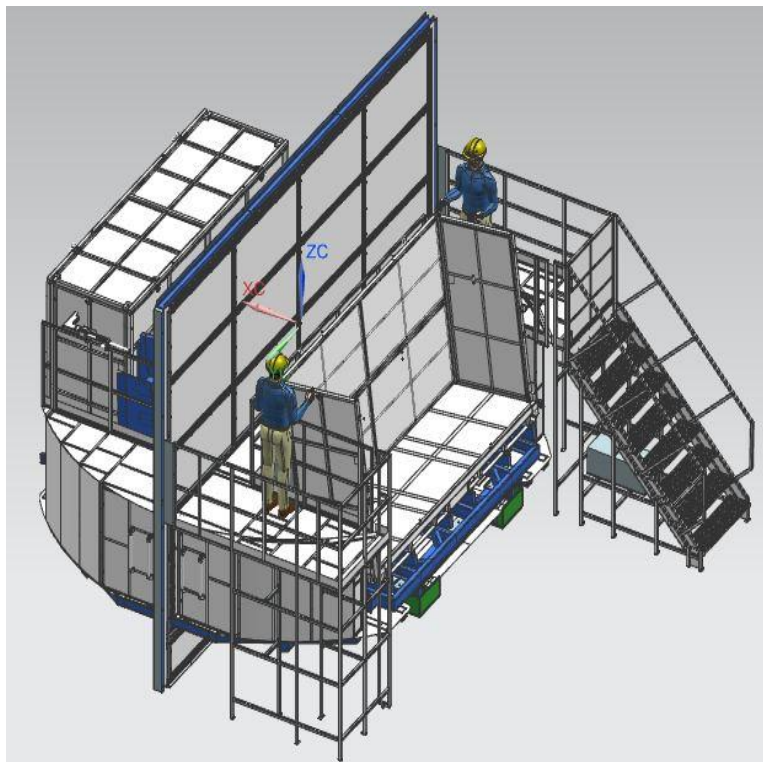




Operating manual



| | |
|--|--|
| 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: | Turn Table |
| OLBRICHT Automation Project-No.: | 801.01 - 180 |
| Year of manufacturing: | 2019 |
| Manufacturer: | -Brünen Phone: +49(0)2856 / 9099960 E-Mail: info@olbricht.de |

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1 Important basic information

1.1 Intended use

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

- Storage of the glass sheets on the racks. (Refer to documentation)

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 Turn Table 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 Turn Table 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:

Turn Table

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 and correct use and maintenance of the Turn Table. Your attention will help to prevent errors, 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 Turn Table 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 Turn Table.

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 Turn Table,
- 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 Turn Table.

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




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 Turn Table.

The warning instructions used are structured as follows:

| | |
|---|---|
| | DANGER |
|  | <p>Type and source of danger</p> <p>This warning advice warns of a danger posing an immediate threat to the health and life of persons.</p> <p>Ignoring this warning will result in very serious injury or death.</p> <ul style="list-style-type: none">• Read this operating instruction carefully and follow the warning advice. |
| | WARNING |
|  | <p>Type and source of danger</p> <p>This warning advice warns of a possible dangerous situation for the health of persons.</p> <p>Non adherence to this warning advice leads to serious injury.</p> <ul style="list-style-type: none">• Read this operating instruction carefully and follow the warning advice. |
| | CAUTION |
|  | <p>Type and source of danger</p> <p>This warning advice warns of a potentially dangerous situation for personal health or of material and environmental damage.</p> <p>Ignoring this warning will result in very serious injury or death.</p> <ul style="list-style-type: none">• 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 Turn Table 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 Turn Table:

- 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 Turn Table.

3.4.1 Qualification of personnel

Persons who are responsible for the operation, maintenance or repair of the Turn Table 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 Turn Table.
- 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 Turn Table 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 Turn Table to make sure that it is safe to operate.

- Is all safety equipment on the Turn Table installed and functional?
- Are any persons in the danger zone of the Turn Table?

3.5.2 Operation

- If the Turn Table malfunctions, stop the machine immediately and lock it. Have the fault repaired immediately by qualified technicians.
- Operate the Turn Table 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 Turn Table.

3.6 Safety equipment on the machine



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

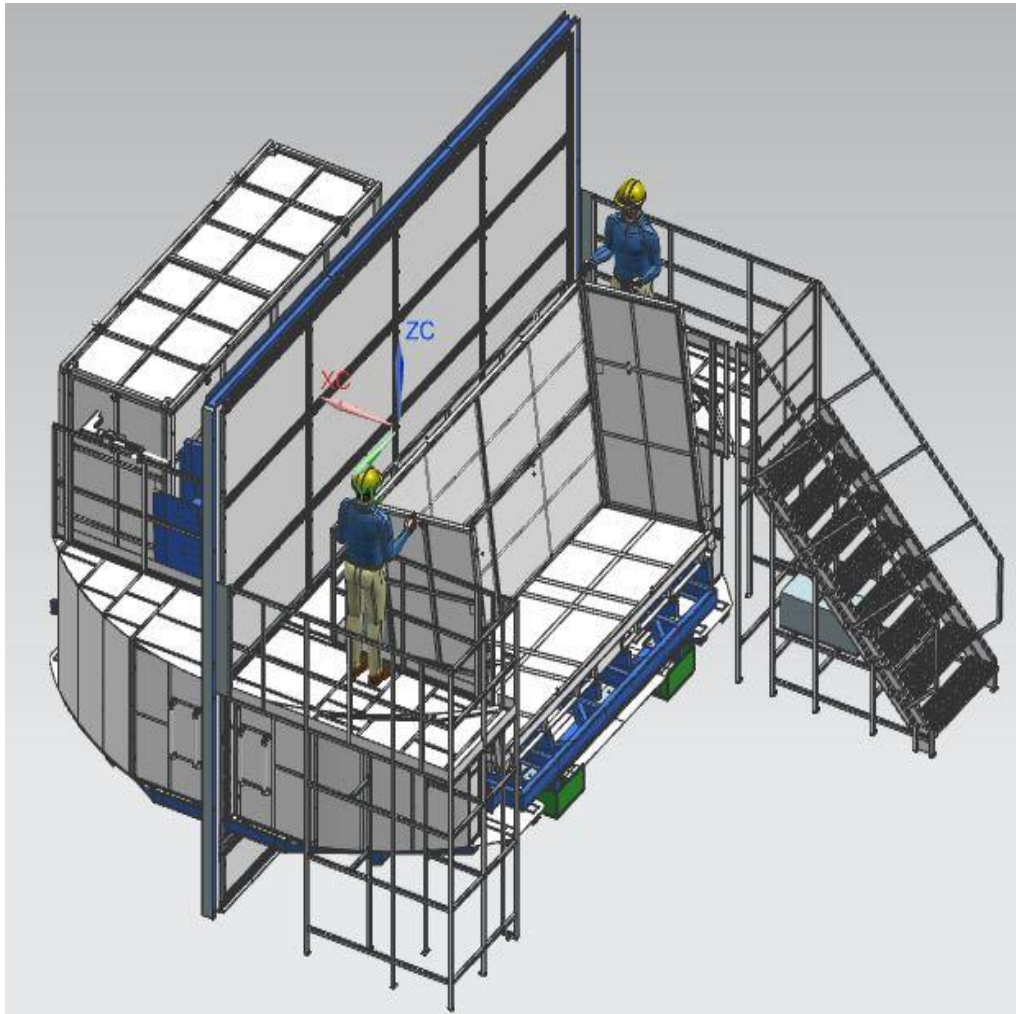
| Sticker | Designation |
|---|--|
|  | Read operator's manual and safety instructions Before placing the machine in operation, read and observe the operator's manual and warning instructions. The operator's manual explains in detail how to operate the machine and contains information on safety, operation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

4 Technical Data

4.1 Functional Description

The general structure of the Turn Table is shown below. The Turn Table's movement is driven by servo motors and its turning diameter is 5800 mm.

The Turn Table, consist of welded frame group at the top and the bottom, motor-reducer drive system and a transferring system at the top. The Turn Table operates at a speed of 1.2 m/min. It allows the finished product to be discharged off the line.



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 Turn Table 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 | 6000 mm |
| Width | 6522 mm |
| Height | 4616 mm |
| Weight | 16000 kg |

4.4 Identification plate

| | | | |
|--|--------------|---|---|
|  | |  |  |
| | | Call us! | |
| Bezeichnung / description: | Turn Table | | |
| Maschinennr. / machine no.: | 801.01 - 180 | | |
| Baujahr / year: | 2019 | | |
| Gesamtgewicht / total weight: | 16000 kg | | |
| Nennleistung / nominal power: | 11.6 | | |
| Betriebsspannung / working voltage: | 480V | | |
| Netzfrequenz / power frequency: | 60 Hz | | |
| Betriebsdruck / working pressure: | 5-6 | | |
| <small>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</small> | | | |

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

Crane or forklift must be used for transport and assembly.

Transport with Forklift;

- ✓ The Turn Table's right and left sides must be transported separately.
- ✓ For transport, the Turn Table must be transported in parts.
- ✓ Welded profile construction, machine frame and motor reducer equipment, and carrier arms on the Turn Table must be removed and transported separately.
- ✓ During transport it is important to carry the machine under the profiles in a balanced way.
- ✓ Care must be taken not to damage the mechanical equipment during transport.

Transport with Crane;

- ✓ The Turn Table's right and left sides must be transported separately.
- ✓ Special rope must be used.
- ✓ When connecting the ropes, care must be taken to avoid damaging the mechanical equipment.
- ✓ Two ropes must be used for transport.
- ✓ Specially designed constructions should be used for transport.

During the transport, care must be taken not to damage the pneumatic elements, motor and bearing systems on the machine and to ensure that they should not be transported from these points.

- ✓ The rope suitable for the dimensions of the transport pack should be used.
- ✓ Transport should be carried out by fixing it close to the center of gravity of the pack.
- ✓ Do not forget any tools on the pack during transportation.

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

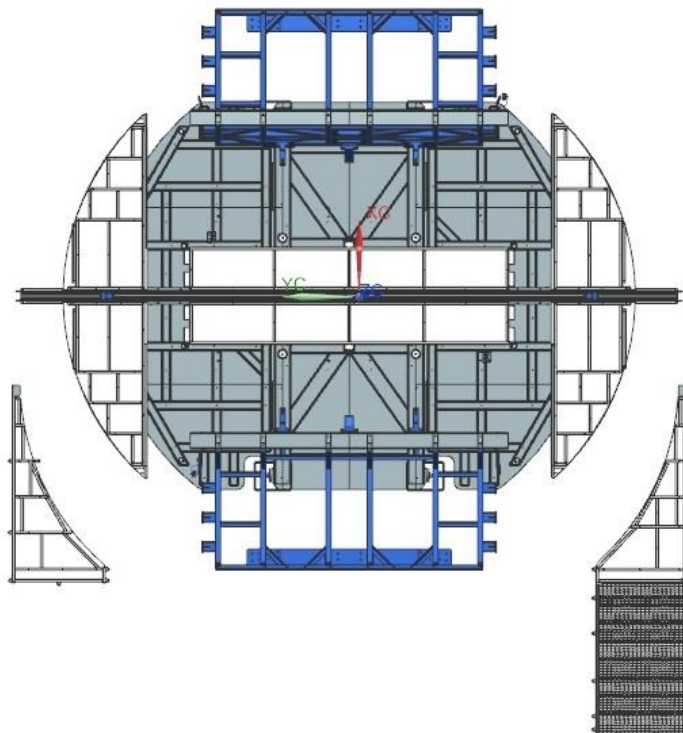
- The machine may only be assembled and disassembled by qualified technicians. These persons must be familiar with relevant regulations relating to the prevention of accidents and industrial safety.
- Work on the electrical and pneumatic systems must be carried out by qualified technicians only.

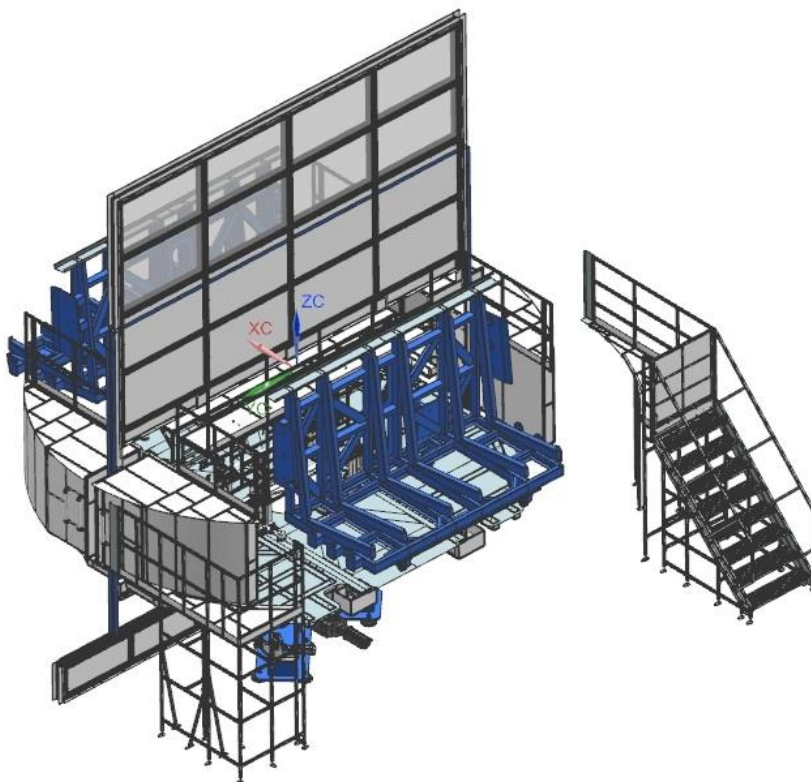
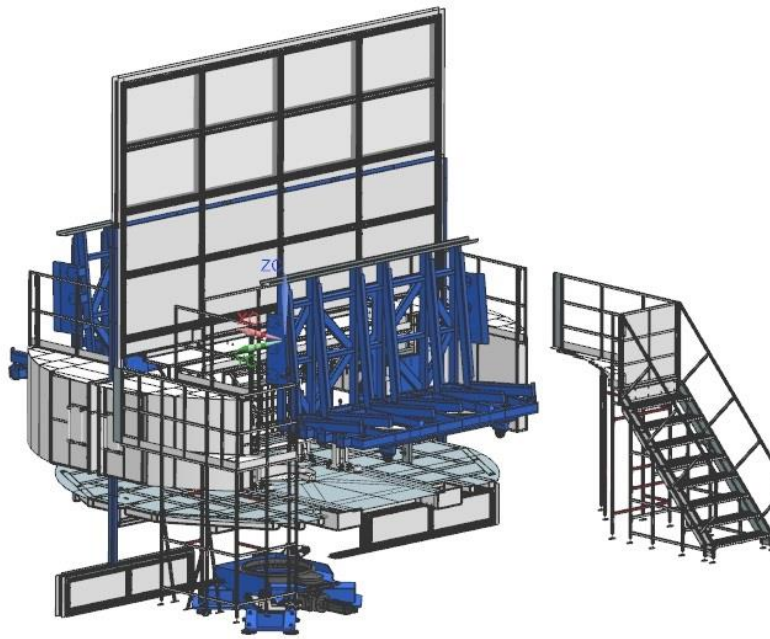
- The working area should be neat, tidy and hazard free.
- Only appropriate, tested and calibrated tools may be used.

6.2 Assembly and disassembly

6.2.1 Assembly

- The machine is delivered in 17 units.
- 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 dismantled.
- 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 |
|--------------------------------|---|---------------|
| Floor mounting elements | Check for tightness of bolts | Monthly |
| Bolts and sensors | Visual check | Daily |
| All cables | Visual check (wiring) | Daily |
| All cables | Check connections by hand | Monthly |
| Rotating axes | Check gap by hand | Monthly |
| Joints of lift group | Check gap by hand | Monthly |
| Joints of lift group | Visual check (the line) | Daily |
| Crate carrier front bearing | Check gap by hand | Monthly |
| Crate carrier front bearing | Check gap by hand | Monthly |
| Slewing rings | Visual check (the line) | Daily |
| A-B SIDE sensor | Check gap by hand | Monthly |
| Lift position sensor | Check gap by hand | Monthly |
| Lift position sensor | Visual check (the line) | Daily |
| Lubrication of bearings | Check by hand(and visual check)/ Lubricate with proper grease | Monthly |
| Oil check of motor and reducer | Inspect the documents of motor manufacturer | Monthly |

8.3 Service Address



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

T:+49 (0) 28 56 / 9 09 96-0
F:+49 (0) 28 56 / 9 09 96-60
info@olbricht.de
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 Turn Table.
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 Turn Table 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 | 801.01.180000___A0_1_1 | TURNTABLE_GENERAL_ASSEMBLY_... | 801.01.180_LIFTIN... | 16000 |
| 1 | 801.01.181000___A1_1_1 | HAREKETLI_GRB_01 | 801.01.180_LIFTIN... | 8272 |
| 1 | 801.01.181400___A1_1_1 | CARRIER_ASSM | 801.01.180_LIFTIN... | 3409 |
| 2 | 801.01.181700___A1_1_1 | CRATE_FORK | 801.01.180_LIFTIN... | 1350 |
| 2 | 801.01.181800___A1_1_1 | PLATFORM | 801.01.180_LIFTIN... | 600 |
| 1 | 801.01.181900___A1_1_1 | MID_PANEL | 801.01.180_LIFTIN... | 250 |
| 1 | 801.01.182000___A1_1_1 | TURN_TABLE_BOT | 801.01.180_LIFTIN... | 2185 |
| 2 | 801.01.182300___A3_1_1 | MERKEZLEME | 801.01.180_LIFTIN... | 38 |
| 1 | 801.01.182400___A2_1_1 | DRIVE_UNIT | 801.01.180_LIFTIN... | 500 |
| 1 | 801.01.183000___A0_1_1 | RIGHT_FIXED_PLTFRM | 801.01.180_LIFTIN... | 370 |
| 1 | 801.01.184000___A0_1_1 | LEFT_FIXED_PLTFRM | 801.01.180_LIFTIN... | 112 |

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 | Quantity | Brand | | CLASS. |
| 1 | Alhan_C6020SS | Castermid | Pcs | 24 | Olbricht | | III |
| 2 | SYJ 55 KF - 50 | Bearing | Pcs | 4 | SKF | | I |
| 3 | IFS 306 | Sensor | Pcs | 2 | IFM | | I |
| 4 | EV-112U | Sensor | Pcs | 4 | KEYENCE | | I |
| 5 | PZ-G41CB | Sensor | Pcs | 4 | KEYENCE | | I |
| 6 | KF87 AQH140/4 | Helical-bevel gear units with adapter Speed [rpm]: 1400 / 9.5 Gear Ratio [i]: 147,32 / X Number of teeth nom./denominator: 5893/40 Input speed [rpm]: 4500 Output speed [rpm]: 31,00 Output torque [Nm]: 3220 Mounting position: M1A Lubrication / quantity [1]: CLP HC 220 Synthetic Oil / PSS / 3,70 Additional Feature Output shaft: 60x120mm lg. Connection Type: Flange-mounted Flange: 350 Output oil seal material: FKM-PSS Inlet Hole: 28 mm (Clamping) | Pcs | 1 | SEW | | I |
| 7 | VSA_20_0844_ZT | Slewing | Pcs | 1 | Han makina | | III |
| 8 | NSE25SN | Screw standing spindle, i = 6: 1 | Pcs | 4 | Nozag | | II |
| 9 | NSE25TSVS | Trapezoidal spindle SVS Hub = 250mm; Ltot = 468mm | Pcs | 4 | Nozag | | II |
| 10 | NSE25SRES | Protection tube to limit switch Stroke = 250mm, Ltot = 307mm | Pcs | 2 | Nozag | | II |
| 11 | NSE25KGGK | Ball joint head Ø 20 with M20 | Pcs | 4 | Nozag | | II |
| 12 | FB90X50/50300 | Bellow x = number of folds x = 11 folds | Pcs | 4 | Nozag | | II |
| 13 | NSE25FBAS | Bellows adapter spindle end | Pcs | 4 | Nozag | | II |
| 14 | NSE25KAL | Cardanadapter lang | Pcs | 4 | Nozag | | II |
| 15 | NSE25KB | the Kardanbolz | Pcs | 8 | Nozag | | II |
| 16 | VW601SLAca. 1450 16/16 Verbindungswelle | 1. Side with half cup coupling with 16 mm bore 2. Side with rigid hub with 16 mm bore | Pcs | 2 | Nozag | | II |
| 17 | NSE25MOA200 | Motoradapter kompl. | Pcs | 2 | Nozag | | II |
| 18 | 09516/28 | Flexible coupling | Pcs | 2 | Nozag | | II |
| 19 | NSE25SR | Thermowell - Stroke = 250mm, Ltot = 307mm | Pcs | 4 | Nozag | | II |
| 20 | NSEESI | Limit switch inductive | Pcs | 8 | Nozag | | II |
| 21 | VPL-B1653C-PK14AA | VPL Motor - 25 Nm - 2500 rpm - Multi Turn Absolute Enc - with Brake | Pcs | 1 | Allen bradley | | I |
| 22 | VPL-B1303C-PJ14AA | VPL Motor - 25 Nm - 2500 rpm - Multi Turn Absolute Enc - with Brake | Pcs | 2 | Allen bradley | | I |
| 23 | ROTEXGS28 6.0-Q28 / 6.0-Q28 | Coupling | Pcs | 1 | KTR | | I |

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) | <ul style="list-style-type: none">• Check✓ Maintenance | Warnings |
| Sensors | 5760 (12 months considering 16 hours a day every day including holidays) | <ul style="list-style-type: none">• Integrity• Fixings• Check correct operation | 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) | <div>• Check</div> <div>✓ Maintenance</div> | Warnings |
| Gear motor | 5760 (12 months considering 16 hours a day every day including holidays) | <div>• Integrity</div> <div>• Fastening</div> <div>✓ Cleaning</div> <div>✓ Screws tightness</div> | In case of failure or malfunction, replace. |
| | | | For further information, refer to the manufacturer's instructions manual. |
| | | | |



Pictures are only for illustration purpose.

| Intervention: | | CHECK | |
|---|---|---|---|
| Maintenance: | | Preventive | |
| Components | Frequency (hours) | <div>• Check</div> <div>✓ Maintenance</div> | Warnings |
| Bearings and bearing supports | 1440 (3 months considering 16 hours a day every day including holidays) | <div>• Noise level anomalies</div> <div>• Integrity</div> <div>✓ Lubrication</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> | | Recommended grease: | |
| | | <div></div> <div>ATOMIC RH (NILS)</div> | |
| | | <div></div> <div>ATOMIC T4938 (NILS)</div> | |
| | | <div></div> <div>BARRIER TA L55/2 (KLÜBER)</div> | |

| Intervention: | | CHECK | |
|--|---|--|---|
| Maintenance: | | Preventive | |
| Components | Frequency (hours) | <div>• Check</div> <div>✓ Maintenance</div> | Warnings |
| Cogwheels | 2880 (6 months considering 16 hours a day every day including holidays) | <div>• Wear</div> <div>• Damage</div> <div>• Noise level anomalies</div> <div>✓ Lubrication</div> <div>✓ Cleaning</div> | In case of failure or malfunction, replace. |
| | | | For further information, refer to the manufacturer's instructions manual. |
|  <div>Pictures are only for illustration purpose.</div> | | Recommended grease: | |
| | | <div></div> <div>ATOMIC RH (NILS)</div> | |
| | | <div></div> <div>ATOMIC T4938 (NILS)</div> | |
| | | <div></div> <div>BARRIERTA L55/2 (KLÜBER)</div> | |