

Reference systems for electrode manufacturing & EDMing



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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.

i 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.

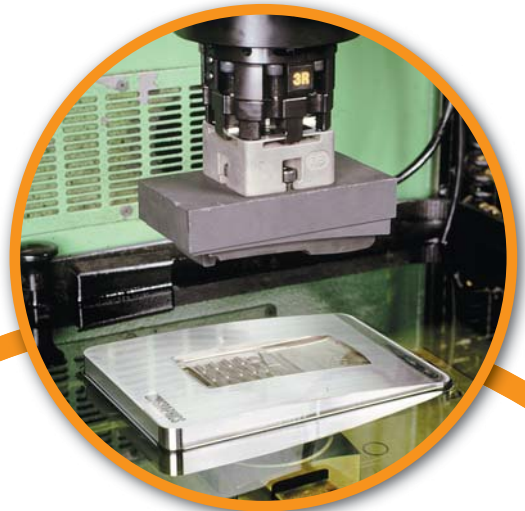
Our thanks to Formverktyg i Nynäshamn AB for the loan of products used in photographs in this catalogue.





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.

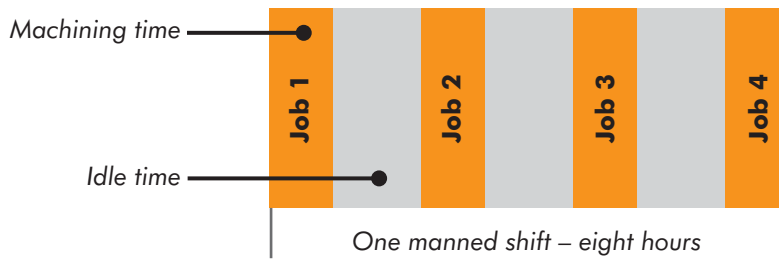
The solution is a stable and exact reference system. This lets you preset away from the machine and then set up the machine with minimum idle time. Quickly and precisely!



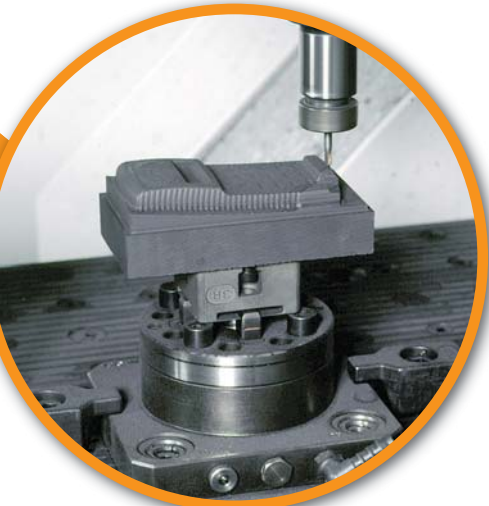
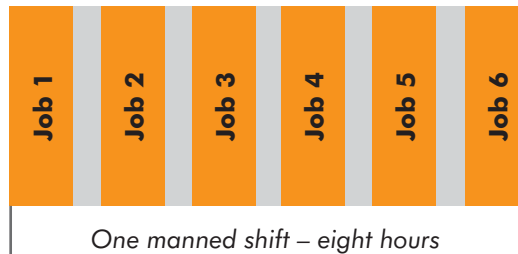
Fitting the machines with the same reference system means that electrodes and workpieces can be moved between the machines without subsequent alignment and checking – **One Minute Set-up**.



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.

From small to large

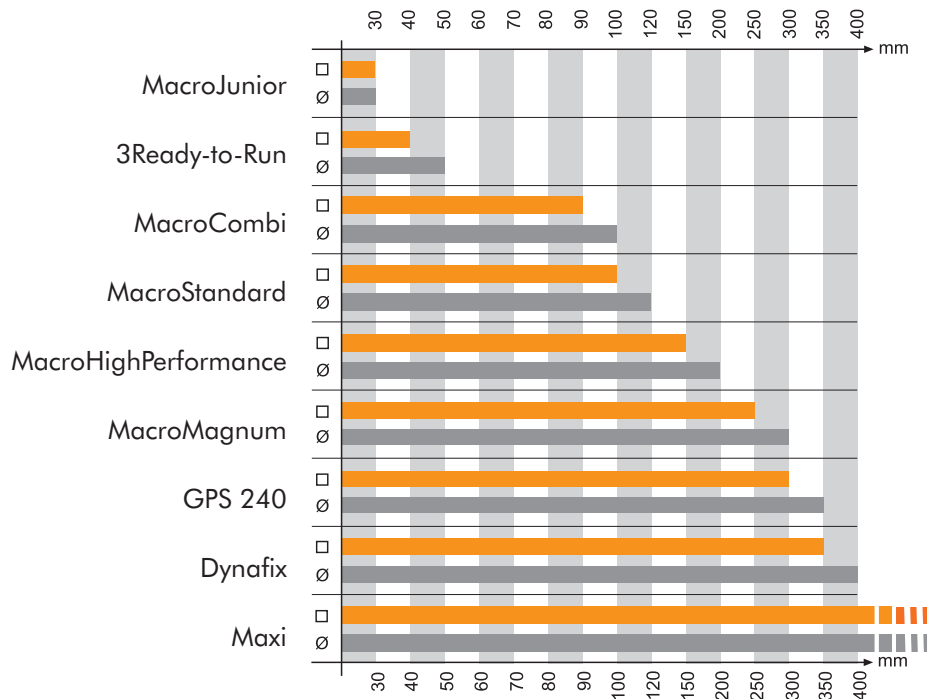
The engineering industry is complex. Every company is unique in terms of type of production, machinery, capacity etc.

To satisfy all these different requirements, System 3R has developed reference systems of exceptional flexibility.

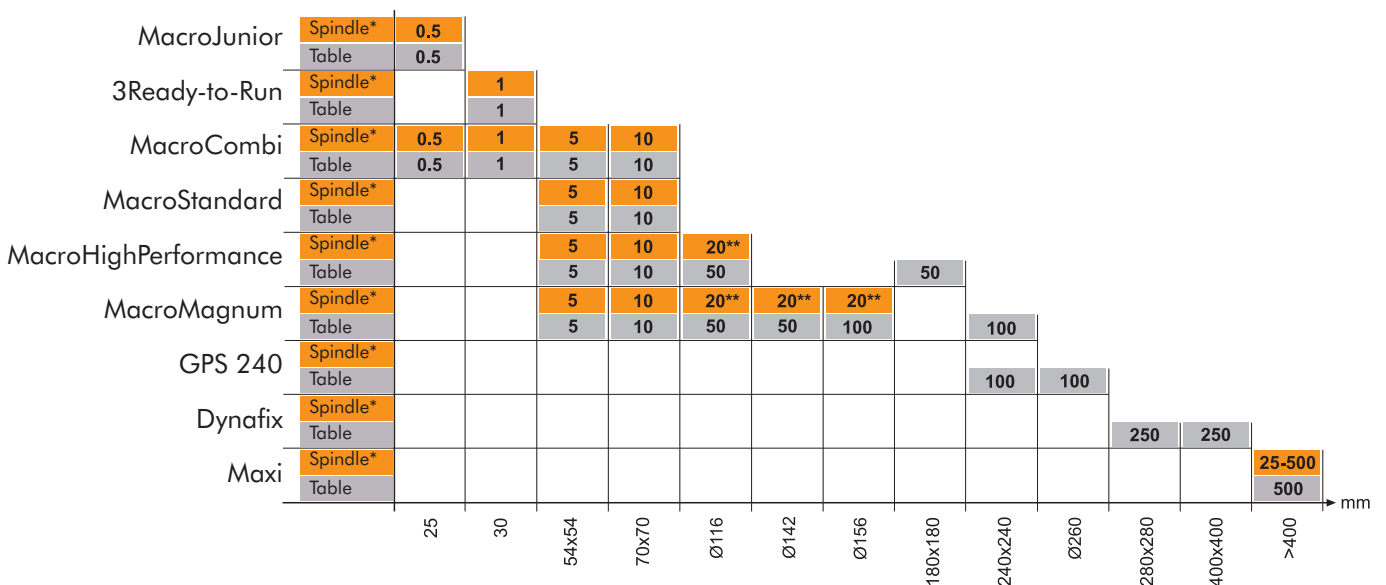
For every size of pallet there is a “recommended”

maximum workpiece size. However, this should only be regarded as a guide, since the size of the workpiece relative to the pallet depends above all on the material and the type of machining.

Maximum size of workpiece or electrode, square or round / mm



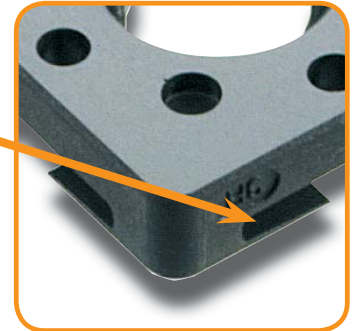
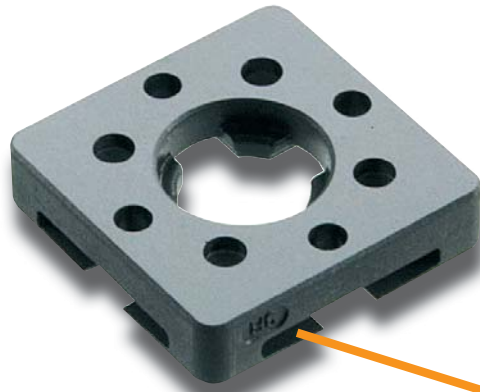
Maximum weight of workpiece or electrode, spindle chuck or table chuck / kg



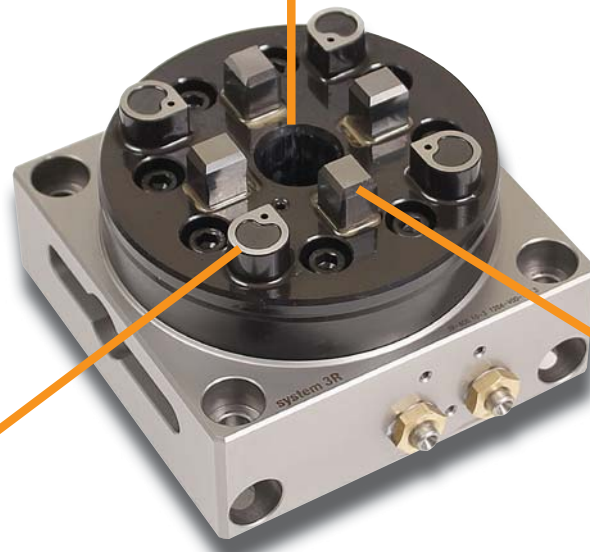
* Die-sinking EDM spindle

** With automatic changing

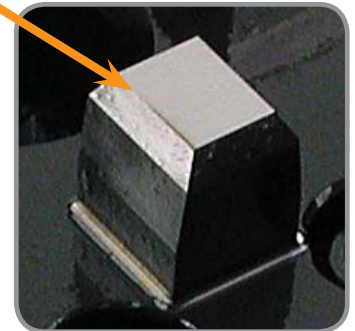
Macro



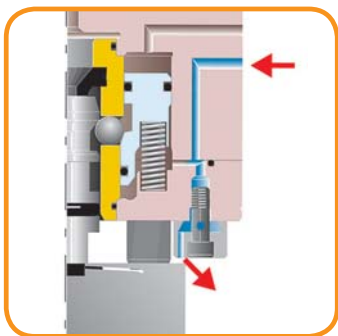
The references of the pallet are created directly in the pallet and on a single plane. There are no loose parts to be installed and adjusted by the user.



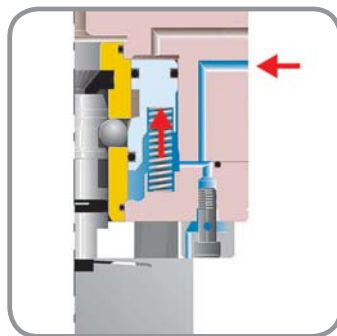
The Z-references of the chuck have generously-sized surfaces to ensure the highest stability.



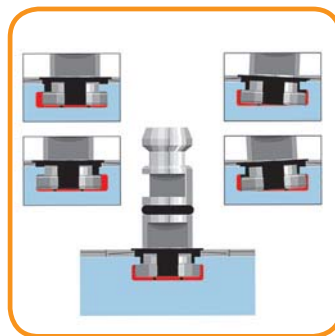
The X and Y references of the chuck are made of cemented carbide.



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[®]

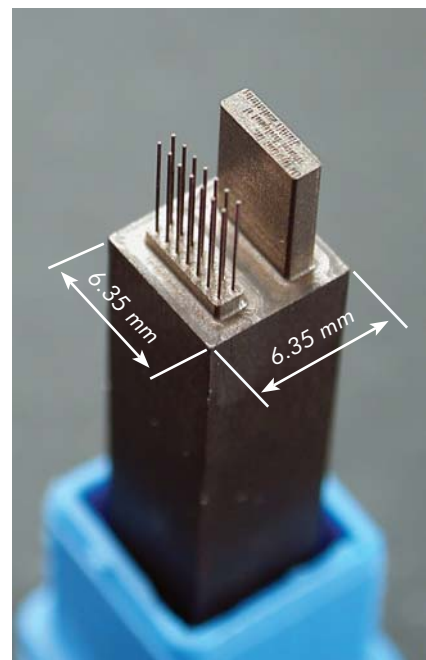
With conventional chucks, vibrations of the workpiece caused by the dynamic forces due to the action and rotation of the cutting tool. Restrictions therefore have to be imposed on the rotation speed and feed rate of the cutting tool, to prevent instability and to achieve the necessary surface quality.

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.



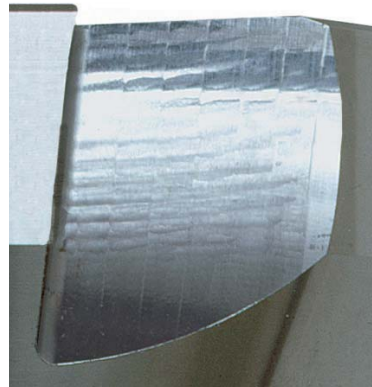
Example Micro Milling:
VDP advantages: The electrode Aspect Ratio (L/\varnothing) was doubled with VDP.
Dimensions: \varnothing 0.134 mm, length 4.8 mm

VDP (Vibration-Damped Palletisation)

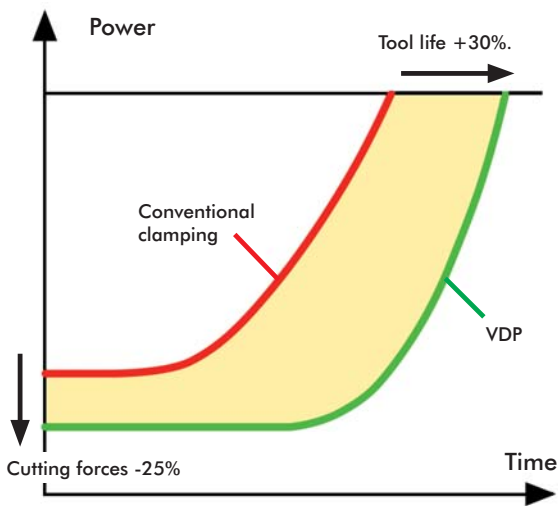
Increase your capacity with $> +30\%$



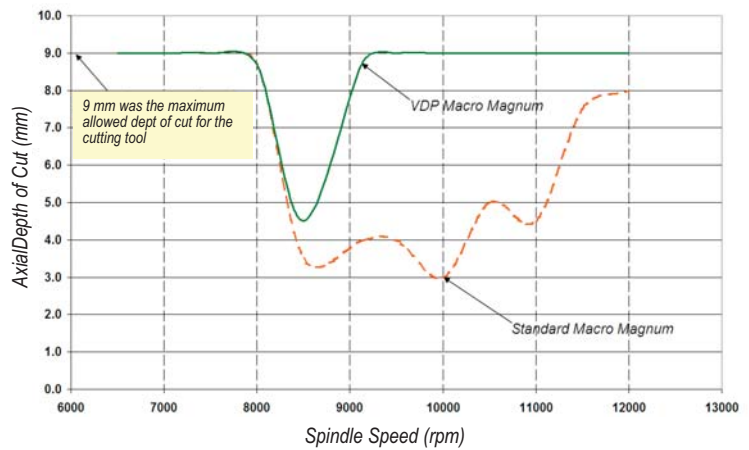
WITH



WITHOUT



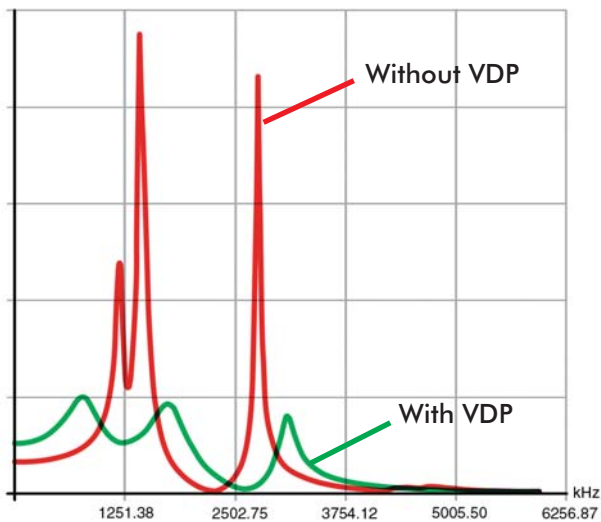
Less tool wear extends the life of the tools = increased revenue.



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.

MacroJunior & MacroCombi

- ... gives extreme flexibility
- ... one chuck, two systems
- ... reduces setting-up times.
- ... ensures precision and quality
- ... is suitable for automatic changing with System 3R's automation program.

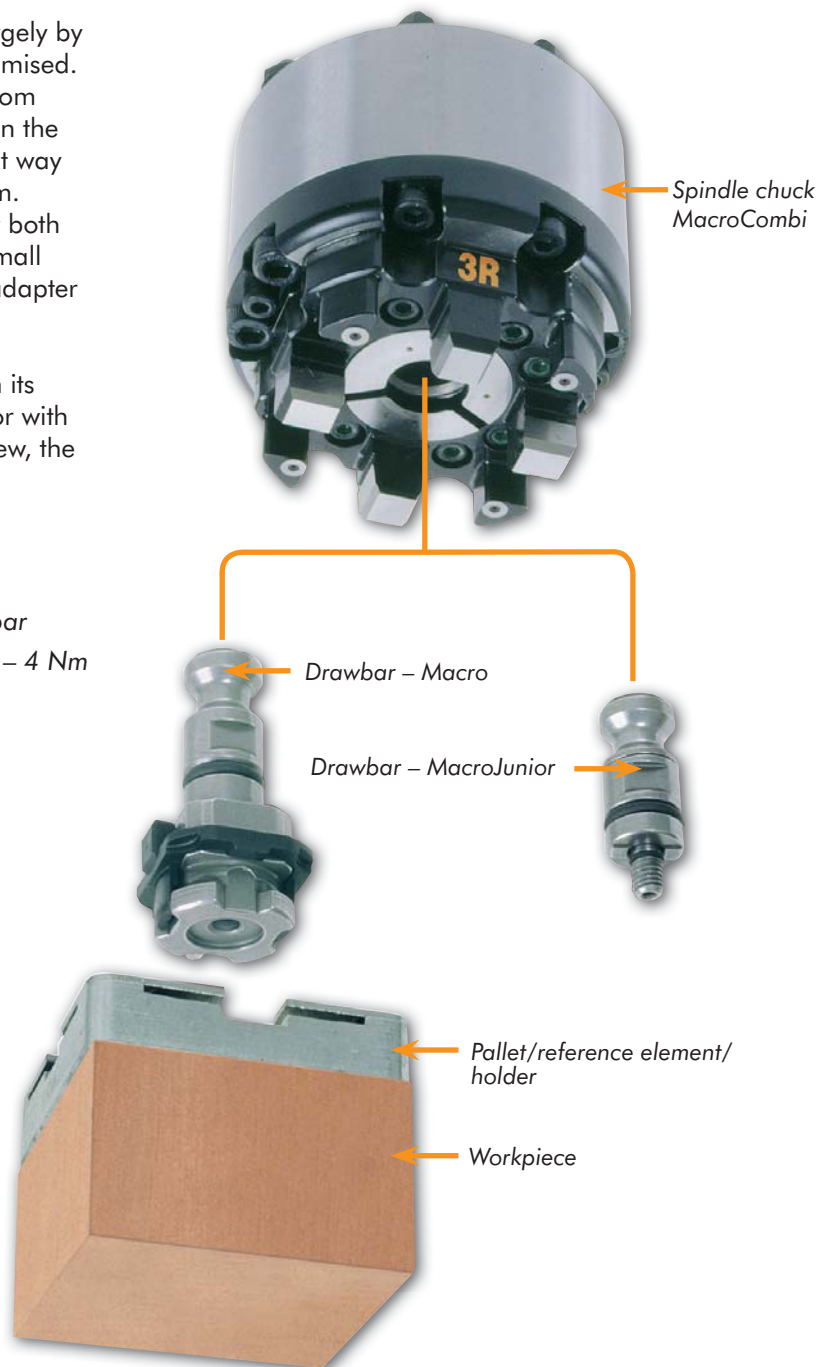
MacroCombi

Profitability in tool manufacturing is determined largely by the extent to which machine downtime can be minimised. A reference system which allows presetting away from the machine – followed by super-rapid tooling-up in the machine when the time comes – is a highly efficient way of working. MacroCombi is such a reference system.

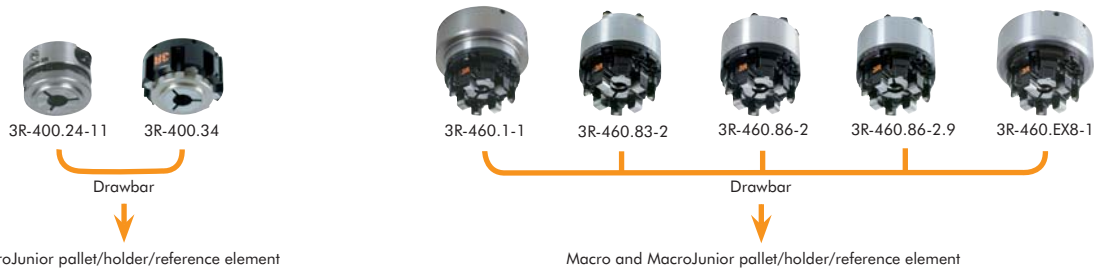
The MacroCombi system offers extreme flexibility both in electrode production and in die-sinking EDM. Small and large electrodes in the same chuck – without adapter elements!

The MacroCombi chucks accept two completely different types of electrode holder. Both Macro with its immovable stability and precision, and MacroJunior with its highly economical holders. The limitations are few, the possibilities many.

- Clamping force – 5000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- Recommended tightening torque, manual chuck – 4 Nm

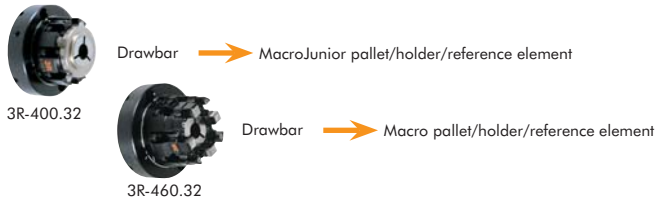


MacroJunior & MacroCombi – Chucks



Spindle chucks

	Article number	Drawbar	Feature
Manual	3R-400.34	3R-405.11	
Pneumatic	3R-460.1-1	3R-405.16 / 3R-405.11	
Pneumatic	3R-460.83-2	3R-405.16 / 3R-405.11	machine-adapted
Pneumatic	3R-460.86-2	3R-405.16 / 3R-405.11	machine-adapted
Pneumatic	3R-460.86-2.9	3R-405.16 / 3R-405.11	machine-adapted. 90°
Pneumatic	3R-460.EX8-1	3R-405.16 / 3R-405.11	machine-adapted
Manual	3R-400.24-11	3R-405.11	



Lathe chuck

	Article number	Drawbar	Feature
Manual	3R-400.32	3R-405.11	
Manual	3R-460.32	3R-405.16/3R-405.11	

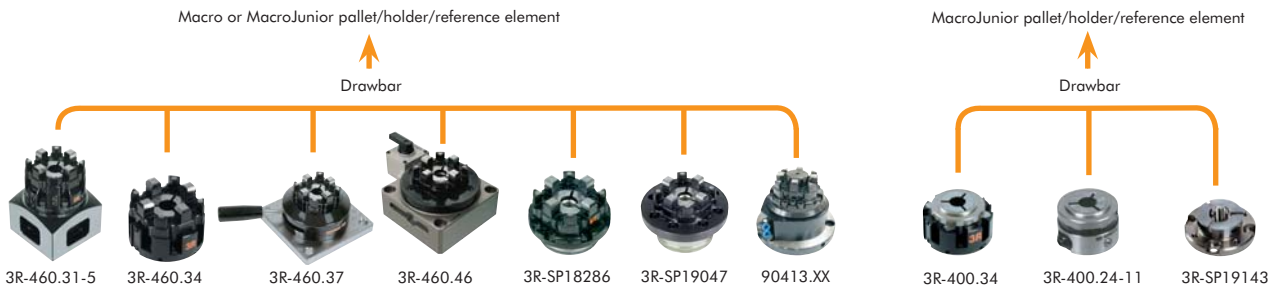


Table chucks

	Article number	Drawbar	Feature
Manual	3R-460.31-5	3R-405.16 / 3R-405.11	horizontal and vertical
Manual	3R-460.34	3R-405.16 / 3R-405.11	
Manual	3R-460.37	3R-405.16 / 3R-405.11	
Pneumatic	3R-460.46	3R-405.16 / 3R-405.11	
Manual	3R-400.34	3R-405.11	

Built-in chucks

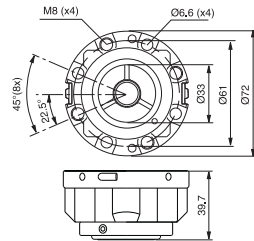
	Article number	Drawbar	Feature
Manual	3R-400.24-11	3R-405.11	
Manual	3R-400.34	3R-405.11	
Manual	3R-460.34	3R-405.16/3R-405.11	
Pneumatic	3R-SP18286	3R-405.16 / 3R-405.11	
Pneumatic	3R-SP19047	3R-405.16 / 3R-405.11	
Manual	3R-SP19143	3R-405.16 / 3R-405.11	
Pneumatic	90413.XX	3R-405.16 / 3R-405.11	

MacroJunior – Chucks

Manual chuck, MacroJunior 3R-400.34

For mounting in the machine spindle by means of 3R-A11489, or on the machine table by means of 3R-A19724 or alternatively 3R-A21944, or in a fixture.

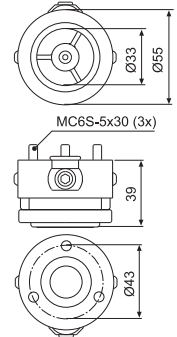
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.6 kg



Manual chuck, MacroJunior 3R-400.24-11

For mounting on machine spindle.

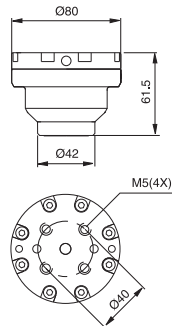
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 0.8 kg



Pneumatic chuck, MacroJunior 3R-410.1-M

For mounting on the machine spindle or in a fixture on the machine table.

- Required drawbar 3R-405.11
- Required air pressure 6 ± 1 bar
- Fixed index positions 3x120°
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.5 kg

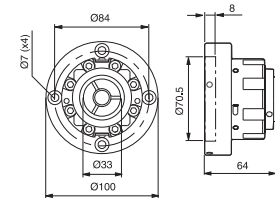


Manual lathe chuck, MacroJunior 3R-400.32

For mounting on a lathe taper.

Note: When ordering a lathe taper, use the order form at the end of the catalogue.

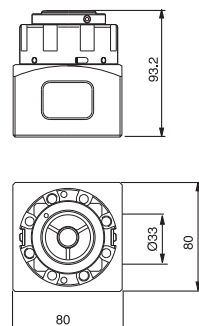
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.8 kg



Manual chuck, MacroJunior 3R-410.31-5

Chuck in High Performance version. Five ground surfaces for vertical or horizontal mounting on the machine table.

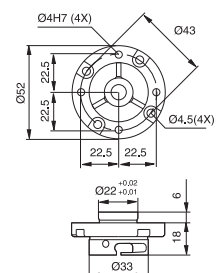
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 3.5 kg



Manual chuck, MacroJunior 3R-SP19143

Stainless steel chuck with ground flange $\text{Ø}22 \times 6$ mm for mounting in a fixture or the WEDM system. Axial locking screw with channel for flushing through the electrode.

- Fixed index positions 3x120°
- Weight 0.8 kg

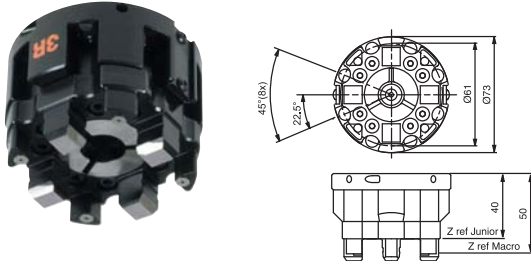


MacroCombi – Chucks

Manual chuck, MacroCombi 3R-460.34

For mounting in the machine spindle by means of 3R-A11489, or on the machine table by means of 3R-A19724 or alternatively 3R-A21944, or in a fixture.

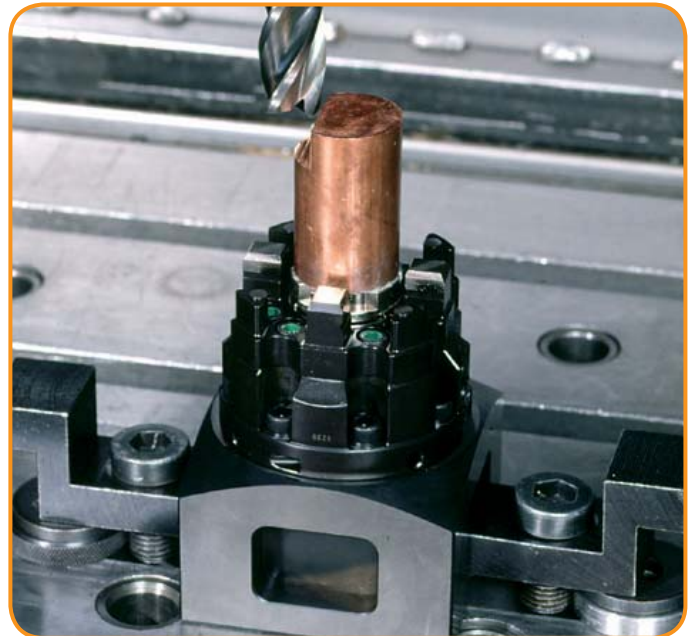
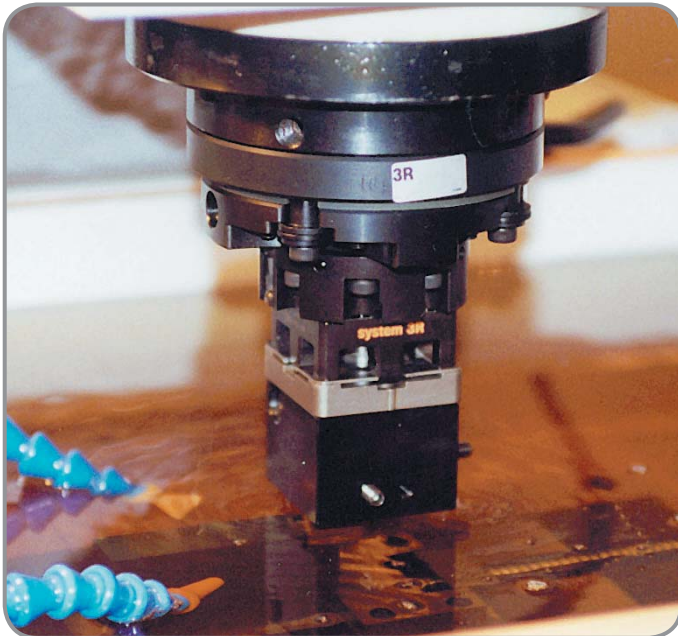
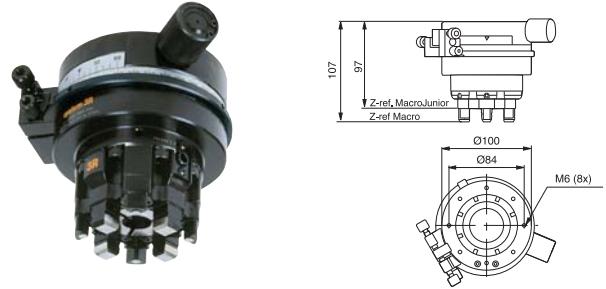
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 1.8 kg



Manual C-axis, MacroCombi 3R-460.35

For mounting on machine spindle with 3R-A3620.

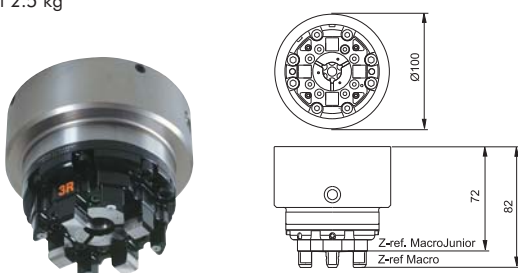
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Fixed index positions 8x45° and 3x120°
- Vernier scale
- Weight 4.3 kg



Pneumatic chuck, MacroCombi 3R-460.1-1

Pneumatic chuck for mounting on machine spindle with 3R-A3620.

- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 2.5 kg

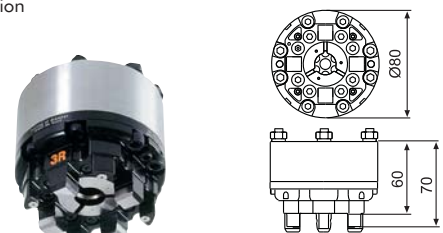


Pneumatic chuck, MacroCombi 3R-460.86-2

Pneumatic chuck for mounting directly on the machine spindle. All X/Y/Z references in hardened and ground steel.

Note: When ordering state machine make and type.

- Four M6 clearance holes, Ø45 mm and four M5 clearance holes, 62x26 mm
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Flushing connection
- Weight 1.9 kg

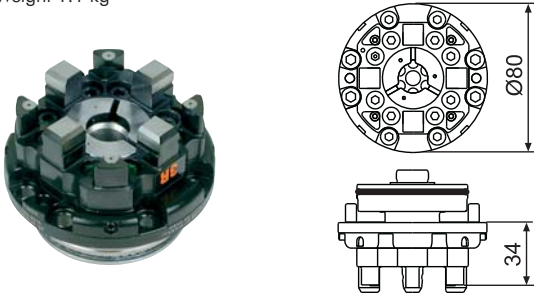


MacroCombi – Chucks

Pneumatic chuck, MacroCombi 3R-SP18286

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

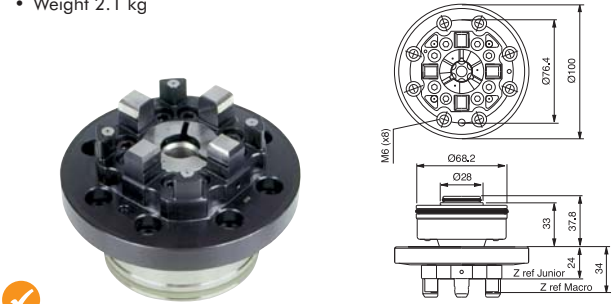
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6 ± 1 bar
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 1.1 kg



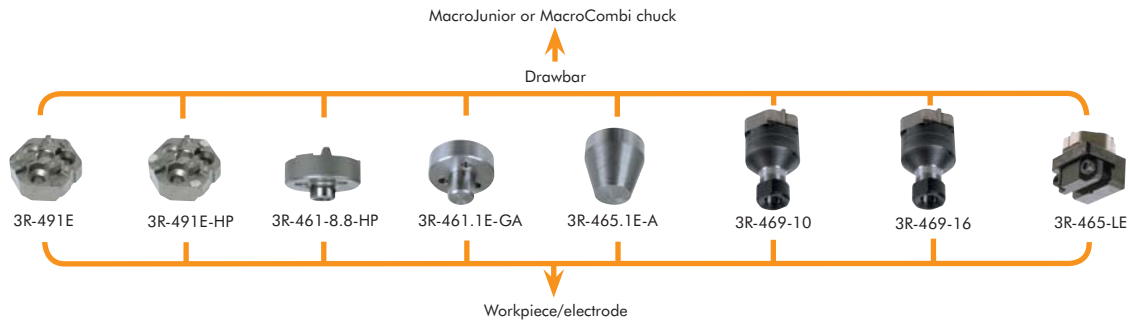
Pneumatic chuck, MacroCombi 3R-SP19047

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

- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6 ± 1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 2.1 kg



MacroJunior – Pallets & Holders



Holders

	Article number		Feature
Sintered pallet Ø25 mm MacroJunior	3R-491E		
Sintered pallet Ø25 mm MacroJunior	3R-491E-HP		parallel ground
Holder Ø26 mm MacroJunior	3R-461-8.8-HP		parallel-ground. Journal Ø8.8 mm
Holder Ø28 mm MacroJunior	3R-461.1E-GA		journal Ø10x10 mm
Holder Ø28 mm MacroJunior	3R-465.1E-A		taper
Collet chuck ETS10, MacroJunior	3R-469-10		Ø0.1-10 mm
Collet chuck ER16, MacroJunior	3R-469-16		Ø0.5-10 mm
Holder, MacroJunior	3R-465-LE		Ø4 - 8 or <8x18 mm

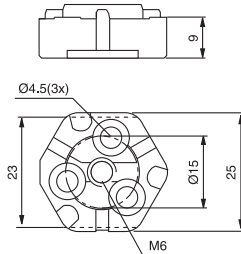
MacroJunior – Chuck adapter, Pallets & Holders

Pallet 25 mm, MacroJunior 3R-491E

For copper or graphite electrodes.

NOTE: The electrode is installed with screw and adhesive assembly, or alternatively brazing.

- Adapted for automatic changing
- Supplied in sets of 30

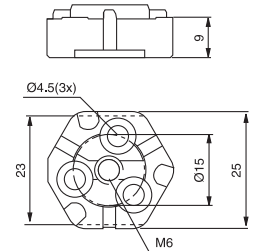


Ground pallet 25 mm, MacroJunior 3R-491E-HP

Top and bottom faces parallel-ground to within 0.002 mm.

NOTE: The electrode is installed with screw and adhesive assembly, or alternatively brazing.

- Adapted for automatic changing
- Supplied in sets of 30

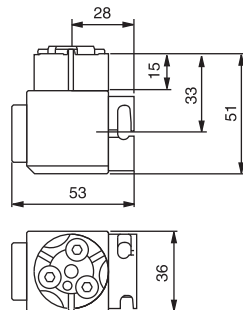


Manual chuck adapter 90°, Junior-Junior 3R-467.9-1

For horizontal mounting of MacroJunior holders. Screw locking.

Note: For EDM machining only.

- Fixed index positions 3x120°
- Weight 0.6 kg



Holder with journal 3R-461.1E-GA

Journal Ø10x10 mm. Intended mainly for graphite electrodes. To be mounted on 3R-491E with three MFT4x12 screws and adhesive.

- Supplied in sets of 30

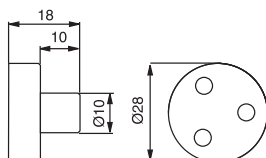


Plate 5.5 mm 3R-SP19270

Used in combination with 3R-491E when electrode blanks are mounted with adhesive and screws*. Permits mounting in MacroCombi chucks.

- Supplied in sets of 30
- *Accessory 3R-PI4.5x25E



Plate 10 mm 3R-SP19269

Used in combination with 3R-491E when soldering round (<50 mm) or square (<40 mm) copper blanks. Permits mounting in MacroCombi chucks.

- Supplied in sets of 30
- Accessory 3R-MFT4x16E



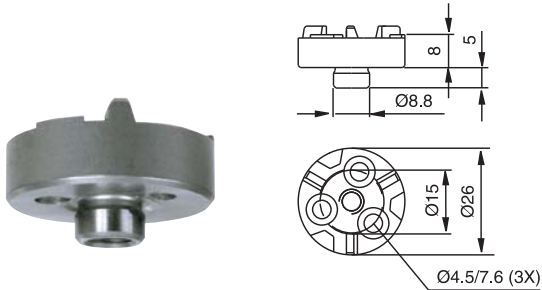
Except 3R-SP19269

MacroJunior – Holders

Holder 25 mm, MacroJunior 3R-461-8.8-HP

Upper and lower faces ground parallel within 0.002 mm.
Locating pin $\varnothing 8.8$ mm (0/0.05 mm).

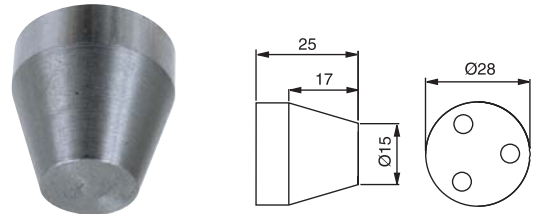
- Not intended for automatic changing
- Supplied singly



Holder with taper 3R-465.1E-A

The taper is machined suitably for attaching very small electrodes.
To be mounted on 3R-491E with three screws MFT4x12.

- Supplied in sets of 30



Collet chucks, MacroJunior

3R-469-10

- For collets ETS10
- Electrode sizes 0.1-2 mm
- Building-in height 47 mm
- Weight 0.1 kg



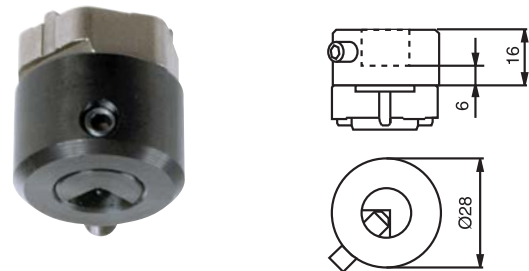
3R-469-16

- For colles ER16
- Electrode sizes 0.5-10 mm
- Building-in height 59.5 mm
- Weight 0.2 kg

Holder, MacroJunior 3R-465-VE

For small electrodes $\varnothing 1-4$ mm, maximum height 30 mm.

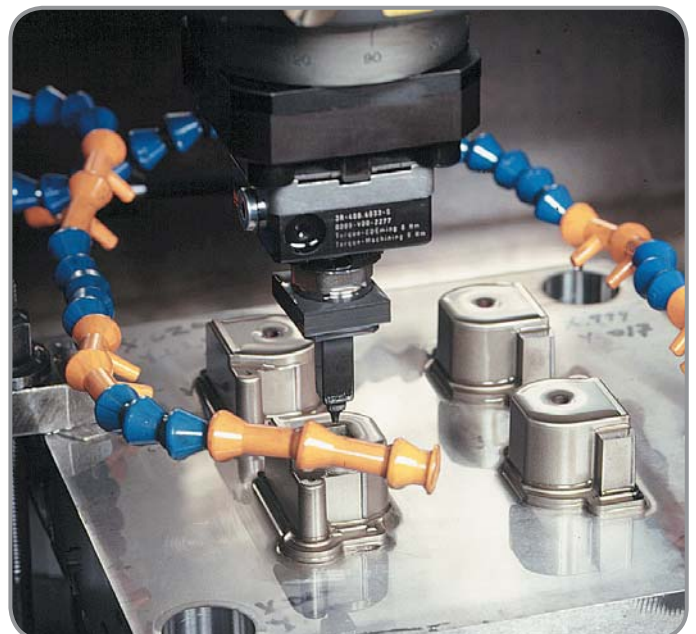
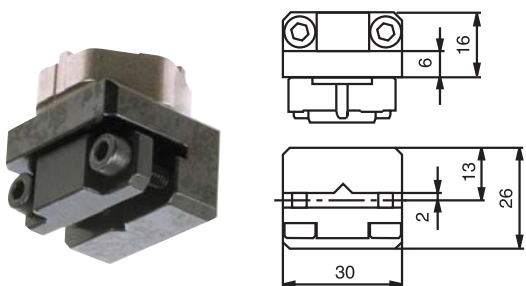
- Supplied in sets of 5



Holder, MacroJunior 3R-465-LE

For round electrodes $\varnothing 4-8$ mm or square $< 8 \times 18$ mm,
and with maximum height 30 mm.

- Supplied in sets of 5



MacroJunior & MacroCombi – Accessories

3Ready-to-Run 3R-494-XXX

The stock range is matched to local preferences and ways of working. This applies to electrode materials, different grades of graphite and copper, and to dimensions. Contact your local 3R representative for further information.

The Vällingby factory can supply holders with factory-mounted copper blanks in sets of ten, as shown in the table.



Article number	Dimensions
3R-494-D10x50	Round blank Ø10x50 mm
3R-494-D12x50	Round blank Ø12x50 mm
3R-494-D16x50	Round blank Ø16x50 mm
3R-494-D22x50	Round blank Ø22x50 mm
3R-494-D26x50	Round blank Ø26x50 mm
3R-494-D32x50	Round blank Ø32x50 mm
3R-494-D40x50	Round blank Ø40x50 mm
3R-494-D50x50	Round blank Ø50x50 mm
3R-494-S12x50	Square blank 12x12x50 mm
3R-494-S22x50	Square blank 22x22x50 mm
3R-494-S26x50	Square blank 26x26x50 mm
3R-494-S32x50	Square blank 32x32x50 mm
3R-494-S40x50	Square blank 40x40x50 mm
3R-494-32x22x50	Square blank 32x22x50 mm
3R-494-40x22x50	Square blank 40x22x50 mm



Drawbar 3R-405.11E

Drawbar Ø15 mm to mount MacroJunior holders in chucks 3R-400.XX and 3R-460.XX.

- Supplied in sets of 10



Check ruler 3R-406.11

For setting angular positions and for centring.

- Measuring length 60 mm



Check mandrel 3R-406.23

Check mandrel with ground C-reference.

- Measuring length 50 mm
- Weight 0.6 kg



Drawbar 3R-405.16E

Drawbar Ø15 mm to mount Macro holders in chucks 3R-460-XX.

- Supplied in sets of 10



Fixed measuring probes

3R-US400.3

For machines with measurement cycle function.

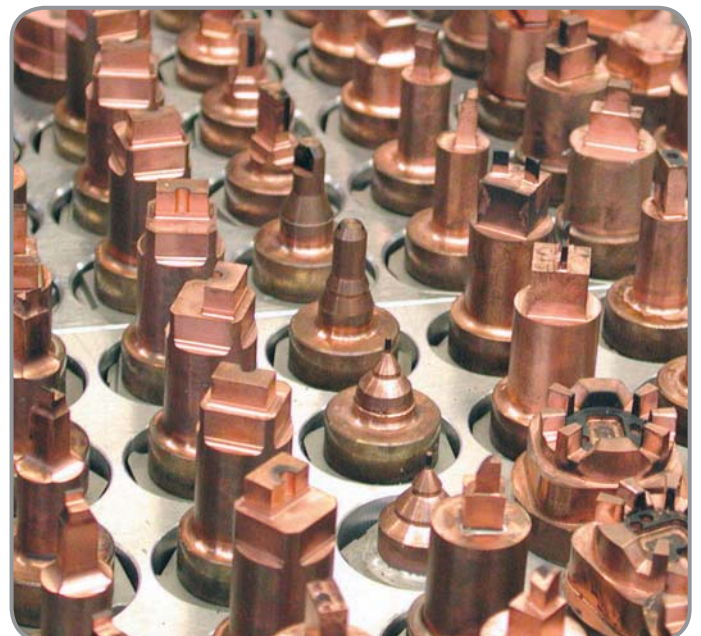
- Measuring ball Ø3 mm
- Overall length 102 mm
- Weight 0.3 kg



3R-US400.5

For machines with measurement cycle function.

- Measuring ball Ø5 mm
- Overall length 103 mm
- Weight 0.3 kg



MacroJunior & MacroCombi – Accessories

TORX screwdriver 3R-333-T20

For screws 3R-PI4.5x20E and 3R-PI4.5x25E.



Torque wrench 3R-614-04

For manual MacroJunior and MacroCombi chucks. Also for 3Refix mandrels Ø10 mm, 3R-901-10E.

- 4 Nm



TORX screws M4 3R-MFT4x12E

For mounting electrode blanks.

- Length 12 mm
- Supplied in sets of 100, including a TORX screwdriver.



Self tapping TORX-screws 3R-PI4.5x20E

For mounting electrode blanks.

- Length 20 mm
- Supplied in sets of 100.



Self tapping TORX-screws 3R-PI4.5x25E

For mounting electrode blanks.

- Length 25 mm
- Supplied in sets of 100.



Soldering kit 3R-404-25

For soldering electrode blanks on 3R-491E or 3R-SP19269

- Supplied with flux.
- Supplied in sets of 100.



Cassette insert 3R-650/8-JR

For storing MacroJunior holders in 3R-650/8x5 and 3R-150/5.

- Supplied in sets of 8



MacroJunior & MacroCombi – Kit & Accessories

User kit

3R-468.31-S

3R-405.11	Drawbar, MacroJunior	x5
3R-405.16	Drawbar, Macro	x5
3R-460.31-5	Manual table chuck	x1
3R-465-L	Holder, MacroJunior	x2
3R-465-V	Holder, MacroJunior	x2
3R-491	Holder, MacroJunior	x30
3R-651.7-S	Pallet Macro 54x54 mm	x6
3R-656.1	Check ruler	x1
3R-658.1-S	Intermediate plate, Macro 54x54 mm	x2
3R-658.2-S	Holder, Macro 54x54 mm	x2
3R-658.4-S	Holder, Macro 54x54 mm	x2
3R-333-T20	Screwdriver, TORX	x1
3R-PI4.5x20	TORX screw	x100
3R-614-04	Torque wrench, 4 Nm	x1



Microscope

3R-4.450

- Magnification x25
- Field of view Ø4 mm
- Weight 0.6 kg



Splash guard

90027.02

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



Ring with code carrier

3R-863.25-10

With pre-programmed unique identity, designed for MacroJunior 25 mm, 3R-491E

- Supplied in sets of 10



Ring with code carrier

3R-863.30-10

With pre-programmed unique identity, designed for 3Ready-to-Run, 3R-494-XX.XX

- Supplied in sets of 10

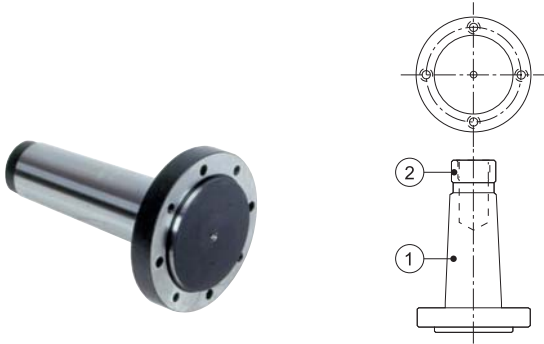


MacroJunior & MacroCombi – Accessories

Lathe taper 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

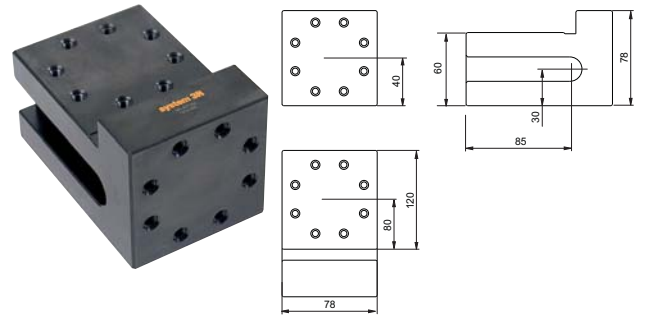
Note: Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted. Use the order form at the end of the catalogue.



Angle shelf 3R-A21944

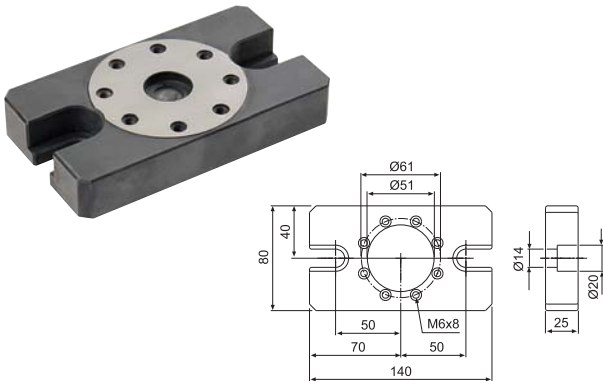
For vertical or horizontal mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on the machine table.

Note: Chuck to be ordered separately.



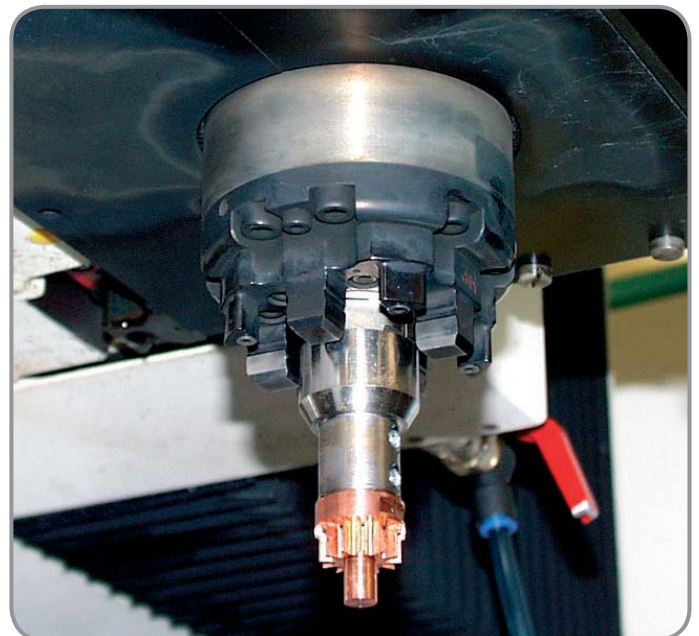
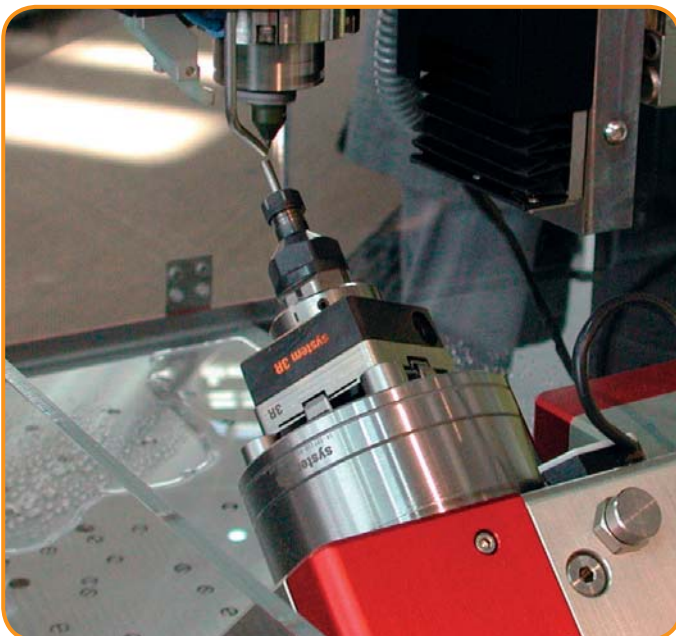
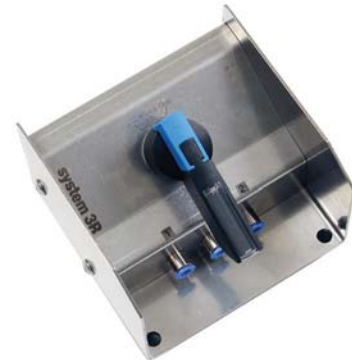
Adapter plate 3R-A19724

For mounting of 3R-400.34, 3R-460.34 and 3R-600.23-S on machine table. Supplied with fixing screws for chuck and table.



Air unit 3R-611.46

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



MacroStd & MacroHP

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.

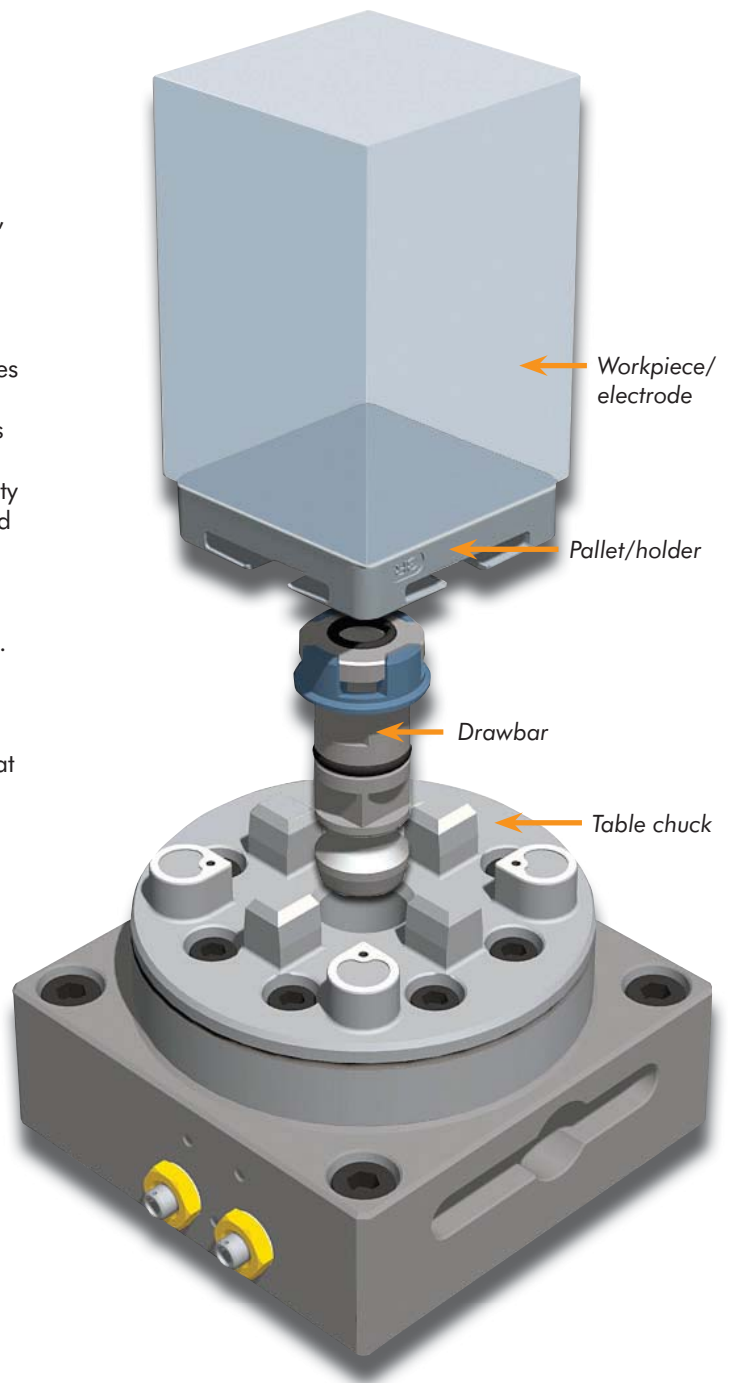
Macro

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.

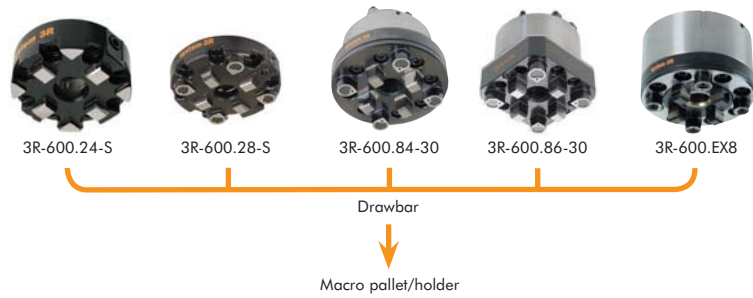
Among users world wide, the Macro system is a byword for precision. And with good reason, since very single Macro product is thoroughly checked before it is dispatched. But precision can be graded too. The Macro products are therefore "classified" in terms of accuracy, material and life – but always 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.

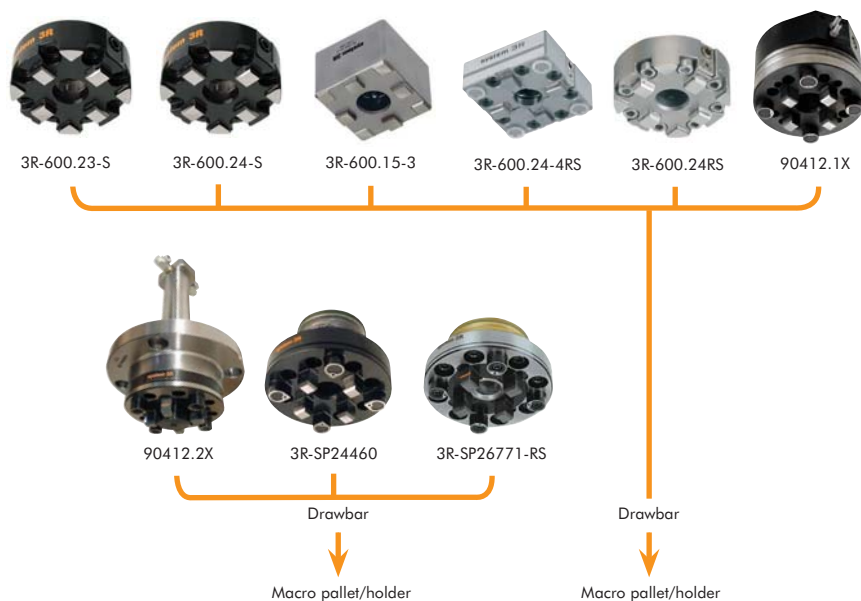


Macro – Chucks

Chucks	Article number	Drawbar	Feature
Manual Std	3R-600.24-S	3R-605.2	ground rear face
Manual Std	3R-600.28-S	3R-605.2	ground rear face
Pneumatic Std	3R-600.84-30	3R-605.1	machine-adapted
Pneumatic Std	3R-600.86-30	3R-605.1	machine-adapted
Pneumatic Std	3R-600.EX8	3R-605.1	machine-adapted



Chucks	Article number	Drawbar	Feature
Manual Std	3R-600.23-S	3R-605.2	Mounting flange, 6 Nm, Ø75 mm
Manual Std	3R-600.24-S	3R-605.2	Ground back face, 6 Nm, Ø75 mm
Pneumatic HP	3R-600.15-3	3R-605.2	Rust-resistant, Ø 56 mm
Manual HP	3R-600.24-4RS	3R-605.2	Rust-resistant, Ø 70 mm
Manual HP	3R-600.24RS	3R-605.1 / 3R-605.4	Rust-resistant, Ø75 mm
Pneumatic Std	90412.1X	3R-605.1 / 3R-605.4	with swivel, low speed
Pneumatic HP	90412.2X	3R-605.1 / 3R-605.4	with swivel, low speed
Pneumatic Std	3R-SP24460	3R-605.1 / 3R-605.4	
Pneumatic HP	3R-SP26771-RS	3R-605.1 / 3R-605.4	rust-resistant

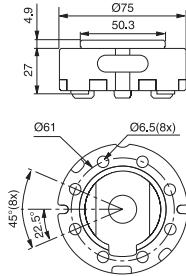


Macro – Chucks

Manual chuck, MacroStd 3R-600.23-S

Cast chuck with mounting flange for mounting on the machine spindle or in a fixture.

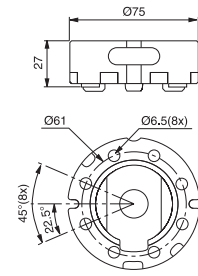
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg



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.

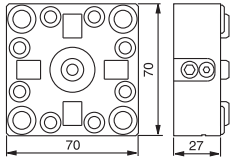
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg



Manual chuck, MacroHP 3R-600.24-4RS

Chuck for Macro holder. Mounts on a suitable fixture.

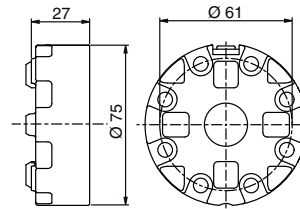
- Required drawbar 3R-605.2RS
- Fixed index positions 4x90°
- Grinded front edge
- Tightening torque 6 Nm
- Rust resistant
- Weight 1 kg



Manual chuck, MacroHP 3R-600.24RS

Manual chuck designed for permanent mounting.

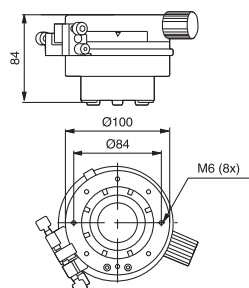
- Tightening torque 6 Nm
- Required drawbar 3R-605.2RS
- Clamping force 6000 N
- Fixed index positions 4x90°
- Rust resistant
- Weight 0.7 kg



Manual C-axis, MacroStd 3R-600.25

For mounting on machine spindle with 3R-A3620.

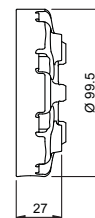
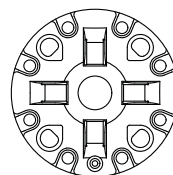
- Required drawbar 3R-605.2
- Fixed index positions 8x45°
- Vernier scale
- Flushing connection
- Weight 4.3 kg



Manual chuck (low profile), MacroStd 3R-600.28

Cast chuck with ground back face for mounting on the machine spindle. Also suitable in a fixture on the machine table or with adapterplate 3R-A26488.

- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.1 kg

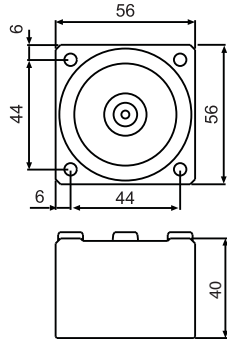


Macro – Chucks

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 $4 \times 90^\circ$
- Rust resistant
- Weight 0.8 kg



Pneumatic chuck, MacroStd 90412.1X

Pneumatic added-on chuck with swivel surrounding unit

- For low RPM
- Machine adapted



Pneumatic chuck, MacroHP 90412.2X

Pneumatic built-in chuck with swivel in the back.

- For high RPM
- Machine adapted



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 chuck, MacroHP 3R-SP26771-RS

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
- Rust-resistant
- Weight 1.8 kg



Macro – Chucks

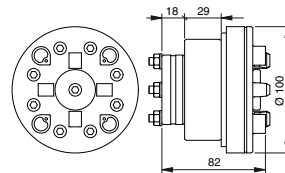


Machine-adapted pneumatic chuck, MacroStd 3R-600.84-30

Pneumatic chuck for mounting directly on the machine spindle.

Note: X/Y/Z references of hardened and ground steel, larger Z-references. Note: When ordering state machine make and type.

- Four M6 clearance holes, \varnothing 45 mm.
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 2.7 kg



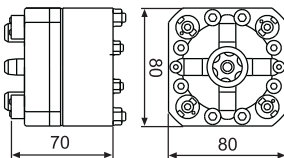
Machine-adapted pneumatic chuck, MacroHP 3R-600.86-1

Pneumatic chuck for mounting directly on the machine spindle.

Note: When ordering state machine make and type.

Note: X/Y-references in cemented carbide, Z-references in hardened and ground steel.

- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Flushing connection
- Weight 2.2 kg

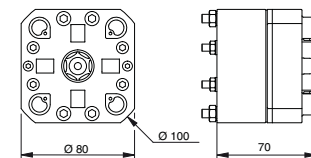


Machine-adapted pneumatic chuck, MacroStd 3R-600.86-30

Pneumatic chuck for mounting directly on the machine spindle.

Note: When ordering state machine make and type. Note: X/Y/Z references of hardened and ground steel, larger Z-references.

- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 2.2 kg



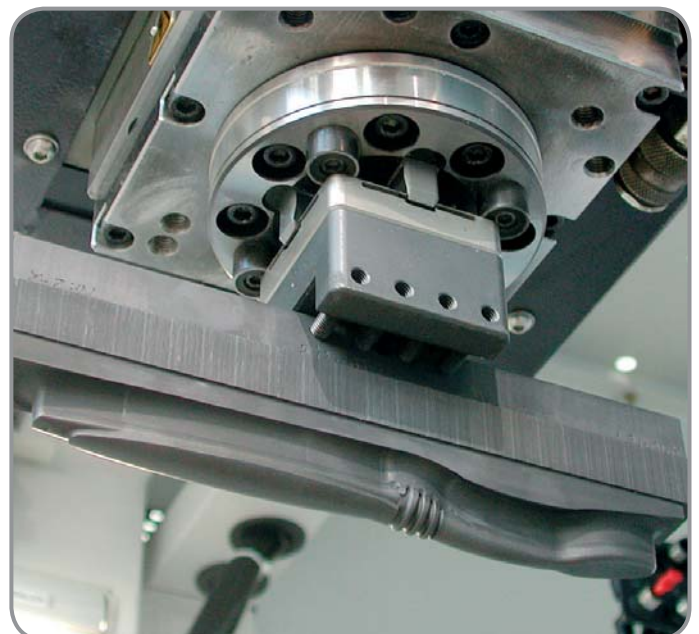
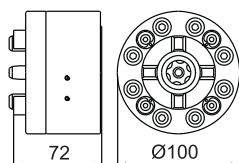
Machine-adapted pneumatic chuck, MacroStd 3R-600.EX8

Pneumatic chuck for mounting directly on the machine spindle.

Note: When ordering state machine make and type.

Note: X/Y/Z references in hardened and ground steel.

- Four M6 clearance holes, \varnothing 41 mm.
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Flushing connection
- Weight 2.2 kg

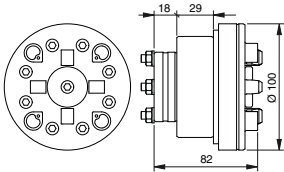


Macro – Chucks

Pneumatic chuck, MacroHP 3R-600.84-3

Pneumatic chuck for permanent mounting on the machine spindle.

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



Pneumatic chuck, MacroStd 3R-600.84-31

Pneumatic chuck for permanent mounting on the machine spindle.
Note: For debris guard 3R-SP27962

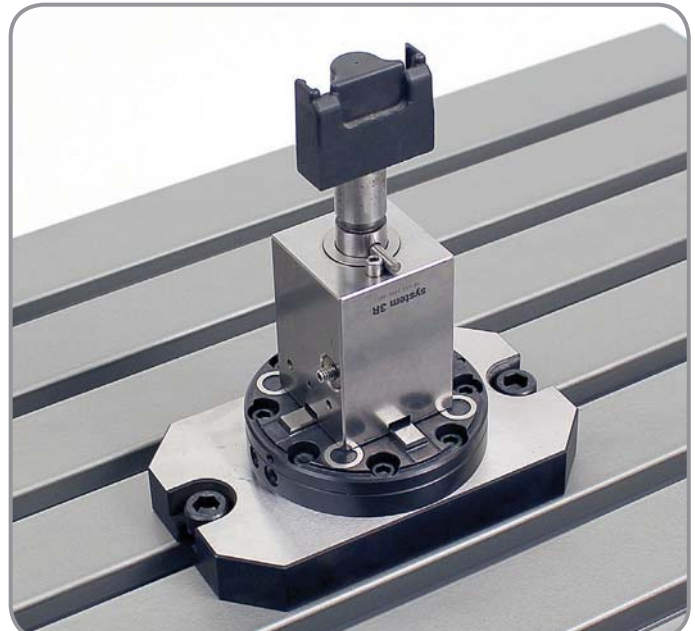
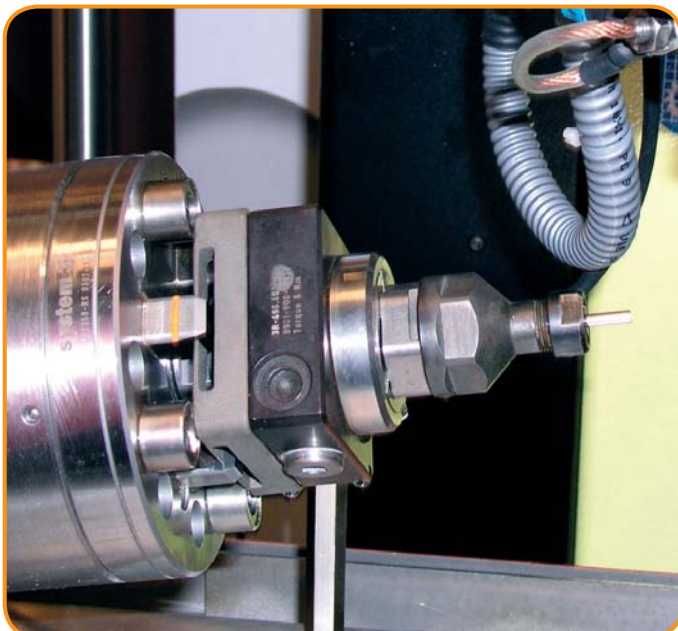
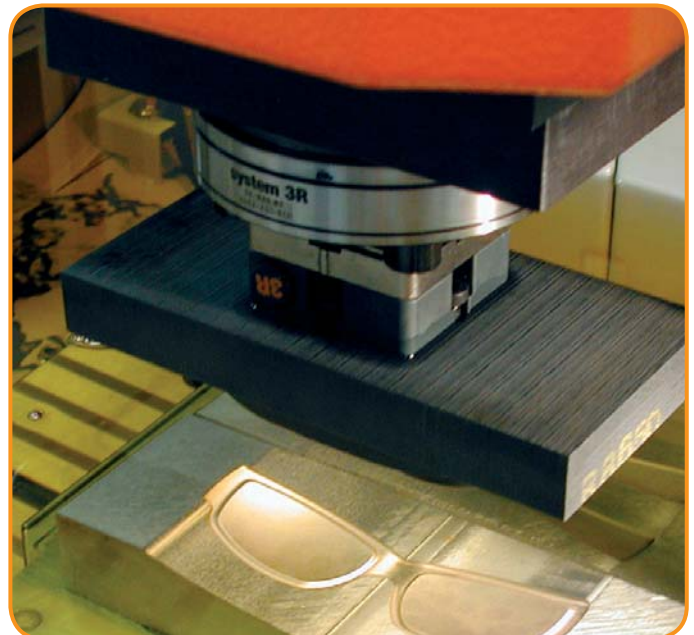
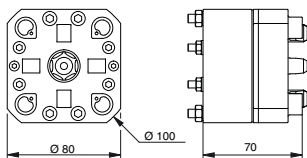
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar.
- Air-blast cleaning of Z-references.
- Turbo locking.
- Fixed index positions $4 \times 90^\circ$.
- Weight 4 kg.



Pneumatic chuck, MacroHP 3R-600.86-3

Pneumatic chuck for permanent mounting on the machine spindle.

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

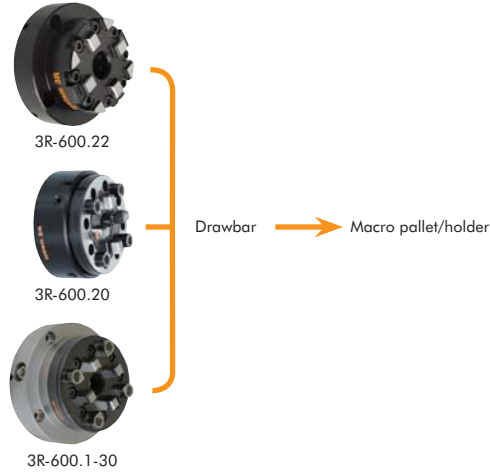
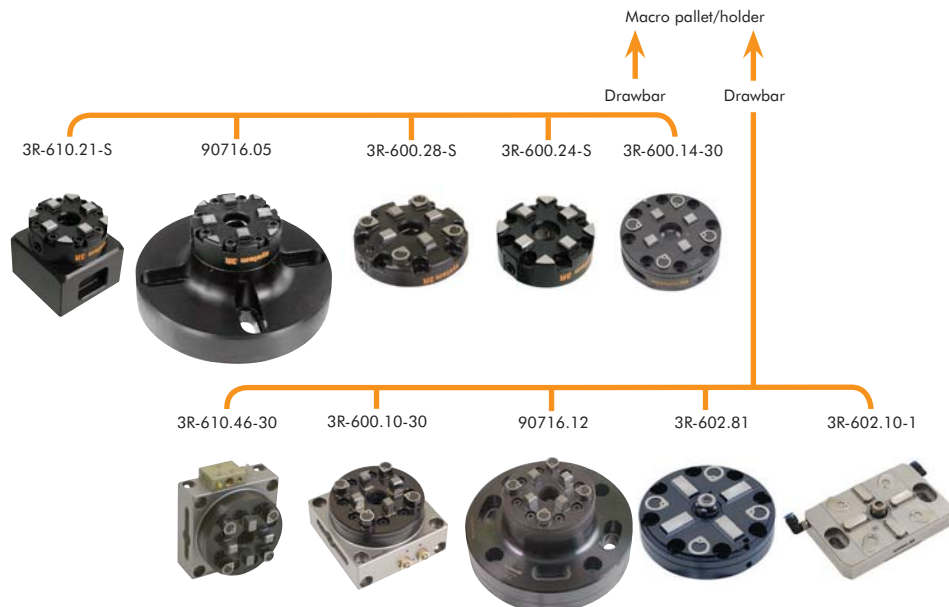


Table chucks	Article number	Drawbar	Feature
Manual Std	3R-610.21-S	3R-605.2	horizontal and vertical, 6 Nm
Manual VDP	90716.05	3R-605.2	vibration-damped, 6 Nm, Ø75 mm
Manual Std	3R-600.28-S	3R-605.2	low profile, 6 Nm, Ø100 mm
Manual Std	3R-600.24-S	3R-605.2	6 Nm, Ø75 mm
Pneumatic Std	3R-610.46-30	3R-605.1 / 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. 3Rfix 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

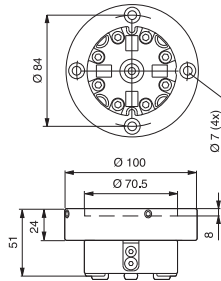


Macro – Chucks

Manual lathe chuck, MacroStd 3R-600.22

With setting screws for centring

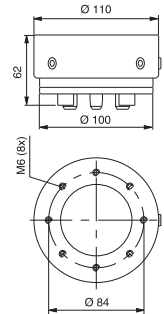
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Weight 2.1 kg



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.

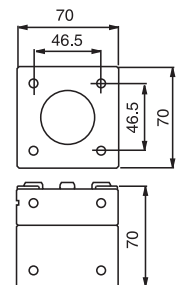
- Required drawbar 3R-605.1
- Fixed index positions 4x90°
- Turbo locking
- Weight 4 kg



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



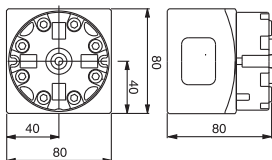
Manual chuck, MacroStd 3R-610.21-S

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

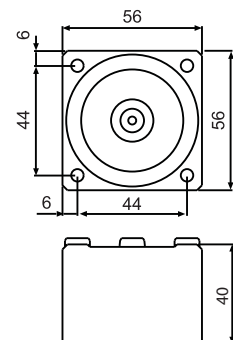


Except 90842

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

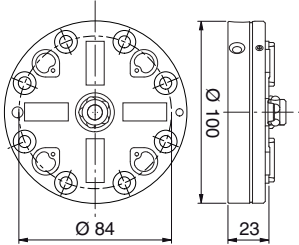


Macro – Chucks

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

Pneumatic chuck for permanent mounting on the machine table.

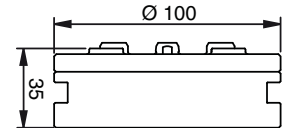
- Required drawbar 3R-605.10
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Weight 1 kg



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

Pneumatic chuck for permanent mounting on the machine table.

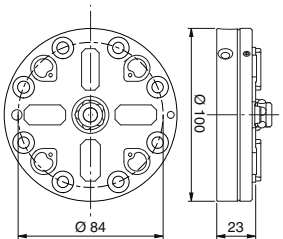
- Required drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Weight 2 kg



Pneumatic chuck, MacroHP 3R-602.81RS

Low-profile

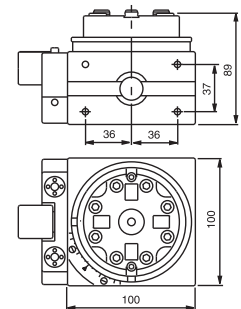
- Required drawbar 3R-605.10
- Clamping force 6000 N
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Rust resistant
- Weight 1 kg



Manual 3R block, MacroStd 3R-610.4

For vertical or horizontal mounting on the machine table.

- Required drawbar 3R-605.2
- Fixed index positions $24 \times 15^\circ$
- Vernier scale
- Weight 5.5 kg



Pneumatic table chuck, VDP 90716.10

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-600.10-31

Pneumatic chuck locked/opened with air gun.

Note: For debris guard 3R-SP27962.

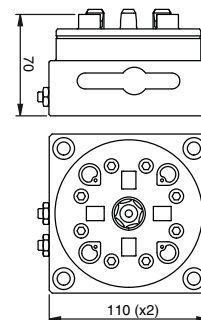
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg



Pneumatic chuck, MacroHP 3R-600.10-3

Pneumatic chuck locked/opened with air gun.

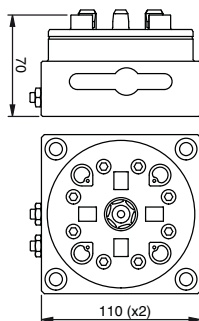
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Weight 4.4 kg



Pneumatic table chuck, MacroStd 3R-600.10-30

Pneumatic chuck locked/opened with air gun.

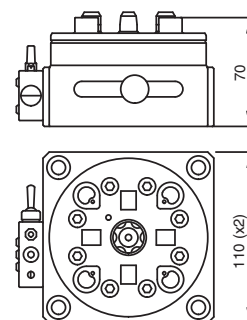
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg



Pneumatic chuck, 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, 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 $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg

VDP



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

VDP

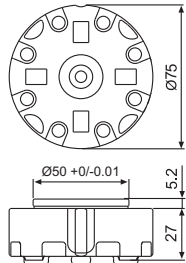


Macro – Chucks

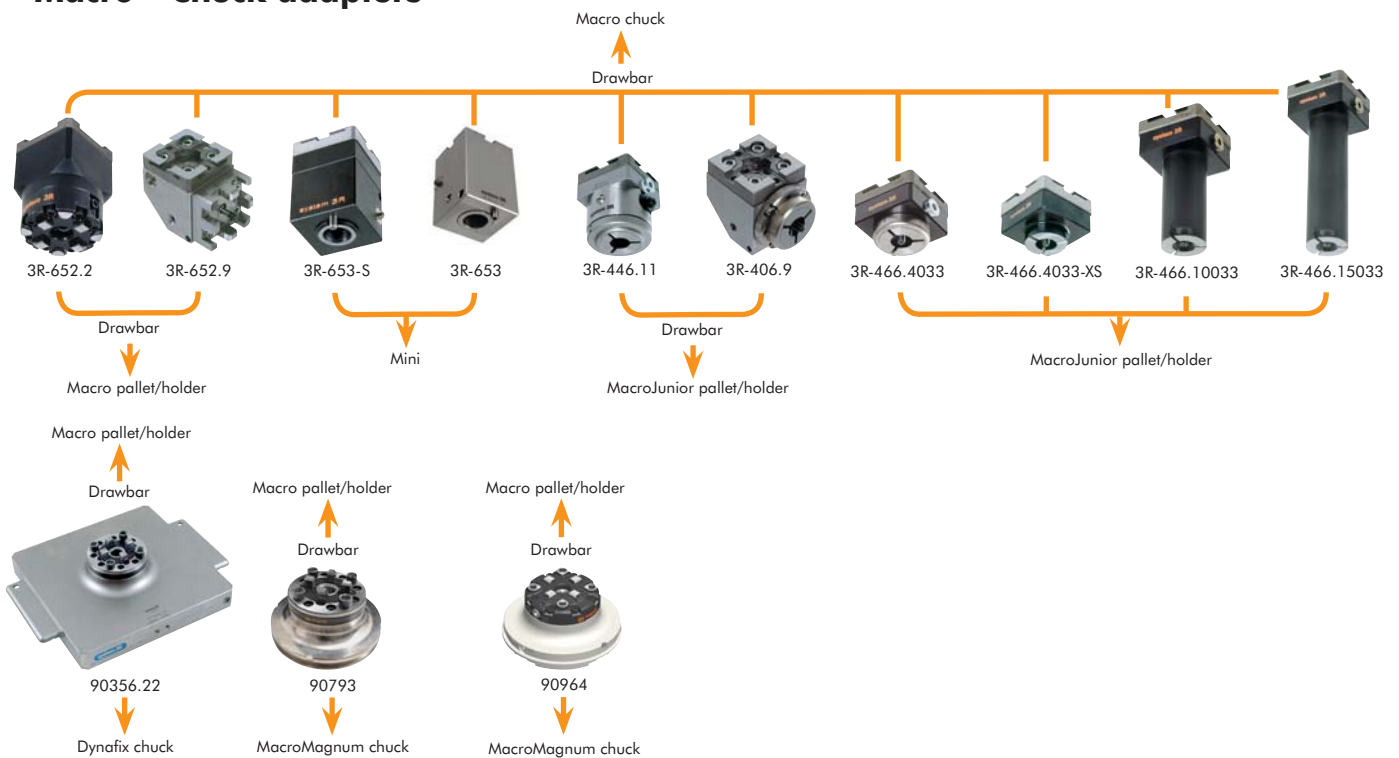
Manual chuck, MacroStd 3R-SP15055

Cast chuck with ground flange for installation in fixture/plate.

- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg



Macro – Chuck adapters



Chuck adapters

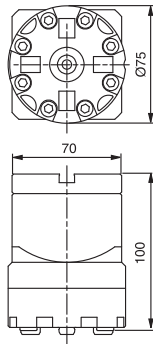
	Article number	Drawbar	Feature
Manual	3R-652.2	3R-605.2	100 mm
Manual	3R-652.9	–	90°. Locking screw with M6 drawpin
Manual	3R-653-S	–	Macro ► Mini
Manual	3R-446.11	3R-405.11	Macro ► MacroJunior
Manual	3R-466.4033	–	Macro ► MacroJunior. locking screw
Manual	3R-466.4033-S	–	Macro ► MacroJunior. locking screw
Manual	3R-406.9	–	Macro ► MacroJunior 90°. locking screw
Manual	3R-466.10033	–	Macro ► MacroJunior 100 mm. locking screw
Manual	3R-466.15033	–	Macro ► MacroJunior 150 mm. locking screw
Manual	3R-653	–	Macro ► Mini, rust-resistant
Pneumatic	90356.22	3R-605.1 / 3R-605.4	Dynafix ► Macro
Pneumatic	90793	3R-605.1 / 3R-605.4	MacroMagnum ► Macro
Manual	90964	3R-605.2	MacroMagnum ► Macro

Macro – Chuck adapters

Manual chuck adapter, Macro-Macro 3R-652.2

100 mm extension.

- Recommended clamping torque 6 Nm
- Required drawbar 3R-605.2
- Weight 4.5 kg



Manual chuck adapter, Macro-Macro 90476.01

Distance adapter to extend the machie spindle. Mechanical clamping from the side.

- Solid X & Y-references
- Length 200 mm
- Ready for automation
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Suitable drawbar 3R-605.2 or similar.
- Weight 8 kg.



Manual chuck adapter, Macro-Macro 90476.02

Distance adapter to extend the machie spindle. Mechanical clamping from the side.

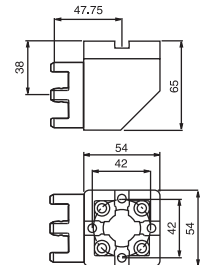
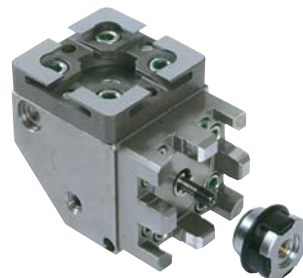
- Solid X & Y-references
- Length 250 mm
- Ready for automation
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Suitable drawbar 3R-605.2 or similar.
- Weight 9 kg.



Manual chuck adapter 90°, Macro-Macro 3R-652.9

For horizontal mounting of Macro holders. Supplied with drawbar for screw locking.

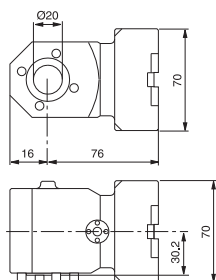
- Rust-resistant
- Weight 2.4 kg



Manual chuck adapter 90°, Macro-Mini 3R-603.9

For horizontal mounting of Mini holders in the Macro system.

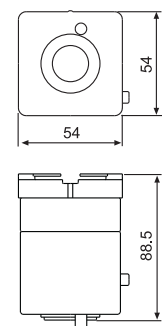
- Rust-resistant
- Flushing connection
- Weight 1.9 kg



Manual chuck adapter, Macro-Mini 3R-653-S

For mounting Mini holders in the Macro system.

- MacroStandard coupling
- Can be changed automatically
- Weight 1.3 kg



Macro – Chuck adapters

Manual chuck adapter, Macro-Mini 3R-653

For mounting Mini holders in the Macro system.

- MacroHP coupling
- Can be changed automatically
- Rust-resistant
- Weight 1.3 kg



Manual chuck adapter, Magnum-Macro 90964

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

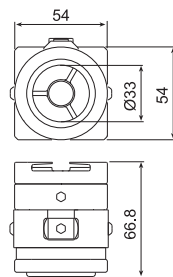
- Requires drawbar 3R-605.2 or similar.
- Solid X & Y-References
- Recommended clamping torque 6 Nm
- Permissible torque 135 Nm
- Clamping force 6000 N
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.3 kg



Manual chuck adapter, Macro-Junior 3R-446.11

For mounting in the Macro system. Side locking of the MacroJunior holder. Duct for flushing through the electrode.

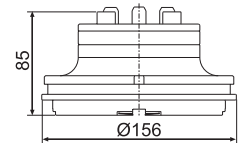
- Precision-cast Macro reference element
- Adapted for automatic changing
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.3 kg



Pneumatic chuck adapter, Magnum-Macro 90793

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

- Weight 4.5 kg

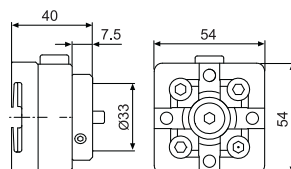


Manual chuck adapters, Macro-Junior 3R-466.4033-S

For mounting in the Macro system. Axial locking screw with channel for flushing through the electrode.

3R-466.4033

- Precision-cast Macro reference element
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1.1 kg



3R-466.4033-S

Note: For EDM machining only.

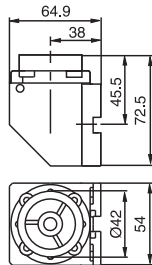
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1 kg

Macro – Chuck adapters & Rotating spindles

Manual chuck adapter 90°, Macro-Junior 3R-406.9

For horizontal mounting of MacroJunior holders in the Macro system. Screw locking.

- Adapted for automatic changing
- Rust-resistant
- Fixed index positions 3x120°
- Weight 2.4 kg



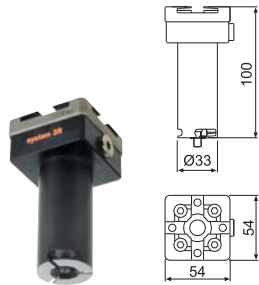
Manual chuck adapters, Macro-Junior

For mounting in the Macro system. Axial locking screw with channel for flushing through the electrode.

Note: For EDM machining only.

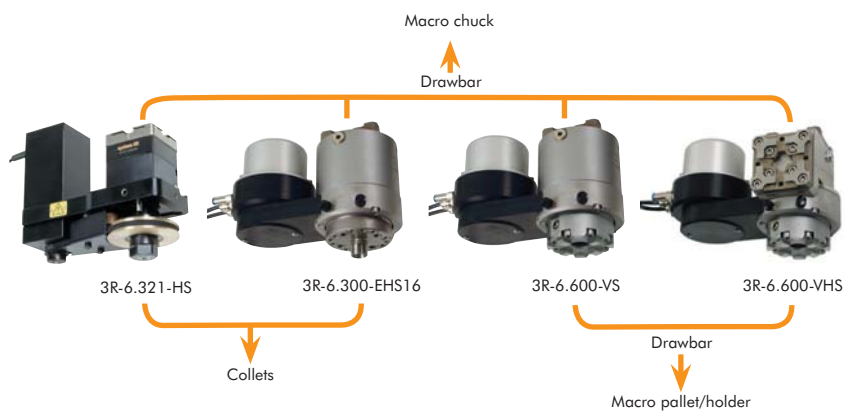
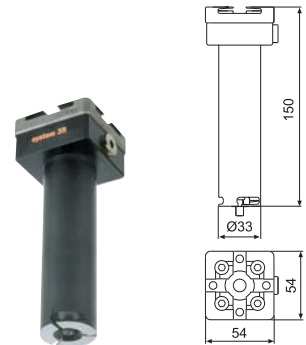
3R-466.10033

- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 0.8 kg



3R-466.15033

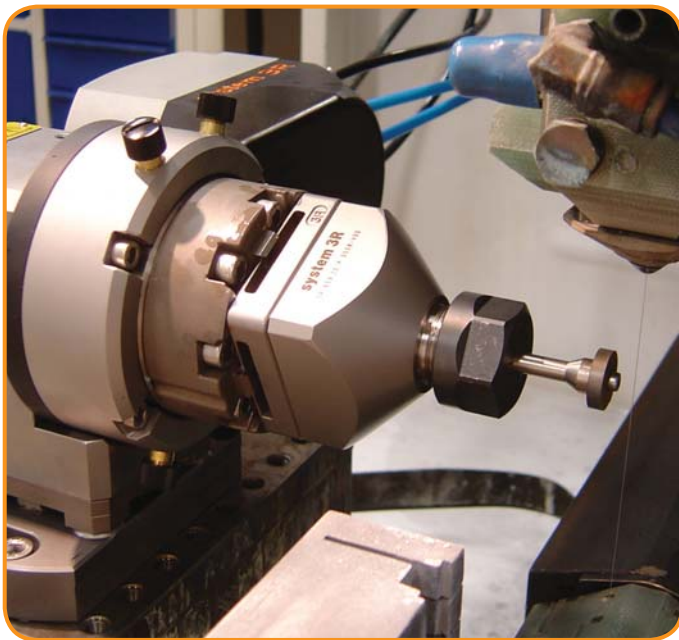
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1.2 kg



Rotating spindles

	Article number	Drawbar	Feature
Vertical standard	3R-6.321-HS	–	collets
Vertical standard	3R-6.600-VS	3R-605.2	rust-resistant
Vertical and horizontal standard	3R-6.600-VHS	3R-605.2	rust-resistant
Vertical standard	3R-6.300-EHS16	–	collets, ER-16, rust-resistant

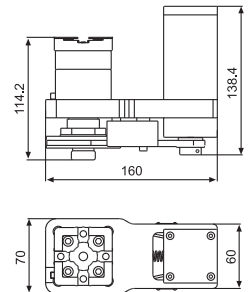
Macro – Rotating spindles



Rotating spindle 3R-6.321-HS

Electrical spindle for round electrodes.

- Supplied with collet chuck set 3R-ER16E
- Electrode sizes $\varnothing 0.5-10$ mm
- Speed range 200-2000 rev/min
- Recommended maximum flushing pressure 40 bar
- Weight 4.9 kg



Rotating spindles

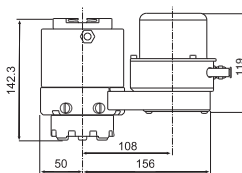
For mounting in a Macro chuck. Flushing via flushing connection

- Control unit included
- Required drawbar 3R-605.2, but 3R-605.2RS in wire EDM machines
- Rust-resistant
- Immersible
- Maximum electrode weight 5 kg
- Maximal flushing pressure through the chuck: 40 bar
- Weight 9.5 kg

3R-6.600-VS

For vertical mounting in EDM machines.

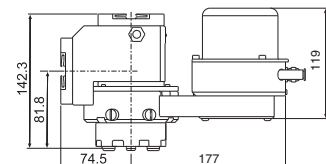
- Speed range 60-2000 rev/min



3R-6.600-VHS

For vertical mounting in die-sinking EDM machines and horizontal mounting in wire EDM machines.

- Speed range 60-1500 rev/min



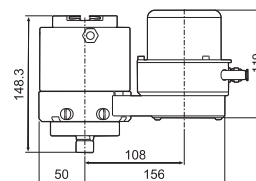
Rotating spindles 3R-6.300-EHS16

For clamping in a vertical Macro chuck. Flushing via flushing connection.

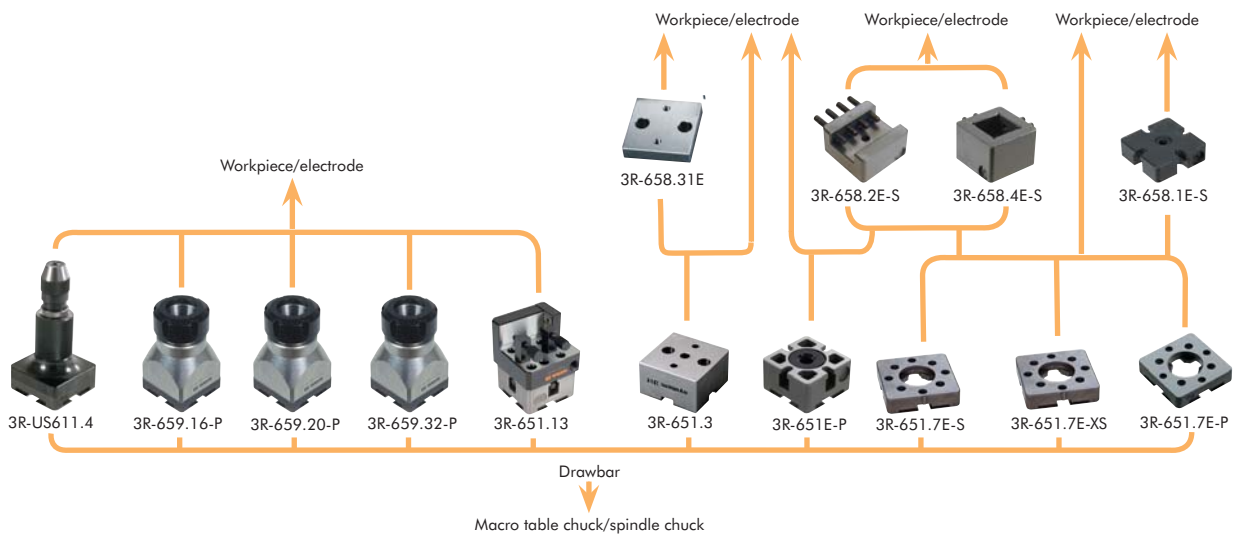
- Control unit included
- Drawbar depends on chosen chuck
- Rust-resistant
- Immersible
- Speed range 60-2000 rev/min
- Maximum flushing pressure 80 bar
- Weight 10 kg

Recommended collet sets

Make	Collet set	Size (mm)	Nut M19x1
Balzer	EHS16	$\varnothing 0.09-3$	Integral
Regofix	ER16, ER16-UP	$\varnothing 0.5-10$	ERM16, ERMC16, ER16 MS
Tecnopinz	ETS16	$\varnothing 1.25-10$	ETS16,2



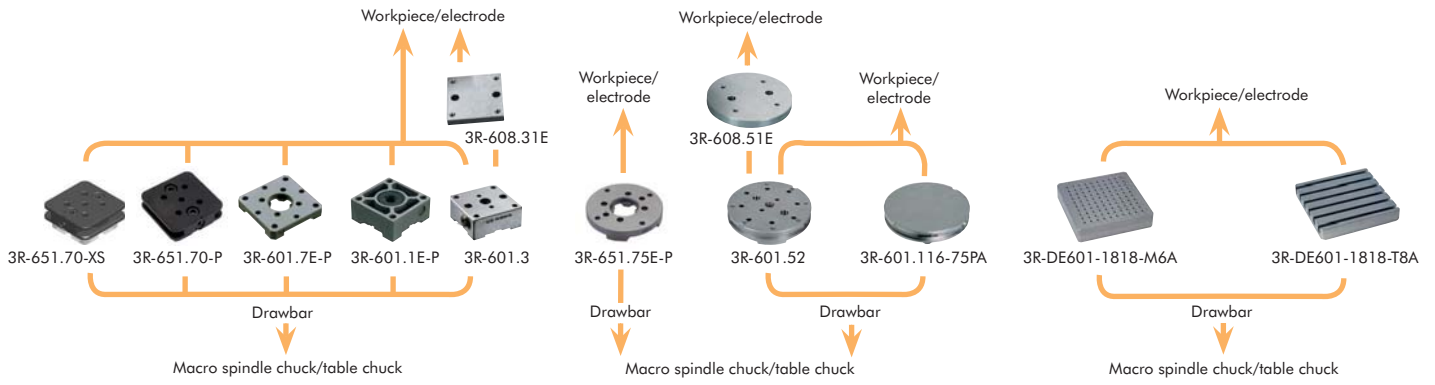
Macro – Pallets, Holders & Ref. elements



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, Std 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	Image	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	Image	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	Image	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.

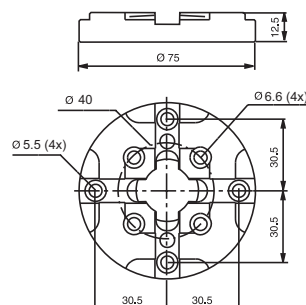


Application example.

Pallet, Ø75 mm 3R-651.75E-P

Hardened and milled with clearance holes for eight fixing screws.

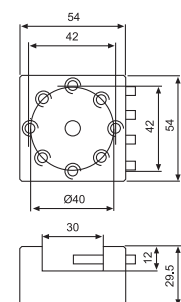
- Fixed index positions 4x90°
- Parallel-ground top and bottom faces
- Adapted for automatic changing
- Rust resistant
- Supplied in sets of 10 pcs.
- Weight per set 2.7 kg.



Holder, 54x54 mm 3R-658.2E-S

Unhardened holder for flat electrodes with maximum width 30 mm. To be mounted on 3R-651.7E-S or 3R-651.7E-XS.

- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.5 kg

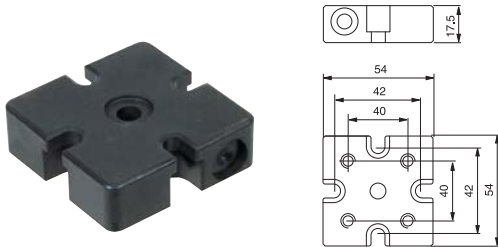


Macro – Pallets, Holders & Spacers

Spacer plate, 54x54 mm 3R-658.1E-S

For graphite electrodes or copper electrodes/workpieces with a rough mounting surface. To be mounted on 3R-651.7E-S, 3R-651.7E-XS or 3R-651.7E-P.

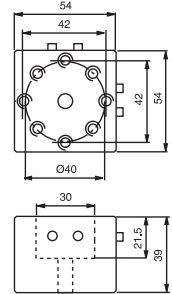
- Ready for code carrier
- Supplied in sets of 8
- Weight per set 2.5 kg



Holder, 54x54 mm 3R-658.4E-S

Unhardened holder for square or round electrodes, max 30 mm. To be mounted on 3R-651.7E-S, 3R-651.7E-XS or 3R-651.7E-P.

- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 5.5 kg



Pallet 54x54 mm, MacroStd

Hardened pallet for copper electrodes and workpieces.

Note: Must be mounted on the copper blank/workpiece before it is locked in a chuck.

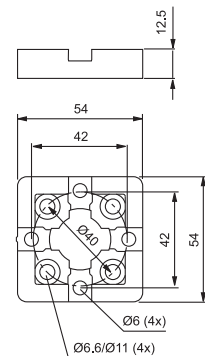
Note: For graphite electrodes, spacer plate 3R-658.1E-S is required.

3R-651.7E-S

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

3R-651.7E-XS

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

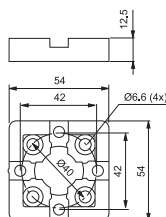


Pallet, 54x54 mm, MacroHP 3R-651.7E-P

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.

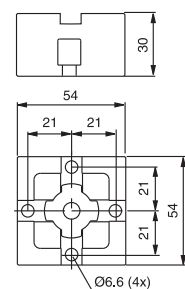
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of 8
- Weight per set 1.3 kg



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

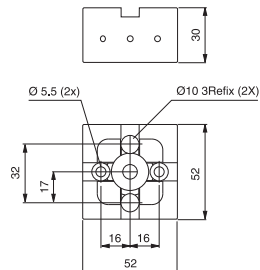


Macro – Pallets & Holders

Pallet, 52x52 mm, MacroHP 3R-651.3

Hardened, with 3Refix holes, flushing connection and clearance holes for two 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
- Flushing duct
- Weight 0.5 kg



Pallet, 52x52 mm 3R-658.31E

Unhardened with 3Refix holes and two M5 threads. Designed to be mounted on 3R-651.3.

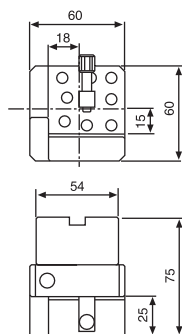
- 3Refix Ø10 mm
- Building-in height 14.4 mm
- Supplied in sets of 10
- Weight per set 2.2 kg



Holder, MacroHP 3R-651.13

Hardened holder for square electrodes max 30 mm.

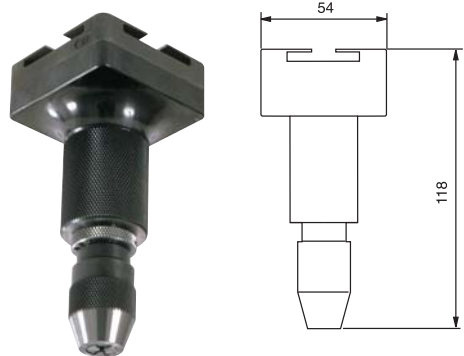
- Max. workpiece: 32x28 mm
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.2 kg



Three-jaw chuck 3R-US611.4

For 0-3 mm electrodes.

- Weight 0.8 kg



Collet chucks, MacroHP

3R-659.16-P

- For collets ER16
- Electrode size 0.5-10 mm
- Flushing duct
- Building-in height 62 mm
- Weight 0.8 kg

3R-659.32-P

- For collets ER32
- Electrode size 2-20 mm
- Flushing duct
- Building-in height 94 mm
- Weight 1.2 kg

3R-659.20-P

- For collets ER20
- Electrode size 1-13 mm
- Flushing duct
- Building-in height 69 mm
- Weight 1.2 kg



Gate chuck 3R-US90-601

Fixed index positions at 0, 30, 45, 60 and 90 degrees. Other angles are set with a sine rule.

- Weight 1.1 kg



Macro – Pallets & Holders

Pallet, 70x70 mm 3R-608.31E

Unhardened with 3Refix holes and four M6 threads.
Designed to be mounted on 3R-601.3 or 3R-601.52.

- 3Refix $\varnothing 10$ mm
- Building-in height 14.2 mm
- Supplied in sets of 10
- Weight per set 4.4 kg

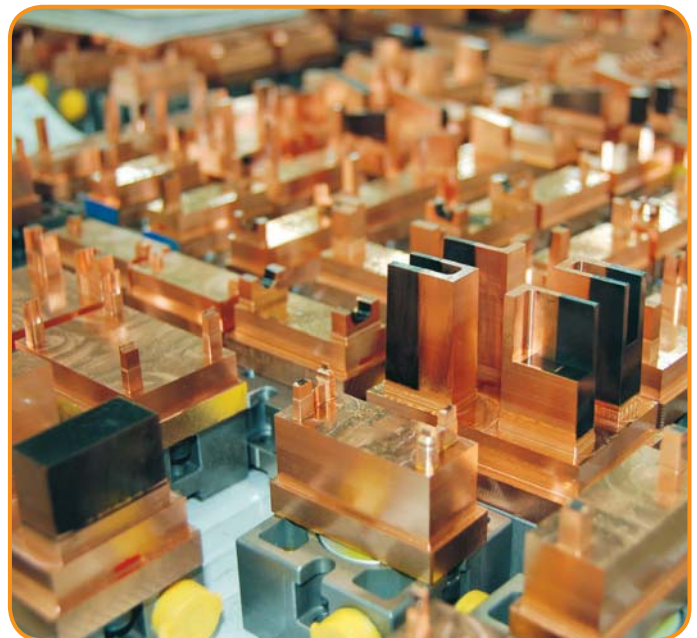
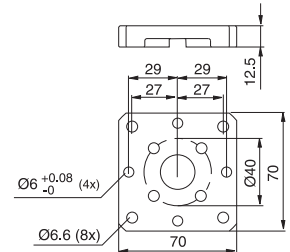
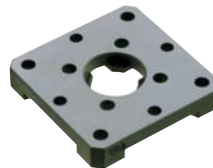


Pallet, 70x70 mm, MacroHP 3R-601.7E-P

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.

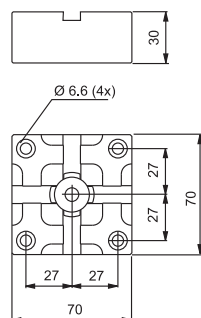
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions $4 \times 90^\circ$
- Rust-resistant
- Supplied in sets of 5
- Weight per set 3 kg



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

Hardened, with clearance holes for four fixing screws.

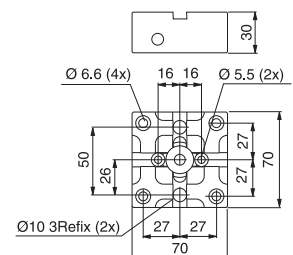
- Adapted for automatic changing
- Ready for code carrier
- Fixed index positions $4 \times 90^\circ$
- Rust-resistant
- Flushing duct
- Supplied in sets of 5
- Weight per set 3.2 kg



Pallet, 70x70 mm, MacroHP 3R-601.3

Hardened with 3Refix holes, flushing connection and clearance holes for six fixing screws.

- 3Refix $\varnothing 10$ mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions $4 \times 90^\circ$
- Rust-resistant
- Flushing duct
- Weight 1 kg

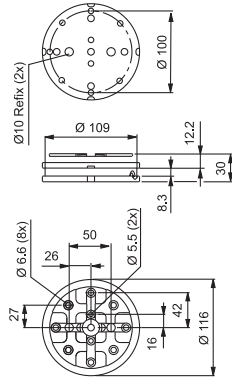


Macro – Pallets & User kits

Pallet, Ø116 mm, MacroHP 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

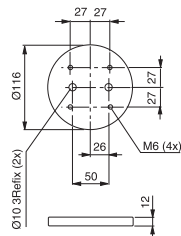
Suitable for pneumatic chucks with drawbar 3R-605.2.



Pallet, Ø116 mm 3R-608.51E

Unhardened with 3Refix holes and four M6 threads. Designed to be mounted on 3R-601.3 or 3R-601.52.

- 3Refix Ø10 mm
- Supplied in sets of 10
- Weight per set 10 kg



Pallets, 180x180 mm

Anodized aluminium pallets with M6 threads.

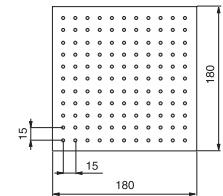
3R-DE601-1818-M6A

- Mounted on pallet 3R-601.116-PA
- 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.

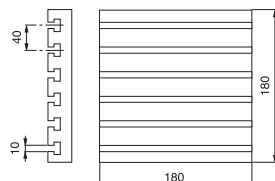
3R-DE601-1818-T8A

- Mounted on pallet 3R-601.116-PA
- 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



User kit 3R-628.31-S

3R-605.1	Drawbar, long	x4
3R-605.2	Drawbar, short	x2
3R-610.21-S	Manual table chuck	x1
3R-651.7-S	Pallet, 54x54 mm	x12
3R-656.1	Check ruler	x1
3R-658.1-S	Spacer plate 54x54 mm	x2
3R-658.4-S	Holder 54x54 mm	x4
3R-658.2-S	Holder 54x54 mm	x4



Macro – User kits & Accessories

User kit 3R-628.41-S



3R-465.1-A	Holder with MacroJunior taper	x4
3R-461.1-GA	Holder with MacroJunior journal	x2
3R-466.4033	Chuck adapter Macro/MacroJunior	x1
3R-466.10033	Chuck adapter Macro/MacroJunior	x1
3R-491	Pallet 25 mm MacroJunior	x10
3R-605.1	Drawbar, long	x4
3R-605.2	Drawbar, short	x2
3R-610.21-S	Manual table chuck	x1
3R-651.7-S	Pallet, 54x54 mm	x8
3R-656.1	Check ruler	x1
3R-658.1-S	Spacer plate 54x54 mm	x2
3R-658.4-S	Holder 54x54 mm	x2
3R-658.2-S	Holder 54x54 mm	x2
	Screw MTF4x12	x90
	Screw wrench	x1

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-605.2RS

- Ø20x36.9 mm with flushing holes Ø7 mm
- Rust-resistant
- Supplied 1 pc.



3R-605.14E

- Ø20x57 mm with flushing holes Ø7 mm
- Supplied in sets of 10 pcs.
- Intended for MacroCombi automatic electrode changers



Drawbars

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-605.10

- Ø20x13 mm
- Supplied 1 pc.

3R-605.10EE

- 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.

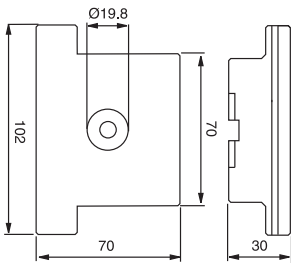


Macro – Accessories

Control ruler 3R-606.1

For setting angular positions and for centring Macro chucks.

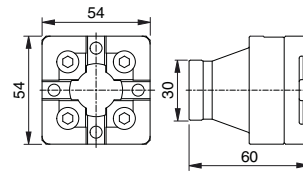
- Ground hole for centring.
- Measuring length 100 mm
- Weight 1.4 kg



Control ruler 3R-656.1

For setting angular positions. Ground outside diameter for centring.

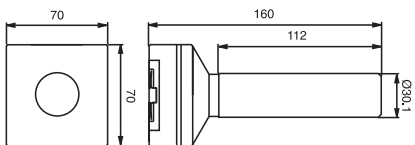
- Measuring length 50 mm
- Weight 0.8 kg



Control rod 3R-606

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

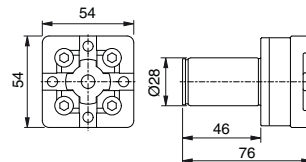
- Measuring length 110 mm
- Weight 2.3 kg



Control rod 3R-656

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

- Measuring length 38 mm
- Weight 1 kg



Measuring probes

Measuring probes with Renishaw measuring head for machines with measurement cycle function.

- Max ball deflection:
X-Axis $\pm 10^\circ$
Y-Axis $\pm 10^\circ$
Z-Axis ± 3 mm

3R-656.31-3P

- Building-in height 112 mm
- Measuring ball $\varnothing 3$ mm
- Weight 0.6 kg

3R-656.31-5P

- Building-in height 112 mm
- Measuring ball $\varnothing 5$ mm
- Weight 0.6 kg



Measuring probe 3R-656.21-SP03

Measuring probe with measuring head for machines with measurement cycle function.

- Building-in height 130 mm
- Measuring ball $\varnothing 3$ mm
- Stiff probe
- Weight 0.8 kg



Macro – Accessories

Microscope 3R-4.650

With transformer (110/220V)
for integral lighting.

- Magnification x25
- Field of view Ø6 mm
- Weight 0.8 kg



Indicating spindle 3R-656.2-P

For measuring centre holes

- Dial indicator required
- Weight 0.6 kg



Centring ring 3R-612.6

For centring 3R-600.20.



Splash guard 3R-RU52L

Rubber guards for pallets 52x52 and
54x54 mm.

- Height 33 mm



Splash guard 3R-RU52

Rubber splash guard for pallets 52x52
and 54x54 mm.

- Height 13 mm



Splash guard 3R-RU70

Rubber splash guard for pallets 70x70 mm.

- Height 13 mm



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.



Splash guard 90027.01

Fits MacroStandard chucks with drawbar 3R-605.2.



Macro – Accessories

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



Torque wrenches 3R-614-04

Mainly for MacroCombi and Ø10 3Refix mandrels.

- 4 Nm

3R-614-06

For Macro chucks

- 6 Nm



Air unit 3R-611.2

Foot operation of pneumatic chucks.



Air unit 3R-611.4

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



Locking ring key 3R-605-GE

To lift the locking ring of the drawbars.

- Supplied in sets of 2



Code carriers 3R-863.01-10

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

- Supplied in sets of 10



Sealing ring, High 3R-612.70-A

For reference element 70x70 mm.



Sealing ring, Low 3R-612.70-S

For reference element 70x70 mm.



Sealing ring, Low 3R-612.75-S

For reference element Ø75 mm.



Macro – Accessories

Chip guard 3R-SP27962

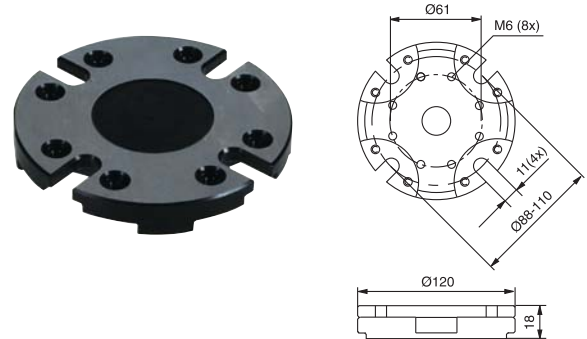
Debris guard for Macro pallets and reference elements 54x54 mm. Requires special Macro chucks similar to 3R-600.10-31, also requires drawbar 3R-605.1.



Adapter plate 3R-A11489

For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S. Supplied with insulation plate and fixing screws.

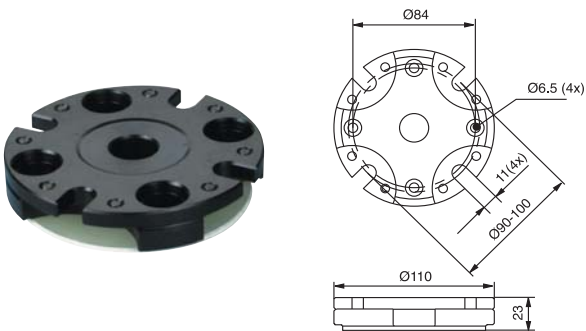
- Flushing connection



Adapter plate 3R-A3620

Adapter plate with eight adjusting screws for mounting spindle chucks. Supplied with fixing screws.

- M10 for 90 mm pitch circle
- M6 for 96 mm pitch circle
- M8 for 100 mm pitch circle



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.

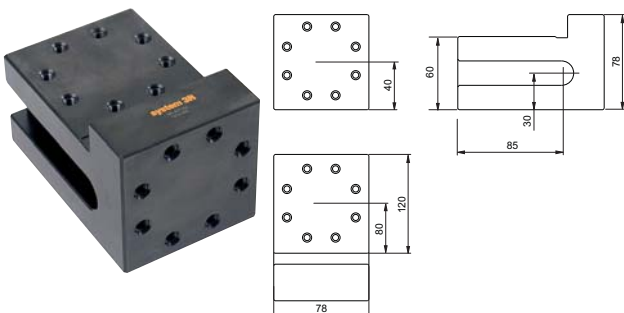
Use the order form at the end of the catalogue.



Angle shelf 3R-A21944

For vertical or horizontal mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on the machine table.

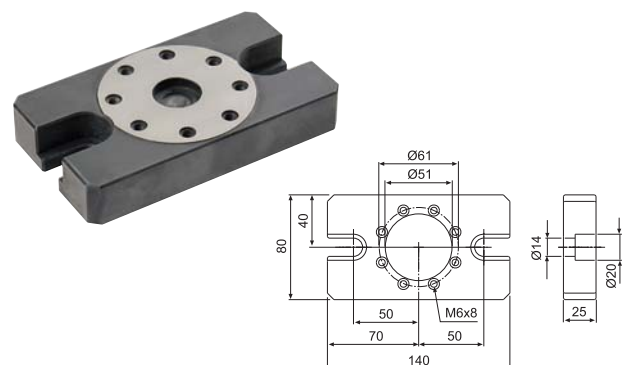
Note: Chuck to be ordered separately.



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.

Note: Chuck to be ordered separately.



Macro – Accessories

Electrode cassette 3R-650/8x5

For eight electrodes 52x52 and 54x54 mm.
• Supplied in sets of 5



3Refix mandrel 3R-901-10E

- 3Refix \varnothing 10 mm
- Recommended tightening torque 4 Nm
- Supplied in sets of 10
- Weight per set 0.2 kg

Note: When positioning with 3Refix mandrels –always tighten the expanding mandrel in the R⁹ hole first.



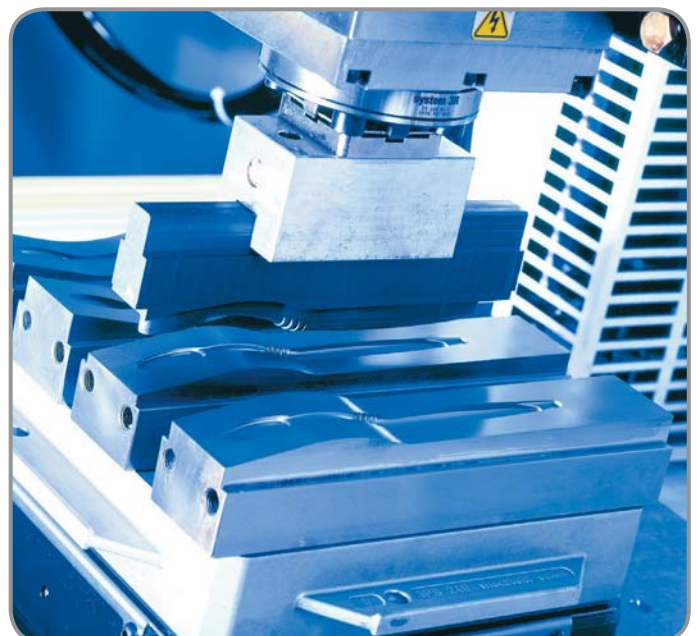
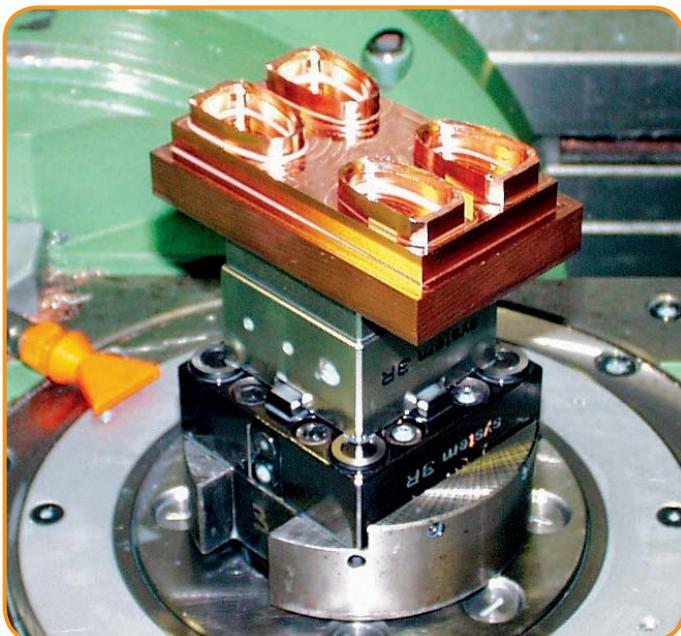
Adapter plate 3R-A26488

For mounting 3R-600.28-S



Converter kit 90842.01

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



MacroNano

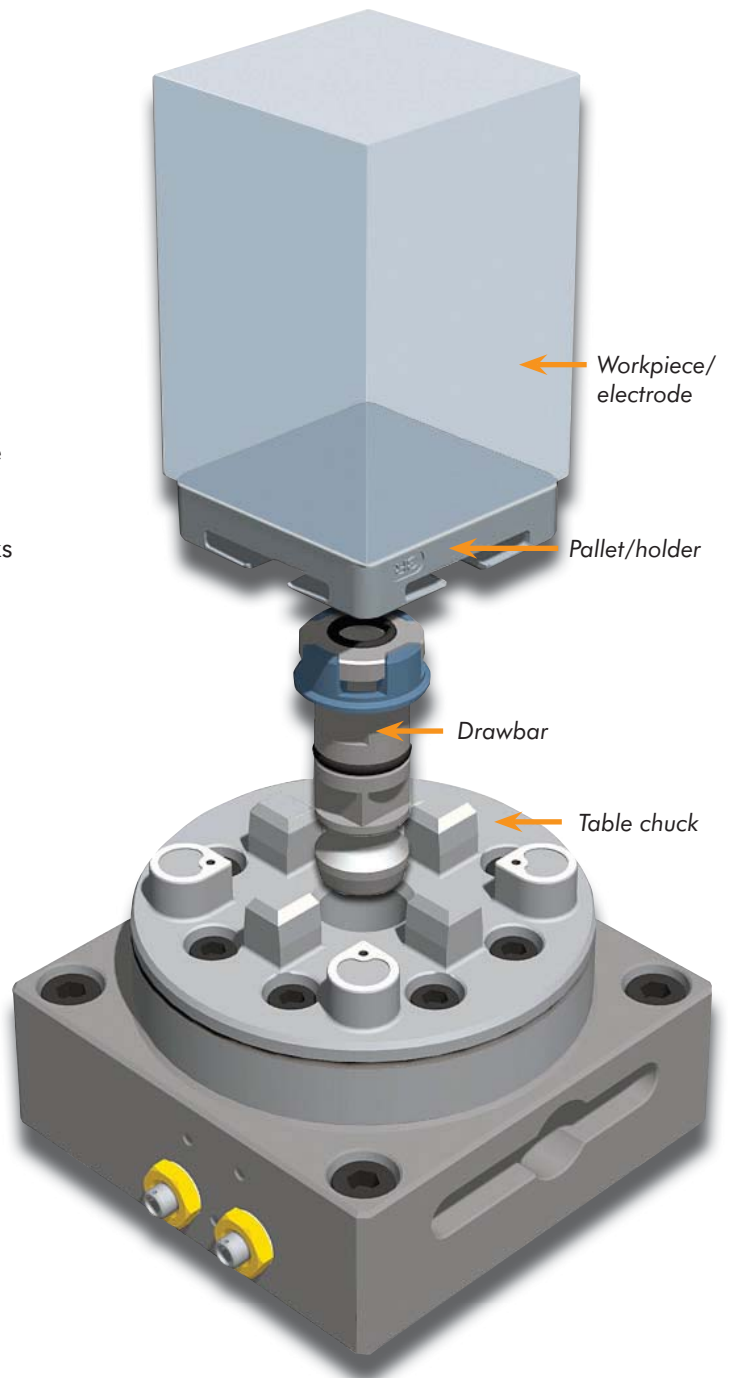
- ... Extremely high accuracy.
- ... High-precision machines are linked together in the production chain, without detracting from the extreme accuracy.
- ... Feedback to the machine for supplementary machining after inspection is possible. This feedback is only meaningful if the pallet system is at least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

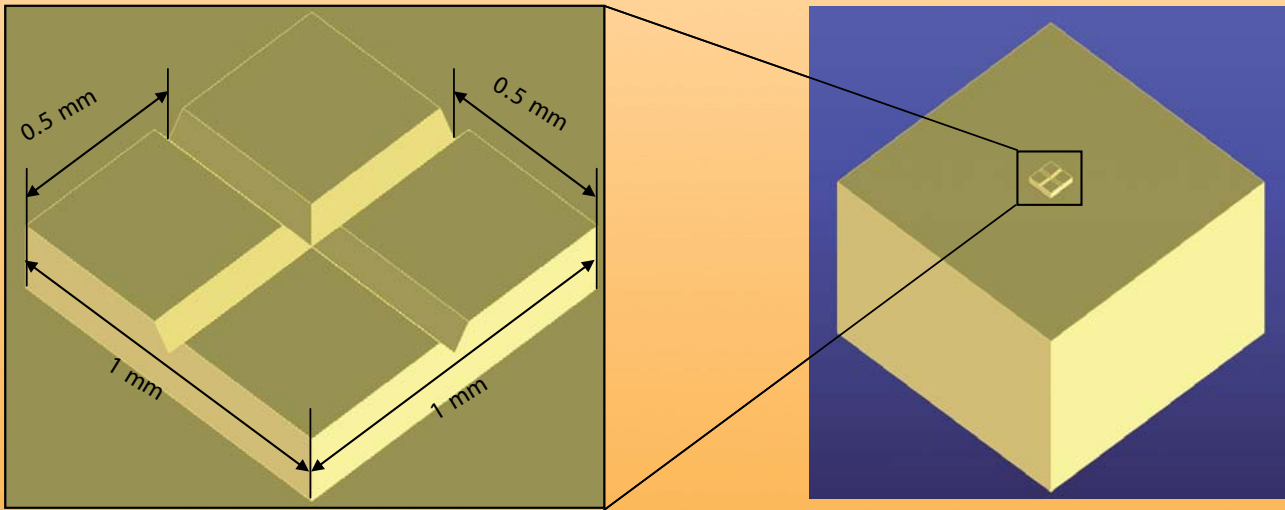
- Repetition accuracy – within 0,001 mm
- Locking force – 6000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- Recommended max workpiece weight – 50 kg.



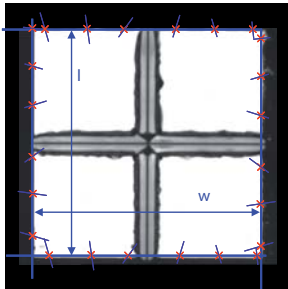
MacroNano

Application example: Microstructuring with Diamond Machining

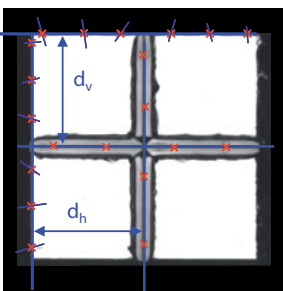
Micro features produced with nano precision



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

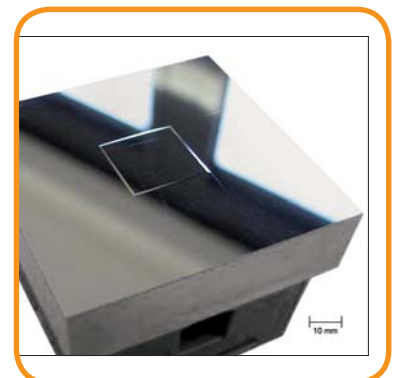


Measurement of groove positions

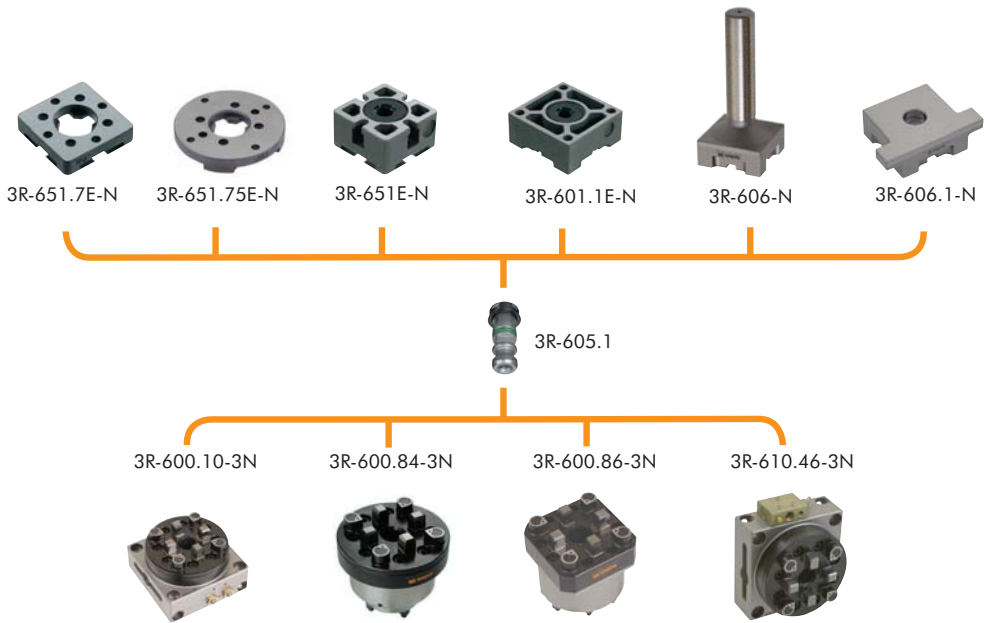
	Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)
W_1	0,9996	l_1	0,9999	d_{v1}	0,4988	d_{h1}	0,5013
W_2	0,9996	l_2	0,9999	d_{v2}	0,4993	d_{h2}	0,4995
W_3	0,9996	l_3	0,9999	d_{v3}	0,4996	d_{h3}	0,5001
W_4	0,9997	l_4	0,9999	d_{v4}	0,4991	d_{h4}	0,4995
W_5	0,9996	l_5	0,9998	d_{v5}	0,5010	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



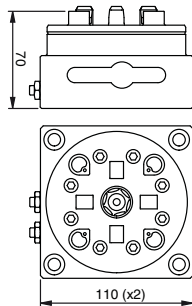
MacroNano – Chucks, Pallets & Accessories



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

Chuck for mounting on the machine table.

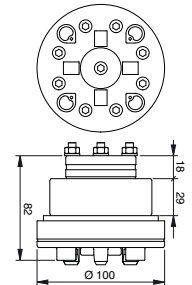
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



Pneumatic chuck, MacroNano 3R-600.84-3N

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

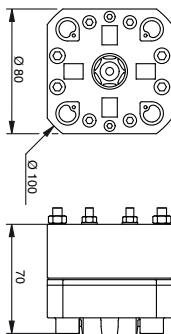
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



Pneumatic chuck, MacroNano 3R-600.86-3N

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

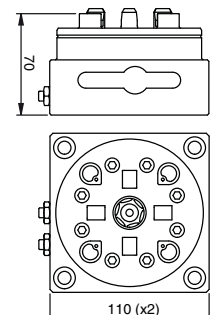
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6 ± 1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



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.

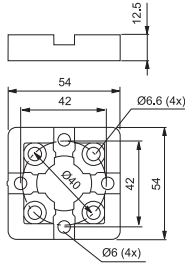


MacroNano – Pallets & Accessories

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

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

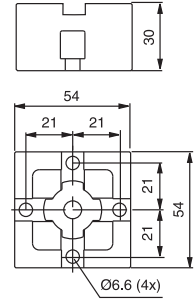
- Fixed index positions 4x90°
- Adapted for automatic changing
- Parallel-ground top and bottom face
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 1.2 kg.



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

Hardened with clearance holes for four fixing screws.

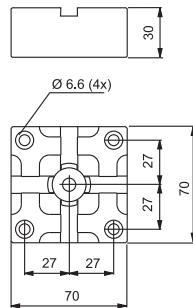
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 3.4 kg.



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

Hardened with clearance holes for four fixing screws.

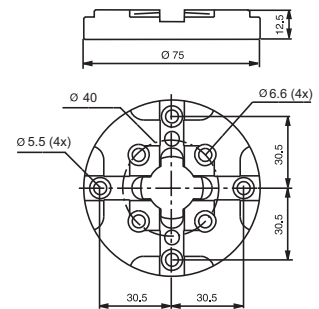
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 5 pcs.
- Weight per set 3.6 kg.



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

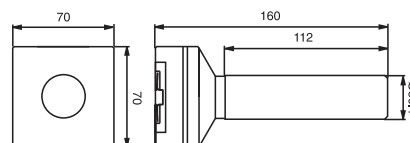
- Ø20x57.1 mm with flushing holes Ø7 mm.
- Supplied in sets of 10 pcs.



Check mandrel, MacroNano 3R-606-N

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

- Measuring length 110 mm.
- Weight 2.3 kg.

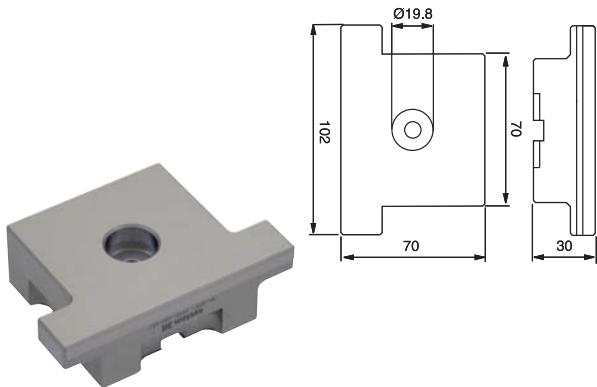


MacroNano – Accessories

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



Air unit 3R-611.2

Foot operation of pneumatic chucks.



Air unit 3R-611.4

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



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.

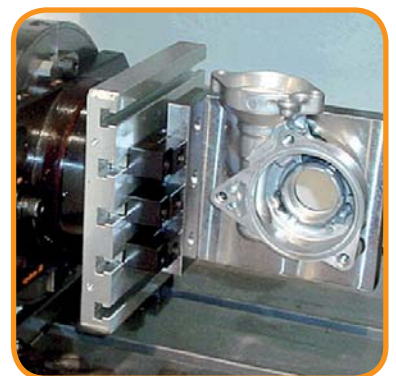
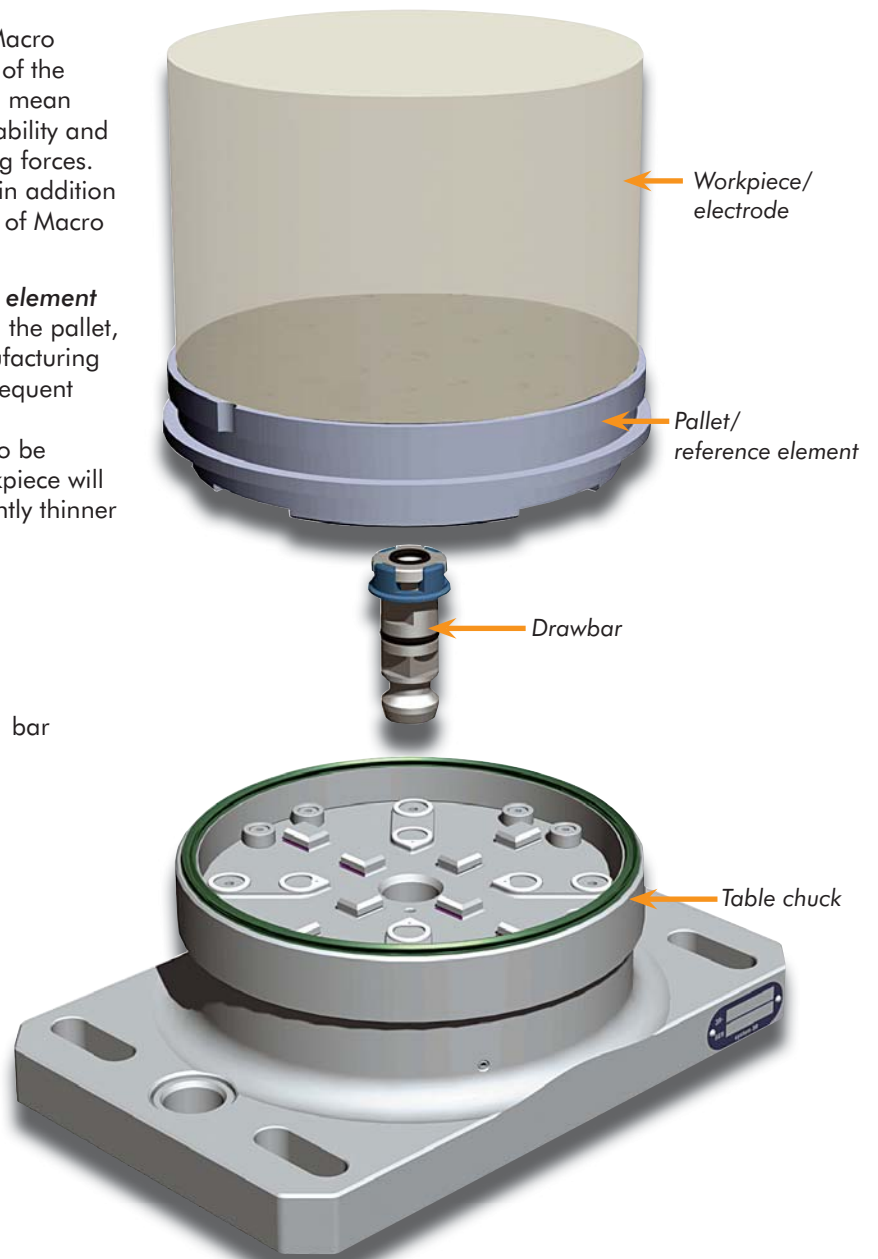
The double references of the chucks mean that in addition to the MacroMagnum pallets, the extensive range of Macro pallets can also be fixed to MacroMagnum.

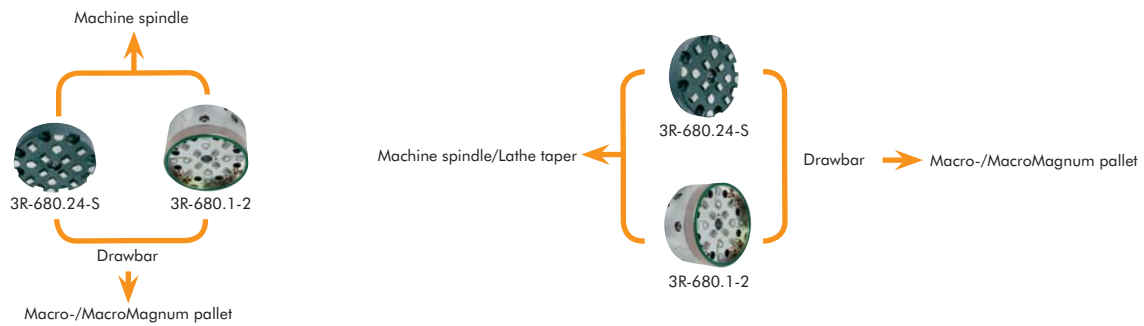
The difference between a pallet and a reference element

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





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

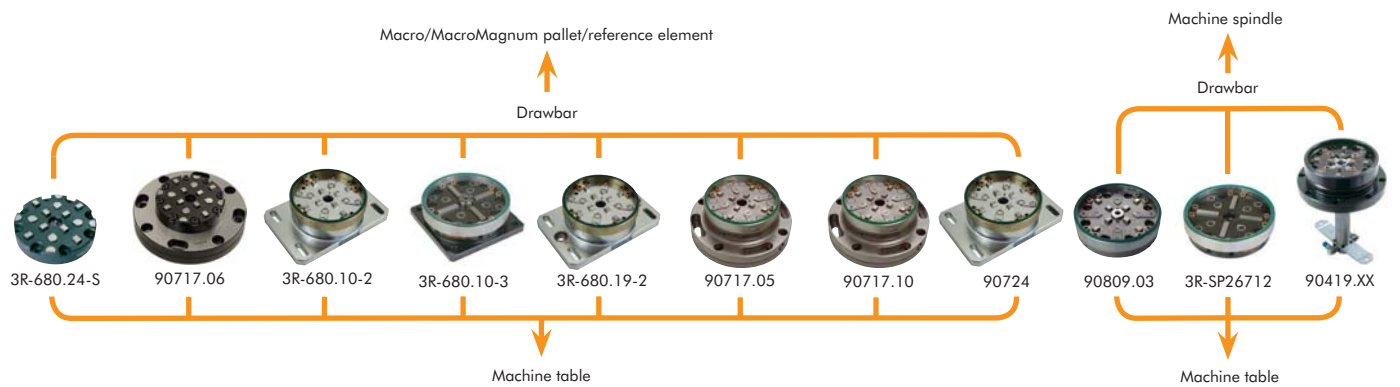
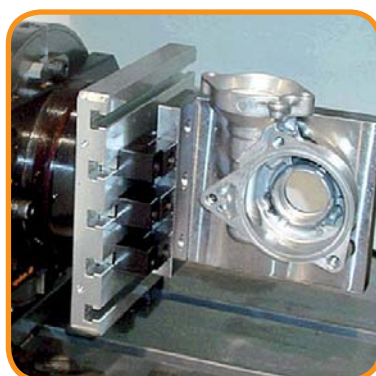


Table chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Manual	90717.06	3R-605.2	vibration-damped
Pneumatic	3R-680.10-2	3R-605.1 / 3R-605.4	matching air unit 3R-611.46
Pneumatic	3R-680.10-3	3R-605.2	low profile, matching air unit 3R-611.2/3R-611.4
Pneumatic	3R-680.19-2	3R-605.1 / 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.

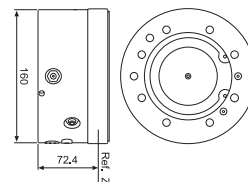
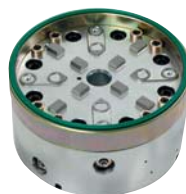
- Required drawbar 3R-605.2.
- Required air pressure 6 ± 1 bar.
- Fixed index positions $4 \times 90^\circ$
- Weight 5 kg.



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.

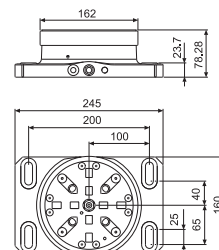
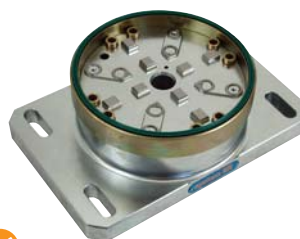
- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Weight 10 kg



Pneumatic table chuck 3R-680.10-2

Pneumatic table chuck.

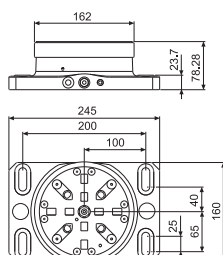
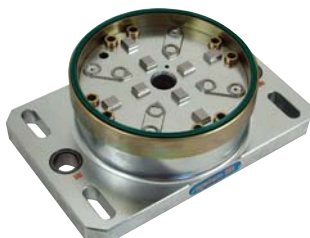
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg



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

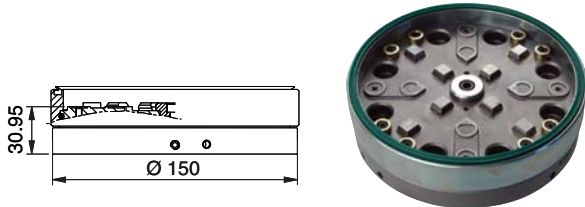


MacroMagnum – Chucks & Chuck adapters

Pneumatic chuck 90809.03

Pneumatic chuck with coarse guiding of the pallet. Intended for permanent building-in.

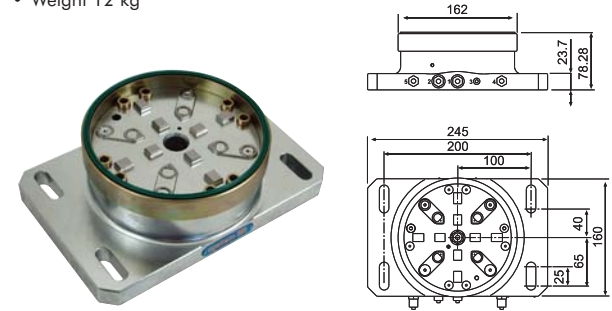
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg



Pneumatic table chuck 90724

Pneumatic table chuck for chuck adapter.

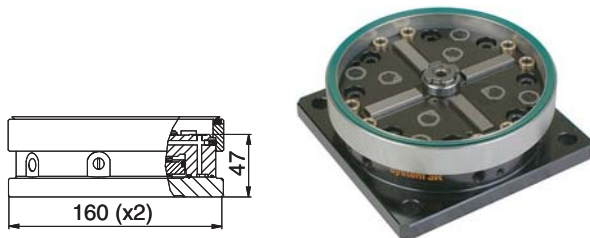
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references on chuck and chuck adapter
- Sealing ring
- Turbo-lockings
- Weight 12 kg



Pneumatic table chuck 3R-680.10-3

For permanent mounting on the machine table.

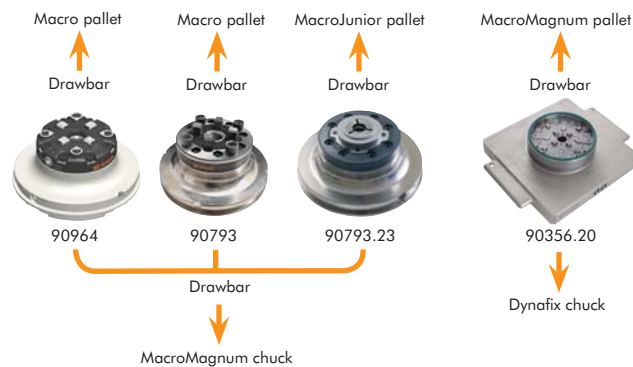
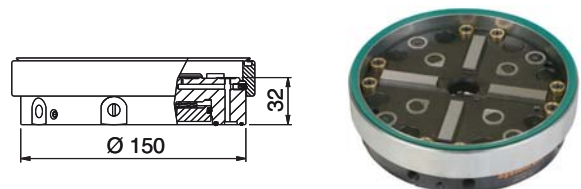
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg



Pneumatic 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



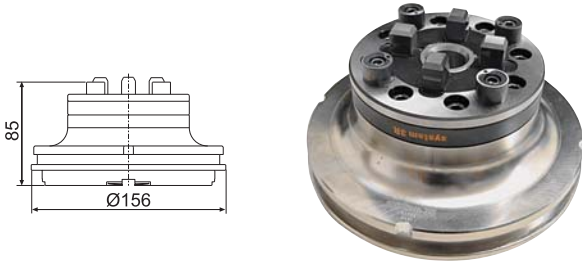
Chuck adapters	Article number	Drawbar	Feature
Pneumatic	90964	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ▶ Macro
Pneumatic	90793	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ▶ Macro
Pneumatic	90793.23	3R-605.1 / 3R-605.4 + 3R-405.11	MacroMagnum ▶ MacroJunior
Pneumatic	90356.20	3R-605.2 / 3R-605.4	Dynafix ▶ MacroMagnum

MacroMagnum – Chuck adapters

Pneumatic chuck adapter, MacroMagnum-Macro 90793

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

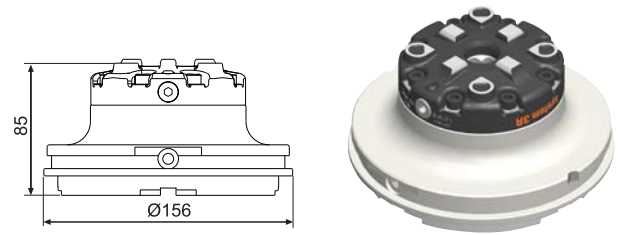
- Weight 4.5 kg



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



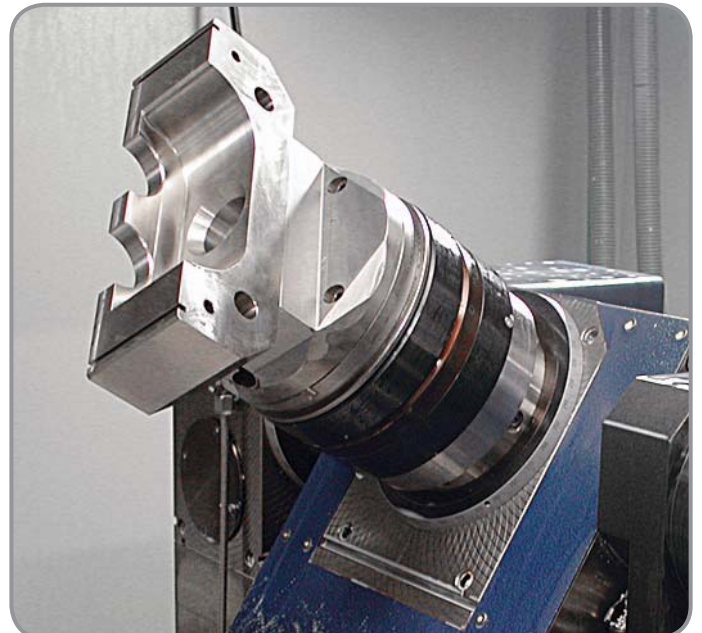
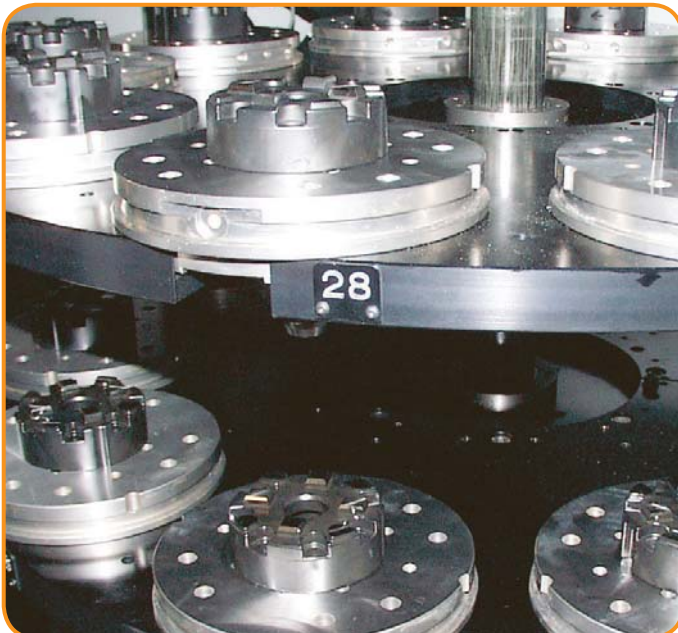
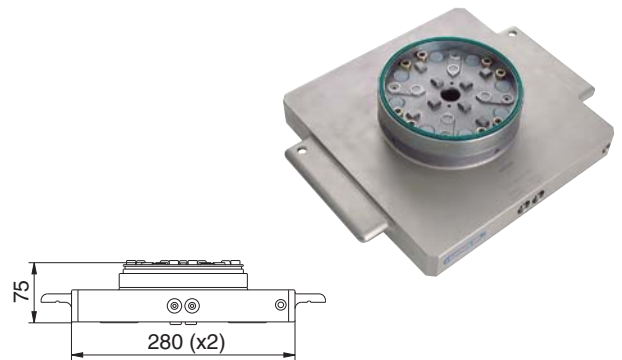
Pneumatic chuck adapter, MacroMagnum-MacroJunior 90793.23

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

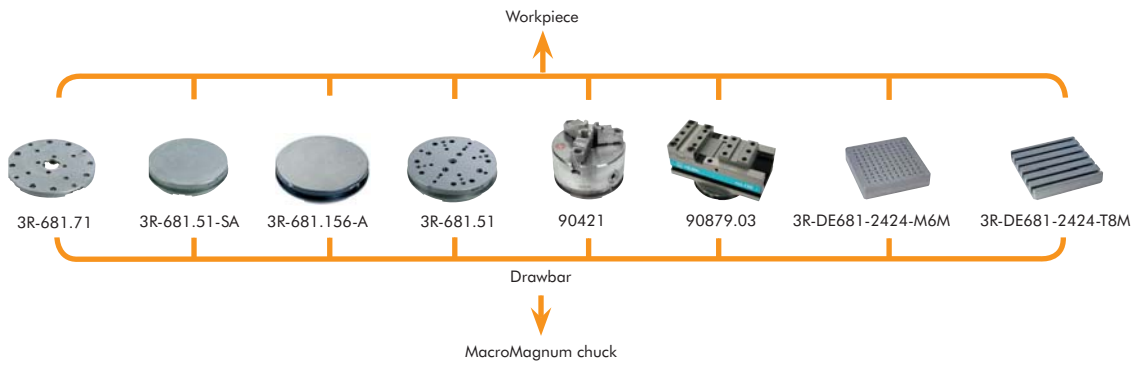


Pneumatic chuck adapter, Dynafix-MacroMagnum 90356.20

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

Pallets 240x240 mm

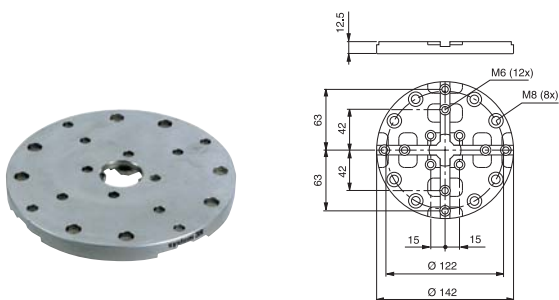
Article number	Feature
Aluminium	3R-DE681-2424-M6M
Aluminium	3R-DE681-2424-T8M
	M6 threads / no automatic changing
	T-slots / no automatic changing

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.

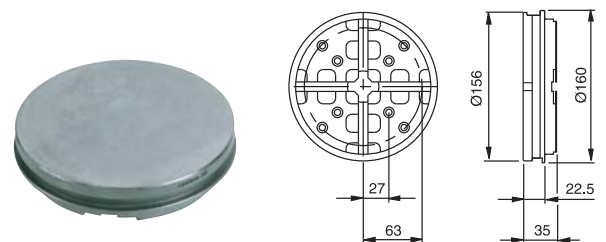
- Rust-resistant
- Weight 1 kg



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

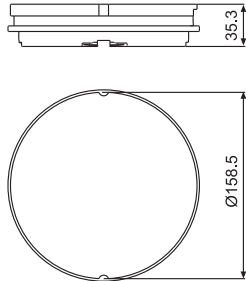


MacroMagnum – Pallets & Accessories

Pallet Ø156 mm 3R-681.156-A

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

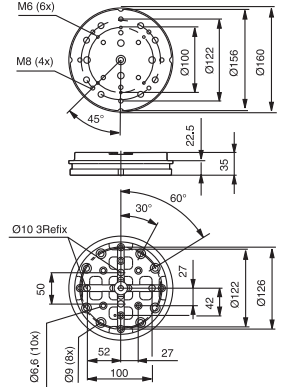
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg



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

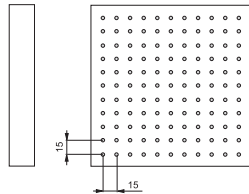
Anodized aluminium pallets with M6 threads.

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 11 kg

3R-DE681-2424-M6M

- Mounted on pallet 3R-681.71
- Building-in height 52.5 mm
- Weight 7.5 kg



Pallets 240x240 mm

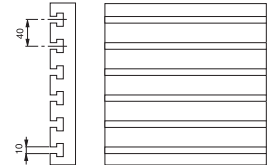
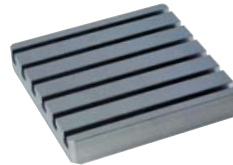
Anodized aluminium pallets with T-slots.

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 11 kg

3R-DE681-2424-T8M

- Mounted on pallet 3R-681.71
- Building-in height 52.8 mm
- Weight 7.5 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-605.4E

For round pallets adapted for automatic changing

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

3R-605.4EE

- 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.



MacroMagnum – 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



Splash guard 90027.03

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



Chip guard 90443

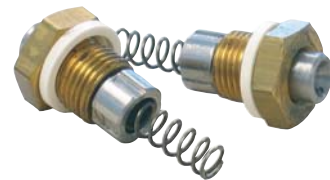
For Macro pallets 52x52, 54x54 and 70x70 in MacroMagnum chucks. For sealing we recommend 3R-RU52L or 3R-RU70 respectively in combination with the debris guard.



Connection for air gun 90815

For manual operation of pneumatic chucks with air gun.

- Supplied in sets of 2 pcs.



Code carriers 3R-863.01-10

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

- Supplied in sets of 10 pcs.



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



MacroMagnum – Accessories

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.



Torque wrench 3R-614-04

For Ø10 mm 3Refix mandrels.

- 4 Nm



Air unit 3R-611.2

Foot operation of pneumatic chucks.



Air unit 3R-611.4

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



Air unit 3R-611.46

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



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.



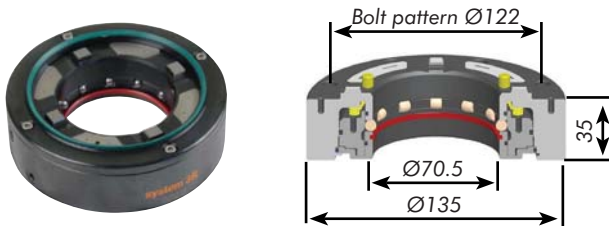
Pre-alignment studs.

Matrix 110

Pneumatic chuck, Matrix 110 3R-690.1-110

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

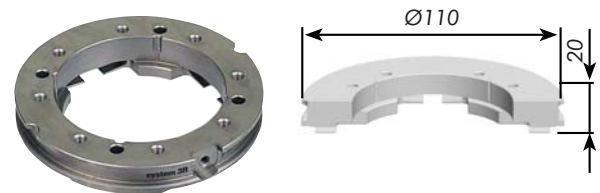
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, -6 ± 1 bar
- Weight 2.5 kg.



Pallet, Matrix 110 3R-691.1-110

- Fixed index positions 4x90°
- Permissible press load 35 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-110 or similar
- Weight 0.5 kg.

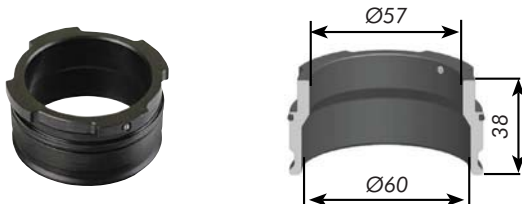
Note: Not self carrying, requires extra support.



Drawbar, Matrix 110 3R-695.2-110

- Adapted for automatic changing
- Weight 0.3 kg.

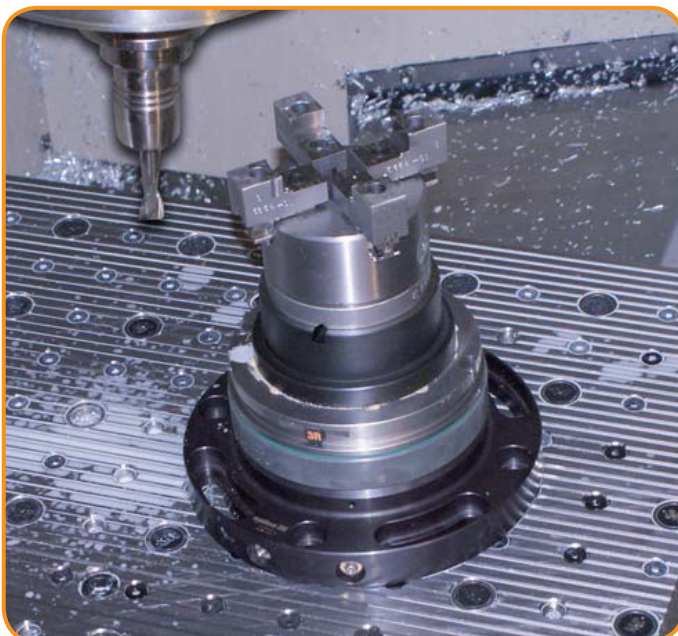
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



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.



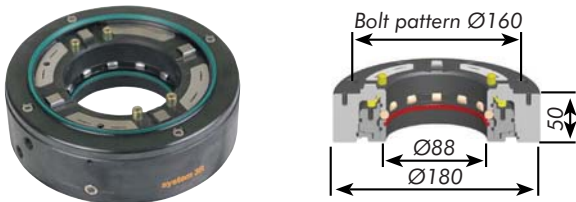
Three-jaw chuck mounted on a pallet.

Matrix 142

Pneumatic chuck, Matrix 142 3R-690.1-142

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

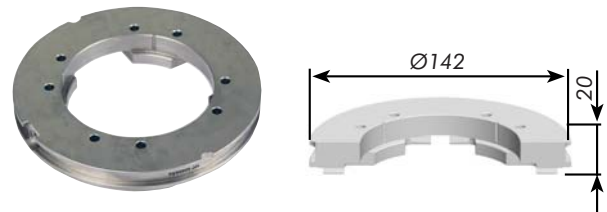
- Fixed index positions 4x90°
- Clamping force 12000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, -6 ± 1 bar
- Weight 7 kg.



Pallet, Matrix 142 3R-691.1-142

- Fixed index positions 4x90°
- Permissible press load 80 ton
- Permissible torque 570 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.

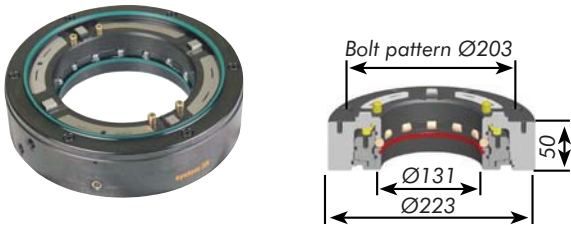


Matrix 185

Pneumatic chuck, Matrix 185 3R-690.1-185

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

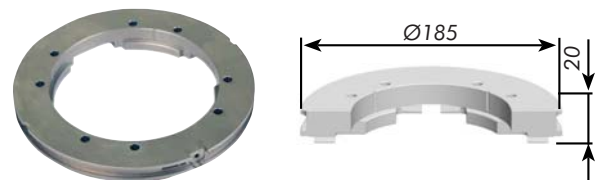
- Fixed index positions 4x90°
- Hardened references
- Clamping force 16 000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, -6 ± 1 bar
- Weight 9 kg.



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.

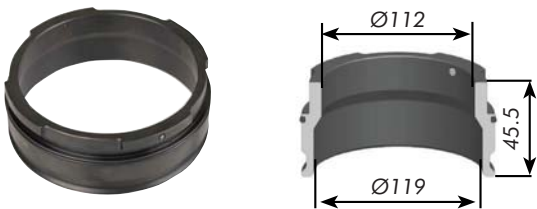
Note: Not self carrying, requires extra support.



Drawbar, Matrix 185 3R-695.2-185

- Adapted for automatic changing
- Weight 0.8 kg.

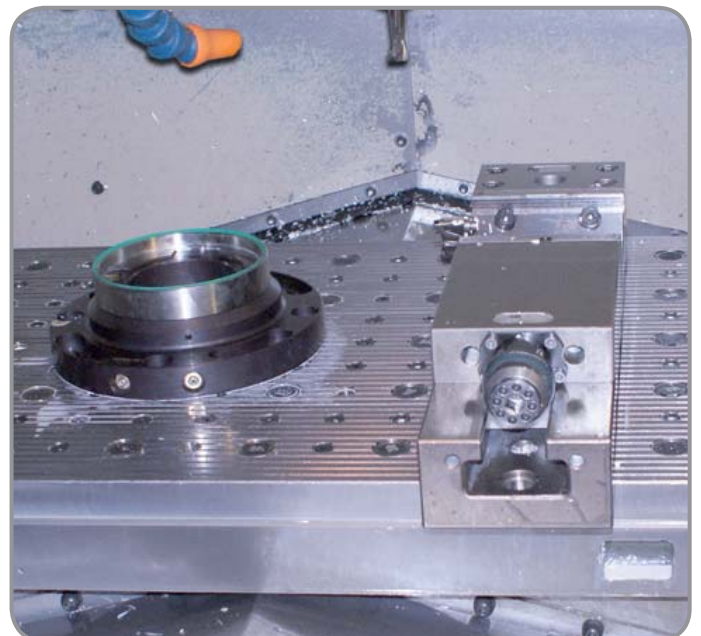
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



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.

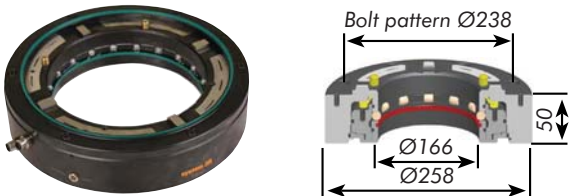


Matrix 220

Pneumatic chuck, Matrix 220 3R-690.1-220

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

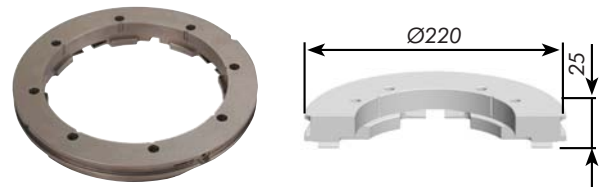
- Fixed index positions 4x90°
- Clamping force 18500 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, -6 ± 1 bar
- Weight 11 kg.



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.

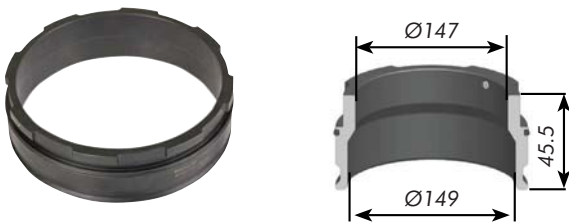
Note: Not self carrying, requires extra support.



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 150 mm.
- Weight 7.5 kg.



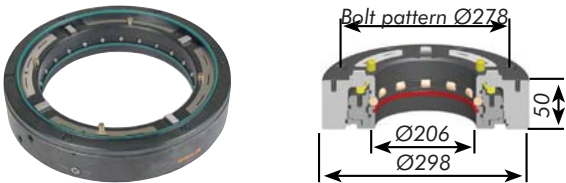
Matrix application:
The pallet is turnable for machining of both sides of a optical lens.

Matrix 260

Pneumatic chuck, Matrix 260 3R-690.1-260

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

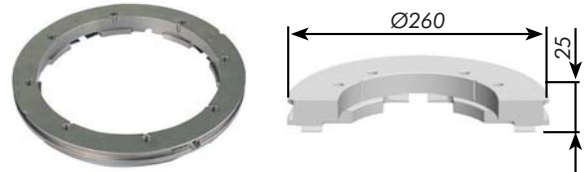
- Fixed index positions 4x90°
- Hardened references
- Clamping force 24000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, -6 ± 1 bar
- Weight 13 kg.



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.

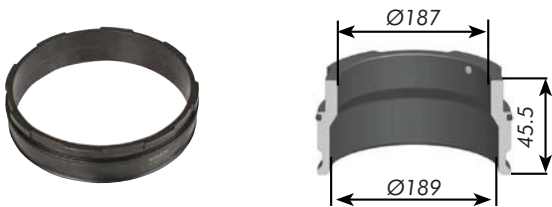
Note: Not self carrying, requires extra support.



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 200 mm.
- Weight 10 kg.



Air unit 3R-611.2

Foot operation of pneumatic chucks.



Air unit 3R-611.4

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



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

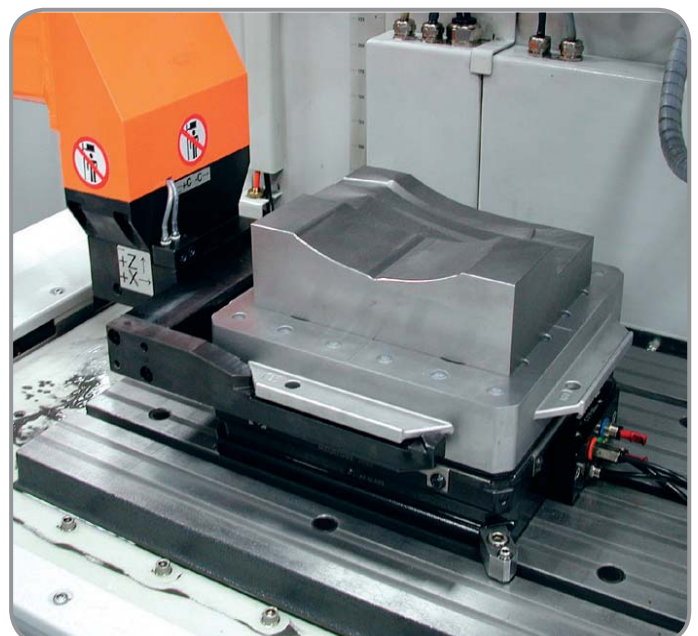
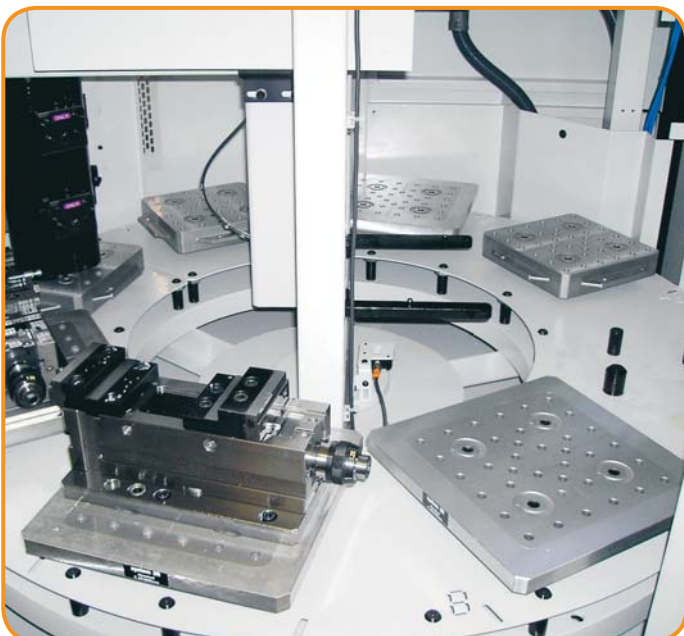
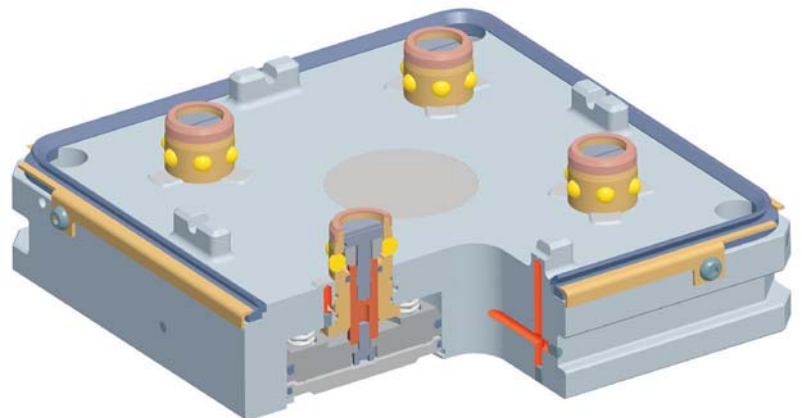
by the centre of the chuck in the GPS 240 system. The chuck can be mounted on the machine table of any machine tool.

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.

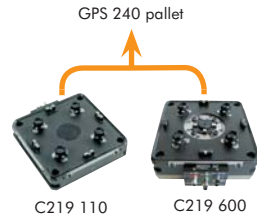
The economical, pressure-die-cast aluminium pallets are very light, making them also suitable for manual handling. Naturally the GPS 240 is also suitable for automatic changing.

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 – Chucks



Chucks

Article number

Feature

Automatic/manual

C219 110

Automatic/manual

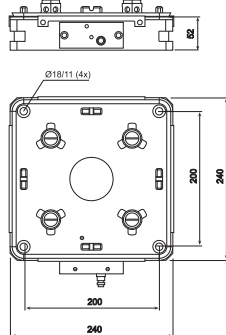
C219 600

Built-in Macro

GPS 240 Pneumatic chuck C219 110

Pneumatic table chuck, mainly intended for applications in die-sinking EDM machines.

- Required air pressure 6 bar
- Recommended actuator C810 830
- Air-blast cleaning of the references
- Weight 17 kg

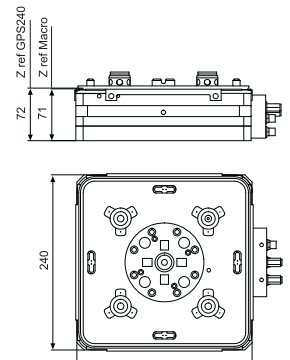


GPS 240 Pneumatic chuck C219 600

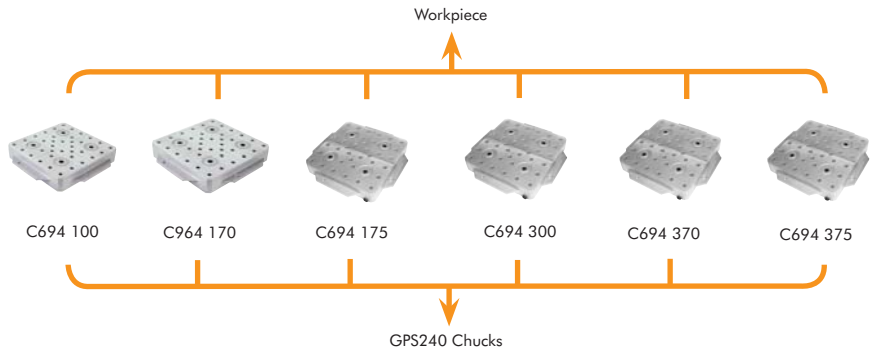
Pneumatic chuck with built-in Macro chuck. Intended for measuring machines.

NOTE: In addition, the following pallets can be mounted in GPS240 by means of C219 600:
Macro 54x54 mm and Macro 70x70 mm

- Required air pressure 6 bar
- Recommended actuator C810 810
- Air-blast cleaning of the references
- Weight 22 kg



GPS 240 – Pallets



Pallets	Article number	Feature
Aluminium	C694 100	Set of 4x C694 100
Aluminium	S500 090	
Aluminium	S500 100	Set of 10x C694 100
Aluminium	C694 170	Prepared for automation
Aluminium	S500 091	Set of 4x C694 170
Aluminium	S500 101	Set of 10x C694 170
Aluminium	C694 175	Ready for automation
Aluminium	S500 092	Set of 4x C694 175
Aluminium	S500 102	Set of 10x C694 175
Aluminium ground	C694 300	Prepared for automation
Aluminium ground	C694 370	
Aluminium ground	C694 375	Ready for automation

☉ Pallet with spring-loaded pin



GPS 240 – Pallets

GPS 240 Palett EDM/Grinding C694 100

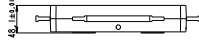
Cast aluminium pallet for EDM and grinding.

- Construction height 48.1 ±0.01 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.02 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500



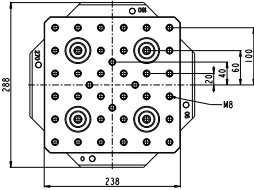
S500 090

- C694 100, Set of 4 pcs.



S500 100

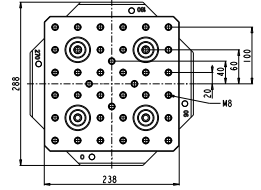
- C694 100, Set of 10 pcs.



GPS 240 Palett Adaptation C694 300

Ground cast aluminium pallet for fixtures and accessories.

- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.01 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500



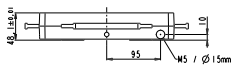
GPS 240 Palett EDM/Grinding Prepared for automation, C694 170

Cast aluminium pallet for EDM and grinding.

Prepared for automation.

Supplied with code carrier mounting, but without code carrier.

- Construction height 48.1 ±0.01 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.02 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500 and code carrier mounting C960 770

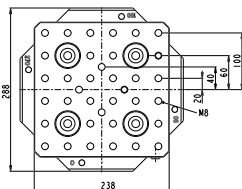


S500 091

- C694 170, set of 4 pcs.

S500 101

- C694 170, set of 10 pcs.

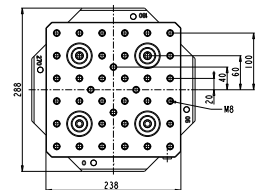
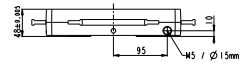


GPS 240 Palett Adaptation Prepared for automation C694 370

Ground cast aluminium pallet for fixtures and accessories.

Prepared for automation. Supplied with code carrier mounting, but without code carrier.

- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.01 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500 and code carrier mounting C960 770

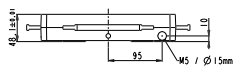


GPS 240 Palett EDM/Grinding Ready for use of automation, C694 175

Cast aluminium pallet for EDM and grinding. Ready for automation.

Supplied complete with code carrier.

- Construction height 48.1 ±0.01 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.02 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500, code carrier mounting C960 770 and code carrier 3R-863.01

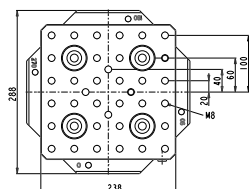


S500 092

- C694 175, set of 4 pcs.

S500 102

- C694 175, set of 10 pcs.

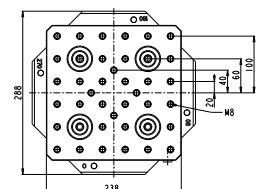
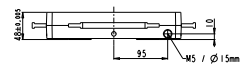
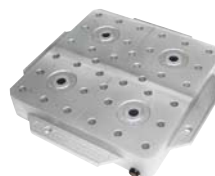


GPS 240 Palett Adaptation Ready for use of automation, C694 375

Ground cast aluminium pallet for fixtures and accessories.

Ready for automation. Supplied complete with code carrier.

- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.01 mm
- Weight 4 kg
- Recommended workpiece weight 100 kg
- Supplied with sealing plugs C531 500, code carrier mounting C960 770 and code carrier 3R-863.01.



GPS 240 – Pallets & Accessories

GPS 240 Pallet with built-in Macro chuck C522 520

Adapter to accept Macro pallets.

- Material: aluminium/steel
- Weight 8.5 kg



GPS 240 Pallets with vice C585 400

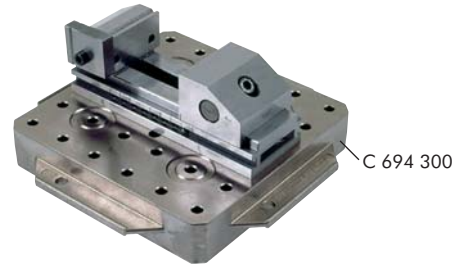
Vice for workpieces <80 mm.

- X/Y-centring with spring-loaded pin

C585 600

Vice for workpieces <120 mm.

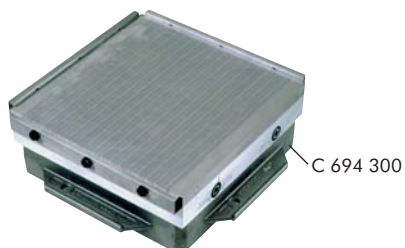
- X/Y-centring with spring-loaded pin



GPS 240 Magnetic pallet C694 260

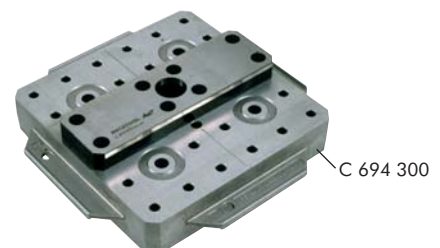
High-precision magnetic pallet for grinding work and for erode.

- Magnetic field height 5 mm
- Clamping force 100 N/cm²
- 240x240 mm
- Weight 23 kg



GPS 240 Master pallet C846 600

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

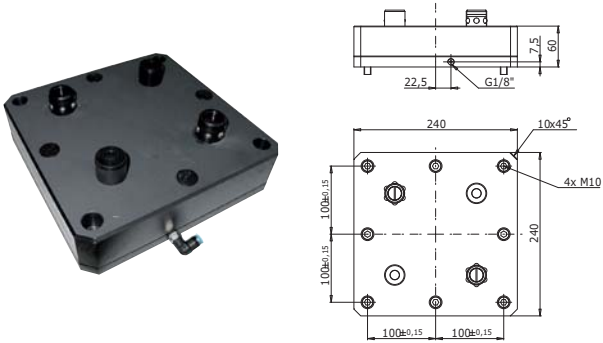


GPS 240 – Accessories

GPS 240 Dummy chuck C210 060

Dummy chuck for locking a pallet in a draining or loading station.

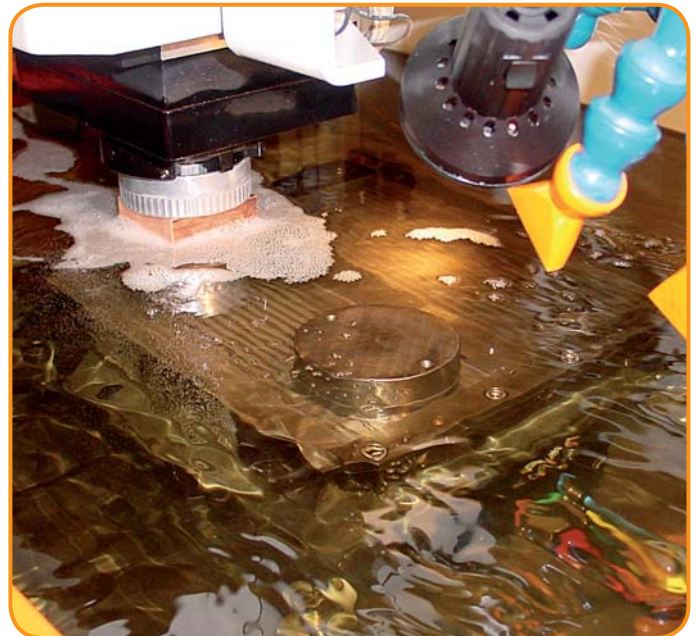
- Required air pressure 6 bar
- Weight 9.5 kg



Draining station C210 050

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

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



Controllers

C810 830

Controller for pneumatic chuck C219 110.

- Four connections - X/Y-locating – air-blast cleaning of Z – open/lock – turbo/venting

C810 850

Controller for 2 pneumatic chucks C219 110.

- Five connections - X/Y-locating – air-blast cleaning of Z – open/lock – turbo/venting – evacuation hose

C810 810

- Six connections - X/Y-locating – air-blast cleaning of Z – open/lock – turbo/venting – Macro open/lock – Macro air-blast cleaning of Z / turbo



GPS 240 – User kits & Accessories

Clamp kit, C810 870

Contents

E030 220 clamp (x4)
 E010 144 washer M10 (x4)
 E010 143 washer M8 (x4)
 E000 428 Allen screw M10x45 (x4)
 E000 354 Allen screw M8x45 (x4)
 E040 030* T-slot nut M10x12 (x4)
 E040 031* T-slot nut M10x14 (x4)
 E040 032* T-slot nut M10x16 (x4)
 E040 033* T-slot nut M10x18 (x4)
 E040 020* T-slot nut M8x12 (x4)
 E040 021* T-slot nut M8x14 (x4)
 E040 022* T-slot nut M8x16 (x4)
 E040 023* T-slot nut M8x18 (x4)



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



Clamp strip kit, C810 880

Contents

C810 881 clamp strip (x2)
 E010 144 washer M10 (x4)
 E010 143 washer M8 (x4)
 E000 428 Allen screw M10x45 (x4)
 E000 354 Allen screw M8x45 (x4)
 E040 030* T-slot nut M10x12 (x4)
 E040 031* T-slot nut M10x14 (x4)
 E040 032* T-slot nut M10x16 (x4)
 E040 033* T-slot nut M10x18 (x4)
 E040 020* T-slot nut M8x12 (x4)
 E040 021* T-slot nut M8x14 (x4)
 E040 022* T-slot nut M8x16 (x4)
 E040 023* T-slot nut M8x18 (x4)



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



Note: The holes in the clamp strips are drilled in accordance with the customer's requirements stated when ordering.

Clamp strip kit for double mounting, C810 920

For mounting two chucks on 300 mm centres.

Contents

C810 921 undrilled spacer (x1)
 C810 881 clamp strip (x2)
 E010 144 washer M10 (x6)
 E010 143 washer M8 (x6)
 E000 428 Allen screw M10x45 (x6)
 E000 354 Allen screw M8x45 (x6)
 E040 030* T-slot nut M10x12 (x6)
 E040 031* T-slot nut M10x14 (x6)
 E040 032* T-slot nut M10x16 (x6)
 E040 033* T-slot nut M10x18 (x6)
 E040 020* T-slot nut M8x12 (x6)
 E040 021* T-slot nut M8x14 (x6)
 E040 022* T-slot nut M8x16 (x6)
 E040 023* T-slot nut M8x18 (x6)



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

Note: The holes in the clamp strips are drilled in accordance with the customer's requirements stated when ordering.

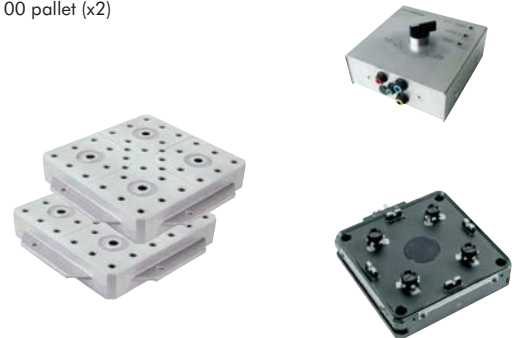


GPS 240 Starter kit S500 650

With a permanent compressed air supply a clamping force of 80000 N can be obtained.

Contents

C219 110 pneumatic chuck
 C810 830 actuator
 C694 100 pallet (x2)



Code carriers 3R-863.01

With pre-programmed unique identity, designed for GPS240.

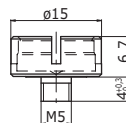
3R-863.01-10

Sets of 10 pcs.



Code carrier, fixture C960 740

Fixture for code carrier 3R-863.01-10.



Sealing C219 007

The chuck seal is a wear part which should be replaced once a year.

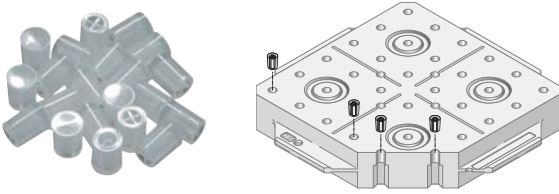
- Material: Viton
- Supplied singly



GPS 240 – Accessories

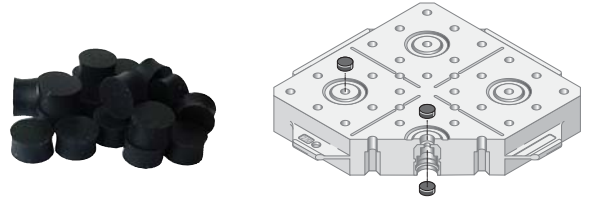
Sealing plugs C531 500

Plugs for sealing GPS 240 pallets.
• Supplied in sets of 40 pcs.



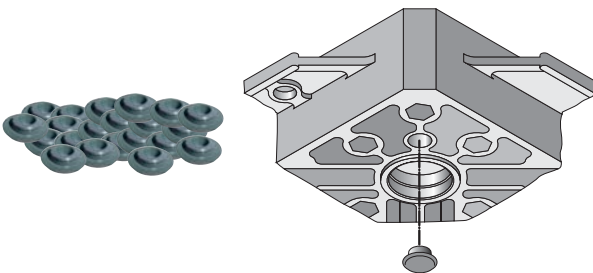
Seals C531 250

To seal the holes in the four clamping elements of the pallet.
• Material: elastomer
• Supplied in sets of 20 pcs.



Reference protectors C531 210

To protect the Z-reference of the pallet.
• Supplied only in sets of 20 (E020 897)



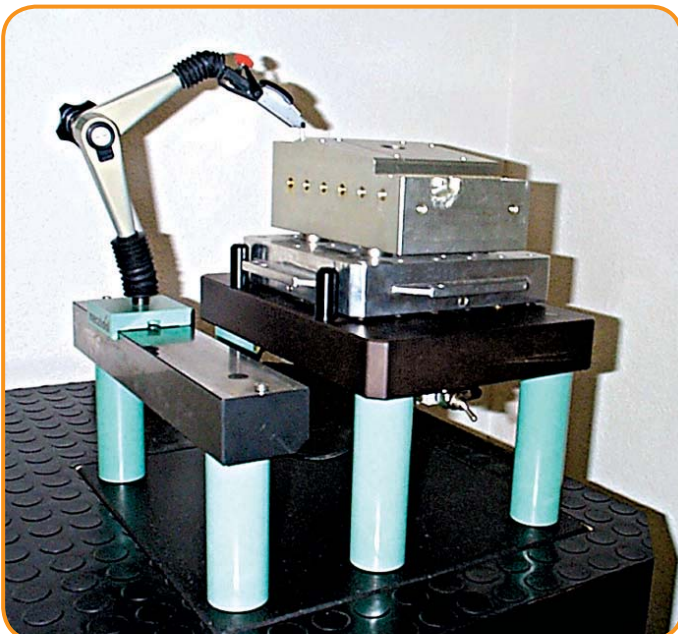
Lifting grip C810 960

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



Presetting station C810 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.



Dynafix

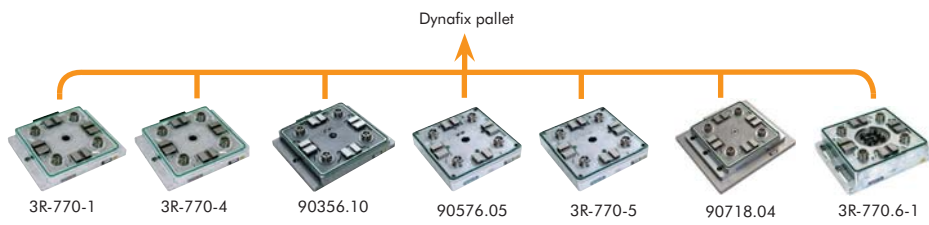
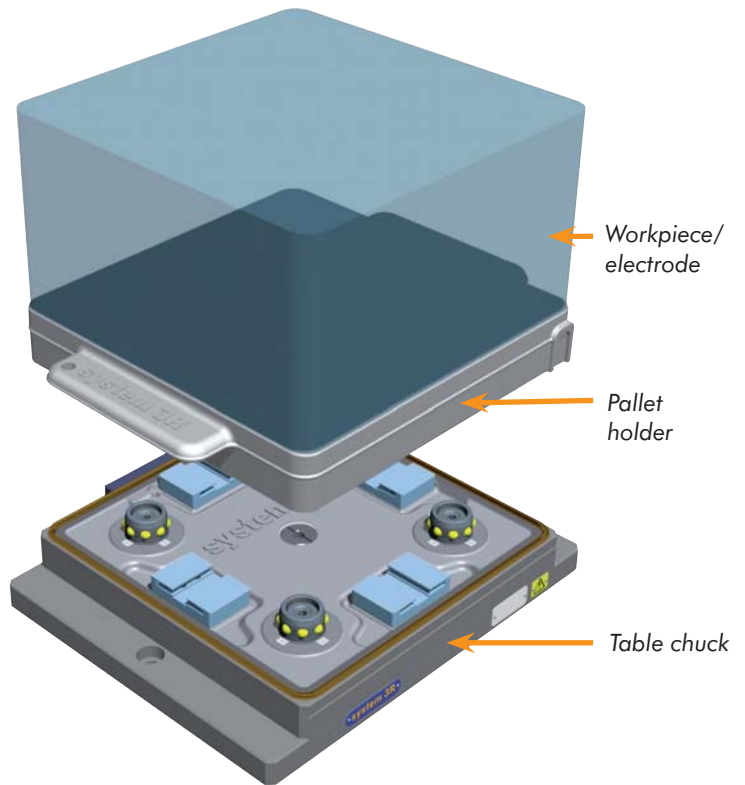
- ... allows machining with optimal cutting data
- ... reduces setting-up times
- ... ensures precision and quality
- ... gives access to System 3R's entire product range
- ... is suitable for automatic changing with System 3R's automation program.

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



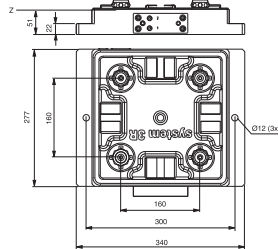
Chucks	Article number	Feature
Pneumatic	3R-770-1	
Pneumatic	3R-770-4	alignment reference
Pneumatic	90356.10	for chuck adapters, with mounting flange
Pneumatic	90576.05	for chuck adapters, without mounting flange
Pneumatic	3R-770-5	for five-axis machines
Pneumatic	90718.04	vibration-damped
Pneumatic	3R-770.6-1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

Dynafix – Chucks

Pneumatic chuck 3R-770-1

Pneumatic table chuck.

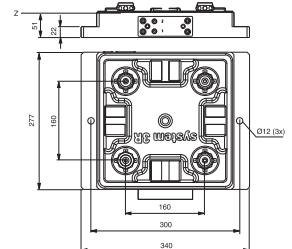
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2.
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



Pneumatic chuck 3R-770-4

Pneumatic table chuck with ground-in reference for alignment.

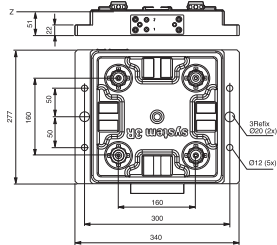
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



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 fixing lugs.
• Weight 24.5 kg

90576.05

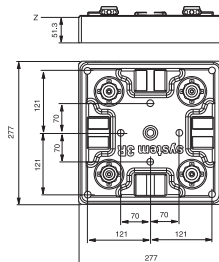
Without fixing lugs.
• Weight 23.5 kg



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



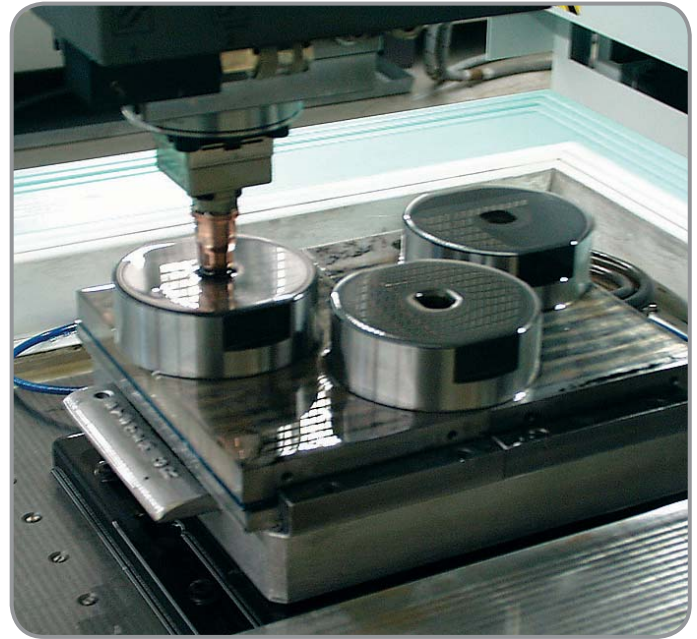
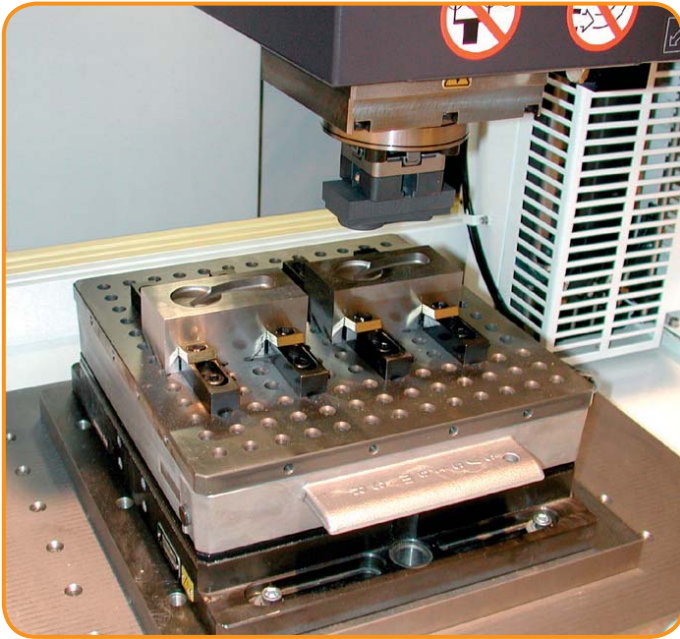
Pneumatic chuck, VDP 90718.04

Pneumatic vibration-damped chuck.

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



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-770.46-1

Pneumatic chuck with integrated MacroCombi 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 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



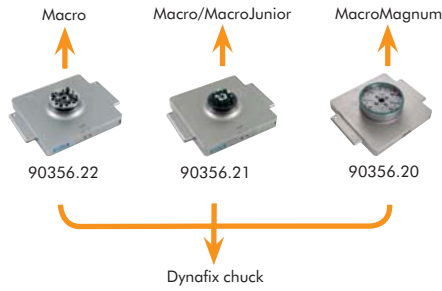
Pneumatic chuck D-20129

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

Chuck adapters	Article number	Feature
Pneumatic	90356.22	Dynafix ▶ Macro
Pneumatic	90356.21	Dynafix ▶ MacroCombi
Pneumatic	90356.20	Dynafix ▶ MacroMagnum

Pneumatic chuck adapter, Dynafix-Macro 90356.22

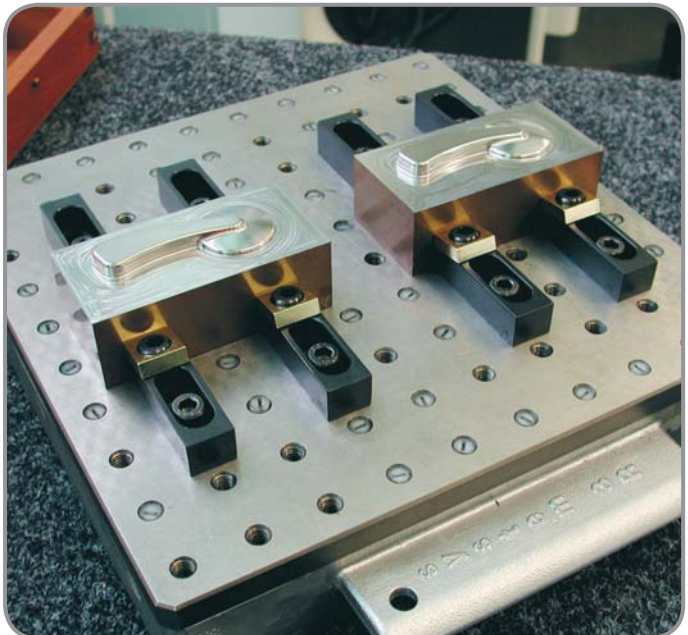
Chuck adapter with built-in pneumatic Macro chuck for mounting in 90356.10 or 90576.05.

Pneumatic chuck adapter, Dynafix-MacroCombi 90356.21

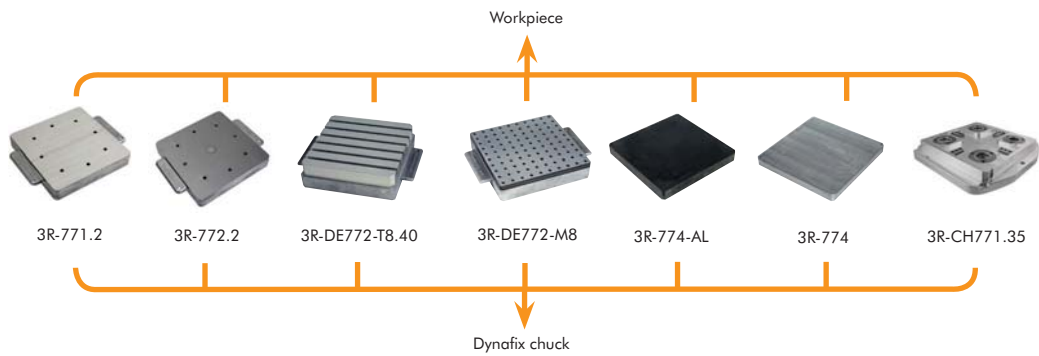
Chuck adapter with built-in pneumatic MacroCombi chuck for mounting in 90356.10 or 90576.05.

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	

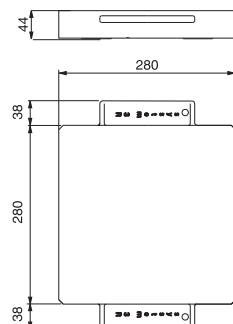
Pallets 400x400 mm

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

Pallet 280x280 mm 3R-771.2

Milled aluminium pallet

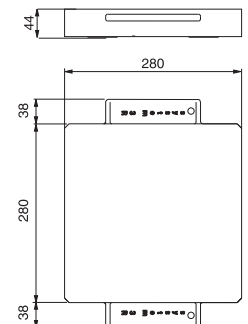
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.04 mm
- Thickness tolerance +0.5/-0 mm
- Weight 6 kg



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

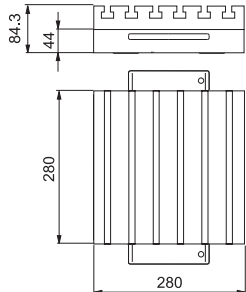
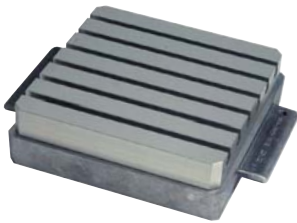


Dynafix – Pallets & Accessories

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

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

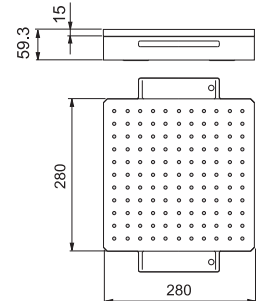
- Adapted for automatic changing
- Ready for code carrier
- Weight 14 kg



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

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

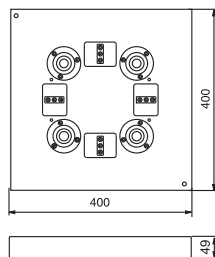
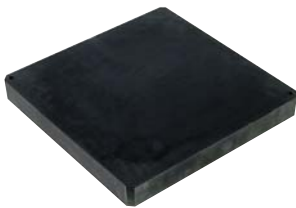
- Adapted for automatic changing
- Ready for code carrier
- Weight 14.5 kg



Pallet 400x400 mm 3R-774-AL

Aluminium pallet.

- Ready for code carrier
- Weight 20 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 kg



Maxi

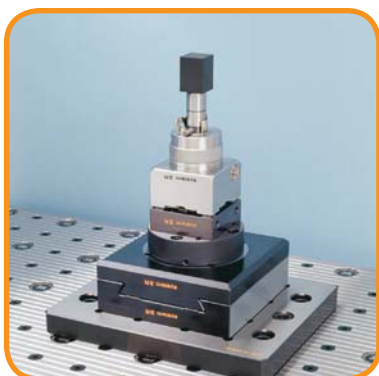
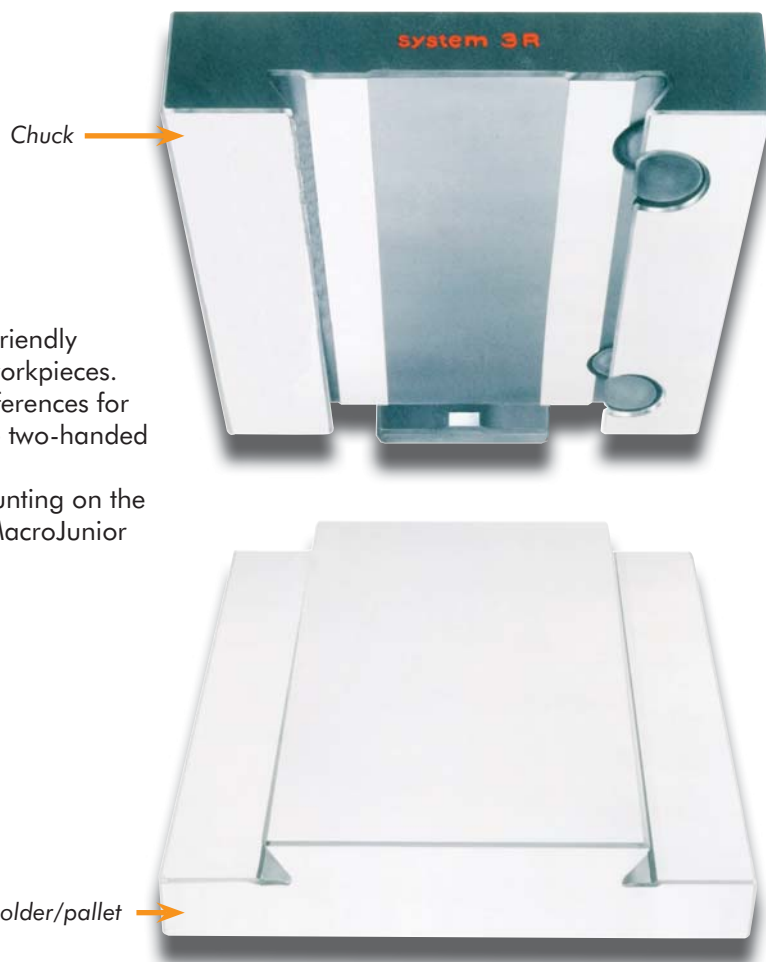
- ... reduces setting-up times.
- ... is user-friendly.
- ... gives access to a large part of System 3R's product range.

Maxi

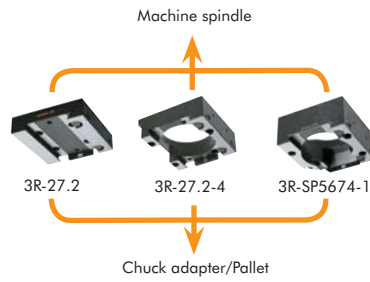
An especially robust, uncomplicated and user-friendly system for larger and heavier electrodes and workpieces. The chucks are of the fishtail type with three references for rapid mounting of the accessories with a single two-handed operation.

Chuck adapters – with Maxi as the basic mounting on the machine table – also give access to the Mini, MacroJunior and Macro systems.

- Repetition accuracy within 0.01 mm.
- Recommended maximum weight 500 kg.



Maxi – Chucks



Spindle chucks

	Article number	Image	Feature
Manual	3R-27.2		
Manual	3R-27.2-4		Machine-adapted
Manual	3R-SP5674-1		Machine-adapted

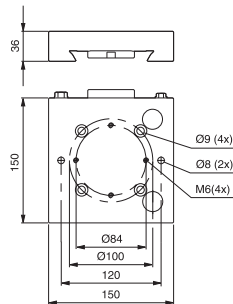
Table chuck

	Article number	Image	Feature
Manual	3R-27.2		

Manual chuck 3R-27.2

For mounting on the machine spindle or on a machine table.

- Immersible
- Maximum electrode weight 500 kg
- Mechanical locking
- Weight 5 kg



Manual chuck 3R-27.2-4

Intended mainly for AGIE machines with Macro as the basic mounting in the machine spindle.

- Immersible
- Maximum electrode weight 500 kg
- Mechanical locking
- Weight 5 kg



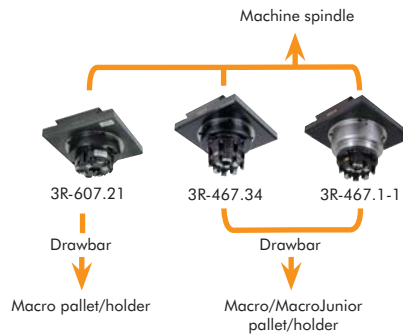
Manual chuck 3R-SP5674-1

Intended mainly for Charmilles machines with Macro as the basic mounting in the machine spindle.

- Immersible
- Maximum electrode weight 500 kg
- Mechanical locking
- Weight 5 kg



Maxi – Chuck adapters



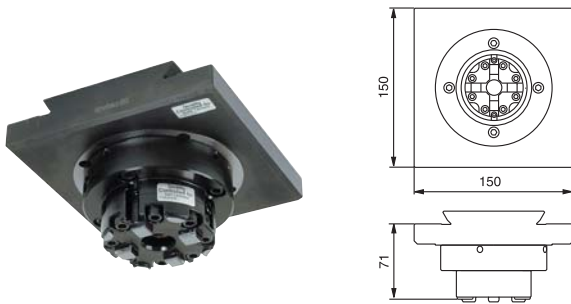
Chuck adapters

Chuck adapters	Article number	Feature
Manual	3R-607.21	Maxi ► Macro
Manual	3R-467.34	Maxi ► Macro/MacroJunior
Pneumatic	3R-467.1-1	Maxi ► Macro/MacroJunior

Manual chuck adapter, Maxi-Macro 3R-607.21

For mounting of Macro holders in the Maxi system.

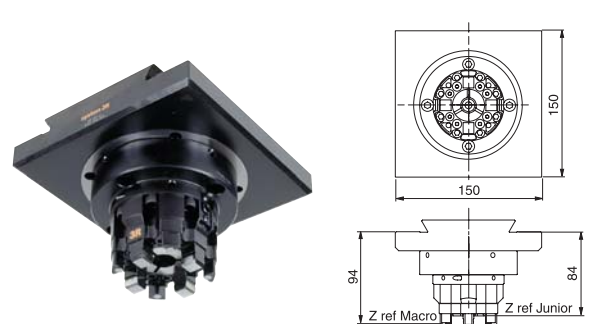
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Maximum electrode weight 50 kg
- Flushing connection
- Weight 6.7 kg



Manual chuck adapter, Maxi-MacroCombi 3R-467.34

For mounting MacroJunior and Macro holders in the Maxi system.

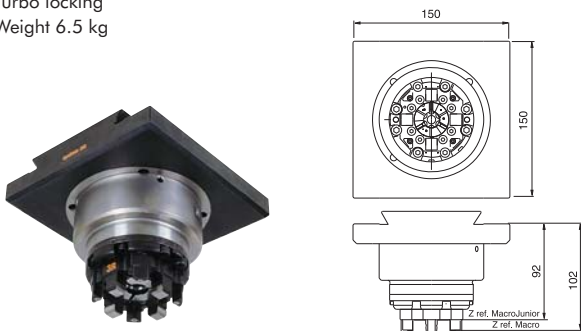
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 7 kg



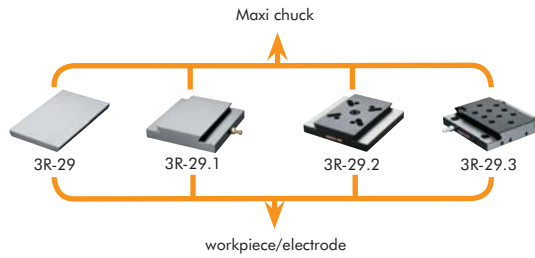
Pneumatic chuck adapter, Maxi-MacroCombi 3R-467.1-1

For mounting MacroJunior and Macro holders in the Maxi system.

- Adapted for automatic electrode changing
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 6.5 kg



Maxi – Pallets



Pallets	Article number	Feature
Unhardened 150x90 mm	3R-29	
Unhardened 150x150 mm	3R-29.1	
Hardened 150x150mm	3R-29.2	
Hardened 150x150mm	3R-29.3	3Refix Ø10 mm

Pallet 150x150 mm 3R-29.1

- Unhardened
- Flushing connection
- Flushing duct
- Weight 4.4 kg

Pallet 150x150 mm 3R-29.2

Pallet with 16 clearance holes for M6 screws and eight M6 threads.

- Hardened
- Weight 4.6 kg

Pallet 150x150 mm 3R-29.3

Pallet with four clearance holes for M6 screws and 3Refix holes.

- 3Refix Ø10 mm
- Hardened
- Flushing connection
- Flushing duct
- Weight 4.6 kg

Pallet 150x90 mm 3R-29

- Unhardened
- Weight 1.2 kg

Mini

- ... reduces setting-up times.
- ... gives rapid and precise mounting.
- ... is suitable for automatic changing with System 3R's automation program.

Mini

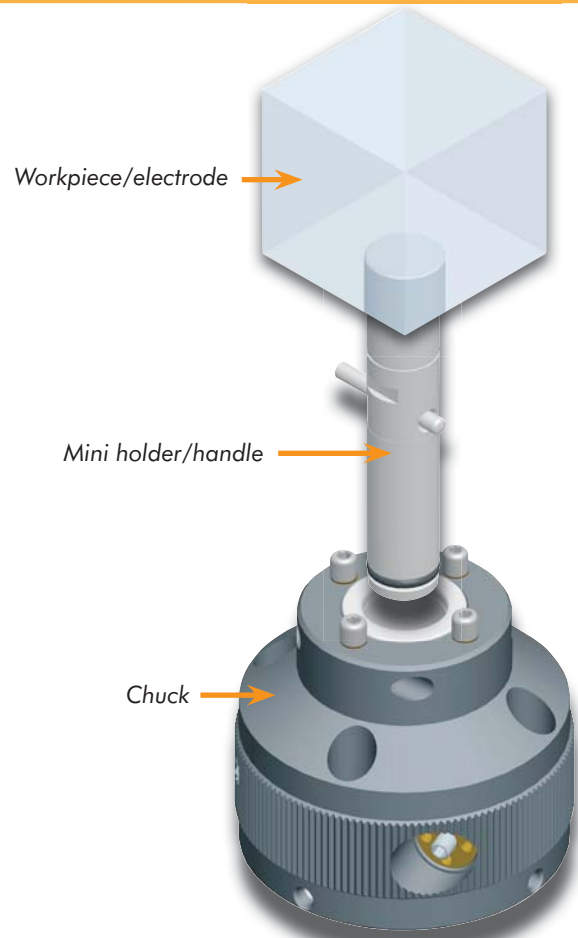
The ancestor of the reference systems! The introduction of the Mini system in the early 1970s created the basis for efficient electrode production and spark-erosion machining. Electrodes could now be produced mounted on inexpensive holders. Subsequent alignment of the electrodes in the spark-erosion machine was eliminated. The Mini system introduced the precision and flexibility that had until then been absent from spark erosion technology.

The Mini system provides rapid and exact mounting of the electrode holders in hydraulic quick-change chucks. This high change accuracy is achieved thanks to the two chambers of the hydraulic system, which expand uniformly and provide symmetrical locking against the fixed Z reference with angular location.

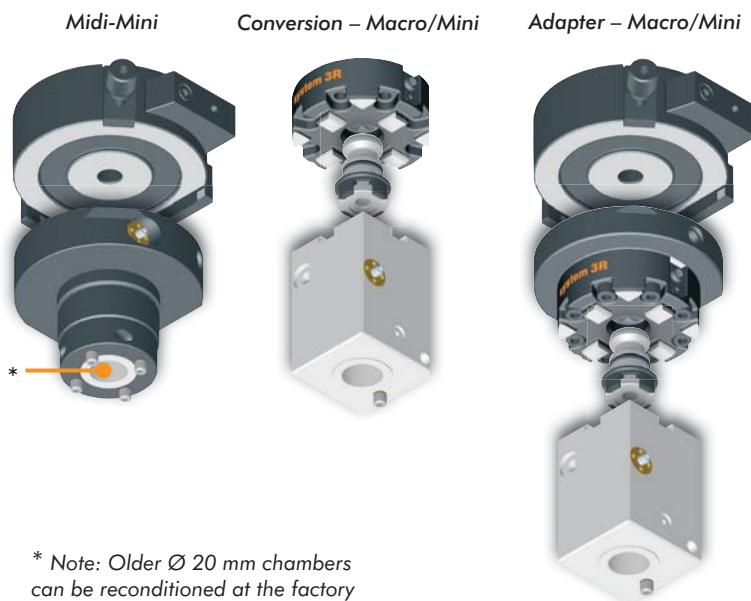
The Mini system is a "Reverse Reference System", in which the chuck adapts itself to the electrode holder, which is why all electrode holders must be exactly alike – in diameter, roundness, straightness and hardness – to meet the accuracy requirements.

Even today, the Mini system is probably the most widespread reference system in the world.

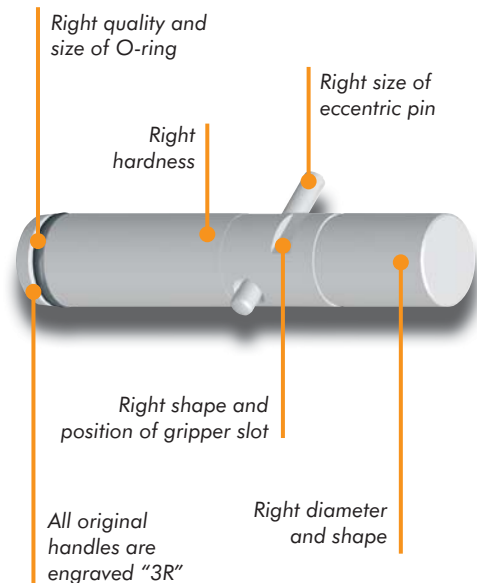
- Clamping force – 4000 N



Upgrade options:

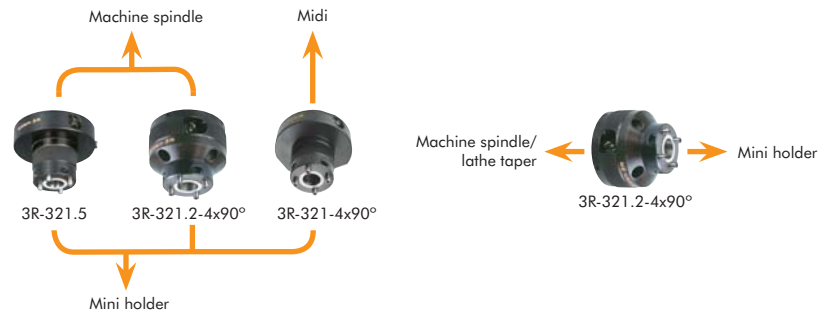


What distinguishes the original from a pirate copy:



Note: Warranty undertakings only apply if genuine System 3R parts have been used.

Mini – Chucks



Spindle chucks

	Article number	Image	Feature
Manual	3R-321.5		Midi ▶ Mini
Manual	3R-321.2-4x90°		
Manual	3R-321-4x90°		

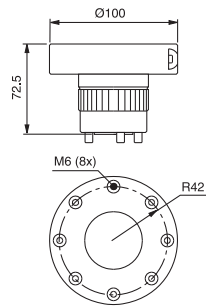
Lathe chuck

	Article number	Image	Feature
Manual	3R-321.2-4x90°		

Manual chuck 3R-321.5

Hydraulic chuck for mounting on machine spindle with 3R-A3620.

- Fixed index positions 4x90°
- Flushing connection
- Weight 1.8 kg



Manual chuck adapter, Midi-Mini 3R-321-4x90°

Hydraulic chuck for mounting on machine spindle with Midi system.

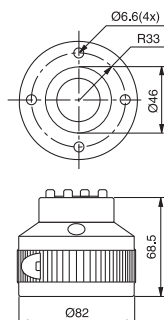
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.3 kg



Manual lathe chuck 3R-321.2-4x90°

Hydraulic chuck with set screws, for mounting on a lathe taper.

- Fixed index positions 4x90°
- Weight 1.3 kg



Mini – Table chucks, Chuck adapters & Rotating spindles

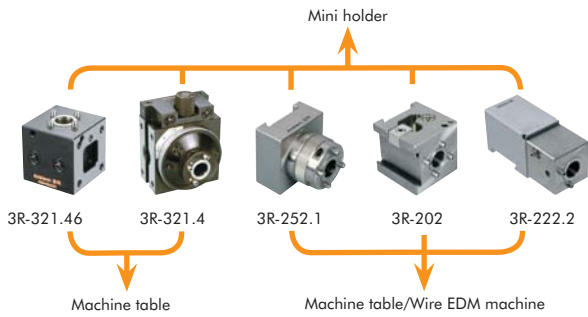
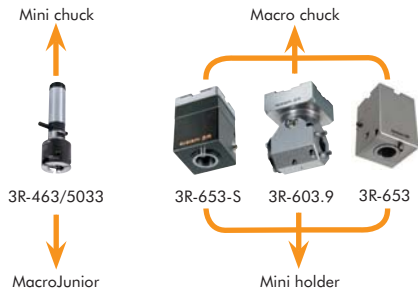
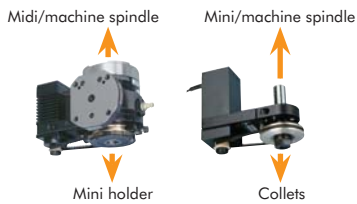


Table chucks	Article number	Feature
Manual	3R-321.46	vertical and horizontal
Manual	3R-321.4	vernier scale
Manual wire EDM	3R-252.1	stainless steel
Manual wire EDM	3R-202	stainless steel. Vertical and horizontal
Manual wire EDM	3R-222.2	stainless steel



Chuck adapters	Article number	Feature
Manual	3R-463/5033	Mini ► MacroJunior 50 mm
Manual	3R-603.9	Macro ► Mini 90°, rust-resistant
Manual	3R-653	Macro ► Mini, rust-resistant
Manual	3R-653-S	Macro ► Mini



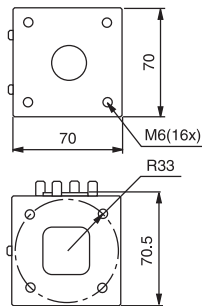
Rotating spindles	Article number	Feature
Vertical and horizontal	3R-1.6S	
Vertical	3R-1.321-HS	tubular electrodes

Mini – Table chucks, Chuck adapters & Rotating spindles

MiniBlock 3R-321.46

Manual hydraulic chuck for vertical or horizontal mounting on the machine table.

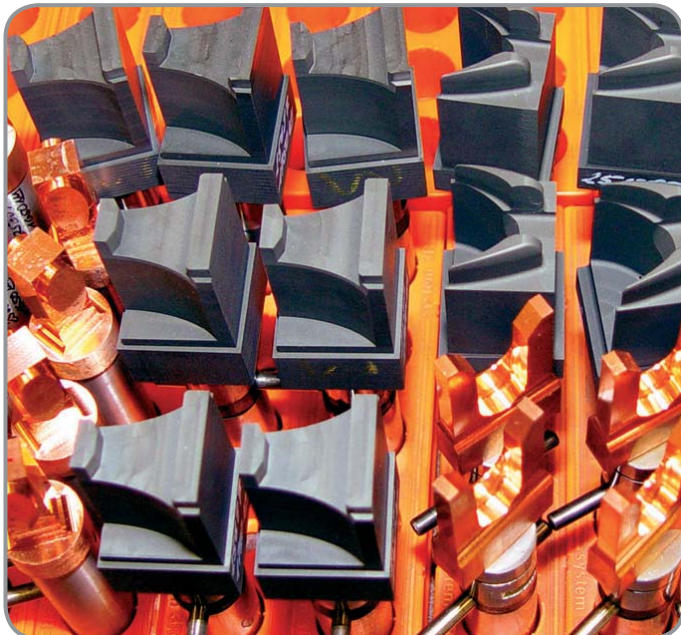
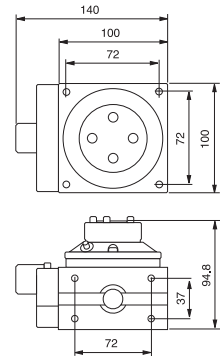
- Fixed index positions 4x90°
- Weight 2.3 kg



3R block 3R-321.4

Manual hydraulic chuck for vertical or horizontal mounting on the machine table.

- Fixed index positions 72x5°
- Vernier scale
- Weight 5.4 kg

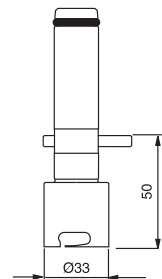


Manual chuck adapter, Mini-MacroJunior 3R-463/5033

For mounting MacroJunior holders in the Mini system. Axial locking screw with channel for flushing through the electrode.

Note: For EDM machining only.

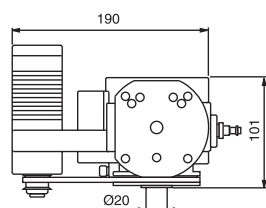
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 0.8 kg



Rotating spindle 3R-1.6S

Electric rotating spindle for electrodes on Mini holders. Vertical or horizontal mounting.

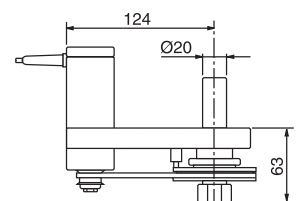
- Immersible
- Maximum electrode weight 2 kg
- Speed range 20-200 rev/min
- Recommended maximum flushing pressure 2 bar.
- Weight 11.6 kg



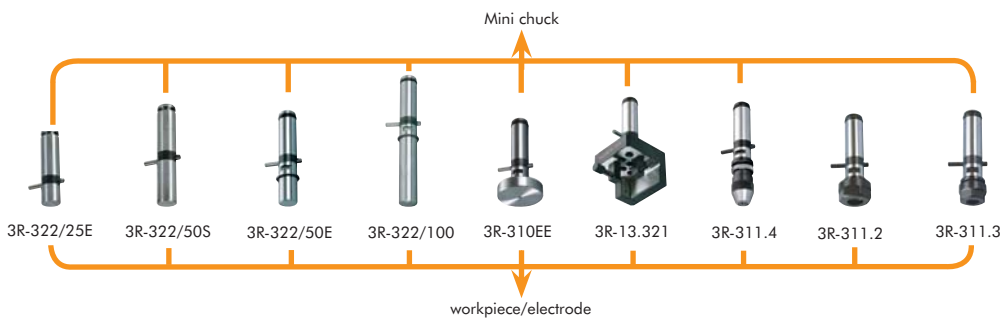
Rotating spindle 3R-1.321-HS

Electric spindle for tubular electrodes in collets ER16.

- Supplied with collet set 3R-ER16E
- Electrode sizes Ø0.5 – 10 mm.
- Speed range 200 – 2000 rev/min.
- Recommended maximum flushing pressure 40 bar.
- Weight 1.4 kg



Mini – Electrode holders



Electrode holder	Article number	Feature
Electrode holder Ø20 mm	3R-322/25E	25 mm
Electrode holder Ø20 mm	3R-322/50S	50 mm
Electrode holder Ø20 mm	3R-322/50E	50 mm. automatic changing
Electrode holder Ø20 mm	3R-322/100	100 mm. automatic changing
Electrode holder	3R-310EE	flange Ø50 mm
Electrode holder	3R-13.321	square electrodes
Three-jaw chuck	3R-311.4	Ø0.1 - 3 mm
Collet chuck	3R-311.2	<Ø13 mm, ER20
Collet chuck	3R-311.3	<Ø10 mm, ER 16

Electrode holder Ø20 mm

Holder with hardened reference part and unhardened electrode mounting part.

3R-322/25S

- Electrode mounting part 25 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7 kg

3R-322/50S

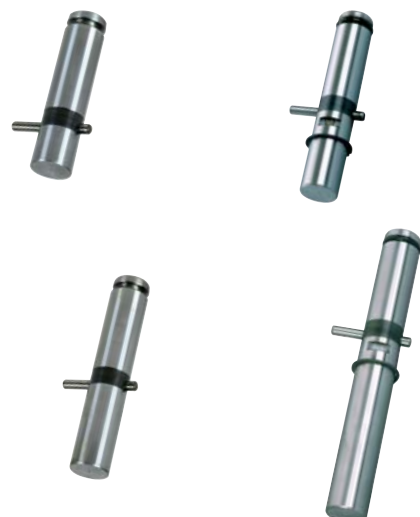
- Electrode mounting part 50 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7.7 kg

3R-322/50E

- Adapted for automatic changing
- Electrode mounting part 50 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7.7 kg

3R-322/100

- Adapted for automatic changing
- Electrode mounting part 100 mm
- Flushing duct
- Supplied in sets of 10 pcs
- Weight per set 3.8 kg

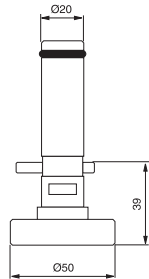


Mini – Electrode holders & Accessories

Electrode holder 3R-310EE

Holder with hardened reference part $\varnothing 20$ mm and unhardened flange $\varnothing 50$ mm.

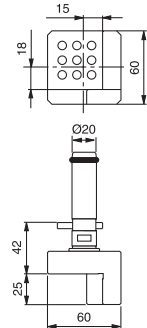
- Adapted for automatic changing
- Electrode mounting part 39 mm
- Flushing duct
- Supplied in sets of 10 pcs.
- Weight per set 4 kg



Electrode holder 3R-13.321

Holder with hardened reference part $\varnothing 20$ mm for mounting square and flat electrodes.

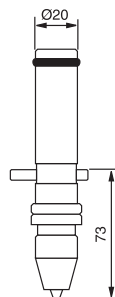
- Max. workpiece: 32x28 mm
- Adapted for automatic changing
- Flushing duct
- Weight 1 kg



Three-jaw chuck 3R-311.4

Chuck $\varnothing 20$ mm for $\varnothing 0.1$ -3 mm electrodes.

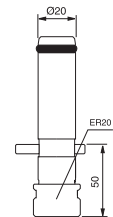
- Adapted for automatic changing
- Weight 0.3 kg



Collet chuck ER20 3R-311.2

Chuck $\varnothing 20$ mm for collets ER20 with electrodes $< \varnothing 13$ mm.

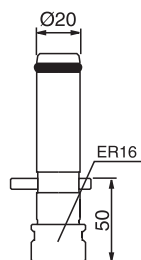
- Adapted for automatic changing
- Weight 0.2 kg



Collet chuck ER16 3R-311.3

Chuck $\varnothing 20$ mm for collets ER16 with electrodes $< \varnothing 10$ mm.

- Adapted for automatic changing
- Weight 0.2 kg



Check mandrel 3R-23

Ground C-reference.

- Measuring length 100 mm
- Weight 0.6 kg



Mini – Accessories

Check ruler 3R-314.2

For setting angular positions.

- Measuring length 96 mm
- Weight 0.4 kg



Indicating spindle 3R-3.321-2

For measuring centre holes.

- Dial indicator required
- Weight 0.4 kg



Microscope 3R-4.321

With transformer (110/220V) for integral lighting.

- Magnification x25
- Field of view Ø6 mm
- Weight 0.6 kg



Clip 3R-301

For angular fixing of Mini holders.

- Supplied in sets of 10 pcs.



Soldering kit 3R-403

For soldering electrode blanks on Mini holders.

- Supplied with flux.



Electrode cassette 3R-150/5

For Mini holder x30.

- Supplied in sets of 5 pcs.



Adapter plate 3R-601.6

For mounting (for example) rotating spindles in the Macro system.

- MacroHP coupling
- Rust-resistant



3Refix

- ... gives a definite position with fixed references
- ... minimal investment, cutting production costs
- ... fast setup with just a few simple manual actions
- ... the expanding mandrel minimises wear in the reference holes.

Increased productivity

need not mean heavy investments in new machines.

3Refix is remarkably simple way to lay a solid foundation from which to view the future with confidence – tool up without indication and cut your production costs!

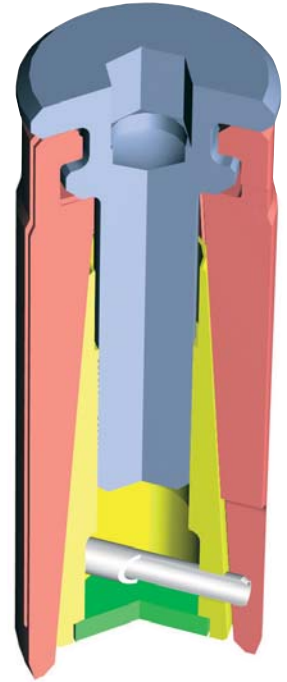
3Refix technology is based on a modular hole pattern with 100x100 mm pitch and 20 mm diameter reference holes. The reference tables have clearly-marked reference holes – A¹, A², B¹, B² etc – and every accessory has two 20 mm diameter holes, which pick up the references from the table. The R⁰-hole gives the X/Y-position and the R¹-hole gives the angle relative to the axes of the machine. This makes it possible to set up the workpiece without the need for alignment and gauging afterwards. So 3Refix accessories provide an unmistakable and fixed position with known references.

The accessories in the 3Refix range usually have a reference height of 30 mm, among other things to allow machining straight through the workpiece. The design also allows a flush pot to be pushed in under the workpiece during EDM machining.

The full effect of 3Refix technology is attained by consistent application with general systemization and standardization of all machine tables and accessories. System 3R can supply reference tables for practically all types and sizes of machines – reference tables that give a distinct interface between machine table and auxiliary tool.

With the aid of 3Refix you can very quickly change the set-up of the machine from one machining operation to another in a few simple operations – One Minute Set-up!

- Repetition accuracy 0.005 mm



3Refix expanding mandrels (2 pcs) determines the position. First 3Refix mandrel is to determine X/Y-position and the second to determine the angle.

3Refix

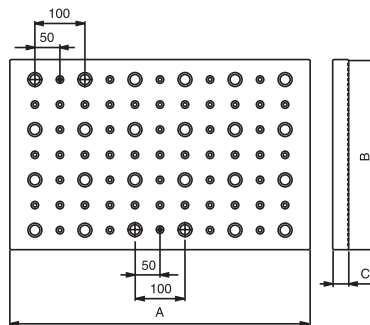
Reference tables

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



Slotted bushes

3R-903-XX.XX

Bushes of hardened spring steel 54 HRC.

- Bore 20 mm, height 20 mm.
- Supplied in 2 pcs.
- Weight per set 0.1 kg



Art. No.

Art. No.	Outside diameter (mm)
3R-903-20.235	23.5
3R-903-20.24	24
3R-903-20.25	25
3R-903-20.254	25.4
3R-903-20.256	25.6
3R-903-20.26	26
3R-903-20.275	27.5
3R-903-20.28	28
3R-903-20.295	29.5
3R-903-20.30	30
3R-903-20.315	31.5
3R-903-20.3175	31.75
3R-903-20.32	32
3R-903-20.34	34
3R-903.20.36	36
3R-903-20.38	38
3R-903-20.381	38.1
3R-903-20.40	40
3R-903-20.414	41.4
3R-903-20.42	42
3R-903-20.4445	44.45

Outside diameter (mm)

3Refix

Bushings

Hardened steel, 60 HRC, for mounting in existing fixtures.



3R-902-10E

Bore / mm.	10H7
Outside diameter / mm	15h6
Height / mm	12
Supplied in sets of	30

3R-902-19.7E

Bore / mm.	19.7
Outside diameter / mm	28h6
Height / mm	20
Supplied in sets of	10

3R-902-20.0E

Bore / mm.	20H6
Outside diameter / mm	28h6
Height / mm	20
Supplied in sets of	10

3R-902-20.3E

Bore / mm.	20H6
Outside diameter / mm	28.3
Height / mm	20
Supplied in sets of	10



Plastic plug 3R-915-20E

Plug to protect Ø20 mm hole from dirt
• Supplied in sets of 50 pcs.



Plastic screw 3R-915-M12E

To protect M12 holes with protective countersinking from dirt.
• Supplied in sets of 50 pcs.



Torque wrench 3R-614-04

For Ø10 mm 3Refix mandrels (3R-901-10E).

- 4 Nm



Torque wrench 3R-914-10

For Ø20 mm 3Refix mandrels (3R-901-20E).

- 10 Nm



Accessories

Allen key 3R-333-03

- 3 mm
- Supplied in 10 pcs.



Allen key 3R-333-05

- 5 mm
- Supplied in 10 pcs.



Collet chucks ETS10 3R-AG410

Intended for MacroJunior.

Collet chuck	Ø0.2-0.1 mm
Collet chuck	Ø0.3-0.2 mm
Collet chuck	Ø0.4-0.3 mm
Collet chuck	Ø0.5-0.4 mm
Collet chuck	Ø0.6-0.5 mm
Collet chuck	Ø0.7-0.6 mm
Collet chuck	Ø0.8-0.7 mm
Collet chuck	Ø0.9-0.8 mm
Collet chuck	Ø1-0.9 mm
Collet chuck	Ø1.25-1 mm
Collet chuck	Ø1.5-1.25 mm
Collet chuck	Ø1.75-1.5 mm
Collet chuck	Ø2-1.75 mm



Collet chucks 3R-ER16E

Intended for Macro & MacroJunior.

Collet chuck	Ø1-0,5 mm
Collet chuck	Ø2-1 mm
Collet chuck	Ø3-2 mm
Collet chuck	Ø4-3 mm
Collet chuck	Ø5-4 mm
Collet chuck	Ø6-5 mm
Collet chuck	Ø7-6 mm
Collet chuck	Ø8-7 mm
Collet chuck	Ø9-8 mm
Collet chuck	Ø10-9 mm



Collet chucks 3R-ER20E

Intended for Macro.

Collet chuck	Ø2-1 mm
Collet chuck	Ø3-2 mm
Collet chuck	Ø4-3 mm
Collet chuck	Ø5-4 mm
Collet chuck	Ø6-5 mm
Collet chuck	Ø7-6 mm
Collet chuck	Ø8-7 mm
Collet chuck	Ø9-8 mm
Collet chuck	Ø10-9 mm
Collet chuck	Ø11-10 mm
Collet chuck	Ø12-11 mm
Collet chuck	Ø13-12 mm



Collet chucks 3R-ER32E

Intended for Macro.

Collet chuck	Ø3-2 mm	Collet chuck	Ø11-10 mm
Collet chuck	Ø4-3 mm	Collet chuck	Ø12-11 mm
Collet chuck	Ø5-4 mm	Collet chuck	Ø13-12 mm
Collet chuck	Ø6-5 mm	Collet chuck	Ø14-13 mm
Collet chuck	Ø7-6 mm	Collet chuck	Ø15-14 mm
Collet chuck	Ø8-7 mm	Collet chuck	Ø16-15 mm
Collet chuck	Ø9-8 mm	Collet chuck	Ø17-16 mm
Collet chuck	Ø10-9 mm	Collet chuck	Ø18-17 mm
		Collet chuck	Ø19-18 mm
		Collet chuck	Ø20-19 mm



Accessories

Flushing adapter 3R-103

For 3R-601.3, 3R-601.52, 3R-603, 3R-603.9 and 3R-651.13.



Spacer plate U-40266

For mounting of small electrodes in 3R-608.32, 3R-658.2E-S and 3R-658.4E-S.

Supplied in sets of.

- 1 mm x10
- 2 mm x10
- 3 mm x10
- 5 mm x10



Nipple 3R-SP20753

Nipple for manual operation by air gun of pneumatic chucks with R1/8" connecting thread.



Labels 3R-LS288P

Supplied with marker pen.

- Size 6x19 mm
- Supplied in sets of 288 pcs.



Labels 3R-LL200P

Supplied with marker pen.

- Size 12x25 mm
- Supplied in sets of 200 pcs.



Code carriers 3R-863.01-10

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

- Supplied in sets of 10 pcs.



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.



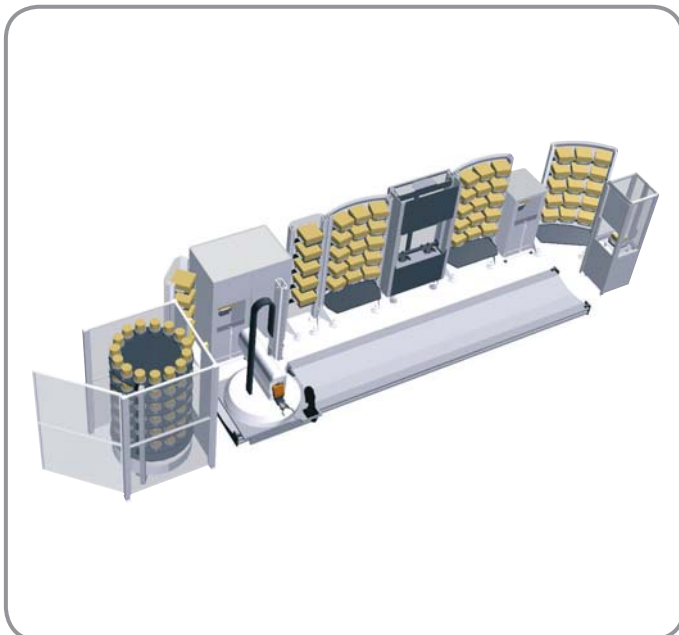
WorkMaster Linear – the flexible Solution

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:

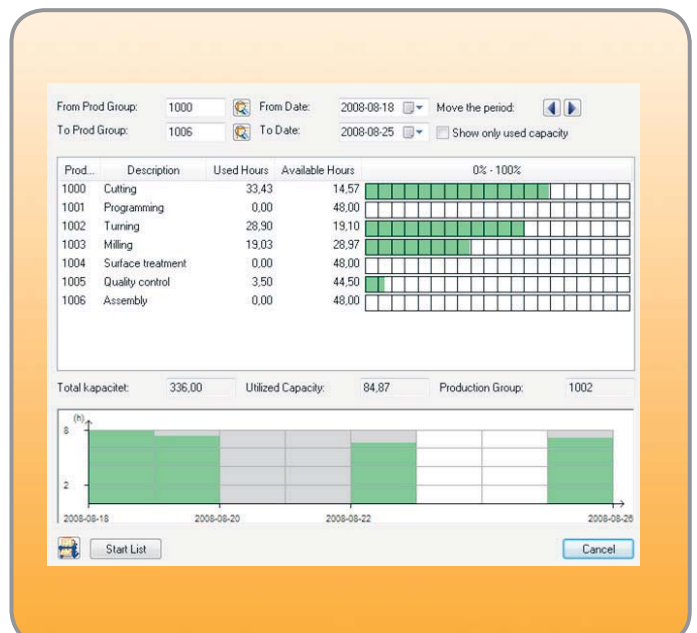
- milling – changing of workpiece and cutting tool
- grinding – changing of workpieces
- die-sinking EDM – changing of workpieces and electrodes
- wire EDM – changing of workpieces



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

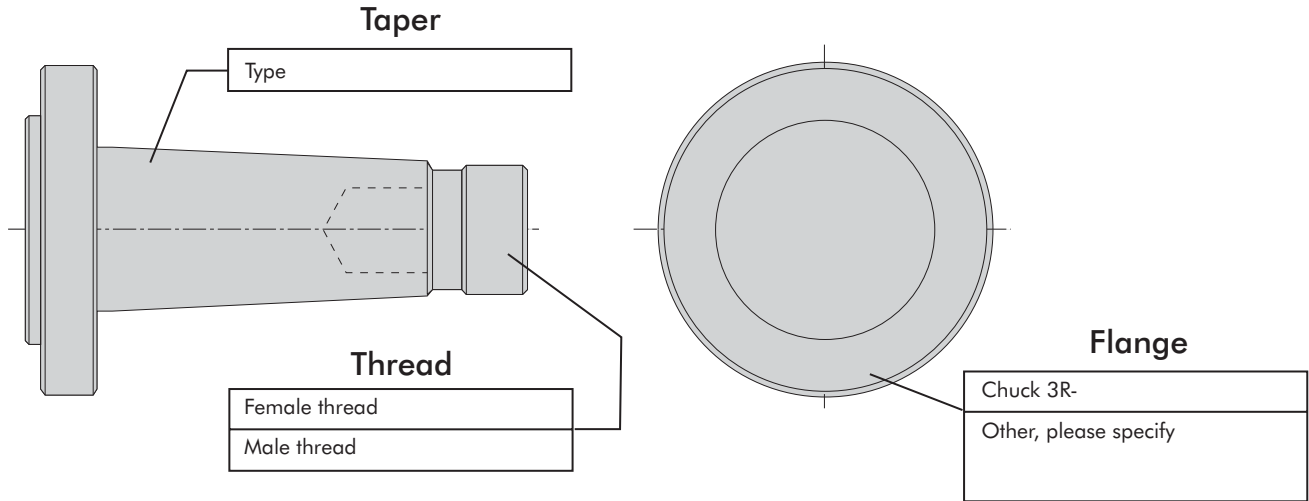
Company _____

Phone _____

Contact _____

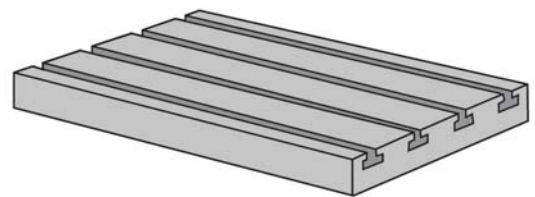
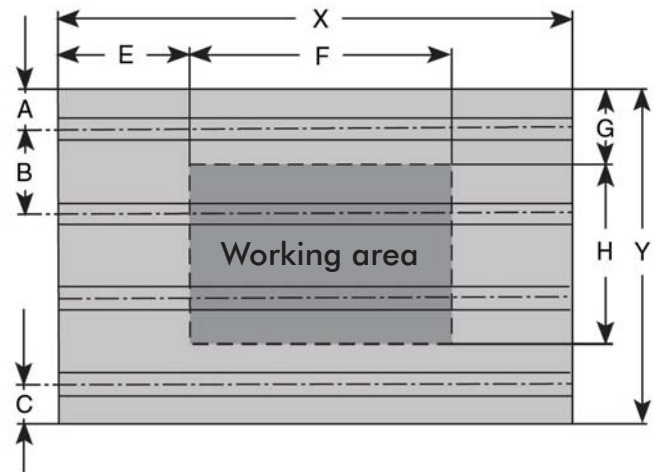
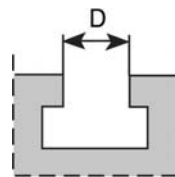
Date _____

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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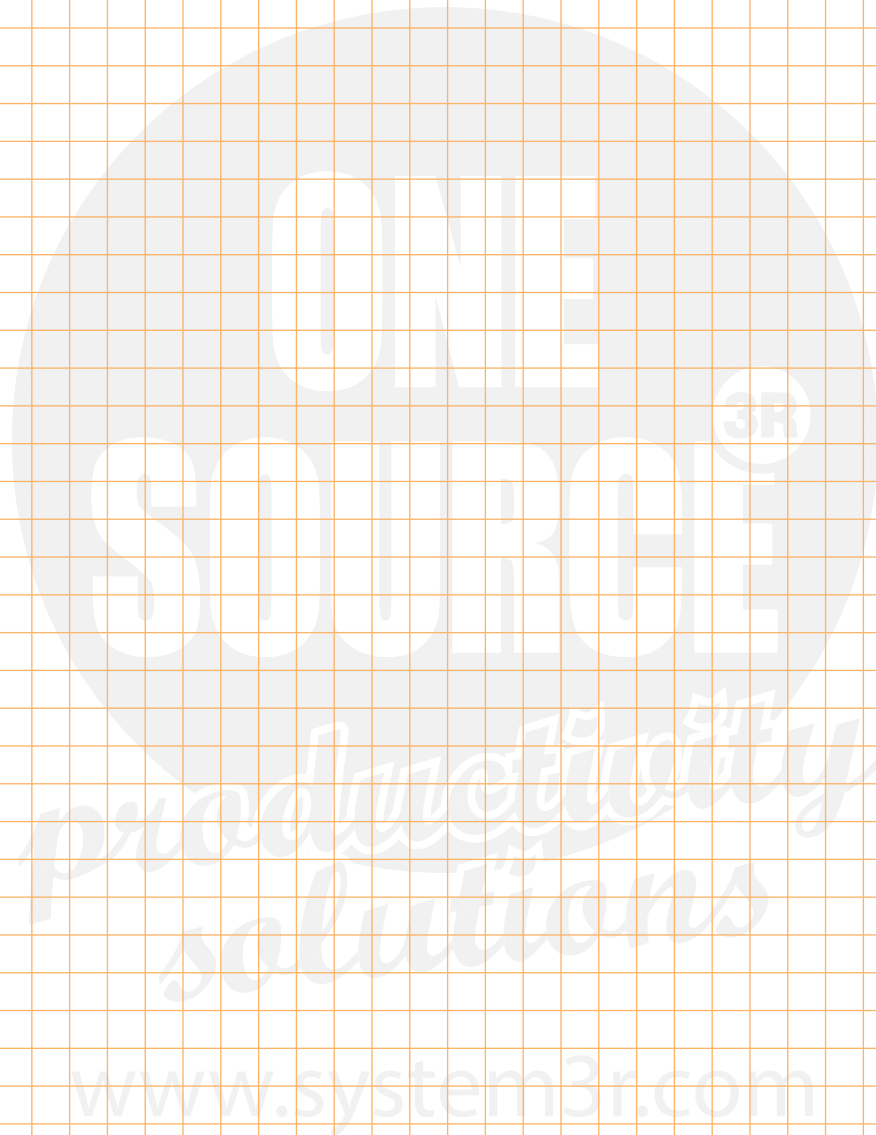
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