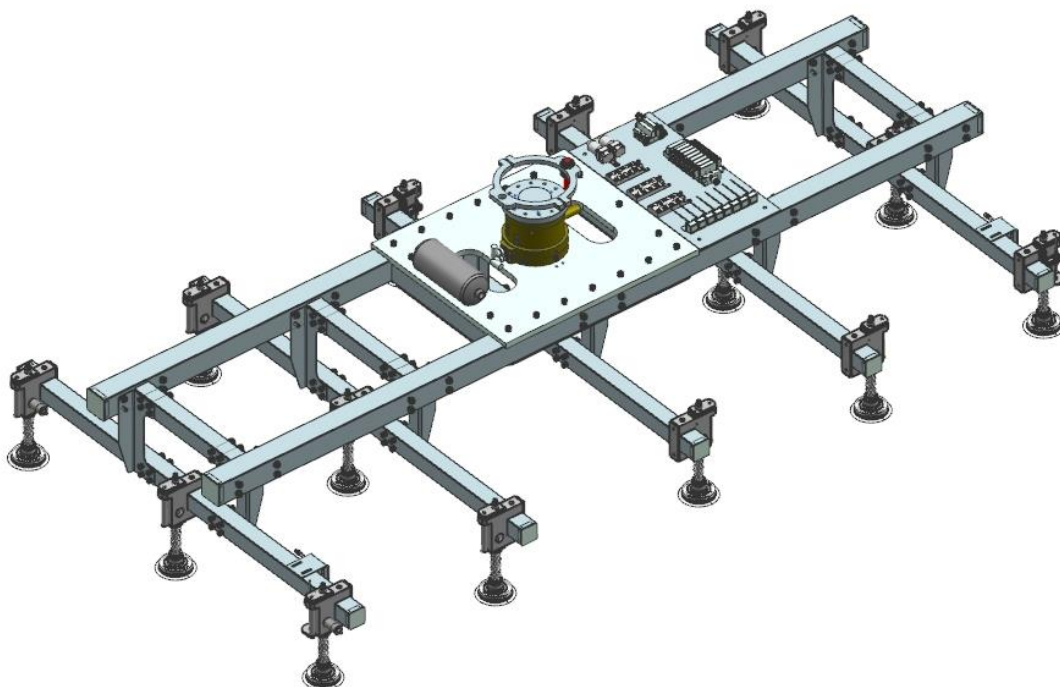




Operating manual



Customer:	SAGE Electrochromics Inc., (Faribault) 2 Sage Way, Faribault, MN 55021 USA
Customer order No.:	Order from 25th of July 2018
Contract-Number:	88440
OLBRICHT Automation Machine Name:	Gripper
OLBRICHT Automation Project-No.:	801.01 - 160
Year of manufacturing:	2019
Manufacturer:	Olbricht Automation GmbH Hamminkelner Straße 30 D-46499 Hamminkeln-Brünen Phone: +49(0)2856 / 9099960 E-Mail: info@olbricht.de

Table of Contents

1	Important basic information	2
1.1	Intended use	2
1.2	Reasonably foreseeable misuse	2
1.3	Legal Notes	3
1.3.1	Warranty instructions	3
1.3.2	Copyright	3
1.3.3	EC Declaration of Conformity	3
2	User instructions	4
2.1	About this operator's manual	4
2.2	Structure of the operator's manual.....	4
2.3	Instructions and procedures	4
2.4	Abbreviations	5
3	Safety	6
3.1	General Information	6
3.2	Meaning of warnings.....	6
3.3	General information on the safety of the machine	7
3.4	Instructions for the owner	7
3.4.1	Qualification of personnel	7
3.4.2	Accident prevention	7
3.5	Information on operating safety	8
3.5.1	Checks before putting the machine into operation.....	8
3.5.2	Operation	8
3.5.3	Maintenance and repair	8
3.5.4	Spare parts	8
3.5.5	Maintenance and repair work.....	8
3.6	General Safety Instructions	9
3.6.1	Warning stickers	10
4	Technical Data	11
4.1	Functional Description	11
4.2	Product description	12
4.3	Dimensions and weight.....	12
4.4	Identification plate.....	13
5	Transport.....	14
5.1	Delivery.....	14
5.2	In-house Transport	14

5.3	Storage	15
6	Installing and commissioning	16
6.1	Safety	16
6.2	Assembly and disassembly	16
	6.2.1 Assembly	16
	6.2.2 Disassembly	17
6.3	Electrical Installation	17
6.4	Commissioning	17
	6.4.1 Preconditions	17
7	Operation manual	18
8	Service and maintenance.....	19
8.1	Safety	19
8.2	Maintenance	19
8.3	Service Address.....	20
9	Disposal.....	21
9.1	Safety	21
9.2	Disposal	21
10	Spare parts	22
10.1	Assembly drawings with parts lists	22
10.2	Spare parts	22
	10.2.1 Classification of spare parts	22
	10.2.2 Instruction for the use of spare parts	23
	10.2.3 Spare parts lists.....	23
11	Applicable Documents	24
11.1	Assembly Drawings	24
11.2	OEM Parts Documentation	24
11.3	Wiring diagrams.....	24
11.4	Spare parts list.....	24
12	Preventive Maintenance	25

1 Important basic information

1.1 Intended use

The Gripper constructed in accordance with its intended use and may be used exclusively for the points listed below.

- Picking up the glass from the Lifting Conveyor.
- Providing the necessary rotations to install separators around the glass.
- Leaving the glass on the Turn Table.

Any use outside these specifications is considered as contrary to the intended use. The manufacturer is not liable for any damage resulting from this. The operator bears the entire risk.

Intended use also includes observing the operating, maintenance and service conditions as prescribed by the manufacturer. Only genuine spare parts from the manufacturer may be used as replacements.

The Gripper may only be used, serviced and repaired by persons who are acquainted with the characteristics of the machine and who have been advised of the dangers involved.

The instructions concerning the operation, service and safe handling of the machine, as described in this operator's manual and stipulated by the manufacturer in the form of warning signs and warning symbols on the machine, must be observed when using the machine.

The relevant accident prevention regulations and the other generally recognized safety-related must be observed when using the machine.

Unauthorized modifications to the Gripper are not permitted. They will exclude the manufacturer's liability for any resulting damage.

1.2 Reasonably foreseeable misuse

A reasonably foreseeable misuse according to the Machinery Directive is defined as the use of the machine in a way not described in these instructions.

1.3 Legal Notes

1.3.1 Warranty instructions

The warranty period for the equipment supplied by the Seller shall be 12 (twelve) months, starting from the date of FAT. The warranty is limited to proprietary parts and manufacturing parts, made by Olbricht Automation GmbH.

In case of defects of equipment, being found during the inspection on site, test-run, or demonstration, the defect will be checked by both parties. If the Seller is responsible for the defect, the Seller shall repair or re-supply the equipment at his own expense. If the Buyer is responsible for the defect, then the Seller will give his assistance to repair or re-supply the equipment to the plant site. Costs thus incurred must be paid by the Buyer.

1.3.2 Copyright

All rights reserved by company Olbricht Automation GmbH.

Unless otherwise agreed, we own the copyrights of all of us delivered drawings, programs and documentations.

Drawings, programs and documentations will only be used by our customers and end-customers in accordance with the contract.

It is not allowed to give drawings, programs and documentations on third parties without permission from the Olbricht Automation GmbH.

1.3.3 EC Declaration of Conformity

Extract of EC Declaration of Conformity:

Olbricht Automation GmbH

Hamminkelter Straße 30, D-46499 Hamminkeln

declare under our sole responsibility that the machine:

Gripper

complies with the following provisions in its delivered version:

Machinery Directive 2006/42/EG, Appendix I.

EMC Directive 2004/108/EC

➔ See full „EC Declaration of Conformity“ on CD Rom

2 User instructions

2.1 About this operator's manual

The operator's manual contains important information for safe use, correct use and maintenance of the Gripper. Your attention will help to prevent dangers, reduce repair costs and downtime and will increase the reliability and service life of the machine.

The entire documentation, which consists of this operator's manual and all documentation provided by the supplier, must be used when working at the machine.

When the machine is sold, the operator's manual must be transferred with it. The operator's manual is intended for the operator of the Gripper and anyone involved in operating and maintaining it. It must be read, understood and applied by every person who is entrusted with the following work on the machine:

- Operation
- Maintenance
- Repairing faults
- Safety

The operator's manual does not replace your personal responsibility as the owner and operator of the Gripper.

2.2 Structure of the operator's manual

The operator's manual is divided into 6 key areas in terms of content:

- user instructions,
- safety instructions,
- machine details,
- instructions for operating the gripper,
- maintenance

2.3 Instructions and procedures

Steps that the operator must carry out are shown as a numbered list.

1. Instruction for action step 1

2. Instruction for action step 2

Instructions that only have one step are not numbered. The same applies for action steps that do not have a specific sequence. A bullet is placed in front of these instructions:

- Handling instruction

2.4 Abbreviations

CE (dt.: EG, engl.: EC)	Communauté Européen (dt.: Europäische Gemeinschaft, engl.: European Community)
DIN	German Industry Standard
EN	European Standard
PLC (dt.: SPS)	Programmable Logic Controller
EMC	Electromagnetic Compatibility Directive
LVD	Low Voltage Directive
UVV	accident prevention regulation
max.	Maximum
min.	Minimum
ca.	circa
e.g.	for example
etc.	et cetera
VDC	Direct current
VAC	Alternating current
Hz	Hertz (frequency)
N	Neutral conductor
PE	ground
V	voltage
h	hour
min	minute
s	second
d	diameter
L	length
mm	millimeter
m	meter
Type	Kind of object or definition
No.	number
Qty	Quantity

3 Safety

3.1 General Information

The chapter on safety contains basic safety instructions and safety regulations for working and operating when using the Gripper.

All instructions in this chapter must be observed to ensure safe handling and trouble-free operation of the Gripper.

There are also additional warnings in the other chapters of this operator's manual, which must also be observed. The warning instructions are given before the respective actions.

Warning instructions with regard to OEM components are contained in the applicable supplier documentation. These warning instructions must also be observed.

3.2 Meaning of warnings

The warnings in the operator's manual are classified according to how serious the danger is and the probability of its occurrence. The danger signs and symbols are provided to advise the user of other unavoidable dangers that may be encountered when operating the Gripper.

The warning instructions used are structured as follows:



DANGER

Type and source of danger

This warning advice warns of a danger posing an immediate threat to the health and life of persons.

Ignoring this warning will result in very serious injury or death.

- Read this operating instruction carefully and follow the warning advice.



WARNING

Type and source of danger

This warning advice warns of a possible dangerous situation for the health of persons.

Non adherence to this warning advice leads to serious injury.

- Read this operating instruction carefully and follow the warning advice.



CAUTION

Type and source of danger

This warning advice warns of a potentially dangerous situation for personal health or of material and environmental damage.

Ignoring this warning will result in very serious injury or death.

- Read this operating instruction carefully and follow the warning advice.



NOTICE

General instructions include tips for usage and useful information but not warning of dangers.

3.3 General information on the safety of the machine

The Gripper is designed and manufactured to the state of the art in technology and the generally accepted rules of engineering. However, operation and maintenance of the machine may involve danger to the health of the user or other persons or may adversely affect the machine and other property.

Therefore, operate the Gripper:

- when it is in good condition and safe to operate in traffic,
- with safety and danger awareness.

This requires that you be familiar with the content of this operating manual, the applicable accident protection regulations and the generally recognized rules of safety and apply these rules as required.

3.4 Instructions for the owner

The owner is responsible for the intended use of the Gripper.

3.4.1 Qualification of personnel

Persons who are responsible for the operation, maintenance or repair of the Gripper must have read and understood these operating instructions, particularly the chapter on safety and warning notices on the corresponding activities, before starting work.

- Representatives of Olbricht Automation GmbH will instruct the operator in the operation and maintenance of the Gripper.
- The operator must ensure that new operating and maintenance personnel are instructed with the same care and to the same extent in operating and maintaining the machine, taking these operating instructions into consideration.
- The machine may only be operated by trained personnel authorized by the owner.
- Persons who are apprentices, in training or under instruction may only work on the machine under the supervision of an experienced person.
- Maintenance and repair work must be carried out by appropriately qualified persons.

3.4.2 Accident prevention

The owner of the machine is responsible for observing the regulations applicable in the country of operation.

The following instructions must also be observed:

- Do not climb up on the machine.
- When working under the machine, protect your head by a helmet. Because extended roller bars may cause danger.
- Long hair must be tied back or otherwise secured and garments must be close-fitting. Jewelry, like chains, is not allowed.

3.5 Information on operating safety

To avoid dangerous situations, the Gripper must only be used in an operationally safe condition.

3.5.1 Checks before putting the machine into operation

Before the first and every subsequent operation, check the Gripper to make sure that it is safe to operate.

- Is all safety equipment on the Gripper installed and functional?
- Is there any person in the danger zone of Gripper?

3.5.2 Operation

- If the Gripper malfunctions, stop the machine immediately and lock it. Have the fault repaired immediately by qualified technicians.
- Operate the Gripper only with the protective covers.
- Rotating machine components can cause serious injury. Make sure that body parts or clothing never come close to rotating components.

3.5.3 Maintenance and repair

Maintenance and repair work involves additional hazards that do not occur during operation of the machine.

- Take particular care when carrying out maintenance and repair work. Work very carefully and with awareness of danger.

3.5.4 Spare parts

- Observe the maintenance and repair intervals specified in this operator's manual exactly.
- Also observe the maintenance and repair intervals for the supplied components. See the supplier documentation for the relevant intervals
- Spare parts must at least comply with the technical standards specified by the manufacturer. This is assured with original spare parts.

3.5.5 Maintenance and repair work

- Disconnect the power supply before all cleaning, maintenance and repair work and when troubleshooting. Wait until all moving parts of the machine have stopped moving.
- Disconnect the power supply before working on the electrical system.
- Make sure that no unauthorized person can switch on the Gripper.

3.6 General Safety Instructions

Read the instructions below and follow them for your safety.

- ✓ Stay away from the robot's working area when the main switch is on.
- ✓ Learn in advance about the general operating conditions of the robot.
- ✓ Learn about the robot's movements. An industrial robot can cause unexpected dangerous consequences due to its movement during operation.
- ✓ Make sure that the **EMERGENCY STOP** button is within reach of the robot.
- ✓ Do not stand under the transported product during transport..
- ✓ Train your personnel extensively on robot handling, system construction and safety.
- ✓ Do not remove, destroy or cover the **CAUTION** and **WARNING** labels on the robot controller and the main body.
- ✓ Always ensure that the workplace safety conditions are fully met.
- ✓ **DO NOT** disassemble, relocate and cover the warning signs on the robot body and control unit.
- ✓ If the signs are too damaged or contaminated to read, replace them immediately.



WARNING







Type and source of danger

This warning advice warns of a possible dangerous situation for the health of persons.

Non adherence to this warning advice leads to serious injury.

- Read this operating instruction carefully and follow the warning advice.

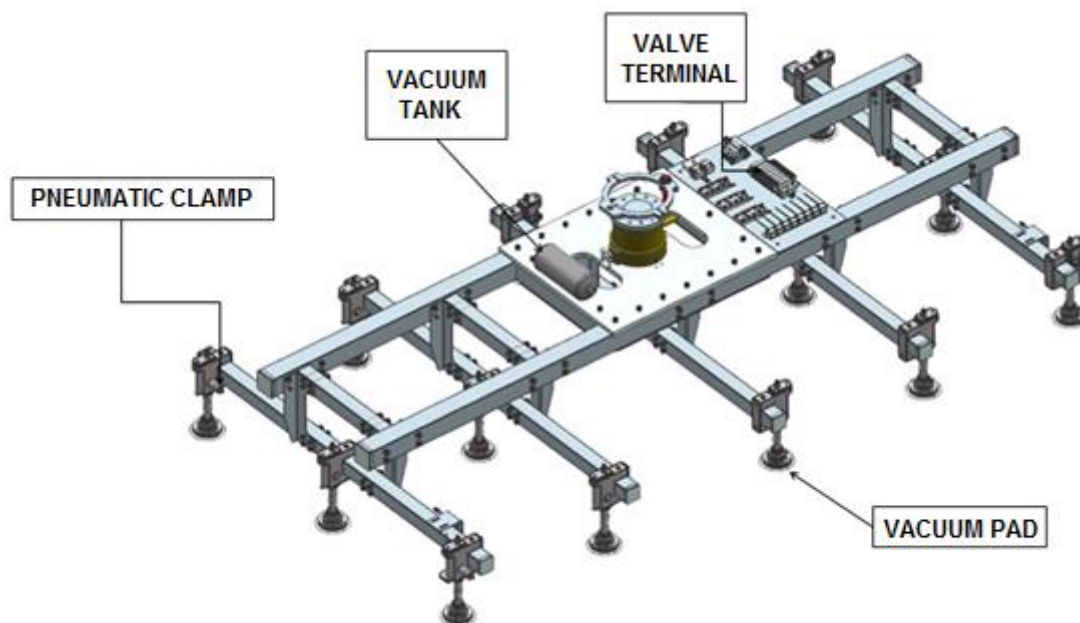
3.6.1 Warning stickers

Sticker	Designation
	<p>Read operator's manual and safety instructions</p> <p>Before placing the machine in operation, read and observe the operator's manual and warning instructions.</p> <p>The operator's manual explains in detail how to operate the machine and contains information on safety, operation and maintenance.</p>
	<p>Wear safety gloves!</p>
	<p>Wear safety-work-shoes!</p>
	<p>Wear protective clothes!</p>
	<p>Wear safety glasses!</p>
	<p>Warning! Crushing of hands.</p> <p>➔ To warn of a closing motion of mechanical parts of equipment</p>

4 Technical Data

4.1 Functional Description

The glass that comes from the Lifting Conveyor is picked up by the robot and the camera is used to check fractures on the glass. If there is a fracture on the glass, it is put into the crate placed on the pedestal. If the glass is intact, it is transported to M170 Cassette Buffer Machine. Here, by rotating the glass, it is ensured that separators are installed around the glass. Once this is complete, the glass is placed in the crate on the Turn Table.



OPERATION STEPS	
STEP 01 :	Robot waits motionless.
STEP 02 :	After the barcode of the glass is read on the lifting conveyor, the glass is taken by the Gripper.
STEP 03 :	The robot moves the glass towards the camera. The camera is checked for fracture on the glass. If the glass is fractured, it leaves the glass on the crate on the pedestal and returns to its initial position. If the glass is intact, it carries the glass to the M170 cassette buffer machine.
STEP 04 :	The robotic hand rotates the glass here, allowing the separators to be installed around the glass with M170 machine.
STEP 05 :	The presence of separators is checked. If installed, it is moved to the Turn Table and placed into the crate.
STEP 06 :	End of the operation.

4.2 Product description



WARNING

Malfunction of machine

Any use outside these specifications is considered as contrary to the intended use. The manufacturer is not liable for any damage resulting from this. The operator bears the entire risk.




The Gripper is built for the purpose of lifting and conveying glass (see table below).

Glass type	Rectangular electrochromic glass called Motherboards (MB)
Width	1850 mm
Length	3200 mm
Glass thickness	2,2 mm
Glass weight	~30 kg

4.3 Dimensions and weight

Dimension	Value
Length	2930 mm
Width	1580 mm
Height	711 mm
Weight	165 kg

4.4 Identification plate

			
		Call us!	
Bezeichnung / description:	Gripper		
Maschinennr. / machine no.:	801.01 - 160		
Baujahr / year:	2019		
Gesamtgewicht / total weight:	165 kg		
Nennleistung / nominal power:			
Betriebsspannung / working voltage:	480V		
Netzfrequenz / power frequency:	60 Hz		
Betriebsdruck / working pressure:	-		
<p>Olbricht Automation GmbH • Hamminkler Str. 30 • D-46499 Hamminklen-Brünen Tel. (0 28 56) 9 09 96-0 • Fax (0 28 56) 9 09 96-60 • E-Mail: info@olbricht.de • www.olbricht.de</p>			

5 Transport

5.1 Delivery

The condition and completeness of the machine must be checked. In case of damages caused by transport, make photos. It must be recorded and the report must be signed. Serious damages caused by transport, which have impact on the functioning and safety of the machine, must be processed only in agreement with the manufacturer.

5.2 In-house Transport

- ✓ During transport of the Gripper, damage may occur which cannot be removed due to fall or impact.
- ✓ The Gripper must only be transported by crane or forklift with special ropes under the supervision of trained personnel.
- ✓ Safety precautions must be taken before transport.
- ✓ When transporting by crane, special locking hooks and ropes that selected according to the load must be used.
- ✓ When transporting by forklift, the lengths of the forks should be considered according to the capacity of the forklift.
- ✓ Care must be taken not to damage the Gripper during transport.
- ✓ A forklift suitable for the size of the equipment to be transported must be used.
- ✓ Transport should be done by fixing the equipment close to the center of gravity.
- ✓ Do not forget any tools on the equipment during transport.
- ✓ During transport, care must be taken not to damage the pneumatic systems and sensors on the system and transport should not be carried out from these points.

CAUTION



Damaging of machine and hurting of people

- The transport of machine must only be carried out by suitable, trained and expressly authorized personnel.
- Establish the transportation route in good time and remove possible obstacles.
- A check must be made to ascertain that all safety and transport devices are fit for operation.

5.3 Storage

- The machines must be stored in closed rooms at a room temperature between 5°C (41°F) and 40°C (104°F) and a relative humidity of max. 60% (non-condensing).
- In case of a longer storage time, it's necessary to preserve all uncoated metal machine parts (shafts, bearings etc.) e.g. the corrosion preventive compound Tectyl 846 K19, this is based on wax (for preserving until 12 month).
- For removing any corrosion preventive compound use cleaning solvent.
- Cover the machines with suitable cover-material to keep them free from dust.
- In case of sea transport a hermetically sealed foil is also allowed.

6 Installing and commissioning

6.1 Safety

CAUTION



Damaging of machine and of hurting people

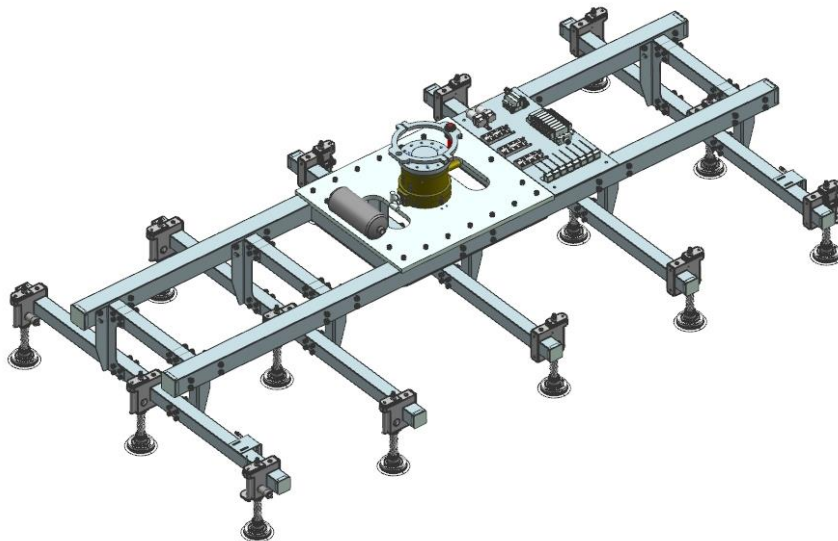
- The machine may only be assembled and disassembled by qualified technicians. These persons must be familiar with relevant regulations relating to the prevention of accidents and industrial safety.
- Work on the electrical and pneumatic systems must be carried out by qualified technicians only.

- The working area should be neat, tidy and hazard free.
- Only appropriate, tested and calibrated tools may be used.

6.2 Assembly and disassembly

6.2.1 Assembly

- The machine is delivered in 1 unit.
- The drawings in chapter 10.1 must be observed.



Strength class	Screw tightening torque MA acc VDI 2230 (Nm)									
	M5	M6	M8	M10	M12	M16	M20	M24	M27	M30
8.8	6.2	10.5	25	50	86	215	410	710	1050	1400
10.9	8.7	15	36	70	121	300	580	1000	1450	2000
12.9	10.5	17.5	43	84	145	360	700	1200	1750	2400

6.2.2 Disassembly

- Before start disassembling, make sure that no glass is placed on the machine and that the power supply (air and electric power) for the complete system has been switched off!
- The drawings in chapter 10.1 must be observed.

6.3 Electrical Installation

- Motors and other electrical components are pre-installed
- Limit switches have to be wired

6.4 Commissioning

6.4.1 Preconditions



NOTICE

Before the system is released, a qualified person must carry out a visual and functional test.

This is to make sure that the machines are in a safe condition and there are no defects or damages due to improper installation.

- Mechanical equipment installed.
- Transport securing devices dismounted.
- Electrical equipment installed and connected.
- Safety and monitoring equipment installed and functioning.
- The function test checks all processes occurring without goods during operation of the machines

7 Operation manual

- ➔ See document „Operation manual of M2S Load-Unload-System“ on CD Rom

8 Service and maintenance

8.1 Safety



WARNING

Moving parts

For cleaning and lubrication all drives of the machine and adjacent machines must be switched off from the power supply. The maintenance work may only be started when the entire machine system has come to a standstill.



CAUTION

Working with chemicals

The safety data sheets and the specific regulations of all chemicals and cleaning agents used for the operation and maintenance of the machine, must be observed.

8.2 Maintenance

- Excess oil and grease must be removed immediately. After completion of the maintenance work, it must be checked whether all protection and safety devices are correctly installed again.
- The machine must be cleaned regularly to ensure a long life of the machine and its production. A weekly cleaning is recommended. Some parts need special care.
- Geared motors, electric drives and other purchased machine parts are to be maintained in accordance with the operating instructions of the manufacturers.
- All fasteners on moving machine parts must be checked for their correct fastening and securing at intervals of 3 months.

Parts	Activity / Remark	Time interval
Movable joint parts of the clamps	Lubrication by hand	Monthly
Bolts and sensor connections	Visual check	Daily
All hoses and fittings	Visual check (the line)	Daily
All hoses and fittings	Check connections by hand	Monthly
Piston (Clamp)	Check the speed	Monthly
Piston (Clamp)	Check the sensor	Monthly
Piston (Clamp)	Check the bolts and the end adapter connections	4-monthly
Piston (Clamp)	Visual check (piston speed adjustment)	Weekly
Conditioner	Discharge of conditioner water	Weekly
Pressure of the line	Visual check for pressure of the line	Daily
Air leak	Visual check	Daily
Presence of the vacuum	Visual check	Daily

8.3 Service Address



OLBRICHT Automation GmbH
 Hamminkelner Str. 30
 D-46499 Hamminkeln-Brünen

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 www.olbricht.de

9 Disposal

9.1 Safety

WARNING

Pollution of the environment due to unsuitable disposal of gear oil.

Gear oil is not fully biodegradable. Therefore oil must not be disposed of in the environment in an uncontrolled manner.



- The proper disposal of used oil must only be undertaken by the authorized maintenance personnel.
- Soak up or dam up oil that has run out of equipment with sand, soil or absorbent material.
- Collect gear oil in a suitable container provided for the purpose and dispose of it in accordance with the local statutory requirements.
- Draining and penetration of oil into the sewerage system.
- Penetration of oil into the water drain by setting up barriers of sand or earth or other appropriate barrier methods.

WARNING

Environmental pollution due to the unsuitable disposal of packaging material



Packaging material contains chemical compounds, which must be dealt with appropriately.

The specialized disposal of packaging material takes place via an appropriately authorized disposal company with adherence to the national regulations.

Do not burn packaging materials or dispose of it as household refuse.

Disposal only by authorized companies.

9.2 Disposal

The following points apply without restriction. The precautions that laid down as a result of national regulations are to be carried out implicitly.

1. Make sure that no glass or any products lie on the Gripper.
2. Switch off the supply of air and electric power.
3. Wear personal protection equipment.
4. Dismantling of machine.
5. All parts, auxiliary and operating substances are to be removed from the Gripper by specialist personnel. In so doing these parts are to be sorted into specific categories.
6. All waste products are then to be disposed of in accordance with local regulations and directives for recycling or special refuse categories by authorized companies.

10 Spare parts


10.1 Assembly drawings with parts lists


Qty	Drawing No.	Designation	Parts list	Weight [kg]
1	801.01.161000__A0_1_1	ROBOT-GRIPPER_ASM	801.01.161_ROBOT...	165
3	801.01.161100__A2_1_1	VAKUM_APARATI_no_sens_1	801.01.161_ROBOT...	2
10	801.01.161200__A2_1_1	VAKUM_APARATI_no_sens_2	801.01.161_ROBOT...	1.8
1	801.01.161300__A0_1_1	ANA_SASE_001	801.01.161_ROBOT...	86
3	801.01.161400__A2_1_1	VAKUM_APARATI	801.01.161_ROBOT...	2

10.2 Spare parts

10.2.1 Classification of spare parts

The parts lists of the assembly drawings have a column “Spares” (see figure below). It shows where the spare parts are located. The spare parts are labeled with **I**, **II**, **III**.

	Classification of spare parts according the need to keep them available
Classification	Explanations:
I	Spare parts that should be available at start-up, because they can fail at any time.
II	Spare parts to be expected for replacement within a two-year operation life-time, depending on normal wear and stress.
III	Spare parts, to be expected for replacement after more than a two-year operation life-time, depending on normal wear and stress, it is recommended to have them on stock.

 Glass Processing & Handling Technologies		Olbricht Automation GmbH		Project No / Machine ID:		801.01	
		PART LIST		Customer name:		SAGE	
				Owner:		Ahmet ALGUR	
				Edit by:		HS,AA,AT,RE	
				Rev. date & No:		19/12/2019	
#	Part / Component No.	Part / Component Name	Unit	Qty	Brand	CLASS.	
1	BNI EIP-508-105-Z015 (*)	EtherNET/IP Haberleşmeli IO-LINK Master 16IN/16OUT (8 IO-LINK)	Pcs	1	Balluff	1	
2	BNI IOL-302-000-K006	16 Input / 16 Out Slave Modül	Pcs	2	Balluff	1	
3	BNI IOL-719-002-Z012	Analog Input Slave Unit	Pcs	1	Balluff	1	
4	VTUG-14-SR8-B1TZ-Q12L-DTL-Q8S-8GLL	Valve block	Pcs	1	Festo	1	
5	VTUG-14-SR8-B1T-Q10L-DQL-Q6S-KL	Valve block	Pcs	1	Festo	3	
6	160236_CRVZS	Air tank	Pcs	1	Festo	3	
7	530033 HGL-1/2-B	Check valve	Pcs	1	Festo	3	
8	359873 MA-50-10-1/4	Pressure gauges	Pcs	1	Festo	3	
9	178458 KP-20-1400	Clamping cartridge	Pcs	6	Festo	1	
10	132040	Fittings	Pcs	25	Festo	1	
11	GFM-2023-21	Bearings	Pcs	55	Igus	2	
12	EV-112U	Sensor	Pcs	3	Keyence	1	
13	UC2000-30GM-IUEP-IO-V15	Sensor	Pcs	1	Pepperl - Fuchs	1	
14	VS-V-W-D PNP K 3C-D (10_06_02_00678)	Vacuum switch	Pcs	10	Schmalz	1	
15	DDF 2-125-P4-E10	Slip ring	Pcs	1	Schunk	2	
16	LR-TB5000C_TB5000CL	Sensor	Pcs	3	Keyence	1	
17	EVE-TR 40 AC3 F (10.03.01.00148)	Dry-Running Vacuum Pumps EVE-TR Voltage (60 Hz): 190-290V/330-500V AC3 with: Filter Suction rate (60 Hz): 48 m³/h Vacuum (60Hz): -850 mbar Rated power (60 Hz): 1.5 kW Weight: 40 kg	Pcs	1	SCHMALZ	1	
18	DR-SGF 125 (10.01.01.12890)	Rubber Seal for SGF suction cup Size: 125 Suction cup material: High temp material HT1 Material hardness: 60 °Sh	piece/ Stück	16	SCHMALZ	1	

10.2.2 Instruction for the use of spare parts

- Only use original-manufactured-equipment (OEM)-spare parts.
- When ordering spare parts, please refer always to Olbricht Automation assembly-drawing-number and part-number. Proprietary spare-parts have to be identified with:
 - a) Name of supplier/manufacturer
 - b) Component designation
 - c) Component identification-number
- The part-number in the part list is identical with the part-number on the associated assembly drawing.
- Some spare parts need special assembly instructions, operating manuals or data sheets.
 - ➔ See folder „Assembly drawings” on CD ROM.



NOTICE

By using other spare parts, the safety and function of the machine are not guaranteed any longer. In this case Olbricht Automation assumes no responsibility.

10.2.3 Spare parts lists

- ➔ See folder „Spare parts list” on CD ROM.

11 Applicable Documents

11.1 Assembly Drawings

- ➔ See folder „Assembly drawings” on CD ROM.

11.2 OEM Parts Documentation

- ➔ See folder „OEM Parts Documentation” on CD ROM.


11.3 Wiring diagrams

- ➔ See folder „Wiring diagrams” on CD ROM.

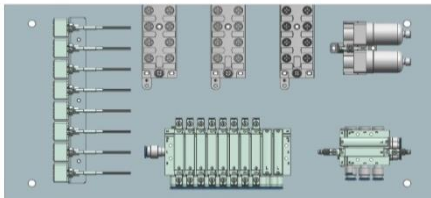
11.4 Spare parts list

- ➔ See folder „Spare parts list” on CD ROM.

12 Preventive Maintenance

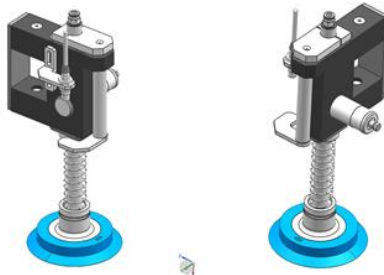
Intervention:		CHECK	
Maintenance:		Preventive	
Components	Frequency (hours)	<div>• Check</div> <div>✓ Maintenance</div>	Warnings
Sensors	5760 (12 months considering 16 hours a day every day including holidays)	<div>• Integrity</div> <div>• Fixings</div> <div>• Check correct operation</div>	In case of failure or malfunction, replace.
			Clean using a dry and clean cloth. If necessary, use suitable detergents
			For further information, refer to the manufacturer's instructions manual.
<div></div> <div>Pictures are only for illustration purpose.</div>			

Intervention:		CHECK	
Maintenance:		Preventive	
Components	Frequency (hours)	<div>• Check</div> <div>✓ Maintenance</div>	Warnings
Valve Group	2880 (6 months considering 16 hours a day every day including holidays)	<div>✓ Integrity</div> <div>• Fixings</div> <div>• Check correct operation</div>	In case of failure or malfunction, replace.
			Clean using a dry and clean cloth. If necessary, use suitable detergents
			For further information, refer to the manufacturer's instructions manual.



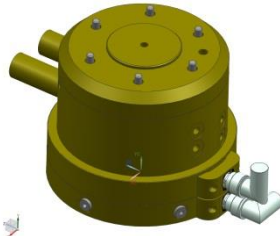
Pictures are only for illustration purpose.

Intervention:		CHECK	
Maintenance:		Preventive	
Components	Frequency (hours)	<ul style="list-style-type: none">• Check✓ Maintenance	Warnings
Vacuum Group	2880 (6 months considering 16 hours a day every day including holidays)	<ul style="list-style-type: none">• Integrity• Fixings• Check correct operation✓ Screws tightness	Replace in the event of excessive wear.
			Clean using a dry and clean cloth. If necessary, use suitable detergents



Pictures are only for illustration purpose.

Intervention:		CHECK	
Maintenance:		Preventive	
Components	Frequency (hours)	<div>• Check</div> <div>✓ Maintenance</div>	Warnings
Slipring	2880 (6 months considering 16 hours a day every day including holidays)	<div>✓ Integrity</div> <div>• Fixings</div> <div>• Check correct operation</div>	In case of failure or malfunction, replace.
			Clean using a dry and clean cloth. If necessary, use suitable detergents
			For further information, refer to the manufacturer's instructions manual.



Pictures are only for illustration purpose.