

Operating Instruction

Compressor Unit with Direct Current Motor

KC100 and KC200 Standard Version

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Additional documents:

- List of spare parts

1 Introduction

1.1 Compressor designation

These operation instructions are applicable for the following compressor. Please read these operating instructions carefully and completely to enable a safe operation.

Type	Machine no.	Notes

1.1.1 General notes

Inquiries of spare parts and their delivery, information for reparation or questions about technical issues of the compressor, can be processed only with the correct type or machine number.

If you did not purchase the compressor directly from the manufacturer, please first contact your distributor.

Additionally, it is prohibited to remove the appliance rating plate.

1.2 Usage of these operating instructions

These operating instructions are part of the product. The owner/ operator has to consider on own authority:

- Operating and maintenance staff has always access to these operating instructions.
- All advices and safety regulations have to be fulfilled during shutdown and operating.
- These operating instructions have to be retained for further utilization.

1.2.1 Copyright

The duplication of text, technical data, drawings or similar is prohibited and demands the agreement of the manufacturer. Technical changes at the compressor unit stay reserved for the manufacturer.

1.2.2 Symbols and notes

The following symbols and notes are used in this document. Read them carefully and follow them.



DANGER!

Cause and kind of danger – ***life-threatening personal injury***

- Steps to save yourself from a life-threatening situation



ATTENTION!

Cause and kind of danger – ***lower personal injury / damage to the machine***

- Steps to save yourself from injuries.



CAUTION!

Cause and kind of danger – ***damage to the machine***

- Steps to avoid damage to the machine



NOTE

Important information

Material ✓ Information about spare parts and supplies

Requirements ✓ Conditions to check out, before moving forward

2 Technical Information

2.1 Technical Data

2.1.1 Rating plate

Serial type, machine number and technical information are listed on the motor rating plate. Additionally, you can look up the serial type and machine number in the part 1.1 Compressor designation of this document.

2.1.2 Compressor data

Type		KC100	KC200
Max. operating pressure:	bar	10	10
Response pressure safety valve	bar	11	11
Cut-in pressure (Standard)	bar	7	7
Switch-off pressure (Standard)	bar	8 – 9	8 - 9
Inlet volume:	l/min	75	150
Effect. capacity 6 bar ² :	l/min	52	104

Factory pressure settings - customer specific settings can be different.

2.1.3 Motor data

KC100

Operating voltage	V DC	12	24	48	80	110
Motor rating	kW	0,5	0,5	0,53	0,53	0,53
Max. power consumption:	A	48	24	13	8	5,5
Rotation speed:	rpm	1500	1500	1500	1600	1600
Dimension (L x W x H):	mm	390x255x320			390x265x320	

KC200

Operating voltage	V DC	12	24	48	80	110
Motor rating	kW	1	1	1	1,2	1,2
Max. power consumption:	A	96	48	24	16	5,5
Rotation speed:	rpm	2400	2500	2500	2600	2600
Dimension (L x W x H):	mm	440x255x320			440x285x320	

2.1.4 General data

System of protection:	IP	66
Shielded:		Yes
Weight KC100:	kg	23
Weight KC200	kg	25
Sound power level LWA max.:	dB (A)	81
Sound pressure level L _{1m} max.:	dB (A)	71
Permissible ambient temperature without inbuilt antifreeze	°C	0 – 25 ¹
Permissible ambient temperature with inbuilt antifreeze	°C	-40 – 25 ¹

			Calculation
Permissible duty cycle ²	%	≤ 70	= $\frac{\text{pulse width (pulse active time)}}{\text{total period of operation}} \times 100$
Total period of operation	min	3 - 20	= Time of duty/ operation + time of stand by

Deviant conditions² will affect the compressors permissible duty cycle. It's the owners or operators' responsibility to check the local ambient conditions and adjust the permissible duty cycle by using self-organised tests

2.2 Technical description

The compressor unit with DC motor and control unit is a compact, powerful unit in block manner, which is composed of two main parts, the single cylinder – compressor and the DC motor as a drive source. Furthermore, we would like to mention following principal technical details that are integrated into the compressor and contribute to increased safety and functionality.

¹ A higher ambient temperature is possible, but demands a stronger cooling of the compressor.

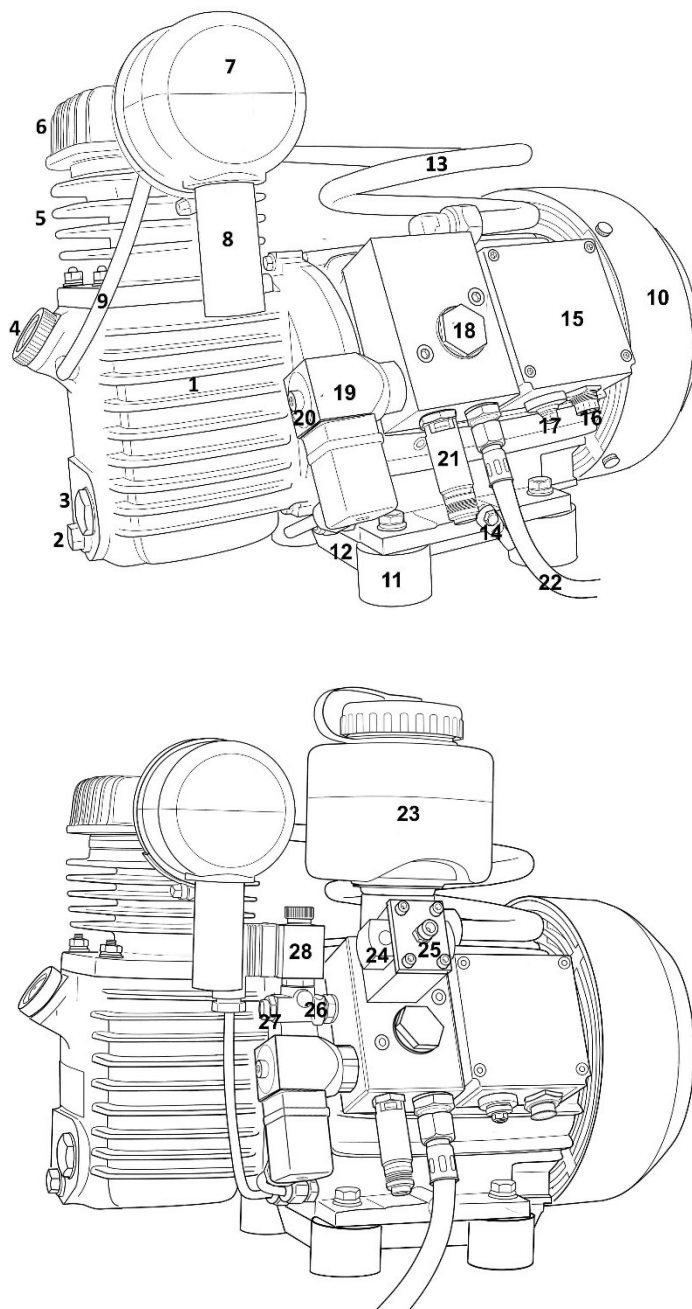
² Ambient temperature 20°C, rel. air humidity 30%, air pressure 1.013 mbar

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> ▪ General area: ▪ intake silencer with air filter ▪ tube cooler ▪ 4 rubber mounts for vibration damping ▪ compressed air tank/ pressure container (delivery on request) | <ul style="list-style-type: none"> ▪ Area control block: ▪ solenoid discharge valve³ ▪ non-return valve ▪ pressure switch ▪ safety valve ▪ inbuilt antifreeze system (delivery on request) ▪ silencer for the discharge air³ | <ul style="list-style-type: none"> ▪ Area electric machine: ▪ power relay ▪ interference suppression ▪ Thermal protection in motor winding ▪ Low voltage protection ▪ Independent and low control voltage ▪ Printed circuit board protects against false starting ▪ Restart lock (approx. 5 sec.) |
|---|---|---|

To ensure the electrical connection security and the corresponding control over the compressor, a control light outside the device signals the respective operating.

An integrated momentum balance in the engine reduces vibration and provides a quiet and low-wear run. For further noise reduction the compressor units are fixed on four rubber mounts

2.3 Component's account



	no.	description
Compressor block	1	Crankcase
	2	Oil drain screw
	3	Oil level gauge
	4	Oil filler neck
	5	Cylinder
	6	Cylinder head
	7	Air filter cap with air filter
	8	Intake silencer with foam sleeve filter
	9	Crankcase vent
DC-Motor	10	Fan cowl
	11	Rubber buffer
	12	Floor pan with circuit board
	13	Tube cooler
Junction box	14	12V/ 24V: Connection 30 – From 48V: (potential-free) ground connection
	15	Junction box cover
	16	4-pin socket for control cable
	17	12V/24V: connection 30 + from 48V DC: 2-pin connector
Control block	18	Non-return valve
	19	Pressure switch
	20	Pressure adjustment screw
	21	Safety valve
	22	Compressed air hose – connection G3/8"
	additional equipment for inbuilt antifreeze	
	23	Container for antifreeze
	24	Regulator/ slide to switch between summer and winter operating mode (amount of antifreeze)
	25	Dosing screw for antifreeze
	26	Solenoid valve
	27	Relief air silencer
	28	Solenoid coil

³ Compressor with inbuilt antifreeze only

3 Utilization & Responsibility



NOTE

This machine was released in immaculate condition and is only to be used as intended. All the information and safety regulations in these operating instructions must be observed and complied with.

3.1 Intended utilization

The compressor units with DC motor are designed for versatile applications in which a compressed air supply is needed to permanent disposition.

The compressor is provided solely for production of compressed air. Any other use is considered improper. The manufacturer is not responsible for any damages resulting from improper utilization.

Correct use includes also the compliance with the manufacturer's regulations of installation, operating and maintenance.

Use is only permitted within the performance limits and in accordance with the environmental conditions described.

3.2 Improper utilization

Wrong utilization can cause personal injury and property damage. Please consider the following notes:

Without additional air treatment compressed air from oil lubricated compressors is not suitable for:

- filling of breathing air devices/ for breathing air purposes
- the use in the dental field
- any direct contact with food.



DANGER!

Compressed air

- Compressed air must **never** be directed at people. The concentrated energy causes a life-threatening situation.



DANGER!

Explosion:

- The compressor unit must not be used in hazardous areas - it is **not** protected against explosions!

3.3 Owners' responsibility

3.3.1 Legal regulations and general information

In general, the laws, safety and accident prevention regulations applicable in the country of operation apply to the use of the compressor. The relevant legal regulations and recognized technical rules must be complied with during installation, maintenance and repairs.

For private use, the safety instructions in these operating instructions must be observed and complied with. In this case, and especially for all work on electrical components, we recommend advice and/or execution by qualified personnel in order to avoid personal injury and damage to property.

For the commercial use of the compressor, among other things, the regulations of the operational safety regulations also apply. (> test periods)

Appoint suitable personnel: Installation, maintenance and repairs on the compressor are only to be carried out by suitable specialist personnel (electricians). (With appropriate training and authorization.) The operating personnel are also instructed and trained in handling electrical and compressed air technology.

3.4 Environmental protection

The operating and auxiliary materials and replacement parts used in the operation of the compressor system must be disposed of in accordance with environmental protection regulations according to the country of operation.

4 Safety

The following list of safety instructions serves as an overview of possible sources of danger. More detailed and specific notes are described in these operating instructions in the corresponding text passages.

4.1 Possible sources of danger

Source of danger	Consequences	Recommended preventive measures
Electricity	Contact with live components can cause electric shock, burns or death	Work on electrical devices only by trained electricians or under their supervision
Compressed air	Releasing or leaking compressed air can cause life-threatening injuries	Depressurize all components completely. Refrain from mechanical changes to pressure leading components
Rotating parts	Contact with the rotating fan wheel can lead to serious injuries.	Only operate the machine with the fan cover. After maintenance and repair work, the fan cover must be screwed tightly back onto the engine.
Temperature	Touching hot components (cylinder head, tube cooler) can lead to injuries.	Avoid contact or wear protective clothing.
Noise	Noise pollution from the compressor block, at a short distance (< 1 m).	Wear ear protection. Only operate the compressor with the assembled silencer.
Supplies	Operating materials (oil, antifreeze) can cause damage to health.	Comply with the manufacturer's safety regulations. Avoid direct physical contact.



NOTE Protective equipment

For your own safety, suitable protective clothing must be worn when working on the compressor. Including: protective gloves, safety goggles, hearing protection, safety shoes, safe work clothing.



NOTE regarding remodeling and changes

Changes and conversions to the compressor can lead to unforeseen dangers. Unauthorized technical changes without consulting the manufacturer are not permitted.

In addition, it is recommended to consider the following:

- Open flames, naked lights, flying sparks and smoking are prohibited in the immediate vicinity of the compressor.
- It must be ensured that the compressor can suck in clean air without any harmful admixtures.
- It is forbidden to use the tube cooler as a carrying handle. This can lead to damages and thus to extreme loss of performance, that may cause injuries.

4.2 Applied safety signs

Safety sign	description
	Warning: hot surface – direct contact only with heat resistant gloves!

4.3 Safety devices



DANGER!

The compressor does not have any inbuilt EMERGENCY-SOP or anything similar – this lies in the owners' responsibility.

The compressor works as subassembly part inbuilt in other vehicles and machines and depends on their electrical safety devices.

- An EMERGENCY-STOP, that is connected to the compressor and stops its operation, has to be installed at the operating location.

The following factory-installed components enable safe handling:

- Safety valve: protects the compressor and the system against exceeding over the maximum permissible operating pressure.
- Non-return valve: Prevents compressed air from flowing back from the tank to the compressor
- Housing & Covers/ Fan Cover: Protect against contact with rotating or electrical components.

These elements must be checked regularly to ensure that they are working correctly. They may not be modified, removed or circumvented.

4.4 Ensure safety

The following safety instructions must be checked and complied with prior to any work on the compressor.



ATTENTION!

Failure to comply with the following measures/requirements can result in serious injury and damage:

4.4.1 General safety note

- Requirements*
- ✓ Ensure that no personnel work in the vehicle/on the machine.
 - ✓ All work has to be carried out only by authorized specialist personnel.

4.4.2 Work on electrical components

Please follow these requirements prior to all work on electrical components to avoid electric shock, burns or death:

- Requirements*
- ✓ Work on electrical components must only be carried out by authorized electricians.
 - ✓ Switch off/disconnect the mains voltage, ensure that it cannot be switched on again and check that there is no voltage.
 - ✓ Check that the potential-free contacts are free of voltage.

4.4.3 Work on the compressed air system

Compressed air and pressurized components can cause serious injury or death due to the forces released when opening or loosening. After switching off, the compressor is still under pressure from the compressed air network to the non-return valve. Depressurize the compressor!

All work on pressurized components must only be carried out by a specialist/at the manufacturer. (this applies to: safety valve, non-return valve, pressure switch, compressed air hose, solenoid valve)

- Requirements*
- ✓ Disconnect the machine from the compressed air network. (if necessary with shut-off valves)
 - ✓ Completely depressurize all pressurized components. (including draining the pressure vessel)
 - ✓ Check, that there is no pressure left, by using suitable measuring equipment (e.g. manometer)
 - ✓ The machine is out of order/ does not operate.
 - ✓ The power supply is switched off, secured against being switched on again and non-voltage-state has been checked.
 - ✓ Compressor has cooled down.

5 Installation and assembly

5.1 Safety instruction for the operating location



ATTENTION!

Disregarding the safety instructions can result in serious injury and damage.

- All instructions from the sections "utilization and responsibility" and "Safety" have been read and implemented.



DANGER!

Risk of explosion!

- **The compressor must not be operated in potentially explosive areas. The machine is not EX-protected**

The following references must be considered for a suitable location:

- Fire, naked flames and smoking are prohibited.
- Do not store combustible materials near the compressor.
- Keep suitable fire extinguisher ready for use.
- Comply with these required ambient conditions:
 - Permissible ambient temperature and humidity
 - Observe the composition of the ambient air, it must be clean, without any harmful components (dust, sand, chemical gases, ...)
 - No wet or damp environment

5.2 Mounting conditions



NOTE

The following installation conditions are important prerequisites for trouble-free operation of the compressor. Disregarding to follow these instructions can cause serious damage and lead to failure on the long term.

- ✓ The floor is level, firm and capable of bearing the weight.
- ✓ Compressor must be bolted firmly to the site.
- ✓ The supplied rubber buffers must be utilized for mounting.
- ✓ Enough cooling for the compressor part must be provided.
- ✓ When installing in a motor vehicle, the airstream must not work against the cooling direction. (Cooling direction acts from the fan cover to the compressor block)
- ✓ Ensure accessibility in order to carry out all work on the machine safely.
- ✓ The oil level gauge must be clearly visible.
- ✓ The supplied air must be clean and dry, without adding water or dirt. If necessary, supply air from another point using an elastic hose line

5.3 Connection to the compressed air network



DANGER!

Compressed air! – Compressed air and pressurized components can cause serious injury or death due to the forces released when opening or loosening.

- Safety instructions for working on the compressed air system must be applied. (Page 6, 4.4.3 Work on the compressed air system))

- Connection**
- Use a flexible compressed air hose line.
 - Lay the compressed air hose line with a slight incline towards the air tank.
 - The compressed air outlet on the compressor is below the control block via a double nipple, connection thread G3/8". A compressed air hose line for connection to the compressed air system is supplied ex works.

- Requirements**
- ✓ The compressor is mounted tightly to the operating location.
 - ✓ Compressor is out of operation and secured against being switched on again.

5.4 Connection to the power supply



DANGER!

Life danger due to electrical power!

- Comply with the safety regulations to work at electrical components (page 6, Work on electrical components)
- Fulfil the demanded safety measures in accordance with the legal regulations. (accident prevention regulations).

Information The type of current, voltage and polarity of the mains supply must match the information on the nameplate of the compressor.
The fuses installed in the compressor can be found in the spare parts list.

- Connection**
1. Loosen the contacts on the compressor.
 2. Select and lay out the cable cross-sections and fuses according to the table.
 3. Screw and check the contacts on the compressor. The tightening torque for the electrical connections is max. 3 Nm (KC100) or 10 Nm (KC200)

- Requirements**
- ✓ The compressor is mounted tightly to the operating location. .

Selection of the cable cross-sections and fuses for the motor connection:

Compressor type	Fuse Plus-connection	Cable cross-section with cable length < 1m	Cable cross-section with cable length > 1m
KC100/1.21 - 12 V	80 A	10,0 mm ²	16,0 mm ²
KC100/1.21 - 24 V	40 A	6,0 mm ²	10,0 mm ²
KC200/1.21 - 12 V	150 A	25,0 mm ²	35,0 mm ²
KC200/1.21 - 24 V	80 A	10,0 mm ²	16,0 mm ²
KC100/1.21 - 48 V	16 A	2,5 mm ²	4,0 mm ²
KC100/1.21 - 80 V	10 A	1,5 mm ²	2,5 mm ²
KC200/1.21 - 48 V	40 A	2,5 mm ²	4,0 mm ²
KC200/1.21 - 80 V	20 A	2,5 mm ²	4,0 mm ²
KC100/1.21 - 110 V	10 A	1,5 mm ²	2,5 mm ²
KC200/1.21 - 110 V	16 A	2,5 mm ²	2,5 mm ²



NOTE

The motor with integrated circuit board has an undervoltage protection and a time-delayed restart lock of approx. 10 seconds.
(Customer-specific changes are excluded.)

5.4.1 Under voltage protection

Trouble-free operation of the compressor requires an operating voltage in the range of -10% to +20% of the nominal voltage. The following faults occur if the operating voltage is not applied properly:

- The compressor does not turn on. = Operating voltage below 10% of the nominal voltage.
- The compressor switches off automatically. = Operating voltage below 25% of the nominal voltage.
- The compressor switches off automatically and can only be switched on again after the control switch has been switched off and after a waiting period of approx. 10 seconds. = brief interruption of the operating voltage or the control cable (loose contact).

5.5 Connection to the control switch



DANGER!

Life danger due to electrical power!

- Comply with the safety regulations to work at electrical components (page 6)

The supplied switch with indicator light is to be used to monitor the machine. In order to ensure safe operation of the compressor, the connection must be made according to the manufacturer's connection circuit or a compatible circuit confirmed by the manufacturer. Any change to the circuitry during the warranty period results in an immediate loss of warranty claims. (See chapter 10. Warranty)



NOTE

The compressor must be able to be switched off at any time!
The switch must be installed within the operator's field of vision.

The exact connection can be found in the connection diagram in the appendix.

Choose the cable cross-sections and fuses according to the following table.

	Fuse supply cable	Cross-section supply cable
61 (Green) supply control cable	2 A	0,75 mm ²
KK (yellow) compressor control	-	0,75 mm ²

5.5.1 Function of the control switch

Control switch type	Application	Control light does not glow	Control light glows with dark	Control light glows brightly
standard compressors KC100/1.21- ; KC200/1.21 – 12V/ 24V DC/ 48V DC (with control switch)	Set control switch in appropriate position	Compressor is out of order	Compressor operates without failure	Fault report – compressor shuts down
compressor with S2-circuit KC200/1.221 (with indicator light)	Without switch (only light)	Compressor operates without failure	-	Fault report – compressor shuts down
compressor 80V DC (with Siemens switch)	red on-/off-switch	Compressor is out of order	Compressor operates without failure	Fault report – compressor shuts down

5.5.2 Reasons for fault report of the control light

- Overtemperature - the motor switches off automatically and can only be switched on again after it has cooled down (approx. 45 minutes).
- Interruption of the main power supply cable or control cable (loose contact)
- Under voltage (page 8, 5.4.1 Under voltage protection)

After a fault or the indicator lamp lights up, the cause must be analyzed and rectified as quickly as possible so that major consequential damage can be avoided as a precaution.

6 Commissioning



ATTENTION!

Disregarding the safety instructions can result in serious injury and damage.

- All instructions from the sections "utilization and responsibility" and "Safety" have been read and implemented.
- All commissioning work must only be carried out by qualified specialist personnel.
- The machine is fully assembled and equipped with all attachments (fan hood!).

The following measure must be taken care of before commissioning.

Oil level check

Requirements ✓ The compressor is out of order.

Check The oil level can be checked at the oil level gauge on the compressor (page 3, 2.3 Component's account, no. 3)

Oil level within the mark (red circle): oil level is okay

Oil level above the mark: drain the excess amount of oil

Oil level at the lower edge of the mark/ below the mark: refill oil asap (page Fehler! Textmarke nicht definiert., Fehler! Verweisquelle konnte nicht gefunden werden. Refilling the oil Fehler! Verweisquelle konnte nicht gefunden werden.)

Cloudy oil within the oil level gauge: change the oil immediately (sign of unfavorable operating conditions – oil-water-mix) (page Fehler! Textmarke nicht definiert., Fehler! Verweisquelle konnte nicht gefunden werden. Changing the oil)

6.1 Start the compressor

Information Check the machine for malfunctions during the first hours of operation.

After approximately 50 hours of operation, check all electrical connections and check the compressor oil level.

Process Start the compressor:

1. Establish power supply. (Start the vehicle.)
2. Turn on the compressor with the supplied and connected control switch.
3. The control light indicates normal operation.
4. The compressor starts as soon as the mains pressure is lower than the preset switch-on pressure. (ca. 7 bar)

Stop the compressor:

1. Turn off the compressor with the supplied and connected control switch.
2. Interrupt the power supply and secure it against being switched on again.

Requirements ✓ All instructions for installation and assembly have been observed. (Page 6, 5 Installation and assembly)
✓ Nobody works at the compressor while its operating.

Result After the correct start, the compressor operates within two operation modes:

Load run: The compressor engine operates; the compressor block provides compressed air.

Ready to start/ idling engine: The compressor engine does not operate, no compressed air is supplied, the compressor is ready for operation.

The compressor switches automatically between these two operation modes due to the setting of the pressure switch. (Pressure switch controls the operation mode of the compressor)

Compressor does not work? ✓ Check the power supply at the engine. (Please consider the notes in the section of under voltage protection in this manual)
✓ Check the electrical connections and cable.
✓ Check the pressure setting of the pressure switch.
✓ Check the connection at the control switch.

6.2 Pressure settings

Information Depending on the compressed air demand, the compressor system is automatically controlled by a pressure switch. After turning on for the first time, the pressure switch switches the compressor on and off according to the set pressure limits. (See table of pressure switch setting, below)

- Process**
1. Start the compressor.
 2. Adjust the pressure setting with the adjustment screw (Allen screw M5) at the pressure switch. The arrows at the pressure switch show the correct direction. (visible at the side view of the compressor)
 - Increase the switch-on pressure:
Turn the adjustment screw to the right (directed away from the compressor)
 - Increase the turn-off pressure:
Turn the adjustment screw to the left. (directed towards the compressor)
 3. Check the pressure setting.

- Requirements** ✓ The pressure switch is assembled at the compressor, or connected directly with the compressed air supply from the compressor.
 ✓ The compressor operates and the pressure switch is pressurized.

Equipment Manometer to check the pressure setting.



NOTE

The maximum operating pressure of 10 bar must not be exceeded.

The equipped safety valve reacts at an operating pressure of 11 bar and more to protect the compressor from damage. In this case, the pressure switch must be reset immediately according to the permissible pressure limits.

If the pressure switch pressure setting triggers the safety valve and the error is not rectified, the machine will go into permanent load operation. The consequences are considerable material damage to the compressor due to excessive demand on the components.

Factory pressure settings

max. operating pressure	turn-off pressure setting	Switch-on pressure setting
10 bar	8 – 9 bar	ca. 7 bar

6.3 Inbuilt antifreeze pump

Switching between summer and winter operation mode

Information The compressor unit is optionally equipped with an antifreeze pump, including an antifreeze container. The pump can be switched between winter and summer operation by changing the position of the pump slide. (Picture no. 24; page 3, 2.3 Component's account)

Process **Blue** – Winter mode: slide position to the right. blue point is visible.
Red – Summer mode: slide position to the left – red point is visible.

Requirements ✓ **Compressor is out of order/ turned off!**

Material commercially available antifreeze for compressor systems or compressed air and brake systems (e.g. Papan Sofro antifreeze), alternatively denatured alcohol is also possible.

Dosing the amount of antifreeze

Information The inbuilt antifreeze pump is set at the minimum flow rate of the antifreeze liquid. According to the weather conditions, the flow rate can be adjusted with the dosing screw (Allen screw M6) on the front. (Picture no. 25, page 3, 2.3 Component's account)

- Process**
1. Loosen the lock nut.
 2. Adjust the dosing screw (M6): The screw reacts very sensitive, only take a half turn stepwise. Turn the screw directed outside to increase the flow rate. Turn the screw directed inside to decrease the flow rate.
 3. Tighten the lock nut.
 4. Start the compressor and check the flow rate. It takes about 3 – 4 circles until the changed amount of antifreeze is set.

Requirements none

Material commercially available antifreeze for compressor systems or compressed air and brake systems (e.g. Papan Sofro antifreeze), alternatively denatured alcohol is also possible.

7 Maintenance



ATTENTION!

Disregarding the safety instructions can result in serious injury and damage.
➤ Alle notes regarding safety are implemented. (Page 6, 4.4 Ensure safety)

7.1 Regular maintenance

The table provides an overview of the required maintenance work. Work steps that can be carried out by the operator of the machine are described in more detail on the following pages. For all other maintenance work, a specialist company or the company KOCI must be contacted.

Maintenance work	Interval	Notes
Check oil level	At the latest every six months	
Oil change	Once a year, or after 500 hours	
Clean air filter/ foam sleeve	500 h	More often, if incoming air is polluted
Exchange air filter/ foam sleeve	At the latest after 2 years	More often, if incoming air is polluted
Check-up fan cover (its attachment and damage)	500 h	
general overhaul	10.000 h	in a specialist workshop/at the manufacturer
Clean cylinder head & valve plate	2.000 h, at the latest after 2 years	in a specialist workshop/at the manufacturer
Exchange ball bearings	After 10.000 h After 5.000 h At the latest after 3 years	During general overhaul at high ambient temperatures (40°C)
Clean inside of the DC motor	1.500 h	In a specialist workshop/ at the manufacturer; check carbon brushes
Check carbon brushes	1.500 h	During cleaning the inside of the DC motor
Release/ vent safety valve	occasionally	Prevents the valve seat from sticking
Drain the condensed water in the compressed air tank	Daily	

h = operation hours



NOTE

In the case of unfavorable operating conditions (high operating temperature, high number of load changes, heavily polluted intake air/dust, use outdoors, ...), maintenance work must be carried out more frequently.

7.2 Carrying out the maintenance work

The steps and instructions described below are for the care and maintenance of the compressor and must be read before commissioning. The associated maintenance intervals can be found in the table in the "Regular maintenance work" section above.

7.2.1 Oil level check

Check The oil level can be checked at the oil level gauge on the compressor (page 3, 2.3 Component's account, no. 3)

Oil level within the mark (red circle): oil level is okay

Oil level above the mark: drain the excess amount of oil

Oil level at the lower edge of the mark/ below the mark: refill oil asap!

Cloudy oil within the oil level gauge: change the oil immediately! (Sign of unfavorable operating conditions – oil-water-mix)

Requirements ✓ The compressor is out of order.

7.2.2 Refilling the oil

Process **Oil level at the lower edge of the mark/ below the mark:** refill oil asap!

1. Remove the oil filler neck.
2. Refill new oil up to the upper edge of the mark.
3. Check the oil filler neck seal.
4. Mount the oil filler neck.
5. Start the compressor, check the oil level after about 2 minutes and refill more oil, if necessary.
6. Turn off the compressor and check for any leakage.

Requirements ✓ The compressor is out of order.
✓ All the requirements for working on electrical components are complied with.
(Page 6, 4.4.2 Work on electrical components)
✓ The compressor has cooled down.

Material Motor oil SAE5W30



CAUTION!

Damage due to incompatible types of oil and contamination!

- Never mix different types of oil.
- Only refill the same type of oil, that is already in the compressor.
- Always use a sieve when refilling the oil, or the original can with integrates sieve.

7.2.3 Changing the oil

Process Drain the compressor oil:

1. Provide a container for the old oil.
2. Remove the oil drain plug and collect all the oil in the container.
3. Check the oil drain plug seal for damage and mount the oil drain plug.

Refill the compressor oil:

1. Fill in new oil up to the upper edge of the mark.
2. Check the oil filler neck seal and fit the oil filler neck.
3. Start the compressor, check the oil level after about 2 minutes and refill more oil, if necessary.
4. Turn of the compressor and check for any leakage.

- Requirements**
- ✓ The compressor is out of order.
 - ✓ The machine is at operating temperature.
 - ✓ All the requirements for working on electrical components are complied with.
(Page 6, 4.4.2 Work on electrical components)
 - ✓ All the requirements for working on compressed air system are complied with.
(Page 6, 4.4.3 Work on the compressed air system)

Material Motor oil SAE5W30
Container for the old oil



ATTENTION!

Risk of burns from hot components and hot compressor oil.

- Wear protective clothing (gloves & long sleeves).



NOTES

The used oil must be disposed of in accordance with the applicable environmental protection regulations.

7.2.4 Cleaning/ changing the air filter

- Process**
1. Remove the strap band (4).
 2. Remove the air filter cap (3).
 3. Take out the air filter (1) and foamed sleeve (2).
 4. Blow out the air filter (1) and foamed sleeve (2) carefully with compressors air.
 5. Clean the air filter cap (3) and sealing surfaces.
 6. Put in the air filter (1) and foamed sleeve (2) in the air filter cap (3) and place it back at the cylinder head (5).
 7. Fasten the strap band (4).
 8. Direct the intake opening of the air filter cap (3) towards the bottom.



- requirements**
- ✓ The compressor is out of order.
 - ✓ The machine has cooled down.
 - ✓ All the requirements for working on electrical components are complied with.
(Page 6, 4.4.2 Work on electrical components)

Material Compressed air
Replacement parts (if necessary)

7.2.5 Maintenance of the ball bearings and carbon brushes (DC motor)

Note Maintenance and repair work on the engine may only be carried out by trained specialist personnel or by the manufacturer.

The ball bearings are permanently lubricated. Relubrication is not required. In the course of an inspection and general overhaul, ball bearings, carbon brushes, commutator and carbon dust deposits must be checked.

- Requirements**
- ✓ The compressor is out of order.
 - ✓ The machine has cooled down.
 - ✓ All the requirements for working on electrical components are complied with.
(Page 6, 4.4.2 Work on electrical components)
 - ✓ All the requirements for working on compressed air system are complied with.
(Page 6, 4.4.3 Work on the compressed air system)

Material Replacement parts (ball bearings and carbon brushes, if necessary)

7.2.6 Check the safety valve

Information If the maximum permissible operating pressure (10 bar) in the pressure vessel is exceeded, the safety valve opens to protect the compressor system and the connected compressed air consumers and blows off the excess air. (at approx. 11 bar) The safety valve must be operated occasionally, but at least once a year, to prevent the valve seat from becoming stuck.
The knurled screw on the lower part of the valve must be closed during normal operation.

Process Turn the safety valve knurled screw counterclockwise until compressed air blows out. Then turn the knurled screw back again.

- requirements**
- ✓ The compressor was turned off during load run – the compressed air tank is under pressure.
 - ✓ All the requirements for working on electrical components are complied with.
(Page 6, 4.4.2 Work on electrical components)

Material Replacement part (if necessary)

The safety valve does not work? Defective safety valve must be replaced immediately by qualified personnel/ manufacturer.



ATTENTION!

Risk of burns from compressed air when blowing off the safety valve.
Hearing damage from noise when blowing off the safety valve.
➤ Wear hearing and eye protection.

7.2.7 Maintenance of the compressed air tank

Information The condensate that has accumulated in the pressure vessel must be drained daily through the condensate drain cock. Significant pressure losses can occur due to leaking pipe fittings. Occasional retightening of the pipe fittings is necessary to avoid leakage.

Material Container to collect the condensate



NOTE

In accordance with the applicable national regulations, pressure vessels must be checked at regular intervals.
The permissible wall thickness of the entire compressed air tank must not be undercut.

7.3 Fasteners and tightening torque

Size	Screw	Quantity	Place of use	Torque in Nm
M6x20	Stud screw	4	Cylinder	15
M6x40	Allen screw	4	Cylinder head	15
M8x65	Hex bolt + locking ring	1	Crank flange	30
M5x25	Stud screw	4	Bearing shield (crank case)	5
M5x25	Hex bolt	4	Bearing shield (fan side)	5
M6x16	Allen screw	1	Fan	3
M5x8	Button head screw	4	Fan cover	4
M5x40	Allen screw	2	Floor pan	2
M8x20	Hex bolt	4	Rubber buffer	20
M4x45	Allen screw	4	Junction box KC100	3
M4x75	Allen screw	4	Junction box KC200	5
M5x10	Hex bolt	1	E-connection -31 KC100	3
M8x20	Hex bolt	1	E-connection -31 KC200	10
M4x18	Allen screw	2	AF-container seat	
M4x60	Allen screw	4	FSMP-end plate	
M6x20	Allen screw	1	FSMP-dosing screw	

M12x1	Grub screw	1	FSMP-Dosierkolben	
G 1/2	Oil drain plug	1	Crank case	15
G 1/4	Oil level gauge	1	Crank case	2

AF... antifreeze

7.4 Performance check

The effective performance of the compressor can be checked by measuring the filling time:

- Process**
1. Turn off the compressor.
 2. Close the outlet of the compressed air tank.
 3. Blow off the tank pressure via the condensate drain cock and close it again.
 4. Switch on the compressor and at the same time measure and compare the filling time to a pressure according to the table.

Material Measuring equipment (stopwatch and manometer)

Approximate filling time in seconds for a 10 l compressed air tank with a constant voltage (1 V deviation is approx. 100 rpm):

Typ	3 bar	6 bar	8 bar	10 bar
KC100/1.21 - 12V/ 24V	30	60	90	120
KC100/1.21 - 48V/ 80V	28	55	80	115
KC200/1.21 - 12V/ 24V	20	35	50	65
KC200/1.21 - 48V/ 80V	20	35	50	65

8 Cause of malfunction and remedy



ATTENTION!

Disregarding the safety instructions can result in serious injury and damage.

➤ Alle notes regarding safety are implemented. (Page 6, 4.4 Ensure safety)

Failure	Possible reasons	remedy
Compressor does not start.	Motor is incorrectly connected	Check motor connection.
	The fuse has tripped and switched off the compressor.	Check motor connection and fuse. Fix the cause.
	Contacts in pressure switch defective.	Replace pressure switch.
	Circuit board defective.	Replace circuit board.
	Relay/ motor contactor defective.	Replace relay/motor contactor.
	Motor defective - bearing damage or winding damage.	Contact KOCI/ specialist workshop.
	Compressor block defective.	Contact KOCI/ specialist workshop.
Compressor starts with difficulty or slowly.	bearing damage	Contact KOCI/ specialist workshop.
	Pistons stuck due to lack of oil or wrong oil.	Check oil level, change oil if necessary.
	Oil level too high.	Check oil level, drain oil if necessary.
	Power supply failure.	Check power supply. Possibly the cable cross-section is too small. Wire corroded/ broken.
Compressor runs hot.	Ambient temperature too high.	Reduce ambient temperature/ cool more.
	Fan cannot suck in freely.	Make sure there is free air supply to the fan.
	Fan hood dirty/ no longer clear.	Clean fan cover and check regularly.
	Valve plate between cylinder head and cylinder leaking, dirty or damaged.	Contact KOCI/ specialist workshop
Compressor runs constantly, switch-off pressure is not reached.	Air filter dirty.	Clean or replace air filter.
	Valve plate between cylinder head and cylinder leaking, dirty or damaged.	Contact KOCI/ specialist workshop
	Compressor leakage.	Seal leaks. Replace components.
	Leakage losses in the compressed air system of the plant.	Check and seal possible leaks.
	Compressed air requirement higher than delivery quantity of the machine.	Use larger machine.

Failure	Possible reasons	remedy
	Check valve does not close.	Replace check valve.
	Solenoid discharge valve ⁴ does not close	Check coil, replace vent valve if necessary.
Motor switches off sometimes and can be switched on again after a short time.	Loose, corroded, or damaged connectors	Check compressor control and its supply.
	Undervoltage protection and restart lockout have been triggered. – Power supply too low	Check the electrical system in the vehicle! Switch off the control switch and switch it on again after approx. 10 seconds.
Compressor switches too often.	Compressed air tank filled with condensate.	Drain condensate.
	Pressure switch hysteresis too low.	Replace pressure switch.
ompressor switches on and off sporadically.	Pressure switch or its contacts defective.	Replace pressure switch
	Circuit board defective.	Replace circuit board.
Air escapes at the solenoid discharge valve during the rest period.	Vent valve does not close Magnetic coil is defective.	Replace solenoid discharge valve.
Air escapes at the non-return valve during the running time.	Non-return valve does not close.	Replace non-return valve
Whistling noises at the cylinder head.	Cylinder head screws loose. Seal defective.	Tighten screws. Replace gasket.
The safety valve blows off although the switch-off pressure has not yet been reached.	Valve seat dirty.	Check safety valve.
	Valve spring in safety valve defective.	Replace safety valve.
Piston rings worn out after a short time or damaged.	Polluted oil.	carry out an oil change. Clean air filter more regularly. Mount an air filter with a higher filter fineness.
Control lamp does not light up	Check fuse	Change fuse, bend fuse holder contacts
	no voltage from the alternator	Check alternator
	wrong connection	check the electrical system in the vehicle.
Control lamp lights up brightly	Undervoltage protection trips.	Check operating voltage at terminal 30 relay (+) against terminal 31 (-) on the motor If there is a voltage drop in the supply line, use a larger line cross-section.
	Interruption of the supply line or control line - Loose contact.	Check supply lines.
Control lamp lights up brightly. The motor gets very hot during prolonged operation, switches off and can only be switched on again after a longer waiting period (approx. 45 minutes).	Temperature sensor has triggered.	Ambient temperature is too high (max. 50°C) or insufficient cooling.
When the compressor has stopped, air escapes from the air filter cap.	Non-return valve dies not close.	Contact KOCI/ specialist workshop

If malfunctions occur, that are not listed above or if there is no remedy successful, please contact the manufacturer for advice. We are pleased to support.

⁴ Only compressor units equipped with inbuilt antifreeze.

9 Storage and transport

9.1 Storage



NOTE

Moisture leads to corrosion damage on the surfaces of the compressor block.
Frost can damage seals and valve membranes.

- Requirements*
- ✓ Moisture must not leak into the compressor.
 - ✓ Avoid condensation.
 - ✓ The storage temperature must not fall below 0°C.

Only store the machine in a dry and frost-free room.

9.2 Transport

To avoid damage during transport, the following instructions must be observed:

- The compressor must only be transported in an upright position.
- Fix it firmly on the four rubber pads.
- Use a wooden pallet for stability.
- No oil is allowed to escape from the compressor during transport.

10 Warranty

The warranty processing takes place on the legal basis of the German Civil Code. In addition, please note the following business guidelines:

- Warranty work is only carried out in the company's own workshop area, since the compressor is easy to transport.
- We reserve the right to determine how and by whom defects or damage are to be remedied.
- The warranty is limited exclusively to the compressor unit and includes material and manufacturing defects.
- Costs incurred as a consequence of the failure of the compressor are not covered.

We accept no liability for:

- Improper use (see chapter "Improper use")
- Improper operating conditions at the place of operation. (See chapter "Installation and commissioning")
- External interference by third parties within the warranty period.
- Unauthorized conversion and changes.
- Improper maintenance and repair.
- Burned windings or power switching relays, if these were destroyed by operation without undervoltage protection. (Customized changes)

Defects that are subject to natural wear and tear are not taken into account of warranty. Wear parts are:

- Pressure switch
- Air filter
- Fuses

Furthermore, the tube cooler is excluded from the warranty, if it was used as a carrying handle for a different purpose.

11 Conformity

Bezeichnung: Gleichstrom - Kompressoraggregat
(Description) (compressor unit with direct current motor)
Typ: KC 100 und KC 200
(Type) (KC100 and KC200)
Modell: 1.0 bis 1.5
(model) (1.0 – 1.5)

Manufacturer:



Zittauer Straße 12
DE-02796 Kurort Jonsdorf
Tel.: +49 35844/764400
info@elektromaschinen-koci.de
www.elektromaschinen-koci.de

EU-Konformitätserklärung (EC – Declaration of Conformity)

Hiermit erklären wir, dass die Maschinen/ Baueinheit: oben aufgeführt
(We declare the compliance of the product): mentioned above
folgenden einschlägigen Bestimmungen entspricht:
(with the following requirements):

EG – Richtlinien (EC – Directives):	EG – Maschinenrichtlinie 2006/42/EG (2006/42/EG-machine-directive)
	EG – Niederspannungsrichtlinie 2014/35/EU (2014/35/EU - low voltage directive)
	EG – Richtlinie 72/245/EWG, in der Fassung 2004/104/EG, zuletzt geändert durch 2009/19/EG für von Fahrzeugen verursachte Funkstörungen (elektromagnetische Verträglichkeit) - als EUB / elektrische Unterbaugruppe / DEKRA-Bescheinigung Nr.: 200614931 (72/245ECC – directive relating to the radio interference (electromagnetic compatibility) of vehicles)

HAMANN CONSULT AG Schallpegelmessung (sound level gauging)

UK – Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union
harmonisation legislation:

UK-Legislation	Supply of Machinery (Safety) Regulations 2008
	Electrical Equipment (Safety) Regulations 2016
	Electromagnetic Compatibility Regulations 2016

Person, die die technischen Unterlagen zur Verfügung stellt (Person in charge of technical documents): Frau Silke Koci

Kurort Jonsdorf, 12.07.2021

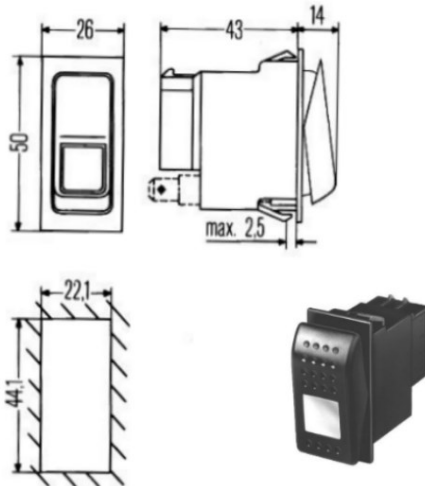

Koci, Silke - Geschäftsführerin (managing director)

12 Appendix

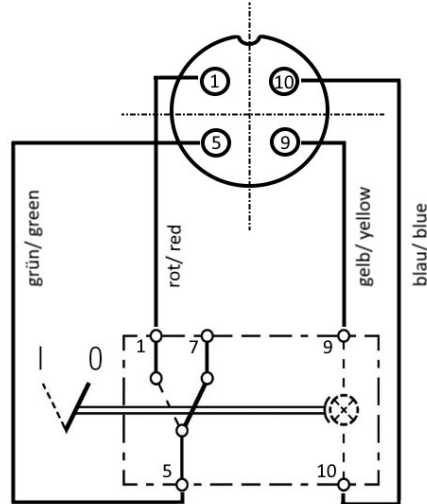
12.1 Connection of the control cable – all operating voltages

Connection of the 4-pin socket in the junction box frame with the supplied control switch:

Supplied control switch



4-pin socket - view from the compressor



Number	Color	Connector	
1	Red	D	Wiring to control switch if the alternator control lamp cable is <u>not used</u> .
5	Green	61	Wiring to the control voltage from the alternator control lamp cable. Or, if no alternator control lamp cable is used, from ignition lock switch via control switch.
7	-	-	Blind / no function
9	Yellow	KK	compressor control in normal operation – dimly illuminated // in case of fault – brightly illuminated (low voltage)
10	Blue	31a	Ground for control lamp/ switch, etc, o.a.

12.2 Connecting of the main supply and control switch – 48V DC and more

Connection of the 2-pin connector in the junction box frame:

