

System 3R

# Tooling

for parts production



### GF Machining Solutions: all about you

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 world-class electrical discharge machines (EDM), Laser texturing and Additive Manufacturing through to first-class Milling and Spindles, Tooling, Automation and software systems — all backed by unrivalled customer service and support — we, through our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies, help you raise your game and increase your competitive edge.

# Design and quality by System 3R



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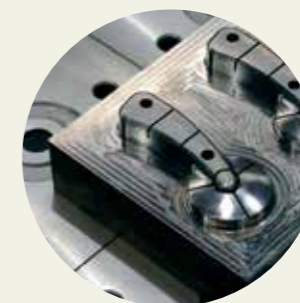
### Care for the environment and protection of natural resources are key elements in System 3R's operations

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

-  Manufactured to meet System 3R's quality requirements, but partly or completely made in a production plant that is not covered by System 3R's ISO9000 certificate.
-  Indicates that the product will normally be shipped within two weeks, provided that it is in stock when the order is placed.

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.

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





Experience always shows that measures to reduce the idle times of your machines are significantly more worthwhile than chasing seconds in the actual machining process. The solution is a stable and exact reference system. This lets you preset away from the machine and then set up the machine with minimum idle time. Quickly and precisely!

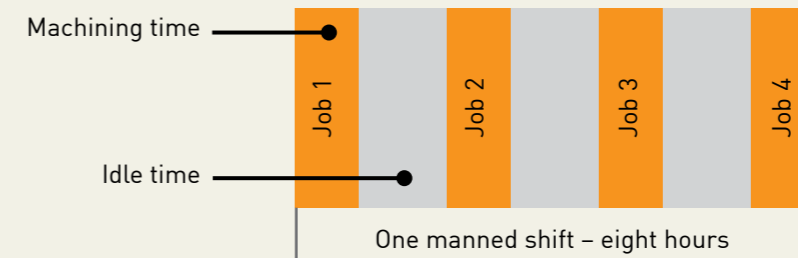


# 1 Minute Set-up

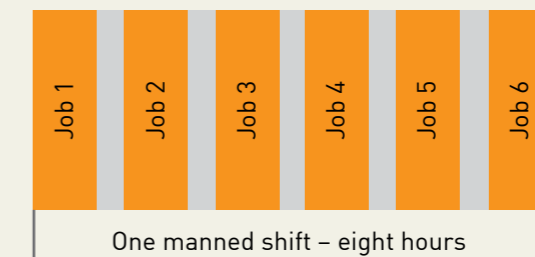


Fitting the machines with the same reference system means that electrodes and workpieces can be moved between the machines without subsequent alignment and checking – **One Minute Set-up.**

## Conventional setting-up



## Pallet system



### Higher productivity, calculation example:

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

### Faster payback, calculation example:

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



### A reference system minimises setup times

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

### Big earnings are within your reach

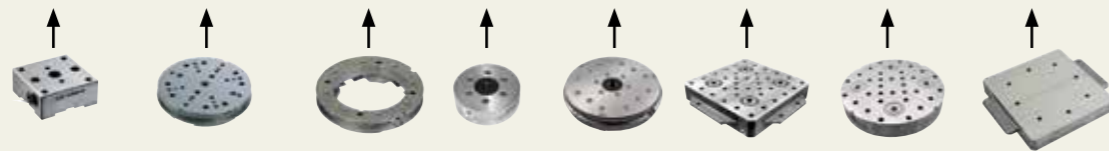
The machine generates revenue when its spindle is turning – and only then.

**Work smarter, not harder.**

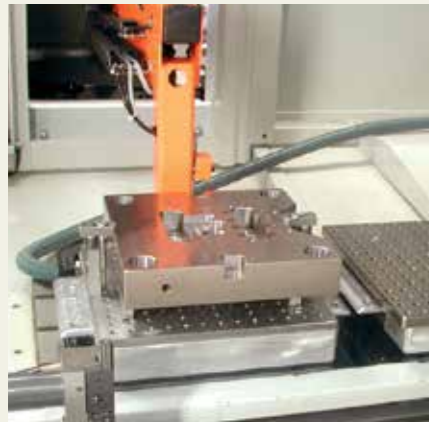


# Introduction – Rough guidance to tooling

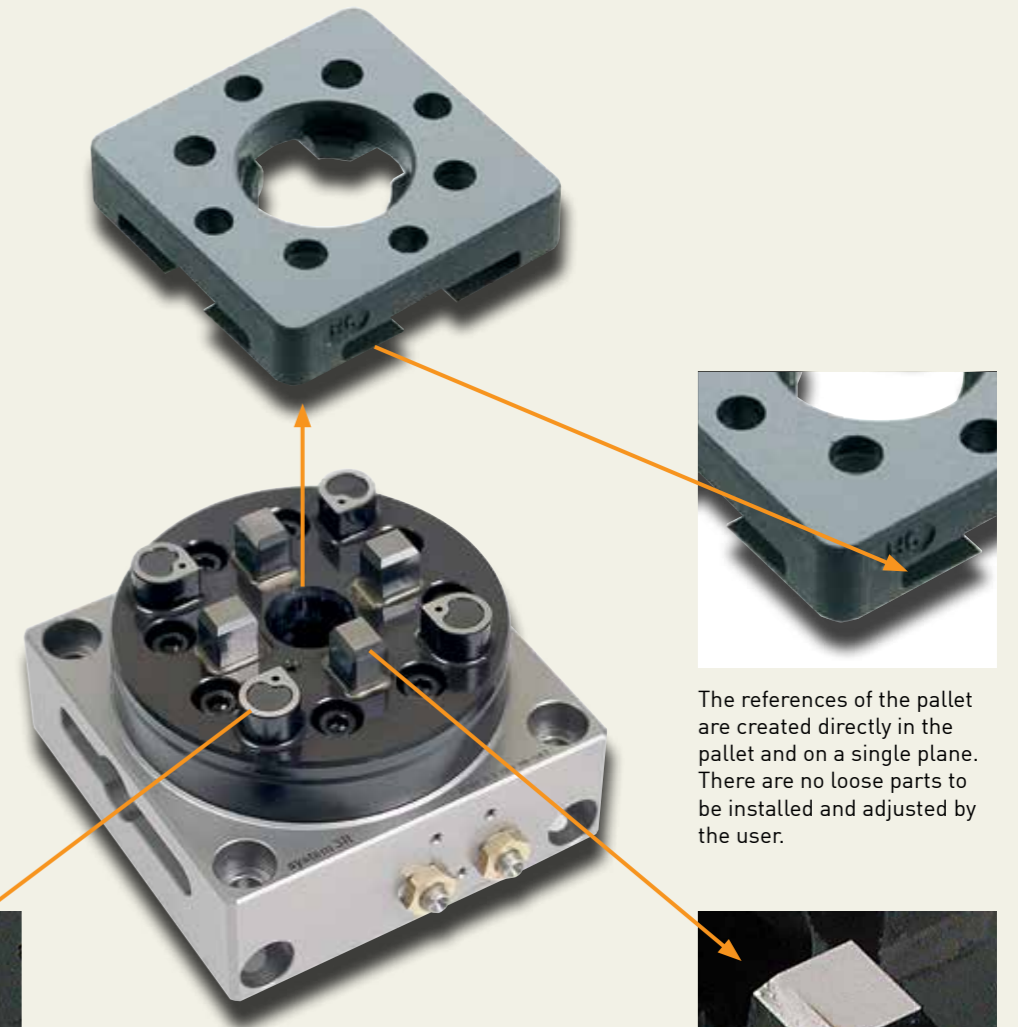
Pallet size (mm)	Reference system / max workpiece weight kg							Dynafix
	Macro	MacroMagnum	Matrix	GPS 70	GPS 120	GPS 240 Square	Round	
Ø 52-54	5 kg	5 kg						
Ø 54-Ø 75	10 kg	10 kg						
Ø 70				10 kg	10 kg			
Ø 110-116	50 kg	50 kg	50 kg					
Ø 120					20 kg			
Ø 142-185	50 kg	100 kg	100 kg					
Ø 220-260		100 kg	200 kg					
Ø 256							150 kg	
Ø 240-300						150 kg		
Ø 280-400								250 kg



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



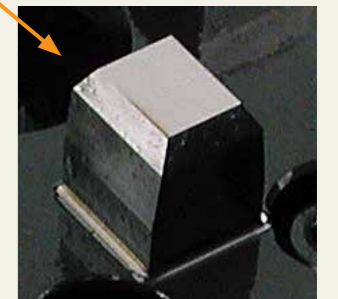
# Macro



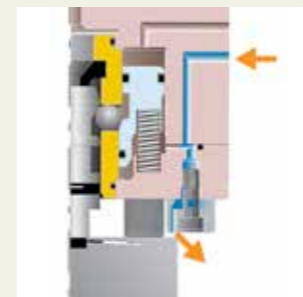
The references of the pallet are created directly in the pallet and on a single plane. There are no loose parts to be installed and adjusted by the user.



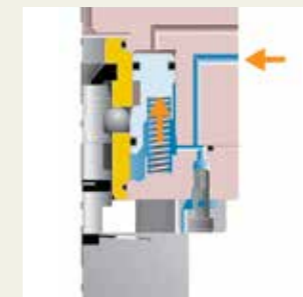
The Z-references of the chuck have generously-sized surfaces to ensure the highest stability.



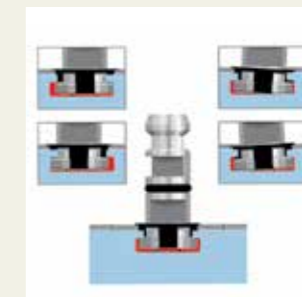
The X and Y references of the chuck are made of cemented carbide.



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



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



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



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



# VDP (Vibration-Damped Palletisation)

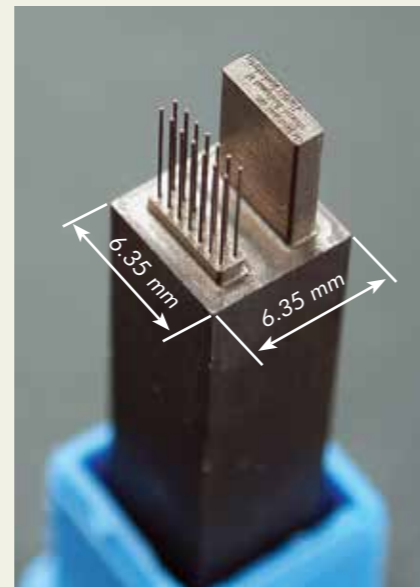
- ... reduces cutting forces by up to 25%. Lower cutting forces gives lower power consumption and less tool wear.
- ... lengthens tool life tool wear by up to 30%, giving lower tool costs.
- ... lengthens the life of the machine spindle. Less vibration in the machine spindle extends the life of the spindle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

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

## Advantages of a damped chuck

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

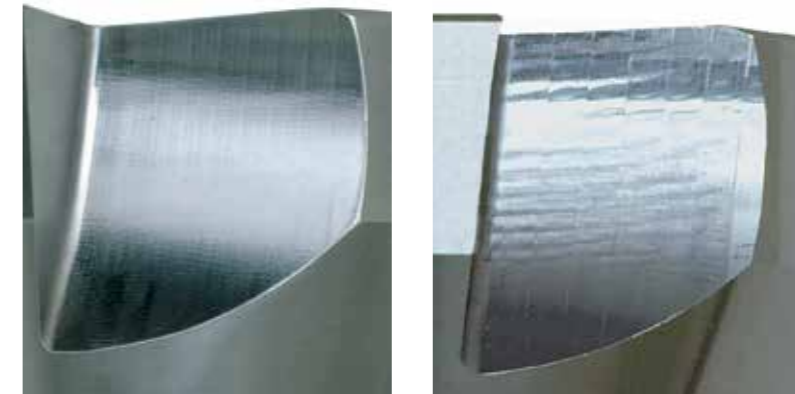
- + **Higher material removal rate** improves productivity.
- + **Better surface finish** reduces the need for finishing.
- + **Less tool wear** extends the life of the cutting tools.
- + **Less vibration** in the machine spindle.
- + **Better dimensional accuracy** gives fewer rejects.
- + **Greater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



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

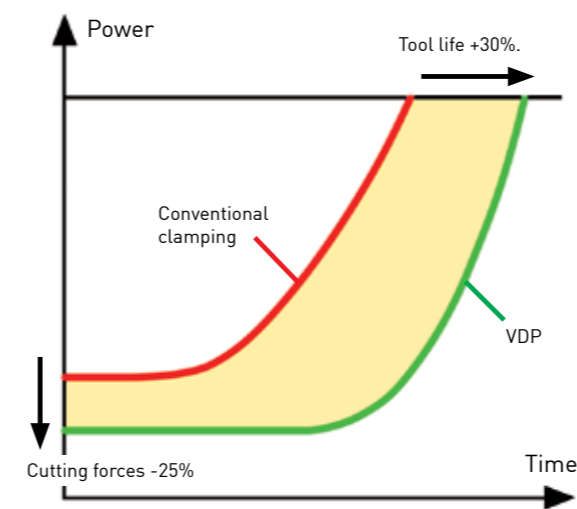
# VDP (Vibration-Damped Palletisation)

Increase your capacity with > +30%

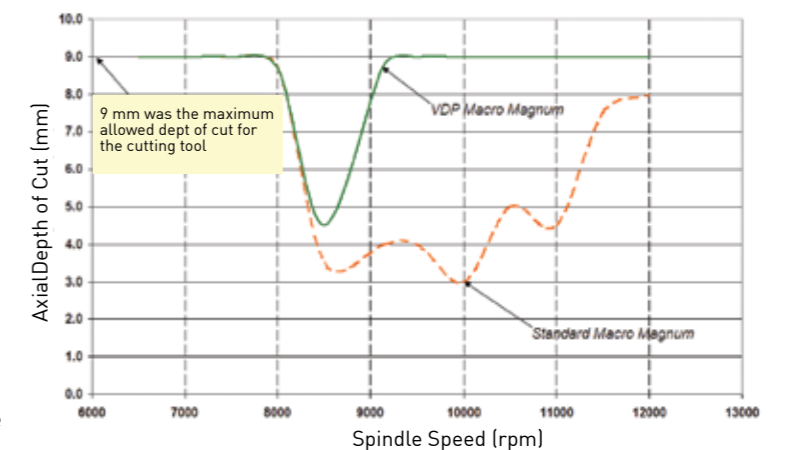


WITH

WITHOUT



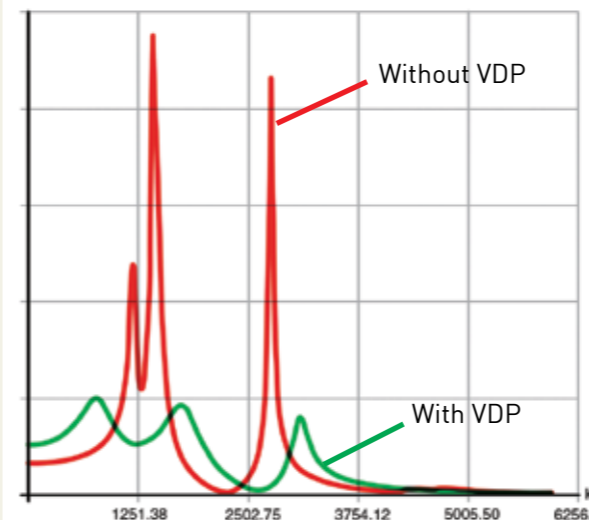
Less tool wear extends the life of the tools = increased revenue.



## Process Stability Analysis (Swiss machine tool manufacturer)

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

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



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

# MacroStd & MacroHP

## Macro...

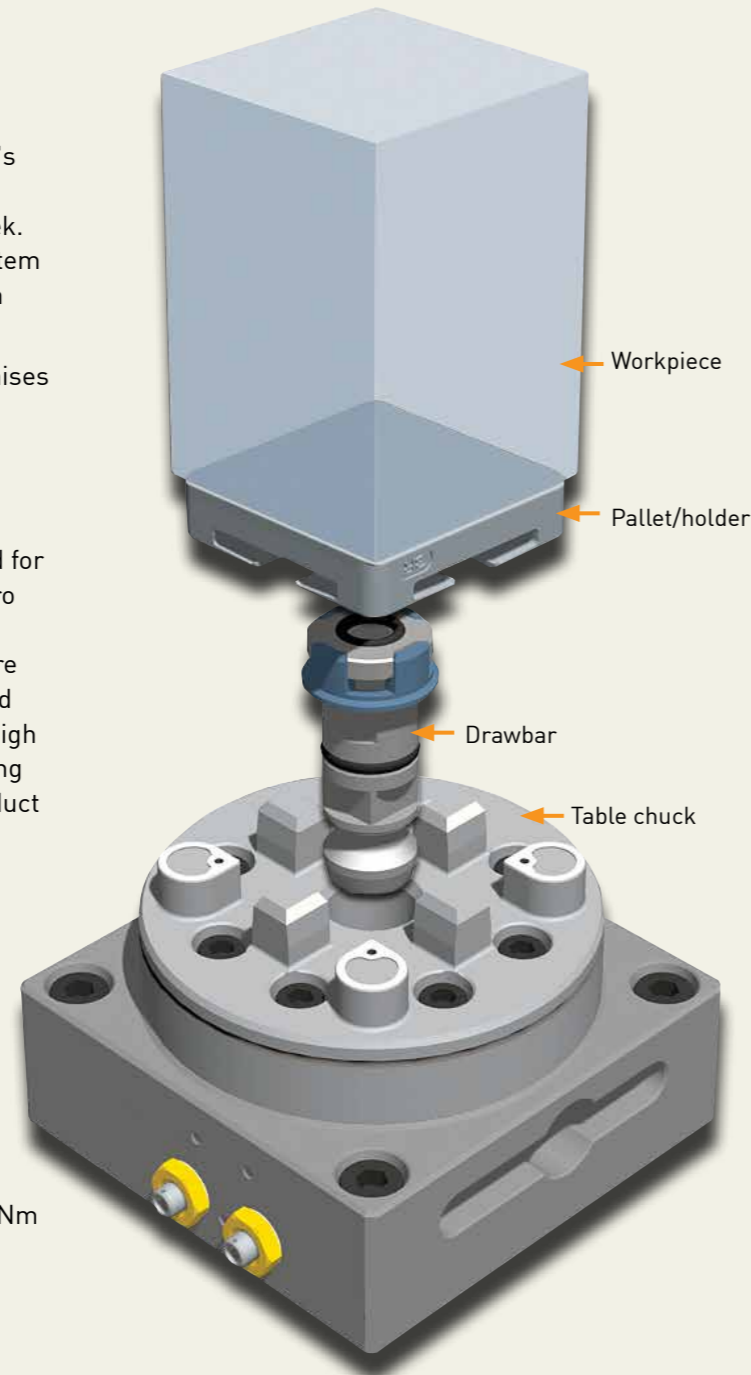
- ... reduces setting-up times.
- ... ensures precision and quality.
- ... has automatic air-blast cleaning of the references in the pneumatic chucks.
- ... has higher locking force in the pneumatic chucks – turbo locking.
- ... has references of cemented carbide or hardened ground steel.
- ... is suitable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

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

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

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

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



## Macro – Chucks

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

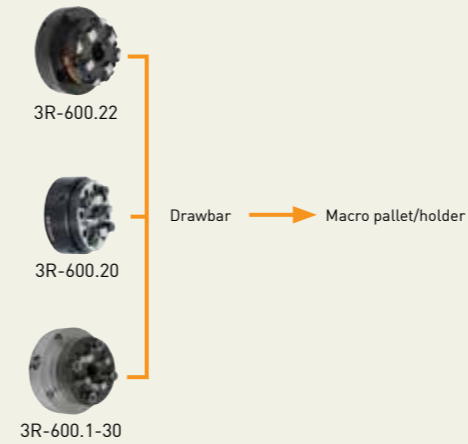
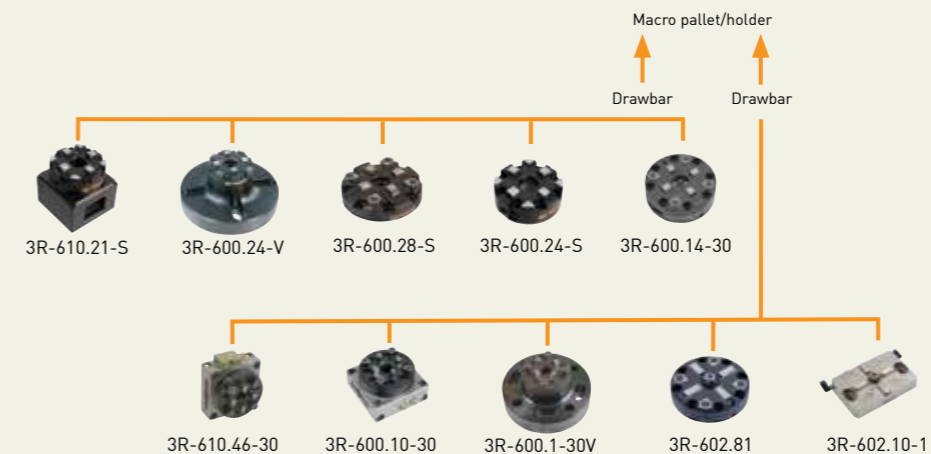


Table chucks	Article number	Drawbar	Feature
Manual Std	3R-610.21-S	3R-605.2	horizontal and vertical, 6 Nm
Manual VDP	3R-600.24-V	3R-605.2	vibration-damped, 6 Nm, Ø75 mm
Manual Std	3R-600.28-S	3R-605.2	low profile, 6 Nm, Ø100 mm
Manual Std	3R-600.24-S	3R-605.2	6 Nm, Ø75 mm
Pneumatic Std	3R-610.46-30	3R-605.1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



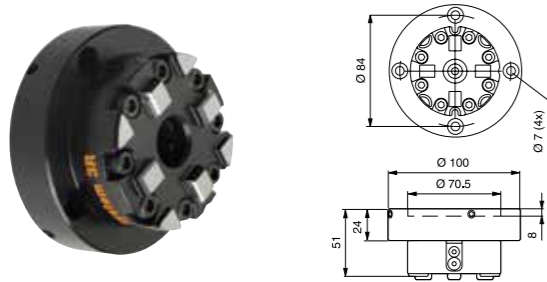


## Macro – Chucks

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

Manual lathe chuck with setting screws for centring.

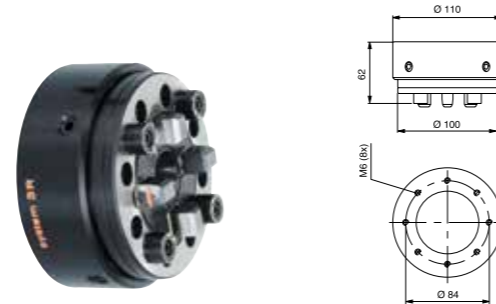
- Tightening torque 6 Nm.
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Weight 2.1 kg.



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

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

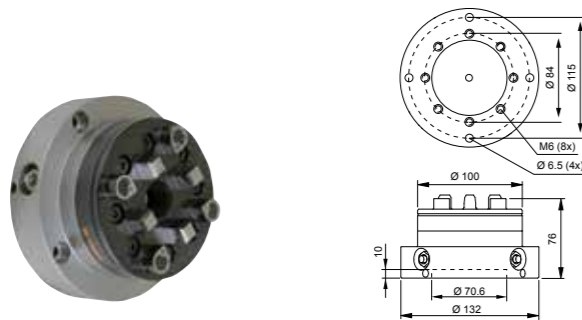
- Required drawbar 3R-605.1 or 3R-605.4
- Carbide XY-references
- Fixed index positions 4x90°
- Tightening torque 4 Nm
- Weight 3.6 kg.



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

Pneumatic chuck for permanent mounting on the machine spindle, onto the machine table or as a lathe chuck.

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



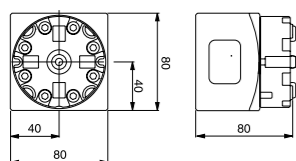
### Manual chuck, MacroStd, 3R-610.21-S

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

- Tightening torque 6 Nm.
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing duct
- Weight 3.5 kg.

#### 90842

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



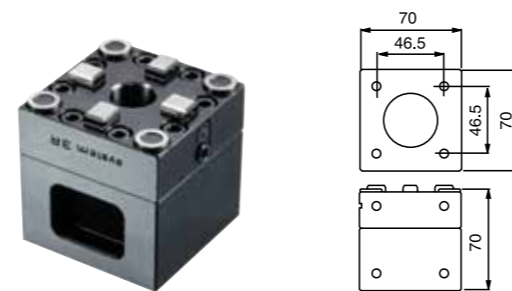
Except 90842



### Manual chuck, MacroStd, 3R-610.21

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

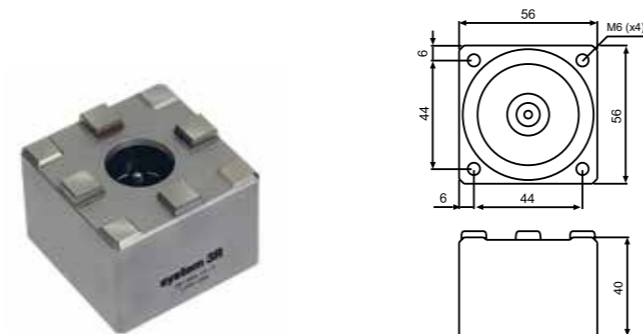
- Tightening torque 6 Nm.
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing duct
- Weight 2.2 kg.



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

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

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

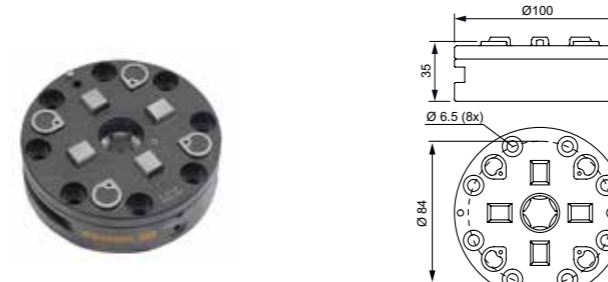


## Macro – Chucks

### Pneumatic chuck, MacroStd, 3R-600.14-30

Pneumatic low profile chuck for permanent mounting on the machine table.

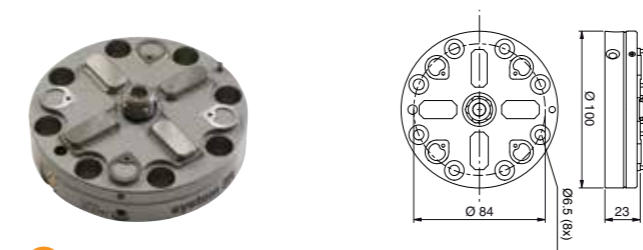
- Required drawbar 3R-605.2
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Weight 2 kg.



### Pneumatic chuck, MacroHP, 3R-602.81RS

Rust resistant pneumatic low profile 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.

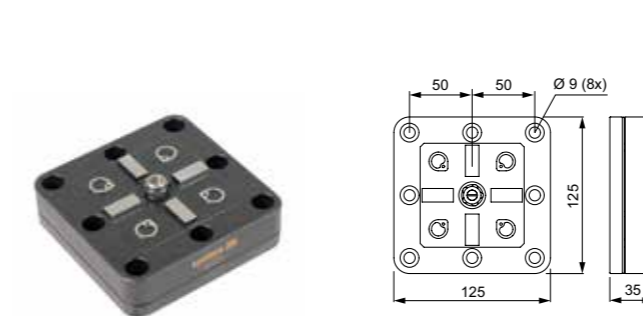


### Pneumatic chuck, VDP, 3R-602.10-V

Pneumatic vibration-damped chuck, low-profile version.

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

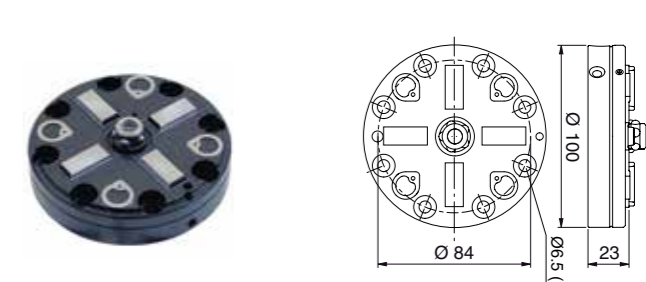
VDP



### Pneumatic chuck, MacroStd, 3R-602.81

Pneumatic low profile chuck for permanent mounting on the machine table.

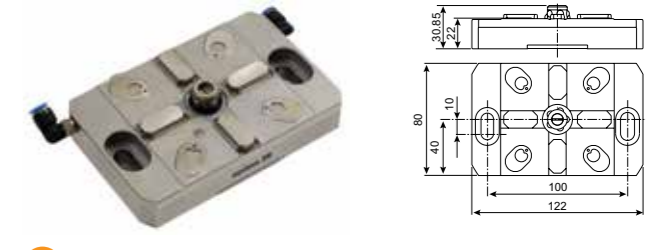
- Required drawbar 3R-605.10
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Weight 1 kg.



### Pneumatic chuck, MacroHP, 3R-602.10-1

Rust resistant pneumatic low profile chuck for Macro holders. Supplied with drawbar 3R-605.10 and protective cover.

- Clamping force 7000 N
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Rust resistant
- Weight 1.0 kg.

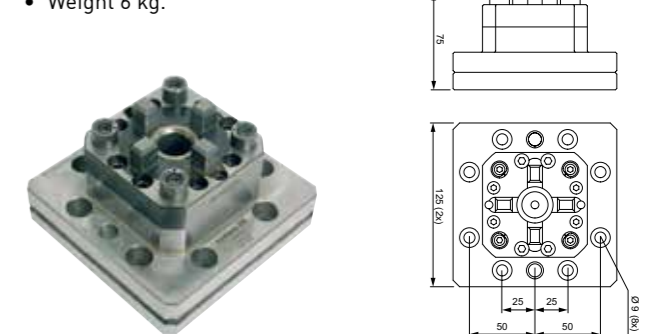


### Pneumatic chuck, VDP, 90716.09

Pneumatic vibration-damped chuck.

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

VDP

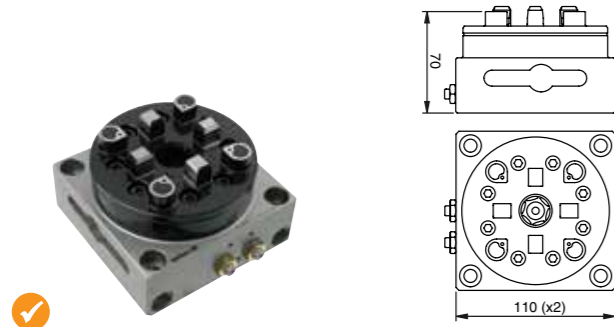


## Macro – Chucks

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

Pneumatic table chuck locked/opened with air gun.

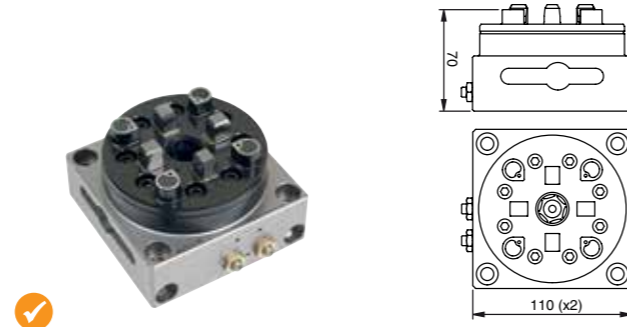
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg.



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

Pneumatic table chuck locked/opened with air gun.

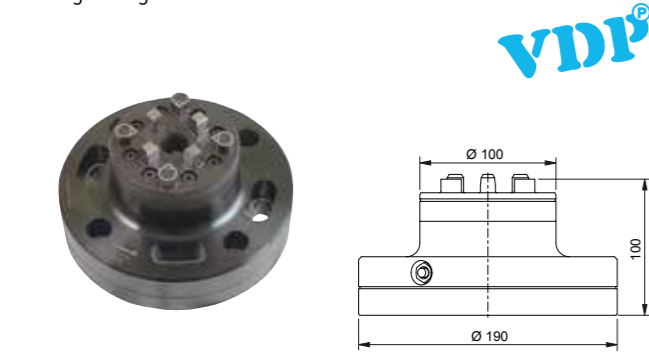
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Weight 4.4 kg.



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

Pneumatic vibration-damped table chuck.

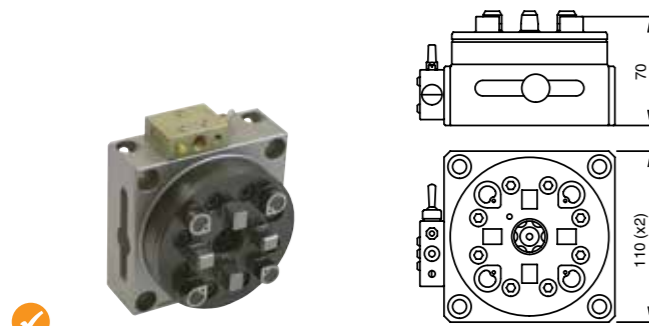
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg.



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

Pneumatic chuck for horizontal or vertical use.

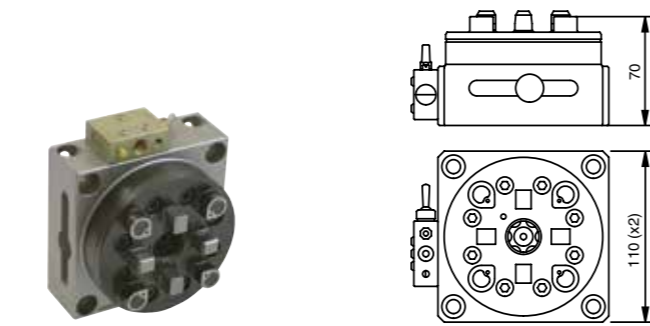
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air unit included
- Weight 4.4 kg.



### Pneumatic chuck, MacroHP, 3R-610.46-3

Pneumatic chuck for horizontal or vertical use.

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



## Macro – Chucks

### Manual chuck, MacroStd, 3R-600.28-S

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

- Tightening torque 6 Nm
- Required drawbar 3R-605.2
- Fixed index positions  $4 \times 90^\circ$
- Flushing connection
- Weight 1.1 kg.



### Manual chuck, MacroStd, 3R-600.23-S

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

- Tightening torque 6 Nm.
- Required drawbar 3R-605.2
- Fixed index positions  $4 \times 90^\circ$
- 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.

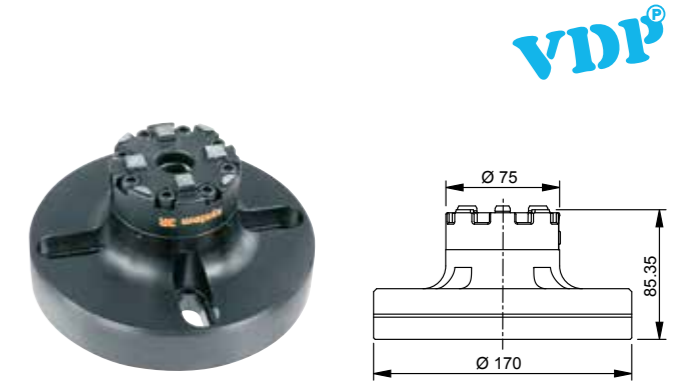
- Tightening torque 6 Nm.
- Required drawbar 3R-605.2
- Fixed index positions  $4 \times 90^\circ$
- Flushing connection
- Weight 0,7 kg.



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

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

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



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

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

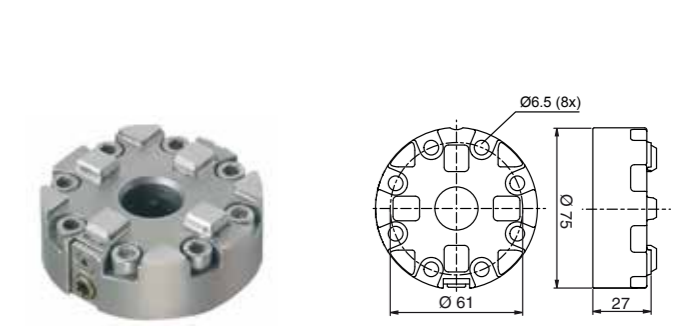
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions  $4 \times 90^\circ$
- Flushing connection
- Weight 0.7 kg.



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

Rust resistant manual chuck for Macro holder. Designed for permanent mounting.

- Tightening torque 6 Nm
- Required drawbar 3R-605.2RS
- Rust-resistant
- Fixed index positions  $4 \times 90^\circ$
- Weight 0.7 kg.





## Macro – Chucks

### Pneumatic chuck, MacroStd, 90412.1X

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

- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Turbo locking.



### Pneumatic chuck, MacroHP, 90412.2X

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

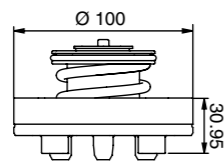
- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Turbo locking.



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

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

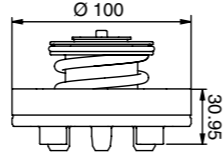
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



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

Rust resistant chuck for Macro holder. For permanent mounting on the machine spindle or fixture.

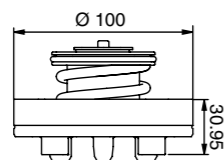
- Required drawbar 3R-605.1RS
- Clamping force 6000 N
- Required air pressure 6±1 bar
- Carbide XY-References
- Rust resistant
- Fixed index positions 4x90°
- Weight 2 kg.



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

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

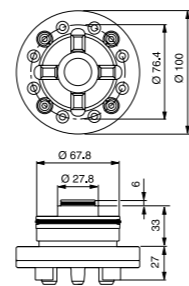
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Carbide XY-References
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



### Pneumatic chuck, MacroHP, 3R-SP7359

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

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



### 3R-SP7359-RS

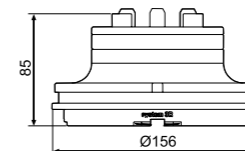
- Rust resistant version, otherwise as 3R-SP7359.

## Macro – Chuck adaptes & adapters

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

MacroMagnum chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-686.10-2A.

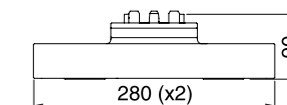
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Turbo locking
- Weight 4.5 kg.



### Pneumatic chuck adapter, Dynafix-Macro, 90356.22

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

- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Clamping force 6000 N
- Carbide XY-References
- Turbo locking



### Hydraulic adapters

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

#### K-40338.4

- Ø10 mm
- Construction height 80 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.3 kg.

#### K-40339.1

- Ø20 mm
- Construction height 90 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.6 kg.

#### K-40338.5

- Ø32 mm
- Construction height 101 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.8 kg.



#### K-40338.3

- Ø16 mm
- Construction height 80 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.4 kg.

#### K-40338.2

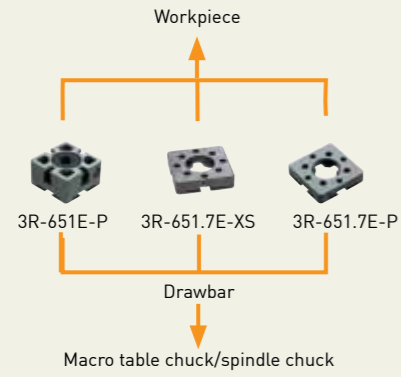
- Ø25 mm
- Construction height 102.5 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 1.7 kg.

#### K-40338.1

- Ø40 mm
- Construction height 140 mm
- Rust resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 2.2 kg.

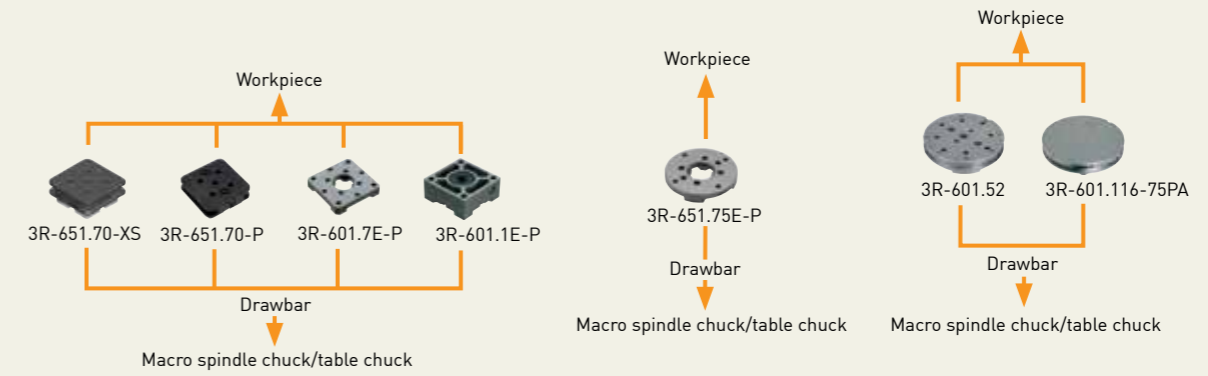


## Macro – Pallets & reference elements



Pallets and ref. element, 54x54 mm	Article number	Feature
Hardened reference element 12.5 mm, HP	3R-651.7E-P	rust resistant
Hardened reference element 12.5 mm, Std	3R-651.7E-XS	
Hardened pallet 30 mm, HP	3R-651E-P	rust resistant

## Macro – Pallets & 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
Unhardened pallet, HP	3R-651.70-P	reference element 54x54 mm
Unhardened pallet, Std	3R-651.70-XS	reference element 54x54 mm

### Ref. element, Ø75 mm

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

Pallets, Ø116 mm	Article number	Feature
Hardened pallet, HP	3R-601.52	3Refix Ø10 mm, rust resistant
Unhardened pallet, HP	3R-601.116-75PA	With reference element Ø75 mm





## Macro – Pallets & reference elements

### Pallet Ø116 mm, 3R-601.116-75PA

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

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



### Accessories:

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

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

Note: Only suitable for Ø116 mm pallets.



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

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

Note: Only suitable for Ø116 mm pallets.



\*For more info please ask System 3R.



### 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 & Z-references hardened
- Ready for code carrier
- Ready for automation
- Gripp outside the pallet
- Sealing ring between pallet and chuck
- Weight 1 kg.



PT = Process Tooling

### Accessories:

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

Suitable for some Macro chucks with drawbar 3R-605.\*.



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

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



\*For more info please ask System 3R.

Application example.

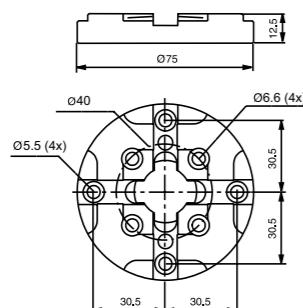


### Reference element Ø75 mm, 3R-651.75E-P

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.

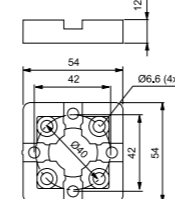
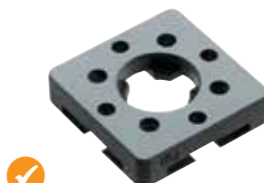


### Reference element 54x54 mm, MacroHP, 3R-651.7E-P

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.



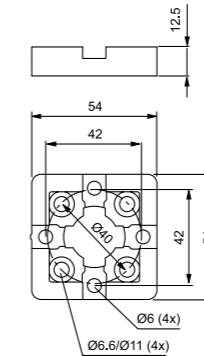
## Macro – Pallets & reference elements

### Reference element 54x54 mm, MacroStd, 3R-651.7E-XS

Hardened pallet for copper electrodes and workpieces.

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

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

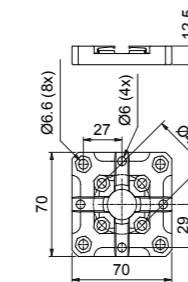
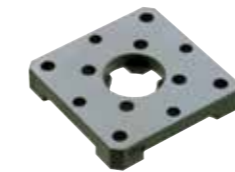


### Reference element 70x70 mm, MacroHP, 3R-601.7E-P

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.

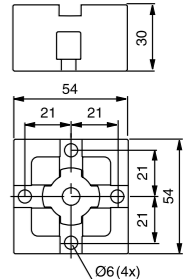
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 5
- Weight per set 3 kg.



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

Hardened, with clearance holes for four fixing screws.

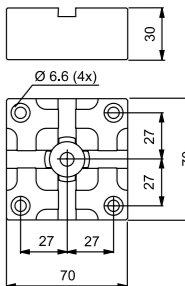
- Ready for code carrier
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.4 kg.



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

Hardened, with clearance holes for four fixing screws.

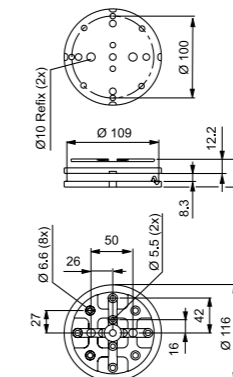
- Ready for code carrier
- Fixed index positions 4x90°
- Rust resistant
- Flushing duct
- Supplied in sets of 5
- Weight per set 3.2 kg.



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

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

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



### Accessories:

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

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

Note: Only suitable for Ø116 mm pallets.



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

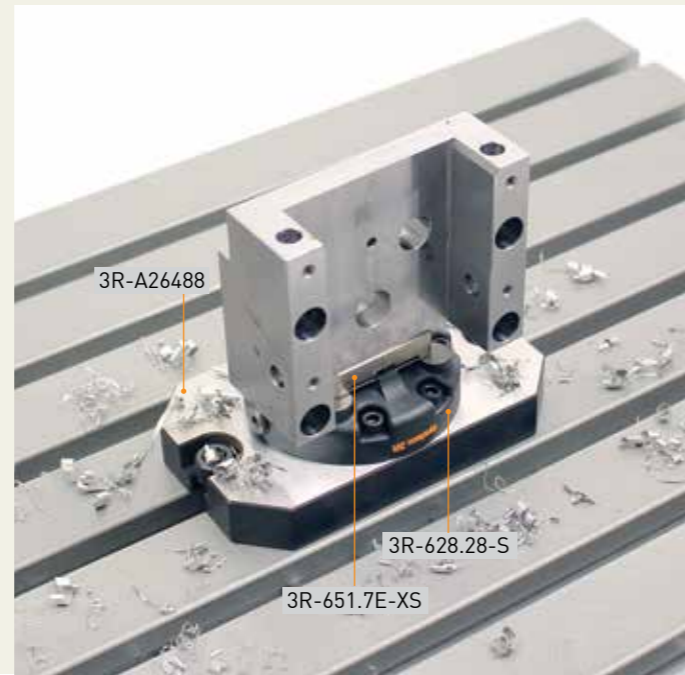
Suitable for some Macro chucks with drawbar 3R-605.2\*.

Note: Only suitable for Ø116 mm pallets.



\*For more info please ask System 3R.

## Macro – Accessories



### Drawbars

#### 3R-605.1E

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

#### 3R-605.2E

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

#### 3R-605.1EE

- Supplied in sets of 40 pcs.

#### 3R-605.2EE

- Supplied in sets of 20 pcs.



#### 3R-605.4E

- For round pallets adapted for automatic changing
- Ø20x57.1 without flushing hole
- Supplied in sets of 10 pcs.

#### 3R-605.4EE

- Supplied in sets of 40 pcs.

#### 3R-605.10

- Ø20x13 mm
- Rust resistant.

#### 3R-605.10E

- Supplied in sets of 10 pcs.

#### 3R-605.10EE

- Supplied in sets of 20 pcs.

### 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

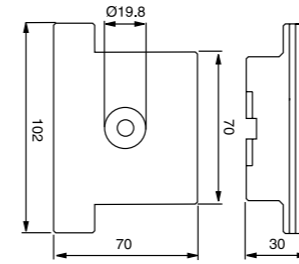


## Macro – Accessories

### Control ruler, 3R-606.1

For setting angular positions and for centring Macro chucks.

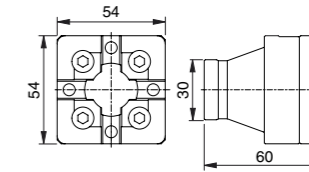
- Ground hole for centring.
- Measuring length 100 mm
- Weight 1.4 kg.



### Control ruler, 3R-656.1

For setting angular positions. Ground outside diameter for centring.

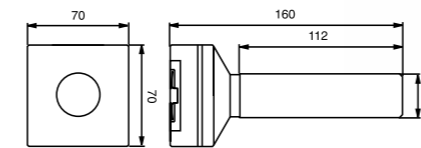
- Measuring length 50 mm
- Weight 0.8 kg.



### Control rod, 3R-606

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

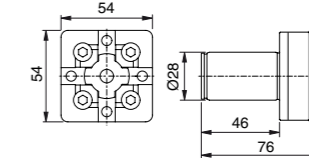
- Measuring length 110 mm
- Weight 2.3 kg.



### Control rod, 3R-656

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

- Measuring length 38 mm
- Weight 1 kg.



### Converter kit, 90842.01

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



### Converter kit, 3R-A27634

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

- Extra height 18.5 mm.





## Macro – Accessories

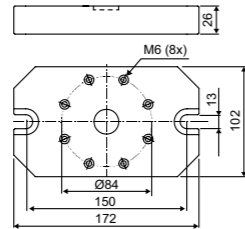
### Centring ring, 3R-612.6

For centring 3R-600.20.



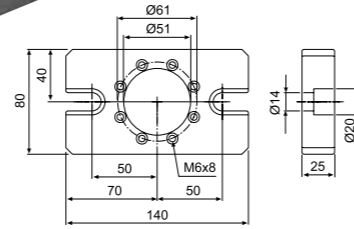
### Adapter plate, 3R-A26488

For mounting 3R-600.28-S.



### Adapter plate, 3R-A19724

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



### Splash guard, 90027

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

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



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

Mainly for MacroCombi and Ø10 3Refix mandrels.

- 4 Nm.

### 3R-614-06

For Macro chucks.

- 6 Nm.

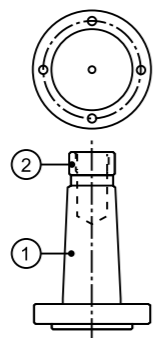


### Lathe taper, 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

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

Use the order form at the end of the catalogue.



### Allen key, 3R-333-03

- 3 mm
- Supplied in 10 pcs.



### Allen key, 3R-333-05

- 5 mm
- Supplied in 10 pcs.



## Macro – Accessories

### Connection for air gun, 90815

For manual operation of pneumatic chucks with air gun.

- Supplied in sets of 2 pcs.



### Locking ring key, 3R-605-GE

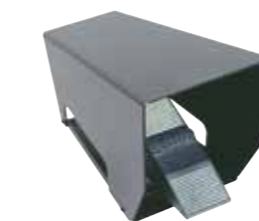
To lift the locking ring of the drawbars.

- Supplied in sets of 2



### Control unit, 3R-611.2

Foot operation of pneumatic chucks.



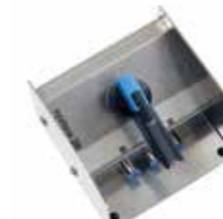
### Control unit, 3R-611.4

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



### Control unit, 3R-611.46

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



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

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

- Supplied in sets of 10.



### 3Refix mandrel

Note: When positioning with 3Refix mandrels –always tighten the expanding mandrel in the R<sup>0</sup> 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-901-20E

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

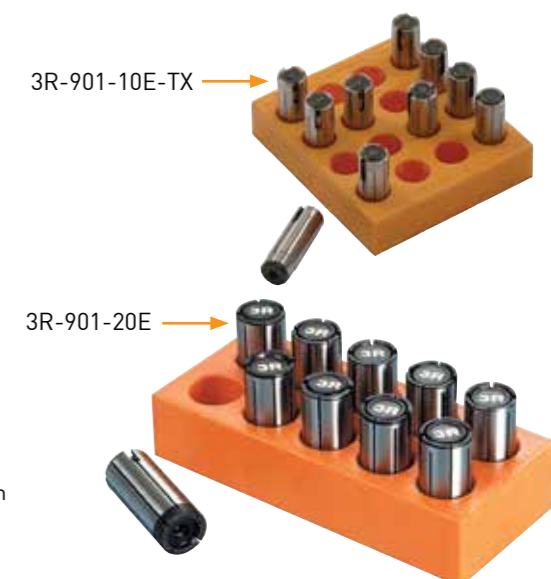


#### 3R-901-10RS

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

#### 3R-901-20RS

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



# MacroNano

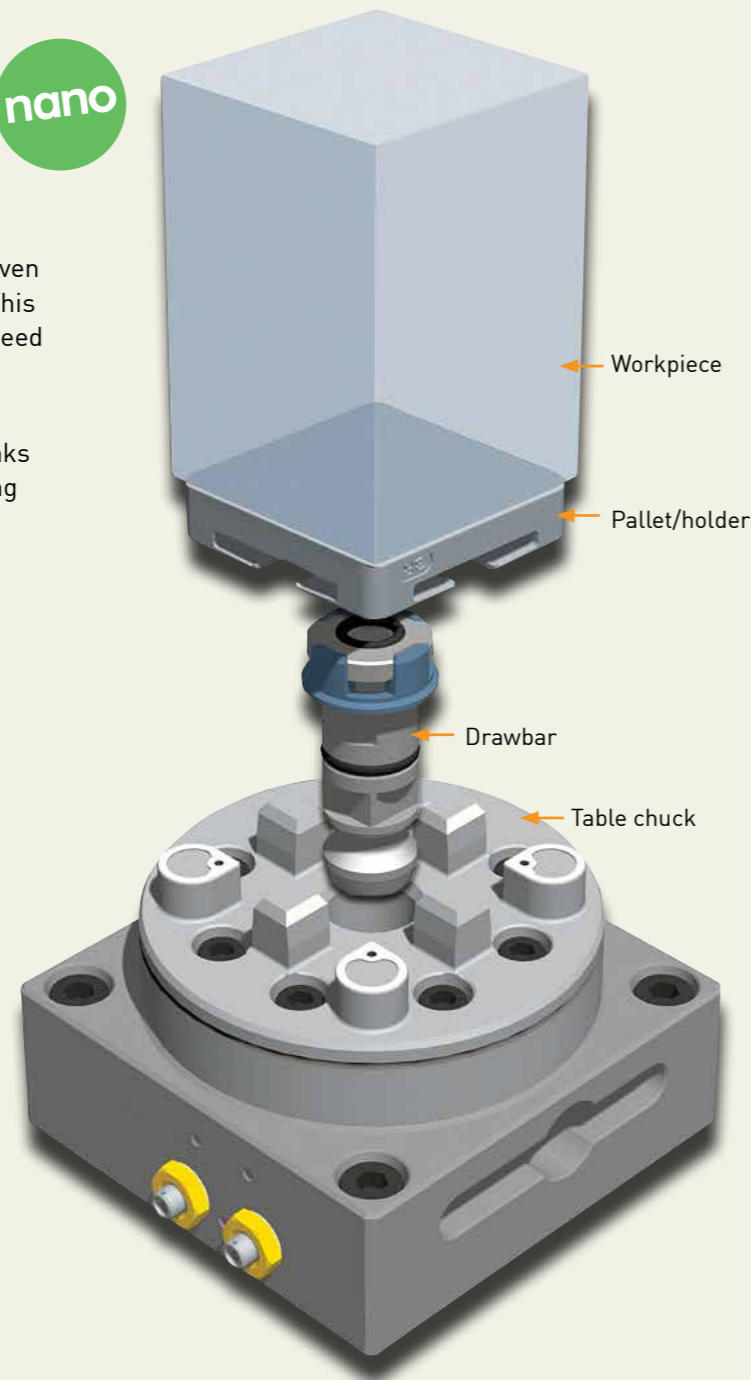
- ... Extremely high accuracy.
- ... High-precision machines are linked together in the production chain, without detracting from the extreme accuracy.
- ... Feedback to the machine for supplementary machining after inspection is possible. This feedback is only meaningful if the pallet system is at least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

## Workholding for Nano Precision

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

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

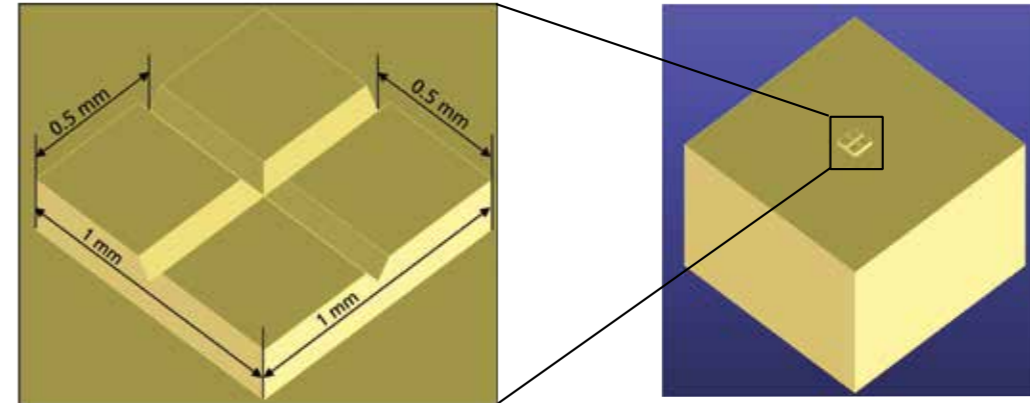
- + Repetition accuracy – within 0.001 mm
- + Locking force – 6000 N
- + Fixed index positions 4x90°
- + Required air pressure, pneumatic chuck – 6±1 bar
- + Recommended max workpiece weight – 50 kg.



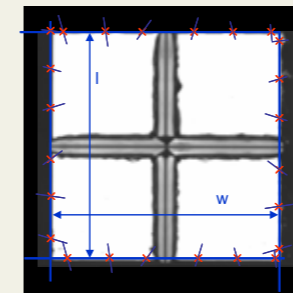
# MacroNano

## Application example: Microstructuring with Diamond Machining

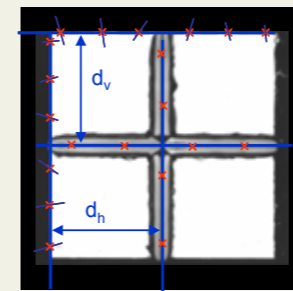
Micro features produced with nano precision



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



Measurement of the cube dimensions

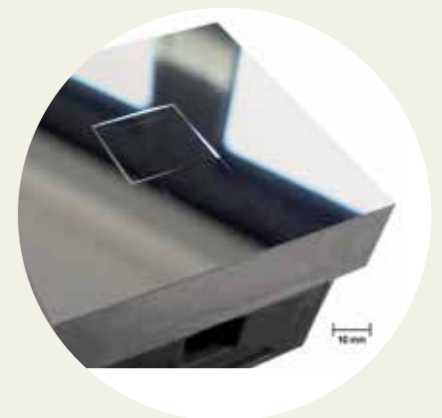


Measurement of groove positions

	Width (mm)	Length (mm)	Vertical dist. (mm)	Horizontal dist. (mm)
W <sub>1</sub>	0.9996	l <sub>1</sub> 0.9999	d <sub>v1</sub> 0.4988	d <sub>h1</sub> 0.5013
W <sub>2</sub>	0.9996	l <sub>2</sub> 0.9999	d <sub>v2</sub> 0.4993	d <sub>h2</sub> 0.4995
W <sub>3</sub>	0.9996	l <sub>3</sub> 0.9999	d <sub>v3</sub> 0.4996	d <sub>h3</sub> 0.5001
W <sub>4</sub>	0.9997	l <sub>4</sub> 0.9999	d <sub>v4</sub> 0.4991	d <sub>h4</sub> 0.4995
W <sub>5</sub>	0.9996	l <sub>5</sub> 0.9998	d <sub>v5</sub> 0.5010	d <sub>h5</sub> 0.5001
W <sub>6</sub>	0.9996	l <sub>6</sub> 0.9998	d <sub>v6</sub> 0.5007	d <sub>h6</sub> 0.5002
W <sub>7</sub>	0.9997	l <sub>7</sub> 0.9999	d <sub>v7</sub> 0.4996	d <sub>h7</sub> 0.5012
W <sub>8</sub>	0.9996	l <sub>8</sub> 0.9999	d <sub>v8</sub> 0.4992	d <sub>h8</sub> 0.5009
W <sub>9</sub>	0.9997	l <sub>9</sub> 0.9999	d <sub>v9</sub> 0.4996	d <sub>h9</sub> 0.5009
W <sub>10</sub>	0.9996	l <sub>10</sub> 0.9998	d <sub>v10</sub> 0.4998	d <sub>h10</sub> 0.5008
<b>W</b>	<b>0.9996</b>	<b>l</b> <b>0.9999</b>	<b>d<sub>v</sub></b> <b>0.4997</b>	<b>d<sub>h</sub></b> <b>0.5004</b>

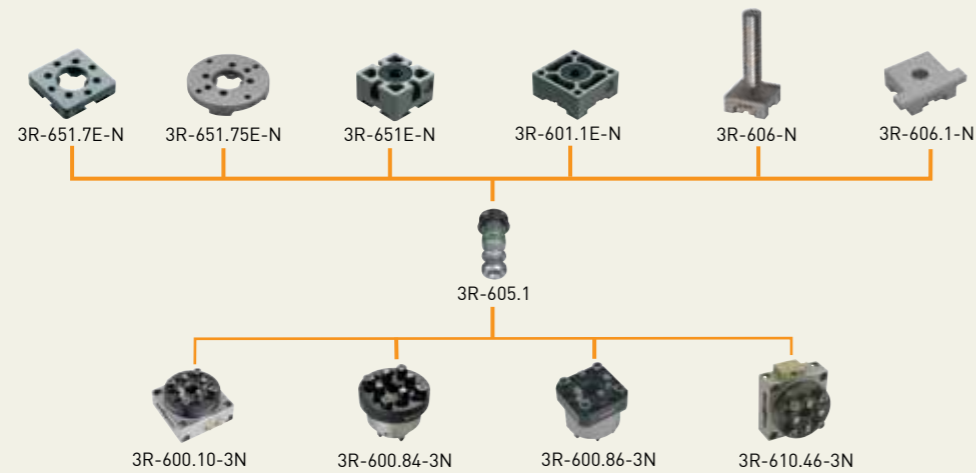
Mean values

Overall structure deviation < 0.5 μm





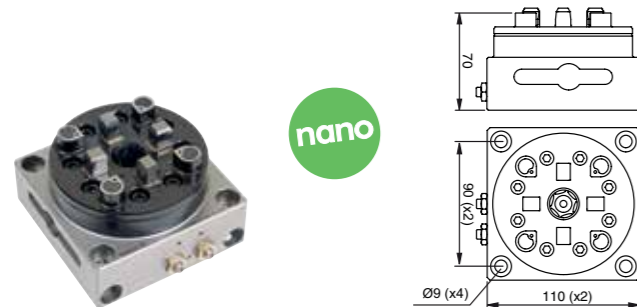
## MacroNano – Chucks, pallets, reference elements & accessories



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

Chuck for mounting on the machine table.

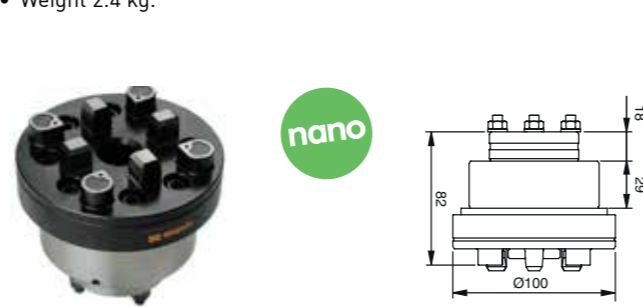
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.



### 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.

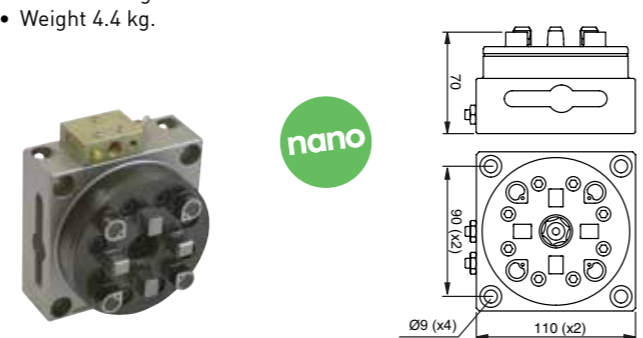
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.



### 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, reference elements & accessories

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

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

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

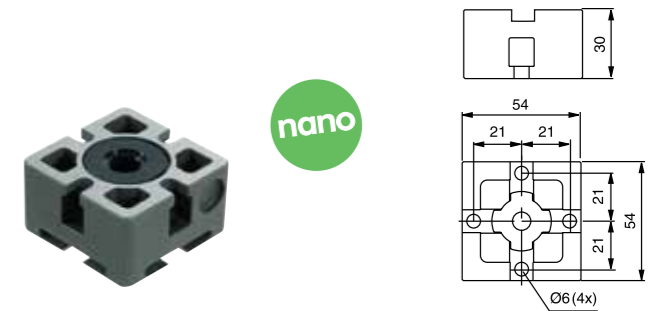
- Fixed index positions 4x90°
- Parallel-ground top and bottom face
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 1.2 kg.



### 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.

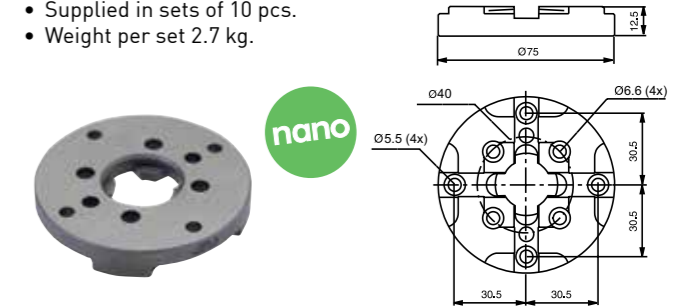


### Reference element Ø 75 mm, MacroNano, 3R-651.75E-N

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.

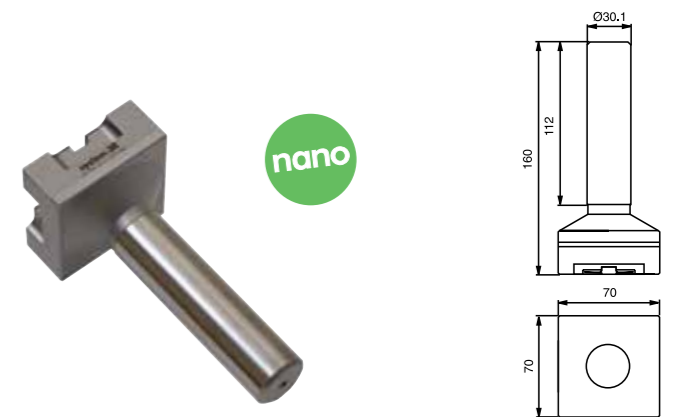
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust resistant
- Supplied in sets of 5
- Weight per set 3 kg.



### Check mandrel, MacroNano, 3R-606-N

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

- Measuring length 110 mm.
- Weight 2.3 kg.

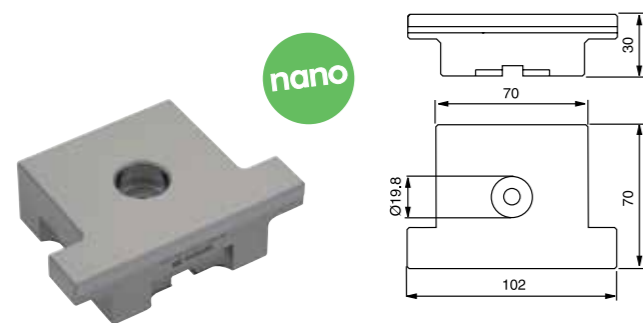


## MacroNano – Accessories

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

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm.
- Weight 1.4 kg.



### Locking ring key, 3R-605-GE

To lift the locking ring of the drawbars.

- Supplied in sets of 2.



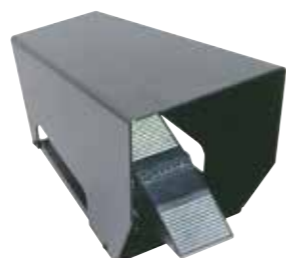
### Drawbar, 3R-605.1E

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



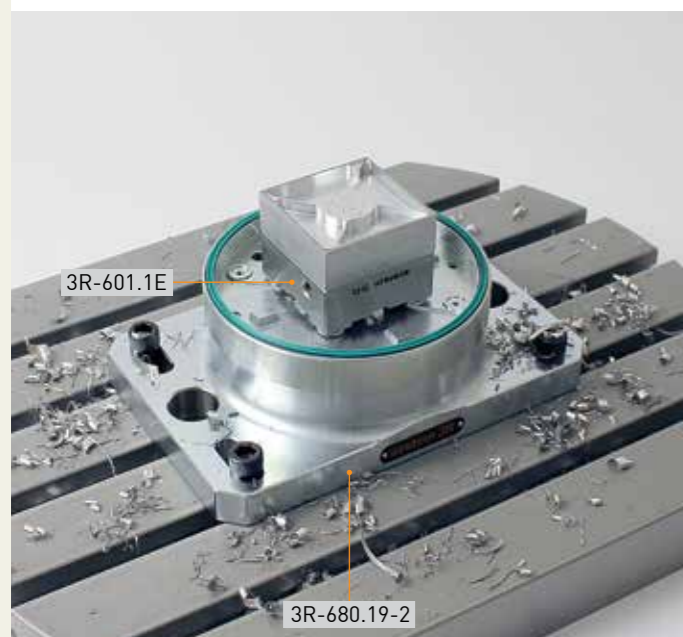
### Air unit, 3R-611.2

Foot operation of pneumatic chucks.



### Air unit, 3R-611.4

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



## MacroMagnum

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

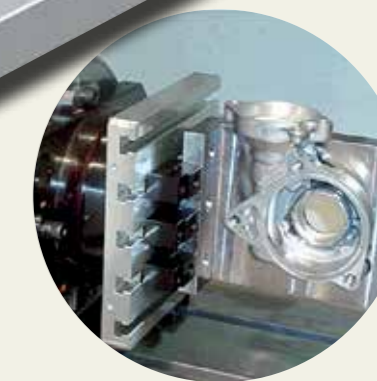
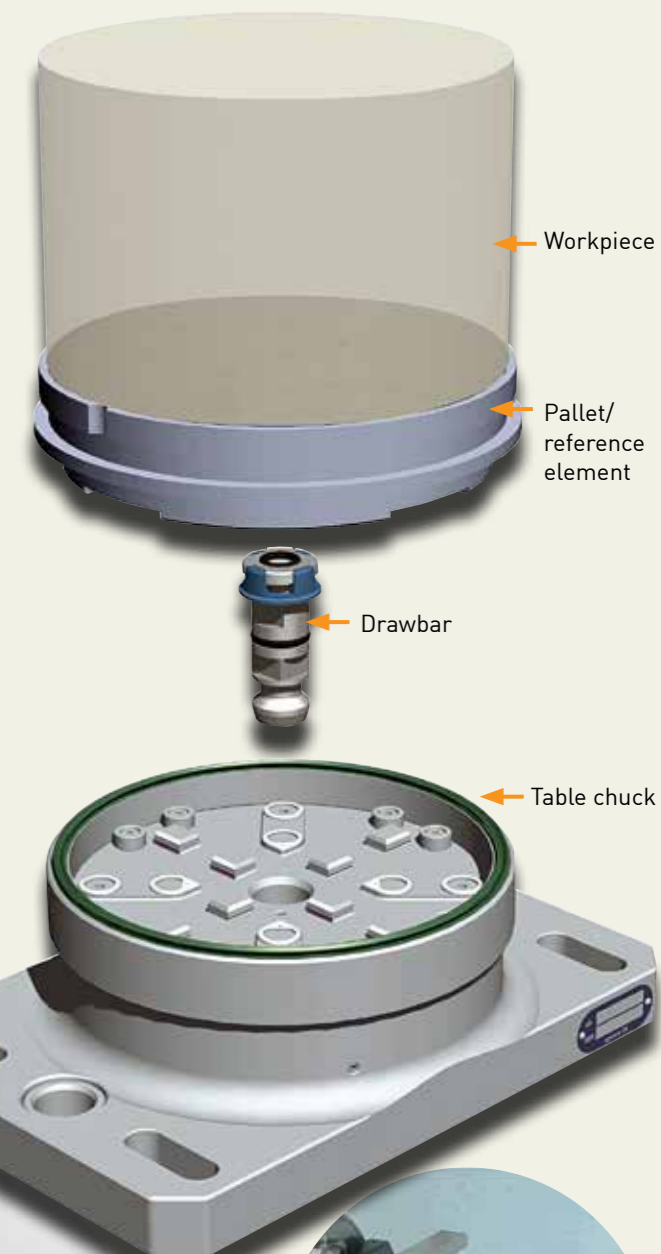
MacroMagnum is larger variant of the patented Macro system. The high clamping force and the position of the reference surfaces far away from the chuck centre mean that MacroMagnum can provide "Macro class" stability and accuracy, even in applications with high machining forces. The double references of the chucks mean that in addition to the MacroMagnum palletts, the extensive range of Macro palletts can also be fixed to MacroMagnum.

### The difference between a pallet and a reference element

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

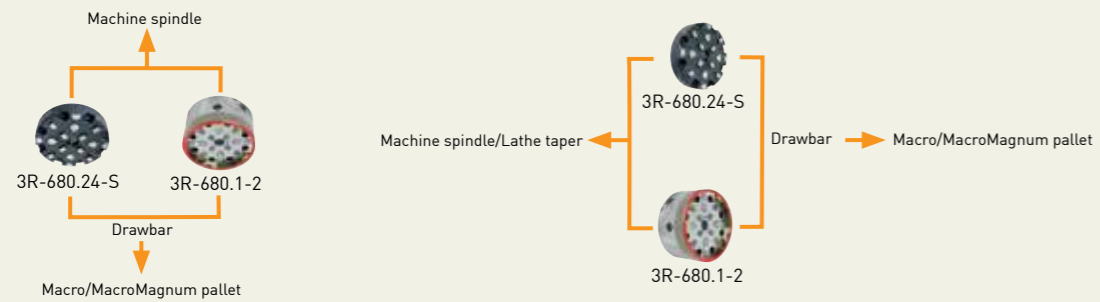
The reference elements are primarily intended to be mounted on the fixtures or vices in which the workpiece will be clamped. The reference elements are significantly thinner in order to limit the total construction height.

- + Repetition accuracy – within 0.002 mm
- + Locking force – 16 000 N
- + Fixed index positions –  $4 \times 90^\circ$
- + Required air pressure, pneumatic chuck –  $6 \pm 1$  bar
- + Recommended tightening torque manual chuck – Macro-pallet 4 Nm
- + Recommended tightening torque manual chuck – MacroMagnum-pallet 10 Nm.





## MacroMagnum – Chucks



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

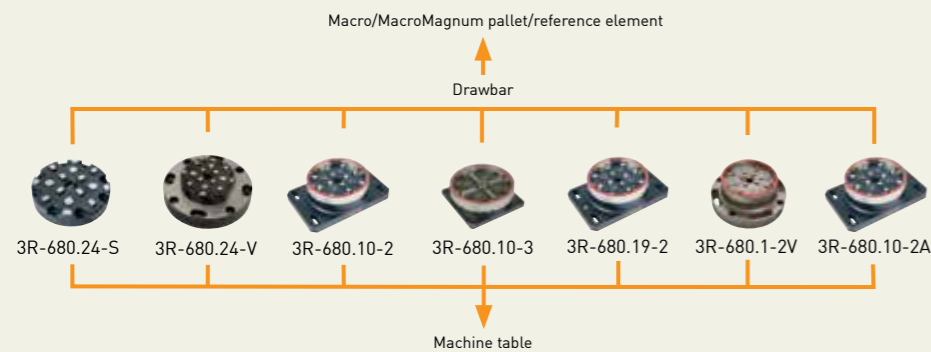


Table chucks	Article number	Drawbar	Feature
Manual	3R-680.24-S	3R-605.2	low profile
Manual	3R-680.24-V	3R-605.2	vibration-damped
Pneumatic	3R-680.10-2	3R-605.1 / 3R-605.4	
Pneumatic	3R-680.10-3	3R-605.2	low profile
Pneumatic	3R-680.19-2	3R-605.1 / 3R-605.4	3Refix Ø20 mm
Pneumatic	3R-680.1-2V	3R-605.1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

Built-in chucks	Article number	Drawbar	Feature
Pneumatic	90809.03	3R-605.1 / 3R-605.4	
Pneumatic	3R-SP26712	3R-605.2	low profile
Pneumatic	90419.XX	3R-605.1 / 3R-605.4	



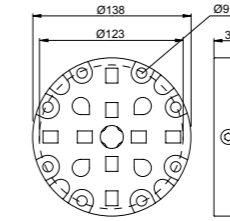
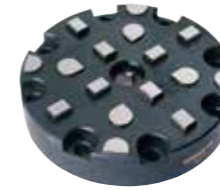
## MacroMagnum – Chucks

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

Low profile 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.

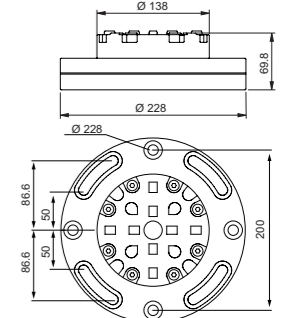
- Required drawbar 3R-605.2.
- Recommended tightening torque: Macro pallet 4 Nm, MacroMagnum pallet 10 Nm
- Fixed index positions 4x90°
- Weight 5 kg.



### 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.

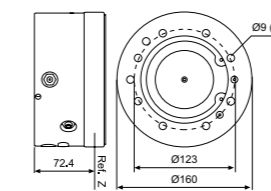


### Pneumatic chuck, 3R-680.1-2

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.

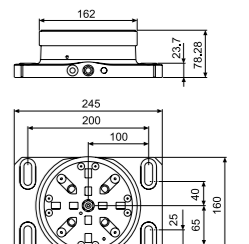
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar.
- Fixed index positions 4x90°
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 9 kg.



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

Pneumatic table chuck.

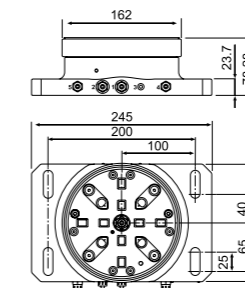
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg.



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

Pneumatic table chuck for chuck adapter.

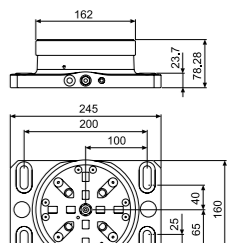
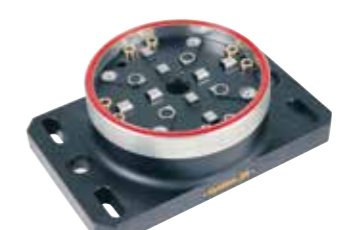
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references on chuck and chuck adapter
- Sealing ring
- Turbo locking
- Weight 12 kg.



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

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.



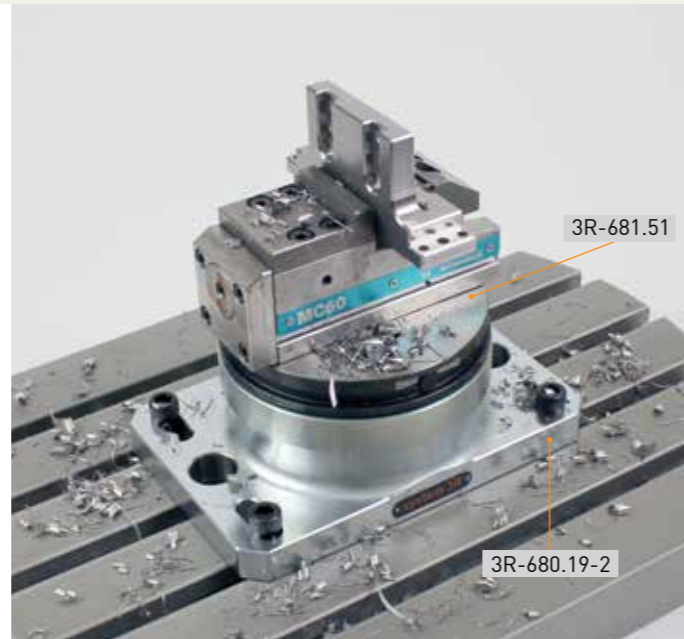
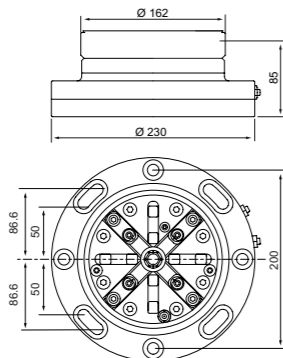
## MacroMagnum – Chucks

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

Pneumatic vibration-damped 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
- Turbo locking
- Weight 13 kg.

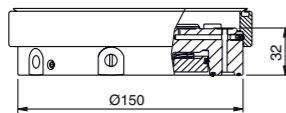
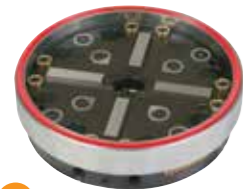
VDP®



### Pneumatic chuck, 3R-SP26712

For permanent mounting on the machine table.

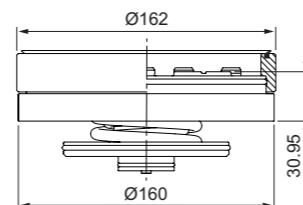
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.



### Pneumatic chuck, 90809.03

Pneumatic chuck intended for permanent building-in.

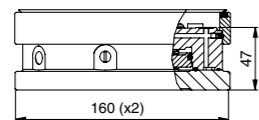
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.



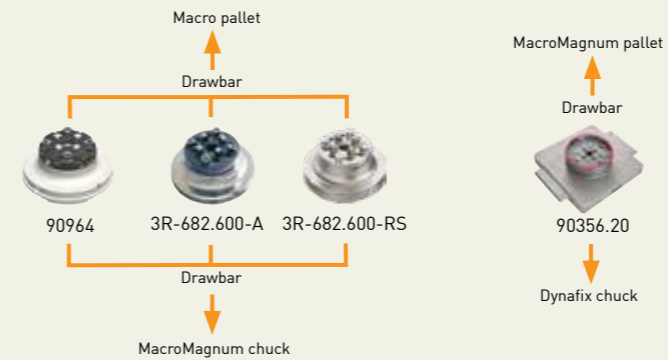
### Pneumatic chuck, 3R-680.10-3

For permanent mounting on the machine table.

- Supplied with drawbar 3R-605.2
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg.



## MacroMagnum – Chuck adapters

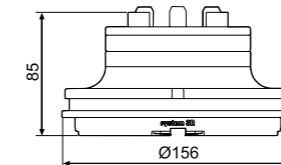


Chuck adapters	Article number	Drawbar	Feature
Pneumatic	90964	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ► Macro
Pneumatic	3R-682.600-A	3R-605.1 / 3R-605.4 + 3R-605.2	MacroMagnum ► Macro
Pneumatic	3R-682.600-RS	3R-605.1RS	MacroMagnum ► Macro
Pneumatic	90356.20	3R-605.2 / 3R-605.4	Dynafix ► MacroMagnum

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

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

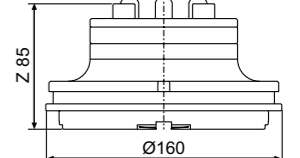
- Requires drawbar 3R-605.1RS
- Carbide X & Y-References
- Clamping force 6000 N
- Turbo locking
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.5 kg



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

Chuck adapter with built-in Pneumatic Macro chuck.

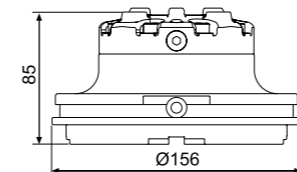
- Requires drawbar 3R-605.1RS
- Carbide X & Y-References
- Rust resistant
- Clamping force 6000 N
- Turbo locking
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.8 kg



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

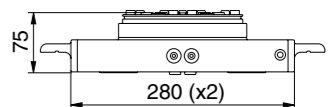
From MacroMagnum into Macro system. Chuck adapter with built-in Macro chuck.

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



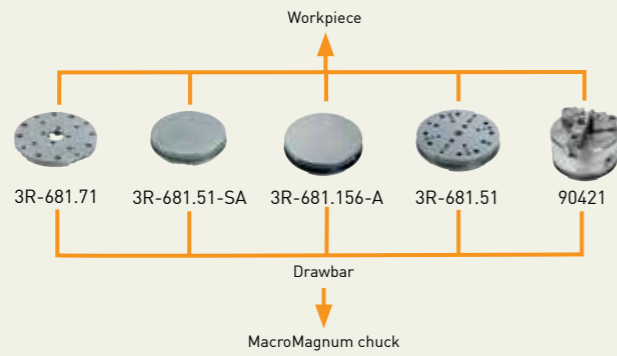
### Pneumatic chuck adapter, Dynafix-MacroMagnum, 90356.20

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





# MacroMagnum – Pallets & reference element



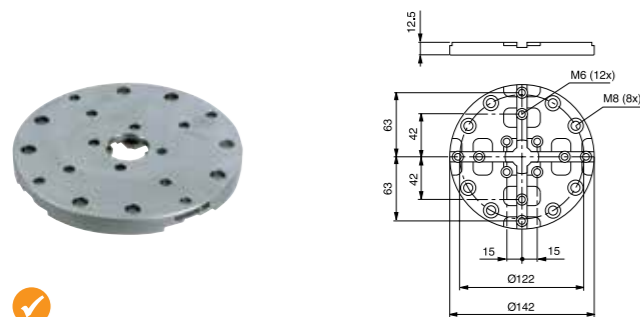
NOTE: All Macro pallets can be used in the MacroMagnum chucks.

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
Three-jaw chuck	90421	



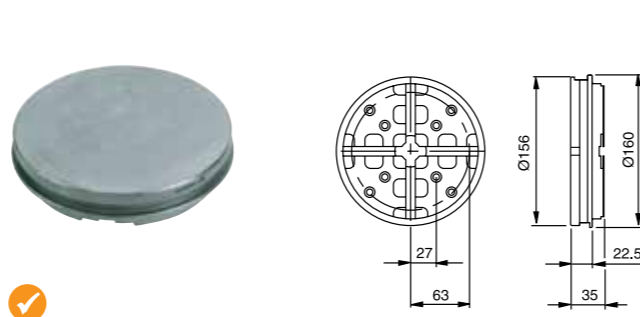
## Reference element Ø142 mm, 3R-681.71

Hardened pallet with clearance holes for fixing screws.  
 Note: Must be mounted on the workpiece/fixture before it is locked in a chuck.  
 • Rust-resistant  
 • Weight 1 kg.



## Pallet Ø156 mm, 3R-681.51-SA

Unhardened pallet with hardened references and hole markings for eight clearance holes.  
 • Adapted for automatic changing  
 • Ready for code carrier  
 • Weight 4.5 kg.



# MacroMagnum – Pallets & accessories

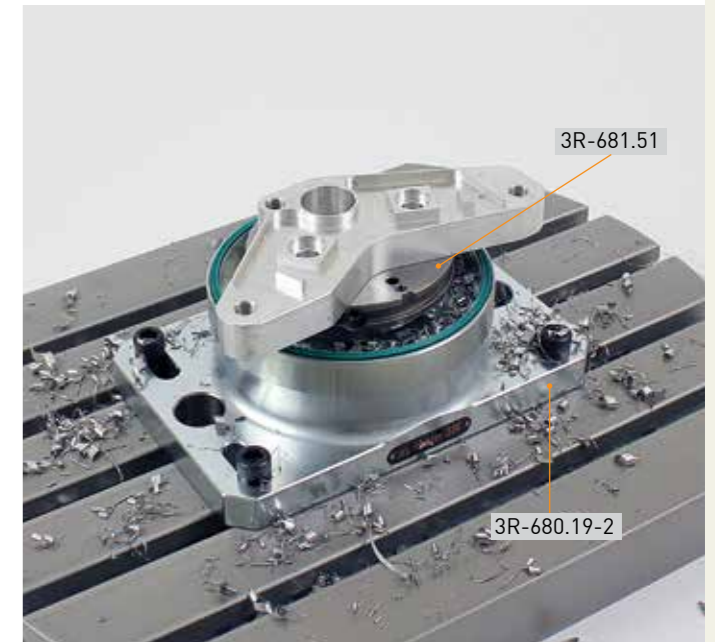
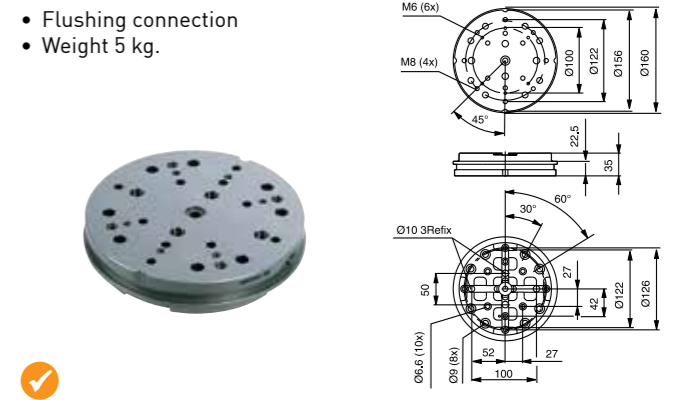
## Pallet Ø156 mm, 3R-681.156-A

Unhardened pallet with hardened reference element type 3R-681.71.  
 • Adapted for automatic changing  
 • Ready for code carrier  
 • Weight 4.5 kg.



## Pallet Ø156 mm, 3R-681.51

Hardened pallet with threads and clearance holes for eight and ten fixing screws.  
 • 3Refix Ø10 mm  
 • Adapted for automatic changing  
 • Ready for code carrier  
 • Rust-resistant  
 • Flushing connection  
 • Weight 5 kg.



## Drawbars

### 3R-605.1E

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



### 3R-605.1EE

• Supplied in sets of 40 pcs.

### 3R-605.2E

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



### 3R-605.2EE

• Supplied in sets of 20 pcs.

### 3R-605.4E

For round pallets adapted for automatic changing.  
 • Ø20x57.1 without flushing hole  
 • Supplied in sets of 10 pcs.



### 3R-605.4EE

• Supplied in sets of 40 pcs.

## MacroMagnum – User kit & Accessories



### Check ruler, 3R-686.1-HD

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

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



### Three-jaw chuck, 90421

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

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



### Splash guard, 90027.03

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



### User kit, 3R-688.24-S

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



### 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.

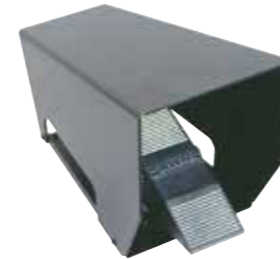
Note: When positioning with 3Refix mandrels – always tighten the expanding mandrel in the R<sup>9</sup> hole first.



## MacroMagnum – Accessories

### Control unit, 3R-611.2

Foot operation of pneumatic chucks.



### Control unit, 3R-611.4

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



### Control unit, 3R-611.46

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



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

For Ø10 mm 3Refix mandrels and manual MacroMagnum chucks.

- 4 Nm.



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

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

- Supplied in sets of 10 pcs.



### Connection for air gun, 90815

For manual operation of pneumatic chucks with air gun.

- Supplied in sets of 2 pcs.



### 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

- ... 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.

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.

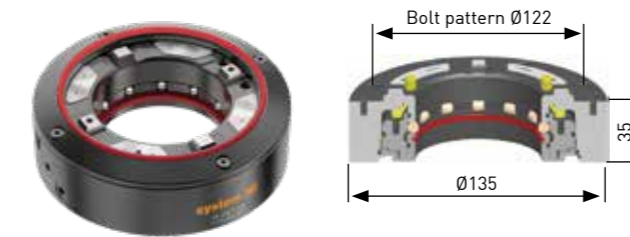


## Matrix 110

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

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

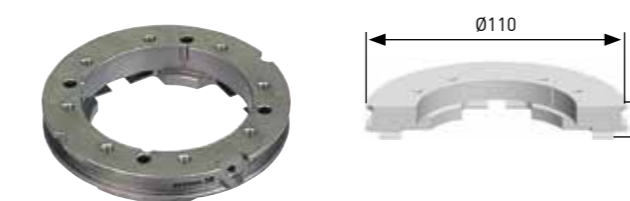
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 9 000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, - 6±1 bar
- Weight 2.7 kg.



### 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.

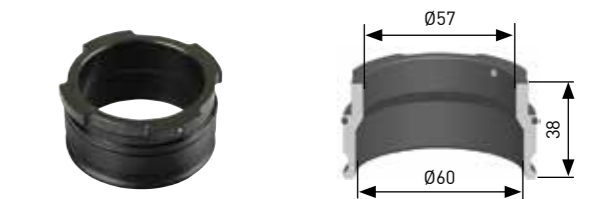
Note: Not self carrying, requires extra support.



### 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.



### 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.



### 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.

- Weight 2.9 kg.



## Matrix 110

### 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.



Three-jaw chuck mounted on a pallet.

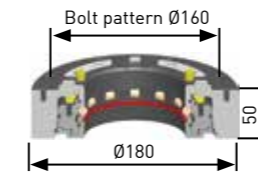


## Matrix 142

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

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

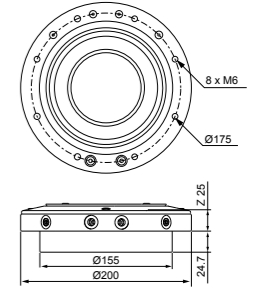
- Fixed index positions 4x90°
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, - 6±1 bar
- Weight 7 kg.



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

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

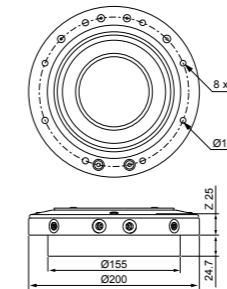
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, - 6±1 bar
- Weight 7 kg.



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

Rust resistant chuck for permanent mounting in the machine table.

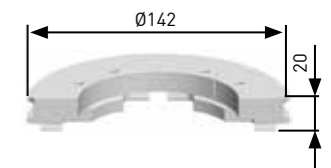
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 15 000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142RS
- Required air pressure, - 6±1 bar
- Weight 7 kg.



### 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.

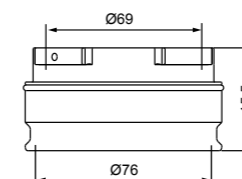
Note: Not self carrying, requires extra support.



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

- Weight 0.5 kg.

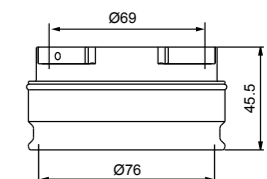
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



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

- Weight 0.5 kg.

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





# Matrix 142

## 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.

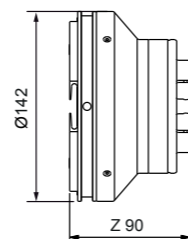
- Solid XY-references
- Rust resistant
- Recommended clamping torque 30 Nm
- Adapted for automatic changing
- Weight 3.9 kg.



## 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.



## 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.



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.

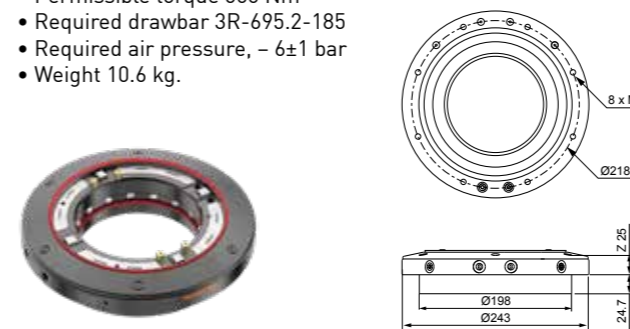
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 20 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185RS
- Required air pressure, - 6±1 bar
- Weight 9 kg.



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

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

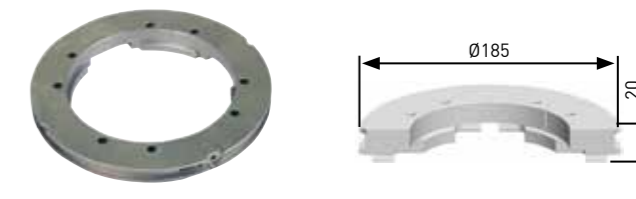
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 20 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, - 6±1 bar
- Weight 10.6 kg.



## 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.

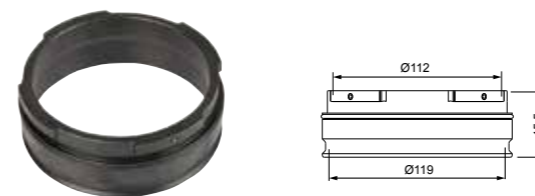
Note: Not self carrying, requires extra support.



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

- Weight 0.8 kg.

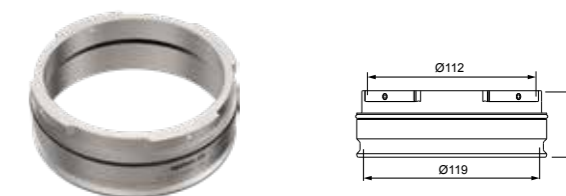
Note: In automation the gripper has to grip on the pallet and not on the drawbar.



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

- Weight 0.8 kg.

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



## Matrix 185

### 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.



### 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.

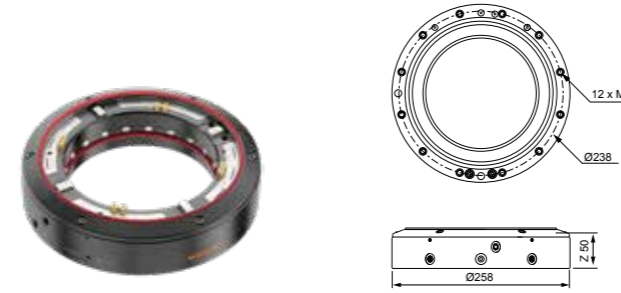


## Matrix 220

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

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

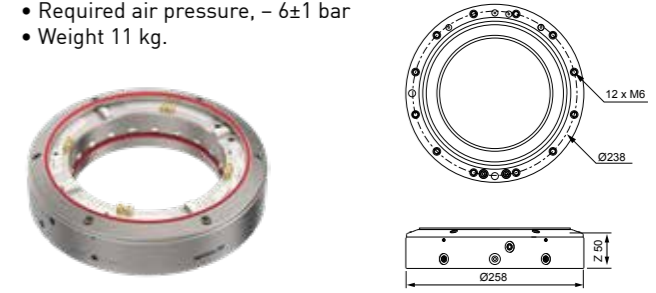
- Fixed index positions 4x90°
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, - 6±1 bar
- Weight 11 kg.



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

Rust resistant chuck for permanent mounting on the machine table.

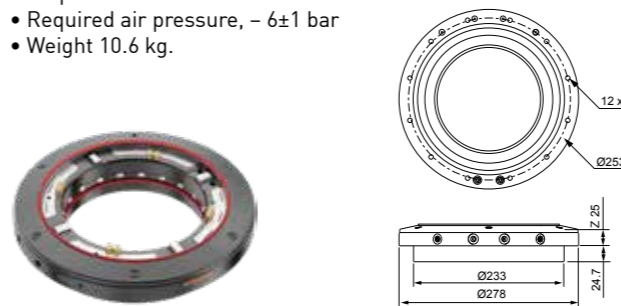
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220RS
- Required air pressure, - 6±1 bar
- Weight 11 kg.



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

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

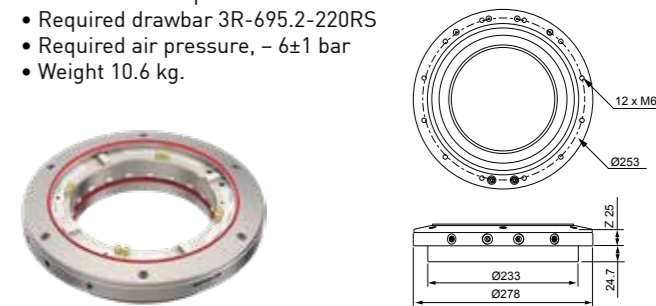
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, - 6±1 bar
- Weight 10.6 kg.



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

Rust resistant chuck for permanent mounting in the machine table.

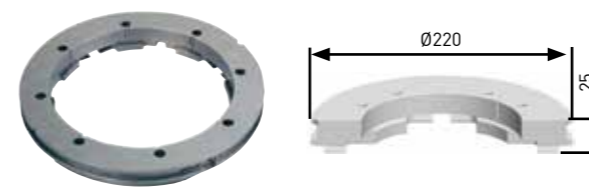
- Fixed index positions 4x90°
- Rust resistant
- Solid XY-References
- Hardened references
- Clamping force 23 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220RS
- Required air pressure, - 6±1 bar
- Weight 10.6 kg.



### 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.

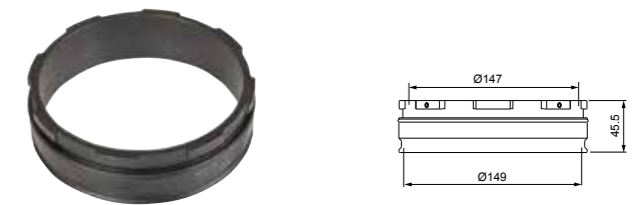
Note: Not self carrying, requires extra support.



### 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.



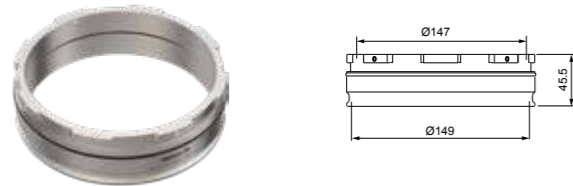


## Matrix 220 & accessories

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

- Weight 0.8 kg.

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



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

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

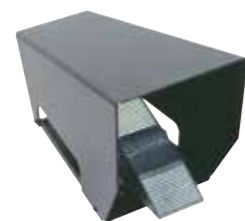
- Ready for code carrier
- Measuring length 150 mm.
- Adapted for automatic changing
- Weight 7.5 kg.



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

### 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.

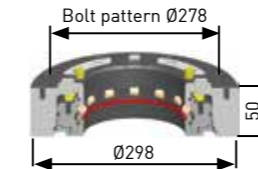


## Matrix 260

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

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

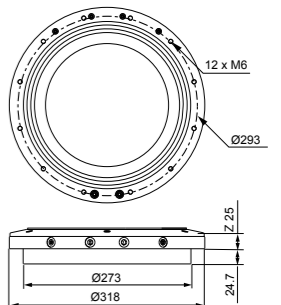
- Fixed index positions 4x90°
- Hardened references
- Clamping force 28 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, - 6±1 bar
- Weight 13 kg.



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

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

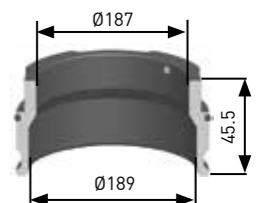
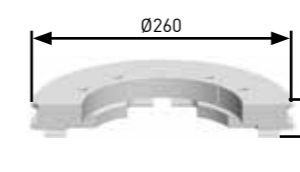
- Fixed index positions 4x90°
- Solid XY-References
- Hardened references
- Clamping force 28 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, - 6±1 bar
- Weight 12.6 kg.



### 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.



### 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.



# GPS 70 & GPS 120

- ... reduces setting-up times.
- ... ensures precision and quality.
- ... is sealed against dirt and swarf.
- ... has pallet clamping without drawbar.
- ... has lightweight pallets.
- ... suitable for automatic changing with System 3R's automation program.

The machining zero point is defined by the centre of the chuck in the GPS 70 and GPS 120 system. The chucks 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 and three-jaw chucks 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 GPS 70 and GPS 120 are 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.

- + Repetition accuracy – within 0.002 mm
- + Indexing accuracy – within 0.005 mm
- + Locking force – 3 000-3 800 N
- + Fixed index positions – 4x90°
- + Required air pressure, pneumatic chuck – 6 bar
- + Recommended max workpiece weight GPS 70 – 10 kg
- + Recommended max workpiece weight GPS 120 – 20 kg



# GPS 70 & GPS 120

Die-cast aluminium & steel pallets with standardised hole pattern. Minimum height in automation magazines by clamping without drawbar.



Pallet handling contour for automated pallet change by robot.



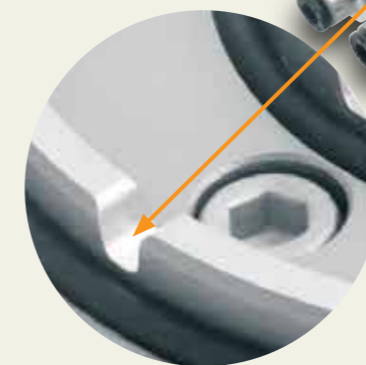
The Z-references are air blast cleaned, through nozzles in the Z-references of the chuck.

Spring loaded clamping mechanism. Releasing by air.



GPS 120 ring with references.

GPS 70 ring with references.

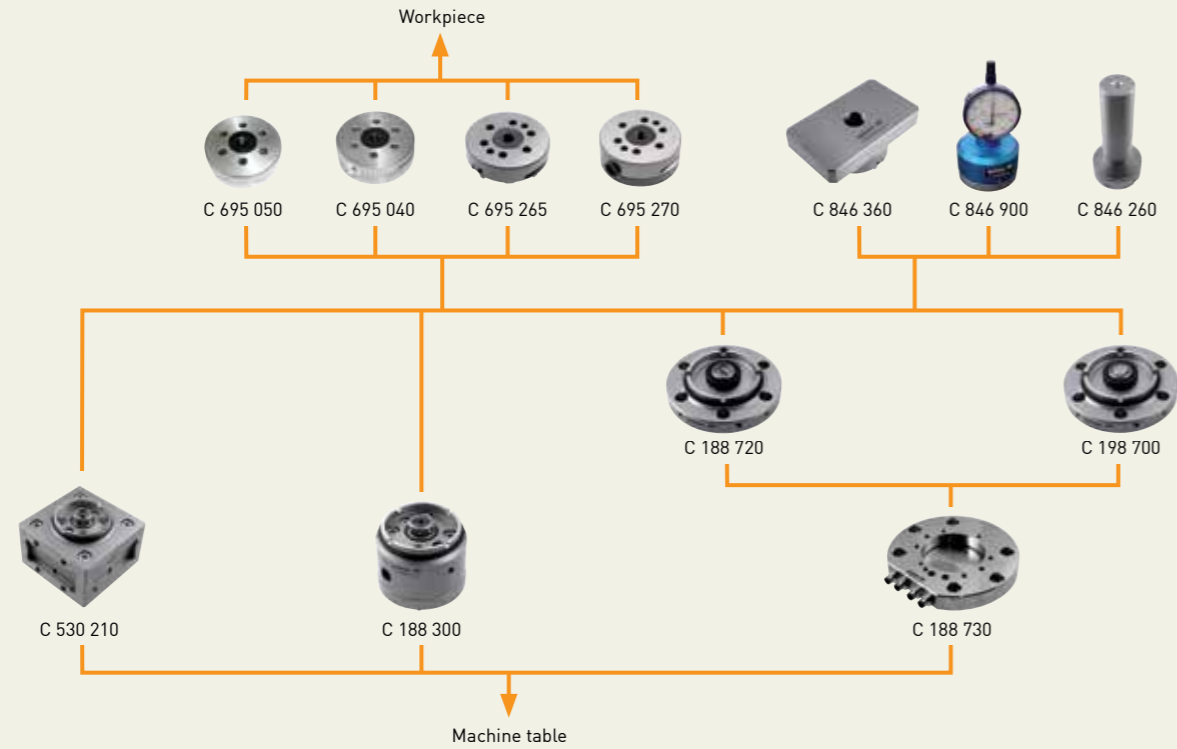


Hardened chuck body with prisms for X/Y centring made out of one piece for maximum stability. Indexing 4x90°.

Sealing rings for completely sealed chuck-pallet interface against dirt and swarf.



## GPS 70 – Chucks & pallets



Chucks	Article number	Feature
Manual, cube	C 530 210	
Manual, round	C 188 300	
Pneumatic manual (automatic)	C 188 720	for manual machining operations
Pneumatic automatic/manual	C 198 700	for manual & automatic machining operations
Flange	C 188 730	fits on C 188 720 & C 188 700

Pallets	Article number	Feature
Cast aluminium	C 695 050	
Cast aluminium	C 695 040	
Steel	C 695 265	
Steel	C 695 270	with pallet protection ring
Pallet protecting ring	C 695 295	fits on C 695 265

Pallet with coined cams    Pallet with spring hardened cams

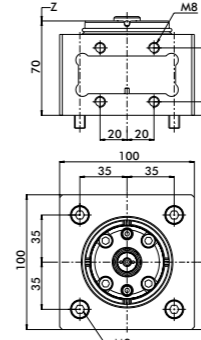


## GPS 70 – Chucks

### GPS 70 Machining cube, manual, C 530 210

For milling, grinding, die-sinking EDM, presetting and measuring station. Suitable for the 5-sided machining of electrodes and workpieces. One side is ground square with the base surface.

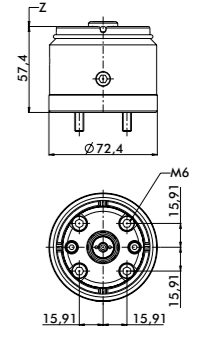
- Dimensions 100 x 100 x 70 mm
- Mounting (from the top) 70 x 70 mm, 4x M8 screws through holes (horizontal)
- Mounting (from the bottom) on GPS 240 pallet: 80 x 80 mm, 4x M8 screws threaded holes (horizontal), 40 x 40 mm, 4x M8 screws threaded holes (vertical)
- Releasing manual with Allen wrench.



### GPS 70 Chuck, manual, C 188 300

For turning, milling, grinding, die-sinking EDM.

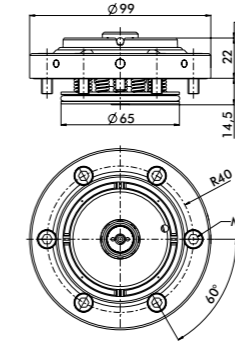
- Dimensions  $\varnothing 72.4 \times 57.4$  mm
- Mounting 4x M6 screws
- Releasing manual with Allen wrench
- Flushing lateral inlet.



### GPS 70 Chuck, pneumatic, C 188 720

For die-sinking EDM, turning, milling, grinding.

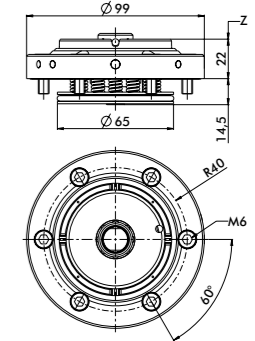
- Dimensions  $\varnothing 99 \times 22$  mm
- Mounting 6x M6 screws (fits on flange C 188 730)
- Releasing pneumatic, 6 bar
- Required air pressure 6 bar
- Air-blast cleaning of Z-references.



### GPS 70 Chuck, pneumatic, C 198 700

For Automation.

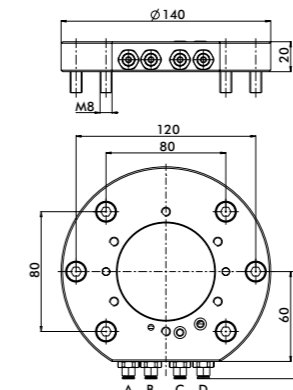
- Dimensions  $\varnothing 99 \times 22$  mm
- Mounting 6x M6 screws (fits on flange C 188 730)
- Releasing pneumatic, 6 bar
- Required air pressure 6 bar
- Air-blast cleaning of Z-references.



### Flange for GPS 70 chuck, C 188 730

Fits on C 188 720 and C 198 700.

- Material: stainless steel, heat pre-treated
- Dimensions  $\varnothing 140 \times 20$  mm
- Mounting 6x M8
- Connections:
  - A = releasing/clamping
  - B = Air-blast cleaning of Z-references
  - C = drain/pallet room venting
  - D = piston room venting.



## GPS 70 – Pallets

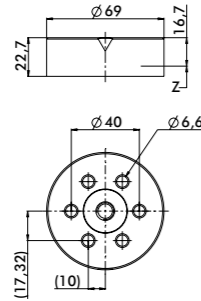
### GPS 70 Aluminium pallet, C 695 050

Cast aluminium pallet.

- Construction height 16.7 ±0.01 mm
- X/Y-centring with coined cam
- Weight 0.2 kg.
- Not prepared for automation.

### Set of pallets, S 500 010

- C 695 050 supplied in sets of 9 pcs.



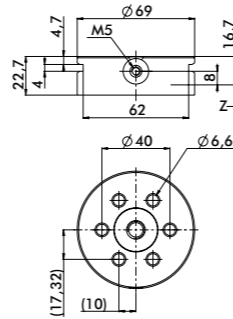
### GPS 70 Aluminium pallet, C 695 040

Cast aluminium pallet.

- Construction height 16.7 ±0.01 mm
- X/Y-centring with coined cam
- Ready for code carrier fixture C 960 740
- Weight 0.2 kg.
- Prepared for automation.

### Set of pallets, S 500 011

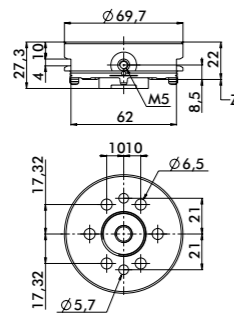
- C 695 040 supplied in sets of 9 pcs.



### GPS 70 Steel pallet, C 695 265

Workpiece and device holder for precision production.

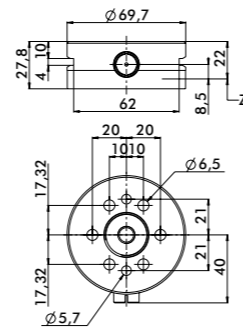
- Construction height 22 ±0.005 mm
- X/Y-centring with springy cams, hardened, stainless
- Ready for code carrier fixture C 960 740
- Weight 0.5 kg.
- Prepared for automation.



### GPS 70 Steel pallet, C 695 270

Workpiece and device holder for precision production with pallet protection ring aluminium.

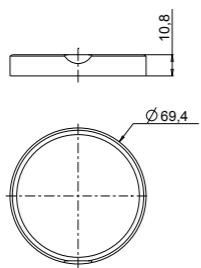
- Construction height 22 ±0.005 mm
- X/Y-centring with springy cams, hardened, stainless
- Ready for code carrier 3R-863.01
- Weight 0.5 kg.
- Prepared for automation.



### GPS 70 Pallet protection ring, C 695 295

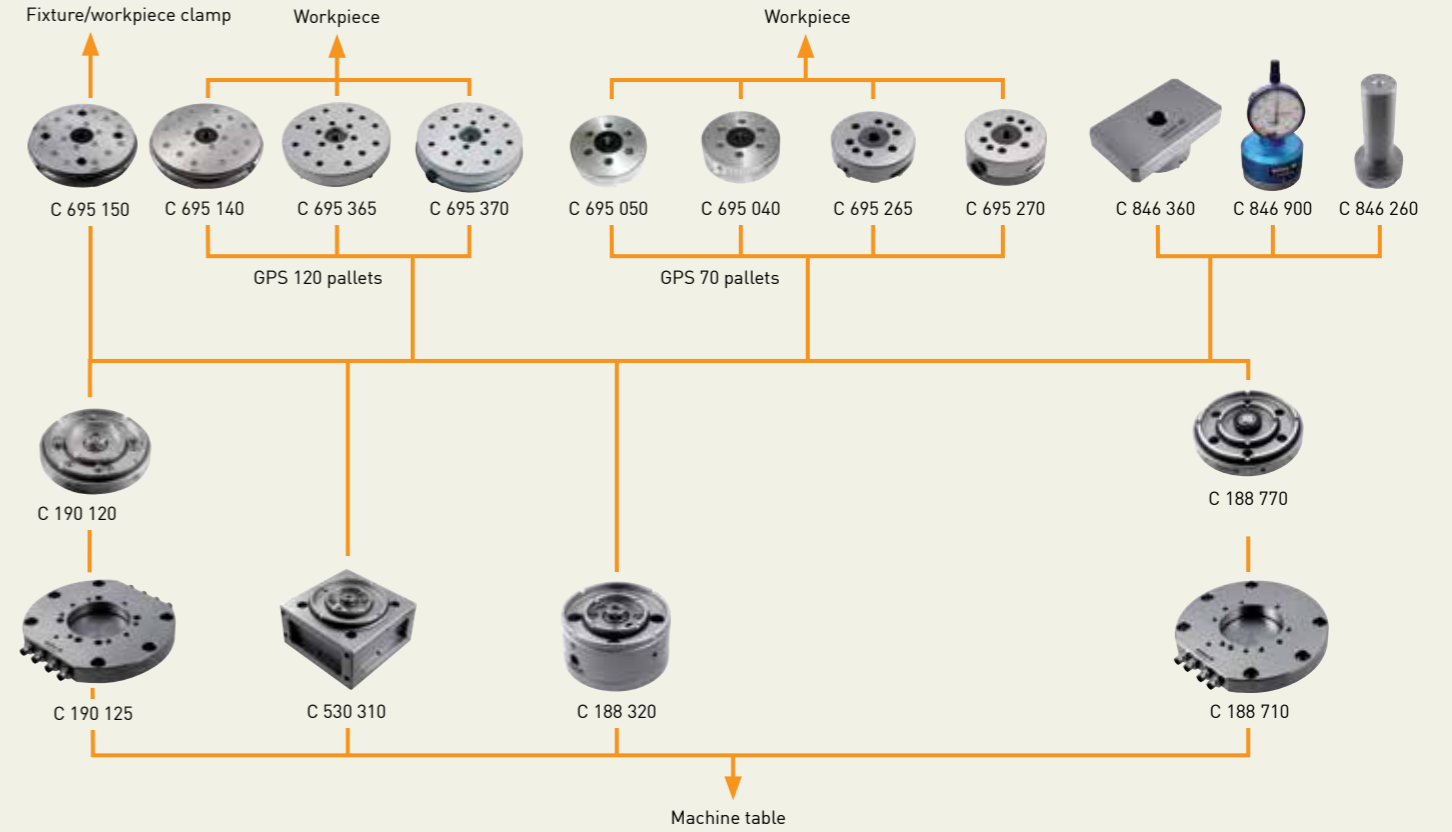
Chip protection between pallet and chuck for GPS 70 steel pallets C 695 265.

- Material plastic
- Dimensions Ø69.4 x 10.8 mm
- Use with code carrier.



☞ Pallet with coined cams ☞ Pallet with springy hardened cams

## GPS 120 – Chucks & pallets



Chucks	Article number	Feature
Manual, cube	C 530 310	
Manual, round	C 188 320	
Pneumatic automatic/manual	C 188 770	for manual & automatic machining operations
Pneumatic automatic/manual	C 190 120	with airdock 4-fold
Flange	C 188 710	fits on C 188 700 & C 188 770
Flange	C 190 125	fits on C 190 120

Pallets	Article number	Feature
Cast aluminium ☞	C 695 140	
Cast aluminium ☞	C 695 150	with airdock 4-fold
Pneumatic manual (automatic) ☞	C 695 365	
Pneumatic automatic/manual ☞	C 695 370	with pallet protection ring
Pneumatic automatic/manual ☞	C 695 395	fits on C 695 365

☞ Pallet with coined cams ☞ Pallet with springy hardened cams

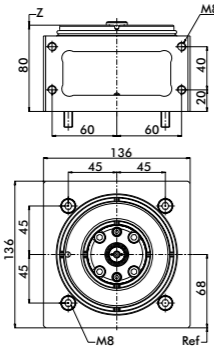


## GPS 120 – Chucks

### GPS 120 Machining cube, manual, C 530 310

For milling, grinding, die-sinking EDM, presetting and measuring station. Suitable for the 5-sided machining of electrodes and workpieces. One side is ground square with the base surface.

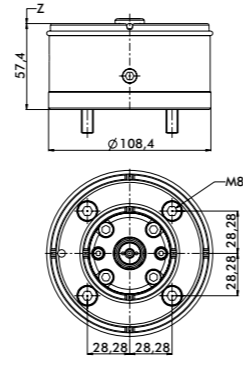
- Dimensions 136 x 136 x 80 mm
- Mounting (from the top) 12 x 120 mm, 4x M8 screws threaded holes (horizontal)
- Mounting (from the bottom): on GPS 240 pallet 90 x 90 mm, 4x M8 screws through holes (horizontal), 120 x 40 mm, 4x M8 screws threaded holes (vertical)
- Releasing manual with Allen wrench.



### GPS 120 Chuck, manual, C 188 320

For turning, milling, grinding, die-sinking EDM.

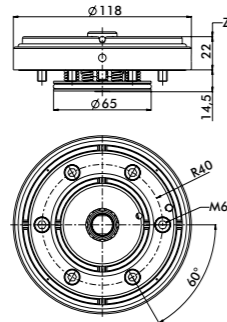
- Dimensions  $\text{Ø}108.4 \times 57.4$  mm
- Mounting 4x M8 screws
- Releasing manual with Allen wrench
- Flushing lateral inlet.



### GPS 120 Chuck, pneumatic, C 188 770

For automation and manual use.

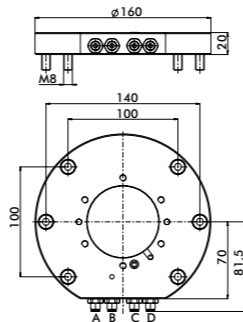
- Dimensions  $\text{Ø}118 \times 22$  mm
- Mounting 6x M6 screws (on flange C 188 710)
- Releasing pneumatic, 6 bar
- Required air pressure 6 bar
- Air-blast cleaning of Z-references only GPS 120.



### Flange for GPS 120 chuck, C 188 710

Fits on C 188 770.

- Material stainless steel, heat pre-treated
- Dimensions  $\text{Ø}160 \times 20$  mm
- Mounting 6x M8
- Connections:
  - A = releasing/clamping
  - B = Air-blast cleaning of Z-references
  - C = drain/pallet room venting
  - D = piston room venting

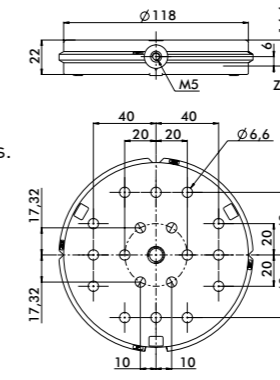


## GPS 120 – Pallets

### GPS 120 Aluminium pallet, C 695 140

Cast aluminium pallet.

- Construction height  $16.6 \pm 0.01$  mm
- X/Y-centring with coined cam
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Weight 0.5 kg.



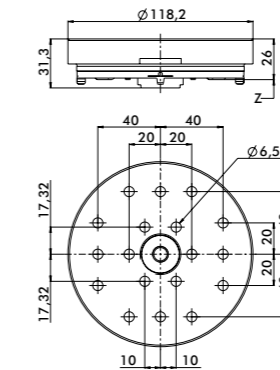
### Set of pallets, S 500 021

- C 695 140 supplied in sets of 4 pcs.

### GPS 120 Steel pallet, C 695 365

Workpiece and device holder for precision production.

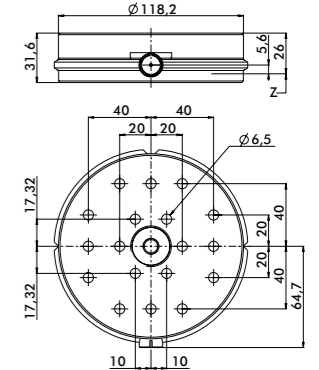
- Construction height  $26 \pm 0.005$  mm
- X/Y-centring with springy cams, hardened, stainless
- Not for automatic changing
- Weight 1.6 kg.



### GPS 120 Steel pallet, C 695 370

Workpiece and device holder for precision production with pallet protection ring aluminium.

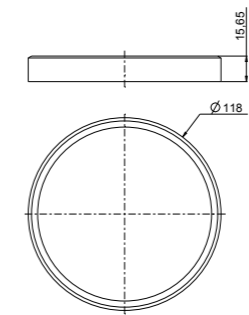
- Construction height  $26 \pm 0.005$  mm
- X/Y-centring with springy cams, hardened, stainless
- Adapted for automatic changing
- Ready for code carrier 3R-863.01
- Weight 1.7 kg.



### GPS 120 Pallet protection ring, C 695 395

Chip protection between pallet and chuck for GPS 120 steel pallets C 695 365.

- Material plastic
- Dimensions  $\text{Ø}118 \times 15.7$  mm
- Not to use with code carrier.





## GPS 120 with airdock

The chuck with airdock is able to transfer the compressed air directly to the pallet via 4 interfaces.

Fixtures and clamping elements in the automation system, amongst other things, can be operated pneumatically with the pallet C 695 150.

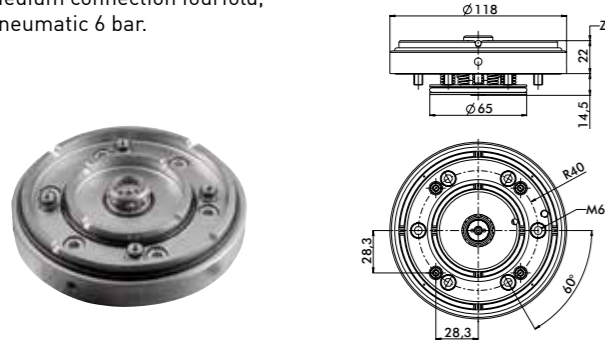
The GPS 120 standard pallets can also be used on the system.



### GPS 120 Chuck, pneumatic, C 190 120

With airdock 4-fold.

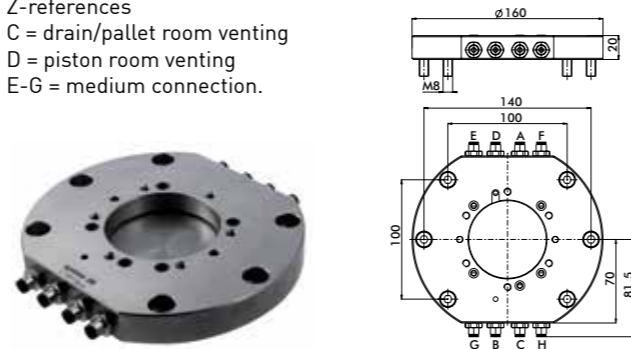
- Stainless steel, hardened
- Dimensions  $\text{Ø}118 \times 22 \text{ mm}$
- Mounting 6x M6 screws (on flange C 190 125)
- Releasing pneumatic, 6 bar
- Required air pressure 6 bar
- Air-blast cleaning of Z-references GPS 120.
- Medium connection fourfold, pneumatic 6 bar.



### Flange for GPS 120 chuck, C 190 125

With airdock 4-fold. Fits on GPS 120 chuck C 190 120.

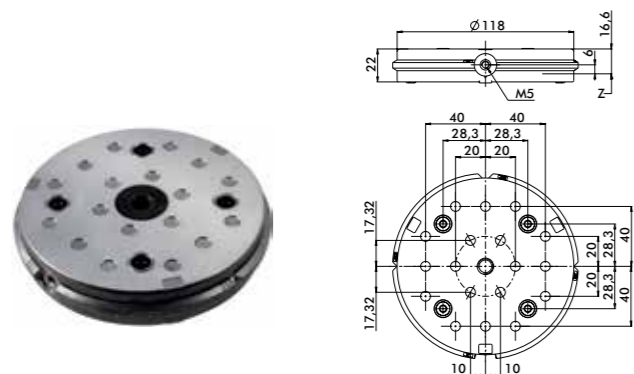
- Stainless steel, heat pre-treated
- Dimensions  $\text{Ø}160 \times 20 \text{ mm}$
- Mounting 6x M8
- Connections:
  - A = releasing/clamping
  - B = Air-blast cleaning of Z-references
  - C = drain/pallet room venting
  - D = piston room venting
  - E-G = medium connection.



### GPS 120 Aluminium pallet, C 695 150

With airdock 4-fold. Fits on GPS 120 chuck C 190 120.

- Airdock compressed air, max. 6 bar
- Construction height  $16.6 \pm 0.01 \text{ mm}$
- X/Y-centring with coined cam
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740



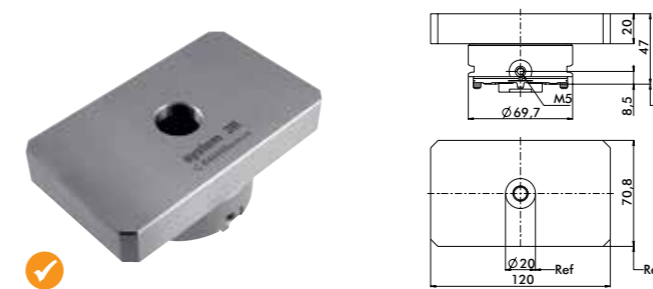
/// Pallet with coined cams

## GPS 70 & 120 – Accessories

### GPS 70 Reference pallet, C 846 360

For the axial and concentric XY alignment of the GPS 70/120 chuck.

- Material stainless steel, hardened
- Height 47 mm
- Construction: 2-piece, form-fitting design
- Repetition accuracy of the centre bore  $0.002 \text{ mm}/0^\circ$
- Parallelism with system axis  $0.003 \text{ mm}/120 \text{ mm}$ .
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740.



### GPS 70 Inspection plug, C 846 260

For the radial alignment of the GPS 70/120 chuck.

- Material stainless steel, hardened
- Height 160 mm
- Construction 2-piece, form-fitting design
- Concentricity  $0.005 \text{ mm}/150 \text{ mm}$ .
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740.



### GPS 70/120 Clamping force testing device, C 846 900

For measuring and adjusting the clamping force of manual chucks and for measuring the clamping force of pneumatic chucks.



### GPS 70 Spare parts set, S 230 150

For GPS 70 pneumatic chucks C 188 720 and C 198 700.

- Contains all the elements for a complete service.

### GPS 120 Spare parts set, S 230 100

For GPS 70/120 pneumatic chucks C 188 700 and C 188 770.

- Contains all the elements for a complete service.



### GPS 70 Spare parts set, S 660 000

For GPS 70 manual chucks C 188 300 and C 530 210.

- Contains all the elements for a complete service.

### GPS 120 Spare parts set, S 230 510

For GPS 120 manual chucks C 188 320 and C 530 310

- Contains all the elements for a complete service.



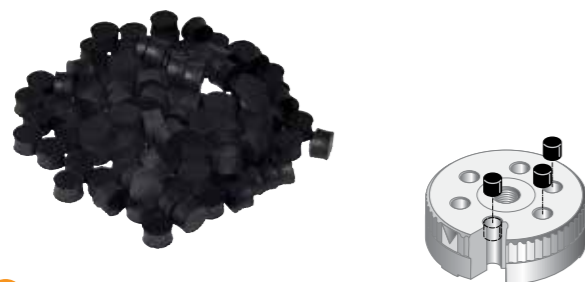


## GPS 70 & 120 – Accessories

### GPS 70/120 Pallet seal, C 531 000

Sealing of unused bores.

- Material elastomer
- Delivery includes set of 100 pieces.



### Code carriers, 3R-863.01

With pre-programmed unique identity, designed for GPS 70/120 pallets.

### 3R-863.01-10

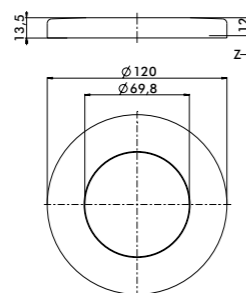
- Sets of 10 pieces.



### GPS 120 Chip protection, C 695 176

Chip protection ring for GPS 120 chucks when used manually with GPS 70 pallets C 695 050.

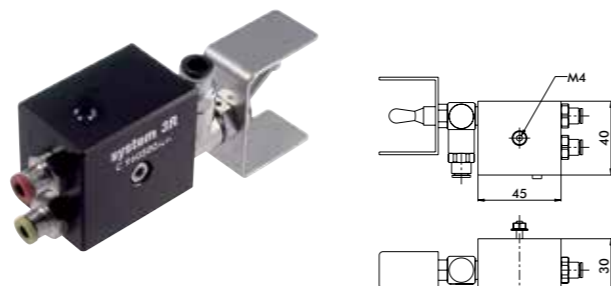
- Material aluminium, anodized
- Dimensions  $\varnothing 120 \times 13.5$  mm.



### Control unit, C 960 500

Manual control unit for clamping and releasing pneumatic chucks.

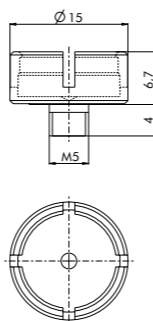
- Connector materials included in delivery
- Connections clamping/releasing, cleaning of Z-supports.



### Code carrier, fixture, C 960 740

Fixture for code carrier 3R-863.01-10.

- The code carrier can be clicked into position.



## GPS 240

- ... 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.

The machining zero point is defined by the centre of the chuck in the GPS 240 system.

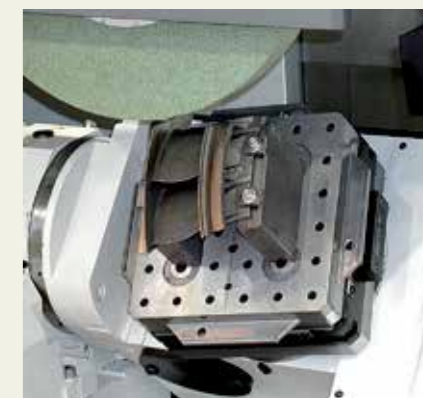
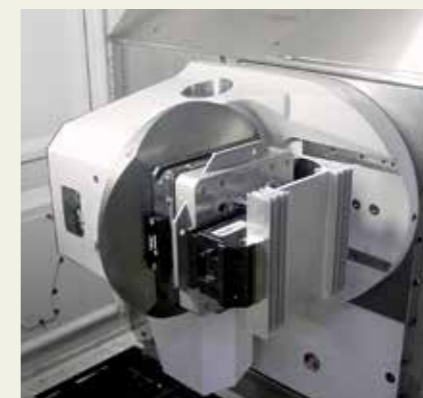
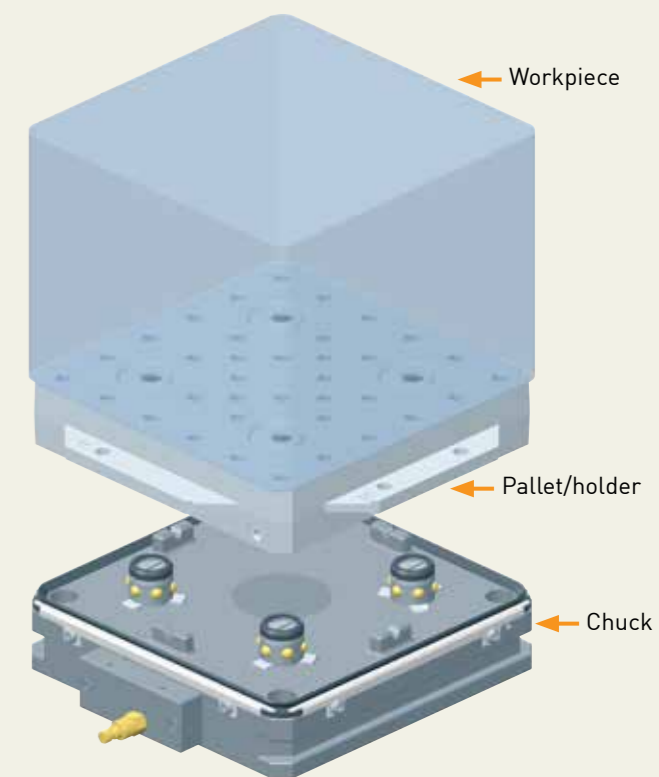
The system is made for universal use and can be used in all kinds of applications milling, turning, grinding, EDM and measuring.

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.

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.

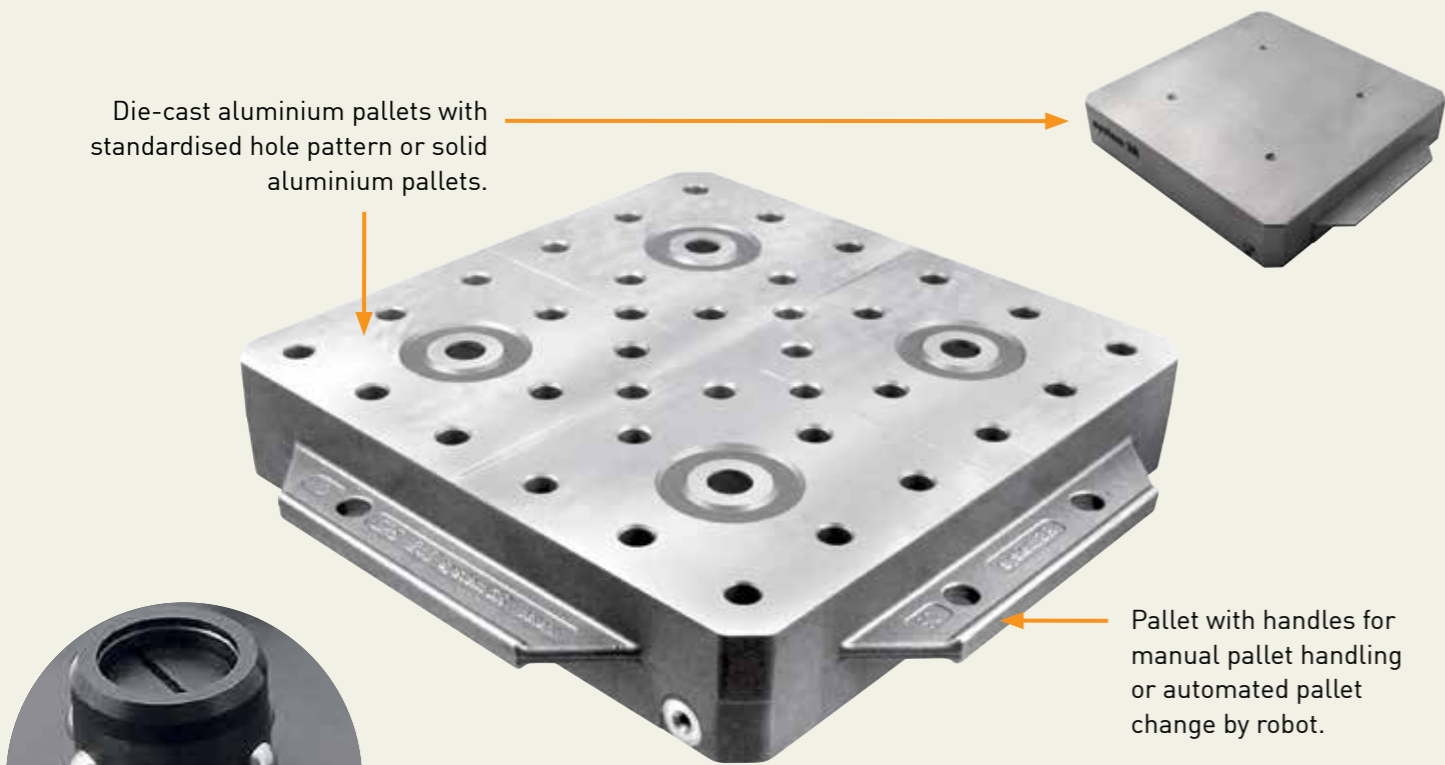
Their standardised hole pattern of the pressure-die-cast aluminium pallets allows the fixation of workpieces, fixtures and accessories such as vices, three-jaw chucks and magnetic tables directly on the pallet from below. This gives collision-free mounting, even with five-sided machining.

- + Repetition accuracy – within 0.002 mm
- + Indexing accuracy – within 0.005 mm
- + Locking force – 30 000 N (with force boost 60 000 N)
- + Fixed index positions –  $4 \times 90^\circ$
- + Required air pressure, pneumatic chuck – 6 bar
- + Recommended max workpiece weight – 150 kg



# GPS 240

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

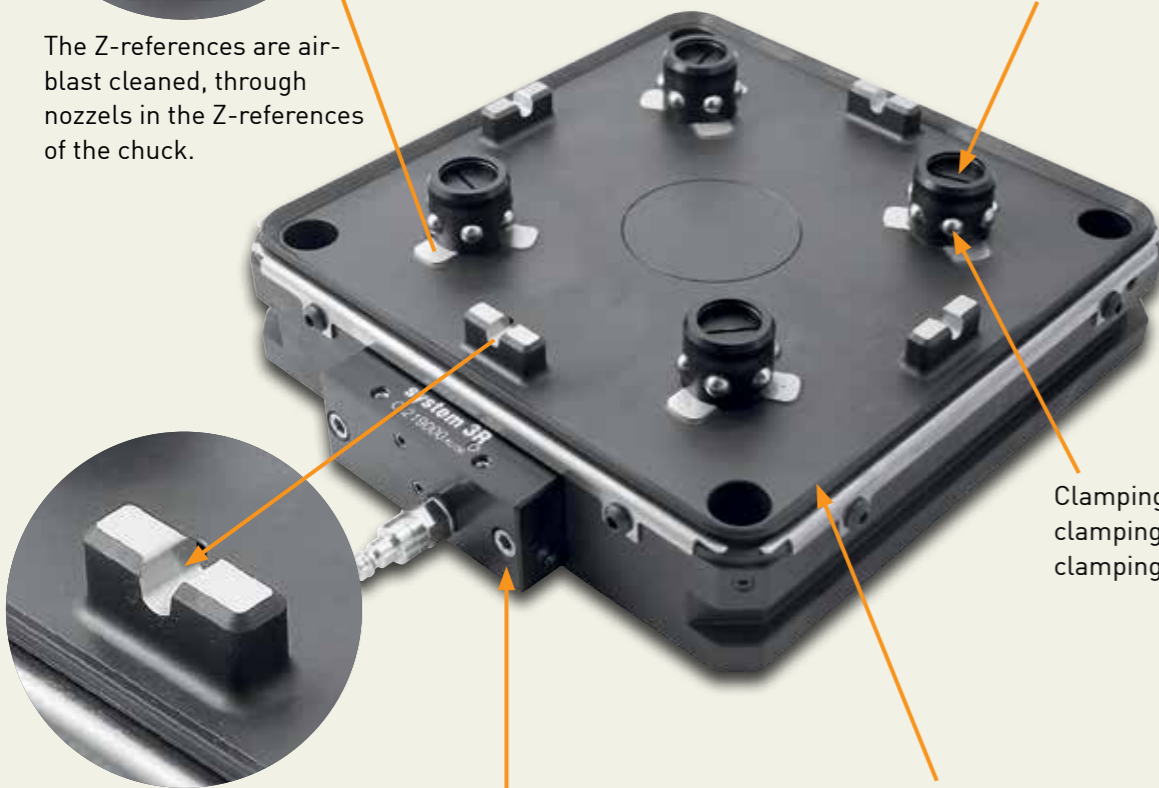


Pallet with handles for manual pallet handling or automated pallet change by robot.



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

Spring loaded clamping mechanism. Releasing by air.



Clamping mechanism with spring clamping force by springs and clamping with balls.

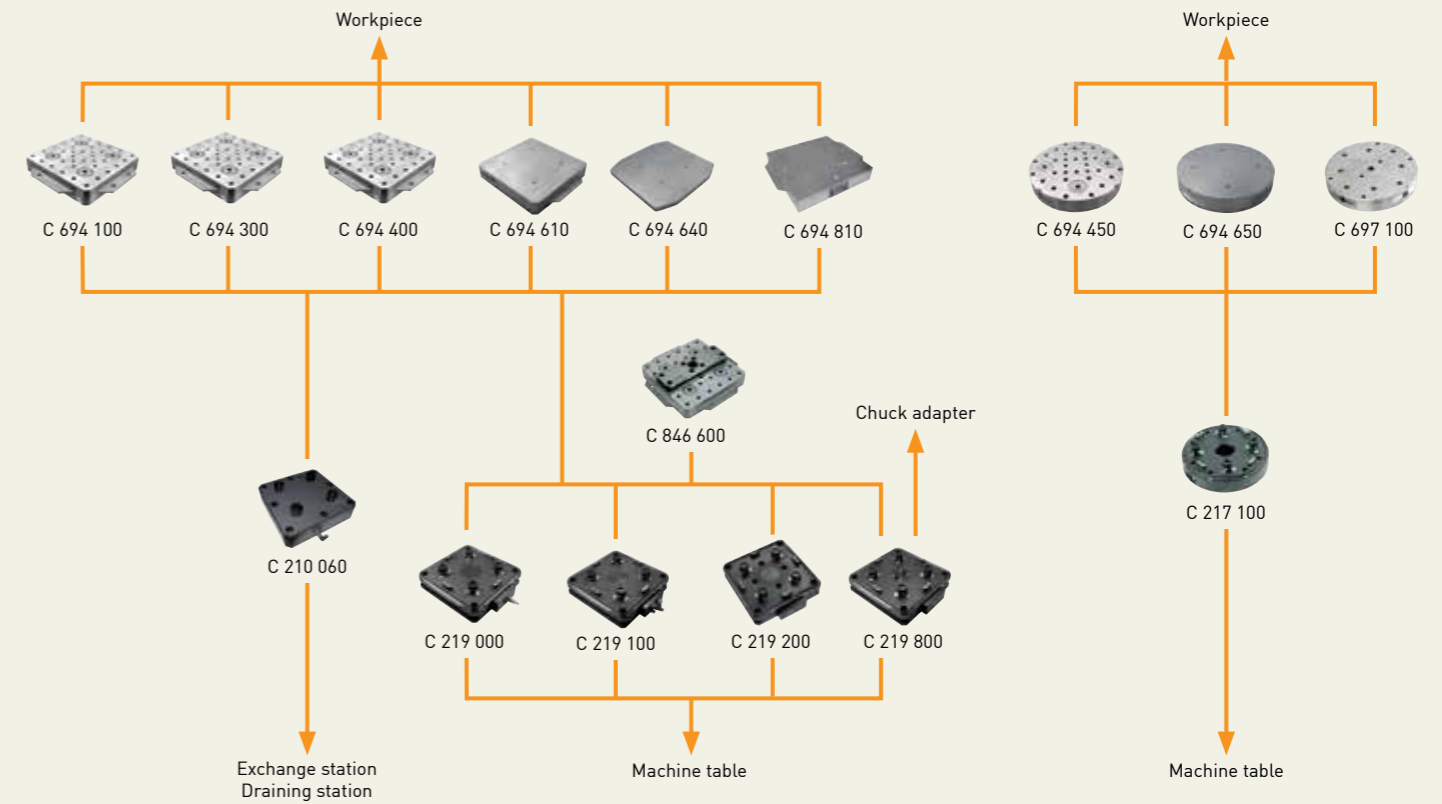


Hardened chuck body with prisms for X/Y centring made out of the piece for maximum stability. Indexing 4x90°.

Connection bloc.

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

# GPS 240 - Chucks & pallets



Chucks square	Art. No.	Feature
Pneumatic manual	C 219 000	for manual machining operations
Pneumatic automatic/manual	C 219 100	for manual and automatic machining operations
Pneumatic automatic/manual	C 219 200	connection from below
Pneumatic automatic/manual	C 219 600	built-in pneumatic Macro chuck
Pneumatic automatic/manual	C 219 800	connection from below, air dock 2-fold
Pneumatic automatic/manual	C 210 060	dummy chuck

Chucks round	Art. No.	Feature
Pneumatic manual	C 217 100	through hole Ø54mm

Pallets square	Art. No.	Feature	Size (mm)
Cast aluminium	C 694 100		240x240
Cast aluminium	C 694 300	ground	240x240
Cast aluminium	C 694 400		240x240
Solid aluminium	C 694 610		240x240
Solid aluminium	C 694 640		300x300
Solid aluminium	C 694 810	ground	240x240

Pallets round	Art. No.	Feature	Size (mm)
Cast aluminium	C 694 450		Ø256
Solid aluminium	C 694 650		Ø256
Solid aluminium	C 697 100	ground	Ø256

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



## GPS 240 – Chucks

### GPS 240 Chucks

- Built-up height 52 mm
- Required air pressure 6 bar
- Air-blast cleaning of the references
- Weight 17 kg.

#### C 219 000

For manual machining operations.

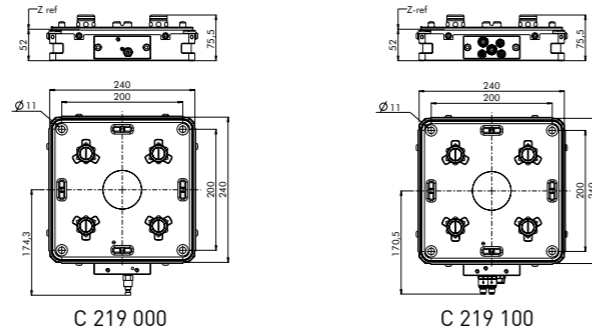
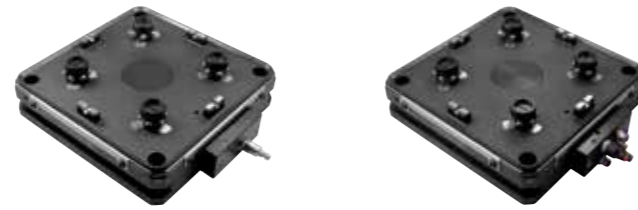
- One air connection
- Clamping force 30 000 N
- Recommended actuator C 810 820 or C 810 710.



#### C 219 100

For manual and automatic machining operations.

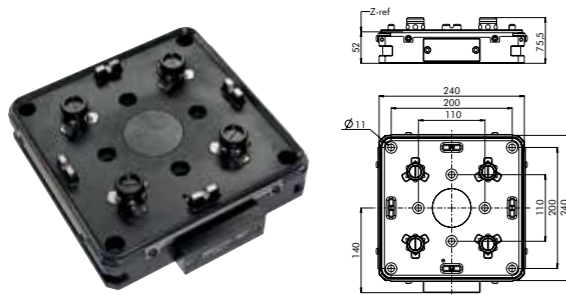
- 5 air connections
- Clamping force 30 000 N/60 000 N
- Recommended actuator C 810 830.



### GPS 240 Chuck automatic, C 219 200

For manual and automatic machining operations.

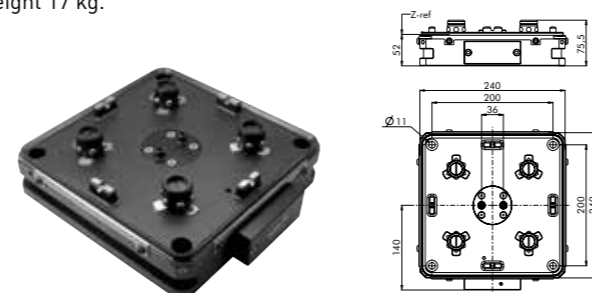
- Built-up height 52 mm
- Air connections positioned centrally on the bottom
  - prism – air-blast cleaning of Z-references – clamping/ releasing – Turbo/ventilation
- Clamping force 30 000 N/60 000 N
- Weight 17 kg.



### GPS 240 Chuck automatic with air dock, C 219 800

For manual and automatic machining operations.

- Built-up height 52 mm
- Air connections positioned centrally on the underside
  - prism – air-blast cleaning of Z-references – clamping/ releasing – Turbo/ventilation
- Air dock: 2-fold, pneumatic 6 bar.
- Clamping force 30 000 N/60 000 N
- Weight 17 kg.

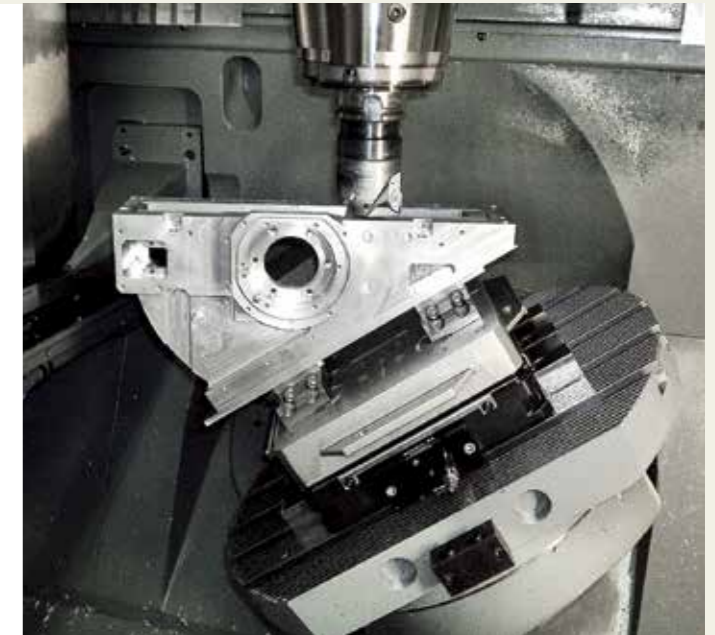
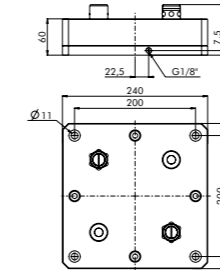


## GPS 240 – Chucks

### GPS 240 Dummy chuck, C 210 060

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

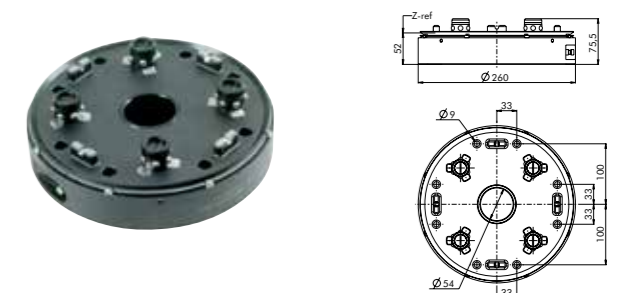
- Required air pressure 6 bar
- Weight 9.5 kg.



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

Pneumatic chuck for applications in lathes and milling machines.

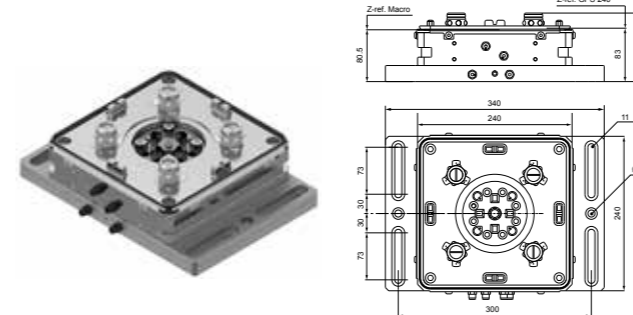
- Built-up height 52 mm
- Required air pressure 6 bar
- Air-blast cleaning of Z-references
- Clamping force 30 000 N
- Recommended control unit C 810 820 or C 810 710
- Weight 16 kg.



### 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.



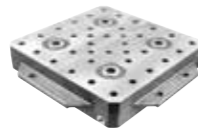


## GPS 240 – Pallets

### GPS 240 Pallet EDM/Grinding, C 694 100

Cast aluminium pallet.

- Construction height 48.1 ±0.01 mm
- X/Y-centring with spring-loaded pin
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Supplied with C 531 500 sealing plugs.
- Recommended workpiece weight 150 kg.
- Weight 4.8 kg



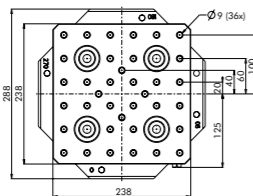
#### S 500 090

- C694 100 supplied in sets of 4 pcs.



#### S 500 100

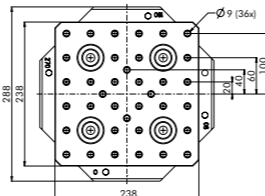
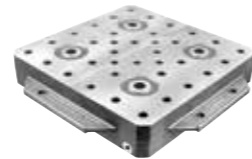
- C694 100 supplied in sets of 10 pcs.



### GPS 240 Pallet 'Adaption', C 694 300

Ground cast aluminium pallet. Suitable for fixtures.

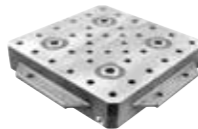
- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Supplied with C 531 500 sealing plugs.
- Recommended workpiece weight 150 kg.
- Weight 4.8 kg



### GPS 240 Pallet 'Production', C 694 400

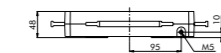
Cast aluminium pallet. Suitable for high-speed milling and arduous milling operations.

- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Supplied with C 531 500 sealing plugs.
- Weight 4.8 kg



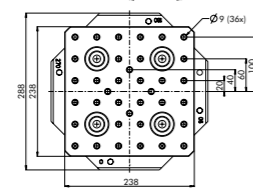
#### S 500 160

- C 694 400 supplied in sets of 4 pcs



#### S 500 170

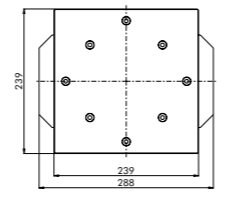
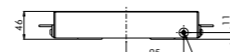
- C 694 400 supplied in sets of 10 pcs.



### GPS 240 Pallet, C 694 810

Ground solid aluminium pallet. Suitable for fixtures.

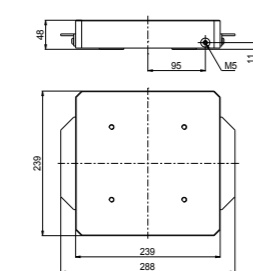
- Construction height 46 ±0.005 mm
- X/Y-centring with springy cams, hardened, stainless
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Weight 7.2 kg.



### GPS 240 Pallet 240x240 mm, C 694 610

Solid aluminium pallet. Suitable for fixtures and accessories.

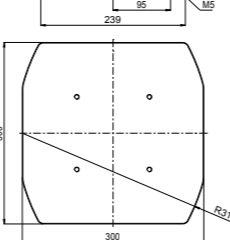
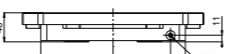
- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Prepared for automation
- Flatness 0.01 mm
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Weight 7.4 kg.





### GPS 240 Pallet 300x300 mm, C 694 640


Solid aluminium pallet. Suitable for fixtures and accessories.

- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Flatness 0.02 mm
- Prepared for automation
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Weight 9 kg.



 Pallet with coined cams.

 Pallet with springy cams, hardened, stainless.

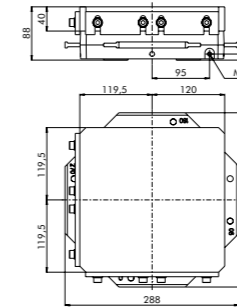
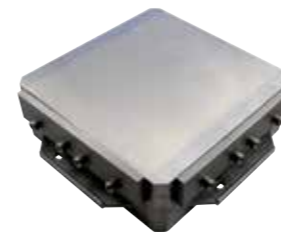
 Pallet with spring-loaded pin.

## GPS 240 – Pallets

### GPS 240 Magnetic table, C 694 260

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

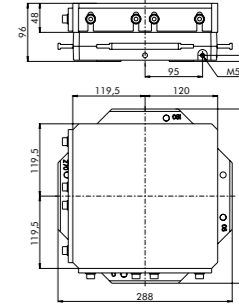
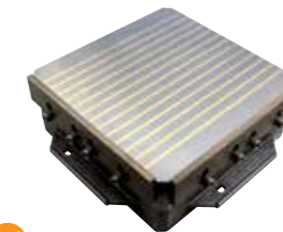
- Magnetic field height 5 mm
- Holding force 100 N/cm<sup>2</sup>
- Dimensions 240x240x88 mm
- X/Y-centring with spring-loaded pin
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Weight 23 kg.



### GPS 240 Magnetic table, C 694 270

Strong magnetic plate for milling.

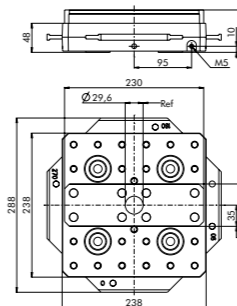
- Magnetic field height 10 mm
- Holding force 150 N/cm<sup>2</sup>
- Dimensions 240x240x96 mm
- X/Y-centring with spring-loaded pin
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Weight 27.1 kg.



### GPS 240 Master pallet, C 846 600

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

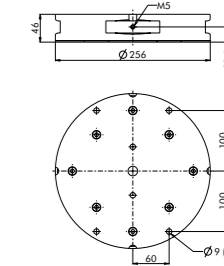
- X/Y-centring: with spring-loaded pin
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Weight 7.4 kg.



### GPS 240 Pallets round, C 697 100

Ground solid aluminium pallet. Suitable for fixtures.

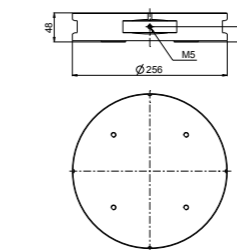
- Construction height 46 ±0.005 mm
- X/Y-centring: with springy cams, hardened, stainless
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Weight 6.2 kg.





### GPS 240 pallet round, C 694 650


Solid aluminium pallet. Suitable for fixtures.

- Construction height 48.0 ±0.01 mm
- X/Y-centring with coined cam
- Adapted for automatic changing
- Ready for code carrier fixture C 960 740
- Recommended workpiece weight 150 kg.
- Weight 6.5 kg.



 Pallet with coined cams.

 Pallet with springy cams, hardened, stainless.

 Pallet with spring-loaded pin.





## GPS 240 – Chuck adapters

### Chuck adapter HP, GPS 240-GPS 120, C 522 800

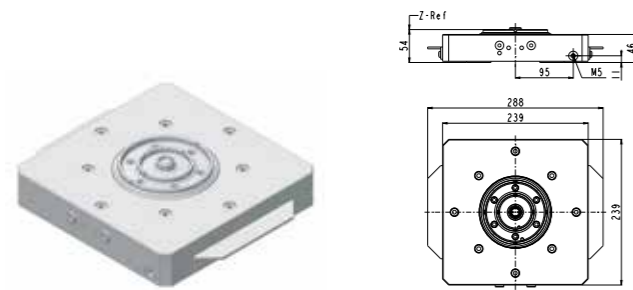
Chuck adapter with built-in pneumatic GPS 120 chuck for mounting in:

- C 219 800 for automated pallet change GPS 120
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change GPS 120; Open/Close GPS 120 with air gun.
- Built-up height 54 mm
- X/Y-centering with springy cams, hardened, stainless steel
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 7.9 kg.

### Chuck adapter Std, GPS 240-GPS 120, C 522 850

Chuck adapter with built-in pneumatic GPS 120 chuck.

- Built-up height 57 mm
- X/Y-centering with coined aluminium cams
- Other specifications as C 522 800.



### Chuck adapter HP, GPS 240-GPS 70, C 522 810

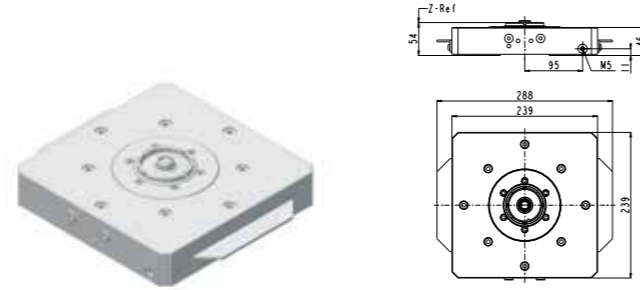
Chuck adapter with built-in pneumatic GPS 70 chuck for mounting in:

- C 219 800 for automated pallet change GPS 70
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change GPS 70; Open/Close GPS 70 with air gun.
- Built-up height 54 mm
- X/Y-centering with springy cams, hardened, stainless steel
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 7.9 kg.

### Chuck adapter Std, GPS 240-GPS 70, C 522 860

Chuck adapter with built-in pneumatic GPS 70 chuck.

- Built-up height 57 mm
- X/Y-centering with coined aluminium cams
- Other specifications as C 522 810.



### Chuck adapter HP, GPS 240-GPS 120, C 522 820

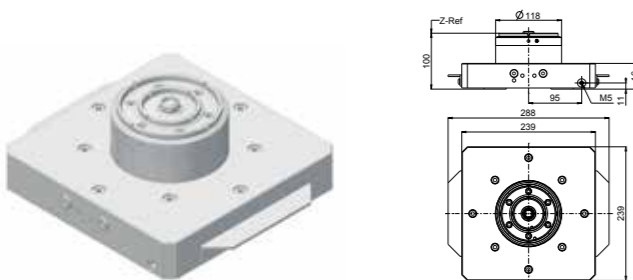
Chuck adapter with built-in pneumatic GPS 120 chuck for mounting in:

- C 219 800 for automated pallet change GPS 120
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change GPS 120; Open/Close GPS 120 with air gun.
- Built-up height 100mm
- X/Y-centering with springy cams, hardened, stainless steel
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 8.9 kg.

### Chuck adapter Std, GPS 240-GPS 120, C 522 870

Chuck adapter with built-in pneumatic GPS 120 chuck.

- X/Y-centering with coined aluminium cams
- Other specifications as C 522 820.



### Chuck adapter HP, GPS 240-GPS 70, C 522 830

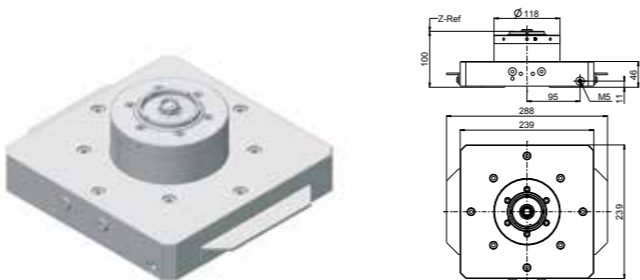
Chuck adapter with built-in pneumatic GPS 70 chuck for mounting in:

- C 219 800 for automated pallet change GPS 70
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change GPS 70; Open/Close GPS 70 with air gun.
- Built-up height 100 mm
- X/Y-centering with springy cams, hardened, stainless steel
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 8.9 kg.

### Chuck adapter Std, GPS 240-GPS 70, C 522 880

Chuck adapter with built-in pneumatic GPS 70 chuck.

- X/Y-centering with coined aluminium cams
- Other specifications as C 522 830.



//// Pallet with coined cams.

↔ Pallet with springy cams, hardened, stainless.

## GPS 240 – Chuck adapters & accessories

### Chuck adapter HP, GPS 240-Macro, C 522 520

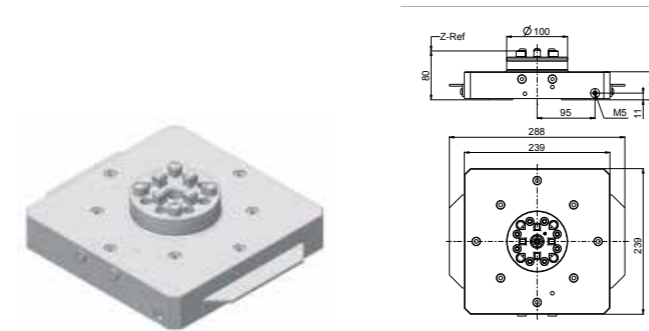
Chuck adapter with built-in pneumatic Macro chuck. 3R-24460 for mounting in:

- C 219 800 for automated pallet change Macro
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change Macro; Open/Close/Turbo Macro with air gun.
- Built-up height 80 mm
- X/Y-centering with springy cams, hardened, stainless steel
- Drawbar 3R-605.1 oder 3R-504.4
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 8.5 kg.

### Chuck adapter Std, GPS 240-Macro, C 522 530

Chuck adapter with built-in pneumatic Macro chuck.

- Built-up height 79 mm
- X/Y-centering with coined aluminium cams
- Other specifications as C 522 520.



### Chuck adapter HP, GPS 240-MacroMagnum, C 522 540

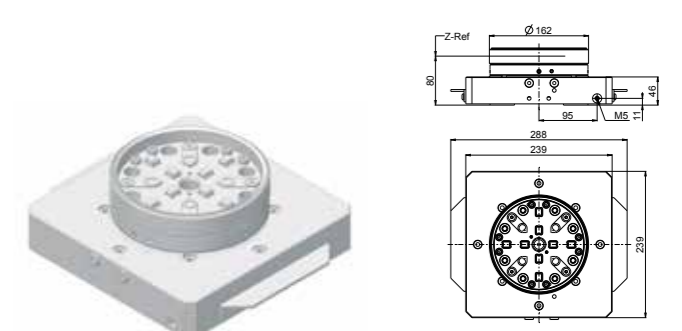
Chuck adapter with built-in pneumatic MacroMagnum chuck 3R-90809.03 for mounting in:

- C 219 800 for automated pallet change MacroMagnum
- C 219 000, C 219 100, C 219 110, C 219 200 for manual pallet change MacroMagnum; Open/Close/Turbo MacroMagnum with air gun.
- Built-up height 80 mm
- X/Y-centering with springy cams, hardened, stainless steel
- Drawbar 3R-605.1 oder 3R-504.4
- Simple retrofit from version „automation“ to version „manual“ by the operator
- Weight 11.7 kg.

### Chuck adapter Std, GPS 240-MacroMagnum, C 522 550

Chuck adapter with built-in pneumatic MacroMagnum chuck.

- Built-up height 79 mm
- X/Y-centering with coined aluminium cams
- Other specifications as C 522 540.



## GPS 240 Controllers

### C 810 820

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

- 1 connection (clamping/releasing).



### C 810 830

Unit for controlling pneumatic chucks C 219 100.

- 4 connections - prism - air-blast cleaning of Z-references - clamping/releasing - Turbo/ventilation.



### Hand gate valve, C 810 710

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



//// Pallet with coined cams.

↔ Pallet with springy cams, hardened, stainless.

## GPS 240 – Accessories

### GPS 240 Spare parts set, S 220 000

Contains all elements for a normal service.

- Suitable for all square chucks, apart from C 219 400
- Recommendation: every 2 years if used manually and annually if used in the automation system.



### Sealing, C 219 007

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

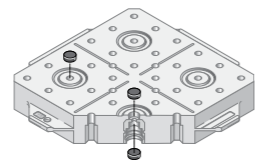
- Material Viton.



### Seals, C 531 250

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

- Material elastomer
- Supplied in sets of 20.



### GPS 240 Spare parts set, S 220 400

Contains all elements for a normal service.

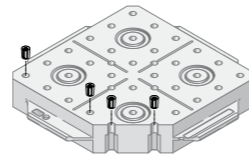
- Suitable for C 217 100
- Recommendation, every 2 years in manual use .



### Sealing plugs, C 531 500

Plugs for sealing GPS 240 pallets.

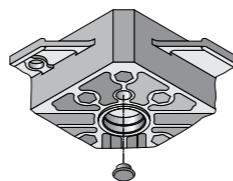
- Supplied in sets of 40.



### Reference protectors, C 531 210

To protect the Z-reference of the pallet.

- Supplied in sets of 20.



## GPS 240 – Accessories & user kits

### Code carriers, 3R-863.01

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



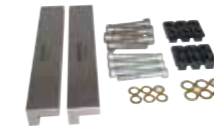
### 3R-863.01-10

- Sets of 10 pieces.



### GPS 240 Clamp strip kit, C 810 880-XX\*

- C 810 881 undrilled clamp strip (x2)
- E 010 144 washer M10 (x4)
- E 010 143 washer M8 (x4)
- E 000 428 Allen screw M10x45 (x4)
- E 000 354 Allen screw M8x45 (x4)
- 12 E 040 030 T-slot nut M10x12 (x4)
- 14 E 040 031 T-slot nut M10x14 (x4)
- 16 E 040 032 T-slot nut M10x16 (x4)
- 18 E 040 033 T-slot nut M10x18 (x4)



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



### GPS 240 Presetting station, C 810 650

For alignment of workpieces on GPS 240 pallets.

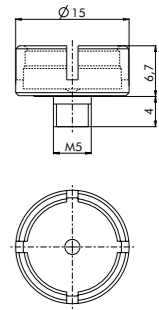
- Parallelism 0.005 mm
- Required air pressure 6 ±1 bar.
- Supplied with dial indicator, dial indicator holder and actuator.



### Code carrier, fixture, C 960 740

Fixture for code carrier 3R-863.01-10.

- The code carrier can be clicked into position.



### GPS 240 Lifting grip, C 810 960

Lifting gear for handling GPS 240 pallets 240x240 mm.

- Weight 2.9 kg





# Dynafix

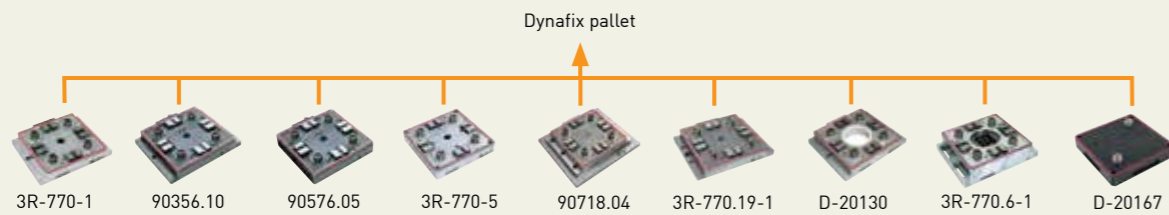
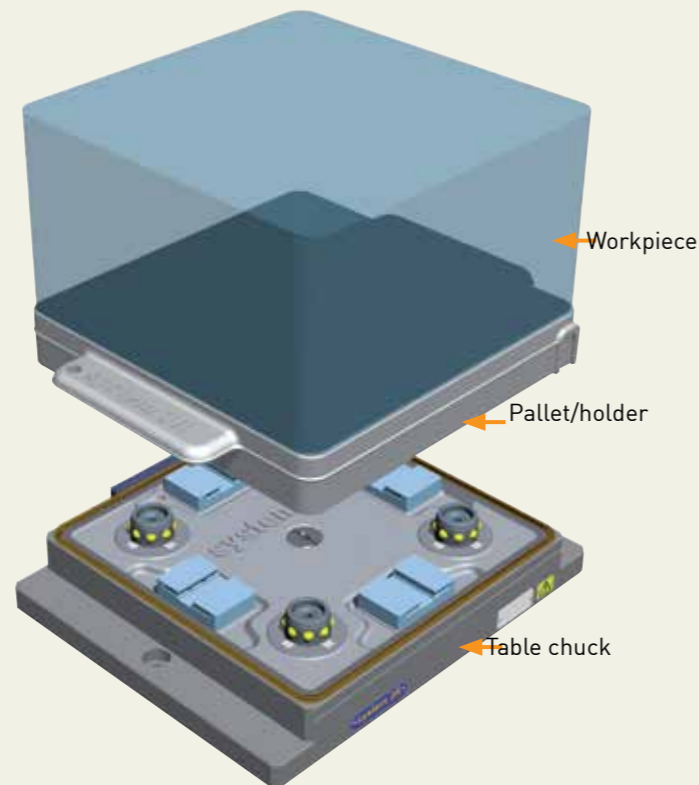
- ... allows machining with optimal cutting data
- ... reduces setting-up times
- ... ensures precision and quality
- ... gives access to System 3R's entire product range
- ... is suitable for automatic changing with System 3R's automation program.

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

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

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

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



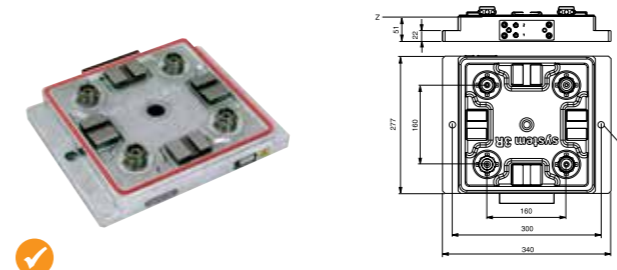
Chucks	Article number	Feature
Pneumatic	3R-770-1	
Pneumatic	90356.10	for chuck adapters, with mounting flange
Pneumatic	90576.05	for chuck adapters, without mounting flange
Pneumatic	3R-770-5	for five-axis machines
Pneumatic	90718.04	vibration-damped
Pneumatic	3R-770.19-1	3Refix holes
Pneumatic	3R-770.6-1	built-in pneumatic Macro chuck
Pneumatic	D-20130	through hole Ø110 mm.
Pneumatic	D-20167	load station

## Dynafix – Chucks

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

Pneumatic table chuck.

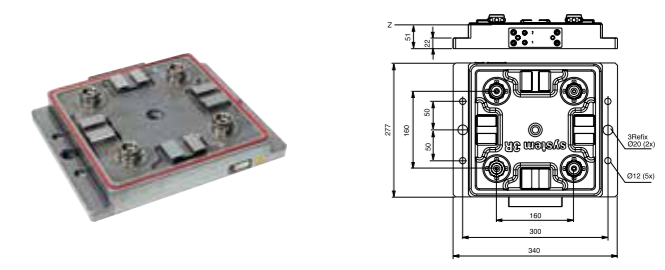
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Recommended actuator 3R-611.4 or 3R-611.2.
- Air-blast cleaning of the Z-references
- Weight 24.5 kg.



### Pneumatic chuck, 3R-770.19-1

Pneumatic table chuck with 3Refix-holes.

- 3Refix Ø20 mm
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Recommended actuator 3R-611.4 or 3R-611.2
- Air-blast cleaning of the Z-references
- Weight 24.5 kg.



### Pneumatic chuck

Pneumatic chucks with extra connections for automatic chuck adapters.

Note: Requires two control units.

- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references.

#### 90356.10

- With fixing lugs.
- Weight 24.5 kg.

#### 90576.05

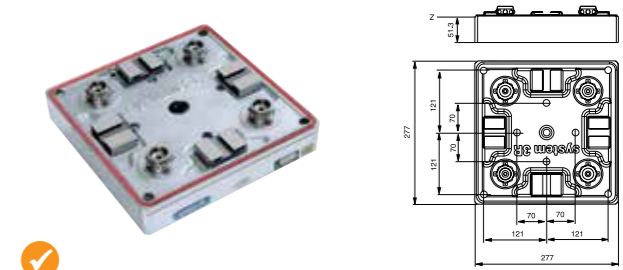
- Without fixing lugs.
- Weight 23.5 kg.



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

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

- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Weight 23.5 kg.



### Pneumatic chuck, VDP, 90718.04

Pneumatic vibration-damped chuck.

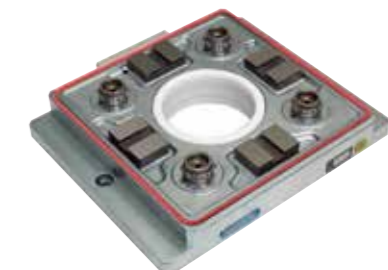
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references.



### Pneumatic chuck, D-20130

Pneumatic chuck with through holes Ø110 mm.

- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Weight 22 kg.





## Dynafix – Chucks



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

Pneumatic chuck with integrated Macro chuck. For CMM machines.

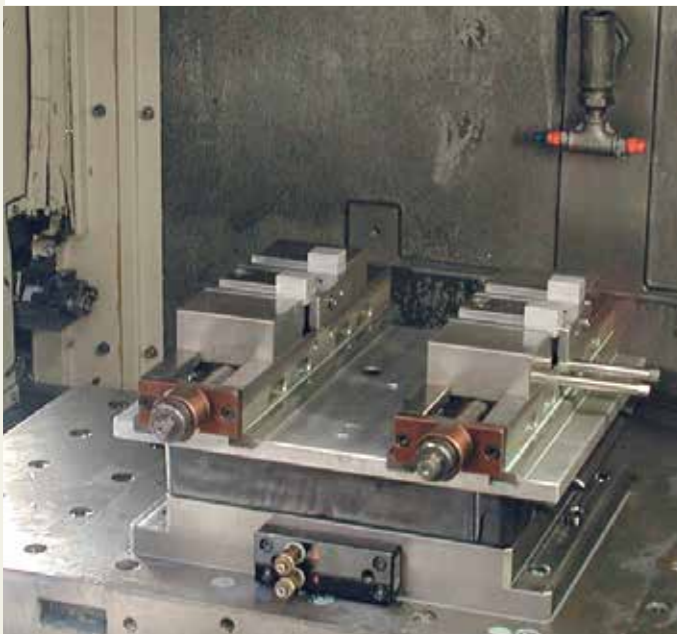
- Required air pressure  $6 \pm 1$  bar
- Fixed index positions  $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Weight 32 kg.



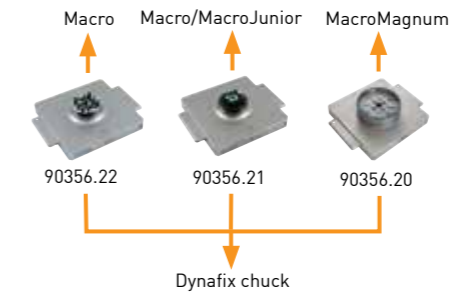
### Pneumatic dummy chuck, D-20167

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.



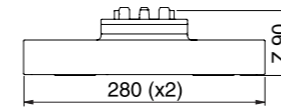
## Dynafix – Chuck adapters



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

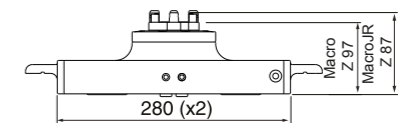
### Pneumatic chuck adapter, Dynafix-Macro, 90356.22

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



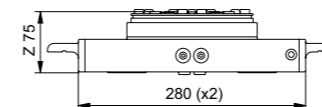
### Pneumatic chuck adapter, Dynafix-MacroCombi, 90356.21

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



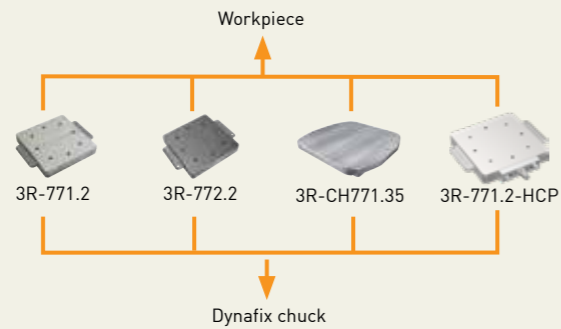
### Pneumatic chuck adapter, Dynafix-MacroMagnum, 90356.20

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





## Dynafix – Pallets

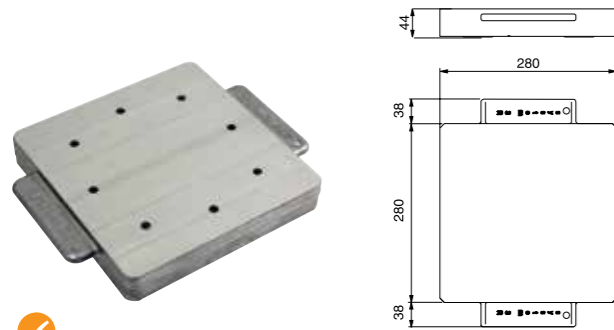


Pallets 280x280 mm	Article number	Feature
Aluminium	3R-771.2	milled
Aluminium	3R-772.2	ground
Aluminium	3R-CH771.35	
Aluminium	3R-771.2-HCP	milled, HCP robot grip

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

Milled aluminium pallet.

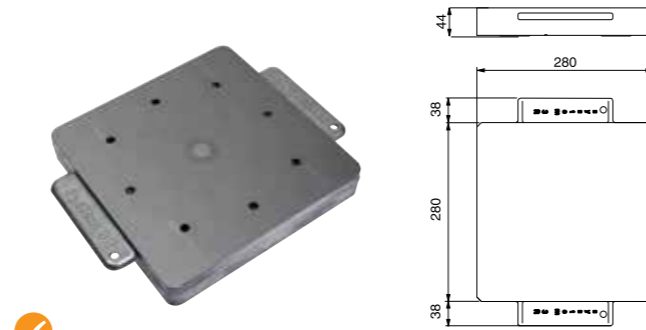
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.04 mm
- Thickness tolerance +0.05/-0 mm
- Weight 6 kg.



### 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 with HCP robot grip, 3R-771.2-HCP

Milled pallet with HCP robot grip mounted on pallet side.

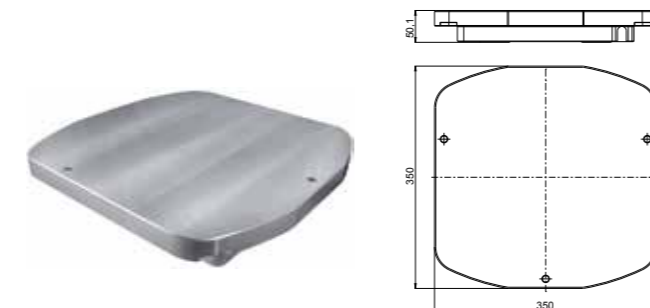
- Prepared for through holes (sealed at delivery)
- Adapted for automatic changing.
- Load weight 150 kg.
- Weight 6.5 kg.



### 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.

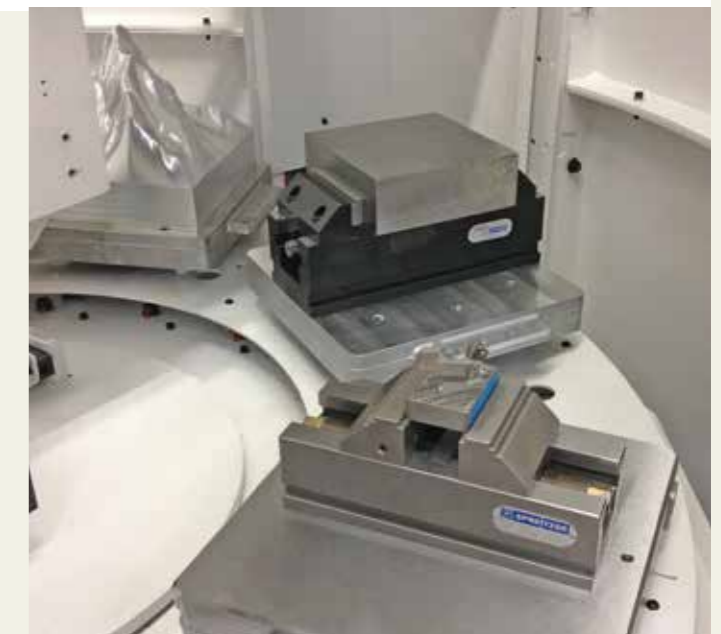
Note: Require drawbars with bayonet interface similar to 3R-605.1.

- 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



# Delphin & Delphin BIG

## Clamping of larger dimensions too, with Delphin

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

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

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



## Advantages of the Delphin clamping system

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

## Facts

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

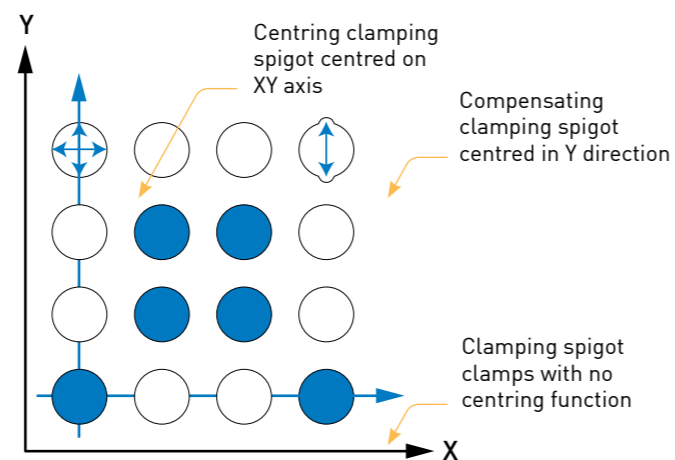


## Function of the Delphin clamping system

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

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

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



# Delphin & Delphin BIG

## Chucks for manual equipping:

**Delphin PSP**  
Pneumatic, clamping force 13'000N

**Delphin HSP**  
Hydraulic, clamping force 15'000N  
Lift-off function

## Chucks for automation:

**Delphin PHP**  
Pneumatic, clamping force 13'000N  
Self-cleaning and presence control

**Delphin HHP / Delphin HCP**  
Hydraulic, clamping force 15'000N  
Self-cleaning and presence control  
Lift-off function.



## Delphin BIG

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

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

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



Delphin BIG

## Delphin BIG Facts

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

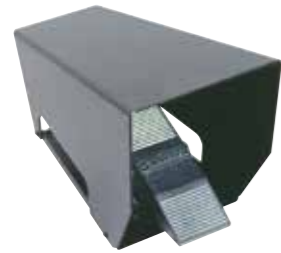




# Accessories

## Control unit, 3R-611.2

Foot operation of pneumatic chucks.



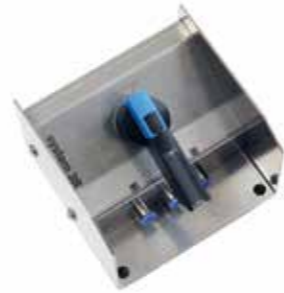
## Control unit, 3R-611.4

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



## Control unit, 3R-611.46

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



## Allen keys

### 3R-333-03

- Supplied in sets of 10 pcs.
- 3 mm.



### 3R-333-05

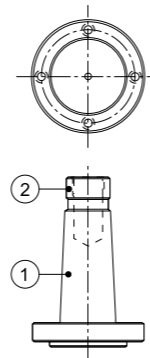
- Supplied in sets of 10 pcs.
- 5 mm.



## Lathe taper, 3R-TXXXX

Taper attachment for mounting chucks in taper spindles.

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



## Locking ring key, 3R-605-GE

To lift the locking ring of the drawbars.

- Supplied in sets of two.



## Labels, 3R-LL200P

Supplied with marker pen.

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



# Accessories

## Connection for air gun, 90815

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

- Supplied in sets of 2.



## Code carriers, 3R-863.01-10

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

- Supplied in sets of 10.



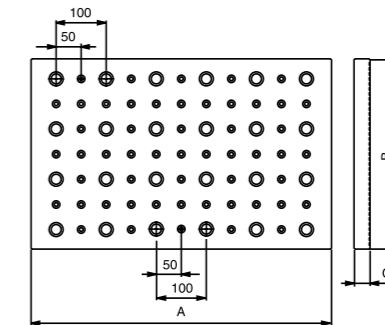
## Reference tables

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

Note: Customised reference tables can be made to order.

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

Use the order form at the end of the catalogue.



### 3R-936-60.38

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

### 3R-936-85.40

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

## 3Refix mandrel

Note: When positioning with 3Refix mandrels –always tighten the expanding mandrel in the R° 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
- Weight 0.02 kg.

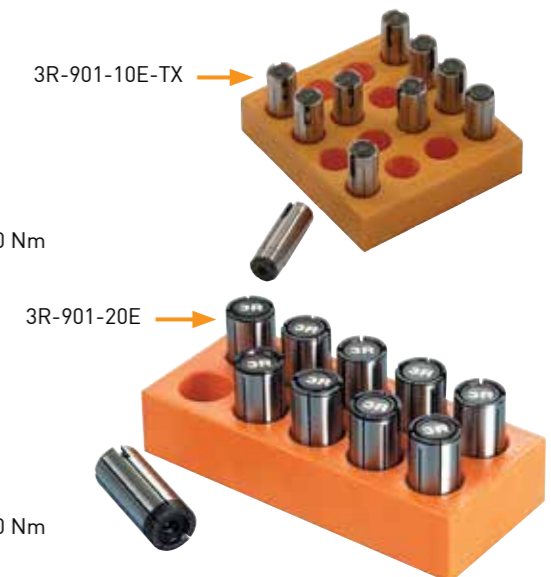
### 3R-901-20E

- 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
- Weight 0.1 kg.



# A wide range of Tooling and Automation products from a single source



## Tooling Catalogues

- + Tooling – for electrode manufacturing and EDMing
- + Tooling – for wire EDMing
- + Tooling – for Parts production
- + Tooling, Delphin modular Clamping System



## Automation Catalogues

- + WorkPal 1
- + WorkPartner 1+
- + Fanuc, six-axis robot
- + WSM – WorkShopManager

For your own copy please contact your System 3R representative.

# 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.



WorkPal 1  
– modest demands, major benefits



WorkPartner 1+  
– can serve two machines



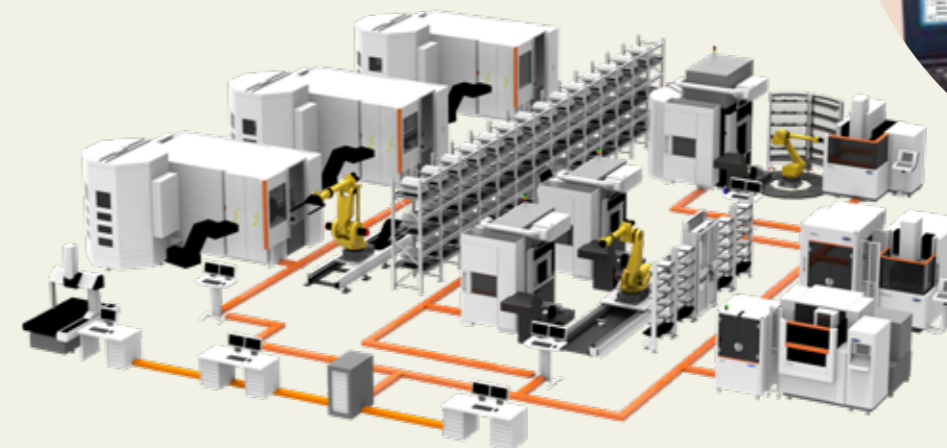
Automation – with six-axis Fanuc industrial robot

## 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.





# Order form

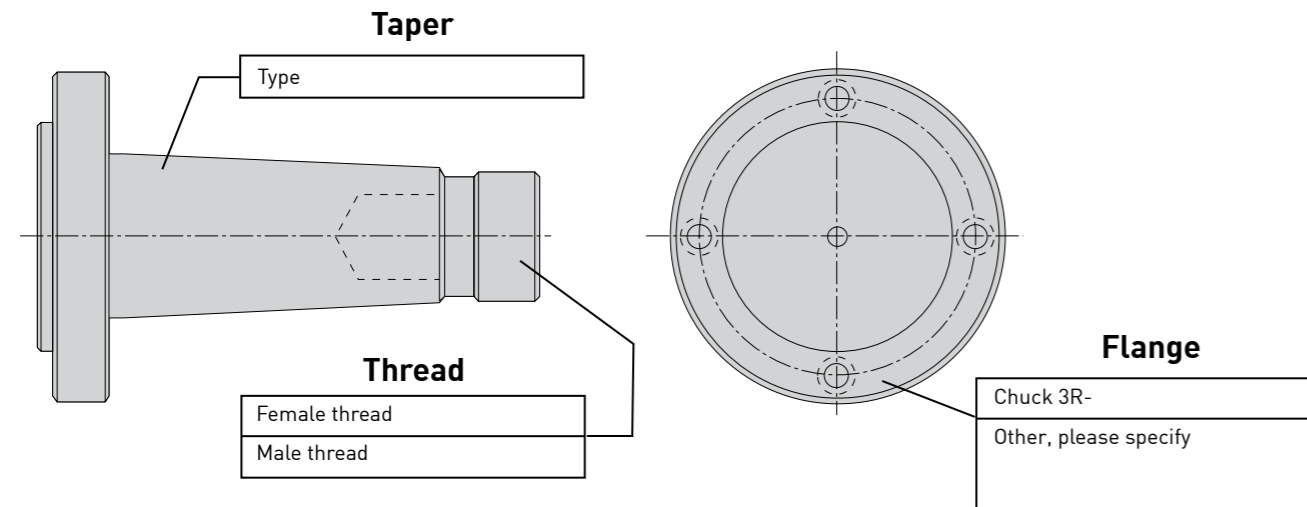
Company \_\_\_\_\_

Phone \_\_\_\_\_

Contact \_\_\_\_\_

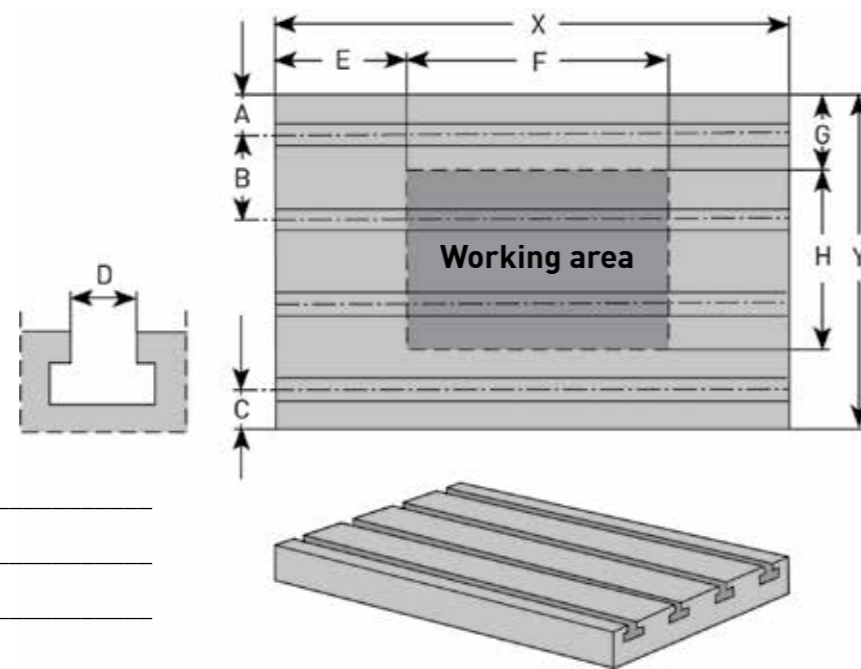
Date \_\_\_\_\_

## Specification of taper attachment



## Specification of 3Refix reference tables

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



No. of T slots \_\_\_\_\_

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

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

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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## Optimize the uptime of your equipment with our Customer Services

- + Ensuring productivity.
- + Reducing running costs and wasted parts.
- + Maximizing the return on your System 3R investments.
- + Extending the product lifetime of your System 3R equipment while maintaining optimum precision.
- + Ensuring robot cell safety satisfies present machine directives.

System 3R's Customer Services is uniquely positioned to help you maximize the availability, value, precision and productivity of your System 3R equipment. Our cost-effective, customer-centric and expert services put your success at the center, ramp up your productivity and ensure predictable, uninterrupted uptime. System 3R's service engineers are your expert partners for a wide range of success-triggering services.

For more info ask your local System 3R dealer.

For contact details, please refer to:  
[www.system3r.com](http://www.system3r.com).

