

# VERO-S quick-change pallet system NSL3

## Assembly and Operating Manual



## Imprint

### Copyright:

This manual is protected by copyright. The author is SCHUNK GmbH & Co. KG. All rights reserved. Any reproduction, processing, distribution (making available to third parties), translation or other usage - even excerpts - of the manual is especially prohibited and requires our written approval.

### Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

**Document number:** 1155408

**Version:** 01.00 | 22/01/2018 | en

© H.-D. SCHUNK GmbH & Co.

All rights reserved.

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

H.-D. SCHUNK GmbH & Co.

Spanntechnik KG

Lothringer Str. 23

D-88512 Mengen

Tel. +49-7572-7614-0

Fax +49-7572-7614-1099

info@de.schunk.com

schunk.com

## Table of Contents

<b>1</b>	<b>General</b>	<b>5</b>
1.1	About this manual	5
1.1.1	Presentation of Warning Labels	5
1.1.2	Applicable documents	6
1.1.3	Sizes	6
1.2	Warranty	6
1.3	Scope of delivery	7
1.4	Accessories	7
<b>2</b>	<b>Basic safety notes</b>	<b>8</b>
2.1	Intended use	8
2.2	Not intended use	8
2.3	Constructional changes	8
2.4	Spare parts	9
2.5	Environmental and operating conditions	9
2.6	Personnel qualification	9
2.7	Personal protective equipment	10
2.8	Notes on safe operation	11
2.9	Transport	11
2.10	Malfunctions	12
2.11	Disposal	12
2.12	Fundamental dangers	12
2.12.1	Protection during handling and assembly	13
2.12.2	Protection during commissioning and operation	13
2.12.3	Protection against dangerous movements	14
2.12.4	Notes on particular risks	14
<b>3</b>	<b>Technical data</b>	<b>17</b>
<b>4</b>	<b>Assembly</b>	<b>18</b>
4.1	General Installation Notes	18
4.2	Aligning the clamping station	19
4.3	Mounting and connecting the clamping station	20
4.3.1	NSL3 150-V1-T	24
4.3.2	NSL3 200	25
4.3.3	NSL3 200-V1-T	26
4.3.4	NSL3 300-200	27
4.3.5	NSL3 400	28
4.3.6	NSL3 600	30

4.3.7	NSL3 800.....	32
4.4	Clamping pins SPA 40, SPB 40, SPC 40, SPG 40 .....	34
4.4.1	Information to clamping pin SPG 40 .....	37
4.5	Clamping pallets PAL-S, PAL-A (optional).....	37
4.6	Screw tightening torques .....	38
<b>5</b>	<b>Function .....</b>	<b>39</b>
5.1	Connections on the clamping station.....	39
5.2	Unlocking connection .....	40
5.3	TURBO connection (with NSL 3-V1) .....	40
5.4	VERO-S connecting strip ASL1-G1/8", ASL2-G1/8" (optional) .....	41
5.5	Cone seal KVS3 (optional) .....	43
5.6	Monitoring system AFS3 138 MMS (optional) .....	44
5.7	Monitoring system AFS3 138 PMI (optional) .....	45
5.8	Media feed-through VERO-S MDN 3-2 (optional).....	46
<b>6</b>	<b>Operation.....</b>	<b>47</b>
<b>7</b>	<b>Maintenance and care .....</b>	<b>48</b>
7.1	Leak test.....	49
<b>8</b>	<b>Troubleshooting .....</b>	<b>50</b>
8.1	The clamping areas do not unlock .....	50
8.2	The clamping areas do not unlock perfectly .....	50
8.3	The quick-change pallet systems no longer open quietly.....	50
<b>9</b>	<b>Parts lists.....</b>	<b>51</b>
9.1	Part lists .....	51
<b>10</b>	<b>Assembly Drawings .....</b>	<b>54</b>
10.1	NSL3 with NSE3 138-V1 quick-change pallet module .....	54
10.2	NSL3 .....	55
<b>11</b>	<b>Declaration of Incorporation .....</b>	<b>56</b>
<b>12</b>	<b>Appendix on Declaration of Incorporation, as per 2006/42/EC, annex II, No. 1 B .....</b>	<b>57</b>

# 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.

	<p><b>⚠ DANGER</b></p> <p><b>Danger for persons!</b> Non-observance will inevitably cause irreversible injury or death.</p>
	<p><b>⚠ WARNING</b></p> <p><b>Dangers for persons!</b> Non-observance can lead to irreversible injury and even death.</p>
	<p><b>⚠ CAUTION</b></p> <p><b>Dangers for persons!</b> Non-observance can cause minor injuries.</p>
	<p><b>NOTICE</b></p> <p><b>Material damage!</b> Information about avoiding material damage.</p>

### 1.1.2 Applicable documents

- General terms of business \*
- Catalog data sheet of the purchased product \*

The documents marked with an asterisk (\*) can be downloaded on our homepage [www.schunk.com](http://www.schunk.com).

### 1.1.3 Sizes

This operating manual applies to the following sizes:

#### Clamping station

- NSL3 150-V1-T
- NSL3 200
- NSL3 200-V1-T
- NSL3 300-200
- NSL3 400
- NSL3 600
- NSL3 800

## 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, ([👉 2.5, Page 9](#))
- Observance of the specified care and maintenance instructions ([👉 7, Page 48](#))

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

\* A cycle consists of a complete clamping procedure ("opening" and "closing" of the simultaneously actuated clamping modules on the clamping station).

### 1.3 Scope of delivery

The scope of delivery includes

- Clamping station in the version ordered
- Accessory pack and separate packing units
  - NSL3 150-V1-T*: 2 sealing rings G1/8", 2 sealing nipples G1/8", 2 pneumatic plug-in connections for nominal hose width-Ø 4, 2 cylindrical clamp blanks (BRR 50)
  - NSL3 200; NSL3 300-200*: 1 sealing ring G1/8", 1 sealing nipple G1/8", 1 pneumatic plug-in connection G1/8" 6/4 for nominal hose width-Ø 4, 4 cylindrical clamp blanks (BRR 50)
  - NSL3 400*: 2 sealing rings G1/8", 2 sealing nipples G1/8", 2 pneumatic plug-in connections G1/8" 6/4 for nominal hose width-Ø 4, 4 cylindrical clamp blanks (BRR 50)
  - NSL3 600*: 1 sealing ring G1/8", 1 sealing nipple G1/8", 1 pneumatic plug-in connection G1/8" 8/6 for nominal hose width-Ø 6, 2 eye bolts M8, 6 cylindrical clamp blanks (BRR 50)
  - NSL3 800*: 1 sealing ring G1/8", 1 sealing nipple G1/8", 1 pneumatic plug-in connection G1/8" 8/6 for nominal hose width-Ø 6, 2 eye bolts M8, 8 cylindrical clamp blanks (BRR 50)

### 1.4 Accessories

(see catalog or data sheets when ordering separately)

- Clamping pallets PAL-S, PAL-A
- Clamping pins SPA, SPB, SPC, SPG
- Protection cover SDE
- Indexing pin IXB V1 NSE plus
- Connecting strip ASL1-G1/8", ASL2-G1/8"
- Cone seal NSE3
- Monitoring system AFS3 138 MMS
- Monitoring system AFS3 138 PMI
- Media feed-through VERO-S MDN 3-2
- Closure of the air supply
- Pneumatic screws M7
- Hose and cable shielding
- Torque wrench

## 2 Basic safety notes

### 2.1 Intended use

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

- The product may only be used within the scope of its technical data, ([↗ 3, Page 17](#)).
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

### 2.2 Not intended use

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

- It is used as a pressing tool, a chuck, a load-handling device or as lifting equipment.
- It is used for turning applications without consulting SCHUNK.
- 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.
- The technical data specified by the manufacturer are exceeded during usage.

### 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 17](#)).
- Make sure that the product is a sufficient size for the application.
- Make sure that the contact surfaces of the interface are always clean.
- Make absolutely sure that no chips of any kind can enter the interface and that the interface fills with cooling emulsion, which is particularly possible with a horizontal design of the clamping station. The best way to ensure both of these requirements is to use the SDE protection covers. If the interface should fill with cooling emulsion, initiate the unlocking process and allow the interface to dry out in an actuated state or carefully blow out with compressed air using suitable protective equipment.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.

## 2.6 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.

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.

## 2.7 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.

## 2.8 Notes on safe operation

### **Incorrect handling of the personnel**

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

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

## 2.9 Transport

### **Handling during transport**

Incorrect handling during transport can make the product unsafe and risk the danger of serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means. For clamping station sizes 400 and above, the scope of delivery includes eye bolts for transport. The eye bolts are intended for transporting the clamping station without a workpiece and must be removed after assembly of the clamping station.
- Secure the product during transport and handling to prevent it from falling.
- Do not walk under 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 can make the product unsafe and risk the danger of serious injuries and considerable material and environmental harm.

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

## 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

	 <b>DANGER</b>
	<p><b>Risk of fatal injury from suspended loads!</b> Falling loads can cause serious injuries and even death.</p> <ul style="list-style-type: none"> <li>• Stand clear of suspended loads and do not step within their swiveling range.</li> <li>• Never move loads without supervision.</li> <li>• Do not leave suspended loads unattended.</li> <li>• Wear suitable protective equipment.</li> </ul>

	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury due to falling device, pallet or workpiece if the clamping pin locking is loosened from the clamping bolt mounting erroneously or as a result of negligence.</b></p> <ul style="list-style-type: none"> <li>• During operation, erroneous or negligent loosening of the clamping pin must be prevented using suitable counter-measures (disconnecting the power supply after locking, use of check valves or safety switches).</li> <li>• The machines and equipment must fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against potential mechanical hazards.</li> <li>• Wear personal protective equipment.</li> </ul>
	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury when the clamping pin axis is being used in a horizontal position or during overhead applications, resulting in the device or pallet falling down.</b></p> <ul style="list-style-type: none"> <li>• Use a crane or a transport truck when transporting.</li> <li>• During horizontal or overhead applications, the device or pallet must be secured before loosening to prevent it from falling.</li> </ul>
	<p><b>⚠ WARNING</b></p> <p><b>The system clamps using spring force. Risk of injury due to parts automatically moving to their end positions following actuation of an "emergency stop" or after switching off the power supply.</b></p> <ul style="list-style-type: none"> <li>• Wait for the system to shut down completely.</li> <li>• Do not reach into the clamping module.</li> <li>• Use pressure maintenance valves.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p><b>Risk of injury due to impurities (e.g. metal chips) in the exhaust and air purge connections of the clamping station.</b></p> <ul style="list-style-type: none"> <li>• Take appropriate protective measures to secure the danger zone.</li> <li>• Wear personal protective equipment (safety goggles).</li> </ul>

	<p><b>⚠ CAUTION</b></p> <p><b>Risk of injury due to compressed air hoses coming loose when connected improperly.</b></p> <ul style="list-style-type: none"> <li>• Use check valves or safety switches.</li> <li>• Take appropriate protective measures to secure the danger zone.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p><b>There is a risk of limbs being crushed by moving parts during manual loading and unloading and during the clamping procedure.</b></p> <ul style="list-style-type: none"> <li>• Do not reach into the clamping pin holder.</li> <li>• Use loading devices.</li> <li>• Wear protective gloves.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p><b>Risk of slipping or falling if the quick-change pallet system's operational environment is not clean (e.g. contaminated with cooling lubricants or oil).</b></p> <ul style="list-style-type: none"> <li>• Ensure that the working environment is clean before starting assembly and installation work.</li> <li>• Wear suitable safety boots.</li> <li>• Follow the safety and accident-prevention regulations when operating the quick-change pallet system, especially when working with machine tools and other technical equipment.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p><b>Risk of burns due to workpieces with high temperatures.</b> There is a risk of burns due to workpieces with high temperatures.</p> <ul style="list-style-type: none"> <li>• Wear protective gloves when removing the workpieces.</li> <li>• Automatic loading is preferred.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p><b>Danger due to pneumatic exhaust noises.</b> Noise pollution from the exhaust system and whistling pneumatic equipment during the working process.</p> <ul style="list-style-type: none"> <li>• Wear hearing protection.</li> </ul>



### 3 Technical data

Type designation	ID no.	Holding force* (M10 / M12)	Fmax ** Total pull-in force without turbo	FmaxT *** Total pull-in force with turbo	Weight
NSL3 150-V1-T	1323568	35 kN / 50 kN	8 kN	28 kN	7.0 kg
NSL3 200	1323569	70 kN / 100 kN	16 kN	---	16.9 kg
NSL3 200-V1-T	1323570	70 kN / 100 kN	16 kN	56 kN	16.7 kg
NSL3 300-200	1323571	105 kN / 150 kN	24 kN	---	27.8 kg
NSL3 400	1323572	140 kN / 200 kN	32 kN	---	35.7 kg
NSL3 600	1323574	210 kN / 300 kN	48 kN	---	54.4 kg
NSL3 800	1323575	280 kN / 400 kN	64 kN	---	73.2 kg

\* Holding force when fastening the clamping pin with a cylindrical screw – DIN EN ISO 4762/12.9

\*\* Total pull-in force (total sum of pull-in forces of all the clamping modules mounted in the clamping station)

\*\*\* Total pull-in force with TURBO function for clamping station NSL3-V1 (total sum of pull-in forces with TURBO of all the clamping modules mounted in the clamping station)

Minimum pressure	5 bar
Unlocking pressure	5 bar to 6 bar
Maximum pressure turbo function	6 bar
Repeatability [mm]	< 0.005 mm
Installation position	Any
Operating temperature	+ 15°C to + 60°C
Required level of cleanliness	IP 30 in accordance with DIN EN 60529
Noise emission [dB(A)]	≤ 70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4
IP rating	IP 67

The actuating pressure for the unlocking function must be set to at least 5 bar up to a maximum of 6 bar.



The actuating pressure for the turbo function must not exceed 6 bar.

## 4 Assembly

### 4.1 General Installation Notes

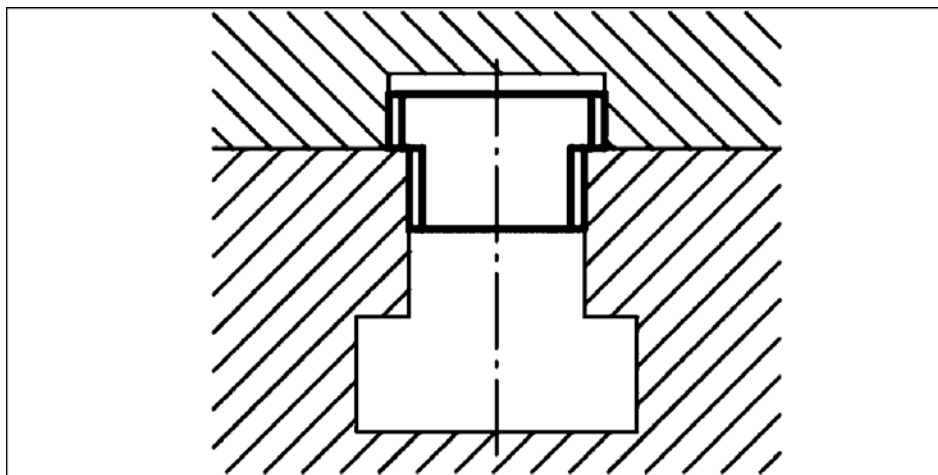
#### Pre-assembly measures

Lift the quick-change pallet system carefully out of the packaging (e.g. using suitable lifting equipment). For clamping stations NSL3 400 or higher, eye bolts are supplied for transporting the clamping station. The eye bolts are to be mounted into the transport threads on the base plate and then removed after assembly. Before assembly, the interfaces (bottom of the clamping station and support area of the machine table) must be clean and free of any contamination or damage.

	<p><b>! WARNING</b></p>
	<p><b>Risk of injury due to unexpected movements!</b>                  If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.</p> <ul style="list-style-type: none"> <li>• Before starting any work on the product: Switch off the power supply and secure against restarting.</li> <li>• Ensure that no residual energy remains in the system.</li> </ul>
	<p><b>! CAUTION</b></p>
	<p><b>Danger of injury due to sharp edges and rough or slippery surfaces</b></p> <ul style="list-style-type: none"> <li>• Wear personal protective equipment, particularly protective gloves.</li> </ul>

## 4.2 Aligning the clamping station

The clamping station can be aligned with loose T-nuts along an aligning groove on the machine table. At least two T-nuts offset lengthwise are provided and their size is matched to the aligning groove on the machine table. The T-nuts are not included in the scope of delivery of the clamping station.



Alignment using T-nuts

### 4.3 Mounting and connecting the clamping station

#### Flatness and distances

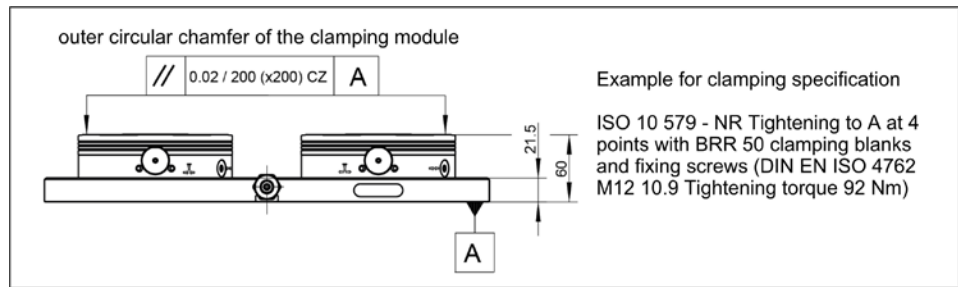
In order to assemble the clamping station, the clamping surface must have a flatness of  $\leq 0.03$  mm is required (based on the entire support areas of the clamping station). The clamping zone must have sufficient rigidity in order to ensure the relative flatness of the clamping modules. If several linked clamping stations are mounted, make sure that the flatness and height deviation of the locating surfaces from module to module (based on a 200 mm gauge for bore holes) is  $\leq 0.03$  mm. The gauge deviation between the separate clamping stations must not exceed  $\pm 0.015$  mm from module to module.

#### Redundancy

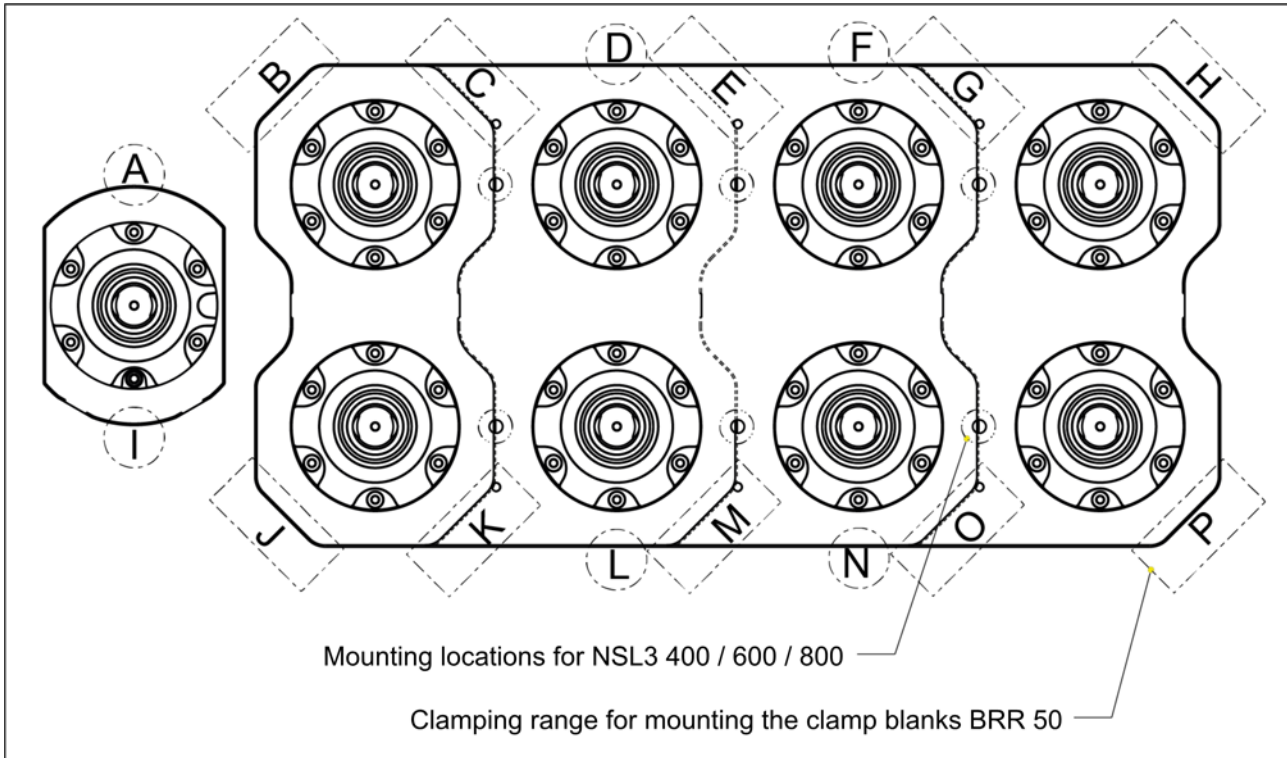
Due to redundancy, the clamping pins with positioning accuracy in one direction (SPB 40) should be used for clamping modules inside a clamping station or multiple linked clamping stations that are more than 160 mm apart or that do not show a positioning tolerance of  $\pm 0.01$  mm. For the clamping areas that are not intended for aligning the device or pallet, clamping pins with centering clearance (SPC 40) can be used (also refer to chapter "Clamping pins" ([👉 4.4, Page 34](#))).

#### Even height of the clamping modules

Even height of the clamping modules inside a clamping station is only ensured when in a clamped state. The clamping station is to be fastened with the BRR 50 clamp blanks included in the scope of delivery. The clamping station must be fastened on the machine table with all clamp blanks provided to ensure safe mounting. The clamp blanks must be fastened using adequately dimensioned fastening screws in accordance with DIN EN ISO 4762 starting with thread size M10. The prescribed arrangement for the BRR 50 clamp blanks can be found in the following clamping diagram. Clamping stations over size NSL3 400 can also be screwed on the machine table with at least two M10 fastening screws. The mounting points are offset centrally between the clamping modules at a distance of 200 mm. Due to the additional screw fitting, increased rigidity on the machine table is achieved for the clamping station.



NSL3 200 Set-up 1



Mounting locations for NSL3 400 / 600 / 800

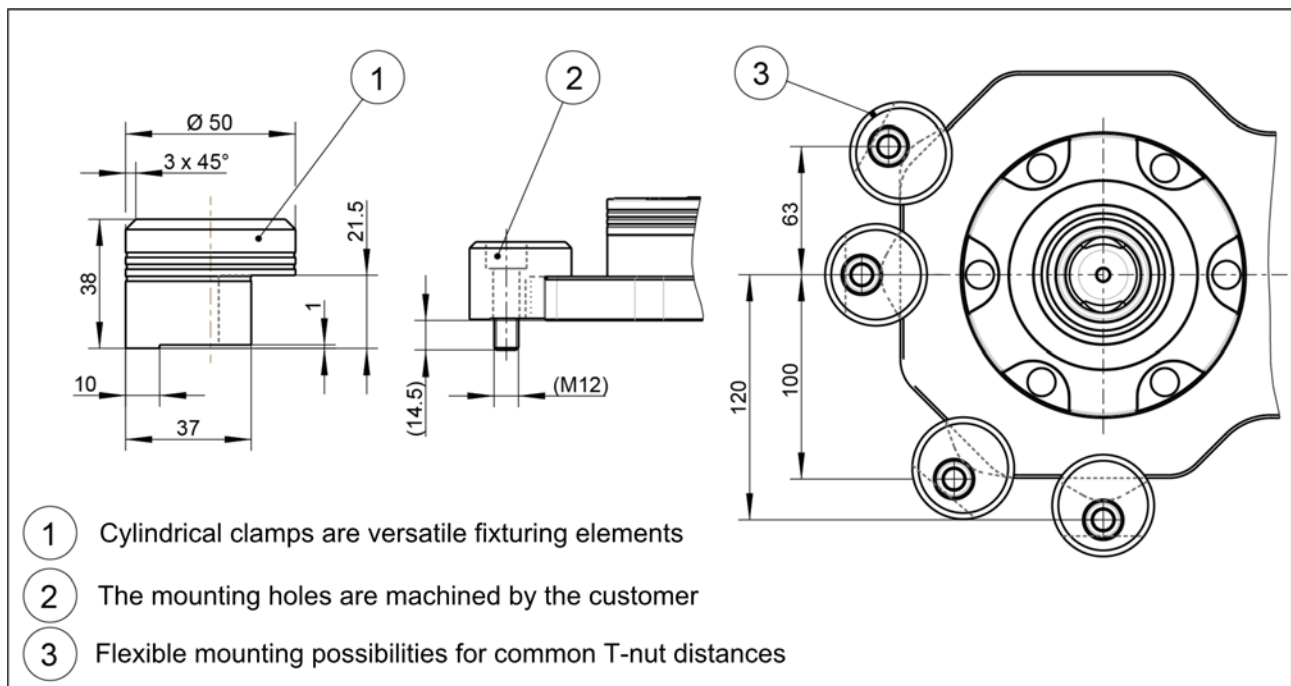
Clamping range for mounting the clamp blanks BRR 50

Clamping diagram

Clamping range				
NSL3 150-V1-T	NSL3 200 / NSL3 200-V1-T	NSL3 400	NSL3 600	NSL3 800
A, I	B, C, J, K	B, E, J, M	B, D, G, J, L, O	B, D, F, H, J, L, N, P

**Note**

The clamping area for the NSL3 300-200 is based on the NSL3 400 clamping diagram. In this case, the four BRR50 clamp blanks supplied with the NSL3 300-200 must be evenly distributed at the round outer diameter at four clamping points.



Mounting clamp blanks

### Alternating ventilation for the clamping modules when connecting and disconnecting the air supply at the clamping station

When connecting the clamping station, it must be taken into consideration that complete ventilation of the piston chambers in all clamping modules during the locking process is only possible via the air connection. For safe pressure ventilation, use the appropriate valves, shut-off valves with discharge or sealing nipples with ventilation.

### NSL3 clamping stations without turbo function

For NSL3 clamping stations without turbo function, ventilation of the clamping modules occurs as a result of pressure applied to the unlocking connection via its own ventilation hole along the bottom of the base plate of the clamping station used. When setting up a clamping station without turbo function on the machine table, make sure that the vented compressed air is able to escape unobstructed along the bottom of the base plate. Make sure that the clamping station with the base plate is not located in the water bath. For this reason, make sure the cooling lubricant in the machine compartment has completely drained when actuating the air connections.

### NSL3-V1 clamping stations with turbo function

For clamping stations with turbo function type NSL3-V1, piston chamber ventilation takes place alternately at one of the two free air connections. The air connections or connected supply lines must have a ventilation option for this reason. When a clamping station NSL3-V1 with turbo connection is used, the spring-actuated locking procedure at the quick-change pallet modules is actively supported with air pressure. This results in a higher pull-in force. The increase in the pull-in force on the clamping modules is achieved with a pressure pulse at the air connection. After actuation of the turbo function, the compressed air supply can be disconnected again.

### Connecting hose lines

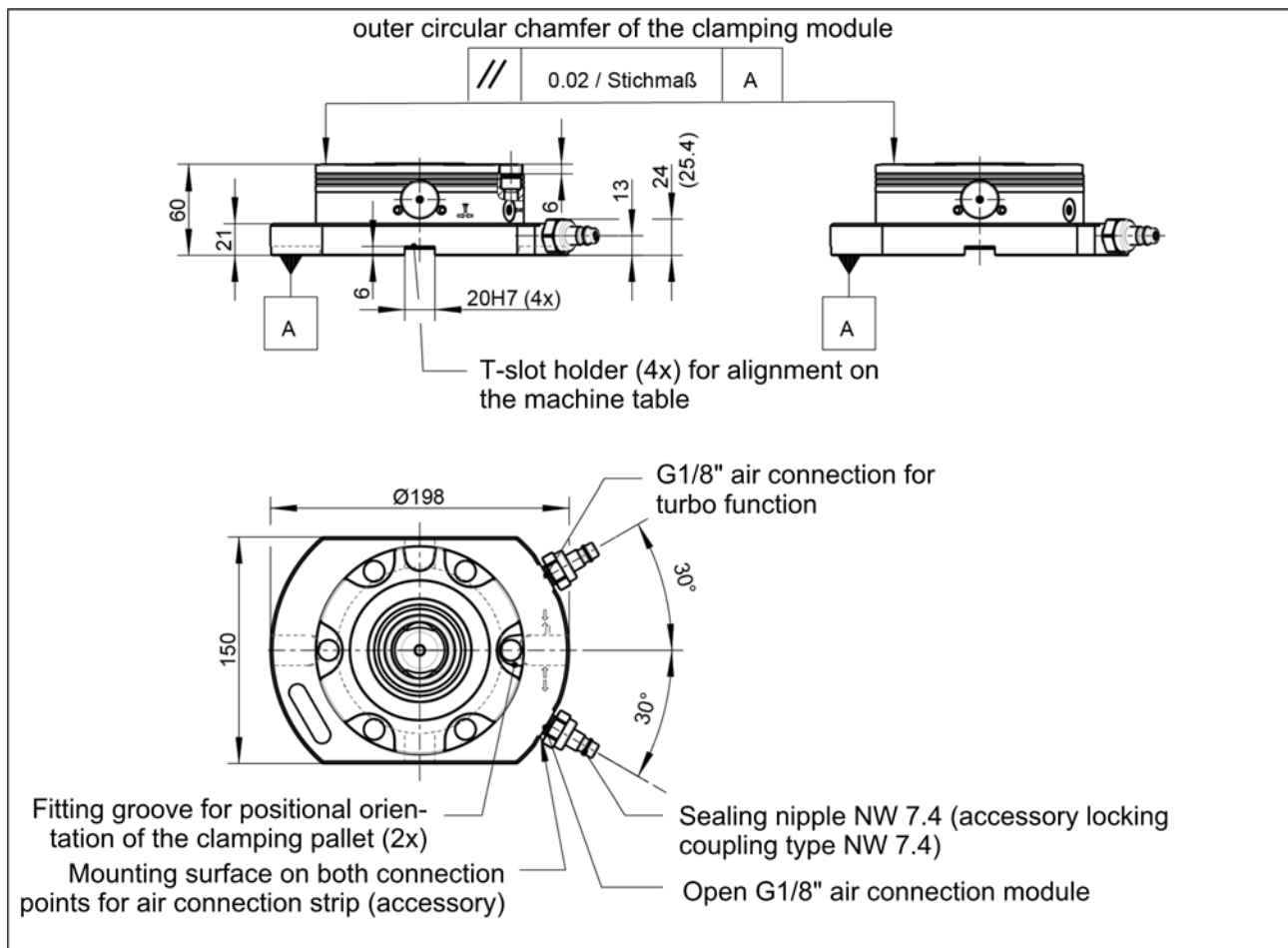
Choosing the minimum cross section for the hose line depends on the number of installed quick-change pallet modules inside one clamping station or in several clamping stations actuated with shared hose lines. Then, supply lines with the following minimum cross sections must be used.

Number of installed clamping modules	min. nominal hose width (hose internal diameter)
1	4 mm
2, 3, 4	6 mm
5	8 mm

When decoupling hose lines, the pneumatic plug-in connection or the sealing nipple must be protected against the ingress of dirt or cooling lubricant. The sealing nipple comes with a plastic cover cap. If, however, the supplied pneumatic plug-in connection is installed, a suitable seal must be provided via an accessory on the plug connection or the hose line.

### 4.3.1 NSL3 150-V1-T

Mounting the clamping station on the machine table takes place using two BRR 50 clamp blanks. There are four alignment grooves on the bottom for holding the sliding blocks in place when aligning the clamping station. These allow for precise alignment along an alignment groove. The clamping station is equipped with a quick-change pallet module with two fitting grooves for the positional orientation of the clamping pallet or for the use of a clamping membrane type SPM plus 138. The NSL3 150-V1-T has two G 1/8" connectors for separate functions. One air connection for unlocking and one air connection for the turbo function. Supply occurs either via the pneumatic plug connections G1/8" 6/4 or the sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted to the supply points at both air connections with separately available connection strips (accessories).

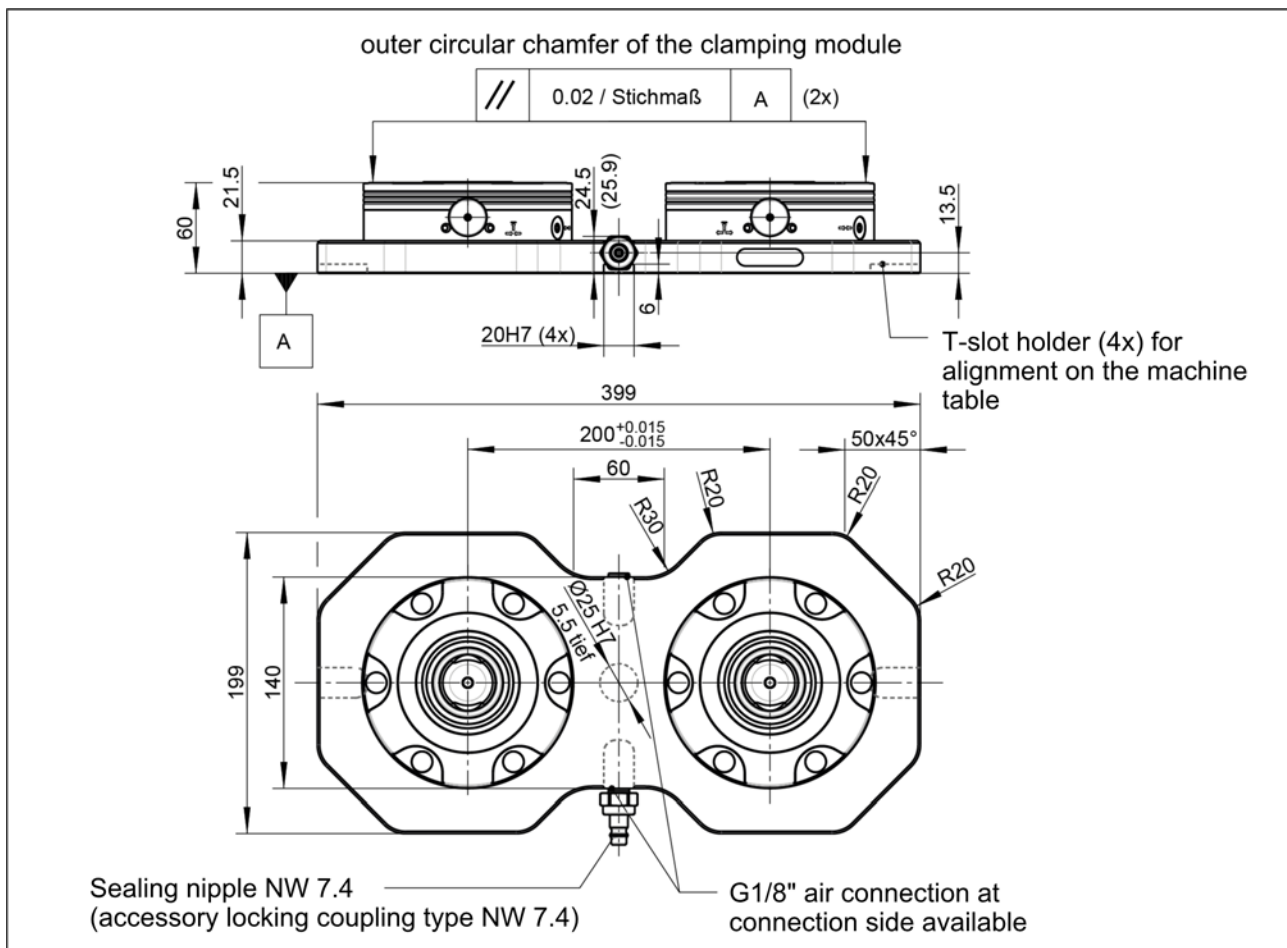


NSL3 150-V1-T



### 4.3.2 NSL3 200

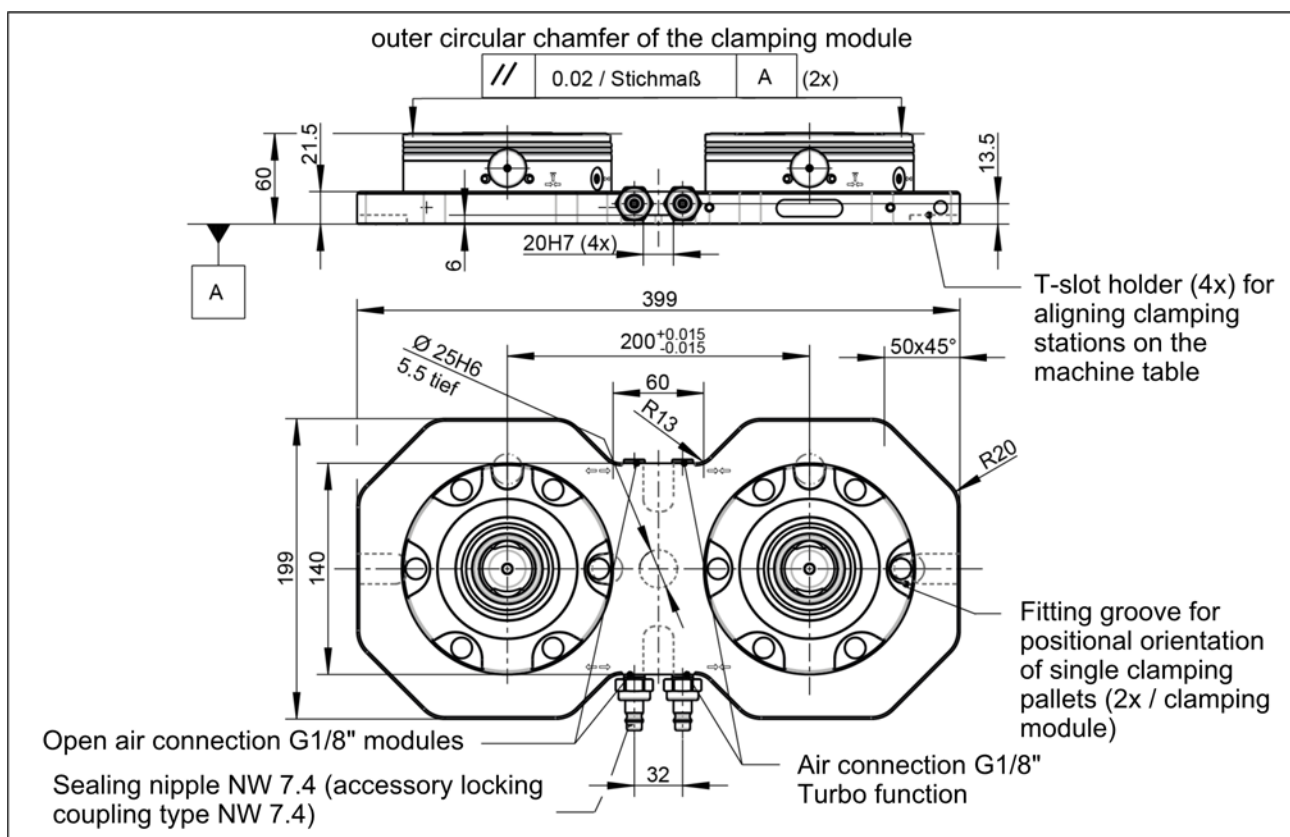
Mounting the clamping station on the machine table takes place using four BRR 50 clamp blanks. There are four alignment grooves on the bottom for holding the sliding blocks in place when aligning the clamping station. These allow for precise alignment along an alignment groove. The NSL3 200 is equipped with two interconnected G 1/8" air connections for simultaneously unlocking both clamping points. The air supply can be connected to either the front or the back of the clamping station. The opposing connection point is closed with a locking screw. Supply occurs either via the pneumatic plug connections G1/8" 6/4 or the sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted at the connection points using a separately available connection strip (accessory).



NSL3 200

### 4.3.3 NSL3 200-V1-T

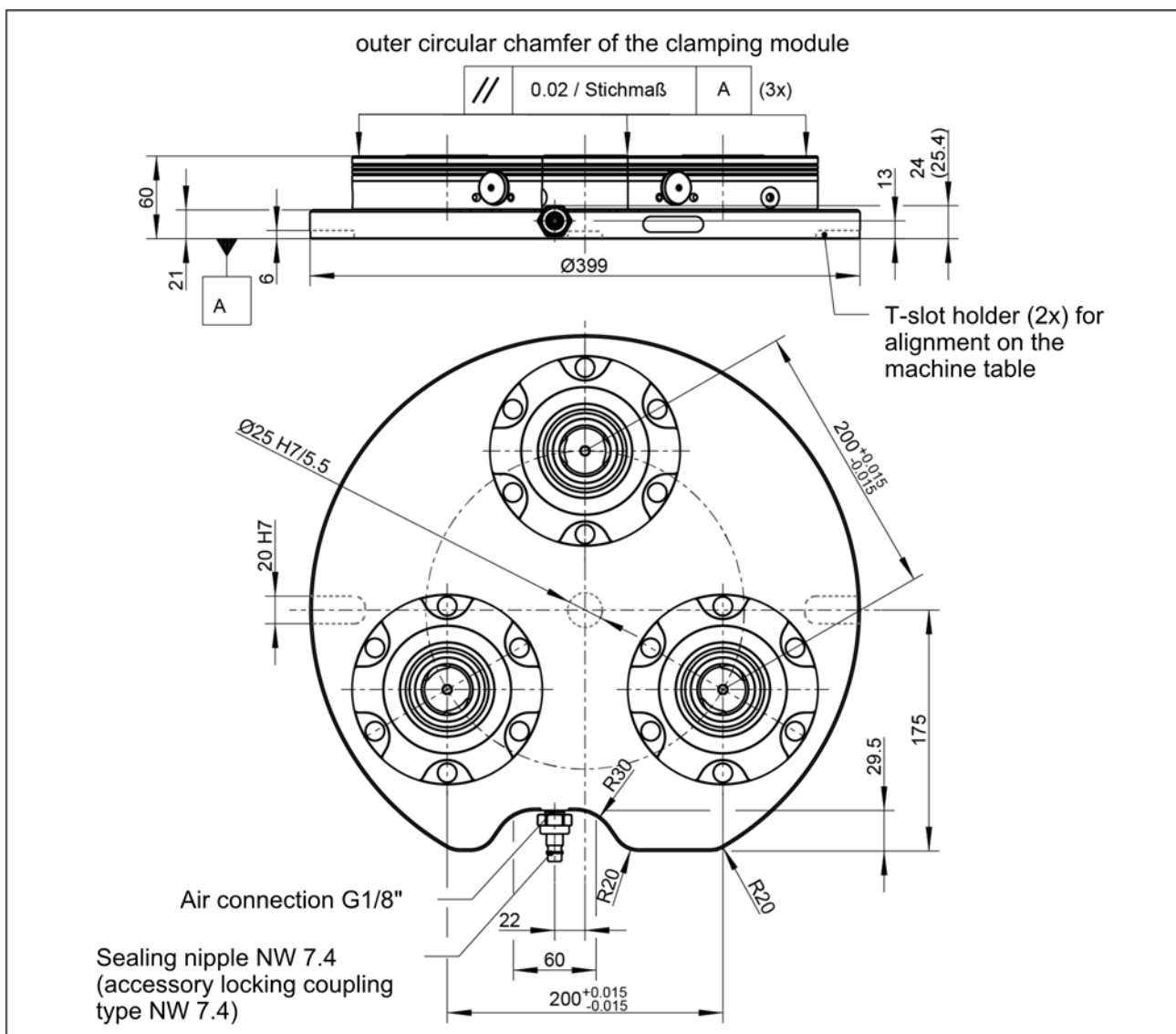
Mounting the clamping station on the machine table takes place using two BRR 50 clamp blanks. There are four alignment grooves on the bottom for holding the sliding blocks in place when aligning the clamping station. These allow for precise alignment along an alignment groove. The NSL3 200-V1-T is equipped with two interconnected G 1/8" air connections for simultaneously unlocking both clamping points. Two additional interconnected G 1/8" air connections to the supply of the turbo function at both clamping points. The air supply can be connected to either the front or the back of the clamping station. The opposing connection points are closed with locking screws. Supply occurs either via the pneumatic plug connections G1/8" 6/4 or the sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station is equipped with quick-change pallet modules with two fitting grooves each. These are intended for positional orientation when using single clamping pallets types PAL-S, PAL-A or clamping membranes for workpiece clamping type SPM plus 138. The clamping station can be retrofitted at the connection points using a 2x connection strip (accessory).



NSL3 200-V1-T

### 4.3.4 NSL3 300-200

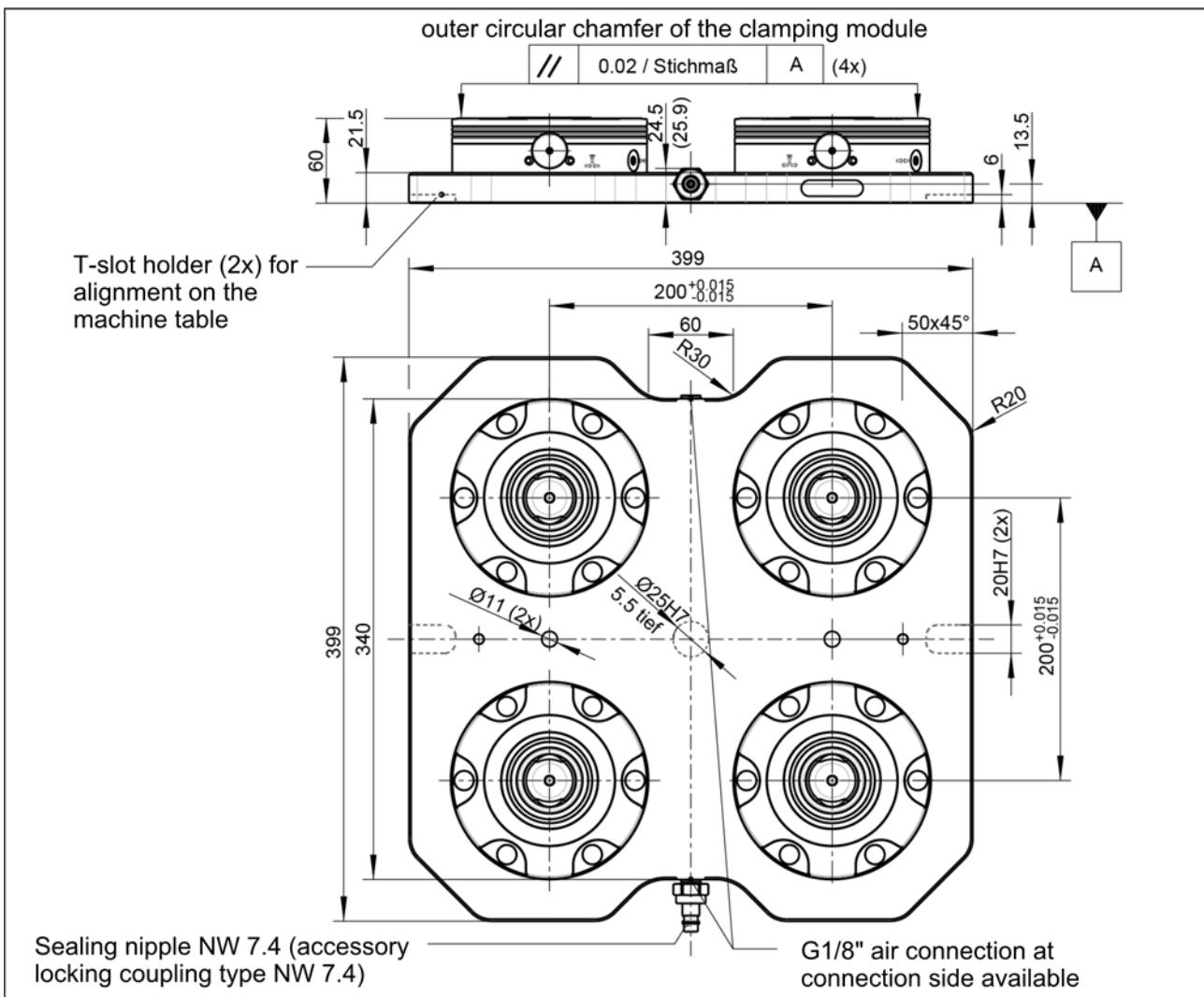
Mounting the clamping station on the machine table takes place using two BRR 50 clamp blanks. There are four alignment grooves on the bottom for holding the sliding blocks in place when aligning the clamping station. These allow for precise alignment along an alignment groove. The NSL3 300-200 is equipped with a G 1/8" air connection for simultaneously unlocking all three clamping points. Supply occurs either via a pneumatic plug connection G1/8" 6/4 or a sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted at the connection points using a separately available connection strip (accessory).



NSL3 300-200

#### 4.3.5 NSL3 400

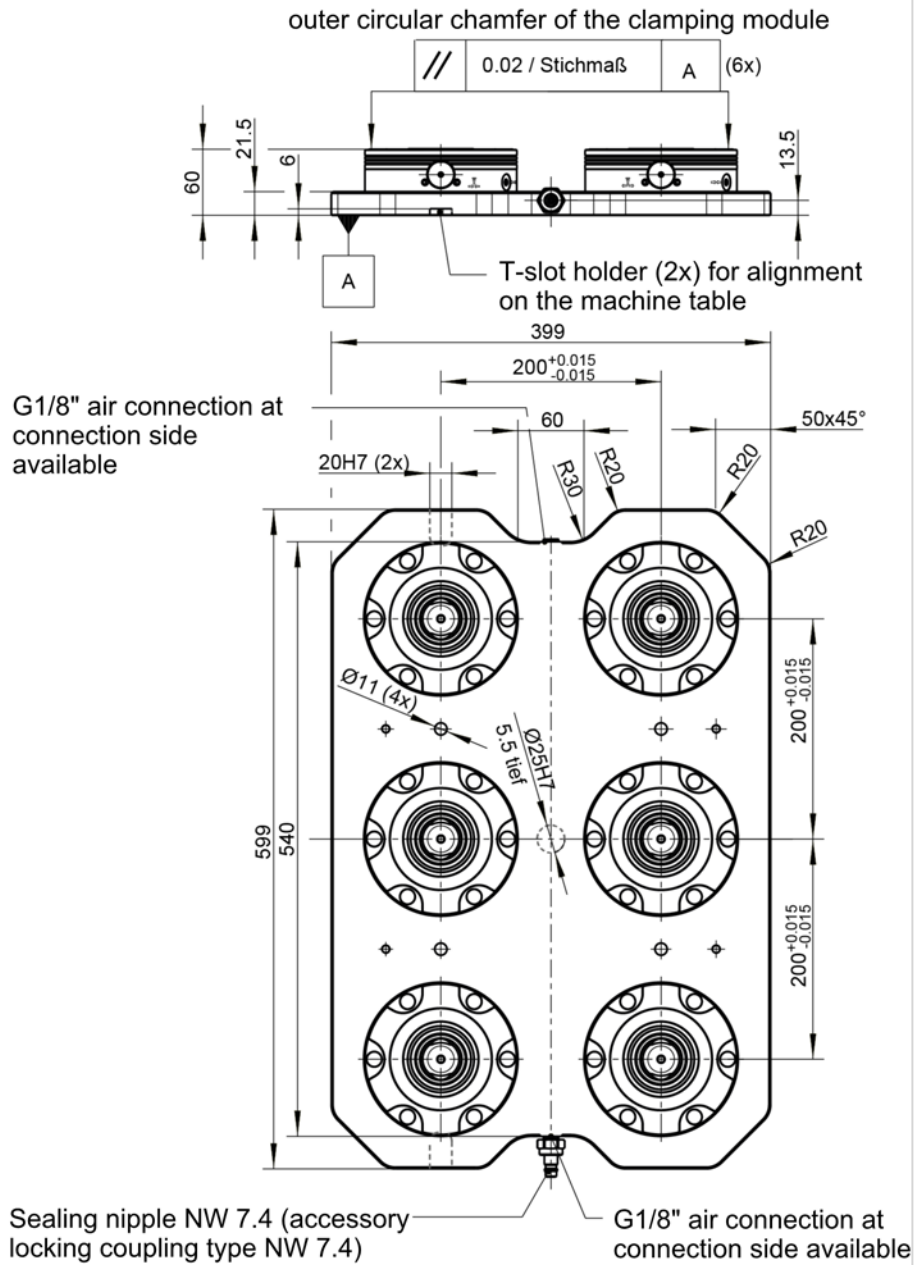
The clamping station is fastened on the machine table using four BRR 50 clamping blanks. The clamping station can also be fastened on the machine table using 2 fastening holes spaced 200 mm apart. These mounting points are fixed between the clamping modules, transverse to the operator side. Size M10 screws can be used at the additional mounting points to achieve more rigid clamping. There are two alignment grooves on the bottom of the clamping station to mount T-nuts used for aligning the clamping stations. These allow for precise alignment along an alignment groove. The NSL3 400 is equipped with two interconnected G 1/8" air connections for simultaneously unlocking all four clamping points. The air supply can be connected to either the front or the back of the clamping station. The opposing connection point is closed with a locking screw. Supply occurs either via a pneumatic plug connection G1/8" 8/6 or a sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted at the connection points using a separately available connection strip (accessory).



NSL3 400

#### 4.3.6 NSL3 600

The clamping station is fastened on the machine table using six BRR 50 clamping blanks. The clamping station can also be fastened on the machine table using 4 fastening holes spaced 200 mm x 200 mm apart. The mounting points are located in the middle between the clamping modules. Size M10 screws can be used at the additional mounting points to achieve more rigid clamping. There are two alignment grooves on the bottom of the clamping station to mount T-nuts used for aligning the clamping stations on the machine table. These allow for precise alignment along an alignment groove. The NSL3 600 is equipped with two interconnected G 1/8" air connections for simultaneously unlocking all six clamping points. The air supply can be connected to either the front or the back of the clamping station. The opposing connection point is closed with a locking screw. Supply occurs either via a pneumatic plug connection G1/8" 8/6 or a sealing nipple (accessory) for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted at the connection points using a separately available connection strip (accessory).

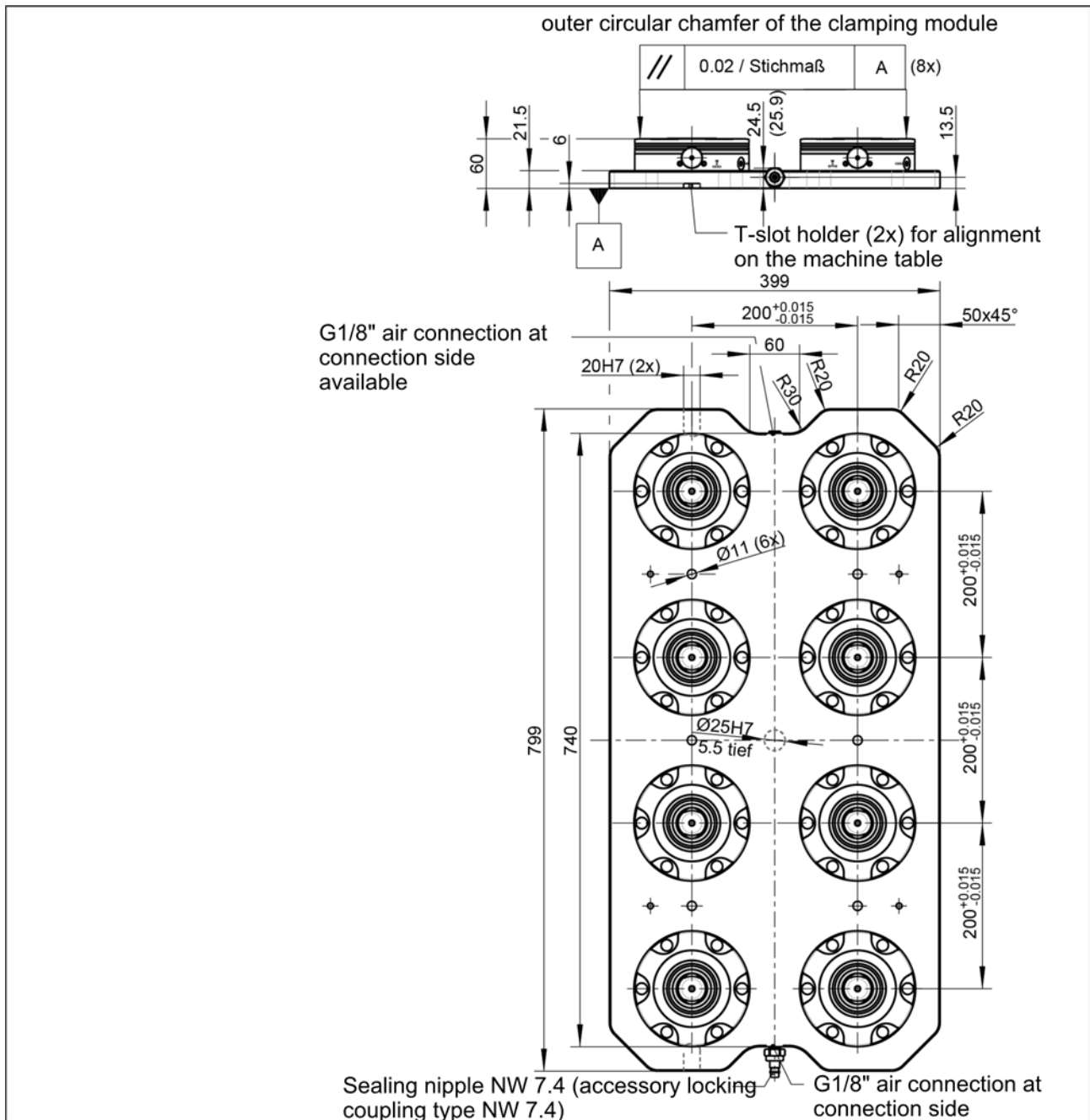


NSL3 600

#### 4.3.7 NSL3 800

The clamping station is fastened on the machine table using eight BRR 50 clamping blanks. The clamping station can also be fastened on the machine table using 6 fastening holes spaced 200 mm x 200 mm apart. The mounting points are located in the middle between the clamping modules. Size M10 screws can be used at the additional mounting points to achieve more rigid clamping on the machine table. There are two alignment grooves on the bottom of the clamping station to mount T-nuts used for aligning the clamping stations on the machine table. These allow for precise alignment along an alignment groove. The NSL3 800 is equipped with two interconnected G 1/8" air connections for simultaneously unlocking all eight clamping points. The air supply can be connected to either the front or the back of the clamping station. The opposing connection point is closed with a locking screw. Supply occurs either via a pneumatic plug connection G1/8" 8/6 or a sealing nipple for locking couplings type NW 7.4 (accessory). The clamping station can be retrofitted at the connection points using a separately available connection strip (accessory).





NSL3 800

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



**NOTICE**

**Notes on clamping pins and mounting 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 for connections to the palette or device.

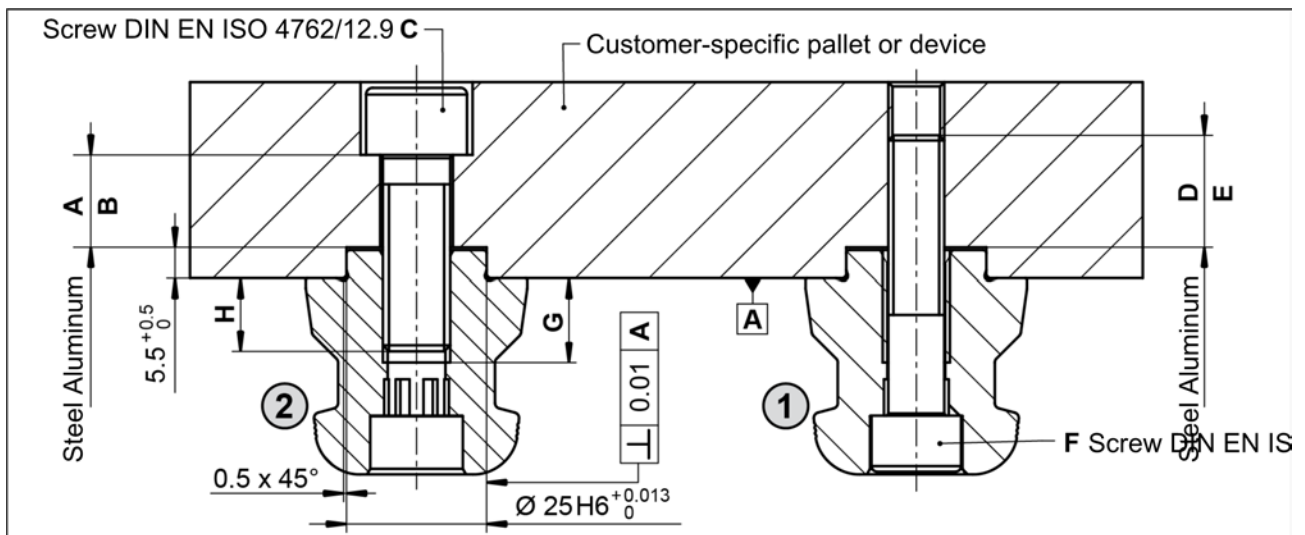
Only original SCHUNK clamping pins may be used.

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 attached in two different ways to the workpiece or pallet; the mounting variants are numbered in order of preference.

If clamping pins are used outside of SCHUNK pallets, for example in customer-specific devices or workpieces, the outer diameter of the part to be clamped must be large enough to completely cover the plan sealing ring on the top of all quick-change pallet systems involved in the clamping function.

Type designation	ID no.	Min. outer diameter on the support of the part
NSE3 138(-K)	1313721, 1313722	68 mm
NSE3 138-V1(-K)	1313723, 1313724	68 mm



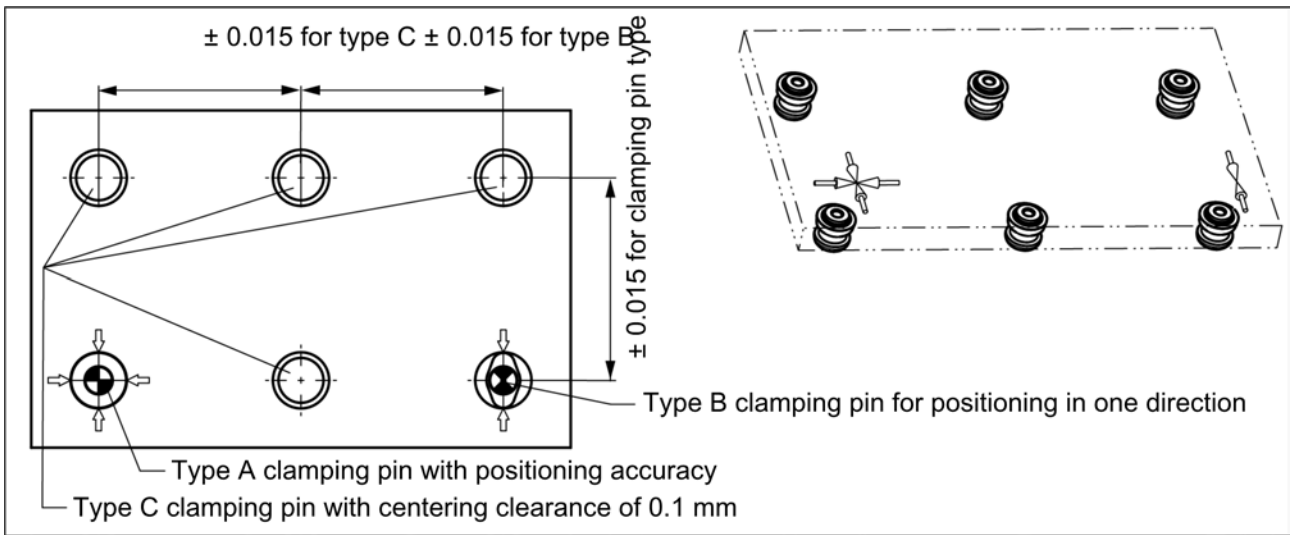
**Tolerances and installation conditions**

Type	ID no.	A	B	C	D	E	F	G*	H
SPA 40	0471151	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPB 40	0471152	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPC 40	0471153	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPG 40	0471154	> 12	> 17	M12	> 15	> 20	M10	25	>22
SPA 40-16	0471064	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPB 40-16	0471065	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPC 40-16	0471066	> 13	> 18	M16	> 18	> 24	M12	20	>16

\* The length of the screwed thread must not exceed the dimension "G" under any circumstances!

**Usage/arrangement of the different types of clamping pins**

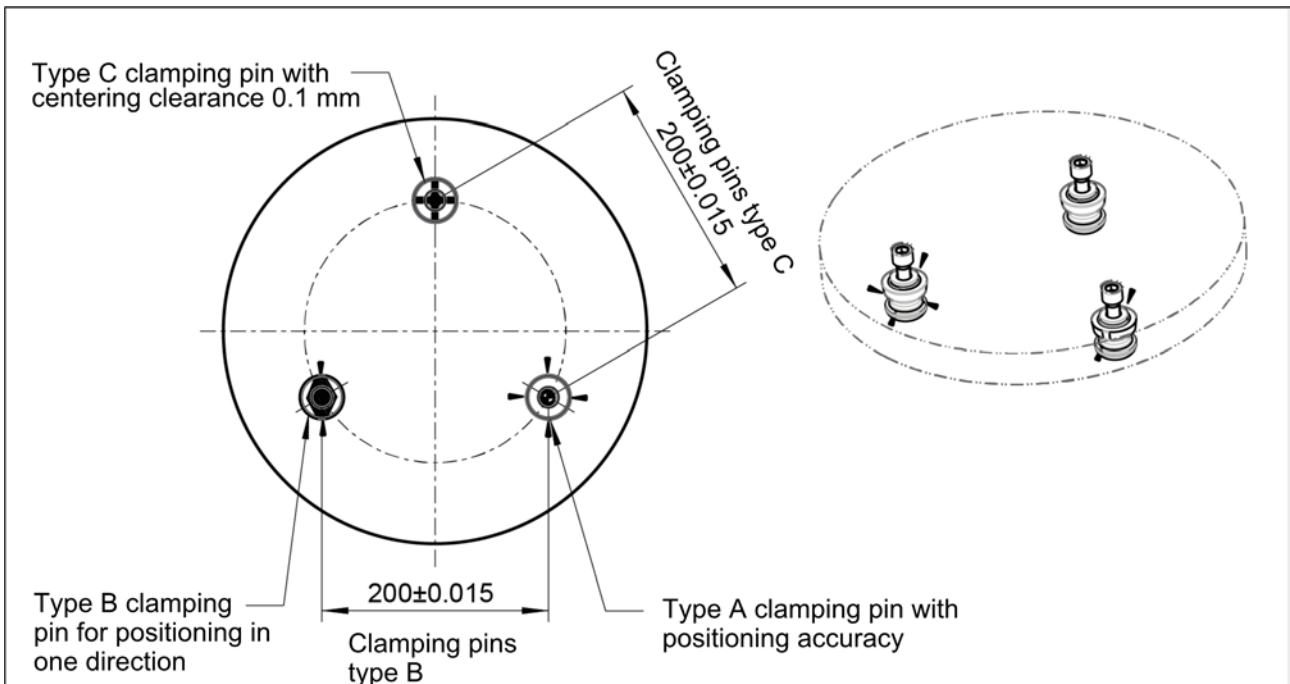
(Application: pallet with 6 clamping positions)



Clamping pallet with 6 clamping areas

**Use / arrangement of the different types of clamping pins with a clamping pallet for clamping station NSL3 300-200**

(Application: clamping pallet with 3 clamping positions)



Clamping pallet with 3 clamping areas

#### 4.4.1 Information to clamping pin SPG 40

The SPG 40 can be used with a clamping position instead of the SPA 40.

With several clamping positions, all three types of clamping pins can be replaced with the SPG 40.

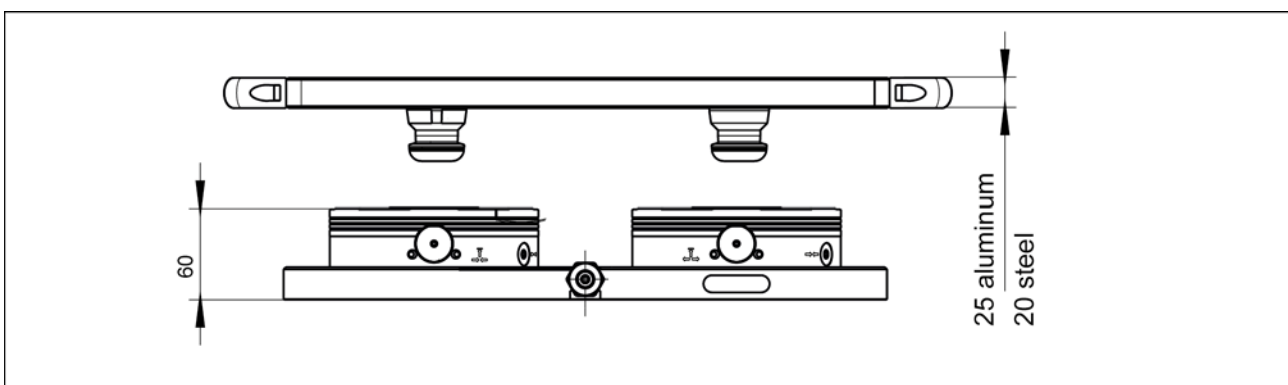
The repeat accuracy increases to  $< 0.002$  mm when using the SPG 40.

When connecting the screws from above, an M12 screw 10 mm longer of strength class 12.9 must be used after order of preference 2.

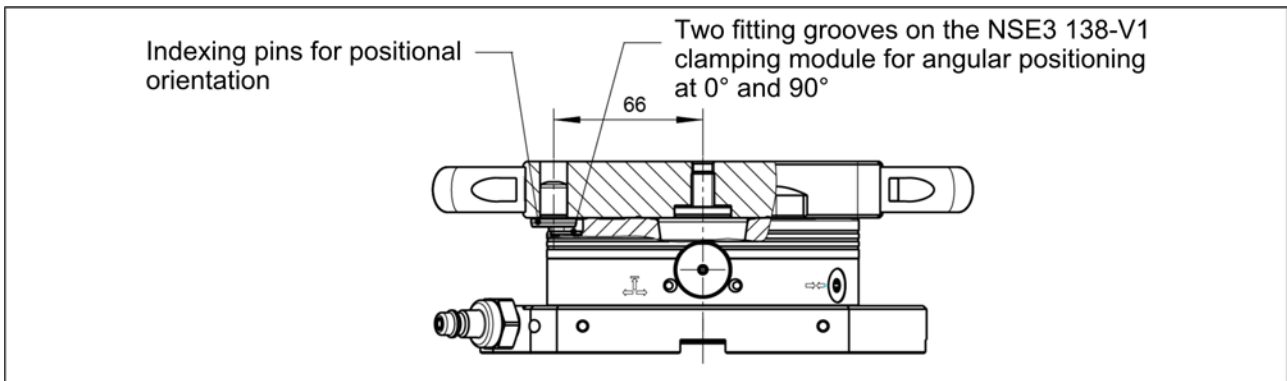
#### 4.5 Clamping pallets PAL-S, PAL-A (optional)

There are suitable VERO-S clamping pallets to be used as accessories for NSL3 clamping stations. There are different sized clamping pallets that correspond to the clamping stations. These are available in steel as well as aluminum. The clamping pallets achieve highly accurate repeat accuracy in combination with the VERO-S NSL3 clamping station.

When using single clamping pallets, these can be placed in a position-oriented and non-rotating fashion on a single NSE3 138-V1 clamping module in combination with the NSL3-V1 clamping station. The positional orientation is achieved using an indexing pin type IXB V1 NSE plus, which inserts into one of two 90° angled fitting grooves on the clamping module. Request our installation drawings if doing the installation yourself.



VERO-S clamping pallets



NSL3 150-V1-T with single clamping pallet

#### 4.6 Screw tightening torques

**Tightening torques for mounting clamping pins to the workpiece or to the clamping pallet.**

(Screw quality 12.9)

Screw size	M8	M10	M12	M14	M16
Tightening torques (Nm)	32	62	108	170	262

**Tightening torques for fastening the clamping station with BRR50 clamp blanks.**

The clamp blanks that have been adjusted by the customer to correspond to the machine table must be fastened to the machine table with fastening screws of strength class 10.9. These fixing screws and any nuts required for the T-slots are not included in the scope of delivery.

**Note:**

The clamping stations should preferably be fastened with M12 screws in connection with the clamp blanks.

(Screw quality 10.9)

Screw size	M10	M12	M14
Tightening torques (Nm)	50	88	120

## 5 Function

The VERO-S NSL3 clamping station guarantees rapid changing of VERO-S clamping pallets, devices or workpieces 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 via the related VERO-S clamping pin.

### 5.1 Connections on the clamping station

The VERO-S clamping station is actuated using an air connection with sealing nipple and sealing coupling. The sealing nipple is included in the accessory pack for the clamping station. The locking couplings are not included in the scope of delivery of the clamping station. The required locking coupling required is the industry standard-size NW 7.4. The scope of delivery also includes a pneumatic plug-in connection with a nominal hose diameter of 4 mm or 6 mm as an alternative connection option.

#### CAUTION

**The pressure chambers of the quick-change pallet modules must be able to vent during actuation.**

- When using customer-specific air connection plug-in systems. Use sealing nipples without shut-off function (with an open through-hole) to vent the clamping module piston chambers.
- The corresponding valves, sound absorbers or shut-off valves should be fitted with a ventilation function.

#### CAUTION

When disconnecting hose lines, the relevant air connections (sealing nipples) must be closed with seal plugs to prevent the ingress of dirt or cooling lubricant. The attachable seal plugs are made of plastic and are included in the scope of delivery.

## 5.2 Unlocking connection



If the unlocking connection on the clamping station is pressurized with compressed air, all modules are unlocked simultaneously. Clamping pallets, devices and workpieces can be exchanged or removed from the clamping station.

Since VERO-S NSE3 clamping modules are spring-operated clamping systems, the connection must remain pressurized with compressed air (at least 5 bar) during the set-up / changing process.

After decoupling the air supply at the unlocking connection, all clamping modules are locked simultaneously. The exchanged clamping pallet is firmly fastened and aligned with high precision. If no clamping pallet is used in the clamping station, the clamping slides of the quick-change pallet module moves into the closed position. Exchanging the clamping pallet is not possible with clamping modules that are not locked.



### WARNING

**Risk of injury due to clamping pallet falling from the clamping station if the unlocking connection is not scheduled pressurized according to schedule.**

- The unlocking connection may only be operated if the clamping pallet has been prevented from falling.

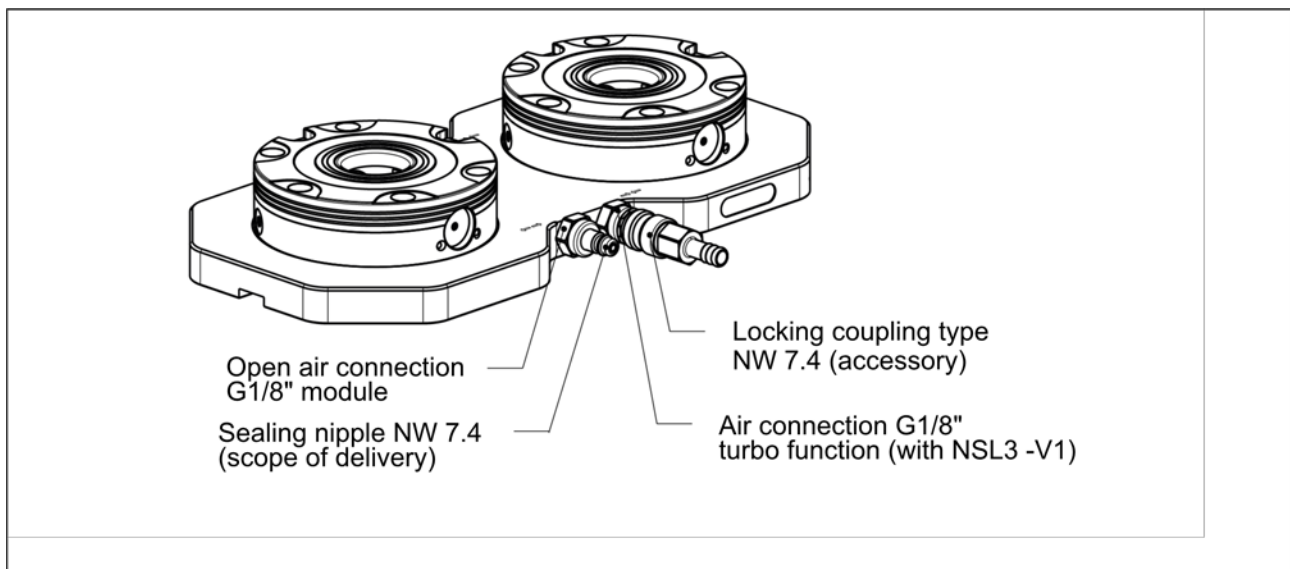
## 5.3 TURBO connection (with NSL 3-V1)



NSL3 -V1 clamping stations are equipped with an additional turbo connection. When compressed air is applied at the connection for the turbo function, this function actively provides air pressure to support the spring-actuated locking procedure of the quick-change pallet module. This increases the pull-in force in all the modules.

One pressure pulse is sufficient to increase the pull-in force until the maximum permissible value is reached. Afterwards, the clamping station can be switched back to depressurized. The pull-in force is retained due to the self-locking function of the spring-loaded system.





Connections on the clamping station

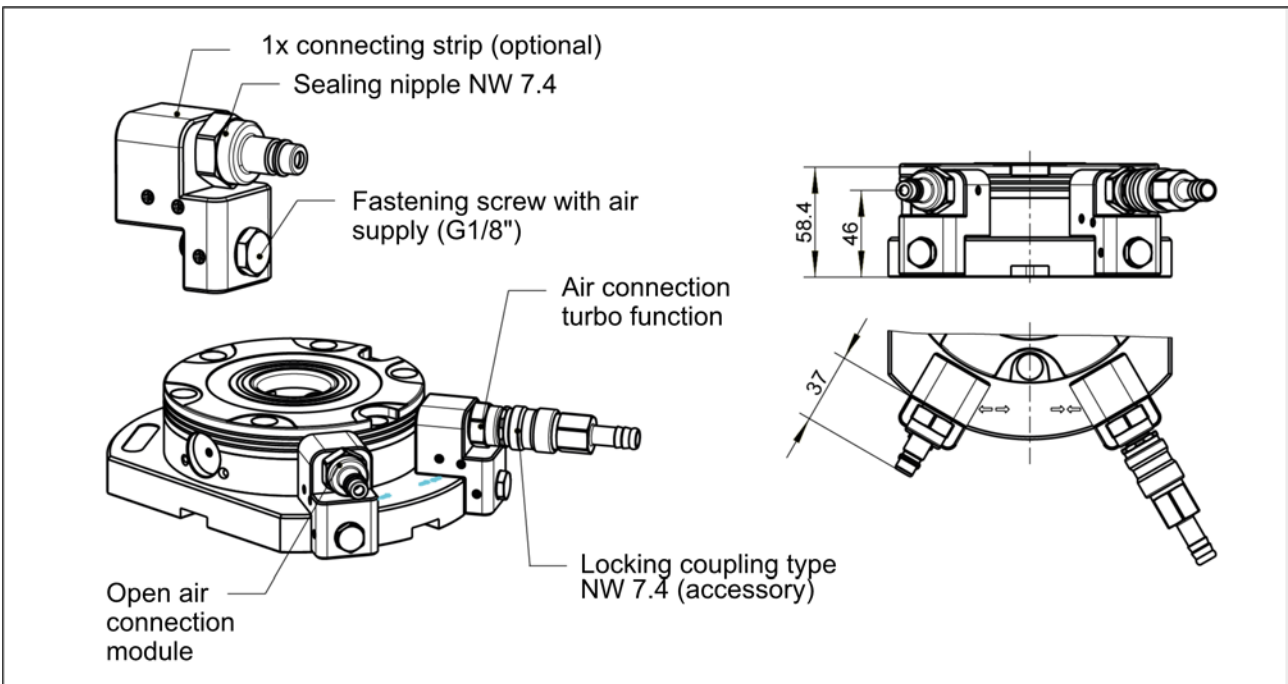
#### 5.4 VERO-S connecting strip ASL1-G1/8", ASL2-G1/8" (optional)

Upon customer request, a VERO-S terminal block can be mounted to the clamping station in order to facilitate access to the air supply point. The connecting strip is equipped with an elevated connection point with a size NW 7.4 sealing nipple. A quick air relief valve is integrated into the connecting strip. The quick air relief reduces the opening and closing times of the clamping station as the air can escape rapidly through a sound absorber. The valve strip is available in two different versions, a single connecting strip type ASL1-G1/8" and a coupled 2x connecting strip type ASL2-G1/8". To mount the connecting strip, the front air connection (sealing nipple) is removed from the clamping station and in its place, the connecting strip is directly adjusted via the hollow screw. The rear air connection of the clamping station remains locked with the locking screw. The NSL3 200-V1-T is fitted with the 2x connecting strip, which supplies both air connections separately. The circuit symbols for the "unlocking function" and the "turbo function" are engraved on the clamping stations type NSL3 -V1.

1x connecting strip ASL1-G1/8" ID  
no.: 1327465 suitable for clamping  
station

NSL3 150-V1-T (installed 2x)	NSL3 200	NSL3 300-200	NSL3 400	NSL3 600	NSL3 800
---------------------------------	----------	--------------	----------	----------	----------

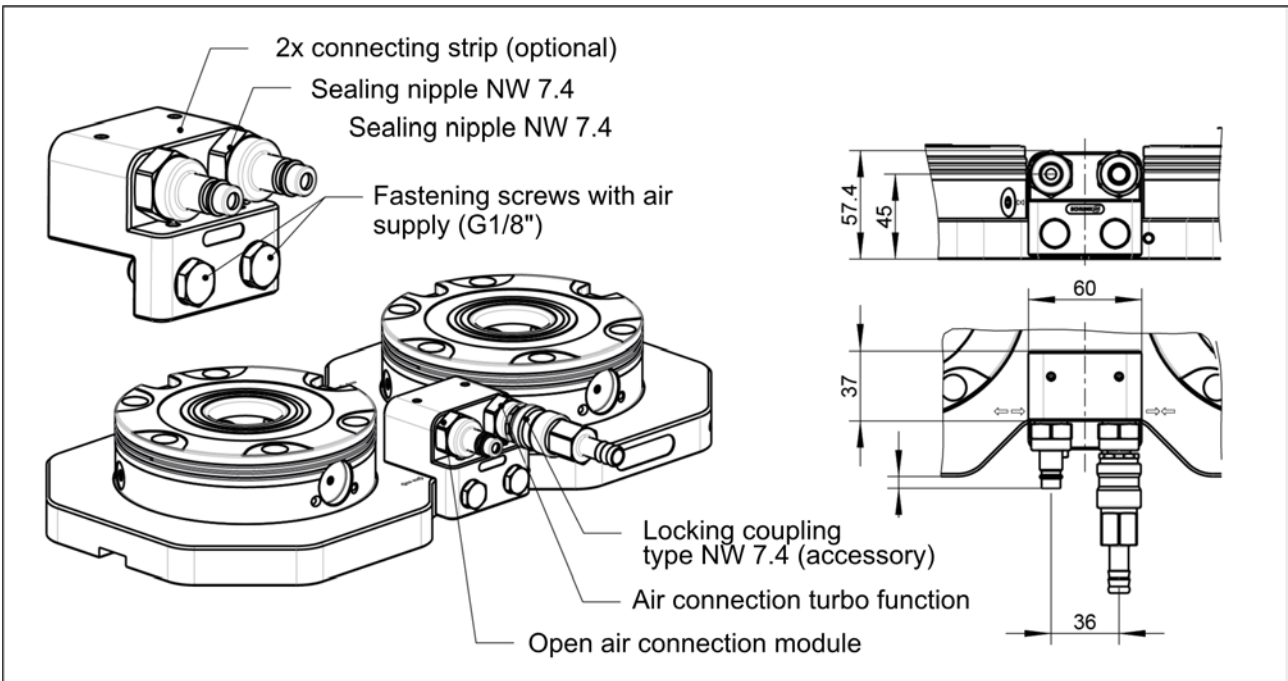
Labeling 1x connecting strip



1x connecting strip ASL1-G1/8"

2x connecting strip ASL2-G1/8" ID no.: 1315007 suitable for clamping station				
NSL3 200-V1-T				

Labeling 2x connecting strip



2x connecting strip ASL2-G1/8"

## 5.5 Cone seal KVS3 (optional)

Upon customer request, VERO-S NSE3 and NSE3-V1 can be retrofitted with a KVS3 cone seal without removing the unit from the installation space. Via the cone seal, the quick-change pallet system can be protected against the penetration of coolant and chips into the change interface.

### Note

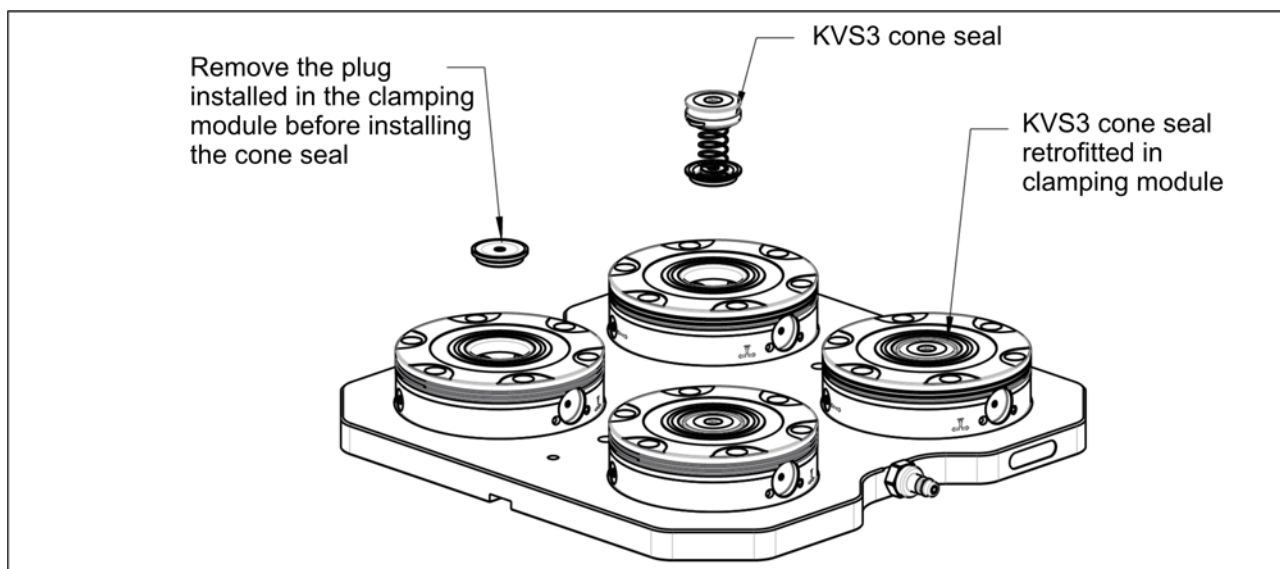
The clamping stations VERO-S NSL3 are not fitted as standard to a connection position for the exhaust function of the clamping modules.

### Note

To install the cone seal in a VERO-S NSE3, the plug fitted must first be removed from the change interface. Use a hexagon socket screwdriver for this purpose.

### Note

The technical data and the exact installation instructions for the cone seal can be found in the operating manual for the VERO-S NSE3, NSE-T3 Document no. : 1152196.



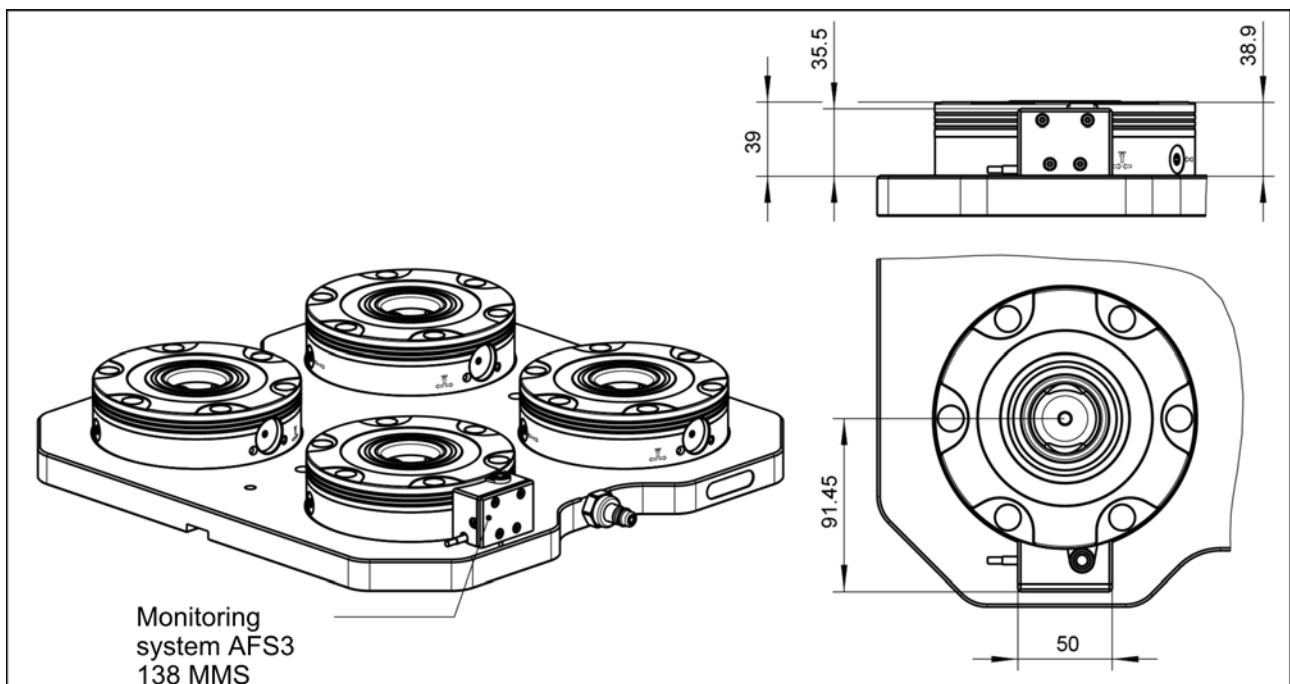
NSL3 clamping station retrofitted with cone seal

## 5.6 Monitoring system AFS3 138 MMS (optional)

The AFS3 138 MMS monitoring system can be mounted to the NSL3 clamping station upon customer request. The monitoring system can evaluate whether the operating states is "TENSIONED" or "UNLOCKED" and transmit this data to the machine control system. Workpiece contact monitoring is possible.

### Note

The technical data and the exact installation instructions for the AFS3 138 MMS can be found in the operating manual for the VERO-S NSE3, NSE-T3 Document no. : 1152196.



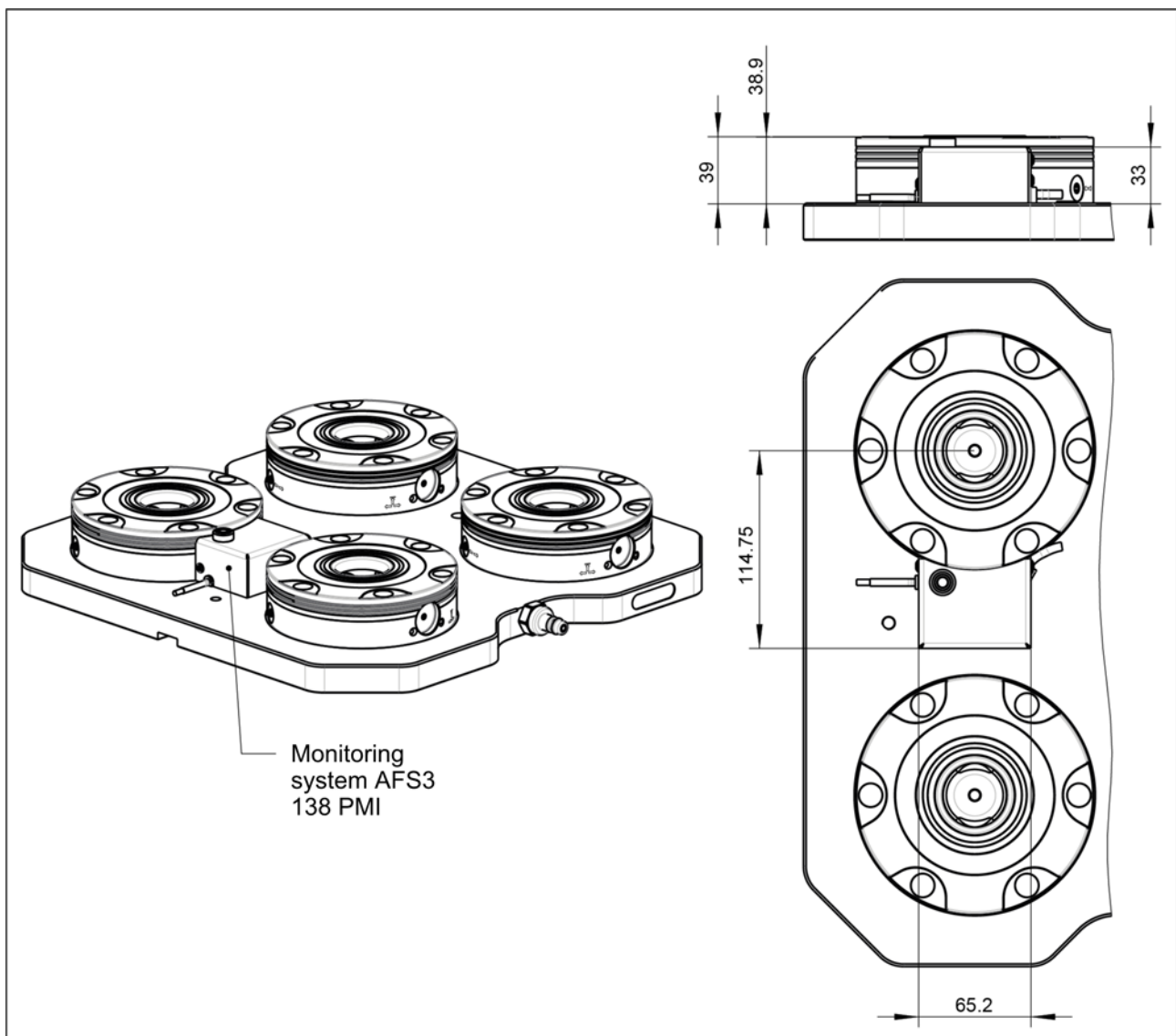
Clamping station NSL3 400 retrofitted with the AFS3 138 MMS monitoring system

## 5.7 Monitoring system AFS3 138 PMI (optional)

The AFS3 138 PMI monitoring system can be mounted to the NSL3 clamping station upon customer request. The monitoring system can evaluate whether the operating states is "TENSIONED" or "UNLOCKED" and transmit this data to the machine control system. Workpiece contact monitoring is possible.

### Note

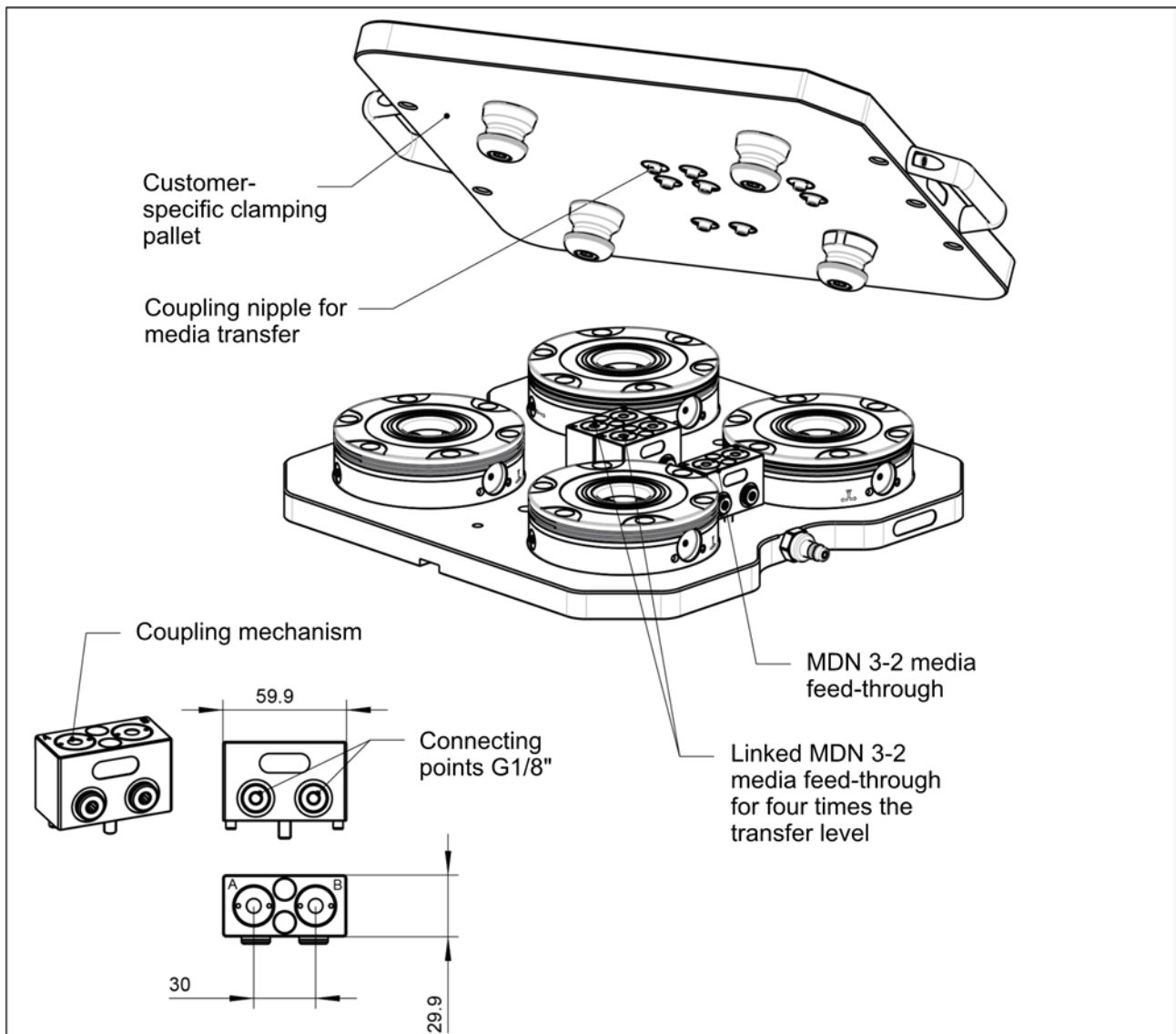
The technical data and the exact installation instructions for the AFS3 138 PMI can be found in the operating manual for the VERO-S NSE3, NSE-T3 Document no.: 1152196.



Clamping station NSL3 400 retrofitted with the AFS3 138 PMI monitoring system

### 5.8 Media feed-through VERO-S MDN 3-2 (optional)

As an option, the NSL3 clamping station can be enhanced with the VERO-S MDN 3-2 media feed-through. The media feed-through is intended for transmitting liquid and gaseous media from the NSL3 clamping station to the clamping pallet. The compact design of the media feed-through allows for variable positioning on the base plate of the clamping station. Attaching the media feed-through requires additional screw threads on the clamping station. Further details on the MDN 3-2 media feed-through and the corresponding coupling elements are available on request.



NSL3 400 clamping station retrofitted with VERO-S MDN 3-2 media feed-through

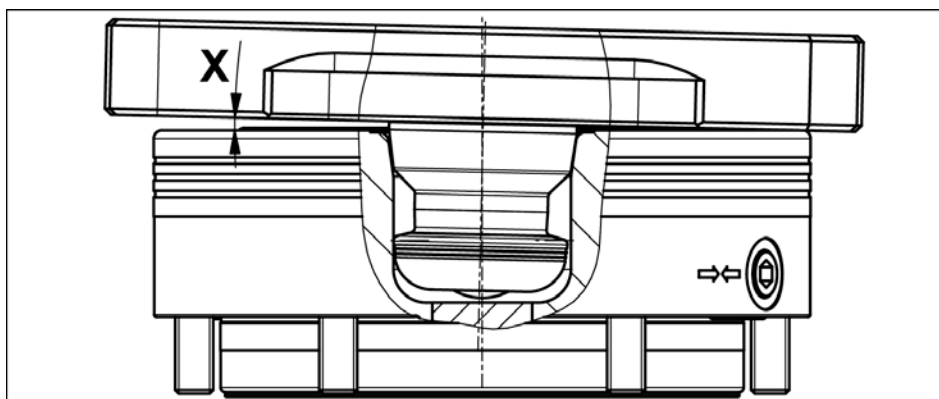


## 6 Operation



### NOTICE

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!



### ⚠ WARNING

Risk of injury due to losing pallets or workpieces in the case of incorrect actuation caused by incorrect operation.  
Risk of injury due to compressed air hoses coming loose when connected improperly.

- Disconnect the energy supply after locking.
- Use check valves or safety switches.
- The danger zone must be surrounded by a protective enclosure during operation.




### ⚠ WARNING

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

- Do not reach into the clamping module.
- Use pressure maintenance valves.
- Use loading devices.


## 7 Maintenance and care

The clamping stations and integrated quick-change pallet system are designed for low-maintenance operation, so that opening and disassembling the fitted clamping modules is only necessary in exceptional cases.

	<b>⚠ CAUTION</b>
	<p><b>Risk of injury and risk of damage to the clamping module when opening the housing cover.</b></p> <p><b>If the clamping module has to be disassembled, send the module to SCHUNK for repair.</b></p> <p><b>The covers of the clamping modules are spring preloaded and may only be removed by trained specialist personnel. The covers can only be disassembled and assembled using a special assembly tool and by observing the corresponding disassembly and assembly instructions.</b></p>

**To ensure the quick-change pallet system operates perfectly, the following instructions are to be observed:**

Pressure medium: Compressed air, compressed air quality according to ISO 8573-1:7 4 4

	<b>NOTICE</b>
	<p><b>A separate maintenance unit with oiler must be used for the air supply.</b></p>

- Check the clamping station at regular intervals (at least every two weeks or after 1000 clampings). The system is functioning correctly if the clamping slides on all simultaneously actuated clamping modules move smoothly at the minimum system pressure of 5 bar and open completely.
- Carry out regular visual/functional checks. In case of visible damage or signs of malfunction, shut down the quick-change pallet system immediately.  
The system may only be commissioned again once the faults have been corrected. For example, by replacing the damaged unit.



- During maintenance work on the quick-change pallet modules or the bottom air supply of the clamping station, new seals must be fitted and lubricated with Renolit HLT 2 or a similar grease before assembly.
- Check the supply hose line to the pressure supply of the clamping station for damage at regular intervals. The supply hose line must be of the appropriate nominal hose width and be completely inserted into the air connections and securely clamped. Protect the supply hose line from kinking and avoid tensile loads. After replacing the hose line, perform a leak test.

**NOTICE**

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

**Detaching thread on the clamping modules**

The clamping modules installed in the clamping stations have two detaching threads located opposite each other. This allows, for example, the clamping modules to be more easily removed from the clamping station for performing maintenance work.

**7.1 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 Test the clamping station for leaks in both module positions.

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

If the clamping system has leaks, check the entire pneumatic 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.

## 8 Troubleshooting

### 8.1 The clamping areas do not unlock

Possible cause	Remedial measures
Defective air connections	Check air supply
Pressure below minimum	Check operating pressure (min. 5 bar)
A component is broken (e.g. due to over-loading)	Replace the module or send it to SCHUNK for repair
Excess tensile load on clamping pins	Reduce support weight

### 8.2 The clamping areas do not unlock perfectly

Possible cause	Remedial measures
Pressure below minimum	Check operating pressure (min. 5 bar)
The modules were not operated with oiled compressed air	Install maintenance unit with oiler
Hose diameter below minimum	for required hose diameters, see chapter "Securing and connecting" ( <a href="#">☞ 4.3, Page 20</a> )
The turbo connection is still pressurized, this applies to clamping stations with turbo function	Ventilate the connection

### 8.3 The quick-change pallet systems no longer open quietly

Possible cause	Remedial measures
The clamping faces on the clamping slides and on the clamping pin are dirty	Remove the clamping pallet and clean the clamping faces on the clamping slides and on the clamping pins. Clean all clamping modules installed on the clamping slides

## 9 Parts lists

### 9.1 Part lists

#### NSL3 150-V1-T (ID no. 1323568)

Item	Characterization	Quantity
1	Base plate	1
2	NSE3 138-V1	1
4	Set-screw	1
11	Locking screw	2
12	Sealing ring G1/8"	2
13	Sealing nipple G1/8"	2
14	Pneumatic plug-in connection G1/8" 6/4	2
21	Cylindrical clamp blanks BRR 50	2

#### NSL3 200 (ID no. 1323569)

Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	2
3	NSE3 138	2
5	O-ring	2
6	O-ring	4
7	Countersunk screw	4
8	Locking screw	1
12	Sealing ring G1/8"	1
13	Sealing nipple G1/8"	1
14	Pneumatic plug-in connection G1/8" 6/4	1
21	Cylindrical clamp blanks BRR 50	4

#### NSL3 200-V1-T (ID no. 1323570)

Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	2
3	NSE3 138	2
5	O-ring	2
6	O-ring	6
7	Countersunk screw	6

9	Set-screw	2
10	Locking screw	2
12	Sealing ring G1/8"	2
13	Sealing nipple G1/8"	2
14	Pneumatic plug-in connection G1/8" 6/4	2
21	Cylindrical clamp blanks BRR 50	4

**NSL3 300-200** (ID no. 1323571)

Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	2
3	NSE3 138-V1	2
5	O-ring	2
6	O-ring	6
7	Countersunk screw	6
9	Set-screw	2
10	Locking screw	2
12	Sealing ring G1/8"	2
13	Sealing nipple G1/8"	2
14	Pneumatic plug-in connection G1/8" 6/4	2
21	Cylindrical clamp blanks BRR 50	4

**NSL3 400** (ID no. 1323572)

Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	4
3	NSE3 138	4
5	O-ring	4
6	O-ring	8
7	Countersunk screw	8
8	Locking screw	1
12	Sealing ring G1/8"	1
13	Sealing nipple G1/8"	1
14	Pneumatic plug-in connection G1/8" 8/6	1
21	Cylindrical clamp blanks BRR 50	4
22	Eye bolt, M8	2

**NSL3 600** (ID no. 1323574)

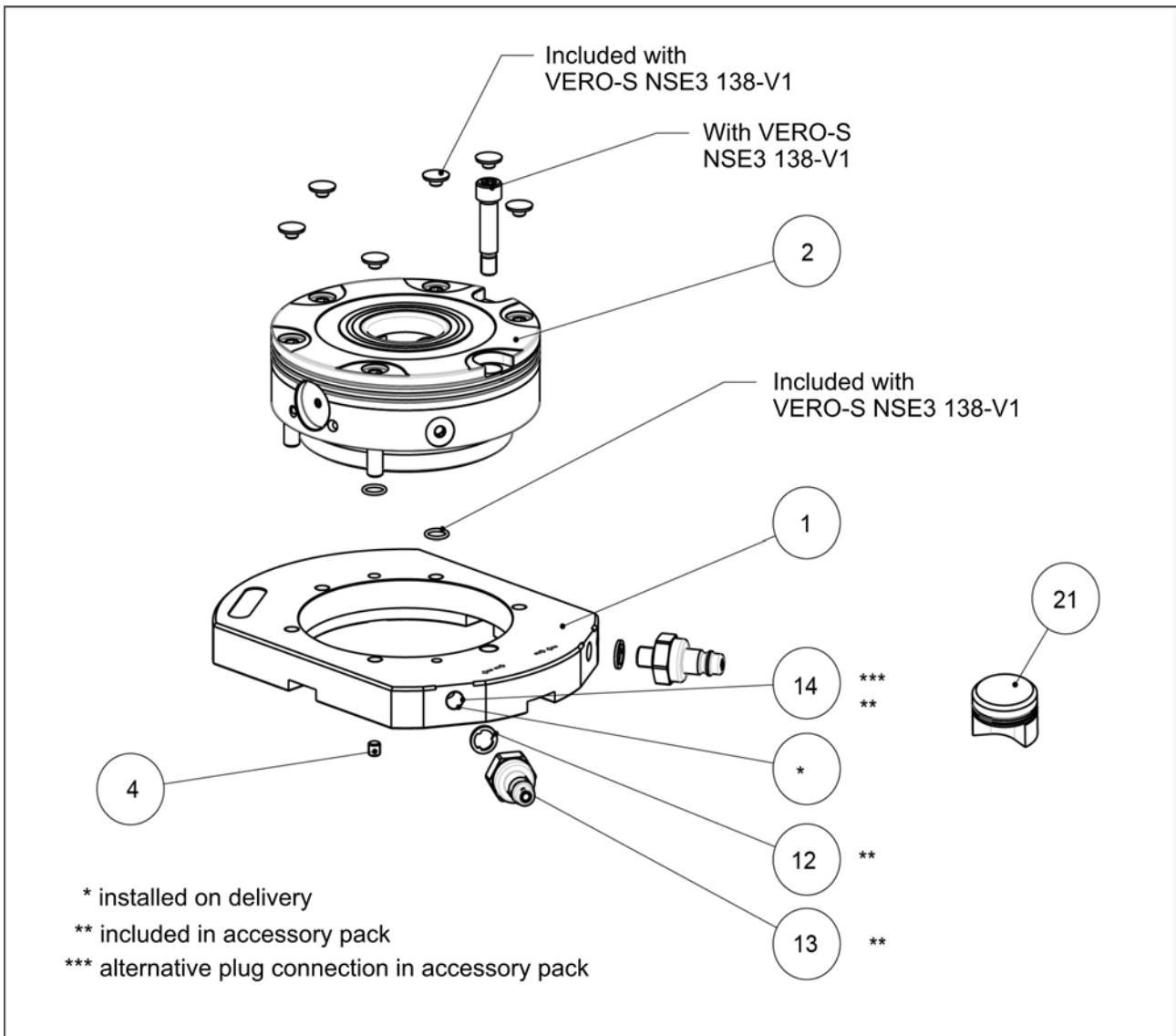
Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	6
3	NSE3 138	6
5	O-ring	6
6	O-ring	12
7	Countersunk screw	12
8	Locking screw	1
12	Sealing ring G1/8"	1
13	Sealing nipple G1/8"	1
14	Pneumatic plug-in connection G1/8" 8/6	1
21	Cylindrical clamp blanks BRR 50	6
22	Eye bolt, M8	2

**NSL3 800** (ID no. 1323574)

Item	Characterization	Quantity
1	Base plate	1
2	Airway strip	8
3	NSE3 138	8
5	O-ring	8
6	O-ring	16
7	Countersunk screw	16
8	Locking screw	1
12	Sealing ring G1/8"	1
13	Sealing nipple G1/8"	1
14	Pneumatic plug-in connection G1/8" 8/6	1
21	Cylindrical clamp blanks BRR 50	8
22	Eye bolt, M8	2

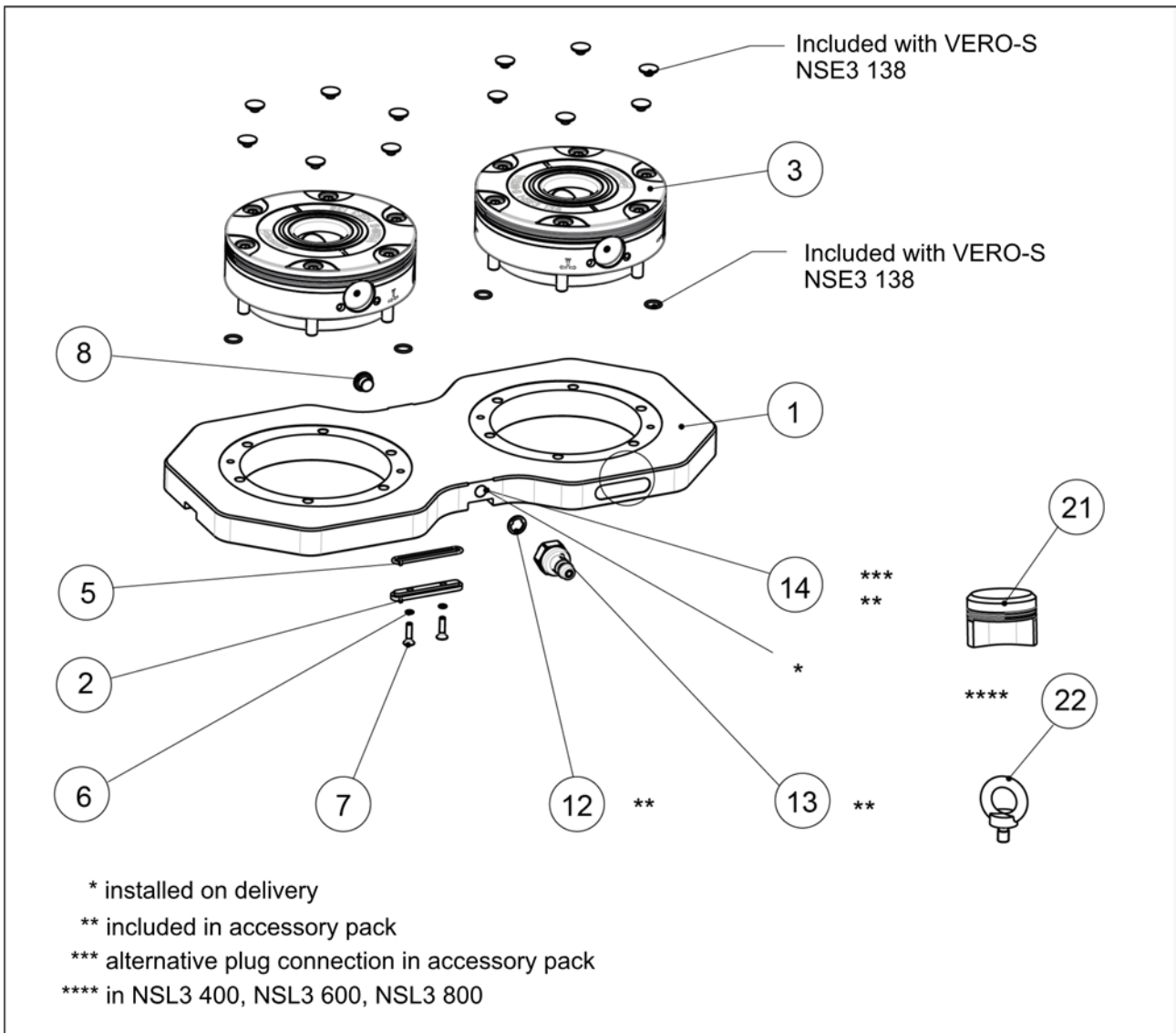
## 10 Assembly Drawings

### 10.1 NSL3 with NSE3 138-V1 quick-change pallet module



NSL3 with NSE3 138-V1 quick-change pallet module

### 10.2 NSL3



NSL3

## 11 Declaration of Incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

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                      Quick-change pallet system VERO-S  
Type designation                          NSL3 150-V1-T, NSL3 200, NSL3 200-V1-T, NSL3 300-200,  
NSL3 400, NSL3 600, NSL3 800  
ID number                                  1323568, 1323569, 1323570, 1323571, 1323572, 1323574,  
1323575

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  
EN ISO 4414:2010                      Pneumatic fluid power – General rules and safety requirements  
for systems and their components

Other related technical standards and specifications:

VDI 3035:2008-05                      Design of machine tools, production lines and peripheral equip-  
ment for the use of metalworking fluids

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 Schröder, Address: see manufacturer's address

*Signature: see original declaration*

Mengen, November 2017

p.p. Philipp Schröder; Head of Engineering Design



## 12 Appendix on Declaration of Incorporation, as per 2006/42/EC, annex II, No. 1 B

1. Description of the basic safety and health protection requirements, as per 2006/42/EC, Annex I, that apply to and are fulfilled for the scope of the partly completed machinery:

Product designation	Quick-Change Pallet System VERO-S
Type designation	NSL3 150-V1-T, NSL3 200, NSL3 200-V1-T, NSL3 300-200, NSL3 400, NSL3 600, NSL3 800
ID number	1323568, 1323569, 1323570, 1323571, 1323572, 1323574, 1323575

		To be provided by the System Integrator for the overall machine	↓
		Fulfilled for the scope of the partly completed machine	↓
		Not relevant	↓
<b>1.1</b>	<b>Essential Requirements</b>		
1.1.1	Definitions		X
1.1.2	Principles of safety integration		X
1.1.3	Materials and products		X
1.1.4	Lighting		X
1.1.5	Design of machinery to facilitate its handling		X
1.1.6	Ergonomics		X
1.1.7	Operating positions		X
1.1.8	Seating		X
<b>1.2</b>	<b>Control Systems</b>		
1.2.1	Safety and reliability of control systems		X
1.2.2	Control devices		X
1.2.3	Starting		X
1.2.4	Stopping		X
1.2.4.1	Normal stop		X
1.2.4.2	Operational stop		X
1.2.4.3	Emergency stop		X
1.2.4.4	Assembly of machinery		X
1.2.5	Selection of control or operating modes		X
1.2.6	Failure of the power supply		X
<b>1.3</b>	<b>Protection against mechanical hazards</b>		
1.3.1	Risk of loss of stability		X
1.3.2	Risk of break-up during operation		X
1.3.3	Risks due to falling or ejected objects		X
1.3.4	Risks due to surfaces, edges or angles		X
1.3.5	Risks related to combined machinery		X
1.3.6	Risks related to variations in operating conditions		X
1.3.7	Risks related to moving parts		X
1.3.8	Choice of protection against risks arising from moving parts		X
1.3.8.1	Moving transmission parts		X
1.3.8.2	Moving parts involved in the process		X
1.3.9	Risks of uncontrolled movements		X
<b>1.4</b>	<b>Required characteristics of guards and protective devices</b>		
1.4.1	General requirements		X
1.4.2	Special requirements for guards		X

Appendix on Declaration of Incorporation,  
as per 2006/42/EC, annex II, No. 1 B

1.4.2.1	Fixed guards			X
1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X
<b>1.5</b>	<b>Risks due to other hazards</b>			
1.5.1	Electricity supply			X
1.5.2	Static electricity			X
1.5.3	Energy supply other than electricity			X
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures		X	
1.45.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise		X	
1.5.9	Vibrations		X	
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine			X
1.5.15	Risk of slipping, tripping or falling			X
1.5.16	Lightning			X
<b>1.6</b>	<b>Maintenance</b>			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	
1.6.3	Isolation of energy sources			X
1.6.4	Operator intervention			X
1.6.5	Cleaning of internal parts	X		
<b>1.7</b>	<b>Information</b>			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices			X
1.7.1.2	Warning devices			X
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery			X
1.7.4	Instructions			X
1.7.4.1	General principles for the drafting of instructions		X	
1.7.4.2	Contents of the instructions			X
1.7.4.3	Sales literature		X	
	<b>The classification from Annex 1 is to be supplemented from here forward.</b>			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery			X
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations			X
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons			X