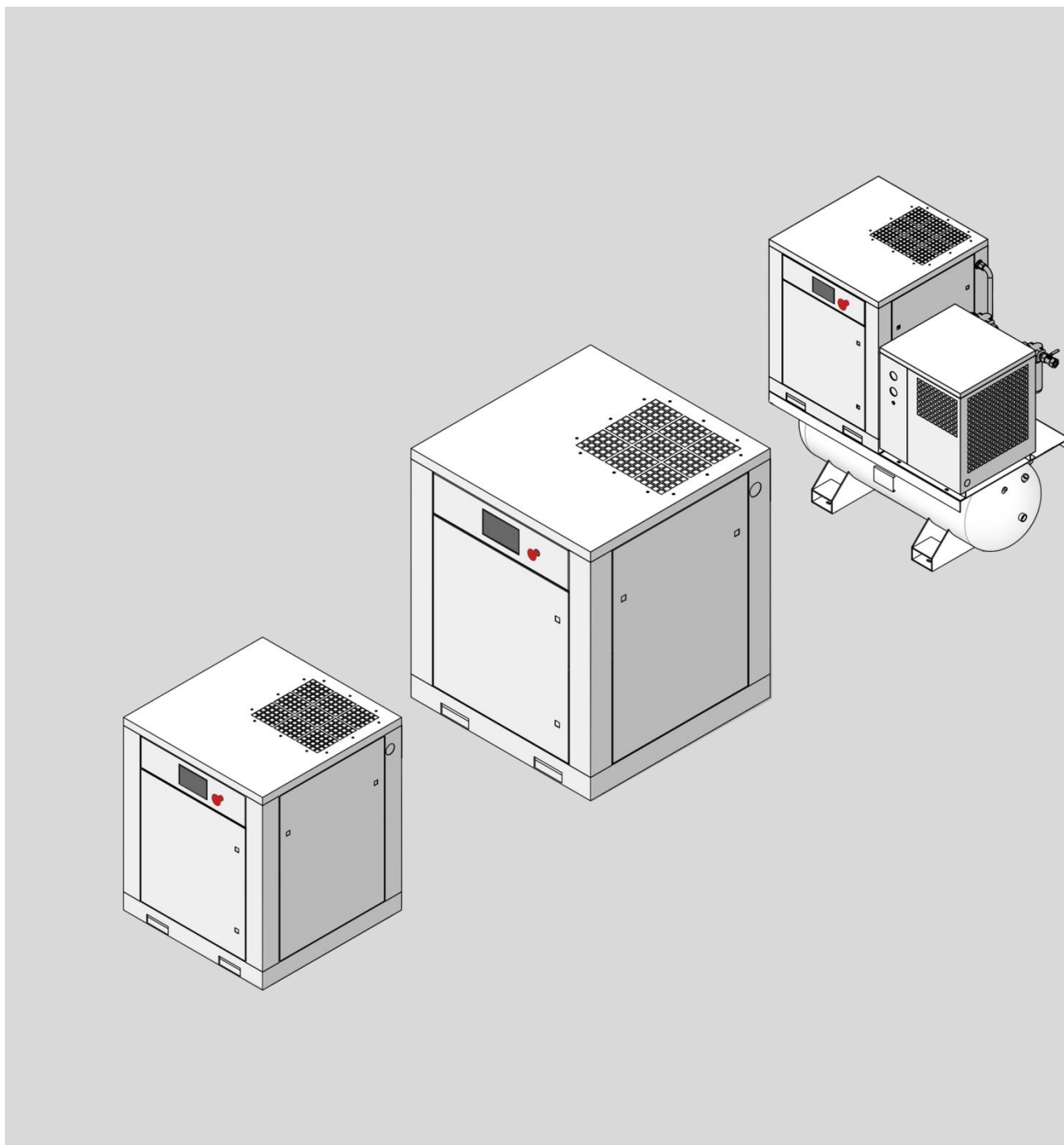


Operating instructions

**firstAir screw compressor
FAS03 – 37**



Read the instructions before operating the compressor!

Visit us at firstaircompressor.com

For support, contact us at support@firstaircompressor.com

Thank you for deciding on a product from our range of screw compressors.

Our company reserves the right to make changes to the design of our products. We are, however, not obliged to modify or optimise any products that have already left the factory. It is, however, possible that we will change the technical data or components without prior notification in future.

.....

Notes:

In the event of general enquiries about the compressor, or questions about maintenance and service, please specify the data on the type plate.

.....

Model: _____

Production number: _____

Date of commissioning: _____

Preface

Thank you for deciding on a product from our range of screw compressors. Our products undergo thorough checks and tests before leaving the factory. In order to be able to guarantee safe, reliable and long-term use of the system, please read the operating instructions carefully before using the system. Compliance with the information about operation contained in the instructions is a prerequisite for a good working condition of the system in the long term.

Thank you!

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2 General information

2.1 Limitation of liability

All information and instructions in this manual have been compiled taking account of the applicable standards and regulations, state-of-the-art technology and our years of knowledge and experience.

The manufacturer assumes no liability for damages caused by:

- Failure to adhere to these instructions
- Improper use
- Assignment of unqualified staff
- Unauthorised conversions
- Technical modifications
- Use of non-approved spare parts

The actual scope of supply may differ from the descriptions and illustrations in these instructions in the case of custom designs, the inclusion of additional order options or as a result of the latest technical modifications.

The obligations agreed in the contract of supply, the manufacturer's general terms and conditions of business and delivery and the legal regulations valid at the time of signing the contract apply.

2.2 Copyright

These instructions are protected by copyright and for internal purposes only.

These instructions must not be made available to third parties, reproduced in any way – even excerpts – and the content must not be utilised and/or communicated, except for internal purposes, without the written permission of the manufacturer.

Any infringement shall be subject to compensation for damages. We reserve the right to assert further claims.

2.3 Guarantee conditions

The guarantee conditions are included in the General Terms and Conditions issued by the manufacturer.

2.4 Customer service

Our Customer Service department is available to provide technical information. See page 2 for contact data.

3.0 Safety instructions

3.1 Explanation of symbols

Safety instructions

The safety instructions and safety information in these instructions are denoted by symbols. The safety instructions are prefaced by signal words which express the extent of the risk.

To prevent accidents, personal injury and property damage, comply with the safety instructions at all times and proceed with caution.



DANGER!

This combination of symbol and signal word indicates an immediate, hazardous situation which will lead to serious or even fatal injuries if not avoided.



WARNING!

This combination of symbol and signal word indicates a potentially hazardous situation which may lead serious or even fatal injuries if not avoided.



CAUTION!

This combination of symbol and signal word indicates a potentially hazardous situation which may cause minor or light injuries if not avoided.



NOTE!

This combination of symbol and signal word indicates a potentially hazardous situation which may cause property damage and environmental damage if not avoided.

3.2 Fundamental dangers

The following section describes residual risks that can arise from the machine and were determined by a risk assessment.

To minimise health hazards and avoid dangerous situations, follow the safety instructions specified here as well as in the following chapters of these instructions.

3.2.1 General dangers at the workplace

Noise



WARNING!
Danger of injury from noise!

The noise level in the work area can cause severe hearing loss.

- Always wear ear protection when working.
- Only stay in the danger zone as long as necessary.

Accumulation of fluids



CAUTION!
Danger of injury due to slipping in accumulated fluids!

Slipping in fluids that have accumulated on the floor may result in a fall. A fall may result in injuries.

- Absorb any accumulations of fluids using suitable means.
 - Wear non-slip safety shoes.
 - Affix warnings and mandatory signs on or near any area in which fluids can accumulate on the floor.
-

3.2.2 Dangers due to electric energy

Electric power



DANGER!

Danger to life due to electric current!

Imminent risk of fatal injury from electric shock in the event of in contact with live parts. Damage to insulation or individual components can present a danger to life.

- Any work on the electrical system must be performed by qualified electricians.
- In the event of damage to insulation, shut down power supply immediately and have repairs performed.
- Before working on active parts of electrical systems and equipment, always disconnect these from the mains supply and ensure they remain disconnected for the duration of the work. In doing so, observe the 5 safety rules:
 - Isolate from electrical supply.
 - Secure against restart.
 - Check for absence of voltage.
 - Ground and short-circuit.
 - Cover or shield any adjacent live parts.
- Never bypass fuses or disable fuses. When replacing fuses, observe the correct amperage.
- Protect energised parts from moisture. This could cause a short circuit.

Stored charges



DANGER!

Danger to life due to stored charges!

Electric charges may be stored in electrical components; these charges may be retained even after the system has been switched off and disconnected from the power supply. Contact with these components may result in serious or fatal injury.

- Before working on the components named, ensure that they have been completely disconnected from the power supply. Allow 10 minutes to elapse to ensure that the internal capacitors have been fully discharged.

3.2.3 Dangers due to mechanical elements

Moving parts



WARNING!

Danger of injury due to moving components!

Rotating parts or parts making linear motions can cause serious injuries.

- Never reach into moving parts or handle moving parts during operation.
- Do not open covers during operation.
- Be aware of the stop delay: Make sure that all parts have stopped moving before opening any covers.
- Wear close-fitting work clothing with low resistance to tearing in the danger area.

Sharp edges and pointed corners



CAUTION!

Danger of injury due to sharp edges and pointed corners!

Sharp edges and pointed corners may cause grazing and cuts to the skin.

- Proceed with caution when working near sharp edges and pointed corners.
- If in doubt, wear protective gloves.

3.2.4 Dangers due to hydraulic energy

Jets of liquid



WARNING!

Danger to life due to jets of liquid escaping under high pressure!

In the event of defective lines or components, a jet of liquid can escape under high pressure. The jet of liquid can cause extremely severe injuries or even death.

- Never hold body parts or objects in the jet of liquid. Keep people out of the danger zone. In the event of accidental contact with the jet of liquid, initiate first aid measures and consult a doctor immediately.
- Initiate an immediate emergency stop. If necessary, take additional measures in order to reduce the pressure and stop the jet of liquid.
- Collect and dispose of escaping liquids properly.

General information / safety instructions

- Have faulty components repaired immediately.

Air receiver



WARNING!

Danger to life in the event of improperly performed work on the air receiver!

Improper handling of air receivers can cause a sudden release of pressure and thereby cause serious or even fatal injuries and considerable material damage.

- Never carry out welding or soldering work on the air receiver tank.
- Do not carry out any mechanical work on the air receiver tank.
- Fully vent the air receiver tank via the fitted vent screw after connecting the pneumatic line.
- Do not start work on compressors with a air receiver before the pressure has been completely relieved and checking that there is no pressure.
- Do not start any work on the air receiver until the gas pre-load pressure has been completely relieved.

Compressed air



WARNING!

Danger of injury due to compressed air!

Compressed air can escape from compressed air hoses or components under pressure in the event of improper handling or in the event of a fault. This can result in eye injuries, dust being raised, or hoses making uncontrolled movements.

Pressurised components can move in uncontrolled manner and can cause injuries if handled incorrectly.

- Before removing pressurised hoses or components, depressurise them.
- Have any faulty pressurised components replaced immediately by specialist personnel.
- Before all work, ensure that the compressor is depressurised; wait at least 5 minutes.

Oil mist



CAUTION!
Danger of injury due to Oil mist!

In the event of high temperatures or mechanical spray dispersion, Oil mist can form. Oil mist can irritate eyes and the respiratory system.

- When working on the Oil system and an Oil mist forms, wear breathing protection and protective goggles and ensure that there is a fresh air supply.

3.2.5 Dangers due to high temperatures

Hot surfaces



WARNING!
Danger of injury due to hot surfaces!

The surfaces of components, and operating materials (e.g. Oil or cooling water) may heat up considerably during operation. Contact between the skin and hot surfaces and liquids cause serious burns to the skin.

- When performing any work near hot surfaces, heat-resistant occupational safety clothing and protective gloves must be worn.
- When performing any work with operating materials, heat-resistant occupational safety clothing and protective gloves must be worn.
- Before any work, make sure that all surfaces have cooled to ambient temperature; wait at least 30 minutes.

Hot operating materials



WARNING!
Danger of injury due to hot operating materials!

Operating materials can reach high temperatures during operation. Skin contact with hot operating materials causes severe skin scalding.

- When performing any work with operating materials, heat-resistant occupational safety clothing and protective gloves must be worn.

- Before performing any work with operating materials, check whether they are hot. If necessary, allow them to cool down.

3.3. Proper use

The machine is designed and constructed for proper use as described here only.

The screw compressor is only used to generate compressed air in a non-explosive environment. The screw compressor may be only supplied with cool, dry and dust-free cooling air.

Proper use also includes compliance with all the information and specifications in these instructions.

Any use going beyond the proper use or other type of use is regarded as misuse.



WARNING! **Danger due to misuse!**

Misuse of the compressor can cause dangerous situations.

- The compressed air may not be used for respiration without prior treatment.
- The compressed air may not be used directly for pharmaceutical or sanitary purposes, or for direct treatment of food, without appropriate after-treatment.
- The screw compressor may not be operated outdoors.
- The screw compressor or individual components may not be converted, modified or re-equipped.
- The screw compressor may not be used in an explosive atmosphere.
- The intake of media other than cool, dry and dust-free cooling air is prohibited.

No claims of any kind can be asserted for damage resulting from misuse.

3.4 Responsibility of the owner

Owner

The owner is the person who operates the machine for commercial or business purposes themselves, or hands it over to a third party for use/application, and who assumes the legal product responsibility for the protection of the user, the personnel or third parties during operation.

Owner obligations

The machine is used for commercial purposes. Therefore, the owner of the machine is subject to legal occupational safety regulations.

In addition to the safety instructions in these instructions, the safety instructions, the regulations for the prevention of accidents and environmental protection regulations applicable at the site of the machine, must also be adhered to.

The following applies in particular:

- The owner must keep informed of the applicable occupational health and safety regulations and identify any additional hazards, resulting from the specific local operating conditions, by performing a risk assessment. These must be implemented in the form of operating instructions for the operation of the machine.
- During the full period of machine use, the owner must check whether the operating instructions created correspond to the current status of rules and regulations and adapt the operating instructions if necessary.
- The owner must clearly regulate and specify responsibilities for installation, operation, repair of malfunctions, maintenance, and cleaning.
- The owner must ensure that all employees who work with the machine have read and understood these instructions. In addition, the owner must train staff at regular intervals and inform the staff of the dangers.
- The owner must provide staff with the required safety clothing and equipment and instruct them that wearing the required protective equipment is mandatory.

Furthermore, the owner is responsible for ensuring that the machine is always in a technically perfect working condition. The following requirements therefore apply:

- The owner must ensure that the maintenance intervals described in these operating instructions are adhered to.
 - The owner must have all safety equipment checked regularly to make sure it is fully functional and complete.
-

- The owner must ensure that the appropriate media connections are provided.
- The owner must ensure that the supply of the required quantity of cooling medium (air/water) is guaranteed.
- The owner must make sure that the required heat extraction is guaranteed.

3.5 Description of the installed safety devices

Main switch with emergency stop function

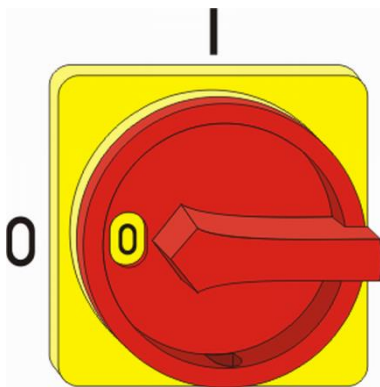


Fig. 1: Main switch

The main switch is also designed as an emergency stop switch. By turning the main switch to the “0” position, the machine is stopped by switching off the power immediately, thereby triggering an emergency stop.



WARNING!
Danger to life due to restarting in an uncontrolled manner!

Restarting the machine in an uncontrolled manner can cause serious or fatal injuries.

- Before restarting, ensure that the reason for the emergency stop has been rectified and that all safety devices are installed and in working order.
- Only turn the main switch to the “I” position when there is no more danger.

Emergency stop button

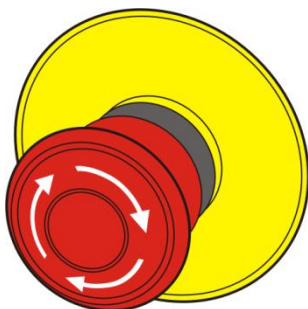


Fig. 2: Emergency stop button

Pressing the emergency stop button stops the machine by switching off the power supply with immediate effect. After an emergency stop button has been pressed, it must be unlocked by turning it to allow a restart.



WARNING!
Danger to life due to restarting in an uncontrolled manner!

Restarting the machine in an uncontrolled manner can cause serious or fatal injuries.

- Before restarting, ensure that the reason for the emergency stop has been rectified and that all safety devices are installed and in working order.

- Do not unlock the emergency stop button until there is no more danger.

Safety valves

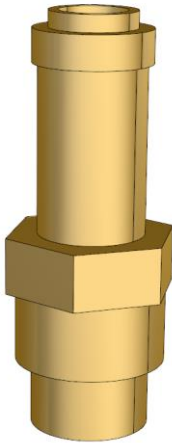


Fig. 3: Safety valve

Safety valves are safety components and are pressure-relief equipment for the areas under pressure such as the boiler, pressure tank, pipes and transport container. In the event of an impermissible pressure increase, safety valves discharge gases, vapours or liquids into the atmosphere.

3.6 Securing against restart



WARNING!

Risk of fatal injury if the machine is restarted without authorisation or in an uncontrolled manner!

An uncontrolled or unauthorised restart of the machine can cause severe or fatal injuries.

- Before restarting, ensure that all safety devices have been fitted and are fully functional, and that there are no hazards for personnel.
- Always adhere to the procedure described below to secure against restart.

4 Design and function

4.1 Design

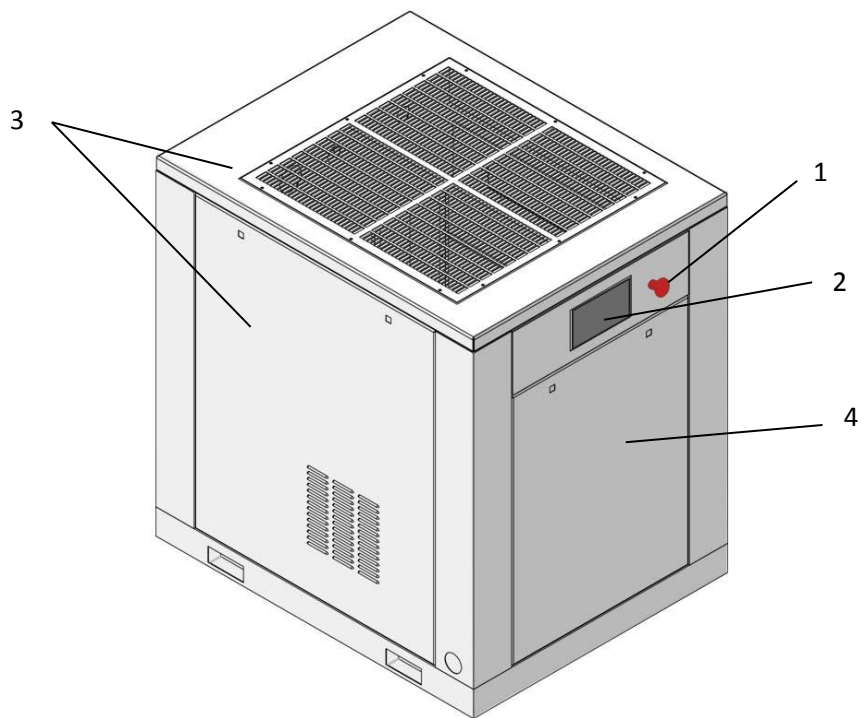


Fig. 1: 37 kW screw compressor

- | | |
|--------------------------|----------------------------|
| 1. Emergency stop button | 3. Noise insulation covers |
| 2. Control panel | 4. Switch cabinet |

Note:

The dimensions and configuration of different models may vary, however share the same basic structure.

4.2 Introduction to the compact, oil-lubricated screw compressor

The compact, oil-lubricated screw compressor is characterised by its reliability, low wear, low vibration properties, smooth running operation and high efficiency.

4.2.1 Brief description of the function

The fresh air supplied by the installed cooling air ventilator is filtered through the intake filter. The air flows over the intake regulator into the compressor stage, where it is compressed together with the injected Oil to the final pressure. The compressed air is largely separated from the Oil in the Oil pressure tank. The subsequent oil separator removes the remaining Oil from the compressed air. The compressed air then flows over the minimum pressure valve and return valve into the compressed air aftercooler and is cooled down before it leaves the screw compressor through the compressed air connection.

The Oil is separated from the compressed air in the Oil pressure tank and the oil separator and flows to the Oil cooler. The Oil temperature regulator adds the cooled Oil to the hot Oil via the Oil cooler bypass in accordance with the temperature set point. Finally, the Oil filter cleans the Oil before it is injected into the compressor stage once again.

4.3 Environmental protection



NOTE!

Danger to the environment due to incorrect handling of environmentally hazardous substances!

If environmentally hazardous substances are handled incorrectly, in particular if they are disposed of incorrectly, there is a risk of considerable harm to the environment.

- Always adhere to the instructions below when handling and disposing of environmentally hazardous substances.
- If environmentally hazardous substances are accidentally released into the environment, take suitable measures immediately. If there are any doubts, inform the responsible community authorities about the damage and enquire about suitable measures to take.

The following environmentally hazardous substances are used:

Oil

Oils can contain toxic substances and substances that are harmful to the environment. They must not be released into the environment. Disposal must be carried out by a specialist disposal company.

Lubricants

Lubricants such as grease, oil and condensate contain toxic substances. They must not be released into the environment. Disposal must be carried out by a specialist disposal company.

4.4 Signage

The following symbols and information signs are posted in the work area. They refer to the immediate surroundings in which they are posted.



WARNING!

Danger of injury due to illegible symbols!

Stickers and signs may become dirty or unidentifiable over time, preventing dangers from being recognised and the necessary operating instructions from being followed. This results in a danger of injury.

- All safety, warning and operating information must be kept in a legible condition at all times.
- Damaged signs or stickers must be replaced immediately.

4.4.1 Warning signs

Electric voltage



Only qualified electricians may work in a room marked with this sign. Unauthorised persons may not enter workplaces marked with this sign, nor open a cabinet marked with this sign.

Automatic start-up



Maintain sufficient distance from all parts that can move; they present a danger of crush injuries or being pulled in.

Hot surface



Hot surfaces, such as machine parts, containers or materials, but also hot liquids, are not always apparent. Do not touch these without protective gloves.

4.4.2 Instructions on the machine

Direction of rotation



There is a direction of rotation sticker on the drive unit and on the cooling air fan. This sticker shows the respective direction of rotation.

Relubrication

Nachschmierung nach XXXX h
Relubrication after XXXX h

The sticker for relubrication is affixed to the drive unit.


Oil filling

Ölfüllung
Oil charged
Remplissage d'huile
XXX XXX No. XXX.XXXXX

The sticker for Oil filling is affixed to the Oil tank and next to the installed controller.

Brief commissioning instructions

The sticker is affixed to the switch cabinet and contains brief commissioning instructions.



Brief commissioning instructions

(The detailed operating instructions must be observed)

Only trained personnel authorised by the operator may set up, operate and maintain the compressor. Operate the compressor in a cool, dry and dust-free environment with good ventilation. Room temperature between +5 °C and +40 °C. A connection to the compressed air network must be made using a flexible hose or vibration compensator. Do not break the aluminium compressed air connection sleeve of the compressor open with a threaded pipe.

Before connecting the electricity, check the required current type, voltage and frequency. Check whether the oil level is at a maximum. The maximum oil level is the lower edge of the oil filler nozzle. The oil must be checked regularly for condensate. Any condensate must be removed using the oil drain and must be reported to Customer Service.

ATTENTION! Check the correct direction of rotation. The correct direction of rotation is indicated by the rotation direction arrow on the compressor stage. To do so, check that the direction of rotation is to the right by using a rotating field measurement device. Start the compressor using start button I; the green lamp lights up. If the network pressure is already higher than the switch-on pressure, the flashing green lamp indicates the compressor is ready for operation.


CAUTION! When the green lamp is flashing, the compressor can switch on by itself at any time! Only switch off the compressor using stop button 0. Red flashing lamp = warning. Red lamp remains lit = fault (compressor standstill). In the event of a warning or fault, observe the display and call customer service if necessary.

If you have any questions, please specify the data on the type plate. The type plate is on the compressed air outlet side of the switch cabinet, or on the lower frame on the maintenance side.

ATTENTION!

Only open the sound damping hood when the compressor is switched off and at a standstill.

Attention:
Danger of injury!
Remove main fuses.



5 Technical data

5.1 Type plate



Fig. 4: Type plate

The type plate is affixed to the rear of the system and contains the following information:

- Licence number
 - Model
 - Capacity
 - Maximum pressure
 - Motor power
 - Net weight
 - Dimensions
 - Manufacturer no.
 - Manufacture date
-

5.2 General specifications

5.2.1 Operating conditions

- Environment

Physical variable	Numerical value	Unit
Temperature range	5 – 45	°C
Maximum relative humidity	60	%
Maximum installation altitude above sea level	1 000	m

5.2.2 Operating materials

- FAS03 –06

Type	Lubricant	Oil quantity	Unit
FAS03	Oil	1.6	Gal
FAS04	Oil	1.6	Gal
FAS06	Oil	1.6	Gal

- FAS07 – 11

Type	Lubricant	Oil quantity	Unit
FAS07	Oil	2.1	Gal
FAS11	Oil	2.1	Gal

- FAS15

Type	Lubricant	Oil quantity	Unit
FAS15	Oil	2.1	Gal

■ FAS18 – 22

Type	Lubricant	Oil quantity	Unit
FAS18	Oil	3.2	Gal
FAS22	Oil	3.2	Gal

■ FAS30 – 37

Type	Lubricant	Oil quantity	Unit
FAS30	Oil	4.75	Gal
FAS37	Oil	4.75	Gal

5.2.3 Air supply and cooling

■ FAS03-6

Type	Compressed air outlet	Cooling air volume
	G/DN	m ³ /h
FAS03	G 1/2	850
FAS04	G 1/2	850
FAS06	G 1/2	850

■ FAS07 – 11

Type	Compressed air outlet	Cooling air volume
	G/DN	m ³ /h
FAS07	G 3/4	1200
FAS11	G 3/4	1200

Design and function

■ FAS15

Type	Compressed air outlet	Cooling air volume
	G/DN	m ³ /h
FAS15	G 3/4	1200

■ FAS18 – 22

Type	Compressed air outlet	Cooling air volume
	G/DN	m ³ /h
FAS18	G 1 1/4	5300
FAS22	G 1 1/4	5300

■ FAS30 – 37

Type	Compressed air outlet	Cooling air volume
	G/DN	m ³ /h
FAS30	G 1 1/2	10 500
FAS37	G 1 1/2	10 500

5.3 FAS03 – 37

5.3.1 Power and dimensions

- FAS03-6

Type	Rated motor output	Screw compressor (standard)		Screw compressor (incl. compressed air tank)		Screw compressor (incl. compressed air tank and dryer)	
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]
FAS03	3	660 x 600 x 890	220	1500 x 600 x 1440	335	1450 x 600 x 1440	425
FAS04	4	660 x 600 x 890	230	1500 x 600 x 1440	345	1450 x 600 x 1440	435
FAS06	5.5	600 x 600 x 890	240	1500 x 600 x 1440	355	1450 x 600 x 1440	445

Design and function

■ FAS07 – 11

Type	Rated motor output	Screw compressor (standard)		Screw compressor (incl. compressed air tank)		Screw compressor (incl. compressed air tank and dryer)	
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]
FAS07	7.5	800 x 800 x 995	280	1650 x 800 x 1510	460	1600 x 800 x 1600	560
FAS11	11	880 x 830 x 1075	300	1650 x 830 x 1665	480	1600 x 830 x 1665	580

■ FAS15

Type	Rated motor output	Screw compressor (standard)		Screw compressor (incl. air tank)		Screw compressor (incl. air tank and dryer)	
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]
FAS15	15	880 x 830 x 1075	400	1500 x 830 x 1590	580	1500 x 830 x 1680	680

■ FAS18 – 22

Type	Rated motor output	Screw compressor (standard)	
	kW	L x W x H [mm]	Weight [kg]
FAS18	18.5	1050 x 880 x 1260	500
FAS22	22	1050 x 880 x 1260	570

■ FAS30 – 37

Type	Rated motor output	Screw compressor	
	kW	L x W x H [mm]	Weight [kg]
FAS30	30	1000 × 1250 × 1310	850
FAS37	37	1000 × 1250 × 1310	880

5.3.2 Connection values

■ FAS03-6

Type	230 V / 460V - 60 Hz current value
	SFA
FAS031	20
FAS033	12.8 / 6.4
FAS041	27.5
FAS043	17.7 / 8.8
FAS061	34.6
FAS063	22.9 / 11.5

■ FAS07 – 11

Type	230 V / 460V - 60 Hz current value
	SFA
FAS073	28.2 / 14.2
FAS113	40.9 / 20.5

Design and function

■ FAS15

Type	230 V / 460V - 60 Hz current value
	SFA
FAS153	61 / 30.4

■ FAS18 – 22

Type	230V / 460 V - 60 Hz current value
	SFA
FAS183	74.4 / 37.1
FAS223	83.8 / 41.9

■ FAS30 – 37

Type	230V / 460 V - 60 Hz current value
	SFA
FAS303	115 / 57.5
FAS373	138.8 / 69.4

6. Screw compressor installation

6.1 Safety instructions for installation and commissioning

Electrical system

**DANGER!****Danger to life due to electric current!**

Danger to life in the event of contact with live components. Active electrical components may make uncontrolled movements and result in severe injuries or even death.

- Switch off the electric power and secure it against a restart before starting work.

Improper commissioning

**WARNING!****Danger of injury due to improper commissioning!**

Improper commissioning may result in serious injuries and considerable property damage.

- Ensure that all installation work has been performed and completed according to the information and instructions in these instructions before commissioning.
 - Before commissioning, ensure that there is nobody in the danger area.
-

Securing against a restart



WARNING!

Danger of fatal injury due to unauthorised restart!

Switching the power supply back on without authorisation during installation presents a danger of severe injuries, or even death, for persons working in the danger zone.

- Switch off all power supplies and secure them against a restart before starting work.

Improper installation and commissioning



WARNING!

Danger of injury due to improper installation and initial commissioning!

Improper installation and initial commissioning can cause serious injuries and considerable property damage.

- Before starting work, ensure sufficient installation space.
- Use caution when handling exposed sharp-edged components.
- Make sure that installation area is organised and clean! Loosely stacked components, or components and tools left lying around, are a source of accidents.
- Install components correctly. Comply with all specified screw tightening torques.
- Ensure components cannot be dropped or cannot fall over.
- Prior to initial commissioning, observe the following:
 - Ensure that all installation work has been performed and completed according to the information and instructions included in these instructions.
 - Ensure that there is nobody in the danger area.

6.2 Requirements for the installation location

Set up the screw compressor so that the following conditions are complied with:

- The installation location is level.
- The stability of the machine is guaranteed.
- The machine is easily accessible and can be accessed from all sides.
- There is sufficient lighting.
- There is sufficient ventilation.
- A power supply is available.
- Escape routes and rescue equipment are freely accessible.
- The machine is not exposed to an explosive atmosphere.
- The machine is not exposed to a corrosive atmosphere.
- The machine is not exposed to direct sunlight.
- There is no external heat from surrounding sources of heat.
- No dust can accumulate.
- Fire protection measures have been taken.
- The machine is not exposed to vibrations.
- The surface is resistant to solvents, impermeable to liquids, is anti-static and easy to clean.
- There are no machines in the vicinity which cause electrical or electromagnetic interference.

6.3 Installation

If the screw compressor is installed in a location which does not comply with the requirements and without specific planning, and operation starts as soon as the lines have been connected, this will, in most cases, be the cause of problems with maintenance as well as a poor quality of the compressed air generated by the screw compressor.



NOTE!

Choosing a suitable installation site is a requirement for proper use of the screw compressor system.

6.4 Information about lines and the foundation

6.4.1 Dangers due to mechanical elements

Moving parts



WARNING!

Danger of injury due to moving components!

Rotating parts or parts making linear motions can cause serious injuries.

- Never reach into moving parts or handle moving parts during operation.
- Do not open covers during operation.
- Be aware of the stop delay: Make sure that all parts have stopped moving before opening any covers.
- Wear close-fitting work clothing with low resistance to tearing in the danger area.

Sharp edges and pointed corners



CAUTION!

Danger of injury due to sharp edges and pointed corners!

Sharp edges and pointed corners may cause grazing and cuts to the skin.

- Proceed with caution when working near sharp edges and pointed corners.
- If in doubt, wear protective gloves.

6.5 General information and safety instructions in relation to electric operating materials

6.5.1 Dangers due to electric energy

Electric power



DANGER!

Danger to life due to electric current!

Imminent risk of fatal injury from electric shock in the event of in contact with live parts. Damage to insulation or individual components can present a danger to life.

- Any work on the electrical system must be performed by qualified electricians.
- In the event of damage to insulation, shut down power supply immediately and have repairs performed.
- Before working on active parts of electrical systems and equipment, always disconnect these from the mains supply and ensure they remain disconnected for the duration of the work. In doing so, observe the 5 safety rules:
 - Isolate from electrical supply.
 - Secure against restart.
 - Check for absence of voltage.
 - Ground and short-circuit.
 - Cover or shield any adjacent live parts.
- Never bypass fuses or disable fuses. When replacing fuses, observe the correct amperage.
- Protect energised parts from moisture. This could cause a short circuit.

Stored charges



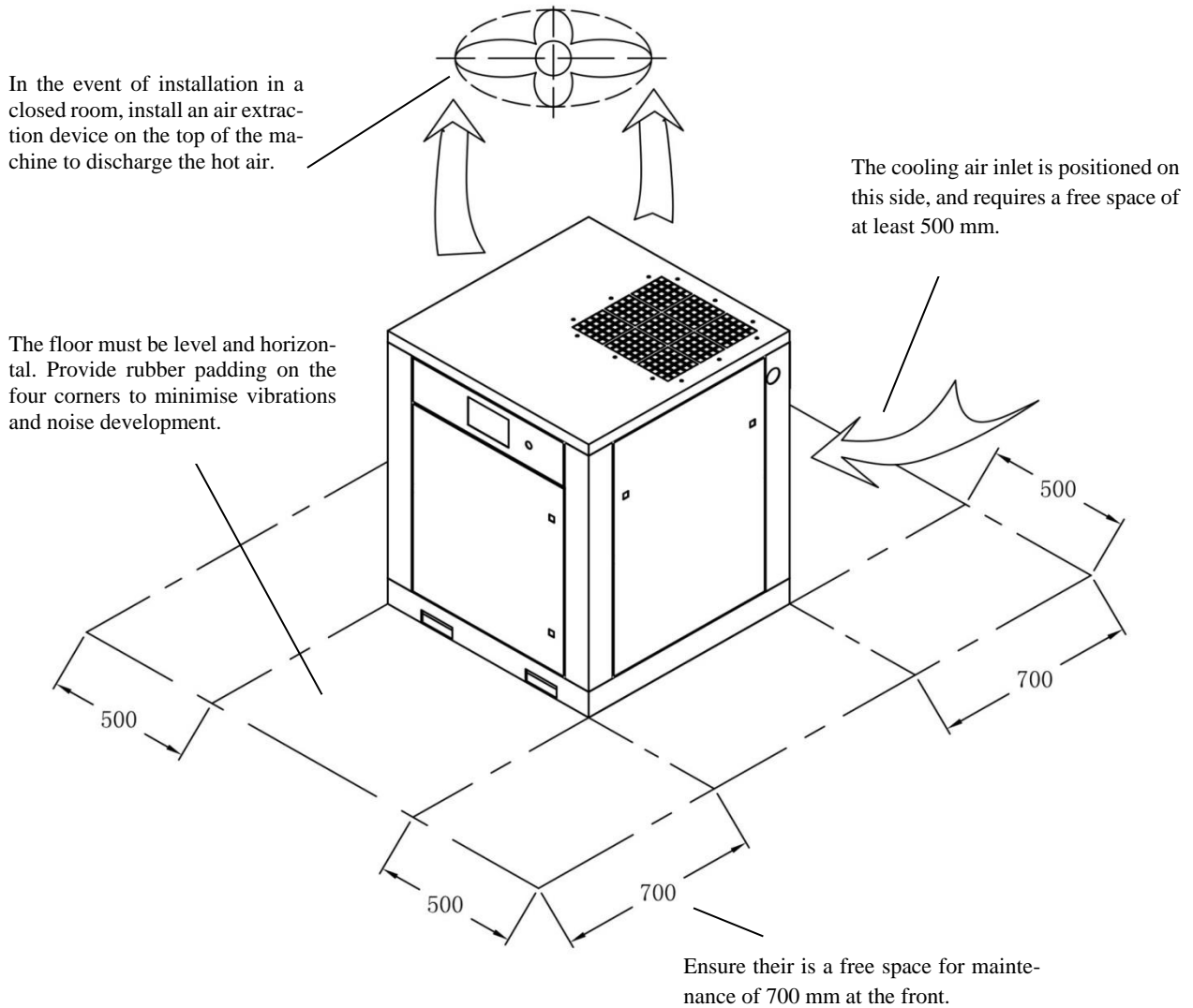
DANGER!

Danger to life due to stored charges!

Electric charges may be stored in electrical components; these charges may be retained even after the system has been switched off and disconnected from the power supply. Contact with these components may result in serious or fatal injury.

- Before working on the components named, ensure that they have been completely disconnected from the power supply. Allow 10 minutes to elapse in order to ensure that the internal capacitors have been fully discharged.

Installation



Schematic diagram of the installation requirements for the screw compressor

7 Interfaces and function of the individual components

7.1 Interfaces

7.1.1 Compressed air route

Dust is filtered from the intake air in the intake filter, and is then conducted through the intake regulator to the compressor stage, where it is compressed and mixed with the Oil. It flows from there to the Oil pressure tank. The compressed air enters the consumer network through the oil separator, the minimum pressure valve and the compressed air aftercooler.

7.1.2 Functional description of the individual components in the compressed air circuit

1. Intake filter

The intake filter is a dry filter made of paper. The maintenance interval is stored in the controller, and can be changed if ambient conditions vary.

2. Intake regulator

When the system pressure falls, the intake regulator ensures a new supply of air to the compressor.

3. Compressor stage

The intake air is compressed by the compressor stage and is conducted to the Oil pressure tank together with the injected Oil.

4. Drive

The compressor stage is driven by an electric motor. This motor is installed on the base frame and drives the main rotor of the compressor stage by means of 2 belt discs with the corresponding transmission ratios. The motor is also controlled using a frequency converter to correspond to consumption on the FAS SC 7 – 37 models.

5. Oil pressure tank

The Oil pressure tank is comprised of several components. The safety valve protects the Oil pressure tank from overpressure. The inspection glass is used to check the Oil level. The Oil is topped up through the filler nozzle and removed through the Oil drain. When at a standstill, the Oil level must be between the upper and lower limit value in the inspection glass. Due to the large cross-section of the Oil pressure tank, the flow rate of the Oil–air mixture is reduced, and this is where the majority of the Oil is separated from the compressed air.

6. Oil separator

The oil separator removes additional Oil from the compressed air. The oil separator needs to be removed in specific time intervals. The maintenance interval is stored in the controller, and can be changed if ambient conditions vary.

7. Minimum pressure and non-return valve

The minimum pressure valve is installed above the Oil–air tank and only opens when the system pressure increases to 4.5 bar.

After switching off the screw compressor, the minimum pressure and non-return valve prevents the compressed air from flowing back out of the network.

8. Compressed air aftercooler

The cooling air fan blows cold air through the cooling fins of the air cooler, thereby cooling the compressed air flowing through it. The cooling effect is highly dependent on the ambient temperature when cooling the air. Observe the ventilation conditions when choosing an installation location. If ambient conditions are not good, deposits of dust can quickly form on the air cooler fins, impairing the cooling effect. This can result in high compressed air final temperatures and, ultimately, to the system heating up. Make sure that the surface of the cooler remains clean.

7.2 Oil interfaces

7.2.1 Oil route

The Oil is injected into the compressor stage together with the intake air. After compression, the compressed air, mixed with Oil, enters the Oil pressure tank. Most of the Oil is separated here. The remaining air, which contains Oil mist, passes the oil separator. More cooling liquid is separated here, and conveyed back to the Oil pressure tank. Due to the pressure in the Oil pressure tank, Oil is pressed into the Oil cooler, and cools down. Contaminants and particles are then removed in the Oil filter. The Oil flow is then split into two parts: one part is injected into the compression chamber through the bottom end of the system housing in order to cool the compressed air; the other part is used to lubricate the bearings on both ends of the system; both flows are then combined at the base of the compression chamber and discharged with the compressed air into the Oil pressure tank.

7.2.2 Functional description of the individual components in the Oil circuit

1. Oil cooler

The Oil cooler and the compressed air aftercooler function in the same cooling mode. The cooling air fan blows cold air through the cooling fins of the air cooler, thereby cooling the compressed air flowing through it. The cooling effect is highly dependent on the ambient temperature when cooling the air. Observe the ventilation conditions when choosing an installation location. If ambient conditions are not good, deposits

of dust can quickly form on the air cooler fins, impairing the cooling effect. This can result in high compressed air final temperatures and, ultimately, to the system overheating. This is why the cooler fins need to be cleaned regularly. Make sure that the surface of the cooler remains clean.

2. Oil filter

The Oil filter is a paper filter that can filter contaminants out of the Oil, such as metal particles. A mesh size of 10 µm ensures bearings and rotors are protected reliably. If the Oil filter is not replaced as specified in the maintenance table, there is a danger of an insufficient flow rate of Oil, high compressed air final temperatures and a shutdown of the system. The service life of the bearings may also be impaired by an insufficient Oil volume.

3. Oil separator

The filter element of the oil separator is comprised of multiple layers of fine fibreglass, allowing the proportion of Oil mist in the compressed air to be reduced significantly after passing the oil separator. The quality of the Oil and the degree of contamination of the ambient air have a large impact on its service life. Only the Oil for screw compressors that we recommend may be used as a Oil.

The Oil filtered by the oil separator is collected in the small, round cavity in the middle, and is conveyed back to the compressor stage through a Oil return line.

4. Oil temperature regulator

There is a thermoregulation valve in front of the Oil cooler. The Oil temperature is low shortly after starting up the system. The thermoregulation valve then automatically opens the return circuit, allowing Oil to flow into the system without passing the Oil cooler. If the Oil temperature increases to more than 67 °C, this valve opens slowly until it is fully open at 72 °C. The entire Oil then passes the Oil cooler first before flowing into the system.

8 Protective and warning devices

8.1 Motor overload protection

There are two electric motors in the screw compressor – a main drive motor and a motor for the cooling air fan. When the operating current exceeds the set upper limit for the protective device under normal operating conditions, the overload protection device automatically shuts down the power supply. After shutdown, the screw compressor starts up again automatically if it has not otherwise been reset by pressing the reset switch manually. The current protection device is set at the factory, and this is very important for protection when the compressor is operating normally. These settings must not be changed without authorisation.

If a motor overload occurs during operation, please contact your service partner immediately. Otherwise there is a danger of further damage.

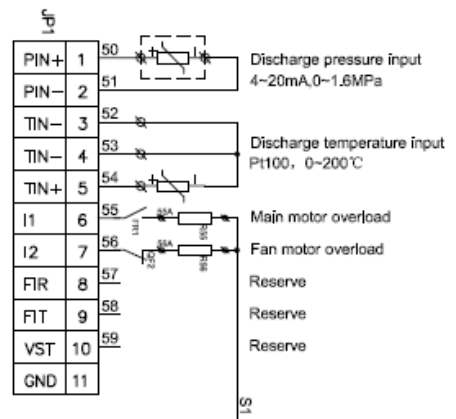
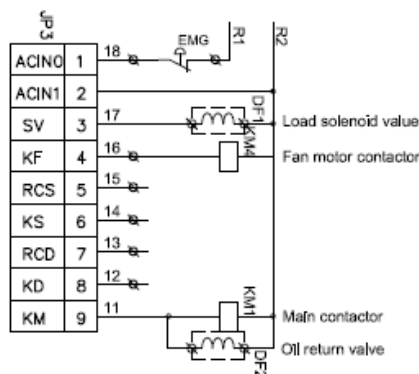
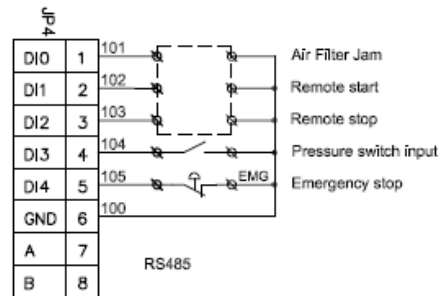
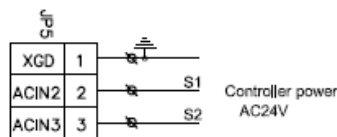
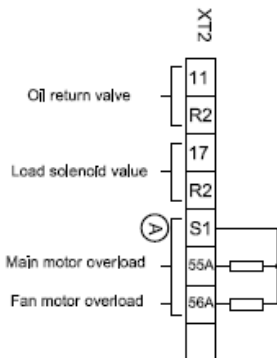
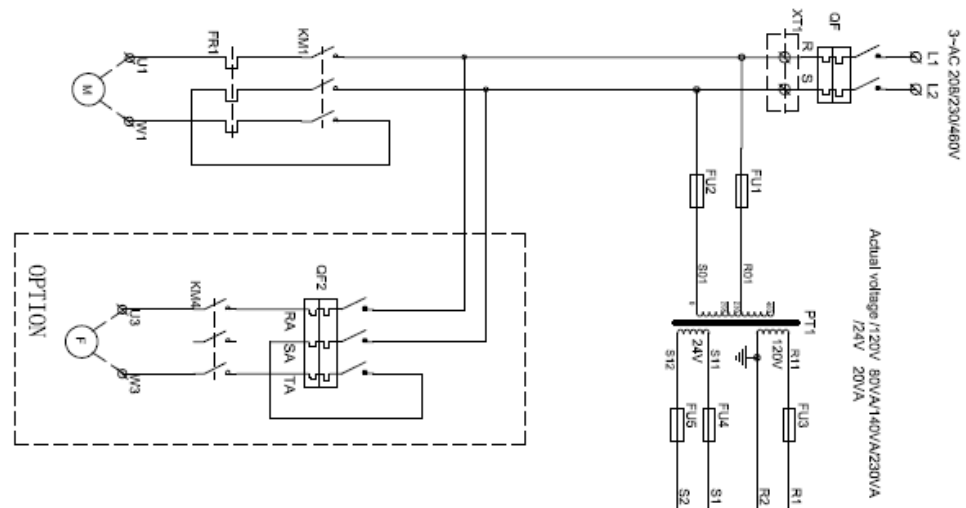
8.2 Compressed air final temperature – excess temperature protection

The maximum compressed air final temperature of the system totals 95 °C. At temperatures above this value, the display will flash and an alarm is triggered. If the temperature exceeds 100 °C, the system automatically shuts down the power supply. There are many possible reasons for an excessively high temperature at the compressed air outlet, with the most frequent being a high level of contaminants in the Oil cooler. When the fins of the Oil cooler are dusty, the cold air can no longer pass the cooler freely, and the temperature gradually increases and causes the system to shut down after reaching the corresponding value. This is why the fins need to be cleaned in short intervals.

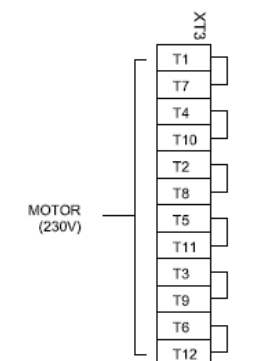
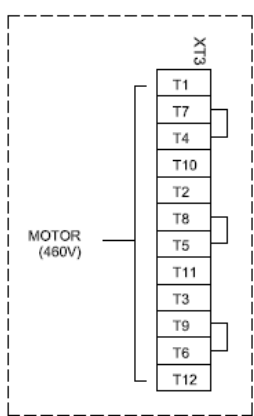
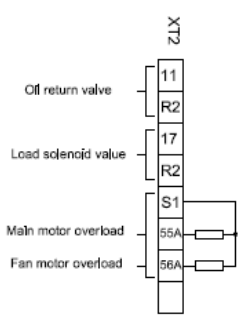
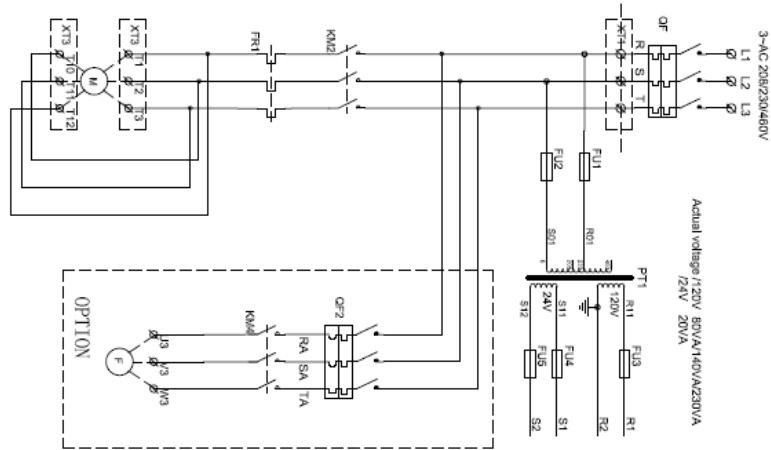
The maximum ambient temperature of the screw compressor totals 45 °C. Consequently, an installation location with a low ambient temperature and good ventilation must be chosen whenever possible. If the excess temperature protection is tripped, the start circuit of the system is stopped; pressing the reset button allows the system to be restarted.

9. Electrical circuit diagram

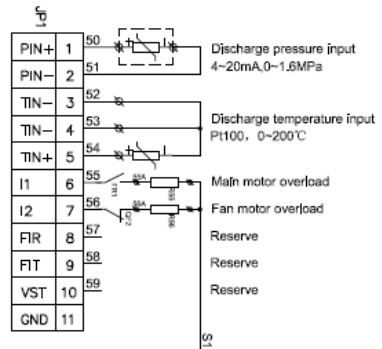
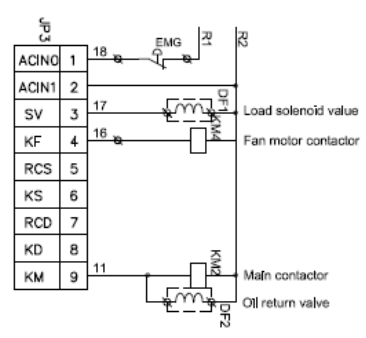
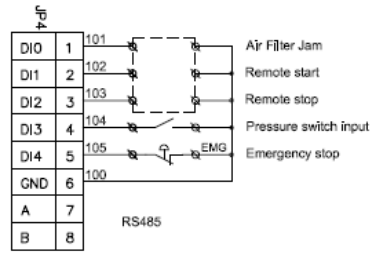
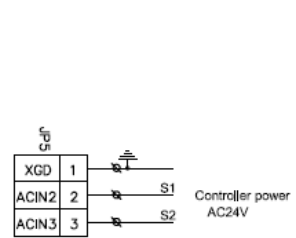
FAS03 – 06 SINGLE PHASE



FAS03 – 06 3 PHASE (DOL)

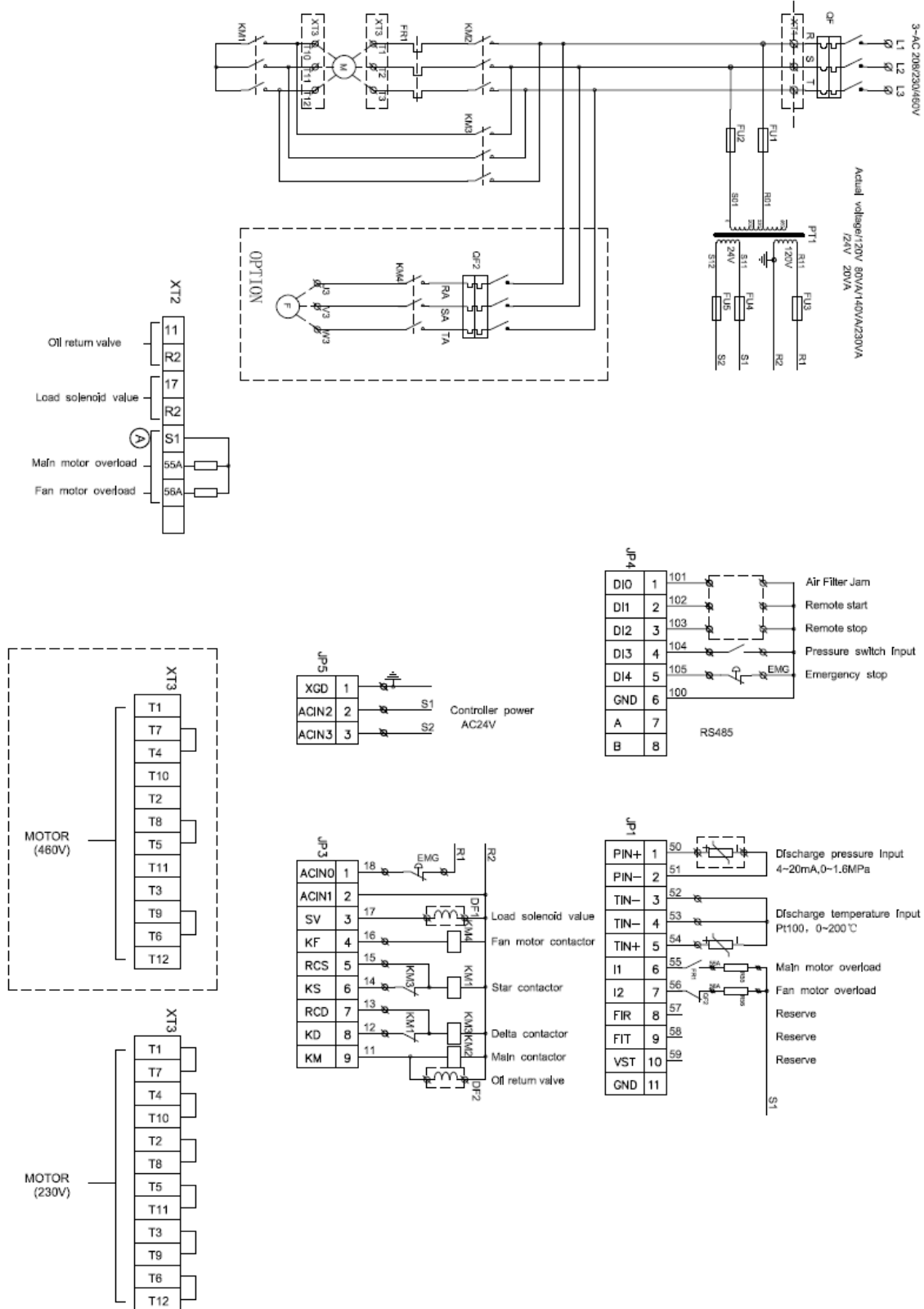


Note: The factory wiring 230V



Electrical circuit diagram

FAS07 – 37 3 PHASE (Y-D)



10 Transportation, packaging and storage

10.1 Safety instructions for transportation

Improper transportation



NOTE!

Property damage due to improper transportation!

Improper transportation can cause packages to fall or topple over. This can cause considerable property damage.

- Proceed with caution when unloading packages upon delivery and when transporting them on the premises, and observe the symbols and instructions on the packaging.
- Only use the fastening points provided.
- Do not remove packaging until shortly before installation.

10.2 Transportation inspection

Upon receipt of the delivery, check for completeness and transportation damage immediately.

In the event of visible transportation damage on the outside, proceed as follows:

- Do not accept the delivery, or only conditionally.
- Make a note of the extent of the damage on the transportation documents or the delivery note issued by the transportation company.
- File a complaint.



File a complaint about each defect as soon as it has been identified. Claims for damages can only be lodged within the applicable claim periods.

10.3 Packaging

About the packaging

The individual screw compressors are packaged in cartons or, at times, on wooden frames and in accordance with the expected transport conditions. Only environmentally-friendly materials are used for the packaging.

The packaging is designed to protect the individual components from transport damage, corrosion and other damage until they are installed. You must therefore not destroy the packaging and not remove it until shortly before installation.

Handling packaging materials

Packaging material must be disposed of in accordance with the legal provisions and local regulations applicable respectively.



NOTE!

Danger for the environment due to incorrect disposal!

Packaging material is a valuable resource and can, in many cases, be re-used or be reconditioned and recycled. Incorrect disposal of packaging materials can cause environmental hazards.

- Dispose of the lubricant in an environmentally friendly manner.
- Observe the disposal regulations applicable locally. Commission a specialist company with disposal, if necessary.

10.3.1 Symbols on the packaging

The following symbols are affixed to the packaging. Always observe these symbols during transportation.

Top



The tips of the arrows point to the top of the package. They must always point upwards, as otherwise the content may be damaged.

Fragile



Identified packages with fragile or sensitive content.

Handle the package with care, do not drop it and do not subject it to impacts.

Protect from moisture



Protect the package from moisture and keep it dry.

10.4 Transportation

Transportation with a fork lift

Packages can be transported with a fork lift under the following conditions:

- The fork lift must be engineered for the weight of the packages.
 - Existing guide rails on the frame must be used.
 - The length of the forks must be at least 1400 mm.
-

Transporting

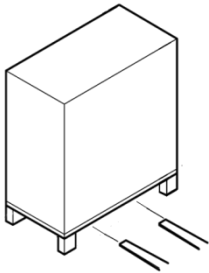


Fig. 5: Transportation with a fork lift

1. Use the fork lift with the forks inserted as shown in fig. 5.
2. Insert the forks so that they protrude on the other side.
3. Ensure that the package cannot tip if the centre of gravity is off-centre.
4. Lift the package and begin transportation.

10.5 Storage

Storage of the packages

Store the packages under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free environment.
- Do not expose to any aggressive media.
- Protect from exposure to sunlight.
- Avoid mechanical jolts.
- Storage temperature: 15 to 35 °C.
- Relative humidity: max. 60%.
- In the event of storage for more than 3 months, check the general condition of all parts and the packaging regularly. If necessary, refresh or replace the rust-proofing.



Under some circumstances, there may be notes about storage on the packages which extend beyond the requirements specified here. Adhere to these accordingly.

11 Operation

11.1 Operating

11.1.1 Safety instructions for operation

Improper operation

**WARNING!****Danger of injury due to improper operation!**

Improper operation may result in serious injuries and considerable property damage.

- Carry out all operating steps in accordance with the specifications and information in these instructions.
- Before starting work, observe the following:
 - Ensure that all covers and safety equipment are installed and function properly.
 - Ensure that there are no persons in the danger area.
- Never disable or bypass safety equipment during operation.

11.1.2 Shutting down in an emergency

In dangerous situations, components movements must be stopped and the power supply has to be shut off as quickly as possible.

Shutting down in an emergency

In an emergency, proceed as follows:

1. Immediately trigger the emergency stop by means of the emergency stop device.
 2. If there is no danger to your own health, remove personnel from the danger zone.
 3. Administer first aid measures as necessary.
 4. Alert the fire services and/or rescue services.
 5. Inform the responsible parties at the location.
 6. Switch the machine off and secure to prevent a restart.
 7. Clear access routes for emergency vehicles.
 8. Brief rescue vehicles.
-

Following rescue measures

9. Inform the responsible authorities if the severity of the emergency requires this.
10. Assign specialist personnel to rectify the fault.



WARNING!

Risk of fatal injury if the machine is restarted without authorisation or in an uncontrolled manner!

An uncontrolled or unauthorised restart of the power supply can result in severe or fatal injuries.

- Before restarting, ensure that all safety devices have been fitted and are fully functional, and that there are no hazards for personnel.

11. Before restarting the machine, ensure that all safety equipment is installed and functional.

11.3 Commissioning, starting and shutting down

11.3.1 Removing the transport protection

Remove the transport protection screw on the vibration damper plate on the base of the unit.



NOTE!

Damage to the compressor stage due to insufficient lubrication!

If the unit is started up after a long transport route, 0.5 l of Oil must be filled in the compressor stage straight away, and the screw compressor must be rotated several times by hand to ensure it does not start up without lubrication.

11.3.2 Connecting to the power supply

Personnel: ■ Qualified electrician

Protective equipment: ■ Protective work clothing
■ Safety shoes

**NOTE!**

Danger of material damage to the compressor stage as a result of incorrect connection of the power supply!

In the event of incorrect connection of the power supply, the compressor stage may be destroyed due to an incorrectly rotating drive.

- Connect the power in accordance with the circuit diagram and check the rotating field before starting the screw compressor.



Prerequisites for correct installation are correctly dimensioned fuses in the mains supply (person-system protection) and a suitable main switch (for switching the supply on and off).

1. Using the data in the circuit diagram (in the switch cabinet), check whether the existing mains supply is suitable. Voltage deviations of more than 10% are not permitted.
 2. Connect the power in accordance with the circuit diagram included in the delivery and in accordance with the technical data.
 3. Check that the direction of rotation is to the right by using a rotating field measurement device.
 4. Ensure that the power cable does not present a stumbling hazard.
-

11.3.3 Connecting to the compressed air network

Personnel:	■ Qualified personnel
Protective equipment:	■ Protective work clothing ■ Safety shoes
Materials:	■ Flexible compressed air hose, max. 1.5 m



WARNING!

Danger of injury due to unpredictable movement of the compressed air hose!

Load switches in the compressed air network cause the compressed air hose to move suddenly, and with high force.

- Anchor and fasten the compressed air hose sufficiently.



A properly planned, installed and serviced compressed air network and an additional stop valve installed at the input to the compressed air network are prerequisites for correct installation.

1. Connect the compressed air in accordance with the technical data.
2. Ensure that the compressed air hose does not present a stumbling hazard.
3. Anchor and fasten the flexible compressed air hose sufficiently.

11.3.4 Switching on – switching off

Check

- whether all screw connections are tight
- that the Oil level in the Oil pressure tank is between the highest level (H) and the lowest level (L).

Press **“ON”**. The compressor starts operation. The current compressor data appear on the controller display.

Pressing the **“OFF”** switch makes the controller switch off the motor once the run-on time has elapsed. (The switch-off delay prevents the compressor from stopping immediately under heavy loads and Oil from escaping from the intake side

This does not apply for **“EMERGENCY STOP”**; in this case, the compressor shuts down immediately!)

11.3.5 Precautionary measures during operation

1. In the event of strong vibrations or unusual noises, the compressor must be shut down immediately using the **“Emergency stop”** button.
2. Lines, tanks and valves are pressurised during operation. Removal of panels or opening screws and nuts during operation is prohibited.
3. If the Oil level falls below the minimum level and the temperature gradually increases during extended periods of operation, stop the system immediately. Check the liquid level after 10 minutes of downtime. If it is still insufficient, wait until the system is no longer pressurised. Then refill Oil.



A sufficiently high compression temperature ensures that the moisture in the intake air does not form condensate. Switching the screw compressor on and off frequently may result in the compressor not reaching the required operating temperature.



NOTE!

Danger of material damage due to condensate in the Oil circuit!

Condensate in the Oil circuit can result in the destruction of the compressor stage.

- In the event of condensate in the Oil pressure tank, contact our service immediately; see page 2 for the contact data.



Condensate is heavier than the Oil

Because the condensate is heavier than the Oil, it collects on the bottom of the Oil pressure tank after extended downtime.

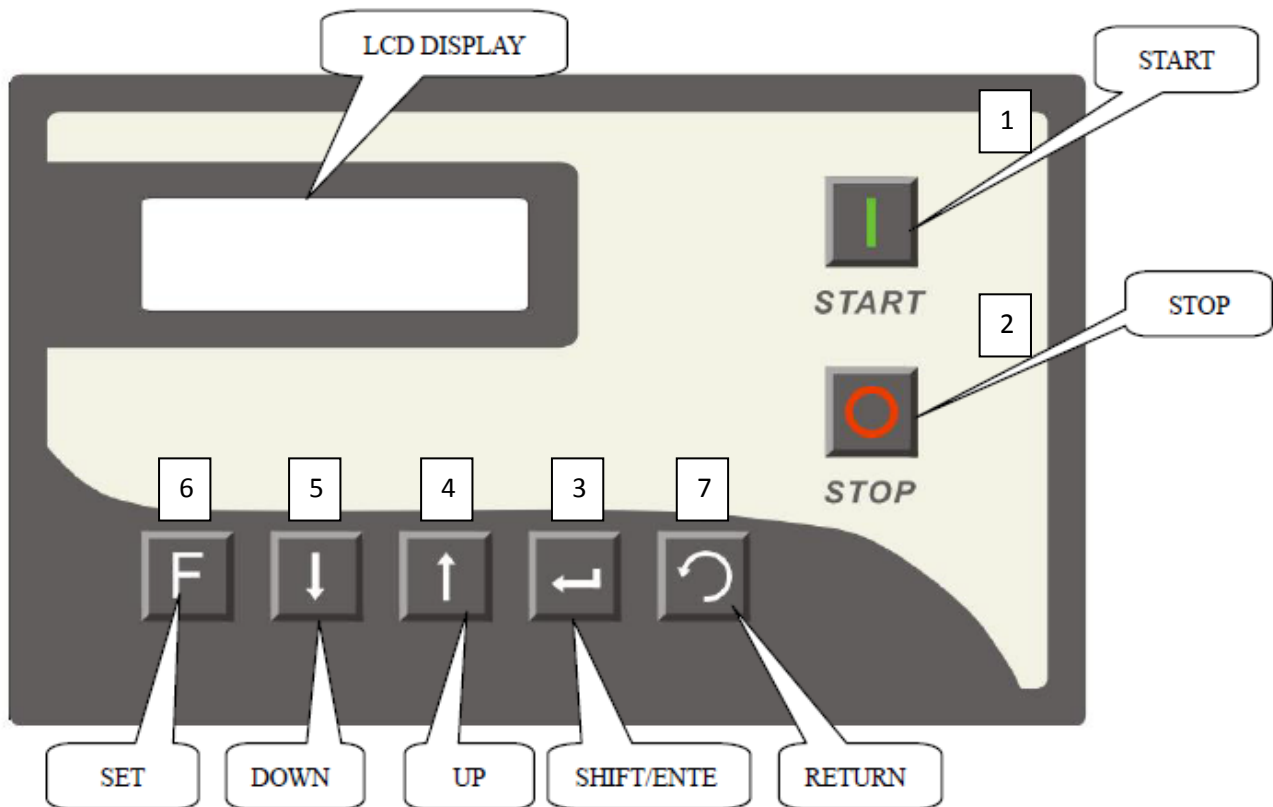
11.3.6 Break in period

The compressor comes from the factory filled with break-in fluid. This fluid needs to be replaced after 500 hours of operation. **After 500 hours, replace the oil and oil filter.**



12 Instructions for operation

12.1 Control panel



12.2 Description of the individual buttons

1 START – Starts and operates the screw compressor, as long as it is free of faults, and switches from “Shutdown” to “Operation” mode.

2 STOP: Stops compressor operation.

3 SET – Press this button after changing parameters to confirm the input data.

4 ARROW UP – Press this button when changing data to increase the value. This button is also used as a selection button when making menu selections.

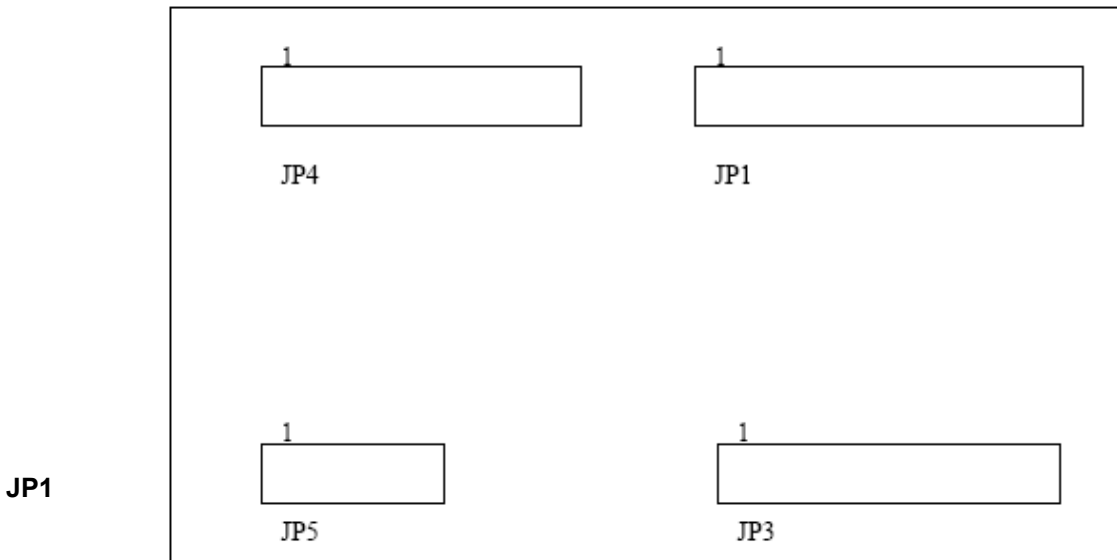
5 ARROW DOWN – Press this button when changing data to decrease the value. This button is also used as a selection button when making menu selections.

6 SHIFT/ENTER – This button is used as a shift button for data changes, and as an enter button when making menu selections.

7 ESC – This button is used to return to a higher-level menu when using the menu.

12.3 Characteristics of the digital inputs and outputs

Description of the control interface



No.	Designation	Description
1	PIN+	Pressure sensor input +
2	PIN-	Pressure sensor input
3	TIN-	Temperature sensor input
4	TIN-	Temperature sensor input
5	TIN+	Temperature sensor input
6	I1	Input for current host sensor (R)
7	I2	Input for current host sensor (T)
8	FIR	Input for current cooling air fan sensor (R)
9	FIT	Input for current cooling air fan sensor (T)
10	VST	Input for three-phase voltage sensor
11	GND	Ground

JP4

No.	Designation	Description
1	DI0	Air filter signal input (usually open)
2	DI1	Oil filter signal input (usually open)
3	DI2	Precipitator element signal input (usually open)
4	DI3	Pressure switchover input (usually open)
5	DI4	Emergency stop signal input (usually closed)
6	GND	Ground
7	A	RS485
8	B	RS485

JP3

No.	Designation	Description
1	ACIN0	Contact input via power1 (public access point for relay output)
2	ACIN1	Contact input via power2 (public access point for internal RC element)
3	VD	Load solenoid valve output
4	KF	Cooling air fan contactor output
5	RCS	RC element output, star-delta starter
6	KS	Star-delta starter contactor output
7	RCD	RC element output, delta starter contactor
8	KD	Delta starter contactor output
9	KM	Main contactor output

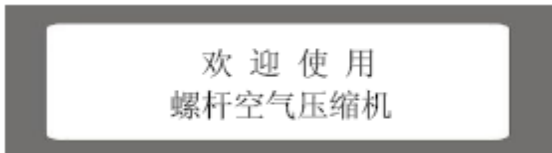
JP5

No.	Designation	Description
1	XGD	Contact with ground
2	ACIN0	25 V AC voltage (the same to R)
3	ACIN1	25 V AC voltage (the same to S)

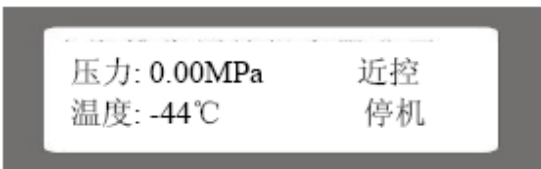
12.4 Operating the screw compressor

12.4.1 Start and start side

After switching on the controller, the operating display on the control panel lights up. A start page appears on the screen.



The standard screen appears automatically after 5 seconds.



The pressure generated, the compressor temperature and the speed in percent are shown in the screen shown above.

12.4.2 Main menu of the screw compressor

Press **“ARROW DOWN” (5)** on the control panel to open the main menu for the compressor.

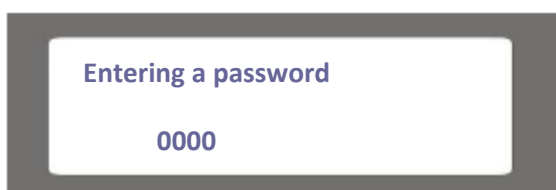


There are four options in the following screen:
Queries – System – Maintenance – Fault
The current menu is marked at the right by **“◆”**.

12.4.3 Set parameters (F)

To change the set parameters, a four-digit password must first be entered. The digit currently active flashes. Press **“ARROW UP” (4)** to increase the current value by “1” and **“ARROW DOWN” (5)** to decrease the current value by the same amount. Move the flashing digit by pressing the **“F” (6)** button. Press the **“F” (6)** button after completing the input.

Operating instructions



If the password entered is correct, press **“F” (6)** to open the menu. “Controller”, “Time” and “Maintenance” then appear on the screen. Press **“ESC” (7)** to return to page 1 for the compressor.



The current menu is marked at the right by **“◆”**. If the symbol **“◆”** displays the selected function, press **“F” (6)** to open the operating screen. To change between parameters, press **“ARROW UP” (4)** or **“ARROW DOWN” (5)**. Press **“ESC” (7)** to return to the page to set the parameters.

12.5 Messages about operating, alarm and fault statuses

12.5.1 Operating status

No.	Status displayed	Description of the status
1	Compressor stopped	Normal stop, compressor can be started
2	Emergency stop of the compressor	The emergency stop button was pressed
3	Compressor running	The compressor is running
4	Compressor pressurised	The compressor is pressurised normally
5	Compressor not pressurised	The compressor is not pressurised
6	Compressor – idle stop	Idling period elapsed, compressor was stopped (normal stop)
7	Compressor Stop delay	Compressor must depressurise before it can be started
8	Delay – main motor overload	The main motor is overloaded, the compressor can only be started after a given delay
9	Contact manufacturer	Servicing or maintenance is required on the compressor

12.5.2 Alarm due to minor faults

A minor fault is signalled in the status bar of the control panel. **The compressor does not stop**; you will, however, be informed that a minor intervention is required.

No.	Alarm displayed	Description of the alarm
1	Replace air filter	The air filter service life has expired – replace air filter, reset compressor
2	Air filter blocked	Air filter blocked or defective – needs replacement
3	Replace Oil filter	The Oil filter service life has expired – replace Oil filter, reset compressor
4	Oil filter blocked	Oil filter blocked or defective – needs replacement
5	Replace Oil precipitator	The Oil precipitator service life has expired – replace Oil precipitator, reset compressor
6	Oil precipitator blocked	Oil precipitator blocked or defective; needs replacement
7	Replace lubricant	The lubricant service life has expired – replace lubricant, reset compressor
8	Alarm – high compressed air final temperature	The compressed air final temperature is too high, check the cooling system
9	Alarm – ambient temperature too low	The ambient temperature is too low – increase the ambient temperature
10	Alarm – ambient temperature too high	The ambient temperature is too high – decrease the ambient temperature
11	Motor bearing temperature too high	The temperature of the bearings in the main motor is too high – check motor bearing
12	Main motor – current too high	The current at the main motor is too high – check the lubrication system
13	Temperature precipitator tank too high	The temperature in the precipitator tank is too high – check the cooling and lubrication system

12.5.3 Alarm due to major faults

If a major fault occurs and the system cannot be restarted, **the compressor stops**. Rectify the problem and restart the compressor. A major fault is displayed in the status line of the controller.

No.	Alarm displayed	Description of the alarm
1	Alarm – High compressed air final temperature	The compressed air final temperature is too high – check the lubrication system
2	Alarm – high final pressure	The final pressure is too high – check the safety valve
3	Temperature sensor – no signal	No temperature sensor signal – check sensor and cable
4	Pressure transducer – no signal	No pressure transducer signal, check sensor and cable
5	Stop – main motor overload	The main motor is overloaded, check the lubrication system for the drive
6	Stop – cooling air fan motor overload	The motor for the cooling air fan is overloaded – check the cooling air fan; if a thermal overload relay is installed, reset the relay
7	Stop – water loss (for water-cooled systems)	Cooling water could not be refilled – check the cooling water system
8	Phase sequence fault	Direction of drive rotation incorrect – change phase sequence of input current
9	Temperature too low	The lubricant temperature is too low – heat up the lubricant
10	Voltage too high	The supply voltage is too high – check the voltage supply
11	Voltage too low	The supply voltage is too low – check the voltage supply
12	Precipitator tank temperature too high	The temperature in the precipitator tank is too high – check the cooling system
13	Precipitator tank pressure too high	The pressure in the precipitator tank is too high – check the relief valve
14	Current incorrect	The power supply fluctuates, pressure relief current too high – check the power supply and relief valve

15	Inverter fault	An inverter feedback fault has occurred.
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13 Maintenance

13.1 Safety instructions for maintenance

Electrical system



DANGER!

Danger to life due to electric current!

Danger to life in the event of contact with live components. Active electrical components may make uncontrolled movements and result in severe injuries.

- Switch off the electric power and secure it against a restart before starting work.

Moving parts



WARNING!

Danger of injury due to moving components!

Rotating parts or parts making linear motions can cause serious injuries.

- Before carrying out any maintenance work on moving components, switch off the machine and secure it against restart. Wait until all components have come to a complete standstill.
- Wear close-fitting work clothing with low resistance to tearing in the danger area.

Securing against a restart



WARNING!

Danger of fatal injury due to unauthorised restart!

Restarting the power supply without authorisation during maintenance puts any personnel in the danger zone at risk from severe injuries, or even death.

- Switch off all power supplies and secure them against a restart before starting work.

Hot surfaces**WARNING!****Danger of injury due to hot surfaces!**

The surfaces of components, and operating materials (e.g. Oil or cooling water) may heat up considerably during operation. Contact between the skin and hot surfaces and liquids cause serious burns to the skin.

- When performing any work near hot surfaces, heat-resistant occupational safety clothing and protective gloves must be worn.
- When performing any work with operating materials, heat-resistant occupational safety clothing and protective gloves must be worn.
- Before any work, make sure that all surfaces have cooled to ambient temperature; wait at least 30 minutes.

Improperly performed maintenance work**WARNING!****Danger of injury due to improperly performed maintenance work!**

Improper maintenance can cause serious injuries and considerable property damage.

- Before starting work, ensure sufficient installation space.
- Make sure that installation area is organised and clean! Loosely stacked components, or components and tools left lying around, are a source of accidents.
- If components were removed, ensure correct installation, reinstall all fastening elements and observe screw torques.
- Prior to re-commissioning, observe the following:
 - Ensure that all maintenance work has been performed and completed according to the information and instructions included in these instructions.
 - Ensure that there is nobody in the danger area.
 - Ensure that all covers and safety equipment are installed and function properly.

Compressed air



WARNING!

Danger of injury due to compressed air!

Compressed air can escape from compressed air hoses or components under pressure in the event of improper handling or in the event of a fault. This can result in eye injuries, dust being raised, or hoses making uncontrolled movements.

Pressurised components can move in uncontrolled manner and can cause injuries if handled incorrectly.

- Before removing pressurised hoses or components, depressurise them.
- Have any faulty pressurised components replaced immediately by specialist personnel.
- Before all work, ensure that the compressor is depressurised; wait at least 5 minutes.

Oil mist



CAUTION!

Danger of injury due to Oil mist!

In the event of high temperatures or mechanical spray dispersion, Oil mist can form. Oil mist can irritate eyes and the respiratory system.

- When working on the Oil system and a Oil mist forms, wear breathing protection and protective goggles and ensure that there is a fresh air supply.

Accumulation of fluids



CAUTION!

Danger of injury due to slipping in accumulated fluids!

Slipping in fluids that have accumulated on the floor may result in a fall. A fall may result in injuries.

- Absorb any accumulations of fluids using suitable means.
- Wear non-slip safety shoes.
- Affix warnings and mandatory signs on or near any area in which fluids can accumulate on the floor.

Environmental protection

Adhere to the following instructions on environmental protection when performing maintenance work:

- Remove any escaped, used or excess grease from all lubrication points which are supplied with lubricant by hand and dispose of it in accordance with the applicable local regulations.
- Collect replaced Oils in suitable containers and dispose of them in accordance with the applicable local regulations.

The following sections describe maintenance work that is required for optimal and fault-free operation of the machine.

If increased wear is identified during regular checks, the required maintenance intervals must be shortened to correspond to the actual signs of wear. For questions about maintenance work or intervals, contact the manufacturer; see the contact data on page 2.

13.2 Oil and filter replacement

No.	Designation	Maintenance cycle
1	Air filter	Every 2 000h
2	Oil filter	Every 2 000h
3	Oil separator	Every 4 000h (FAS03, 4, 6 every 2000h)
4	Oil	Replace break in fluid after 500h, every 4 000h thereafter

13.3 Maintenance

No.	Content	Maintenance cycle					
		Check daily	2 000 h or 1x year	4 000 h or 1x year	8 000 h or every 2 years	16 000 h or every 3 years	24 000 h or every 4 years
1	Compressed air – check temperature and Oil parameters	x	x	x	x	x	x
2	Check for compressed air and Oil leaks	x	x	x	x	x	x
3	Check for leakage	x	x	x	x	x	x
4	Check the voltage, amperage and temperature increase in the motor of the screw compressor		x	x	x	x	x
5	Check for vibrations and noises	x	x	x	x	x	x
6	Clean the system technically		x	x	x	x	x
7	Replace Oil and Oil filter		x	x	x	x	x
8	Replace air filter insert		x	x	x	x	x
9	Check the belt and replace when necessary (on models with belt drive)		x	x	x	x	x
10	Check fasteners		x	x	x	x	x
11	Check the Oil cooler and compressed air aftercooler, clean when necessary		x	x	x	x	x
12	Check the temperature of the cooler		x	x	x	x	x
13	Clean the cover of the cooling air fan and fins of the main motor		x	x	x	x	x
14	Refill lubricant for main motor		x	x	x	x	x
15	Clean or replace prefilter screen		x	x	x	x	x
16	Check all valves			x	x	x	x

Maintenance

No.	Content	Maintenance cycle					
		Check daily	2 000 h or 1x year	4 000 h or 1x year	8 000 h or every 2 years	16 000 h or every 3 years	24 000 h or every 4 years
17	Check or calibrate pressure sensor and temperature sensor			X	X	X	X
18	Check the power supply to the switch cabinet and the solenoid valve			X	X	X	X
19	Replace the oil separator		X*	X	X	X	X
20	Check the vibration dampers			X	X	X	X
21	Clean the motor fins and the fan hood			X	X	X	X
22	Replace Oil		X*	X	X	X	X
23	Replace the intake regulator				X	X	X
24	Replace the minimum pressure valve				X	X	X
25	Replace the temperature control valve				X	X	X
26	Replace motor bearings					X	X
27	Overhaul/replace compressor stage						X

(* FAS03, 4, 6 only)

The maintenance intervals depend on the operating conditions and get along with cool and clean ambient conditions, a high operating grade and low load runs.

At differing requirements the manufacturer have to be informed!

13.4 Measures on completion of maintenance

After completion of the maintenance work and before switching the machine on, carry out the following steps:

1. Check all screw connections which were unfastened beforehand to make sure they are tightened.
2. Check whether all protective devices and covers removed beforehand have been reinstalled properly.
3. Ensure that all tools, materials and other items of equipment that were used have been removed from the work area.
4. Carefully open the compressed air network-side shut-off valve.
5. Clean the work area and remove any substances such as fluids, processing material or similar that may have escaped.
6. Ensure that all safety equipment on the machine functions perfectly.

14 Troubleshooting the screw compressor

Fault description	Cause	Remedy	Personnel
Compression temperature too high	Intake or ambient temperature too high	Ventilate compressor room	Trained person
	Cooling air intake or outlet blocked	Unblock cooling air intake or outlet sufficiently	Trained person
	Oil contains contaminants	Replace the Oil	Qualified personnel
	Oil low	Refill Oil	Qualified personnel
	Oil cooler contains contaminants	Clean the Oil cooler	Qualified personnel
Network pressure drops	Compressed air consumption higher than delivery quantity of the screw compressor	Screw compressor with higher delivery quantity necessary	Manufacturer
	Intake filter clogged	Replace intake filter	Qualified personnel
	Relief valve discharges during compression	Check relief valve and replace gaskets if necessary	Manufacturer
	Intake regulator does not open	Check solenoid valve and plunger and replace if necessary	Manufacturer
Network pressure drops	Leaks in the compressed air network	Seal the compressed air network	Qualified personnel

Troubleshooting

Fault description	Cause	Remedy	Personnel
Screw compressor discharges via safety valve	Minimum pressure valve blocked	Clean or replace minimum pressure valve	Manufacturer
	Safety valve faulty	Check safety valve and replace if necessary	Manufacturer
	Oil separator clogged	Replace the oil separator	Qualified personnel
<i>"High pressure" in display</i>	Oil separator clogged	Replace the oil separator	Qualified personnel
	Higher outside pressure present in compressed air network	Equalise outside pressure or disconnect from the network	Qualified personnel
Screw compressor does not start automatically or does not convey after being switched off beforehand by reaching the final pressure or from idle	Network pressure set too high	Reset network pressure	Trained person
	Interruption in the power circuit	Check power circuit for interruption	Qualified electrician
	Ambient temperature below +1 °C, message	Install auxiliary heating or regulate temperature of compressor room, and also contact the manufacturer	Qualified personnel
	Switching times are activated in the circuit	Check switching and pressure times in the circuit	Trained person

Troubleshooting

Fault description	Cause	Remedy	Personnel
System does not start up when the start switch is pressed	Network pressure higher than switch-on pressure	Observe network pressure and change settings	Trained person
	“Lokl” or “Remo” symbol flashes	Remote control activated	Trained person
	No voltage at the screw compressor	Check whether there is voltage	Qualified electrician
	Electrical fault in the controller	Check controller	Qualified electrician
Compressed air contains a lot of Oil (Oil consumption too high)	Return line for the Oil is blocked	Clean or replace return line for the Oil	Qualified personnel
	Faulty oil separator	Replace oil separator	Qualified personnel
System stops before reaching the final pressure	Excess temperature or overpressure	Rectify fault	Qualified personnel
	Interruption in the control power circuit	Check power circuit	Qualified electrician
Pressure drop	Pressure difference of the filters too high	Replace filter	Qualified personnel

14.1 Commissioning after rectifying a fault

After rectifying the fault, carry out the following steps for recommissioning:

1. Check all screw connections which were unfastened beforehand to make sure they are tightened.
2. Ensure that all tools, materials and other items of equipment that were used have been removed from the work area.
3. Check whether all protective devices and covers removed beforehand have been reinstalled properly.
4. Reset emergency stop equipment.
5. Acknowledge fault
6. Carefully open the compressed air network-side shut-off valve.
7. Make sure that there is nobody in the danger area.
8. Start the screw compressor

15 Dismantling and disposal

Once the service life has ended, the machine must be dismantled and disposed of in an environmentally responsible manner.

15.1 Safety instructions for dismantling and disposal

Electrical system

**DANGER!****Danger to life due to electric current!**

Danger to life in the event of contact with live components. Active electrical components may make uncontrolled movements and result in severe injuries.

- Switch off the electric power supply and secure it against a restart before starting to dismantle the machine.

Improper dismantling

**WARNING!****Danger of injury due to improper dismantling!**

Any residual energy stored, sharp-edged components, points and corners on or in the machine or the tools required can result in injuries.

- Before starting work, ensure there is sufficient space.
- Use caution when handling exposed sharp-edged components.
- Ensure the workplace is organised and clean! Loosely stacked components, or components and tools left lying around, are a source of accidents.
- Dismantle components properly. Observe what can be high inherent component weights. If necessary, using lifting equipment.
- Ensure components cannot be dropped or cannot fall over.
- Consult the manufacturer in the event of uncertainty.

15.2 Dismantling

Before starting dismantling:

- Switch the machine off and secure to prevent a restart.
- Physically disconnect the entire power supply from the machine, allow stored residual energy to discharge.
- Remove operating materials and auxiliary materials, as well as residual processing materials and dispose of them in an environmentally responsible manner.

Then clean modules and components properly and disassemble them in compliance with the occupational safety and environmental regulations applicable locally.

15.3 Disposal

If no agreement has been made for return or disposal, recycle the disassembled components:

- Scrap metals.
- Recycle plastic elements.
- Sort other components by material properties and dispose of them separately.



NOTE!

Danger for the environment due to incorrect disposal!

Incorrect disposal can cause environmental hazards.

- Have electrical scrap, electronic components, lubricants and other consumables disposed of by certified specialist companies.
- If there are any doubts about environmentally responsible disposal, contact the local community authorities or specialist disposal company for information.

