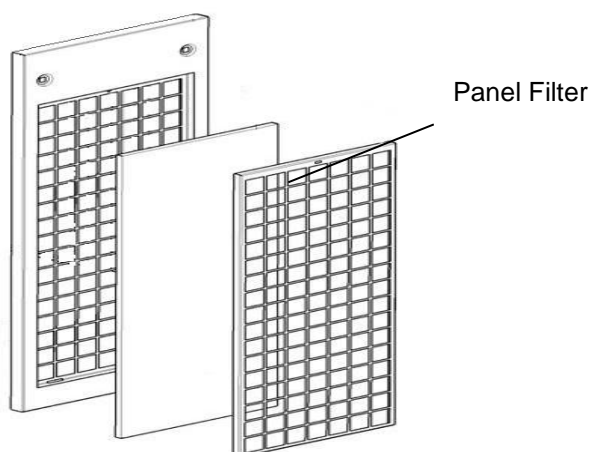


Figure 9 Panel Filter Replacement

Rotary Screw Air Compressor

- Frequently clean the panel filter. For this purpose, remove the filter cover sheet by loosening the corner bolts, and apply compressed air at the back of the filter (outwards). When the dust on filter is removed, you can use the filter again. The panel filter is characteristically oily to some extent. If you fail to clean it for long times, this oil is hardened, which makes the cleaning impossible. In such cases, replace the filter.

To replace the panel filter;

- Stop the compressor. Remove the bolt at the top of the perforated pouch holding the filter, and take the perforated pouch out.
- Replace the new filter, and screw the perforated pouch in place.

8.3.5 Air Filter Replacement

- The air filter inside the compressor aims at holding the dust before entering the compressor air filter. Apply compressed air outwardly to clean the air filter.
- In cases where the air filter is not properly cleaned, the separator filter used in separation of oil and air from each other is rapidly clogged.

The frequency of air filter replacement depends on the environmental conditions and maintenance intervals; it should be performed average once **2000 hours** or semiannually. More frequent replacements might be needed if the environment is extremely dusty. To replace the air filter;

In 7.5 - 20 HP machines;

- Pull and open the air filter lid.
- Remove the old filter.
- If necessary, wipe the housing with a lint-free cloth.
- Install the new filter.
- Place and tighten the lid.
- Restart the air filter meter.
- Replace the filter once **2000 hours**. More frequent replacements might be needed if the environment is extremely dusty.

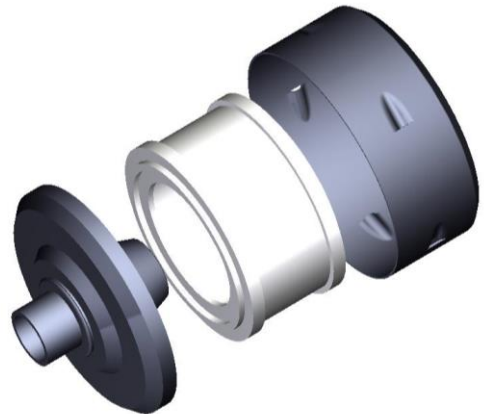


Figure 10 Air Filter Replacement

8.3.6 Replacement of Separator Element

Regularly replace the separator element once a year. It is impossible to clean this filter.

To replace the separator element:

Spin-On type separators used in power machines;

- Stop the compressor, and wait for the complete discharge of the internal pressure.
- Use the filter wrench to remove the old separator element.
- Slightly lubricate the new separator seal.
- Place the filter, and thoroughly tighten it by hand.
- Restart the compressor, and check it for leaks from the seals and other connections.

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Figure 11 Separator Element Replacement

8.3.7 Maintenance of the Cooling Radiator

- The panel filter should be routinely cleaned to keep the radiator clean.
- As the cooling air flows between the cooling radiator slices, some quantity of dust may enter between the slices and clog the radiator slices like in the panel filter. Apply (from outside to inside) pressurized air between the slices at the back of the radiator for cleaning.
- If the dust between slices meets the oil, it may be caught and hardened; in such cases, spray a non-flammable industrial cleaner between the radiator slices for cleaning.

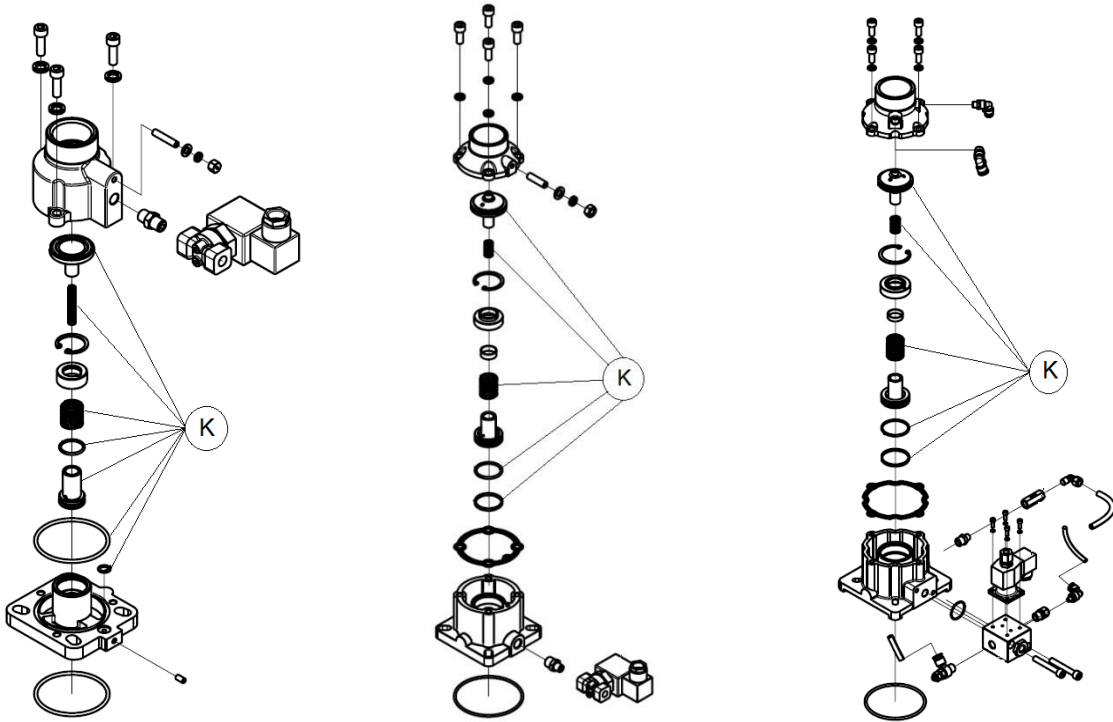
8.3.8 Maintenance of the separator oil return line (scavenge)

- While the separator filter separates the air from oil, some oil penetrates inside from the filter element. This oil is recycled into the system through the oil return line.
- When the compressor operates under load, the oil flow should be observed from the oil return line hose.
- If the small hole (orifice) in the oil return line is clogged the oil level in tank rapidly decreases, resulting in oil flow into the compressed air system.
- If you detect any oil flow during the water discharge under the air tank or the compressor oil level continuously reduces at each daily oil level checks, the scavenge line might be clogged. Stop the compressor, and remove the scavenge line, and clean the small hole (orifice) in the scavenge line by compressed air or a piece of thin wire.
- Do not enlarge the scavenge orifice diameter, or the compressor capacity reduces.

8.3.9 Intake Valve Maintenance Kit

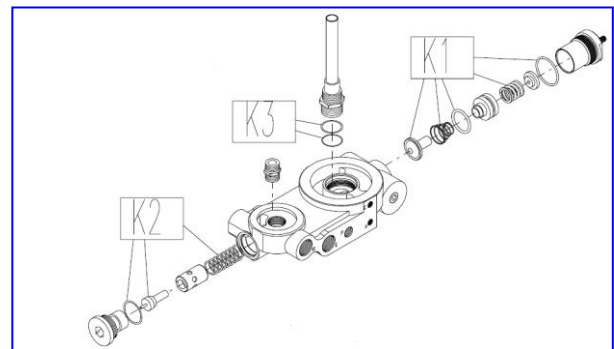
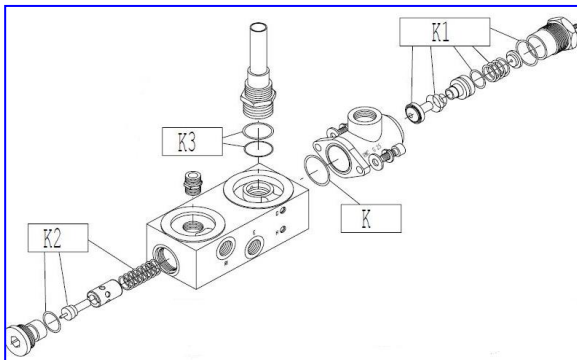
Intake Valve kit replacement is performed every **8000 hours or 12 months** whichever comes first. All parts in the kit must be replaced together. Failure to replace the intake valve repair kit on time can cause permanent damages to the compressor and downtime.

Rotary Screw Air Compressor



Intake Valve Maintenance Kit

8.3.10 Thermostatic Valve Maintenance Kit and Thermal Element Replacement



Thermostatic Valve Maintenance Kit

Thermostatic Valve combination block kit replacement is performed every **8000 hours or 12 months** whichever comes first. The kit contains minimum pressure valve repair kit (K1), thermostatic valve repair kit (K2) and separator tube O-rings. For trouble-free operation of your compressor, the kits should be replaced in a timely manner.

Thermal element (K1) replacement is performed every **8000 hours or 12 months** whichever comes first. For trouble-free operation of your compressor, the kits should be replaced in a timely manner.

Rotary Screw Air Compressor

8.3.11 Motor Maintenance

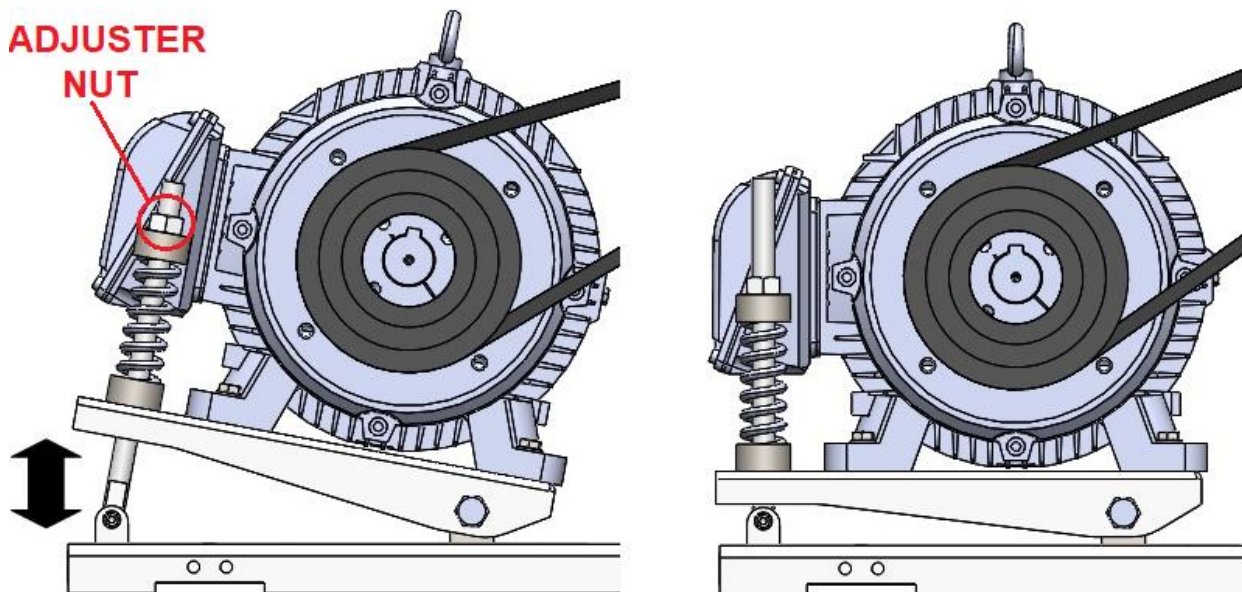
For the electric motors to have long life and operate in high performance, the following measures should be taken:

- Properly ground the compressor.
- Do not change the pressure, thermal current and time settings for the compressor operation. In cases where the preset value is exceeded, the load would be increased, so that the motor current would be higher. It may result in failure of your motor.
- Do not use any separator, oil filter and similar products beyond their useful service life. As the failure in performing maintenance works in due time would mechanically force the system, the compressor and motor would be overloaded, and their useful life would be shortened.
- Keep clean the cooling fan, ventilation ducts and fan protective cover grill.
- The altitude from sea level and ambient temperature directly affects the motor cooling coefficient. In standard conditions, your motor would properly work without any problem in 1000 meter altitude and up to the ambient temperature of 40 degrees Celsius. The loading rate should be reviewed in higher altitudes and temperatures.

<u>ALTITUDE (up to)</u>	<u>1000</u>	<u>1500</u>	<u>2000</u>	<u>2500</u>	<u>3000</u>	<u>3500</u>	<u>4000</u>	<u>meters</u>
%	100	98	95	91	87	83	78	

<u>AVG. TEMPERATURE (up to)</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>	<u>50</u>	<u>55</u>	<u>60</u>	<u>°C</u>
%	100	100	100	97	93	87	82	

8.3.12 Belt replacement and adjustment



Rotary Screw Air Compressor

Figure 12 Belt Drive System

- Stop the compressor and disconnect the compressor power supply from the main switch.
- Loosen adjuster nut to release the belt.
- Slowly turn the pulleys and remove the belts. Be careful for your fingers not to be caught between the belt and the pulley.
- Slowly turn and replace the new belts of original size.
- Take care for the belt not to overturn when being replaced.
- There are equivalent number of canals in the belt and pulley. Be sure that the belt perfectly fits on the both pulleys in the canals in opposite canals of the same level.
- Tighten the adjuster nut in balanced manner to get the belt tensioned.
- Use a proper gauge to check the front sides of the motor and screw pulley in the same direction in horizontal and vertical positions.
- Recheck all the screws and bolts for any possible loosening.
- Energize and restart the compressor. Check the belt vibrations in operating condition; if the belt vibrates while operating, it means that the belt is loose, or the pulleys are not properly aligned. Then, accurately readjust the pulley. Keep in mind that the belt life would be very short, and the compressor would likely be damaged due to overheating, vibration and similar reasons if the pulleys are not properly adjusted.
- Adjust the belt until you see that the compressor rotates in the same frequency at idle and under load.
- If the belt is left loose while it is at idle, it flaps, and this is visible. If this is the case, tighten it until it is straightened.

Rotary Screw Air Compressor

Table 8 Periodical Maintenance Schedule

MAINTENANCE TO BE PERFORMED	Maintenance Table												
	As reflected by Controller	Per oil analysis results	Daily Maintenance	Every 125 hours	2000 hours / 6 months	4000 hours / 12 months	6000 hours / 18 months	8000 hours / 12 months	16000 hours / 24 months	10000 hours / 30 months	16000 hours / 36 months	14000 hours / 42 months	30000 hours / 48 months
<i>Check Oil Level</i>			<input checked="" type="checkbox"/>										
<i>Check Discharge Pressure and Temperature</i>			<input checked="" type="checkbox"/>										
<i>Check Control Panel for Advisory Text Messages</i>			<input checked="" type="checkbox"/>										
<i>Check The Compressor Cooler, Clean If Necessary</i>				<input checked="" type="checkbox"/>									
<i>Check, Replace If Necessary; Solenoid Valve and Vacuum Switch</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check, Replace If Necessary; Thermistor Probes</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check, Replace If Necessary; Blown Down Valve</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check, replace If Necessary; Hoses</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check, replace If Necessary; Condensate Drain</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check, replace If Necessary; Pressure Transducer</i>								<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
<i>Check Loose Power Connection</i>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Check Belt Tension, replace if necessary</i>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Clean The Compressor Panel Filter</i>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Clean The Control Box Panel Filter</i>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Air / Oil Leaks or Damages</i>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Replace Oil Filter Element</i>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Replace Air Filter Element</i>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Replace Panel Filter Element</i>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Replace Air/Oil Separator (Spin-On Type)</i>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<i>Replace Belts</i>									<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
<i>Oil Replacement OILROT103G</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
<i>Oil Sample</i>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Motor Greasing</i>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Check Pressure Relief Valve</i>								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<i>Multiblock Service Kit Replacement</i>								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<i>Intake Valve Service Kit Replacement</i>								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<i>Line Filter Kit Replacement (At least once per year)</i>								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<i>Minimum Pressure Rebuild Kit</i>							<input checked="" type="checkbox"/>						
<i>Suction Valve Rebuild Kit</i>							<input checked="" type="checkbox"/>						

