

# **TAKTOMAT**

passion for automation



## **Rotary indexing table**

Type RT - TT

Original Operating instructions

Version 2.0.1 |  
29.02.2016

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## 1 Document revision

| Version       | Date       | Comment   | Name |
|---------------|------------|---|------|
| Version 2.0.1 | 23.05.2016 | Layout adaption, added excerpt of Atex and declaration of incorporation |      |
| Version 1.0.4 | 20.10.2014 |   |      |

## 2 Overview / brief description

### 2.1 General description

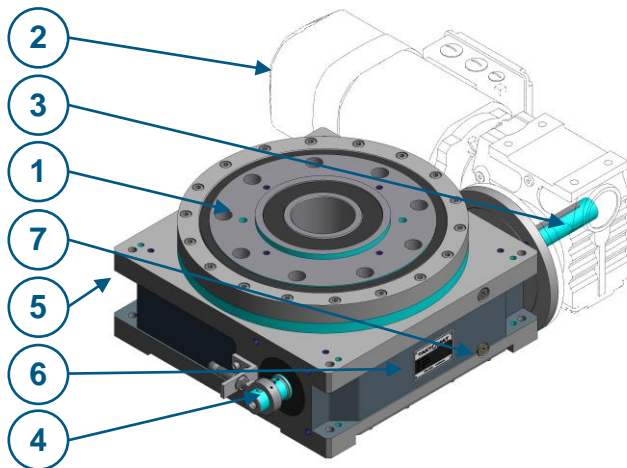


Figure 1 Rotary indexing table Type RT S01

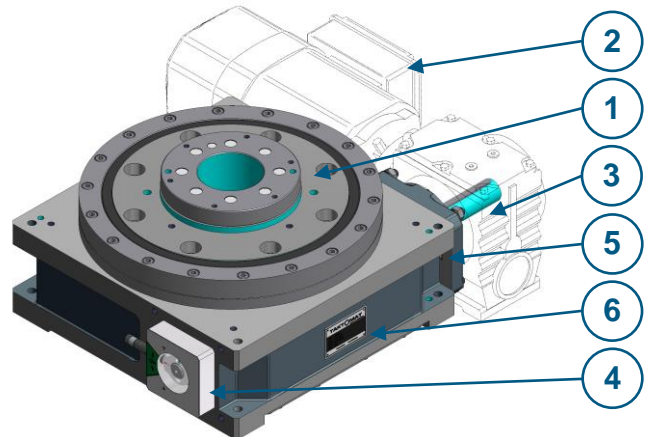


Figure 2 Rotary indexing table Type RT S03

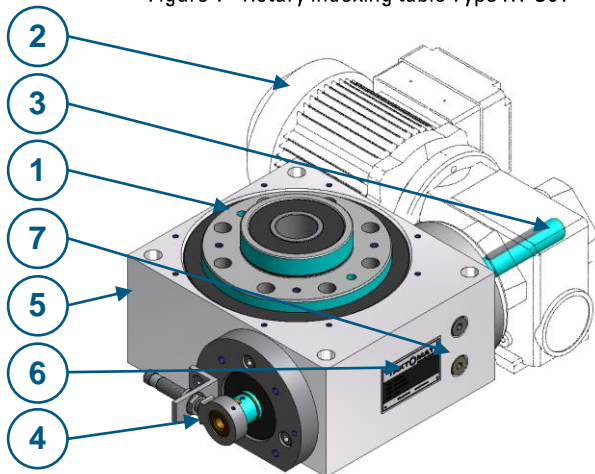


Figure 3 Rotary indexing table Type TT S01

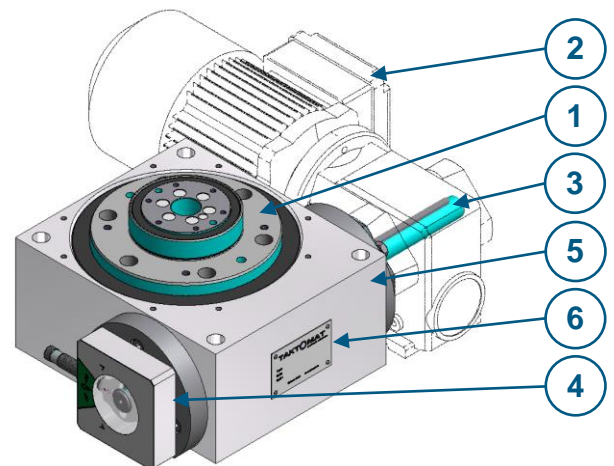


Figure 4 Rotary indexing table Type TT S03

- (1) Star wheel / output flange
- (2) Drive unit
- (3) Input shaft (drive)
- (4) Position indicator
- (5) Housing
- (6) Rating plate
- (7) Drain plug

The Cylinder Cam Rotary Indexing Table Type RT or TT converts uniform input movement to an intermittent or uniformly, reduced and intermittent output movement. The intermittent, reduced and uniform output movement is generated by an induction-hardened, precision-finished cylinder cam.

The use of mathematical laws of motion guarantees a soft, shockproof and jerk-free movement that has been optimally designed for its intended purpose. The construction makes it possible to position the star wheel positively without any play.

### 3 About these Operating Instructions

#### Designation

These Operating Instructions describe the Rotary indexing table RT - TT. The Rotary indexing table RT - TT is referred to below as 'the machine'.

#### 3.1 Purpose of these Operating Instructions

The Operating Instructions are intended to help you to:

- work efficiently
- ensure quality
- find information quickly
- avoid danger

#### Table of contents

The Operating Instructions have a table of contents at the front. This gives you an overview of all the sections in the document.

#### Headings and page numbers

The chapters are numbered sequentially. The sections within each chapter are numbered sequentially.

#### Safety information

Any safety information is placed before the descriptions of actions that may pose a risk. You will find a detailed description of the safety information in the chapter entitled Safety.

#### Text, symbols, figures

Instructions for performing various activities and other information are presented in small, discrete sections.

The information is presented using a combination of text, symbols and figures.

Instructions for performing action are described in the appropriate sequence and numbered accordingly.

#### Instructions for action

For the sake of clarity the instructions for action have been broken down into individual steps:

- ▶ Introductory text...
  - ⇒ Instruction result

#### Lists

Any lists which do not include individual operating steps are indicated as follows:

- Lists...
  - Sub-items in lists

#### Figures

Figures, dimensions and technical data presented in these Operating Instructions may be subject to change.

**Cross-references**

Cross-references point you to additional descriptions within the Operating Instructions. (chapter number/page number).

**Third-party components**

Refer to the Operating Instructions of the relevant manufacturers for information on operation and maintenance of third-party components fitted in the system.

**Additional documentation**

To complement the information in these Operating Instructions, please read the following regulations and directives:

- safety regulations and accident prevention regulations
- instruction sheets, instruction booklets
- work instructions provided by the statutory accident insurance provider
- generally accepted occupational health regulations

**Manufacturer**

TAKTOMAT GmbH  
Rudolf-Diesel-Straße 14  
D-86554 Pöttmes

Tel: +49 (0) 8253-9965-0  
Fax: +49 (0) 8253-9965-50  
eMail: [info@taktomat.de](mailto:info@taktomat.de)  
Internet: <http://www.taktomat.de/>

**Technical information**

The technical information, figures and data contained in these Operating Instructions are correct at the time of printing.

Our products undergo continuous further develop.

We therefore reserve the right to make any changes and improvements that we deem appropriate.

However, this does not, imply any obligation to apply such changes retrospectively to equipment already supplied.

**3.1.1 Published by**

TAKTOMAT GmbH  
Rudolf-Diesel-Straße 14  
D-86554 Pöttmes

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Pöttmes, Februar 2014

## 4 Excerpt Declaration of Incorporation

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### Declaration of Incorporation of Partly Completed Machinery according to EC-Machinery Directive 2006/42 EC, Annex II B Original Declaration of Incorporation

The manufacturer: **TAKTOMAT kurvengesteuerte Antriebssysteme GmbH**  
**Rudolf-Diesel-Straße 14**  
**D 86554 Pöttmes**

hereby declares that the contents delivered for the following product

|                         |  |
|-------------------------|--|
| Product:                | Cylinder Cam Rotary Indexing Table       |
| Type:                   | RT250                                    |
| Serial number:          | R1R02--101349                            |
| Commercial designation: | Cylinder Cam Rotary Indexing Table RT250 |

comply as far as possible with the following essential requirements of the Machinery Directive 2006/42/EC: Annex I .

In addition, this partly completed machinery complies with all of the provisions of the Directive 2014/35/EU (Low Voltage Directive) and the Directive 2014/30/EU (EMC Directive).

This partly completed machinery may not be put into service until the final machinery or system into which it is to be incorporated or of which it is to serve as a component complies in its entirety (i.e. including the partly completed machinery for which this declaration has been issued) with the provisions of the Directive 2006/42/EC as well as national legislation for incorporation of the Directive into national law and the corresponding declaration of conformity has been issued.

The relevant technical documentation for the machinery pursuant to Annex VII Part B has been produced. The manufacturer undertakes to send the relevant documentation for the partly completed machinery electronically to national authorities in case of a duly reasoned request.

Person responsible for documentation: Taktomat GmbH  
Address: Rudolf-Diesel-Straße 14, D-86554 Pöttmes

Pöttmes, Date

Norbert Hofstetter  
CEO

**TAKTOMAT**  
passion for automation

TAKTOMAT kurvengesteuerte Antriebssysteme GmbH

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## 5 Safety information

### 5.1 General information

This document contains important information on the safe use of the machine. This information is intended to ensure personal safety and prevent damage to the machine. The information is intended for the operator and for properly trained, qualified and instructed staff responsible for operating and servicing the machine.

Additional task-specific safety information is included in the relevant sections on the different phases during the service life of the system.

### 5.2 Explanation of the symbols used

#### **DANGER**



##### **DANGER!**

This combination of symbol and alert word indicates an inherently dangerous situation which can be fatal or cause serious injury if it is not avoided.

#### **WARNING**



##### **WARNING!**

This combination of symbol and alert word indicates a potentially dangerous situation which can be fatal or cause serious injury if it is not avoided.

#### **CAUTION**



##### **CAUTION!**

This combination of symbol and alert word indicates a potentially dangerous situation which can cause minor injury.

#### **NOTICE**



##### **NOTICE!**

This combination of symbol and alert word indicates a potentially dangerous situation which can cause damage to property or harm the environment if it is not avoided.

#### **ADDITIONAL SYMBOLS**



##### **REFER TO INSTRUCTION MANUAL/BOOKLET!**

This symbol signifies that the instruction manual/booklet of the component supplier must be read.



##### **WEAR HEAD PROTECTION!**

This symbol signifies that head protection must be worn.



##### **WEAR EYE PROTECTION!**

This symbol signifies that eye protection must be worn.

**WEAR SAFETY FOOTWEAR!**

This symbol signifies that safety footwear must be worn.

**WEAR PROTECTIVE GLOVES!**

This symbol signifies that protective gloves must be worn.

### 5.3 Intended use

The machine is intended for installation in a surrounding construction, thus integrating it to form part of an overall system. The machine is controlled by the overall system. The functions of the protective equipment are also connected to the machine via the controller. The machine may only be operated as part of a CE-compliant system.

**Any use that deviates from the intended use is regarded as inappropriate use.**

This includes:

- any use outside the permitted operating limits
- any use in conjunction with foodstuffs
- any use in conjunction with aggressive materials (such as acids)
- transporting the system using the designated lifting points or eye bolts.

**The manufacturer shall not be liable for any damage resulting from such use. Intended use also includes observance of all the information in these instructions.**

### 5.4 Foreseeable misuse

Any use beyond or other than the intended use is regarded as misuse.

#### 5.4.1 Guarantee conditions

Changes to the structure of the materials used in the machine, e.g. the drilling of additional holes, can result in damage to the components. This is not regarded as intended use and may lead to loss of warranty or liability claims as a consequence.

#### 5.4.2 Directives, statutory provisions and standards

The following statutory provisions and standards were applied:

Machine Directive 2006/42/EC, Annex I

Low Voltage Directive 2014/35/EU

EMC Directive 2014/30/EU

### 5.5 Technical condition of the machine

Do not use the machine if it is not in sound condition technically. If the machine is used when it is not in a sound condition technically, there is a risk of death or injury to staff and a risk of damage to property.

#### 5.5.1 Make no changes in the safety provisions

The manufacturer has made safety provisions. No liability will be accepted if the operator of the machine makes any changes in the safety provisions without express permission.

## 5.6 General hazards

This section lists risks associated with the machine that remain even when it is operated according to its intended use.

In order to reduce the risk of personal injury or damage to property, and to avoid potentially dangerous situations, the safety information provided here and in the other sections of these Operating Instructions must be observed.

### 5.6.1 Risk of death by electrocution

#### **DANGER**



**Risk of death by electrocution!**

**There is an immediate risk of fatal injury due to electric shock if live components are touched.**

**Damage to the insulation or to individual components can cause fatal injury.**

- ▶ Only allow work on the electrical system to be carried out by qualified electrical engineers.
- ▶ In the event of damage to the insulation, immediately shut off the power supply and initiate a repair.
- ▶ Before starting work on active parts of the electrical system or equipment, ensure that it is completely powered down and cannot be switched on again.

### 5.6.2 Risk of injury from moving parts

#### **WARNING**



**Risk of injury from moving parts!**

**Moving parts can cause serious injury.**

- ▶ Do not reach into moving parts or carry out work on moving parts while the system is in operation.
- ▶ Never open any covers while the system is in operation.

## 5.7 Responsibility of the operator

The machine is to be used commercially according to its intended use. The operator of the machine is therefore subject to statutory occupational health and safety provisions.

In addition to the general safety information contained in this document, any further safety, accident prevention and environmental regulations applicable to the field of application of the machine must also be observed.

**In particular, operators have the following obligations:**

- They must always be fully informed of the most recent occupational safety regulations and perform a risk assessment to identify any additional hazardous locations and places resulting from the specific working conditions at the place of use. They must document any such findings in the form of operating instructions (work instructions, work descriptions, etc.) for use during operation.
- During the entire service life of the machine, they must check whether the operating instructions they have written are compliant with current regulations and make any necessary adjustments.
- They must unambiguously regulate and define who is responsible for carrying out installation, operation, maintenance and cleaning.
- They must ensure that the staff deployed have the necessary qualifications for the work they are instructed to perform.
- They must ensure that all staff who work on the machine have read and understood all the documents relevant for its operation (Operating Instructions, maintenance regulations, safety guidelines).
- They must provide training for the staff at regular intervals and inform them of potential dangers.
- They must bear the responsibility for personal injury and damage to property arising from manipulation of the machine. For this reason, the machine and its safety equipment must be inspected at regular intervals to ensure that they are in sound condition and functioning properly, and the results of this inspection must be suitably documented.
- They must ensure that the machine is always in a sound condition technically.

### 5.7.1 Preventive measures

**It is recommended that the operator take the following preventive measures:**

- Only allow qualified, trained and properly instructed staff to work on the machine.
- Unambiguously define the responsibilities of operating and service personnel.
- Supplement these Operating Instructions with
  - stipulations deriving from national and regional labor and environmental regulations
  - adjust information covering specific operational aspects (workflows, supervisory obligations, reporting obligations, fire alarm equipment, etc.)
- Occasionally check to confirm that the Operating Instructions are being used and that such use is correct, and when necessary repeat the instruction process.
- Ensure that all documentation is permanently available in a readable form and easily accessible at the point of use.
- Observe any periodic checks and inspections that are required (by law) or specified in this document.
- Replace in good time any components indicated in these documents as being crucial for safety.
- Regularly inspect the machine to ensure that the safety equipment operates correctly.
- Make sure that safety information and hazard warnings on the machine and in the working area are always legible.
- Take steps to ensure that the machine is regularly inspected for visible damage and defects.

## 5.8 Staff qualification

The various activities described in these Operating Instructions require different qualifications of the staff entrusted with these duties.



### ! WARNING

**Danger if staff are insufficiently qualified!**

Persons who are inadequately qualified are unable to assess the risks associated with working on the machine and expose themselves and others to the risk of serious or fatal injury.

- ▶ Ensure that all work is performed only by suitably qualified persons.
- ▶ Keep insufficiently qualified persons at a safe distance from the working area.

### 5.8.1 Qualified staff

For the purposes of these Operating Instructions, qualified staff are understood to be

- operators who have been specially trained and instructed in working with the machine.
- installation and service staff who have appropriate expertise in setting up and maintaining the machine and who are familiar with the safety information.
- The qualified staff must have read and understood the contents of the Operating Instructions before the machine is taken into service and must have been informed of the risks associated with working with the machine by the machine operator.
- A knowledge of first aid is required.

### 5.8.2 Competent specialists

Competent specialists are persons whose specialist training and experience have given them sufficient knowledge with respect to using this machine and who are sufficiently familiar with the relevant statutory occupational health regulations, accident prevention regulations, directives, and generally approved technical practice that they are able to assess whether the condition of the machine allows it to be used safely.

### 5.8.3 Auxiliary staff

Work on or in the vicinity of this machine which is not associated with the actual operation of the machine (e.g. cleaning, transport, material provisioning, etc.) can be performed by other persons. Before the machine is taken into service, the qualified staff of the machine operator must instruct such persons with regard to the nature of the work to be performed and the risks associated with working on the machine. Take special care when instructing persons who cannot read or write, and instruct them separately!

### 5.8.4 Servicing, repairing and maintaining the machine

Service, repair and maintenance work on the machine may only be carried out by service engineers of the manufacturer or by qualified staff authorized by Taktomat GmbH. When carrying out such work, always cordon off the working area carefully!

## 5.9 Labeling

### 5.9.1 Rating plate



Figure. 5 Example of a rating plate

There is a rating plate attached to the machine:

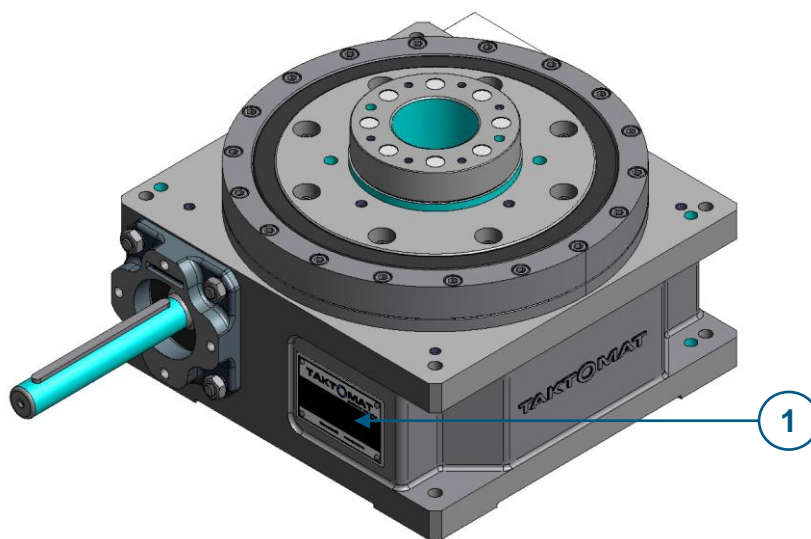


Figure 6 Position Rating plate (1)

## 6 Construction and function

### 6.1 Construction Rotary indexing table Type RT - TT

#### 6.1.1 Rotary indexing table RT100 - RT250 und TT075 - TT315

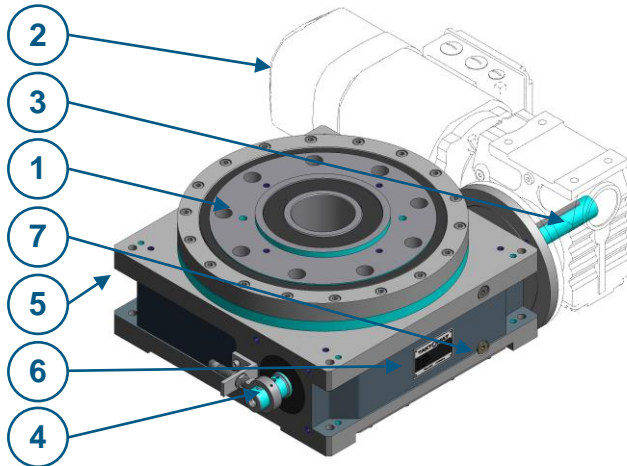


Figure 7 Rotary indexing table Type RT S01

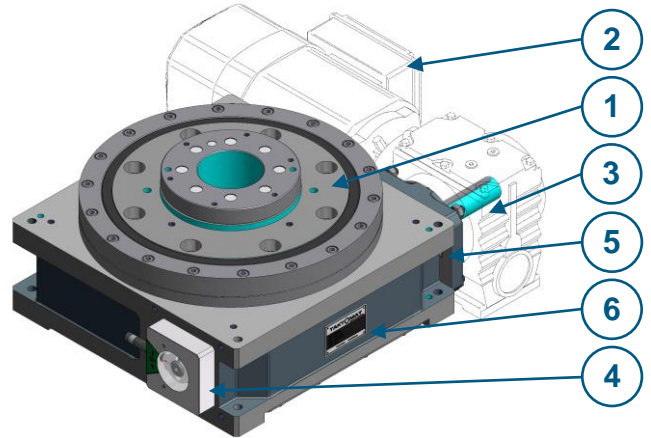


Figure 8 Rotary indexing table Type RT S03

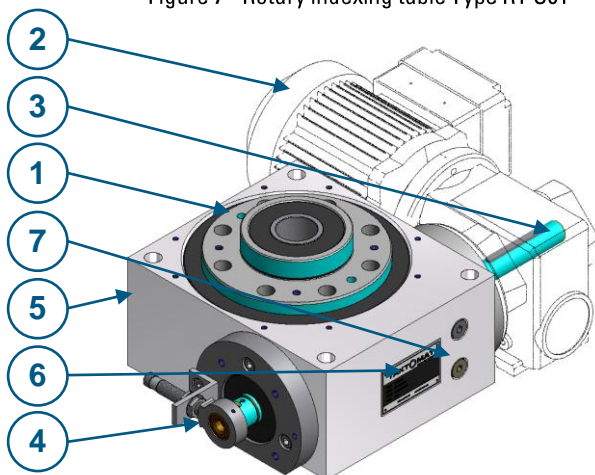


Figure 9 Rotary indexing table Type TT S01

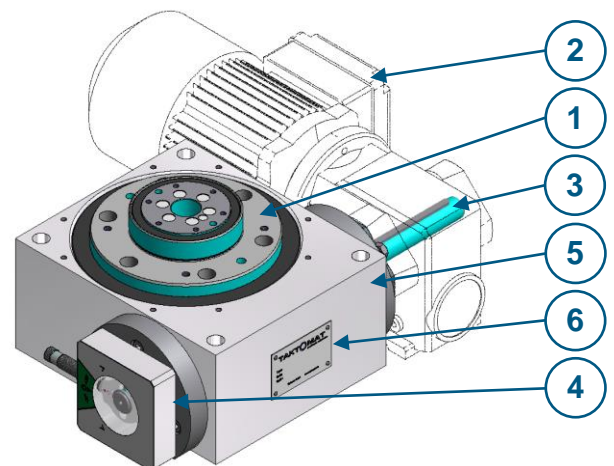


Figure 10 Rotary indexing table Type TT S03

- (1) Star wheel / Output flange (output)
- (2) Drive unit
- (3) Input shaft (drive)
- (4) Position indicator
- (5) Housing
- (6) Rating plate
- (7) Drain plug
- (8) Center colum (series S03)

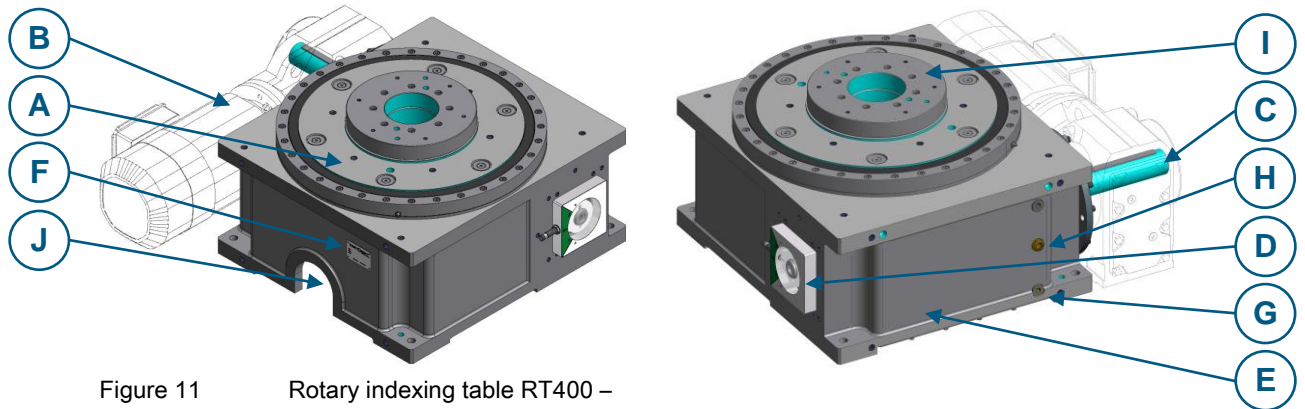


Figure 11 Rotary indexing table RT400 – RT630 S03

- (A) Star wheel / output flange
- (B) Drive unit
- (C) Input shaft (drive)
- (D) Position indicator
- (E) Housing
- (F) Rating plate
- (G) Drain plug
- (H) Oil sight glass
- (I) Center column (only on series S03)
- (J) Cable aperture

## 6.2 Function

The drive unit drives (2 and B) the star wheel / output flange (1 and A) via the input shaft (3 and C) and the cylinder cam. The output plane is perpendicular to the drive plane. The machine converts a uniform radial movement on the drive side to an intermittent or uniformly reduced output movement. The accessories are mounted on the star wheel / output flange (1 and A). The position indicator (4 and D) shows the current position of the cylinder cam. The rating plate (6 and F) is attached to the housing (5 and E). If required additional accessories are mounted on the center column (I) (only possible on series S03). The housing (E) of the cylinder cam rotary indexing table from type RT400 on has a cable aperture (J).

No additional mechanical locking for the star wheel / output flange is necessary.

This can lead to mechanical over tightening and ultimately to the destruction of the rotary indexing table.

Power is provided either by means of a three-phase brake motor via worm drive or by means of a chain-wheel or belt wheel on the drive shaft of the rotary indexing table.

This is firmly connected to the cylinder cam, without any further internal gear sets, and it turns the star wheel through cam followers.

The type RT star wheel is mounted within a wire-race bearing assembly, stiff and free of play (inside steel rings not in the casting). The type TT star wheel is mounted in tapered roller bearings, stiff and free of play. The shaft seals appropriate for each size seal off the rotary indexing table inside and out.



## 6.3 Operating modes

The machine has the following operating modes:

- Normal operational
  - Intermittent operation
  - Continuous operation
  - Reversing operation (Oscilating operation)
- Inching mode
- Emergency-Stop

### NOTICE



**Damage arising from operation without an appropriate machine controller!  
Improper control of the machine can cause serious material damage.**

- ▶ Do not operate in inching mode without an appropriate universal machine controller.
- ▶ Use an appropriate universal machine controller.

### 6.3.1 Normal operation

Normal operation is regarded as the movement of the output flange in a direction from one position to the next. The rotational direction of the output flange is determined by the rotational direction of the drive. With a three-phase motor this can easily be reversed by swapping two phases of the supply voltage.

#### 6.3.1.1 Intermittent operation

The drive shaft stops in the dwell phase. The step time is fixed. The dwell period is variable. This mode of operation is used in plants with much longer processing times than times and is the most common mode of operation.

#### 6.3.1.2 Continuous operation

The machine runs continuously without the motor stopping. Step and dwell times are fixed and are run through continuously. The drive motor has only one rotational direction. This mode of operation is frequently used in fast-running plants with short processing times. The machine is mechanically synchronized to the rest of the plant by the free drive shaft. The ratio of dwell to step time can be adjusted within certain limits by TAKTOMAT when producing the cam.

### 6.3.2 Reversing operation (reciprocating operation)

The drive of the machine is always decelerated to the reverse position and accelerated after the reverse phase. In this mode of operation, the output flange shuttles back and forth between two positions.

### 6.3.3 Inching mode

In inching operation, the output flange moves in small increments between two positions. The cylinder cam cannot gently accelerate and decelerate the accumulated load. This puts the hardware under stress, since any acceleration that occurs during the inching operation exceeds that of normal operation many times over. No inching operation is permitted if there are no suitable machine controls that allow gentle acceleration and braking of the load.

### 6.3.4 Emergency-Stop

Emergency stop is comparable with the stopping in inching operation. Frequent emergency-stop situations should be avoided.

## 6.4 Cycle time

A complete cycle of the machine is defined as the indexing of the output flange from one dwell position to the next. The cycle time consists of the step time and dwell time together. The step time corresponds to the step angle of the cam and the dwell time corresponds to the angle without the cam gradient.



Figure 12 0° cam – gradient

(1) 0° cam gradient = dwell phase

### Example: RT 160-8-270

This is a rotary indexing table size 160 with 8 indexing points (8x45° Output flange rotation), a switch angle of the cam of 270° and a dwell angle of 90°. With an input rotational speed of 60 rpm and continuous input rotational speed, the rotary indexing table will execute 60 cycles per minute. The step time of the Output flange is 0.75s. The dwell time is 0.25s.

## 6.5 Technical Data

### 6.5.1 Rotary indexing table Type RT - TT

From internal transmission ratio 16 on the pitch error on the cylinder cam rises by 5" to 8" due to multi point locking.

### 6.5.2 Ambient conditions

Following ambient conditions apply to all Rotary indexing table described in this operating manual.

#### NOTICE



Deviating ambient conditions can cause material damage.

Do not operate in deviating ambient conditions.

- ▶ Adhere to the given temperature range.
- ▶ Relative humidity should not exceed the given range.
- ▶ Other ambient condition only in consultation with Taktomat.

Temperature range [°C]

+10 to + 40

Relative humidity [%]

max 40 to 70

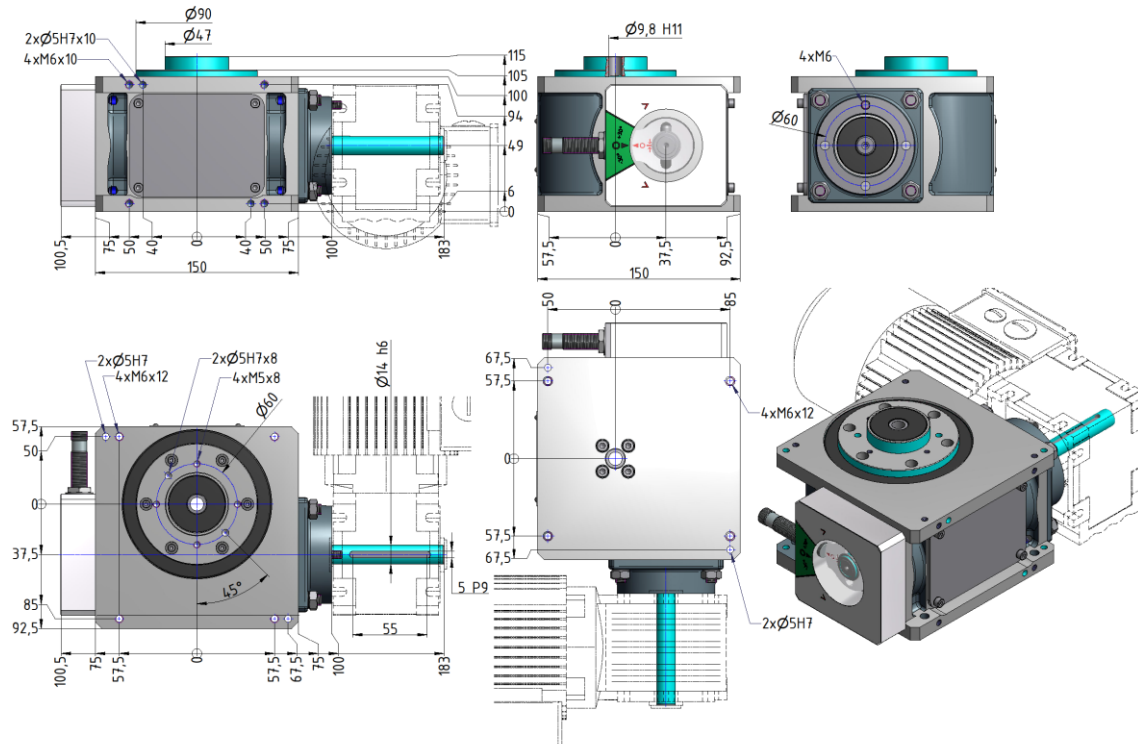
**6.5.3 Rotary indexing table TT075 S03**


Figure 13 Dimensional drawing TT075 S03

**Primary dimensions**

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 90                                |
| Height (mounting surface of output flange) [mm]            | 105                               |
| Internal diameter Ø [mm]                                   | 9,8                               |
| Maximum recommended accessory plate diameter [mm]          | 500                               |
| Approx. weight of Rotary indexing table without drive [kg] | 12                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

**Precision**

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 28   |
| Axial runout on Output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on Output flange -Ø ± [mm] | 0,01 |

**Max. strain on output flange**

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 1,5 |
| Radial force Fr [kN]    | 0,6 |
| Tilting moment Mk [kNm] | 0,5 |

**Max. strain on center colum**

|                         |      |
|-------------------------|------|
| Axial force Fa [kN]     | 0,5  |
| Tilting moment Mk [kNm] | 0,04 |

#### 6.5.4 Rotary indexing table RT100 S03

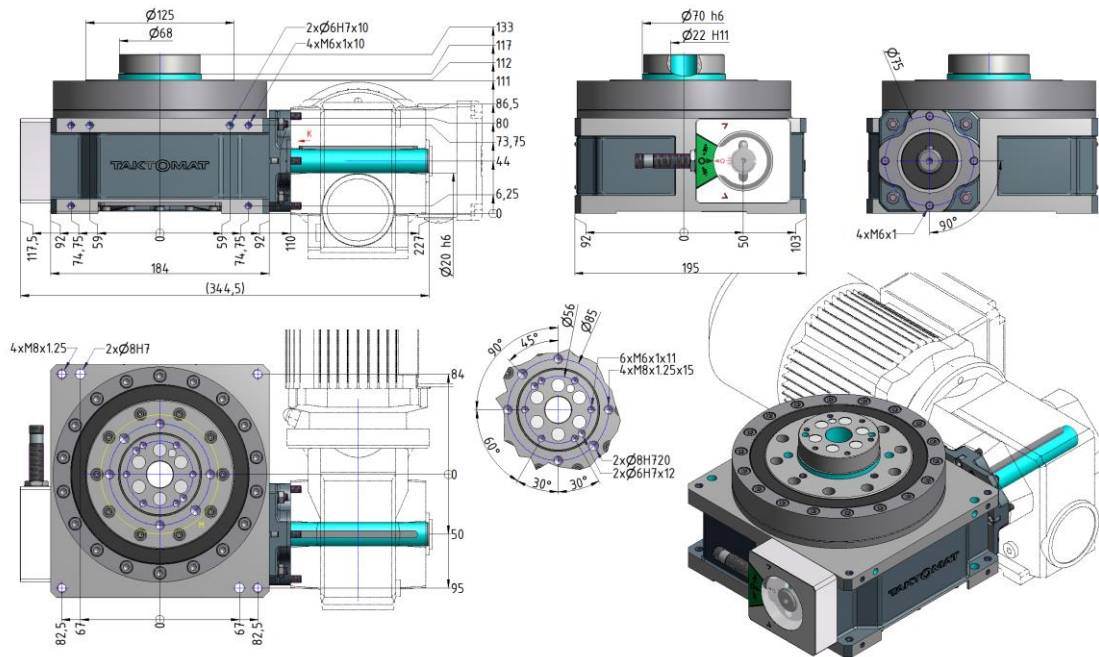


Figure 14 Dimensional drawing RT100 S03

## Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 125                               |
| Height (mounting surface of output flange) [mm]            | 112                               |
| Internal diameter Ø [mm]                                   | 22                                |
| Maximum recommended accessory plate diameter [mm]          | 800                               |
| Approx. weight of Rotary indexing table without drive [kg] | 32                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |
| <b>Precision</b>   |                                   |
| Indexing accuracy in angular seconds ± ["]                 | 35                                |
| Axial runout on Output flange -Ø ± [mm]                    | 0,01                              |
| Concentric runout on Output flange -Ø ± [mm]               | 0,01                              |
| <b>Max. strain on output flange</b>                        |                                   |
| Axial force Fa [kN]  | 6                                 |
| Radial force Fr [kN]                                       | 3,8                               |
| Tilting moment Mk [kNm]                                    | 0,7                               |
| <b>Max. strain on center colum</b>                         |                                   |
| Axial force Fa [kN]  | 5                                 |
| Tilting moment Mk [kNm]                                    | 0,19                              |

### 6.5.5 Rotary indexing table TT125 S03

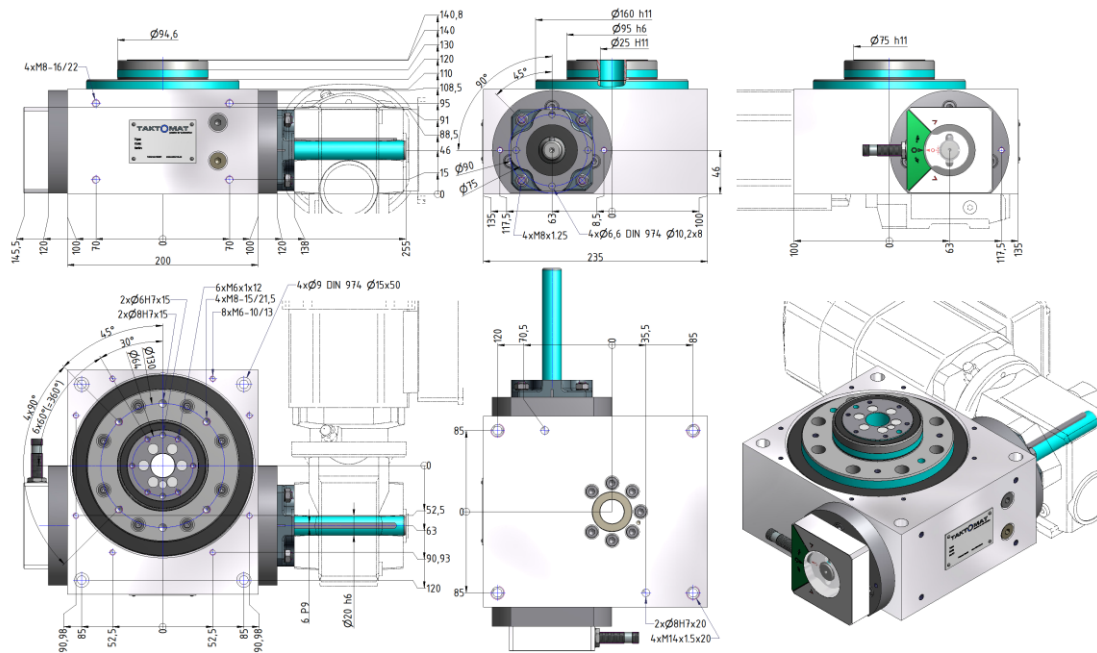


Figure 15 Dimensional drawing TT125 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 160                               |
| Height (mounting surface of output flange) [mm]            | 120                               |
| Internal diameter Ø [mm]                                   | 35                                |
| Maximum recommended accessory plate diameter [mm]          | 1000                              |
| Approx. weight of Rotary indexing table without drive [kg] | 24                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |       |
|--|-------|
| Indexing accuracy in angular seconds ± ["]   | 30    |
| Axial runout on Output flange -Ø ± [mm]      | 0,015 |
| Concentric runout on Output flange -Ø ± [mm] | 0,015 |

#### Max. strain on output flange

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 6   |
| Radial force Fr [kN]    | 2,8 |
| Tilting moment Mk [kNm] | 0,2 |

#### Max. strain on center column

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 3   |
| Tilting moment Mk [kNm] | 0,2 |

### 6.5.6 Rotary indexing table RT160 S03

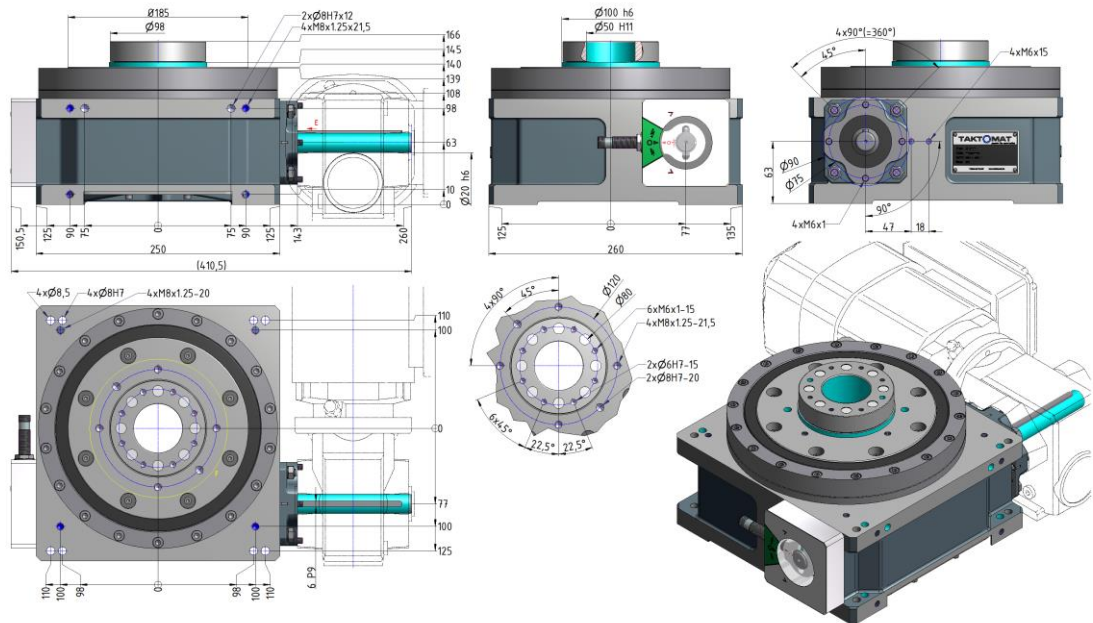


Figure 16 Dimensional drawing RT160 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 185                               |
| Height (mounting surface of output flange) [mm]            | 140                               |
| Internal diameter Ø [mm]                                   | 50                                |
| Maximum recommended accessory plate diameter [mm]          | 1300                              |
| Approx. weight of Rotary indexing table without drive [kg] | 31                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 30   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

#### Max. strain on output flange

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 15  |
| Radial force Fr [kN]    | 8   |
| Tilting moment Mk [kNm] | 2,7 |

#### Max. strain on center colum

|                         |      |
|-------------------------|------|
| Axial force Fa [kN]     | 7,5  |
| Tilting moment Mk [kNm] | 0,53 |



### 6.5.7 Rotary indexing table RT200 S03

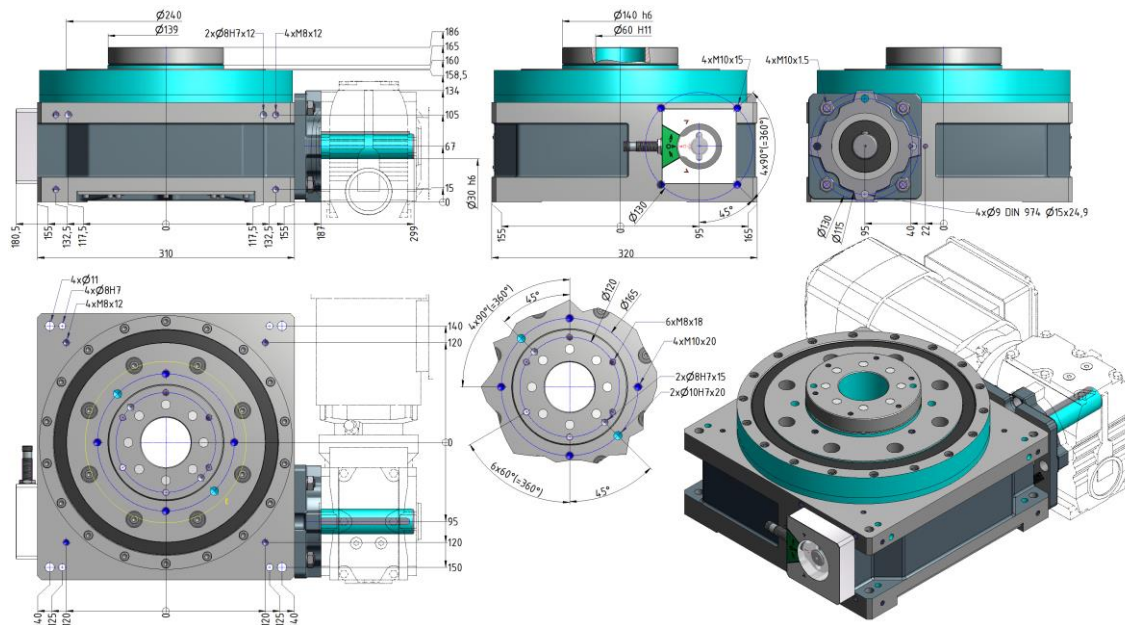


Figure 17 Dimensional drawing RT200 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 240                               |
| Height (mounting surface of output flange) [mm]            | 160                               |
| Internal diameter Ø [mm]                                   | 60                                |
| Maximum recommended accessory plate diameter [mm]          | 1800                              |
| Approx. weight of Rotary indexing table without drive [kg] | 63                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 30   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

#### Max. strain on output flange

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 21  |
| Radial force Fr [kN]    | 11  |
| Tilting moment Mk [kNm] | 3,7 |

#### Max. strain on center colum

|                         |      |
|-------------------------|------|
| Axial force Fa [kN]     | 12,5 |
| Tilting moment Mk [kNm] | 1,2  |



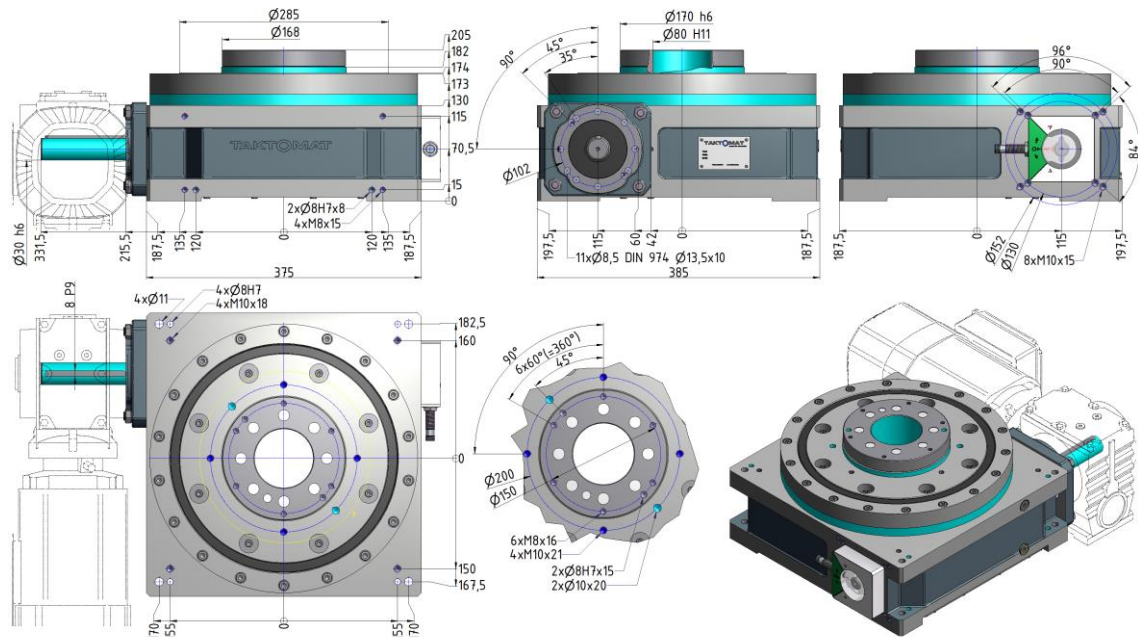
**6.5.8 Rotary indexing table RT250 S03**


Figure 18 Dimensional drawing RT250 S03

**Primary dimensions**

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 285                               |
| Height (mounting surface of output flange) [mm]            | 174                               |
| Internal diameter Ø [mm]                                   | 80                                |
| Maximum recommended accessory plate diameter [mm]          | 2200                              |
| Approx. weight of Rotary indexing table without drive [kg] | 100                               |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

**Precision**

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 25   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

**Max. strain on output flange**

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 27 |
| Radial force Fr [kN]    | 14 |
| Tilting moment Mk [kNm] | 5  |

**Max. strain on center column**

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 25 |
| Tilting moment Mk [kNm] | 2  |

### 6.5.9 Rotary indexing table TT250 S03

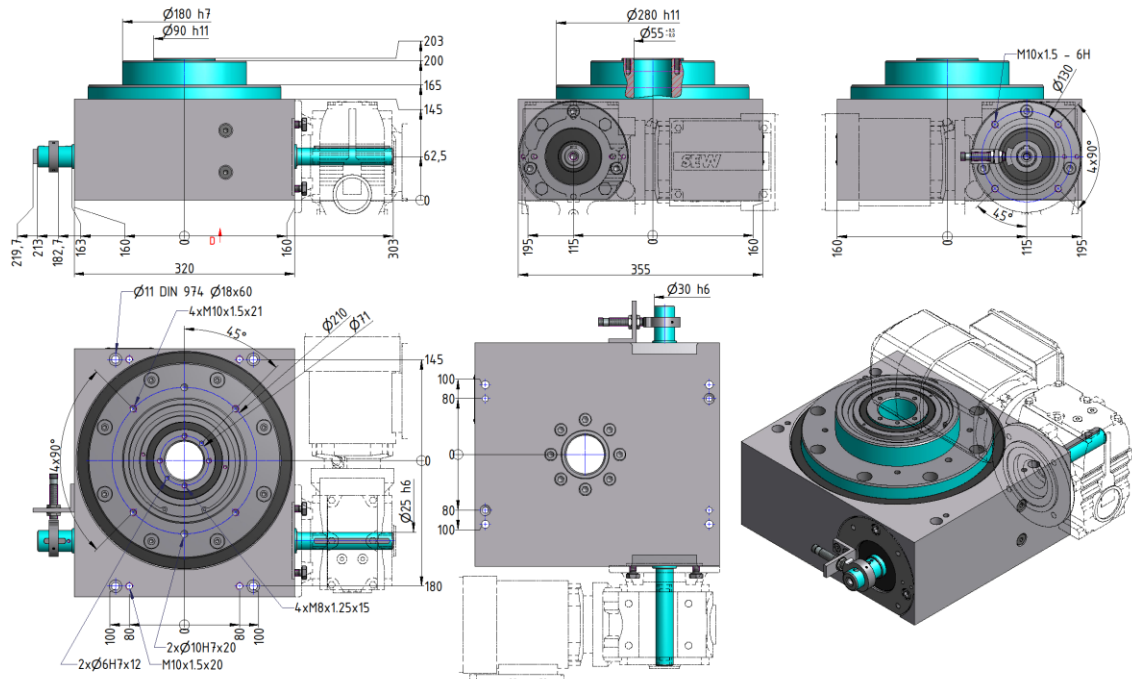


Figure 19 Dimensional drawing TT250 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 280                               |
| Height (mounting surface of output flange) [mm]            | 165                               |
| Internal diameter Ø [mm]                                   | 50                                |
| Maximum recommended accessory plate diameter [mm]          | 2000                              |
| Approx. weight of Rotary indexing table without drive [kg] | 77                                |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 25   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

#### Max. strain on output flange

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 23 |
| Radial force Fr [kN]    | 24 |
| Tilting moment Mk [kNm] | 2  |

#### Max. strain on center colum

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 12 |
| Tilting moment Mk [kNm] | 2  |

### 6.5.10 Rotary indexing table TT315 S03

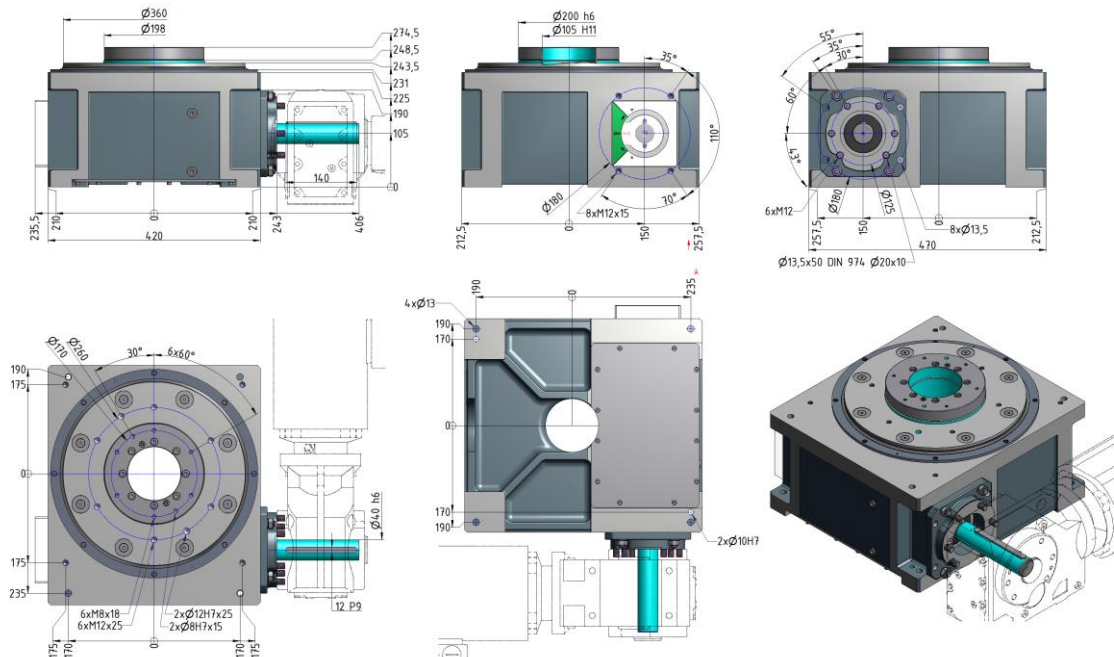


Figure 20 Dimensional drawing TT 315 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 360                               |
| Height (mounting surface of output flange) [mm]            | 243,5                             |
| Internal diameter Ø [mm]                                   | 90                                |
| Maximum recommended accessory plate diameter [mm]          | 2800                              |
| Approx. weight of Rotary indexing table without drive [kg] | 193                               |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 23   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

#### Max. strain on output flange

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 32 |
| Radial force Fr [kN]    | 17 |
| Tilting moment Mk [kNm] | 5  |

#### Max. strain on center colum

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 28 |
| Tilting moment Mk [kNm] | 4  |

### 6.5.11 Rotary indexing table RT400 S03

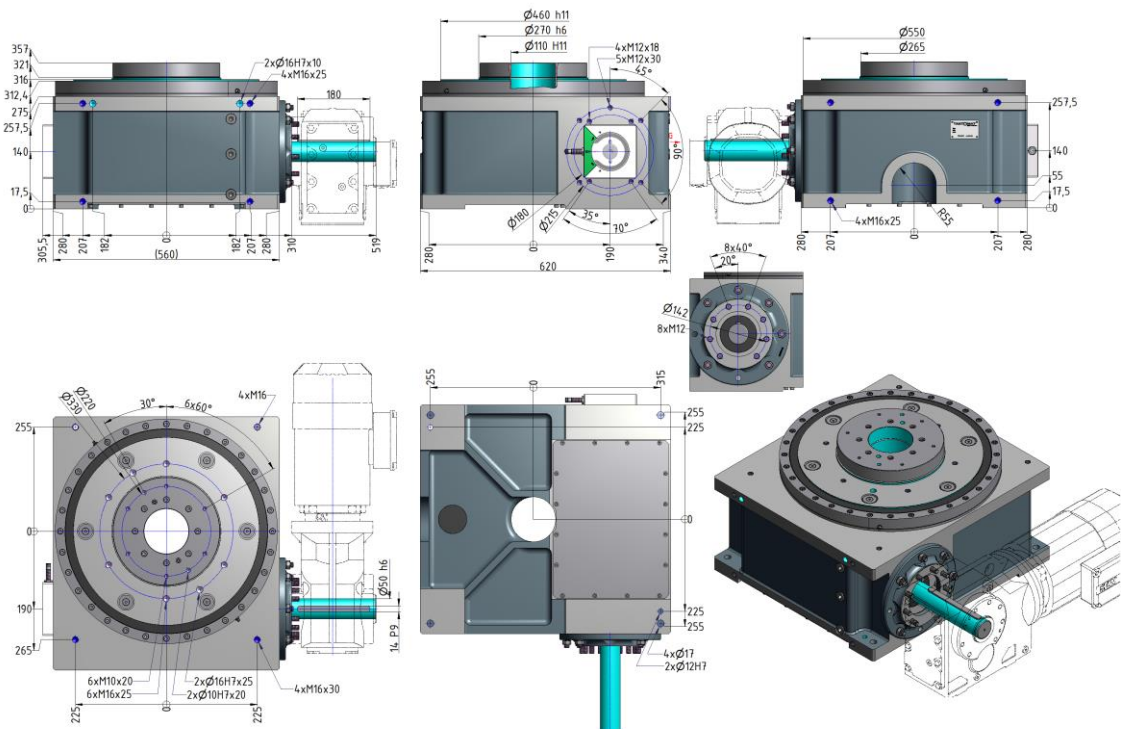


Figure 21 Dimensional drawing RT400 S03

## Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 460                               |
| Height (mounting surface of output flange) [mm]            | 316                               |
| Internal diameter Ø [mm]                                   | 110                               |
| Maximum recommended accessory plate diameter [mm]          | 3500                              |
| Approx. weight of Rotary indexing table without drive [kg] | 325                               |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

## Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds $\pm$ ["]           | 18   |
| Axial runout on output flange $-\emptyset \pm$ [mm]      | 0,01 |
| Concentric runout on output flange $-\emptyset \pm$ [mm] | 0,01 |

Max. strain on output flange

|                            |    |
|----------------------------|----|
| Axial force $F_a$ [kN]     | 50 |
| Radial force $F_r$ [kN]    | 26 |
| Tilting moment $M_k$ [kNm] | 10 |

## Max. strain on center colum

|                            |     |
|----------------------------|-----|
| Axial force $F_a$ [kN]     | 45  |
| Tilting moment $M_k$ [kNm] | 5,5 |

### 6.5.12 Rotary indexing table RT500 S03

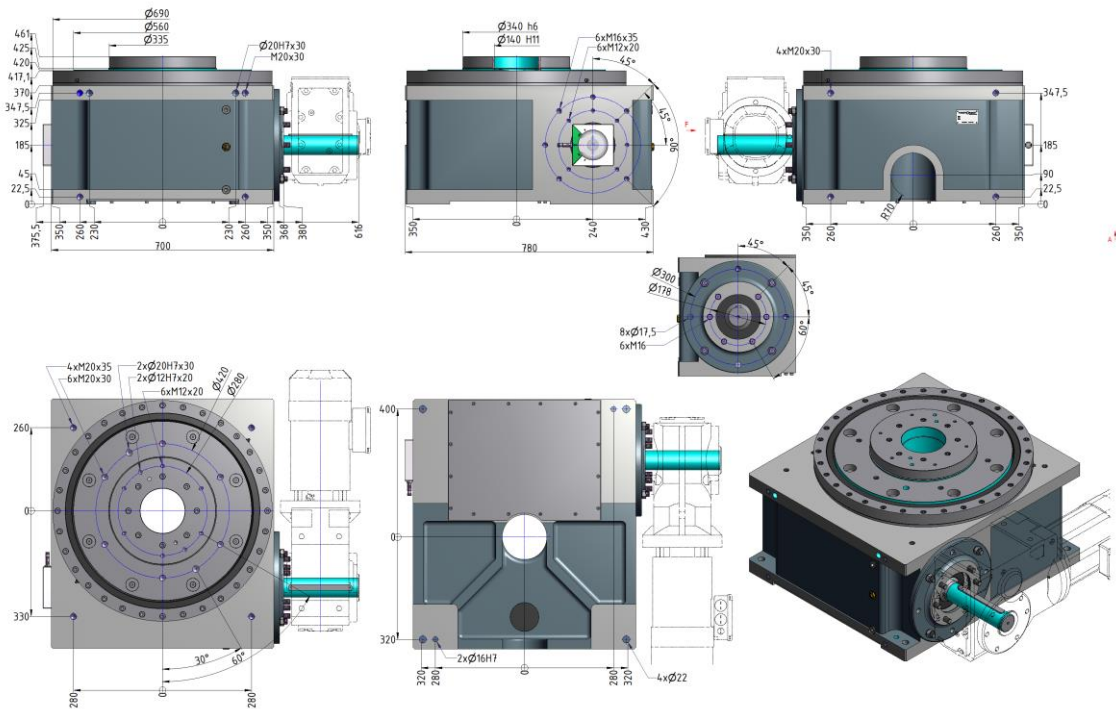


Figure 22 Dimensional drawing RT500 S03

#### Primary dimensions

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 560                               |
| Height (mounting surface of output flange) [mm]            | 420                               |
| Internal diameter Ø [mm]                                   | 140                               |
| Maximum recommended accessory plate diameter [mm]          | 4500                              |
| Approx. weight of Rotary indexing table without drive [kg] | 600                               |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

#### Precision

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 15   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

#### Max. strain on output flange

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 84 |
| Radial force Fr [kN]    | 49 |
| Tilting moment Mk [kNm] | 22 |

#### Max. strain on center colum

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 60  |
| Tilting moment Mk [kNm] | 7,8 |



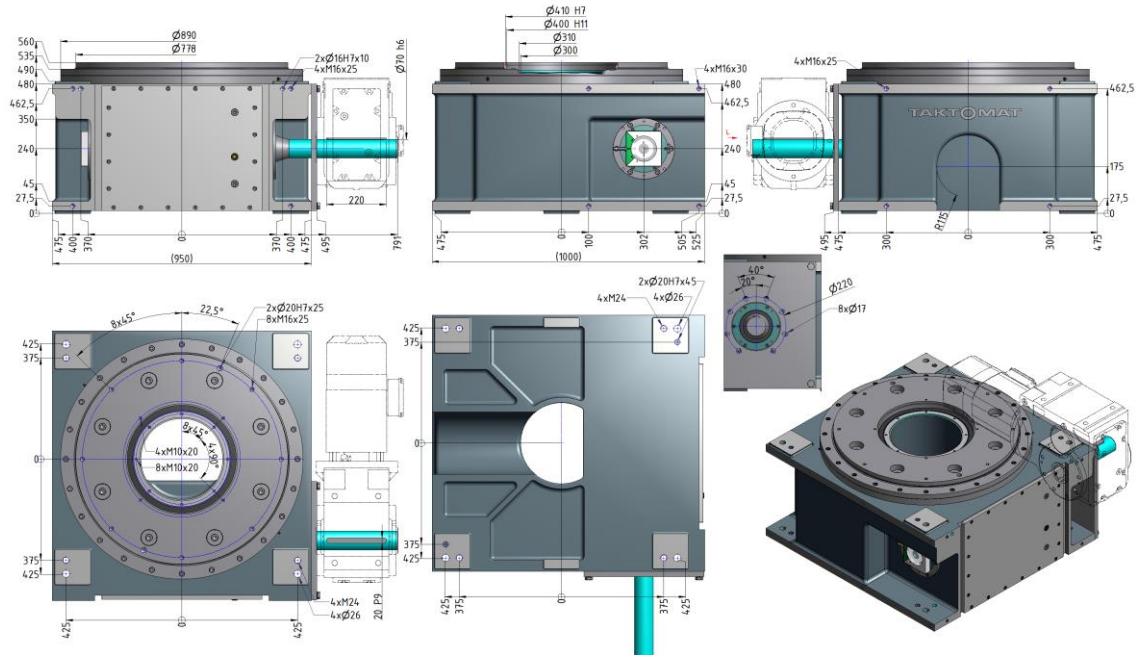
**6.5.13 Rotary indexing table RT630 S03**


Figure 23 Dimensional drawing RT630 S03

**Primary dimensions**

|  |                                   |
|--|-----------------------------------|
| Star wheel / Output flange Ø [mm]                          | 778                               |
| Height (mounting surface of output flange) [mm]            | 560                               |
| Internal diameter Ø [mm]                                   | 250                               |
| Maximum recommended accessory plate diameter [mm]          | 6000                              |
| Approx. weight of Rotary indexing table without drive [kg] | 1600                              |
| Standard internal transmission ratio                       | 2,3,4,6,8,10,12,16,20,24,30,36    |
| Direction  | cw, ccw, reversing                |
| Installation orientation                                   | horizontal, vertical, upside down |

**Precision**

|  |      |
|--|------|
| Indexing accuracy in angular seconds ± ["]   | 15   |
| Axial runout on output flange -Ø ± [mm]      | 0,01 |
| Concentric runout on output flange -Ø ± [mm] | 0,01 |

**Max. strain on output flange**

|                         |     |
|-------------------------|-----|
| Axial force Fa [kN]     | 145 |
| Radial force Fr [kN]    | 86  |
| Tilting moment Mk [kNm] | 41  |

**Max. strain on center colum**

|                         |    |
|-------------------------|----|
| Axial force Fa [kN]     | 80 |
| Tilting moment Mk [kNm] | 9  |

## 7 Transport

### 7.1 Safety information

#### NOTICE



**Damage arising from improper transport!**

**Improper transport can cause significant damage to property.**

- ▶ Take care and take note of the symbols on the packaging when unloading the machine on delivery and when transporting it on the premises.

### 7.2 Transport inspection

Immediately on receipt, check to make certain that the delivery is complete and has not been damaged during transport:

Proceed as follows if there are visible signs of damage during transport:

- ▶ Do not accept the delivery or only do so conditionally.
- ▶ Record the extent of the damage on the transport documentation or on the associated delivery note.
- ▶ Immediately report any damage to the manufacturer of the machine.

#### ⚠ DANGER



**Risk of fatal injury from suspended loads and falling parts!**

**Parts can fall during transport and cause serious or fatal injury.**

- ▶ Do not walk under suspended loads.
- ▶ Keep people clear of the danger zone.
- ▶ Always use lifting gear with a sufficient load capacity.
- ▶ Always use forklift trucks or pallet trucks with a sufficient load capacity and fork length.
- ▶ Do not leave the load suspended if you leave the working area.

### 7.3 Packaging, handling, unpacking

The machine is packed in plastic sheeting or cardboard packaging and secured to a pallet for transportation.

#### NOTICE



**Damage arising from improper transport!**

**Improper transport can cause significant damage to property.**

- ▶ The machine must not be allowed to become wet while it is being transported.
- ▶ Take the machine out of the packaging just before installation
- ▶ Remove the packaging carefully and dispose of it with due regard to environmental considerations.

### 7.4 Installation location, place of use

The machine should be stored and set up under the following conditions:

- Do not store the system in the open.
- Store the machine in a dry room at a temperature above 8°C.
- Do not expose the system to any aggressive agents.
- Protect from direct sunlight.

**7.4.1 Transport using sling equipment****Staff****Protective equipment**

Qualified staff



- The sling equipment (see figure) must be attached in the threaded holes (see table and dimensions sheet) in the positions shown in the figure and checked to ensure that it is working correctly (see the instructions for the sling equipment).

Transport the machine as follows if you are using sling equipment:

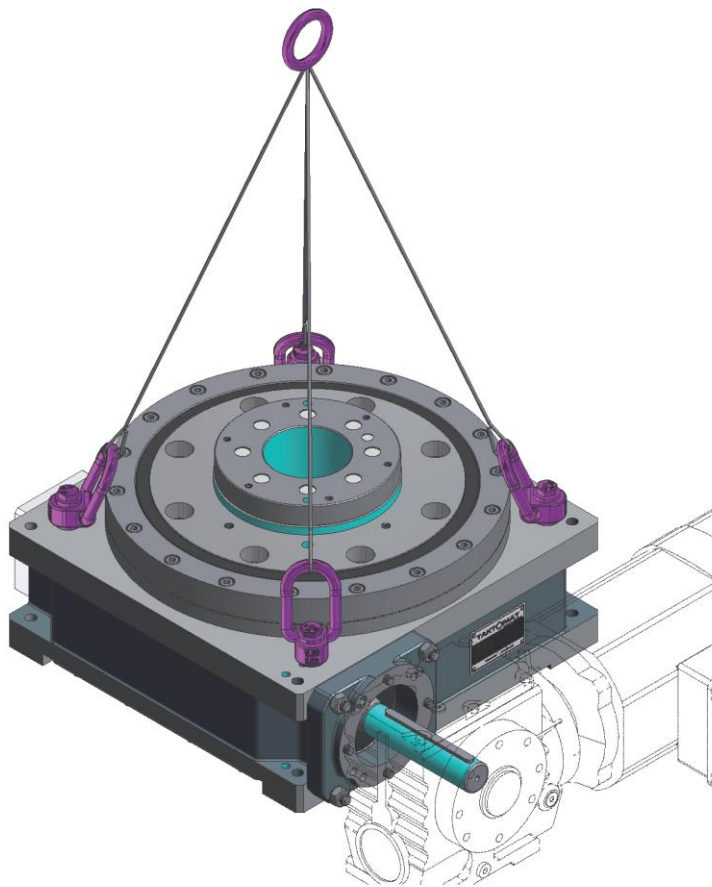


Figure 24 Transport using sling equipment



**Lifting instructions:**

The angle between the perpendicular and the sling chain must lie between 0° and 45°.

## NOTICE

**Damage arising from improper transport!**

**Improper transport can cause significant damage to property.**

- ▶ Take care and take note of the symbols on the packaging when unloading the machine on delivery and when transporting it on the premises
- ▶ Use slinging equipment with sufficient load capacity
- ▶ Align slinging equipment in load direction.
- ▶ If the recommended angle between perpendicular and the sling chain or sling strap exceeds 45° the load capacity of the sling equipment is reduced.

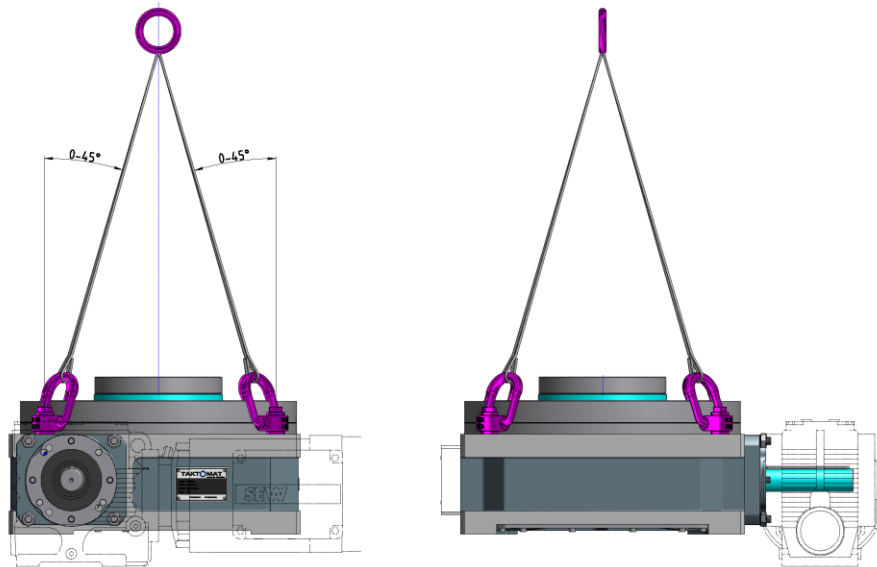


Figure 25 Lifting instructions

**Thread table for screw attachment points:**

Suitable threaded holes are provided on the machine to accommodate slinging equipment. Please refer to the dimensions sheet in the technical data for the thread sizes.

**Recommendation sling equipment:**

| Type  | Number of sling points | Recommendation sling equipment | Thread |
|-------|------------------------|--------------------------------|--------|
| RT100 | 4                      | VLBG 0,3t                      | M8     |
| RT160 | 4                      | VLBG 0,3t                      | M8     |
| RT200 | 4                      | VLBG 0,3t                      | M8     |
| RT250 | 4                      | VLBG 0,63t                     | M10    |
| RT400 | 4                      | VLBG 1,5t                      | M16    |
| RT630 | 4                      | VLBG 4t                        | M24    |
| TT75  | 4                      | VRS-F                          | M6     |
| TT125 | 4                      | VRS-F                          | M6     |

| Type          | Number of sling points | Recommendation sling equipment | Thread |
|---------------|------------------------|--------------------------------|--------|
| TT252 / TT250 | 4                      | VRS-F                          | M10    |
| TT315         | 4                      | VRS-F                          | M12    |

## 8 Mechanical installation

### 8.1 Installation orientation

Possible Installation orientations.

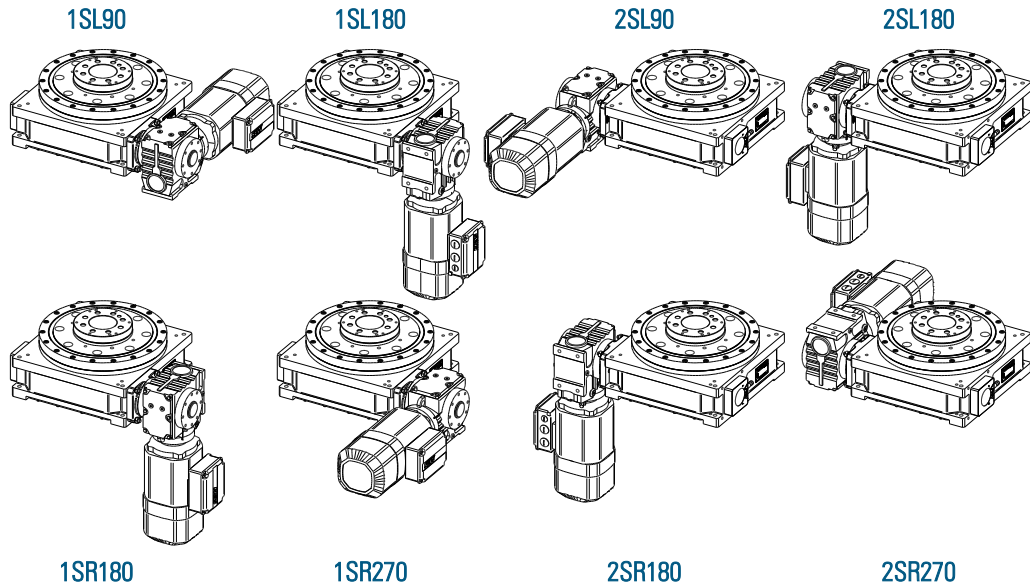


Figure 26 Possible drive installation orientations RT-TT

### NOTE



**Damage arising from improper installation of the drive!**

**Improper installation of the drive can cause significant damage to property and material.**

- ▶ Always follow the original operating instructions of the drive manufacturer on mounting the drive (Standard SEW) to the machine.
- ▶ Oil control – and drain bolts as well as air escape valves must be freely accessible without mechanical intervention.

### 8.2 Securing the drive

Staff

Protective equipment

Qualified staff



The drive must be secured with bolts at the specified points. The type of drive, servo motor or asynchronous motor has to be agreed by **TAKTOMAT**.

On request, **TAKTOMAT** can supply an adapter flange for use between the drive and the RT housing. The input shaft must not be remachined. The diameter and length of the hollow shaft of the drive are determined by the dimensions of the input shaft (refer to the dimensions sheet for information).

- ▶ Secure the drive with the specified bolts at the specified points (see figure: Drive assembly sequence)
- ▶ Fasten the bolts with the appropriate torque (see torque table)
- ▶ Check tightening torque after fastening

Mount the drive on the Rotary indexing table as follows:

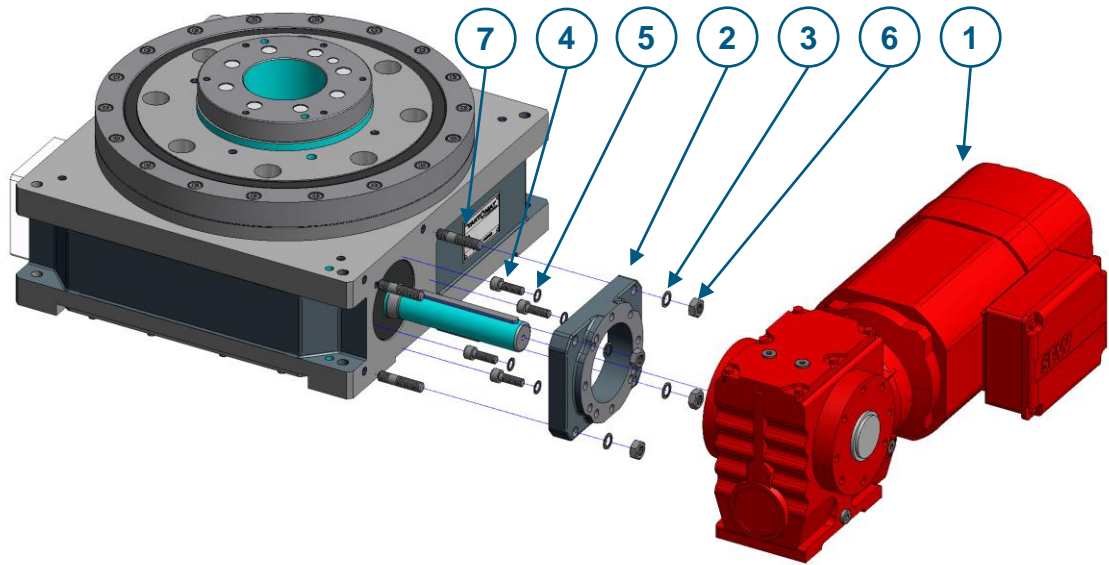


Figure 27 Drive assembly sequence

| Item | Designation    |
|------|----------------|
| 1    | Drive          |
| 2    | Adapter flange |
| 3    | SCHNORR washer |
| 4    | Allen screw    |
| 5    | SCHNORR washer |
| 6    | Nut            |
| 7    | Bolt           |

## 8.3 Installation and commissioning

### 8.3.1 Safety information

#### **DANGER**

**Risk of death by electrocution!**

**There is an immediate risk of fatal injury due to electric shock if live components are touched.**

**Damage to the insulation or to individual components can cause fatal injury.**



- ▶ Only allow work on the electrical system to be carried out by qualified electrical engineers.
- ▶ In the event of damage to the insulation, immediately shut off the power supply and initiate a repair.
- ▶ Before starting work on active parts of the electrical system or equipment, ensure that it is completely powered down and cannot be switched on again.

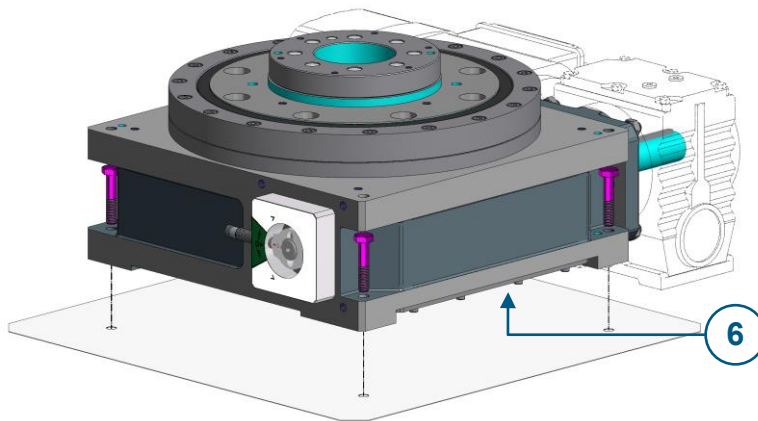


Figure20 Installation of the Rotary indexing table RT-TT; Side 6 Standard

### 8.3.2 Installation

#### Staff

#### Protective equipment

Qualified staff



- ▶ The surface on which the machine is to be installed must be level.
- ▶ Clean the installation surface and apply a film of oil.
- ▶ Place the Rotary indexing table RT - TT on the installation surface.
- ▶ Secure the Rotary indexing table RT - TT with screws and studs according to requirements.
- ▶ Compare the power supply with the details on the rating plate.
- ▶ Connect the drive unit.
- ▶ The housing of the Rotary indexing table RT - TT has to be earthed consistently according to the VDE regulations with adequate width.

#### Accessories on the star wheel / output flange

Observe the following constraints when attaching accessories to the star wheel / output flange:

- ▶ Maximum weight moved (as per Taktomat project planning)
- ▶ Minimum positioning time (as per Taktomat project planning)
- ▶ Maximum overhang (tipping moment) (as per Taktomat project planning)
- ▶ Maximum tightening torque for securing holes, see torque table

### 8.4 Adjustment of the position cam series S01

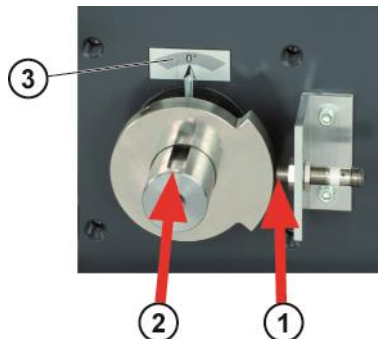


Figure 28 Detail position cam

- (1) Middle of switch flag aligned with the sensor.
- (2) Correct setup of the switch cam.
- (3) Decal (The grey area of the decal is only symbolic and does not indicate the length of the dwell phase.)

The position cam is secured in place by means of two radial screws on the drive shaft. It is correctly set up when the keyway and the pointer point to the zero reference mark on the decal (2) and the middle of the switching flag is aligned with the sensor (1).

#### 8.4.1 Minimizing time losses

Depending on the speed of the machine, the dwell phase can be a few hundredths to several tenths of a second. If the drive is stopped right at the beginning of the dwell phase, in the following cycle you will lose the time the drive requires to carry out the rest of the dwell phase.

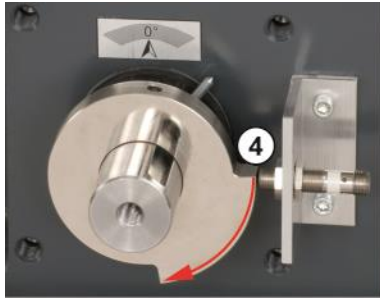


Figure 29 Detail delayed shutdown

- (4) Ideal breakpoint at the end of the position cam.

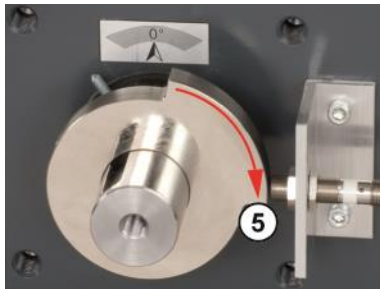


Abb. 30 Detail delayed shutdown

- (5) Stop immediately with the rising flank.

Time-optimized control of the machine means starting the external machining right at the start of the dwell phase (rising flank on the position sensor) and allowing the drive to turn for a short time for it to come to a standstill shortly before the end. (4). No time in the next cycle is lost!

You need a second switch cam to get time optimized control.

With continuous reversing operation always stop with the rising flank of the position sensor since the dwell phase is left again in the opposite direction.

## 8.5 Maintenance task

### 8.5.1 Maintenance plan

| Interval      | Maintenance activity   | Staff           |
|---------------|--|-----------------|
| Daily         | General visual and acoustic inspection   | Operator        |
| Monthly       | Check that no oil is escaping from the Rotary indexing table RT - TT   | Operator        |
| Monthly       | Check oil level  | Operator        |
| Semi - annual | Lubricate the Rotary indexing table Type RT400-RT630, siehe Kap. Lubrication   | Operator        |
| Semi - annual | <ul style="list-style-type: none"> <li>▶ Visual inspection for damage</li> <li>▶ Remove any dust deposits (especially on ventilation grills of the drive units)</li> <li>▶ Inspect electric cables for damage</li> </ul> | Qualified staff |
| Annual        | Controll Rotary indexing table if it is without play in dwell position   | Qualified staff |



## 8.6 Checking the oil level

Staff                      Protective equipment

Operator



The Rotary indexing table of type TT075 - TT315 and RT100 - RT250 are life - time lubricated.

The Rotary indexing table RT400 on are equipped with an oil sight glass and must be serviced according to the maintenance plan.

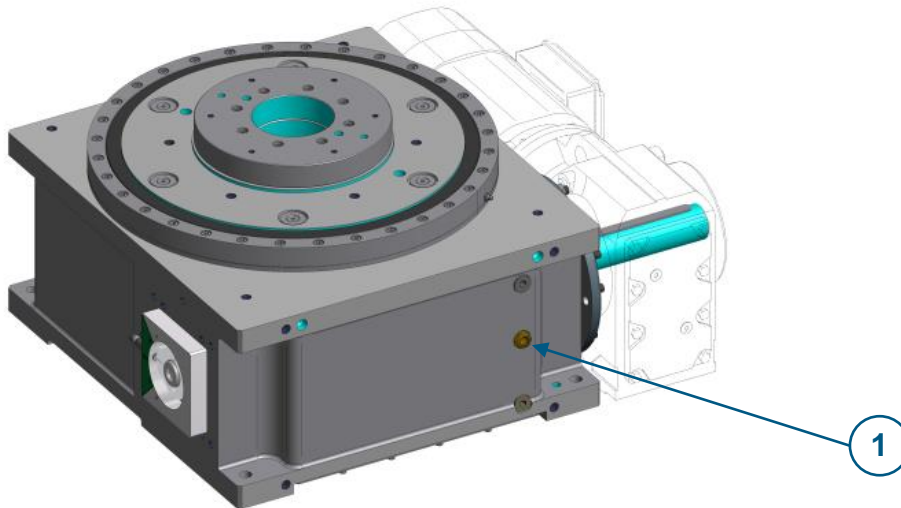


Figure 31 Checking the oil level, (1) Oil sight glass

### NOTICE



**Damage arising from improper oil check!**

**Improper oil check can cause injury to staff and material.**

- ▶ Power off the machine and secure it to prevent it from being switched on inadvertently!
- ▶ Wait until the machine has 30 minutes of downtime!
- ▶ Only check oil level after the machine has stopped!
- ▶ The oil level must, by no means rise over the top mark of the oil sight glass!

#### Checking oil level.

The specified oil level of the machine (1) is the mid marking of the oil sight glass.

- ▶ Top up oil as required.

#### 8.6.1 Oil fill quantities

| Type  | Fill quantity [l] [dm <sup>3</sup> ] | Type  | Fill quantity [l] [dm <sup>3</sup> ] |
|-------|--------------------------------------|-------|--------------------------------------|
| RT100 | 0,30                                 | TT075 | 0,45                                 |
| RT160 | 0,60                                 | TT125 | 0,45                                 |
| RT200 | 0,80                                 | TT250 | 1,10                                 |
| RT250 | 1,00                                 | TT315 | 4,50                                 |
| RT400 | 9,50                                 |       |                                      |
| RT500 | 19,00                                |       |                                      |
| RT630 | 30,00                                |       |                                      |

## 8.7 Lubrication

### 8.7.1 Requirements for lubricants

#### General

To ensure safe operation and a long service life, it is necessary to lubricate the machine carefully. The specified oil and grease must be applied to all lubrication points.

Carefully clean dirty lubrication points using a suitable agent and then lubricate them with new lubricant. After lubrication, any excess lubricant must be removed and properly disposed of.

The oil and grease used must be silicone-free.

#### Lubricating oil

Use only lubricating oil compliant with DIN 51 517 (ISO VG 460 )

#### Recommended gear oil

| Manufacturer  | Designation               |
|---------------|---------------------------|
| Mobil         | Mobilgear 600 XP 460      |
| BP            | Energol GR-XP 460         |
| SHELL         | Omala 460                 |
| LIQUI MOLY    | meguin Getriebeöl CLP 460 |
| Zeller+Gmelin | Divinol ICL ISO 460       |
| Klüber        | Klüberoil GEM 1 N         |

#### Lubricating grease

Use only lubricating grease compliant with DIN 51 825-KP 2K.

#### Recommended lubricating grease:

| Manufacturer  | Designation       |
|---------------|-------------------|
| Mobil         | Mobilux EP2       |
| BP            |                   |
| SHELL         |                   |
| LIQUI MOLY    |                   |
| Zeller+Gmelin | Divinol Fett EP 2 |
| Klüber        | -                 |
| THK           | THK lubricant AFA |

#### Note:

Only use lithium soap based grease for lubrication. The use of greases based on different materials causes gummy deposits, decomposes the grease and destroys its lubricating properties.

## 8.8 Lubricating Rotary indexing table

Staff                      Protective equipment

Qualified staff



### Tools and accessories required

Grease gun with adapter.

Lubricating grease: Mobil – Mobilux EP2

The Rotary indexing table of type RT400 on are equipped with grease nipples and must be serviced according to the maintenance plan.

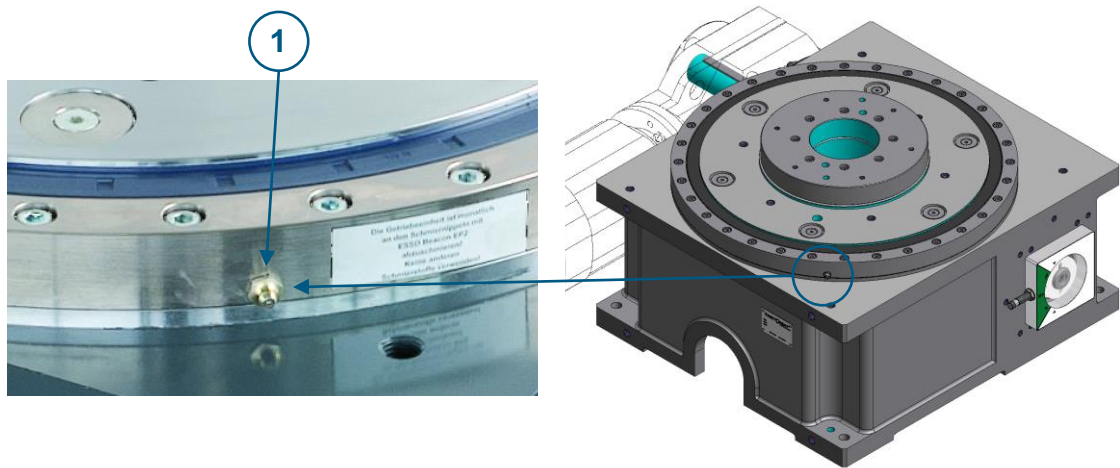


Figure 32 Detail grease nipple Rotary indexing table Type RT400 on

(1) Grease nipple

- ▶ Apply grease to the grease nipple (1) using the grease gun.
- ▶ Remove excess grease.

### 8.8.1 Graese quantity

| Type  | Graese quantity [gr] | Type  | Graese quantity [gr] |
|-------|----------------------|-------|----------------------|
| RT400 | 98,0                 | TT315 |                      |
| RT500 | 123,0                |       |                      |
| RT630 | 160,0                |       |                      |
|       |                      |       |                      |

## 8.9 Replacing cam follower

### 8.9.1 Safety information



#### **⚠ DANGER**

**Risk of death by electrocution!**

**There is an immediate risk of fatal injury due to electric shock if live components are touched.**

**Damage to the insulation or to individual components can cause fatal injury.**

- ▶ Only allow work on the electrical system to be carried out by qualified electrical engineers.
- ▶ In the event of damage to the insulation, immediately shut off the power supply and initiate a repair.
- ▶ Before starting work on active parts of the electrical system or equipment, ensure that it is completely powered down and cannot be switched on again.

#### Staff

Qualified staff

#### Protective equipment



Check the machine for play. Cam followers have to be changed if there is play in one or more positions.

**The following assembly sequence must be strictly adhered to.**

The cylinder cam rotary indexing table must first be isolated from the power supply to allow the Taktomat cam follower (TKR) to be removed and maintained safely and efficiently. Any external accessories that obstruct access to the cam follower must be removed correctly.

The following tools are required to remove the TKR cam follower:

- Clip hooks, flat-blade screwdriver
- Internal circlip pliers
- Internal extractor
- Hexagonal socket set

The following replacement parts and consumables are recommended:

- Cap plug
- Retaining ring
- Schnorr locking washer
- TKR Taktomat cam follower

### 8.9.2 Assembly sequence replacing cam follower of type RT - TT

#### NOTICE



Damage arising from improper securing the rotary indexing table against dirt during the repair!  
 Improper securing the machine against dirt can cause injury to material.

- ▶ Steps must be taken to ensure that no foreign bodies can get inside the cylinder cam rotary indexing table.
- ▶ It is therefore recommended that the holes from which the idler bushes have been withdrawn should be covered!

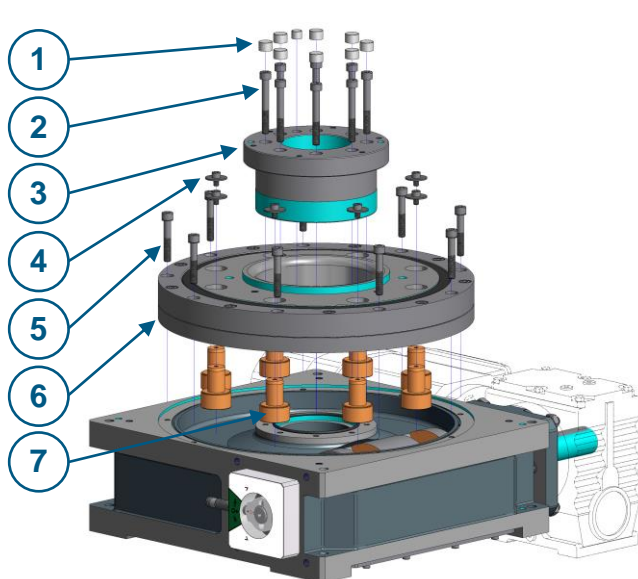


Abb. 33 Detail assembly sequence cam follower RT

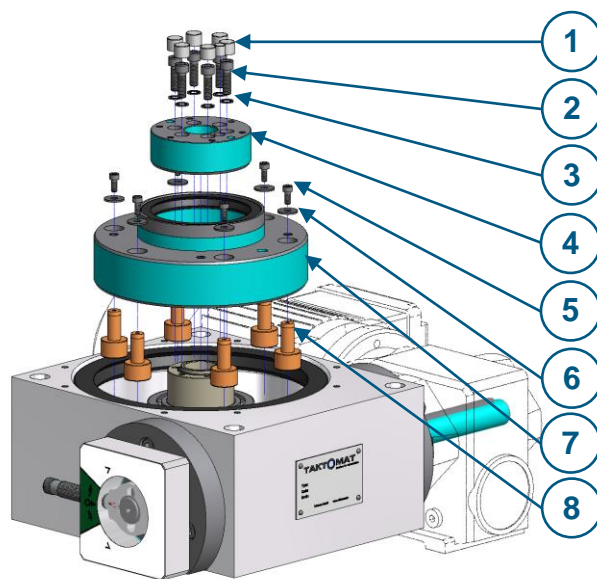


Abb. 34 Detail assembly sequence cam follower TT

(1) to (8) Sequence of work steps RT to TT

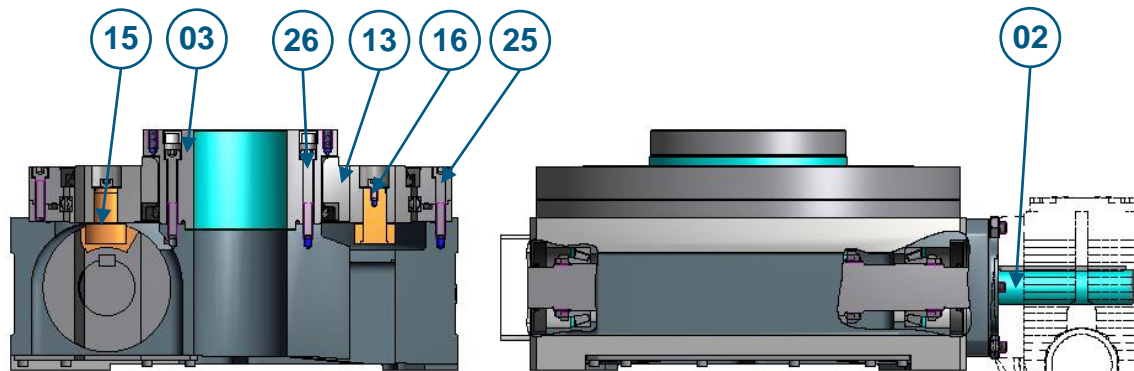
**8.9.2.1 Assembly sequence replacing cam follower of type RT**


Figure 35 Detail replacing cam follower RT

| Pos | Designation                |
|-----|----------------------------|
| 02  | Input shaft (drive)        |
| 03  | Center column              |
| 13  | Star wheel / output flange |
| 15  | Cam follower               |
| 16  | Screws + washer            |
| 25  | Long screw                 |
| 26  | Screws                     |

| Step | Action  |
|------|---|
| (1)  | ▶ Turn input shaft (drive) <b>02</b> to the middle of the dwell. In the standard version, the grooves of the keyways point upwards.   |
| (2)  | ▶ Loosen Screws <b>26</b> of the housing (every screw).<br>▶ Remove center column.<br>▶ Loosen the long screws <b>25</b> of the housing (every second screw).<br>▶ The wire race bearing is mounted and prestressed in the assembly ring. |
| (3)  | ▶ In an upward direction, pull out the output flange <b>13</b> with appropriate sling equipment.  |
| (4)  | ▶ Check cam follower.   |
| (6)  | ▶ Remove cam followers <b>15</b> . Replace the damaged and the two adjacent cam followers.  |
| (7)  | ▶ Reassemble in reverse order.  |

### 8.9.2.2 Assembly sequence replacing cam follower of type TT

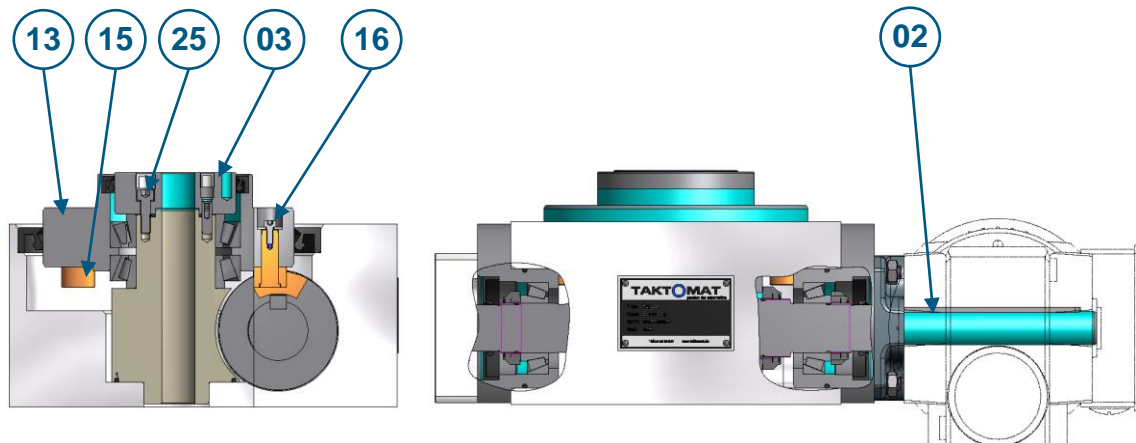


Figure. 36 Detail replacing cam follower TT

| No.. | Designation                |
|------|----------------------------|
| 02   | Input shaft (drive)        |
| 03   | Center column              |
| 13   | Star wheel / output flange |
| 15   | Cam follower TKR           |
| 16   | Screws + washer            |
| 25   | Screws                     |

| Step | Action  |
|------|---|
| (1)  | ▶ Turn input shaft (drive) <b>02</b> to the middle of the dwell. In the standard version, the grooves of the keyways point upwards. |
| (2)  | ▶ Loosen Screws <b>25</b> of the housing (every screw).<br>▶ Remove center column.  |
| (3)  | ▶ In an upward direction, pull out the output flange <b>13</b> with appropriate sling equipment.                                    |
| (4)  | ▶ Check cam followers.  |
| (5)  | ▶ Loosen the locking screws <b>16</b> on cam followers that has to be replaced.   |
| (6)  | ▶ Remove cam follower <b>15</b> . Replace the damaged and the two adjacent cam followers.   |
| (7)  | ▶ Reassemble in reverse order.  |

### 8.9.2.3 Torque table

| Steel screws Quality grade 8.8 | Torque (Nm) |
|--------------------------------|-------------|
| M4                             | 3,3         |
| M5                             | 6,5         |
| M6                             | 11,3        |
| M8                             | 27,3        |
| M10                            | 54          |
| M12                            | 93          |
| M14                            | 148         |
| M16                            | 230         |

## 9 Troubleshooting

### 9.1 Safety information

#### **DANGER**



**Risk of death by electrocution!**

There is an immediate risk of fatal injury due to electric shock if live components are touched.

Damage to the insulation or to individual components can cause fatal injury.

- ▶ Only allow work on the electrical system to be carried out by qualified electrical engineers.
- ▶ In the event of damage to the insulation, immediately shut off the power supply and initiate a repair.
- ▶ Before starting work on active parts of the electrical system or equipment, ensure that it is completely powered down and cannot be switched on again.

#### **WARNING**



**Risk of injury from improper troubleshooting!**

Improper troubleshooting can cause serious injury to staff and material.

- ▶ Before starting work ensure that there is sufficient room to carry out the work.
- ▶ Pay attention to tidiness and cleanliness in the working area! Loose parts and tools which are piled up or lying around are sources of accidents.

| Fault  | Possible cause  | Remedy   |
|--|---|--|
| Drive does not turn  | <ul style="list-style-type: none"> <li>• No power supply</li> <li>• Drive contactor malfunction</li> <li>• Drive protection switch triggered</li> <li>• Brake not released</li> </ul>                         | <ul style="list-style-type: none"> <li>▶ Check power supply</li> <li>▶ Change contactor</li> <li>▶ Let the drive cool down; latch the protection switch of the drive</li> <li>▶ Incorrectly connected or worn brake</li> <li>▶ Check sensor settings at the switching cam.</li> <li>▶ Check sensor cable at the sensor.</li> </ul> |
| Drive turns, but the mounting plate does not move.                                 | <ul style="list-style-type: none"> <li>• Worm gear malfunction</li> <li>• Safety coupling overload / disengaged</li> <li>• Cam followers tear off due to massive overload</li> <li>• Levers broken</li> </ul> | <ul style="list-style-type: none"> <li>▶ Contact TAKTOMAT</li> <li>▶ Remove outside blockade / latch the safety coupling</li> <li>▶ Contact TAKTOMAT</li> <li>▶ Contact TAKTOMAT</li> </ul>  |
| Drive turns, but mounting plate does not move, mounting plate is not free of play. | <ul style="list-style-type: none"> <li>• Cam follower tear off due to overload</li> </ul>   | <ul style="list-style-type: none"> <li>▶ Contact TAKTOMAT</li> </ul>   |



## 9.2 Disassembly



### **! DANGER**

**Risk of death by electrocution!**

**There is an immediate risk of fatal injury due to electric shock if live components are touched.**

**Damage to the insulation or to individual components can cause fatal injury.**

- ▶ Only allow work on the electrical system to be carried out by qualified electrical engineers.
- ▶ In the event of damage to the insulation, immediately shut off the power supply and initiate a repair.
- ▶ Before starting work on active parts of the electrical system or equipment, ensure that it is completely powered down and cannot be switched on again.

#### **Before starting disassembly:**

- ▶ Disconnect all power supplies to the machine and ensure that it cannot be reconnected.
- ▶ Disassemble assemblies and components, observing any local environmental protection regulations.

## 9.3 Disposal

- ▶ If no return or disposal agreement has been concluded, dispose of the components in a recycling facility after they have been properly disassembled.
- ▶ Scrap metal parts.

## 10 Spare part and wear part

Spare part must meet the manufacturer's technical specifications. This is always ensured if original Spare part are used.

### 10.1 Spare part and wear part Type RT - TT

Spare part and wear part of the product Rotary indexing table are basically order specific. To accelerate the order process of the Spare part and wear part, we need the following information which is located on the rating plate: Serial number of the machine.

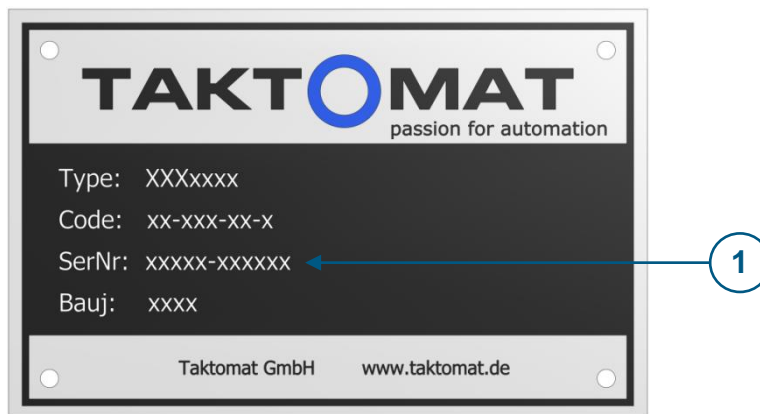
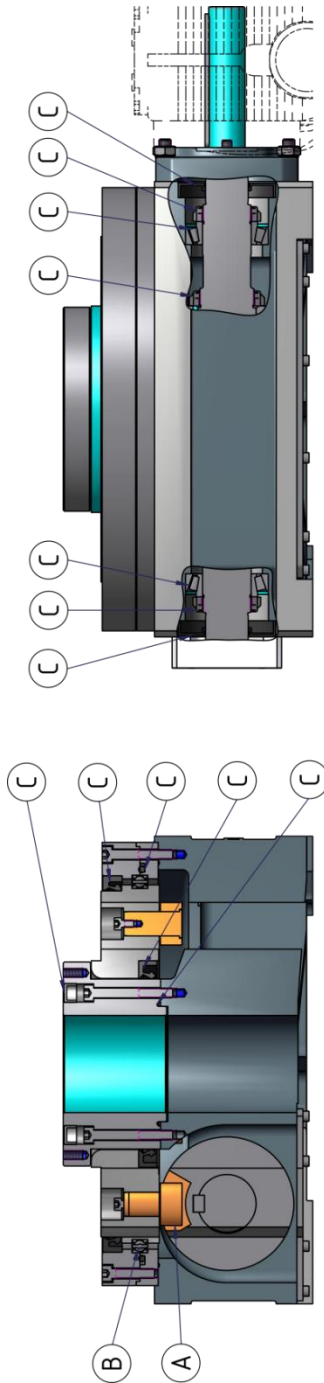


Figure 37 Example Rating plate

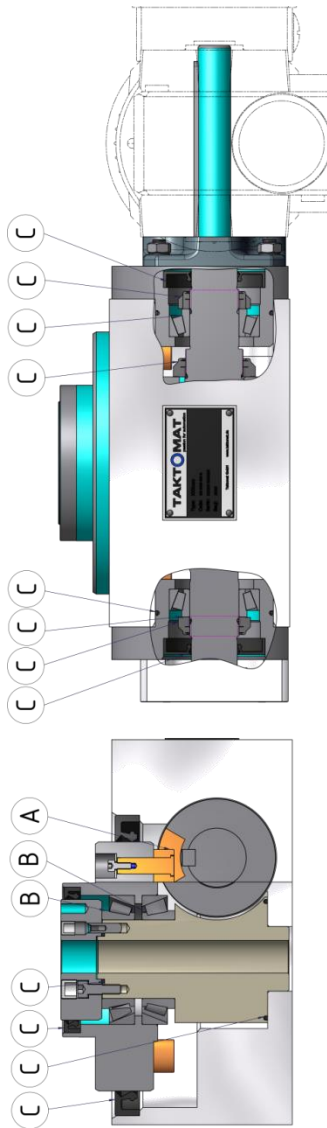
Position (1) Serial number

## 10.1.1 Spare part and wear part Type RT



| No | Designation   | RT100S03<br>Index no. | RT160S03<br>Index no. | RT200S03<br>Index no. | RT250S03<br>Index no. | RT400S03<br>Index no. | RT500S03<br>Index no. | RT630S03<br>Index no. | Tear part (ET)/ Wear<br>part (VT) |
|----|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------------------|
| A  | Cam follower TKR 2 Stopp                            | 308712                | 300281                | 300281                | 300281                | 305590                | 304998                | 317137                | VT                                |
| A  | Cam follower TKR 3 Stop                             | 300282                | 300281                | 300281                | 300281                | 305590                | 304997                |                       | VT                                |
| A  | Cam follower TKR 4 Stop                             | 300282                | 301233                | 300281                | 308800                | 305820                | 317275                |                       | VT                                |
| A  | Cam follower TKR 5 Stop                             | 300282                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 6 Stop                             | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 8 Stop                             | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 10 Stop                            | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 12 Stop                            | 300282                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 16 Stop                            | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 20 Stop                            | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 24 Stop                            | 300282                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| A  | Cam follower TKR 30 Stop                            | 300282                | 301233                | 300281                | 308800                | 305590                |                       |                       | VT                                |
| A  | Cam follower TKR 36 Stop                            | 313237                | 301233                | 300281                | 308800                | 305820                |                       |                       | VT                                |
| B  | Wier race bearing                                   | 301107                | 301097                | 313804                | 301123                | 303413                | 323718                | 307020                | VT                                |
| C  | Assembly kit<br>(includes bearings and<br>sealings) | 324763                | 325038                | 323761                | 323504                | 323612                | 317800                | 312054                | VT                                |

### 10.1.2 Spare part and wear part Type TT



| No | Designation                                      | TT075S03<br>Item no. | TT125S03<br>Item no. | TT252<br>Item no. | TT315S03<br>Item no. | Spare part(ET)/ Wear<br>part (VT) |
|----|--|----------------------|----------------------|-------------------|----------------------|-----------------------------------|
| A  | Cam follower TKR 2 Stop                          | 308712               | 308712               | 308712            | 305590               | VT                                |
| A  | Cam follower TKR 3 Stop                          | 301615               | 308712               | -                 | -                    | VT                                |
| A  | Cam follower TKR 4 Stop                          | 308712               | 313237               | 300281            | 305590               | VT                                |
| A  | Cam follower TKR 5 Stop                          |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 6 Stop                          |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 8 Stop                          |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 10 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 12 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 16 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 20 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 24 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 30 Stop                         |                      |                      |                   |                      |                                   |
| A  | Cam follower TKR 36 Stop                         |                      |                      |                   |                      |                                   |
| B  | Tapered roller bearing                           | 301497               | 300305               | 300304            | 305352               | VT                                |
| C  | Assembly kit<br>(includes bearings and sealings) | -                    | 311283               | 304590            | 303270               | VT                                |