

Manual

Screw compressor

G Drive 38 - 45, 56 - 75 V Drive 38 - 45, 56 - 75



Read the instructions prior to performing any task!

ALMiG Kompressoren GmbH Adolf-Ehmann-Straße 2 73257 Köngen, Germany Phone: +49 7024 9614 240 Fax: +49 7024 9614 209 Email: info@almig.de Internet: www.almig.de Service Hotline: Phone: +49 1805 25 87 00 Fax: +49 1805 25 87 01 Translation of the original operating instructions

© ALMiG Kompressoren GmbH 2015



Information on these operating instructions

These instructions enable you to use the machine safely and efficiently. The instructions are a component part of the machine and must be kept in the direct vicinity of the machine and be accessible for staff at all times.

Staff must have carefully read and understood these instructions before starting all work. The basic prerequisite for safe working is compliance with all the safety and operating instructions included in these operating instructions.

The local occupational health and safety regulations and general safety rules for the application area of the machine also apply.

The instructions for the machine do not cover operation of the controller. Therefore, the instructions and content of the instructions for the controller in question must also be taken into account.

Furthermore, the instructions found in the appendices for the installed components also apply.

Copyright

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

Passing this manual on to third parties, duplication of any kind – even in the form of excerpts – as well as the use and/or disclosure of its contents without the written consent of the manufacturer is not permitted, except for internal purposes.

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

Limitation of liability

All information and instructions in this manual have been compiled taking account of the applicable standards and regulations, state-ofthe-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 replacement 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.

Customer service

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

Our employees are also always interested in receiving new information and hearing of your experiences from practice which may be valuable for improving our products.



Table of contents

1	Overview	7
	1.1 Overview	7
	1.2 Brief description	9
	1.3 Description of assemblies	9
	1.3.1 Controller	
	1.3.2 Sound insulation covers	. 10
	1.3.3 Drive unit	. 10
	1.3.4 Intake filter	. 10
	1.3.5 Compressor stage	
	1.3.6 Coolant liquid pressure tank	
	1.3.7 Fine precipitator	
	1.3.8 Minimum pressure and non-return valve	
	1.3.9 Cooler	
	1.3.10 Coolant liquid filter	
	1.3.11 Cooling air fan	
	1.4 Interfaces	.14
2	Safety	.16
	2.1 Symbols in these instructions	.16
	2.2 Proper use	. 17
	2.3 Responsibility of the owner	.18
	2.4 Personnel requirements	.18
	2.4.1 Qualifications	. 18
	2.4.2 Unauthorised persons	.19
	2.4.3 Training	
	2.5 Personal protective equipment	.19
	2.6 Fundamental dangers	.20
	2.6.1 General dangers at the workplace	
	2.6.2 Dangers due to electric energy	
	2.6.3 Dangers due to mechanical elements	
	2.6.4 Dangers due to hydraulic energy	
	2.6.5 Dangers due to pneumatics and stored residual energy	
	2.6.6 Dangers due to chemical substances	
	2.6.7 Dangers due to high temperatures	
	2.7 Safety devices	
	2.7.1 Position of the safety devices	
	2.7.2 Description of the installed safety devices	
	2.8 Securing against restart	
	2.9 Behaviour in the event of fire or accidents	
	2.10 Environmental protection	
	2.11 Signage	
	2.11.1 Warning signs	
	2.11.2 Instructions on the machine	.29



3	Technical data	30
	3.1 Type plate	30
	3.2 Emissions	
	3.3 General specifications	
	3.3.1 Operating conditions	
	3.3.2 Coolant liquid3.3.3 Operating materials	
	3.4 Screw compressor G Drive 38 – 45, 56 – 75	
	3.4.1 Plant data	
	3.4.2 Air supply and cooling	
	3.4.3 Connection values	
	3.5 Screw compressor V Drive 38 – 45, 56 – 75	38
	3.5.1 Plant data	38
	3.5.2 Air supply and cooling	38
	3.5.3 Connection values	40
4	Transport, packaging and storage	42
	4.1 Safety instructions for transport	42
	4.2 Transport inspection	42
	4.3 Packaging	42
	4.4 Symbols on the packaging	42
	4.5 Transport	43
	4.6 Storage	43
5	Installation and initial commissioning	44
	5.1 Safety instructions for installation and initial commissioning	
	5.2 Requirements for the installation location	45
	5.3 Installation	45
	5.3.1 Ventilation	45
	5.3.2 Water cooling (optional)	47
	5.3.3 Heat recovery for heating/drinking water	
	5.3.4 Connecting to the compressed air network	
	5.3.5 Connecting to the power supply	
	5.4 Checking the coolant liquid level	
	5.5 Start-up lubrication of the compressor stage	
	5.6 Switching on after installation	
	5.7 Tasks after initial commissioning	
	5.8 Setting parameters	
6	Operation	
-	6.1 Safety instructions for operation	
	6.2 Controller	
	6.3 Shutting down in an emergency	
7	Maintenance	
•		
	7.1 Safety instructions for maintenance	55



	7.2 Replacement parts	57
	7.3 Maintenance schedule	57
	7.4 Maintenance work	59
	7.4.1 Checking for leaks	59
	7.4.2 Checking the coolant liquid level/topping up the coolant liquid	
	7.4.3 Checking the compressor temperature	61
	7.4.4 Checking soiling of the cooler	
	7.4.5 Replacing the intake filter	
	7.5 Measures on completion of maintenance	
8	Faults	65
	8.1 Safety instructions for fault rectification	65
	8.2 Fault displays	
	8.3 Fault table	
	8.4 Commissioning after rectifying a fault	69
9	Disassembly and disposal	70
	9.1 Safety instructions for disassembly and disposal	70
	9.2 Disassembly	70
	9.3 Disposal	
	•	

	Anhang	71
Α	Training log	72
в	Screw tightening torques	73
С	Service manual	74
D	Replacement parts list	78



1 Overview

1.1 Overview

Screw compressor

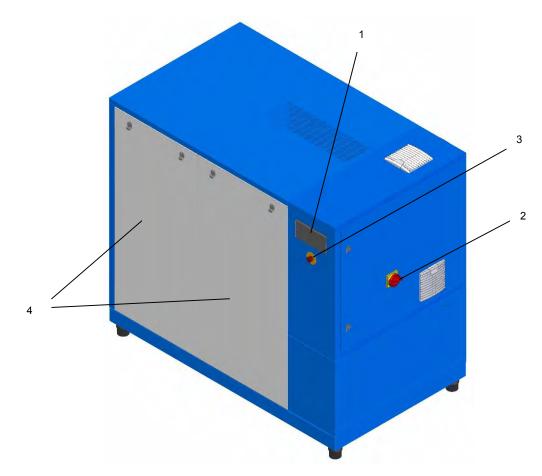


Fig. 1: Screw compressors G/V Drive 38 – 45, 56 – 75

- 1 Controller
- 2 Main switch

- 3 Emergency stop button (option)4 Sound insulation covers

This chapter illustrates the screw compressors described in these instructions. The various compressors primarily differ in terms of size and the installed drive. However, their basic construction is the same.



Assemblies

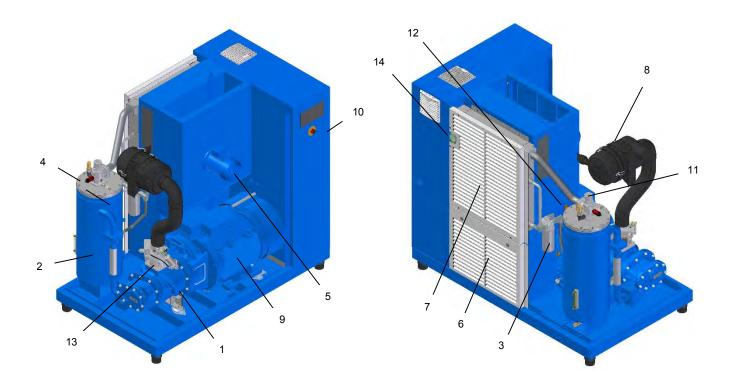


Fig. 2: Screw compressor G/V Drive 38 – 45, 56 – 75

- 1 Compressor stage
- (G Drive with gearbox)
 2 Coolant liquid pressure tank
 3 Coolant liquid filter
 4 Fine precipitator
 5 Cooling for for

- 5 Cooling air fan6 Coolant liquid cooler7 Compressed air after-cooler

- Intake filter 8
- 9 Motor
- 10 Switch cabinet
- (V Drive with frequency converter)
- 11 Minimum pressure and non-return valve
- Safety valve
 Intake regulator
- 14 Compressed air connection



1.3 Description of assemblies

1.3.1 Controller

Controller variants

For the controller variant installed, please consult the label on the controller. For detailed information about the controller installed, consult the separate Controller documentation.

1.2 Brief description

The air drawn in by the compressor 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 coolant liquid to the final pressure. The compressed air is largely separated from the coolant liquid in the coolant liquid pressure tank. The subsequent fine precipitator removes the remaining coolant liquid from the compressed air. The compressed air then flows over the minimum pressure valve and return valve into the compressed air after-cooler and is cooled down before it leaves the screw compressor through the compressed air connection.

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



1.3.2 Sound insulation covers



Fig. 4: Sound insulation covers

The sound insulation covers (on 3 sides, example in Fig. 4/1) may only be removed by specialist staff using the special spanner that is included in the scope of delivery. Sound insulation covers are a part of the electric shock protection.

1.3.3 Drive unit

Various drive units are installed in the screw compressors, and these drive units distinguish themselves through their structure, their output values and their functional principle as follows:

Screw compressor with gear drive



Fig. 5: Screw compressor G Drive with gear drive The screw compressor G Drive is driven via a gearbox (Fig. 5/1).

Screw compressor with direct drive and frequency converter



Fig. 6: Screw compressor V Drive with direct drive and frequency converter

On the screw compressor V Drive, the electric motor is speed-controlled by the frequency converter in the switch cabinet Fig. 6/1). The drive is direct and applied via a coupling (Fig. 6/2).

1.3.4 Intake filter

2

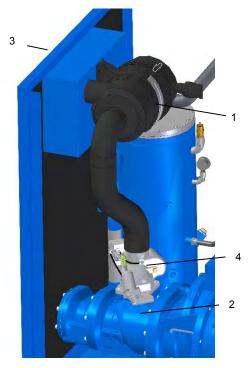


Fig. 7: Intake filter

The intake filter (Fig. 7/1) is attached above the compressor stage (7/2). The air is drawn in directly through a perforated plate (7/3), it is filtered in the intake filter and then fed to the compressor stage via the intake regulator (Fig. 7/4).



1.3.5 Compressor stage

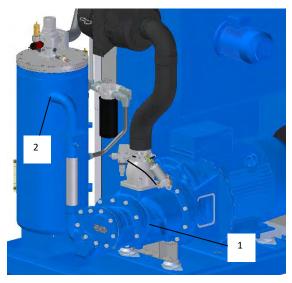


Fig. 8: Compressor stage

The intake air is compressed by the compressor stage (Fig. 8/1) and is fed to the coolant liquid pressure tank (Fig. 8/2) together with the injected coolant liquid.

1.3.6 Coolant liquid pressure tank

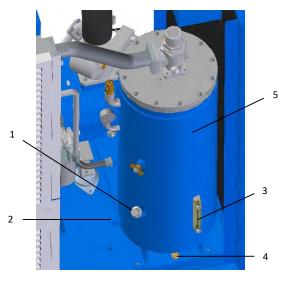


Fig. 9: Coolant liquid pressure tank

- 1 Filler nozzle
- Connection for coolant liquid heater (optional)
- 3 Inspection glass
- 4 Coolant liquid drain
- 5 Coolant liquid pressure tank

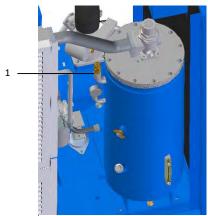


Fig. 9/1: Safety valve

The coolant liquid pressure tank is comprised of several components. The safety valve (Fig. 9/1) protects the coolant liquid pressure tank from overpressure. The level of the coolant liquid can be read through the inspection glass. The coolant liquid is topped up via the filler nozzle and removed via the coolant liquid drain.

Coolant liquid heater (optional)

A coolant liquid heater can be installed in the coolant liquid pressure tank at the factory or retrofitted at a later time. It prevents damage from condensation or freezing of the condensate, e.g. for a screw compressor which is set up in a cold or humid location.

1.3.7 Fine precipitator

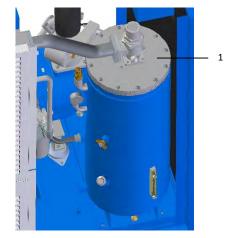


Fig. 10: Fine precipitator

The fine precipitator (Fig. 10/1) removes the residual coolant liquid from the compressed air and it is built into the coolant liquid tank.



1.3.8 Minimum pressure and nonreturn valve

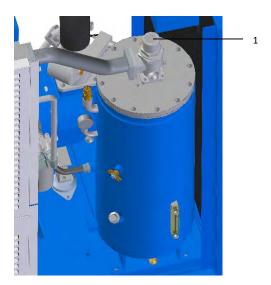


Fig. 11: Minimum pressure and non-return valve

The minimum pressure and non-return valve (Fig. 11/1) only opens if the system pressure rises to 4.5 bar. After switching off the screw compressor, the minimum pressure and nonreturn valve prevents the compressed air from flowing back out of the network.



1.3.9 Cooler

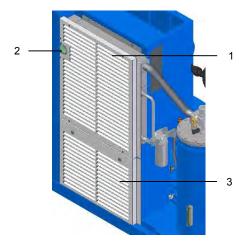


Fig. 12: Cooler

The compressed air is cooled in the compressed air after-cooler (Fig. 12/1) before it leaves the screw compressor via the compressed air connection (Fig. 12/2). The coolant liquid is cooled by the coolant liquid cooler (Fig. 12/3) and fed back into the coolant circuit.

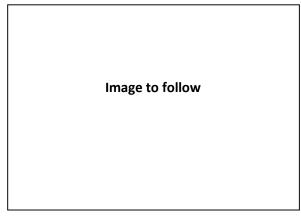


Fig. 13: Connections for water cooling

Water-cooled screw compressors (optional for screw compressors G Drive 38 – 75 and V Drive 38 –75)

In water-cooled screw compressors, a fresh air fan provides sufficient fresh intake air and removes radiation heat.

1.3.10 Coolant liquid filter

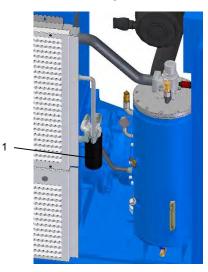


Fig. 14: Coolant liquid filter

The coolant liquid filter (Fig. 14/1) cleans the coolant liquid before it is injected into the compressor section once again.

1.3.11 Cooling air fan

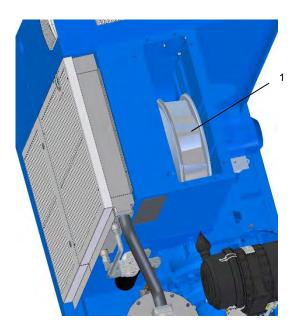


Fig. 15: Cooling air fan

The compressed air after-cooler and the coolant liquid cooler are cooled by the cooling air fan (Fig. 15/1). This fan draws the air through the cooler and blows it up and out.



1.4 Interfaces

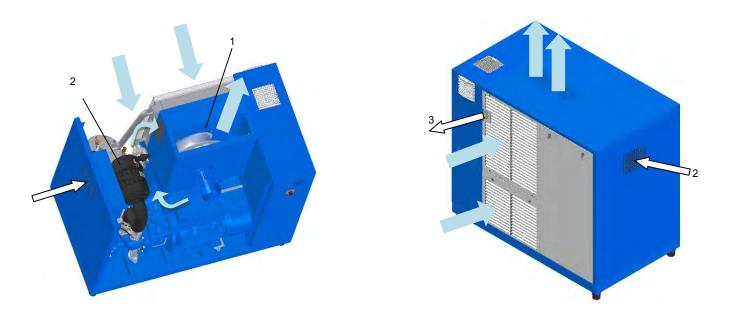


Fig. 16: Flow chart for screw compressor G/V Drive 38 - 45, 56 - 75

The screw compressor contains the following interfaces:

- Air supply
 - Cooling air fan (Fig. 16/1)
 - Intake filter (Fig. 16/2)
- Compressed air connection (Fig. 16/3)
- Water cooling and heat recovery (optional)
 - Water feed (Fig. 17/2)
 - Water return (Fig. 17/1)

Image to follow

Fig. 17: Screw compressor with water cooling (optional) / heat recovery (optional)

Page 14



Air supply



Fig. 18: Cooling air fan and intake filter

The cooling air fan (Fig. 18/1) draws the air through the compressed air after-cooler (Fig. 18/2) and the coolant liquid cooler (Fig. 18/3). The air is also used for process cooling. The air needed for compression is drawn in directly by the compressor stage through an intake regulator and the intake filter (Fig. 18/4) via a separate opening. (Fig. 18/5).

Compressed air connection



Fig. 19: Compressed air connection

The air compressed by the compressor is available to the compressed air network at the compressed air connection (Fig. 19/1) after it has been filtered and cooled.

Water cooling and heat recovery (optional)

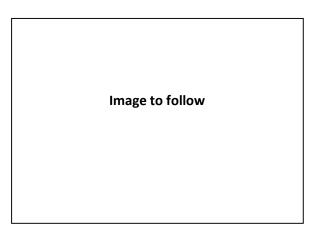


Fig. 20: Water connection

The cooling water required for water cooling is taken from the water feed / water inlet (Fig. 20/2) and used to cool the system. After the cooling process the cooling water is expelled again via the water return / water outlet (Fig. 20/1).

The water required for heat recovery (HR) is taken from the water feed / water inlet (Fig. 20/2) and used to cool the system. After the cooling process the heated water is expelled again via the water return / water outlet (Fig. 20/1).



The water circuit for heat recovery is not released until it has reached operating temperature. Changes to the preset temperature will render the warranty null and void.

	Water recovery and water
	cooling (optional)

The respective heat exchangers are integrated into the screw compressor's coolant liquid circuit and transfer the generated compression heat from the coolant liquid to the water.



2 Safety

This section is a summary of all the important safety aspects to ensure optimum protection of personnel and safe and trouble-free operation.

Disregard for procedures and safety instructions given in this manual can lead to dangerous situations.

2.1 Symbols in these instructions

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.

ANGER!

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

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

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

NOTE!

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

\bigcirc ENVIRONMENTAL PROTECTION!

This combination of symbol and signal word indicates possible hazards for the environment.

Safety instructions contained in operating instructions

Safety instructions may relate to certain individual operating instructions. These safety instructions are embedded in the operating instructions so that they do not interrupt the flow of reading when performing the relevant action. The signal words described above are used.

Example:

1. Unfasten the screw.



Close the cover carefully.

3. Tighten the screw.

Special safety instructions

The following symbols are used in conjunction with the safety instructions in order to draw attention to particular hazards:

Warning signs	Type of danger
	Warning of dangerous electrical voltage.



Warning sign	Type of danger
	Warning of potentially explosive substances.
	Warning of a hazard area.

Tips and recommendations



Further markings

The following markings are used in these instructions for emphasising operating instructions, results, lists, references and other elements:

Marking	Explanation
_	Step-by-step operating instructions
-	Results of actions
	List with no fixed order
[button]	Operating controls (e.g. button, switch), display
"display"	Screen elements (e.g. buttons, assignment of function keys)

2.2 Proper use

The machine is designed and constructed exclusively for the proper use described here.

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 in these instructions.

Any use above and beyond the intended use, or any other type of use, is considered 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 any media other than cool, dry and dust-free cooling air is forbidden.

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



2.3 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's obligations

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

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

The following applies in particular:

- The owner must inform himself or herself about the applicable occupational health and safety regulations and identify any additional hazards resulting from the specific local operating conditions as part of 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 where 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 relevant hazards.
- The owner must provide staff with the required safety devices and inform 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 devices checked regularly to ensure they are fully functional and complete.
- The owner must ensure that the appropriate media connections are in place.
- The owner must ensure that the supply of the required quantity of cooling medium (air/water) is ensured.
- The owner must ensure that the required heat extraction is performed.

2.4 Personnel requirements

2.4.1 Qualifications

WARNING!

Danger of injury due to insufficient personnel qualifications!

If insufficiently qualified personnel perform work on the machine or remain in the hazard area of the machine, hazards arise that can cause severe injuries and significant material damage.

- Therefore, all work must only be carried out by sufficiently qualified personnel.
- Unqualified personnel must be kept away from the hazard areas.

These instructions specify the personnel qualifications required for the different areas of work, listed below:

Qualified electrician

Due to their technical training, knowledge and experience and their knowledge of the relevant standards and regulations, qualified electricians are able to perform work on electrical systems and to independently recognise and avoid possible hazards.

Qualified electricians are specially trained for the environment in which they work and are familiar with the relevant standards and regulations.

Qualified electricians must fulfil these regulations and the applicable legal provisions for accident prevention.



Qualified personnel

Due to their technical training, knowledge and experience and their knowledge of the regulations, qualified personnel are able to perform the work assigned to them and independently recognise and avoid possible hazards.

Manufacturer

Certain work may only be performed by our qualified personnel or qualified personnel commissioned by us. Other personnel are not authorised to perform such work. Contact our service department to schedule an appointment for any required work.

Forklift operator

Forklift operators must be at least 18 years old and, on the basis of their physical, mental and character-based attributes, be suited to the task of driving forklift vehicles with a driver's seat or driver's control stand.

In addition, forklift operator's have been trained in how to drive forklift vehicles with a driver's seat or driver's control stand.

Forklift operators have proven to the owner their ability to drive forklift vehicles with a driver's seat or driver's control stand and have been commissioned by the owner in writing to do so.

Trained person

Trained persons have received training from the owner on the tasks assigned to them and on the possible hazards in case of improper behaviour.

Personnel may only be persons who can be expected to carry out their work reliably. Persons with impaired reactions due to, for example, the consumption of drugs, alcohol, or medication are prohibited.

When selecting personnel, the age-related and occupational regulations governing the application area must be observed.

2.4.2 Unauthorised persons

A WARNING!

Risk of fatal injury for unauthorised persons due to dangers in the hazard and work area!

Unauthorised persons who do not fulfil the requirements described here are not familiar with the hazards present in the work area. For this reason, unauthorised persons are at risk of serious injury and even death.

- Keep unauthorised persons away from the hazard and work area.
- In case of doubt, approach the person and instruct them to leave the work area.
- Interrupt work for as long as unauthorised persons are present in the hazard and work area.

2.4.3 Training

The owner must provide personnel with training at regular intervals. For better traceability, the performance of this training must be documented (*Appendix A "Training Log" on page 72*).

2.5 Personal protective equipment

Personal protective equipment is used to protect personnel from dangers which could compromise their safety or health while working.

When performing the various tasks on and with the machine, personnel must wear personal protective equipment. This equipment will be indicated separately in the individual chapters of these instructions. This personal protective equipment is described below:

- It is mandatory to put on the personal protective equipment specified in the different chapters of these instructions before starting work.
- Always comply with the instructions governing personal protective equipment posted in the work area.



Description of personal protective equipment

Protective work clothing



Protective work clothing is tight-fitting clothing with low tensile strength, tight sleeves and without protruding sections. It is primarily used to protect against being caught in moving machine parts. Do not wear rings, chains or any other type of jewellery.

Hearing protection



Hearing protection is used to protect against hearing damage.

Light respiratory protection



Light respiratory protection is used to protect against harmful dust.

Protective goggles



Protective goggles are used to protect the eyes against flying debris and splashing liquid.

Protective gloves



Protective gloves are used to protect hands from abrasion, grazing, punctures and deeper injuries, and from contact with hot surfaces.

Safety shoes



Safety shoes are used to protect against heavy falling parts and slipping on slippery surfaces.

2.6 Fundamental dangers

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

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

2.6.1 General dangers at the workplace

Noise



Danger of injury from noise!

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

- Always wear hearing protection when working.
- Only stay in the hazard area as long as is necessary.

Accumulation of fluids

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 in or near any area in which fluids can accumulate on the floor.



2.6.2 Dangers due to electric energy

Electric current

A DANGER!

Risk of fatal injury due to electric current!

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

- All work on the electrical system must be performed by qualified electricians.
- In the event of damage to insulation, switch off the power supply immediately and commission repairs.
- 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 or disable fuses. When replacing fuses, observe the correct amperage.
- Protect energised parts from moisture. This could cause a short circuit.

Stored charges

A DANGER!

Risk of fatal injury due to stored charges!

Electric charges may be stored in electrical components 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 such components, 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.

2.6.3 Dangers due to mechanical elements

Moving parts



Danger of injury due to moving components!

Rotating parts and/or components that make linear movements can cause serious injuries.

- Never reach into moving parts or handle moving parts during operation.
- Do not open covers during operation.
- Observe the after-run time: Ensure that all parts have stopped moving before opening any covers.
- Wear close-fitting work clothing with low tensile strength when in the hazard area.



Sharp edges and pointed corners

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.

2.6.4 Dangers due to hydraulic energy

Jets of liquid

Risk of fatal injury due to liquid jets escaping under high pressure!

In the event of faulty lines or components, liquid jets can escape under high pressure. Liquid jets can cause the severe or even fatal injuries.

- Never hold body parts or objects in a liquid jet. Keep people out of the hazard area. In the event of accidental contact with a liquid jet, 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 liquid jet.
- Collect and dispose of escaping liquids properly.
- Have faulty components repaired immediately.

2.6.5 Dangers due to pneumatics and stored residual energy

Pressure accumulator

Risk of fatal injury due to improper work on pressure accumulators!

Improper handling of pressure accumulators 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 pressure accumulator tank.
- Do not carry out any mechanical work on the pressure accumulator tank.
- Fully vent the pressure accumulator tank via the fitted vent screw after connecting the pneumatic line.
- Do not start work on systems with a pressure accumulator until the pressure has been completely relieved and before checking that there is no pressure.
- Do not start any work on the pressure accumulator until the gas pre-load pressure has been completely relieved.



Compressed air

Risk of injury due to compressed air!

Compressed air can escape from compressed air hoses or pressurised components 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 an uncontrolled manner and can cause injuries if handled incorrectly.

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

2.6.6 Dangers due to chemical substances

Coolant mist



Danger of injury due to coolant mist!

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

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

2.6.7 Dangers due to high temperatures

Hot surfaces



Danger of injury due to hot surfaces!

Component surfaces and operating materials (e.g. coolant liquid or cooling water) may heat up considerably during operation. Skin contact with hot surfaces or liquids can cause serious burns.

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

Hot operating materials

Danger of injury due to hot operating materials!

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

- When performing any work with operating materials, heat-resistant protective work 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.



2.7 Safety devices

WARNING!

Risk of fatal injury if safety devices are not fully functional!

If safety devices are faulty or disabled, there is a risk of severe to fatal injuries.

- Before starting any work, check whether all the safety devices are fully functional and correctly installed.
- Never disable or bypass safety devices.
- Make sure that all safety devices are accessible at all times.

2.7.1 Position of the safety devices

The following illustrations show the position of the safety devices.

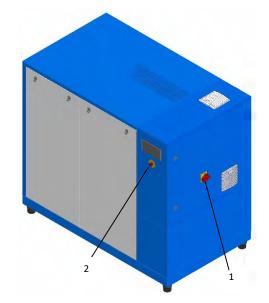


Fig. 21: G/V Drive 38 – 45, 56 – 75 1 Main switch 2 Emergency stop button (option)



2.7.2 Description of the installed safety devices

Main switch with emergency stop function

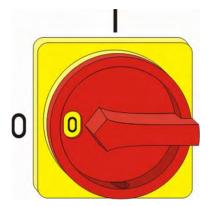


Fig. 24: Main switch

The main switch is also designed as an emergency stop switch. Turning the main switch to the "0" position stops the machine by switching off the power supply immediately, thereby triggering an emergency stop.

Danger to life due to restarting in an uncontrolled manner!

Restarting the machine in an uncontrolled manner can cause severe 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. 25: 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 turned and unlocked to allow a restart.

Danger to life due to restarting in an uncontrolled manner!

Restarting the machine in an uncontrolled manner can cause severe 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. 26: 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.

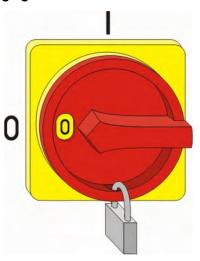
2.8 Securing against restart

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.

Securing against a restart



- Fig. 27: Securing the main switch
- **1.** Switch off the power supply. To do so, turn the main switch to the "0" position.
- **2.** Secure the main switch with a padlock (Fig. 27).
- **3.** Have the employee responsible keep the key for the padlock safe.
- 4. Once all work has been performed, ensure that personnel are not at risk from any hazards.
- 5. Ensure that all protective equipment and safety devices are installed and functional.

🔥 WARNING!

Risk of fatal injury due to unauthorised restart!

If the main switch is secured with a padlock, there may be personnel in the hazard area. These people are at risk from fatal injury if the power supply is switched on.

 Before removing the padlock and switching the power supply back on, make sure that personnel are not at risk from any hazards.

6. Remove the padlock from the main switch.



ή

If no main switch is installed, proceed as follows.

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.

Securing against a restart

- **1.** Switch off the power supply.
- **2.** Inform the parties responsible that work is being performed in the hazard area.
- 3. Attach a sign to the machine to indicate that work is being carried out in the hazard area and that switching on the machine is prohibited. Include the following details on the sign:
 - Switched off on (date):
 - Switched off at (time):
 - Switched off by:
 - Note: Do not switch on!
 - Note: Do not switch on until you have made sure that personnel are not at risk from any hazards.
- **4.** Once all work has been performed, ensure that personnel are not at risk from any hazards.
- 5. Ensure that all protective equipment and safety devices are installed and functional.

\Lambda WARNING!

Risk of fatal injury due to unauthorised restart!

Any personnel in the hazard area are at risk from fatal injury if the power supply is switched back on in an uncontrolled manner.

- Before switching the power supply back on, make sure that personnel are not at risk from any hazards.
- 6. Remove the sign.

2.9 Behaviour in the event of fire or accidents

Preventive measures

- Always be prepared for fires and accidents!
- Keep first-aid equipment (first-aid box, blankets etc.) and fire-extinguishing equipment within reach and ensure it is fully functional.
- Familiarise personnel with accident reporting, first-aid and rescue equipment.
- Keep access routes clear for emergency vehicles.



Measures in the event of fire or accidents

- Immediately trigger the emergency stop using the emergency stop device.
- If there is no danger to your own health, evacuate persons from the hazard area.
- Perform first aid measures as necessary.
- Alert fire and/or rescue services.
- In the event of fire: if there is no danger to your own health, fight fire with fireextinguishing equipment until the fire service arrives.
- Inform the responsible parties at the location.
- Clear access routes for emergency vehicles.
- Brief emergency staff in rescue vehicles.

2.10 Environmental protection

ENVIRONMENTAL PROTECTION!

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 damage 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 in doubt, inform the responsible local authorities about the damage and enquire about suitable measures.

The following environmentally hazardous substances are used:

Coolant liquid

Coolant liquids 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 and oil contain toxic substances. They must not be released into the environment. Disposal must be carried out by a specialist disposal company.

2.11 Signage

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

Danger of injury due to illegible symbols!

Over time, stickers and signs can become dirty or unidentifiable due to other factors, so that risks may not be recognised and the necessary operating instructions cannot be followed. This presents a risk 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.

2.11.1 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



Keep a sufficient distance from all parts that can move as they pose a risk of crushing or entanglement.



Hot surface



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

2.11.2 Instructions on the machine

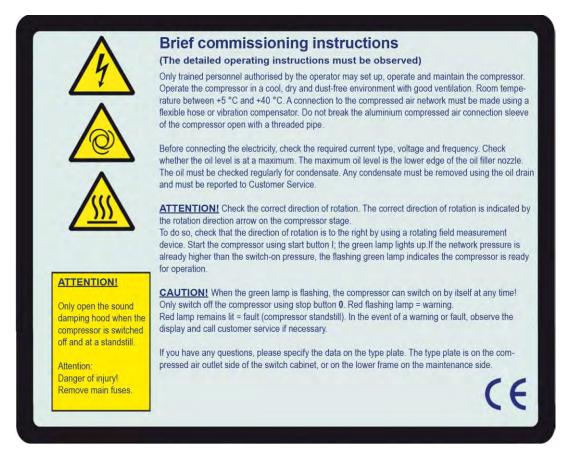
Direction of rotation



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.

Brief instructions for commissioning

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



Re-lubrication

Nachschmierung nach XXXX h
Relubrication after XXXX h

The sticker for re-lubrication is affixed to the drive unit.

Oil filling

Ölfüllung Oil charged Remplissage d'huile	
xxx xxx	No. XXX.XXXX

The sticker for oil filling is on the coolant tank and next to the installed controller.



3 Technical data

3.1 Type plate

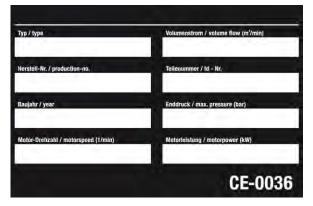


Fig. 28: Type plate

The type plate is on the lower frame on the maintenance side and on the sound insulation cover on the cooling air exhaust side or cooling water intake and outlet side and includes the following details:

- Manufacturer
- Product type
- Manufacturing no.
- Year of construction
- Speed
- Volume flow
- Part number
- Final pressure
- Motor power



3.2 Emissions

Noise emissions

G Drive 38 – 75

Drive	Noise emission	
	dB (A)	
38	74	
45	75	
56	75	
75	75	

V Drive 38 – 75

V Drive	Noise emission	
	dB (A) n = 50%	dB (A) n = 100%
38	66	70
45	66	70
56	67	71
75	67	71



3.3 General specifications

3.3.1 Operating conditions

Environment

Specification	Value	Unit
Temperature range	+37 to +113 (+3 to +45)	°F (°C)
Relative humidity, maximum	60%	
Maximum installation altitude above sea level.	3,281 (1,000)	ft (m)

3.3.2 Coolant liquid

The following coolant liquids have been tested and approved for use in the compressors:

Designation	Туре	Article number
Standard coolant liquid (semi-synthetic)	ALUB BLUE S+	583.04055
		(10 I container)
Synthetic coolant liquid	ALUB Syn S	583.00004
		(10 I container)
Food grade coolant liquid	ALUB Food H1	583.04010
		(10 I container)
Biodegradable coolant liquid	ALUB GREEN S	583.10051
		(10 I container)



Only fully synthetic coolant is suitable for high-temperature systems.



3.3.3 Operating materials

Screw compressors G Drive 38 – 45

Туре	Operating material	Fill quantity	Unit
38	Coolant liquid	39	I
45	Coolant liquid	39	1

Screw compressors G Drive 56 – 75

Туре	Operating material	Fill quantity	Unit
56	Coolant liquid	52	1
75	Coolant liquid	52	L

Screw compressors V Drive 38 – 45

Туре	Operating material	Fill quantity	Unit
38	Coolant liquid	39	I
45	Coolant liquid	39	1

Screw compressors V Drive 56 – 75

Туре	Operating material	Fill quantity	Unit
56	Coolant liquid	52	I
75	Coolant liquid	52	L



3.4 Screw compressor G Drive 38 – 45, 56 – 75

3.4.1 Plant data

Plant data for screw compressor G Drive 38 – 45

Туре	Rated motor Screw compressor, air-cooled Screw compresso output		Screw compressor, air-cooled		, water-cooled
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]
38	37	1900x1100x1725	1100	1900x1100x1725	1
45	45	1900x1100x1725	1250	1900x1100x1725	/

Plant data for screw compressor G Drive 56 – 75

Туре	Rated motor Screw compressor, air-cooled Screw compressor, water-cooled		Screw compressor, air-cooled		, water-cooled
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]
56	55	2300x1380x1950	2120	2300x1380x1950	1
75	75	2300x1380x1950	2241	2300x1380x1950	1

3.4.2 Air supply and cooling

Air-cooled screw compressors G Drive 38 – 45

Туре	Compressed air connection	Heat recovery	Cooling air quantity	Feed air duct	Exhaust air duct
	G / DN	G	m³/h	mm	mm
38	2"	1	6800	750 x 1478	634 x 224
45	2"	1	7000	750 x 1478	634 x 224

Air-cooled screw compressors G Drive 56 – 75

Туре	Compressed air connection	Heat recovery	Cooling air quantity	Feed air duct	Exhaust air duct
	G / DN	G	m³/h	mm	mm
56	2	1	8923	810 x 950	939 x 597
75	2	1	10192	810 x 950	939 x 597



Water-cooled screw compressors G Drive 38 – 45

Туре	Compressed air connection	Heat recovery/ cooling water connection	Cooling air quantity	Feed air duct	Exhaust air duct
	G / DN	G	m³/h	mm	mm
38	1	1	1	/	1
45	1	1	1	1	1

Water-cooled screw compressors G Drive 56 – 75

Туре	Compressed air connection		Cooling air quantity	Feed air duct	Exhaust air duct
	G / DN	G	m³/h	mm	mm
56	1	1	1	/	1
75	1	1	1	/	1

3.4.3 Connection values

3.4.3.1 Screw compressor G Drive 38 – 75 50 Hz

Screw compressor G Drive 38 – 45

Туре	Current at 230 V/50 Hz		Current at 3	380 V/50 Hz	Current at 400 V/50 Hz	
	In	Fuse	In	Fuse	In	IFuse
	Α	A gL	Α	A gL	Α	A gL
38	127	160	81	100	78	100
45	153	200	96	125	93	125

Screw compressor G Drive 38 – 45

Туре	Current at 415 V/50 Hz		Current at 440 V/50 Hz		Current at 500 V/50 Hz		Max.
	In	Fuse	IN	Fuse	In	Fuse	switching frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
38	76	100	70	100	65	100	15
45	90	125	83	100	77	100	12



Screw compressor G Drive 56 – 75

Туре	Current at 2	230 V/50 Hz	Current at 3	380 V/50 Hz	Current at 4	Current at 400 V/50 Hz		
	In	IFuse	In	Fuse	In	IFuse		
	Α	A gL	Α	A gL	Α	A gL		
56	182	200	117	160	112	125		
75	242	315	149	200	142	160		

Screw compressor G Drive 56 – 75

Туре	Current at 4	415 V/50 Hz	Current at 440 V/50 Hz		Current at 500 V/50 Hz		Max. switching	
	IN	IFuse	IN	IFuse	IN	IFuse	frequency	
	Α	A gL	Α	A gL	Α	A gL	1/h	
56	108	125	100	125	93	125	8	
75	137	160	128	160	118	160	6	



3.4.3.3 Screw compressor G Drive 38 – 75 60 Hz

Screw compressor G Drive 38 – 45

Туре	Current at 2	230 V/60 Hz	Current at 3	380 V/60 Hz	Current at 400 V/60 Hz		
	In	Fuse	In	Fuse	In	Fuse	
	Α	A gL	Α	A gL	Α	A gL	
38	127	160	81	100	78	100	
45	153	200	96	125	93	125	

Screw compressor G Drive 38 – 45

Туре	Current at 4	415 V/60 Hz	Current at 4	440 V/60 Hz	Current at \$	Max. switching		
	In	IFuse	In	Fuse	In	IFuse	frequency	
	Α	A gL	Α	A gL	Α	A gL	1/h	
38	76	100	70	100	65	100	15	
45	90	125	83	100	77	100	12	

Screw compressor G Drive 56 – 75

Туре	Current at 2	230 V/60 Hz	Current at 3	380 V/60 Hz	Current at 4	400 V/60 Hz
	In	Fuse	In	Fuse	In	Fuse
	Α	A gL	Α	A gL	Α	A gL
56	182	200	117	160	112	125
75	242	315	149	200	142	160

Screw compressor G Drive 56 – 75

Туре	Current at 4	415 V/60 Hz	Current at 4	140 V/60 Hz	Current at	500 V/60 Hz	Max. switching
	In	IFuse	IN	IFuse	IN	IFuse	frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
56	108	125	100	125	93	125	8
75	137	160	128	160	118	160	6



3.5 Screw compressor V Drive 38 – 45, 56 – 75

3.5.1 Plant data

Plant data for screw compressor V Drive 38 – 45

Туре	Rated motor output	Screw compressor, air-cooled		Screw compressor, water-cooled		
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]	
38	37	1900x1100x1725	1050	1900x1100x1725	1	
45	45	1900x1100x1755	1200	1900x1100x1725	/	

Plant data for screw compressor V Drive 56 – 75

Туре	Rated motor output	Screw compressor, air-cooled		Screw compressor, water-cooled		
	kW	L x W x H [mm]	Weight [kg]	L x W x H [mm]	Weight [kg]	
56	55	2300x1380x1950	1941	2300x1380x1725	1	
75	75	2300x1380x1950	2041	2300x1380x1725	/	

3.5.2 Air supply and cooling

Air-cooled screw compressors V Drive 38 – 45

Туре	Compressed air connection	Heat recovery	Cooling air quantity	Feed air opening	Cross-section of exhaust
	G / DN	G	m³/h	mm	mm
38	2"	1	6800	750 x 1478	634 x 224
45	2"	1	7000	750 x 1478	634 x 224

Air-cooled screw compressors V Drive 56 – 75

Туре	Compressed air connection	Heat recovery	Cooling air quantity	Feed air duct	Exhaust air duct	
	G / DN	G	m³/h	mm	mm	
56	2"	1	8923	810 x 950	939 x 597	
75	2"	1	10192	810 x 950	939 x 597	



Water-cooled screw compressors V Drive 38 – 45

Туре	Compressed air connection	Heat recovery/ cooling water connection	oling water quantity		Exhaust air duct
	G / DN	G	m³/h	mm	mm
38	/	1	1	1	/
45	/	1	1	1	/

Water-cooled screw compressors V Drive 56 – 75

Туре	Compressed air connection	Heat recovery/ cooling water connection	Cooling air quantity	Feed air duct	Exhaust air duct
	G / DN	G	m³/h	mm	mm
56	/	1	1	1	/
75	1	1	1	1	1



3.5.3 Connection values

3.5.3.1 Screw compressor V Drive 38 - 75 50 Hz

Screw compressor V Drive 38 – 45

Туре	Current at 230 V/50 Hz		Current at 3	380 V/50 Hz	Current at 400 V/50 Hz		
	In	Fuse	In	Fuse	In	IFuse	
	Α	A gL	Α	A gL	Α	A gL	
38	-	-	78	100	75	100	
45	-	-	93	125	90	125	

Screw compressor V Drive 38 – 48

Туре	Current at 415 V/50 Hz		Current at 440 V/50 Hz		Current at 500 V/50 Hz		Max.
	IN	Fuse	IN	Fuse	In	IFuse	switching frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
38	73	100	67	100	62	100	20
45	88	125	81	100	75	100	20

Screw compressor V Drive 56 – 75

Туре	Current at 230 V/50 Hz		Current at 3	880 V/50 Hz	Current at 400 V/50 Hz	
	IN	IFuse	In	IFuse	In	IFuse
	Α	A gL	Α	A gL	Α	A gL
56	-	-	115	125	110	125
75	-	-	147	160	140	160

Screw compressor V Drive 56 – 75

Туре	Current at 415 V/50 Hz		Current at 440 V/50 Hz		Current at 500 V/50 Hz		Max.
	IN	IFuse	IN	IFuse	IN	IFuse	switching frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
56	106	125	98	125	91	125	15
75	135	160	126	160	116	160	15



3.5.3.3 Screw compressor V Drive 38 – 75 $\,$ 60 Hz $\,$

Screw compressor V Drive 38 – 45

Туре	Current at 230 V/60 Hz		Current at 3	880 V/60 Hz	Current at 400 V/60 Hz		
	In	Fuse	In	IFuse	In	IFuse	
	Α	A gL	Α	A gL	Α	A gL	
38	-	-	78	100	75	100	
45	-	-	93	125	90	125	

Screw compressor V Drive 38 – 45

Туре	Current at 415 V/60 Hz		Current at 440 V/60 Hz		Current at 500 V/60 Hz		Max.
	IN	IFuse	IN	IFuse	IN	IFuse	switching frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
38	73	100	67	100	62	100	20
45	88	125	81	100	75	100	20

Screw compressor V Drive 56 – 75

Туре	Current at 230 V/60 Hz		Current at 3	380 V/60 Hz	Current at 400 V/60 Hz		
	In	Fuse	In	Fuse	In	IFuse	
	Α	A gL	Α	A gL	Α	A gL	
56	-	-	115	125	110	125	
75	-	-	147	160	140	160	

Screw compressor V Drive 56 – 75

Туре	Current at 415 V/60 Hz		Current at 440 V/60 Hz		Current at 500 V/60 Hz		Max.
	IN	IFuse	In	Fuse	IN	IFuse	switching frequency
	Α	A gL	Α	A gL	Α	A gL	1/h
56	106	125	98	125	91	125	15
75	135	160	126	160	116	160	15



4 Transport, packaging and storage

4.1 Safety instructions for transport

Improper transport

NOTE!

Material damage due to improper transport!

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.

4.2 Transport inspection

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

In the event of visible transport 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 transport documents or the delivery note issued by the transportation company.
- File a complaint.

î

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.

4.3 Packaging

About the packaging

The individual screw compressors are packaged in cartons or sometimes on wooden frames and according to the anticipated 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 do not remove it until shortly before installation.

Handling packaging materials

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

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 packaging materials in an environmentally friendly manner.
- Observe the applicable local disposal regulations. Commission a specialist company with disposal, if necessary.

4.4 Symbols on the packaging

The following symbols are used on the packaging. Always observe these symbols during transport.



Transport, packaging and storage

This way up



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

Fragile



Identifies 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.

4.5 Transport

Transport with a forklift

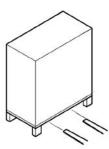
Packages can be transported with a forklift under the following conditions:

- The forklift must be designed for the weight of the package.
- Existing guide rails on the frame must be used.
- The length of the forks must be at least 1400 mm.

Transporting

Personnel:

- Forklift operator



- Fig. 29: Transport with a forklift
- **1.** Drive the fork lift with the forks as shown in Fig. 29.
- **2.** Insert the forks so that they stick out on the other side.
- **3.** Ensure that the package cannot topple if the centre of gravity is off-centre.
- **4.** Lift the package and begin the transport.

4.6 Storage

Storage of packages

Store 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.

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



5.1 Safety instructions for installation and initial commissioning

Electrical system

A DANGER!

Risk of fatal injury 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

Danger of injury due to improper initial 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 hazard area.

Securing against a restart

MARNING!

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 hazard area.

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

Improper installation and commissioning initial commissioning

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.
- Proceed with caution when handling exposed sharp-edged components.
- Ensure the installation location is organised and clean. Loosely stacked components, or components and tools left lying around, are a potential source of accidents.
- Install components correctly. Comply with the specified screw tightening torques.
- Ensure components cannot be dropped and 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 hazard area.



5.2 Requirements for the installation location

Set up the screw compressor so that the following conditions are fulfilled:

- The installation site is level.
- The installation site is frost-proof (at least +3C°).
- 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 a potentially 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 heat sources.

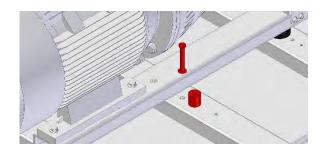
There is no accumulation of dust.

- 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 that could cause electrical or electromagnetic interference.

5.3 Installation

Transport securing devices must be removed before initial commissioning!





5.3.1 Ventilation

A DANGER!

Danger to life from the use of explosive gas mixtures, vapours, dust or aggressive hazardous substances!

The use of explosive gas mixtures, vapours, dust or aggressive hazardous substances to ventilate the screw compressor can cause severe or even fatal injuries as well as significant material damage.

- Never use explosive gas mixtures, vapours, dust or aggressive hazardous substances to ventilate the screw compressor.
- Ensure that no potentially explosive gas mixtures, vapours, dust or aggressive hazardous substances enter the ventilation of the screw compressor.

The air supplied via the intake openings is used for compression and system cooling.



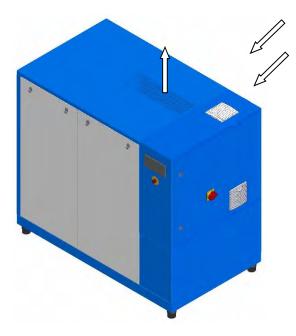
Personnel:

- Qualified personnel
- Protective equipment:
- Safety shoes
- Protective work clothing

NOTE!

Material damage due to condensation! Cooling air that is too humid can create condensation.

- Only supply cool, dry and dust-free cooling air.
- For the intake of outside air, use a recirculating air flap.



- Fig. 30: Screw compressor G/V Drive 38 – 45, 38 – 75
- **1.** Provide the required quantity of cooling air according to the technical data for the screw compressor.
- **2.** Extract the exhaust air according to the technical data for the screw compressor.

This way, you prevent the installation room and the screw compressor from heating up.

Forced ventilation and bleeding (optional)



The forced ventilation and bleeding must be dimensioned so that the required supply and exhaust air can be supplied and extracted taking into account the existing residual thrust from the cooling air ventilator. The exhaust air can also be used for heat recovery.

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing



- Fig. 31: Overview illustration of air duct connection G/V Drive 38 – 45
- **1.** For the nominal diameters of the duct connections and details about residual thrust refer to the data sheet and the installation diagrams included in the scope of delivery.
- When connecting air ducts, include the appropriate additional supporting fans for installation in the ducts.
 Take care with the compressed air outlet as it is also within the intake area!



5.3.2 Water cooling (optional)

For water-cooled systems, the compressed air after-cooler and the coolant liquid cooler are cooled with external cooling water.

The table below provides an overview of the corrosion resistance of the plate heat exchangers that are used as standard for screw compressors. The table lists the most important chemical components. However, corrosion is a very complex process that is affected by many different components interacting with each other. This table is therefore a considerable simplification; despite this, the limits should not be exceeded!

Prerequisites Input temperature max. +35°C / pre-pressure 4–10 bar / Pre-filtering 0.1 – 0.3 mm

WATER CONTENT	-	
	(mg/l or ppm)	
	X	0
Alkalinity (HCO ₃ ⁻)	70–300	>300
Sulphate ^[1] (SO ₄ ²⁻)	< 70	70–300
HCO3 ⁻ / SO4 ²⁻	>1	<1
Electrical conductivity	10–500 μS/cm	<10 µS/cm / >500 µS/cm
pH ^[2]	7.5–9.0	<7.5 / >9.0
Ammonium (NH ₄ ⁺)	<2	2 – 20
Chlorides (Cl ⁻)	<300	>300
Free chlorine (Cl ₂)	<1	1–5
Hydrogen sulphide (H ₂ S)	<5.05	>0.05
Free (aggressive) carbon dioxide (CO ₂)	<5	5–20
Total hardness (°dH)	4-8.5	
Nitrate ^[1] (NO ₃ ⁻)	<100	>100
Iron ^[3] (Fe)	<0.2	>0.2
Aluminium (Al)	<0.2	>0.2
Manganese ^[3] (Mn)	<0.1	>0.1

X Good resistance

O Corrosion may occur if multiple components are combined Use only with written approval of ALMiG !

^[1] Sulphates and nitrates act as inhibitors on pitting corrosion caused by chlorides in pH-neutral environments

^[2] In general, a low pH value (under 6) increases the risk of corrosion and a higher pH value (over 7.5) reduces the risk of corrosion

^[3] Fe³⁺ and Mn⁴⁺ are strong oxidising agents and can increase the risk of localised corrosion on stainless steels SiO₂ above 150 ppm increases the risk of calcification



Solenoid valve

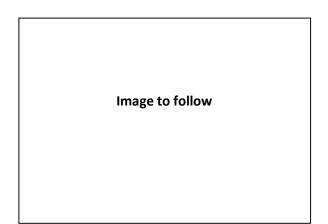
An solenoid valve (optional) must be attached upstream of the cooling water inlet.

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing



- Fig. 32: Cooling water connections (screw compressors G/V Drive 38 – 75)
- 1. Connect the cooling water connections with flexible and water-resistant hoses.



5.3.3 Heat recovery for heating and drinking water (optional)

1

Screw compressors can be equipped with an optional heat recovery function for heating water or with an optional heat recovery function for drinking water (safety heat exchanger with sealing medium).

The water must fulfil the following criteria:

Specification	Value	Unit
Input temperature max.	+35	°C
Pre-pressure	4 – 10	bar

Personnel:

- Qualified personnel
- **Protective equipment:**
- Safety shoes
- Protective work clothing
- **1.** For the water quantity, water temperatures and water pressure, see the data sheet.

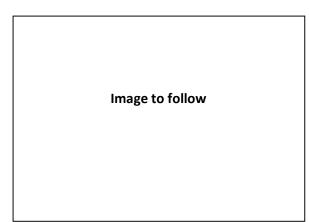


Fig. 33: Screw compressor with heat recovery (optional)

- 1 Cooling water inlet
- 2 Cooling water outlet
- 2. Connect heat recovery to the connections.

5.3.4 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

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

Load changes in the compressed air network cause the compressed air hose to make sudden movements with high force.

 Anchor and fasten the compressed air hose properly.

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.



- Fig. 34: Compressed air connection (Fig. 34/1) G/V Drive 38 – 45, 56 – 75
- 1. Connect the compressed air in accordance with the technical data (Chapter 3 "Technical data" on page 30).
- **2.** Ensure that the compressed air hose does not present a tripping hazard.



3. Anchor and fasten the flexible compressed air hose sufficiently.

5.3.5 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 could be damaged irreparably 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.
- ů

Properly dimensioned safety devices (for personal/system protection) in the mains supply line and a suitable master switch (for switching the power supply on/off) are prerequisites for correct installation.

- **1.** Using the data in the circuit diagram (in the switch cabinet), check whether the existing mains network is suitable. Voltage deviations of more than 10% are not permitted.
- 2. Connect the power according to the provided wiring diagram (in the switch cabinet) and the technical data (*Chapter 3 "Technical data" on page 30*).
- **3.** Check that the direction of rotation is clockwise by using a rotating field measurement device.
- **4.** Ensure that the power cable does not present a tripping hazard.

5.4 Checking the coolant liquid level

Personnel:

- Qualified personnel

Protective equipment:

- Protective work clothing
- Safety shoes
- Protective gloves
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- **2.** Open and remove the sound insulation cover with the special spanner.

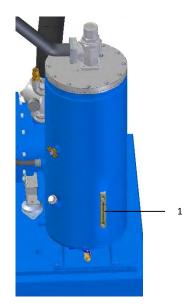


Fig. 35: Inspection glass

- **3.** Check the oil inspection glass (Fig. 35/1) to make sure the level is correct
- **4.** If necessary, top up coolant liquid *Chapter* 7.4.2 "Checking the coolant liquid level/ topping up the coolant liquid" on page 59.



5.5 Start-up lubrication of the compressor stage

Personnel:

- Qualified personnel

- Protective equipment:
- Protective work clothing
- Safety shoes

NOTE!

Property damage due to lacking coolant liquid in the compressor stage!

A lack of coolant liquid in the compressor stage after longer downtimes, e.g. between factory delivery and initial commissioning or after a longer downtime can cause significant property damage to the screw compressor.

 Top up the coolant liquid directly in the compressor stage before the initial commissioning or after a longer downtime.

Coolant liquid quantities for direct filling in the compressor stage

Screw compressor	Coolant liquid filling
	I
G Drive 38 – 45 56 – 75	2,5
V Drive 38 – 45 56 – 75	2,5

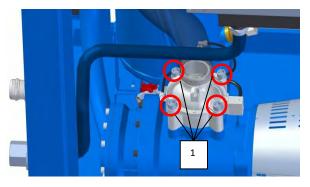


Fig. 36: Fastening screws for the intake regulator

1. Undo the fastening screws for the intake regulator (Fig. 36/1).

NOTE!

Material damage due to incorrect coolant liquid!

Mixing different coolant liquids or using incorrect coolant liquids causes significant property damage to the screw compressor.

- Only use the coolant liquid prescribed in the technical data.
- For high temperature systems, use only fully synthetic coolant ALUB Syn S.
- **2.** Unscrew the intake regulator.
- **3.** Fill coolant liquid directly into the compressor stage.
- **4.** Re-fit the intake regulator and tighten the screws (Fig. 36/1).



5.6 Switching on after installation

Personnel:

- Qualified personnel

Protective equipment:

- Hearing protection
- Protective work clothing
- Safety shoes
- **1.** Check the media connections to make sure that they are installed correctly.
- **2.** Ensure that there are no tools or loose objects lying in or on the machine.
- **3.** Check the connectors for the components and tighten the screws.
- **4.** Install the sound installation covers and make sure that they are sealed.
- 5. Carefully open the shut-off gate valve downstream of the compressed air port between the screw compressor and the compressed air network.
 - The screw compressor is now connected to the compressed air network.
- **6.** Switch on the main switch.
- **7.** Start the screw compressor (*controller documentation*).
 - The screw compressor is ready and may start up automatically at any time.

5.7 Tasks after initial commissioning

Personnel:

- Qualified personnel

Protective equipment:

- Protective work clothing
- Safety shoes
- Protective gloves
- Light respiratory protection
- Protective goggles

MARNING!

Danger of injury due to hot surfaces!

Component surfaces and operating materials (e.g. coolant liquid or cooling water) may heat up considerably during operation. Skin contact with hot surfaces or liquids can cause serious burns.

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

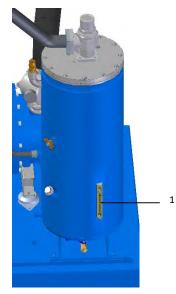


CAUTION!

Danger of injury due to coolant mist!

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

- When working on the coolant system and a coolant mist forms, wear respiratory protection and protective goggles and ensure that there is a fresh air supply.
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- 2. Open and remove the sound insulation covers with the special spanner.
- **3.** Wait until the components have cooled.
- **4.** Check all coolant liquid and compressed air lines for leaks.
- **5.** Remove any coolant liquid that is still in the system.
- **6.** Check the connectors for the components and tighten the screws.



- Fig. 37: Checking the coolant liquid level in the inspection glass
- Check the coolant liquid level in the inspection glass (Abb. 37/1) and, if necessary, top up as described in Chapter 7.4.2 "Checking the coolant liquid level/ topping up the coolant liquid" on page 59.
- **8.** Install the sound installation covers and make sure that they are sealed.

NOTE!

damage.

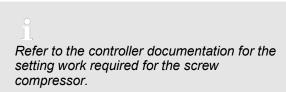
Material damage due to compressor temperature that is too low or too high! If the compressor temperature is too low or too high, the screw compressor may sustain

 Contact the manufacturer for more detailed information.

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.

9. Check compressor temperature (*Chapter 7.4.3 "Checking the compressor temperature" on page 61*).

5.8 Setting parameters





6 Operation

6.1 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 devices are installed and functioning properly.
 - Ensure that there is nobody in the hazard area.
- Never disable or bypass safety devices during operation.

6.2 Controller

Controller documentation

Refer to the controller documentation for information on how the screw compressor is controlled.

6.3 Shutting down in an emergency

In dangerous situations, the movements of components have to be stopped and the energy 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 using the emergency stop device.
- **2.** If there is no danger to your own health, evacuate persons from the hazard area.
- **3.** Perform first aid measures as necessary.
- 4. Alert fire 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 emergency staff in rescue vehicles.

Following rescue measures

- **9.** Inform the responsible authorities if the severity of the emergency requires this.
- **10.** Instruct qualified personnel to rectify the fault.

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 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.
- **11.** Before restarting the machine, ensure that all safety devices are installed and functional.



7 Maintenance

7.1 Safety instructions for maintenance

Electrical system

A DANGER!

Risk of fatal injury 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

Danger of injury due to moving components!

Rotating parts and/or components that make linear movements 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 tensile strength when in the hazard area.

Securing against a restart

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

Danger of injury due to hot surfaces!

Component surfaces and operating materials (e.g. coolant liquid or cooling water) may heat up considerably during operation. Skin contact with hot surfaces or liquids can cause serious burns.

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



Improperly performed maintenance work

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.
- Ensure the installation location is organised and clean. Loosely stacked components, or components and tools left lying around, are a potential 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 hazard area.
 - Ensure that all covers and safety devices are installed and functioning properly.

Compressed air

Risk of injury due to compressed air!

Compressed air can escape from compressed air hoses or pressurised components 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 an uncontrolled manner and can cause injuries if handled incorrectly.

- Before removing pressurised hoses or components, depressurise them.
- Have faulty pressurised components replaced immediately by qualified personnel.
- Before all work, ensure that The compressor is depressurised by waiting at least 5 minutes.

Coolant mist



Danger of injury due to coolant mist!

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

 When working on the coolant system and a coolant mist forms, wear respiratory 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 in 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:

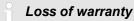
- Remove any escaped, used or excess grease from all lubrication points which are supplied with lubricant by hand and dispose of it in accordance with the applicable local regulations.
- Collect replaced oils in suitable containers and dispose of them in accordance with the applicable local regulations.

7.2 Replacement parts

Risk of injury due to use of incorrect replacement parts!

Using incorrect or faulty replacement parts poses risks for personnel and can lead to damage, malfunctions or complete failure.

- Only use genuine replacement parts supplied by the manufacturer or manufacturer-approved replacement parts.
- If in doubt, always contact the manufacturer.



The use of non-approved replacement parts will invalidate the manufacturer's warranty.

Procure replacement parts from authorised dealers or from the manufacturer directly. See page 2 for contact data.

The replacement parts list can be found in the Appendix.

7.3 Maintenance schedule

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.



All work must documented in the service manual (Chapter C of Service Manual, page 74).



Maintenance

Interval	Maintenance work	Personnel
Daily	Check coolant liquid level (Chapter 7.4.2 "Checking the coolant liquid level/topping up the coolant liquid" on page 59)	Qualified personnel
	Check for leaks (Chapter 7.4.1 "Checking for leaks" on page 59)	Qualified personnel
	Check the compressor temperature, warning message and error messages (controller documentation)	Trained person
Weekly	Check cooler for soiling (Chapter 7.4.4 "Checking soiling of the cooler" on page 62) Clean if necessary	Qualified personnel
	Check intake filter for soiling / replace (Chapter 7.4.5 "Replacing the intake filter" on page 63)	Qualified personnel
At the latest - every 4000 operating hours (G/V Drive 38 – 45)	General compressor maintenance	Manufacturer
- every 4000 operating hours (G/V Drive 56 – 75)		
- at least 1x a year		

The specified maintenance intervals are based on:

- Max. humidity of 60%
- Compressor temperature of max. 85°C
- Prerequisites for the installation location (Chapter 5.2, page 50)

The maintenance intervals depend on the operating conditions and are based on cool and clean ambient conditions, a high level of utilisation and few load changes. In the event of different conditions, contact the manufacturer!



7.4 Maintenance work

Necessary maintenance work

Necessary maintenance work appears on the display of the controller as a warning.

7.4.1 Checking for leaks

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing
- Light respiratory protection
- Protective goggles
- Protective gloves
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- 2. Close compressed air network-side shutoff valve and secure against re-opening.
- **3.** Open and remove the sound insulation covers with the special spanner.
- **4.** Check all lines and the base for leaks.
- **5.** If there is coolant liquid in the system, remove it.
- **6.** Check the connectors for the components and tighten the screws.

7.4.2 Checking the coolant liquid level/topping up the coolant liquid

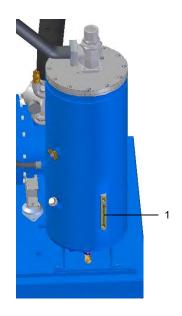
Checking the coolant liquid level

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing
- Light respiratory protection
- Protective goggles
- Protective gloves



- Fig. 38: Inspection glass
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- **2.** Close compressed air network-side shut-off valve and secure against re-opening.

Before checking the inspection glass, wait 10 min. for the coolant liquid to flow back into the tank.

- **3.** Open and remove the sound insulation covers with the special spanner.
- **4.** Check the coolant liquid in the inspection glass (Fig. 38/1).
- 5. The coolant liquid must be between the markings. If the liquid is below the lower marking, top up with coolant liquid.



Topping up the coolant liquid

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing
- Light respiratory protection
- Protective goggles
- Protective gloves

Materials:

- Drip pan for coolant liquid
- Funnel with filling aid

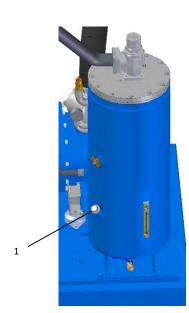


Fig. 39: Filler plug

Before completely opening the filler plug, allow the residual pressure to escape from the tank.

- **1.** Switch the screw compressor off and secure it to prevent restarting.
- 2. Close compressed air network-side shutoff valve and secure against re-opening.
- 3. Open and remove the sound insulation covers with the special spanner.

- **4.** Use a drip pan to make sure that the leaking coolant liquid is collected.
- **5.** Loosen the filler plug (Fig. 39/1), remove it and make sure that gasket does not get lost.

NOTE!

Property damage due to incorrect coolant liquid!

Mixing different coolant liquids or using incorrect coolant liquids causes significant property damage to the screw compressor.

- Only use the coolant liquid prescribed in the technical data.
- For high temperature systems, use only fully synthetic coolant ALUB Syn S.

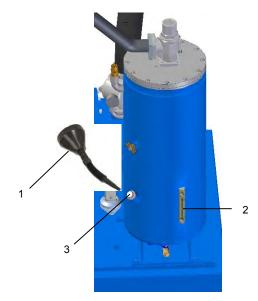


Fig. 40: Filler nozzle

- **6.** Use a funnel (Fig. 40/1) to top up coolant liquid to the level of the marking in the inspection glass (Fig. 40/2).
- **7.** Position the gasket and check that it is firmly in place.
- **8.** Re-insert and tighten the filler plug (Fig. 40/2).



7.4.3 Checking the compressor temperature

Personnel:

- Trained person

Protective equipment:

- Safety shoes
- Protective work clothing

NOTE!

Material damage due to compressor temperature that is too low or too high!

If the compressor temperature is too low or too high, the screw compressor may sustain damage.

- Contact the manufacturer for more detailed information.

 $\hat{\mathbb{1}}$

- The compressor temperature should be between 70°C and 100°C.
- At 105°C, a warning is output.
- At 110 °C the screw compressor is switched off automatically.
- 1. On the controller, check Compressor temperature.



7.4.4 Soiling of the cooler

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing
- Light respiratory protection
- Protective goggles
- Protective gloves
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- 2. Close compressed air network-side gate valve and secure against re-opening.
- **3.** Open the sound insulation covers with the special spanner and remove them.
- **4.** Check the compressed air and coolant liquid cooler from inside and outside for soiling.
- 5. Remove soiling.



i

Soiling can be removed by blowing it out, for instance. While doing this, make sure that the soiling from the device is blown out of rather than into the machine. In case of severe soiling, consult the manufacturer.



7.4.5 Replacing the intake filter

Standard intake filter

Personnel:

- Qualified personnel

Protective equipment:

- Safety shoes
- Protective work clothing
- Light respiratory protection
- Protective goggles
- Protective gloves
- **1.** Switch the screw compressor off and secure it to prevent restarting.
- **2.** Close compressed air network-side shutoff valve and secure against re-opening.
- **3.** Open and remove the sound insulation covers with the special spanner.



Fig. 41: Fit of intake filter

4. Undo the seal for the intake filter (Fig. 41/1).



Fig. 42: Removing the cover from the intake filter

- **6.** Remove the cover from the intake filter. (Fig. 42/2)
- **7.** Remove the old filter element (Fig. 42/1).



Maintenance

- **7.** Insert the new filter element (Fig. 42/1).
- **8.** Attach the cover of the intake filter (Fig. 42/2).
- **9.** Push the seal for the intake filter into place (Fig. 41/1).

7.5 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 that were unfastened beforehand to make sure they are tightened.
- **2.** Check that 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 the machine's safety devices function perfectly.
- **7.** Document work on the machine in the service manual (*Appendix C "Service manual" on page 74*).



8 Faults

The following section describes possible causes of faults and the work to remedy them.

If faults occur more frequently, shorten the maintenance intervals according to actual wear.

In case of faults that cannot be remedied using the following instructions, contact the manufacturer, see contact data on page 2.

8.1 Safety instructions for fault rectification

Electrical system

A DANGER!

Risk of fatal injury 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.

Securing against a restart

Danger of fatal injury due to unauthorised restart!

Restarting the power supply without authorisation during troubleshooting puts any personnel in the hazard area at risk from severe injuries, or even death.

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

Improperly performed troubleshooting!

Danger of injury due to improper troubleshooting!

Improperly performed troubleshooting can cause serious injuries and considerable property damage.

- Before starting work, ensure sufficient installation space.
- Ensure the installation location is organised and clean. Loosely stacked components, or components and tools left lying around, are a potential 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 troubleshooting work has been performed and completed according to the information and notes contained in theses instructions.
 - Ensure that there is nobody in the hazard area.
 - Ensure that all covers and safety devices are installed and functioning properly.



Hot surfaces

Danger of injury due to hot surfaces!

Component surfaces and operating materials (e.g. coolant liquid or cooling water) may heat up considerably during operation. Skin contact with hot surfaces or liquids can cause serious burns.

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

Compressed air

Risk of injury due to compressed air!

Compressed air can escape from compressed air hoses or pressurised components 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 an uncontrolled manner and can cause injuries if handled incorrectly.

- Before removing pressurised hoses or components, depressurise them.
- Have faulty pressurised components replaced immediately by qualified personnel.
- Before all work, ensure that The compressor is depressurised by waiting at least 5 minutes.

Coolant mist

Danger of injury due to coolant mist!

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

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

Behaviour in the event of faults

Essentially, the following applies:

- **1.** In the event of faults that present an immediate risk to persons or property, immediately initiate an emergency stop.
- 2. Determine the cause of the fault.
- If a fault necessitates work in the hazard area, switch off the machine and secure it against restarting.

Inform the responsible persons about the fault immediately.

4. Depending on the type of fault, have it rectified by authorised qualified personnel or rectify it yourself.

The fault table shown below provides information about who is authorised to rectify each fault.

8.2 Fault displays

Refer to the *controller documentation* for information on fault displays.



8.3 Fault table

Fault description	Cause	Remedy	Personnel
Compression temperature too high	Intake or ambient temperature too high	Ventilate compressor room	Qualified personnel
	Cooling air intake or outlet blocked	Unblock cooling air intake or outlet sufficiently	Qualified personnel
	Coolant liquid contains contaminants	Replace coolant liquid	Manufacturer
	Coolant liquid low	Top up coolant liquid (Chapter 7.4.2 "Checking the coolant liquid level/topping up the coolant liquid" on page 59)	Qualified personnel
	Coolant liquid cooler contains contaminants	Clean the coolant liquid cooler (Chapter 7.4.4 "Checking soiling of the cooler" on page 62)	Qualified personnel
Network pressure drops	Compressed air consumption higher than delivery quantity of the screw compressor	Compressed air consumption drops	Manufacturer
	Intake filter clogged	Replace intake filter (Chapter 7.4.5 "Replacing the intake filter" on page 6)	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
	Leaks in the compressed air network	Seal off the compressed air network	Qualified personnel
Screw compressor discharges via safety	Minimum pressure valve blocked	Clean or replace minimum pressure valve	Manufacturer
valve	Safety valve faulty	Check safety valve and replace if necessary	Manufacturer
	Fine precipitator clogged	Replace fine precipitator	Manufacturer
"Overpressure fault" or	Fine precipitator clogged	Replace fine precipitator	Manufacturer
"Network pressure too high"	Higher outside pressure present in compressed air network	Equalise outside pressure or disconnect from the network	Qualified personnel



Faults

Fault description	Cause	Remedy	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 (controller documentation)	Trained person
	Interruption in the power circuit	Check power circuit for interruption	Qualified electrician
	Ambient temperature below +1°C, message "Coolant liquid temperature too low"	Install auxiliary heating or regulate temperature of compressor room, and also contact the manufacturer	Manufacturer
	Switching times are activated in the circuit	Check switching and pressure times in the circuit (controller documentation)	Trained person
System does not start up when the start switch is pressed	Network pressure higher than switch-on pressure	Observe network pressure and change settings <i>(controller documentation)</i>	Trained person
	The " <i>remote"</i> symbol flashes	Remote control activated (controller documentation)	Trained person
	No voltage at the screw compressor	Check whether there is voltage	Qualified electrician
	Electrical fault in the controller	Check controller	Qualified electrician
	Switching times are activated in the circuit	Check switching and pressure times in the circuit (controller documentation)	Trained person
Compressed air contains a lot of coolant liquid	Return line for the coolant liquid is blocked	Clean or replace return line for the coolant liquid	Manufacturer
(coolant liquid consumption too high)	Faulty fine precipitator	Replace fine precipitator	Manufacturer
System stops before reaching the final	Excess temperature or overpressure	Rectify fault (controller documentation)	Qualified personnel
pressure	Interruption in the control power circuit	Check circuit	Qualified electrician
Pressure drop	Pressure difference of the filters too high	Replace filter	Qualified personnel



8.4 Commissioning after rectifying a fault

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

- **1.** Reset emergency stop equipment.
- **2.** Acknowledge fault (controller documentation).
- Ensure that there is nobody in the hazard area.
- **4.** Start the screw compressor (*controller documentation*).



9 Disassembly and disposal

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

9.1 Safety instructions for disassembly and disposal

Electrical system

A DANGER!

Risk of fatal injury 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

Danger of injury due to improper disassembly!

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.
- Proceed with 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 potential source of accidents.
- Dismantle components properly. Note that some components are heavy. If necessary, use lifting equipment.
- Ensure components cannot be dropped and cannot fall over.
- Consult the manufacturer in the event of uncertainty.

9.2 Disassembly

Before starting the disassembly:

- 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.

9.3 Disposal

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

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

igoplus ENVIRONMENTAL PROTECTION!

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 a specialist disposal company for information.



Appendix



A Training log

Date	Name	Type of training	Training conducted by	Signature



B Screw tightening torques

Lock screws/nuts (black, dry surface)

Version B 158/193/196/251 or similar

Thread	Category 8.8	Unit	Category 10.9	Unit
M 5	3.69 (5)	lbf ft (Nm)	7.38 (10)	lbf ft (Nm)
M 6	5.9 (8)	lbf ft (Nm)	13.28 (18)	lbf ft (Nm)
M 8	14.75 (20)	lbf ft (Nm)	32.45 (44)	lbf ft (Nm)
M 10	29.5 (40)	lbf ft (Nm)	64.17 (87)	lbf ft (Nm)
M 12	50.89 (69)	lbf ft (Nm)	111.37 (151)	lbf ft (Nm)
M 16	125.39 (170)	lbf ft (Nm)	280.27 (380)	lbf ft (Nm)

Lock screws/nuts (black, dry surface) Version DIN 912/931/933/934/982 or similar

Thread	Category 8.8	Unit	Category 10.9	Unit
M 5	4.43 (6)	lbf ft (Nm)	6.27 (8.5)	lbf ft (Nm)
M 6	7.38 (10)	lbf ft (Nm)	10.33 (14)	lbf ft (Nm)
M 8	18.44 (25)	lbf ft (Nm)	25.81 (35)	lbf ft (Nm)
M 10	36.14 (49)	lbf ft (Nm)	50.89 (69)	lbf ft (Nm)
M 12	63.43 (86)	lbf ft (Nm)	88.51 (120)	lbf ft (Nm)
M 16	154.89 (210)	lbf ft (Nm)	217.58 (295)	lbf ft (Nm)



C Service manual

Compressor type:	
Plant number:	
Please specify for all enquiries, orders and correspondence.	

Motor number:	
Pressure tank number:	
Date of commissioning:	

ALMiG Customer Service:



Daily checks		Weekly checks						
Operating hours	Coolant liquid level	Leakage	Compressor temperature	Cooler soiling	Condensate formation	Clean intake filter mats	Date	Name





Additional maintenance and repair work					
Operating hours	Date	Replacement parts	Name		

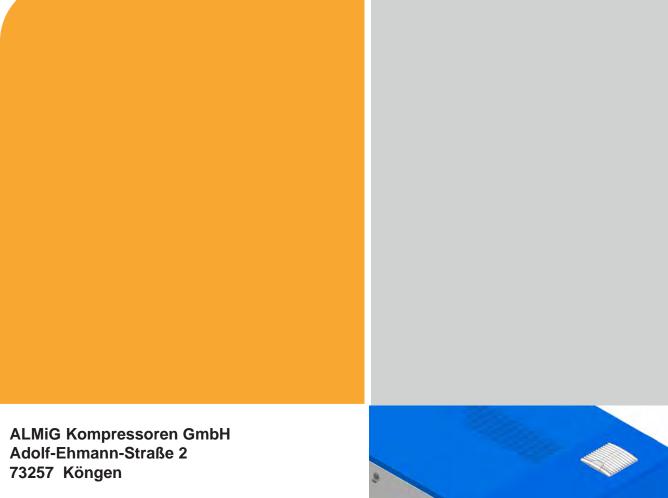


D Replacement parts list

Replacement parts list

The replacement parts list is included with the supplied documents.





Phone+49 7024 9614 0Emailinfo@almig.deInternetwww.almig.de



Article number 195. 04059_gb