

MacroNano

Nano-precision machining requires nano-precision referencing of workpieces and tools. Even with state-of-the-art solutions, this is a real challenge. It becomes even more challenging when references have to be determined in the shortest possible time.

Our MacroNano system is best described in two words – precise and quick! Via ultra-precise coupling of both workpiece and tool clamping, the system ensures linking throughout the entire production chain.

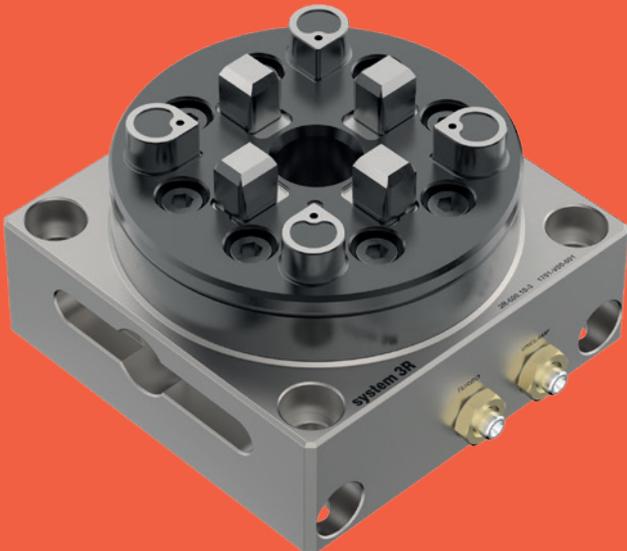
- Repetition accuracy within 0.001 mm
- Clamping force 6,000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- Recommended max. workpiece weight 50 kg.

ADVANTAGES

- extremely high accuracy.
- without detracting from the extreme accuracy, high-precision machines can be linked in the production chain.
- feedback to the machine for supplementary machining after inspection is possible. Such feedback is only meaningful if the pallet system is at least as accurate as the measuring machine.

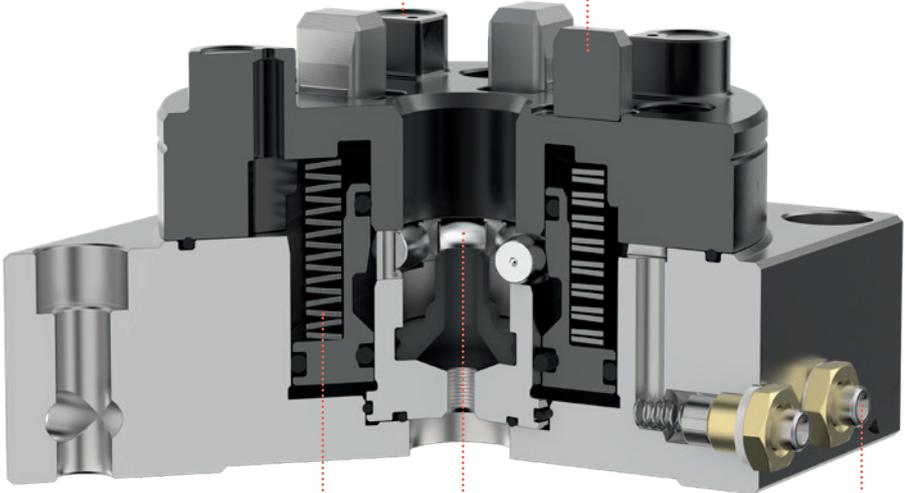


MacroNano in detail



Z-references are cleaned by air blasted through the chuck's Z-reference nozzles.

X and Y-references.



Spherical rolls.

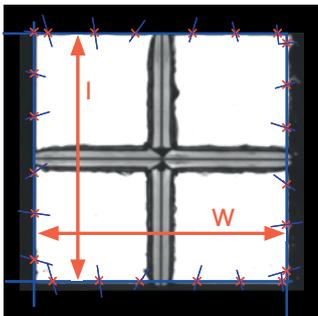
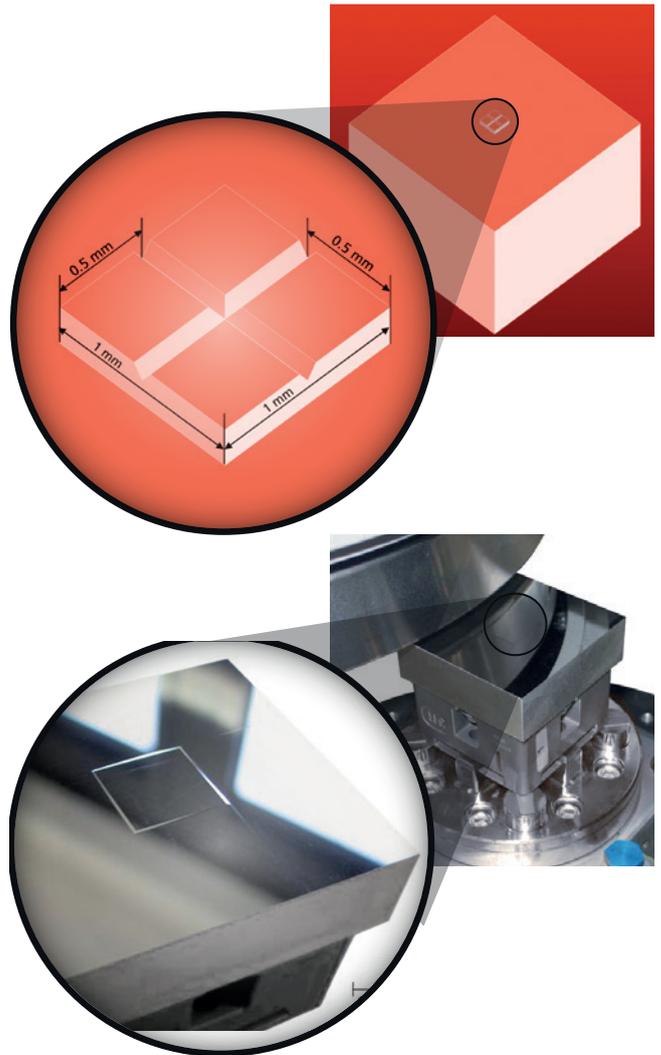
Spring-loaded when idling; special Turbo function via added air pressure.

Side air inlets are ready for air gun use on delivery.

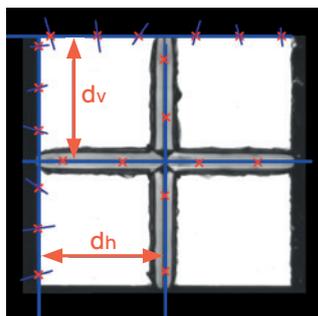
Application example: Microstructuring with diamond Machining

Micro features produced to nano precision.

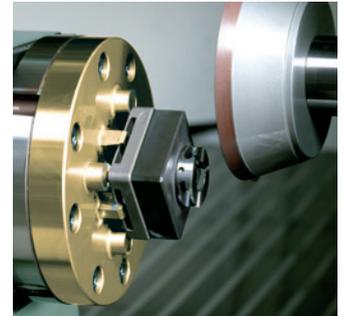
This microstructure was produced using two different diamond flycutting machines. Each was equipped with a MacroNano chuck and use was made of the MacroNano system's indexing feature. The square in the middle of the workpiece (picture on the right) was produced by plane milling on the 1st machine. To produce the microgrooves, the pallet carrying the workpiece was then transferred to the 2nd machine's chuck. The zero reference was determined only once on the 1st machine. Thanks to the MacroNano system's precision (indexing included therein), it was then carried throughout the entire process chain. Overall structure deviation was less than 0.5 microns.



Cube dimension measurement



Groove position measurement

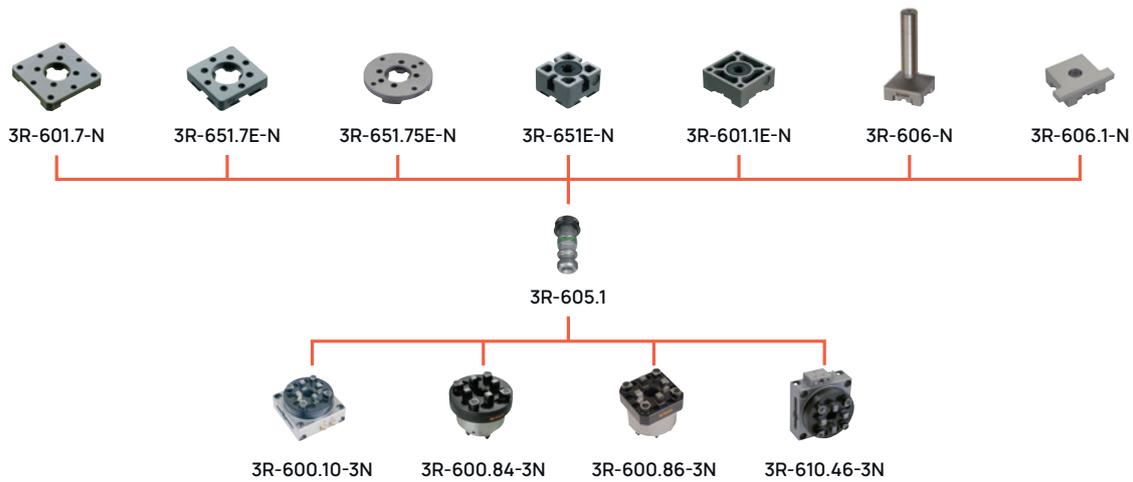


Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)	
W ₁	0.9996	l ₁	0.9999	dv ₁	0.4988	dh ₁	0.5013
W ₂	0.9996	l ₂	0.9999	dv ₂	0.4993	dh ₂	0.4995
W ₃	0.9996	l ₃	0.9999	dv ₃	0.4996	dh ₃	0.5001
W ₄	0.9997	l ₄	0.9999	dv ₄	0.4991	dh ₄	0.4995
W ₅	0.9996	l ₅	0.9998	dv ₅	0.5010	dh ₅	0.5001
W ₆	0.9996	l ₆	0.9998	dv ₆	0.5007	dh ₆	0.5002
W ₇	0.9997	l ₇	0.9999	dv ₇	0.4996	dh ₇	0.5012
W ₈	0.9996	l ₈	0.9999	dv ₈	0.4992	dh ₈	0.5009
W ₉	0.9997	l ₉	0.9999	dv ₉	0.4996	dh ₉	0.5009
W ₁₀	0.9996	l ₁₀	0.9998	dv ₁₀	0.4998	dh ₁₀	0.5008
W	0.9996	l	0.9999	dv	0.4997	dh	0.5004

Mean values

Overall structure deviation < 0.5 μm

MacroNano – Chucks, pallets & accessories



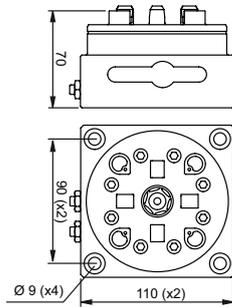
Pneumatic chuck, MacroNano, 3R-600.10-3N

Chuck for mounting on machine table.

- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



NANO



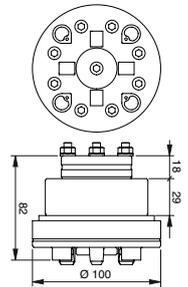
Pneumatic chuck, MacroNano, 3R-600.84-3N

Chuck for building-in (e.g. in a fixture, dividing head or B-axis).

- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 2,4 kg.



NANO



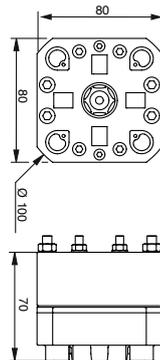
Pneumatic chuck, MacroNano, 3R-600.86-3N

Chuck for building-in (e.g. in a fixture).

- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



NANO



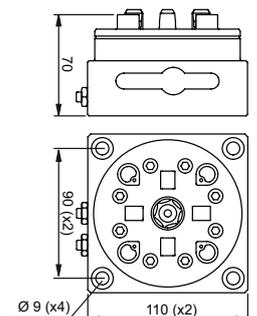
Pneumatic chuck, MacroNano, 3R-610.46-3N

Chuck for mounting on machine table with integral air unit. For horizontal and vertical use.

- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



NANO



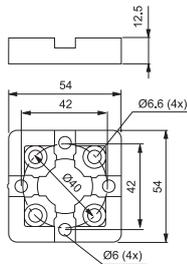
MacroNano – Pallets & accessories

Reference element 54x54 mm, MacroNano, 3R-651.7E-N

Hardened and precision cast; has clearance holes for four fixing screws.

NOTE: Must be mounted on the workpiece/fixture before it is locked in a chuck.

- Fixed index positions 4x90°
- Parallel-ground top and bottom faces
- Rust resistant
- Supplied in sets of 8
- Weight per set 1.2 kg.

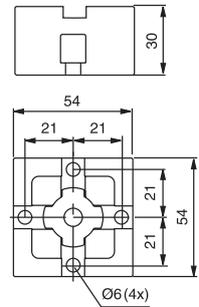


NANO

Pallet 54x54 mm, MacroNano, 3R-651E-N

Hardened; has clearance holes for four fixing screws.

- Fixed index positions 4x90°
- Ready for code carrier
- Rust resistant
- Supplied in sets of 8
- Weight per set 3.4 kg.

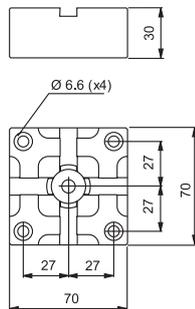


NANO

Pallet 70x70 mm, MacroNano, 3R-601.1E-N

Hardened; has clearance holes for four fixing screws.

- Fixed index positions 4x90°
- Ready for code carrier
- Rust resistant
- Supplied in sets of 5 pcs
- Weight per set 3.6 kg.



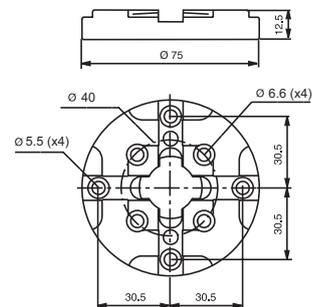
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Reference element Ø 75 mm, MacroNano, 3R-651.75E-N

Hardened and milled; has clearance holes for eight fixing screws.

NOTE: Must be mounted on the workpiece/fixture before it is locked in a chuck.

- Fixed index positions 4x90°
- Parallel-ground top and bottom faces
- Rust resistant
- Supplied in sets of 10
- Weight per set 2.7 kg.



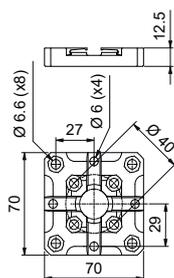
NANO

Reference element 70x70 mm, MacroNano, 3R-601.7-N

Hardened and precision cast; has clearance holes for four fixing screws.

NOTE: Must be mounted on the workpiece/fixture before it is locked in a chuck.

- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 5
- Weight per set 3 kg.

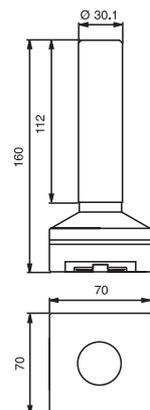


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Control rod, MacroNano, 3R-606-N

Control rod with ground C-reference for setting Macro chucks.

- Measuring length 110 mm
- Weight 2.3 kg.



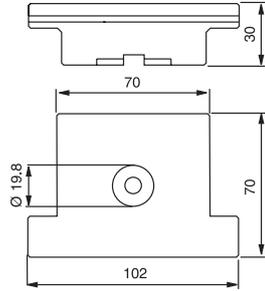
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MacroNano – Accessories

Check ruler, MacroNano, 3R-606.1-N

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm
- Weight 1.4 kg.



NANO

Drawbar, 3R-605.1E

- Ø 20x57.1 mm with flushing holes Ø 7 mm
- Supplied in sets of 10.



Air unit, 3R-611.2

Foot operation of pneumatic chucks.



Air unit, 3R-611.4

Unit for operation of pneumatic chucks. Two functions, open/close.



Locking ring key, 3R-605-GE

To lift drawbar locking rings.

- Supplied in sets of 2.



Code carriers, 3R-863.01-10

With pre-programmed unique identity, designed for use on pallets.

- Supplied in sets of 10.

