

User Manual

Screw Air Compressor L07-L22

General Information

These compressors are for compressing atmospheric air and are not suitable for compressing any other gas. They are designed and manufactured to give optimum performance with long life and reliability.

This manual gives the user all the information required to install and operate the compressors and carry out the regular schedules for servicing and maintenance, which will ensure the maximum satisfactory service life.

Servicing facilities and the supply of genuine replacement parts are provided through a worldwide network of CompAir Companies and Distributors. If replacement parts are needed, the user should, in the first instance, contact the local CompAir Company or Distributor.

The information given in this manual was correct at the time of printing, however, as part of continuous development, modifications to parts and procedures may be made without notice which could affect the servicing requirements of the compressors. Before any servicing or maintenance work is undertaken the user is advised to contact the local CompAir Company or Distributor who is supplied with revised and up-dated information.

In any communication concerning the compressor it is essential to quote the MODEL, SERIAL NUMBER and where possible the YEAR of MANUFACTURE.

All pressure data given in this manual refer to overpressures (pressure gauge pressures) unless specified otherwise.

Maintenance

To ensure the continued trouble-free operation of the compressor unit it is important that periodic maintenance and servicing is carried out in accordance with the information given in the 'Maintenance' section of this manual. To assist in this matter your local CompAir Company or Distributor can provide a number of optional maintenance agreements to suit your requirements. These agreements provide the user with the expertise of our factory trained technicians and the guarantee that only Genuine CompAir parts will be used.

Warranty

The conditions of the CompAir Warranty are set out in the Company's standard Conditions of Sale available from the CompAir Company or Distributor supplying the machine.

**USE ONLY COMPAIR GENUINE PARTS. YOUR WARRANTY
COULD BE AFFECTED IF A SERVICE OR REPAIR IS
CARRIED OUT USING NON-GENUINE PARTS.**

Data sheet for users

<p>CompAir Drucklufttechnik GmbH Argenthaler Strasse 11 55469 Simmern</p>	
Baujahr; anno; annee; ano	Identifizierungs-Nummer ; Ref.-No.
1 <input style="width: 50px;" type="text"/>	2 <input style="width: 200px;" type="text"/>
Gesamtgewicht; total weight; poids total ; peso totale ; peso total	Typ;type;tipo
3 <input style="width: 200px;" type="text"/>	4 <input style="width: 50px;" type="text"/> kg
Made in Germany	CE
5 <input style="width: 50px;" type="text"/>	

Einbauverdichter; air end; bloccompresseur a vis; vite; cabezal compresor	6	<input style="width: 90%;" type="text"/>
Auftrags-Nr.; order number; numero de commande; numero di commessa; numero de pedido	7	<input style="width: 90%;" type="text"/>
Verdichtungsmedium; compression medium; medium decom- pression; medium di compressione; medium decompression	8	<input style="width: 90%;" type="text"/>
Spannung/Phase/Frequenz; voltage/phase/frequency; tension/phase/frequence; tensione/fase/frequenza; voltage/fase/frecuencia	9	<input style="width: 90%;" type="text"/>
Volumenstrom; volume rate of flow; debit - volume; portata effettiva; caudal efectivo	10	<input style="width: 80%;" type="text"/> m ³ /min
Stufendrucke; stage pressures; pression d'etages; pressioni degli stadi; presion de las etapas	11	<input style="width: 30%;" type="text"/> 1 <input style="width: 30%;" type="text"/> 2 bar g
Ansaugdruck; suction pressure; pression d'aspiration; pressione d'aspirazione; presion de aspiracion	12	<input style="width: 80%;" type="text"/> bar
Vollaststrom; full load current; Intensite a pleine charge; corrente a pieno carico; corriente de carga plena	13	<input style="width: 80%;" type="text"/> A
Drehzahl; speeds; vitesse; numero giri; revoluciones	14	<input style="width: 80%;" type="text"/> min ⁻¹
Installierte Motorleistung; installed motor capacity; puissance moteur installee; potenza installata del motore; potencia instalada del motor	15	<input style="width: 80%;" type="text"/> kW

100007686

*) The values on the type plate are maximum values.

Your CompAir distributor

Name: _____	
Address: _____ _____ _____	
Telephone: _____	Fax: _____
Contact: _____	Spare Parts: _____
	Service: _____

1. Foreword

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 health and safety 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 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 genuine CompAir spare parts. Genuine 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 in (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
Argenthaler Strasse 11
55469 Simmern

Baujahr; anno;
annee; ano


Identifizierungs-Nummer; Ref.-No.

1 2

Gesamtgewicht;
total weight;
poids total;
peso totale;
peso total

Typ; type; tipo

3

4 kg Made in Germany  5

Einbauverdichter; air end; bloccompresseur
a vis; vite; cabezal compresor

6

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

7

Verdichtungsmedium; compression medium; medium decompression;
medium di compressione; medium de compresion

8

Spannung/Phase/Frequenz; voltage/phase/frequency;
tension/phase/frequence; tensione/fase/frequenza;
voltage/fase/frecuencia

9

Volumenstrom; volume rate of flow; debit -
volume; portata effettiva; caudal efectivo

10 m³/min

Stufendrucke; stage pressures; pression
d'etages; pressioni degli stadi; presion de las etapas

11 bar g

Ansaugdruck; suction pressure; pression
d'aspiration; pressione d'aspirazione; presion de aspiracion

12 bar

Vollaststrom; full load current; intensite a pleine charge;
corrente a pieno carico; corriente de carga plena

13 A

Drehzahl; speeds; vitesse; numero giri;
revoluciones

14 min⁻¹

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

15 kW

100007686

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 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 genuine spare parts
- Modifications and changes to the installation

The warranty and liability conditions of the general terms and conditions of CompAir 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 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!

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

3. Safety regulations

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 or pressurized 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 slidable 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 must be set up on a level surface with full contact between its base frame and the supporting surface.

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.

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 after cooler 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. When connecting the compressor on the mains side to the compressed air system available at the customer's end, check the operating temperatures and operating pressures required and examine the required connecting flange or the connection thread for proper functioning.

In the case of connections by means of connecting hoses, take appropriate measures to prevent whipping of the loose end in the event that the hose connection tears off.

3. Safety regulations

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 start 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 installed unit-specific safety valves only assume the pressure safeguarding function of the compressor unit provided in currently valid standards and regulations.

For pressure components/systems mounted to the connecting flange on the pressure side, a pressure safety device (safety valve or similar) has to be installed taking into account the weakest pressurized component.

The min. and max. temperatures of +1 °C/33.8 °F and +45 °C/113°F are also valid for the intake air. Pipes and/or other parts with a surface temperature higher than 70 °C/158 °F 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 fan 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-ventilated 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.

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.

3. Safety regulations

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 in an environment or areas 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 shutdown 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 or on top of 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.

3. Safety regulations

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.

Every six months, check the pressure pipe and pressure vibration damper for carbon deposits. If excessive deposits are found, they should 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 70 °C/158 °F 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.

3. Safety regulations

If the set-up, maintenance or repair require the demounting 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 deenergized 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.
- Above 95 dB(A): the warning signs have to contain the recommendation that occasional visitors also have to wear ear protectors.

3. Safety regulations

- 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.

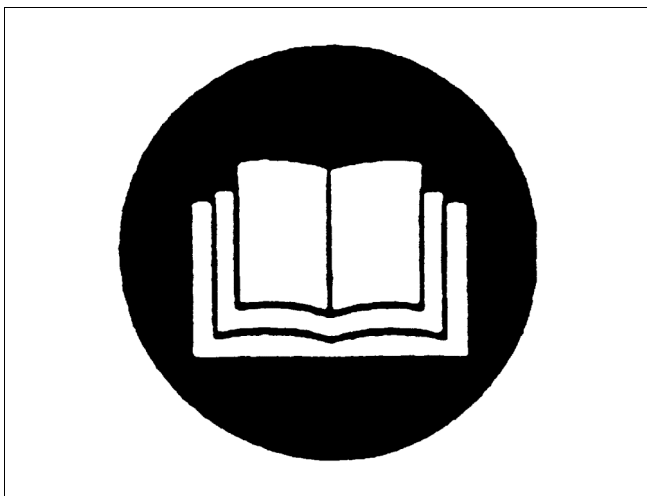
This is particularly true during the months of winter.

If there is a risk that the temperature will fall or rise above the limits of -10 °C/14 °F to +65 °C/149 °F , the electrical controller must be removed and stored in ambient temperatures of +5 °C/41 °F to +30 °C/86 °F.

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 breathe in compressed air from this system.

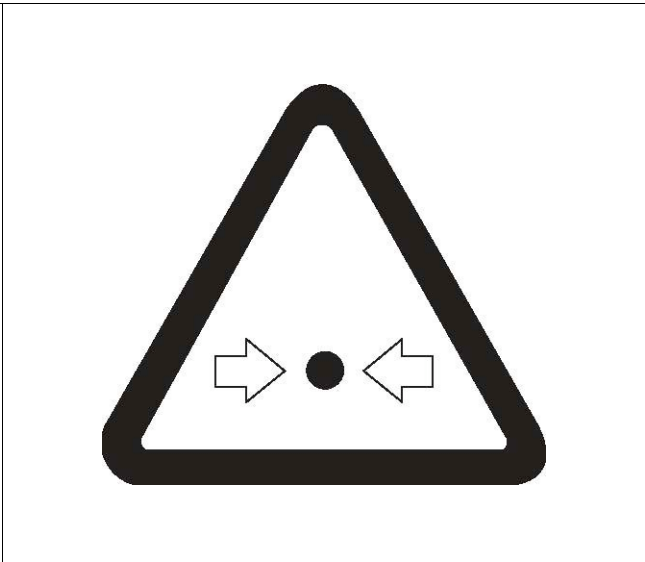


Never operate the unit with open doors or loose access panels.

3. Safety regulations



Warning: Hot surface



Warning: Pressurized part or system

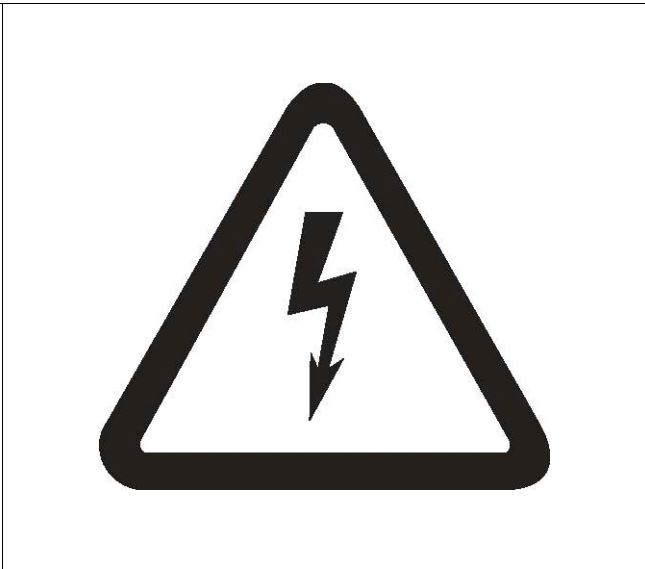


Warning: This system can start up by means of a remote control or automatically after a power failure.

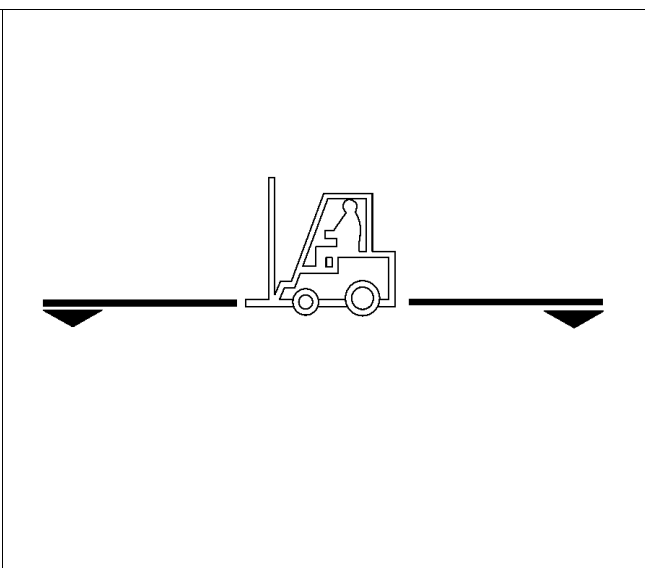
3. Safety regulations



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



Warning: Danger of electric shock

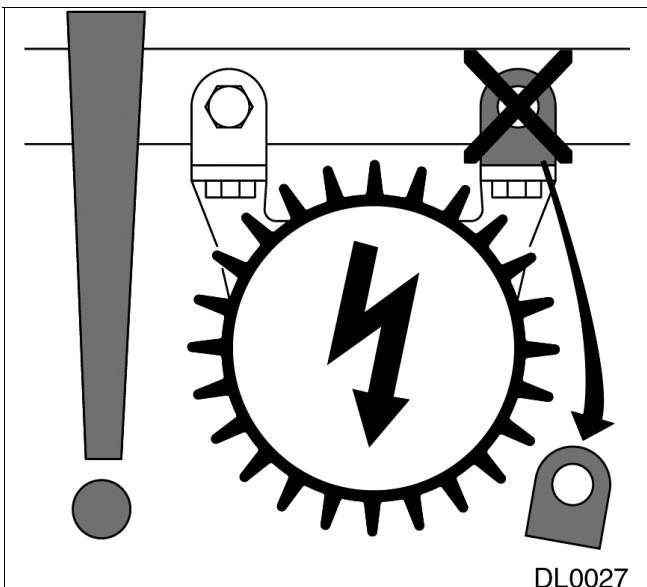


Attention: Lifting point

3. Safety regulations



Attention: Check and, if required, re-tighten connection terminals. For further details, see the operating instructions.



Attention: Electric motor fasteners

Electric motor fasteners used for securing the unit during transportation have to be removed prior to commissioning (see also chapter 6.4).

4. Design and functioning

4.1 Design of the unit

4.1.1 Design of the unit L07-L11

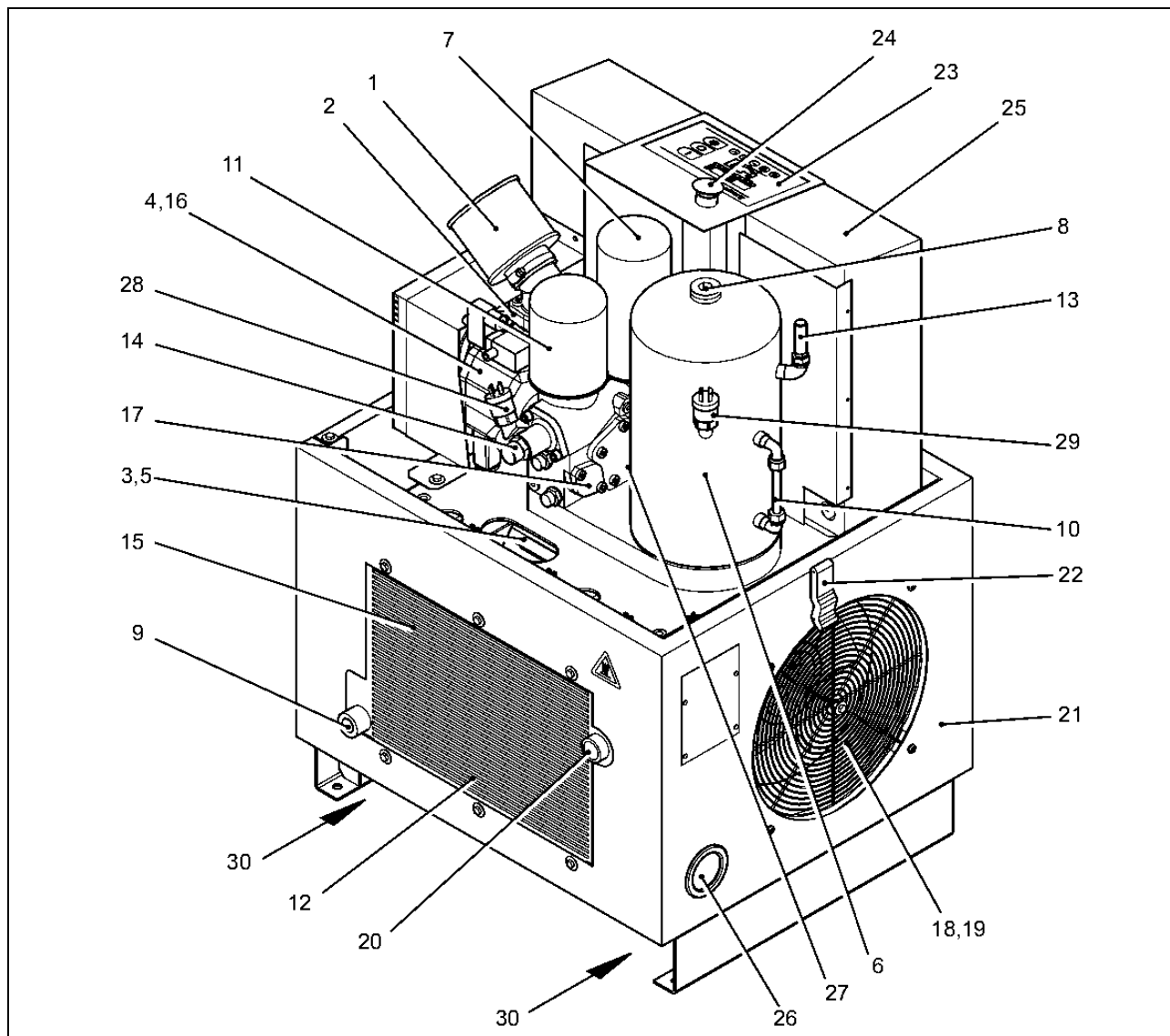


Fig. 3a L07-L11

- | | | |
|------------------------|-------------------------------------|---|
| 1 Intake filter | 12 Oil cooler | 23 Control keypad |
| 2 Intake regulator | 13 Safety valve | 24 EMERGENCY OFF push-button |
| 3 Electric motor | 14 Pressure holding and check valve | 25 Control cabinet |
| 4 Screw compressor | 15 Air cooler | 26 Supply cable gland |
| 5 Belt drive | 16 Oil fine separator extractor | 27 Final compression temperature sensor |
| 6 Pressure reservoir | 17 Oil temperature regulator | 28 Network pressure sensor |
| 7 Oil fine separator | 18 Cooling air ventilator | 29 Final compression pressure sensor |
| 8 Oil filling port | 19 Cooling air inlet filter mat | 30 Opening for lifting gear |
| 9 Oil drain | 20 Compressed air outlet | |
| 10 Oil level indicator | 21 Base frame | |
| 11 Oil filter | 22 Lock hood | |

4. Design and functioning

4.1.2 Design of the unit L15-L22

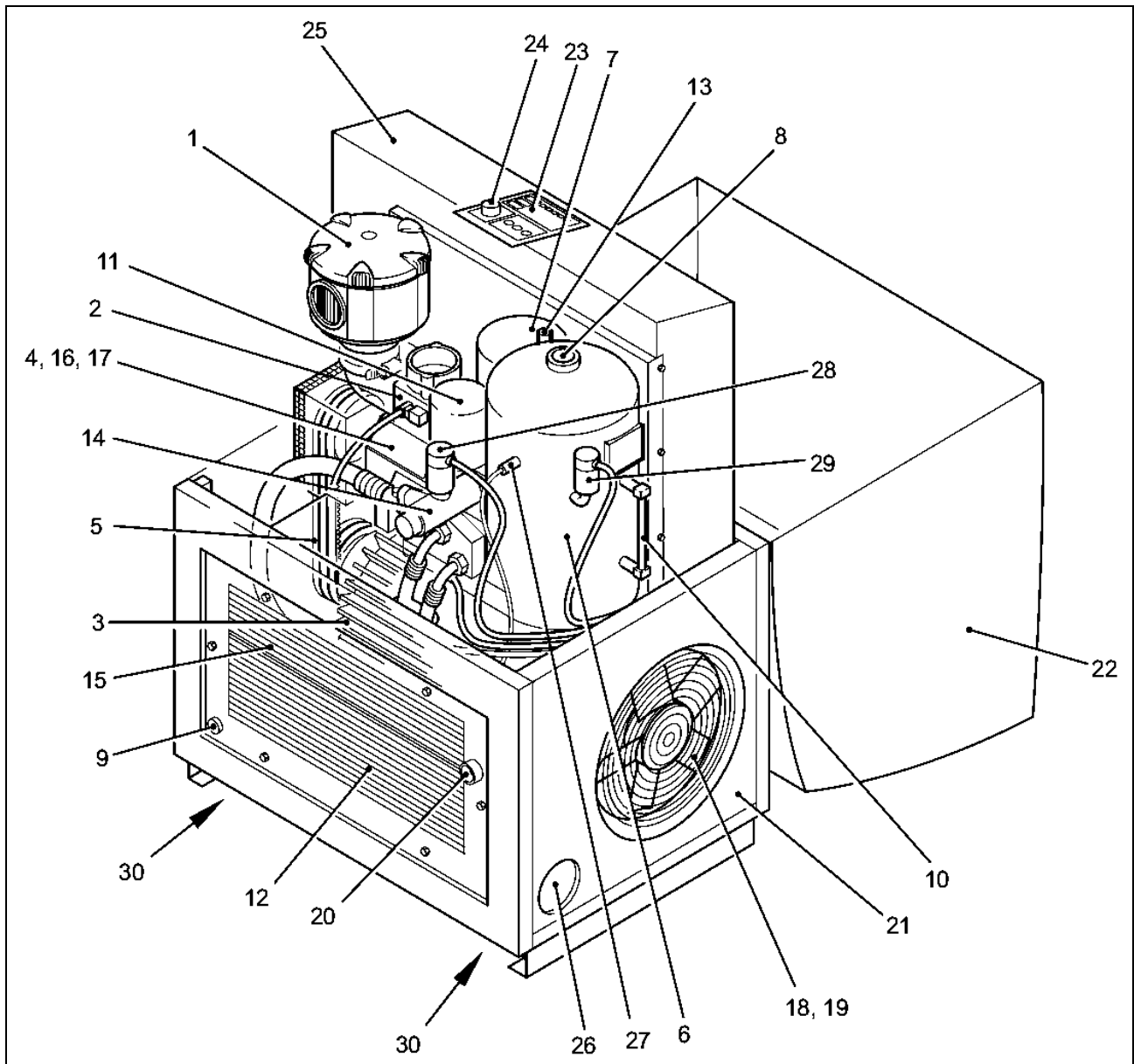


Fig. 3 b L15-L22

- | | | |
|------------------------|-------------------------------------|---|
| 1 Intake filter | 12 Oil cooler | 23 Control keypad |
| 2 Intake regulator | 13 Safety valve | 24 EMERGENCY OFF push-button |
| 3 Electric motor | 14 Pressure holding and check valve | 25 Control cabinet |
| 4 Screw compressor | 15 Air cooler | 26 Supply cable gland |
| 5 Belt drive | 16 Oil fine separator extractor | 27 Final compression temperature sensor |
| 6 Pressure reservoir | 17 Oil temperature regulator | 28 Network pressure sensor |
| 7 Oil fine separator | 18 Cooling air ventilator | 29 Final compression pressure sensor |
| 8 Oil filling port | 19 Cooling air inlet filter mat | 30 Opening for lifting gear |
| 9 Oil drain | 20 Compressed air outlet | |
| 10 Oil level indicator | 21 Base frame | |
| 11 Oil filter | 22 Lock hood | |

4. Design and functioning

4.2 Schematic diagram

4.2.1 Schematic diagram L07-L11

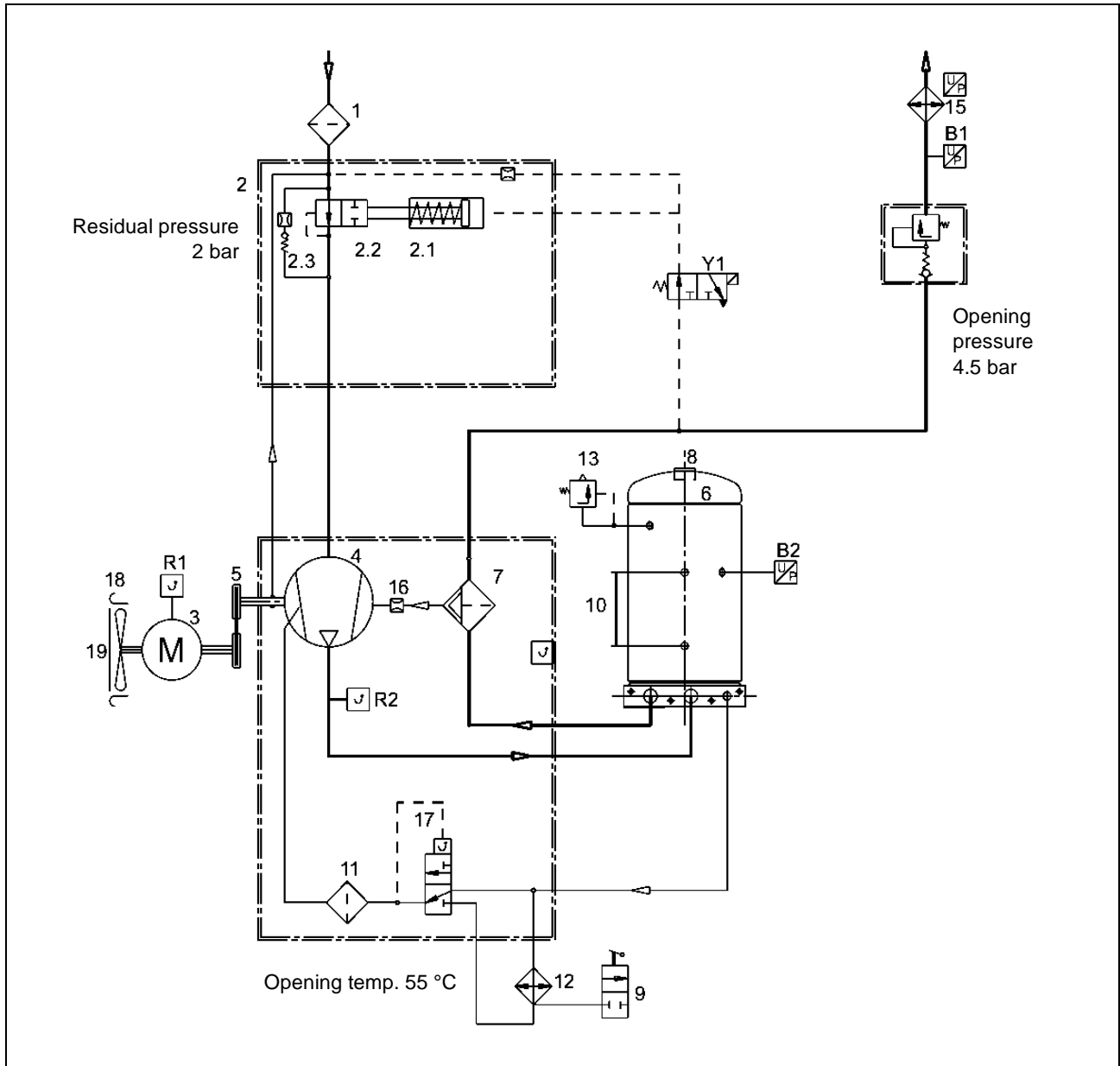


Fig. 4 a L07-L11

- | | | |
|------------------------|--|--------------------------------------|
| 1 Intake filter | 11 Oil filter | B1 Network pressure sensor |
| 2 Intake regulator | 12 Oil cooler | B2 Final compression pressure sensor |
| 2.1 Actuator | 13 Safety valve | Y1 3/2-way solenoid valve |
| 2.2 Intake valve | 14 Pressure holding and check valve (opening pressure 4.5 bar) | |
| 2.3 Check valve | 15 Air cooler | |
| 3 Electric motor | 16 Oil fine separator extractor | |
| 4 Compressor block | 17 Oil temperature regulator (opening temperature 55 °C) | |
| 5 Belt drive | 18 Cooling air ventilator | |
| 6 Pressure reservoir | 19 Filter mat cooling air inlet | |
| 7 Fine separator | R1 Motor temperature | |
| 8 Oil filler cap | R2 Final compression temperature | |
| 9 Oil drain | | |
| 10 Oil-level indicator | | |
- Compressed air line
 - - - - - Oil line
 - · - · - Control line

4. Design and functioning

4.2.2 Schematic diagram L15-L22

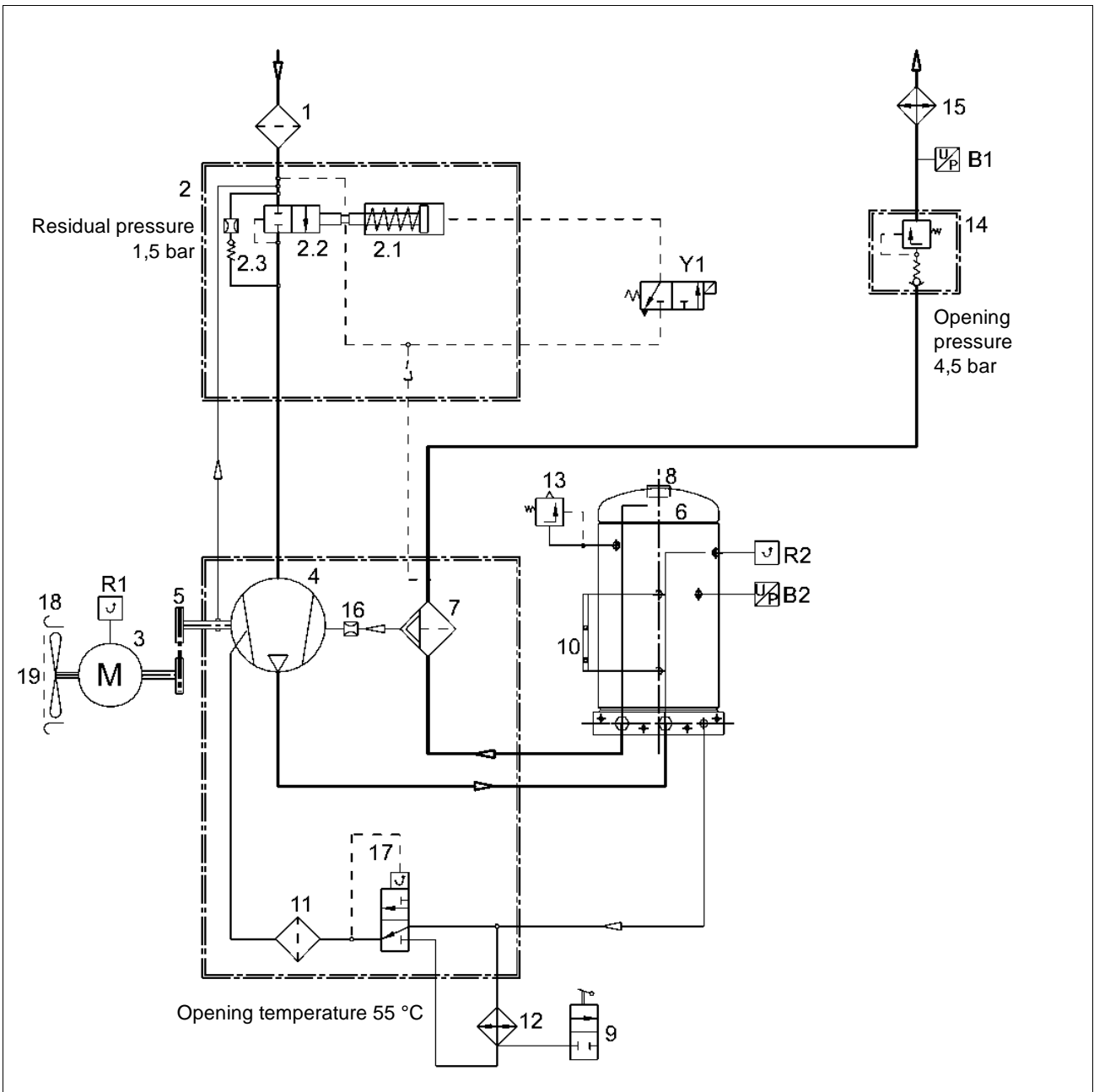


Fig. 4 b

- | | | |
|------------------------|--|--------------------------------------|
| 1 Intake filter | 11 Oil filter | B1 Network pressure sensor |
| 2 Intake regulator | 12 Oil cooler | B2 Final compression pressure sensor |
| 2.1 Actuator | 13 Safety valve | Y1 3/2-way solenoid valve |
| 2.2 Intake valve | 14 Pressure holding and check valve (opening pressure 4.5 bar) | |
| 2.3 Check valve | 15 Air cooler | |
| 3 Electric motor | 16 Oil fine separator extractor | |
| 4 Compressor block | 17 Oil temperature regulator (opening temperature 55 °C) | |
| 5 Belt drive | 18 Cooling air ventilator | |
| 6 Pressure reservoir | 19 Filter mat cooling air inlet | |
| 7 Fine separator | R1 Motor temperature | |
| 8 Oil filler cap | R2 Final compression temperature | |
| 9 Oil drain | | |
| 10 Oil-level indicator | | |
- Compressed air line
 Oil line
 - - - - - Control line

4. Design and functioning

4.3 Oil circuit

The oil flows from the pressure reservoir (- 6 - Fig. 40) into the oil thermostat (- 17 - Fig. 4). With oil temperatures $< 55\text{ }^{\circ}\text{C}/131\text{ }^{\circ}\text{F}$ the oil flows via the by-pass of the oil cooler directly into the oil filter (- 11 - Fig. 4) and is then injected into the screw compressor (- 4 - Fig. 4).

With oil temperatures of between $55\text{ }^{\circ}\text{C}/131\text{ }^{\circ}\text{F}$ and $70\text{ }^{\circ}\text{C}/158\text{ }^{\circ}\text{F}$ the oil flow is divided and fed into the oil cooler (- 12 - Fig. 4) and the by-pass.

With oil temperatures above $70\text{ }^{\circ}\text{C}/158\text{ }^{\circ}\text{F}$ the entire oil flow is directed via the oil cooler through the oil filter into the screw compressor.

The oil separated by the oil separator element (- 7 - Fig. 4) is fed through an oil scavage line to the screw compressor.

The entire oil circulation is based on a differential pressure in the system. Considering the pressure difference of approx. 2 bar/29 PSI within the oil circuit, the oil is then injected into the screw compressor with approx. 8 bar/116 PSI at a reservoir pressure of e.g. 10 bar/145 PSI.

When the screw compressor is in the off-load mode, a sufficiently high pressure differential and thus the required oil injection quantity is achieved owing to the fact that when the intake regulator (- 2 - Fig. 4) is closed, a vacuum pressure occurs in the intake connection.

Excess pressure of approx. 2 bar/ 29 PSI (L07-L11 residual pressure) or 1.5 bar/22 PSI (L15-L22 residual pressure) is produced in the pressure reservoir at the same time.

4.4 Air circuit

The intake air passes through the intake filter (- 1 - Fig. 4) and the intake regulator (- 2 - Fig. 4) into the screw compressor (- 4 - Fig. 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 - Fig. 4). After pre-separation and subsequent fine separation by the separator element (- 7 - Fig. 4), the compressed air with a low oil content is fed via the minimum pressure valve (- 15 - Fig. 4) and the air cooler (- 16 - Fig. 4) into the consumer network.

4.5 System control

4.5.1 System control L07-L11

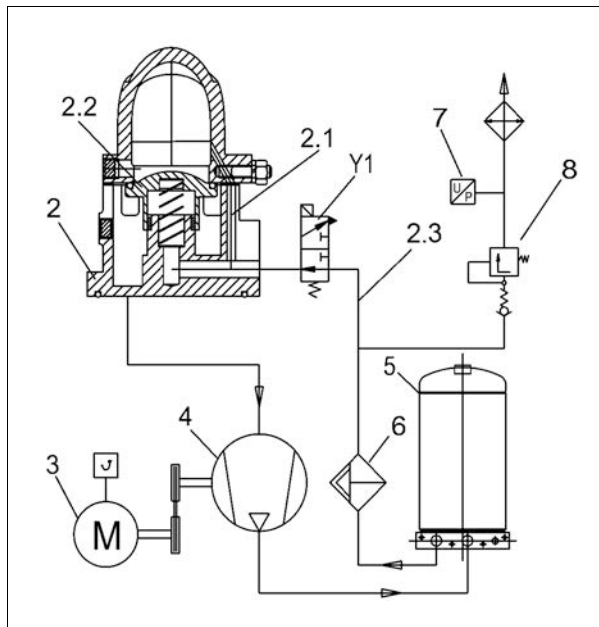


Fig. 5 a L07-L11

Standstill of the system

- When the system is at rest the intake regulator (- 2 - Fig. 5a) is opened.
- The solenoid valve (Y1 Fig. 5a) is de-energised.
- The pressure reservoir (- 5 - Fig. 5a) is bled via the blow-off line (- 2.1 and -2.3- Fig. 5a) into the suction channel.

Starting the system


- The motor (- 3 - Fig. 5b) starts up in the Y-mode.
- The compressor extracts a certain volume of air via a start valve (- 2.2 - Fig. 5a). Pressure builds up in the reservoir and closes the regulator.
- When changing over to Δ operation, the solenoid valve (- Y1 - Fig. 5a) is energised, which blocks the connection between pressure vessel and intake regulator.
- The intake regulator opens due to the intake vacuum pressure.
- The minimum pressure valve (- 8 - Fig. 5a) opens when the pressure reservoir is approx. 4.5 bar.
- Compressed air is now delivered into the consumer network.

4. Design and functioning

Automatic operation (open-close operation)

- When the pressure reaches the upper switching point set on the network pressure sensor (-7 - Fig. 5a), solenoid valve (Y1 Fig. 5a) is de-energised.
- The intake regulator (- 2 - Fig. 5a) is vented and closed.
- The pressure reservoir (- 5 - Fig. 5a) is depressurised via the intake filter.
- The compressor is now running in idle mode.
- If the mains pressure does not fall within 90 seconds (adjustable) to the lower switching point, the system shuts down.
- If the lower switching point is reached in less than 90 seconds, the solenoid valve (- Y1 - Fig. 5a) is energised again.
- The unit now changes over to on-load operation.

Stopping the system

- After pressing the OFF button  (Fig. 16) on the operating panel, the solenoid valve (- Y1 - Fig. 5a) is de-energised.
- The intake regulator (-2- Fig. 5a) closes and the tank (-5- Fig. 5a) is relieved.
- After 30 seconds, the drive motor (- 3 - Fig. 5a) is shut down.

4.5.2 System control L15-L22

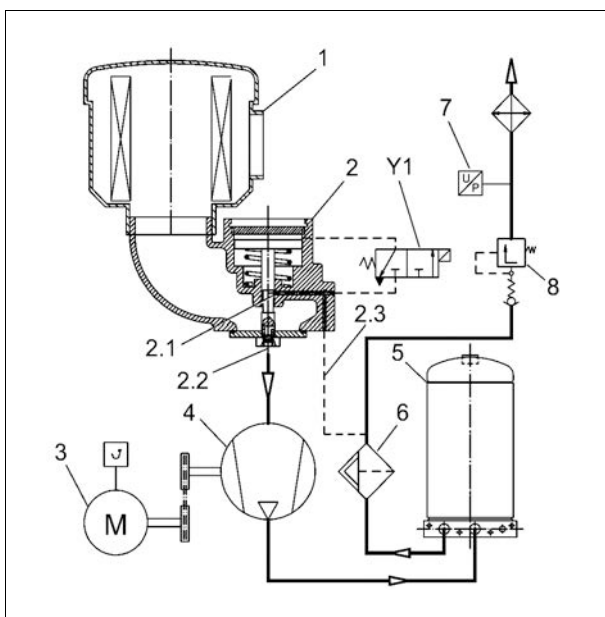


Fig. 5b L15-L22

Standstill of the system

- When the system is at rest the intake regulator (- 2 - Fig. 5b) is closed.
- The solenoid valve (Y1 Fig. 5b) is de-energised.
- The pressure reservoir (- 6 - Fig. 5b) is bled via the blow-off line (- 2.1- and -2.3- Fig. 5b) into the suction channel.


Starting the system

- The motor (- 3 - Fig. 5b) starts up in the Y-mode.
- The compressor extracts a certain volume of air via a start valve (- 2.2 - Fig. 5b). Pressure builds up in the reservoir.
- When changing over to Δ -operation, the solenoid valve (- Y1 - Fig. 5b) is energised and a connection is then established between the pressure reservoir and the intake regulator.
- The intake regulator opens.
- The minimum pressure valve (- 8 - Fig. 5b) opens when the pressure reservoir is approx. 4.5 bar.
- Compressed air is now delivered into the consumer network.

Automatic operation (open-close operation)

- When the pressure reaches the upper switching point set on the network pressure sensor (-28 -(B1)), solenoid valves (- 19 -(Y1) and - 20 -(Y4)) are de-energised.
- The intake regulator (- 2 - Fig. 5b) is bled and closed.
- The pressure reservoir (- 5 - Fig. 5b) is depressurised via the intake filter.
- The compressor is now running in idle mode.
- If the mains pressure does not fall within 90 seconds (adjustable) to the lower switching point, the system shuts down.
- If the lower switching point is reached in less than 90 seconds, the solenoid valve (- Y1 - Fig. 5b) is energised again.
- The unit now changes over to on-load operation.

Stopping the system

- After pressing the OFF button  (Fig. 16) on the operating panel, the solenoid valve (- Y1 - Fig. 5b) is de-energised.
- The intake regulator (-2- Fig. 5b) closes and the tank (-5- Fig. 5b) is relieved.

After 30 seconds, the drive motor (- 3 - Fig. 5b) is shut down.

4. Design and functioning

4.6 Hood (opening/closing)

The compressor is provided with a detachable plastic hood that allows easy access to all parts that are subject to servicing.

Opening / closing the hood (Fig. 6)

- Open the lock (- 1 - Fig. 6)
- Remove the hood (- 2 - Fig. 6) and put it down at a safe place
- Close the hood in the reverse order

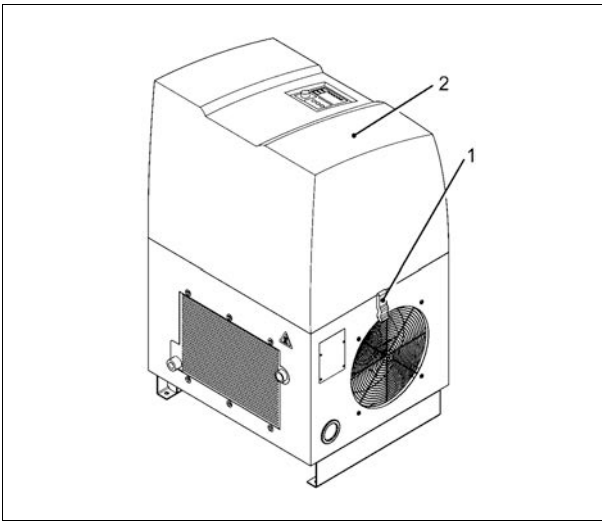


Fig. 6

- 1 Lock
- 2 Hood

5. Transport and installation

5.1 Transport

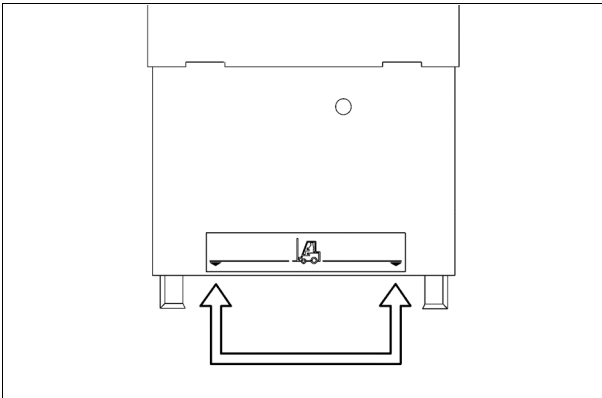


Fig. 7

Note

Before transporting the unit, remove the doors.

Danger

The compressor must be lifted using a suitable forklift 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 and its hood via the enclosure. The screw compressor is lifted with the help of a fork lift truck (Fig. 7). 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

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

50-Hz- compressors:

L07	215 kg	L15	327 kg
L11	233 kg	L18	353 kg
		L22	359 kg

60-Hz- compressors:

L07	218 kg	L15	351 kg
L11	233 kg	L18	356 kg
		L22	365 kg

5.2 Installation

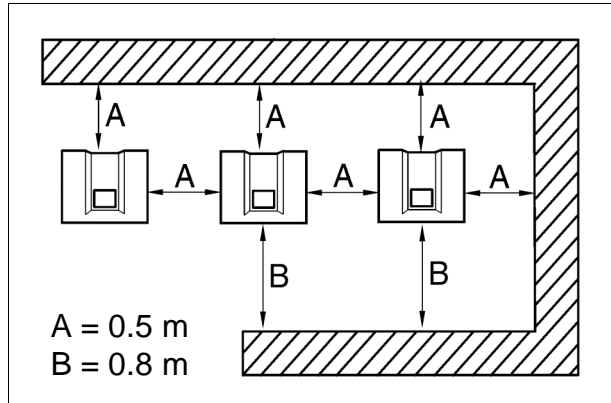


Fig. 8

Danger

- The weight carrying capacity of the foundation has to be taken into account when installing the compressor.
- 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 70 °C/158 °F 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. 8).

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. Preparations for commissioning

6.1 Cooling air volume/minimum cross

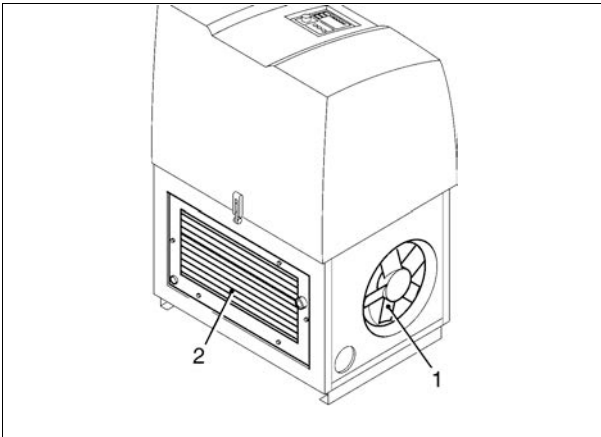


Fig. 9

- 1 Cooling air intake
- 2 Cooling air outlet

The cooling air volume required by these screw compressors is as follows:

50-Hz-compressors:

L07	ca. 34 m ³ /min	L15	ca. 59 m ³ /min
L11	ca. 37 m ³ /min	L18	ca. 56 m ³ /min
		L22	ca. 56 m ³ /min

60-Hz- compressors:

L07	ca. 34 m ³ /min	L15	ca. 48 m ³ /min
L11	ca. 37 m ³ /min	L18	ca. 54 m ³ /min
		L22	ca. 54 m 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 duct cross-section of approx. 0.15 m² for L07-L11, 0.2 m² for L15-L22.

Important

The stated minimum cross-section refers to a maximum duct length of 5 m/16.4 ft and a maximum of one bend. In the event of differing values (over 5 m/16.4 ft, more than one bend, filter cartridges, screens, etc.), please contact your technical adviser.

CompAir screw compressors are rated for ambient temperatures and cooling temperatures of +1°C/ 33.8°F to +45°C/113°F. 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 quantity required by the compressors installed in the compressed air station.

6.2 Compressed air connection

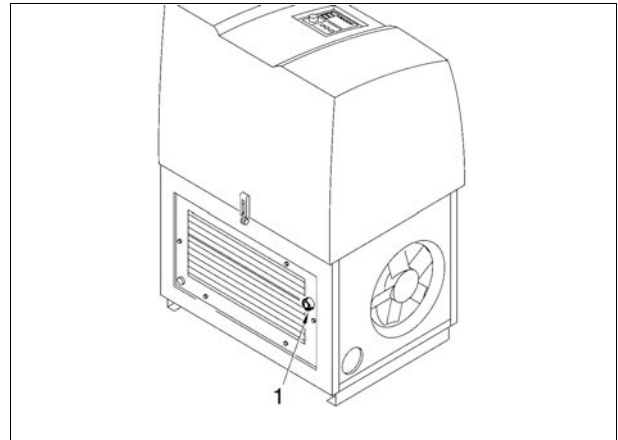


Fig. 10

- 1 Compressed air connection

The compressed air line system is connected at the compressed air supply of the screw compressor (- 1 - Fig. 10).

For this you should use a flexible connection (e.g. compressed air hose, compensator).

L07-L11	sleeve G 3/4"
L15-L22	sleeve G 1"

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 back pressure at all lines.

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

6. Preparations for commissioning

6.3 Electrical connection

Recommended supply cable cross-sections and fuses				
Compressor type	Supply voltage [V]	Installed nominal motor power [kW]	Fuse protection (slow-blow fuse) [AgL]	Line cross section at 30°C [mm ²]
50-Hz-Compressors				
L07	220	7,5	35	4G6
L07	400	7,5	20	4G2,5
L11	220	11,0	50	4G10
L11	400	11,0	35	4G6
L15	220	15,0	63	4G16
L15	400	15,0	35	4G6
L18	220	18,5	80	4G25
L18	400	18,5	50	4G10
L22	220	22,0	100	4G35
L22	400	22,0	50	4G10
60-Hz- Compressors				
L07	220	7,5	35	4G6
L07	230	7,5	35	4G6
L07	460	7,5	20	4G2,5
L11	220	11,0	50	4G10
L11	230	11,0	50	4G10
L11	460	11,0	35	4G4
L15	220	15,0	63	4G16
L15	230	15,0	63	4G16
L15	460	15,0	35	4G6
L18	220	18,5	80	4G25
L18	230	18,5	80	4G25
L18	460	18,5	35	4G6
L22	220	22,0	80	4G25
L22	230	22,0	80	4G25
L22	460	22,0	50	4G10

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 cable cross-sections given in the table comply with VDE 0298, part 4 - table 13, column 7. (Rubber hose line at 30 °C/86 °F and max. line length of 50 m). In the case of differing conditions (line length, temperature and grouping), establish the cross sections in accordance with DIN VDE 0298, part 4 or BS7671 taking into account the cable type.

Important

If local regulations are stricter than the values specified above, observe the stricter regulations.

Compressor units are finished in the factory according to standard EN60204 (industrial machinery). Please observe the following important notes:

Danger

The customer has to connect a main switch in the incoming line of the compressor unit (unless factory-mounted as special accessories) (DIN EN 1012 - 1).

If this switch does not provide short-circuit and overload protection for the system, suitable back-up fuses have to be installed according to EN 60269-1 (low voltage directive) (see table).

The main switch must meet the requirements of the safety standard EN 60 204-1 (electrical equipment of machinery) as well as of EN 60947-2 (low-voltage switchgear and control gear (circuit-breakers)).

6. Preparations for commissioning

The electrical connection and protective measures have to be installed in accordance with VDE, BS or local regulations. As a rule, additional instructions of the relevant power supplier have also to be adhered to.

The electrical 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 colors. Work on control cabinets may only be carried out by electrotechnical specialists. If the installation conditions of the system differ from the conditions described in EN60204, please contact your technical adviser.

To establish an electrical connection, proceed as follows:

Guide in supply cable at cable entry (- 1 - Fig. 11) (cut slit in cable entry to match cable diameter), guide through clamp (- 2 - and - 3 - Fig. 11) and through cable screw connection on switch cabinet (- 4 - Fig. 11) and tighten screw connection.

Connect the supply line to the connecting terminals as shown in the circuit diagram.

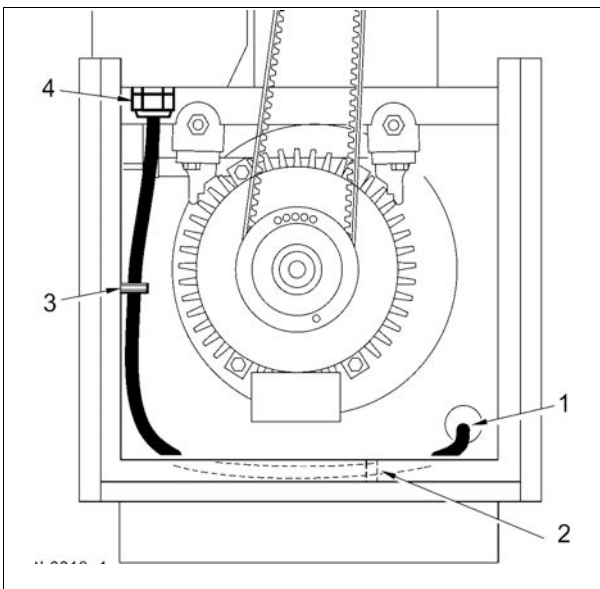


Fig. 11

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 output voltages during under load operation and, if required, re-set. Several tapping points are provided for this purpose (see circuit diagram). Fig. 12 illustrates an example.

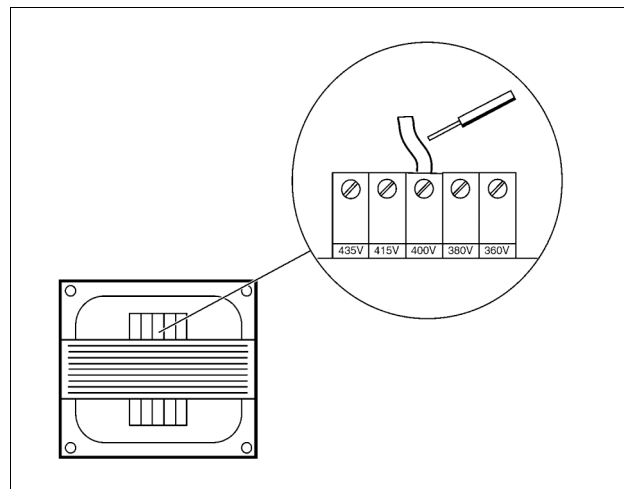


Fig. 12

Danger

When carrying out adjustment work on the control power transformer, the unit must be electrically isolated and locked off.

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 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 during under load operation of the unit by measuring the control power transformer output voltages.

6. Preparations for commissioning

6.4 Electric motor fasteners for secure transportation

Fasteners used for securing the electric motor (- 1 - Fig. 13) during transportation must be removed prior to commissioning.

To remove the fasteners, proceed as follows:

- After the panel has been removed, support the motor by screwing the belt adjusting bolt (- 2 - Fig. 13) clockwise until it touches the motor.
- Loosen the fastening screws (- 3 - and - 4 - Fig. 13) and remove the fasteners
- Check V-belt (- 5 - Fig. 13) is correctly placed in the in V-belt pulleys
- Screw the belt adjusting bolt back until it reaches the lock nut (- 6 - Fig. 13) on the holder (- 7 - Fig. 13); securely fasten the motion screw (anti-clockwise)

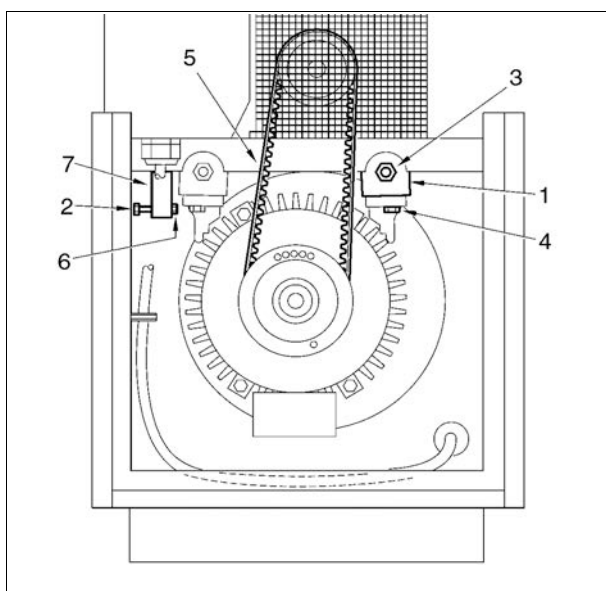


Fig. 13

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!

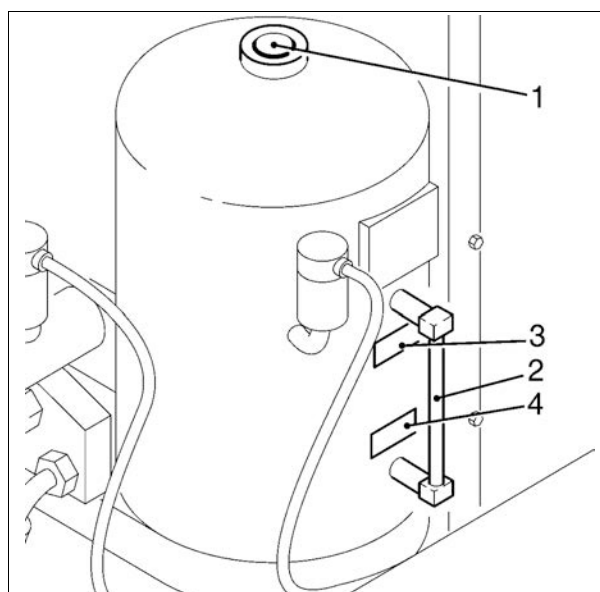


Fig. 14


- 1 Oil filler cap R1"
- 2 Oil-level indicator
- 3 Maximum oil level
- 4 Minimum oil level

Important

Do not mix oils of different specifications.

Machines which are delivered without oil must first be filled to the max. mark in the pressure reservoir sight glass (see also chapters 9.4 and 9.14)

Check the oil level as follows:

- Switch off the screw compressor unit by pressing the button  (Fig. 16).
- Wait at least 5 minutes for the oil to settle and for the air to disperse
- The oil level is checked with the help of the transparent plastic tube at the pressure reservoir (- 2 - Fig. 14) after every stop and at regular intervals. If required, top up oil

Also see chapter 8 "Service and maintenance"

6. Preparations for commissioning

6.6 Sound pressure level

Sound pressure level measured in dB(A) according to PN8NTC 2.2 under full load at a distance of 1 m (tolerance: ± 3 dB(A)):

50 Hz compressors	dB(A)
L07	68
L11	69
L15	69
L18	70
L22	70

60 Hz compressors	dB(A)
L07	72
L11	72
L15	73
L18	73
L22	73

Subject to technical revision.

7. Commissioning

7.1 First commissioning

Danger

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

Only operate the screw compressor with closed access panels.

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.

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

First commissioning is carried out as follows:

- Remove transport guards (see chapter 6.4, Fig. 13)
- Fill oil in the pressure vessel up to "maximum oil level" mark. (This applies to compressor systems which are delivered without having been filled with oil). (Refer to Chapter 9.4 and 9.14 for information on filling oil).
- Check the oil level in the pressure reservoir (see also chapter 6.5). (Fig. 14)
- Check the setting of the control-power transformer (see also chapter 6.3). (Fig. 12)
- Check and re-tighten all connecting terminals of the electrical control.
- Open isolator valves between the screw compressor, reservoir and pipe.
- Operate main power supply switch.
- Once the power supply has been switched on, the POWER LOSS fault appears. This fault must be acknowledged using the \ominus key (Fig. 16). You will find more information about the control in chapter 8.
- The factory setting of the setpoint value for the network pressure (upper and lower switching point) is saved in the compressor control DELCOS Pro and depends on the relevant pressure variant of the compressor (see nameplate fig. 2, stage pressures = maximum operating pressure). Chapter 8.5.2 describes how you check these settings or change the values.
- Temporarily open the hood to check the direction of rotation, for specified direction, see (- 1 - Fig. 15)

Important

If the direction of rotation is incorrect, immediately shut down the unit using the large emergency STOP button on the control panel (-24- Fig. 3) and not using the \odot key (Fig. 16), as otherwise you may cause serious damage to the compressor, even if only operated briefly.

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

Danger

Beware of rotating parts!

Rotating parts can lead to injuries. Stay at a safe distance away from rotating machine parts!

Press the START button \odot (- 2 - Fig. 16) and check the direction of rotation. With a wrong direction of rotation, press the red emergency STOP button (-24- Fig. 3) immediately and correct the direction of rotation.

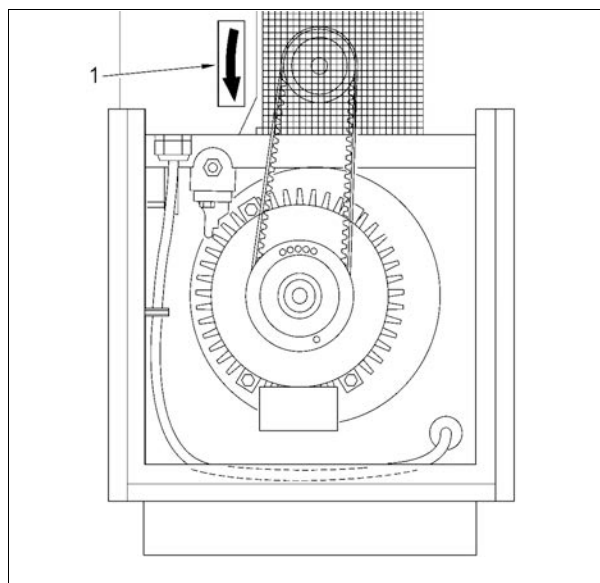


Fig. 15

1 Drive motor's direction of rotation

Note

For switching the compressor off "normally", use only the stop push-button \odot (Fig. 16), but not the EMERGENCY STOP push-button (-24- Fig. 3). After having been switched off, the compressor is aftercooled for 30 seconds (soft stop).

Temperature start-up protection

The screw compressor unit will not start up if the ambient temperature is lower than + 1 °C/33.8 °F.

7. Commissioning

7.2 Routine commissioning




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.

For routine commissioning, proceed as follows:

- Check oil level in the pressure reservoir (see also chapter 6.5).
- Open shut-off valves between the screw compressor, reservoir and pipe.
- Switch on the power supply master switch.
- Once the power supply has been switched on, the POWER LOSS fault appears. This fault must be acknowledged using the  key (Fig. 16).
- Press START button  (Fig. 16).
- To switch off the compressor in the usual way use the STOP button  (Fig. 16) and not the emergency STOP button. After shutdown the compressor has a run on time of 30 seconds (soft-stop).

Start-up protection of the electric motor

The screw compressor unit will not start up if the final compression pressure is more than 0,8 bar / 11, 6 PSI.

Temperature start-up protection



The screw compressor unit will not start up if the ambient temperature is lower than + 1 °C/33.8 °F.

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 a malfunction as follows:

- Turn master switch off.
- Eliminate fault.
- Turn master switch on.
- Press acknowledgement push-button  (Fig. 16)
- Start the screw compressor unit by pressing the START button  (Fig. 16).

8. Control system

8.1 General

This chapter is used to quickly commission the unit. The control system is explained in detail in the separate DELCOS *Pro* operating instructions.

When the unit has been switched on for the first time, the POWER LOSS fault appears on the display. This fault must be acknowledged using . This is a routine message, the compressor is not defective.

When supplied, the display language is set to English. To set another language, see chapter 8.5.1.

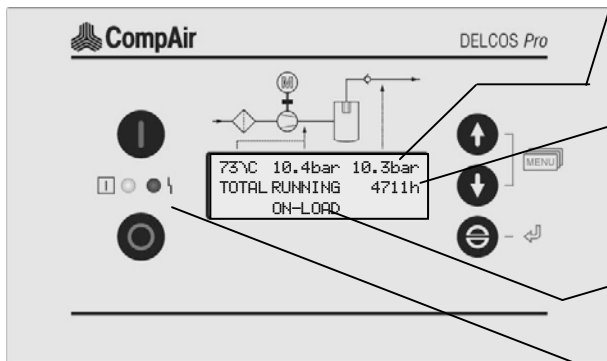









Fig. 16

8.2 Keys

-  Switch on unit
-  Switch off unit

The three keys on the right next to the display have a dual function:

-  +  at the same time
Call up or exit menu, exit menu / sub-menu
-  Switch to next sub-menu / menu item, or reduce a value
-  Switch to previous sub-menu / menu item, or increase a value
-  Acknowledgement key,
if you are in a menu / sub-menu, the acknowledgement key functions as an Enter key [↵].

8.3 Status indicator (display / light signals)

The control system is fitted with a three-row display.

1st row:



The *final compression temperature*, *final compression - pressure* and *network pressure* are permanently displayed here.

Final compression temperature: is the temperature measured downstream of the compressor stage.

Final compression pressure: is the pressure measured downstream of the compressor stage.

Network pressure: is the pressure within the system connected downstream of the compressor.

The following symbols may also be used in the 1st row:

-  F₂ Second pressure range / timer active
-  Remote start / stop activated

2nd row:

The second row is reserved for the menu. You can view values like the total service hours and set values like the nominal pressure in the menu.

3rd row:

The third row shows status, fault and warning - messages.

Light signals

The DELCOS *Pro* is fitted with two light signals (red, green).

Red light signal:

Flashing slowly: warning, maintenance due

Flashing rapidly: fault, unit is stopped until fault has been rectified

The red light signal only goes out once the warning or fault has been remedied properly.

Green light signal:

Flashing: system is ready, i.e. the motor may start up automatically at any time.

Lit up permanently: the drive motor is running

8.4 Displaying / changing values

8.4.1 Selecting values

You can display values, e.g. total hours, and set the control system, e.g. cut-in and cut-out times, in the sub-menu.

To reach the main menu, you must press the \uparrow + \downarrow keys at the same time.

You can use the \uparrow or \downarrow keys to switch between the following sub-menus:

```
[ MAINTENANCE SCHED. ]  
[ CONTROL MENU ]  
[ FAULT MEMORY ]  
[ TIMER CONTROL ]  
[ LIMIT VALUES ]  
[ OPTIONAL IN-/OUTPUTS ]
```

Enter a sub-menu by pressing the \ominus key.

Again here you can use the \uparrow or \downarrow keys to go to a menu item.

To exit the sub-menu, you must press the \uparrow + \downarrow keys at the same time.

To then fully exit the main menu, you must again press the \uparrow + \downarrow keys at the same time.

8.4.2 Changing values

Enter the sub-menu and then the menu item containing the value you wish to change.

Then press the \ominus key, the value flashes. You can now press \uparrow or \downarrow to change the value. You must then press the \ominus key again to confirm the value.

8.5 Default settings

Danger

When programming in standby, the machine may start up at any time.

8.5.1 Selecting language

You can change the language by pressing the \ominus + \uparrow or \ominus + \downarrow keys. Press these keys at the same time until the right language appears.

8.5.2 Setting network pressure

Max. network pressure:

The network pressure is set in the [CONTROL MENU] sub-menu. The \uparrow + \downarrow keys have to be pressed at the same time to do this. You are then taken to the main menu. Use \downarrow to switch to the [CONTROL MENU] sub-menu. Then please press the \ominus key.

The CUT-OUT POINT menu item now appears on the display. Again pressing the \ominus key causes the value to flash. You can now correct (increase or decrease) this value using \uparrow or \downarrow . Then confirm the value set by pressing the \ominus key.

Note

The control system checks whether the value set can be used. The maximum network pressure CUT-OUT POINT must be at least 0.2 more than the minimum network pressure CUT-IN POINT. You may therefore have to first set the minimum network pressure point. To prevent your compressor suffering from excess wear, the difference between the CUT-OUT POINT and CUT-IN POINT should not be too small.

Example:

```
CUT-OUT POINT 10.0bar  
CUT-IN POINT 9.8bar
```

Min. network pressure:

In the [CONTROL MENU] sub-menu please use \downarrow to go to the CUT-IN POINT menu item.

Pressing the \ominus key causes the value to flash.

You can now correct (increase or decrease) this value using \uparrow or \downarrow . Then confirm the value set by pressing the \ominus key.

8. Control system

8.5.3 Setting time/date (timer)

The DELCOS *Pro* accumulator can bridge a loss of power lasting between around two to three weeks. If power is lost for longer periods, the timer's time and date are lost and have to be entered anew.

Press the \uparrow + \downarrow keys at the same time. Use \downarrow to go to the [TIMER CONTROL] sub-menu and press the \ominus key. The date and time are displayed there in the following format:

TU 30.10.07 12:10:34

If you press the \ominus key, the left-hand value (day of the week) starts to flash. You can now use the \uparrow or \downarrow keys to set this. Then confirm the value by pressing the \ominus key.

All values can now be set in succession using this procedure. When the last value (seconds) has been set, the timer is fully set and you can exit the menu by twice pressing the \uparrow + \downarrow keys at the same time.

8.6 Starting the unit

Danger

If the unit is ready, i.e. the green LED is flashing, the compressor may automatically start at any time.

Use the main switch to switch the unit on.

If warning or fault messages appear in the third row of the display, these first have to be rectified and confirmed using the \ominus key.

Then start the unit by pressing the \odot key on the DELCOS *Pro*.

8.7 Switching off the unit

The unit is switched off by pressing the \odot key on the DELCOS *Pro*. However the unit will only stop after a 30-second soft-stop.

The soft-stop is preset to protect the compressor.

Note

The unit may only be shut down using the emergency off button in real emergencies. When shutting down normally, please use the \odot key.

8.8 Emergency off button

The emergency off button is located above the DELCOS *Pro*. It is used to immediately shut down the unit. Only use the emergency off button to shut down the unit in emergencies. When shutting down normally, always use the \odot key.

8.9 Acknowledging warning / fault messages

Warning and fault messages are shown in the third row of the display. The red light signal flashes at the same time.

You will find a table containing messages and suggested ways of remedying problems in the separate DELCOS *Pro* operating instructions.

8.9.1 Warning messages

When there are warnings, the red light signal flashes slowly. The unit does not automatically shut down when there are warnings. However ignored warnings may cause faults.

Rectify what is causing the warning and press the \ominus key to hide the warning.

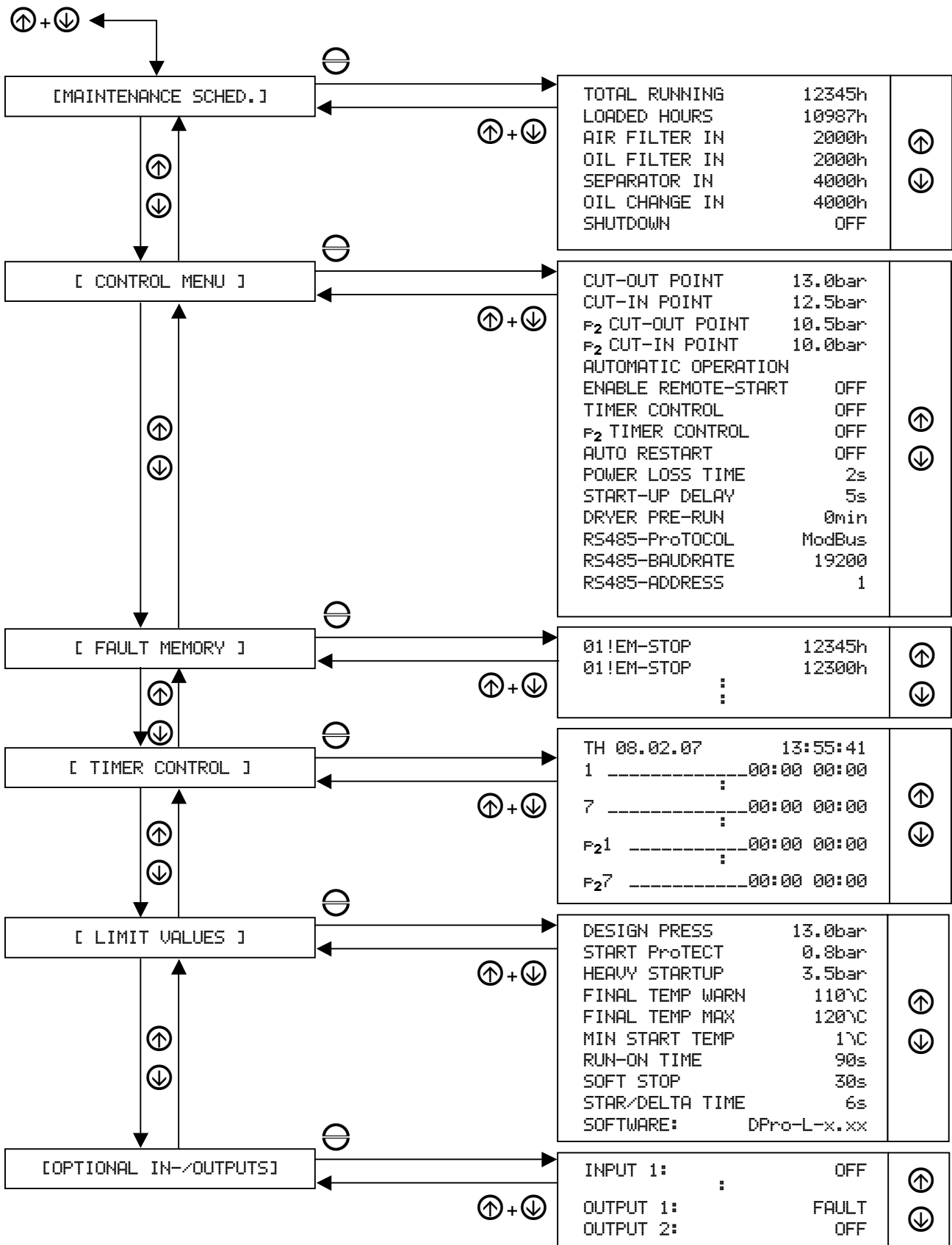
8.9.2 Fault messages

Fault messages result in the unit automatically shutting down or do not permit the unit to be started.

Once you have rectified the problem, you still have to confirm by pressing the \ominus key.

8. Control system

8.10 Menu structure (values are examples)



9. Service and maintenance

9.1 Maintenance 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.

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

9.2 Maintenance electric motor

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

9.3 Maintenance schedule

Danger

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

Checks and maintenance work may only be carried out when the following points are observed:

- ***Press the STOP button on the control panel and wait until the screw compressor unit has come to rest and the screw compressor unit is depressurized***
- ***The pressure display does no longer indicate pressures < 0.3 bar/4.4 PSI.***
- ***Shortly after switching the screw compressor off, the system can contain a low residual pressure.***
- ***The screw compressor unit must therefore be depressurized prior to any maintenance work by slowly opening the lock (oil filler cap) with integral vents***
- ***The customer-installed main switch is set to "O" (OFF) and locked off***
- ***Warning:***
Electrical voltage: Only work on the screw compressor unit when it is disconnected.

9. Service and maintenance

Service packages

Package C	Oil filter cartridge, air filter cartridge
Package D	Oil separator element
Package E	Worn parts
Package V	V-belt set (recommendation)

Intervals are valid for normal industrial environments and operating conditions.
For order numbers see the spare parts list.

Maintenance items

W1 European-version

Oil change (CompAir - 4000 hours oil)

Valid for normal industrial environments (when in doubt, check the oil change intervals by carrying out an oil analysis) Minimum oil change = 1 x year

W2 Replacement of oil filter cartridge

Valid for normal industrial environments

W3 Replacement of oil fine separator cartridge

Valid for normal industrial environments

W4 Replacement of air filter cartridge

Valid for normal industrial environments

W5 Safety valve / functional test

at least once a year

W6 V-belt

(only visual check)

W7 Checking/tightening of connecting terminals in the switch cabinet/ and checking of the "control transformer" setting

W8 Checking/tightening screw connections

W9 General maintenance/cleaning

(In the case of a very dirty atmosphere, the cleaning intervals have to be shortened as required)

W10 Replacing the V-belt (recommendation)

(only complete sets)

W11 Cleaning/replacement of cooling air inlet filter

(In the case of a very dirty atmosphere, the cleaning intervals have to be shortened as required)

Intervals

	Operating hours	During comm.	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
			No later than x months	3 M	6 M	9 M	12 M	15 M	18 M	21 M	24 M	27 M	30 M	33 M
Required service package	Package C			•		•		•		•		•		•
	Package D					•				•				•
	Package E									•				
	Package V													•
Maintenance	W1					•				•				•
	W2			•		•		•		•		•		•
	W3					•				•				•
	W4			•		•		•		•		•		•
	W5					•				•				•
	W6	•				•				•				•
	W7	•				•				•				•
	W8	•				•				•				•
	W9					•				•				•
	W10													•
	W11			•		•		•		•		•		•

These maintenance intervals must be adhered to!

9. Service and maintenance

9.4 Oil change

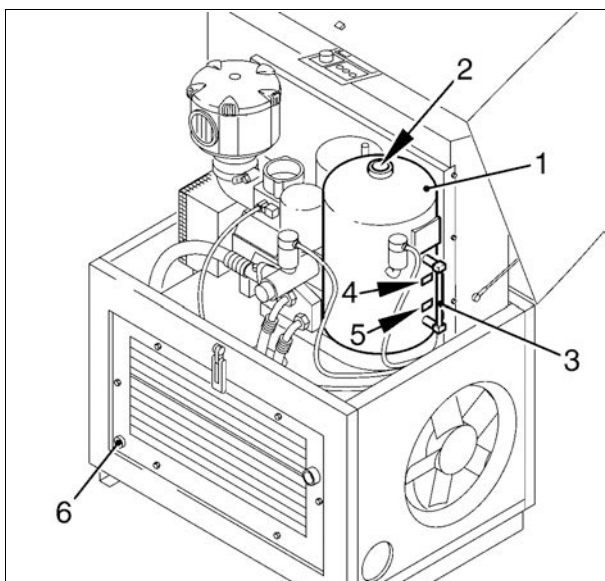


Fig. 17

- 1 Oil reservoir
- 2 Oil filler cap R1"
- 3 Oil-level indicator
- 4 Max. oil level
- 5 Min. oil level
- 6 Oil drain R1/2"

Danger

Only change the oil when the screw compressor unit is not in operation and is 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, do not allow it to seep into the ground!

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).

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

Do not mix lubricating oils of different makes. When changing over to a new oil type, the oil in the oil circuit must be drained completely.

For the oil change intervals, see maintenance schedule.

When changing the oil, proceed as follows:

- Switch the screw compressor unit off and ensure that it is depressurized, electrically isolate and locked off.
- Slowly open the oil filler cap (- 2 - Fig. 17), to depressurize the screw compressor by releasing any residual pressure in the unit
- Remove the oil filler cap
- Open the oil drain (- 6 - Fig. 17) for the pressure reservoir and the oil cooler
- Drain oil at operating temperature
- Close the oil drain
- Fill in oil up to the marking "maximum oil level" (- 4 - Fig. 17) (L07-L11 approx. 5 litres, L15-L22 approx. 6 litres)
- Close the oil filler cap
- Let the screw compressor unit run for approx. 2 minutes
- Check for leakages
- Switch the screw compressor unit off
- Wait at least 5 minutes for the oil to settle and for the air to disperse
- Check oil level (see chapter 6.5)
- The oil level must be between the maximum level (- 4 - Fig. 17) and minimum level (- 5 - Fig. 17) marked on the oil reservoir.
- 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) have a strong influence on the oil change intervals.

In this case the oil must be analyzed to check the permissible length of time that the oil can be used (see also chapter 9.14). Under no circumstances should the oil be used beyond its design life.

9.5 Change of oil filter cartridge

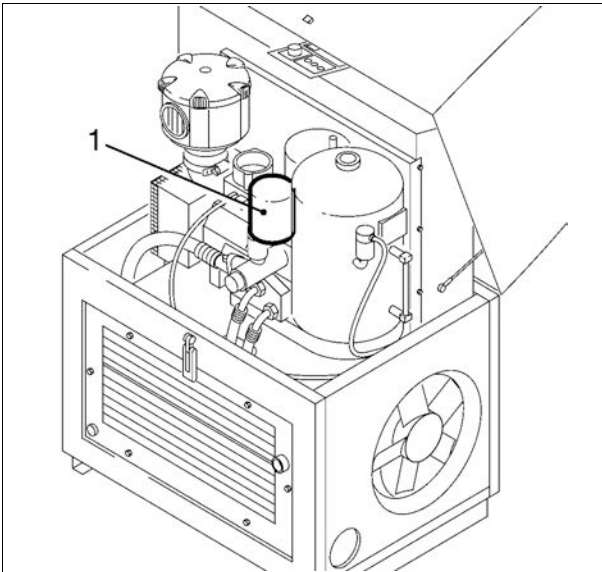


Fig. 18

1 Oil filter cartridge

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.

Change the oil filter cartridge as follows:

- Switch the screw compressor unit off and ensure that it is depressurized, electrically isolate and locked off.
- Wait at least 5 minutes for the oil to settle and for the air to disperse.
- Unscrew the oil filter cartridge (- 1 - Fig. 18) 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 (see chapter 6.5)
- If required, top up oil.

Changing intervals for oil filter cartridge

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).

Where such conditions exist the filter element may require changing more frequently.

9.6 Change of the fine separator cartridge

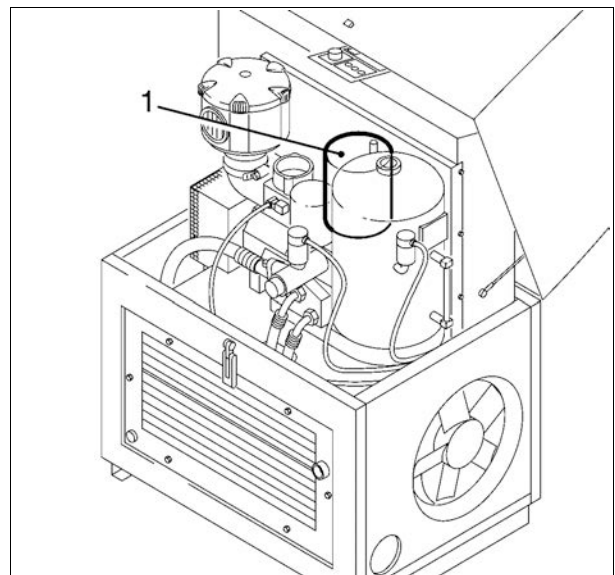


Fig. 19

1 Oil fine separator

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.

9. Service and maintenance

Change the oil fine separator as follows:

- Switch the screw compressor unit off and make sure that it is depressurised and no voltage is supplied.
- Unscrew the fine separator cartridge (-1- Fig. 19) using an appropriate tool
- Dispose of the fine separator cartridge according to the regulations
- Oil the gasket of the new fine separator cartridges lightly
- Screw on the new fine separator cartridge and tighten manually (take notice of the instructions on the fine separator cartridge)
- Check for leakage
- Check oil level (see chapter 6.5)
- If required, top up oil.

Changing intervals for oil fine separator cartridge

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).

Where such conditions exist the filter element may require changing more frequently.

9.7 Change of air intake filter

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 the 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.

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.

9.7.1 Change of air intake filter L07-L11

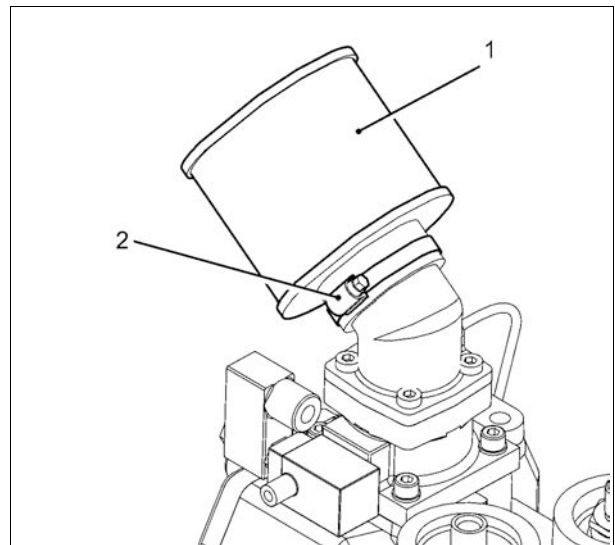


Fig. 20 L07-L11

- 1 Air intake filter
- 2 Fixing clip

Change the air filter as follows:

- Loosen the fixing clamp (- 2 - Fig. 20)
- Pull off the air filter (- 1 - Fig. 20) and replace it with a new one
- Put the air filter on and tighten the fixing clamp (- 2 - Fig. 20)

9.7.2 Changing of air intake filter L15-L22

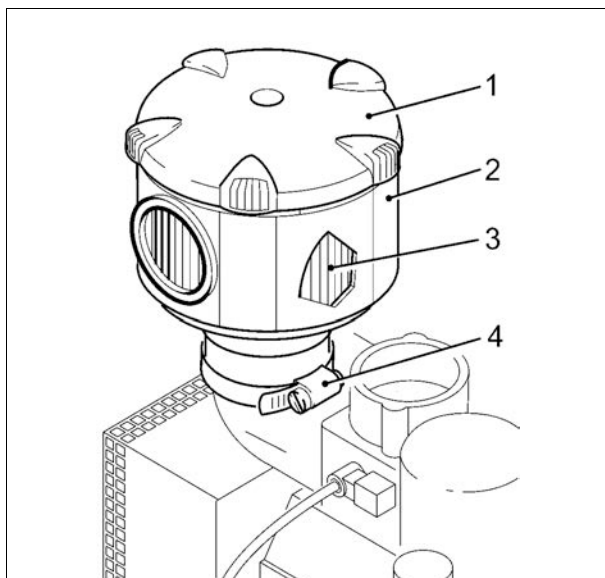


Fig. 21 L15-L22

- 1 Air filter housing cover
- 2 Air filter housing
- 3 Air filter element
- 4 Fixing clip

Change the air filter as follows:

- Loosen and remove the air filter housing cover (- 1 - Fig. 21)
- Remove the air filter (- 3 - Fig. 21) and replace it with a new one
- Insert the air filter cartridge into the air filter housing (- 2 - Fig. 21)
- Screw the air filter housing cover on to the air filter housing

Changing intervals for air filter cartridge

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).

Where such conditions exist the filter element may require changing more frequently.

9.8 Safety valve

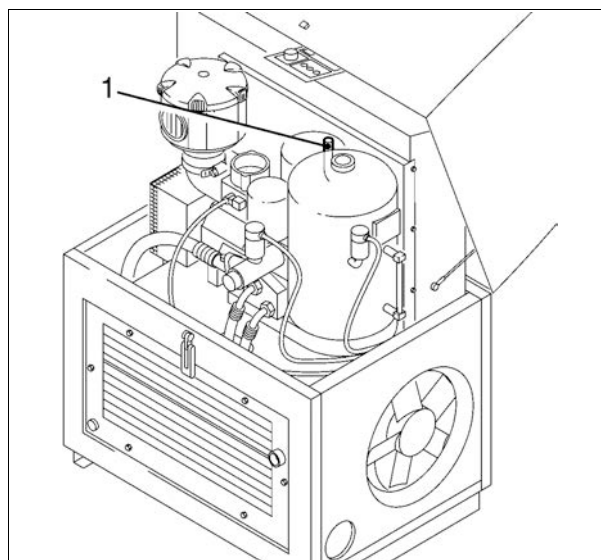


Fig. 22

- 1 Safety valve

Testing the safety valve

The valve should be tested on a separate compressed air line in accordance with local legislation.

Operate the safety valve depending on the type of valve:

- by unscrewing the cap one or two turns and retightening it
- or by pulling the valve lifting lever

Danger

Never operate a screw compressor system with a defective safety valve or without safety valve!

9.9 Changing V-belts/automatic tensioning system

Danger

Only perform checks and carry out work when the screw compressor unit is out of operation and depressurized, electrically isolated and locked off.

Any safety equipment which had to be removed for the replacement of the V-belt set must be remounted 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.

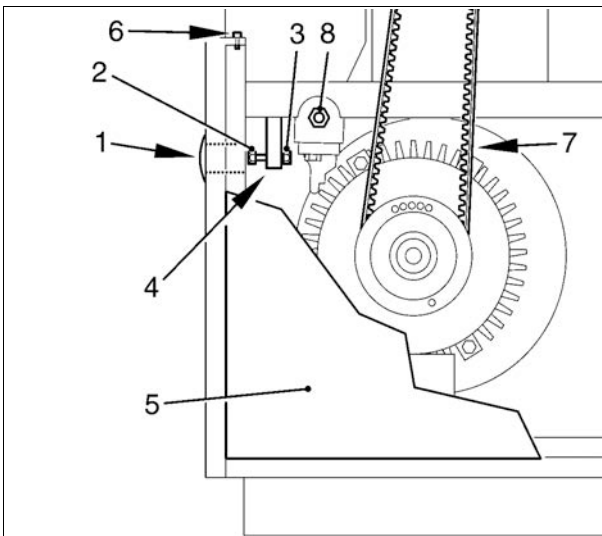


Fig. 23

- 1 Cover cap
- 2 Motion screw
- 3 Lock nut
- 4 Holder
- 5 Panel
- 6 Capscrew
- 7 V-belt set
- 8 Rotational axis

The V-belt preload needed is specified by the weight of the motor, which is mounted in a rotary fashion (- 8 - Fig. 23).

Changing the V-belt is carried out as follows:

- Remove the panel (- 5 - Fig. 23) by loosening the capscrews (- 6 - fig. 34)
- Remove the cover cap (- 1 - Fig. 23) from the access panel
- Lift the motor by turning the motion screw (- 2 - Fig. 23) clockwise until the V-belts are released
- Clean/degrease the V-belt pulleys
- Replace the V-belt set (- 7 - Fig. 23)
- Screw the motion screw back in until the lock nut (- 3 - Fig. 23) reaches the holder (- 4 - Fig. 23); securely fasten the motion screw (anti-clockwise)
- Replace the cover cap and the panel

9.10 Connecting terminals in the switch cabinet/control transformer setting

Danger

In the case of electric voltage:

- **Actuate STOP button @ at the operating panel**
- **Set the customer-fitted main power switch to "O" (OFF).**

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

The setting of the control transformer must be checked according to chapter 6.3 "Electrical connection".

9.11 Fittings

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

Check the hose and piping for unsealed areas.

9.12 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.

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

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

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

The electric motor is permanently lubricated.

9.13 Clean / change filter with cooling air inlet and control cabinet inlet

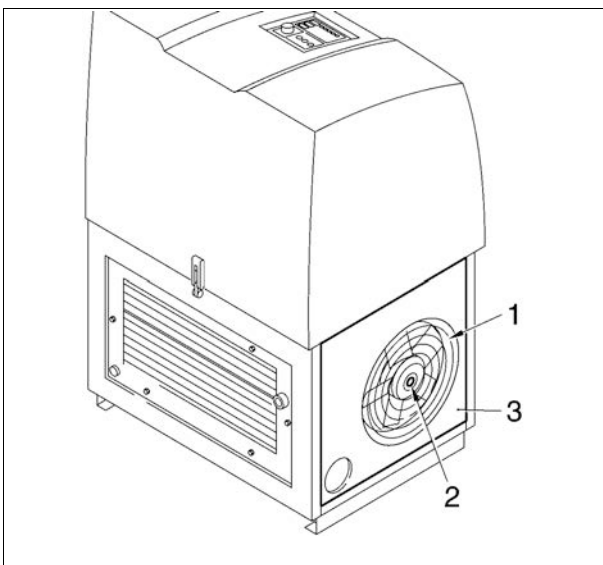


Fig. 24

- 1 Filter mat cooling air inlet
- 2 Mounting bolt
- 3 Bottom access panel

Danger

Only perform filter mat change after the compressor system has been shut down and depressurized!

Perform filter mat change as follows:

- Remove mounting bolt (- 1 - Fig. 24).
- Remove filter mat (- 1 - Fig. 24) and clean, exchange if damaged.
- Re-insert filter mat in the bottom access panel (- 3 - Fig. 24).
- Secure filter mat by means of the mounting bolt.

Cleaning:

Clean the filter mat by brushing or washing.

Important

Never install the filter mat in a wet or moist state!

Changing times for the filter mat

The operating modes and the quality of the suctioned air (e.g. dust content) has a strong influence on the filter service life.

The filter should be checked on a weekly basis, eventually daily basis, for dust build-up.

In these operational cases, shorter change intervals are possible.

9.14 Maintenance information 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 regulations relating to the prevention of accidents, use lubricants the properties of which meet the requirements of the operating conditions on site. Do not mix lubricating oils of different makes. When changing over to a new oil type, drain the old oil completely from the system.

If final compression temperatures of more than 90 °C/ 195 °F occur continually, the oil change intervals given in section 9.3 (maintenance schedule) are halved.

The oil change intervals should be calculated more accurately in accordance with the actual operating conditions by analyzing the oil.

Use the following oil type:

European version

CompAir „4000“

10. 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
	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/ 33.8 °F	6. Make sure that the ambient temperature is not less than +1 °C/ 33.8 °F; install an auxiliary heater, if required
	7. Remote control has been activated via terminal strip	7. Deactivate remote control/timer
	8. Mains pressure is above the lower switch set point	8. Wait until the mains pressure has fallen below the lower switch set point
Unit stops during the start-up phase	1. Intake regulator only closes partly, pressure builds up too quickly in the pressure reservoir	1. Fix intake regulator or, if required, replace; check solenoid valves
	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. Oil too viscous	4. Select the type of oil according to the ambient conditions or install an auxiliary heater
	5. Maximum motor switching cycles exceeded due to too frequent manual on and off-switching	5. Avoid frequent manual on and off-switching, let electric motor cool down
Unit does not reach the set mains pressure	1. Mains pressure sensor set too low	1. Check, re-set
	2. Intake regulator opens only partly	2. Fix intake regulator or, if required, replace; check solenoid valves
	3. Excessive air consumption	3. Reduce consumption or cut in a further compressor
	4. V-belt slips	4. Replace the V-belt set
	5. Fine separator clogged	5. Replace fine separator cartridge
	6. Air filter clogged	6. Replace air filter cartridge
	7. Heavy leakage in the compressor system	7. Check unit
	8. Mains pressure exceeds the lower switching point	8. Wait until the mains pressure has fallen below the lower switching point

10. Trouble-shooting

Malfunction	Possible cause	Remedy
Unit switches off	1. Ambient temperature too high	1. Ventilate compressor room
	2. Electric motor defective	2. Check electric motor and thermistor
	3. Fan defective	3. Check/replace fan
	4. Cross section of the electric supply lines too small	4. Measure power requirement, if necessary, replace lines
	5. Power requirement too high	5. Oil fine separator clogged, replace, if necessary
	6. Oil level too low	6. Top up oil in the pressure reservoir
	7. Oil injection pressure too low	7. Replace oil filter cartridge, clean oil system
	8. Excessive oil temperature	8. Check oil cooler and fan/ Check oil thermostat
Excessive idling pressure	1. Intake regulator does not close correctly	1. Check intake regulator
	2. System not unloaded	2. Check intake regulator
Oil in the compressed air	1. Oil fine separator defective	1. Replace oil fine separator cartridge
	2. Oil foams	2. Change oil
	3. Oil level too high	3. Drain off oil
	4. Minimum pressure valve defective	4. Check minimum pressure valve
Oil in the air filter	1. Intake regulator setback function defective	1. Check intake regulator
	2. Intake regulator does not close correctly	2. Check intake regulator
	3. Frequent emergency shutdown	3. The emergency shutdown may only be activated in the case of safety-relevant functional problems
Safety valve opens	1. Safety valve defective	1. Replace
	2. Oil fine separator clogged and final compression pressure sensor defective	2. Replace oil fine separator cartridge and change final compression pressure sensor
	3. Intake regulator closes too slowly	3. Check intake regulator and solenoid valve
	4. Mains pressure sensor defective	4. Replace mains pressure sensor
	5. Electronics defective	5. Replace electronics

Danger

Never operate the screw compressor with defective safety valve!

11. Annex

11.1 Technical data EUROPE version L07-L22 50 Hz

Technical Data L07-L11 50Hz		L07			L11		
Maximum operating pressure	bar	7,5	10	13	7,5	10	13
Minimum operating pressure	bar	5,0					
Ambient temperature	°C	+ 1 / + 45					
Flow	m ³ /min	1,14	0,93	0,69	1,68	1,41	1,14
Final compression temperature above ambient temp.	°C	10	9	8	12	11	10
Sound pressure level (to Cagi Pneurop PN8NTC2)	dB(A)	68			69		
Nominal motor rating	kW	7,5			11		
Full-load current max. IP55 (220V)	A	32			52		
Full-load current max. IP55 (400V)	A	16			26		
Motor protection type		IP55					
Nominal speed	rpm	3000					
Nominal fan motor power	kW	no separate fan motor					
Recommended cable cross-section 220V / 400V	mm ²	4G6 / 4G2,5			4G10 / 4G6		
Recommended fuse size 220V / 400V	A	35 / 20			50 / 35		
Cooling air flow through ventilator	m ³ /min	34			37		
Cooling air outlet temperature above ambient temp.	°C	12			17		
Max. allowable pressure drop in duct at ambient 35°C/45°C	Pa	30					
Compressor oil fill	l	5					
Residual oil capacity	mg/m ³	3 - 5					
Compressed air delivery connection		EN 10226 Rp 3/4" (DIN 2999 - Rp 3/4)					
Weight	kg	215			233		
Dimensions L x W x H	mm	687 x 585 x 1000					

Technical Data L15-L22 ; 50 Hz		L15			L18			L22		
Maximum operating pressure	bar	7,5	10	13	7,5	10	13	7,5	10	13
Minimum operating pressure	bar	5,0								
Ambient temperature	°C	+ 1 / + 45								
Flow	m ³ /min	2,47	2,10	1,68	3,07	2,60	2,22	3,46	3,04	2,58
Final compression temperature above ambient temp.	°C	9	8	7	12	11	10	13	12	11
Sound pressure level (to Cagi Pneurop PN8NTC2)	dB(A)	69			70			70		
Nominal motor rating	kW	15			18,5			22		
Full-load current max. IP55 (220V)	A	60			72			88		
Full-load current max. IP55 (400V)	A	30			36			44		
Motor protection type		IP55								
Nominal speed	rpm	3000								
Nominal fan motor power	kW	no separate fan motor								
Recommended cable cross-section 220V / 400V	mm ²	4G16 / 4G6			4G25 / 4G10			4G35 / 4G10		
Recommended fuse size 220V / 400V	A	63 / 35			80 / 50			100 / 50		
Cooling air flow through ventilator	m ³ /min	59			56			56		
Cooling air outlet temperature above ambient temp.	°C	14			18			21		
Max. allowable pressure drop in duct at ambient 35°C/45°C	Pa	20								
Compressor oil fill	l	8								
Residual oil capacity	mg/m ³	3 - 5								
Compressed air delivery connection		EN 10226 Rp 1" (DIN 2999 - Rp 1)								
Weight	kg	327			353			359		
Dimensions L x W x H	mm	823 x 696 x 1162								

11. Annex

11.2 Technical data EUROPE version L07-L22 60 Hz

Technical Data L07-11 ; 60 Hz		L07			L11		
Maximum operating pressure	bar	7,5	9	13	7,5	9	13
Minimum operating pressure	bar	5,0					
Ambient temperature	°C	+ 1 / + 45					
Flow	m ³ /min	1,15	1,00	0,69	1,61	1,53	1,14
Final compression temperature above ambient temp.	°C	10	9	8	12	11	10
Sound pressure level (to Cagi Pneurop PN8NTC2)	dB(A)	72					
Nominal motor rating	kW	7,5			11		
Full-load current max. IP55 (220V)	A	IP55					
Full-load current max. IP55 (400V)	A	3600					
Motor protection type		no separate fan motor					
Nominal speed	rpm	4G6 / 4G2,5			4G10 / 4G4		
Nominal fan motor power	kW	35 / 20			50 / 35		
Recommended cable cross-section 220V / 400V	mm ²	34			37		
Recommended fuse size 220V / 400V	A	12			17		
Cooling air flow through ventilator	m ³ /min	30					
Cooling air outlet temperature above ambient temp.	°C	5					
Max. allowable pressure drop in duct at ambient 35°C/45°C	Pa	3 - 5					
Compressor oil fill	l	EN 10226 Rp 3/4" (DIN 2999 - Rp 3/4)					
Residual oil capacity	mg/m ³	218			233		
Compressed air delivery connection		687 x 585 x 1000					
Weight	kg						
Dimensions L x W x H	mm						

Technical Data L15-22 ; 60 Hz		L15			L18			L22		
Maximum operating pressure	bar	7,5	9	13	7,5	9	13	7,5	9	13
Minimum operating pressure	bar	5,0								
Ambient temperature	°C	+ 1 / + 45								
Flow	m ³ /min	2,31	2,14	1,54	2,96	2,71	2,13	3,43	3,12	2,50
Final compression temperature above ambient temp.	°C	9	8	7	12	11	10	13	12	11
Sound pressure level (to Cagi Pneurop PN8NTC2)	dB(A)	73								
Nominal motor rating	kW	15			18,5			22		
Full-load current max. IP55 (220V)	A	IP55								
Full-load current max. IP55 (400V)	A	3600								
Motor protection type		no separate fan motor								
Nominal speed	rpm	4G16 / 4G6			4G25 / 4G6			4G25 / 4G10		
Nominal fan motor power	kW	63 / 35			80 / 35			80 / 50		
Recommended cable cross-section 220V / 400V	mm ²	48			54			54		
Recommended fuse size 220V / 400V	A	17			19			22		
Cooling air flow through ventilator	m ³ /min	20								
Cooling air outlet temperature above ambient temp.	°C	8								
Max. allowable pressure drop in duct at ambient 35°C/45°C	Pa	3 - 5								
Compressor oil fill	l	EN 10226 Rp 1" (DIN 2999 - Rp 1)								
Residual oil capacity	mg/m ³	351			356			365		
Compressed air delivery connection		823 x 696 x 1162								
Weight	kg									
Dimensions L x W x H	mm									

11.3 Layout plan L07-L11

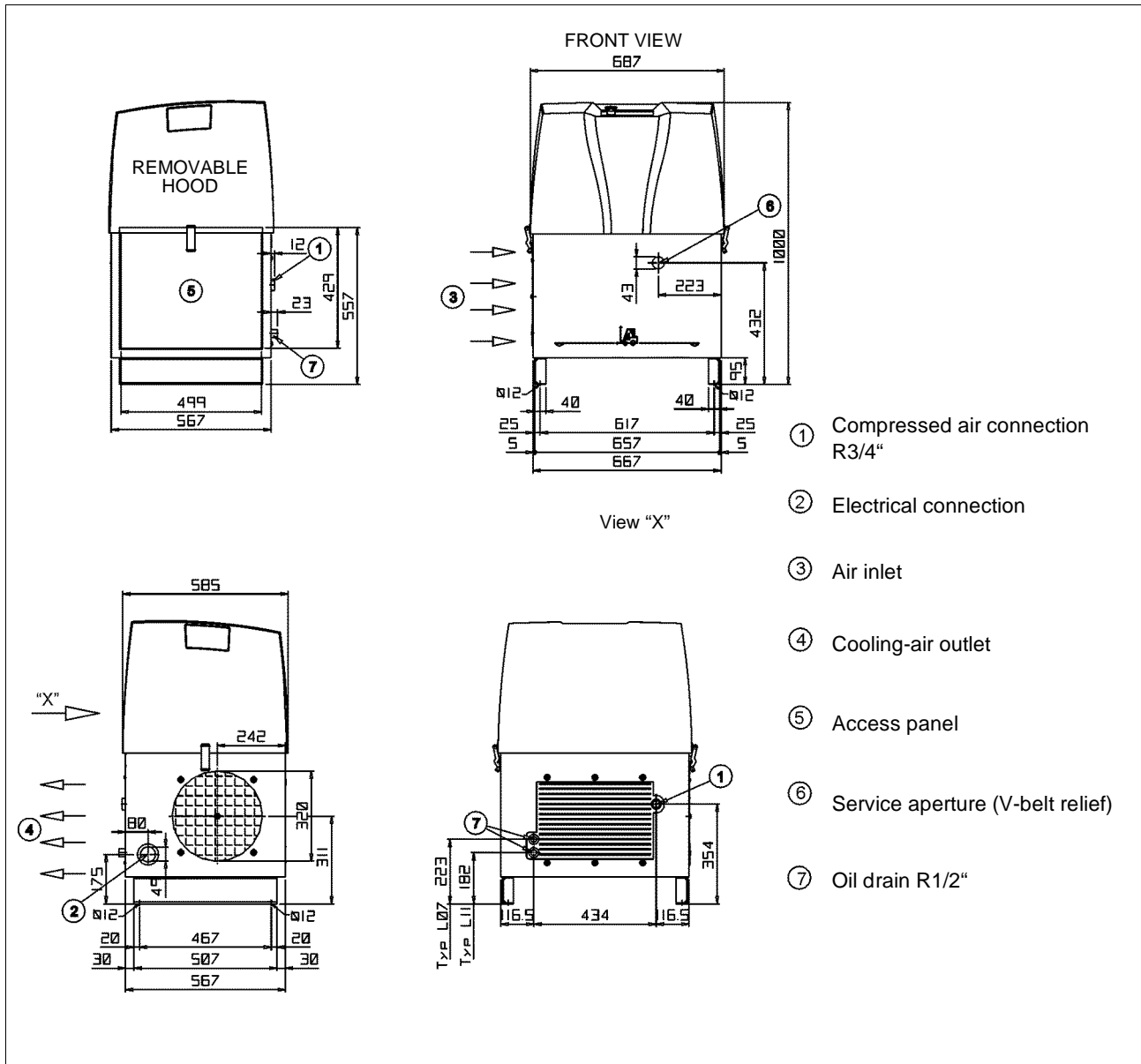


Fig. 25

11.4 Layout plan L15-L22

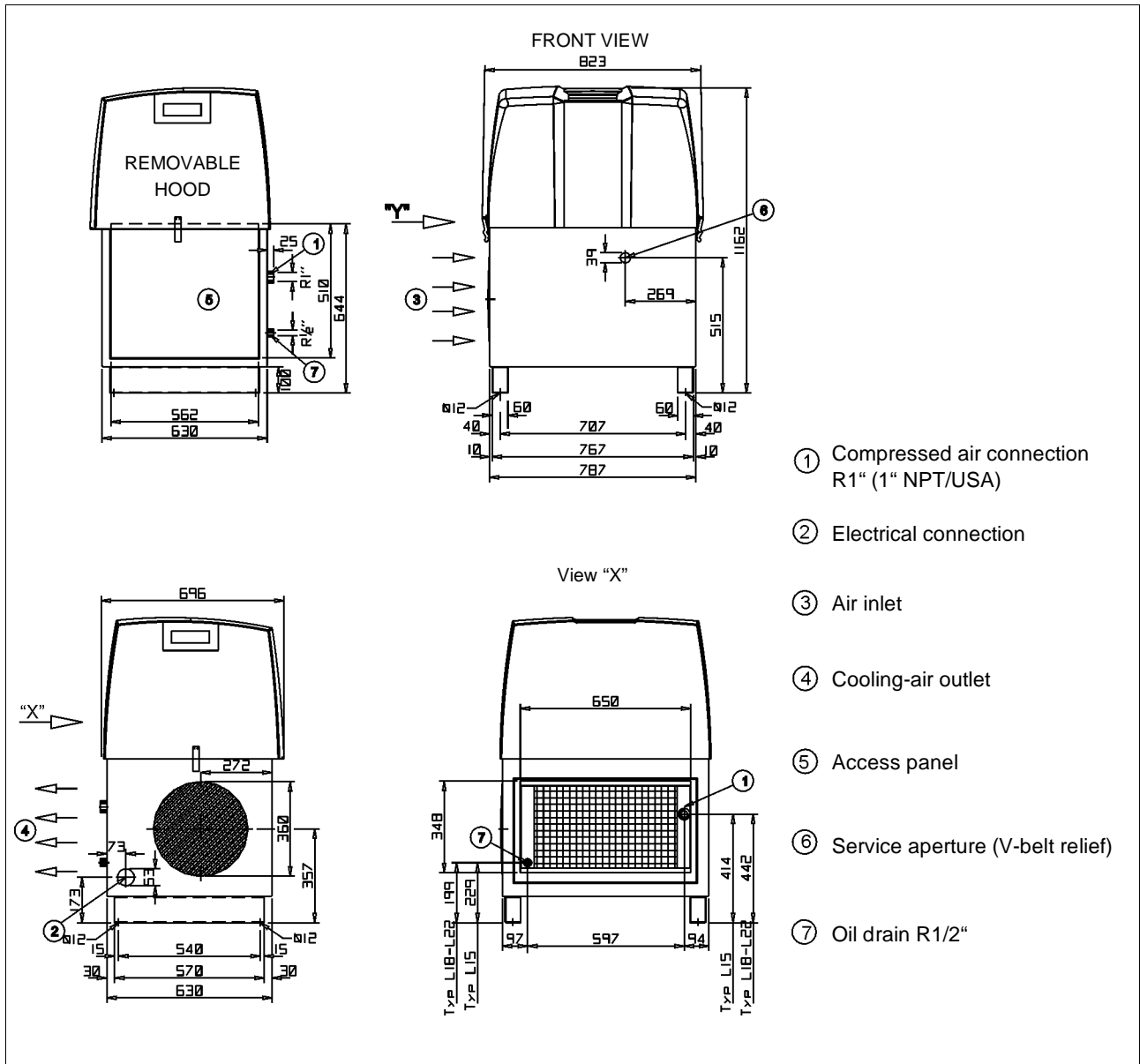


Fig. 26

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