

PERMANENT MAGNET SCREW AIR COMPRESSOR

USER MANUAL



Application for 15kw~132kw

Foreword

Thank you for using our Permanent Magnet Screw Air Compressor.

This unit compressor have been inspected and tested strictly before delivering.

In order to ensure the safe and reliable operation of this compressor, we strongly recommend that the user need to read this **USER MANUAL** before installation and commissioning.

The User Manual is including the compressor principle, operation, daily management and regular maintenance.

Please contact us or any distributor of us in case of any difficulty in understanding while using the manual so as to operate the screw air compressor safely and economically and expand its service life.

This User Manual is suit for the **C series permanent magnet** screw air compressors, in which some components or functions introduced may vary in different models. This manual only works as instruction on installation and application; it is not the quality certificate.

Our company reserves the right to make any modification on adjustment and improvement of the product without giving further notice if any modification is carried out. The company reserves the right of final interpretation.

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Chapter One Safety and Matters for Attention

This permanent magnet screw air compressor is the machine which using the air or inert gases. Apart from general safety rules, the following matters on safety shall be paid attention as below,

- 1.The operators of the screw air compressor shall be trained by the supplier or manufacturer about the working principle, daily operation, daily maintenance and safety matters. The operators should have the experience in safety issues, and pay attention to all the local safety regulations. When the requirement in manual is not accord with the items in local safety regulations. Need to carry out the stricter item in that manual or local safety regulation.
- 2.The commissioning of new equipment shall be performed by the professional whom accredited by our company or our authorized distributor. Meanwhile, the operator should have an on-site training that provided by our company or our authorized distributor.
- 3.The power supply must be a special line equipped with safety devices as air switch, grounding, etc.
- 4.Discharge pressure of the compressor shall never exceed the pressure specified on the nameplate. No one is allowed to adjust the discharge pressure on his own without the consent of the manufacturer. Otherwise, any result shall be beyond responsibilities of the manufacturer.
5. Pay attention that it will hurt people and even cause death when can not operate appropriately the compressor and the electric devices. So need to power off and shut down the compressor when troubleshooting or maintenance. Besides, an obvious sign “no switching on” shall be placed at the power supply to prevent any other people turn on the switch. Additionally, need to discharge all the compressed air which in the compressor system, and you just can troubleshooting or maintenance when the compressor has cooled down.
6. Must be close the case when the compressor is running.
- 7.Prohibit to use the flammable, explosive, volatile or corrosive cleaning agents when cleaning the component or parts.
8. Need to inspect termly the protection system of shutdown and other devices such as the safety valve and so on. It should inspect every year.
- 9.Specially pay attention to the follow items when maintenance or replace the consumable parts. Make sure there is good conductivity in the seal gasket when replace the air/oil separator.(You can use the stapler to nail the metal nails on the two seal gaskets but can not affect the sealing performance.) Otherwise it will occur the risk of static sparks and even explosion.
10. Should be equipped with the fire extinguishers near the compressor system equipment.

Chapter Two Compressing Principle and Process of the Screw Compressor

2.1 Compressing Principle of the Screw Compressor

2.1.1 Air Suction Process

When the motor drives the rotor, the tooth groove space of male and female rotors is in maximum size when it turns to the intake port, and then air from outside is drawn in. As the intake side surface of rotor turns away from the intake port on the casing, the air in the tooth groove is enclosed between male & female rotors and the casing. Thus the “suction process” is completed.

2.1.2 Air Compression and Oil Injection Process

During the conveying process, the volume decreases gradually while the air is compressed accordingly, thereby resulting in the increase of pressure and temperature. Meanwhile the lubricating oil, which is turned into mist due to air pressure difference, is injected in, playing the role of temperature reduction, sealing and lubrication.

2.1.3 Air Discharge Process

When the enclosed tooth cusps of rotors rotate to the place open to the discharge port on the casing, the compressed air begins to discharge until the meshed face of tooth cusp and groove moves to the air discharge end. Then there's no space between the tooth grooves, the “air discharge process” is completed. At the same time, another couple of tooth grooves of male & female rotors rotates to the intake port and forms the maximum space. The suction process begins, so does another compressing cycle.

2.2 Compressor System Process

2.2.1 Air System Process

After being filtered by the air filter, the air enters the compressing chamber through the intake valve for compression. Then it is discharged into the oil-air tank with lubricating oil, and then goes through the air/oil separator for separation, the minimum pressure valve and the cooler, finally to the using system.

2.2.2 Oil System Process

The mixture of air and oil from the compressing chamber enters the oil-air tank for preliminary separation. The separation lubricating oil returns to the compressor through the oil temperature control valve, the cooler and the oil filter.

2.3 Function of Main Parts

2.3.1 **Air filter**.....a filtering device filtering the air sucked in by the compressor, whose main function is to eliminate dust and impurities in the air.

2.3.2 **Intake valve**.....its action is controlled by the intake valve cylinder to realize unloading or loading. When the compressor is started up, the intake valve is closed to ensure the unloading start. Whereas the compressor runs with load, air from the solenoid valve pathway enters the intake valve cylinder and opens the valve to the maximum to realize full-load running. When the pressure reaches corresponding set value, the solenoid valve acts to release the pressure of intake valve cylinder. The intake valve closes to achieve unloading running.

2.3.3 **Air-end**.....it is the double screw air compressor, the air inlet is on the top of the casing, the air outlet is at the bottom of casing, and a couple of high precision male rotor and female rotor is mounted in parallel to the hosing.

2.3.4 **Oil tank**it is an storage device for lubrication oil, meanwhile it is the initial separation device of the mixed air and oil. After the air passing the air oil separator,

2.3.5 **Air/oil Separator**.....separating the lubricating oil in mist from the compressed air that has been separated.

2.3.6 **Safety Valve**.....Safety valve is the component to keep safe. When the air conditioning system failed and resulted in pressure of the oil and gas barrel which is higher than approximately 5% of the rated exhaust gas pressure. The safety valve will take off automatically the pressure will drop below the rated discharge pressure.

ØNot Allow to have any adjustment in the safety valve. Prohibit running the compressor without the safety valve.

2.3.7 Minimum Pressure valve.....With fine oil separator connected to the outlet, which opening pressure is set to 0.4 ~ 0.5MPa, minimum pressure valve mainly has the following functions:

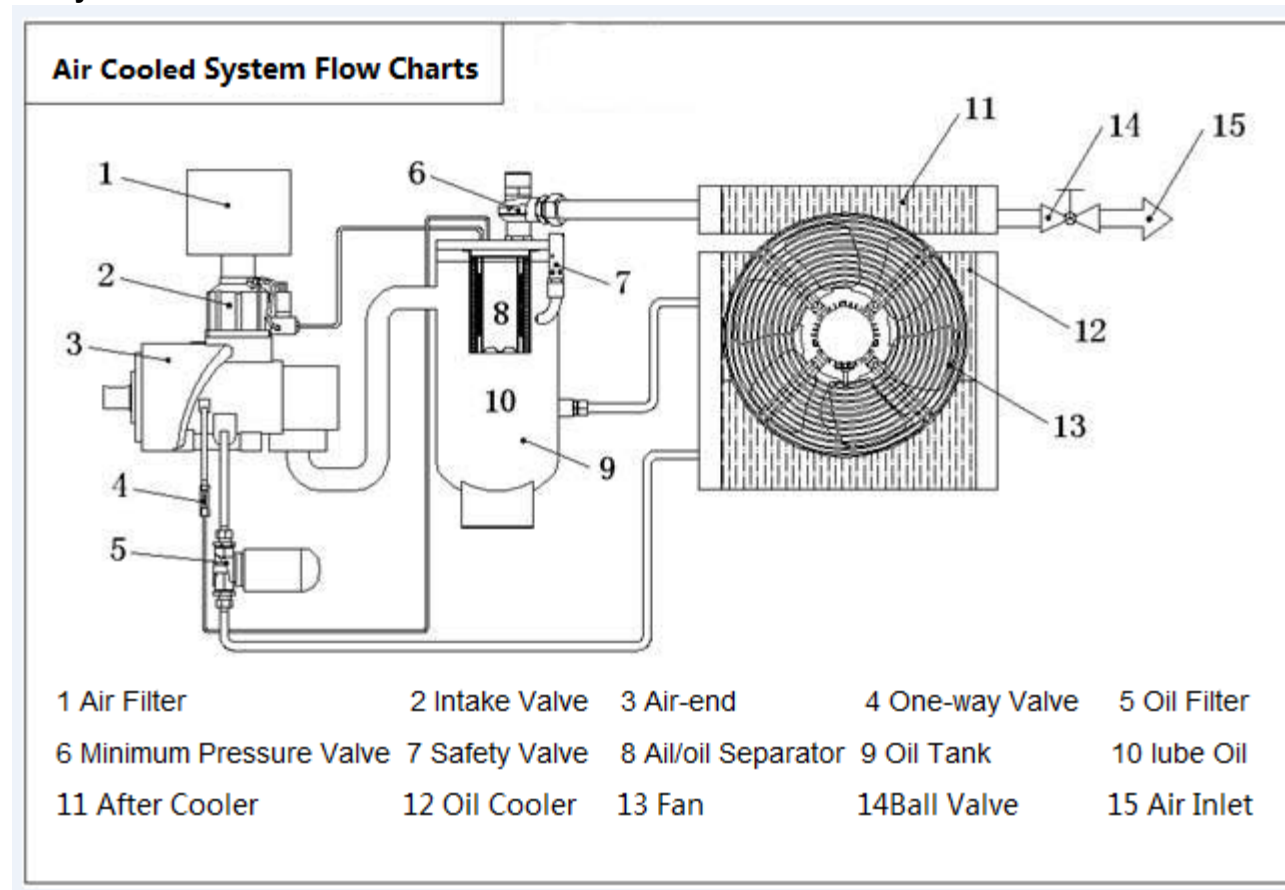
- A. Starting to establish priority cycle oil pressure is required to ensure the machine lubrication.
- B. The air pressure in the Oil barrel should be exceeded 0.40MPa before opening, it can reduce the air flow which is flowing through fine oil separator, to ensure the effect of the oil and gas separation, and to protect the oil fine separation due to the pressure difference is too large to avoid damage.
- C. Prevent return function: When the pressure drops of the barrel after the shutdown, to prevent the reverse flow of compressed air pipeline

2.3.8 Oil filter.....For filtering impurities in the lubricating oil such as inferior materials, metal particles, etc., to guarantee the lubricating oil entering the air-end unpolluted, thereby avoiding affect on the service life of air-end.

2.3.9 Cooler.....Where the compressed oil and air go through heat exchange to achieve cooling effect and guarantee the best running status of the compressor.

2.3.10 Solenoid Valve.....When the working pressure reaches the pressure sensor setting pressure, it will control the solenoid valve action and control to close the intake valve.

2.4 System Flow Charts



Chapter Three Technical Parameter

3.1 Technical Parameter

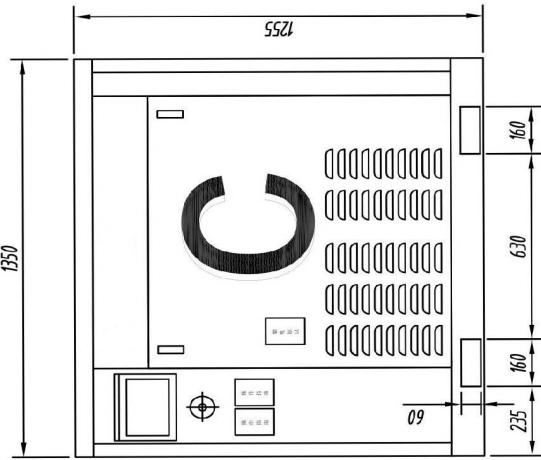
Item	Unit	C15PM	C22PM	C37PM	C37+	C55PM
Power	kW	15	22	37	37	55
Maximum F.A.D.	M ³ /min	2.8	4.7	7.9	8.3	12.0
Max. Working Pressure	$\leq 1.0\text{MPa}$ Please connect with the supplier if need the pressure is 1.25Mpa.					
Voltage(V)/Frequency	AC380V-50Hz					
Drive Type	PM Motor/Direct Driven					
Starting Mode	Variable Frequency Soft Starting					
Connection(inch)	Inch	G1"	G1"	G1-1/2"	G1-1/2"	G1-1/2"
Size(mm)	L	1150	1150	1350	1350	1500
	W	800	800	930	930	1125
	H	1135	1135	1255	1255	1480
Net Weight	kg	480	500	680	700	950

Item	Unit	C55PM+	C75PM	C90PM	C110PM	C132PM
Power	kW	55	75	90	110	132
Maximum F.A.D.	M ³ /min	12.0	16.0	20.1	22	27.0
Max. Working Pressure	$\leq 1.0\text{MPa}$ Please connect with the supplier if need the pressure is 1.25Mpa.					
Voltage(V)/Frequency	AC380V-50Hz					
Drive Type	PM Motor/Direct Driven					
Starting Mode	Variable Frequency Soft Starting					
Connection(inch)	Inch	G1-1/2"	G2"	DN65	DN65	DN65
Size(mm)	L	1500	1950	2150	2150	2150
	W	1125	1200	1280	1280	1280
	H	1480	1650	2005	2005	2005
Net Weight	kg	1000	1150	1560	1560	1760

3.2 Drawing

[illegible]

(C15/22PM)



4. The reserved length of cable no less than 1m.
5. Surrounding the air compressor a space of over 1m shall be reserved there air at least 1.1m spaces for the front of air compressor.
6. No any force or moment after installing the outside pipes.
7. Prohibition of use plastic pipe in the after treatment system.
8. Seal the forklift hole with the cover board after installing the compressor.
9. The pressure consumption should less than 6mm while installing the wind guide.
10. Voltage & Frequency 380V/50Hz/3ph, must connect the ground wire.

[illegible]

AFCC75PM. 01. 00

Chapter Four Installation

4.1 Acceptance

Apart from the engineering notices in local safety regulations, attentions shall also be paid to the following aspects:

- 4.1.1 Please check whether there is any damage in the appearance of the packing box before you accept the products.
- 4.1.2 Open the packing box, and check whether there's any defect or damage on the compressor case or inside the compressor
- 4.1.3 Check the content by the packing list.
- 4.1.4 Contact the supplier in time in case of any problem.

4.2 Correct Location of the Compressor Room

- 1. The compressor room should be at the cool, clean and good ventilation place. Its ambient temperature should be in 0-40°C.
- 2. The compressor room should be with the lifting equipment. It need to use the forklift, Long frame as the hoisting equipment if without the lifting equipment.
- 3. Avoid to install the compressor in the outdoor. Avoid the rain, sun exposure and too much dust come into the compressor.
- 4. Avoid to install the compressor in the small room without good ventilation. Avoid the compressor with the high discharge temperature fault.
- 5. Avoid to install the compressor in the dust room. Avoid to destroy the compressor.
- 6. Avoid to install the compressor in the flammable, explosive and volatile substances. Avoid to happen the explosion and corrosion.



It not good for installing the compressor in the place which more than 1000 meters above the sea level or low temperature outdoor.

4.3 Installation

- 1. It should install an air receiver after the compressor. And the capacity of the air receiver should be 20% bigger than the free air delivery per minute of the compressor. And drain the water inside the air receiver regularly.
- 2. If there is the air dryer. The air receiver should be installed in front of the air dryer. In order to buffer and cool the compressor before go into the air dryer. The air dryer should be with the bypass valve in order for future maintenance.
- 3. It should be installed on the cement ground which can carrying the compressor.
- 4. If without the special demands, don't install the shockproof pad.
- 5. In order to facilitate inspection and maintenance, the compressor should be have a distance more than 1.5M from the wall.

4.4 Pine Connection

- 1. The main pipeline shall slope downward by 1°-2° to facilitate the discharge of water and oil impurities.
- 2. Diameter of the pipeline shall be reasonable, whose minimum shall be no less than the diameter of exhaust pipeline of the compressor, in order to avoid too much sudden variation in diameter.
- 3. Make sure that there's no additional external force on the exhaust valve and no additional stress on the connecting pipe.
- 4. Design and construction of the pipeline shall be in conformity with relevant national standards.
- 5. Elbow, diameter variation and stop valve shall be avoided in the pipeline as much as possible to reduce pressure loss.
- 6. Ring structure is recommended for the pipeline for the purpose of gas pressure balance.
- 7. Dryer and filter shall be installed with the receiver tank, in order to get rid of the moisture, oil and impurities in the compressed air, it is better to install the bypass pipeline and ball valve to maintenance.

4.5 General specifications and electrical safety standards

1. According to the size of the compressor power, the correct selection of power wire and breaker. Not choose too small diameter, otherwise the power cord easily burn due to high temperatures and dangerous

2. It is best to use a single set of power systems for the compressor, especially to avoid other different power consumption in parallel. Such as using in parallel, it may be due to excessive voltage drop or the imbalance of a three-phase current compressor to make it overload and trip the protection device , so please pay more special attention to high power air compressor.

3. When the compressor is in power distribution, you must make sure the power supply voltage is match to the motor's rated voltage.

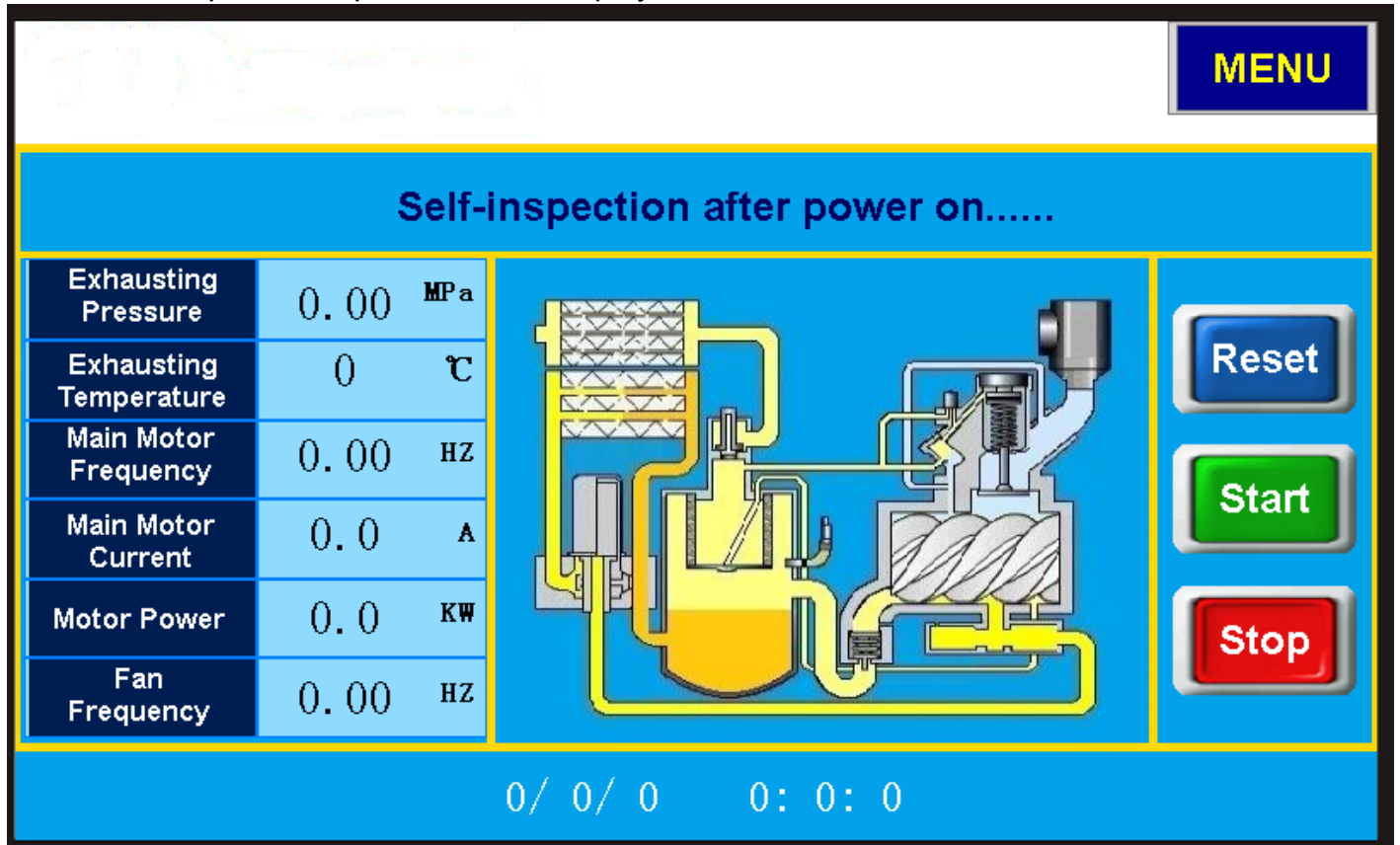
4. You must set up the ground wire of the motor or system, and prevent leakage danger, and the ground wire is not directly connected to the air duct. During operation of the motor supply voltage and rating deviation is less than $\pm 5\%$; frequency and rating value's deviation is less than $\pm 1\%$; the motor phase current in any one phase deviation is not greater than average of the three three-phase $\pm 10\%$.

Chapter Five Permanent Magnet Controller System

5.1 Introduction of the Display

5.1.1 Home Page

When the compressor is power on, the display will be showed as below,



(I) Compressor State

There are 10 states will be happened in this compressor.

And it will be showed in the top of the display.

Items	State	Description
1	Self-inspection after power on	When power on the compressor, it will with 5 seconds self-testing.
2	Stopped	When the compressor is without the abnormal condition and alarm, also not in the start state (mean it stops). The compressor just can be start under the stop state.
3	Running	Compressor starts without alarm, it is in running state.
4	Stop delay	After compressor gets the stop signal, compressor will be in a stop delay state until it stops completely.
5	Stop & Lock	You can not press the Starts button when press the Stop Lock. Just can restart the compressor after this stop lock set time.
6	Error, please check	Alarm will be appeared when in stop state, the alarm won't be disappeared until eliminate the alarm.
7	Stop in fault	Alarm will be appeared when in run state, compressor can not be restarted until eliminate the alarm.
8	Emergency Stopped	Press the emergency stop button, compressor in an emergency stopped state. Compressor can not be restarted until reset the emergency stop.
9	Emergency stopped, please reset	Compressor can not be restarted until reset the emergency stop.
10	Sleeping	Compressor will be in sleeping state if it is in unloading and reach to the sleeping setting time. It will load automatically once the pressure is lower than the wake up setting pressure.

(II) Exhausting Pressure

Displays the discharge pressure

(III) Exhausting Temperature

Displays the discharge temperature

(IV) Main Motor Frequency

Displays the current main motor running frequency

(V) Main Motor Power

Displays the current main motor using power

(VI) Fan Frequency

Displays the current fan motor running frequency

(VII) Reset

When the compressor is in warning in fault state, should trouble shooting first, and then press the button "Reset", the compressor will be in "Stop" state.

(VIII) Start

When the compressor in "Stop" state, it can run start the compressor if press the button "Start".

But when the compressor in "Running", "Stop & Lock", "Sleeping", "Warning" state, it can not start the compressor though you press the button "Start".

(IX) Stop

When the compressor in "Running", "Stop Delay", "Sleep" state, it can stop the compressor if press the button "Stop".

5.1.2 Menu

5.1.2.1 User Parameter

There are 2 pages about the User Parameter. One page is about the main motor setting. Another is the Fan setting.

5.1.2.1.1 Main Motor Setting

Fan Setting		Main Motor Setting		MENU	
Constant Pressure	0.00 MPa	Over Unloading Time	0 S		
Unloading Pressure	0.00 MPa	Stop Delay Time	0 S		
Loading Pressure	0.00 MPa	Stop Restart Time	0 S		
Pressure PID Kp	0.00	Pre-operation Frequency	0.00 HZ		
Pressure PID Ti	0.0 S	Pre-operation Time	0 S		

Interpretation about the main motor setting

Item	Function
Constant Pressure	The constant pressure means the using pressure. Normally, after the compressor loading, the pressure will stable in the constant pressure. When the using volume is higher, the pressure will deviate the constant pressure, but it will close to the constant pressure soon.
Unloading Pressure	The unloading pressure means the maximum pressure of the user demands. When the pressure reaches to this unloading pressure value, the intake valve will be closed, in order to stop the pressure rising.
Dormancy Judge Time	When use the little compressed air steadily, means the pressure stable in the constant pressure, and the main motor runs in the minimum frequency over the “Dormancy Judge Time, the main motor will enter the “Sleep” state.
Loading Pressure	The loading pressure means the minimum pressure of the user demands. The compressor will be loading again if the pressure reaches this loading pressure value.
Pressure PID Kp Pressure PID Ti	Generally using the default value is OK. If the using volume is changed frequently, the real pressure also is changed frequently, can rising the pressure PID KP value, the bigger pressure PID KP value, the more responsive. The smaller pressure PID Ti value, the faster responsive. When the pressure PID Kp is too large, the motor can not adapt the shake, so can not adjust the pressure Kp value too much.
Rre-operation Frequency Pre-operation Time	When start the compressor, the main motor frequency will rise from 0 to the pre-operation frequency. Continue to run in the pre-operation frequency, it will adjust the frequency so that the using pressure can reach to the constant pressure.
Stop Delay Time Stop Restart Time	In the compressor stop process, the main motor will be lowed from the real time frequency to 0 frequency through the stop delay time. And then complete the stop process, enter the “stop and lock” state. Just can restart the compressor after passing the “Stop Restart Time”.

5.1.2.1.2 Fan Setting

Main Motor Setting		Fan Setting		MENU	
Constant Temperature	0 °C	Fan Open Temp	0 °C		
Breeze Time	0 s	Fan Stop Temp	0 °C		
Temperature PID Kp	0.00	Maximum Frequency	0.00 HZ		
Temperature PID Ti	0.0 s	Unloading Frequency	0.00 HZ		
Temperature Sampling (Ts)	0 s	Loading Frequency	0.00 HZ		

Interpretation about the fan setting

Item	Function
Constant Temperature	The constant temperature means setting discharge temperature. In the normal condition (compressor without fault, enough lube oil, cooling condition is very good).The real discharge temperature will be stable in the constant temperature.
Fan Open Temp	When the discharge temperature increase to this setting fan open temperature, the fan will be open.
Fan Stop Temp	When the fan is opened and the discharge temperature reduces to this setting fan stop temperature, the fan will be stop.
Loading Pressure	The loading pressure means the minimum pressure of the user demands. The compressor will be loading again if the pressure reaches this loading pressure value.
Temperature PID Kp Temperature PID Ti	Generally using the default value is OK If the discharge temperature is changes frequently, should increase the response ability of the inverter. Means increase the temperature Kp value and reduce the temperature Ti value. The bigger temperature Kp value, the stronger response of inverter. The smaller temperature Ti value, the faster response of inverter. When the temperature Kp is too large, the motor can not adapt the shake, so can not adjust the temperature Kp value too much.
Maximum Frequency	It is the maximum frequency of the fan.
Unloading Frequency	The fan frequency when in unloading, it can not greater than the maximum frequency.
Loading Frequency	The fan frequency when loading.
Breeze Time	When the fan starts, the fan frequency will be rising from 0 HZ to 15HZ, and continue to run for the breeze time, And then adjust the frequency to make the discharge temperature close to the constant temperature.
Temperature Sampling(TS)	It is the periodic time of the system to update the discharge temperature. The smaller temperature sampling value, the faster update action. Generally it is set in the default value.

5.1.2.1.3 Maintenance Parameter

MENU

Air Filter Service Life <div style="background-color: #002060; color: white; padding: 5px;">0 Hour</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="background-color: #e6f2ff; padding: 5px;">0 Hour</div> </div>	Air/Oil Separator Service Life <div style="background-color: #002060; color: white; padding: 5px;">0 Hour</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="background-color: #e6f2ff; padding: 5px;">0 Hour</div> </div>	Lubrication Oil Service Life <div style="background-color: #002060; color: white; padding: 5px;">0 Hour</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="background-color: #e6f2ff; padding: 5px;">0 Hour</div> </div>
Oil Filter Service Life <div style="background-color: #002060; color: white; padding: 5px;">0 Hour</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="background-color: #e6f2ff; padding: 5px;">0 Hour</div> </div>	Motor Grease Service Life <div style="background-color: #002060; color: white; padding: 5px;">0 Hour</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="background-color: #e6f2ff; padding: 5px;">0 Hour</div> </div>	Stop & Maintenance time <div style="background-color: #ff0000; color: white; padding: 5px;">0 Hour</div>

Please set the maintenance parameter according the user situation. It will alarm when the using time is equal or greater than the service life. That means you need to replace the parts. Please set the using time in 0 after replace the parts.

Interpretation about the maintenance parameter

Item	Function
Air Filter Service Life	The service life of the air filter. It will alarm when the using time of the air filter reaches to this setting time.
Air/oil Separator Service Life	The service life of the air/oil separator. It will alarm when the using time of the air/oil separator reaches to this setting time.
Lubrication Oil Service Life	The service life of the lubrication oil. It will alarm when the using time of the lubrication oil reaches to this setting time.
Oil Filter Service Life	The service life of the oil filter. It will alarm when the using time of the oil filter reaches to this setting time.
Motor Grease Service Life	The service life of the motor grease. It will alarm when the using time of the motor grease reaches to this setting time.
Stop and Maintenance Time	Maximum running time after the alarm happened. Can not run the compressor if do not maintain the compressor over this setting time.

5.1.2.1.4.Operating Parameter

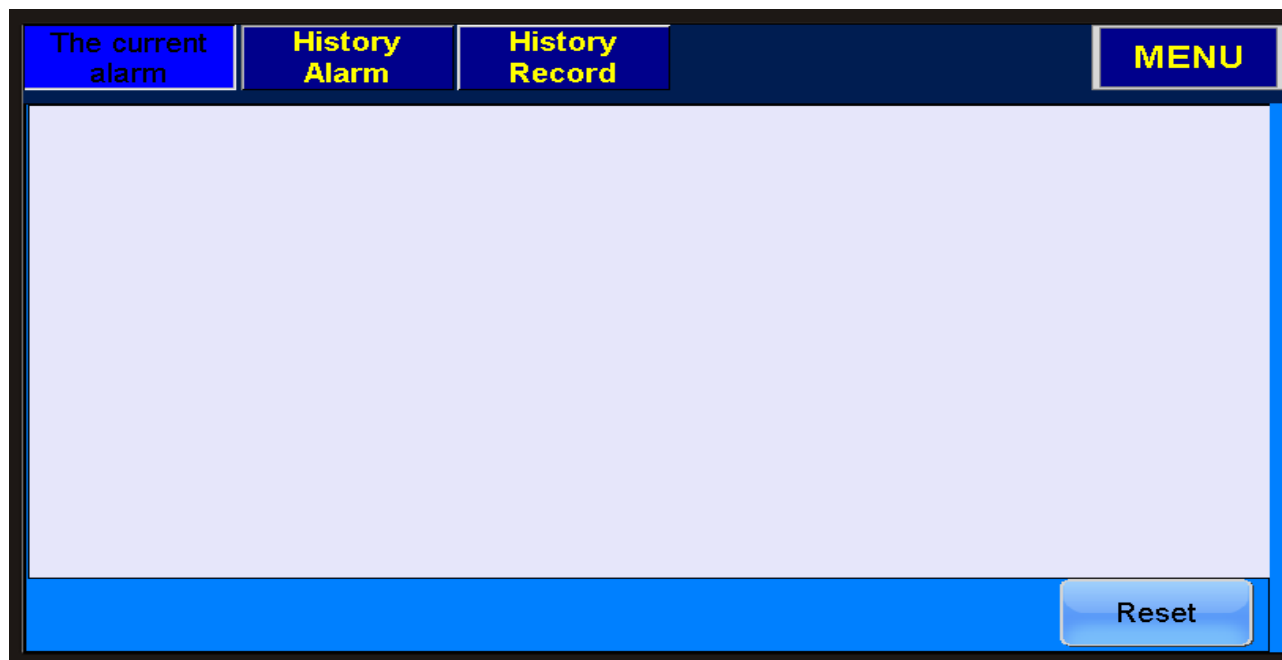
MENU			
Main Motor Current	Main Motor Frequency	Fan Current(A)	Fan Frequency
A	HZ	A	HZ
Exhausting Pressure	Exhausting Temperature	Output Voltage	Motor Power
Mpa	°C	V	KW
	Motor Total Run Time	Total Power Consumption	
	Hour	KWH	

5.1.2.1.5.Protection Setting

MENU		
Pre-alarm Discharge Temperature		°C
Stop Discharge Temperature		°C
Pre-alarm Discharge Pressure		MPa
Stop Discharge Pressure		MPa

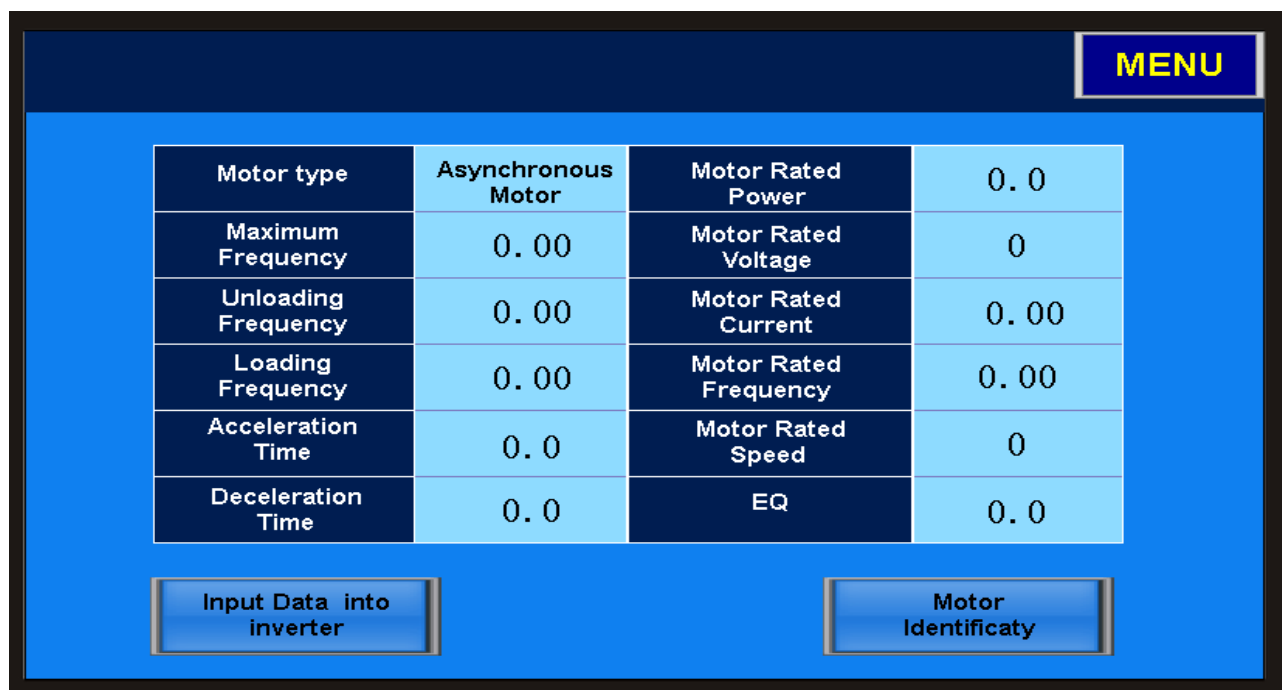
5.1.2.1.6, Alarm List

There are the current alarm and alarm history in the alarm list.
You can reset if you press the Fault Reset button.



The interface for the Alarm List is displayed within a dark blue frame. At the top, there are four buttons: 'The current alarm', 'History Alarm', 'History Record', and 'MENU'. The 'History Alarm' button is highlighted in yellow. Below these buttons is a large, empty light blue rectangular area. At the bottom right of this area is a 'Reset' button.

5.1.2.1.7. Inverter



The interface for Inverter parameters is displayed within a dark blue frame. At the top right is a 'MENU' button. The main area contains a table with motor parameters. Below the table are two buttons: 'Input Data into inverter' and 'Motor Identificaty'.

Motor type	Asynchronous Motor	Motor Rated Power	0.0
Maximum Frequency	0.00	Motor Rated Voltage	0
Unloading Frequency	0.00	Motor Rated Current	0.00
Loading Frequency	0.00	Motor Rated Frequency	0.00
Acceleration Time	0.0	Motor Rated Speed	0
Deceleration Time	0.0	EQ	0.0

5.1.2.1.8. Factory Parameter

Clear alarms		Clear Power Consumption		Clear Run Time		English		Chinese		MENU	
Compressor model :						Factory Parameter Password		1			
Serial Number:						Inverter Parameter Password		2			
Product Date:		YY MM DD				Protection Parameter Password		3			
						Maintenance Parameter Password		4			
<div>Save Factory Data</div>											
Main Motor Type		PM Synchronous Motor		P1 Max.Value pressure Sensor		MPa		PLC Time Setting			
Fan Run Mode		Power Freq.		P1 Error Value		MPa				YY MM	
Limited Run Function		Prohibit		T1 Error Value		°C				DD Hr	
Limited Run Time				Power Error Value		%				Min Sec	
Total Time				Carrier Frequency		KHZ		Input			

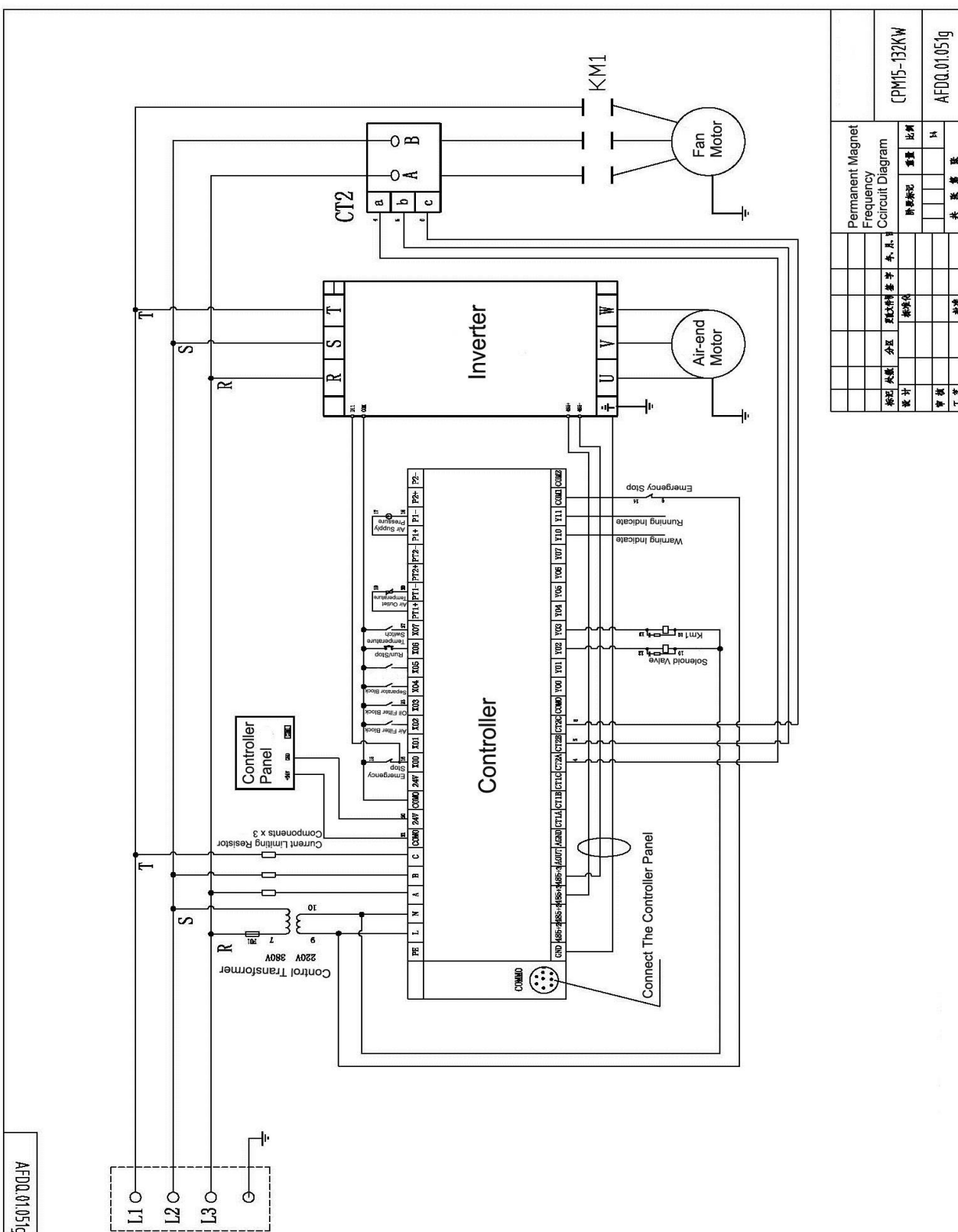
5.2 Electric Control Principle Diagram

The control system can let the air-end in variable frequency drive and the fan in fix frequency drive.

The variable frequency drive system is more and more popular as it has a small impact on the electric net when starting, stable discharge pressure, save energy, control the air-end temperature accurately, low noise.

The H2U-8A91G-XP controller is installed in series with the 2 unit MD500 inverter by RS485 communication.

Please see the electric control principle diagram as below,



Chapter Six Periodic Maintenance and Replacement of Consumable Parts

6.1 Summary

Operator must adhere to the proper operation and safety rule as per the user manual during maintain and replace consumable parts. Prohibit to taking out any screw, cover and parts while air compressor is under operating or inner system still has pressure. Only can maintain the compressor after air compressor power off and no inner pressure.

6.2 Daily Maintenance

6.2.1 Before compressor operation, please observe the oil level indication which attached on the oil tank. Add oil if oil level lower than the standard.

6.2.2 Check each connection, whether has loosen or damaged screw or nut.

6.2.3 Discharge the condenser water form oil tank.

6.2.4 Check each data which is showed in the PLC, whether these parameter in a normal range.

6.2.5 Observe each parts which has leakage problem. If has leakage problem, ensure release all the inner pressure and check it.

6.3 Oil Filter

The replacement time is 500 hours in the initial running-in period. Later the replacement is required to be taken every 1,000-2,000 hours, the replacement time varies with the ambient condition.

6.4 Air Filter

Generally it has to be cleaned every 500-1,000 hours with pure compressed air purging from the interior to the exterior; and replace with another new element after cleaning for 2-4 times. Yet the dirty environment, dust screen cleanliness and the casing door opening will affect the service life of air filter. It is forbidden to operate the compressor while the air filter element has been disassembled for then entrance of unfiltered air is likely to cause sever wear of the air-end and jam the air/oil separator.

6.5 Discharge the condensed water

Condenser water store up in the oil tank, especially during the humid climate, when the discharge temperature lower than the pressure dew point of compressed air or when air compressor stop, more and more condenser water store up in the oil tank, which emulsify the lubrication oil and affect the performance of compressor.

1. Lubrication oil go bad
2. The separating effect of air/ oil separator not good, big differential pressure.
3. The parts go rusting

Therefore should discharge condenser water timely according with the humidity condition.

Before discharge the condenser water, please notice that air compressor power off, and let the compressor cool down. Recommend discharge the condenser water in the morning before start up the compressor.

1. Loosen the screw cover.
2. Open the valve slowly and discharge the condenser water, until oil discharged.
3. Close the valve, tighten the screw cover.

6.6 Air/oil Separator

The maximum service life of the out-laid air/oil separator is generally 1,500-3,000 hours, and the in-laid air/oil separator is 3,000-6,000 hours. Yet the air filter and dust screen cleanliness, the states of oil filter and lubrication oil, and the working environment have great impact on the service life of the air/oil separator, and even lead it invalid. During replacement of air/oil separator, the sealing gasket must be guaranteed with good electric conductivity, so as to ensure proper grounding of the air/oil separator (metal staples may be nailed on the two gaskets but shall not affect their sealing performance), otherwise risk of static sparks may occur.

6.7 Lubrication Oil

Please use DLG screw air compressor lubrication oil

The lubricating oil has to be replaced after 500 hours' service in the initial running-in period. Later the replacement is required every 4000 hours.

In order to avoid damage to the compressor by products unqualified or in immiscibility, it is forbidden to use the lubrication oil in mix with that of other brands or trademarks.

Prohibit to discharge the used lubrication oil in any place, user should collect the used oil and process it, otherwise it will pollutes environment seriously.

6.8 Motor Grease

Appropriate lubrication shall be guaranteed during the running of motor. Supplement or replace the motor grease as per the oil injection volume, time and grade specified on the nameplate. (3,000 hours for 4-pole motor and 1,000 hours for 2-pole motor). The motor grease shall be replaced timely when the bearing is overheated or the motor grease is deteriorated during the running of the motor.

6.9 Maintenance of Safety Valve

The safety valve is installed on the top of the oil tank. It should be inspected once or twice per year. Or inspected according the provisions of local labor department. Please inspect the safety as below,

- 1, Turn off the compressor and make sure the pressure has been released. Should be without power supply.
- 2, Dismantle the safety valve from the compressor.
- 3, Check the safety valve with the specialized equipment. Check its action is sensitive or not.
- 4, Install the safety valve to the compressor.



The working pressure of the safety valve should be smaller than the design pressure.

The user can not adjust by himself.

6.10 Add the Lubrication Oil

When the compressor is running, the compressor oil level should be kept to the level which between the minimum and maximum level. It will affect the separation function if with too much lube oil. Meanwhile, it also effects the lubrication and cooling function it's with too little lube oil. In the cycle of oil replacement, It should add the lube oil if the oil level is lower than the minimum level. Please see the method as below,

- 1, Turn off the compressor and make sure the pressure has been released. Should be without power supply.
- 2, Open the filler which in the oil tank and add the right amount lube oil into the oil tank.

6.11 Standard Inspection Items of the Compressor

NO.	INSPECTION ITEMS	INSPECTION CONTENTS	INSPECTION TIME			REMARKS
			DAILY	MON THLY	EVERY 6 MONTHS	
1	LUBRICATION OIL	OBSERVE AND ADD	■			CHECK WHETHER THE LUBRICATING OIL LEVEL IS AT THE NORMAL LOCATION.
2	AIR RELEASE VALVE	CONFIRM NORMAL OPERATION		■		PAY ATTENTION TO THE FLEXIBILITY AND SEALING PERFORMANCE.
3	SOLENOID VALVE	CONFIRM NORMAL OPERATION		■		PAY ATTENTION TO THE FLEXIBILITY AND SEALING PERFORMANCE.
4	AIR FILTER	INSPECT AND CLEAN		■		CLEANLINESS
5	COOLER	INSPECT AND CLEAN		■		PAY ATTENTION TO THE CLEANLINESS ON THE SURFACE.
6	SAFETY VALVE	CONFIRM NORMAL OPERATION			■	ENSURE NORMAL OPERATION, AND PAY ATTENTION TO IT'S FLEXIBILITY.
7	INTAKE VALVE	CONFIRM NORMAL OPERATION		■		CONFIRM NORMAL OPERATION.
8	RUBBER BUFFER	INSPECT			■	ENSURE THERE IS NO DAMAGE, INCLINE OR DISPLACEMENT.
9	OIL GAUGE	INSPECT	■			MAKE SURE GOOD DEFINITION FOR OBSERVATION AND GOOD SEALING CONDITION.
10	MOTOR	INSPECT		■		ENSURE ITS INSULATION.
11	HOSE	INSPECT		■		REPLACE IN CASE OF LEAKAGE OR CRACK.

Note: Mark “■” means the time for inspection.

Chapter seven Troubleshooting

ITEM	FAILURE	CAUSE	RESOLUTION
1	PHASE SEQUENCE ERROR	PHASE SEQUENCE ERROR	EXCHANGE TWO PHASES OF THE CONNECTION; CHECK POWER SUPPLY AND VOLTAGE.
2	HIGH DISCHARGING TEMPERATURE	1. DIRTY OR BLOCKED COOLER 2. DETERIORATED LUBRICATING OIL 3. INSUFFICIENT LUBRICATING OIL 4. HIGH AMBIENT TEMPERATURE 5. BLOCKED DUST SCREEN 6. FAILURE IN OIL TEMPERATURE CONTROL VALVE 7. FAILURE IN TEMPERATURE SWITCH OR SENSOR 8. BLOCKED OIL FILTER	1. CLEAN THE COOLER. 2. REPLACE LUBRICATING OIL. 3. ADD LUBRICATING OIL. 4. IMPROVE VENTILATION. 5. CLEAN DUST SCREEN. 6. REPAIR OR REPLACE. 7. REPLACE. 8. REPLACE.
3	MAIN MOTOR OVERLOADED	1. TOO HIGH SET PRESSURE 2. BLOCKED SECONDARY AIR/OIL SEPARATOR 3. TOO LOW VOLTAGE 4. FAILURE IN BODY OF COMPRESSOR 5. TOO HIGH DISCHARGING PRESSURE	1. RESET PRESSURE. 2. REPLACE. 3. REPAIR BY ELECTRICIAN. 4. CONTACT THE SERVICE UNIT OF THE COMPANY. 5. EXCEED THE PRESSURE SETTING.
4	FAN MOTOR OVERLOADED	1. DIRTY OR BLOCKED COOLER 2. MOTOR FAILURE 3. TOO LOW VOLTAGE	1. CLEAN THE COOLER. 2. REPAIR THE MOTOR. 3. CHECK POWER SUPPLY.
5	OIL FILTER BLOCKED	SERVICE LIFE EXPIRES (NOT FAILURE)	REPLACE
6	AIR/OIL SEPARATOR BLOCKED	SERVICE LIFE EXPIRES (NOT FAILURE)	REPLACE
7	AIR FILTER BLOCKED	SERVICE LIFE EXPIRES (NOT FAILURE)	REPLACE
8	HIGH OIL CONTENT IN THE AIR	1. BLOCKED OIL PIPE OF THE AIR/OIL SEPARATOR 2. BROKEN RUBBER RING OF OIL RETURN PIPE CORE FOR THE AIR/OIL SEPARATOR 3. TOO HIGH OIL LEVEL 4. BROKEN AIR/OIL SEPARATOR	1. CLEAN THE OIL RETURN PIPE. 2. REPLACE. 3. CHECK THE OIL LEVEL. 4. REPLACE.
9	INSUFFICIENT DISCHARGE VOLUME	1. BLOCKED AIR FILTER 2. POOR MOTION OF THE INTAKE VALVE 3. BLOCKED AIR/OIL SEPARATOR 4. LEAKAGE IN AIR RELEASE VALVE OR PIPE	REPAIR AND REPLACE IF NECESSARY.
10	NO-LOAD RUNNING DISABLED	1. FAILURE IN THE PRESSURE SENSOR 2. FAILURE IN THE INTAKE VALVE 3. FAILURE IN THE RELIEF SOLENOID VALVE	REPAIR AND REPLACE IF NECESSARY.
11	LOAD RUNNING DISABLED	1. FAILURE IN THE PRESSURE SENSOR 2. FAILURE IN THE INTAKE VALVE 3. FAILURE IN THE SOLENOID VALVE 4. FAILURE IN THE MIN. PRESSURE VALVE	REPAIR AND REPLACE IF NECESSARY.
12	FAILURE OF FREQUENCY CONVERTER	WRONG CONNECTION OF THE FREQUENCY CONVERTER	CHECK THE CONNECTION OF FREQUENCY CONVERTER.

Chapter Eight Daily Running Records of the Compressor

Model:

Serial No.:

Recorded by:

Date	Running Time HR	Loaded Current A	Discharging Pressure Mpa	Discharging Temperature °C	Replacement of Lubricating Oil Every 4,000 hr.	Cleaning of Air Filter Every 500 hr.	Cleaning of Oil Filter Every 2,000 hr.	Cleaning of air/oil separator Every 3,000 hr.
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In order to guarantee the operation performance of compressor, the company recommends the user to fill in “Daily Running Records of the Compressor”. If the user can provide the running records when the compressor has troubles, the maintenance personnel may eliminate the failures in the shortest time.
(Suggest that you can copy this page. It is convenient for record the daily running.)