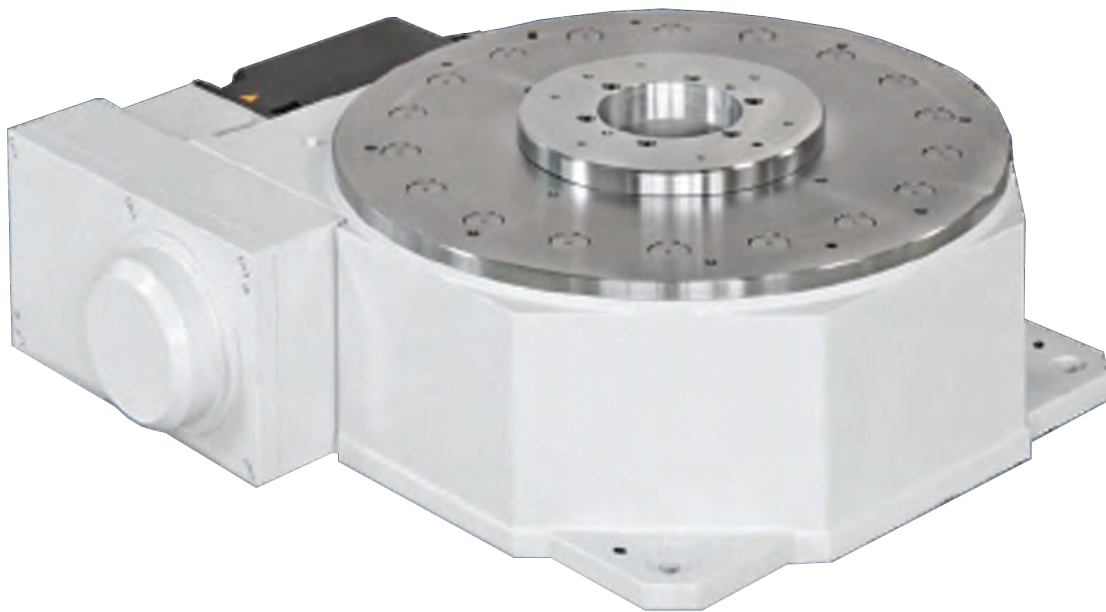


ROTARY INDEXING TABLE CR0700C



ASSEMBLY AND INSTRUCTIONS MANUAL

Mechanical system documentation
Rotary indexing table CR0700C



Document: Assembly and instructions manual

Variant: Mechanical system documentation

Valid for: Rotary indexing table

Type: CR0700C

Revision R02-2014

Revisions			
Date	Revision	Chapter	Reason
15.01.2010	R01-2010	All	Created
15.09.2011	R09-2011	All	Extension, safety
15.02.2014	R02-2014	All	New design

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1 Introduction

1.1 Definition

Rotary indexing table

A rotary indexing table from the CR series is a freely-programmable, heavy-duty rotary table.

In the following, the rotary indexing table will be referred to as "machine".

1.2 Intended use

The machine is an incomplete machine in terms of Directive 2006/42/EC, Article 1g and 2g.

The machine is intended for the installation into other machines, into other incomplete machines, or is to be assembled with them.

It may only be used within the limitations defined in the order characteristics.

Commissioning is prohibited until it has been established that the machine into which the aforementioned product should be installed is conform with Directive 2006/42/EC and all other applicable directives governing its use.

Intended use also requires the observance of the included documentation and compliance with the maintenance provisions.

1.3 Non-intended use

Any use of the machine other than intended is considered non-intended use and is not permitted.

The machine should not be subject to loads beyond its maximum capacity. Possible additions to the rotary table are defined in the order specifications and must be adhered. Additions to the table housing are prohibited. Drilling and welding to add additional components is prohibited.

The machine is not suitable for use:

- in wet or damp environments of any kind (water, oils, acids, steam or vapours, etc.).
- in an environment with gases or radiation.
- in potentially-explosive atmospheres.

It is prohibited for persons to ride on the rotary disc.

1.4 Laws / EC Directives / Standards

The machine is designed and constructed to conform to:

- applicable laws
- Directive 2006/42/EC (Machinery Directive)
- Low Voltage Directive, 2006/95/EC
- EMC Directive 2004/108/EC
- and the harmonised standards that we have cited

and meets state-of-the-art technological standards in terms of its construction.

1.5 EC Declaration

An EC Declaration as specified by Directive 2006/42/EC (Machinery Directive) is included with each machine at delivery.

The text of this EC Declaration is as follows:

WEISS GmbH

Siemensstrasse 17

D-74722 Buchen, Germany

Declaration of incorporation of partly completed machinery
in accordance with EC Machinery Directive 2006/42/EC, Annex II B

Prohibition of commissioning

We hereby declare that the machine called Rotary indexing table CR0700C is intended for the installation into another machine or is to be assembled with other machines to a machine in terms of the directive 2006/42/EC.

Commissioning is prohibited until it has been established that the machine into which the aforementioned product should be installed satisfies the provisions of the EC Machinery Directive, and that a Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex II A has been issued.

1.6 Further applicable documents

Where the rotary indexing table is supplied as a purely mechanical component without a servo motor or a component with a motor supplied by the customer, no further pertinent documentation need be observed.

Where the scope of delivery includes, in addition to mechanical components, a servo motor from the Firma Weiss GmbH scope of delivery and further components such as an amplifier, commissioning software or additional interfaces, further documents are required in addition to this operating manual to ensure safe working with the machine. Information and specifications in these documents should be observed.

- Electrical operating manual
- Operating manual WAS.handling Windows programme
- Operating manual for the interfaces utilised:
 - ▶ WAS.indexer Profibus DP
 - ▶ WAS.indexer CAN
 - ▶ WAS.indexer Ethernet
 - ▶ WAS.indexer RS232
- Documents from suppliers

1.7 Operating manual

This operating manual is a translation of the original operating manual and is part of the scope of delivery.

We reserve the right to undertake modifications resulting from further technological development that diverge from the data and illustrations contained in this operating manual.

The operating manual and the associated valid documentation are not subject to an automatic revision service.

Information on the respective current edition can be obtained from the manufacturer.

Local regulations must be observed.

This operating manual describes handling of the machine and contains important instructions and information to assist you in using the machine as intended.

These operating instructions are intended for trained technical personnel or persons who have been instructed. The operating manual must always be stored at the site of installation, and must be read, understood and observed by all persons who work with or on the machine.

Safety instructions in individual chapters should be observed.





1.7.1 Explanation of safety instructions in this manual

This manual contains instructions that you should observe for your personal safety and to avoid material damage.

Safety instructions for your personal safety are highlighted by a sign containing a warning triangle and signal word. The associated text describes the hazard involved, avoidance options and the consequences which may result from failure to observe the safety instruction.

General instructions or instructions relating to possible material damage are highlighted by a sign without a warning triangle.

They are, depending on the degree of risk involved, illustrated as follows:

	<i>A warning triangle with the signal word DANGER indicates an immediate hazardous situation, which, if not avoided, will lead to fatalities or severe injuries.</i>
	<i>A warning triangle with the signal word WARNING indicates a potential hazardous situation, which, if not avoided, can lead to fatalities or severe injuries.</i>
	<i>A warning triangle with the signal word CAUTION indicates a potential hazardous situation, which, if not avoided, can lead to light or medium injuries.</i>
	<i>A sign with the signal word NOTICE indicates potential material damage or provides additional information, which should be observed when operating the machine.</i>

1.7.2 Legend

Symbols and abbreviations with the following meaning are used in this manual to make its content more clear:

1. Indicates a numbered list.
 - a) Indicates the second level of a numbered list.
- Indicates a list.
 - ▶ Indicates the second level of a list.



The book symbol before a section of text indicates further applicable documents.



The information symbol before a section of text indicates an additional note or an important tip for use.

1.7.3 Figures

The figures shown are examples. There may be differences between the illustrations and the actual delivery.

1.7.4 Directory of valid pages

Pages of this operating manual including the title page: 44

1.8 Guarantee

The machine is covered by a guarantee of 24 months from the date of delivery without shift limitations.

2 Safety

2.1 Fundamental safety instructions

2.1.1 Operator's obligation to exercise diligence

This machine conforms to state-of-the-art technological standards and ensures a maximum level of safety.

However, this level of safety can only be attained under operating conditions if all measures necessary for this have been taken. The operator's obligation to exercise diligence includes planning of these measures and the inspection of their realisation.

The operator must ensure that

- the machine is only used as intended.
- the machine is only operated in faultless, functional condition and mechanical and electrical safety devices are present.
- required personal protective clothing is provided for and used by operating, maintenance and repair personnel.
- the operating manual and all other applicable documentation is maintained at all times in legible condition and is accessible at the implementation site of the machine. Ensure that all personnel who has to execute activities tasks on the machine can access the operating manual at all times.
- only adequately qualified and authorised personnel maintain and repair the machine.
- such personnel are instructed regularly in all questions concerning occupational safety and environmental protection, including the operating manual and safety instructions contained therein.
- all safety instructions and warnings affixed to the product are not removed and must remain legible.
- national accident prevention guidelines and company-internal guidelines are complied with.
- VDE regulations are complied with.
- the EMC legislation is complied with during installation.

2.2 Safety equipment for the machine

2.1.2 Requirements to be met by personnel

It is imperative that the following safety instructions be observed during all operations involving the machine. This ensures avoidance of life-threatening injuries, machine damage, other material damage and environmental damage.

The personnel must ensure that

- trainees are initially permitted to only work on the machine under the supervision of an experienced person.
- all personnel who maintain the machine read the operating manual and confirm with their signature that they have understood the operating manual.
- unauthorised persons are not in the vicinity of the machine when tasks are being performed.
- supplemental to the operating manual the operating instructions as specified in labour protection legislation and work equipment use legislation are complied with.
- the operator or supervisory personnel are informed in the event of malfunction.
- required personal protective clothing is used.

The following work described in this operating manual should only be realised by qualified personnel:

- Installation
- Commissioning
- Operating
- Maintenance

2.2 Safety equipment for the machine

The operating company is responsible for ensuring that a suitable safety concept is developed and applied for the safe operation of the machine.

The operating company must take all measures to protect his personnel against injury by the machine.

These include:

- Protective grid with monitored safety door
- Emergency-stop circuit
- Light barriers or switch mats
- Warning signs

2.3 Residual hazards

2.3.1 General residual hazards

WARNING

Risk of injury due to absent safety equipment.

Realisation of the safety concept is the responsibility of the operator. The operator must provide for adequate safety measures (e.g. safety grid, light barriers, emergency-stop circuits, covers, warning indicators, etc.).

A rotating plate can collide with the loading device, if the machine is not operated properly during loading. The inertia of workpieces and the high torque can force the rotary indexing table out of its anchoring. The owner must ensure a proper supply of workpieces. Failure to comply with this instruction can result in severe or fatal injury.

Risk of explosion during operation in a potentially-explosive environment.

Due to constraints governing the correct use of the machine, the machine is not designed for use in a potentially-explosive atmosphere. The operator must take all measures to ensure that the machine is only operated as intended.

Risk of injuries due to burning.

The servo motor and the brake can reach temperatures of up to 100 °C during operation, and the (optionally) installed brake resistor can reach a temperature of up to 200 °C. Prior to carrying out any work on these components, the machine must first cool down sufficiently to avoid any risk of burning through contact. Burn injuries will arise from contact with hot components.

Use of spare parts / Attachment of supplemental devices

If spare parts are used, or if supplemental devices are attached that are not approved by the manufacturer, consequential damages can occur. Only use spare parts that are cited in our spare parts list or spare parts that we have approved. You must consult with us prior to attaching supplemental devices. Failure to comply with these instructions means that the possibility of personal injury cannot be excluded.

Danger of crushing injuries due to impermissible changes

Injuries can occur as a result of impermissible changes. Do not make any changes to the machine. Failure to comply by these instructions can lead to personal injury.

2.3.2 Residual hazards due to mechanical causes

WARNING

Risk of injuries due to crushing or collision.

The rotary table on the machine rotates at a very high torque. The spring-loaded brake integrated in the servo motor is a holding brake and not an approved safety brake. The brake is not a redundant design. One should therefore never reach into the working area of the rotary table. Possible injury caused by another rotating rotary table as a result of brake failure should be prevented with suitable safety equipment.

2.3.3 Residual hazards due to electrical causes



Electric shocks can cause serious or fatal injuries.

Power and control connections may still conduct electricity after the machine has been deactivated and is stationary. Energised capacitors inside the servo drive may still be charged, despite the power supply being deactivated. Work on electrical equipment should only be realised by skilled electrical personnel and under observance of specifications in the electrical operating manual. Electrical connections for the machine should only be loosened or plugged in when the power supply is deactivated and secured against reactivation. The status of capacitor charging should be measured prior to working on machine electrical equipment. The procedure for measuring charges is described in the electrical operating manual. Touching energised components can lead to serious or even fatal injuries.

A failure or malfunction of the control system can lead to injuries caused by uncontrolled system behaviour or automatic startup.

The operator must take all measures to ensure that the machine is only operated in compliance with regulations.

3 Product description

3.1 Structure

The basic rotary indexing table consists of the table housing [1], the rotary table [2] and a prestressed zero-backlash reduction gear unit [3].

A servo motor [4] provided by the customer (or a servo motor from the WEISS GmbH scope of delivery) can be premounted, depending on the order.

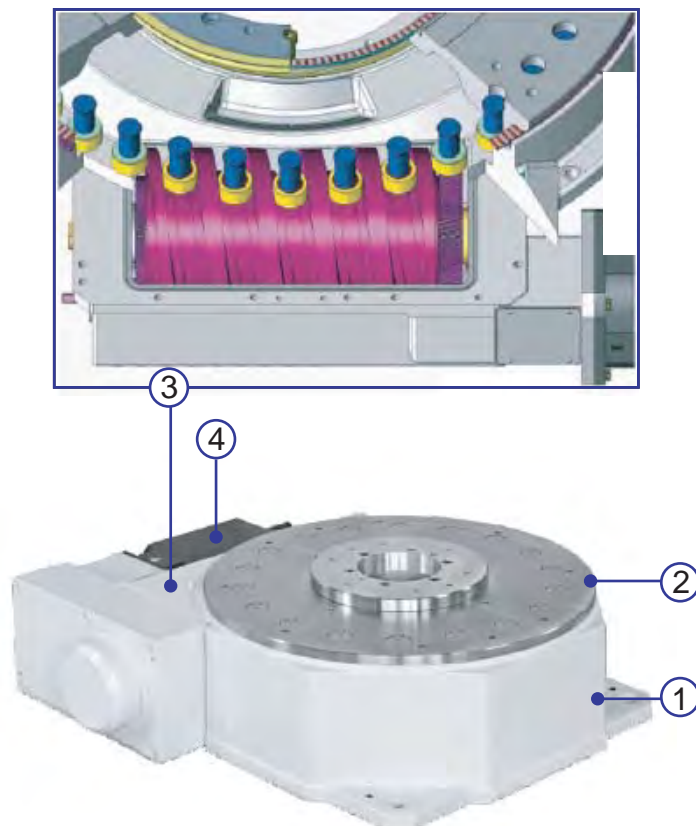


Fig. 1: Machine modules

The table housing contains two openings [1] sealed with covers for use as cable inlets in the centre bore [2].



Fig. 2: Cable inlet

3.2 Function

The servo motor is actuated by the servo amplifier in compliance with the programmed motion profile and rotates, accelerates or decelerates the rotary table on the machine. The rotary table can be operated as an anticlockwise rotating, clockwise rotating or oscillating component.

The combination of the zero-backlash and precision of the WEISS gear unit and the rotary encoder mounted on the servo motor enable exact positioning of the rotary table.

The rotary table is held in its position by the holding brake integrated in the servo motor when the machine is stationary. Brake pressure is generated by springs. The brake is triggered electromagnetically and activates automatically if the motor power is switched off or in the case of a power failure.

3.3 Technical data

3.3.1 Scope of delivery

The scope of delivery of the machine depends on the order involved. Please refer to the order information or order specifications for individual components.

3.3.2 Type plate

The type plate is fitted to the housing of the machine and contains the details described in the illustration.

NOTICE *The illustrated type plate is only an example of a machine and is not identical to the actual type plate of the described product.*

A second type plate is included in the scope of delivery. The second plate can be mounted at a clearly-visible location on the machine to allow viewing of performance data if the type plate fitted by the manufacturer is concealed by any other structures.

Additional barcode serial number

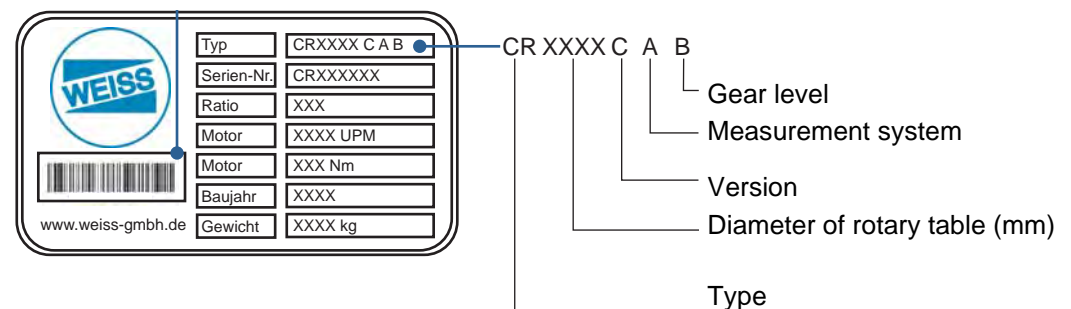


Fig. 3: Example of a type plate

3.3.3 Sound level

The A-weighted emission sound pressure level does not exceed the allowable peak.

3.3.4 Electrical connections

Operating voltage	Data for electrical connections is governed by the order in question.
Control voltage	Data for electrical equipment is contained on the servo motor type plate and, in the case of delivery with a servo amplifier, in the electrical operating manual.
Brake voltage	

3.3.5 Rotary encoder

Type	Rotary encoder data is governed by the motor.
Resolution	
Precision	

3.3.6 Gear characteristics

Weiss standard			
Type	Transmission ratio	Motor speed	Peak torque on motor shaft
CR0700C	144	2000 UpM	80 Nm

See details on type plate for special versions.

3.3.7 Ambient conditions and weight

Ambient temperature	between +10 °C and +40 °C
Weight without motor	630 kg

3.3.8 Installation positions

Permissible installation positions for the machine are:

- horizontal [1]
- vertical, servo motor mounted on side below [2]
- vertical, servo motor mounted below and inside [3]
- overhead [4]

BEACHT *The venting screw is factory-fitted for the ordered installation position. If the installation position is changed subsequently compared to the order specifications, the venting screw needs to be repositioned (see chapter 3.3.8).*

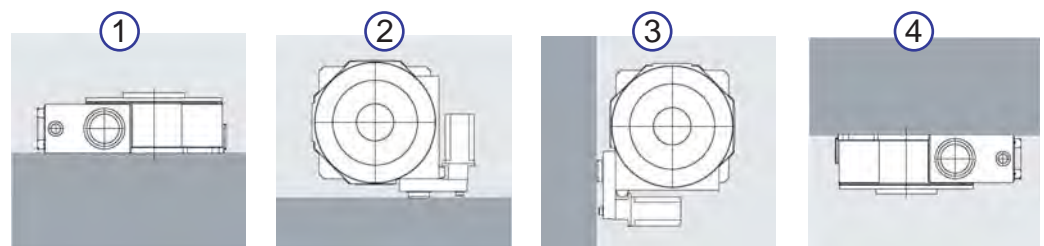


Fig. 4: Installation positions

4 Transport

4.1 Safety during transport

4 Transport

4.1 Safety during transport

! WARNING

Falling or sagging loads can lead to grievous injuries. Inadequately dimensioned load bearing equipment can break. Transport vehicles not designed to support the weight of the machine may fail or topple over.

Lifting devices, conveyor vehicles (pallet trucks) and load carrying equipment should conform to regulations and be designed to support the weight of the machine including packaging. It is forbidden to stand or be present under suspended or lifted loads. A falling or toppling machine can cause grievous or fatal injuries.

- Transport tasks should only be performed in compliance with the safety instructions
- Note that projecting sharp edges can cause injuries.
- The transport path must be cordoned off and safeguarded in such a manner that unauthorised personnel cannot enter the danger zone.
- The parts must be safeguarded against tipping or falling.

4.2 Appliances and auxiliary equipment approved for transportation

! WARNING Risk of injury emanating from falling machine.

Shackles should be used for transporting the unpacked machine. The shackles are screwed to the rotary table with bolts. The lifting slings can be attached to the eyelets on the shackles.

A packaging insert provides information on the position of the permissible thread and the dimensions of the bolts.

NOTICE Where a machine with a servo motor already mounted is transported, severe damage may be caused to components as a result of collisions involving the servo motor or rotary encoder during transportation. Handle with care.

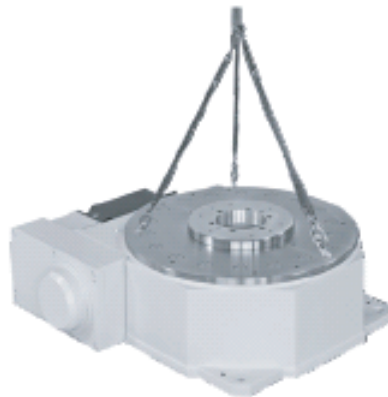


Fig. 5: Transporting the unpacked machine

4.3 Transport damage

The delivery should be inspected for damage immediately after it is received. The contents of the delivery should be checked for damage if damage to the packaging is detected which could indicate damage to the contents. Details of the scope of delivery are provided in Chapter 3.3.1.

Detected damage should be immediately reported to the transportation company and confirmed.

4.4 Intermediate storage

NOTICE *The machine must not be stored with the bleed screw is pointing down, since otherwise oil may leak out.*

Observe the storage conditions listed in the following table, if intermediate storage is planned for a longer period of time.

Climatic zone	Packaging	Storage location	Storage duration
Moderate Europe USA Canada China Russia (except tropical areas)	Packed in containers	Roofed over Protected against rain and snow Not exposed to vibrations	Max. 3 years with regular inspection of packaging
	Open	Roofed over and sealed at a constant temperature and air humidity (5 °C < T < 60 °C, 50% relative humidity) No sudden temperature fluctuation and controlled ventilation with filter (free of dirt and dust) No aggressive vapours and no vibrations	2 years and longer with regular inspection Check for cleanliness and machine damage during inspection Check that corrosion protection is intact
Tropical Asia Africa Central and South America Australia New Zealand (except moderate areas)	Packed in containers With moisture absorbers and humidity indicator sealed in film Protect against insect damage and mould formation by treating chemically	Roofed over Protected against rain Not exposed to vibrations	Max. 3 years with regular inspection of packaging
	Open	Roofed over and sealed at a constant temperature and air humidity (5 °C < T < 60 °C, 50% relative humidity) No sudden temperature fluctuation and controlled ventilation with filter (free of dirt and dust) No aggressive vapours and no vibrations Protected against insect damage	2 years and longer with regular inspection Check for cleanliness and machine damage during inspection Check that anticorrosion protection is unspoiled

5 Installation

5.1 Safety during installation

WARNING

Falling or sagging loads can lead to grievous injuries. Inadequately dimensioned load bearing equipment can break. Transport vehicles not designed to support the weight of the machine may fail or topple over.

Lifting devices, conveyor vehicles (pallet trucks) and load carrying equipment should conform to regulations and be designed to support the weight of the machine including packaging. It is forbidden to stand or be present under suspended or lifted loads. A falling or toppling machine can cause grievous or fatal injuries.

Injuries caused by falling loads.

Parts stacked on top of each other can slip and fall. Do not loosen any fixing elements and transportation securing devices without the express instructions of the company installation personnel. Wear personal protective clothing.

Injuries caused by incorrect installation.

Improper installation can cause consequential damage. Work should only be assigned to auxiliary personnel by the company's installation personnel. The fastening material must be adequately dimensioned so that it can withstand the stresses produced during operation. The consequence of improper installation is the possibility that operating and maintenance personnel can be injured.

Injuries caused by sharp-edged machine parts which are still uncovered and accessible.

Wear personal protective clothing.

Electric shocks can cause serious or fatal injuries.

Improperly performed maintenance tasks on the electrical equipment or contact with energised lines can cause an electrical shock with severe to fatal injuries. Work on electrical equipment should only be performed by qualified electricians and in compliance with the specifications in the operating manual for electrical systems. The supply cables must be checked to ensure that they are de-energised, prior to connection. The connection to the supply energy must be established in accordance with the information in the circuit diagrams.

Danger due to missing covers

To connect the electrical components to the power supply the covers have to be removed or the junction boxes have to be opened. It is possible to touch energised parts. After concluding the installation tasks the covers that have been removed have to be re-mounted and junction boxes have to be re-closed. Failure to comply with this safety instruction can result in severe or fatal injuries.

- Ensure that only authorised personnel are in the work area of the machine and that no one could be injured due to the installation work.
- Ensure that no components are damaged and that they are only installed in clean, functional condition. Improperly placed or improperly fastened system parts can fall or tip over.
- Ensure that all components are installed in accordance with the described arrangement.
- Ensure that specified tightening torques are observed.

NOTICE *Incorrectly-laid cables (e.g. where the bending radius is too small) can cause cable scorching and burning. Electronic components can be damaged by electrostatic influences.*

5.2 Installation prerequisites

Check prior to installation whether the dimensions of the installation site and building conditions correspond to the necessary prerequisites and measurement specification in the drawing documents.

Particularly ensure that:

- The supporting floor is level and rigid.
 - ▶ Maximum permissible flatness error: 0.1 mm.
 - ▶ Maximum permissible roughness: Rz 6.3
- The substructure of the installation site must be statically measured to an adequate degree to ensure that it can support the operating weight of the machine.
- The servo motor should be easily accessible for maintenance work and at a minimum distance of 100 mm from other modules for motor ventilation.
- The shaft seals are protected against wear in case of abrasive ambient conditions.

5.3 Installation of the rotary indexing table

5.3.1 Operating media / Auxiliary media / Tools

The following are required for installation of the machine:

- One set of spanners
- One torque wrench
- One set of screwdrivers
- Screw securing agent (e.g. Loctite ® 243)
- Commercially-available solvents
- Drift for fitting parallel pins
- Quality 8.8 screws

Thread	M8	M10	M12	M16	M20
Tightening torque	25 Nm	50 Nm	80 Nm	200 Nm	400 Nm

5.3.2 Mechanical assembly

5.3.2.1 Preparing installation

Prior to installation, open the package unit, unpack the machine so that it is accessible from all sides and unscrew it from the transport pallet.

All components should be freed of anti-corrosion agent and dirt with a commercially-available solvent prior to installing the machine and fixing plate.

NOTICE Do not bring the sealing lips of the oil seals in contact with the solvent, as this could cause damage to the material.

5.3.2.2 Adjusting the venting screw

NOTICE The venting screw is factory-fitted in the ordered installation position. If the installation position is changed from the position which the machine was ordered for, the venting screw must be repositioned.

1. Unscrew the venting screw [1], screw a plug screw [2] into the hole and tighten.
2. Move the rotary indexing table to the desired installation position.
3. Chose a venting aperture suitable for the new installation position and unscrew the plug screw [2].
4. Screw the venting screw [1] into the hole and tighten.



Fig. 6: Adjusting the venting screw

5.3 Installation of the rotary indexing table

5.3.2.3 Installing the base plate or frame (horizontal installation)

1. Carry the base plate or frame to the installation site (observing the transportation regulations) and align in compliance with the installation plan.
2. Mark the drilling points on the floor through the holes.
3. Remove the base plate or frame.
4. Drill the fixing holes.
5. Screw the base plate or frame firmly to the floor with fixing anchors.

5.3.2.4 Inserting pins in the rotary indexing table and screwing firmly into position (horizontal installation)

1. Deposit the rotary indexing table (observing the transportation regulations) on the base plate or frame and align it to correspond to the holes and pin holes.
2. Precentre both parallel pins and then drive in the first parallel pin 1/3 of its length.
3. Screw in the fixing screws and tighten slightly.
4. Drive in the second parallel pin completely, followed by the first parallel pin.
5. Tighten the fixing screws firmly in a diagonal pattern with a torque wrench.
6. Remove the yellow plug in the venting screw [1].

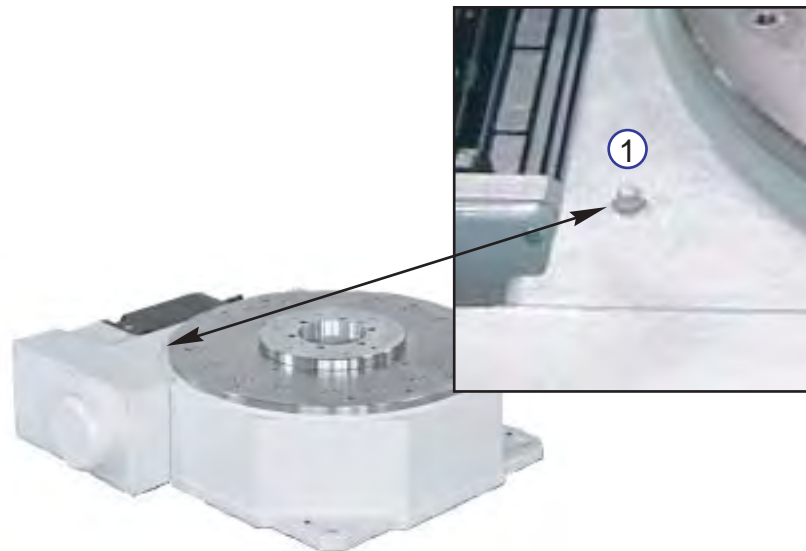


Fig. 7: Removing the plug

5.3 Installation of the rotary indexing table

5.3.2.5 Manual movement of the rotary table

A square pinion on the front of the gear unit is provided for fitting a hand crank to aid manual aligning of the rotary table in the desired position using the zero-backlash precision gears.

NOTICE *The rotary table can only be rotated with the hand crank if the motor brake is aerated or the motor is removed.*

WARNING *Danger from rotary table which runs on.*

The gearing mechanism is not self-locking. For a vertical installation of the machine (see chapter 3.3.7) gravitational forces acting on unevenly distributed loads can cause the rotating plate to rotate while bleeding the brake, leading to severe or fatal injury. The rotating plate should be supported prior to bleeding the brake, to ensure that it does not continue to rotate subsequently.

WARNING *Danger from unexpected activation.*

There is a risk of unexpected activation due to the power supply not been deactivated or inadvertent reactivated. The power supply to the motor should be deactivated and secured against reactivation prior to commencing manual rotation of the rotary table. Unexpected activation will grievously or fatally injure persons within the rotation radius of the machine.

1. Deactivate the power supply to the servo motor and secure against reactivation.
2. Remove the cover [1] over the square pinion [2].
3. Aerate the motor brake (manually or through external activation of the brake power).
4. Mount a hand crank with a spanner width of 14 mm on the square pinion [2] and rotate the rotating ring into the desired position. The rotation can be in either direction.
5. Stop brake aeration.
6. Remove the hand crank.
7. Replace the cover [1].
8. Activate the power supply to the servo motor.

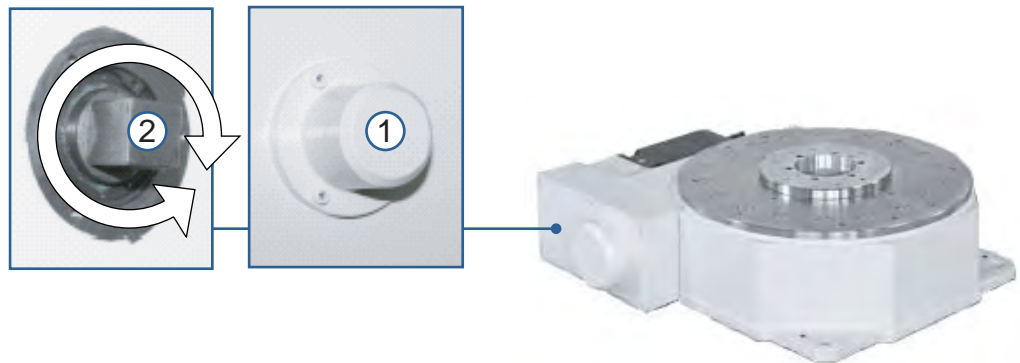


Fig. 8: Manual movement of the rotary table

5.4 Installing the safety equipment

5.3.3 Installation of additional components

NOTICE Only use the provided holes.

The provided holes must be used to install additional components. Never drill additional holes in the machine or weld parts to it.

5.3.3.1 Installation of additional indexing plates and structures

An additional indexing plate may only be mounted with the tolerance holes, centring holes and threads provided to ensure concentricity and the accuracy of parts.

Additional fixing options are provided in the centre bore on the machine to ensure a rigid connection to the basic structure.

NOTICE Possible blockage of the rotary table caused by penetrating dirt.

A suitable lip seal should be installed between the rotating plate and fixed plate of the machine (or between the rotating plate and optionally-mounted fixed plate) to prevent blocking of the gear unit caused by dirt penetrating the gap (WEISS recommends a gap dimension of 1mm) caused by the mounting of additional indexing plates.

Ensure when mounting the lip seal that it does not interfere with existing hole patterns.

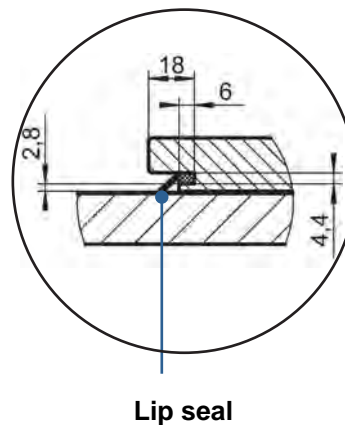


Fig. 9: Example of a fixed plate with lip seal

5.4 Installing the safety equipment

Fitting of safety equipment and emergency-stop buttons is the responsibility of the operator. The machine may not be operated without safety equipment which is suitable for the intended purpose.

5.5 Instructions on disposal of packaging material

Packaging materials should be reused or disposed of properly in compliance with national regulations.

6 Commissioning

6.1 Safety during commissioning



Risk of injuries emanating from unexpected start-up.

Connections which were not established correctly or external influences on the electrical equipment can cause the machine to start unexpectedly and uncontrolled movement. Activate and check all safety equipment and emergency-stop circuits prior to commissioning.

- Ensure that the machine is only commissioned by qualified personnel in compliance with the safety instructions.
- Ensure that only authorised personnel are in the work area, and that others cannot be injured due to the commissioning process.

The following prerequisites must be met prior to commissioning the machine:

- The machine is correctly mounted.
- The electrical equipment for the servo motor power supply and motor brake is available and correctly fitted.
- All cables are laid properly and correctly connected in compliance with valid electrical circuit documents.
- The required safety equipment and emergency-stop circuits are available and functioning correctly.

Prior to commissioning the machine, check whether

- the drive is undamaged and not blocked.
- all connections have been correctly established.
- all tools and external parts have been removed.
- all safety covers are correctly installed.
- no other hazard sources are present.

The following should be checked during commissioning

- the servo motor for faultless operation (no overloading, no varying speed).
- no excessive noise development is detected.
 - ▶ Excessive noise development can be a sign of incorrect installation if, for example, the rotary table is subjected to tension, due to an uneven supporting floor.
- the gear unit limit values (e.g. input torque and speed) should be adhered to.
 - ▶ Compare with the type plate.

6.2 Initial commissioning

6.2.1 Configuring the machine zero point

A zero point marking [1] is applied to both the fixed part and rotating part of the machine by the manufacturer to aid configuration of the machine zero point.

1. Activate the main switch.
2. Rotate the rotary table in jog mode until both marks are opposite each other.

NOTICE *Alternatively, the machine zero point can also be freely selected.*

The freely-selected zero point should in this case be permanently marked on the machine (in the same manner as the marks applied by the manufacturer) to enable rapid teaching of the zero point after repair work.

3. Save the settings.

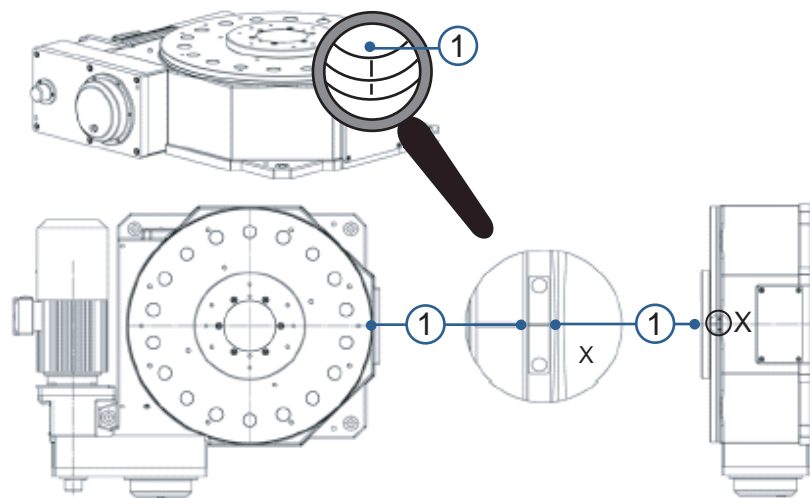


Fig. 10: Marking the zero point

NOTICE *Invalid machine zero point.*

The machine zero point is rendered invalid if the machine is removed and remounted again, the servo motor or coupling has been replaced, or the servo drive or battery for the control has been renewed!

6.3 Recommissioning

⚠ WARNING *Risk of injury emanating from an operationally unsafe machine.*
An operationally unsafe machine can cause injuries and material damage. Recommissioning should only be realised after it has been ascertained that the machine is in a functionally reliable condition and no risk emanates from it during operation.

A visual inspection of the machine should be conducted prior to re-commissioning. The following should be checked and ensured in this regard:

- No damage is present on the machine.
- No foreign objects, tools or other objects are on the machine.
- All supply units are connected and operating.
- Safety equipment is ready for operation.

7 Operation

7.1 Safety during operation

WARNING

Grievous to fatal injuries can be caused if a rotating plate collides with the loading equipment, due to the incorrect handling during loading of the rotary table.

The inertia of work pieces and the high torque can wrench the machine out of its anchoring.

Risk of injury due to incorrect alteration of operating parameters.

Operating parameters should only be changed by authorised persons. Altered operating parameters should be checked in a test.

Risk of injury caused by motor brake failure.

In the event of motor brake failure, the rotary table may run on and cause injuries, despite the servo motor being stationary. The motor brake should be inspected at regular intervals.

Risk of injury due to coupling breakage.

Actuation of an emergency stop button can cause the rotary table to stop abruptly, and this in turn may lead to breakage of the coupling. The rotary table spins to a stop and cause injury if there is an attempt at intervention. Personnel should only reach into a working area when the rotary table is stationary. The coupling should be subject to a visual inspection at regular intervals.

7.2 Rotary indexing table operation

The machine is designed for integration into other machines, into other incomplete machines or equipment or for connection to them.

Safe operation and control are the responsibility of the operator.

7.3 Operating personnel workstations

The operating personnel workstations are determined by the operator of the plant or product in which the machine is integrated.

8 Malfunctions

8.1 Safety when remedying malfunctions



Injury of non-authorized personnel.

Malfunctions should only be remedied by instructed personnel provided by the operator who are trained and authorised to perform these tasks. The machine should be deactivated with the main switches and secured against unintentional reactivation prior to remedy. The radius of action of moving machine parts should be secured.

8.2 Errors / Cause / Remedy

Error	Cause	Remedy	
The rotary table does not rotate.	The coupling between the servo motor and gear unit is broken.	Replace the coupling	
	Servo motor is defective	Replace servo motor	
	The rotary table is mechanically blocked.	Check the rotary table, top and bottom, for mechanical blockage. Unblock the rotary table in jog mode. If this is not possible, proceed as described in chapter 5.3.2.5. Remove the reason for the blockage.	Check the gap between the fixed and rotating plate for foreign objects. Remove any foreign objects.
			Check the gap between the fixed and rotating plate for foreign objects. Remove any foreign objects.
	Initial commissioning: The rotary table is under mechanically tension.	Check that the location site is level and the machine correctly installed. Check the machine structure.	

8.3 Customer Service

Please provide the following details if you require the assistance of our Customer Service:

- Serial number of the machine
- Description of the malfunction that has occurred
- Time and attendant circumstances of the malfunction that has occurred
- Assumed cause

You can contact our Customer Service from Monday to Friday between 08:00 and 17:00 at the

Service number +49 (0) 6281 - 5208-0

or at service@weiss-gmbh.de

An answering machine will provide you with information outside of the hours listed above.

9 Maintenance

9.1 Safety during maintenance

WARNING

Injuries caused by the power supply and residual energy.

All power sources should be deactivated prior to carrying out maintenance work, and secured against unintentional reactivation and marked with a sign indicating that maintenance work is in progress. All moving parts should be stationary. Loads should be secured against sagging or slipping. All components energized with electrical power should be de-energized (Extinguished LED's on the servo drive do not mean that all components have been completely de-energised). Check by measuring to ensure that all components are de-energised. Work on electrical equipment may only commence if the voltage is less than 42 VDC.

Injury of non-authorized personnel.

Maintenance work should only be realised by instructed personnel who have been authorised to perform these tasks. The operating instructions laid down by the operator must be rigidly adhered to.

Injuries resulting from maintenance work that has not been announced.

The working area should be secured over a wide area prior to realising maintenance work and marked with warning signs. Operating personnel must be informed that maintenance work is being carried out.

Injuries caused by the use of incorrect components or incorrect operating media.

Only spare parts that are specified in our spare parts lists should be used. Subsequent modifications to the machine are not permitted. Only specified operating media should be used. Self-securing screws and nuts should always be replaced. All specified screw tightening torques should be strictly adhered to.

Injuries caused by the absence of safety equipment.

No safety equipment or safety components should be removed. Where dismantling of individual safety equipment is unavoidable for maintenance purposes, the parts removed should be refitted immediately after maintenance work is completed and should be tested to ensure that the integrity of their safety functions is assured.

- Ensure that only qualified electricians perform all tasks on the electrical equipment.
- Ensure that all work steps for maintenance are performed in the specified sequence.
- Ensure that specified tightening torques are observed.
- Ensure that all foreign objects are removed from the work area after the maintenance.

9.2 Maintenance work

Maintenance includes tasks for the purpose of:

- Inspection
- Maintenance
- Repair

⚠ WARNING *Danger from unexpected activation.*

There is a risk of unexpected start-up if the power supply has not been deactivated or is inadvertent reactivated. The power supply to the machine has to be deactivated and secured against reactivation, prior to commencing maintenance work. Unexpected start up can cause severe injuries.

Impermissible changes and the use of spare parts and supplemental devices that are not approved by the manufacturer can cause injuries.

⚠ CAUTION *Burns*

Motor and the brake can reach temperatures of up to 100 °C during operation. Prior to carrying out any work on these components, first the machine has to cool down sufficiently to avoid any risk of burning due to contact. Burn injuries will occur if there is contact with hot components.

9.3 Inspections

9.3.1 Inspect the servo motor annually

The documentation supplied by the servo motor manufacturer should be observed during the inspection.

NOTICE *Replacing the damaged servo motor.*

No unilateral repairs should be realised on the servo motor. The servo motor should be replaced in the case of damage or a loss of brake force.

9.3.2 Check the coupling after every 2 million activations

The coupling connects the servo motor to the machine zero-backlash precision gears.

The coupling should be subjected to a visual inspection after every 2 million activations.

It should be checked for wear, mechanical faults, dirt and locking screw torque (120 Nm).

The coupling should be replaced immediately if deficiencies or damage are detected.

9.4 Maintenance

The machine is maintenance free. The zero-backlash precision gears run in an oil sump, thus ensuring they are lubricated for their entire service life.

Utilised oil:	Shell Omala 680 (CLP 680 conforming to DIN 51517)
Oil volume:	8.0 litres

9.5 Repair

9.5.1 Replace servo motor

⚠ WARNING *Danger from rotary table which runs on.*

The gear unit is not self-arresting. Where the machine is installed in vertical position gravitational forces acting on unevenly distributed loads can cause the rotary table to rotate during brake aeration or opening of the coupling locking screws, leading to serious or even fatal injuries. The rotary table should be supported prior to aerating of the brake and loosening of the coupling locking screws to ensure it does not rotate any farther.

NOTICE *Only use servo motors that conform to the permitted specification.*

Exceeding the permissible limit values can cause damage or failure of the zero-backlash precision gear unit. The servo motor must conform to permissible specifications relative to speed and peak torque. The permissible values are specified on the type plate and in Chapter 3.3.

1. Disconnect the servo motor and rotary encoder plug connections [1].
2. Remove the cover [2].
3. Remove the motor flange plate fixing screws [3].
4. Remove the screws [4] and crank shaft cover [5].
5. Aerate the motor brake (manually or through external activation of the brake power) and turn manually with a spanner (A/F 14) on the square shaft [6] until the coupling locking screws [7] are visible.
6. Loosen the locking screw [7] on the gear side of the coupling.

⚠ WARNING *Injuries due to a falling servo motor.*

A falling servo motor can lead to crushing of limbs. Prior to loosening the fixing screws, the servo motor should be secured against falling with supports placed under it or by suspending on a lifting device.

7. Pull the servo motor [8] backwards.

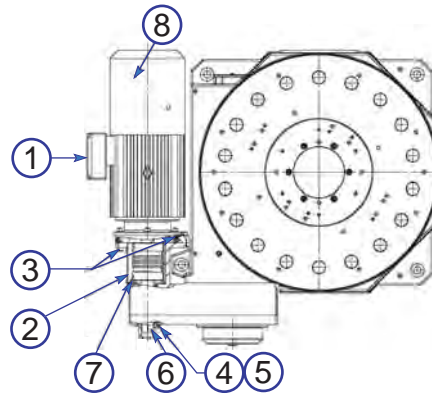


Fig. 11: Replace servo motor

8. Mount the motor flange plate from the old motor on the new servo motor.
9. Unscrew the coupling from the old servo motor and fit to the motor shaft of the new servo motor.
10. Fit the servo motor [8] together with the coupling to the gear shaft.
11. Screw in and tighten the motor flange plate fixing screws [3]. In this process comply with the specified tightening torque (Chapter 3.3.7).
12. Tighten the coupling locking screws [7] with a torque of 120 Nm.
13. Mount the crank shaft cover [5] and cover [2].
14. Interrupt brake aeration and fit the servo motor and rotary encoder plug connections [1].
15. Re-adjust the machine zero point as specified in chapter 6.2.1.

9.5.2 Replace the coupling

⚠️WARNING *Danger from rotary table which runs on.*

The gear unit is not self-arresting. Where the machine is installed in vertical position gravitational forces acting on unevenly distributed loads can cause the rotary table to rotate during brake aeration or opening of the coupling locking screws, leading to serious or even fatal injuries. The rotary table should be supported prior to aerating of the brake and loosening of the coupling locking screws to ensure it does not rotate any farther.

1. Disconnect the servo motor and rotary encoder plug connections [1].
2. Remove the cover [2].
3. Remove the motor flange plate fixing screws [3].
4. Remove the screws [4] and crank shaft cover [5].
5. Aerate the motor brake (manually or through external activation of the brake power) and turn manually with a spanner (A/F 14) on the square shaft [6] until the coupling locking screws [7] are visible.
6. Loosen the locking screw [7] on the gear side of the coupling.

⚠️WARNING *Injuries due to a falling servo motor.*

A falling servo motor can lead to crushing of limbs. Prior to loosening the fixing screws, the servo motor should be secured against falling with supports placed under it or by suspending on a lifting device.

7. Pull the servo motor [8] backwards.
8. Unscrew the coupling and fit the new coupling to the motor shaft.
9. Fit the servo motor [8] together with the coupling to the gear shaft.
10. Screw in and tighten the motor flange plate fixing screws [3]. In this process comply with the specified tightening torque (Chapter 3.3.7).
11. Tighten the coupling locking screws [7] with a torque of 120 Nm.
12. Mount the crank shaft cover [5] and cover [2].
13. Interrupt brake aeration and fit the servo motor and rotary encoder plug connections [1].
14. Re-adjust the machine zero point as specified in chapter 6.2.1.

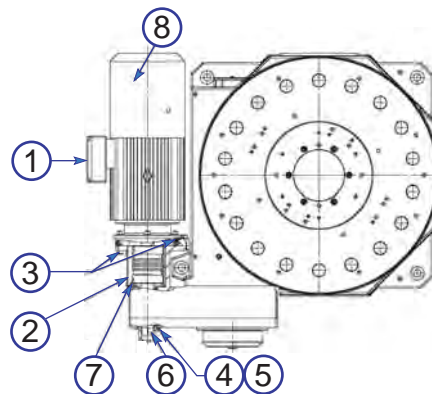


Fig. 12: Replace the coupling

10 Decommissioning / Dismantling / Disposal

10.1 Safety during decommissioning and dismantling



Injury of unauthorised persons.

When dismantling and during removal transport parts can tip or fall over. Ensure that decommissioning and dismantling are only executed by personnel who have been trained, instructed and authorised for this purpose. The safety instructions for transport must also be complied with for removal transport. Failure to comply with these instructions can result in serious injuries.

- Wear personal protective clothing and protective equipment.
- When dismantling and for transport removal, the safety instructions for transport and the transport guidelines must be complied with.

10.2 Decommissioning

10.2.1 Temporary decommissioning

The machine should be deactivated for decommissioning and secured against unintentional reactivation.

Workpieces which are still present on the rotary table should be removed.

The machine should be fitted with a sign that clearly indicates that it is temporarily decommissioned.

NOTICE *For recommissioning, comply with the instructions in chapter 6.3.*

10.3 Dismantling and disposal

WARNING *Injuries can be caused during dismantling by falling components and by swinging or falling loads during transportation with lifting equipment*

The following points must be observed to avoid injuries and/or environmental damage during dismantling and disposal:

- Ensure that the correct tools and adequately-dimensioned load lifting equipment are used and the stationary safety of dismantled machine components is assured to avoid injuries.
- Note that emerging lubricant, solvent, preserving agents, etc. can cause cauterizing and burns if they come into direct contact with skin.

10.3.1 Disposal of components

NOTICE *Subassemblies should be disposed of properly! Improper disposal of subassemblies can cause environmental damage and will be prosecuted!*

Dispose of subassemblies in compliance with valid local regulations. Ensure that auxiliary operational media are disposed of in compliance with environmental protection regulations. Local regulations governing the correct recycling and disposal of waste should be observed.

The machine consists of:

- steel and soft cast iron (housing, shafts, gears, bearings)
- copper (servo motor and electric cables)
- plastic (electric cables)
- electronic components (servo amplifier)

11 Service and spare parts

11.1 Ordering spare parts

Please supply us with the following details when ordering spare parts:

- Serial number of the machine
- Order number of the spare part obtained from the spare parts list
- Number of spare parts required

Please send your spare parts order to

WEISS GmbH
Siemensstraße 17
D-74722 Buchen/Odw.

Tel: +49 (0) 6281 - 5208-0
Fax: +49 (0) 6281 - 5208-99
E-mail: service@weiss-gmbh.de
Internet: <http://www.weiss-gmbh.de>

A complete list of the addresses of our sales representatives is available on our website..

11.2 Table type CR0700C-Standard

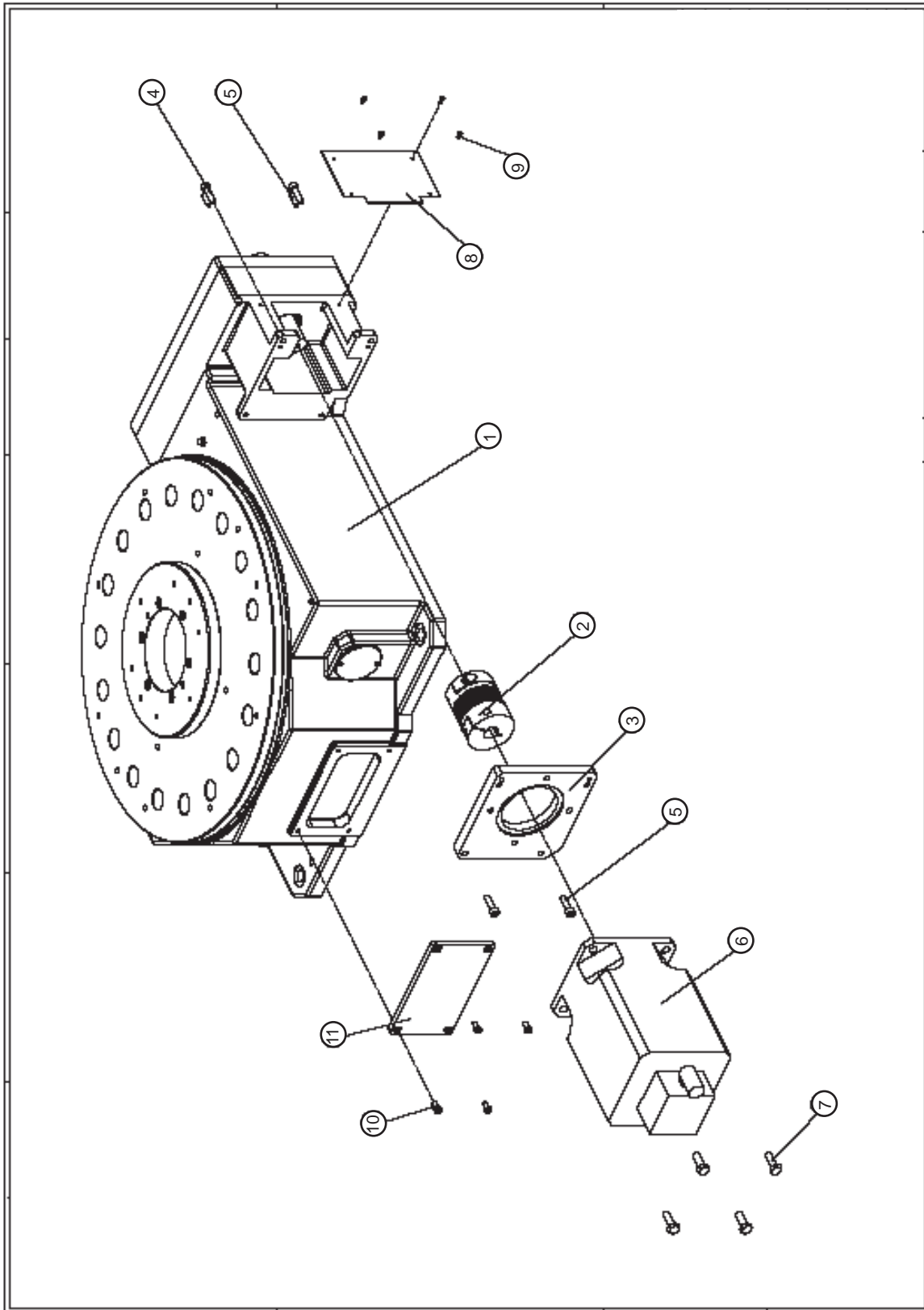
Pos.	Weiss part number	Designation	Quantity
1	CR700C-1000-00-0	Module	1
2*	680-028035001	AKD200_xxxx	1
3*	CR700C-XXXX-00-0	Motor flange	1
4	-	Norm 6325 M8x28	4
5	-	Norm 912 M10x35	10
6**	XXX-XXXXXXXX	Servo motor	1
7	-	Norm 933 M12x35	4
8	CR700C-2220-00-1	Plate	1
9	300-738000001	DIN7380_M05x08	4
10	-	Norm 6912 M8x16	8
11	CR700C-1130-00-0	Cover plate	2

*Coupling and motor flange are governed by the motor

**The servo motor used depends on the order involved

Please refer to the order characteristics for the exact data, or inquire at Weiss GmbH.

11.2 Table type CR0700C-Standard



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12.3 Personal notes

Lined area for personal notes, consisting of numerous horizontal dashed lines.

12.3 Personal notes

A series of 25 horizontal dashed lines for writing personal notes.



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