VERO-S Quick-Change Pallet System
NSE-M plus 138
Assembly and Operating Manual
Imprint

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Technical changes:
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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 ................................................................. 4
   1.1 Warnings ........................................................................... 4
2 Basic safety notes ....................................................................... 5
   2.1 Intended use ...................................................................... 5
   2.2 Not intended use .................................................................. 5
   2.3 Notes on particular risks .................................................... 5
   2.4 Product safety ..................................................................... 7
       2.4.1 Holding force and screw strength .............................. 7
       2.4.2 Constructional changes, attachments or modifications ..... 7
   2.5 Personnel qualification ...................................................... 8
   2.6 Organizational measures .................................................. 8
3 Warranty .................................................................................. 10
4 Scope of delivery ....................................................................... 10
5 Technical data ........................................................................... 11
6 Assembly .................................................................................. 12
   6.1 General assembly notes ...................................................... 12
   6.2 Mounting and actuation ..................................................... 12
   6.3 Clamping station (optional) ............................................... 14
   6.4 Clamping pins SPA 40, SPB 40, SPC 40, SPG 40 .................. 15
       6.4.1 Information to clamping pin SPG 40 ......................... 17
7 Function ................................................................................... 18
   7.1 Unlocking the clamping system ......................................... 18
   7.2 Locking the clamping system ............................................. 18
8 Maintenance and care ............................................................... 20
9 Trouble shooting ....................................................................... 21
10 Part list ................................................................................... 21
11 Assembly drawing .................................................................... 22
1 About this manual

This instruction is an integral part of the product and contains important information for a safe and proper assembly, commissioning, operation, care and maintenance.

- Before using the product, read and note the instruction, especially the chapter "Basic safety notes".

1.1 Warnings

You will find the following warnings in this manual:

The described measures must be observed to prevent the danger of personal injuries and material damage.

<table>
<thead>
<tr>
<th>Symbols and signal words</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![DANGER]</td>
<td>Dangers for persons. Nonobservance will inevitably cause irreversible injury or death</td>
</tr>
<tr>
<td>![CAUTION]</td>
<td>Dangers for persons. Non-observance can cause minor injuries.</td>
</tr>
<tr>
<td>![NOTICE]</td>
<td>Information about avoiding material damage</td>
</tr>
</tbody>
</table>
2 Basic safety notes

Risks to persons and property may arise from incorrect handling, assembly and adjustment of this product if these instructions are disregarded.

- Read the assembly and operating manual before assembling and commissioning.
- Report breakdowns and damages as soon as you detect it and repair immediately, so as to keep the extent of damage as small as possible and to avoid risking the safety of the product. **Only use SCHUNK original spares when replacing damaged parts.**
- Keep this manual available for the personnel at all times.
- If the product is passed on to a third party, these instructions must also be passed on.

2.1 Intended use

This product is intended for positioning and clamping of clamping pallets or workpieces. This product may only ever be employed within the restrictions of its technical specifications. The requirements of the applicable directives must be observed and complied with.

The product is intended for industrial use for installation / mounting for machinery table or machine pallets.

Use as intended also requires that the user has read and understood this entire operating manual, in particular the chapter “Basic safety notes”.

2.2 Not intended use

A not intended use of the product is for example when used as: hoisting device, toolholder, compression mold or gripper.

The technical data are being exceeded during use.

2.3 Notes on particular risks

- Perform maintenance work, modifications, and attachments outside the danger zone.
- For all work, secure the system against accidental operation.
- Do not reach into the open mechanism of the clamping pin holder.
• Only specialist personnel may perform assembly, modification and disassembly work.

---

**WARNING**

Risk of injury to persons during transport and in case of horizontally placed clamping pin axis due to falling down of the fixture or pallet, or not allowed overhead application.

Overhead application is not allowed since the clamping area is not secured by a spring.

Use a crane or a transport trolley during transport.

In case of horizontal application, secure the fixture or pallet against falling down during loosening the clamping modules.

---

**WARNING**

Risk of injury to persons due to falling down of the fixture, pallet or workpiece by erroneous or negligent loosening of the clamping pins.

Erroneous or careless loosing of the clamping pin during operation must be ruled out by removing the spanner wrench.

The danger zone must be surrounded by a protective enclosure during operation.

---

**WARNING**

Risk of injury due to falling down of the fixture, pallet or workpiece due to an insecure force connection at the clamping area.

It is absolutely necessary to lock the clamping system with the recommended torque to establish the force connection in the clamping area.

The spanner wrench grip must not be extended in order to actuate the drive.

---

**CAUTION**

During manual loading and unloading, risk of crushing of limbs due to too large gaps between moving parts and during the chucking operation.

Do not touch in the mounting area of the clamping pin.

Work with the smallest possible clamping and opening strokes.

Use loading aids.

Wear protective gloves.
2.4 Product safety

The product may pose a danger to persons (risk of injury) and property if, for example:

• it is used other than as intended;
• it is not installed or maintained properly;
• the safety and installation instructions, the safety and accident prevention regulations valid at the usage site or the EC Machinery Directive are not observed.

Maintenance instructions

The maintenance and servicing intervals must always be complied with. The intervals indicated refer to a standard working environment. Operating the gripper in an environment in which it is subjected to abrasive dusts or corrosive and/or aggressive vapours and/or liquids requires the prior consent of SCHUNK.

Safety during assembly and maintenance

During assembly, connection, setting, commissioning and testing, it is important to eliminate the possibility of the fitter or any other persons accidentally activating the system.

Refrain from all work that could threaten safety.

2.4.1 Holding force and screw strength

The holding force of the Quick Change Pallet System is essentially limited by the strength of the screwed connections with which the clamping pin is connected to the pallet or device. On this basis fastening screws of the property class 12.9 are to be used only.

Only original SCHUNK-Unilock-Clamping-Pins are to be used.

When the clamping pin is used in the customer’s own assembly device, the customer is to provide for a sufficiently dimensioned tap and satisfactory strength of the fastening material.

2.4.2 Constructional changes, attachments or modifications

Additional threads, bore holes or attachments which are not supplied as accessories by SCHUNK may affect safety. They may only be applied after obtaining the prior consent of SCHUNK.
2.5 Personnel qualification

The assembly and disassembly, commissioning, operation and maintenance of the system may be performed only by trained specialist personnel. Specialist personnel are persons who by their technical training, experience and knowledge are capable of assessing the work to be performed and recognizing potential dangers, and are thus able to take appropriate countermeasures. Have personnel trained by manufacturer if required.

Every person called upon by the operator to work on the system must have read and understood the complete Assembly and Operating Manual, especially chapter 2 "Basic safety notes".

Clearly define the sphere of responsibility for personnel for operation, maintenance and repair. Only allow personnel who is familiar with the safety requirements of the system to carry out maintenance and repair work in the spheres which are relevant to safety.

Specify operator’s responsibility, also with regard to safety-relevant behavior, and authorize operator to oppose instructions that breach the safety regulations.

During the training and instruction period, personnel must be continuously supervised by a specialist when working with the turning rings on the system.

2.6 Organizational measures

Compliance with the Regulations
The business operator must guarantee that suitable measures in organisation and instruction are taken to ensure that the appropriate safety rules and regulations are complied with by the persons entrusted with operation, maintenance and repair of the system.

Supervision of Conduct
The business operator is required, at least from time to time, to check personnel’s conduct regarding awareness of safety and hazards.

Hazard Notices
The business operator must ensure that the notes of safety and hazards for the machine to which the system is mounted are observed and that the notice signs are clearly legible.
Troubles
If troubles occur at the system which could affect safety or production characteristics indicate that faults are in existence, the machine (to which the system is mounted) must be stopped immediately and stand still as long as required to locate and eliminate the fault.

Spare Parts
Only use original spare parts from SCHUNK.

Environmental Protection Requirements
The current environmental protection requirements must be observed during all maintenance and repair work.
3 Warranty

The warranty is valid for 24 months from the delivery date to the production facility under the following conditions:

- Intended use in 1-shift operation
- Observation of the maintenance and lubrication intervals
- Observation of the ambient conditions and operating conditions

Parts touching the workpiece and wearing parts are not part of the warranty.

4 Scope of delivery

- Quick Change Pallet System NSE-M plus 138
- Assembly and Operating Manual
- Enclosed pack
  - 6 Covering caps
  - 6 Fastening screws M8

- Accessories
  - Clamping pallets Type PAL
  - Clamping pins Types SPA, SPB, SPC, SPG
  - Dome-shaped centering bushing Type ZKA
  - Protection cover Type SDE
  - Fitting bolt PBN
  - Spanner wrench
## 5 Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSE-M plus 138</td>
<td>Id.-No. 0471140</td>
</tr>
<tr>
<td>Retention force* (M10 / M12 / M16)</td>
<td>35 kN / 50 kN / 75 kN</td>
</tr>
<tr>
<td>Pull down force</td>
<td>2.5 kN</td>
</tr>
<tr>
<td>Operating torque</td>
<td>15 Nm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>&lt; 0.005 mm</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>15°C – 60°C</td>
</tr>
<tr>
<td>Installation position</td>
<td>Horizontal or vertical no overhead application!</td>
</tr>
</tbody>
</table>

Retention force for mounting the clamping pin with cylindrical head screw – DIN EN ISO 4762/12.9

*Note: Force values are for M10, M12, and M16 screws.*
6 Assembly

The item numbers to the corresponding individual parts refer to the drawing in chapter 11.

Access to the drive piston (item 4) on the side must be ensured during the assembly of the manually actuated quick change pallet system, in particular in the event of clamped clamping pallets. Check whether the drive piston is easy to access in order to open or close the clamping module prior to the installation.

Wear protective equipment (protective gloves and safety shoes).

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury due to falling down of the Quick Change Pallet System during transport</td>
</tr>
<tr>
<td>Transport carefully.</td>
</tr>
<tr>
<td>Use a crane and/or a trolley for transport</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury due to squeezing</td>
</tr>
<tr>
<td>Install the Quick Change Pallet System carefully.</td>
</tr>
<tr>
<td>Don't get your limps in a gap between moving parts or clamping fixture of the machine.</td>
</tr>
</tbody>
</table>

6.1 General assembly notes

If several clamping units are to be mounted in serial connection, please make sure that the evenness and deviation in height of the supporting surfaces from module to module keeps within 0.01 mm (relating to a depth gauge of 200 mm). The deviation of the interface position should not exceed ± 0.015 mm.

Due to the redundancy, clamping systems that are lying further than 160 mm apart from each other or whose positioning tolerance is not within ± 0.01 mm should use clamping pins with positioning accuracy in one direction (SPB 40). For clamping positions which are not used for alignment of the devices or pallets, clamping pins with centric scope (SPC 40) can be used (see also chapter 6.4).

6.2 Mounting and actuation

If you wish to install the unit yourself, please request our drawing.

The NSE-Mplus 13 is fastened in the installation area with six screws M8 (see figure 1).
Positioning of the module can be done via two different centering diameters of the installation area:
Ø 138H6 (upper area)
Ø 110H6 (bottom area) depending on the installation version.

The clamping system is suitable for partial or complete installation

Partial installation should be preferred.

An access bore to the actuation connection must be provided in the installation space for the complete installation.

Make sure the hexagon socket of the actuating piston is easy to
access at all times. An access bore of sufficient size ensures that the access to the hexagon socket is well visible.

If any chips are in the access bore or hexagon socket, they have to be removed prior to actuation.

The clamping system is driven manually by rotating the drive piston (item 4). The drive piston is laterally in the base body (item 1).

The drive piston (item 4) is actuated with a hexagon screwdriver (angled pin wrench). Symbols, engraved on the base body, indicate the direction of rotation for locking or unlocking the clamping area.

No air supply is required for the operation of the clamping system. The openings on the base side therefore do not have to be sealed.

### 6.3 Clamping station (optional)

![Clamping station diagram](image)

Clamping range for mounting the clamp blanks BRR 50

<table>
<thead>
<tr>
<th>Clamping range</th>
<th>1-fold</th>
<th>2-fold</th>
<th>4-fold</th>
<th>6-fold</th>
</tr>
</thead>
</table>
Modules for stationary use can be optionally equipped with manually actuated quick change pallet modules. The quick change pallet modules can be arranged and distributed as desired. The arrangement of conventional modules for stationary use is illustrated in fig. 2.

Reliable access to the actuating piston must be ensured by the arrangement of the modules, which applies in particular to adapted clamping pallets.

**NOTE**

The evenness in height of the modules on the clamping station is only guaranteed when clamped. The clamping station is mounted using the BRR 50 cylindrical clamp blanks. See the clamping diagram (fig. 2) for the arrangement of the BRR 50 cylindrical clamp blanks.

For questions on clamping stations for manually actuated Quick-Change Pallet Modules, contact our technical customer service.

### 6.4 Clamping pins SPA 40, SPB 40, SPC 40, SPG 40

**NOTICE**

**Notes on clamping pins and fastening screws**

The holding force of the quick change pallet 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 the clamping pins are to be used in customer-owned devices, the customer must provide sufficiently dimensioned threaded holes or a sufficiently thick mounting material.

The clamping pins can be fastened onto the mounting or pallet in 2 different ways, the fastening variations are numbered in the preferred sequence.
Tolerances and assembly conditions

<table>
<thead>
<tr>
<th>Type</th>
<th>Id.-No.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA 40 RF</td>
<td>0471151</td>
<td>&gt; 12</td>
<td>&gt; 17</td>
<td>M12</td>
<td>&gt; 15</td>
<td>&gt; 20</td>
<td>M10</td>
<td>15</td>
</tr>
<tr>
<td>SPB 40 RF</td>
<td>0471152</td>
<td>&gt; 12</td>
<td>&gt; 17</td>
<td>M12</td>
<td>&gt; 15</td>
<td>&gt; 20</td>
<td>M10</td>
<td>15</td>
</tr>
<tr>
<td>SPC 40 RF</td>
<td>0471153</td>
<td>&gt; 12</td>
<td>&gt; 17</td>
<td>M12</td>
<td>&gt; 15</td>
<td>&gt; 20</td>
<td>M10</td>
<td>15</td>
</tr>
<tr>
<td>SPG 40 RF</td>
<td>0471154</td>
<td>&gt; 12</td>
<td>&gt; 17</td>
<td>M12</td>
<td>&gt; 15</td>
<td>&gt; 20</td>
<td>M10</td>
<td>25</td>
</tr>
<tr>
<td>SPA 40-16 RF</td>
<td>0471064</td>
<td>&gt; 13</td>
<td>&gt; 18</td>
<td>M16</td>
<td>&gt; 18</td>
<td>&gt; 24</td>
<td>M12</td>
<td>20</td>
</tr>
<tr>
<td>SPB 40-16 RF</td>
<td>0471065</td>
<td>&gt; 13</td>
<td>&gt; 18</td>
<td>M16</td>
<td>&gt; 18</td>
<td>&gt; 24</td>
<td>M12</td>
<td>20</td>
</tr>
<tr>
<td>SPC 40-16 RF</td>
<td>0471066</td>
<td>&gt; 13</td>
<td>&gt; 18</td>
<td>M16</td>
<td>&gt; 18</td>
<td>&gt; 24</td>
<td>M12</td>
<td>20</td>
</tr>
</tbody>
</table>

Application / Disposition of different clamping pin types

(Application example: pallet with 6 clamping areas)
6.4.1 Information to clamping pin SPG 40

The SPG 40 RF can be used instead of the SPA 40 RF.
When using the RF SPG 40, the repeatability increases to <0.002 mm.
Use a 10 mm longer M12-screw of the screw grade 12.9, when screwing from above.
7 **Function**

The item numbers to the corresponding individual parts refer to the drawing in chapter 11.

The clamping system has a release mechanism with manual actuation.

The actuating piston, which is actuated with a hexagon screwdriver (angled pin wrench), can be accessed on the side of the base body of the quick change pallet module.

A cam on the drive piston transfers the rotary movement to the drive ring, which guides the clamping slides into the clamping area.

The clamping function is purely manual. No compressed air is required. This makes the clamping system extremely flexible and allows it to be used wherever no pressure medium is available.

7.1 **Unlocking the clamping system**

1. The manually actuated clamping system is unlocked by rotary movement at the drive piston (item 4) which can be accessed from the side. Insert the hexagon screwdriver in the hexagon socket of the drive piston and turn it counter-clockwise.

2. The clamping slides (item 3) move outwards until the final position of the rotary movement is reached.

3. The clamping pin is unlocked. The clamping pins are available as separate accessories in four versions (see chapter 6.4). They are mounted on customized pallets or devices.

4. The pallet can be removed.

7.2 **Locking the clamping system**

1. The pallet can be inserted in the clamping system as soon as the clamping slides are unlocked and the rotary movement at the drive piston has reached the back stop.

2. Insert the pallet in the clamping system.

3. Insert the hexagon screwdriver in the hexagon socket of the drive piston and turn it clockwise. After a few degrees of rotation the unlocking position is leaved and the module closes automatically.
4 The clamping slides are guided inwards by spring by means of cams at the drive ring. When locking, the pallet is pulled onto the contact surface of the clamping module and the clamping pin is clamped in the clamping module in a self-locking and form-fitting manner.

The clamping pin is centered at the taper bore of the clamping module, which is why the angular alignment of the clamping system can be selected as desired.
8 Maintenance and care

The Quick Change Pallet System is designed for minimum-maintenance operation, so that opening and disassembly of the clamping modules is only necessary in exceptional cases.

If it is necessary to disassemble the quick change pallet system, this may only be performed by trained specialist personnel.

- Clean all parts thoroughly and check for damage and wear. Damaged and worn parts must be replaced.
- Grease the sliding surfaces of the guide curves in the drive piston with LINO MAX 200.
- Grease the sliding surfaces of all movable components with Renolit HLT 2.

Replace damaged parts only with original SCHUNK replacement parts!

A repeated functional check is to be conducted before the start-up.

General operating conditions

- Make sure that the bearing surface of the interface is always clean.
- Please arrange the necessary, so that chips of any type can’t get into the interface. Moreover, please avoid that coolant emulsion fills up in the interface, especially if the axis of the clamping pin is vertically aligned. Both can be avoided by using a protection cover SDE 138.
  If the interface should nevertheless fill with coolant emulsion, start locking and dry the interface during actuation.
- For operation, only high-quality coolant emulsions with rust-protection additions should be used.
- Regularly inspect the units (at least every 2 weeks or after 1000 clamping cycles). Perfect operation is given whenever the clamping slides move smoothly without increased application of force when actuated by means of the piston. Safe operation also includes the self-locking of the clamping area.
- Regularly inspect the system visually and control proper function. In case of visible damages or signs of malfunction, please stop the operation immediately. The system should not be started up again, before all the damages are repaired. I.e. by exchanging the damaged unit.
9 Trouble shooting

The clamping area does not unlock perfectly

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The module is not lubricated sufficiently</td>
<td>Disassemble the module, clean and lubricate it (see chapter 8)</td>
</tr>
<tr>
<td>The clamping slides or movement mechanism is damaged</td>
<td>Disassemble the module and replace damaged and worn parts with original SCHUNK spare parts (see chapter 8)</td>
</tr>
<tr>
<td>Excess tensile load on clamping slides</td>
<td>Reduce the load</td>
</tr>
</tbody>
</table>

The clamping area unlocks automatically

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The actuating piston or movement mechanism is damaged</td>
<td>Disassemble the module and replace damaged and worn parts with original SCHUNK spare parts (see chapter 8)</td>
</tr>
</tbody>
</table>

10 Part list

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Base body</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Drive ring</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Clamping bar</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Drive piston</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Actuation piston</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Cover</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Bearing shell</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Compression spring</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Steel ball Ø 5</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Cylindrical pin Ø 6 x 24</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Cylindrical pin Ø 6 x 30</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Cylindrical pin Ø 8 x 25</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Countersunk screw M6 x 16</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>Cylindrical screw M8 x 45</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>Protective caps</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>O-ring Ø 82 x 3</td>
<td>1</td>
</tr>
</tbody>
</table>
11 Assembly drawing