



Quick-change pallet system VERO-S NST3

Assembly and Operating Manual

Translation of Original Operating
Manual

Hand in hand for tomorrow

Imprint

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Technical changes:

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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.

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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.

CAUTION

Information about avoiding material damage.

1.1.2 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and Operating Manual for VERO-S quick-change pallet system NSE3 *
- Assembly and Operating Manual for VERO-S tombstone VAT / VAT3 *

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

1.1.3 Sizes

This operating manual applies to the following sizes:

Clamping station

- NST3 400–250
- NST3 500–300

1.2 Warranty

The warranty for standard products is 24 months from the date of delivery from the factory, or 50,000 cycles* for manually operated clamping devices and 500,000 cycles* for power operated clamping devices. For special clamping devices, it is 12 months from the date of delivery from the factory, assuming appropriate use in accordance with the following conditions:

- Observe the applicable documents, ► [1.1.2](#) [5]
- 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

- Clamping station in the version ordered
- Assembly and Operating Manual

1.4 Accessories

(see catalog or data sheets when ordering separately)

- VAT-AE, VAT-DR, VAT-DW, VAT3-AE, VAT3-DR, VAT3-DW tombstones
- SAT tombstones
- SAT NSF plus tombstones
- SPA, SPB, SPC, SPG clamping pins
- SDE protection cover
- ASL2-G1/8" connecting strip
- VSK Ø10-NW7.4 locking coupling for air supply
- Torque wrench

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 and the compatible add-on components are 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, with clamping devices for higher temperatures (HT variant) up to 200°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 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 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 and cooling emulsion from filling the interface.
- Only use cooling emulsions with anti-corrosive additives when machining.
- When using the cone seal, protect it from direct high-pressure spraying with cooling emulsion.

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



⚠ WARNING

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

- During operation, unintentional loosening of the clamping pin or 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.
- For modules with media transfer units, ensure the loading weight on the change interface is sufficient to ensure the surface of the interface is level with the module.



⚠ WARNING

Risk of injury when the clamping pin or 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.
- Do not reach into the clamping module.



⚠ 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).



⚠ CAUTION

Risk of injury from pressurized media transfer unit interfaces. The actuated clamping device on top of these may move unexpectedly as a result.

- Do not control the media transfer units until the device is clamped on the quick-change pallet systems.
- Take suitable protective measures to secure the danger zone.

3 Technical data

Type designation	ID no.	Holding force* (M10 / M12 / M16) [kN]	Fmax ** [kN]	FmaxT *** [kN]	Weight [kg]
NST3 400-250	1337138	140 / 200 / 300	32	112	52
NST3 500-300	1337139	140 / 200 / 300	32	112	76

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

** Total pull-in force without TURBO function (total sum of pull-in forces of all the clamping modules mounted in the clamping station)

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

The following values may be taken from the relevant customer drawing:

Specification	Description
Mx_{max}	transmittable torque at clamping station x-axis
My_{max}	transmittable torque at clamping station y-axis
Mz_{max}	transmittable torque at clamping station z-axis

Actuating pressure [bar]	6
Repeat accuracy [mm]	< 0.005
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]
IP protection class	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). 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 dirt or damage.



⚠ 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

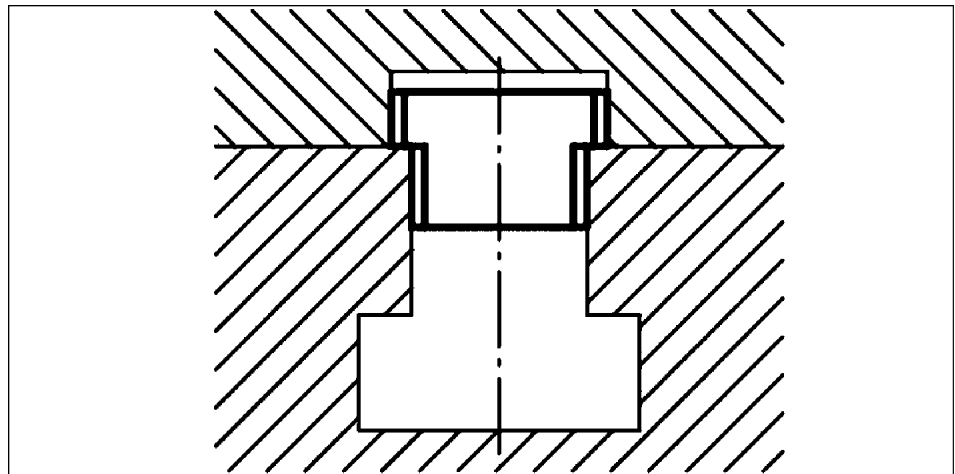
Danger of injury due to sharp edges and rough or slippery surfaces

- Wear personal protective equipment, particularly protective gloves.

4.2 Aligning the clamping station

4.2.1 Alignment using T-nuts

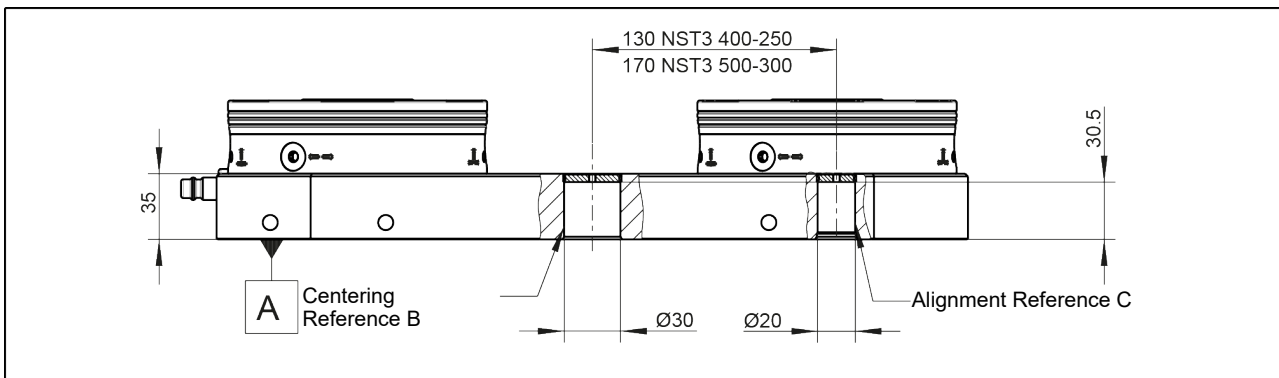
The clamping station can be aligned with loose T-nuts along an aligning groove on the machine table. At least two T-nuts offset lengthwise are provided and their size is matched to the aligning groove on the machine table. The T-nuts are not included in the scope of delivery of the clamping station.



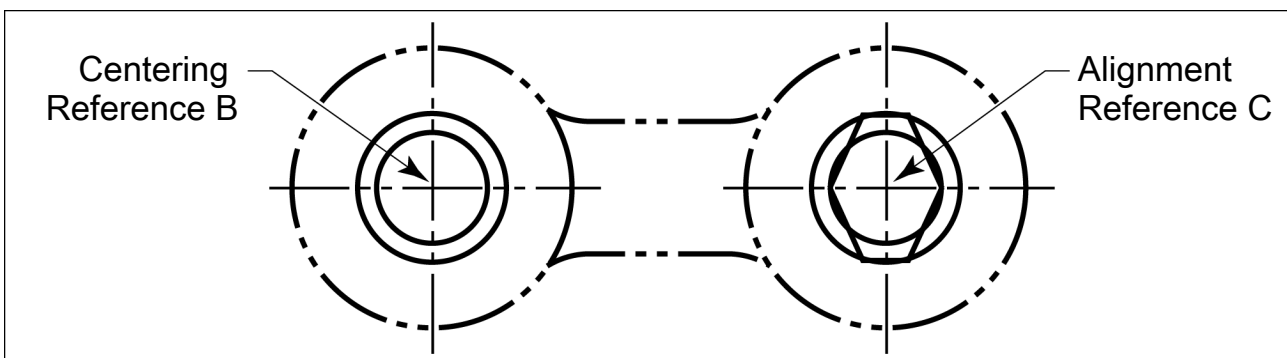
Alignment using T-nuts

4.2.2 Alignment using alignment elements

The clamping station can be mounted on the machine table via a centering pin for the center bore. The clamping station is aligned at an angle in a suitable alignment hole or alignment groove of the machine table via an adjustment pin, an adjustment pin with alignment width or a T-slot, and all six degrees of freedom are completely fixed. The alignment elements are not included in the scope of delivery of the clamping station.



Alignment via alignment elements



Alignment with two alignment holes

4.3 Mounting and connecting the clamping station

To prevent chip accumulation, a sufficient number of protective covers for covering the mounting screws is provided in the accessory kit.



⚠ WARNING

Risk of injury due to brass bore hole cover plate ejecting during a turning application of the clamping station.

The brass bore hole cover plates of the mounting screws may only be used for stationary applications of the clamping station.

Flatness and distances

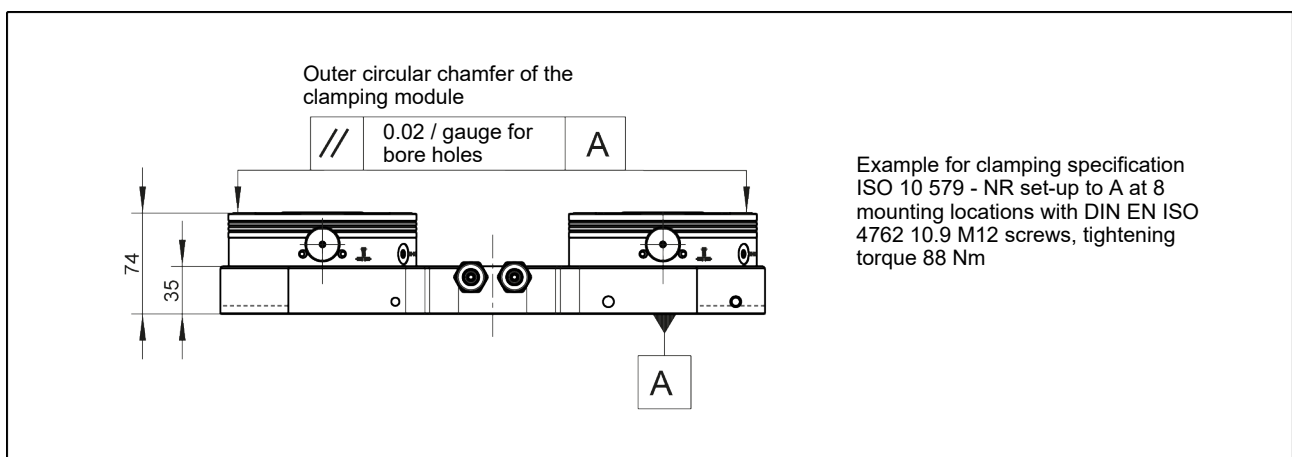
In order to assemble the clamping station, the clamping surface must have a flatness of ≤ 0.03 mm (based on the entire support areas of the clamping station). The clamping zone must have sufficient rigidity in order to ensure the relative flatness of the clamping modules. If several clamping stations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

Redundancy

For the sake of conformity, 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 ± 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 [20]).

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 fastened with cylindrical screws DIN EN ISO 4762 10.9 with thread size M12 or M16, depending on the version. If screws of size M12 are used for the NST3 500-300, they must each be mounted with a washer at the mounting point. The mounting screws and washers are not included in the scope of delivery. In order to ensure secure mounting, the clamping station must be fastened on the machine table at all possible mounting points. With the NST3 500-300, the clamping modules mounted must be removed prior to assembly in order to make the outer mounting locations accessible. For individually drilled holes, the permissible drilling ranges in the attached drilling drawings must be observed.



NST3 set-up

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 air bleed screw.

Ensure that the connecting points of the clamping station are not located in the water bath. For this reason, make sure the coolant in the machine compartment has completely drained when actuating the air connections.

For the clamping stations, piston chamber ventilation takes place alternately at one of the two free air connections. For this reason, the air connections or connected supply lines must have a ventilation option.

Connecting hose lines

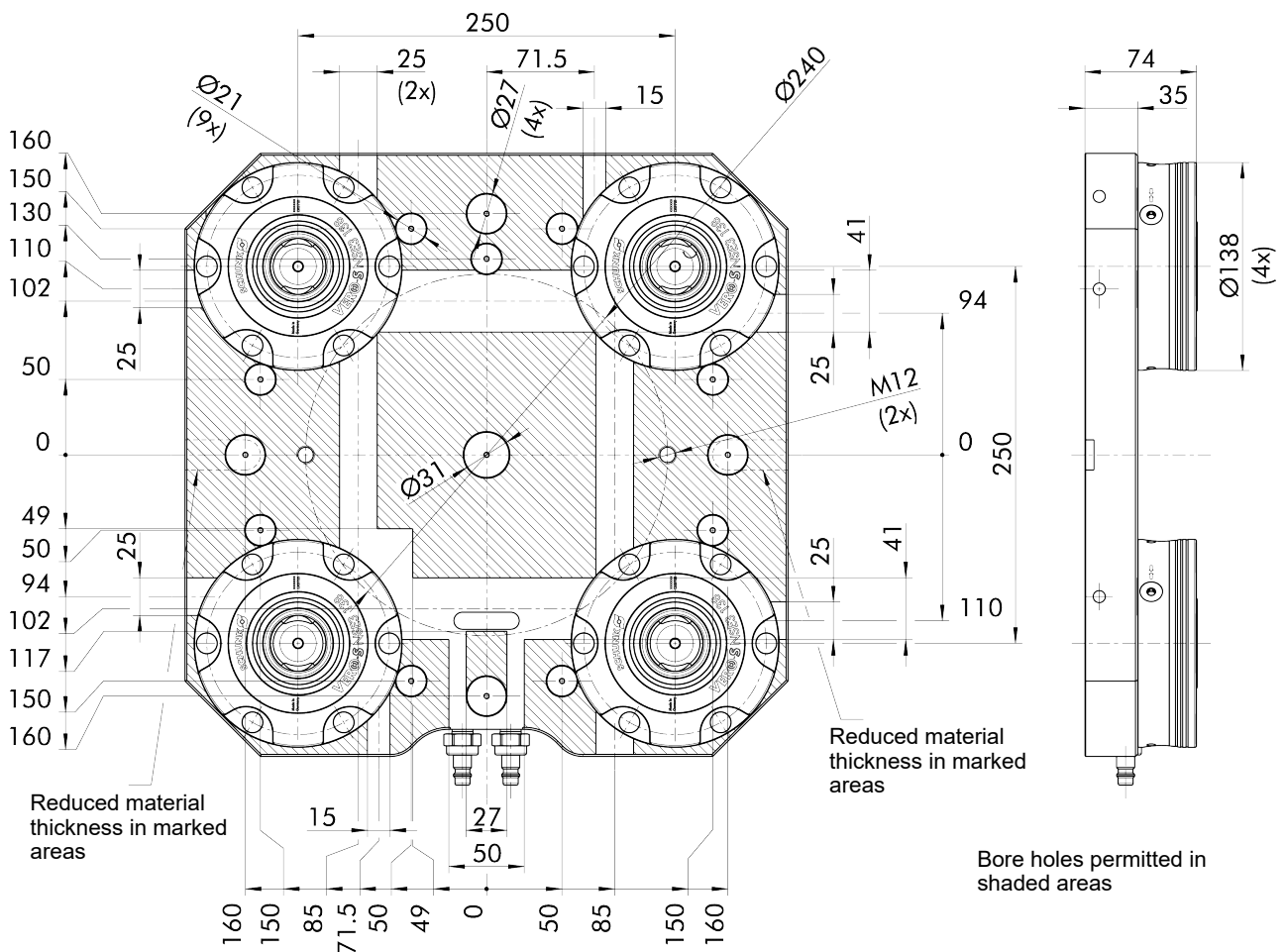
Choosing the minimum cross section for the hose line depends on the number of quick-change pallet modules installed inside one clamping station or in several clamping stations actuated with shared hose lines. Then, supply lines with the following minimum cross sections must be used.

Number of clamping modules installed	min. nominal hose width (hose inner diameter)
4	6 mm
8	8 mm

When decoupling hose lines, the pneumatic plug-in connection or the sealing nipple must be protected against the ingress of dirt or coolant. The sealing nipple comes with a plastic cover plug.

4.3.1 NST3 400-250

Depending on the design of the machine table, the clamping station is mounted on the machine table with screws size M12 or M16 according to DIN EN ISO 47 10.9. The permissible drilling ranges for individually drilled holes can be found in the drilling drawings. There are two alignment grooves on the bottom of the clamping station for mounting loose T-nuts to be used for aligning the clamping stations. These allow for precise alignment along an alignment groove. Alignment to the machine table is also possible by installing a centering pin and an alignment pin. The NST3 400-250 has two G 1/8" connections for separate functions. One air connection for unlocking and one air connection for the turbo function. Supply is via 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 a separately available connecting strip (accessory).

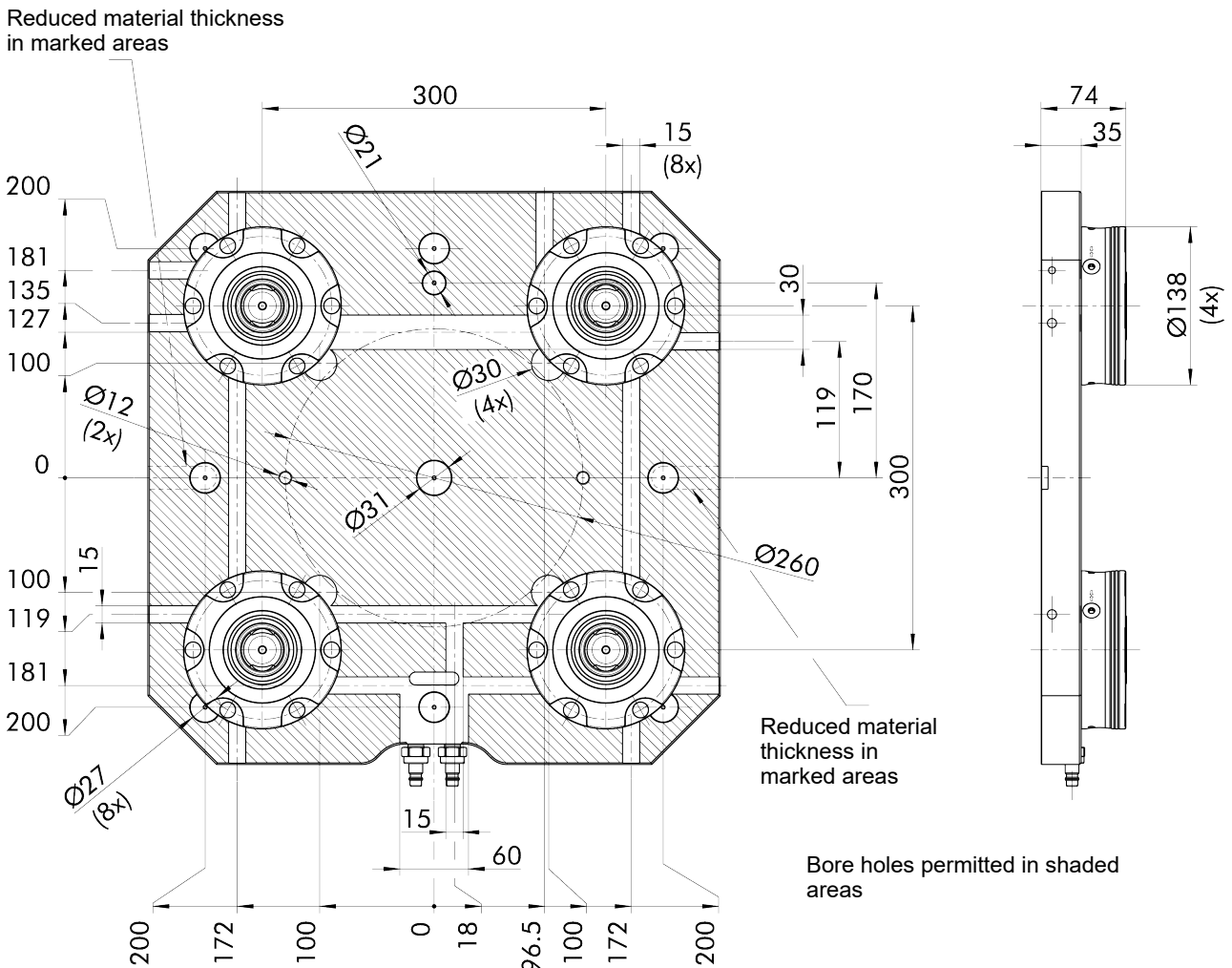


4.3.2 NST3 500-300

The clamping station is fastened to the machine table with size M16 screws according to DIN EN ISO 4762 10.9. The mounting points can also be screwed with M12 bolts and suitable washers. The permissible drilling ranges for individually drilled holes in the attached drilling drawings must be observed. There are two alignment grooves on the bottom of the clamping station for mounting loose T-nuts to be used for aligning the clamping stations. These allow for precise alignment along an alignment groove. Alignment to the machine table is also possible by installing a centering pin and an alignment pin. The NST3 500-300 has two G1/8" connections for separate functions. One air connection for unlocking and one air connection for the turbo function. Supply is via 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 connecting strip (accessory).

Note:

The access to the outer mounting locations requires all four quick-change pallet modules to be disassembled. After the assembly of the clamping station, the modules have to be installed again with the required tightening torque. The scope of delivery includes new cover flaps for closing the fastening screws of the clamping modules.



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

CAUTION

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 tombstone 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 and fasteners with sufficient material strength.

The clamping pins 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 pins". 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 flat sealing ring on the top of all quick-change pallet systems involved in the clamping function.

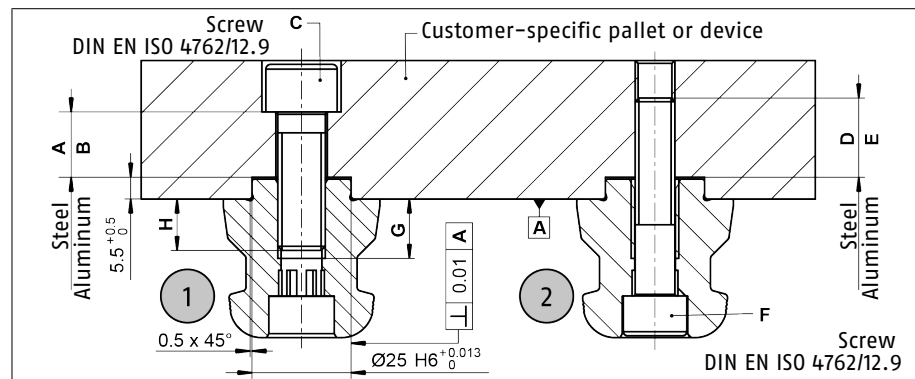
Designation Type ID no.

**min. outer diameter
on the support of the part**

NSE3 138 (-K)

1313721, 1313722

68 mm



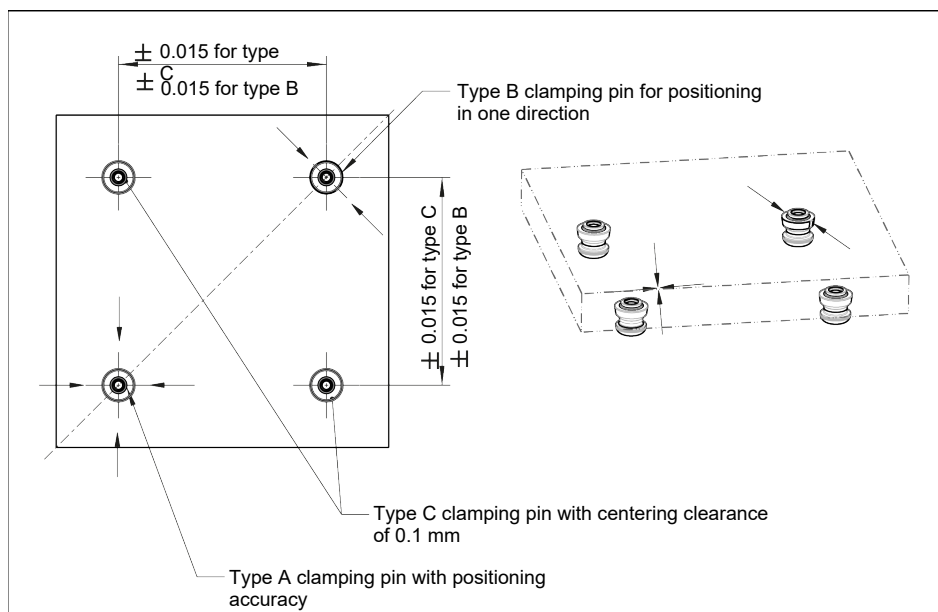
Mounting the clamping pins

Tolerances and installation conditions

Type	ID	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-in thread must not exceed the dimension "G" under any circumstances!

Usage/arrangement of the different types of clamping pins (Application: pallet with 4 clamping areas)



Clamping pallet with 4 clamping areas

4.4.1 Information to clamping pin SPG 40

The SPG 40 can be used at a clamping area instead of the SPA 40. If there are several clamping areas and a position tolerance of >0.05 mm, only the clamping area with the SPA 40 clamping pin type may be replaced with the SPG 40. If the position tolerance between the clamping areas is <0.05 mm, all clamping pin types may 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, a 10 mm longer M12 screw of strength class 12.9 must be used according to the mounting option on the left in the illustration.

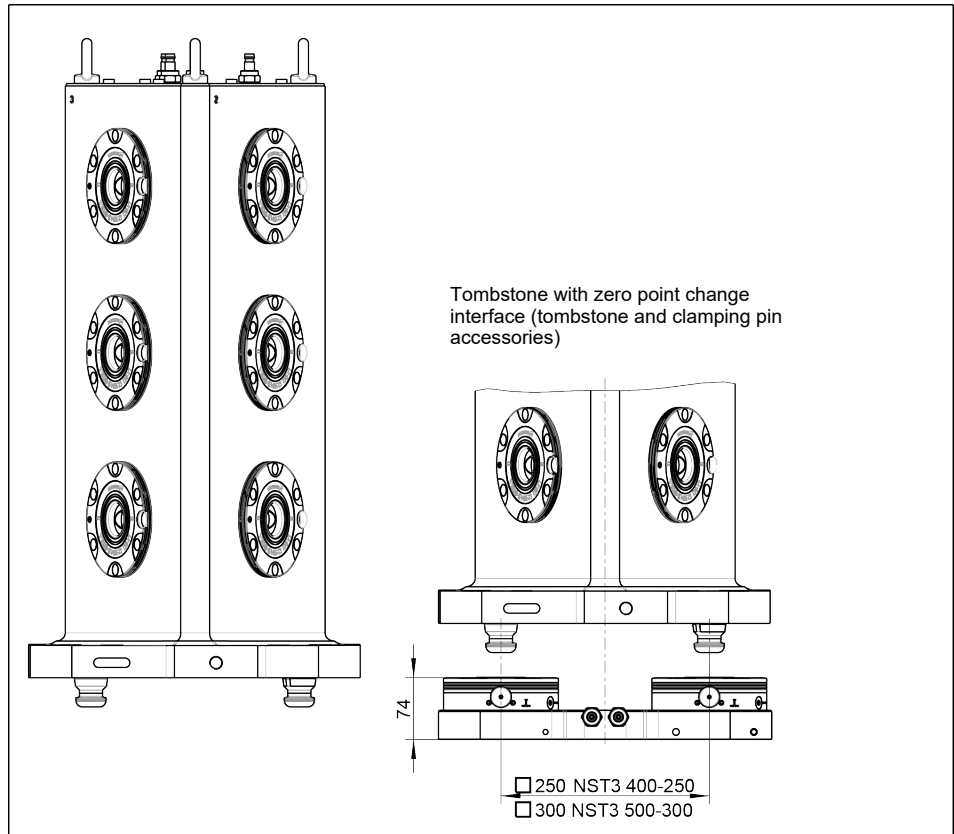
CAUTION

Note

Heavy and high clamping systems such as tombstones must be screwed to the clamping pins with M12 screw size at a minimum. When using SPG 40 clamping pins, fastening must be according to order preference 1.

4.5 VERO-S tombstones (optional)

Suitable VERO-S tombstones are available as accessories for clamping stations. There are different sized tombstones that correspond to the clamping stations. These are available in the pallet sizes 400 x 400 mm and 500 x 500 mm. The tombstones can be equipped with VERO-S zero point clamping pins, thus achieving a highly precise change-repeat accuracy together with the clamping station.



Tombstone

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 torque for mounting the clamping station and for reinstalling clamping modules with fixing screws DIN EN ISO 4762.

The clamping station 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:

For the NST3 500-300, all four clamping modules require disassembly due to the fact that the outer mounting locations are concealed by the clamping modules. The fixing screws used for the clamping modules must be tightened according to the torque specifications for reinstallation.

(Screw quality 10.9)

Screw size	M8	M12	M16
Tightening torques (Nm)	28	88	160

5 Function

The VERO-S NST3 clamping station guarantees rapid changing of VERO-S tombstones, 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 with a high level of repeat accuracy via the related VERO-S clamping pin.

5.1 Connections on the clamping station

The VERO-S clamping station is equipped with an unlocking connection and a connection for the turbo function. The air connection for each is actuated via a sealing nipple for a quick-release 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 (type: VSK Ø10-NW7.4 ID. 1344010 accessory).

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 cover plates to prevent the ingress of dirt or coolant. The attachable cover plates 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. Tombstones, 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 tombstone or 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 modules move to the closed position. Exchanging the clamping pallet is not possible with clamping modules that are not locked.



⚠ WARNING

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

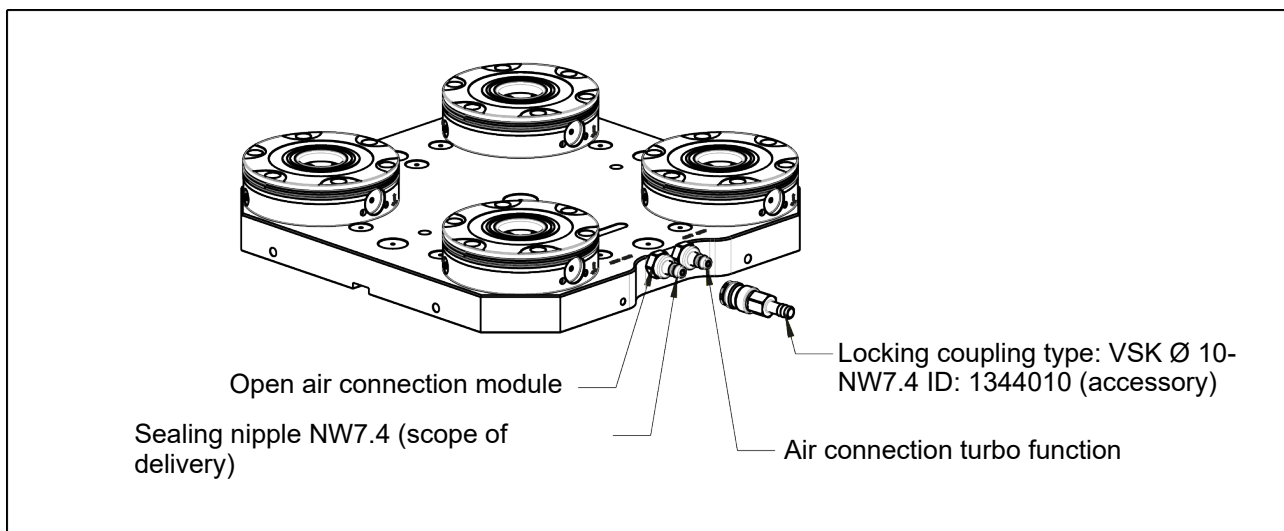
- The unlocking connection may only be operated if the tombstone or clamping pallet has been prevented from falling.
- On production machines with a swivel function, the clamping station always swings back into set-up position.

5.3 TURBO connection



The 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-down force in all the modules.

One pressure pulse is sufficient to increase the pull-down 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.

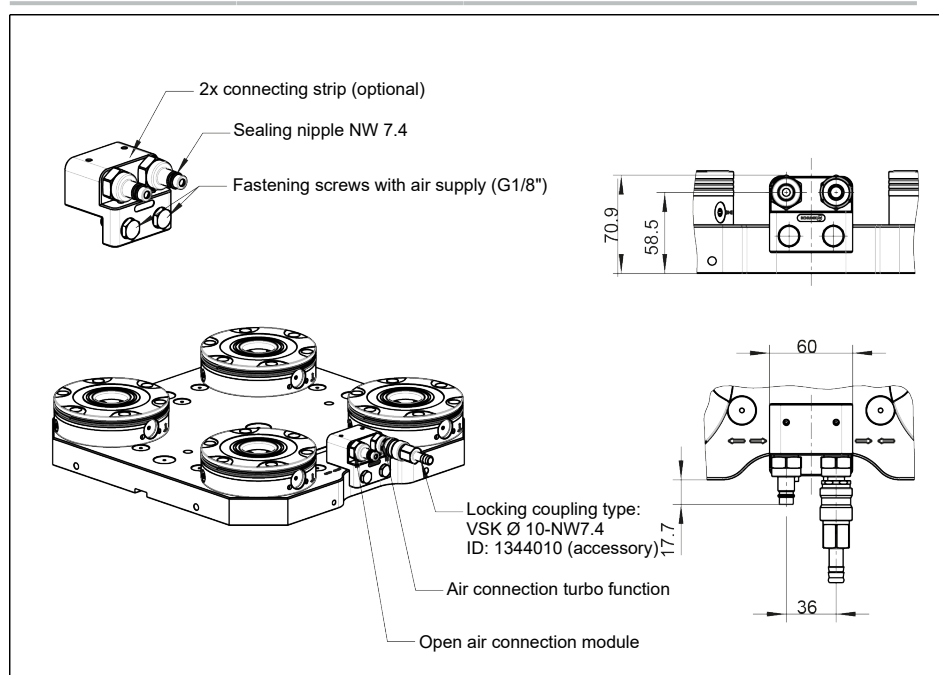


Connections on the clamping station

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

Upon customer request, a VERO-S connecting strip type ASL2 G1/8" can be mounted to the clamping station in order to facilitate access to the air supply points. The connecting strip is equipped with an elevated connection point with two size NW 7.4 sealing nipples. A quick air relief valves are 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. To mount the connecting strip, the front air connections (sealing nipples) are removed from the clamping station and in their place, the connecting strip is directly adjusted via the hollow screws. The circuit symbols for the "unlocking function" and the "turbo function" are engraved on the clamping station.

Type:	Id- No.:	Suits all clamping stations
ASL2 -G1/8"	1315007	NST3 400-250 & NST3 500-300



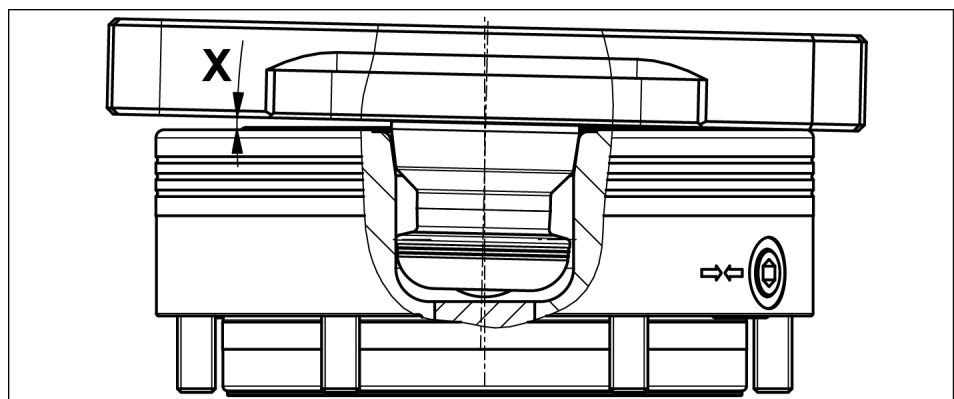
2x connecting strip ASL2-G1/8"

6 Operation

CAUTION

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.



⚠ CAUTION

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

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

The back cover of the clamping module is spring preloaded and must only be removed by trained specialist personnel. The cover can only be disassembled and assembled using a special assembly tool and by observing the corresponding disassembly and assembly instructions.

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

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

CAUTION

A separate maintenance unit must be used for the air supply. The quick-change pallet system is designed for operation with dry compressed air. If oiled compressed air is used for operation, this must be done every time. The compressed air should be prepared with 1 to 2 drops of oil for an air volume of 1000 liters. This corresponds to approx. 1400 clamping cycles with NSE3 138.

- 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.

CAUTION

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 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 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 overloading)	Replace the module or send it to SCHUNK for repair
Excess tensile load on clamping pins	Reduce support weight

9.2 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" ▶ 4.3 [15]
The turbo connection is still pressurized	Ventilate the connection

9.3 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

10 Parts lists

When ordering spare parts, it is essential to specify the type, size and, above all, the serial number of the product. **Seals, sealing elements, screw connections, springs, bearings, screws and wiper strips as well as parts that come into contact with the workpiece are not covered by the warranty.**

10.1 Part lists

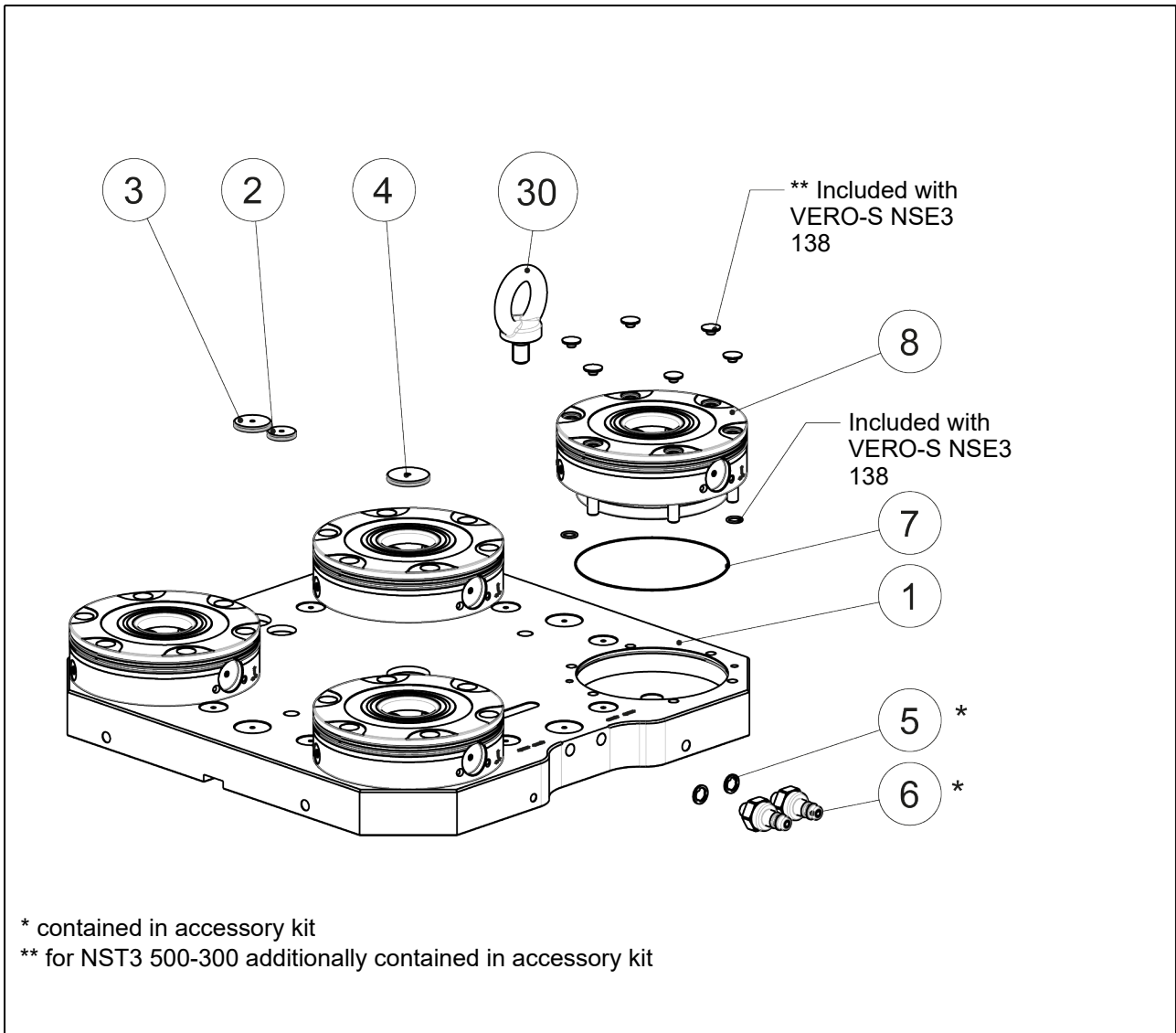
NST3 400-250 (ID. 1337138)

Item	Description	Quantity
1	Base plate	1
2	M12 cover to close the bore	9
3	M16 cover to close the bore	4
4	M18 cover to close the bore	1
5	Sealing ring G1/8"	2
6	Sealing nipple G1/8"	2
7	O-ring	4
8	VERO-S NSE3 138	4
30	Eye bolt DIN 580 M12	2

NST3 500-300 (ID. 1337139)

Item	Description	Quantity
1	Base plate	1
2	M12 cover to close the bore	1
3	M16 cover to close the bore	8
4	M18 cover to close the bore	1
5	Sealing ring	2
6	Sealing nipple G1/8	2
7	O-ring	4
8	VERO-S NSE3 138	4
30	Eye bolt DIN580 M12	2
31	Cover plug for VERO-S	24

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:	NSL, NSD, NST, GSL, SSN, SSN turn

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

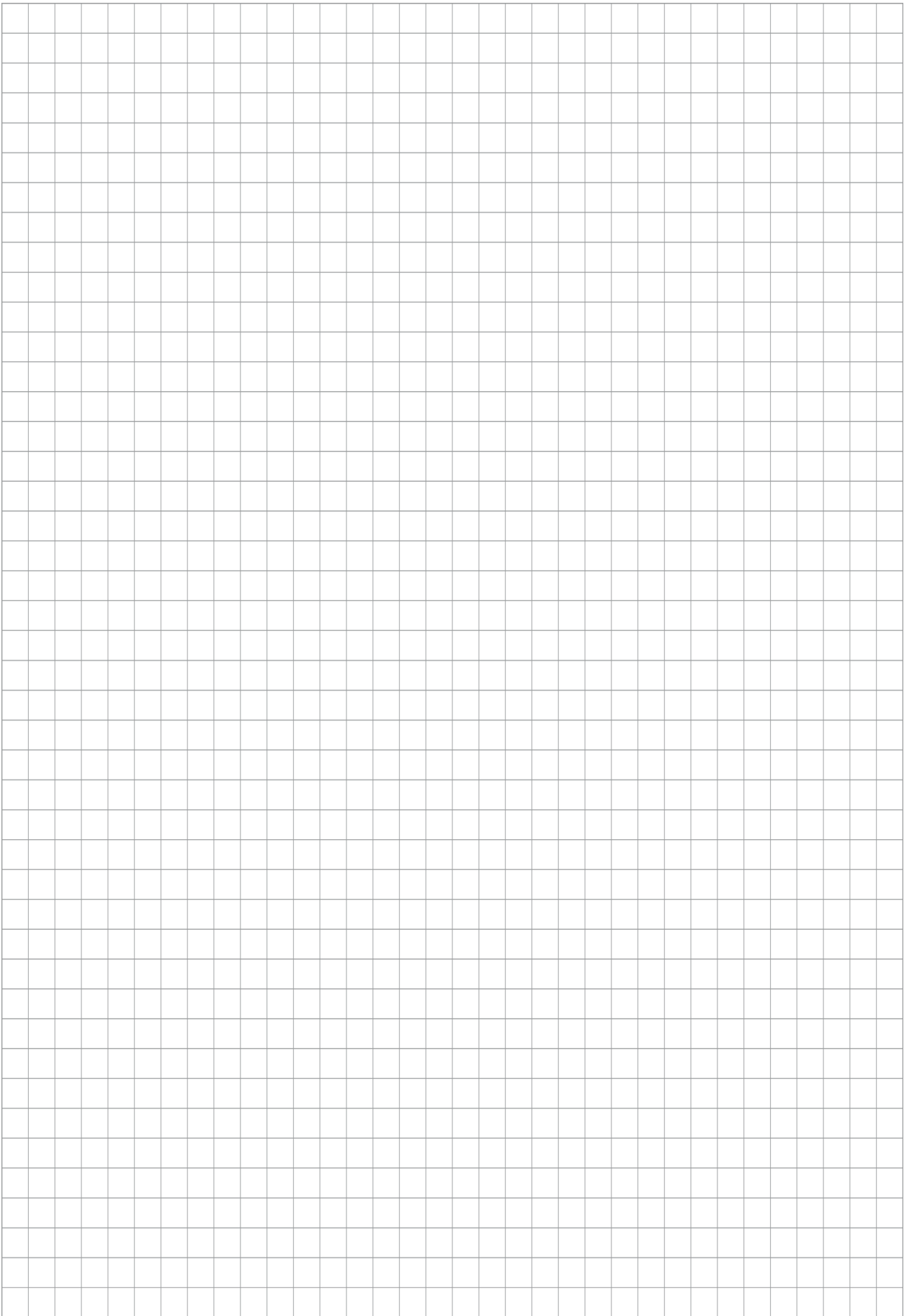
Mengen, 19th of July 2023

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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