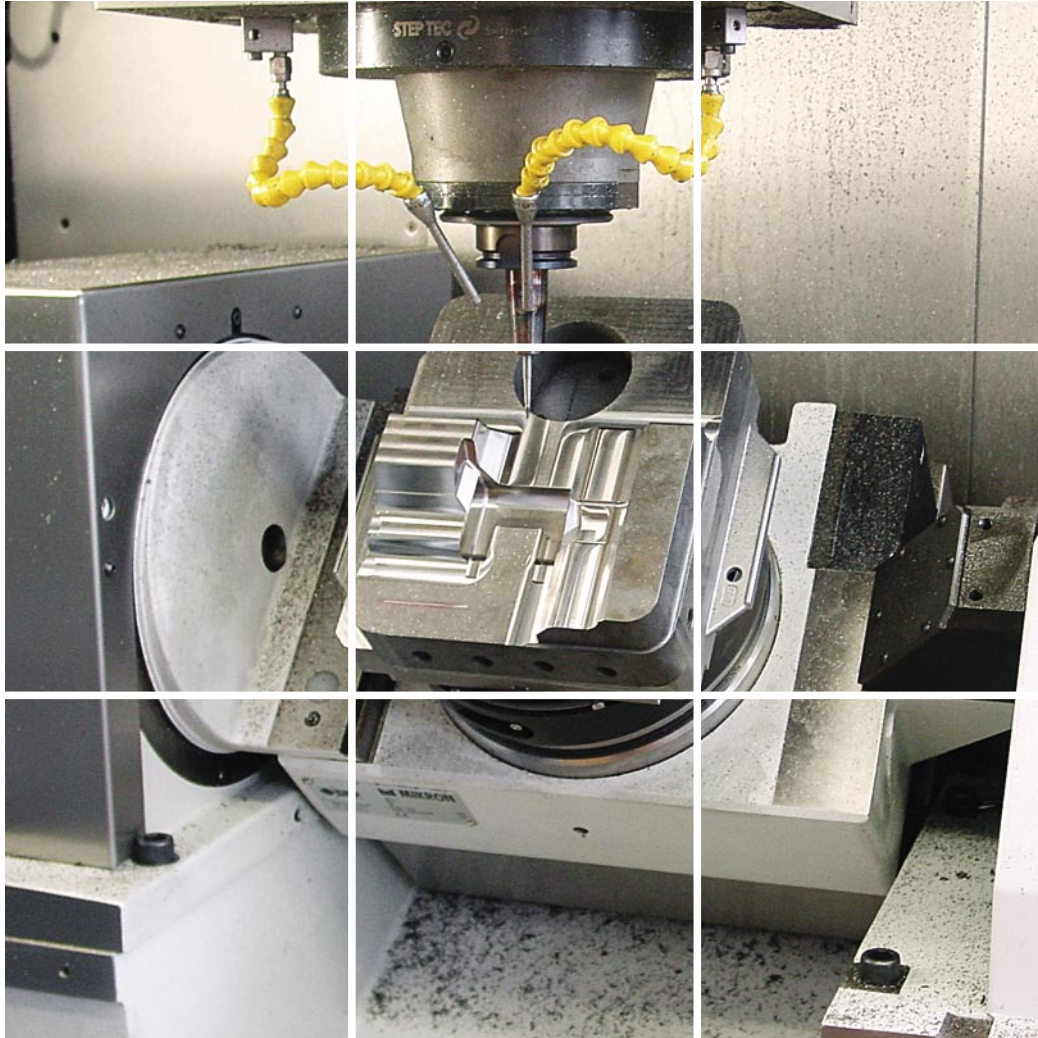


Reference systems for precision machining.
The standard range.



FOCUS ON THE COMPLETE PICTURE FOR GREATER COMPETITIVENESS

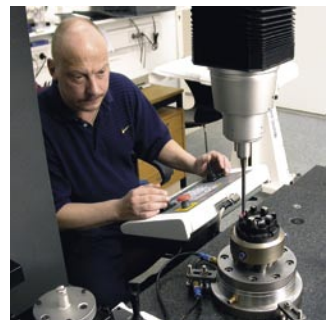
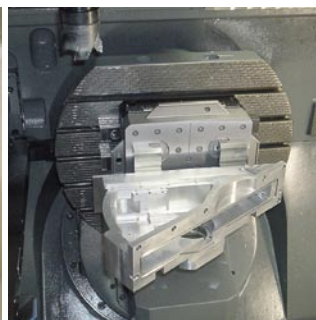
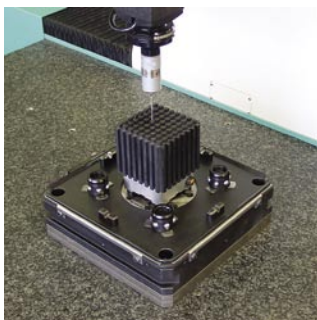
It is a well-known fact that competition in the manufacturing industry is constantly growing. The trend towards shorter runs and more variations means that the total time from order to delivery is the crucial factor in the choice of a supplier. And it is not only the process time in the various machines that counts here. Profitability is determined increasingly by the ability to minimise dead time in the machines and to have efficient flows of material and information in the workshop.

So what really matters is to focus on the complete picture. Total throughput time instead of individual process time! The company that can offer the quickest delivery of small batches of customer-specific products will win out in future competition situations.

The solution is a stable and exact reference system. This lets you preset away from the machine and then set up the machine in seconds. In fact, this is an essential requirement for modern production.

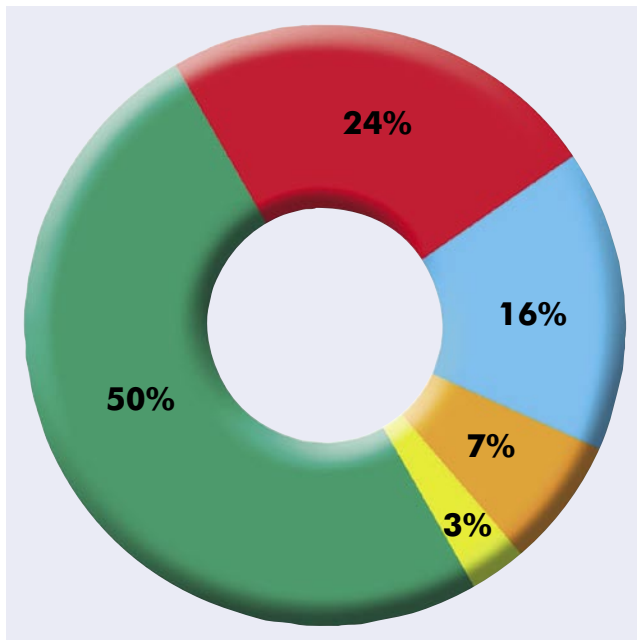
With System 3R reference systems, you radically increase the capacity of your machinery. Partly by minimising setting-up times. And partly because the reference systems are compatible with every machine in your workshop. And – not the least important point – it's only a short step to automation.

You get a reference system that you can build on steadily, bit by bit. Always flexible. Always reliable. Absolutely stable and exact.



EVER TOUGHER DEMANDS ON THE ENGINEERING INDUSTRY

- Shorter delivery times
- Smaller series sizes
- Increased accuracy
- Global competition
- Pressure on prices

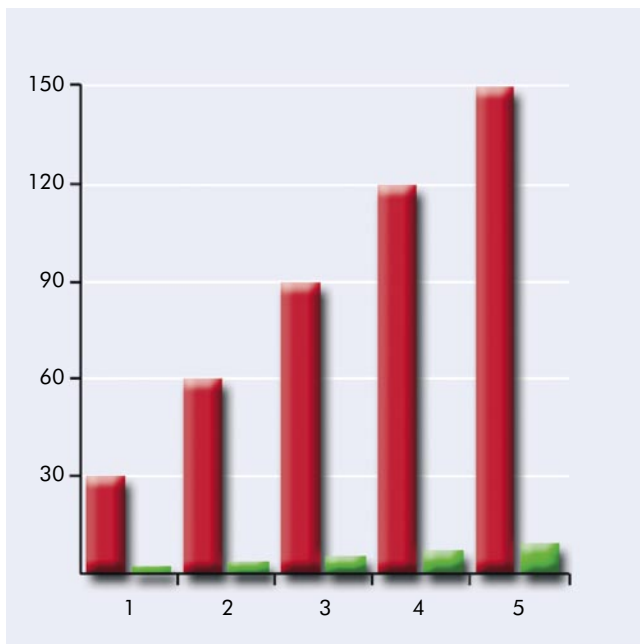


IN THE MANUFACTURING INDUSTRY, MACHINE TIME usually breaks down as follows:

- Machining 50%
- Setting up the fixture 24%
- Changing workpieces 16%
- Changing tools 7%
- Other 3%

INTERNATIONAL PRODUCTIVITY STUDIES show that measures to reduce machine downtimes are significantly more profitable than chasing fractions of seconds in the actual machining process.





A REFERENCE SYSTEM CUTS SETTING-UP TIMES DRAMATICALLY

Example:

Three setups per day and machine

Without palletisation:

$3 \times 30 \text{ minutes} = 90 \text{ minutes per day}$

With palletisation:

$3 \times 2 \text{ minutes} = 6 \text{ minutes per day}$

Saving per machine and day = 84 minutes

■ Tooling-up without palletisation
■ Tooling-up with palletisation

BIG EARNINGS ARE WITHIN YOUR REACH.

If the preconditions are 200 working days with an hourly cost of €60:

Three setups per day and machine

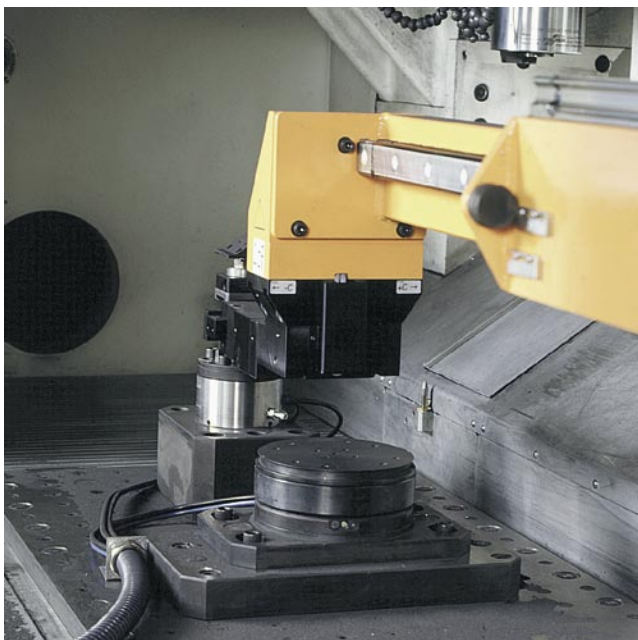
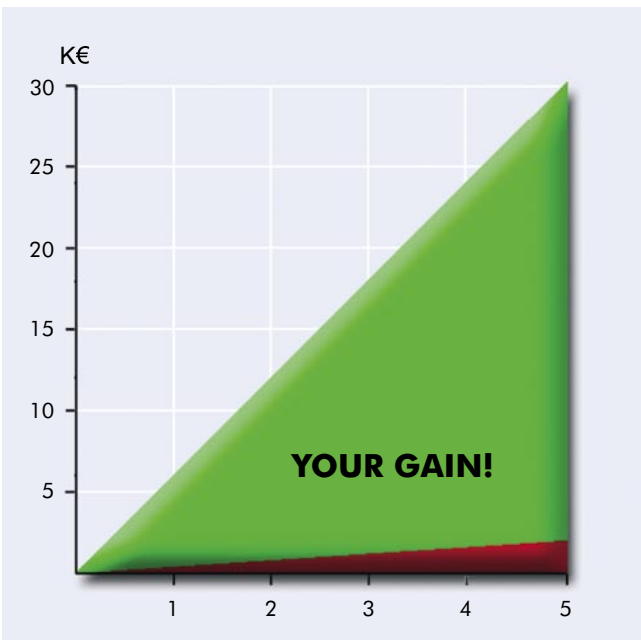
Cost without palletisation:

$3 \times 30 \text{ minutes} = 1.5 \text{ hours} \times 200 \times 60 = \text{€}18000$

Cost with palletisation:

$3 \times 2 \text{ minutes} = 0.1 \text{ hours} \times 200 \times 60 = \text{€}1200$

Saving per machine and year
 $= \text{€}18000 - \text{€}1200 = \text{€}16800$



MANUAL PALLETISATION LAYS A SOLID FOUNDATION for possible later automated production.

- Increased utilisation of existing machine capacity
- Unmanned production overnight and at weekends
- Lower production costs
- Fewer rejects
- Shorter depreciation time.

THIS IS HOW YOU CAN USE THE CATALOGUE

1

What are the maximum dimensions of the workpieces you will be machining?

Examples:

Square workpiece, steel, 200 x 200 x 150 mm
(weight about 47 kg)

Round workpiece Ø250 x 150 mm
(weight about 57 kg)

2

Go to the table and find a system which has pallets for workpieces as in the example.

Example:

MacroMagnum, GPS 240 and Dynafix are suitable pallet systems

Maximum workpiece dimensions □ x height mm Ø x height mm	Reference system							
	Macro		Macro Magnum		GPS 240		Dynafix	
	□	Ø	□	Ø	□	Ø	□	Ø
50								
100								
150								
200								
250								
300								
350								
400								

3

Go to the next table and find the system that has the most suitable pallet size and capacity with respect to weight.

Example:

GPS 240 has suitable pallet sizes which can handle the weight in the example.

4

Choose the chuck that meets your particular requirements.

Example:

Chapter GPS 240, sub-section chucks.

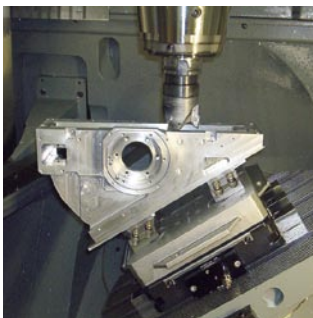
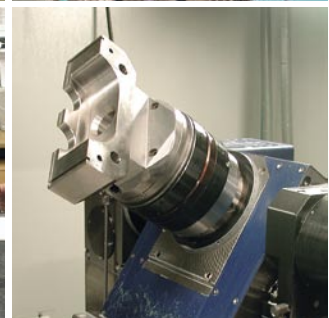
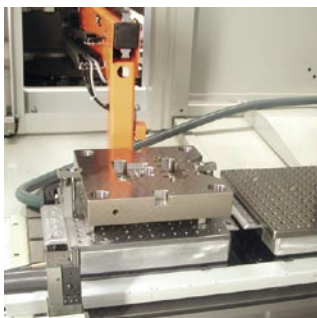
5

When ordering a chuck and pallet – don't forget to order any accessories you may need.

Example:

Controller, sealing plugs, reference protectors or clamp kit.

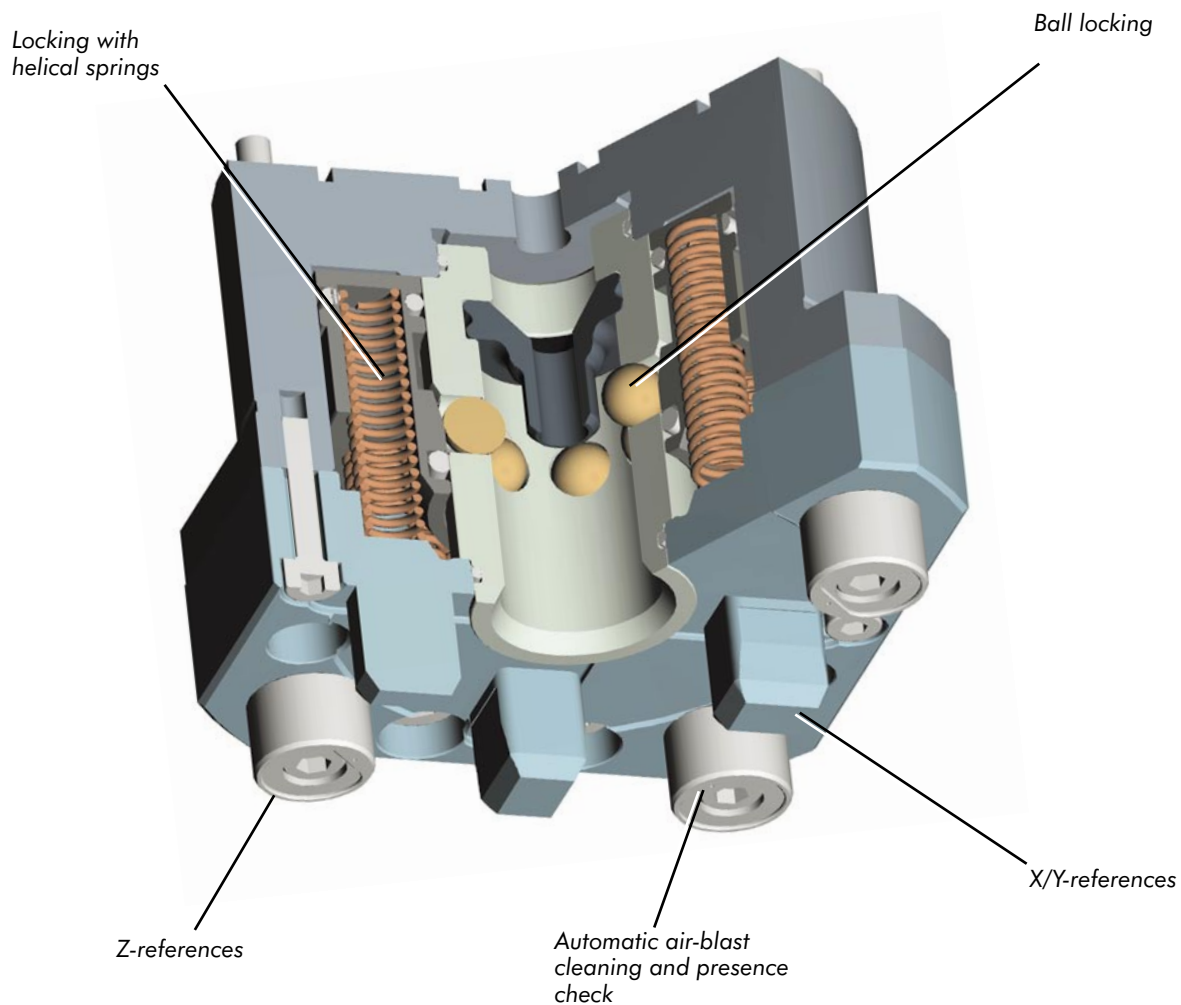
Pallet size [mm]	Reference system / max workpiece weight kg			
	Macro	Macro Magnum	GPS 240	Dynafix
54 x 54	5 kg	5 kg		
70 x 70	10 kg	10 kg		
Ø75	10 kg	10 kg		
Ø116	50 kg	50 kg		
Ø142		50 kg		
Ø156		100 kg		
180 x 180	50 kg			
240 x 240		100 kg	100 kg	
Ø260			100 kg	
280 x 280				250 kg
400 x 400				250 kg



IF YOU WANT TO COMPETE in the global manufacturing industry, you need to study every aspect of efficiency. The important thing is to get the maximum number of machine hours out of every machine. The machines generate revenue when they are producing – and only then!

In the field of precision machining, it's simply a matter of minimising lead times, whether the runs are long or short, or even with one-piece manufacturing. 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 - One Minute Set-up.

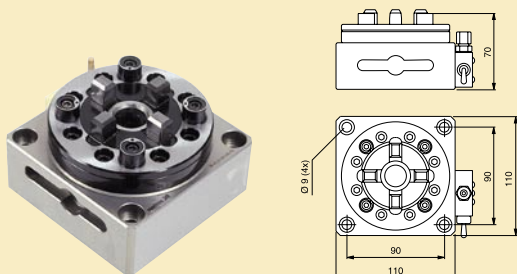
Macro is such a reference system. A system with references of cemented carbide which give unsurpassed wear resistance and life. A system that minimises the throughput time, and which, thanks to its accuracy, practically eliminates rejects. A system that increases flexibility and profitability. A system that increases competitiveness and ensures the success of its users.



Automatic table chuck MacroHP 3R-610.46

Pneumatic chuck with integral air unit.

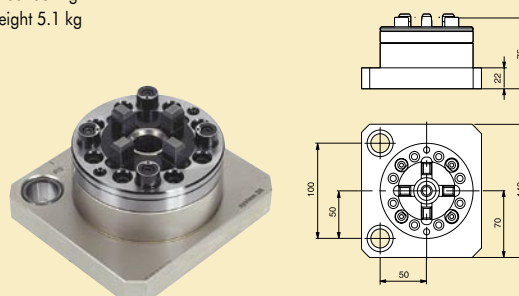
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg



Automatic table chuck MacroHP 3R-600.19

Pneumatic chuck with 3Refix holes for mounting on the machine table.

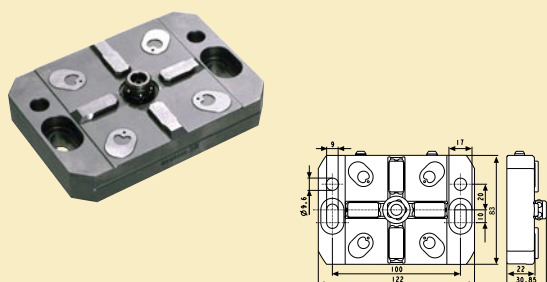
- 3Refix $\varnothing 20$ mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 5.1 kg



MacroHP automatic chuck 3R-602.10HP

Pneumatic chuck for mounting on a machine table. Supplied with drawbar 3R-605.10 and protective cover.

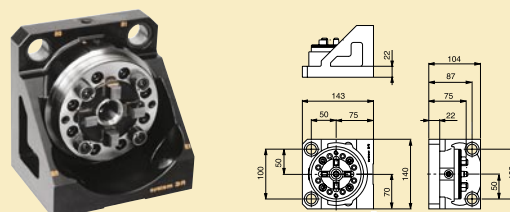
- Required air pressure 6 ± 1 bar.
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references.
- Weight 1.1 kg



Automatic table chuck MacroHP 3R-610.19

Pneumatic chuck for vertical or horizontal mounting on the machine table.

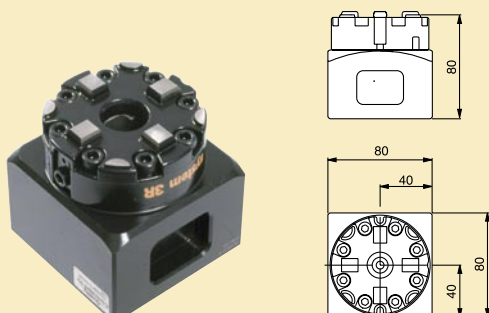
- 3Refix $\varnothing 20$ mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 8.3 kg



Manual chuck MacroStandard 3R-610.21-S

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

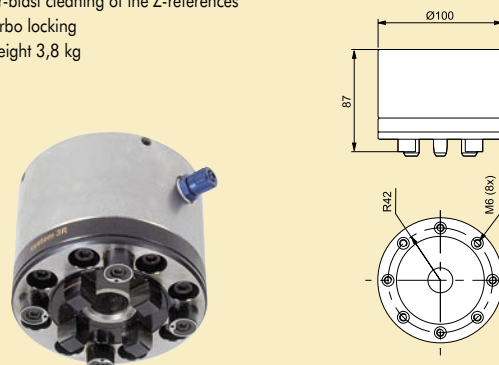
- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Weight 3.5 kg



MacroHP automatic chuck 90588

Opening and air-blast cleaning through air connection on side or back of chuck.

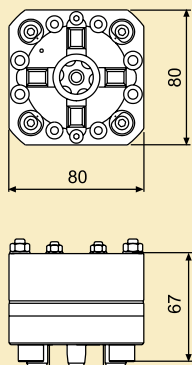
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 3,8 kg



MacroHP automatic chuck 3R-600.86-20

Pneumatic chuck for building-in.

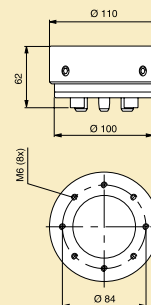
- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar.
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 2.2 kg



MacroHP manual lathe chuck 3R-600.20

For mounting on a lathe taper with centring ring 3R-612.6.

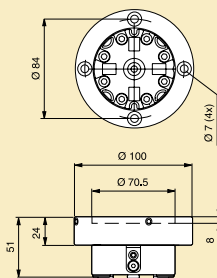
- Required drawbar 3R-605.1
- Fixed index positions $4 \times 90^\circ$
- Weight 3,6 kg



Manual lathe chuck MacroStandard 3R-600.22

With setting screws for centring

- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Weight 2.1 kg



Automatic chuck MacroHP

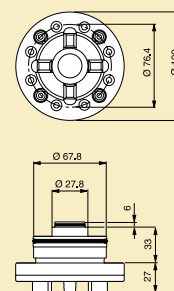
3R-SP7359

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

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

3R-SP7359-RS

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



MacroHP automatic chuck 3R-SP13829

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

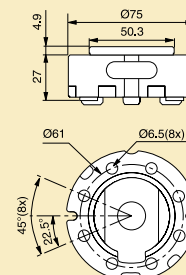
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 2 kg



MacroStandard manual chuck 3R-600.23-S

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

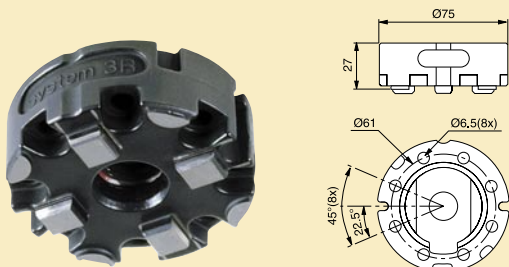
- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Weight 1 kg



MacroStandard manual chuck 3R-600.24-S

Cast chuck with ground rear face for mounting in a fixture or 3R-A21944.

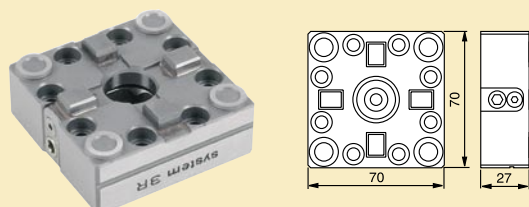
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Weight 1 kg



MacroHP manual chuck 3R-600.24-RS

Stainless steel chuck for mounting on a fixture.

- Required drawbar 3R-605.2RS
- Fixed index positions 4x90°
- Weight 1 kg



MacroHP hydraulic chucks

Chucks 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

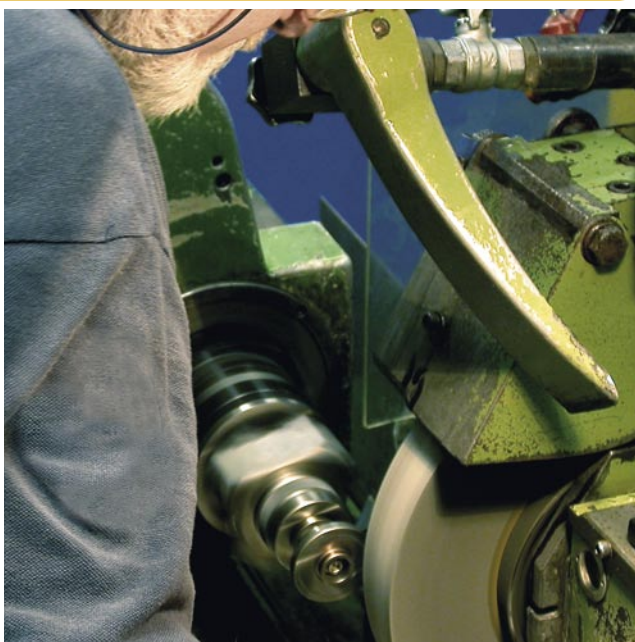
- Ø40 mm
- Construction height 140 mm
- Rust-resistant
- Adapted for automatic changing
- Ready for code carrier
- Weight 2.2 kg



MacroHP hydraulic chuck 90826.XX

For hydraulic clamping of round workpieces. The chucks have integral vibration damping. Standard diameters are 12, 20, 25, 32, 42 and 50 mm.

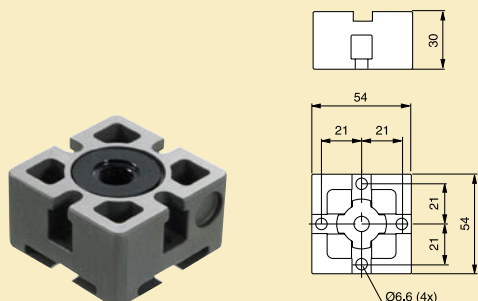
Note: Intermediate sizes are clamped with standard collets.



Pallet 54x54 mm 3R-651E-P

Hardened, with clearance holes for four fixing screws.

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

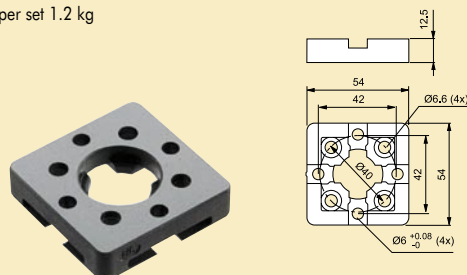


Reference element 54x54 mm 3R-651.7E-P

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

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

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

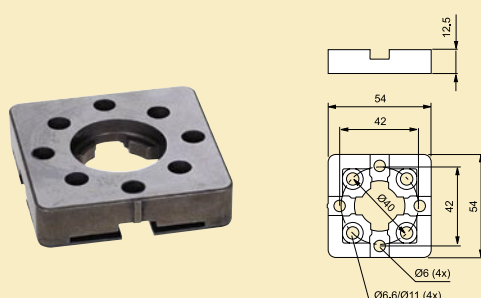


Reference element 54x54 3R-651.7E-XS

Hardened reference element with four clearance holes.

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

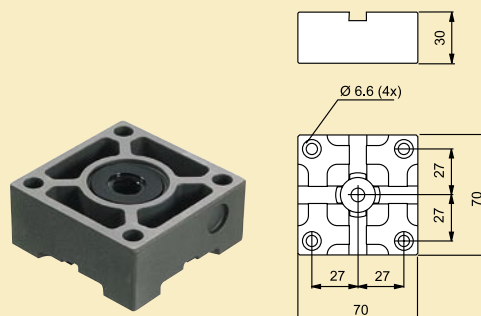
- Adapted for automatic changing
- Supplied in sets of eight
- Weight 1.3 kg



Pallet 70x70 mm 3R-601.1E-P

Hardened, with clearance holes for four fixing screws.

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

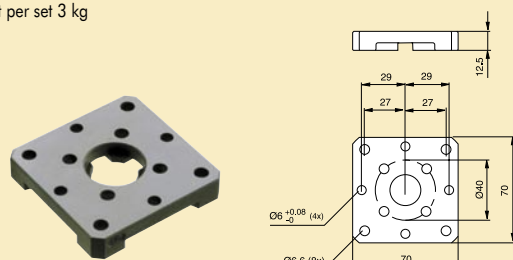


Reference element 70x70 mm 3R-601.7E-P

Hardened and precision cast with clearance holes for eight fixing screws.

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

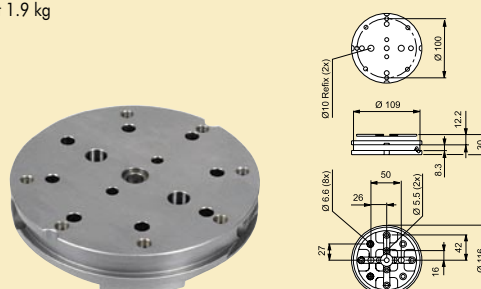
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of five
- Weight per set 3 kg



Pallet Ø116 mm 3R-601.52

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

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



Reference elements, Ø75 mm

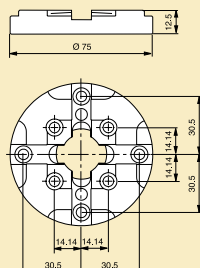
Hardened reference elements for presses and for rotary applications.

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

- Rust-resistant
- Supplied singly.

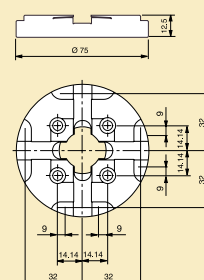
90506.01

- Max press force 20 ton
- Eight clearance holes for M5 screws



90506

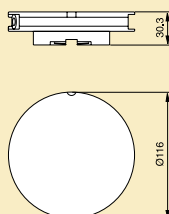
- Max press force 50 ton
- Four clearance holes for M5, six clearance holes for M4, and two locating pin holes



Pallet Ø116 mm 3R-601.116-PA

Unhardened pallet with precision-cast clutch parts type 3R-601.7E-P.

- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Weight 1.8 kg

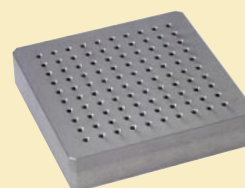


Pallets 180x180 mm

Anodized aluminium pallets with M6 threads.

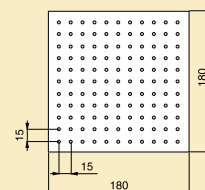
3R-601-1818-M6A

- Mounted on pallet 3R-601.116-PA
- Building-in height 70 mm
- Adapted for automatic changing
- Ready for code carrier
- Weight 5.5 kg



3R-601-1818-M6M

- Mounted on pallet 3R-601.7E-P
- Building-in height 53 mm
- Weight 4 kg

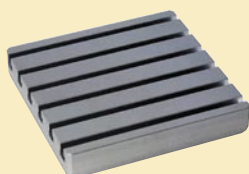


Pallets 180x180 mm

Anodized aluminium pallets with T-slots.

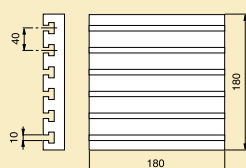
3R-601-1818-T8A

- Mounted on pallet 3R-601.116-PA
- Building-in height 70 mm
- Adapted for automatic changing
- Ready for code carrier
- Weight 5.5 kg



3R-601-1818-T8M

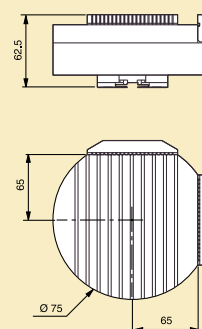
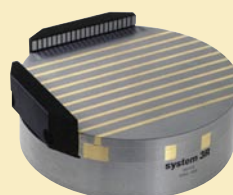
- Mounted on pallet 3R-601.7E-P
- Building-in height 53 mm
- Weight 5.5 kg



Magnetic table Ø158 mm 90336

Pallet with magnet.

- Weight 17 kg



Drawbars

3R-605.1E

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



3R-605.2RS

- Ø20x36.9 mm with Ø7 mm flushing hole
- Rust-resistant
- Supplied singly



3R-605.2E

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



3R-605.10

- Ø20x13 mm
- Rust-resistant
- Supplied singly



Check mandrel 3R-606

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

- Measuring length 110 mm
- Weight 2.3 kg



Check ruler 3R-606.1

For setting angular positions and for centring Macro chucks.

- Measuring length 100 mm
- Weight 1.4 kg



Check ruler 3R-656.1

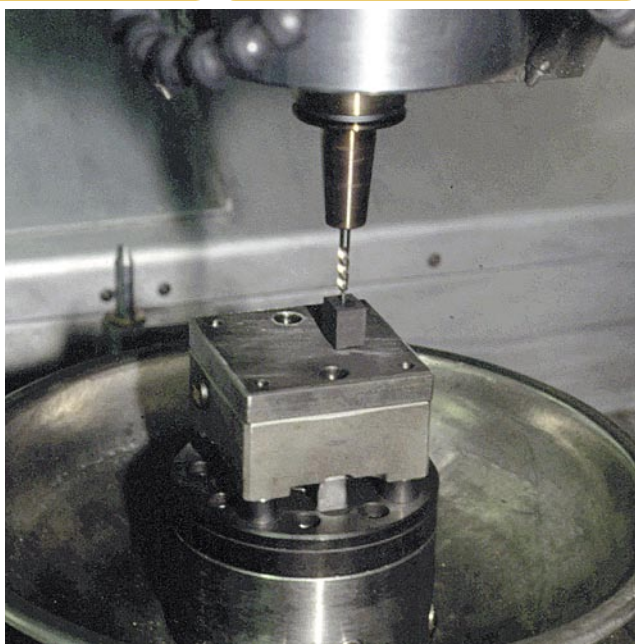
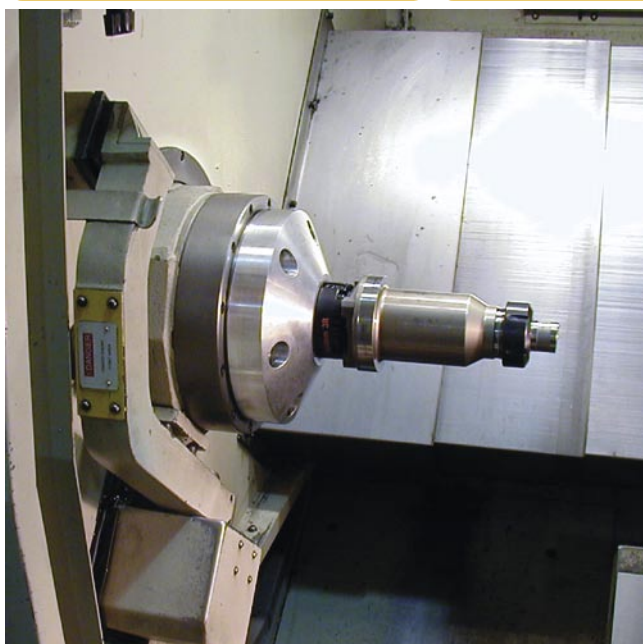
For setting angular positions. Ground outside diameter for centring.

- Measuring length 50 mm
- Weight 0.8 kg



Centring ring 3R-612.6

For centring 3R-600.20.



Sealing ring 3R-612.116

Steel ring for absolute sealing of pallets 3R-601.52, 3R-601.116-PA, 3R-601-1818-M6A, 3R-601-1818-M6M, 3R-601-1818-T8A and 3R-601-1818-T8M against MacroHP chucks.



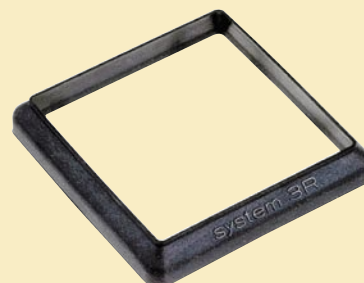
Splash guard 3R-RU52

Rubber splash guard for pallets 52x52 mm and 54x54 mm.
• Height 13 mm



Splash guard 3R-RU70

Rubber splash guard for pallets 70x70 mm.
• Height 13 mm



Splash guard 90027

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

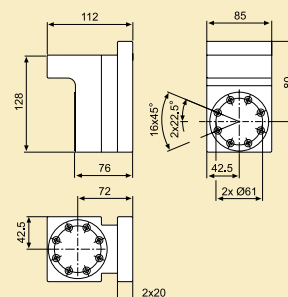
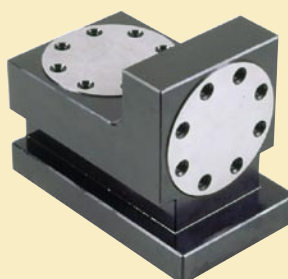
Note: Does not work with sealing ring 3R-612.116.



Angle shelf 3R-A21944

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

Note: Chuck to be ordered separately.



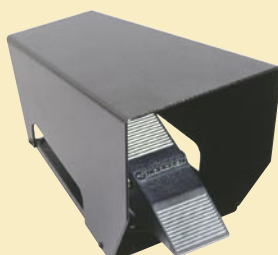
Control unit 3R-611.1

Unit for hand operation of opening/locking of MacroMagnum pallets in pneumatic chucks



Control unit 3R-611.2

Foot operation of pneumatic chucks.



Control unit 3R-611.41

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



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