

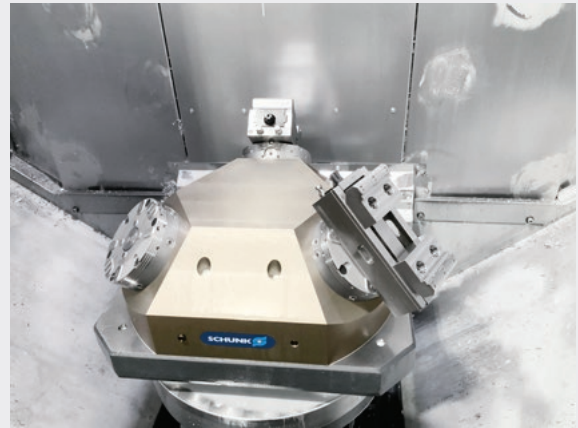


VERO-S NSE-A3

**Powerful quick-change pallet
modules for high-end
palletizing**

Fully equipped automation modules for automated machine tool loading.

Automated loading and unloading is increasingly becoming the standard even for small batch sizes and individual parts. The goal is to reduce set-up times and enable round-the-clock production with low manpower requirements. The versatile VERO-S NSE-A3 automation module has been specially developed for this purpose. Stepped locating surfaces, a blow-off function, cone seal and integrated media transfer units are the perfect basis for maximum precision while at the same time ensuring reliable processes. For greater transparency in the clamping procedures, the automation module offers smart interaction together with the AFS3 IOL 138 monitoring unit. The clamping statuses and pallet presence can be transmitted to the machine control system via IO-Link.



Advantages – Your benefits

- + Integrated cone seal by default**
For protecting the change interface from coolant, dust, and chips
- + Stepped contact surfaces**
Ensure a clean system of clamping pallets or clamping devices
- + Integrated cleaning function**
No chips or coolant on the flat work surface
- + 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**
The pull-down force increases up to 250% for optimum use of the machine performance, hence high efficiency.
- + All query functions are integrated**
Maximum process reliability even with rough machining
- + Integrated media transfer unit**
For transfer of fluids of up to 300 bar

Technical data

Description	Cone seal	Anti-rotation protection	Sensory monitoring (optional)	Integrated media transfer unit	Pull-down force	Pull-down force with turbo
					[kN]	[kN]
NSE-A3 138	●		●		8	28
NSE-A3 138-V4	●	●	●		8	28
NSE-A3 138-V4-P	●	●	●	●	8	28
NSE-A3 138-V4-P1	●	●	●	●	8	28

Function NSE-A3 138-V4-P

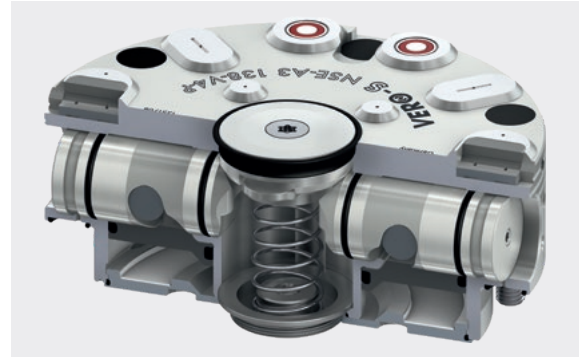
The clamping procedure of the module is carried out by an integrated spring assembly. An axial piston and a patented drive kinematics convert the spring force into a maximum pull-down force on the clamping pin. Clamping is carried out by two clamping slides and is self-retained. In addition, the pull-down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



- 1 Standard cone seal**
For protection of the changing interface
- 2 Anti-rotation protection V4**
For precise position orientation of the clamping pallet, with simultaneous compensation of the inaccuracies of the loading robot
- 3 Patented dual stroke system**
High pull-down forces are ensured between the piston and the clamping slide
- 4 Turbo function**
For amplification of the pull-down force
- 5 Completely sealed system**
Therefore absolutely maintenance-free
- 6 Monitoring of the clamping slide position "open condition" and "locked condition"**
Via dynamic pressure possible
- 7 Stepped contact surfaces**
With integrated cleaning function
- 8 Integrated media transfer unit**
For transfer of fluids of up to 300 bar

Cone seal integrated in the standard version

All clamping modules of the NSE-A3 series are equipped with a cone seal as standard. Due to this cone seal, the changing interface is reliably protected against the ingress of coolant, dust, and chips.



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.



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.

- 1 **Spring force**
Stainless, fatigue-resistant pressure springs.
- 2 **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.



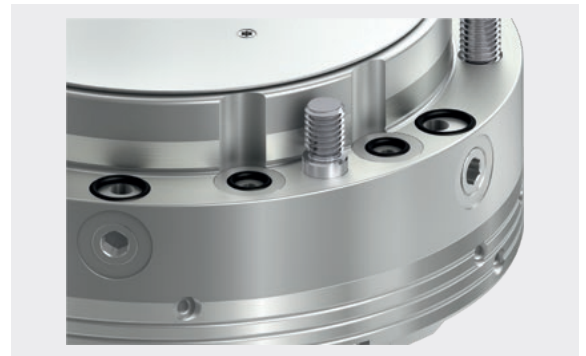
Stepped contact surfaces

The clamping device or the workpiece is located on stepped flat surfaces of the quick-change pallet module. This ensures clean and ideal support for transmitting high torques.



Control of the quick-change pallet system

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



Hermetically sealed – maintenance-free

The cover plate at the lower piston chamber and the O-rings on the round clamping slides completely seal the system. Benefit: No penetration of chips, dirt or coolant. The module is maintenance-free.



Made of stainless steel – long service life

All functional components are made of hardened stainless steel.



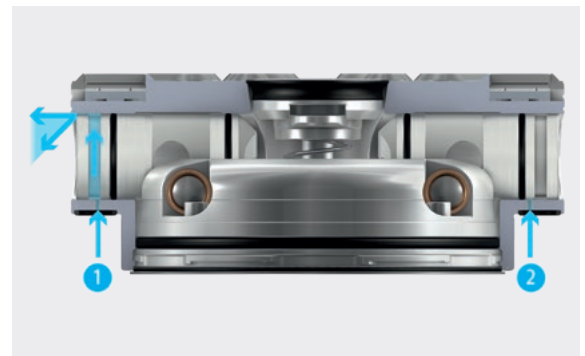
Cleaning and monitoring of the aligning surface

All NSE-A3 clamping modules have integrated contact monitoring as standard (dynamic pressure monitoring). The contact surface is cleaned when loading the pallet. This ensures a reliable sequence.



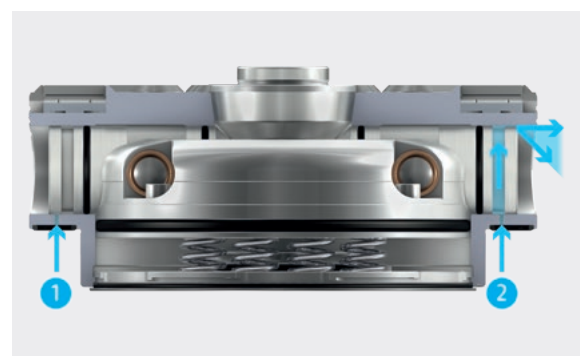
Monitoring of the clamping slide position via the dynamic pressure – opened condition

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

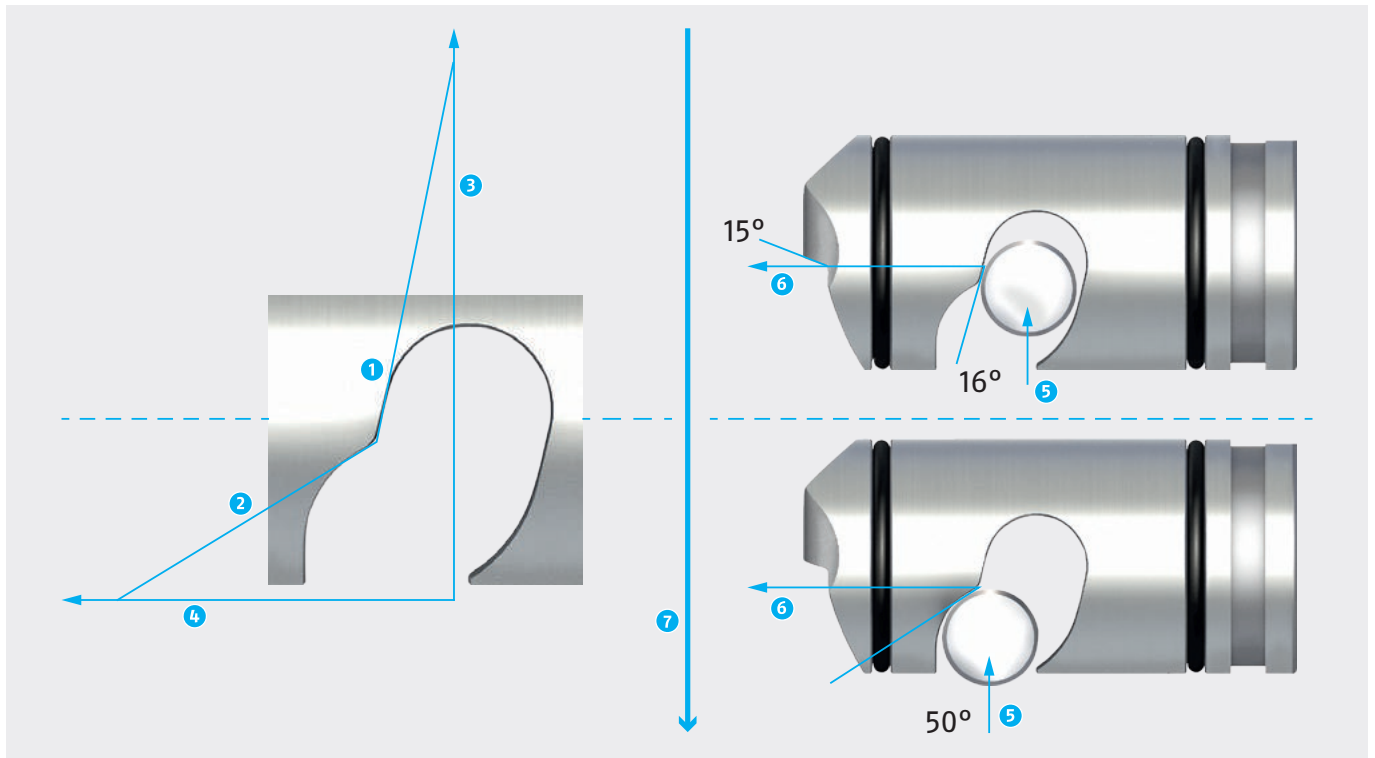


Monitoring of the clamping slide position via the dynamic pressure – locked condition

- 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.



Fast and clamping stroke – the patented force



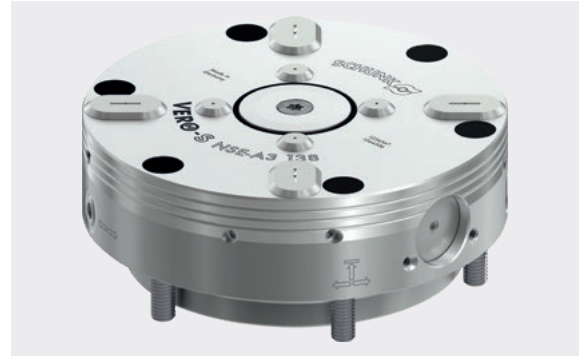
The patented dual stroke system provides the best transmission ratios and maximum pull-down force.

- 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.

Module versions

Standard version

All NSE-A3 modules are available with a cone seal as standard. The modules are suitable for partial and full installation. Stepped locating surfaces and a blow-off function enable reliable loading of the modules free of coolant and chips.



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.



Media transfer unit P

The NSE-A3 138-V4-P module has an integrated media transfer unit. With this media transfer unit, both pneumatics and hydraulics can be transferred through the module to the clamping device with a permitted system pressure of up to 300 bar.



Media transfer unit P1

The NSE-A3 138-V4-P1 module has an integrated media transfer unit. With this media transfer unit, pneumatics can be transferred through the module to the clamping device with a permitted system pressure of up to 9 bar.



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

Up to two clamping statuses can be monitored via the programmable position sensor with subsequent data transmission via IOL-Link with NSE-A3 modules:

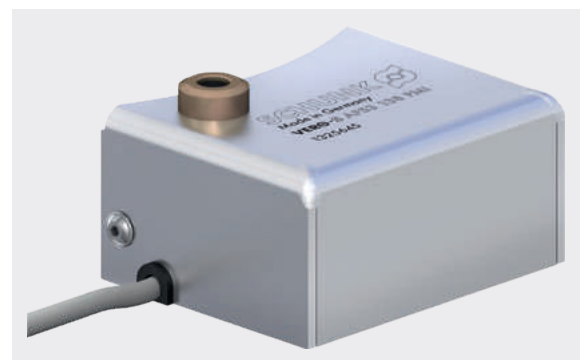
- Open condition
- Locked condition with clamping pins



Variant 2 – AFS3 138 PMI

Up to two clamping statuses can be monitored via the programmable position sensor with NSE-A3 modules:

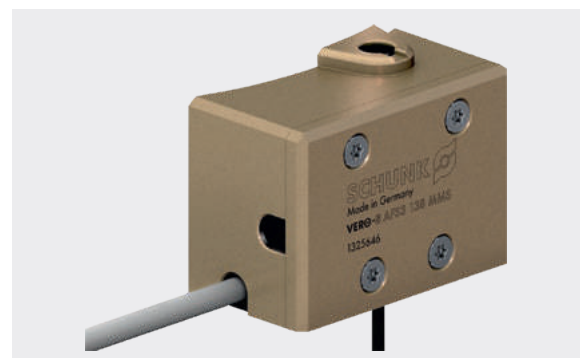
- Open condition
- Locked condition with clamping pins
- Error message when locked without clamping pin



Variant 3 – AFS3 138 MMS

Up to two clamping statuses can be monitored via the programmable position sensor with NSE-A3 modules:

- Open condition
- Locked condition with clamping pins



Automation module

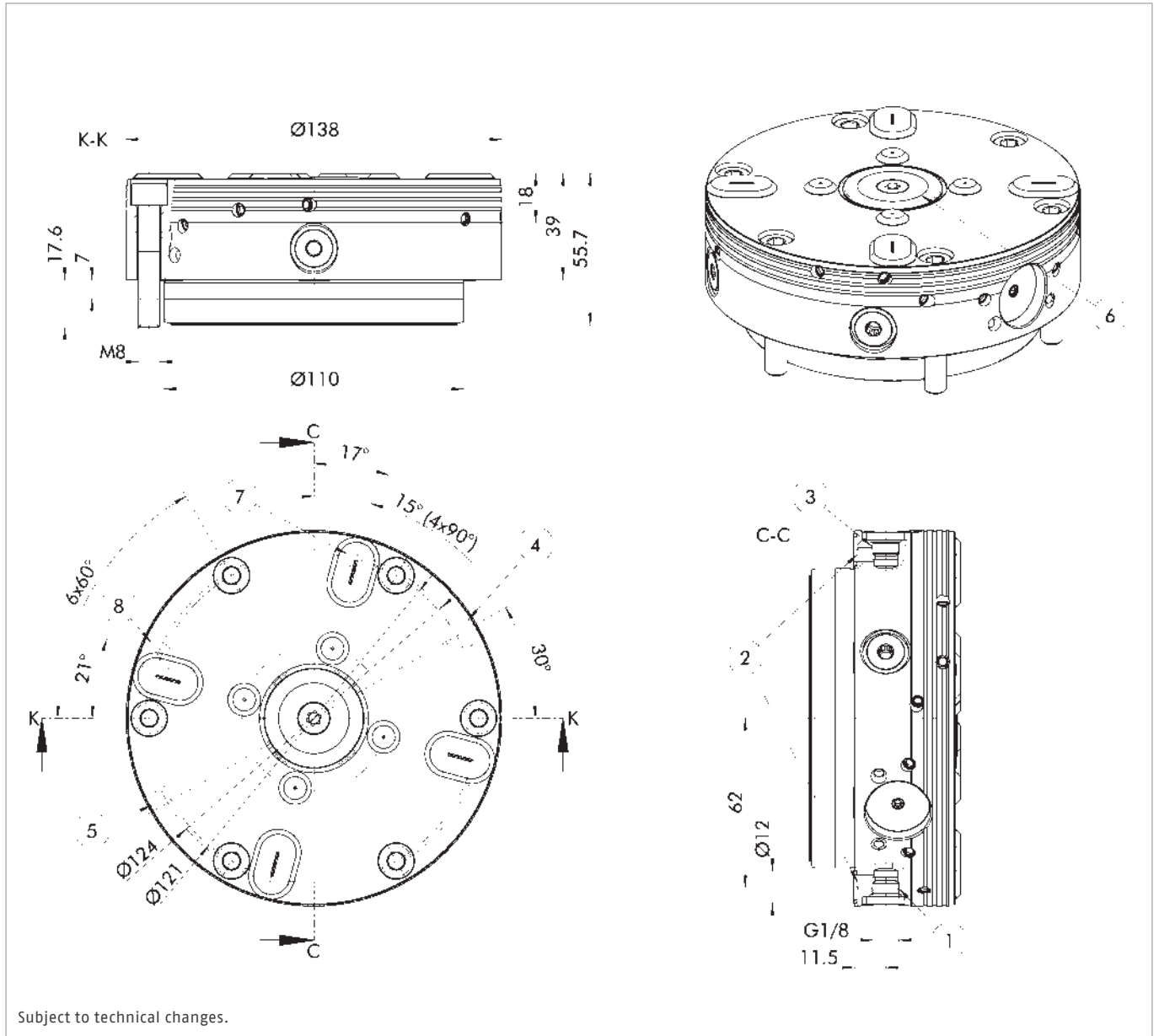
With cone seal

Scope of delivery

Clamping module, mounting screws, O-rings, cover caps, operating manual; without clamping 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]
NSE-A3 138	1364306	●	8	28	6	< 0.005	4.1



Subject to technical changes.

- 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 Cone seal
- ⑦ Hose-free direct connection for air purge
- ⑧ Hose-free direct connection for air purge and air control

Automation module

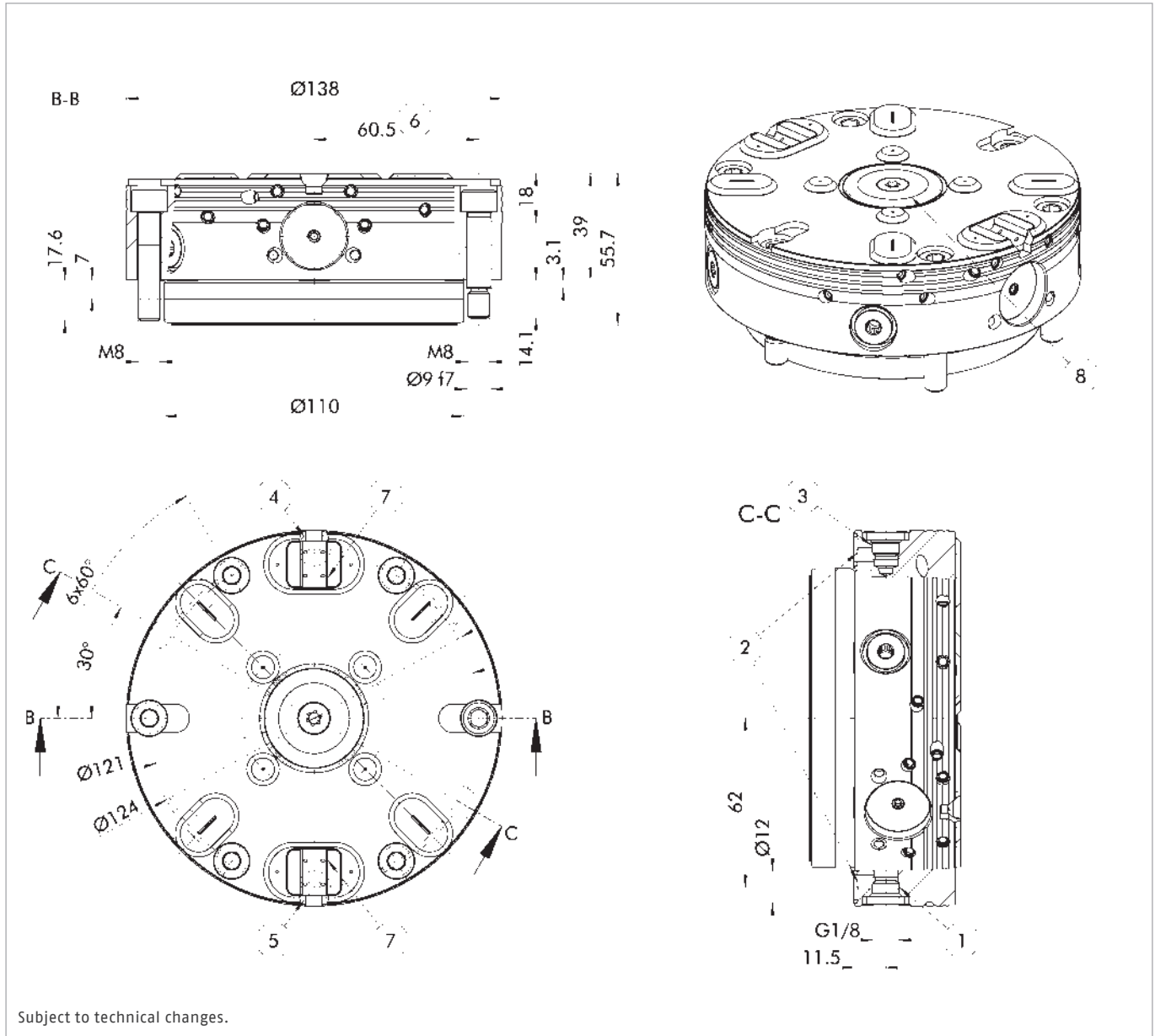
With cone seal and anti-rotation protection V4

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]
NSE-A3 138-V4	1364307	●	8	28	6	< 0.005	4.1



Subject to technical changes.

- 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 Clearance 60.5 ± 0.01 mm for the fitting screw
- ⑦ Fitting groove for positional alignment of the clamping pallet
- ⑧ Cone seal

Automation module

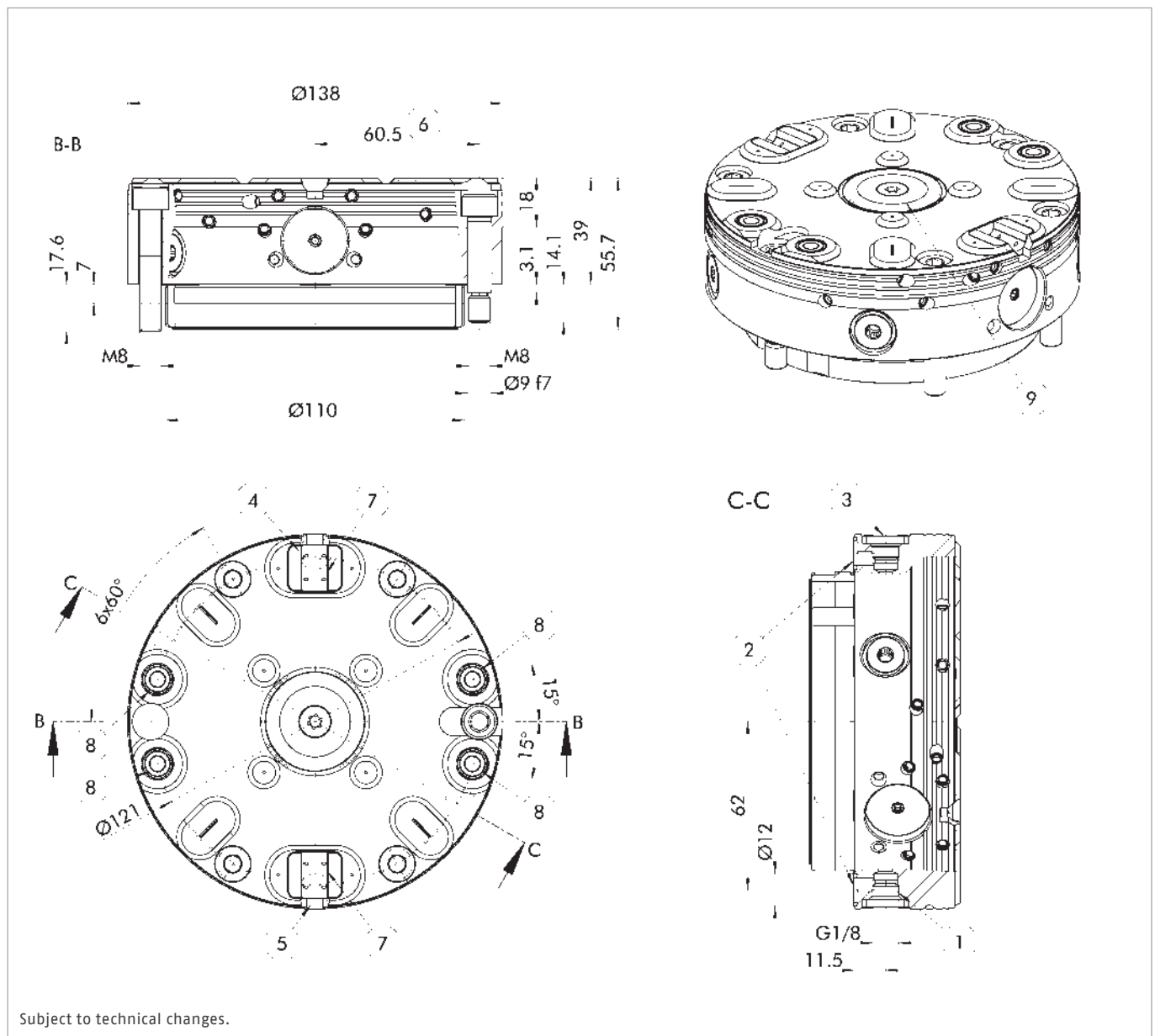
With cone seal, anti-rotation protection V4 and media transfer unit for pneumatics or hydraulics

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]	Permissible system pressures [bar]	Repeat accuracy [mm]	Min. pallet weight [kg]	Weight [kg]
NSE-A3 138-V4-P	1351708	●	8	28	6	300	< 0.005	20	4.2



- 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 Clearance 60.5 ± 0.01 mm for the fitting screw
- ⑦ Fitting groove for positional alignment of the clamping pallet
- ⑧ Media transfer unit
- ⑨ Cone seal

Automation module

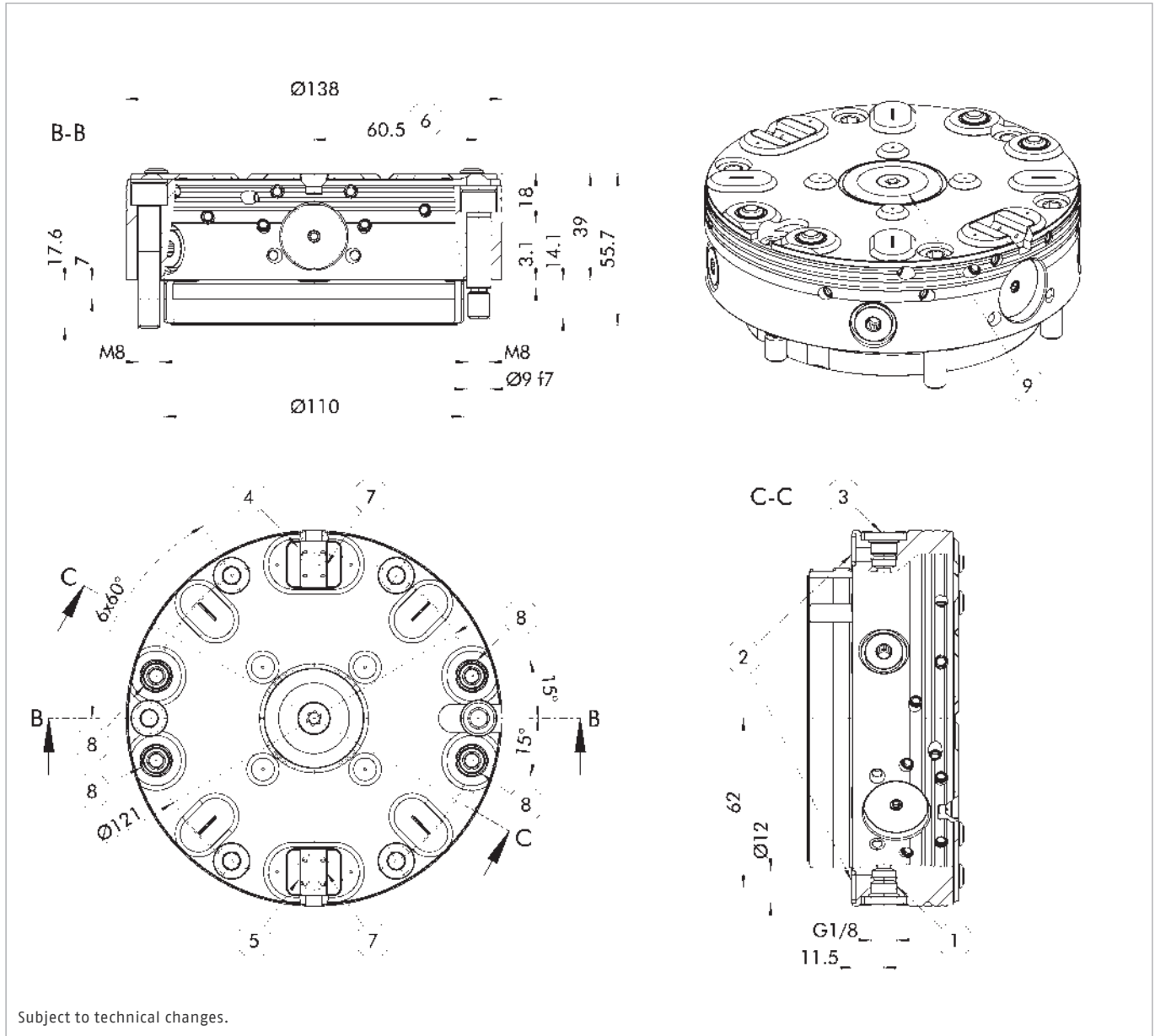
With cone seal, anti-rotation protection V4 and media transfer unit for pneumatics

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]	Permissible system pressures [bar]	Repeat accuracy [mm]	Weight [kg]
NSE-A3 138-V4-P1	1339726	●	8	28	6	9	< 0.005	4.2



Subject to technical changes.

- 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 Clearance 60.5 ± 0.01 mm for the fitting screw
- ⑦ Fitting groove for positional alignment of the clamping pallet
- ⑧ Media transfer unit
- ⑨ Cone seal

Accessories

Clamping pins

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



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA 40	0471151
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPB 40	0471152
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPC 40	0471153

Clamping pins

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



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA 40-16	0471064
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPB 40-16	0471065
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	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
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA-X 40	0471155
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	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
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPG 40	0471154

Dove tail pins

Clamping pins with a mounting depth of 3.5 mm



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA-S 40	1310630
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPB-S 40	1323856
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPC-S 40	1323857

Clamping pins without centering collar

The clamping pin is screwed into the workpiece using a fitting screw.
Fitting screw with fitting diameter \varnothing 8 mm = ID 0471634.
Fitting screw with fitting diameter \varnothing 10 mm = ID 0471635.



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA-OB 40	0471631
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPB-OB 40	1316935
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPC-OB 40	1316936

Heavy duty pins

Clamping pins with integrated mounting threads for high holding forces.



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPA-F 40	0471171
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	SPC-F 40	0471172

Clamping pin extension

For lifting the workpiece from the machine table, and for improving the accessibility of the machine spindle.



Suitable for	Description	ID
Module Ø 138	SP-VL 50-10-SPA	0471405
Module Ø 138	SP-VL 50-10-SPB	0471407
Module Ø 138	SP-VL 50-10-SPC	0471409
Module Ø 138	SP-VL 50-12-SPA	0471406
Module Ø 138	SP-VL 50-12-SPB	0471408
Module Ø 138	SP-VL 50-12-SPC	0471410
Module Ø 138	SP-VL 100-10-SPA	0471464
Module Ø 138	SP-VL 100-10-SPB	0471466
Module Ø 138	SP-VL 100-10-SPC	0471468
Module Ø 138	SP-VL 100-12-SPA	0471465
Module Ø 138	SP-VL 100-12-SPB	0471467
Module Ø 138	SP-VL 100-12-SPC	0471469

Indexing pins

Used as an anti-rotation protection for VERO-S modules with anti-rotation protection V4.



Suitable for	Description	ID
NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	IXB V4	9982432

Monitoring unit

Integrated monitoring of clamping slide positions and pallet presence via IO-Link.



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	AFS3 IOL 138	1488905

Inductive monitoring segments

Integrated monitoring of clamping slide positions and pallet presence.



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	AFS3 138 PMI	1325645

Magnetic monitoring segments

Integrated monitoring of clamping slide positions and pallet presence.



Suitable for	Description	ID
NSE-A3 138 NSE-A3 138-V4 NSE-A3 138-V4-P NSE-A3 138-V4-P1	AFS3 138 MMS	1325646

Coupling

Used as a counter piece in clamping pallets or devices for the transfer of compressed air or hydraulics.



Suitable for	Description	ID
NSE-A3 138-V4-P	VSK-K NSE3	9985387



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