

MacroNano

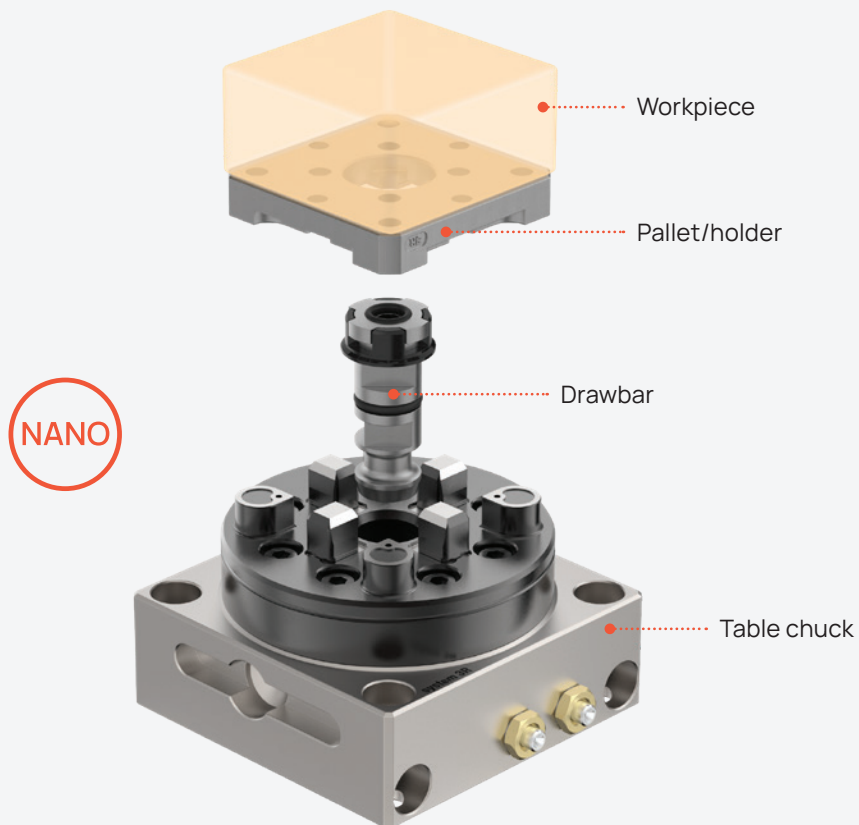
Nano-precision machining requires nano-precision referencing of workpieces and tools. Even with state-of-the-art solutions, this is a real challenge. It becomes even more challenging when references have to be determined in the shortest possible time.

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.

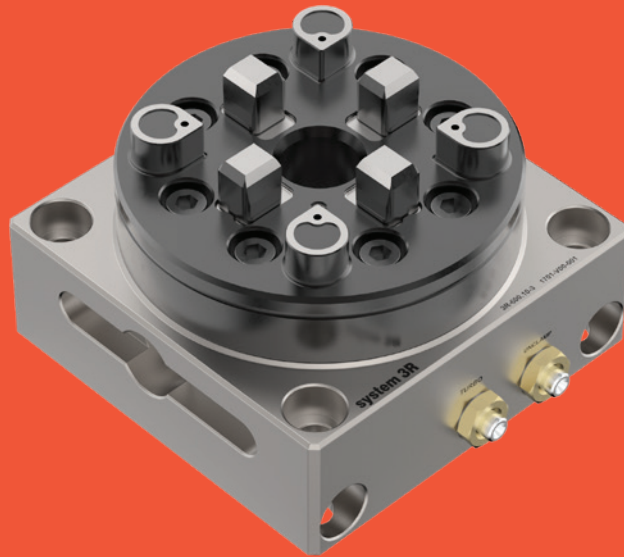
- Repetition accuracy within 0.001 mm
- Locking force 6.000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- Recommended max. workpiece weight 50 kg.

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.

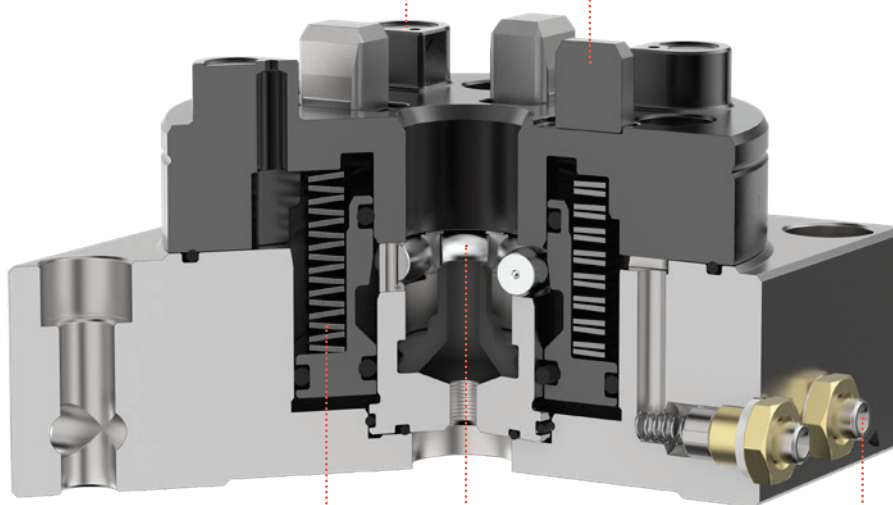


MacroNano in detail



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

X and Y-references.



Spherical rolls.

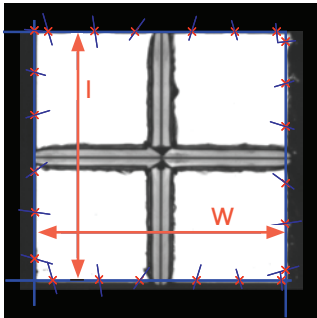
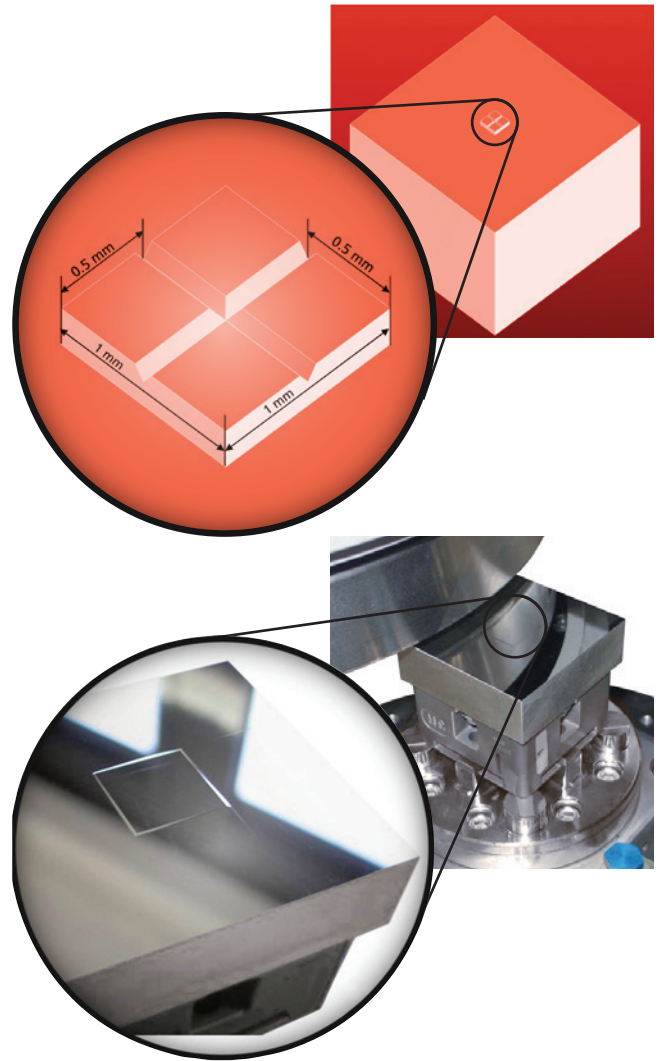
Spring-loaded when idling; special Turbo function via added air pressure.

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

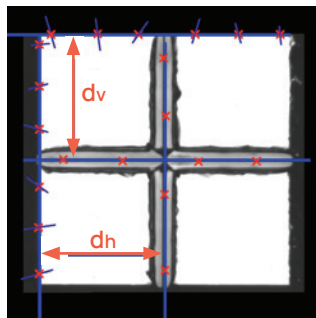
Application example: Microstructuring with diamond Machining

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

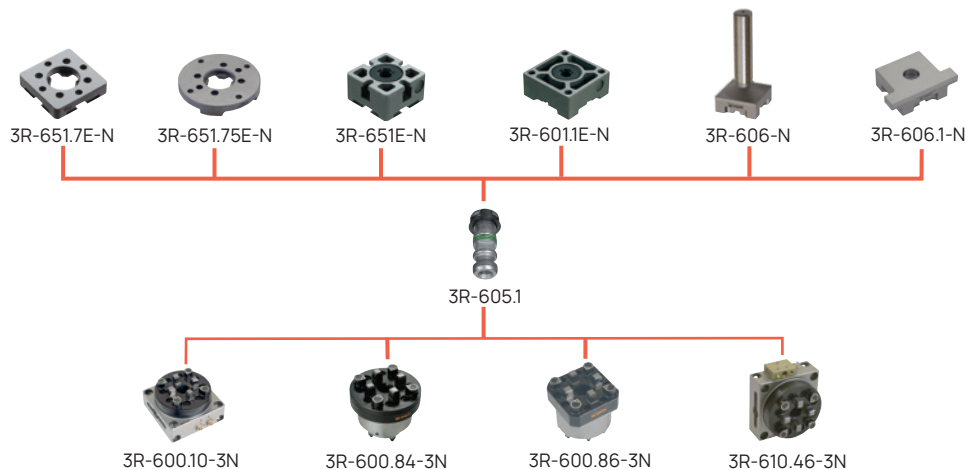


Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)	
W ₁	0.9996	l ₁	0.9999	dv ₁	0.4988	dh ₁	0.5013
W ₂	0.9996	l ₂	0.9999	dv ₂	0.4993	dh ₂	0.4995
W ₃	0.9996	l ₃	0.9999	dv ₃	0.4996	dh ₃	0.5001
W ₄	0.9997	l ₄	0.9999	dv ₄	0.4991	dh ₄	0.4995
W ₅	0.9996	l ₅	0.9998	dv ₅	0.5010	dh ₅	0.5001
W 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 μ m

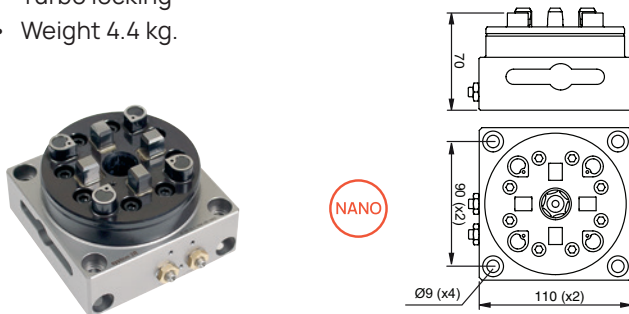
MacroNano – Chucks, pallets, reference elements & accessories



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

Chuck for mounting on the machine table.

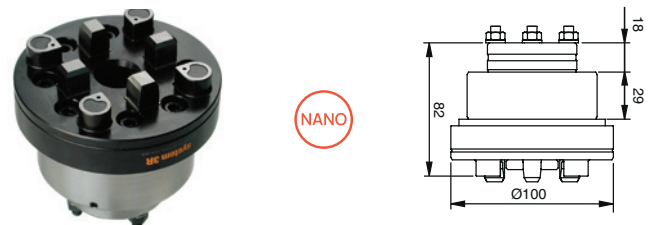
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



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

Chuck for building-in, for example 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.



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

Chuck for building-in, for example in a fixture.

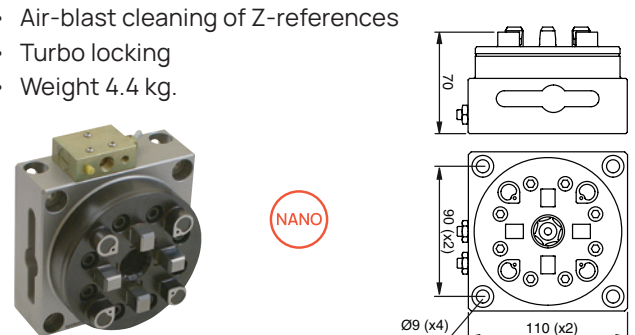
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



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

Chuck for mounting on the 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.



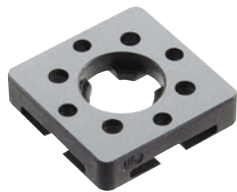
MacroNano – Pallets, reference elements & accessories

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

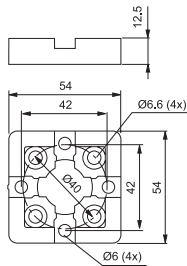
Hardened and precision-cast, with clearance holes for four fixing screws.

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

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



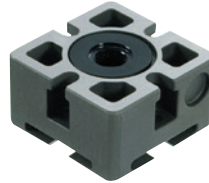
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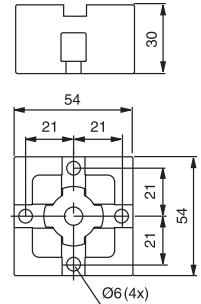
Pallet 54x54 mm, MacroNano, 3R-651E-N

Hardened with 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.



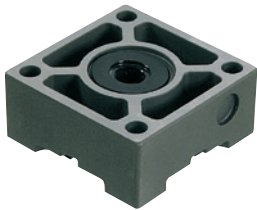
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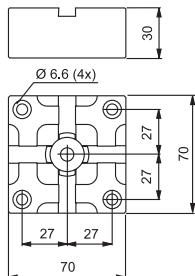
Pallet 70x70 mm, MacroNano, 3R-601.1E-N

Hardened with clearance holes for four fixing screws.

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



NANO



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

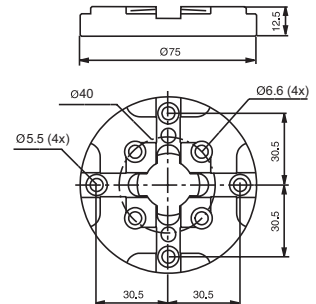
Hardened and milled with clearance holes for eight fixing screws.

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

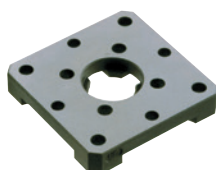


Reference element 70x70 mm, MacroNano, 3R-601.7-N

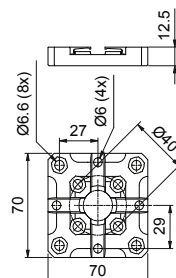
Hardened and precision-cast, with clearance holes for four fixing screws.

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.



NANO



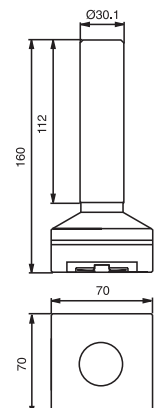
Control rod, MacroNano, 3R-606-N

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

- Measuring length 110 mm.
- Weight 2.3 kg.



NANO

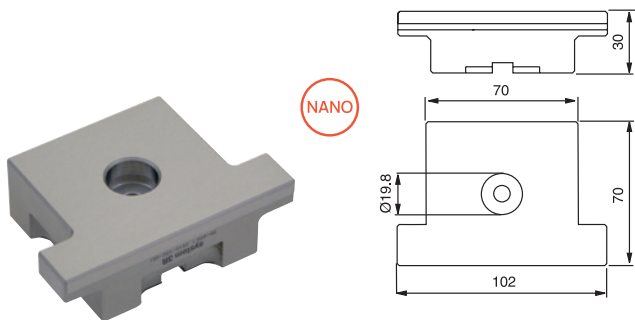


MacroNano – Accessories

Control ruler, MacroNano, 3R-606.1-N

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm.
- Weight 1.4 kg.



Drawbar, 3R-605.1E

- Ø20x57.1 mm with flushing holes Ø7 mm.
- Supplied in sets of 10.



Locking ring key, 3R-605-GE

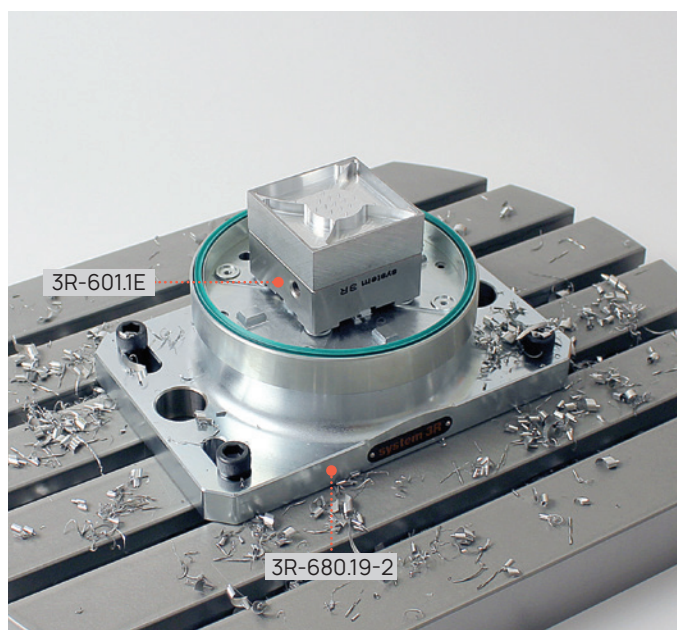
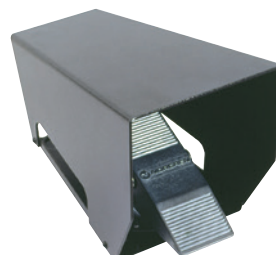
To lift the locking ring of the drawbars.

- Supplied in sets of 2.



Air unit, 3R-611.2

Foot operation of pneumatic chucks.



Air unit, 3R-611.4

Unit for operation of pneumatic chucks. Two functions, opened/closed.

