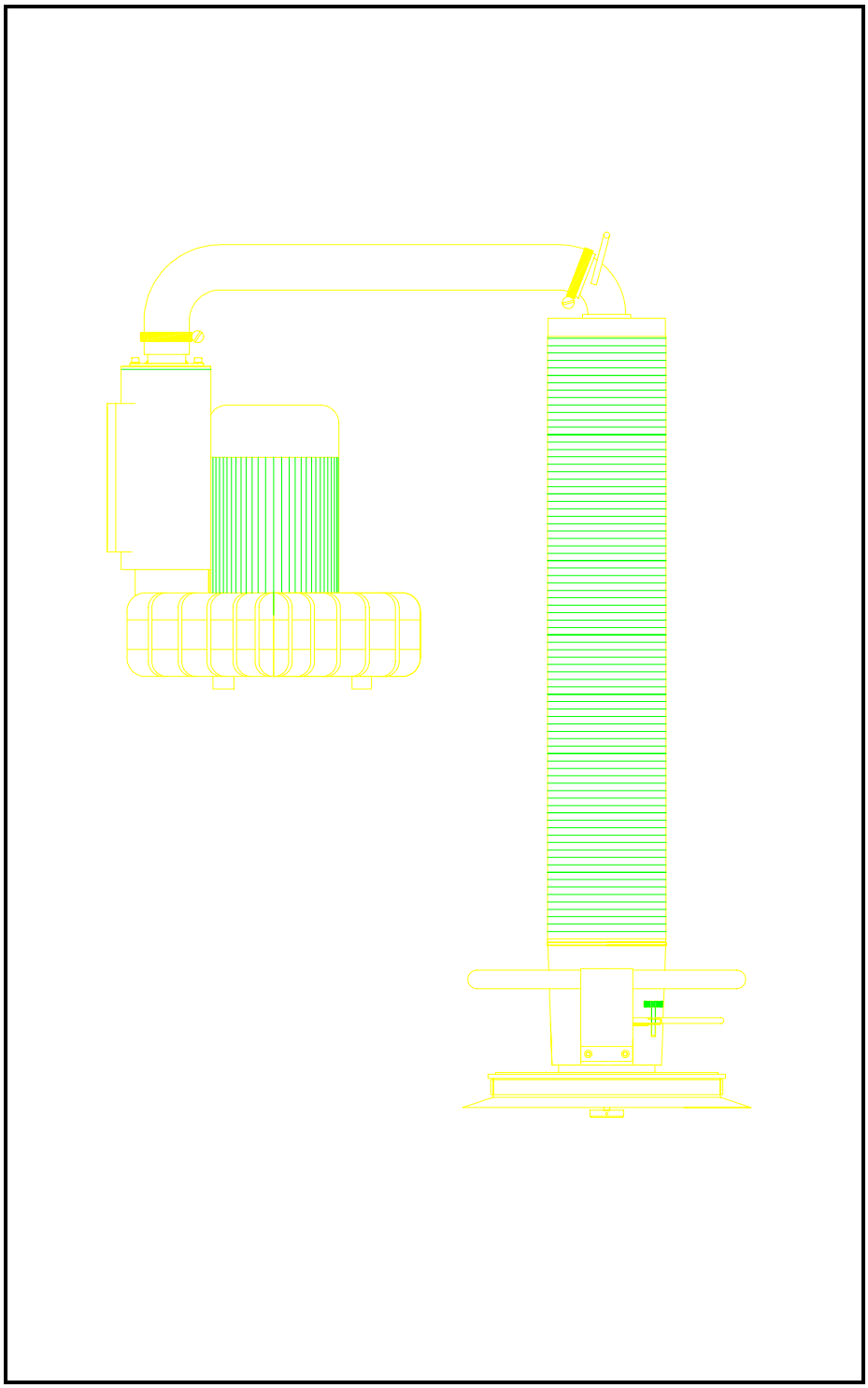
Lifting and crane technology

Instruction manual: Vacuhandling (VH)

CE



R30
R50
R520
R1020
Eco-Line

TABLE OF CONTENTS

		Page
0	**General directions**	**3**
0.1	General safety directions	3
0.1.1	Safety and hazard precautions	3
0.2	General safety specifications and procedures	3
0.2.1	Warning colour/marking/danger signs	3
0.3	Special safety directions	3
0.4	Notes on hazard protection	3
0.4.1	Hazards caused by mechanical influences	4
0.4.2	Hazards caused by electrical energy/power supply	4
0.4.3	Sound pressure level (SPL)	4
0.5	Technical status	4
0.5.1	Technical datas	4
0.5.2	Recurrent checks	4
0.6	Operational parameters	4
0.6.1	Directions for the use of the instruction manual	4
1	**Description**	**5**
1.1	Operating conditions	5
1.2	General functional description	5
1.2.1	Components	5
2	**Start-up**	**5**
2.1	Transport and assembly	5
2.2	Connection	5
2.2.1	Power connection for operating voltage	5
2.2.2	Earth connections	5
2.2.3	Direction of rotation check	5
2.2.4	Operational check	5
2.3	Further checks following assembly and installation	5
2.3.1	Check the fuses	5
2.3.2	Electrical connection check	5
2.4	Operation	5
2.4.1	Lifting and lowering	5
2.4.2	Touching the transportation goods	6
2.4.3	Lowering the transportation goods and severing the suction unit	6
2.4.4	Interrupting the work	6
2.4.5	Power failure	6
3	**Service and maintenance**	**6**
3.1	General regulations for service and maintenance work	6
3.2	Daily servicing	6
3.3	Weekly servicing	6
3.4	Wear parts	6
3.4.1	Lifting hose	6
3.4.2	Gasket	6
3.5	Removal of break-downs on the Vacuhandling	6
3.6	Ordering of spare parts	6
4	**Appendix**	
4.1	Declaration of conformity	

Spare parts / Ordering of spare parts

The 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 vacuumlifter model to hand. Thereby a quick and correct supply of the spare parts required will be effected!

Vacuumlifter model : .....

Manufacture number : .....

Year of manufacture : .....

Carrying capacity : .....

Original spare parts for the vacuumlifter 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 must be kept within the operating area of the vacuumlifter.
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 vacuumlifters:

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 ir 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 suspension means.

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 vacuumlifter should be secured against unauthorized 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 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 commence-ment 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:
- Crashing, 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, equipement 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 service or repair work.
- Short circuit.

Source:
- Contact with, touching of or standing too close to non-insulated power and voltage supply terminals.
- Utilization of not insulated tools.
- Free-lying electricity supply terminals following breakdown of insulation.
- Inadequate execution of safety checks following repair work.
- Incorrect fusing.

Protection possibilities:
- Machinery and equipement designated for repair or service work should be isolated before commencement of such work.
- First check isolated parts for voltage.
- Regularly check the isolated 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 insulated tools only.

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 1999. 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 Council from 14.06.89 (89/392/EWG).

0.5.1 Technical datas

0.5.1.1	Models R30, R50, R520, R1020, Eco-Line	table 0-1
0.5.1.2	Special models	table 0-2

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 to 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

Vacuumlifters of the R and Eco-Line series are vacuumlifters for different loads. The carrying capacity has been designed for a specific type of 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.
- 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 Direction 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 und figure numeration:
The pages are consecutively numbered. Empty pages are not numbered, however are calculated together with the consecutive pages.
Figures are numbered consecutively and by chapters.

Example:
Figure 0-1 means: In chapter 0, figure 1.

1 Description

General:
This operating manual applies to the series types:
R, Eco-Line

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 Components (see drawing 9360.9202)

1	Suction surface	One or several suction surfaces, adapted to the load, can be provided.
2	Control part	Both the holding stirrup and the control stirrup are attached to the control part allowing the guidance of the load resp. the lifting and lowering movement.
3	Lifting hose	
4	Pivoted part	
5	Trolley	Corresponding with the GIS profile
6	Hose carriage	
7	Feed hose	
8	Hose clip	
9	Protective motor switch	
10	Blower	

2 Start-up

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

CAUTION !
The operating staff must carefully read the instruction manual of the vacuumlifter 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 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 vacuumlifter 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 vacuumlifter is effected on-site by our qualified customer service personnel.
The assembly is to be made according to the assembly instructions 9360.9202.

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 vacuumlifter, check to ensure that the voltage defined on the load plate is the same as that which is available.
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.

2.2.2 Earth connections

DANGER !
The protective conductor is not to carry any power.

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

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

2.2.4 Operational check

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

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 secured in its path.

CAUTION !
- Avoid clamping, knotting and crushing of cable.
- Check cable clamps and securing material are securely seated.

2.4 Operation

2.4.1 Lifting and lowering

- Check airtightness of system.
- Balance suction unit without load by means of the scanning bolt. The suction unit on no-load shall slowly arrive at upper end position and be kept there floating.
- Balance suction unit under load by means of the turning knob. The loaded suction unit shall be kept floating, when letting go the reversing valve.
- The control stirrup is located under the longer holding stirrup.

- In non-operated condition the apparatus is balanced.
- To set the control stirrup going downwards causes the apparatus to lower.
- To set the control stirrup going upwards causes the lifting movement of the apparatus.
- A more pronounced lifting or lowering of the control stirrup causes faster up- or downwards movement.

2.4.2 Touching the transportation goods

- To set the control valve going downwards causes the apparatus to lower onto the transportation goods. The scanning bolt frees the whole suction effect and the suction unit is put under vacuum.
- When the control valve is brought into its resting position (by letting go of the control stirrup), a slow lifting of the load takes place up to the floating point, in accordance with the balancing.
- To set the control valve going upwards causes the lifting of the load.

2.4.3 Lowering the transportation goods and severing the suction unit

- To set the control valve going downwards causes the transportation goods to lower.
- Once the lowering process has terminated, i.e. the load put down, the suction pad shall be severed by means of complete downpressing of the control stirrup and simultaneous light lifting of the control unit.
- Switching over the control stirrup in lifting direction initiates the lifting process without load.

2.4.4 Interrupting the work

- The Vacuhandling apparatus shall be disconnected when not in use.
- Put the apparatus on the floor with the lifting hose stretched.

2.4.5 Power failure

- In the event of a power failure the lifting unit lowers, with or without load, in accordance with the course of pressure of the running out turbine.

3 Service and maintenance

3.1 General regulations for service and maintenance work

Operating failures on the vacuumlifters 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 vacuumlifter 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 original 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 vacuumlifters. 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 vacuumlifters. The main switch must be switched off.

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.

3.2 Daily servicing

- Check tightness of the whole system.
- Check wear on the sealing lips.
- Check control valve performance.

3.3 Weekly servicing

- Check easy running of the installation.
- Check the complete system regarding dirt accumulation (additional silencing, eventual dust filter).

3.4 Wear parts

3.4.1 The lifting hose

- The lifting hose is considered as wear part. Its lifetime depends on several factors of influence:
  - Balancing of the installation.
  - Frequent ascending to length of block.
  - Number of load alternations.
  - Number of bucklings in the lifting hose.

3.4.2 Gasket

- The gasket of the suction surfaces is considered as wear part. Its lifetime depends on several factors of influence:
  - Roughness of the surface of the piece to be transported.
  - Temperature of the piece to be transported.

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 immediately.

3.5 Removal of break-downs on the vacuumlifter (VH)

See table 3-1.

3.6 Ordering of spare parts

Notes on how to order spare parts can be found on page 2.

Table 0-1

Types	Motor power	3x380/400V 50Hz	1x220/230V 50Hz	Lifting height	Duty	Carrying capacity	Protection blower	Lifting hose Ø	SPL	Fuses
	kW	A	A	m	%	kg	IP	mm	dBA	A
R30	3.0	7.2	-	1.7	100	30	54	160	82	15
R50	2 x 3.0	2 x 7.2	-	1.7	100	50	54	160	82	20
R520	3.0	7.2	-	1.7	100	50	54	200	82	15
R1020	2 x 3.0	2 x 7.2	-	1.7	100	100	54	200	82	20
Eco-Line 20	1.2	-	5.0	1.7	100	20	10	160	75	10 (inert)
Eco-Line 30	1.2	-	5.0	1.7	100	30	10	200	75	10 (inert)

Table 3-1

Fault:	**Check:**	**Measures to take:**
VH descends without load, control valve in neutral position.	- Air-tightness of the vacuum system - Vacuum generator - Adjusting of scanning bolt - Vacuum	- Seal leakage - Change fuse - Renew adjustment
VH descends with load, control valve in neutral position.	- As above - Adjustment of control knob	- As above - Renew adjustment
VH does not lift the load.	- Max. weight of the load - Leakage in the system - Vacuum generator Type R30/R520: Vacuum 2600 mm c.o.w. Type R50/R1020: Vacuum 4600 mm c.o.w. - Dust filter obstructed	- Seal leakage - Clean dust filter - Tighten hole clips
VH does not turn easily.	- Rotary connection on top	- Lubricate with spray oil.
VH in uppermost position, but ascends and descends continously.	- Scanning bolt, check adjustment „without load“.	- Turn scanning bolt slightly, until VH descends a few cm.
Scanning bolt underneath the suction surface starts natural vibration.	- Scanning bolt must not come into natural vibration, when VH without load is in resting position, even the bolt is touched.	- Remove control unit from lifting hose. On the inside of the control unit there is a disc, centered by 2 screws and prestressed by springs. Prestress the 2 springs evenly.

Figure 0-1

CE

Figure 0-2