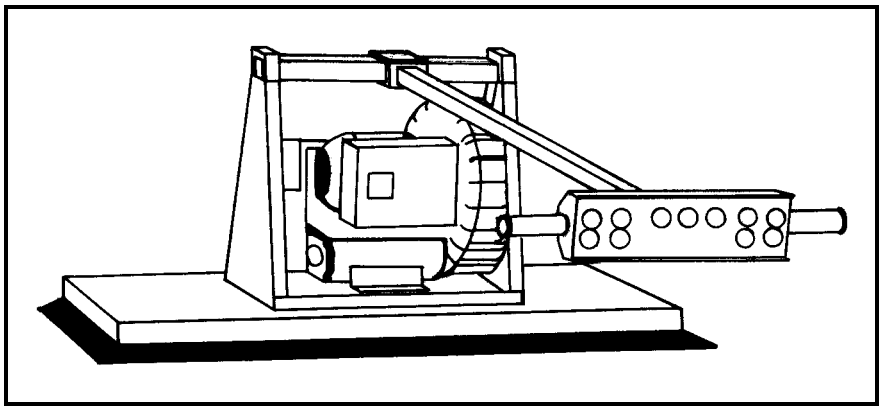
Lifting and crane technology

Instruction manual Vacujet

RG / RGK



RVP

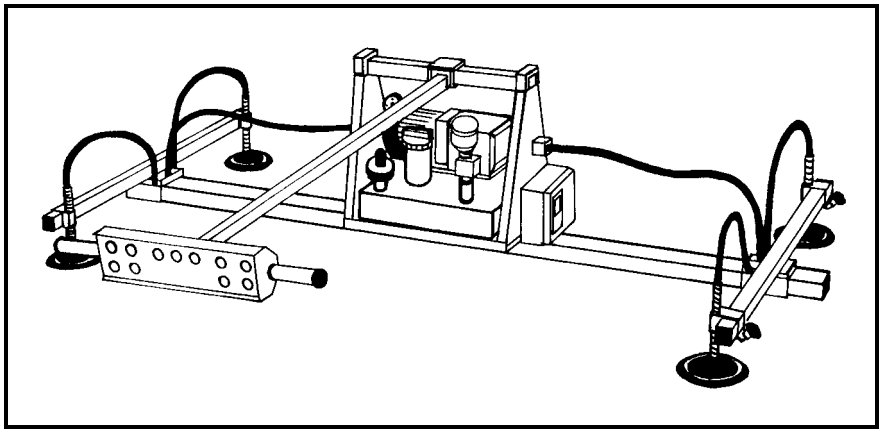


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TABLE OF CONTENTS

Spare parts / Ordering of spare parts

The correct order numbers for the original spare parts are to be taken from the spare parts list. Please ensure that you have the following data on your vacuum lifter model to hand. Thereby a quick and correct supply of the parts required will be effected!

Vacuum lifter model : .....

Manufacture number : .....

Year of manufacture : .....

Carrying capacity : .....

Original spare parts for the vacuum lifter can be acquired from the following addresses:

1. Manufacturer

GIS AG
Hebe- und Fördertechnik
Luzernerstrasse 50
CH-6247 Schötz

2. Agent

.....

.....

.....

.....

0 General directions

0.1 General safety directions

0.1.1 Safety and hazard precautions

The following symbols and terms are used in this instruction manual for safety and hazard instructions:

DANGER !
The non-compliance either in part or full of work and operational directions marked with this symbol can result in serious personal injury or even death.
Danger notices must be **strictly** complied with.

CAUTION !
The non-compliance either in part or full of work and operational directions marked with this symbol can result in major machinery, property or material damage.
Cautionary notices must be **strictly** adhered to.

NOTE
Effective and simple operation is the result of following the directions denoted under this symbol.
"Note" directions make light work.

0.2 General safety specifications and procedures

The instruction manual for the vacuumlifter must be kept within the operating area of the hoist.
Furthermore, supplementary to the instruction manual, the statutory regulations governing general accident prevention and environment protection are to be enforced.
The operator must observe the following standards and regulations concerning construction, inspection and operation of vacuum lifters:

EC-Regulations for machines	89/392/EWG
amended by	91/368/EWG
EC-Low voltage regulation	73/23/EWG
EN 292	Safety of machines
IEC 34-1	Circulatory electric machines
IEC 34-5	IP protections
IEC 364	Electric installations
IEC 947-5-1	Low voltage control gears
CEN/TC 147	Lifting means, lifting gears
prEN N 104F, June 94	5.2.2: Vacuum lifting devices
DIN 15428	Load suspension devices, technical terms of delivery
DIN 15429	Load suspension devices, supervision of use
ISO 2374	Lifting means, lifting gears

Operating and service personnel must have read and understood the operating instructions, in particular the safety instructions, before commencing work. Protection gear for operating and service personnel must be made available and worn at all times.

The operator or its designate is responsible for the safety and hazard awareness of the operating personnel and are responsible for the supervision thereof.

0.2.1 Warning colour / Marking / Danger signs

- CE symbol figure 0-1
- Model plate figure 0-2

0.3 Special safety directions

Transport and assembly:
- Single parts and large components are to be carefully affixed to suitable and technically acceptable hoisting apparatus/ load lifting members.

Connection:
- The connection work is only to be effected by personnel specifically designated and trained for the job

Start-up/operation:
- Before initial start-up, as well as daily start-up carry out a visual check and effect the predefined user-checks routine
- Do not omit any serious safety procedure
- Only put the vacuumlifter into operation when the available protection and safety apparatus is fully functional
- Damage to the vacuumlifter and changes in its operational characteristics must be reported immediately to the person responsible
- After use, or when in a non-operational mode, the vacuum lifter should be secured against unauthorised and unwarranted use
- Suction of any explosive vapors or gas is forbidden
- Transport of persons is not allowed
- Moving loads above persons is not allowed
- Persons are not allowed to remain below moving loads
- Moving of overloads is not permitted
- Always monitor and control the load

See also adequate application (chapter 0.6)

Cleaning/service/repair/maintenance/refitting:
- For assembly work above body height, the necessary working platforms or ladders are to be made available
- Do not use machine parts for this purpose
- Check the electrical cable for chaff marks and damage
- For safety and environmental protection, trap and dispose of fuel or other agents used
- Safety apparatus that has been disassembled for the service or repair of the hoist must be reassembled and checked after the service and repair work has been completed
- The predefined testing and service intervals found in the instruction manual must be adhered to
- Directions found in the instruction manual, with regard to the exchange of parts are to be followed
- Operating personnel are to be informed before the commencement of special or refitting work
- The repair working area should be copiously secured
- During service or repair work, the vacuumlifter should be secured against unwarranted switching on
- Warning signs are to be placed
- The power cable is to be disconnected and secured against unwarranted connection
- Screw connections that have been loosened for repair or service work must be re-tightened
- Parts that are not reusable, such as O-rings, gaskets, self locking nuts, split-pins and washers are to be replaced

Shut down/storage:
- Before long periods of inactivity or storage, the vacuumlifter must be cleaned and preserved (oiling/greasing)

0.4 Notes on hazard protection

Hazard areas must be clearly marked by warning signs and secured by isolation.
It must be assured that the warnings regarding hazard areas are given due attention.

Hazards can stem from:
- Inexpert application
- Incomplete adherence to the safety directions
- Incomplete or inexact execution of test and service work

0.4.1 Hazards caused by mechanical influences

Human injury:

DANGER !

Unconsciousness and injury through:
- Crushing, shearing, cutting and twisting
- Retraction, expulsion, ramming and rubbing
- Slipping, stumbling and falling

Source:
- Crush, shear and twist area
- Breaching or bursting of parts

Protective possibilities:
- Floor, equipment and machinery are to be kept clean
- Eliminate leakages
- The safety distance must properly be observed

0.4.2 Hazards caused by electrical energy / power supply

Work on electrical apparatus or machinery may only be effected by qualified electricians or persons under the supervision and guidance of qualified electricians, in accordance with predefined electro-technical regulations.

Human injury:

DANGER !

Death through electrical shock, injury and burns through:
- Contact
- Faulty insulation
- Faulty servicing or repair work
- Short circuit

Source:
- Contact with, touching of or standing too close to non-insulated power and voltage supply terminals
- Free-lying electricity supply terminals following breakdown of insulation
- Inadequate execution of safety checks following repair work
- Incorrect fusing

Protection possibilities:
- Machinery and equipment designated for repair or service work should be isolated before commencement of such work
- First check isolated parts for voltage
- Regularly check the electrical fittings
- Immediately change loose or damaged cables
- Blown fuses must be replaced with fuses of the correct value
- Avoid contact or touch with live terminals
- Use only insulated tools

0.4.3 Sound pressure level (SPL)

The sound pressure levels of the vacuum generators are indicated in table 0-1. These can be slightly altered by suction noises at the suction surfaces.

Measurement of SPL according to DIN 45 635

0.5 Technical status

This instruction manual was written in 1996. It corresponds to no. 1.7.4 and no.4.4 of the appendage 1 in the version of the first alteration dated 20.06.91 (91/368/EWG) of the instruction of the European Rates from 14.06.89 (89/392/EWG).

0.5.1 Technical datas

0.5.2 Recurrent checks

Each device/ unit operator has to adequately note all checks, maintenance and inspections performed into the inspection pass, and must have these confirmed by the competent person in charge.
Incorrect or missing entries lead to forfeiture of the manufacturer's warranty.

CAUTION !
Devices and cranes are to be periodically tested by an expert. Basically, visual and functional checks are to be performed, whereby the condition of the components with regards to damage, wear, corrosion or other alterations are be determined. Apart from this, the completeness and efficiency of the safety contrivance will be assessed. In order to correctly value wearing parts, it may be necessary to dismantle the equipment under inspection.

CAUTION !
The carrying means must be inspected in their entire length, which implies even covered or hidden parts.

CAUTION !
All periodical inspections are to be arranged by the operator.

0.6 Operational parameters

Vacuum lifting devices of the RG, RGK and RVP series are vacuumlifters for different loads. The carrying capacity has been designed for a specific load.
The vacuum lifting devices are manufactured according to the latest state of the art and recognized safety rules and are tested for safety by the manufacturer.
Vacuum lifting equipment may only be used in perfect technical condition, in accordance with their operating parameters, by trained operators who are aware of the safety requirements and hazards.
The operating parameters of the vacuum equipment also include observance of the prescribed operating, service and maintenance requirements laid down by the manufacturer.

The operational parameters do not include:
- exceeding the defined load capacity
- altered position of the suction surface to the load (except for RGK in the tilting operation)
- diagonal pulling of loads
- heaving, pulling or dragging of loads
- use of the vacuum lifting device for loads outside the operational parameters

See also chapter 0.3

0.6.1 Directions for the use of the instruction manual

This instruction manual includes the following chapters:
0 General
1 Description
2 Start-up instructions
3 Service and maintenance

Supplementary to the instruction manual, the following documentation from the operator must be noted:
- Declaration of conformity
- Inspection pass
- Spare parts list(s)
- Circuit diagrams

Page and figure numeration:
The pages are consecutively numbered. Empty pages are not numbered, however are calculated together with the consecutive pages.
Figures are numbered consecutively by chapter.

Example :
figure 3-1 means: in chapter 3, figure 1

1 Description

General:
This operating manual applies to the series types: RG, RGK, RVP

1.1 Operating conditions

The carrying capacity is designed for specific loads. The type of load is marked in the test manual. The manufacturer will only guarantee safety and durability of operation if the vacuum equipment is used with this type of load.
The position of the suction surface to the load is specified and may not be altered.

1.2 General functional description

1.2.1 Basic unit (fig. 1-1 / 1)

a)
- RG, RGK:
  Blower designed as side channel compressor with a centrifugal mass for slowing down the pressure drop in the event of a power failure
- RVP:
  Vacuum pump designed as rotary pump with reserve tank for slowing down the pressure drop

b)
- Pressure indicator

c)
- Control box with components: optical and acoustic warning device if the vacuum falls below the permissible level
- Protective motor switch
- Control voltage 24 V

d)
- Load discharge valve:
  RG; RGK by switching over the turbine gates;
  blow/suction
  RVP by atmospheric pressure feed

e)
- water separator, return valve and dust filter only for RVP model

1.2.2 Operation (fig. 1-1 / 2)

- Operating unit with standard equipment: on/off; load discharge; blower ON/OFF; emergency stop; traversing
- The following push button switches can be added: lengthwise motion and tilting

1.2.3 Operating arm (fig. 1-1 / 3)

- Transverse operation: 650 mm and 1100 mm are standard lengths
- Lengthwise operation: can be telescoped up to 3000 mm

1.2.4 Suspension (fig. 1-1 / 4)

- Fishplate for the load hook

1.2.5 Suction surfaces (fig. 1-1 / 5)

- Each unit is equipped with one or more suction surfaces. These are adapted to the load and can be designed as suction box or suction plate.

1.2.6 Tilting

- RGK:
  The tilting is designed as a linear drive with limit switches in both end positions. The 24 V contactor control is integrated into the complete unit.

1.2.7 Cable reels (fig. 1-1 / 7)

- The power supply comes via 5-pole self-winding cable reels. The connections to the Vacujet can be plugged in.
- Standard extendable length: 5 m

1.2.8 Lifting means (fig. 1-1 / 8)

- The GIS electric chain hoist (EM 50) is recommended for the lifting process.

2 Start-up

DANGER !
Mechanical adjustments may only be performed by authorized specialists.

CAUTION !
The operating staff must carefully read the operating instructions of the vacuum lifter and the electric chain hoists belonging to it before its initial operation and carry out all checks. Only when a safe operation has been established may the device be put into operation. Unauthorized persons may not operate the device or perform any work with the help of the same.

2.1 Transport and assembly

For the transport and assembly of the vacuumlifter, the safety direction for handling with loads are to be followed (see chapter 0.3).
The vacuum lifting device must be assembled by qualified staff, always bearing in mind the accident prevention directions in chapter 0.2. Before assembly the vacuum lifter must be stored in an enclosed room or covered area.
Should the equipment be destined for operation outdoors, then it is recommended that a protection roof is erected to shield it from the influences of the weather.
It is recommended that the assembly and connection of the vacuum lifter is effected on-site by our qualified customer service personnel.

2.2 Connection

2.2.1 Power connection for operating voltage

DANGER !
Electrotechnical adjustments may only be performed by authorized specialists.

CAUTION !
Before connection of the vacuum lifter, check to ensure that the voltage defined on the load plate is the same as that which is available.
The vacuum generator must not be switched off when actuating the emergency stop button.
The vacuum lifting device must be connected according to the wiring diagram supplied.
The motor protective switch is set at the works. This setting must not be altered.
When the vacuum equipment is delivered together with a GIS electric chain hoist, the connecting cable is put through the lateral thread bore PG 21.

NOTE
Opening the integrated clamp with a 3,5 mm wide screw driver, in accordance with figure 2-1.

2.2.2 Earth connections

DANGER !
The protective conductor is not to carry any power. With motor carriage operation, the power supply is enclosed in a terminal box of the drive motor.

NOTE
The earth conducteur is wired up to the earth connection terminal as green/yellow wire. Earth conductor of the power supply to the terminal (PE) are connected with yellow/green wire.

2.2.3 Direction of rotation check

CAUTION !
The direction of rotation of the motor must be in accordance with the arrow shown on the ventilating cap.
The rotational directions of the electric chain hoist must be in accordance with the symbols of the push button switches.

Should this not be the case, then the two power cables (L1, L2) must be changed over.

2.2.4 Warning device

The warning device must be checked for operation on start-up:

Switch to suction position:
- if the supply voltage fails
- if half the ultimate pressure is not reached

A maintenance-free lead accumulator operates the warning device. Its working life is approx. 5 years.
The vacuum lifting device is inoperative without the warning device.

2.2.5 Operational check

- Operational check of all pushbuttons on the operating unit.
- The movement directions must agree with the symbols.
- Check the suction capacity on a smooth, air-impermeable surface when the pressure gauge must reach the minimum ultimate pressure (see table 0-1).

CAUTION !
Hard, movable objects on the load must be avoided. The suctioning of such objects can lead to break-downs.

CAUTION !
The RVP model pump may only be used in a horizontal position.
Side tilting or head position leads to loss of oil.
The oil level must be checked in the inspection glass when starting up.

2.2.6 Limit switch when tilting

The functioning of the limit switches (both end positions of tilting) must be checked when starting up.

2.3 Further checks following assembly and installation

2.3.1 Check the fuses

Check the fuses in the tool box. The value of the fitted fuses must coincide with the values given in the table 0-1 technical datas for the appropriate motor type.

DANGER !
At no time use higher value fuses than stated in the table 0-1!

2.3.2 Electrical connection check

- Check electrical power supply run is safely seated and secure in its path

CAUTION !
- Avoid clamping, knotting and crushing of cable
- Check cable **c**lamps and securing material are securely seated
- With external traction relief check the security of the traction relief cable for the control switch

3 Service and maintenance

3.1 General regulations for service- and maintenance work

Operating failures on the vacuum lifters impairing the safe operation of the device are to be cleared immediately. The vacuum lifting device may only be serviced by trained and authorized specialists.

NOTE
We recommend to have maintenance work performed by our customer service.

CAUTION !
If the operator performs maintenance work on a vacuum lifting device on his own account, the type of maintenance performed must be entered together with the date of performance into the inspection pass.

Alterations to, as well as changes of and supplements to the vacuum lifter which may impair the safety must be authorized by manufacturer in advance. Constructional alterations to the vacuum lifting device not authorized by the manufacturer lead to an exclusion of the manufacturer's liability in case of damage.
Material warranty claims will only be recognized if solely genuine spare parts by the manufacturer have been employed.
We explicitly wish to point out that orginal parts and accessories not supplied on our behalf cannot be inspected or released by us.

General:
Service and maintenance are preventive measures designed to enhance the full functionality of vacuum lifters. Non-compliance with the service and maintenance routines can result in reduction of the useful function of and/ or damage to the vacuum lifting devices.
Service and maintenance work is, in accordance with the instruction manual, to be effected at the predefined time intervals.

During service and maintenance work the general accident prevention directions, the special safety directions (chapter 0.3) as well as the notes on hazard protection (chapter 0.4) are to be followed.

DANGER !
Service and maintenance work is only to be effected on unloaded vacuum lifters. The main switch must be off. The lower sheave or the hook fittings must be lying on the floor or a maintenance platform.

The maintenance work encompass sight checks and cleaning routines.

The service work includes additional functional checks.

During the functional checks, all securing elements and cable clamps must be checked for secure seating.
Cables must be inspected for dirt, discoloration and arc spots.

CAUTION !
Used operating fuels (oil, lubricants ...) are to be safely collected and disposed of in an environmentally friendly manner.

Service and maintenance intervals are so defined:

t	daily
3 M	quarterly
12 M	annualy

The predefined service and maintenance intervals are for standard operating hours. They are to be reduced when the loading of the vacuum lifting device is on average large and when unfavourable conditions surface frequently during operation (dust, heat, humidity, steam etc.)

3.2 Suction rubber gasket

The suction rubber gasket must be periodically checked for wear. The vacuum lifting device must then be placed on a smooth air-impermeable surface.
If the minimum ultimate pressure is not reached due to damage or other factors, the suction rubber gasket must be replaced.

3.3 Pressure system

The pressure on the pressure indicator must be constantly monitored. If the minimum ultimate pressure is not reached, the vacuum device must not be operated.
Possible causes:
- air chambers blocked on the blower
- leak in the line system
- suction rubber gasket in poor condition
- blocked lines

3.4 RG; RGK models

These models are maintenance-free in principle. All bearings have permanent lubrication.
Any repairs to the blower are best done by the manufacturer.

3.5 RVP model

For maintenance work on the pump for the RVP model, we recommend the manufacturer's spare parts kits. The latter also includes the maintenance instructions.

a) Oil check
- The oil level must be checked every 24 hours.
- The oil must be changed every 500 operating hours.
- If the oil is dark or turbid, the oil must be changed.

CAUTION !
Only original oil must be used.
For the oil change, the oil tank must not be filled above the maximum oil level mark.

b) Filter
- The cleaning filter of the pump must be replaced every 3000 operating hours.
- The filter cartridge of the series-connected air filter must be regularly cleaned (open the two hinged covers, blow out the filter cartridge from inside to outside).

c) Water separator
- According to the moisture of the air, the water separator must be regularly emptied as soon as it is full up to the mark.

d) Pump

CAUTION !
After lifting of humid loads the Vacujet must be running, on position "load discharge", for a minimum of 5 minutes.

3.6 Cable reels

The flat spiral spring of the cable reel is subject to natural wear due to constant reverse bending fatigue. The spiral spring may break as a result. The spring is suitably protected for risk-free replacement.
Instructions are enclosed with the spare spring where replacement is necessary.

3.7 Ordering of spare parts

Notes on how to order spare parts can be found on the very first page.

Table 0-1

Types	Motor power	3x380V 50Hz	RPM	Control voltage	Vacuum min.	Nominal suction capacity	Sound pressure level	Dead weight basic unit
	kW	A	1/min	V	N/mm^2	m^3/h	dBA	kg
RG 400	1.7	4	2850	24	200	170	85	55
RGK 400	1.7	4	2850	24	200	170	85	65
RVP 125	0.4	1.4	2860	24	900	10	60	48

Table 0-2

Types	Tilting motor	Motor power	3x380V 50Hz	RPM	Travel
		kW	A	1/min	mm
RGK 400	GESR56E	0.5	1.5	2800	100

Figure 0-1

Figure 0-2

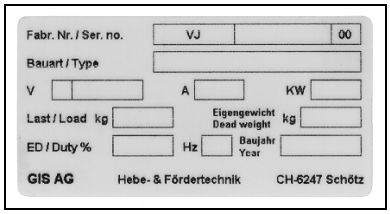

Figure 2-1

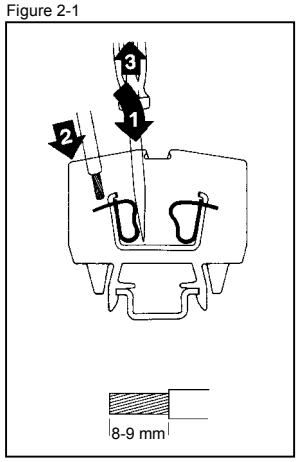

Figure 1-1