

DK50 DE



INSTRUCTIONS FOR USE

EN

CE 0434

ekom®

CONTENTS

1. GENERAL INFORMATION	2
PURPOSE.....	2
OPERATOR'S RESPONSIBILITY FOR PATIENT SAFETY	2
MARKINGS	2
WARNINGS.....	2
General safety warnings	3
Electrical system safety warnings	3
WARNING NOTICES AND SYMBOLS	4
USE.....	5
STORAGE AND TRANSPORT	5
2. EQUIPMENT DESCRIPTION	6
3. TECHNICAL DATA	8
4. OPERATION	9
INSTALLATION AND FIRST OPERATION	9
Removal of transport stabilizers	9
Compressed air connection	10
Electrical connection	10
First operation	10
Adjusting the output air pressure	11
OPERATION	11
Switching the compressor on	11
Running the compressor	11
Cleaning the compressor	11
5. MAINTENANCE	12
REPAIRS AND SERVICE	12
MAINTENANCE SCHEDULE.....	12
Checking tightness of joints and inspecting the equipment.....	13
Replacing filter elements.....	14
Changing suction filter elements	14
Securing the equipment before transport.....	15
SHUTDOWN	15
EQUIPMENT DISPOSAL	15
6. TROUBLESHOOTING	16
7. SPARE PARTS	17
8. ELECTRIC AND PNEUMATIC DIAGRAMS	18
WIRING DIAGRAM	18
PNEUMATIC DIAGRAM	18

GENERAL INFORMATION

1. GENERAL INFORMATION

PURPOSE

The EKOM DK50 DE is a medical air compressor that supplies clean, oil-free compressed air for use with medical ventilators.

OPERATOR'S RESPONSIBILITY FOR PATIENT SAFETY

Instructions for use is an integral part of the equipment and must be kept with the compressor. Careful review of this manual will provide information necessary for correct operation of the equipment.

Rx only

US Federal law restricts the sale of this device by or on the order of a physician.

MARKINGS

Products marked with the CE mark of compliance meet the safety requirements of the European Union (93/42/EEC).

WARNINGS

- The safety of operating personnel and trouble-free operation of the equipment are ensured only if original parts are used. Only accessories and spare parts mentioned in the technical documentation or expressly approved by the manufacturer can be used.
- If any other accessories or consumable materials are used, the manufacturer cannot be held responsible for the safe operation and functionality of the equipment.
- The warranty does not cover damages resulting from the use of accessories or consumable materials other than those recommended by the manufacturer.
- The manufacturer assumes responsibility for the safety, reliability and function of the equipment only if:
 - Installation, calibration, amendments, extensions and repairs are performed by the manufacturer, one of its representatives or a service provider authorized by the manufacturer
 - The equipment is used in accordance with the Installation, Operation and Maintenance Manual
- The Installation, Operation and Maintenance Manual accurately describes the design of the compressor and its compliance with safety and technical standards. The manufacturer reserves all rights to its wiring diagrams, procedures and names.

General safety warnings

The equipment is designed to operate safely when used correctly. Please note the following safety measures to avoid injury or damage.

- Equipment operation must comply with all local codes and regulations.
- Original packaging should be kept for the possible return of the unit. Only original packaging ensures optimal protection of the equipment during transport. If it is necessary to return the equipment during the warranty period, the manufacturer is not liable for damages caused by incorrect packaging.
- The user must immediately notify the supplier if any problem occurs during the use of the equipment.
- This product is not intended for use in areas where there is a risk of an explosion. Do not operate the compressor in the presence of flammable anesthetics.
- Never feed oxygen or nitrous oxide into the compressor. Compressor components are not approved for oxygen or nitrous oxide use.

Electrical system safety warnings

- The equipment must be connected to ground. In order to assure proper grounding, connect the compressor to a receptacle marked "hospital grade."
- Before the compressor is plugged in, make sure that the voltage and frequency of the mains specified on the equipment are the same as the power mains.
- Before operating, check for possible damage to the equipment and any connections. Damaged pneumatic and electrical lines must be replaced immediately.
- If a technical failure occurs, immediately disconnect the equipment from the mains (pull out the main power plug).
- During repairs and maintenance, ensure that:
 - The main power plug is removed from the power socket
 - Compressed air lines are disconnected
 - All pressure has been released from the air tank
- Only a qualified technician can install this equipment.

GENERAL INFORMATION

WARNING NOTICES AND SYMBOLS

The following symbols are used for important information in the Installation, Operation and Maintenance Manual and on packaging and the product:



Attention, see instructions for use



Caution, risk of electric shock



Consult instructions for use



CE mark of compliance



Caution, hot surface



Handling mark on package – FRAGILE



Handling mark on package – THIS SIDE UP



Handling mark on package – KEEP DRY



Handling mark on package – TEMPERATURE LIMITATIONS



Handling mark on package – LIMITED STACKING



Mark on package – RECYCLABLE MATERIAL



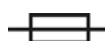
Alternating current



Ground connection



Equipotentiality



Fuse

USE

- The equipment can be installed and operated only in a dry, ventilated and dust-free area. Climatic conditions for operation - see Technical data.
- The compressor must stand on a flat and stable base.
- The compressor must not be exposed to rain. The equipment must not be used in humid or wet environments. Never use the compressor in the presence of flammable liquids or gases.
- Before connecting the compressor to respiration equipment, make sure that it meets the requirements of the respiration equipment. Refer to the Technical data for this purpose.
- Any use other than the compressor's intended use is not considered to be safe. The manufacturer is not responsible for any damages that result if the compressor is used for any other purpose. Risk is exclusively assumed by the operator/user.

STORAGE AND TRANSPORT

The compressor is shipped from the factory in transport packaging with the pump stabilized, protecting it from damage during transport.



For transport, always use the original packaging and secure the compressor in the upright position.



Protect the compressor from humidity, contamination and extreme temperatures during transport and storage. A compressor in its original packaging should be stored in a warm, dry and dust-free area.



Keep the packaging material, if possible. If not, dispose of the packaging material in an environmentally-friendly way. Cardboard can be recycled.



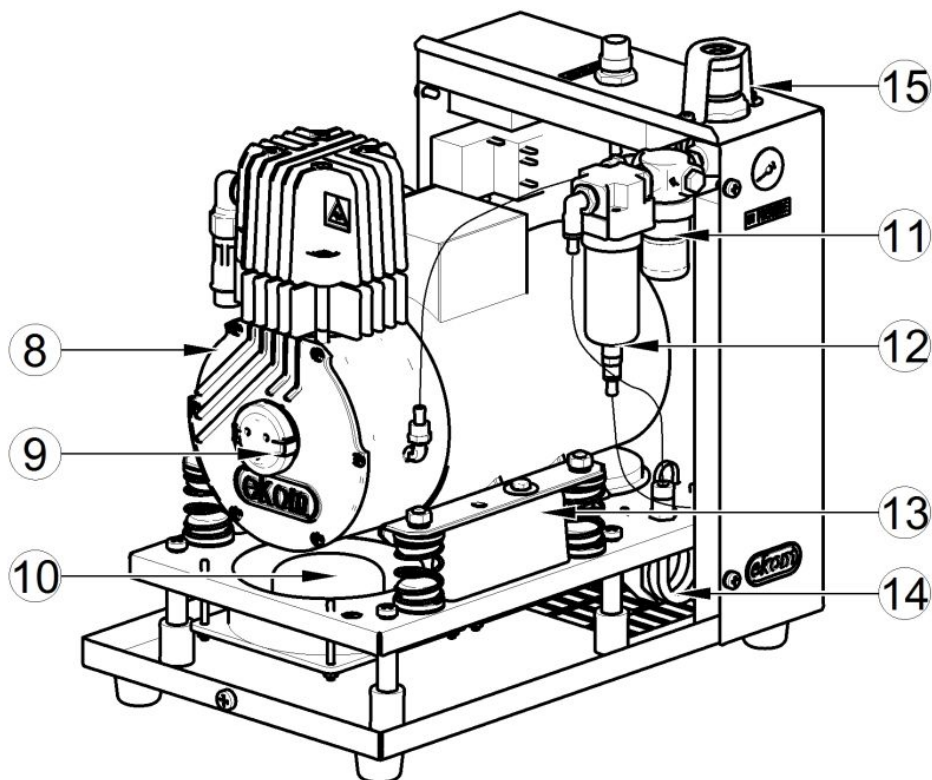
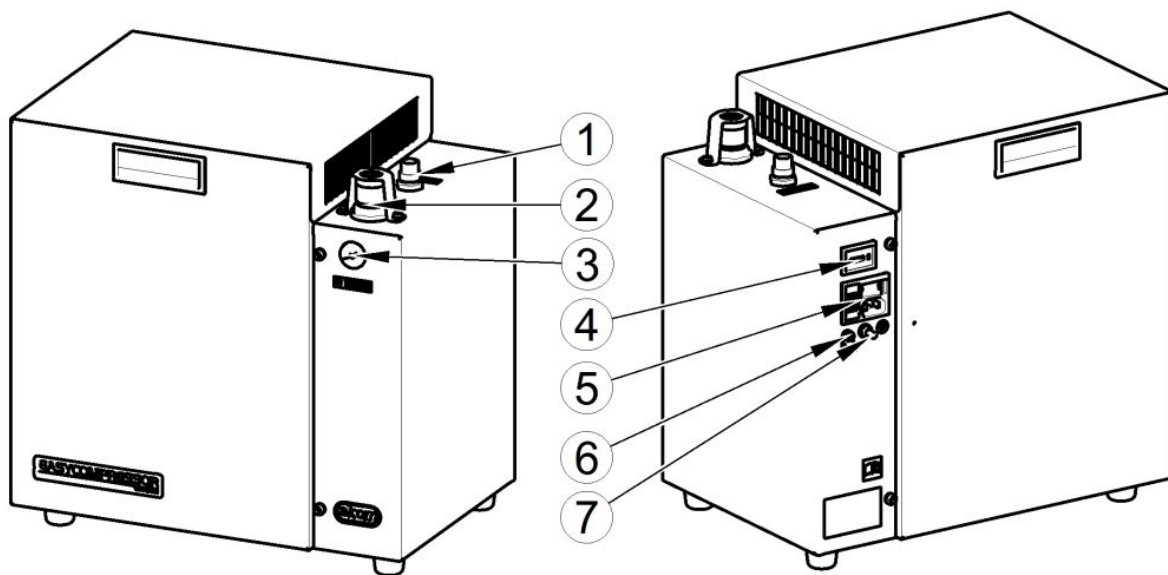
Prior to transport it is necessary to secure the motor inside the compressor (Chapter 5).

EQUIPMENT DESCRIPTION

2. EQUIPMENT DESCRIPTION

1. OUT - compressed air outlet
2. Pressure regulator
3. Output air pressure gauge (with accuracy of $\pm 5\%$)
4. Hour meter
5. Switch, power connector and fuses
6. Power cord anchor
7. Equipotential connector
8. Compressor
9. Suction filter
10. Fan
11. Safety valve
12. Filter (5 μm) with automatic condensate drain
13. Supporting base
14. Cooler
15. Regulator safety cover

The equipment uses an oil-free piston compressor (8) driven by a low-maintenance electric motor. Compressed air is cooled in the cooler (14) where condensed water is separated into a separate tank (12). Compressor working pressure is set using the safety valve (11). Constant output pressure is maintained by the pressure regulator (2).



TECHNICAL DATA

3. TECHNICAL DATA

TYPE		DK50 DE
VERSION		low flow
Output flow at pressure 3.5 bar (51 psig)	L/min	20
Voltage / Frequency / Nominal current	V/Hz/A	230/50-60 / 2.3 110-120/60 / 4.4
Air filtration	µm	5
Pressure dew point at 3 bar, 20°C, 50% Relative air humidity		5°C (9°F) below the ambient temperature
Outlet connection		DISS 1160-A (3/4"-16 UNF)
Sound level	dB(A)	48 49 / 60 Hz
Mode of operation		Continuous - S1
Separation of condensed water		Automatic
Output pressure		3.0 bar (43 psig) Adjustable to max. 3.5 bar (51 psig)
Pressure range		5 bar (72.5 psig)
Adjustment of output air pressure		Pressure regulator
Dimensions of compressor	w x d x h	270 x 395 x 400 mm (10.5 x 15.5 x 16 in)
Dimensions of packaging	w x d x h	350 x 460 x 500 mm (14 x 18 x 19.5 in)
Net weight		23 kg (51 lbs)
Gross weight		29 kg (64 lbs)
Implementation according to	EN 60601-1, EN 12021	Type B class I.
Classification acc. to MDD 93/42 EEC, 2007/47 EC		II b

Climatic conditions for storage and transport

Temperature -25°C to +55°C (-13°F to +131°F), 24 hrs +70°C (+158°F)

Relative air humidity 10% to 90% (no condensation)

Relative air humidity for seaworthy packing 10% to 100% (with condensation)

Climatic conditions for operation

Temperature +15°C to +40°C (+59°F to +104°F)

Relative air humidity up to +70%

IPX0 Rating

FAD efficiency correction for differences in elevation

FAD correction table

Elevation [mamsl]	0 - 1500	1501 - 2500	2501 - 3500	3501 - 4500
FAD [l/min]	FAD x 1	FAD x 0.8	FAD x 0.71	FAD x 0.60

FAD efficiency refers to conditions at an elevation of 0 mamsl:

Temperature: 20°C

Atmospheric pressure: 101325 Pa

Relative humidity: 0%

4. OPERATION

INSTALLATION AND FIRST OPERATION



Do not use the compressor immediately after unpacking as it will not adjust to the ambient temperature.



Only qualified personnel can install the compressor and put it into operation for the first time. The installer shall train the operating personnel in the use and routine maintenance of the equipment. Installation and training of personnel should be acknowledged by the installer's signature on the installation certificate.



Before starting the compressor for the first time the stabilisation elements used to support the equipment during transport must be removed. Starting the compressor without removing the stabilisation elements can permanently damage the equipment!



The compressor does not contain a backup power supply.



It is forbidden to block the ventilation openings located in the upper part of the equipment!



If the compressor is equipped with a main source of air, the standby air source must be available.



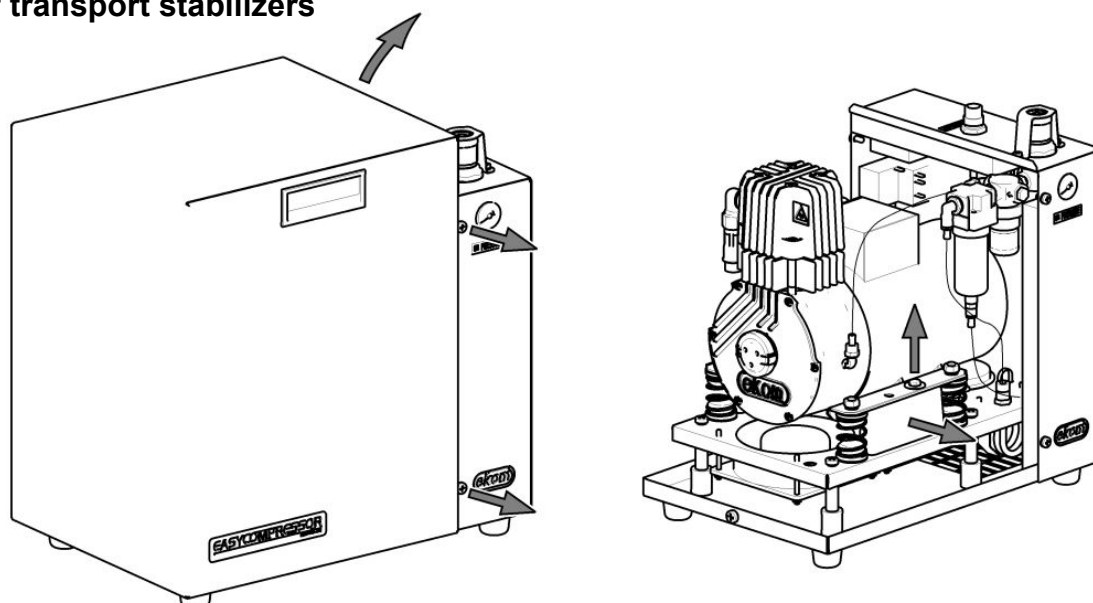
ANY MODIFICATION OF THIS EQUIPMENT IS FORBIDDEN!



If this equipment is used nearby other instruments, the equipment must be observed in order to verify normal operations in the configuration it will be used.

Instruments may be affected electro-magnetically!

Removal of transport stabilizers



OPERATION

Remove the four screws from the side of the equipment. Remove the cover and disconnect the ground wire.

Remove the two (2) M6 screws marked with the red warning washers and remove the stabilisation elements

Keep the screws and stabilisation elements in the event the compressor is transported at a later time.

Connect the grounding wire and reattach the cover.

Compressed air connection

The given appliance or respiratory apparatus should be connected to the **OUT** (1) quick coupler, as this is the outlet for compressed air.



The hose connecting the compressor to the respiration equipment must not pass through a cold environment i.e. placed on the ground. It should be as short as possible with no kinks (this may cause water to condense inside the hose).

Electrical connection



The compressor comes with a plug containing an appropriate protective contact (ground.) Adhere to local electrical regulations. The voltage and frequency of the mains must comply with the specifications on the data label.



The electrical cord must not be stressed or have any tension exerted upon it, and must always be free.

- The socket must be accessible for safety reasons so that the equipment can be safely disconnected from the power supply in case of an emergency.
- The relevant current circuit must be protected.
- Connection of the ground connection (7) to other equipment must adhere to local electrical regulations.
- Fasten the electrical cord through the holder (6).

First operation

- Make sure that the stabilizing screws used during transport were removed.
- Check that the connection to the compressed air supply is correct.
- Check for proper connection to the main power supply.
- Switch on the pressure switch (5) to position "I".

The compressor will be operational once it is put into operation.

During equipment operation condensed water is released from the compressed air circuit through the automatic separator in the filter and drained to the evaporation tank.

Adjusting the output air pressure

The manufacturer has pre-set the output air pressure to 3 bar. If needed the output air pressure can be adjusted by turning the handle on the pressure regulator (2). The safety cover (15) must be removed before adjusting the output pressure. Push up the regulator knob and adjust the setting; once set, push it back down to secure its position. Reinstall the safety cover!



The maximum allowed output air pressure is 3.5 bar. Damage to respiration equipment may occur at higher outlet air pressures due to the presence of condensed water in the compressed air exiting the equipment.

OPERATION



In case of emergency, switch the equipment off at the switch and pull out the main power plug.

Switching the compressor on

The compressor is switched on at the main power switch (1) by putting it in position "I".

Running the compressor

The compressor runs permanently once switched on. Condensed water removed from the compressed air evaporates from the evaporation tank back into the surrounding environment. The pressure gauge displays the outlet air pressure.

Cleaning the compressor

To clean the compressor, use a detergent that contains no abrasives, chemical solvents or other corrosive agents.

MAINTENANCE

5. MAINTENANCE

REPAIRS AND SERVICE

Warranty and extended warranty repairs are to be completed by the manufacturer or a service provider authorized by the manufacturer.

The manufacturer reserves the right to modify the equipment in any way that will not alter the function or the operation of the equipment.

Only a qualified technician or the Customer Service Department of the manufacturer may perform repairs that go beyond routine maintenance. Use only spare parts and accessories approved by the manufacturer.



Prior to any maintenance or repairs, switch off the compressor and disconnect it from the mains (pull out the main power plug).

Cover removal

- Remove the four screws from the side of the equipment.
- Remove the cover
- Disconnect the grounding conductor
- Reassemble using the opposite order

MAINTENANCE SCHEDULE

Notice!

The operating entity is obliged to ensure that all tests of the equipment are carried out repeatedly at least once within every 24 months (EN 62353) or in intervals as specified by the applicable national legal regulations. A report must be prepared on the results of the tests (e.g.: according to EN 62353, Annex G), including the measurement methods used.

Maintenance	Page	Time interval	To be performed by
Replace filters in filter	14	Every 4000 hours	Qualified expert
Test the tightness of joints and inspect the equipment	13	After two years	Qualified expert
Replace piston complete with piston rings, O-rings and bearing	Service documentation	Every 8000 hours	Qualified expert
Replace suction filter	14	Every 8000 hours	Qualified expert
Perform "Repeated Test" according to EN 62353	12	1 x 2 years	Qualified expert

Checking tightness of joints and inspecting the equipment

Test for leakage:

- Disconnect the outlet hose from the quick coupling OUT (1); compressed air consumption will stop.
- Switch off the compressor
- Use soapy water to check for leaks in connections
- Tighten or re-seal joints as necessary.

Inspect the equipment:

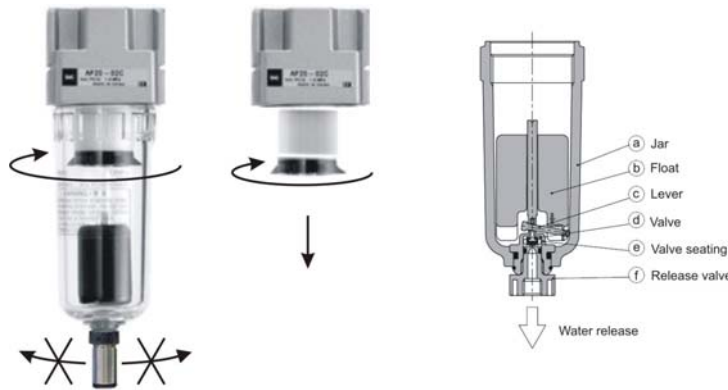
- Check the status of the compressor motor for balanced operation or noise.
- Check the condition of the hangers above the pump.
- Check fan functionality.
- Check the working pressure values. Make sure the control knob on the pressure regulator (2) and the relief valve (11) are securely closed. The knob must be pulled up before setting the pressure or pushed down once the pressure has been set. Turn the pressure regulator (2) knob in the (+) direction until its maximum position is reached. Turn on the compressor and set the air consumption to around 10 L/min. Check the working pressure on the pressure gauge is at 5 bar; if this value needs to be changed, adjust the pressure using the knob on the relief valve (11). Turn this knob (2) to set the output pressure (normally 3 bar) at consumption of around 10 L/min.
- Check the condition of filter (12). With regular operation, condensate drains automatically. Verify this function by comparing the level of condensate in the tank to the scale line indicating the maximum level. If the level of condensate is above the scale line, replace the faulty parts.
- Examine the pump for:
 - Defects in the crankcase
 - Free movement of the crank shaft
- If necessary, replace any faulty parts.

MAINTENANCE

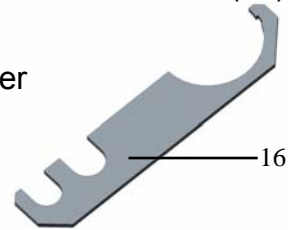
Replacing filter elements



Prior to servicing the equipment, reduce the pressure to zero and disconnect the equipment from the main power supply.



- Unscrew the cover and pull it out using the enclosed wrench (16).
- Unscrew the filter holder.
- Replace the filter and screw the filter holder into place.
- Screw the cover back in place.



Spare filtration pad:

Plastic (5 µm) (12) AF20P-060S

Item 025200113

If the water release system becomes clogged, disassemble the release valve (f), clean the outlet, remove the float (b) with a lever mechanism (c, d, and e) from the tank, clean all components with a soap solution and then reassemble.

Changing suction filter elements

- Raise the clasps on the cover (9) and remove the cover.
- Replace the filter element. Filters that are only slightly dirty can be cleaned using compressed air. Filters can be washed.
- Reposition the cover.

Replacement parts:

Suction filter 03 POLYESTER, No. 025200126

Securing the equipment before transport

The equipment must be secured before any type of transport. Proceed using the opposite order of the procedure shown in Chapter 4 in the section for releasing the compressor.

SHUTDOWN

If the compressor is not going to be used for a long period of time, disconnected it from the main power supply and release the pressure.

EQUIPMENT DISPOSAL

- Disconnect the equipment from the main power supply.
- Release the pressure.
- Dispose of the equipment according to local regulations.
- Parts used in this product have no negative impact on the environment when disposed of properly.

TROUBLESHOOTING

6. TROUBLESHOOTING



Prior to servicing the equipment, reduce the pressure to zero and disconnect the equipment from the main power supply.

Only trained service personnel can perform the activities listed in the troubleshooting guide.

FAILURE	POTENTIAL CAUSE	SOLVING COMMON PROBLEMS
Compressor does not start	Problem with electrical power source	Main breaker is off
		Check voltage in socket
		Check fuses – replace faulty fuse
		Loosen terminal – tighten it
		Check the electrical cord - replace defective cord
	Damaged motor winding, damaged thermal protection	Replace the motor
	Capacitor failure	Replace capacitor
	Seized piston or other rotating part	Replace damaged parts
Low compressor performance	Incorrect working or output pressure settings	Adjust to stipulated pressure
	Air leak in compressed air distribution system	Check compressed air distribution system – seal loose joint
	Excessive air consumption	Do not exceed maximum flow (see Technical Data)
	Worn piston rings	Replace worn piston rings
	Plugged suction filter element	Replace contaminated element
	Plugged filter element	Replace contaminated element
Low compressor output pressure	Incorrect working or output pressure settings	Adjust to stipulated pressure
	Air leak in compressed air distribution system	Check compressed air distribution system – seal loose joint
	Excessive air consumption	Do not exceed maximum flow (see Technical Data)
	Worn piston assembly	Replace the piston assembly
	Plugged suction filter element	Replace contaminated element
	Plugged filter element	Replace contaminated element
Motor has stopped - thermal motor protection has tripped	Ventilation openings are covered	Uncover ventilation openings
	Cooling fans are not working	Replace the defective fan
	Equipment is hot, space is not ventilated	Secure suitable conditions
	Seized piston or other rotating part	Replace damaged parts
Compressor is noisy (knocking, metal noises)	Damaged piston bearing, piston rod, motor bearing	Replace damaged bearing
	Failed (cracked) hanger spring	Replace the damaged hanger
Water leaking from outlet	Hose from the equipment is too long or on the ground	Shorten the hose
	Malfunctioning filter float system	Clean or replace float system
	Incorrect working or output pressure settings	Adjust to stipulated pressure
	Excessive air consumption	Do not exceed maximum flow (see Technical Data)

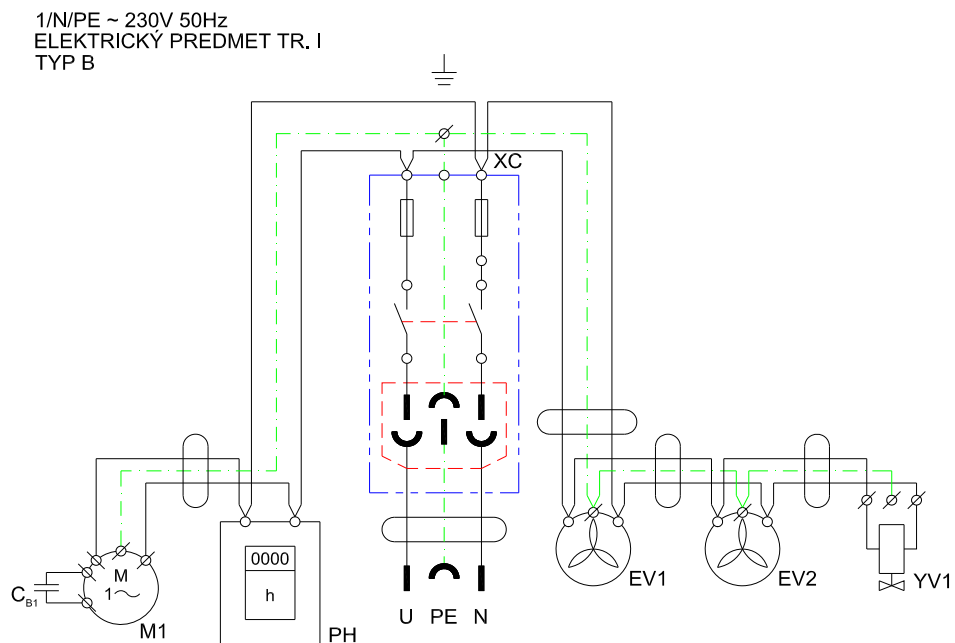
7. SPARE PARTS

• Filtration elements		AF20P-060S	025200113
• Fuse			
version	230V	T6.3A	038100004
• Insertion	DISS	1160-A	024000261
• suction filter	03 POLYESTER		025200126

ELECTRIC AND PNEUMATIC DIAGRAMS

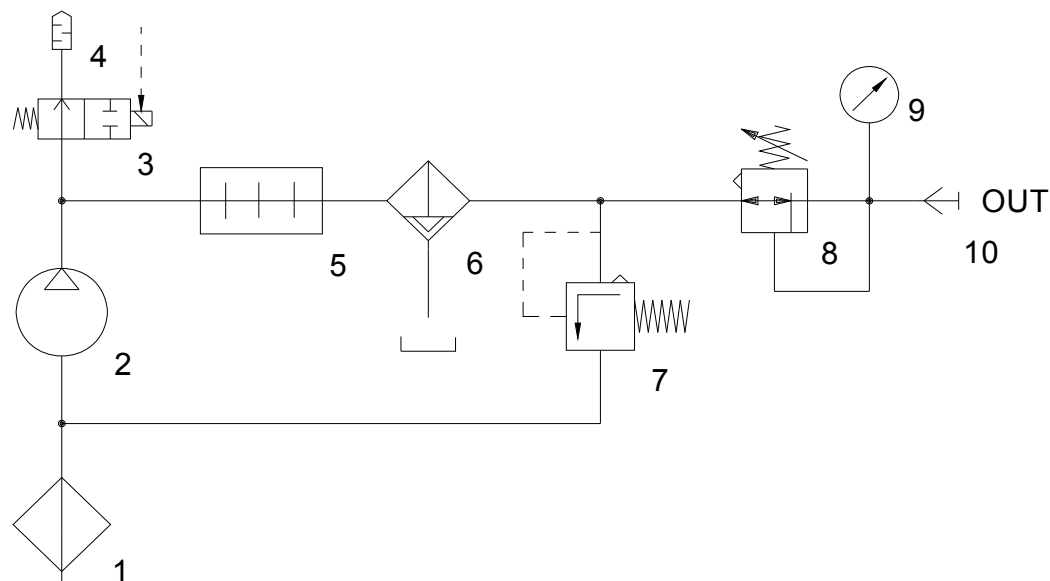
8. ELECTRIC AND PNEUMATIC DIAGRAMS

WIRING DIAGRAM



EV1, EV2	Fan
YV1	Solenoid valve
M1	Elektric motor
Cb1	Capacitor
PH1	Hour counter

PNEUMATIC DIAGRAM



1. Suction filter
2. Compressor
3. Solenoid valve
4. Noise muffler
5. Cooler
6. Filter with condensate separator
7. Safety valve
8. Pressure regulator
9. Pressure gauge
10. Compressed air outlet

DK50 DE



PRODUCENT:
ПРОИЗВОДИТЕЛЬ:
HERSTELLER:
VÝROBCA:

EKOM spol. s r.o.
Priemyselná 5031/18
921 01 PIEŠŤANY
Slovenská republika
tel.: +421 33 7967255
fax: +421 33 7967223
e-mail: ekom@ekom.sk
www.ekom.sk