AEB/AED **SERIES**

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INSTRUCTION MANUAL

SCREW AIR COMPRESSOR

螺杆式空气压缩机

www.vpackmachinery.com

Catalogue

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Preface

Thank you very much for choosing Our screw air compressor. The products of our company have passed strict inspection and test before leaving the factory, but in order to ensure that the machine can be safe, reliable, durable use, please read the operation manual carefully before installation and test. If you do not understand the content of this manual, please contact the service units of the company, we will serve you wholeheartedly.

Service telephone: 0760-28166696

Instruction

1. Unless otherwise specified, all pressures referred to in this Manual are surface pressures and all units are international units.
2. Please indicate the model, pressure type and manufacturing number when contacting the company about maintenance and service of the compressor, which are indicated on the nameplate and warranty card of the machine.
3. The Company reserves the right to change the design of the products. The specifications or parts of some products may be modified in the future without prior notice.

MACHINE TYPE _____
FACTORY NUMBER _____
POWER-ON DATE _____

Safety precautions

Before you use your new device, please read the following safety precautions carefully and strictly follow them in subsequent use. This is very important for your personal safety and equipment safety! All violations of safety precautions, will cause serious consequences!

1. It is absolutely forbidden to use compressed air as the air source directly inhaled into the respiratory system, and do not blow the compressed air directly to food. If the compressed air is used for the above purposes, the compressed air shall be treated.

2. The compressor unit should be operated by fixed personnel. Operators should read through and understand the content of this manual, follow the working procedures and safety precautions in the manual.

3, the new machine debugging must be appointed or approved by our company debugging personnel.

4, piping welding, need to move away from the surrounding flammable items, and pay attention to prevent welding sparks into the air compressor, cause fire.

5. The power supply line leading to the air compressor needs to install air switches, fuse wires and other safety devices. In order to ensure the reliability and safety of electrical equipment, it is necessary to connect the appropriate grounding wire. If necessary, lightning protection device shall be installed.

6, air compressor can only one-way rotation, such as reverse rotation will produce serious consequences such as rotor stuck! Although the air compressor is equipped with reverse protection function (that is, the unit can not be started when the phase sequence is connected in reverse), it is still necessary to test whether the steering is correct after the first starting up, power line change or motor repair, so as to ensure that the head is not damaged by the reverse turning.

7. When starting the machine, ensure that there is no one in the crew, close the door of the crew, and inform the maintenance personnel around the crew first. During maintenance, the machine must pay attention to ensure that no one or tools touch the moving parts in the machine.

8. The compressor cannot work under the exhaust pressure higher than the specified on the nameplate, otherwise it will cause the motor to stop over overload or burn down.

9. Pressure of compressed air and oil are dangerous. During the operation of the unit, it is forbidden to open the following parts: oil and gas barrels, coolers, water separators, drainage ball valves and plugs. When overhauling or maintaining, the compressed air in the whole air compressor system should be completely released.

10, the compressor voltage is fatal danger, do all kinds of maintenance and repair, must cut off the power supply, and lock the switch, and in the switch hanging maintenance and forbid closing signs, in order to prevent others closing power.

11. During the operation of the compressor, it is forbidden to approach the high-speed

rotating parts such as fans, belts and couplings, so as to avoid danger.
12. When the compressor is running, the surface temperature of some parts is very high, such as oil and gas barrel, oil cooler, oil pipe, exhaust pipe, etc. When checking the operation state of the unit, please be sure not to make the skin contact directly with the surface of these parts. Maintenance and overhaul should be stopped in the compressor and cooling can be carried out before, to prevent burns.
13, in the compressor failure or unsafe factors, do not force the boot. At this point, the power supply should be cut off and marked conspicuously.
14. When cleaning the components of the unit, it is strictly prohibited to use flammable, explosive and volatile cleaning agents, and non-corrosive safe solvents should be used.
15. The safety valve and shutdown protection system must be checked regularly to ensure their sensitivity and reliability. Generally it should be inspected once a year.
16. The unit in use should be checked regularly and maintained strictly according to the maintenance cycle. When there are signs of failure, the machine should be shut down in time, without delay, so as to avoid serious consequences.
17. There are pressure vessels in the compressor. Please pay attention to the local regulations on pressure vessels.
18. Without the permission and guidance of the Company or the authorized dealer, no internal parts of the compressor can be adjusted, disassembled or transformed by themselves.
19. If the compressor needs to replace any parts, it must use the pure original parts provided by Our Company or the designated dealer, especially the lubricating oil must use the special oil of Our screw air compressor, and strictly follow the oil change cycle and oil change procedure. If users use non-Our screw air compressor special oil, the company will not be responsible for the machine warranty! Please pay special attention to it.
20, compressor lubricating oil is combustible, please do not cigarette butts, kindling and other close to lubricating oil. Appropriate fire extinguishers should be provided near the unit.
21, compressor condensate discharge should be connected with the waste water treatment system. Replaced lubricants, filters, etc. shall not be discharged and discarded at will, please refer to the local environmental protection laws and regulations.

Chapter 1 Receiving and Installation of Air Compressor

1、Receiving Good

1. When you receive the air compressor, please immediately count the quantity, type and specification as well as the attached materials according to the items listed in the packing list.

2. Visually check whether the air compressor and its accessories are damaged during transportation.

3. If there is any shortage or damage, please appeal to the transportation company for compensation immediately, and inform our company or the dealer to assist in handling. We suggest that the machines and packing materials be kept as they are for the time being to confirm the damage. If you are not satisfied, please let us know within six days after the arrival of the goods.

2、Hoisting and handling

1. Lifting: the whole machine can be lifted by forklift or crane.

Note: 1) the sling shall be prevented from damaging the sound insulation cover or damaging the paint film when lifting.

2) When hoisting and lifting the whole machine, do not use the lifting hole on the top of the motor or the sound insulation cover.

2, handling

Forklift can be used for transportation in the factory.

For long distance transportation, please note that the transportation fixing bolts must be locked to prevent the seismic platform or motor from shifting during transportation. The unit must have a packing case, and the unit must be fixed on the base of the packing case. Excessive vibration and tilt should be avoided in transportation. Inverting is absolutely prohibited!

2、Installation

Installation site selection and proper planning of the whole system the most easily ignored by the staff, often casually looking for a position, casual piping immediately after use, little imagine so hasty approach is buried under a lot of hidden trouble, easy to cause poor quality compressed air in the future, consumables, life is short, problems such as air compressor maintenance difficulties, serious when even lead to failure of the unit, thereby causing loss to the shutdown. So we should pay enough attention to it. For technical questions about the whole air pressure system planning, please consult our technical department. The following are some basic requirements. Please read them carefully.

1、 Selection of installation site：

（1）Compressor must be installed indoors, and require good lighting and lighting to facilitate operation and maintenance.

（2）Should choose as far as possible clean air, dust less place. A large amount of dust is very serious to the harm of air compressor, which is often ignored:

①The burden of the air filter is increased, and its service life is greatly shortened.

②Although the compressor is installed with a high-precision air filter, there will still be a very small amount of fine dust through the filter core into the compression system. If there is too much dust in the air, the dust entering the compression system will be greatly increased, affecting the quality of lubricating oil, shortening the service life of oil filters and fine oil separators, and serious rotor wear.

③For air-cooled compressor, dust will gradually attach to the fins of the cooler and affect the cooling effect of the cooler. If dust is too much, this effect will be greatly aggravated, and the maintenance work of the cooler will also be increased.

④although the compressor is equipped with a prefilter, but too much dust will still make it blocked soon, not only increase the workload of cleaning, but also reduce the air into the compressor case, affecting the heat transfer in the box. The effect on air-cooled units is more obvious.

（3）The ambient temperature of air-cooled compressor should generally be less than 40℃, and the ambient temperature of water-cooled compressor should be less than 43℃.

The reason for this requirement is economic：

① the higher the ambient temperature, the less air output of the air compressor, resulting in a waste of energy.

② High ambient temperature increases the operating temperature of the compressor. Although the compressor is equipped with temperature protection, users do not have to worry about overtemperature, but the compressor running at too high a temperature for a long time will speed up the deterioration of lubricating oil, shorten its replacement cycle, which is actually not economic.

③ Too high ambient temperature is not conducive to the heat dissipation of the motor, which will affect its service life.

In addition, the ambient temperature must be higher than 5℃, controlled above the freezing point temperature of water and lubricating oil. If you really need the unit operating below 5℃, especially the unit operating below 0℃, you must choose the air cooling unit, and please inform the company to provide you with low temperature operation matters needing attention and may need low temperature lubricating oil or radiation heating.

（4）Air compressor should be installed in a dry environment as far as possible, especially to avoid the exhaust air of cooling water tower.

When the air is compressed, the pressure increases, and if the temperature is low, the gaseous water vapor in the air will condense a lot of liquid water, and the more moist the air is, the more water will condense. Although this product has advanced technology to prevent moisture precipitation, but if the air is very humid, there will still be some moisture condensation, especially when the machine is not running continuously. Although the lubricating oil used in this product has excellent anti-emulsification performance, but such as water precipitation, a large amount of water mixed with the lubricating oil for a long time, in the internal circulation of the compressor, will still make the lubricating oil emulsification, performance decline, deterioration is accelerated. It will cause the rust of rotor, oil and gas barrel, pipeline and so on, which is very harmful. So the dryness of the environment is very important.

（5）Air compressor should be reserved around the maintenance space and maintenance enough to allow parts in and out of the channel. The distance between the air compressor and the wall should be more than one meter, and the top should be more than 2 meters higher than the compressor, so as to facilitate heat dissipation and lifting.

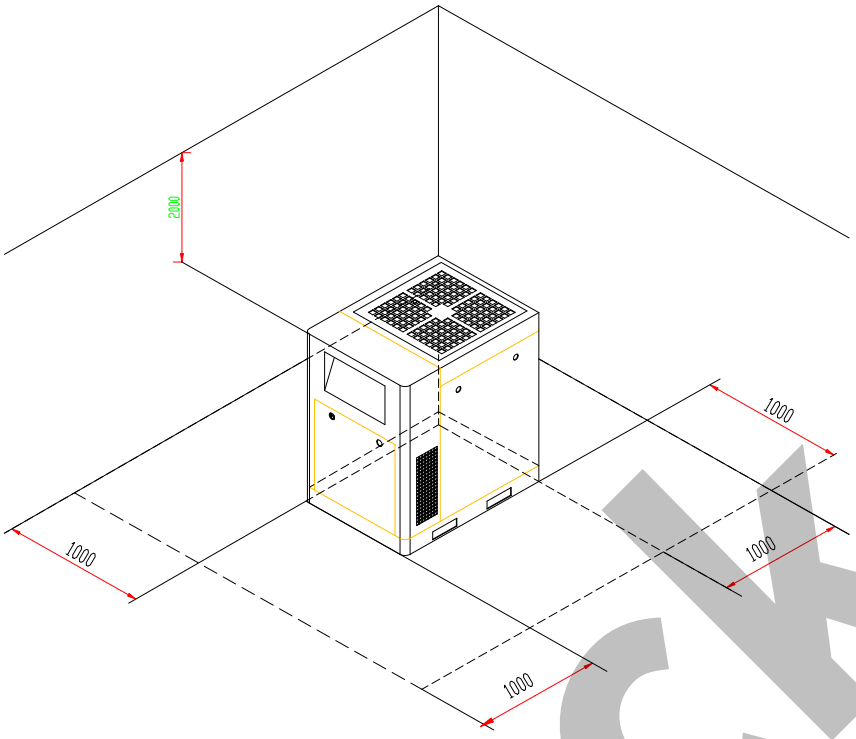


Photo 1

（6）Installation of crowns to facilitate maintenance. This is especially true for high-power compressors.

（7）Air compressor is heating equipment, compressor room ventilation is very important. It is especially important for air-cooled models, as described in P10.

（8）Gas that may affect the performance of air compressor lubricating oil is not allowed in the environment. Typical such as: ozone, acid gas, a variety of corrosive gases, flammable and explosive gases, etc

（9）The machine should be kept clean and tidy around, remove unnecessary, hinder the operation of the articles, especially can not have inflammable and explosive articles.

2、 Basic

（1）The vibration produced by the screw compressor is very small, and it does not need a special foundation, nor does it need the fixing of anchor bolts, but it needs to be placed on the flat hard ground, and the installation should be as horizontal as possible, with the maximum inclination of not more than 5°. In addition, we need to consider the emission of lubricating oil. The discharge of compressor oil is led from the bottom of the oil and gas barrel to the side of the seat by pipe. If it is inconvenient to discharge oil at this height, the following methods can be used：

① Place the compressor unit on a suitable base with a certain height, such as a strong platform above the ground, to obtain the desired discharge height. However, it should be noted that if the compressor is raised, the space at the bottom of the compressor base must be closed with solid materials to prevent noise leakage

②An oil pool is set up below the ground near the oil outlet to place the oil container

③Drain the oil into a flat container.

（2）If the air compressor is installed upstairs, it must be well anti-vibration treatment. Such as the use of shock pads to prevent vibration transmission and resonance.

3、 Pipe fittings

(1) The main road must be inclined 1° ~ 2°, and the lowest place should be equipped with an automatic drain valve to discharge the condensed water in the pipeline.

(2) The pressure drop of the pipe line shall not exceed 5% of the set pressure of the air compressor. When the pipe is long, it is best to choose a pipe diameter larger than the design value to reduce the pressure drop. The branch line must be connected from the top of the main line to avoid condensate water flowing down the line to the working machine. Use tapered tubing when the pipe diameter changes, otherwise turbulent flow will occur at the junction, resulting in large pressure loss. In the pipeline should minimize the use of elbow and all kinds of valves to reduce pressure loss. At the same time, because the gas impact will shorten the life of the pipeline, so the pipeline should be fixed firmly to avoid vibration.

(3) After the air compressor, buffer purification equipment such as gas storage tank and dryer should be equipped. The ideal configuration sequence should be air compressor → gas storage tank → dryer. The air storage tank can filter out most of the water. At the same time, the air storage tank also has the function of reducing the temperature of the discharged gas. The air with lower temperature and less water content enters the dryer again, which can reduce the load of the dryer. At the same time, if the system uses gas intermittently, and the gas consumption at the tip is large, the gas storage tank can play a buffer role, so as to reduce the number of empty heavy vehicles of the air compressor and prolong the life of air components of the air compressor.

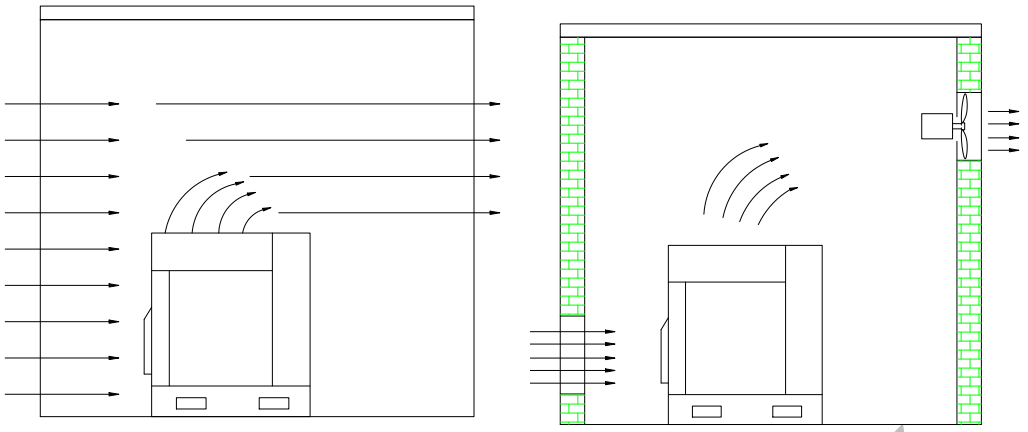
(4) the ideal piping is the main line around the whole plant. In this way, the branch line in any position of the plant can obtain compressed air in both directions, and if the air consumption of a branch line suddenly increases, it will not cause obvious pressure drop.

(5) Dryers, filters and other equipment and pipelines that need to be maintained in the future must be equipped with bypass pipelines and valves in appropriate positions. For various technical problems related to piping, please contact our company for consultation.

The cooling system

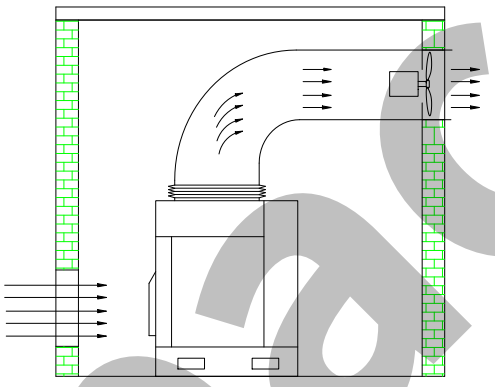
For the air cooling unit, all the heat generated by the compressor must be taken away by the cold air of the environment, so the ventilation and heat exchange of the machine room is very important. The typical ventilation equipment layout of the machine room is shown in the figure. Figure 2(a) shows that the machine room is not closed and has a naturally flowing wind field. Please install the compressor according to the wind direction. Fig. 2(b) shows that an exhaust fan shall be installed in the closed machine room, whose air volume shall be greater than that of the cooling fan of the air compressor, and the area of the cold air inlet shall be sufficient. Fig. 2(c) An air duct is installed at the outlet of the exhaust fan on the top of the air compressor to drain the hot air discharged from the air duct. If the air duct is too long and affects the heat dissipation, a fan with the same air volume as the cooling fan of the air compressor should be installed at the outlet of the air duct.

When installing the air ducts, leave room for the installation of canvas movable joints for maintenance (so that when cleaning the cooler, there is enough room to remove the compressor cover plate and other parts).



（a）　　(b)

图 2



（c）

图 2

Chapter Two Overview of screw air compressor

1、Introduction of fuel injection screw air compressor：

1.Fuel injection screw air compressor has become the new mainstream of the development of today's air compressor. Compared with the piston compressor under the same power, it has unparalleled advantages, superior performance and reliability. It has the advantages of small vibration, low noise, high efficiency and no wearing parts. The precision coordination between the main and auxiliary rotors and between the rotor and the body shell reduces the gas backflow leakage and improves the efficiency. Only the rotor meshing, no cylinder reciprocating motion, reduce the source of vibration and noise sources; The unique lubrication mode brings many advantages:

2.By virtue of the pressure difference generated by itself, lubricating oil is constantly injected into the compression chamber and bearing, which simplifies the complex mechanical structure.

3.The injected lubricating oil can form an oil film between the rotors, and the main rotor can directly drive the secondary rotor to rotate, without the need for high precision synchronous gear.

4.The injection of lubricating oil can increase the compression tightness.

5.Lubricating oil absorbs a large amount of compression heat, so even if the single-stage compression ratio is up to 16, the nose can still be controlled below the carbon formation and deterioration temperature of ordinary lubricating oil, and there is no friction between the rotor and the housing due to different expansion coefficients.

6.Lubricating oil reduces noise caused by high frequency compression.

2、Body structure of oil injection screw air compressor：

The oil injection screw type air compressor produced by our company is a kind of double shaft volumetric rotary compressor. The air inlet is located at the upper end of the housing, and the exhaust port is opened at the lower end. Two high-precision main and auxiliary rotors are mounted in parallel in the housing. The main rotor has five teeth, the secondary rotor has six teeth; The tooth shape is spiral and the two meshes with each other. Both ends of the main and secondary rotors are supported and positioned by bearings.

3、Compression principle of screw compressor (refer to Figure 3)

1.Inspiration process:

When the rotor rotates, the intertooth volume formed by the main and secondary rotors gradually expands, and the volume is only connected with the suction port, and the outside air is sucked into the intertooth volume. When the intertooth volume increases to the maximum, the intertooth volume is disconnected from the suction port, and the suction ends. This is the "intake process".。

2.Sealing and conveying process:

At the end of the inhalation, the main and auxiliary rotor teeth summit and the casing closed, the air in the volume between the teeth is closed in the main, auxiliary rotor and shell composed of the closed cavity, this is the "closure process". The two rotors continue to rotate, the main and auxiliary

rotor teeth meshing with each other, the meshing surface gradually moves to the exhaust end, and the air in the volume between the teeth is also transported to the exhaust end, that is, the "conveying process".

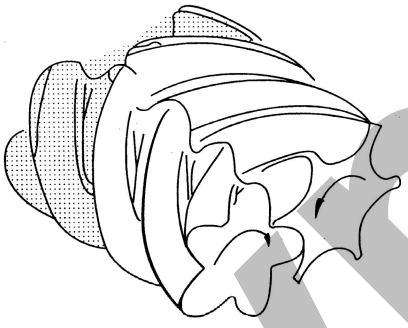
3.Compression and oil injection process:

During the conveying process, with the rotation of the rotor, the volume between the teeth decreases due to the meshing of the rotor teeth, and the volume of the gas in the volume between the teeth decreases accordingly. The gas is compressed and the pressure increases, which is the "compression process". At the same time of compression, the lubricating oil is sprayed into the groove and mixed with the air due to the pressure difference.

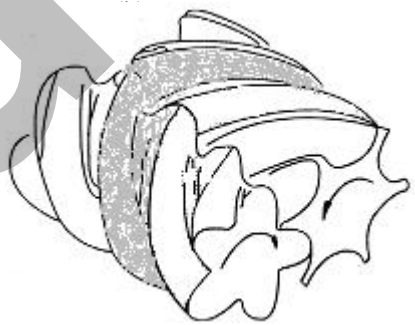
4. Exhaust process:

When the rotor reaches the point where the intertooth volume is connected with the housing exhaust port, the compressed gas begins to discharge. This process continues until the profile lines at the end of the teeth are fully engaged. At this point, the intertooth volume is zero and the gas is completely discharged, which is the completion of the "exhaust process".

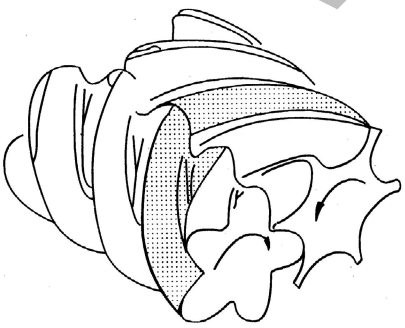
1. Breathe in process



2. Sealing and conveying process



3. Compression and injection process



4. Exhaust process

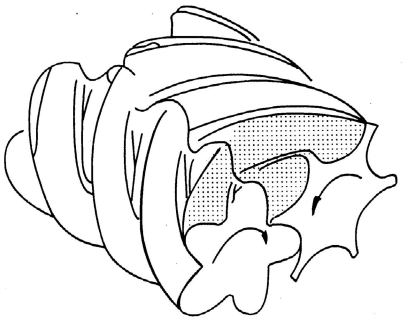


图 3

11KW～45KW系统流程详图

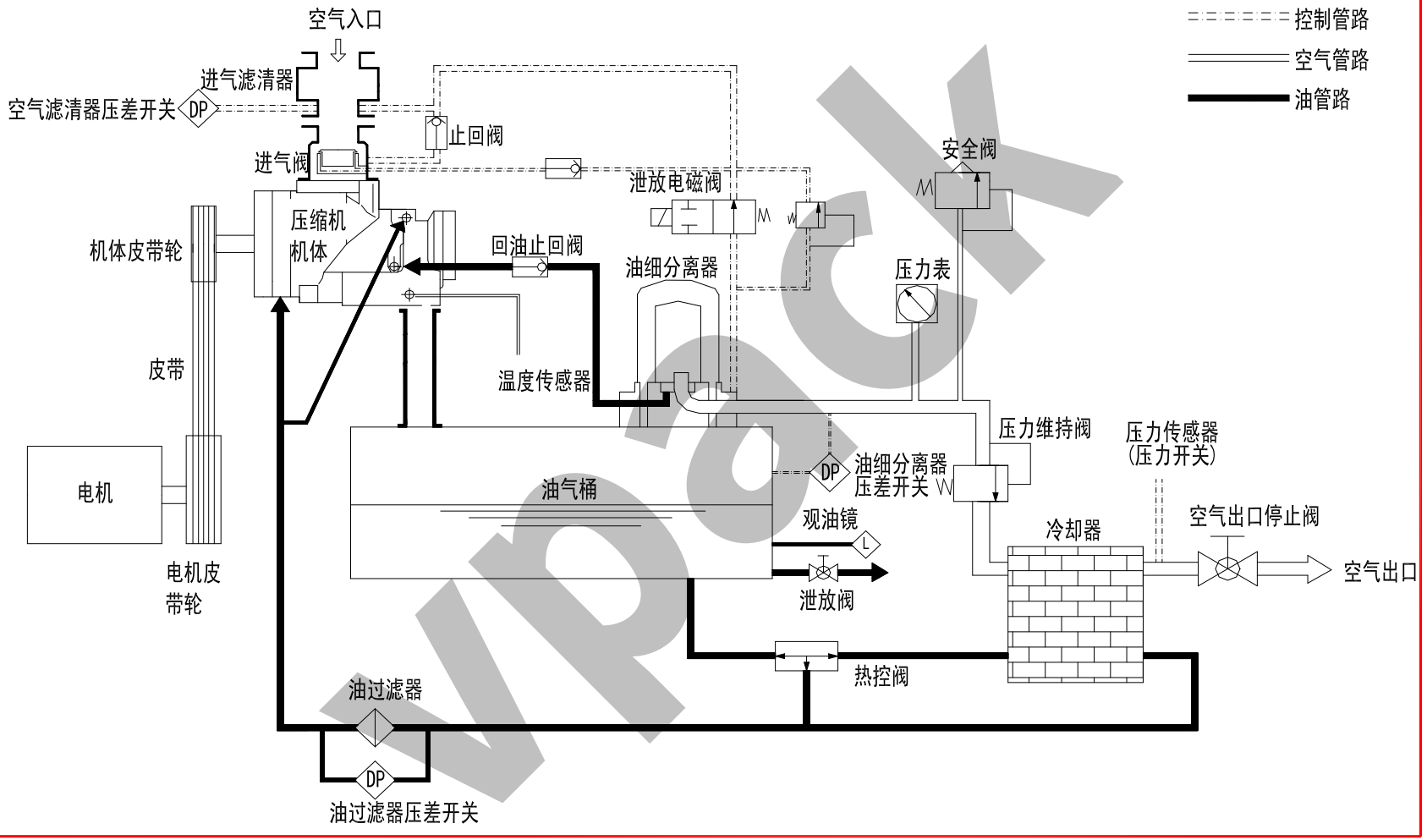


图 4-1

55KW及以上机型系统流程图

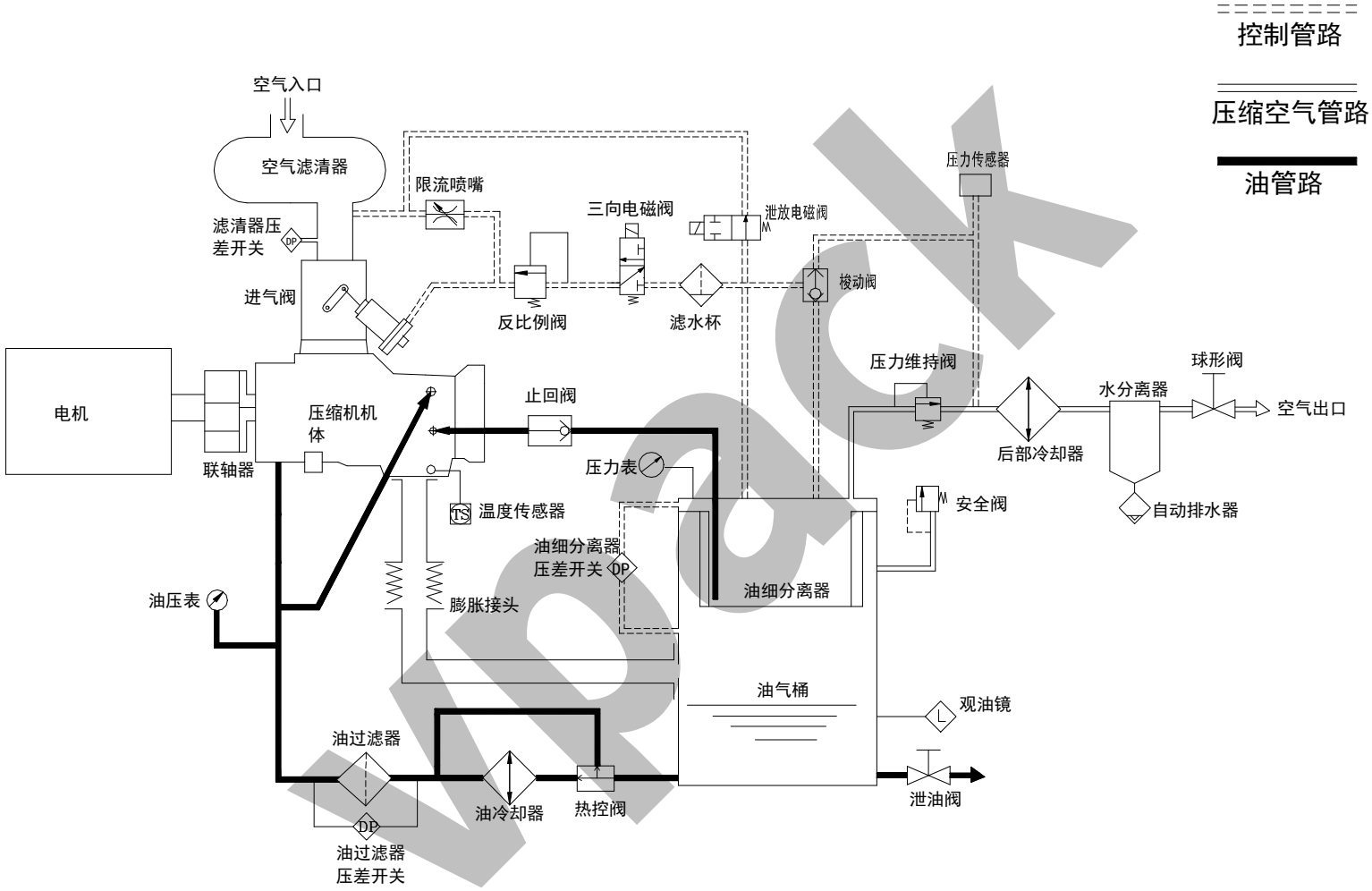


图 4-2

Chapter Three Introduction of the system flow and parts function

I、Air system flow

1、 After the dust is filtered by the air filter, the air enters the compressor body through the intake valve for compression and mixes with the lubricating oil. The compressed air mixed with the oil is discharged into the oil and gas barrel. After the oil is removed by the oil and gas barrel and the oil separator, the pure air is sent into the use system through the pressure maintenance valve and the rear cooler.

2、 Function description of each component in the air path:

（1）Air filters

The air filter element is a dry paper filter element, its main function is to filter the dust in the air. When the air filter blocking indicator light on the control panel is on, it means that the air filter element must be cleaned or replaced, but the compressor continues to operate.

The shell of the air filter is made of iron or plastic, and the cyclone dust removal device is installed. inside, which can remove most of the dust and greatly prolong the life of the air filter element.

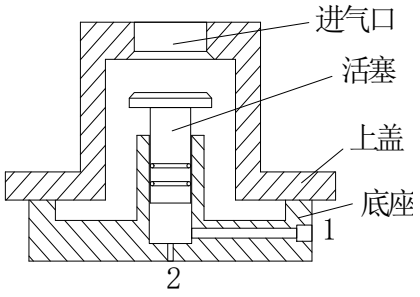
（2）Intake valve

The intake valve is one of the core components in the air flow and control system of the whole air compressor. The opening or closing action of the intake valve corresponds to the two operating states of the air compressor :(the opening or closing of the intake valve is for the air inlet in the valve, and the opening of the intake valve is the opening of the air inlet)

Heavy truck: the intake valve is fully open, the air compressor runs at full load, and the total air output is realized.

Empty car: the intake valve is fully closed, the air compressor operates without load, and there is no compressed air output.

Adjustment: the intake valve is partially opened, the air compressor is partially loaded, and the output of compressed air is between 0 and 100%.



11KW ~ 45KW models adopt piston inlet valve, structure

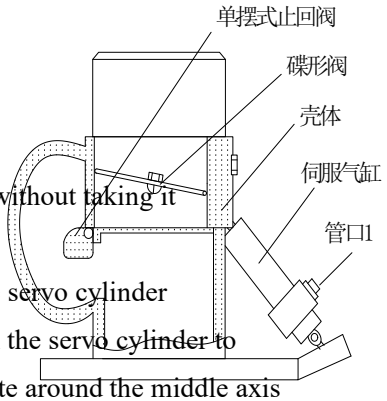
As shown in Fig. 5-1, it is mainly composed of upper cover, base, piston and other parts. When the air compressor is running, as long as the pipeline 1 has no pressure input, the micro hole 2 will release the pressure at the bottom of the piston, the piston will move down under the vacuum suction generated by the rotation of the rotor, the air inlet will be opened, the air will be inhaled, and the air compressor will run in heavy load. When nozzle 1 has a pressure input, and the pressure is enough to overcome the vacuum suction, the piston is driven upward by air pressure until it contacts the top cover to close the intake. The air compressor runs without load. The pressure supply of nozzle 1 is controlled by the relief solenoid valve.

Photo 5-1

Type 55KW and above adopts butterfly inlet valve structure, as shown in Fig. 5-2.

Mainly by disc, single swing type check valve, servo cylinder, shell and other parts

Composition. The piston in the servo cylinder moves up and down to push the disc shaft to rotate,



This drives the disc to open or close the air inlet.

The disc is naturally closed, which allows the air compressor to start without taking it

Load startup

When nozzle 1 has pressure input, and this pressure can overcome the servo cylinder

When the internal spring force, the air pressure will push the piston in the servo cylinder to

In upward motion, the ejector rod on the piston causes the disc to rotate around the middle axis

Rotation. At this time, the intake valve is opened, and the air compressor is heavy.

Photo 5-2

When the pressure relief of nozzle 1 is released, the piston of the servo cylinder is under the action of the spring force

Return to normal disposal. The butterfly plate is also driven by the reset, the air inlet is closed, and the air compressor is empty.

When the pressure input of nozzle 1 is not enough to completely overcome the spring force, the piston will maintain balance in a certain position in the middle, and the corresponding butterfly plate will also stabilize at a certain Angle, so that the intake valve will keep partially open, and the air compressor will be allowed to adjust the operation.

The input pressure of nozzle-1 is controlled by a three-way solenoid valve and an inverse valve.

The disc of the intake valve is also provided with a single swing check valve. In case of emergency shutdown, the check valve can prevent the high pressure oil and gas recoil in the system from ejecting out of the inlet valve.

To be sure: when empty, there is still a small amount of air inhaled by the body (butterfly inlet valve from the butterfly on the vacuum suction, piston type air intake valve from the system of the vacuum line inhaled), inhalation of air is compressed by discharge solenoid valve discharge, because there is discharge throttling, make the gas suction and discharge of gas balance, the pressure inside the system remain at 0.2 ~ 0.3 MPa, to ensure the normal circulation of lubricating oil.

（3）Expansion joint (no type below 55KW)

The expansion joint is installed on the pipeline between the exhaust end of the body and the inlet of the oil and gas barrel to compensate for the deformation of the pipeline caused by thermal expansion and the deformation caused by the vibration of the unit.

（4）Barrels of oil and gas

Oil and gas barrels have two functions: storage of lubricating oil and the first separation of oil and gas. The oil and gas mixture discharged by the compressor body is first discharged to the oil and gas barrel. After the oil and gas barrel is separated for the first time, most of the oil is separated and settled at the bottom of the oil and gas barrel. The compressed air that still contains a small amount of oil will be sent to the oil fine separator.

The oil and gas barrel side is equipped with an oil viewing mirror for observing the oil level. The normal oil level is: when the machine is running, the oil level is between the two red lines of the oil mirror. If the oil level is found to be higher than the upper red line during the operation of the heavy truck, the oil level is too high; if the oil level is found to be lower than the lower red line during the

operation of the heavy truck, the oil level is too low. It is recommended to stop the machine immediately for refueling.

The oil level at the time of shutdown may be located above the upper red line because the oil in the system flows back to the oil and gas barrel after shutdown.

The oil and gas drum is equipped with refueling port for adding lubricating oil. There is a drain at the bottom, which is used for discharging condensate water and discharging lubricating oil when changing oil.

（5）The relief valve

If the system failure makes the pressure in the oil and gas barrel reach more than 1.1 times the set exhaust pressure, the safety valve will be opened to make the pressure drop to the set exhaust pressure below. The safety valve has been adjusted before leaving the factory. Please do not adjust it casually. The safety valve should be tested for normal operation at least once every six months.

（6）Pressure maintenance valve

The pressure maintenance valve is located at the outlet of the oil separator, and its opening pressure is generally set at 0.4 ~ 0.5MPa. The pressure maintenance valve is set this way because:

A. When the compressor is just started, the minimum pressure required for lubricating oil circulation in the system should be set up first to ensure good lubrication of the body.

B. When the pressure in the oil and gas barrel exceeds the set opening pressure of the pressure maintenance valve, the pressure maintenance valve opens to allow the discharge of compressed air, so as to avoid reducing the oil and gas separation effect due to the too fast air flow through the fine oil separator, and also protect the fine oil separator from being damaged due to the excessive pressure difference between the inner and outer walls.

In addition, the pressure maintenance valve has a check function. When the air compressor is empty, the pressure in the air compressor system is low, and the higher pressure in the user system will not flow back because of the existence of the pressure maintenance valve.

The pressure maintenance valve has been set when leaving the factory and no adjustment is needed in use.

（7）Rear cooler

Refer to Cooling System Instructions.

II、Lubricating oil system flow

1、 Description of injection process

The lubricating oil circulation of the screw compressor is automatically realized by the pressure difference between the oil and gas barrel and the oil injection port in the compressor body, without the need for a special oil pump. The specific process is as follows: after the high-temperature lubricating oil comes out of the oil and gas barrel, it passes through the thermal control valve, enters the oil cooler for cooling, and then goes through the oil filter to remove the impurity particles. Then it is divided into two ways: most of the oil is sprayed into the compression chamber from the lower end of the body to participate in the compression process. A small part of the oil goes to the front and rear ends of the body

to lubricate the bearing group of the body. Lubricating bearing oil finally returns to the suction port and enters the compression chamber together with the air to participate in the compression process.

The compressed air mixed with the oil enters the oil and gas barrel, and the oil and gas barrel separates most of the oil and gas directly settle at the bottom of the oil and gas barrel to prepare for the next circulation. The remaining small amount of oil in the air is separated by the oil separator and flows back to the suction end of the body through the return pipe and check valve.

2、 Function description of each component on the oil circuit

（1）Thermal control valve：

The production of moisture and its hazard to compressors have been described previously. The heat control valve in the oil circuit can effectively prevent a large amount of condensed water from precipitation. Its functions are as follows: the thermal control valve has a total of three interfaces: oil inlet, oil outlet and side port. The side port is connected to the oil cooler inlet, which is closed under normal condition. When the oil temperature at the oil inlet is low (such as when the cold unit just starts), the thermal control valve does not operate, and the oil flows directly into the oil filter without passing through the cooler. When the oil temperature gradually rises to above 67℃, the thermal control valve begins to operate, the side port is gradually opened, the oil outlet is gradually closed, and part of the oil begins to enter the oil cooler for cooling. When the oil temperature continues to rise to more than 72℃, the side ports are all opened, the oil outlet is all closed, and the lubricating oil flows through the oil cooler for cooling. This can ensure that the exhaust temperature is higher than 70℃, so as to avoid a large amount of condensed water in the compressed air precipitation in the unit.

11KW ～ 18KW The model has no thermal control valve, and the exhaust temperature is controlled by the start and stop of the fan.

（2）Oil cooler

Refer to Cooling System Instructions.

（3）The oil filter

Oil filter is a paper filter, its function is to remove particles in oil impurities.

When the pressure differential indicator light of oil filter on the control panel is on, it indicates that the oil filter is blocked and must be replaced, but the compressor still continues to operate. The oil filter needs to be replaced after the first running in period of about 1000 hours of the new machine. If the oil is not replaced in time, it may lead to insufficient oil intake and excessively high exhaust temperature. At the same time, the insufficient oil will affect the bearing life.

（4）Oil fine separator

Oil separator is one of the key components of oil injection screw compressor. Its core part is made of multilayer fine glass fiber. The outside is provided with a fixed iron mesh cage and flange, shell, etc. After the separation of the oil separator, the oil content in the compressed air can be controlled below 3ppm (the oil separator can do nothing for the oil in the air in the vapor state, so this part of the oil will be taken away by the air). The oil separator is a disposable component.

Under normal circumstances, the life of the oil separator core can reach 4000 hours. However, some factors have a great impact on its service life. Such as:

① The cleanliness of lubricating oil. If there are many impurities such as dust in lubricating oil, the oil separator core will soon be blocked. Therefore, please pay special attention to the cleanliness of the environment and the maintenance of the air filter.

② Lubricating oil quality. If the quality of lubricating oil is not good or has deteriorated, it will seriously affect its life.

Please refer to P21 for instructions on the use of lubricating oil.

In general, whether the oil fine separator is damaged can be determined by the following methods:

① he oil content in the air line increases

② There is a pressure difference switch of the oil separator between the oil barrel and the oil separator. When the pressure difference between the oil separator and the oil separator exceeds the set value of 0.1Mpa, the pressure difference indicator light is on, which means the oil separator has been blocked and should be replaced immediately

③ Check whether the oil pressure is high

④ Whether the current increases

III、The cooling system

The cooling system is one of the most important parts of the air compressor, because the air is compressed to release a lot of heat, these heat is to be taken away by the cooling system for heat exchange. The cooling system is divided into two categories: air-cooled and water-cooled.

(1) Air cooled cooling system

The cooling system consists of two parts: fan and cooler. The cooler is made of aluminum plate-fin heat exchanger. The fan blows the cold air forcibly to the cooler, and when the air flows through the cooling fins of the cooler, it exchanges heat with compressed air or lubricating oil to take the heat away and achieve the effect of cooling compressed air and lubricating oil.

Attention should be paid to the use of air-cooled units：

① the temperature of cold air (basically equal to the ambient temperature) is very important, can not be too high, it is recommended not to exceed 40℃

② When the cooler is exposed to the air, the fins will be stained with dust. If too much dust is gathered, the heat exchange effect of the cooler will be seriously affected. Therefore, the dust on the surface of the fin should often be blown clean with compressed air. If the situation is serious and cannot be blown clean, it must be cleaned with detergent. When cleaning the components of the unit, it is strictly prohibited to use inflammable, explosive and volatile cleaning agent.

When cleaning, the cover plate on the side of the cooler bracket can be disassembled and blown upward with a hand-held air gun.

(2) Water cooled cooling system

Use shell and tube type cooler. One is the rear cooler to cool the compressed air and the other is the oil cooler to cool the lubricating oil before it is injected into the body. This kind of cooler is a series of thin-walled heat exchanger copper tubes arranged in parallel in the shell. Water goes inside the copper tubes and hot oil or hot air goes outside the copper tubes. After heat exchange, the water takes

away the heat of the oil and air。

Water-cooled coolers are less sensitive to ambient temperature conditions and are easier to control the exhaust temperature. However, if the cooling water quality is too poor, the cooler is easy to scale and block, or be corroded, resulting in increased maintenance costs. Even caused serious damage to the cooler and scrap. Recommended cooling water should meet at least the following requirements：

Water pressure: ≥ 0.2Mpa, ≤ 0.5Mpa, inlet water temperature ≤ 32oC, water quantity varies according to different models, please consult the technical department of the company for details.

In areas with hard water quality, water softener must be added to the circulating water and the water must be changed regularly. If there are too many impurities in the water, a water filter must be installed on the inlet pipe of the cooling water of the air compressor.

Water-cooled units will also be equipped with a small fan for heat dissipation in the case.

IV、Control system

The control system includes a detection element (to detect the running state of the unit) and an executive element (to execute the control action), which can realize the automatic operation of the air compressor without special personnel on duty. See system flow chart for details.

The main components of the control system are introduced：

（1）inlet valve：See instructions in P12 for details

（2）release solenoid valve

Discharge solenoid valve is a two two usually open solenoid valve, normal is conduction, when the power is closed, the power signal is given by the CPU. Its function is to start, stop and empty car release the pressure in the system. When the unit runs in these states, the valve breaks the electrical conductivity, the pressure in the system is released.

When the air compressor is heavy, the valve is powered off and the system stops discharging.

In 45KW and below models, this valve also controls the intake valve to realize the operation control of the unit empty load truck. When the unit needs to operate without load, the valve is broken and conductive, and the air flow can pass to the inlet 1 of the air inlet and close the inlet to realize empty car. When the air compressor is needed for heavy vehicles, the valve is closed, the air inlet is opened, and the air supply begins.

（3）three-way solenoid valve :(only 55KW and above models)

This is a two - three usually closed solenoid valve, normal closure, electricity to open. It and the discharge solenoid valve at the same time power or power loss. When heavy truck is needed, this valve can be powered to open, so that the pressure in the system can be transferred to inlet valve servo cylinder orifice 1, so as to open the intake valve and realize the operation of heavy truck. When empty car is needed, this valve shuts off power, cuts off the pressure supply of inlet valve servo cylinder 1, closes the inlet valve, and realizes empty car (at this time, the discharge solenoid valve is discharged).

（4）Pressure control element

There are two kinds of pressure control elements: pressure switch and pressure sensor.

If not specifically required, the 11 kW to 22 kW models use a pressure switch to control the exhaust pressure. When the pressure switch senses that the gas pressure reaches the pressure limit set by itself, the switch closes and the signal is sent to the CPU. The CPU sends a signal to control the power

failure of the discharge solenoid valve, and the unit is empty.

When the user's system pressure drops to the set limit, the pressure switch is disconnected, the CPU sends a signal to control the discharge solenoid valve to get power, and the unit can load the car.

When the unit leaves the factory, the upper and lower limits of the pressure switch are set according to the working pressure required by the user when ordering the unit. The upper limit is the maximum working pressure required by the customer, and the lower limit is generally the maximum working pressure of -0.2Mpa. Users must not adjust themselves.

For models with pressure switches, there is a pressure gauge on the control panel to show the pressure of the unit system. In heavy truck, this pressure is equal to the exhaust pressure. When the vehicle is empty, this pressure is the circulating pressure of the empty vehicle inside the unit.

Pressure sensor for 37KW and above models. The pressure sensor senses the gas pressure and converts it into a current signal and sends it to the CPU, which then converts it into a digital signal and sends it to the LCD screen to display the pressure value at the right time, and sends the control signal according to the judgment of the pressure value.

The pressure sensor senses the pressure behind the pressure maintenance valve, the user system pressure. When the user system pressure rises to the set limit, the CPU sends a signal to control the solenoid valve power off, and the unit is empty.

When the user's system pressure drops to the set limit, the CPU sends a signal to control the solenoid valve to get power, and the unit can load the car.

When the unit leaves the factory, it will set the upper and lower limits according to the working pressure required by the user when ordering the unit. The upper limit is the maximum working pressure required by the customer, and the lower limit is generally the maximum working pressure of -0.15MPa.

（5）Temperature control element

The temperature control element is also divided into two kinds, one is the temperature sensor rod and the temperature switch, used for 11 KW ~ 15KW models; One is a temperature sensor, used for 30KW and above models

The temperature rod is a thermocouple, which senses the exhaust temperature of the compressor body and converts it into an electrical signal to the temperature switch. What the temperature switch does is：

① he electric signal sent by the temperature sensor rod is converted and displayed

② Temperature protection function. The temperature protection value can be set on the temperature switch. When the exhaust temperature reaches the temperature protection set value (100℃), the temperature switch will operate and send a signal to the CPU, which will send a signal to stop the unit.

In the case of loss of oil, fan failure, environmental temperature is too high, may lead to excessive exhaust temperature.

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After the exhaust temperature protection action, the system start loop will be cut off. At this time, the system cannot be started again. It must press the emergency stop button and reset to make the

exhaust temperature protection lifted before starting again.

The temperature sensor senses the system temperature and converts it into a current signal and sends it to the CPU, which then converts it into a digital signal and sends it to the LCD screen to display the timely exhaust temperature value, and sends the control signal according to the judgment of the temperature value.

The system can control the start and stop of the fan according to the exhaust temperature of the unit. See the attached page for details. In the case of oil loss, fan failure and excessively high ambient temperature, the exhaust temperature may be too high. When the exhaust temperature reaches the protection set value (100℃), the CPU will send a signal to make the unit stop.

After the exhaust temperature protection action, the system start loop will be cut off. At this time, the system cannot be started again. It must press the emergency stop button and reset to make the exhaust temperature protection lifted before starting again.

（6）adjustable valve

The function of the regulating valve is to reduce the near-air volume of the unit when the gas consumption is not fully loaded, allowing the regulating operation, avoiding frequent empty and heavy vehicles, and saving electricity.

Adjustable valve is divided into two kinds: direct proportional valve and reverse proportional valve.

Proportional valve for 37KW ~ 45KW models, with piston inlet valve use. The action is as follows: when the input pressure is lower than the set pressure (set pressure is 0.02MPa lower than the upper limit of the unit pressure), the proportional valve does not act, no output pressure. When the input pressure is greater than the set pressure, the valve is opened, the output pressure to the piston inlet valve 1, so that the piston moves up to close the inlet, thereby reducing the intake volume. The higher the input pressure, the greater the output pressure of the proportional valve, the greater the closure of the intake valve, the smaller the intake volume.

Inverse proportional valve for 55KW and above models, with butterfly inlet valve. The action is as follows: when the input pressure is lower than its set pressure, the proportional valve does not act, the output pressure is equal to the input pressure. When the input pressure is greater than its set pressure, the valve begins to operate, so that the output pressure is lower than the input pressure, the higher the input pressure, the smaller the output pressure.

The unit usually sets the operating pressure of the reverse valve as 0.02MPa lower than the upper limit of the unit pressure. When the pressure rises to this pressure, the output pressure of the inverse valve decreases, so that the pressure of inlet valve servo cylinder orifice 1 decreases, the intake valve is slightly closed, and the unit begins to allow adjustment. If the pressure continues to rise, the output pressure of the inverse valve continues to decrease, and the intake valve is also smaller and smaller, at this time, the unit's exhaust volume is also smaller and smaller.

The regulating valve has been set when leaving the factory. Please do not adjust it.

Note: there is no volume regulating valve for models of 22KW and below.

（7）Shuttle valve (55KW and above models only)

The shuttle valve has two air source inlets and one outlet. It only allows the higher pressure of the

two air sources to pass through, and the other is sealed off.

Its function is to provide higher control pressure to the servo cylinder of the intake valve under different operating conditions. In this way, the intake valve can be opened quickly when an empty car is needed to turn to a heavy car.

（8）The check valve

The check valve is located between the return pipe and the body. It allows the oil filtered out of the fine separator to flow into the body in one direction, and prevents the oil in the body from flowing back to the fine separator before the system pressure drops to zero after the shutdown (the oil flowing back to the fine separator will greatly increase the oil consumption of the unit).

In the use of piston intake valve models (11kW ~ 45kW), there are two check valves for vacuum line to prevent oil flow back.

(9) Differential pressure switch：

There are three kinds of filter elements in the unit, namely, air filter, oil filter and oil separator. Once these filter elements are blocked, they will cause bad effects on the operation of the unit, so the unit is equipped with differential pressure switch for these three kinds of elements. When the pressure difference between front and rear reaches the pressure difference set by the pressure difference switch after these components are blocked, the pressure difference switch acts and the signal is input to CPU, then the corresponding indicator light on the control panel lights up, indicating that the components are blocked and should be replaced in the shortest time. Do not have fluke psychology to continue to use, so easy to cause other unit failure or damage, the gain outweighs the loss.

Differential pressure when the pressure switch action signal: air filter -0.006Mpa

Oil filter 0.18MPa

Oil fine separator 0.1MPa

11KW ~ 15KW model without differential pressure switch, the control system has been set in the filter material service time, when reached the set time, the replacement.

Five, electrical system

1, boot disk:

The startup disk concentrates various electrical components, as described below

(1) Contactor :

11KW～15KW models are for direct start. There are 2 contactors on the start plate, M and F, among which F controls the fan operation and M controls the main motor operation. When the main motor starts, M is closed, the main motor is △ connection, and it starts directly.

22KW and above models are Y-△ start, there are 4 contactors on the start plate, M, D, S, F, among which F controls the fan operation, and the other three control the main motor. When the main motor starts, M and S are closed, and the main motor is Y connection, which reduces the starting current. After a few seconds, it will automatically switch to M and D pull-in, and the main motor will be △ connection. There is an electrical self-locking design between the contactors D and S to ensure that they cannot be simultaneously closed.

All contact contactor have received from the CPU instruction operation.

Note: 22KW and below models have no capacity regulating valve.

(2) Overload protector:

There are two motors in the unit, which are the air compressor driving the main motor and the fan motor. The circuit is equipped with overload protectors for these two motors. This is a thermal protector. When the motor current exceeds the set protection value of the protector and keeps it for a period of time, the protector will automatically cut off the main power supply and stop the air compressor. It should track down the original current overload due to timely troubleshooting. Once the protector operates, it must be reset before the unit can restart. When resetting, just press the reset button on the protector.

The protection setting value of the protector is generally 1.1 times the rated phase current of the protected motor.

(Phase current = rated current on the motor nameplate × 0.577)

(3) Transformer

There are two transformers PT1 and PT2 on the startup disk. PT1 is the main transformer, which provides power for the entire electronic control system. PT2 is a three-phase transformer, which provides a three-phase power phase sequence signal for judging whether the steering of the unit is correct.

(4) Relay circuit board

The function of the relay circuit board is to relay and switch signals. The weaker control signal from the CPU (such as the power loss of the discharge

solenoid valve, the contactor pull signal, etc.) can be converted into a large current signal to drive the solenoid valve and the contactor through the relay . It can also convert the signals from the differential pressure switch and overload protector to the CPU. The reverse phase protector is also integrated in the circuit board.

(5) CPU

It is the control center of the whole unit. The signals of various detection components are transmitted to it, and various commands are issued to control the operation of the whole machine, and various operating parameters and fault information are displayed on the LCD screen.

See Chapter 4 for detailed CPU control functions

See next page for electrical schematic diagram

6. Transmission system:

A EB model adopts belt drive system. The motor shaft and the machine body shaft are respectively equipped with a motor pulley and a machine body pulley, and are connected with a high-strength belt. The speed of the machine body can be changed by changing the diameter of the two pulleys.

(1) For the type of belt drive, the belt must be checked after the first 30 hours of operation of the new machine. If it is too loose, it should be adjusted immediately, and then checked or adjusted every 1500 to 2000 hours.

Using a force gauge, add a load of 3kg to the belt to measure its deformation. If the deformation exceeds the standard value, adjust the belt tension. The deformation of this model is 6 ± 0.3mm .

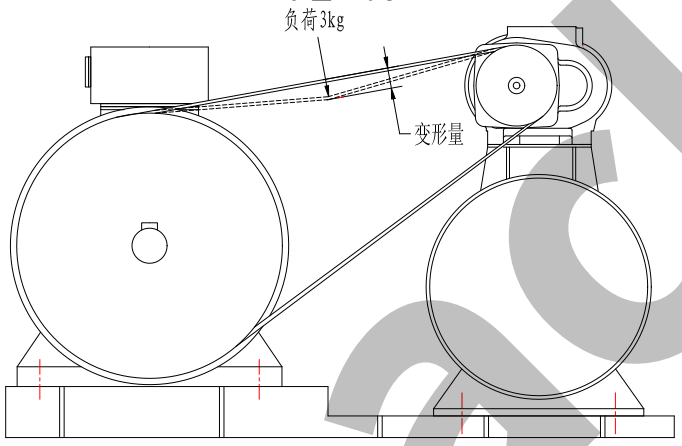


Figure 7

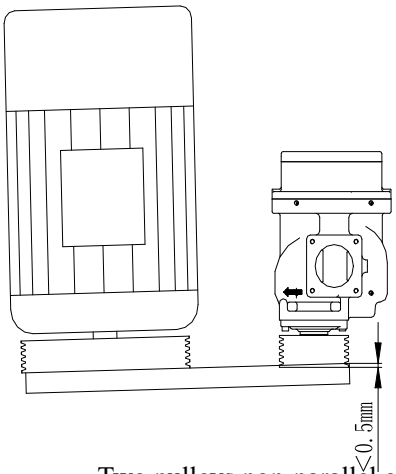
When adjusting the belt tension, first loosen the four fixing screws of the motor base slightly, and then move the motor with the adjusting screw next to it, and then tighten the fixing screws of the motor after measuring with a tension meter.

After adjusting the belt tension and replacing the main motor or compressor body, it is necessary to re-adjust the position of the motor so that the flatness error of the two pulleys does not exceed 0.5mm . If the error is too large, it will cause belt wear and shorten the life. See picture 8

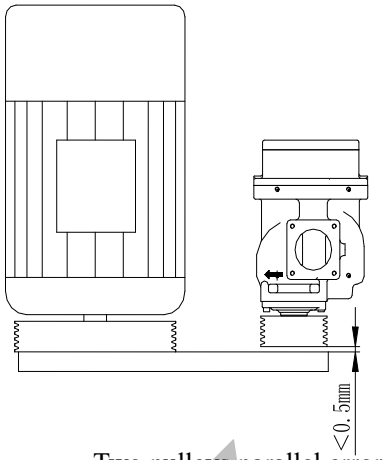
Inspection method: Place one end of the straight edge of a rigid, one-meter long ruler against the outer end surface of the motor pulley. At this time, the distance between the other end of the ruler and the body pulley is the flatness error. If the inspection finds that the flatness error of the pulley is too large, you can contact our company or the dealer for flatness.

(2) If you need to change the belt, all the belts must be replaced together, not just one of them, otherwise it will cause tension imbalance.

(3) When adjusting or replacing, do not splash lubricating oil on the belt or pulley to prevent the belt from slipping.



Two pulleys non-parallel error



Two pulleys parallel error

Figure 8

A ED above models with associated couplings transmission mode. This kind of system is composed of several parts such as center bracket, coupling, elastic body and transmission gear.

1） .The central console:

The body and the motor are connected as a whole through the center bracket ,and the motor shaft and the body extension shaft are accurately aligned through the positioning stop on the motor front flange and the body shell and the high-precision processing center bracket.

2） .Couplings and elastomer

The motor shaft and the machine body shaft are driven by a pair of couplings. Between the two couplings is a plum-shaped elastic body. The coupling and the elastic body do not need maintenance and can be used for a long time.

3） .Transmission gear

The front half of the machine body is a gear box with a pair of transmission gears inside. Projecting drive gear mounted on the shaft body, a driven gear mounted on the main rotor, the torque input from the motor is transmitted to the main rotor shaft through the gear, turn the main sub-sub-rotor and drive, realization of compressed gas. There are also some models without transmission gears, and the motor shaft directly drives the main rotor through a coupling.

7. Other auxiliary devices :

1， shock device:

The screw compressor itself has little vibration, but there is still a little vibration. Moreover, the vibration is slightly larger at the moment of starting and Y-△ conversion. In order to isolate these vibrations from being transmitted

to the base, a shock-proof device is installed in the unit. The motor and the body are respectively supported by two shock-proof pads.

Note: During transportation, the shock-proof table or motor and body must be fastened with bolts. The bolts are locked when the equipment leaves the factory, and you need to loosen these bolts before starting the machine.

2, pre-filter:

In order to prevent excessive dust from entering the isolation cover of the unit, a pre-filter is installed at the air inlet of the unit. Remove the prefilter requires frequent cleaning to avoid blocking the machine resulting in reduced gas output and a set temperature and so on. In dusty environments and air-cooled units need to be cleaned more frequently.

8. Lubricant

Lubricating oil plays a vital role in the normal and reliable operation of screw compressors. Its function has been briefly introduced in Chapter 2, which is detailed here:

1, for lubrication: each lubricant oil film is formed between the rotors meshing engagement hardly wear to the rotor is rotated. It also lubricates the bearings at both ends of the rotor and the transmission gears in gear transmission models.

2, cooling effect: After the air is compressed will release a large amount of heat, which thanks to absorb and take away the lubricating oil sprayed into the compressor body of the compressor to ensure that the temperature will not be too dangerous. More importantly, the compressor discharge temperature lower compression state closer to the ideal isothermal compression, more efficient pressure compressor more power.

3, acts as a seal: made even after grinding precision screw rotor, but still there is a small clearance when engaged, causing leakage of air. The oil film formed by the lubricating oil between the rotors can greatly reduce these gaps, thereby reducing leakage and improving efficiency.

4, since the noise reduction effect. Screw compressor because of its own structural characteristics cause it to point will have a greater high-frequency noise when the compressed gas, the lubricating oil improves the compression, the rotor eliminates friction, thereby reducing operating noise.

Because lubricating oil plays such an important role in screw compressors, the corresponding requirements for the quality of lubricating oil are very high, and its quality is required to have excellent oxidation resistance, anti-emulsification, anti-foaming, anti-aging, Corrosion resistance, abrasion resistance, etc. Use of poor quality lubricants, oils deteriorate quickly deteriorate, the viscosity urgent drama increased loss of lubricating properties of the oil, moving parts accelerated wear and tear, acid greatly increased. As a result, important parts

such as rotors and bearings are corroded, greatly reducing the service life of the unit, and even causing serious consequences such as rotor jamming in severe cases! The mixed use of two or more kinds of lubricating oil will also degrade the quality of the oil, or cause the oil to produce gelatinous serious consequences due to the incompatible additives of the respective additives!

Warning: When the compressor is filled with other company's lubricant, all promises of Our will automatically become invalid.

The special oil for Our screw air compressors uses high-quality refined base oils and special high-quality additives, manufactured according to the highest quality standards, and has been tested and approved by the company for a large number and long-term to ensure that various performances can meet the requirements.

Oil extended performance over time under normal circumstances fall slowly, a once reaches a sharp decline in the performance of its service life. Our recommended oil change interval is 3000 hours, but because the customer's use environment and conditions are very different, this period may change, and many factors will affect the oil change interval: load, temperature, humidity, environment, etc. The following conditions will greatly shorten the life of the oil:

① Poor ventilation makes the ambient temperature too high, or the maintenance is not timely, causing the compressor to run at a higher temperature for a long time;

②High humidity environment or rainy season;

③Dust environment.

It is very worthwhile to extend the service life of the lubricant as much as possible, so these factors should be avoided as much as possible during use. If the above factors exist, it is recommended to shorten the lubricant replacement cycle accordingly. Even a good environment, these factors do not exist, do not exceed 3000 Xiaoshi oil change, because the profit oil quality has a certain decline, the compressor does not operate in the best condition, if it continues to use, accelerating the deterioration of the oil quality, damage The risk of compressors is gradually increasing. When the oil deteriorates to the tendency of carbon formation, not only the lubricating performance of the oil has been severely reduced, resulting in increased wear of the rotor and bearings, but also the flash point has dropped a lot. At this time, the lubricating oil may be at high temperatures Spontaneous combustion occurs and the consequences are extremely dangerous!

The user is particularly reminded that it is extremely dangerous to just continue to replenish the lubricating oil or only change half of the oil every time. Because the newly added oil cannot restore the original performance of the unchanged lubricating oil, the continued use of these oils will cause the above-

mentioned various damages and dangers! Therefore, be sure to replace the lubricant in full within the prescribed time.

9.MOTOR

For the use and maintenance of the main motor, please refer to the motor manual in the accompanying documentation.

Chapter 4 Description of Compressor Control Function

See attached page for details

Chapter 5 Operation

1. New machine commissioning

1 , to confirm the installation of the compressor and piping meet all requirements.

2 , confirm that the power supply line wiring is correct, then the grounding wire.

3 , release the vibration table, or transport motor bracket fixing bolt.

4 , inside the drums check the oil level is within a predetermined oil level.

5 , if a long time before the delivery test, the intake valve should be added from about 0 .5 liters of lubricating oil, the air compressor and the number of revolutions turned by hand, to prevent oil loss burning the compressor start-up,

pay special attention not to allow foreign matter out Into the compressor body to avoid damage to the compressor.

6， the power transmission to the compressor wheel. If the power phase does not match, the LCD screen displays the message "Power phase sequence error". Just cut off the power supply and adjust any two of the power cords. Test whether the main voltage is correct and whether the three-phase voltage is balanced.

7， open air compressor outlet, make sure each vent valve in the closed unit. The water-cooled model opens the cooling water inlet and outlet.

8， the first power-operated equipment, such as drying, cooling towers, etc., and confirmed its normal operation.

9， the steering Test: Press " the ON " button, rotation of the compressor, immediately press the "emergency stop button" confirm steering compressor. Refer to the arrow on the compressor body for correct steering. The cooling fan also needs to pay attention to the direction of rotation. Although the compressor has been tested in the production process, the steering test is still an important step in the commissioning of the new machine.

10， start: press " the ON " button starts the operation of the compressor.

11， observe display instruments and indicators are normal, if unusual sound, vibration, leakage, immediately press the "emergency stop button" downtime.

12， operating temperature adjustment

After the compressor runs for 40 minutes, adjust the opening of the return valve to control the exhaust temperature of the heavy vehicle to be around 80 ℃ . (The air-cooled type does not need to be adjusted). When adjusting, gradually reduce the opening of the return valve, and then adjust the opening after responding to the compressor discharge temperature.

13， stop: Press the " OFF " key, compressor delay 15 seconds after the shutdown.

14， various protection functions to adjust the compressor has been tested in the factory before the test machine in good, so you do not need to test again, completely safe to use. Because if these protection functions are retested, many parts need to be readjusted. For the unit, these tests are not necessarily economical and beneficial, such as overload protection, high temperature trip protection, and safety valve take-off pressure tests.

2. Daily check before starting

The daily inspection before starting up is necessary for the normal operation of the compressor, so please perform it.

1. Drain the oil and gas barrel: open the drain valve of the oil and gas barrel a little to drain the condensed water when the machine stops, and close it immediately when there is lubricating oil flowing out.

2, to check the oil level: the oil level should be near the oil view mirror on the line to ensure that the oil level will not too low during operation.

3, electrical inspection. Loose joints and broken wires in the circuit may sometimes cause unexpected major accidents, so electrical inspections must be performed every two months.

4, the peripheral device is ready to: power transmission, cooling towers, pumps, compressor outlet valve is opened, compressed air dryer operation.

5, the compressor is started.

3. Matters needing attention during operation

1, when the operation there is abnormal sound and unusual vibration should be shut down immediately.

2, in operation regularly check the oil level, if found oil level gauge oil level is close to the lower limit, should be shut down to add, do not wait until the oil level is too low before refueling, because of lack of easily lead to high-temperature fuel trip, accelerate deterioration of lubricating oil And other hazards.

3, check the lines for leaks. Loose pipe joints and broken O-rings will cause oil and gas leakage in the unit. Please check for leakage every week. Including all parts of the pipeline outside the unit.

4, the operation of each .8 water meter inspection record voltage, current, gas pressure, exhaust temperature, fuel level and other operating data. Please refer to P54 for the record sheet. Please make sure to make these records. Our service technicians will analyze the operating conditions of the unit and give you helpful suggestions to make your compressor run more reliable and economical. Once the unit fails, the reasons can also be analyzed by referring to these records. Which need special attention observing and recording the exhaust gas temperature, exhaust gas temperature in the normal range of 70-95 deg.] C, such as out of this range can inform us to assist in checking.

5, the compressor is strictly prohibited start with a load. When the system is stopped (the pipeline before the pressure maintenance valve), if there is pressure, it will constitute the load of the motor at the start. At this time, the start will cause the motor current to be too large, causing the circuit to trip or damage the motor and air compressor. Therefore, after each shutdown, wait one to two minutes for the system pressure to drop to zero before starting. The panel found that the exhaust pressure is not zero, must hastily

start air compressor, and required to identify the reasons for troubleshooting.

4. Treatment methods for long-term downtime

Shutdown for more than 2 months is regarded as a long-term shutdown and should be handled carefully according to the following methods, especially in high humidity seasons or areas.

--Electrical equipment such as the control panel should be wrapped with plastic cloth or greased paper to prevent moisture intrusion.

--Drain the water in the oil cooler and the rear cooler completely. (Water cooling unit)

--Close all openings to prevent moisture and dust from entering.

--It is recommended to replace the lubricating oil with a new one before stopping use, and run it for 30 minutes, and drain the condensed water from the oil drum and oil cooler every other day. If the lubricating oil has been changed shortly before the stop, the oil may not be changed, but the water must be drained the next day after operation.

--If there is any malfunction, it should be eliminated first for future use.

Restart procedure:

--Remove the protective plastic cloth or greased paper.

--Measure the ground insulation of the motor, which should be above 1MΩ.

--Restart and use the new machine according to the test steps.

If the shutdown time is less than 2 months, it is recommended not to do long-term shutdown treatment. You can run the unit for about one hour a week, and drain the condensate the next day.

Chapter VI Maintenance and Inspection

Careful maintenance and maintenance of the compressor can always keep the compressor in good condition and maximize its performance, and promptly eliminate the unfavorable factors that may cause failures, and prolong the service life of various parts. Therefore, it is very worthy of seriousness. jobs. The idea of neglecting maintenance if there is no failure of the compressor is very dangerous. This increases

the possibility of the unit failure and waits until the failure occurs before repairing, which will cost maintenance costs and bear the loss of shutdown. Please implement correct and timely maintenance and maintenance in accordance with the provisions of this manual. Make sure to use genuine parts during maintenance. These parts are important parts that affect the performance and life of the machine. If the original parts or the oil specified by the company are not used , the company will not be responsible for the warranty. If you have any questions, please contact the service unit.

1. Cleaning and replacement of consumables

1, the air filter

The air filter housing has a cyclone dust removal device, and the dust removal port needs to be squeezed to discharge dust frequently to avoid clogging and affecting the dust removal effect.

Remove the air filter and clean it every 1000 hours of compressor operation or when the air filter pressure difference indicator is on. It is generally replaced every 2000 hours, and the time is shortened if the environment is poor.

Disassembly and cleaning methods:

① Loosen the lock nut of the air filter box cover and remove the air filter box cover.

② Loosen the filter lock nut, remove the air filter.

③ Use low-pressure compressed air (<0.3Mpa dry compressed air to blow the filter element from the inside to the outside. The entire filter element must be blown everywhere.

④Replace the filter element.

2, pre-filter

It must be removed and cleaned every 1-2 weeks without replacement. If the environment is poor, the cleaning time will be shortened.

3, the oil filter

The first replacement is performed after 1000 hours of operation of the compressor, after which it is generally replaced every 2000 hours. If the environment is poor and the lubricating oil is dirty, it may be clogged when the service life is less than 2000 hours. At this time, the oil filter block indicator on the control panel will be on, and the liquid crystal display will show that the oil filter is blocked. At this time, the oil filter needs to be replaced .

Replacement method:

①Remove the oil filter element from the oil filter housing. A chain wrench or a cloth strap wrench can be used.

② Clean the oil filter housing.

③ cast a thin layer of lubricant on the seal of the new cartridge

④ Install a new filter element. Rotate manually to make the sealing ring contact with the shell tightly, and then use a chain wrench or cloth strap wrench to tighten 1/4 to 1/3 of a turn.

Note: Be careful when using a chain spanner or a cloth strap spanner, and don't flatten the filter housing.

4, fine oil separator

When the oil fine separator is blocked, the indicator light is on and the liquid crystal shows that the oil fine separator is blocked, or when the oil pressure is higher than the air pressure, it must be replaced. The general replacement cycle is 4000 hours. If the environment is poor, the time will be shortened.

The specific disassembly and assembly method of the external oil fine separator is the same as the oil filter element. Note that when replacing the oil fine separator, prevent dirty objects from falling into the oil drum to avoid affecting the operation of the air compressor.

For the built-in oil fine separator, follow the steps below when replacing it:

①. After the air compressor is stopped, close the air outlet and open the drain valve to confirm that the system has no pressure.

②. Disassemble the pipeline above the oil and gas barrel, and remove the pipeline from the outlet of the pressure maintaining valve to the aftercooler.

③. Remove the oil return pipe.

④, remove the oil barrel fixing bolt cover, the cover is removed oil barrel.

⑤. Remove the oil fine separator and check the O-ring, and replace with a new oil fine separator.

⑥. Install the oil and gas barrels in the reverse order of disassembly, and ensure that after the oil fine separator is installed, the barrel body and the oil fine separator are in good contact to prevent static electricity. The test method can use the multimeter diode file to measure the oil fine separator the lid bolts are turned oN if it indicates that improper installation or no O-ring can be used.

5, lubricants

First oil change in compressor operation of 1000 hours, and then every 3 000 hours replacement (exhaust gas temperature at 80 ~ 90 ℃). If the environmental conditions are poor, the exhaust temperature must be shortened when the exhaust temperature is high.

Oil change steps:

①Drain the lubricating oil in the system

a. The unit was completely shut down and there was no pressure in the oil and gas barrels.

b. The main circuit, and an electrical panel do maintenance marker, to prevent others start the control gate and the compressor unit.

c. Wipe off possible dirt around the fuel cap.

d. Unscrew the fuel filler cap.

e. Unscrew the oil drain ball valve of the oil and gas barrel, cooler, and body exhaust pipe. When the oil is hot, it is beneficial to the oil discharge. Therefore, the oil can be drained shortly after the shutdown.

f. Remove the oil filter, pour out the oil inside and reinstall it.

②Cleaning system

a. Close the drain valve of each part.

b. Inject 50% of new oil from the oil filler . (The normal oil volume of this model is about 30 liters)

c. Tighten the fuel filler cap.

d. Start the unit to run for 20 to 30 minutes and shut down.

e. Repeat step 1 to completely drain the oil in the system.

③Fill in the normal amount of oil, lock the filler cap, and the unit can operate normally.

The necessity of cleaning: While the system requirements as far as possible the parts of oil drained, but a few lines and fittings are still a small amount of oil can not be discharged. These oil residues in the system will quickly deteriorate, and will affect the new oil, accelerate the deterioration of the new oil, and cause unpredictable consequences. Through cleaning, these residual oils and other residual fine impurities can be washed away to the greatest extent, and the purity of the newly added oil can be guaranteed.

Please make a detailed record of the time and quantity of each consumable replacement and lubricating oil addition. These records will be very useful. Our service technicians will analyze the operating status of the unit, and give you helpful suggestions to make your compression Machine operation is more reliable and economical. Once the unit fails, the reasons can also be analyzed by referring to these records

2. Regular inspection and maintenance

The following table lists the items that need to be inspected, cleaned, adjusted, supplemented or replaced regularly, please follow them. Some of these projects require personnel with professional skills or under their guidance to complete. If you need to maintain these projects, please contact our company or distributors.

Check item	Work content	daily	weekly	1000 Two months	2000 Four months	3000 Six months	6000 One year	25000 Four years	Remarks
Clean inside and outside the unit	clean	○							
Pre-filter	clean	○							
Lubricating oil level	Check supplement	○							
Drain condensate	an examination	○							
Whether the pipeline is leaking	an examination		○						
The electrical wiring is intact	an examination		○						
air filter	Clean replacement	○		○	●				
Oil filter	replace			※		●			
Oil fine separator	replace					○●			
lubricating oil	replace	○		※		●			
Belt	Check and adjust				○				
The electromagnetic valve	Function check						○		
Pressure maintenance valve	Function check						○		Replace O-ring

Cooler	Clean inspection			○Air cooling		○Water cooling			
Differential pressure switch	an examination						○		
sensor	Check correction						○		
Thermal control valve	Function check						○		
Oil and gas barrel	Vent dew inspection							○	
Shock absorbers	Check and replace						○		
Hose	Check and replace						○		
Oil viewing glasses	Clean replacement					○			
Electrical components and connectors	an examination			○					
Motor bearing grease	Supplemental replacement				○				
Motor insulation test	an examination							○	
Compressor body	Bearing oil seal inspection and replacement							○	

Operating time unit: hour ○Inspection, cleaning, adjustment, supplement ●Replacement ※ Replacement for new machine 1000 hour

Chapter 7 Failure Analysis and Elimination

Compressor event of failure, please contact your dealer or our service department designated by their check sent to check the repair, do not dismantle parts themselves. The following troubleshooting table is for reference only.

After each failure and maintenance, please make a detailed record of the failure status, cause and solution, or save the maintenance service order that the service staff has added for you.

Troubleshooting table

project	Failure situation	Possible cause	Eliminate countermeasures
(One)	Unable to start Check the fault display on the LCD screen first, and then solve the symptomatically	1. Blown fuse 2. Overload protector action 3. Loose wiring or poor contact 4. Voltage is too low 5. Motor failure 6. Body failure 7. Reverse and under-phase protection action	1. Ask an electrician to repair and replace 2. Ask an electrician for maintenance 3. Overhaul tight 4. Ask an electrician for maintenance 5. Please call air maintenance personnel 6. Manual body, if it cannot be turned, please contact Our company service unit 7. Check the power cord and all

			contacts
(two)	The operating current is high, the compressor stops by itself Check the fault display on the LCD screen first, and then solve the symptomatically	1. Voltage is too low 2. Exhaust pressure is too high 3. Poor contact of circuit contacts 4. Incorrect lubricant specification 5. Belt drive loose 6. Oil fine separator blocked 7. Compressor body failure	1. Ask an electrician for maintenance 2. Check pressure switch or pressure sensor 3. Overhaul 4. Check oil number, change oil 5. Check and adjust 6. Replace the oil fine separator 7. Manual body, if it cannot be turned, please contact Our company service unit

(three)	Operating current is lower than normal value	1. Too much air consumption (operating under pressure below set value) 2. Air filter is clogged 3. Malfunction of intake valve 4. Improper pressure setting	1. Check consumption and add compressor if necessary 2. Clean or replace 3. Disassemble, clean and add grease 4. Readjust the set pressure

project	Failure situation	Possible cause	Eliminate countermeasures
(four)	Exhaust temperature is lower than 70℃	1. Too much cooling water 2. The ambient temperature is too low 3. Empty car for too long 4. Temperature control element failure 5. Thermal control valve failure	1. Adjust the outlet valve of the cooling water 2. Reduce the heat dissipation area of the cooler 3. Increase air consumption 4. Adjust or replace 5. Replace thermal control valve

(Fives)	The exhaust temperature is high, the air compressor automatically trips	1. Insufficient lubricant 2. Insufficient cooling water 3. High cooling water temperature 4. High ambient temperature 5. The cooler is not clean or clogged 6. Incorrect or deteriorated lubricant specifications 7. Thermal control valve failure 8. Oil filter blocked 9. Clogged pre-filter 10. Cooling fan failure 11. Temperature control element failure	1. Check the oil level, if the oil is insufficient, please stop and refuel 2. Check the temperature difference between inlet and outlet pipes 3. Check the inlet water temperature 4. Improve the environment and lower the room temperature 5. Check the temperature difference between the inlet and outlet, the normal temperature difference is 5～8℃, if it is lower than 5℃ , clean it with low pressure air or remove it and clean it with chemicals 6. Check the oil number, change the oil 7. Check whether the oil is cooled by the oil cooler, if not, replace the thermal control valve 8. replace 9. clean 10. Overhaul or replace 11. Overhaul or replace

(six)	High oil content in the air, short lubricating oil addition cycle	1. The oil level is too high 2. Oil return line blocked 3. Damaged oil return check valve 4. Exhaust pressure is too low 5. Damaged and invalid oil fine separator 6. Pressure maintenance valve spring fatigue 7. Damaged O-ring of oil fine separator core tube	1. Check the oil level and drain properly 2. Disassemble and clean 3. replace 4. Adjust and repair pressure control components 5. Replace with new products 6. Update spring 7. replace
project	Failure situation	Possible cause	Eliminate countermeasures
(Seven)	Can't run at full load	1. Pressure control element failure 2. Solenoid valve failure 3. Malfunction of intake valve 4. Malfunction of pressure maintaining valve 5. Control line leakage 6. Electrical circuit failure	1. Overhaul or replace 2. Overhaul or replace 3. After disassembly and cleaning, add lubricating grease to check whether the control pipeline is unblocked 4. After disassembly, check whether the valve seat and check valve are worn out, if worn, replace it 5. Check the leak location and lock

			6. Overhaul or replace
(Eight)	The vehicle cannot be empty. When the vehicle is empty, the pressure still maintains the working pressure or continues to rise, and the safety valve operates	1. Pressure control element failure 2. Malfunction of intake valve 3. The solenoid valve fails or the discharge line is blocked 4. Electrical circuit failure	1. Overhaul or replace 2. Add lubricating grease after disassembly and cleaning 3. Overhaul or replace 4. Overhaul or replace
(nine)	Compressor air volume is lower than normal	1. Air intake filter is clogged 2. Poor operation of intake valve 3. Oil fine separator blocked 4. Drain solenoid valve or pipeline leakage	1. Clean or replace 2. Add lubricating grease after disassembly and cleaning 3. replace 4. Overhaul, replace if necessary

(ten)	Frequent empty/heavy vehicles	1. Pipeline leak 2. Pressure control element setting error or failure 3. Unstable air consumption 4. Pressure maintenance valve leaks	1. Check the leak location and lock 2. Overhaul or replace 3. Increase the capacity of the gas tank 4. Overhaul or replace
(±)	Oil mist emerges from the air filter during shutdown	1. The intake valve is not closed tightly or stuck 2. Heavy vehicle shutdown 3. Pressure maintenance valve leaks 4. Relief solenoid valve failure 5. Check valve failure	1. Check the intake valve . If stuck, disassemble and clean and add grease 2. Avoid heavy vehicle downtime 3. Overhaul or replace 4. Overhaul or replace 5. Overhaul or replace

Operation record of screw air compressor

month Project Time							
① Liquid level of oil and gas barrel							
②Air filter △P indicator							
③Oil filter △P indicator							
④ Oil fine separator △P indicator							

⑤ Operating current (A)							
⑥Operating voltage (V)							
⑦Exhaust pressure (kg/cm ² G)							
⑧ exhaust temperature of (℃)							
⑨Lubricating oil pressure (kg/cm ² G)							
⑩ Operating hours (HOUR)							
recorder							
Remarks							

Note: ①. Items 1-4 are normally marked with "√" in the field, abnormally marked with "×" (you must try to eliminate)

③. Items 5-10 are recorded in numbers