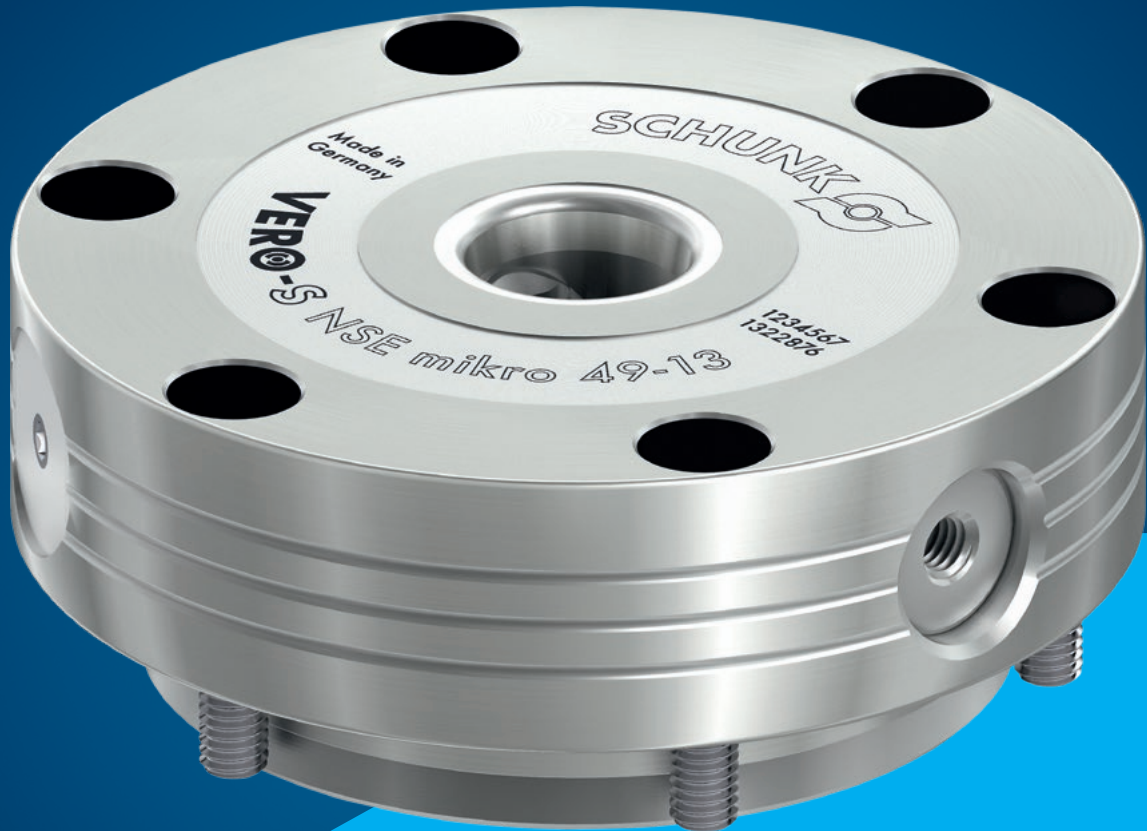


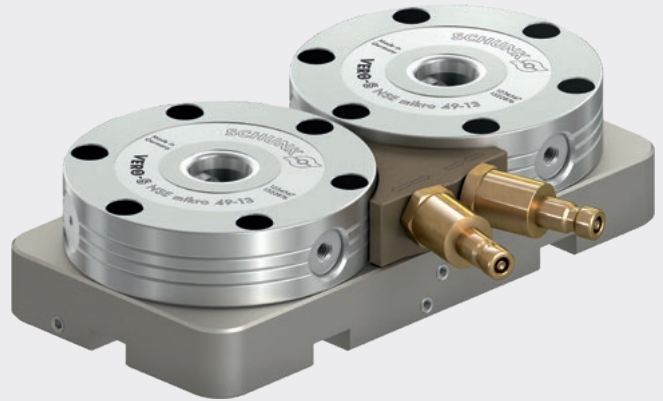


VERO-S NSE mikro 49-13

**Innovative technology in
confined spaces**

Sealed micro-clamping modules with significantly increased pull-down force with minimum pitches

With the VERO-S NSE mikro 49-13, SCHUNK has closed the gap between the NSE mikro 49 and the NSE mini 90 series. Thanks to the drive kinematics via a piston, the module achieves significantly higher pull-down forces while maintaining the same minimal pitch of just 50 mm. Two round clamping slides ensure a hermetic seal and reliably protect the interior against dirt and coolant. The modules are suitable for rapid change of workpieces, components, and pallets in very light metal cutting as well as in assembly cells and measuring machines.



Advantages – Your benefits

- + Minimum height**
Expands your machine's workspace
- + All pneumatic modules can be operated at 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**
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
- + The modules are corrosion-free and completely sealed**
Long life time and maximum process reliability
- + Turbo integrated by default**
Pull-down force increased up to 375% to make the most of the machine's performance, hence high efficiency
- + One consistent clamping pin size for all NSE mikro modules**
No danger of confusion or incorrect operation
- + Integrated slide monitoring**
Can also be used in automated applications

Function NSE mikro 49-13

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 High-precision short taper centering**
 Ensures μ -precise connection
- 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**
 Via dynamic pressure possible
- 8 Cover plugs for mounting screws**
 Therefore no accumulation of coolant or chips possible
- 9 Sliding bearings in the force flow**
 For maximum pull-down forces with a long service life
- 10 Pneumatic system**
 Actuation with 6 bar

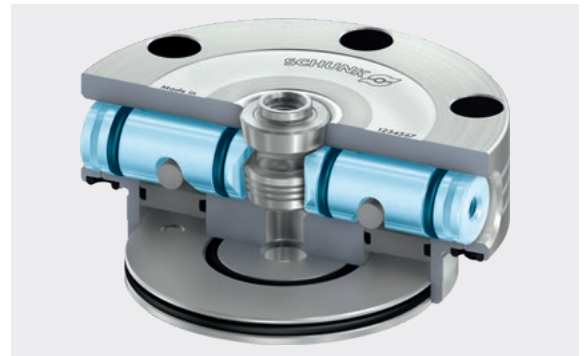
Centering via short taper

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



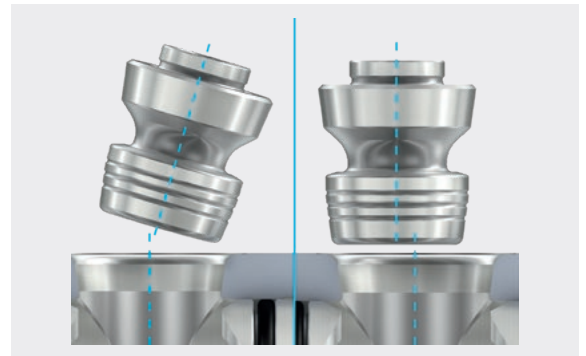
Locking via clamping slides

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

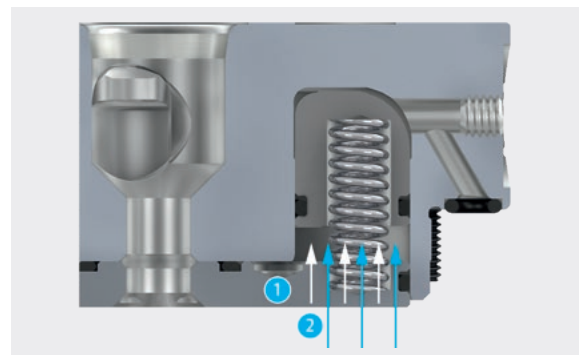
Insertion radii on the clamping pin enable quick and safe joining even at a tilt angle and in case of eccentricity. Benefit: More user friendly for manual and automatic loading.



Integrated turbo function

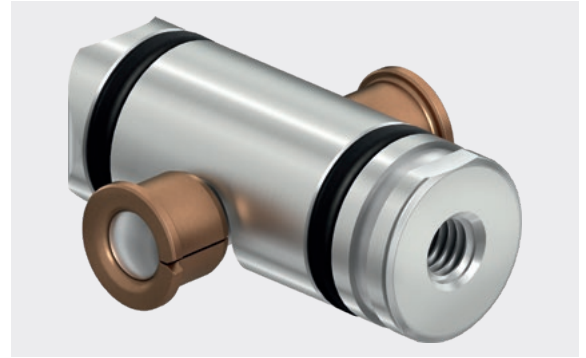
In order to raise the pull-down force, the quick-change pallet module is additionally pressurized with compressed air during clamping. The turbo function increases the pull-down force by up to a factor of 4 (max. 1,500 N) compared to clamping merely based on spring force. The active turbo function allows higher cutting parameters in the machining process.

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



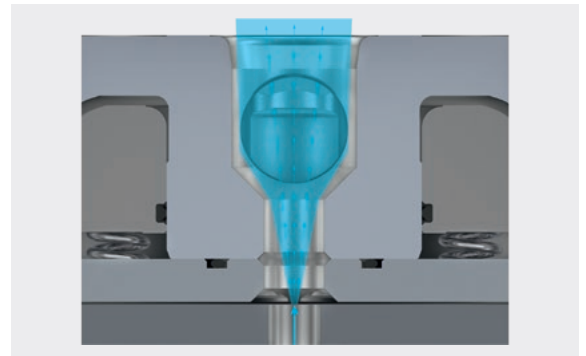
Rolling friction between piston and clamping slide

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.



Air purge connection

For a blow-out function, the base plate under the clamping pin opening can be provided with a bore.



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

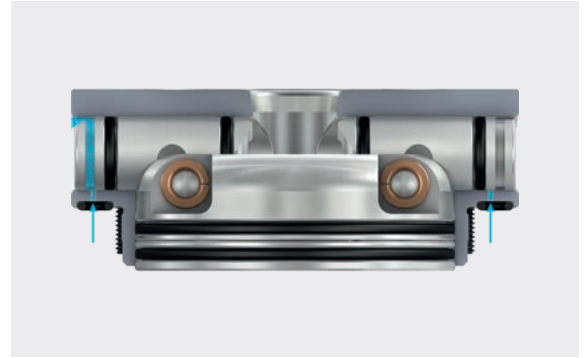
All functional components are made of hardened stainless steel.



Monitoring the clamping slide position – opened status

All NSE mikro 49-13 clamping modules are equipped as standard with monitoring of the clamping slide positions via dynamic pressure. Depending on the position of the clamping slide, one side is under dynamic pressure and the other side is ventilated.

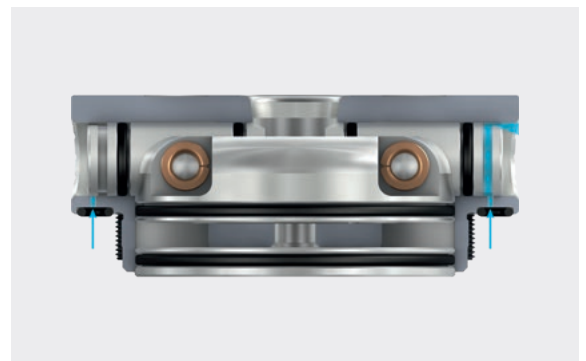
- 1 **Deaeration**
The compressed air can escape because the clamping slide is not positioned above the bore hole.
- 2 **Dynamic pressure**
The compressed air cannot escape because the clamping slide is above the bore hole.



Monitoring the clamping slide position – locked status

All NSE mikro 49-13 clamping modules are equipped as standard with monitoring of the clamping slide positions via dynamic pressure. Depending on the position of the clamping slide, one side is under dynamic pressure and the other side is ventilated.

- 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.



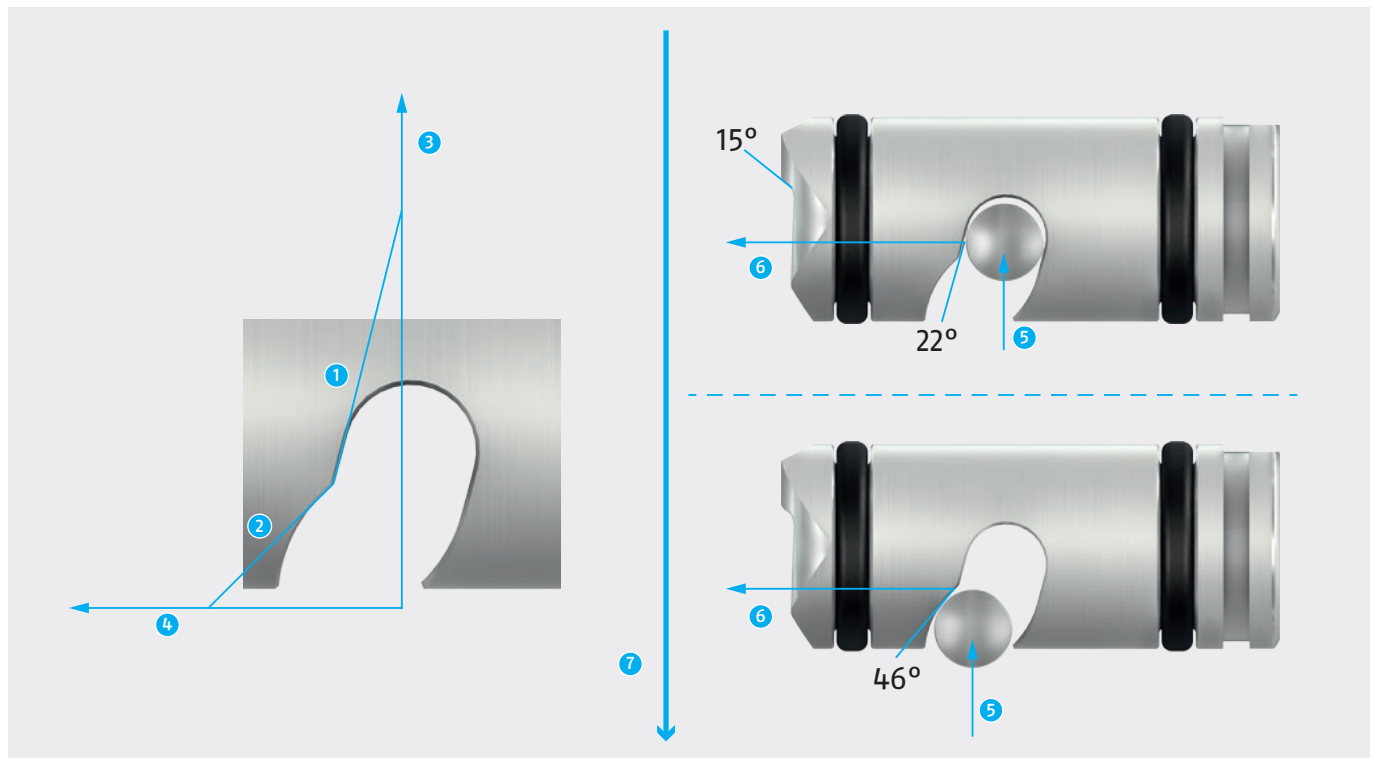
Arrangement of clamping pins type A, B, and C

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.

Clamping station

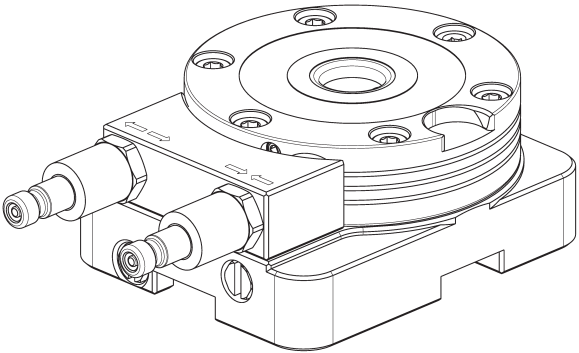
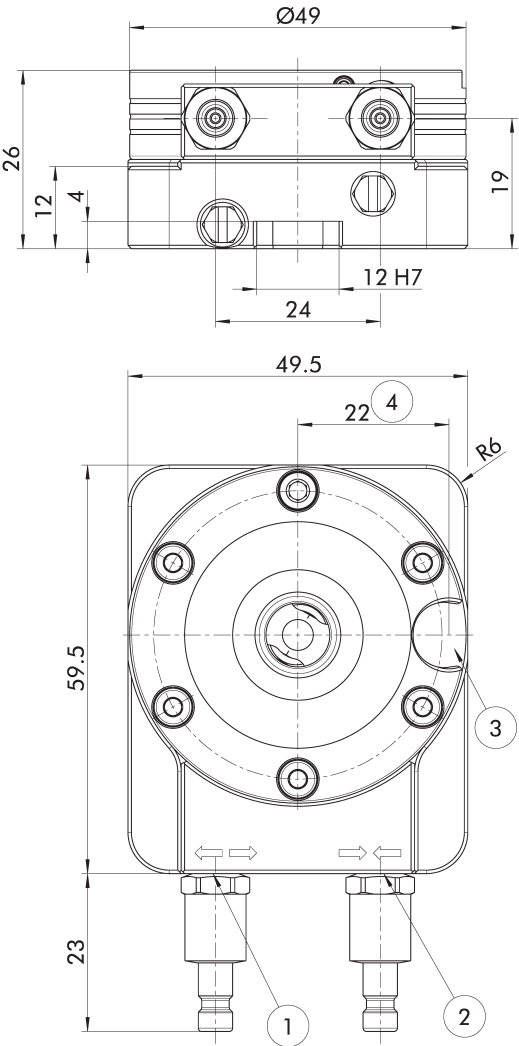
1-way clamping station with anti-rotation protection V10 and turbo function

Scope of delivery

Clamping station, cylindrical clamps, operating manual; without clamping pins

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Weight [kg]
NSL mikro 50-13-V10	1358958	0.4	1.5	6	0.5



Subject to technical changes.

- ① Air connection M6 module open
- ② Air connection M6 turbo function
- ③ Fitting groove for positional alignment of the clamping pallet
- ④ Measure of clearance 22 ± 0.01 mm for IXB V10 mikro in the clamping pallet

Clamping station

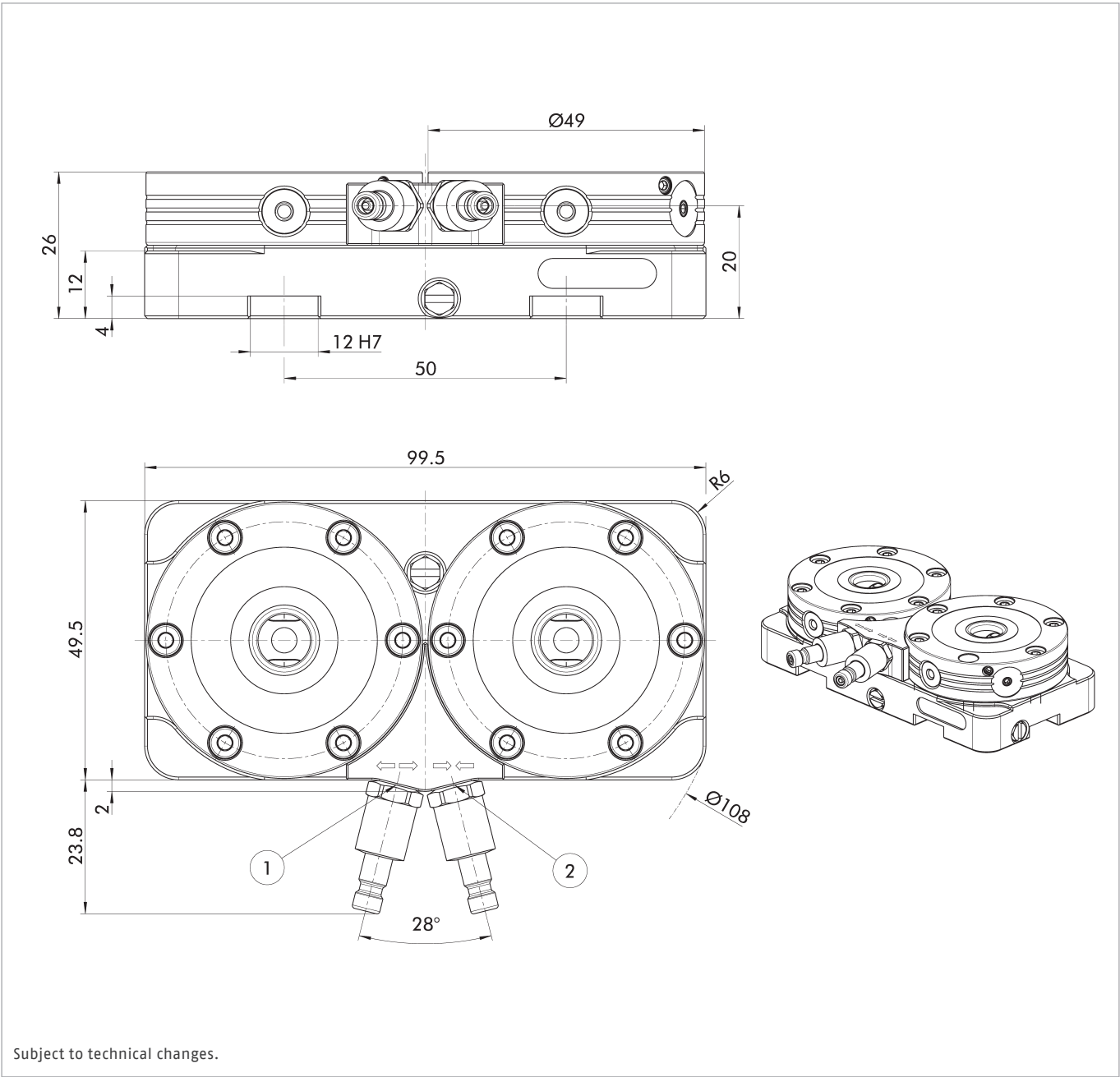
2-way clamping station with turbo function

Scope of delivery

Clamping station, cylindrical clamps, operating manual; without clamping pins

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Weight [kg]
NSL mikro 50-13-2	1358959	0.8	3	6	0.8



① Air connection M6 opening modules

② Air connection M6 turbo function

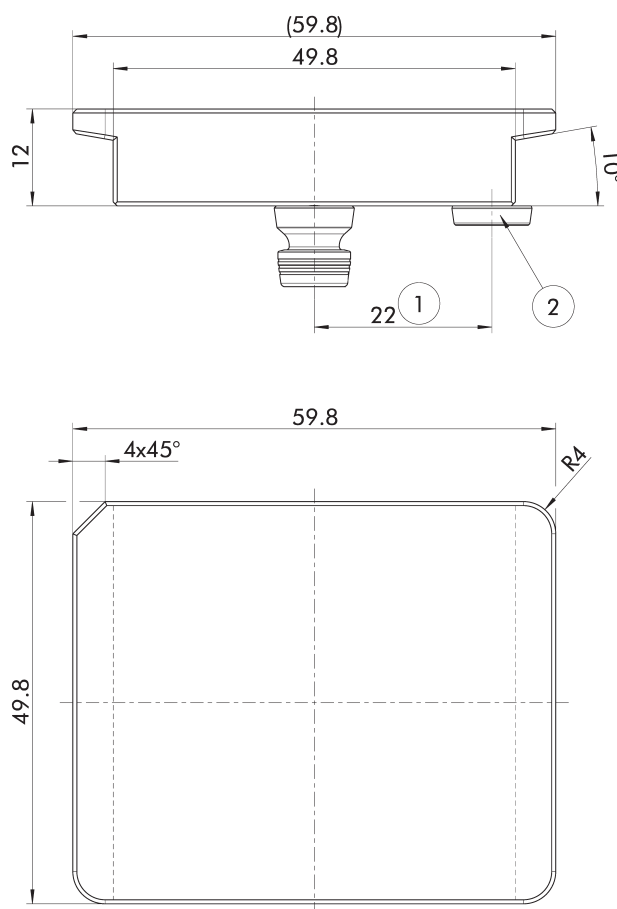
Clamping pallet

Scope of delivery

Clamping pallets, clamping pins, indexing pins

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL S mikro 60 x 50-V10	1358960	Steel	0.02	0.25



Subject to technical changes.

① Measure of clearance 22 ± 0.01 mm for IXB V10 mikro in the clamping pallet

② IXB V10 mikro indexing pin for position orientation on the NSE mikro 49-13-V10

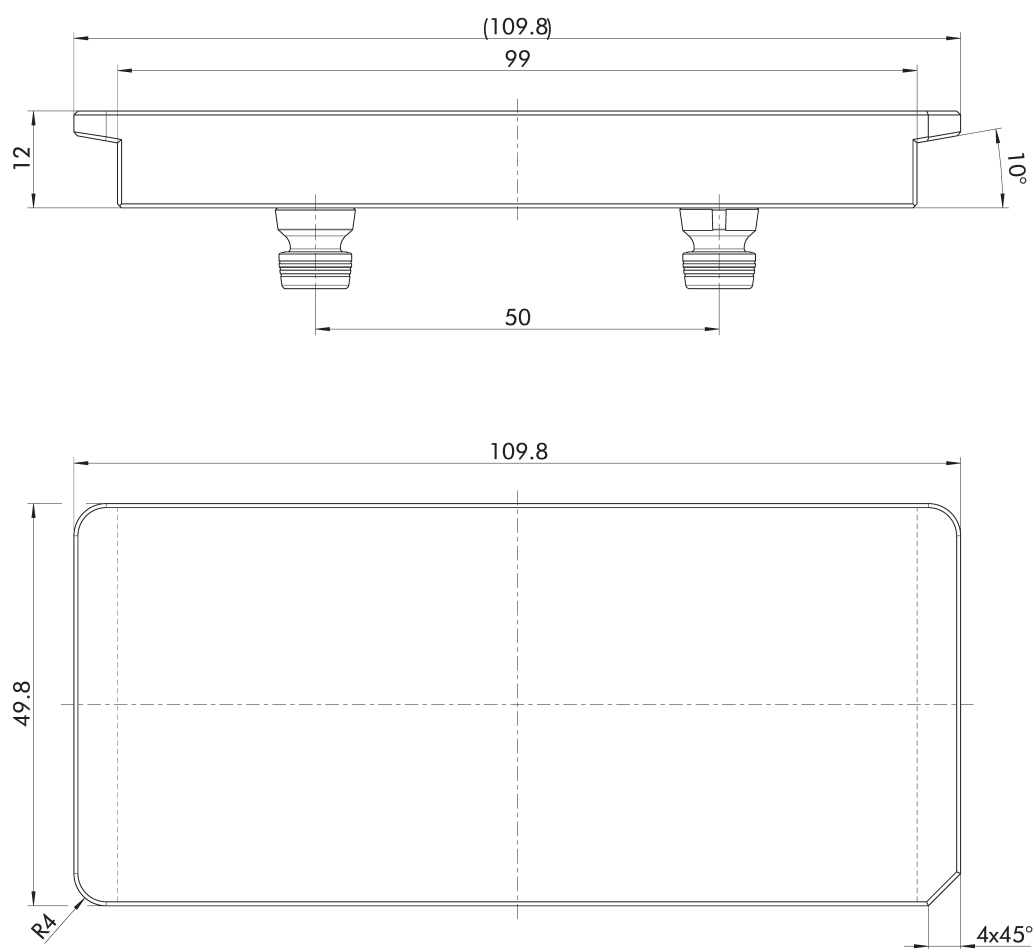
Clamping pallet

Scope of delivery

Clamping pallet, clamping pins

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL S mikro 110 x 50	1358961	Steel	0.02	0.5



Subject to technical changes.

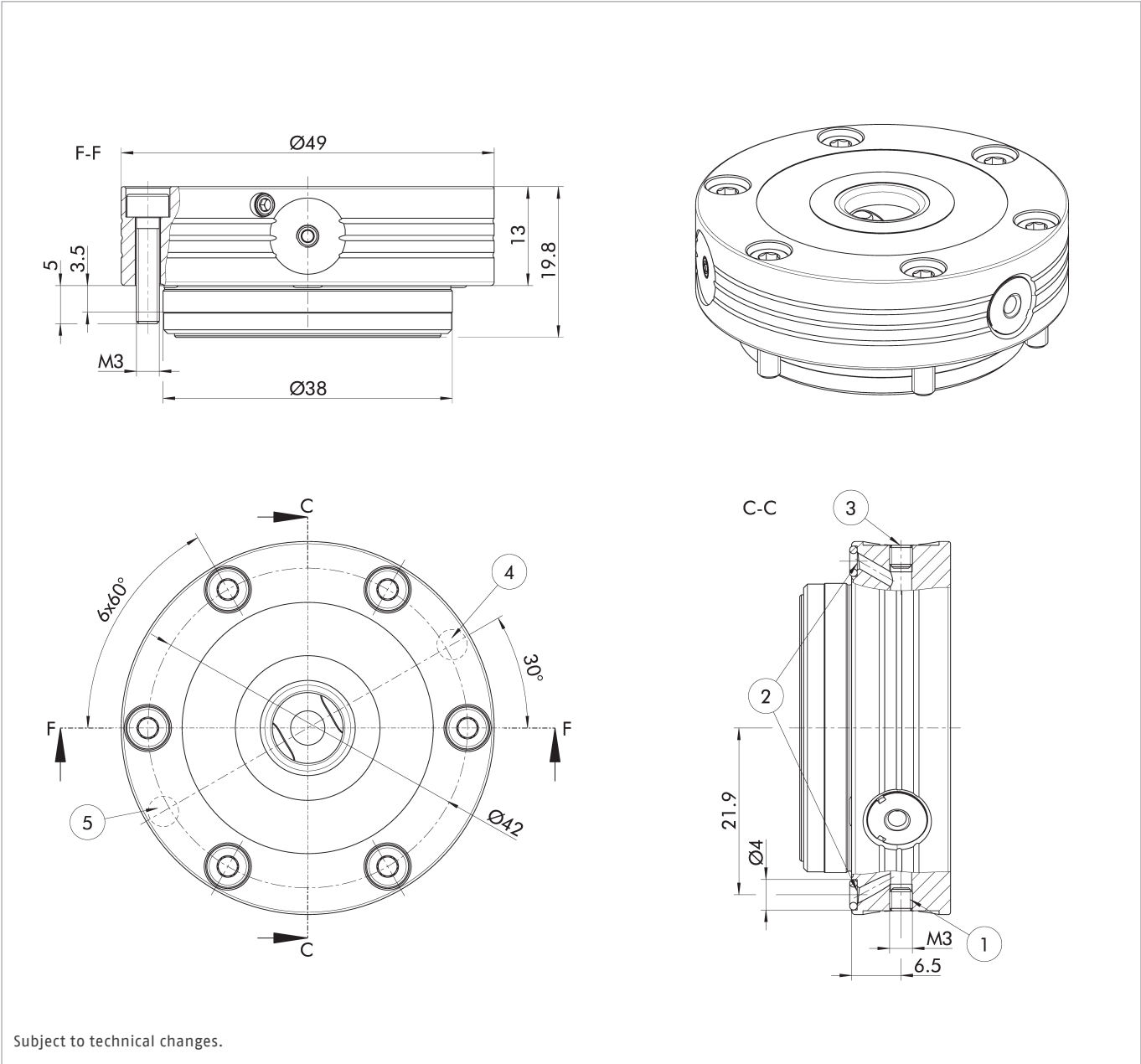
Quick-change pallet module

Scope of delivery

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

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Repeat accuracy [mm]	Weight [kg]
NSE mikro 49-13	1322876	0.4	1.5	6	< 0.005	0.2



- ① Turbo connection via screw connection M3
- ② Hose-free direct connection
- ③ Unlocking connection via screw connection M3
- ④ Hose-free direct connection for monitoring module open
- ⑤ Hose-free direct connection for slide monitoring module closed

Quick-change pallet module

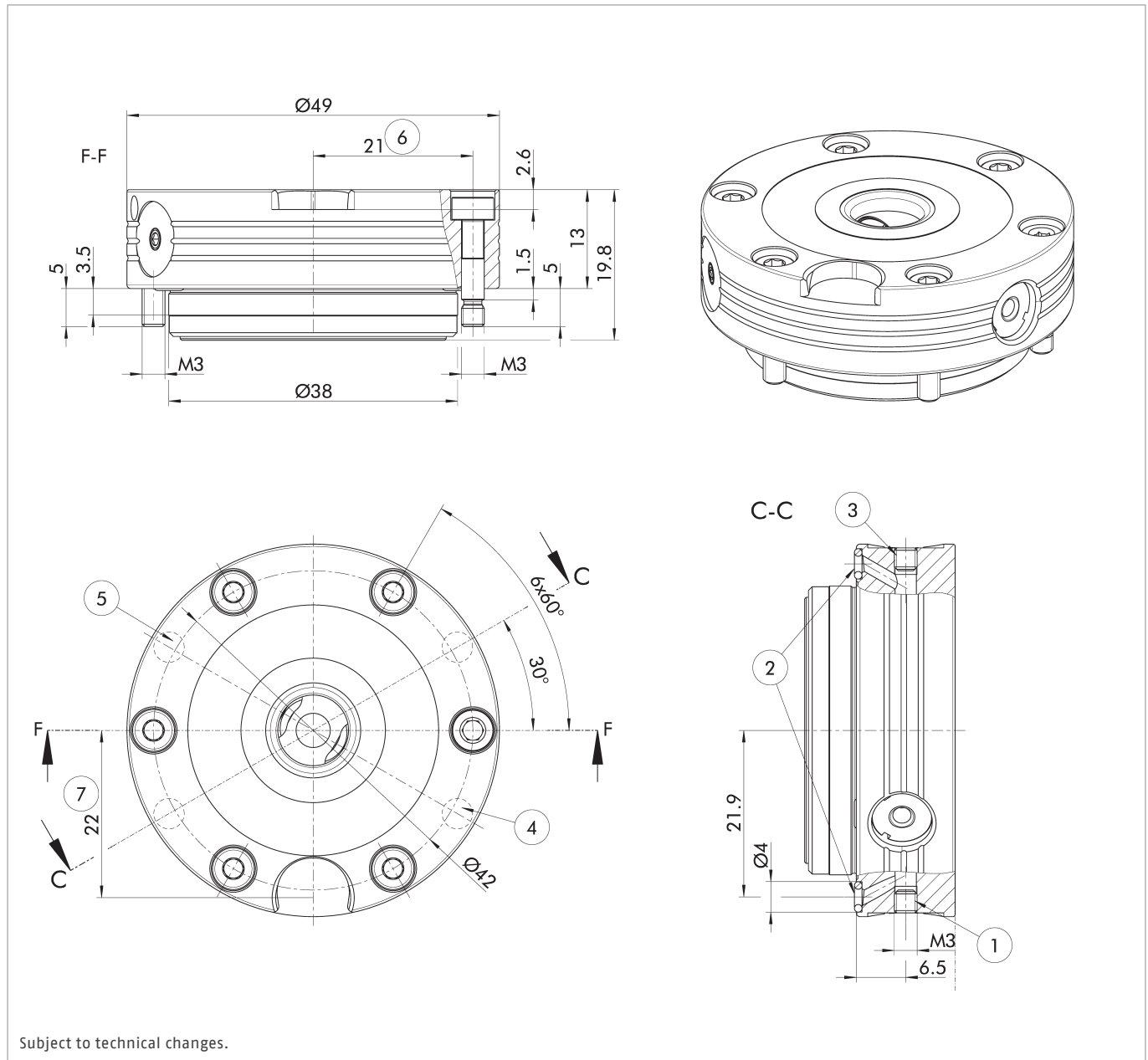
With anti-rotation protection V10

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	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Repeat accuracy [mm]	Weight [kg]
NSE mikro 49-13-V10	1357110	0.4	1.5	6	< 0.005	0.2



- ① Turbo connection via screw connection M3
- ② Hose-free direct connection
- ③ Unlocking connection via screw connection M3
- ④ Hose-free direct connection for monitoring module open
- ⑤ Hose-free direct connection for slide monitoring module closed
- ⑥ Clearance 21 ± 0.01 mm for fitting screw PSC mikro V10 (ID 1358504) in the clamping station
- ⑦ Measure of clearance 22 ± 0.01 mm for IXB V10 mikro in the clamping pallet

Accessories

Clamping pins SPx mikro

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



Suitable for	Description	ID
NSL mikro 50-13-V10		
NSL mikro 50-13-2		
NSE mikro 49-13		
NSE mikro 49-13-V10	SPA mikro 10	0436610
NSL mikro 50-13-2		
NSE mikro 49-13		
NSE mikro 49-13-V10	SPB mikro 10	0436620
NSE mikro 49-13		
NSE mikro 49-13-V10	SPC mikro 10	0436630

Indexing pin

Used as an anti-rotation protection for VERO-S modules with anti-rotation protection V10.



Suitable for	Description	ID
NSL mikro 50-13-V10		
NSE mikro 49-13-V10	IXB V10 mikro	0436930



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