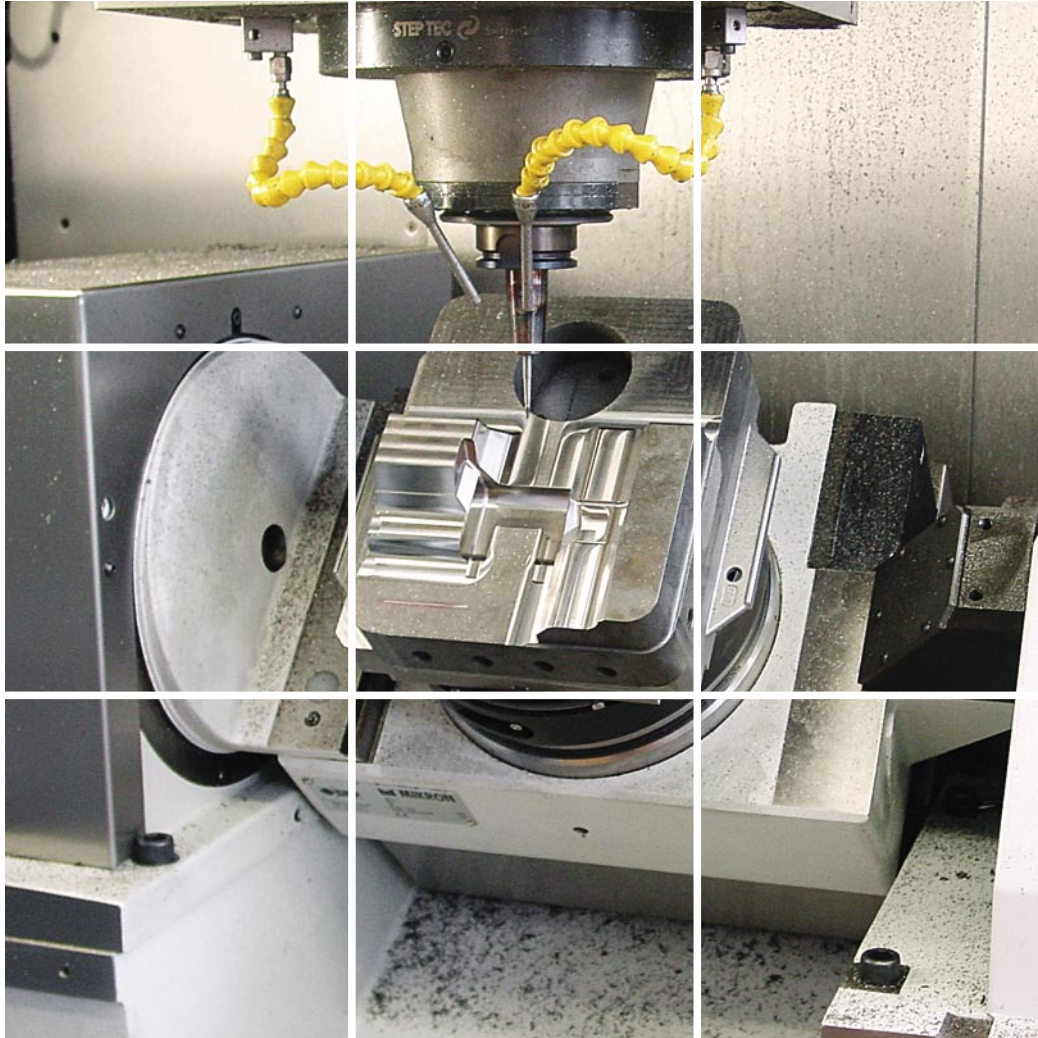


Reference systems for precision machining.
The standard range.



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.

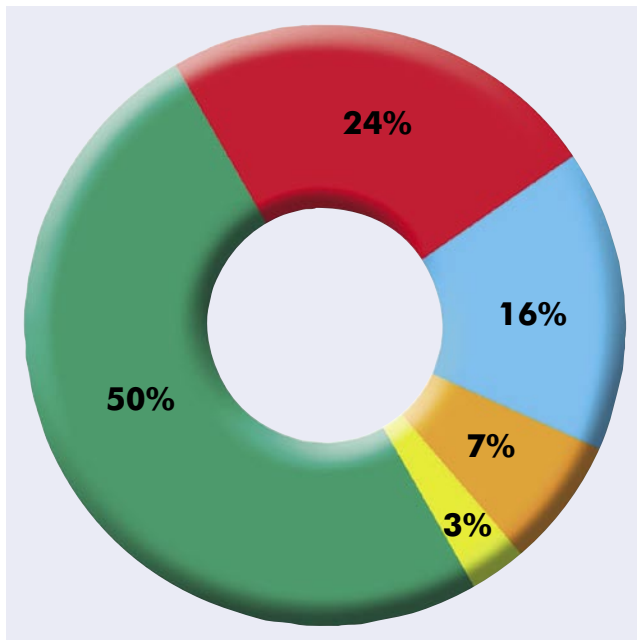
With System 3R reference systems, you radically increase the capacity of your machinery. Partly by minimising setting-up times. And partly because the reference systems are compatible with every machine in your workshop. And – not the least important point – it's only a short step to automation.

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



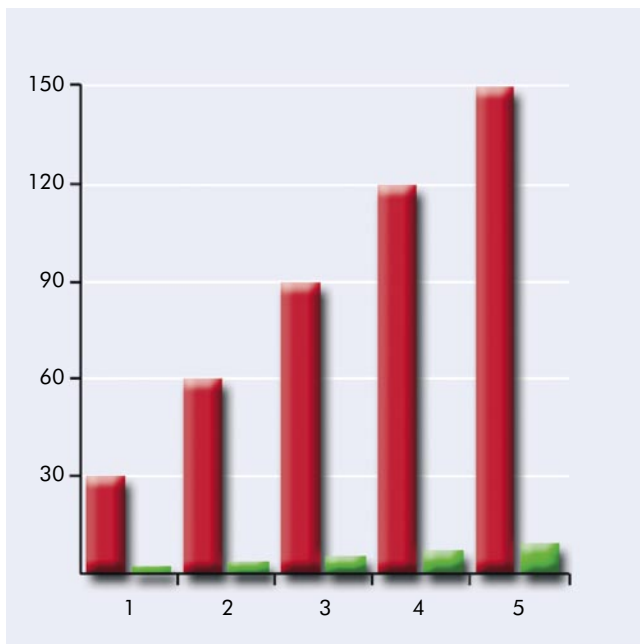
IN THE MANUFACTURING INDUSTRY, MACHINE TIME usually breaks down as follows:

- 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

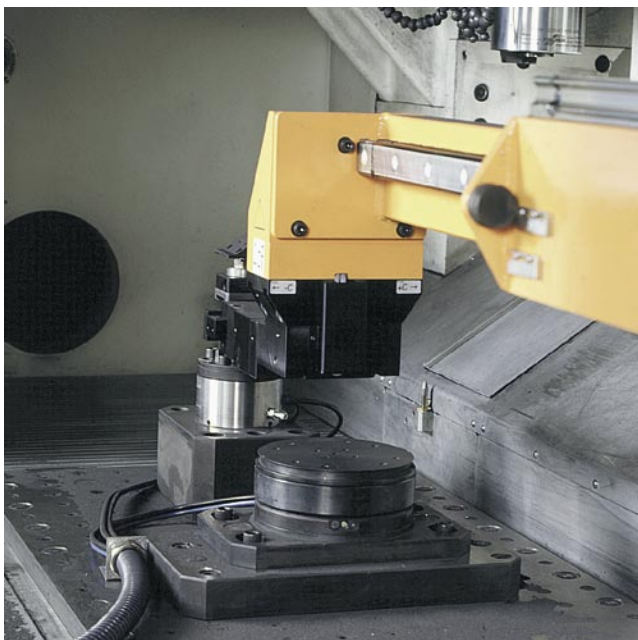
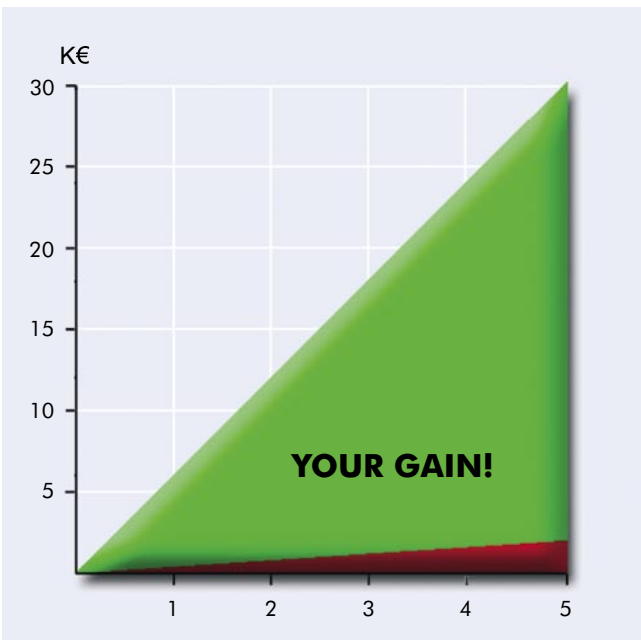
Cost without palletisation:

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

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.

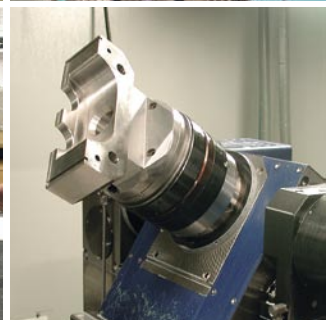
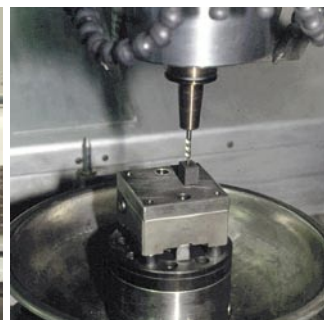
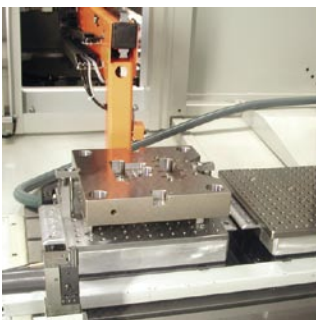
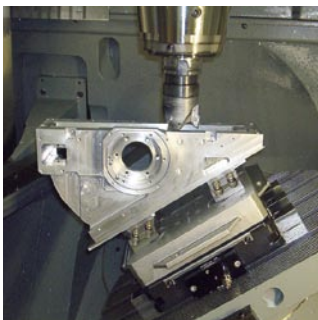
5

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

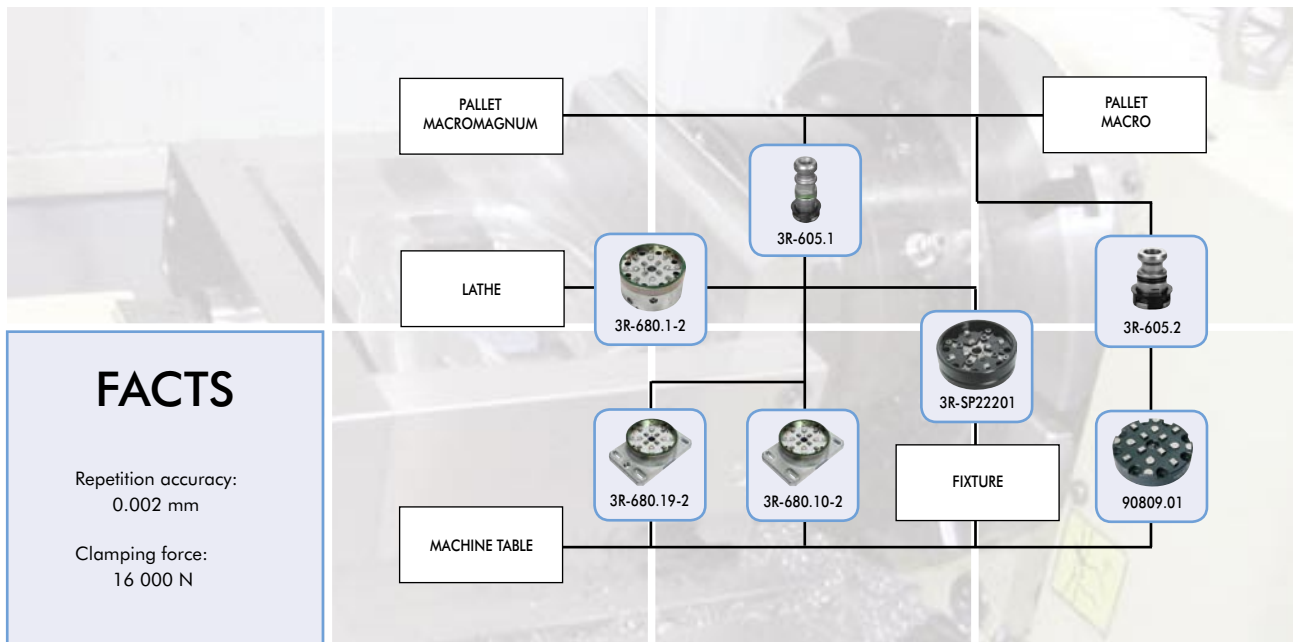
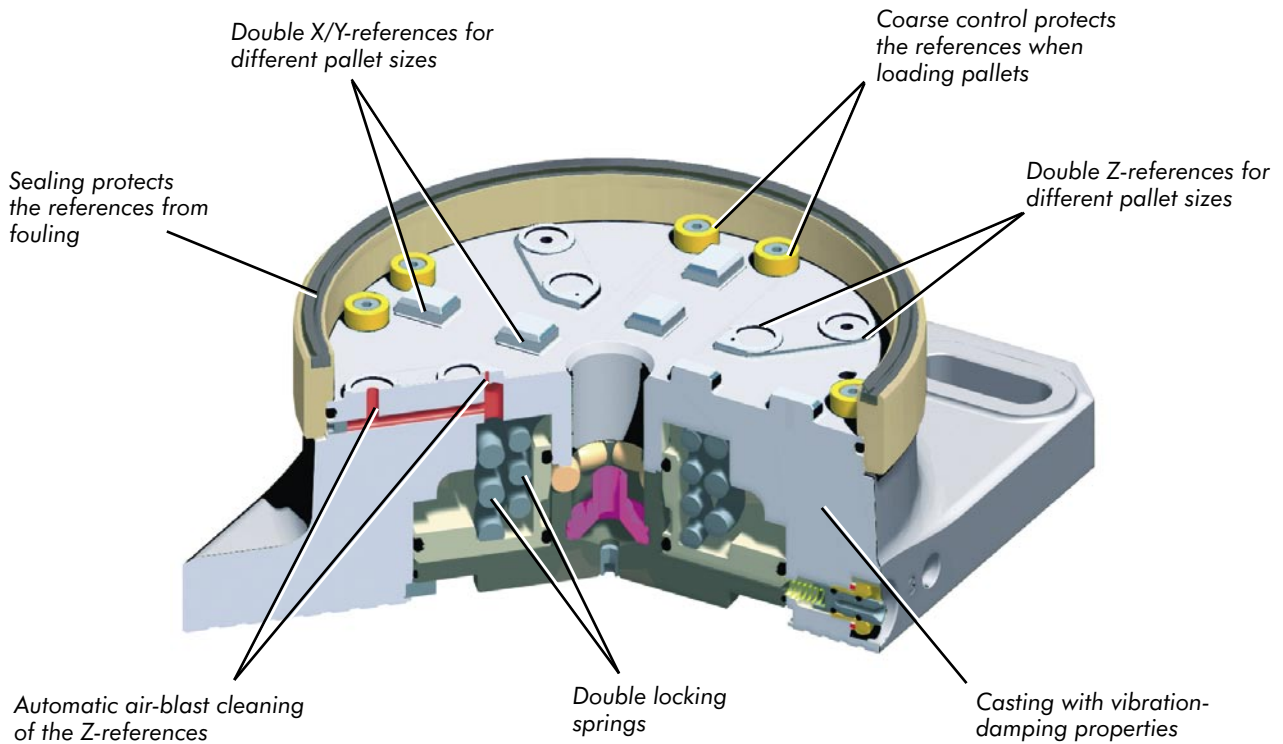


RAPID CHANGES in today's consumption patterns must be met with manufacturing methods which give profitability even with short runs.

Shorter runs mean frequent setting-up, so that setting-up times are becoming increasingly significant in terms of the financial results. Every minute of setting-up time that can be converted to active machining time means lower costs. So – minimised setting-up

times lead to higher productivity, greater flexibility and therefore increased profitability.

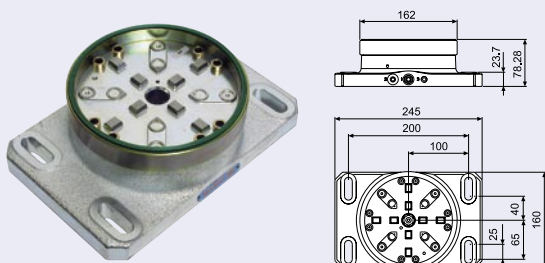
MacroMagnum is a further development of the patented Macro system. The powerful clamping force and the position of the reference surfaces far away from the chuck centre provide a stability and accuracy that are ideal for applications with powerful machining forces.



Automatic chuck 3R-680.10-2

Pneumatic table chuck.

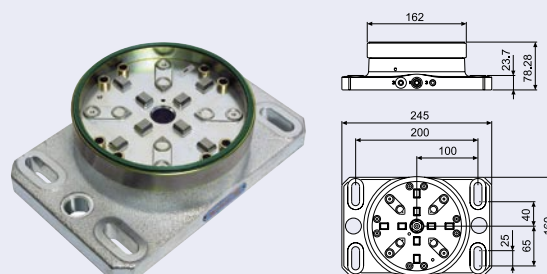
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg



Automatic chuck 3R-680.19-2

Pneumatic table chuck with 3Refix-holes.

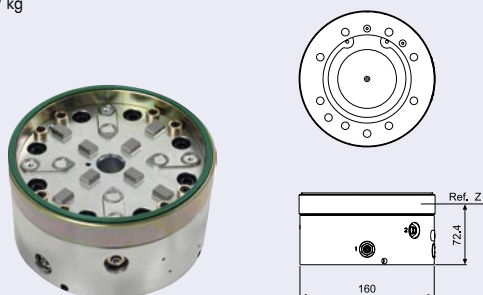
- 3Refix $\varnothing 20$ mm
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg



Automatic chuck 3R-680.1-2

Pneumatic spindle chuck. Operated via the machine.

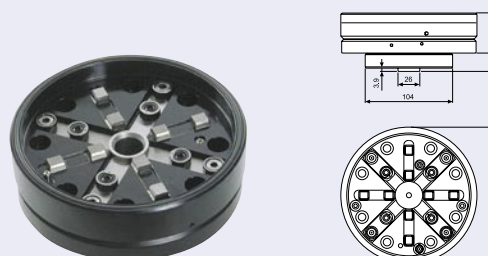
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Flushing duct
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 9 kg



Automatic chuck 3R-SP22201

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

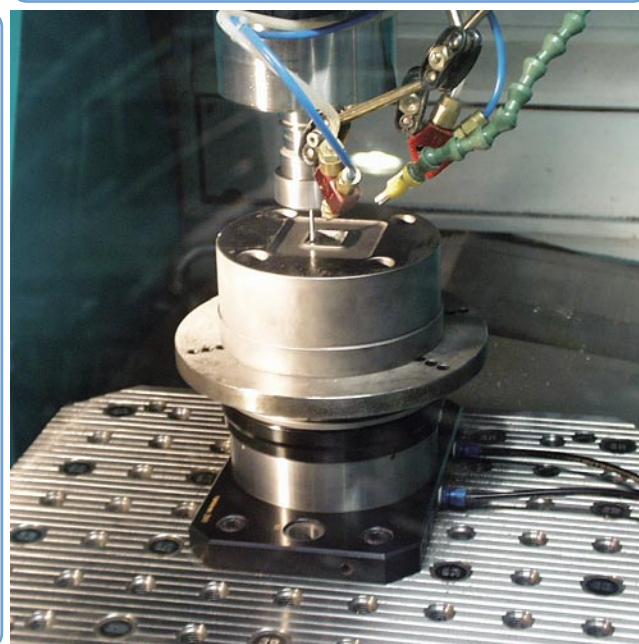
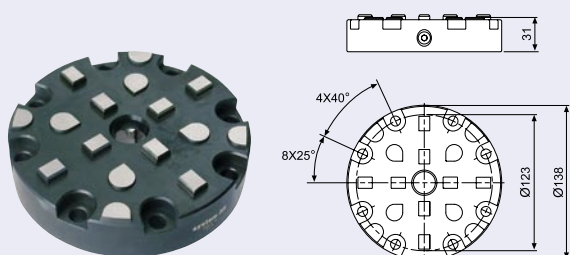
- Required drawbar 3R-605.1
- Required air pressure 6 ± 1 bar
- Fixed index positions $4 \times 90^\circ$
- Air-blast cleaning of Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 5 kg



Manual chuck 90809.01

Manual chuck for machine spindle or machine table.

- Required drawbar 3R-605.2
- Fixed index positions $4 \times 90^\circ$
- Weight 5 kg

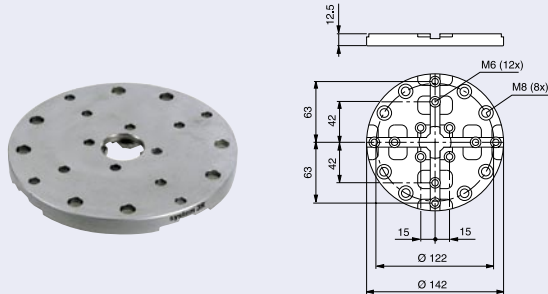


Reference element Ø142 mm 3R-681.71

Hardened reference element with clearance holes for fixing screws.

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

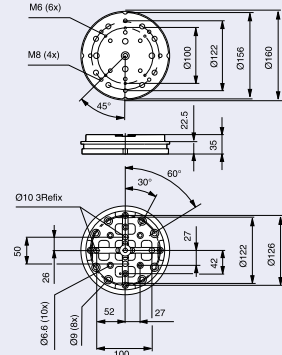
- Rust-resistant
- Weight 1 kg



Pallet Ø156 mm 3R-681.51

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

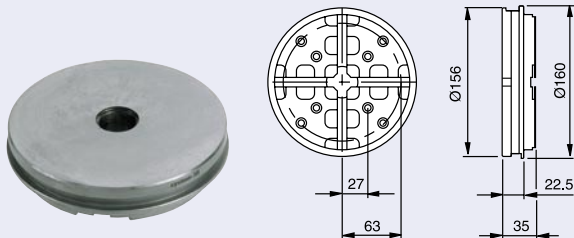
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Rust-resistant
- Flushing connection
- Weight 5 kg



Pallet Ø156 mm 3R-681.51-SA

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

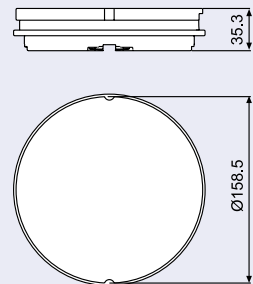
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg



Pallet Ø156 mm 3R-681.156-A

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

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



Pallets 240x240 mm

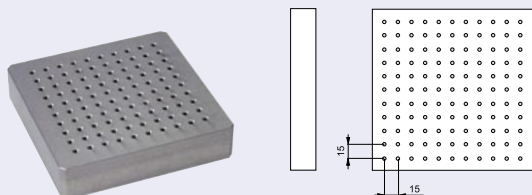
Anodized aluminium pallets with M6 threads.

3R-681-2424-M6A

- Mounted on pallet 3R-681.51
- Adapted for automatic changing
- Ready for code carrier
- Building-in height 75 mm
- Weight 11 kg

3R-681-2424-M6M

- Mounted on pallet 3R-681.71
- Building-in height 53 mm
- Weight 7.5 kg



Pallets 240x240 mm

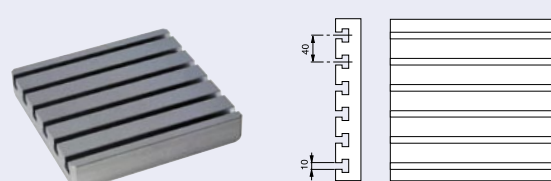
Anodized aluminium pallets with T-slots.

3R-681-2424-T8A

- Mounted on pallet 3R-681.51
- Adapted for automatic changing
- Ready for code carrier
- Building-in height 75 mm
- Weight 11 kg

3R-681-2424-T8M

- Mounted on pallet 3R-681.71
- Building-in height 53 mm
- Weight 7.5 kg



Three-jaw chuck 90421

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

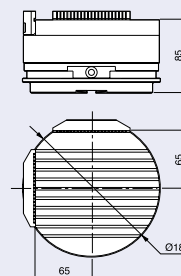
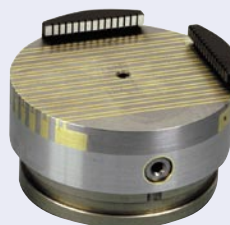
- Total height 127 mm
- Weight 16 kg



Magnetic table Ø158 mm 90363

Pallet with magnet

- Weight 18 kg



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



Drawbar 3R-605.1E

- Drawbar Ø20x57.1 mm with flushing holes Ø7 mm
- Designed for automatic changing
- Supplied in sets of ten



Drawbar 3R-605.2E

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



Splash guard 90027.03

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



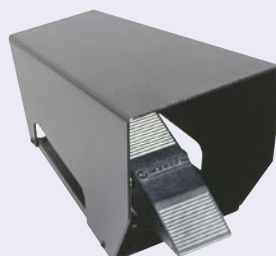
Control unit 3R-611.1

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

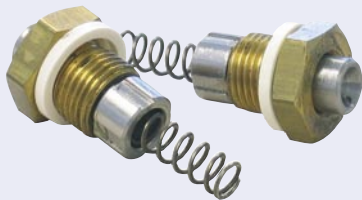
Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.



Connection for air gun 90815

Fits automatic chucks 3R-680.10-2, 3R-680.19-2, 3R-680.1-2 and 3R-SP22201.

- Supplied in sets of two.



Adapter plate 90387

For clamping 3R-680.1-2 in four- and five-axis multi-operation machines.



Hose 3R-611-C

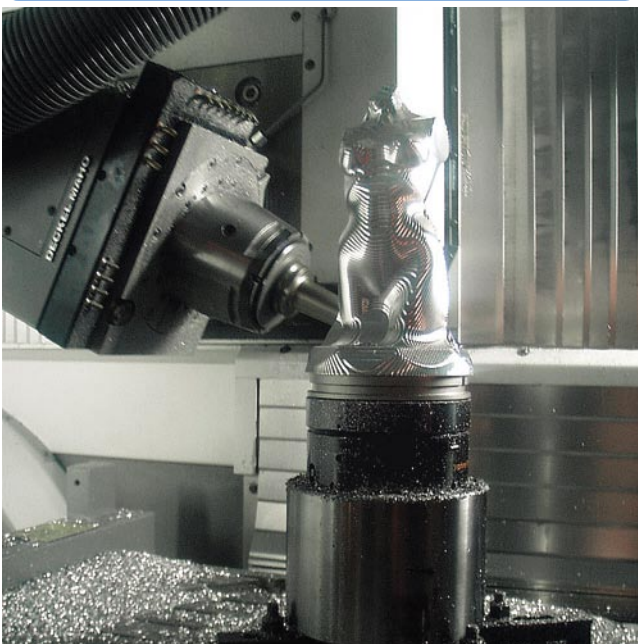
Steel-reinforced rubber hose, gives protection from hot metallic swarf.

- 4 m.
- 4 nipples 1/8".



Chip guard 90443

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



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