POSEIDON Edition
BAUER KOMPRESSOREN

OPERATING MANUAL

Compressor unit

› PE320-VE-OX

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1 Preface

1.1 Manufacturer's details

1.1.1 Contact data BAUER KOMPRESSOREN

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1.2 About this manual

Depending on the version, the unit may look different from the images in this document.

1.2.1 Purpose of this manual

This manual will make it easier to become familiar with the product and make use of its intended application possibilities. The manual contains important information for operating the product safely, properly and economically. Following the instructions in this manual will help to avoid dangers, minimise repair costs and downtimes, and increase the reliability and service life of the product.

1.2.2 Target groups of this manual

The manual is intended for the following target groups:

- Operating company of the machine
- Operating personnel
- Assembly personnel and maintenance personnel
- Testing personnel

1.2.3 Storing this manual

This manual is a part of the product.

- It must be stored such that it is easily accessible to the personnel at any time.
- No pages may be extracted from the manual.
- If the product is resold, the manual must be handed over along with the product.

1.2.4 Symbols used

The following symbols are used in the manual:

Symbol	Meaning
	Dangers for persons. For more information, see Chapter 2.3 Display and meaning of warnings, Page 16.
	Information for understanding or optimising the work processes.
	Information for solving problems or for troubleshooting.
✓	Prerequisite for an operating procedure.
❯	Operating procedure, also measures in a warning.
1. 2. ...	Step-by-step operating procedure. Follow the sequence.
	End result
	Follow the instructions for safe disposal.

Tab. 1 Symbols used and their meaning

1.2.5 Abbreviations used

The following Abbreviations are used in this manual:

Abbreviations	Meaning
Fig.	Figure
barg	Relative pressure in Bar
bara	Absolut pressure in Bar
No.	Number
Pos.	Position, item
P.	Page
Tab.	Table

1.2.6 Disclaimer of liability

BAUER KOMPRESSOREN reserves the right to make modifications to the technical specifications, software described and / or documentation without prior notice.

All the information in this manual is correct at the time of printing.
BAUER KOMPRESSOREN reserves the right to make technical changes that are made for improvement purposes or increase the safety standard.

1.3 About this product

1.3.1 Identifying the product

This manual is applicable for the models and series specified on the title page.

- Take the exact model and serial number from the type plate and enter into the figure below.
- In case of customer service enquiries, always specify the model and serial number of the product.

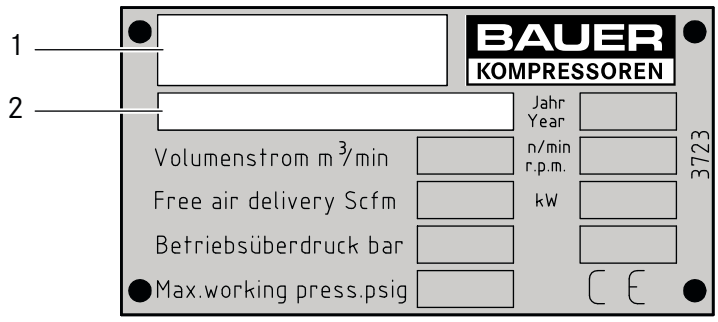


Fig. 1 Type plate

1 Model 2 Serial number

1.3.2 Application

The machine is intended exclusively for the compression and the storage of the medium specified, under consideration of the conditions specified, see Technical Data.

1.3.3 Variants and equipment

Variants	PE320-VE-OX
Operating pressure max. [bar]	330
Delivery volume [l/min]	320
Filter system	P41

The following components are included as standard:

- Filter system (see table above)
- Automatic condensate drain
- Condensate collection vessel (10 l)
- Compressor control system B-CONTROL MICRO

1.3.4 Options

The actual range of options of the unit can be read about in the sales documents.

The following additional equipment is optionally available:

- Completely covered, soundproof frame
- Exhaust chute with or without ventilations flaps
- External intake system via roof
- Condensate collection vessel (60l)
- B-LINK Access point for WLAN access
- B-CLOUD for online monitoring of unit data and controlled remote access for third parties (from software version 3.00)
- B-SECURUS filter saturation monitor
- B-KOOL refrigerative dryer for extended cartridge service life
- B-DETECTION PLUS i gas measurement device
- Filling device with up to 4 direct or hose connections

1.3.5 Scope of supply

The minimum scope of supply comprises:

- the product
- all necessary consumable material such as oil and filters (excluding fuels such as petrol or diesel fuel), either provided as accessory kit or already filled in or installed
- a hose for oil draining and condensate draining
- a funnel for topping up the oil
- a filter wrench for cartridge change (only for units with a filter system)
- a wrench for unlocking the side cladding
- a wrench for opening the control box
- these instructions

1.3.6 Applied standards

Declaration of conformity

The product has been constructed in line with the directives listed in the conformity declaration or the state of the art and recognised safety-related regulations; see .

CE mark

With the EC mark affixed on the product, BAUER KOMPRESSOREN declares that the product satisfies the application requirements specified in the harmonisation legislation of the European Community provided for its affixing.

2 For your safety

2.1 Intended usage

The machine is intended exclusively for the compression and the storage of the medium specified, under consideration of the conditions specified, see Technical Data.

Proper use also includes:

- the compliance with this manual and the installation instructions as well as the fulfilment of the installation requirements.
- the compliance with the maintenance intervals and the fulfilment of the maintenance works
- the fulfilment of the applicable regulations

Any use apart from those mentioned above is considered to be not intended.

2.2 Improper use

Any use apart from the intended use mentioned above is considered to be not intended. The manufacturer/supplier can assume no liability for damage resulting from this type of usage. The user alone bears the risk of this. A claim for guarantee shall be rendered inapplicable in the following cases:

- In the event of improper use.
- In the event of non-compliance with the performance limits and the authorized operating conditions of the machine.
- When operating without safety equipment or with incorrect or non-functional safety equipment.
- If unauthorized or unqualified persons work with or on the machine.
- If unauthorized operating supplies are used.
- If accessories and spare parts that are not made for the machine are used. Only original spare parts may be used.
- If unauthorised modifications, alterations or program changes are carried out on the machine.
- If modifications or repairs are carried to system parts that must be accepted, without having obtained consent or another acceptance by an expert technician or audit authority of the operator’s country.

2.3 Display and meaning of warnings

2.3.1 Hazard classes

Important instructions regarding personal protection and safe operation are indicated in the manual in distinct hazard classes. The hazard classes explain how states or individual steps of an operation sequence are dangerous and can cause damage.

Hazard class	Description
DANGER	Indication of an immediate imminent danger. If the warning is not observed, this will result in death or serious injuries.
WARNING	Indication of a potentially dangerous situation. If the warning is not observed, this can result in death or serious injuries.
CAUTION	Indication of a potentially dangerous situation. If the warning is not observed, this can result in minor injuries.
NOTICE	Indication of a potentially dangerous situation. If the warning is not observed, this can result in material damage.

Tab. 2 Hazard classes

2.3.2 Structure of the warnings

The warnings describe the type and source of danger, the consequences of not heeding these warnings, and measures to be taken to avert the danger. A warning is always structured according to the following pattern:

⚠ WARNING

Type and source of danger.
Consequences of not heeding the warning

› Measures for averting the danger.

2.3.3 Danger warnings on the machine

Depending on the construction and purpose of use, the following indications are affixed to the machine and included in the manual; these indications point to potential dangers:

Symbol	Meaning
	Caution, automatic control!
	Caution, hot surfaces!
	Caution, electric shock!
	Caution, oxidizing substances!
	Follow the instructions
	Wear hearing protection
	Pay attention to the direction of rotation

Tab. 3 Danger warnings on the machine

2.4 Product safety

2.4.1 Fundamental safety information

Fundamental dangers

The following safety measures always include:

- The machine should only be used in a technically perfect condition and in an intended, safety and danger-aware method, taking into account the operating instructions.
- Faults that have a negative effect on safety must be immediately rectified.
- In addition to the manual, follow and advise the generally applicable binding regulations for accident prevention and for environmental protection.

Danger due to electric current

Work on electrical units or operating materials may only be carried out by an electrical technician or other trained persons working under the guidance and supervision of an electrical technician and must be performed in accordance with electrotechnical regulations.

- Only use original fuses with the current stipulated. In the event of faults in the electrical power supply, switch off the machine immediately.
- Disconnect machine parts on which inspection, maintenance or repair work is carried out. Once the components have been isolated from the supply, first check that they are de-energised and then short-circuit them before also isolating neighbouring energised components.
- Check the electrical equipment of a machine on a regular basis. Defects such as loose connections or scorched cables must be rectified immediately.
- If work on live parts is required, enlist a second person who can interrupt the power supply in an emergency. Cordon off the working area with a red-and-white safety chain and a warning sign. Only use insulated tools.
- All persons who handle electrical components and equipment that is fitted in electrical components must be earthed.
- Measuring instruments and devices must be earthed. Measuring tips on potential-free measuring instruments must be briefly earthed on suitable earthed surfaces before being used to take measurements.

Danger due to pneumatics

Work on pneumatic devices must only be carried out by persons having special skills and experience with pneumatics.

- All lines, hoses and screwed fittings should be checked regularly for leaks and externally detectable damage. Any damage must be rectified immediately. Compressed air or gases coming out can cause injuries and fires.
- Before commencing repair work, depressurise any sections of the system and pressure lines that are going to be opened.
- Lay and fit the pressure lines properly. Do not swap the connections over. The fittings, length and quality of the pressure lines must comply with requirements.

Danger due to gas, dust and smoke

- When working with smothering gases, you must monitor the oxygen concentration in the room using a mobile gas measuring device.
- When working in confined spaces, ensure adequate ventilation and follow existing national regulations where applicable.
- Execute welding, flame-cutting and grinding work on and next to the machine only when the work has been specifically approved.
- Before welding, flame-cutting and grinding, clean the machine and surroundings of dust and flammable materials and ensure adequate ventilation to avoid a danger of explosion.

Danger due to oil, grease and other chemical substances

- When handling oils, grease and other chemical substances, observe the safety regulations applicable to the product.

Danger due to noise

- The noise protection equipment on the machine must be in the protection position when the equipment is running.
- Wear the specified personal hearing protection.

2.4.2 Safety instructions regarding transport and loading work

Carry out the following measures to ensure safe transport:

- Machines, individual parts and larger components must be securely fastened to lifting tackles.
- Do not stand or work under suspended loads.
- Use only experienced persons for slinging the loads and instruct the crane drivers. The instructor must be in view of the operator or in voice contact with him.
- Use only suitable lifting tackles, load carrying equipment and transport vehicles with adequate carrying capacity.
- Secure the load in a reliable manner. Use suitable lashing points.
- Fit transport securing devices to the machine for transporting if necessary. Fix the relevant sign. Remove the transport securing devices before commissioning/recommissioning.
- Re-fit and secure the parts removed for transport purposes before recommissioning.
- Isolate the machine from all external energy supplies, even if the location to be changed is over a small distance. Connect the machine properly to the mains before recommissioning.

2.4.3 Safety information regarding operation

Carry out the following measures to ensure safe operation:

- Refrain from any working practices which may compromise safety.
- Only operate the machine if all protection equipment and safety-related equipment (e.g. detachable protection equipment, emergency stop equipment and noise reduction devices) are present and functioning correctly.
- In the event of malfunctions, stop and secure the machine immediately. Any fault must be rectified or eliminated immediately.
- Switch the machine on and off and manage indicator displays as stipulated in the operating manual.
- Before switching on / starting up the machine, make sure that there is no risk of it harming anyone whilst in operation.
- Adhere to the activities and dates for setting, maintenance and inspection as stipulated in the manual, including specific information on replacing parts/ fitting components. These activities may only be carried out by specialist personnel.
- Inform the operating personnel about the special tasks and service work before starting it. Nominate a supervisor.

2.4.4 Safety instructions regarding maintenance, service and repairs

Carry out the following measures for ensuring safe maintenance, service and repair work:

- For all work that affects the operation, adjustment of production capacities, changeover or setting of the machine and its safety-relevant equipment and inspection, maintenance and repair, observe the switching on and switching off procedures in accordance with the operating instructions and instructions for servicing work.
- Service area to be made and secured as large as possible if required.
- If the machine is switched off completely for maintenance and repair work, you must ensure that it is secured against unexpectedly starting up: Lock the main control systems and affix a warning sign to the main switch.
- Begin maintenance/repair work by cleaning any oil, fuel or cleaning agents off the machine; in particular, the connections and screw fittings. Do not use aggressive cleaning agents. Use lint-free cleaning cloths.
- During maintenance and repair work, any screw connections that have been loosened must always be tightly screwed back in again.
- Use suitable tools for all the work to be carried out. Do not use sparking tools in potentially explosive areas.
- If safety equipment needs to be removed for maintenance and repair purposes, it must be reattached and inspected as soon as the maintenance and repair work is complete.
- Working with safety equipment removed is only allowed for trained or competent personnel. The personnel must not have loose long hair, loose clothing or jewellery, including rings. There is a danger of injury e.g. by being caught up or being drawn in.
- Make sure that auxiliary materials and replacement parts are disposed off safely and in an environmentally-friendly manner.
- When working above head height you must use access equipment and working platforms provided for the purpose or other safety-compliant equipment. Do not use machine parts as access aids. When carrying out maintenance work at higher levels you must wear fall arresting equipment.
- Carry out the function test after maintenance work and repair work only after leaving the danger area.

2.4.5 Safety instructions regarding cleaning

Carry out the following measures to ensure safe cleaning:

- Before cleaning the machine with water, a steam jet (high pressure cleaner) or other cleaning agents, cover or seal off all openings that must not be penetrated by water/steam/cleaning agents for reasons of safety and/or functionality. Electric motors and control cabinets are particularly at risk.
- When carrying out cleaning work in the machine room, make sure that the temperature sensor on the fire alarm and extinguisher equipment does not come into contact with hot cleaning agents to prevent triggering the extinguisher equipment.
- In explosive areas, clean plastic parts only with a humid tissue to avoid electrostatic charging.
- After the cleaning work, completely remove the covers / seals.
- After cleaning, inspect all lines for leaks, loose connections, chafe marks and damage. Repair any defects detected immediately.

2.4.6 Particular dangers

Safe handling of pressure vessels

There are two types of pressure vessels:

- Pressure vessels for static load: The pressure vessels are under virtually constant operating pressure, and the pressure fluctuations are very small. Pressure vessels for static load are not specially marked and can be operated as long as no safety-relevant faults are found during the regular vessel repeat testing procedures.
- Pressure vessels for dynamic load: The pressure vessels are under fluctuating operating pressure, and the pressure can fluctuate between atmospheric pressure and the maximum permissible operating pressure. In the technical documents for these vessels, you will find details concerning the permissible operating duration in the form of the permissible cycle figures depending on the fluctuation of the operating pressure. The change between two different pressures is designated as a load change. Two load changes, i.e. one pressure approach and one pressure departure, are a cycle.

Follow the following safety instructions to ensure safe handling of pressure vessels:

- Always observe the permissible operating method of the pressure vessel.
- Never open or release the vessel covers or pipe connectors under pressure. Always depressurise the vessel or machine.
- Never exceed the permissible vessel operating pressure.
- Never heat the vessel or other individual parts above the stated maximum operating temperature.
- Damaged pressure vessels should always be replaced completely. Pressurised vessel components cannot be obtained as spare parts because the vessels are only ever tested and documented as a unit (see pressure vessel documentation, serial numbers).
- Check pressure vessels regularly internally and externally for corrosion damage.
- Do not use used pressure vessels if the number of load cycles and previous operating mode are not clearly known.
- In order not to load the pressure vessel unnecessarily, always check the non-return valves and pressure retention valves at regular intervals for internal and external leaks and functionality.
- Replace aluminium pressure vessel at the latest after 15 years.
- In the case of pressure vessels for dynamic load: Record the number of cycles completed. Note down the number of cycles run if there is no automatic cycle counter.
- In the case of pressure vessels for dynamic load: When half of the permissible cycles are reached (aluminium vessel: 1/4 of the permissible number of cycles) is reached, the vessel must be subjected to an internal test which includes testing the critically loaded vessel areas using suitable test procedures in order to ensure operational safety.
- In the case of pressure vessels for dynamic load: After reaching the permissible number of permissible cycles, the vessel must be replaced and scrapped.

Instructions for handling Nitrox

Adhere to the following instructions when handling oxygen and Nitrox gas mixture:

- Many materials, such as oil, grease, paint, flammable solvent or metallic swarf can ignite or even explode if they come into contact with compressed oxygen. Oxygen itself is not flammable, but can facilitate and promote burning of flammable materials.
- Clothing which has been worn in oxygen-enriched atmospheres must not be worn in proximity to a naked flame or other igniting possibilities unless they have thoroughly aired.
- Commissioning of Nitrox systems may only be carried out by trained personnel who are familiar with the unit and who can produce evidence of training.
- Any indication of a loss of pressure of the filling station under pressure must be categorised as dangerous and must be rectified by an expert technician.
- Only use fittings, bottles, valves, hoses or connections that are suitable for Nitrox.
- Only use cleaning agents, lubricants, sealants and fittings, bottles, valves, hoses or connections that are suitable for Nitrox.
- Filling should only be carried out in well-ventilated rooms without danger of ignition, such as welding or naked flames.
- The operator must have attended a training course and must be aware of all possible dangers.
- Local and national regulations must be observed.
- Maintenance must only be carried out by the manufacturer or a competent person who is qualified for this type of installation.
- The persons concerned must be made aware of the risks involved with the handling of oxygen and must have been thoroughly trained in the relevant protection measures.
- It may also be necessary to supplement the training of employees by practical demonstrations of individual actions on site and by practicing by the employees under technical supervision, e.g. by practicing for the eventuality of damage and by fire-fighting practice.
- Adhere to the filter service life.
- When changing the cartridge, particular attention must be paid to hygiene and general cleanliness.
- Get a replacement cartridge and store it properly.
- Keep in mind the storage period of the filter cartridge.
- Do not use filter cartridges with damaged packaging.
- Record filling processes in a logbook.
- Check the quality of the compressed Nitrox gas mixture or get it checked at regular intervals.

2.4.7 Safety and monitoring equipment

Provide the following safety equipment and ensure their function:

- Do not remove the protection guard from moving parts when the machine is being operated.
- If needed, design the return flow (e.g. natural gas) in such a manner that there is no danger to people and the environment. Comply with the statutory provisions.
- Rule out dangers arising due to electrical energy by earthing and using suitable fuses.
- If necessary, fit touch protection over hot or moving parts.

Emergency stop switch

In machines without a separate emergency stop switch, the red-yellow main switch assumes the function of an emergency stop switch.

- Press the emergency stop switch in case of an emergency.
  The control voltage will be interrupted and the machine will turn off.

2.5 Instructions regarding emergency

2.5.1 Behaviour in case of faults and emergencies

If safety-relevant faults occur in the machine or the operating behaviour indicates this:

- Switch off the machine and notify the authority/person responsible of the fault.
- Only trained and authorised specialist personnel may rectify the faults.
- Restart the machine only after the cause of the fault has been determined and rectified.

2.6 Organisational duties

2.6.1 Personnel selection and qualification

Pay attention to the following points when selecting the personnel:

- Ensure that statutory minimum age limits are observed.
- Ensure that only entrusted personnel work on the assigned tasks.
- Deploy only the trained, instructed or competent personnel. Follow the legal regulations while doing so. If the country-specific regulations do not make any statement regarding qualification of personnel, the manufacturer recommends proceeding in accordance with the regulations of the German Ordinance on Industrial Safety and Health.
- Ensure that only trained personnel operate the equipment.
- Ensure that only the service personnel trained and authorised by BAUER KOMPRESSOREN carry out the assembly and installation activities.
- Ensure that only competent personnel carry out the first commissioning and recurrent tests.
- Ensure that only trained personnel carry out maintenance activities.
- Clearly define the responsibilities that personnel have in terms of operation, maintenance and repairs.
- Establish a responsible person and give him/her authorisation to reject any instructions from third parties that are in breach of safety procedures.
- Only allow apprentices or other personnel who are undergoing instruction or general training to work on/use the device while under constant supervision by an experienced member of staff.

The qualification and knowledge of personnel can be summarised as follows:

Personnel	Qualification
Trained personnel (e.g. operators and employees)	This manual was read and understood. Instruction by the manufacturer or a person authorised by the manufacturer for this purpose.
Trained personnel and/or experts (e.g. expert electricians and maintenance personnel)	An expert is a person who has the required expert knowledge for the servicing the products described in these operating instructions. Completed technical professional education with at least one year's professional experience and regular training.
Competent personnel or a person competent for testing (e.g. service personnel of BAUER KOMPRESSOREN and expert)	A person competent for testing is a person who has the required expert knowledge for testing the products described in these operating instructions. Completed technical professional training with at least one year's professional experience in manufacture, assembly, operation or maintenance as well as contemporary professional activity and regular training, particularly with regard to the following topics: • The design and manufacturing process • The equipment and safety concepts • The assembly, installation and operation • Intended use • Risk assessment • Tests, test intervals, test procedures, including evaluation of the results • Influences and damage patterns relevant in practice

Tab. 4 Personnel qualifications

2.6.2 Duties of the operating company

The operating company is responsible for the intended use of the machine.

- Keep the instruction manual to hand near the machine and must be available to the personnel at all times. Ensure that the informations are complete and readable. If the product is resold, the manual must be handed over along with the product.
- In addition to the operating instructions, observe the local applicable regulations for accident prevention and environmental protection. The operator must instruct the personnel accordingly.
- Complement this manual with local applicable regulations.
- Complement this manual with specificities about the operational processes and with informations about supervision and reporting obligations.
- Ensure the intended use of the machine and take appropriate measures to prevent the improper use of the machine.
- Take measures to ensure safe operation and fault-free condition of the machine.
- Ensure that only personnel with the relevant qualifications work on the machine. Observe the legal minimum age permissible.
- The operator must provide the necessary personal protective equipment, such as hearing protection or protective goggles.

2.6.3 Duties of the personnel

The personnel must comply with the following safety requirements:

- Read and understand the operating instruction manual.
- Refrain from any working practices which may compromise safety.
- Use personal protection equipment if required.
- Observe all the safety instructions and danger warnings on the machine.
- Check the machine for outwardly noticeable damage and defects before taking it into operation and at regular time intervals during operation. If changes occur in the machine or in its operating behaviour and these could impact on safety, stop the machine immediately and report the fault to the department/ person responsible.

2.7 Safety regulations

The following list of safety regulations does not claim to be exhaustive and up-to-date, and is applicable only for the Federal Republic of Germany.

- Ensure that the equivalent provisions of the operator's country are observed.
- Ensure that all other statutory regulations and provisions, in particular, safety regulations, pertaining to the operation or conveying medium are observed.

The following regulations, provisions and trade association rules must be observed for commissioning and operation of compressor units as filling units in the Federal Republic of Germany:

- 14. ProdSV – German Ordinance on Pressure Vessels - fourteenth ordinance for the Product Safety Law dated 27 September 2002
- ProdSG – German Product Safety Law - law regarding the provision of products in the market dated 8 November 2011
- BetrSichV – German Ordinance on Industrial Safety and Health - ordinance on safety and health protection when using resources dated 3 February 2015

Adhere to the TRBS (technical regulations for operational safety) and TRGS (technical regulation for dangerous substances) for concrete specifications regarding the details of the German Ordinance on Industrial Safety and Health:

- TRBS 1111 - hazard assessment and safety assessment - TRBS dated 5 September 2006
- TRBS 1201 - tests of resources and units that need monitoring - TRBS dated 6 August 2012
- TRBS 1203 - competent persons - TRBS dated 17 March 2010
- TRBS 2141 - risks due to vapour and pressure - general requirements - TRBS dated 31 January 2007
- TRBS 3145 / TRGS 725 - transportable compressed gas tanks - filling, provision, intra-company transportation, emptying - TRBS / TRGS dated 14 June 2013
- TRBS 3146 / TRGS 726 - stationary pressure units for gases - TRBS / TRGS dated 14 April 2014

If a high pressure compressor is used for filling pressurised gas containers (cylinders) or for supplying pneumatic systems, the trade association regulations, rules, information and principles of safety and health while working apply to commissioning and operation within the Federal Republic of Germany:

- BGV A1 / DGUV Regulation 1 - principles of prevention (edition 04/2005; 01/2008; 01/2009)
- BGR 500 / DGUV Rule 100-500 - operating the resources (edition 10/2004; 07/2005; 09/2005; 11/2005; 12/2005; 03/2006; 08/2006; 10/2006; 03/2007; 04/2008)

Instructions for the licensing process and the testing of filling stations before commissioning

For further instructions for the licensing process and the testing of filling stations before commissioning, refer to the information sheet (can be obtained from BAUER KOMPRESSOREN).

The test certificates and documents supplied with the compressor are important and must be included in the application documents as part of the licensing process. The documents that relate to recurrent tests also have an important role to play and must, therefore, be stored carefully.

In accordance with the German Ordinance on Industrial Safety and Health (BetrSichV), compressor units used as filling stations must be subjected to an acceptance test by the relevant monitoring authority (TÜV in the Federal Republic of Germany) prior to commissioning.

If the compressor is going to be used for filling pressurised gas containers (cylinders) which are intended for others, the unit must be licensed by the relevant authority before the acceptance test (Trade Supervisory Board in the Federal Republic of Germany).

Tests governed by accident prevention regulations are carried out by the manufacturer or a specialist.

3 Product description

3.1 Structure

The machine may vary slightly from the following illustrations, depending on the scope of delivery and equipment level.

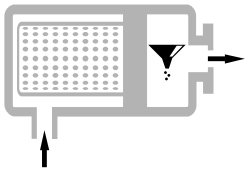
Fig. 2 Compressor unit with hidden cladding

1	Compressor block	4	Final pressure safety valve	7	Condensate collection vessel
2	Filter	5	Non-return valve with pressure gauge and venting valve	8	Main switch
3	Particle filter (option, not available for Nitrox applications)	6	Final separator	9	Operating panel

3.2 Function

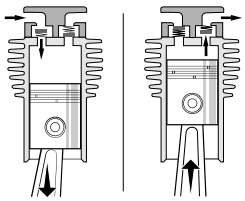
The method of operation, i.e. the route of the medium through the unit is shown in the piping layout in the appendix.

3.2.1 Intake



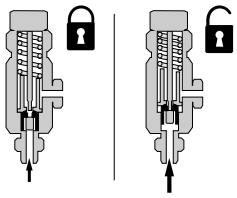
The compressor unit draws the medium to be compressed via the intake filter. The replaceable filter element removes the solid particles from the medium taken in and protects the compressor and the downstream fittings.

3.2.2 Compression



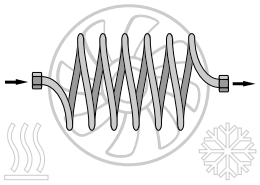
Compression takes place in the compressor block. The integrated compressor blocks operate on the displacement principle and are multi-stage piston compressors. Every compressor stage consists of a piston, cylinder and valve head. The intake and pressure valves, which are mounted in the valve heads, control the gas change of the individual compressor stages.

3.2.3 Protection



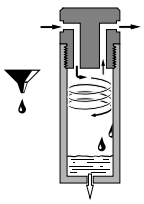
Safety valves protect the individual compressor stages from over-pressure. The safety valves open and direct the medium back to the environment as soon as the monitored pressure rises above the set response pressure on the safety valves.

3.2.4 Cooling



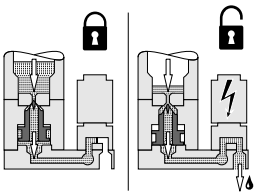
Spiral heat exchangers cool the medium that is heated up during compression. One or more fan wheel(s) provides the necessary cooling air flow. Depending on the type of compressor, the fan wheels are either driven by a crankshaft (directly or via V-belts), or directly by electric motors.

3.2.5 Separation of the condensate



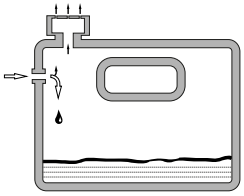
The condensate incorporated in the compressed medium, consisting of water and oil, is separated from the medium after each compressor stage by special separators. Separation from the medium of the liquid water and oil constituents is by centrifugal action. The liquid condensate collects in the lower part of the vessel.

3.2.6 Condensate drain

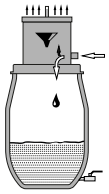


Electro-pneumatic drain valves drain away the condensate that gathers in the separators at regular intervals. In addition, the automatic condensate drain is designed so that it removes the water from the separators when the unit is switched off and unloads the compressor when the unit is started.

3.2.7 Collecting the condensate

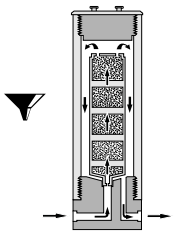


The integrated condensate collection system is connected to the condensate outlet fitting on the unit via a hose and serves for central collection of condensate generated.



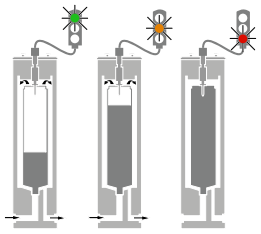
The external condensate collection system (option) is connected to the condensate outlet fitting on the unit via a hose and serves for central collection of condensate generated. An integrated filter unit separates the condensate from the medium so that the medium flows to atmosphere clean. The condensate collection tray is fitted with a mechanical level indicator for optical warning of an impending requirement for emptying. In addition, when the vessel is full, a max. contact can switch the compressor off automatically or the customer's alarm system can be triggered.

3.2.8 Filtration



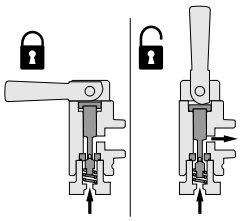
The filter system serves to further clean the compressed gas mixture and consists of 1 or 2 cartridge filters, depending on the type. Depending on the filter cartridge being used, moisture, oil, and/or CO are removed from the compressed medium.

Filter monitoring (option)



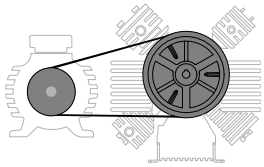
The integrated SECURUS filter monitoring system continuously monitors the drying capacity of the filter cartridge. Depending on the size of the compressor, a warning signal is issued between 1 and 7 hours before saturation of the cartridge. If the cartridge is not replaced after the warning signal lights up, the SECURUS system switches the compressor unit off after the cartridge has been finally used up.

3.2.9 Filling



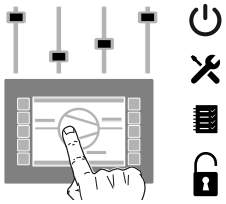
Filling fittings are used to distribute the compressed medium. The consumers are connected using special valves and filling couplings.

3.2.10 Drive



The compressor is driven by the drive motor via one or more V-belts. Depending on the compressor unit, the motor is either mounted on clamping rails or on a hinged platform. The V-belts are tensioned either by a tensioner or by the weight of the drive motors.

3.2.11 Control system

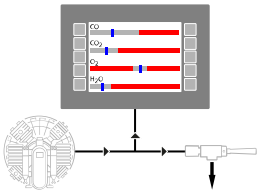


The electronic control system monitors the most important operating parameters using sensors and counters, and controls the operation of the compressor unit by continuous comparison between the measured and set parameters. Communication between the operator and the machine is by control panel with display and operating buttons.

Alongside the control and monitoring of important operating parameters, the control system offers additional functions (depending on the unit configuration):

- Semi-automatic and fully-automatic mode
- Language selection
- Password protection
- Maintenance management
- Cycle counters for capture of the load change of the pressure equipment
- Data logger and logbook for recording event history
- Software update via SD card

3.2.12 Gas measurement (option)



The integrated gas measurement device B-DETECTION PLUS i continuously measures the composition of the gas in the compressed medium under ambient conditions. In order to carry out measurement, a small volume of the air mixture to be tested is branched out of the filling section of the compressor unit, and directed to the measurement device after reducing the pressure. The gas measurement device monitors the following values as standard: CO2, CO, O2 content and temperature. Moisture and oil content monitoring are optional.

3.3 Operating modes

3.3.1 Semi-automatic

After the compressor is switched on manually, it switches off automatically on reaching the switch-off pressure. It needs to be restarted manually. It can be switched off manually at all times.

3.4 Connections

3.4.1 Overview

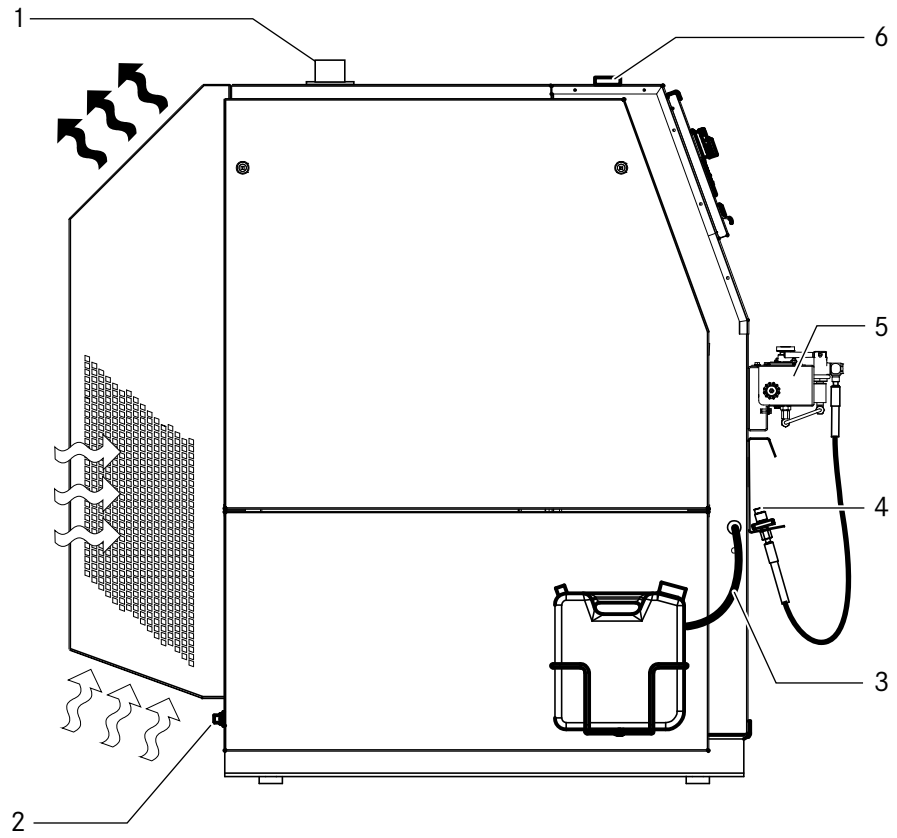


Fig. 3 Connections

1	Intake connection	4	Filling connection (option)
2	Pressure outlet	5	Filling panel (option)
3	Condensate outlet	6	B-Link for W-LAN connection (option)

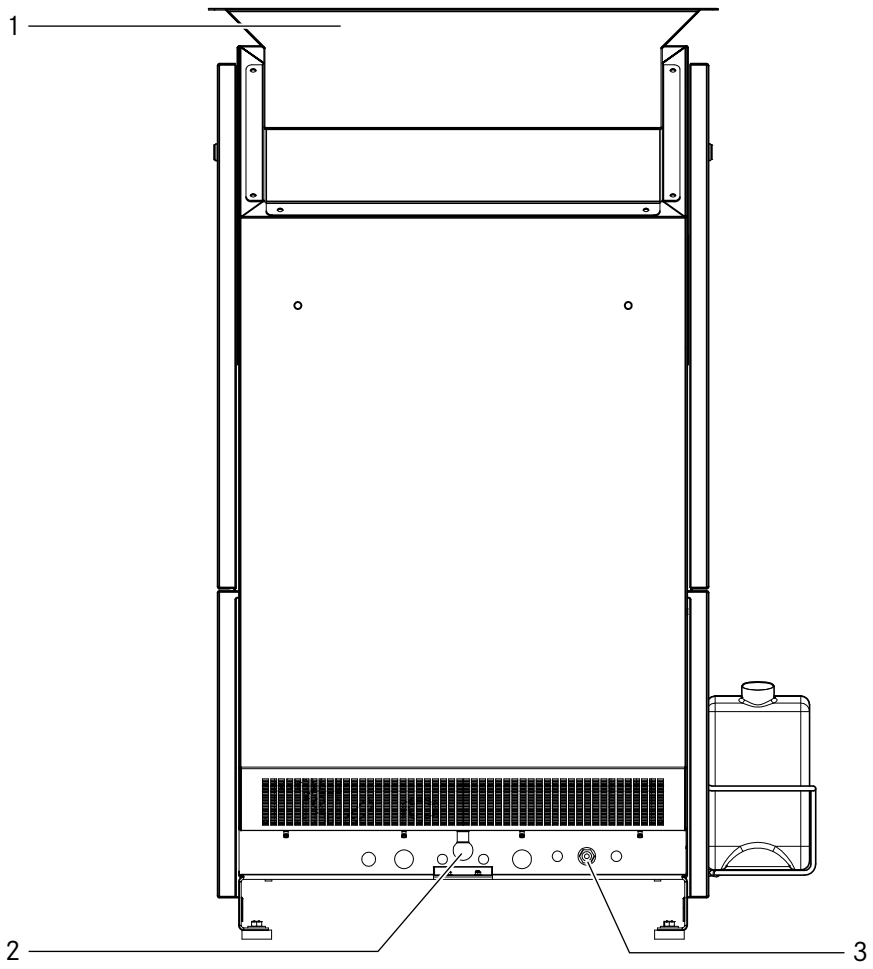


Fig. 4 Connections, rear

1 Exhaust chute (option)
2 Electrical connection
3 Pressure outlet

3.5 Control elements

3.5.1 Overview

Fig. 5 Control elements

1 Main switch

2 Operating panel

3.5.2 Operating panel

Operating panel B-CONTROL MICRO

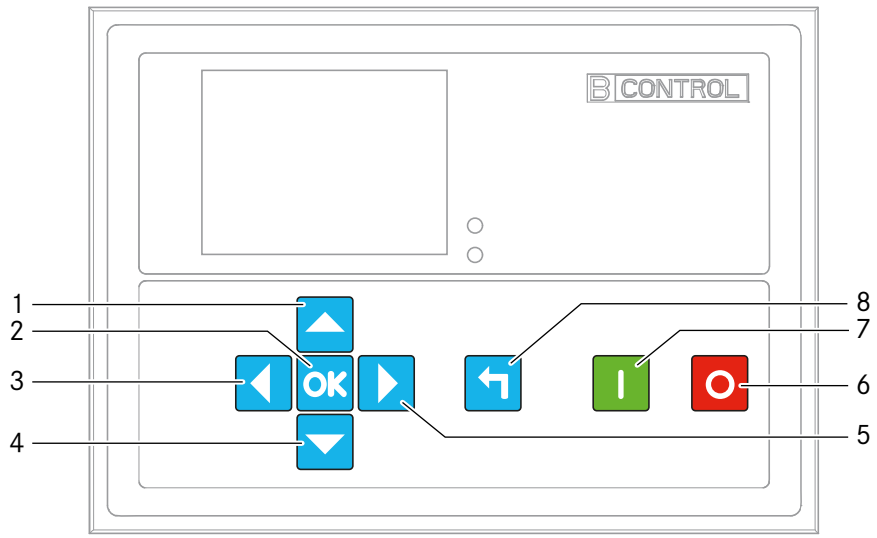


Fig. 6 Operating keys B-CONTROL MICRO

1	Move selection frame upwards or increase the value	5	Move selection frame or cursor right
2	Confirm selection or input	6	Stop unit
3	Move selection frame or cursor left	7	Start unit
4	Move selection frame down or reduce the value	8	Exit menu or cancel input

3.6 Display elements

3.6.1 Overview

Fig. 7 Display elements

1 Pressure gauge, filter pressure

2 Operating panel

3.6.2 Display elements B-CONTROL MICRO

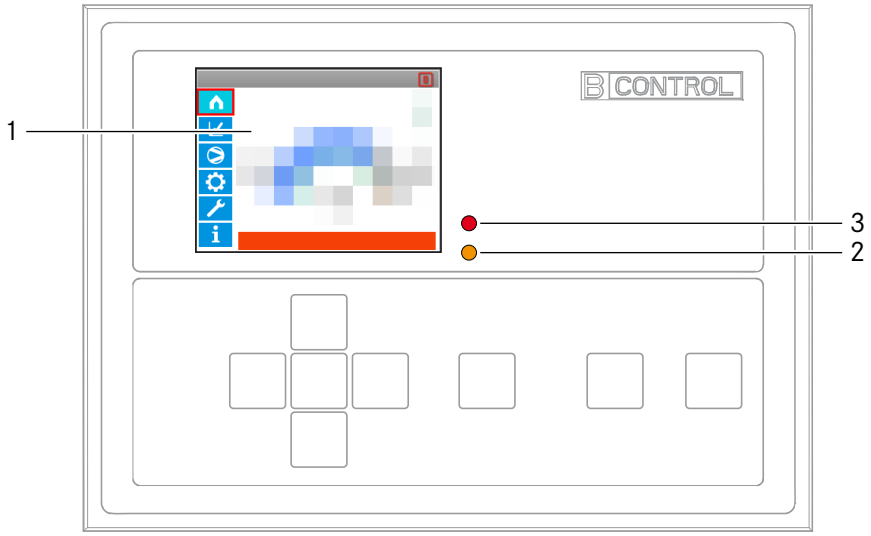


Fig. 8 Display elements B-CONTROL MICRO

1 Display
Operating parameters and configuration parameters, display of alarm messages and warning messages

2 Alarm-LED
Optical signalisation of an alarm

3 Warning LED
Optical signalisation of a warning

Start page

The start page appears when the unit is turned on and includes all the important information concerning the unit.

Fig. 9 Start page B-Control micro

1	Main menu	7	Footer: Red for fault, yellow for warning
2	Measured values menu	8	Digital final pressure display
3	Compressor setup menu	9	Analogue final pressure display
4	B-Control setup menu	10	Analogue saturation status of the SECURUS filter cartridge (option)
5	Maintenance menu	11	Header for displaying the screen name and unit status
6	Messages menu		

Meaning of the symbols displayed

The following symbols can be displayed on the control system:

Symbol	Where?	Meaning
	Footer	There is a warning message. Warning LED flashing.
	Footer	There is a fault message. Alarm LED flashing.
	Header	Unit is running
	Header	Unit is stopped
	Header	Unit in standby
	Central display box	Submenu
	Central display box	Setting value
	Header	No authorisation
	Header	Authorisation exists
	Central display box	Filter cartridge 3/4 full
	Central display box	Filter cartridge will soon be saturated
	Central display box	Filter cartridge saturated

Tab. 5 Meaning of the symbols displayed

Programme overview

Level 0	Level 1	Level 2	Level 3	Level 4	Authorisation
Main menu	Measured values				–
	Compressor Setup	Final pressure			0
		Intake pressure			1
		Gas balloon level			1
		Unit / compressor setup	Operating mode		1
			Control logic		1
			Valves	Condensate valves, intake valve	0, 2
				Valve test	0
			Sensor setting		2
			SECURUS		1
			SECCANT CAN		1
			Lubrication		1, 2
			B-DETECTION	Interface	1
				Alarm suppression	1
				Purge valve	1
	B-Control Set-up	Time/Date			0
		Display			0
		Software	Save configuration		1
			Load configuration		1
			Update software		1
			Load factory settings		0
		Alarm relay			0
		Language/Units			0
		Logger			1
		IP address / B-App password			1
	Maintenance	Compressor maintenance			1
		Tightness test, safety valve test			1
		Log in			–
		Diagnosis IO			1

Level 0	Level 1	Level 2	Level 3	Level 4	Authorisation
		Maintenance air analysis	Maintenance intervals air analysis	Calibration intervals air analysis	1
		Calibration gas sensors			1
	Messages	Current message list	Historical list of messages (logbook)	Logbook export	_

4 Technical data

4.1 Technical data PE320-VE-OX

Category and unit	Value
Performance characteristics	
Medium	Air, Nitrox (up to max. 40% oxygen)
Intake pressure	atmospheric
Operating pressure max. [bar]	330
Blow-off pressure, final pressure safety valve [bar]	225/330
Switch-off pressure [bar]	220/320
Compressor block	IK12.14
Delivery volume [l/min] measured using cylinder filling (10 l) from 0 to 200 bar, ± 5%	320
Cooling air flow, min. [m^3/h]	2250
Speed [rpm]	1450 ±5%
Drive motor type	E-motor (three phase AC)
Ambient conditions	
Maximum permissible ambient temperature [°C]	+5 ... +40
Location [m above sea level]	0 ... 1000 above sea level
Electromagnetic compatibility in accordance with EMC directive [class]	A (installation in industrial environment)
Explosion protection	no
Maximum permissible inclination	5°
Weights and measures	
Dimensions, fully-clad version [mm]	1480x830x1520
Dimensions, semi-clad version [mm]	1140x830x1520
Weight, fully-clad version [kg]	399
Weight, semi-clad version [kg]	299
Operating and auxiliary materials	
Oil	see Chapter 9.2.5 Lubrication oil, Page 121
Oil consumption [g/kWh]	0.3 ±0.2
Emissions	
Noise pressure level [dB(A)] in accordance with ISO 3744 at 1 m distance, fully-clad version	72 ±2

Category and unit	Value
Noise output level [dB(A)] in accordance with ISO 3744, fully-clad version	88 ±2
Electricity	
Standard operating voltage [V]	400
Standard frequency [Hz]	50
Motor power [kW]	7.5
Power consumption [kW]	6.9
Connection plug design [A]	16

4.2 Technical data Compressor block

4.2.1 Technical data compressor block IK12.14

Category and unit	Value
Permissible media	Air, Nitrox (with max. 40% oxygen)
Intake pressure [bar]	0.0 (atmospheric)
Operating pressure [bar]:	
• Air • Nitrox	• 90 ... 420 • 90 ... 330
Permissible ambient temperature [°C]:	
• Air • Nitrox	• +5 ... +45 • +5 ... +40
Delivery volume [l/min]:	160 ... 300
Speed [rpm]	900 ... 1450
Number of stages	4
Number of cylinders	3
Cylinder bore 1st stage [mm]	105
Cylinder bore 2nd stage [mm]	105/88
Cylinder bore 3rd stage [mm]	28
Cylinder bore 4th stage [mm]	12
Piston stroke [mm]	40
Direction of rotation (looking onto the fly-wheel)	left
Drive type	V-belt
Pressure of safety valve 1st stage [bar]	5
Pressure of safety valve 2nd stage [bar]	24
Pressure of safety valve 3rd stage [bar]	100
Oil quantity [l]	2.8
Oil pressure [bar]	4.5 ±1.5
Permissible inclination [°]:	
• Transverse inclination (with oil intake line option) • Longitudinal inclination (with oil intake line option)	• 15 (30) • 5 (10)
Weight [kg]	59
Power consumption [kW]	3.2 ... 7.2

4.3 Technical data Filter system

4.3.1 Technical data filter system P41

Category and unit	Value
Number of cartridge filters	1
Operating pressure max. [bar]	350 / 420
Operating pressure min. [bar]	90
Deployment temperature range [°C]	+5 ... +50
Residual water content max. [mg/m^3]	10
Residual oil content max. [mg/m^3]	0.1
Residual carbon monoxide (CO) content* max. [mg/m^3]	5
Max. permissible number of load cycles	See accompanying pressure equipment operating instructions

* Only when using filter cartridges with CO removal and a maximum CO concentration of 25 ml/m^3 in the intake area of the compressor.

4.4 Technical data B-DETECTION PLUS i

Category and unit	B-DETECTION PLUS i
Medium	Natural air, Nitrox (max. 40% O_2) Minimum air quality: • Particle class in accordance with ISO 8573: 5 • Humidity class in continuous running mode: 3 (≤-20°C) • Residual oil content in continuous running mode: ≤ 0.5mg/m³
Max. permissible impact loading	2 g
Measurement data	
Measured values	• Carbon dioxide content (CO_2) in ppm • Carbon monoxide content (CO) in ppm • Oxygen content (O_2) in % • Absolute moisture in mg/m³ (option) • Gaseous hydrocarbons in mg/m³ (option, for Nitrox not available)
Operating conditions	
Pressure range • Inlet pressure (inlet AIRBOX) • Measured pressure, sensors	Pressure range • 0-350 bar • Ambient pressure (approx. 1,013 mbar abs.)
Permissible operating temperature	+5...+45 °C
Permissible flow rate (inlet AIRBOX)	max 850 l/min
Flow rate	1.0...3.0 l/min
Maximum permissible ambient humidity	90% relative humidity
Explosion protection	no
Measuring ranges	
CO_2	0-2,000 ppm
CO	0-25 ppm
O_2	0-40%
Dewpoint	-70 °C... +60 °C
Gaseous hydrocarbons	0.00-1.00 ppm
Measurement accuracy	
CO_2	• ±0.5 % (calibration temperature), • ±2.5 % (at 10°C deviation from calibration temperature) • ±4.0 % (over entire temperature range)

Category and unit	B-DETECTION PLUS i
CO	• ±1.0 % (calibration temperature) • ±2.0 % (at 10°C deviation from calibration temperature) • ±3.5 % (over entire temperature range)
O_2	±1% measured value
Dewpoint at 20°C	±2 °C
Absolute humidity	• ±1 mg/m^3 (at -70°C dewpoint) • ±3 000 mg/m^3 (at 20°C dewpoint)
VOC (volatile organic compounds)	• ±2 % (at calibration temperature), • ±8 % (at 5 to 45°C)
Electrical data	
Serial connection	Modbus RS485
Alarms	Alarm for overshooting of threshold values
Operating voltage	24 VDC
Electromagnetic compatibility in accordance with EN61326-1: Emission	Class B
Electromagnetic compatibility in accordance with EN61326-1: Stability	Table 1 & 3

Tab. 6 Technical data B-DETECTION PLUS i

4.5 Technical data Motor

For technical data about the motor, see the motor rating plate.

5 Transport and storage

5.1 Transport

5.1.1 Checking the cargo

The shipping agent shall be liable for damage that can be traced back without a doubt to improper transport. The passage of risk is contractually regulated.

1. Ensure that the delivery item is unpacked by authorised personnel.
2. Check the delivered item immediately for transport damage.
3. Check the delivered item immediately against the packing lists to ensure completeness.
4. Report any irregularities to BAUER KOMPRESSOREN immediately. Complaints made later cannot be considered.
5. Never put the machine into operation if it is damaged.

5.1.2 Preparing for transport

1. Ensure that the machine is neither electrically nor pneumatically connected.
2. Allow the machine to cool down to ambient temperature.
3. Depressurize the machine or do not exceed an overpressure of 2 bar
4. Fluids such as oil and possibly cooling water should be drained.
5. Pack loose parts such as tools and accessories in suitable individual packaging.
6. Secure moving parts on the machine.
7. Protect electric and electronic components and their connections from moisture and mechanical damage.
8. Ensure that the packaging and/or vessels are such that the parts inside can be handled safely and cannot be damaged during the transport.

5.1.3 Transport

⚠ WARNING

Danger of crushing due to falling, tilting or swinging loads!
Crushing can result in death or serious injuries.

- Follow the safety instructions and safety regulations when transporting the machine.
- Follow the transport instructions.
- Keep in mind the transport weights and measurements.
- Use suitable transport equipment.
- Wear appropriate personal protection equipment.

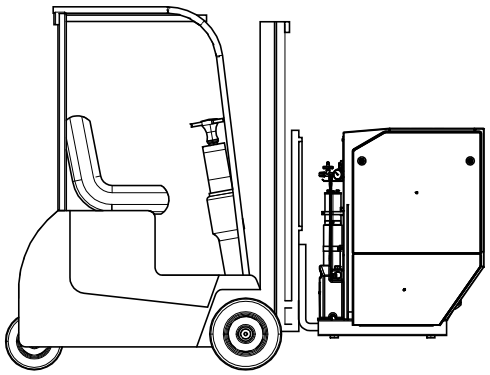


Fig. 10 Transporting the unit

1. Ensure that the transport of machine has been properly prepared, see Chapter 5.1.2, Page 53.
2. Lift the machine using a fork-lift truck as shown above and transport it slowly.
3. Fix the machine on a pallet and clean the loading area for transporting the machine on a mobile carrier. The loading area must be swept clean and be free from oil/grease.

Use appropriate anti-slip mats and blocking devices.

4. The pallet must be secure against slipping and tipping over by perfect form-fitting. Use anti-slip mats and blocking devices to do so.

5.2 Storage and preservation

5.2.1 Selecting the storage location

› Ensure that the storage space fulfils the following conditions: dry, frost-free, vibration-free.

Covering with plastic sheets is recommended only if it prevents condensation from being formed. Lift plastic sheets from time to time for monitoring.

Recommendation: Protect from direct sunlight.

Direct sunlight can lead to changes in colour and premature ageing of the plastic parts.

5.2.2 Preparing for preservation

1. Bring unit to operating temperature.
2. Operate unit for 10 minutes once the required operating pressure is reached.
3. Check all pipes, filters and valves (including safety valves) for leaks.
4. Open the outlet cock and run the unit at the set minimum pressure for 5 minutes.
5. Stop the unit.
6. Drain the condensate from the intermediate separators and the final separator.
   ↳ The pressure goes down to 0 bar.
7. Close the filling cocks or the outlet cock.
8. Tighten all the screwed fittings on the unit.
9. For unit with filter system: Keep the cartridge in the cartridge filter in order to absorb the penetrating moisture.
10. Let the unit cool down.

↳ The unit is prepared for preservation.

5.2.3 Preservation

If the unit has to be stored for more than 2 years, request special instructions from BAUER KOMPRESSOREN, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.

If the unit is put out of operation for more than 6 months, preserve it as follows:

1. Start up the unit.
2. Spray approximately 5 cm^3 of compressor oil (approx. 10 cm^3 for compressor series K22 and above) into the intake opening of the 1st stage whilst the compressor is running. Do not allow the compressor to run more than 30 seconds, in order to prevent heating of the oil, thus reducing the compressor oil's adhesive properties.
3. Switch the unit off.
4. Close all cocks.
5. Uncouple the V-belt.

Preserving the motor

Treat the motor as per the instructions issued by the motor manufacturer.

5.2.4 Inspecting the unit during storage

When a unit is preserved and stored: Put unit into operation every 6 months as follows:

After an extended period of storage the oil in the compressor and the motor will age. For this reason, you should drain the old off after 2 years and then replace it with new oil, see Chapter 9.6 Maintenance activities - Lubricating oil system , Page 127.

1. Open the outlet cock.
2. Operate unit for 10 minutes.
3. For compressors with compressed oil lubrication: Ensure that the compressed oil lubrication is working correctly. In doing so, check the oil flow in the sight glass and/or oil pressure at the pressure gauge.
4. Stop the unit.
5. Open the condensate drain cocks and release the pressure.
   ↳ The unit is pressure-free.
6. Close condensate drain cocks.
7. Preserve unit again, see Chapter 5.2.3 Preservation , Page 56.

6 Installation

6.1 Preparing the installation site

⚠ WARNING

Ignition risk as a result of increased oxygen concentration!
In the event of a fault, oxygen can escape to the environment. There is the highest level of ignition risk with an increased oxygen concentration in the ambient air.

- Ensure adequate ventilation.
- Remove all materials from the room that may ignite automatically at increased oxygen concentrations, and take the relevant fire protection measures.
- If the room arrangements are particularly unsuitable, you may have to provide a gas alarm device!

1. Make sure that the installation site complies with the required ambient conditions, see technical data.
2. Make sure that the surface is flat and clean.
3. Make sure that the surface can support the weight of the machine and that the machine is stable.
4. Make sure that the surface is suitable for fixing the unit down.
5. Make sure that there is adequate space around the unit. Observe the minimum distances and opening area of the doors.
6. Make sure that the discharge and air inlet openings are free from obstruction. Take appropriate measures to ensure that the openings remain clear.

6.2 Installing the unit

6.2.1 Installing the unit

⚠ WARNING

Danger of injuries due to improper assembling!
Improper assembling can result in personal and material damage.

› Install and connect the unit properly and in accordance with the relevant guidelines.

1. Install the unit such that it is not exposed to direct sunlight.
2. Ensure that the machine can be accessed from all sides.
3. Ensure that there is 50 cm of space around the machine for fitting and disassembling the lines as well as for maintenance work and disassembling and assembling the machine.
4. The unit should be installed in such a way that the cooling fan on the compressor can draw in cool air from the outside. For this, install the unit as close as possible to the intake opening.
5. Install the unit in such a way that intake of heated up or even hot air is avoided.
6. Maintain a minimum distance of 50 cm to flammable objects.

⚠ DANGER

Danger of poisoning!
There is a danger of poisoning when solvent-containing substances enter the breathing gas.

› Close the intake opening before treating the compressor with preservatives and solvent-containing substances.

7. If operating in salt-containing atmospheres, the compressor must be sprayed with a corrosion-protection agent.

6.2.2 Ensuring cooling

For the unit to operate, sufficient cooling air must be ensured. The cooling temperature here is the same as room temperature. Observe the operating conditions for correct room temperature and cooling temperature, see Technical Data.

Ensuring natural ventilation

A supply of natural cooling air is possible under the following circumstances:

- No thermal overloads are expected
- The unit has a low drive power rating
- The unit is operated only intermittently
- The unit is in a moderate climate

The intake and exhaust openings depend upon the following parameters:

- Motor drive power rating
- The difference in height between the intake and exhaust openings
- The air volume of the compressor room

The following table provides an overview of the required parameters. If these parameters are not reached, artificial ventilation must be provided, see Installing artificial ventilation, Page 62.

Motor power [kW]	Room volume/height difference					
	V = 50 m³ Δh = 2 m		V = 100 m³ Δh = 3 m		V = 200 m³ Δh = 4 m	
	Inlet [m²]	Outlet [m²]	Inlet [m²]	Outlet [m²]	Inlet [m²]	Outlet [m²]
2.2	0.12	0.10	–	–	–	–
3	0.24	0.20	0.12	0.10	–	–
4	0.30	0.25	0.12	0.10	–	–
5.5	0.42	0.35	0.24	0.20	0.12	0.10
7.5	0.90	0.75	0.60	0.50	0.24	0.20
11	1.38	1.15	0.90	0.75	0.54	0.45
15	1.92	1.60	1.45	1.20	0.90	0.75

Tab. 7 Air inlets and outlets dependent on motor power and room volume as well as height difference

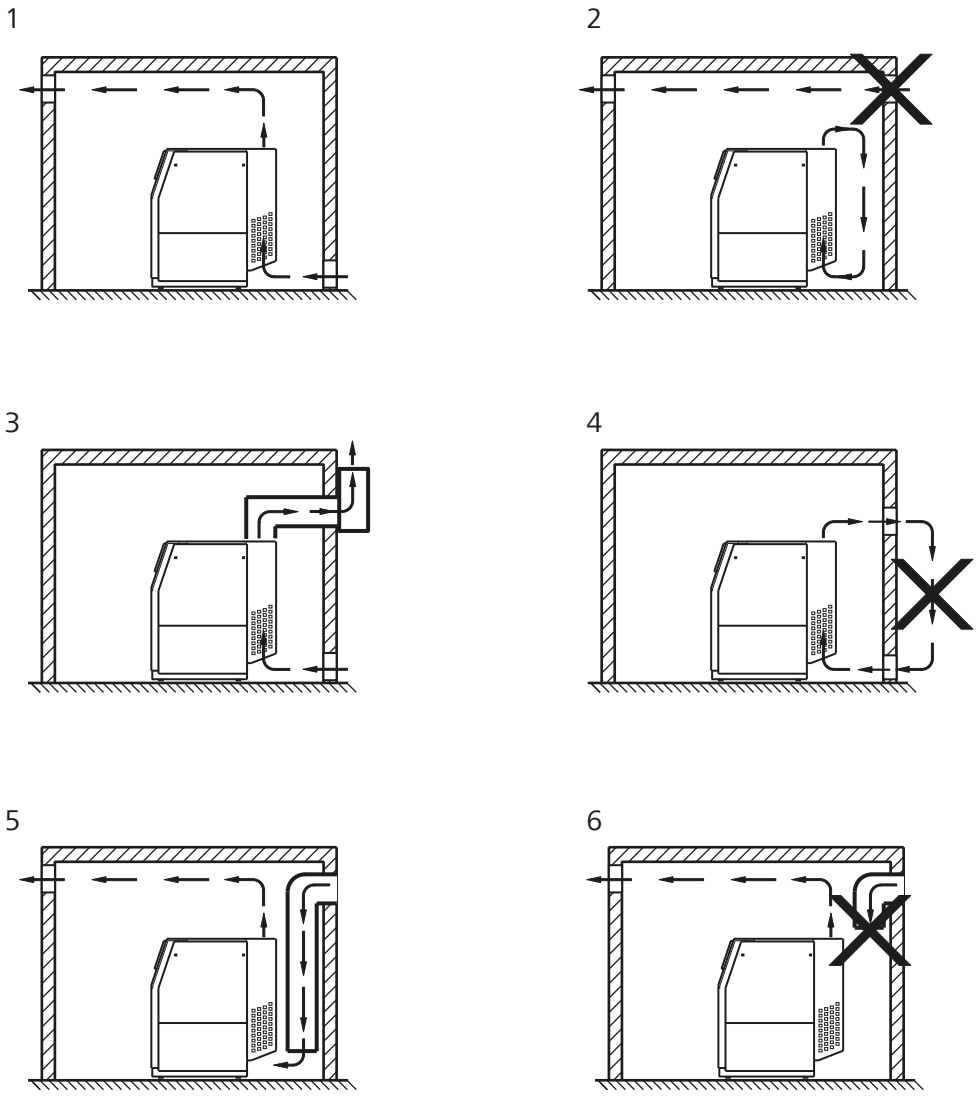


Fig. 11 Ensuring natural ventilation

1	Correct: Air inlet low, cooling air flows through the unit	3	Correct: Air outlet directed upwards, cooling circuit possible	5	Correct: Cooling air is directed directly into the unit
2	Incorrect: Air inlet too high, cooling air does not reach the unit	4	Incorrect: Hot air is not dissipated, but circulates and is drawn in again	6	Incorrect: Cooling air does not reach the intake opening, inlet duct is too short

1. Install unit correctly according to the figure.
2. When installing, you must maintain a minimum distance of 0.5 m to walls. This distance can be omitted if the installation is in front of a sufficient opening.

Installing artificial ventilation

Artificial ventilation is required if natural ventilation does not prevent the room temperature from rising above the permissible maximum ambient temperature, see technical data.

The natural ventilation cannot be sufficient in the following cases:

- Drive power rating >11 kW
- Unit is installed in a very small room
- Cooling air openings are smaller than needed
- Other equipment with higher rates of heat development are operated in the same room
- Two or more compressors are operated in the same room

In case of artificial ventilation, one of the following options must be selected:

- free blowing out with room fan
- ducted ventilation with or without additional fan
- ducted ventilation with circulation flap and additional fan

The required cooling air flow and cooling air duct cross section can be calculated. In all cases, the recommended flow speed is 3 to 5 m/s, max. 10 m/s.

Formula for calculating the required cooling air flow: **Required cooling air flow [m³/h] = 360 x drive power rating [kW]**

Formula for calculating the cooling air duct cross section: **Duct cross section [m²] = cooling air flow [m³/h] / (flow speed [m/s] x 3600)**

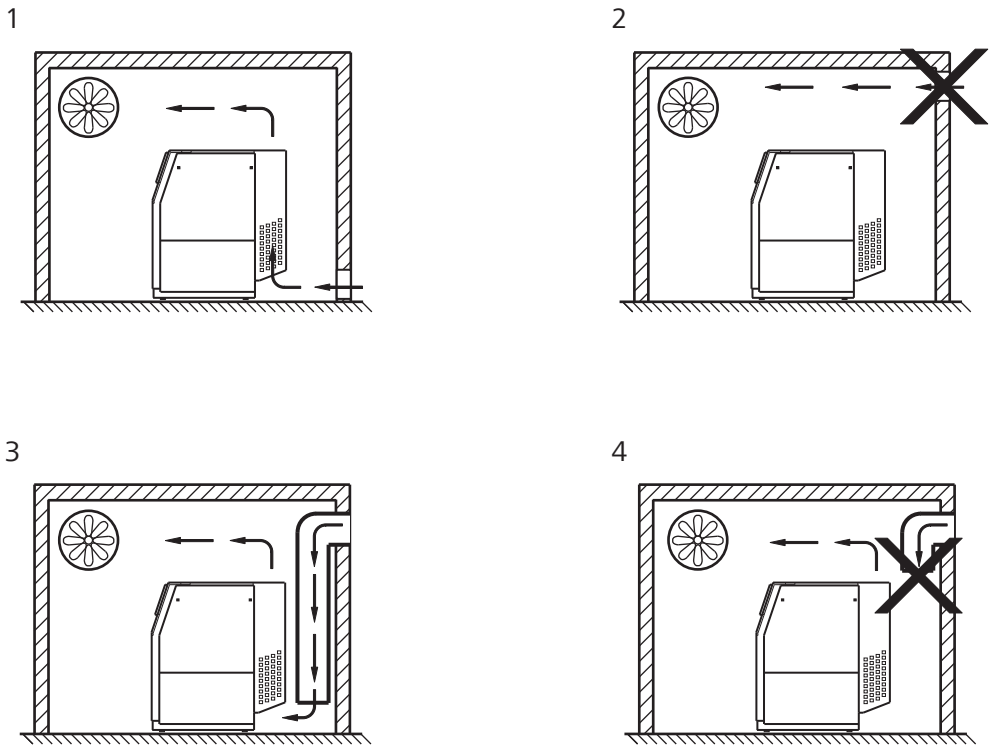


Fig. 12 Installing artificial ventilation

1	Correct: The air flows along an intended flow line through the compressor	3	Correct: The cooling air is directed downwards through a ventilation duct
2	Incorrect: The cooling air draws through	4	Incorrect: Length of the ventilation duct inadequate

1. Install unit correctly according to the figure.
2. When installing, you must maintain a minimum distance of 0.5 m to walls. This distance can be omitted if the installation is in front of a sufficient opening.
3. When installing ducted ventilation, ensure that the maximum counter-pressure in the inlet and outlet ducts of 0.5 mbar (=5 mm W.G.) measured at a distance of 1 m are not exceeded.

6.3 Electrical connection of the unit

⚠ DANGER

Danger to life due to electric voltages!
Contact with live parts leads to death or serious injuries.

- Work on the electrical unit may be carried out by an electrician only.
- Make sure that the unit is tension-free for the necessary work.

1. Follow the basic safety instructions, see Chapter 2.4.1 Fundamental safety information, Page 18.
2. Observe the local electricity supply company's regulations.
3. On units that are supplied without a connection plug, provide a tested plug connector in the version applicable in the specific country.
4. Check for perfect protection line laying.
5. Check that the motor voltage, switchgear voltage and frequency agree with the mains voltage and mains frequency.
6. Apply the correct fuses.

The compressors require a very high starting current. Then the protection must be designed for heavy starting. For this reason the customer must protect the machine by means of class K or D (class depending on manufacturer) automatic circuit breaker. For further details, contact your local electrical installation company.

7. The customer must supply the required cabling, main fuse and a main switch (power circuit breaker).
8. Ensure that the main switch can be related distinctly and directly to the unit.
9. For permanently fixed installations: Fit an isolator for isolation from the mains having a contact opening distance of at least 3mm at each terminal.

6.4 Pneumatic connection of the unit

⚠ WARNING

Danger of injury from improper connection!
Pressure lines improperly laid out and installed can burst or tear under pressure!

- Trained expert personnel must establish the pneumatic connection.
- Lay out and install the pressure lines properly. Do not interchange the connections.
- The fittings, length and quality of the pressure lines must comply with requirements.

✓ Pneumatic knowledge is present.
✓ Suitable material and piping with screwed fittings are available.
✓ All components are de-pressurised.

1. Design and execute the piping in accordance with state of the art technology and the applicable regulations. In doing so, observe the pressures, temperatures, flow speeds, pressure losses and material compatibility.
2. Design the piping with adequately large dimensions. The pressure drop over all components must not exceed 2-5 %.
3. Design the piping in such a way that fluid collections cannot form.
4. Make sure that all components are designed to suit the relevant temperatures.
5. Female threads or screwed pipe fittings are fitted to the components. Take care to use the correct thread design (e.g. cylindrical or conical female thread).
6. In the case of severely loaded piping: Use clamping ring screwed fittings.
7. Clean the inside of the piping carefully before assembly.
8. Lay the piping without stresses and with adequate fixing.
9. Observe the type and size of the connections, see unit drawing.

6.5 Having the unit accepted

At the BAUER KOMPRESSOREN factory, components such as the compressor, storage system and other accompanying assemblies are subjected to a technical partial acceptance inspection by the TÜV.

- Before commissioning the unit, have it inspected at the installation site by a qualified person or authorised inspection agency, see Chapter 2.7 Safety regulations, Page 29 .

7 Commissioning and operation

7.1 Caution in case of units with gas measurement device

7.1.1 Instructions for operation

⚠ WARNING

Danger on account of incorrect measurement results!

- Make sure that all persons who operate the device at least meet the requirements for trained personnel. This is the responsibility of the operator.
- Follow the safety instructions.
- Check the function of the sensors before each time you use it, or check the measured values using an independent measurement device.

⚠ WARNING

Danger from exceeding the permissible load cycles on the pressure vessel!

The optional integrated purge valve on the gas measurement device directs the air back into the environment if the threshold values are exceeded. Each purge creates additional pressure fluctuations in the filter vessels on the connected compressor or filter system. These pressure fluctuations reduce the service life of the filter vessels and need to be taken account of when determining the number of load cycles for the pressure vessels.

For further information concerning the maximum permitted number of load cycles, see the operating instructions for the compressor or pressurised equipment.

- Read off the switching cycles of the purge valve on the page "Maintenance air analysis" in the section "Purge valve switching cycles".
- During the regular testing of the pressure vessels, add the read-off switching cycles to the number of load cycles already run. Compare the resulting figure with the maximum permissible number of load cycles of the relevant vessel.

Keep the following in mind for measuring devices with the VOC* sensor:

In case of unforeseeable deviations in the operating characteristic due to an early warning and/or shutdown of the compressor, the optional VOC sensor* helps prevent an excessively high percentage of specific volatile hydrocarbons in the breathing air.

Since the VOC sensor also measures components (short-chain volatile hydrocarbons) that do not come under the definition of oil as per DIN EN 12021:2014 (mixture of hydrocarbons and other organic compounds that contain six or more hydrocarbon atoms (C6+)), it may lead to a warning message or shutdown of the compressor before the specified filter service life.

We always recommend replacing the filter cartridges when the set VOC threshold value is overshot since an excessively high VOC value can have different causes (among others, irregular operating conditions, non-executed maintenance or a high percentage of volatile hydrocarbons in the intake air).

Note: BAUER had the compressed and generated breathing air of BAUER breathing air compressors externally tested for their residual oil content - after being filtered through the original cartridges used from the BAUER product range (P21, P31, P41, P61) – by the certified Institute for Energy and Environmental Technology (IUTA) on the basis of the measurement technique certified as per ISO 8573. Herewith, it was confirmed that the limits of DIN EN 12021:2014 as well as ISO 8573 class 2 were achieved under the specified test conditions (samples were taken at 20 °C and 40 °C and operating pressures of 150 and 300 bar) and by taking into account the prescribed cartridge service lives.

* VOC = volatile organic compounds (i.e. hydrocarbon-containing materials that evaporate readily)

7.2 Starting up the unit

7.2.1 Checks before each commissioning

⚠ WARNING

High noise level!

Remaining next to open units can lead to hearing loss.

› Wear ear defenders.

✓ The unit is correctly installed and connected.
✓ All the safety equipment is installed and tested for proper function.

1. Ensure that only trained, instructed or competent personnel operate the machine, see Chapter 2.6.1 Personnel selection and qualification, Page 26.
2. Determine whether maintenance work needs to be performed, see Chapter 9.1 Maintenance table, Page 117.
3. Perform oil level check and if needed, refill oil, see Chapter 9.6 Maintenance activities - Lubricating oil system , Page 127.
4. Perform a visual inspection of all components. If there are any irregularities, switch off the unit immediately and locate and rectify any errors or get in touch with the BAUER customer service department, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.
5. When the control system is switched on, check the indicated temperature values on the display for plausibility. Contact customer service in the event of implausible values.
6. You must also observe the chapter “Commissioning the unit for the first time” when first commissioning.
7. When commissioning after a long standstill period, you must also observe the chapter “Commissioning the unit after longer downtimes”.

↳ The unit is ready for operation.

Further caution must be exercised in case of units with gas measurement device

1. Check the gas sensors. See Chapter 9.14.1 Checking the sensors, Page 150 or check the measurements using an independent measurement device.
2. Apply the gas to be analysed to the measurement device or start the compressor unit.

Do you get elevated measured values?

The optional purging device automatically directs the compressed air into the surroundings until the measured values are within the permissible range of values. Proceed as follows on installations without automatic purging device:

- Open the manual purge valve and purge the pressure line. Make sure that the pressure in the system or in front of the AIRBOX does not fall below 7 bar, since otherwise the reaction time of the gas measurement device will be extended.
- Wait until the measured values are within the permissible range of values and close the purge valve.

Does the compressor switch off?

A longer purge time may be required, depending on the standstill time and the operating conditions.

- Reset the fault message and repeat the procedure.

3. Check the measured values for plausibility.
   - The measurement device is ready for operation.

7.2.2 Commissioning the unit for the first time

All compressor units are checked before delivery in the factory so that commissioning can be carried out after proper erection, installation and successful acceptance tests. However, the following points must always be observed.

1. Follow the instructions on commissioning, see 'Checks before each commissioning'.
2. Install the accompanying filter cartridge(s). See Chapter 9.7 Maintenance activities filter system, Page 133
3. Turn the compressor over by hand using the flywheel to check that all components are capable of moving freely.
4. Check all fixing screws for tightness. If needed, re-tighten them with the specified torque.
5. Check all screwed pipe fittings for leaks. If needed, re-tighten them with the specified torque.
6. Make sure that the rotation direction of the motor is correct, see Chapter 7.2.4 Checking the direction of rotation of the motor, Page 73.

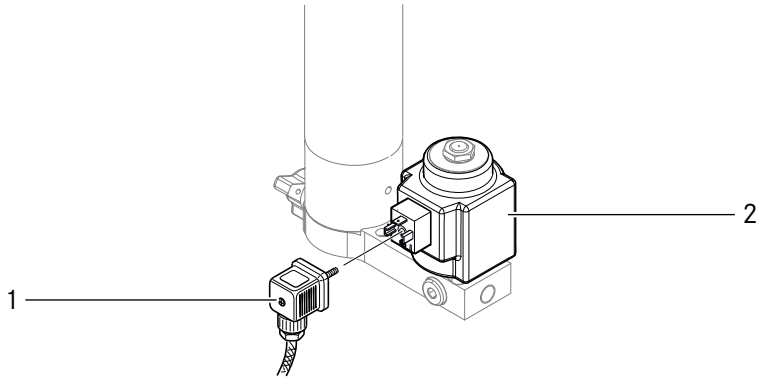


Fig. 13 Plug of solenoid valve coil

1 Screw to pull out the plug
2 Solenoid valve coil

7. Remove the plug from the solenoid valve coil and allow the compressor to run with open condensate drain valves for 10 minutes in order to ensure perfect lubrication before starting to build up the pressure.
8. After 10 minutes, fit the plug of the solenoid valve coil again.
9. Observe the pressure build-up in the unit properly. If there are any irregularities, switch off the unit immediately and locate and rectify any errors or get in touch with the BAUER customer service department, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.

7.2.3 Commissioning the unit after longer downtimes

1. Please see chapter “Checks before each commissioning”.
2. Treat the motor in accordance with the instructions provided by the motor manufacturer.
3. After an extended period of storage, or after a standstill time of more than 2 years: the oil should be drained off and replaced with fresh oil, see chapter Maintenance.
4. Compressors with integrated filter system only: replace the filter cartridge(s) if the compressor has been at a standstill for longer than 6 months.

⚠ WARNING

Danger of injuries due to highly compressed escaping gas!
The escaping gas stream may cause uncontrolled movements of hoses and flexible pressure lines. In addition, the noise generated can cause hearing damage.

- Wear ear defenders.
- Fasten or hold the valves that are attached to hoses before opening them.

5. Start the unit with open outlet cock or filling valve and run for 10 minutes to warm up.
6. Check the oil flow and/or oil pressure.

Is the oil flow and/or oil pressure incorrect?

- Check the compressed oil lubrication and, if necessary, vent the oil circuit.

7. Close the outlet cock or the filling valve.
8. Test the final pressure safety valve for proper function, see chapter Maintenance.
9. Check the intermediate pressure safety valve for leaks.
10. If the unit operates normally, stop it.

↳ The unit is ready for operation.

7.2.4 Checking the direction of rotation of the motor

⚠ DANGER

Danger to life due to electric voltages!
Contact with live parts leads to death or serious injuries.

- Work on the electrical unit may be carried out by an electrician only.
- Make sure that the unit is tension-free for the necessary work.
- Switch off the unit and secure it from being accidentally switched on again.
- Do not make any changes in the motor terminal box.
- Before switching on the unit, make sure that all panels have been fitted properly.

NOTICE

Material damage due to incorrect direction of rotation of the unit!
The integrated oil pump lubricates the compressor block only if the direction of rotation is correct. Inadequate lubrication can lead to damage to the unit within a few seconds.

- Ensure that the direction of rotation of the motor corresponds to the direction of rotation arrow on the unit.

1. Switch on the unit and switch off after max. 2 seconds.
2. Check the direction of rotation of the motor immediately after switching on with the direction of rotation arrow on the unit (Position and appearance of the rotation arrow can vary, depending on the unit):  or 

Does the direction of rotation of the motor not correspond with the direction of rotation arrow on the unit?

- Swap two of the three phases at the input terminals in the switchgear box.

7.3 Operating the electronic control

This chapter describes only the settings editable by the operator e.g. within the authorization level "0". All other settings require special knowledge and must be carried out by qualified personnel within the relevant login level.

7.3.1 Navigating in the control system

If no action is taken after 10 minutes the display goes back to the homepage.

Fig. 14 Navigating in the control system

1. Place the red selection frame on the symbol of the desired menu using the navigation keys ▲ ▼ ◀ ▶.
2. Confirm by pressing the OK key OK.

↳ The menu will open.

Was an incorrect menu selected?

› Press reset button ↰ to go back one page.

7.3.2 Modifying the settings

Grey input fields are protected and can be edited only with the appropriate authorisation, see Chapter 7.3.3 Entering password, Page 77.

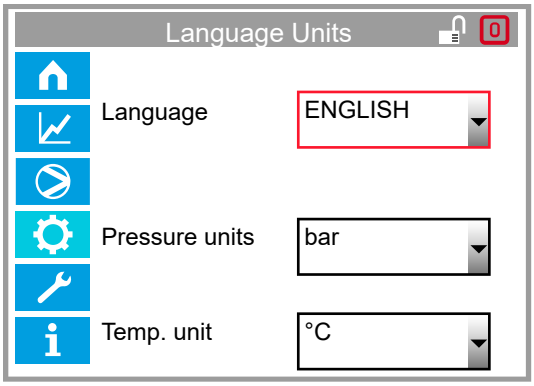


Fig. 15 Selecting field

1. Place the red selection frame on the desired field using the navigation keys ▲ ▼ ◀ ▶.
2. Confirm by pressing the OK key OK.
   ↳ An input window appears.

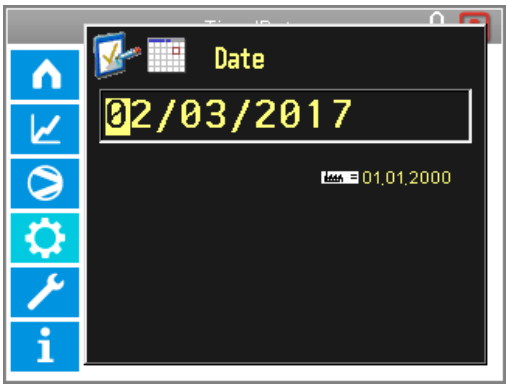


Fig. 16 Entering values

3. Select characters or option using the navigation keys ▲ ▼. Press the navigation keys ◀ ▶ to change between characters.
4. Confirm input by pressing the OK key OK.

↳ The display returns to the menu or sub-menu and displays the new value.

The wrong menu was selected or was no change made?

› Press reset button to cancel the input.

7.3.3 Entering password

Certain parameters are password-protected to provide protection for personnel and machine. When an attempt is made to change a password-protected value or setting, the message “Authorisation required” appears on the screen.

Access to the input of the password is located in the following menu:

Start page → Maintenance → Login

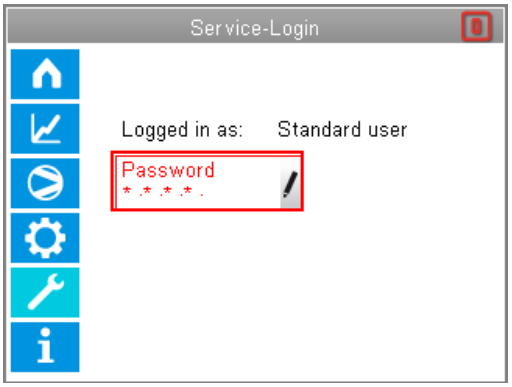


Fig. 17 Window for password entry

1. Enter single digits of the password using the navigation keys ▲ ▼ ◀ ▶.
2. Confirm by pressing the OK key OK.

↳ The current authorisation appears on the display. An open padlock appears in the display header.

Authorisations

The type and number of adjustable parameters depends on the level of authorisation. For an overview of the setting parameters and the corresponding required authorisations, see Chapter 3.6, Page 40.

Keep password secure and give them only to instructed personnel. The responsibility of passing on the password falls to the operating company.

The necessary knowledge and the password for carrying out the settings at maintenance level can be acquired during a training course. Further information is available on our website www.bauer-kompressoren.de.

Authorisation	Application level	Password	Description
0	Operator level	1000	Standard access for operators and trained personnel
1	Maintenance level	****	Access for trained and authorised persons
2	Configuration level	****	Access only for trained BAUER employees and approved dealers with certificate
3	B-Manager level	****	Access only for persons with B-Manager training with certificate
4	Programming level	****	Access only for trained BAUER employees

Tab. 8 Authorisations

7.3.4 Inserting the memory card

⚠ DANGER

Danger of electrocution!
Danger to life due to contact with live parts.

› Allow work be carried out on and in the control system only by qualified personnel with professional training as electricians.

The compressor control has two slots for SD cards:

- There is a slot on the back of the display unit for the display control system
- There is a slot on the right edge of the control unit for the compressor control system

Inserting the memory card for the display control system

✓ The unit is switched off.

1. Open the cover of the compressor control system.

Fig. 18 Insert the memory card in the display control system

2. Insert SD card into the slot at the back of the display unit.
3. Close the cover of the compressor control system.

Insert the memory card of the unit control system

✓ The unit is switched off.

1. Open the cover of the compressor control system.

Fig. 19 Insert the memory card in the compressor control system

2. Insert SD card into the slot at the right outer edge of the control unit.
3. Close the cover of the compressor control system.

7.4 Configuring the electronic control system

7.4.1 Setting time and date

Access to the setting of the time and date is located in the following menu:
Start page → B-Control Setup → Time/Date

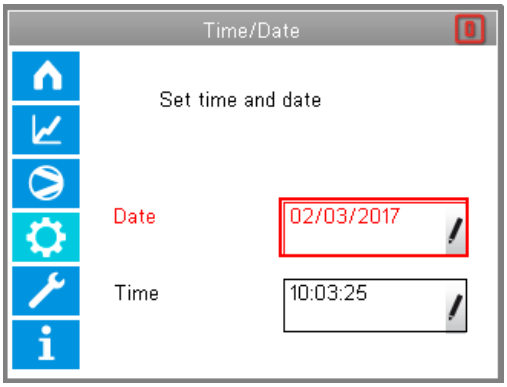


Fig. 20 Setting time and date

1. Place the selection frame on the field **Date** or **Time**, see Chapter 7.3.2 Modifying the settings, Page 75.
2. Change the settings with the navigation keys ▲ ▼.
3. Confirm by pressing the **OK** key.

7.4.2 Setting language and units

Access to the setting of the language and units is located in the following menu:
Start page → B-Control Setup → Language/Units

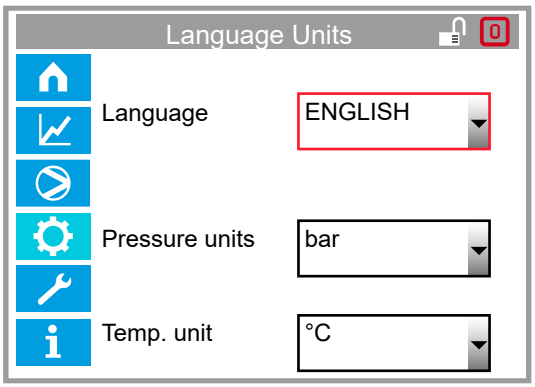


Fig. 21 Setting language and units

1. Set the selection frame on the language field.
2. Change the settings with the navigation keys ▲ ▼.
3. Confirm by pressing the OK key OK.

Setting the units is carried out in the same way.

7.4.3 Setting the display

The Display page allows the user to set the display of the lighting conditions and determine the duration of the background lighting following the last action.

Access to the setting of the display is located in the following menu:

Start page → B-Control Setup → Display

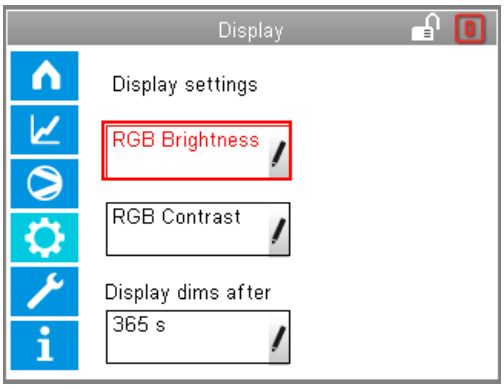


Fig. 22 Setting the display

1. Place the selection frame on the field **RGB brightness** , **RGB contrast** or **Display dims after**.
2. Change the settings with the navigation keys ▲ ▼.
3. Confirm by pressing the OK key OK.

7.4.4 Setting the final pressure

The final pressure measured controls the switching on and off of the compressor unit.

A second final pressure sensor is optional. The set values of the second final pressure sensor are displayed only if the sensor is registered.

Access to the setting of the final pressure is located in the following menu:

Start page → Compressor Setup → Final pressure

Logging in with authorisation level 0 is required, see Authorisations, Page 78.

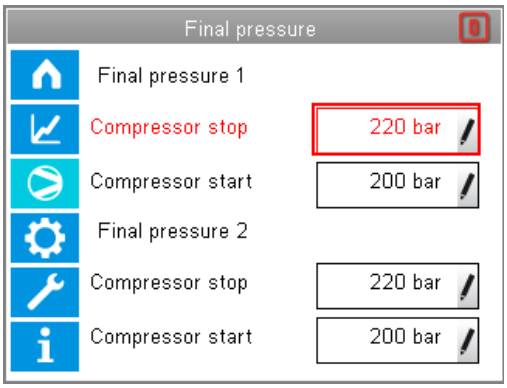


Fig. 23 Setting the final pressure

› Set pressure values for Compressor stop and Compressor start and confirm.

The compressor start value must lie below the compressor stop value.

7.4.5 Setting the valves

The individual settings pages help in setting the valve type and the response times of the valves. The number and type of valves depend on the compressor type.

Access to the setting of the valves is located in the following menu:

Start page → Compressor Setup → Unit/compressor Setup→ Valves

For setting the interval and drain duration, login with authorisation level 0 is required, see Authorisations, Page 78.

For setting the valve type, login with authorisation level 2 is required, see Authorisations, Page 78.

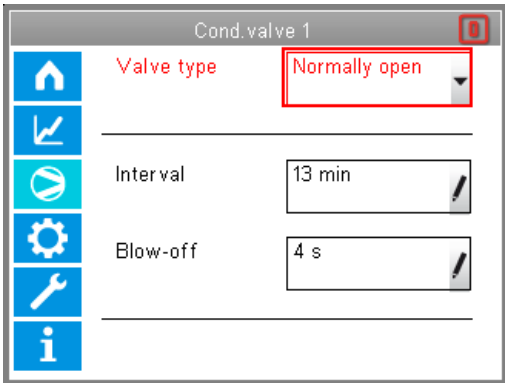


Fig. 24 Setting the valves

NOTICE

Damage to the compressor!

Incorrect interval duration and drain duration of the condensate valves can lead to flooding of the separator.

- Only experienced unit operators or customer service technicians may set the valves.

- Set interval in minutes and drain duration in seconds and confirm.

  - Or -

  With intake valve: Set start delay and switch off delay in seconds and confirm.

7.4.6 Setting the alarm relay

The alarm relay determines the behaviour of the unit when a warning message or a fault message is received. Three operating modes are available for selection:

- **Errors only**: The unit stops automatically when an error occurs.
- **Errors and Warnings**: The unit stops automatically when an error or warning occurs.
- **Errors and Warnings flashing**: The unit stops automatically when an error occurs. When a warning occurs, the relay flashes at one-second intervals.

Access to the setting of the alarm relay is located in the following menu:

Start page → B-Control Setup → Alarm relay

Logging in with authorisation level 0 is required, see Authorisations, Page 78.

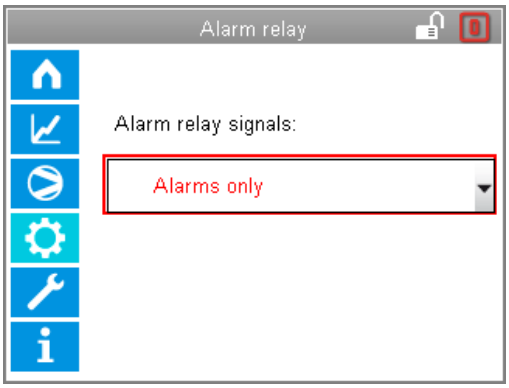


Fig. 25 Setting the alarm relay

› Select mode of operation of the alarm relay and confirm.

7.4.7 Loading the factory settings

Loading the factory settings allows the original settings that were available when the unit was delivered to be restored.

The current settings are overwritten and lost once the configuration is loaded.

The factory settings are protected and can be reloaded at any time.

Access to the restoring of the factory settings is located in the following menu:

Start page → Compressor Setup → Unit settings→ Software→ Load factory settings

Logging in with authorisation level 0 is required, see Authorisations, Page 78.

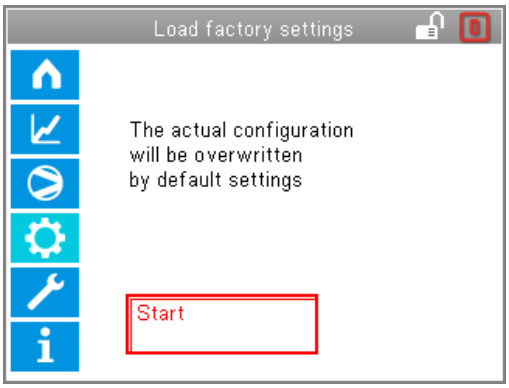


Fig. 26 Loading the factory settings

Select **Start** and confirm.

The factory settings will be loaded. The existing settings will be overwritten.

7.4.8 Connecting to a local network

The units are equipped, as standard for connection to a local network using a LAN bush. The LAN connection serves primarily for the connection to a local WLAN router, in order to operate the unit using a smartphone via a WLAN, see Chapter 7.5.10 Operating the control system with the B-APP, Page 101

The network interface is automatically configured, or the unit is automatically detected in the network, after connecting to the local network.

If necessary, the connection can be set manually. Proceed as follows:

Access
Start page > B-Control Setup > IP address / B-App password

1. Connect the unit to the local network using the LAN bush on the back of the unit and an Ethernet cable.
2. Set main switch to I.
3. Open the page "IP address / B-App password".
4. In the box "Addressing", select the setting "static IP".
5. Enter the values for "IP address", "Subnet" and "Gateway".
6. Switch the unit off and on again
   ↳ The settings have been accepted.

7.4.9 B-CLOUD Connection configuration

The connection between the electronic device control and the B-CLOUD is calibrated as follows:

Access
Start page > B-Control Setup > Cloud connection

Prerequisites:

✓ The electronic device control is fitted with the B-CLOUD ready option.
✓ The electronic device control is connected to the internet.

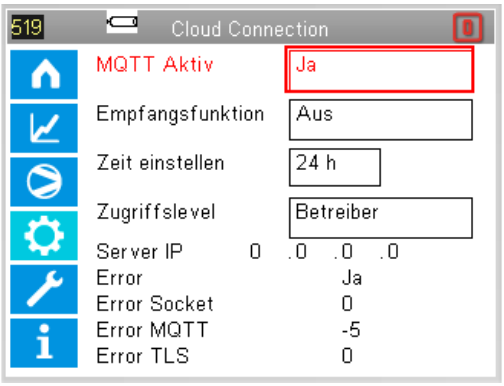


Fig. 27 Page Cloud connection

1. Open the page "Cloud connection" on the device display.
2. Activate connection, if necessary. To do this, set the field "MQTT Active" to **Yes**.
   ↳ The connection will be created. The "Error" field shows the value **No**.

*Does the "Error" show the value **Yes**?*

The connection to the B-CLOUD server cannot be created.

❯ Check the internet connection.

3. Adjust the "reception function" to limit access to the device. See table below.

Value	Function
Off	only one-sided communication permitted: from the control system to the B-CLOUD
In hours	two-sided communication permitted within the stipulated duration, see "Set time" below
Permanent	two-sided communication permitted at all times

4. Only with "reception function" = **In hours**:
   Enter the permitted access duration in the field "Set time" in hours.
   Factory setting = 24 hours.
   - A timer starts when you set the duration. The remaining time appears on the right next to the setting field.
   - The control system automatically switches to the "reception function" mode **Off** after the set duration has expired.
5. Only with "reception function" = **In hours** or **Permanent**:
   Set maximum "Access level" to limit the setting possibilities for the authorised B-CLOUD user. See table below:

Access level	Target group	Permitted settings
Operating company	Standard access for operators and trained personnel	• Operating parameters
Service	Access for trained and authorised persons	• Operating parameters • Maintenance parameters
Configurator	Access only for trained BAUER employees and approved dealers with certificate	• Operating parameters • Maintenance parameters • Configuration parameters
Administrator	Access only for trained BAUER employees	• Operating parameters • Maintenance parameters • Configuration parameters • Programming parameters

- Only authorised users can access the device control via the B-CLOUD. The creation of authorised remote users and their individual access levels is carried out in the B-CLOUD application and is the responsibility of the operator.
- For safety reasons, the access level set on the device display always has priority and applies to all authorised remote users, irrespective of the access level set in the B-CLOUD.

The connection is set up.

For registration of the device in the B-CLOUD see next chapter.

B-CLOUD: Registering user and device

The user and the device need to be registered in the B-CLOUD before being able to use the B-CLOUD option.

Prerequisites:

- ✓ The device control and the B-CLOUD are connected, see preceding chapter
- ✓ Internet access computer or mobile end user device
- ✓ Email address

Register the device as follows:

Fig. 28 Page Software

1. On the device display, open the page "Settings" > "Software" and note the 8-digit serial number on the left under the header (in the example above "99990010").

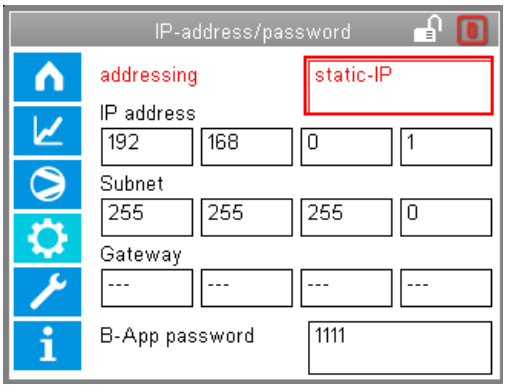


Fig. 29 Page IP address / Password

2. On the device display, open the page "Settings" > "IP address / Password" and note the "B-App Password".

3. Open B-CLOUD internet page (http://b-cloud.bauer-kompressoren.de/), enter email address and password received previously.
   ↳ The screen shows the area reserved for the registered user on the B-CLOUD server.
4. Select **Add device** and register the device using the serial number noted previously and the B-App password.
   ↳ The user and the device are registered in the B-CLOUD. See B-CLOUD help for further information about functions and settings.

Release your device in the B-CLOUD to your service partner responsible to receive rapid and uncomplicated support in the event of a problem.

7.5 Operation

⚠ CAUTION

Danger of injury due to automatic re-start of the unit!
The unit can re-start automatically depending on the version.

- Follow the safety instructions for the unit.
- Operate the unit only if the safety devices are installed.
- Ensure that a suddenly restarted unit does not pose dangers to people or the machine.

7.5.1 Switching the unit on

✓ Initial start-up has been performed correctly.
✓ All covers are kept closed.

⚠ WARNING

Danger of injury due to unit in operation.

- Do not perform any work on the unit when it is in operation.
- For all assembly and maintenance work, disconnect the motor and secure it against turning on again.

NOTICE

Risk of damage due to insufficient lubrication

- Avoid operationg periods of less than 10 minutes.
- If the operating period is less than 10 minutes, operate the compressor with open condensate drain valves to ensure proper lubrication of all components prior to pressurize the system.

1. Set the main switch to **I**.

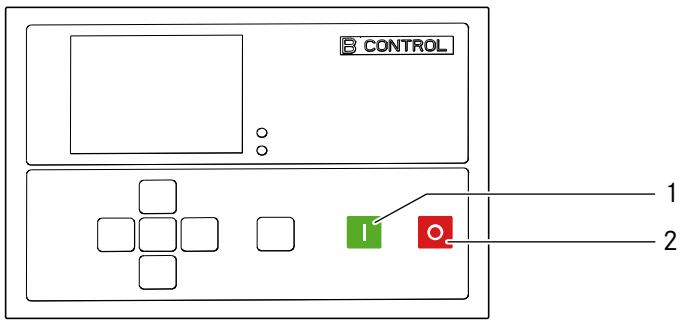


Fig. 30 Starting the unit

2. The display shows no alarm.
   Press the green ON button on the control system.

↳ The unit is ready for operation.

7.5.2 Switching the unit off

1. Press the OFF button on the control system.
   ↳ The unit is switched off.
2. Set main switch to **0**.

↳ The unit is switched off and currentless.

7.5.3 Behaviour in case of emergency

Switching the unit off in case of an emergency

The unit is equipped with at least one emergency stop switch, see Chapter 2.4.7 Safety and monitoring equipment, Page 25.

❯ Press the emergency stop switch.

↳ The unit stopps operation and is shut down to a safe state.

Restarting the unit after an emergency

✓ The emergency situation no longer exists. The cause has been rectified.

1. Turn the red button of the emergency stop switch clockwise.
2. If applicable, reset the alarm message on the control unit.
3. Switch the unit on.

7.5.4 Displaying the operating values

The monitored operating values can be displayed at any time.

Access
Start page → Measured values

Proceed as follows to display the measured values:

1. Open the "Measured values" menu.
2. Press navigation buttons ◀ ▶ to scroll the pages.

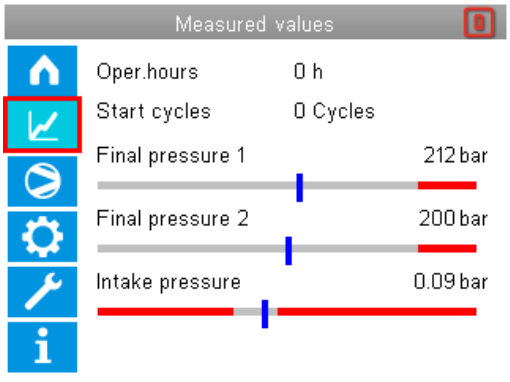


Fig. 31 Measured values

7.5.5 Checking the maintenance intervals

For planning purposes, the upcoming maintenance activities can be displayed at any time in the "Maintenance" menu.

Access
Maintenance > Maintenance intervals

Proceed as follows to display the maintenance intervals:

1. Open the "Maintenance" menu.

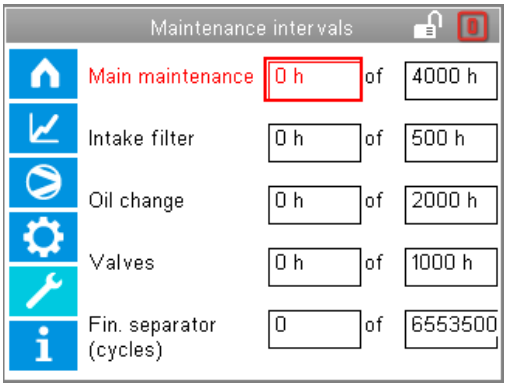


Fig. 32 Maintenance intervals

2. Compare the target and actual times for the maintenance activities. Organise the maintenance if necessary.

7.5.6 Checking the maintenance intervals for gas sensors

For planning purposes, the upcoming maintenance activities for the gas sensors can be displayed at any time in the "Maintenance" menu.

Access
Maintenance > Maintenance air analysis

Proceed as follows to display the maintenance intervals:

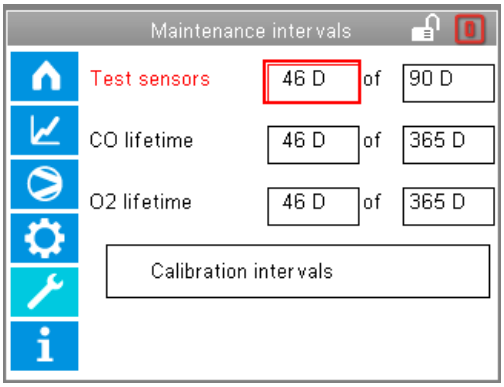


Fig. 33 Maintenance intervals

1. Open the "Maintenance intervals" page.
   ↳ The actual times are displayed in the left-hand column and the target times for each individual sensor are displayed in the right-hand column.
2. Compare the target and actual times for the maintenance activities. Organise the maintenance if necessary.
3. Press the "Calibration intervals" box to check them.

7.5.7 Displaying the current messages

Current warning and fault messages are listed in the Messages menu and can be called up at any time. Each message contains a time stamp with the date and time, message number and the message text.

There are messages only when the alarm or warning LED flashes or lights up.

Access
Start page → Messages

Proceed as follows to display the messages:

1. Open the page "Messages".
2. Press navigation buttons ▲ ▼ to scroll through the messages.

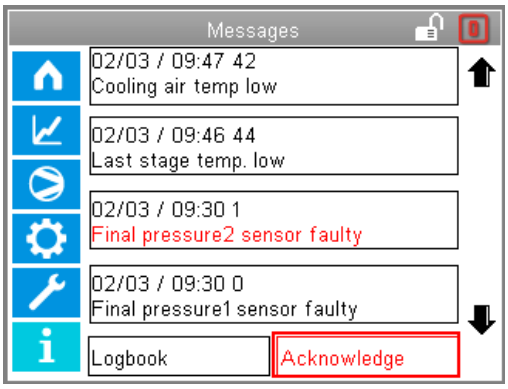


Fig. 34 Displaying the current messages

7.5.8 Displaying the logbook

The control system stores every warning and fault message received in the "logbook".

Access
Start page → Messages → Logbook

Proceed as follows to display the logbook:

✓ The display shows the Messages page, see Chapter 7.5.7 Displaying the current messages, Page 98.

1. Place selection frame on the function key "Logbook" using the navigation buttons and confirm.
2. Press navigation buttons ▲ ▼ to scroll through the messages.

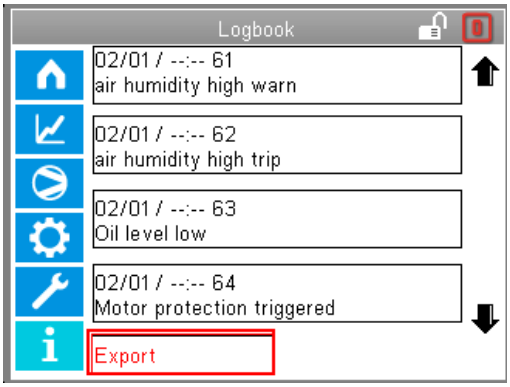


Fig. 35 Displaying the logbook

7.5.9 Resetting the messages

A message can be acknowledged before or after the fault rectification. However, the unit will only be ready for operation after the fault has been rectified or after the message has disappeared from the alarm list.

Access
Start page → Messages

Proceed as follows to reset warning and fault messages:

⚠ CAUTION

Danger of injury due to automatic re-start of the unit.
The unit can re-start automatically depending on the version.

› Ensure that a suddenly restarted unit does not pose dangers to people or the machine.

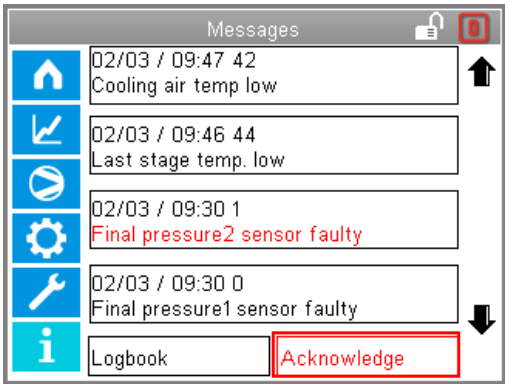


Fig. 36 Resetting messages

✓ The signal lamps are flashing or lighting up.

1. Read fault messages in the message list and eliminate the cause of fault.
2. Place selection frame on the function key "acknowledge" using the navigation buttons and confirm.
   ↳ The message list is empty. The signal lamps go out.

The list is not empty.

The fault has not been eliminated.

› Eliminate the fault or contact customer service. Advise the number of the fault message to customer service.

7.5.10 Operating the control system with the B-APP

The electronic control system B-CONTROL MICRO can be operated via WLAN using a smartphone.

You can download the B-APP free of charge from the AppStore and from Google Play.

Connect the control system with the smartphone as follows:

- ✓ The control system is connected to a B-LINK Access point or a customer router.
- ✓ The B-APP is installed on the Smartphone.
- ✓ The control system is switched on.
- ✓ The B-APP password for connecting the control system is present, see in the control system under: Main menu > B-CONTROL Setup > IP address / password.

The B-APP needs to be regularly updated and the illustration shown below may deviate from the actual representation.

1. Display the available WLAN connections on the Smartphone.
2. Select “B-LINK” connection and enter password **B-Control_0217**.

   - Or -

   Create connection with own router.
3. Start the B-APP on the Smartphone.

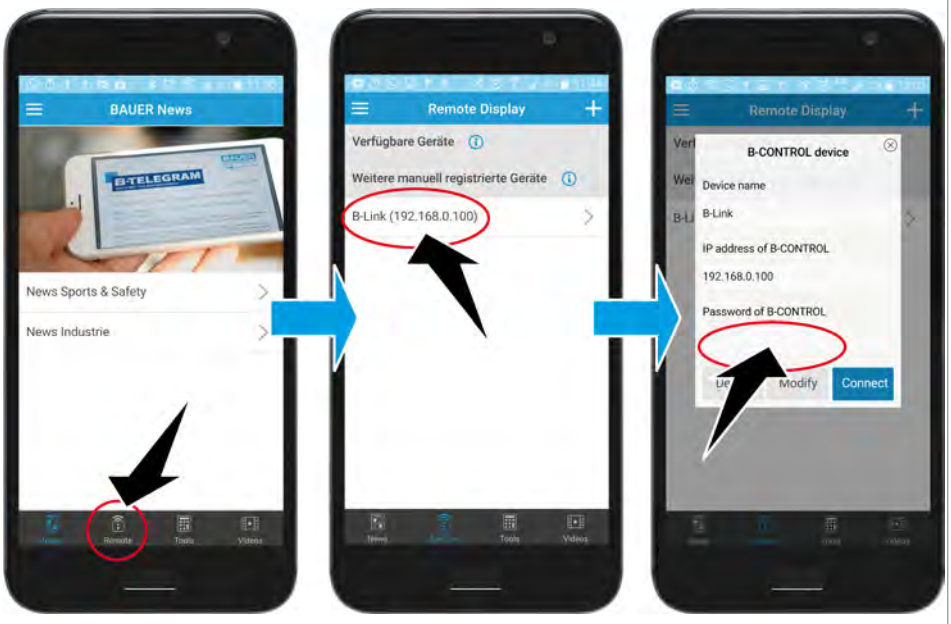


Fig. 37 Connecting the B-APP with the compressor control system

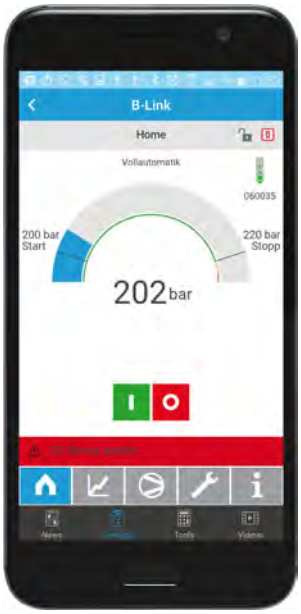
4. Click on the "Remote" symbol in the footer on the B-APP start page.
   ↳ The router or the device "B-LINK (192.168.0.100)" appears in the list of available devices.

The router or the device B-LINK does not appear in the list of available devices?

› Click on the "+" symbol and enter the IP address of the router or B-LINK. The B-LINK IP address is: **192.168.0.100**

5. In the list of available devices, click on the router or the "B-LINK (192.168.0.100)" to create the connection.
   ↳ A window showing the connection data appears on the display.

6. Enter the B-APP password in the relevant box and click on the "Connect" box.
   ↳ The start page of the control system appears on the Smartphone. Remote only allows control of start I, stop O and "message acknowledge".



7.6 Filling operation

⚠ DANGER

Danger of poisoning due to pollutants in breathing air!
Inhaling harmful gases can be dangerous to life.

- Make sure that the air drawn in is free from toxic gases, exhaust gases or solvent vapours.
- Do not fill breathing air cylinders with air from workrooms.
- Do not fill breathing air cylinders if the air drawn has a CO component of more than 25 ppmV (parts per million by volume). This is applicable even when using a CO filter cartridge.
- The bound CO_2 is released from the filter cartridge again after a pressure drop and an extended standstill period. For this reason, after a standstill period of more than 6 hours, purge the compressor unit before connecting breathing air cylinders, as described below.

7.6.1 Flushing the unit manually

⚠ CAUTION

Increased noise level!
Danger of acute hearing damage or noise-related hearing impairment!

- Wear ear defenders.

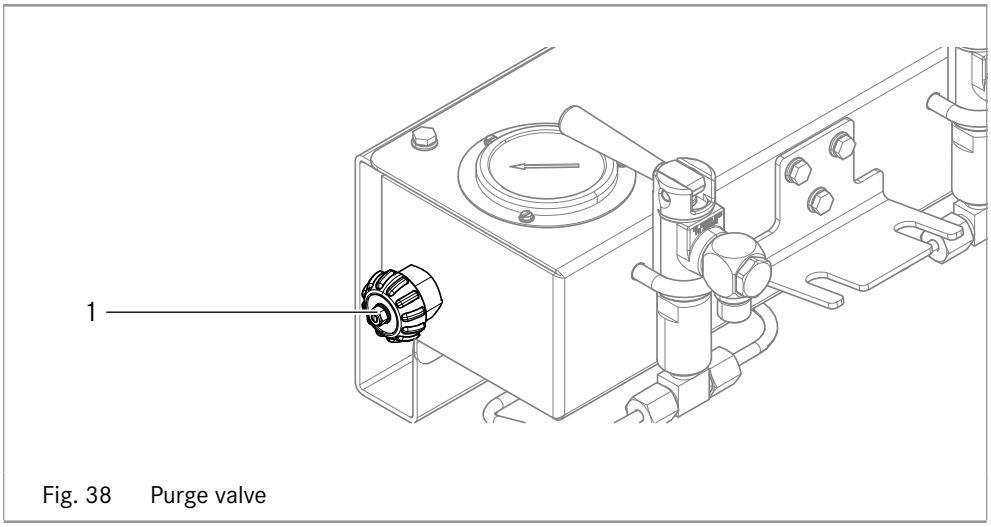


Fig. 38 Purge valve

1. Switch on unit.
2. Slowly open purge valve.
3. Release the compressed air into the atmosphere for 6 minutes.
4. Close purge valve.

↳ The unit is ready for the filling operation.

7.6.2 Analysing the air

✓ The unit is switched on, and it was either started up properly or calibrated correctly.
✓ The function of the sensors was tested.

⚠ WARNING

Danger on account of incorrect measurement results!

❱ Check the measured values using a second measurement device.

1. Wait until the measured values stabilise. On units with automatic purging device, the air in the environment is extracted automatically provided that the measured values are outside the threshold values.

Does the compressor unit switch off?

The compressed air exhibits prohibited gas concentrations.

❱ Check the measured values and quality of the drawn-in air.

2. Check the displayed measured values for plausibility.
3. Read off the measured values.

Instruction for measuring the oil content

Keep the following in mind for measuring devices with the VOC* sensor:

In case of unforeseeable deviations in the operating characteristic due to an early warning and/or shutdown of the compressor, the optional VOC sensor helps prevent an excessively high percentage of specific volatile hydrocarbons in the breathing air.

Since the VOC sensor also measures components (short-chain volatile hydrocarbons) that do not come under the definition of oil as per DIN EN 12021:2014 (mixture of hydrocarbons and other organic compounds that contain six or more hydrocarbon atoms (C6+)), it may lead to a warning message or shutdown of the compressor before the specified filter service life.

We always recommend replacing the filter cartridges when the set VOC threshold value is overshot since an excessively high VOC value can have different causes (among others, irregular operating conditions, non-executed maintenance or a high percentage of volatile hydrocarbons in the intake air).

Note: BAUER had the compressed and generated breathing air of BAUER breathing air compressors externally tested for their residual oil content - after being filtered through the original cartridges used from the BAUER product range (P21, P31, P41, P61) – by the certified Institute for Energy and Environmental Technology (IUTA) on the basis of the measurement technique certified as per ISO 8573. Herewith, it was confirmed that the limits of DIN EN 12021:2014 as well as ISO 8573 class 2 were achieved under the specified test conditions (samples were taken at 20 °C and 40 °C and operating pressures of 150 and 300 bar) and by taking into account the prescribed cartridge service lives.

* VOC = volatile organic compounds (i.e. hydrocarbon-containing materials that evaporate readily)

7.6.3 Filling the compressed air cylinders (hose filling connection)

⚠ WARNING

Danger of injuries due to the use of non-approved or damaged filling equipment and compressed air cylinders!
Unsuitable or damaged material may burst or tear under pressure.

- Use only approved filling devices and compressed air cylinders.
- Ensure that filling equipment and compressed air cylinders are in a flawless condition.
- Ensure that the compressed air cylinder to be connected for the filling pressure are approved; refer to the stamp on the shoulder of the cylinder.

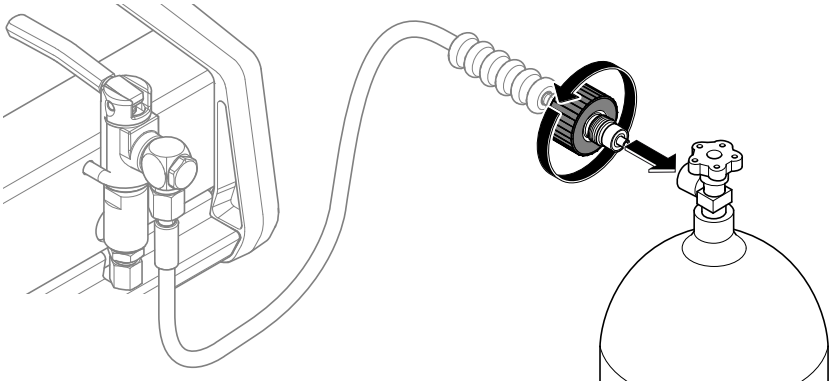


Fig. 39 Connecting the compressed air cylinders

1 Filling connection

1. Connect the filling connection (Fig. 39-1) to the compressed air cylinder.

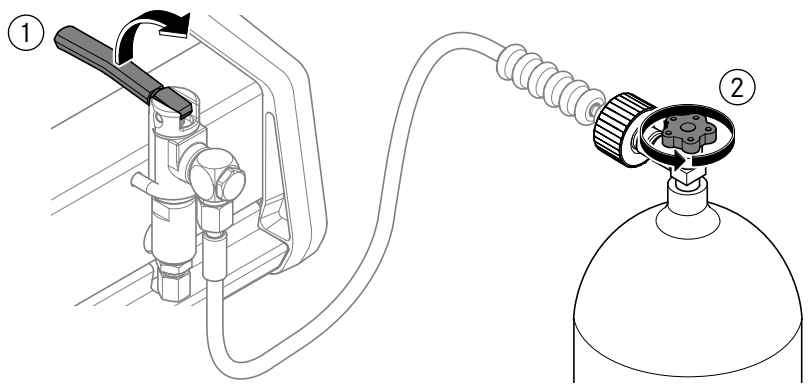


Fig. 40 Filling the compressed air cylinder

1 Filling valve 2 Cylinder cock

2. Open filling valve (Fig. 40-1).
3. Open cylinder cock (Fig. 40-2).
4. Switch on unit.
   ↳ The compressed air cylinder is filled.
5. Drain the condensate regularly, generally every 15 min.
   - Or -
   On units with automatic condensate drain, check that the condensate drains regularly.
6. Switch the unit off when the filling pressure has been reached.
   - Or -
   On units with automatic switch-off, check that the unit switches off automatically.

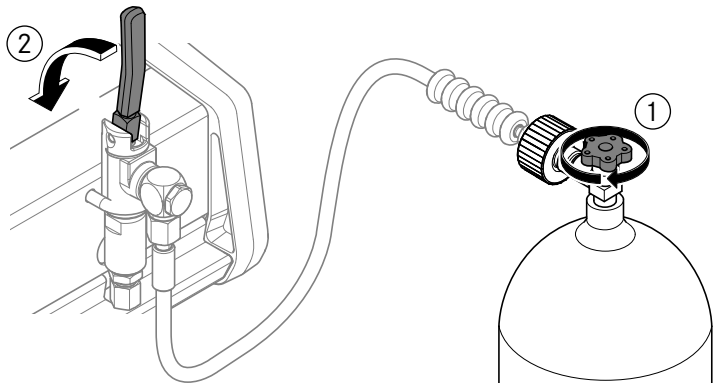


Fig. 41 Removing the compressed air cylinder

1 Cylinder cock 2 Filling valve

7. Close cylinder cock (Fig. 41-1).
8. Close filling valve (Fig. 41-2).
   ↳ The cylinder connection is de-pressurised.
9. Remove compressed air cylinder.

During filling, the compressed air cylinder heats up because of the subsequent compression in the compressed air cylinder. Allow the cylinder to cool after removing it: this causes the pressure in the compressed air cylinder to drop. The compressed air cylinder can then be reconnected and filled until the relevant nominal filling working pressure is achieved.

7.6.4 Filling the compressed air cylinders (direct filling connection)

⚠ WARNING

Danger of injuries due to the use of non-approved or damaged filling equipment and compressed air cylinders!
Unsuitable or damaged material may burst or tear under pressure.

- Use only approved filling devices and compressed air cylinders.
- Ensure that filling equipment and compressed air cylinders are in a flawless condition.
- Ensure that the compressed air cylinder to be connected for the filling pressure are approved; refer to the stamp on the shoulder of the cylinder.

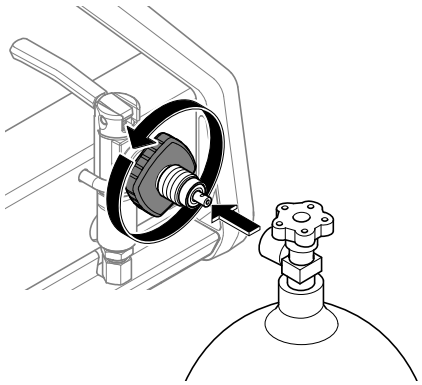


Fig. 42 Connecting the compressed air cylinders

1. Connect the compressed air cylinder to the cylinder connection.

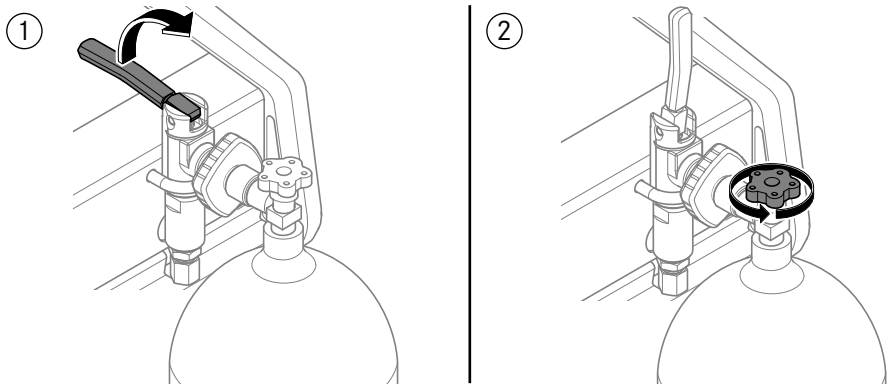


Fig. 43 Opening the filling valve and cylinder cock

2. Open filling valve.
3. Open cylinder cock.

4. Switch on unit.
   ↳ The compressed air cylinder is filled. The unit switches off automatically when the filling pressure has been reached.
5. Drain the condensate regularly, generally every 15 min.
   - Or -
   On units with automatic condensate drain, check that the condensate drains regularly.
6. Switch the unit off when the filling pressure has been reached.
   - Or -
   On units with automatic switch-off, check that the unit switches off automatically.

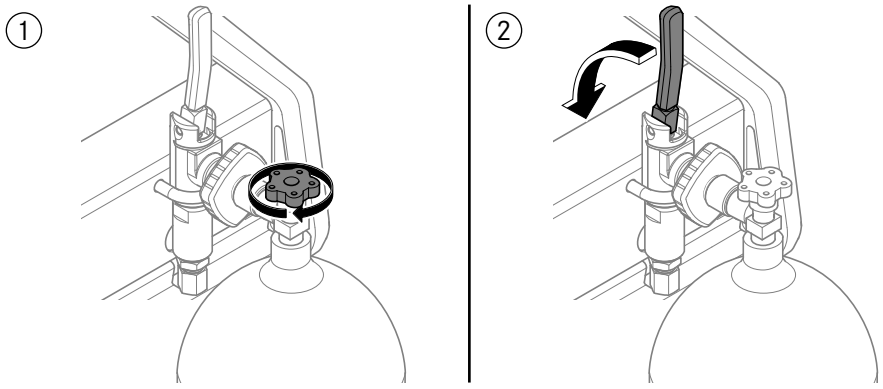


Fig. 44 Closing the filling valve and cylinder cock

7. Close cylinder cock.
8. Close filling valve.
   ↳ The cylinder connection is de-pressurised.
9. Remove compressed air cylinder.

During filling, the compressed air cylinder heats up because of the subsequent compression in the compressed air cylinder. Allow the cylinder to cool after removing it: this causes the pressure in the compressed air cylinder to drop. The compressed air cylinder can then be reconnected and filled until the relevant nominal filling working pressure is achieved.

8 Troubleshooting

8.1 Fault finding and fault correction

8.1.1 Fault finding in drive motor

Description	Cause	Rectification
Motor does not start.	Fault in the electrical power supply.	Check lines and fuses. Compare the motor data with the mains supply.

8.1.2 Fault finding in compressor block

Description	Cause	Rectification
No oil pressure.	Air in the oil pump. Direction of rotation is incorrect.	Vent the oil pump and lines. Check and rectify direction of rotation.
The compressor does not achieve final pressure.	Line or condensate drain valves leaking. Final pressure safety valve blows off too early. Piston rings stuck or worn. Piston clearance too large.	Tighten and seal lines. Clean condensate drain valves and replace if worn. Clean and reset final pressure safety valve. Free the piston rings or replace them if needed. Check clearance and replace parts if necessary.
Delivery rate drops.	Piping leaking.	Tighten and seal lines.
Intermediate pressure safety valve blows off.	Intermediate pressure too high, suction valves or pressure valves leaking.	Check suction and pressure valves and replace if needed.
Compressor getting too hot.	Cooling air feed is inadequate. Suction valves or pressure valves leaking. Direction of rotation is incorrect.	Check installation. Observe a max. ambient temperature of +45 °C. Check suction and pressure valves and replace if needed. Check and rectify direction of rotation.
Taste of oil in the air.	The filters are not serviced, and the filter cartridges are saturated. Incorrect oil type used.	Maintain the filters and replace the filter cartridge. Use approved oil. Carbonised valves should be cleaned.

8.1.3 Fault finding in electrical control system

Description	Cause	Rectification
Control system does not switch on.	No control voltage present. Control fuse defective. Control voltage circuit interrupted due to loose line or terminals. Thermal over-current relay has responded.	Check the supply line. Replace fuse and rectify the cause. Tighten the terminals. Check compressor drive and correct the settings.
Thermal over-current relay for drive motor responds.	Power consumption too high. Over-current relay is set too low.	Check compressor drive. Rectify the setting.
Control system does not switch off; the final pressure safety valve blows off.	Final pressure monitor is set too high. Final pressure safety valve defective.	Rectify the setting. Replace the safety valve.
On-site residual current device (RCD) responds.	Residual current device is unsuitable.	Use all-current sensitive RCD (type B).

8.1.4 Fault finding in automatic condensate drain

Description	Cause	Rectification
Inadequate water removal or much condensate coming out (>40 ml at function check)	Opening time or cycle time of solenoid valve set incorrectly Solenoid valve does not open fully Solenoid valve does not open; solenoid valve is defective Solenoid valve does not open; continuous voltage at the solenoid valve	Check the set opening time or cycle time at the timer and have it adjusted if necessary Check solenoid valve, clean and replace if necessary Check solenoid valve and replace if necessary Check electrical control system and timer
Only a small amount of air/ condensate comes out during function check	Condensate valve/ sieve insert contaminated	Dismantle condensate valve, remove sieve insert, dismantle and clean the components or replace them
The operating pressure is not achieved or the condensate valve is dripping	Solenoid valve leaking, pilot pressure greater than 15 bar, valve seat defective Solenoid valve leaking, pilot pressure greater than 15 bar, valve piston moves with difficulty Solenoid valve leaking, pilot pressure greater than 15 bar, valve piston surface damaged Solenoid valve leaking, solenoid valve contaminated Solenoid valve leaking, solenoid valve seat is damaged Solenoid valve does not close, solenoid valve is defective Solenoid valve does not close, solenoid valve not getting power Condensate valve/ solenoid valve hose is leaking	Remove condensate valve, dismantle and clean; replace valve seat Remove the condensate valve, dismantle and clean; check ease of movement of the piston in the valve body after cleaning, replace piston if necessary Replace valve piston Clean solenoid valve and replace if necessary Replace solenoid valve Replace solenoid valve Check power supply and reestablish it if necessary Check the hose; check correct seating of the hose in the connections; replace hose and/ or plug connections if necessary

8.1.5 Troubleshooting gas measurement device

Description	Cause	Rectification
Differential pressure too high	- Flow rate too high - Secondary pressure at pressure reducer too high	- Check installation of nozzle in AIRBOX, re-install if necessary - Measure secondary pressure, replace pressure reducer if too high
Differential pressure too low	- Flow rate too low - Particle filter blocked	- Check hose connections for leaks - Replace the filters
No flow	- Hose connection between AIRBOX and B-DETECTION interrupted - The solenoid valve at the gas sampling does not open - Gas sampling solenoid valve is defective	- Check correct location of the hose in the plug connections - Check connection against circuit diagram - Replace the solenoid valve
Alarm does not go off	- Alarm threshold values incorrect	- Check alarm threshold values and change if necessary
Sensor offline	- Sensor missing - Sensor contact faulty	- Install sensor - Check lines and plugs
Measured value not being displayed	- Sensor not registered	- Register sensor in dataset (B-Manager)
Sensor test shows CO or O_2 measured value too low	- Calibration required	- Re-calibrate the sensors. Replace the sensors if no improvement results.
Compressor switches off after starting, despite alarm suppression	- CO value too high (alarm suppression for CO only 30 seconds) - Moisture content too high	- Restart compressor. If the compressor switches off again, the CO concentration in the ambient air is too high. Ensure adequate ventilation. - Repeat start and purge process (above all at First commissioning considerable residual moisture in the system)
Purge valve does not open, despite fault message on B-DETECTION	- Cable connection between B-DETECTION and AIRBOX faulty - Solenoid and/or valve defective	- Check lines and plugs - Check solenoid and/or valve, replace if necessary

9 Maintenance

9.1 Maintenance table

The following chapters describe the maintenance activities that are listed in the maintenance table, and which are necessary for optimal and fault-free operations. If the regularly scheduled checks reveal an enhanced degree of wear and tear, the required maintenance intervals must be shortened in accordance with the observed wear and tear.

Information regarding the maintenance intervals can be found in the maintenance booklet.

In case of queries related to maintenance work and maintenance intervals, please contact the service department of BAUER KOMPRESSOREN, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.

9.2 Resources for maintenance and repairs

9.2.1 Torques for screws

- Unless otherwise stated, the following torques must be used.
- The quoted values are guidelines for set screws (coarse thread at 75% of minimum yield strength) and apply to greased screws.
- Self-locking nuts must not be re-used, replace them.

Thread	Tightening torques		
	Property class 8.8	Property class 10.9	Property class 12.9
M4	3 Nm (2 ft. lbs.)	5 Nm (4 ft. lbs.)	6 Nm (4 ft. lbs.)
M5	6 Nm (4 ft. lbs.)	9 Nm (7 ft. lbs.)	10 Nm (7 ft. lbs.)
M6	10 Nm (7 ft. lbs.)	16 Nm (12 ft. lbs.)	18 Nm (13 ft. lbs.)
M7	17 Nm (13 ft. lbs.)	25 Nm (18 ft. lbs.)	30 Nm (22 ft. lbs.)
M8	25 Nm (18 ft. lbs.)	37 Nm (27 ft. lbs.)	43 Nm (32 ft. lbs.)
M10	51 Nm (38 ft. lbs.)	75 Nm (55 ft. lbs.)	87 Nm (64 ft. lbs.)
M12	87 Nm (64 ft. lbs.)	130 Nm (96 ft. lbs.)	150 Nm (111 ft. lbs.)
M14	140 Nm (103 ft. lbs.)	205 Nm (151 ft. lbs.)	240 Nm (177 ft. lbs.)
M16	215 Nm (159 ft. lbs.)	310 Nm (227 ft. lbs.)	370 Nm (273 ft. lbs.)
M18	300 Nm (221 ft. lbs.)	430 Nm (317 ft. lbs.)	510 Nm (376 ft. lbs.)
M20	430 Nm (317 ft. lbs.)	620 Nm (457 ft. lbs.)	720 Nm (531 ft. lbs.)
M22	580 Nm (428 ft. lbs.)	830 Nm (613 ft. lbs.)	970 Nm (715 ft. lbs.)
M24	740 Nm (546 ft. lbs.)	1060 Nm (782 ft. lbs.)	1240 Nm (915 ft. lbs.)

Tab. 9 Tightening torques for set screws with coarse thread

9.2.2 Bolt tightening sequence

All the valve head screws, cylinder fixing screws and the corresponding nuts must be tightened evenly in a cold condition, and this must be done in the following order.

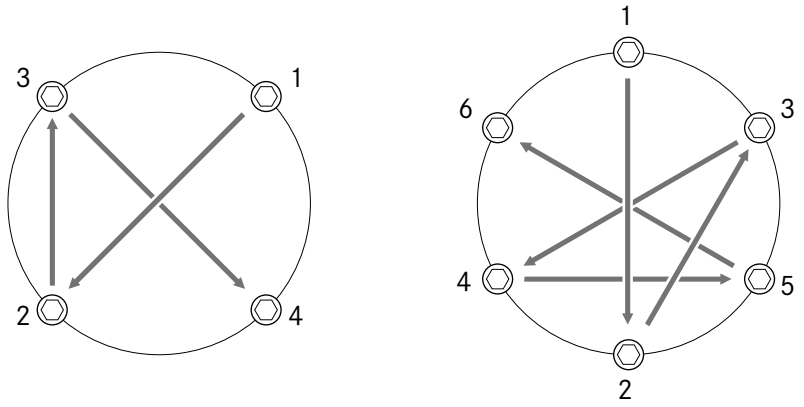


Fig. 45 Bolt tightening sequence

9.2.3 Adhesive and sealant

Application range	Adhesive or sealant
High-strength bolt locking, gluing in of threaded studs	Loctite 620
Thread sealing cord, sealing of conical threads	Teflon tape
Temperature-resistant silicone sealant, metal-on-metal sealing, high-temperature bonds, e.g. valve heads, cylinders	Order number N18247 (50 g)

Tab. 10 Adhesive and sealant table

9.2.4 Lubricant

Application range	Lubricant
Rubber parts, plastic parts, thread of the filter housing	Special grease for Nitrox applications, order number FM0531
O-rings	
Bolts, pins, threaded pins	
Shaft seal rings: Ring and shaft	Special grease for Nitrox applications, order number N25992

Tab. 11 Lubricant table

9.2.5 Lubrication oil

Depending on the type of application of the unit, the following is demanded of the lubrication oil that is used:

- low residue formation
- no carbon deposits in the valves
- good corrosion protection
- emulsification of condensed water in crankcase

To ensure perfect operation, BAUER KOMPRESSOREN recommends using only those oils listed in this operating instructions and that have been tested and approved by us.

Lubrication oil list

The exclusive use of high-quality branded oils is essential because of the thermal loads encountered in the compressor. In order to ensure perfect operation, we recommend using only those oils listed below from BAUER in the quoted operating conditions tested and approved by us.

- There is the highest risk of ignition during the operation of compressor units with Nitrox gas mixture if unsuitable lubricants have been used. We recommend exclusive use of the BAUER special synthetic compressor oil listed below.
- These oils have been tried and tested at ambient temperatures listed below. At low ambient temperatures you will need compressor heating that is capable of heating the unit up to the permissible ambient temperature.

BAUER special compressor oils			
Designation	**Oil type**	**Permissible type of application**	**Permissible ambient temperature**
N28355	Synthetic oil	• Nitrox	+5...+40 °C

Order number

BAUER special compressor oils can be delivered in the following packing units:

N28355	
Volume	**Order number**
0.5-l cylinder	N28355-0.5
1-l cylinder	N28355-1
5-l can	N28355-5
20-l can	N28355-20

9.2.6 Test material

Application range	Test medium
Screwed fittings, lines	Leak detection spray, order number N25833

Tab. 12 Test medium table

9.2.7 Filter cartridges

Replacement cartridges

Replacement cartridges for filter system P41				
Order number	**Application range**	**Filtration of**	**SECURUS monitoring**	**Length [inch]**
061686	Diving, breathing protection	H_2O/Oil	X	20
061687	Diving, breathing protection	H_2O/Oil/CO	X	20
062565	Diving, breathing protection	H_2O/Oil	-	20

9.3 Checking the unit for leaks

In “Tightness test” mode, the compressor is started manually and then switches off automatically after the final pressure has been reached. Venting of the condensate valves is blocked for entire running time, the compressor comes to a standstill at the prevailing excess pressure after switching off automatically. This permits tightness and leakage testing.

Access to the tightness test mode is located in the following menu:

Start page → Maintenance → Tightness & safety valve test → Tightness test

Logging in with authorisation level 1 is required, see Authorisations, Page 78.

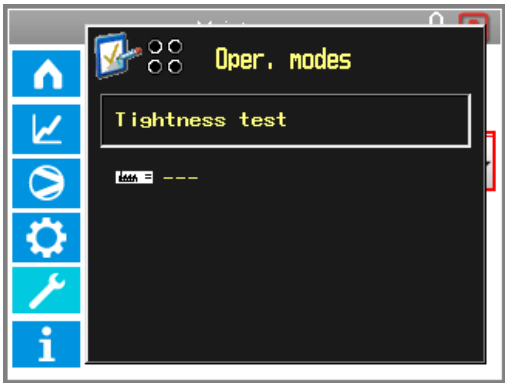


Fig. 46 Checking the unit for leaks

1. Select tightness test and confirm.
   ↳ The warning LED flashes.
2. Press start button I to start the test.
   ↳ The compressor builds up pressure and stops once the final pressure is reached.
3. Leave the unit for at least 10 min and read off final pressure.
4. Press stop button 0.
   ↳ The tightness test mode is deactivated, the warning LED goes out.

If the pressure has fallen by more than 10% of the final pressure within 10 min, the unit has a leak.

- Perform a tightness test again and look for spots with leaks using a leak detector spray.
- Render the unit leak-proof again.

9.4 Depressurising the unit

9.4.1 De-pressurising the filter circuit

De-pressurise the filter circuit as follows before any work is carried out:

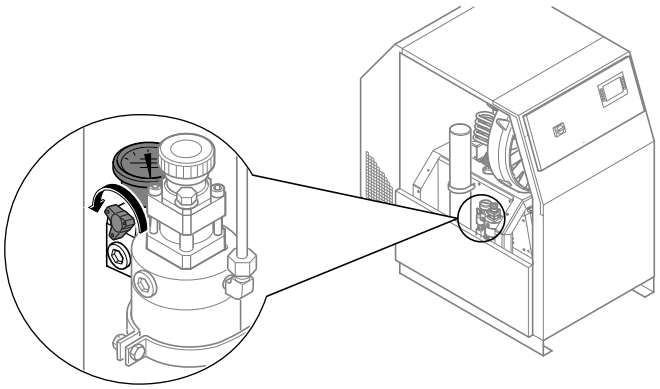


Fig. 47 De-pressurising the filter

✓ The unit is switched off.

1. Open the left-hand side cladding.
2. Slowly open venting valve.
3. Wait until the pressure has dropped and the pressure gauge indicates 0 bar.

↳ The filters are de-pressurised.

9.5 Maintenance activities - Intake section

9.5.1 Maintenance work

⚠ CAUTION

Danger of burns!

Even after switching off the unit, pressure lines, heat exchangers, compressors, condensate valves, oil and possibly cooling water can be at high temperatures. There is a danger of burns if they are touched!

› Wear appropriate personal protection equipment or gloves.

Replacing the intake filter

Maintain the filter insert of the intake filter regularly and/or as per the maintenance schedule.

The maintenance intervals are dependent on the condition of the air being drawn in. If there is a lot of dust it may be necessary to carry out maintenance monthly or weekly.

Check the leak-tightness of the intake filter regularly and during each maintenance.

⚠ WARNING

Danger of poisoning from contaminated breathing gas!

- Ensure cleanliness and hygiene.
- Only use cleaning agents and sealants that are suitable for Nitrox.

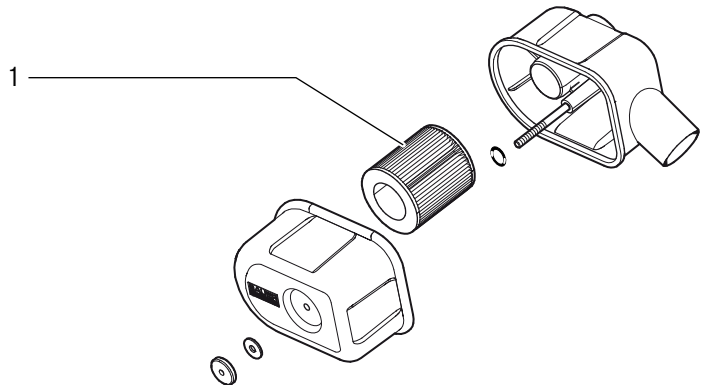


Fig. 48 Intake filter

1 Filter element

1. Remove the cover.
2. Remove filter element.
3. Brush off or blow out the filter element dry and replace it if necessary.
4. Clean the filter housing with a damp cloth. Make sure that no dust gets into the intake tube.
5. Check the seal of the cover and the O-ring for perfect condition and replace them if necessary.
6. Insert new filter element.
7. Place the cover.

9.6 Maintenance activities - Lubricating oil system

⚠ WARNING

Ignition risk as a result of increased oxygen concentration!
The use of unsuitable lubricants during the compression of Nitrox can lead to ignition.

- Only use lubricants approved for use with Nitrox during the compression of Nitrox! See Chapter 9.2, Page 118.

⚠ CAUTION

Danger of burns!
Even after switching off the unit, pressure lines, heat exchangers, compressors, condensate valves, oil and possibly cooling water can be at high temperatures. There is a danger of burns if they are touched!

- Wear appropriate personal protection equipment or gloves.

9.6.1 Maintenance work

Checking the oil level

NOTICE

Damage to unit due to incorrect oil level!

- Make sure that the oil level is between the minimum mark and the maximum mark.

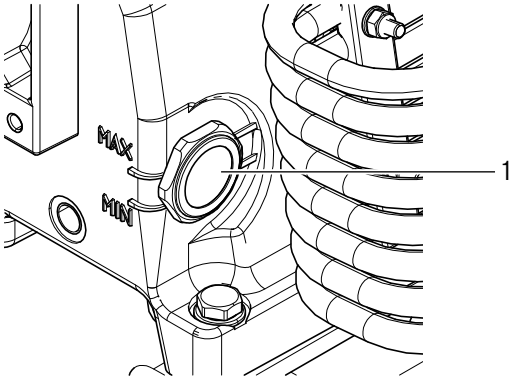


Fig. 49 Oil level gauge

- Use the oil level gauge to check the oil level. The oil level must be within the two markings on the oil level gauge.

Is the oil level under the minimum mark?

- Refill oil, see Filling oil, Page 132.

Oil change

⚠ CAUTION

Danger of burns!
Even after switching off the unit, pressure lines, heat exchangers, compressors, condensate valves, oil and possibly cooling water can be at high temperatures. There is a danger of burns if they are touched!

› Wear appropriate personal protection equipment or gloves.

NOTICE

Damage to the compressor due to contaminated oil filter!
If the oil filter is contaminated, the bypass valve in the oil filter opens. The unfiltered oil then circulates through the compressor.

› Replace the oil filter after each oil change operation.

Draining the oil

✓ Unit is at operating temperature.
✓ Suitable container is available for collecting the oil.

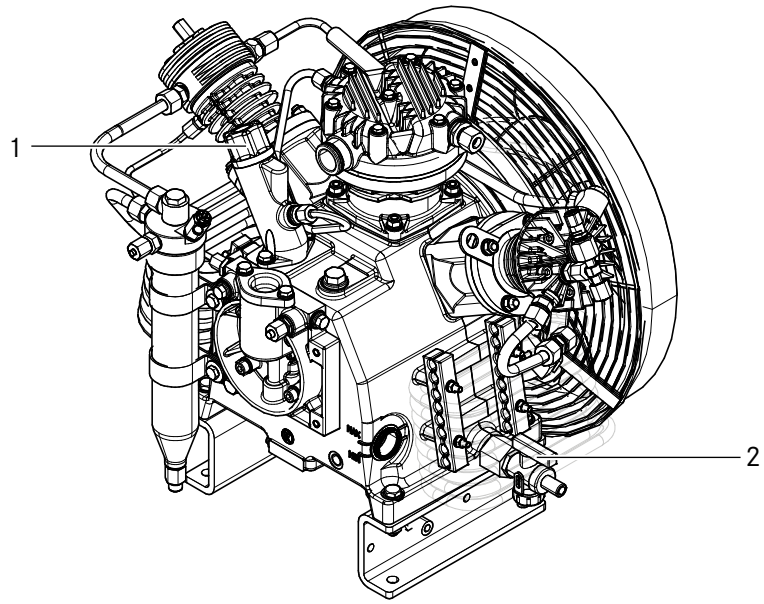


Fig. 50 Draining the oil

1 Oil filler spigot 2 Oil drain cock

1. Open oil filler spigot.
2. Open the oil drain cock and collect the oil in a suitable container.

If the red plastic handle of the oil drain cock is damaged or lost, the cock can be opened using the cover cap.

For this purpose, unscrew the cover cap, turn it 90° upwards, place it on the cock and open it.

3. Close oil drain cock.
4. Use a suitable wrench to unscrew the oil level gauge.
5. Clean the inner side (prism) of the oil level gauge.
6. Check sealing ring and replace if necessary.
7. Screw in the oil level gauge with a torque of 10 Nm.

NOTICE

Environmental damage caused by improper disposal of waste oil!

- Dispose of used oil as special waste. Be mindful of the local regulations relating to the disposal of special waste.

8. Dispose of used oil.

Changing the oil filter

✓ The required replacement parts are available.

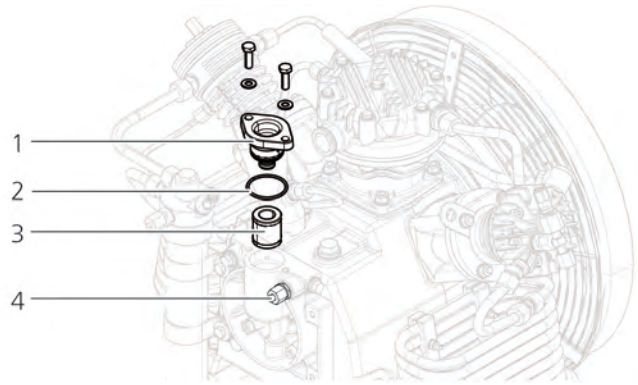


Fig. 51 Replacing the oil filter

1	Cover of the oil filter housing	3	Filter element
2	Sealing ring	4	Closing plug

1. Use key SW 13 to undo the screws on the cover of the oil filter housing.
2. Pull the oil filter out of the oil filter housing, along with the cover.
3. Detach the oil filter from the cover.
4. Insert new oil filter.
5. Install and fasten cover.
6. Fill oil, see Filling oil, Page 132.

Filling oil

⚠ WARNING

Ignition risk as a result of increased oxygen concentration!
The use of unsuitable lubricants during the compression of Nitrox can lead to ignition.

› Only use lubricants approved for use with Nitrox during the compression of Nitrox! See Chapter 9.2, Page 118.

✓ Suitable BAUER compressor oil is available, see Chapter 9.2.5 Lubrication oil, Page 121. Refer to technical data for the required quantity.

1. Open oil filler spigot.
2. Fill fresh oil until the oil reaches the maximum-mark on the oil level gauge.
3. Close oil filler spigot.
4. Use the oil level gauge to check the oil level.
   ↳ The oil level must be between the two markings on the oil level gauge.
5. Wait for a few minutes, then start up the unit when the oil level is as it should be.

9.7 Maintenance activities filter system

9.7.1 Instructions for filter maintenance

⚠ DANGER

Danger of poisoning!
Using unsuitable filter cartridges can allow pollutants to enter the breathing air and lead to poisoning.

- Only use CO filter cartridges for petrol or diesel fuel powered compressors.
- In environments with a high CO content (residential areas, near roads, etc.), use CO filter cartridges also for electrically powered compressors.
- Note that CO filter cartridges can only reduce the CO content to a permissible value with CO inlet concentrations below 25 ppmV (parts per million by volume).

⚠ WARNING

Risk of damage and injuries when maintaining the filter system!
Non-observance of the following instructions can result in personal injury or material damage. For this reason, always observe:

- The filter must only be maintained in a de-pressurised condition.
- Replace the filter cartridge in good time.
- Do not exceed the service life of the filter vessels.
- Ensure cleanliness and hygiene.
- Only use cleaning agents and sealants that are suitable.
- Only use filter cartridges with undamaged packaging.
- Do not use filter cartridges with overshot durability date.

9.7.2 Checking the load cycles

The separators and filters are dynamically loaded and need to be checked and, if necessary, replaced at set intervals and number of load cycles.

For further information see the accompanying operating instructions for pressurised equipment.

The responsibility for monitoring the load cycles of all pressure vessels is with the operator.

On units having electronic control systems, the maintenance intervals of the final separator are monitored. In the "Maintenance" menu of the control system, you can read off the maximum authorised number of load cycles and the already expired load cycles. A message appears in the display when maintenance is due.

The load cycles of the filter depend on the operating conditions and will need to be determined individually.

9.7.3 Determine the cartridge service life

- In case of units with filter monitoring, the drying capacity of the filter cartridge is continuously monitored and upcoming cartridge changes are automatically displayed.
- On units without filter monitoring, the cartridge service life periods can be determined as follows:
  - Using tables, see Determine cartridge service life on the basis of tables, Page 136, or
  - Using formulae, see Chapter 11.2 Filter cartridge replacement intervals, Page 162, or
  - Using a calculation tool, see below:

BAUER recommends the use of the BAUER KOMPRESSOREN APP (B-APP) and of the contained calculation tool for the determination of the cartridge service life. The calculation tool takes into account a variety of parameters and thus enables a precise determination of the service life.

You can download the B-APP free of charge from the AppStore and from Google Play.

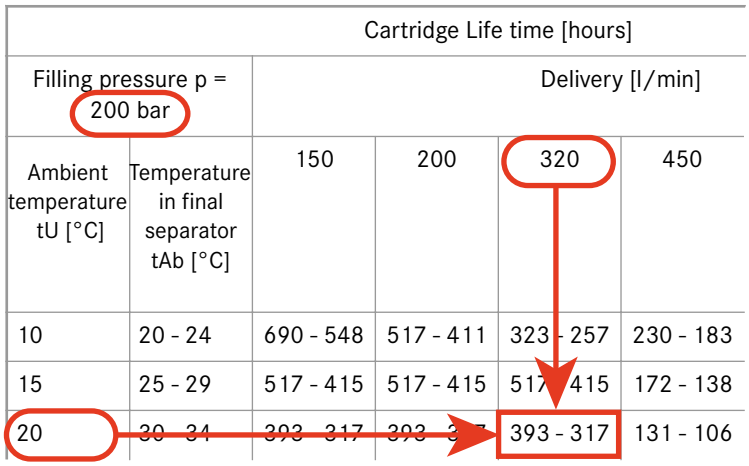
Determine cartridge service life on the basis of tables

The number of operating hours or the number of possible cylinder fillings per filter cartridge can be determined using the tables in the appendix, with due regard to the ambient temperature and the cartridge being used.

The tables contain calculated cartridge service life figures, which refer to defined and constant operating conditions. Tolerances in the cartridge filling and varying operating temperatures can lead to considerably deviations from the stated details which can, as a result, only be considered to be reference values for the operating company.

Determining the cartridge service life in hours

The cartridge service life values and the maximum number of operating hours per filter cartridge or cartridge combination is to be determined as follows:



		Cartridge Life time [hours]			
Filling pressure p = 200 bar		Delivery [l/min]			
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	150	200	320	450
10	20 - 24	690 - 548	517 - 411	323 - 257	230 - 183
15	25 - 29	517 - 415	517 - 415	517 - 415	172 - 138
20	30 - 34	393 - 317	393 - 317	393 - 317	131 - 106

Fig. 52 Example: Determining the cartridge service life in operating hours

1. Take the cartridge number from the sticker on the filter and select the relevant table in the appendix to these instructions.
2. Select the table with the correct filling pressure e.g. 200 bar.
3. Select the column with the correct delivery volume e.g. 320 l/min.
4. Select the row with the average ambient temperature e.g. 20°C.
5. Read off the number of maximum permitted operating hours e.g. 393 - 317.

The cartridge service life can also be determined on the basis of the cylinder fillings, see Determining the cartridge service life in cylinder fillings, Page 138.

Determining the cartridge service life in cylinder fillings

The cartridge service life values and the maximum number of cylinder fillings per filter cartridge or cartridge combination is to be determined as follows:

			Number of bottle fillings n and bottle size [l]	
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	Moisture content of air, saturated X [g/m³]	7 l	**10 l**
10	20 - 24	17,31 - 21,80	4433 -3520	3103 -2464
15	25 - 29	23,07 - 28,79	3327 -2666	2329 -1866
20	30 - 34	30,40- 37,63	2524 -2039	1767 -1428
25	35 - 39	39,65 - 48,64	1936 -1578	1355 -1104
30	40 - 44	51,21 - 62,41	1499 -1230	**1049 -861**

Fig. 53 Example: Determining the cartridge service life in cylinder fillings

1. Take the cartridge number from the sticker on the filter and select the relevant table in the appendix to these instructions.
2. Select the column with the relevant cylinder size e.g. 10 l.
3. Select the row with the average ambient temperature e.g. 30°C.
4. Read off the number of maximum permitted cylinder fillings e.g. 1049 - 861.

The cartridge service life can also be determined on the basis of the operating hours, see Determining the cartridge service life in hours, Page 137.

9.7.4 Changing the cartridge of the filter vessel

Filter base, filter housing and filter head jointly form a pressure vessel, which has been tested as a unit. If necessary, change the filter cartridges individually and one after the other to avoid a mix-up of the vessel parts.

Requirements:

- ✓ Vacuum packing of the cartridge is undamaged.
- ✓ Special filter wrench (part of the scope of supply) is available
- ✓ A clean cloth is provided.
- ✓ A suitable lubricant is available, see Chapter 9.2 Resources for maintenance and repairs, Page 118.

1. De-pressurise the filter circuit, see Chapter 9.4 Depressurising the unit , Page 124.
2. In case of filter systems with SECURUS filter monitoring: Disengage union nuts detach the connector of the cable from the coupling.

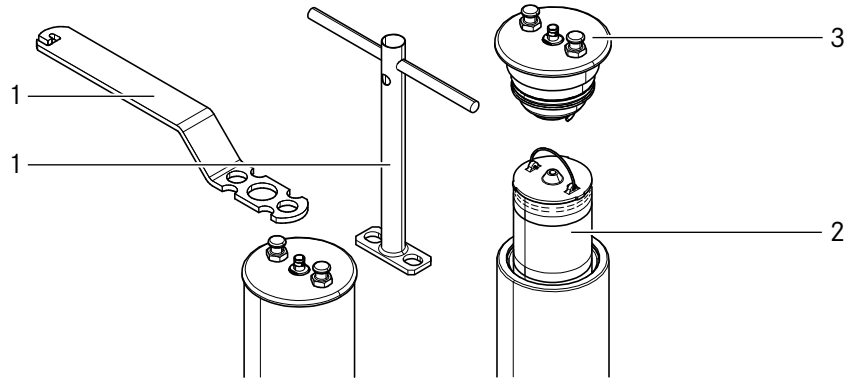


Fig. 54 Changing the cartridge in the cartridge filter

1 Special tool
2 Cartridge
3 Filter head

3. Use the special filter spanner tool to unscrew and remove the filter head.
4. Pull the cartridge out of the filter using the bracket.
5. Wipe out the inside of the filter housing with a clean cloth. Check the filter housing for corrosion and, if necessary, replace the defective parts.
6. Remove the new cartridge from the vacuum packing, and remove the protection caps from both ends.
7. Insert the cartridge into the filter and push it firmly down into the mounting.
8. Clean and lightly lubricate the screwed fitting and thread of the filter head.
9. Screw in the filter head manually, and use the special wrench to tighten it. Maximum torque: 1 Nm

NOTICE

Environmental damage caused by improper disposal of filter cartridges!

› Dispose of saturated filter cartridges as special waste. Be mindful of the local regulations relating to the disposal of special waste.

10. Dispose of saturated cartridge.
11. Close the venting valve and check for leaks after pressure build-up.

9.8 Check filling hoses

The testing period for hose lines must be determined by operators as per the stipulations of the locally applicable regulations (the Industrial Safety Regulation applies in Germany). The hose lines must be tested by a competent person.

Based on the German regulations, Bauer recommends the following testing periods for compressors:

- Normal operating conditions:
  - Testing period: 6 months (including storage period)
  - Replacement schedules: 6 years
  - Storage period: max. 2 years
- Increased requirements (strong internal and external influences, short cycle times, pressure impulse):
  - Testing period: 6 months (including storage period)
  - Replacement schedules: 2 years
  - Storage period: max. 2 years

✓ The compressor unit is switched off.
✓ The compressor unit is depressurised

1. Check whether connection threads are dimensionally correct and free of errors.
2. Check whether the transition point between the hose fitting and hose is damaged.
3. Check whether the outer hose covering is torn.
4. Damaged hose lines must be exchanged and scrapped immediately.

9.9 Maintenance activities pressure maintaining valve

9.9.1 Checking the pressure maintaining valve

In order not additionally to load the pressure vessel unnecessarily, the pressure maintaining valve must be checked regularly or in accordance with the maintenance schedule.

The opening pressure of the pressure maintaining valve depends on the final pressure of the unit. BAUER recommends setting the pressure maintaining valve to approx. 60% of the final pressure:

Final pressure [bar]	Set opening pressure [bar]
190 - 225	150 ±10
225- 350	180 ±10
350 - 420	200 ±10
420 - 550	300 ±10

✓ A pressure gauge is connected upstream to the pressure maintaining valve.

1. Check the pressure maintaining valve for internal and external leaks.
2. On pressure maintaining valves with integrated non-return valve, check also the non-return valve for internal and external leaks.
3. Check the function and opening pressure of the pressure maintaining valve.

As long as the pressure delivered by the compressor is below the set opening pressure of the pressure maintaining valve, the final pressure gauge and the display, if fitted, show zero. However the pressure increase can be observed on the pressure gauge fitted upstream of the pressure maintaining valve. As soon as the pressure maintaining valve starts to open, the final pressure gauge and the display shows the commencing pressure rise. The opening pressure can be checked on the pressure gauge fitted upstream of the pressure maintaining valve.

See table above for the opening pressure of the pressure maintaining valve.

Does the opening pressure of the pressure maintaining valve deviate from the specified setting value?

› Set the pressure maintaining valve as described below.

9.9.2 Adjusting the pressure maintaining valve

The pressure maintaining valves may only be adjusted by trained personnel. For more information, contact the BAUER customer service department, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.

1. Disengage locknuts (if they are present).
2. Unscrew the locking screw a little.
3. Use the setting screw to re-adjust the opening pressure.

A rotation to the right increases the pressure, while a rotation to the left reduces it.

4. After the adjustment has been made, check whether the pressure maintaining valve is working properly, see Chapter 9.9.1 Checking the pressure maintaining valve, Page 141.

9.10 Maintenance activities safety valves

⚠ WARNING

Danger of injury for compressed gas escaping!
The resultant noise can damage hearing. Ejected particles may cause eye injuries.

- Wear protective goggles and personal ear defenders.
- Check the safety valves with utmost care when the compressor is running.
- Do not repair safety valves; replace them completely.

Follow the following instructions:

- Check safety valves with lifting device annually for function or mobility.
- The blow-off pressure of the safety valves must be checked at regular intervals. The country-specific statutory stipulations apply to the test intervals. BAUER KOMPRESSOREN however recommends an annual check.
- If a check of the response pressure is impossible for technical reasons, the safety valves will need to be replaced.
- Only competent personnel may check the response pressure, see Chapter 2.6.1 Personnel selection and qualification, Page 26.
- The compliance with the test intervals and the organisation of the check is the responsibility of the operator.

9.10.1 Checking the blow-off pressure of safety valves

BAUER KOMPRESSOREN recommends that the intermediate pressure safety valves be replaced as a precautionary measure. The blow-off pressure can be checked only with considerable expenditure.

The blow-off pressure of the final pressure safety valve can be checked using the **Safety valve test mode**.

The final pressure safety valve can be tested using the **Safety valve test mode**. In the safety valve test mode, the compressor is started manually and only switches off again after the **0** button is pressed. The final pressure sensors are inactive and the compressor can build up pressure against the safety valves without any hindrance.

⚠ WARNING

Danger of injuries due to deactivation of automatic switch-off!

- Operate the unit in the safety valve test mode only under supervision.
- Switch off the unit immediately when the displayed final pressure exceeds the set blow-off pressure of the safety valve.

⚠ WARNING

Danger of injury for compressed gas escaping!

- Wear protective goggles and personal ear defenders.

Access to the safety valve test mode is located in the following menu:

Start page → Maintenance → Tightness & Safety valve test

Logging in with authorisation level 1 is required, see Authorisations, Page 78.

- ✓ The area around the unit must be secured over a large distance.
- ✓ The main switch is in position I.
- ✓ The pressure outlet or the isolating cock or the filling valves are closed.

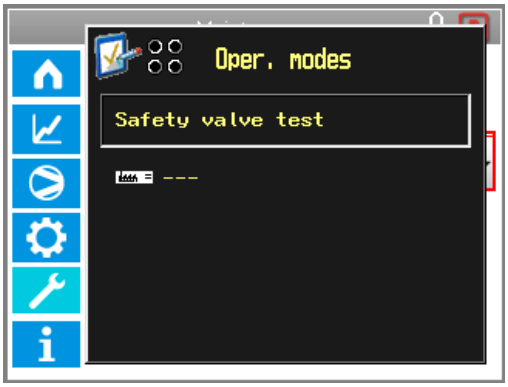


Fig. 55 Checking the safety valve

1. **Safety Valve** Select **Test** and confirm.
   ↳ The warning LED flashes.
2. Press start button **I** to start the test.
   ↳ The compressor starts to build up pressure.
3. Observe the pressure increase on the display.
4. Switch the unit off immediately if the final pressure safety valve does not blow when the set blow-off pressure is reached.
   - Or -
   Read off the blow-off pressure of the safety valve on the display.
5. Press stop button **0**.
   ↳ The safety valve test mode is deactivated.

Does the safety valve not blow off or does the blow-off pressure need to be re-adjusted?

❯ Replace the safety valve completely or have it adjusted.

9.11 Maintenance activities pressure gauge

Pressure gauges must be checked in accordance with the maintenance schedule. Using a special testing pressure gauge is recommended for checking the pressure gauges, see BAUER KOMPRESSOREN catalogue of high-pressure accessories.

Allowances should be made for minor deviations during operation. If the pressure gauge shows large inaccuracies, however, it will need to be replaced.

✓ A testing pressure gauge is available.

1. Connect the testing pressure gauge parallel to the pressure gauge to be checked.
2. Compare the display of the pressure gauge under operating conditions.
3. If the pressure gauge shows large inaccuracies, however, it will need to be replaced.

9.12 Maintenance activities - Intake valves and pressure valves

9.12.1 Replacing the suction valves and pressure valves

Only competent personnel may replace the valves of the compressor. For more information, contact the BAUER customer service department, see Chapter 1.1.1 Contact data BAUER KOMPRESSOREN, Page 9.

NOTICE

Material damage due to dissimilar suction and pressure valves!

❯ Replace the suction and pressure valves only in sets.

9.13 Maintenance activities - Automatic condensate drain

9.13.1 Testing the condensate valves

The sub-menu **Valve test** displays the current status of the valves (open / closed) and enables the function of the individual valves to be checked.

Access to the valve test is located in the following menu:

Start page → Compressor setup → Unit/compressor setup → Valves → Valve test

Logging in with authorisation level 1 is required, see Authorisations, Page 78.

As soon as you leave the page, the test status of the valves is cancelled.

✓ The unit is switched on, but is not running.

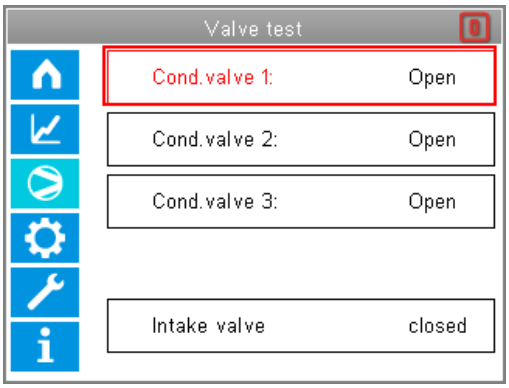


Fig. 56 Valve test

❯ Select valves and confirm.

↳ A distinct click can be heard.

No click heard.

The valve piston is jammed or the valve is defective.

❯ Check valve, and replace if necessary.

9.13.2 Checking the function of automatic condensate drain

⚠ WARNING

Danger of injury for compressed gas escaping!

- Wear protective goggles and personal ear defenders.

⚠ CAUTION

Danger of poisoning!

Condensate is toxic.

- Condensate must not be swallowed.
- Do not breathe condensate in. Ensure adequate air exchange.

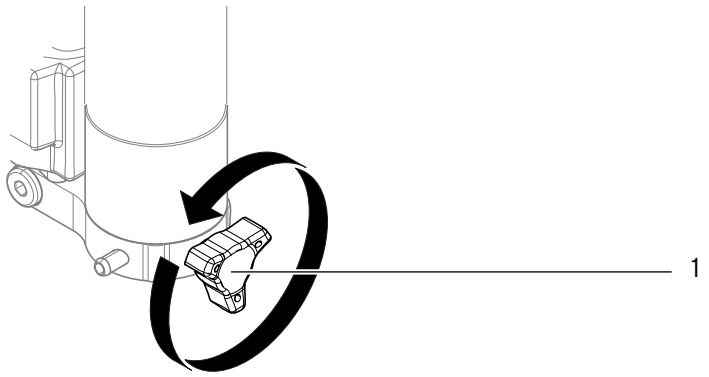


Fig. 57 Opening the condensate drain cock

1 Drain cock

1. After a water removal operation has been carried out by the condensate drain valve, open all the condensate drain cocks of the individual separators one after the other.
   - If almost no condensate is emerging, it means that the condensate drain valves are working properly.

Is condensate emerging?

The setting times are inappropriate or the condensate drain valves are not working correctly.

- Check the set times and adapt to the air or gas humidity if necessary.
- If the problem persists, look for the fault and rectify it. See Chapter 8.1.4 Fault finding in automatic condensate drain, Page 115Chapter 8.1, Page 113.

2. Clean the float switch in the condensate collection vessel, if fitted, in order to prevent it from sticking on account of oil residues.

9.14 Maintenance activities gas measurement unit

9.14.1 Checking the sensors

The sensors must be checked before each commissioning and once every 3 months, with the help of certified gas samples of known concentrations. We recommend using the BAUER test gas kit for testing the sensors.

Check the sensors as follows:

- ✓ The personnel executing the work will fulfil the minimum requirements for qualified expert personnel.
- ✓ Certified gas samples of known concentrations are available.
- ✓ The B-DETECTION PLUS service log book or function check form is present.
- ✓ The compressor is switched off or is in standby.

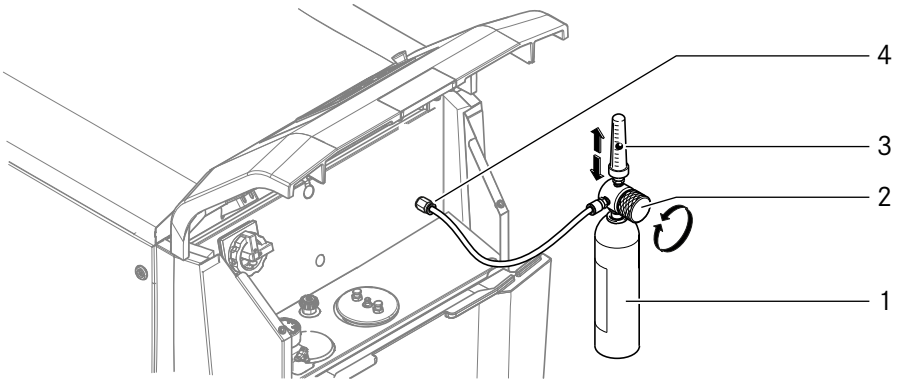


Fig. 58 Checking the sensors

1	Gas cylinder	3	Flow gauge
2	Pressure reducer	4	Plug connection

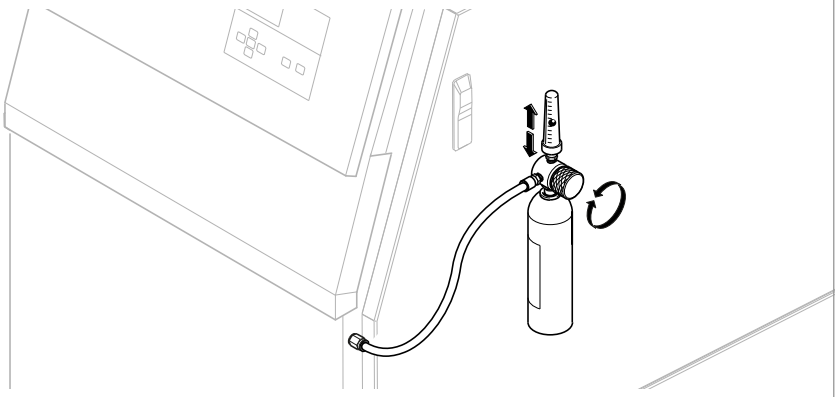


Fig. 59 Checking the sensors

1. Screw the pressure reducer with integrated flow meter onto the gas cylinder.

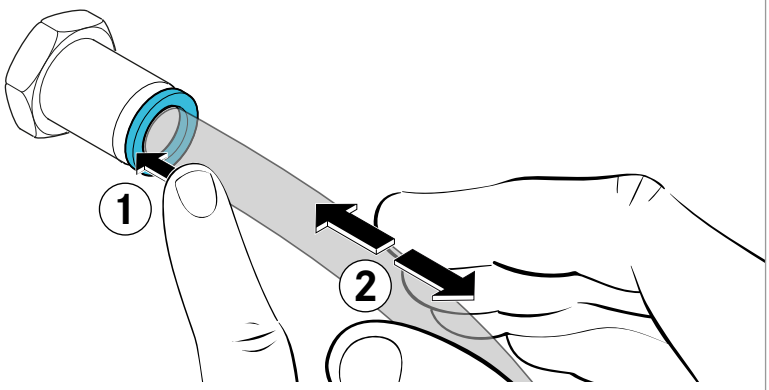


Fig. 60 Inserting and removing the hose

2. Use the hose to connect the flow meter to the pressure reducer. Insert the intake hose into the plug connection up to the stop (at least to a depth of 15 mm).
3. Adjust the pressure reducer so that the flow is between 0.5 and 1.0 l/min or adjust so that the ball is floating in the centre of the indicator.
4. Wait for at least two minutes, or wait until the measured values stabilise.
5. Record the measured values in the service log book, and compare them with the specified gas concentrations.

Are the measured values outside the quoted tolerance range?

› Calibrate the relevant sensors and replace if necessary.

6. Check the response behaviour and function of the alarms and alarm threshold values. Enter the result on the function check form.

9.14.2 Calibrating the sensors

We recommend using the BAUER calibration gas kit for calibration.

Two different gas samples are required for calibrating the individual sensors: Low calibration gas and High calibration gas.

See the spare parts list provided for reference and application purposes of the gas samples.

⚠ CAUTION

Danger in the event of improper calibration!
In the event of improper calibration, the measurement device will indicate incorrect measured values and compressed air cylinders may be filled with prohibited gas concentrations.

- Always carry out two-point calibration.
- When calibrating the Low and High point separately (not recommended), always start with the Low point calibration.

Access to the calibration of the gas sensors is located in the following menu:

Start page → Maintenance → Calibration

Logging in with authorisation level 1 is required, see Authorisations, Page 78.

- ✓ The personnel executing the work must fulfil the minimum requirements for qualified expert personnel.
- ✓ Certified gas samples of known concentrations are available.
- ✓ The measurement device is switched on.
- ✓ The compressor is switched off or is in standby.

Calibration of the individual sensors can take several minutes.

The process can be abandoned at any time using the Reset button ↰.

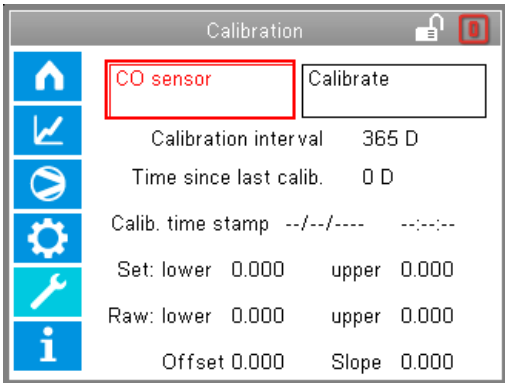


Fig. 61 Calibration page

1. Select the sensor on the calibration page.
   ↳ The calibration page shows the date and the values of the last calibration carried out.
2. Press the "Calibration" box.
3. Select "Two-point calibration".
4. Enter the calibration values or the gas concentrations of the Low and High calibration gases. See the Low and High gas concentrations stated on the calibration gas samples.
5. Press the "Calibration" box.
   ↳ Instructions appear on the display.
6. Apply a suitable Low calibration gas and a flow rate of 1.5 l/min to the measurement device.
7. Wait at least 2 minutes until the measured values (actual value and raw value) are stable.
8. Press the "Calibration" box.
   ↳ After successful calibration of the lower calibration point, the request appears to apply High calibration to the measurement device.
9. Apply a suitable High calibration gas and a flow rate of 1.5 l/min to the measurement device.
10. Wait at least 2 minutes until the measured values (actual value and raw value) are stable.
11. Press the "Calibration" box.
12. "Calibration successful" appears on the display.
13. Remove the gas sample.
14. Press "OK".
    ↳ The calibration values are updated and the calibration interval for the relevant sensor is reset automatically.

15. Repeat the calibration as described above for all sensors (excluding the dew-point sensor).

9.14.3 Replacing the filters

The filters must be replaced at least once every 12 months, and whenever the sensor is replaced.

- ✓ The personnel executing the work must fulfil the minimum requirements for trained personnel.
- ✓ The measurement device is deactivated and disconnected from the power grid.
- ✓ The measurement device is depressurised.

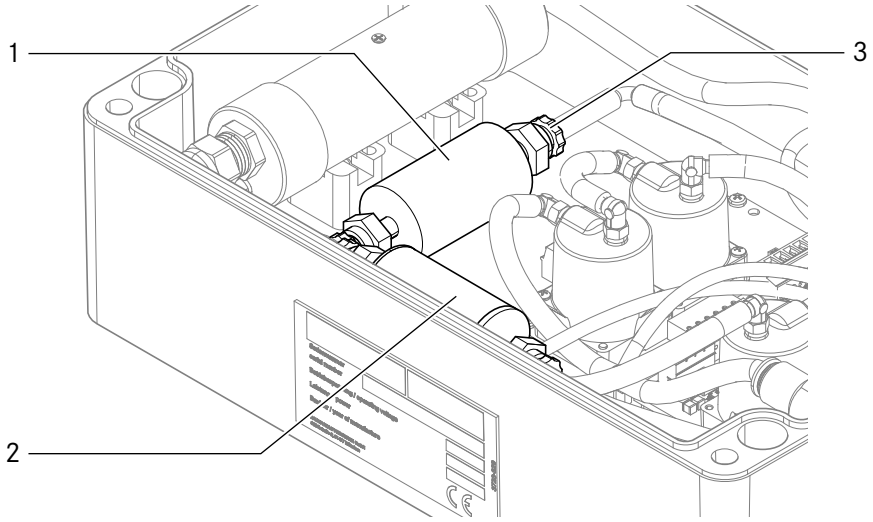


Fig. 62 Replacing the filters

1	Particle filter	3	Screwed fitting
2	Activated charcoal filter		

1. Unplug the filter carefully.
2. Unscrew the screwed fittings from the filter and screw onto the new filter.
3. Refit the hoses. Observe the direction of flow: the filters are slightly conical and the gas needs to flow from the thicker side to the thinner side.
4. Re-insert the filter.

9.15 Maintenance activities electrical system

9.15.1 Maintaining the electrical control systems

⚠ DANGER

Danger to life due to electric voltages!
Contact with live parts leads to death or serious injuries.

- Work on the electrical unit may be carried out by an electrician only.
- Make sure that the unit is tension-free for the necessary work.

1. Check all the screwed terminal connections in the switchgear box for tightness. Pay particular attention to the contacts on the power contactors.

Regardless of this, the required safety checks associated with BGV, DIN VDE or local regulations must be carried out by the operating company.

Only with switchgear cabinets with installed fans:

The fans include a standard filter mat for pre-filtering of dry, coarse dust and fluff in the ambient air.

2. Check the filter after 2000 operating hours and replace it if necessary. Reduce the maintenance intervals accordingly if there is a lot of dust produced.

To increase the degree of protection, and where the grain size < 10 µm, we recommend the use of fine filter mats.

9.16 Maintenance activities drive system

9.16.1 V-belt maintenance

⚠ WARNING

Danger of injury due to unit in operation!

- Do not perform any work on the unit when it is in operation.
- For all assembly and maintenance work, disconnect the motor and secure it against re-start pressure.

Checking the V-belt

✓ The unit is switched off and secured against being automatically switched on again.

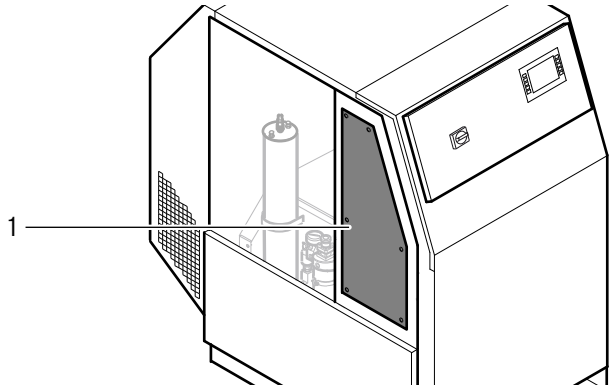


Fig. 63 Removing the V-belt guard

1 V-belt guard

1. With fully-clad units, remove the side cladding.
2. Release the fixing screws on the V-belt guard and remove the V-belt guard.
3. Check the V-belt for damage and wear and tear.
4. Re-fitting the V-belt guard.

Replacing the V-belt

Replace damaged and worn V-belts as follows.

In case the situation involves multiple V-belts, always replace them in sets.

✓ The unit is switched off and secured against being switched on again.

1. Remove the right cladding
2. With fully-clad units, release the fixing screws on the V-belt guard and remove the V-belt guard
3. Remove the old V-belts.
4. Place the new V-belts around the flywheel on the compressor.
5. Lift the motor slightly and place the V-belts on the V-belt pulley on the motor.
6. Replace the V-belt guard and cladding.

10 Disassembly and disposal

10.1 Decommissioning and disposal

10.1.1 Decommissioning

Decommission the machine as follows:

⚠ WARNING

Danger from gases coming out!
Dangerous gas concentrations can arise when decommissioning the machine.

› Ensure adequate air exchange and ventilation.

1. Separate the machine from the power supply or from any energy supply.
2. Depressurise the machine.
3. Disconnect the pneumatic connections.
4. Drain condensates and collect it.
5. Take out the filter cartridges, if needed.
6. Drain oil and collect it.

Dispose of machine, removed components and the gathered substances such as oil and condensate in accordance with Chapter 10.1.2, Page 160.

10.1.2 Dispose the unit

To exclude health and enviromental damage when disposing the unit, assemblies and equipment, observe the following instructions.

NOTICE

Environmental damage in case of improper disposal!
Electrical waste, electronic components, lubricants and other auxiliary materials are subject to the provisions regarding the treatment of special waste.

› Ensure that these materials are only disposed of by licensed specialised companies.

1. Be mindful of the local regulations.
2. Before disassembly, switch off the unit properly according to Chapter 10.1.1, Page 159 .
3. Ensure that the disassembled components of the unit are, in accordance with the applicable local regulations, recycled or disposed of in an orderly fashion.

- Metallic components to be turned into scrap metal.
- Electrical and electronic components to be turned into electrical waste.
- Dispose chemicals according to the manufacturer´s instructions in the safety data sheet.
- Plastic parts, cardboard and paper should be recycled.
- Dispose of the remaining components after sorting them with respect to the nature of the materials.

11 Appendix

11.1 Sample declaration of conformity

This sample declaration of conformity serves as an example. The signed declaration of conformity is supplied separately.

Declaration of conformity according to Machinery Directive 2006/42/EC	
The manufacturer, BAUER KOMPRESSOREN GmbH, Stäblistr. 8, D-81477 Munich hereby declares that the following products	CE

PE320-VE-OX	**PE550-VE-OX**	**PE700-VE-OX**

fulfil all the relevant provisions of the following directives:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 2014/68/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU

The safety objectives of the Low Voltage Directive 2014/35/EU have been fulfilled in accordance with Annex I, section 1.5.1 of the Machinery Directive 2006/42/EC.

Applied harmonised European standards:

- EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN 1012-1:2010 Compressors and vacuum pumps - Safety requirements - Part 1: Air compressors
- EN 60204-1:2006+A1:2009 Safety of machinery - Electrical equipment of machines
- EN ISO 19353:2016 Safety of machinery - Fire prevention and fire protection
- EN 12021:2014 Respiratory equipment - Compressed gases for breathing apparatus
- EN 144-3:2003 Respiratory protective devices - Gas cylinder valves

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

Person authorised to compile the technical file:

- John Doe, Stäblistraße 8, D-81477 Munich

Date:	Manufacturer's stamp:	John Doe (Managing Director):
xx.xx.xxxx		

11.2 Filter cartridge replacement intervals

The operating hours count or the number of possible cylinder fillings per filter cartridge can be determined from the tables included in the following sections, taking into account the ambient temperature and the cartridge used for standard operating pressures and standard flow rates. If the operating conditions change, the volume of air or gas prepared can be calculated using the following formulae, depending on the preparation emphasis:

The tables contain calculated cartridge service life figures, which refer to defined and constant operating conditions. Tolerances in the cartridge filling and varying operating temperatures can lead to considerably deviations from the stated details which can, as a result, only be considered to be reference values for the operating company.

Volume of air or gas that can be prepared: Filter cartridges with emphasis on Drying

The drying capacity of the filter cartridge or the volume of air prepared depends on moisture level of the mediums X [g/m^3] and on the molecular sieve mass mMS [g] contained in the filter cartridge, and can be determined as follows:

- Volume of air that can be prepared Va [m^3] = 0.2 x mMS [g] / (X [g/m^3] / p [bar])

* For the molecular sieve mass mMS [g], see section lower down with the service life times of the individual filter cartridge

Filter cartridge service life in hours

The filter cartridge time in hours is, in turn, derived from the processable air volume and with reference to the flow rate or the compressor delivery rate:

- Filter cartridge service life tp [h] = Va [m^3] / (Q [m^3/min] x 60 [min/h])

Number of cylinder fillings

The number of cylinder fillings can also be derived from the volume of air that can be prepared and with reference to the cylinder fill volume* VF [m^3]:

- Number of cylinder fillings n = Processable air volume Va [m^3] / cylinder fill volume VF [m^3]

* For the cylinder fill volume see table below.

The cylinder fill volume depends on the pressure and the cylinder size

Cylinder size l [l]	Cylinder fill volume VF [m^3] for pressure p	
	200 bar	300 bar
7	1.4	2.1
10	2	3
12	2.4	3.6

11.2.1 Filter cartridge 062565

Filter cartridge order number	Molecular sieve mass mMS [g]
062565	870

Cartridge service life [hours]					
Filling pressure p = 200 bar		Delivery volume [l/min]			
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	150	200	250	320
10	20 - 24	223 - 177	168 - 133	134 - 106	105 - 83
15	25 - 29	168 - 134	168 - 134	168 - 134	168 - 134
20	30 - 34	127 - 103	127 - 103	127 - 103	127 - 103
25	35 - 39	98 - 79	98 - 79	98 - 79	98 - 79
30	40 - 44	76 - 62	76 - 62	76 - 62	76 - 62
35	45 - 49	59 - 49	59 - 49	59 - 49	59 - 49
40	50 - 54	47 - 39	47 - 39	47 - 39	47 - 39

Cartridge service life [hours]					
Filling pressure p = 300 bar		Delivery volume [l/min]			
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	150	200	250	320
10	20 - 24	335 - 266	251 - 200	201 - 160	157 - 125
15	25 - 29	251 - 201	189 - 151	151 - 121	118 - 94
20	30 - 34	191 - 154	143 - 116	114 - 92	89 - 72
25	35 - 39	146 - 119	110 - 89	88 - 72	69 - 56
30	40 - 44	113 - 93	85 - 70	68 - 56	53 - 44
35	45 - 49	89 - 73	66 - 55	53 - 44	41 - 34
40	50 - 54	70 - 58	52 - 44	42 - 35	33 - 27

Cartridge service life [hours]					
Filling pressure p = 400 bar		Delivery volume [l/min]			
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	150	200	250	320
10	20 - 24	447 - 355	335 - 266	268 - 213	209 - 166
15	25 - 29	251 - 201	189 - 151	151 - 121	118 - 94
20	30 - 34	191 - 154	143 - 116	114 - 92	89 - 72
25	35 - 39	146 - 119	110 - 89	88 - 72	69 - 56

30	40 - 44	113 - 93	85 - 70	68 - 56	53 - 44
35	45 - 49	89 - 73	66 - 55	53 - 44	41 - 34
40	50 - 54	70 - 58	52 - 44	42 - 35	33 - 27

			Number of cylinder fillings n according to cylinder size [l]		
Ambient temperature tU [°C]	Temperature in final separator tAb [°C]	Air humidity, saturated X [g/m^3]	7 l	10 l	12 l
10	20 - 24	17.31 - 21.80	1436 - 1140	1005 - 798	838 - 665
15	25 - 29	23.07 - 28.79	1077 - 863	754 - 604	629 - 504
20	30 - 34	30.40 - 37.63	818 - 661	572 - 462	477 - 385
25	35 - 39	39.65 - 48.64	627 - 511	439 - 358	366 - 298
30	40 - 44	51.21 - 62.41	485 - 398	340 - 279	283 - 232
35	45 - 49	65.52 - 79.28	379 - 314	266 - 219	221 - 183
40	50 - 54	83.08 - 99.85	299 - 249	209 - 174	175 - 145

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