

CHAMPION



Operating and service manual

Screw air compressor
FM-45

8.1 Maintenance schedule

			DAILY ²	WEEKLY ²	EVERY 4000 HOURS OR 12 MONTHS ¹	EVERY 8000 HOURS OR 24 MONTHS ¹	EVERY 20000 HOURS OR 60 MONTHS ¹	EVERY 24000 HOURS OR 72 MONTHS ¹
SERVICE A	Controller	Note and record sump pressure	•	•	•	•	•	•
	Controller	Note and record discharge pressure	•	•	•	•	•	•
	Controller	Note and record discharge temperature	•	•	•	•	•	•
	Enclosure Filters	Check condition, clean if required	•	•	•	•	•	•
	Scavenge oil system	Check operation	•	•	•	•	•	•
SERVICE B	Controller	Check fault history		•	•	•	•	•
	Controller	Check for any service requirements		•	•	•	•	•
	Oil System	Check oil level and top up if required		•	•	•	•	•
	Aftercooler/Oil Cooler	Check condition, clean if required		•	•	•	•	•
SERVICE C	Oil Filter	Renew oil filter element			•	•	•	•
	Air Filter	Renew air filter element			•	•	•	•
	Oil System	Renew oil (Mineral or Foodgrade)			•	•	•	•
	Oil System ⁵	Renew oil (Synthetic) AEON9000				•	•	•
	Dryer Cooling Air Inlet Filter ³	Renew cooling air inlet filter			•	•	•	•
	Control System	Check operation			•	•	•	•
	Blowdown System	Check operation			•	•	•	•
	Electrical Wiring	Check connections and condition			•	•	•	•
	Controller	Check connections and plugs			•	•	•	•
	Inlet Water Strainer ⁴	Check condition, clean if required			•	•	•	•
	Separator Filter	Renew separator filter			•	•	•	•
	Pipe work	Replace Victaulic Couplings			•	•	•	•
	Oil Scavenge System	Clean and check operation			•	•	•	•
	Relief Valve	Functionally test			•	•	•	•
	Oil Scavenge System	Renew oil scavenge tubing				•		•
SERVICE D	Minimum Pressure Valve	Renew minimum pressure valve				•		•
	Intake Valve	Overhaul intake valve				•		•
	Emergency Stop Button	Test emergency stop button				•		•
	Motor Drive Coupling Insert	Check condition and renew if required				•		•
	VSD Drive/Starter	Check condition of contacts and renew if required				•		•
ADDITIONAL	Air End	Renew air end shaft seal						•
	Shaft Seal Oil Return Tube	Renew shaft seal oil return tube						•
	Oil Hoses	Check condition and renew if required					•	•
	Control Solenoids	Renew control solenoids					•	•
	Drive Belts ³	Renew drive belts					•	•
	Drive Motor Bearings	Renew drive motor bearings						•
	Drive Motor AVM's	Check drive motor Anti Vibration Mounts						•
	Air End Discharge Temperature Sensor	Renew temperature sensor						•
	Oil Bypass Element	Renew oil bypass element						•
	Air End AVM's	Check air end Anti Vibration Mounts						•
	Air End	Renew Air End	Predictive - only when required					

¹ Whichever occurs soonest² Normally undertaken by end user through visual check³ If applicable

8. Assistance and maintenance

Inspection of the pressure vessel in accordance with local guidelines

Where the compressor is part of an integrated unit, please refer to the separate dryer manual for any dryer related service tasks. Receiver certification beyond the initial period is the customers responsibility. Please refer to the Operators handbook if there are specific local service requirements relevant to the territory you are in e.g. Oil and Filter change intervals which may be different to those shown above.

Service intervals will be shorter depending on the ambient operating conditions (heat, humidity, dirt etc.), effecting Lubricants, filters, separators etc.

8.2 Maintenance recommendations

Note

The screw compressor unit can only operate to your complete satisfaction when the maintenance work is carefully carried out at the specified intervals.

In order to facilitate this task, the scope of supply of the screw compressor unit comprises the "Maintenance and inspection manual for the manufacturer compressors", in which you can list your performed maintenance work at the specified intervals.

You can also have this maintenance work performed by our trained technicians. Please ask your dealer for a maintenance contract.


8.3 Maintenance schedule



Warning

When performing control, adjusting and maintenance work, be careful with hot surfaces of machine parts.

Checks and maintenance work may only be carried out when the following points are observed:

Press the STOP button  on the control panel and wait until the screw compressor unit has come to rest and the screw compressor unit is depressurized.

The customer-installed main switch is set to "O" (OFF) and locked off.



Warning

Warning: Electrical voltage: Only work on the screw compressor unit when it is disconnected.

The risk of electric shock only exist for the models equipped with condensers. Please always first disconnect the system from the power supply and wait another 10 minutes before touching the electrical components. The power condensers require this time in order to discharge!

Attention

Shortly after switching the screw compressor off, the system can contain a low residual pressure.

Therefore, before any maintenance intervention, it is necessary to unload the screw compressor by slowly opening the threaded closing cap (oil filling hole).

The intervals are valid in case of industrial environment and normal use conditions. In case of doubts, please check the replacement intervals analysing oil.

In case high incidence of impurities, shorten the maintenance intervals according to necessity

For order numbers see the spare parts list.

8.4 Oil change

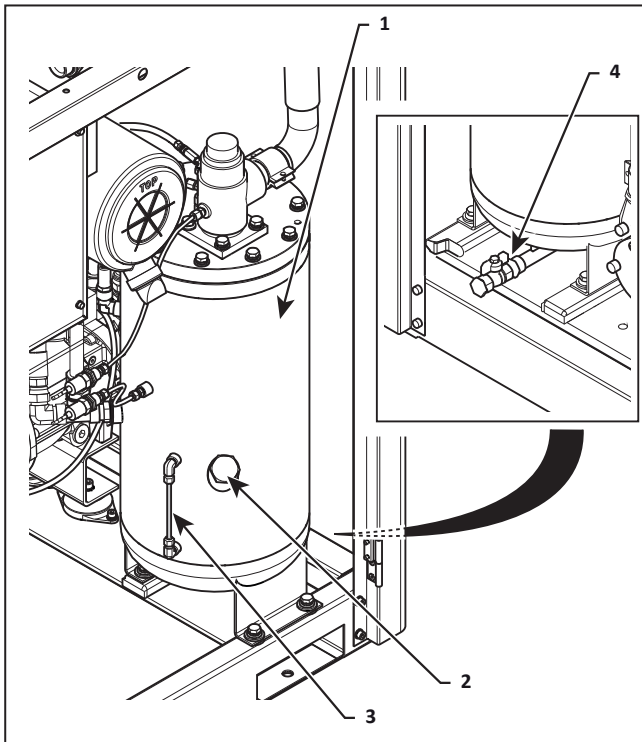


Fig.17

- 1 Oil reservoir
- 2 Oil filler cap
- 3 Oil-level indicator
- 4 Oil drain



Warning

Only change the oil when the screw compressor unit is not in operation and is depressurized! Be careful when draining hot oil: Danger of scalding!

Attention

Remove oil residues and other deposits from unit parts and from the coolers of compressors, which are exposed to hot compressed air, according to the operating instructions.

Note

Collect the waste oil, do not allow it to seep into the ground!

Disposal in accordance with the regulations! Do not spill oil! Check for leakage! With these compressors, the oil change intervals strongly depend on the degree of contamination of the circulating oil. It must therefore be taken care that no oil-deteriorating matter (dusts, vapours, gases) are transported through the air intake filter into the oil circuit of the compressor unit. Also a high content of humidity in the intake air and the formation of condensate within the machine affect the service life of the lubricant oil so that a reduction in the oil change intervals may become necessary. The specified oil change intervals refer to an intake air from a normal environment without a high content of foreign matter (dusts, vapours, gases).

When changing the oil, the waste oil is to be drained completely, since used oil reduces the service life of the new oil fill considerably.

Do not mix lubricating oils of different makes.

For the oil change intervals, see maintenance schedule.

When changing the oil, proceed as follows:

- Switch the screw compressor unit off and ensure that it is depressurized, electrically isolate and locked off.
- Slowly open the oil filler cap (2), to depressurize the screw compressor by releasing any residual pressure in the unit
- Remove the screw closure cap (2) from the oil filling coupling
- Open the oil drain (4) for the pressure reservoir
- Drain oil at operating temperature
- Close the oil unloading hole (4)
- Fill in oil up to the marking "maximum oil level" (approx. 23 litres)
- Close the oil filler cap
- Start the screw compressor for about 2 minutes, then switch it off
- Check for leakages
- Switch the screw compressor unit off
- Wait at least 10 minutes for the oil to settle and for the air to disperse
- Check oil level
- The oil level must be between the maximum level and minimum level marked on the oil reservoir.
- If required, top up oil

8. Assistance and maintenance

8.5 Change of oil filter cartridge

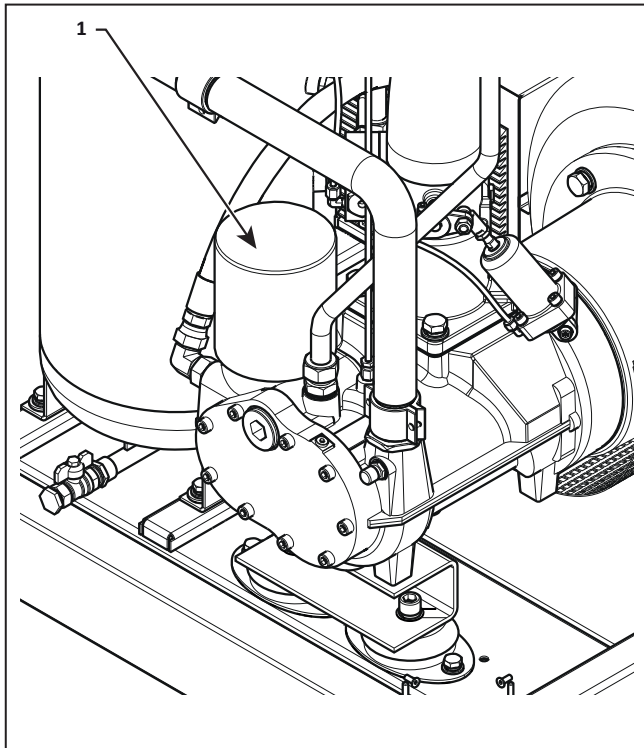


Fig.18

1 Oil filter cartridge



Warning

Only replace the oil filter cartridge when the screw compressor unit is out of operation and depressurized!

Be careful with hot oil: Danger of scalding!

Attention

Do not spill oil!

Note

*Dispose of the oil filter cartridge in line with the regulations
- special waste ! Check for leakage!*

For the changing intervals, see the maintenance schedule.

Change the oil filter cartridge as follows:

- Switch the screw compressor unit off and ensure that it is depressurized, electrically isolate and locked off.
- Wait at least 10 minutes for the oil to settle and for the air to disperse.
- Open the access door
- Unscrew the oil filter cartridge (1) using an appropriate tool
- Dispose of the oil filter cartridge according to the regulations
- Oil the gasket of the new oil filter cartridge slightly
- Screw on the new oil filter cartridge and tighten manually (take notice of the instructions on the oil filter cartridge)
- Start the screw compressor for about 2 minutes, then switch it off
- Check for leakage
- Check oil level (see chapter 6)
- If required, top up oil.

Changing intervals for oil filter cartridge

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the service life of the filters (air filters, oil filters, oil separator filter). Where such conditions exist the filter element may require changing more frequently.

8.6 Oil separator filter cartridge replacement

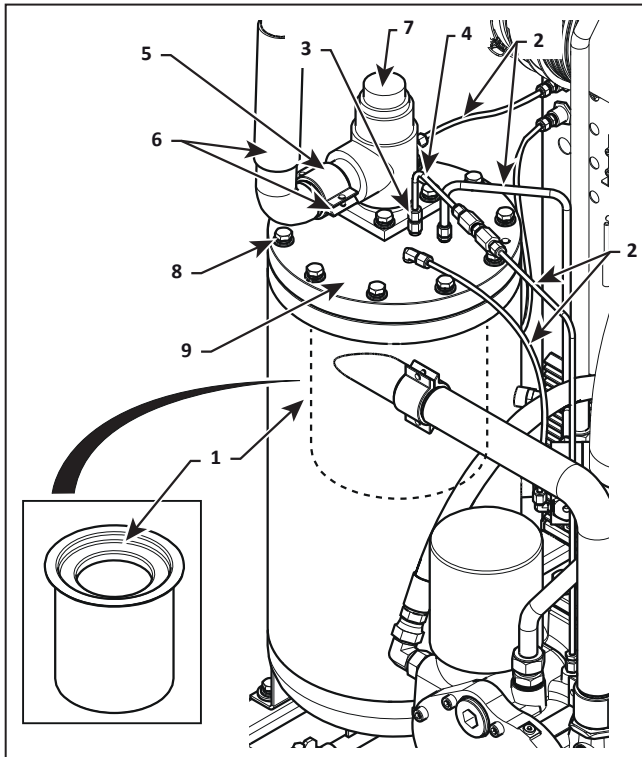


Fig.19

- | | |
|---|---|
| 1 | Oil separator filter |
| 2 | Plastic pipe for oil extraction |
| 3 | Oil extractor pipe junction |
| 4 | Oil extractor |
| 5 | Victaulic's connection joint to the cooling device |
| 6 | Victaulic's connection pipe to the pressure check valve |
| 7 | Valve |
| 8 | Hexagonal screw |
| 9 | Reservoir cover |



Warning

The pressure reservoir is under pressure! Only work on the screw compressor unit when it is out of operation and depressurized!

Be careful with hot oil: Danger of scalding!

Attention

Do not spill oil!

Note

To dispose of the oil separator filter, please observe the standards in force for "Special waste"!

For the changing intervals, see the maintenance schedule.

Change the oil separator as follows:

- Switch the screw compressor unit off and make sure that it is depressurised and no voltage is supplied.
- Wait at least 10 minutes for the oil to settle and for the air to disperse.
- Open the door
- Unscrew the plastic pipe of the oil extractor (2), disconnect all flexible and rigid pipework (2)
- Loosen the junction (3) and extract the oil recovery rigid pipe (4)
- Loosen the joint (5) and open it
- Disconnect the pipe (6) from the valve (7)
- Remove all the hexagonal screws (8) on the pressure reservoir cover circumference
- Remove the cover (9); in case of difficulty when removing the cover, screw the two M12x40 screws in the specific threaded holes to detach the cover from the reservoir
- Remove the oil separator filter (1)
- Clean the sealing surfaces and replace the O-rings
- Install a new filter
- Reposition the cover (9) of the reservoir in its starting position
- Screw the hexagon head screws (8) in the reservoir cover and tighten
- Reassemble all the dismantled pipes on the pressure reservoir.

Changing intervals for oil separator cartridge

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the service life of the filters (air filters, oil filters, oil separator filter).

Where such conditions exist the filter element may require changing more frequently.

8. Assistance and maintenance

8.7 Change of air intake filter



Warning

Only perform checks and carry out work on the screw compressor when the unit is out of operation and depressurized!

Attention

Never operate the screw compressor unit without the air filter (even a short operating time without this filter can result in considerable damage to the machine)!

A clogged air filter must be cleaned or replaced when the maintenance point has been reached.

Check the air filter for accumulated dust at least once a week or, if required, daily.

During maintenance work, take care that no dirt enters the clean air side of the air filter.

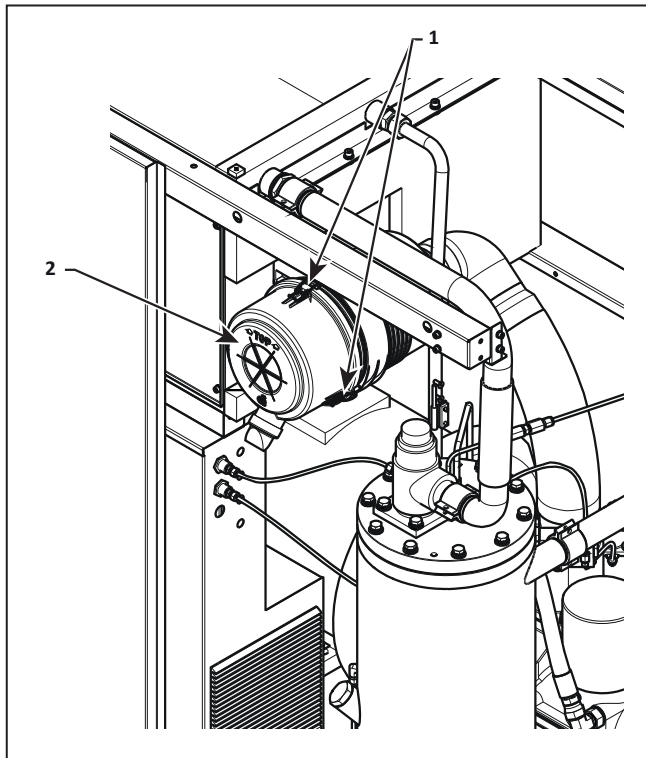


Fig.20

Change the air filter as follows:

- Open the door
- Release the levers (1) and remove the cover (2)
- Remove the air filter and replace it with a new one
- Remount the cover (2)

Changing intervals for air filter cartridge

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the service life of the filters (air filters, oil filters, oil separator filter).

Where such conditions exist the filter element may require changing more frequently.

8.8 Safety valve

The safety valve must be replaced once a year.

8.9 Fittings

The fittings of the air and oil circuits have to be checked and, if required, re-tightened according to the maintenance schedule.

8.10 General maintenance and cleaning

Attention

Remove oil residues and other deposits from unit parts and from the coolers of compressors, which are exposed to hot compressed air, according to the operating instructions.

Blow off the screw compressor unit with compressed air at the specified intervals (never direct compressed air towards persons) paying particular attention to:

- Regulating elements
- Fittings
- Compressor block
- Cooler
- Electric motor

The electric motor is permanently lubricated.

8.11 Motor lubrication

The electric motor maintenance must be performed following the motor operational instructions, see the motor instruction manual for further information.

8.12 Clean / change filter with cooling air inlet and control cabinet inlet

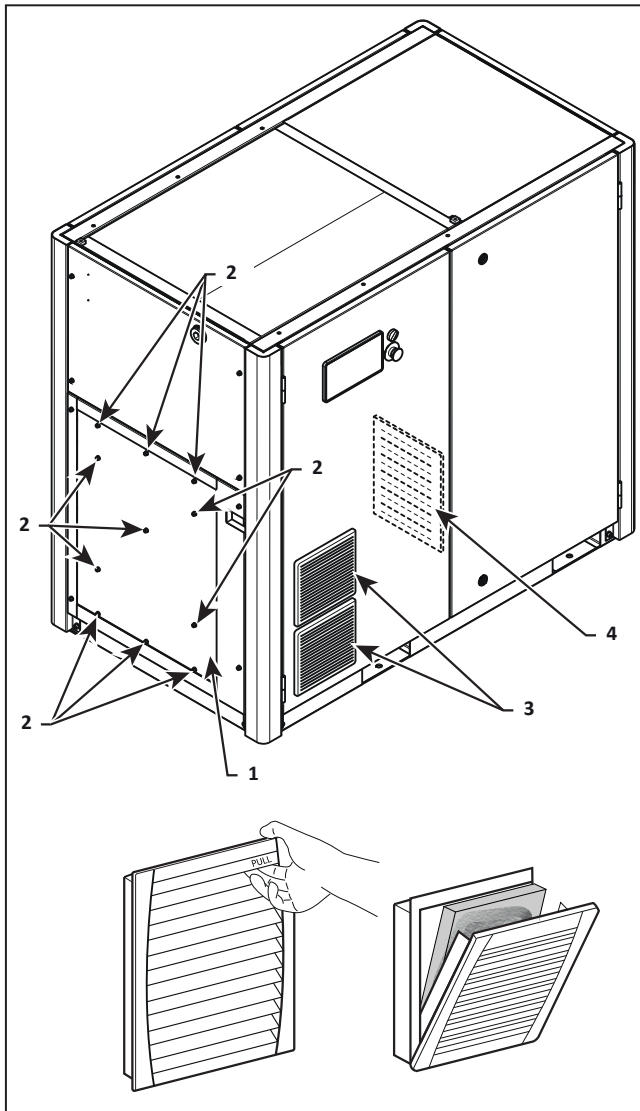


Fig.21

- 1 Filter mat cooling air inlet
- 2 Mounting screw
- 3 Outlet filter (only for variable speed versions)
- 4 Inlet filter (only for variable speed versions)



Warning

Only perform filter mat change after the compressor system has been shut down and depressurized!

a) Perform filter mat change as follows:

- Remove the fixing screws (2)
- Remove filter mat (1) and clean, exchange if damaged.
- Reinsert the filtering fabric (1)
- Secure filter mat by means of the mounting bolt.

Cleaning:

Clean the filter mat by brushing or washing.

Attention

Never install the filter mat in a wet or moist state!

b) Electrical cabinet and board inlet and outlet filters (only for variable speed versions)

- Open the doors
- Open the ventilation grids of the intake filter (4) and of the outlet filter (3).
- Remove the filters.
- Reposition the grids in the filter slot.

Changing times for the filter mat

The operating modes and the quality of the suctioned air (e.g. dust content) has a strong influence on the filter service life.

The filter should be checked on a weekly basis, eventually daily basis, for dust build-up.

In these operational cases, shorter change intervals are possible.

8.13 Inspection intervals of the storage tanks and of the electrical systems

Inspect the holding tank and the electrical system as indicated by the rules in force in the country of use.

8. Assistance and maintenance

8.14 Maintenance indications and advised lubricants for the compressors

Lubricant recommendations

Please note that proper lubrication will considerably increase the service life of your compressor unit.

According to regulations relating to the prevention of accidents, use lubricants the properties of which meet the requirements of the operating conditions on site.

Do not mix lubricating oils of different makes. When changing over to a new oil type, drain the old oil completely from the system.

At final supply temperatures constantly higher than 90 °C, the oil change intervals indicated in the "Maintenance diagram" are halved.

The oil change intervals should be calculated more accurately in accordance with the actual operating conditions by analyzing the oil.

Use the following oil types:

Use specific oil recommended by the manufacturer.

8.15 Recommended oil

Manufacturer compressors are filled in the factory with AEON / CHAMPLUBE lubricants.

These lubricants are formulated according to the highest quality standards and are authorised, tested and approved in the factory for use with rotary screw compressors.

AEON / CHAMPLUBE lubricants are available from the authorised distributors of Manufacturer compressors.

8.15.1 Oil specifications

Oil specification: -DIN-VDL-ISO VG46

The following lubricants are recommended for the compressor:

- **CHAMPLUBE** - Oil, for the first filling.
- **AEON 6000 FG** - (USDA compatible for uses in the food industry)
- **AEON 9000 SP** - (SYNTHETIC)

Important

The SYNTHETIC lubricant is recommended for:

- oil temperatures > 90°C
- ambient temperatures < 2°C

For these compressors it is recommended to use AEON / CHAMPLUBE specific lubricants.

Other types of lubricants may cause:

- shorter duration of the oil filter, the oil separators and the oil itself
- formation of a patina and obstructions in the oil circuit
- higher oil consumption
- excess of impurities and damage to the compressor

Important

Do not mix different types of oil.

If the recommended type of oil has not been used, ask Manufacturer for instructions on how to clean the oil circuit.