OIL- FREE

AIR FOR LIFE

invent DK50 DI

INSTRUCTIONS FOR USE

EN

ekom®

MEDICAL COMPRESSOR | **DK50 DI**

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CONTENTS

1. GENERAL INFORMATION

INTENDED USE

The DK50 DI medical air compressor is indicated for supplying compressed air for medical ventilators.

OPERATOR'S RESPONSIBILITY FOR PATIENT SAFETY

This manual 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
USA Federal law restrict this device to sale by or on the order of a physician.

MARKINGS

Products marked with the TÜV Rheinland C US certification mark comply with all regulations in the United States of America and Canada.

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 this manual.
- This 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 anaesthetics.
- Never feed oxygen or nitrous oxide into the compressor. Compressor components are not approved for oxygen or nitrous oxide use.

Electrical system safety warnings

- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
- 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.

WARNING NOTICES AND SYMBOLS

The following symbols are used for important information in this manual and on packaging and the product:


General warning


Caution, risk of electric shock


Refer to instruction manual


Certification mark for the EU


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


Ground connection


Alternating current


Fuse


Never dispose of the battery with common household waste


Manufacturer

IP21 Device is protected against touch by fingers and water condensation

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.

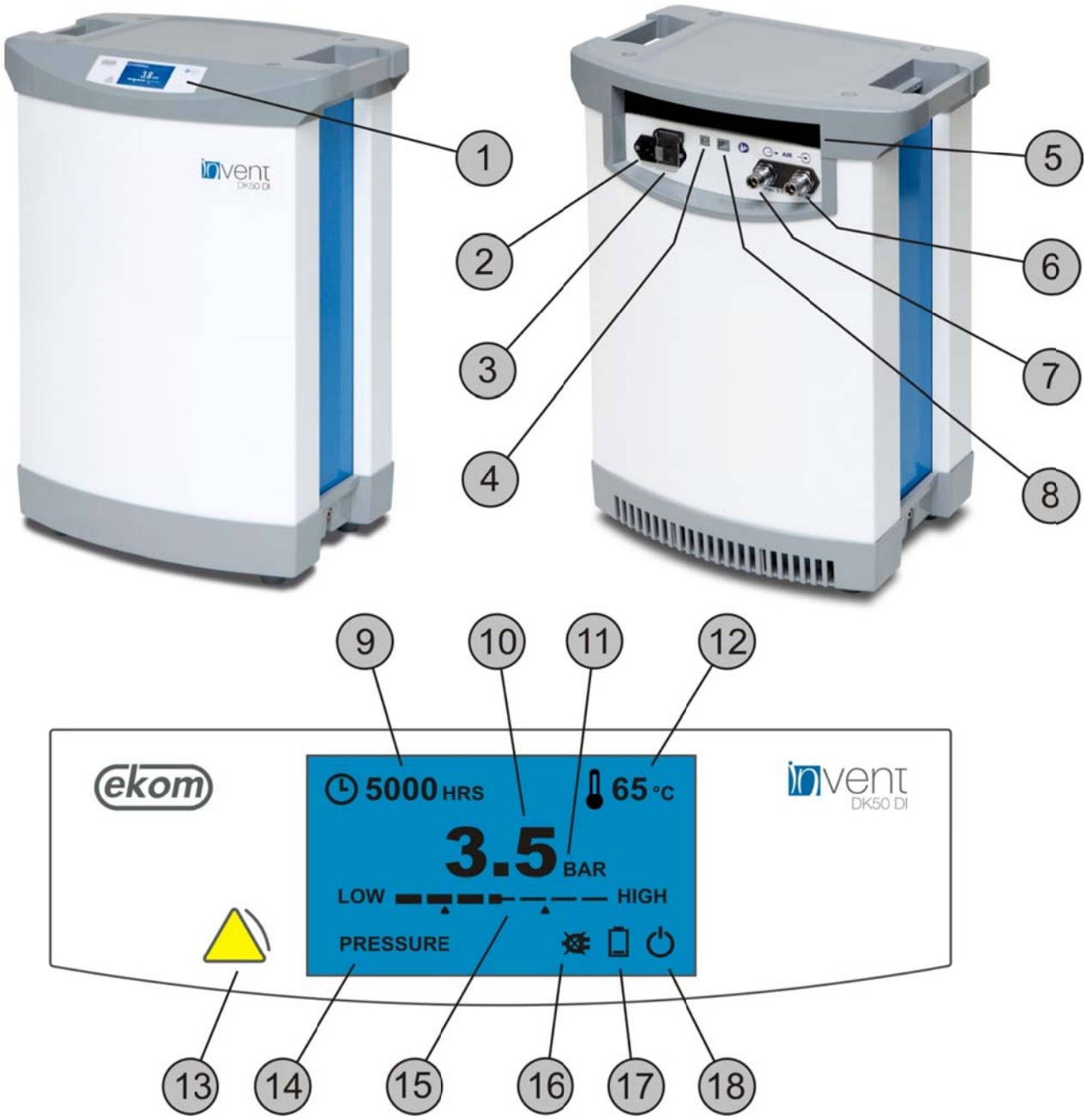
Protect the compressor from humidity, contamination and extreme temperatures during transport and storage. A compressor in its original packaging should be stored in a warm, dry and dust-free area.

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

Before moving or transporting the compressor, the pressure in the air tank and hoses must be released.

Prior to transport it is necessary to secure the motor inside the compressor (Chapter 4.)

2. EQUIPMENT DESCRIPTION



1. Display unit
2. Fused power cord connector
3. Power switch
4. USB port
5. Inlet filter
6. Air inlet from the external source
7. Air outlet
8. Ethernet port
9. Total operating hours
10. Output pressure
11. Pressure units bar / psi
12. Internal temperature
13. Signal indicator
14. Signal / service description (low pressure, high pressure, mains, temperature, service)
15. Pressure indicator
16. Loss of power
17. Battery indicator
18. Power / standby indicator

DISPLAY UNIT

NORMAL DISPLAY

Output pressure indicator

During normal operation the pressure displayed on the graphical bar occur between the pressure limits, symbols ▲▲ below the graphical bar.

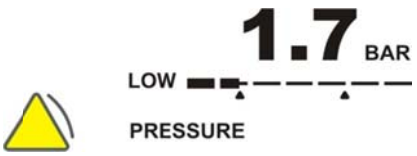
Default pressure units are **BAR**. Change of units to **PSI** is available. To change settings contact your service representative.

Total operating hours indicator

Power / standby indicator

In run mode, the symbol permanently displayed.
In stand-by mode, the symbol flashed.

SIGNALS



Low pressure

Signal is active, until the pressure is below the low pressure limit.

Default value is 1,7 bar. Change of value is available. To change settings contact your service representative.

High pressure

Signal is active, until the pressure is above the high pressure limit.

Default value is 5,0 bar. Change of value is available. To change settings contact your service representative.

High temperature

Signal is active if internal temperature rise above 65°C.

Loss of power

The signal is activated after a power loss. The device automatically turns off after 5 minutes signal duration.

SERVICE INDICATIONS

SERVICE 500

Indication of on-coming periodic maintenance

Message is permanently displayed. Digit indicates how many hours remain to the prescribed service action. To ensure preventive maintenance contact your service representative in time.

SERVICE

Indication of necessity realize periodic maintenance

Message flashed. It is necessary to perform periodic maintenance. Contact your service representative.

Battery indicator

If the symbol is displayed, the battery needs replacing. Contact your service representative.

FEATURES

AUTO OFF — **Switching to standby**

sufficient pressure in the central air distribution (default more than 2,5 bar)

AUTO ON — **Switching to run**

insufficient pressure in the central air distribution (default less than 2,2 bar)

POWER SAVE — **Switching to standby**

air consumption is for some time very low or null

FULL OFF — **Shutdown**

after 5 minutes without power supply

FUNCTION

Description

The DK50 DI medical compressor is a portable air compressor designed to supply air to medical ventilators. Optional equipment is stand. Assembly compressor with stand is a mobile device. Integrated oil-free piston pump continuously compresses air, which is then cooled, filtered and dried. The compressed air is fed into an internal tank with a defined pressure range.

Backup compressed air source

The equipment is connected to the central air distribution line of hospital and medical ventilator is connected to the outlet air connector of device. Compressed air in the central distribution line is measured by the pressure sensor. The compressor remains in STANDBY mode when the pressure level is sufficient. If the pressure drops, the controller automatically starts up the compressor.

Primary compressed air source

The compressor continuously supplies compressed air for use with the medical ventilator if not connected to a central compressed air line.

Warning:

The user is obliged to secure a suitable backup compressed air source if compressed air deliveries from the compressor are interrupted. The manufacturer cannot assume any liability for any damages that occur in connection with an interruption of compressed air deliveries to a patient.

3. TECHNICAL DATA

TYPE		DK50 DI		
Article number		430700A19-010	430700B19-010	430700019-010
Nominal voltage Frequency Current	V Hz A	100 50 / 60 7.1	120 60 6.0	230 50 / 60 2.8
Output flow (FAD) Output pressure		55 LPM 3 bar / 43.5 psi	55 LPM 3.5 bar / 50.8 psi	
Output flow (FAD)* Output pressure *		-	40 LPM 4.0 bar / 58 psi	
Peak flow without pressure drop below1.7 bar (25 psi)		180LPM@0.5sec		
Outlet connection		DISS 1160-A (3/4"-16 UNF) optional NIST (EN 739)		
Air filtration	µm	0.01		
Dew point depression		□10 °C		
Noise level	dB(A)	□ 48		
Operating mode		Continuous - S1		
Draining of condensate water		Maintenance-free		
Cut-in pressure		2.2 bar / 31.9 psi		
Cut-off pressure		2.5 bar / 36.3 psi		
Low pressure signal		1.7 bar / 24.7 psi		
High pressure signal		5.0 bar / 72.5 psi		
High temperature signal		65 °C / 149 °F		
Signal on loss of power		yes		
Battery indicator		yes		
Maintenance indicator	hrs	5,000		
Air tank capacity	L	2		
Service connection port		USB B		
Dimensions Dimensions with trolley	W x L x H	365 x 305 x 595 mm / 14.4 x 12.0 x 23.4 in 550 x 555 x 1150 mm / 21.7 x 21.9 x 45.3 in		
Net weight		30 kg / 66 lbs		
Configuration pursuant to IEC 60601-1:2005, ANSI/AAMI ES60601-1:2005, CAN/CSA 22.2 No. 60601-1:2008		Class I.		
Classification pursuant to MDD 93/42 EEC, 2007/47 EC		II b		

*) Consult factory

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 100% (with condensation)

Climatic conditions for operation
Temperature +10°C to +40°C (+50°F to +104°F)
Atmosferic pressure 680 hPa to 1080 hPa
Relative air humidity 10% to +95%

IP21 Rating

Output flow correction for differences in elevation

Output flow correction table

Elevation [mamsl]	0 - 1500	1501 - 2500	2501 - 3500
Output flow [l/min]	FAD x 1	FAD x 0.8	FAD x 0.71

FAD efficiency refers to conditions at an elevation of 0 mamsl:
Temperature: 20°C
Atmospheric pressure: 1013 hPa
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.

Prior to start-up must be unsecuring the air pump inside. If the compressor is switched on with securing the air pump, the device could be permanently damaged.

The compressor does not contain a backup power supply.

Never block the air intake filter on the backside or the vent outlets on the lower 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!

Unlocking of air pump

Before the first use it is necessary unlock the air pump inside to the normal position.

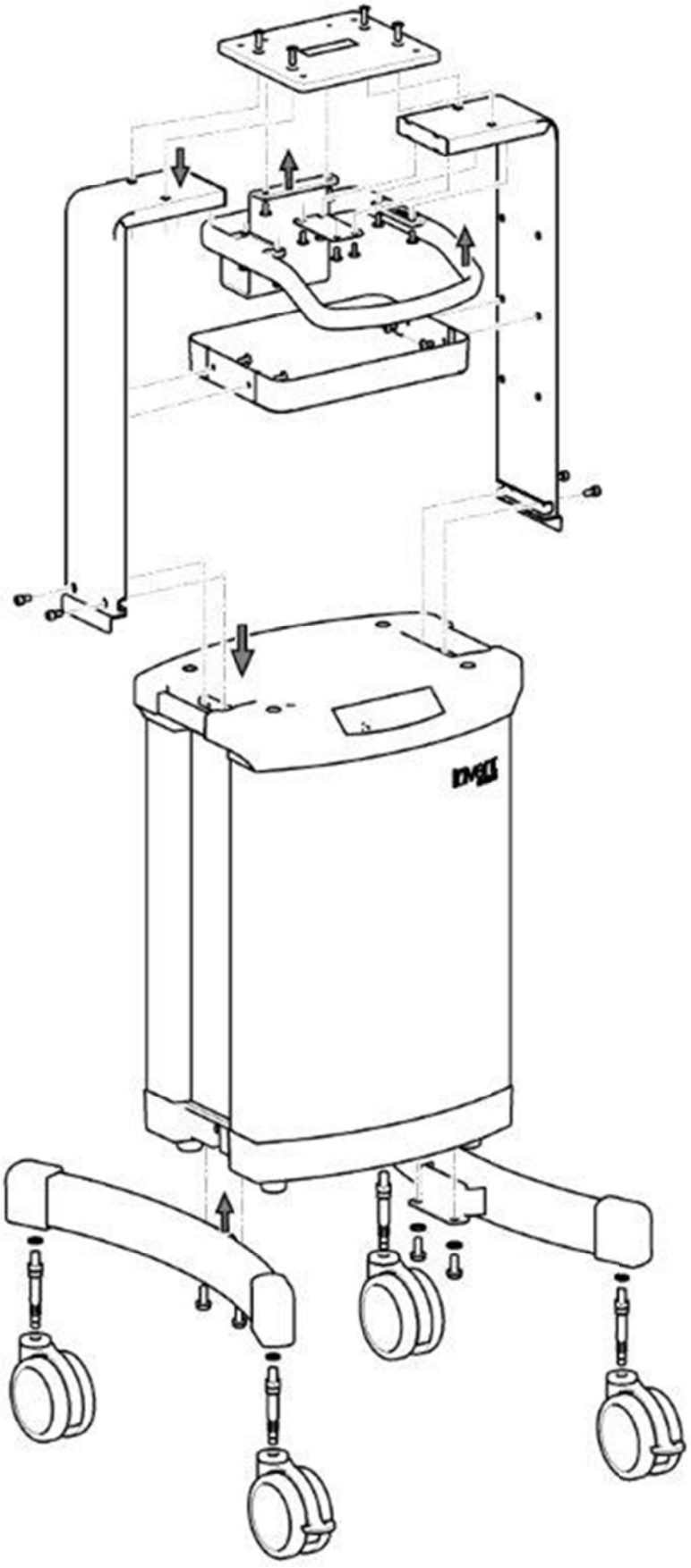
Unpack the device and place it on a flat floor.

Transport position
Air pump inside is locked, two red screws protruding out.

Normal position
Before use it is necessary unlock the air pump inside. Screw both screws inward using included wrench Nr. 5.

Before the later transport of device, it is necessary lock the air pump to the transport position.

Installation of trolley



The trolley allows mobile placement of the compressor and the medical ventilator with accessories.

The trolley can be configured according customer requirements. For a specific application consult manufacturer.

To install the stand you need keys no. 3, 4 and 5 for mounting cap screws and end wrench no. 15 for mounting the wheels. Keys and screws are enclosed depending on range of delivery.

Maximal load-carrying capacity with load in the upper plate axis is 30kg.

The assessment of stability of the delivered assembly the part of which is trolley is the obligation of the assembly supplier. The manufacturer of the trolley bears no responsibility for damages caused by unreasonable load!

Compressed air connection

Air inlet (WALL)

Connect the compressed air line from the central distribution line to the WALL quick coupling - inlet compressed air (if a central air distribution line is available).

Air outlet (OUT)

Connect the pressure hose to the medical ventilator to the OUT quick coupling on the compressed air outlet.

Air from the central distribution system is automatically connected through the compressor to the OUT outlet port. In this configuration, the compressor serves as a backup source of compressed air. If the air pressure from the central distribution system is reduced, the compressor automatically switches on and there is no interruption in the supply of continuously pressurized air at the outlet of the compressor.

The maximum rated air pressure for the WALL quick coupling is 5.5 bar / 80 psi. Please note that the air supply from the central distribution line entering the compressor must be medical grade air (particulate size and moisture content). The compressor does not modify the air from the central distribution line.

The hose connecting the compressor to medical ventilator 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.

Communication port connections

Service connection

The USB-B port (4) may be used only for maintenance to set-up and service actions. These actions can be realised only by qualified expert.

First operation

- Make sure that the pump inside of device was unsecured.
- Check that the connection to the compressed air supply is correct.
- Check for proper connection to the main power supply. Before the equipment is plugged in, make sure that the voltage and frequency shown on the equipment are the same as provided by the power connection.
- Switch on the pressure switch to position “I”.

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 by putting it in position "I". The compressor operates in one of the following modes depending on the pressure in the central distribution line and on the consumption of compressed air:

STANDBY / indicator flashing - when pressure in the central compressed air line is sufficient and the power switch is on, the compressor is in standby mode. The equipment functions as a backup compressed air source, monitoring the pressure in the central compressed air line, with the compressor coming online if the pressure drops to a pre-set level.

RUN / indicator permanently displayed - the compressor operates at low pressure in the central compressed air line or if the equipment is not connected to a central compressed air line.

Running the compressor

The display shows the value of outlet pressure in BAR or PSI units. Change of units is available, contact your service representative.

Total operating hours indicator displaying total operating hours. For preventive maintenance hours see chapter Maintenance.

Operating signals

Low pressure. The signal is active when the equipment is started up until the compressor reaches the low pressure limit. The signal may be activated during operations due to a lack of seal in the compressed air section past the compressor, increased air consumption or an equipment fault. Call on an authorized maintenance service provider in the event of a fault.

High pressure. In the case of pressure rise above the high pressure limit indication flashes and the buzzer signal is activated. The air pump will be turned off until the pressure drops.

High temperature . If the temperature rise above 65°C indication flashes and the buzzer signal is activated. Check if the cooling of compressor is not restricted or ambient temperature is not too high.

Loss of power. In the case of loss of power symbol flashes and the buzzer signal is activated. Check the electricity supply. After 5 minutes, the signal is turned off.

Operators must quickly secure a backup air source for the patient in the event any of these signals activate during equipment operation.

Cleaning and replacing the air inlet filter

At least once a week take out and clean the inlet filter (5) located on the back side. Wash the filter in warm soapy water, rinse thoroughly and allow it to dry. Insert the clean filters so that the intake openings are completely covered by the filters.

Cleaning the compressor

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

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.

Manufacturer will make available on request information that will assist service personnel to repair of medical device.

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).

MAINTENANCE SCHEDULE

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
Clean air inlet filter	20	At least once a week	Staff
Preventive maintenance after 5,000 hrs (KIT DI 5K) - replacement of microfilter - cleaning of internal parts by compressed air - tightness inspection	Maintenance documentation	5,000 hours	Qualified technician
Preventive maintenance after 10,000 hrs (KIT DI 10K)	Maintenance documentation	10,000 hours	Qualified technician

Every 5,000 hours of operation must be carried out the preventive maintenance.

Indication of on-coming periodic maintenance

SERVICE 500 Message is permanently displayed. Digit indicates how many hours remain to the prescribed service action. To ensure preventive maintenance contact your service representative in time.

Indication of necessity realize periodic maintenance

SERVICE Message flashed. It is necessary to perform periodic maintenance. Contact your service representative.

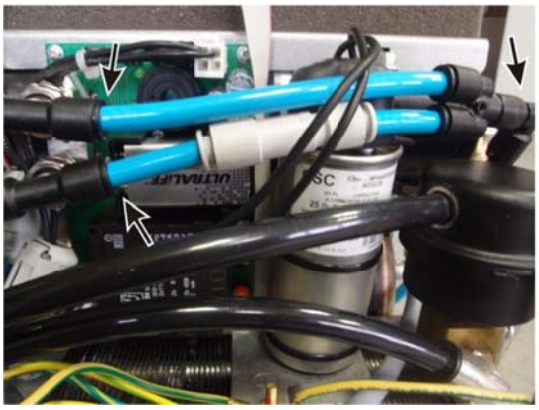
Battery indicator

If the symbol is permanently displayed, the battery needs replacing. Contact your service representative.

Replacing of battery

Battery may be changed only by service personnel.

- Disasemble pneumatic parts in three points marked in the picture and remove them.
- Remove used battery and then replace it with fresh battery. Use only original 9V Li-MnO2 non-rechargeable battery, article Nr. 031500034-000.
- Make sure the new battery is inserted in the correct direction with the “+” side top.
- Connect pneumatic parts in the correct position according the picture.



Safety valve check

Only allow the safety valve freely puff for a short period of time.

Check tightness of joints and inspect the equipment

Leakage test:

- Turn on the compressor
- Stop consumption of compressed air.
- If the pneumatic system does not leak, the compressor must at a short time (within 5 minutes) turn off.
- If the compressor is not turned off, the pneumatic system is leaking. Use soapy water to find the leaky joint. Start with the joints outside the case, and then test the ones inside the case after removing the covers.
- 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 condition of the filter. With regular operation, condensate from the filter drains automatically.
- Check the status of air pump
- If necessary, replace any faulty parts.

Replacing the suction filter

- Unlock the cover and pull it out.
- Replace the filter, see Chapter Maintenance materials
- Lock the cover

Replacing of air filter cartridge

- Unscrew the two screws on the service cover below the filter vessel, remove the cover.
- Remove the vessel and replace the filter cartridge, see Chapter Maintenance material.
- Screw the filter vessel, screw on the service cover.

Replacing of fuses

- The fuse failure is usually result by failure on the device. Before replacing a fuse, fix failure on device.
- Use a flat screwdriver to remove the fuse holder.
- Replace the broken fuse. Use the correct type and value, see Chapter Maintenance material.
- Put in the holder with fuses

Replacing of power supply cord

Device with a damaged power cord should not be used. Replace the defective power cord with a new one. Use the correct cord type, see the Chapter Maintenance material.

Maintenance materials

Inlet filter	061000544-000
Filter cartridge AAF 03528 cMP	025200294-000
Suction filter 05W POLYESTER	025200194-000
KIT DI 5K	604041142-000
KIT DI 10K	604041143-000
Battery 9V Li-MnO2 - Non-Rechargeable	031500034-000
Fuse T8A, 250V, model 100V a 120V	038100015-000
Fuse T6,3A, 250V, model 230V	038100004-000
Power supply cord CE, 6051.2094	034300074-000
Power supply cord CE, 6051.2003 black	034130034-000
Power supply cord UK, 6051.2008	034130035-000
Power supply cord US 120V, 6051.2095	034130075-000
Power supply cord US 230V, 6051.2001	034130033-000
Power supply cord AU 6051.2030	034130036-000
Power supply cord CN, 6051.2032	034130048-000

SHUT-DOWN

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

EQUIPMENT DISPOSAL

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

BATTERY DISPOSAL

No battery may be disposed with common household waste. Dispose of non-functional batteries at suitable collection sites.

6. TROUBLESHOOTING

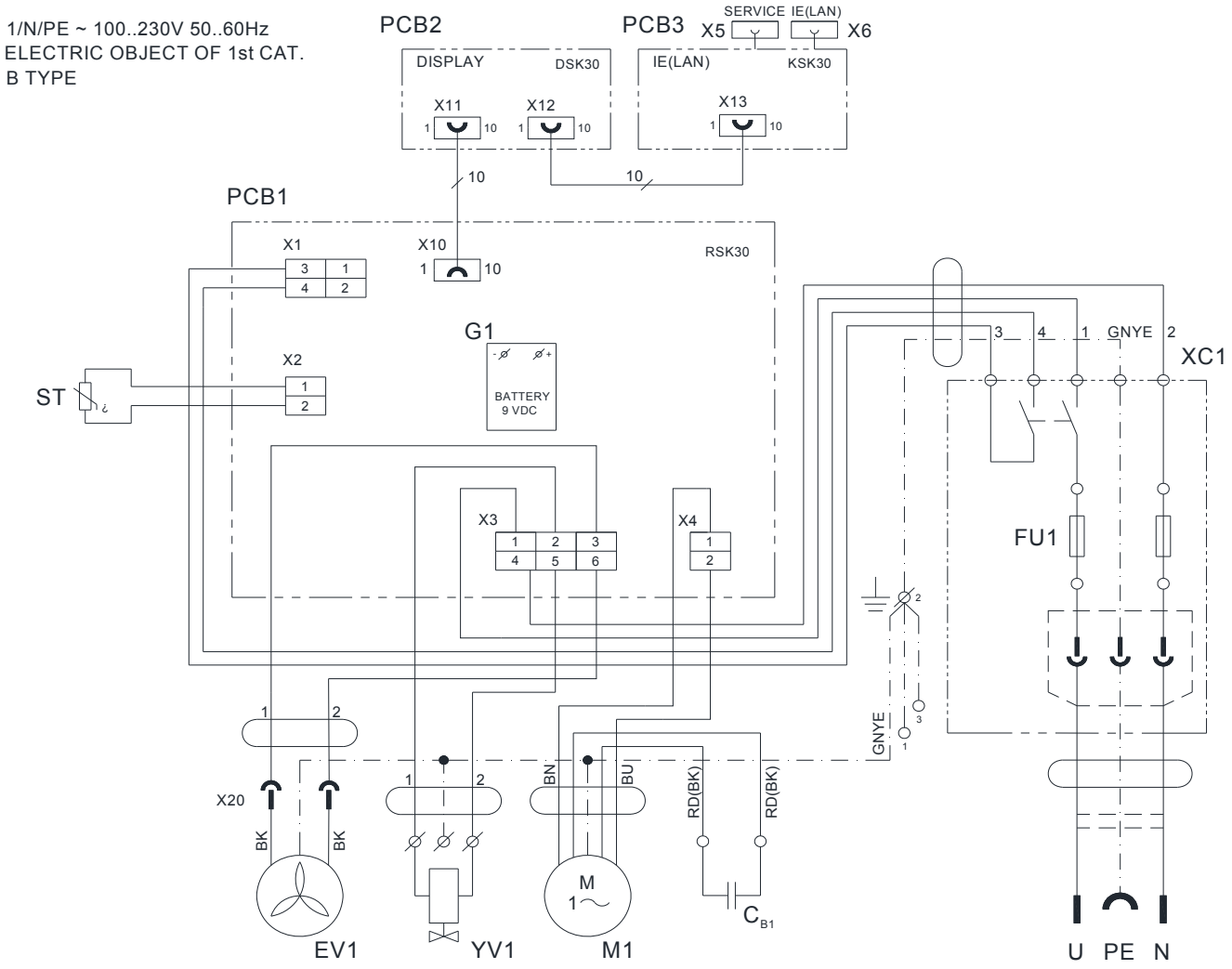
Prior to servicing the equipment, reduce the pressure in the air tank to zero and disconnect the equipment from the main power supply.

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

FAILURE	SYMPTOM, CAUSE	FIXES
Compressor is noisy	Motor was not unlocked	Unlock the motor inside of the device
	Mechanical or electrical fault	Contact maintenance
Compressor does not start	Switch not on	Turn on the switch
	Power loss signal	Connect the power plug to the outlet
		Check voltage in socket
		Check fuses – replace faulty fuse
		Check the electrical cord - replace defective cord
	Power indicator flashing. Compressor is in STANDBY mode	No output flow. Compressor starts after air consumption.
		Compressor starts once pressure in the WALL connection drops
	High temperature signal. Compressor is overheated	Allow the compressor to cool and ensure proper ventilation. Contact maintenance if the compressor does not restart
	Maintenance indicator	Contact maintenance
	Mechanical or electrical fault	Contact maintenance
Low pressure signal constantly on	Excessive air consumption	Adjust air consumption to compressor parameters
	Air can be heard leaking from the compressor	Replace any leaking components
	Suction filter is plugged	Contact maintenance
	Dryer filter dirty	Contact maintenance
	Air can be heard leaking from the compressor	Contact maintenance
	Compressor is noisy	Contact maintenance
	Mechanical or electrical fault	Contact maintenance
High temperature signal constantly on	High ambient temperature	Ensure a suitable environment
	Ventilation openings are covered	Ensure ventilation openings are open
	Intake filter is plugged	Clean or replace plugged filter
	Mechanical or electrical fault	Contact maintenance
Battery indicator constantly on	Defective battery	Contact maintenance
Maintenance indicator SERVICE flashed	Necessity realize periodic maintenance	Contact maintenance

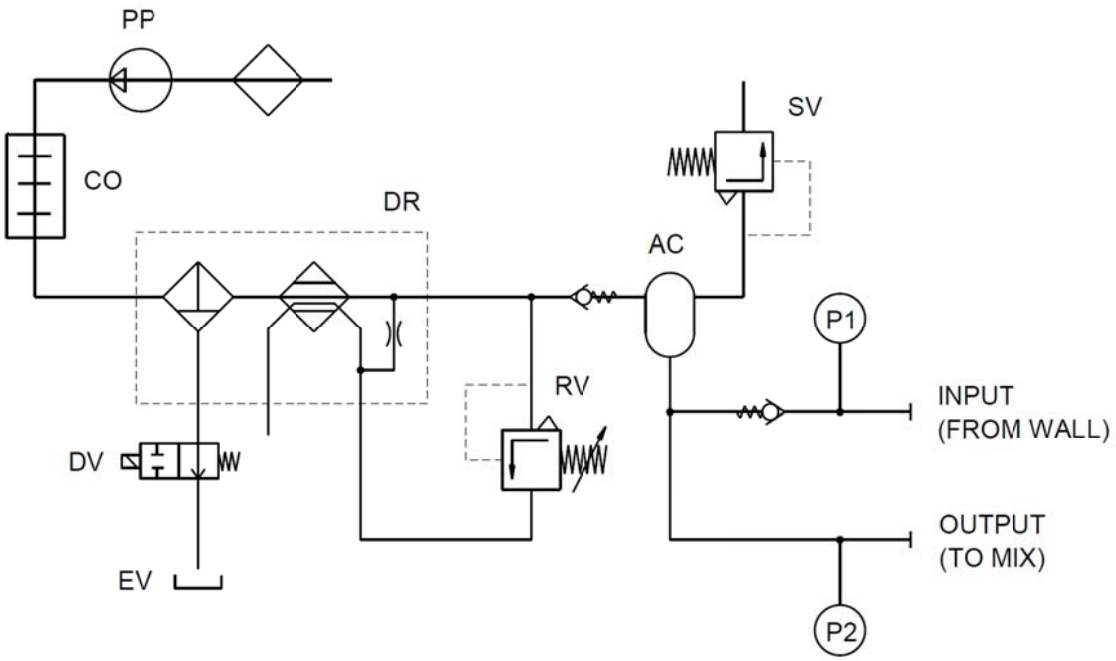
7. ELECTRIC AND PNEUMATIC DIAGRAMS

WIRING DIAGRAM



PCB - Printed circuit board
XC1 - Connector / Switch
FU1 - Fuses
CB1 - Capacitor
M1 - Motor
YV1 - Solenoid valve
EV1 - Fan
ST - Temperature sensor

PNEUMATIC DIAGRAM



CO	-	Cooler
PP	-	Pump
DR	-	Dryer
DV	-	Drain valve
EV	-	Evaporator
AC	-	Accumulator
RV	-	Relief valve
SV	-	Safety valve
P1, P2	-	Pressure sensors

8. GUIDANCE AND MANUFACTURER'S DECLARATIONS

Guidance and manufacturer's declaration - electromagnetic emissions		
The DK50 DI Compressor is intended for use in the electromagnetic environment specified below. The customer or the user of the DK50 DI Compressor should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The DK50 DI Compressor uses RF energy only for their internal functions. Therefore, the RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The DK50 DI Compressor is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	The device is not likely to cause any flicker, as the current flow is approx. constant after the start up.	

Guidance and manufacturer's declaration - electromagnetic immunity			
The DK50 DI Compressor is intended for use in the electromagnetic environment specified below. The customer or the user of the DK50 DI Compressor should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV 5 kHz repetition frequency Applied to mains connection	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV L-N ±2 kV L-PE; N-PE Applied to mains connection	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruption, and voltage variations on power supply input lines IEC 60601-4-11	< 5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (> 95% dip in U_T) for 5 s	< 5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (> 95% dip in U_T) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. The device stops and restarts automatically at each dip. In this case does not occur unacceptable pressure drop.
Power frequency (50/60 Hz) IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
NOTE: U_T is the A.C. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The DK50 DI Compressor is intended for use in the electromagnetic environment specified below. The customer or the user of the DK50 DI Compressor should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the DK50 DI Compressor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d=1,2\sqrt{P}$ $d=1,2\sqrt{P}$, 80 MHz to 800 MHz $d=2,3\sqrt{P}$, 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which theDK50 DI Compressor is used exceeds the applicable RF compliance level above, the DK50 DI Compressor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the DK50 DI Compressor. [b] Over the frequency range 150 kHz to 80 kHz, field strengths should be less than 3 V/m.			

MEDICAL COMPRESSOR

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