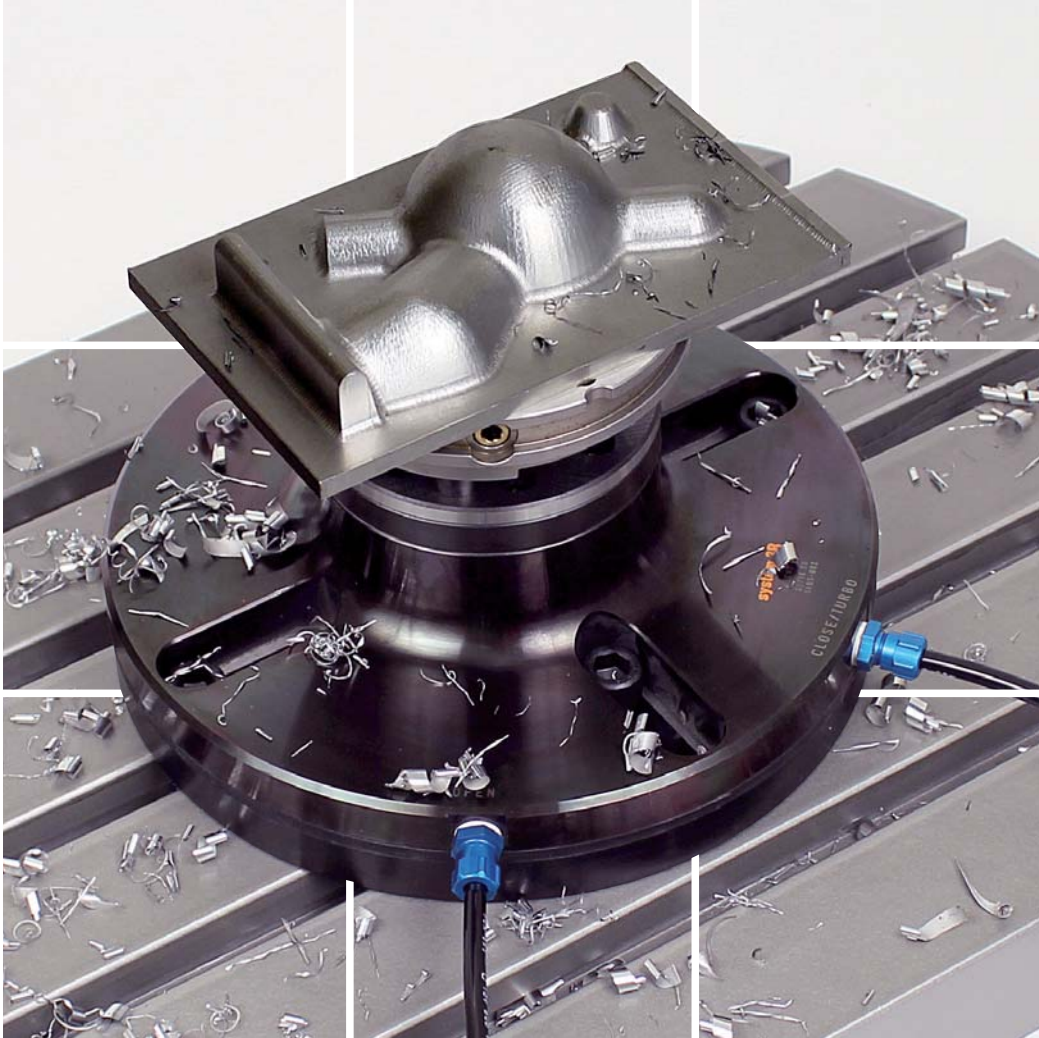


Reference systems for precision machining




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Care for the environment and protection of natural resources are key elements in System 3R's operations

- We take all necessary precautions to prevent contamination of soil, air and water.
- In our production processes, we continually improve the efficiency of our energy use.
- The products and methodologies we offer the market improve the efficiency of our customers' use of existing resources.

 Manufactured to meet System 3R's quality requirements, but partly or completely made in a production plant that is not covered by System 3R's ISO9000 certificate

 Indicates that the product will normally be shipped within two weeks, provided that it is in stock when the order is placed.

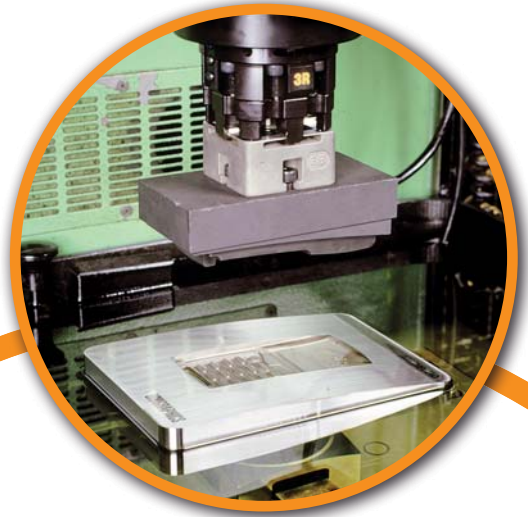
Our thanks to Formverktyg i Nynäshamn AB for the loan of products used in photographs in this catalogue.





Experience always shows that measures to reduce the idle times of your machines are significantly more worthwhile than chasing seconds in the actual machining process.

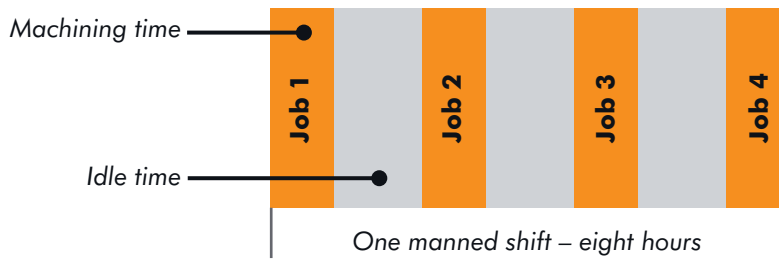
The solution is a stable and exact reference system. This lets you preset away from the machine and then set up the machine with minimum idle time. Quickly and precisely!



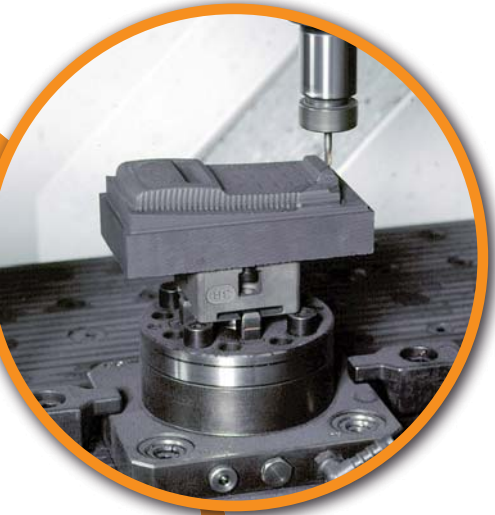
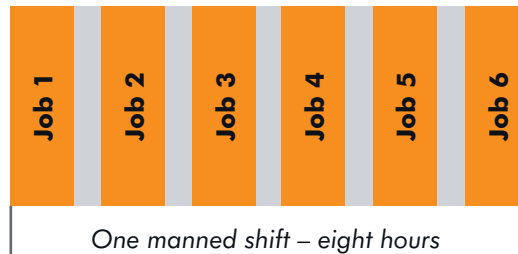
Fitting the machines with the same reference system means that electrodes and workpieces can be moved between the machines without subsequent alignment and checking – **One Minute Set-up**.



Conventional setting-up



Pallet system



Higher productivity, calculation example:

	Conventional setting-up	Pallet system
Working time per day	8	8
Setting-up time per day (hours)	-4	-0.5
Spindle time per day	=4	=7.5
Working days per week	x5	x5
Spindle time per week	= 20	=37.5

Faster payback, calculation example:

	Conventional setting-up	Pallet system
Hourly invoicing (€)	50	50
Spindle time / week (hours)	x20	x37.5
Revenue / week (€)	=1 000	=1 875
Capital cost of machine (€)	150 000	150 000
Capital cost pallet system (€)	0	+10 000
Total capital outlay (€)	=150 000	=160 000
Paybacktime (weeks)	150	85



A reference system minimises setup times

Every minute that can be converted from internal to external setting time increases the spindle time of the machine and with it the productivity of the business.

Big earnings are within your reach

The machine generates revenue when its spindle is turning – and only then.

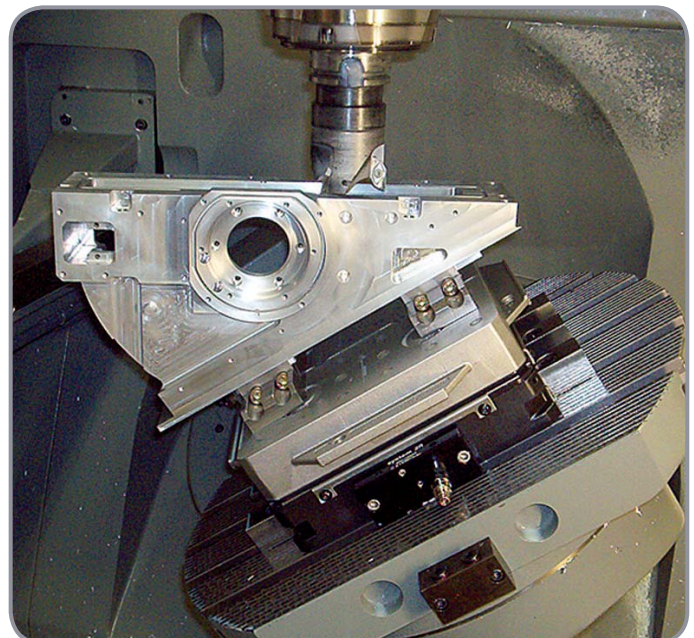
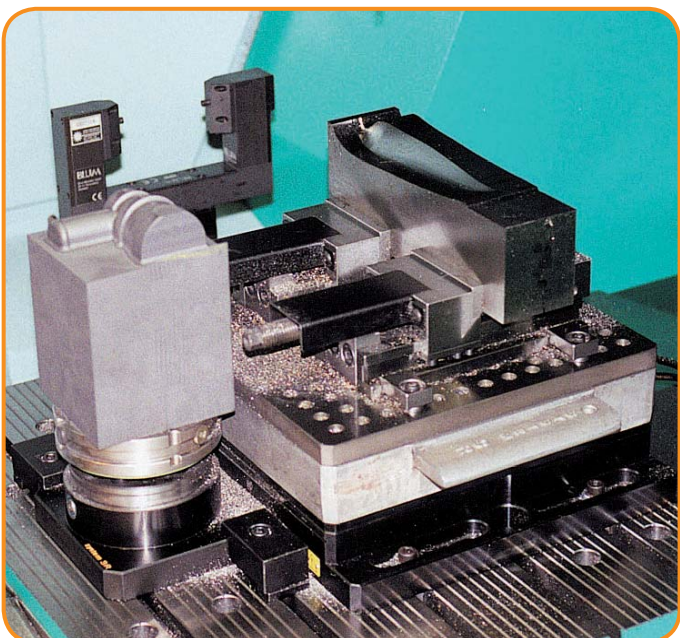
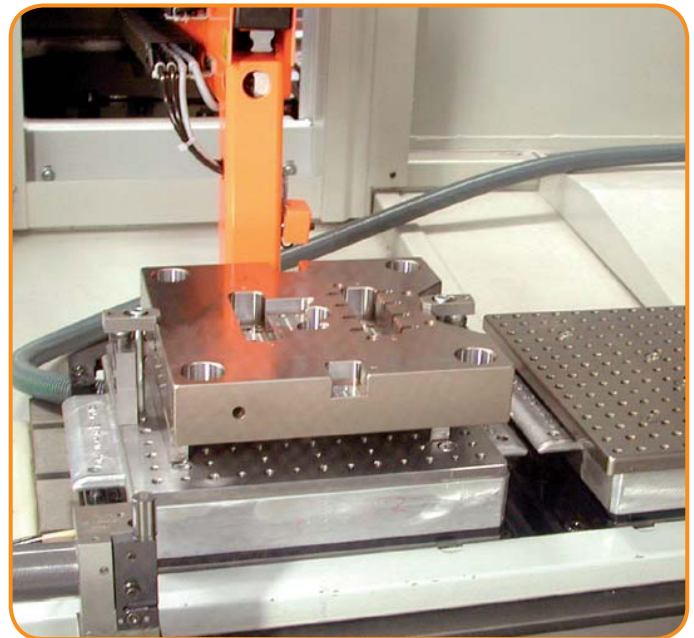
Work smarter, not harder.

Introduction – Rough guidance to tooling

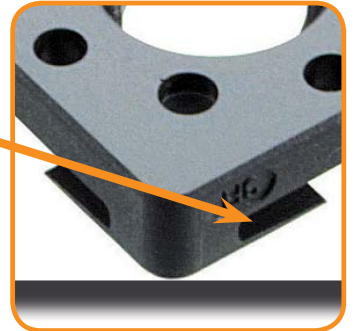
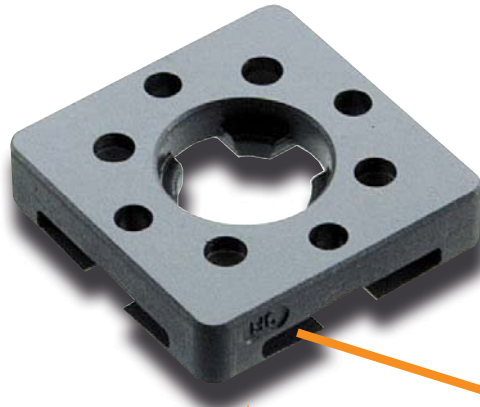
Intervall of pallet size (mm)	Reference system / max workpiece weight kg				
	Macro	MacroMagnum	Matrix	GPS240	Dynafix
∅52-54	5 kg	5 kg			
∅54-∅75	10 kg	10 kg			
∅110-116	50 kg	50 kg	50 kg		
∅142-185	50 kg	100 kg	100 kg		
∅220-260		100 kg	200 kg	100 kg	
∅280-400					250 kg



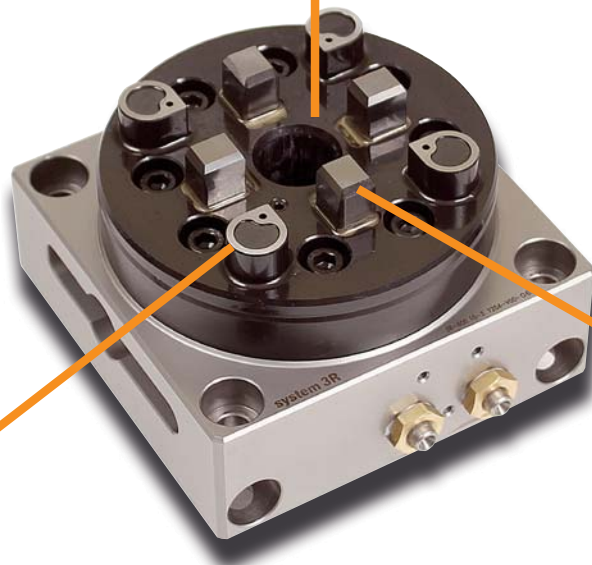
Above list is only a rough guidance which may deviate between article number of pallets as well as individual application. Please check with local 3R representative for more detailed confirmation.



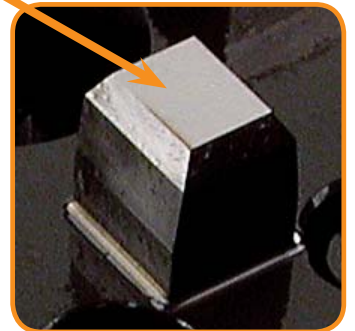
Macro



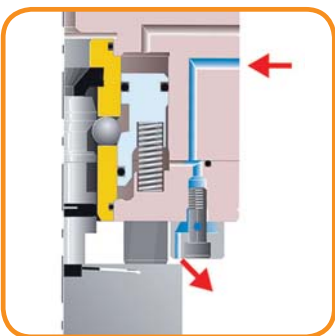
The references of the pallet are created directly in the pallet and on a single plane. There are no loose parts to be installed and adjusted by the user.



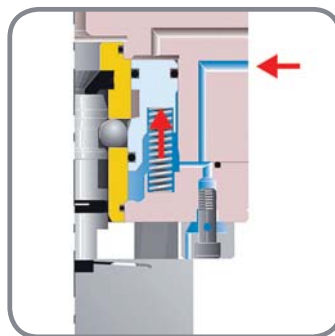
The Z-references of the chuck have generously-sized surfaces to ensure the highest stability.



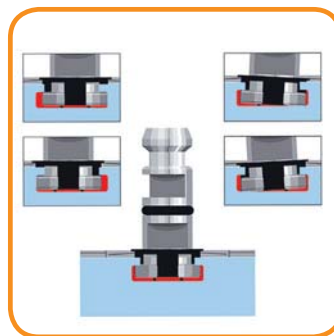
The X and Y references of the chuck are made of cemented carbide.



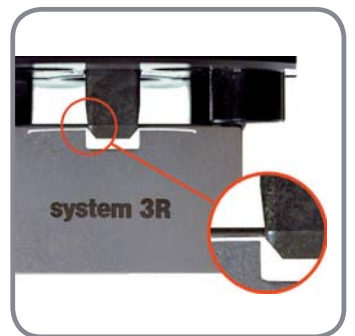
The Z-references are automatically air-blast cleaned, through nozzles in the Z-references of the chuck.



Turbo locking. Extra locking force is provided by air-blast cleaning air which is automatically diverted to the locking piston when the Z-references seal against each other.



Drawbar with floating bayonet fitting. No traction forces, ultimate accuracy.



The lip edge of the pallet is angled to match the angle of the boss. This maximises the mating surface area between the parts, resulting in precision alignment, minimal wear and enduring precision.

VDP (Vibration-Damped Palletisation)

- ... reduces cutting forces by up to 25%. Lower cutting forces gives lower power consumption and less tool wear.
- ... lengthens tool life tool wear by up to 30%, giving lower tool costs.
- ... lengthens the life of the machine spindle. Less vibration in the machine spindle extends the life of the spindle by at least 30%.
- ... gives shorter lead times. VDP allows machining with higher cutting data – better utilisation of the existing machine capacity. A 30 % capacity increase is within your reach.

VDP[®]

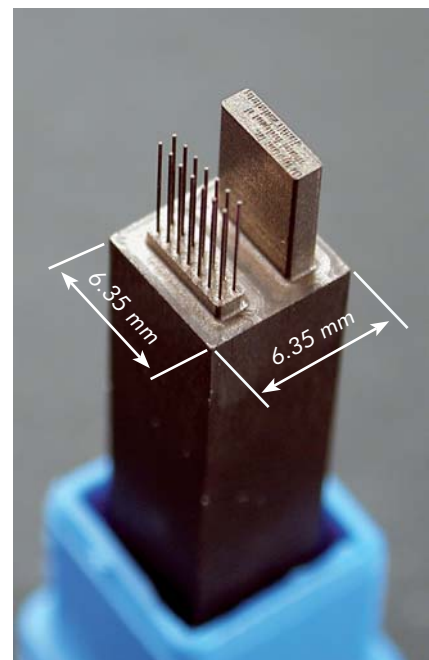
With conventional chucks, vibrations of the workpiece caused by the dynamic forces due to the action and rotation of the cutting tool. Restrictions therefore have to be imposed on the rotation speed and feed rate of the cutting tool, to prevent instability and to achieve the necessary surface quality.

Advantages of a damped chuck

After intensive research into the dynamics of chuck systems, machine tool maker System 3R has developed and patented a chuck with vibration-damped palletisation (VDP). By reducing the vibrations of the workpiece and a considerable proportion of the vibrations of the cutting tool, the VDP technology improves the dynamics of the entire metal cutting process. This means that machine tools can be operated at higher speeds with greater accuracy and at the same time with less wear. Workpieces can usually be produced in a single operation within strict dimensional tolerances and with a surface quality in the micrometer range – a millionth of a metre.



- **Higher material removal rate** improves productivity.
- **Better surface finish** reduces the need for finishing.
- **Less tool wear** extends the life of the cutting tools.
- **Less vibration** in the machine spindle.
- **Better dimensional accuracy** gives fewer rejects.
- **Greater scope** for machining difficult materials and complex shapes.
- **Shorter lead times** thanks to a higher material removal rate.
- **Lower noise level** during machining.



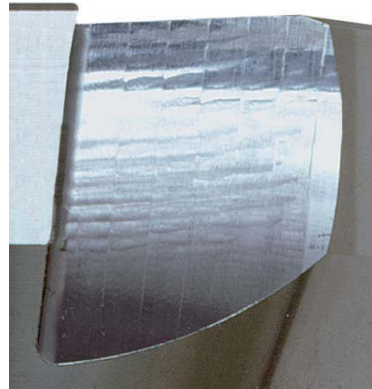
Example Micro Milling:
VDP advantages: The electrode Aspect Ratio (L/\varnothing) was doubled with VDP.
Dimensions: \varnothing 0.134 mm, length 4.8 mm

VDP (Vibration-Damped Palletisation)

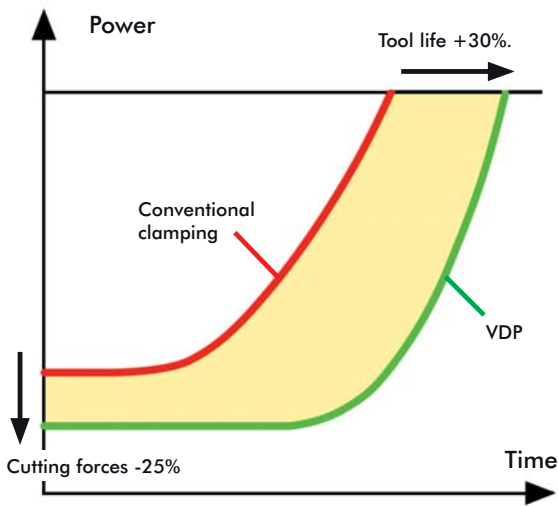
Increase your capacity with $> +30\%$



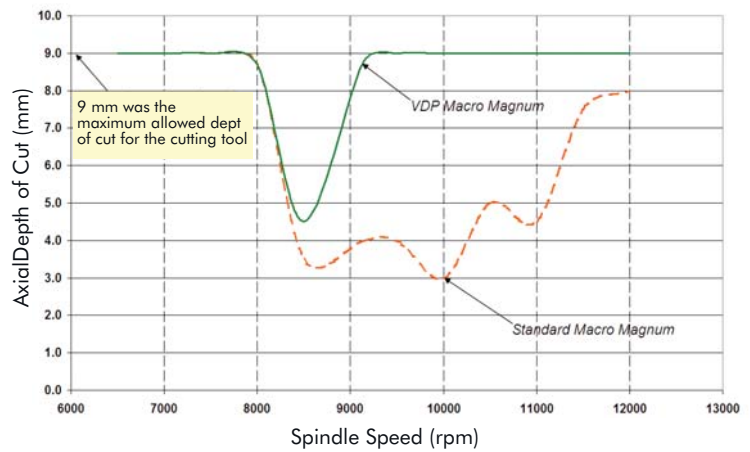
WITH



WITHOUT



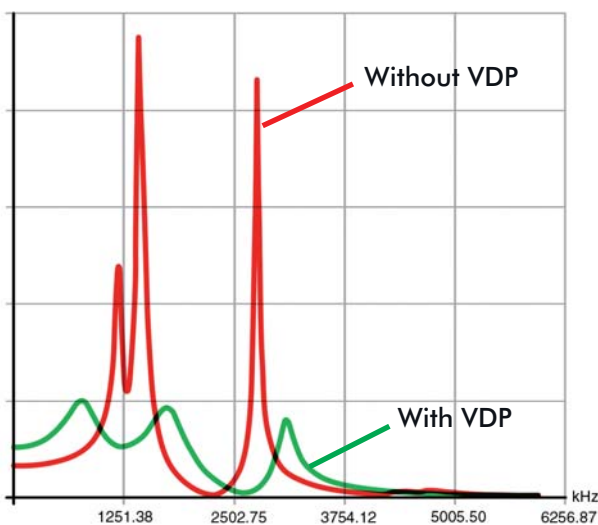
Less tool wear extends the life of the tools = increased revenue.



Process Stability Analysis (Swiss machine tool manufacturer)

Cutting Speed (RPM)	Axial Depth of Cut (mm)		Increase in removal rate due to VDP (%)
	Magnum Std	Magnum VDP	
8500	3.5	4.5	28.6
9000	4.0	9.0*	125
10000	3.0	9.0*	200

*Depth of cut is limited by the cutting tool used for the tests and not by the VDP.



The diagram shows the effect on the oscillation amplitude when machining with the workpiece clamped conventionally and in a damped chuck.

Macro

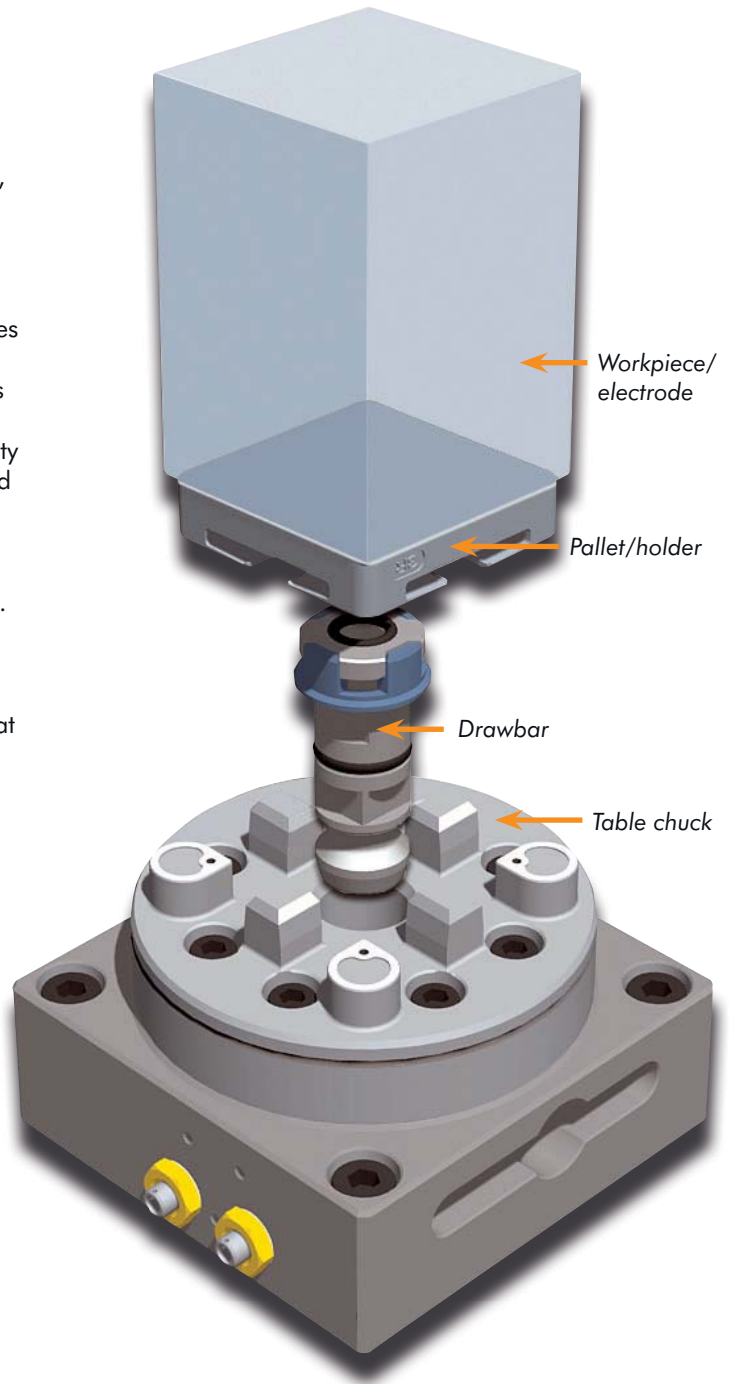
- ... reduces setting-up times.
- ... ensures precision and quality.
- ... has automatic air-blast cleaning of the references in the pneumatic chucks.
- ... has higher locking force in the pneumatic chucks – turbo locking.
- ... has references of cemented carbide or hardened ground steel.
- ... is suitable for automatic changing with System 3R's automation program.

If you want to compete in the global manufacturing industry, you need to study every aspect of efficiency. It's a matter of extracting the highest possible number of spindle-hours from each machine, every day of the week. And here, the importance of a high-class reference system can never be over-estimated. A reference system which reduces setup times to a few minutes.

Macro is such a reference system. A system that minimises the throughput time, and which, thanks to its accuracy, practically eliminates rejects. A system that increases flexibility and profitability. A system that increases competitiveness and ensures the success of its users.

Among users world wide, the Macro system is a byword for precision. And with good reason, since very single Macro product is thoroughly checked before it is dispatched. But precision can be graded too. The Macro products are therefore "classified" in terms of accuracy, material and life – but always with full compatibility – as Standard, High Performance and Nano. Even so, it's worth remembering that the accuracy of a system is determined by the product with the lowest classification.

- Repetition accuracy:
 - MacroNano – within 0.001 mm
 - MacroHighPerformance – within 0.0015 mm
 - MacroStandard – within 0.002 mm
- Locking force – 6000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- Recommended tightening torque, manual chuck – 6 Nm
- Recommended max workpiece weight – 50 kg.



Macro – Chucks

Lathe chucks	Article number	Drawbar	Feature
Manual Std	3R-600.22	3R-605.2	Mounting flange
Manual HP	3R-600.20	3R-605.1 / 3R-605.4	Carbide references, 4 Nm
Pneumatic Std	3R-600.1-30	3R-605.1 / 3R-605.4	

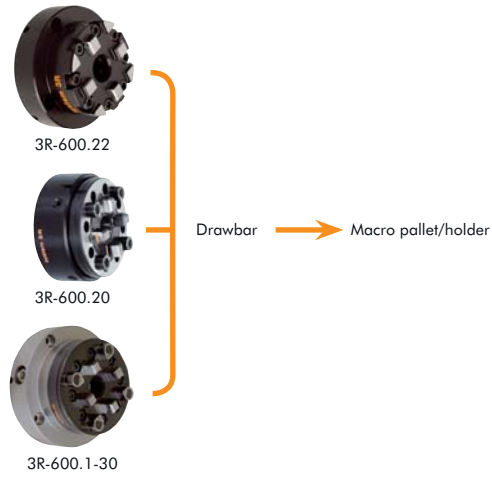
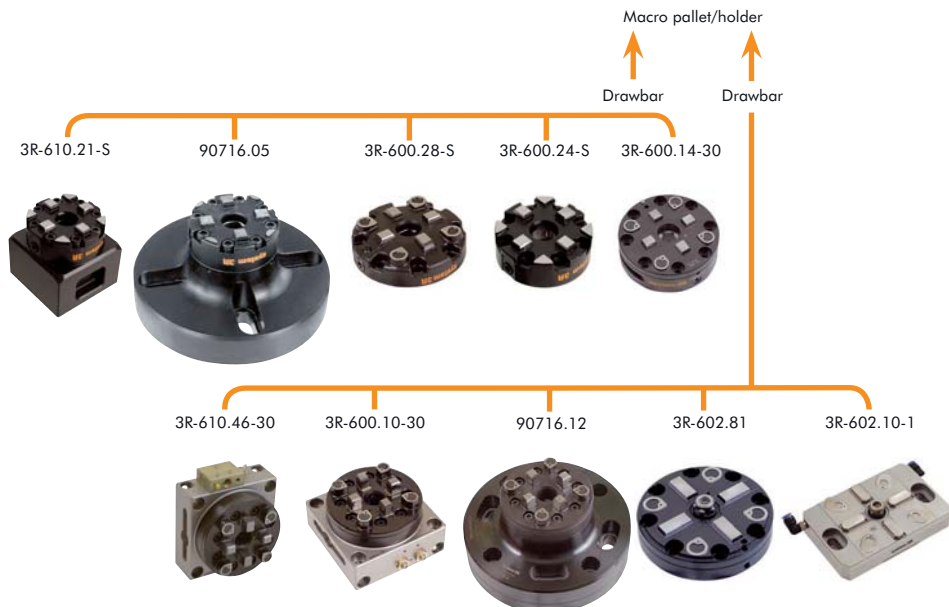


Table chucks	Article number	Drawbar	Feature
Manual Std	3R-610.21-S	3R-605.2	horizontal and vertical, 6 Nm
Manual Std	90716.05	3R-605.2	vibration-damped, 6 Nm, Ø75 mm
Manual VDP	3R-600.28-S	3R-605.2	low profile, 6 Nm, Ø100 mm
Manual Std	3R-600.24-S	3R-605.2	6 Nm, Ø75 mm
Pneumatic Std	3R-610.46-30	3R-605.1 / 3R-605.4	horizontal and vertical
Pneumatic Std	3R-600.10-30	3R-605.1 / 3R-605.4	
Pneumatic Std	3R-600.14-30	3R-605.2	low profile
Pneumatic HP	3R-610.19	3R-605.1 / 3R-605.4	horizontal and vertical. 3Rrefix Ø20
Pneumatic VDP	90716.12	3R-605.1 / 3R-605.4	vibration-damped
Pneumatic Std	3R-602.81	3R-605.10	low profile
Pneumatic HP	3R-602.10-1	3R-605.10	rust-resistant

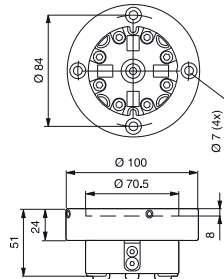


Macro – Chucks

Manual lathe chuck, MacroStd 3R-600.22

With setting screws for centring

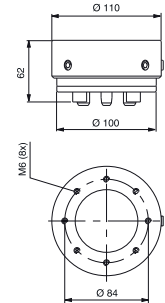
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Weight 2.1 kg



Manual chuck, MacroHP 3R-600.20

For mounting on the machine spindle with 3R-A3620 or on a lathe taper with centring ring 3R-612.6.

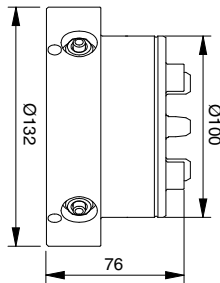
- Required drawbar 3R-605.1 or 3R-605.4
- Fixed index positions 4x90°
- Tightening torque 4 Nm
- Weight 3.6 kg



Pneumatic chuck, MacroStd 3R-600.1-30

Pneumatic chuck for permanent mounting on the machine spindle or onto the machine table.

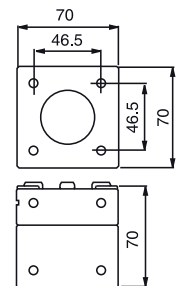
- Required drawbar 3R-605.1
- Fixed index positions 4x90°
- Turbo locking
- Weight 4 kg



Manual chuck, MacroStd 3R-610.21

Three ground faces for vertical or horizontal mounting on the machine table.

- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing duct
- Weight 2.2 kg



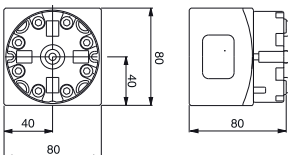
Manual chuck, MacroStd 3R-610.21-S

Two ground faces for vertical or horizontal mounting on the machine table.

- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing duct
- Weight 3.5 kg

90842

- Required drawbar 3R-605.1, otherwise as 3R-610.21-S

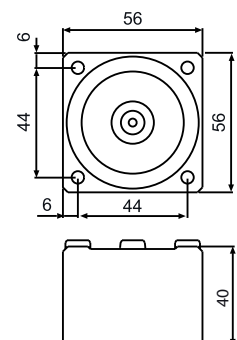


Except 90842

Pneumatic chuck, MacroHP 3R-600.15-3

Pneumatic chuck for permanent mounting on the machine table.

- Drawbar 3R-605.2RS included
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Rust resistant
- Weight 0.8 kg

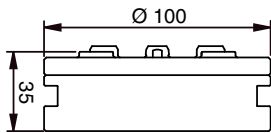


Macro – Chucks

Pneumatic chuck (low profile), MacroStd 3R-600.14-30

Pneumatic chuck for permanent mounting on the machine table.

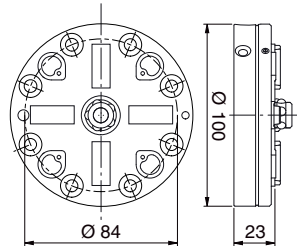
- Required drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Weight 2 kg



Pneumatic chuck (low profile), MacroStd 3R-602.81

Pneumatic chuck for permanent mounting on the machine table.

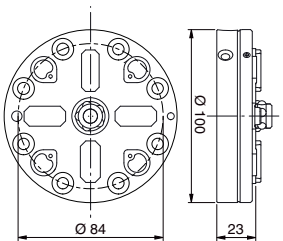
- Required drawbar 3R-605.10
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Weight 1 kg



Pneumatic chuck (low profile), MacroHP 3R-602.81RS

Pneumatic chuck for permanent mounting on the machine table.

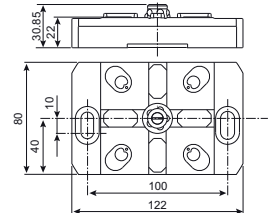
- Required drawbar 3R-605.10
- Clamping force 6000 N
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Rust resistant
- Weight 1 kg



Pneumatic chuck, MacroHP 3R-602.10-1

Pneumatic chuck for Macro holders. Supplied with drawbar 3R-605.10 and protective cover.

- Clamping force 7000 N
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Weight 1.0 kg



Pneumatic table chuck, VDP 3R-602.10-V

Pneumatic vibration-damped chuck, low-profile version.

- Required drawbar 3R-605.10
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking

VDP[®]



Pneumatic table chuck, VDP 90716.09

Pneumatic vibration-damped chuck.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg

VDP[®]

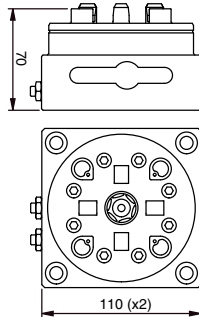


Macro – Chucks

Pneumatic table chuck, MacroStd 3R-600.10-30

Pneumatic chuck locked/opened with air gun.

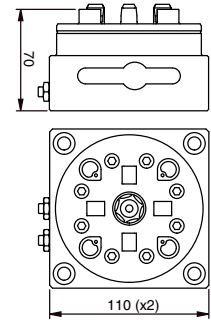
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg



Pneumatic chuck, MacroHP 3R-600.10-3

Pneumatic chuck locked/opened with air gun.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Weight 4.4 kg

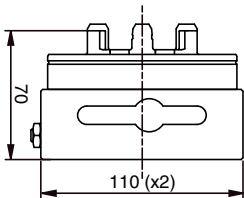


Pneumatic table chuck, MacroStd 3R-600.10-31

Pneumatic chuck locked/opened with air gun.

Note: For debris guard 3R-SP27962.

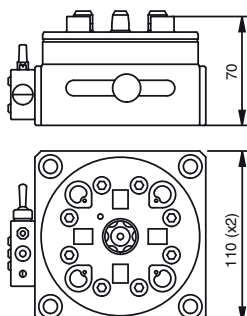
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg



Pneumatic chuck, MacroStd 3R-610.46-30

Pneumatic chuck for horizontal or vertical use.

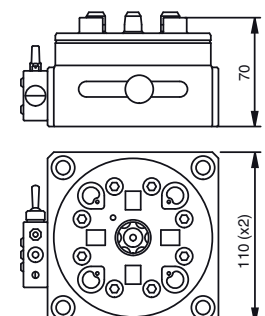
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air unit included
- Weight 4.4 kg



Pneumatic table chuck, MacroHP 3R-610.46-3

Pneumatic chuck for horizontal or vertical use.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air unit included
- References of cemented carbide
- Weight 4.4 kg

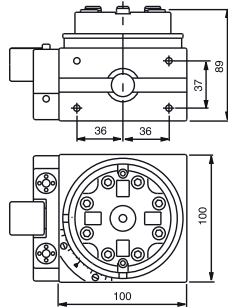


Macro – Chucks

Manual 3R block, MacroStd 3R-610.4

For vertical or horizontal mounting on the machine table.

- Required drawbar 3R-605.2
- Fixed index positions 24x15°
- Vernier scale
- Weight 5.5 kg



Pneumatic table chuck, VDP 90716.12



Pneumatic vibration-damped chuck.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg



Manual table chuck, VDP 90716.05



Manual vibration-damped chuck, $\varnothing 170$ mm.

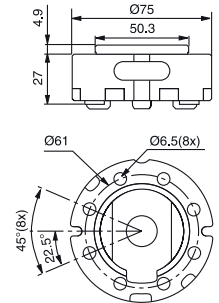
- Required drawbar 3R-605.2
- Building-in height 85 mm.
- Centre spacing 63 to 100 mm
- Weight 6 kg



Manual chuck, MacroStd 3R-600.23-S

Cast chuck with mounting flange for mounting on the machine spindle or in a fixture, alternatively 3R-A19724, on the machine table.

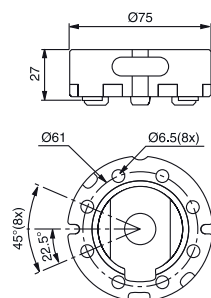
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0,7 kg



Manual chuck, MacroStd 3R-600.24-S

Cast chuck with ground back face for mounting on the machine spindle with 3R-A11489 or in a fixture on the machine table.

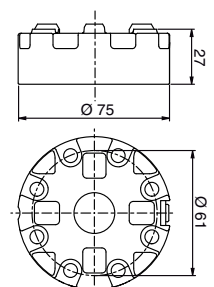
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0,7 kg



Manual chuck, MacroHP 3R-600.24RS

Manual chuck for Macro holder. Designed for permanent mounting.

- Tightening torque 6 Nm
- Required drawbar 3R-605.2RS
- Rustresistant
- Fixed index positions 4x90°
- Weight 0.7 kg



Macro – Chucks

Pneumatic chuck, MacroStd 90412.1X

Pneumatic chuck with built-on surface-mounted swivel. Intended for B-axes and similar. Air connection from the side. For further information contact System 3R.

- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Turbo locking



Pneumatic chuck, MacroHP 90412.2X

Pneumatic chuck with integral swivel at the rear. Intended for B-axes and similar. Air connection from the rear. For further information contact System 3R.

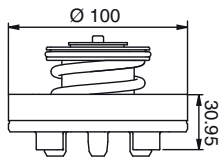
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Turbo locking



Pneumatic chuck, MacroStd 3R-SP24460

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.

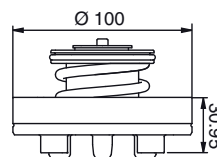
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg



Pneumatic built-in chuck, MacroHP 3R-SP26771-RS

Chuck for Macro holder. For permanent mounting on the machine spindle or fixture

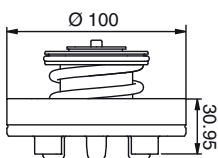
- Clamping force 6000 N
- Required drawbar 3R-605.1RS
- Fixed index positions $4 \times 90^\circ$
- Weight 2 kg



Pneumatic chuck, MacroHP 3R-SP26771

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- References of cemented carbide
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg



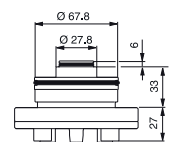
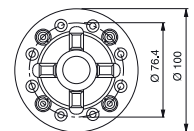
Pneumatic chucks, MacroHP 3R-SP7359

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.

- Required drawbar 3R-605.1, 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg

3R-SP7359-RS

- Rust-resistant version, otherwise as 3R-SP7359

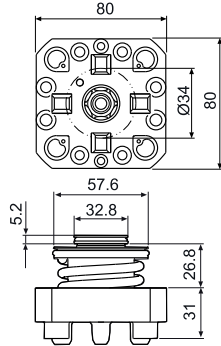


Macro – Chucks & Chuck adapters

Pneumatic chuck, MacroStd 3R-SP25442

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.

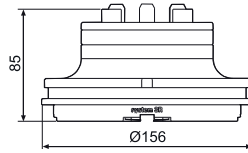
- Required drawbar 3R-605.1, 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Turbo locking
- Weight 1.8 kg



Pneumatic chuck adapter, MacroMagnum-Macro 90793

MacroMagnum chuck adapter with built-in pneumatic Macro chuck for mounting in 90724.

- Weight 4.5 kg



Hydraulic chucks

Chucks with hydraulic locking of end mills for re-grinding or new production.

K-40338.4

- $\varnothing 10$ mm
- Construction height 80 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.3 kg

K-40338.3

- $\varnothing 16$ mm
- Construction height 80 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.4 kg

K-40339.1

- $\varnothing 20$ mm
- Construction height 90 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.6 kg

K-40338.2

- $\varnothing 25$ mm
- Construction height 102.5 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.7 kg

K-40338.5

- $\varnothing 32$ mm
- Construction height 101 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.8 kg

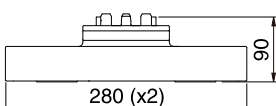
K-40338.1

- $\varnothing 40$ mm
- Construction height 140 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 2.2 kg

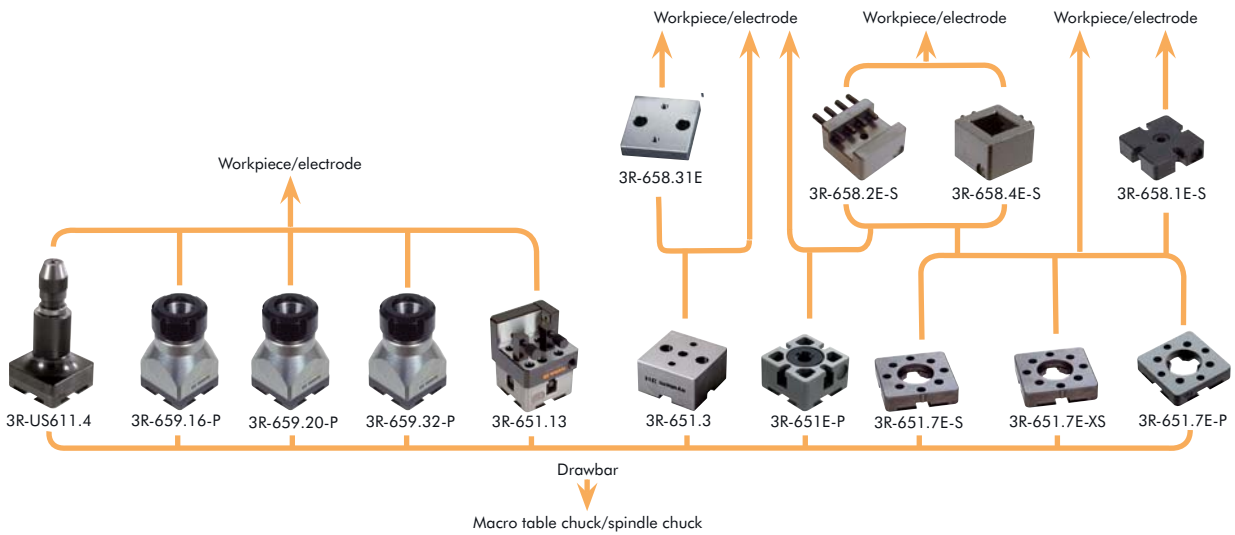


Pneumatic chuck adapter, Dynafix-Macro 90356.22

Dynafix chuck adapter with built-in pneumatic Macro chuck for mounting in 90356.10 or 90576.05.



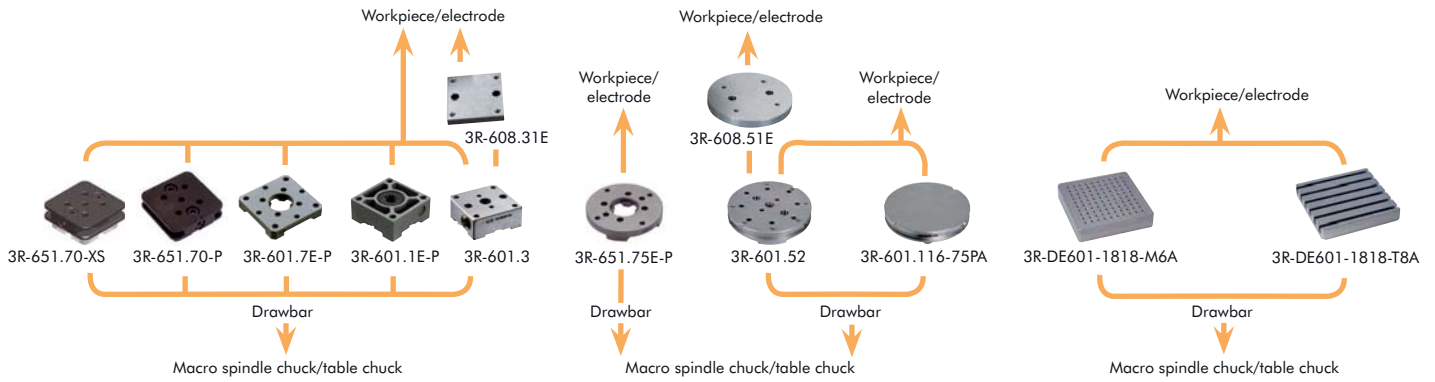
Macro – Pallets, holders & spacers



Holder, pallets and ref. element, 54x54 mm	Article number	Feature
Hardened reference element 12.5 mm, HP	3R-651.7E-P	rust-resistant
Hardened reference element 12.5 mm, Std	3R-651.7E-XS	
Hardened reference element 12.5 mm, Std	3R-651.7E-S	surface-treated
Hardened pallet 30 mm , HP	3R-651E-P	rust-resistant
Hardened pallet 30 mm , HP	3R-651.3	52x52 mm / 3Refix Ø10, rust-resistant
Unhardened pallet 14.4 mm	3R-658.31E	52x52 mm / 3Refix Ø10
Hardened holder, HP	3R-651.13	<30x30 mm
Unhardened holder	3R-658.4E-S	<30x30 mm
Unhardened holder	3R-658.2E-S	<30 mm
Spacer plate standard and HP	3R-658.1E-S	
Collet chuck ER16, HP	3R-659.16-P	Ø0,5-10 mm, rust-resistant
Collet chuck ER20, HP	3R-659.20-P	Ø1-13 mm, rust-resistant
Collet chuck ER32, HP	3R-659.32-P	Ø2-20 mm, rust-resistant
Three-jaw chuck	3R-US611.4	



Macro – Pallets, holders & spacers



Pallets and ref. elements, 70x70 mm

	Article number	Feature
Hardened reference element 12.5 mm, HP	3R-601.7E-P	rust-resistant
Hardened pallet 30 mm, HP	3R-601.1E-P	rust-resistant
Hardened pallet 30 mm, HP	3R-601.3	rust-resistant. 3Refix Ø10
Unhardened pallet 14.2 mm	3R-608.31E	3Refix Ø10
Unhardened pallet, HP	3R-651.70-P	reference element 54x54 mm
Unhardened pallet, Std	3R-651.70-XS	reference element 54x54 mm

Ref. element, Ø75 mm

Hardened reference element 12.5 mm standard and HP	3R-651.75E-P	rust-resistant
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Pallets, Ø116 mm

	Article number	Feature
Hardened pallet, HP	3R-601.52	3Refix Ø10 mm, rust-resistant
Unhardened pallet, HP	3R-601.116-75PA	With reference element Ø75 mm
Unhardened pallet	3R-608.51E	3Refix Ø10 mm

Pallets, 180x180 mm

	Article number	Feature
Aluminium, HP	3R-DE601-1818-M6A	M6 threads
Aluminium, HP	3R-DE601-1818-T8M	T-slot. Not automatic changing



Macro – Pallets & holders

Pallet Ø116 mm 3R-601.116-75PA

Unhardened palett with reference element 3R-651.75-P.

- X, Y & Z-references hardened
- Ready for code carrier
- Ready for automation



Accessories:

Sealing ring, High 3R-612.116-A

Suitable for chucks with drawbar 3R-605.1.



Sealing ring, Low 3R-612.116-S

Suitable for pneumatic chucks with drawbar 3R-605.2.



Pallet 70x70 mm 3R-651.70-P

Unhardened palett.

- Ready for code carrier
- Ready for automation
- Weight 1 kg.



Pallet 70x70 mm 3R-651.70-XS

Unhardened palett with reference element 3R-651.7-XS

- X, Y & Z-references hardened
- Ready for code carrier
- Ready for automation
- Weight 1 kg.



Accessories:

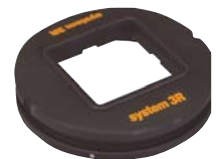
Sealing ring, High 3R-612.54-A

Suitable for chucks with drawbar 3R-605.1.



Sealing ring, Low 3R-612.54-S

Suitable for pneumatic chucks with drawbar 3R-605.2.

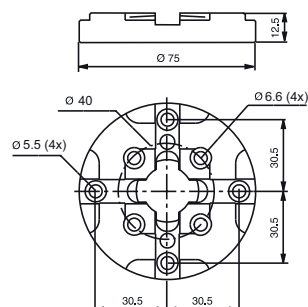


Application example.

Pallet Ø75 mm 3R-651.75E-P

Hardened and milled with clearance holes for eight fixing screws.

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

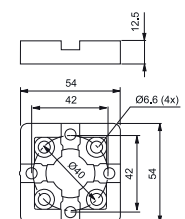


Pallet 54x54 mm, MacroHP 3R-651.7E-P

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.

- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of 8
- Weight per set 1.3 kg



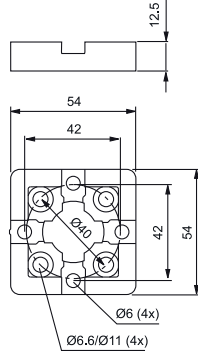
Macro – Pallets & holders

Pallet 54x54 mm, MacroStd 3R-651.7E-XS

Hardened pallet for copper electrodes and workpieces.

Note: Must be mounted on the workpiece before it is locked in a chuck. Note: For graphite electrodes spacer plate 3R-658.1E is required.

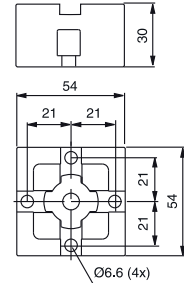
- Untreated side faces
- Adapted for automatic changing
- Supplied in sets of 8
- Weight per set 1.3 kg



Pallet 54x54 mm, MacroHP 3R-651E-P

Hardened, with clearance holes for four fixing screws.

- Adapted for automatic changing
- Ready for code carrier
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.4 kg

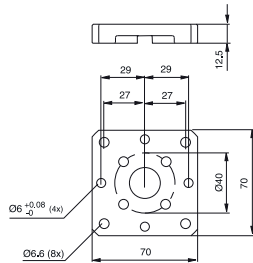
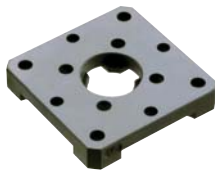


Pallet 70x70 mm, MacroHP 3R-601.7E-P

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.

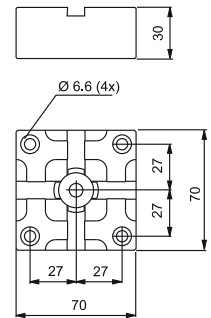
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of 5
- Weight per set 3 kg



Pallet 70x70 mm, MacroHP 3R-601.1E-P

Hardened, with clearance holes for four fixing screws.

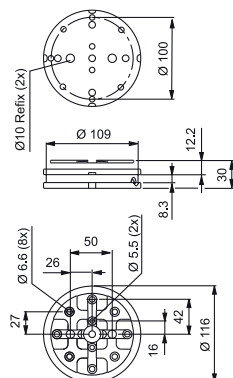
- Adapted for automatic changing
- Ready for code carrier
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Supplied in sets of 5
- Weight per set 3.2 kg



Pallet Ø116 mm 3R-601.52

Hardened, with 3Refix holes and clearance holes for ten fixing screws.

- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Weight 1.9 kg



Accessories:

Sealing ring, High 3R-612.116-A

Suitable for chucks with drawbar 3R-605.1.



Sealing ring, Low 3R-612.116-S

Suitable for pneumatic chucks with drawbar 3R-605.2.



Macro – Pallets & accessories

Pallets 180x180 mm

Anodized aluminium pallets with M6 threads.

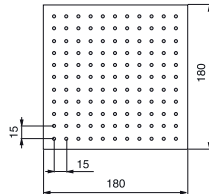
3R-DE601-1818-M6A

- Mounted on pallet 3R-601.116-75PA
- Building-in height 70.3 mm
- Adapted for automatic changing
- Ready for code carrier
- Weight 5.5 kg



3R-DE601-1818-M6M

- Mounted on pallet 3R-601.7E-P
- Building-in height 52.5 mm
- Weight 4 kg



Pallets 180x180 mm

Anodized aluminium pallets with T-slots.

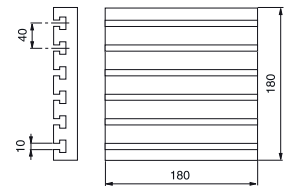
3R-DE601-1818-T8A

- Mounted on pallet 3R-601.116-75PA
- Building-in height 70.3 mm
- Adapted for automatic changing
- Ready for code carrier
- Weight 5.5 kg



3R-DE601-1818-T8M

- Mounted on pallet 3R-601.7E-P
- Building-in height 52.5 mm
- Weight 5.5 kg



Drawbars

3R-605.1E

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

3R-605.2E

- Ø20x36.9 mm with Ø7 mm flushing hole
- Supplied in sets of 5 pcs.

3R-605.1EE

- Supplied in sets of 40 pcs.

3R-605.2EE

- Supplied in sets of 20 pcs.

3R-605.4E

For round pallets adapted for automatic changing

- Ø20x57.1 without flushing hole
- Supplied in sets of 10 pcs.

3R-605.10

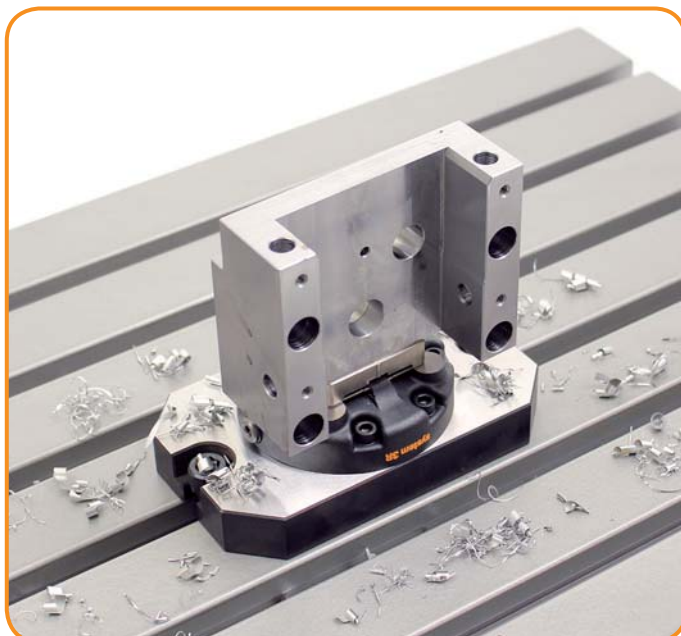
- Ø20x13 mm
- Supplied singly

3R-605.10EE

- Supplied in sets of 20 pcs.

3R-605.4EE

- Supplied in sets of 40 pcs.



Clamping force meter

3R-SSP059

For pneumatic and manual chucks. Suits all chucks from MacroCombi to MacroMagnum.

- Required drawbar 3R-605.1 or similar
- Working range 1-25 kN.
- Weight 5 kg

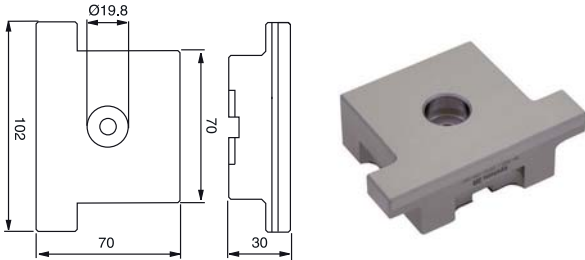


Macro – Accessories

Control ruler 3R-606.1

For setting angular positions and for centring Macro chucks.

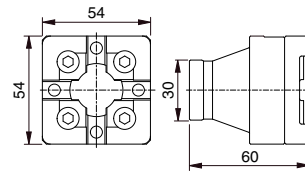
- Ground hole for centring.
- Measuring length 100 mm
- Weight 1.4 kg



Control ruler 3R-656.1

For setting angular positions. Ground outside diameter for centring.

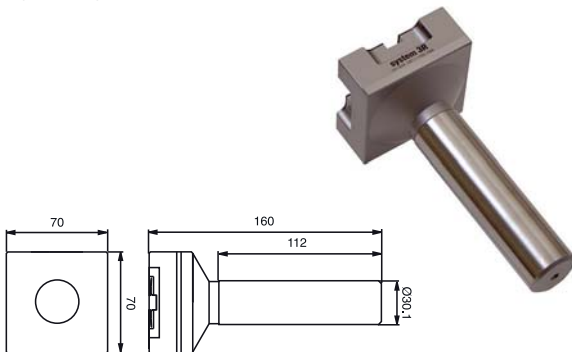
- Measuring length 50 mm
- Weight 0.8 kg



Control rod 3R-606

Check mandrel with ground C-reference for setting Macro chucks.

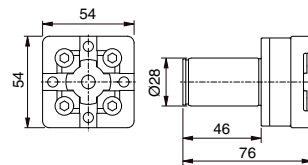
- Measuring length 110 mm
- Weight 2.3 kg



Control rod 3R-656

Check mandrel with ground C-reference for setting Macro chucks.

- Measuring length 38 mm
- Weight 1 kg



Converter kit 90842.01

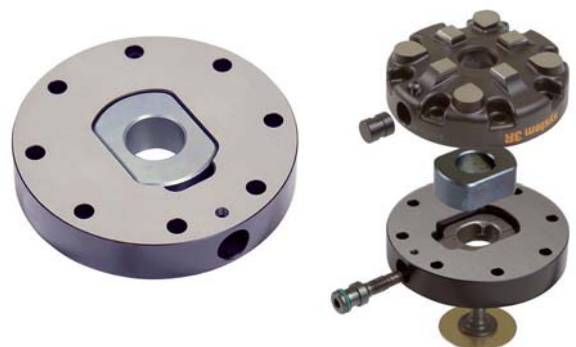
To convert 3R-600.24-S to enable long drawbar 3R-605.1.



Converter kit 3R-A27634

To convert 3R-600.28-S to enable long drawbar 3R-605.1.

- Extra height 18.5 mm



Macro – Accessories

Centring ring 3R-612.6

For centring 3R-600.20.



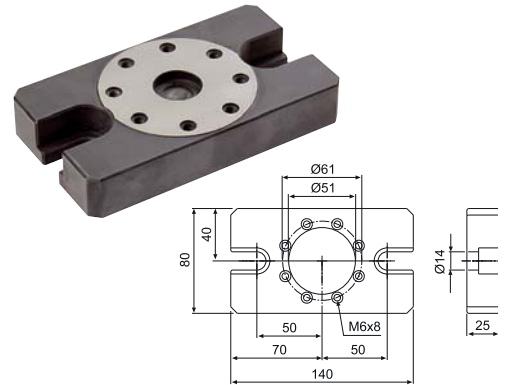
Adapter plate 3R-A26488

For mounting 3R-600.28-S



Adapter plate 3R-A19724

For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on machine table. Supplied with fixing screws for chuck and table.



Splash guard 90027

Splash guard for Macro chucks with long drawbar. Can also be used as a cover for unused chucks.

Note: Does not work with sealing ring 3R-612.116.



Torque wrenches 3R-614-04

Mainly for MacroCombi and Ø10 3Refix mandrels.

- 4 Nm

3R-614-06

For Macro chucks

- 6 Nm

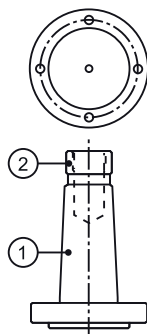


Lathe taper 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

Note: Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted.

Use the order form at the end of the catalogue.



Allen key 3R-333-03

- 3 mm
- Supplied in 10 pcs.



Allen key 3R-333-05

- 5 mm
- Supplied in 10 pcs.



Macro – Accessories

Connection for air gun 90815

For manual operation of pneumatic chucks with air gun.

- Supplied in sets of 2 pcs.



Locking ring key 3R-605-GE

To lift the locking ring of the drawbars.

- Supplied in sets of 2



Labels 3R-LL200P

Supplied with marker pen.

- Size 12x25 mm
- Supplied in sets of 200



Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.4

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



Control unit 3R-611.46

Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.



Code carriers 3R-863.01-10

With pre-programmed unique identity, designed for pallet use.

- Supplied in sets of 10



3Refix mandrel

Note: When positioning with 3Refix mandrels – always tighten the expanding mandrel in the R⁰ hole first.

3R-901-10E

- 3Refix Ø10 mm
- Recommended tightening torque 4 Nm
- Supplied in sets of 10 pcs.
- Weight per set 0.2 kg



3R-901-20E

- 3Refix Ø20 mm
- Recommended tightening torque 10 Nm
- Supplied in sets of 10 pcs.
- Weight per set 1 kg

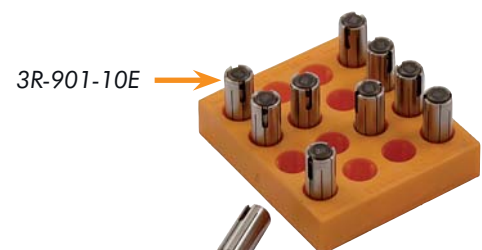


3R-901-10RS

- 3Refix Ø10 mm
- Rust-resistant
- Recommended tightening torque 4 Nm
- Supplied singly
- Weight per set 0.5 kg

3R-901-20RS

- 3Refix Ø20 mm
- Rust-resistant
- Recommended tightening torque 10 Nm
- Supplied singly
- Weight per set 0.1 kg



3R-901-20E



MacroNano

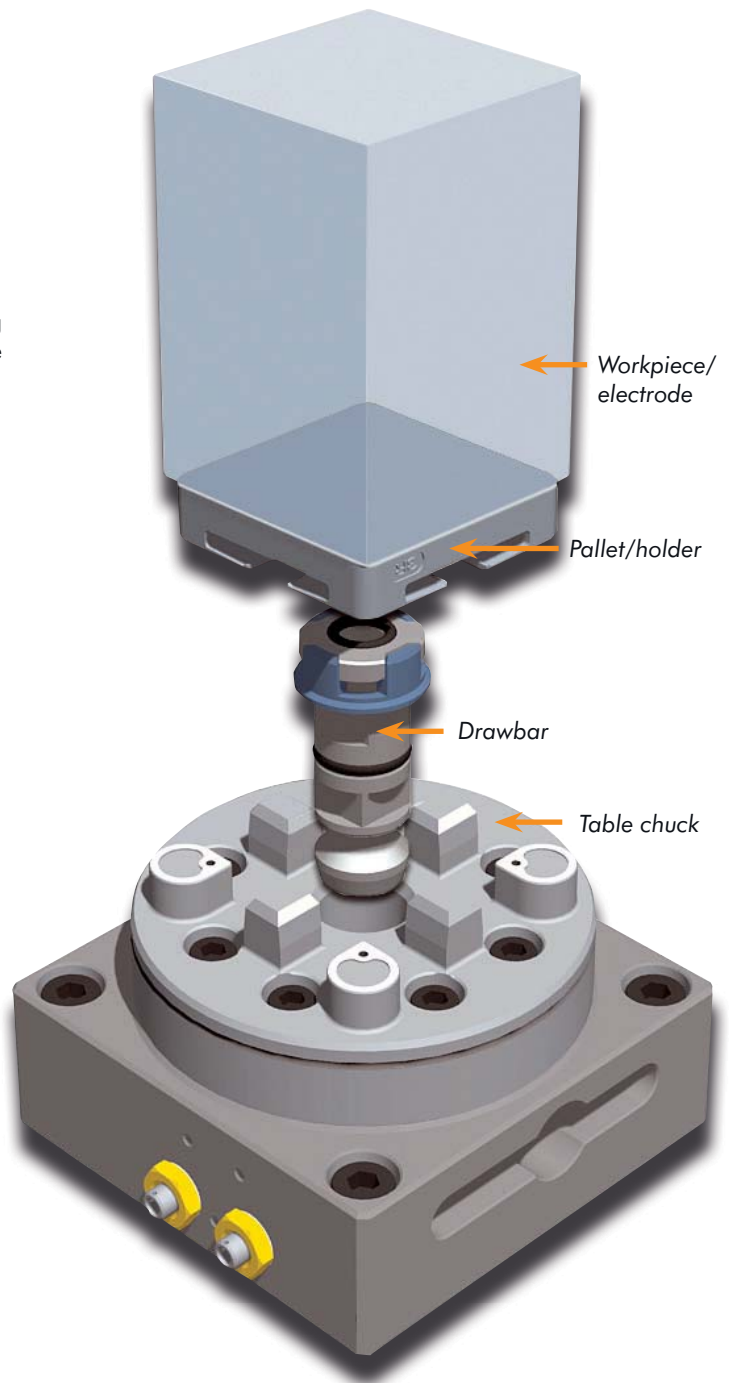
- ... Extremely high accuracy.
- ... High-precision machines are linked together in the production chain, without detracting from the extreme accuracy.
- ... Feedback to the machine for supplementary machining after inspection is possible. This feedback is only meaningful if the pallet system is at least as accurate as the measuring machine.

Workholding for Nano Precision

Nano-precision machining requires nano-precision referencing of workpieces and tools- a real challenge even with state of the art solutions available in the market. This becomes even more challenging when the references need to be established in the shortest possible time.

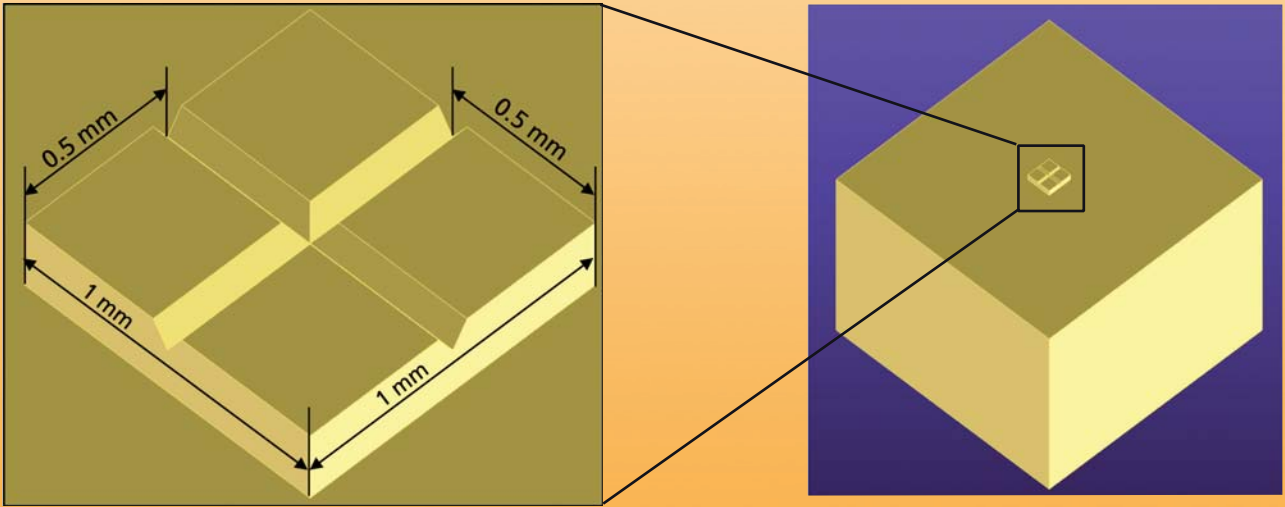
MacroNano system is best described in two words as precise and quick! The MacroNano clamping system links the production chain through an ultra-precision coupling both for workpiece and tool holding.

- Repetition accuracy – within 0,001 mm
- Locking force – 6000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- Recommended max workpiece weight – 50 kg.

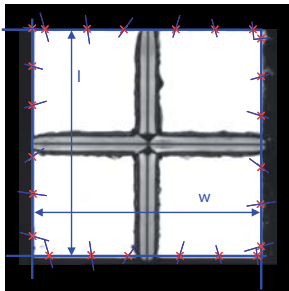


Application example: Microstructuring with Diamond Machining

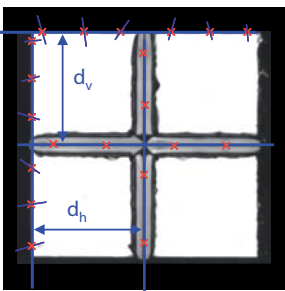
Micro features produced with nano precision



This micro structure is produced by Diamond Flycutting operations on two different machines, each equipped with a MacroNano chuck. The square in the middle of the workpiece (right picture) is produced by plane milling on 1st machine, making use of indexing feature of the MacroNano system. The pallet carrying the workpiece is then transferred to the chuck on 2nd machine to produce the micro-grooves, once again using the indexing feature. The zero reference was determined only once on the 1st machine and then carried through the whole process chain using both the indexing precision and the system precision of the MacroNano system; overall structure deviation is less than 0.5 micron.



Measurement of the cube dimensions

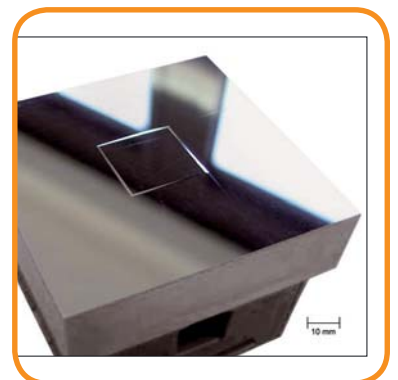


Measurement of groove positions

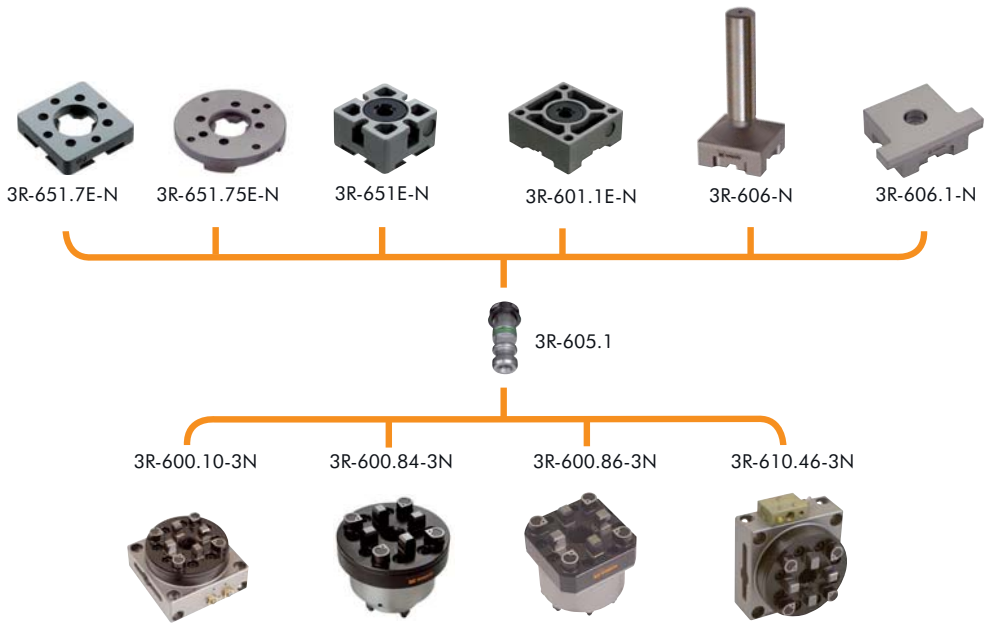
	Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)
W_1	0,9996	l_1	0,9999	d_{v1}	0,4988	d_{h1}	0,5013
W_2	0,9996	l_2	0,9999	d_{v2}	0,4993	d_{h2}	0,4995
W_3	0,9996	l_3	0,9999	d_{v3}	0,4996	d_{h3}	0,5001
W_4	0,9997	l_4	0,9999	d_{v4}	0,4991	d_{h4}	0,4995
W_5	0,9996	l_5	0,9998	d_{v5}	0,5010	d_{h5}	0,5001
W_6	0,9996	l_6	0,9998	d_{v6}	0,5007	d_{h6}	0,5002
W_7	0,9997	l_7	0,9999	d_{v7}	0,4996	d_{h7}	0,5012
W_8	0,9996	l_8	0,9999	d_{v8}	0,4992	d_{h8}	0,5009
W_9	0,9997	l_9	0,9999	d_{v9}	0,4996	d_{h9}	0,5009
W_{10}	0,9996	l_{10}	0,9998	d_{v10}	0,4998	d_{h10}	0,5008
W	0,9996	l	0,9999	d_v	0,4997	d_h	0,5004

Mean values

Overall structure deviation < 0,5 μm



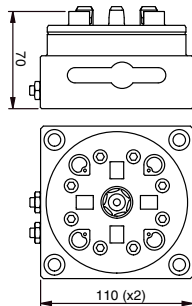
MacroNano – Chucks, Pallets & Accessories



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

Chuck for mounting on the machine table.

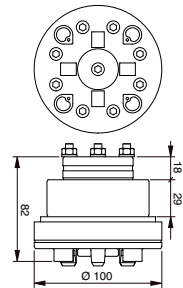
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



Pneumatic chuck, MacroNano 3R-600.84-3N

Chuck for building-in, for example in a fixture, dividing head or B-axis.

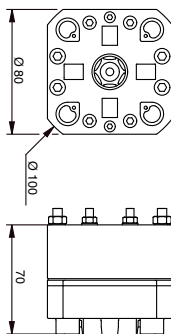
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



Pneumatic chuck, MacroNano 3R-600.86-3N

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

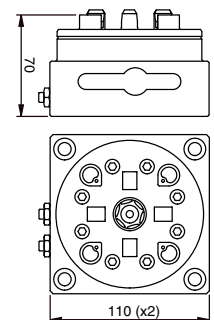
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



Pneumatic table 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 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.

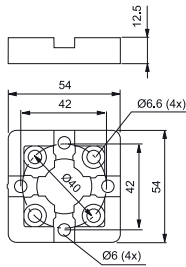


MacroNano – Pallets & Accessories

Pallet 54x54 mm, MacroNano 3R-651.7E-N

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

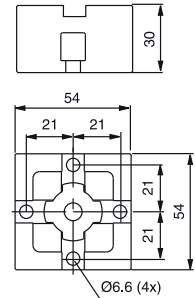
- Fixed index positions 4x90°
- Adapted for automatic changing
- Parallel-ground top and bottom face
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 1.2 kg.



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

Hardened with clearance holes for four fixing screws.

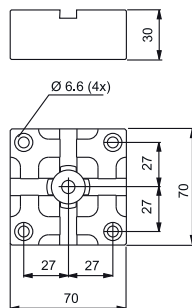
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 3.4 kg.



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

Hardened with clearance holes for four fixing screws.

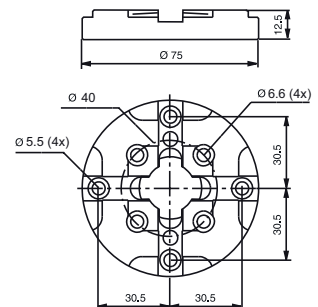
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 5 pcs.
- Weight per set 3.6 kg.



Pallet dia. 75 mm, MacroNano 3R-651.75E-N

Hardened and milled with clearance holes for eight fixing screws.

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



Drawbar 3R-605.1E

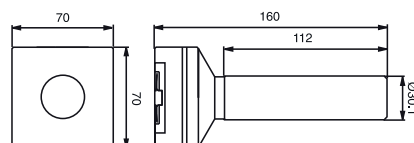
- Ø20x57.1 mm with flushing holes Ø7 mm.
- Supplied in sets of 10 pcs.



Check mandrel, MacroNano 3R-606-N

Check mandrel with ground C-reference for setting Macro chucks.

- Measuring length 110 mm.
- Weight 2.3 kg.

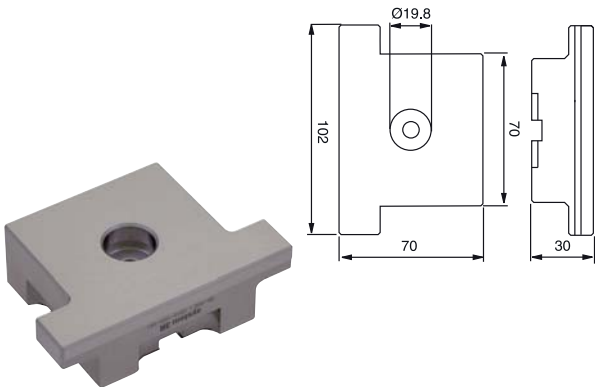


MacroNano – Accessories

Check ruler, MacroNano 3R-606.1-N

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm.
- Weight 1.4 kg.



Locking ring key 3R-605-GE

To lift the locking ring of the drawbars.

- Supplied in sets of 2



Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.4

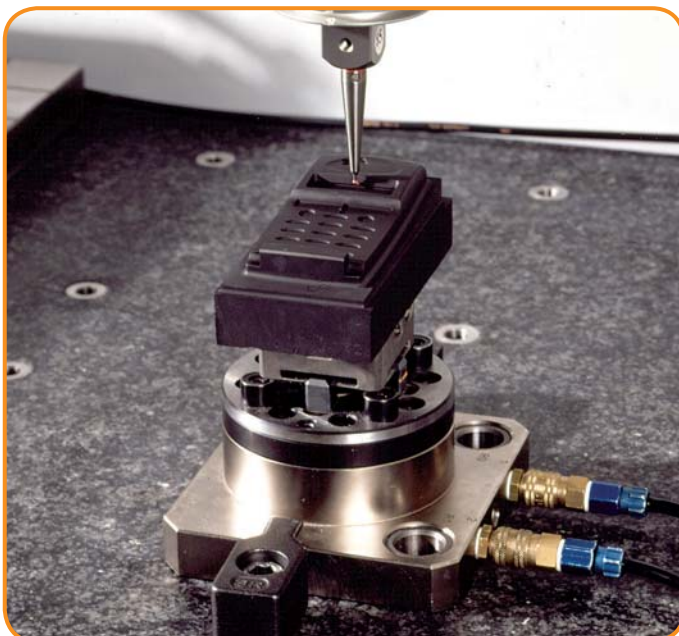
Unit for operation of pneumatic chucks. Two functions, opened/closed.



Code carriers 3R-863.01-10

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

- Supplied in sets of 10



MacroMagnum

- ... allows mounting of both MacroMagnum and Macro pallets
- ... reduces setting-up times
- ... ensures precision and quality
- ... can handle high machining forces
- ... is suitable for automatic changing with System 3R's automation program.

MacroMagnum is larger variant of the patented Macro system. The high clamping force and the position of the reference surfaces far away from the chuck centre mean that MacroMagnum can provide "Macro class" stability and accuracy, even in applications with high machining forces.

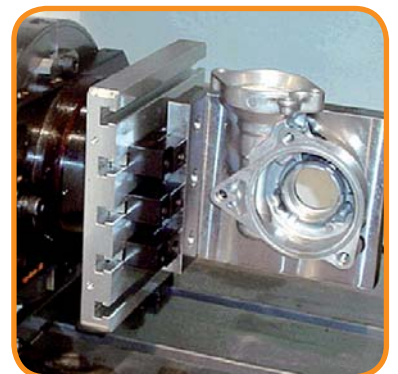
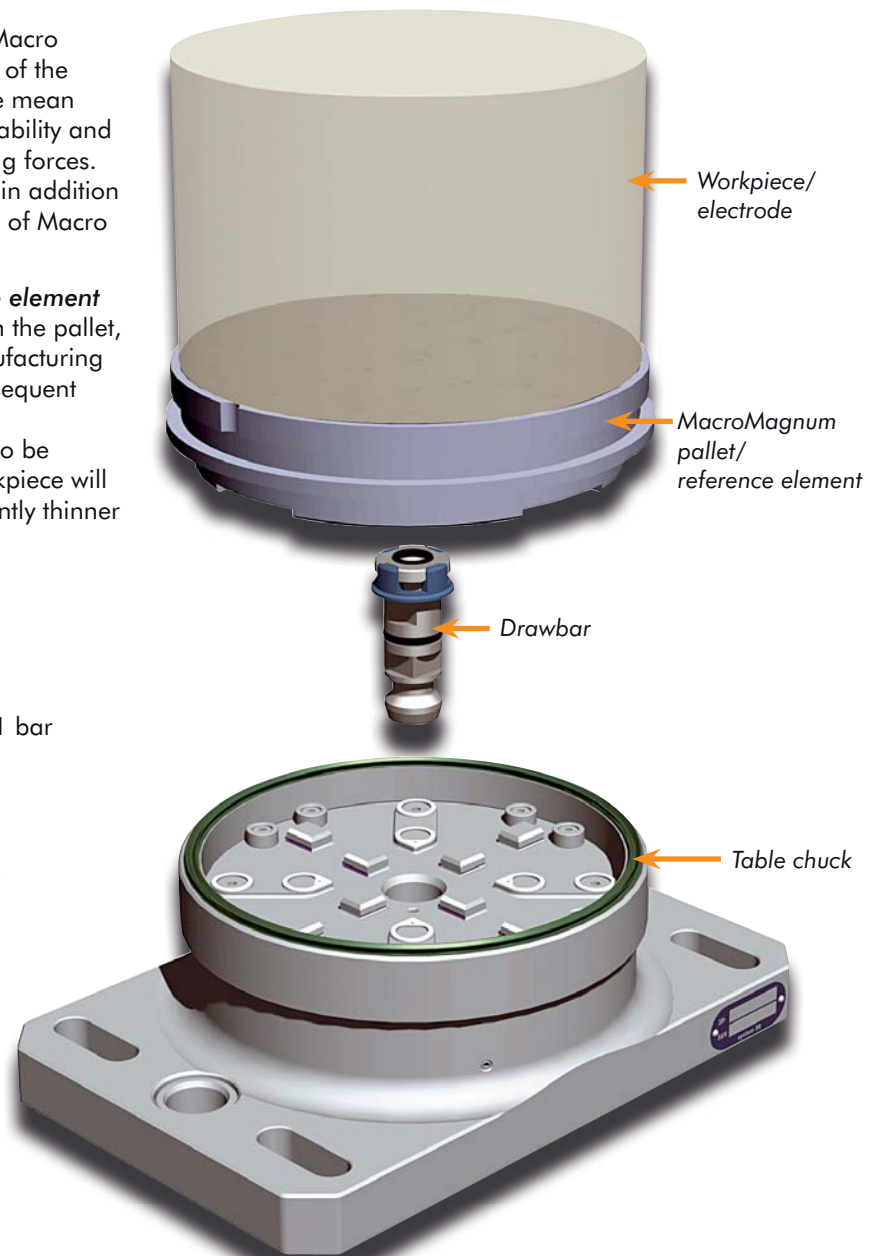
The double references of the chucks mean that in addition to the MacroMagnum pallets, the extensive range of Macro pallets can also be fixed to MacroMagnum.

The difference between a pallet and a reference element

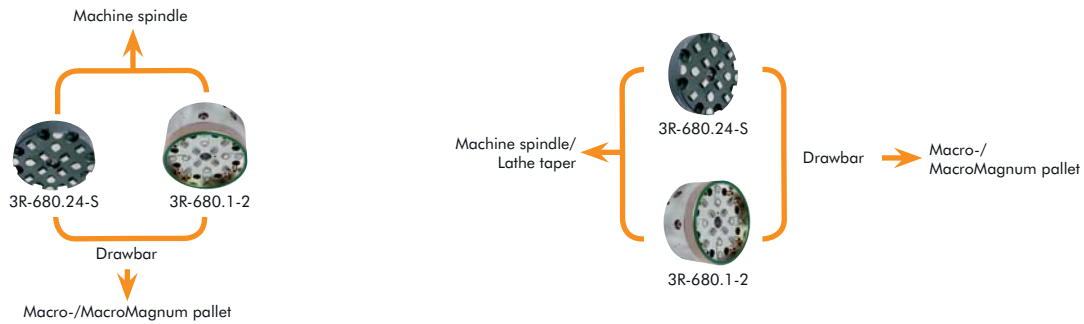
Usually the electrode blank is mounted directly on the pallet, which then carries the blank throughout the manufacturing process – from machine to machine, without subsequent alignment.

The reference elements are primarily intended to be mounted on the fixtures or vices in which the workpiece will be clamped. The reference elements are significantly thinner in order to limit the total construction height.

- Repetition accuracy – within 0.002 mm
- Locking force – 16 000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- Recommended tightening torque manual chuck – Macro-pallet 5 Nm
- Recommended tightening torque manual chuck – MacroMagnum-pallet 12 Nm



MacroMagnum – Chucks



Spindle chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Pneumatic	3R-680.1-2	3R-605.1 / 3R-605.4	matching air unit 3R-611.46
Lathe chucks			
Manual	3R-680.24-S	3R-605.2	low profile, fits 90809.01-10
Pneumatic	3R-680.1-2	3R-605.1 / 3R-605.4	matching air unit 3R-611.46

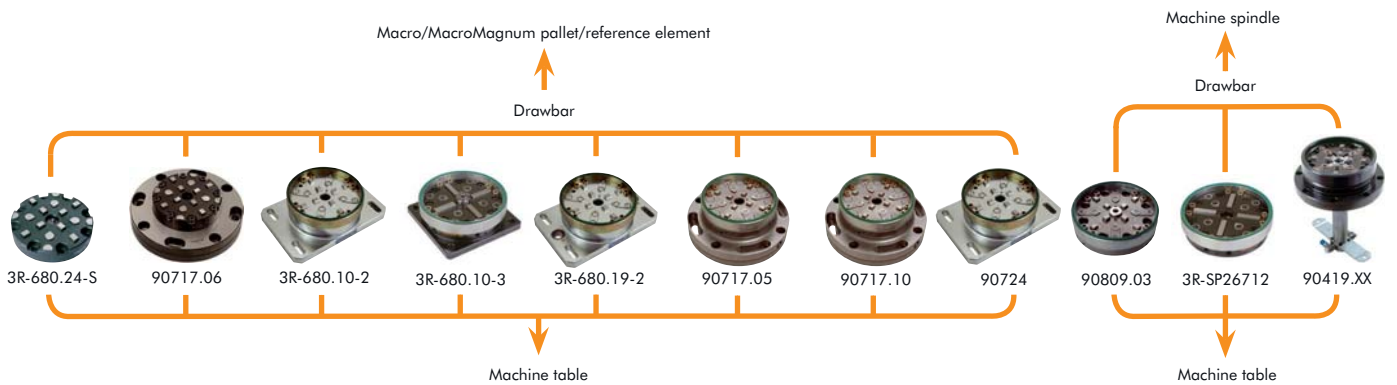
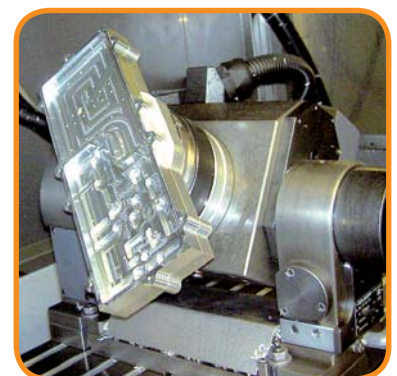
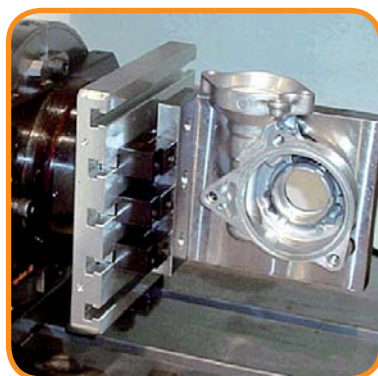


Table chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Manual	90717.06	3R-605.2	vibration-damped
Pneumatic	3R-680.10-2	3R-605.1 / 3R-605.4	matching air unit 3R-611.46
Pneumatic	3R-680.10-3	3R-605.2	low profile, matching air unit 3R-611.2/3R-611.4
Pneumatic	3R-680.19-2	3R-605.1 / 3R-605.4	3Refix Ø20 mm, matching air unit 3R-611.46
Pneumatic	90717.05	3R-605.1 / 3R-605.4	vibration-damped, matching air unit 3R-611.46
Pneumatic	90717.10	3R-605.1 / 3R-605.4	vibration-damped, matching air unit 3R-611.46
Pneumatic	90724	3R-605.1 / 3R-605.4	for chuck adapter, matching air unit 3R-611.46
Built-in chucks			
Pneumatic	90809.03	3R-605.1 / 3R-605.4	matching air unit 3R-611.46
Pneumatic	3R-SP26712	3R-605.2	low profile, matching air unit 3R-611.2/3R-611.4
Pneumatic	90419.XX	3R-605.1 / 3R-605.4	



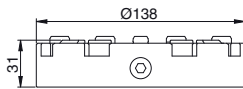
MacroMagnum – Chucks

Manual chuck, Low profile 3R-680.24-S

For permanent mounting on the machine spindle or table.

Note: Master pallet 3R-606.1 or 3R-686.1-HD is required at installation.

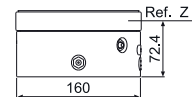
- Required drawbar 3R-605.2.
- Required air pressure 6 ± 1 bar.
- Fixed index positions $4 \times 90^\circ$
- Weight 5 kg.



Pneumatic chuck 3R-680.1-2

Pneumatic chuck for machine spindles and lathes. Opened/locked by an air gun against a valve on the side, or alternatively on the back, of the chuck.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar.
- Fixed index positions $4 \times 90^\circ$
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 9 kg.



Manual table chuck, VDP 90717.06



Manual vibration-damped table chuck.

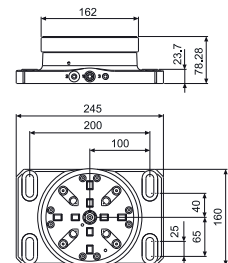
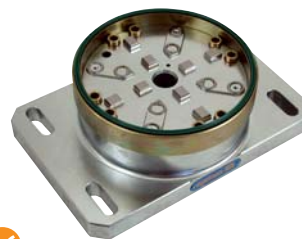
- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Weight 10 kg



Pneumatic table chuck 3R-680.10-2

Pneumatic table chuck.

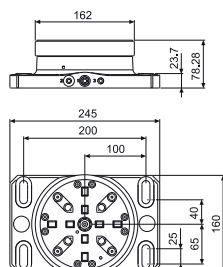
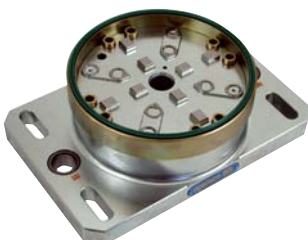
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg



Pneumatic table chuck 3R-680.19-2

Pneumatic table chuck with 3Refix-holes.

- 3Refix $\varnothing 20$ mm
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg



Pneumatic table chuck, VDP 90717.05



Pneumatic vibration-damped chuck.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 13 kg



MacroMagnum – Chucks & chuck adapters

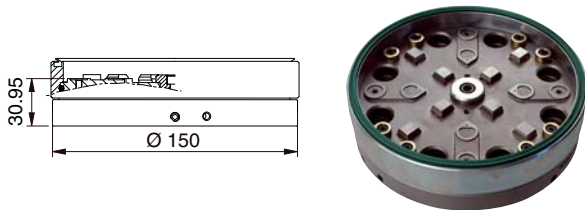


Chuck adapters	Article number	Drawbar	Feature
Pneumatic	90964	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ► Macro
Pneumatic	90793	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ► Macro
Pneumatic	90356.20	3R-605.2 / 3R-605.4	Dynafix ► MacroMagnum

Pneumatic chuck 90809.03

Pneumatic chuck intended for permanent building-in.

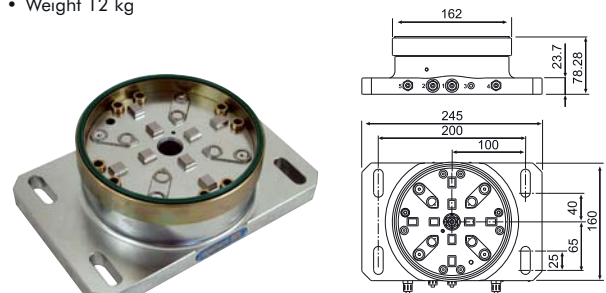
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg



Pneumatic table chuck 90724

Pneumatic table chuck for chuck adapter.

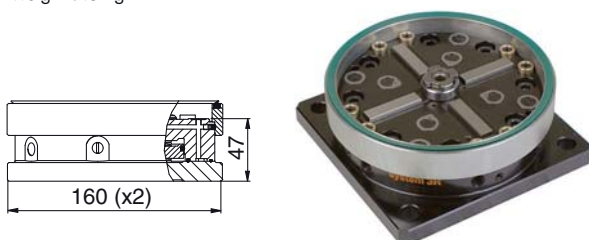
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references on chuck and chuck adapter
- Sealing ring
- Turbo-lockings
- Weight 12 kg



Pneumatic table chuck 3R-680.10-3

For permanent mounting on the machine table.

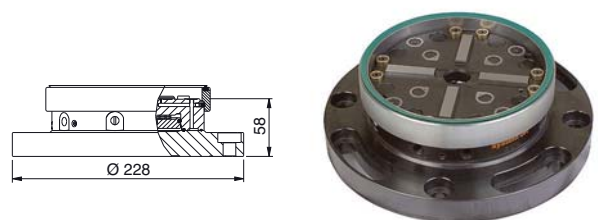
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg



Pneumatic table chuck 3R-680.1-3

For permanent mounting on the machine table.

- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 11.5 kg

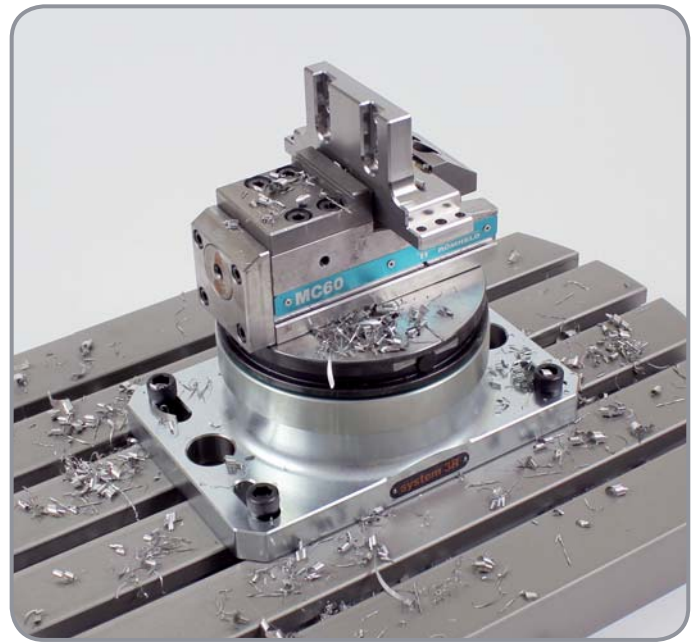
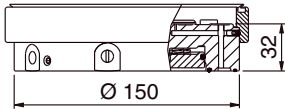


MacroMagnum – Chucks & chuck adapters

Pneumatic chuck 3R-SP26712

For permanent mounting on the machine table.

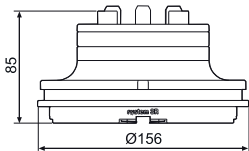
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg



Pneumatic chuck adapter, MacroMagnum-Macro 90793

Chuck adapter with built-in pneumatic Macro chuck for mounting in 90724.

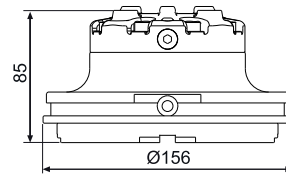
- Weight 4.5 kg



Manual chuck adapter, MacroMagnum-Macro 90964

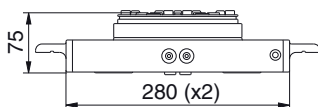
From MacroMagnum into Macro system. Chuck adapter with built-in Macro chuck.

- Requires drawbar 3R-605.2 or similar.
- Solid X & Y-References
- Recommended clamping torque 6 Nm
- Permissible torque 135 Nm
- Clamping force 6000 N
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.3 kg

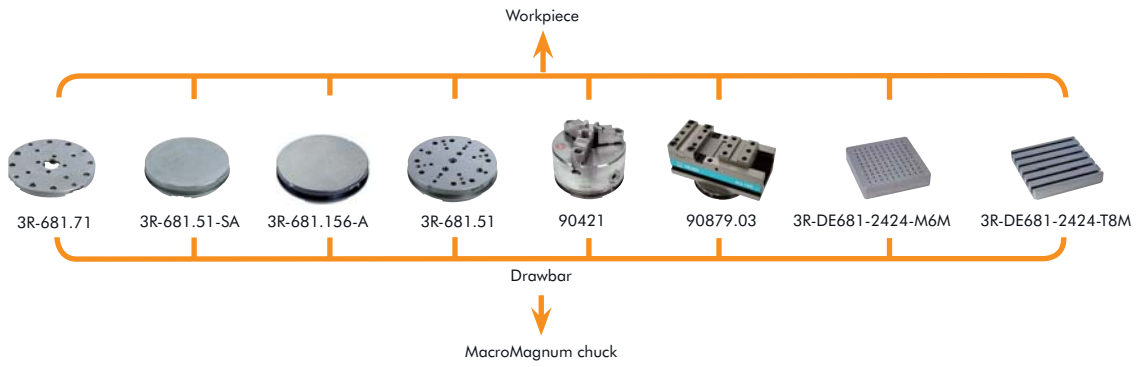


Pneumatic chuck adapter, Dynafix-MacroMagnum 90356.20

Chuck adapter with built-in pneumatic MacroMagnum chuck for mounting in 90356.10 or similar. See Dynafix for further information.



MacroMagnum – Pallets



NOTE: All Macro pallets can be used in the MacroMagnum chucks

Pallets, reference element Ø142 mm

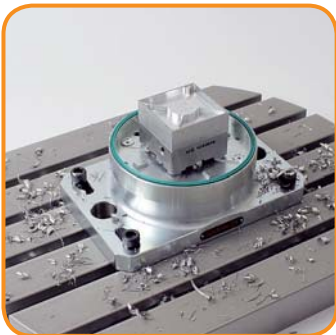
Article number	Feature
Hardened reference element 12.5 mm 3R-681.71	rust-resistant

Pallets Ø156 mm

Article number	Feature
Unhardened pallet 35 mm 3R-681.51-SA	reference element Ø142 mm
Unhardened pallet 35 mm 3R-681.156-A	
Hardened pallet 35 mm 3R-681.51	
Three-jaw chuck 90421	3Refix Ø10 mm
Vice 90879.03	

Pallets 240x240 mm

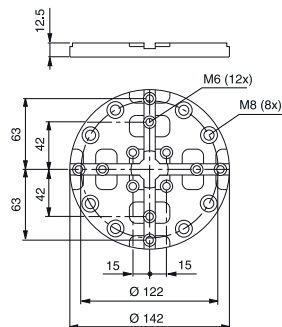
Article number	Feature
Aluminium 3R-DE681-2424-M6M	M6 threads / no automatic changing
Aluminium 3R-DE681-2424-T8M	T-slots / no automatic changing



Pallet Ø142 mm 3R-681.71

Hardened pallet with clearance holes for fixing screws.
Note: Must be mounted on the workpiece/fixture before it is locked in a chuck.

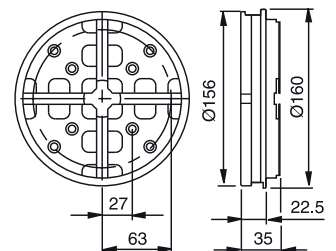
- Rust-resistant
- Weight 1 kg



Pallet Ø156 mm 3R-681.51-SA

Unhardened pallet with hardened references and hole markings for eight clearance holes.

- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg

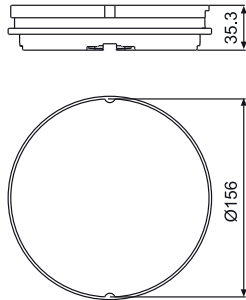


MacroMagnum – Pallets & Accessories

Pallet Ø156 mm 3R-681.156-A

Unhardened pallet with hardened reference element type 3R-681.71.

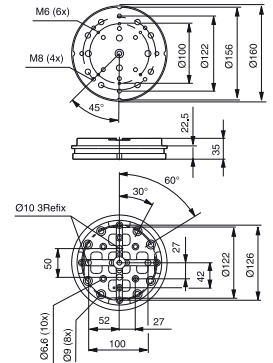
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg



Pallet Ø156 mm 3R-681.51

Hardened pallet with threads and clearance holes for eight and ten fixing screws.

- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Rust-resistant
- Flushing connection
- Weight 5 kg



Pallets 240x240 mm

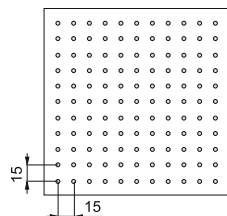
Anodized aluminium pallets with M6 threads.

3R-DE681-2424-M6A

- Mounted on pallet 3R-681.51-SA
- Adapted for automatic changing
- Ready for code carrier
- Building-in height 75.3 mm
- Weight 10.5 kg

3R-DE681-2424-M6M

- Mounted on pallet 3R-681.71
- Building-in height 52.5 mm
- Weight 7.3 kg



Pallets 240x240 mm

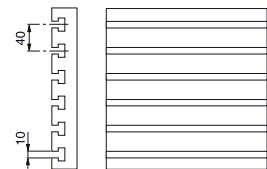
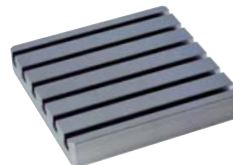
Anodized aluminium pallets with T-slots.

3R-DE681-2424-T8A

- Mounted on pallet 3R-681.51-SA
- Adapted for automatic changing
- Ready for code carrier
- Building-in height 75.3 mm
- Weight 9.8 kg

3R-DE681-2424-T8M

- Mounted on pallet 3R-681.71
- Building-in height 52.5 mm
- Weight 6.5 kg



Drawbars

3R-605.1E

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

3R-605.1EE

- Supplied in sets of 40 pcs.



3R-605.2E

- Ø20x36.9 mm with Ø7 mm flushing hole
- Supplied in sets of 5 pcs.

3R-605.2EE

- Supplied in sets of 20 pcs.



3R-605.4E

For round pallets adapted for automatic changing

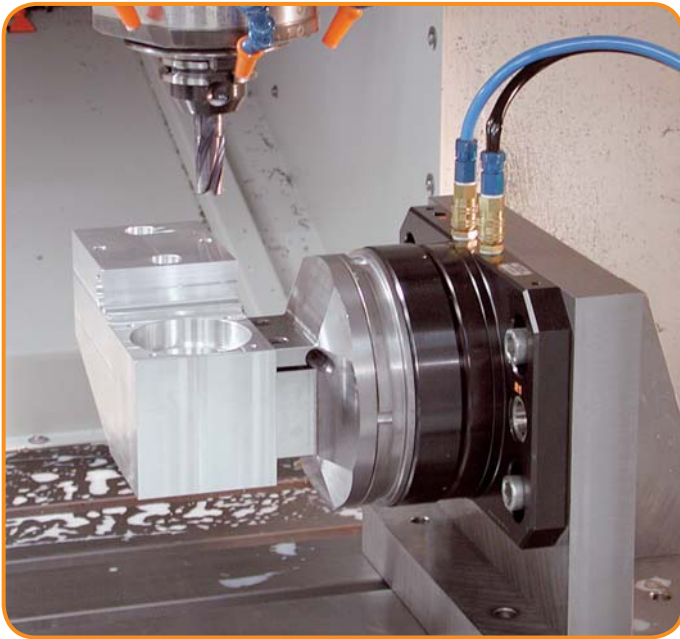
- Ø20x57.1 without flushing hole
- Supplied in sets of 10 pcs.

3R-605.4EE

- Supplied in sets of 40 pcs.



MacroMagnum – User kit & Accessories



Check ruler 3R-686.1-HD

Check ruler for setting flatness and angular positions.
Ground hole for centring.

- Adapted for automatic changing
- Ready for code carrier
- Measuring length 130 mm
- Weight 6 kg



Three-jaw chuck 90421

Three-jaw chuck mounted on pallet 3R-681.51-SA.

- Adapted for automatic changing
- Ready for code carrier
- Total height 127 mm
- Weight 16 kg



Splash guard 90027.03

Intended for MacroMagnum chucks. Can also be used as a cover for unused chucks.



Chip guard 90443

For Macro pallets 52x52, 54x54 and 70x70 in MacroMagnum chucks. For sealing we recommend 3R-RU52L or 3R-RU70 respectively in combination with the debris guard.



User kit 3R-688.24-S

3R-680.24-S MacroMagnum chuck, Manual, Low profile, 1 pc.
3R-681.51-SA MacroMagnum Pallet Ø156 mm, 4 pcs.
3R-605.2 Drawbar, 2 pcs.



MacroMagnum – Accessories

Lifting device 90855

For dia. 156 mm pallets, prepared for automation only.

- Suitable for: 3R-681.51, 3R-681.51-SA and 3R-681.156-A
- Weight 1 kg



3Refix mandrel 3R-901-10E

- 3Refix Ø10 mm
- Recommended tightening torque 4 Nm
- Supplied in sets of 10 pcs.
- Weight per set 0.2 kg

Note: When positioning with 3Refix mandrels – always tighten the expanding mandrel in the R⁰ hole first.



Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.4

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



Control unit 3R-611.46

Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.



Torque wrench 3R-614-04

For Ø10 mm 3Refix mandrels.

- 4 Nm



Code carriers 3R-863.01-10

With pre-programmed unique identity, designed for pallet use.

- Supplied in sets of 10 pcs.



Connection for air gun 90815

For manual operation of pneumatic chucks with air gun.

- Supplied in sets of 2 pcs.



Matrix

- ... reduces setting-up times
- ... ensures precision and quality
- ... has automatic air-blast cleaning of the references
- ... is sealed against dirt and swarf – withstands severe work environments
- ... has enhanced clamping force – turbo locking
- ... is suitable for automatic changing with System 3R's automation program.

The Matrix system

Measures to reduce the downtime of your machines are significantly more worth while than chasing seconds in the actual machining process. What matters is to keep the machines running. And that's when you need an interface that gives fast setting-up.

The Matrix system is just that kind of interface. Setting-up in parallel away from the machine while it is working and then setting up in a matter of seconds in the stationary machine. Important for long runs, but crucial for the profitability of short runs or one-piece production.

The design has been optimised for metal-cutting machining and is ideal for work involving high machining forces. The generous diameter of the drawbar means short distances between the references and the applied locking force, giving maximum stability and accuracy. The inherent properties of the Matrix system truly come into their own in tough machining applications.

As well as extreme accuracy, Matrix features low construction height, ultra-precise indexing, a drawbar with through hole. The through hole allows high/long workpieces to be sunk into the chuck for stable/rigid fixation.



Prepared for automatic chuck adapter.



Spherical rolls.



Inlets on side & underneath.



Low built-in height.



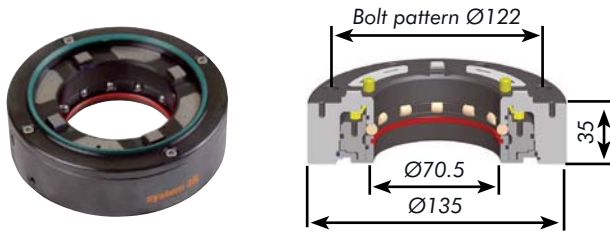
Pre-alignment studs.

Matrix 110

Pneumatic chuck, Matrix 110 3R-690.1-110

Chuck for permanent mounting on the machine table or into a PM press.

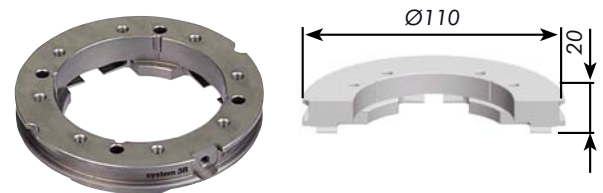
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, -6 ± 1 bar
- Weight 2.5 kg.



Pallet, Matrix 110 3R-691.1-110

- Fixed index positions 4x90°
- Permissible press load 35 ton
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110 or similar
- Weight 0.5 kg.

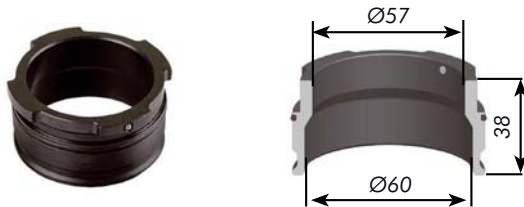
Note: Not self carrying, requires extra support.



Drawbar, Matrix 110 3R-695.2-110

- Adapted for automatic changing
- Weight 0.3 kg.

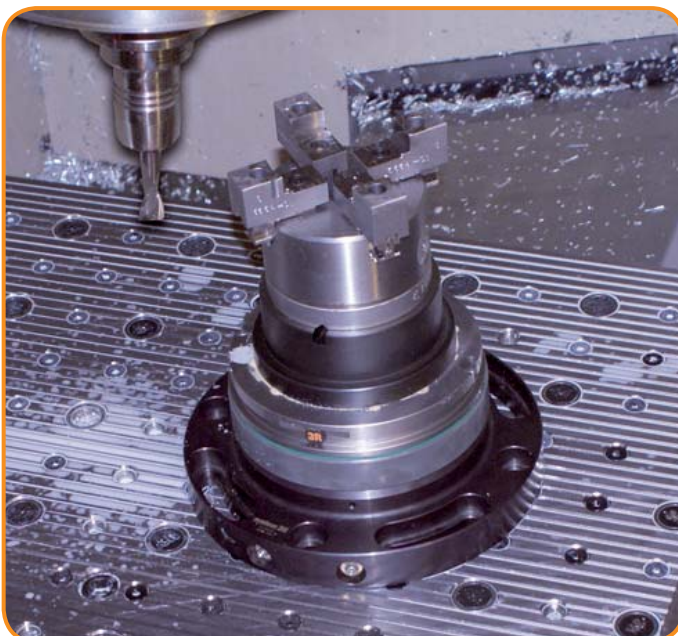
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



Check ruler, Matrix 110 3R-696.1-110

For setting flatness and angular positions.

- Ground hole for centering.
- Adapted for automatic changing
- Ready for code carrier
- Measuring length 80 mm.
- Weight 1.6 kg.



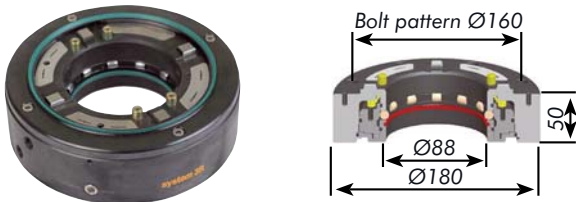
Three-jaw chuck mounted on a pallet.

Matrix 142

Pneumatic chuck, Matrix 142 3R-690.1-142

Chuck for permanent mounting on the machine table or into a PM press.

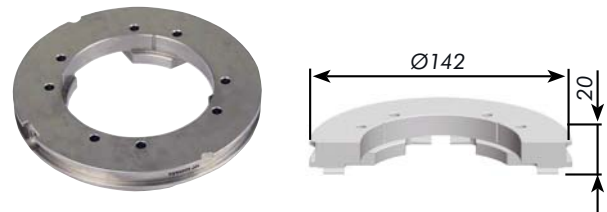
- Fixed index positions 4x90°
- Clamping force 12000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, -6 ± 1 bar
- Weight 7 kg



Pallet, Matrix 142 3R-691.1-142

- Fixed index positions 4x90°
- Permissible press load 80 ton
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142 or similar
- Weight 1.2 kg.

Note: Not self carrying, requires extra support.



Drawbar, Matrix 142 3R-695.2-142

- Adapted for automatic changing
- Weight 0.5 kg

Note: In automation the gripper has to grip on the pallet and not on the drawbar.



Check ruler, Matrix 142 3R-696.1-142

For setting flatness and angular positions. Ground hole for centering.

- Adapted for automatic changing
- Ready for code carrier
- Measuring length 100 mm.
- Weight 3.4 kg.

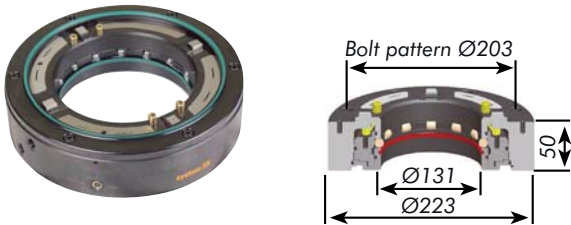


Matrix 185

Pneumatic chuck, Matrix 185 3R-690.1-185

Chuck for permanent mounting on the machine table or into a PM press.

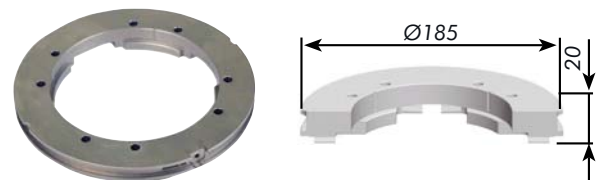
- Fixed index positions 4x90°
- Hardened references
- Clamping force 16 000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, -6 ± 1 bar
- Weight 9 kg.



Pallet, Matrix 185 3R-691.1-185

- Fixed index positions 4x90°
- Permissible press load 130 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-185 or similar
- Weight 1.7 kg.

Note: Not self carrying, requires extra support.



Drawbar, Matrix 185 3R-695.2-185

- Adapted for automatic changing
- Weight 0.8 kg.

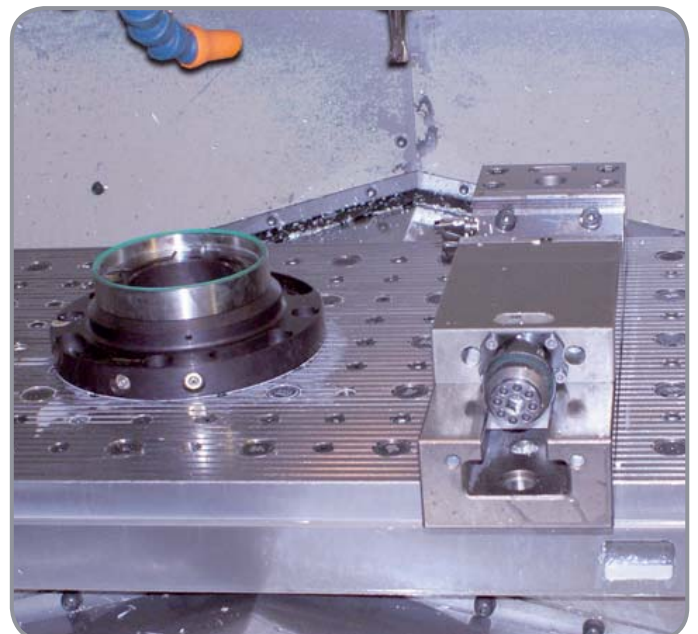
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



Check ruler, Matrix 185 3R-696.1-185

For setting flatness and angular positions. Ground hole for centering.

- Adapted for automatic changing
- Ready for code carrier
- Measuring length 125 mm.
- Weight 5.7 kg.

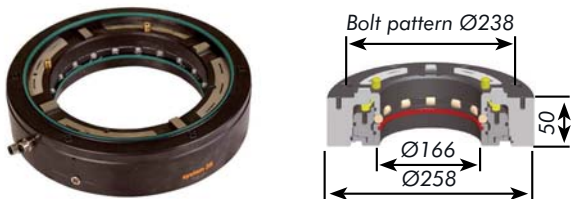


Matrix 220

Pneumatic chuck, Matrix 220 3R-690.1-220

Chuck for permanent mounting on the machine table or into a PM press.

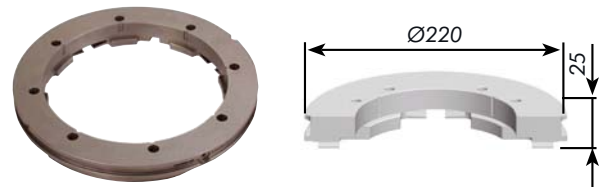
- Fixed index positions 4x90°
- Clamping force 18500 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, -6 ± 1 bar
- Weight 11 kg.



Pallet, Matrix 220 3R-691.1-220

- Fixed index positions 4x90°
- Permissible press load 160 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-220 or similar
- Weight 2.6 kg.

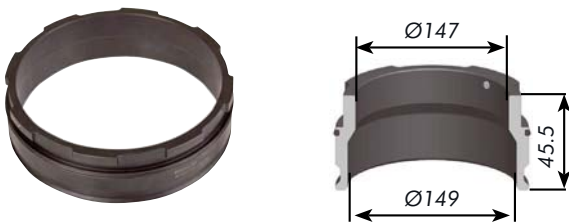
Note: Not self carrying, requires extra support.



Drawbar, Matrix 220 3R-695.2-220

- Adapted for automatic changing
- Weight 1.3 kg.

Note: In automation the gripper has to grip on the pallet and not on the drawbar.



Check ruler, Matrix 220 3R-696.1-220

For setting flatness and angular positions. Ground hole for centering.

- Adapted for automatic changing
- Ready for code carrier
- Measuring length 140 mm.
- Weight 7.5 kg.



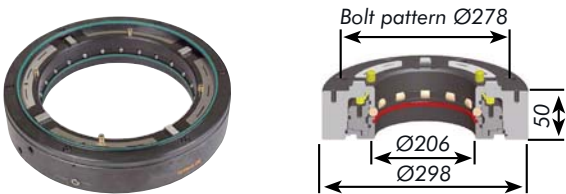
*Matrix application:
The pallet is turnable for machining of both sides of a optical lens.*

Matrix 260 & Accessories

Pneumatic chuck, Matrix 260 3R-690.1-260

Chuck for permanent mounting on the machine table or into a PM press.

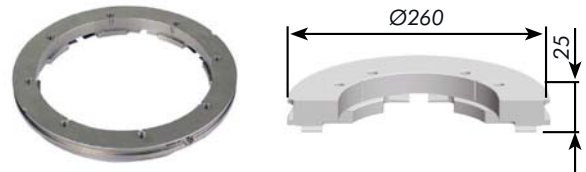
- Fixed index positions 4x90°
- Hardened references
- Clamping force 24000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, -6 ± 1 bar
- Weight 13 kg.



Pallet, Matrix 260 3R-691.1-260

- Fixed index positions 4x90°
- Permissible press load 210 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-260 or similar
- Weight 3.2 kg.

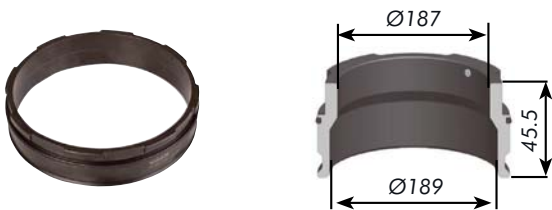
Note: Not self carrying, requires extra support.



Drawbar, Matrix 260 3R-695.2-260

- Adapted for automatic changing
- Weight 1.5 kg.

Note: In automation the gripper has to grip on the pallet and not on the drawbar.



Check ruler, Matrix 260 3R-696.1-260

For setting flatness and angular positions. Ground hole for centering.

- Adapted for automatic changing
- Ready for code carrier
- Measuring length 160 mm.
- Weight 10 kg.



Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.4

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



Code carriers 3R-863.01-10

With pre-programmed unique identity, designed for pallet use.

- Supplied in sets of 10



GPS 240

- ... Seal protects the reference surfaces from dirt
- ... High locking force
- ... Inexpensive, lightweight pallets
- ... A lifting mechanism protects the references when loading heavy workpieces

The machining zero point is defined

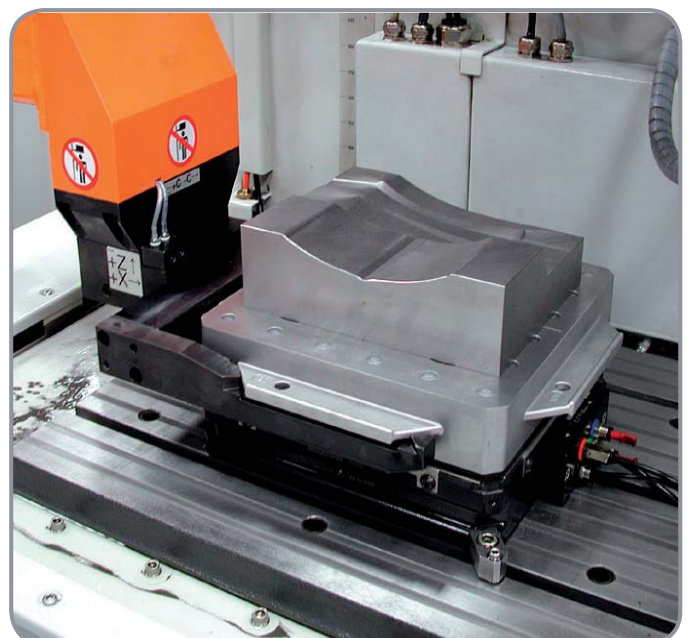
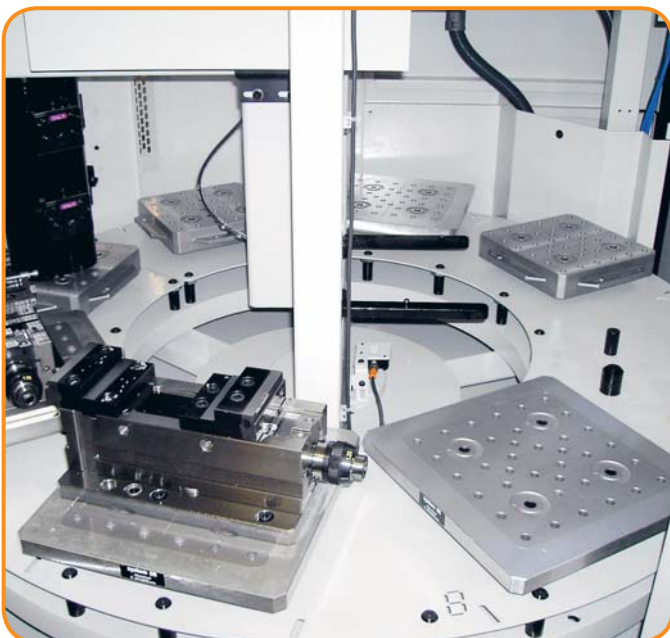
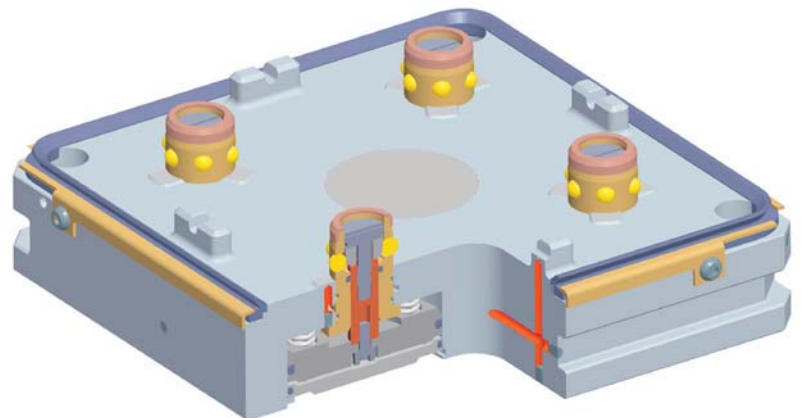
by the centre of the chuck in the GPS 240 system. The chuck can be mounted on the machine table of any machine tool.

The standardised hole pattern of the pallet allows the fixation of workpieces, fixtures and accessories such as vices, three-jaw chucks and magnetic tables from below. This gives collision-free mounting, even with five-sided machining.

The economical, pressure-die-cast aluminium pallets are very light, making them also suitable for manual handling. Naturally the GPS 240 is also suitable for automatic changing.

The chuck seal prevents dirt penetrating between the chuck and the pallet. This simplifies maintenance and lengthens the life of the components. A lifting mechanism which operates on locking/opening protects the references when loading heavy workpieces.

- Repetition accuracy: 0.002 mm
- Clamping force: 30000 N
(with force boost: 80000 N)
- Indexing accuracy: 0.005 mm



GPS 240 – Overview of chucks

GPS 240 – Table chucks			Page
Pneumatic manual	C219 000		47
Pneumatic automatic / manual	C219 100		47
Pneumatic automatic / manual	C219 400	through hole Ø100mm	48
Pneumatic automatic / manual	C219 200	connection from below	48
Pneumatic automatic / manual	C219 800	connection from below, medium connection	48
Pneumatic automatic / manual	C210 060	dummy chuck	48
GPS 240 – Lathe chuck			Page
Pneumatic manual	C217 100	through hole Ø54mm	48
Pneumatic manual	C217 400	through hole Ø100mm	48

GPS 240 Chucks

- Building-in height 52 mm
- Required air pressure 6 bar
- Air-blast cleaning of the references
- Weight 17 kg

C 219 000

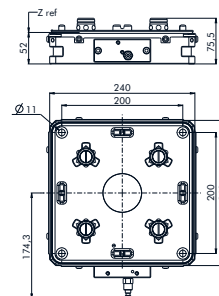
For manual machining operations.

- One air connection
- Clamping force 30 000 N
- Recommended actuator C 810 820 or C 810 710

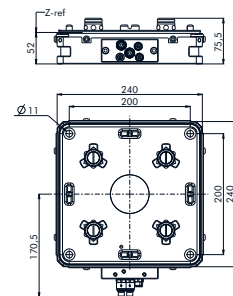
C 219 100

For manual and automatic machining operations.

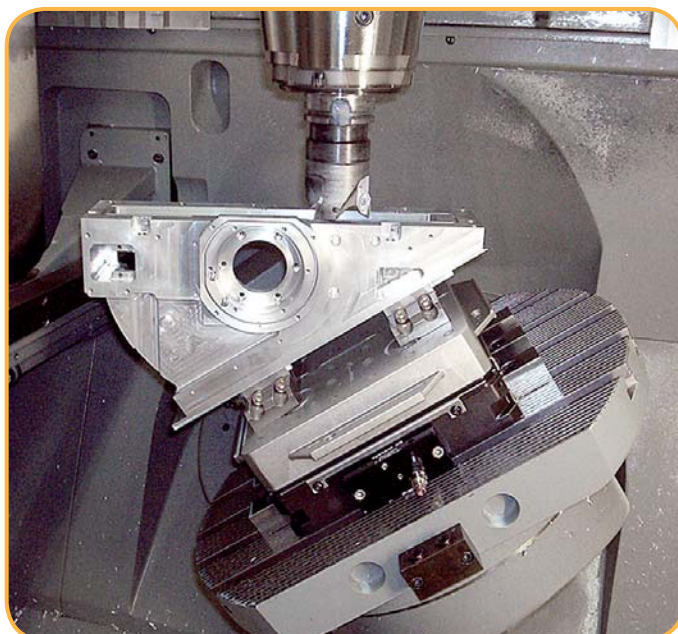
- 5 air connections
- Clamping force 30 000 N/80 000 N
- Recommended actuator C 810 830



C 219 000



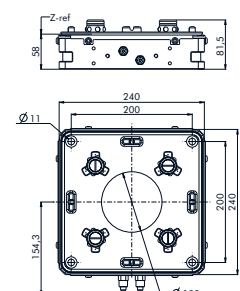
C 219 100



GPS 240 Chuck automatic with hole Ø100 mm C 219 400

For special applications.

- Building-in height 58 mm
- Required air pressure 8 bar
- Air-blast cleaning of the references
- Clamping force 30 000 N
- Recommended actuator C 810 830
- Weight 17 kg

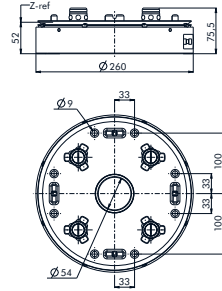


GPS 240 – Chucks

GPS 240 Chuck manual round with hole Ø54 mm C 217 100

Pneumatic chuck for applications in lathes and milling machines.

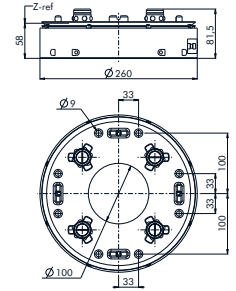
- Building-in height 52 mm
- Required air pressure 6 bar
- Air-blast cleaning of the references
- Clamping force 30 000 N
- Recommended control unit C 810 820 or C 810 710
- Weight 16 kg



GPS 240 Chuck manual round with hole Ø100 mm C 217 400

For special applications.

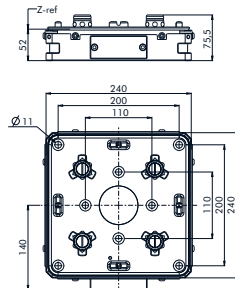
- Building-in height 58 mm
- Required air pressure 8 bar
- Air-blast cleaning of the references
- Clamping force 30 000 N
- Recommended actuator C 810 820 or C 810 710
- Weight 17 kg



GPS 240 Chuck automatic C 219 200

For manual and automatic machining operations.

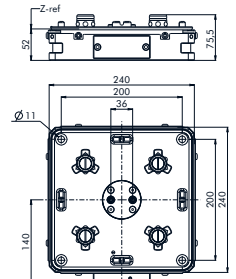
- Building-in height 52 mm
- Air connections positioned centrally on the underside – prism – Z-cleaning – clamping/releasing – Turbo/ventilation
- Clamping force 30 000 N/80 000 N
- Weight 17 kg



GPS 240 Chuck automatic with medium connection C 219 800

For manual and automatic machining operations.

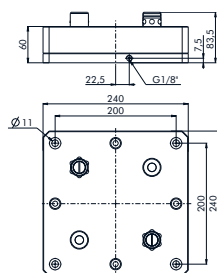
- Building-in height 52 mm
- Air connections positioned centrally on the underside – prism – Z-cleaning – clamping/releasing – Turbo/ventilation
- Medium connection 2-fold
- Clamping force 30 000 N/80 000 N
- Weight 17 kg



GPS 240 Dummy chuck C 210 060

Dummy chuck for clamping a GPS 240 pallet on a draining station.

- Required air pressure 6 bar
- Weight 9.5 kg



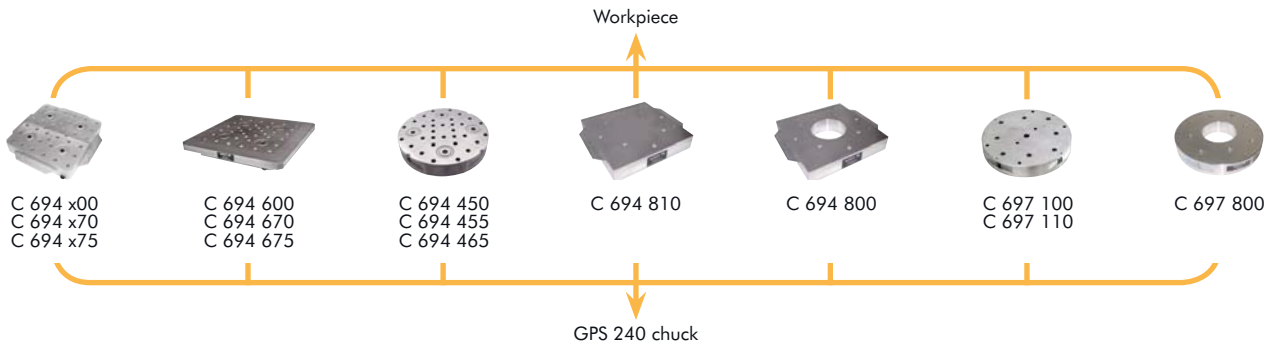
Draining station C 210 050

Drains out swarf and liquid when the dummy chuck is tipped.

- Supplied without dummy chuck
- Dimensions 820x605x1310 mm
- Weight 80 kg



GPS 240 – Overview of pallets



Pallets	Size [mm]	Not prepared for automation	Prepared for automation	Ready for use of automation	Page
GPS 240 cast aluminium	240x240	⊙ C 694 100	C 694 170	C 694 175	49
GPS 240 cast aluminium	240x240	⊙ C 694 300	C 694 370	C 694 375	50
GPS 240 cast aluminium	240x240	/// C 694 400	C 694 470	C 694 475	50
GPS 240 cast aluminium	300x300	/// C 694 600	C 694 670	C 694 675	50
GPS 240 cast aluminium	Ø260	/// C 694 450	C 694 455	C 694 465	51
For automation with thread for code carrier fixture					Page
GPS 240 aluminium	240x240	/// C 694 810			51
GPS 240 aluminium	240x240	/// C 694 800	through hole Ø100mm		51
GPS 240 aluminium	Ø260	/// C 697 100			51
GPS 240 aluminium	Ø260	/// C 697 110	with hole pattern		51
GPS 240 aluminium	Ø260	/// C 697 800	through hole Ø100mm		51

/// Coined pallet for high machining forces

⊙ Pallet with spring-loaded pin

GPS 240 Pallets EDM/Grinding C 694 100 / C 694 170 / C 694 175

Cast aluminium pallet.

Suitable for EDM and grinding.

- Construction height 48,1 ±0,01 mm
- X/Y-centring with spring-loaded pin
- Flatness 0,02 mm
- Weight 4,8 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs

C 694 100

Not prepared for automation

S 500 090

- C694 100 set of four

S 500 100

- C694 100 set of ten

C 694 170

Prepared for automation

- With code carrier fixture C 960 740

S 500 091

- C 694 170 set of four

S 500 101

- C 694 170 set of ten

C 694 175

Ready for use of automation

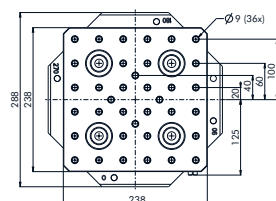
- With code carrier fixture C 960 740 and code carrier 3R-863.01

S 500 092

- C 694 175 set of four

S 500 102

- C 694 175 set of ten

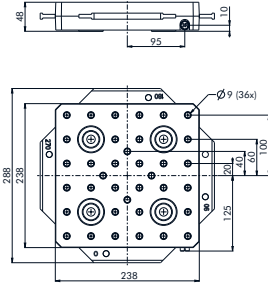


GPS 240 – Pallets

GPS 240 Pallets Adaption C 694 300 / C 694 370 / C 694 375

Ground cast aluminium pallet.
Suitable for fixtures and accessories.

- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.01 mm
- Weight 4,8 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs



C 694 300

Not prepared for automation

C 694 370

Prepared for automation

- With code carrier fixture C 960 740

C 694 375

Ready for use of automation

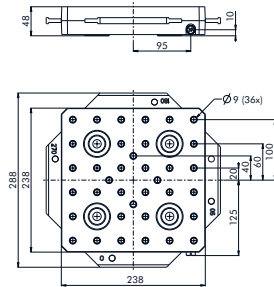
- With code carrier fixture C 960 740 and code carrier 3R-863.01



GPS 240 Pallets Produktion C 694 400 / C 694 470 / C 694 475

Cast aluminium pallet. Suitable for high-speed milling and arduous milling operations.

- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Flatness 0.02 mm
- Weight 4,8 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs



C 694 400

Not prepared for automation

S 500 160

- C 694 400 set of four

S 500 170

- C 694 400 set of ten

C 694 470

Prepared for automation

- With code carrier fixture C 960 740

S 500 161

- C694 470 set of four

S 500 171

- C694 470 set of ten

C 694 475

Ready for use of automation

- With code carrier fixture C 960 740 and code carrier 3R-863.01

S 500 162

- C694 475 set of four

S 500 172

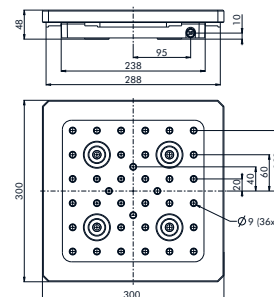
- C694 475 set of ten



GPS 240 Pallets 300x300 mm C 694 600 / C 694 670 / C 694 675

Cast aluminium pallet. Suitable for high-speed milling and arduous milling operations.

- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Flatness 0.02 mm
- Weight 7 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs



C 694 600

Not prepared for automation

C 694 670

Prepared for automation

- With code carrier fixture C 960 740
- Same gripper as for 240x240 mm pallets

C 694 675

Ready for use of automation

- With code carrier fixture C 960 740 and code carrier 3R-863.01
- Same gripper as for 240x240 mm pallets

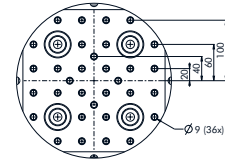
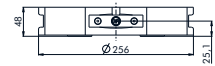


GPS 240 – Pallets

GPS 240 Pallets round C 694 450 / C 694 455 / C 694 465

Cast aluminium pallet. Suitable for high-speed milling and arduous milling operations.

- Construction height 48.0 ± 0.01 mm
- X/Y-centring with coined cam
- Flatness 0.02 mm
- Weight 4.3 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs



C 694 450

Not prepared for automation

C 694 455

Prepared for automation

- With code carrier fixture C 960 740

C 694 465

Ready for use of automation

- With code carrier fixture C 960 740 and code carrier 3R-863.01



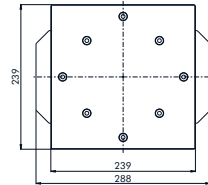
GPS 240 Pallets C 694 800 / C 694 810

Ground aluminium pallet.

- Construction height 46 ± 0.01 mm
- X/Y-centring with coined cam
- Flatness 0,01 mm

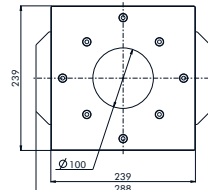
C 694 810

- Weight 7,2 kg



C 694 800

- With hole $\varnothing 100$ mm
- Weight 6,2 kg

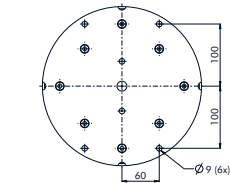
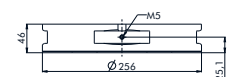


GPS 240 Pallets round C 697 100 / C 697 110

Ground aluminium pallet.

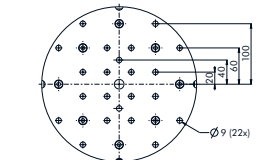
- Construction height 46 ± 0.01 mm
- X/Y-centring with coined cam
- Flatness 0.01 mm
- Weight 6,2 kg

C 697 100



C 697 110

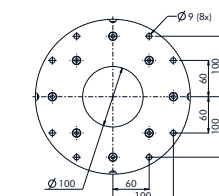
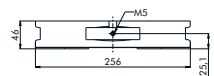
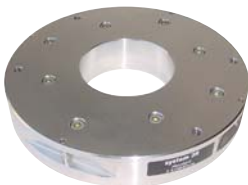
- Hole pattern on 40 mm centres



GPS 240 Pallet round with hole $\varnothing 100$ mm C 697 800

Ground aluminium pallet.

- Construction height 46 ± 0.01 mm
- X/Y-centring with coined cam
- Flatness 0,01 mm
- Weight 5.2 kg



Master pallet C 846 600

The pallet has a ground reference ruler and a ground indication hole for alignment of the references.



C 694 370



GPS 240 – Pallets

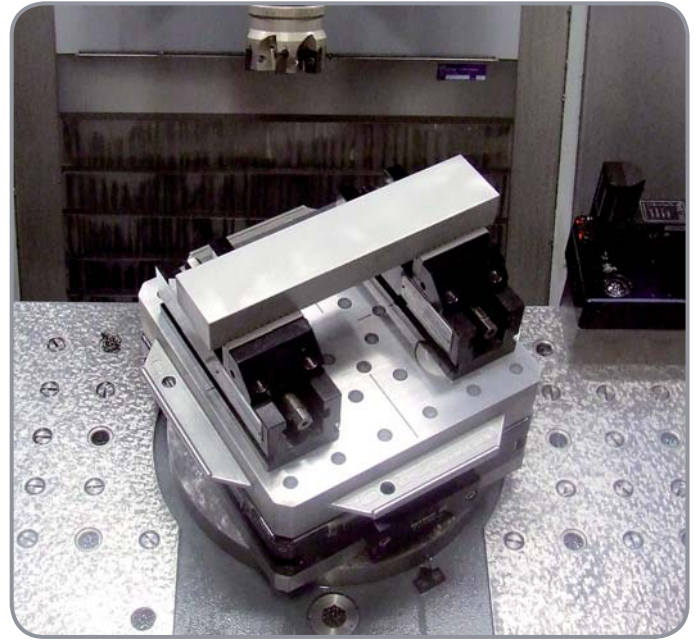
GPS 240 Pallet with centric clamping vise

Example:

Spreitzer MZE 280-100 & GPS 240 pallet C 694 470



For further information please ask for catalogue A000460 "Add-On E-Shop System 3R & Spreitzer".



GPS 240 Pallets with vice C 585 400 / C 585 600

Vice for workpieces <80 mm / <120 mm.

- X/Y-centring with spring-loaded pin

C 585 400

- Vice for workpieces <80 mm

C 585 600

- Vice for workpieces <120 mm

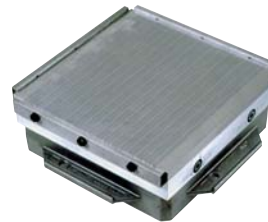


C 694 300

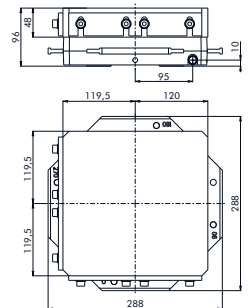
GPS 240 Magnetic tables C 694 270

Strong magnetic plate for milling.

- Magnetic field 6 mm
- Holding force 120 N/cm²
- Dimensions 240x240x96 mm
- Weight 21.5 kg



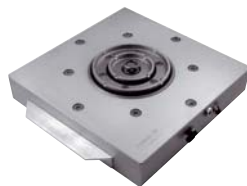
C 694 370



GPS 240 Pallets with integrated GPS 70/120 chuck C 522 560 / C 522 580

Adapter pallet which can accommodate the GPS 70/120 pallets.

- Material aluminium / steel.
- Height Z-Z 54 mm.
- X/Y-centring with coined cam
- Weight 8,1 kg.

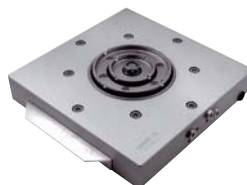


C 522 560

- For manual manufacturing
- 1 connection from below

C 522 580

- Prepared for automation
- 2 connections from below
- Suitable chuck C219 800

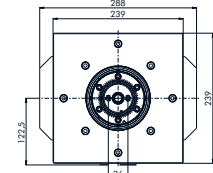
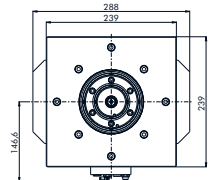


GPS 70/120 System

With the adaption with integrated GPS 70/120 chuck both systems can be used.

- the GPS 240 system for bigger workpieces and devices
- the GPS 70/120 system for smaller workpieces

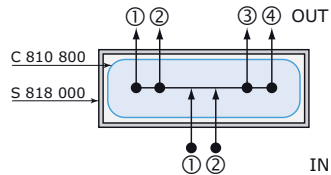
For detailed information on GPS 70/120 system please ask for catalogue A000380.



GPS 240 – Kits & Accessories

Pneumatic control "2/4" C 810 800

To control two systems on the machine table
with only two hoses.
2x2 functions – open/lock and presence detection.



S 818 000

C 810 800 with protective cover
which is adapted to suit the machine.



Code carriers 3R-863.01

With pre-programmed unique identity,
designed for GPS 240.

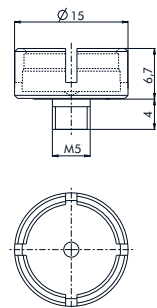
3R-863.01-10

Sets of 10 pieces.



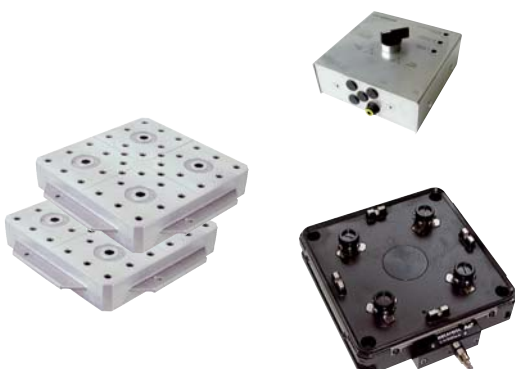
Code carrier, fixture C 960 740

Fixture for code carrier 3R-863.01-10.



GPS 240 Starter Kit S 500 310

Contents
C 219 000 Chuck
C 810 820 Actuator
C 694 400 Pallets Production (2x)



Lifting grip C 810 960

Lifting gear for handling GPS 240 pallets 240x240 mm.
• Weight 2.9 kg



GPS 240 – Accessories

Clamp kit C 810 870

Contents

- E 030 220 clamp (x4)
- E 010 144 washer M10 (x4)
- E 010 143 washer M8 (x4)
- E 000 428 Allen screw M10x45 (x4)
- E 000 354 Allen screw M8x45 (x4)
- E 040 030* T-slot nut M10x12 (x4)
- E 040 031* T-slot nut M10x14 (x4)
- E 040 032* T-slot nut M10x16 (x4)
- E 040 033* T-slot nut M10x18 (x4)
- E 040 020* T-slot nut M8x12 (x4)
- E 040 021* T-slot nut M8x14 (x4)
- E 040 022* T-slot nut M8x16 (x4)
- E 040 023* T-slot nut M8x18 (x4)



* When ordering, state the required dimension of the T-slot nut.



Clamp strip kit C 810 880

Contents

- C 810 881 undrilled clamp strip (x2)
- E 010 144 washer M10 (x4)
- E 010 143 washer M8 (x4)
- E 000 428 Allen screw M10x45 (x4)
- E 000 354 Allen screw M8x45 (x4)
- E 040 030* T-slot nut M10x12 (x4)
- E 040 031* T-slot nut M10x14 (x4)
- E 040 032* T-slot nut M10x16 (x4)
- E 040 033* T-slot nut M10x18 (x4)
- E 040 020* T-slot nut M8x12 (x4)
- E 040 021* T-slot nut M8x14 (x4)
- E 040 022* T-slot nut M8x16 (x4)
- E 040 023* T-slot nut M8x18 (x4)



* When ordering, state the required dimension of the T-slot nut.



Presetting station C 810 650

For alignment of workpieces on GPS 240 pallets.

- Parallelism 0.005 mm
- Required air pressure 6 ± 1 bar.
- Supplied with dial indicator, dial indicator holder and actuator.



Hand gate valve C 810 710

For controlling pneumatic chucks
C 217 100 and C 219 000.



Controllers

C 810 820

Unit for controlling pneumatic chucks C 217 100 and C 219 000.

- 1 connection (clamping/releasing)

C 810 830

Unit for controlling pneumatic chucks C 219 100 and C 219 600.

- 4 connections (- prism / - Z-cleaning / - clamping/releasing / - Turbo/ventilation)

C 810 850

Unit to control two pneumatic chucks.

- 5 connections (- prism / - Z-cleaning / - clamping/releasing / - Turbo/ventilation / - ventilation tube)



GPS 240 – Accessories

Sealing C 219 007

The chuck seal is a wear part which should be replaced every three to six months.

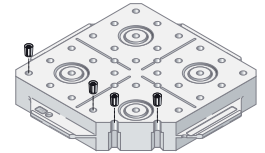
- Material: Viton
- Supplied singly



Sealing plugs C 531 500

Plugs for sealing GPS 240 pallets.

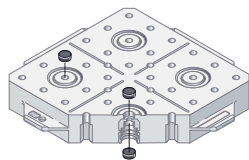
- Supplied in sets of 40



Seals C 531 250

To seal the holes in the four clamping elements of the pallet.

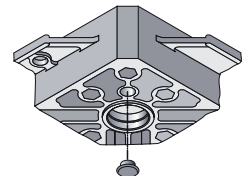
- Material: elastomer
- Supplied in sets of 20



Reference protectors C 531 210

To protect the Z-reference of the pallet.

- Supplied in sets of 20



Dynafix

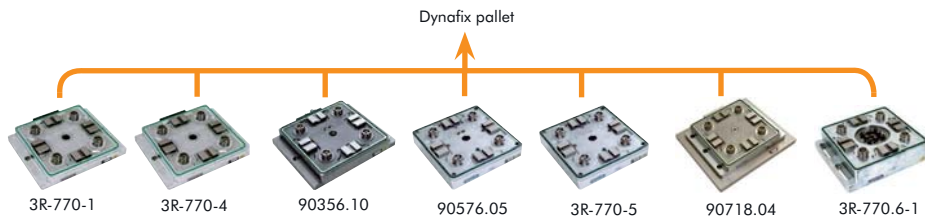
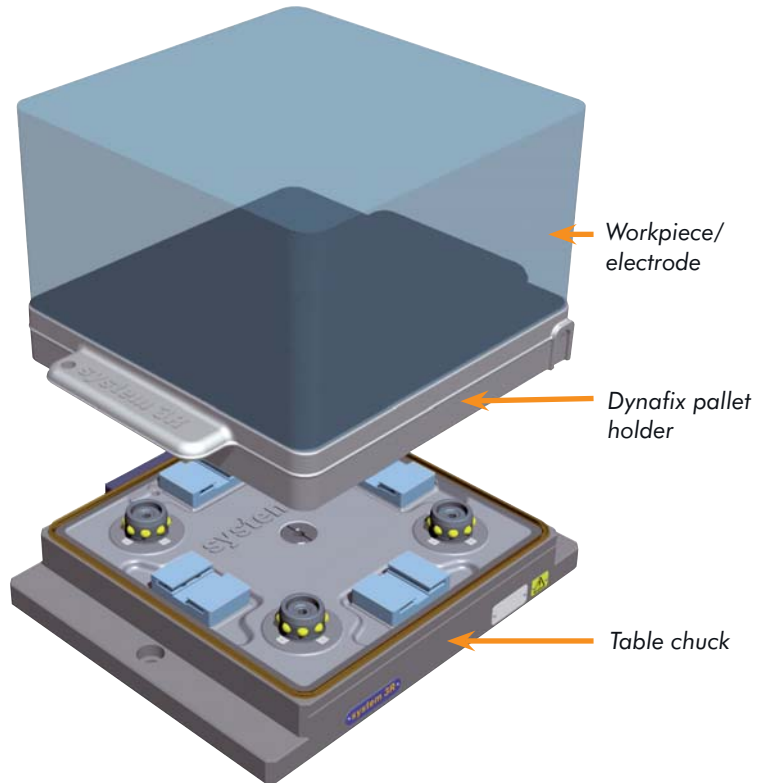
- ... allows machining with optimal cutting data
- ... reduces setting-up times
- ... ensures precision and quality
- ... gives access to System 3R's entire product range
- ... is suitable for automatic changing with System 3R's automation program.

Dynafix permits machining with optimal cutting data, without sacrificing accuracy and quality. The easy-to-handle aluminium pallets have reference elements of high-alloy steel with directly measurable Z-references.

Locking mechanism with built-in soft-landing function protects the references and simplifies handling in applications involving heavy workpieces. In addition, automatic air-blast cleaning of the Z-references and peripheral sealing make Dynafix a practical and user-friendly reference system which minimises setting-up times, increases machine capacity and provides a basis for automated production.

Dynafix as the basic means of fixing to the machine table gives unsurpassed flexibility in terms of workpiece size. Using chuck adapters provides access to practically every reference system in System 3R's extensive product range. Rapid, precise pallet changing in sizes from Ø25 mm to 400 x 400 mm in the same basic mounting – manually or automatically.

- Repetition accuracy – within 0.002 mm
- Locking force – 60 000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar



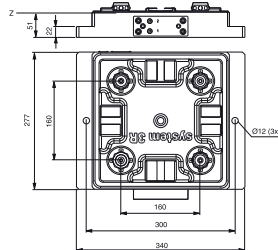
Chucks	Article number	Feature
Pneumatic	3R-770-1	
Pneumatic	3R-770-4	alignment reference
Pneumatic	90356.10	for chuck adapters, with mounting flange
Pneumatic	90576.05	for chuck adapters, without mounting flange
Pneumatic	3R-770-5	for five-axis machines
Pneumatic	90718.04	vibration-damped
Pneumatic	3R-770.6-1	built-in pneumatic Macro chuck

Dynafix – Chucks

Pneumatic chuck 3R-770-1

Pneumatic table chuck.

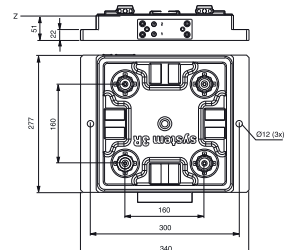
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2.
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



Pneumatic chuck 3R-770-4

Pneumatic table chuck with ground-in reference for alignment.

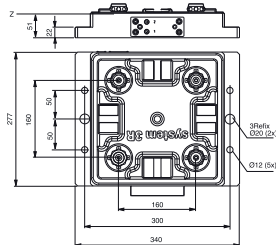
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



Pneumatic chuck 3R-770.19-1

Pneumatic table chuck with 3Refix-holes.

- 3Refix $\varnothing 20$ mm
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



Pneumatic chuck

Pneumatic chucks with extra connections for automatic chuck adapters.

Note: Requires two control units.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references

90356.10

With mounting flange.

- Weight 24.5 kg

90576.05

Without mounting flange

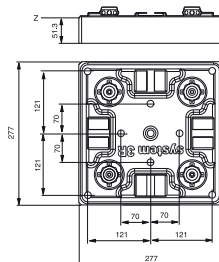
- Weight 23.5 kg



Pneumatic chuck 3R-770-5

Pneumatic table chuck for applications in five-axis machines.
Air connection from below.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Weight 23.5 kg

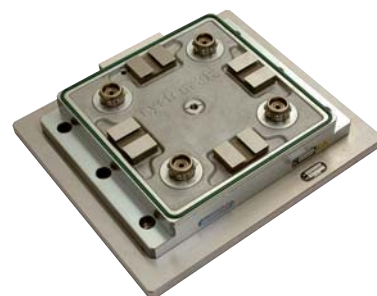


Pneumatic chuck, VDP 90718.04

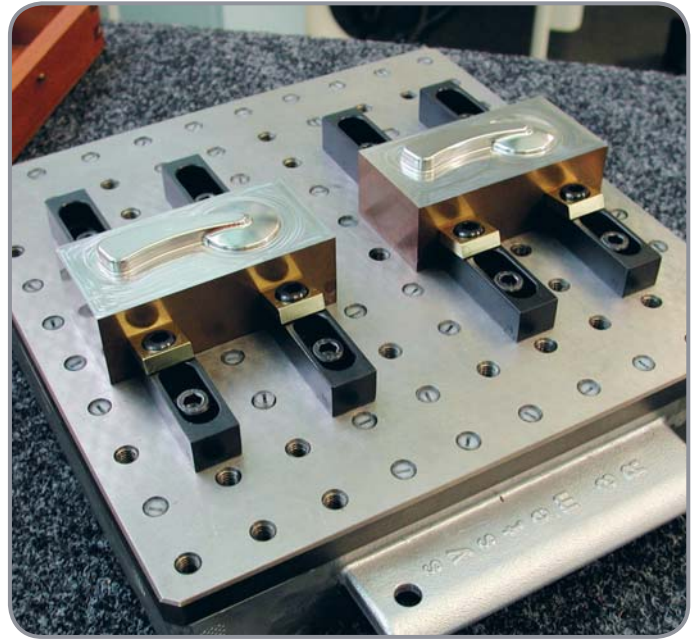
Pneumatic vibration-damped chuck.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references

VDP®



Dynafix – Chucks



Pneumatic chuck D-20130

Pneumatic chuck with through holes $\varnothing 110$ mm.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Weight 22 kg



Pneumatic chuck 3R-770.6-1

Pneumatic chuck with integrated Macro chuck.
For CMM machines.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Weight 32 kg



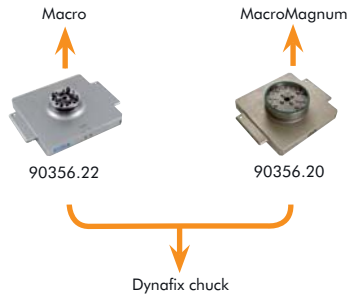
Pneumatic chuck D-20129

Pneumatic chuck with manual Macro Std chuck in the center.

- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



Dynafix – Chuck adapters



Chuck adapters	Article number	Feature
Pneumatic	90356.22	Dynafix ▶ Macro
Pneumatic	90356.20	Dynafix ▶ MacroMagnum

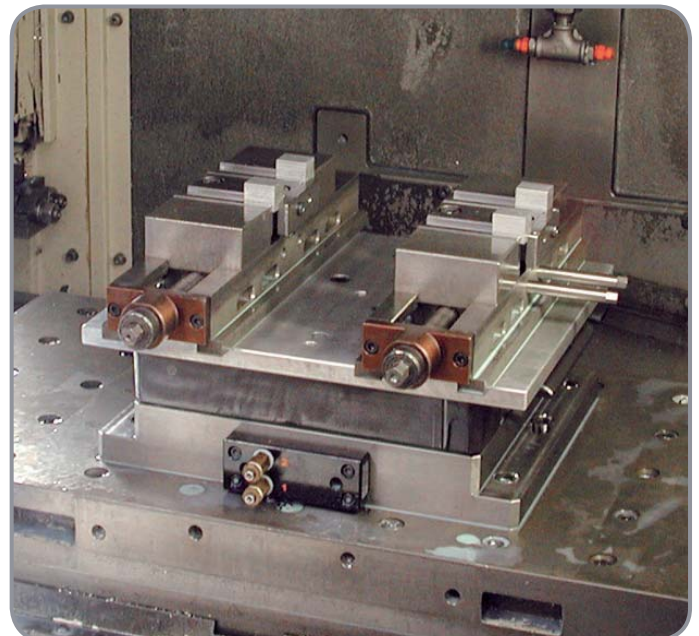
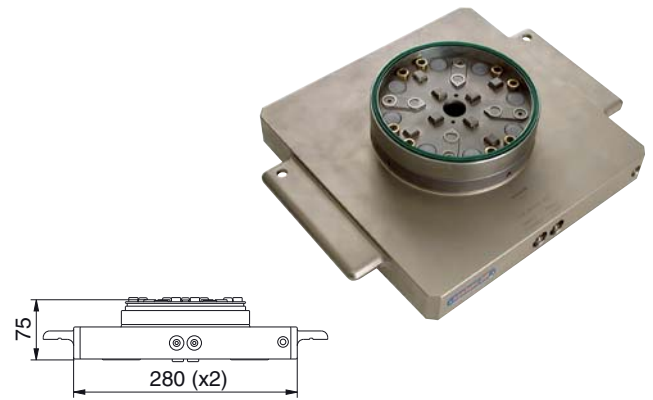
Pneumatic chuck adapter, Dynafix-Macro 90356.22

Chuck adapter with built-in pneumatic Macro chuck for mounting in 90356.10 or 90576.05.

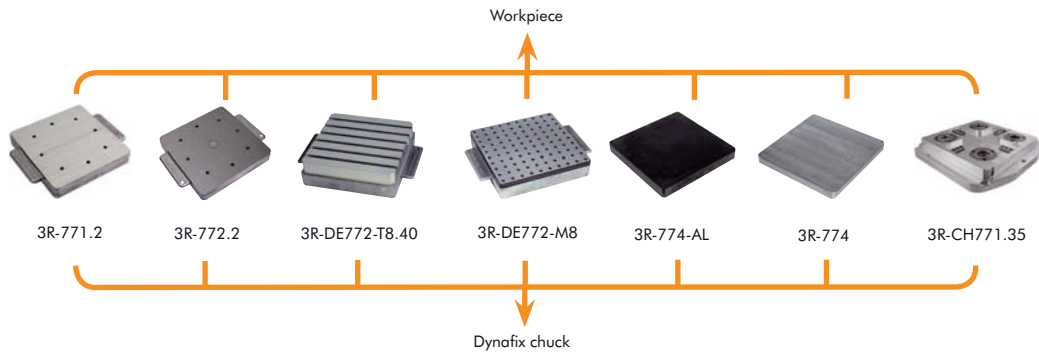


Pneumatic chuck adapter, Dynafix-MacroMagnum 90356.20

Chuck adapter with built-in pneumatic MacroMagnum chuck for mounting in 90356.10 or 90576.05.



Dynafix – Pallets

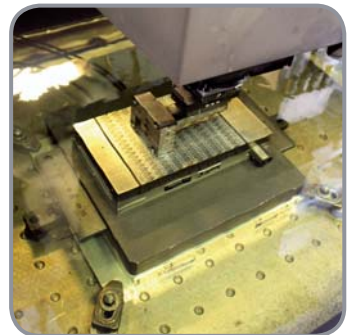


Pallets 280x280 mm

	Article number	Feature
Aluminium	3R-771.2	
Aluminium	3R-772.2	ground
Aluminium	3R-DE772-T8.40	T-slots
Aluminium	3R-DE772-M8	M8 threads.
Aluminium	3R-CH771.35	

Pallets 400x400 mm

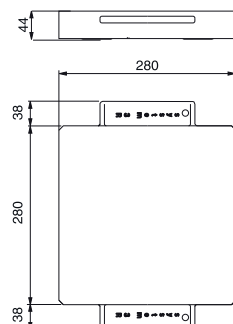
	Article number	Feature
Aluminium	3R-774-AL	
Steel	3R-774	



Pallet 280x280 mm 3R-771.2

Milled aluminium pallet

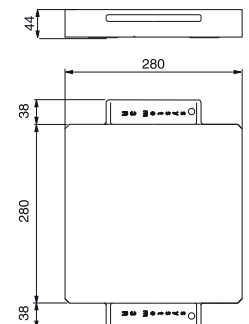
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.04 mm
- Thickness tolerance +0.5/-0 mm
- Weight 6 kg



Pallet 280x280 mm 3R-772.2

Ground aluminium pallet

- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.005 mm
- Thickness tolerance -0,1 / -0.14 mm
- Weight 6 kg

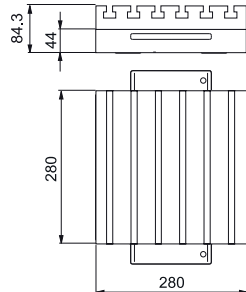


Dynafix – Pallets & Accessories

Pallet 280x280 mm 3R-DE772-T8.40

Anodized aluminium pallet with six T-slots for M8 on 40 mm centres.

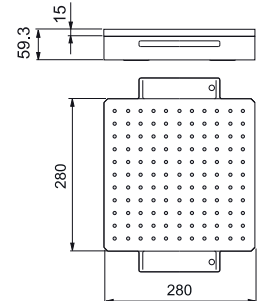
- Adapted for automatic changing
- Ready for code carrier
- Weight 14 kg



Pallet 280x280 mm 3R-DE772-M8.28

Hardened steel pallet with 139 M8 threads on 20 mm centres.

- Adapted for automatic changing
- Ready for code carrier
- Weight 14.5 kg



Pallets 400x400 mm 3R-774-AL

Aluminium pallet.

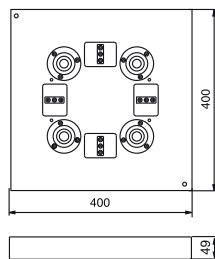
- Ready for code carrier
- Weight 20 kg



3R-774

Steel pallet.

- Ready for code carrier
- Weight 47 kg



Pallet 350x350 mm 3R-CH771.35

Aluminium pallet.

- Building-in height 50.1 mm
- Ready for code carrier
- Weight 12.1 kg



Reference elements 3R-771.7

Reference kit for users who want to make their own pallets or fixtures.



Master pallet 3R-776.1-2

For alignment of the Dynafix references. With ground reference rulers, hole and surface.

- Adapted for automatic changing
- Ready for code carrier
- Weight 8.0 kg



Delphin & Delphin BIG

Clamping of larger dimensions too, with Delphin

The modular design with the Delphin zero point clamping system offers you the greatest possible flexibility.

You can arrange the machine equipment as a base-plate or as a built-up solution, precisely in accordance with your requirements.

Pallets or workpieces can now be positioned and clamped with great accuracy on the Delphin clamping system.



Advantages of the Delphin clamping system

- Modular design
- Large product portfolio
- Uniform clamping spigots
- Spring centring for pinpoint accuracy

Facts

Repetition accuracy: < 0.005 mm
Clamping force: 13'000N pneumatic
15'000N hydraulic

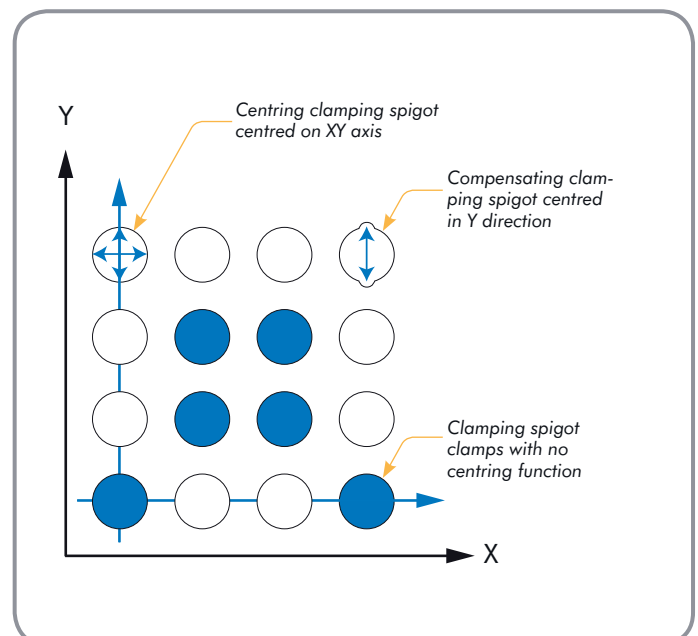


Function of the Delphin clamping system

One special feature in relation to modular equipping of the machine tables is the option for arrangement and number of chucks. Regardless of the requirements of the application, you determine the quantity and the particular centre distance with which you wish to equip the machine table.

Our recommendation: use at least 4 chucks per workpiece or work with pallets.

The conical clamping spigots are mounted directly in the device or workpiece. Centring of the conical face of the centring and compensating clamping spigots free of play achieves maximum accuracy.



Delphin & Delphin BIG

Chucks for manual equipping:

Delphin PSP

Pneumatic, clamping force 13'000N

Delphin HSP

Hydraulic, clamping force 15'000N

Lift-off function

Chucks for automation:

Delphin PHP

Pneumatic, clamping force 13'000N

Self-cleaning and presence control

Delphin HHP / Delphin HCP

Hydraulic, clamping force 15'000N

Self-cleaning and presence control

Lift-off function



Delphin BIG



Delphin BIG:

The newest member of the Delphin family was developed specially for large workpieces.

This opens up entirely new approaches for the production of large workpieces or the manufacture of large moulds.

Because of its optimised shape, the clamping system is highly tolerant during loading of the pallets, by a crane for instance.

Delphin BIG Facts

- Clamping force 50'000N
- Repetition accuracy $\pm 0.005\text{mm}$
- Lift-off function
- Cleaning
- Presence control
- Suitable for automation



Accessories

Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.4

Unit for operation of pneumatic chucks. Two functions – open/closed.



Control unit 3R-611.46

Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.



Allen keys

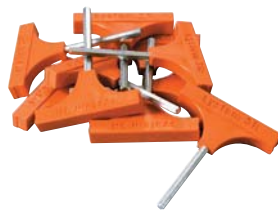
3R-333-03

- Supplied in sets of 10 pcs.
- 3 mm



3R-333-05

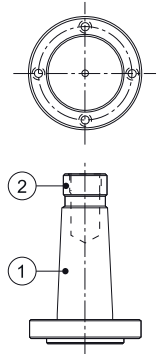
- Supplied in sets of 10 pcs.
- 5 mm



Lathe taper 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

Note: Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted. Use the order form at the end of the catalogue.



Locking ring key 3R-605-GE

To lift the locking ring of the drawbars.

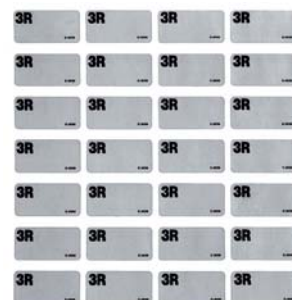
- Supplied in sets of two



Labels 3R-LL200P

Supplied with marker pen.

- Size 12x25 mm
- Supplied in sets of 200

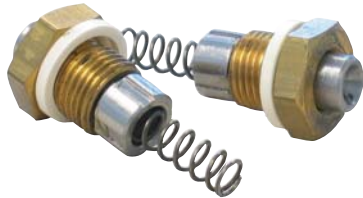


Accessories

Connection for air gun 90815

Fits automatic chucks 3R-680.10-2, 3R-680.19-2 and 3R-680.1-2.

- Supplied in sets of 2



Code carriers 3R-863.01-10

With pre-programmed unique identity, designed for Macro systems and Dynafix.

- Supplied in sets of 10



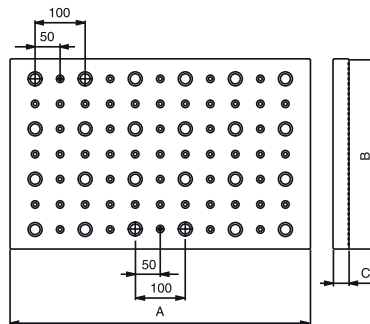
Reference tables

Reference tables of structurally-stable toughened steel (270-320 HB). Hardened bushes in dead-end holes for 3Refix mandrels Ø20 mm at 100x100 mm modular spacing, as well as M12 tapped mounting holes with 50x50 mm modular spacing.

Note: Customised reference tables can be made to order.

Note: Hardened reference tables (650-700 HB) can be made to order.

Use the order form at the end of the catalogue.



3R-936-60.38

- A = 600 mm
- B = 380 mm
- C = 32 mm
- Weight 55 kg

3R-936-85.40

- A = 850 mm
- B = 400 mm
- C = 32 mm
- Weight 83 kg

3Refix mandrel

Note: When positioning with 3Refix mandrels –always tighten the expanding mandrel in the R⁰ hole first.

3R-901-10E

- 3Refix Ø10 mm
- Recommended tightening torque 4 Nm
- Supplied in sets of 10 pcs.
- Weight per set 0.2 kg



3R-901-10RS

- 3Refix Ø10 mm
- Rust-resistant
- Recommended tightening torque 4 Nm
- Supplied singly
- Weight per set 0.5 kg

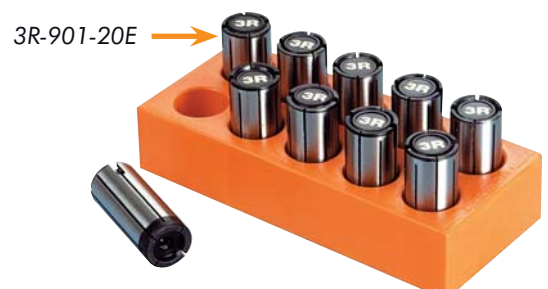
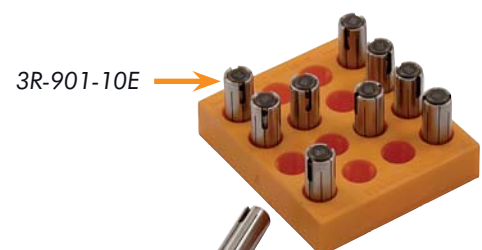
3R-901-20E

- 3Refix Ø20 mm
- Recommended tightening torque 10 Nm
- Supplied in sets of 10 pcs.
- Weight per set 1 kg



3R-901-20RS

- 3Refix Ø20 mm
- Rust-resistant
- Recommended tightening torque 10 Nm
- Supplied singly
- Weight per set 0.1 kg



Automation

Utilise every hour of the day and night!

An automatic production cell can generate revenue round the clock, seven days a week. Why be satisfied with 40 productive machine-hours a week when the same machine can achieve over 100 additional hours a week? Use every hour of the day and night for production!

WorkPal, WorkPartner and WorkMaster – three “aces” which boost your productivity and sharpen your competitiveness.

And not least – they bring faster payback on the investments you made.



WorkPal Compact Servo – modest demands, major benefits

WorkPal Compact Servo is a simple step into the world of automation. It's an easy-to-use, user-friendly pallet changer for automatic changing of pallets in milling and/or EDM machines, for example.

A sliding door gives maximum access to the magazine, making it easier to manage the pallets. The extremely compact unit is simple to install. And what's more, WorkPal Compact Servo only needs minimal floor space.

WorkPartner 1+ – can serve two machines

WorkPartner 1+ is an extremely compact unit for changing pallets – on machine tables and at machine spindles in one or two machines. Its modular construction means that magazine capacity is extremely flexible and can be adapted to your company's needs.

Typical application areas

- Milling – changing of workpieces.
- Grinding – changing of workpieces.
- Die-sinking EDM – changing of workpieces and electrodes.
- Wire EDM – changing of workpieces.



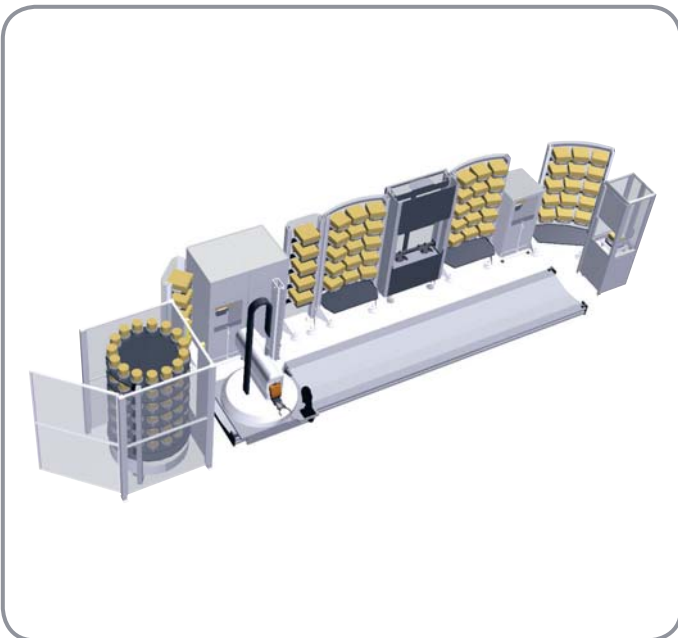
Automation

WorkMaster – a modular automation concept

WorkMaster is a flexible automation concept for applications in one or more milling and/or EDM machines, for example. And changing can be done both in the machine spindle and on the machine table.

The changer unit is completely self-contained and can be adapted to "tailor-made" automation solutions with several types of magazine, as well as a number of options. One, two or three machines in the same production cell.

One clear advantage is the "open architecture" of the system. The customer chooses the machine (or machines) suited to the particular requirements of the business, and a WorkMaster is added.



WorkMaster Linear – the flexible Solution

WorkMaster Linear is an automation concept that gives extreme flexibility. By placing WorkMaster on rails, the changer unit can be made to serve a large number of machines, and at the same time more space is created for magazines and peripherals.

Several designs of magazine are available. The basic variants are modular racks or rotating magazines, where the shelves are matched to the pallet systems in System 3R's wide range of products.

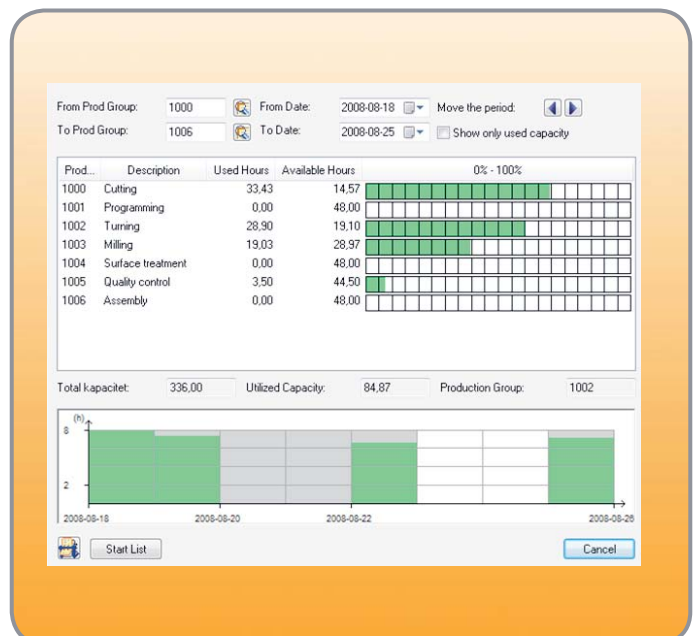
Typical fields of application are:

- milling – changing of workpiece and cutting tool
- grinding – changing of workpieces
- die-sinking EDM – changing of workpieces and electrodes
- wire EDM – changing of workpieces

WorkShopManager

- Preparation – Order Creation, Operation lists & Identify
- CellManager – Manually loaded machines, robot loaded machines, Automatic electrode selection, Cutting tool monitoring & Robot manager
- Execution – Batch Builder, Batch ID, Magazine positions, Transfer of NC programs
- Monitoring

See separate publications for further information about WorkPal, WorkPartner, WorkMaster, WorkMaster Linear, Automation with six-axis industrial robots and WorkShopManager.



Order form

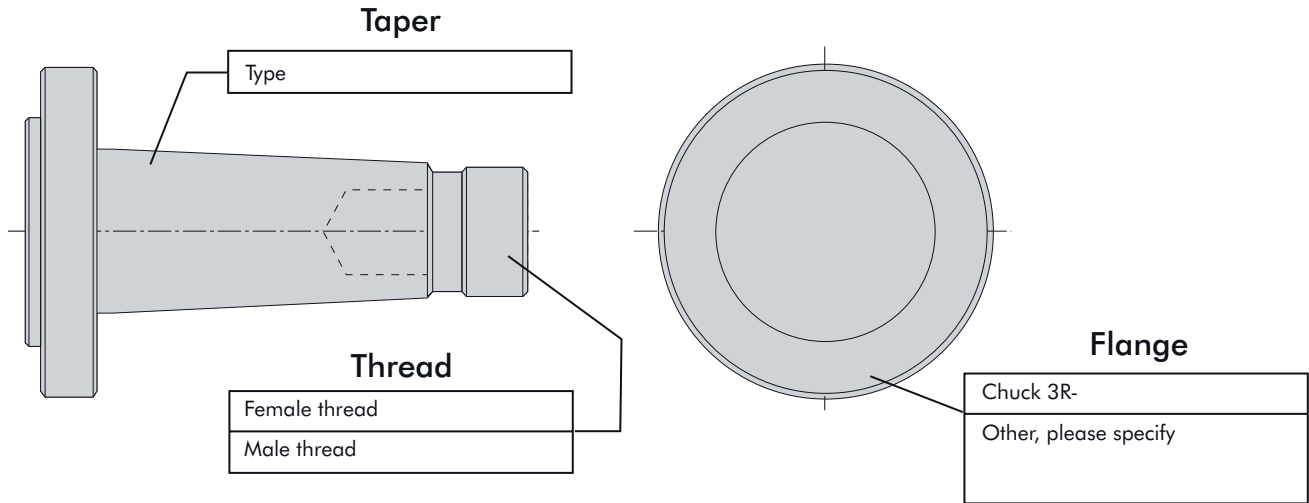
Company _____

Phone _____

Contact _____

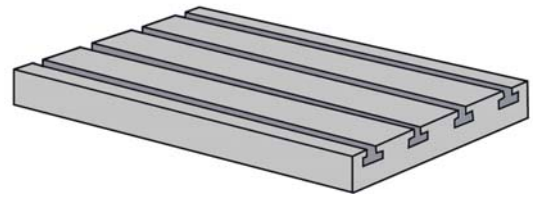
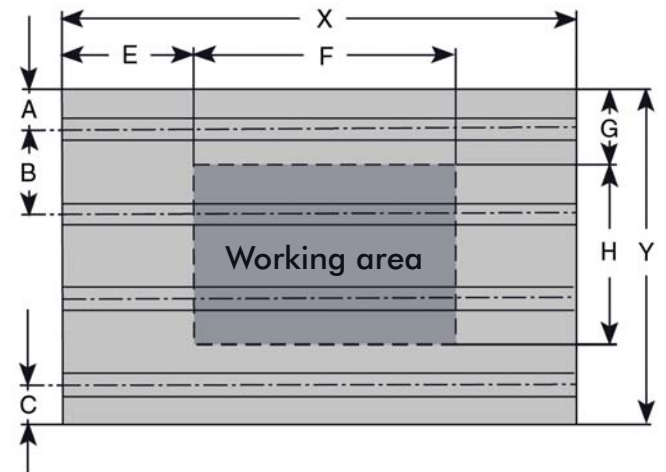
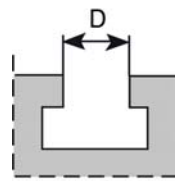
Date _____

Specification of taper attachment



Specification of 3Refix reference tables

- A _____ mm
- B _____ mm
- C _____ mm
- D _____ mm (T slots)
- E _____ mm
- F _____ mm
- G _____ mm
- H _____ mm
- X _____ mm
- Y _____ mm



No. of T slots _____
 Make of machine _____
 Hardened/unhardened _____
 Other information _____

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