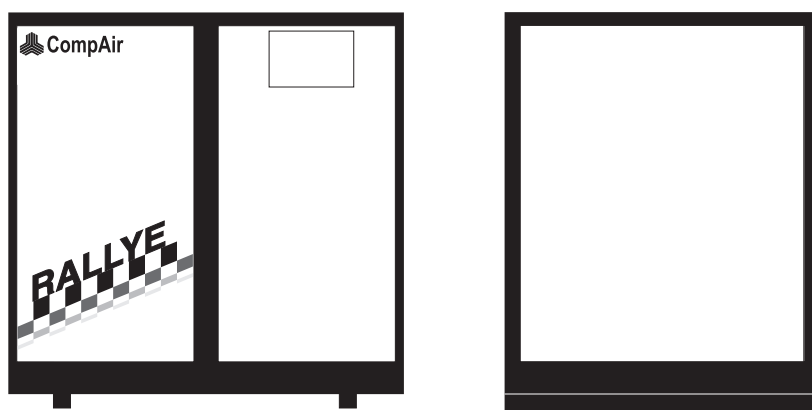


RALLYE

070 - 112



Operating instructions

Screw compressor

RALLYE - AS/WS

1.1 Notes on the compressor

CompAir screw compressors are the result of many years of research and development. These prerequisites combined with high quality standards guarantee the manufacture of screw compressors providing a long service life, high reliability and cost-effective operation. It stands to reason that all requirements concerning environmental protection are met.

Certificate of conformity

The compressor and its accessories as supplied by CompAir conform to the basic safety and health requirements included in the EC Machinery Directive 89/392/EWG, version 93/44/EWG. The compliance with these directives is confirmed by the "CE mark" (fig. 1).



Fig. 1

1.2 Intended use

The machine/unit has been constructed in accordance with state-of-the-art technology and the recognized safety regulations. Nevertheless, its use may constitute a risk to life and limb of the user or third persons or cause damage to the machine or to other material property, if

- it is not used as intended,
- it is operated by unqualified personnel,
- it is improperly modified or changed,
- the safety regulations are not observed.

Therefore, any person entrusted with the operation, maintenance or repair of the machine must read and follow the safety regulations. If required, this has to be acknowledged by signature.

In addition,

- relevant accident prevention regulations,
 - generally recognized safety regulations and
 - national regulations
- have to be observed.

The machine/unit must only be used in technically perfect condition and in accordance with its intended use and the instructions set out in the operating manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine/unit! Any functional defects, especially those affecting the safety, have to be rectified immediately (or rectified by others)!

The machine/unit is designed exclusively for the generation of compressed air to power air-driven devices. Using the machine/unit for purposes other than those mentioned above is considered contrary to its intended use. The manufacturer/supplier cannot be held responsible for damage resulting from such use. The risk of such misuse lies solely with the user.

Operating the machine within the limits of its intended use also involves observing the instructions set out in the operating manual and complying with the inspection and maintenance directives.

1.3 Maintenance

Carefully performed maintenance is imperative, this ensures that your screw compressor can meet all the requirements placed upon it. It is therefore imperative to adhere to the specified maintenance intervals and to carry out the maintenance work with particular care, especially when the unit is utilized under harsh operating conditions.

Servicing

Please contact your authorized CompAir dealer in the case of malfunctions or when spare parts are required. In the case of damage, our fully trained personnel will ensure that a quick and proper repair is carried out using original CompAir spare parts. Original CompAir spare parts are manufactured utilizing state-of-the-art technology, thus guaranteeing the further reliable operation of the unit.

In case of queries

Please enter the data on the nameplate of your compressor into the nameplate shown below (fig. 2). In the case of queries or spare parts orders, please refer to the compressor type indicated on the nameplate, the identification no. and the year of construction. With this information at hand it can be guaranteed that you will receive the right information or required spare parts.

1. Foreword

CompAir Drucklufttechnik GmbH
Argentahlerstrasse 11
55469 Simmern

Baujahr/anno;
année/ano 1 2 Identifizierungs-Nummer; Ref.-No.

Typ/type/tipo 3

Gesamtgewicht;
total weight;
poids total
peso total 4 kg

Einbaueinheit; air end; bloccocompressore
a vis/vite; cabezal compresor 5

Auftrags-Nr.; order number; numero de commande;
numero di commessa; numero de pedido 6

Verdichtungsmedium; compression medium; medium de com-
pression ;medium di compressione; medium de compression 7

Volumenstrom; volume rate of flow; debit-
volume; portata effettiva; caudal efectivo 8 m³/min

Ansaugdruck; suction pressure; pression
d'aspiration; pressione d'aspirazione; presión de aspiración 9 bar

Stufen drucke; stages pressures; pression
d'étages; pression degli stadi; presión de las etapas 10 1 2 3 bar

Drehzahl; speeds; vitesse; numero giri;
revoluciones 11 min⁻¹

Installierte Motorleistung; installed motor
capacity; puissance moteur installée;
potenza installata del motore;
potencia instalada del motor 12 kW

9363 9350

Fig. 2

1.4 Notes

General

These operating instructions are intended to familiarize the user with the machine/unit and its intended use. The instructions contain important notes on how to operate the compressor safely, properly and cost-effectively. Observing these instructions helps to avoid risks, to reduce repair costs and downtimes and to increase the reliability and service life of the machine/unit.

The operating instructions have to be supplemented by the respective national rules and regulations regarding the prevention of accidents and environmental protection. They must always be available at the location of the machine/unit. The operating instructions must be read and followed by any person carrying out work in connection with the machine/unit, e.g. operation, including setting up, trouble-shooting in the operation cycles, disposal of production waste, care, service, and disposal of waste fuels and consumables, upkeep (maintenance, inspection, repair), transport.

Besides the operating instructions and the binding regulations for the prevention of accidents, which are valid in the country and place of operation of the machine/unit, the generally recognized technical regulations for safe and proper working have also to be observed.

Guarantee

Operate this compressor only if you have an exact knowledge of the machine taking into respect these instructions.

CompAir Drucklufttechnik cannot be held responsible for the safe operation of the machine/unit if it is used in a manner, which does not correspond to the intended use, or for other applications, which are not mentioned in these instructions.

Warranty claims will not be accepted in the case of

- Operating errors
- Incorrect maintenance
- Wrong auxiliary materials
- Use of spare parts other than CompAir original spare parts
- Modifications and changes to the installation

The warranty and liability conditions of the general terms and conditions of CompAir Drucklufttechnik will not be extended by the notes above.

Any unauthorized change to the compressor unit/station, or the installation of components not accepted by the manufacturer (e.g. fine separator) will result in the withdrawal of the CE mark. As a consequence, any liability and warranty claims will not be accepted by the manufacturer.

Safety regulations

Danger

The safety regulations in chapter 3 of the operating instructions have to be strictly observed.

Technical changes

In the course of technical development we reserve the right to modify the units without further notice.

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3. Safety regulations

3.1 Identification of safety guidelines

CompAir is not liable for any damage or injury resulting from the non-observance of these safety instructions or negligence of the usual care and attention required during handling, operation, maintenance or repair, even if this is not explicitly mentioned in these operating instructions.

If any of the regulations contained in these instructions - especially with regard to safety - does not correspond to the local legal provisions, the stricter of both shall prevail.

These safety regulations are general and valid for various types of machines and equipment. It is therefore possible that some references do not apply to the unit(s) described in these instructions.

Danger

Passages marked with this sign indicate a possible danger to persons.

Important

Passages marked with this sign indicate a possible danger to machines or part of machines.

Note

Passages marked with this sign provide technical information on an optimal cost-effective use of the machine.

3.2 General safety instructions

Organizational measures

The operating instructions must always be at hand at the place of operation of the machine/unit (in the tool compartment or box provided for such a purpose) !

In addition to the operating instructions, all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection must be adhered to and passed on to others ! These compulsory regulations may also deal with the handling of hazardous materials or the issuing/wearing of personal protective equipment, or traffic regulations.

Instructions, including supervisory responsibility and duty of notification for taking into account in-plant factors, for example regarding work organization, sequences of operations, personnel assigned to certain tasks, are to be added to the operating manual.

The personnel entrusted with working on the machine must have read the operating instructions and in particular the chapter on safety regulations before starting work. Reading the instructions after work has begun is too late. This applies especially to persons working only occasionally on the machine, e.g. for setting up or maintenance.

Check on a regular basis that the personnel are carrying out the work in compliance with the operating instructions and that they are paying attention to the safety requirements !

For safety reasons, long hair must be tied back or otherwise secured, garments must be close-fitting and no jewellery - such as rings - may be worn. Injury may result from being caught up in the machinery or from rings catching on moving parts ! As necessary or as required by regulations, personal protective equipment should be used.

Observe all safety and warning notices attached to the machine/unit !

See to it that safety instructions and warnings attached to the machine are always complete and perfectly legible.

In the case of safety-relevant changes to the machine/unit or its operating behaviour, stop the machine/unit immediately and report the fault to the responsible department/person !

Spare parts have to comply with the technical requirements specified by the manufacturer. This can always be ensured by using original spare parts.

Hydraulic hoses have to be changed within stipulated and periodic intervals, even if no safety-relevant faults have been detected !

3. Safety regulations

Adhere to prescribed intervals or those specified in the operating instructions for routine checks and inspections !

For the execution of maintenance work, tools and workshop equipment adapted to the task on hand are absolutely indispensable.

The personnel must be made familiar with the location and operation instructions of fire extinguishers ! Observe all fire-warning and fire-fighting procedures !

Limit values (pressures, time settings, etc.) have to be permanently identified !

Selection and qualification of personnel; basic responsibilities

Work on/with the machine/unit must be carried out by reliable personnel only. Statutory minimum age limits must be observed!

Employ only trained or instructed personnel and clearly set out the individual responsibilities of the personnel for operation, set-up, maintenance and repair !

Ensure that only authorized personnel work on or with the machine !

Define the machine operator's responsibilities giving the operator the authority to refuse instructions by third persons that are contrary to safety regulations.

Do not allow persons to be trained or instructed or persons taking part in a general training course to work on or with the machine/unit without being permanently supervised by an experienced person !

Work on the electrical equipment of the machine/unit must be carried out only by a skilled electrician in accordance with electrical engineering rules and regulations.

Work on system elements such as hoses may only be carried out by personnel with special knowledge and experience of hydraulics !

3.3 Changes and modifications to the machine

Do not make any changes, modifications or attachments to the machine/unit, which could affect safety, without the supplier's prior permission !

Unauthorized changes to the machine are not permitted for safety reasons.

Original parts were especially designed for this machine. We would like to point out that we have not released and will not release parts and special accessories which have not been supplied by us. The installation and/or use of such products can therefore affect the active and/or passive safety.

The manufacturer is not liable for damage resulting from the use of non-original parts or special accessories. This applies also to the installation and setting of safety equipment and valves as well as to welding on structural parts.

3.4 Installation and normal operation

Installation

In addition to the general technical operation in accordance with the stipulations of the local authorities, we would like to refer in particular to the following regulations.

For the lifting of a compressor, a suitable lifting mechanism is to be used, which meets the local safety regulations. All loose or slewable parts must be safely fixed before the machine can be lifted. It is strictly prohibited to stay in the danger zone of a lifted load.

The correct method of lifting (according to the operating instructions of the load suspension device) has to be ensured.

All blind flanges, plugs, caps and bags with drying agent have to be removed prior to the installation of the pipes. Distributing pipes and pipe connections have to be of the proper size and suitable for the relevant operating pressure.

The system has to be installed in such a way that it is adequately accessible and the required cooling is guaranteed. Never block the air intake. Make sure that the ingress of humidity via the intake air is kept to a minimum.

3. Safety regulations

The air intake is to be located so that no hazardous constituent (solvent vapour, etc., but also dusts and other hazardous material) can be sucked in. This applies also to flying sparks.

The air intake is to be positioned so that no loose clothing of persons can be sucked in.

Make sure that the pressure line from the compressor to the aftercooler or the air circuit can expand under heat and does not come into contact with inflammable material.

The pressure line connected to the air outlet of the system must be fitted stress-free.

If a remote control is used, the system must carry a clearly visible sign with the following note : Attention ! This installation is operated by remote control and can start up without prior warning !

As an additional safety measure, persons, who start remotely controlled systems, have to take sufficient safety precautions in order to ensure that nobody is checking the system or working on it. For this, a label with a corresponding warning notice has to be attached to the remote control equipment.

Compressed air and cooling water lines have to be clearly marked in line with the local regulations.

If a system comprises several compressors, hand-operated isolator valves have to be installed in order to be able to shut off each machine individually. When operating pressure systems, do not rely on the effectiveness of check valves alone to isolate these systems.

Safety equipment, protective covers or insulation must not be removed or modified. Any pressure reservoir, which is located outside the system, the permissible operating pressure of which is higher than the atmospheric pressure and which is fitted with two or more pressure supply lines, has to be equipped with additional safety equipment, which will automatically prevent the admissible operating pressure from rising by more than 10 %.

The system-specific safety valves used in these compressors only assume the pressure safeguarding functions that are prescribed according to currently valid standards and regulations.

For the pressure devices/systems installed at the pressure side connection flange of the compressor, a corresponding pressure safeguarding feature (safety valve or similar) must be provided taking into account the weakest pressurized component.

The min. and max. temperatures of +1 °C and +40 °C are also valid for the intake air.

Pipes and/or other parts with a surface temperature higher than 80 °C have to be suitably identified and shielded against touching.

Electrical connections must meet the local regulations. Power units must be connected to earth and protected from short-circuits by means of fuses.

Cold dryer

Wherever possible, the cold dryer should be installed in a place where the ambient air is as clean as possible and where the temperatures never rise above or fall below the respective limit values as indicated in the operating instructions. If required, the cooling air is to be taken from a cleaner, cooler or warmer area via an intake channel; depending on the size of the machine, an additional ventilator could turn out to be necessary.

If the room temperature can fall below zero, the condensation drain system must be protected from freezing, e.g. by means of a steam heater.

If it is possible that the intake temperature of the air will exceed, from time to time, the admissible maximum specified in the operating instructions, a pre-cooler with condensate drain is to be installed before the dryer.

Tests or repair work on the coolant circuit may only be carried out in a well vented room. Never breathe in coolant vapour; if necessary, wear a breathing mask. Always wear protective goggles and gloves. If skin comes into contact with coolants, rinse well with water. Never take off or tear up clothes but rinse them well with water until the coolant is washed off; then see a doctor.

Condensate drain

The drain hose for condensate discharge is to be connected to the drains or to a collecting reservoir, if local regulations prohibit direct discharge to the drains. In connection with this, it must be taken into account that the condensate from compressors with oil-lubricated pressure chambers can contain oil.

Note

When operating water-cooled screw compressor units, the following points must strictly be adhered to :

- *As a result of leakage in oil/water coolers some oil can get into the cooling water circuit.*
- *Cooling water must not be discharged in an uncontrolled manner to the public drainage systems. Uncontrolled overflowing of the oil separator reservoir to the public drainage systems must be avoided. Strictly observe the relevant waste water regulations.*

3. Safety regulations

- *Maintenance and repair work has to be carried out carefully. Dismantled bundles of pipes have to be checked for damage prior to being reinstalled. In the case of even the slightest damage, the pipes have to be replaced.*
Always use new seals when carrying out assembly and mounting work.

Normal operation

Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state !

Operate the machine only when all protective equipment, emergency shut-off equipment, sound-proofing elements and extraction devices are in place and fully functional !

Check regularly that

- all means of protection are correctly fitted and fixed,
- all hoses and/or pipes within the system are in good condition, firmly fixed and do not chafe,
- there are no leakages (fuel, oil or coolant),
- all fittings are firmly tightened,
- all wires are connected correctly and are in good condition,
- all safety valves and other pressure relief mechanisms are in good order and not blocked by e.g. dirt or paint,
- the safety mechanisms are fully functional.

If compressed air hoses are used, they must be of the proper size and suitable for the relevant operating pressure. Do not use chafed, damaged or poor-quality hoses.

Only use hose couplings and fittings of the right type and the correct size.

Before blowing through a hose or an air pipe ensure that the open end is positively held. A free end whips and can cause injuries.

Before decoupling a hose ensure that it is pressureless.

Refrain from any working method which is doubtful in terms of safety.

Never play around with compressed air !

Never aim compressed air at your skin or at other persons !

Never use compressed air to clean your clothing.

When using compressed air to clean equipment take the utmost care and always wear protective goggles.

The compressed air generated by these compressors must never be used for breathing unless it has been conditioned for those applications in line with the "safety requirements for respiratory air".

Never use the machine in an environment, where inflammable or poisonous vapour can be sucked in.

Never operate the system at pressures and temperatures below or above the values indicated in the technical data sheet.

The access panels, etc. have to be closed during operation.

Persons who stay in an environment or rooms, in which the sound pressure is 85 dB(A) or higher, have to wear ear protectors.

Check the machine/unit at least once per shift for visible damage and faults ! Report any changes (including changes in the machine's operating behaviour) to the responsible department/person immediately. If necessary, stop and lock the machine immediately !

In the case of malfunction, stop the machine/unit immediately and lock it ! Have any defects rectified immediately !

Observe the start-up and stopping procedures and the control displays according to the operating instructions.

Before starting up or setting the machine in motion, ensure that nobody is at risk.

Do not cut off or remove extraction or venting facilities while the machine is running.

3.5 Special work/maintenance

Carefulness

Observe the adjusting, maintenance and inspection activities and intervals set out in the operating instructions, including information on the replacement of parts and equipment. These activities may be carried out by skilled personnel only.

Brief the operating personnel prior to starting special operations or maintenance work ! Appoint a person to supervise the activities !

Maintenance and repair work may only be carried out under the supervision of a person who is qualified for this work.

Oil losses result in a slippery floor. Therefore, always clean the floor and the outside of the machine prior to starting the maintenance work.

Checks, maintenance and repair work may only be carried out with the screw compressor being at rest and depressurized. Protective equipment to be removed for this work, has to be refitted after completion of these activities. Operation of the machine without protective equipment is not permitted. When working on a running screw compressor system, working clothes have to be close-fitting.

If the machine/unit is completely shut down for maintenance and repair work, it must be secured against inadvertent restarting :

- Lock the main command elements and remove the key and/or
- attach a warning sign to the main switch.

Always use the correct tools for maintenance and repair work.

Never use inflammable solvents or carbon tetrachloride to clean parts. Take precautions against poisonous vapours from cleaning agents.

In any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices or any work related to maintenance, inspection and repair, always observe the start-up and shut-down procedures set out in the operating instructions and the information on maintenance work.

Ensure that the maintenance area is adequately secured.

To lower the risk of accidents, individual parts and large assemblies being moved for replacement purposes should be carefully attached to lifting tackle and secured. Use only suitable and technically correct lifting gear and only utilize suspension systems with adequate lifting capacity. Never work or stand under suspended loads !

During maintenance and when carrying out repair work, cleanliness is very important. Avoid the ingress of dirt by covering parts and free openings with a clean cloth, paper or adhesive tape.

After the completion of each repair, check that tooling or loose parts have not been left in the machine, drive motor or drive equipment and ensure that no cloth has been left inside these units.

Be careful when the screw compressor system is in operation.

Maintenance/rectification of faults

The employer has to inform the employee of the dangers possibly arising during the repair and maintenance of the machine/unit as well as on how to avoid them; the employee has to observe all measures for safety at work. Safety equipment for the prevention or elimination of danger has to be maintained regularly and functionally checked at least once a year. Faults observed have to be immediately rectified and/or reported to the responsible person.

Use only original spare parts.

Only carry out maintenance and repair work when the system is not in operation and the power supply disconnected. Ensure that the power unit cannot be switched on inadvertently.

Before removing or opening pressurized components, positively isolate any source of pressure and depressurize the entire system.

Never weld near oil systems or carry out any other work requiring heat. Pressure reservoirs or components and pipes containing oil have to be drained completely and cleaned, for example by means of a steam jet, before beginning such work.

Never weld any pressure reservoir or change it in any way.

If work which produces heat, flames or sparks has to be carried out on a machine, the adjacent components have to be protected by means of non inflammable material.

Before releasing the power unit for operation after maintenance or overhaul, check that the operating pressures, temperatures and time settings are correct and that the regulating and shut-down equipment function properly.

3. Safety regulations

Examine the pressure tube and the pressure vibration dampers for carbon deposits every six months. Excessive deposits have to be removed.

Motor, air filter, electrical components and regulating equipment have to be protected from the ingress of humidity, e.g. when cleaning the system by means of a steam jet.

Under no circumstance must the sound-proofing material be removed or modified.

Never use etching solvents which could attack the materials used.

If indicated or if there is any suspicion that an internal part of the machine has run hot, the machine has to be shut down.

In order to avoid an increase in the operating temperature, check and clean the heat transfer surfaces (cooling fins, intermediate cooler, water cooling jackets, etc.) at regular intervals. Prepare a plan of the most favourable cleaning intervals for each machine.

Avoid damage to the safety valves and other pressure reducing components. Check in particular for clogging caused by paint, oil carbon or the accumulation of dust, which could deteriorate the effectiveness of these components.

Insulation or protective shielding, the temperature of which may exceed 80 °C and which could be erroneously touched by the personnel, must not be removed before these parts have cooled down to room temperature.

Check the accuracy of pressure and temperature indicators at regular intervals. If the admissible tolerance limits have been exceeded, these devices have to be replaced.

Before removing or overhauling a compressor, a motor or another machine, ensure that all moveable parts of a mass of more than 15 kg cannot move or roll away.

After completion of repair work, always verify that no tools, loose parts or cloths have been left in or on the machine, drive motor or drive equipment. Machines performing a back and forward main movement have to be cycled at least once, rotating machines have to be cycled several times in order to ensure that there are no mechanical faults in the machine or the drive member. Check the direction of rotation of the electric motors during first commissioning and after each modification of the electrical connections in order to prevent the compressor from being damaged.

The fastening of loads and the instructing of crane operators should be entrusted to experienced persons only. The person giving the instructions must be within sight or voice contact with the operator.

For carrying out overhead assembly work always use specially designed or otherwise safety-orientated ladders and working platforms. Never use machine parts as a climbing aid. Wear a safety harness when carrying out maintenance work at greater heights.

Keep all steps, handles, handrails, platforms, landings and ladders free from dirt, snow and ice !

Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before carrying out maintenance or repair work ! Never use aggressive detergents ! Use lint-free cleaning rags !

Before cleaning the machine with water or steam jet (high pressure cleaner) or other cleaning agents, cover mask all openings which have to be protected from the ingress of water, steam or detergents for safety and/or functional reasons, in particular electric motors and switch cabinets.

After cleaning, remove the covers/masking completely !

Check all hydraulic oil lines for leakage, loose fittings, abrasion and damage after cleaning. Any defect must be rectified immediately !

Always re-tighten screwed connections which have been loosened for maintenance and repair work.

If the set-up, maintenance or repair require the dismantling of safety equipment, this equipment has to be remounted and checked immediately after these activities.

Ensure that consumables and replacement parts are disposed of in a safe and environmentally friendly manner.

3.6 Warning of special dangers

Electric energy

Use only original fuses with the specified current rating. Switch off the machine/unit immediately if trouble occurs in the electric system.

Work on the electrical system or equipment may only be carried out by a skilled electrician or by specially instructed personnel under the control and supervision of such an electrician and in line with the relevant electrical engineering rules.

If regulations require, the power supply to parts of machines and plants, on which inspection, maintenance and repair work is to be carried out, must be cut off. Before starting any work, check the de-energized parts for the presence of power and ground or short-circuit them in addition to insulating adjacent live parts and elements.

The electrical equipment of the machines/units is to be inspected and checked at regular intervals. Defects such as loose connections or scorched cables must be rectified immediately.

Necessary work on live parts and elements must be carried out in the presence of a second person who can cut off the power supply in case of danger by operating the emergency shutdown or main power switch. Secure the working area with a red-and-white safety chain and a warning sign. Use insulated tools only.

Before starting work on high-voltage assemblies and after having cut out the power supply, the feeder cable must be grounded, and components, such as capacitors, short-circuited with a grounding rod.

Gas, dust, steam and smoke

Carry out welding, flame-cutting and grinding work on the machine/unit only if this has been expressly authorized, as there may be a risk of explosion and fire.

Before carrying out welding, flame-cutting and grinding operations, clean the machine/unit and its surroundings from dust and other inflammable substances and make sure that the premises are adequately ventilated (risk of explosion) !

Adhere to the regulations valid for the place of operation !

Observe any existing national regulations if work is to be carried out in small rooms.

Hydraulics, pneumatics

Work on hydraulic equipment may only be carried out by persons with special knowledge and experience of hydraulics.

Check all lines, hoses and screwed connections regularly for leaks and obvious damage. Repair damage immediately. High pressure jets of oil may cause injury and fire.

Depressurize all system sections and pressure pipes (hydraulic system, compressed-air system) which are to be removed in accordance with the specific instructions for the assemblies concerned before carrying out any repair work.

Hydraulic and compressed-air lines must be laid and fitted properly. Ensure that no connections are exchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.

Noise

Sound-proofing elements on the machine/unit have to be active during operation (i.e. sound-proofing panels closed, etc.).

Wear personal ear protection as prescribed.

Noise, even at a low level, can cause nervousness and annoyance; over a longer period of time, our nervous system can suffer serious damage. We therefore recommend a separate machine room in order to keep the noise of the machine away from the workshop.

Depending on the number of machines in a machine room, the noise can be quite loud. In accordance with the sound pressure level at manned posts, the following precautions have to be taken :

- Below 70 dB(A) :
No special measures
- Above 70 dB(A)
Persons who stay permanently in this room have to wear ear protectors
- Below 85 dB(A)
In the case of occasional visitors who stay in this room only for a short while, no special precautions are to be taken
- Above 85 dB(A)
Hazardous noise zone ! A warning sign has to be attached to each entrance indicating that everybody who enters the room - even for a short time only - has to wear ear protectors.

3. Safety regulations

- Above 95 dB(A)
The warning signs have to contain the recommendation that occasional visitors also have to wear ear protectors.
- Above 105 dB(A)
Special ear protectors, which are suitable for the noise level and the spectral composition of the noise must be available. A corresponding warning sign must be fixed to each entrance door.

Take care that the noise transmission through walls and frames does not result in too high a noise level in the surrounding areas.

Oils, greases and other chemical substances

When handling oils, greases and other chemical substances, observe the safety regulations for this product !

Be careful when handling hot fuels and consumables (danger of burning or scalding) !

Rooms subject to explosion hazards

Danger

Compressor units must never be operated in areas subject to explosion hazards!

(Exception: Special units with the corresponding technical modifications)

3.7 Storage of compressors

All compressors are protected against corrosion at the factory for transport and for brief storage before commissioning.

If the compressors are to be stored for period exceeding six months, additional precautions must be taken.

Compressors which are to be shut down for a lengthy period must also be protected from corrosion.

Since corrosion occurs more quickly in damp atmospheres than in dry conditions, it is not possible to specify a maximum permissible standstill time which will apply in all cases.

Note

The following aspects must be taken into account for storage of storing compressors.

The compressor should be stored in a dry building which should be heated if possible.

This is particularly true during the months of winter.

If there is a risk that the temperature will fall or rise above the limits of -10 °C to +65 °C , the electrical controller must be removed and stored in ambient temperatures of +5 °C to +30 °C.

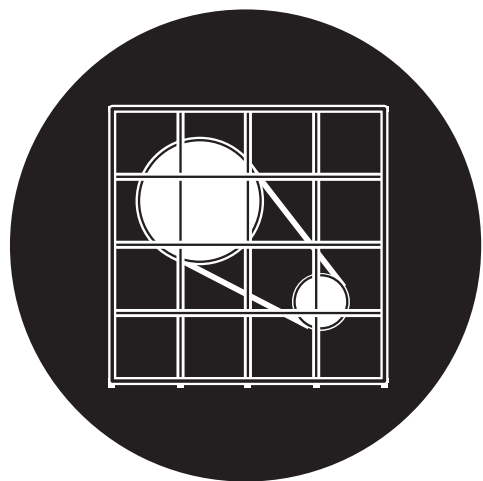
Before commissioning the compressor all the electrical and electronic components and units should be checked for the ingress of water or condensation.

3. Safety regulations

3.8 Symbols and explanations



Carefully read the operating manual before commissioning or servicing this compressor.



Never operate the machine without protective equipment fitted.



Never breath in compressed air from this system.

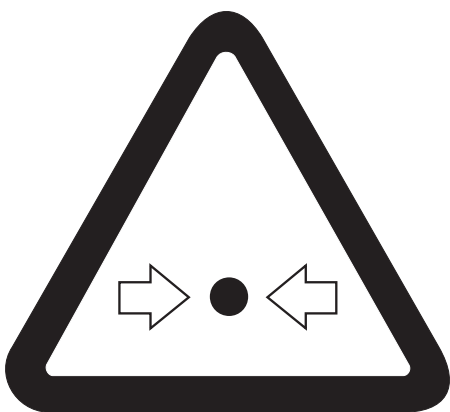
3. Safety regulations



Warning: Never operate the unit with open doors or loose access panels.



Warning: Hot surface

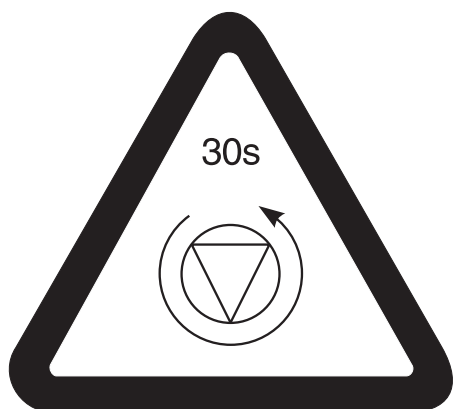


Warning: Pressurized part or system

3. Safety regulations



Warning: This system can start up by means of a remote control or automatically after a power failure.



Warning: The system continues to run for 30 seconds after pressing the O-key.

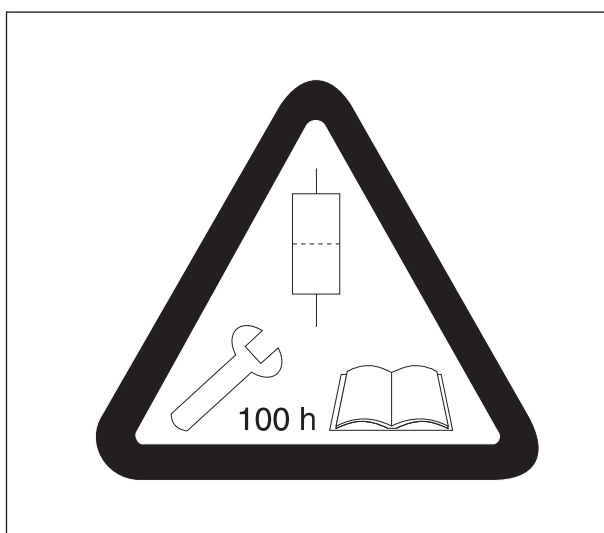


Warning: Danger of electric shock

3. Safety regulations



Lifting point

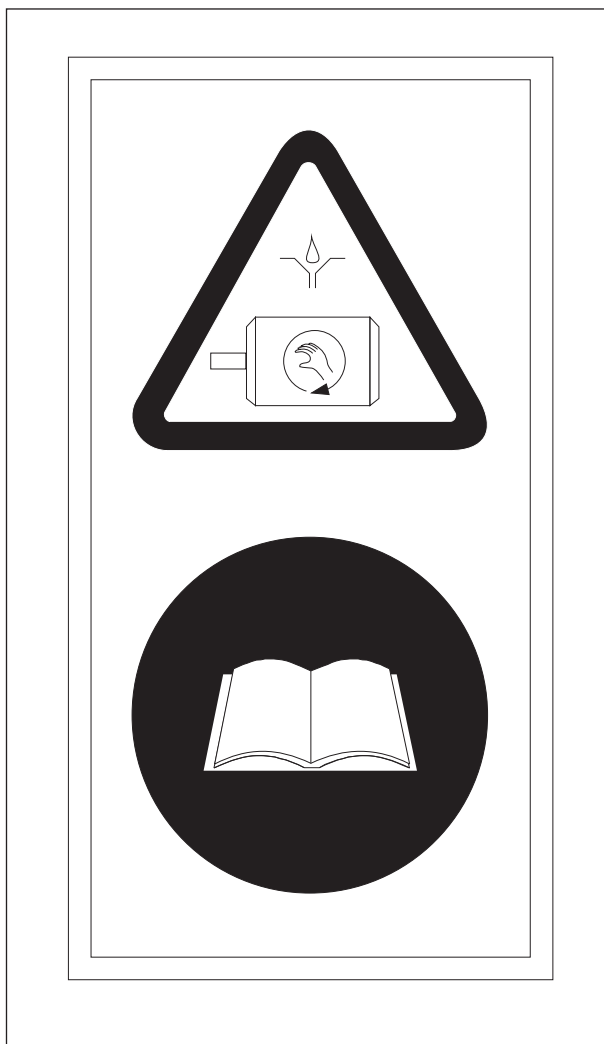


Warning: Change the running-in oil filter cartridge after approx. 100 operating hours. For further recommendations, see the operating instructions.



Warning: Check connecting terminals and retighten, if required. For further recommendations, see the operating instructions.

3. Safety regulations



Attention: Only lubricate the system while the motor is running. For further details, see the operating instructions

4. Design and functioning

4.1 Design of the unit

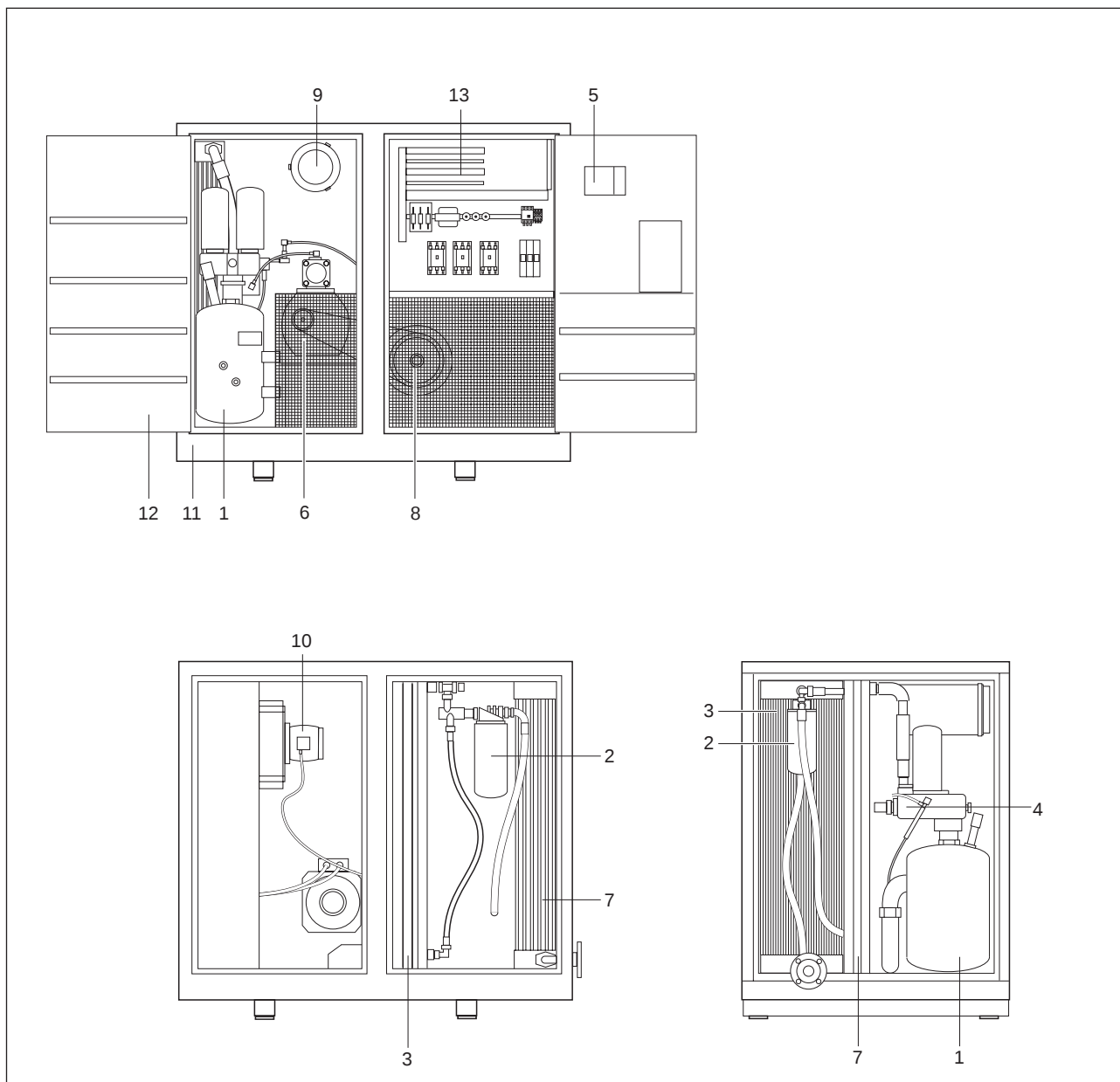


Fig. 3

- | | | | |
|---|----------------------------------|----|------------------------|
| 1 | Pressure reservoir | 8 | El. motor |
| 2 | Oil filter | 9 | Air filter |
| 3 | Oil cooler | 10 | Cooling air ventilator |
| 4 | Pressure holding and check valve | 11 | Support frame |
| 5 | Operating panel control | 12 | Panel |
| 6 | Screw compressor | 13 | Switch cabinet |
| 7 | Air cooler | | |

4.2 Design of the water-cooled unit

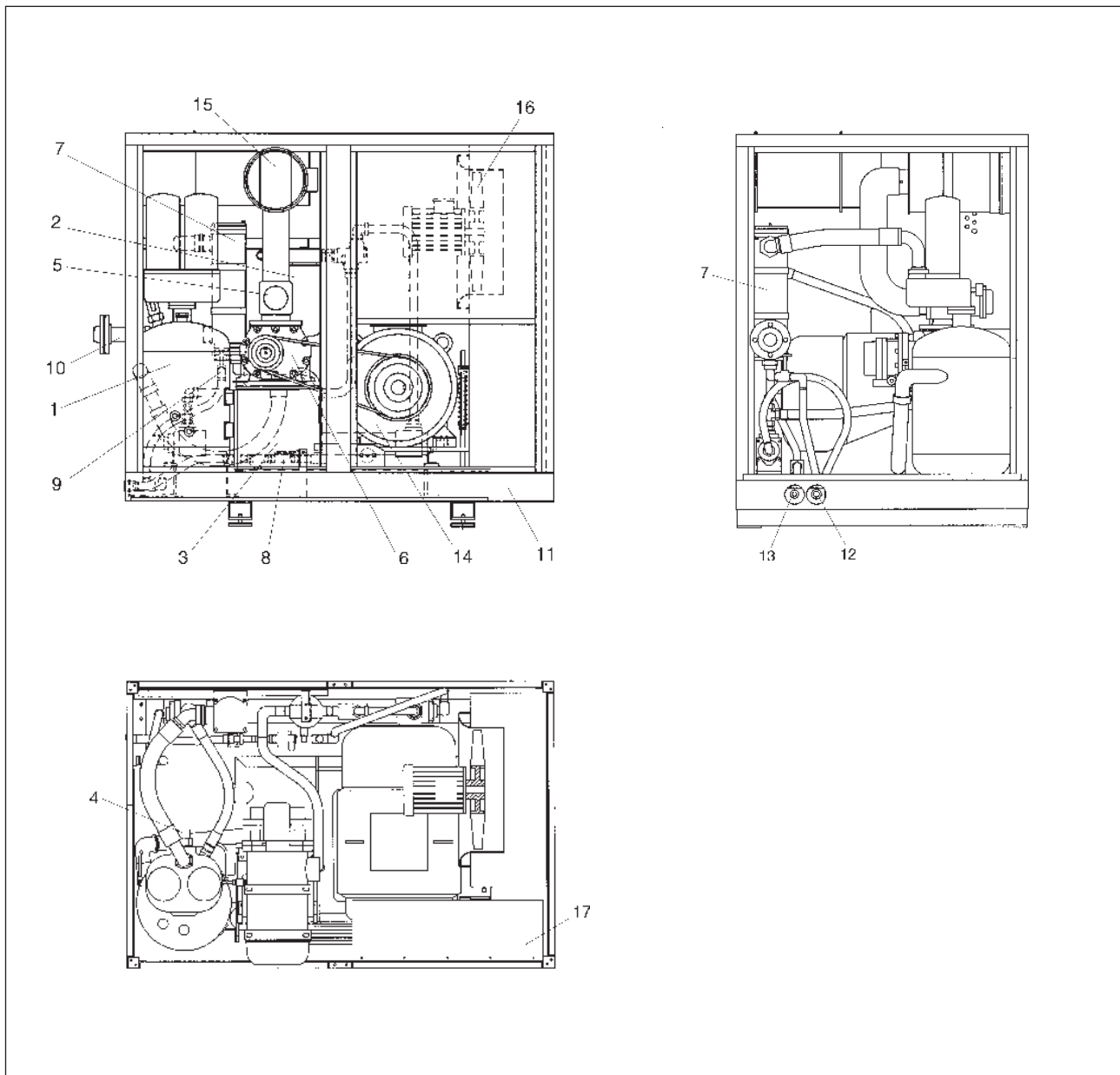


Fig. 4

- | | | | |
|---|----------------------------------|----|------------------------------|
| 1 | Pressure reservoir | 8 | Cooling water solenoid valve |
| 2 | Oil filter | 9 | Manual control valve |
| 3 | Oil cooler | 10 | Pressure pipe to the mains |
| 4 | Pressure holding and check valve | 11 | Support frame |
| 5 | Operating panel control | 12 | Cooling water outlet |
| 6 | Screw compressor | 13 | Cooling water inlet |
| 7 | Air cooler | 14 | Electric motor |
| | | 15 | Air filter |
| | | 16 | Cooling air ventilator |
| | | 17 | Switch cabinet |

4.3 Schematic diagram

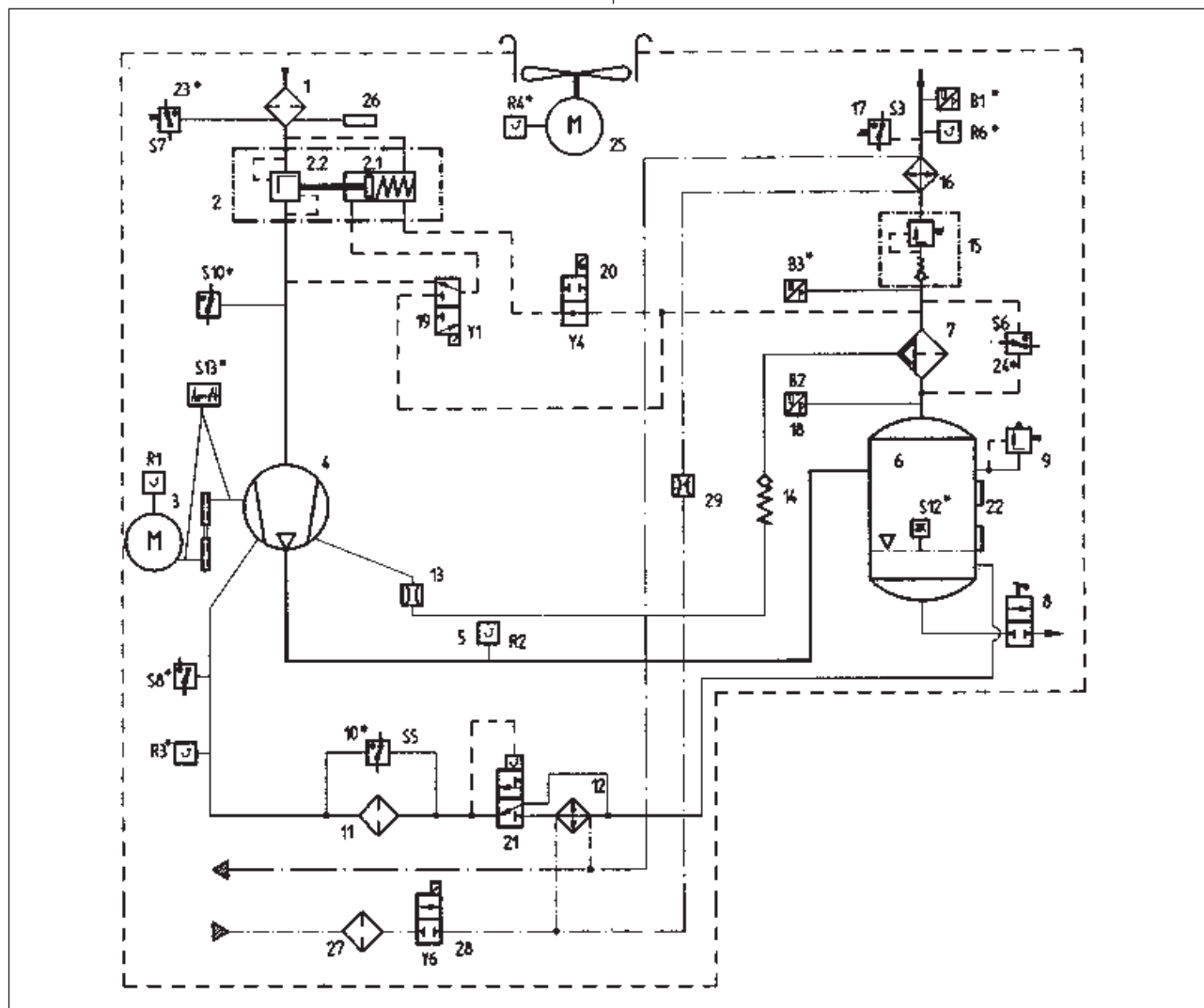


Fig. 5

1. Intake filter	17. Pressure monitor	R1 Motor temperature*	ter*
2. Intake regulator	18. Pressure monitor + display	R2 Compressor temperature	S6 Differential pressure fine separator*
2.1 Actuating cylinder	19. 3/2-way solenoid valve	R3 Oil injection temp.*	S7 Differential pressure air filter*
2.2 Pressure control valve	20. 2/2-way solenoid valve	R4 Ventilator motor temp.*	S8 Oil injection pressure*
3. Electric motor	21. Oil temperature regulator	R6 After-cooler temperature*	S10 Direction of rotation monitor*
4. Screw compressor	22. Oil level indicator	B1 Sensor mains pressure*	S12 Oil level*
5. Thermo-sensor + indicator	23. Switch of intake filter (maintenance)*	B2 Sensor compression end pressure	S13 Bearing monitor SPM*
6. Pressure reservoir	24. Switch of fine separator (maintenance)*	B3 Sensor outlet of the oil fine separator*	Y1 Regulating valve
7. Fine separator cartridge	25. Ventilator	S3 Pressure monitor	Y4 Blow-off valve
8. Oil drain ball valve	26. Clogging indicator of air filter	S5 Differential pressure oil filter*	Y6 Cooling water solenoid valve (WS only)
9. Safety valve	27. Dirt trap (WS only)		
10. Switch of oil filter (maintenance)*	28. Cooling water solenoid valve (WS only)		
11. Oil filter	29. Throttle valve, settable (WS only)		
12. Oil cooler			
13. Throttle			
14. Check valve			
15. Valve combination: Pressure holding + check valve			
16. Air cooler			

* option

4.4 Oil circuit

The required oil is drawn from the pressure reservoir - 6 -, passes through the oil thermostat - 21 - (closes the by-pass line of the oil cooler - 12 - and opens the passage to the oil cooler at an oil temperature > 55 °C), through the oil filter - 11 - and is fed to the screw compressor - 4 -.

The oil separated in the fine separator - 7 - is fed through an oil line to the screw compressor - 4 -. The entire oil circulation is based on a natural differential pressure in the system. Considering the pressure difference of approx. 1.5 bar within the oil circuit, the oil is then injected into the compressor - 4 - with approx. 5.5 bar at a reservoir pressure of e.g. 7 bar.

During idle running of the screw compressor, the required oil injection quantity is achieved owing to the fact that a sufficiently high pressure drop occurs and thus, with the inlet controller - 2 - being closed, a vacuum pressure develops at the inlet connection (place of injection).

4.5 Air circuit

The intake air passes through the suction filter - 1 - and the intake regulator - 2 - into the screw compressor - 4 -. During the compression process, the intake air is cooled via the injected oil, and the developed air/oil mixture flows tangentially into the pressure reservoir (oil reservoir) - 6 -. After the pre-separation and the subsequent fine separation in the oil fine separator - 7 -, the compressed air with a low oil content passes through the valve combination - 15 -, the air cooler - 16 - and the condensate separator (option) into the consumer network.

The condensate separated in the condensate separator (option) is carried to the outside via a solenoid valve (option) which is to be installed by the customer and controlled by a "Kondensomat" (option).

4.6 Start/stop/shutdown

Start of the unit

- The electric motor - 3 - starts up in the Y-mode.
- The intake regulator - 2 - is closed.
- The oil supply of the screw compressor - 4 - is provided by the vacuum pressure where the injection takes place.
- The cooling water solenoid valve - 29 - (**only in W-units**) opens as it is energized.
- When changing over to Δ -operation, the solenoid valves - 19 + 20 - switch due to being energized.
- The air in the system circulates via the solenoid valve - 19 - into the lower pressure chamber of the actuating cylinder - 2.1 -. The upper control chamber of the actuating cylinder - 2.1 - is isolated from the pressure reservoir - 6 - by solenoid valve - 20 - and is bled into the intake channel.
- The pressure control valve - 2.2 - in the intake regulator - 2 - opens.
- The valve combination (pressure holding and check valve) - 15 - opens at a system pressure of approx. 4.5 bar.
- The delivery of compressed air into the consumer network starts.

Automatic operation (open/close operation)

- When the mains pressure reaches the maximum value set at pressure monitor - 17 -, the solenoid valves - 19 + 20 - de-energize.
- The pressure control valve - 2.2 - closes. This happens because the lower control chamber of the actuating cylinder - 2.1 - is relieved by the de-energized solenoid valve - 19 - and as a result of the pressurization of the upper control chamber in the actuating cylinder - 2.1 - and the force of the compression spring in the actuating cylinder - 2.1 -.
- The screw compressor - 4 - is running in the idle mode.
- The pressure reservoir - 6 - is depressurized.
- If the mains pressure does not fall to the minimum value set at pressure monitor - 17 - or at the sensor of the mains pressure B1 within 6 minutes, the system shuts down.
- The cooling water solenoid valve - 29 - (only WS-units) de-energizes and closes.
- If the minimum value preset at pressure monitor - 17 - or at the sensor of the mains pressure B1 is reached in less than 6 minutes, the solenoids - 19 + 20 - are again energized.
- The unit changes over to load operation.

Throttling operation (option)

- The upper switching point is set to the maximum operating pressure at pressure monitor - 17 - or, depending on the machine version, at the sensor of the mains pressure B1 (0.3 bar higher than the setting of the proportional regulator). The standard proportional regulator can only be used for a pressure range of between 7 bar and the nominal pressure.
- The regulation range can be set lower by adjusting the proportional regulator accordingly.
- With an increasing input pressure (increasing pressure in the pressure reservoir - 6 -), the proportional regulator provides a decreasing output pressure within the regulating range (corresponds to a decreasing pilot pressure in the lower control chamber of the actuator - 2.1 -).
- As a result of the pressure drop in the lower control chamber, the compression spring in the upper control chamber partly closes the pressure control valve - 2.2 - and thus causes throttling of the intake flow.

Note

The throttling operation provides only a restricted throttling function, the task of which is to reduce the supply flow to 70 %. When this value is reached, the pressure monitor - 17 - or the mains pressure sensor B1 (depending on the machine version) switches the screw compressor unit over to automatic operation.

Stopping of the system

- After pressing the OFF-key on the operating panel, the solenoid valves - 19 + 20 - are de-energized.
- The pressure control valve - 2.2 - in the intake regulator - 2 - closes and the system is relieved.
- After approximately 30 seconds, the electric motors - 3 + 25 - shut down.
- The cooling water solenoid valve - 28 - (only in WS-units) de-energizes and closes.

Standstill of the system

- When the system is at rest the intake controller - 2 - is closed by the compression spring in the actuating cylinder - 2.1 -.
- The solenoid valves - 19 + 20 - are de-energized.
- The pressure reservoir - 6 - is bled via the solenoid valve - 20 - and actuating cylinder - 2.1 - into the intake channel.

5.1 Transport

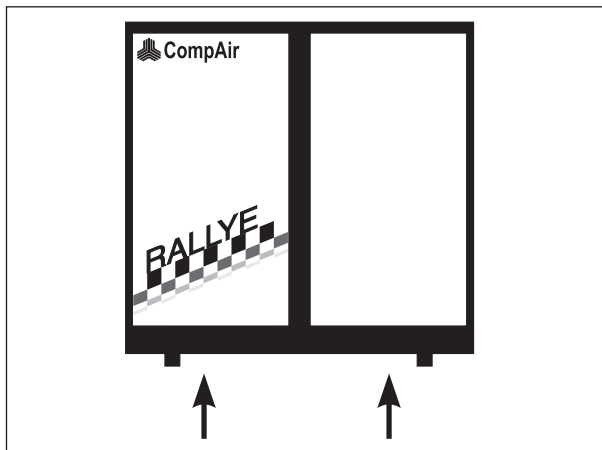


Fig. 6

Danger

The screw compressor unit must be lifted using a suitable fork lift truck, which complies with the local safety regulations.

Before lifting, all loose or slewable parts of the machine have to be firmly secured.

It is strictly prohibited to work or stand in the danger zone of a lifted load.

The proper lifting of the load (according to the operating instructions of the load suspension device) has to be ensured.

Important

Never lift or lash the compressor via its enclosure.

The screw compressor is lifted with the help of a fork lift truck (fig. 6). The separation of the forks and their length must be taken into account for transportation.

Only use the identified lifting points. Do not slide the unit when it is standing on the floor.

Weights (with electric motor IP 23)

The values listed below are approximate values, they refer to a screw compressor unit including oil fill :

Version:

RALLYE 070/071/072	approx.	1120	kg
RALLYE 085/086/087	approx.	1165	kg
RALLYE 100/101/102	approx.	1170	kg
RALLYE 110/111/112	approx.	1280	kg

Weights (with electric motor IP 54)

The values listed below are approximate values, they refer to a screw compressor unit including oil fill :

Version:

RALLYE 070/071/072	approx.	1165	kg
RALLYE 085/086/087	approx.	1260	kg
RALLYE 100/101/102	approx.	1370	kg

5.2 Installation

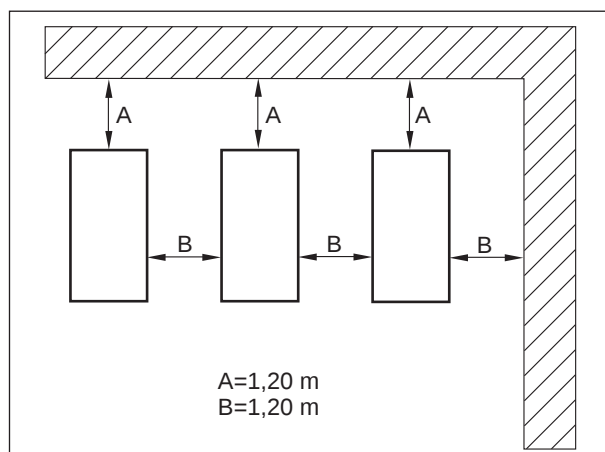


Fig. 7

Danger

- *The foundation weight carrying capacity has to be taken into account.*
- *Provide for a solid and plane base.*
- *The intakes are to be located so that no hazardous constituent (solvent vapour, etc., but also dusts and other hazardous material) can be sucked in. This applies also to flying sparks.*
- *Pipes and/or other parts with a surface temperature higher than 80 °C have to be suitably identified and secured against touching. See also the safety regulations in chapter 3 of the operating instructions.*

Important

The operator has to provide adequate ventilation for the compressor station.

The screw compressor unit has to be levelled.

A minimum distance from walls, other machines, etc. should be maintained so that there is sufficient clearance for maintenance and repair work (fig. 7).

During operation of the screw compressor unit, heat is generated by the electric motor and the compression process. The screw compressor radiates a part of this heat into the surroundings.

Proper ventilation has a considerable effect on the service life and the performance of a compressor.

6.1 Cooling air volume/minimum cross-sections

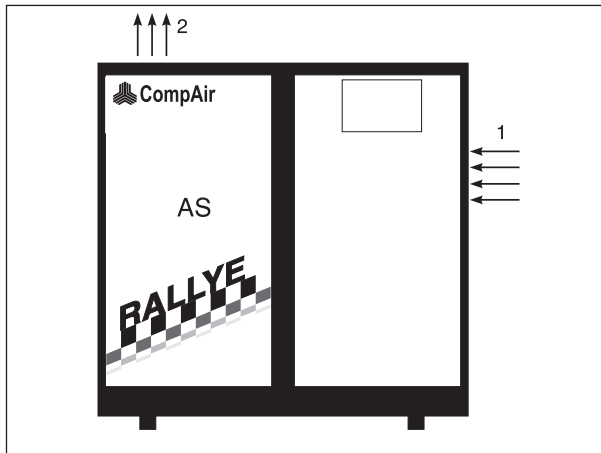


Fig. 8

Figures :

- 1 Cooling air intake
- 2 Cooling air outlet

The cooling air volume required by air-cooled (AS) and water-cooled (WS) screw compressors is as follows :

RALLYE 070-087 AS :	ca. 100m ³ min,
RALLYE 100-112 AS :	ca. 140m ³ /min.
RALLYE 070-112 WS :	ca. 65m ³ /min.

Under unfavourable local conditions, we recommend the installation of venting ducts. However, the velocity of the cooling air should not exceed 5 m/s. We recommend a minimum cross-section of approx. 0.4 m².

Important

The stated minimum cross-section refers to a maximum duct length of 5 m and a maximum of one bend. In case of differing values (over 5 m, more than one bend, filter cartridges, screens, etc.) please contact your technical adviser.

CompAir screw compressors are rated for ambient temperatures and cooling air temperatures of +1 °C to +40 °C. In the case of temperatures other than the above limiting values, please consult your technical adviser.

Note

In order to ensure a good heat dissipation, auxiliary fans should be rated to process approximately 15 to 20 % more air volume than the total cooling air volume required by the compressors installed in the compressed air station.

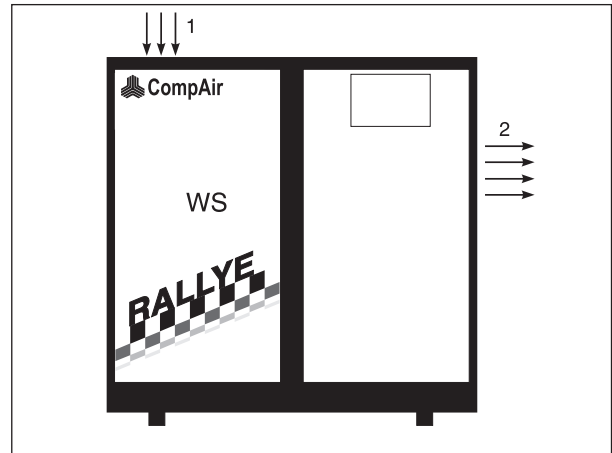


Fig. 9

6.2 Compressed air connection

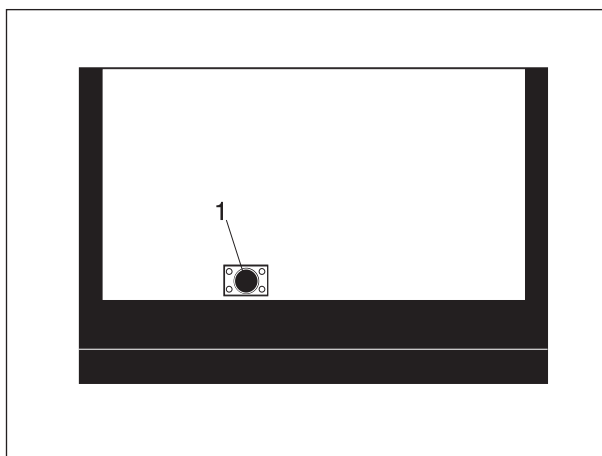


Fig. 10

Figure 10 :

- 1 Compressed air outlet DN 50, PN 16



Fig. 10a

The screw compressor is completely assembled in the factory.

The compressed air mains is connected to the tapping flange of the screw compressor (DN 50). The compensator (fig. 15) is available as optional extra.

Note

After-coolers, separators, collecting reservoirs and the compressed air lines must be equipped with drain facilities at their lowest points to drain collected liquids. These facilities have to be fitted to allow the observance of the draining of such liquids.

Hand-operated drain facilities have to be actuated in accordance with the operating instructions.

Automatic drain facilities have to be checked for proper function at regular intervals. When draining condensates into a collecting line, which also collects the condensate from other machines, make sure that the collecting line is free from counterpressure. Therefore, measures have to be taken to ensure that counterpressure cannot build up.

Condensate may contain oil ! When draining condensate, observe the corresponding regulations for waste water disposal.

6. Preparations for commissioning

6.3 Water connection for W-version

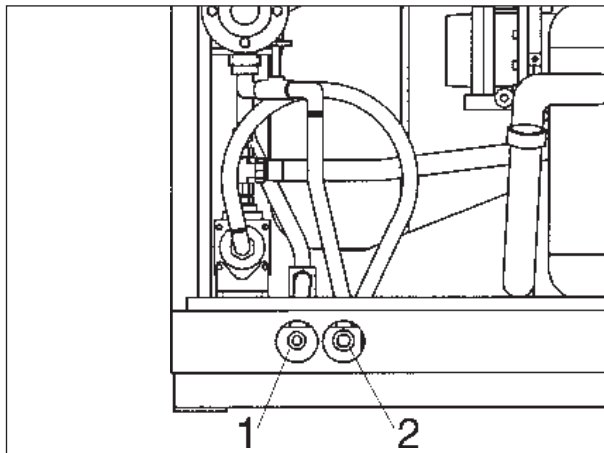


Fig. 11

Figure 11 :

- 1 Cooling water intake
- 2 Cooling water outlet

Important

During danger of frost or extended periods of standstill of the screw compressor unit, the cooling water is to be drained.

Maintenance and repair work must be carried out carefully.

Dismantled bundles of pipes have to be checked for damage prior to being reinstalled. In the case of even the slightest damage, the pipes have to be replaced. Always use new seals when carrying out assembly and mounting work.

Note

Before first commissioning - or when re-commissioning after maintenance of the water-cooled units, the air cooler must be bled via the bleed screw.

When operating water-cooled screw compressor systems, the following must be taken into account :

- *As a result of leakage in oil/water coolers some oil can get into the cooling water circuit.*
- *Cooling water must not be discharged in an uncontrolled manner to the public drainage systems. Uncontrolled overflowing of the oil separator reservoir to the public drainage systems must be avoided. Strictly observe the relevant waste water regulations.*

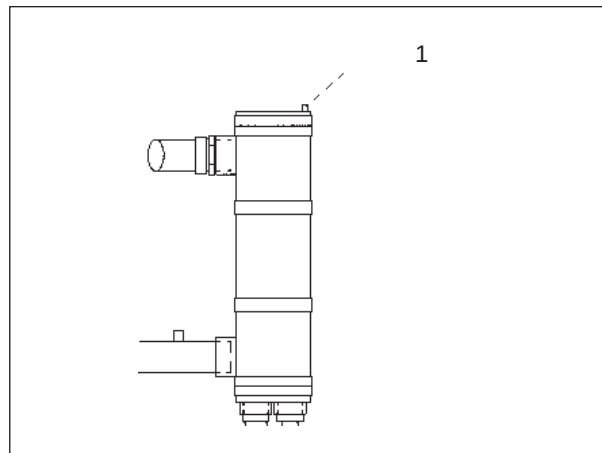


Fig. 12

Figure 12 :

- 1 bleed screw

The cooling water circuit is completely assembled and fitted in the screw compressor unit.

The water connections of RALLYE WS are as follows:

RALLYE

- Water intake: G 3/4"
- Water outlet: G 1"

Permissible cooling water data :

- Cooling water pressure : >>min./max.<<:
RALLYE 070 - 102 : 2 / 5 bar
110 - 112 : 3 / 5 bar
- Cooling water inlet temperature :
>>min./max.<<: 5 / 35 °C
- Cooling water outlet temperature : >>max.<<: 55 °C

The cooling water requirement at maximum operating pressure, related to a water inlet temperature of 12 to 15 °C, $\Delta t = 15$ °C :

RALLYE 070/071/072	ca. 40 l/min
RALLYE 085/086/087	ca. 50 l/min
RALLYE 100/101/102	ca. 60 l/min
RALLYE 110/111/112	ca. 70 l/min

The cooling water quantity for the oil and air cooler must be set by means of a manual control valve at the time of commissioning.

Compressed air outlet temperature	30 to 35 °C
Oil temperature	65 to 75 °C

Note

If possible, the cooling water outlet temperature should be lower than 50 °C in order to avoid an increased precipitation of lime.

6. Preparations for commissioning

6.4 Electrical connection

Recommended supply line cross-sections and fuses

RALLYE - 380 V/50 Hz	Installed nominal motor power [kW]	Nominal motor power ventilator A (W) [kW]	Fuse protection (slow-blow fuse) [A]		Wire cross-section at 30 °C [mm ²]	
			A	W	A	W
070 - 072	37	1.1 (0.37)	100	80	3 x 35 /PE 16	3 x 25 /PE 16
085 - 087	45	1.1 (0.37)	125	100	3 x 50 /PE 25	3 x 35 /PE 16
100 - 102	55	2.2 (0.37)	125	125	3 x 50 /PE 25	3 x 50 /PE 25
110 - 112	75	2.2 (0.37)	160	160	3 x 70 /PE 35	3 x 70 /PE 35

RALLYE - 400/415 V/50 Hz	Installed nominal motor power [kW]	Nominal motor power ventilator A (W) [kW]	Fuse protection (slow-blow fuse) [A]		Wire cross-section at 30 °C [mm ²]	
			A	W	A	W
070 - 072	37	1.1 (0.37)	80	80	3 x 25 /PE 16	3 x 25 /PE 16
085 - 087	45	1.1 (0.37)	100	100	3 x 35 /PE 25	3 x 35 /PE 16
100 - 102	55	2.2 (0.37)	125	125	3 x 50 /PE 25	3 x 50 /PE 25
110 - 112	75	2.2 (0.37)	160	160	3 x 70 /PE 35	3 x 70 /PE 35

Notes on the table:

We do not know the cable type used by you, its length and the installation conditions (temperatures, grouping). The table above can therefore only be regarded as a guideline.

The supply line cross-sections given in the table correspond to VDE 0100, part 523 - group 2 (multi-wire cables or grouped, individual wires at 30 °C and a max. line length of 50 m). In the case of differing conditions (cable length, temperature and grouping), the cable cross-sections have to be selected in line with DIN VDE 0298, part 4, which also refers to the cable type.

The setting value of the motor protective switch for the fan drive depends on the individual ambient and installation conditions on site. For safety reasons, the exact setting values should be obtained from the manufacturer.

$$I_{\text{setting}} = I_{\text{nom}} \times 1.15 \times \text{voltage correction, if required}$$

I_{nom} see nameplate

RALLYE compressed air stations are finished in the factory according to standard EN60204 (industrial machinery). Please observe the following notes:

Danger

The customer has to connect a main switch in the incoming line of the RALLYE screw compressor unit (unless factory-mounted as special accessories) (DIN EN 1012 - 1). If this switch does not assume short-circuit and overload protection functions for the system, suitable back-up fuses must be installed (see table)

The main switch must meet the requirements of safety standard EN 60 204-1/Art. 5.3 (electrical equipment of machinery).

The electrical connections and the protective measures have to be carried out in line with VDE regulations or the national stipulations in your country. Generally, additional rules of the respective electrical power supplier have to be observed.

If the erection conditions of the system deviate from the conditions described in EN60204, please contact your technical consultant.

The connections must be made by an authorized specialist.

Attention: Interference voltage! If external electric circuits, which cannot be cut out via the main switch, are connected to the control, these have to be identified according to EN60204. Warning signs have to be fixed near the main switch and near these electric circuits. In addition, these conductors have to be laid separately and/or identified by colours.

Work on control cabinets may only be carried out by electrotechnical specialists.

Checking the setting of the control-power transformer

The control-power transformer is factory-preset to the rated voltage. However, practice has shown that the actual supply voltage often differs from this value. In order to adjust the unit to the local conditions, the setting of the control-power transformer must be checked by measuring the control-power transformer supply voltage under load and, if required, re-set. Several tapping points are provided for this purpose (see circuit diagram).

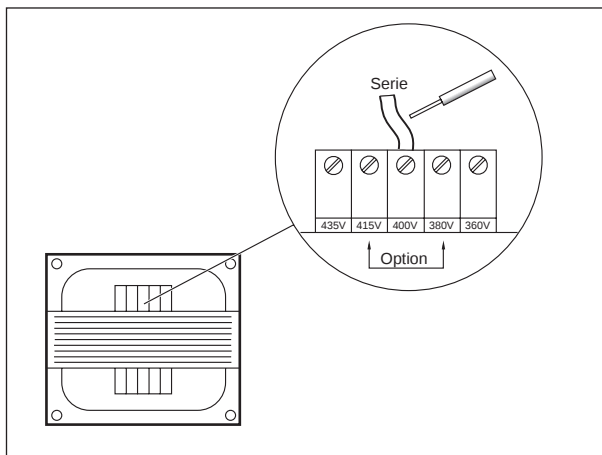


Fig. 13

Danger

When carrying out adjustment work on the control-power transformer, the unit must be off circuit.

Work on the control cabinet may only be carried out by electrotechnical specialist personnel.

Important

A wrong setting of the control-power transformer jeopardizes the trouble-free operation of RALLYE 070 - 112 compressor units and can result in malfunction or damage.

The verification of the control-power transformer setting is a must during commissioning and periodic inspection/maintenance, as the voltage supply conditions may vary.

The correct setting should be checked in on-load operation of the unit by measuring the control-power transformer output voltage.

Start-up of the unit after connection to the electric network/Checking the direction of rotation

After connection to the electric network the unit can be started up for the first time. Make sure that the compressed air lines are connected and observe the following notes:

Important

When connecting a compressor unit to the electric network for the first time, it is necessary to check the drive motor for the correct direction of rotation (see arrow).

In the case of a wrong direction of rotation stop the unit immediately by actuating the emergency OFF push-button. The normal stop push-button stops the drive only after the soft stop time (several seconds).

Even a short operation of the drive in the wrong direction of rotation (approx. 2 seconds) results in severe damage or consequential damage.

Connecting terminals for heater (option)

For RALLYE with 380/400/415 V:

- Connecting terminals for heater
230 V $\pm 10\%$
- 2.0 kW, 1P/N/PE
- Integrated thermostat
- Graphical symbol : with ventilator
- Supply of the unit : 3P/PE

6. Preparations for commissioning

6.5 Oil level check

Danger

Only check the oil level when the screw compressor unit is out of operation and depressurized ! The pressure reservoir can be under pressure and the oil hot. Warning : Danger of scalding ! Do not spill oil ! Check for leakage !

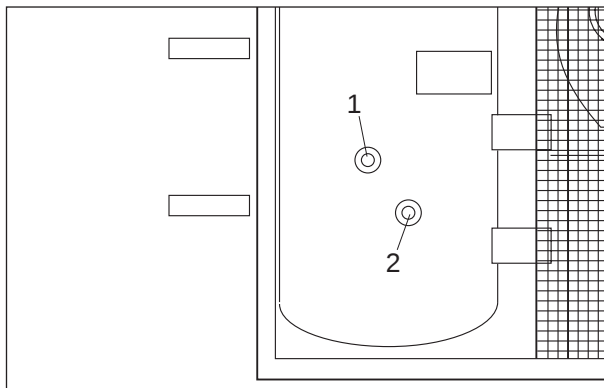


Fig. 14

Figure 14:

- 1 max.
- 2 min.

Important

Do not mix oils of different specifications.

Check oil level

- The oil level is checked at the oil sight-glass at the pressure reservoir (fig. 14) after every stop and at regular intervals.
- The oil should have settled and the air entrapped should have been dispersed. This procedure may take up to one hour (depending on the conditions).
- The max. oil level is in the middle of the upper oil level sight-glass, the min. oil level in the middle of the lower oil sight glass (fig. 14). If required, top up oil.

See also chapter 9 "Maintenance".

6.6 Sound pressure level

Sound pressure level measured to DIN 45 635 under full load at a distance of 1 m dB(A):

RALLYE	air-cooled AS	water-cooled WS
070	71	70
071	71	70
072	71	70
085	72	72
086	72	72
087	72	72
100	74	73
101	74	73
102	74	73
110	78	78
111	78	78
112	78	78

Subject to technical revision.

7.1 First commissioning

Danger

Make sure before commissioning that nobody is in the danger zone of the motor/screw compressor.

Only operate the screw compressor with closed access panels.

The safety valve can be hot as a result of preceding operation. A functional check must only be carried out at operating pressure. Be careful with escaping air (danger of burning and scalding).

Important

Although every CompAir screw compressor has been subjected to a test run at the factory and has again been thoroughly inspected before shipment, damage during shipment cannot be excluded. For this reason, every screw compressor should be checked once again for damage before being commissioned. In addition, it should be observed during the first operating hours. The screw compressor unit is completely factory-assembled. It can be directly connected to the compressed air mains by means of a flexible connection.

If the screw compressor is newly connected to a power supply, check the direction of rotation of the drive motor !

With a wrong direction of rotation, shut down the unit immediately by actuating the emergency shut-down, otherwise the compressor might suffer serious damage.

The access panels may temporarily be opened for checking the direction of rotation (wear ear protectors).

Moreover, the following points must be taken into account :

- Fasteners used for securing the unit during transportation have to be removed prior to commissioning.
- Before commissioning, panels and doors should be realigned, if required.
- Check and, if necessary, correct the pre-set values at the Kondensomat (option).
- Re-tighten all connecting terminals of the electrical control before commissioning.
- Check the oil levels in the pressure reservoir before each commissioning.
- Open the isolator valves between the screw compressor, reservoir and pipe,
- Operate main switch.
- Before each commissioning, check the safety valve (fig. 15) for function by turning the knurled cap at the safety valve (at operating pressure).

- When switching the power supply on, all of the LEDs and all segments of the LCD displays will light up for a display test.
- For testing purposes, all LEDs and segments on the operating panel light up.
- Press the OFF-key for unlocking.
- Press the ON-key, the ON-key lights up >>green<< in order to show that the screw compressor unit is in the automatic operating mode.

Note

Before first commissioning or when re-commissioning after maintenance of the water-cooled units, the air cooler must be bled via the bleed screw.

7.2 Routine commissioning

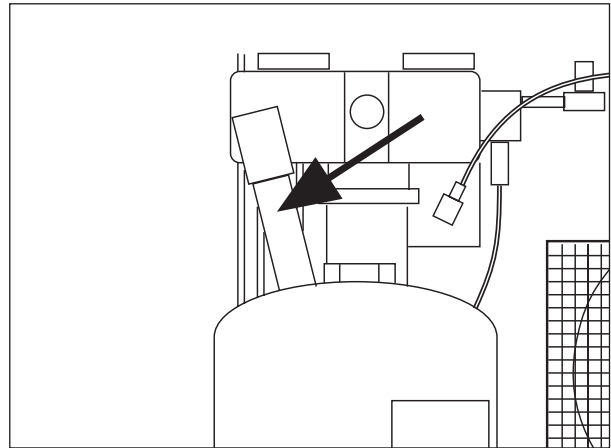


Fig. 15

Danger

Make sure before commissioning that nobody is in the danger zone of the motor/screw compressor.

After completion of work : Verify that all safety devices have been refitted and that all tools have been removed.

Only operate the screw compressor unit with closed access panels.

Before each commissioning, check the safety valve (fig. 15) for function by turning the knurled cap at the safety valve (at operating pressure). The safety valve can be hot as a result of preceding operation. A functional check must only be carried out at operating pressure. Be careful with escaping air (danger of burning and scalding).

7. Commissioning

Note

The condensate separator (option) and the condensate drain (option) have to be installed by the customer. Before first commissioning or when re-commissioning after maintenance of the water-cooled units, the air cooler must be bled via the bleed screw.

Before each commissioning of the screw compressor follow the steps below :

- Check the oil levels in the pressure reservoir.
- Open the isolator valves between the screw compressor, reservoir and pipework.
- Actuate main switch.
- Check the safety valve at operating pressure.
- For testing purposes, all LEDs and all segments on the operating panel light up.
- Press the OFF-key for unlocking.
- Press the ON-key, the ON-key lights up >>green<< in order to acknowledge that the screw compressor unit is in the automatic operating mode.

Start-up protection of the electric motor

The screw compressor unit does not start up, if the system pressure is higher than 0.8 bar.

Temperature start-up protection

The screw compressor unit does not start up, if the ambient temperature is lower than +1 °C.

7.3 Commissioning after malfunction

Important

Do not switch the screw compressor on repeatedly without having rectified the malfunction, since this may cause considerable damage to the machine.

Re-start after an automatic shutdown due to malfunction:

- Operate emergency shutdown
- Rectify malfunction
- Unlock emergency shutdown
- Press the [Q] acknowledgement key
- The screw compressor unit can only be restarted when the [Q] acknowledgement key has been pressed.
- Start the screw compressor unit by pressing the [I] key.

7.4 Operating modes

Automatic operation

The generation of compressed air is stopped when the set maximum operating pressure has been achieved, and the electric motor stops after a corresponding coasting time (dependent upon the electrical network). The generation of compressed air commences and the electric motor cuts in, when the operating pressure has decreased to the set minimum value.

Throttling operation

The delivery of compressed air is throttled as soon as the pressure range set at the proportional regulator has been reached.

7.5 Setting of the operating pressure

Danger

The operating pressure must be set by a specialist only.

The operating pressure must not be set higher.

Important

The operating pressure is set as follows :

RALLYE 070/085/100/110	to 7.5 bar
RALLYE 071/086/101/111	to 10.0 bar
RALLYE 072/087/102/112	to 13.0 bar

A higher setting of the operating pressure is not permitted.

It is possible to reduce the operating pressure to a minimum of 5 bar.

The admissible maximum number of motor cycles is controlled by the DELCOS electronics.

For systems with electronic control DELCOS 3000 and DELCOS SL, the operating pressure is set via the electronics.

7.6 Monitoring

The operating pressure and the compressor temperature can be read from the text field on the control panel.

Compressors with oil-lubricated pressure chambers are to be operated in a manner that avoids exceeding of the pre-set final compression temperature.

The screw compressor is equipped with an automatic operation monitoring system, which shuts the unit down in the case of the following malfunctions.

- 1 - Excessive temperature of the screw compressor
- 2 - Excessive temperature of the electric motor
- 3 - Overloading of the ventilator motor

Important

Warning : Electric voltage !

Encoders for automatic operation monitoring must not be bridged !

The screw compressor unit must not be operated with bridged encoders !

8.1 Maintenance and lubricant recommendations

Note

The screw compressor unit can only operate to your complete satisfaction, when the maintenance work is carefully carried out at the specified intervals.

In order to facilitate this task, the scope of supply of the screw compressor unit comprises the "Maintenance and inspection manual for CompAir compressors, in which you can list your performed maintenance work at the specified intervals.

The operating hours stated herein are recommended maintenance intervals for average operating conditions. Depending on the intake conditions, the operating times may differ.

You can also have this maintenance work performed by our trained technicians. Please ask your technical adviser for a maintenance contract.

For compressor lubrication, the employer has to provide oils which are, with regard to their composition, viscosity, inflammation point and resistance to aging, suitable to the relevant operating conditions. Do not use other oils.

8.2 Maintenance electric motor

The maintenance of the electric motor is to be performed in line with the motor operating instructions.

8.3 Maintenance schedule

Danger

When carrying out control, adjusting and maintenance work, be careful with hot surfaces of machine parts.

Checking and maintenance work may only be carried out when :

- *Press the OFF-key on the control panel and wait until the screw compressor unit has come to rest;*
- *the screw compressor unit is depressurized,*
- *the pressure display does no longer indicate pressures < 0.3 bar.*
- *Shortly after switching the screw compressor off, the system can contain a low residual pressure.*
- *The screw compressor unit must therefore be unloaded prior to any maintenance work by slowly opening the plug (oil fill port) with integral venting bore.*
- *The customer-installed main switch is set to "0" (OFF);*
- *Warning : Electrical voltage:
Only work on the screw compressor unit when it is disconnected.*

8. Maintenance

Maintenance items

- W 1 Oil change (mineral oils)¹⁾ -
in a normal industrial environment (when in doubt
with regard to the oil change intervals - 3000 OH,
have your oil supplier carry out an oil analysis)
- W 2 Replacement of the oil filter cartridge -
in a normal industrial environment (recommended
in connection with an oil change, or after the re-
sponse of the oil filter Δp monitor, if installed)
- W 3 Replacement of the oil fine separator cartridge -
in a normal industrial environment (or replace-
ment after the response of the filter Δp monitor, if
installed)
- 1) Oil changes when the CompAir special oil "blue
energy" (option) is used.
1st change after 3000 h, then every 10000 h,
however, after three years at the latest.

- W 4 Replacement of air filter cartridge
in a normal industrial environment (or after the
response of a filter Δp monitor, if installed)
- W 5 Safety valve
- W 6 V-belt - only visual check
- W 7 Connecting terminals in the switch cabinet of the
electric motor
- W 8 Fittings
- W 9 General maintenance/cleaning
In the case of a very dirty atmosphere, the clean-
ing intervals have to be shortened as required.

Maintenance plan													
OH W	During commissioning	100	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	
W 1 ¹		•			•			•			•		
W 2		•	•		•			•			•		
W 3					•			•			•		
W 4					•			•			•		
W 5	•	•	•	•	•	•	•	•	•	•	•	•	
W 6	•	•			•			•			•		
W 7	•	•	•	•	•	•	•	•	•	•	•	•	
W 8	•	•			•			•			•		
W 9			•		•			•			•		
For the lubrication of the electric motor, see 8.13.													
These maintenance intervals have to be adhered to !													

8.4 Oil change

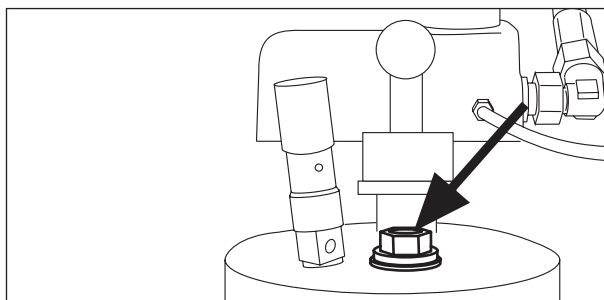


Fig. 20

Danger

The oil must only be changed, when the screw compressor is out of operation and depressurized !

Be careful when draining hot oil : Danger of scalding !

Important

Remove oil residues and other deposits from unit parts and from the coolers of compressors, which are exposed to hot compressed air, according to the operating instructions.

Note

Collect the waste oil, let not seep away into the soil ! Disposal in accordance with the regulations ! Do not spill oil ! Check for leakage !

With these compressors, the oil change intervals strongly depend on the degree of contamination of the circulating oil. It must therefore be taken care that no oil-deteriorating matter (dusts, vapours, gases) are transported through the air intake filter into the oil circuit of the compressor unit. Also a high content of humidity in the intake air and the formation of condensate within the machine affect the service life of the lubricant oil so that a reduction in the oil change intervals may become necessary. The specified oil change intervals refer to an intake air from a normal environment without a high content of foreign matter (dusts, vapours, gases). If, under favourable conditions, it is intended that the oil service life be extended, oil samples have to be examined, and the extension of the operating time is to be determined on the basis of these analysis results.

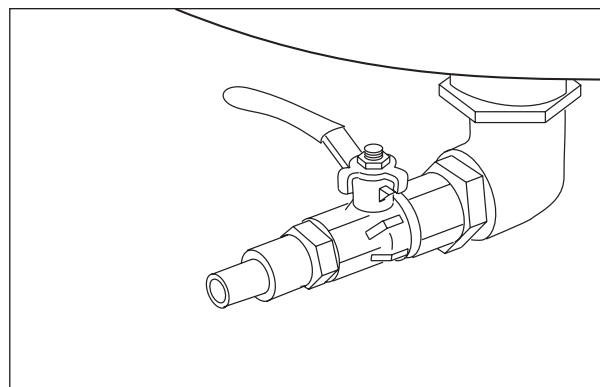


Fig. 21

Note

When changing the oil, the waste oil is to be drained completely, if possible, since used oil reduces the service life of the new oil fill considerably.

Lubricants of different types should not be mixed. When changing over to a new oil type, the oil in the oil circuit must be drained completely.

For the oil change intervals, see the maintenance schedule.

When changing the oil, proceed as follows :

- Carefully open the oil drain (fig. 19) of the pressure reservoir and the oil cooler, utilize the residual pressure in the unit for draining.
- Open the oil drain (fig. 20) of the pressure reservoir and the oil cooler
- Drain the oil at operating temperature
- Close the oil drain (fig. 20) of the pressure reservoir and the oil cooler
- Fill in oil (approx. 40 L)
- Close the oil filling hole with the plug screw
- Let the screw compressor unit run for approx. 2 minutes
- Check for leakages
- Switch the screw compressor unit off
- Check oil level :
For this, the oil should have settled, i.e. the entrapped air should have been dispersed
- The oil level must be in the center of the oil sight-glass
- If required, top up oil.

Changing intervals for lubricants

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the oil change intervals. We therefore recommend to have your mineral oil supplier work out oil analyses in the starting time. This is required in any case, if the specified oil change intervals are to be extended.

8.5 Change of the oil filter cartridge

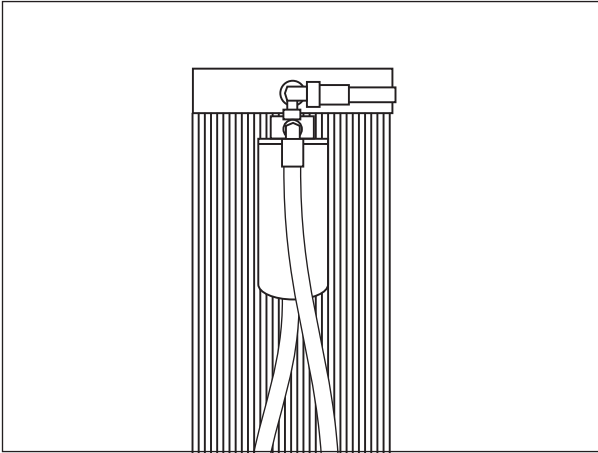


Fig. 22

Danger

Only replace the oil filter cartridge, when the screw compressor unit is out of operation and depressurized ! Be careful with hot oil : Danger of scalding ! Do not spill oil !

Note

Dispose of the oil filter cartridge in line with the regulations - special waste - ! Check for leakage !

For the changing intervals, see the maintenance schedule.

If the oil filter cartridge is monitored (option), a high differential pressure is indicated at the operating panel. If the corresponding LED lights up, change the oil filter cartridge.

Make sure that the screw compressor unit is depressurized. Change the oil filter cartridge as follows :

- Unscrew the oil filter cartridge using an appropriate tool
- Dispose of the oil filter cartridge according to the regulations
- Oil the gasket of the new oil filter cartridge slightly
- Screw on the new oil filter cartridge and tighten manually (take notice of the instructions on the oil filter cartridge)
- Check for leakage
- Check oil level
- If required, top up oil.

Changing intervals for oil filter cartridges

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the oil change intervals.

8.6 Change of the oil fine separator

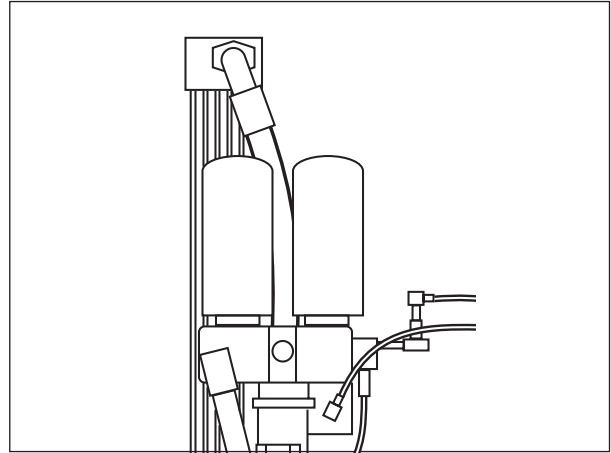


Fig. 23

Danger

The pressure reservoir is under pressure ! Only work on the screw compressor unit, when it is out of operation and depressurized ! Be careful with hot oil : Danger of scalding ! Do not spill oil !

Note

Dispose of the fine separator cartridge in line with the regulations - special waste - ! Check for leakage !

For the changing intervals, see the maintenance schedule.

If the oil fine separator cartridge is monitored (option), a high differential pressure is indicated at the operating panel. If the corresponding LED lights up, change the oil fine separator cartridge.

Make sure that the screw compressor unit is depressurized. Change the oil fine separator cartridge as follows :

- Unscrew the fine separator cartridge using an appropriate tool
- Dispose of the fine separator cartridge according to the regulations
- Oil the gasket of the new fine separator cartridge slightly
- Screw on the new oil filter cartridge and tighten manually (take notice of the instructions on the fine separator cartridge)
- Check for leakage

Changing intervals of oil fine separators

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the oil change intervals.

8.7 Air filter change/check

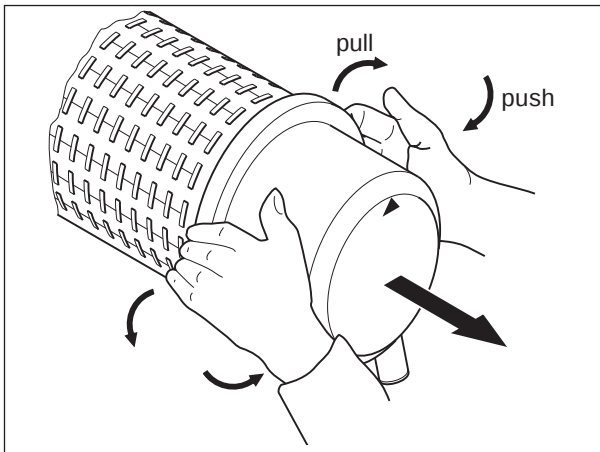


Fig. 24

Danger

Only perform checks and carry out work on the screw compressor when the unit is out of operation and depressurized !

Important

Never operate the screw compressor unit without air filter (even a short operating time without this filter can result in considerable damage to the machine) !

A clogged air filter must be cleaned or replaced when the maintenance point has been reached.

If the air filter cartridge is monitored (option), a high differential pressure is indicated on the operating panel. When the corresponding LED lights up, the air filter cartridge is to be replaced.

Check the air filter for accumulated dust at least once a week or, if required, daily.

During maintenance work, take care that no dirt enters the clean air side of the air filter.

Maintenance of the air filter

The air filter must be cleaned intermediately or be replaced by a new one (refer to the instructions on intermediate cleaning).

Intermediate cleaning of the air filter

Note

Intermediate cleaning can be done no more than five times.

The air filter must be replaced when damaged, after five intermediate cleaning procedures or after two years at the latest.

Clean the filter carefully in order to avoid damage to the filter material and ensure that no dust enters the clean air side of the filter.

Intermediate cleaning is to be carried out as follows :

- Pull both spring latches at the lower part of the housing outwards and remove the lower part
- Remove the cover from the dust collector (lower part of the housing) and empty it.
- The collector must not be more than half full - if required, shorten the maintenance intervals.
- Carry out an intermediate cleaning of the air filter cartridge (observe the note on "intermediate cleaning") or replace it by a new one.
- Carefully slide the air filter cartridge into the housing. When closing the housing, the air filter cartridge is automatically placed in the correct position.
- Fit the cover into the dust collector (lower part of the housing).
Attention: Take note of the marking for the correct position.
- Close the air filter with the lower part of the housing. The spring latches must snap into place.

Intermediate cleaning of the air filter by blowing through with compressed air

Danger

When blowing through an air filter, observe the following :

- ***Wear protective goggles and a breathing mask***
- ***The pressure of the compressed air must not exceed 5 bar***
- ***Blow through the air filter from the inside to the outside until the formation of dust has considerably decreased.***

Intermediate cleaning of the air filter by rinsing

Danger

Never use gasoline, alkaline solutions or hot liquids for cleaning !

Rinse the filter as follows :

- Swirl the air filter cartridge in luke-warm water which contains a special non-foaming rinsing agent
- Let the air filter dry
- Never install wet or damp air filters.

Check the air filter for damage

Before reinstalling the cleaned air filter, it must be thoroughly checked for cracks, holes or other damage by examining it against the light using a bright light source (portable lamp). Check also the seals.

Changing intervals for filter and separator cartridges

The operating conditions (e.g. coolant temperatures), the operating modes and the quality of the intake air (e.g. content of dust, content of gaseous foreign matter such as SO₂, solvent vapours, etc.) have a strong influence on the service life of the filters (air filters, oil filters, fine separators).

8.8 Safety valve

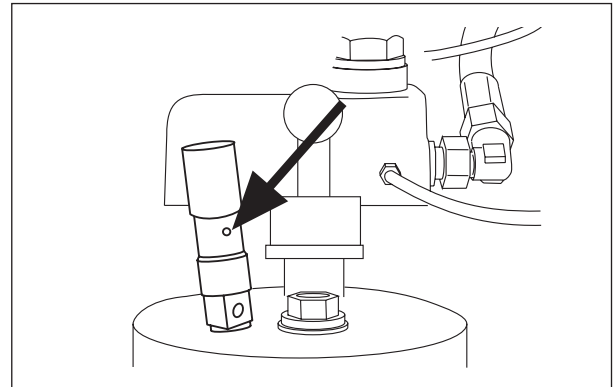


Fig. 25

Danger

Never operate a screw compressor unit with a defective safety valve !

Before each commissioning, check the safety valve for function by turning the knurled cap at the safety valve at operating pressure.

If the safety valve does not function properly, it must be immediately replaced by a new safety valve with the corresponding pressure rating.

The safety valve can be hot as a result of previous operation !

Escaping air can be hot and contain oil (danger of burning/scalding) !

8.9 V-belts - automatic tensioning system

Danger

Only perform checks and carry out work when the screw compressor unit is out of operation and depressurized !

Any safety equipment which had to be removed for the replacement of the V-belt set must be re-mounted after completion of this work.

Important

The replacement of a single V-belt is not permitted, always replace a complete V-belt set. During the entire service life of the V-belt set, no readjustment of the automatic V-belt tensioning system will be necessary.

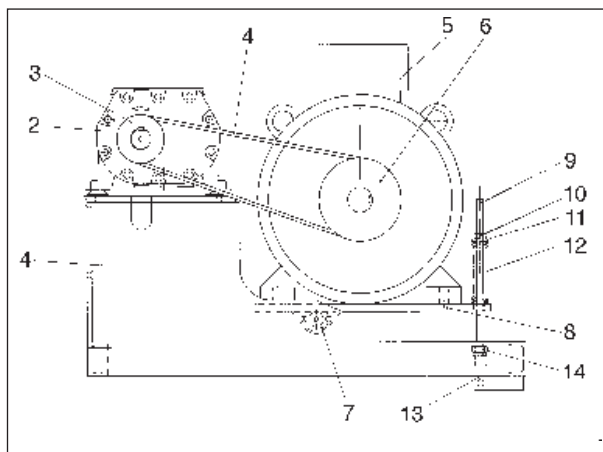


Fig. 26

- 1 Main frame of the drive
- 2 Compressor
- 3 V-belt pulley - compressor
- 4 V-belt set
- 5 Electric motor
- 6 V-belt pulley - electric motor
- 7 Bearing flange
- 8 Threaded rod
- 9 Distance sleeve
- 10 Clamping nut (self-locking)
- 11 Guide ring
- 12 Compression spring
- 13 Adjustment support
- 14 Nut

It is not permissible to loosen the bearing flange screws (anti-vibration mount of the electric motor).

Any changes to the anti-vibration mount of the electric motor can result in a drastic reduction in the service life of the drive system.

The required pre-tensioning rate of the V-belt for each screw compressor type is set in the factory.

For the adjustment after the first installation or a replacement of the V-belt set, the compression spring has to be pretensioned. For this purpose, a blue marking is provided on the threaded rod.

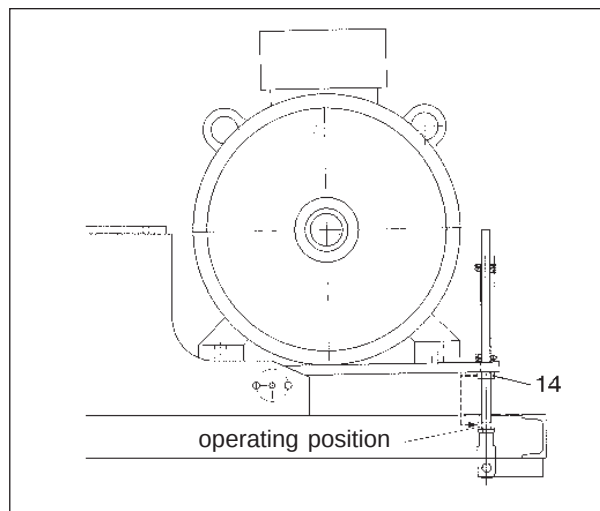


Fig. 27

When replacing the V-belt set, the automatic tensioning system can be stress-relieved by means of the nut (14) (fig. 27). After the replacement of the V-belts, the nut (14) has to be returned to the "operation" position (mechanical stop of the fork and clevis combination (13)).

The compression spring has to be set to the corresponding colour marking on the threaded rod using the clamping nut (10).

8.10 Connecting terminals in the switch cabinet

Danger

In the case of electric voltage :

- **Actuate OFF-key at the operating panel**
- **Set the customer-fitted main power switch to "0" (OFF)**

The connecting terminals in the switch cabinet have to be checked and, if required, retightened during first commissioning and later on in line with the maintenance schedule.

8.11 Fittings

The fittings of the air and oil circuits have to be checked and, if required, retightened according to the maintenance schedule.

8.12 General maintenance and cleaning

Important

Remove oil residues and other deposits from unit parts and from the coolers of compressors, which are exposed to hot compressed air, according to the operating instructions.

8. Maintenance

Blow off the screw compressor unit with compressed air at the specified intervals (never aim compressed air at persons) paying particular attention to :

- Regulating elements
- Fittings
- Compressor block
- Cooler
- Electric motor

Note

Before first commissioning or when re-commissioning after maintenance of the water-cooled units, the air cooler must be bled via the bleed screw.

When operating water-cooled screw compressor units, the following points must be taken into account :

- *As a result of leakage in oil/water coolers some oil can get into the cooling water circuit.*
- *Cooling water must not be discharged in an uncontrolled manner to public drainage systems. Uncontrolled overflowing of the oil separator reservoir to the public drainage systems must be avoided. Strictly observe the relevant waste water regulations.*
- *Maintenance and repair work has to be carried out carefully. Dismantled bundles of pipes have to be checked for damage prior to being reinstalled. In the case of even the slightest damage, the pipes have to be replaced. Always use new seals when carrying out assembly and mounting work.*

8.13 Lubrication of electric motors

The two bearings of the electric motor must be lubricated at specified intervals, which are determined by the type of motor.

The motor-specific lubrication intervals and lubricant quantities for standard motors are listed in the following tables.

In addition this maintenance data is also given on the relevant motor nameplates.

Note

If there are differences between these operating instructions and the relevant motor nameplate, in case of doubt the data on the motor nameplate shall always prevail.

For the exact lubrication intervals for the electric motor of your compressor unit, see the following table >>operating hours<<.

Operating hours

Type of motor	kW	IP23	IP54
RALLYE 070 - 072	37	2500 h	2000 h
RALLYE 085 - 087	45	2000 h	2000 h
RALLYE 100 - 101	55	2000 h	1500 h
RALLYE 110 - 112	75	2000 h	

For lubrication, use lithium-saponified roller bearing grease, which meets the following requirements :

- Consistence class (NLGI) : 3
- Worked penetration : 220 - 250
- Drop point : > 180 °C
- Ash content : < 4 %
- Water content : < 0.4 %

This corresponds to a lubricating grease to DIN 51 825, part 1, KH 3 R. Roller bearing greases with different thickeners (soap basis) should not be mixed. The same applies to lubricating greases with P-additives.

If changing over to another type of grease cannot be avoided, consult the motor or machine manufacturer.

Grease recommendation :

- Aral / Aralup 4193
- Esso / Unirex N3
- SKF / Grease LGHT 3
- SKF / Grease LGHQ 3
- Statoil-UNIWAY HTC

Lubrication is by the two lubrication points which are on the outside of the panelling; these points are accordingly identified.

Lubricate the compressor unit at the identified lubrication points whilst it is running and use an appropriate grease gun.

When lubricating the bearings of the electric motor, always use the grease quantities as indicated. The following table shows the required grease quantities for each bearing :

Quantity of grease in grams

Type of motor: in the bearing:	[kW]	IP23	IP54
		AS/GS ¹ [g]	AS/GS ¹ [g]
RALLYE 070 - 072	37	20	20
RALLYE 085 - 087	45	24	24
RALLYE 100 - 101	55	24	24
RALLYE 110 - 112	75	26	

- 1) AS = Bearing on the motor drive side
GS = Opposite side of the motor

In order to check that the right grease quantity was used, weigh the grease gun before and after lubrication of the individual electric motor bearings.

Attention

The operational safety of the electric motor and the entire compressor system depends to a great extent on the lubrication intervals. Poor or no lubrication of electric motors can lead to considerable machine damage and, if the non-compliance with the maintenance instructions can be proved, warranty and liability claims will be rejected.

Note

If the bearings temperature or running noise increases during operation, shut the compressor unit down immediately and inform the responsible service department.

Faults on electric machines may only be rectified by skilled personnel.

8.14 Maintenance instructions and lubricant recommendations for stationary compressors

Lubricant recommendations

Please note that proper lubrication will considerably increase the service life of your compressor unit.

According to the Accident Prevention Regulations for Compressors (VGB 16), lubricating oils are to be used, the properties of which correspond to the intended operating conditions.

When in doubt, please contact the manufacturer or your oil supplier.

Mixing of different lubricant oils should be avoided. This means also that, when changing over to another type of oil, the old oil is to be drained completely from the oil circuit.

Unless specified otherwise, all lubricant oils should comply with ISO VG 32 DIN 51519, July 1976, with 28-35 mm²/s (cSt)/40 °C (with regard to viscosity comparable to SAE 10 W to DIN 51511, February 1973) or at permanent ambient temperatures above +15 °C of the viscosity class to ISO VG 46, DIN 51519, July 1976, with 41-50 mm²/s (cSt)/40 °C (with regard to viscosity comparable to SAE 15 W to DIN 51511, February 1973).

In particular, the following is to be used :

- a) Lubricant oils VCL to DIN 51506, August 1982
- b) Special oils for screw compressors with oil injection cooling
- c) In a dirty industrial atmosphere, motor oils to MIL-L-2104 C
- d) Turbine oils L-TD DIN 51515 with an FZG value > 10
- e) CompAir "blue energy"

Before using synthetic lubricants, consult the manufacturer.

9. Trouble-shooting

Malfunction	Possible cause	Remedy
Unit cannot be started	1. No operating or control voltage	1. Check fuses, main switch and supply line
	2. Malfunction not acknowledged	2. Acknowledge fault message
	3. Pressure reservoir not depressurized	3. Wait until depressurized, the reservoir pressure must be <0.8 bar for a start
	4. Electric motor defective	4. Check connections, winding, etc.
	5. Compressor defective	5. Turn the compressor manually; if required, replace
	6. Ambient temperature less than +1 °C	6. Make sure that the ambient temperature is not less than +1 °C; install an auxiliary heater, if required.
	7. Display shows >>E<< in the pressure or the temperature display	7. Check sensors, connections and lines
Unit stops during the start-up phase	1. The intake regulator closes only partly	1. Repair or, if required, replace the intake regulator; check solenoid valve - 19 -
	2. Short-circuit in the unit	2. Determine and eliminate cause; replace defective fuses
	3. Connecting terminals in the switch cabinet are loose	3. Check and re-tighten
	4. No or insufficient pressure builds up in the pressure reservoir during the Δ phase	4. Check the pressure holding valve and the opening function of the intake regulator
	5. Oil too viscous	5. Select the type of oil according to the ambient conditions or install an auxiliary heater
	6. >>E<< appears on the display	6. Check sensors, connections and lines
	7. Maximum motor switching cycles exceeded due to too frequent manual on and off-switching	7. Avoid frequent manual on and off-switching, let electric motor cool down
	8. Timer for Y/Δ-circuit set too short	8. Correct timer
Unit does not reach the end pressure	1. Pressure monitoring device set too low	1. Check, re-set
	2. Intake regulator opens only partly	2. Repair or, if necessary, replace intake regulator; check solenoid valves - 19 + 20 -
	3. Excessive air consumption	3. Reduce consumption or cut in a further compressor
	4. V-belt slips	4. Replace the V-belt set
	5. Oil fine separator clogged	5. Replace oil fine separator
	6. Air filter clogged	6. Carry out intermediate cleaning or replace
	7. Heavy leakage in the compressor system	7. Check unit

9. Trouble-shooting

Malfunction	Possible cause	Remedy
Unit switches off	1. Ambient temperature too high 2. Ventilator defective 3. >>E<< appears on the pressure or temperature displays 4. Cross-section of the electric supply lines too small 5. Power requirement too high 6. Oil level too low 7. Oil injection pressure too low 8. Excessive oil temperature	1. Ventilate compressor room 2. Check el. motor and protective motor switch 3. Check sensors, connections and lines 4. Measure power requirement, if necessary, replace lines 5. Oil fine separator or air filter cartridge clogged; replace, if necessary 6. Top up oil in the pressure reservoir 7. Replace oil filter cartridge, clean oil system 8. Check oil cooler and ventilator
Excessive idling pressure	1. Intake regulator does not close correctly 2. System not unloaded	1. Check intake regulator and solenoid valves (19 + 20) 2. Check solenoid valve (19) and lines
Oil in the compressed air	1. Oil fine separator defective 2. Oil foams 3. Oil level too high 4. Opening pressure of the pressure control valve too low 5. Check valve 14 defective	1. Replace 2. Change oil, blow-off time too short 3. Drain off oil 4. Check pressure holding valve 4. Replace check valve
Oil in the air filter	1. Packing spool in the intake regulator defective 2. Intake regulator does not close correctly 3. Blow-off time too short 4. Check valve defective	1. Check sliding fit and sealing surface and replace, if necessary 2. Check intake regulator and solenoid valves - 19 + 20 - 3. Extend time (nozzle) 4. Remove check valve
Safety valve opens	1. Safety valve defective 2. Oil fine separator clogged 3. Intake regulator closes too slowly 4. Pressure monitoring device defective 5. Electronics defective 6. Solenoid valves - 19 + 20 - defective	1. Replace 2. Replace 3. Check intake regulator and solenoid valves - 19 + 20 - 4. Replace 5. Replace 6. Replace

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Technische Änderungen vorbehalten

Subject to technical revision

Sous réserves de modifications techniques

