

**⚠ WARNING**

PLEASE READ THE ENTIRE CONTENTS OF THIS MANUAL PRIOR TO INSTALLATION AND OPERATION. BY PROCEEDING YOU AGREE THAT YOU FULLY UNDERSTAND AND COMPREHEND THE FULL CONTENTS OF THIS MANUAL. FORWARD THIS MANUAL TO ALL OPERATORS. FAILURE TO OPERATE THIS EQUIPMENT AS DIRECTED MAY CAUSE INJURY OR DEATH.

REV A 03-21-16

p/n 5900177

**INSTALLATION AND OPERATION MANUAL**

**ROTARY-SCREW AIR COMPRESSOR 7.5 HP**

**MODEL:  
RS7580H603**



**READ FIRST**



Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.



**⚠ CAUTION**

The safe operating temperature range for this product is 41° F - 104° F

Keep this operation manual near the machine at all times. Make sure that ALL USERS read this manual .

**SHIPPING DAMAGE CLAIMS**

When this equipment is shipped, title passes to the purchaser upon receipt from the carrier. Consequently, claims for the material damaged in shipment must be made by the purchaser against the transportation company at the time shipment is received.

**BE SAFE**

Your new Compressor was designed and built with safety in mind. However, your overall safety can be increased by proper training and thoughtful operation of this equipment. **DO NOT** operate or repair this equipment without reading this manual and the important safety instructions shown inside.



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**NOTE:**

Every effort has been taken to ensure complete and accurate instructions have been included in this manual, however, possible product updates, revisions and or changes may have occurred since this printing. BendPak Ranger reserves the right to change specifications without incurring any obligation for equipment previously or subsequently sold.

Not responsible for typographical errors.

# SECTION 1

Our Screw Compressor units are intended to provide compressed air to power pneumatic tools, operate spray equipment and supply air for pneumatic valves and actuators. A small amount of oil carryover is present in the compressed air stream. The compressed air has a final oil level of < 3ppm. Applications requiring higher levels of air free of oil vapor should have the appropriate filter installed. The Screw compressor units are to be mounted per the instructions provided on a solid floor. Any other use of these units will void the warranty and the manufacturer will not be responsible for problems or damages resulting from such misuse.

## SAFETY GUIDELINES

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.



Watch for this symbol: It Means: Immediate hazards which will result in severe personal injury or death.



Watch for this symbol: It Means: Hazards or unsafe practices which could result in severe personal injury or death.



Watch for this symbol: It Means: Hazards or unsafe practices which may result in minor personal injury or product or property damage.

## INTRODUCTION

1. Carefully remove the crating and packing materials.



Be careful when cutting steel banding material as items may become loose and fall causing personal harm or injury.

2. Check the voltage, phase and proper amperage requirements for the motor shown on the motor plate. Wiring should be performed by a certified electrician only.

3. Confirm voltage before connecting power to your machine or serious damage to the motor/electronics will result.

## BREATHABLE AIR WARNING

This compressor/pump is NOT equipped and should NOT be used "as is" to supply breathing quality air. For any application of air for human consumption, you must fit the air compressor/pump with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification G 7.1 - 1966, OSHA 29 CFR 1910. 134, and/or Canadian Standards Associations (CSA).

## DISCLAIMER OF WARRANTIES

In the event the compressor is used for the purpose of breathing air application and proper in-line safety and alarm equipment is not simultaneously used, existing warranties are void, and the company disclaims any liability whatsoever for any loss, personal injury or damage!

## UNPACKING

After unpacking the unit, inspect carefully for any damage that may have occurred during transit. Make sure to tighten fittings, bolts, etc., before putting unit into service.



Do not operate unit if damaged during shipping, handling or use. Damage may result in bursting and cause injury or property damage.



Failure to follow danger, warning, and caution instructions may lead to serious personal injury or death to operator or bystander or damage to property. Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.

For additional copies or further information, contact:

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## SECTION 2

### GENERAL SAFETY PRECAUTIONS

Since the air compressor and other components (material pump, spray guns, filters, lubricators, hoses, etc.) may be under high pressure and be subject to explosions, the following safety precautions must be observed at all times:

1. **READ AND UNDERSTAND** all safety warning procedures before installation and operation.
2. **KEEP HANDS AND FEET CLEAR.** Remove hands and feet from any moving parts.
3. **KEEP WORK AREA CLEAN.** Cluttered work areas invite injuries.
4. Consider work area environment. Do not expose equipment to rain. **DO NOT** use in damp or wet locations. Keep area well lighted.
5. **ONLY TRAINED OPERATORS** should operate this equipment. All non-trained personnel should be kept away from work area. Never let non-trained personnel come in contact with, or operate machine.
6. **USE MACHINE CORRECTLY.** Use machine in the proper manner. Never use adapters other than what is approved by the manufacturer.
7. **DO NOT** override or disable safety valves and/or devices.

8. **NEVER** operate compressor without a belt guard or Side covers in place This unit can start automatically without warning. Personal injury or property damage could occur from contact with moving parts.



9. **DRESS PROPERLY.** Non-skid steel-toe footwear is recommended when operating machine.

10. **GUARD AGAINST ELECTRIC SHOCK.** This equipment must be grounded while in use to protect the operator from electric shock. Never connect the green power cord wire to a live terminal. This is for ground only. Follow all local electrical and safety codes as well as the United States National Electrical Codes (NEC) and Occupational Safety and Health Act (OSHA).



11. The motor on this machine contains high voltage. Disconnect power at the receptacle before performing any electrical repairs. Secure plug so that it cannot be accidentally plugged in during service.

12. **RISK OF EXPLOSION.** This equipment has internal arcing or sparking parts which should not be exposed to flammable vapors. This machine should not be located in a recessed area or below floor level.



13. Tanks rust from moisture build-up, which weakens the tank. Make sure to drain tank regularly and inspect periodically for unsafe conditions such as rust formation and corrosion.

14. **STAY ALERT.** Watch what you are doing. Use common sense. Be aware.

15. **CHECK FOR DAMAGED PARTS.** Check for condition of all moving parts, breakage of parts or any condition that may affect the machines operation. Do not use if any component is broken or damaged.

16. An ASME code safety relief valve with a setting no higher than the Maximum Allowable Working Pressure (MAWP) of the tank **MUST** remain installed on this compressor to protect the pressurized components from bursting. Maximum operating pressure is 150 psi. Do not operate with pressure switch or pilot valves set higher than 150 psi. Never attempt to adjust ASME safety valve. Keep safety valve free from paint and other accumulations.

17. **NEVER** remove safety related components or device from the machine. Do not use if safety related components are damaged or missing.

18. Before each use, inspect compressed air system and electrical components for signs of damage, deterioration, weakness or leakage. Repair or replace defective items before using.

19. Check all fasteners at frequent intervals for proper tightness.

20. Compressor parts may be hot even if the unit is stopped. Keep fingers away from a running compressor; fast moving and hot parts will cause injury and/or burns.



21. If the equipment should start to vibrate abnormally, **STOP** the engine/motor and check immediately for the cause. Vibration is generally an indication of trouble.

22. To reduce fire hazard, keep engine/motor exterior free of oil, solvent, or excessive grease.

22. Never attempt to repair or modify a tank. Welding, drilling or any other modification will weaken the tank resulting in damage from rupture or explosion. Always replace worn, cracked or damaged tanks. Drain liquid from tank daily.

## SPRAYING PRECAUTIONS

1. Fast moving air will stir up dust and debris which may be harmful. Release air slowly when draining moisture or depressurizing the compressor system.
2. Do not spray flammable materials in vicinity of open flame or near ignition sources including the compressor unit. Do not smoke when spraying paint, insecticides, or other flammable substances.
3. Use a face mask/respirator when spraying and spray in a well ventilated area to prevent health and fire hazards.
4. Do not direct paint or other sprayed material at the compressor. Locate compressor as far away from the spraying area as possible to minimize over spray accumulation on the compressor.
5. When spraying or cleaning with solvents or toxic chemicals, follow the instructions provided by the chemical manufacturer.



## SECTION 3

### GENERAL OVERVIEW

The BendPak Hush-Quiet™ RS7580H603 Rotary Screw Air Compressor produces well over twice the CFM of conventional, reciprocating piston compressors.

The RS7580H603 is engineered for high performance, efficiency, reliability and blessed silence to meet the excessive demands of high-volume automotive shops and dealerships like yours.

### WORKING PRINCIPLES

**COMPRESSION:** Air is drawn through the Air Intake Filter and Intake Control Valve then, the twin rotary screws compress the air smoothly and efficiently. At the same time, oil is injected into the compressing cavity to cool and lubricate the screw assembly.

**OIL SEPARATION:** The compressed air and oil mixture is then run through the air and oil separation cartridge. The majority of the oil is separated out from the compressed air by gravity and centrifugal force. The remaining oil mist is removed from the air oil mixture by

passing the air through the Separation Cartridge core. The compressed air has a final oil level of < 3ppm.

The oil is then filtered and returned to the reciprocating screw assembly for reuse via an oil return tube fitted with a valve assembly to limit the loss of pressure in the compressed air line.

**COOLING:** After the oil is separated from the compressed air it is routed to the after cooler. The compressed air temperature is lowered by 7 -10°C/ 4-7°F above the ambient temperature. A minimum pressure valve is used to guarantee that at startup there is always the minimum pressure needed to maintain oil pressure for operation. A check valve prevents the compressed, cooled, air from flowing backwards through the separation element.

### SYSTEM CONTROLS

The goal of the control system is the regulation of the air intake during all phases of operation and startup. The Control System is comprised of intake valve, work piston, magnetic valve and pressure gauge.

**STARTUP:** The spring loaded intake valve requires minimum pressure to open and generate enough pressure to get the lubricating oil flowing to the reciprocating screws at startup.

**LOAD:** At load the vacuum within the compressor keeps the intake valve open, and the system pressure increases.

**FULL LOAD:** When the oil separation pressure chamber reaches 0.4MPa the pressure valve opens to allow the compressed air to flow out.

**NO LOAD:** When the pressure of the outflow line reaches the desired rated pressure, the pressure switch opens the magnetic valve and the system pressure drops to the minimum required to maintain a proper flow of the lubricating oil.



**CONDENSATION:** At lower operating temperatures the amount of water that can condense into the oil is higher. The Compressor is equipped with a thermostatic valve set to 70° C (158°F), oil will not pass through the oil cooler until it reaches the set temperature of 70° C /158°F.

## SECTION 4 INSTALLATION AND INSPECTION BEFORE OPERATION

The Compressor is best operated in a clean, temperature controlled environment. If the compressor is going to be operated with an air intake temperature below 5°C / 41°F an anti-condensation apparatus is required and the oil separation element should be heated.

**OVERHEATING:** If the ambient temperature is above 40°C, / 104°F or the compressor is operating in an area near a heat source, the compressors cooling capacity may not be adequate enough to prevent damage to the compressor. In that case, the intake air may need to be cooled or plumbed to and draw air from a filtered outside air source.

If the work load is consistently below 100% of the compressor's rated full load, a higher ambient operating pressure temperature may be satisfactory. The maximum internal working temperature is 105°C / 221 °F, operating above this temperature will cause the compressor to stop working and may cause permanent damage.

**DISCHARGE TEMPERATURE:** Discharge temperature is measured at the vent frame end of the compressor. The Discharge temperature will vary according to operating and environmental conditions, temperature, load percentage, the cleanliness of the oil, cleanliness of the intake filter and the cleanliness of the oil filter.

The normal discharge temperature is between 70°C and 90°C / 158°- 194°F When the compressor starts up from a cold condition, the discharge temperature will quickly rise to 85°C / 185°F, then the thermostatic valve will open and close to regulate the discharge temperature.

**LUBRICATION:** PowerCool is a powerful synthetic lubricant that's designed to help rotary screw air compressors reach maximum performance. The PowerCool unique \ formulation has a 2-year / 8,000-hour useful lifespan to save you money otherwise spent on disposal fees.

Other lubricants can require changing up to 8 times as often as PowerCool. The carryover is up to 75% lower than mineral oils and PAOs, which means less fluid for makeup and reduced contamination. All this results in superior compressor performance, which in turn leads to lower costs from excellent cooling and superior efficiency.

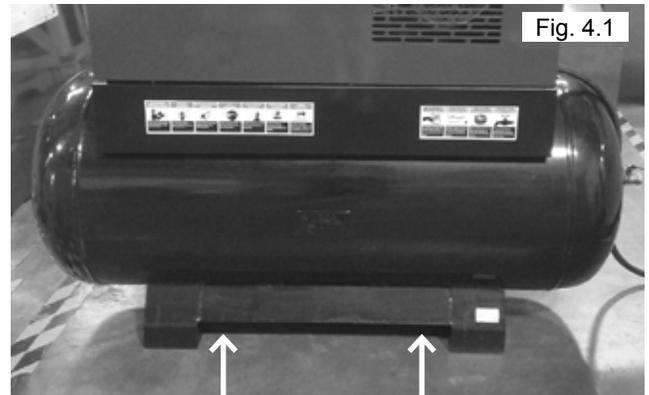
### LOCATION REQUIREMENTS:



Disconnect, tag and lock out power source then release all pressure from the system before attempting to install, service, relocate or perform any maintenance.



**Do not** lift unit by attaching any lifting device onto the outside case. **DO NOT** lift or move unit without appropriately rated forklift, pallet jack or other lifting device. There are slots in the base frame of the compressor for the forklift or pallet jack forks. (See Fig. 4.1)



**Never** use the wood shipping pallet for mounting the compressor.

Install and operate unit at least 39" / 1m from any obstructions in a clean, well ventilated area. This will ensure an unobstructed flow of air to cool compressor and allow adequate space for maintenance. The surrounding air temperature should not exceed 100° F / 38° C. Do not locate the compressor air inlet near steam, paint spray, sandblast areas or any other source of contamination.



### NOTE:

If compressor operates in a hot, moist environment, supply compressor pump with clean, dry outside air. Supply air should be piped in from external sources.

The compressor should be located in a clean, dust free, well ventilated location.



**THE AIR NEEDS TO BE FREE OF TOXIC FUMES OR GASES, INFLAMMABLE GAS OR EXPLOSIVE GAS. DO NOT STORE TOXIC, VOLATILE, CORROSIVE OR FLAMMABLE AGENTS NEAR THE COMPRESSOR.**



**THE COMPRESSOR SHOULD NOT BE LOCATED OUTDOORS. THE AIR INTAKE OF ANY BUILDING OR ENCLOSED STRUCTURE MUST BE FILTERED TO HELP ELIMINATE THE DUST IN THE AIR.**

Ambient operating temperature should be greater than 41° F / 5° C to allow for the minimum required oil lubrication.



Compressor should be located on a solid level surface.

The Compressor location should be well ventilated and precautions should be taken to exhaust the warm exhaust air outside of the compressor building and or prevent the warm exhaust air from being drawn into the air intake or increasing the ambient temperature of the compressor building or room.

## SECTION 5

### REQUIREMENTS FOR AIR PIPING



**NEVER USE PLASTIC (PVC) PIPE FOR COMPRESSED AIR. SERIOUS INJURY OR DEATH COULD RESULT.**

Any tube, pipe or hose connected to the unit must be able to withstand the temperature generated and retain the pressure. All pressurized components of the air system, tube, pipe or hose must have a pressure rating higher than or equal to 200 psi or bursting could result and injury occur.

Connect the piping system to any accumulation tank using the same size fitting as the discharge port.

Pipe thread lubricant must be used on all male pipe threads, and all joints are to be made up tight, since small leaks in the piping system are the largest single cause of high operating costs. All piping should be sloped to an accessible drain point and all outlets should be taken off from the top of the main distribution air line so that moisture cannot enter the outlet.

### INSTALLING A SHUT-OFF VALVE

A shut-off valve should be installed on the discharge port of the Compressor to control the air flow and isolate the components for maintenance. The valve should be located between the tank and the piping system.

When creating a permanently installed system to distribute compressed air, find the total length of the system and select pipe size from the chart.

<b>MINIMUM PIPE SIZE FOR COMPRESSED AIR LINE</b>				
<b>CFM</b>	<b>Length Of Piping System</b>			
	<b>25'</b>	<b>50'</b>	<b>100'</b>	<b>250'</b>
10	1/2"	1/2"	3/4"	3/4"
20	3/4	3/4	3/4	1
40	3/4	1	1	1
60	3/4	1	1	1
100	1	1	1	1 1/4

Bury underground lines below the frost line and avoid pockets where condensation can gather and freeze.

Apply air pressure to the piping installation and make sure all joints are free from leaks BEFORE underground lines are covered. Before putting the compressor into service, find and repair all leaks in the piping, fittings and connections.

The diameter of the discharge pipe should be a least the same as that of the compressor's output pipe.

All pipe and connectors should be able to bear the rated pressure and be rated for compressed air delivery and comply with all local building and safety codes.

The configuration should meet the requirements for the velocity of compressed air.

The pressure drop of the pipeline must exceed the set pressure by 5% or more.

Use the minimum amount of bends to ensure the smoothest airflow as possible. If the pipeline run is long, the diameter of the pipe should be increased.

Prevent any condensation from flowing into any equipment by installing the pipeline run with a minimum slope of 1-2° with drain valves located at the low spots. Slope piping so that it drains towards a drop leg or moisture trap away from the compressor.

Consideration of future emergencies, temporary compressor and maintenance needs of equipment should be incorporated into the pipeline design and may include bypass lines, shut off valves, air take off locations, strain on the piping due to dead weight of the pipe, expansion and contraction of the pipe, strains for internal pressure.

An air oil separator should be installed at the head of the pipeline.

A one way valve is mounted on the exit line of the compressor.

The compressor has integrated anti vibration devices and does not have any support for the air pipeline. All external piping requires approved support systems. All piping should be connected to the compressor out line in such a manner as to keep any condensation from running back towards the compressor.

When an air drier is installed in the pipeline, an air tank/reservoir is recommended as the compressed air temperature will be lowered prior to entering the drying system and therefore increase the efficiency and lower the energy use of the drying system.



A flexible hose or coupling should be installed between the compressor and the service piping/ and or the tank; and the tank and the service piping.



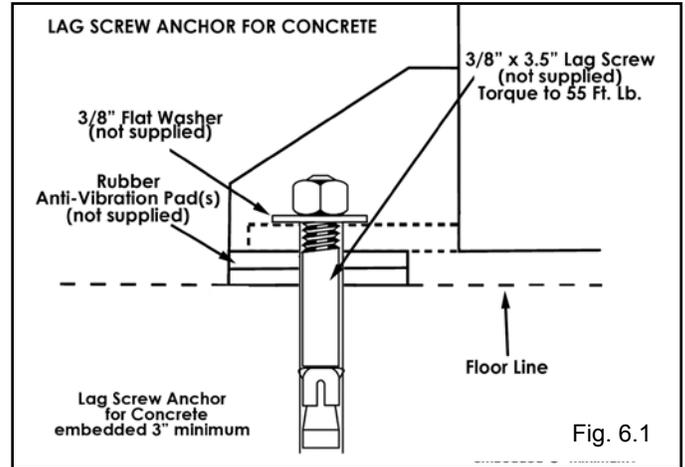
Failure to properly install the tank can lead to cracks at the welded joints and possible bursting.

## SECTION 6

### FLOOR MOUNTING

The compressor should be bolted onto a flat, even, concrete floor or on a separate concrete foundation.

If installing the optional Air Tank, Anti-vibration pads should be used between the tank legs and the floor. When using anti-vibration pads, do not draw bolts tight. Allow the pads to absorb vibrations. (See Fig. 6.1)



## SECTION 7

### ELECTRICAL CONNECTIONS



**DO NOT PERFORM ANY MAINTENANCE OR INSTALLATION OF ANY COMPONENTS WITHOUT FIRST ENSURING THAT ELECTRICAL POWER HAS BEEN DISCONNECTED AT THE SOURCE OR PANEL AND CANNOT BE RE-ENERGIZED UNTIL ALL MAINTENANCE AND/OR INSTALLATION PROCEDURES ARE COMPLETED.**



**ALL WIRING AND ELECTRICAL CONNECTIONS MUST BE PERFORMED BY A QUALIFIED ELECTRICIAN. INSTALLATION MUST BE IN ACCORDANCE WITH LOCAL AND NATIONAL CODES.**

Overheating, short circuiting and fire damage will result from inadequate wiring. Wiring must be installed in accordance with National Electrical Code and local codes and standards that have been set up covering electrical apparatus and wiring.

**POWER:** Standard Requirements; 230V, 3Phase, 60HZ, Grounded.

Be certain that adequate wire sizes are used, and that:

1. Service is of adequate ampere rating.
2. The supply line has the same electrical characteristics (voltage, cycles and phase) as the motor.
3. The line wire is the proper size and that no other equipment is operated from the same line. The chart below gives minimum recommended wire sizes for compressor installations.

<b>MINIMUM WIRE SIZE USE 75°C COPPER WIRE</b>				
HP	Amps	Single	Three Phase	
		Phase 230V	208/230V	460/575V
SPL	up to 22.0	10 AWG		
5.0		8 AWG	12 AWG	14 AWG
7.5		8 AWG	10 AWG	12 AWG
10.0		N/A	8 AWG	12 AWG
15.0		N/A	6 AWG	10 AWG
25.0		N/A	3 AWG	8 AWG

Recommended wire sizes may be larger than the minimum set up by local ordinances. If so, the larger size wire should be used to prevent excessive line voltage drop. The additional wire cost is very small compared with the cost of repairing or replacing a motor electrically "starved" by the use of supply wires which are too small.

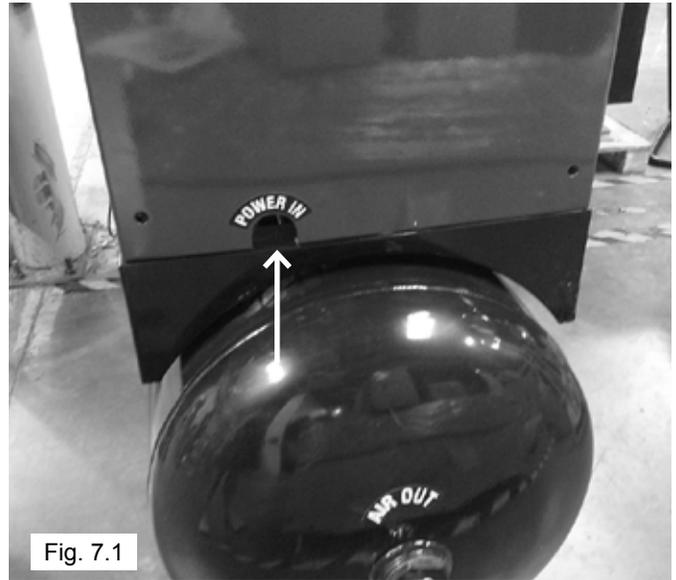
Improperly grounded electrical components are shock hazards. Make sure all the components are properly grounded to prevent death or serious injury.



**This product must be grounded.** Grounding reduces the risk of electrical shock by providing an escape wire for the electric current if short circuit occurs. This product must be installed and operated with a power cord or cable that has a grounding wire.



The base of the unit has holes in it for routing of the power cord. (See Fig. 7.1)



1. Remove the Access panel on the Power Control Box Side of the Compressor. (See Fig. 7.2)



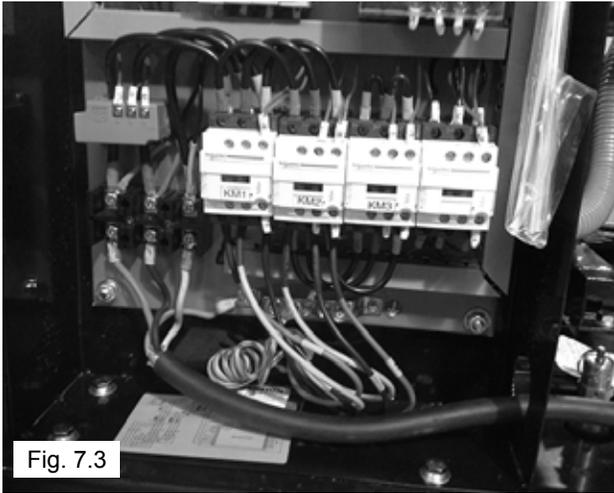


Fig. 7.3

2. Route the power cable through the bottom of the Power Control Box and to the Terminal Block as shown below. (See Fig. 7.3 )

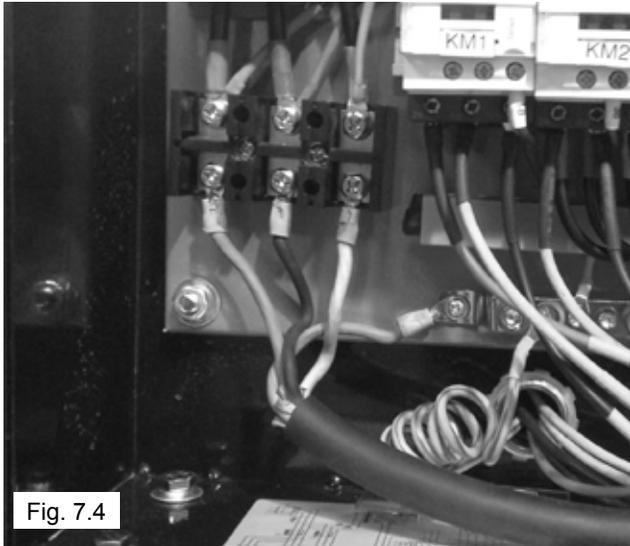


Fig. 7.4

3. Connect the Power Source Wires to the incoming Power Terminal Block. (See Fig. 7.4)

### DIRECTION OF MOTOR ROTATION



**MOTOR ROTATION:** The 3 Phase power must be connected properly to the compressor to ensure the motor is rotating in the right direction. The compressor controller is fitted with phase detection to prevent damage to the compressor. In the event of miss-connection of the three phase power.

1. If the motor does not start upon first startup, then likely the sequence of the three phase wiring is incorrect. Check the Failure history as outlined in the Trouble Shooting to confirm phase problem.

2. Reverse the two phases of power input. **DO NOT** alter the wiring of the motor or starter.

### GUARDING



ALL MAINTENANCE PANELS MUST BE INSTALLED DURING NORMAL OPERATION. ALL MOVING PARTS MUST BE GUARDED. ALL ELECTRICAL COVERS MUST BE INSTALLED BEFORE TURNING ON THE POWER.

## SECTION 8

### PRE-OPERATION INSPECTION



DO NOT PERFORM ANY MAINTENANCE OR INSTALLATION OF ANY COMPONENTS WITHOUT FIRST ENSURING THAT ELECTRICAL POWER HAS BEEN DISCONNECTED AT THE SOURCE OR PANEL AND CANNOT BE RE-ENERGIZED UNTIL ALL MAINTENANCE AND/OR INSTALLATION PROCEDURES ARE COMPLETED.



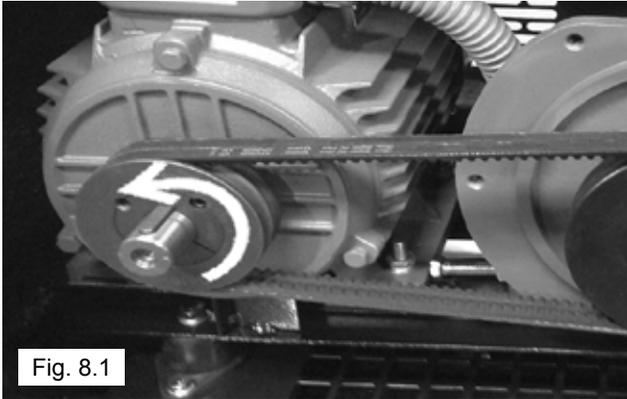
Depressurize before servicing, failure to do so can cause severe injury or death.

# ! WARNING

**LOCK OUT SOURCE AND RELIEVE PRESSURE BEFORE SERVICING.**

## INSPECTION OF THE SCREW AIR END

1. Rotate the Pulley on the Screw Air End by hand a couple of complete rotations counterclockwise to ensure the Air End is not locked and is pre-lubricated. (See Fig. 8.1)

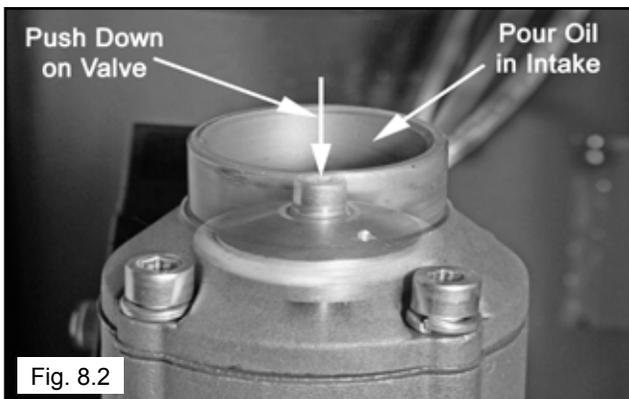


# ! CAUTION

**IF COMPRESSOR HAS NOT BEEN IN USE FOR MORE THAN TWO MONTHS OR STORED FOR A LONG PERIOD OF TIME, PERFORM THE FOLLOWING STEPS:**

Refer to Maintenance, Section 12 for details on Intake Valve Assembly.

1. Remove the Air Intake Filter Housing and Filter.
2. Open the Intake Valve by pressing down gently on top of the Intake Valve to open and hold open. (See Fig. 8.2)



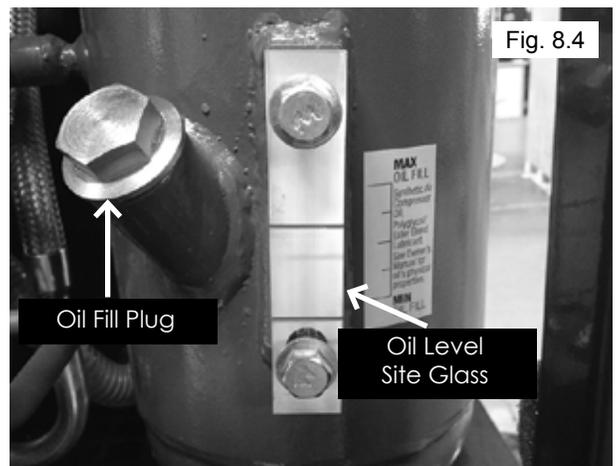
3. Then pour .5 quart (.5 litre) of lubricating oil into Air End through the Intake Valve.
4. Rotate the Pulley on the Screw Air End by hand a couple of complete rotations counterclockwise to ensure the Air End is not locked and lubricated properly. (See Fig. 8.1)
5. Make sure all oil enters Air End.
6. Make sure Intake Valve closes when released.

## OIL LEVEL INSPECTION

1. Remove the Access panel on the Oil Separator Side of the Compressor. (See Fig. 8.3)



2. The oil level must be above the upper red line after the compressor is off has been stopped for thirty minutes. The oil level when the compressor is running must be between the upper and lower red line indicated on the Oil Level Site glass. (See Fig. 8.4 & 8.5)



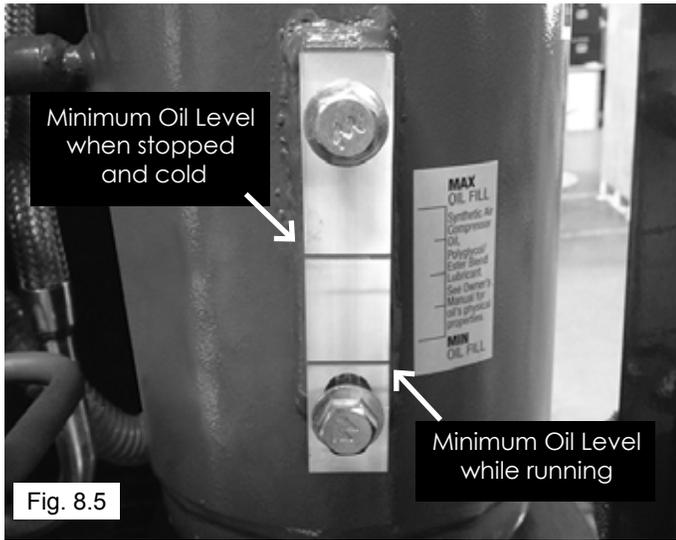


Fig. 8.5

3. Fill with PowerCool Synthetic Air Compressor Lubricant if necessary and inspect the O-Ring on the Oil Fill Plug before tightening.



DO NOT OVER FILL. OVER FILLING CAN CAUSE A HIGH LEVEL OF OIL IN THE COMPRESSED AIR. DO NOT UNDER FILL. UNDER FILLING CAN CAUSE OVER HEATING AND DAMAGE.

## TRANSMISSION INSPECTION:

### Belt Inspection.

1. Remove the Access panel on the right side Drive Belt Side of the Compressor.
2. Check that all drive belts are in the pulley grooves. Adjust the tension of belts through the adjusting Bolt on motor. (See Fig. 8.6)

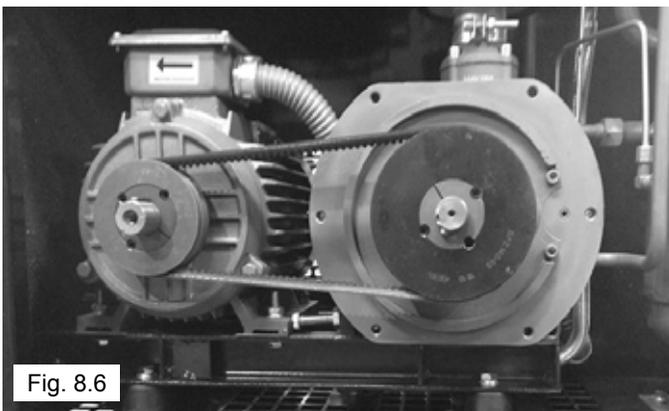


Fig. 8.6

(See Belt maintenance on page 28 for Belt adjustment details.)

## STOP VALVE INSPECTION

Check if the stop valve is open.

## SECTION 9 DAILY OPERATION



IN THE EVENT OF ANY TROUBLE OR OPERATION PROBLEM NOT DETECTED AND TERMINATED BY THE CONTROL SOFTWARE. THE COMPRESSOR CAN BE SHUT DOWN BY PRESSING THE EMERGENCY STOP BUTTON.

## EMERGENCY STOP

1. To immediately stop the Compressor press the Emergency Stop Button to cut off the power supply of the controller and contactor power. (See Fig. 9.1)

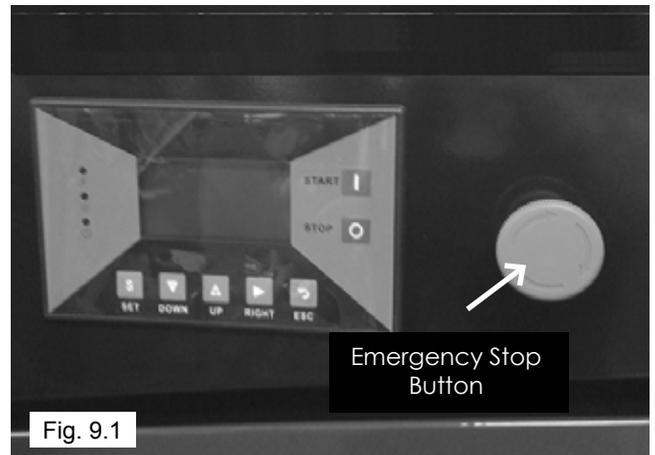


Fig. 9.1

2. To Reset Emergency Stop; Twist Emergency Stop Button clockwise, The Emergency Stop Button will pop back out. The Compressor cannot be restarted until the failure has been cleared and the Restart Delay time (90 seconds) has expired.
3. The Compressor cannot be restarted until the failure has been cleared and the Restart Delay time (90 seconds default) has expired.

## DAILY STARTUP PROCEDURE:

Before start up:

- a) Check the operating button to see if it is in normal condition.
- b) Make sure there are no abnormal noise vibration or oil leakage.
- c) Check the instruments of pressure gauge, oil thermometer, ammeter, indicator light, etc are in

normal condition.

- d) Check the oil return pipe to see if it is in normal condition.
- e) Check the pressure of the automatic stop.
- f) Check the unloading valve to see if it is deflating or not when the machine stopped. Check also the exhaust temperature.
- g) Check the voltage and electric current to see if they are in normal condition.

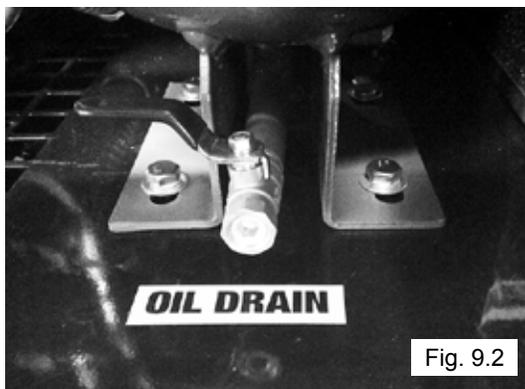


- h) Check, clean and replace the safety valve if necessary.
- i) Record the voltage, current, air pressure, exhaust temperature and oil level every day and take notes of the working time, maintenance status and abnormalities per shift.

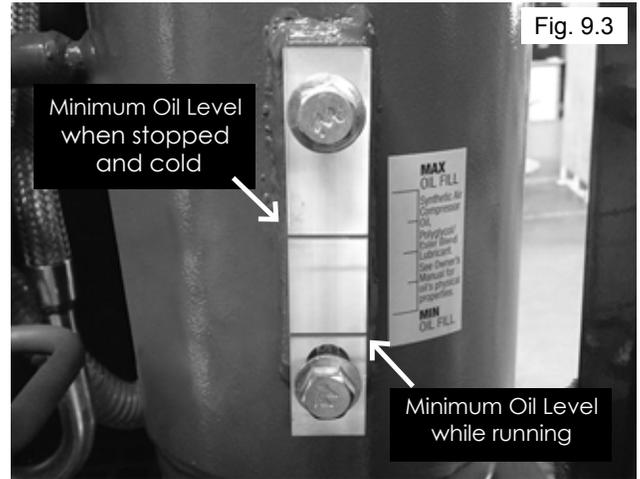
### ATTENTION:

**Don't open oil drain ball valve until five minutes after stopping the compressor.**

- 1. Open the oil drain valve slightly and drain off any water from the bottom of the oil Tank. Drain fluid until water stops flowing and only oil flows. (See Fig. 9.2 )



- 2. The oil level must be above the upper red line after the compressor is shut off and has been stopped for thirty minutes. The oil level when the compressor is running must be between the upper and lower red line indicated on the Oil Level Site Glass. (See Fig. 9.3 )



- 3. Fill with PowerCool Synthetic Air Compressor Lubricant if necessary and inspect the O-Ring on the Oil Fill Plug before tightening.

### START UP PROCEDURE:

- 1. Make sure any installed valves are open.
- 2. Turn on the Power; The LCD Display will show a welcoming message and then the Display will indicate Compressor's **STATE: NORMAL STOP**.



- 3. Press the **ON** Button; The compressor will begin the Delayed Start countdown, once the delayed time is reached the Compressor will start up automatically. If necessary pressing the **STOP** Button during the delayed Start Countdown will Stop the delayed start Countdown and place the Compressor in the **STATE: NORMAL STOP**. (The compressor will not be able to be restarted for at least ninety seconds (default) after it has been stopped for any reason.)
- 4. After starting up: Watch the pressure on the control panel. Check operating temperature and the general conditions inside the compressor.

The Compressor will run in the **STATE: AUTO LOADING** until the preset system pressure is reached. The

Compressor will continue to run in the **STATE: AUTO UNLOADING** until the system pressure falls below the preset minimum pressure.

The Compressor maintains the preset system pressure by moving from the **STATE: AUTO LOADING**, pressuring the system, to the **STATE: AUTO UNLOADING**; not building any pressure.

Use the monitoring features to monitor pressure, power and other compressor running values to ensure the Compressor is operating normally. See The Parameter Section of this Manual for details on setting pressures and monitoring running parameters.

The Compressor should run smoothly with no excess vibrations.

### ATTENTION:

**Do not restart compressor up within 90 Seconds after compressor has been stopped. Release all pressure within AIR OIL separation element before restarting. Avoid compressor start up when there is back pressure in the system.**

### SHUT DOWN PROCEDURE:

1. Press the **OFF** button, the compressor will move to **STATE: READY STOP**. The Controller will countdown the Remaining delay until the Compressor will stop and then shut down the Compressor when the set time is reached. If the compressor has begun the stop sequence, Press the Emergency Stop Button if you need to stop the compressor immediately.



**DO NOT ASSUME THAT THE COMPRESSOR CAN NOT STARTUP IF THE MOTOR IS NOT RUNNING. CONFIRM THE STATE OF THE COMPRESSOR BEFORE PERFORMING ANY OPERATION, INSPECTION OR WORK NEAR THE MOTOR AND ENSURE LOCK OUT AND TAG OUT PROCEDURES HAVE BEEN PERFORMED.**



**IN THE EVENT OF ANY TROUBLE OR OPERATION PROBLEM NOT TERMINATED BY THE CONTROL SOFTWARE. THE COMPRESSOR CAN BE SHUT DOWN BY PRESSING THE EMERGENCY STOP BUTTON.**

## SECTION 10

### LCD CONTROLLER PANEL OPERATION

The LCD CONTROLLER panel is used to monitor and adjust the Parameters of the Screw Compressor.

The Parameters are set at the factory and it is recommended to leave most of the settings at their factory default values.

The values most likely to require adjustment by the end user are described below.

The Complete Menu Hierarchy is available at the end of this section.

The Factory Parameters and some of the Customer Parameters should only be adjusted by a factory trained service Technician.

### LCD CONTROLLER PANEL OVERVIEW

#### BUTTON DESCRIPTION



**START** Start Button; Press this button to start the Compressor.



**STOP** Stop Button: Press this button to stop the Compressor.



**Set Button:** Press this button to confirm the input data to be saved after modification of the data.



**Down Button:** Press this button to lower the value during data modification. Press this button to select a menu option during menu selection.



**Up Button:** Press this button to raise the value during data manipulation. Press this button to select a menu option during menu selection.



**Right Button:** This button can be used as cursor during the data modification and as confirm button during menu selection.



**Escape Button:** Press this button to return to the menu operation or to previous page.

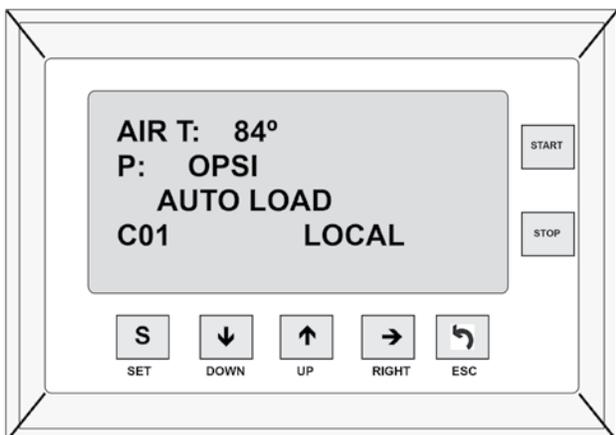
## STATUS DISPLAY AND OPERATION:

1. When the unit is powered up, the Display interface will display the welcome screen as follows:

AFTER FIVE SECONDS THE DISPLAY WILL CHANGE:



**AIR T:** Indicates air temp in degrees Celsius.  
**STATE:** Indicates Current Motor State.  
**P:** Indicates PSI  
**ADD0001:** Indicates Network Address.  
**0 S:** Indicates number of seconds remaining if in a "DELAY STATE"  
**NEAR:** Indicates Local Control (NEAR) or



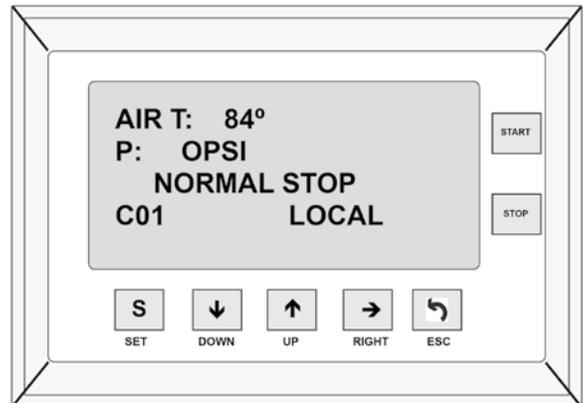
Remote Control. (Far)

## RUN PARAMETER

Use the RUN PARAMETER menu to view or monitor the compressor settings while running in any state. The settings cannot be changed or modified in this view but can be changed from other menus.

To view the RUN PARAMETER: MOTORS CURRENT:

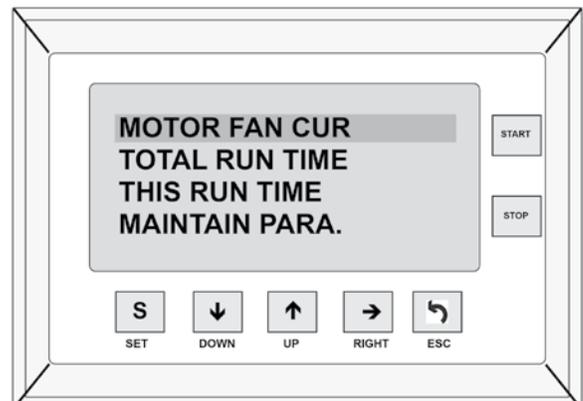
1. From the Main screen:
2. Press **↓** Enter to access the Main Menu Selection.



3. Press **↓** or **↑** to move the black cursor over the menu "RUN PARAMETER" and then press **→**.
4. Press **↓** or **↑** to highlight MOTORS CURRENT.



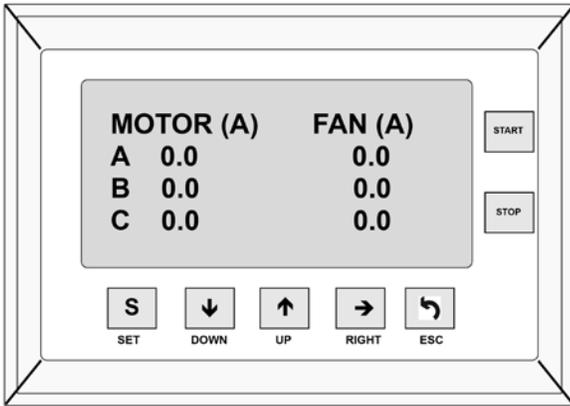
5. Press **→**.



5. The display will show the amount of AMPS drawn

per leg for the HOST (Main Motor) and the FAN (Cooling Fan).

6. Press the **RETURN** button “RT” and return to the



upper menu or the main screen.

**NOTE:**

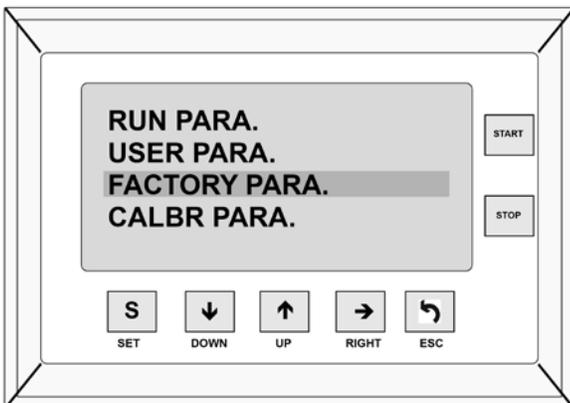
The display will automatically return to the main screen after several seconds of inactivity.

To view the other **RUN PARAMETERS** such as the **TOTAL RUN TIME, THIS RUN TIME, MAINTENANCE PARAMETER, HISTORY FAULT, PRODUCTION DATE** and **THIS FAULT**, return to the upper level menus and use the same method used to view **MOTORS CURRENT** parameters to view the other settings.

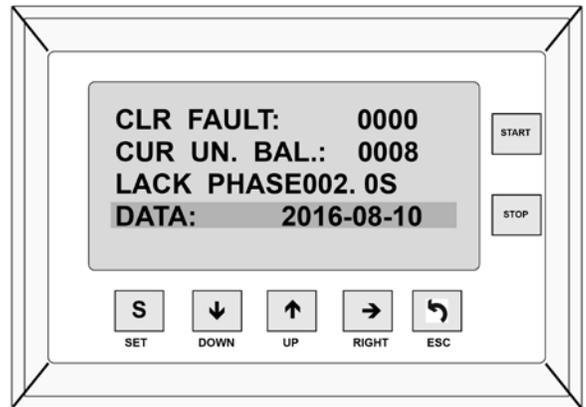
**CALENDAR SETTING**

To adjust the Date; (No Password is required to modify the Date).

1. From the Main screen:
2. Press **↓** Enter to access the Main Menu Selection.
3. Press **↓** to move the black cursor over the menu item “**FACTORY PARA.**”
4. Press **→** .



5. Press **↓** or **↑** to highlight and choose “**DATA**”.



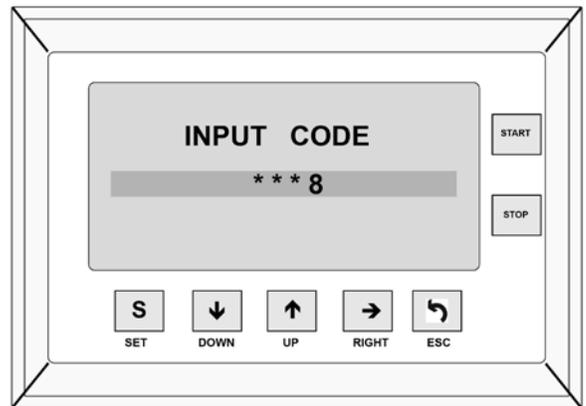
6. Press **→** .

7. The number will blink indicating it is modifiable. Use the **↓** or **↑** button to change the values of the selected parameter (month, day, year). Press the “**S**” button to confirm and save the data after finishing the modification.

**DEFAULT “PASSWORD”**

Some of the settings require a pin code, the factory default password you can use is **1688**.

Use the **↓** or **↑** buttons to enter the numbers.

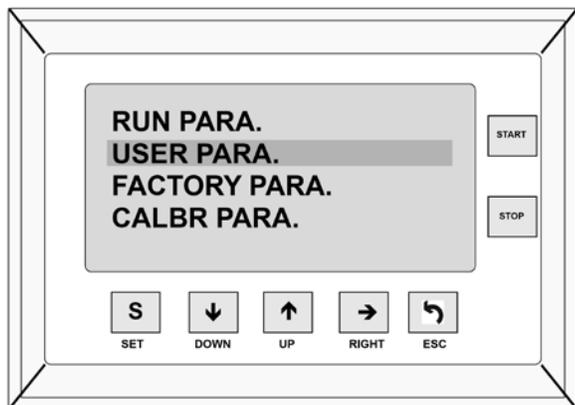


**CHANGING THE “PASSWORD”**

To reset the Password.

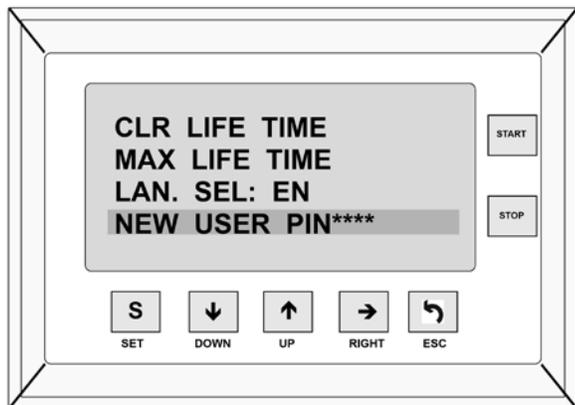
1. From the Main screen:
2. Press **↓** Enter to access the Main Menu Selection.

3. Press **↓** or **↑** to highlight the menu item **“USER PARAMETER”**.



4. Press **→**.

5. Press **↓** or **↑** to highlight the menu item **“NEW USER PASSWORD”**. Located on the Third row down.



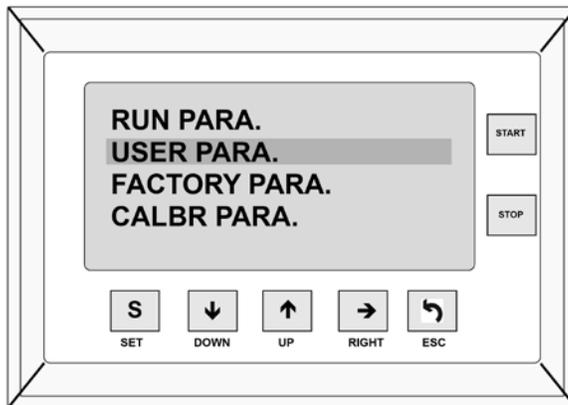
6. Press **→**.

7. Use the **↓** or **↑** button to change the values of the selected parameter. Press the **“S”** button to confirm and save the data after finishing the modification.

## LANGUAGE SETTING

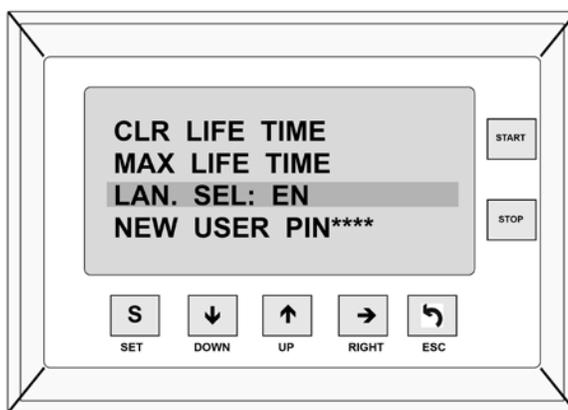
To choose Language Settings:

1. From the Main Screen:
2. Press **↓** Enter to access the Main Menu Selection.
3. Press **↓** to move the black cursor over the menu item **“USER PARA.”**



4. Press **→**.

5. Press **↓** to choose **“LAN. SEL: EN”**



6. Press **→**.

## CHANGING THE MAXIMUM AND MINIMUM SYSTEM PRESSURE SETTINGS

The maximum and minimum pressure in the system have already been pre-set by the factory. The Maximum allowable pressure in the system is 150 PSI (1.034Mpa).

The compressor will run in a Loaded State (building pressure) until it reaches the Maximum Pressure Setting value.

The compressor will run in an Unloaded State (Running but not building pressure) until the pressure in the system falls below the Minimum Pressure Setting.

The Range Value represents the amount of pressure below the Maximum Pressure Setting that will trigger the Compressor to change from Unloaded State (not building pressure or Normal Off State to Loaded State Building Pressure).

Example:

Max Pressure is set at: 150 PSI / 1.034 Mpa  
 Range Value set at: 25 PSI / .172 Mpa.  
 The Minimum Pressure is 125 PSI / .862 Mpa

(150 Max) - (Range 25 PSI) = Min 125 PSI



**DO NOT ASSUME THE COMPRESSOR CAN NOT STARTUP IF THE MOTOR IS NOT RUNNING. CONFIRM THE STATE OF THE COMPRESSOR BEFORE PERFORMING ANY OPERATION, INSPECTION OR WORK NEAR THE MOTOR AND ENSURE LOCK OUT AND TAG OUT PROCEDURES HAVE BEEN PERFORMED.**



**DO NOT PERFORM ANY MAINTENANCE OR INSTALLATION OF ANY COMPONENTS WITH OUT FIRST ENSURING THAT ELECTRICAL POWER HAS BEEN DISCONNECTED AT THE SOURCE OR PANEL AND CANNOT BE RE-ENERGIZED UNTIL ALL MAINTENANCE AND/OR INSTALLATION PROCEDURES ARE COMPLETED.**

Use the Chart below to convert PSI to Mpa.

PSI	Mpa	Bar	kg/cm2
1	0.007	0.07	0.07
25	0.172	1.72	1.76
50	0.345	3.45	3.52
75	0.517	5.17	5.27
100	0.689	6.89	7.03
110	0.758	7.58	7.73
110	0.758	7.58	7.73
120	0.827	8.27	8.44
130	0.896	8.96	9.14
140	0.965	9.65	9.84
145	1.000	10.00	10.19
150	1.034	10.34	10.55
160	1.103	11.03	11.25
To Convert Psi to Mpa Multiply: Psi x .006894757 = Mpa			
To Convert Psi to Kg/cm2 Multiply: Psi x .070307 = Kg/cm2			
To Convert Psi to Bar Multiply: Psi x .06894757 = Bar			



**FOR TECHNICAL SUPPORT, PLEASE CALL:  
1-(800) 253-2363 Ext. 196**

**TO ORDER PARTS, PLEASE CALL:  
1-(800) 253-2363 Ext. 191**

# SECTION 11

## CONTROLLER SOFTWARE MENU HIERARCHY

### 1) RUN PARAMETER (Displays Values Only)

#### a. MOTORS CURRENT

i.	AMPS/LEG			
	Current (Amps)	R	S	T
	HOST	x.x	x.x	x.x
	FAN	x.x	x.x	x.x

This setting displays the number of amps drawn per supply leg.

HOST: The amps being drawn by the main electric motor.

FAN: The amps being drawn by the cooling Fan.

#### b. TOTAL RUN TIME

i.	TOTAL RUN TIME:	x H xx M
ii.	LOADING TIME:	x H xx M

TOTAL RUN TIME is the total amount of time the compressor has been running.

LOADING TIME is the amount of time the compressor has been running in LOADED STATE.

These hour counters can be reset under FACTORY PARAMETERS.

#### c. THIS RUN TIME

i.	THIS RUN TIME:	x H xx M
ii.	THIS LOADING TIME:	x H xx M

THIS RUN TIME is the total amount of time the compressor has been running in any state during the most recent cycle

THIS LOADING TIME is the amount of time the compressor has been running in LOADED STATE in the most recent Cycle.

These hour counters can be reset under FACTORY PARAMETERS.

#### d. MAINTENANCE PARAMETER

		RUN TIME	SET
i.	OIL FILTER	0000	0000
ii.	O-G FILTER	0000	0000
iii.	GAS FILTER	0000	0000
iv.	LUBE	0000	0000
v.	GREASE	0000	0000

The RUN TIME for each maintenance item is the amount of time since the maintenance item has been reset, and ideally performed, changed or replaced.

The SET TIME is the amount of time set for a reminder alarm to go off to remind to change, perform or replace the maintenance item.

These hour counters can be reset under FACTORY PARAMETERS.

**e. HISTORY FAULT –**

DISPLAYS “FAULT HISTORY”

**f. PRODUCTION DATE, NUM**

- i. PROD DATE: 2009:xx:xx
- ii. SERIAL NUMBER: xxxxxxxx

DISPLAYS THE PRODUCTION DATE AND SERIAL NUMBER.

These hour counters can be reset under FACTORY PARAMETERS.

**g. THIS FAULT-**

DISPLAYS “CURRENT FAULT STATUS”

These faults can be cleared by fixing fault.

**2) CALENDAR- (DISPLAYS /MODIFY CURRENT DATE AND TIME, NO PASSWORD REQUIRED)**

DATE & TIME  
2009-11-17  
W-2  
00: 00: 00  
H M SEC

Can be reset from this screen

**3) CUSTOMER PARAMETER (Modifies Values)( Password Required)**

**a. SET P.T.**

i. LOADING – xx.xx Mpa  
Pressure at which Compressor will switch to LOADED STATE  
(To build pressure). (NOT APPLICABLE)

ii. UNLOADING – xx.xx Mpa  
Pressure at which Compressor will switch to Unload State.  
(Not Build Pressure) (NOT APPLICABLE)

(NOTE: Maximum and minimum pressure is set using the PRESSURE SWITCH Mounted behind the Power Control Box.)

iii. FAN START- x °C  
The Oil temperature at which fan will turn on.

iv. FAN STOP - x °C  
The Oil temperature at which fan will turn off.

**b. SET TIME**

i. HOST START TIME – 0008S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

When using the controller to protect the motor the time set here can not match the impulse starting current of the motor. Time set here must be longer than that of the STAR DELAY TIME plus LOAD DELAY TIME.

ii. FAN START TIME – 0006S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

When using the controller to protect the motor the time set here can not match the impulse starting current of the motor.

iii. STAR DELAY TIME – 0006S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

Star contactor release starting delay time.

iv. LOAD DELAY TIME – 0002S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

The loading delay time after star contactor releases.

v. EMPTY DELAY TIME – 0020M

Amount of time the Compressor will wait while running in UNLOADED STATE before switching to NORMAL STOP STATE.

vi. STOP DELAY TIME – 0010S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

Amount of time the Compressor will wait after pressing Stop or off button before shutting down.

vii. START DELAY TIME – 0100S **(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

Amount of time the Compressor will wait after pressing on button before starting up.

**c. OPERATION MODE (CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

i. ON/OFF MODE:

1. NEAR / FAR

Compressor Control mode:

NEAR: Compressor is controlled by settings made at the compressor itself.

FAR: is selected if the Compressor is networked and controlled by another Compressor or computer. (NOT SUPPORTED AT THIS TIME)

ii. LOAD MODE

1. AUTO/ MANU

AUTO: Compressor automatically goes from UNLOADED to LOADED to OFF based on the local settings.

MANU: MANUAL CONTROL Compressor can be switched from LOADED to UNLOADED to OFF manually using the Controller.

iii. COM – Used when Compressor is networked. (NOT SUPPORTED AT THIS TIME)

1. COMP/BLOCK/PROHIBIT

iv. COM- ADD .xxxx (Default should be 001)

**d. BLOCKING MODE** Used when Compressor is networked. (NOT SUPPORTED AT THIS TIME)  
**(CHANGE BY FACTORY AUTHORIZED TECHNICIAN ONLY.)**

i. BLOCKING STAE:

1. MAIN/ SLAVE

ii. BLOCK ON/OFF

1. ORDER/ALONE

iii. TURN TIME: 00099H

- iv. BLOCKING NUM EA: 0016
- v. BLOCK LOAD P: 2.00 Mpa
- vi. BLOCK UNLOAD P: 2.00 Mpa
- vii. BLOCK DELAY: 200S

**e. CLR LIFE TIME**

- i. OIL RESET- 0000H  
Clear/reset Oil hours counter.
- ii. O/G RESET- 0000H  
Clear/reset Oil/G hours counter.
- iii. GAS RESET- 0000H  
Clear/reset Gas hours counter. (Not Applicable)
- iv. LUBE RESET- 0000H  
Clear/reset Lube hours counter.
- v. GREASE RESET- 0000H  
Clear/reset Grease hours counter.

**f. MAX LIFE SET**

MAX TIME SET:

- i. Oil            0000H  
Set the amount of time for Oil Reminder Alarm.
- ii. O/G          0000H  
Set the amount of time for O/G Reminder Alarm.
- iii. Gas         0000H  
Set the amount of time for Gas Reminder Alarm.
- iv. Lube         0000H  
Set the amount of time for Lube Reminder Alarm.
- v. Grease        0000H  
Set the amount of time for Grease Reminder Alarm.

**g. LANGUAGE SEL;**

- i. ENGLISH
  - ii. CHINESE
- Select the display language here.

**h. NEW USER PASSWORD**

Reset the user password here.

#### 4) FACTORY PARAMETER

**DO NOT CHANGE UNLESS INSTRUCTED  
TO DO SO BY A FACTORY TECHNICIAN.**

- a. HOST RATED CUR:** 38.0A  
Max amp draw allowed for electrical motor before auto shut off.
- b. FAN RATED CUR:** 14A  
Max amp draw allowed for fan motor before auto shut off.
- c. PRE ALARM T** 105° C  
Alarm will sound when system temperature reaches this setting.
- d. STOP T** 110° C  
Compressor will stop when temperature reaches this setting.
- e. STOP P:** 1.30 Mpa  
Compressor will stop when pressure reaches this setting to prevent over pressurizing system.
- f. UNLOAD LIM P.** .80 Mpa  
Minimum pressure required for proper oil lubrication while running in Unloaded State.
- g. CLR LOAD TIME** 0000H  
Resets/ Clears the Total Load Time Clock.
- h. CLR TOTAL TIME** 0000H  
Resets/ Clears the Total Run Time Clock.
- i. CLR FAULT RECORD** 0000  
Resets/ Clears the Fault Record History.
- j. UNBALANCE SCOPE** 0010  
Time to trigger fault if unbalance load is detected.
- k. LACK PHASE STOP** 000.50S  
Amount time before compressor stops when a Lack of Phase is detected on incoming Power Supply Legs.
- l. OTHER** 0000M  
Not Used at this time.
- m. PROD TIME** 2009-07-10  
Change the Production Date.
- n. PROD NUM** XXXXXXXX  
Change the Production Number (Serial Number).
- o. PRE ALARM L** 0000H  
The amount of time the STOP P alarm will sound before Compressor is shut down.
- p. MAX RUN** 0000H  
Sets the maximum amount of time the compressor can be run.

## MEASUREMENT RANGE OF THE DISPLAY

- A) Oil Temperature of Oil: -20 ~ 150°C ; Accuracy : ± 1°C
- B) Air Temperature: 20 ~ 150°C ; Accuracy : ± 1°C
- C) Running time: 0 ~ 9999999 Hours
- D) Current Display Measuring Range: 0 ~ 999.9A
- E) Pressure: 0 ~ 1.6 Mpa, Accuracy: 0.01 Mpa

Phase Sequence Protection: If the protector detects an improper phase sequence, shut down activates in ≤ 2s.

Motor Protection: This control unit has the following 5 basic protection functions for the motor and fan.

- A) Rotor Lock Protection. After motor start, if the working current reaches 4 or 8 times of the set value, the protection activates. The activation time is less than 0.2s.
- B) Short Circuit Protection: if detected current reaches 8 times or more above the set value, the protection activates, the activation time is less than 0.2s.
- C) Lack Phase Protection: If any of the phase lack; the protection activates and the activation time is less than 0.2s.

D) Unbalance Protection: If the current difference between any of the two phases reaches a percentage of 60~ 70 % the activation time is less than 5s.

E) Overload anti-time limitation protection (time unit: s): See the following table. The multiple = I actual value / I Set value.

<b>I act / I set</b>	≥1.2	≥1.3	≥1.5	≥1.6	≥2.0	≥3.0
<b>Time para</b>						
<b>Action time</b>	60	48	24	8	5	1

When the running current of the motor is 1.2 ~ 3.0 times of the set value, the overload multiple and action delay time will be accordance with the following table.

Temperature Protection: When the actual detected temperature is higher than the set temperature, the protection activates and the activation time is ≤ 2s.

The output relay contactor capacity: 250V5A.  
The lifetime of the contactors: 500,000 cycles.

The current display tolerance ≤ 1.0%  
RS-485 communication.

MAIN CONTROLLER DISPLAY LAMPS		
ITEM	MEANING AND FUNCTION	LIGHTS STATUS
POWER	Controller Power On.	PWR Lamp ON.
RUN	Controller Running.	RUN Lamp ON.
Failure	Shut Down when fault is detected.	ERR lights Blinking
Input Switching Value	Terminal 20 ~ 12 Input Switching value activate	[N00 08 lights, but if input point is not activated, no lamp will light up.
Output Switching Value	Terminals 27, 28, 29, 30, 31, 35, 36, 37, 38 and 39 output switching value activate	OUT00 ~ 09 Corresponding indicator lamp will light up.
Data Save	Set Data and save time	PWR lamps blinks once.

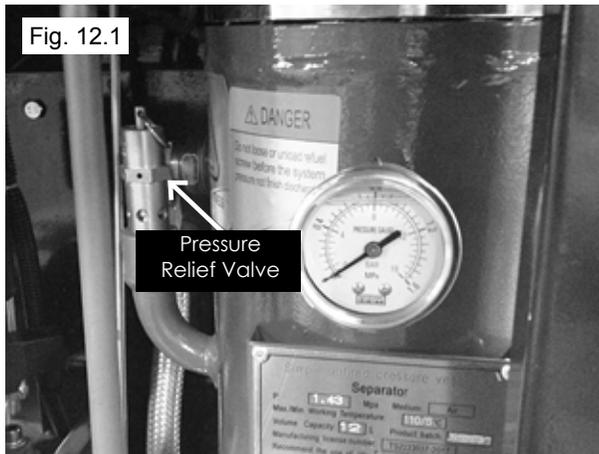
# SECTION 12

## MAINTENANCE

### MAINTENANCE ITEMS AND MAINTENANCE PERIODS

Bendpak Rotary Screw Compressors require regular maintenance. Regular maintenance will provide long Compressor component life and long term trouble free operation.

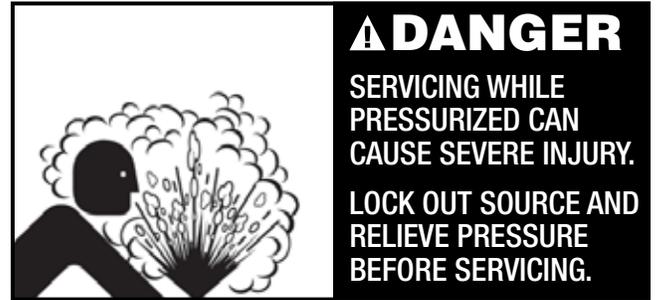
1. Bleed off any internal pressure by pulling open pressure relief valve located on the left side of the Oil Separation Filter. (See Fig. 12.1 )



2. Confirm the pressure has been bled off by reading Pressure on oil Separation Tank. (See Fig.12.2 )



**DO NOT PERFORM ANY MAINTENANCE OR INSTALLATION OF ANY COMPONENTS WITHOUT FIRST ENSURING THAT ELECTRICAL POWER HAS BEEN DISCONNECTED AT THE SOURCE OR PANEL AND CANNOT BE RE-ENERGIZED UNTIL ALL MAINTENANCE AND/OR INSTALLATION PROCEDURES ARE COMPLETED.**



**DO NOT PERFORM ANY MAINTENANCE OR INSTALLATION OF ANY COMPONENTS WITHOUT FIRST ENSURING THAT ALL INTERNAL PRESSURE HAS BEEN RELIEVED FROM THE SYSTEM. ISOLATE THE COMPRESSOR FROM THE AIR SUPPLY LINE /AIR TANK WITH USE OF SHUT OFF VALVES.**

### MAINTENANCE SCHEDULES

- Check the running temperature and working pressure. (Daily)
- Record the current, voltage, temperature and pressure. (Daily)
- Clean compressor only after stopping (Weekly)
- Blow the air filter with compressed air. (Weekly)
- Check oil level (Monthly)
- Check the bolts on the belt pulley( Shaft coupling) Only after compressor is stopped and the power is locked out.)
- Blow the cooler with compressed air.

\*Please see pages 32 -33 for more detailed information.

#### ATTENTION:

**Reduce the Maintenance intervals in severe operating environments or severe demand applications.**

#### First 500 operating hours (first Maintenance)

- Check the quality of oil. The oil may be reused after being filtered cleanly. Otherwise, replace it.
- Replace the oil filter.
- Replace the intake filter.
- Replace the oil separation filter.
- Check the wear of belt pulley and the alignment of the motor and Air End pulleys.

#### Every 2000 Hours

- Replace the oil filter.
- Replace the intake filter.
- Replace the oil separation filter.
- Check the wear of belt pulley and the alignment of the motor and Air End pulleys.
- Check intake-control valve.

## Every 4000 hours.

Perform the 2000 Hours procedures and:

- Replace the lubricating oil.
- Check the minimum-pressure control valve.
- Check all electrical connections.
- Check main bolts, main nuts and connectors are tight.
- Check all maintenance panel clasps for proper operation.
- Check intake-control valve.
- Check electrical motor for bearing end play

### ATTENTION:

Ensure all parts are properly secured or tightened after performing maintenance tasks. Ensure all tools, rags or equipment is removed from internal areas of compressor before closing panels and starting up.

## DAILY OPERATION AND MAINTENANCE:

Before start up:

### ATTENTION:

Don't open oil drain ball valve until five minutes after stopping compressor.

1. Open the oil drain valve slightly and drain off any water from the bottom of the oil Tank. Drain fluid until water stops flowing and only oil flows. (See Fig 12.3 )



Fig. 12.3

2. The oil level must be above the upper red line after the compressor is off has been stopped for thirty minutes. The oil level when the compressor is running must be between the upper and lower red line indicated on the Oil Level Site glass. (See Fig. 12.4 )

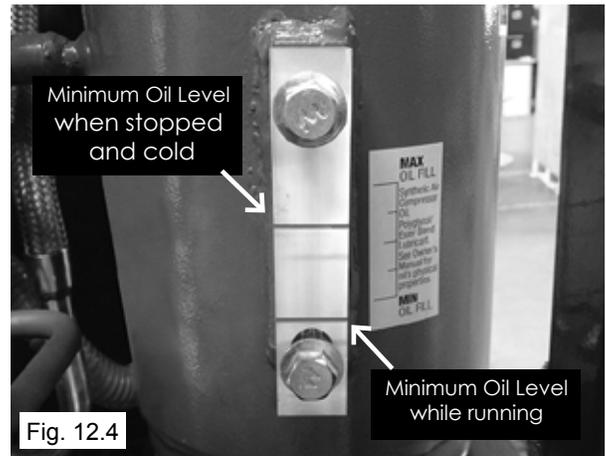


Fig. 12.4

3. Fill with PowerCool Synthetic Air Compressor Lubricant if necessary and inspect the O-Ring on the Oil Fill Plug before tightening.

4. After starting up: Watch the pressure on the control panel. Check operating temperature and the general conditions inside compressor.

## INTAKE FILTER INSPECTION/ REPLACEMENT PROCEDURE

1. Open Drive Belt Side (right) panel. (See Fig.12.5 )



Fig. 12.5

2. Unscrew the wing nut counter clockwise to remove cover.(See Fig. 12.6)



Fig. 12.6

**CAUTION**

ENSURE THAT NO FOREIGN OBJECTS OR DEBRIS FALLS INTO THE INTAKE AREA DURING MAINTENANCE PROCEDURES.

3. Check the condition of intake filter, either blow it clean with compressed air or replace if necessary. (See Fig. 12.7)

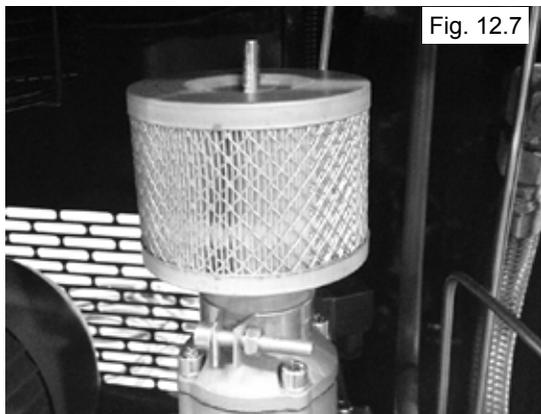


Fig. 12.7

4. Inspect the inside of the plastic Intake Air Filter housing and remove hose clamp and clean if necessary.
5. Reinstall the Intake Air Filter Housing and new Filter and Twist the Intake Air Filter Cover clockwise to tighten.

**OIL FILTER REPLACEMENT PROCEDURE**

**CAUTION**

PERFORM THE LOCKOUT TAG OUT AND DEPRESSURIZATION PROCEDURES AS OUTLINED IN SECTION 12.1.

The Oil Separation Filter is a spin-on style of filter like that of a typical automotive oil filter making for easy replacement.

1. Remove the Access panel on the left side / Oil Separator Side of the Compressor. (See Section 8; Fig. 8.3)
2. Using an Oil Filter wrench if necessary, unscrew the Oil Filter counter clock wise. (See Fig. 12.8 )



Fig. 12.8

3. Clean the threads and seat and then apply a light layer of clean oil to the face of the Oil Filter seat. (See Fig. 12.9)

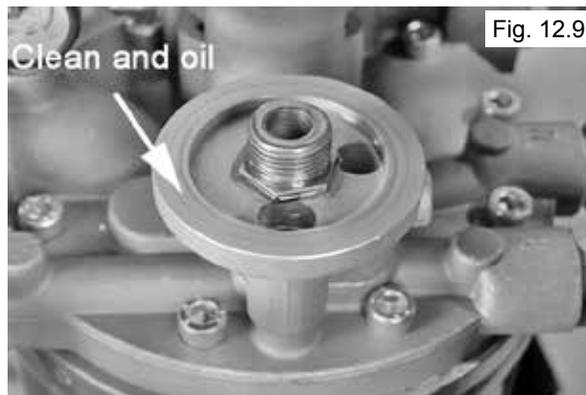


Fig. 12.9

4. Screw the new Oil Filter on clockwise and hand tighten only.

**AIR OIL SEPARATION FILTER REPLACEMENT PROCEDURE**

1. Remove the Access panel on the Rear Side of the Compressor.

**CAUTION**

PERFORM THE LOCKOUT TAG OUT AND DEPRESSURIZATION PROCEDURES AS OUTLINED IN SECTION 12.1.

**NOTE:**  
The Oil Separation Tank needs to be unbolted and tilted to provide adequate clearance for removal of the Air Oil Separator Filter.

2. Unbolt the Oil Separation Tank mounting bolts. (See Fig. 12.10 )

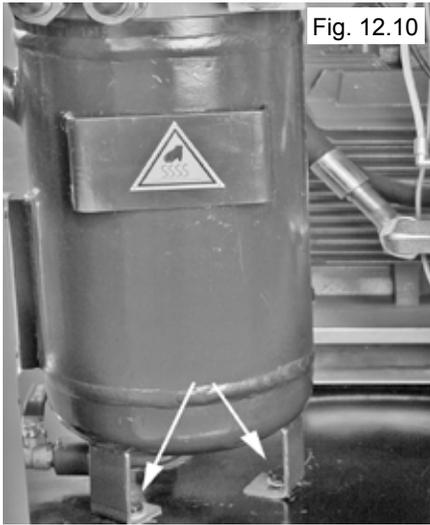


Fig. 12.10

3. Using an Oil Filter wrench if necessary, unscrew the Air Oil Separator Filter counter clockwise. (See Fig.12.11)



Fig. 12.11

4. With The Oil Separation Tank unbolted; lean the Tank towards the inside of the compressor while lifting the Air Oil Filter up and off the center pipe.

5. Clean the threads and seat and then apply a light layer of clean oil to the face of the Air Oil Separator Filter seat. (See Fig. 12.12)

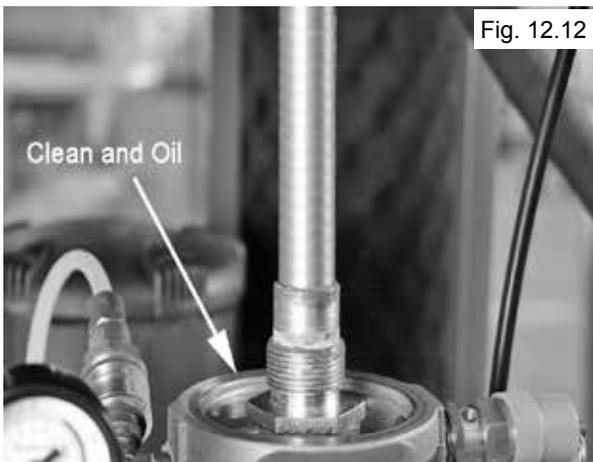


Fig. 12.12

6. Screw the new Air Oil Filter on clockwise and hand tighten only.

## FEATURES OF THE INTAKE CONTROL VALVE

The Intake Control Valve consists of a valve body, valve gate, piston, cylinder, spring, gasket. There is a Control Plate and an Electromagnetic Control Valve mounted on the side. The Intake Control Valve controls load shedding, noise reduction, depressurization, on/off adjustment.

The Valve also adjusts to maintain a minimum amount of pressure (0.2 -0.3Mpa) to keep the minimum amount of Lubricating Oil in the Air end.

The Air Intake Valve should be inspected at 4000hrs. Pay close attention to the white seal rings. if worn, cracked or damaged replace it. See next Section for inspection and replacement instructions.

## INTAKE VALVE INSPECTION/REPLACEMENT PROCEDURE



**ENSURE THAT NO FOREIGN OBJECTS OR DEBRIS FALLS INTO THE INTAKE AREA DURING MAINTENANCE PROCEDURES.**

1. Remove the Air Filter Housing assembly.
2. Unbolt the four Socket Head cap screws and remove the Valve Body Top. Use caution as the Valve is under light spring pressure. (See Fig. 12.13)

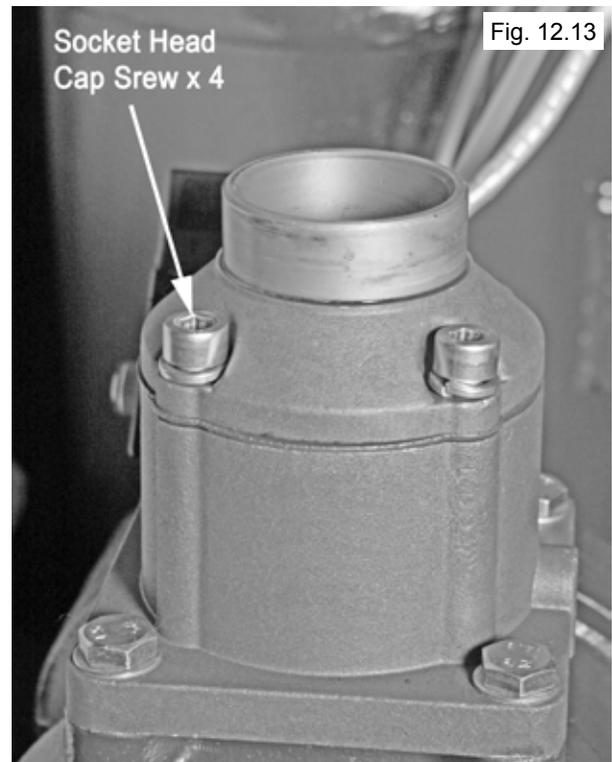
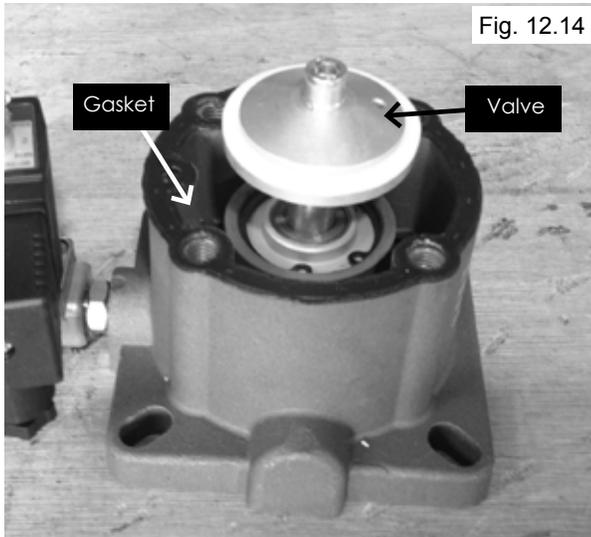
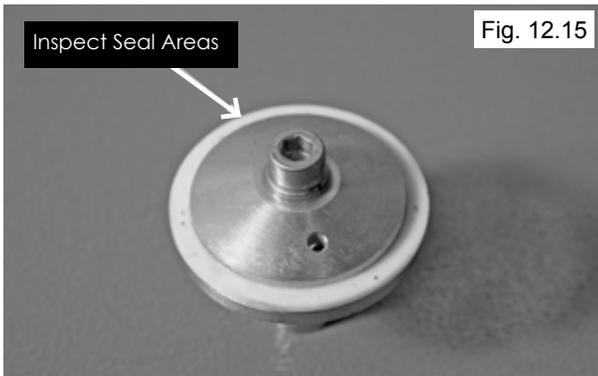


Fig. 12.13

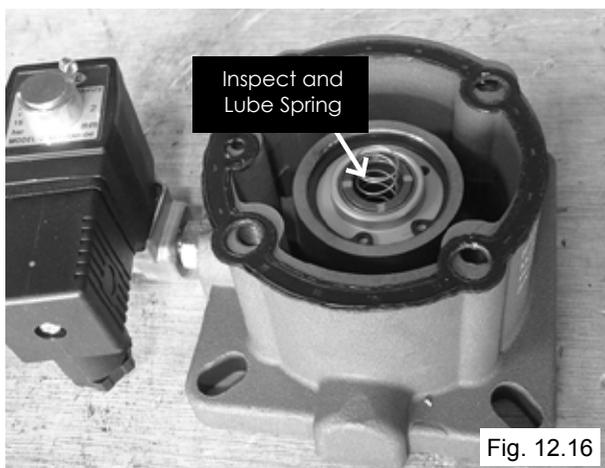
3. Remove and replace the Valve Body Top Gasket. Remove the Valve. (See Fig. 12.14)



4. Inspect the white seal on the Valve for damage or cracks. Replace if damaged. (See Fig. 12.15)



5. Lubricate Valve and Valve Spring with high temperature grease. (See Fig. 12.16)



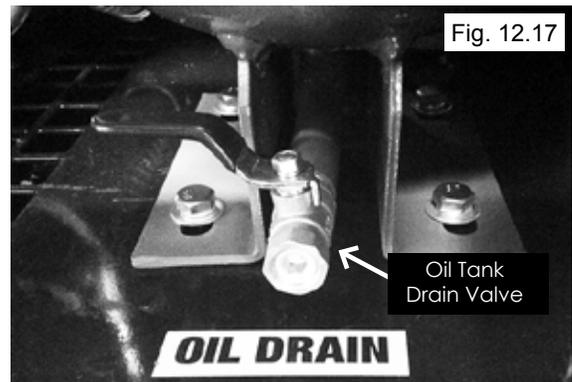
6. Install new Gasket. Installation is reverse of the above procedures.

## OIL CHANGE PROCEDURE

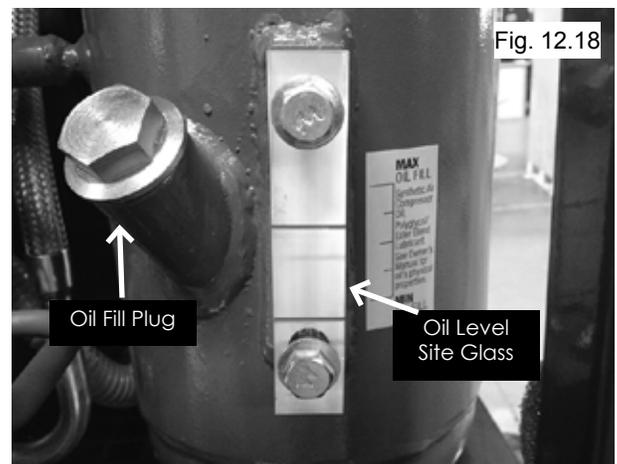
### ATTENTION:

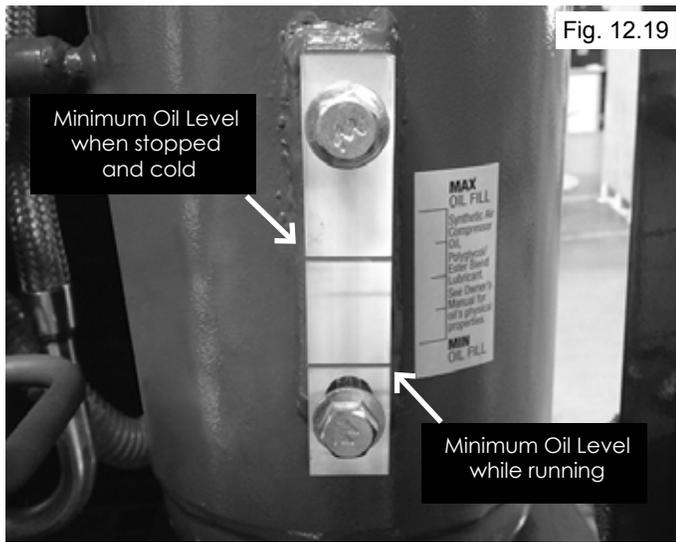
**Replace the Oil more frequently when the dust level and the operating temperature are high, in severe operating environments or severe demand applications.**

1. Connect a drain hose up to the Drain Ball Valve.
2. Open the Oil Fill Plug.
3. Open the Drain Ball Valve and drain used oil into an approved container and dispose of in accordance with local regulations. (See Fig. 12.17 )



4. Close Drain Ball Valve.
5. Use a clean funnel, fill the Oil Separation tank with PowerCool Synthetic Air Compressor Lubricant.
6. Install and tighten the Oil Fill Plug.
7. The oil level must be above the upper red line after the compressor is off has been stopped for thirty minutes. The oil level when the compressor is running must be between the upper and lower red line indicated on the Oil Level Site glass. (See Fig. 12.18 -12.19 )



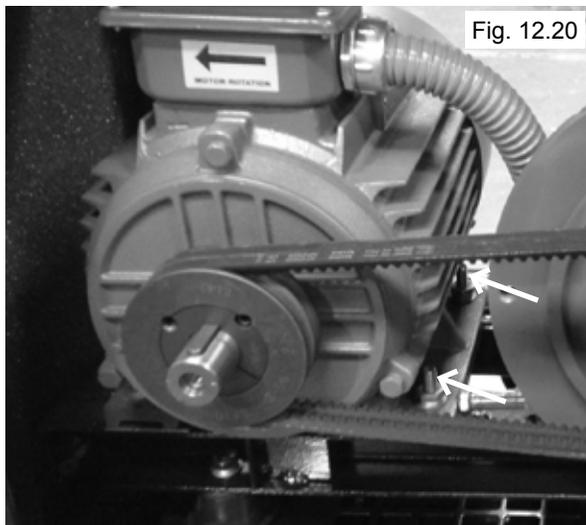


8. Start the compressor. Check the oil level while running and add oil as required. Check again after compressor has been running for about 30 minutes and stopped for 30 minutes. If oil level is low, add Oil as needed.

### ALIGNMENT OF DRIVE BELT AIR END PULLEY AND MOTOR PULLEY

If the air end or motor is moved or replaced, the alignment of the drive belt pulleys of the motor and air end need to be adjusted. Misaligned pulleys can cause premature belt wear and or bearing damage.

1. Bolt down the Air End in proper position.
2. Loosen the Motor mounting bolts. (See Fig. 12.20)



3. Using a straight edge or square and or level, adjust the motor until the Motor pulley and Air End Pulley are in the same vertical and horizontal plane. Shims may be required. (See Fig. 12.21 )

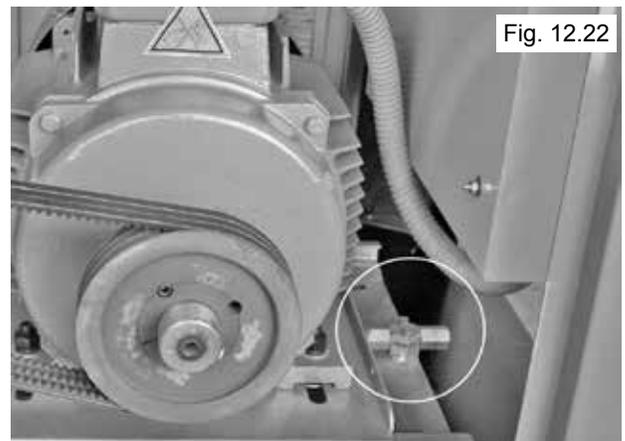


4. Tighten the Mount Bolts and adjust Pulley Tension as described in procedure below.

### DRIVE BELT ADJUSTMENT AND REPLACEMENT

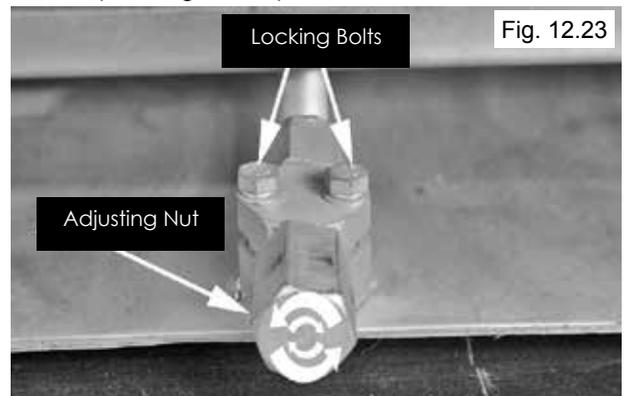
#### Drive Belt Adjustment

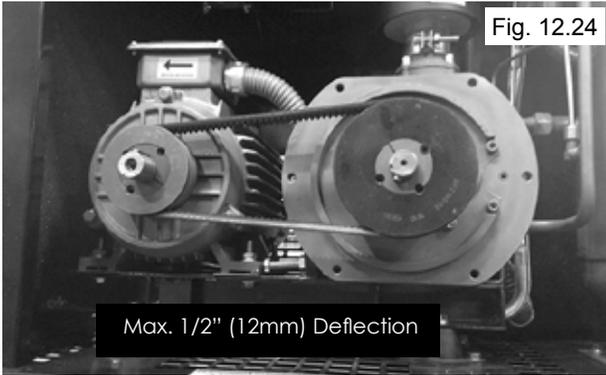
1. Locate the Drive Belt Tension Adjusting assembly. (See Fig. 12.22)



2. Loosen the two Locking Bolts. (See Fig. 12.23)

3. Rotate the Adjusting Nut, then adjust the tension of the Belts. (See Fig. 12.23)





4. Belt should have no more than 1/2"/12mm deflection measured near the middle of the belts. (See Fig. 12.24)
5. Tighten the Locking Bolts.

### ATTENTION:

**AFTER BELT ADJUSTMENT OR REPLACEMENT, RUN THE COMPRESSOR FOR FIVE MINUTES. THEN STOP THE COMPRESSOR AND READJUST IF NECESSARY. RUN THE COMPRESSOR FOR TEN MINUTES AND THEN STOP COMPRESSOR AND RECHECK AND ADJUST IF NECESSARY.**

### NOTE:

**When replacing worn or damage drive belt, ALWAYS replace the entire group of belts at the same time.**

1. Follow the procedure described above and loosen Drive Belt tension enough to remove and replace.
2. Align and Adjust as described before.

### AIR EXHAUST OVERHEAT PROTECTION

When the air exhaust temperature is higher that the set limited unload temperature, the controller will sound an alarm and stop the machine. Local Failure will display "Air Exhaust High Temperature".

### REVERSE RUNNING PROTECTION OF THE AIR COMPRESSOR:

If the Phases of the incoming power are reversed, the Local Failure will display "wrong phase sequence". The controller will not allow the motor to startup under this condition. Check and reverse the incoming power legs.

### OVER PRESSURE PROTECTION:

When the pressure of the air exhaust is higher than the set stop pressure of the controller, the controller will

sound an alarm and stop the machine; the Local Failure displays "Pressure too High".

### SENSOR FAILURE PROTECTION:

If the Pressure Sensor or the Temperature Sensor Cable is broken, the controller will sound an alarm and stop the machine: the local failure displays "xxx sensor failure".

### INTERLOCK PROTECTIONS:

The Host is running and the air exhaust temperature reaches the fan starting temperature but the Fan does not run, the controller alarm will sound, and the Local Failure displays "Fan is stopped".

### ALARMS AND NOTICES

#### Text Display Tips

1. Air Filter Alarm tips  
**Check the alarm using the switch signal.**  
 The Controller will display a message on the text display to remind the operator that "air filter is blocked" by checking the pressure difference switch operation state.  
**Set the running time alarm of the air filter.**  
 The Text displays "Air filter life terminated" when the usable life of the filter terminates.
2. Oil Filter alarm tips.  
**Check the alarm using the switch signal.**  
 The controller will display a message on the text display to remind the operator that "the oil filter is blocked" by checking the pressure difference switch operating state.
3. Oil Separator alarm tips  
**Check the alarm using the switch signal**  
 The controller will display a message on the text display to remind the operator that "the oil separator is blocked" by checking the pressure difference switch operating gate.  
**Set the running time alarm of the oil separator**  
 The Text displays "Oil separator life terminated" when the usable life of the oil separator terminates.
4. Lubricate Oil Alarm tips  
**The Test displays "Lubricate Oil life terminated"**  
 when the usable life of the lubricating oil ends.
5. Lubricate Grease alarm tips  
**Text says "Lubrication Grease life terminated"**  
 when the usable life of the lubricating grease terminates.

Checking Items	Working content	Maintenance cycle						Remarks
		Day	Week	Month	Half Year	A Year	Two Years	
Fastener	Check the bolts and transmission components	☆						The bolts and transmission components can't fall off or loosen.
Coupling	Check the coupling	☆						Concentricity is normal with no damage
Strainer of oil return pipe				★				No sundries
Condition of oil return in transparent return pipe	Make sure the oil return is normal	☆						Oil return is fluent
Unloading valve	Make sure the machine is stopped and deflating	☆						Normal stop, unloading and deflating
Lubricating oil <input type="checkbox"/>	Check the level and quality of oil	☆						The oil level should be within the alerting line, without oxidation discoloration
Air (oil) exhausting temperature	Make sure the venting temperature	☆						The normal temperature is between 70°C and 105°C
Voltage and current	Check the voltage and current	☆						Within 1.2 times of that of the rated current
Air Filter <input type="checkbox"/>	Cleaning		☆					Replace the filter element only.
Drainage in gas and oil barrel	Water drainage		☆					Discharge from the oil discharge valve
Dustproof gauze	cleaning and maintenance			☆				Take out and clean
Pipeline system	Check the situation of oil leakage and air leakage	☆						No phenomenon of oil leakage
Circuit system	Line terminal or displaying information	☆						No phenomena of information alarming or wire decrustation
Oil strainer <input type="checkbox"/>	checking and cleaning			☆				Replace the filter element only
Filter element of oil-gas separator	Cleaning and replacement			★				Replace the filter element only

Checking Items	Working content	Maintenance cycle						Remarks
		Day	Week	Month	Half Year	A Year	Two Years	
Mechanical seal for the host machine	Checking the leakage	☆						The quantity of oil leakage is less than 1.5g/h
Motor insulation	Checking the insulation resistance					★		More than 2MΩ when the voltage is 500V
Relief valve	Checking the sensitivity of the action				☆			In condition of rated pressure, it can discharge when the discharging ring of the relief valve is pulled with a force less than 1 kg and the sundries are cleared off.
Pressures of automatic stop and automatic start up	Checking the sensitivity of the action	☆						Stop pressure and start-up pressure are in normal condition .
Cooler	Maintenance and cleaning	☆						Clean the surface dirt in the way of blowing
Indicator of the oil level indicator	Checking the clarity	☆						Replace it when the oil level is fuzzy .
Belt and pulley	Checking the firmness or replacement	☆						Extrude the center of the belt with the thumb to make sure it is 10 to 15 mm and with no damage.

**NOTES:** “ ☆ “ refers to parts that are maintained by users, “ ★ “ refers to parts that are entrusted to service center . “ □ ” refers to parts that must be replaced after the new machine running continuously for 500 hours, then replace them after 3000 hours’ work. The maintenance parts are those whose working time are less than 6000 hours .

#### PROCESSING METHOD OF LONG TERM SHUTDOWN

EQUIPMENT SHOULD BE SEALED IF IT IS SHUTDOWN FOR A LONG PERIOD OF TIME

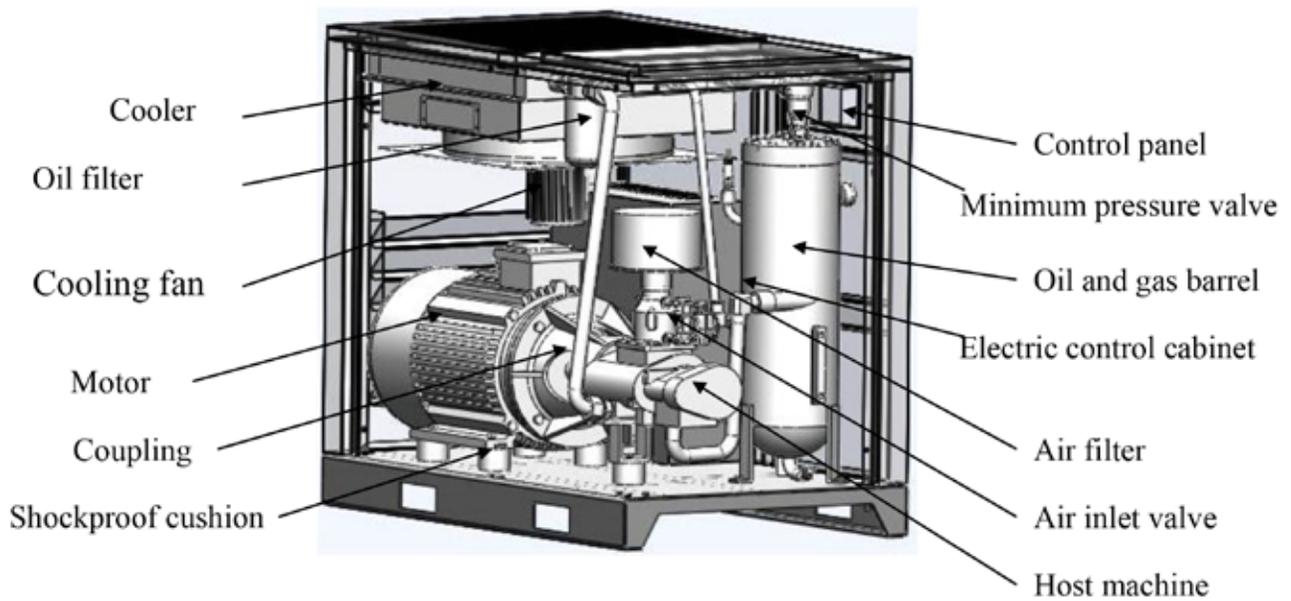
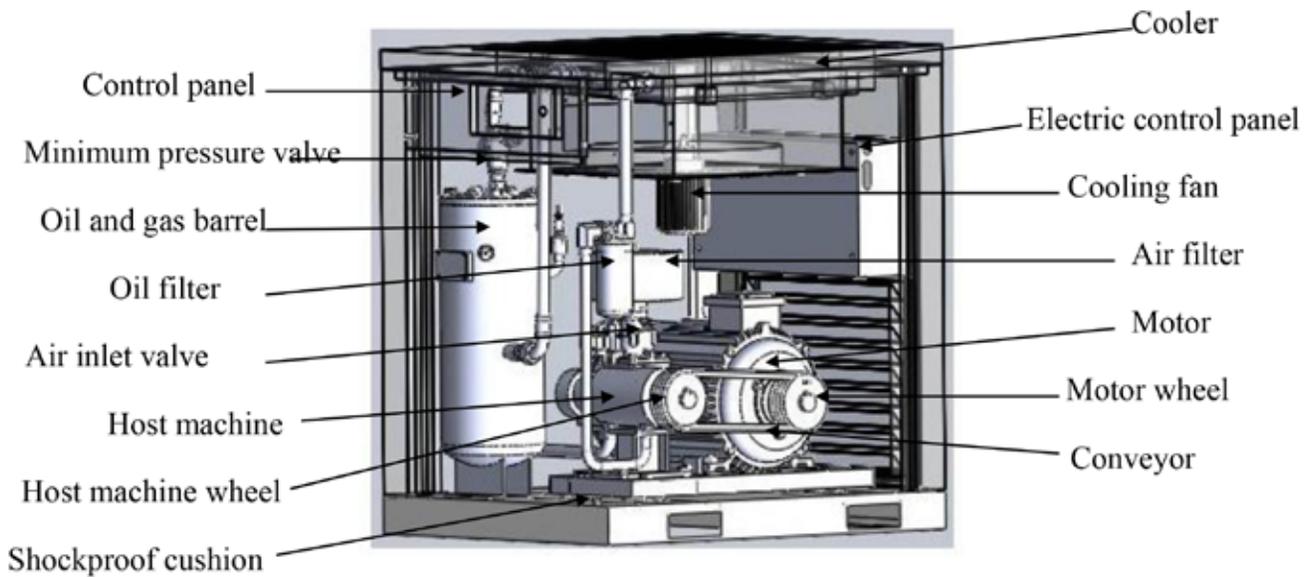
- Clean the equipment and spread some anti-rust oil on the parts which are easy to rust.
- Electric equipment such as: motor control panel, all valves, tables, indicators, etc. shall be wrapped up with plastic paper or oil paper.
- The water in the oil cooler (gas and oil barrel), gas cooler and air storage tank shall be all discharged.
- Covering all the equipment with plastic paper or some other similar materials.
- Transportation fixed screw should be locked if the transfer storage space is changed,

**To restart the sealed air compressor, the motor insulation resistance should be measured first (No less than 1 MΩ). If the air compressor has been sealed for more than a year the lubricant should be replaced.**

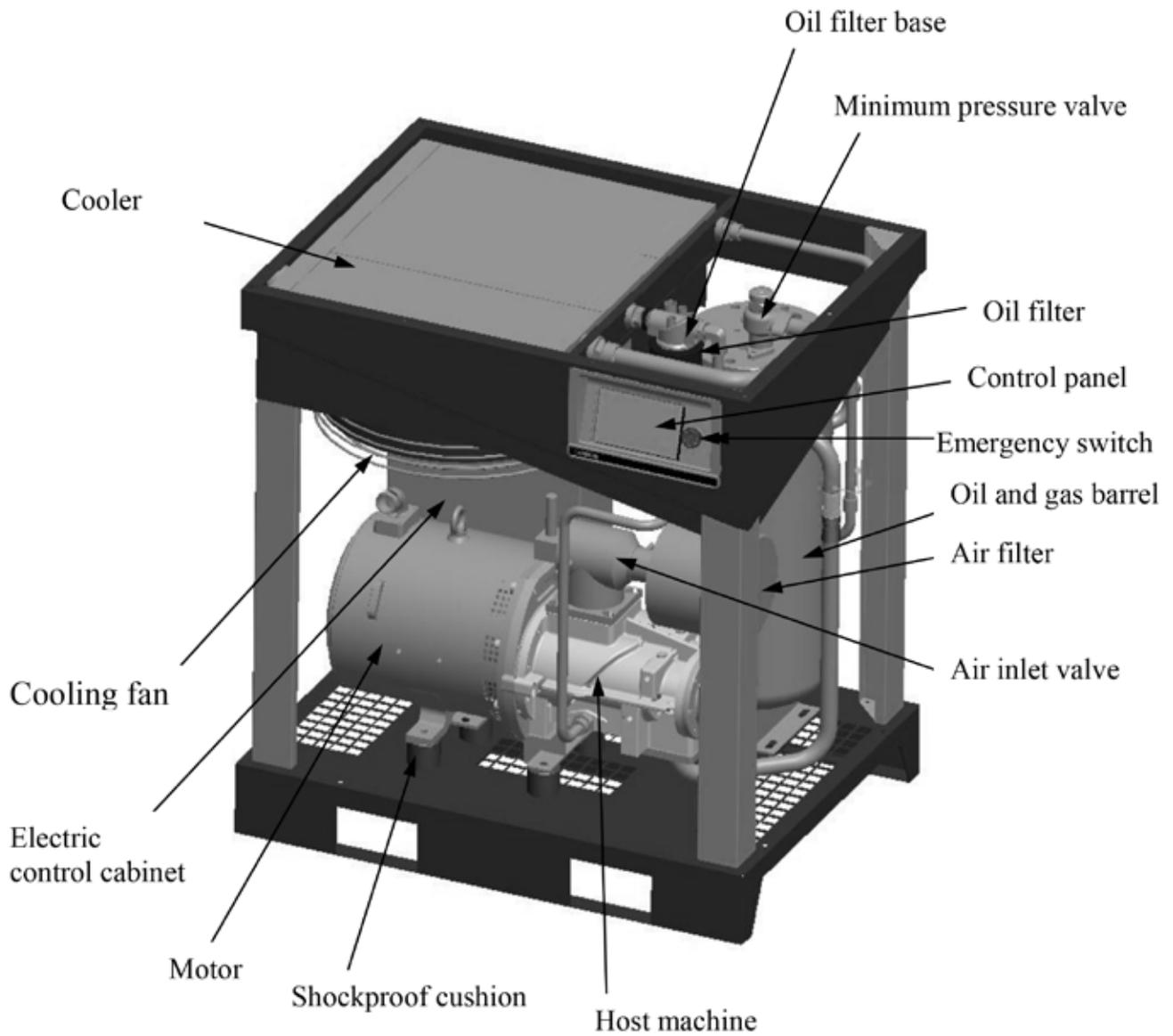
<b>PROBLEM</b>	<b>CAUSES</b>	<b>MEASUREMENT TO MAKE</b>
Motor starting up failure	No input voltage or the voltage is in abnormal condition .	Check the power supply circuit
	Phase failure (The motor gives out "buzz-buzz" sound)	Check the power line terminal, electric controller and on-line terminals
	Connection error in power phase position	Adjust the phase-sequence and repair or replace the main controller
	Blownfuse	Check and make sure there is no error in circuit and replace the fuse
	Burning of AC contactor or failure	Repair or replace
	Failure of pressure switch (Pressure sensor)	Repair or replace
	Motor burning out and bearing failure	Repair or replace
	Clamping stagnation in dynamic tray in handpiece or block up caused by bearing failure	Repair or replace
	Temperature sensor operation protection	Find out the causes and eliminate the breakdown
	Current protector operation protection	Find out the causes and eliminate the breakdown
Frequent starting up	Failure in starting up the time delay unit	Check and reset the time delay unit and main controller or replace it
	Serious leakage in pipeline	Check the leaking parts and eliminate the breakdown
	Volume of air storage tank is not large enough	Add air storage tanks or replace larger air storage tanks
	Environmental temperature is too high	Increase the air volume in the unit room
	The cooler is dirty and with bad heat dissipation	Clean the cooler
	Blocking in oil pipeline	Check and get the pipe through
	Failure of temperature sensor	Repair and replace
	The lubricating oil is not enough	Add lubricating oil
	Failure in cooling fan	Repair or replace
	Failure in pressure switch, force sensor and main controller	Repair adjust and replace
Too low exhaust pressure	Too much air consumption	Repair the pipeline, buy more air compressors and control the air volume
	Serious leakage in pipeline	Repair and replace if necessary
	Blocking in air filter	Clean and replace the filter element
	Breakdown in air inlet valve	Repair or replace
	Blocking in oil-gas separator	Repair or replace
	Leakage in unloading solenoid valve	Repair or replace
	Slipping in V shape rotational belt	Repair,adjust and replace

PROBLEM	CAUSES	MEASUREMENT TO MAKE
Great consumption of lubricating oil	Blocking in oil return pipe Warranty period of oil-gas separator is due Too high lubricating oil level Breakdown in minimum pressure valve No use of special lubricating oil Fasteners become flexible. Host bearing wear or damage in motor Conveyor wear Wear or looseness in the coupling Foreign matters enter rotating parts such as handpiece, motor or fan	Disentangle or replace Clean or replace Decrease the oil level Repair or replace Exchange the special lubricating oil Repair or replace Replace the belt Check,fasten or replace Repair or replace
Abnormal noise and vibration	Failure in empty the used lubricating oil No use of special lubricating oil Too high exhausting temperature Breakdown in air inlet valve Gas return in minimum pressure valve Unloading solenoid valve fails to deflate Breakdown in handpiece, motor and the bearing V shape rotation belt is too tight Low input voltage(The wire is too long and the diameter is too small) Poor contact in circuit	Empty the used oil and add new special lubricating oil Exchange special lubricating oil Increase air volume and decrease the environmental temperature or repair the temperature control valve and cooling system Repair or replace Repair or replace Repair or replace Repair or replace Repair and adjust the handpiece Adjust the wire Repair or replace Repair or replace
Early deterioration in lubricating oil	Serious imbalance in three-phase voltage Poor contact or current capacity of the breaker is not large enough No use of special lubricating oil Too high temperature, great current and operation of overload protector Phase failure Breakdown in temperature controller and main controller Inconformity in three-phase resistance value ( Motor burnt our) Breakdown in fan bearing	Check and eliminate the breakdown Repair or replace Exchange for special lubricating oil Repair or replace Check the circuit and AC contactor Repair or replace Repair or replace Repair or replace
Great current or trip caused by slow rotation of the motor	Too great differential pressure in pipeline (Blocking in filter element) Too high temperature, great current and operation of overload protector Phase failure Breakdown in temperature controller and main controller Inconformity in three-phase resistance value ( Motor burnt our) Breakdown in fan bearing	Check and eliminate the breakdown Repair or replace Exchange for special lubricating oil Repair or replace Check the circuit and AC contactor Repair or replace Repair or replace Repair or replace
Failure of rotating in cooling fan	Breakdown in fan bearing	Repair or replace

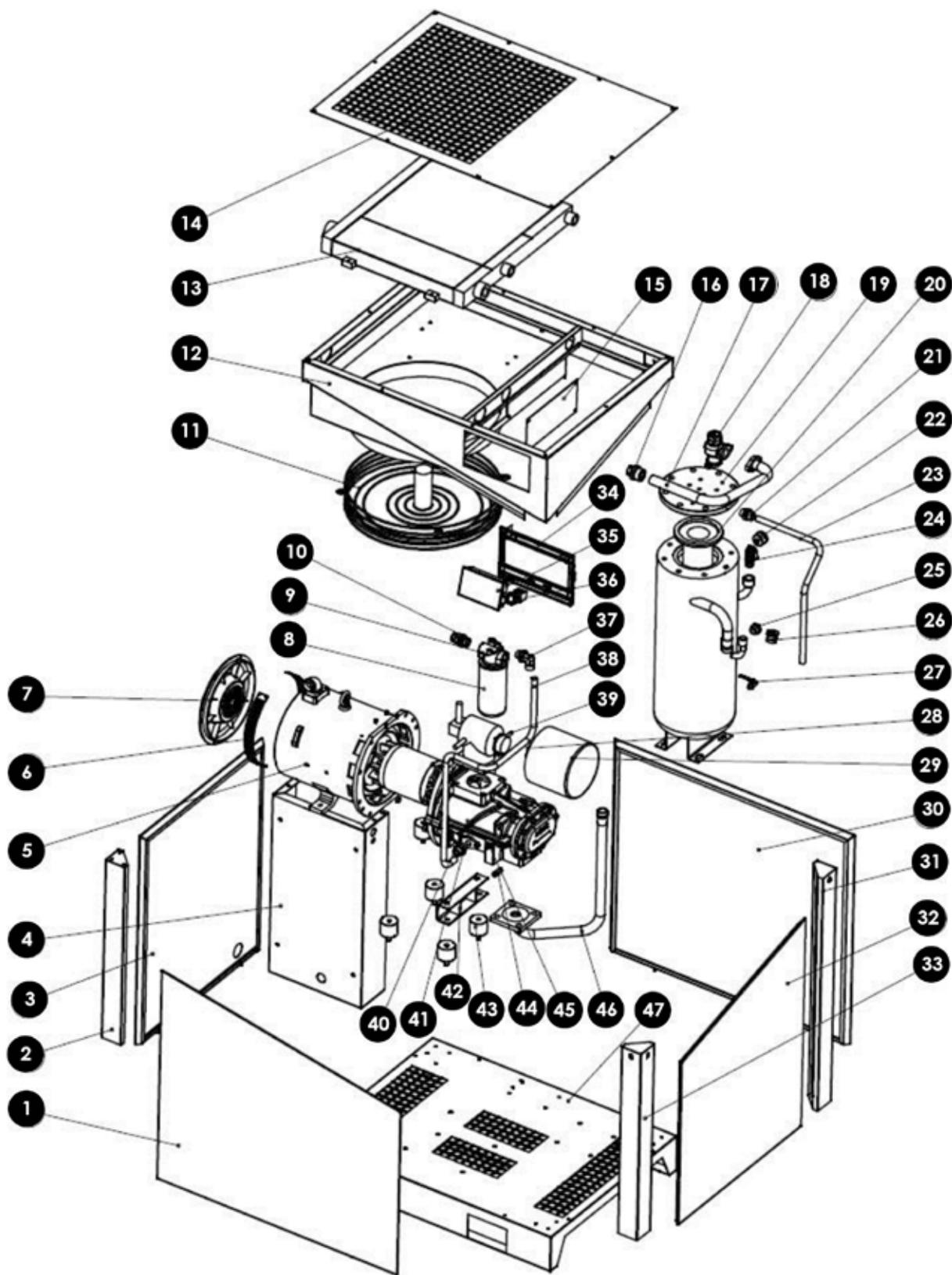
## RS7580H603 SCREW COMPRESSOR PARTS LIST



## RS7580H603 SCREW COMPRESSOR PARTS LIST



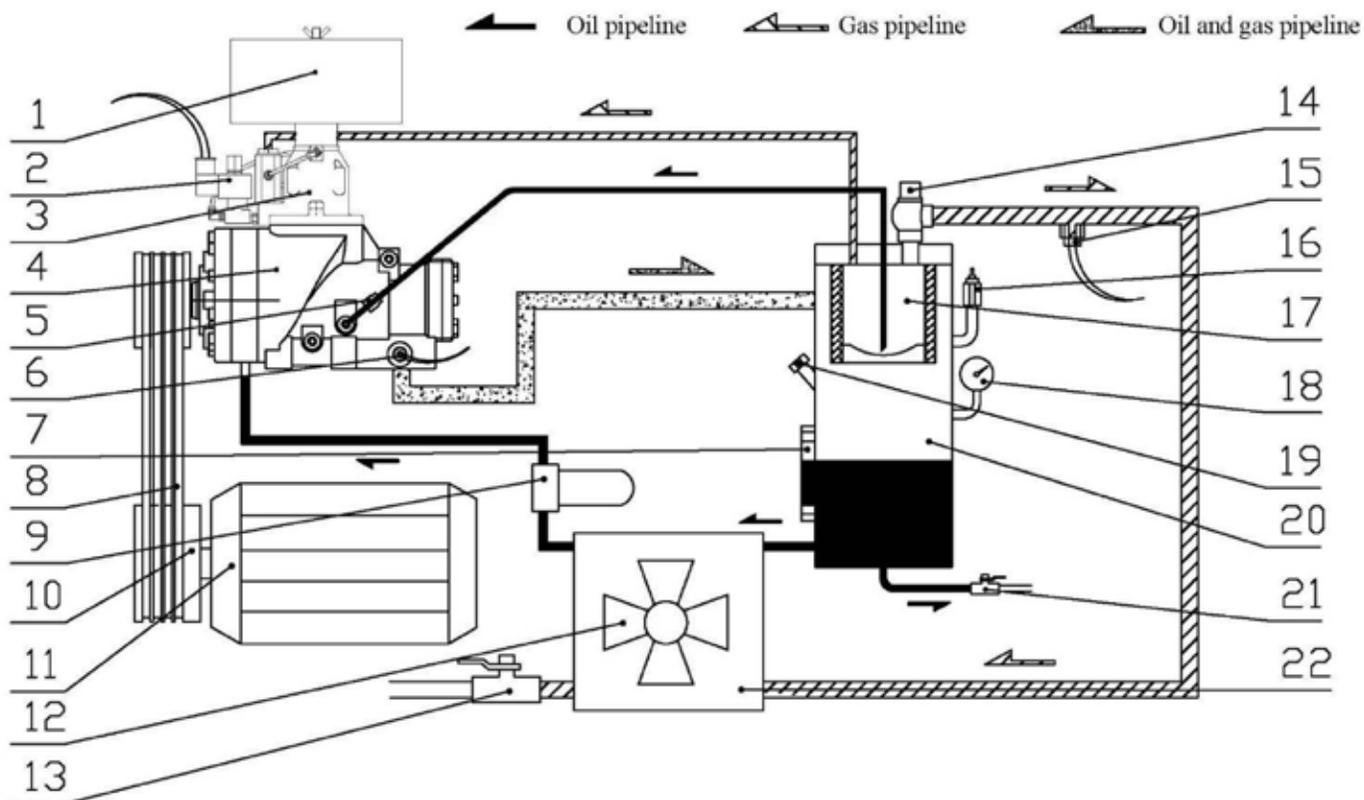
# RS7580H603 SCREW COMPRESSOR PARTS LIST



## RS7580H603 SCREW COMPRESSOR PARTS LIST

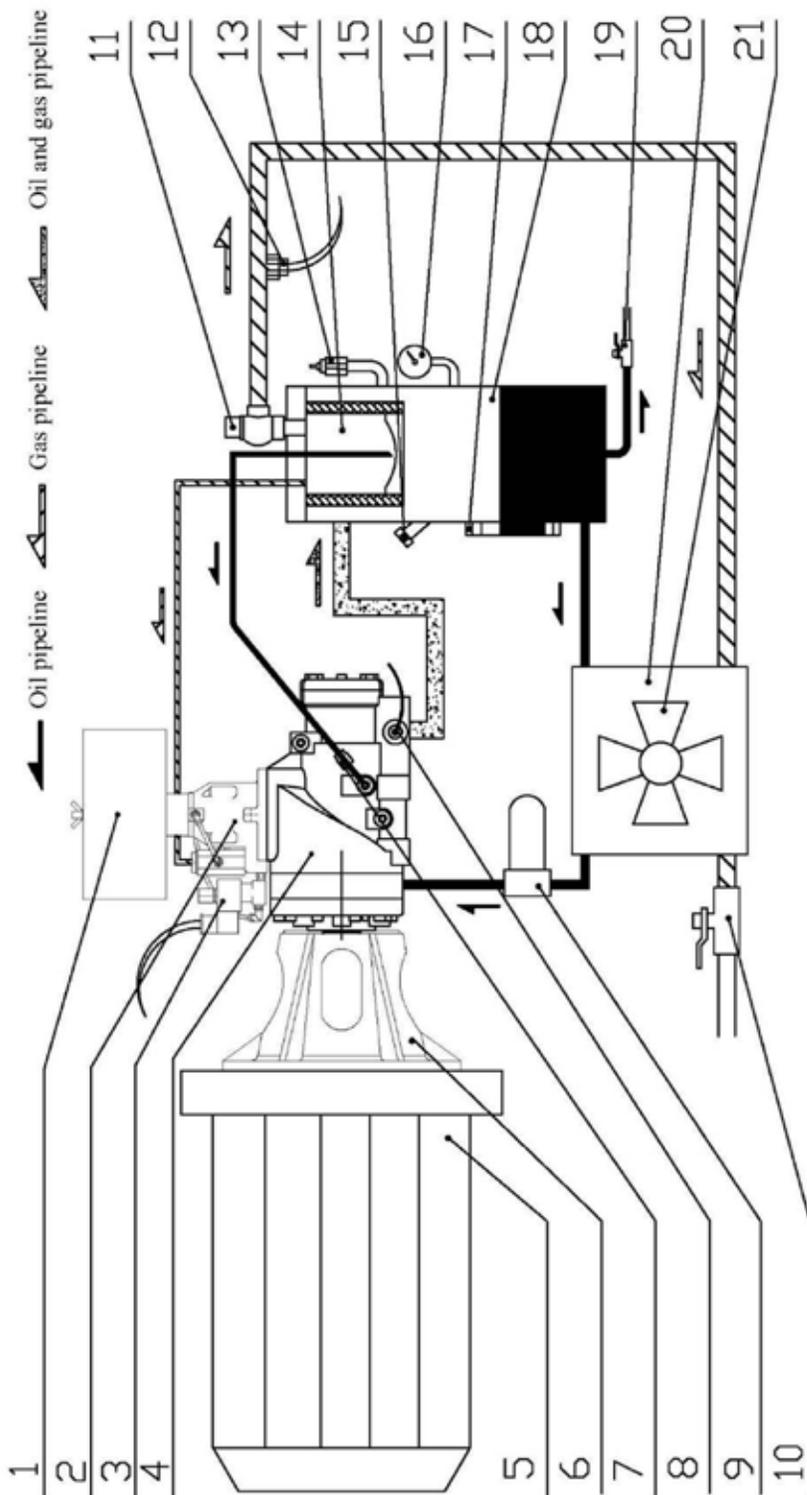
S.N.	Name	Quantity	S.N.	Name	Quantity
1	front shutter	1	25	Oil mirror	1
2	Vertical shaft on left side of the front shutter	1	26	Oil inlet plug of Oil-gas barrel	1
3	Left shutter	1	27	Ball valve	1
4	Electric control cabinet	1	28	Air filter element	1
5	Motor barrel	1	29	Air filter cover	1
6	Gridding plate	1	30	Back shutter	1
7	Motor barrel back cover	1	31	Vertical shaft on right side of the back shutter	1
8	Oil filter	1	32	Right shutter	1
9	Oil filter base	1	33	Vertical shaft on right side of the front shutter	1
10	adjustable straight connector	1	34	Plastic panel	1
11	Cooling fan	1	35	Display control panel	1
12	The protective cover of the cooler & fan	1	36	Emergency stop switch	1
13	cooler	1	37	90° adjustable connector	1
14	Head cover plate	1	38	Main return pipe of air end	1
15	Fan cover plate	1	39	Air inlet valve	1
16	Discharge pipe straight connector	1	40	Host machine	1
17	Discharge pipe of oil-gas barrel	1	41	Oil inlet straight connector	1
18	Minimum pressure valve	1	42	Air end support	1
19	Flange cover of oil-gas barrel	1	43	Rubber Anti-vibration foot	1
20	Built-in oil-gas fine differentiator	1	44	oil return valve	1
21	Oil return pipe straight connector	1	45	Temperature sensor	1
22	Pressure gauge	1	46	Discharge pipe of air end	1
23	Oil return pipe of oil and gas barrel	1	47	Main base plate	1
24	Safety valve	1			

## RS7580H603 SCREW COMPRESSOR PARTS LIST



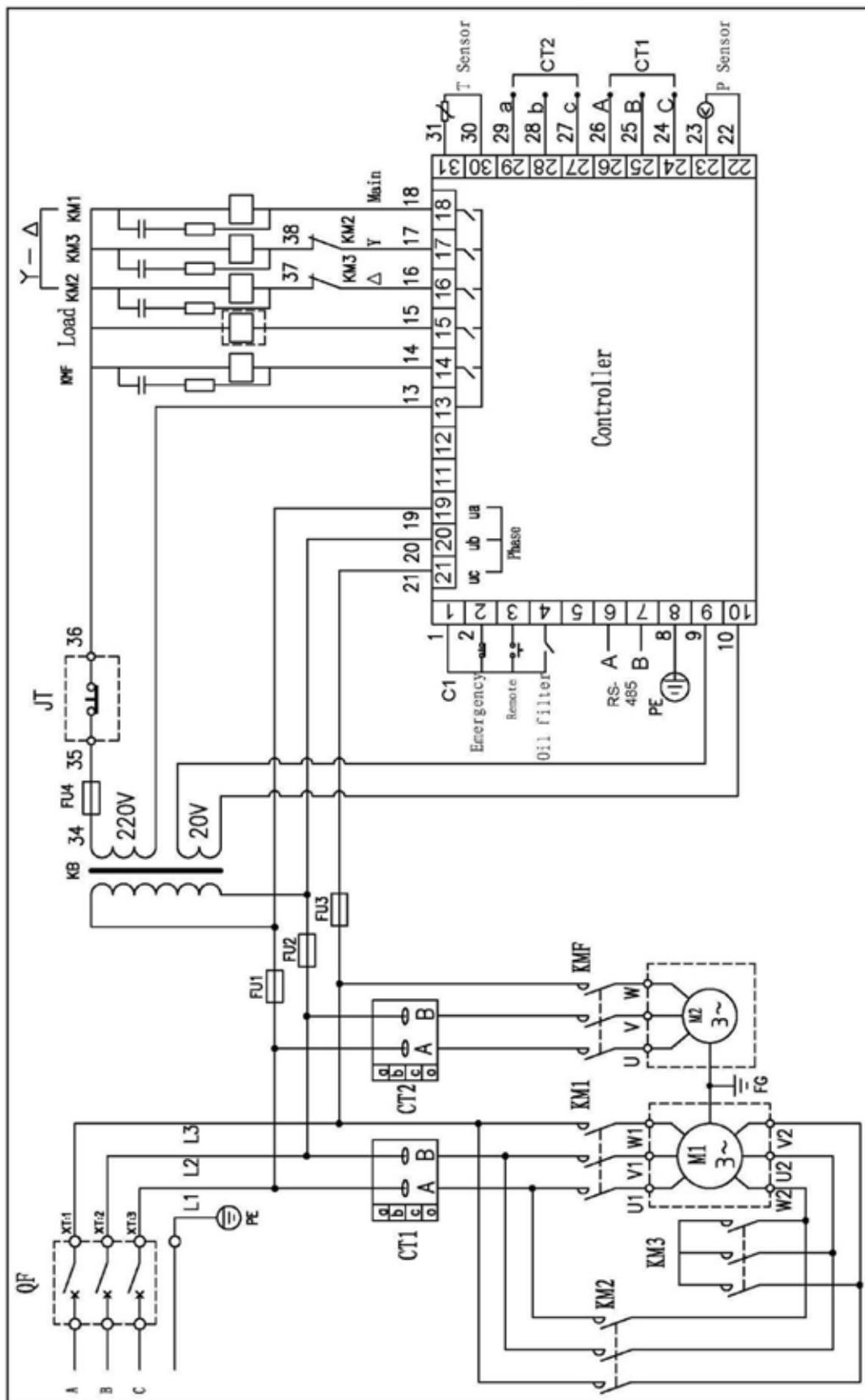
1	Air filter	7	Oil sight glass	13	Ball valve	19	Pouring orifice
2	Unloading and valve	8	Pelt	14	Pressure maintain valve	20	Oil and water outlet valve
3	Air inlet group valve	9	<b>Oil filter</b>	15	Pressure sensor	21	Ball valve
4	Screw host machine	10	Pulley	16	Safety valve	22	Cooler
5	Oil non-return valve	11	Drive motor	17	Gas-oil separator		
6	Temperature sensor	12	Cooling fan	18	Pressure gauge		

# RS7580H603 SCREW COMPRESSOR PARTS LIST

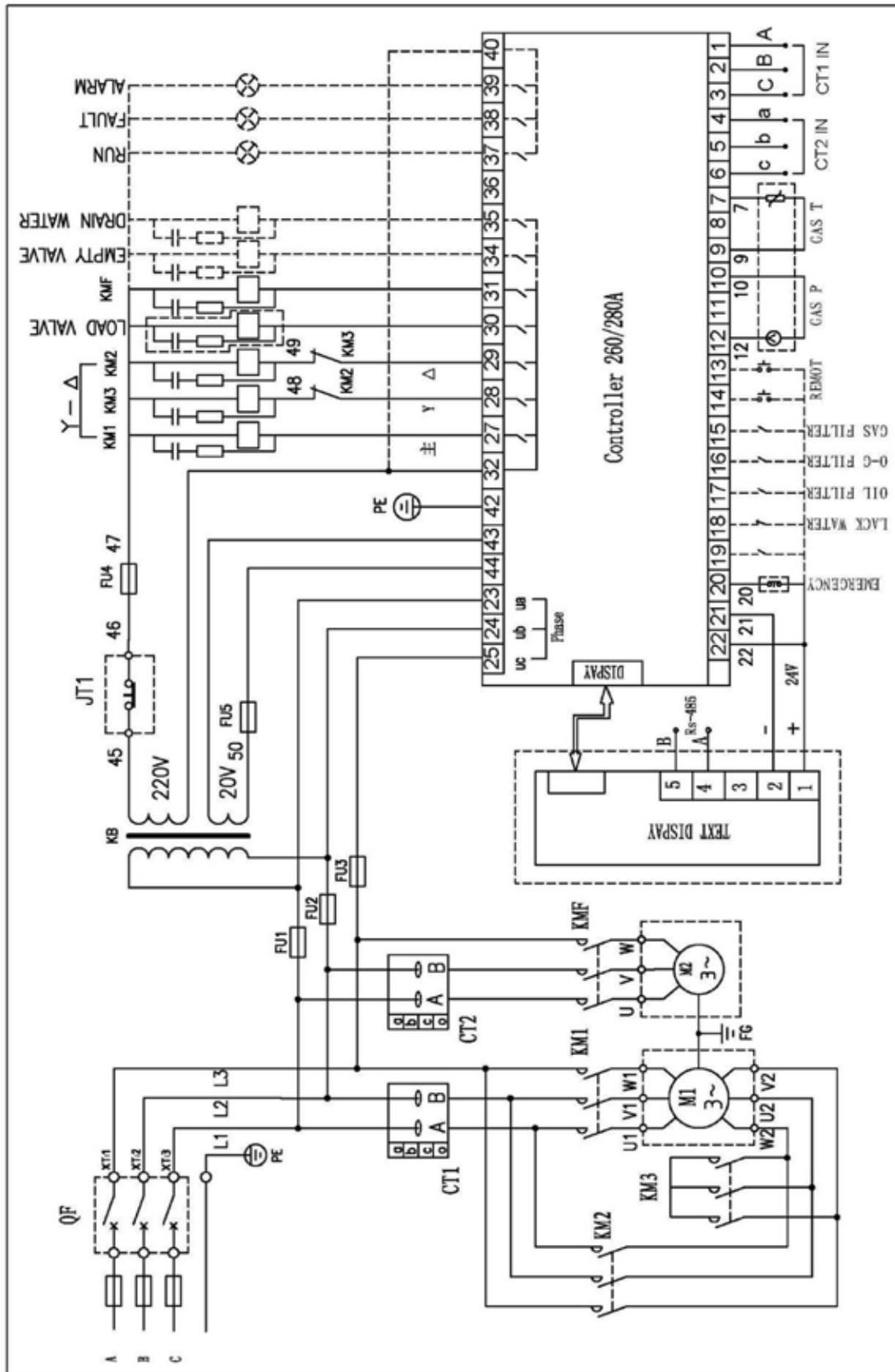


1	Air filter	7	One-way valve	13	Safety valve	19	Oil and water outlet valve
2	Air inlet group valve	8	Temperature sensor	14	Gas-oil separator	20	Cooler
3	Unloading and valve	9	Oil filter	15	Pouring orifice	21	Cooling fan
4	Screw host machine	10	Ball valve	16	Pressure gauge		
5	Drive motor	11	Pressure maintain valve	17	Oil sight glass		
6	Centric coupling holder	12	Pressure sensor	18	Oil and gas barrel		

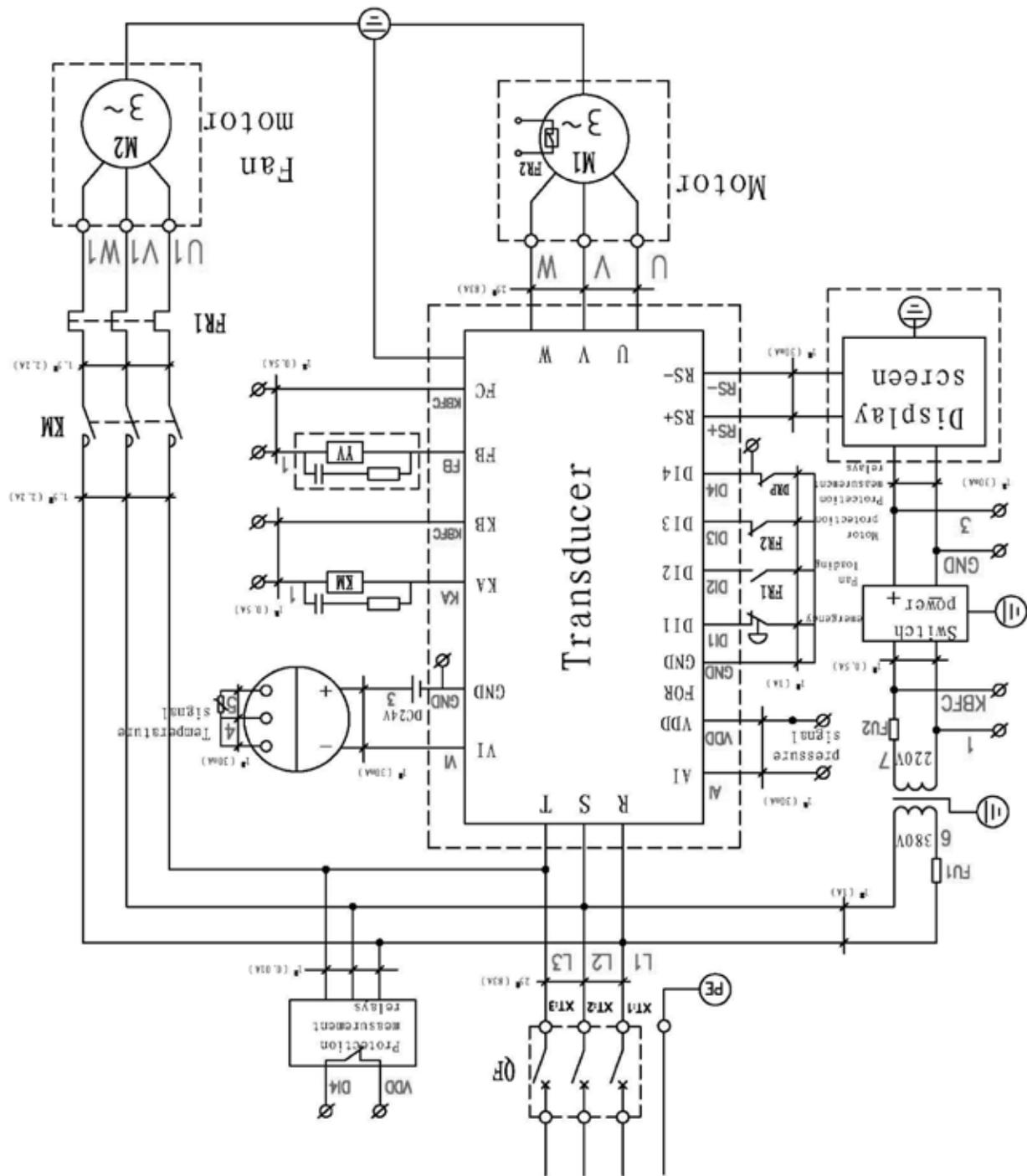
# RS7580H603 COMPRESSOR ELECTRIC DIAGRAM



# RS7580H603 COMPRESSOR ELECTRIC DIAGRAM



# RS7580H603 COMPRESSOR ELECTRIC DIAGRAM





## HUSH-QUIET™ ROTARY SCREW AIR COMPRESSOR WARRANTY

Better Products – Better Service – Better Value

Duration: From date of purchase by the original Purchaser or 60-24-12 months from the date of shipment by BendPak or whichever comes first.

- ✓ **Five Years (60-Months) Warranty** on the compressor tank only
- ✓ **Two Years (24-Months) Warranty** on the compressor pump only
- ✓ **One Year (12-Months) Warranty** on operating components
- ✓ **One Year (12-Months) Labor Warranty** on site or at factory
- ✓ **One Year (12-Months) Free-Shipping\*** on ground-freight charges related to warranty performance

### Limited Warranty

17. Who gives this warranty (Warrantor): BendPak Inc., 1645 Lemonwood Dr., Santa Paula, CA 93060
18. Who receives this warranty (Purchaser): The original Purchaser (other than for purpose of resale)
19. What products are covered by this warranty: Any BendPak Tri-Max Air Compressor\*\*
20. What is covered under this warranty: manufacturer defects due to material and/or workmanship with the exceptions noted below.
21. What is not covered under this warranty:
  - a. Any failure that results from Purchaser's abuse, neglect or failure to operate, maintain or service product in accordance with instructions provided in the owner's manual(s) supplied or any pre-delivery service, (assembly, oil, lubricants, adjustment etc.)
  - b. Items or service normally required to maintain the product, i.e. lubricants, oil, etc.
  - c. Items considered general wear parts such as rubber belts, hoses, etc. unless wear or failure is a direct result of manufacturer defect due to material and/or workmanship Other items not listed but considered general wear parts; a. Pump wear or valve damage caused by using oil not specified; b. Pump or valve damage caused by any oil contamination or by failure to follow proper oil maintenance guidelines; c. Ring wear or valve damage from inadequate filter maintenance
  - d. Any component damaged in shipment or any failure caused by installing or operating air compressor under conditions not in accordance with installation and operation guidelines or damaged by contact with tools or surroundings
  - e. Motor or pump failure caused by rain, excessive humidity, corrosive environments or other contaminants
  - f. Rusted tanks, including but not limited to rust due to improper drainage or corrosive environments. The five-year tank warranty applies to ASME air receivers only if they are installed on rubber anti-vibration pads or approved equivalent.
  - g. Cosmetic defects that do not interfere with product functionality
  - h. Damage due to incorrect voltage or improper wiring
  - i. Any incidental, indirect, or consequential loss, damage, or expense that may result from any defect, failure, or malfunction of BendPak Inc. product
  - j. All electrical components are guaranteed for one year against defects in workmanship and/or materials when the lift is installed and used according to specifications.
22. Responsibilities of Warrantor under this warranty: Repair or replace, at Warrantor's option, component which is defective, has malfunctioned and/or failed to conform within duration of the warranty period. BendPak Inc. will pay reasonable labor costs for the first 12 months only
23. Responsibilities of Purchaser under this warranty:
  - a. Provide dated proof of purchase and maintenance records
  - b. In some cases, components may be required to be shipped to the nearest BendPak Authorized Service Center. Freight costs, after 12-months, must be borne by the Purchaser.
  - c. Use reasonable care in the operation and maintenance of the products as described in the owner's manual(s).
24. When Warrantor will perform repair or replacement under this warranty: Repair or replacement will be scheduled and serviced according to the normal work flow at the servicing location, and depending on the availability of replacement parts.

\*Free-shipping applies to direct shipping points within the 48 continental United States. Rural area shipping surcharge may apply for remote addresses. \*\*For all BendPak brand Two-Post or Four-Post Vehicle Service Lifts (excluding specialty lifts, high rise, commercial parking, material handling, or models for particular purpose) manufactured on or following 1/1/2011.

### Limitation of Liability

BendPak/Ranger shall have no obligation pursuant to this Warranty with respect to products which in our sole judgment have been altered, damaged, misused, abused, badly worn, lost or improperly maintained. This Warranty is null and void if the customer or any other person other than an authorized representative of BendPak/Ranger has made any attempt to service or modify the tool prior to its return to BendPak/Ranger under this Warranty. In no event will either party be liable for any damage caused by the other party's failure to fulfill its responsibilities under these terms and conditions. In no event will either party be liable for any lost profits, lost savings, incidental damage, or other economic consequential damages BendPak/Ranger products are provided and sold as is without any express or implied warranties including warranties of merchantability or fitness for particular purpose. No warranties, expressed or implied, will apply after this period. BendPak may modify these terms and conditions at any time by either providing the customer with written notice or posting such revised terms on [www.bendpak.com](http://www.bendpak.com). Such revised terms shall be effective thirty days from the date of such written notice or posting.







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