



VERO-S NSE3

**The premium quick-change
pallet modules for universal
milling operations**

The most powerful quick-change pallet modules as a basis for the VERO-S modular system.

Positioning and clamping in one single operation – VERO-S gets to the heart of rationalization. The NSE3 premium models form the basis for the VERO-S modular system, and are either installed directly in the machine table, or attached to it as a clamping station. In times of mounting pressure on costs, with the help of a clamping pallet, pallet coupling and robot module, the clamping devices can be automatically inserted and removed by a robot, thereby increasing the machine running times. Depending on the application, the module can also be expanded by a unique selection of different equipment.



Advantages – Your benefits

- + SCHUNK modular system**
Innumerable combinations of standard clamping devices to suit all different types of machines
- + 100% compatible with NSE plus generation**
Existing NSE plus modules can be replaced 1:1 by NSE3 modules
- + All modules can be operated with a system pressure of 6 bar**
Additional pressure intensifiers are not required
- + Positioning via short taper**
Very easy joining process at a repeat accuracy of < 0.005 mm
- + Patented dual stroke system for highest pull-down forces**
Therefore extremely rigid clamping without vibrations
- + Form-fit, self-retained locking**
Full pull-down force is maintained even in the event of a pressure drop
- + Turbo integrated by default**
Pull-down force increased up to 300% for optimal utilization of the machine's performance, hence high efficiency.
- + Optional equipment versions**
To protect the change interface via cone seal or sensory monitoring possibilities of the clamping slide positions

Function NSE3 138

The clamping procedure of the module is carried out by an integrated spring assembly. An axial piston and a patented drive kinematics convert the spring force into a maximum pull-down force on the clamping pin. Clamping is carried out by two clamping slides and is self-retained. In addition, the pull-down force can be increased by means of an integrated turbo function. The module is opened pneumatically with a system pressure of 6 bar.



- ① **Optional cone seal**
For protection of the changing interface
- ② **Patented dual stroke system**
A patented dual stroke system between piston and clamping slide ensures maximum pull-down forces
- ③ **Turbo function**
For amplification of the pull-down force
- ④ **Large contact surfaces**
For transmitting the pull-down and holding forces
- ⑤ **Completely sealed system**
Therefore absolutely maintenance-free
- ⑥ **Large flat surface**
For best support and highest rigidity
- ⑦ **Monitoring of the clamping slide position "open condition" and "locked condition"**
Via dynamic pressure possible
- ⑧ **Flat seal to protect the interface during machining**
Dampens the placement of the workpiece or clamping pallet
- ⑨ **Cover plugs for mounting screws**
Therefore no accumulation of coolant or chips possible
- ⑩ **Sliding bearings in the force flow**
For maximum pull-down forces with a long service life
- ⑪ **Lower-lying countersunk screws**
For easy cleaning of the flat surface

100% compatible with NSE plus generation

The quick-change pallet modules of the NSE3 generation are 100% installation compatible with the NSE plus generation. Therefore all modules can be exchanged against each other 1:1.



Exchangeability of the plug against a cone seal

All quick-change pallet modules from the NSE3 generation are standard equipped for integrating a cone seal. The standard plug can easily be replaced by a cone seal at a later point.



Centering via short taper

The precise short taper centering combined with the form-fit and self-retaining locking characterizes the SCHUNK quick-change pallet system.



Locking via clamping slides

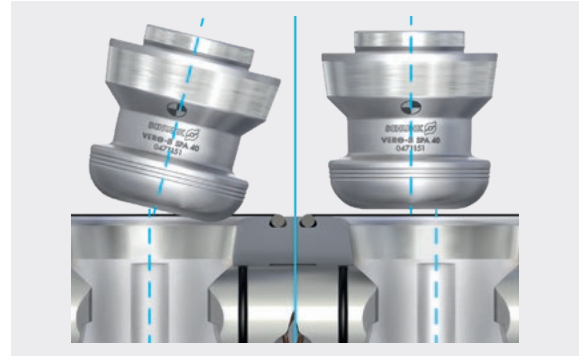
Large contact surfaces between clamping slides and clamping pin ensure a low surface pressure, resulting in a long service life.



Easy joining – more user-friendly

Insertion radii on the clamping pin enable quick and safe joining even at a tilt angle and in case of eccentricity.

Benefit: More user friendly for manual and automatic loading.



Integrated turbo function

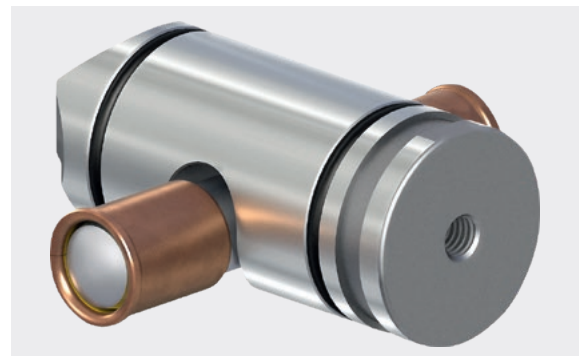
In order to increase the pull-down force, the quick-change pallet module is additionally actuated with compressed air. Compared to the pure clamping force achieved via spring force, the turbo function influences the pull-down force by a factor 3.5 (max. 28,000 N). By using the active turbo function, achieving higher cutting parameters during the machining process is possible.

- ❶ **Spring force**
Stainless, fatigue-resistant pressure springs.
- ❷ **Additional force**
Resulting from the turbo function.



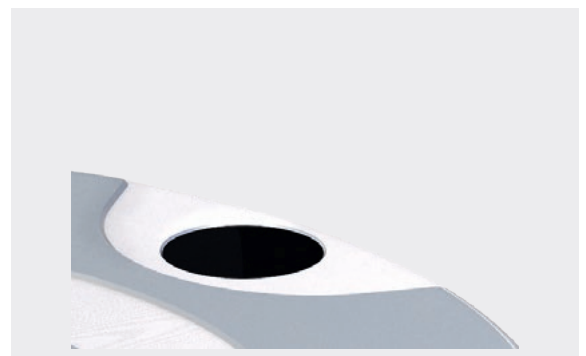
Rolling friction between piston and clamping slide

In order to further increase the pull-down force, plain bearing bushings are integrated in the piston for bearing the cylinder pin. Therefore the efficiency is increased and wear minimizes at the same time.



Lower-lying countersunk screws

Countersunk screws are used in the lower-lying flat surface, allowing an easy cleaning of the flat surface.



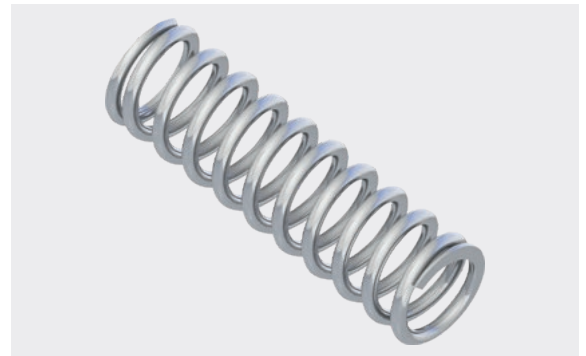
Control of the quick-change pallet system

The modules are actuated via lateral or bottom air connections.
Benefit: The module is versatile in installation.



Pressure spring made of stainless steel

For maximum service life, all of the actuating springs are made of fatigue-free stainless steel.



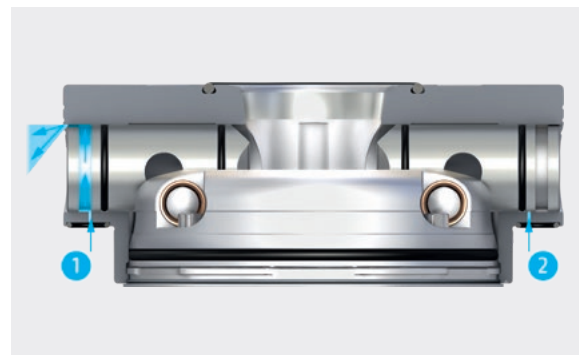
Made of stainless steel – long service life

All functional components are made of hardened stainless steel.



Monitoring of the clamping slide position via the dynamic pressure – opened condition

- ❶ **Deaeration**
The compressed air can escape because the clamping slide is not positioned above the bore hole.
- ❷ **Dynamic pressure**
The compressed air cannot escape because the clamping slide is above the bore hole.



Monitoring of the clamping slide position via the dynamic pressure – locked condition

- 1 **Dynamic pressure**
The compressed air cannot escape because the clamping slide is above the bore hole.
- 2 **Deaeration**
The compressed air can escape because the clamping slide is not positioned above the bore hole.



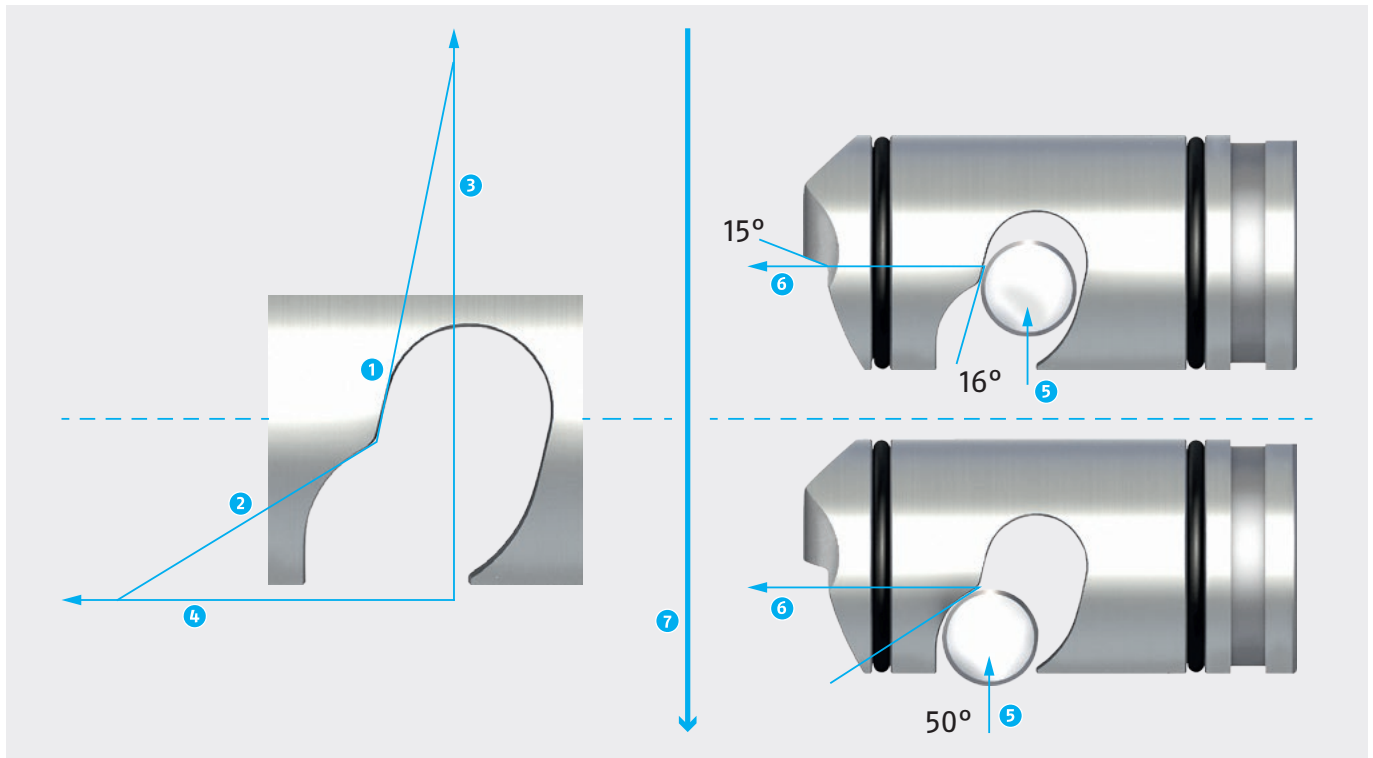
Arrangement of clamping pins type A, B, and C

The clamping pin is used for clamping and positioning the workpieces or devices to be converted. Basically, there are three different types of clamping pins:

- 1 **Type A**
Fixed
- 2 **Type B**
Positioned – diamond shaped
- 3 **Type C**
With a centering play



Fast and clamping stroke – the patented force



The patented dual stroke system provides the best transmission ratios and maximum pull-down force.

- 1 Clamping stroke**
Minimum clamping slide movement and an enormous increase in pull-down force due to the small angle.
- 2 Fast stroke**
The upstream stroke of the clamping stroke has low forces but a long stroke.
- 3 Y-axis**
Shows the increase in the resulting force due to the various angles.
- 4 X-axis**
Shows the distance traveled by the clamping slide due to the various angles.
- 5 Actuation force**
Force transferred from the piston to the clamping slide.
- 6 Force on the clamping slide**
Force-amplified clamping slide due to angular relations.
- 7 Pull-down force on the clamping pin**
Due to the different surfaces, the pull-down force is five times higher than the actuating force.

Third-generation module versions

Standard version

All third-generation modules are available with or without cone seal. The modules are suitable for partial and full installation. For single palletizing, it is available with anti-rotation protection V1 and V4.



Tombstone version

Also available in the third generation – the NSE-T3 tombstone module, with or without cone seal. Due to its slim design, it is particularly suitable for applications with tombstone or swiveling table. For single palletizing it is also available with the anti-rotation protection V1 and V4.



Anti-rotation protection V1

Modules with anti-rotation protection V1 are used for palletizing single modules. With the help of an indexing pin, the clamping device or clamping pallet can be fixed in two positions with high precision and without play.



Anti-rotation protection V4

The main area of application for the V4 anti-rotation protection is automated machine loading. The cylindrical pins in the clamping pallet compensate for inaccuracies of the robot. The two flex elements – in combination with the pull-down force – then ensure highly accurate positioning.



Optional cone seal

Due to the optional cone seal, the changing interface is reliably protected against the ingress of coolant, dust, and chips.



1. Module locked without clamping pin

In the ventilated status, the seal is applied to the short taper, completely sealing the changing interface.



2. Module opens without clamping pin

When the module is opened, the seal contracts into its initial state.



3. Module open with clamping pin

The cone seal is pushed downwards by introducing the clamping pin into the module, which releases the changing interface.



Optional sensor variants

The mounting threads prepared in the standard version allow optional mounting of sensor variants. Pallet presence can be queried via an inductive proximity switch and different clamping states via different position sensors.



Variant 1 – AFS3 IOL

Monitoring unit for detecting the "open", "clamped" and "closed without clamping pin" clamping states for all NSE3 modules. An inductive proximity switch also detects the presence of pallets. The data is then transferred to the machine control via IO-Link.



Variant 2 – AFS3 138 PMI

Inductive monitoring unit for detecting the "open" and "clamped" clamping states as well as outputting a "closed without clamping pin" fault message for all NSE3 138 modules. An inductive proximity switch also detects the presence of pallets.



Variant 3 – AFS3 138 MMS

Magnetic monitoring unit for detecting the "open" and "clamped" clamping states for all NSE3 138 modules. An inductive proximity switch also detects the presence of pallets.



Quick-change pallet module

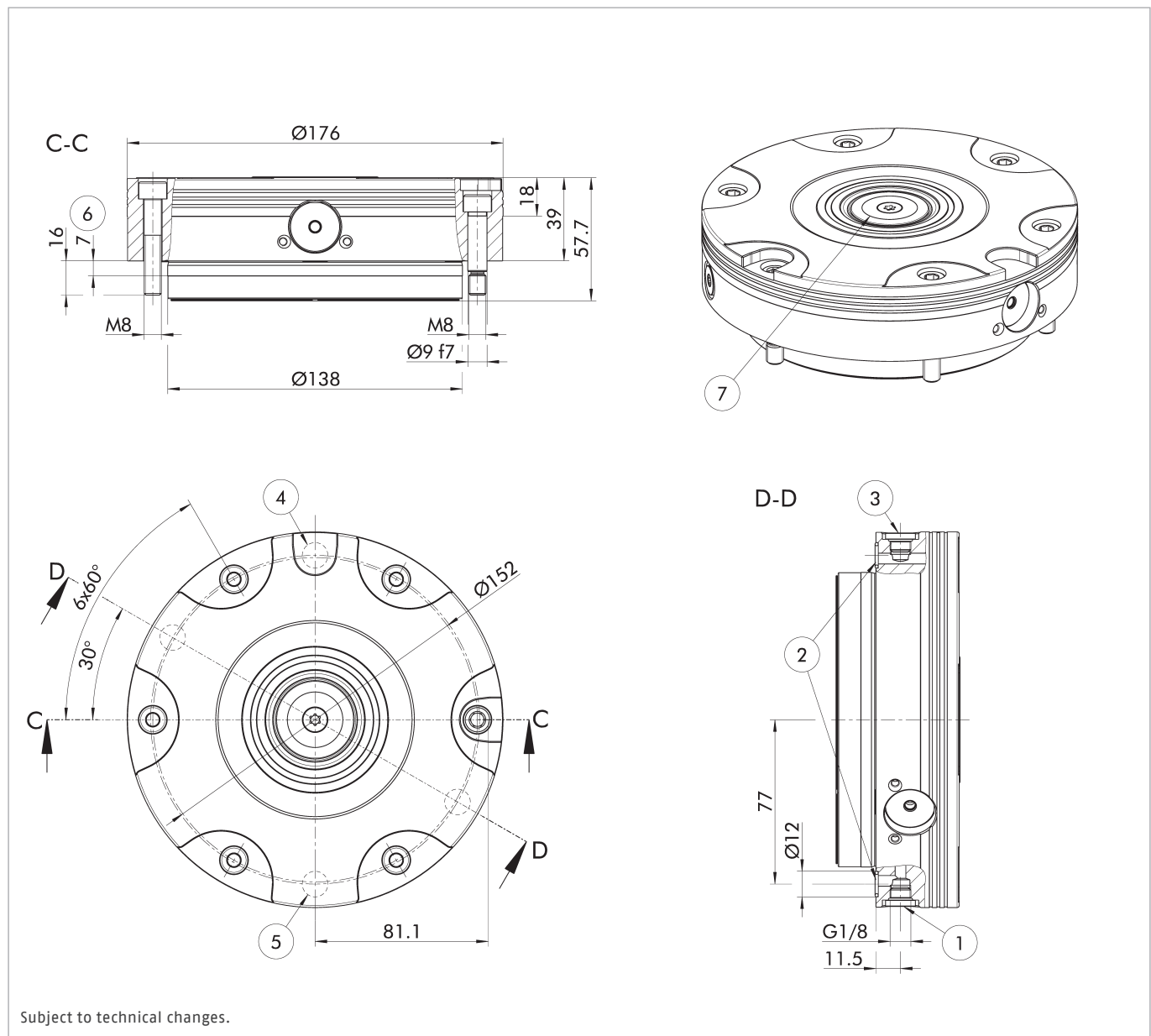
With anti-rotation protection V1

Scope of delivery

Clamping module, mounting screws, fitting screws, O-rings, cover caps, operating manual; without clamping pins, without indexing pins

Technical data

Description	ID	Cone seal	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Repeat accuracy [mm]	Weight [kg]
NSE3 176-V1	1464669		9	40	6	< 0.005	8
NSE3 176-V1-K	1464670	●	9	40	6	< 0.005	8



- ① Unlocking connection via screw connection G1/8
- ② Hose-free direct connection
- ③ Turbo connection via screw connection G1/8
- ④ Hose-free direct connection for monitoring module open
- ⑤ Hose-free direct connection for slide monitoring module closed
- ⑥ Fitting length module's seat
- ⑦ Optional: Cone seal

Accessories

Clamping pins SPx

Clamping pin for positive connection with NSE3 clamping modules.



Suitable for	Description	ID
NSE3 176-V1	SPA 40	0471151
NSE3 176-V1	SPB 40	0471152
NSE3 176-V1	SPC 40	0471153

Clamping pins SPx

Standard clamping pins with M16 thread for form-fit connection of workpieces or devices with NSE3 clamping modules.



Suitable for	Description	ID
NSE3 176-V1	SPA 40-16	0471064
NSE3 176-V1	SPB 40-16	0471065
NSE3 176-V1	SPC 40-16	0471066

Compensation pins

Clamping pin for compensating fluctuations of the bore hole gauges.
SPA-X 40 = compensation in one direction of ± 1 mm.
SPA-XY 40 = compensation in all directions of ± 1 mm.



Suitable for	Description	ID
NSE3 176-V1	SPA-X 40	0471155
NSE3 176-V1	SPA-XY 40	0471156

Accuracy pin

Clamping pins with patented flex taper with a repeat accuracy of less than 0.002 mm.



Suitable for	Description	ID
NSE3 176-V1	SPG 40	0471154

Dove tail pins

Clamping pins with a mounting depth of 3.5 mm



Suitable for	Description	ID
NSE3 176-V1	SPA-S 40	1310630
NSE3 176-V1	SPB-S 40	1323856
NSE3 176-V1	SPC-S 40	1323857

Heavy duty pins

Clamping pins with integrated mounting threads for high holding forces.



Suitable for	Description	ID
NSE3 176-V1	SPA-F 40	0471171
NSE3 176-V1	SPC-F 40	0471172

Indexing pin

Used as an anti-rotation protection for VERO-S modules with anti-rotation protection V1.



Suitable for	Description	ID
NSE3 176-V1	IXB V1	0471980
NSE3 176-V1	IXB V1-K	0432371

Cone seal

For quick and easy retrofitting of existing modules NSE3 without cone seal to protect the change interface.



Suitable for	Description	ID
NSE3 176-V1	KVS 40	1313742

Monitoring unit

Integrated monitoring of clamping slide positions, pallet presence and the pressure in the turbo chamber via IO-Link



Suitable for	Description	ID
NSE3 176-V1	AFS3 IOL 176	1536492

Cover caps

Used to cover the mounting screws and to avoid the accumulation of chips.



Suitable for	Description	ID
NSE3 176-V1	ADK-1 M8-SW6	9988527



**H.-D. SCHUNK GmbH & Co.
Spanntechnik KG**

Lothringer Str. 23
D-88512 Mengen
Tel. +49-7572-7614-1300
Fax +49-7572-7614-1039
CMM@de.schunk.com
schunk.com