



# **STATIONARY SCREW COMPRESSOR OPERATION & MAINTENANCE MANUAL**



**PRODUCTION LICENCE: XK06-110-00613**

# Content

Points for Attention	4
Technical Parameters of Compressor	5
Chapter 1. General	7
1.1 General	7
1.2 System Flow	7
1.2.1 Air Pipeline System	8
1.2.2 Oil pipeline System	9
1.3 Cooling System	9
1.4 Controlling Protective System	9
1.5 Electric Schematic System	10
1.6 Electric Controller and Operating Panel	10
Chapter 2 Installation of Compressor	11
2.1 Outer Dimension	11
2.2 Environmental for installing compressor	12
2.3 Electronic Installation Requirement	12
Chapter 3 Compressor Operation	13
3.1 Commissioning of A New Compressor	13
3.2 Daily Work	14
3.2.1 Opening machine	14
3.2.2 Compressor running status	14
3.2.3 Breakdown	16
3.2.4 Important notes during operating	16
3.3 Long-term Stop	16
3.3.1 Preparation	16

3.3.2 Restart	17
<b>Chapter 4 Maintenance and Care</b>	<b>17</b>
4.1 Lubricating Oil	17
4.1.1 Oil Replacing Cycle	17
4.1.2 Replace oil and oil filter	17
4.2 Belt Adjustment	18
4.3 Spare part replace and maintenance	19
4.3.1 Maintenance of Air filter	19
4.3.2 Oil Filter Care	20
4.3.3 Oil-gas Separator Care	20
4.3.4 Clean the cooler	20
4.3.5 Safety valve	20
4.3.6 Inlet Valve	21
4.3.7 Min. Pressure Valve	21
4.4 Protective maintenance plan	22
<b>Chapter 5 Fault Analysis and Troubleshooting</b>	<b>23</b>
5.1 Introduction	23
5.2 Troubles that may occur to a compressor and shooting methods	23

### **Points for Attention**

- 1 Compressor shall be operated by professional personnel, who shall carefully read and understand this manual, and strictly abide by the procedures and safety notes contained herein.
- 2 Compressor shall be kept away from inflammables and heat sources, and it cannot be put in places permeating with dusts, salt mist, or other harmful gas.
- 3 Power cable of the right one shall be used. Users shall install air switch and fuse in front of the inlead wire. For safe operation, the unit shall be properly grounded.
- 4 Make sure that the power supply of correct phase is applied so as to avoid reverse rotation of the unit .
- 5 Compressor shall not operate in pressure higher than the discharge pressure marked on the nameplate, or the motor may stop for over loading.
- 6 Switch off the power supply and release the compressed air before each maintenance or repair, and put warning mark so as to avoid accidental switching on.
- 7 The door of the unit shall be closed when the compressor is operating. If need to conduct examination and repair in operating state, do not let your body or tools touch the running parts so as to avoid accidents.
- 8 It is strictly prohibited to open the door when the machine is in standby status since it would restart work at any time.
- 9 It is strictly prohibited to change the unit structure and control method without manufacturer's written consent.

## Technical Parameters of Compressor



.JD-15A



.JD-30A

Air cooling Screw air compressor technic parameter:

	JD-10A	JD-15A	JD-20A	JD-25A	JD-30A	JD-40A	JD-50A	JD-60A	JD-75A	JD-100A	JD-125A	JD-150A	JD-175A	JD-200A	
Air delivery (m <sup>3</sup> /min/MPa)	1.2/0.7	1.87/0.7	2.3/0.7	3.3/0.7	3.8/0.7	4.9/0.7	6.4/0.7	8.3/0.7	10.3/0.7	14.2/0.7	16.3/0.7	20.7/0.7	24.1/0.7	26.5/0.7	
	1.15/0.8	1.75/0.8	2.25/0.8	3.1/0.8	3.6/0.8	4.7/0.8	6.0/0.8	7.4/0.8	9.6/0.8	12.5/0.8	15.7/0.8	18.6/0.8	22.5/0.8	26.0/0.8	
	0.94/1.0	1.55/1.0	2.05/1.0	2.7/1.0	3.3/1.0	4.3/1.0	5.3/1.0	6.7/1.0	8.5/1.0	11.9/1.0	14.05/1.0	17.0/1.0	19.9/1.0	23.6/1.0	
		1.43/1.2	1.85/1.2	2.4/1.2	2.9/1.2	4.0/1.2	4.6/1.2	6.0/1.2	7.1/1.2	10.3/1.2	13.0/1.2	16.1/1.2	17.1/1.2	21.8/1.2	
Stage	Single Stage														
Ambient Temperature(°C)	≤40														
Cooling Way	Air cooling														
Exhaust Temperature(°C)	< Ambient Temperature +15°C														
Driven Way	Belt/Direct					Belt/Direct					Direct Driven				
Start Way	Direct Driven														
Power Supply(V/Ph/Hz)	380. 440/3/50. 60														
Power(kw)	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	
Volume of Lubricating Oil(L)	8	9	9	16	16	16	20	20	26,32	45	70	70,80	70,80	70	
Noise(dB)	≤65	≤74	≤75	≤70/75	≤70/75	≤70/75	≤82	≤82	≤82	≤85	≤85	≤82	≤88	≤80	
Net Weight(kg)	290	330	350	550	550	630	850	900	1050	1750	2250	2250	2400	2500	
Diameter of Outlet(Inch)	G3/4	G3/4	G3/4	G1	G1	G1	G1 1/4	G1 1/4	G1 1/2	DN40PN1.6	DN65PN1.6	DN65PN1.6	DN65PN1.6	DN65PN1.6	
Meas.(mm)	Length	1125	800	800	1150	1150	1150	1486	1486	1590	1906	2500	2566	2566	2566
	Width	720	950	950	950	950	950	1088	1088	1088	1186	1600	1600	1600	1600
	High	1253	1155	1155	1350	1380	1380	1500	1500	1500	1575	2090	2090	2090	2090

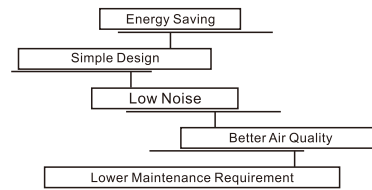
## Technical Parameters of Compressor



.JD-50A



.JD-100A



Water cooling Screw air compressor technic parameter:

	JD-100W	JD-125W	JD-150W	JD-175W	JD-200W	JD-250W	JD-300W	JD-350W	JD-400W	
Air delivery (m <sup>3</sup> /min/mpa)	14.2/0.7	16.3/0.7	20.7/0.7	24.1/0.7	26.5/0.7	33.5/0.7	38.7/0.7	43.2/0.7	55.0/0.7	
	12.5/0.8	15.7/0.8	18.6/0.8	22.5/0.8	26.0/0.8	31.0/0.8	35.3/0.8	42.3/0.8	52.8/0.8	
	11.9/1.0	14.05/1.0	17.0/1.0	19.9/1.0	23.6/1.0	28.4/1.0	32.4/1.0	38.5/1.0	47.8/1.0	
	10.3/1.2	13.0/1.2	16.1/1.2	17.1/1.2	21.8/1.2	25.6/1.2	28.9/1.2	35.2/1.2	43.2/1.2	
Stage	Single Stage									
Ambient Temperature(°C)	≤40									
Cooling Way	Water cooling									
Exhaust Temperature(°C)	Ambient Temperature +15°C									
Driven Way	Belt/Direct	Direct Driven								
Start Way	Y-Δ									
Power Supply(V/ph/Hz)	380. 440/3/50. 60						380. 440.3000.6000.10000/3/50.60			
Power(kw)	75	90	110	132	160	200	220	250	315	
Volume of Lubricating Oil(L)	45	70	70,80	70,80	70	130	130	150	150	
Noise(dB)	≤85	≤85	≤82	≤88	≤80	≤88	≤88	≤88	≤88	
Net Weight(kg)	1750	2250	2250	2400	2500	3600	4000	4300	6200	
Diameter of Outlet(Inch)	DN40PN1.6	DN65PN1.6	DN65PN1.6	DN65PN1.6	DN80PN1.6	DN80PN1.6	DN100PN1.6	DN100PN1.6	DN100PN1.6	
Meas.(mm)	Length	1906	2500	2566	2566	2566	2560	3230	3230	3230
	Width	1186	1600	1666	1666	1666	1660	2500	2566	1880
	High	1575	2090	1800	1800	1800	1800	1906	2566	2566

# Chapter 1. GENERAL

## 1.1 General

JD series screw air compressor is stationary with single stage oil spray system, and air cooling. It is assembled in a cabinet with sound insulation. It has micro computer controlling to make the best use of energy consumption and make it easy to operate and monitor.

## 1.2 System Flow

The mainframe includes air end, main motor, oil-gas separator, oil pipe system, cooling system, air pipe system and electric controlling etc.

Please see below System Diagram 1-1

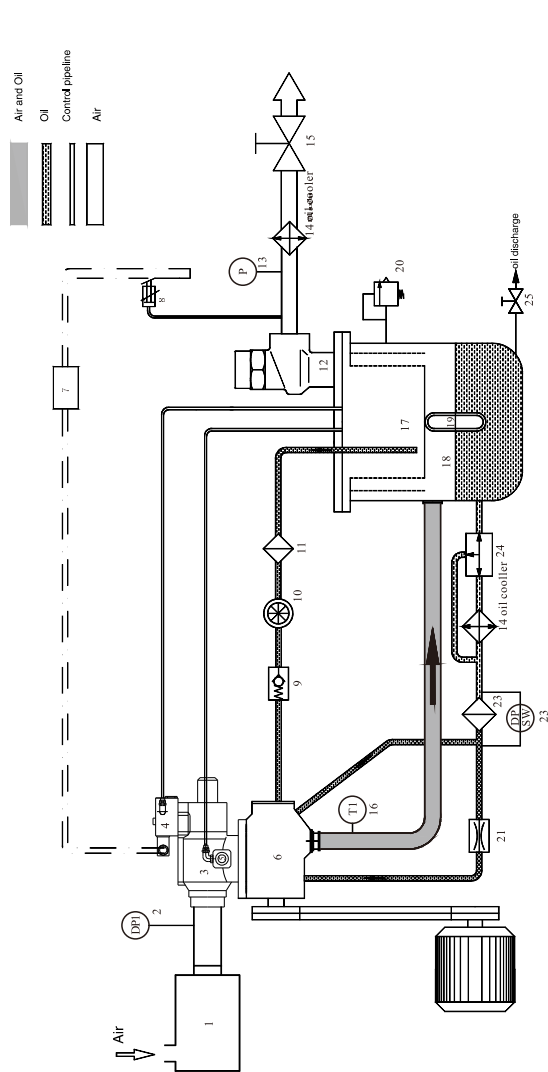


Diagram 1-1 System Layout

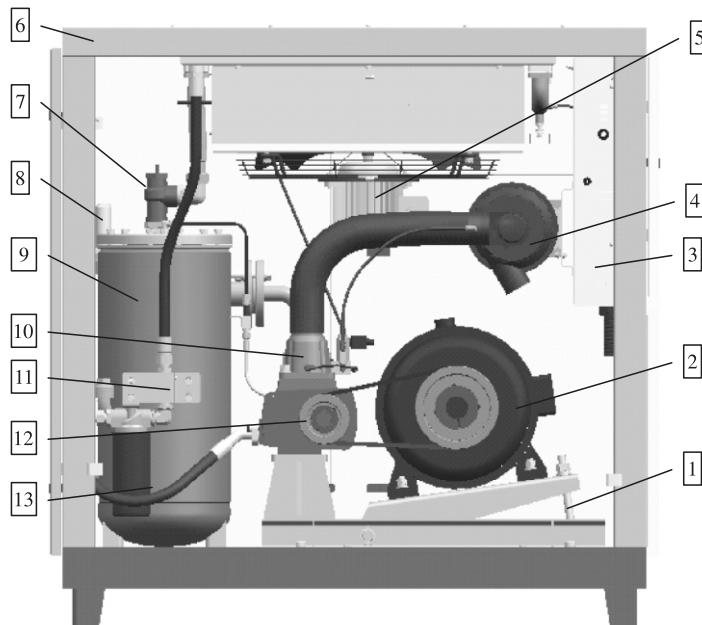
### 1.2.1 Air Pipeline System

Air is sucked from air filter and inlet valve into mainframe for compressing. The mixer after compressing flow into gas tank and begin to separate preparative, then come into oil-gas separator, the compressed air after oil-gas separating discharge out of the compressor through Min. pressure valve and after cooler to users` pipe.

The function of the air filter is getting rid of the impurity from the inlet air to keep the airend clean. The inlet valve could adjusted the inlet air volume based on the customer`s demand to save energy and ensure compressor to start in negative load state so as to avoid lubricator or compressed air flow back when unit stops. The Min. pressure valve ensures oil circle process to prevent compressed air in pipeline flow back that cause damage or restart difficulty.

The minimum valve would ensure the pressure is no less than 0.35Mpa to keep the oil flow smoothly. And it protect the air flow back when the machine is discharging or stop working.

The auto-drain valve is beside the inlet valve. When the compressor discharge and stop work, the auto-drain valve opens directly to release pressure.



- |                             |                               |
|-----------------------------|-------------------------------|
| 1. Adjust screw with strain | 8. Safety valve               |
| 2. Main Motor               | 9. Oil and air canister       |
| 3. Electric control cabinet | 10. Inlet valve               |
| 4. Air filter               | 11. Temperature control valve |
| 5. Fan Motor                | 12. Main frame                |
| 6. Crust                    | 13. Lube filter               |
| 7. Min pressure valve       |                               |



## Diagram 1-2 JD- Series Configuration

### 1.2.2 Oil Pipeline System

Most of the lubricating oil in the oil-gas mixture gushed from the vent of the mainframe assembles at the bottom of the oil-gas tank after initial collision. The remained oil flows back to mainframe through oil-gas separator. When lubricating oil temperature is under 70°C, the temperature valve open the bypass circle automatically, and oil spray directly to mainframe and lubricating parts; The bypass circle shut automatically when temperature is increasing to 70°C, and oil cooler circle opened for lubricator condense. The bypass closes complete when it reaches 85°C, and lubricating oil flow through cooler into mainframe.

The function of the temperature control valve (or cooling fan control) in the oil pipeline system is to maintain lubricant temperature and density so as to speed unit working temperature and keep unchanged constantly. It stops the moisture condensed in the system that will cause emulsification and degeneration of the lubricating oil and damage its function. The oil filter is to remove impurities in the lubricating oil, avoid the abrasion of the bearing and the rotors and prolong the service life of the compressor.

### 1.3 Cooling System

The air cooling system includes lubricant cooling and after cooler, the fan would suck the cool wind and blow into cooler chip to let the compressed air and lubricant oil to have the heat exchange to get the effort. The maximum temperature for this system is 40 centigrade. If exceed it, the exhausting air temperature would be higher.

### 1.4 Controlling Protective System

JD series compressor is controlled by the mini-computer. The air flow regulating system is to control the state of the intake valve automatically according to the quantity change of user's air consumption so as to achieve the purpose of saving energy. When air consumption reduces and the discharge pressure reaches or exceeds the maximum value of the air flow adjusting range, the pressure controller works to be unloading operation automatically. When the gas consumption increase, the machine would restart into loading status. At the same time, the computer would monitor the machine. When there is some unexpected things happen such as overloading for motor and exhausting air with high temperature, it would stop machine immediately to protect the compressor.

There is the safety valve on the oil separator tank. When the pressure exceeds the settled value,

the safety valve would open automatically to release the pressure to ensure the safety. This system has perfect function to unload. Normally the safety valve doesn't open.

### **1.5 Electric Schematic System**

The electric schematic system is composed with main motor, fan motor, electric controller, magnetic valve, temperature sensor, pressure transport and mini-computer.

To have a good protection for the main motor and fan motor to burn under abnormal status, we have the heat protector inside machines (selection), the device can resume its function automatically. When the temperature is higher than the set value, the controller of the compressor would stop the machine, and show the fault code on the display window for this action.

Electric schematic diagram is shown in **controller manual** for your reference.

**Note: User should set up short circuit protection equipment and ground line in front of compressor power cord inlet.**

**Warning: The circuits in the electric control cabinet and those connection between the electric control cabinet and the electromotor can't be dismantled by the user!**

### **1.6 Electric controller and Operating Panel**

The Micro-computer controller and controlling panel is integrate with operating controlling and protecting, temperature indication and protecting, phase and motor protecting, pressure control and operating records etc.

To make sure that the team works normally, the operator must acquaint with all the button on the panel. Indicated window, indicator light to make the judgment for the parameter and symbol.

Compressor parameter setting and operating are shown in 《Controller Manual 》。

## Chapter 2 Installation of Compressor

### 2.1 Outer Dimension (Diagram 2-1)

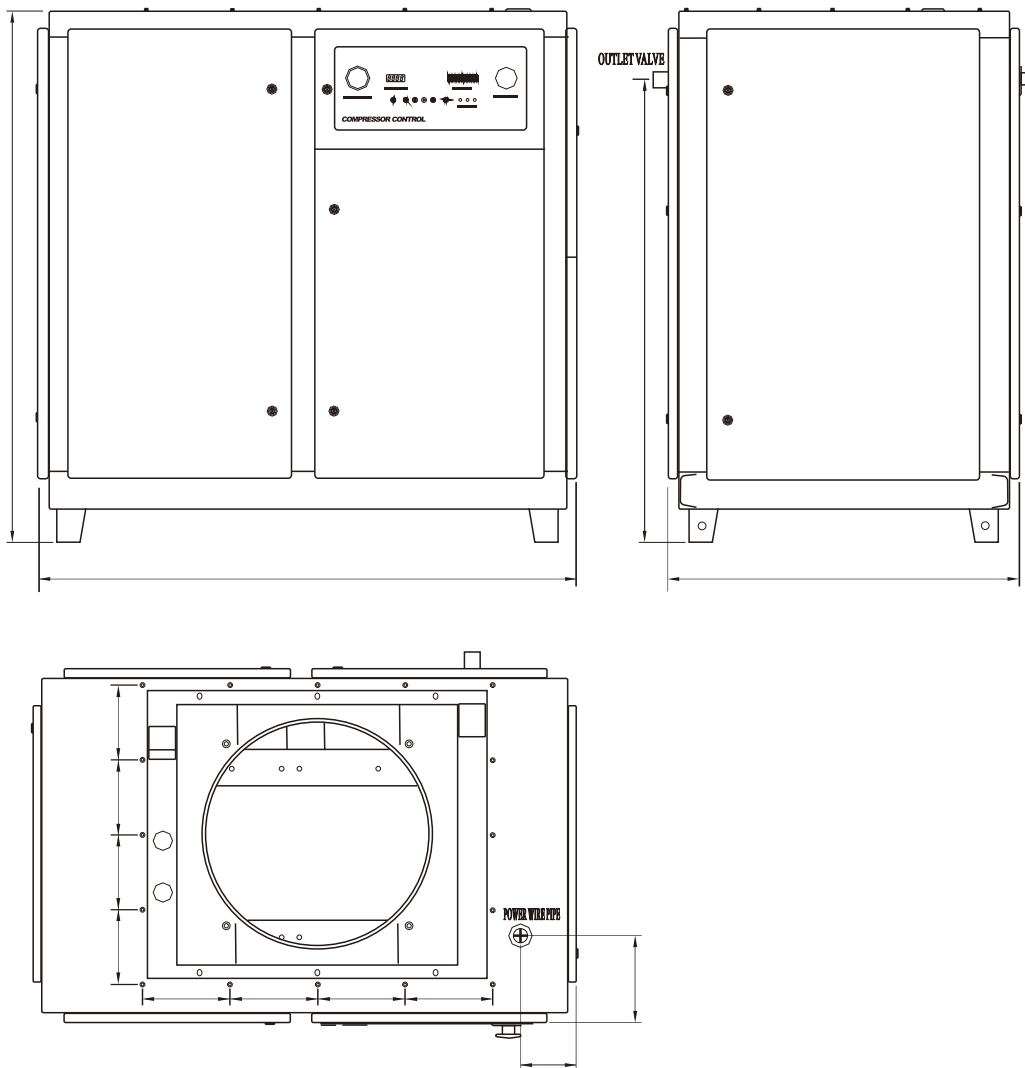


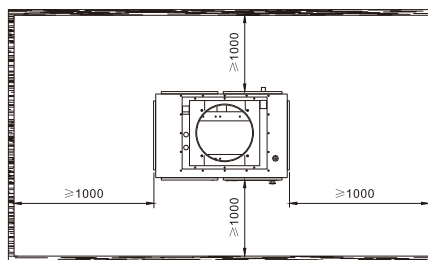
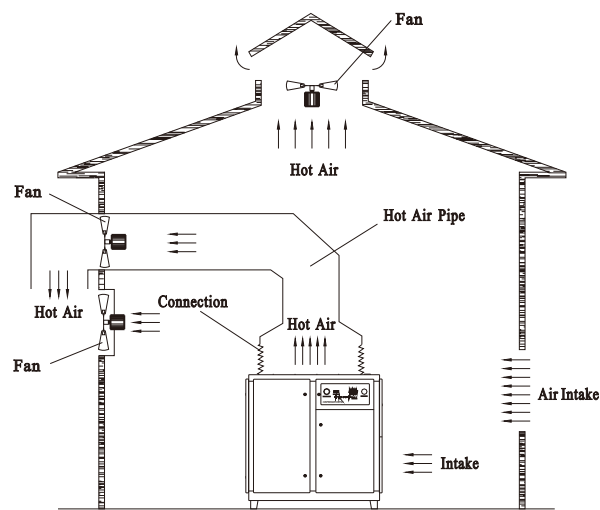
Fig 2-1 outer dimension

### 2.2 Environmental for installing compressor

Must have suitable location for the compressor. It is recommended to have a special room for it. The demand is listed as below.

1. Its working environment shall be roomy and bright for operation and maintenance. This compressor shall be kept at least one meter from surrounding walls and its top shall be at least 1 meter away from the ceiling for operation and ventilation.

2. It must be kept away from heat and dust sources with the maximum environment temperature not more than 40 degrees Celsius. It is recommended to have fan cooling whose processing volume is larger than the compressor fan processing volume.
3. The relative humidity should be low and less dust, no acid and other kind of erosion gas. If the air quality is under the standard, it is better to assemble some filter device to get it clean in advance.
4. With a box skid-mounted structure, this compressor can be placed on the leveling ground. If



place in the upstairs, you have some protection for the vibration.

### 2.3 Electronic Installation Requirement

1. Independent power system is suggested for compressor. This can avoid overload or unbalance in triple phases when connected with other equipment. And the three phase voltage should be about 360-400V stably.
2. Select correct power cable. Too small size cable is prohibited.

3. Rating current from power source and motor must be the same.
4. Short circuit protection such as pressure switch is necessary to line up with power supply.
5. Ground line must be connected to compressor to avoid power leak. It is not allowed to directly line with air or water tube

## **Chapter 3 Operation of Compressor**

To ensure the machine works normally, the operator must acquaint with all the regulation for this machine including the relative character and operation way.

### **3.1 Commissioning of A New Compressor**

- (1) Unscrew the 4 bolts and nuts connected to the big base for transportation on the base assembly.
- (2) Connect power cable and ground cable, and check if the voltage is correct and 3-phase voltages are balanced.
- (3) Check if electric connections are safe, firm and reliable.
- (4) Check if the oil level in the oil-gas tank is near the center

Note: if phases of the power supply are not conforming, the “phase sequence” fault LED on the control panel will light on, any other two phases of power cables can be changed over.

- (5) Open the exhaust ball valve.
- (6) Rotation test:

Although this set is equipped with anti-phase protection device, a rotation test is still an important procedure for the startup of a new compressor. After repairing the electromotor, it is of the same importance to conduct rotation test. The testing way is easy:

Press START button to rotate the compressor, and soon after press "emergency stop" button to stop the compressor, and then check if the rotating direction of the compressor is same as the direction of the arrow on the air end. Upon wrong rotating direction, change over any two phases of power cables. With fan electromotor, the rotating direction shall also be noted.

- (7) Restart the compressor, and the machine set will automatically enter star-delta startup. Slowly turn off compressed air outlet ball valve till that the system enters “unload” operation. Check if system unload pressure meets the set value (refer to table 1-1). If not, it shall be reset. Meanwhile, see that if display meters and LED work normally. Upon abnormal sound, vibration or leakage, immediately press “emergency stop” button for

servicing.

- (8) Stop: Press "STOP" button, the machine set enters shutdown procedure, intake air control valve will be closed and unloaded, air relief valve releases air, and the electromotor stops after several seconds.

**Note: In normal conditions, do not use "EMERGENCY STOP" button to stop the compressor.**

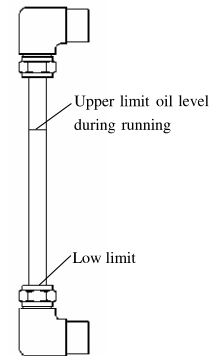
## 3.2 Daily Work

### 3.2.1 Opening Machine

- (1) Open the plug and ball valve of oil-gas tank and let out the condensed water deposited in the very bottom and shutdown and close them immediately when lubricating oil flows out.

Note: Before opening oil-gas tank outlets, make sure the pressure inside the tank is completely released.

- (2) Check if the airend could work smoothly.
- (3) Open the outlet valve of the compressor,
- (4) Turn on the power and start up compressor peripherals, such as compressed air dryer.
- (5) Start up the compressor to ensure if it works normally such as the time for Y- $\Delta$  exchanging time, running noise, exhausting pressure, lubricant oil pressure, exhausting temperature, and make recorder for all data.
- (6) After some time, check whether the oil level is under or close to the low limit for oil, adding lubricating oil if required.
- (7) If find any abnormal situation, press "STOP" or "EMERGENCY" button. Restart after solving the trouble shoot.



draw 3-1 oil level

### 3.2.2 COMPRESSOR Running Status

#### 1. Start

Press "START" button when all preparations finished, the Y connector inside the electric cabinet sucked and the motor runs at low speed, meanwhile, the main air valve closed, only a few air enter the compressor through the one way valve inside the air intake valve, the compressor start with light duty and a trial system pressure is formed inside the oil-gas tank.

#### 2. Upload

6-7 seconds after starting, the motor runs as  $-\Delta$  mode, the electromagnetic valve in the air intake valve is on power after 2 seconds, the compressed oil inside the oil-gas tank enter the air intake tank and unclosed the air valve, large sum of air enter the compressor and it runs at full load.

When the system pressure inside the oil-gas tank reaches or exceeds 0.35Mpa, the min. pressure valve open and begin to supply compressed air. This operating will continue only if the system pressure value under the unloading settings. (refer to 4.3, the value is same as the pressure controller)

### **3. Unload**

If the air usage volume is constantly less than the discharging volume, the discharging air pressure will reach or exceed the unload settings, at this time, the pressure controller acts and Micro-computer will close the electromagnetic valve, the main air intake valve closed and stop incoming large sum of air, only few air enter the compressor through one way valve, the min. pressure valve acts and separate the pressing system and user's connecting pipe line. Meanwhile, the air releasing valve inside the air intake valve open and release the air inside oil-gas tank to 0.3~0.4Mpa and decrease the compressor's back pressure and sustain the oil lubricating system as well.

Under unloading operating, if the discharging pressure decrease to the settings for pressure controller re-uploading( refer to 4.3), the Micro-computer powered the electromagnetic valve and the main air valve unclosed while air discharging valve close, the compressor is on again.

If some problem occurs to the unloading controller or settings wrong done, and the compressor can not unload in correct system pressure, the safety valve on the oil-gas tank must be open and release the system pressure to avoid too high system pressure causing danger, at this situation, should stop the machine immediately and check the air intake valve, pressure controller and see if the setting of pressure controller is correct.

### **4. Work to do**

If the unloading operating last a long time (this compressor is set as 15 minutes.) , the Micro-computer will order the compressor into a work to do state and the main motor and fan motor stop operating so as to save energy.

Under work to do state, the Micro-computer will restart the compressor when the air discharging pressure decrease to the settings for re-uploading for pressure controller if the compressed air is needed.

Under work to do state, the indicator light "RUNNING" on the controlling panel continuously glow, **it is banned to open any doors nor any servicing action to avoid accidents.**

#### **3.2.3 Breakdown**

##### **1. Normally stop**

Press the "STOP" button to stop the machine if no need air for a long time, the "POWER" light continue glow. The main air valve close while air releasing valve open and discharge the pressure inside oil-gas tank, the compressor will stop operation under lower system pressure after 15 seconds.

Use key switch to cut off the power supply after the compressor stop, close the air transmitting valve to avoid any impact from the compressed air outside. Finally, the outer power source should be plug off as well to avoid accidents.

## **2. Breakdown**

Any electronic problem or over temperature occurs, the Micro-computer will stop the machine immediately, the indicator light on the controlling panel will glow meanwhile error code displays on the window, at this time, all problems should be resolved according to presentation and restart the compressor by pressing “ Re” button.

## **3. Emergency stop**

If any abnormal situation occurs to the compressor, should press” **EMERGENCY STOP**” to stop the machine immediately, resolve the problem before restart the machine.

### **3.2.4 Important notes during operating**

1. Stop the machine immediately if any abnormal noise occurs.
2. Not allowed to loose any pipe connection, bolts or nuts, nor open or close any valve.
3. Refill the oil once the oil level is too low.
4. The operator shall make appropriate records for each shift, including pressure system pressure, system temperature, oil partial pressure difference, oil level and operating hours, etc. if applicable, use IR temperature detector to test the temperatures of different parts and record supply voltage and current.

### **3.3 Long-term Stop**

#### **3.3.1 Preparation**

If the compressor need long term time stop, need to do the following arrangements.

- (1) Any malfunction shall be corrected for the next use.
- (2) Completely discharge the compressed water in oil-gas tank and oil cooler to prevent the machine erosion.
- (3) Close all outlets to prevent moisture or dirt from coming in.
- (4) If no air required over 2 months, it is suggested to replace with new oil before shutdown and run for 30 minutes, drain out the condensed water inside the oil-gas tank the day after.

#### **3.3.2 Restart**

1. Remove the coverings of all outlets.
2. Measure the insulation against ground of the electromotor and the valve should be over 1M  $\Omega$ .
3. Restart the compressor by following the procedures as described in Section 3.1



## Chapter 4 Maintenance and Care

### 4.1 Lubricating oil

Lubricating oil is essential to the performance and service life of screw compressor. If inappropriate lubricating oil is used, it will cause severe damage to the compressor. Therefore, please use lubricating oil specially for screw compressor. The special lubricating oil for screw compressor of our company is of outstanding quality. Its viscosity target at 40°C fits screw compressor very well. Meanwhile, it is of ageing resistance, difficult to be mixed with water to be emulsified or foamed and corrosion resistant, etc.

You could use **JIEBAO** material oil or **JIEBAO** synthetic oil but can't use the mixed oil.

#### 4.1.1 Oil Replacing Cycle

- (1) The initial oil change shall be conducted at about 500 hours operation of the compressor
- (2) And following changes shall be conducted for each 2,000 hours (using **JIEBAO** mineral oil) or 6,000~8,000 hours (using **JIEBAO** synthetic oil).
- (3) It needs replace once a year.
- (4) If the oil ingredient analysis shows it is necessary to replace lubricant, it should be done immediately.

Under worse environment or the discharge temperature is comparatively high, the oil change interval should be shortened.

#### 4.1.2 Replace oil and oil filter

- (1) Close the outlet valve slowly let the compressor unload for about 3 minutes.
- (2) Stop the compressor and shut down power supply
- (3) When the pressure of the oil separator tank release, open the oil net slowly and press and rotate the compressor at its rotating direction about 10 cycles.
- (4) Use special wrench to remove the oil filter, make sure put the lubricating oil into the container, clean the oil filter when no lubricator flow out.
- (5) Replace the oil filter (refer to 4.4.3).
- (6) Remove the oil plug and enclose the oil valve, let the lubricating oil drain out to oil-gas tank and make good disposal for this oil to avoid environmental pollution.
- (7) Close the oil valve and put on the oil plug, refill the lubricating oil up to the upper limit level (refer to Diagram 3-1), re-tighten the oil plug.
- (8) Let the compressor stop after 5 min. operating, release the system pressure out of the

oil-gas tank, when the oil level sustained, enclose the oil plug slowly and refill lubricating oil up to upper limit level.( see Diagram 3-1), re-tighten the oil plug.

## 4.2 Belt Adjustment

The tension of newly installed belt shall be checked after 30 hours operation and checked for each 1,500 hours operation after that. The way to test the tension of a single belt is: When the corresponding force P vertically acts on the middle top surface of the belt, Belt with stipulated specification and type shall be used. The adjustment values of the tension of each belt are as follows:

	New Belt	30 hours later
Depth H(mm)	9.7	9.7
force P(N)	40~42.4	35.2~37.6

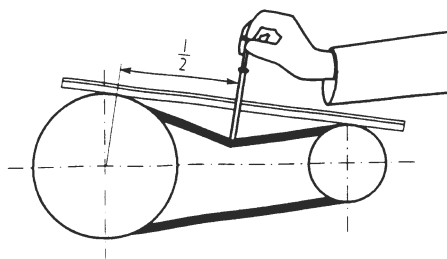


Fig. 4-1 Measurement of Belt Tension

Belts of the same batch number shall be used to make sure that each belt has the same tension, and all belts shall be replaced at a time. Never use new belts with old ones.

When adjust the belt tension, let the fixed screw on the motor base loosed then rotate screw to pull the main motor to let the belt tense and measure it at the same time. When the tension comes up to the demand, tighten the screw on the motor base.

During replacing or adjusting belt, don't let the lubricant oil spoil on the belt to prevent it slip.

## 4.3 Spare Parts Replacement and Maintenance

### 4.3.1 Maintenance of Air filter

1. If the color zone is exposed fully or come to red color zone that is to show the air filter has been blocked and need clean and replace. See figure 4-3 as show.

2. The way to clean the filter: Use compressed air no more than 5 bar clean air to blow outward. The blowing opening is about 20mm from the inner surface.
3. Not allowed slap the filter element nor clean it with water, replace it when it is broken and when it is oily or deeply contaminated.
4. After cleaning or replacing element, should press the reset button till the indication for the pollution go back total.
5. The filter element operation life is every 4000 hours. If the compressor works in a bad situation, we should shorten the replacing period.



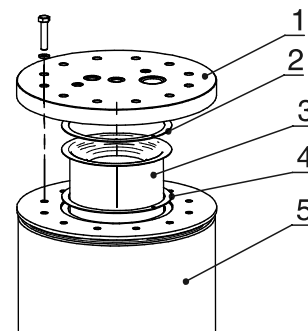
Fig4-4 Diagram for oil filter clean

#### 4.3.2 Oil Filter Care

1. Generally, the oil filter shall be replaced for the first operation about 500 hour then 1000 hours once. If you change lubricant oil, you need to change oil filter at the same time. If the environment is mess, should shorten replacing interval.
2. The replacing steps are as follows:
  - 1). Remove the oil filter with band-type wrench after the machine stop and cool down.
  - 2). Clean the seal washer of the new oil filter and apply a layer of clean lubricating oil onto the seal washer.
  - 3) Install the new oil filter onto the lubricator filter base and make sure the seal washer contact the oil filter base and tighten it by hand about half a cycle.

#### 4.3.3 Oil-gas Separator Care

Generally, the oil-gas separator filter shall be replaced after 4000 hours operation, When the operating time exceed the enacted time, the failure indicate light on the control panel will twinkle and the display window will show "H1-\*\*\*", then the separator filter should be replaced. The separator filter should be replaced in a shorter time if the machine is in a more dust circumstance. The separator filter element can be used after washed, should change new one.



1. cover 2. seal washer 3.filter element 4.seal washer 5. separator tank

The separator filter element should be changed as the following steps:

- i. Stop the machine and unload the pressure

- ii. Take apart the tube, which connect with the top cover, take off the top cover.
- iii. Take out the separator element, replace with the new one
- iv. Note: There should be metal pin on the seal washer, so that can be sure the separator filter be grounded, to prevent the static charge cause fire. If the seal washer is damaged, two pins should be put on the new seal washer.

Note: The machine should be clean to “0” after replacing the oil filter element.

#### 4.3.4 Clean Cooler

When the exhausting temperature is a little higher compared normal, you would use compressed clean air to blow the rust from the fan fin. If can't blow out, you would use a suitable cleanser for it. But never use brush with metal steel And ensure to make the surface dry after cleaning.

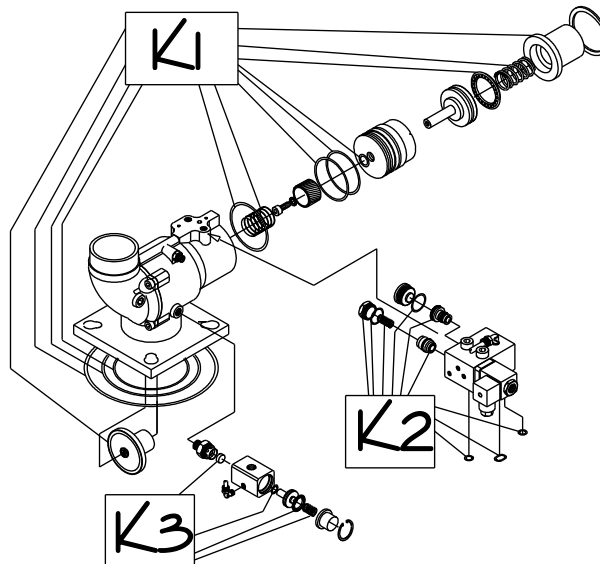
#### 4.3.5 Safety Valve

To check the starting pressure of safety valve once annually. If wrong, have to be adjusted. It is better to contact JIEBAO or professional person for it. The test would be done on the single air pipeline system.

**Note: The safety valve has been set in the factory, don't adjust at will.**

#### 4.3.6 Inlet Valve (R90E1)

When the inlet valve block or leak, clean or replace the spare part for it. The maintenance kits is

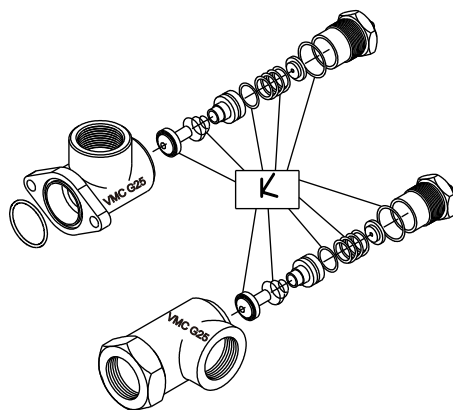


listed as below.

K1: valve body kit    K2: controlling parts kit    K3: discharging valve kit.

#### 4.3.7 Min. Pressure Valve

When the combined valve block or leak, clean or replace the spare part for it. The maintenance kits is listed as below.



#### 4.4 Protective Maintenance Plan

Project	Maintenance cycle (working hour)					
	daily	500	1000 three months	2000 half year	4000 one year	8000 two years
Daily maintenance						
Check oil level	√					
Check the seal for all the component	√					
Check the measure meter is correct	√					
Check air filter maintenance indicator	√					
Discharge water after stopping machine	√					
Air system						
Clean or replace inlet air mesh		√				
Clean air filter		√				
Replace air filter					√	
Clean or replace inlet valve spare part					√	
Clean or replace combined valve spare part					√	
Clean cooler		√				
Check or adjust pressure transport					√	
Check or adjust safety					√	
Oil pipe system						
Change oil for new machine		√				
Add lubricant oil(if need)			√			
Check the cleanness for the returned oil pipe				√		
Replace oil filter		√ new one	√			
Replace oil gas separator				√ <sup>①</sup>	√ <sup>②</sup>	
Change oil				√ <sup>①</sup>		√ <sup>②</sup>
Transmission system						
Check or adjust belt tension			√			
Check or replace belt					√	
Add lubricant grease for motor bearing					√	
Electronic system						
Check emergency button		√				
Check the electronic connect reliability		√				
Check the controller work normally					√	

①using JIEBAO mineral oil.

②using JIEBAO synthetic oil.

## Chapter 5 Fault Analysis and Troubleshooting

### 5.1 Introduction

The malfunctions of the compressor are subject to many factors.

Here it is important to collect the data of machine set operation. According to these data, an operator can find the performance variation of the machine set and find out the hidden trouble. For example, the intensified vibration of the machine set may originate from the encrustation of the heat exchanger.

Before servicing or replacing parts, a detailed analysis of different factor that may lead to the malfunction shall be conducted to find the very reason. Do not disassemble and remove at will, so as to avoid unnecessary damage.

At first, the following items shall be inspected:

2. If the adaptor of the wire connector becomes flexible or comes off
3. If the pipeline is damaged
3. If there are parts damaged for overheat or short circuit. An obvious symptom is color change or burned appearance.

### 5.2 Troubles that may occur to a compressor and trouble shooting methods are as follows

#### Fault Analysis and Troubleshooting

Fault	Probable Cause	Remedy
1. Start failure (phase sequence LED on)	1. Fuse burnt out	1. Refer to electrical personnel for servicing and replacement
	2. wrong phase or short of phase	2. Refer to electrical personnel for servicing and replacement
	3. Cable connects loosely or poor contact	4. Refer to electrical personnel for servicing and replacement
	4. Supply voltage too low	5. Refer to electrical personnel for servicing and replacement
	5. Electromotor failure	6. Refer to electrical personnel for servicing and replacement
	6. Mainframe failure	7. Rotate the mainframe manually. If not rotatable, please contact our Company or dealer
2. Discharge temperature is too high	1. Lubricating oil insufficient	1. Check the oil level of oil-gas tank
	2. Ambient temperature too high	2. Improve ventilation condition and reduce room temperature

(over 105 °C)	3. Oil cooler fin blocked	3.Clean oil cooler fin
	4. Oil filter blocked	4. Replace oil filter
	5. Temperature control valve failure	5.Check if oil is cooled through oil cooler; if not, repair or replace temperature control valve
	6. Lubricating oil brand incorrect	6. Check oil brand and replace oil. Please refer to Section 5.1
	7. Cooling fan failure	7. Repair or replace cooling fan and drive electromotor
	8. Temperature sensor damaged	8. Check or replace temperature sensor
3. Discharge temperature T is lower than normal value (lower than 75°C)	1. Ambient temperature is low	1. Appropriately reduce the heat elimination area of the cooler
	2. Temperature control valve malfunction	2. Repair or replace temperature control valve
	3. Exhaust thermometer incorrect	3.Check and replace thermometer or temperature sensor
4. Supply air pressure P1 is lower than discharge pressure	1.The user's air consumption is greater than air supply	1. a. Reduce air consumption b. Check for leakage on the gas pipeline
	2. Air filter blocked	2. Clean or replace filter
	3.Air intake valve cannot be fully opened	3. Check the action of air intake valve
	4. Pressure transport malfunction or set value too low	4. Repair or replace pressure transport, or reset if not set properly
	5. Minimum pressure valve invalid	5. Check/repair minimum pressure valve
	6. Oil-gas separator blocked	6.Check and replace oil-gas separator
5. Supply air pressure P1 is higher than the set value of unload pressure	1. Pressure transport malfunction or set value too high	1. Repair o replace pressure transport or reset if not set properly
	2. Unload parts (e.g.: electromagnetic valve in air intake control valve C and air release valve) invalid	2.Check if unload parts work normally
	3. Control gas pipeline leakage	3. Check and clear control gas pipeline leakage
6. System pressure (tank pressure) too high	1. Unload parts (e.g.: electromagnetic valve in air intake control valve C and air release valve) invalid	1. Check if unload parts act normally
	2. Pressure transport failure or set value too high	2. Check pressure transport



	3. Control air source leakage	3. Check control pipeline for leakage
	4. Oil-gas separator blocked	4. Replace oil-gas separator
	5. Minimum pressure valve invalid	5. Check/repair minimum pressure valve
7. Oil content in compressed air too high, oil feed cycle shortened	1. Excessive oil feed, oil level in oil-gas tank too high	1. Check oil level, discharge excessive oil
	2. Oil return pipe filter or flow controlling orifice blocked	2. Clean filter element and flow controlling orifice and replace them if necessary
	3. Filter element of oil-gas separator or seal washer damaged	3. Check oil-gas separator and replace it if damaged
	4. O-ring of oil-gas separator base aged or damaged	4. Replace O-ring
	5. Leakage point in oil pipeline system	5. Check oil pipeline and clear leakage point
	6. Poor oil quality, excessive foam	6. Replace with new oil that meets requirement
8. Oil mist comes out from air filter upon shutdown	1. No unload or short unload time before shutdown	1. a. Repair air intake control valve b. Check shutdown time delay relay and other electrical lines
	2. Minimum pressure valve leakage	2. Repair minimum pressure valve and replace it when necessary
	3. Air release incomplete	3. Check air release valve
9. Excessively frequent switches between unload and reload	1. Pipeline leakage	1. Check leakage position and clear off
	2. Pressure difference set value of pressure transport too small	2. Reset pressure difference value
	3. Air consumption unstable	3. Increase air storage tank capacity and add relief pressure valve behind the air storage tank if required