



# Quick-change pallet system

## VERO-S NSA plus

### Assembly and Operating Manual

Translation of Original Operating  
Manual

Hand in hand for tomorrow

## Imprint

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### Technical changes:

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

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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

Customer Management

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**Please read the operating manual in full and keep it close to the product.**

## Table of Contents

<b>1</b>	<b>General .....</b>	<b>5</b>
1.1	About this manual.....	5
1.1.1	Illustration of safety notes .....	5
1.1.2	Applicable documents .....	6
1.1.3	Design .....	6
1.2	Warranty .....	6
1.3	Scope of delivery.....	6
1.3.1	Accessories .....	6
<b>2</b>	<b>Basic safety notes.....</b>	<b>7</b>
2.1	Appropriate use .....	7
2.2	Inappropriate use .....	7
2.3	Structural changes.....	7
2.4	Spare parts .....	8
2.5	Ambient conditions and operating conditions .....	8
2.6	Material limitations .....	8
2.7	Personnel qualification .....	8
2.8	Personal protective equipment .....	9
2.9	Transport.....	9
2.10	Protection during handling and assembly .....	9
2.11	Protection during commissioning and operation .....	10
2.12	Notes on safe operation.....	10
2.13	Disposal .....	10
2.14	Fundamental dangers .....	11
2.15	Protection against dangerous movements .....	11
2.16	Notes on particular risks .....	11
<b>3</b>	<b>Technical data .....</b>	<b>13</b>
3.1	Suitability for welding applications.....	13
<b>4</b>	<b>Function .....</b>	<b>14</b>
4.1	Clamping function .....	14
4.2	Lifting function.....	15
4.3	Air control and blow-out function for cleaning the plane surface .....	15
4.4	Dynamic pressure monitoring at the clamping slides.....	16
<b>5</b>	<b>Assembly.....</b>	<b>17</b>
5.1	Pre-assembly .....	17
5.2	Installing and connecting .....	17
5.3	Fastening and connection .....	17

5.3.1 NSA plus 120 .....	19
5.3.2 NSA plus 160.....	21
5.4 Clamping rings SRA, SRB, SRC.....	23
5.5 Pneumatic circuit diagram .....	25
5.6 Screw tightening torques .....	26
<b>6 Operation .....</b>	<b>27</b>
<b>7 Maintenance and care .....</b>	<b>28</b>
<b>8 Storage.....</b>	<b>29</b>
<b>9 Trouble shooting.....</b>	<b>30</b>
<b>10 Seal kit and part lists .....</b>	<b>31</b>
10.1 Seal kit lists .....	31
10.2 Part Lists .....	31
<b>11 Assembly drawing .....</b>	<b>32</b>
<b>12 Manufacturer certificate.....</b>	<b>33</b>

# 1 General

## 1.1 About this manual

This manual contains important information for the safe, correct use of the product.

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

Personnel must have read and understood this manual before beginning any work. The observance of all safety notes in this manual is a prerequisite to ensure safe work processes.

The illustrations are intended to provide a basic understanding and may deviate from the actual version.

Besides this manual, other documents which apply are those listed under ▶ 1.1.2 [ 6 ]

### 1.1.1 Illustration of safety notes

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



#### **⚠ DANGER**

Denotes a hazard with a high degree of risk that, if not avoided, will result in death or serious injury.



#### **⚠ WARNING**

Denotes a hazard with a medium degree of risk that, if not avoided, could result in death or serious injury.



#### **⚠ CAUTION**

Denotes a hazard with a low degree of risk that, if not avoided, could result in a minor or moderate injury.

#### **CAUTION**

Information about avoiding material damage.

### 1.1.2 Applicable documents

- General Terms and Conditions \*
- Catalog data sheet for the attached product \*
- Technical data sheet for optional attachments \*
- Approval drawings

The documents labeled with an asterisk (\*) can be downloaded from **schunk.com**.

### 1.1.3 Design

This guide applies to the following sizes in all variants

#### Quick-Change Pallet System

- Size NSA plus 120
- Size NSA plus 160

## 1.2 Warranty

The warranty for standard products is 24 months from the date of delivery from the factory, or 500,000 cycles\* assuming appropriate use in accordance with the following conditions:

- Observe the applicable documents, ▶ [1.1.2](#) [ 6 ]
- Observance of the ambient conditions and operating conditions
- Observe the care and maintenance instructions

Parts touching the workpiece and wearing parts are not covered by the warranty.

\* One cycle comprises one complete clamping procedure ("opening" and "closing").

## 1.3 Scope of delivery

The scope of delivery includes

- Quick-change pallet system in the version ordered
- Accessory kit
- Assembly and Operating Manual

### 1.3.1 Accessories

on separate order, see catalog or data sheets

- Clamping rings Types SRA, SRB, SRC

## 2 Basic safety notes

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

### 2.1 Appropriate use

- This product is intended for positioning and clamping workpieces or clamping pallets on machine tools.
- The product may only be used within the scope of its technical data.
- The product is intended for industrial and commercial use.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Clamping of pallets and workpieces with temperatures between 0°C and 100°C.

### 2.2 Inappropriate use

The product is not being used appropriately if:

- the product is used as a pressing tool, a toolholder, a load-handling device or as lifting equipment.
- the technical data specified are exceeded during usage.
- the clamping ring is not mounted properly.
- the product is used for turning applications over 100 RPM without consulting SCHUNK.
- the product is not fully covered by the pallet, the fixture or the workpiece.
- the product is brought into contact with aggressive media, especially acids.
- the product is used in abrasive blasting processes, especially sandblasting.

### 2.3 Structural changes

#### Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- 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.

- Only use original spare parts and spares authorized by SCHUNK.

## 2.5 Ambient conditions 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 in the service life of the product.

- Ensure that the product is only used within its technical data.
- Ensure that the product is of a sufficient size for the application.
- Ensure that the contact surfaces of the interface and recesses towards the locating surfaces above the mounting points are kept clean at all times. Prevent chips from entering the interface.
- Only use cooling emulsions with anti-corrosive additives when machining.

## 2.6 Material limitations

The product is made of steel alloys, elastomers and aluminum alloys. In addition, Branotect anti-rust oil and Renolit HLT2 are incorporated into the product as auxiliary and operating materials.

## 2.7 Personnel qualification

### Inadequate qualification of personnel

Any work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- All work must be performed by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe country-specific accident prevention regulations and the general safety notes.

The following personnel qualifications are required for the various activities on the product:

<b>Qualified electrician</b>	Qualified electricians have the professional training, knowledge, and experience to work on electrical systems, to recognize and avoid potential dangers, and know the relevant standards and regulations.
<b>Specialist personnel</b>	Specialist personnel have the specialized training, knowledge, and experience to perform the tasks entrusted to them, to recognize and avoid potential dangers, and know the relevant standards and regulations.
<b>Instructed person</b>	Instructed persons have been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.
<b>Manufacturer's service personnel</b>	The manufacturer's service personnel have the specialized training, knowledge, and experience to perform the work entrusted to them and to recognize and avoid potential dangers.

## 2.8 Personal protective equipment

### Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that may interfere with their health or safety at work.

## 2.9 Transport

### Handling during transport

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

- During transport and handling, secure the product to prevent it from falling.

## 2.10 Protection during handling and assembly

### Incorrect handling and assembly

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

- All work must only be performed by appropriately qualified personnel.
- Secure the system against accidental operation during all work.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

## 2.11 Protection during commissioning and operation

### Falling or violently ejected components

Falling and ejected components can lead to serious injury or death.

- Take suitable protective measures to secure the danger zone.

### Manual loading

- If the clamping device is closed, the clamping pallet rests on the clamping slides after loading. When the clamping device is opened, the clamping pallet falls down. This poses a risk of crushing.

## 2.12 Notes on safe operation

### Incorrect manner of working by personnel

An incorrect manner of working can make the product unsafe and risks serious injuries and considerable material damage.

- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded here.
- Do not expose the product to any media that lead to swelling or corroding of seals.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.
- The machine spindle must not be started until the clamping pressure in the clamping device has built up.
- Unclamping may only occur once the machine spindle has come to a standstill.

## 2.13 Disposal

### Handling of disposal

Incorrect handling of disposal can make the product unsafe and lead to risks of environmental harm.

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

## 2.14 Fundamental dangers

### General

- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- Do not reach into the open mechanism or movement area of the product during operation.

## 2.15 Protection against dangerous movements

### Safe condition

Quick-change pallet system clamped and without energy.

### Unexpected movements

If the system still retains residual energy, serious injuries can be caused while working on the product.

- Establish a safe state, switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.

## 2.16 Notes on particular risks



### **⚠ WARNING**

**Risk of injury due to falling device, pallet or workpiece if the clamping ring is loosened erroneously or as a result of negligence.**

- During operation, unintentional loosening of the clamping ring must be prevented by suitable countermeasures (implementation of the safety functions according to the risk assessment of the integrator).
- Wear personal protective equipment.



### **⚠ WARNING**

**Risk of injury during commissioning due to a falling unlocked device, pallet or workpiece.**

- During loading, check that the coupling elements, devices, pallets or workpieces are positioned so they are aligned to each other.
- Clamping pallets with torque pin must be fed to the module in the correct orientation before locking.



### **⚠ WARNING**

**Risk of injury when the clamping ring axis is in a horizontal position or during overhead applications due to the device or pallet falling down.**

- Use a crane or a transport truck when transporting workpieces or clamping pallets.
- During horizontal or overhead applications, the device or clamping pallet must be secured before loosening to prevent it from falling.



### **⚠ WARNING**

**The quick-change pallet 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 or failure of the power supply.**

- Wait for the system to come to a complete standstill in safe state.



### **⚠ CAUTION**

**Risk of injury due to contamination (e.g. coolant or splashing water) in the blow-out and air purge connections of the clamping module or in the change interface.**

- Clean the quick-change pallet system before loading.
- Wear personal protective equipment (safety goggles).

### 3 Technical data

Actuating pressure [bar]	6
Repeat accuracy [mm]	< 0.005
Lifting height [mm]	0.5
Installation position	any
Operating temperature [°C]	+5 to +60
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 8573-1:2010 [7:4:4]
Protection class	IP 67

Designation Variant	ID number	Holding force* [kN]	Lifting force [kg]	Pull down force without turbo [kN]	Pull down force with turbo [kN]
NSA plus 120	0471610	50	100	3	9
NSA plus 160	0471710	75	200	5	15

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

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

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

#### 3.1 Suitability for welding applications

The clamping device can be used for welding applications with a **welding current of up to 525 A**. The welding current is allowed to flow through the clamping device.

#### **CAUTION**

**In welding applications, special care must be taken to ensure that the operating temperature of the clamping device is not exceeded due to heat conduction in the workpiece.**

#### **CAUTION**

**The contact surfaces of the workpiece and the clamping bolt must always be kept clean to ensure the best possible contact with the clamping device.**

**If the quick-change pallet system is to be used outside the specified welding currents, please contact your SCHUNK contact person.**

## 4 Function

### NOTICE

In order to achieve the maximum lifting force, the clamping system should be actuated with an operating pressure of 6 bar. A lower operating pressure avoids proper decoupling of the clamping system

### 4.1 Clamping function

#### Unlocking

1. To unlock the clamping system, compressed air has to be supplied (operating pressure 6 bar).
2. The positively driven piston is moved upwards when it is actuated with compressed air.
3. The clamping slides (Item 2) and the piston (Item 4) are connected by a bevel joint. They move inwards and thus release the clamping ring. The lifting pins are moving upwards at the same time and lift the pallet.  
The clamping rings are available as a separate accessory in three versions (see ▶ 5.4 [□ 23]). The clamping rings are assembled to customer-specific pallets or devices.
4. The pallet can be removed.

#### Locking

1. Before inserting a pallet, the clamping system has to be supplied with compressed air (operating pressure 6 bar), so that the clamping slides retract and the system is in unlocked status.
2. The pallet can be inserted now.
3. To lock, depressurize the system.
4. The piston is led upwards by spring force. The locking process of the fast stroke is carried out first, then the one for the power stroke is actuated which leads to a very high pull-down force.  
When the turbo connection is actuated, the springactuated locking process is actively supported by compressed air. If the turbo connection is not used, the concerned piston side must be able to deaerate.
5. The lifting pin lowers and the pallet gets to the contact surface.
6. An air flow on the locating surface is created via a blow out groove. This way the clamping ring support is cleaned, so that when a pallet is set down, the flat surface is clean.
7. The clamping slides move outside and lock the clamping ring at the pallet self-locking as well as form-fit. Therefore pressure actuation of the clamping module during machining is not necessary.  
Centering of the clamping rings is done at the conical surface of the clamping module. The angular alignment of the clamping slide is freely selectable.

## 4.2 Lifting function

The NSA plus 120 quick-change pallet system has a lifting function for lifting the pallets after opening. During the locking process the clamping ring is self-centering and slowly clamped at the supporting surface. The lifting function is also used for air control (see ▶ 4.3 [15]).

Two axially moveably lifting pins (Item 7) are integrated in the base body (Item 1). The lifting pins are sealed with O-rings (Item 16) against ingress of coolant, dust and chips. The blow-out function is started by the clamping slides (Item 2) and is transmitted by the steel balls (Item 11). The lifting pins are located within the clamping ring. Therefore lifting is carried out directly at the bottom side of the pallet.

The maximum admissible lifting force per clamping module is limited (see Link Technische Daten). The admissible total weight of the device's setup which is to be lifted onto a clamping module, should not be exceeded. A higher weight can lead to warping during removal of the pallet. This could cause a malfunction and damage to the clamping system. The stroke range of the lifting pin amounts to 0.5 mm.

In the locked condition the pins lower by about 0.1 mm. The lifting pins lower without any effort. No minimum tracking force of the clamping pallet is necessary.

## 4.3 Air control and blow-out function for cleaning the plane surface

The NSA plus quick-change pallet module disposes of an air control. Channel holes are located on all four raised clamping ring locating surfaces of the clamping system in order to monitor the dynamic pressure. In this way the dynamic pressure at the supporting surface of the quickchange pallet module can be monitored with an electronic pressure switch. When the clamping module is unlocked or locked, differentiated pressure conditions prevail at the supporting surface. Moreover, the bore holes of the air control are used as blow-out function for cleaning the plane surfaces (see ▶ 4.1 [14]).

When using this control and cleaning function, it must be ensured that the clamping ring is in the right position orientation. The cylinder head countersinks of the clamping ring must not be positioned on the air outlet holes of the clamping module, since otherwise the blast air will escape and it will not be possible to build up a measurable dynamic pressure.

**The measurable differential pressure must be minimal 1 bar so that a reliable evaluation is possible, via the air gap sensor. The maximum pressure is 2 bar.**

For supervision, a pressure gauge, an adjustable throttle and an air gap sensor are needed.

The clamping modules of a clamping station (connected in parallel up to a certain number) can be monitored on a pressure switch.

The air connection is made the standard way via the coupling hose on the lower face side of the quick change pallet module. For sealing the air connection see ▶ 5.3 [17]. Basically the use of the air control function is not necessary for the operation of the clamping module.

#### **4.4 Dynamic pressure monitoring at the clamping slides**

The NSA plus quick-change pallet module features dynamic pressure monitoring on the clamping slides.

It is therefore possible, for example, to monitor the dynamic pressure on the clamping slides of the quick-change pallet module using an electronic pressure switch. This means the slide position can be monitored electronically in order to ensure that the clamping slides are in an unlocked position. This way, the clamping system can be protected from any possible damage.

**The measurable differential pressure must reach a minimum of 1 bar for assessment via the air gap sensor to be reliable. The maximum pressure is 2 bar.**

Monitoring requires a pressure gauge, an adjustable throttle and an air gap sensor.

The air connection is made the standard way via the coupling bore on the lower face side of the quick-change pallet module. Sealing the air connection (see ▶ 5.3 [17]). Use of the dynamic pressure monitoring function is not mandatory for the basic operation of the clamping module.

In a clamping station with up to 4 clamping modules, the clamping slide monitoring functions "Module open" and "Module clamped" can each be switched in parallel and monitored at a pressure switch for the respective function.

## 5 Assembly

### 5.1 Pre-assembly

Request our installation drawings if installing the module in the customer's clamping stations yourself.

### 5.2 Installing and connecting



#### **⚠ WARNING**

##### **Risk of injury due to unexpected movements!**

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

1. Check the flatness of the mounting surface, ▶ 5.3 [17].
2. Screw the module with the O-rings inserted onto the clamping station.
  - ⇒ Observe permissible tightening torques for the mounting screws and the strength class, ▶ 5.6 [26].
3. Connect module, ▶ 5.3 [17].
  - ⇒ via the hose-free direct connection in the base of the quick-change pallet system.
4. If necessary, connect the monitoring functions.

### 5.3 Fastening and connection

#### **Flatness**

If several linked clamping modules are mounted, make sure that the flatness and height deviation of the outer ring bearing surfaces from clamping module to clamping module (with respect to a 200 mm gauge) is  $\leq 0.02$  mm. The gauge deviation from module to module must not be greater than  $\pm 0.015$  mm. The position tolerance of all module seats must not exceed a total value of 0.05 mm.

### Redundancy

Due to redundancy, a clamping ring with positioning accuracy in one direction (SRB, positioned diamond shaped) must be used for clamping systems that are more than 160 mm apart or that do not show a positioning tolerance of  $\pm 0.01$  mm. The diamond-shaped alignment surfaces on the SRB clamping ring must be aligned at right angles to the longitudinal axis between clamping rings SRA and SRB. This allows for compensation of a distance offset between the clamping areas to be aligned. For the clamping areas that are not intended for aligning the device or pallet, clamping rings with centering clearance (SRC) must be used (see ▶ 5.4 [📄 23]).

### Turbo connection

When using the turbo connection (if supply is connected), the spring-actuated locking procedure is actively supported with air pressure, thereby enhancing the achievable pull down force. One pressure pulse is sufficient to increase the force. The pressure line can be decoupled afterwards without the pull down force being impaired. If the turbo connection is not used, the relevant side of the piston must be able to ventilate.

### Connecting hose lines

If several quick-change pallet systems are activated via jointly connected hose lines, feed lines with the following minimum cross-sections must be used.

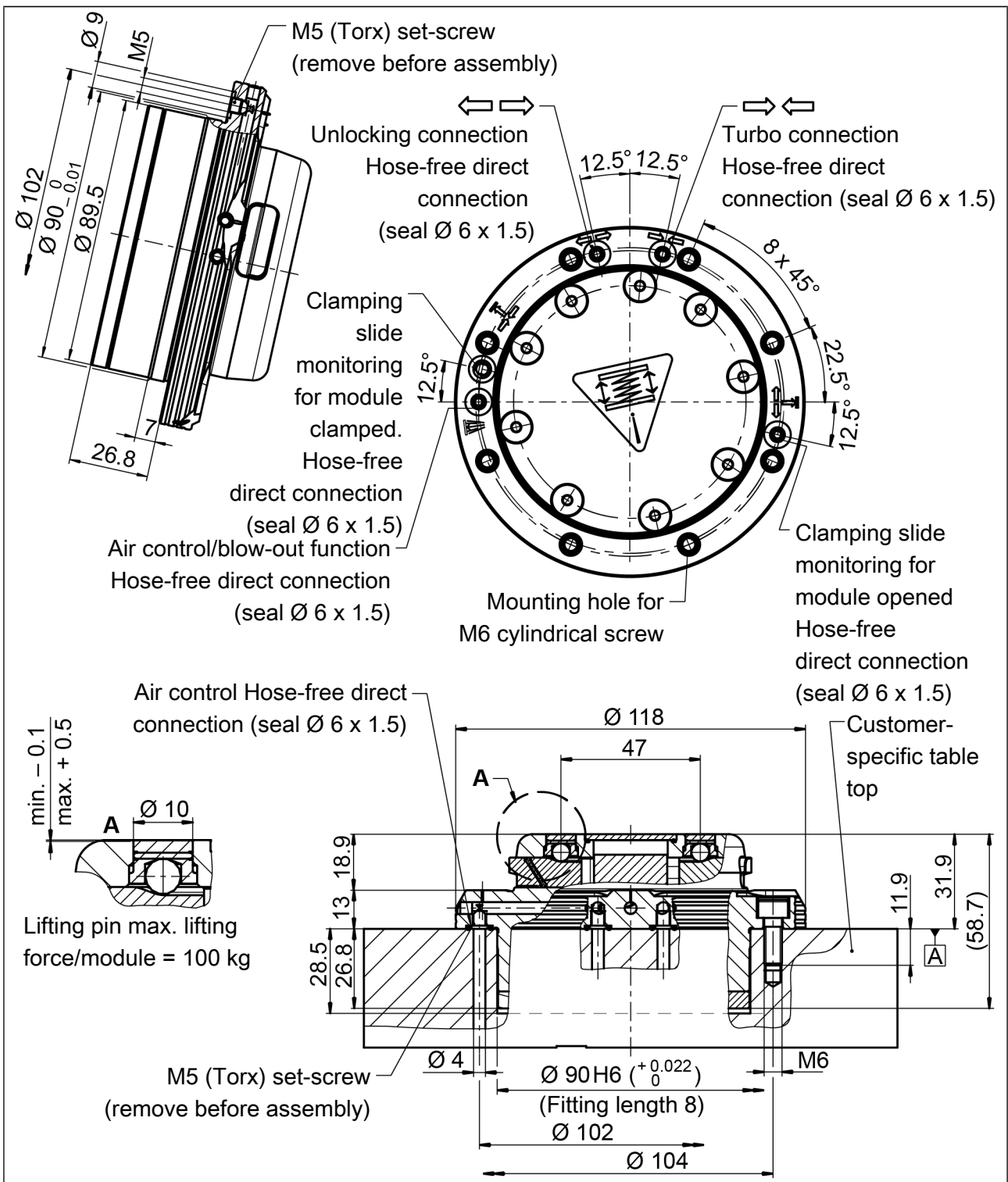
Number of modules	At least nominal hose width
1	4 mm
2, 3, 4	6 mm
from 5	8 mm

When disconnecting hose lines, the relevant openings of the air supply connections must be protected with seal plugs or cover plates to prevent the entry of dirt or coolant.

### NOTE

When connecting the quick change pallet system, please make sure that a complete deaeration of the piston area during the locking operation is possible through the air ports. Therefore, valves or stop valves for deaeration should be available. If the turbo connection will not be used, it must be possible that the relevant piston side can be deaerated. If the pneumatic port for turbo effect should not be used, the concerned piston side must have to possibility to deaerate itself.

### 5.3.1 NSA plus 120



NSA plus 120 - mounting and connections

The NSA plus 120 is secured in the installation space using 8 M6 screws, ▶ 5.6 [ 26].

The assembly module is positioned using the centering diameter of the installation space: Ø 90H6.

All base-side air connections for the module ("Open module") and the turbo functions are closed with M5 x 4 set-screws.

The air connection is made the standard way via the coupling bore on the lower face side of the quick-change pallet module. For axial sealing, the O-rings must be inserted in the base-side O-ring seats of the clamping module.

The accessory kit of the NSA plus 120 contains the  $\varnothing 6 \times 1.5$  (Item 21) O-rings for sealing the hose-free direct connections on the base side.

When the turbo connection is used, the spring-actuated locking procedure is actively supported with air pressure. If the turbo connection is not used, the relevant side of the piston must be able to ventilate.

Request our installation drawings if doing the installation yourself.

The NSA plus 120 size has an air control, and dynamic pressure monitoring of the clamping slide position is possible. Via two separate air connections, the clamping slide position can be monitored in "OPENED" and/or "CLOSED" status alternately.

The monitoring functions can be monitored via an electronic pressure switch. A pressure switch signals to the operator or the machine which position the clamping slides are in or if the clamping pallet is completely flush and locked.

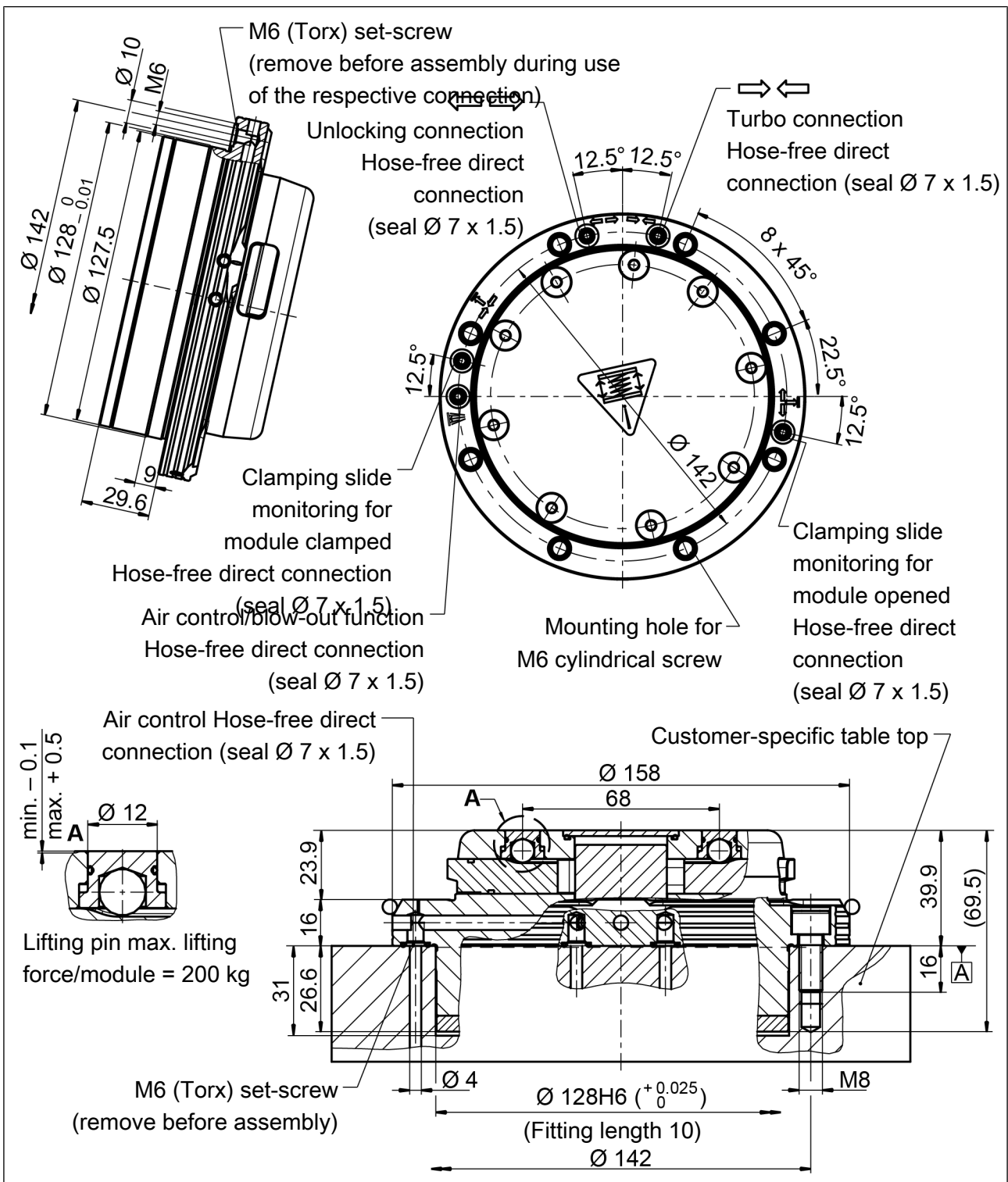
The air connection for the monitoring functions is done the standard way via the coupling hose on the lower face side of the quick-change pallet module.

To do this, remove the M5 x 4 Torx (Item 23) set-screws. For axial sealing, the O-rings must be inserted in the base-side O-ring seats of the clamping module.

The  $\varnothing 6 \times 1.5$  (Item 21) O-ring for sealing the air connection is contained in the accessory kit.

When the turbo connection is used, the spring-actuated locking procedure is actively supported with air pressure. If the turbo connection is not used, the relevant side of the piston must be able to ventilate.

### 5.3.2 NSA plus 160



NSA plus 160 - mounting and connections

The NSA plus 160 is secured in the installation space using 8 M8 screws, ▶ 5.6 [26].

The assembly module is positioned using the centering diameter of the installation space:  $\varnothing 128H6$

All base side air connections for the module ("Open module") and the turbo functions are closed with M6 x 5 set-screws.

The air connection is made the standard way via the coupling bore on the lower face side of the quick-change pallet module. For axial sealing, the O-rings must be inserted in the base-side O-ring seats of the clamping module.

The accessory kit of the NSA plus 160 contains the  $\varnothing 7 \times 1.5$  (Item 21) O-rings for sealing the bottom hose-free direct connections. When the turbo connection is used, the spring-actuated locking procedure is actively supported with air pressure. If the turbo connection is not used, the relevant side of the piston must be able to ventilate.

Request our installation drawings if doing the installation yourself.

The NSA plus 160 size has an air control, and dynamic pressure monitoring of the clamping slide position is possible. Via two separate air connections, the clamping slide position can be monitored in "OPENED" and/or "CLOSED" status alternately.

The monitoring functions can be monitored via an electronic pressure switch. A pressure switch signals to the operator or the machine which position the clamping slides are in or if the clamping pallet is completely flush and locked.

The air connection for the monitoring functions is done the standard way via the coupling hose on the lower face side of the quick-change pallet module.

To do this, remove the M6 x 5 Torx (Item 23) set-screws. For axial sealing, the O-rings must be inserted in the base-side O-ring seats of the clamping module.

The  $\varnothing 7 \times 1.5$  (Item 21) O-ring for sealing the air connection is contained in the accessory kit.

When the turbo connection is used, the spring-actuated locking procedure is actively supported with air pressure. If the turbo connection is not used, the relevant side of the piston must be able to ventilate.

## 5.4 Clamping rings SRA, SRB, SRC

### CAUTION

#### Notes on clamping rings and mounting screws

The holding force of the quick-change pallet system is essentially limited by the tightness of the screw connection connecting the clamping ring to the pallet or the device. This is why only screws of strength class 12.9 may be used.

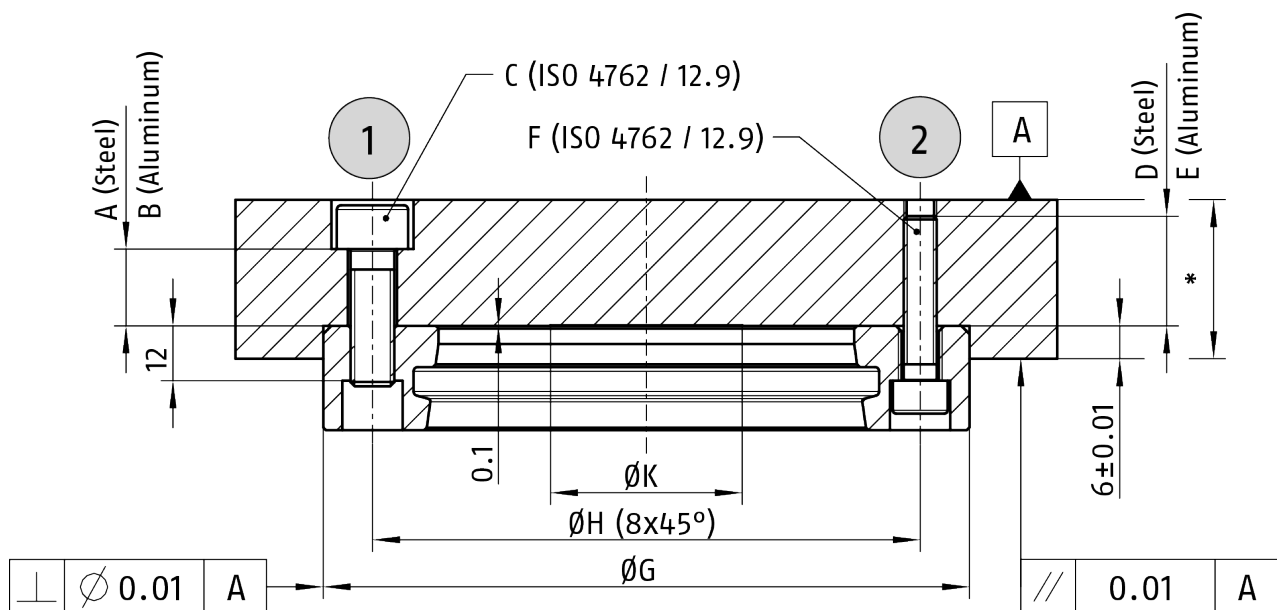
Only original SCHUNK clamping rings may be used.

If the clamping rings are to be used in customer-owned devices, the customer must provide sufficiently dimensioned threaded holes or a sufficiently thick mounting material.

The clamping rings can be attached to the workpiece or pallet in two different ways. Preference should be given to the left mounting option in the illustration "Mounting the clamping rings". With this variant, if there is a module failure then the device or pallet can be removed after disassembling the clamping rings. The mounting screw is supplied for the right mounting option as shown in the illustration.

When using the air control function, it must be ensured that the clamping ring is in the right position orientation. The air outlet holes on the raised support surfaces of the clamping module must be fully covered by the plane surface of the clamping ring. The cylinder head countersinks of the clamping ring must not be positioned on the air outlet holes.

Request our installation drawings of the clamping rings if doing the installation yourself.



Mounting the clamping rings

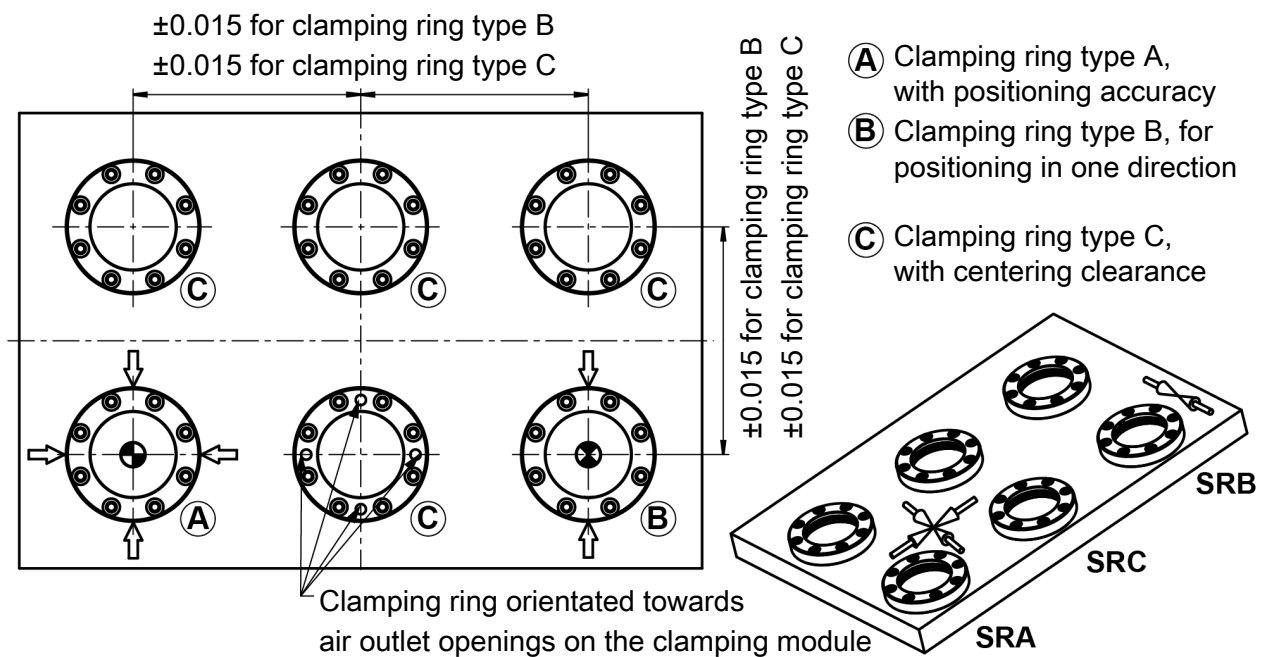
### Tolerances and installation conditions

Type	ID number	A	B	C	D	E	F	G (H6)	H ( $\pm 0.2$ )	K
SRA 120	0471650	> 8	> 13	M8	> 9	> 12	M6	$\varnothing 118$	$\varnothing 100$	$\varnothing 35$
SRB 120	0471651	> 8	> 13	M8	> 9	> 12	M6	$\varnothing 118$	$\varnothing 100$	$\varnothing 35$
SRC 120	0471652	> 8	> 13	M8	> 9	> 12	M6	$\varnothing 118$	$\varnothing 100$	$\varnothing 35$
SRA 160	0471750	> 14	> 18	M10	> 12	> 15	M8	$\varnothing 158$	$\varnothing 140$	$\varnothing 55$
SRB 160	0471751	> 14	> 18	M10	> 12	> 15	M8	$\varnothing 158$	$\varnothing 140$	$\varnothing 55$
SRC 160	0471752	> 14	> 18	M10	> 12	> 15	M8	$\varnothing 158$	$\varnothing 140$	$\varnothing 55$

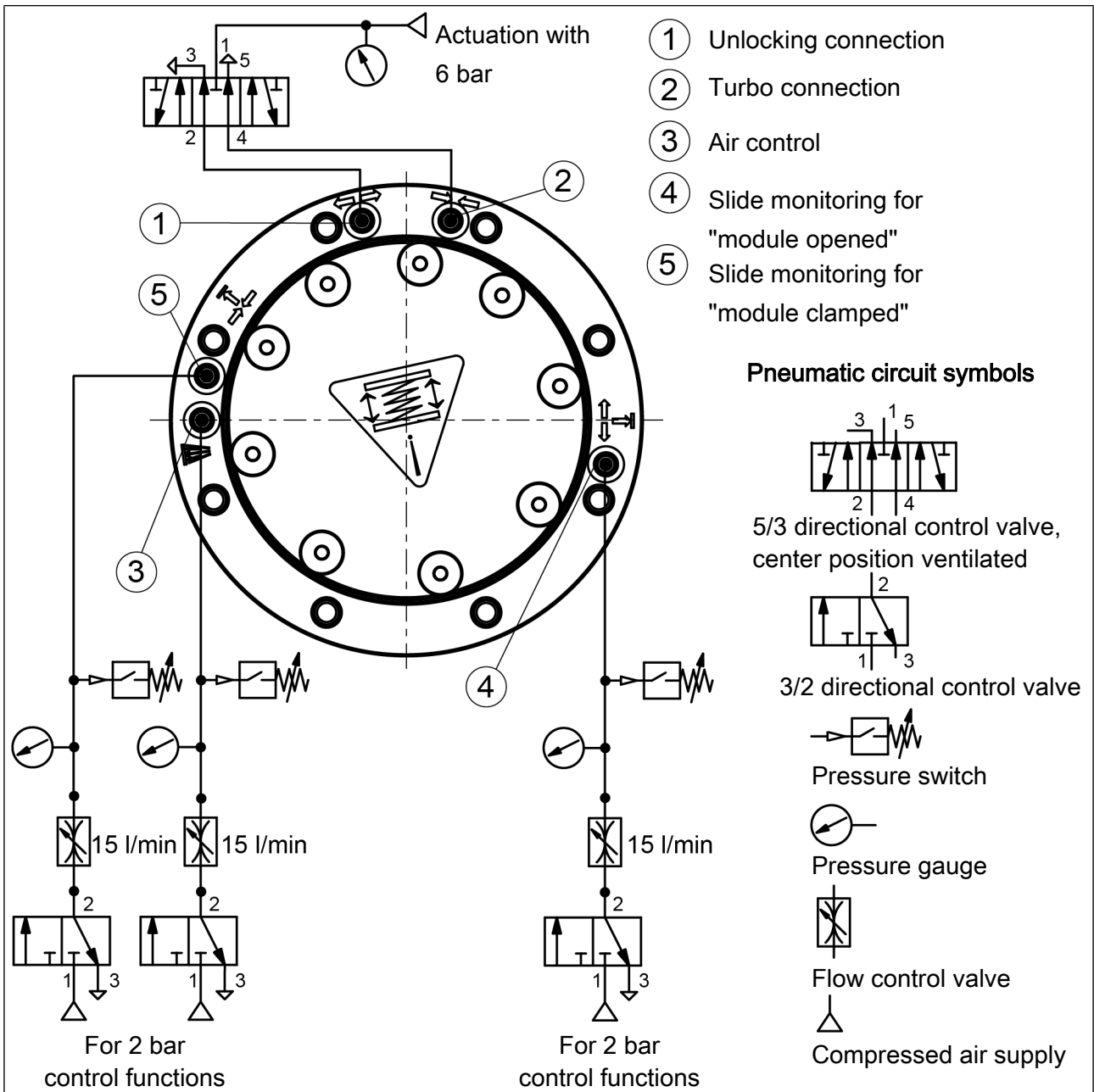
#### Use / arrangement of the different types of clamping rings

When positioning the clamping rings, deviating from the previous arrangement examples, the position tolerances given in the following illustration must be observed.

The clamping ring type B may deviate in its twisting position by max.  $\pm 10^\circ$ .



### 5.5 Pneumatic circuit diagram



**Observe the following when controlling quick-change pallet systems:**

**Turbo function:**

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

**Clamping slide monitoring:**

- The max. pressure for clamping slide monitoring is 2 bar.
- Limit volumetric flow to 15 l/min.
- Pressure difference upon failure of a module min. 1 bar.

**Air control system / exhaust function for flat installation:**

- The max. pressure of the air control function is 2 bar.
- Limit volumetric flow to 15 l/min.
- The measurable pressure difference must reach at least 1 bar.

In order to guarantee reliable evaluation, the pressure and air volume must be held constant. Pressure fluctuations can affect the settings of the differential pressure sensor and lead to incorrect measurement results. The length and cross-section of lines can affect the switching time of the control components. It may be necessary to readjust the control components. Check the control components of the monitoring functions at regular intervals. If errors occur in the monitoring control system, you must detect the cause of the error.

## 5.6 Screw tightening torques

**Tightening torques for mounting the clamping rings**

(Screw quality 12.9)

Screw size	M6	M8	M10	M12	M14	M16
Tightening torque (Nm)	15	32	62	108	170	262

**Tightening torques for mounting the clamping modules**

(Screw quality 10.9)

Screw size	M4	M5	M6	M8	M10	M12	M14
Tightening torque (Nm)	4.2	7.5	13	28	50	88	120

## 6 Operation



### ⚠ 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 falling parts during transport of the quick change pallet system, when the axis of the clamping ring is in a horizontal position, or in the case of overhead application**

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



### ⚠ WARNING

**Risk of injury due to losing pallets or workpieces if the supply of compressed air drops or fails, and due to the clamping rings immediately closing**

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



### ⚠ CAUTION

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

- Do not reach into the clamping ring holder.
- Work with the smallest possible clamping and opening strokes.
- Use loading devices.
- Wear protective gloves.

## 7 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.

The operating time of the clamping system depends on the number of clamping cycles and the operating conditions. After appr. every 500,000 clamping cycles maintenance work should be done. Thereby every wear part (seals and bearing shells) has to be exchanged, ▶ 10 [ 31].



### ⚠ CAUTION

**Risk of injury and risk of damage to the clamping module when opening the housing cover.**

**If the clamping module has to be disassembled, ship the module to SCHUNK for repair.**

**The covers of the clamping modules are spring-packaged may be removed only by trained personnel.**

**In order to maintain proper function of the system please consider the following notes:**

Pressure medium: Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]

### CAUTION

**The air supply must be done via a separate maintenance unit with oiler.**

- 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.
- For operation, only high-quality coolant emulsions with rust-protection additions should be used. The same as stipulated for the machining centers.
- Regularly inspect the units (at least every 2 weeks or after 1000 clamping cycles). A proper function is assured, if the clamping bars and the lifting pins are moving smoothly at minimum pressure (5 bar) without jerks.
- 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 by exchanging the damaged unit. I.e. by exchanging the damaged unit.

## 8 Storage

When storing the product for a longer period of time, observe the following points:

- Clean the product and lubricate it lightly.
- Store the product in a suitable transport container.
- Only store the product in dry rooms.
- Protect the product from major temperature fluctuations.

**NOTE:** Before recommissioning, clean the product and all attachments, check for damage, functionality and leaks.

## 9 Trouble shooting

### The clamping area does not unlock

Possible cause	Corrective action
Faulty air connections	Check air supply
Pressure drops below minimum	Check operating pressure (min. 5 bar)
Component is broken, e.g. through overloading	Replace module or send it to SCHUNK for repair
Tensile load to the clamping pin is too high	Reduce load

### The clamping area does not unlock perfectly

Possible cause	Corrective action
Pressure drops below minimum	Check operating pressure (min. 5 bar)
Module has not been operated with lubricated air	Install a maintenance unit with oiler
The hose diameter is below minimum	Required hose diameter, see chapter "General assembly notes"
The pneumatic port for "turbo effect" is still actuated with pressure	Vent the connection

### The quick change pallet system no longer opens quietly

Possible cause	Corrective action
The clamping faces on the clamping slides and on the clamping pin are dirty	Remove the clamping pin and clean the clamping faces on the clamping slides and on the clamping pin.

## 10 Seal kit and part lists

### 10.1 Seal kit lists

Size / Sealing kit*	ID number
NSA plus 120	0471612
NSA plus 160	0471712

\* For included items, see note **X** in the Parts List chapter below. Seals are wearing parts and are recommended to be replaced during maintenance. The sealing kit can only be ordered as a complete kit.

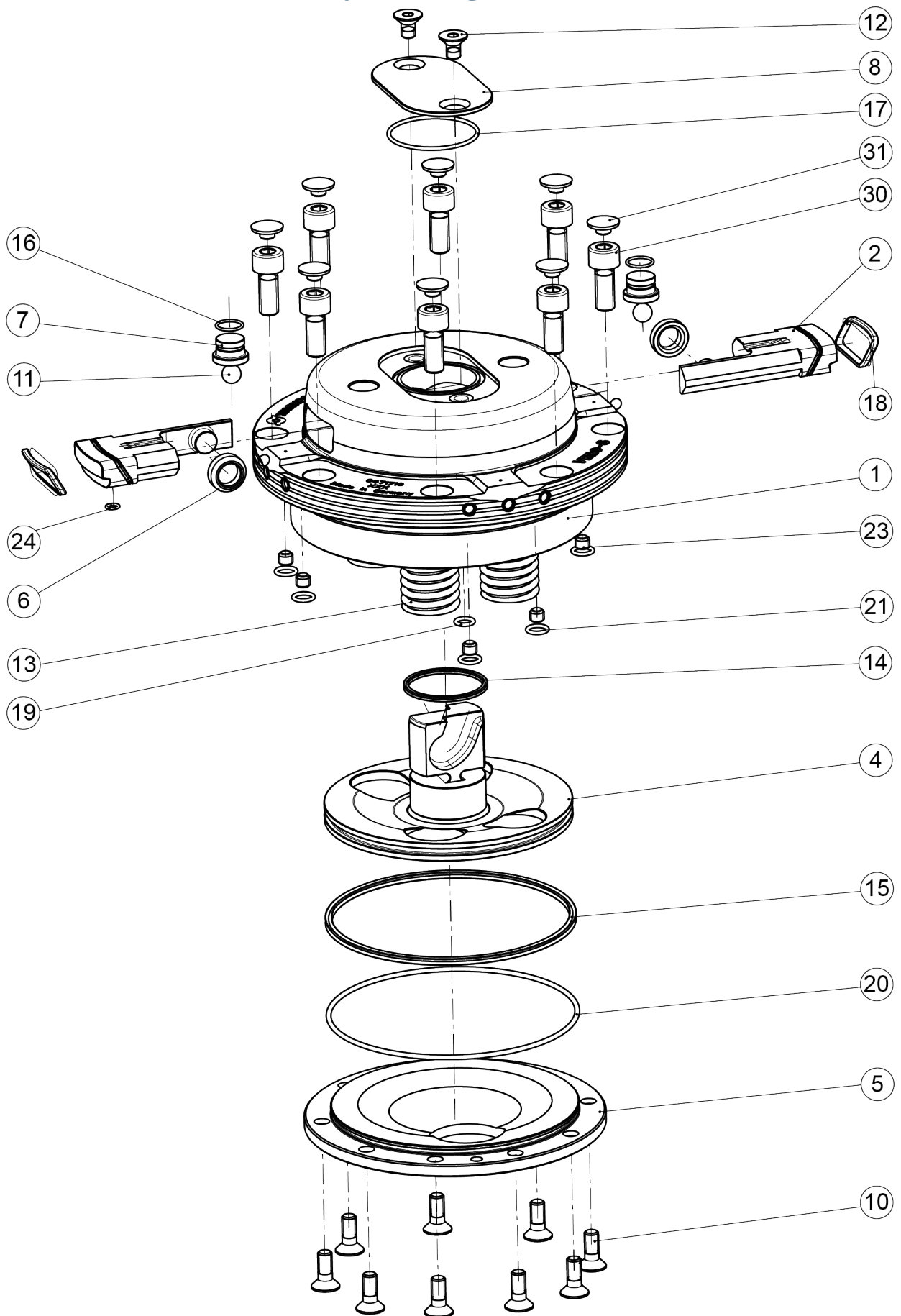
### 10.2 Part Lists

Size NSA plus 120 (ID number 0471610)

Size NSA plus 160 (ID number 0471710)

Item	Designation	Quantity	Note
1	Body	1	
2	Clamping slide	2	
4	Piston	1	
5	Cover	1	
6	Bearing shell	2	<b>X</b>
7	Lifting pin	2	
8	Cover plate	1	
10	Countersunk screw	9	
11	Steel ball	2	
12	Countersunk screw	2	
13	Compression spring	4	
14	Quad ring	1	<b>X</b>
15	Quad ring	1	<b>X</b>
16	O-ring	2	<b>X</b>
17	O-ring	1	<b>X</b>
18	O-ring	2	<b>X</b>
19	O-ring	1	<b>X</b>
20	O-ring	1	<b>X</b>
21	O-ring	5	<b>X</b>
23	Set-screw	5	
24	O-ring	2	<b>X</b>
30	Screw	8	
31	Cover cap	8	

# 11 Assembly drawing



## 12 Manufacturer certificate

Manufacturer / Distributor:	H.-D. SCHUNK GmbH & Co. Spanntechnik KG Lothringer Str. 23 D-88512 Mengen
Product:	Quick-change pallet system
Designation:	VERO-S
Type designation:	NSA, NSE, E-compact, AV CU

**Heinz-Dieter SCHUNK GmbH & Co. Spanntechnik KG** certifies that the above-mentioned products, when used as intended and in compliance with the operating manual and the warnings on the product, are safe according to the national regulations and:

- a **risk assessment** has been carried out in accordance with ISO 12100:2010.
- an **operating manual** for the assembly instructions has been created in accordance with the contents of the Machinery Directive 2006/42/EC Annex I No. 1.7.4.2. and the contents of the provisions of Annex VI of the Machinery Directive 2006/42/EC.
- **Markings** have been made in accordance with EN 1550:1997+A1:2008 Section 6.3.1, VDMA 34192:2019 Section 6.3 or ISO 16156:2004 Section 6.3. The requirements of Annex I No. 1.7.3. of the Machinery Directive 2006/42/EC have been complied with.
- the relevant basic and proven safety principles of the Annexes of **ISO 13849-2:2012**, taking into account the requirements of the documentation have been observed for the component. The parameters, limitations, ambient conditions, characteristic values, etc. for proper operation are defined in the operating manual.
- an  $MTTF_D$  value of 150 years can be estimated for mechanical components using the informative procedure in Table C.1 of ISO 13849-1:2015.
- **fault exclusion** against the fault "Unexpected release without pending release signal".
- the **fault exclusion** against the fault "Breakage during operation" in compliance with the parameters, limitations, ambient conditions, characteristic values and maintenance intervals, etc., specified in the operating manual.
- that internal bore diameters in the **pipe or control lines** are at least 2 mm for pneumatic clamping systems and at least 3 mm for hydraulic clamping systems

### Harmonized Standards applied:

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

### Other related technical Standards and specifications:

- **VDMA 34192:2019** Safety requirements for clamping devices for use on machines

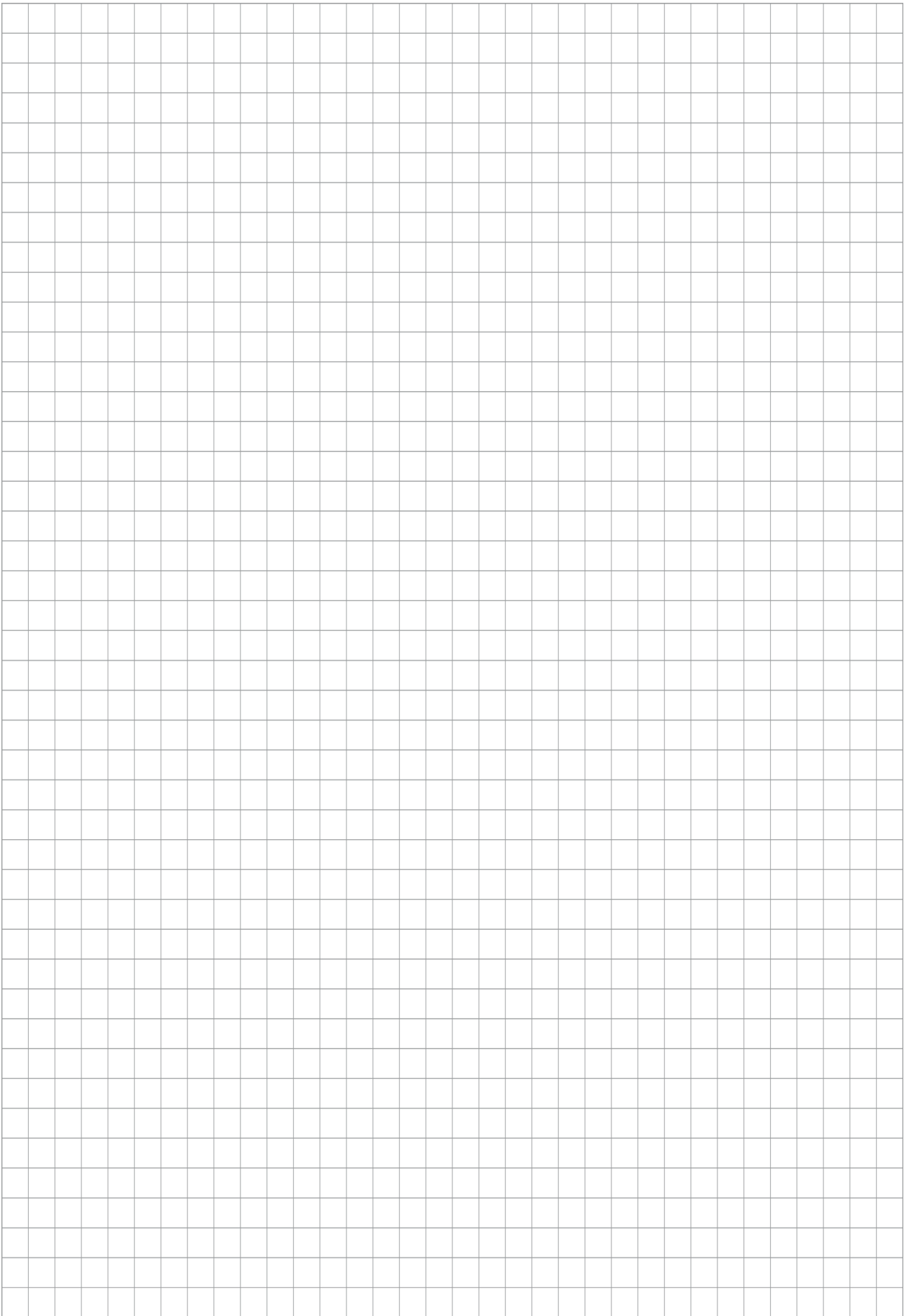
Mengen, 19th of July 2023

*Signature: see original declaration*

*Signature: see original declaration*

p.p. Philipp Schröder  
Head of Development standard products

p.p. Alexander Koch  
Head of Engineering Design special products







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