Pneumatic front-end chuck
ROTA TB2 / ROTA TB2 LH
Assembly and Operating Manual
Dear Customer,

thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under (☞ 1.1.2, Page 6) are applicable.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="DANGER" /></td>
<td>Danger for persons! Non-observance will inevitably cause irreversible injury or death.</td>
</tr>
<tr>
<td><img src="image" alt="WARNING" /></td>
<td>Dangers for persons! Non-observance can lead to irreversible injury and even death.</td>
</tr>
<tr>
<td><img src="image" alt="CAUTION" /></td>
<td>Dangers for persons! Non-observance can cause minor injuries.</td>
</tr>
<tr>
<td><img src="image" alt="CAUTION" /></td>
<td>Material damage! Information about avoiding material damage.</td>
</tr>
</tbody>
</table>
1.1.2 Applicable documents

- General terms of business
- Catalog data sheet of the purchased product
- Calculation of the jaw centrifugal forces, "Technology" chapter in the lathe chuck catalog

The documents marked with an asterisk (*) can be downloaded on our homepage schunk.com.

1.1.3 Sizes

This operating manual applies to the following sizes:

- ROTA TB2 470-185 / 470-185 LH
- ROTA TB2 600-275 / 600-275 LH
- ROTA TB2 685-325 / 685-325 LH
- ROTA TB2 850-375 / 850-375 LH
- ROTA TB2 1000-560 / 1000-560 LH

1.2 Warranty

The warranty period is 24 months after delivery date from factory or 500,000 cycles*, if it is used as intended, under the following conditions:

- Observe the applicable documents, (1.1.2, Page 6)
- Observe the ambient conditions and operating conditions.
- Observe the specified maintenance and lubrication intervals, (1.7, Page 43)

Parts touching the workpiece and wear parts are not included in the warranty.

* A cycle consists of a complete clamping process ("Open" and "Close").

1.3 Scope of delivery

1. Lathe chuck ROTA TB2 (LH)
6. T-nuts
2. Elbow connectors
2. Straight connectors
9 or 12. Fastening screws
1. Eye bolt
1. Operating manual
2 Basic safety notes

2.1 Intended use

This product is intended for clamping workpieces on machine tools and other suitable technical devices.

- The product may only be used within the scope of its technical data, (☞ 3, Page 20).
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.
- The maximum RPM of the chuck and the required clamping force must be determined by the user for the respective clamping task based on the applicable standards and technical specifications of the manufacturer. (See also “Calculations for clamping force and RPM” in the chapter “Technical data”). (☞ 3, Page 20)

2.2 Not intended use

A not intended use of the product is for example:

- It is used as a press, a punch, a toolholder, a load-handling device or as lifting equipment.
- the product is used for unintended machines or workpieces.
- the technical data is exceeded when using the product. (☞ 3, Page 20)
- if workpieces are not clamped properly, paying particular attention to the clamping forces specified by the manufacturer.
- if it is used in working environments that are not permissible.
- if the product is operated without a protective cover.

2.3 Constructional changes

Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.
2.4 Spare parts

Use of unauthorized spare parts
Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.
- Use only original spare parts or spares authorized by SCHUNK.

2.5 Environmental and operating conditions

Required ambient conditions and operating conditions
Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.
- Make sure that the product is used only in the context of its defined application parameters, (☞ 3, Page 20).
- Make sure that the product is a sufficient size for the application.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.

Clamping force tester
Depending on the operating conditions, the function and clamping force must be checked after a certain period of operation (☞ 7.2.1, Page 47). Only use a calibrated clamping force tester for measuring during the clamping force test.

With the smallest possible actuating pressure (clamping cylinder), the base jaws should move evenly. This method only provides a limited indication and is not a substitute for measuring the clamping force.

If the clamping force has dropped too much or if the base jaws and pistons no longer move properly, the chuck must be disassembled, cleaned, and relubricated (☞ 7, Page 43).

2.6 Notes on safe operation

- The machine spindle may only be started up when clamping pressure has built up in the cylinder and clamping has followed in the permitted work area.
- Unclamping may only be possible when the machine spindle has come to a standstill.
• If the clamping energy fails, the workpiece must remain firmly clamped until the spindle is shut down and the workpiece is secured.
• The technical safety requirements in the respective operating instructions must be observed exactly.

Function check
After setting up the chuck, it must be checked to ensure that it is functioning properly prior to commissioning.

Two important points are:

Clamping force! The clamping force specified for the chuck must be reached at the maximum actuating force/pressure.

Stroke monitoring! The pressure should be monitored by the lathe by means of mechanical pressure monitoring or wirelessly via an RSS-P1.

Stroke monitoring of ROTA TB2 chuck with continuous stroke: The base jaw edge should be within the marked area during clamping.

ROTA TB2 chuck with dual stroke (LH version):
Visual check: The gold-colored indicator pin (on each jaw) should not protrude and the base jaw edge should be within the area marked “Clamping Zone”.

![Diagram of ROTA TB2 chuck with dual stroke (LH version)]
Optional stroke monitoring of the switch cam with stationary inductive proximity switch:
Neither of the two proximity switches should be wired.
When defining the required clamping force for machining a workpiece, the centrifugal force of the clamping jaws must be taken into account (according to VDI 3106).
If the clamping jaws are changed, then it is necessary to adapt the stroke monitoring to the new situation.

**Speed**

⚠️ **DANGER**

Possible risk of fatal injury to operating personnel if the chuck's top speed is exceeded and a workpiece is released or parts fly off.
If the machine tool or technical equipment can reach a higher speed than the chuck's top speed, a reliable speed limiter must be installed and proof must be provided that the speed limiter is effective.

**Maintenance instructions**
The chuck's reliability and safety can only be guaranteed if the operator complies with the manufacturer's maintenance instructions.

- For lubrication, we recommend our tried and tested special grease, LINOMAX plus. Unsuitable lubricants can have a negative impact on the functioning of the chuck (clamping force, coefficient of friction, wear characteristics).
  (For product information about LINOMAX plus, see the "Accessories" chapter of the SCHUNK lathe chuck catalog or contact SCHUNK).
• Use a suitable high-pressure grease gun to ensure that you reach all the greasing areas.
• To ensure correct distribution of the grease, move the clamping piston to its end positions several times, lubricate again, and then check the clamping force.
• We recommend checking the clamping force using a clamping force tester before starting a new production run and between maintenance intervals. "Only regular checks can guarantee optimal safety."
• The clamping force should always be measured in the state of the chuck as used for the current clamping situation. If top jaws with clamping steps are used, measuring must be performed in the same step as for the respective clamping task. In the event of high operating speeds, clamping force losses must be accounted for due to the centrifugal force acting on the chuck jaws. The operating clamping force must in this case be determined by means of dynamic measurement.
• Move the clamping piston through to its end position several times after 500 clamping strokes, at the latest. (This moves the lubricant back to the surfaces of the force transmission. This means that the clamping force is retained for longer).

Following a longer shutdown period (more than 6 hours), always re-tension the clamped lathe chuck in order to compensate for the setting properties of the clamping situation or possible pressure losses and the resulting loss of clamping force.

**Safety notes for servicing**

Follow all the applicable legal norms for health and safety during servicing. Use suitable personal protective equipment, especially protective gloves, goggles and safety boots, paying particular attention to the operating system and hazard assessment.

![DANGER]

**Possible risk of fatal injury to operating personnel due to chuck failure if the servicing instructions for the chuck are disregarded!**

The servicing instructions specified by the manufacturer must be complied with to ensure safe operation of the chuck. Work must be carried out by qualified specialist personnel with the relevant safety training.
Use of special chuck jaws
When using special chuck jaws, please observe the following rules:

• The chuck jaws should be designed to be as light and as low as possible. The clamping point must be as close as possible to the chuck face (clamping points at a greater distance lead to greater surface pressure in the jaw guidance and can significantly reduce the clamping force).

• Do not use welded jaws.

• If for constructional reasons the chuck jaws in special design are heavier than the top jaws assigned to the clamping device, greater centrifugal forces must be accounted for when defining the required clamping force and the recommended speed.

• Screw the jaw mounting screws into the bore holes furthest apart.

• The maximum recommended speed may only be operated in conjunction with maximum actuating force and only with the chuck in optimal, fully functioning condition.

• If the chuck is involved in a collision, it must be subjected to a crack test before using it again. Replace damaged parts with original SCHUNK spare parts.

• Replace the chuck jaw mounting screws if there are signs of wear or damage. Only use screws with a quality of 12.9.

2.6.1 Substantial modifications

No substantial modifications may be made to the chuck.

If the operator carries out a substantial modification to the chuck, the product shall no longer conform to the EC Machinery Directive 2006/42/EC.

2.7 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

• All work may only be performed by qualified personnel.

• Before working with the product, the personnel must have read and understood the complete assembly and operating manual.

• Observe the national safety regulations and rules and general safety instructions.
Basic safety notes

The following personal qualifications are necessary for the various activities related to the product:

**Trained electrician**  
Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

**Qualified personnel**  
Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

**Instructed person**  
Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.

**Service personnel of the manufacturer**  
Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

### 2.8 Personal protective equipment

**Use of personal protective equipment**

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.
2.9 Transport

Handling during transport
Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.10 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.11 Disposal

Handling of disposal
The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.12 Fundamental dangers

General
- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
• Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
• If the energy supply is connected, do not move any parts by hand.
• Do not reach into the open mechanism or movement area of the product during operation.

2.12.1 Protection during handling and assembly

Incorrect handling and assembly
Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.
• Have all work carried out by appropriately qualified personnel.
• For all work, secure the product against accidental operation.
• Observe the relevant accident prevention rules.
• Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads
Falling loads may cause serious injuries and even death.
• Stand clear of suspended loads and do not step into their swiveling range.
• Never move loads without supervision.
• Do not leave suspended loads unattended.

2.12.2 Protection during commissioning and operation

Falling or violently ejected components
Falling and violently ejected components can cause serious injuries and even death.
• Take appropriate protective measures to secure the danger zone.
• Never step into the danger zone during operation.

2.12.3 Protection against dangerous movements

Unexpected movements
Residual energy in the system may cause serious injuries while working with the product.
• Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
• Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it
must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.

- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

2.12.4 Notes on particular risks

**DANGER**

Risk of fatal injury to operating personnel due to the workpiece falling down or being flung out in the event of a power failure

In the event of a power failure, the lathe chuck's clamping force may fail immediately and the workpiece may be released in an uncontrolled manner. This poses a risk of death or injury to the operating personnel and can result in serious damage to the automated system.

- The machine manufacturer and the operator of the machine must carry out and document a hazard assessment and risk analysis to ensure that suitable measures are taken to maintain the lathe chuck's clamping force until the machine comes to a standstill and the workpiece can be secured (e.g. using a crane or suitable lifting equipment).

- The machines and equipment must fulfill the minimum requirements of the EC Machinery Directive; specifically, they must have effective technical measures to protect against potential mechanical hazards.
**DANGER**

Possible risk of fatal injury to operating personnel if a jaw breaks or if the lathe chuck fails because the technical data have been exceeded and a workpiece is released or parts fly off

- The technical data specified by the manufacturer for using the lathe chuck must never be exceeded.
- The lathe chuck may only be used on machines and facilities that fulfill the minimum requirements of the EC Machinery Directive; specifically, they must have effective technical measures to protect against possible mechanical hazards.

**DANGER**

Possible risk of fatal injury to operating personnel from clothing or hair being caught on the lathe chuck and being dragged into the machine

Loose clothing or long hair may become caught on projecting parts of the lathe chuck and be drawn into the machine.

- The machines and equipment must fulfill the minimum requirements of the EC Machinery Directive; specifically, they must have effective technical measures to protect against potential mechanical hazards.
- Always wear tight-fitting clothing and a hairnet when working on the machine and the lathe chuck.

**WARNING**

Risk of injury due to dropping the chuck during transport, installation or removal.

- Take special care in the danger zone when transporting, installing or removing the chuck.
- Note the relevant load securing regulations for working safely with cranes, ground conveyors, lifting gear and load-handling equipment.
## Basic safety notes

### CAUTION

**Danger of slipping and falling in case of dirty environment where the chuck is used (e.g. by cooling lubricants or oil).**

- Ensure that the working environment is clean before starting assembly and installation work.
- Wear suitable safety shoes.
- Follow the safety and accident-prevention regulations when operating the chuck, especially when working with machine tools and other technical equipment.

### CAUTION

**Danger of limbs being crushed by opening and closing of the chuck jaws during manual loading and unloading or when replacing moving parts.**

- Do not reach between the jaws.
- Wear safety gloves.
- Observe the safety and accident prevention regulations during operation of the chuck, especially in connection with machining centers and other technical equipment.

### CAUTION

**Risk of burns due to workpieces with high temperatures.**

- Wear protective gloves when removing the workpieces.
- Automatic loading is preferred.
Basic safety notes

⚠️ CAUTION

Danger of damage due to incorrectly selected clamping position of the clamping jaws to the workpiece.
An incorrectly selected clamping position of the clamping jaws to the workpiece can result in damage to the base and top jaws.

- Make sure that the workpiece clamping is concentric.
- In the case of a chuck with a quick-change jaw system the top jaws must not protrude radially beyond the base jaws used. **Exception:** The supporting jaw variant 3 protrudes beyond the chuck base jaw due to the construction of the jaw. In this case, the T-nuts must always be inserted completely into the groove of the chuck base jaw.

⚠️ CAUTION

Hazard from vibration due to imbalanced rotating parts and noise generation.
Physical and mental strains due to imbalanced workpieces and noise during the machining process on the clamped and rotating workpiece.

- Ensure the chuck's axial and concentric runout.
- Check options for remedying imbalances on special top jaws and workpieces.
- Reduce the speed.
- Wear hearing protection.

2.13 2-jaw chuck

In the 2-jaw version the maximum actuating force must be limited to 6 bar (temporary load).
In the 2-jaw version the working pressure must be limited to 5.5 bar.
### 3 Technical data

#### 3.1 Chuck data

<table>
<thead>
<tr>
<th>ROTA TB2</th>
<th>470-185</th>
<th>600-275</th>
<th>685-325</th>
<th>850-375</th>
<th>1000-560</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer diameter Ftk / distributor ring [mm]</td>
<td>470 / 467</td>
<td>605 / 605</td>
<td>685 / 685</td>
<td>850 / 850</td>
<td>1000 / 925</td>
</tr>
<tr>
<td>Distributor ring diameter [mm]</td>
<td>400</td>
<td>535</td>
<td>610</td>
<td>775</td>
<td>850</td>
</tr>
<tr>
<td>Total clamping force at 6 bar [kN]</td>
<td>115</td>
<td>200</td>
<td>280</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Chuck through-hole [mm]</td>
<td>185</td>
<td>275</td>
<td>325</td>
<td>375</td>
<td>560</td>
</tr>
<tr>
<td>Overall stroke per jaw [mm]</td>
<td>7</td>
<td>11.7</td>
<td>10</td>
<td>11.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Operating pressure min/max [bar]</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
</tr>
<tr>
<td>Speed [rpm]</td>
<td>1700</td>
<td>1300</td>
<td>1000</td>
<td>750</td>
<td>500</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>182</td>
<td>366</td>
<td>440</td>
<td>908</td>
<td>1012</td>
</tr>
<tr>
<td>Jaw serration</td>
<td>3/32&quot;x90&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrifugal force of the base jaw $M_{cGB}$ [kgm]</td>
<td>0.68</td>
<td>1.06</td>
<td>1.81</td>
<td>4.17</td>
<td>4.33</td>
</tr>
<tr>
<td>Max. jaw eccentricity of center of gravity in axial direction $a_{max}$ [mm]</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>42</td>
<td>42</td>
</tr>
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</table>

<table>
<thead>
<tr>
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<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Chuck through-hole [mm]</td>
<td>185</td>
<td>275</td>
<td>275</td>
<td>375</td>
<td>560</td>
</tr>
<tr>
<td>Overall stroke per jaw [mm]</td>
<td>20</td>
<td>25.4</td>
<td>38.1</td>
<td>25.4</td>
<td>12.8</td>
</tr>
<tr>
<td>Fast stroke / clamping stroke [mm]</td>
<td>13 / 7</td>
<td>16.9 / 8.5</td>
<td>28.1 / 10</td>
<td>13.4 / 12</td>
<td>15 / 10.4</td>
</tr>
<tr>
<td>Operating pressure min/max [bar]</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
<td>2 / 8</td>
</tr>
<tr>
<td>Speed [rpm]</td>
<td>1300</td>
<td>1100</td>
<td>1000</td>
<td>750</td>
<td>500</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>194</td>
<td>366</td>
<td>431</td>
<td>1009</td>
<td>1000</td>
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</tbody>
</table>
### Torques per screw

<table>
<thead>
<tr>
<th>ROTA TB2</th>
<th>470-185 LH</th>
<th>600-275 LH</th>
<th>630-275 LH</th>
<th>850-375 LH</th>
<th>1000-560 LH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaw serration</td>
<td>3/32&quot;x90°</td>
<td>0.67</td>
<td>1.19</td>
<td>1.45</td>
<td>4.57</td>
</tr>
<tr>
<td>Centrifugal force of the base jaw $M_{cGB}$ [kgm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. jaw eccentricity of center of gravity in axial direction $a_{max}$ [mm]</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>42</td>
<td>42</td>
</tr>
</tbody>
</table>

The specified maximum speed of rotation stated only applies when using the maximum clamping force and the SHB-type, hard, standard stepped jaws that go with the chuck.

![WARNING]

**Risk of personal injury and property damage due to parts flying off in the event of a screw breakage on unhardened top jaws!**

Soft standard top jaws must be hardened in the countersink region.

They should only be depth-hardened, not surface-hardened.

If unhardened top jaws or chuck jaws in a special design are used, ensure that the jaws weigh as little as possible. For soft top jaws or jaws in special design jaws the speed permitted for the cutting task must be calculated in accordance with VDI 3106 whereby the max. recommended speed may not be exceeded. The calculated values must be checked by dynamic measurement. Function monitoring (piston movement and actuating pressure) must be performed in accordance with the guidelines of the Berufsgenossenschaft (employers' mutual insurance association).

### 3.2 Clamping force / speed diagrams

The diagrams refer to a 3-jaw chuck.

Clamping force/speed curves were determined with hard standard stepped jaws SHB, SWB and SWB-AL. The maximum actuating force was introduced and the jaws were placed flush with the base jaw outer edge.

The chuck is in perfect condition and lubricated with SCHUNK LINO MAX special grease.

Should one or several of the above mentioned parameters be changed the diagrams are no longer valid.
Torques per screw

**Chuck set-up for clamping force / speed diagram**

<table>
<thead>
<tr>
<th>F/3</th>
<th>Clamping force per jaw</th>
<th>S</th>
<th>Center of gravity</th>
</tr>
</thead>
<tbody>
<tr>
<td>r_s</td>
<td>Center of gravity radius</td>
<td>a_max</td>
<td>Max. jaw eccentricity of center of gravity in axial direction</td>
</tr>
<tr>
<td>F_{max}</td>
<td>Max. actuating force</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Clamping force-RPM diagram ROTA TB2 470-185**

**Clamping force-RPM diagram ROTA TB2 600-275**
Torques per screw

Clamping force-RPM diagram ROTA TB2 685-325

- SP-HB 630
  - 17.4 kg
  - \( r_S = 229.5 \text{ mm} \)
- SP-WB 630
  - 34.1 kg
  - \( r_S = 214.5 \text{ mm} \)

Required minimum clamping force 33%

Clamping force-RPM diagram ROTA TB2 850-375

- SP-WB 800
  - 30.6 kg
  - \( r_S = 276 \text{ mm} \)
- SP-HB 800
  - 43.2 kg
  - \( r_S = 276 \text{ mm} \)

Required minimum clamping force 33%

Clamping force-RPM diagram ROTA TB2 1000-560

- SP-HB 800
  - 30.6 kg
  - \( r_S = 407.5 \text{ mm} \)
- SP-WB 800
  - 43.2 kg
  - \( r_S = 357.5 \text{ mm} \)

Required minimum clamping force 33%

Clamping force-RPM diagram ROTA TB2 470-185 LH
Torques per screw

Clamping force-RPM diagram ROTA TB2 600-275 LH

Clamping force-RPM diagram ROTA TB2 630-275 LH

Clamping force-RPM diagram ROTA TB2 850-375 LH
3.3 Calculations for clamping force and speed

Missing information or specifications can be requested from the manufacturer.

<table>
<thead>
<tr>
<th>Legend</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$F_c$</td>
<td>Total centrifugal force [N]</td>
<td>$M_{cAB}$</td>
<td>Centrifugal torque of top jaws [Kgm]</td>
</tr>
<tr>
<td>$F_{sp}$</td>
<td>Effective clamping force [N]</td>
<td>$M_{cGB}$</td>
<td>Centrifugal torque of base jaws [Kgm]</td>
</tr>
<tr>
<td>$F_{sp\text{min}}$</td>
<td>minimum required clamping force [N]</td>
<td>$n$</td>
<td>Speed of rotation [RPM]</td>
</tr>
<tr>
<td>$F_{sp0}$</td>
<td>Initial clamping force [N]</td>
<td>$r_s$</td>
<td>Center of gravity radius [mm]</td>
</tr>
<tr>
<td>$F_{spz}$</td>
<td>Cutting force [N]</td>
<td>$r_{sAB}$</td>
<td>Center of gravity radius of top jaw [mm]</td>
</tr>
<tr>
<td>$m_{AB}$</td>
<td>Mass of one top jaw [kg]</td>
<td>$s_{sp}$</td>
<td>Safety factor for clamping force</td>
</tr>
<tr>
<td>$m_B$</td>
<td>Mass of chuck jaw set [kg]</td>
<td>$s_z$</td>
<td>Safety factor for machining</td>
</tr>
<tr>
<td>$M_c$</td>
<td>Centrifugal torque [kgm]</td>
<td>$\Sigma_s$</td>
<td>Max. clamping force of lathe chuck [N]</td>
</tr>
</tbody>
</table>

$\text{kgm} \times 9.81 = \text{Nm}$
3.3.1 Calculation of the required clamping force in case of a given rpm

The initial clamping force $F_{sp0}$ is the total force impacting radially on the workpiece via the jaws due to actuation of the lathe chuck during shutdown. Under the influence of rotation, the jaw mass generates an additional centrifugal force. The centrifugal force reduces or increases the initial clamping force depending on whether gripping is from the outside inwards or from the inside outwards.

The sum of the initial clamping force $F_{sp0}$ and the total centrifugal force $F_c$ is the effective clamping force $F_{sp}$.

$$F_{sp} = F_{sp0} \mp F_c [N]$$

(−) for gripping from the outside inwards
(+) for gripping from the inside outwards

---

**DANGER**

Risk to life and limb of the operating personnel and significant property damage when the RPM limit is exceeded! With gripping from the outside inwards, and with increasing RPM, the effective clamping force is reduced by the magnitude of the increasing centrifugal force (the forces are opposed). When the RPM limit is exceeded, the clamping force drops below the required minimum clamping force $F_{sp\text{min}}$. Consequently, the workpiece is released spontaneously.

- Do not exceed the calculated RPM.
- Do not fall below the necessary minimum clamping force.
The required effective clamping force for machining $F_{sp}$ is calculated from the product of the machining force $F_{spz}$ and the safety factor $S_z$. This factor takes into account uncertainties in the calculation of the machining force. According to VDI 3106: $S_z \geq 1.5$.

$$F_{sp} = F_{spz} \cdot S_z \text{ [N]}$$

From this we can derive the calculation of the initial clamping force during shutdown:

$$F_{sp0} = S_{sp} \cdot (F_{sp} \pm F_c) \text{ [N]}$$

(+) for gripping from the outside inwards
(−) for gripping from the inside outwards

**CAUTION**

This calculated force must not be larger than the maximum clamping force $\Sigma S$ engraved on the lathe chuck. See also "Lathe chuck data" table (sec 3.1, Page 20)

From the above formula it is evident that the sum of the effective clamping force $F_{sp}$ and the total centrifugal force $F_c$ is multiplied by the safety factor for the clamping force $S_{sp}$. According to VDI 3106, the following also applies here: $S_{sp} \geq 1.5$.

The total centrifugal force $F_c$ is dependent on both the sum of the masses of all jaws and on the center of gravity radius and the speed of rotation.

**CAUTION**

For safety reasons, in accordance with DIN EN 1550, the centrifugal force may be a maximum of 67% of the initial clamping force.

The formula for the calculation of the total centrifugal force $F_c$ is:

$$F_c = \sum (m_B \cdot r_s) \cdot \left(\frac{\pi \cdot n}{30}\right)^2 = \sum M_c \cdot \left(\frac{\pi \cdot n}{30}\right)^2 \text{ [N]}$$

For this, $n$ is the given speed of rotation in RPM. The product $m_B \cdot r_s$ is referred to as the centrifugal torque $M_c$.

$$M_c = m_B \cdot r_s \text{ [kgm]}$$

In case of toolholders with split chuck jaws, i.e., with base jaws and top jaws, for which the base jaws change their radial position only by the stroke amount, the centrifugal torque of the base jaws $M_{cGB}$ and the centrifugal torque of the top jaws $M_{cAB}$ need to be added:

$$M_{c} = M_{cGB} + M_{cAB} \text{ [kgm]}$$
The centrifugal torque of the base jaws $M_{cGB}$ can be found in the table "Lathe chuck data" (Page 20). The centrifugal torque of the top jaws $M_{cAB}$ is calculated as per:

$$M_{cAB} = m_{AB} \cdot r_{sAB} \text{[kgm]}$$

### 3.3.2 Calculation example: required initial clamping force for a given speed

**Required initial clamping force $F_{sp0}$ for a given RPM $n$**

The following data is known for the machining job:
- Gripping from the outside in (application-specific)
- Machining force $F_{spz} = 3000 \text{ N}$ (application-specific)
- max. RPM $n_{max} = 3200 \text{ RPM}$ ("Lathe chuck data" table)
- RPM $n = 1200 \text{ RPM}$ (application-specific)
- Mass of one (!) top jaw $m_{AB} = 5.33 \text{ kg}$ (application-specific)
- Center of gravity radius of top jaw $r_{sAB} = 0.107 \text{ m}$ (application-specific)
- Safety factor $S_z = 1.5$ (according to VDI 3106)
- Safety factor $S_{sp} = 1.5$ (according to VDI 3106)

**Note:** Masses of the jaw mounting screws and T-nuts are not taken into account.

First the required effective clamping force $F_{sp}$ is calculated using the machining force stated:

$$F_{sp} = F_{spz} \cdot S_z = 3000 \cdot 1.5 \Rightarrow F_{sp} = 4500 \text{ N}$$

Initial clamping force during shutdown:

$$F_{sp0} = S_{sp} \cdot (F_{sp} + F_c)$$

Calculation of total centrifugal force:

$$F_c = \sum M_c \cdot \left(\frac{\pi \cdot n}{30}\right)^2$$

For two-part chuck jaws, the following applies:

$$M_c = M_{cGB} + M_{cAB}$$

Take the centrifugal torque of the base jaw and top jaw specified from the "Lathe chuck data" table:

**$M_{cGB} = 0.319 \text{ kgm}$**

For the centrifugal torque of the top jaw, the following applies:

$$M_{cAB} = m_{AB} \cdot r_{sAB} = 5.33 \cdot 0.107 \Rightarrow M_{cAB} = 0.57 \text{ kgm}$$
Centrifugal torque for one jaw:
\[ M_c = 0.319 + 0.571 \Rightarrow M_c = 0.89 \text{ kgm} \]
The chuck has 3 jaws, the total centrifugal torque is:
\[ \sum M_c = 3 \cdot M_c = 3 \cdot 0.889 \Rightarrow \sum M_c = 2.667 \text{ kgm} \]
The total centrifugal force can now be calculated:
\[ F_C = \sum M_c \cdot \left( \frac{\pi \cdot n}{30} \right)^2 = 2.668 \cdot \left( \frac{\pi \cdot 1200}{30} \right)^2 \Rightarrow F_C = 42131 \text{ N} \]
Initial clamping force during shutdown that was sought:
\[ F_{SP0} = S_{SP} \cdot (F_{SP} + F_C) = 1.5 \cdot (4500 + 42131) \Rightarrow F_{SP0} = 69947 \text{ N} \]

### 3.3.3 Calculation of the permissible speed in case of a given initial clamping force

**Calculation of the permissible RPM** \( n_{perm} \) **in case of a given initial clamping force** \( F_{SP0} \)

The following formula can be used to calculate the permissible RPM for a given initial clamping force during shutdown:
\[
 n_{UL} = \frac{30}{\pi} \cdot \sqrt{\frac{F_{SP0} - (F_{SPz} \cdot S_2)}{\sum M_c}} \quad \text{[min}^{-1}] \]

**CAUTION**
For safety reasons, the calculated permissible RPM may not exceed the maximum RPM inscribed on the lathe chuck!

**Example of calculation: Permissible RPM for a given effective clamping force**

The following data is known from previous calculations:

- Initial clamping force during shutdown \( F_{SP0} = 17723 \text{ N} \)
- Machining force for machining job \( F_{SPz} = 3000 \text{ N} \) (application-specific)
- Total centrifugal torque of all jaws \( \sum M_c = 2,668 \text{ kgm} \)
- Safety factor \( S_2 = 1.5 \) (according to VDI 3106)
- Safety factor \( S_{SP} = 1.5 \) (according to VDI 3106)

**NOTE:**
Masses of the jaw mounting screws and T-nuts are not taken into account.

Identifying the permissible RPM:
The calculated RPM $n_{\text{perm}} = 1495$ RPM is smaller than the maximum permissible RPM of the lathe chuck $n_{\text{max}} = 3200$ RPM (see "Lathe chuck data" table (see 3.1, Page 20)).

This calculated RPM may be used.

### 3.4 Grades of Accuracy

Tolerances for radial and axial run-out accuracy correspond to the Technical Supply Terms for lathe chucks as per DIN ISO 3442-3.

### 3.5 Permissible imbalance

The ROTA TB2 / ROTA TB2 LH in ungreased state without T-nuts and top jaws corresponds to the balancing quality class 6.3 (according to DIN ISO 21940-11). Residual imbalance risks may arise due to insufficient rotation compensation being achieved (see DIN EN 1550 6.2 e). This applies particularly to high speeds, asymmetrical workpieces or the use of various top jaws, as well as uneven application of lubricants. In order to prevent damage resulting from these residual risks, the entire rotor is to be dynamically balanced in accordance with DIN ISO 21940-11.

### 4 Torques per screw

**Tightening torques for mounting screws used to clamp the chuck on lathes or other suitable technical equipment** (screw quality 10.9)

<table>
<thead>
<tr>
<th>Screw size</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12</th>
<th>M14</th>
<th>M16</th>
<th>M18</th>
<th>M20</th>
<th>M22</th>
<th>M24</th>
<th>M27</th>
<th>M30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admissible torque $M_A$ (Nm)</td>
<td>13</td>
<td>28</td>
<td>50</td>
<td>88</td>
<td>120</td>
<td>160</td>
<td>200</td>
<td>290</td>
<td>400</td>
<td>500</td>
<td>1050</td>
<td>1500</td>
</tr>
</tbody>
</table>

**Tightening torques for mounting screws used to attach top jaws onto the chuck** (screw quality 12.9)

<table>
<thead>
<tr>
<th>Screw size</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12</th>
<th>M14</th>
<th>M16</th>
<th>M20</th>
<th>M24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. admissible torque $M_A$ (Nm)</td>
<td>16</td>
<td>30</td>
<td>50</td>
<td>70</td>
<td>130</td>
<td>150</td>
<td>220</td>
<td>450</td>
</tr>
</tbody>
</table>
5 Assembly

5.1 Pre-assembly measures

Carefully lift the product (e.g. using suitable lifting gear) from the packaging.

⚠️ CAUTION

Danger of injury due to sharp edges and rough or slippery surfaces
Use personal protective gear, especially safety gloves.

Check the delivery for completeness and for transport damage.
Check the machine spindle head or machined intermediate flange for radial and axial runout. The maximum permissible value is 0.005 mm according to DIN 6386 and ISO 3089.

The bore holes on the locating face must be chamfered and the face must be completely clean.

⚠️ CAUTION

Excessively long fastening screws can stand up in the tapping drill hole or damage the machine spindle.
During assembly of the chuck and flange the length of the mounting screws must be taken into account.

In case of optional mechanical pressure monitor with inductive proximity switch:
Loosen set screw (107) and remove switch cam (93).

For mechanical stroke monitoring with inductive proximity switches:
Disassemble switch cam (92) (in case of dual stroke chuck).

5.2 Distributor ring

The distributor ring is a completely separate component from the chuck and is centered and held stationary on the spindle head of the lathe axially and radially with a spacer bracket.

After the first set-up of the chuck on the spindle nose of the lathe, the height of the spacer bracket is defined. For the execution of the spacer bracket it is important to know whether the screw-on surface on the front of the spindle box of the lathe is machined or unmachined.
NOTE:
The axial labyrinth gap between the chuck body and the distributor ring must be 1.5 mm for all TB2 chucks. Only then is the correct transfer of air from the distributor ring to the chuck body ensured.

5.2.1 Mounting with bracket

The height of the bracket is the sum of the distances between the face side of the spindle box and the face side of the distributor ring. In the case of a machined spindle box end face the calculated dimension can be regarded as the height of the spacer bracket. In the case of an unmachined end face of the spindle box the height should be defined as the sum of the single clearances minus 4 - 5 mm. It is advantageous to weld the spacer bracket consisting of 2 shells according to the drawing overleaf. The main dimensions corresponding to the single chuck sizes can be found in the drawing overleaf.

Otherwise it is not possible to customize the design of the spacer bracket; however, it should have the stability of the depicted construction. For mounting the spacer bracket, six M8 threaded holes must be drilled in the distributor ring of the chuck at 60° intervals. After completion of the threaded mounting holes on the
spindle box and the holes in the spacer bracket, the latter must be screwed onto the distributor ring.

Now the chuck with the distributor ring and the screwed on spacer bracket can be placed finally on the spindle nose. The outer diameter of the distributor ring corresponds to the maximum outer diameter of the chuck. This allows precise centric alignment of the distributor ring to the chuck prior to being screwed on.

**NOTE**
The distributor ring must be aligned to the chuck outer diameter to achieve a radial and axial runout tolerance of at least 0.1 mm.

During disassembly of the chuck from the spindle nose, it is best not to remove the spacer bracket from the distributor ring; instead, only loosen it from the spindle box. The adjusting sleeves require no further adjustment. During disassembly of the chuck from the spindle nose, it is best not to remove the spacer bracket from the distributor ring; instead, only loosen it from the spindle box. The adjusting sleeves require no further adjustment.
**5.2.2 Mounting with 2-part clamping ring (D.R.M.B.)**

It is possible to clamp the distributor ring to the machine by means of a 2-part clamping ring onto a rigid collar (at least 8 mm wide). In this case the distributor ring is clamped radially to this collar by means of two screws. The height of the clamping ring must be designed according to the chapter “Mounting with bracket” *(☞ 5.2.1, Page 32)*.

During assembly this 2-part clamping ring is first screwed to the threads of the distributor ring. Then the entire assembly is clamped to the rigid collar of the machine. For fastening the chuck with a bayonet or camlock the clamping ring should have a cavity in order to access the flanged nuts or clamping cams with the corresponding wrench.

**NOTE**
The distributor ring must be aligned to the chuck outer diameter to achieve a radial and axial runout tolerance of at least 0.1 mm.
5.3 Attachment of the ROTA TB2 chuck

A chuck flange is mounted on the spindle nose. The chuck is bolted to the chuck flange from the front face side with 9 or 12 M16 or M24 hexagon socket screws. SCHUNK offers standard flanges for mounting the ROTA TB2 chuck on spindles according to DIN 55026, DIN 55027 and DIN 55029.
5.4 Optional mechanical pressure monitor with inductive proximity switch

If the chuck is ordered with the optional mechanical pressure monitoring (SCHUNK ID no. 0818205), this option is already integrated in the chuck.

The monitoring function has been set to the working pressure of 6 bar. If the working pressure has to be changed, refer to the chapter “Mounting of the optional mechanical pressure monitoring system” (§ 8.2.1, Page 53). Pressure monitoring is possible only if the chuck is in a specified position within the lathe. The pressure can be monitored only for O.D. clamping setups.
After attaching the chuck and the distributor ring the mechanical pressure monitoring system should be put into operation.

Insert the switch cam (93) into the rod (99) and tighten the set screw (107).

Pressurize the chuck to the working pressure (6 bar) so that the jaws move radially inward. The switch cam moves to the right.

Adjust the inductive proximity switch mounted on the machine so that it is triggered by a 1 mm leftward movement of the switch cam – this corresponds to a pressure loss of 1 bar (see Fig. 7 “Mechanical monitoring”). Mechanical pressure monitoring is possible only for O.D. clamping.

⚠️ **DANGER**

**Potential danger of death for operating personnel due to loss of workpiece and objects flying off.**

If the inductive proximity switch responds there is a loss of clamping force in the chuck.

- **If the inductive proximity switch responds, do not operate the machine!**

---

**Option mechanical pressure monitoring with inductive proximity switch**

Pressure loss: control cam moves outside

---

**Mechanical path control with inductive proximity switches**

Mechanical monitoring
5.5 Mechanical stroke monitoring with inductive proximity switches on dual stroke chucks

Every dual stroke chuck (LH version) is prepared for mechanical stroke monitoring.

In lathes prepared for mechanical stroke monitoring, this function should be put into operation.

Stroke monitoring is possible only if the chuck is in a specified position within the lathe.

Adjust the inductive proximity switch on the left (see Fig. 7 “Mechanical monitoring”) so that it just responds in the position in which the base jaws are radially outward.

The inductive proximity switch on the right should be triggered if the dimension “L” of the switch is at the following value:

- ROTA TB2 470-185 LH: 29.4 mm
- ROTA TB2 600-275 LH: 28.1 mm
- ROTA TB2 630-275 LH: 24.1 mm
- ROTA TB2 850-375 LH: 29.3 mm
- ROTA TB2 1000-560 LH: 28.8 mm

**WARNING**

Danger of injury due to workpieces flying off and danger of damage to the chuck if the machine is put into operation despite proximity switch indicator.

- The machine may be released for operation only if the inductive proximity switch on the right responds and not the one on the left!
- The chuck may be in the workpiece loading position and released for automatic workpiece loading only if the proximity switch on the left responds and not the one on the right.
6 Function

The item numbers specified for the corresponding individual components relate to chapter drawings. (☞ 13, Page 59)

6.1 Principle of Operation

The problem of air supply was solved by a stationary distributor ring with profile ring seals arranged therein.

Openings in the two elastic radially deformable profile seals allow the compressed air to flow through a non-return valve to one of the two pressure chambers. The pilot controlled non-return valve controls the feeding to one pressure chamber and the simultaneous forced ventilation of the second pressure chamber. This triggers the piston stroke and the base jaws are moved by the wedge hook. The valve system blocks and stores the pressure in the chuck body while the profile seals, due to their elasticity, are raised from the chuck body by the ventilation of the supply lines and therefore are not subject to wear from the rotating chuck.

NOTE:

The air is diverted directly outside by a quick-action ventilation function using sound absorbers. This significantly reduces clamping times and noise levels. For the chucks ROTA TB2 600 (LH) through ROTA TB2 1000 (LH) the double check valve is integrated in an insert (see chapter: Drawings “Valve insert” (☞ 13, Page 59)).
6.2 Air transmission system

Air transfer takes place only when the headstock spindle is at a standstill, via profile seals provided radially in the distributor ring. The profile seal is designed so that the outer upper section of the surface is larger than the surface of the openings. Upon pressurization the difference in surface area exerts a radial force on the profile seal in the ring-shaped chamber of the distributor ring, resulting in optimal static sealing of the profile seal at the air transfer point. This allows low-loss flow of the air through the openings in the profile seal into the cylinder chamber of the chuck.

If the supply of compressed air is stopped, the double check valve closes and the pre-tensioned profile seal raises from the chuck body due to its elasticity and is not subjected to wear during rotation of the chuck.

NOTE:
The air is diverted directly outside by a quick-action ventilation function using sound absorbers. This significantly reduces clamping times and noise levels. For the chucks ROTA TB2 600 (LH) through ROTA TB2 1000 (LH) the double check valve is integrated in an insert (see chapter: Drawings “Valve insert” (☞ 13, Page 59)).
CAUTION

During actuation of the clamping device (clamping or releasing) it must be ensured that a short ventilation time is maintained between the switching processes. This ventilation time must last at least 0.5 seconds, depending on the hose length. For this purpose we recommend the use of a 4/3- or 5/3-way valve (central position depressurized).

6.3 Pilot controlled check valve

The pilot controlled check valve is a self-contained structural unit consisting of a valve body and two blocking pistons. It can easily be serviced from the face side of the chuck by means of a locking screw. The valve unit controls the flow of two air channels from and to the profile seals through the two blocking pistons. The change of the air flow at the profile seals causes the air channel to one cylinder chamber (release chamber) to be ventilated. The reversal of compressed air from one cylinder chamber to another is caused by the axial movement of the valve body, while the two single blocking or non-return pistons execute only one stroke during blocking of their corresponding cylinder chambers. Both O.D. and I.D. clamping are therefore possible through the entire valve system.

6.4 Faults, causes and solutions
<table>
<thead>
<tr>
<th>Fault</th>
<th>Causes and solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.D. or I.D. clamping: The chuck closes, but opens again right away</td>
<td>Valve system executes no switching movement: Remove check valve system, clean bore and lightly oil, reinstall valve system.</td>
</tr>
<tr>
<td>Audible escape of air under the distributor ring when control unit is</td>
<td>Foreign object under the profile seals: Disassemble distributor ring, remove profile seals, wash out, knead with grease, oil and reinstall.</td>
</tr>
<tr>
<td>actuated after the jaws complete the clamping movement</td>
<td></td>
</tr>
<tr>
<td>Distributor ring becomes hot</td>
<td>Profile ring seals are in contact with the chuck body, resulting in wear; check pressure; distributor ring must be without pressure during the rotary movement; completely dismantle the chuck, clean, grease and replace profile ring seals.</td>
</tr>
<tr>
<td>Distributor ring becomes hot (stationary mounting)</td>
<td>Align distributor ring to chuck (see chapter “Distributor ring” (☞ 5.2, Page 31)); the gap between the distributor ring and the body must be even.</td>
</tr>
<tr>
<td>Clamping force decreases after extended use</td>
<td>Completely dismantle the chuck, clean, grease and reassemble; replace seals.</td>
</tr>
<tr>
<td>Audible escape of air at the chuck after completion of the clamping</td>
<td>O-ring in chuck is damaged or seal rings under the hexagon socket screws are missing or not tight.</td>
</tr>
<tr>
<td>process</td>
<td></td>
</tr>
<tr>
<td>Dual stroke chuck: When clamping the workpiece the 3 indicator pins protrude from the front side more than 0.5 mm; or the base jaw edge is outside of the permissible area marked “Clamping Zone”; or, if mechanical stroke monitoring with an inductive proximity switch is installed, the machine receives the signal “Clamping not permissible”</td>
<td>The overlap of the clamping stroke in the chuck piston is insufficient. There is a danger that parts will be damaged in the force transmission area. The top jaws must be offset radially outward by one or more teeth until the indicator pin in the chuck body is countersunk during O.D. clamping; or the base jaw edge is within the “Clamping Zone”; or, if stroke monitoring is installed, the machines receives a release signal.</td>
</tr>
<tr>
<td>Pressure monitoring with the inductive proximity switch sends no release signal.</td>
<td>Check working pressure. Clamping cylinder is leaking in the cylinder or valve area; check working pressure. Replace defective seal elements. If necessary, completely dismantle chuck, clean, grease and replace O-rings and/or profile seals.</td>
</tr>
<tr>
<td>Pressure monitoring with the inductive proximity switch initially sends a release signal. After a short time the machine no longer receives a release signal.</td>
<td>Chuck is leaking in the cylinder or valve area. Check working pressure. Replace defective seal elements. If necessary, completely dismantle chuck, clean, grease and replace O-rings and/or profile seals.</td>
</tr>
</tbody>
</table>
7 Commissioning and maintenance

7.1 Commissioning

The item numbers specified for the corresponding individual components relate to chapter drawings. ([13, Page 59])

Check whether the jaw guides and the piston of the ROTA TB2 power chuck are sufficiently lubricated at the lubrication nipples countersunk into the base jaws; otherwise use LINO MAX special grease to lubricate the base jaws in retracted position.

An insufficiently lubricated chuck loses significant clamping force.

On the front face side of the chuck there is a hexagon socket locking screw, size 6.

Behind the locking screw (15) the pilot-controlled double check valve controls the pressurization and ventilation of the two pressure chambers and shuts off the pressure toward the outside.

It is very important to lightly lubricate the bore hole of the valve system with Klüber special grease QNB 50/100, to ensure a smoothly operating valve system. Excessive grease as well as impurities in the valve bore significantly impair the function of the chuck and should be avoided.

CAUTION

During actuation of the clamping device (clamping or releasing) it must be ensured that a short ventilation time is maintained between the switching processes. This ventilation time must last at least 0.5 seconds, depending on the hose length. For this purpose we recommend the use of a 4/3- or 5/3- way valve (central position depressurized).

NOTE

Turning, facing or finish-turning of the ROTA TB2 power chuck is not allowed. Drilling in the front face side of the chuck is permitted only after consulting the SCHUNK technical sales department.

7.2 Maintenance

A WEH-type maintenance unit, consisting of a filter, a water separator and an oiler, must be connected upstream of the power chuck. The air enriched with oil supplies all sliding parts of the cylinder chamber with an oil film. The oil level of the oil tank must be checked daily, and oil must be added if necessary. If the oil...
Consumption is too low, i.e. if the oil level does not visibly drop over a period of 2 to 3 days, the oil adjustment screw must be opened slightly. Depending on the accumulation of condensation, the condensation drain screw must be opened occasionally.

**2-part maintenance unit, WEH type with filter, oiler, and pressure control valve**

<table>
<thead>
<tr>
<th>Type</th>
<th>WEH-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID number</td>
<td>0890021</td>
</tr>
</tbody>
</table>

**Technical Data**

| Oil type                  | Shell Tellus S2 MA 32  
<table>
<thead>
<tr>
<th></th>
<th>Esso Febis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>G 1/4&quot;</td>
</tr>
<tr>
<td>Nominal pressure</td>
<td>10 bar</td>
</tr>
</tbody>
</table>
### Commissioning and maintenance

![Diagram of ROTA TB2/ROTA TB2 LH]

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounted directly from front: 2 bore holes Ø L, depth C4</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Lateral mounting with two retaining brackets (accessories)</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Protective metal cage with container made of transparent polycarbonate</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Fill level indication for condensate (small inspection port)</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Fill level indication for oil – min./max. (large inspection port)</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>Semi-automatic condensate drain, G 1/8 connection</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ø W</th>
<th>G 1/4”</th>
<th>D</th>
<th>84</th>
<th></th>
<th>K</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container</td>
<td>7 cl</td>
<td>D1</td>
<td>42</td>
<td></td>
<td>K1</td>
<td>28</td>
</tr>
<tr>
<td>A</td>
<td>125</td>
<td>E</td>
<td>89</td>
<td>Ø L</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>213</td>
<td>E1</td>
<td>65</td>
<td>Ø L1</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>
Basic setting for oiler

<table>
<thead>
<tr>
<th>Chuck type</th>
<th>Air consumption/jaw stroke at 6 bar</th>
<th>Clamping strokes</th>
<th>Number of oil drops</th>
<th>Oil quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROTA TB2 470 (LH) — ROTA TB2 1000 (LH)</td>
<td>5 – 11 liters</td>
<td>100</td>
<td>approx. 2 - 3</td>
<td>approx. 18 mm³</td>
</tr>
</tbody>
</table>

Flow rate characteristic curves and pressure drops

Cleaning and lubrication of the chuck

The uniform clamping force, accuracy, and life span of the chuck depend greatly on regular cleaning and sufficient lubrication. Rust, scale, casting dust, and chips produce friction and reduce motion.

The chuck must therefore be lubricated after every 40 operating hours by means of the grease gun at the 3 base jaw lubrication nipples with LINOMAX plus special grease. Afterwards, the chuck must be actuated two to three times without a workpiece; the fully extended jaw stroke will then distribute the grease.
The chuck valve system must occasionally be lightly lubricated with oil. In order to do this, the locking screw the face side of the chuck first needs to be removed. The double check valve is removed from the bore hole and the bore hole and the valve are cleaned to remove dirt and any foreign bodies.

The silencers (item 50) must be cleaned or renewed every 2 months or whenever they become blocked.

For less significant contamination, it is sufficient to blow out the filters with air in the opposite direction. For significant contamination, the filters should be freed of grease and oil with a solvent. In doing so, the warning labels for hazardous substances from the solvent manufacturer should be observed!

The fine serration of the base jaws and top jaws must be cleaned when the hardened reversible jaws or soft top jaws are adjusted, otherwise the run-out accuracy will be impaired.

Foreign matter, such as dust, scale, casting dust, and fine chips, penetrates into almost every chuck, even though there is optimal sealing provided by the hardened guide bushing in the through-hole and by the closed base jaws. Coolant washes away lubricant. Therefore, every chuck occasionally must be completely disassembled, cleaned, and lubricated, and the sealing rings replaced. The time for which the chuck can be used before full maintenance is required depends on the level of dirt it accumulates and the clamping frequency. As such, it is not possible to specify a generally applicable rule for this.

7.2.1 Maintenance intervals

**Lubricating the greasing areas:**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Demands</th>
</tr>
</thead>
<tbody>
<tr>
<td>every 40 hours</td>
<td>normal / use of coolant</td>
</tr>
<tr>
<td>every 8 hours</td>
<td>high / use of coolant</td>
</tr>
<tr>
<td>after 1200 hours or when needed</td>
<td>Full cleaning with disassembly of the chuck depending on type of contamination and quantity</td>
</tr>
</tbody>
</table>

**Cleaning the silencer:**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Demands</th>
</tr>
</thead>
<tbody>
<tr>
<td>every 2 months</td>
<td>Clean the silencer, if necessary in case of severe contamination replace the silencer</td>
</tr>
</tbody>
</table>
Please regularly check the lathe chuck for tightness by applying a clamping force tester over a longer period of time (> 10 min.). The clamping force should not drop during this period. Please adjust the inspection interval to the operating conditions of the clamping device, however, we do recommend conducting a check every 5,000 clamping cycles at the latest.

7.2.2 Hardened Reversible Jaws and Soft Top Jaws

The fine serration of the base and top jaws for chuck sizes 470 – 1000 is 3/32” x 90°, so that the adjusting stroke from tooth to tooth is 2.4 mm.

Make sure that the top jaws are set for clamping on the fine serration so that no more than 2/3 of the jaw stroke has to be extended (clamping reserve).

In the case of LH chucks make sure that the indicator pin is completely countersunk or that the correctly set stroke monitoring system enables the clamping.

Hardened reverse jaws may be used only in sets as packaged at the factory, since they are ground in sets on the chuck. Normally, one set of hardened reverse jaws is ordered with the chuck. During assembly and disassembly of the reverse jaws numbered 1 to 3 make sure that the single jaws are paired with the base jaws with the same numbers in order to achieve good true running properties.

Turning of the soft top jaws must be performed on the chuck in the same clamping position and at the same operating pressure specified for machining of the workpiece. It is very important that all mounting screws are tightened firmly and evenly. ([^4, Page 30])

The fine serration of the base and top jaws must always be clean, especially during adjustment of the top jaws, since otherwise the true running properties will be impaired. Tighten hardened reverse jaws and soft top jaws to the specified torque. Insufficiently tightened top jaws will significantly impair the true running properties!

[^4, Page 30]
8 Disassembly and assembly

The item numbers specified for the corresponding individual components relate to chapter drawings. ([ap 13, Page 59])

8.1 Disassembly and cleaning

1 Unscrew the two pneumatic quick-release screw connection on the distributor ring (8) and loosen the distributor ring (8) with the mount on the spindle nose. Loosen the chuck mounting screws (24) and lift the chuck on the included eye bolt (threads on chuck body outer circumference) from the spindle nose using a crane.

2 Remove the two profile ring seals (47) on the distributor ring (8) and inspect for wear. Before inserting the profile ring seals (47) in the distributor ring grooves, it is recommended to knead them with grease by hand so they remain elastic. Make sure there is no visible grease residue. When re-inserting the profile ring seals (47) make sure that the air passage holes do not coincide with the pneumatic connections of the distributor ring.

⚠️ WARNING
Pressure in chuck! Danger of injury due to ejected objects.
It is absolutely necessary to carefully remove the valve system (13) before continuing with the disassembly!

3 Valve insert ROTA TB2 470 (LH)
Carefully pull out the locking screw (15) with O-ring (37) and remove the pilot-controlled double check valve system (13).

Valve insert ROTA TB2 600 – 1000 (LH)
Remove screws (11). Remove the insert (1). The screw countersinks are equipped with M10 press-off threads. The four O-rings (12) can be removed. Remove the screws (15) with the O-ring (37). Remove the pilot-controlled check valve (2).

4 Inspect all O-rings of the valve system and replace, if necessary.

5 Disassemble the screws (36), the cover (12) and the flat seal (11) on all three jaw sides.
For dual stroke chucks:
Unscrew the screws (108). Remove the plate (90) from the chuck. Pull the rod and the bolts (89 and 91) out of the chuck;
these parts are connected by means of a high-strength adhesive bond.

6 Unscrew the locking screws with the O-rings (10 and 48) and remove the membranes (33) from the chuck. Remove the sound absorber (50).

7 **ROTA TB2 without mechanical pressure monitoring:**
   Loosen the set screw (103) in the chuck body radial bore. Disassemble the seal (69), the rod (99) and 2 O-rings (105).
   **ROTA TB2 with mechanical pressure monitoring:** (see drawing “Mechanical pressure monitoring” ([13, Page 59])
   Loosen set screw (107) and remove cam (93). **CAUTION Parts are under spring tension!** Unscrew the locking screw (96).
   Remove the bolt (97) and the compression spring (101). Press off the piston (94) with the extension (98) from the back and remove it toward the front. Use a longer threaded rod (M3) to pull out the sleeve (95) toward the front. If the sleeve bore is worn replace the sleeve (98). Replace O-rings (102, 105, 106, 111).
   (For mounting of the mechanical pressure monitoring system see chapter “Mounting of optional mechanical pressure monitoring” ([8.2.1, Page 53])

8 On the chuck mount (7) with O-ring (39, 44) unscrew the hexagon socket screws (23), screw 3 of these into the existing press-off threads and remove the mount.

9 Loosen the hexagon socket screws (25) connecting the piston cover (6) with the piston (3). Screw three of these into the existing threaded holes of the piston cover (6) and press off the piston cover (6) from the piston (3).

10 Remove O-rings (41 and 44) from the piston cover.

11 On the front side of the chuck loosen the hexagon socket screws (20) of the sleeve (4) and remove the sleeve (4) toward the front by lightly tapping it from the back side of the chuck.

12 Remove O-ring (46) from the sleeve.

13 Loosen the hexagon socket screws (21) to disassemble the sealing disk (5) and remove the O-rings (42 and 43).

14 The piston (3) can be removed from the chuck body (1) and the base jaws (2) can be removed from the base jaw guides by pulling them inward through the piston bore hole of the chuck body. Both the base jaws (2) and the base jaw guides in the chuck body (1) and the hardened reverse jaws are marked 1, 2 and 3, to allow proper re-assembly and the same true running properties.
15 **CAUTION** Parts of the indicator pin function are under spring tension! Remove the set screw (27) on all 3 jaw sides and remove the compression springs (28), pins (18) and indicator pins (17) from the chuck.

16 Remove O-ring segments (32) from the chuck.

17 Clean and blow out all parts of the chuck. Check all O-rings for damage and wear; replace if necessary, exercising care during insertion. Oil the cylinder chamber of the chuck. Use SCHUNK LINO MAX special grease to lubricate jaw guides in the chuck body, base jaws and pistons on the wedge hook.

8.2 Assembly

1 With reference to the chapter “Screw torques” (☞ 4, Page 30) tighten all screws to the specified torque using a torque wrench. Insert compression spring (28) and pin (18) into the chuck body bore hole. **CAUTION** The indicator pin is under spring tension!

2 Mount the flat seals (11) with the cover (12) and countersunk screws (36) on the three jaw guides. Insert O-ring segments (32) into the matching grooves. **Chuck in LH version:**
   Insert the indicator pin (17) with the compression spring (28) into the radial bore hole in the chuck body. **CAUTION** The indicator pin is under spring tension!

3 Apply liquid thread locking varnish to the set screw (27) and screw it into the bore hole against the spring tension until the set screw is flush with the chuck outside diameter.

4 Insert the marked base jaws (2) into the corresponding guides. **NOTE:**
   Align the piston wedge hook with the dot marking in the inner surface with the jaw guide 1.

5 Allow the piston with O-rings (40) to lock into the wedge hooks of the base jaws (2) and insert to the end of the stroke.

6 Insert O-ring (43) and sealing disk (5) with O-ring (42) and tighten the hexagon socket screws (14, 21) for a solid and air-tight connection to the chuck body. In the case of the chuck sizes ROTA TB2 850 (LH) and TB2 1000 (LH) the screws (21) are not used, i.e. the sealing disk is inserted into the chuck body.
7 Insert the piston cover (6) with O-ring (41 and 44) into the piston (3) and tighten the hexagon socket screws (25).

8 Use eye bolts to hold the chuck mount with inserted O-rings (39 and 45) over the back of the chuck body and align the sword bolt (112) to the matching hole in the chuck body. Connect using hexagon socket screws (23).

9 Lubricate valve system (13) and valve bore with oil, insert and secure with locking screw (15) and O-ring (37).

10 **ROTA TB2 600 – 1000 (LH):**
   Insert the valve insert into the bore hole and mount in the chuck with the three hexagon socket screws.

11 Insert sleeve (4) with inserted O-ring (46) from the front side of the chuck and screw together with the hexagon socket screws (20).

12 For mounting of the distributor ring see chapter “Mounting with 2-part clamping ring” (**5.2, Page 31**).

13 Mount the valve insert (13) in the chuck body using the screws (11).

14 Place the membranes (33) with the correct orientation (tapered part inward - see Fig. 13) into the matching bore holes. Mount locking screws with O-ring (10) in the chuck body. Mount sound absorber (50) radially on the circumference and tighten.

**LH version:**
Insert rod and bolt with high-strength adhesive bond (89 and 91) into the bore hole of the chuck body with the correct orientation. Insert plate (90) in base jaw 1. Use the groove to insert the milled bevel in the bolt (91).
8.2.1 Mounting of optional mechanical pressure monitoring system

In general, the working pressure may only be inspected for O.D. clamping.

1. Loosen set-screw (pos. 103) at the circumference of the chuck body.

2. Remove lock (pos. 69) with the extension (pos. 99) and the O-rings (pos. 105) from the lathe chuck from the front.

3. Remove extension (pos. 99) from the lock (pos. 69). The extension is used for the mechanical pressure monitoring (see below).

4. Carefully insert the sleeve (pos. 98) with O-ring (pos. 102) into the chuck bore to the stop.

5. Carefully insert sleeve (pos. 95) with inserted O-rings (pos. 105 and 106) with longer thread rods (M3) into the lower bore hole.

6. Tighten set-screw (pos. 103) radially in the chuck body.

7. Firmly stick together the piston (pos. 94) with extension (pos. 99). After the drying time, insert O-ring (pos. 111) and insert from the front to the stop into the bore hole of the chuck body.

8. Insert the springs (pos. 101) into the piston. Screw in locking screw (pos. 96) with inserted bolt against the spring pressure into the chuck body. **CAUTION The parts are under spring tension!**

9. Apply fluid screw lock to the threaded pin (pos. 100) and mount into the bore hole of the locking screw (pos. 96).

10. Depending on the working pressure, the depth $X$ of the threaded pin is adjusted. The values are only a guideline.
    - $X = 6$ mm at 6 bar
    - $X = 8.1$ mm at 8 bar
    - $X = 3.8$ mm at 4 bar.

11. When commissioning the clamping chuck on the machine, it should be ensured that with the working pressure (O.D. clamping) the cam (pos. 93) protrudes 2 mm out of the groove of the mounting (pos. 7) (see fig. "Mechanical queries"). The cam (pos. 93) is fixed in the extension with a threaded pin (pos. 107). (For commissioning see chapter 9.1)
9 Control of types TB2, TB2 LH

For actuation of the front-end power chuck, a 24V electropneumatic safety control block is available, consisting of a pressure control valve, a pressure switch, 2 magnetic valves with automatic clamping time monitoring including 2 sensors and 2 analysis units (see separate operating manual).

A maintenance unit consisting of a filter, water separator and oiler must be installed upstream of this control block.
10 TB2S, TB2S LH stationary power chucks

CAUTION

No distributor ring,
no check valve,
always continuous pressure

The operating manual for the types TB2 / TB2 LH also applies analogously for the types TB2S / TB2S LH. Due to the horizontal chuck utilization, extra care should be taken with respect to lubrication of the base jaws and cleaning of the fine serration.

Instead of the control unit described above, normal 5/2-way valves are used for actuation.

11 Power Chuck with extended and standard jaw stroke (LH)

Do not use dual stroke chucks (LH series) for I.D. clamping. Also, do not clamp workpieces on the fast stroke, since this stroke executes very large jaw strokes but very low clamping forces (1). In chucks of the TB2 LH series, make sure that the entire fast stroke plus at least 1/3 of the clamping stroke (corresponding to the basic overlap) is traveled during workpiece clamping (2).
12 Spare parts

When ordering spare parts, it is imperative to specify the type, size and above all the manufacturing no of the chuck.

Seals, sealing elements, screw connections, springs, bearings, screws and wiper bars plus parts coming into contact with the workpiece are not covered by the warranty.

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chuck body</td>
</tr>
<tr>
<td>2</td>
<td>1 set base jaws</td>
</tr>
<tr>
<td>3</td>
<td>Piston</td>
</tr>
<tr>
<td>4</td>
<td>Sleeve</td>
</tr>
<tr>
<td>5</td>
<td>Sealing disk</td>
</tr>
<tr>
<td>6</td>
<td>Piston cover</td>
</tr>
<tr>
<td>7</td>
<td>Cylinder mount (ROTA TB2 850 and TB2 1000)</td>
</tr>
<tr>
<td>8</td>
<td>Distributor ring</td>
</tr>
<tr>
<td>9</td>
<td>T-nuts</td>
</tr>
<tr>
<td>10</td>
<td>Locking screw</td>
</tr>
<tr>
<td>11</td>
<td>Flat seal</td>
</tr>
<tr>
<td>12</td>
<td>Cover</td>
</tr>
<tr>
<td>13</td>
<td>Insert (or for ROTA TB2 470 (LH)) double check valve</td>
</tr>
<tr>
<td>15</td>
<td>ROTA TB2 470 (LH) locking screw</td>
</tr>
<tr>
<td>16</td>
<td>Filler plug</td>
</tr>
<tr>
<td>17</td>
<td>LH version: Indicator pin</td>
</tr>
<tr>
<td>18</td>
<td>LH version: Pin</td>
</tr>
<tr>
<td>19</td>
<td>Cylindrical screws DIN ISO 4762 /10.9</td>
</tr>
<tr>
<td>20</td>
<td>Cylindrical screws DIN ISO 4762 /10.9</td>
</tr>
<tr>
<td>21</td>
<td>Cylindrical screw DIN 7984/8.8</td>
</tr>
<tr>
<td>22</td>
<td>Cylindrical screws DIN ISO 4762 /10.9</td>
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<tr>
<td>23</td>
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<td>24</td>
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<tr>
<td>25</td>
<td>Cylindrical screws DIN ISO 4762 /10.9</td>
</tr>
<tr>
<td>26</td>
<td>Hydraulic-type lubrication nipple</td>
</tr>
<tr>
<td>27</td>
<td>LH version: Set screw</td>
</tr>
<tr>
<td>28</td>
<td>LH version: Compression spring</td>
</tr>
<tr>
<td>32</td>
<td>O-ring DIN 3771</td>
</tr>
<tr>
<td>33</td>
<td>Membrane (fast ventilation)</td>
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<tr>
<td>36</td>
<td>Countersunk screw</td>
</tr>
<tr>
<td>Item</td>
<td>Designation</td>
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<tr>
<td>------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>37</td>
<td>ROTA TB2 470 (LH) O-ring DIN 3771</td>
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<td>38</td>
<td>O-ring DIN 3771</td>
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<tr>
<td>39</td>
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<tr>
<td>46</td>
<td>O-ring DIN 3771</td>
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<tr>
<td>47</td>
<td>Profile seal</td>
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<tr>
<td>48</td>
<td>O-ring DIN 3771</td>
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<tr>
<td>49</td>
<td>Sound absorber</td>
</tr>
<tr>
<td>50</td>
<td>Straight screw connection</td>
</tr>
<tr>
<td>51</td>
<td>Swivel fitting</td>
</tr>
<tr>
<td>52</td>
<td>Fiber seal</td>
</tr>
<tr>
<td>53</td>
<td>Copper sealing ring (ROTA TB2 470 (LH))</td>
</tr>
<tr>
<td>54</td>
<td>Lock</td>
</tr>
<tr>
<td>55</td>
<td>Dummy insert RSS-P1</td>
</tr>
<tr>
<td>56</td>
<td>Extension of stroke monitoring (LH version)</td>
</tr>
<tr>
<td>57</td>
<td>Plate (LH version)</td>
</tr>
<tr>
<td>58</td>
<td>Bolt (LH version)</td>
</tr>
<tr>
<td>59</td>
<td>Bolt (LH version)</td>
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<tr>
<td>60</td>
<td>Extension</td>
</tr>
<tr>
<td>61</td>
<td>Set screw</td>
</tr>
<tr>
<td>62</td>
<td>O-ring DIN 3771</td>
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<tr>
<td>63</td>
<td>Cylindrical screws ISO 4762/10.9 (LH version)</td>
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<tr>
<td>64</td>
<td>Sword bolt</td>
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<tr>
<td>65</td>
<td>Eye bolt</td>
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### Mechanical pressure monitoring assembly

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>93</td>
<td>Cam</td>
</tr>
<tr>
<td>94</td>
<td>Piston</td>
</tr>
<tr>
<td>95</td>
<td>Sleeve</td>
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### Spare parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
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</thead>
<tbody>
<tr>
<td>96</td>
<td>Bolt</td>
</tr>
<tr>
<td>97</td>
<td>Pressure bolt</td>
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<tr>
<td>98</td>
<td>Sleeve</td>
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<td>100</td>
<td>Set screw</td>
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<tr>
<td>101</td>
<td>Compression spring</td>
</tr>
<tr>
<td>102</td>
<td>O-ring DIN 3771</td>
</tr>
<tr>
<td>105</td>
<td>O-ring DIN 3771</td>
</tr>
<tr>
<td>106</td>
<td>O-ring DIN 3771</td>
</tr>
<tr>
<td>107</td>
<td>Set screw</td>
</tr>
<tr>
<td>111</td>
<td>O-ring DIN 3771</td>
</tr>
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</table>

### Valve insert ROTA TB2 600-1000 (LH)

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
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<tr>
<td>1</td>
<td>Insert</td>
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<td>2</td>
<td>Double check valve</td>
</tr>
<tr>
<td>11</td>
<td>Cylindrical screw DIN 7984/8.8</td>
</tr>
<tr>
<td>12</td>
<td>O-ring DIN 3771</td>
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<tr>
<td>15</td>
<td>Locking screw</td>
</tr>
<tr>
<td>37</td>
<td>O-ring DIN 3771</td>
</tr>
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</table>
Assembly drawings

13 Assembly drawings

* Scope of delivery for dual stroke chucks

** ROTA TB2 470 (LH) only valve without insert

Mechanical pressure monitoring
14 Translation of the original declaration of incorporation


Manufacturer/ Distributor
H. D. SCHUNK GmbH & Co. Spanntechnik KG
Lothringer Str. 23
D-88512 Mengen

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation: $Company name$
ID number: $Additional company details$

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

Applied harmonized standards, especially:

EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction

Other related technical standards and specifications:

DIN ISO 702-4:2010-04 Machine tools - Connecting dimensions of spindle noses and work holding chucks - Part 4: Cylindrical assembly
VDI 3106:2004-04 Determination of permissible speed (rpm) of lathe chucks (jaw chucks)

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery, has been created.

Person authorized to compile the technical documentation:
Philipp Schräder, Address: see manufacturer’s address

Signature: see original declaration

Mengen, September 2017 p.p. Philipp Schräder; Head of Engineering Design