VERO-S direct workpiece clamping

The WDB modular system

Superior Clamping and Gripping

SCHUNK

VERO-S WDB

SCHUNK is an official member of MF.

Clamping Technology I Overview

Chuck Jaws

Lathe Chucks

Stationary Workholding

Toolholders

Hydraulic Expansion Technology

VERO-S

KONTEC

TANDEM

ROTA

MAGNOS

PLANOS

The „ideal“ clamping fixture

(often) reality

„ideal“ – clamping fixture

Solution: SCHUNK direct workpiece clamping

The clamping pins are fixed directly into the workpiece and clamped with quick – change pallet modules.

- Best accessibility (5 sides)
- Easy, predictable set-up
- Optimal repeatability and positioning accuracy (less interfaces)
- Reliable set-up (max. pull-down forces of VERO-S clamping modules)

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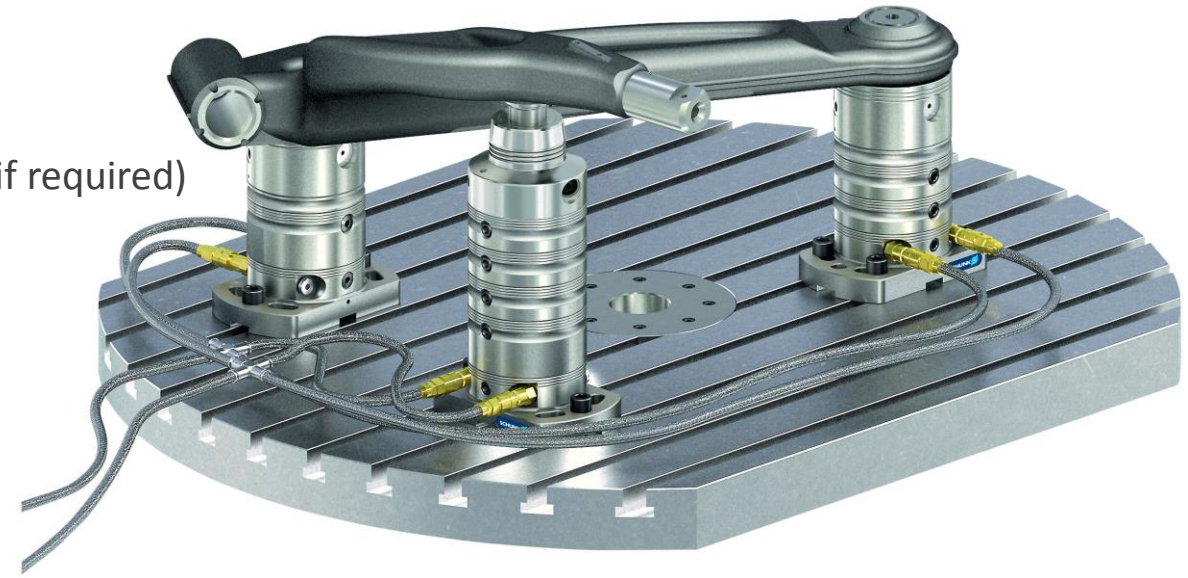
The „troubleshooter“ also for free-form parts

Characteristics of set-up

- Optimal accessibility
- Maximum flexibility
- Flexible pitches
- Different height levels
- Balancing in various axis (if required)
- Modular system
- Pneumatic actuation



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Components

Basic set-up:

4. Clamping pin as dirct interface to the workpiece
3. Direct clamping module pneumatic WDN 99-70
2. Stacking module WDS 99
   Available heights: 30, 50, 80, 120, 160 mm
1. Basic module WDB 99-60

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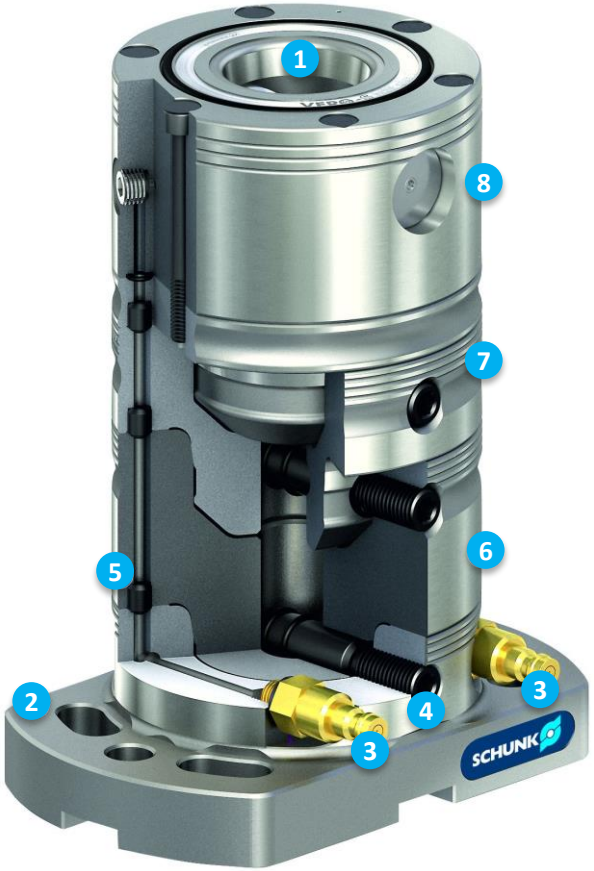
Basic set-up

1. Centering via short taper
2. Basic module VERO-S WDB 99-60
3. Pneumatic ports on basic modul
4. Locking mechanics
5. Medium transfer through the stacking module
6. Stacking module WDS 99-50
7. Stacking module WDS 99-30
8. Clamping module WDN 99-70



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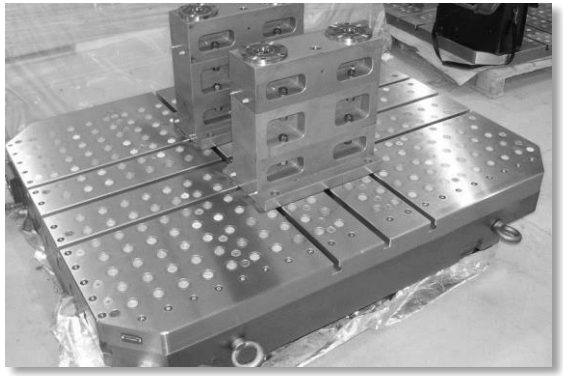
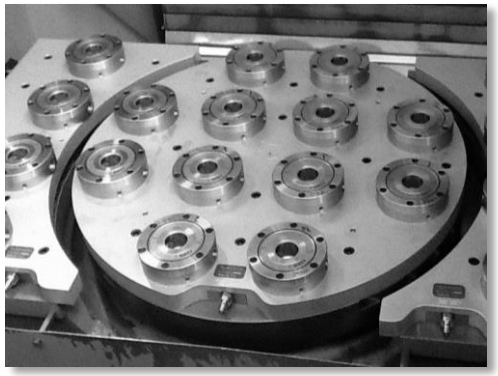
Tables / Face Plates

The suitable WDB set-up for any machine table or face plate:

T-nut tables



Gridplates



VERO-S clamping stations

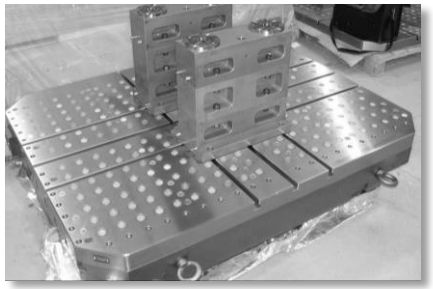
VERO-S WDB

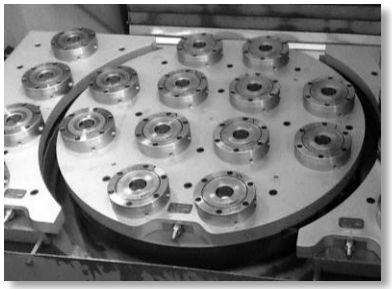
Overview basic modules

WDB 99-60
for T-nut tables

WDR 99-60
for gridplates

WDG 99-60
for VERO-S clamping stations





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Highlights basic modules

Integrated media transfer as a standard feature

- Media is always supplied via the basic module directly on the machine table by the patented medium transfer system, regardless of the height of the clamping spot.

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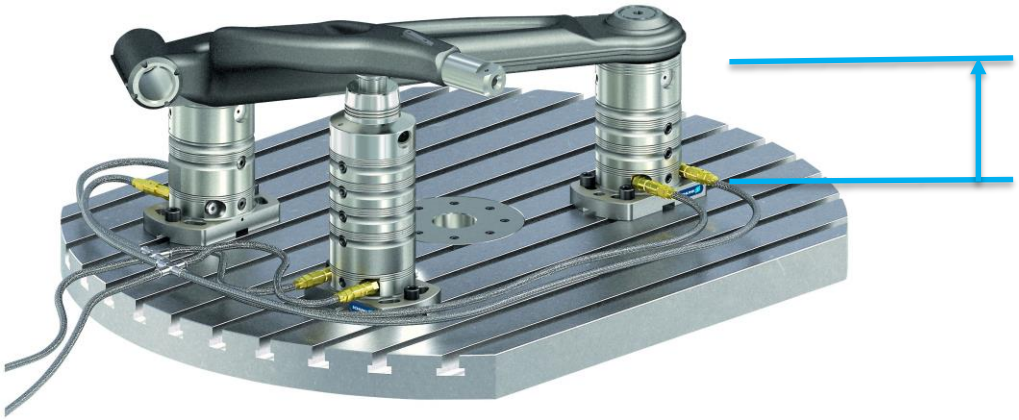
Workpiece with individual height levels

Individual height levels by stacking modules for individual set-up:



e.g. spindle accessibility from 5 sides

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Overview stacking modules

Stacking modules:

- Incrementally stackable in 10mm steps beginning from 80mm height, using the compensation module WDA 99 even stepless

Description	ID number	Height level
WDS 99-30	0471601	30 mm
WDS 99-50	0471602	50 mm
WDS 99-80	0471607	80 mm
WDS 99-120	0471608	120 mm
WDS 99-160	0471609	160 mm

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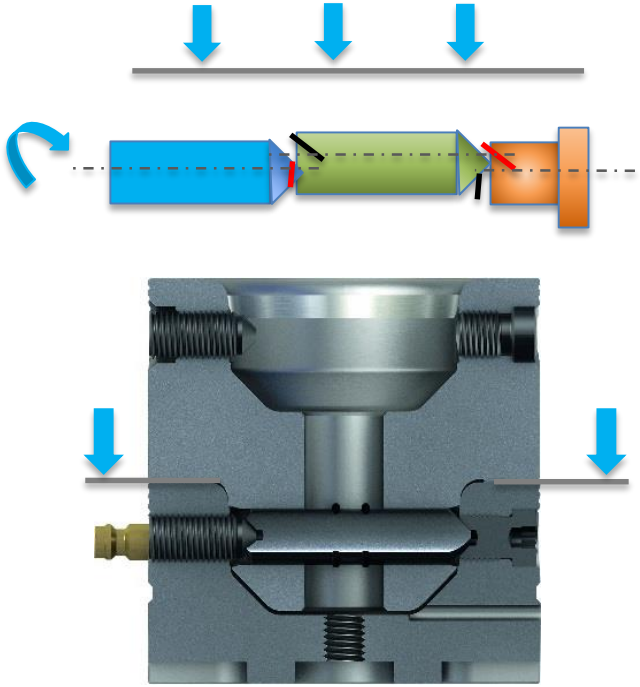
Highlights stacking modules

Locking via clamping connection

- Form and force fit connection with extremely high pull-down forces by just one locking screw.
- Integrated pull-down effect by taper on the locking pins.



Maximum pull-down forces

- 25 kN at 50 Nm actuating torque

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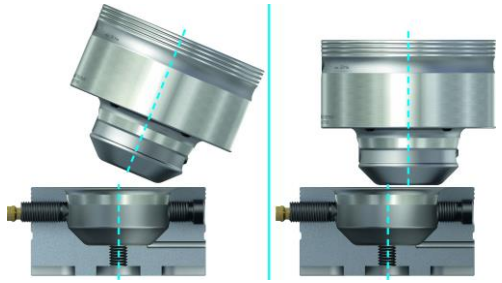
Highlights stacking modules

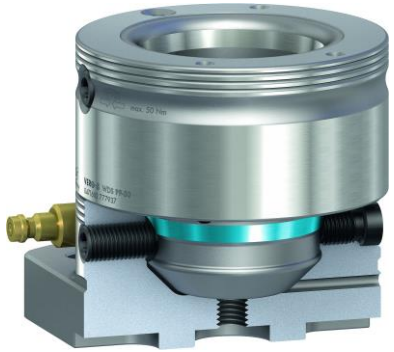
Easy positioning

- Feed chamfers on the clamping pin enable quick and safe joining even with a tilt angle and eccentricity.



Centering via short taper

- µ-exact joining (< 0.005 mm) of the individual components within view seconds.



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Workpiece clamping

Pneumatically or manually workpiece clamping modules, either with fix Z-axis reference or with compensation in Z-axis

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Overview direct clamping modules

WDN 99-70

Pneumatic quick change pallet module, fitting directly on basic modules and all stacking modules.
Pull down force: 15kN at 6 bar Turbo

WDN-M 99-70

Manual quick change pallet module, fitting directly on basic modules and all stacking modules.
Pull down force: 15 kN at 20 Nm

WDA 99-70 D36

Compensation module, pneumatically actuated.
Holding force: 4 kN with 6 Turbo

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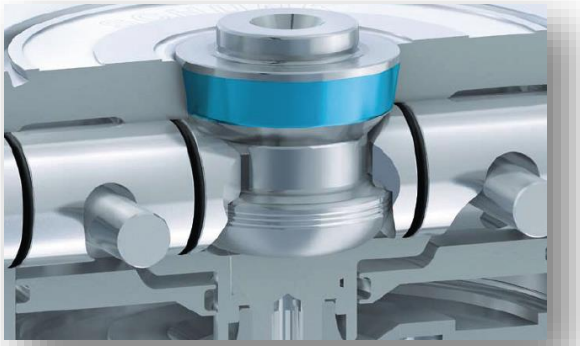
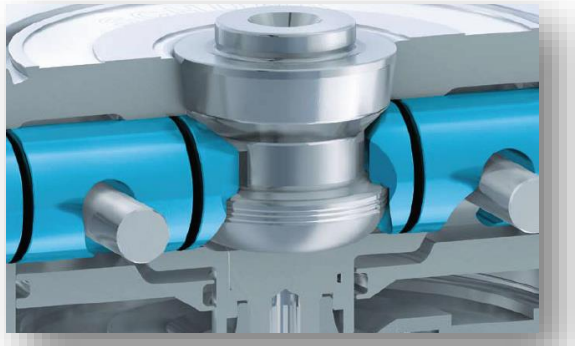
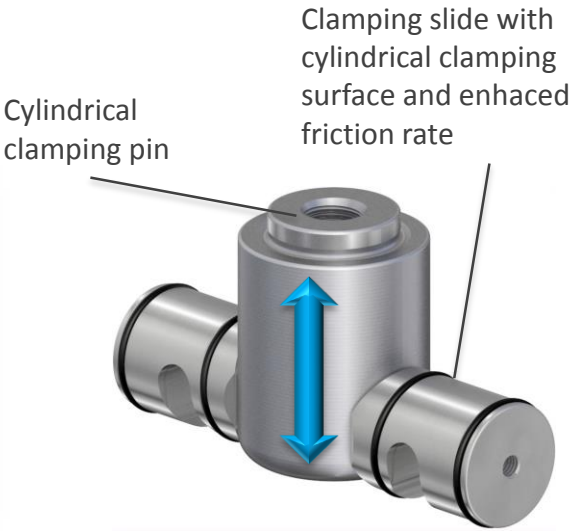
Highlights direct clamping module







Centering via short taper

- µ-exact joining (< 0.005 mm) of the individual components within view seconds.

Locking via clamping slide

Large contact surfaces between clamping slide and clamping pin ensure a low surface pressure. This results in a long service live.

Compensation in X-, Y- and Z-direction

The WDA 99-70 D36 clamps a cylindrical pin.
The function is as a SPC clamping pin, however with compensation in Z axis. The workpiece is actively supported withoutr influence of deformation.

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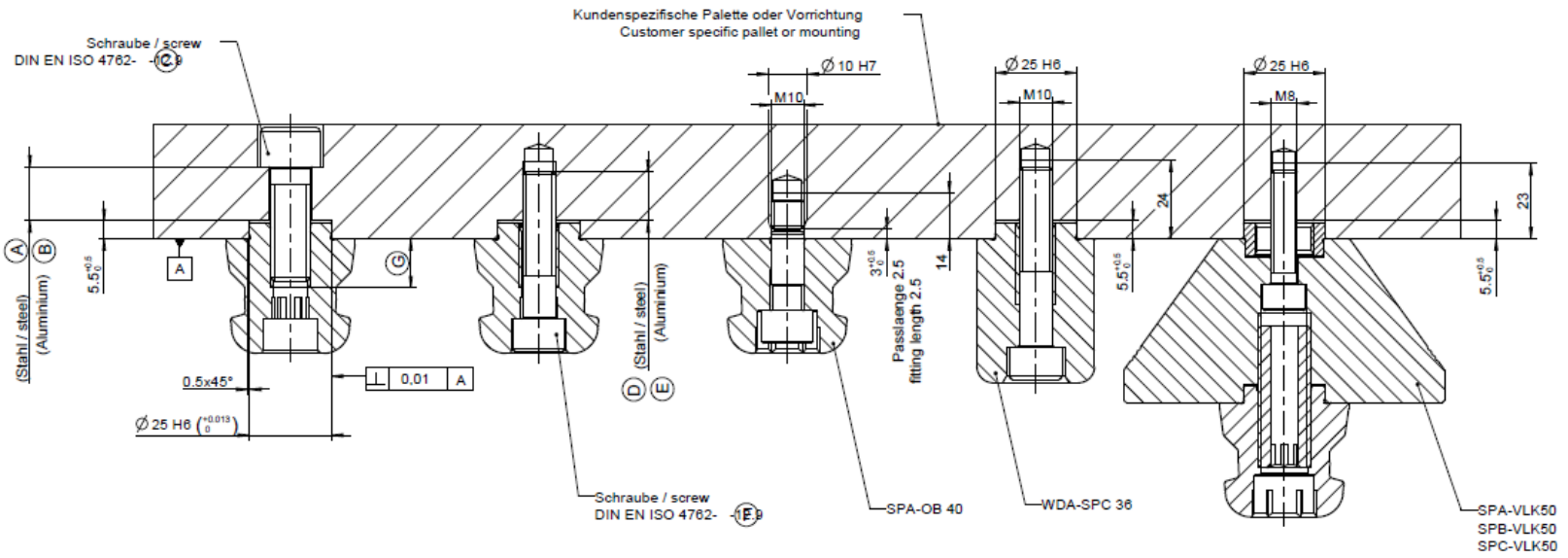
Interface to workpiece

As the connecting interface to the workpiece ther are a hughe variety of clamping pins, clamping arbors and extensions available.



VERO-S WDB

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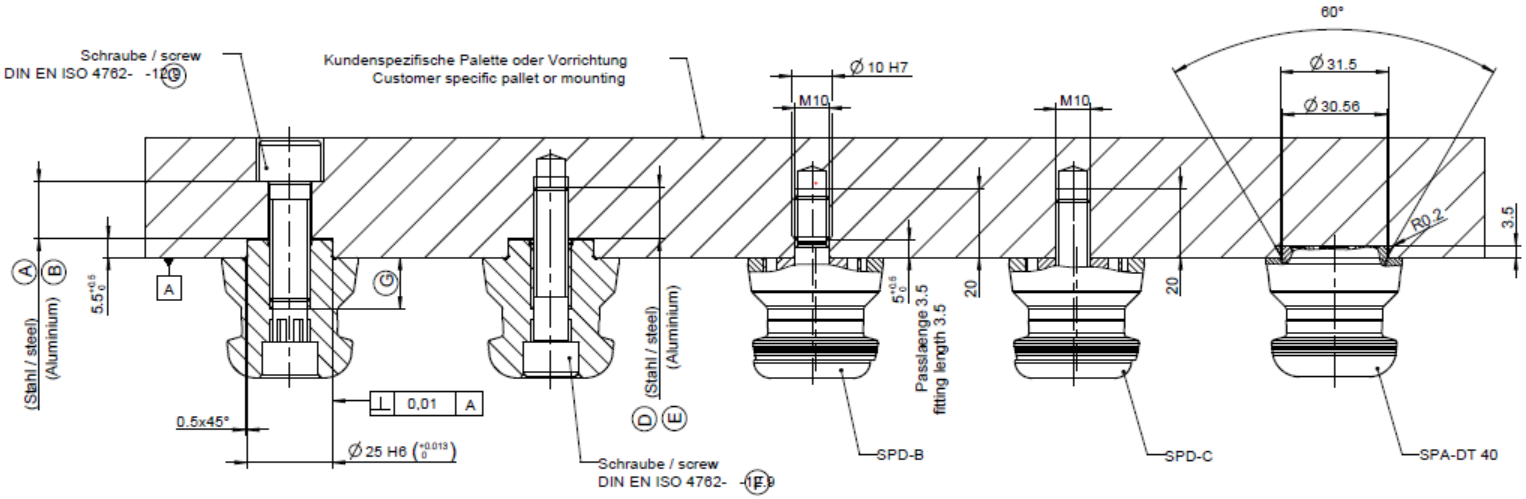

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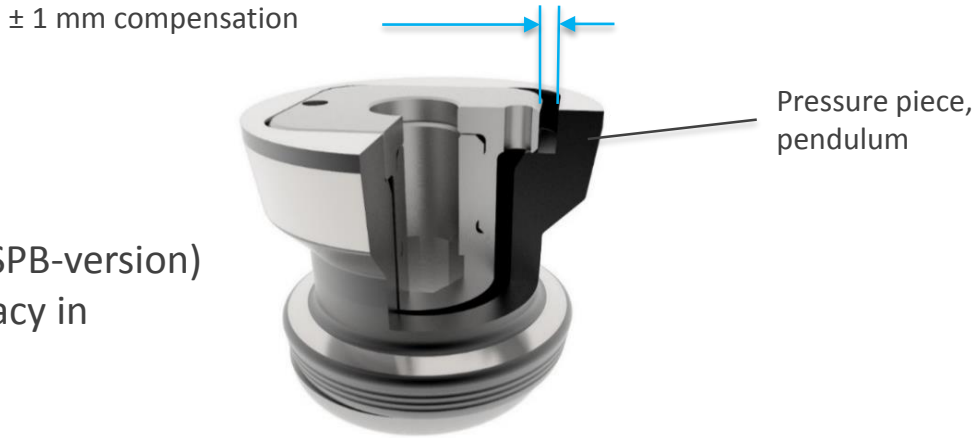
Highlights SPD-B clamping pin



± 1 mm compensation

- Pitch compensation in one direction (SPB-version) for a perfect compensation of inaccuracy in workpiece geometry.

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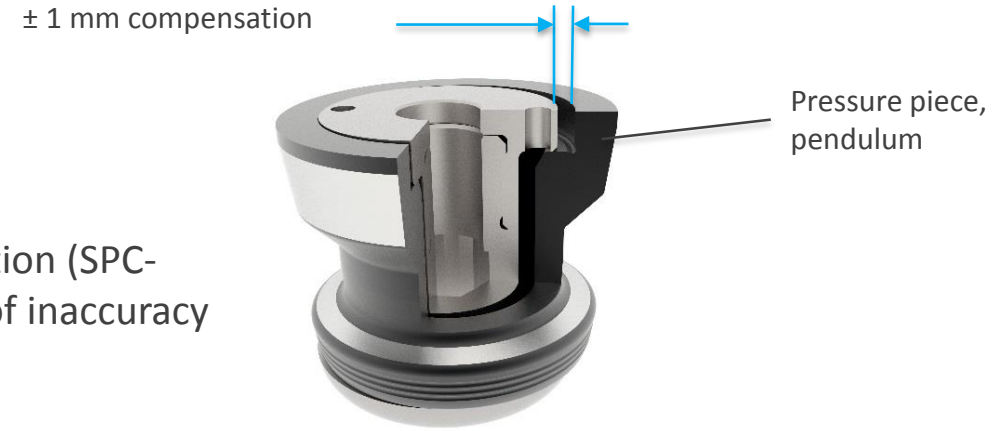
Highlights SPD-C clamping pin



± 1 mm compensation

- Pitch compensation in all radial direction (SPC-version) for a perfect compensation of inaccuracy in workpiece geometry.

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Highlights SPA-DT 40 clamping pin

„dovetail – clamping pin“

→ Assembly interface in the workpiece requires only 3,5mm depth. No thread or screw hole in the workpiece required.

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Components

Workpiece

SPA/SPB/SPC 40 RF

SP-VL 50

SPA-DT

SPD-B / SPD-C

SPA/B/C-OB 40

WDA-SPC 36

Clamping pins

WDN 99-70 - 0471603

WDN-M 99-70 - 0471611

WDA 99-70 - 0471615

Clamping modules

WDS 99-30
0471601

WDS 99-50
0471602

WDS 99-80
0471607

WDS 99-120
0471608

WDS 99-160
0471609

Stacking modules

WDB 99-60 - 0471617

WDR 99-60 - 0471619

WDG 99-60 - 0471618

Basic modules

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Best practice

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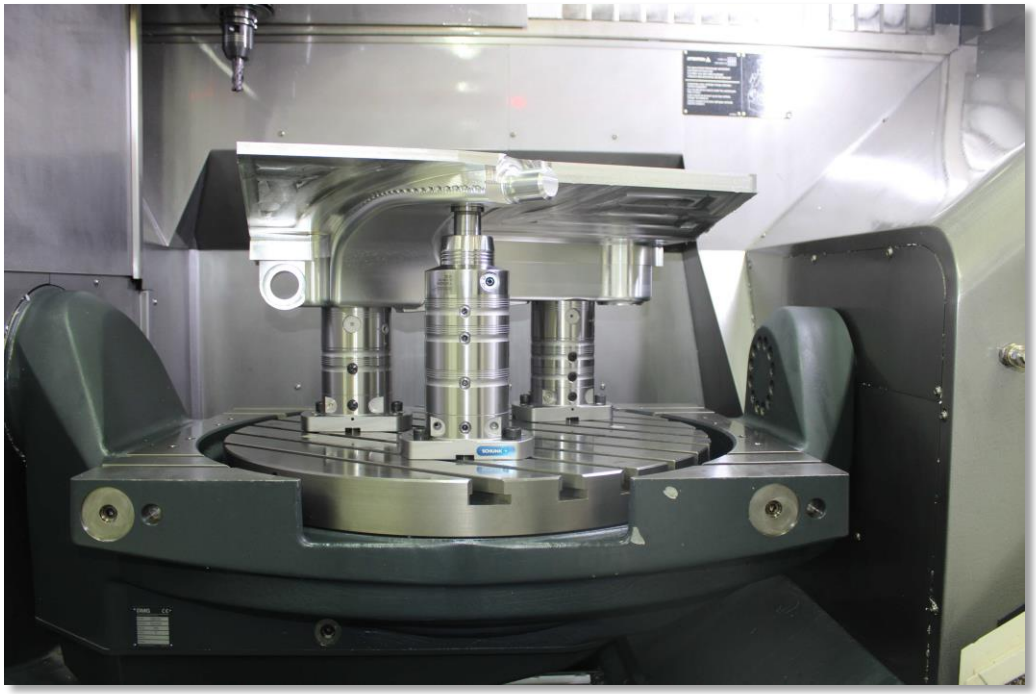

Workpiece clamped by 3 clamping spots. 2 clamping spots with plane contact in Z – axis using WDN 99-70 modules and 1 clamping spot with axial compensation, using WDA 99-70 module.

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Best practice

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Finished workpiece with freeform surface.

Ideal accessibility for the machine spindle.

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Best practice

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Compensating clamping spot in axial direction makes sure the workpiece is clamped and supported without any influence of deformation. Using a WDA SPC-36 as the workpiece connected element.

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Best practice

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Application with 3x WDN 99-70 pneumatic modules and 1x WDA 99-70 D36 compensating module.

All side accessability for the machine spindle.

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Best practice

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Application with 3x WDN-M 99-70 (direct clamping module, manually actuated)

Use of a clamping pin extension SPC-VLK 50 for excellent accessability of the machine spindle.

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Best practice

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Application with 3x WDN 99-70 pneumatic and 1x compensating module WDA 99-70 D36 pneumatic.
(Compensation 9 to 20 mm in height), basic modules are WDR 99-60 for set-up on grid plates.

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Best practice

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Using 3 clamping pin extenstions type SP-VL 50 for excellent accessability of the machine spindle.

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Best practice

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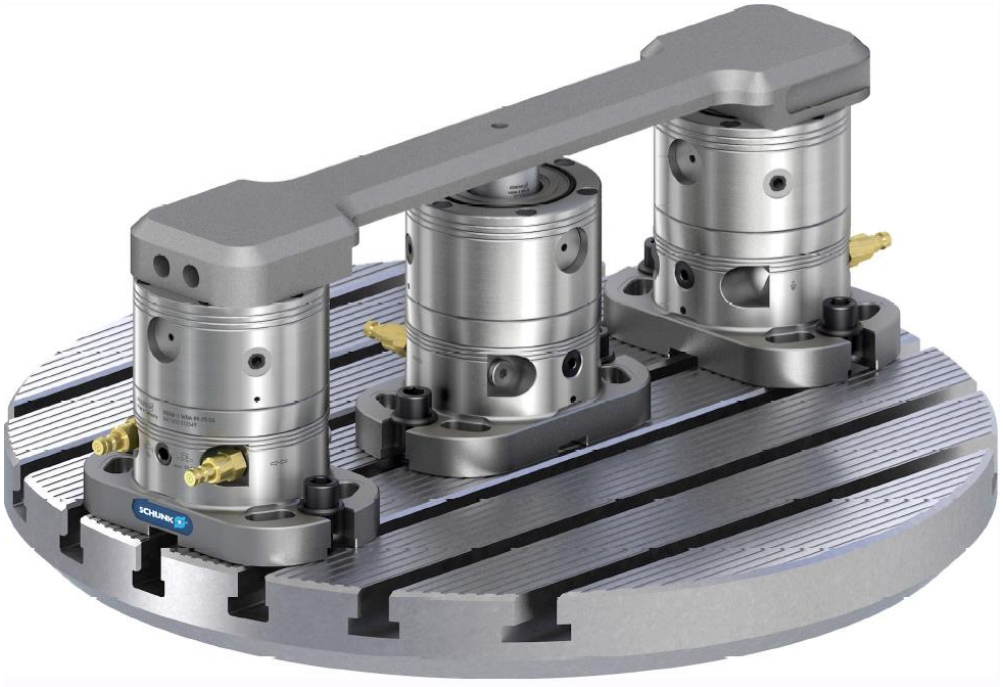


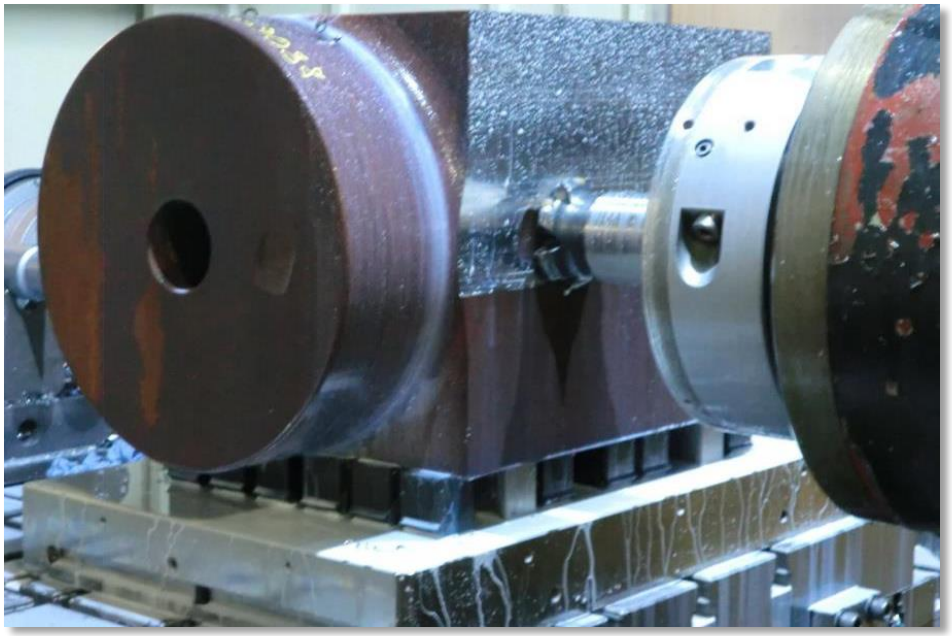
Clamping a thin-walled workpiece on a 3 spot set-up, using 2off WDN 99-70 direct clamping modules, supported by 1off WDA 99-70 compensating module in the center.

Basic modules placed on T-nut table, fixed with M12 screws.

MAGNOS Square Pole Technology

Earlier set-up by magnetic workpiece clamping

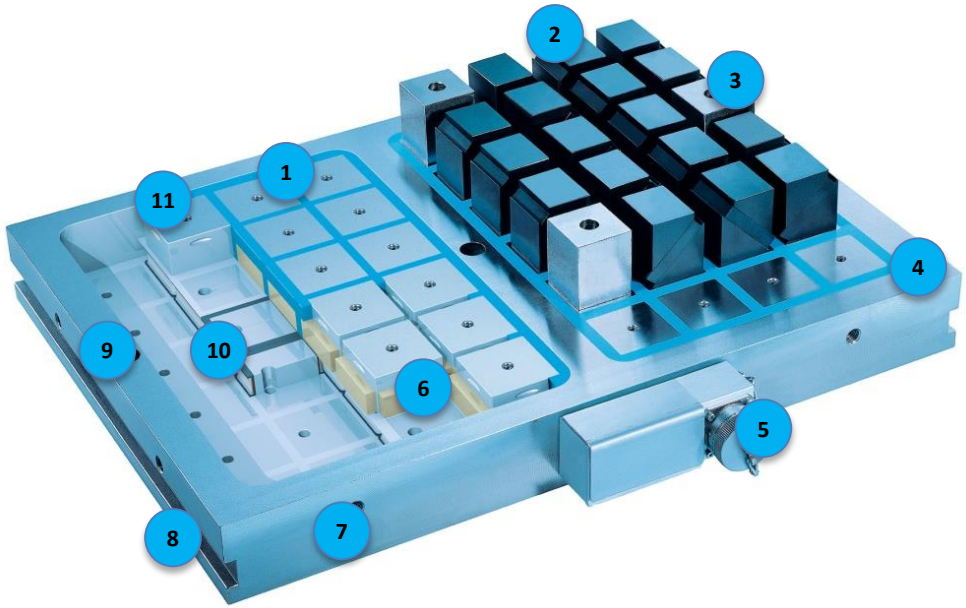
An earlier set-up to machine the clamping pin interfaces into the workpiece can be done by the SCHUNK MAGNOS magnetic clamping system



MAGNOS Square Pole Technology

Cross section

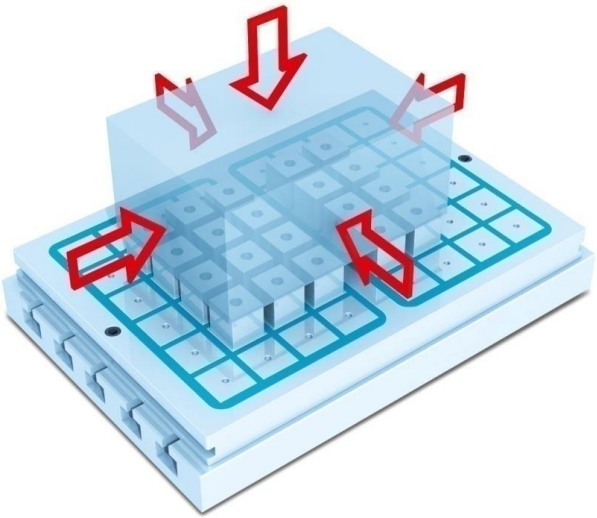
1. synthetic resin grouting
2. flexible pole extension
3. fixed pole extension
4. solid base plate made of C45 (galvanized)
5. connector
6. neodymium magnet
7. holes for workpiece stop
8. fastening groove
9. fastening bore
10. coil body, insulated version
11. (invertible) AlNiCo magnet embedded in the coil

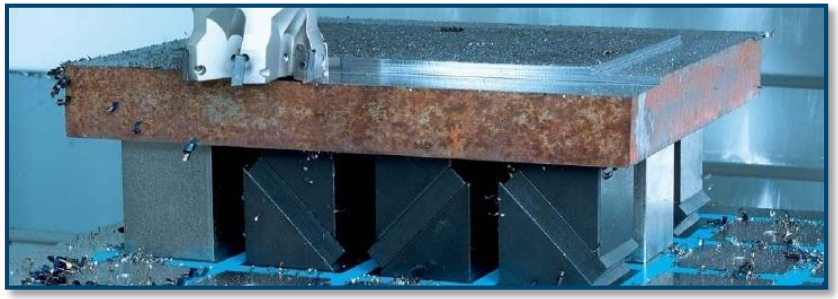


MAGNOS Square Pole Technology

5-side machining

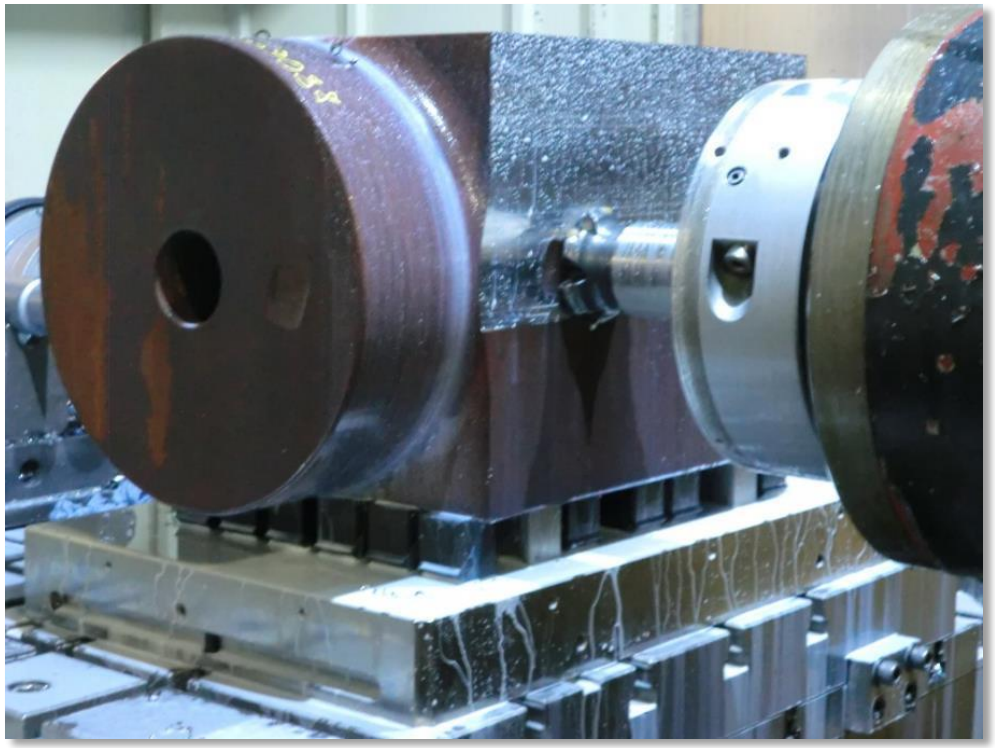
- free accessibility from 5 sides
- no risk of collision
- higher accuracy through machining in 1 setting





MAGNOS Square Pole Technology

Best practice



Rough material (forging part) is clamped on MAGNOS magnetic clamping plate. Magnet plate is equipped with flexible pole extensions to make sure the workpiece is clamped totally free of deformation.
Accessibility from all sides for the machine spindle.

MAGNOS Square Pole Technology

Best practice

Preparation of workpiece for WDB direct clamping. Machining of clamping pin interfaces into the workpiece and clean of plane surface.