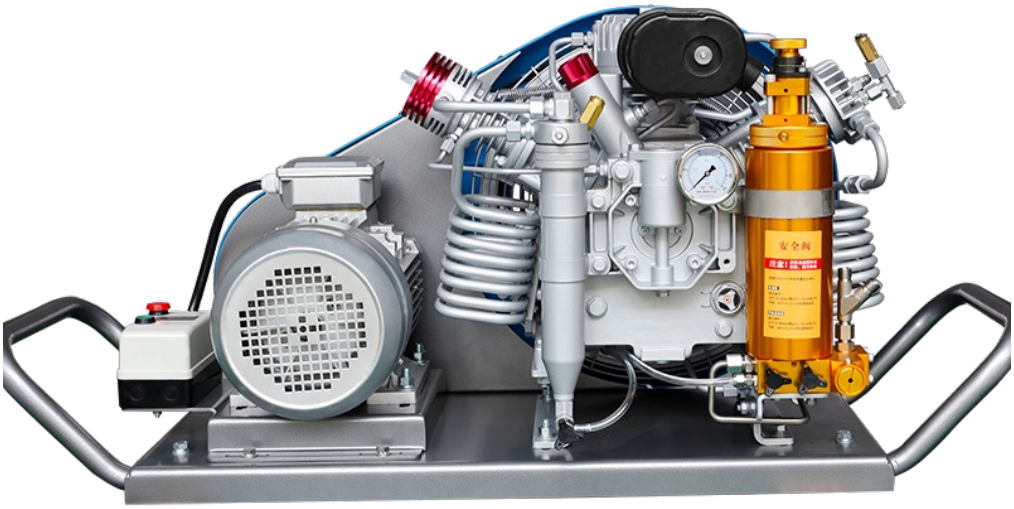
Muskwell
Breathing Air Compressor

Maintenance Manual

High Pressure Breathing Air Compressor



Model: AG320

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INSTRUCTION

This manual contains general information and instructions to operate high pressure breathing air compressor units.

Before taking the compressor into operation it is essential to study the instruction manual of that compressor.

All instructions should be observed and carried out in the order laid down to prevent damage and premature wear to the equipment and the units served by it.

While every effort is made to ensure the accuracy of the particulars contained in this manual, the manufacturing company will not, under any circumstances, be held liable for any inaccuracies or the conse-quences thereof.

WARNING

The breathing air produced with this high pressure compressor is sub-ject to strict quality standards. Ignoring the operating and maintenance instructions can lead to severe injury or in serious cases even death.

We reserve the right to make changes to the technology of our com-pressors as well as to this accompanying documentation in accordance to technical progress.

Edition January 2025

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1. Maintenance instructions

1.1 Maintenance record

We recommend that all maintenance work must be recorded on a maintenance log, indicating the date and work performed. This avoids more than regular repairing costs due to forgotten maintenance work. If you need to claim during the warranty period, you can also prove the maintenance work has been carried out regularly, and the damage caused has nothing to do with the maintenance work. For this reason, we provide you with the corresponding maintenance record form, please fill it out truthfully, sign and mark the date.

1.2 Maintenance guidelines

Always turn off the machine and completely depressurize the entire system before performing any work.

Never use welding to repair pressure pipes.

Always spray leaking agent (non-corrosive) on the connectors to check for any air leaks and repair all leaks.

Use only original factory parts for maintenance.

Maintain three-phase asynchronous motors according to the manufacturer's operating instructions.

Dispose of used filter cartridges in accordance with relevant regulations.

1.3 Lubricated oil

1.3.1 Types of lubricated oil

For proper care and maintenance of the compressor, using the correct lubricating oil is of vital importance. Depending on the application of the compressor the requirements placed on the oil are :

- Low deposits
- No carbonizing effect, especially in the valves
- Good anti-corrosion properties
- Emulsifying of the condense in the crankcase
- For breathing air application, also physiological and toxicological suitability.
- Due to the thermal load, only high quality lubricating oils should be used. You are recommend to restrict oils to those which have been approved by us.

1.3.2 Lubricated oil maintenance frequency

Before each use, check the lubricating oil level;

After the new machine runs for 25 hours, change the oil for the first time;

After 75 hours of operation, change the oil for the second time;

After running for 150 hours, change the oil for the third time;

After that, change the oil every 250 hours of operation;

Regardless of cumulative running time, we recommend an oil change every 12 months.

1.3.3 Oil level checking

Check oil level at sight gauge on the compressor block.

The oil level should be more than half of the oil level sight gauge.

When the oil level is lower than half of the oil level indicator glass, it is necessary to add oil to the compressor.

1.3.4 Precautions for changing lubricated oil

In order to prevent serious damage to the compressor, the following instructions must be strictly followed when changing the compressor lubricating oil:

- Only add or replace lubricants of the same type.
- Drain oil while still warm by means of oil drain plug.
- Check valves, coolers, oil-water separators, purifiers, and all tubes and pipes for deposits.
- If deposits are detected, perform the follow the steps:

(1). Replace or clean valves, coolers, oil-water separator, purifiers, and all pneumatic tubes and hoses from all deposits.

(2). Fill compressor with the new lubricating oil.

(3). After approx. 100 operating hours, check lubricating oil for degree of contamination, and change lubricating oil again if necessary.

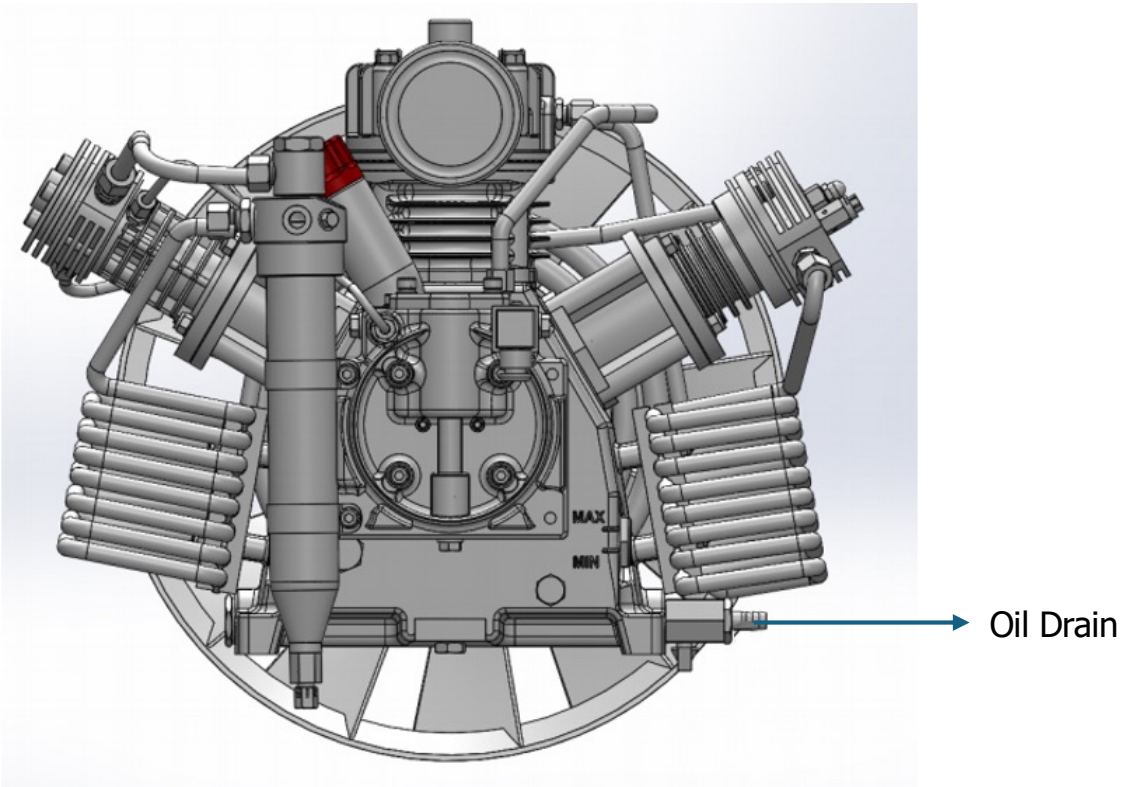
1.3.5 Replacing the lubricated oil

Approximately 2.5 liters of oil are required for each oil change.

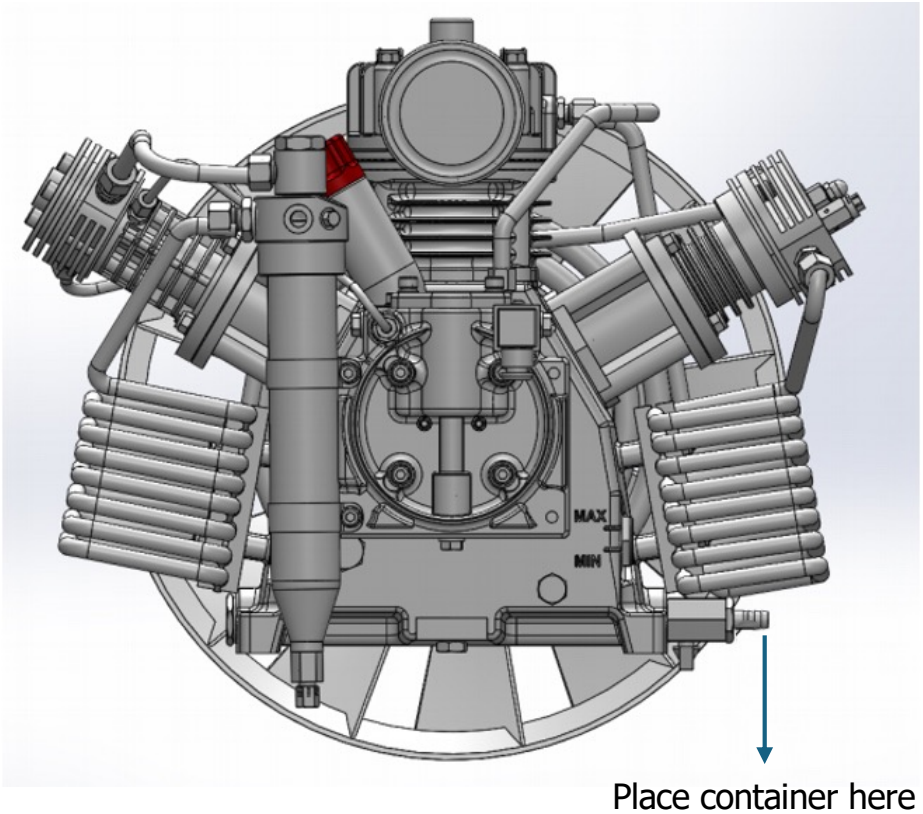
Steps to change the lubricating oil:

(1) Start the compressor and run for about 2 minutes, heating the lubricating oil, close the compressor and the drain valves at all stages.

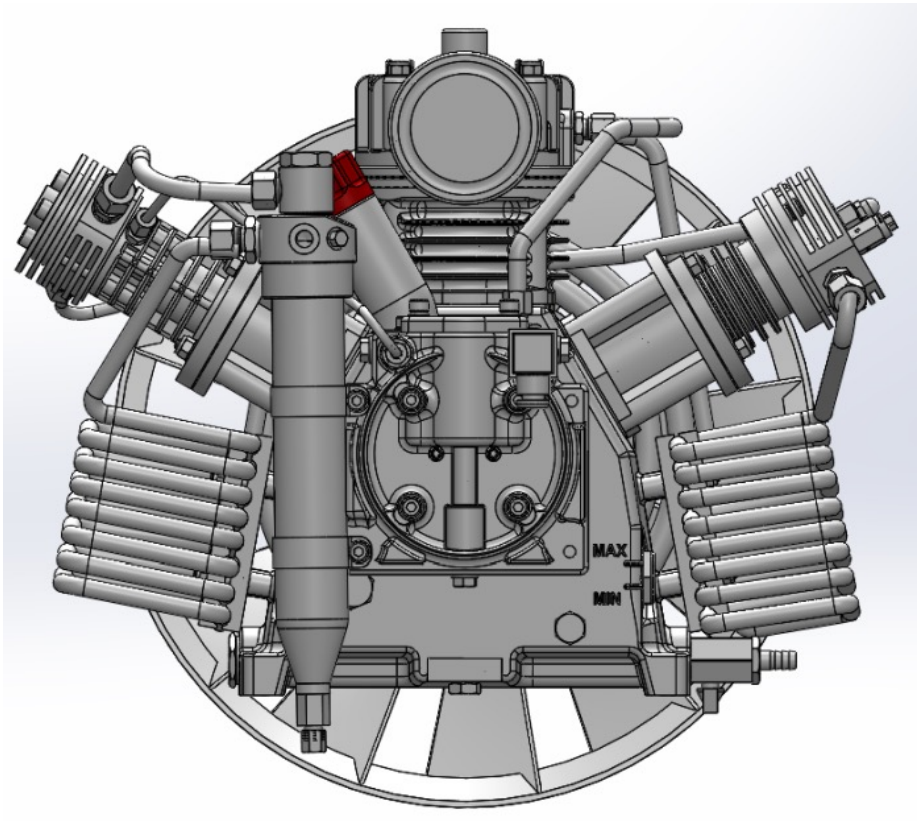
(2) Tilt the compressor 30°.



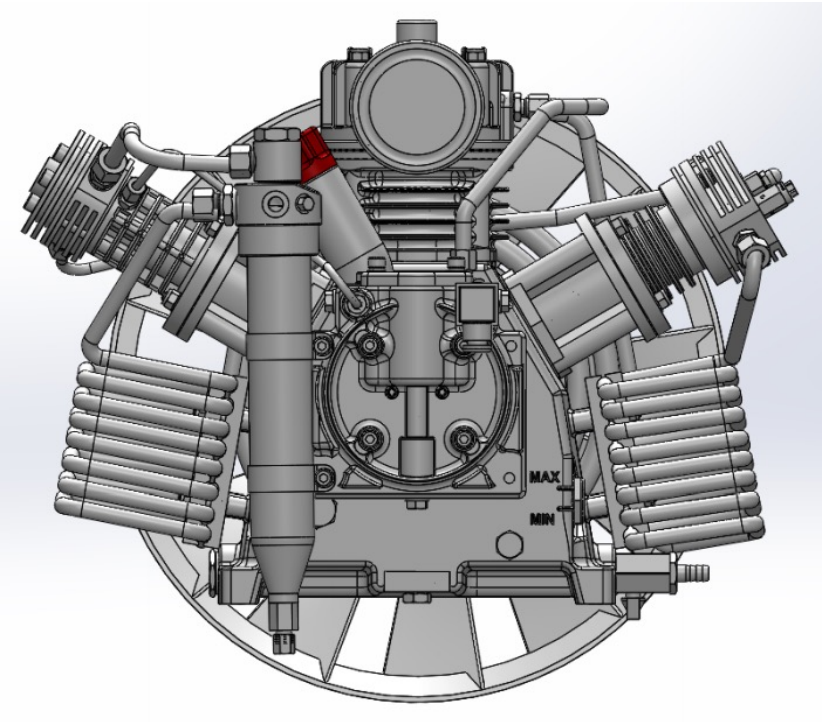
(3) Place a suitable container (a flat container larger than 2.5 liters) under the oil drain



(4) Open the oil release valve and drain the oil.



(5) Close the oil drain valve and re-place the compressor horizontally again.



(6) Open the upper cover of the oil cup and use the funnel to fill the compressor with oil (use the recommended special lubricating oil, do not overfill).

(7)Check that the oil level is half way up the oil level indicator glass.

1.4 Lubricating system

1.4.1 Brief introduction

The compressor is lubricated by hydraulics. The oil pressure is generated by the gear pump(No.1 component on the oil pump) itself, which generates a pressure of about 5 bar.

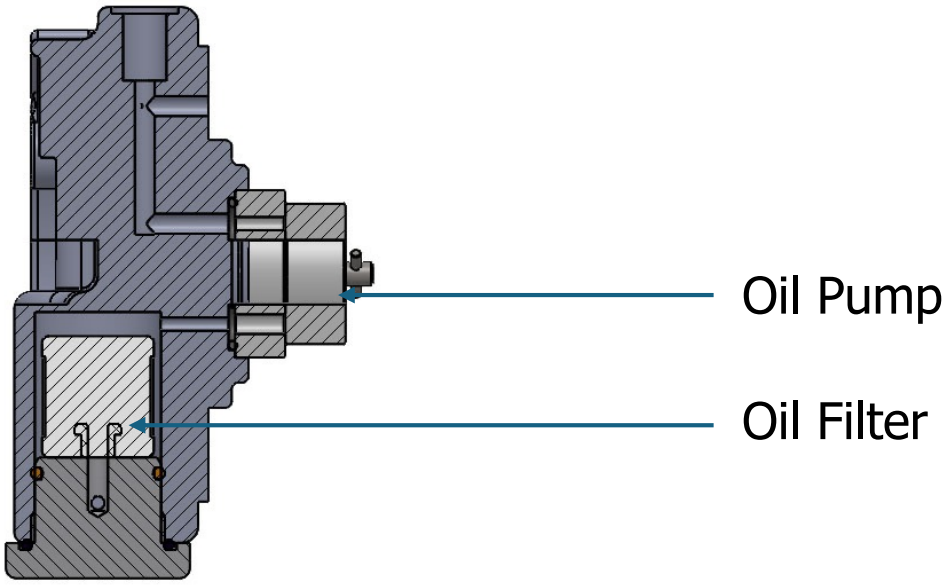
The oil pump is controlled by a crank, which pumps oil through the oil filter (No. 2 component) and the small pressure valve (No. 2 component) to the third stage cylinder. The oil is then distributed into the third stage under the guidance of the piston.

The oil pressure of the minimum pressure valve can be displayed through the pressure standard line, and the pressure can be adjusted through the electronic device.

1.4.2 General introduction for checking and replacing the oil filter element

Replace oil filter device with every oil change, otherwise, the bypass valve would open if filter element is clogged, and the oil would circulates through without being filtered!

Figure: Lubricant oil system



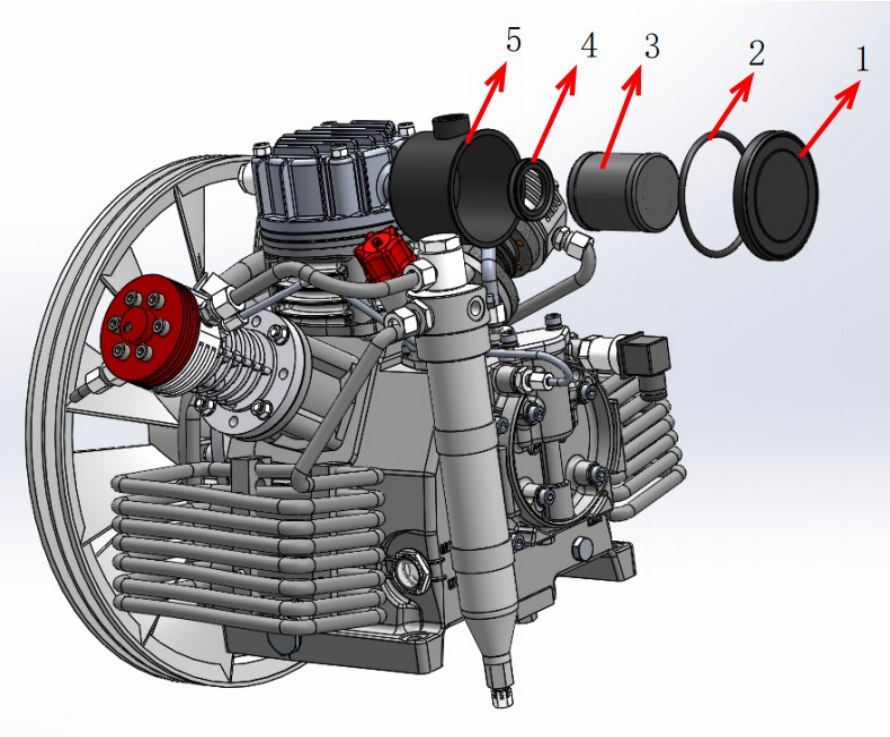
1.5 Air intake filter

1.5.1 Brief introduction

Inlet air can be filtered with a fine mesh filter.

Once the air filter element is polluted, it will cause the air intake to be blocked, and the valve plate in the compressor will be damaged as a result, the compressor cannot get pure air, and it may also cause the danger of the compressor overheating.

Air filter's paper element can be cleaned with compressed air. A damaged air intake filter element should be replaced immediately (See below).



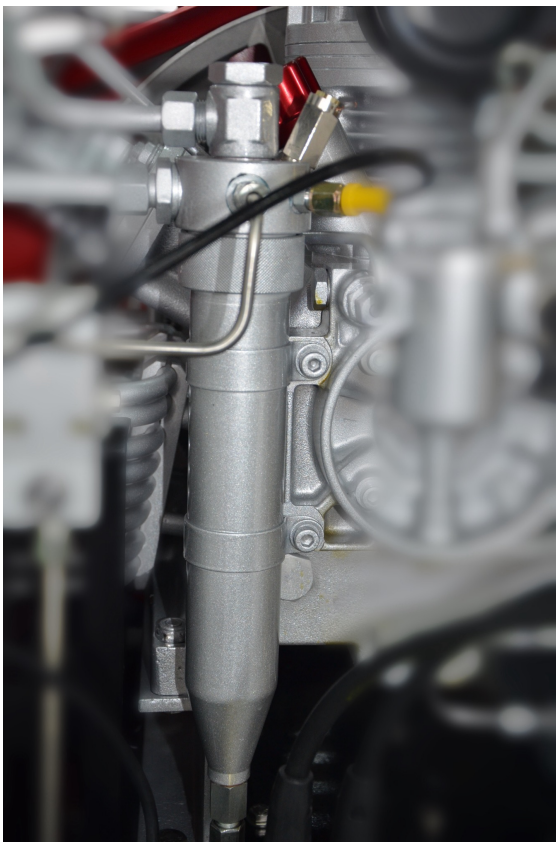
1-air filter cover 2-O-ring 3-filter element 4-rubber pad 5-air filter housing

1.5.2 Maintenance frequency of air intake filter element

- Check filter element every **25 hours** of operation;
- Every **125 hours** of operation, replace filter element.

1.6 Inter-stage separator

The inter-stage separator is installed between the 2nd and 3rd stages of the compressor. Separators are primarily used to remove water and oil that accumulates when the air is condensed during compression. Separators are mainly achieved by the centrifugal action provided by the turbine (oscillating). (See below)



1.6.1 Maintenance

The inter-stage separator requires no maintenance other than regular condensate drain.

1.6.2 Condensate drain

Drain the condensate every 15 to 30 minutes or ensure that the automatic condensate drain is regularly drained.

1.7 Filtration system

1.7.1 How the filtration system works

First, the air enters the filter cartridge and is locked in a fluidic device that causes the air to flow towards the inner wall of the filter cartridge. This kind of air circulation makes the water and oil in the air separated and flows to the bottom of the filter cartridge in the form of water droplets. There is a drain valve at the bottom of the filter cartridge, which can be drained by manually opening the drain valve.

Next, the air enters the filter cartridge for final filtration. The filter cartridge is installed in the middle of the filter housing and sealed by an O-ring. Air is exhausted from the connector in the middle of the filter cartridge, through the pressure maintenance valve to the filling valve.

1.7.2 Filter safety hole

Filter safety hole prevents pressurization without filter cartridge. There is a safety hole in the filter housing base, which can only be sealed when the filter cartridge is placed.

There is no any high pressure created when there is no filter cartridge!

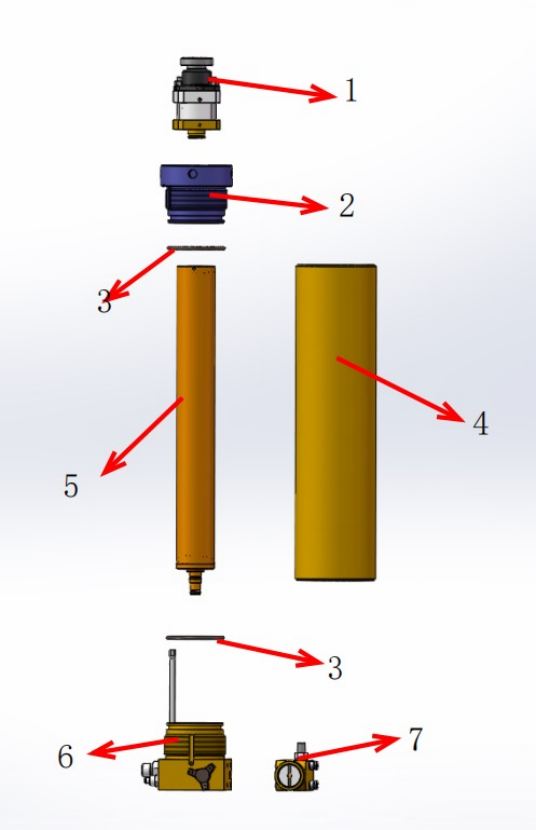
Without filter cartridge, the vent hole will not be sealed, the compressed air would be leak out, and no high pressure would be formed, thereby ensuring that unfiltered air would not be supplied to air consuming devices.

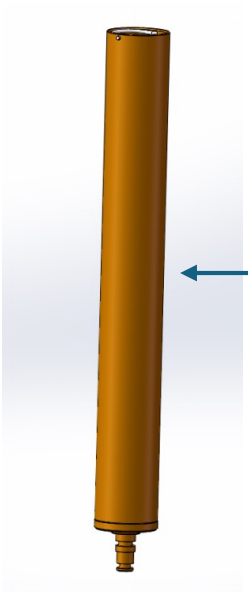
The air hole can be used to check the quality of the O-ring on the filter cartridge. If air is leaking from the vent even with the filter cartridge installed, the O-ring is either broken or damaged during installation. Remove the filter cartridge to inspect and replace the filter cartridge or O-ring if necessary.

1.7.3 Model and service life span of filter cartridge

The filter cartridge includes molecular sieve and activated carbon.

1. **Final stage safety valve**
2. **Filter cartridge cover**
3. **O-ring for housing seal**
4. **Filter housing**
5. **Filter cartridge**
6. **Filter housing base**
7. **Pressure maintenance valve**





- Filter Model: F-12-LX
- The filter could filter 40pcs 10L air cylinders @20℃
- The filter with vacuum packing and design life of 2 years.

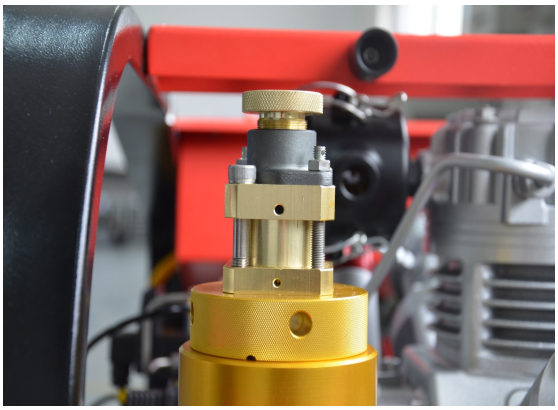
Before actual use, it is strictly forbidden to take the spare filter cartridge out of the vacuum bag. Otherwise, the high-sensitivity filling material will absorb moisture from the outside air, slowly reach saturation and cannot use it again.

F-12-LX can handle about 40pcs 10L air cylinders when the intake air temperature is 20°C. Affected by factors such as air humidity and ambient temperature, the service life span of the filter cartridge in the filter housing will also vary, so it is necessary to check the air quality of the compressed air frequently to determine whether to replace the filter cartridge.

1.7.4 Replacing the filter cartridge

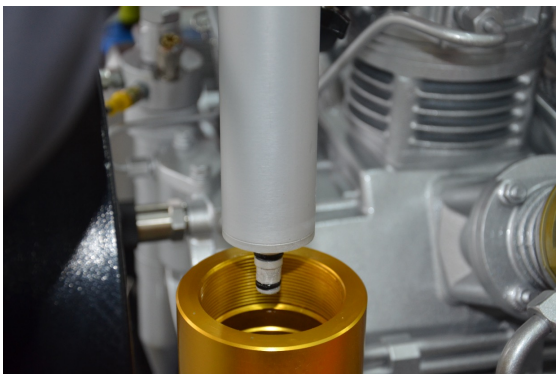
- Turn off the compressor, exhaust the air in the filter cartridge (rotate the blow-down valve knob counterclockwise or turn the safety valve knob clockwise to release the pressure manually) and wait for the filter cartridge to completely release the pressure. This should take about 1-2 minutes.
- When no any more air is released from the blow-down valve, the filter cartridge is considered to be completely depressurized.

- At this point, the upper cover of the filter housing can be removed. If there is no pressure in the filter housing, the upper cover of the filter housing can be removed. (But make sure that it is under the condition that the filter housing is completely depressurized).

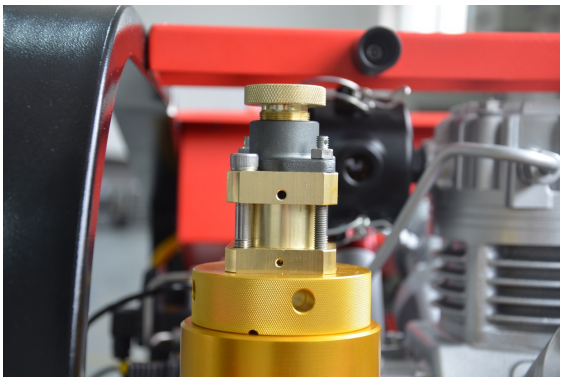


Take the filter cartridge out from the housing, separated it from the housing base

- Install a new filter cartridge into the filter housing (the filter cartridge needs to be pushed in gently).



- Put the filter housing cap cover back on the housing and tighten (counterclockwise).



Dispose of used filter cartridge in strict accordance with local regulations.

This filter cartridge can filter water, oil, and hydrocarbons, but not toxic gases.

1.8 Safety valve

1.8.1 Brief introduction

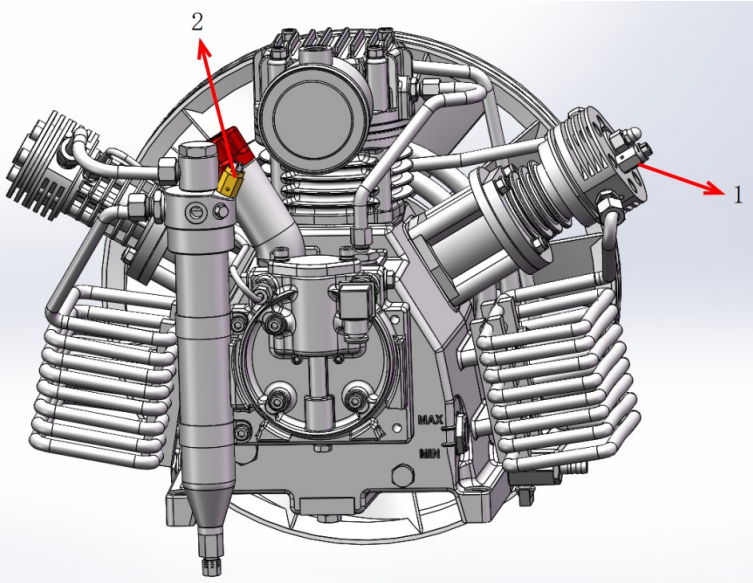
Each stage of Muskwell COMPRESSORS is equipped with a safety (pressure relief) valve. The safety valve can ensure that the pressure of each stage of the compressor does not exceed its rated limitation. The last stage safety valve controls the maximum working pressure of the compressor, which can be set during the test running.

Safety valve factory setting:

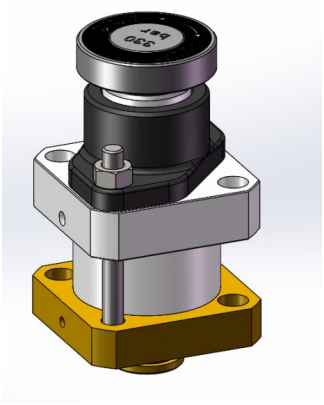
1st stage: 8 bar

2nd stage: 60 bar

3rd stage : set for the max. working pressure（such as 225Bar or 300Bar）



1. 1st stage safety valve(8bar）
2. 2nd stage safety valve(60bar)



Figure：3rd stage safety valve(330bar/225bar)

In order to ensure that the safety valve can be used normally and has not been modified. The safety valves are all sealed by Muskwell when they leave the factory. And be adjusted to the corresponding pressure value. If an intermediate pressure safety valve is released, the next stage valve cannot be closed normally, and the valve should be checked. Usually the problem is the inlet valve of the next stage.

1.8.2 Safety valve maintenance frequency

The following maintenance work is required for the safety valve:

Every time you use it, check whether the safety valve is leaking;

Check the relief pressure of the final safety valve every year or when necessary.

1.8.3 Safety valve operation inspection

Turn the knurled knob on top of the valve clockwise until the valve vents. (We suggest not to exceed 80% of the final pressure setting value to avoid damage to the safety valve.)

It also keeps the valve functioning properly and relieves pressure if it is not functioning properly.

1.8.4 Check the relief pressure of the final safety valve

When all valves are closed, increasing the pressure of the compressor to the final safety valve to start leaking, and the pressure of the pressure relief can be seen from the pressure gauge. If the pressure exceeds 10% of the setting value, replace the safety valve.

1.9 Pressure maintenance valve

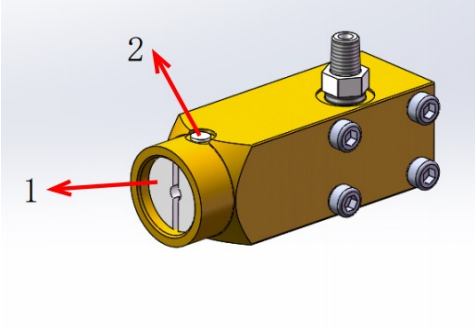
1.9.1 Brief introduction

The pressure maintenance valve is installed at the F12 outlet of the filter system.

It guarantees a pressure increase in the filter from the start of the transferring, thus obtaining a constant and optimum filtration effect. This guarantees the correct working conditions of the cylinders in the final stage.

Adjust the pressure maintenance valve (as shown) to 150±10bar.

1.9.2 Pressure and valve maintenance



The pressure maintenance valve is adjusted at the factory to the required pressure and usually requires no routine maintenance or readjustment. In case readjustment is required, loosen the safety screw (2) and adjust the screw (1) with a suitable screwdriver to the required pressure.

clockwise = increasing pressure
Counterclockwise = lower pressure

1.10 Valve seat

The valve seat is an important part of the compressor and is a vulnerable part. The quality of the valve seat and the quality of its work directly affect the air delivery capacity, power loss and operation feasibility of the compressor. The valve seat is operated by a flow of the medium. During the suction stroke, the intake valve opens and the medium air flows into the cylinder. At the beginning of the compression stroke, the intake valve is closed and the medium opens the outlet valve.

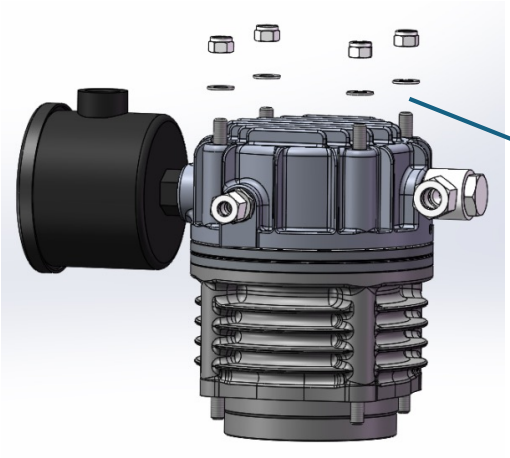
1.10.2 General instructions for checking and replacing valve seats

- When replacing the valve seat, it must be replaced as a whole set.
- Pay attention to the installation sequence.
- Check every part of the valve seat, if found damaged, replace the valve seat.
- The screws on the valve cover must be tightened with a torque wrench (refer to the torque value in Section 7.2).
- Check and clean the dirt in the gap between the valve seat and the valve seat head.
- Carefully clean the dirty valve seat. Pointed tools must not be used at this time.
- Dip the valve seat into diesel or gasoline and clean it with a soft brush.
- Only use gaskets and O-rings that are in good condition.
- After restarting for 30 minutes, stop the machine and cool down to ambient temperature, then re-tighten the screws and nuts of the valve. Otherwise, the valve seat may become loose due to the gasket.
- Complete all the installation work, agitate the pulley manually to check whether all parts are installed properly.

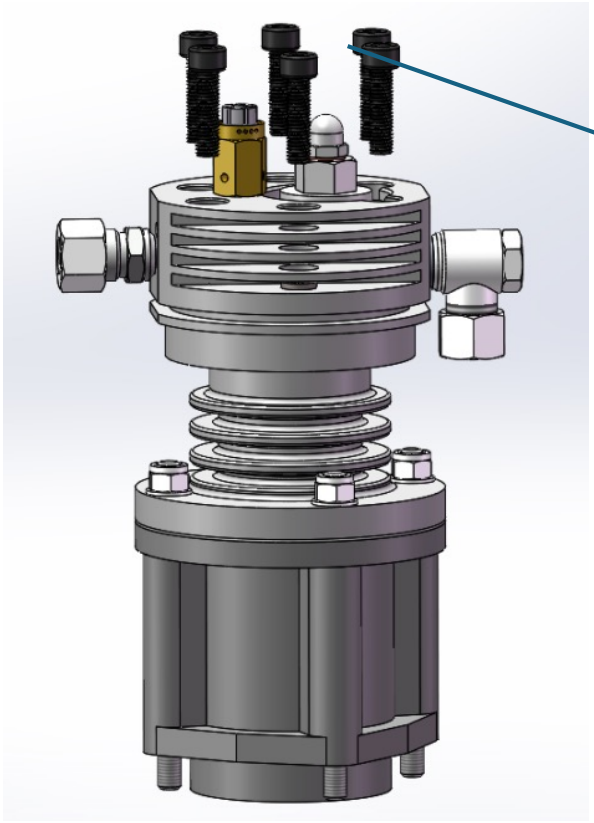
1.10.3 Frequency of valve maintenance

- After the first 25 hours of operation, tighten the fixing screws of the seat top cover;
- Every 500 operating hours the valve seat is removed and inspected;
- Seat should be replaced every 2000 operating hours or 2 years to avoid fatigue damage.

1.10.3 Tighten the fixing screws on the seat top cover

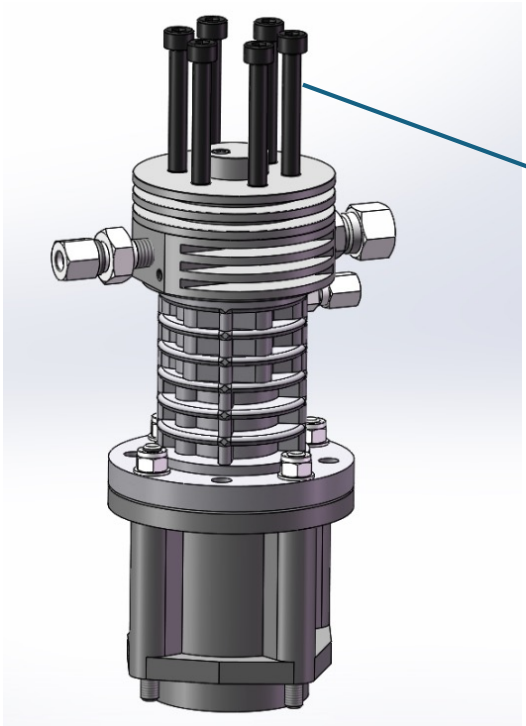


1st stage cylinder



Tighten the screws on the top cover of the 2nd stage valve seat with a torque wrench

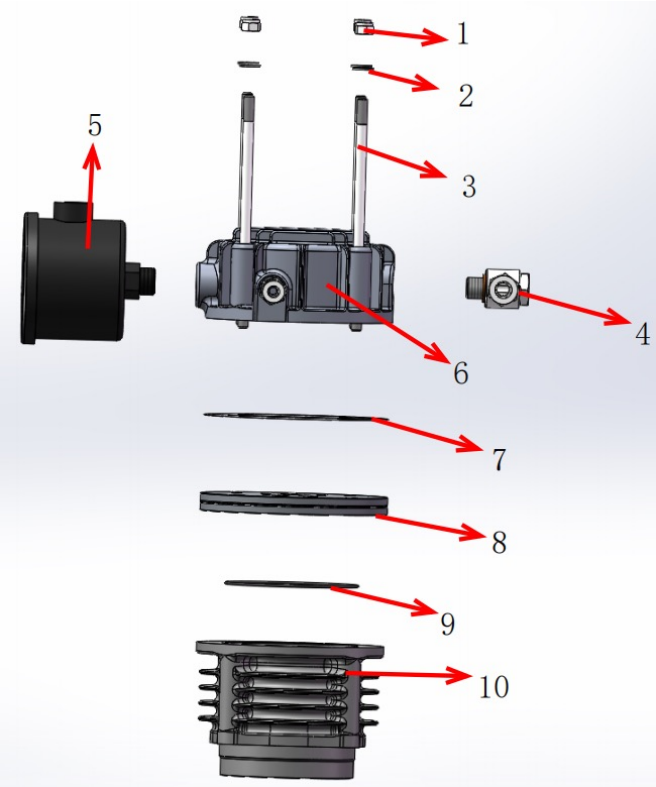
1st stage cylinder



Use a torque wrench to tighten the screws on the top cover of the 3rd-stage valve seat

1.10.5 Check and replace valves

Replacing the 1st stage intake/outlet valve

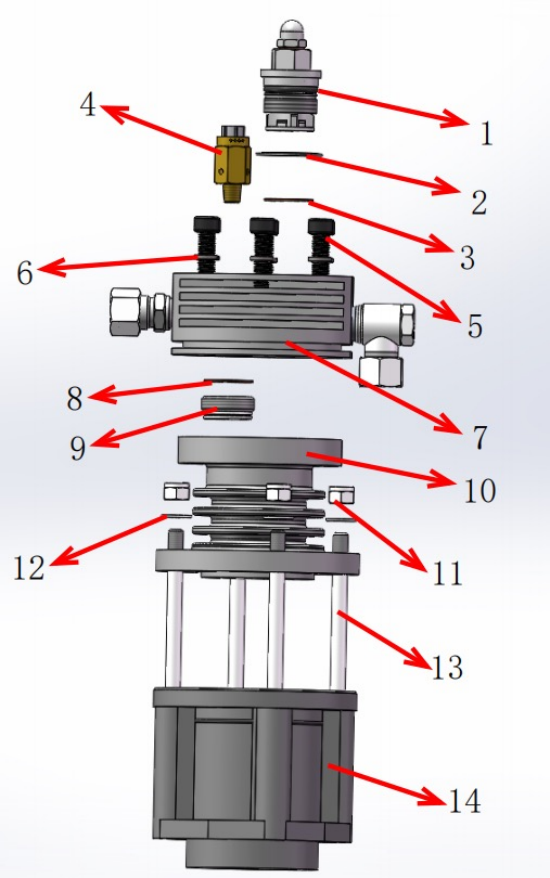


1. **M8 self locking nuts;**
2. **M8 flat washer;**
3. **M8*180 double ended screw;**
4. **1st stage air outlet connector;**
5. **1st stage intake air filter;**
6. **1st stage cylinder head;**
7. **Paper pad on the 1st stage valve plate;**
8. **1st stage valve plate;**
9. **Seal O-ring;**
10. **1st stage cylinder sleeve;**

(1) Loose M8 self locking nuts(1)，take out M8 flat washer(2)；
(2) Remove the first-stage cylinder head (6), and take out the paper pads (7,8) on the valve plate;

(3) Check whether the first-stage inlet/outlet valve plate is damaged (8).

Replace the 2nd stage intake/outlet valve



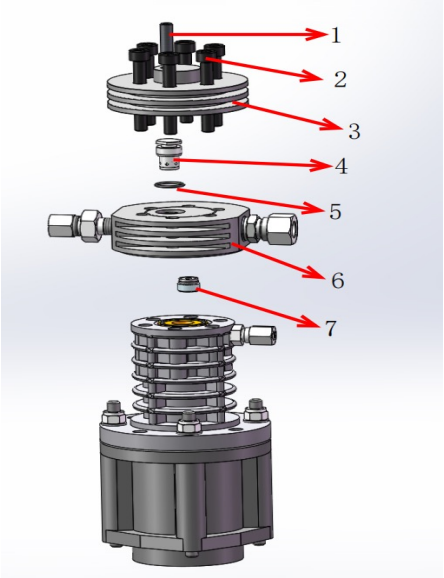
1. **2nd stage outlet valve;**
2. **Spring washer;**
3. **Copper pad;**
4. **1st stage safety valve;**
5. **M8 hexagon socket head screw;**
6. **M8 flat washer;**
7. **2nd stage valve seat;**
8. **Copper pad;**
9. **2nd stage inlet valve;**
10. **2nd stage cylinder;**
11. **M8 self locking nuts;**
12. **M8 flat washer;**
13. **M8 double ended screw;**
14. **2nd stage cylinder head;**

(1) Rotate the outlet valve (1) counterclockwise, take out the O-ring 21.7 x 3.5, and check whether the O-ring and the outlet valve are damaged;

(2) Rotate counterclockwise to loosen the inner hexagon socket head screw - M8 x 30 (5) that fixes the second stage valve seat and take out the valve seat (7);

(3) Use a special tool to remove the intake valve (9) and check whether it is damaged.

Change 3rd stage inlet/outlet valve



1. **Hex socket head cap screw with concave end;**
2. **Hex socket head cap screw;**
3. **3rd stage outlet valve;**
4. **O-ring on the outlet valve;**
5. **3rd stage valve seat;**
6. **3rd stage inlet valve;**

(1) Rotate counterclockwise to loosen the hexagon socket head screw (1) at the concave end of the valve gland, then use the hexagon wrench to loosen the hexagon socket head screw (2), and then take out the valve gland (3);

(2) Take out the O-ring 15.6 x 1.78 (5), take out the outlet valve (4) and check whether the O-ring and the outlet valve are damaged;

(3) Use a special tool to remove the intake valve (7) and check whether it is damaged.

(4) When reinstalling, pay attention to the installation sequence of each components (remember to contact the manufacturer for maintenance if the valve body is damaged).

1.11 Filling valve

1.11.1 Filling valve maintenance frequency

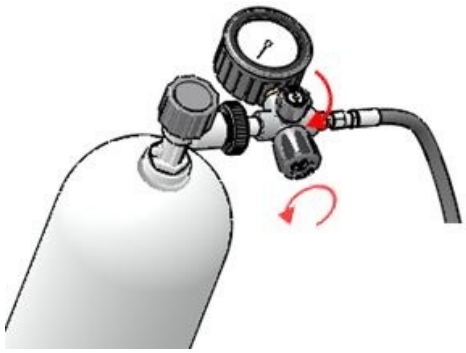
Every time you use it, visually inspect the filling hose for damage and whether the threaded connection is intact.

After the first 25 hours of operation, check the function and air tightness of the filling valve.

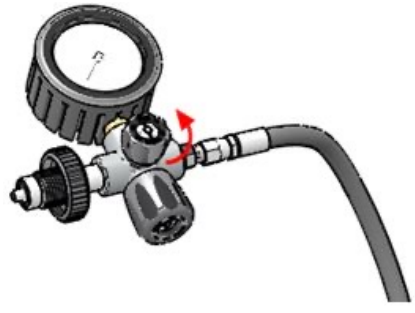
1.11.2 Check the function and air tightness of the filling valve

1) Check the air tightness of the filling valve: firstly close the deflation knob, open the filling knob to fill the cylinder, and use a leaking agent to check whether the filling valve is leaking.

2) Check the filling function of the filling valve: close the deflation knob, open the filling valve knob, fill the filling valve, observe whether there is air ejection at the arrow in the diagram, if there is any air ejection, the filling function is normal, if there is no air ejection, then the maintenance is needed.



3) Check the deflation function of the filling valve: open the deflation valve, fill the filling valve, and observe whether there is air ejected from the vent hole. If there is any air ejected, the deflation function is normal; if there is no any air ejected, it needs to be repaired.



1.12 Cooling pipes and connectors

1.12.1 Check the air rightness frequency of cooling pipes and connectors

After the new machine has been running for 25 hours, check the air tightness of the cooling pipe and connectors

1.12.2 Check the air tightness of cooling pipes and connectors

Method: After start the compressor, spray the leakage agent (non-corrosive) on the cooling pipe and connectors. If there are any bubbles, it means air leakage. If there is no, it is normal.

1.13 Compressor drive system

The driving system of the compressor includes: belt, three-phase asynchronous motor, electrical control system.

To start the motor or make the electric control system work, the following components are indispensable: the main switch and the main fuse, both of which must be installed by the customer.

Refer to the appendix for the circuit diagram for internal control of the compressor, and for the exploded diagram.

1.13.1 Belts

The compressor is driven by a drive motor through a belt. The motor is mounted on the frame and needs to be correctly adjusted to pull the belt force.

The compressor device is driven by a motor through a V-belt, and the tension and wear of the V-belt should be checked regularly.

1.13.2 Belt maintenance frequency

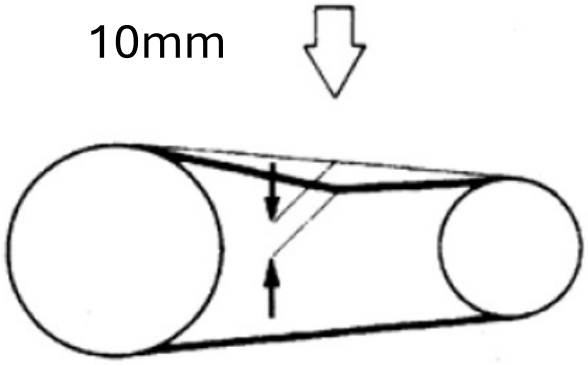
The belt tension should be readjusted after the new machine has been running for 25 hours.

Every 125 hours thereafter, check the belt for damage or wear.

1.13.3 Check belt tension and wear

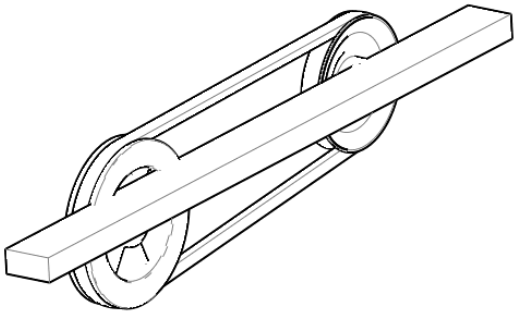
Improper belt tension and improperly adjusted pulleys can cause premature belt wear.

The best belt pull is the minimum that doesn't slip when fully loaded. A rough way to measure whether the belt tension is moderate is to apply pressure to the belt with your thumb in the middle of the two pulleys. The belt should be inclined within 10 mm, indicating moderate tension.



1.13.4 Adjusting the tension of the belt

- Slightly loosen the motor mounting nuts.
- Adjust the motor position until the belt tension is correct.
- Tighten the motor mounting nuts.
- Let the motor run for about 5 minutes. Stop motor, check V-belt tension and readjust if necessary.
- After adjusting the tension and tightening the motor nut, check whether the two wheels are in a straight line to avoid excessive wear on the V-belt. As shown in the picture, hold a ruler and attach it to the compressor pulley and the motor pulley. The ruler must be parallel to the belt.



1.14 Electric motor

Except for external cleaning, the drive motor does not need any other maintenance. The bearings of the motor need to be lubricated according to its model, please follow the regulations written on the motor. For the safety of workers, all live parts must have protective covers.

1.15 Maintenance of cooling system

The piston cylinder of the compressor, the intermediate cooling pipe and the final cooling pipe are all air-cooled.

For this reason, the compressor is fitted with a cooling fan on the gravity end of the crankshaft, opposite the motor pulley. It draws cooling air from the surroundings through the fan shroud.

The cooling system does not require regular maintenance.

2. Reactivating the compressor

2.1 Overview

If the compressor is put out of service for more than six months, the unit should be preserved in accordance with the following instructions:

Make sure the compressor is kept indoors in a dry, dust free room. Only cover the compressor with plastic, if it is certain that no condensation will form under the sheet. Nevertheless, the sheet should be removed from time to time and the unit cleaned on the outside. If this procedure cannot be followed and/or the compressor is going to be taken out of service for more than 2 years, please contact our Technical Service Department for special instructions.

The compressor is not resistant to salt water, if it does not need to work, please put it in a dry place.

2.2 Preparations before storage

Before preserving the compressor unit, run it warm and when it reaches the specified service pressure, keep it running for approx. 10 minutes.

Then carry out the following:

1.Check all pipes, filters and valves (also safety valves) for leakage.

2. Tighten all couplings, as required.
3. After 10 minutes, open the filling valve or all air outlets of the compressor, and let the compressor operate for 5 minutes under the lowest working pressure.
4. After these 5 minutes, shut the system down. Drain condensate from separators. depressurize unit. Shut filling valves/ outlet valve.
5. Open filters and grease threads.
6. Make sure the filter cartridge remain in the filter housing, This will prevent oil entering filling lines as a result of preservation procedures.
7. Remove intake filter from manifold and all intake lines from valve heads.
8. Let compressor unit cool down.

2.3 Preserving the compressor

1. Turn the compressor on and spray a small amount (approx. 10 ccm/0.6 cu. in.) of compressor oil into the valve head inlet port (compressors with dual 1st stage: **each** of the inlet ports) while the compressor is running. Do not let the compressor warm up too much, to keep oil sticky.
2. Shut compressor unit off.
3. Close all valves.
4. Place the dust cap onto the inlet port.

24 Preserving the motor

Preserve the motor according to the instructions of the motor/engine manufacturer.

2.5 Preventive maintenance during storage

Run the compressor **once every 6 months** as described in the following:

1. Remove the dust cap from the inlet port and insert the intake filter element.
2. Open the filling valves or the outlet valve and let the unit run for approx. 10 minutes or until the pressure gauges indicate the correct values.
3. Stop the compressor.
4. Open the condensate drain valve, drain the condensate, and close the condensate drain valve again.
5. Follow the procedure for storing the compressor in accordance with the "Storing the Compressor" section of this chapter.

2.6 Changing the lube oil for preserving

- After prolonged storage, the oil will age in the compressor and engine. It should be drained after **2 years** at the latest and replaced with fresh oil.
- The stated period can only be attained when the crankcase is sealed during the preservation period in accordance with the preservation requirements.
- After changing the oil, turn the compressor and the engine or run them for the required period.
- Check the lubrication of the compressor when putting the unit into operation once every six months or when turning the compressor.
- The oil pump is functioning properly if the oil pressure gauge indicates the prescribed pressure.

2.7 Check items after stored for a period of time.

1) Check the function and air tightness of the filling.

2) Check and clean the air intake filter housing.

3) Check and clean the filter element .

4) Check the O-ring.

5) Check the tension and wear of the belt.

6) Check the air tightness of cooling pipes and.

7) Check whether the cooling pipe holder is tightened.

8) Check whether the pressure gauge returns to zero when there is no pressure.

9) Tighten the fixing screws of the valve top.

2.8 Reactivating the compressor

After the compressor has been preserved for a period of time, the following steps need to be taken:

- If the compressor has been preserved for more than 12 months, we recommend changing the lubricating oil before use.
- Replace the last stage's filter cartridge.
- Check the oil level of the compressor
- Check the condition of the V-belt and replace if necessary.
- Check that the markings on the filling hose are clearly visible and replace if necessary.
- Open the filling valve and run the compressor for about 10 minutes.
- Close the filling valve and allow the compressor to boost.
- Check that the safety valve is installed correctly.
- Check the tightness of all connections and pipes.
- The compressor can only be put into operation after the above steps are carried out and handled properly.

3. Maintenance Instructions

3.1 Overview

Preventive maintenance usually includes replacement of valves, gaskets, seals, and repairing maintenance work.

The compressor can be repaired to a certain extent, but it must be carried out by personnel with certain experience and skills, and pay attention to the following items:

1. The crankshaft and bearings cannot be repaired.

2. The safety valve cannot be repaired, but can be completely replaced.

If you have any repair or maintenance questions, please contact our technical service department.

3.2 Tightening torque values and sequence

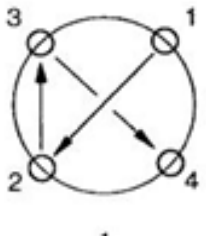
Unless otherwise specified in the text, the torque values apply. All valve head screws torque wrench tightening! This indicated torque values are valid for bolts in greased condition. Replace self-retaining nuts on reassembly.

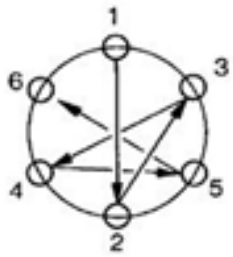
Standard Bolt or screw	Thread	Max. torque value
Hex and Allen head	M6	10Nm(7ft.lbs)
Hex and Allen head	M8	25Nm(18ft.lbs)
Hex and Allen head	M10	45Nm(32ft.lbs)
Hex and Allen head	M12	75Nm(53ft.lbs)
Hex and Allen head	M14	120Nm(85ft.lbs)
Hex and Allen head	M16	200Nm(141ft.lbs)
Pipe connections (living connectors)		Hand tightening + 1/2 cycle

Screw torque consequence

Tighten valve head and cylinder bolts/nuts equally in the sequence shown in the figure below.

Be sure to tighten all parts in cold to hand-warm, unpressurized conditions.





3.3 Precautions for maintenance

1. Use white Vaseline or lubricating silicone grease for O-ring grease.
2. The sealing thread without sealing ring or sealing copper gasket is sealed with 704 sealant, and raw tape can be used if necessary.
3. Keep all parts clean during assembly.
4. The moving parts should be moved by hand after assembly to ensure that they can rotate or move smoothly.
5. When installing the air valve, ensure that the air valve is flat.

3.4 Maintenance items after repair work

1) Check the function and air tightness of the filling valve.

2) Check and clean air intake filter element.

3) Check and change the filter cartridge.

4) Check the O-ring.

5) Check the tension and wear of the belt.

6) Check the air tightness of cooling pipes and joints.

7) Check whether the cooling pipe holder is tightened.

8) Tighten the setscrews on the seat cover.

3.5 Trouble-shooting

Trouble	Cause	Remedy
Can't start	Check problem with circuit	Check the fuses, contacts, and wire connectors to ensure that the parameters of the motor match the power supply
	Check if the voltage is too low	Contact the power supply department
	Check whether the power plug is in good contact	Connect the power properly
	Check if the fan can be turned by hand	If not, contact the supplier
	Whether the power supply is out of phase	Quickly shut down and check the power
Can't start	The power cord is too long or too thin	Use proper cable
	Whether the motor is damaged	Contact the supplier
The motor runs off-axis	Belt damage	Replace

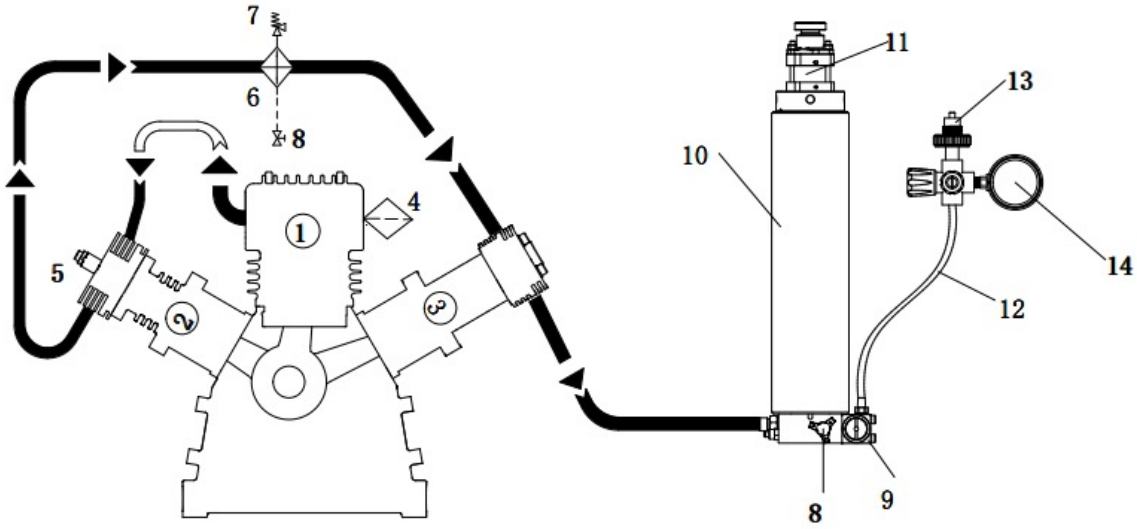
Can't fill to the rated pressure	Leakages on connectors	Tighten, clean or replace
	Check if the relief valve is venting when the nominal pressure is not reached	Re-adjustment
	Check each connectors of the pipeline for air leakages	Tighten, clean or replace
	Check the filling valve for any leaking	Is the connector correct?
	Check if the air intake filter is clogged	Replace
	Machine internal failure	Contact with supplier
	Faulty or inaccurate pressure gauge	Replace pressure gauge
	Drain valve	Clean or replace
Excessive compressor vibration	V-belt is loose	Check belt tightness, re-tighten belt
	Compressor block and/or engine sliding teeth	Tighten or replace
	Fixed foot wear	Replace
	Uneven ground	Adjusting compressor placement
Compressor running too hot	Air intake filter clogged	Clean or replace
	Ambient temperature over high	Adjust the ambient temperature or shorten the machine running time
	Insufficient cooling air intake/outlet volume	Reduce length or increase diameter
	Intake pipe is too long	Increasing diameter
	Compressor is running in a wrong direction	Replace to a correct rotate direction
	Inlet/pressure valve clogged	Clean or replace
Leakage of safety valve	Problem with next stage suction/pressure valve	Clean or replace
	The next stage filter clogged	Replace
	Safety valve leaking	Replace（modification is strictly prohibited）

Mixed oil in air	Molecular sieve filter needs to be replaced	Replace
	Wrong lubricant was used	Use only recommended lubricants
	Wrong filter cartridge selected	Replace a correct filter cartridge
	Sleeve/piston worn	Replace
Compressor output insufficient	Inlet/pressure valve clogged	Clean or replace
	Sleeve/piston worn	Replace
	V-belt sliding	Re-tightening
Filling too slow	Check if the relief valve is venting when the nominal pressure is not reached	Re-adjustment
	Check each connections of the pipeline for air leakage	Tighten, clean or replace
	Check the filling valve for any leakages	Check if the connector correct
	Machine internal failure	Replace
	Faulty or inaccurate pressure gauge	Replace pressure gauge
	If the belt too loose	Tighten V-belt
Excessive belt wear	Improper belt pull	Re-adjustment
	Pulley off axis	Re-adjustment
The smell of oil in the air	The filter cartridge inside the filter is saturated	Replace filter cartridge
	Use unsuitable lubricant	Replace correct oil
Too much oil consumption	Damaged piston rings, pistons or cylinder sleeves	Replace damaged parts
	Air intake filter clogged	Replace intake filter element
	Compressor over hot	Enhanced cooling effects
Air leakages from filter housing safety hole	No filter cartridge	Install filter cartridge
	A filter cartridge existed but the safety hole leaks	Check/replace O-ring

4. Mode of operation

Working principle of compressor

The air is drawn in through inlet filter(4), it enters the first-stage cylinder through the inlet valve of the first-stage cylinder and then being compressed by the first-stage cylinder, then enters the first-stage cooler through the outlet valve of the first-stage cylinder, the cooled air enters the 2nd-stage ②. The compressed air enters the 2nd-stage cooling pipe through the outlet valve of the 2nd-stage cylinder and then enters the 3rd-stage cylinder after being treated by the oil-water separator. The air compressed by the 3rd-stage cylinder enters the 3rd-stage cylinder through the outlet valve of the 3rd-stage cylinder cooling pipe, and then into the ⑩F12 filter system, the filtered pure air is discharged through the filling hose.



1. 1st stage cylinder; **2.** 2nd stage cylinder; **3.** 3rd stage cylinder; **4.** Inlet filter; **5.** 1st stage safety valve; **6.** 1st stage inter-cooler; **7.** 2nd stage safety valve; **8.** Manual condensate drain tap; **9.** Pressure maintenance valve; **10.** F09 filter system; **11.** 3rd stage safety valve; **12.** Air filling hose; **13.** Air filling connector; **14.** Pressure gauge;

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