Clamping towers for power chucks of VERO-S quick-change pallet system
ID No. 0489063
Assembly and Operating Manual
Dear customer,

congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer’s complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase.

Kindest Regards

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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 of the product and may differ from the actual product design.

In addition to these instructions, the documents listed under (see 1.2, Page 6) are applicable.

1.1 Warnings

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

<table>
<thead>
<tr>
<th>⚠️ DANGER</th>
</tr>
</thead>
</table>
| **Danger for persons.**  
Non-compliance will inevitably cause irreversible injury or death. |

<table>
<thead>
<tr>
<th>⚠️ WARNING</th>
</tr>
</thead>
</table>
| **Dangers for persons.**  
Ignoring a safety note like this can lead to irreversible injury and even death. |

<table>
<thead>
<tr>
<th>⚠️ CAUTION</th>
</tr>
</thead>
</table>
| **Dangers for persons.**  
Non-observance can cause minor injuries. |
1.2 Applicable documents

- General terms of business *
- Assembly and Operating Manuals for SCHUNK Power Chucks *
- Approval drawing of the special clamping device
- Operating manuals for outsourced parts (if present)

The documents marked with an asterisk (*) can be downloaded on our homepage www.de.schunk.com.
2 Basic safety notes

Improper handling, assembly and maintenance of this product may result in risk to persons and equipment if this operating manual is not observed.

Report any failures and damage immediately and repair without delay to keep the extent of the damage to a minimum and prevent compromising the safety of the product.

Only use original SCHUNK spare parts.

2.1 Appropriate use

This product is intended for positioning and clamping workpieces on machine tools with a non-rotating machine table / slowly swiveling indexing unit, and other suitable technical devices.

The clamping device may only be used on the basis of its technical data. The maximum technical data must not be exceeded!

Clamping pallets can also be clamped when VERO-S quick-change pallet modules are used.

The product is intended for industrial use.

Intended use also means that the user has read and understood this operating manual in its entirety, especially the chapter “Basic safety notes”.

The necessary clamping force must be determined by the operator for each clamping task in accordance with the valid standards or technical specifications of the manufacturer.

The permissible bearing load capacity of the clamping device may not be exceeded.

2.2 Not intended use

The product is not being used as intended if, for example:

A workpiece or a device is not clamped properly.

It is used as a pressing tool, a chuck, a load-handling device or as lifting equipment.

It is used in working environments that are not permissible.

People work on machines or technical equipment that do not comply with the EC Machinery Directive 2006/42/EC, disregarding the applicable safety regulations.
Basic safety notes

The technical data specified by the manufacturer are exceeded. The product is used for machines or workpieces for which it is not intended, or is used with unapproved accessories.

2.3 Notes on particular risks

This product may pose a danger to persons and property if, for example:

- It is not used as intended;
- It is not installed or maintained properly;
- The safety and installation instructions, local applicable safety and accident prevention regulations or the EC Machinery Directive are not observed.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk of injury due falling parts during transport, assembly and disassembly the Quick-Change Pallet System.</strong></td>
</tr>
<tr>
<td>Improperly secured parts can break off and fall.</td>
</tr>
<tr>
<td>• Use a suitable lifting equipment and transport.</td>
</tr>
<tr>
<td>• During transport do not step into the danger area.</td>
</tr>
<tr>
<td>• Wear personal protective equipment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk of injury to persons due to falling down of the fixture, pallet or workpiece by erroneous or negligent loosening of the clamping pins.</strong></td>
</tr>
<tr>
<td>• During operation, incorrect or incautious loosening of the clamping pin must be prevented by suitable measures (disconnection of power supply after locking, use of safety valves or safety switches).</td>
</tr>
<tr>
<td>• The machines and facilities must fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against possible mechanical hazards.</td>
</tr>
<tr>
<td>• Wear personal protective equipment.</td>
</tr>
</tbody>
</table>
## Basic safety notes

### WARNING

**Risk of injury to persons during transport of the system and in case of horizontally placed clamping pin axis or overhead applications due to falling down of the fixture or pallet.**

- Use a crane or trolley for transport.
- In case of horizontal or overhead applications, secure the fixture or pallet against falling down during loosening the clamping modules.

### WARNING

**The system is spring-packaged. Risk of injury due to independent motions of components into its end positions after pressing the “Emergency stop” or switching off or failure of the energy supply.**

- Wait until the system stops completely.
- Do not reach into the clamping modules.
- Use pressure maintenance valves.

### CAUTION

**Risk of injury due impurities (e.g. metal shavings) in the exhaust and air purge ports of the clamping station.**

- The danger zone must be surrounded by a protective enclosure during operation.
- Wear personal protective equipment (safety goggles).

### CAUTION

**Danger of injury due to loosening of incorrectly connected compressed air hoses.**

- Wear safety valves or safety switches.
- The danger zone must be surrounded by a protective enclosure during operation.
### Basic safety notes

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>There is a risk of limbs being crushed during manual loading and unloading of moving parts and during the clamping process.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Do not reach into the clamping pin holder.</td>
</tr>
<tr>
<td></td>
<td>• Use loading aids.</td>
</tr>
<tr>
<td></td>
<td>• Wear protective gloves.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Risk of slipping or falling if the chuck's operational environment is not clean (e.g. contaminated with cooling lubricants or oil).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ensure that the working environment is clean before starting assembly and installation work.</td>
</tr>
<tr>
<td></td>
<td>• Wear suitable safety boots.</td>
</tr>
<tr>
<td></td>
<td>• Follow the safety and accident-prevention regulations when operating the chuck, especially when working with machine tools and other technical equipment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Risk of burns due to workpieces with high temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workpieces with high temperatures pose the risk of burns.</td>
</tr>
<tr>
<td></td>
<td>• Wear protective gloves when removing the workpieces.</td>
</tr>
<tr>
<td></td>
<td>• Automatic loading is preferred.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Risk of exposure to pneumatic’s exhaust noise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Noise from air system and pneumatic equipment during the machining process.</td>
</tr>
<tr>
<td></td>
<td>• Wear hearing protection.</td>
</tr>
</tbody>
</table>
2.4 **Product safety**

**General notes**

- During all work on the device, switch off the energy supplies and make sure there is no residual energy in the system. Perform maintenance, modifications, or installations outside of the danger zone.
- For all work, secure the system against accidental operation.
- Do not reach into the open mechanism.
- Only specialist personnel may perform assembly, modification and disassembly work.
- Following assembly, maintenance work or set-up processes on the device, its function will have to be checked prior to commissioning. Make sure there are no leaks.
- If the device is involved in a collision, it must be tested to see if it is still functioning properly before using it again. Only use original SCHUNK spare parts when replacing damaged parts.
- Check the clamping device at least once per shift for externally visible damage and malfunctions.

**Maintenance specifications**

Follow the maintenance and care instructions. These instructions are based on a normal working environment. If the product is to be operated in an environment with abrasive dusts or corrosive or aggressive fumes or fluids, prior approval must be obtained from SCHUNK.

**Safety during assembly and servicing**

During assembly, connection, adjustment, commissioning and testing, make sure that no accidental operation of the system by the fitter or other persons is possible.

Never work in an unsafe manner.

Follow all the applicable legal standards 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.
Basic safety notes

2.4.1 Instructions for VERO-S Quick-Change Pallet Systems

The holding force of the system is limited essentially by the tightness of the screw connection which connects the clamping pin to the pallet or the device. This is why only screws of strength class 12.9 may be used.

- Only original SCHUNK clamping pins may be used.
- If clamping pins are used, the size of the screw connection must be adequate.
- The part or pallet to be clamped must be secured against twisting on the VERO-S quick-change pallet system.
- Before initiating the clamping procedure of the VERO-S clamping modules, you must ensure that the workpiece to be clamped or the clamping pallet is contacting the modules fully without a gap.
- Before initiating an opening operation, you must ensure that the workpiece to be clamped or the clamping pallet is secured or held in place and cannot fall out.
- Only the correct module or the correct modules may be actuated. In multiple options can be selected, modules and valves are specially labeled.
- If the clamping device is disconnected from the pressure medium during the machining sequence, no valve may be actuated during this time.
  If the directional control valve is in "Open" position instead of "Turbo" position when the pressure medium is reconnected, the modules will open immediately and the clamped part will fall out.
- When reconnecting the pressure medium, you must ensure that the workpiece or the clamping pallet cannot fall out.
2.4.2  Note on power chucks with top jaws

- Renew the chuck jaw mounting screws if there are signs of wear or damage. Only use screws with a quality of 12.9. The screws must be renewed with screws of the same length.
- Chuck jaws should be designed to be as low as possible. The clamping point must be as close as possible to the housing. Clamping points at a greater distance cause higher surface pressures in the jaw guides and can reduce the clamping force.
- To avoid overloading the chuck jaws, base jaws, base jaw guides and mounting screws, the clamping force must be reduced at higher clamping positions. The cutting values must be adjusted.
- The middle of the clamping points of a chuck jaw should be as close to the center of the guide of the base jaws as possible. Off-center clamping applications create stresses in the base jaws, which reduce the clamping force and increase wear.
- The mounting screws of the chuck jaws must be positioned so as to achieve the greatest possible effectiveness. The resulting forces must be absorbed and the screws should not be overloaded.
- Do not use welded jaws.
- If the clamping device is involved in a collision, it must be subjected to a crack test before using it again. Damaged parts must be replaced with original SCHUNK spare parts.

2.4.3  Notes for pressure maintenance units

General information about pressure maintenance

- A pressure maintenance unit ensures that the clamping device remains clamped until the machine stops if the pressure medium fails.
- If the device is disconnected from the medium supply line during machining, the actuating valve for controlling the clamping device may not be actuated while the device is disconnected. When the pressure medium is reconnected, the clamping device could immediately switch to the current function and the workpiece might fall out.
Pneumatic pressure maintenance

- If the device is disconnected from the medium supply line during machining, the coupling nipple must be ventilated. The remaining air between the coupling nipple and the pressure maintenance valve must be able to escape.
- To prevent cooling lubricant from entering the pneumatic system, the supplied protective cap must be placed on the coupling nipple while it is disconnected.
- The system must be checked for leaks once a week. Pressure loss must not exceed 0.1 bar per hour.
- Tightness can be monitored if the clamping device has a pressure gauge. We recommend checking the pressure gauge before changing the workpiece.
Hydraulic pressure maintenance

- The system must be checked for leaks once a week. Pressure loss must not exceed 0.5 bar in 3 minutes.
- The pressure range specified by the device must be maintained. If the system pressure is too low, the pressure accumulator might not fill up and no oil reserves would be available in the event of a pressure failure. The system could be damaged if the pressure is too high.

2.4.4 Control of proper function

After mounting the clamping device, its proper function must be checked before start-up.

Three important points are:

- **Clamping force of the clamping device.** At maximum actuating force, the clamping force specified for the clamping device must be reached.

- **Secure clamping of the workpiece.** The clamping device should not travel to stop position internally during the clamping procedure. This can be checked by moving the clamping device into clamping position with and without the workpiece. Note the distance between the base jaws and the chuck body to determine whether sufficient clamping reserve is available for workpiece clamping.

- **Monitoring functions** If the clamping device has monitoring functions, they must be checked prior to start-up. Error situations must be simulated.

2.4.5 Constructional changes, attachments, or modifications

Additional bore holes, threads or attachments / modifications that are not offered by SCHUNK as accessories may impair the product’s safety. These may only be fitted with the approval of SCHUNK.

**If the operator performs a substantial modification on the clamping device, the product will no longer conform to the EC Machinery Directive 2006/42/EC.**

2.5 Personnel qualification

The product must only be installed, removed, started up, operated and serviced by qualified specialist personnel with the relevant safety training.
All persons charged with operating, maintaining and servicing this product must have access to the operating manual, especially the chapter "Basic safety notes" (☞ 2, Page 7). We recommend that the operator creates in-house safety operating instructions.

Trainees may work on machines and technical equipment in which this product is installed, provided that they are supervised at all times by qualified specialist personnel.

### 2.6 Organizational measures

**Obeying the rules**
The operator must employ suitable organizational measures and instructions in order to ensure that the relevant safety rules are obeyed by the persons asked to operate, maintain and repair the product.

**Checking the behavior of personnel**
The operator must at least occasionally check that the personnel are behaving in a safety conscious manner and are aware of the potential hazards.

**Danger signs**
The operator must ensure that the signs concerning safety and hazards on the machine where the product is mounted are clearly legible and are observed.

**Faults**
If a malfunction occurs in the product and endangers safety, or if a problem is suspected due to production behavior, the machine on which the product is mounted must be stopped immediately and remain shut down until the malfunction has been located and remedied. Only allow specialists to remedy malfunctions.

**Spare parts**
Only use original SCHUNK spare parts.

**Environmental regulations**
The applicable environmental regulations must be observed for all maintenance and repair work.

### 2.7 Using personal protective equipment

When using this product, you must comply with the relevant health and safety at work rules and you must use the required personal safety equipment (minimum: category 2).
3 Torque per screw

Tightening torques to mount the clamping system on the machine table. (Screw quality 10.9)

<table>
<thead>
<tr>
<th>Screw size</th>
<th>M4</th>
<th>M5</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>
</tr>
</thead>
<tbody>
<tr>
<td>Admissible torque $M_A$ (Nm)</td>
<td>4.2</td>
<td>7.5</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>
</tr>
</tbody>
</table>

Tightening torques for attaching top jaws on a power chuck and the chuck piston on the cylinder piston. Fastening screws for VERO-S clamping pins. (Screw quality 12.9)

<table>
<thead>
<tr>
<th>Screw size</th>
<th>M4</th>
<th>M5</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>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torques $M_A$ (Nm)</td>
<td>5</td>
<td>9</td>
<td>15</td>
<td>32</td>
<td>62</td>
<td>108</td>
<td>170</td>
<td>262</td>
<td>510</td>
<td>880</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 Warranty

If the product is used as intended, the warranty is valid for 12 months from the date of delivery from the production facility under the following conditions:

- Observe the applicable documents (☞ 1.2, Page 6)
- Observe the environmental and operating conditions.
- Compliance with the technical data.
- Observe the maximum number of clamping cycles for the clamping device in question (see operating manual for the clamping device)
- Observation of the maintenance and care instructions (☞ 9, Page 32)

Parts touching the work piece and wearing parts are not part of the warranty.
5 Scope of delivery

Device
The precise scope of delivery is set out in the order confirmation and depends on the items ordered. All details are also shown in the approval drawing of the special clamping device. The devices shown in this operating manual are only examples.

Accessory pack:
The accessory pack normally contains all components required for assembly and alignment of the device on the machine table. It also includes the required air connections and the appropriate quick coupling for operating the device. Depending on the items ordered it may also contain components that are not fitted for transportation reasons.

Assembly and operating manual for clamping devices

Approval drawing
6 Technical data

6.1 General technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation position</td>
<td>Any</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>+15 °C – +60 °C</td>
</tr>
<tr>
<td>Required level of cleanliness</td>
<td>IP 30 in accordance with DIN EN 60529</td>
</tr>
<tr>
<td>Noise emission [dB(A)]</td>
<td>≤ 70</td>
</tr>
<tr>
<td>Pressure medium</td>
<td>Compressed air, compressed air quality according to ISO 8573-1:7 4 4</td>
</tr>
</tbody>
</table>

Warranty and maximum clamping cycles

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of warranty</td>
<td>12 Months</td>
</tr>
<tr>
<td>Maximum clamping cycle number</td>
<td>See operating manuals for the clamping devices used</td>
</tr>
</tbody>
</table>

6.2 Technical data with VERO-S quick-change pallet systems

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum pressure</td>
<td>5 bar</td>
</tr>
<tr>
<td>Unlocking pressure</td>
<td>6 bar</td>
</tr>
<tr>
<td>Maximum pressure TURBO</td>
<td>6 bar</td>
</tr>
</tbody>
</table>

A separate maintenance unit with oiler must be used for the air supply.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12</th>
<th>M16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding force per clamping pin when mounting with cylindrical screw (DIN EN ISO 4762/12.9)</td>
<td>15 kN</td>
<td>25 kN</td>
<td>35 kN</td>
<td>50 kN</td>
<td>75 kN</td>
</tr>
</tbody>
</table>

The following values must be taken from the relevant approval drawing:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>Mass of clamping station</td>
</tr>
<tr>
<td>(p_{\text{max}})</td>
<td>Max. permissible actuating pressure</td>
</tr>
<tr>
<td>(F_{\text{max}})</td>
<td>Total pull-in force (sum of individual pull-in forces)</td>
</tr>
<tr>
<td>(F_{\text{max} T})</td>
<td>Total pull-in force with TURBO (sum of individual pull-in forces with TURBO)</td>
</tr>
<tr>
<td>(M_{\text{max} X})</td>
<td>Transmittable torque about x-axis</td>
</tr>
<tr>
<td>kg</td>
<td>bar</td>
</tr>
<tr>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Nm</td>
<td></td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_{max \ Y}$</td>
<td>Transmittable torque about y-axis</td>
<td>Nm</td>
</tr>
<tr>
<td>$M_{max \ Z}$</td>
<td>Transmittable torque about z-axis</td>
<td>Nm</td>
</tr>
<tr>
<td>$n_{max}$</td>
<td>Permitted rotation speed of the device</td>
<td>rpm</td>
</tr>
</tbody>
</table>

The specified values are dependent on the pull-in force of the modules, the number of modules and their arrangement on the base plate. If available, the TURBO function must be used.

### Sample view

![Diagram showing technical specifications](image)

Further technical specifications can be found in the catalog data sheets and the operating manuals for the modules used (applicable documents).

### 6.3 Technical data with the power chucks (see approval drawing)

Pressures, clamping forces, accuracies and other technical data must be found in the approval drawing for the special clamping device.

**A separate maintenance unit with oiler must be used for the air supply.**
7 Assembly

Measures before starting assembly
Carefully lift the device out of the packaging (e.g. with suitable lifting equipment). When transporting the device, always use the supplied supports (such as eye bolts or mounting threads) in the bore holes provided in the base plate. The positions of the transport threads are shown in the approval drawing.

⚠️ CAUTION

Risk of injury due to sharp edges and rough or slippery surfaces
Wear personal protective equipment, particularly protective gloves.

Check that the delivery is complete and that there is no transport damage.
Assembly, dismantling and modification work on the clamping device may only be carried out by specialist personnel.
Discontinue the power supply lines and ensure that there is no residual energy in the system before performing assembly, modification, maintenance, or adjustment work.

⚠️ WARNING

There is a risk of injury from dropping the clamping device during transport, installation or removal
- Secure the clamping device against falling during transport and when installing or detaching it.
- Use a crane and/or a transport truck for transportation.
- Stay clear of the suspended load.
- Wear suitable safety clothing.

⚠️ CAUTION

Risk of injury due to crushing.
- Install the clamping device carefully.
- Do not place any limbs into the gaps or between the clamping device and the machine.
- Wear protective gloves.
The device may only be assembled with suitable lifting equipment. The device must be lifted on the transport fixtures intended for that purpose.

Before assembly, the interfaces must be cleaned and free from dirt.

See the approval drawing for correct alignment and fastening of the device on the machine table. The mounting is done by fastening screws. ([3, Page 17])

**WARNING**

Risk of injury due to brass mounting screw cover caps being hurled out during turning applications on the clamping station. The brass cover caps for the mounting screws must only be used for stationary applications on the clamping station.

Accurate positioning of the clamping devices (see specification in the approval drawing) is only guaranteed when clamped on a theoretically flat surface, and the modules are viewed as non-rigid parts as per ISO 10579-NR. The locating surface on the machine table is classed as reference A.
8 Functional description

8.1 Functional description with VERO-S quick-change pallet module

8.1.1 General functional description of VERO-S

The device guarantees rapid changing of workpieces, clamping pallets or devices in the machine room with a high level of repeat accuracy.

In the VERO-S quick-change pallet modules, the clamping pallet is positioned and locked in place using clamping pins.

If two or more clamping pins are used, an SPA clamping pin and an SPB clamping pin must be used. The SPB clamping pin must be installed so that it is as far away as possible from the SPA clamping pin and can perform the radial alignment to the SPA clamping pin.

If more than 2 clamping pins are used, only SPC pins may be used. A VERO-S module with a torque pin must be present if clamping pallets with only one clamping pin are used. In this case, an indexing pin can engage in a dedicated groove, radially align the pallet and prevent it from twisting. This indexing pin (IXB V1) is available as an accessory.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury due to losing pallets or workpieces in the case of incorrect actuation caused by incorrect operation.</td>
</tr>
<tr>
<td>Risk of injury due to compressed air hoses coming loose when connected improperly.</td>
</tr>
<tr>
<td>• Disconnect the energy supply after locking.</td>
</tr>
<tr>
<td>• Use check valves or safety switches.</td>
</tr>
<tr>
<td>• The danger zone must be surrounded by a protective enclosure during operation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury due to falling parts during transport of the quick-change pallet system, when the axis of the clamping pin is in a horizontal position, or in the case of overhead application</td>
</tr>
<tr>
<td>• Use a crane for transportation.</td>
</tr>
<tr>
<td>• In the case of overhead application, or if the system is in a horizontal position, secure the pallets or workpieces so that they do not fall when releasing the clamping module.</td>
</tr>
</tbody>
</table>
### Functional description

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk of injury due to losing pallets or workpieces if the supply of compressed air drops or fails, and due to the clamping pins immediately closing</strong></td>
</tr>
<tr>
<td>• Do not reach into the clamping module.</td>
</tr>
<tr>
<td>• Use pressure maintenance valves.</td>
</tr>
<tr>
<td>• Use loading devices.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>There is a risk of limbs being crushed by moving parts during manual loading and unloading and the clamping procedure.</strong></td>
</tr>
<tr>
<td>• Do not reach into the clamping pin holder.</td>
</tr>
<tr>
<td>• Use loading devices.</td>
</tr>
<tr>
<td>• Wear protective gloves.</td>
</tr>
</tbody>
</table>

**Note about pallet changing**

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When changing the pallet using lifting equipment or a robot, ensure that the pallet is lifted exactly parallel to the modules. The inclination (X) during lifting may not exceed 1.2°. If the inclination is larger, the clamping pins can jam and the system components could be damaged or destroyed. In this case, the system must be inspected and damaged parts must be replaced immediately. Only original SCHUNK spare parts may be used!</strong></td>
</tr>
</tbody>
</table>
8.1.2 Media connections

Automatic control option
Depending on the model, the clamping device is continuously supplied with compressed air via the machine table or manually through connection/disconnection.
Possible functions are:
Open / Turbo / Module slide monitoring / Dynamic pressure monitoring for pallet presence / Air purge and blow-out function
The settings for air pressure and the throttle valve can be found in the operating manual of the VERO-S clamping module.

Manual control option
VERO-S modules can be opened and the turbo function can be actuated via a locking coupling.

NOTICE
The chambers in the modules must be ventilated on actuation.
• When using customer systems: Use a sealing nipple without a shut-off function.
• The corresponding valves, sound absorbers or shut-off valves should be fitted with load relief.

NOTICE
When disconnecting hose lines, the relevant openings must be secured with seal plugs to prevent ingress of dirt or cooling lubricant.

Unpacking connection
Sealing ring
Sealing nipple
Cover plug
TURBO connection
Sealing coupling

Connections
8.1.3 Manual unlocking connection

If the unlocking connection on the device is pressurized with compressed air, all modules are unlocked simultaneously. Clamping pallets, devices and workpieces can be inserted in and removed from the device.

Since the VERO-S modules are spring-actuated clamping systems, the connection must remain pressurized during the tooling/changing procedure.

**WARNING**

Risk of injury due to clamping pallet falling from the device if the unlocking connection is actuated when the clamping station is not in a horizontal position.

If the unlocking connection is actuated when the clamping station is not in a horizontal position, loss of the clamping pallet is possible.

- The unlocking connection may only be actuated when the device is in a horizontal position.

8.1.4 Manual TURBO connection

A turbo connection for increased tensile force is available upon request. When compressed air is applied, this actively provides air pressure to support the spring-actuated locking procedure. This increases the pull-in force in all the modules.

A pressure pulse is sufficient until the maximum permissible value is reached. The clamping station can then be depressurized. The pull-in force is maintained due to the system's self-locking mechanism.

The technical data and the maximum permitted pressure for the turbo connection can be found in the Assembly and Operating Manual for Quick-change Pallet Systems.

8.1.5 Direct air connection via the indexing head

The direct air connection uses the media feed-through of the machine table. Functions are executed by the machine control system.

If, in addition to the direct air connections, manual air connections are available for the same functions, they are separated by OR valves.
8.1.6 Media transfers from the device to the clamping pallets

Clamped pallets can be supplied with liquid or gas pressure media via media transfers.

The coupling nipple and coupling mechanism are located coaxially opposite each other before the coupling procedure. The holders for the two coupling elements must be moved approx. 2 - 3 mm in front of the point of contact with the front sealing surfaces, without exceeding the radial position tolerance. The front, axially acting sealing surfaces of the coupling elements must be protected against contamination. This seal can be replaced separately in case of wear.

Coupling elements must be depressurized during the coupling process.

The coupling forces for the entire coupling processes must be observed. If necessary, excess pressure must be applied to the coupling elements. Further details of the coupling elements are available on request.

Before activating the pressure medium and before starting the machining process, you must ensure that the device is correctly mounted, the media interfaces have established contact and the VERO-S modules are locked.
**NOTICE**

A clamping pallet with a media transfer must never be rotated by 180° when it is placed on the media interface. This would rotate the direction of actuation. Torsion resistance must be ensured, for example by using one pin per torque pin. As a result, loading is only possible in one position.

---

**CAUTION**

There is a risk of limbs being crushed by moving parts during manual loading and unloading and the clamping procedure.

- Do not reach into the clamping pin holder.
- Use loading devices.
- Wear protective gloves.

---

### 8.1.7 Dynamic pressure monitoring and air purge

For other functions, such as monitoring the clamping slide, air purge or pallet presence, see the operating manual for quick-change pallet systems.

### 8.1.8 Adjusting modules for even height (depending on the version and items ordered)

If there is a requirement for the modules to have an even height or for the size of the base plate, this can be adjusted as an option using additional adjusting plates. Additional recesses for O-rings are necessary in the base plate to seal the adjusting plates against the base plate. These adjusting plates are fitted prior to delivery.

- Align the centrical base plate on the indexing head and fasten it.
- Measure the module surface with a dial gauge or measuring probe.
- Mark the lowest module.
- Adjust the remaining modules to the required even height by grinding the adjusting plates as required.
- Tighten the mounting screws for the modules to the specified torque (see operating manual for the relevant VERO-S quick-change pallet system).
- Check the results.
- Fit the cover caps on the mounting screws.
8.2 Functional description with pallet chucks

8.2.1 General functioning description

The device guarantees rapid and oriented changing and clamping of workpieces in the machine room.

The power chucks are equipped with chuck jaws which hold the workpiece firmly. Pay attention to the clamping and aligning surfaces provided when inserting the workpiece.

**WARNING**

Risk of injury to operating personnel if the clamping block 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 clamping block must never be exceeded.
- The clamping block may only be used on machines and facilities that fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against possible mechanical hazards.

**WARNING**

Risk of injury from workpiece loss if compressed air or oil pressure fails or is reduced and from improper controlling (operator error)!

- Use pressure maintenance valves.
- Safeguards in user program.

**WARNING**

Risk of injury from clamping block or chuck jaws falling during transport, installation or removal!

- Make sure the clamping block and chuck jaws do not fall during transport, installation or removal.
- Use a crane and/or a transport truck for transportation.
- Only install the clamping block on machines with the appropriate connection dimensions.
Functional description

**CAUTION**

Risk of crushing from chuck jaws opening and closing when manually loading and unloading!

- Do not reach between the chuck jaws.
- Wear personal protective equipment.
- Prevent the clamping block from being actuated unintentionally.
- Use automated loading.

**CAUTION**

Risk of slipping or falling if the operational environment of the clamping block is not clean (e.g. contaminated with cooling lubricants or oil).

- Ensure that the working environment is clean before starting assembly and installation work.
- Wear suitable safety boots.
- Follow the safety and accident-prevention regulations when operating the clamping block, especially when working with machine tools 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.

8.2.2 Connections of the clamping tower (depending on device)

The clamping device is supplied with liquid or gas pressure medium via the machine table.

Functions of the clamping pallet:
- clamping, releasing, air control, air purge, pressure maintenance (depending on the version).

The assignment of the lines and their individual functions is shown in the approval drawing.

Media transfer can take place directly or via coupling elements.

**Automatic control of the clamping devices using the machine control system**
All functions and controls are activated by the machine control system.

Depending on the version, the clamping devices can be operated all together per side of the device or each one individually.

On the device, there are no elements for controlling and operating the clamping devices. This must be done using the machine control system.

Manual control of the clamping devices using valves on the clamping device

There must be controlled continuous pressure available for manual control of the clamping device. Additionally, a tank line is required in a hydraulic system.

Operating the hand lever on the valve clamps or opens the clamping device.

On the device, there are no elements for controlling the clamping devices. This must be done using the machine control system.

Example of manual operation
9 Maintenance and care

The clamping device is designed for low-maintenance operation. As such opening and disassembly of the clamping devices is only necessary in exceptional cases.

Observe the following instructions to ensure proper operation of clamping devices:

- Pressure medium: compressed air, quality in accordance with ISO 8573-1-2010, class 7.4.4
- Make sure that the contact surfaces of the interface are always clean.
- Only use high-quality cooling emulsion with anti-corrosive additives during processing.
- Carry out regular visual/functional checks. In case of visible damage or signs of malfunction, shut down the clamping device immediately. The system may only be commissioned again once the faults have been corrected. For example, by replacing the damaged unit.
- Replace the hose lines for the clamping device every 12 months. The hoses must have the appropriate installation dimensions and must be inserted completely into the air connections. After replacing the hose lines, perform a leak test.

<table>
<thead>
<tr>
<th>Function</th>
<th>Color</th>
<th>ID No. Ø 6 x 1</th>
<th>ID No. Ø 8 x 1.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlocking</td>
<td>Transparent</td>
<td>9985714</td>
<td>9984959</td>
</tr>
<tr>
<td>TURBO</td>
<td>Blue</td>
<td>9985715</td>
<td>9984960</td>
</tr>
</tbody>
</table>

NOTICE

A separate maintenance unit with oiler must be used for the air supply.

NOTICE

Only polyurethane hydrolysis-resistant air hoses with appropriate diameters are to be used.

The hoses fitted prior to delivery are sorted by function using different colors. Replacements can be ordered using the numbers specified below.
## Maintenance and care

<table>
<thead>
<tr>
<th>Function</th>
<th>Color</th>
<th>ID No. Ø 6 x 1</th>
<th>ID No. Ø 8 x 1.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air purge</td>
<td>Red</td>
<td>9985716</td>
<td>9985722</td>
</tr>
<tr>
<td>Pallet monitoring</td>
<td>Green</td>
<td>9985717</td>
<td>9985723</td>
</tr>
<tr>
<td>Clamping slide</td>
<td>Silver</td>
<td>9985725</td>
<td>9985726</td>
</tr>
</tbody>
</table>

### 9.1 Maintenance and care with VERO-S quick-change pallet modules

**CAUTION**

Risk of injury and risk of damage to the clamping module when opening the housing cover. If the clamping module has to be disassembled, send the module to SCHUNK for repair. The covers of the clamping modules are spring preloaded and must only be removed by trained specialist personnel. The covers for the NSE plus 138, NSE plus 138-V1, NSE-T plus 138, NSE-T plus 138-V1, NSE plus 176 and NSE plus 176-V1 sizes can also only be fitted and removed using a special assembly tool and observing the corresponding fitting and removal instructions.

- For further information on maintenance and care, see the operating manual of the VERO-S quick-change pallet system.
- Make absolutely sure that no chips of any kind can enter the interface and that the interface does not fill with cooling emulsion, which is particularly possible with vertical positioning of the clamping pin axis. The best way to ensure both of these is to use the SDE 40, SDE 138 or SDE 176 protective covers. If the interface should fill with cooling emulsion, initiate the unlocking process and dry out the interface in actuated state.
- Check the units at regular intervals (at least every two weeks or after 1000 clamping operations). The system is functioning correctly if the clamping slides move smoothly at minimum system pressure (5 bar).

### 9.2 Maintenance and care with power chucks

Unscrew the fastening screws of the power chucks and remove from the centrical base plate using suitable lifting equipment. Observe the instructions for maintenance and care in the operating manual of the clamping device.
10 Leak test

As part of a leak test, the air and plug-in connections and the coupling mechanism should be tested for leaks.

The following components are required for the leak test: pressure gauge, supply line with coupling nipple.

Performing the leak test

1. Connect the components to the air connection in the following order: pressure gauge, supply line with coupling nipple.
2. Pressurize the clamping system with compressed air.
3. Check the device in for leaks in both functions (open / close).

To identify any leaks in a clamping station, no clamping pallet should be fitted.

If the clamping system has leaks, check the entire system (e.g. using leak detector spray).

If any leaks are identified, check the seals and replace them if necessary. Leaks at the plug-in connections or in the pneumatic lines, for example, must be sealed and any defective components replaced.

11 Transport and storage

Transport fixtures such as eye bolts or trunnions are only for the transport of the clamping device, without a workpiece, and must be removed once the device has been set up.

Protect the clamping device from corrosion.
12 Disposal

After decommissioning, place the clamping device in a position that enables any liquids in the clamping device to drain out.

- Collect the escaping liquids and dispose of them properly in line with the statutory provisions.
- Remove any identifiable plastic or aluminum parts installed in or on the clamping device and dispose of them properly in line with the statutory provisions.
- Dispose of the clamping device's metal parts as scrap metal.

Alternatively, you can return the clamping device to SCHUNK for proper disposal.

13 Spare parts

A list of spare parts for the special device can be requested from SCHUNK (please specify part number).

14 Drawings

An assembly drawing with item numbers of spare parts for the special device can be requested from SCHUNK (please specify part number).