RotarScrew COMPRESSORS

OPERATOR'S MANUAL

Thank you for buying our product.
Your air compressor has been engineered and manufactured to high standard for dependability, ease of operation, and operator safety. When properly cared for, it will give you years of rugged, trouble-free performance.

WARNING:

READ this manual CAREFULLY before operating or servicing this air compressor, to familiarize yourself with the proper safety, operation, and standard operating procedures of this unit.
Failure to comply with instructions in this manual could result in the voiding of your warranty, and personal injury, and/or property damage. **The manufacturer of this air compressor will not be liable for any damage because of failure to follow the instructions in this manual**.

Save this manual for future reference

P/N 9070834 - OM Ver. 01/25

EN

CONTENTS

► TECHNICAL DATA

See the documents available in the following folder (*):.....**\1 - TECHNICAL DATA SHEET - FICHA TÉCNICA**

► INSTRUCTION AND MAINTENANCE MANUAL:

This manual (*): .....**\2 - COMPRESSOR MANUALS - MANUALES DE COMPRESORES**

► OVERALL DIMENSIONS

See the documents available in the following folder (*):.....**\3 - DIMENSIONAL DRAWINGS - DIMENSIONES TOTALES**

The code of the drawing with the overall dimensions is shown in the technical data sheet

► WIRING DIAGRAM

See the documents available in the following folder (*):.....**\4 - ELECTRICAL WIRING DIAGRAM - ESQUEMA ELÉCTRICO**

The code of the wiring diagram is shown in the technical data sheet

► CONTROL PANEL

See the documents available in the following folder (*):.....**\5 - CONTROLLERS MANUALS - MANUALES DE CONTROLADORES**

The name of the electronic controller is shown in the technical data sheet

(*) All documents and folders mentioned in the table of contents are on the USB drive supplied with the basic documentation of the compressor.
After connecting the USB drive to a PC, search for the code of the compressor (located on the technical data label of the compressor) in order to find the corresponding technical data sheet.
All other documents for the purchased compressor model are found within the technical data sheet (Operating and maintenance manual, Controller manual for end user, Overall dimensions and Wiring diagram).

Standard outfit

The following accessories are supplied with the compressor:
- operating and maintenance manual,
- anti-vibration pads,
- oil/condensate drain pipe.

Always check that the above accessories are available. Once the goods have been delivered and accepted, no complaints are accepted.

Condition of the machine when supplied

Every compressor is shop tested and delivered ready to be installed and to be commissioned.The oil used for first filling is: FSN Original Oil.

► **Important note**: Bolts and screws are metric, therefore it is necessary to operate with suitable tools during operating and/or maintenance activities.

SAFETY INFORMATION

Please read and understand this entire manual before attempting to assemble, operate or install the product.

Safety symbols

- The following signal words and meanings are intended to explain the levels of risk associated with this product.

DANGER	Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

GENERAL WARNINGS

- Rotary compressors are intended for heavy continuous industrial use. They are especially suitable for industrial applications requiring high air consumption for a long time.
- The compressor should be run and operated only in compliance with the indications given in this manual. Safely keep this manual in a known and easily reachable place for the whole working life of the compressor.
- A supervisor shall be appointed in the company where the compressor is installed. They shall be responsible for compressor inspections, adjustments and maintenance. Should a substitute be appointed for the supervisor, they shall carefully read the operating and maintenance manual and any remarks about the service and maintenance carried out so far.

SAFETY PRECAUTIONS AND WARNINGS

WARNING:
Read and understand all instructions listed below prior to un-crating or installing compressor package. Failure to do so can result in personal injury or damage to compressor package.

WARNING:
To avoid serious personal injury, do not attempt to use this product until you read thoroughly and understand completely the operator's manual. Save this operator's manual and review frequently for continuing safe operation and instructing others who may use this product.

Save these instructions

To Do:

- **Make sure that mains voltage** corresponds to the voltage indicated on data label and install compressor to all local applicable electric codes.
- **Always check oil level** before starting the compressor. Use the correct lubricant at all times.
- **Be familiar with emergency stop control** and all other controls.
- **Unplug the connector** before any maintenance work, so to avoid accidental start.
- **Disconnect all power supplies** to the compressor plus any remote controllers prior to servicing the unit.
- **Relieve all pressure internal** to the compressor prior to servicing.
- **Ensure that all parts** have been correctly reassembled after any maintenance work.
- **Keep your work area clean and well lit.** Dark areas invite accidents. The floor must not be slippery from wax or dust.
- **Keep children and animals** off the working area to avoid injuries caused by devices connected to the compressor.
- **Ensure the temperature** of the working environment ranges between + 36 and + 113 °F (+2 and + 45 °C). Lower temperatures may causes condensate accumulation inside the oil separator tank (inside the compressor). **Check for condensate and if necessary, drain it (see maintenance)**.
- **The compressor should be installed** and operated in a non-explosive environment.
- **Allow at least 32 in. (80 cm)** between the compressor and the wall so to allow free air flow to the fan.
- **Press the emergency button** on the control panel only in case of actual need so as to avoid possible damages to people or the very compressor.

- **When calling for technical assistance** and/or advice, always mention model, code and serial number indicated on the technical data label.
- **Always follow the maintenance schedule** specified in this manual and check all safety devices.
- **Observe gauges daily** to ensure compressor is operating properly.
- **Always wear proper safety equipment** when using compressed air.
- **Save these instructions.** Refer to them frequently and use them to instruct others who may use this air compressor.

Do Not:

Do not touch inner parts and pipes as they are very hot during compressor operation and stay hot for a certain time after compressor stops.
Do not position inflammable close to and onto the compressor.
Do not move the compressor when the tank is under pressure.
Do not operate the compressor if the power cable is damaged or defective or if connection is unstable.
Do not operate the compressor in wet or dusty environments.
Never aim the air jet at people or animals.
Do not allow unauthorized people to operate the compressor and give them all required instructions.
Do not hit fans with blunt objects as they might break during compressor operation.
Never operate the compressor without air filter and/or pre-filter.
Never use a flammable or toxic solvent for cleaning the air filter or any parts.
Do not tamper with safety and adjusting devices.
Never operate the compressor when doors/panels are open or removed.
Do not attempt to service any part while the compressor is operating.
Do not strike the fans with contusive or metal objects as they could cause sudden breakage during functioning.
Do not allow the compressor to function without the filter and/or air pre-filter.
Do not tamper with safety and adjustment devices.
Never allow the compressor to function with the hatches/panels open or removed.
Do not depend on check valves to hold system pressure.
Do not exceed the limit of 20 start-ups per hour of compressor operation.

You Should Know:

- Air from this compressor will cause severe injury or death if used for breathing or food processing.
- This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.

⚠ WARNING:

Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

⚠ WARNING:

This product can expose you to chemicals including lead, which is known to the state of California to cause cancer and birth defects or other reproductive harm.
For more information go to www.p65warnings.ca.gov

SYMBOLS

Symbols used in the manual

Several symbols have been used inside the manual, which highlight dangerous situations, give practical advice or simple information. These symbols are found at the side of a text, at the side of a figure or at the top of a page (in this case they refer to all subjects considered on the entire page).
Pay attention to the meaning of the symbols.

Symbol	Name	Designation / Explanation
	**WARNING!**	Important description on service, dangerous situations, safety, accident prevention recommendations and/or very important information.
	**MACHINE STOPPED!**	All operations highlighted by this symbol must be strictly carried out only after stopping the machine.
	**POWER OFF!**	All operations to be strictly carried out only after powering off the machine.
	**SPECIALIZED PERSONNEL!**	All operations highlighted by this symbol to be strictly carried out only by a specialized technician.

Symbols used on the compressor

Several different labels are applied to the compressor. Their function is most of all to highlight any hidden dangers and to indicate correct behaviour during use of the machine or in particular situations.
It is of fundamental importance that they are respected.

Warning symbols	Designation / Explanation
	High temperature risk.
	Electric shock risk.
	Risk from hot or dangerous gases in the work area.
	Pressurised container.
	Moving mechanical parts.
	Maintenance in progress.
	Machine with automatic start-up.

Prohibition symbols	Designation / Explanation
	Do not open hatches when the machine is functioning.
	If necessary, always use the emergency stop button and not the line isolating switch
	Do not use water to put out fires on electrica appliances

Obligation symbols	Designation / Explanation
	Carefully read the user instructions.

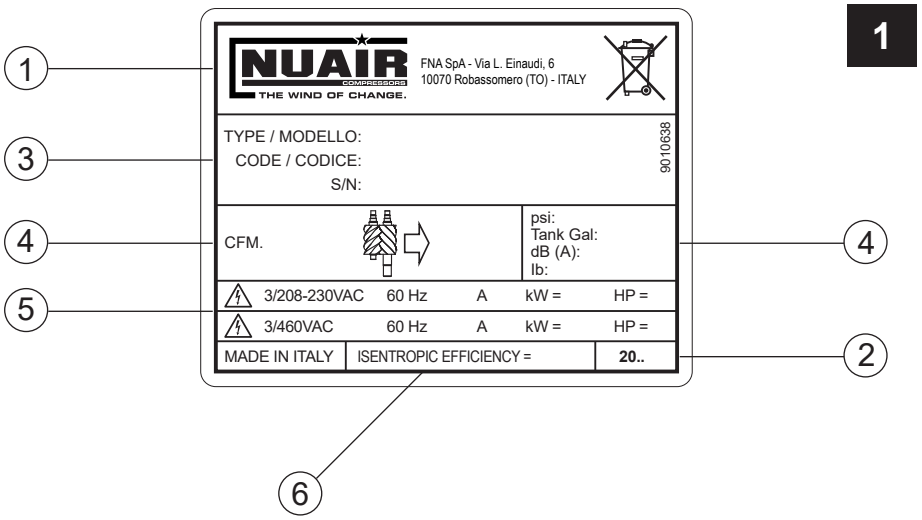
PRODUCT IDENTIFICATION

See Figure 1.

The compressor You have purchased has its own plate showing the following data:

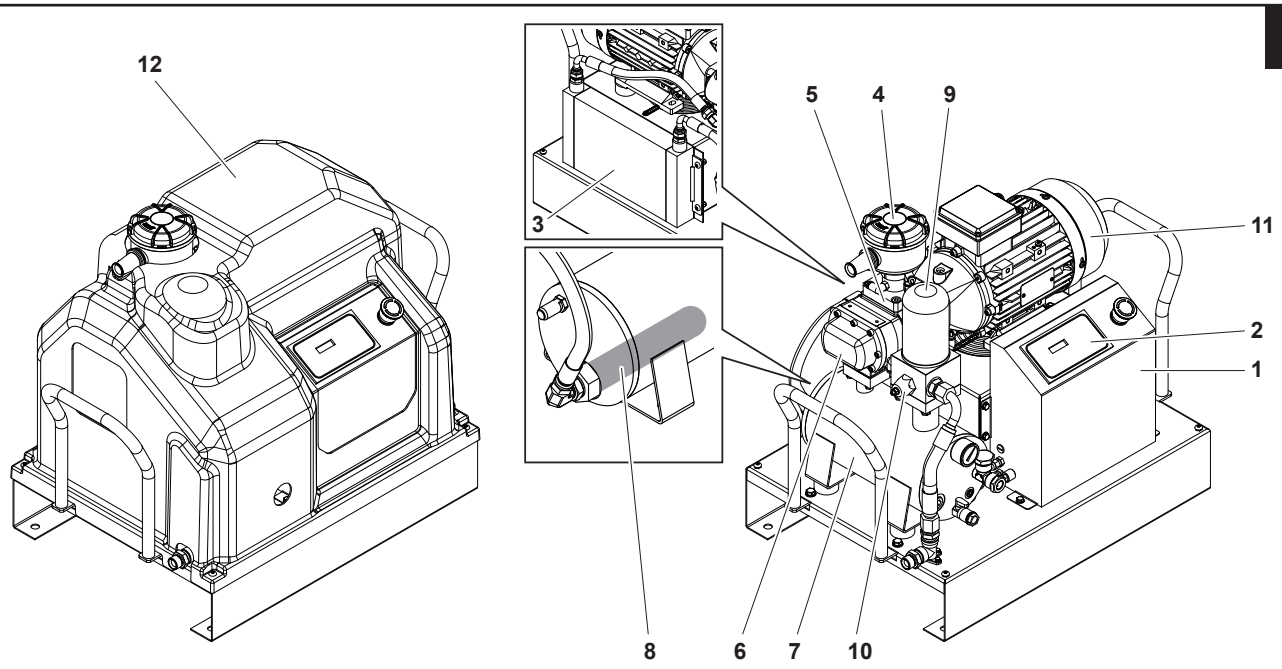
1. Manufacturer's data.
2. Year of manufacture.
3. TYPE = name,
   CODE = code,
   SERIAL NO. = serial number (to be always mentioned when calling for technical assistance).
4. Tech data: air delivery, Max. operating pressure, Tank capacity, sound level, weight.
5. Voltage, frequency, absorption, power.
6. Isentropic efficiency.

1



DESCRIPTION OF THE COMPRESSOR

2



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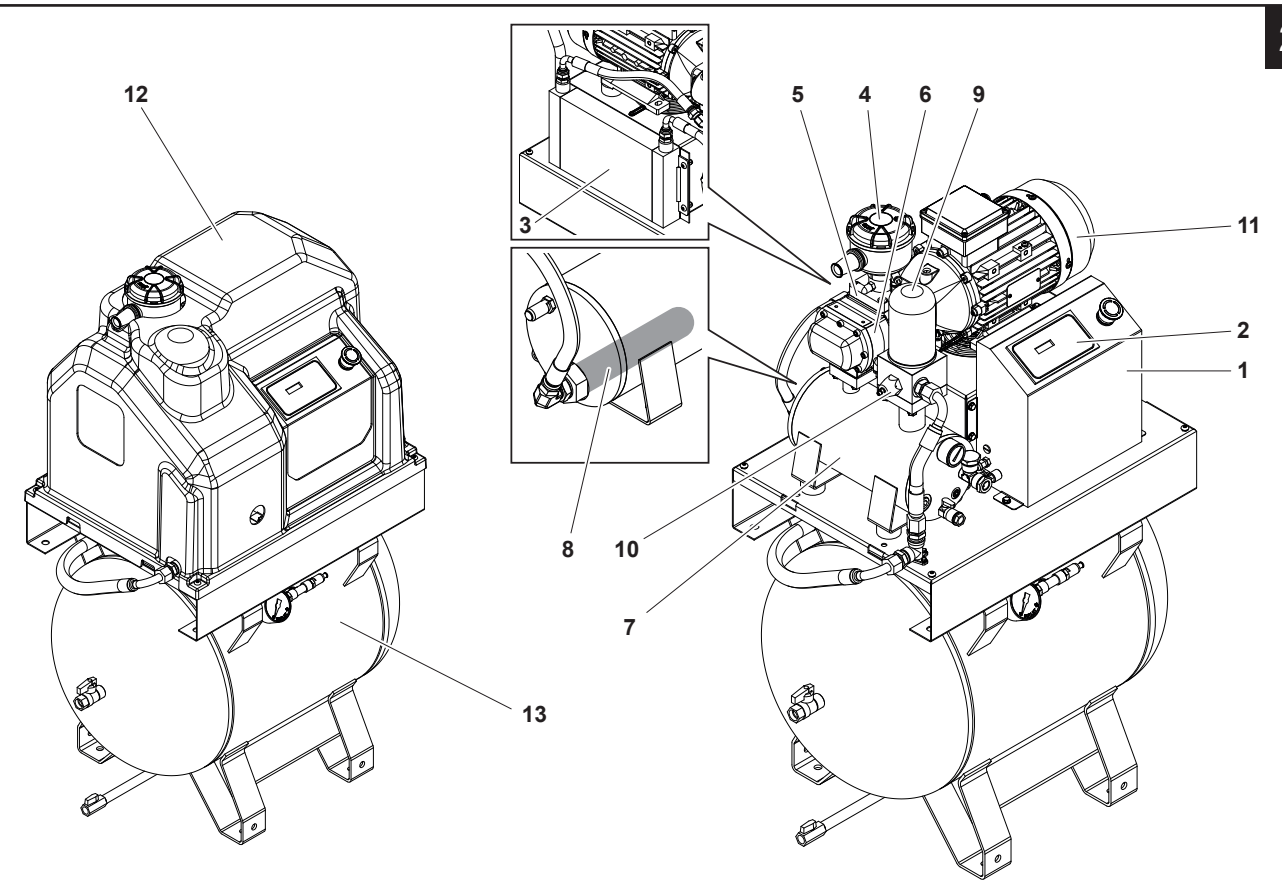


FEATURES

See Figures 2 - 2a.

The compressor essentially consists of the following:

1. Electrical equipment
2. Electronic controller
3. Oil radiator
4. Air filter
5. Suction regulator
6. Screw compressor
7. Oil separator tank
8. Oil filter
9. Oil separator filter
10. Minimum pressure valve
11. Electric motor
12. Casing
13. 90l tank

UNPACKING AND HANDLING THE MACHINE

When delivered, compressor top is protected by cardboard and/or wooden packing.

WARNING:

Wear suitable protective gloves and then cut the outer straps and then remove the packaging from the top. Check the (outer) good condition of the machine before moving the compressor. Visually check that no parts are damaged. Also ensure that all accessories are available.

Lift the machine using a fork lift truck. Fit the anti-vibration pads into their proper seat and move the machine to the room chosen for its location with maximum care.

Keep all packing materials at least for the warranty period for any future movement. In case of need, it will be safer when shipping it to the technical assistance dept.

Then, dispose of packing materials in compliance with current laws.

LOCATION

See Figure 3.

Remove the compressor from the wooden pallet used for transport and position it on the floor, on its shock-absorbers if supplied.

The wooden pallet is only used for transport, the compressor must not be placed on the pallet during operation.

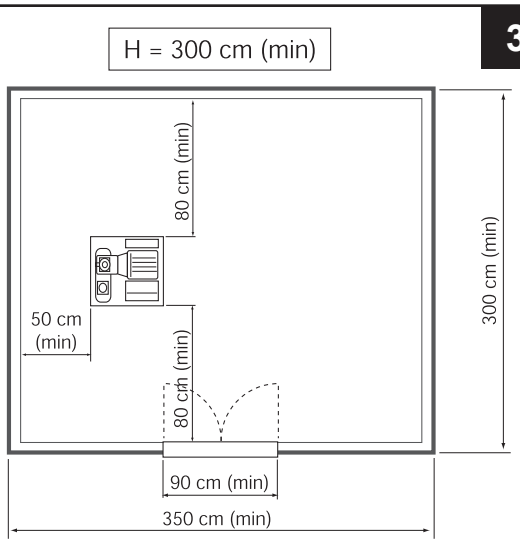
The room chosen for the installation of the compressor should meet the following requirements and comply with what is specified in the current safety and accident prevention regulations:

- **low percentage** of dust in the air,
- **proper room ventilation and size** that allow room temperature under 122 °F (50 °C). In the event of inadequate hot air discharge, fit the exhaust fans as high as possible.

► **NOTE:** Condensate should be collected either into a pit or a tank.
CONDENSATE IS A POLLUTING MIXTURE! It must not be let into the sewage.

The dimensions of the spaces are indicative only but it is advisable to follow them as closely as possible.

3



Important note:

For machines with the configuration shown in figure 2 (see previous page): the minimum capacity of the storage tank to which the machine is connected **MUST NOT** be less than 90 litres.

ELECTRICAL CONNECTION

See Figure 4.

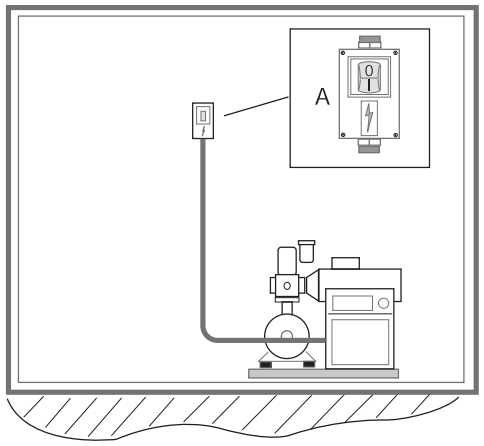
A qualified electrician in compliance with standards and local codes should do all electrical wiring. Be sure to investigate the local requirements before installing the compressor.
The power supply should be adequate and free of parasitic loads that will cause an under voltage condition during the operation of the compressor, otherwise there will be nuisance electrical shutdowns.

► **NOTE:** Some models may be dual voltage, as shown on their technical data label.

In case of changing the supply voltage, it is necessary to perform the following tasks:
– change the electrical hook-up of (electric) motor
– change the fuses supplied
– see the wiring diagram.

- The mains cable should have a cross-section suitable for the machine power and should include no. 3 phase wires and no. 1 earth wire.
- **A fused or magnetothermal switch** must be installed near the point where the cables go into the machine, between the mains cable and the compressor control panel.
- The switch (A) should be easily reached by the operator. The cables should be of the approved type and installed with the following grade of protection: minimum IP44.

4



► **NOTE:** To select the cables cross-section and the suitable circuit breaker follow the sizing indications in the chart shown below:

Minimum wire size & circuit breaker chart

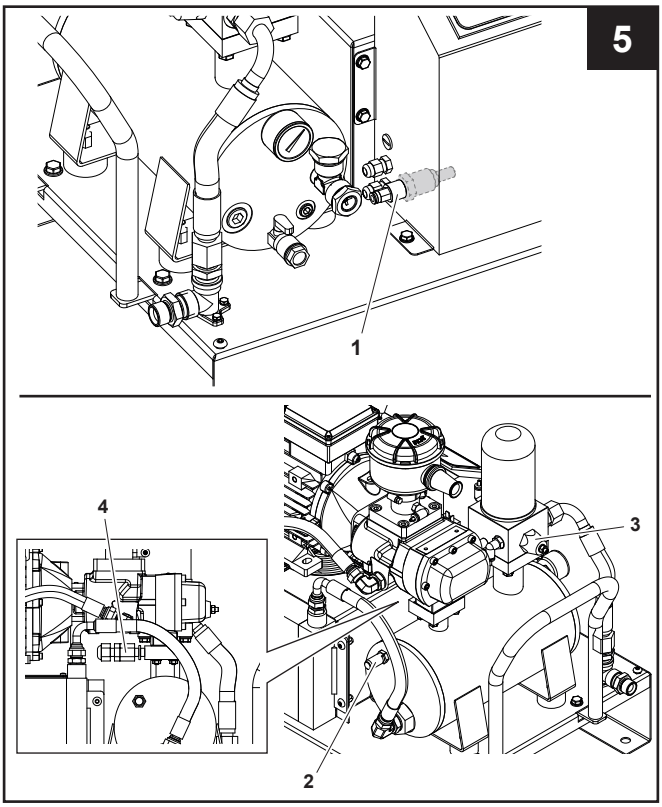
Model	Pressure	Minimum wire size AWG (208-230 V)	Minimum wire size AWG (460 V)	Delayed circuit breaker suitable for motor start 208-230 V	Delayed circuit breaker suitable for motor start 460 V
2.2 HP 1/208-230	116 PSI	12	/	30 A	/
2.2 HP 3/208/460	116 PSI	14	14	20 A	10 A

If the compressor has been stopped for more than 30 days, it is needed to manually add some oil into the air-end, in order that air-end is lubricated at first start, as described in the "Screw compressors quick guide installation".
The non-compliance of this prescription could cause a seizing of the air-end. Contact your dealer for more details.

SAFETY AND CONTROL DEVICES

See Figure 5.

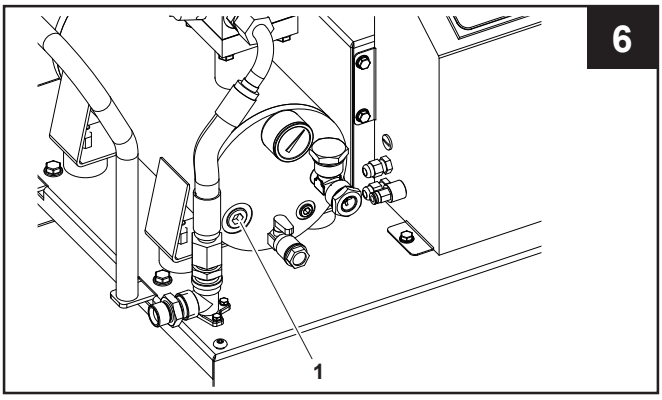
1) **Pressure transducer**:
   regulates STOP and START pressure
2) **Safety valve**:
   opens the air vent to the safety value.
3) **Minimum pressure valve**:
   prevents leakage of compressed air if the pressure is below the calibration value of the valve
4) **Maximum temperature probe**:
   shuts down motor when 230 °F (110 °C) is exceeded.



HEATER ELEMENT (OPTIONAL KIT)

See Figure 6.

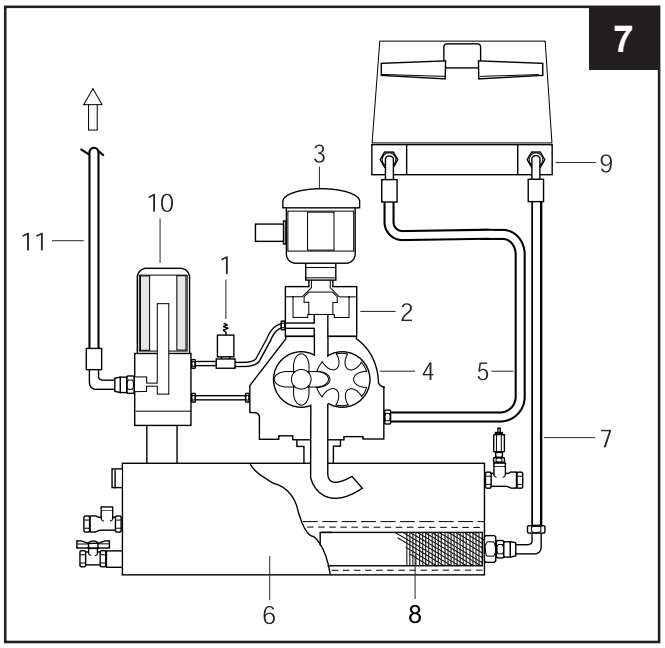
– Recommended on machines with non-continuous operating cycles.
– The heater element immersed in the oil of the oil trap tank (Fig.6) keeps it hot and prevent excessive condensation.
– When installed, the operation is automatically controlled by the electronic control unit. The heater element is powered only during the standby stage under specific conditions.



WORKING CYCLE

See Figure 7.

1) At start up the motor starts directly; it reaches standard speed after 5-7 seconds.
2) The solenoid valve (1) receives current and closes. The suction regulator (2) opens and takes in atmospheric air through the filter (3).
3) At this stage, the compressor runs at full speed and begins to compress the air in the tank (6).
4) The compressed air cannot come out from the minimum pressure valve set at 3÷4 bar.
5) The compressed air compresses the oil in the tank (6) and forces it to flow through the filter (8) and pipe (7) to the radiator (9).
6) If the oil temperature is below 167 °F (75 °C) the electric fan remains still.
7) If the oil temperature exceeds 167 °F (75°C) the ventilator starts operating and cooled oil returns to the compressor through pipes (5).
8) The oil reaches the compressor (4) mixing with the intake air creating an air/oil mixture which ensures the seal and the lubrication of the moving parts of the compressor.
9) The air/oil mixture returns to the tank (6) where the air is pre-separated and later a final separation of the oil takes place, through the oil separator filter (10), and finally it is conveyed to the distribution network.
10) Upon standby or shutdown, the motor stops, the solenoid valve (1) is no longer powered and opens, allowing the oil separator tank (6) to be depressurised.



- Correct maintenance is crucial to achieve maximum efficiency of your compressor, and to lengthen its operating life.
- It is also important to comply with the maintenance intervals recommended, but remember that such intervals are suggested by the manufacturer in the event that the environmental conditions of use of the compressor are optimal (see “Installation” chapter).
- The maintenance intervals can therefore be reduced depending on the environmental conditions the compressor operates in.
- The oil is FSN Original Oil, use of a different oil does not guarantee perfect efficiency and compliance with the maintenance intervals.
- The maintenance operations described in the table below and on the following pages must be carried out by authorised personnel.

MAINTENANCE SCHEDULE

Type of maintenance	Maintenance schedule		
	work hours		or at least
	(when MINERAL OIL is used)	(when SYNTHETIC OIL is used)	
Drain condensate from air tank (if present)	50	50	weekly
Drain condensate from the oil separator tank	50	50	weekly
Oil check and top up if necessary	500	500	once a month
Clean air filter	1000	1000	-
Check radiator for clogging and clean it	1000	1000	once a year
Replace air filter	1000	1000	once a year
Replace oil filter	2000	4000	once a year
Replace oil separator filter	2000	4000	once a year
Replace oil	2000	4000	once a year
Replace scavenge non return valve	4000	4000	once a year
Intake valve service	4000	4000	
Minimum pressure valve overhaul	8000	8000	
Replace flexible hoses	8000	8000	
Solenoid valve replacement	8000	8000	
Air-end overhaul/ replacement	16000	16000	
Refer to the motor manual and/or to the motor data plate for electric motor bearing maintenance			

To verify correct machine operation, perform the following checks **after the first 100 hours of work**:

1) Check the **oil level**: top up with the same type of oil if necessary.
2) Check for proper **screw tightening**: in particular the power electric connection screws.
3) Visually check that all **fittings seal properly.**
4) Check **room temperature**.

BEFORE MAINTAINING THE MACHINE ALWAYS PERFORM THE FOLLOWING:
√ **Press the machine automatic stop button (do not use the emergency button).**
√ Power the machine off by means of the external switch on the wall.
√ Close the line cock.
√ Make sure that no compressed air is inside the oil separator tank.
√ Remove cases and/or panels.

DRAIN CONDENSATE

See Figure 8.

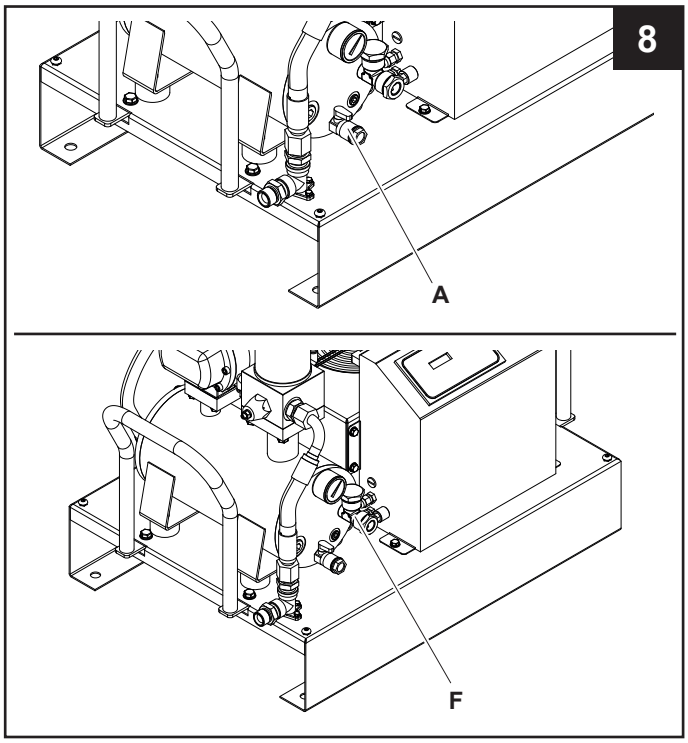
The oil/air mixture cooling is set at a higher temperature with respect to the dew point of the air (under standard operating conditions of the compressor). However, the condensate in the oil cannot be fully removed.
Drain condensation by opening cock **A** and then close it as soon as oil begins to flow out instead of water. Check the oil level and top up if necessary.

► **CONDENSATE IS A POLLUTING MIXTURE!**
It must not be let into the sewage.

OIL CHECK AND TOP UP IF NECESSARY

See Figure 8.

Check the oil level by means of indicator on the left side of the oil separator tank; if the level is below the maximum, top up through the port **F**;
For the quantity of oil required to top up from the minimum to the maximum level, see the technical datasheet.



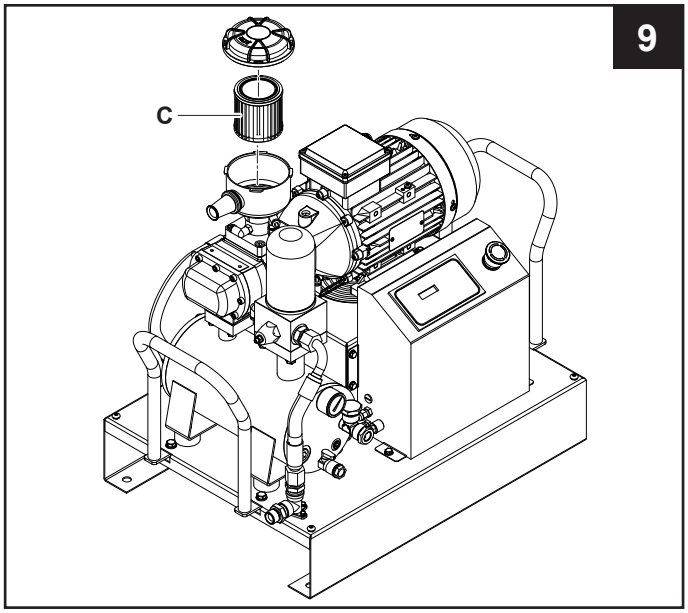
CLEANING/REPLACING THE AIR FILTER

See Figure 9.

Clean the air filter **C** from the inside towards the outside using compressed air.
Check against the light for possible cuts: replace the filter if any.
The filter cartridge and the cover should be assembled with care, so that no dust goes into the compression unit.

CLEANING THE RADIATOR

Clean the radiator in case of excessive over temperature and at least once a year.
Proceed as follows:
- Remove the radiator unit and spray (with spray gun + solvent) from the outside towards the inside;
- Check for proper air flow through the radiator.



CHANGE OIL FILTER

See Figure 10.

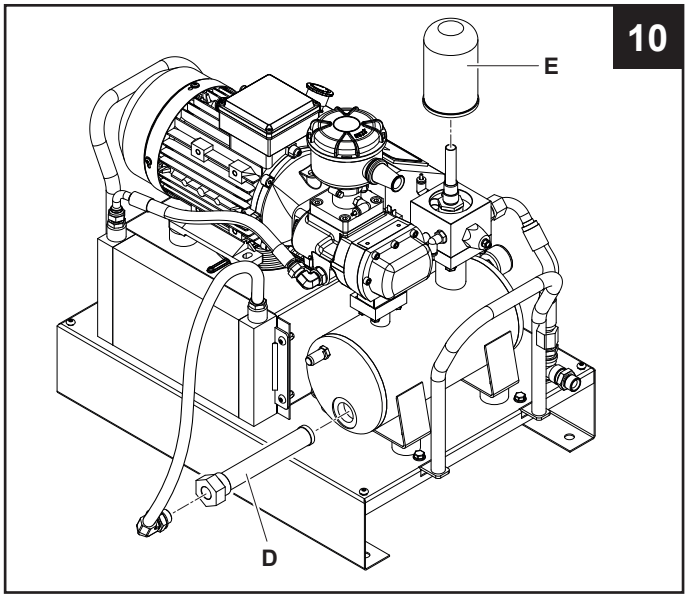
Change oil filter **D**: this must occur when the tank is not under pressure and without oil.
Always apply some oil on the O ring seal of the filter, before refitting it manually.

CHANGE OIL SEPARATOR FILTER

See Figure 10.

The oil separator filter **E** cannot be cleaned, but must be replaced.
- Unscrew filter manually (or if necessary use an appropriate filter tool) turning it anticlockwise.
- After having slightly greased the oil separator filter seal and O-ring, fit the new filter by turning clockwise.

Warning: replacements must be performed at the same time of the oil change.



REPLACING THE OIL

See Figure 11.

When the compressor temperature is over 158 °F (70°C), change the oil.

- Insert the supplied hose onto cock **A**.
- Remove the used oil separator filter **H**.
- Open cock **A** and allow oil to flow into a collection tray, until complete drainage. Close the cock and remove the pipe.
- Remove cap **G** and pour new oil from port **F** (quantity for complete refilling: see the technical data table).
- Close the cap **G**.
- Install the new oil separator filter **H**.
- Power the machine on.
- Start the machine and wait for 5 minutes, then stop the machine.
- Vent all air.
- Wait for 5 minutes and check the oil level; top up if necessary.

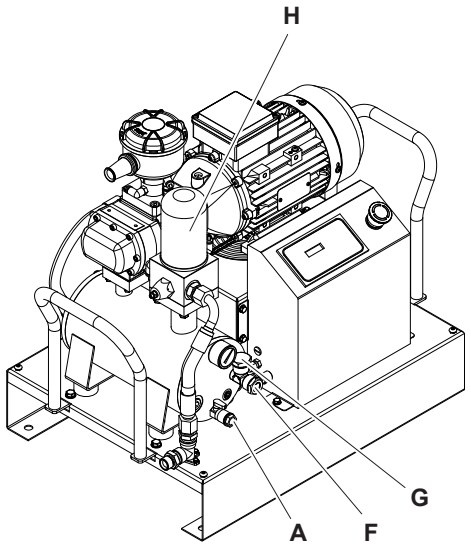
► **SPENT OIL CAN POLLUTE THE ENVIRONMENT!**
For its disposal, operate in accordance to current environmental protection laws.

- The oil used for the first time is **FSN Original Oil**, as described below:

Description	Type of oil
RotEnergyPlus 46cST	Synthetic lubricant ISO 46 for industrial use

A label attached to the compressor tank indicates the exact type of oil used before first installation. You are advised to use that type of oil in all the oil changes planned for scheduled maintenance (for the time intervals, refer to the maintenance schedule).
If the type of oil needs to be changed, it must be done only when fully changing it. **NEVER MIX DIFFERENT TYPES OF OIL**.
In this case, it is recommended to replace the oil filter and the oil separator filter as well.

11



TROUBLESHOOTING

Problem	Cause	Remedy
Motor stopped (thermal relay operation signal)	1. Voltage too low. 2. Overtemperature. 3. Electric fan motor overtemperature.	1. Check voltage, press Reset and then restart. 2. Check motor absorption and relay setting. In case of regular absorption press Reset and restart. 3. Check electric fan motor and clixon condition.
High oil consumption	1. Faulty drainage. 2. Oil level too high. 3. Oil separator filter broken. 4. Oil separator filter seal leaking.	1. Check oil drain hose and check valve. 2. Check oil level and drain some, if necessary. 3. Replace oil separator filter. 4. Replace oil separator nipple seals.
Intake filter leaks oil	1. Suction regulator stays open.	1. Check regulator and solenoid valve.
Safety valve opening	1. Pressure too high. 2. Suction regulator does not close at the end of the cycle. 3. Oil separator filter clogged.	1. Check service pressure switch setting. 2. Check regulator and solenoid valve. 3. Replace oil separator filter.
Sensor for compressor temperature triggered	1. Room temperature too high 2. Radiator clogged. 3. Oil level too low. 4. Electrical fan does not start.	1. Increase ventilation. 2. Clean radiator with solvent. 3. Top up oil. 4. Check electric fan motor and clixon condition.
Poor compressor performance	1. Air filter dirty or clogged.	1. Clean or replace the filter.
Compressor does not compress air while running	1. Regulator closed. It cannot open because it is dirty.	1. Remove intake filter and check for proper manual opening. Remove and clean, if necessary.
Compressor compresses air beyond max. pressure value	1. Regulator open. It cannot close because it is dirty.	1. Remove and clean regulator.
Compressor does not start	1. Oil separator filter clogged. 2. Min. pressure valve does not close perfectly.	1. Replace oil separator filter. 2. Remove the valve, clean and replace seal, if necessary.
Compressor hardly starts	1. Voltage too low. 2. Tube leaking.	1. Check mains voltage. 2. Tighten fittings.