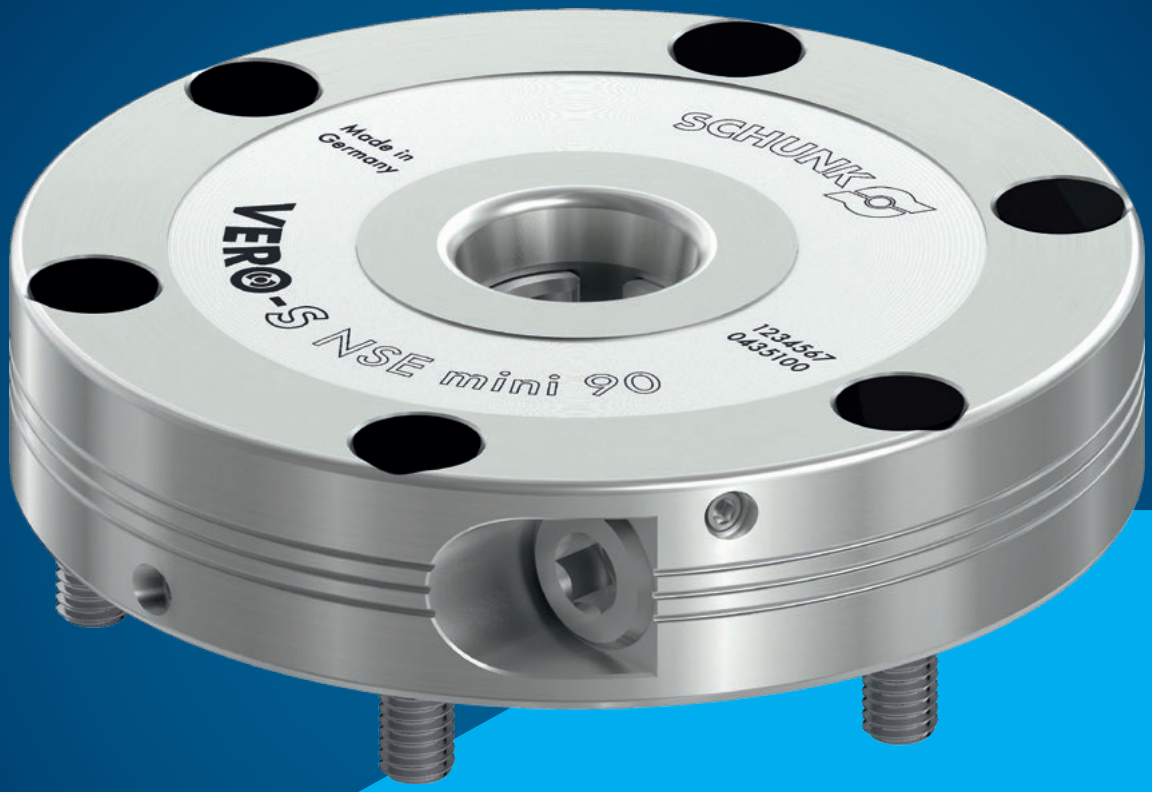
SCHUNK



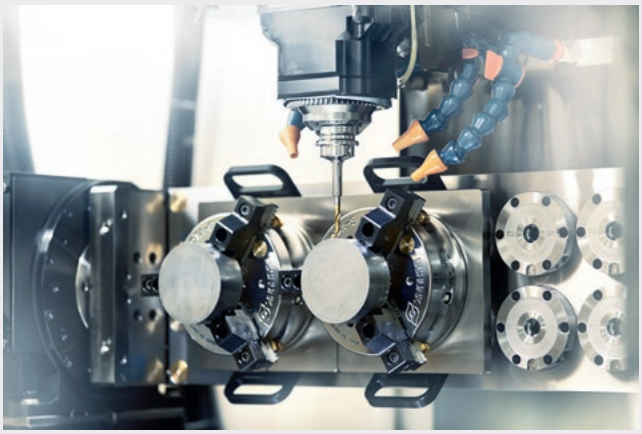
VERO-S NSE mini 90

High-performance modules for the smallest variable gauges

Hand in hand for tomorrow

The flat quick-change pallet system for use with light force applications and small gauges

Within SCHUNK's large modular system, VERO-S NSE mini is an optimal addition for small applications. At a height of just 20 mm, the NSE mini 90 is an extremely flat quick-change pallet module that allows small gauges to be implemented. It is particularly suitable for applications with light force application such as machining aluminum or plastic or for use on measuring devices.



Advantages – Your benefits

- **SCHUNK modular system**
  Innumerable combinations of standard clamping devices to suit all different types of machines
- **Low height design**
  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 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
- **Corrosion-free stainless steel design**
  Long life time and maximum process reliability
- **Turbo integrated by default**
  Pull-down force increased up to 300% for optimal utilization of the machine's performance, hence high efficiency.
- **One consistent clamping pin size for all NSE mini-modules**
  No danger of confusion or incorrect operation
- **Integrated slide monitoring**
  Can also be used in automated applications

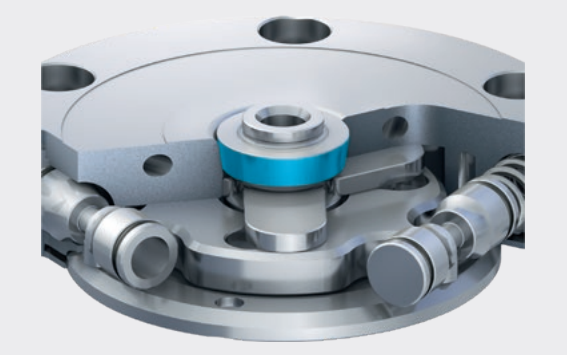
Function NSE mini 90

The clamping procedure of the module is carried out by an integrated spring assembly. A drive ring and a patented drive kinematics convert the spring force into a maximum pull-down force on the clamping pin. Clamping is carried out by three clamping slides and is self-retaining. In addition, the pull-down force can be increased by use 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**
   The patented dual stroke system between drive ring and clamping slide enables extremely high 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. **Patented drive concept**
   Allows for an extremely flat design
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. **Insertion radii on the clamping pin**
   For fast and safe connecting even in the event of tilt angle and eccentricity
10. **Pneumatic system**
    Actuation with 6 bar

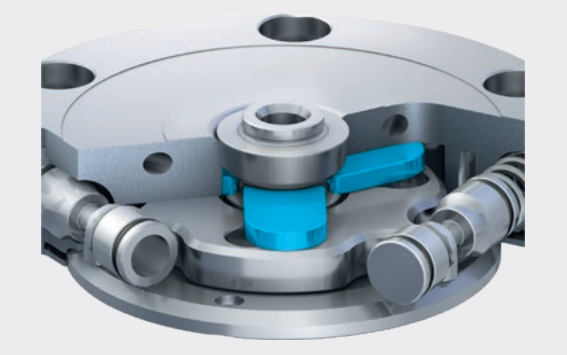
Centering via short taper

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



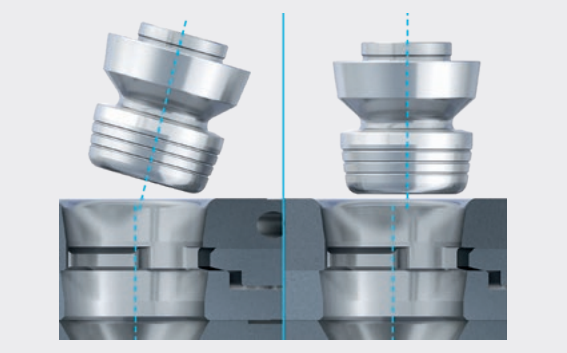
Locking via clamping slides

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



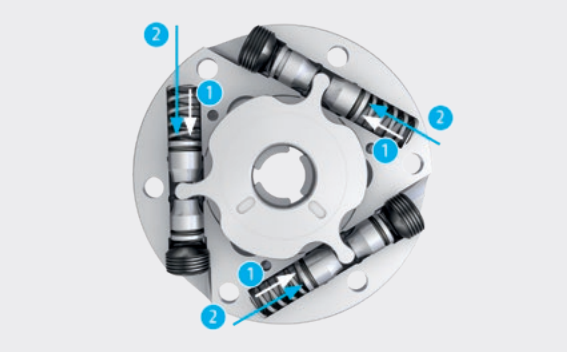
Easy joining – more user-friendly

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

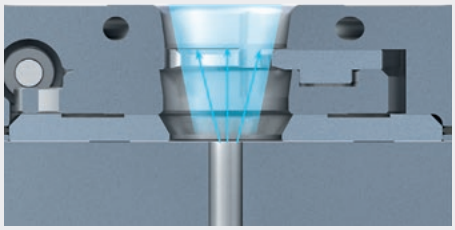
In order to raise the pull-down force, the quick-change pallet module is additionally pressurized with compressed air during clamping. The turbo function increases the pull-down force by up to a factor of 3 (max. 1,500 N) compared to clamping merely based on spring force. The active turbo function allows higher cutting parameters in the machining process.



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

Air purge connection

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



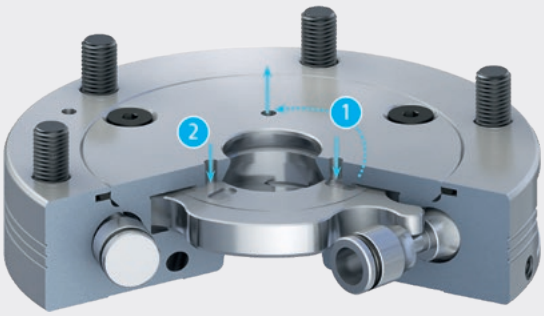
Made of stainless steel – long service life

All functional components are made of hardened stainless steel.

Monitoring of the clamping slide position

The open and closed positions of the clamping slide can be monitored via dynamic pressure.

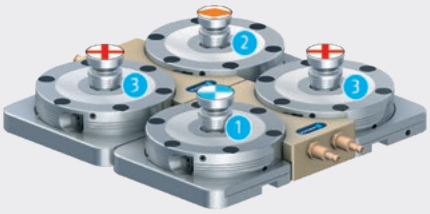
1. **Deaeration**
   The compressed air can escape via the slot and a flat area in the cover.
2. **Dynamic pressure**
   The compressed air cannot escape, because the slot is not located above the bore.



Arrangement of clamping pins type A, B, and C

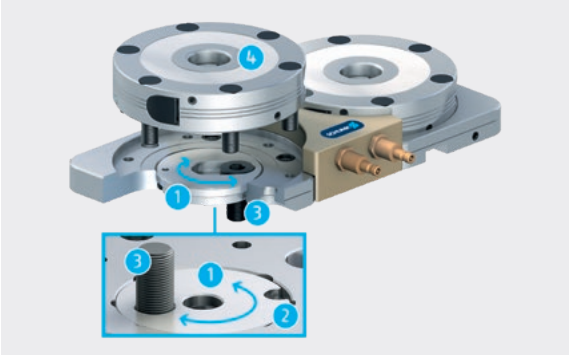
The clamping pin is used for clamping and positioning the workpieces or devices to be converted. Basically, there are three different types of clamping pins:

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



Saves space through compact design

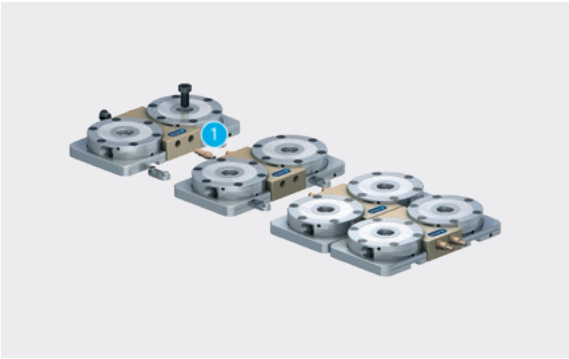
Due to the patented mounting system for fixing the clamping station on the machine table, a low height of just 30 mm can be realized. Mounting is done via a pivot-mounted clamping disc. It can be pre-adjusted for all major T-slot spacings and it is located under the module.



1. **Clamping disk**
   For pre-positioning and mounting
2. **Clamping screw**
   For pre-setting to the T-slot distance of the machine table
3. **Mounting screw**
   For mounting the clamping station on the machine table
4. **NSE mini 90 module**

Variability due to the modular system

Whether as 2-way, 4-way or multiple clamping station – VERO-S NSL mini individually adapts to all requirements. For every application. On all conventional machine tables. Through a modular system the NSL mini 100-2 clamping stations can be extended as often as desired. Mounting is easy: Replacing the locking screws through adapters for the air coupling and interconnect the clamping stations.

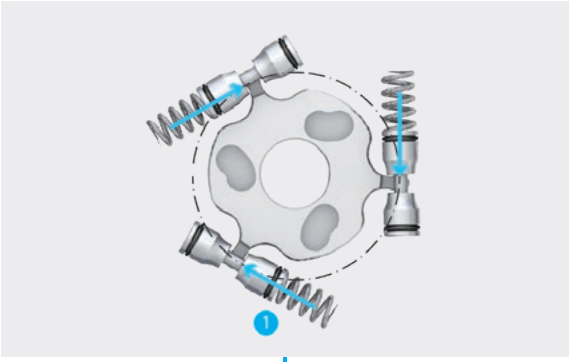


1. **Adapter for air coupling**

Patented drive concept NSE mini 90

Due to the patented drive concept, the pull-down force is 10x higher than the actuating force. This means the actuating force is converted at a ratio of 1:3.

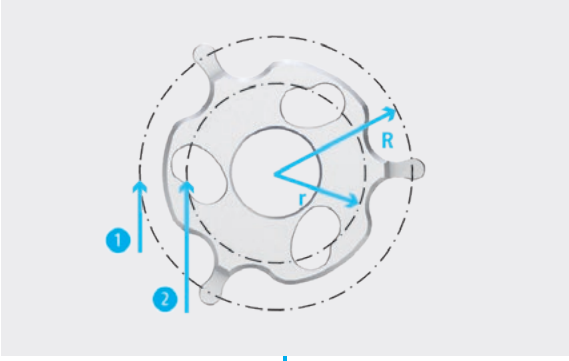
1. **Actuation force**



1. Force transmission

The first force transmission results from the lever ratio (R/r), which results from the two attack radii of the respective force.

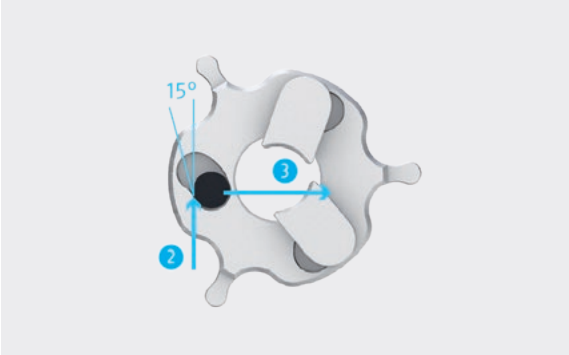
1. **Actuation force**
2. **Force on the drive ring**



2. Force transmission

The second force transmission results from the 15° angle of the inclined plane of the clamping contour in the drive ring. Via this contour, radial movement of the drive ring is transmitted in an axial movement of the clamping slide.

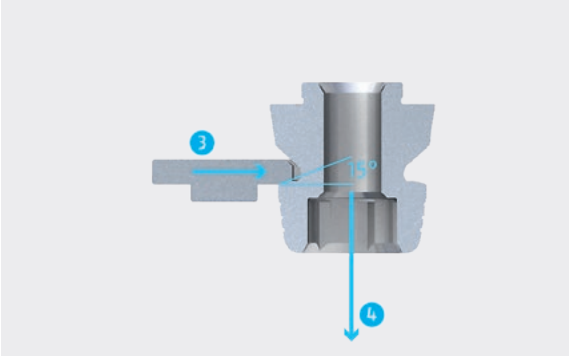
1. **Force on the drive ring**
2. **Force on the clamping slide**



3. Force transmission

The third force transmission results from the 15° angle between clamping slide and clamping pin.

1. **Force on the clamping slide**
2. **Resulting pull-down force**



Clamping station

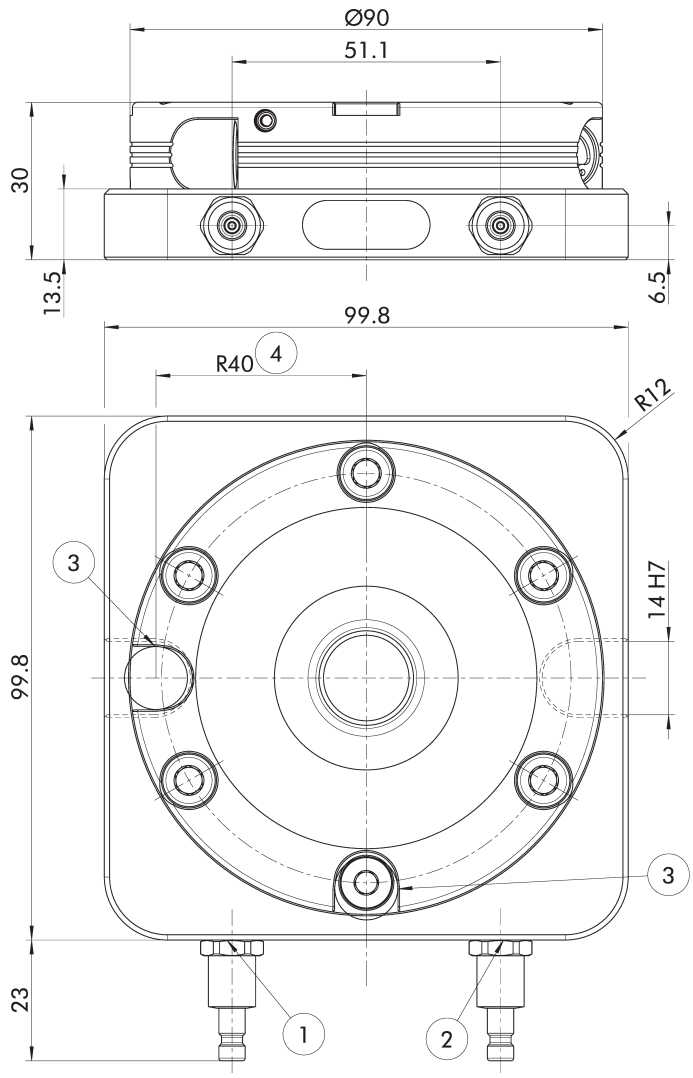
1-way clamping station with anti-rotation protection V1 and turbo function

Scope of delivery

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

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Weight [kg]
NSL mini 100-V1	*1304680*	0.5	1.5	6	1.7



Subject to technical changes.

① G1/8 air connection, open module
② G1/8 air connection, turbo function
③ Fitting groove for orientation of the clamping pallet position
④ Clearance 40 ± 0.01 mm for IXB V1 mini in the clamping pallet

Clamping station

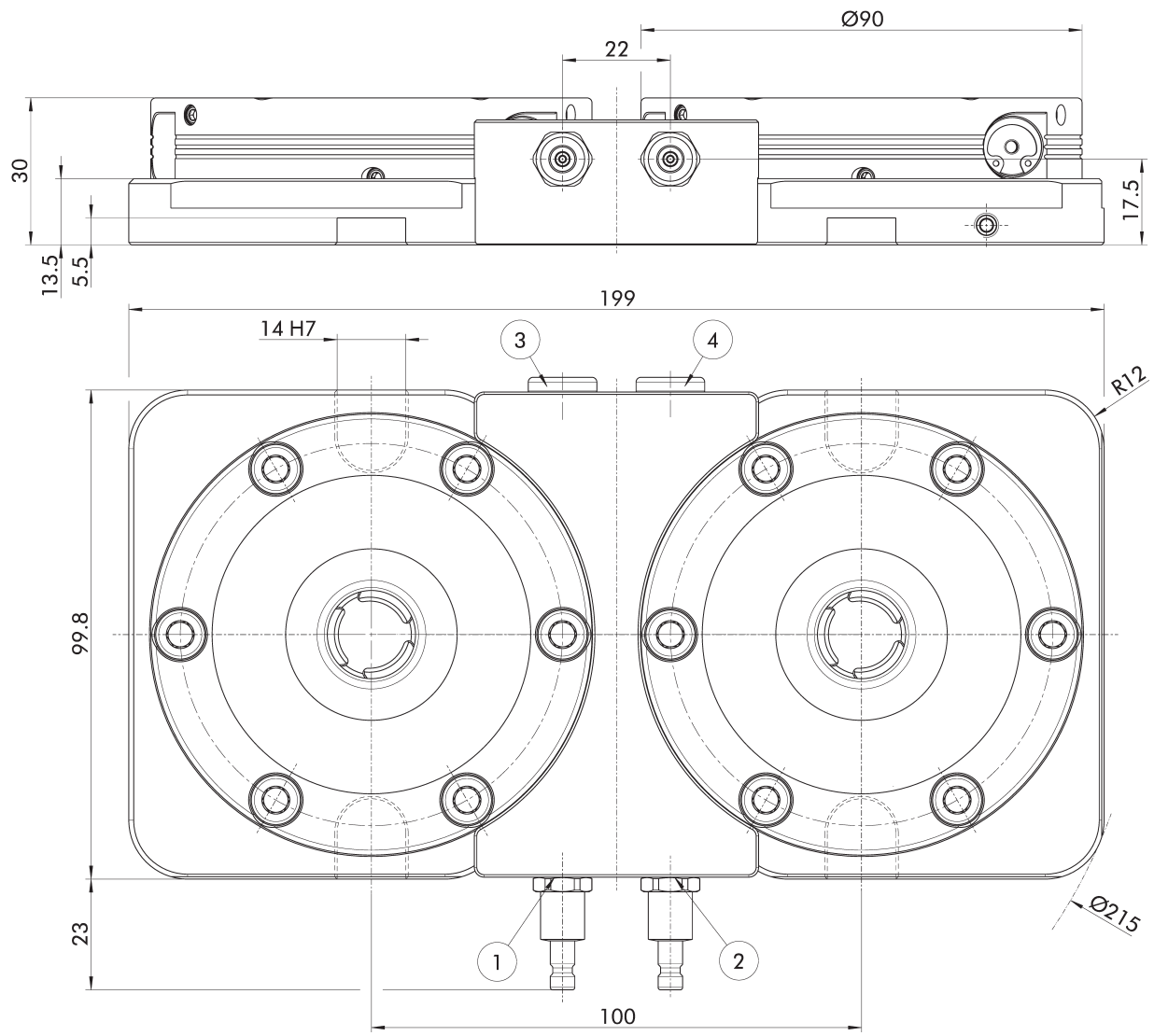
2-way clamping station with turbo function

Scope of delivery

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

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Weight [kg]
NSL mini 100-2	*0435220*	1	3	6	3.5



Subject to technical changes.

(1) G1/8 air connection, open modules
(2) G1/8 air connection, turbo function
(3) G1/8 air connection, open modules for modular extension
(4) G1/8 air connection for turbo function for modular expansion

Clamping station

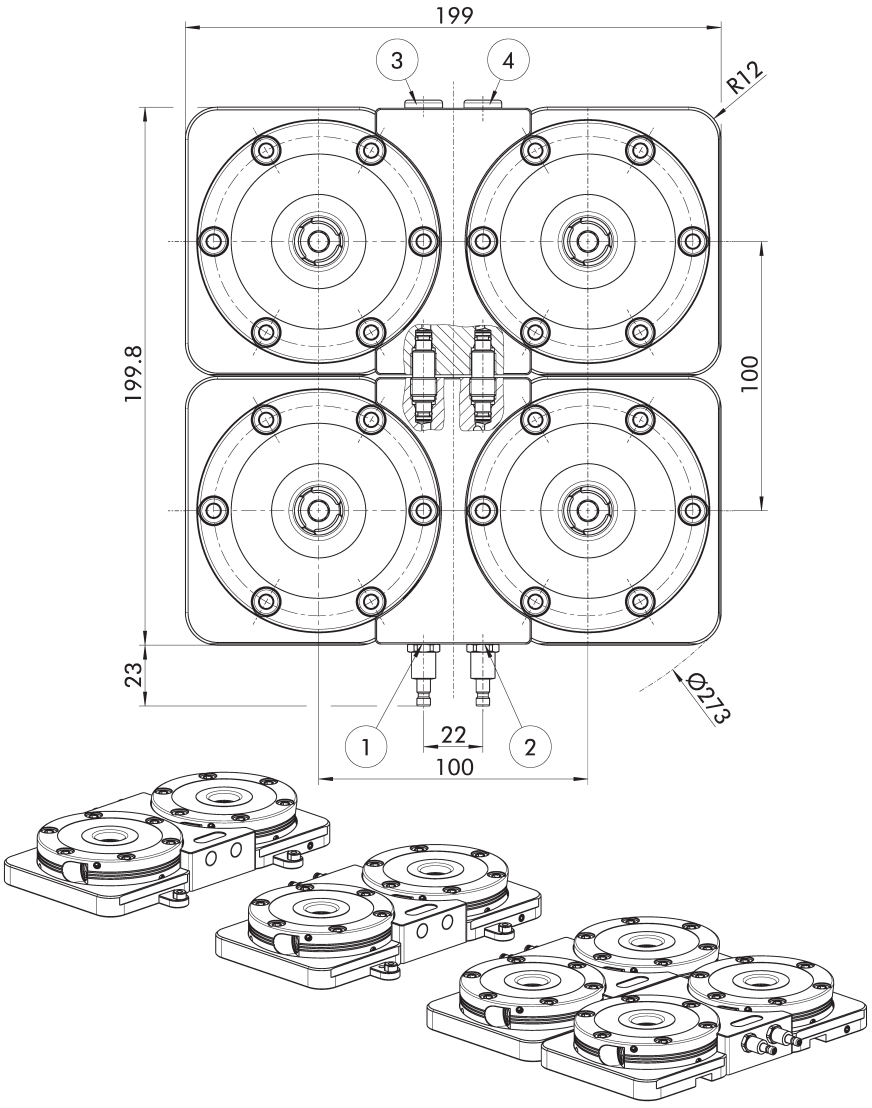
4-way clamping station with turbo function

Scope of delivery

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

Technical data

Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Weight [kg]
NSL mini 100-4	*0435240*	2	6	6	7



Subject to technical changes.

① G1/8 air connection, open modules
② G1/8 air connection, turbo function
③ G1/8 air connection, open modules for modular extension
④ G1/8 air connection for turbo function for modular expansion

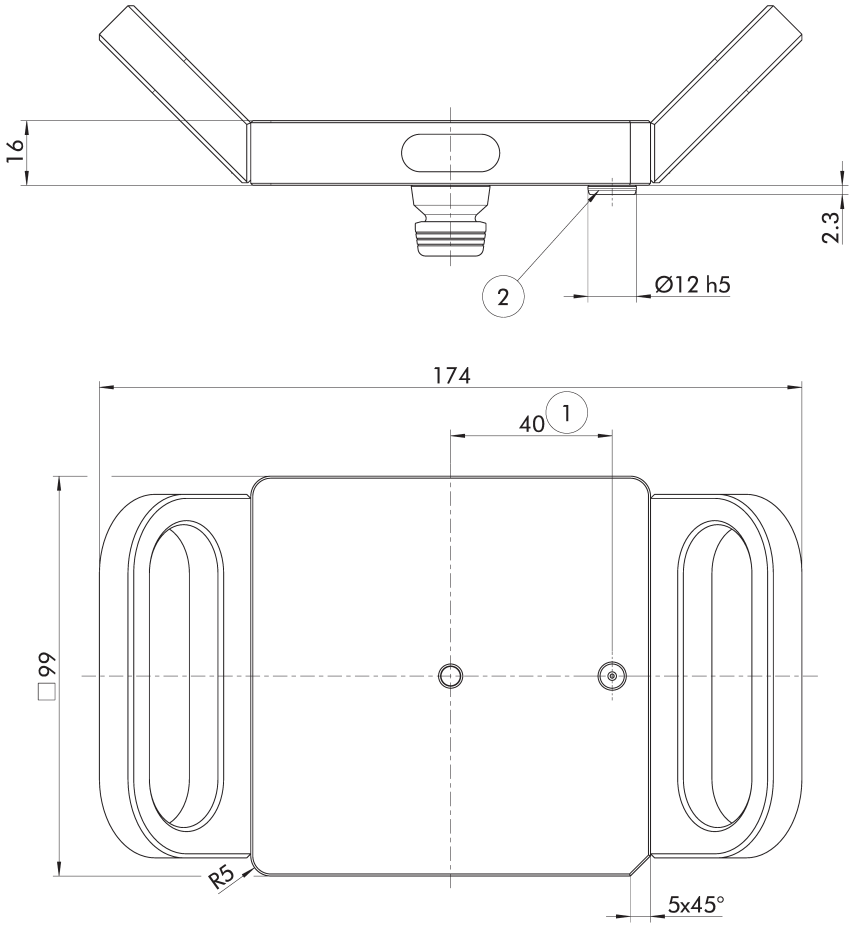
Clamping pallet

Scope of delivery

Clamping pallet, clamping pin, aluminum handles, indexing pin

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL S mini 99 x 99-V1	*0435310*	Steel	0.02	1.4



Subject to technical changes.

(1) 40 ± 0.01 mm for in-house production

(2) IXB V1 mini indexing pin for position orientation on the NSE mini 90-V1

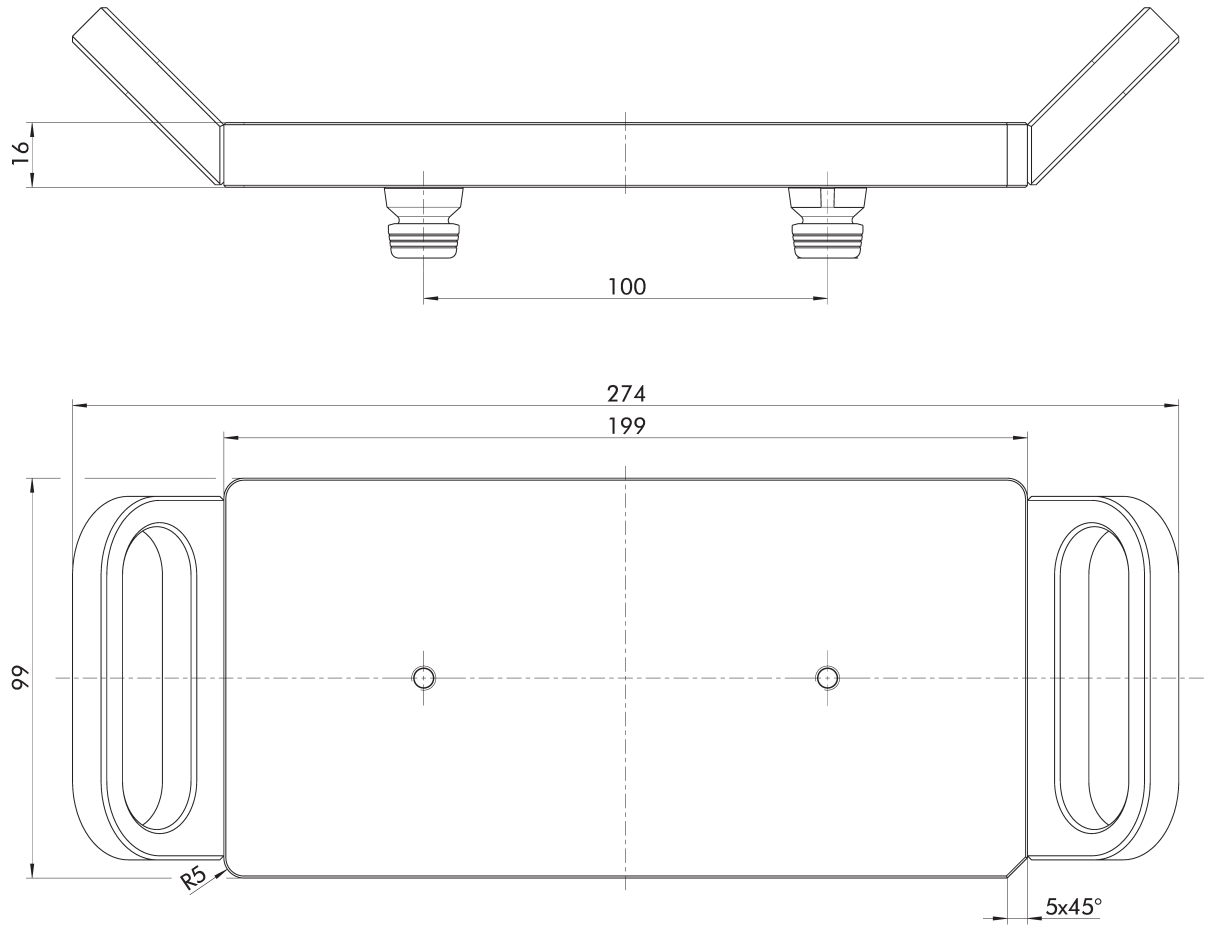
Clamping pallet

Scope of delivery

Clamping pallets, clamping pins, aluminum handles

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL S mini 199 x 99	*0435320*	Steel	0.02	2.7



Subject to technical changes.

Clamping pallet

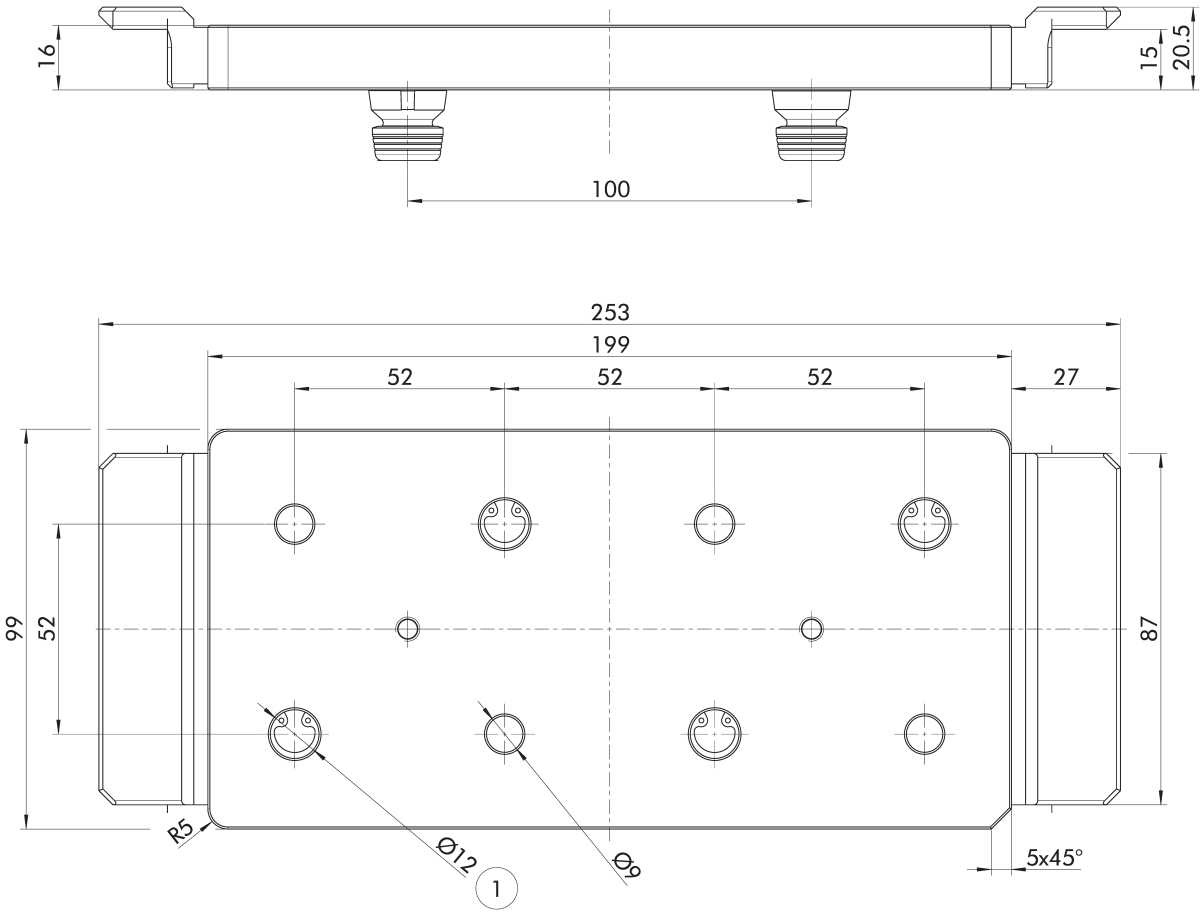
Clamping pallet with prepared bore hole grid for clamping devices.
Suitable clamping devices:
KSC mini 70-80, KSC mini 70-100, KSC3(-K) 80-130, KSC3(-K) 80-190

Scope of delivery

Clamping pallet, clamping pins, handles; without clamping device

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL-K S mini 199 x 99	*1551644*	Steel	0.02	2.6



Subject to technical changes.

(1) Prepared for alignment pins Ø 12m6

(2) Prepared for M8 screws

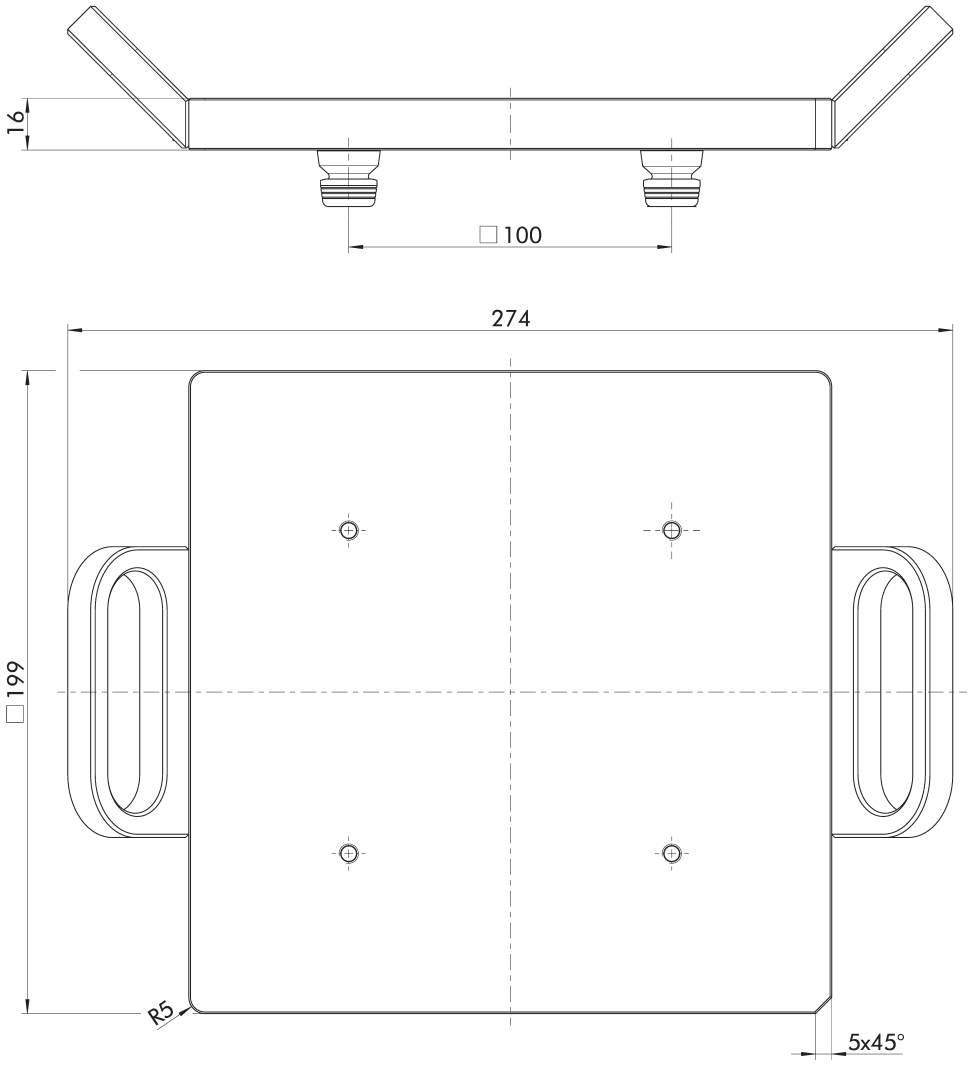
Clamping pallet

Scope of delivery

Clamping pallets, clamping pins, aluminum handles

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL S mini 199 x 199	*0435340*	Steel	0.02	5.2



Subject to technical changes.

Clamping pallet

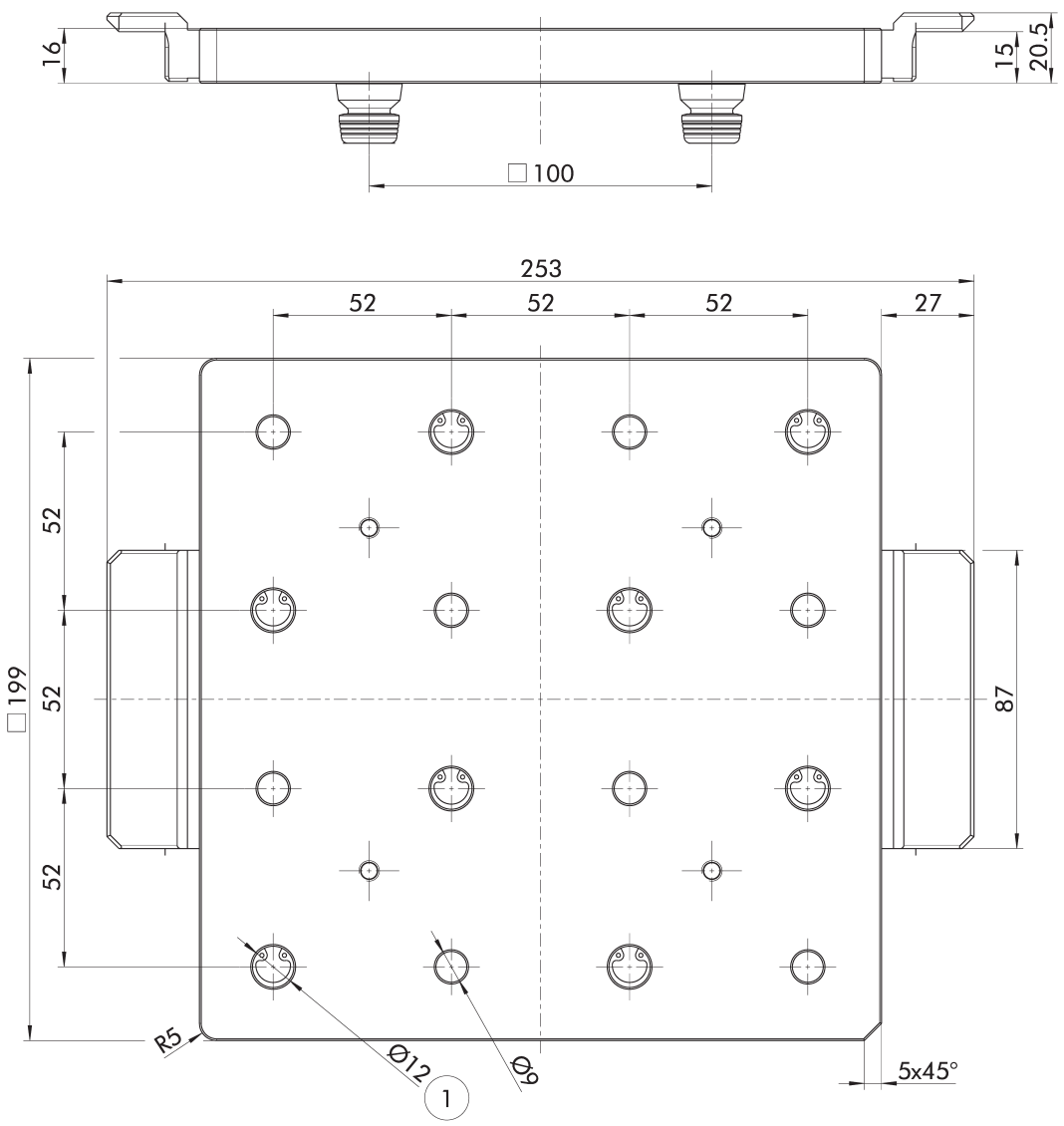
Clamping pallet with prepared bore hole grid for clamping devices.
Suitable clamping devices:
KSC mini 70-80, KSC mini 70-100, KSC3(-K) 80-130, KSC3(-K) 80-190

Scope of delivery

Clamping pallet, clamping pins, handles; without clamping device

Technical data

Description	ID	Material	Plane parallelism [mm]	Weight [kg]
PAL-K S mini 199 x 199	*1551645*	Steel	0.02	5



Subject to technical changes.

(1) Prepared for alignment pins Ø 12m6

(2) Prepared for M8 screws

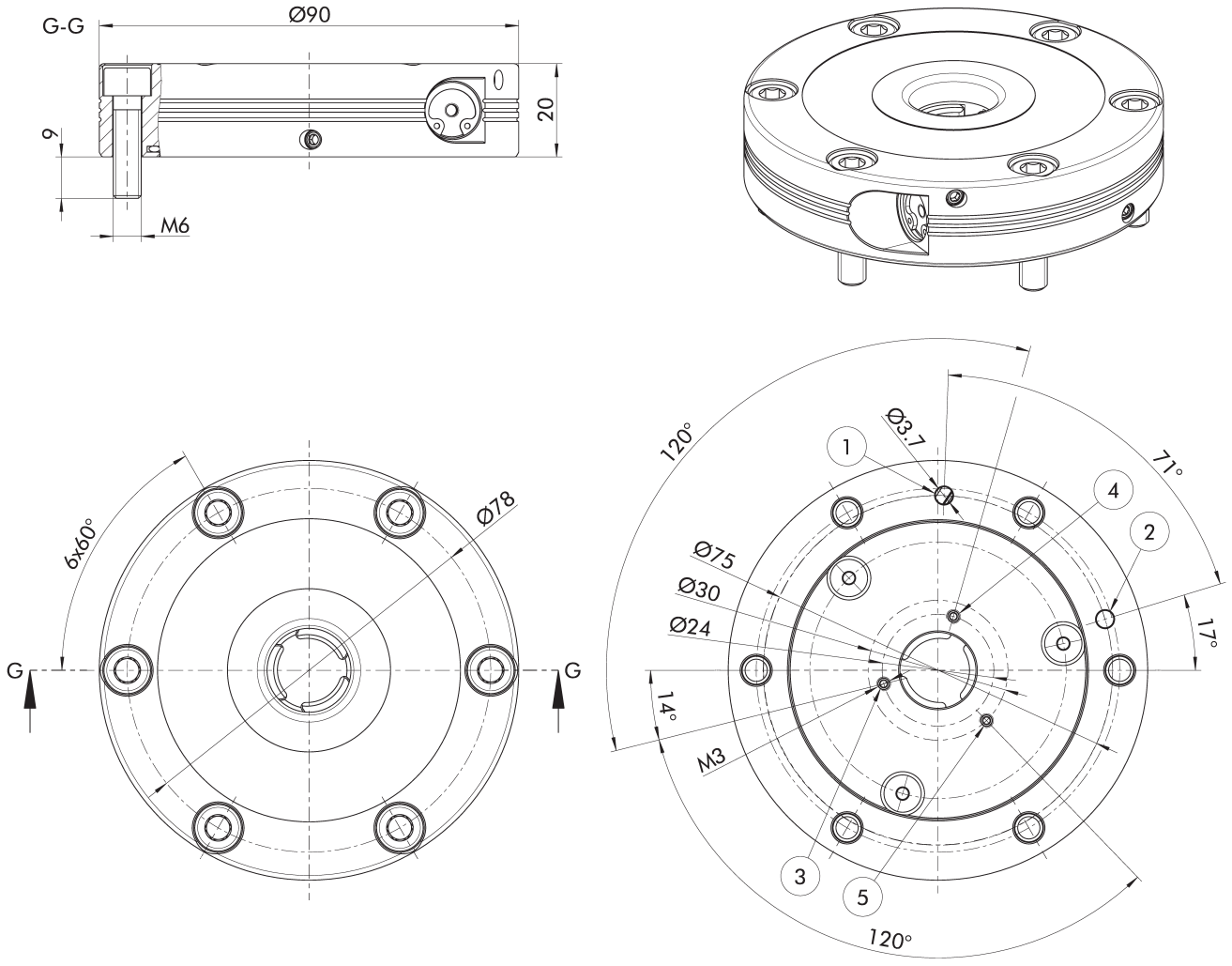
Quick-change pallet module

Scope of delivery

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

Technical data

Description	ID	Pull-down force	Pull-down force with turbo	Unlocking pressure	Repeat accuracy	Weight
		[kN]	[kN]	[bar]	[mm]	[kg]
NSE mini 90	*0435100*	0.5	1.5	6	< 0.005	1



Subject to technical changes.

① Hose-free direct connection module open
② Hose-free direct connection turbo function
③ Monitoring module open via dynamic pressure
④ Monitoring module closed via dynamic pressure
⑤ Air bleeder hole for monitoring

Quick-change pallet module

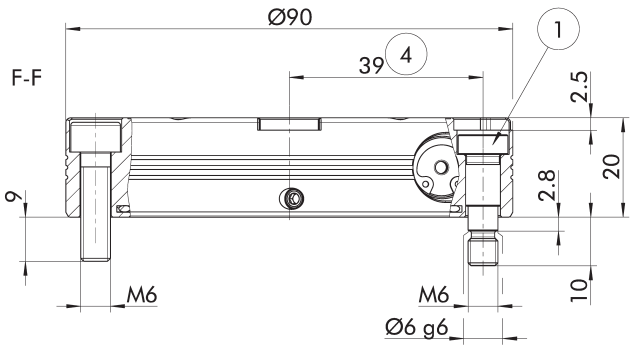
With anti-rotation protection V1

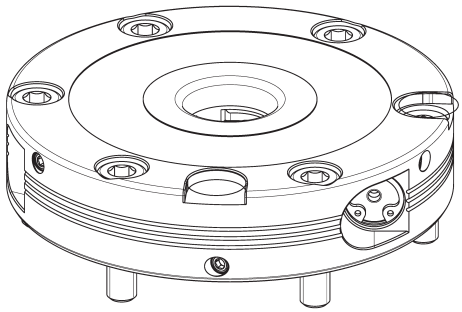
Scope of delivery

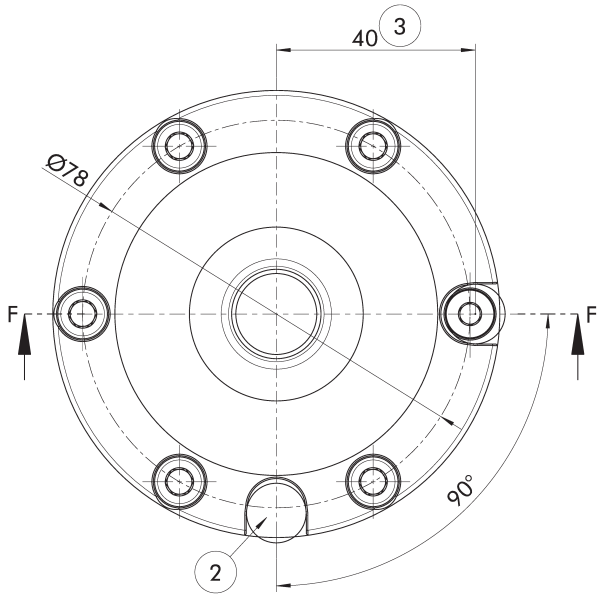
Clamping module, mounting screws, fitting screws, O-rings, cover caps, operating manual; without clamping pins, without indexing pins

Technical data

Description	ID	Pull-down force	Pull-down force with turbo	Unlocking pressure	Repeat accuracy	Weight
		[kN]	[kN]	[bar]	[mm]	[kg]
NSE mini 90-V1	0435105	0.5	1.5	6	< 0.005	1







Subject to technical changes.

(1) Fitting screw for positional orientation
(2) Fitting groove for orientation of the pallet position
(3) Clearance 40 ± 0.01 mm for IXB V1 mini in the clamping pallet
(4) Clearance 39 ± 0.01 mm for fitting screw PSC mini V1 (ID 0435921) in the clamping station

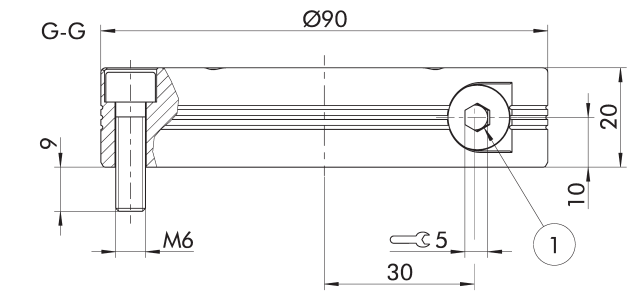
Manual quick-change pallet module

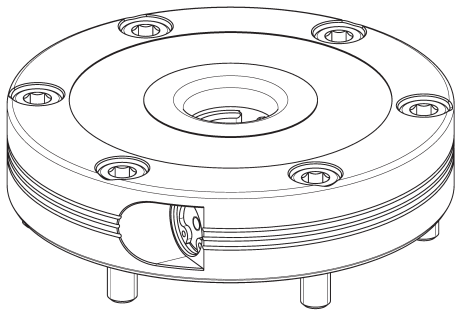
Scope of delivery

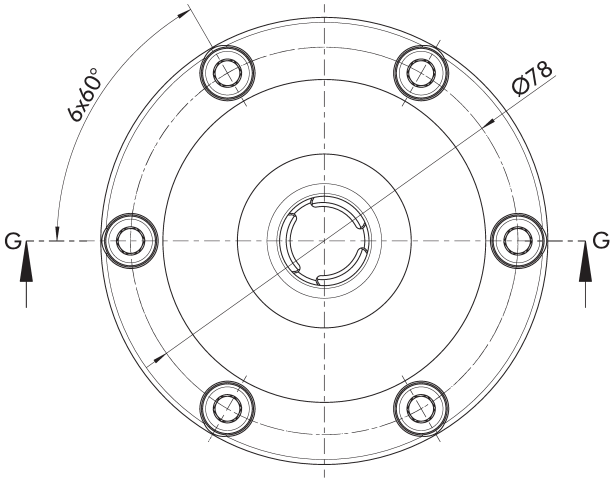
Clamping module, mounting screws, O-rings, cover caps, operating manual; without clamping pins

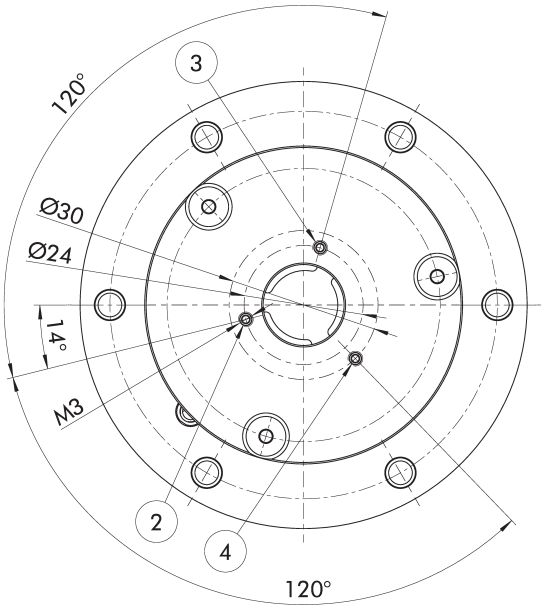
Technical data

Description	ID	Pull-down force [kN]	Unlocking torque [Nm]	Repeat accuracy [mm]	Weight [kg]
NSE-M mini 90	*0435140*	1	10	< 0.005	1









Subject to technical changes.

(1) Unlock connection AF 5
(2) Monitoring module open via dynamic pressure
(3) Monitoring module closed via dynamic pressure
(4) Air bleeder hole for monitoring

Manual quick-change pallet module

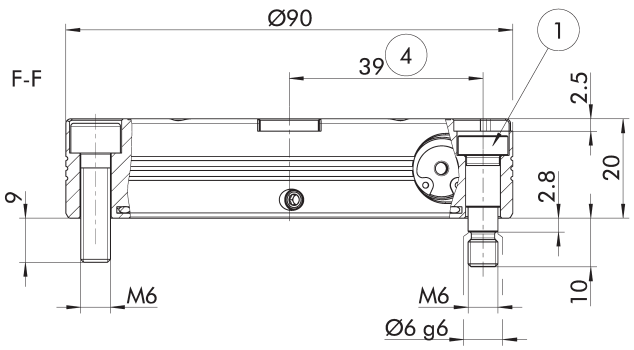
With anti-rotation protection V1

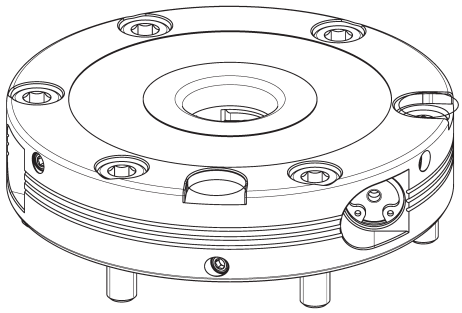
Scope of delivery

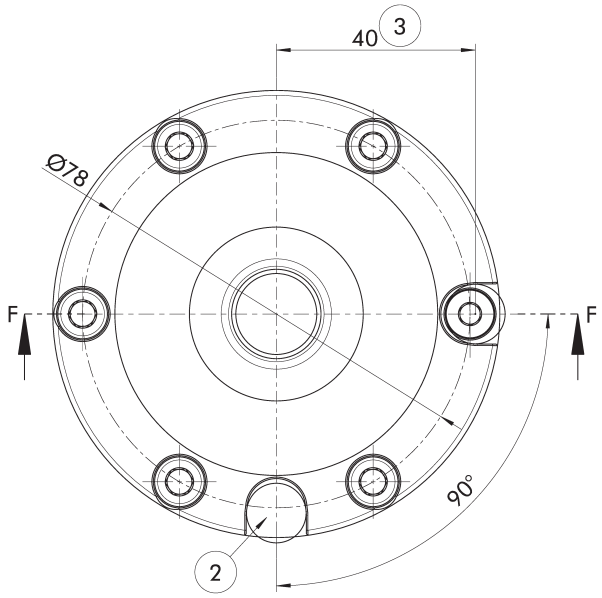
Clamping module, mounting screws, fitting screws, O-rings, cover caps, operating manual; without clamping pins, without indexing pins

Technical data

Description	ID	Pull-down force [kN]	Unlocking torque [Nm]	Repeat accuracy [mm]	Weight [kg]
NSE-M mini 90-V1	*0435145*	1	10	< 0.005	1







Subject to technical changes.

(1) Fitting screw for positional orientation
(2) Fitting groove for orientation of the pallet position
(3) Clearance 40 ± 0.01 mm for IXB V1 mini in the clamping pallet
(4) Clearance 39 ± 0.01 mm for fitting screw PSC mini V1 (ID 0435921) in the clamping station

Accessories

Coupling set
For connecting two NSL mini 100-2 clamping stations.

Suitable for	Description	ID
NSL mini 100-2 NSL mini 100-4	VSK-K NSL mini	*1543512*

Clamping pins SPx mini
Clamping pin for positive connection with NSE mini clamping modules.

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SPA mini 20	*0435610*
NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SPB mini 20	*0435620*
NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SPC mini 20	*0435630*

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

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SP-VL mini 30-6-SPA	*0435640*
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SP-VL mini 60-6-SPA	*0435650*

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

Suitable for	Description	ID
NSL mini 100-V1 NSE mini 90-V1 NSE-M mini 90-V1	IXB V1 mini	*0435930*

Locking coupling
Quick-change coupling for easy actuation of VERO-S clamping stations or module height extensions.

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4	VSK G1/8-NW2.7	*9985830*

Protection covers
Used to close the changing interface and to cover the contact surface.

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SDE mini 90	*0435670*

Protection covers
For closing the changing interface.

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4 NSE mini 90 NSE mini 90-V1 NSE-M mini 90 NSE-M mini 90-V1	SDE mini 20	*0435660*

Cylindrical clamp blanks

For individual fastening of the clamping stations or console plates on all common machine table slot spacings

Suitable for	Description	ID
NSL mini 100-V1 NSL mini 100-2 NSL mini 100-4	BRR mini 40	*8508199*

Cover caps

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

Suitable for	Description	ID
NSE mini 90 NSE-M mini 90	ADK M6-SW5	*9985503*
NSE mini 90-V1 NSE-M mini 90-V1	ADK M6-SW4	*0435911*

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