

System 3R


# Tooling for EDM



# Becoming better every day – since 1802

## GF Machining Solutions



When all you need is everything, it's good to know that there is one company that you can count on to deliver complete solutions and services. From unmatched Electrical Discharge Machining (EDM), Laser texturing, Laser micromachining, Additive Manufacturing and first-class Milling and Spindles to Tooling and Automation, all of our solutions are backed by unrivaled customer service and expert GF Machining Solutions training. Our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies help you raise your game—and our digital business solutions for intelligent manufacturing, offering embedded expertise and optimized production processes across all industries, increase your competitive edge.

 We are System 3R.  
We are GF Machining Solutions.

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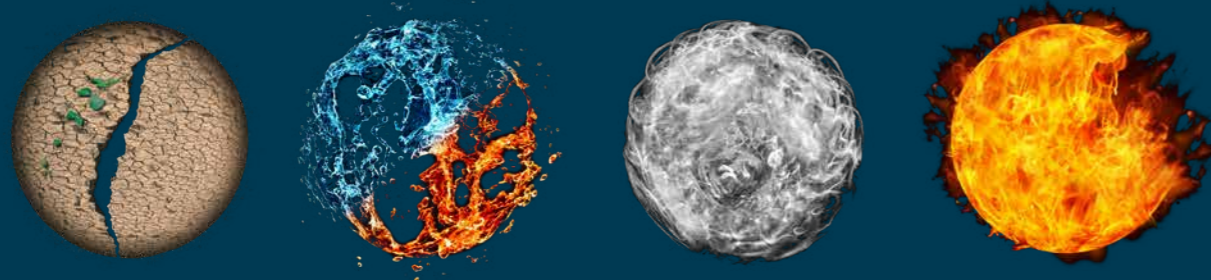
**Dimensions and weights stated in the product boxes are not normative unless this is expressly stated.**

-  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 ISO 9000 certificate.
-  Indicates that the product is normally shipped within two weeks, provided that it is in stock when the order is placed.

3R-XXX in an article number means that the article is established on the market and has proven its quality in extensive use by customers. All 3R articles are to be regarded as standard articles and thus have a quality certificate.

**NOTE:** All wire EDM articles in this catalogue are made of rust-resistant material.

# 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.

# One minute set-up

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!

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.

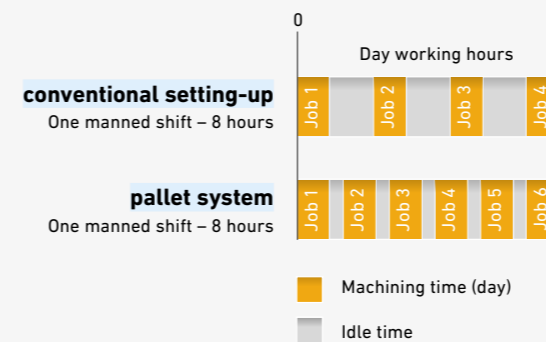
### Fitting the machines with the same reference

System means that electrodes and workpieces can be moved between the machines without subsequent alignment and checking – **One Minute Set-up**.

### Big earnings are within your reach

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

**Work smarter, not harder.**



### Higher productivity, calculation example

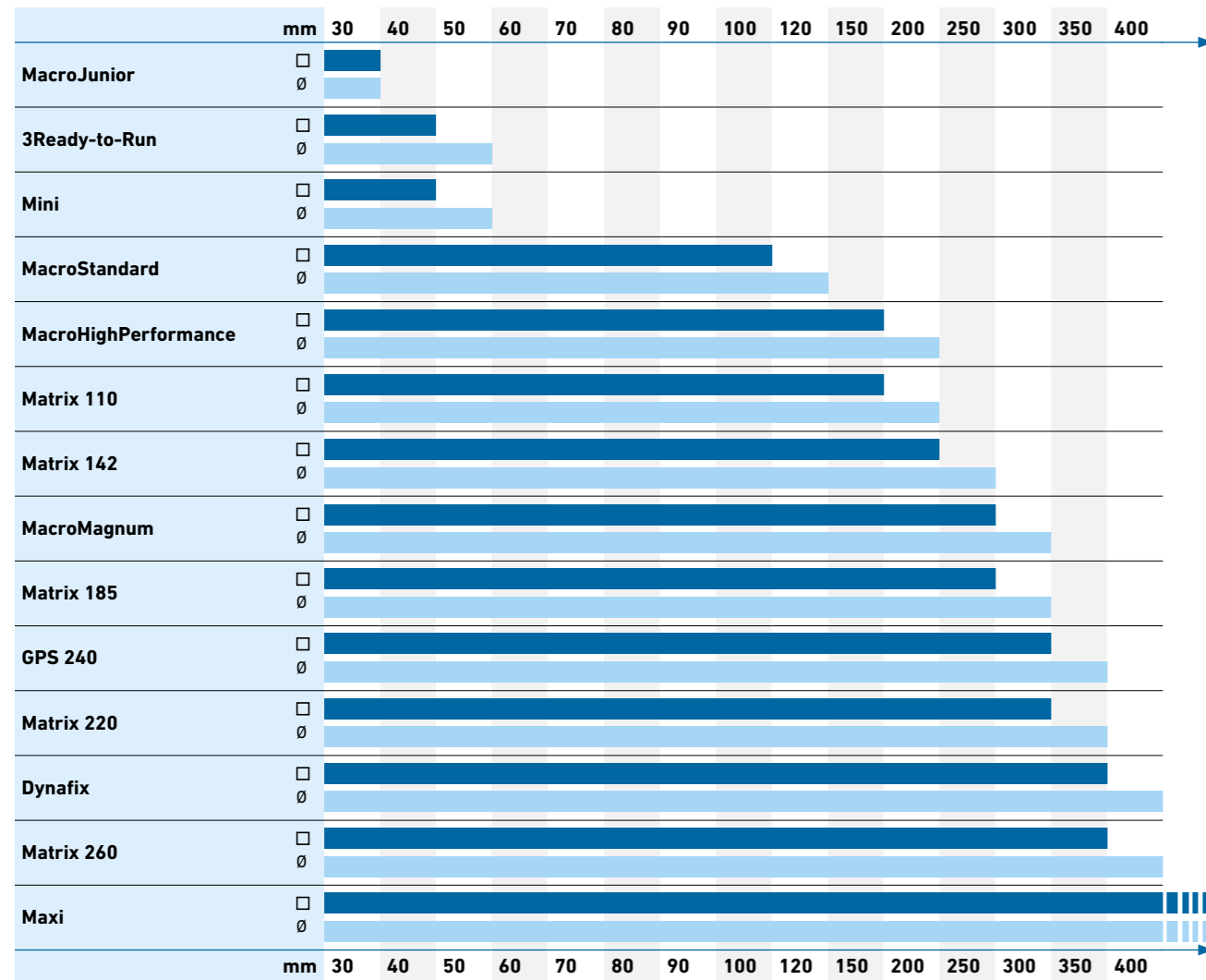
	Conventional setting-up	Pallet system
Working time per day	8	8
Setting-up time per day (hours)	-4	-0.5
Spindle time per day	=4	=7.5
Working days per week	x5	x5
Spindle time per week	=20	=37.5

### 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

# Introduction – Rough guidance to tooling

Maximum size of workpiece or electrode, square or round (mm)



Maximum workpiece weight (kg)

Pallet size (mm)	MacroJunior	3Ready-to-Run	Mini	Macro Std/HP	Macro-Magnum	Matrix	GPS 240	Dynafix	Maxi
Ø 20			1 kg						
Ø 35	0.5 kg								
Ø 30		1 kg							
□ 52-54				5 kg	5kg				
□ 54-Ø75				10 kg	10 kg				
Ø 110-116				50 kg	50 kg	50 kg			
Ø 142-185				50 kg	100 kg	100 kg			
□ 150-150									500 kg
Ø 220-260					100 kg	200 kg			
Ø 256							150 kg		
□ 240-300							150 kg		
□ 280-400								250 kg	

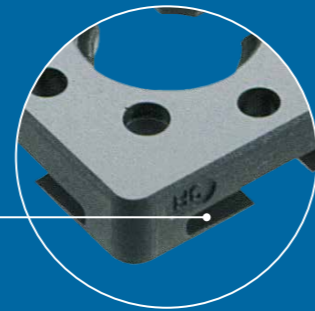
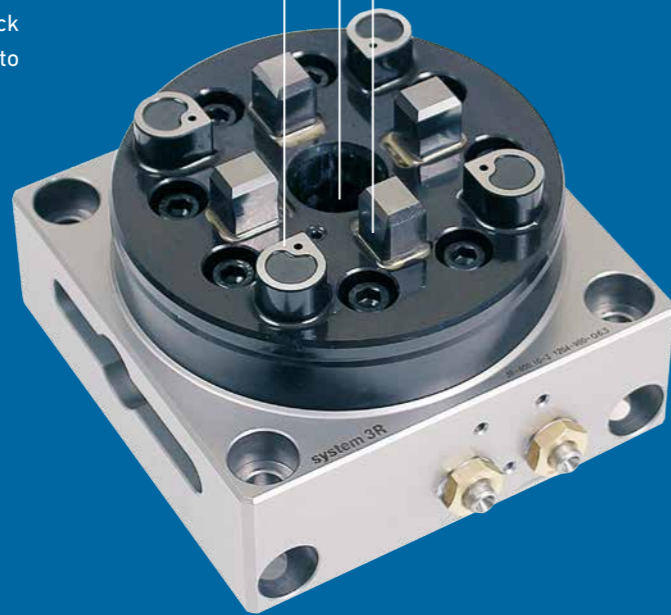
Above list is only a rough guidance which may deviate between article number of pallets as well as individual application. Please check with local 3R representative for more detailed confirmation.

# Macro in details

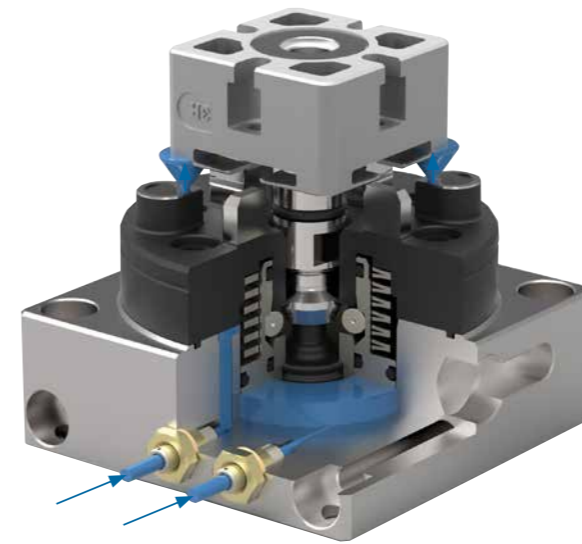
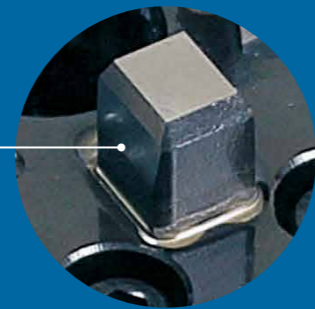
The references of the pallet are created directly in the pallet and on a single plane. There are no loose parts to be installed and adjusted by the user.



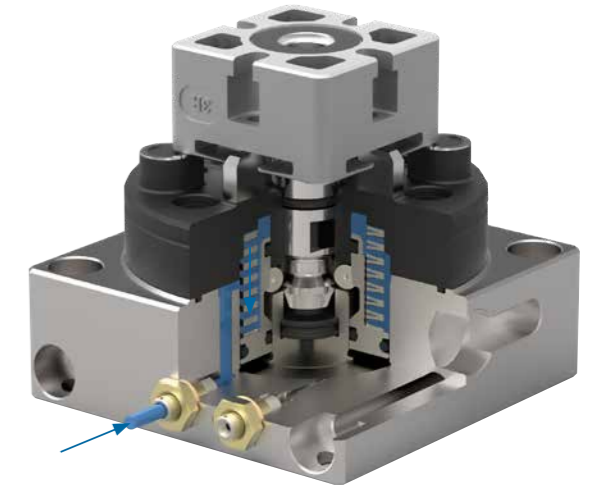
The Z-references of the chuck have generously-sized surfaces to ensure the highest stability.



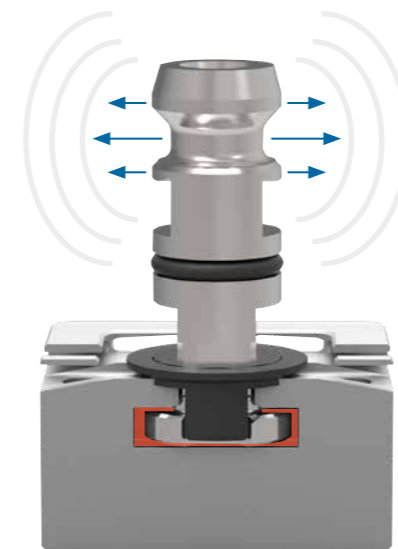
The X and Y references of the chuck are made of cemented carbide.



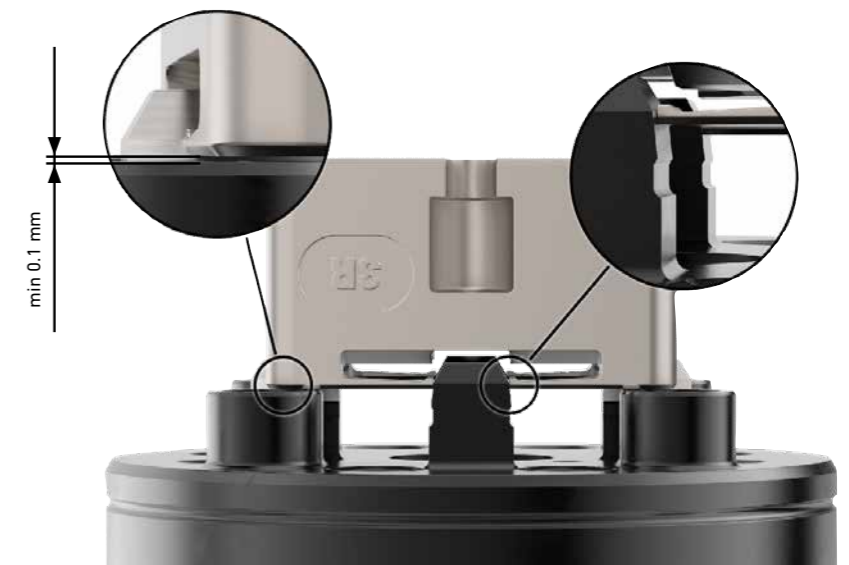
The Z-references are automatically air-blast cleaned, through nozzles in the Z-references of the chuck.



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<sup>®</sup> (Vibration-Damped Palletisation)

↑ **25%**

Reduces cutting forces by up to 25%. Lower cutting forces gives lower power consumption and less tool wear.

↑ **30%**

- 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.

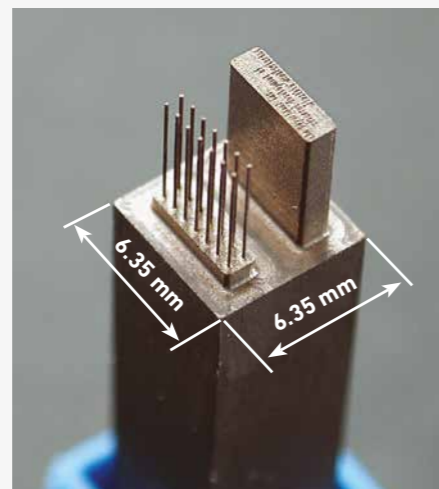


With conventional chucks, vibrations of the workpiece caused by the dynamic forces due to the action and rotation of the cutting tool. Restrictions therefore have to be imposed on the rotation speed and feed rate of the cutting tool, to prevent instability and to achieve the necessary surface quality.

- 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

## 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.



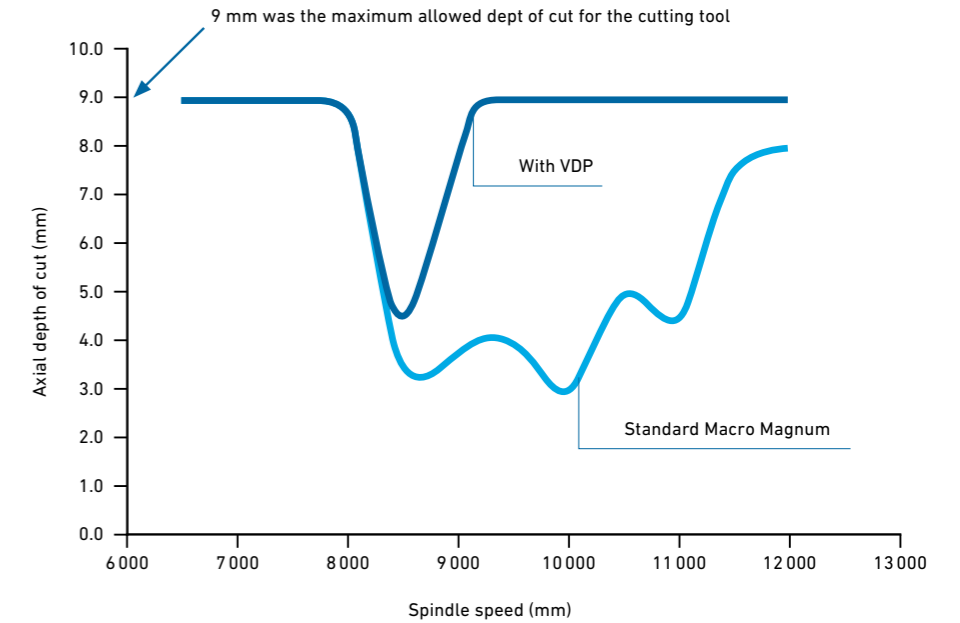
## Example Micro Milling

VDP advantages: The electrode Aspect Ratio (L/ Ø) was doubled with VDP. Dimensions: Ø0.134 mm, length 4.8 mm

# VDP (Vibration-Damped Palletisation)

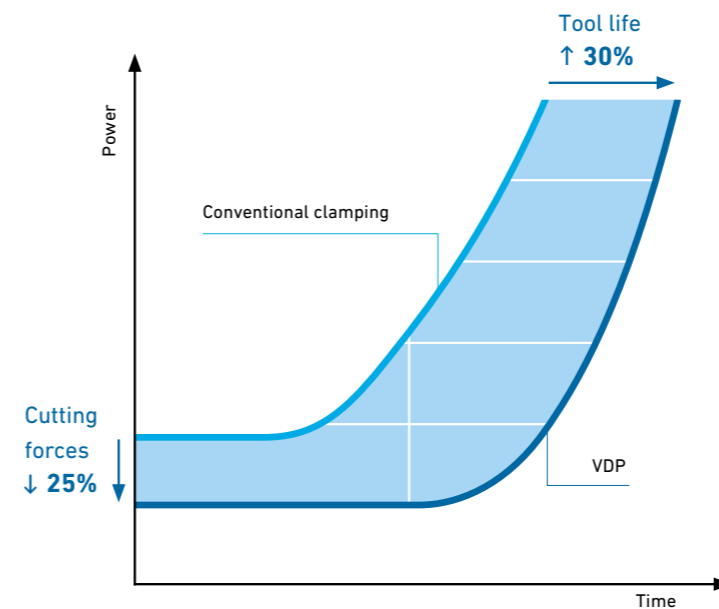
Increase your capacity with

↑ **30%**

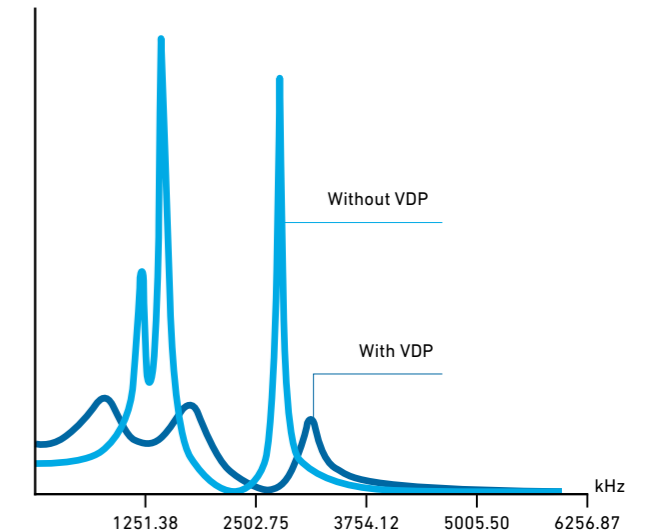


Cutting speed (mm)	Axial depth of cut (mm)		Increase in removal rate due to VDP (%)
	Magnum Std	Magnum VDP	
8 500	3.5	4.5	28.6
9 000	4.0	9.0*	125
10 000	3.0	9.0*	200

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



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



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

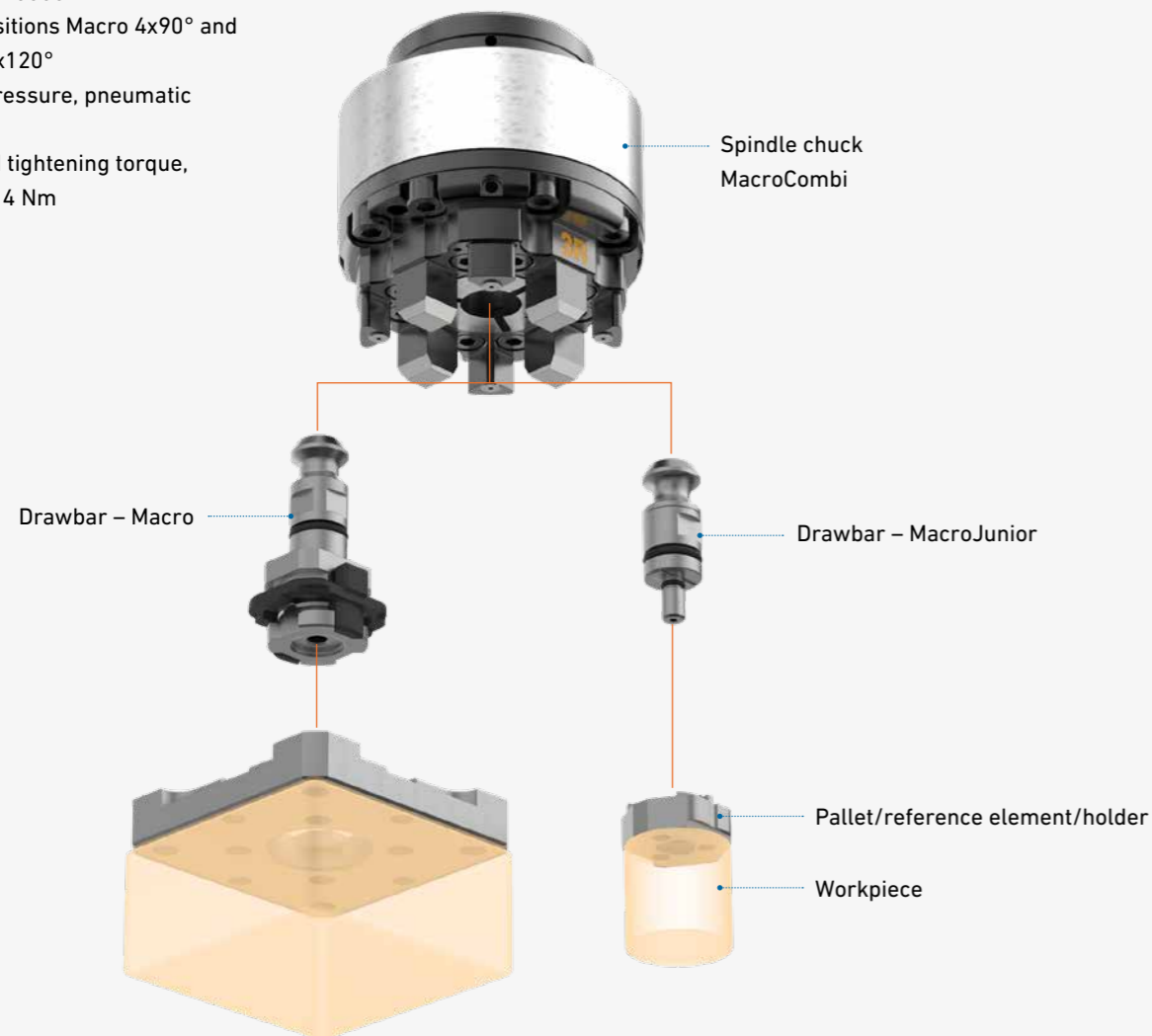
# MacroJunior and MacroCombi

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.

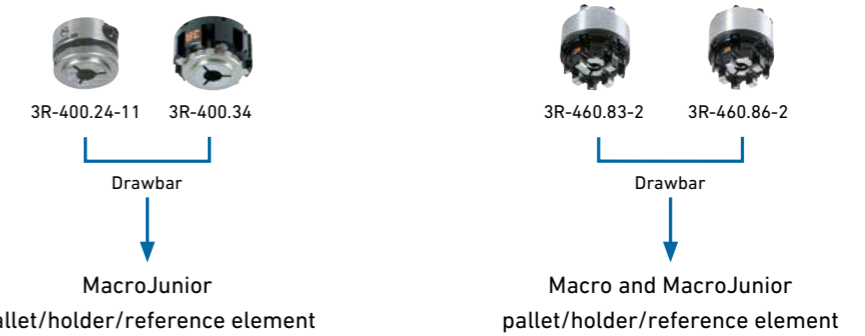
## Advantages

- 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
- Remporem fugiatur

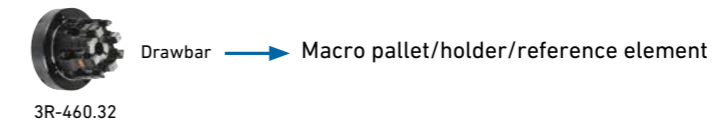
- Clamping force: 5000 N
- Fixed index positions Macro 4x90° and MacroJunior 3x120°
- Required air pressure, pneumatic chuck: 6±1 bar
- Recommended tightening torque, manual chuck: 4 Nm



## MacroJunior and MacroCombi – Chucks



Spindle chucks	Article number	Drawbar	Feature
Manual	3R-400.34	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
Manual	3R-400.24-11	3R-405.11	



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

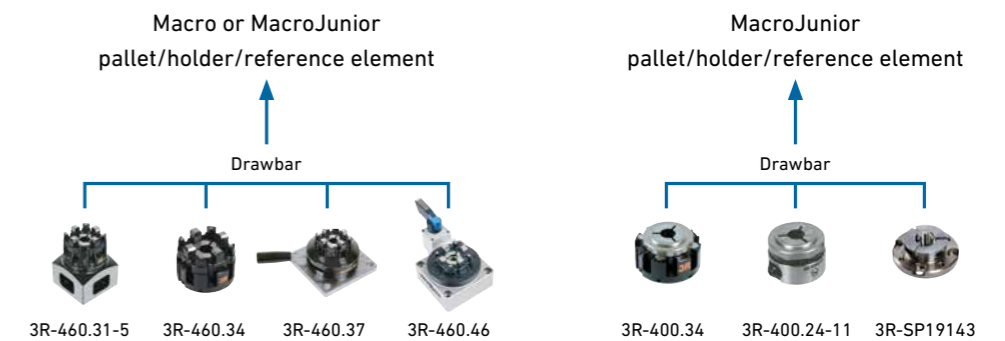


Table chucks	Article number	Drawbar	Feature
Manual	3R-460.31-5	3R-405.16 / 3R-405.11	horizontal and vertical
Manual	3R-460.34	3R-405.16 / 3R-405.11	
Manual	3R-460.37	3R-405.16 / 3R-405.11	
Pneumatic	3R-460.46	3R-405.16 / 3R-405.11	
Manual	3R-400.34	3R-405.11	

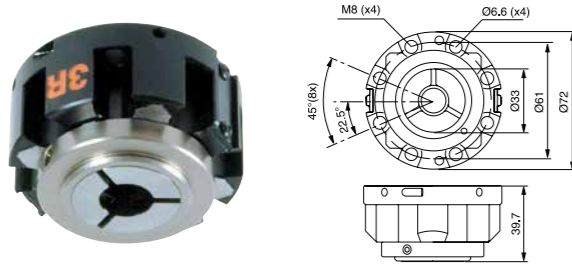
Built-in chucks	Article number	Drawbar	Feature
Manual	3R-400.24-11	3R-405.11	
Manual	3R-400.34	3R-405.11	
Manual	3R-460.34	3R-405.16 / 3R-405.11	
Manual	3R-SP19143		

## 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.

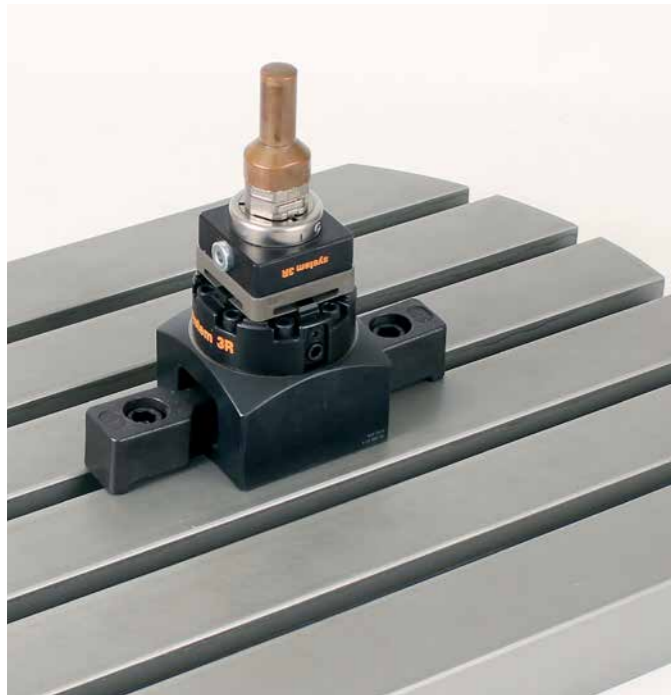
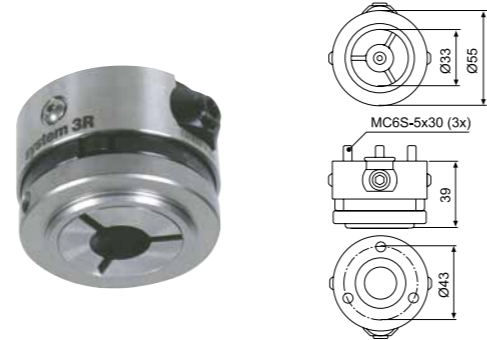
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.6 kg



### Manual chuck, MacroJunior, 3R-400.24-11

For mounting on machine spindle.

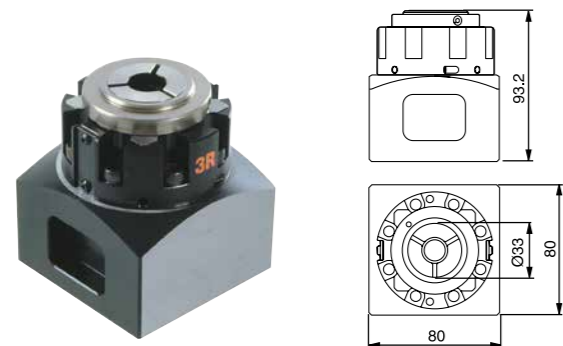
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 0.8 kg



### Manual chuck, MacroJunior, 3R-410.31-5

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

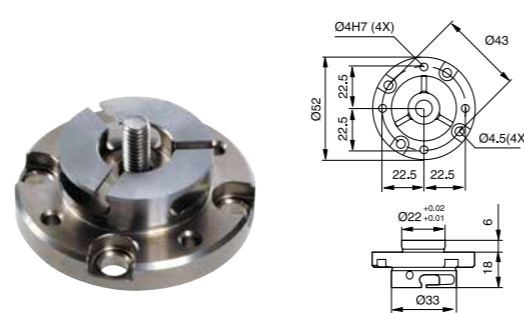
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 3.5 kg



### Manual chuck, MacroJunior, 3R-SP19143

Stainless steel chuck with ground flange Ø22x6 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

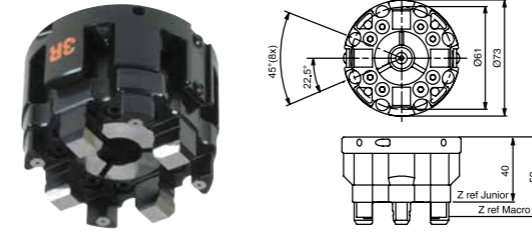


## MacroCombi – Chucks

### 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

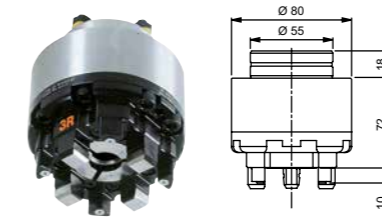


### Pneumatic chuck, MacroCombi, 3R-460.83-2

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
- 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 2.1 kg

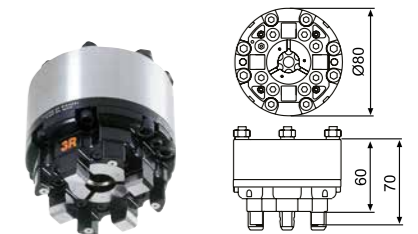


### Pneumatic chuck, MacroCombi, 3R-460.86-2

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.

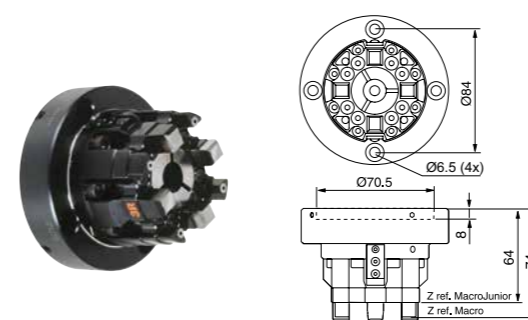
- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Flushing connection
- Weight 1.9 kg



### Manual lathe chuck, MacroCombi, 3R-460.32

For mounting on a lathe taper.

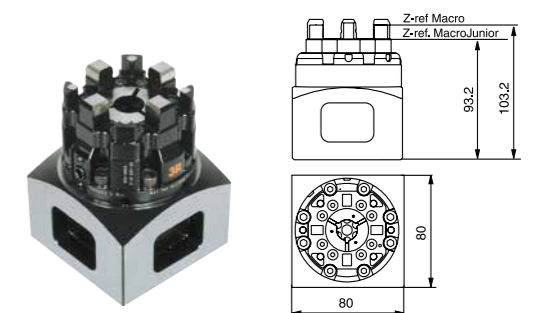
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 2.0 kg



### Manual chuck, MacroCombi, 3R-460.31-5

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

- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 3.5 kg



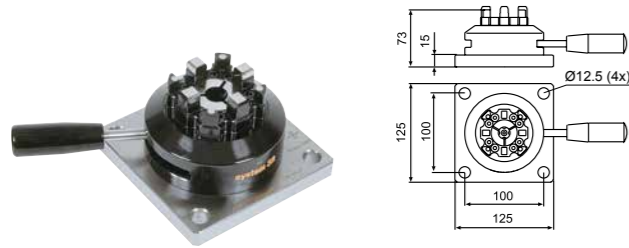


## MacroJunior – Chucks

### Manual chuck, MacroCombi, 3R-460.37

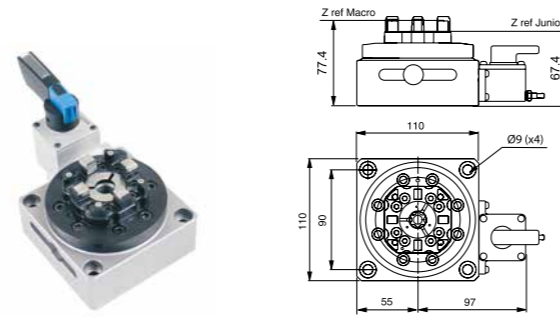
The locking mechanism is operated by a removable handle.

- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 4.5 kg



### Pneumatic chuck, MacroCombi, 3R-460.46

- Pneumatic chuck with integral air unit.
- 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 4.4 kg



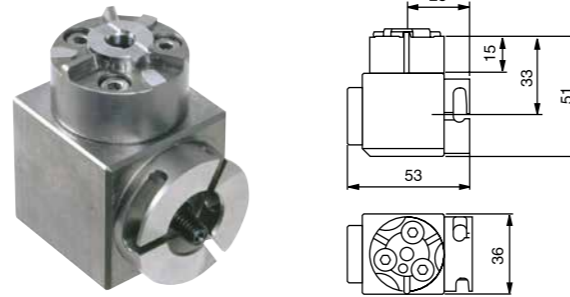
## MacroJunior – Chuck adapter

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

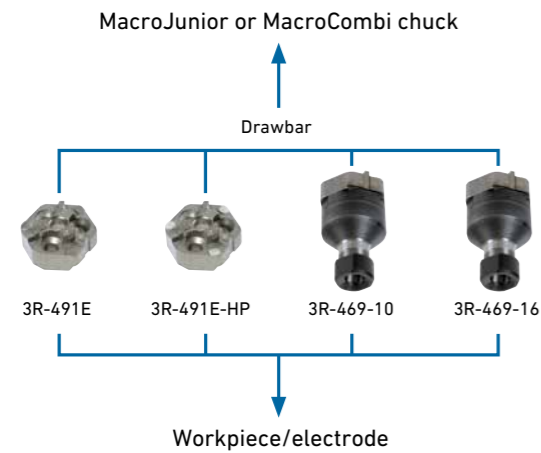
For horizontal mounting of MacroJunior holders. Screw locking.

**NOTE:** For EDM machining only.

- Fixed index positions 3x120°
- Weight 0.6 kg



## MacroJunior – Pallets and Holders



Holders	Article number	Feature
Sintered pallet Ø25 mm MacroJunior	3R-491E	
Sintered pallet Ø25 mm MacroJunior	3R-491E-HP	parallel ground
Collet chuck ETS10, MacroJunior	3R-469-10	Ø0.1-10 mm
Collet chuck ER16, MacroJunior	3R-469-16	Ø0.5-10 mm

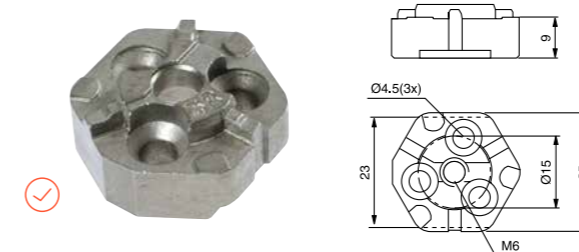
## MacroJunior – Pallets and Holders

### 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

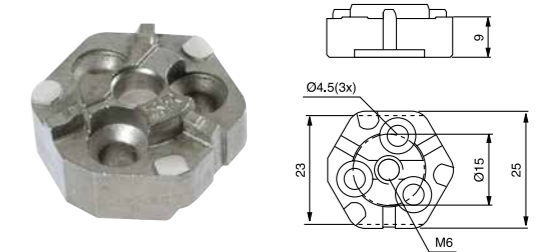


### Ground pallet 25 mm, MacroJunior, 3R-491E-HP

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

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

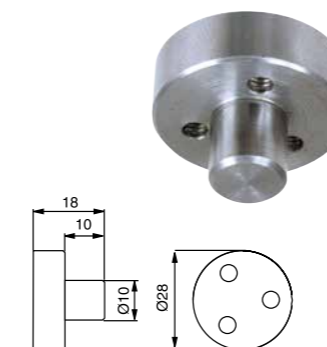
- Adapted for automatic changing
- Supplied in sets of 30



### 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



## MacroJunior – Holders



### 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

### 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



## MacroJunior and MacroCombi – Accessories

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

Blanks mounted on MacroJunior holders for the manufacture of electrodes. 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

\* =

### 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.

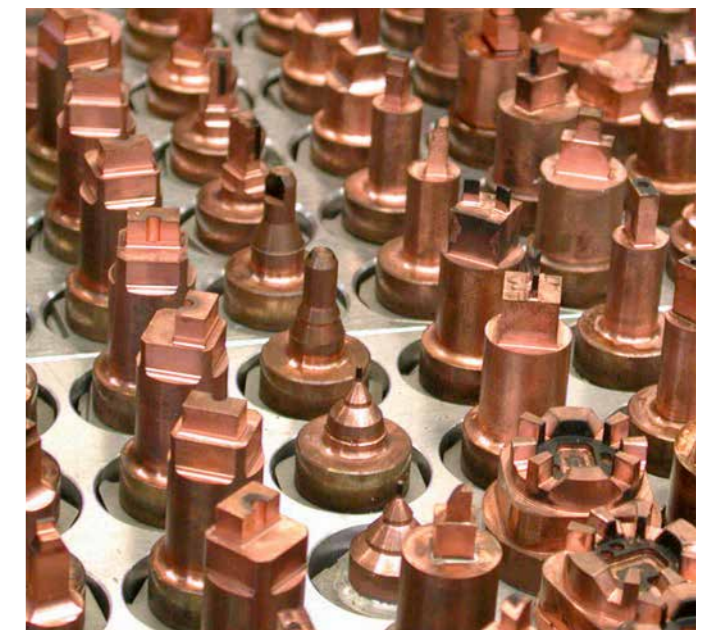
- Measuring ball Ø3 mm
- Overall length 102 mm
- Weight 0.3 kg



#### 3R-US400.5

For machines with measurement cycle function.

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



## MacroJunior and 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 and MacroCombi – Kit and 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, MacroJunior	x1
3R-465-L	Holder, MacroJunior	x2
3R-465-V	Holder, MacroJunior	x2
3R-491	Holder, MacroJunior	x30
3R-651.7-XS	Reference element, 54x54 mm, Macro	x6
3R-656.1	Check ruler, Macro	x1
3R-658.1-S	Intermediate plate, 54x54 mm, Macro	x2
3R-658.2-S	Holder, 54x54 mm, Macro	x2
3R-658.4-S	Holder, 54x54 mm, Macro	x2
3R-333-T20	Screwdriver, TORX	x1
3R-PI4.5x20	TORX screw	x100
3R-614-04	Torque wrench, 4 Nm	x1



### 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



### Clamping force meter kit, 3R-SSP115-BASE

For both pneumatic and manual chucks. This stand alone unit in combination with individual drawbars or drawbar kits, able to cover MacroJunior, Macro, MacroMagnum and Dynafix.

**NOTE:** Require drawbars with bayonet interface similar to 3R-605.1.

- Add-on kit for use in MacroJunior, 3R-SSP115-JUN
- Operating temp. +10 to +40° C
- Gauge size Ø90x47 mm
- Working range 1-22 kN
- Deviation ± 0.1 kN
- Weight: Display 0.34 k  
Gauge 1.3 kg



### Add-on kit, 3R-SSP115-Jun

Add-on kit for 3R-SSP115-BASE.

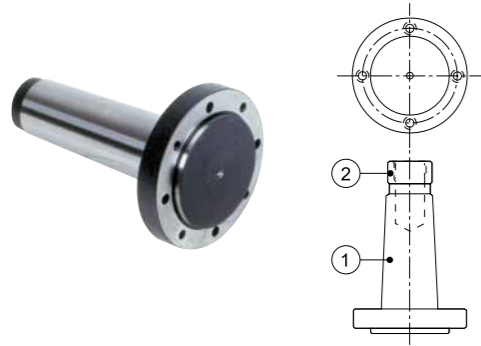


## MacroJunior and MacroCombi – Accessories

### Lathe taper, 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

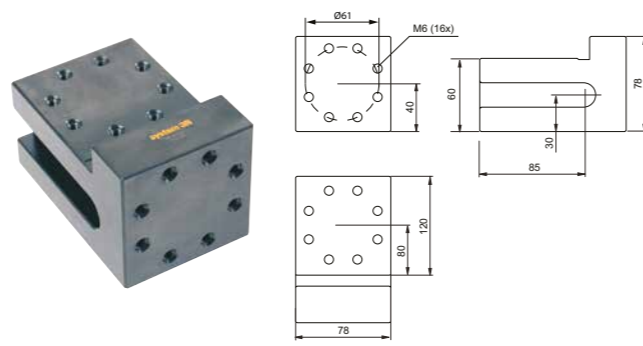
**NOTE:** Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted. Use the order form at the end of the catalogue.



### Angle shelf, 3R-A21944

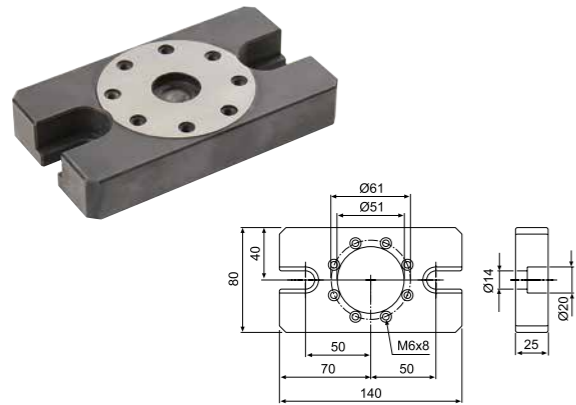
For vertical or horizontal mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on the machine table. Intended for milling

**NOTE:** Chuck to be ordered separately.



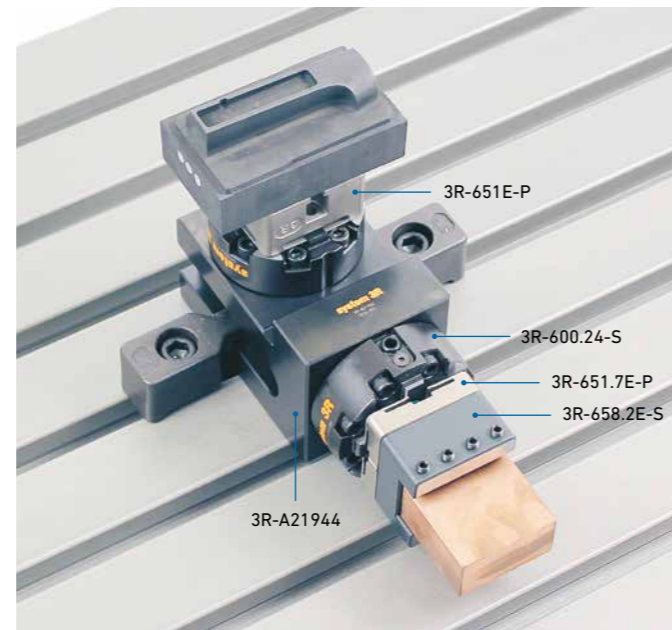
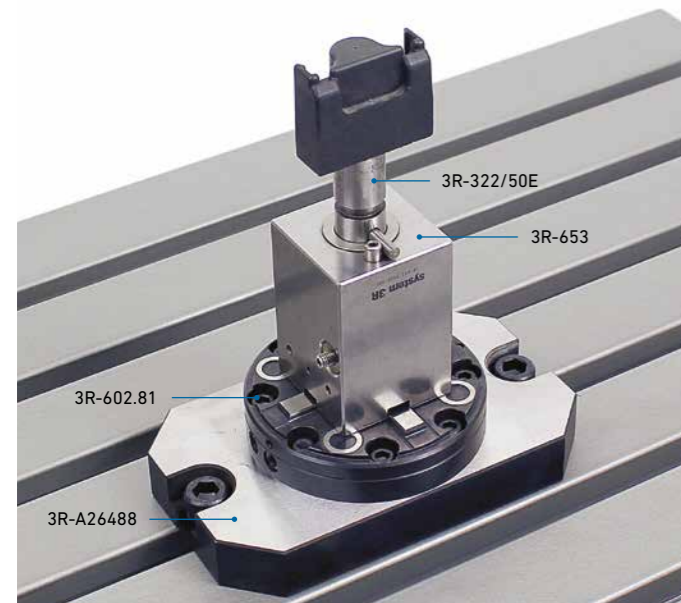
### Adapter plate, 3R-A19724

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.



### Air unit, 3R-611.46

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



## MacroStd and MacroHP

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.

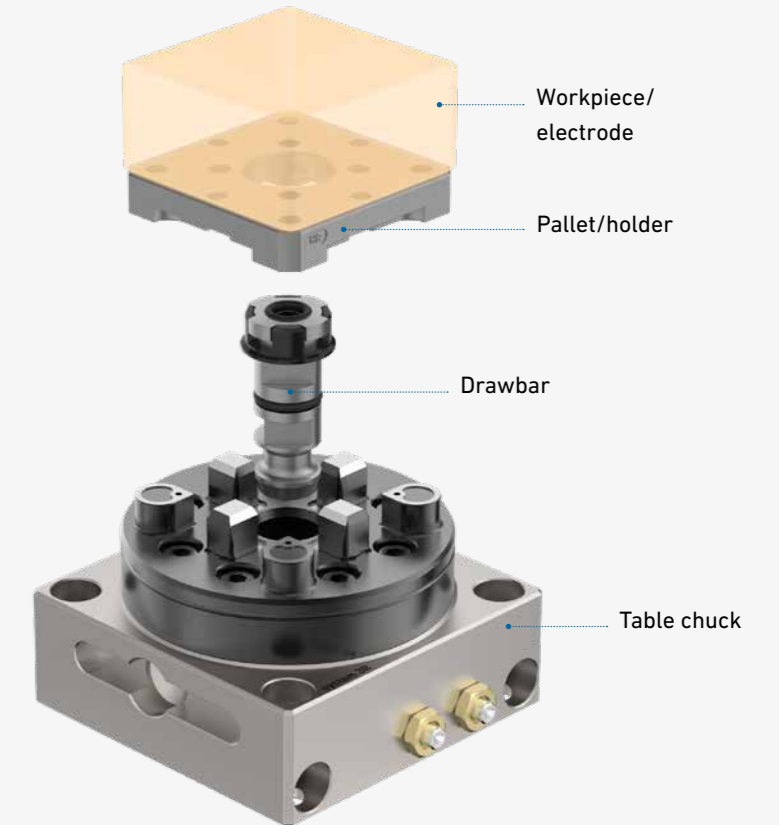
Among users world wide, the Macro system is a byword for precision. And with good reason, since every single Macro product is thoroughly checked before it is dispatched. But precision can be graded too. The Macro products are therefore "classified" in

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.

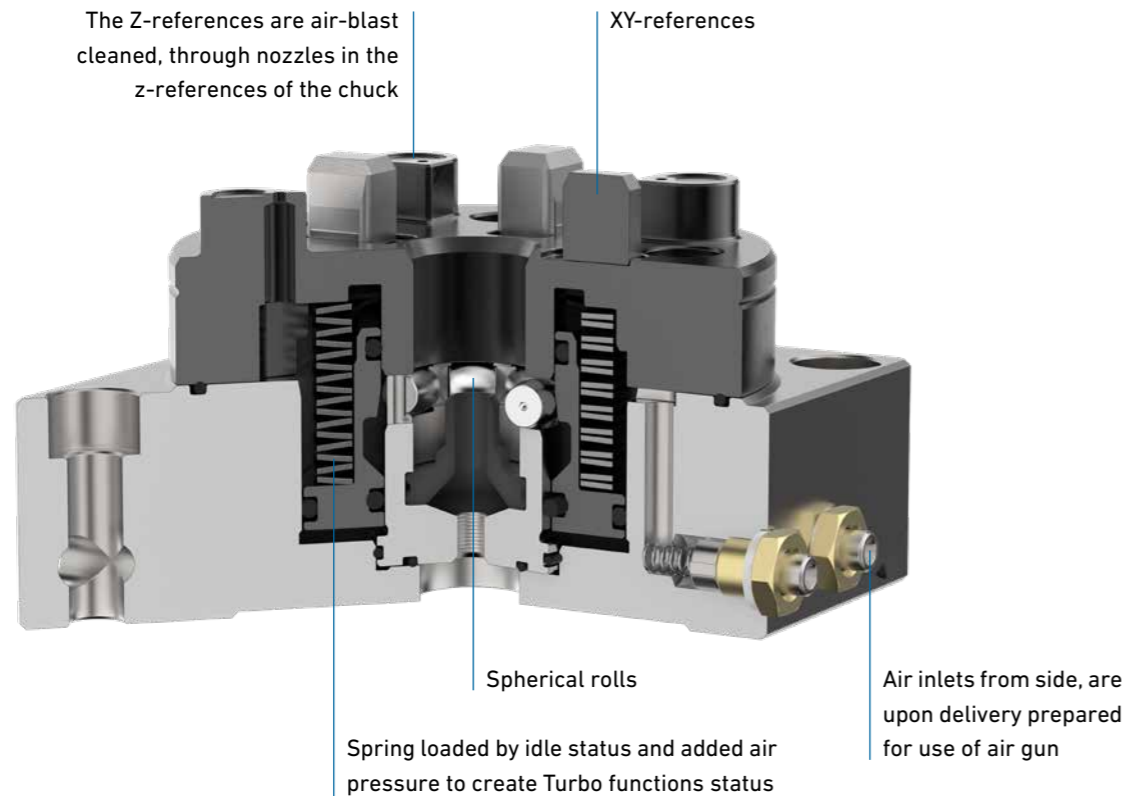
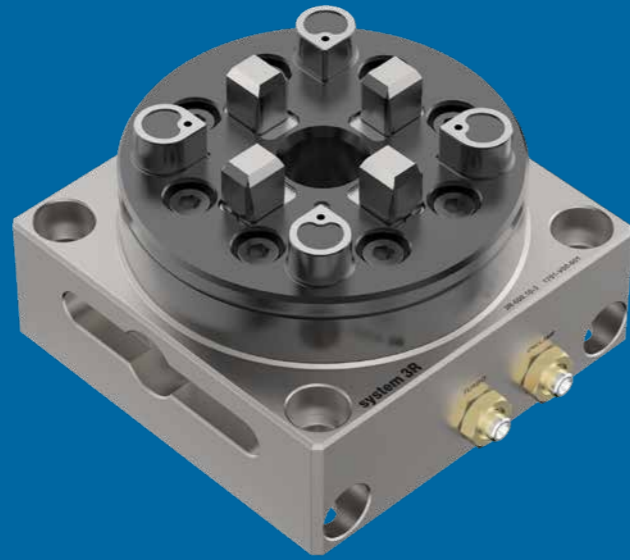
- Repetition accuracy:
  - MacroNano within 0.001 mm
  - Macro (Std and HP) within 0.002 mm
- Locking force: 6000 N
- Fixed index positions: 4x90°
- Required air pressure, pneumatic chuck: 6±1 bar
- Recommended tightening torque, manual chuck: 6 Nm
- Recommended max workpiece weight: 50 kg

### Advantages

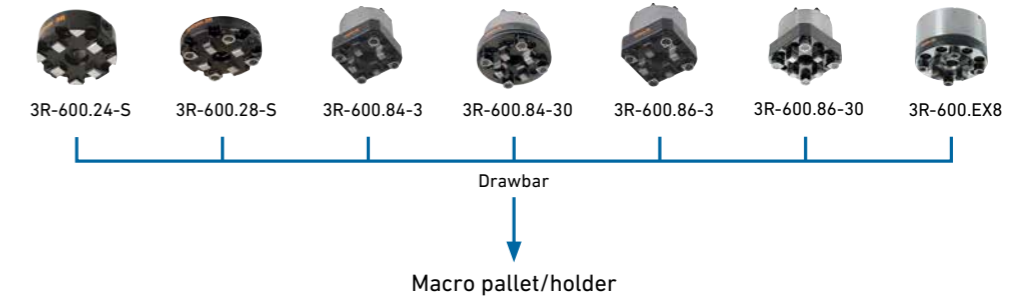
- Reduces setting-up times.
- Ensures precision and quality.
- Has automatic air-blast cleaning of the references in the pneumatic chucks.
- Has higher locking force in the pneumatic chucks – turbo locking.
- Has references of cemented carbide or hardened ground steel.
- Is suitable for automatic changing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



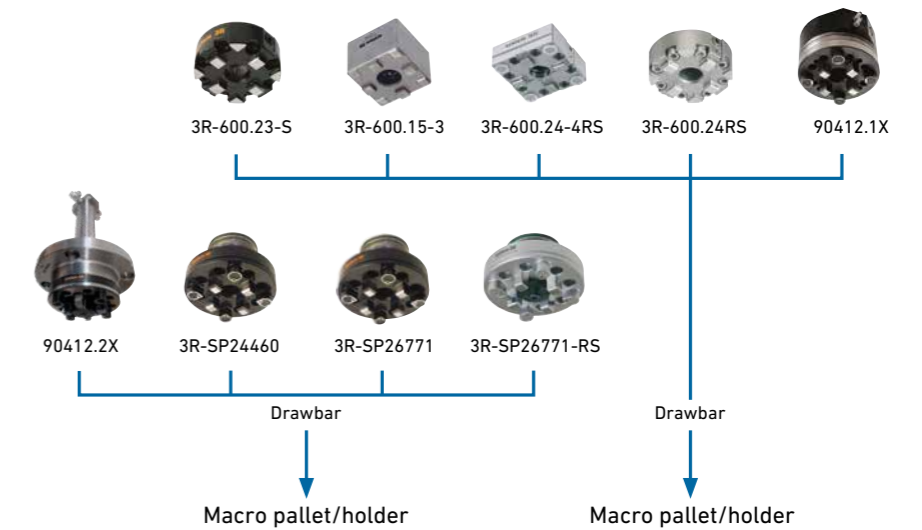
# Macro in details



## Macro – Chucks



Chucks	Article number	Drawbar	Feature
Manual Std	3R-600.24-S	3R-605.2	ground back face, 6 Nm, Ø75 mm
Manual Std	3R-600.28-S	3R-605.2	ground back face
Pneumatic HP	3R-600.84-3	3R-605.1	machine-adapted
Pneumatic Std	3R-600.84-30	3R-605.1	machine-adapted
Pneumatic HP	3R-600.86-3	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



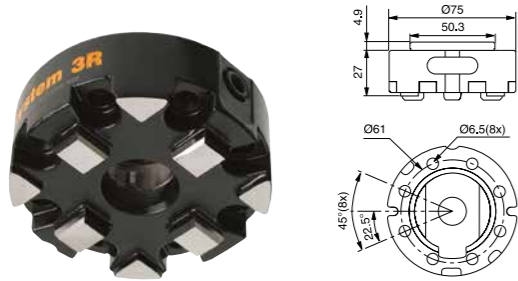
Chucks	Article number	Drawbar	Feature
Manual Std	3R-600.23-S	3R-605.2	Mounting flange, 6 Nm, Ø75 mm
Pneumatic HP	3R-600.15-3	3R-605.2	Rust resistant, $\varnothing$ 56 mm
Manual HP	3R-600.24-4RS	3R-605.2RS	Rust resistant, $\varnothing$ 70 mm
Manual HP	3R-600.24-RS	3R-605.2RS	Rust resistant, Ø75 mm
Pneumatic Std	90412.1X	3R-605.1 / 3R 604.4	with swivel, low speed
Pneumatic HP	90412.2X	3R-605.1 / 3R 604.4	with swivel, low speed
Pneumatic Std	3R-SP24460	3R-605.1 / 3R 604.4	
Pneumatic HP	3R-SP26771	3R-605.1	
Pneumatic HP	3R-SP26771-RS	3R-605.1RS	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
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg



### Manual chuck, MacroStd, 3R-SP15055

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

- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- 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.

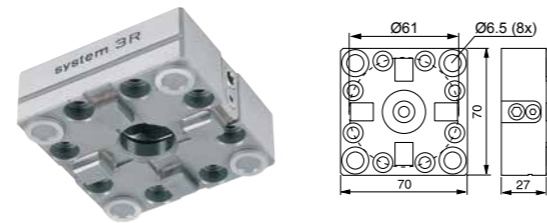
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg



### Manual chuck, MacroHP, 3R-600.24-4RS

Rust resistant chuck for Macro holder. Mounts on a suitable fixture.

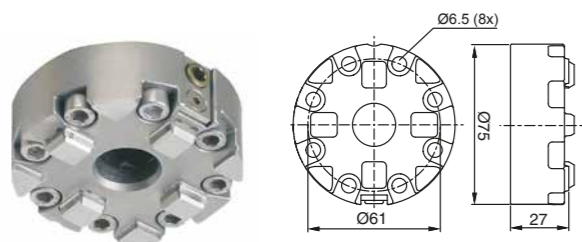
- Required drawbar 3R-605.2RS
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Grinded front edge
- Rust resistant
- Weight 1 kg



### Manual chuck, MacroHP, 3R-600.24RS

Rust resistant manual chuck designed for permanent mounting.

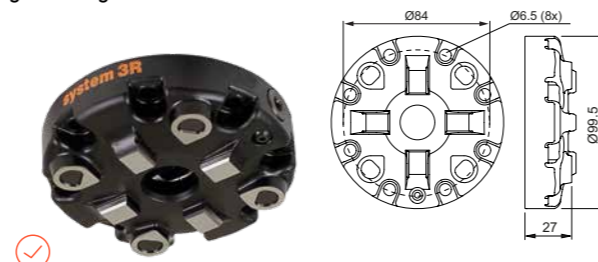
- Required drawbar 3R-605.2RS
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Clamping force 6000 N
- Rust resistant
- Weight 0.7 kg



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

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
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.1 kg

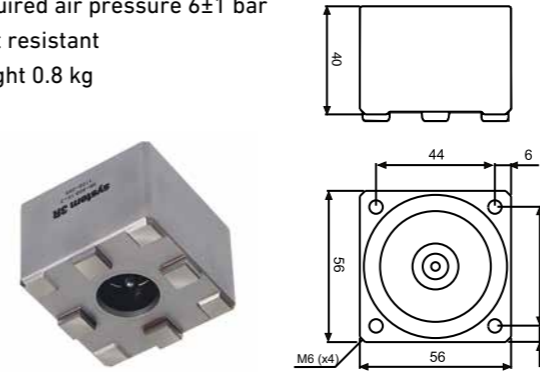


## Macro – Chucks

### Pneumatic chuck, MacroHP, 3R-600.15-3

Rust resistant pneumatic chuck for permanent mounting on the machine table.

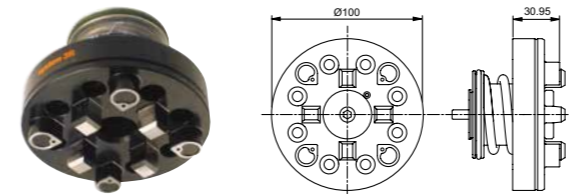
- Drawbar 3R-605.2RS included
- Fixed index positions 4x90°
- Required air pressure 6±1 bar
- Rust resistant
- Weight 0.8 kg



### Pneumatic chuck, MacroStd, 3R-SP24460

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

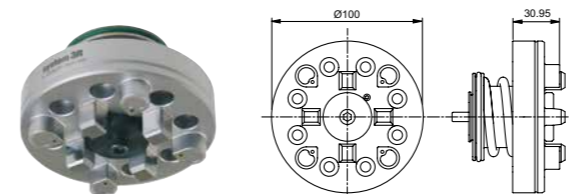
- Required drawbar 3R-605.1 or 3R-605.4
- Fixed index positions 4x90°
- Required air pressure 6±1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg



### Pneumatic chuck, MacroHP, 3R-SP26771-RS

Rust resistant pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.

- Required drawbar 3R-605.1RS
- Fixed index positions 4x90°
- Required air pressure 6±1 bar
- Carbide XY-references
- Air-blast cleaning of Z-references
- Turbo locking
- Rust resistant
- Weight 1.8 kg



### Pneumatic chuck, MacroStd, 90412.1X

Pneumatic added-on chuck with swivel surrounding unit.

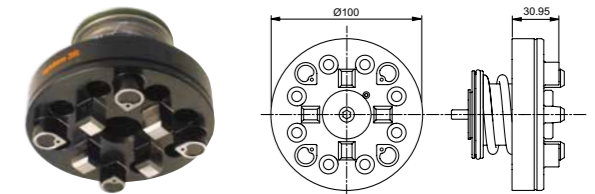
- For low RPM
- Machine adapted



### Pneumatic chuck, MacroHP, 3R-SP26771

Pneumatic chuck for building-in, for example on machine spindle or fixture.

- Required drawbar 3R-605.1 or similar
- Fixed index positions 4x90°
- Carbide XY-references
- Required air pressure 6±1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg



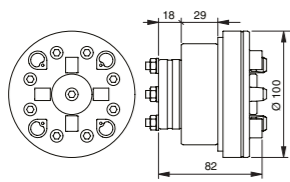
## Macro – Chucks



### Pneumatic chuck, MacroHP, 3R-600.84-3

Pneumatic chuck for permanent mounting in the machine spindle.

- Required drawbar 3R-605.1
- Fixed index positions 4x90°
- Required air pressure 6±1 bar
- Four M6 clearance holes, Ø 45 mm
- Air-blast cleaning of Z-references
- Flushing connection
- Turbo locking.
- Carbide XY-References
- Weight 2.4 kg



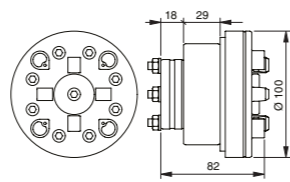
### Pneumatic chuck, MacroStd, 3R-600.84-30

Pneumatic chuck for permanent mounting in the machine spindle.

**NOTE:** X/Y/Z references of hardened and ground steel, larger Z-references.

**NOTE:** When ordering state machine make and type.

- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Four M6 clearance holes, Ø 45 mm
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 2.4 kg

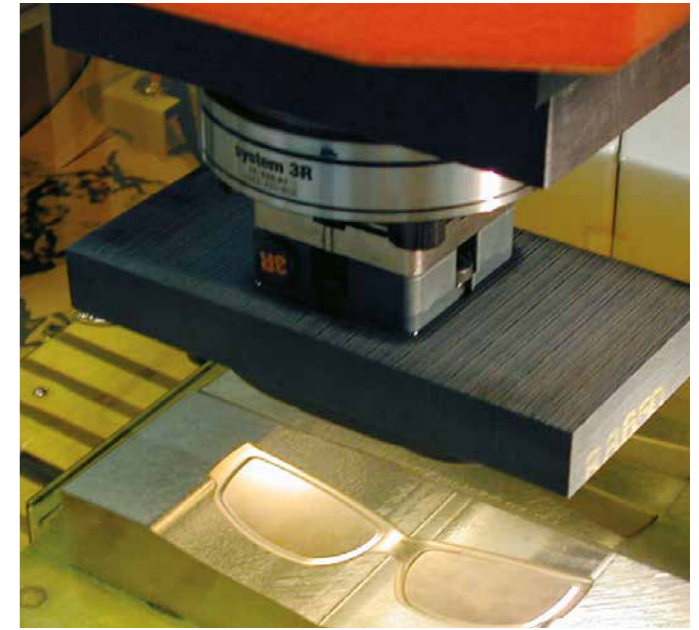


## Macro – Chucks

### Pneumatic chuck, MacroHP, 90412.2X

Pneumatic built-in chuck with swivel in the back.

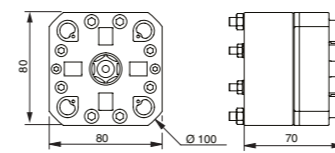
- For high RPM
- Machine adapted



### Pneumatic chuck, MacroHP, 3R-600.86-3

Pneumatic chuck for permanent mounting in the machine spindle.

- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Turbo locking
- Carbide XY-References
- Weight 1.8 kg



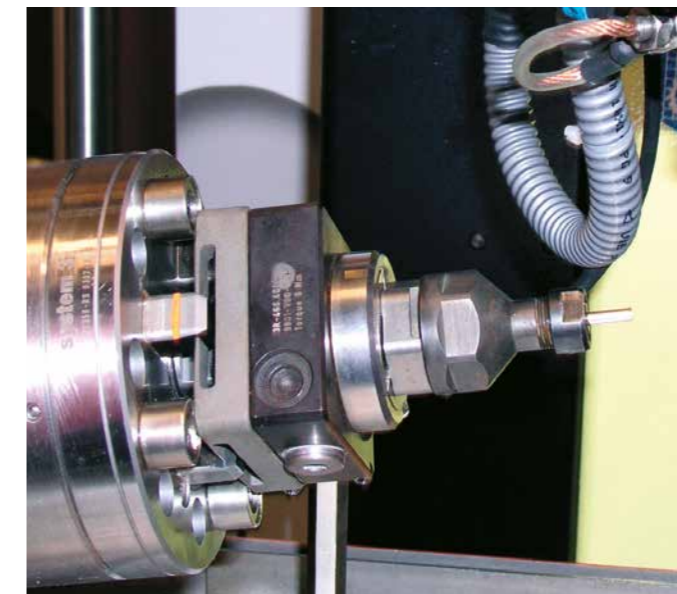
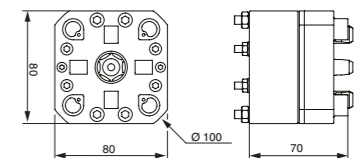
### Pneumatic chuck, MacroStd, 3R-600.86-30

Pneumatic chuck for permanent mounting in the machine spindle.

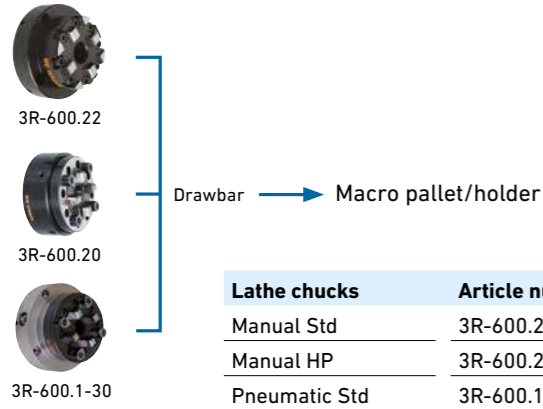
**NOTE:** When ordering state machine make and type.

**NOTE:** X/Y/Z references of hardened and ground steel, larger Z-references.

- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 1.8 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	

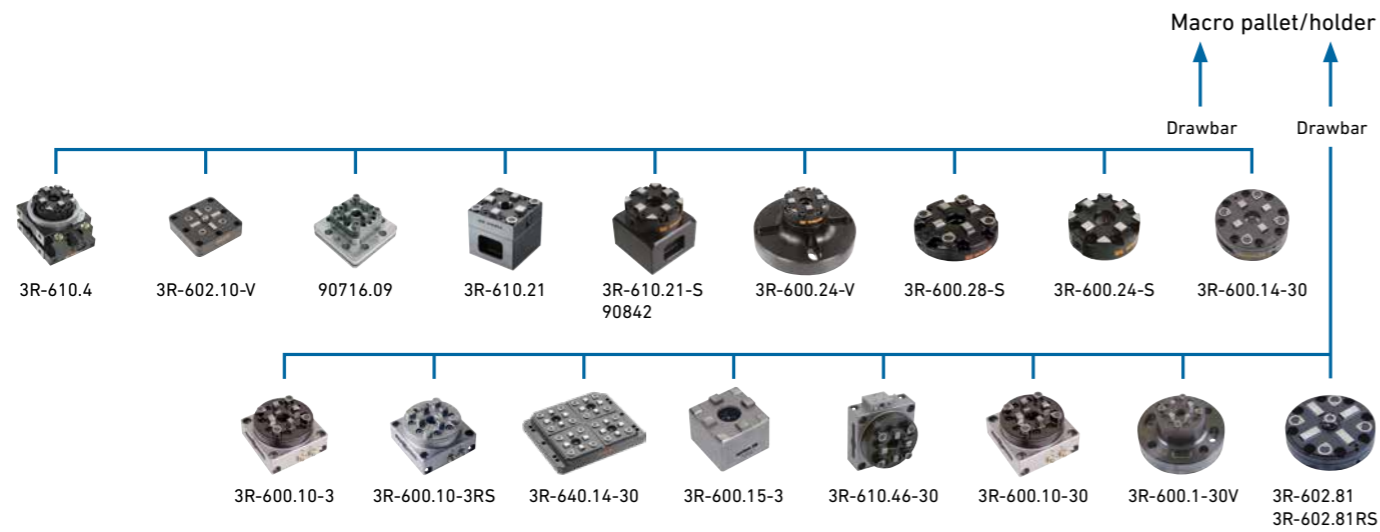
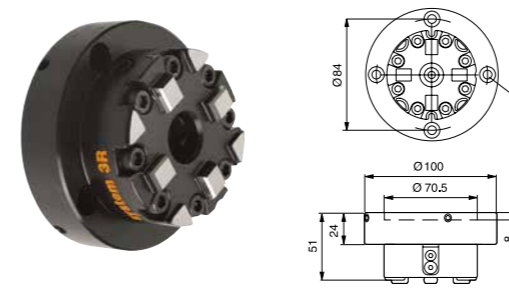


Table chucks	Article number	Drawbar	Feature
Manual Std	3R-610.21	3R-605.2	horizontal and vertical, 6 Nm
Manual Std	3R-610.21-S	3R-605.2	horizontal and vertical, 6 Nm
Manual Std	90842	3R-605.1	horizontal and vertical, 6 Nm
Manual VDP	3R-600.24-V	3R-605.2	vibration-damped, 6 Nm, Ø75 mm
Manual Std	3R-600.28-S	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 HP	3R-600.15-3	3R-605.2RS	rust resistant
Pneumatic Std	3R-600.10-30	3R-605.1 / 3R-605.4	
Pneumatic HP	3R-600.10-3	3R-605.1 / 3R-605.4	
Pneumatic HP	3R-600.10-3RS	3R-605.1RS	rust resistant
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. 3Refix Ø20
Pneumatic VDP	3R-600.1-30V	3R-605.1 / 3R-605.4	vibration-damped
Pneumatic Std	3R-602.81	3R-605.10	low profile
Pneumatic HP	3R-602.81RS	3R-605.10	low profile, rust-resistant
Pneumatic Std	3R-610.4	3R-605.2	horizontal and vertical, vernier scale
Pneumatic VDP	3R-602.10-V	3R-605.10	vibration-damped
Pneumatic VDP	90716.09	3R-605.1 / 3R-605.4	vibration-damped
Pneumatic Std	3R-640.14-30	3R-605.2	4 Macro chucks

## Macro – Chucks

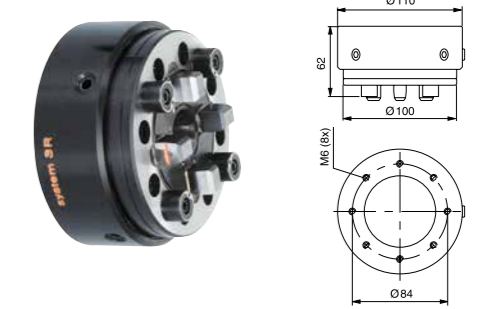
### Manual lathe chuck, MacroStd, 3R-600.22

- With setting screws for centring.
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Weight 2.1 kg



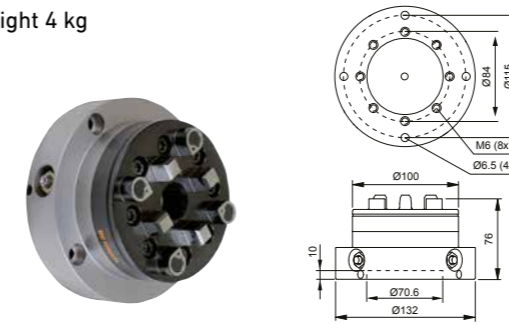
### Manual chuck, MacroHP, 3R-600.20

- 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
- Tightening torque 4 Nm
- Fixed index positions 4x90°
- Carbide XY references
- Weight 3.6 kg



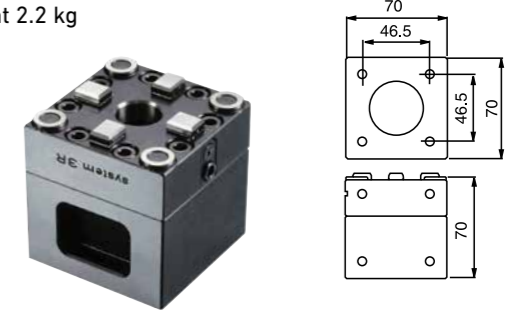
### Pneumatic chuck, MacroStd, 3R-600.1-30

- 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
- Tightening torque 6 Nm
- 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
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Flushing duct
- Weight 3.5 kg

### 90842

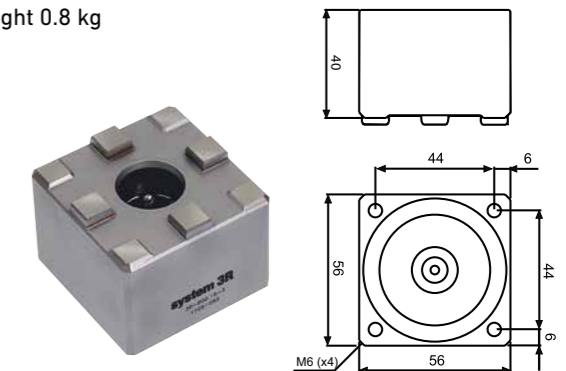
- Required drawbar 3R-605.1, otherwise as 3R-610.21-S



Except 90842

### Pneumatic chuck, MacroHP, 3R-600.15-3

- Pneumatic chuck for permanent mounting on the machine table.
- Drawbar 3R-605.2RS included
- Fixed index positions 4x90°
- Required air pressure 6±1 bar
- Rust resistant
- Weight 0.8 kg



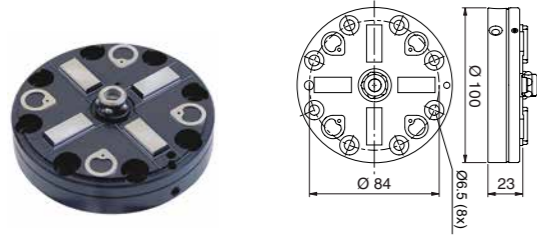


## Macro – Chucks

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

Pneumatic chuck for permanent mounting on the machine table.

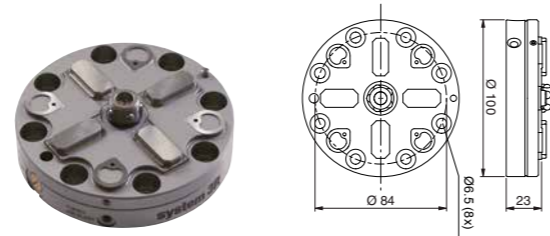
- Required drawbar 3R-605.10
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Weight 1 kg



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

Pneumatic chuck for permanent mounting on the machine table.

- Required drawbar 3R-605.10
- Clamping force 6000 N
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Rust resistant
- Weight 1 kg

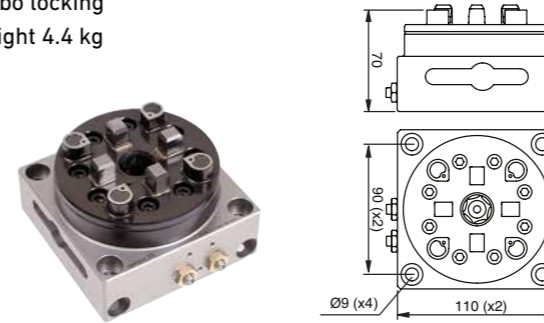


## Macro – Chucks

### Pneumatic chuck, MacroHP, 3R-600.10-3

Pneumatic chuck locked/opened with air gun.

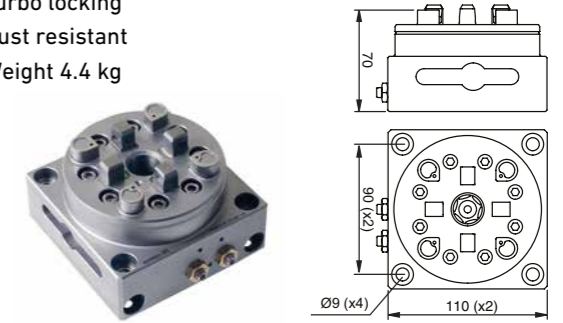
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Weight 4.4 kg



### Pneumatic chuck, MacroHP, 3R-600.10-3RS

Pneumatic chuck locked/opened with air gun.

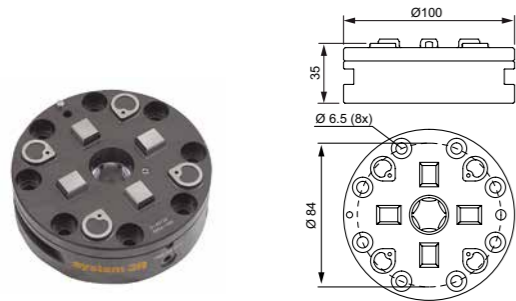
- Required drawbar 3R-605.1RS
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Rust resistant
- Weight 4.4 kg



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

Pneumatic chuck for permanent mounting on the machine table.

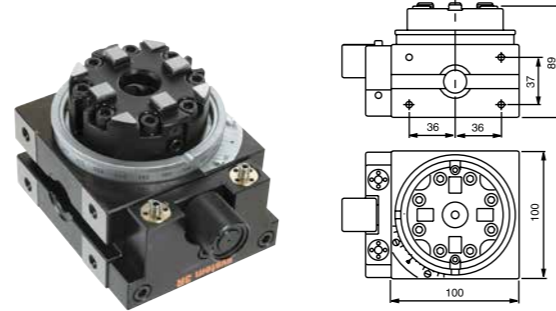
- Required drawbar 3R-605.2
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Weight 2 kg



### Manual 3R block, MacroStd, 3R-610.4

For vertical or horizontal mounting on the machine table.

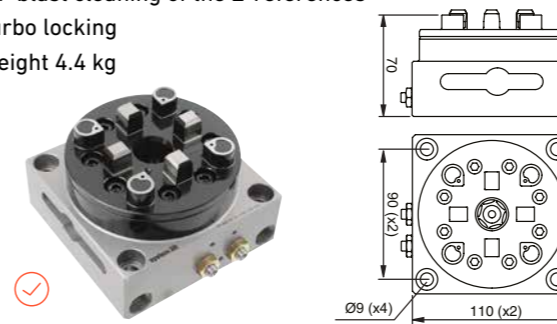
- Required drawbar 3R-605.2
- Fixed index positions 24x15°
- Vernier scale
- Weight 5.5 kg



### Pneumatic chuck, MacroStd, 3R-600.10-30

Pneumatic chuck locked/opened with air gun.

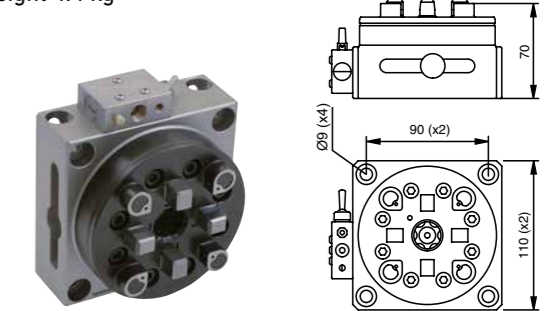
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg



### Pneumatic chuck, MacroStd, 3R-610.46-30

Pneumatic chuck for horizontal or vertical use.

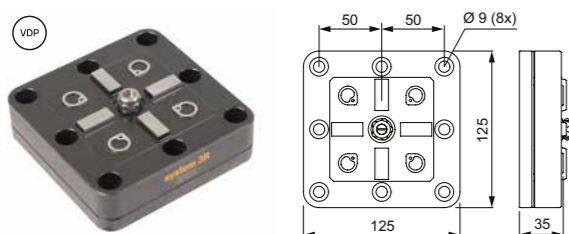
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air unit included
- Weight 4.4 kg



### Pneumatic chuck, VDP, 3R-602.10-V

Pneumatic vibration-damped chuck, low-profile version for permanent mounting on the machine table.

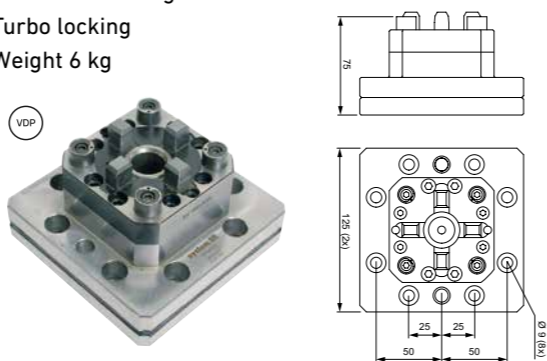
- Required drawbar 3R-605.10
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking



### Pneumatic chuck, VDP, 90716.09

Pneumatic vibration-damped chuck for permanent mounting on the machine table.

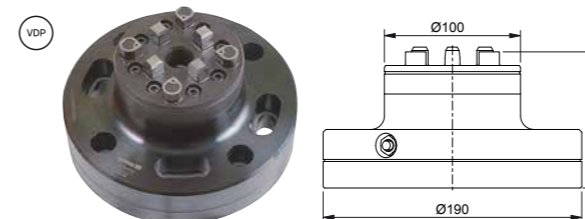
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg



### Pneumatic chuck, VDP, 3R-600.1-30V

Pneumatic vibration-damped chuck.

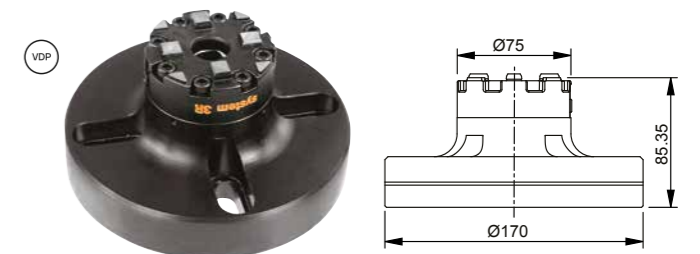
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg



### Manual chuck, VDP, 3R-600.24-V

Manual vibration-damped chuck, Ø170 mm.

- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Tightening torque 6 Nm
- Building-in height 85 mm.
- Centre spacing 63 to 100 mm
- Weight 6 kg



## Macro – Chucks

### Pneumatic chuck, Macro Quad, 3R-640.14-30

For permanent mounting on the machine table. All connections from the side or back of the chuck.

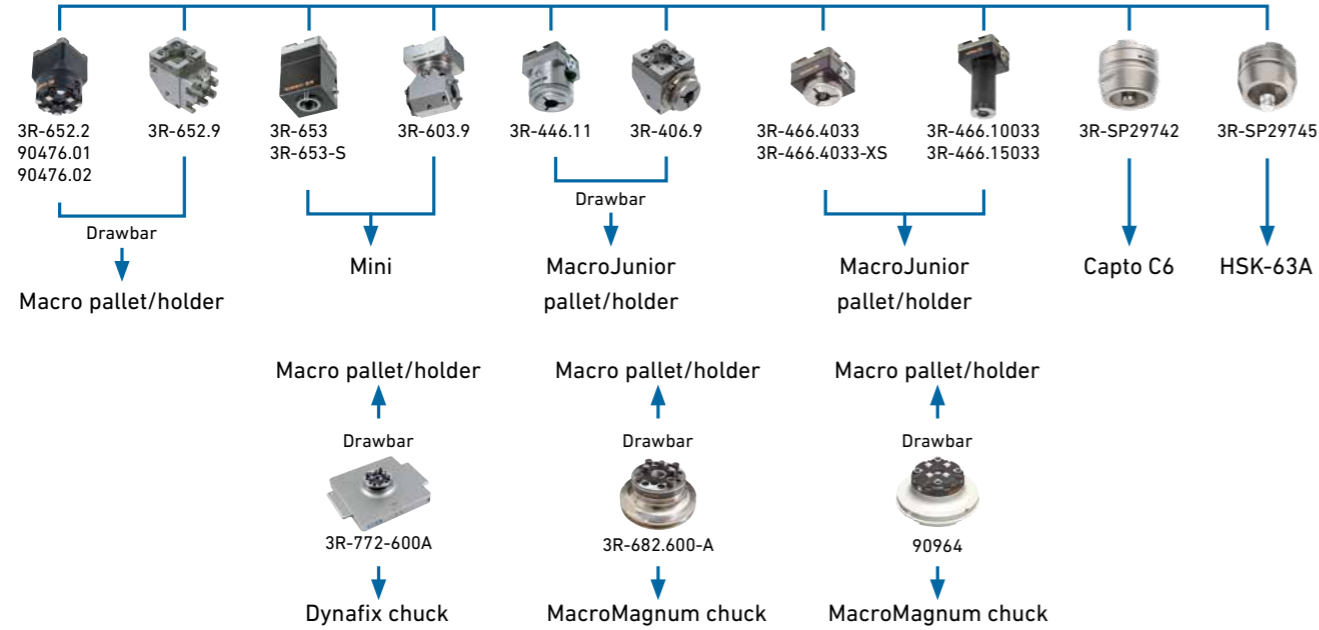
- Required drawbar 3R-605.2 or similar
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Permissible torque 135 Nm
- Air-blast cleaning of the Z-references
- Solid X and Y-references
- Turbo locking
- Weight 10 kg



## Macro – Chuck adapters

Macro chuck

Drawbar



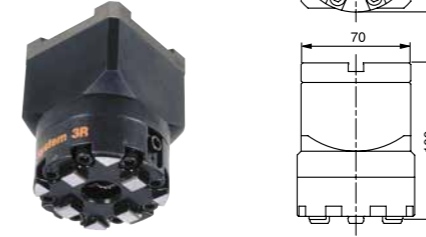
Chuck adapters	Article number	Drawbar	Feature
Manual	3R-652.2	3R-605.2	100 mm
Manual	3R-652.9		90°. Locking screw with M6 drawpin
Manual	3R-653		Macro -> Mini, rust resistant
Manual	3R-653-S		Macro -> Mini
Manual	3R-603.9		Macro -> Mini 90°, rust resistant
Manual	3R-446.11	3R-405.11	Macro -> MacroJunior
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-SP29742		Macro -> Capto C6, rust resistant
Manual	3R-SP29745		Macro -> HSK-63A, rust resistant
Pneumatic	3R-772-600A	3R-605.1 / 3R-605.4	Dynafix -> Macro
Pneumatic	3R-682.600-A	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

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

- Required drawbar 3R-605.2
- Solid X and Y-references
- Height 100 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Weight 4.5 kg



### Manual chuck adapter, Macro-Macro, 90476.01

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

- Required drawbar 3R-605.2
- Solid X and Y-references
- Height 200 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Weight 8 kg



### Manual chuck adapter, Macro-Macro, 90476.02

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

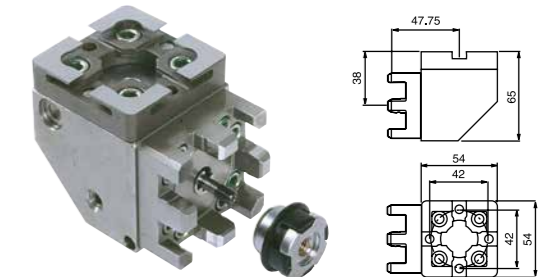
- Required drawbar 3R-605.2
- Solid X and Y-references
- Height 250 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Weight 9 kg



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

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

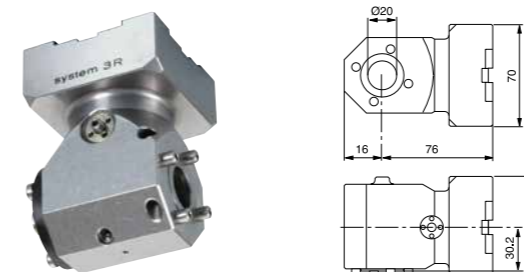
- Rust resistant
- Weight 2.4 kg



### 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

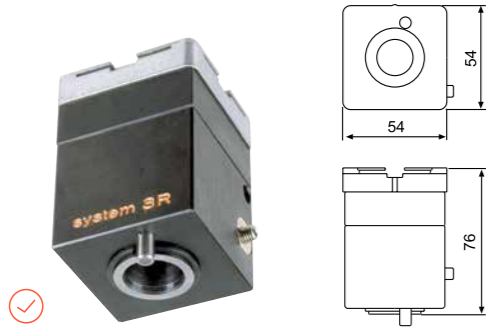


## Macro – Chuck adapters

### 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



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

For mounting Mini holders in the Macro system.

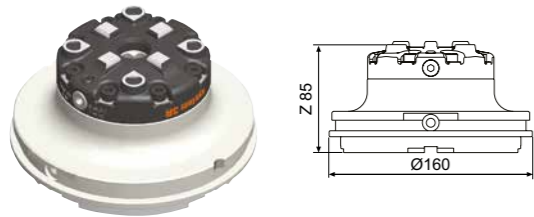
- MacroHP coupling
- Can be changed automatically
- Rust-resistant
- Weight 1.3 kg



### Manual chuck adapter, MacroMagnum-Macro, 90964

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

- Requires drawbar 3R-605.2 or similar.
- Solid X and 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-Macro, 3R-682.600-A

Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-680.10-2A.

- Weight 4.5 kg



### Manual adapter, Macro-Capto C6, 3R-SP29742

Access to clamping from underneath. Torque wrench for optimal performance.

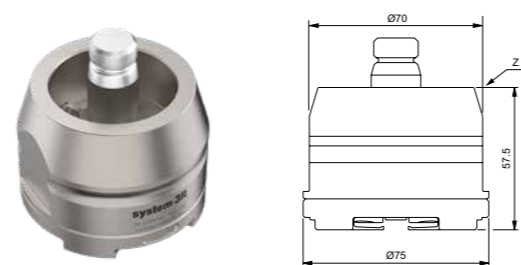
- Suitable for automatic changer.
- Recommended clamping torque 30 Nm
- Rust-resistant
- Weight 1.5 kg



### Manual adapter, Macro-HSK-63A, 3R-SP29745

Access to clamping from underneath. Torque wrench for optimal performance.

- Suitable for automatic changer.
- Recommended clamping torque 30 Nm
- Rust-resistant
- Weight 1.5 kg

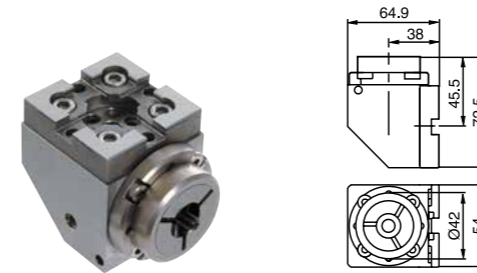


## Macro – Chuck adapters

### Manual chuck adapter 90°, Macro-MacroJunior, 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 adapter, Macro-MacroJunior, 3R-446.11

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

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

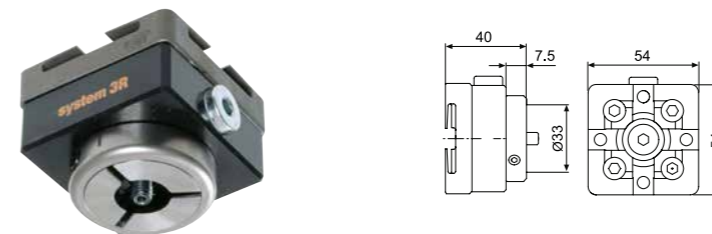


### Manual chuck adapters, Macro-MacroJunior

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.

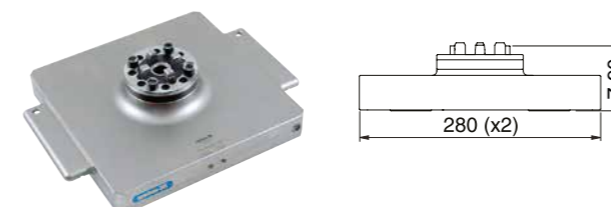
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1 kg



### Pneumatic chuck adapter, Dynafix-Macro, 3R-772-600A

Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-770-1A or 3R-700-5A.

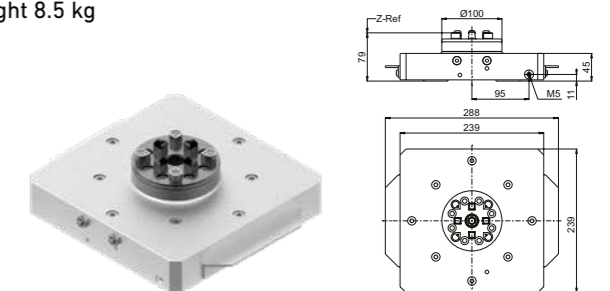
- Weight 11 kg



### Pneumatic chuck adapter, GPS 240-Macro, C522520

Chuck adapter with built-in pneumatic Macro chuck for mounting in C219800.

- Built-up height 79 mm
- X/Y-centring with springy cams, hardened, stainless
- Macro chuck 3R-SP24460
- Drawbar 3R-605.1 or 3R-605.4
- Adapted for automatic changing
- Weight 8.5 kg



## Macro – Chuck adapters and Rotating spindles

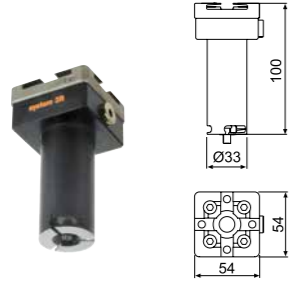
### Manual chuck adapters, Macro-MacroJunior

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

**NOTE:** For EDM machining only.

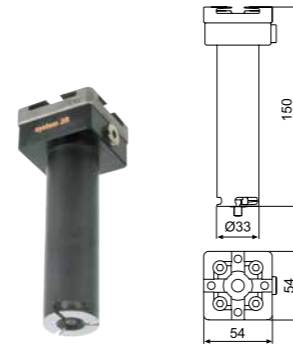
#### 3R-466.10033

- Fixed index positions 3x120°
- Adapted for automatic changing
- Height 100 mm
- Weight 0.8 kg

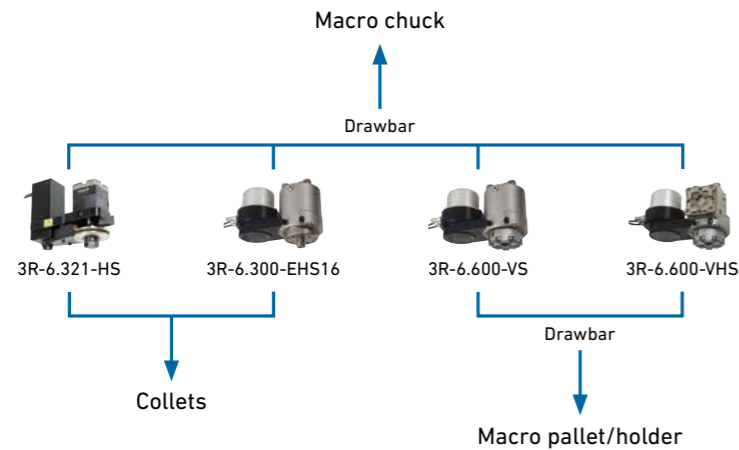


#### 3R-466.15033

- Fixed index positions 3x120°
- Adapted for automatic changing
- Height 150 mm
- Weight 1.2 kg



## Macro – Rotating spindles



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

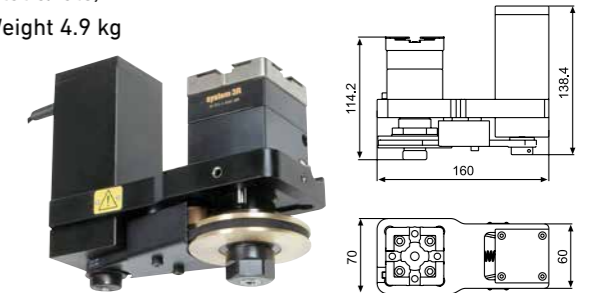
## Macro – Rotating spindles



### Rotating spindle, 3R-6.321-HS

Electrical spindle for round electrodes.

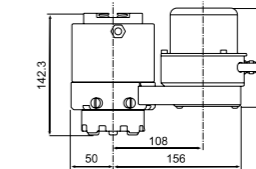
- Supplied with collet chuck set 3R-ER16E
- Electrode sizes Ø0.5-10 mm
- Speed range 200-2000 rev/min
- Recommended maximum flushing pressure 1 bar (dynamic/rotating)
- Recommended maximum flushing pressure 10 bar (static/idle)
- Weight 4.9 kg



### 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

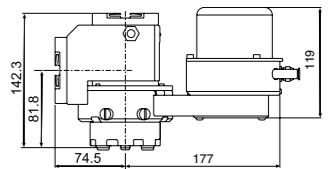
For vertical mounting in EDM machines.

- 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.

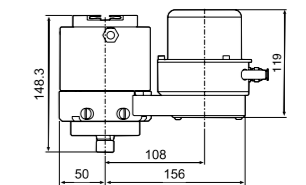
- Speed range 60-1500 rev/min



### Rotating spindles, 3R-6.300-EHS16

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

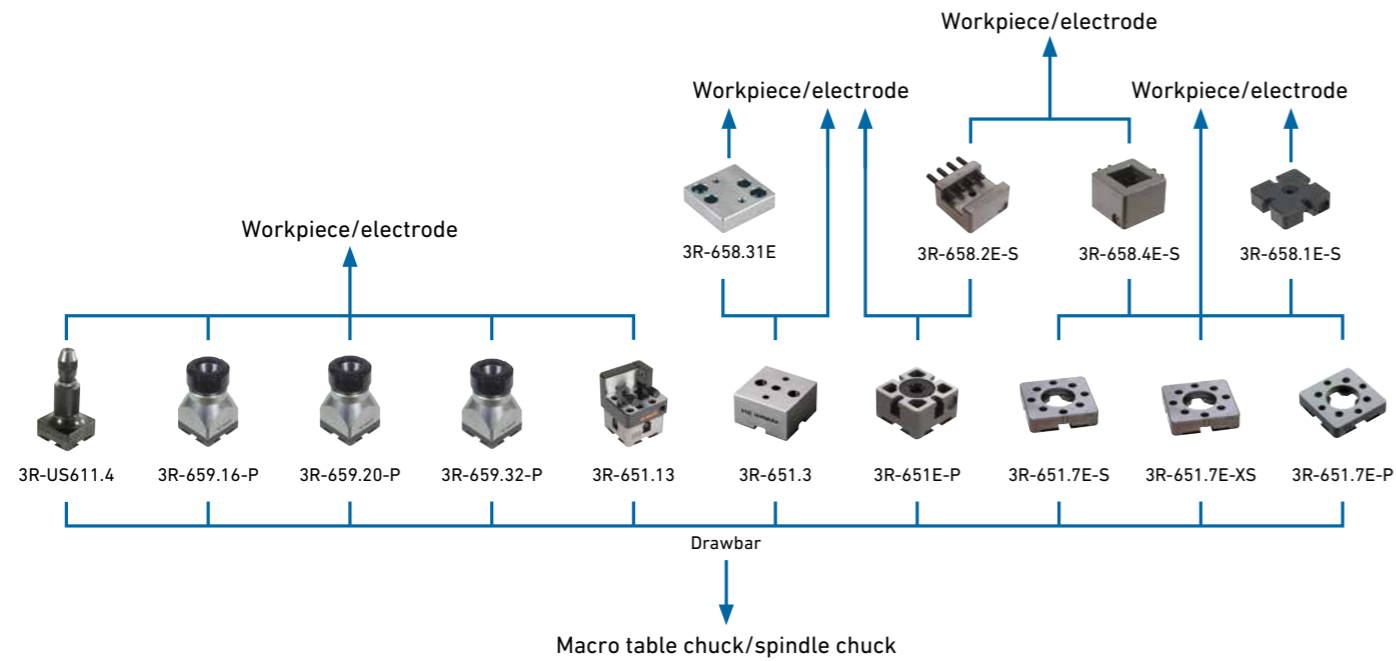
- Drawbar depends on chosen chuck
- Control unit included
- Rust-resistant
- Immersible
- Speed range 60-2000 rev/min
- Maximum flushing pressure 80 bar
- Weight 10 kg



### Recommended collet sets

Make	Collet set	Size (mm)	Nut M19x1
Baltzer	EHS16	Ø0.09-3	Integral
Regofix	ER16, ER16-UP	Ø0.5-10	ERM16, ERM16, ER16 MS
Tecnopinz	ETS16	Ø1.25-10	ETS16.2

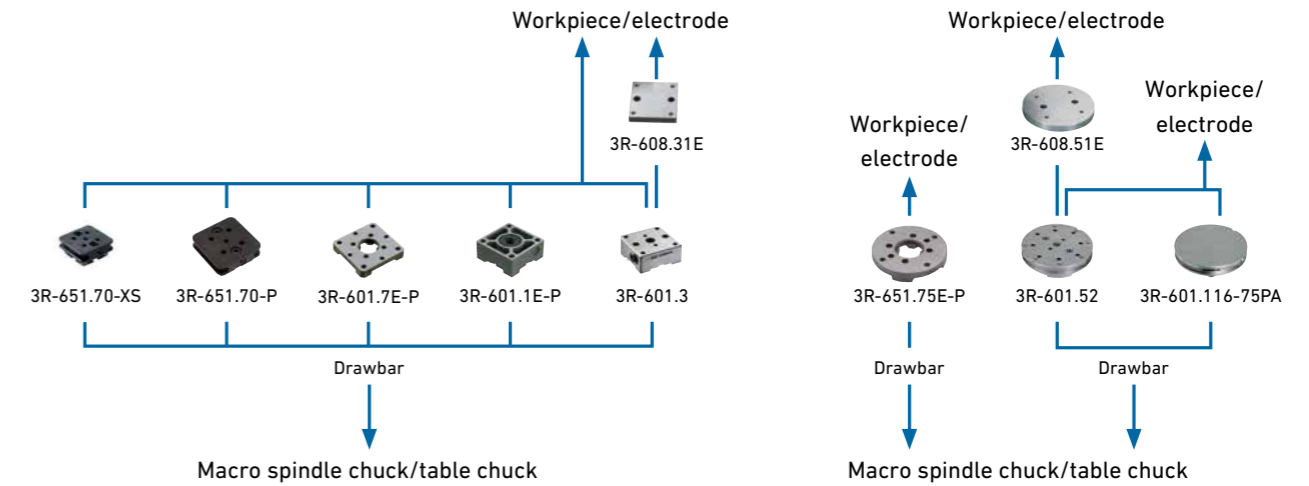
## Macro – Pallets, holders and reference elements



Holders, pallets and ref. elements, 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 and reference elements



Pallets and ref. elements, 70x70 mm	Article number	Feature
Hardened reference element 12.5 mm, HP	3R-601.7E-P	rust resistant
Hardened pallet 30 mm, HP	3R-601.1E-P	rust resistant
Hardened pallet 30 mm, HP	3R-601.3	rust resistant. 3Refix Ø10
Unhardened pallet 14.2 mm	3R-608.31E	3Refix Ø10
Unhardened pallet, HP	3R-651.70-P	reference element 54x54 mm
Unhardened pallet, Std	3R-651.70-XS	reference element 54x54 mm

Ref. element, Ø75 mm	Article number	Feature
Hardened reference element 12.5 mm standard and HP	3R-651.75E-P	rust resistant



## Macro – Pallets, reference elements and spacers

### Reference element 54x54 mm, MacroStd

Hardened reference element 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.

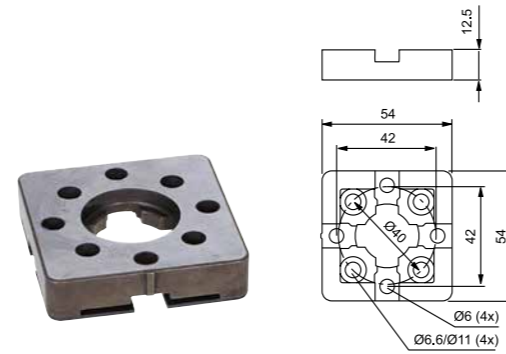
#### 3R-651.7E-S

- Nickel-plated side faces
- Supplied in sets of 8
- Weight per set 1.3 kg



#### 3R-651.7E-XS

- Untreated side faces
- Supplied in sets of 8
- Weight per set 1.3 kg

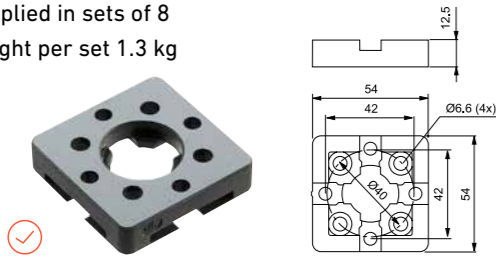


### Reference element 54x54 mm, MacroHP, 3R-651.7E-P

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.

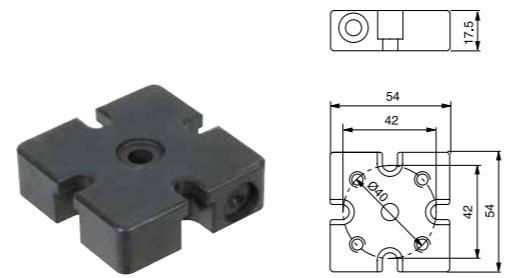
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 8
- Weight per set 1.3 kg



### 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.

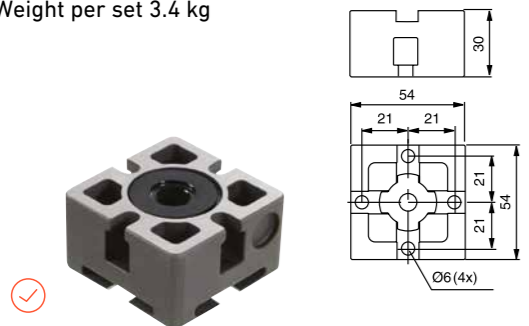
- Ready for code carrier
- Supplied in sets of 8
- Weight per set 2.5 kg



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

Hardened, with clearance holes for four fixing screws.

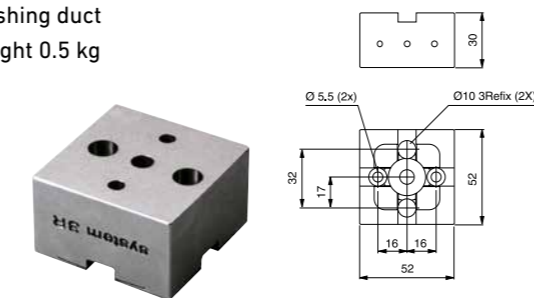
- Ready for code carrier
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.4 kg



### Pallet, 52x52 mm, MacroHP, 3R-651.3

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

- 3Refix Ø10 mm
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Weight 0.5 kg

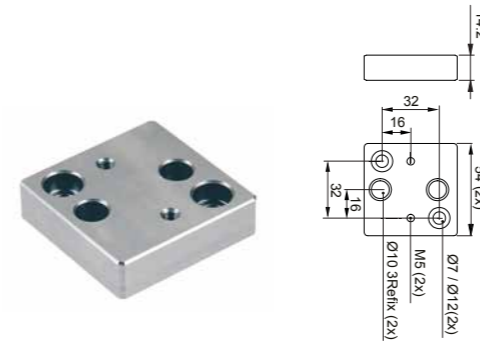


## Macro – Pallets and holders

### Pallet, 52x52 mm, 3R-658.31E

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

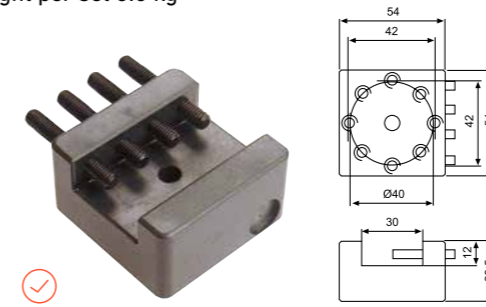
- 3Refix Ø10 mm
- Building-in height 14.4 mm
- Supplied in sets of 10
- Weight per set 2.2 kg



### Holder, 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.

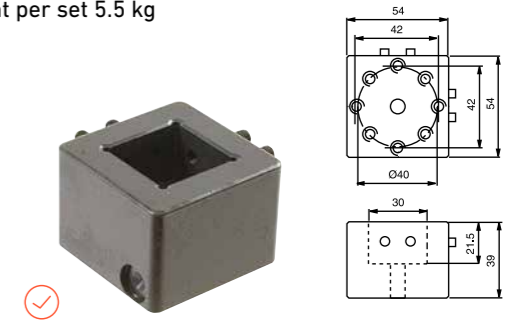
- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.5 kg



### 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.

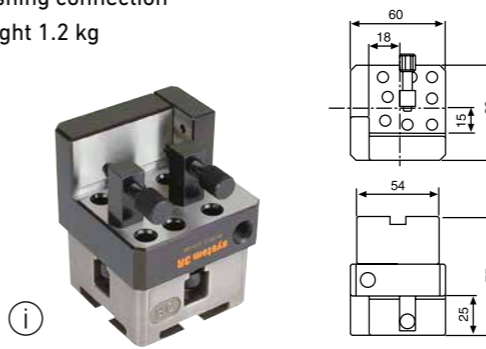
- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 5.5 kg



### Holder, MacroHP, 3R-651.13

Hardened holder for square electrodes max 30 mm.

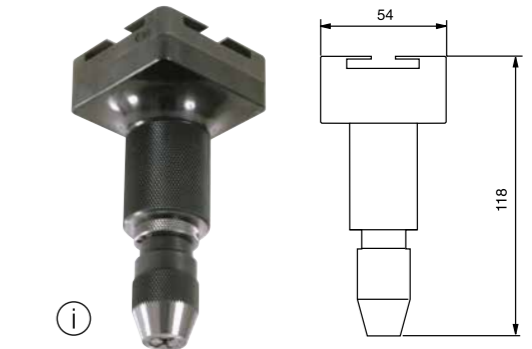
- Max. workpiece 32x28 mm
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.2 kg



### Three-jaw chuck, 3R-US611.4

For 0-3 mm electrodes.

- Weight 0.8 kg

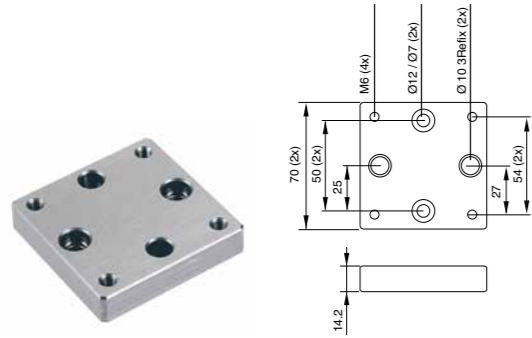


## Macro – Pallets and reference elements

### 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 Ø10 mm
- Building-in height 14.2 mm
- Supplied in sets of 10
- Weight per set 4.4 kg

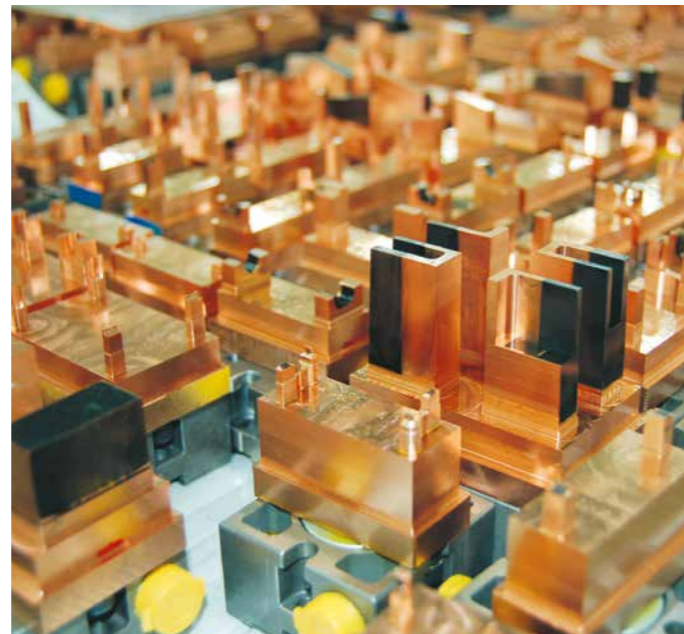
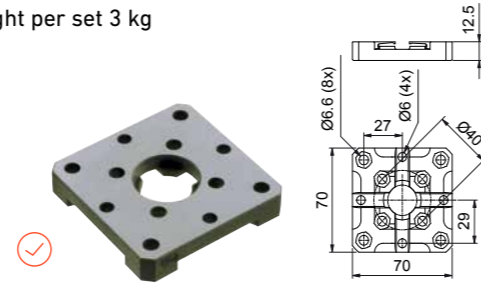


### Reference element, 70x70 mm, MacroHP, 3R-601.7E-P

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.

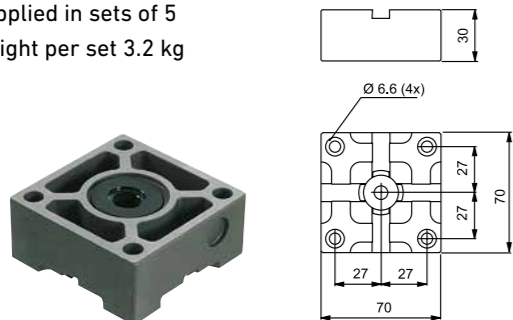
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 5
- Weight per set 3 kg



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

Hardened, with clearance holes for four fixing screws.

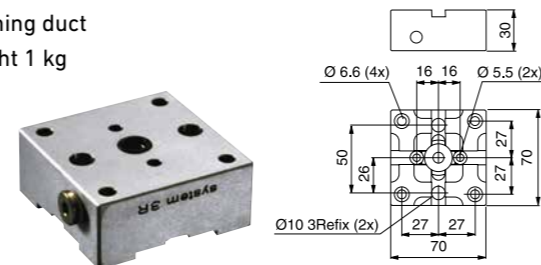
- Ready for code carrier
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Supplied in sets of 5
- Weight per set 3.2 kg



### Pallet, 70x70 mm, MacroHP, 3R-601.3

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

- 3Refix Ø10 mm
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Weight 1 kg



## Macro – Pallets, reference elements and accessories

### PT Pallet, 70x70 mm, 3R-651.70-P

Unhardened pallet with reference element 3R-651.7-P.

- Ready for code carrier
- Ready for automation
- Gripp outside the pallet
- Sealing ring between pallet and chuck
- Weight 1 kg



### PT Pallet, 70x70 mm, 3R-651.70-XS

Unhardened pallet with reference element 3R-651.7-XS.

- X, Y and Z-references hardened
- Ready for code carrier
- Ready for automation
- Gripp outside the pallet
- Sealing ring between pallet and chuck
- Weight 1 kg



### Accessories

#### PT Sealing ring, High, 3R-612.54-A

Suitable for some Macro chucks with drawbar 3R-605.1\*.



#### PT Sealing ring, Low, 3R-612.54-S

Suitable for some Macro chucks with drawbar 3R-605.2\*.



\*For more info please ask GF Machining Solutions.

PT = Process Tooling

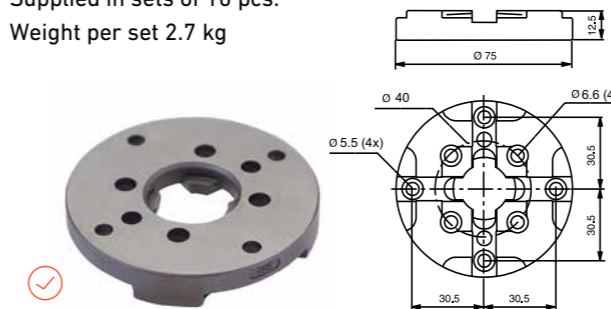
Application example:



### Reference element, 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
- Rust resistant
- Supplied in sets of 10 pcs.
- Weight per set 2.7 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 and user kits

### Pallet, Ø116 mm, 3R-601.116-75PA

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

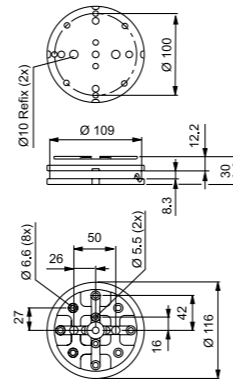
- X, Y and Z-references hardened
- Ready for code carrier
- Adapted for automatic changing



### Pallet, Ø116 mm, MacroHP, 3R-601.52

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

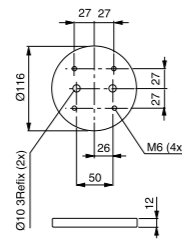
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Weight 1.9 kg



### 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



### Sealing ring, High, 3R-612.116-A

Suitable for some Macro chucks with drawbar 3R-605.1\*.

**NOTE:** Only suitable for Ø116 mm pallets.



\*For more info please ask GF Machining Solutions.

### Sealing ring, Low, 3R-612.116-S

Suitable for some Macro chucks with drawbar 3R-605.2\*.

**NOTE:** Only suitable for Ø116 mm pallets.



### 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-XS	Ref. element, 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



\*For more info please ask GF Machining Solutions.

## Macro – User kits and 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-XS	Reference element, 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-605.1

- Ø20x57.1 mm with flushing hole Ø7 mm
- Supplied 1 pc

#### 3R-605.1E

- 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 hole Ø7 mm
- Intended for MacroCombi automatic electrode changers
- Supplied in sets of 10 pcs



### Drawbars

#### 3R-605.2

- Ø20x36.9 mm with flushing hole Ø7 mm
- Supplied 1 pc

#### 3R-605.2E

- Supplied in sets of 5 pcs

#### 3R-605.2EE

- Supplied in sets of 20 pcs



\*1 Except 3R-605.2EE.

#### 3R-605.10

- Ø20x13 mm
- Rust resistant
- Supplied 1 pc

#### 3R-605.10E

- Supplied in sets of 10 pcs

#### 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



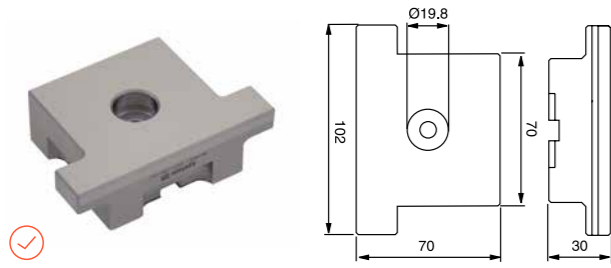


## Macro – Accessories

### Control ruler, 3R-606.1

For setting angular positions and for centring Macro chucks.

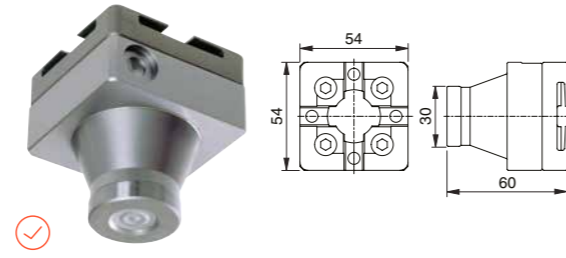
- Ground hole for centring.
- Measuring length 100 mm
- Weight 1.4 kg



### Control ruler, 3R-656.1

For setting angular positions. Ground outside diameter for centring.

- Measuring length 50 mm
- Weight 0.8 kg



## Macro – Accessories

### Indicating spindle, 3R-656.2-P

For measuring centre holes.

- Dial indicator required
- Weight 0.6 kg



### Centring ring, 3R-612.6

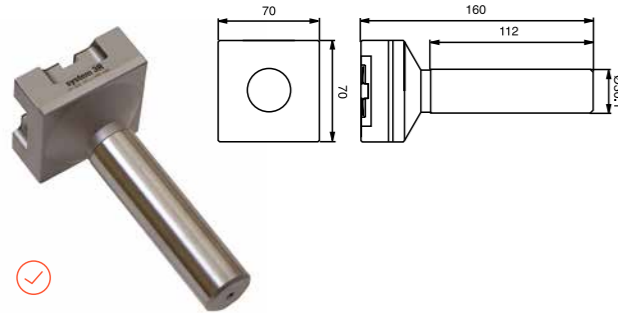
For centring 3R-600.20



### 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



### 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.



### 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  $\pm 3$  mm



### 3R-656.31-3P

- Building-in height 112 mm
- Measuring ball Ø3 mm
- Weight 0.6 kg

### 3R-656.31-5P

- Building-in height 112 mm
- Measuring ball Ø5 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 Ø3 mm
- Stiff probe
- Weight 0.8 kg

## Macro – Accessories

### Clamping force meter kit, 3R-SSP115-BASE

For both pneumatic and manual chucks. This stand alone unit in combination with individual drawbars or drawbar kits, able to cover MacroJunior, Macro, MacroMagnum and Dynafix.

**NOTE:** Require drawbars with bayonet interface similar to 3R-605.1.

- Add-on kit for use in Macro/MacroMagnum, 3R-SSP115-MACRO
- Operating temp. +10 to +40° C
- Gauge size Ø90x47 mm
- Working range 1-22 kN
- Deviation ± 0.1 kN
- Weight
  - Display 0.34 kg
  - Gauge 1.3 kg



### Add-on kit, 3R-SSP115-Macro

Add-on kit for 3R-SSP115-BASE



### 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. Suitable for some Macro chucks\*.



### Sealing ring, Low, 3R-612.70-S

For reference element 70x70 mm. Suitable for some Macro chucks\*.



### Sealing ring, Low, 3R-612.75-S

For reference element Ø75 mm. Suitable for some Macro chucks\*.



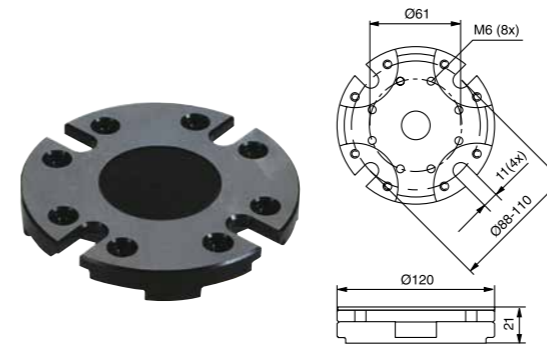
\*For more info please ask GF Machining Solutions.

## Macro – Accessories

### Adapter plate, 3R-A11489

For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S.

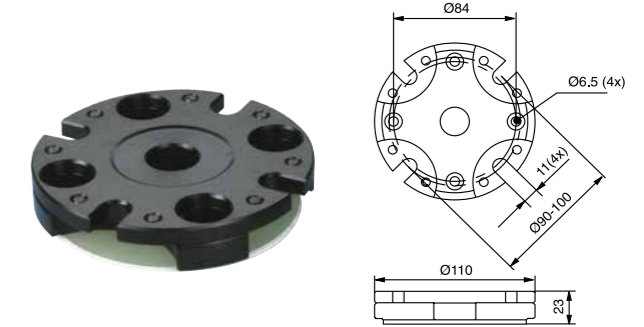
- Supplied with insulation plate and fixing screws
- Flushing connection
- Weight 1.4 kg



### Adapter plate, 3R-A3620

Adapter plate with eight adjusting screws for mounting spindle chucks. For mounting 3R-460.1-1, 3R-600.1-30 and 3R-600.20.

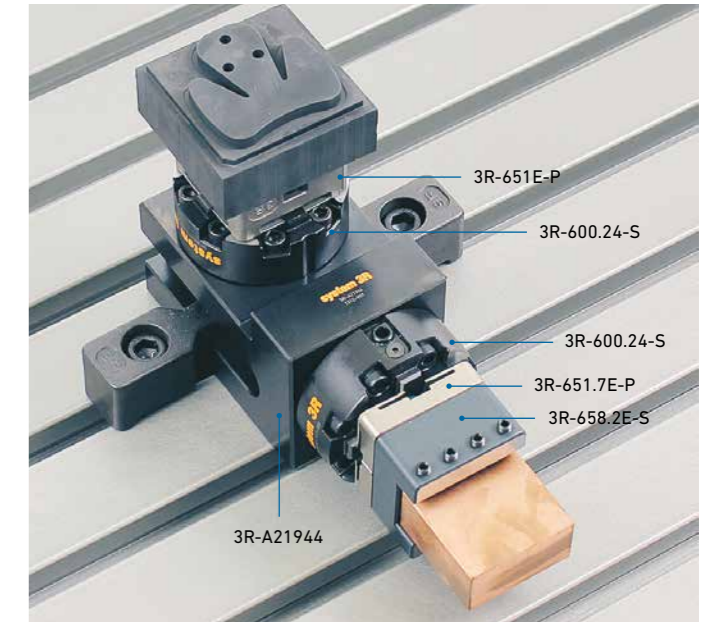
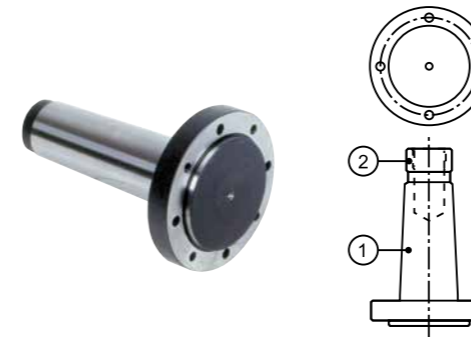
- Supplied with insulation plate and fixing screws
- M10 for 90 mm pitch circle
- M6 for 96 mm pitch circle
- M8 for 100 mm pitch circle.
- Weight 1.1 kg



### Lathe taper, 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

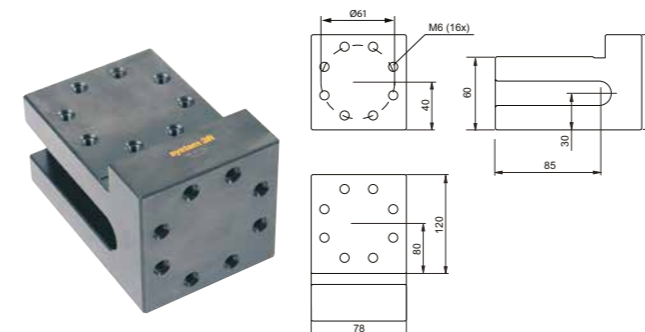
**NOTE:** Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted. Use the order form at the end of the catalogue.



### 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. Intended for milling.

**NOTE:** Chuck to be ordered separately.

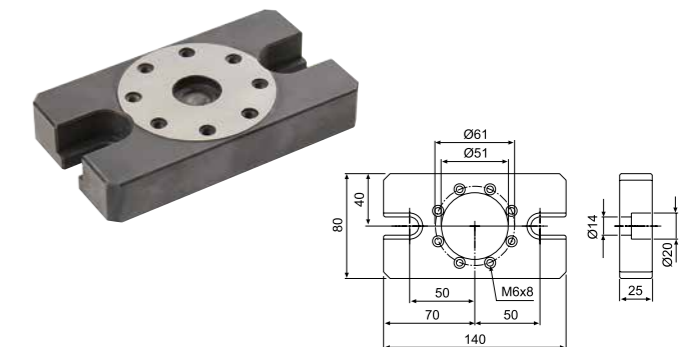


### Adapter plate, 3R-A19724

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

**NOTE:** Chuck to be ordered separately

- Supplied with fixing screws for chuck and table.



## Macro – Accessories

### Electrode cassette, 3R-650/8x5

For eight electrodes 52x52 and 54x54 mm.

- Supplied in sets of 5



### 3Refix mandrel, 3R-901-10E-TX

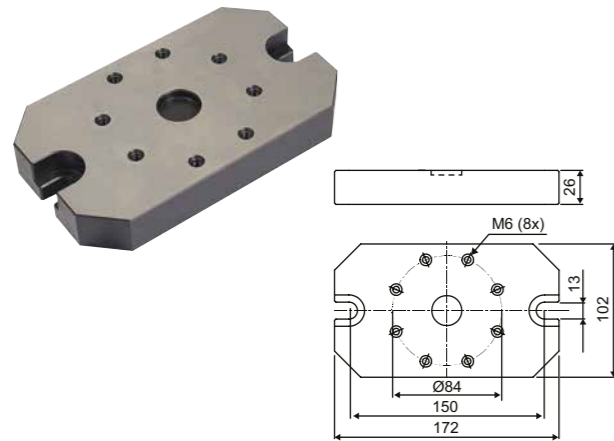
- 3Refix Ø10 mm
- Recommended tightening torque 4 Nm
- Supplied in sets of 10
- Weight per set 0.2 kg

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



### Adapter plate, 3R-A26488

For mounting 3R-600.28-S, 3R-600.28-S, 3R-600.14-30 and 3R-602.81.



### Converter kit, 90842.01

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



### Torque wrenches, 3R-614-04

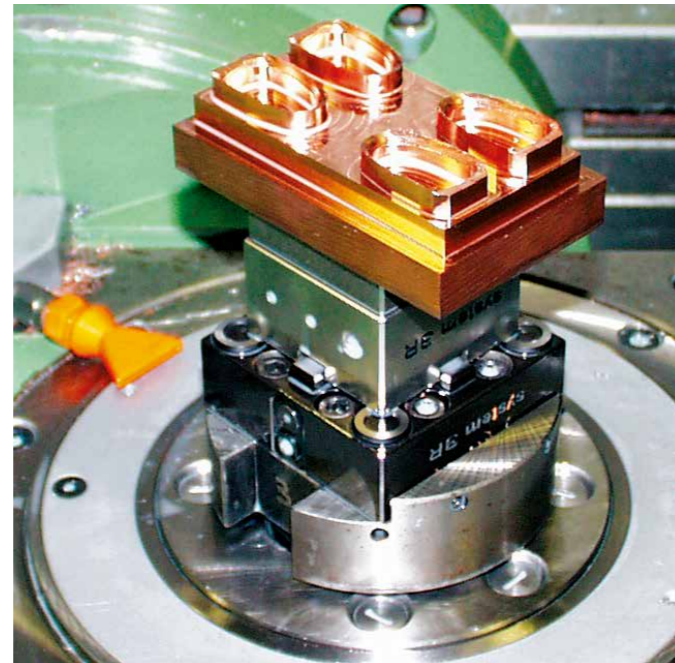
Mainly for MacroCombi and Ø10 3Refix mandrels.

- 4 Nm

### 3R-614-06

For Macro chucks

- 6 Nm



# MacroNano

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.

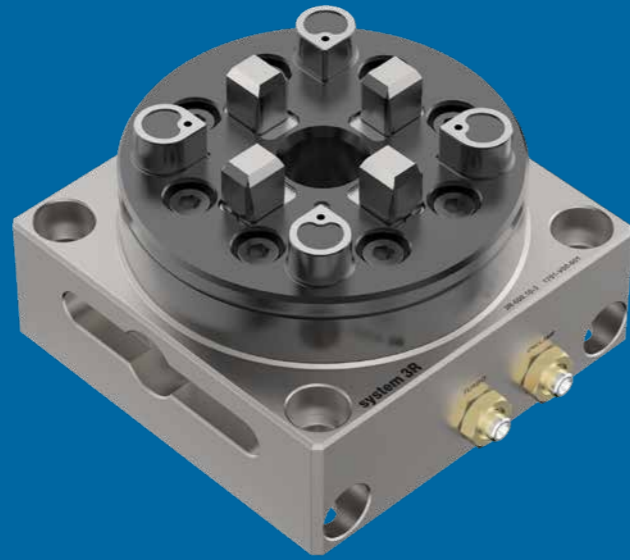
- Repetition accuracy within 0,001 mm
- Locking force: 6000 N
- Fixed index positions : 4x90°
- Required air pressure, pneumatic chuck: 6±1 bar
- Recommended max workpiece weight: 50 kg

### Advantages

- 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.



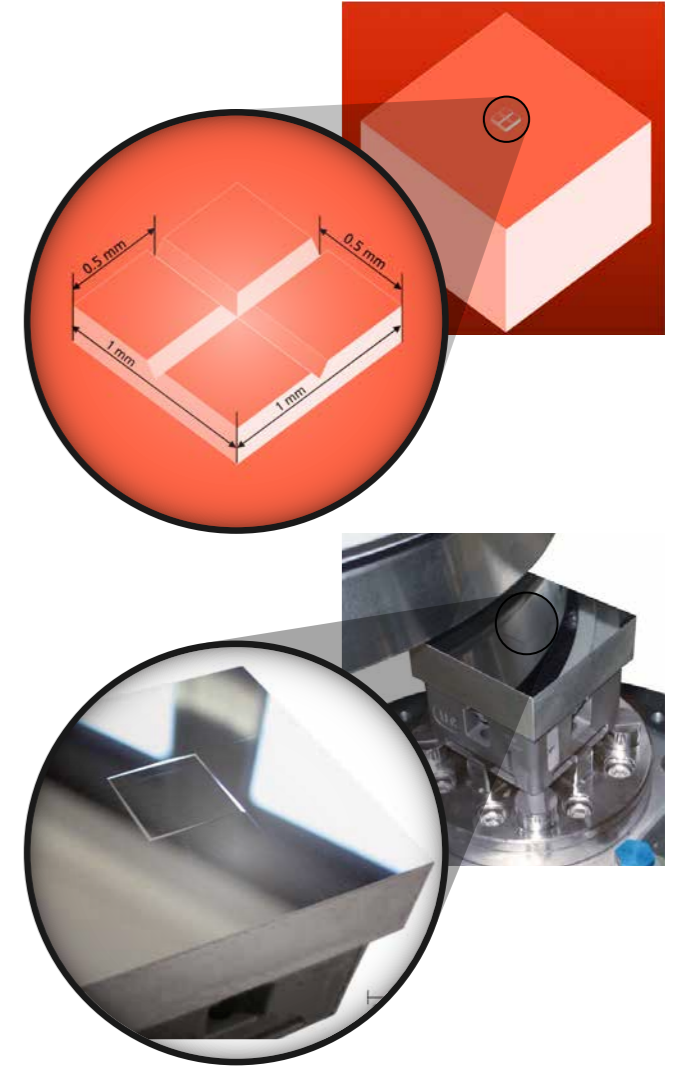
# MacroNano in details



## MacroNano

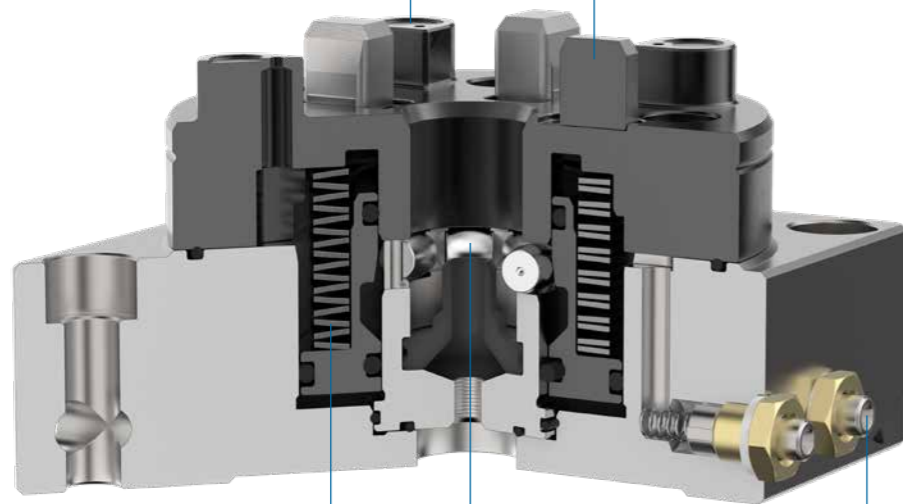
### Application example: Microstructuring with Diamond Machining

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 1<sup>st</sup> machine, making use of indexing feature of the MacroNano system. The pallet carrying the workpiece is then transferred to the chuck on 2<sup>nd</sup> machine to produce the micro-grooves, once again using the indexing feature. The zero reference was determined only once on the 1<sup>st</sup> 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.



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

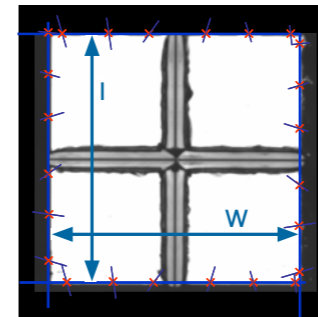
XY-references



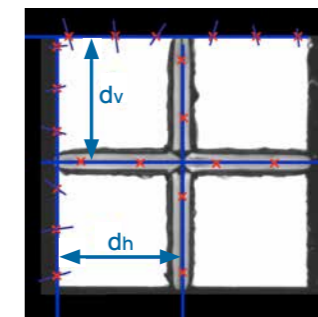
Spherical rolls

Spring loaded by idle status and added air pressure to create Turbo functions status

Air inlets from side, are upon delivery prepared for use of air gun



Measurement of the cube dimensions



Measurement of groove positions

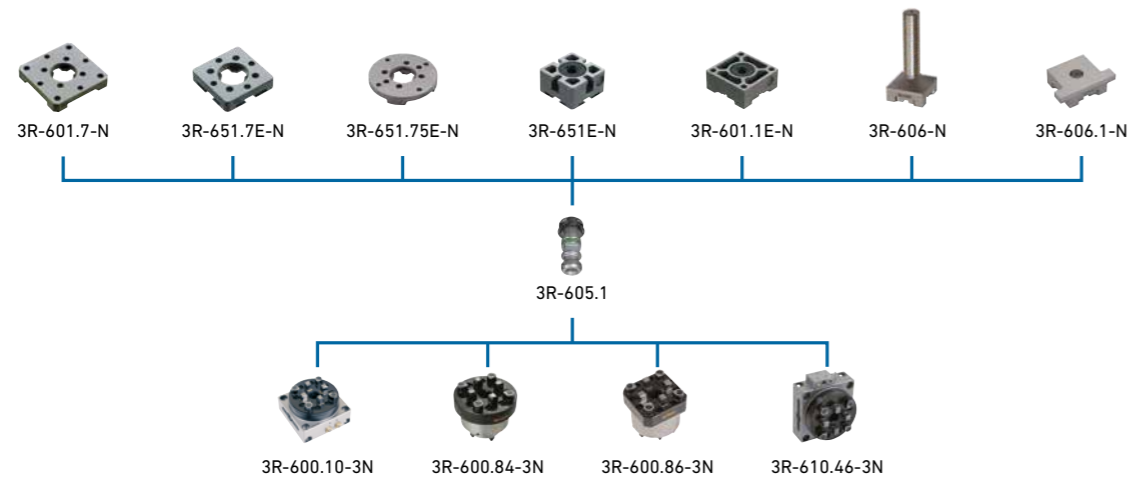


Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)	
W <sub>1</sub>	0.9996	l <sub>1</sub>	0.9999	dv <sub>1</sub>	0.4988	dh <sub>1</sub>	0.5013
W <sub>2</sub>	0.9996	l <sub>2</sub>	0.9999	dv <sub>2</sub>	0.4993	dh <sub>2</sub>	0.4995
W <sub>3</sub>	0.9996	l <sub>3</sub>	0.9999	dv <sub>3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

Mean values

Overall structure deviation < 0.5 μm

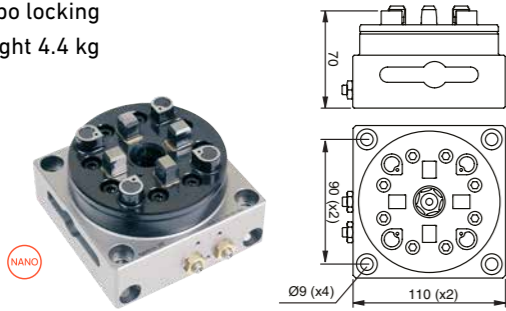
## MacroNano – Chucks, pallets and accessories



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

Chuck for mounting on the machine table.

- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±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 2,4 kg



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

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

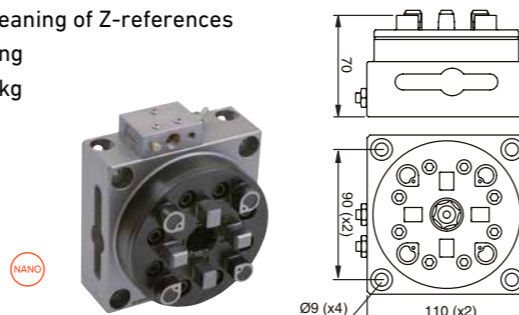
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg



### Pneumatic chuck, MacroNano, 3R-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 and accessories

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

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

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

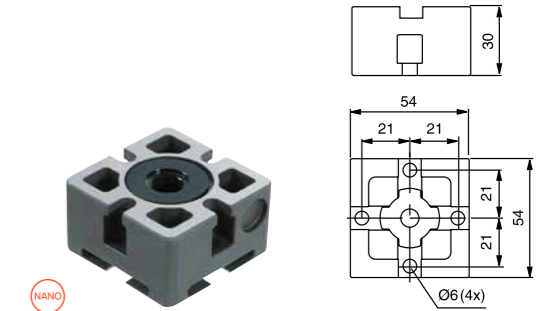
- Fixed index positions 4x90°
- Parallel-ground top and bottom face
- Rust resistant
- Supplied in sets of 8 pcs
- Weight per set 1.2 kg



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

Hardened with clearance holes for four fixing screws.

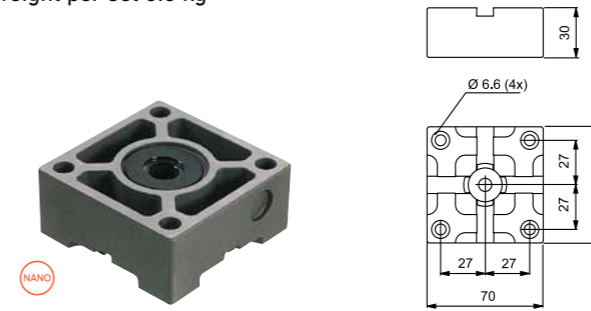
- Fixed index positions 4x90°
- Ready for code carrier
- Rust resistant
- Supplied in sets of 8 pcs
- Weight per set 3.4 kg



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

Hardened with clearance holes for four fixing screws.

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

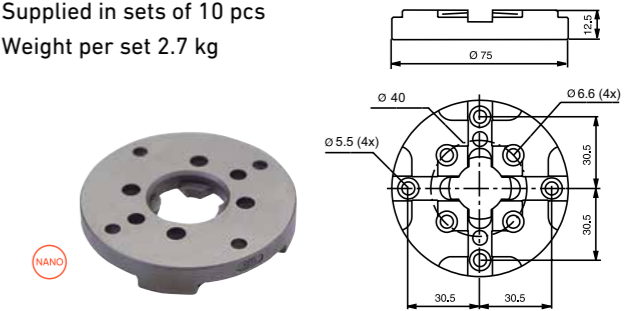


### Reference element Ø 75 mm, MacroNano, 3R-651.75E-N

Hardened and milled with clearance holes for eight fixing screws.

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

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

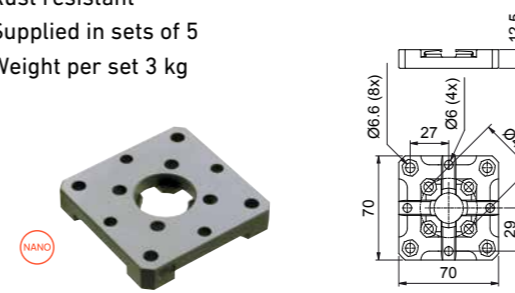


### Reference element 70x70 mm, MacroNano, 3R-601.7-N

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

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

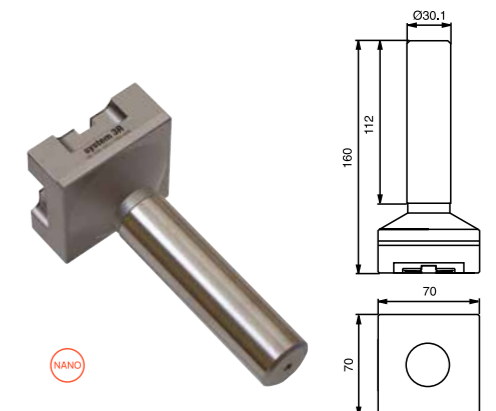
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 5
- Weight per set 3 kg



### Control rod, MacroNano, 3R-606-N

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

- Measuring length 110 mm.
- Weight 2.3 kg

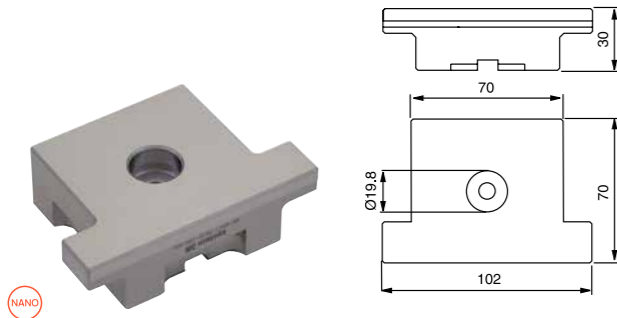


## MacroNano – Accessories

### Check ruler, MacroNano, 3R-606.1-N

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm.
- Weight 1.4 kg



### Drawbar, 3R-605.1E

- $\varnothing 20 \times 57.1$  mm with flushing holes  $\varnothing 7$  mm
- Supplied in sets of 10 pcs



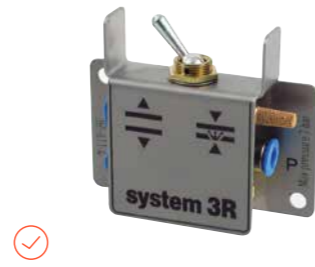
### Air unit, 3R-611.2

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 use on pallets.

- Supplied in sets of 10



# MacroMagnum

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

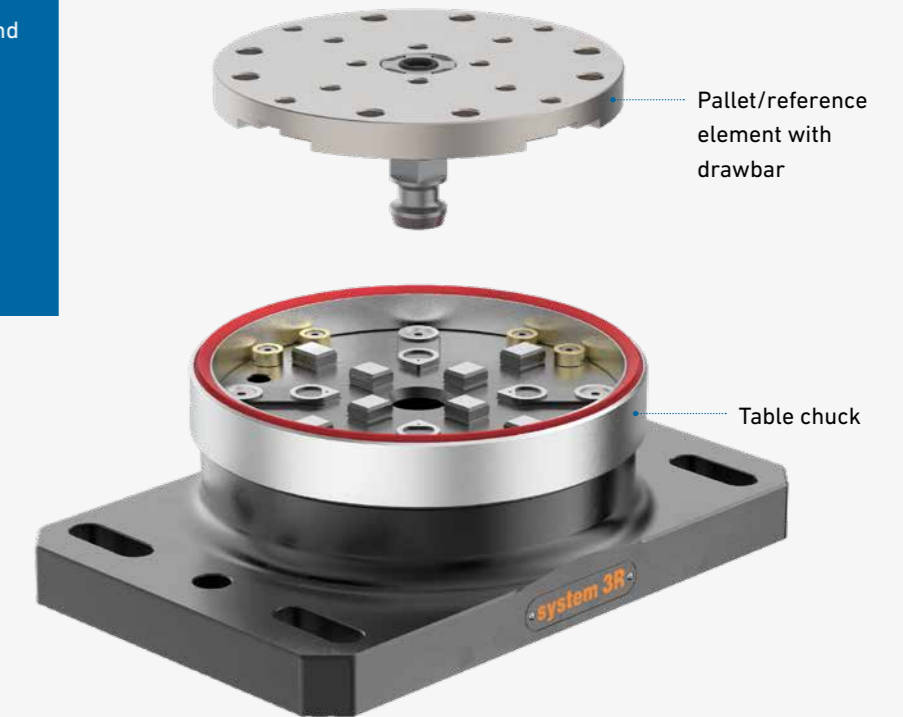
Usually the electrode blank is mounted directly on the pallet, which then carries the blank throughout the manufacturing process – from machine to machine, without subsequent alignment. The reference elements are primarily intended to be mounted on

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.

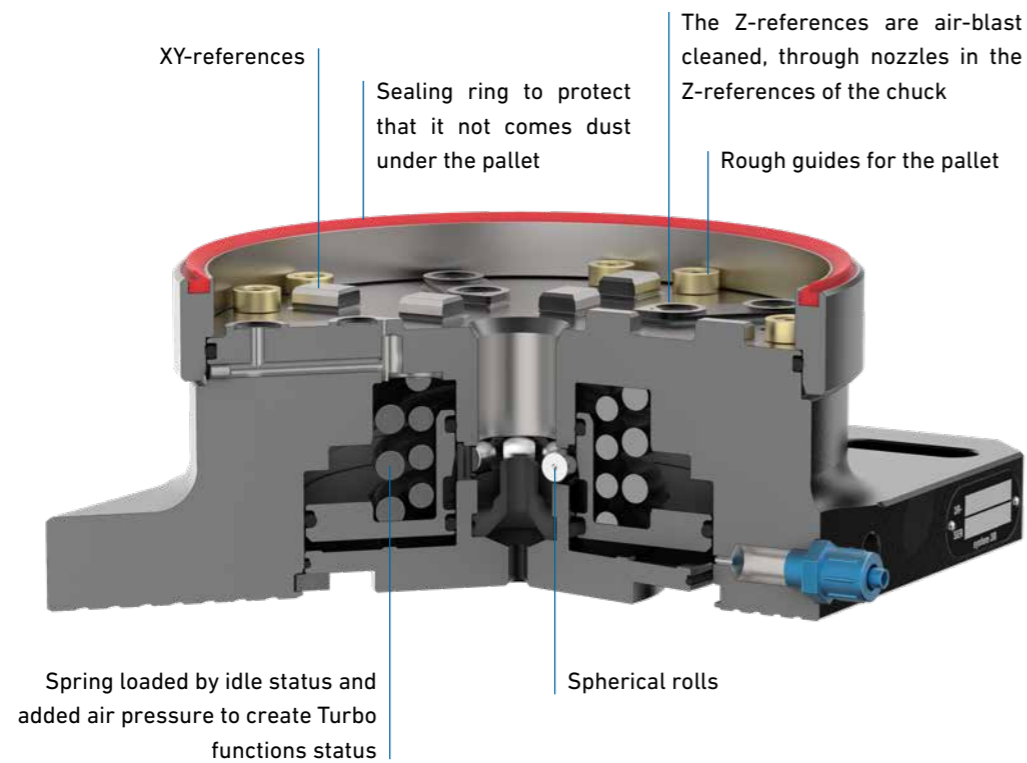
- Repetition accuracy within 0.002 mm
- Clamping force: 16 000 N
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck: 6±1 bar
- Recommended tightening torque manual chuck Macro-pallet: 4 Nm
- Recommended tightening torque manual chuck MacroMagnum-pallet: 10 Nm.
- Max workpiece weight (manual loading): 100 kg

### Advantages

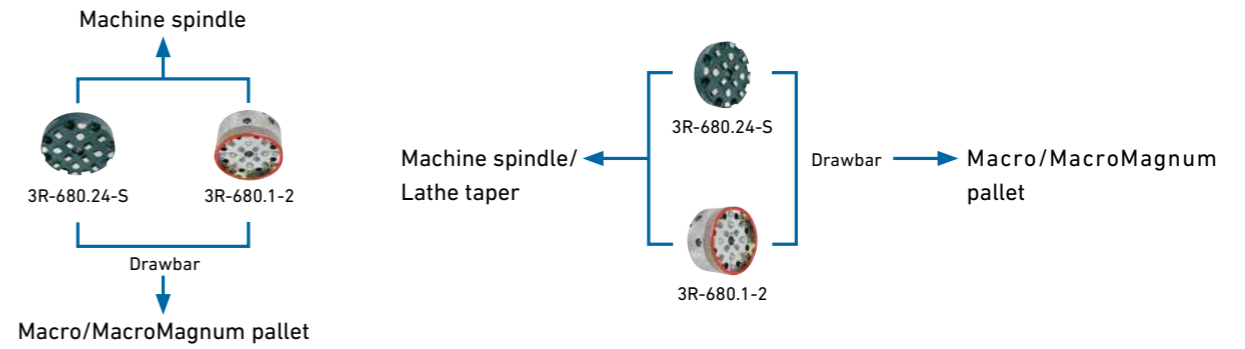
- Allows mounting of both MacroMagnum and Macro pallets.
- Reduces setting-up times.
- Ensures precision and quality.
- Can handle high machining forces.
- Is suitable for automatic changing with System 3R's automation program.



# MacroMagnum in details

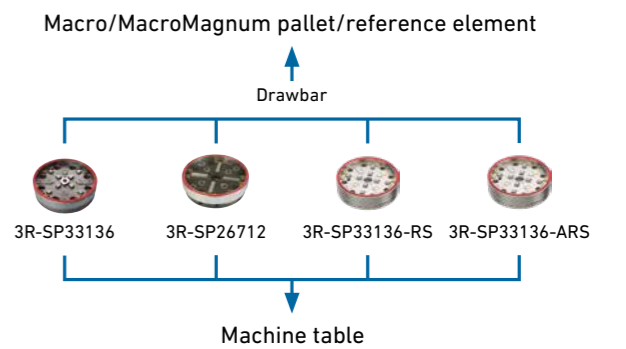
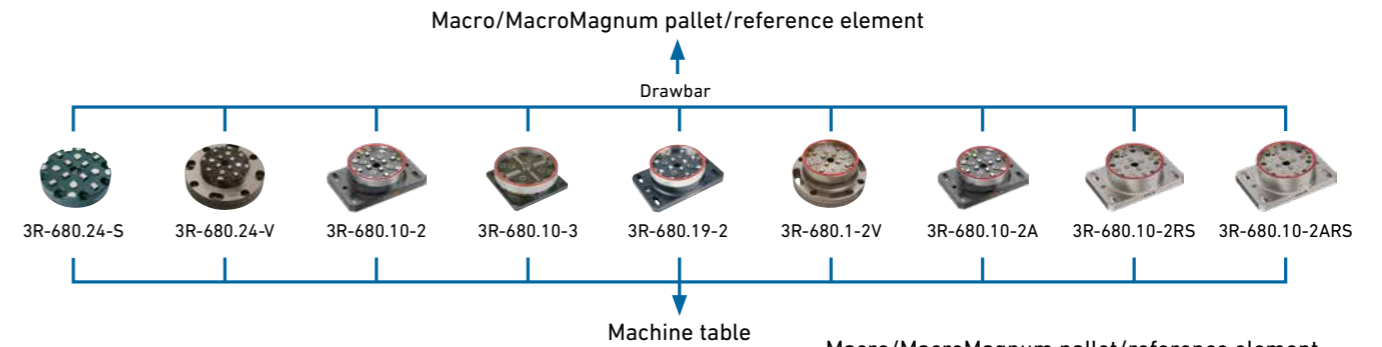


## MacroMagnum – Chucks



Spindle chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Pneumatic	3R-680.1-2	3R-605.1 / 3R-605.4	

Lathe chucks	Article number	Drawbar	Feature
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	



Spindle chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Manual	3R-680.24-V	3R-605.2	vibration-damped
Pneumatic	3R-680.10-2	3R-605.1 / 3R-605.4	
Pneumatic	3R-680.10-3	3R-605.2	low profile
Pneumatic	3R-680.19-2	3R-605.1 / 3R-605.4	3Refix Ø20 mm
Pneumatic	3R-680.1-2V	3R-605.1 / 3R-605.4	vibration-damped
Pneumatic	3R-680.10-2A	3R-605.1 / 3R-605.4	for chuck adapter
Pneumatic	3R-680.10-2RS	3R-605.1RS	rust resistant
Pneumatic	3R-680.10-2ARS	3R-605.1RS	rust resistant, for chuck adapter

Spindle chucks	Article number	Drawbar	Feature
Pneumatic	3R-SP33136	3R-605.1 / 3R-605.4	
Pneumatic	3R-SP26712	3R-605.2	low profile
Pneumatic	3R-SP33136-RS	3R-605.1RS	rust resistant
Pneumatic	3R-SP33136-ARS	3R-605.1RS	rust resistant, for chuck adapter

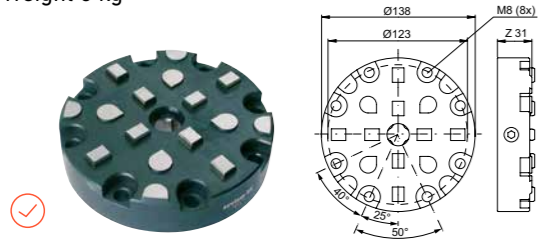
## MacroMagnum – Chucks

### Manual chuck, 3R-680.24-S

Low profile pneumatic chuck for permanent mounting on the machine spindle or table.

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

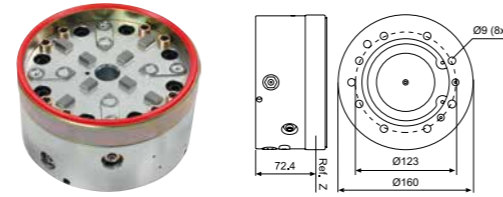
- Required drawbar 3R-605.2
- Recommended tightening torque:
  - Macro pallet 4 Nm
  - MacroMagnum pallet 10 Nm
- Fixed index positions 4x90°
- Weight 5 kg



### 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 4x90°
- Sealing ring
- Turbo locking of MacroMagnum pallets
- Weight 9 kg

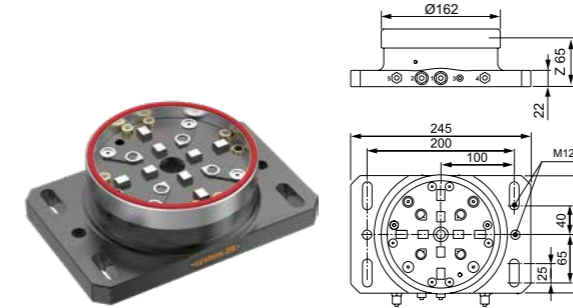


## MacroMagnum – Chucks

### Pneumatic chuck, 3R-680.10-2A

Pneumatic table chuck for chuck adapter.

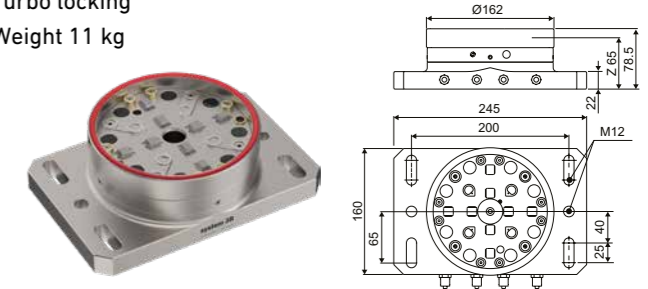
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references on chuck and chuck adapter
- Sealing ring
- Turbo locking
- Weight 12 kg



### Pneumatic chuck, 3R-680.10-2ARS

Rust resistant pneumatic table chuck for chuck adapter.

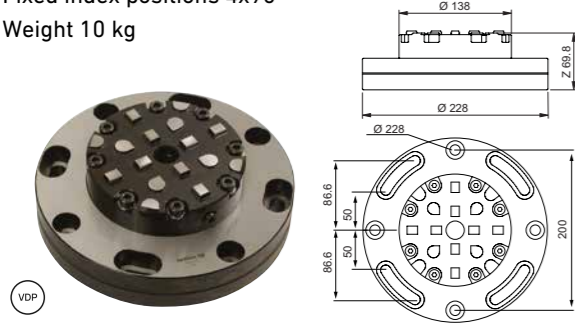
- Required drawbar 3R-605.1RS
- Rust resistant
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 11 kg



### Manual chuck, VDP, 3R-680.24-V

Manual vibration-damped table chuck.

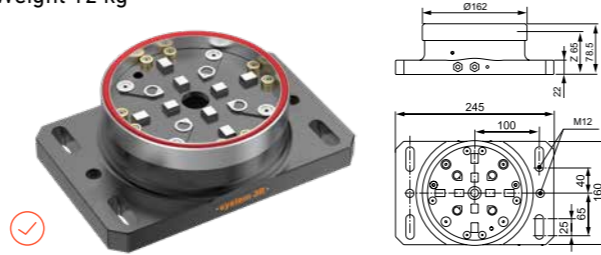
- Required drawbar 3R-605.2
- Recommended tightening torque:
  - Macro pallet 4 Nm
  - MacroMagnum pallet 10 Nm
- Fixed index positions 4x90°
- Weight 10 kg



### Pneumatic chuck, 3R-680.10-2

Pneumatic table chuck.

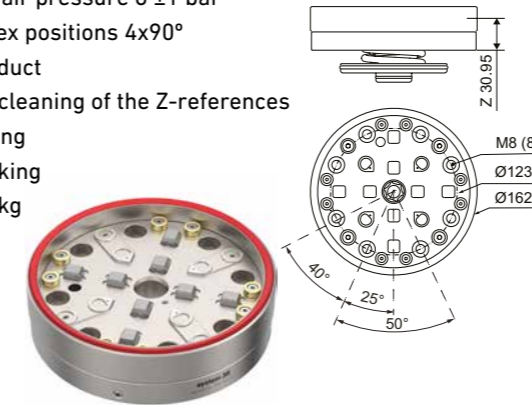
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking of MacroMagnum pallets
- Weight 12 kg



### Pneumatic chuck, 3R-SP33136

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

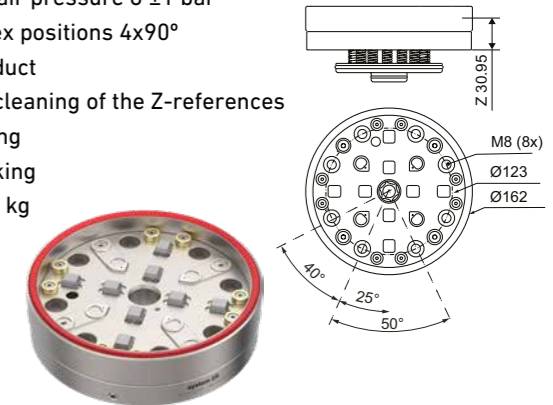
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg



### Pneumatic chuck, 3R-SP33136-RS

Rust resistant pneumatic table chuck.

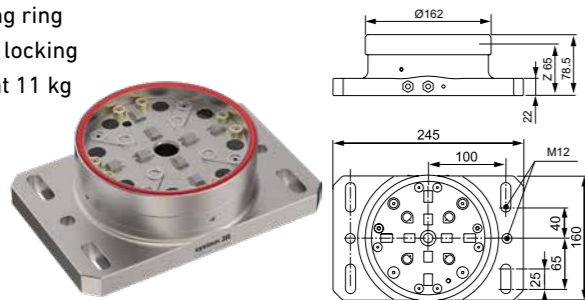
- Required drawbar 3R-605.1RS
- Rust resistant
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 11 kg



### Pneumatic chuck, 3R-680.10-2RS

Rust resistant pneumatic table chuck.

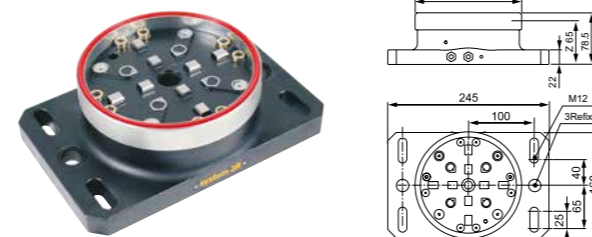
- Required drawbar 3R-605.1RS
- Rust resistant
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 11 kg



### Pneumatic chuck, 3R-680.19-2

Pneumatic table chuck with 3Refix-holes.

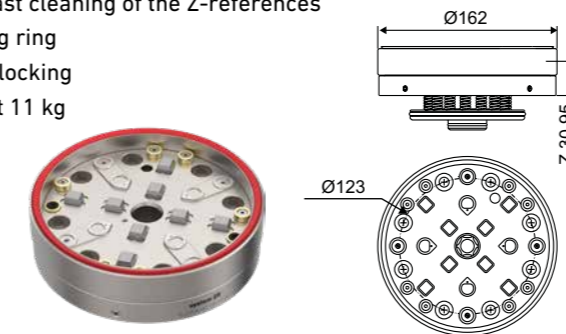
- 3Refix Ø20 mm
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking of MacroMagnum pallets
- Weight 12 kg



### Pneumatic chuck, 3R-SP33136-ARS

Rust resistant pneumatic table chuck for chuck adapter.

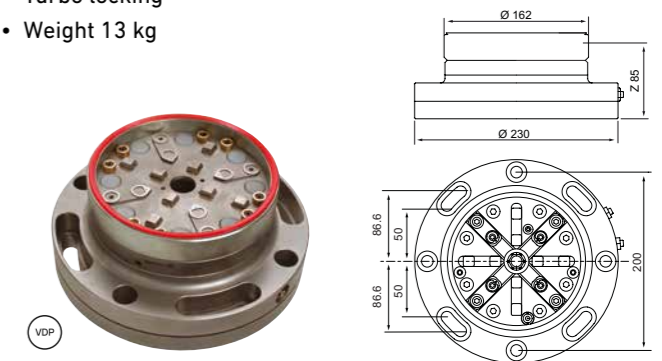
- Required drawbar 3R-605.1RS
- Rust resistant
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 11 kg



### Pneumatic chuck, VDP, 3R-680.1-2V

Pneumatic vibration-damped chuck.

- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 13 kg



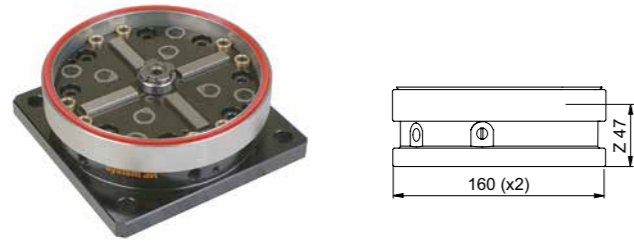


## MacroMagnum – Chucks

### Pneumatic chuck, 3R-680.10-3

For permanent mounting on the machine table.

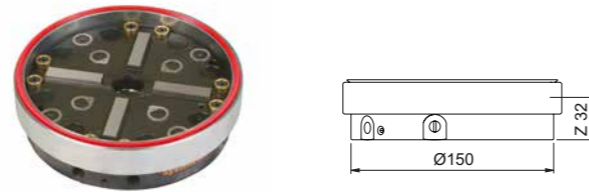
- Supplied with drawbar 3R-605.2
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg



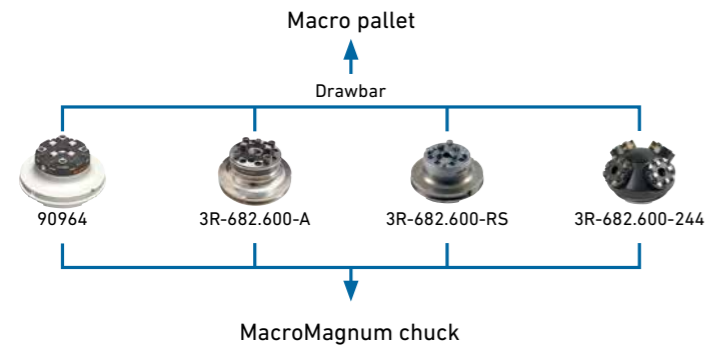
### Pneumatic chuck, 3R-SP26712

For permanent mounting on the machine table.

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



## MacroMagnum – Chuck adapters



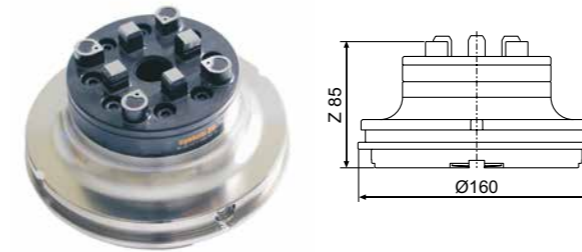
Chuck adapters	Article number	Drawbar	Feature
Manual	90964	3R-605.2	MacroMagnum -> Macro
Pneumatic	3R-682.600-A	3R-605.1 / 3R-605.4	MacroMagnum -> Macro
Pneumatic	3R-682.600-RS	3R-605.1RS	MacroMagnum -> Macro, Rust resistant
Manual	3R-682.600-244	3R-605.2 (x4)	MacroMagnum -> Macro
Pneumatic	3R-772-680A	3R-605.1 / 3R-605.4	Dynafix -> MacroMagnum

## MacroMagnum – Chuck adapters

### Pneumatic chuck adapter, MacroMagnum-Macro, 3R-682.600-A

Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-680.10-2A.

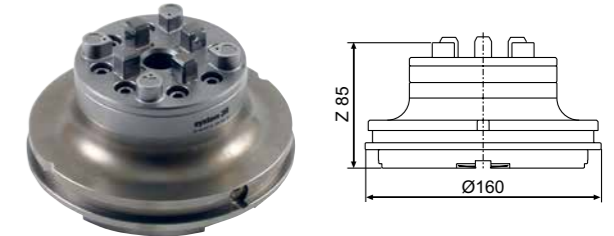
- Requires drawbar 3R-605.1
- Carbide X and Y-References
- Clamping force 6000 N
- Turbo locking
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.5 kg



### Pneumatic chuck adapter, MacroMagnum-Macro, 3R-682.600-RS

Chuck adapter with built-in Pneumatic Macro chuck.

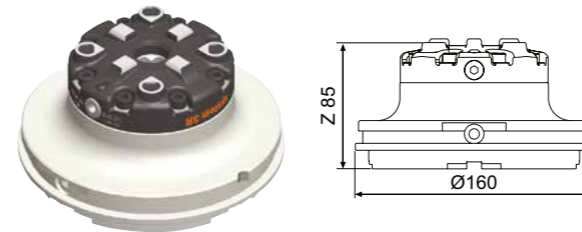
- Requires drawbar 3R-605.1RS
- Carbide X and Y-References
- Rust resistant
- Clamping force 6000 N
- Turbo locking
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.8 kg



### 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 and Y-References
- Clamping force 6000 N
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.3 kg

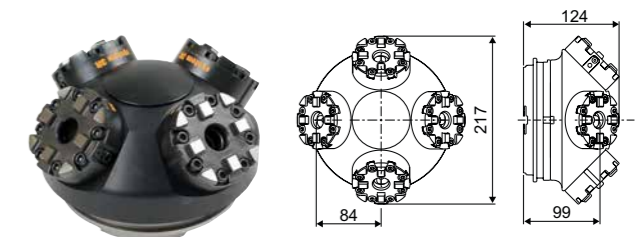


### Manual Multi Station, MacroMagnum-Macro, 3R-682.600-244

Multi holder with 4 Macro chucks (prepared for total 5 chucks). Angeled positions clears the paths for machine tools.

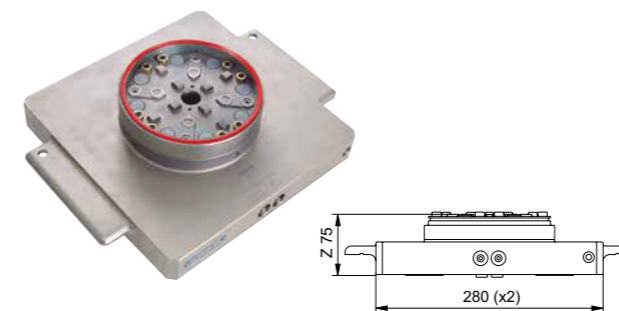
**NOTE:** Also available with 5 Macro chucks, ask for 3R-682.600-245

- Requires drawbar 3R-605.2 (x4)
- Optimal for 5-axis machines.
- Macro chucks 3R-600.24-S, included, 4 pcs.
- Mounted onto a MacroMagnum pallet.
- Weight 10 kg



### Pneumatic chuck adapter, Dynafix-MacroMagnum, 3R-772-680A

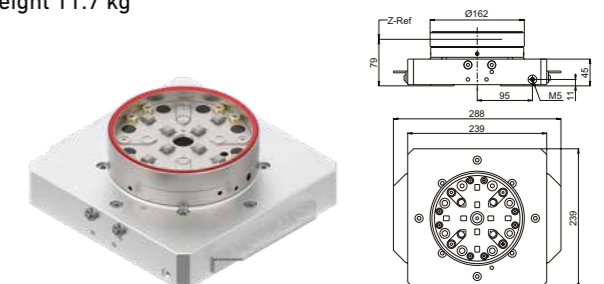
Chuck adapter with built-in pneumatic MacroMagnum chuck for mounting in 3R-770-1A or similar. See Dynafix for further information.



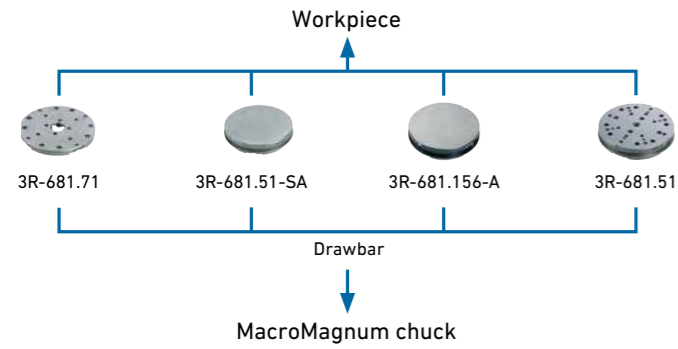
### Pneumatic chuck adapter, GPS 240-MacroMagnum, C522540

Chuck adapter with built-in pneumatic Macro Magnum chuck for mounting in C219800.

- Built-up height 79 mm
- X/Y-centring with springy cams, hardened, stainless
- MacroMagnum chuck 3R-90809.03
- Drawbar 3R-605.1 or 3R-605.4
- Adapted for automatic changing
- Weight 11.7 kg



## MacroMagnum – Pallets



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

Reference element Ø142 mm	Article number	Feature
Hardened reference element 12.5 mm	3R-681.71	rust-resistant

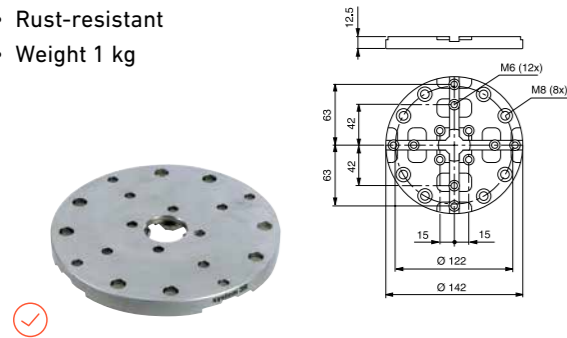
Pallets Ø156 mm	Article number	Feature
Unhardened pallet 35 mm	3R-681.51-SA	
Unhardened pallet 35 mm	3R-681.156-A	reference element Ø142 mm
Hardened pallet 35 mm	3R-681.51	3Refix Ø10 mm

### Reference element Ø142 mm, 3R-681.71

Hardened reference element with clearance holes for fixing screws.

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

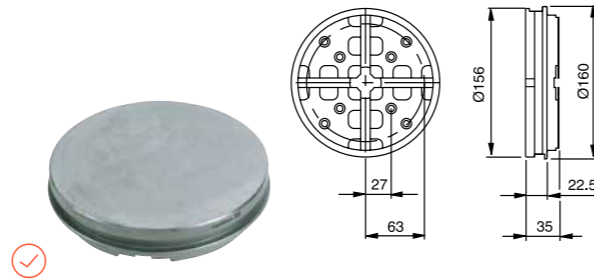
- Rust-resistant
- Weight 1 kg



### 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



### Pallet Ø156 mm, 3R-681.156-A

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

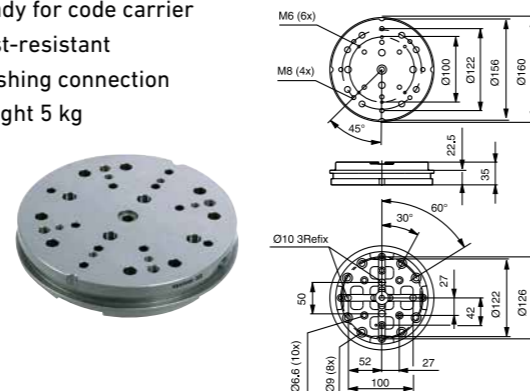
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg



### 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



## MacroMagnum – accessories

### Drawbars

#### 3R-605.1E

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



#### 3R-605.2E

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



#### 3R-605.4E

For round pallets adapted for automatic changing.

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



#### 3R-605.1EE

- Supplied in sets of 40 pcs

#### 3R-605.2EE

- Supplied in sets of 20 pcs

### Drawbars

#### 3R-605.1RS

- Drawbar Ø20x57.1 mm with flushing hole Ø7 mm



#### 3R-605.2RS

- Drawbar Ø20x36.9 mm with flushing hole Ø7 mm

#### 3R-605.2E-RS

- Sets of 5 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.

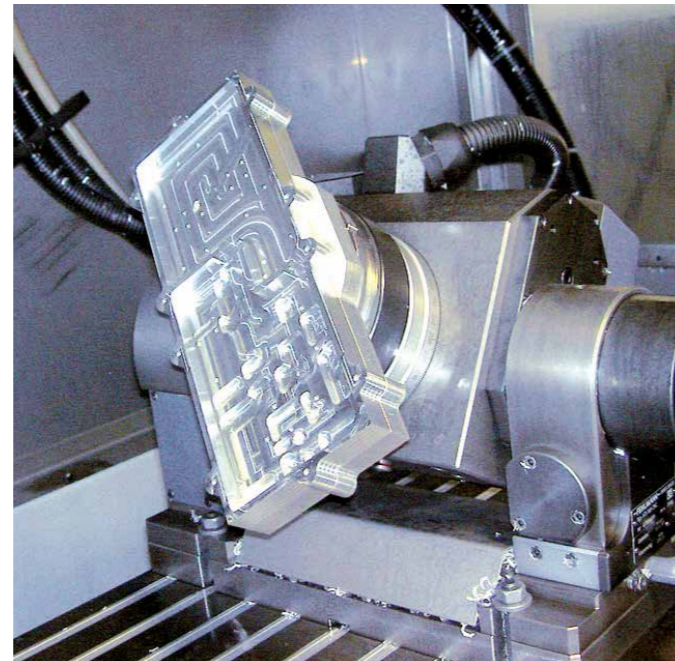
- Supplied in sets of 2 pcs



### Code carriers, 3R-863.01-10

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

- Supplied in sets of 10 pcs



## MacroMagnum – Accessories

### 3Refix mandrel, 3R-901-10E-TX

- 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 and manual MacroMagnum chucks.

- 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.



### Clamping force meter kit, 3R-SSP115-BASE

For both pneumatic and manual chucks. This stand alone unit in combination with individual drawbars or drawbar kits, able to cover MacroJunior, Macro, MacroMagnum and Dynafix.

**NOTE:** Require drawbars with bayonet interface similar to 3R-605.1.

- Add-on kit for use in Macro/MacroMagnum, 3R-SSP115-Macro
- Operating temp. +10 to +40° C
- Gauge size Ø90x47 mm
- Working range 1-22 kN
- Deviation ± 0.1 kN
- Weight:
  - Display 0.34 kg
  - Gauge 1.3 kg



### Add-on kit, 3R-SSP115-Macro

Add-on kit for 3R-SSP115-BASE



# Matrix in details



## Matrix

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.

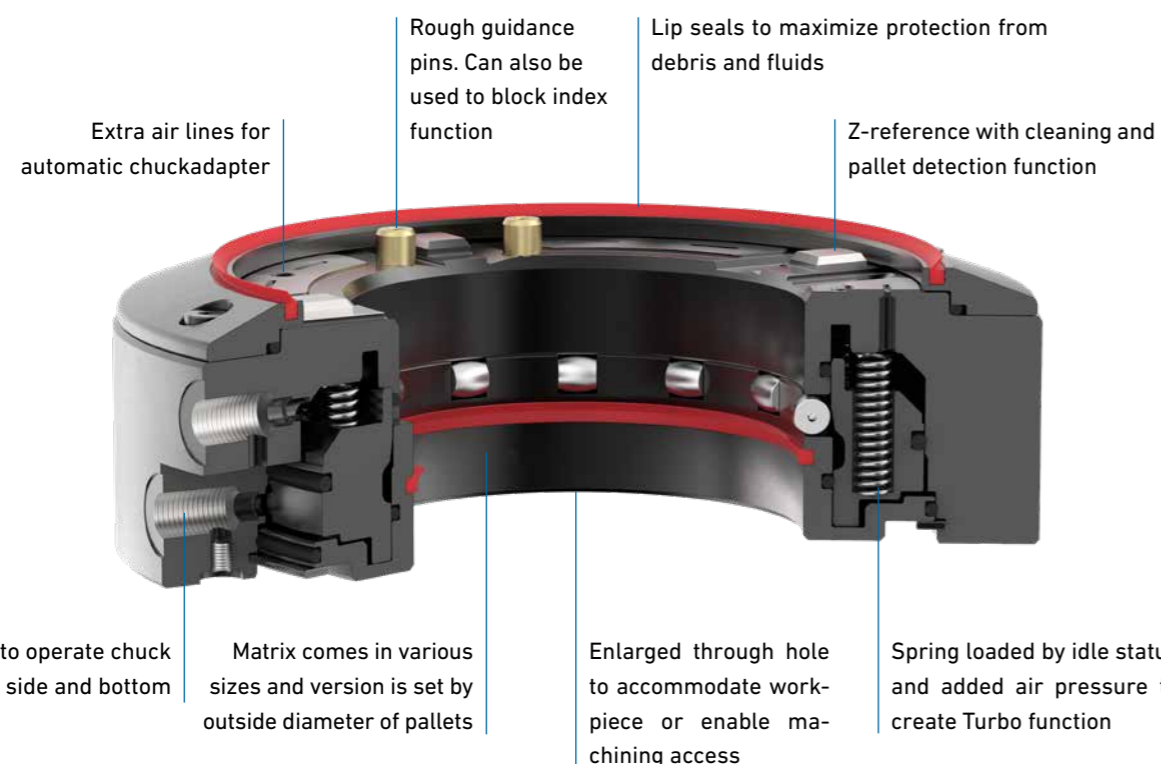
As well as extreme accuracy, Matrix features low construction height, ultra-precise indexing, a drawbar with through hole. The

through hole allows high/long workpieces to be sunk into the chuck for stable/rigid fixation.

- Repetition accuracy:
  - Matrix 110 and Matrix 142 within 0.002 mm
  - Matrix 185, Matrix 220 and Matrix 260 within 0.003 mm
- Fixed index positions: 4x90°
- Required air pressure, pneumatic chuck: 6±1 bar
- Clamping force:
  - Matrix 110: 9000 N
  - Matrix 142: 15000 N
  - Matrix 185: 20000 N
  - Matrix 220: 23000 N
  - Matrix 260: 28000 N
- Max workpiece weight (manual loading):
  - Matrix 110: 50 kg
  - Matrix 142 and Matrix 185: 100 kg
  - Matrix 220 and Matrix 260: 200 kg

### Advantages

- 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.

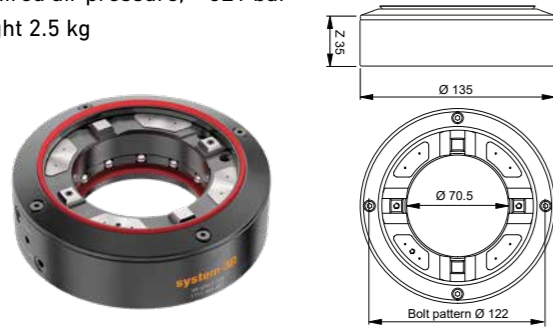


## Matrix 110

### Pneumatic chuck, Matrix 110, 3R-690.1-110

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

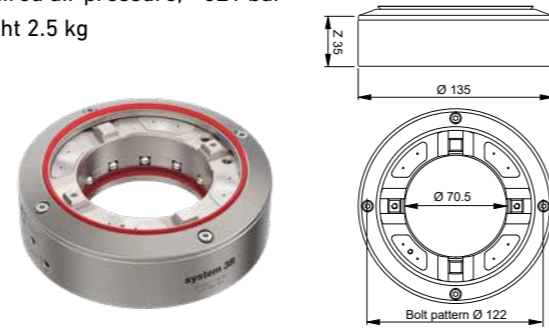
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.5 kg



### Pneumatic chuck, Matrix 110, 3R-690.1-110-RS

Chuck for permanent mounting on the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Required drawbar 3R-695.2-110RS
- Required air pressure, - 6±1 bar
- Weight 2.5 kg



### Pneumatic built-in chuck, Matrix 110, 3R-SP28395

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

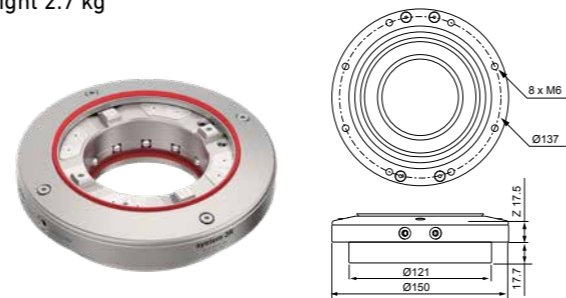
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.7 kg



### Pneumatic built-in chuck, Matrix 110, 3R-SP28395-RS

Chuck for permanent mounting in the machine table.

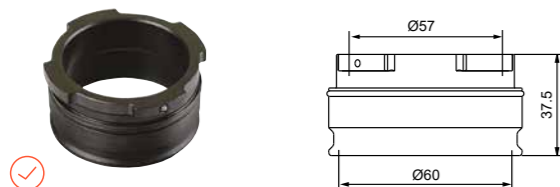
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Required drawbar 3R-695.2-110RS
- Required air pressure, - 6±1 bar
- Weight 2.7 kg



### Drawbar, Matrix 110, 3R-695.2-110

- Weight 0.3 kg

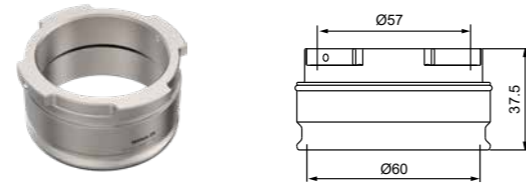
**NOTE:** In automation the gripper has to grip on the pallet and not on the drawbar.



### Drawbar, Matrix 110, 3R-695.2-110RS

- Rust resistant
- Weight 0.3 kg

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

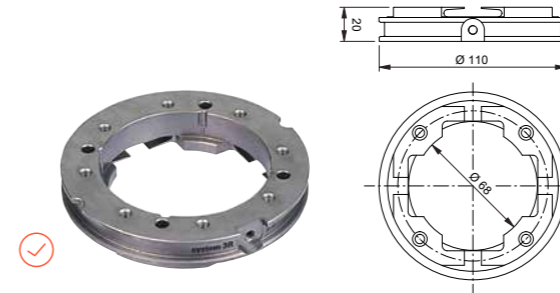


## Matrix 110

### Pallet, Matrix 110, 3R-691.1-110

- Fixed index positions 4x90°
- Permissible press load 25 ton
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110 or similar
- Adapted for automatic changing
- Weight 0.5 kg

**NOTE:** Not self carrying, requires extra support.



### Collet chuck ER20, Matrix 110, 3R-699.20-110D

The pallet can be flipped over to gain access from rear side.

- Range for collets Ø1-13 mm
- Recommended drawbar 3R-695.2-110
- Adapted for automatic changing
- Weight 1.3 kg



### Check ruler, Matrix 110, 3R-696.1-110

For setting flatness and angular positions.

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



### Adapter, Matrix 110-Ø20, 3R-SP31380-RS

Intended to fit cut tools with Ø20 mm. Also adapted to fit System 3R Mini electrode holders with Ø20 mm.

- Rust resistant
- Weight 2.9 kg



### Air gun interface, Matrix 110, 3R-SP29185

Dedicated attachment enabling use of air gun for 3R-690.1-110 and 3R-690.1-110-RS.

- Weight 0.5 kg



### Index blocker-pin, Matrix 110, 3R-SP29196

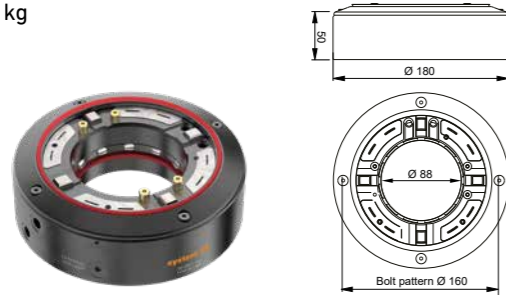


## Matrix 142

### Pneumatic chuck, Matrix 142, 3R-690.1-142

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

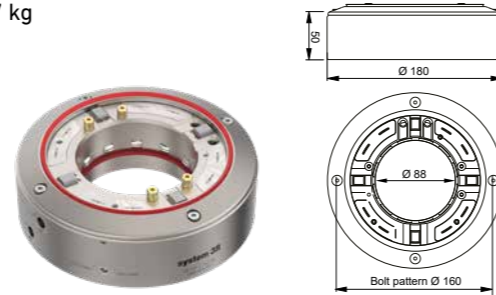
- Fixed index positions 4x90°
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, - 6±1 bar
- Weight 7 kg



### Pneumatic chuck, Matrix 142, 3R-690.1-142-RS

Chuck for permanent mounting on the machine table.

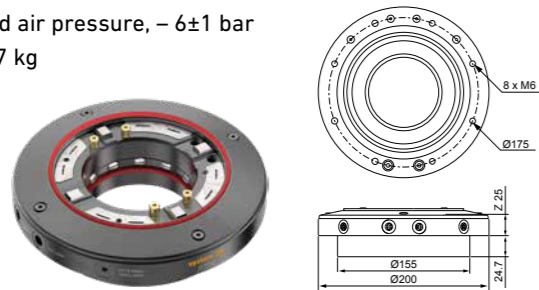
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Required drawbar 3R-695.2-142RS
- Required air pressure, - 6±1 bar
- Weight 7 kg



### Pneumatic built-in chuck, Matrix 142, 3R-SP28219

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

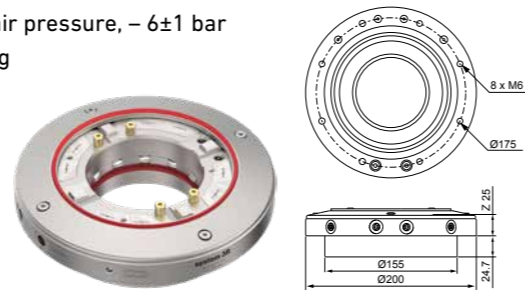
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, - 6±1 bar
- Weight 7 kg



### Pneumatic built-in chuck, Matrix 142, 3R-SP28219-RS

Rust resistant chuck for permanent mounting in the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142RS
- Required air pressure, - 6±1 bar
- Weight 7 kg



### Drawbar, Matrix 142, 3R-695.2-142

- Weight 0.5 kg

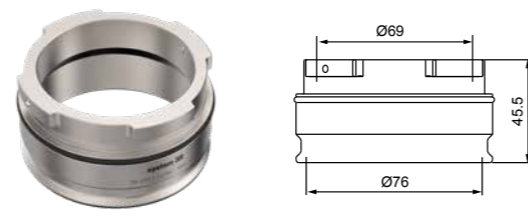
**NOTE:** In automation the gripper has to grip on the pallet and not on the drawbar.



### Drawbar, Matrix 142, 3R-695.2-142RS

- Rust resistant
- Weight 0.5 kg

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

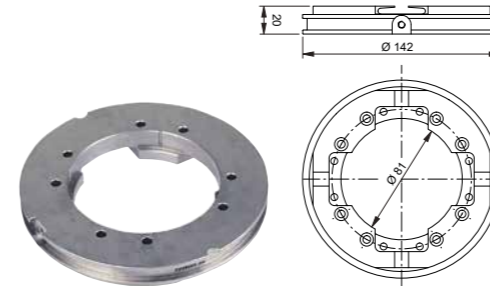


## Matrix 142

### Pallet, Matrix 142, 3R-691.1-142

- Fixed index positions 4x90°
- Permissible press load 75 ton
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142 or similar
- Adapted for automatic changing
- Weight 1.2 kg

**NOTE:** Not self carrying, requires extra support.



### Check ruler, Matrix 142, 3R-696.1-142

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

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



### Collet chuck ER20, Matrix 142, 3R-699.20-142D

The pallet can be flipped over to gain access from rear side.

- Range for collets Ø1-13 mm
- Recommended drawbar 3R-695.2-142
- Adapted for automatic changing
- Weight 3.1 kg



### Collet chuck ER40, Matrix 142, 3R-699.40-142D

The pallet can be flipped over to gain access from rear side.

- Range for collets Ø3-30 mm
- Recommended drawbar 3R-695.2-142
- Adapted for automatic changing
- Weight 3.4 kg



### Adapter, Matrix 142-Capto C6, 3R-SP30752

From Matrix 142 to Capto C6 system.

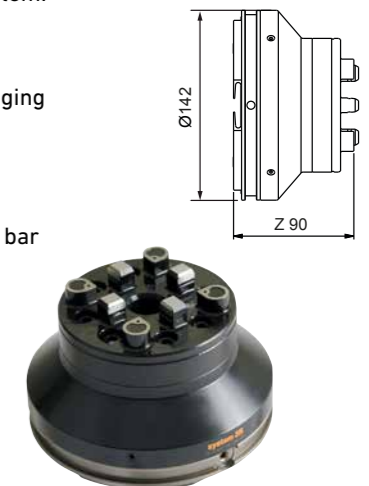
- Solid XY-references
- Rust resistant
- Recommended clamping torque 30 Nm
- Adapted for automatic changing
- Weight 3.9 kg



### Adapter, Matrix 142-Macro, 3R-SP30997

From Matrix 142 to Macro system.

- Required drawbar 3R-605.1
- Fixed index positions 4x90°
- Adapted for automatic changing
- Hardened references
- Clamping force 6 000 N
- Permissible torque 300 Nm
- Required air pressure, - 6±1 bar
- Weight 7 kg



## Matrix 142

### Handle device, Matrix 142, 3R-692.7-142

A holding device for lifting pallet.

- Weight 0.9 kg



### Lifting aid, Matrix 142, 3R-692.8-142

Cradle to support 3R-692.7-110 and 3R-692.7-142 for lifting by crane.

- Weight 1.5 kg



### Index blocker-pin, Matrix 142, 3R-SP29533E

Replace two rough guidance pins for function of blocking index functionality.



#### Matrix application:

Pallet with special fixture for protruding workpiece in this case a "hip joint".



## 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 20 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, - 6±1 bar
- Weight 9 kg



### Pneumatic chuck, Matrix 185, 3R-690.1-185-RS

Rust resistant chuck for permanent mounting on the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 20 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185RS
- Required air pressure, - 6±1 bar
- Weight 9 kg



### Pneumatic built-in chuck, Matrix 185, 3R-SP28268

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

- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 20 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, - 6±1 bar
- Weight 10.6 kg



### Pneumatic built-in chuck, Matrix 185, 3R-SP28268-RS

Chuck for permanent mounting in the machine table.

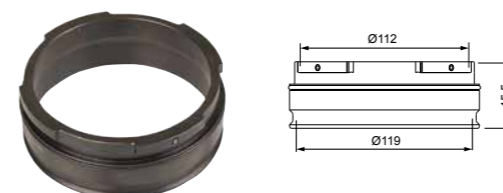
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 20 000 N
- Required drawbar 3R-695.2-185RS
- Required air pressure, - 6±1 bar
- Weight 10.6 kg



### Drawbar, Matrix 185, 3R-695.2-185

- Weight 0.8 kg

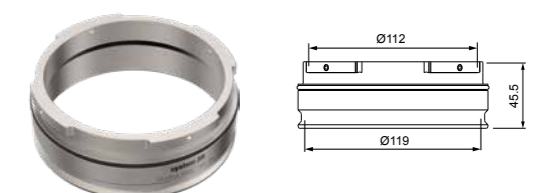
**NOTE:** In automation the gripper has to grip on the pallet and not on the drawbar.



### Drawbar, Matrix 185, 3R-695.2-185RS

- Rust resistant
- Weight 0.8 kg

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

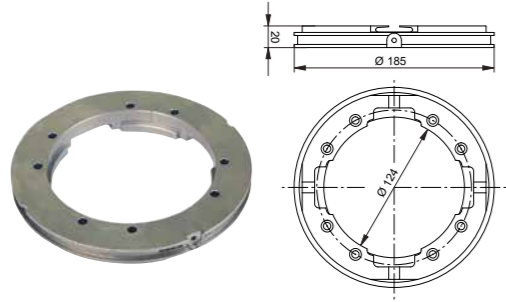


## Matrix 185

### Pallet, Matrix 185, 3R-691.1-185

- Fixed index positions 4x90°
- Permissible press load 100 ton
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185 or similar
- Adapted for automatic changing
- Weight 1.7 kg

**NOTE:** Not self carrying, requires extra support.



### Check ruler, Matrix 185, 3R-696.1-185

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

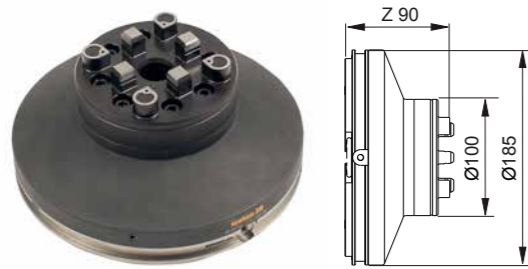
- Ready for code carrier
- Measuring length 125 mm.
- Adapted for automatic changing
- Weight 5.7 kg



### Chuck adapter, Matrix 185-Macro, 3R-SP29998

From Matrix 185 into Macro system. Chuck adapter with built-in Macro chuck.

- Required drawbar 3R-605.1
- Built in height 90 mm
- Hardened references
- Weight 8 kg



### Handle device, Matrix 185, 3R-692.7-185

A holding device for lifting pallet.

- Weight 1.8 kg



### Lifting aid, Matrix 185, 3R-692.8-220

Craddle to support 3R-682.7-156, 3R-692.7-185 and 3R-692.7-220 for lifting by crane.

- Weight 2.5 kg



### Index blocker-pin, Matrix 185, 3R-SP29533E

Replace two rough guidance pins for function of blocking index functionality.



## 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°
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, - 6±1 bar
- Weight 11 kg



### Pneumatic chuck, Matrix 220, 3R-690.1-220-RS

Rust resistant chuck for permanent mounting on the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220RS
- Required air pressure, - 6±1 bar
- Weight 11 kg



### Pneumatic built-in chuck, Matrix 220, 3R-SP28340

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

- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, - 6±1 bar
- Weight 10.6 kg



### Pneumatic built-in chuck, Matrix 220, 3R-SP28340-RS

Rust resistant chuck for permanent mounting in the machine table.

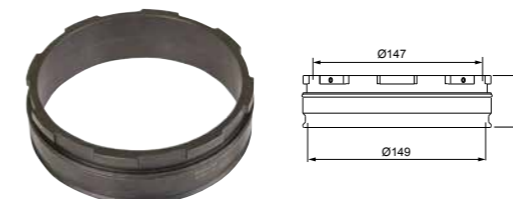
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220RS
- Required air pressure, - 6±1 bar
- Weight 10.6 kg



### Drawbar, Matrix 220, 3R-695.2-220

- Weight 1.3 kg

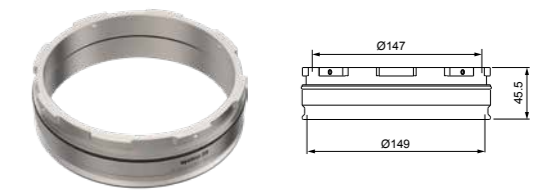
**NOTE:** In automation the gripper has to grip on the pallet and not on the drawbar.



### Drawbar, Matrix 220, 3R-695.2-220RS

- Rust resistant
- Weight 0.8 kg

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



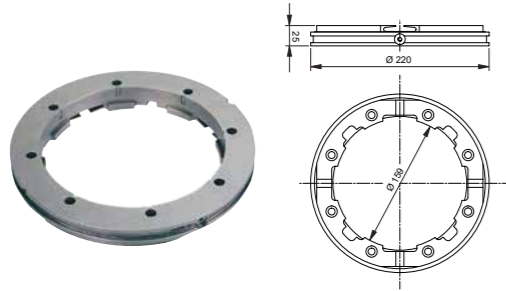


## Matrix 220

### Pallet, Matrix 220, 3R-691.1-220

- Fixed index positions 4x90°
- Permissible press load 150 ton
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220 or similar
- Adapted for automatic changing
- Weight 2.6 kg

**NOTE:** Not self carrying, requires extra support.



### Check ruler, Matrix 220, 3R-696.1-220

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

- Ready for code carrier
- Measuring length 150 mm.
- Adapted for automatic changing
- Weight 7.5 kg



## Matrix 220 and accessories

### Handle device, Matrix 220, 3R-692.7-220

A holding device for lifting pallet.

- Weight 1.5 kg



### Lifting aid, Matrix 220, 3R-692.8-220

Cradle to support 3R-682.7-156, 3R-692.7-185 and 3R-692.7-220 for lifting by crane.

- Weight 2.5 kg

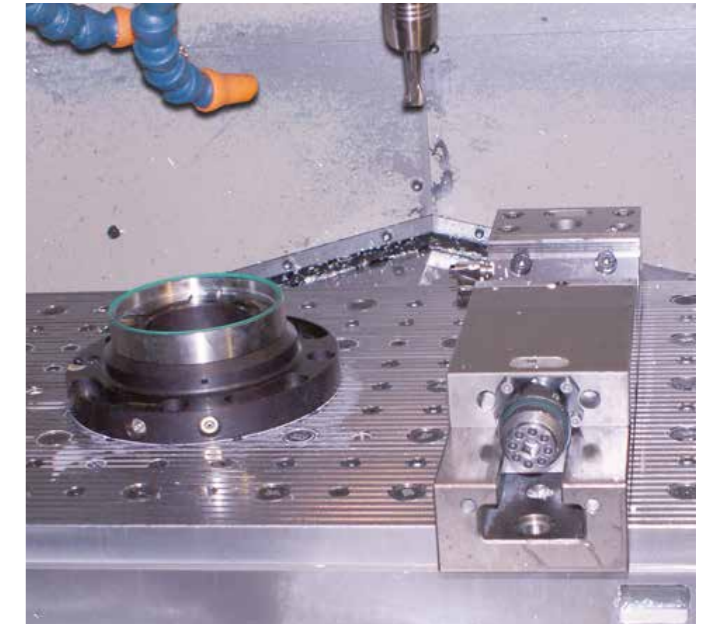


### Matrix application:

The pallet is turnable for machining of both sides of a workpiece.

### Index blocker-pin, Matrix 220, 3R-SP29559E

Replace four rough guidance pins for function of blocking index functionality.



### 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

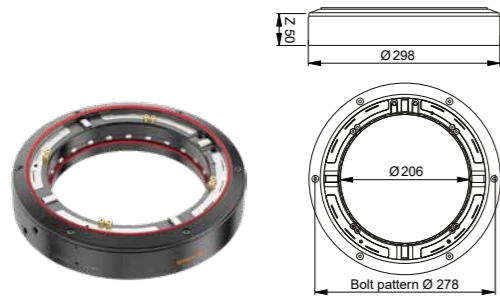


## Matrix 260

### Pneumatic chuck, Matrix 260, 3R-690.1-260

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

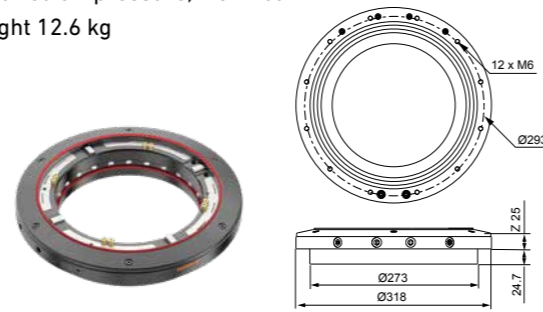
- Fixed index positions 4x90°
- Hardened references
- Clamping force 28 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, – 6±1 bar
- Weight 13 kg



### Pneumatic built-in chuck, Matrix 260, 3R-SP28345

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

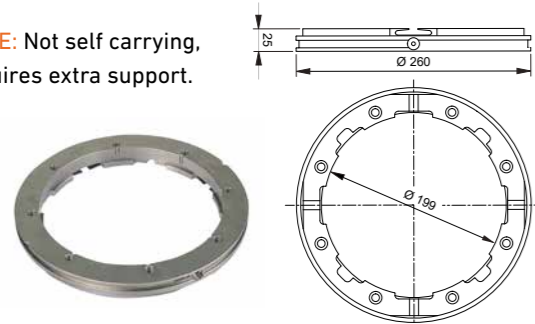
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 28 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, – 6±1 bar
- Weight 12.6 kg



### Pallet, Matrix 260, 3R-691.1-260

- Fixed index positions 4x90°
- Permissible press load 200 ton
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260 or similar
- Adapted for automatic changing
- Weight 3.2 kg

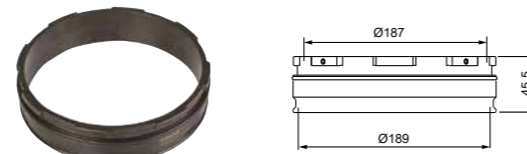
**NOTE:** Not self carrying, requires extra support.



### Drawbar, Matrix 260, 3R-695.2-260

- 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.

- Ready for code carrier
- Measuring length 200 mm.
- Adapted for automatic changing
- Weight 10 kg



### Index blocker-pin, Matrix 260, 3R-SP29559E

Replace four rough guidance pins for function of blocking index functionality.



# MatrixNano

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.

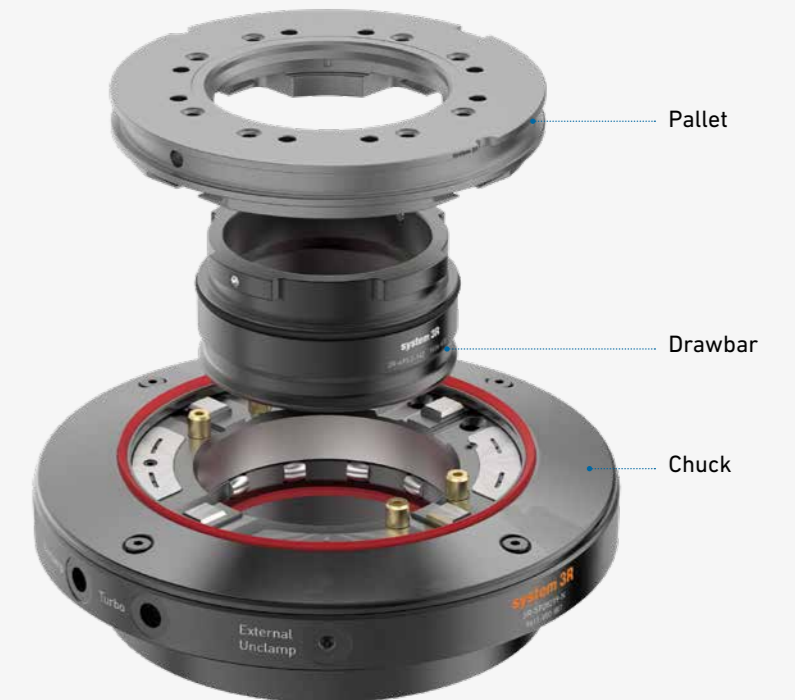
As well as extreme accuracy, Matrix features low construction height, ultra-precise indexing, a drawbar with through hole. The

through hole allows high/long workpieces to be sunk into the chuck for stable/rigid fixation.

- Repetition accuracy:
  - Matrix 110 Nano and Matrix 142 Nano within 0.001 mm
- Fixed index positions: 4x90°
- Required air pressure, pneumatic chuck: 6±1 bar
- Clamping force:
  - Matrix 110: 9000 N
  - Matrix 142: 15000 N
  - Matrix 185: 20000 N
  - Matrix 220: 23000 N
  - Matrix 260: 28000 N
- Max workpiece weight (manual loading):
  - Matrix 110: 50 kg
  - Matrix 142 and Matrix 185: 100 kg
  - Matrix 220 and Matrix 260: 200 kg

### Advantages

- 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



# MatrixNano in details



## Matrix 110 Nano

### Pneumatic chuck, Matrix 110 Nano, 3R-690.1-110-N

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

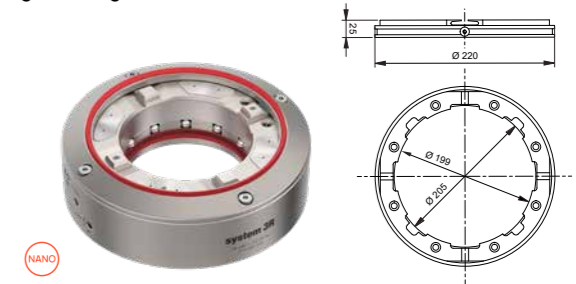
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.5 kg



### Pneumatic chuck, Matrix 110 Nano, 3R-690.1-110-RS-N

Chuck for permanent mounting on the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Required drawbar 3R-695.2-110RS
- Required air pressure, - 6±1 bar
- Weight 2.5 kg



### Pneumatic built-in chuck, Matrix 110 Nano, 3R-SP28395-N

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

- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.7 kg



### Pneumatic built-in chuck, Matrix 110 Nano, 3R-SP28395-RS-N

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

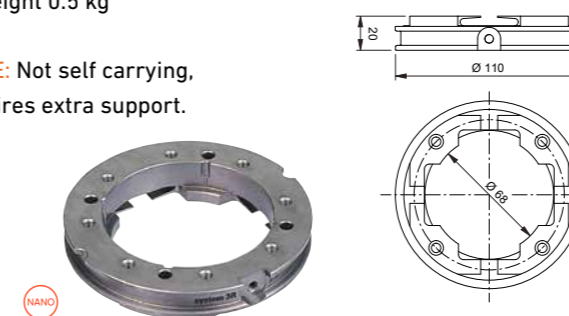
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.7 kg



### Pallet, Matrix 110 Nano, 3R-691.1-110-N

- Fixed index positions 4x90°
- Permissible press load 25 ton
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110 or similar
- Adapted for automatic changing
- Weight 0.5 kg

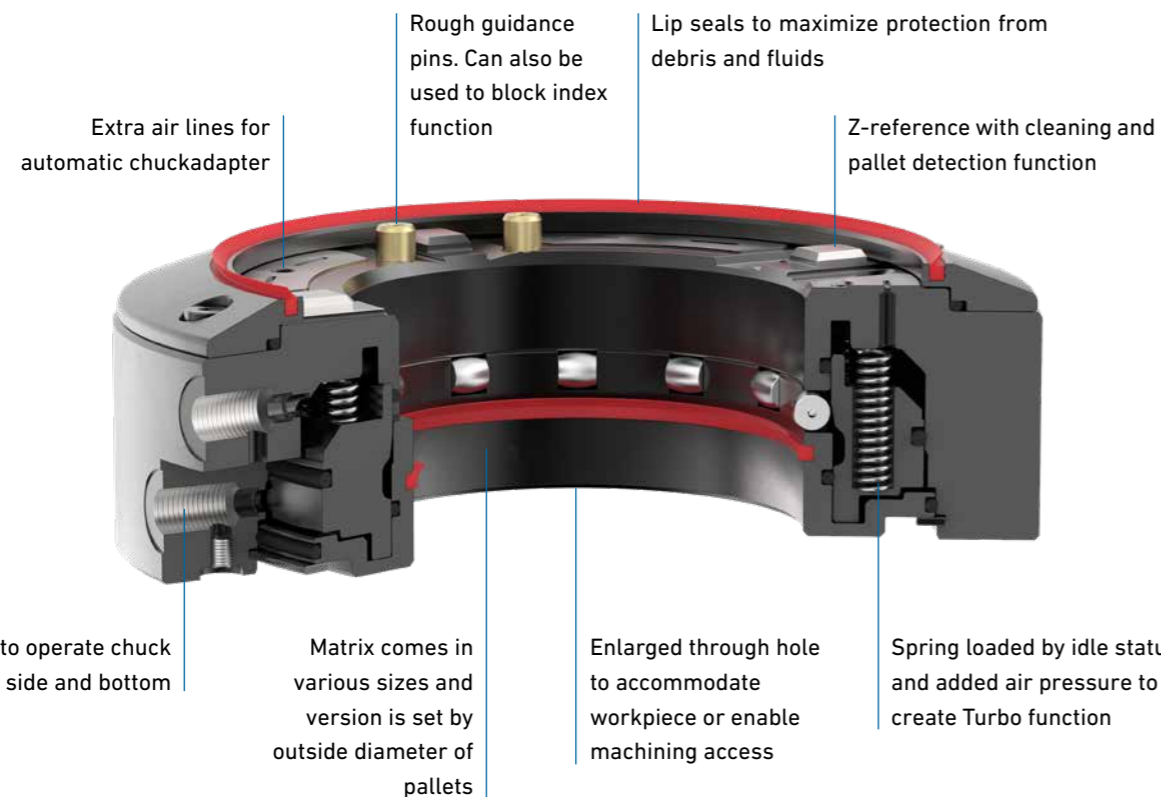
**NOTE:** Not self carrying, requires extra support.



### Check ruler, Matrix 110 Nano, 3R-696.1-110-N

For setting flatness and angular positions.

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

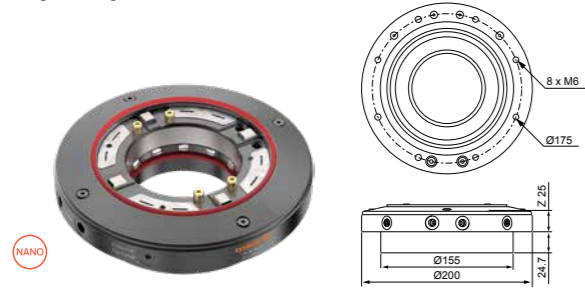


## Matrix 142 Nano

### Pneumatic built-in chuck, Matrix 142 Nano, 3R-SP28219-N

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

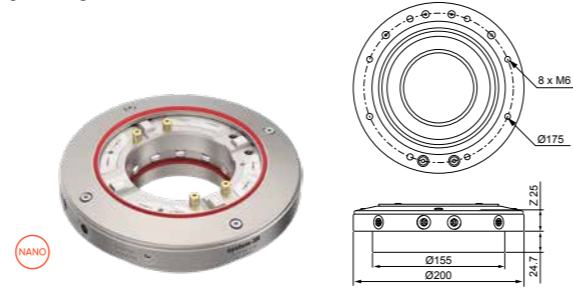
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, – 6±1 bar
- Weight 7 kg



### Pneumatic built-in chuck, Matrix 142 Nano, 3R-SP28219-RS-N

Rust resistant chuck for permanent mounting in the machine table.

- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142RS
- Required air pressure, – 6±1 bar
- Weight 7 kg



### Pneumatic chuck, Matrix 142 Nano, 3R-690.1-142-N

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

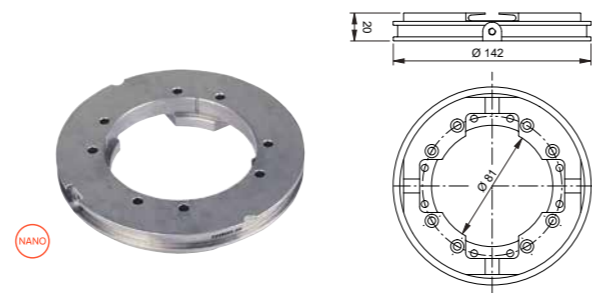
- Fixed index positions 4x90°
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, – 6±1 bar
- Weight 7 kg



### Pallet, Matrix 142 Nano, 3R-691.1-142-N

- Fixed index positions 4x90°
- Permissible press load 75 ton
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142 or similar
- Adapted for automatic changing
- Weight 1.2 kg

**NOTE:** Not self carrying, requires extra support.



### Check ruler, Matrix 142 Nano, 3R-696.1-142-N

For setting flatness and angular positions.

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



## GPS 240

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.

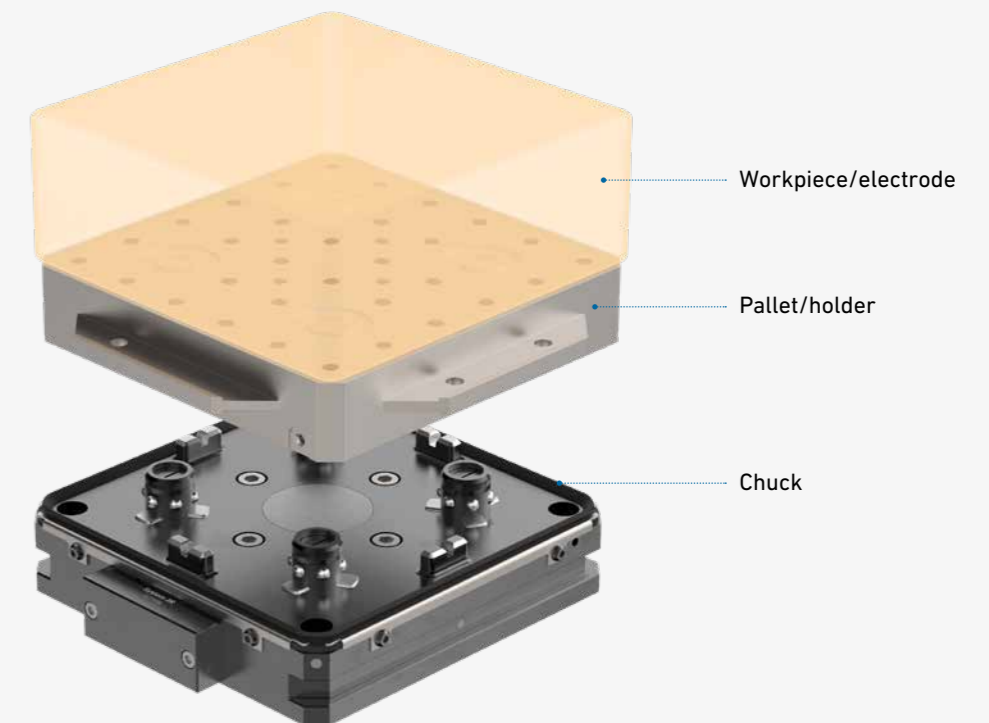
The chuck seal prevents dirt penetrating between the chuck and

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 within 0.002 mm
- Indexing accuracy within 0.005 mm
- Clamping force: 25 000 N (with force boost 50 000 N)
- Fixed index positions: 4x90°
- Required air pressure, pneumatic chuck: 6 bar
- Max workpiece weight (manual loading): 150kg

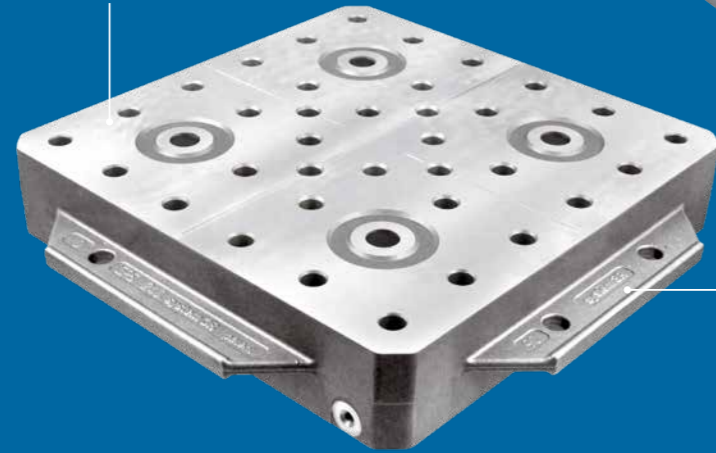
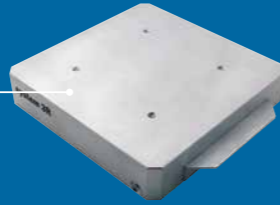
### Advantages

- Reduces setting-up times.
- Ensures precision and quality.
- Is sealed against dirt and swarf.
- Has lightweight pallets.
- Suitable for automatic changing with System 3R's automation program



# GPS 240 in details

Die-cast aluminium pallets with standardised hole pattern or solid aluminium pallets

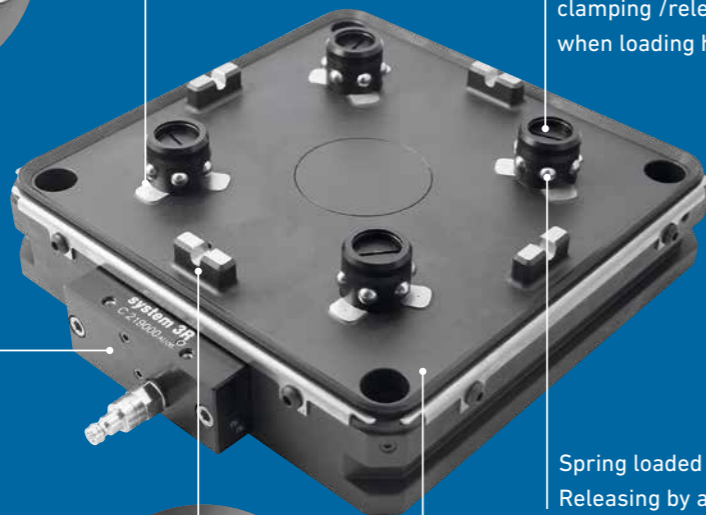


Pallet with handles for manual pallet handling or automated pallet change by robot



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

A lifting mechanism which operates on clamping /releasing protects the references when loading heavy workpieces

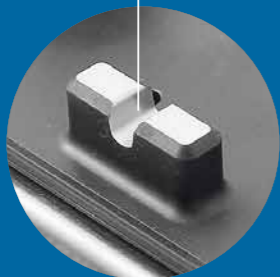


Connection bloc

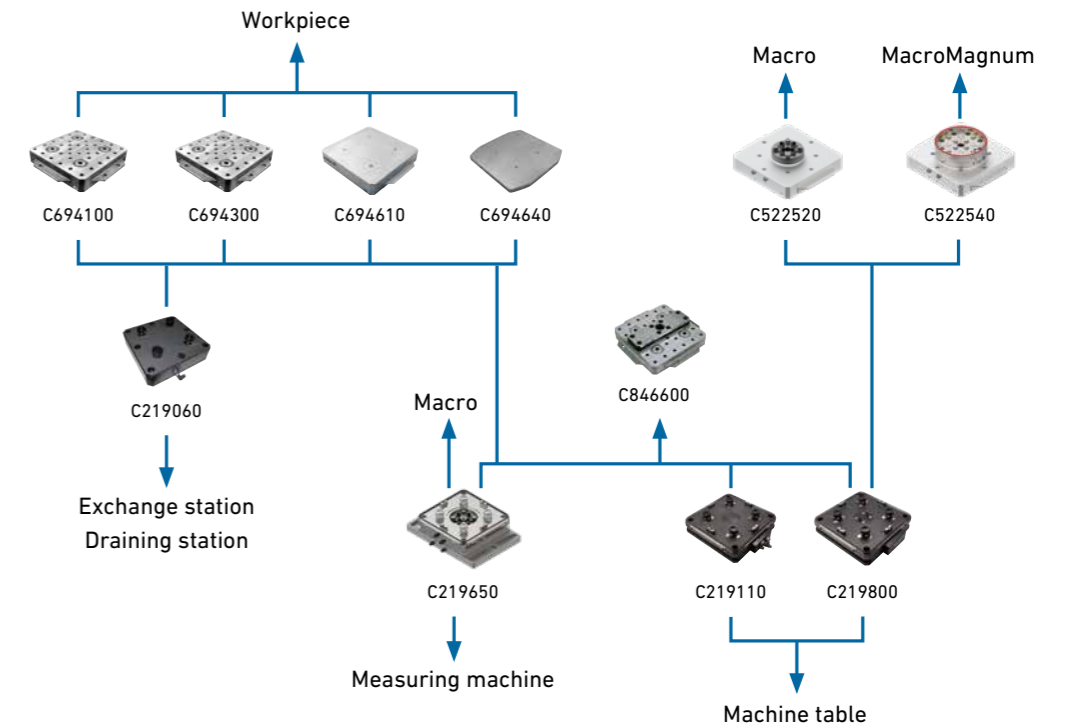
Spring loaded clamping mechanism. Releasing by air

Hardened chuck body with prisms for X/Y centring made out of one piece for maximum stability. Indexing 4 x 90°





Seal for a completely sealed chuck-pallet interface against dirt and swarf





## GPS 240 – Chucks



Chucks, square	Article number	Feature
Pneumatic automatic/manual	C219110	for manual and automatic machining operations
Pneumatic automatic/manual	C219650	built-in pneumatic Macro chuck
Pneumatic automatic/manual	C219800	connection from below, 2-fold Airdock
Pneumatic automatic/manual	C210060	dummy chuck

Pallets, square	Article number	Feature	Size (mm)
Cast aluminium 	C694100		240x240
Cast aluminium 	S694300	ground	240x240
Solid aluminium 	S 694610		240x240
Solid aluminium 	C694640		300x300

 Pallet with spring-loaded pin.

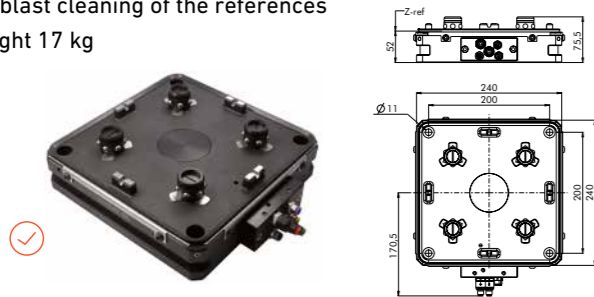
 Pallet with coined cams.

## GPS 240 – Chucks

### GPS 240 Chuck automatic, C219110

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

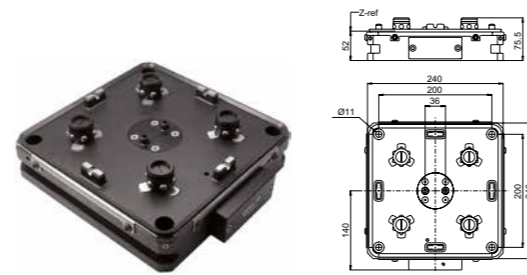
- Required air pressure 6 bar
- 5 air connections
- Repetition accuracy 0.002 mm
- Indexing accuracy 0.005 mm
- Clamping force 25 000 N/50 000 N
- Recommended control unit C810830
- Air-blast cleaning of the references
- Weight 17 kg



### GPS 240 Chuck automatic with 2-fold Airdock, C219800

For manual and automatic machining operations.

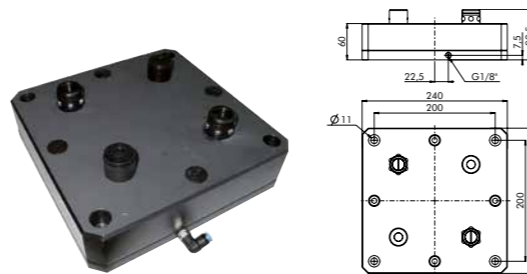
- Building-in height 52 mm
- Air connections positioned centrally on the underside - prism - Z-claing - clamping/releasing - Turbo/ventilation
- Medium connection 2-fold
- Clamping force 25 000 N/50 000 N
- Weight 17 kg



### GPS 240 Dummy chuck, C210060

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

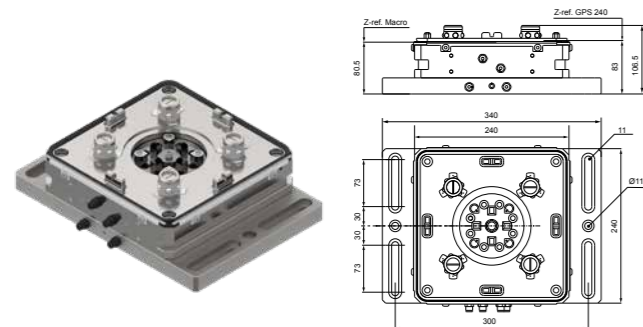
- Required air pressure 6 bar
- Weight 9.5 kg



### GPS 240 Pneumatic chuck with built-in Macro chuck, C 219 650

Pneumatic chuck with built-in Macro chuck. Intended mainly for measuring machines. The following pallets can be mounted in GPS 240 by means of C 219 650: Macro 54x54 mm and Macro 70x70 mm

- Required air pressure 6 bar
- Air-blast cleaning of the references
- Weight 24 kg



## GPS 240 – Pallets

### GPS 240 Pallet 'EDM/Grinding', C694100

Cast aluminium pallet.

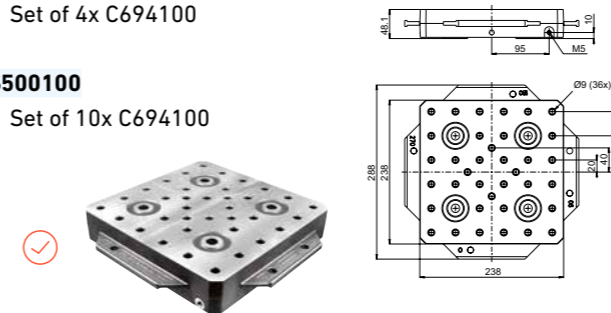
- Construction height 48.1 ±0.01 mm
- X/Y-centring with spring-loaded pin
- Recommended workpiece weight 100 kg
- Supplied with C531500 sealing plugs
- Weight 4.8 kg

#### S500090

- Set of 4x C694100

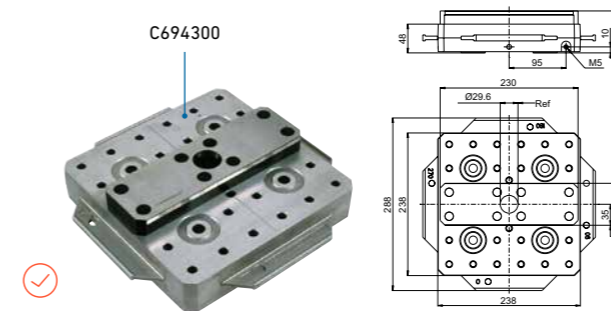
#### S500100

- Set of 10x C694100



### GPS 240 Master pallet, C846600

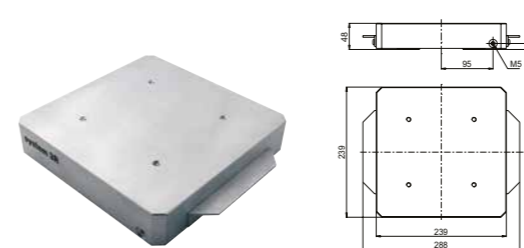
The pallet has a ground reference ruler and a ground indication hole for alignment of the references.



### GPS 240 Pallet 240x240 mm, C694610

Solid aluminium pallet.Suitable for fixtures and accessories.

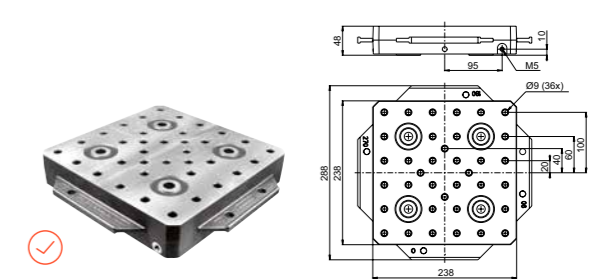
- Prepared for automation.
- Construction height 48 ±0.01 mm
- X/Y-centring with coined cam
- Recommended workpiece weight 150 kg.
- Weight 7.4 kg



### GPS 240 Pallet 'Adaptation', C694300

Ground cast aluminium pallet.Suitable for fixtures and accessories.

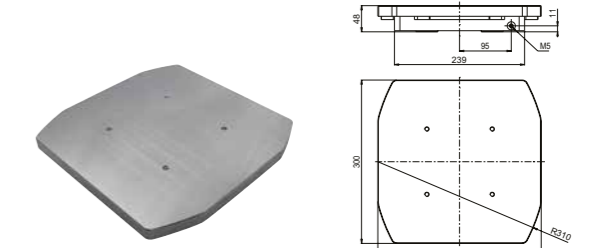
- Prepared for automation.
- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Recommended workpiece weight 100 kg
- Supplied with C531500 sealing plugs
- Weight 4.8 kg



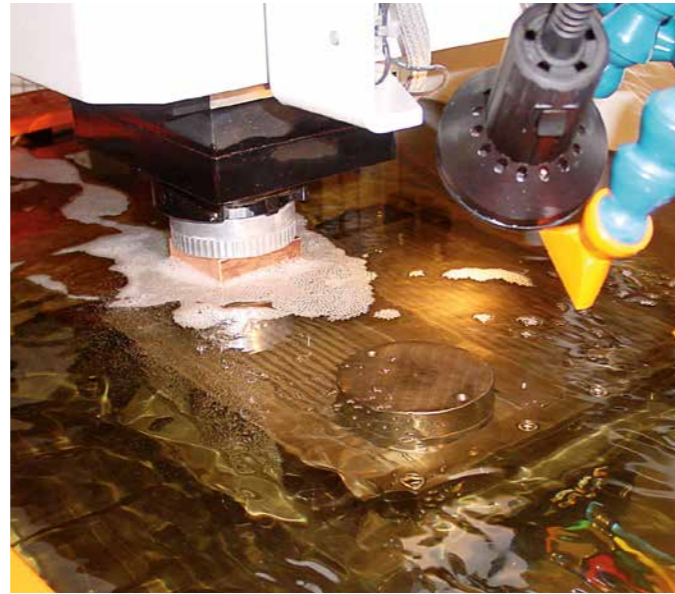
### GPS 240 Pallet 300x300 mm, C694640

Solid aluminium pallet.Suitable for fixtures and accessories.

- Prepared for automation.
- Construction height 48 ±0.01 mm
- X/Y-centring with coined cam
- Recommended workpiece weight 150 kg.
- Weight 9 kg



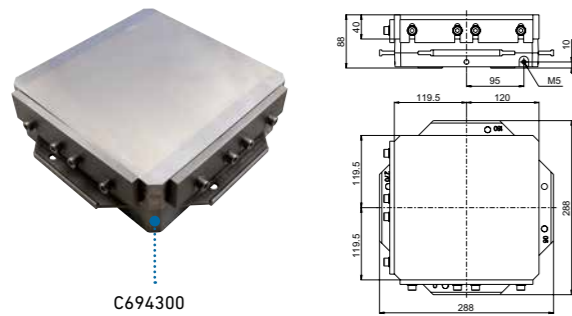
## GPS 240 – Accessories



### GPS 240 Magnetic table, C694260

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

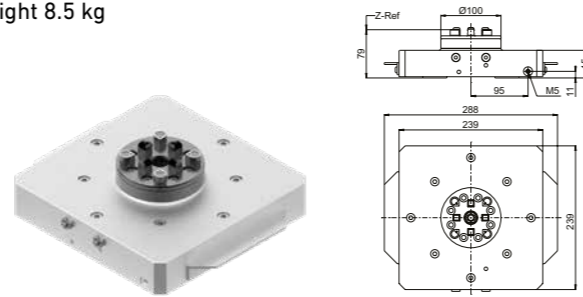
- Magnetic field height 5 mm
- Holding force 100 N/cm<sup>2</sup>
- Dimensions 240x240x88 mm
- Weight 23 kg



### Pneumatic chuck adapter, GPS 240-Macro, C522520

Chuck adapter with built-in pneumatic Macro chuck for mounting in C219800.

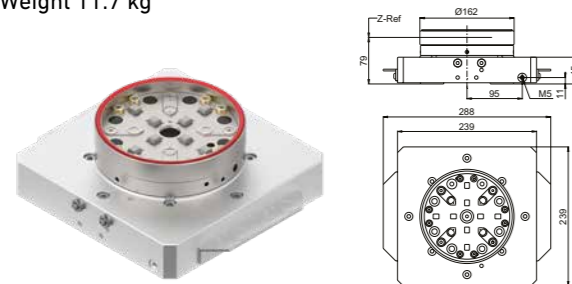
- Built-up height 79 mm
- X/Y-centring with springy cams, hardened, stainless
- Macro chuck 3R-SP24460
- Drawbar 3R-605.1 or 3R-605.4
- Adapted for automatic changing
- Weight 8.5 kg



### Pneumatic chuck adapter, GPS 240-MacroMagnum, C522540

Chuck adapter with built-in pneumatic Macro Magnum chuck for mounting in C219800.




- Built-up height 79 mm
- X/Y-centring with springy cams, hardened, stainless
- MacroMagnum chuck 3R-90809.03
- Drawbar 3R-605.1 or 3R-605.4
- Adapted for automatic changing
- Weight 11.7 kg



Other chuck adapters:

**GPS 240-GPS 70, C522810**

**GPS 240-GPS 120, C522800**

-  Pallet with springy hardened cams.
-  Pallet with spring-loaded pin.
-  Pallet with coined cams.

## GPS 240 – Accessories

### GPS 240 Controller, C810830

Unit for controlling pneumatic chucks C219110.

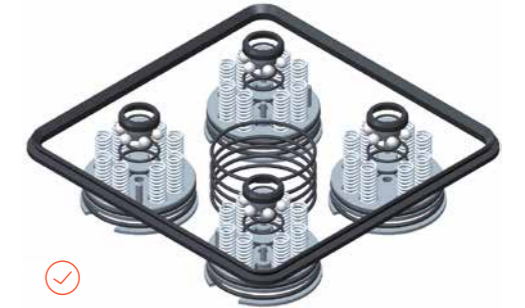
- 4 connections – X/Y-locating – air-blast cleaning of Z – open/lock – turbo/ventilation.



### GPS 240 Spare parts set, S220000

Contains all elements for a normal service.

- Suitable for all square chucks
- Recommendation: every 2 years if used manually and annually if used in the automation system.



### GPS 240 Chuck seal, C219007

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

- Material Viton
- Supplied singly



## GPS 240 – Accessories

### GPS 240 Seals, C531250

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

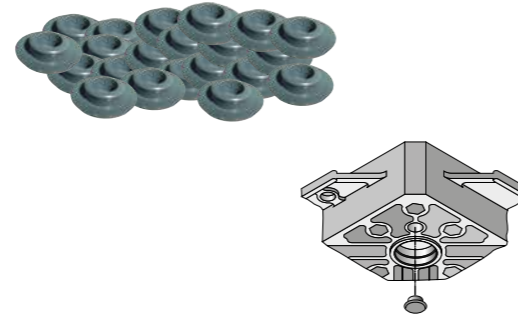
- Material elastomer
- Supplied in sets of 20



### GPS 240 Reference protectors, C531210

To protect the Z-reference of the pallet.

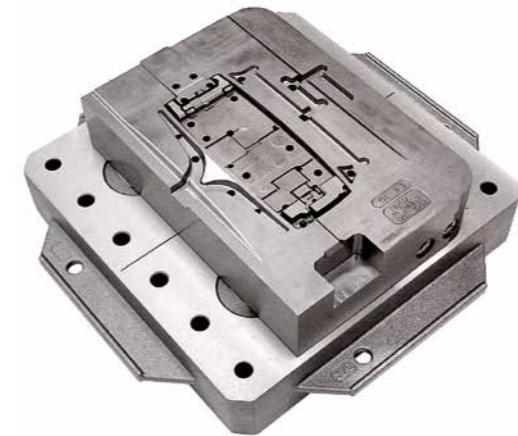
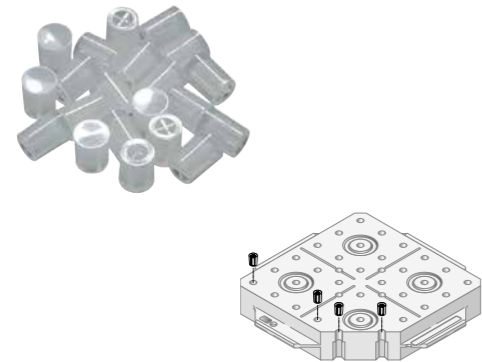
- Supplied in sets of 20



### GPS 240 Sealing plugs, C531500

Plugs for sealing GPS 240 pallets.

- Supplied in sets of 40



### Code carriers, 3R-863.01

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

#### 3R-863.01-10

- Sets of 10 pieces



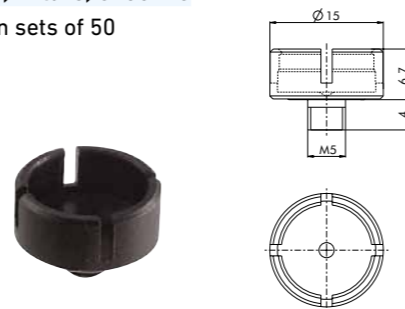
### Code carrier, fixture, C960740

Fixture for code carrier 3R-863.01-10.

- The code carrier can be clicked into position
- Supplied in sets of 10

### Code carrier, fixture, C960745

- Supplied in sets of 50



## GPS 240 – User kits

### GPS 240 Clamp strip kit, C810880-XX\*

C810881 undrilled clamp strip (x2)

E010144 washer M10 (x4)

E010143 washer M8 (x4)

E000428 Allen screw M10x45 (x4)

E000354 Allen screw M8x45 (x4)

12 E040030 T-slot nut M10x12 (x4)

14 E040031 T-slot nut M10x14 (x4)

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



### GPS 240 Presetting station, C810650

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

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.

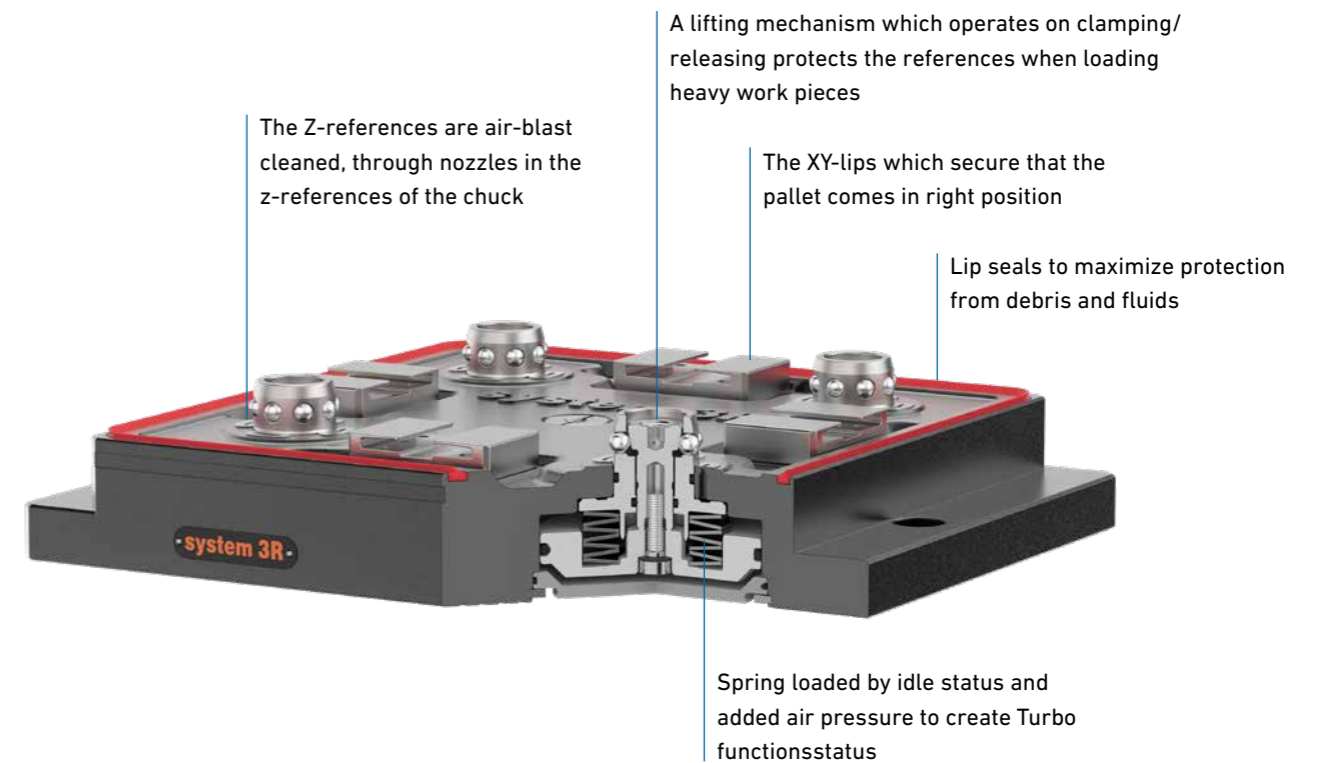
- Repetition accuracy – within 0.002 mm
- Clamping force – 50 000 N
- Fixed index positions – 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- Max workpiece weight (manual loading): 100 kg

## Advantages

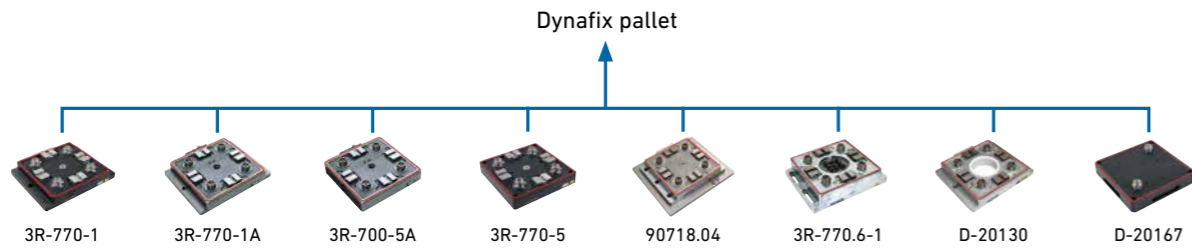
- Allows machining with optimal cutting data.
- Reduces setting-up times.
- Ensures precision and quality.
- Gives access to System 3R's entire product range.
- Is suitable for automatic changing with System 3R's automation program



# Dynafix in details



## Dynafix – Chucks

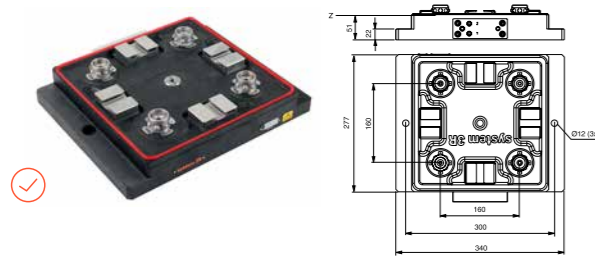


Chucks	Article number	Feature
Pneumatic	3R-770-1	mounting flange
Pneumatic	3R-770-1A	for chuck adapters, with mounting flange
Pneumatic	3R-770-5A	for chuck adapters, without mounting flange
Pneumatic	3R-770-5	for five-axis machines
Pneumatic	90718.04	vibration-damped
Pneumatic	3R-770.6-1	built-in pneumatic Macro chuck
Pneumatic	D-20130	through hole Ø110 mm
Pneumatic	D-20167	load station

### Pneumatic chuck, 3R-770-1

Pneumatic table chuck.

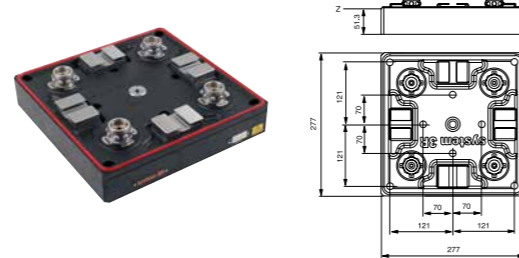
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Recommended actuator 3R-611.4 or 3R-611.2.
- Air-blast cleaning of the Z-references
- Weight 24.5 kg



### Pneumatic chuck, 3R-770-5

Pneumatic table chuck for applications in five-axis machines.

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



### Pneumatic chuck

Pneumatic chucks with extra connections for automatic chuck adapters.

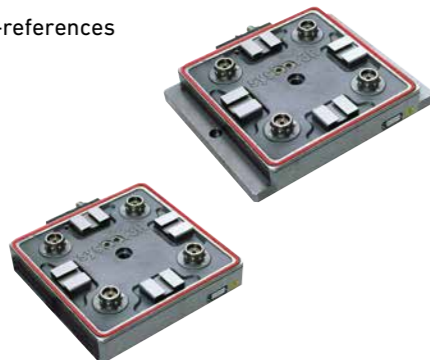
**NOTE:** Requires two control units.

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

#### 3R-770-1A

With fixing lugs.

- Weight 24.5 kg



#### 3R-770-5A

Without fixing lugs.

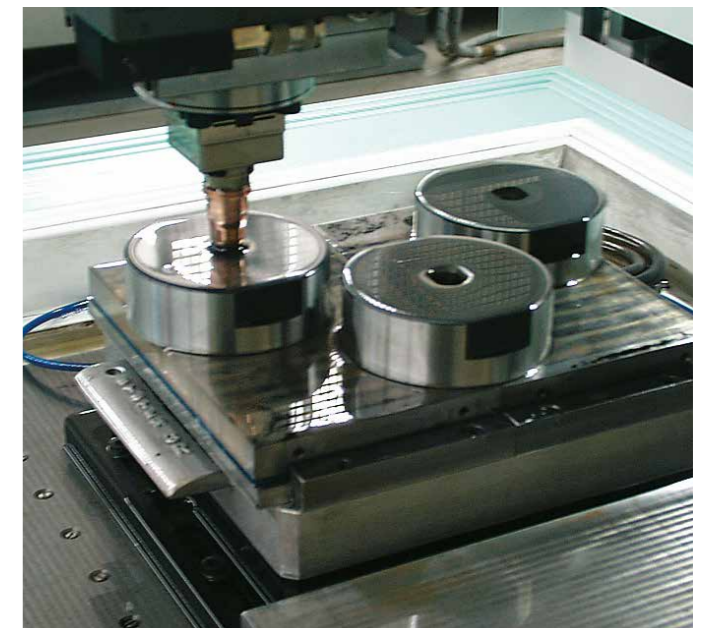
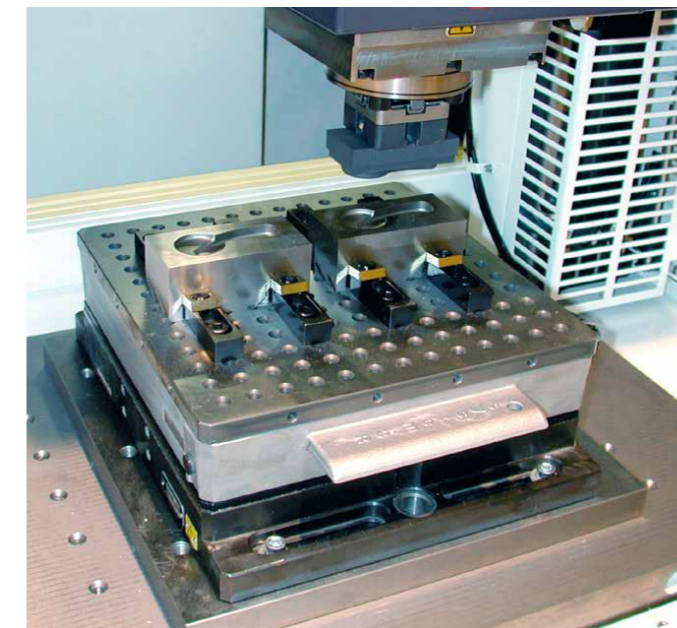
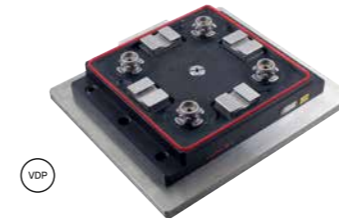
- Weight 23.5 kg

## Dynafix – Chucks

### Pneumatic chuck, VDP, 90718.04

Pneumatic vibration-damped chuck.

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



### Pneumatic chuck, 3R-770.6-1

Pneumatic chuck with integrated Macro chuck. For CMM machines.

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



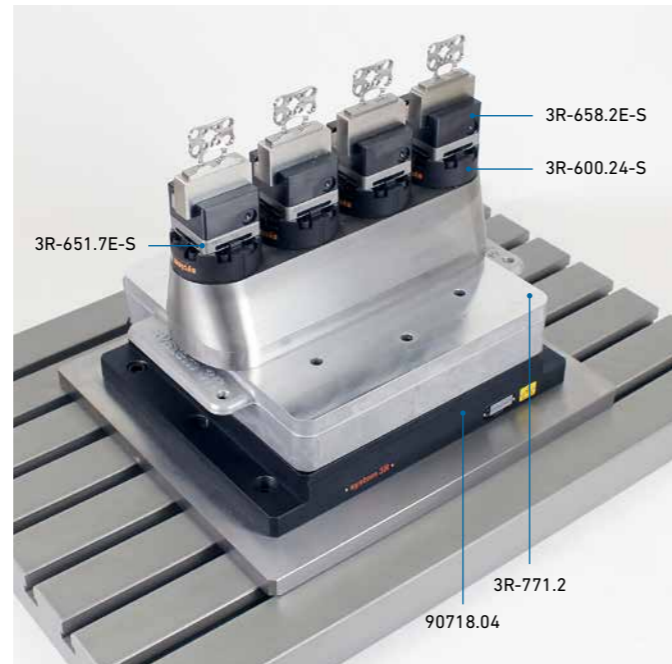
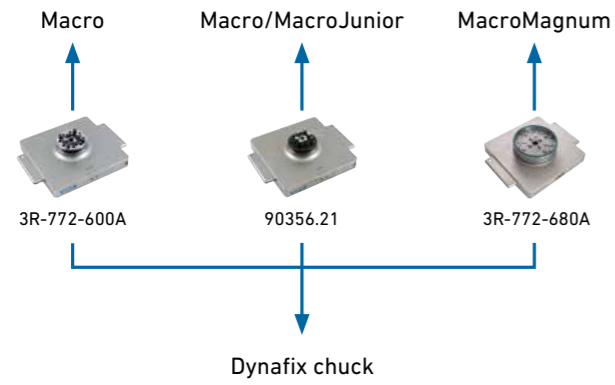
### Pneumatic dummy chuck, D-20167

To use as a load station for pallets with workpieces.

- Rust resistant
- Prepared for sensor 05-7041
- Clamping force 5 000 N
- Max load weight 250 kg
- Weight 11 kg



## Dynafix – Chuck adapters



Chuck adapters	Article number	Feature
Pneumatic	3R-772-600A	Dynafix -> Macro
Pneumatic	90356.21	Dynafix -> MacroCombi
Pneumatic	3R-772-680A	Dynafix -> MacroMagnum

### Pneumatic chuck adapter, Dynafix-Macro, 3R-772-600A

Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-770-1A or 3R-770-5A.

- Weight 11 kg



### Pneumatic chuck adapter, Dynafix-MacroCombi, 90356.21

Chuck adapter with built-in pneumatic MacroCombi chuck for mounting in 3R-770-1A or 3R-770-5A.

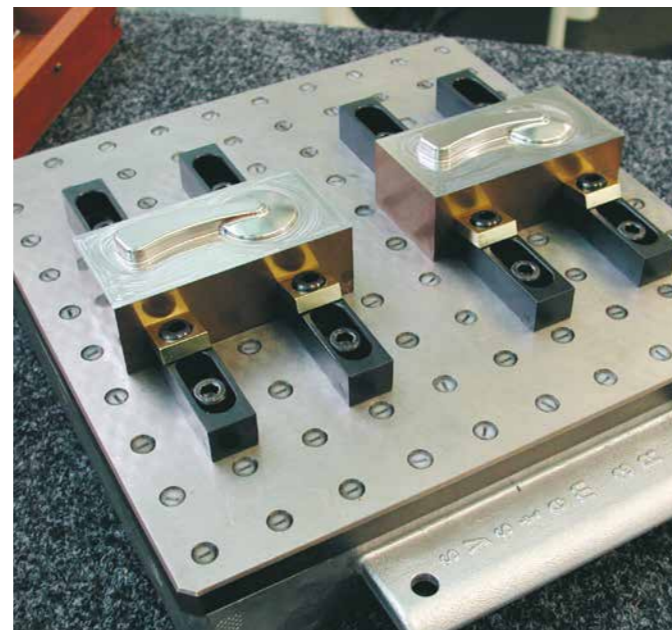
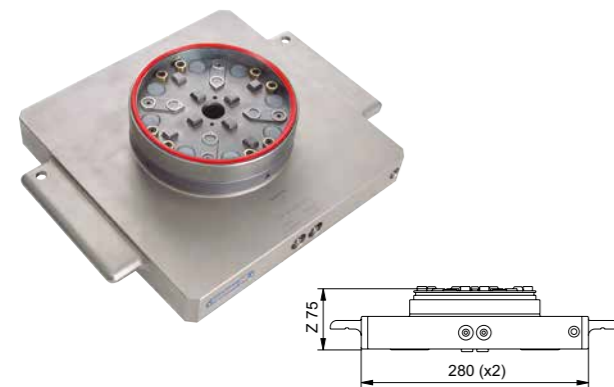
- Weight 11 kg



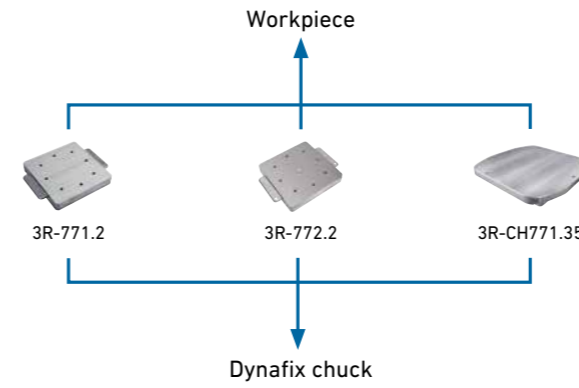
### Pneumatic chuck adapter, Dynafix-MacroMagnum, 3R-772-680A

Chuck adapter with built-in pneumatic MacroMagnum chuck for mounting in 3R-770-1A or 3R-770-5A.

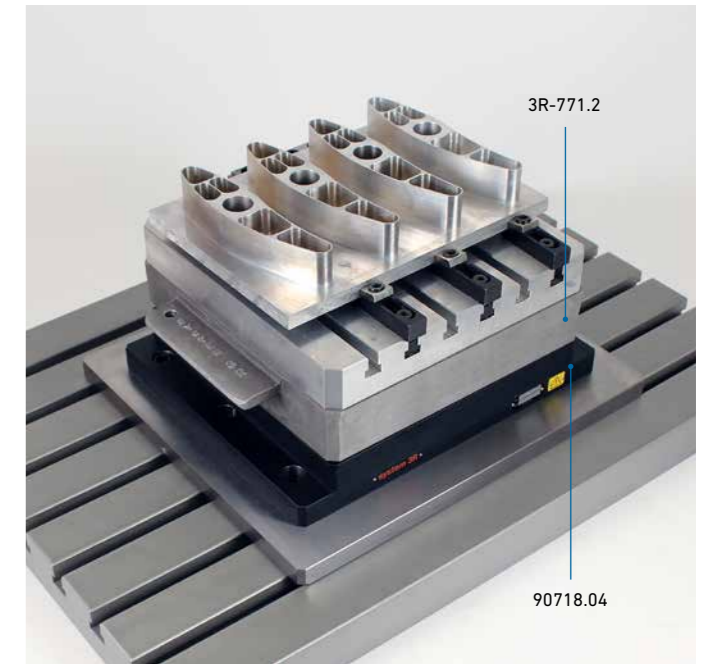
- Weight 13.5 kg



## Dynafix – Pallets



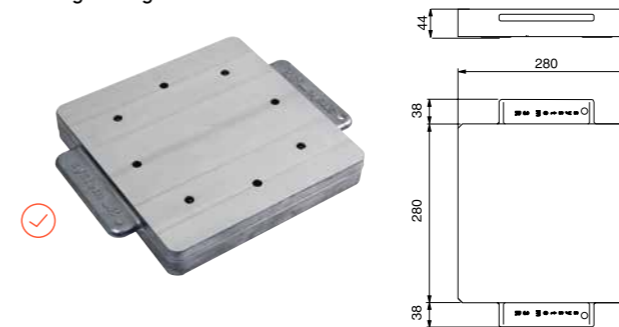
Pallets	Article number	Feature
Aluminium	3R-771.2	milled
Aluminium	3R-772.2	ground
Aluminium	3R-CH771.35	



### Pallet 280x280 mm, 3R-771.2

Milled aluminium pallet.

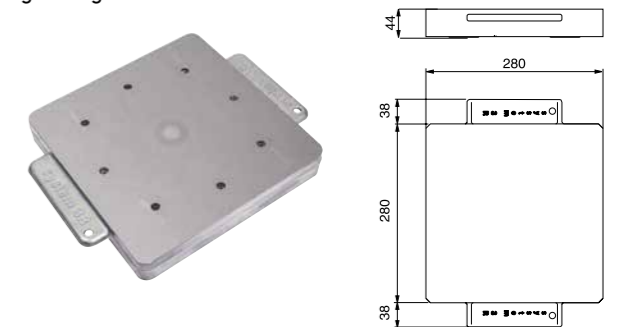
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.04 mm
- Thickness tolerance +0.05/-0 mm
- Weight 6 kg



### Pallet 280x280 mm, 3R-772.2

Ground aluminium pallet.

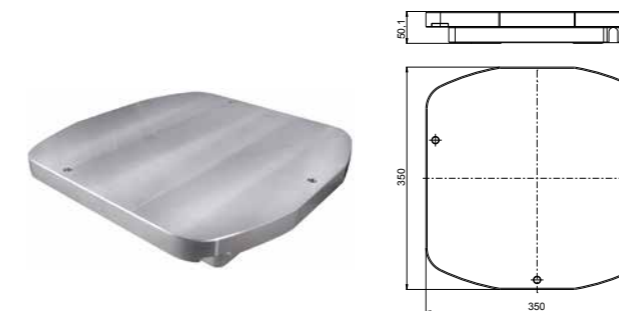
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.005 mm
- Thickness tolerance -0.1/-0.14 mm
- Weight 6 kg



### Pallet 350x350 mm, 3R-CH771.35

Aluminium pallet.

- Adapted for automatic changing.
- Ready for code carrier
- Weight 12.1 kg



## Dynafix – Accessories

### 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



### Clamping force meter kit, 3R-SSP115-BASE

For both pneumatic and manual chucks. This stand alone unit in combination with individual drawbars or drawbar kits, able to cover MacroJunior, Macro, MacroMagnum and Dynafix.

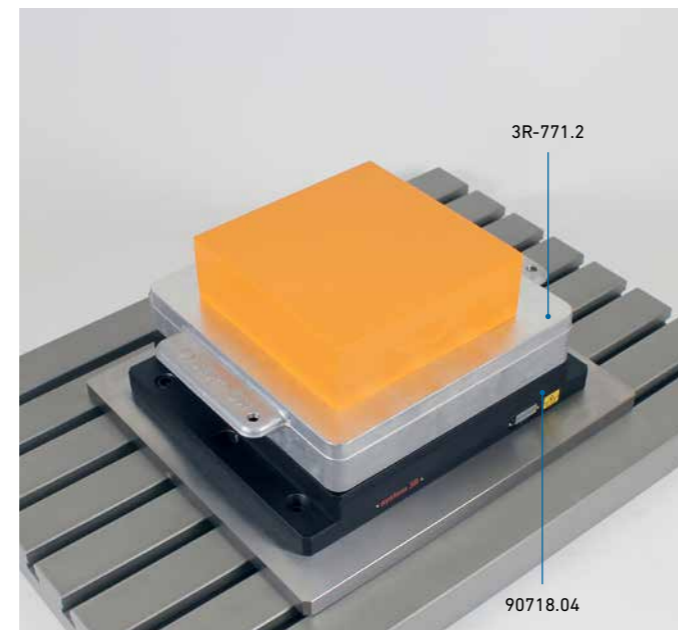
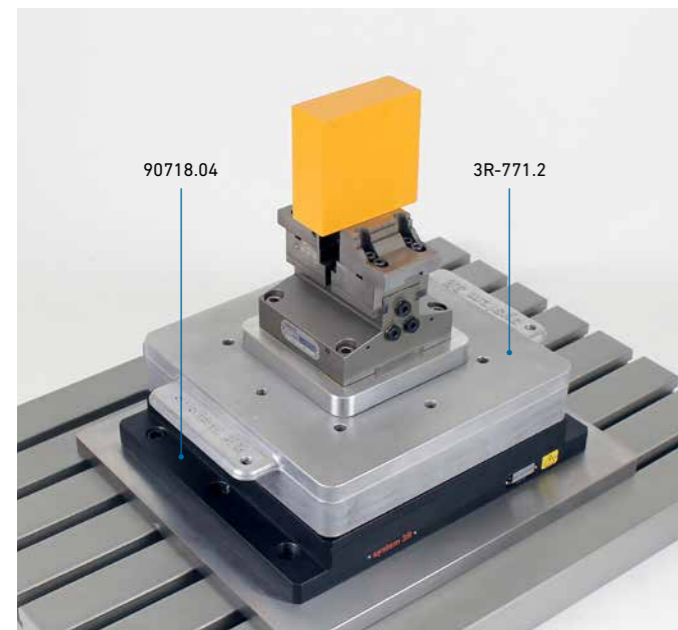
**NOTE:** Require drawbars with bayonet interface similar to 3R-605.1.

- Add-on kit for use in Dynafix, 3R-SSP115-DYN
- Operating temp. +10 to +40° C
- Gauge size Ø90x47 mm
- Working range 1-22 kN
- Deviation ± 0.1 kN.
- Weight:
  - Display 0.34 kg
  - Gauge 1.3 kg



### Add-on kit, 3R-SSP115-DYN

Add-on kit for 3R-SSP115-BASE



# Maxi

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.

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

### Advantages

- Reduces setting-up times.
- Is user-friendly.
- Gives access to a large part of System 3R's product range

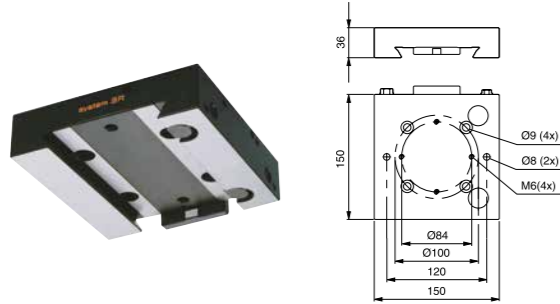


## Maxi – Chuck and pallet

### Manual chuck, 3R-27.2

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

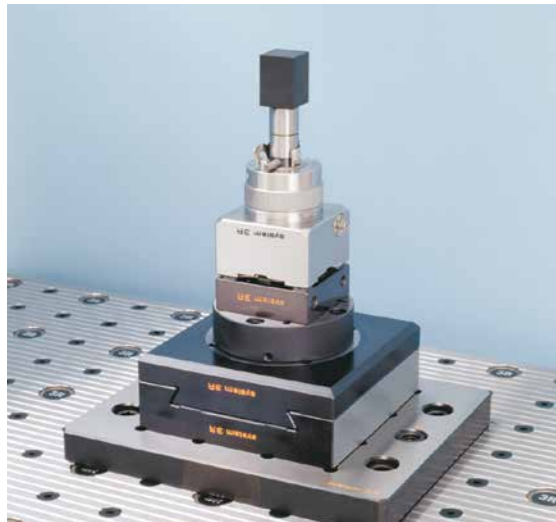
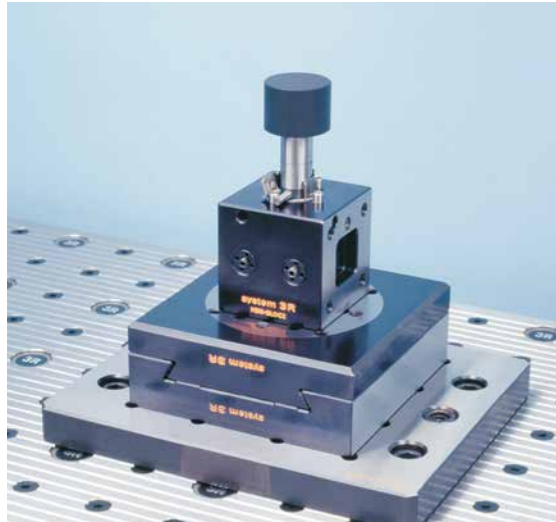
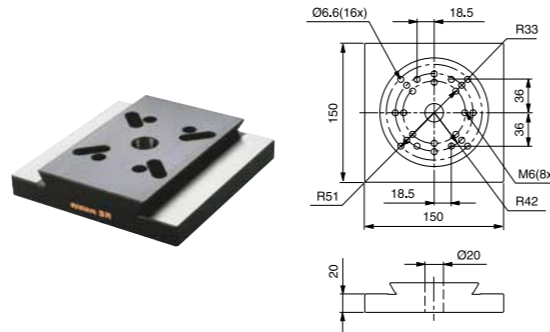
- Immersible
- Maximum electrode weight 500 kg
- Mechanical locking
- Weight 5 kg



### Pallet 150x150 mm, 3R-29.2

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

- Hardened
- Weight 4.6 kg



## 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 elec-

trode 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

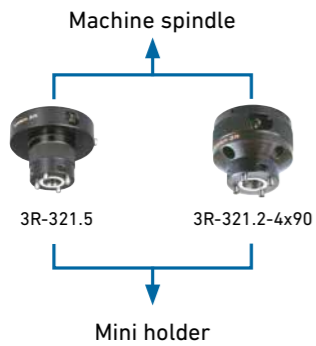
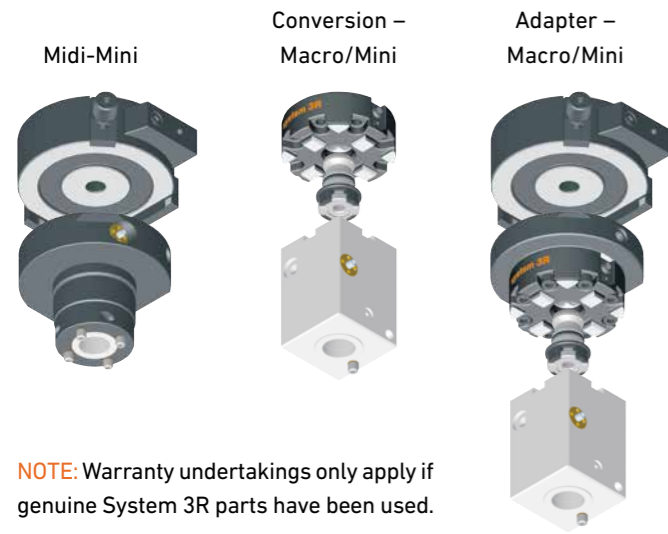
### Advantages

- Reduces setting-up times.
- Gives rapid and precise mounting.
- Is suitable for automatic changing with System 3R's automation program



## Mini – Chucks

### Upgrade options:



Spindle chucks	Article number	Feature
Manual	3R-321.5	
Manual	3R-321-4x90	

Lathe chuck	Article number	Feature
Manual	3R-321.2-4x90	

### Manual chuck, 3R-321.5

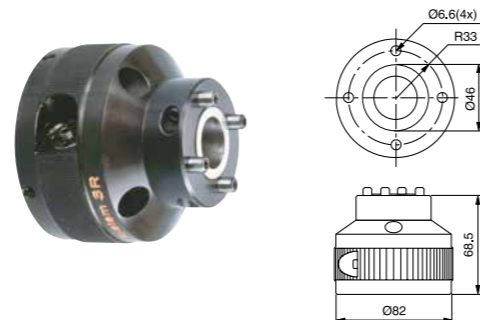
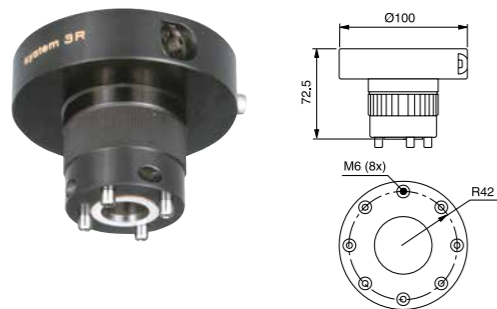
Hydraulic chuck for mounting on machine spindle with 3R-A3620.

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

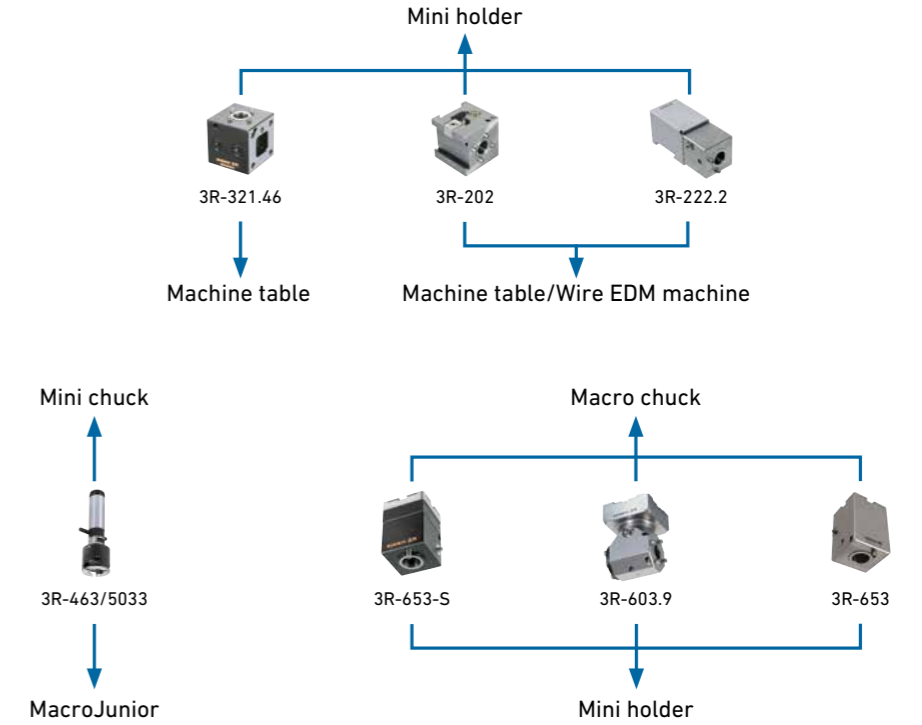
### Manual lathe chuck, 3R-321.2-4x90

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

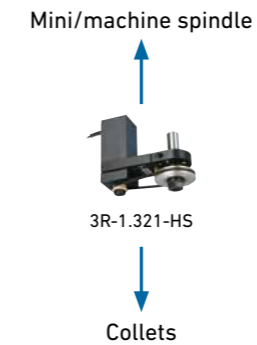
- Fixed index positions 4x90°
- Weight 1.3 kg



## Mini – Table chucks, chuck adapters and rotating spindle



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



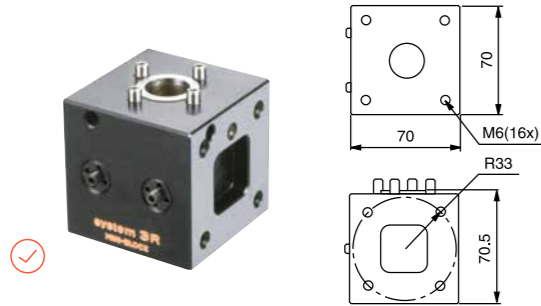
Rotating spindle	Article number	Feature
Vertical	3R-1.321-HS	tubular electrodes

## Mini – Table chucks, chuck adapters and rotating spindle

### MiniBlock, 3R-321.46

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

- Fixed index positions 4x90°
- Weight 2.3 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.

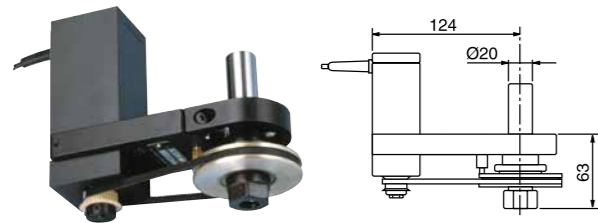
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 0.8 kg



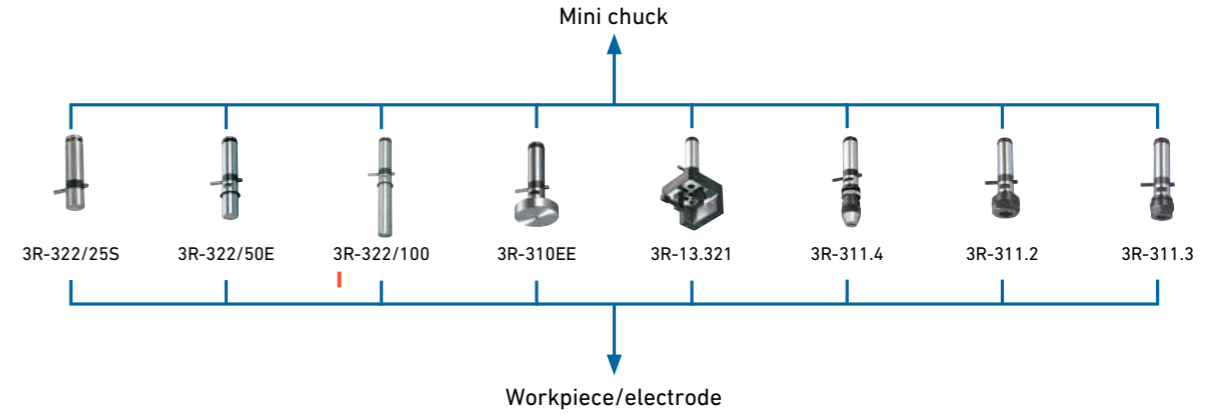
### Rotating spindle, 3R-1.321-HS

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 1 bar (dynamic/rotating)
- Recommended maximum flushing pressure 10 bar (Static/idle)
- Weight 1.4 kg



## Mini – Electrode holders



Electrode holder	Article number	Feature
Electrode holder Ø20 mm	3R-322/25S	25 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	Ø0.3 - 3 mm
Collet chuck	3R-311.2	<Ø13 mm, ER20
Collet chuck	3R-311.3	<Ø10 mm, ER16

### Electrode holder Ø20 mm

Holder with hardened reference part and unhardened electrode mounting part.

#### 3R-322/25S

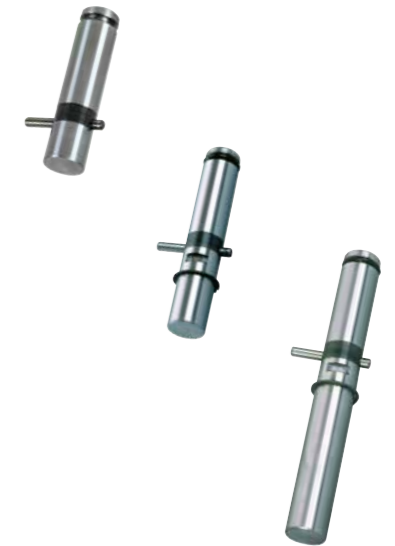
- Electrode mounting part 25 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7 kg

#### 3R-322/50E

- 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

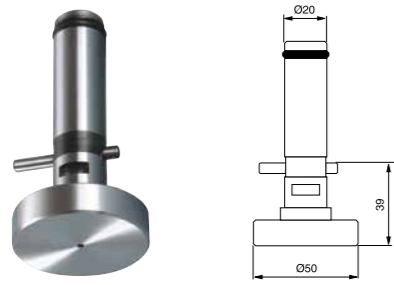


## Mini – Electrode holders and Accessories

### Electrode holder, 3R-310EE

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

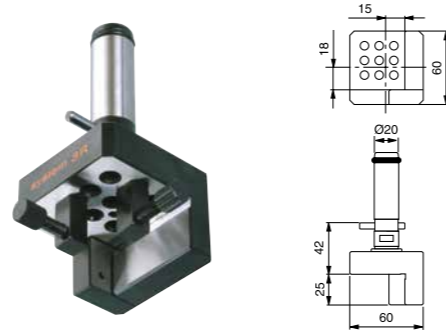
- Adapted for automatic changing
- Electrode mounting part 39 mm
- Flushing duct
- Supplied in sets of 10 pcs
- Weight per set 4 kg



### Electrode holder, 3R-13.321

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

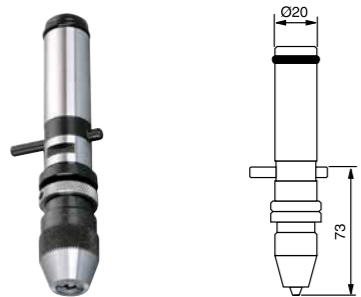
- Max. workpiece: 32x28 mm
- Adapted for automatic changing
- Flushing duct
- Weight 1 kg



### Three-jaw chuck, 3R-311.4

Chuck  $\varnothing 20$  mm for  $\varnothing 0.3$ -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.

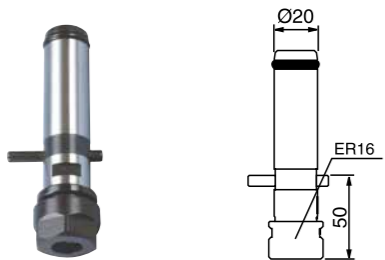
- Adapted for automatic changing
- Weight 0.2 kg



### 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



### 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





# 3Refix

## 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



### Advantages

- 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



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

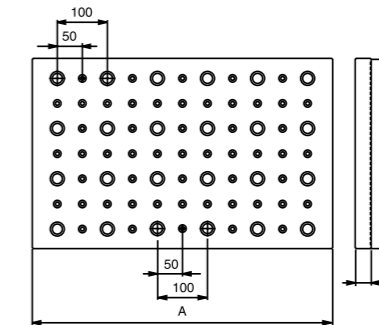
## 3Refix

### 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-TX

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

#### 3R-901-10RS

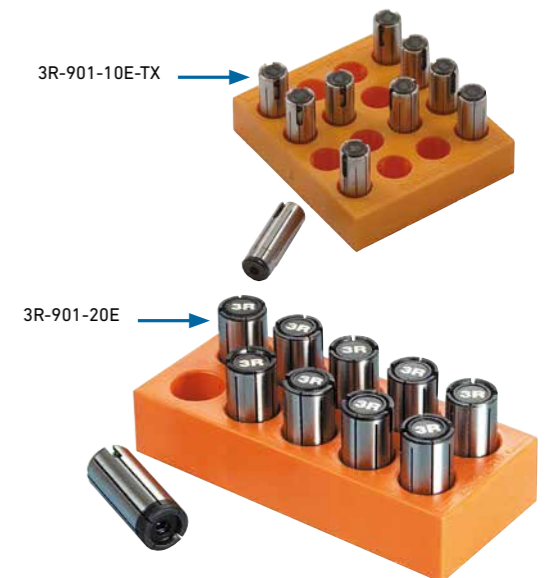
- 3Refix Ø10 mm
- Rust-resistant
- Recommended tightening torque 4 Nm
- Supplied singly
- Weight 0.02 kg

#### 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 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.	Outside Ø (mm)	Art. No.	Outside Ø (mm)
3R-903-20.235	23.5	3R-903-20.34	34
3R-903-20.24	24	3R-903.20.36	36
3R-903-20.25	25	3R-903-20.38	38
3R-903-20.254	25.4	3R-903.20.381	38.1
3R-903-20.256	25.6	3R-903-20.40	40
3R-903-20.26	26	3R-903-20.414	41.4
3R-903-20.275	27.5	3R-903-20.42	42
3R-903-20.28	28	3R-903-20.4445	44.45
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		

## 3Refix

### Bushings, 3R-902-10E

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

- Bore / mm. 10h7
- Outside diameter / mm 15h6
- Height / mm 12
- Supplied in sets of 30



### Bushings, 3R-902-20.0E

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

- Bore / mm. 20h6
- Outside diameter / mm 28h6
- 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-TX).

- 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



### Collets, 3R-ER16E

Intended for Macro, MacroJunior and Mini.

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

### Collets, 3R-ER20E

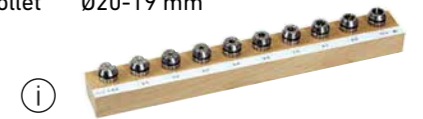
Intended for Macro.

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

### Collets, 3R-ER32E

Intended for Macro.

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



### Nipple, 3R-SP20753

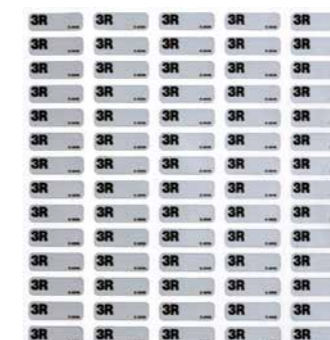
Nipple for manual operation by air gun of pneumatic chucks with R1/8" connecting thread.



### Labels, 3R-LS288P

Supplied with marker pen.

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



### 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 1, WorkPartner 1+ and Fanuc - three "aces" which boost your productivity and sharpen your competitiveness.

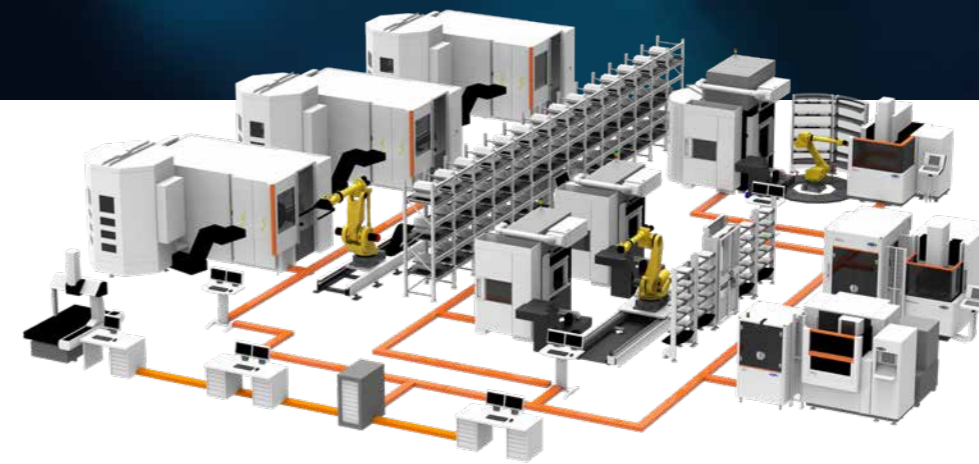
And not least – they bring faster payback on the investments you made.

# WSM WorkShopManager

User-friendly Cell Management Software

Master workshop complexity and manage all control processes with our software. For manually controlled and automated processes.

- Simplify the preparation of jobs
- Easily execute the jobs in manual or automated machines
- Monitor the process, change priorities and get utilization statistics
- ID chip management to ensure highest process security.



**WorkPal 1**  
Modest demands, major benefits



**Automation**  
With six-axis Fanuc industrial robot



**WorkPartner 1+**  
Can serve two machines



# Sustainability declaration

## Improved productivity

You can increase the use of resources by allowing machines to work during unmanned time, e.g. nights and weekends, by using the existing production equipment at its best. Produce in-house 24/7 instead of outsourcing from far away and shipping.

By seamlessly integrating advanced technology, execute repetitive tasks with precision and speed, freeing up human resources for higher-value activities. Machines equipped with our Automation systems work tirelessly, reducing errors, optimizing production schedules, and achieving consistent output.

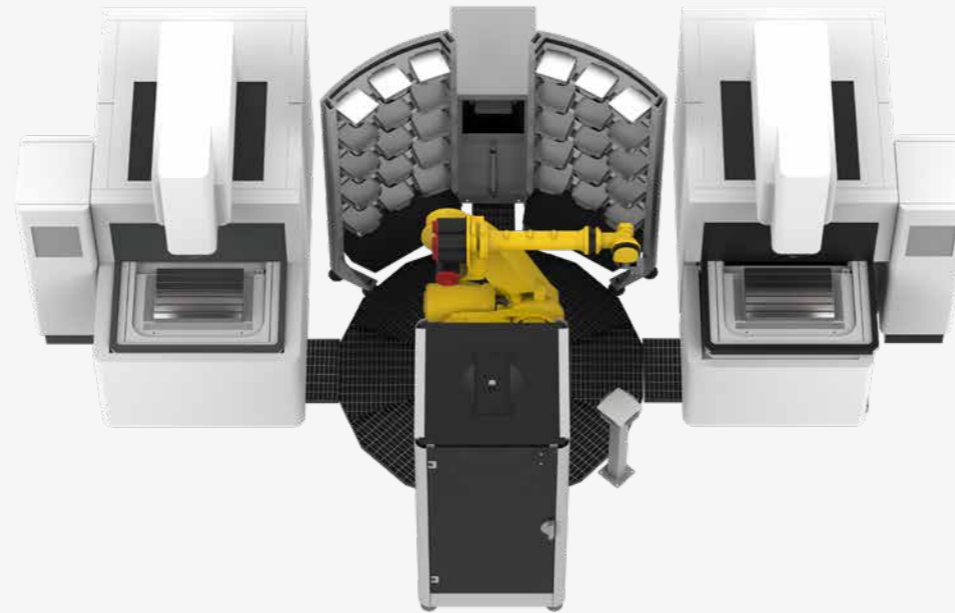
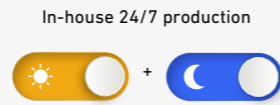
## Advanced ease of operation

The ease of operation with automated machines in the industry has revolutionized efficiency and productivity. With intuitive interfaces and streamlined processes, workers can quickly adapt and control complex tasks with minimal training. Automated systems eliminate human error and allow for precise execution, resulting in consistent output and reduced downtime.

## Preserve the operator's health by using a robot in a safe separated volume

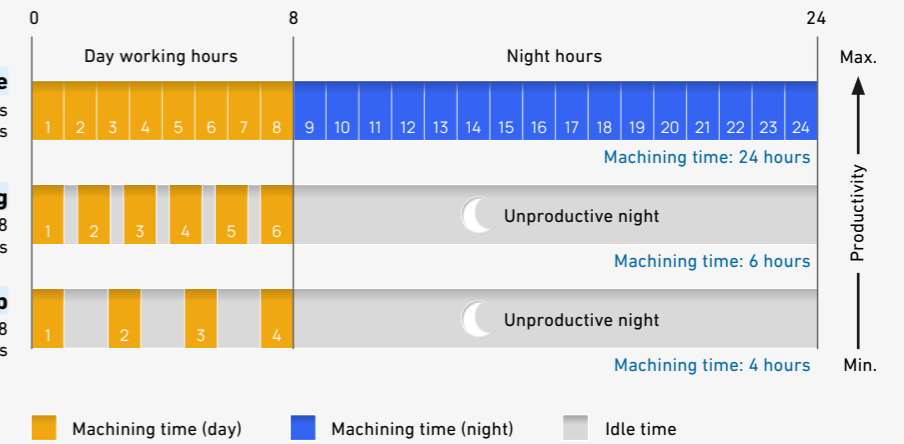
Implementing automated machines in the industry offers a promising avenue for improving operator health. By taking over physically demanding tasks, our machines reduce the risk of musculoskeletal injuries and fatigue-related issues.

Additionally, advanced sensors and AI algorithms can detect hazardous conditions, alerting operators to potential dangers and allowing for prompt intervention. This synergy between automation and human operators enhances workplace safety and promotes a healthier work environment.



## Tooling + automation + software

One manned shift – 8 hours  
Two more unmanned shifts – 16 hours



## Carbon-neutral from the very start of the manufacturing down to recycling after use

- Our Automation solutions are manufactured in a neutral carbon site: our System 3R manufacturing site in Vällingby – Sweden is CO<sub>2</sub> neutral
- With the ability to self-diagnose and adapt, our machines with Automation achieve extended working lives, reducing maintenance costs and optimizing production processes
- During their working time, they can use the electrical power at times outside of daily peak times
- Sustainable afterlife: Automation products can be disposed as metals and regular electronics

## About GF Machining Solutions

# Multi-technology solutions provider

Our commitment to you and your specific applications is proven by the value-adding intelligence, productivity and quality delivered by our multi-technology solutions. Your success is our chief motivator. That's why we are continuously advancing our legendary technical expertise. Wherever you are, whatever your market segment and whatever the size of your operation, we have the complete solutions and the customer-centric commitment to accelerate your success—today.

### EDM (Electrical Discharge Machining)



#### Wire-cutting EDM

GF Machining Solutions' wire-cutting EDM is fast, precise and increasingly energy efficient. From ultraprecise machining of miniaturized components down to 0.02 mm to powerful solutions for demanding high-speed machining with respect to surface accuracy, our wire EDM solutions position you for success.

#### Die-sinking EDM

GF Machining Solutions is revolutionizing die-sinking EDM with features like iGAP technology to dramatically boost machining speed and reduce electrode wear. All of our die-sinking systems offer fast removal and deliver mirror finishes of Ra 0.1 µm (4 µin).

#### Hole-drilling EDM

GF Machining Solutions' robust hole-drilling EDM solutions enable you to drill holes in electrically conductive materials at a very high speed—and, with a five-axis configuration, at any angle on a workpiece with an inclined surface.

### Tooling and Automation



#### Tooling

Our customers experience complete autonomy while maintaining extreme accuracy, thanks to our highly accurate System 3R reference systems for holding and positioning electrodes and work pieces. All types of machines can easily be linked, which reduces set-up times and enables a seamless transfer of workpieces between different operations.

#### Automation

Together with System 3R, we also provide scalable and cost-effective Automation solutions for simple, single machine cells or complex, multi-process cells, tailored to your needs.

### Milling



#### Milling

Precision tool and mold manufacturers enjoy a competitive edge with our Mikron MILL S solutions' fast and precise machining. The Mikron MILL P machines achieve above-average productivity thanks to their high performance and Automation. Customers seeking fastest return on investment benefit from the affordable efficiency of our MILL E solutions.

#### High Performance Airfoil Machining

Our Liechti turnkey solutions enable the highly dynamic manufacturing of precision airfoils. Thanks to the unique performance and our expertise in airfoil machining, you increase productivity by producing at the lowest cost per part.

#### Spindles

As part of GF Machining Solutions, Step-Tec is engaged in the very first stage of each machining center development project. Compact design combined with excellent thermal and geometric repeatability ensure the perfect integration of this core component into the machine tool.

### Software



#### Digitalization solutions

To drive its digital transformation, GF Machining Solutions acquired symmedia GmbH, a company specialized in software for machine connectivity. Together, we offer a complete range of Industry 4.0 solutions across all industries. The future requires the agility to adapt quickly to continual digital processes. Our intelligent manufacturing offers embedded expertise, optimized production processes, and workshop Automation: solutions for smart and connected machines.

### Advanced manufacturing



#### Laser texturing

Aesthetic and functional texturing is easy and infinitely repeatable with our digitized Laser technology. Even complex 3D geometries, including precision parts, are textured, engraved, microstructured, marked and labeled.

#### Laser micromachining

GF Machining Solutions offers the industry's most complete line of Laser micromachining platforms optimized for small, high-precision features to meet the increasing need for smaller, smarter parts to support today's leading-edge products.

#### Laser Additive Manufacturing (AM)

GF Machining Solutions and 3D Systems, a leading global provider of additive manufacturing solutions and the pioneer of 3D printing, have partnered to introduce new metal 3D printing solutions that enable manufacturers to produce complex metal parts more efficiently.

### Service + Success



#### We take you to new heights

Our Success Packs are designed to maximise your return on investment and empower you in your quest for success across all industrial segments. Our subscription packs feature a comprehensive range of services that guarantee the access and support you need to get the most out of your assets today, while preparing for the challenges of tomorrow. Our trusted experts backed by our latest cutting-edge, intelligent Digital Solutions, provide a full range of services.

#### eCatalog

Keep your equipment operating at peak precision and performance with our wide range of certified consumables and original wear parts. Our online catalog has it all (ecatalog.gfms.com).

Worldwide for you



## Our locations

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Geneva ++  
Langnau ++

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Marinha Grande, Portugal +  
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Hanoi, Vietnam ++

Plant + Center of Demonstration + Sales company

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# Order form

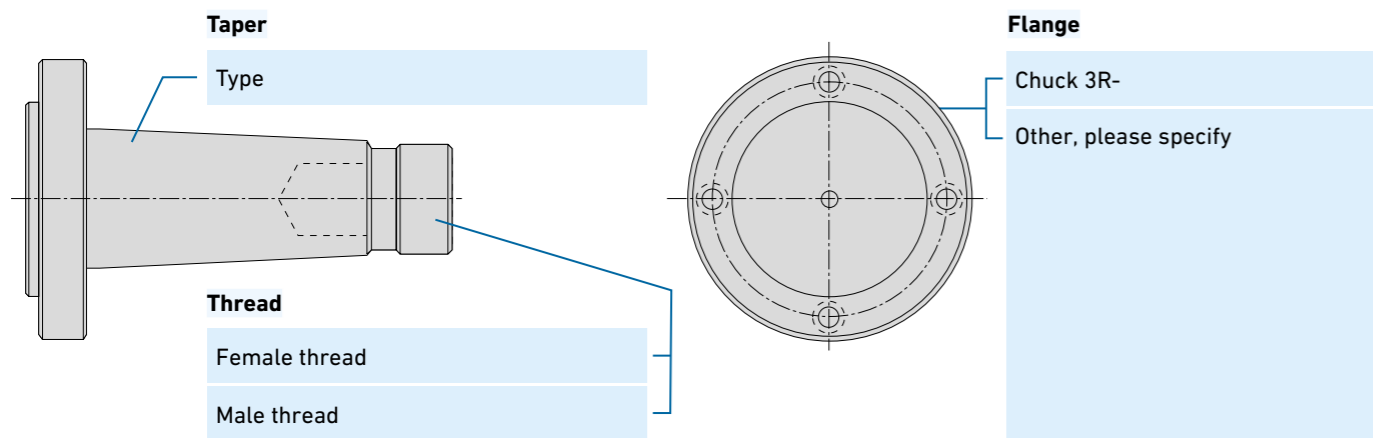
## Your information

Date \_\_\_\_\_

Company \_\_\_\_\_ Phone \_\_\_\_\_

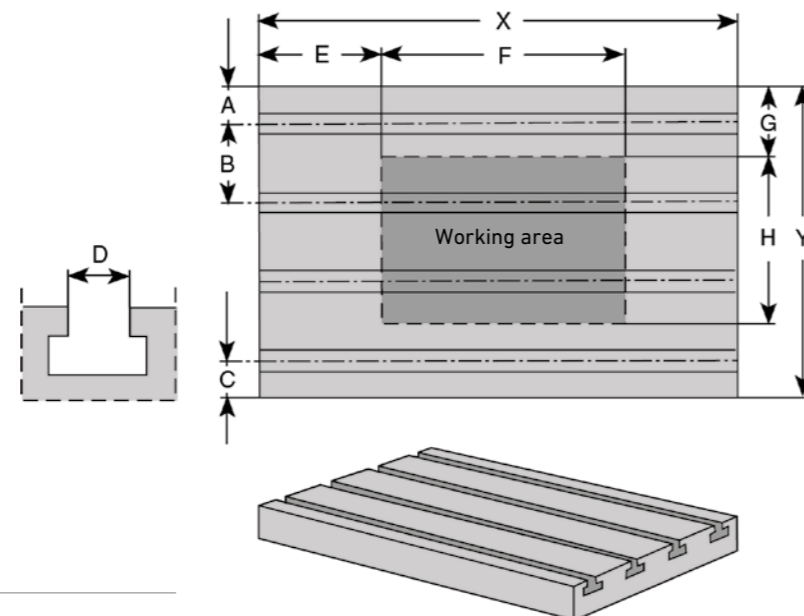
Contact \_\_\_\_\_ Email \_\_\_\_\_

## 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



N° of slots \_\_\_\_\_

Make of machine \_\_\_\_\_

Hardened/unhardened \_\_\_\_\_

Other information \_\_\_\_\_

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## At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Additive Manufacturing, Spindle, Tooling and Automation solutions. A comprehensive package of services completes our proposition.

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