

Operating instructions

Screw compressor
SiloKing 700 / 1100 / 1500
SiloKing 700 / 1100 LS



Doc-ID: 5067 / BA / EN

Release: Rev. 01 / 11/04/2018

The operating instructions must be read by the SiloKing operator before start-up!

Translation of the original operating manual

© CVS engineering GmbH

Großmattstraße 14
79618 Rheinfeldern / Germany

Phone: +49 (0)7623 71741-0
Customer service: +49 (0)7623 71741-0
E-Mail: info@cvs-eng.de
Internet: www.cvs-eng.de



1	General	4
1.1	Information regarding the operating instructions	4
1.2	Pictogram explanation	5
1.3	Limitation of Liability	6
1.4	Copyright protection.....	6
1.5	Spare parts	7
1.6	Warranty conditions	7
1.7	Customer Service	7
2	Safety	8
2.1	Intended use	8
2.2	Acceptance and monitoring	8
2.3	Operator's responsibility	8
2.4	Operating personnel	9
2.4.1	Requirements	9
2.5	Personal protective equipment	10
2.6	Occupational safety and special risks	10
3	Technical data	15
4	Design and function	18
4.1	Design.....	18
4.2	Function	20
4.3	Control and display elements	20
5	Transport and storage	21
5.1	Safety notes for transport	21
5.2	Transport.....	21
5.3	Storage	21
6	Start-up and operation	22
6.1	Safety during start-up	22
6.2	Start-up	22
6.3	Switching off.....	23
6.4	Inspections to be performed	23
7	Maintenance	24
7.1	Safety during maintenance work	24
7.2	Maintenance schedule.....	24
7.3	Performance of maintenance work.....	25
8	Malfunctions	27
8.1	Safety.....	27
8.2	Recommissioning after corrective action	27
8.3	Malfunction table.....	28
9	Spare parts	29
10	Decommissioning and disposal	30
	Index	31

General

1 General

1.1 Information regarding the operating instructions

These operating instructions provide important information on how to deal with the SiloKing. A precondition for safe operation is the observance of all specified safety and handling instructions.

Furthermore, all local accident prevention regulations and general safety regulations valid for the application area of the SiloKing must be observed.

Carefully read the operating instructions before starting any work! It is a product component and must be kept in direct proximity of the SiloKing, well accessible to the personnel at all times.

When passing the SiloKing on to third parties, the operating instructions must also be handed over.

1.2 Pictogram explanation

Warning notes

Warning notes are characterised by pictograms in these operating instructions. The warning notes are marked by signal words expressing the extent of the hazard.

It is absolutely essential to observe the notes and to proceed with caution in order to prevent accidents as well as bodily injuries and property damage.



DANGER!

points to an immediately dangerous situation, which can lead to death or serious injuries if it is not avoided.



WARNING!

... points to an immediately dangerous situation, which can lead to death or serious injuries if it is not avoided.



CAUTION!

... points to a potentially dangerous situation, which can lead to minor or light injuries if it is not avoided.



ATTENTION!

... points to a potentially dangerous situation, which may lead to property damage if it is not avoided.

Hints and recommendations



NOTE!

... highlights useful hints and recommendations as well as information for an efficient and trouble-free operation.

General

1.3 Limitation of Liability

All specifications and notes in these operating instructions were compiled with consideration to the valid standards and regulations, the state of the art as well as to our long-standing knowledge and experience.

The manufacturer is not liable for damages caused by:

- Non-observance of the operating instructions
- Improper use
- Deployment of non-trained personnel
- Arbitrary modifications
- Technical changes
- Use of non-approved spare and wear parts

The actual scope of supply may differ from the explanations and illustrations described in this manual in case of special designs, if additional order options are made use of, or due to latest technical changes.

Incidentally, the responsibilities agreed upon in the delivery contract, the general terms and conditions as well as the manufacturer's conditions of delivery and the statutory provisions valid at the time of contract conclusion shall apply.

Warranty

The manufacturer guarantees the correct functioning of the applied process technology and the performance parameters identified.

The warranty period commences on the date the SiloKing is delivered to the customer.

Components are exempted from the warranty and from claims for defects as far as wear and tear damage is concerned.

1.4 Copyright protection

Surrendering the operating instructions to third parties without written permission of the manufacturer is not permitted.



NOTE!

Content details, texts, drawings, pictures and other illustrations are protected by copyright and are subject to industrial property rights. Any improper use shall be liable to prosecution.

Any type and form of duplication also of extracts as well as the exploitation and/or communication of the contents are not permitted without the manufacturer's written declaration of consent.

1.5 Spare parts

**WARNING!****Risk of injury by incorrect spare parts!**

Incorrect or defective spare parts can result in damage, malfunctions or total failure and also impair safety.

Therefore:

- Use only the manufacturer's original spare parts.

Procure spare parts from authorised dealers or directly from the manufacturer. Refer to page 2 for address.

1.6 Warranty conditions

For warranty conditions refer to the "General Terms and Conditions".

1.7 Customer Service

Our customer service can be contacted for any technical advice. Information about the responsible contact person can be retrieved by telephone, fax, E-mail or via the Internet at any time, refer to manufacturer's address on page 2.

Safety

2 Safety

2.1 Intended use

The SiloKing 700 / 1100 / 1500, SiloKing 700 / 1100 LS screw compressors are designed exclusively for compressing filtered air. The SiloKing has been developed for installation into a superordinate system.

Use the SiloKing only as intended.

All specifications in the operating instructions must be strictly adhered to (technical data, operating data, permissible working range), refer to chapter 3 in this regard.

All types of claims due to damage arising from improper use are excluded. The operator alone shall be responsible for any damage arising from improper use.

2.2 Acceptance and monitoring

The SiloKing is not subject to any acceptance and monitoring obligation.

2.3 Operator's responsibility

The SiloKing is used for industrial purposes.

The operator of the SiloKing is therefore subject to the legal obligations concerning occupational safety.

The provisions valid at the place of installation as well as the safety and accident prevention regulations of the Institution for statutory accident insurance and prevention must be observed. The operator must in particular:

- inform himself on the valid industrial safety regulations.
- determine the additional hazards that arise from the special working conditions at the SiloKing 's place of installation by means of a hazard assessment.
- implement the necessary rules of conduct for operation of the SiloKing at the place of installation by means of user instructions.
- check at regular intervals during the SiloKing's entire period of use whether the user instructions correspond to the current state of the body of rules and regulations.
- adapt the operation instructions, if necessary to the new regulations, standards, and operating conditions .
- clearly regulate the responsibilities for installing, operating, maintaining and cleaning the SiloKing.
- ensure that all employees working on or with the SiloKing have read and understood the operating instructions. In addition he must at regular intervals train the employees in how to deal with the SiloKing and inform them about potential hazards.

Furthermore, the operator is responsible that the SiloKing:

- is always in a technically perfect condition.
- is maintained in accordance with specified maintenance intervals.
- all safety equipment is regularly checked for completeness and correct functioning.

2.4 Operating personnel

2.4.1 Requirements



WARNING!

Risk of injury in case of inadequate qualification!

Improper handling can lead to considerable bodily injuries and property damage.

Therefore:

- Have any activities only carried out by the individuals designated for that purpose.

The operating instructions specify the following qualification requirements for the different fields of activity:

- **Instructed persons**
have been instructed during instructions provided by the operator with regard to the work assigned to them and possible hazards arising from improper conduct.
- **Specialists**
are due to their technical training, knowledge and experience and their knowledge of the pertinent regulations able to carry out the work assigned to them and to independently recognize potential hazards.

Safety

2.5 Personal protective equipment

When handling the SiloKing, it is necessary to wear personal protective equipment, in order to minimise health hazards.

- Before carrying out any work, properly don the necessary protective equipment such as gloves, safety goggles, etc. and wear during work.

2.6 Occupational safety and special risks

The remaining risks that result from the hazard analysis are specified in the following section.

Observe the safety notes listed here and the warning notes in the other chapters of these instructions to reduce health hazards and to avoid dangerous situations.

Hazard symbols on the SiloKing

The relevant dangerous spots on the SiloKing are identified by these pictograms:



DANGER!
General danger pictogram!

... denotes general dangerous situations for individuals. Non-observance of the safety instructions can result in severe injuries or death. .



DANGER!
Danger of burns!

... denotes the presence of a hot surface.

Hazard notes and occupational safety

For your own safety and that of the machine, the following information must be observed and complied with:

Improper operation

DANGER!
Danger due to improper operation!


- Use the SiloKing only in a technically perfect condition. Malfunctions that are relevant for safety have to be promptly eliminated.
- Conversions of the SiloKing are not permissible and can impair safety.
- Before carrying out regular maintenance, cleaning and repair work, switch off power supply and secure SiloKing against restarting (switch off drives).
- Never bridge any safety equipment or put it out of operation.
- Any work on the SiloKing and/or on electrical equipment must be carried out by specialised staff.
- Repair and maintenance work may only be carried out when the SiloKing is stationary. For this, the SiloKing must be secured against restarting!
- The SiloKing may not be under pressure or in a state of vacuum while work is being carried out on it.
Close shut-off valve on the vehicle side and vent the pipe between SiloKing and shut-off valve or manually relieve excess pressure at safety valve. Observe pressure gauge!
- The drive's protective equipment may only be removed when the SiloKing is stationary and has to be correctly refitted after completion of work.
- Only dismantle accidental contact protection after SiloKing and pressure pipe have cooled down.
- It is an environmental protection requirement that any liquids arising during maintenance work (e.g. oil) must be collected and disposed of in an environmentally compatible manner.

Safety

Moving components



WARNING!

Risk of injury by moving components!

Powered rotating components can cause the most serious injuries!

Therefore during operation:

- It is absolutely forbidden for persons to stay in the hazard area or in the immediate vicinity!
- Do not put safety devices and/or functions out of operation and do not render them inoperative or bypass them.
- Never reach into open outlets and inlets or into running equipment.

Before entering the hazard area:

- Switch off power supply and secure against restarting.
- Wait for standstill of lagging components.
- Wait for automatic dissipation and/or discharge of residual energies (compressed air).

Compressed air



WARNING!

Risk of injury due to compressed air!

Pneumatic energies can cause the most serious injuries.

In the case of damage to individual components, air can be discharged under high pressure and injure e.g. the eyes. Therefore:

- Before starting any work, first depressurise pressurised components. Pay attention to accumulators. Accumulator pressure must also be completely relieved.

Signposting



WARNING!

Risk of injury by illegible pictograms!

Labels and signs can become dirty or unrecognisable in the course of time.

Therefore:

- Always keep safety, warning and operating instructions in a well legible condition.
- Immediately replace damaged or obliterated signs or labels.

Improper transport



Danger!
Danger by falling down or tilting of the SiloKing!

The weight of the SiloKing may injure a person and cause serious bruising!

Therefore:

- Depending on the dead weight and size of the SiloKing, use a pallet on which the SiloKing can be moved by means of a fork lift.
- For lifting the SiloKing, use suitable lifting gear (slings, etc.) that is designed for the weight of the SiloKing.
- When putting the slings in position, take care to avoid putting stress on individual components.
- Only use the provided attachment points with eye bolts.

Start-up, operation



WARNING!
Risk of injury due to improper start-up and operation

Improper start-up and operation can lead to serious bodily injuries or property damage. Therefore:

- Have all work during initial operation exclusively performed by the manufacturer's employees or by his authorised representatives or by trained personnel.
- Start-up and operation may only be performed by adequately qualified personnel that has been authorised and instructed by the operator.
- Before the start of any work, ensure that all covers and protective devices are correctly installed and function correctly.
- Never override any protective equipment during operation.
- Pay attention to tidiness and cleanliness in the working area! Loosely stacked or scattered components and tools are accident sources.

Safety

Electrical system



DANGER!
Mortal danger due to electric current!

There is mortal danger in case of contact with live components.

Activated electrically driven components can start to move uncontrolled and cause severest injuries.

Therefore:

- Switch off the electric power supply before commencing any work and secure against restarting.
- Work on the electrical system, on individual electrical components and on the connections may only be carried out by electrical specialists.

Maintenance and troubleshooting



WARNING!
Risk of injury due to improper maintenance and troubleshooting!

Improper maintenance and troubleshooting can lead to serious bodily injuries or property damage.

Therefore:

- Maintenance work and troubleshooting work may only be carried out by sufficiently qualified and instructed personnel.

Secure the SiloKing against being switched on again, switch off the drives!

- Before starting any work, provide for sufficient space and freedom of movement during assembly.
- Pay attention to tidiness and cleanliness in the assembly area! Loosely stacked or scattered components and tools are accident sources.

If components must be replaced:

- Pay attention to correct installation of spare parts.
- Properly reassemble all fastening elements.
- Observe screw tightening torques.
- Before restarting, ensure that all covers and protective devices are correctly installed and function correctly.
- After completion of maintenance work and troubleshooting, check correct functioning of safety equipment.

3 Technical data

SiloKing performance characteristics ¹⁾		Unit	Model 700			Model 1100			
Input speed	SiloKing	[min ⁻¹]	2400	3000	3600	2000	2400	3000	3600
	SiloKing LS	[min ⁻¹]	1950	2440	2930	1630	1950	2440	2930
Intake volume flow at a final overpressure at the pressure flange	0.0 bar	[m ³ /h]	420	540	650	550	675	850	1050
	2.5 bar		376	471	587	475	581	756	962
Coupling power at a final overpressure at the pressure flange:	0.0 bar	[kW]	11.0	13.5	16.0	17	19.0	22.5	26.5
	2.5 bar		25.5	31.5	38.0	31	37.0	49.0	59.5
Final temperature at final overpressure = 2.0 bar		[°C]	188	184	179	191	188	184	179
max. perm. final temperature at final overpressure = 2.5bar		[°C]	250						

SiloKing performance characteristics ¹⁾		Unit	Model 1500		
Input speed		[min ⁻¹]	1000	1500	2000
Intake volume flow at a final overpressure at the pressure flange	0.0 bar	[m ³ /h]	770	1220	1640
	2.0 bar		690	1140	1560
	2.5 bar		670	1120	1540
Coupling power at a final overpressure at the pressure flange of:	0.0 bar	[kW]	14	26	40
	2.0 bar		41	62	85
	2.5 bar		48	71	96
Final temperature at final overpressure = 2.0 bar		[°C]	180	176	176
max. perm. final temperature at final overpressure = 2.5bar		[°C]	250		

1) Suction pressure at suction flange = 1.0 bar, suction and ambient temperature = 20 °C, geodetic altitude max. 1000 m

Tab. 1: Performance characteristics

Technical data

Permissible working range	Unit	Model 700	Model 1100	Model 700 LS	Model 1100 LS	Model 1500
Drive speed ⁰⁾	[min ⁻¹]	2400...3600	2000...3600	1950...2930	1630...2930	1000...2000
Weight SiloKing	[kg]	117	127	126	135	185
Weight SiloKing with adapter gear	[kg]	157	167	166	175	–
Suction temperature ¹⁾	[°C]	– 10...+ 40				
Geodetic height ¹⁾	[m]	0...1000				
Negative pressure suction side (e.g. due to soiling)	[mbar]	0...65				
Maximum final overpressure at the pressure flange ²⁾	[bar]	2.5				
Running time in continuous operation ³⁾	[h]	max. 3.0				
Permissible inclination from the horizontal	[°]	±10				±3

0) When an adapter gear unit is fitted, the drive speed is reduced in accordance with the transmission ratio used

1) For suction temperatures or heights outside the permissible working range, consult with CVS.

2) In case of increased suction temperatures or heights, the maximum permissible final pressure is reduced. Consult with CVS.

3) For continuous operation in excess of 3 hours, an oil cooler must be installed. Installation instructions on request.

Tab. 2: Permissible working range

Gear oil specification	Value
Specification	API CD/SF or higher
SAE viscosity class	10W40 or 15W40
Oil pressure SiloKing	min. 0.5 bar (excess pressure)
Gear oil quantity SiloKing ¹⁾	
Type 700 / 1100	8 litres
700 LS / 1100 LS	7 litres
1500	6.8 litres
Gear oil quantity, adapter gear:	
Type 700 / 700 LS / 1100 / 1100 LS	
– Drive shaft top	1.1 litres
– Drive shaft right and left	1.5 litres

1) When connecting a gear oil cooler, the oil quantity must be increased commensurate with the additional volume.

Tab. 3: Gear oil specification

Recommended gear oils

Brand	Type of oil
CVS ¹⁾	CVS Lube 2000
CVS	CVS Lebensmitteltauglich

Other gear oil grades on request.

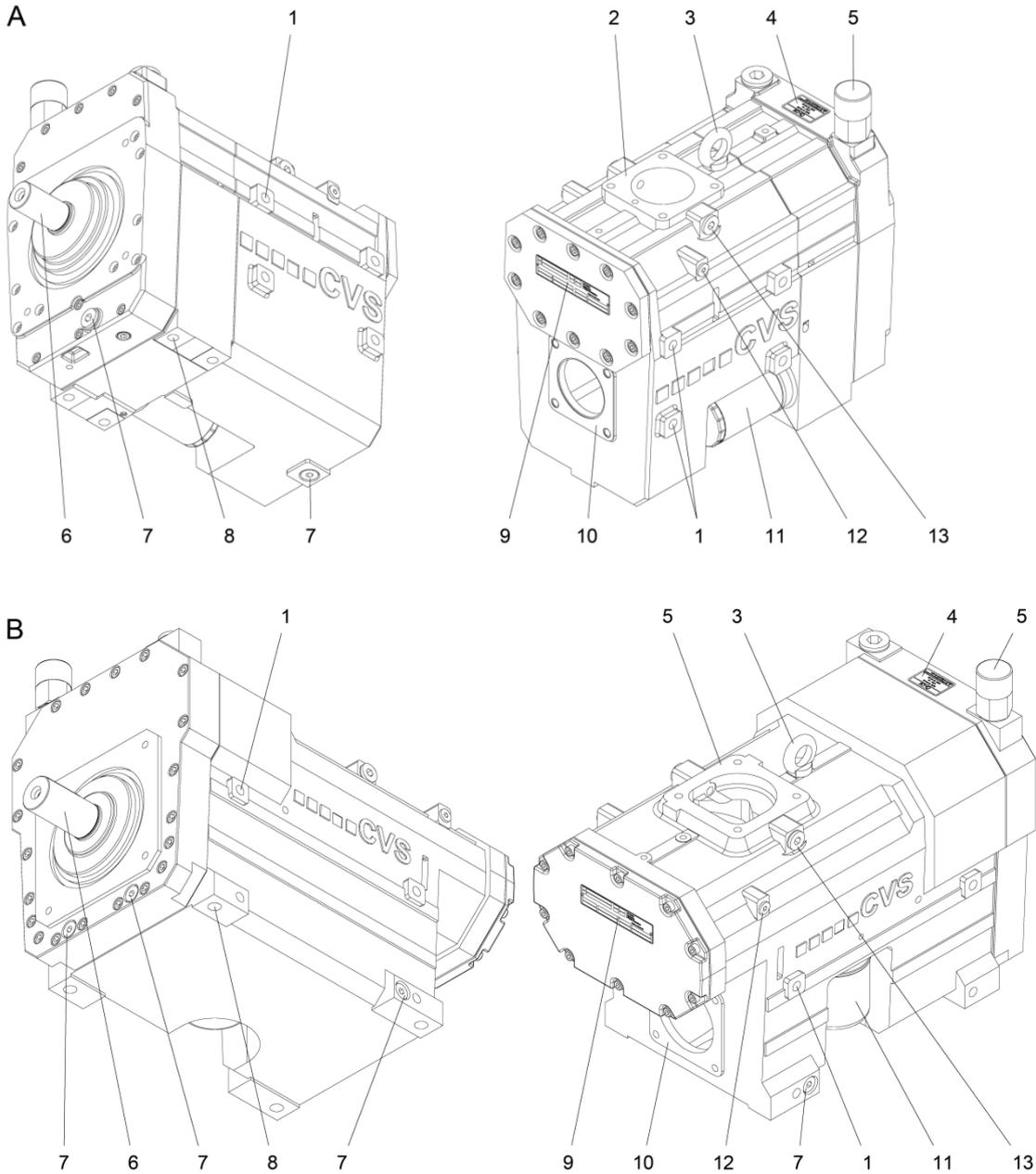
- 1) Using CVS Lube 2000 doubles the oil change intervals to 1 year or 1000 operating hours (see chapter 7.2) and extends the warranty period to 2 years.

Tab. 4: Types of gear oil

Design and function

4 Design and function

4.1 Design



A: SiloKing 700 / 1100 / 700 LS / 1100 LS

B: SiloKing 1500

Fig. 1: View of the SiloKing and details

- | | | | | | |
|---|--|---|--|----|--|
| 1 | Attachment thread vertical (4 pieces per side of the SiloKing) | 5 | Oil filler neck cap / gearbox ventilation with oil dip stick | 9 | Rating plate data SiloKing |
| 2 | Air outlet flange | 6 | Drive shaft with feather key | 10 | Air intake flange |
| 3 | Attachment point for transport | 7 | Oil drain screw | 11 | Gear oil filter |
| 4 | Rating plate gear oil | 8 | Horizontal fastening screw thread (4 pieces) | 12 | Connection oil pressure gauge |
| | | | | 13 | Connection pressure gauge or temperature sensor for compressed air |

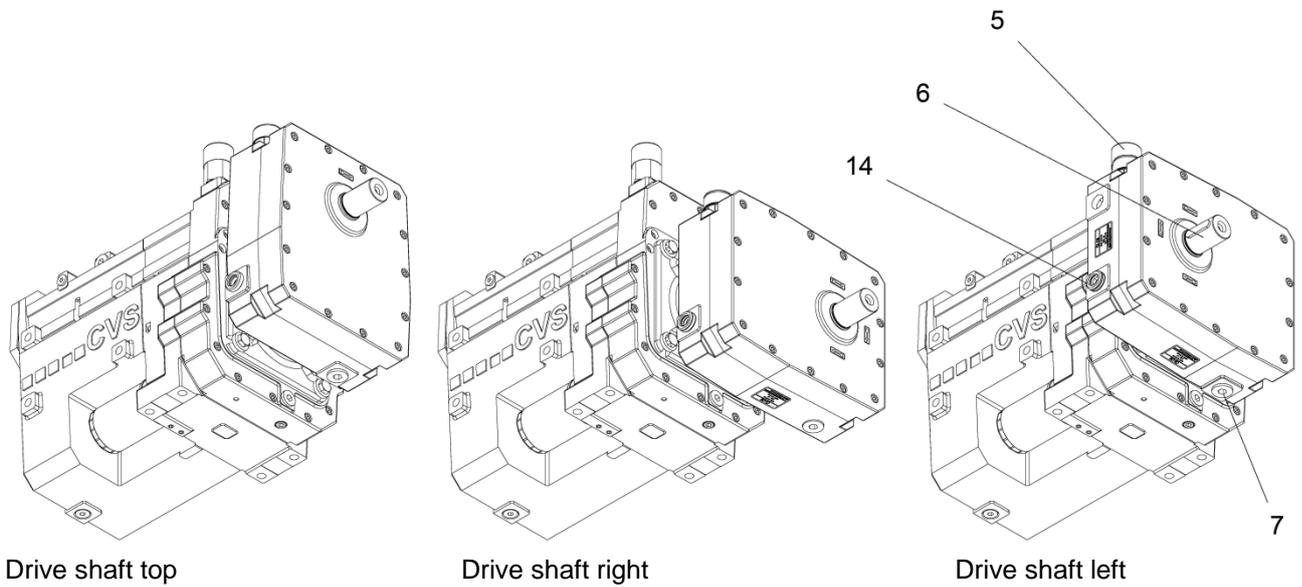


Fig. 2: View of the SiloKing type LS with adapter gear

- 5 Oil filler neck cap / gear ventilation
- 6 Drive shaft with feather key
- 7 Oil drain screw
- 14 Oil sight glass

Design and function

4.2 Function

Functional principle

Cleaned air is taken in via the air intake flange. Two screw rotors compress the air completely dry. The rotors are running contact-free both in relation to each other and to the casing. They are kept apart by a synchronising gearbox. The compressed air reaches the consumer via the air outlet flange.

Lubrication

Bearing and gearbox are supplied with gear oil via an oil filter by means of an integrated oil pump.

Cooling

The heat is dissipated to the ambient air via the casing surface.

Sense of rotation

The direction of rotation of the drive shaft is clockwise when looking at the drive shaft (SiloKing without adapter gear).

Drives

The machine is driven via coupling, V-belt or articulated shaft.
For drive via PTO shaft and when installing the SiloKing inside the vehicle chassis, CVS offers an adapter gear with a transmission ratio of 1:2 or 1:2.5 (type 700 / 1100 / 700 LS / 1100 LS).

4.3 Control and display elements

Depending on the installation location, different display elements such as pressure gauge, temperature gauge and negative pressure display are available.

5 Transport and storage

5.1 Safety notes for transport

See chapter 2.6 Safety!

5.2 Transport

The SiloKing fastened on a baseplate must be transported by means of a fork lift or suitable straps. The lifting gear must be designed for the weight of the SiloKing.

For future transports:

- Seal all open connections with protective caps (prevents penetration of dirt and water)
- Secure against vibrations
- Drain gear oil
- Securely fasten the SiloKing prior to transport (e.g. screw it onto a pallet)
- Transport and put down the SiloKing with a fork lift or secure with straps and lift with suitable lifting gear.

5.3 Storage

Storage of packages

Store packages under the following conditions:

- Do not store outdoors.
- Store dry and dust free.
- Do not expose to aggressive media.
- Protect against solar irradiation.
- Avoid mechanical vibrations.
- Storage temperature: -10 to +60 °C
- Relative humidity: max. 95%, non-condensing
- If storage lasts longer than 3 months, regularly check the general condition of all parts and of the packaging.
- On SiloKings intended for export (overseas), bags with desiccant are placed into the inlets and outlets. These bags keep moisture away from the SiloKing's workspace. Remove bags before suction and pressure line are connected.

Start-up and operation

6 Start-up and operation

6.1 Safety during start-up

See chapter 2.6 Safety!

6.2 Start-up



ATTENTION!

The SiloKing or the adapter gear must always have a sufficient oil level. Check oil level and top up if necessary. See rating plate oil on the SiloKing or chapter 3 Tab. 3 / Tab. 4: Types of gear oil.

Inspection prior to initial start-up

The following points must be checked prior to initial start-up:

- Transport damage to the SiloKing
- Entire installation
- Correctness of data on the rating plate
- Conduits for free passage and leak tightness.
- Screw connections for tightness
- Direction of rotation of the drive by switching it on and off briefly (correct direction of rotation: clockwise as seen on the drive shaft (for SiloKing without adapter gear), see direction of rotation arrow)
- Oil level
- Direction of installation and function of non-return valve
- Safety valve function
- Accidental contact protection function
- Suction and pressure lines must be installed

Start-up

- Ensure that the SiloKing is positioned at an acceptable angle (see chapter 3 Tab. 1)
- Depressurise the pressure side
- Open shut-off devices
- Switch on drive (engage gently)
- Adjust input speed
- Check operating data

Inspections during operation

During operation **the operator** has to check the following data **every 20 minutes**:

- Drive speed (see chapter 3 Tab. 2)
- Final overpressure (see chapter 3 Tab. 2)
- Gear oil pressure at the SiloKing (see chapter 3 Tab. 3)

6.3 Switching off

Switch off the SiloKing as follows:

- Switch off drive.
- Close shut-off valves, drain condensate if necessary, e.g. when using a compressed air aftercooler.

6.4 Inspections to be performed

Gear oil inspection

Check the gear oil level in the SiloKing with an oil dipstick or on the oil sight glass of the adapter gear. Top up with oil if necessary.

Non-return valve inspection

The non-return valve is maintenance free, but is subject to wear like any other moving part. We recommend a visual inspection every 3 months. In this connection, the non-return valve must be dismantled, cleaned, freed of deposits and checked for freedom of motion.

Safety valve inspection

The safety valve is no regulating device!

The operational capability must be checked on start-up and later at weekly intervals.

The safety valve must be secured against misadjustment. Blocking or manipulating the safety valve can have penal consequences if it gives rise to an accident. Any warranty claims shall also be forfeited in such a case.

The nominal opening pressure may not exceed the maximum permissible final overpressure (refer to chapter 3 Tab. 2) or the permissible system pressure, provided the latter is lower.

Functional testing is carried out by actuating the manual ventilation with the SiloKing running.

Maintenance

7 Maintenance

7.1 Safety during maintenance work

See chapter 2.6 Safety!

Personal protective equipment

The following must be worn during all maintenance work:

- Safety working clothing
- Protective gloves
- Safety shoes
- Safety goggles

Environmental protection

Observe the following information with regard to environmental protection during maintenance:

- Remove emerging, used or excessive grease at all lubricating points that are manually supplied with lubricant and dispose of in accordance with valid local regulations.
- Collect exchanged oil in suitable containers and dispose of in accordance with valid local regulations.

7.2 Maintenance schedule

The following describes the maintenance work that is necessary for an optimum, trouble-free operation. Maintenance intervals must be observed.

If increased wear of individual components or functional groups is determined during regular inspections, the operator has to reduce the required maintenance intervals on the basis of the actual signs of wear.

Changes compared to normal operation (increased power consumption, temperatures, vibrations, noises, etc. or response of monitoring systems) lead to the assumption that the functions are impaired. These then have to be subjected to an inspection by specialised staff.

In case of queries regarding the maintenance work and intervals: contact the manufacturer (service address → page 2).

For maintenance schedule refer to next page.

Maintenance schedule

Interval	Maintenance work	To be carried out by
Weekly	Check and clean SiloKing (refer to chapter 7.3)	Operator
	Check screw connections	
	Check gear oil level (see chapter 3 Tab. 3)	
	Check the degree of contamination of the air filter (see chapt. 3 Tab. 2)	
	Check V-belt tension *	
	Check connection to drive (coupling, V-belt) *	
	Check safety valve *	
	Clean compressed air after cooler or oil cooler, clean cooling air fins *	
quarterly	Check non-return valve (refer to chap. 6.4)	Specialised staff
half-yearly or every 500 h	Carry out gear oil change (refer to chap. 7.3)	
	Oil filter change (refer to chap. 7.3)	
Annually or every 1000 h when using CVS Lube 2000	Carry out gear oil change (refer to chap. 7.3)	
	Oil filter change (refer to chap. 7.3)	

* Observe manufacturer's recommendations

Tab. 5: Maintenance schedule

7.3 Performance of maintenance work

Cleaning the SiloKing

When cleaning the SiloKing, observe the following:

1. Switch off the SiloKing and secure against restarting.
2. Remove contamination.
 - Do not use aggressive cleaning agents.
 - No water may penetrate into the SiloKing. Caution when using a high pressure cleaner.
 - After wet cleaning, warm up the SiloKing for a few minutes.

Gear oil change at the SiloKing

Open oil drain screws (Fig. 1), drain oil. Dismantle oil filter with the aid of a strap wrench. Lightly oil the new oil filter on the rubber seal and tighten by hand. Close oil drain plugs, fill in oil (see chap. 3 Tab. 3 and Tab. 4). Check the fill level on the oil dipstick.



WARNING!
Risk of burns from hot oil!

Hot oil can cause serious personal injury.

Therefore:

- Allow the gear oil to cool before changing.

Maintenance

Changing the gear oil on the adapter gear

Open oil drain plugs (see chapt. 4 Fig. 2), drain oil. Close the oil drain plugs again. Remove the gear breather filter and fill in oil (see chapt. 3 Tab. 3) up to the top edge of the oil sight glass. Reassemble the gear breather filter.



WARNING!

Risk of burns from hot oil!

Hot oil can cause serious personal injury.

Therefore:

- Allow the gear oil to cool before changing.

Safety valve inspection

The safety valve must be secured against misadjustment. Functional testing is carried out by actuating the manual ventilation with the SiloKing running.

Action after lengthy standstill

During a lengthier standstill, we recommend to put the SiloKing into operation every 4 weeks for approx. 15 minutes.

8 Malfuncions

This chapter describes possible causes of malfuncions and trouble shooting tasks.

Reduce the maintenance intervals if similar malfuncions occur repeatedly due to above-average intensive use so intervals correspond to the actual load.

Contact the manufacturer in case of malfuncions that cannot be repaired with the aid of the following information (→ page 2)!

8.1 Safety

Refer to chapter 2.6 Safety! Personnel

Personnel

- The trouble shooting work described at this point can be carried out by the operator, unless otherwise indicated.
- Some work may only be carried out by specially trained specialised staff or exclusively by the manufacturer himself. This is specifically pointed out in the description of the individual malfuncions.
- Only electrical specialists may carry out work on the electrical system.
- Components and parts may only be replaced by specialised staff.

Personal protective equipment

Refer to chapter 7.1.

Environmental protection

Refer to chapter 7.1.

Conduct in the case of malfuncions

The following basically applies:

1. Immediately switch off the SiloKing in case of malfuncions representing an immediate danger for individuals or material assets.
2. Switch of all power supplies and secure against restarting.
3. Inform person in charge at the place of installation.
4. Depending on the type of malfunction, have the cause determined and eliminated by responsible and authorised specialised personnel.

8.2 Recommissioning after corrective action

After corrective action or trouble shooting:

1. Ensure that nobody is staying in the hazard area.
2. Start in accordance with the instructions in chapter „start-up“.

Malfuncions

8.3 Malfunction table

Malfunction:	Possible cause	Corrective action	Execution
Flow rate too low	Air filter soiled	Clean or replace filter cartridge	Operator
	Pressure line leaky	Eliminate leakage	Specialised staff
	Speed too low	Correct speed (see chapter 3 Tab. 2)	Operator
Abnormal noise emission	Misalignment vis-à-vis drive	Align SiloKing	Specialised staff
	Bearing defective	Replace bearing	Manufacturer
	Lack of lubricating oil	Top up with oil (see chapter 3 Tab. 3)	Operator
	Unsuitable lubricating oil	Oil change (refer to Tab. 3)	Operator
	Wrong speed	Correct speed (see chapter 3 Tab. 2)	Operator
	Foreign bodies in the SiloKing	Clean SiloKing	Specialised staff
	Final pressure too high	Maintain perm. final pressure (see chapter 3 Tab. 2)	Operator
Compressed air temperature too high	Head loss in suction system too high	Clean or replace filter cartridge	Operator
	Final overpressure too high	Maintain maximum final overpressure (see chapter 3 Tab. 2) Check pressure line for clogging	Specialised staff
	Wrong speed	Correct speed (see chapter 3 Tab. 2)	Operator
	Pressure gauge defective	Replace pressure gauge	Specialised staff
	Operating pressure is not attained	Leakage in the pressure line	Eliminate leakage
Wrong speed		Correct speed (see chapter 3 Tab. 2)	Operator
Pressure gauge defective		Replace pressure gauge	Specialised staff
Power requirement too high	Speed too high	Correct speed (see chapter 3 Tab. 2)	Operator
	Final pressure too high	Maintain perm. final pressure (see chapter 3 Tab. 2)	Operator
	Shut-off valve not fully open	Fully open shut-off valve	Operator
Safety valve blows off	Pressure line clogged	Eliminate clogging	Operator
	Pressure gauge defective	Replace pressure gauge	Specialised staff
Oil pressure too low	Lack of lubricating oil	Top up with oil (see chapter 3 Tab. 3)	Operator
	Operator Max. inclination exceeded	Correct inclination (see chapter 3 Tab. 2)	Operator
	Speed too low	Correct speed (see chapter 3 Tab. 2)	Operator
	Oil filter soiled	Replace oil filter	Operator
	Unsuitable lubricating oil	Oil change (see chapter 3 Tab. 3)	Operator

Malfunction:	Possible cause	Corrective action	Execution
Oil pressure fluctuates heavily	Lack of lubricating oil	Top up with oil (see chapter 3 Tab. 3)	Operator
	Operator Max. inclination exceeded	Correct inclination (see chapter 3 Tab. 2)	Operator
	Unsuitable lubricating oil	Oil change (see chapter 3 Tab. 3)	Operator

Tab. 6: Malfunction table

9 Spare parts

We recommend that you stock a maintenance kit.

Maintenance parts (depending on type)

Oil filter

Air filter

Gear oil

Customer Service

In case of queries regarding the product, spare part orders, repairs, replacement SiloKing and dispatch of fitters, please contact our customer service: Phone: +49 (0)7623 71741-31

Decommissioning and disposal

10 Decommissioning and disposal

A SiloKing that is no longer usable should not be recycled as complete unit, but disassembled into individual components and recycled according to material types. Non-recyclable materials have to be disposed of in an environmentally compatible manner.

- Prior to decommissioning and disposal of the SiloKing, it must be completely separated from the surrounding units.
- The disassembly and disposal of the SiloKing may only be carried out by specialised staff.
- The SiloKing has to be disposed of in accordance with the respective country-specific regulations.

Index

A		L	
Acceptance	8	Liability	6
C		M	
Cleaning.....	25	Maintenance	24
Components, moving.....	12	Maintenance schedule	24
Compressed air	12	Maintenance work.....	25
Compressed air	12	Malfunction table.....	28
Contact person	7	Malfunctions.....	27
Copyright protection	6	O	
Customer Service	7	Occupational safety	10
D		Operating instructions.....	4
Danger of burns.....	10	Operating personnel	9
Danger pictograms	10	Operator.....	8
Dangers	10	P	
Design.....	18	Protective equipment.....	10, 24
Design and function.....	18	R	
Disposal.....	30	Recommissioning	27
F		S	
Function	20	Safety.....	8
G		Signposting	12
Gear oil change	25, 26	Spare parts	7, 29
Gear oils, recommended	17	Specialists.....	9
I		Standstill lengthy.....	26
Improper operation	11	Start-up	22
Inspection		Storage	21
before the initial start-up	22	Switching off.....	23
during the operation	22	Symbols in the instructions	5
gear oil	23	T	
non-return valve	23	Technical data	15
safety valve	23	Transport.....	21
Inspection safety valve	26	W	
Instructions	9	Warranty	6, 7
Intended use.....	8		

