

Quick-change pallet system
VERO-S NSE-HT mini 88-20
Assembly and Operating Manual

Imprint

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Document number: 1411420

Version: 09.00 | 15/05/2025 | en

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.

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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 [5]

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.

NOTICE

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 *
- Installation drawing

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

1.1.3 Design

This manual applies to the following sizes in all variants ▶ 3 [📄 12]

Quick-Change Pallet System

- Size NSE-HT mini 88-20

1.2 Warranty

The warranty is valid for 24 months from the delivery date to the production facility or:

- 500,000 cycles* at operating temperatures $\leq +60^{\circ}\text{C}$ without contact with metal powders (AM powder)
- 250,000 cycles* at operating temperatures $> +60^{\circ}\text{C}$ without contact with metal powders (AM powder)
- 150,000 cycles* at operating temperatures $\leq +60^{\circ}\text{C}$ with contact with metal powders (AM powder)
- 10,000 cycles* at operating temperatures $> +60^{\circ}\text{C}$ with contact with metal powders (AM powder)

For appropriate use under the following conditions:

- Observance of the applicable documents ▶ 1.1.2 [📄 5]
- Observance of the ambient conditions and operating conditions ▶ 2.5 [📄 8]
- Observance of the specified care and maintenance instructions ▶ 6 [📄 27]

Parts touching the workpiece and wearing parts are not part of 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 variant ordered
- Accessory kit

1.4 Accessories

(see catalog or home page when ordering separately)

- Clamping pin
 - SPA mini 20 (ID: 0435610)
 - SPB mini 20 (ID: 0435620)
 - SPC mini 20 (ID: 0435630)
 - SPA-HT mini 20 (ID: 1393004)
 - SPB-HT mini 20 (ID: 1393005)
 - SPC-HT mini 20 (ID: 1393006)
- Protection cover
 - SDE mini 20 (ID: 0435660)
- Indexing pin
 - IXB V1 mini (ID: 0435930)
 - IXB-HT V1 mini (ID: 1460953)
- Cover plugs for mounting screws
 - ADK-HT M4-SW3 PTFE (ID: 1419146)

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 Intended use

This product is intended solely for the positioning and clamping of clamping pallets, devices, substrate plates or workpieces on machine tools, additive manufacturing machines that work according to the SLM method, or other suitable technical devices.

- The product may only be used in combination with original SCHUNK clamping pins.
- The product may only be used within the scope of its technical data, ▶ 3 [12].
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this operating manual.

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 pin or 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 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 [12].
- 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 or larger quantities of metal powder of any kind can enter the interface and that the interface does not fill with cooling emulsion, which is particularly possible with vertical alignment of the clamping pin axis. The best way to ensure that neither of these incidents occur is to use the protection covers SDE mini 20 (ID: 0435660). **For use at temperatures above +60°C, the O-ring on the SDE mini must be removed.** If the interface should fill with cooling emulsion, initiate the unlocking process and dry out the interface in actuated state.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.

NOTICE

At high ambient temperatures a tempering effect may occur, which leads to a golden yellow surface. This is completely normal and does not limit the function in any way.

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:

Qualified electrician	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.
Specialist personnel	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.
Instructed person	Instructed persons have been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.
Manufacturer's service personnel	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 with or without chuck jaws 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



⚠ DANGER

When operated with inert gas, there is a danger of suffocation due to escaping inert gas as a result of leakage.

- Provide a gas warning system according to DIN EN 45544-4:2017-01.
- Observe maintenance and inspection intervals.
- In case of discomfort or dizziness, leave the premises immediately, report any symptoms and go out into the fresh air.



⚠ DANGER

Risk of injury if the clamping pin, the mounting screw of the clamping pin, or the clamping module breaks when overloaded and the object to be clamped is released uncontrollably.

The product must never be operated outside its appropriate use.



⚠ WARNING

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.

- Wait for the system to shut down completely.
- Do not reach into the centering hole when the power supply is connected.
- Use pressure maintenance valves.



⚠ CAUTION

Risk of crushing the limbs when reaching into the centering hole during the actuation process, in the event of a pressure failure or inadvertent actuation of the product.

- Wait for the system to shut down completely.
- Only reach into the centering hole when the power supply is disconnected (e.g. for cleaning purposes).
- Prevent power supply from inadvertently being activated.



⚠ CAUTION

Avoid contact between lubricant and the skin or eyes.

- Wear personal protective equipment (protective gloves and safety glasses).

3 Technical data

Actuating pressure [bar]	min. 5, max. 6
Repeat accuracy** [mm]	< 0.005
Installation position	any
Permissible installation types	Partial installation, partially recessed, full installation
Operating temperature [°C]	+15 to +200
Actuation temperature [°C]	+15 to +200
Required level of cleanliness	Cleanliness level 0 – SASO according to VDA 19.2
Noise emission [dB(A)]	≤ 70
Pressure medium	Compressed air, inert gas (e.g. argon), pressurizing medium quality according to ISO 8573-1:2010 [7:4:2]

Designation	NSE-HT mini 88-20	NSE-HT mini 88-20-V1
ID number	1419192	1460874
Holding force (M6 / M8)* [kN]	15 / 25	15 / 25
Pull down force without turbo [N]	500	500
Pull down force with turbo [N]	2500	2500

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

** Guaranteed for partial installations and partially recessed installations. The values for a full installation may differ slightly. The reason for this is the flat surface of the clamping module, which is offset from the pallet for optimum thermal transfer. The actuating pressure for the turbo function must not exceed 6 bar.

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.

NOTICE

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.

NOTICE

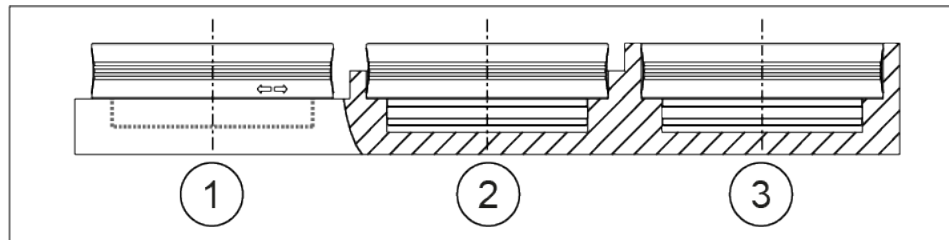
The contact surfaces of the workpiece and the clamping bolt must always be kept clean to ensure the best possible contact with the clamping device.

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

4 Assembly

4.1 Pre-assembly

Request our installation drawing if installing the clamping modules in the customer's clamping stations yourself.



Installation types

① Partial installation ② Partially recessed installation ③ Full installation

4.2 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.



⚠ CAUTION

Danger of injury due to sharp edges and rough or slippery surfaces

- Wear personal protective equipment, particularly protective gloves.



⚠ CAUTION

Risk of injury due to crushing

Install the quick-change pallet system carefully.

Do not place any limbs into the gaps or between the clamping station and the machine.

1. Check the flatness of the mounting surface, ▶ 4.3 [14].
2. Screw the module with the clamping station.
 - ⇒ Observe permissible tightening torques for the mounting screws and the strength class, ▶ 4.5 [23].
3. Connect module ▶ 4.3 [14]
 - ⇒ via the hose-free direct connection,
4. Connect turbo connection if necessary.

4.3 Fastening and connection

Flatness

If several linked clamping modules are mounted, make sure that the flatness and height deviation of the locating surfaces from module to module (based on a 100 mm gauge for bore holes) is ≤ 0.01 mm. The gauge deviation may not exceed ± 0.015 mm.

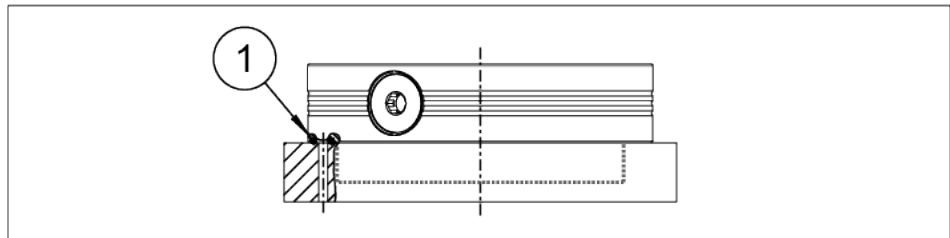
Redundancy

Due to redundancy, the clamping pins with positioning accuracy in one direction (SPB mini 20) should be used for clamping systems that are more than 100 mm apart or that do not show a positioning tolerance of ± 0.01 mm. For the clamping areas that are not intended for alignment of the device or pallet, clamping pins with centering clearance (SPC mini 20) can be used (also refer to chapter "Clamping pins" ▶ 4.4 [18]).

Air bleeding for the piston chamber

When connecting the quick-change pallet systems, it is important to note that the air can be completely bled from the piston chamber only via the air connections during the locking process. The relevant valves or shut-off valves should therefore be equipped with load relief.

This also applies to the turbo connection. **If the turbo connection is not used, the relevant side of the piston must have a way of being ventilated.** This is done via the turbo connection itself.



Air bleeding via turbo connection

Turbo connection

When using the turbo connection (if supply is connected), the spring actuated locking procedure is actively supported with air pressure and in so doing strengthens the achievable pull down force of the quick-change pallet system. 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 nominal widths for the hoses must be used.

Number of modules	min. nominal hose width
1-4	4 mm
5-8	5 mm
> 8	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 ingress of dirt or coolant.

4.3.1 NSE-HT mini 88-20

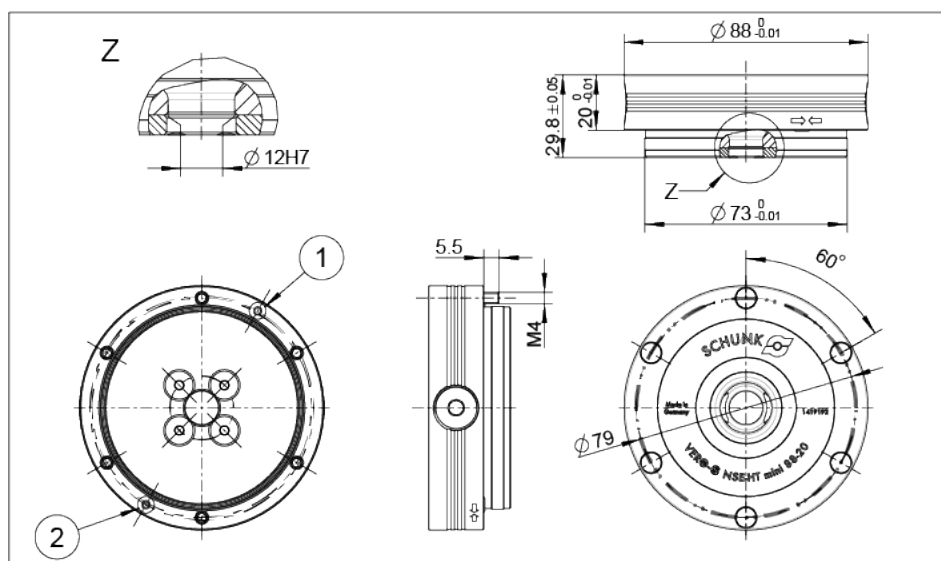
Fasten in the installation space with 6 M4 screws.

The assembly clamping module is positioned using the centering diameter of the installation space: $\varnothing 73$ H6.

The air connection is normally made via the coupling holes in the floor of the unit.

The fitting bore $\varnothing 12$ H7 can be used to position the installation space (e.g. a clamping station). The positioning element (e.g. positioning pin $\varnothing 12$ g6) must not protrude deeper than 12.5 mm into the clamping module to avoid collision with the clamping pin.

At the same time, the bore provides emergency access to the clamping pin screw if the clamping pin was screwed from below ▶ 4.4 [18]. In the event of a malfunction, the clamping pin can be removed from the removable installation space so that the pallet or workpiece can be released from the clamping module (provided that the $\varnothing 12$ H7 bore is not blocked by the installation space).



Mounting and connection

- ① Hose-free direct connection "open clamping module" ← →
- ② Hose-free direct connection "turbo function" → ←

4.3.2 NSE-HT mini 88-20-V1

Fasten in the installation space with 6 M4 screws.

The assembly clamping module is positioned using the centering diameter of the installation space: **Ø73 H6**.

The exact position orientation is done with a fitting screw with a diameter of **Ø4 g6 x 2.5 mm**.

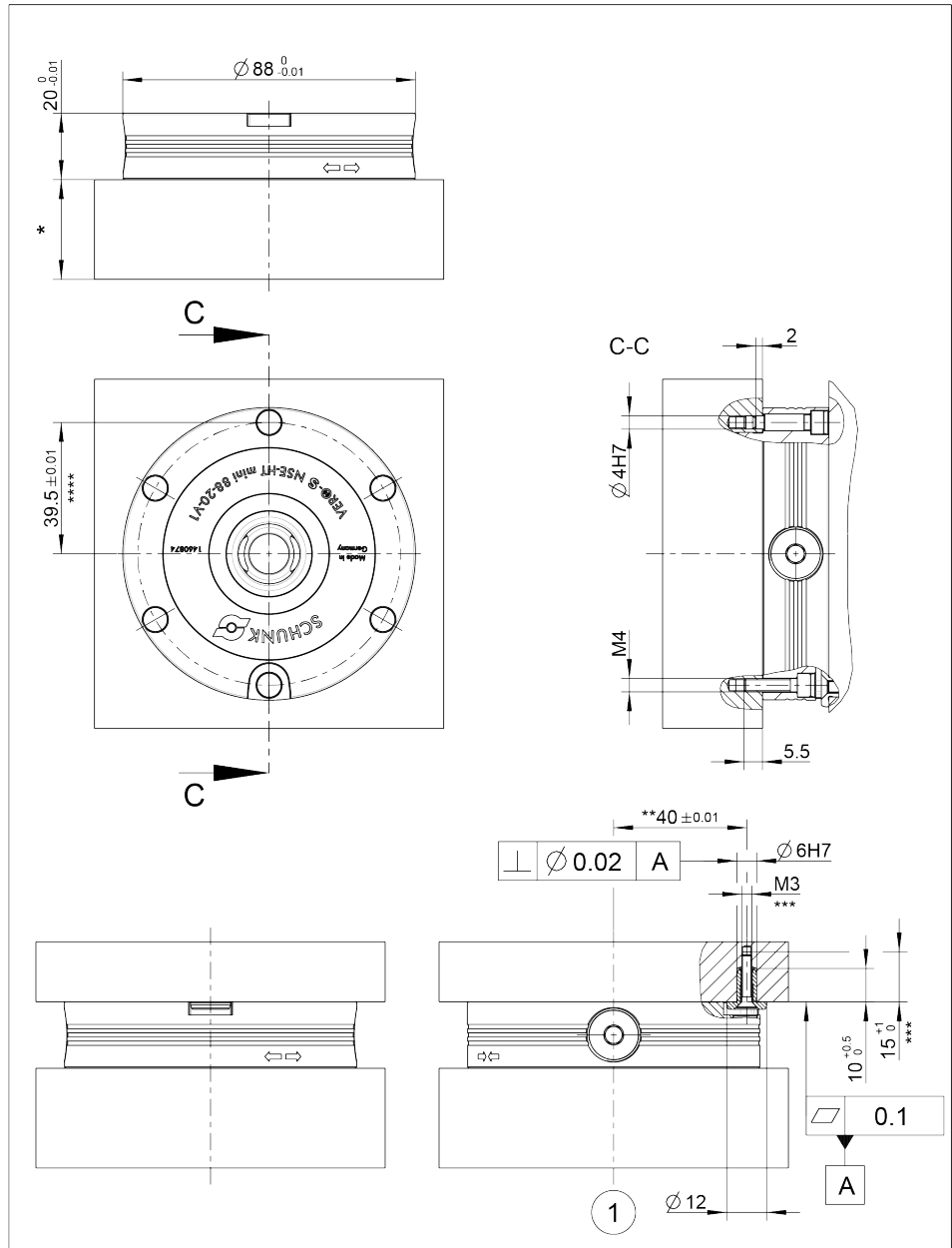
Precise alignment and positioning of the quick-change pallet system requires that the fitting bore **Ø4 H7** on the opposite side is precisely positioned in the mounting position.

The air connection is normally made via the coupling holes in the floor of the unit.

The NSE-HT mini 88-20-V1 allows the position orientation of the clamping pallet by **indexing pins**:

- IXB V1 mini (ID: 0435930)
- IXB-HT V1 mini (ID: 1460953)

The indexing pin is pressed in the clamping pallet. For applications with temperatures $> +60^{\circ}\text{C}$, using the IXB-HT V1 mini is recommended. This can be additionally secured in the clamping pallet to prevent falling out due to thermal expansion of the bore by means of a **countersunk screw ISO 10642 - M3 x 16-010.9**.



Installation specifications

Illustration shows the installation type "partial installation"

- ① Position orientation of the pallet via the torque pin
- * All clamping modules of equal height within 0.01 mm
- ** Measure of clearance for indexing pins
- *** Optional mounting by countersunk screw ISO 10642 – M3 x 18 – 010.9 at temperatures > +60°C (only possible for IXB-HT V1 mini)
- **** Measure of clearance for fitting screw PSC NSE-HT mini 88-20-V1

4.4 SPA mini 20, SPB mini 20, SPC mini 20 clamping bolts

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 ▶ 4.5 [□ 23].

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.

For high-temperature applications (> 200°C to 520°C) it is essential to observe the reduced holding forces and tightening torques!

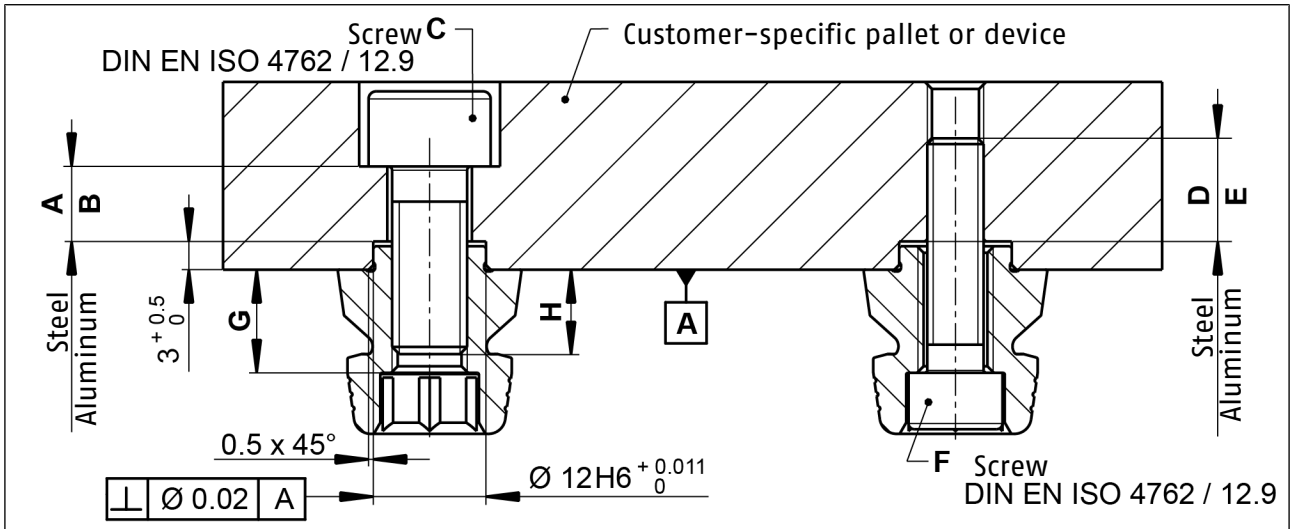
The clamping pins can be attached to the device or pallet in two different ways. The mounting variant on the left in the illustration, which is screwed from above, is the preferred variant. With this variant, if there is a module failure then the device or pallet can be removed after disassembling the clamping pins.

NOTICE

Notes on thermal distortion and released clampings

Clampings released when the clamping module is unlocked can lead to the required flatness of the clamped object no longer being maintained. This causes problems in downstream processes because the clamping pin no longer protrude correctly into the clamping module.

Any clampings released must not lead to the permissible flatness being exceeded (see illustration "Mounting the clamping pins").

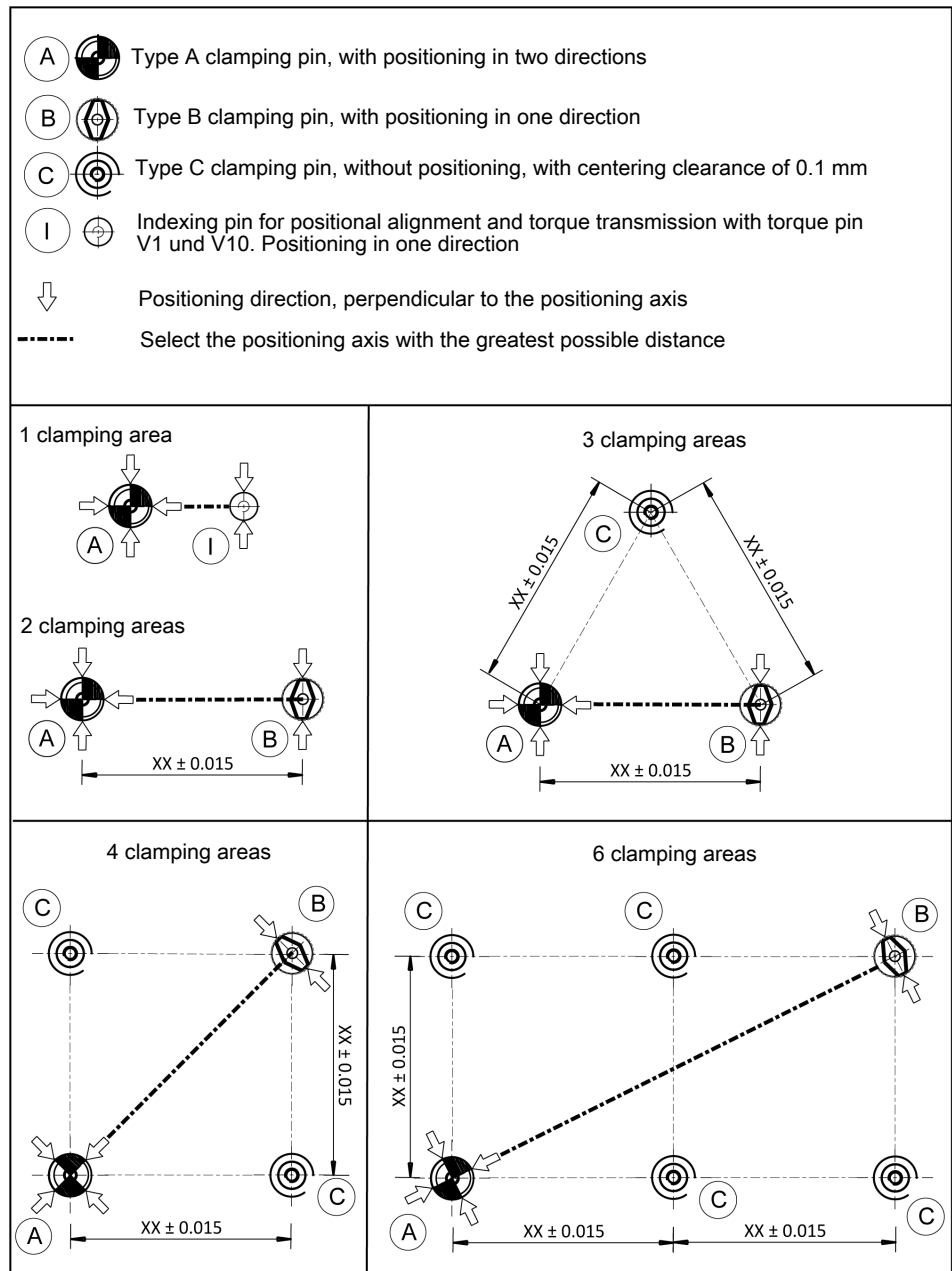


Mounting the clamping pins

Tolerances and installation conditions

Type	ID	A	B	C	D	E	F	G	H
SPA mini 20	0435610	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPB mini 20	0435620	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPC mini 20	0435630	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPA-HT mini 20	1393004	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPB-HT mini 20	1393005	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm
SPC-HT mini 20	1393006	> 8 mm	> 13 mm	M8	> 9 mm	> 11 mm	M6	11 mm	> 8 mm

Usage/arrangement of the different types of clamping pins



4.4.1 Accessories for high-temperature applications

Accessories for high-temperature applications are indicated with the suffix "-HT". They have been developed for use in additive production (SLM 3D printing), but can also be used in other applications, taking into account the instructions in this manual. The following table shows the list of the available accessories for high-temperature applications

Designation	SPA-HT mini 20	SPB-HT mini 20	SPC-HT mini 20	IXB-HT V1 mini
ID number	1393004	1393005	1393006	1460953
Permissible temperature range [°C]	5 to 520	5 to 520	5 to 520	5 to 520
Holding force 5 to 200°C [kN] (M6/M8)	15 /25	15 /25	15 /25	-
Reduced holding force* > 200 to 520°C [kN] (M6/M8)	6 /10	6 /10	6 /10	-

* See chapter "Holding force for high temperature applications" ▶ 4.4.2 [21].

NOTICE

At high ambient temperatures, a tempering effect may occur, resulting in a golden yellow surface. This is completely normal and does not limit the function in any way.

NOTICE

Due to the retightening of the clamping pin screw, the repeat accuracy may deviate from < 5 µm. The play in the clamping pin fitting results in a maximum possible deviation of 22 µm.

4.4.2 Holding force at high temperatures

When exposed to very high temperatures (> 200°C to 520°C), the holding force of the clamping pin screw is reduced.

The specified reduced holding forces are only valid after retightening with the specified tightening torque in a **cooled** state (< 60°C).

→ See screw tightening torques Ⓐ and Ⓑ

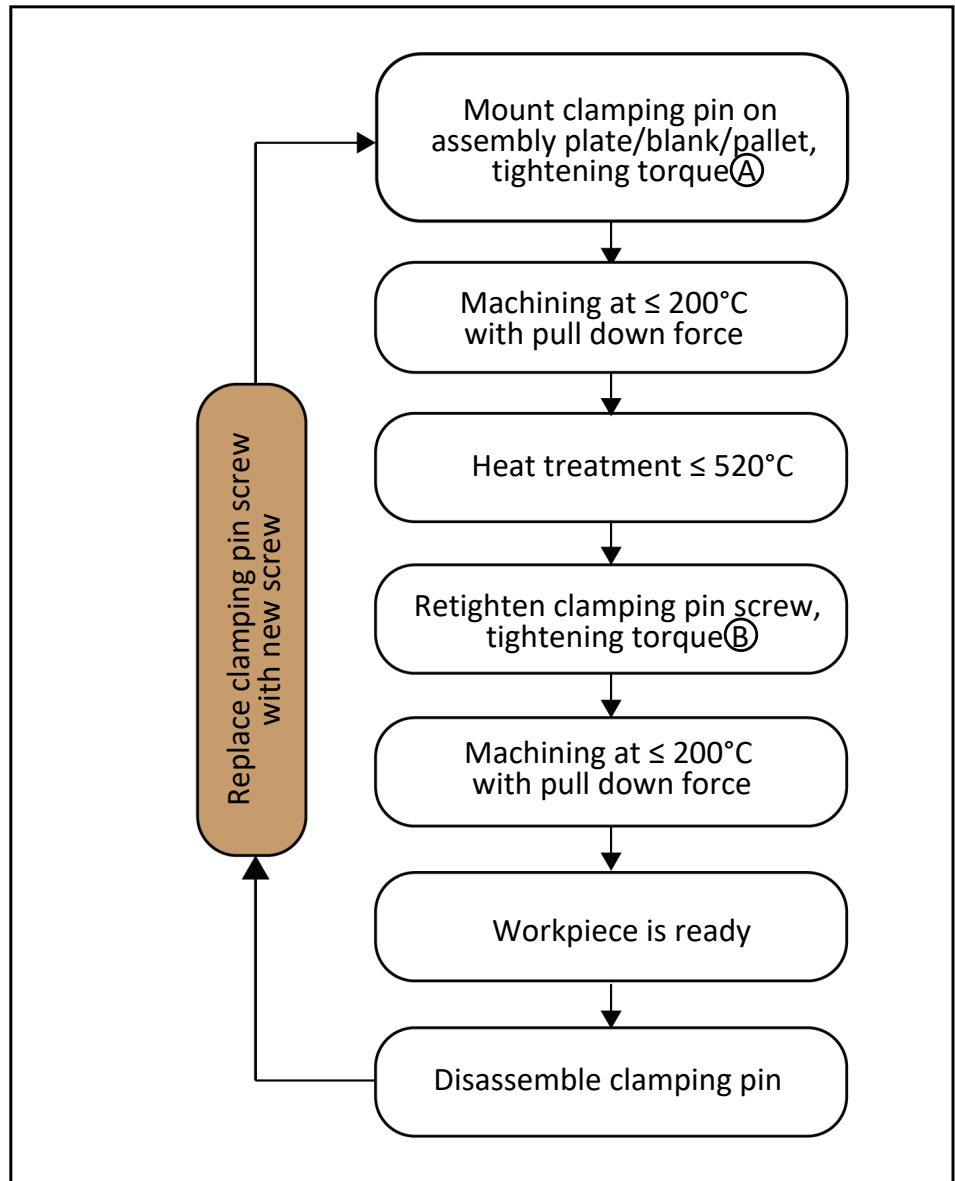
At temperatures > 200°C, the clamping pin must not be actively subjected to a tensile force (e.g. during heat treatment).

NOTICE

After a temperature cycle > 200°C the clamping pin screws must be replaced with new screws.

At temperatures $\leq 200^{\circ}\text{C}$, the screw does not need to be retightened or replaced.

The following example process illustrates the procedure.



4.5 Screw tightening torques



⚠ DANGER

Risk of screw failure due to the use of screws of a lower strength class than specified. In the event of a screw failure, the cover under spring force can be ejected. A failure of the clamping pin mounting screw can cause the object to be clamped to fall down.

- Only screws of the strength class specified in the operating manual may be used. Observe the tightening torques.
- Wear personal protective equipment (safety shoes).

Tightening torques for mounting the clamping modules and clamping pins

(Screw quality 12.9)

Screw size	M4	M6	M8
Tightening torques at 5 – 200 °C (Nm) [Ⓐ]	5	15	32
Tightening torques at 200 – 520 °C (Nm) [Ⓑ]	-	10	20

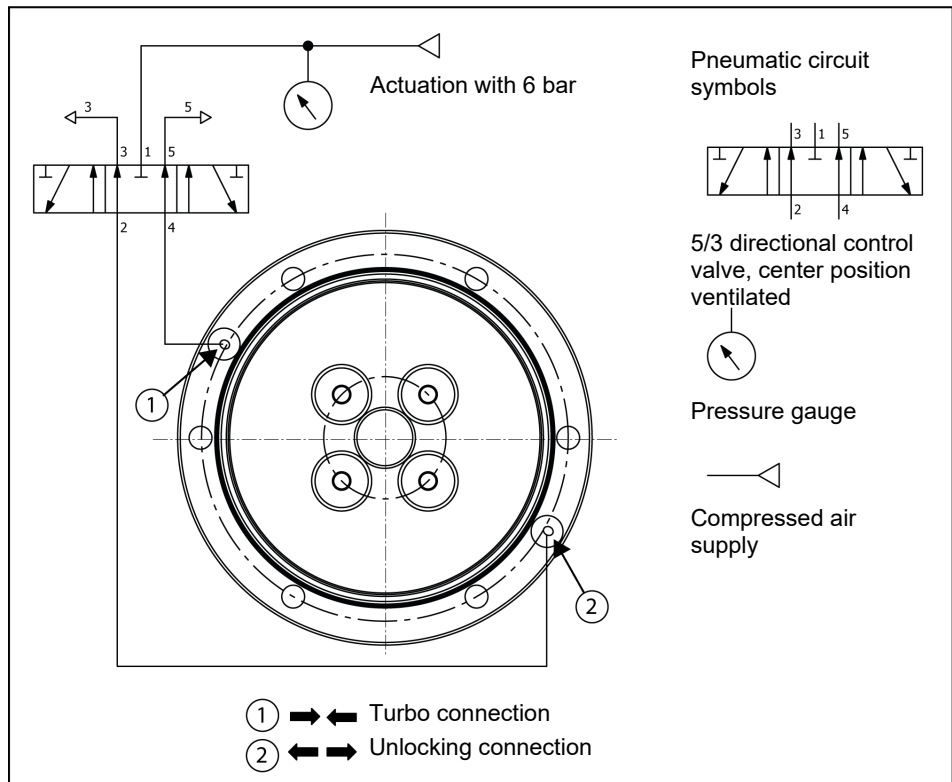
Tightening torques for mounting indexing pin and clamping module cover

(screw quality 010.9)

Screw size	M3	M5
Tightening torques (Nm)	1	5

4.6 Pneumatic circuit diagram

Arrows for the turbo (→ ←) and unlocking connection (← →) are engraved on the outside of the product. These are used for orientation of the installation. See pneumatic circuit diagram.



When controlling the quick-change pallet system NSE-HT mini, the following must be observed:

Turbo function:

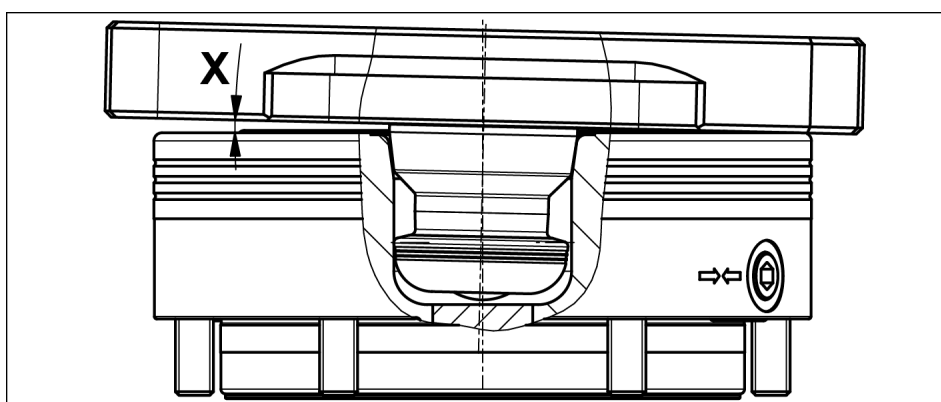
- The actuating pressure for the turbo function must not exceed 6 bar.

5 Operation

NOTICE

When changing the pallet using lifting equipment or a robot, ensure that the pallet is lifted exactly parallel to the clamping 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.



⚠ DANGER

Danger of the object to be clamped falling down if it is not secured against uncontrolled movements. If the clamping module is unlocked when the clamping pin axis is horizontal or upside-down, the object to be clamped may fall down.

- If it is horizontal or upside-down, the object to be clamped must be secured against uncontrolled movements before the clamping module is unlocked.
- During operation, incorrect or negligent loosening of the clamping pin must be prevented using suitable countermeasures (disconnecting the power supply after locking, use of check valves or safety switches).



⚠ WARNING

Risk of injury in the event of a failure or a drop in actuating pressure due to unexpected closing of the clamping module.

- Do not reach into the centering hole.
- Use pressure maintenance valves.
- Use loading devices.



⚠ WARNING

Risk of injury if the clamping pin, the mounting screw of the clamping pin, or the clamping module breaks when overloaded and the object to be clamped is released uncontrollably.

- The product must never be operated outside of its appropriate use.



⚠ WARNING

If the object to be clamped is placed on the closed clamping module during manual loading and unloading, it does not lie flat on the flat surface. If the clamping module is opened, the object to be clamped falls onto the flat surface.

If the clamping pin is not centered in the centering taper of the clamping module, a jerky, pulling-up motion to the flat surface will occur. In both cases there is a danger of crushing of the limbs.

- Do not reach between the clamping module and the object to be clamped.
- Use loading devices.
- Only load with the clamping module open.

6 Maintenance and care

The quick-change pallet system is designed for low-maintenance operation, so that opening and disassembling the product is only necessary in exceptional cases and for maintenance.

A maintenance by SCHUNK is required when 250,000 cycles have been reached. At that time, the wearing parts are to be replaced and the product is to be relubricated. Please contact Schunk for this purpose.



⚠ WARNING

Risk of injury due to unexpected movements of components when the power supply is switched on or there is residual energy in the system.

- Before starting any work on the product: Switch off the energy supply and secure against re-connection.
- Ensure that no residual energy remains in the system.



⚠ CAUTION

Cover is under spring force and can be ejected when disassembled. The cover may only be removed by SCHUNK service personnel.

NOTICE

Special seals and a special grease are used in the product. These may only be replaced with original SCHUNK spare parts by a SCHUNK service employee. Otherwise, the product may be damaged or destroyed.

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

Operating conditions	Interval for functional test* (whichever comes first)
Operating temperature $\leq +60^{\circ}\text{C}$ without contact with metal powders	min. once per month or after 10,000 cycles
Operating temperature $> +60^{\circ}\text{C}$ without contact with metal powders	min. once every 2 weeks or after 5,000 cycles
Operating temperature $\leq +60^{\circ}\text{C}$ with contact with metal powders	min. once per month or after 500 cycles
Operating temperature $> +60^{\circ}\text{C}$ with contact with metal powders	min. once per month or after 100 cycles

*Functional test:

The system is functioning correctly if the clamping slides move smoothly at minimum system pressure (5 bar).

- Carry out regular visual/functional checks.

- Always immediately remove any impurities from the interfaces.
- Maintenance intervals must always be carried out in accordance with the actual prevailing working environment conditions and the operator's experience.

If the product no longer functions properly, please contact SCHUNK.

6.1 Leak test

The following components are required to check for leaks: pressure gauge, shut-off valve, supply line and quick coupler.

The tightness must be checked for the "OPEN" position.

1. Connect the components to the actuation connection in the following order (← →) of the installation space:
pressure gauge – shut-off valve – quick coupling – supply line.
2. Apply compressed gas (6 bar) to the actuating connection (← →), so that the product unlocks.
3. Close the shut-off valve, remove the supply line and record the actual pressure.
4. Read the pressure again after 5 minutes. The clamping module is:
 - sealed, if the pressure gauge indicates a pressure drop of less than 0.2 bar/min.
 - not sealed, if the pressure gauge indicates a pressure drop of more than 0.2 bar/min.

In the event of a leak, the leakage point can be located with leak detection spray.

7 Disassembly

If the product is to be removed from the installation space, there are two procedures for disassembly:

Using clamping pins (preferred method):

1. Unlock the product (← →)
2. Insert clamping pin (SPA or SPB mini 20)
3. Lock product, disconnect power supply
4. Remove cover plugs (item 6) (e.g. by re-boring), remove mounting screws (item 17).
5. Screw the M8 screw into the clamping pin and pull out the product by the screw. If the product cannot be pulled out, use a long M8 screw to press the product. Continue to screw the screw into the clamping pin until the pin presses against the installation space or machine table and lifts the product.
6. If disassembly is successful, the bottom-side unlocking connection can be pressurized with compressed gas using a compressed air pistol so that the clamping pin can be removed again.

Using detaching or forcing threads in the product

M5 threads are provided on two of the six countersunk screws for the mounting screws (item 17). These can also be used to disassemble the product:

1. Disconnect the power supply
2. Remove cover plugs (item 6), remove mounting screws (item 17).
3. Screw M5 eye bolts or similar connecting elements into the threads and pull the product out of the installation space.
If the product cannot be pulled out:
4. Insert cylindrical elements $\varnothing 4 \times 12$ mm (e.g. cylindrical pins) into the holes with the M5 thread.
5. Screw M5 screws into the threads and press the product against the cylindrical elements.

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 Troubleshooting

9.1 The clamping area does not unlock / does not unlock properly

Possible cause	Solution(s)
Defective air connections	Check air supply
Pressure below minimum	Check operating pressure (min. 5 bar)
A component is broken (e.g. due to overloading)	Replace the clamping module or send it to SCHUNK for repair
Excess tensile load on clamping pins	Reduce tensile load on clamping pins
The turbo connection is still pressurized	Bleed the connection
Leakage due to worn seal	Check for leaks ▶ 6.1 [📄 28] In case of leakage send the clamping module to SCHUNK for repair
Hose diameter below minimum	For required hose diameters, see chapter "Mounting and connection" ▶ 4.3 [📄 14]

9.2 The quick-change pallet system no longer opens quietly

Possible cause	Solution(s)
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
Leakage due to worn seal	Check for leaks ▶ 6.1 [📄 28] In case of leakage send the clamping module to SCHUNK for repair.

10 Parts lists

NSE-HT mini 88-20 (ID 1419192)

NSE-HT mini 88-20-V1 (ID 1460874)

Item	Designation	Quantity	Note
1	Body	1	
2	Clamping slide	2	
3	Piston	1	
4	Cover	1	
5	Locking screw	2	
6	Cover cap	6	X / Z
7	Fitting screw	1	V1 / Z
8	O-ring	2	X
9	O-ring	2	X
10	O-ring	1	X
11	O-ring	1	X
12	O-ring	1	X
13	O-ring	1	X
14	O-ring	2	X / Z
15	Compression spring	6	
16	Screw	4	
17	Screw	4	V1 / Z
	Screw	6	Z
18	Screw	1	V1 / Z

Parts list key

V1 only for NSE-HT mini 88-20-V1

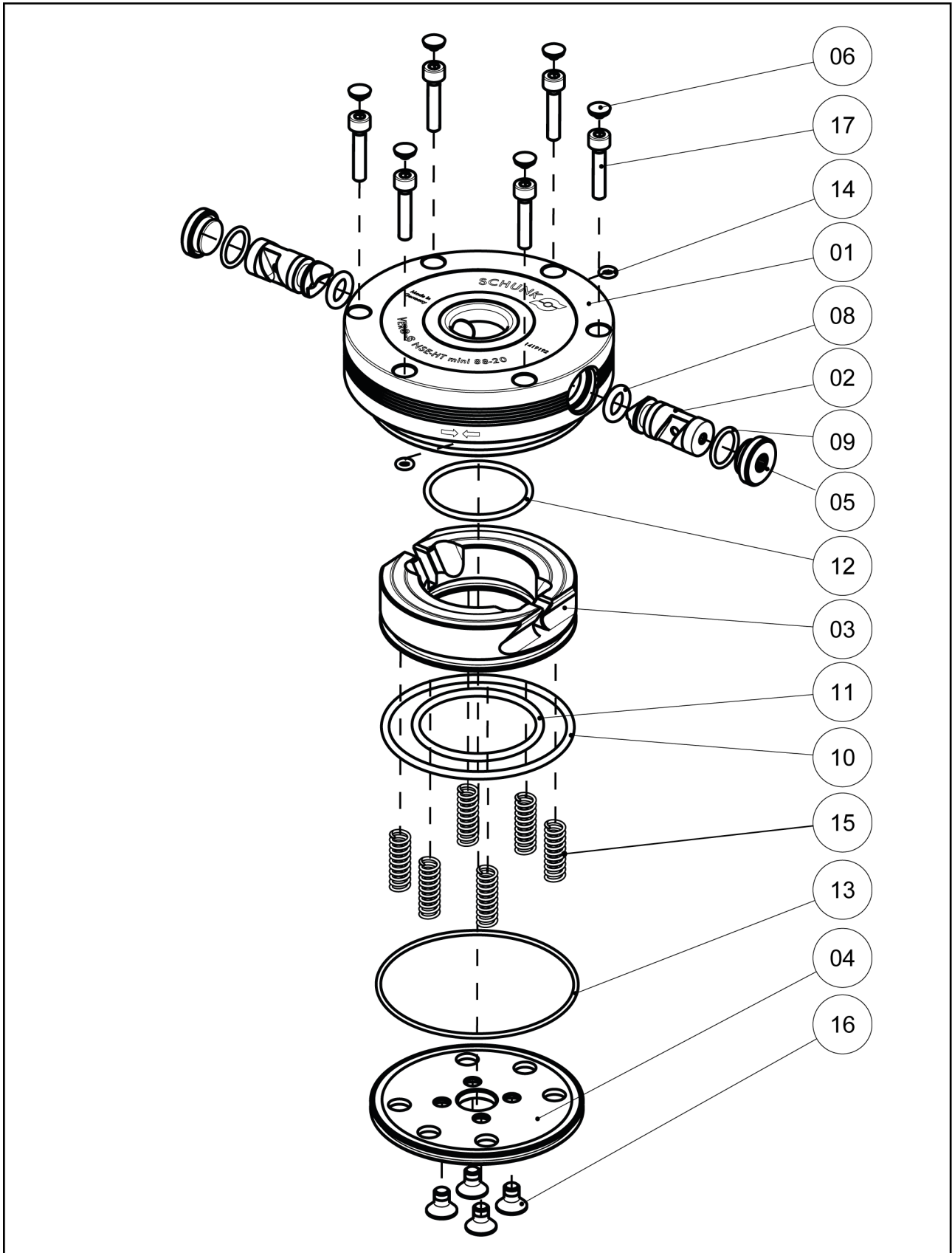
X replaced during maintenance

Z included in the accessory kit

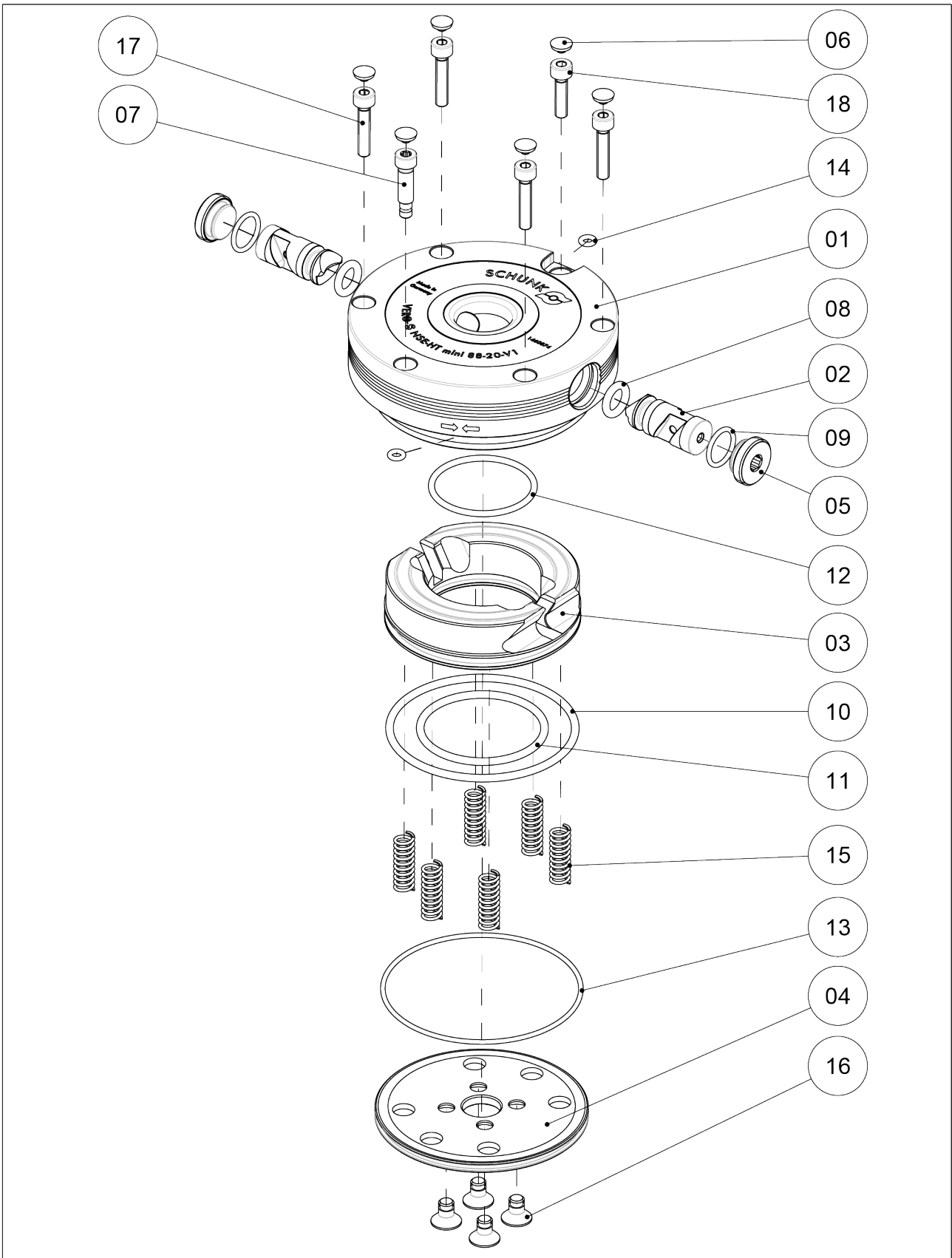
Seals are wearing parts and are replaced during maintenance from SCHUNK.

11 Assembly Drawings

11.1 NSE-HT mini 88-20



11.2 NSE-HT mini 88-20-V1



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 $MTTF_0$ 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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