System 3R

Tooling
for electrode manufacturing & EDMing
Design and quality by System 3R
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</table>

### 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.
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.

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!
System 3R tooling for electrode manufacturing & EDMing

Conventional setting-up

<table>
<thead>
<tr>
<th>Job 1</th>
<th>Job 2</th>
<th>Job 3</th>
<th>Job 4</th>
<th>Job 5</th>
<th>Job 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining time</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>Idle time</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
</tbody>
</table>

One manned shift – eight hours

Pallet system

<table>
<thead>
<tr>
<th>Job 1</th>
<th>Job 2</th>
<th>Job 3</th>
<th>Job 4</th>
<th>Job 5</th>
<th>Job 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining time</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>Idle time</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
</tbody>
</table>

One manned shift – eight hours

**Higher productivity**, calculation example:

<table>
<thead>
<tr>
<th></th>
<th>Conventional setting-up</th>
<th>Pallet system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working time per day</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Setting-up time per day (hours)</td>
<td>-4</td>
<td>-0.5</td>
</tr>
<tr>
<td>Spindle time per day</td>
<td>=4</td>
<td>=7.5</td>
</tr>
<tr>
<td>Working days per week</td>
<td>x5</td>
<td>x5</td>
</tr>
<tr>
<td>Spindle time per week</td>
<td>= 20</td>
<td>=37.5</td>
</tr>
</tbody>
</table>

**Faster payback**, calculation example:

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

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

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

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

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

<table>
<thead>
<tr>
<th>System</th>
<th>Maximum size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacroJunior</td>
<td>50</td>
</tr>
<tr>
<td>3Ready-to-Run</td>
<td>50</td>
</tr>
<tr>
<td>MacroCombi</td>
<td>50</td>
</tr>
<tr>
<td>MacroStandard</td>
<td>50</td>
</tr>
<tr>
<td>MacroHighPerformance</td>
<td>50</td>
</tr>
<tr>
<td>MacroMagnum</td>
<td>50</td>
</tr>
<tr>
<td>GPS 240</td>
<td>50</td>
</tr>
<tr>
<td>Dynafix</td>
<td>50</td>
</tr>
<tr>
<td>Maxi</td>
<td>50</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>System</th>
<th>Maximum weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacroJunior</td>
<td>Spindle: 0.5, Table: 0.5</td>
</tr>
<tr>
<td>3Ready-to-Run</td>
<td>Spindle: 1, Table: 1</td>
</tr>
<tr>
<td>MacroCombi</td>
<td>Spindle: 0.5, Table: 1</td>
</tr>
<tr>
<td>MacroStandard</td>
<td>Spindle: 5, Table: 10</td>
</tr>
<tr>
<td>MacroHighPerformance</td>
<td>Spindle: 5, Table: 10</td>
</tr>
<tr>
<td>MacroMagnum</td>
<td>Spindle: 5, Table: 10, 20**</td>
</tr>
<tr>
<td>GPS 240</td>
<td>Spindle: 5, Table: 10</td>
</tr>
<tr>
<td>Dynafix</td>
<td>Spindle: 100, Table: 100</td>
</tr>
<tr>
<td>Maxi</td>
<td>25-500</td>
</tr>
</tbody>
</table>

* Die-sinking EDM spindle  ** With automatic changing
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.

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 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 X and Y references of the chuck are made of cemented carbide.
VDP (Vibration-Damped Palletisation)

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.
**VDP (Vibration-Damped Palletisation)**

**Increase your capacity with > +30%**

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

### Cutting Speed (RPM)

<table>
<thead>
<tr>
<th>Cutting Speed</th>
<th>Axial Depth of Cut [mm]</th>
<th>Increase in removal rate due to VDP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8500</td>
<td>3.5</td>
<td>4.5</td>
</tr>
<tr>
<td>9000</td>
<td>4.0</td>
<td>9.0*</td>
</tr>
<tr>
<td>10000</td>
<td>3.0</td>
<td>9.0*</td>
</tr>
</tbody>
</table>

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

**Process Stability Analysis (Swiss machine tool manufacturer)**

- Power
- Cutting forces -25%
- Time
- Less tool wear extends the life of the tools = increased revenue.

**Conventional clamping**

**VDP**

**WITH**

**WITHOUT**

9 mm was the maximum allowed dept of cut for the cutting tool.
MacroJunior & MacroCombi

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

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

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

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

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

... gives extreme flexibility
... one chuck, two systems
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+ Recommended tightening torque, manual chuck – 4 Nm
## MacroJunior & MacroCombi – Chucks

### Spindle chucks

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<thead>
<tr>
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<th>Drawbar Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>3R-400.34</td>
<td>3R-405.11</td>
</tr>
<tr>
<td>3R-460.1-1</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-460.83-2</td>
<td>3R-405.16 / 3R-405.11 machine-adapted</td>
</tr>
<tr>
<td>3R-460.86-2</td>
<td>3R-405.16 / 3R-405.11 machine-adapted</td>
</tr>
<tr>
<td>3R-460.86-2.9</td>
<td>3R-405.16 / 3R-405.11 machine-adapted 90°</td>
</tr>
<tr>
<td>3R-460.EX8-1</td>
<td>3R-405.16 / 3R-405.11 machine-adapted</td>
</tr>
<tr>
<td>3R-400.24-11</td>
<td>3R-405.11</td>
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</table>

### Lathe chuck

<table>
<thead>
<tr>
<th>Article number</th>
<th>Drawbar Feature</th>
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<tbody>
<tr>
<td>3R-400.32</td>
<td>3R-405.11</td>
</tr>
<tr>
<td>3R-460.32</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
</tbody>
</table>

### Table chucks

<table>
<thead>
<tr>
<th>Article number</th>
<th>Drawbar Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>3R-460.31-5</td>
<td>3R-405.16 / 3R-405.11 horizontal and vertical</td>
</tr>
<tr>
<td>3R-460.34</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-460.37</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-460.46</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP18286</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP19047</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP19143</td>
<td>3R-405.16 / 3R-405.11</td>
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</table>

### Built-in chucks

<table>
<thead>
<tr>
<th>Article number</th>
<th>Drawbar Feature</th>
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<tbody>
<tr>
<td>3R-400.24-11</td>
<td>3R-405.11</td>
</tr>
<tr>
<td>3R-400.34</td>
<td>3R-405.11</td>
</tr>
<tr>
<td>3R-460.34</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP18286</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP19047</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
<tr>
<td>3R-SP19143</td>
<td>3R-405.16 / 3R-405.11</td>
</tr>
</tbody>
</table>
MacroJunior – Chucks

**Manual chuck, MacroJunior, 3R-400.34**
For mounting in the machine spindle by means of 3R-A11489, or on the machine table by means of 3R-A19724 or alternatively 3R-A21944, or in a fixture.
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.6 kg.

**Pneumatic chuck, MacroJunior, 3R-410.1-M**
For mounting on the machine spindle or in a fixture on the machine table.
- Required drawbar 3R-405.11
- Required air pressure 6±1 bar
- Fixed index positions 3x120°
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.5 kg.

**Manual chuck, MacroJunior, 3R-400.24-11**
For mounting on machine spindle.
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 0.8 kg.

**Manual lathe chuck, MacroJunior, 3R-400.32**
For mounting on a lathe taper.
Note: When ordering a lathe taper, use the order form at the end of the catalogue.
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 1.8 kg.

**Manual chuck, MacroJunior, 3R-410.31-5**
Chuck in High Performance version. Five ground surfaces for vertical or horizontal mounting on the machine table.
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 3.5 kg.

**Manual chuck, MacroJunior, 3R-SP19143**
Stainless steel chuck with ground flange Ø22x6 mm for mounting in a fixture or the WEDM system. Axial locking screw with channel for flushing through the electrode.
- Fixed index positions 3x120°
- Weight 0.8 kg.
MacroCombi – Chucks

Manual chuck, MacroCombi, 3R-460.34
For mounting in the machine spindle by means of 3R-A11489, or on the machine table by means of 3R-A19724 or alternatively 3R-A21944, or in a fixture.
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Weight 1.8 kg

Pneumatic chuck, MacroCombi, 3R-460.86-2
Pneumatic chuck for mounting directly on the machine spindle. All X/Y/Z references in hardened and ground steel.
Note: When ordering state machine make and type.
- Four M6 clearance holes, 67x20 mm
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Flushing connection
- Weight 2.1 kg

Pneumatic chuck, MacroCombi, 3R-460.83-2
Pneumatic chuck for mounting directly on the machine spindle. All X/Y/Z references in hardened and ground steel.
Note: When ordering state machine make and type.
- Four M6 clearance holes, 67x20 mm
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 2.5 kg

Pneumatic chuck, MacroCombi, 3R-460.1-1
Pneumatic chuck for mounting on machine spindle with 3R-A3620.
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 2.5 kg

Pneumatic chuck, MacroCombi, 3R-460.83-2
Pneumatic chuck for mounting directly on the machine spindle. All X/Y/Z references in hardened and ground steel.
Note: When ordering state machine make and type.
- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Flushing connection
- Weight 1.9 kg
MacroCombi – Chucks

Pneumatic chuck, MacroCombi, 3R-460.86-2.9
Pneumatic chuck for mounting directly on the machine spindle. MacroJunior references offset 90°. All X/Y/Z references in hardened and ground steel.
Note: When ordering state machine make and type.
• Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Required air pressure 6±1 bar
• Air-blast cleaning of the Z-references
• Flushing connection
• Weight 1.9 kg.

Manual lathe chuck, MacroCombi, 3R-460.32
For mounting on a lathe taper
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Weight 2.0 kg.

Manual chuck, MacroCombi, 3R-460.37
The locking mechanism is operated by a removable handle.
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Weight 4.5 kg.

Pneumatic chuck, MacroCombi, 3R-460.EX8-1
Pneumatic chuck for mounting directly on the machine spindle. All X/Y/Z references in hardened and ground steel.
Note: When ordering state machine make and type.
• Six M6 clearance holes, Ø41 mm
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Required air pressure 6±1 bar
• Air-blast cleaning of the Z-references
• Flushing connection
• Weight 2.5 kg.

Manual chuck, MacroCombi, 3R-460.31-5
Chuck in HighPerformance version. Five ground surfaces for vertical or horizontal mounting on the machine table.
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Weight 3.5 kg.

Pneumatic chuck, MacroCombi, 3R-460.46
Pneumatic chuck with integral air unit.
• Required drawbar for Macro holder 3R-405.16
• Required drawbar for MacroJunior holder 3R-405.11
• Required air pressure 6±1 bar
• Air-blast cleaning of Z-references
• Turbo locking
• Weight 4.4 kg.
### MacroCombi – Chucks

**Pneumatic chuck, MacroCombi, 3R-SP18286**

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 1.1 kg.

**Pneumatic chuck, MacroCombi, 3R-SP19047**

Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.
- Required drawbar for Macro holder 3R-405.16
- Required drawbar for MacroJunior holder 3R-405.11
- Required air pressure 6±1 bar
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 2.1 kg.

### MacroJunior – Pallets & Holders

**MacroJunior or MacroCombi chuck**

**Drawbar**

**Workpiece/electrode**

#### Holders

<table>
<thead>
<tr>
<th>Holders</th>
<th>Article number</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sintered pallet Ø25 mm MacroJunior</td>
<td>3R-491E</td>
<td></td>
</tr>
<tr>
<td>Sintered pallet Ø25 mm MacroJunior</td>
<td>3R-491E-HP</td>
<td>parallel ground</td>
</tr>
<tr>
<td>Holder Ø26 mm MacroJunior</td>
<td>3R-461-8.8-HP</td>
<td>parallel-ground. Journal Ø8.8 mm</td>
</tr>
<tr>
<td>Holder Ø28 mm MacroJunior</td>
<td>3R-461.1E-GA</td>
<td>journal Ø10x10 mm</td>
</tr>
<tr>
<td>Holder Ø28 mm MacroJunior</td>
<td>3R-465.1E-A</td>
<td>taper</td>
</tr>
<tr>
<td>Collet chuck ETS10, MacroJunior</td>
<td>3R-469-10</td>
<td>Ø0.1-10 mm</td>
</tr>
<tr>
<td>Collet chuck ER16, MacroJunior</td>
<td>3R-469-16</td>
<td>Ø0.5-10 mm</td>
</tr>
<tr>
<td>Holder, MacroJunior</td>
<td>3R-465-LE</td>
<td>Ø4-8 or Ø8x18 mm</td>
</tr>
</tbody>
</table>
MacroJunior – Chuck adapter, Pallets & Holders

Pallet 25 mm, MacroJunior, 3R-491E
For copper or graphite electrodes.
NOTE: The electrode is installed with screw and adhesive assembly, or alternatively brazing.
• Adapted for automatic changing
• Supplied in sets of 30.

Ground pallet 25 mm, MacroJunior, 3R-491E-HP
Top and bottom faces parallel-ground to within 0.002 mm.
NOTE: The electrode is installed with screw and adhesive assembly, or alternatively brazing.
• Adapted for automatic changing
• Supplied in sets of 30.

Manual chuck adapter 90°, Junior-Junior, 3R-467.9-1
For horizontal mounting of MacroJunior holders. Screw locking.
Note: For EDM machining only.
• Fixed index positions 3x120°
• Weight 0.6 kg.

Holder with journal, 3R-461.1E-GA
Journal Ø10x10 mm. Intended mainly for graphite electrodes. To be mounted on 3R-491E with three MFT4x12 screws and adhesive.
• Supplied in sets of 30.

Plate 5.5 mm, 3R-SP19270
Used in combination with 3R-491E when electrode blanks are mounted with adhesive and screws*. Permits mounting in MacroCombi chucks.
• Supplied in sets of 30
• *Accessory 3R-PI4.5x25E.

Plate 10 mm, 3R-SP19269
Used in combination with 3R-491E when soldering round (<50 mm) or square (<40 mm) copper blanks. Permits mounting in MacroCombi chucks.
• Supplied in sets of 30
• Accessory 3R-MFT4x16E.

Except 3R-SP19269
**MacroJunior – Holders**

**Holder 25 mm, MacroJunior, 3R-461-8.8-HP**
Upper and lower faces ground parallel within 0.002 mm. Locating pin Ø8.8 mm (Ø0.05 mm).
- Not intended for automatic changing
- Supplied singly.

**Holder with taper, 3R-465.1E-A**
The taper is machined suitably for attaching very small electrodes. To be mounted on 3R-491E with three screws MFT4x12.
- Supplied in sets of 30.

**Collet chucks, MacroJunior**

**3R-469-10**
- For collets ETS10
- Electrode sizes 0.1-2 mm
- Building-in height 47 mm
- Weight 0.1 kg.

**3R-469-16**
- For collets ER16
- Electrode sizes 0.5-10 mm
- Building-in height 59.5 mm
- Weight 0.2 kg.

**Holder, MacroJunior, 3R-465-VE**
For small electrodes Ø1-4 mm, maximum height 30 mm.
- Supplied in sets of 5.

**Holder, MacroJunior, 3R-465-LE**
For round electrodes Ø4-8 mm or square 8x18 mm, and with maximum height 30 mm.
- Supplied in sets of 5.
3Ready-to-Run, 3R-494-XXX
Blanks mounted on MacroJunior holders for the manufacture of electrodes. The stock range is matched to local preferences and ways of working. This applies to electrode materials, different grades of graphite and copper, and to dimensions. Contact your local 3R representative for further information.
The Vällingby factory can supply holders with factory-mounted copper blanks in sets of ten, as shown in the table.

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<thead>
<tr>
<th>Article number</th>
<th>Dimensions</th>
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</thead>
<tbody>
<tr>
<td>3R-494-D10x50</td>
<td>Round blank Ø10x50 mm</td>
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<tr>
<td>3R-494-D12x50</td>
<td>Round blank Ø12x50 mm</td>
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<tr>
<td>3R-494-D16x50</td>
<td>Round blank Ø16x50 mm</td>
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<td>3R-494-D22x50</td>
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<td>3R-494-D26x50</td>
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<tr>
<td>3R-494-D32x50</td>
<td>Round blank Ø32x50 mm</td>
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<tr>
<td>3R-494-D40x50</td>
<td>Round blank Ø40x50 mm</td>
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<tr>
<td>3R-494-D50x50</td>
<td>Round blank Ø50x50 mm</td>
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<tr>
<td>3R-494-S12x50</td>
<td>Square blank 12x12x50 mm</td>
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<tr>
<td>3R-494-S22x50</td>
<td>Square blank 22x22x50 mm</td>
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<tr>
<td>3R-494-S26x50</td>
<td>Square blank 26x26x50 mm</td>
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<tr>
<td>3R-494-S32x50</td>
<td>Square blank 32x32x50 mm</td>
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<tr>
<td>3R-494-S40x50</td>
<td>Square blank 40x40x50 mm</td>
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<tr>
<td>3R-494-32x22x50</td>
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<tr>
<td>3R-494-40x22x50</td>
<td>Square blank 40x22x50 mm</td>
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</table>

Drawbar, 3R-405.11E
Drawbar Ø15 mm to mount MacroJunior holders in chucks 3R-400.XX and 3R-460.XX.
- Supplied in sets of 10.

Check ruler, 3R-406.11
For setting angular positions and for centring.
- Measuring length 60 mm.

Check mandrel, 3R-406.23
Check mandrel with ground C-reference.
- Measuring length 50 mm
- Weight 0.6 kg.

Drawbar, 3R-405.16E
Drawbar Ø15 mm to mount Macro holders in chucks 3R-460-XX.
- Supplied in sets of 10.

Fixed measuring probes

3R-US400.3
For machines with measurement cycle function.
- Measuring ball Ø3 mm
- Overall length 102 mm
- Weight 0.3 kg.

3R-US400.5
For machines with measurement cycle function.
- Measuring ball Ø5 mm
- Overall length 103 mm
- Weight 0.3 kg.
MacroJunior & MacroCombi – Accessories

**TORX screwdriver, 3R-333-T20**
For screws 3R-PI4.5x20E and 3R-PI4.5x25E.

**Soldering kit, 3R-404-25**
For soldering electrode blanks on 3R-491E or 3R-SP19269.
- Supplied with flux.
- Supplied in sets of 100.

**Cassette insert, 3R-650/8-JR**
For storing MacroJunior holders in 3R-650/8x5 and 3R-150/5.
- Supplied in sets of 8.

**Torque wrench, 3R-614-04**
For manual MacroJunior and MacroCombi chucks. Also for 3Refix mandrels Ø10 mm, 3R-901-10E.
- 4 Nm.

**TORX screws M4, 3R-MFT4x12E**
For mounting electrode blanks.
- Length 12 mm
- Supplied in sets of 100, including a TORX screwdriver.

**Self tapping TORX-screws, 3R-PI4.5x20E**
For mounting electrode blanks.
- Length 20 mm
- Supplied in sets of 100.

**Self tapping TORX-screws, 3R-PI4.5x25E**
For mounting electrode blanks.
- Length 25 mm
- Supplied in sets of 100.
MacroJunior & MacroCombi – Kit & accessories

User kit, 3R-468.31-S

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>3R-405.11</td>
<td>Drawbar, MacroJunior</td>
<td>x5</td>
</tr>
<tr>
<td>3R-405.16</td>
<td>Drawbar, Macro</td>
<td>x5</td>
</tr>
<tr>
<td>3R-460.31-S</td>
<td>Manual table chuck</td>
<td>x1</td>
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<tr>
<td>3R-465-L</td>
<td>Holder, MacroJunior</td>
<td>x2</td>
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<tr>
<td>3R-465-V</td>
<td>Holder, MacroJunior</td>
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<td>3R-491</td>
<td>Holder, MacroJunior</td>
<td>x30</td>
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<tr>
<td>3R-651.7-S</td>
<td>Pallet Macro 54x54 mm</td>
<td>x6</td>
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<tr>
<td>3R-656.1</td>
<td>Check ruler</td>
<td>x1</td>
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<tr>
<td>3R-658.1-S</td>
<td>Intermediate plate, Macro 54x54 mm</td>
<td>x2</td>
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<tr>
<td>3R-658.2-S</td>
<td>Holder, Macro 54x54 mm</td>
<td>x2</td>
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<tr>
<td>3R-658.4-S</td>
<td>Holder, Macro 54x54 mm</td>
<td>x2</td>
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<tr>
<td>3R-333-T20</td>
<td>Screwdriver, TORX</td>
<td>x1</td>
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<tr>
<td>3R-P14.5x20</td>
<td>TORX screw</td>
<td>x100</td>
</tr>
<tr>
<td>3R-614-04</td>
<td>Torque wrench, 4 Nm</td>
<td>x1</td>
</tr>
</tbody>
</table>

Microscope, 3R-4.450

- Centering location
- Magnification x25
- Field of view Ø4 mm
- Weight 0.6 kg.

Splash guard, 90027.02

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

Ring with code carrier, 3R-863.25-10

With pre-programmed unique identity, designed for MacroJunior 25 mm, 3R-491E.
- Supplied in sets of 10.

Ring with code carrier, 3R-863.30-10

With pre-programmed unique identity, designed for 3Ready-to-Run, 3R-494-XX.XX.
- Supplied in sets of 10.
MacroJunior & MacroCombi – Accessories

**Lathe taper, 3R-TXXXX**
Taper attachment for mounting chucks in taper spindles. Note: Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted. Use the order form at the end of the catalogue.

**Angle shelf, 3R-A21944**
For vertical or horizontal mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on the machine table. Intended for milling. Note: Chuck to be ordered separately.

**Adapter plate, 3R-A19724**
For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on machine table. Supplied with fixing screws for chuck and table.

**Air unit, 3R-611.46**
Unit for operation of pneumatic chucks. Three positions – open/neutral/closed.
Macro if you want to compete in the global manufacturing industry, you need to study every aspect of efficiency. It’s a matter of extracting the highest possible number of spindle-hours from each machine, every day of the week. And here, the importance of a high-class reference system can never be over-estimated. A reference system which reduces setup times to a few minutes.

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

Among users worldwide, 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

<table>
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<tr>
<th>Chucks</th>
<th>Article number</th>
<th>Drawbar</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Std</td>
<td>3R-600.24-S</td>
<td>3R-605.2</td>
<td>ground rear face</td>
</tr>
<tr>
<td>Manual Std</td>
<td>3R-600.23-S</td>
<td>3R-605.2</td>
<td>ground rear face</td>
</tr>
<tr>
<td>Pneumatic Std</td>
<td>3R-600.84-30</td>
<td>3R-605.1</td>
<td>machine-adapted</td>
</tr>
<tr>
<td>Pneumatic Std</td>
<td>3R-600.86-30</td>
<td>3R-605.1</td>
<td>machine-adapted</td>
</tr>
<tr>
<td>Pneumatic Std</td>
<td>3R-600.EX8</td>
<td>3R-605.1</td>
<td>machine-adapted</td>
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</table>

<table>
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<th>Article number</th>
<th>Drawbar</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Std</td>
<td>3R-600.23-S</td>
<td>3R-605.2</td>
<td>Mounting flange, 6 Nm, Ø75 mm</td>
</tr>
<tr>
<td>Manual Std</td>
<td>3R-600.24-S</td>
<td>3R-605.2</td>
<td>Ground back face, 6 Nm, Ø75 mm</td>
</tr>
<tr>
<td>Pneumatic HP</td>
<td>3R-600.15-3</td>
<td>3R-605.2</td>
<td>Rust-resistant, Ø 56 mm</td>
</tr>
<tr>
<td>Manual HP</td>
<td>3R-600.24-4RS</td>
<td>3R-605.2</td>
<td>Rust-resistant, Ø 70 mm</td>
</tr>
<tr>
<td>Manual HP</td>
<td>3R-600.24RS</td>
<td>3R-605.1/3R-605.4</td>
<td>Rust-resistant, Ø75 mm</td>
</tr>
<tr>
<td>Pneumatic Std</td>
<td>90412.1X</td>
<td>3R-605.1/3R-605.4</td>
<td>with swivel, low speed</td>
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<tr>
<td>Pneumatic HP</td>
<td>90412.2X</td>
<td>3R-605.1/3R-605.4</td>
<td>with swivel, low speed</td>
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<td>Pneumatic Std</td>
<td>3R-SP24440</td>
<td>3R-605.1/3R-605.4</td>
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<tr>
<td>Pneumatic HP</td>
<td>3R-SP26771-RS</td>
<td>3R-605.1/3R-605.4</td>
<td>rust-resistant</td>
</tr>
</tbody>
</table>
Macro – Chucks

**Manual chuck, MacroStd, 3R-600.23-S**
Cast chuck with mounting flange for mounting on the machine spindle or in a fixture.
- Tightening torque 6 Nm
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg.

**Manual chuck, MacroStd, 3R-600.24-S**
Cast chuck with ground back face for mounting on the machine spindle with 3R-A11489 or in a fixture on the machine table.
- Tightening torque 6 Nm
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 0.7 kg.

**Manual chuck, MacroStd, 3R-600.28-S**
Cast chuck with ground back face for mounting on the machine spindle. Also suitable in a fixture on the machine table or with adapterplate 3R-A26488.
- Tightening torque 6 Nm
- Required drawbar 3R-605.2RS
- Clamping force 6000 N
- Fixed index positions 4x90°
- Rust resistant
- Weight 1.1 kg.

**Manual chuck, MacroHP, 3R-600.24-4RS**
Chuck for Macro holder. Mounts on a suitable fixture.
- Required drawbar 3R-605.2RS
- Fixed index positions 4x90º
- Grinded front edge
- Tightening torque 6 Nm
- Rust resistant
- Weight 1 kg.

**Manual chuck, MacroHP, 3R-600.24RS**
Manual chuck designed for permanent mounting.
- Tightening torque 6 Nm
- Required drawbar 3R-605.2RS
- Fixed index positions 4x90º
- Rust resistant
- Weight 0.7 kg.

**Manual chuck (low profile), MacroStd, 3R-600.28-S**
Cast chuck with ground back face for mounting on the machine spindle. Also suitable in a fixture on the machine table or with adapterplate 3R-A26488.
- Tightening torque 6 Nm
- Required drawbar 3R-605.2
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.1 kg.
**Macro – Chucks**

**Pneumatic chuck, MacroHP, 3R-600.15-3**
Pneumatic chuck for permanent mounting on the machine table.
- Drawbar 3R-605.2RS included
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Rust resistant
- Weight 0.8 kg.

**Pneumatic chuck, MacroHP, 90412.2X**
Pneumatic built-in chuck with swivel in the back.
- For high RPM
- Machine adapted.

**Pneumatic chuck, MacroHP, 3R-SP26771-RS**
Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.
- Carbide XY-references
- 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
- Rust-resistant
- Weight 1.8 kg.

**Pneumatic chuck, MacroStd, 3R-605.15-3**
Pneumatic chuck for building-in, for example in a fixture, dividing head or B-axis.
- Drawbar 3R-605.2RS included
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Turbo locking
- Rust resistant
- Weight 0.8 kg.

**Pneumatic chuck, MacroStd, 3R-SP24460**
Pneumatic added-on chuck with swivel surrounding unit.
- For low RPM
- Machine adapted.

**Pneumatic chuck, MacroStd, 90412.1X**
Pneumatic added-on chuck with swivel surrounding unit.
- 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.
Macro – Chucks

Pneumatic chuck, MacroHP, 3R-600.84-3
Pneumatic chuck for permanent mounting on the machine spindle.
- Four M6 clearance holes, Ø 45 mm
- Required drawbar 3R-605.1
- Required air pressure 6±1 bar.
- Fixed index positions 4x90°.
- Air-blast cleaning of Z-references.
- Flushing connection
- Turbo locking.
- Carbide XY-References
- Weight 4 kg.

Machine-adapted pneumatic chuck, MacroStd, 3R-600.84-30
Pneumatic chuck for mounting directly on the machine spindle.
Note: X/Y/Z references of hardened and ground steel, larger Z-references. Note: When ordering state machine make and type.
- Four M6 clearance holes, Ø 45 mm
- Required drawbar 3R-605.1
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 2.7 kg.
Macro – Chucks

**Pneumatic chuck, MacroHP, 3R-600.86-3**
Pneumatic chuck for permanent mounting on the machine spindle.

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

**Machine-adapted pneumatic chuck, MacroStd, 3R-600.86-30**
Pneumatic chuck for mounting directly on the machine spindle.

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

- Four M6 clearance holes, 67x20 mm and four M5 clearance holes, 63x26 mm
- Required drawbar 3R-605.1
- Required air pressure ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Flushing connection
- Turbo locking
- Weight 2.2 kg.

**Machine-adapted pneumatic chuck, MacroStd, 3R-600.EX8**
Pneumatic chuck for mounting directly on the machine spindle.

Note: When ordering state machine make and type. Note: X/Y/Z references in hardened and ground steel.

- Six M6 clearance holes, Ø 41 mm.
- Required drawbar 3R-605.1
- Required air pressure ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Flushing connection
- Weight 2.2 kg.
Macro – Chucks

<table>
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<tr>
<th>Lathe chucks</th>
<th>Article number</th>
<th>Drawbar</th>
<th>Feature</th>
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<td>3R-600.22</td>
<td>3R-605.2</td>
<td>Mounting flange</td>
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<td>Manual HP</td>
<td>3R-600.20</td>
<td>3R-605.1 / 3R-605.4</td>
<td>Carbide references, 4 Nm</td>
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<tr>
<td>Pneumatic Std</td>
<td>3R-600.1-30</td>
<td>3R-605.1 / 3R-605.4</td>
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<tbody>
<tr>
<td>Manual Std</td>
<td>3R-610.21-S</td>
<td>3R-605.2</td>
<td>horizontal and vertical, 6 Nm</td>
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<td>3R-605.2</td>
<td>vibration-damped, 6 Nm, Ø75 mm</td>
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<td>3R-605.10</td>
<td>rust-resistant</td>
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</tbody>
</table>
Macro – Chucks

Manual lathe chuck, MacroStd, 3R-600.22
With setting screws for centring.
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Weight 2.1 kg.

Pneumatic chuck, MacroStd, 3R-600.1-30
Pneumatic chuck for permanent mounting on the machine spindle or onto the machine table.
- Required drawbar 3R-605.1
- Fixed index positions 4x90°
- Turbo locking
- Weight 4 kg.

Manual chuck, MacroStd, 3R-610.21-S
Two ground faces for vertical or horizontal mounting on the machine table.
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Flushing duct
- Weight 3.5 kg

90842
- Required drawbar 3R-605.1, otherwise as 3R-610.21-S.

Manual chuck, MacroHP, 3R-600.20
For mounting on the machine spindle with 3R-A3620 or on a lathe taper with centring ring 3R-612.6.
- Required drawbar 3R-605.1 or 3R-605.4
- Fixed index positions 4x90°
- Tightening torque 4 Nm
- Carbide references
- Weight 3.6 kg.

Manual lathe chuck, MacroStd, 3R-600.22
With setting screws for centring.
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Fixed index positions 4x90°
- Weight 2.1 kg.

Manual chuck, MacroHP, 3R-600.15-3
Pneumatic chuck for permanent mounting on the machine table.
- Drawbar 3R-605.2RS included
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Rust resistant
- Weight 0.8 kg.

Except 90842
**Macro – Chucks**

---

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

Pneumatic chuck for permanent mounting on the machine table.
- Required drawbar 3R-605.10
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Weight 1 kg.

---

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

Pneumatic chuck for permanent mounting on the machine table.
- Required drawbar 3R-605.10
- Clamping force 6000 N
- Fixed index positions 4x90°
- Air-blast cleaning of Z-references
- Rust resistant
- Weight 1 kg.

---

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

Pneumatic chuck for permanent mounting on the machine table.
- Required drawbar 3R-605.2
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Weight 2 kg.

---

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

For vertical or horizontal mounting on the machine table.
- Required drawbar 3R-605.2
- Fixed index positions 24x15°
- Vernier scale
- Weight 5.5 kg.

---

**Pneumatic table 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.

---

**Pneumatic table chuck, VDP, 90716.09**

Pneumatic vibration-damped chuck.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg.
Macro – Chucks

Pneumatic chuck, MacroHP, 3R-600.10-3
Pneumatic chuck locked/opened with air gun.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Weight 4.4 kg.

Pneumatic table chuck, MacroStd, 3R-600.10-30
Pneumatic chuck locked/opened with air gun.
- Required drawbar 3R-605.1 or 3R-605.4
- All references of hardened and ground steel
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 4.4 kg.

Pneumatic chuck, MacroHP, 3R-600.10-3RS
Pneumatic chuck locked/opened with air gun.
- Required drawbar 3R-605.1RS
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Carbide XY-References
- Turbo locking
- Rust resistant
- Weight 4.4 kg.

Pneumatic table chuck, VDP, 3R-600.1-30V
Pneumatic vibration-damped chuck.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 6 kg.

Manual table chuck, VDP, 3R-600.24-V
Manual vibration-damped chuck, Ø170 mm.
- Required drawbar 3R-605.2
- Tightening torque 6 Nm
- Building-in height 85 mm.
- Centre spacing 63 to 100 mm
- Weight 6 kg.
Macro – Chuck adapters

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<th>Drawbar Feature</th>
<th>Feature</th>
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<td>Manual</td>
<td>3R-652.9</td>
<td>3R-605.2</td>
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<tr>
<td>Manual</td>
<td>3R-653-S</td>
<td>3R-405.11</td>
<td>90°. Locking screw with M6 drawpin</td>
</tr>
<tr>
<td>Manual</td>
<td>3R-446.11</td>
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<tr>
<td>Manual</td>
<td>3R-466.4033</td>
<td>–</td>
<td>Macro-Junior, locking screw</td>
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<tr>
<td>Manual</td>
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<td>Macro-Junior, locking screw</td>
</tr>
<tr>
<td>Manual</td>
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<tr>
<td>Manual</td>
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<td>Macro-Junior 100 mm, locking screw</td>
</tr>
<tr>
<td>Manual</td>
<td>3R-466.15033</td>
<td>–</td>
<td>Macro-Junior 150 mm, locking screw</td>
</tr>
<tr>
<td>Manual</td>
<td>3R-653</td>
<td>–</td>
<td>Macro-Junior, locking screw</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90356.22</td>
<td>3R-405.1 / 3R-405.4</td>
<td>Dynafix</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90793</td>
<td>3R-405.1 / 3R-405.4</td>
<td>MacroMagnum</td>
</tr>
<tr>
<td>Manual</td>
<td>90964</td>
<td>3R-605.2</td>
<td>MacroMagnum</td>
</tr>
</tbody>
</table>

Manual chuck adapter, Macro-Macro, 3R-652.2

Distance adapter to extend the mache spindle. Mechanical clamping from the side.
- Solid X & Y-references
- Height 100 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Required drawbar 3R-605.2
- Weight 4.5 kg.

Manual chuck adapter, Macro-Macro, 90476.01

Distance adapter to extend the mache spindle. Mechanical clamping from the side.
- Solid X & Y-references
- Height 200 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Required drawbar 3R-605.2
- Weight 8 kg.
Macro – Chuck adapters

Manual chuck adapter, Macro-Macro, 90476.02
Distance adapter to extend the mache spindle. Mechanical clamping from the side.
- Solid X & Y-references
- Height 250 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Required drawbar 3R-605.2
- Weight 1.9 kg.

Manual chuck adapter 90°, Macro-Macro, 3R-652.9
For horizontal mounting of Macro holders. Supplied with drawbar for screw locking.
- Rust-resistant
- Weight 2.4 kg.

Manual chuck adapter 90°, Macro-Mini, 3R-603.9
For horizontal mounting of Mini holders in the Macro system.
- Rust-resistant
- Flushing connection
- Weight 1.9 kg.

Manual chuck adapter, Macro-Mini, 3R-653-S
For mounting Mini holders in the Macro system.
- MacroStandard coupling
- Can be changed automatically
- Weight 1.3 kg.

Manual chuck adapter, Macro-Macro, 90476.02
Distance adapter to extend the mache spindle. Mechanical clamping from the side.
- Solid X & Y-references
- Height 250 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Required drawbar 3R-605.2
- Weight 1.9 kg.

Macro – Chuck adapters

Manual chuck adapter, Macro-Macro, 90476.02
Distance adapter to extend the mache spindle. Mechanical clamping from the side.
- Solid X & Y-references
- Height 250 mm
- Adapted for automatic changing
- Flushing duct
- Recommended clamping torque 6 Nm
- Permissible torque: 135 Nm
- Required drawbar 3R-605.2
- Weight 1.9 kg.

Manual chuck adapter 90°, Macro-Macro, 3R-652.9
For horizontal mounting of Macro holders. Supplied with drawbar for screw locking.
- Rust-resistant
- Weight 2.4 kg.

Manual chuck adapter 90°, Macro-Mini, 3R-603.9
For horizontal mounting of Mini holders in the Macro system.
- Rust-resistant
- Flushing connection
- Weight 1.9 kg.

Manual chuck adapter, Macro-Mini, 3R-653-S
For mounting Mini holders in the Macro system.
- MacroStandard coupling
- Can be changed automatically
- Weight 1.3 kg.

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.
Macro – Chuck adapters

Manual chuck adapter, Macro-MacroJunior, 3R-446.11
For mounting in the Macro system. Side locking of the MacroJunior holder. Duct for flushing through the electrode.
- Precision-cast Macro reference element
- Adapted for automatic changing
- Required drawbar 3R-405.11
- Fixed index positions 3x120°
- Weight 4.5 kg.

Pneumatic chuck adapter, MacroMagnum-Macro, 3R-682.600-A
Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-680.10-2A.
- Weight 4.5 kg.

Manual chuck adapter 90°, Macro-MacroJunior, 3R-406.9
For horizontal mounting of MacroJunior holders in the Macro system. Screw locking.
- Adapted for automatic changing
- Rust-resistant
- Fixed index positions 3x120°
- Weight 2.4 kg.

Manual chuck adapters, Macro-MacroJunior
For mounting in the Macro system. Axial locking screw with channel for flushing through the electrode.
3R-466.4033
- Precision-cast Macro reference element
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1.1 kg.

3R-466.4033-S
Note: For EDM machining only.
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 1 kg.
Macro – Chuck adapters & Rotating spindles

**Manual chuck adapters, Macro-MacroJunior**
For mounting in the Macro system. Axial locking screw with channel for flushing through the electrode. Note: For EDM machining only.

3R-466.10033
- Adapted for automatic changing
- Height 100 mm
- Fixed index positions 3x120°
- Weight 0.8 kg.

**Manual chuck adapter, Macro-GPS 70, C 188 550**
Adaption of Macro on GPS 70.
- Built-up height 45.5 mm
- Tightening torque 2.8 Nm
- Required drawbar N 901 800
- Weight 1 kg.

**Manual chuck adapter, GPS 70-Macro, C 188 560**
Adaption of GPS 70 on Macro.
- Built-up height 60 mm
- Required drawbar 3R-605.2
- Weight 1.9 kg.

**3R-6-600-VS**
- Fixed index positions 3x120°
- Weight 1 kg.

**3R-6-600-VHS**
- Fixed index positions 3x120°
- Weight 1 kg.

**3R-6-300-EHS16**
- Collets, ER-16, rust-resistant

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**Rotating spindles**

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<tr>
<th>Article number</th>
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<th>Feature</th>
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</thead>
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<td>–</td>
<td>collets</td>
</tr>
<tr>
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<td>3R-605.2</td>
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</tr>
<tr>
<td>Vertical and horizontal standard 3R-6-600-VHS</td>
<td>3R-605.2</td>
<td>rust-resistant</td>
</tr>
<tr>
<td>Vertical standard 3R-6-300-EHS16</td>
<td>–</td>
<td>collets, ER-16, rust-resistant</td>
</tr>
</tbody>
</table>
Rotating spindles
For mounting in a Macro chuck. Flushing via flushing connection.
- Control unit included
- Required drawbar 3R-605.2, but 3R-605.2RS in wire EDM machines
- Rust-resistant
- Immersible
- Maximum electrode weight 5 kg
- Maximal flushing pressure through the chuck: 40 bar
- Weight 9.5 kg.

3R-6.600-VS
For vertical mounting in EDM machines.
- Speed range 60-2000 rev/min.

3R-6.600-VHS
For vertical mounting in die-sinking EDM machines and horizontal mounting in wire EDM machines.
- Speed range 60-1500 rev/min.

Rotating spindles, 3R-6.300-EHS16
For clamping in a vertical Macro chuck. Flushing via flushing connection.
- Control unit included
- Drawbar depends on chosen chuck
- Rust-resistant
- Immersible
- Speed range 60-2000 rev/min
- Maximum flushing pressure 80 bar
- Weight 10 kg.

Recommended collet sets

<table>
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<tr>
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<th>Collet set</th>
<th>Size (mm)</th>
<th>Nut M19x1</th>
</tr>
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<tbody>
<tr>
<td>Balzer</td>
<td>EHS16</td>
<td>Ø0.09-3</td>
<td>Integral</td>
</tr>
<tr>
<td>Regofix</td>
<td>ER16, ER16-UP</td>
<td>Ø0.5-10</td>
<td>ERM16, ERMC16, ER16 MS</td>
</tr>
<tr>
<td>Tecnopinz</td>
<td>ETS16</td>
<td>Ø1.25-10</td>
<td>ETS16,2</td>
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Macro – Pallets, holders & reference elements

<table>
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<tr>
<td>Hardened reference element 12.5 mm, Std</td>
<td>3R-651.7E-XS</td>
<td></td>
</tr>
<tr>
<td>Hardened reference element 12.5 mm, Std</td>
<td>3R-651.7E-S</td>
<td>surface-treated</td>
</tr>
<tr>
<td>Hardened pallet 30 mm, HP</td>
<td>3R-651.3</td>
<td>52x52 mm / 3Refix Ø10, rust-resistant</td>
</tr>
<tr>
<td>Hardened pallet 30 mm, HP</td>
<td>3R-651E-P</td>
<td>rust-resistant</td>
</tr>
<tr>
<td>Unhardened pallet 14.4 mm</td>
<td>3R-658.31E</td>
<td></td>
</tr>
<tr>
<td>Hardened holder, HP</td>
<td>3R-651.13</td>
<td>&lt;30x30 mm</td>
</tr>
<tr>
<td>Unhardened holder</td>
<td>3R-658.4E-S</td>
<td>&lt;30x30 mm</td>
</tr>
<tr>
<td>Unhardened holder</td>
<td>3R-658.2E-S</td>
<td>&lt;30 mm</td>
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<tr>
<td>Spacer plate, Std and HP</td>
<td>3R-658.1E-S</td>
<td></td>
</tr>
<tr>
<td>Collet chuck ER16, HP</td>
<td>3R-659.16-P</td>
<td>Ø0.5-10 mm, rust-resistant</td>
</tr>
<tr>
<td>Collet chuck ER20, HP</td>
<td>3R-659.20-P</td>
<td>Ø1-13 mm, rust-resistant</td>
</tr>
<tr>
<td>Collet chuck ER32, HP</td>
<td>3R-659.32-P</td>
<td>Ø2-20 mm, rust-resistant</td>
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<tr>
<td>Three-jaw chuck</td>
<td>3R-US611.4</td>
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</tbody>
</table>
Macro – Pallets, holders & spacers

### Pallets and ref. elements, 70x70 mm

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<tr>
<th>Feature</th>
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<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardened reference element 12.5 mm, HP</td>
<td>3R-601.7E-P</td>
<td>rust-resistant</td>
</tr>
<tr>
<td>Hardened pallet 30 mm, HP</td>
<td>3R-601.1E-P</td>
<td>rust-resistant</td>
</tr>
<tr>
<td>Hardened pallet 30 mm, HP</td>
<td>3R-601.3</td>
<td>rust-resistant, 3Refix Ø10</td>
</tr>
<tr>
<td>Unhardened pallet 14.2 mm</td>
<td>3R-608.31E</td>
<td>3Refix Ø10</td>
</tr>
<tr>
<td>Unhardened pallet, HP</td>
<td>3R-651.70-P</td>
<td>reference element 54x54 mm</td>
</tr>
<tr>
<td>Unhardened pallet, Std</td>
<td>3R-651.70-XS</td>
<td>reference element 54x54 mm</td>
</tr>
</tbody>
</table>

### Ref.element, Ø75 mm

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<tr>
<td>Hardened reference element 12.5 mm standard and HP</td>
<td>3R-651.75E-P</td>
<td>rust-resistant</td>
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</tbody>
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### Pallets, Ø116 mm

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<tr>
<th>Feature</th>
<th>Article number</th>
<th>Feature</th>
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<tr>
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<td>3R-601.52</td>
<td>3Refix Ø10 mm, rust-resistant</td>
</tr>
<tr>
<td>Unhardened pallet, HP</td>
<td>3R-601.116-75PA</td>
<td>With reference element Ø75 mm</td>
</tr>
<tr>
<td>Unhardened pallet</td>
<td>3R-608.51E</td>
<td>3Refix Ø10 mm</td>
</tr>
</tbody>
</table>
Macro – Pallets & holders

Pallet, Ø116 mm, 3R-601.116-75PA
Unhardened palett with reference element 3R-651.75-P.
- X, Y & Z-references hardened
- Ready for code carrier
- Ready for automation.

Accessories:
Sealing ring, High, 3R-612.116-A
Suitable for some Macro chucks with drawbar 3R-605.1*.
Sealing ring, Low, 3R-612.116-S
Suitable for some Macro chucks with drawbar 3R-605.2*.

*For more info please ask System 3R.

Pallet, 70x70 mm, 3R-651.70-P
Unhardened palett with reference element 3R-651.7-P.
- Ready for code carrier
- Ready for automation
- Weight 1 kg.

Pallet, 70x70 mm, 3R-651.70-XS
Unhardened palett with reference element 3R-651.7-XS.
- X, Y & Z-references hardened
- Ready for code carrier
- Ready for automation
- Weight 1 kg.

Accessories:
Sealing ring, High, 3R-612.54-A
Suitable for some Macro chucks with drawbar 3R-605.1*.
Sealing ring, Low, 3R-612.54-S
Suitable for some Macro chucks with drawbar 3R-605.2*.

*For more info please ask System 3R.

Pallet, Ø75 mm, 3R-651.75E-P
Hardened and milled with clearance holes for eight fixing screws.
- Fixed index positions 4x90°
- Parallel-ground top and bottom faces
- Adapted for automatic changing
- Rust resistant
- Supplied in sets of 10 pcs.
- Weight per set 2.7 kg.

Holder, 54x54 mm, 3R-658.2E-S
Unhardened holder for flat electrodes with maximum width 30 mm. To be mounted on 3R-651.7E-S or 3R-651.7E-XS.
- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.5 kg.

For more info please ask System 3R.
Macro – Pallets, holders & spacers

**Spacer plate, 54x54 mm, 3R-658.1E-S**
For graphite electrodes or copper electrodes/workpieces with a rough mounting surface. To be mounted on 3R-651.7E-S, 3R-651.7E-XS or 3R-651.7E-P.
- Ready for code carrier
- Supplied in sets of 8
- Weight per set 2.5 kg.

**Holder, 54x54 mm, 3R-658.4E-S**
Unhardened holder for square or round electrodes, max 30 mm. To be mounted on 3R-651.7E-S, 3R-651.7E-XS or 3R-651.7E-P.
- Ready for code carrier
- Flushing duct
- Supplied in sets of 8
- Weight per set 5.5 kg.

**Pallet 54x54 mm, MacroStd**
Hardened pallet for copper electrodes and workpieces.
Note: Must be mounted on the copper blank/workpiece before it is locked in a chuck.
Note: For graphite electrodes, spacer plate 3R-658.1E-S is required.

**3R-651.7E-S**
- Nickel-plated side faces
- Adapted for automatic changing
- Supplied in sets of 8
- Weight per set 1.3 kg.

**3R-651.7E-XS**
- Untreated side faces
- Adapted for automatic changing
- Supplied in sets of 8
- Weight per set 1.3 kg.

**Pallet, 54x54 mm, MacroHP, 3R-651.7E-P**
Hardened and precision-cast, with clearance holes for four fixing screws.
Note: Must be mounted on the workpiece/fixture before it is locked in a chuck.
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of 8
- Weight per set 1.3 kg.
Macro — Pallets & holders

**Pallet, 54x54 mm, MacroHP, 3R-651E-P**
Hardened, with clearance holes for four fixing screws.
- Adapted for automatic changing
- Ready for code carrier
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Supplied in sets of 8
- Weight per set 3.4 kg.

**Pallet, 52x52 mm, MacroHP, 3R-651.3**
Hardened, with 3Refix holes, flushing connection and clearance holes for two fixing screws.
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Weight 0.5 kg.

**Pallet, 52x52 mm, 3R-658.31E**
Unhardened with 3Refix holes and two M5 threads. Designed to be mounted on 3R-651.3.
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Weight 0.5 kg.

**Holder, MacroHP, 3R-651.13**
Hardened holder for square electrodes max 30 mm.
- Max. workpiece 32x28 mm
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.2 kg.

**Three-jaw chuck, 3R-US611.4**
For 0-3 mm electrodes.
- Weight 0.8 kg.
Macro – Pallets & holders

Collet chucks, MacroHP

3R-659.16-P
- For collets ER16
- Electrode size 0.5–10 mm
- Flushing duct
- Building-in height 62 mm
- Weight 0.8 kg.

3R-659.20-P
- For collets ER20
- Electrode size 1–13 mm
- Flushing duct
- Building-in height 69 mm
- Weight 1.2 kg.

3R-659.32-P
- For collets ER32
- Electrode size 2–20 mm
- Flushing duct
- Building-in height 94 mm
- Weight 1.2 kg.

Gate chuck, 3R-US90-601
Fixed index positions at 0, 30, 45, 60 and 90 degrees. Other angles are set with a sine rule.
- Weight 1.1 kg.

Pallet, 70x70 mm, 3R-608.31E
Unhardened with 3Refix holes and four M6 threads. Designed to be mounted on 3R-601.3 or 3R-601.52.
- 3Refix Ø10 mm
- Building-in height 14.2 mm
- Supplied in sets of 10
- Weight per set 4.4 kg.

Pallet, 70x70 mm, MacroHP, 3R-601.7E-P
Hardened and precision-cast, with clearance holes for four fixing screws.
Note: Must be mounted on the workpiece/fixture before it is locked in a chuck.
- Adapted for automatic changing
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Supplied in sets of 5
- Weight per set 3 kg.
### Pallet, 70x70 mm, MacroHP, 3R-601.1E-P
Hardened, with clearance holes for four fixing screws.
- Adapted for automatic changing
- Ready for code carrier
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Supplied in sets of 5
- Weight per set 3.2 kg.

![Image of Pallet 70x70 mm, MacroHP, 3R-601.1E-P]

### Pallet, 70x70 mm, MacroHP, 3R-601.3
Hardened with 3Refix holes, flushing connection and clearance holes for six fixing screws.
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Parallel-ground top and bottom faces
- Fixed index positions 4x90°
- Rust-resistant
- Flushing duct
- Weight 1 kg.

![Image of Pallet 70x70 mm, MacroHP, 3R-601.3]

### Pallet, Ø116 mm, MacroHP, 3R-601.52
Hardened, with 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.

![Image of Pallet Ø116 mm, MacroHP, 3R-601.52]

### Accessories:

#### Sealing ring, High, 3R-612.116-A
Suitable for some Macro chucks with drawbar 3R-605.1*.

![Image of Sealing ring, High, 3R-612.116-A]

#### Sealing ring, Low, 3R-612.116-S
Suitable for some Macro chucks with drawbar 3R-605.2*.

*For more info please ask System 3R.

### Pallet, Ø116 mm, 3R-608.51E
Unhardened with 3Refix holes and four M6 threads.
- Designed to be mounted on 3R-601.3 or 3R-601.52.
- 3Refix Ø10 mm
- Supplied in sets of 10
- Weight per set 10 kg.

![Image of Pallet Ø116 mm, 3R-608.51E]

### User kit, 3R-628.31-S

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3R-605.1</td>
<td>Drawbar, long</td>
<td>x4</td>
</tr>
<tr>
<td>3R-605.2</td>
<td>Drawbar, short</td>
<td>x2</td>
</tr>
<tr>
<td>3R-610.21-S</td>
<td>Manual table chuck</td>
<td>x1</td>
</tr>
<tr>
<td>3R-651.7-S</td>
<td>Pallet, 54x54 mm</td>
<td>x12</td>
</tr>
<tr>
<td>3R-656.1-S</td>
<td>Check ruler</td>
<td>x1</td>
</tr>
<tr>
<td>3R-658.1-S</td>
<td>Spacer plate 54x54 mm</td>
<td>x2</td>
</tr>
<tr>
<td>3R-658.4-S</td>
<td>Holder 54x54 mm</td>
<td>x4</td>
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<tr>
<td>3R-658.2-S</td>
<td>Holder 54x54 mm</td>
<td>x4</td>
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</table>

![Image of User kit, 3R-628.31-S]
Macro – User kits & accessories

User kit, 3R-628.41-S

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>3R-465.1-A</td>
<td>Holder with MacroJunior taper</td>
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<tr>
<td>3R-461.1-6A</td>
<td>Holder with MacroJunior journal</td>
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<td>3R-466.4033</td>
<td>Chuck adapter Macro/MacroJunior</td>
<td>x1</td>
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<tr>
<td>3R-466.10033</td>
<td>Chuck adapter Macro/MacroJunior</td>
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<tr>
<td>3R-491</td>
<td>Pallet 25 mm MacroJunior</td>
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<td>3R-605.1</td>
<td>Drawbar, long</td>
<td>x4</td>
</tr>
<tr>
<td>3R-605.2</td>
<td>Drawbar, short</td>
<td>x2</td>
</tr>
<tr>
<td>3R-610.21-S</td>
<td>Manual table chuck</td>
<td>x1</td>
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<tr>
<td>3R-651.7-S</td>
<td>Pallet, 54x54 mm</td>
<td>x8</td>
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<td>x2</td>
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<tr>
<td>3R-658.4-S</td>
<td>Holder 54x54 mm</td>
<td>x2</td>
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<tr>
<td>3R-658.2-S</td>
<td>Holder 54x54 mm</td>
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<tr>
<td></td>
<td>Screw MTF4x12</td>
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<td></td>
<td>Screw wrench</td>
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<tr>
<td>3R-605.14E</td>
<td>Ø20x57.1 mm with flushing holes Ø7 mm</td>
<td>Supplied in sets of 10 pcs.</td>
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<tr>
<td>3R-605.1EE</td>
<td>Supplied in sets of 40 pcs.</td>
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<tr>
<td>3R-605.2E</td>
<td>Ø20x36.9 mm with Ø7 mm flushing hole</td>
<td>Supplied in sets of 5 pcs.</td>
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<tr>
<td>3R-605.2EE</td>
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<tr>
<td>3R-605.4E</td>
<td>Ø20x57.1 without flushing hole</td>
<td>Supplied in sets of 10 pcs.</td>
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<td>3R-605.4EE</td>
<td>Supplied in sets of 40 pcs.</td>
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<tr>
<td>3R-605.10</td>
<td>Ø20x13 mm</td>
<td>Supplied 1 pc.</td>
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<tr>
<td>3R-605.10E</td>
<td>Supplied in sets of 10 pcs.</td>
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<tr>
<td>3R-605.10EE</td>
<td>Supplied in sets of 20 pcs.</td>
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</tbody>
</table>

Drawbars

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>3R-605.1E</td>
<td>Ø20x57.1 mm with Ø7 mm flushing holes</td>
</tr>
<tr>
<td></td>
<td>Supplied in sets of 10 pcs.</td>
</tr>
<tr>
<td>3R-605.1EE</td>
<td>Supplied in sets of 40 pcs.</td>
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<tr>
<td>3R-605.2E</td>
<td>Ø20x36.9 mm with Ø7 mm flushing hole</td>
</tr>
<tr>
<td></td>
<td>Supplied in sets of 5 pcs.</td>
</tr>
<tr>
<td>3R-605.2EE</td>
<td>Supplied in sets of 20 pcs.</td>
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<tr>
<td>3R-605.10</td>
<td>Ø20x13 mm</td>
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<tr>
<td></td>
<td>Rust-resistant</td>
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<tr>
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<td>Supplied 1 pc.</td>
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<tr>
<td>3R-605.10E</td>
<td>Supplied in sets of 10 pcs.</td>
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<tr>
<td>3R-605.10EE</td>
<td>Supplied in sets of 20 pcs.</td>
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<tr>
<td>3R-605.4E</td>
<td>For round pallets adapted for automatic changing</td>
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<tr>
<td></td>
<td>Ø20x57.1 without flushing hole</td>
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<tr>
<td></td>
<td>Supplied in sets of 10 pcs.</td>
</tr>
<tr>
<td>3R-605.4EE</td>
<td>Supplied in sets of 40 pcs.</td>
</tr>
</tbody>
</table>
**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 rod, 3R-606**
Check mandrel with ground C-reference for setting Macro chucks.
- Measuring length 110 mm
- Weight 2.3 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-656**
Check mandrel with ground C-reference for setting Macro chucks.
- Measuring length 38 mm
- Weight 1 kg.

**Measuring probes**
Measuring probes with Renishaw measuring head for machines with measurement cycle function.
- Max ball deflection:
  - X-Axis ±10°
  - Y-Axis ±10°
  - Z-Axis ±3 mm.

- **3R-656.31-3P**
  - Building-in height 112 mm
  - Measuring ball Ø3 mm
  - Weight 0.6 kg.

- **3R-656.31-5P**
  - Building-in height 112 mm
  - Measuring ball Ø5 mm
  - Weight 0.6 kg.

**Measuring probe, 3R-656.21-SP03**
Measuring probe with measuring head for machines with measurement cycle function.
- Building-in height 130 mm
- Measuring ball Ø3 mm
- Stiff probe
- Weight 0.8 kg.
## Macro – Accessories

### Microscope, 3R-4.650
With transformer [110/220V] for integral lighting.
- Magnification x25
- Centering location
- Field of view Ø6 mm
- Weight 0.8 kg.

### Indicating spindle, 3R-656.2-P
For measuring centre holes.
- Dial indicator required
- Weight 0.6 kg.

### Centring ring, 3R-612.6
For centring 3R-600.20.

### Splash guard, 3R-RU52L
Rubber guards for pallets 52x52 and 54x54 mm.
- Height 33 mm.

### Splash guard, 3R-RU52
Rubber splash guard for pallets 52x52 and 54x54 mm.
- Height 13 mm.

### Splash guard, 3R-RU70
Rubber splash guard for pallets 70x70 mm.
- Height 13 mm.

### Splash guard, 90027
Splash guard for Macro chucks with long drawbar. Can also be used as a cover for unused chucks.
Note: Does not work with sealing ring 3R-612.116.

### Splash guard, 90027.01
Fits MacroStandard chucks with drawbar 3R-605.2.
Macro – Accessories

**Clamping force meter, 3R-SSP059**
For pneumatic and manual chucks. Suits all chucks from MacroCombi to MacroMagnum.
- Required drawbar 3R-605.1 or similar
- Working range 1-25 kN.
- Weight 5 kg.

**Torque wrenches, 3R-614-04**
Mainly for MacroCombi and Ø10 3Refix mandrels.
- 4 Nm.

**3R-614-06**
For Macro chucks
- 6 Nm.

---

**Air unit, 3R-611.2**
Foot operation of pneumatic chucks.

**Air unit, 3R-611.4**
Unit for operation of pneumatic chucks. Two functions, opened/closed.

**Locking ring key, 3R-605-GE**
To lift the locking ring of the drawbars.
- Supplied in sets of 2.

**Code carriers, 3R-863.01-10**
With pre-programmed unique identity, designed for pallet use.
- Supplied in sets of 10.

---

**Sealing ring, High, 3R-612.70-A**
For reference element 70x70 mm.
Suitable for some Macro chucks*.

**Sealing ring, Low, 3R-612.70-S**
For reference element 70x70 mm.
Suitable for some Macro chucks*.

**Sealing ring, Low, 3R-612.75-S**
For reference element Ø75 mm.
Suitable for some Macro chucks*.

---

*For more info please ask System 3R.
Macro – Accessories

**Adapter plate, 3R-A11489**
For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S.
- Supplied with insulation plate and fixing screws
- Flushing connection.

**Adapter plate, 3R-A3620**
Adapter plate with eight adjusting screws for mounting spindle chucks.
- Supplied with fixing screws
- M10 for 90 mm pitch circle
- M6 for 96 mm pitch circle
- M8 for 100 mm pitch circle.

**Lathe taper, 3R-TXXX**
Taper attachment for mounting chucks in taper spindles.
Note: Manufactured on request. State machine type, taper (1), drawbar thread (2) and which 3R chuck is to be mounted.
Use the order form at the end of the catalogue.

**Angle shelf, 3R-A21944**
For vertical or horizontal mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on the machine table. Intended for milling.
Note: Chuck to be ordered separately.

**Adapter plate, 3R-A19724**
For mounting of 3R-400.34, 3R-460.34 and 3R-600.24-S on machine table.
Note: Chuck to be ordered separately
- Supplied with fixing screws for chuck and table.
Macro – Accessories

Electrode cassette, 3R-650/8x5
For eight electrodes 52x52 and 54x54 mm.
• Supplied in sets of 5.

3Refix mandrel, 3R-901-10E-TX
• 3Refix Ø10 mm
• Recommended tightening torque 4 Nm
• Supplied in sets of 10
• Weight per set 0.2 kg.

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

Adapter plate, 3R-A26488
For mounting 3R-600.28-S.

Converter kit, 90842.01
To convert 3R-600.24-S to enable long drawbar 3R-605.1.
MacroNano

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

Workholding for Nano Precision

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

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

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

<table>
<thead>
<tr>
<th>Width (mm)</th>
<th>Length (mm)</th>
<th>Vertical dist. (mm)</th>
<th>Horizontal dist. (mm)</th>
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<td>l₁ 0.9999</td>
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<td>dₜ₁ 0.5013</td>
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<td>dₜ₁₀ 0.5008</td>
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</tbody>
</table>

Mean values

Overall structure deviation < 0.5 µm
MacroNano – Chucks, pallets & accessories

Pneumatic table chuck, MacroNano, 3R-600.10-3N
Chuck for mounting on the machine table.
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.

Pneumatic chuck, MacroNano, 3R-600.84-3N
Chuck for building-in, for example in a fixture, dividing head or B-axis.
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.

Pneumatic table chuck, MacroNano, 3R-600.86-3N
Chuck for building-in, for example in a fixture, dividing head or B-axis.
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 1.8 kg.

Pneumatic table chuck, MacroNano, 3R-610.46-3N
Chuck for mounting on the machine table with integral air unit. For horizontal and vertical use.
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck – 6±1 bar
- References of cemented carbide
- Required drawbar 3R-605.1
- Air-blast cleaning of Z-references
- Turbo locking
- Weight 4.4 kg.
MacroNano – Pallets & accessories

Pallet 54x54 mm, MacroNano, 3R-651.7E-N
Hardened and precision-cast, with clearance holes for four fixing screws.
- Fixed index positions 4x90°
- Adapted for automatic changing
- Parallel-ground top and bottom face
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 1.2 kg.

Pallet 54x54 mm, MacroNano, 3R-651E-N
Hardened with clearance holes for four fixing screws.
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 8 pcs.
- Weight per set 3.4 kg.

Pallet 70x70 mm, MacroNano, 3R-601.1E-N
Hardened with clearance holes for four fixing screws.
- Fixed index positions 4x90°
- Adapted for automatic changing
- Ready for code carrier
- Rust resistant
- Supplied in sets of 5 pcs.
- Weight per set 3.6 kg.

Pallet dia. 75 mm, MacroNano, 3R-651.75E-N
Hardened and milled with clearance holes for eight fixing screws.
- Fixed index positions 4x90°
- Parallel-ground top and bottom faces
- Adapted for automatic changing
- Rust resistant
- Supplied in sets of 10 pcs.
- Weight per set 2.7 kg.

Drawbar, 3R-605.1E
- Ø20x57.1 mm with flushing holes Ø7 mm.
- Supplied in sets of 10 pcs.

Check mandrel, MacroNano, 3R-606-N
Check mandrel with ground C-reference for setting Macro chucks.
- Measuring length 110 mm.
- Weight 2.3 kg.
MacroNano – Accessories

**Check ruler, MacroNano, 3R-606.1-N**
For setting angular positions and for centring Macro chucks.
- Measuring length 100 mm.
- Weight 1.4 kg.

**Locking ring key, 3R-605-GE**
To lift the locking ring of the drawbars.
- Supplied in sets of 2.

**Air unit, 3R-611.2**
Foot operation of pneumatic chucks.

**Air unit, 3R-611.4**
Unit for operation of pneumatic chucks. Two functions, opened/closed.

**Code carriers, 3R-863.01-10**
With pre-programmed unique identity, designed for use on pallets.
- Supplied in sets of 10.
MacroMagnum

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

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

The difference between a pallet and a reference element
Usually the electrode blank is mounted directly on the pallet, which then carries the blank throughout the manufacturing process – from machine to machine, without subsequent alignment.
The reference elements are primarily intended to be mounted on the fixtures or vices in which the workpiece will be clamped. The reference elements are significantly thinner in order to limit the total construction height.

+ Repetition accuracy – within 0.002 mm
+ Locking force – 16 000 N
+ Fixed index positions 4x90°
+ Required air pressure, pneumatic chuck – 6±1 bar
+ Recommended tightening torque manual chuck – Macro-pallet 4 Nm
+ Recommended tightening torque manual chuck – MacroMagnum-pallet 10 Nm.
<table>
<thead>
<tr>
<th></th>
<th>Article number</th>
<th>Drawbar</th>
<th>Feature</th>
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<tbody>
<tr>
<td><strong>Spindle chucks</strong></td>
<td>Manual</td>
<td>3R-680.24-S</td>
<td>3R-605.2</td>
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<td>Pneumatic</td>
<td>3R-680.1-2</td>
<td>3R-605.1 / 3R-605.4</td>
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<td>3R-605.1 / 3R-605.4</td>
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<td><strong>Table chucks</strong></td>
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<td>3R-680.1-2V</td>
<td>3R-605.1 / 3R-605.4</td>
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<td>90717.10</td>
<td>3R-605.1 / 3R-605.4</td>
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<td>3R-680.10-2A</td>
<td>3R-605.1 / 3R-605.4</td>
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<tr>
<td><strong>Built-in chucks</strong></td>
<td>Pneumatic</td>
<td>90809.03</td>
<td>3R-605.1 / 3R-605.4</td>
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<td>3R-5P26712</td>
<td>3R-605.2</td>
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<td>Pneumatic</td>
<td>90419.XX</td>
<td>3R-605.1 / 3R-605.4</td>
</tr>
</tbody>
</table>
MacroMagnum – Chucks

Manual chuck, Low profile, 3R-680.24-S
For permanent mounting on the machine spindle or table.
Note: Master pallet 3R-606.1 or 3R-686.1-HD is required at installation.
- Required drawbar 3R-605.2.
- Recommended tightening torque:
  Macro pallet 4 Nm
  MacroMagnum pallet 10 Nm
- Fixed index positions 4x90°
- Weight 5 kg.

Manual table 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 table chuck, 3R-680.10-2
Pneumatic table chuck.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo-locking of MacroMagnum pallets
- Weight 12 kg.

Pneumatic table chuck, VDP, 3R-680.1-2V
Pneumatic vibration-damped chuck.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Turbo locking
- Weight 13 kg.
MacroMagnum – Chucks & chuck adapters

Pneumatic chuck, 90809.03
Pneumatic chuck with coarse guiding of the pallet. Intended for permanent building-in.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.

Pneumatic table 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 table chuck, 3R-680.10-3
For permanent mounting on the machine table.
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg.

Pneumatic chuck, 3R-SP26712
For permanent mounting on the machine table.
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.

<table>
<thead>
<tr>
<th>Chuck adapters</th>
<th>Article number</th>
<th>Drawbar</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic</td>
<td>90964</td>
<td>3R-605.1 / 3R-605.4</td>
<td>MacroMagnum ■ Macro</td>
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<tr>
<td>Pneumatic</td>
<td>3R-682.600-A</td>
<td>3R-605.1 / 3R-605.4</td>
<td>MacroMagnum ■ Macro</td>
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<tr>
<td>Pneumatic</td>
<td>3R-682.400-A</td>
<td>3R-605.1 / 3R-605.4 + 3R-605.11</td>
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<td>90356.20</td>
<td>3R-605.2 / 3R-605.4</td>
<td>Dynafix ■ MacroMagnum</td>
</tr>
</tbody>
</table>

MacroMagnum – Chucks & chuck adapters

Pneumatic chuck, 90809.03
Pneumatic chuck with coarse guiding of the pallet. Intended for permanent building-in.
- Required drawbar 3R-605.1 or 3R-605.4
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.

Pneumatic table 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 table chuck, 3R-680.10-3
For permanent mounting on the machine table.
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of Z-references
- Sealing ring
- Turbo locking
- Weight 7.5 kg.

Pneumatic chuck, 3R-SP26712
For permanent mounting on the machine table.
- Supplied with drawbar 3R-605.2
- Required air pressure 6 ± 1 bar
- Fixed index positions 4x90°
- Flushing duct
- Air-blast cleaning of the Z-references
- Sealing ring
- Turbo locking
- Weight 5 kg.

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<tr>
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<tr>
<td>Pneumatic</td>
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<td>3R-682.600-A</td>
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<td>3R-682.400-A</td>
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<td>MacroMagnum ■ MacroJunior</td>
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<tr>
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<td>90356.20</td>
<td>3R-605.2 / 3R-605.4</td>
<td>Dynafix ■ MacroMagnum</td>
</tr>
</tbody>
</table>
MacroMagnum – Chuck adapters

Pneumatic chuck adapter, MacroMagnum-Macro, 3R-682.600-A
Chuck adapter with built-in pneumatic Macro chuck for mounting in 3R-680.10-2A.
- Weight 4.5 kg

Manual chuck adapter, MacroMagnum-Macro, 90964
From MacroMagnum into Macro system. Chuck adapter with built-in Macro chuck.
- Requires drawbar 3R-605.2 or similar.
- Solid X & Y-References
- Recommended clamping torque 6 Nm
- Permissable torque 135 Nm
- Clamping force 6000 N
- Max load 50 kg to acquire accuracy 0.002 mm
- Weight 4.3 kg

Pneumatic chuck adapter, MacroMagnum-MacroJunior, 3R-682.400-A
Chuck adapter with built-in pneumatic MacroJunior chuck for mounting in 3R-680.10-2A.

Pneumatic chuck adapter, Dynafix-MacroMagnum, 90356.20
Chuck adapter with built-in pneumatic MacroMagnum chuck for mounting in 90356.10 or similar. See Dynafix for further information.
MacroMagnum – Pallets

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

### Pallets, reference element Ø142 mm

<table>
<thead>
<tr>
<th>Article number</th>
<th>Feature</th>
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</thead>
<tbody>
<tr>
<td>3R-681.71</td>
<td>rust-resistant</td>
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### Pallets Ø156 mm

<table>
<thead>
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<th>Article number</th>
<th>Feature</th>
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<tr>
<td>3R-681.51-SA</td>
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<tr>
<td>3R-681.156-A</td>
<td>reference element Ø142 mm</td>
</tr>
<tr>
<td>3R-681.51</td>
<td>3Refix Ø10 mm</td>
</tr>
</tbody>
</table>

### Pallet Ø142 mm, 3R-681.71

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

### Pallet Ø156 mm, 3R-681.51-SA

Unhardened pallet with hardened references and hole markings for eight clearance holes.
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg.
MacroMagnum – Pallets & accessories

**Pallet Ø156 mm, 3R-681.156-A**
Unhardened pallet with hardened reference element type 3R-681.71.
- Adapted for automatic changing
- Ready for code carrier
- Weight 4.5 kg.

**Pallet Ø156 mm, 3R-681.51**
Hardened pallet with threads and clearance holes for eight and ten fixing screws.
- 3Refix Ø10 mm
- Adapted for automatic changing
- Ready for code carrier
- Rust-resistant
- Flushing connection
- Weight 5 kg.

**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 8 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 – Accessories

Check ruler, 3R-686.1-HD
Check ruler for setting flatness and angular positions. Ground hole for centring.
- Adapted for automatic changing
- Ready for code carrier
- Measuring length 130 mm
- Weight 6 kg.

Splash guard, 90027.03
Intended for MacroMagnum chucks. Can also be used as a cover for unused chucks.

Chip guard, 90443
For Macro pallets 52x52, 54x54 and 70x70 in MacroMagnum chucks. For sealing we recommend 3R-RU52L or 3R-RU70 respectively in combination with the debris guard.

Connection for air gun, 90815
For manual operation of pneumatic chucks with air gun.
- Supplied in sets of 2 pcs.

Code carriers, 3R-863.01-10
With pre-programmed unique identity, designed for pallet use.
- Supplied in sets of 10 pcs.

Lifting device, 3R-682.7-156
For dia. 156 mm pallets, prepared for automation only.
- Suitable for: 3R-681.51, 3R-681.51-SA and 3R-681.156-A
- Weight 1 kg.
MacroMagnum – Accessories

3Refix mandrel, 3R-901-10E-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 R² hole first.

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.

Torque wrench, 3R-614-04
For Ø10 mm 3Refix mandrels and manual MacroMagnum chucks.
- 4 Nm

Air unit, 3R-611.46
Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.

3Refix mandrel, 3R-901-10E-TX
- 3Refix Ø10 mm
- Recommended tightening torque 4 Nm
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Torque wrench, 3R-614-04
For Ø10 mm 3Refix mandrels and manual MacroMagnum chucks.
- 4 Nm

Air unit, 3R-611.46
Unit for hand operation of pneumatic chucks. Three functions – open/neutral/closed.
Matrix

... reduces setting-up times
... ensures precision and quality
... has automatic air-blast cleaning of the references
... is sealed against dirt and swarf – withstands severe work environments
... has enhanced clamping force – turbo locking
... is suitable for automatic changing with System 3R’s automation program.

The Matrix system
Measures to reduce the downtime of your machines are significantly more worth while than chasing seconds in the actual machining process. What matters is to keep the machines running. And that’s when you need an interface that gives fast setting-up.

The Matrix system is just that kind of interface. Setting-up in parallel away from the machine while it is working and then setting up in a matter of seconds in the stationary machine. Important for long runs, but crucial for the profitability of short runs or one-piece production.

The design has been optimised for metal-cutting machining and is ideal for work involving high machining forces. The generous diameter of the drawbar means short distances between the references and the applied locking force, giving maximum stability and accuracy. The inherent properties of the Matrix system truly come into their own in tough machining applications.

As well as extreme accuracy, Matrix features low construction height, ultra-precise indexing, a drawbar with through hole. The through hole allows high/long workpieces to be sunk into the chuck for stable/rigid fixation.
Matrix 110

Pneumatic chuck, Matrix 110, 3R-690.1-110
Chuck for permanent mounting on the machine table or into a PM press.
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9000 N
- Permissible torque 100 Nm
- Required drawbar 3R-695.2-110
- Required air pressure, –6±1 bar
- Weight 2.5 kg.

Pallet, Matrix 110, 3R-691.1-110
- Fixed index positions 4x90°
- Permissible press load 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.

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 12000 N
- Permissible torque 300 Nm
- Required drawbar 3R-695.2-142
- Required air pressure, – 6±1 bar
- Weight 7 kg.

![Pneumatic chuck](image)

**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.

![Check ruler](image)

**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 simila
- Adapted for automatic changing
- Weight 1.2 kg.

Note: Not self carrying, requires extra support.

![Pallet](image)

**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](image)

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 16 000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-185
- Required air pressure, – 6±1 bar
- Weight 9 kg.

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

- Fixed index positions 4x90°
- Permissible press load 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.

**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 18500 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-220
- Required air pressure, – 6±1 bar
- Weight 11 kg.

Pallet, Matrix 220, 3R-691.1-220
- Fixed index positions 4x90°
- Permissible press load 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.

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.
Matrix 260 & accessories

**Pneumatic chuck, Matrix 260, 3R-690.1-260**
Chuck for permanent mounting on the machine table or into a PM press.
- Fixed index positions 4x90°
- Hardened references
- Clamping force 24000 N
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, – 6±1 bar
- Weight 13 kg.

**Pallet, Matrix 260, 3R-691.1-260**
- Fixed index positions 4x90°
- Permissible press load 200 ton
- Permissible torque 600 Nm
- Required drawbar 3R-695.2-260 or similar
- Adapted for automatic changing
- Weight 3.2 kg.

Note: Not self carrying, requires extra support.

**Drawbar, Matrix 260, 3R-695.2-260**
- Weight 1.5 kg.

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

**Check ruler, Matrix 260, 3R-696.1-260**
For setting flatness and angular positions. Ground hole for centering.
- Ready for code carrier
- Measuring length 200 mm.
- Adapted for automatic changing
- Weight 10 kg.

**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.
... reduces setting-up times.
... ensures precision and quality.
... is sealed against dirt and swarf.
... has inexpensive, 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 chuck can be mounted on the machine table of any machine tool.

The standardised hole pattern of the pallet allows the fixation of workpieces, fixtures and accessories such as vices, three-jaw chucks and magnetic tables from below. This gives collision-free mounting, even with five-sided machining.

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

The chuck seal prevents dirt penetrating between the chuck and the pallet. This simplifies maintenance and lengthens the life of the components. A lifting mechanism which operates on locking/opening protects the references when loading heavy workpieces.

+ Repetition accuracy – within 0.002 mm
+ Indexing accuracy – within 0.005 mm
+ Locking force – 30 000 N (with force boost 80 000 N)
+ Fixed index positions – 4x90°
+ Required air pressure, pneumatic chuck – 6 bar
+ Recommended max workpiece weight – 100kg.
GPS 240

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

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

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

Connection bloc.

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

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

Spring loaded clamping mechanism. Releasing by air.

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

System 3R tooling for electrode manufacturing & EDMing
GPS 240 – Chucks

Chucks, square

<table>
<thead>
<tr>
<th>Feature</th>
<th>Article number</th>
<th>Feature 1</th>
</tr>
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<tbody>
<tr>
<td>Pneumatic automatic/manual</td>
<td>C 219 110</td>
<td>for manual &amp; automatic machining operations</td>
</tr>
<tr>
<td>Pneumatic automatic/manual</td>
<td>C 219 600</td>
<td>built-in pneumatic Macro chuck</td>
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<tr>
<td>Pneumatic automatic/manual</td>
<td>C 219 800</td>
<td>connection from below, medium connection</td>
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<tr>
<td>Pneumatic automatic/manual</td>
<td>C 210 060</td>
<td>dummy chuck</td>
</tr>
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</table>

Pallets, square

<table>
<thead>
<tr>
<th>Feature</th>
<th>Article number</th>
<th>Feature 1</th>
<th>Size (mm)</th>
</tr>
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<tbody>
<tr>
<td>Cast aluminium</td>
<td>C 694 100</td>
<td>240x240</td>
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<tr>
<td>Cast aluminium</td>
<td>S 694 300</td>
<td>ground</td>
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<tr>
<td>Solid aluminium</td>
<td>S 694 610</td>
<td>ground</td>
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</tr>
<tr>
<td>Solid aluminium</td>
<td>C 694 640</td>
<td>ground</td>
<td>300x300</td>
</tr>
</tbody>
</table>

Pallet with coined cams. Pallet with spring-loaded pin.
GPS 240 – Chucks

GPS 240 Chuck automatic, C 219 110
Pneumatic table chuck, mainly intended for applications in die-sinking EDM machines.
- Required air pressure 6 bar
- 5 air connections
- Repetition accuracy 0.002 mm
- Indexing accuracy 0.005 mm
- Clamping force 30 000 N/80 000 N
- Recommended control unit C 810 830
- Air-blast cleaning of the references
- Weight 17 kg.

GPS 240 Chuck automatic with medium connection, C 219 800
For manual and automatic machining operations.
- Building-in height 52 mm
- Air connections positioned centrally on the underside - prism - Z-claing - clamping/releasing - Turbo/ventilation
- Medium connection 2-fold
- Clamping force 30 000 N/80 000 N
- Weight 17 kg.

GPS 240 Pneumatic chuck with built-in Macro chuck, C 219 600
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 219 600: Macro 54x54 mm and Macro 70x70 mm
- Required air pressure 6 bar
- Recommended control unit C 810 810
- Air-blast cleaning of the references
- Weight 22 kg.

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 – 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
- Flatness 0.02 mm
- Weight 4.8 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs

GPS 240 Pallet ‘Adaption’, C 694 300
Ground cast aluminium pallet.
Suitable for fixtures and accessories.
Prepared for automation.
- Construction height 48.0 ±0.005 mm
- X/Y-centring with spring-loaded pin
- Flatness 0.01 mm
- Weight 4.8 kg
- Recommended workpiece weight 100 kg
- Supplied with C 531 500 sealing plugs

S 500 090
- Set of 4x C 694 100

S 500 100
- Set of 10x C 694 100

GPS 240 Master pallet, C 846 600
The pallet has a ground reference ruler and a ground indication hole for alignment of the references.

GPS 240 Pallet 240x240 mm, C 694 610
Ground solid aluminium pallet.
Suitable for fixtures and accessories.
Prepared for automation.
- Construction height 48 ±0.005 mm
- X/Y-centring with coined cam
- Flatness 0.01 mm
- Weight 7.4 kg
- Recommended workpiece weight 100 kg.

GPS 240 Pallet 300x300 mm, C 694 640
Ground solid aluminium pallet.
Suitable for fixtures and accessories.
Prepared for automation.
- Construction height 48 ±0.01 mm
- X/Y-centring with coined cam
- Flatness 0.02 mm
- Weight 9 kg
- Recommended workpiece weight 100 kg.
GPS 240 – Accessories

GPS 240 Pallets with vice

C 585 400
Vice for workpieces <80 mm.
- X/Y-centring: with spring-loaded pin.

C 585 600
Vice for workpieces <120 mm.
- X/Y-centring: with spring-loaded pin.

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/cm²
- Dimensions 240x240x88 mm
- Weight 23 kg.

GPS 240 Magnetic table, C 694 260

Pneumatic chuck adapter, GPS 240-Macro, C 522 520
Chuck adapter with built-in pneumatic Macro chuck for mounting in C 219 800.
- Built-up height 80 mm
- X/Y-centring with springy cams, hardened, stainless
- Adapted for automatic changing
- Weight 8.5 kg.

Pneumatic chuck adapter, GPS 240-MacroMagnum, C 522 540
Chuck adapter with built-in pneumatic Macro Magnum chuck for mounting in C 219 800.
- Built-up height 80 mm
- X/Y-centring with springy cams, hardened, stainless
- Adapted for automatic changing
- Weight 11.7 kg.
GPS 240 – Accessory

GPS 240 Controllers

C 810 830
Unit for controlling pneumatic chucks C 219 110.

C 810 850
Unit to control two pneumatic chucks.

C 810 810
Unit for controlling pneumatic chucks C 219 600.
- 6 connections - X/Y-locating – air-blast cleaning of Z – clamping/releasing – turbo/venting – Macro clamping/releasing – Macro air-blast cleaning of Z / turbo

GPS 240 Spare parts set, S 220 000
Contains all elements for a normal service.
- Suitable for all square chucks
- Recommendation: every 2 years if used manually and annually if used in the automation system.

GPS 240 Chuck seal, C 219 007
The chuck seal is a wear part which should be replaced every three to six months.
- Material Viton
- Supplied singly

GPS 240 Lifting grip, C 810 960
Lifting gear for handling GPS 240 pallets 240x240 mm.
- Weight 2.9 kg.

GPS 240 Controllers

GPS 240 Spare parts set, S 531 260
Plugs for sealing fixation screw holes on GPS 240 chucks.
- Suitable for square chucks
- Supplied in sets of 20.

GPS 240 Controllers

GPS 240 Accessories

Unit to control two pneumatic chucks.

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories

GPS 240 Accessories
GPS 240 – Accessories

GPS 240 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 Reference protectors, C 531 210
To protect the Z-reference of the pallet.
- Supplied in sets of 20.

GPS 240 Sealing plugs, C 531 500
Plugs for sealing GPS 240 pallets.
- Supplied in sets of 40.

Code carriers, 3R-863.01
With pre-programmed unique identity, designed for GPS 240 pallets.

3R-863.01-10
- Sets of 10 pieces.

GPS 240 – Accessories

Code carrier, fixture, C 960 740
Fixture for code carrier 3R-863.01-10.
- The code carrier can be clicked into position.
GPS 240 – User kits

GPS 240 Clamp kit, C 810 870
E 030 220 clamp (x4)
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)
E 040 030* T-slot nut M10x12 (x4)
E 040 031* T-slot nut M10x14 (x4)
E 040 032* T-slot nut M10x16 (x4)
E 040 033* T-slot nut M10x18 (x4)
E 040 020* T-slot nut M8x12 (x4)
E 040 021* T-slot nut M8x14 (x4)
E 040 022* T-slot nut M8x16 (x4)
E 040 023* T-slot nut M8x18 (x4)
* When ordering, state the required dimension of the T-slot nut.

GPS 240 Clamp strip kit, C 810 880
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)
E 040 030* T-slot nut M10x12 (x4)
E 040 031* T-slot nut M10x14 (x4)
E 040 032* T-slot nut M10x16 (x4)
E 040 033* T-slot nut M10x18 (x4)
E 040 020* T-slot nut M8x12 (x4)
E 040 021* T-slot nut M8x14 (x4)
E 040 022* T-slot nut M8x16 (x4)
E 040 023* T-slot nut M8x18 (x4)
* When ordering, state the required dimension of the T-slot nut.

GPS 240 Clamp strip kit for double mounting, C 810 920
For mounting two chucks on 300 mm centres.
C 810 921 undrilled spacer (x1)
C 810 881 undrilled clamp strip (x2)
E 010 144 washer M10 (x6)
E 010 143 washer M8 (x6)
E 000 428 Allen screw M10x45 (x6)
E 000 354 Allen screw M8x45 (x6)
E 040 030* T-slot nut M10x12 (x6)
E 040 031* T-slot nut M10x14 (x6)
E 040 032* T-slot nut M10x16 (x6)
E 040 033* T-slot nut M10x18 (x6)
E 040 020* T-slot nut M8x12 (x6)
E 040 021* T-slot nut M8x14 (x6)
E 040 022* T-slot nut M8x16 (x6)
E 040 023* T-slot nut M8x18 (x6)
* When ordering, state the required dimension of the T-slot nut.

GPS 240 Starter kit, S 500 650
C 219 110 pneumatic chuck
C 810 830 actuator
C 694 100 pallets (2x).

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.
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 produkt 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.

<table>
<thead>
<tr>
<th>Chucks</th>
<th>Article number</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic</td>
<td>3R-770-1</td>
<td></td>
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<tr>
<td>Pneumatic</td>
<td>3R-770-4</td>
<td>alignment reference</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90356.10</td>
<td>for chuck adapters, with mounting flange</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90576.05</td>
<td>for chuck adapters, without mounting flange</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>3R-770-5</td>
<td>for five-axis machines</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90718.04</td>
<td>vibration-damped</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>3R-770.6-1</td>
<td>built-in pneumatic Macro chuck</td>
</tr>
</tbody>
</table>
Dynfix – 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-770-4
Pneumatic table chuck with ground-in reference for alignment.
- 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.
Dynfix – Chucks

**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.

**Pneumatic chuck, 3R-770.46-1**
Pneumatic chuck with integrated MacroCombi chuck.
For CMM machines.
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Weight 32 kg.

**Pneumatic chuck, 3R-770.6-1**
Pneumatic chuck with integrated Macro chuck.
For CMM machines.
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Weight 32 kg.

**Pneumatic chuck, D-20129**
Pneumatic chuck with manual Macro Std chuck in the center.
- Required air pressure 6 ±1 bar
- Fixed index positions 4x90°
- Air-blast cleaning of the Z-references
- Weight 24.5 kg.
Dynfix – Chuck adapters

<table>
<thead>
<tr>
<th>Chuck adapters</th>
<th>Article number</th>
<th>Feature</th>
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</thead>
<tbody>
<tr>
<td>Pneumatic</td>
<td>90356.22</td>
<td>Dynafix ▶ Macro</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90356.21</td>
<td>Dynafix ▶ MacroCombi</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>90356.20</td>
<td>Dynafix ▶ MacroMagnum</td>
</tr>
</tbody>
</table>

**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.
### Dynfix – Pallets

#### Pallets 280x280 mm

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<tr>
<th>Article number</th>
<th>Feature</th>
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</thead>
<tbody>
<tr>
<td>3R-771.2</td>
<td>Aluminium</td>
</tr>
<tr>
<td>3R-772.2</td>
<td>Aluminium</td>
</tr>
<tr>
<td>3R-DE772-T8.40</td>
<td>Aluminium</td>
</tr>
<tr>
<td>3R-DE772-M8</td>
<td>Aluminium</td>
</tr>
<tr>
<td>3R-774-AL</td>
<td>Aluminium</td>
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<tr>
<td>3R-774</td>
<td>Aluminium</td>
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<tr>
<td>3R-CH771.35</td>
<td>Aluminium</td>
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</tbody>
</table>

#### Pallets 400x400 mm

<table>
<thead>
<tr>
<th>Article number</th>
<th>Feature</th>
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<tbody>
<tr>
<td>3R-774-AL</td>
<td>Aluminium</td>
</tr>
<tr>
<td>3R-774</td>
<td>Steel</td>
</tr>
</tbody>
</table>

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

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

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

Ground aluminium pallet.
- Adapted for automatic changing
- Ready for code carrier
- Flatness 0.005 mm
- Thickness tolerance -0.1 / -0.14 mm
- Weight 6 kg.
**Dynafix – Pallets & Accessories**

**Pallet 280x280 mm, 3R-DE772-T8.40**
Anodized aluminium pallet with six T-slots for M8 on 40 mm centres.
- Adapted for automatic changing
- Ready for code carrier
- Weight 14 kg.

**Pallet 280x280 mm, 3R-DE772-M8.28**
Hardened steel pallet with 139 M8 threads on 20 mm centres.
- Adapted for automatic changing
- Ready for code carrier
- Weight 14.5 kg.

**Pallet 400x400 mm, 3R-774-AL**
Aluminium pallet.
- Ready for code carrier
- Weight 20 kg.

**Pallet 280x280 mm, 3R-DE772-M8.28**
Aluminium pallet.
- Ready for code carrier
- Weight 12.1 kg.

**Reference elements, 3R-771.7**
Reference kit for users who want to make their own pallets or fixtures.

**Master pallet, 3R-776.1-2**
For alignment of the Dynafix references. With ground reference rulers, hole and surface.
- Adapted for automatic changing
- Ready for code carrier
- Weight 8 kg.
Maxi

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

Maxi an especially robust, uncomplicated and user-friendly system for larger and heavier electrodes and workpieces. The chucks are of the fishtail type with three references for rapid mounting of the accessories with a single two-handed operation. Chuck adapters – with Maxi as the basic mounting on the machine table – also give access to the Mini, MacroJunior and Macro systems.

+ Repetition accuracy within – 0.01 mm.
+ Recommended maximum weight – 500 kg.
Maxi – Chuck & pallet

**Manual chuck, 3R-27.2**
For mounting on the machine spindle or on a machine table.
- Immersible
- Maximum electrode weight 500 kg
- Mechanical locking
- Weight 5 kg.

**Pallet 150x150 mm, 3R-29.2**
Pallet with 16 clearance holes for M6 screws and eight M6 threads.
- Hardened
- Weight 4.6 kg.
Mini

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

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

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

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

+ Clamping force – 4000 N.

Upgrade options:

- Midi-Mini
- Conversion – Macro/Mini
- Adapter – Macro/Mini

What distinguishes the original from a pirate copy:

- Right size of eccentric pin
- Right quality and size of O-ring
- Right hardness
- Right shape and position of gripper slot
- All original handles are engraved “3R”

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

Spindle chucks

<table>
<thead>
<tr>
<th>Manual</th>
<th>Article number</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>3R-321.5</td>
<td>Midi Mini</td>
</tr>
<tr>
<td>Manual</td>
<td>3R-321.2-4x90°</td>
<td></td>
</tr>
<tr>
<td>Manual</td>
<td>3R-321-4x90°</td>
<td></td>
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</tbody>
</table>

Lathe chuck

<table>
<thead>
<tr>
<th>Manual</th>
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<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>3R-321.2-4x90°</td>
<td></td>
</tr>
</tbody>
</table>

Manual chuck, 3R-321.5

Hydraulic chuck for mounting on machine spindle with 3R-A3620.
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.8 kg.

Manual lathe chuck, 3R-321.2-4x90°

Hydraulic chuck with set screws, for mounting on a lathe taper.
- Fixed index positions 4x90°
- Weight 1.3 kg.

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

Hydraulic chuck for mounting on machine spindle with Midi system.
- Fixed index positions 4x90°
- Flushing connection
- Weight 1.3 kg.
Mini – Table chucks, chuck adapters & rotating spindles

**Table chucks**

<table>
<thead>
<tr>
<th>Manual</th>
<th>Feature</th>
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<tbody>
<tr>
<td>3R-321.46</td>
<td>vertical and horizontal</td>
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<tr>
<td>3R-252.1</td>
<td>stainless steel</td>
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<tr>
<td>3R-202</td>
<td>stainless steel, vertical and horizontal</td>
</tr>
<tr>
<td>3R-222.2</td>
<td>stainless steel</td>
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</tbody>
</table>

**Chuck adapters**

<table>
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<tr>
<th>Manual</th>
<th>Feature</th>
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</thead>
<tbody>
<tr>
<td>3R-443/5033</td>
<td>Mini ▶ MacroJunior 50 mm</td>
</tr>
<tr>
<td>3R-603.9</td>
<td>Macro ▶ Mini 90°, rust-resistant</td>
</tr>
<tr>
<td>3R-653</td>
<td>Macro ▶ Mini, rust-resistant</td>
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<tr>
<td>3R-653-S</td>
<td>Macro ▶ Mini</td>
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**Rotating spindles**

<table>
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<tr>
<th>Feature</th>
<th>Article number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical and horizontal</td>
<td>3R-1.6S</td>
</tr>
<tr>
<td>Vertical</td>
<td>3R-1.321-HS</td>
</tr>
<tr>
<td>tubular electrodes</td>
<td></td>
</tr>
</tbody>
</table>
Mini – Table chucks, chuck adapters & rotating spindles

MiniBlock, 3R-321.46
Manual hydraulic chuck for vertical or horizontal mounting on the machine table.
- Fixed index positions 4x90°
- Weight 2.3 kg.

Manual chuck adapter, Mini-MacroJunior, 3R-463/5033
For mounting MacroJunior holders in the Mini system. Axial locking screw with channel for flushing through the electrode.
Note: For EDM machining only.
- Adapted for automatic changing
- Fixed index positions 3x120°
- Weight 0.8 kg.

Rotating spindle, 3R-1.6S
Electric rotating spindle for electrodes on Mini holders. Vertical or horizontal mounting.
- Immersible
- Maximum electrode weight 2 kg
- Speed range 20-200 rev/min
- Recommended maximum flushing pressure 2 bar.
- Weight 11.6 kg.

Rotating spindle, 3R-1.321-HS
Electric spindle for tubular electrodes in collets ER16.
- Supplied with collet set 3R-ER16E
- Electrode sizes Ø0.5 – 10 mm.
- Speed range 200 – 2000 rev/min.
- Recommended maximum flushing pressure 40 bar.
- Weight 1.4 kg.
Mini – Electrode holders

Electrode holder Ø20 mm
Holder with hardened reference part and unhardened electrode mounting part.

<table>
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<tr>
<th>Electrode holder</th>
<th>Article number</th>
<th>Feature</th>
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</thead>
<tbody>
<tr>
<td>Electrode holder Ø20 mm</td>
<td>3R-322/25E</td>
<td>25 mm</td>
</tr>
<tr>
<td>Electrode holder Ø20 mm</td>
<td>3R-322/50S</td>
<td>50 mm</td>
</tr>
<tr>
<td>Electrode holder Ø20 mm</td>
<td>3R-322/50E</td>
<td>50 mm, automatic changing</td>
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<tr>
<td>Electrode holder Ø20 mm</td>
<td>3R-322/100</td>
<td>100 mm, automatic changing</td>
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<tr>
<td>Electrode holder</td>
<td>3R-310EE</td>
<td>flange Ø50 mm</td>
</tr>
<tr>
<td>Electrode holder</td>
<td>3R-13.321</td>
<td>square electrodes</td>
</tr>
<tr>
<td>Three-jaw chuck</td>
<td>3R-311.4</td>
<td>Ø0.1 - 3 mm</td>
</tr>
<tr>
<td>Collet chuck</td>
<td>3R-311.2</td>
<td>Ø13 mm, ER 20</td>
</tr>
<tr>
<td>Collet chuck</td>
<td>3R-311.3</td>
<td>Ø10 mm, ER 16</td>
</tr>
</tbody>
</table>

3R-322/25S
- Electrode mounting part 25 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7 kg.

3R-322/50S
- Electrode mounting part 50 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7.7 kg.

3R-322/50E
- Adapted for automatic changing
- Electrode mounting part 50 mm
- Flushing duct
- Supplied in sets of 30 pcs
- Weight per set 7.7 kg.

3R-322/100
- Adapted for automatic changing
- Electrode mounting part 100 mm
- Flushing duct
- Supplied in sets of 10 pcs
- Weight per set 3.8 kg.
Mini – Electrode holders & Accessories

**Electrode holder, 3R-310EE**
Holder with hardened reference part Ø20 mm and unhardened flange Ø50 mm.
- Adapted for automatic changing
- Electrode mounting part 39 mm
- Flushing duct
- Supplied in sets of 10 pcs.
- Weight per set 4 kg.

**Electrode holder, 3R-13.321**
Holder with hardened reference part Ø20 mm for mounting square and flat electrodes.
- Max. workpiece: 32x28 mm
- Adapted for automatic changing
- Flushing duct
- Weight 1 kg.

**Three-jaw chuck, 3R-311.4**
Chuck Ø20 mm for Ø0.1-3 mm electrodes.
- Adapted for automatic changing
- Weight 0.3 kg.

**Collet chuck ER20, 3R-311.2**
Chuck Ø20 mm for collets ER20 with electrodes < Ø13 mm.
- Adapted for automatic changing
- Weight 0.2 kg.

**Collet chuck ER16, 3R-311.3**
Chuck Ø20 mm for collets ER16 with electrodes < Ø10 mm.
- Adapted for automatic changing
- Weight 0.2 kg.

**Check mandrel, 3R-23**
Ground C-reference.
- Measuring length 100 mm
- Weight 0.6 kg.
Mini – Accessories

**Check ruler, 3R-314.2**
For setting angular positions.
- Measuring length 96 mm
- Weight 0.4 kg.

**Indicating spindle, 3R-3.321-2**
For measuring centre holes.
- Dial indicator required
- Weight 0.4 kg.

**Microscope, 3R-4.321**
With transformer [110/220V] for integral lighting.
- Magnification x25
- Centering location
- Field of view Ø6 mm
- Weight 0.6 kg.

**Clip, 3R-301**
For angular fixing of Mini holders.
- Supplied in sets of 10 pcs.

**Soldering kit, 3R-403**
For soldering electrode blanks on Mini holders.
- Supplied with flux.

**Electrode cassette, 3R-150/5**
For Mini holder x30.
- Supplied in sets of 5 pcs.

**Adapter plate, 3R-601.6**
For mounting (for example) rotating spindles in the Macro system.
- MacroHP coupling
- Rust-resistant.
3Refix

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

**Increased productivity**

need not mean heavy investments in new machines.
3Refix is remarkably simple way to lay a solid foundation from which to view the future with confidence – tool up without indication and cut your production costs!
3Refix technology is based on a modular hole pattern with 100x100 mm pitch and 20 mm diameter reference holes. The reference tables have clearly-marked reference holes – A1, A2, B1, B2 etc – and every accessory has two 20 mm diameter holes, which pick up the references from the table. The R0-hole gives the X/Y-position and the R1-hole gives the angle relative to the axes of the machine. This makes it possible to set up the workpiece without the need for alignment and gauging afterwards. So 3Refix accessories provide an unmistakable and fixed position with known references.
The accessories in the 3Refix range usually have a reference height of 30 mm, among other things to allow machining straight through the workpiece. The design also allows a flush pot to be pushed in under the workpiece during EDM machining.
The full effect of 3Refix technology is attained by consistent application with general systemization and standardization of all machine tables and accessories. System 3R can supply reference tables for practically all types and sizes of machines – reference tables that give a distinct interface between machine table and auxiliary tool.
With the aid of 3Refix you can very quickly change the set-up of the machine from one machining operation to another in a few simple operations – **One Minute Set-up!**

+ Repetition accuracy 0.005 mm.

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

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

Note: Customised reference tables can be made to order.
Note: Hardened reference tables (650-700 HB) can be made to order.
Use the order form at the end of the catalogue.

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

3R-901-10E-TX
- 3Refix Ø10 mm
- Rust-resistant
- Recommended tightening torque 4 Nm
- Supplied singly
- Weight per set 0.5 kg.

3R-901-20E
- 3Refix Ø20 mm
- Recommended tightening torque 10 Nm
- Supplied in sets of 10 pcs.
- Weight per set 1 kg.

3R-901-10RS
- 3Refix Ø10 mm
- Rust-resistant
- Recommended tightening torque 4 Nm
- Supplied singly
- Weight per set 0.5 kg.

3R-901-20RS
- 3Refix Ø20 mm
- Rust-resistant
- Recommended tightening torque 10 Nm
- Supplied in sets of 10 pcs.
- Weight per set 1 kg.

Slotted bushes, 3R-903-XX.XX
Bushes of hardened spring steel 54 HRC.
- Bore 20 mm, height 20 mm.
- Supplied in 2 pcs.
- Weight per set 0.1 kg.

Art. No. | Outside diameter (mm)
---------|---------------------
3R-903-20.235 | 23.5
3R-903-20.24  | 24
3R-903-20.25  | 25
3R-903-20.254 | 25.4
3R-903-20.256 | 25.6
3R-903-20.26  | 26
3R-903-20.275 | 27.5
3R-903-20.28  | 28
3R-903-20.295 | 29.5
3R-903-20.30  | 30
3R-903-20.315 | 31.5
3R-903-20.3175| 31.75
3R-903-20.32  | 32
3R-903-20.34  | 34
3R-903-20.36  | 36
3R-903-20.38  | 38
3R-903-20.381 | 38.1
3R-903-20.40  | 40
3R-903-20.414 | 41.4
3R-903-20.42  | 42
3R-903-20.4445| 44.45
### 3Refix

**Bushings**

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

<table>
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<tr>
<th>Bushing Code</th>
<th>Bore (mm)</th>
<th>Outside Diameter (mm)</th>
<th>Height (mm)</th>
<th>Supplied in Sets of</th>
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<td>15 H6</td>
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**Plastic plug, 3R-915-20E**

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

**Plastic screw, 3R-915-M12E**

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

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

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

**Torque wrench, 3R-914-10**

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

Allen key, 3R-333-03
• 3 mm
• Supplied in 10 pcs.

Allen key, 3R-333-05
• 5 mm
• Supplied in 10 pcs.

Collets ETS10, 3R-AG410
Intended for MacroJunior.
Collet Ø0.2-0.1 mm
Collet Ø0.3-0.2 mm
Collet Ø0.4-0.3 mm
Collet Ø0.5-0.4 mm
Collet Ø0.6-0.5 mm
Collet Ø0.7-0.6 mm
Collet Ø0.8-0.7 mm
Collet Ø0.9-0.8 mm
Collet Ø1-0.9 mm
Collet Ø1.25-1 mm
Collet Ø1.5-1.25 mm
Collet Ø1.75-1.5 mm
Collet Ø2-1.75 mm.

Collets, 3R-ER16E
Intended for Macro & MacroJunior.
Collet Ø1-0.5 mm
Collet Ø2-1 mm
Collet Ø3-2 mm
Collet Ø4-3 mm
Collet Ø5-4 mm
Collet Ø6-5 mm
Collet Ø7-6 mm
Collet Ø8-7 mm
Collet Ø9-8 mm
Collet Ø10-9 mm.

Collets, 3R-ER20E
Intended for Macro.
Collet Ø2-1 mm
Collet Ø3-2 mm
Collet Ø4-3 mm
Collet Ø5-4 mm
Collet Ø6-5 mm
Collet Ø7-6 mm
Collet Ø8-7 mm
Collet Ø9-8 mm
Collet Ø10-9 mm
Collet Ø11-10 mm
Collet Ø12-11 mm
Collet Ø13-12 mm.

Collets, 3R-ER32E
Intended for Macro.
Collet Ø3-2 mm
Collet Ø4-3 mm
Collet Ø5-4 mm
Collet Ø6-5 mm
Collet Ø7-6 mm
Collet Ø8-7 mm
Collet Ø9-8 mm
Collet Ø10-9 mm
Collet Ø11-10 mm
Collet Ø12-11 mm
Collet Ø13-12 mm
Collet Ø14-13 mm
Collet Ø15-14 mm
Collet Ø16-15 mm
Collet Ø17-16 mm
Collet Ø18-17 mm
Collet Ø19-18 mm
Collet Ø20-19 mm.
Accessories

Flushing adapter, 3R-103
For 3R-601.3, 3R-601.52, 3R-603, 3R-603.9 and 3R-651.13.

Spacer plate, U-40266
For mounting of small electrodes in 3R-608.32, 3R-658.2E-S and 3R-658.4E-S.
Supplied in sets of:
- 1 mm x10
- 2 mm x10
- 3 mm x10
- 5 mm x10

Nipple, 3R-SP20753
Nipple for manual operation by air gun of pneumatic chucks with R1/8" connecting thread.

Labels, 3R-LS288P
Supplied with marker pen.
- Size 6x19 mm
- Supplied in sets of 288 pcs.

Labels, 3R-LL200P
Supplied with marker pen.
- Size 12x25 mm
- Supplied in sets of 200 pcs.

Spacer plate, U-40266
For mounting of small electrodes in 3R-608.32, 3R-658.2E-S and 3R-658.4E-S.
Supplied in sets of:
- 1 mm x10
- 2 mm x10
- 3 mm x10
- 5 mm x10

Code carriers, 3R-863.01-10
With pre-programmed unique identity, designed for Macro systems and Dynafix.
- Supplied in sets of 10 pcs.
Utilise every hour of the day and night!
An automatic production cell can generate revenue round the clock, seven days a week. Why be satisfied with 40 productive machine-hours a week when the same machine can achieve over 100 additional hours a week? Use every hour of the day and night for production!
WorkPal, WorkPartner, Transformer & Fanuc - four “aces” which boost your productivity and sharpen your competitiveness.
And not least – they bring faster payback on the investments you made.

WorkPal Compact Servo – modest demands, major benefits
WorkPal Compact Servo is a simple step into the world of automation. It’s an easy-to-use, user-friendly pallet changer for automatic changing of pallets in wire EDM machines, for example.
A sliding door gives maximum access to the magazine, making it easier to manage the pallets. The extremely compact unit is simple to install. And what’s more, WorkPal Compact Servo only needs minimal floor space.
Automation

WorkPartner 1+ – can serve two machines
WorkPartner 1+ is an extremely compact unit for changing pallets – on machine tables and at machine spindles in one or two machines. Its modular construction means that magazine capacity is extremely flexible and can be adapted to your company’s needs.

Typical application areas:
+ Milling – changing of workpieces.
+ Grinding – changing of workpieces.
+ Die-sinking EDM – changing of workpieces and electrodes.
+ Wire EDM – changing of workpieces.

Transformer – a modular automation concept
Transformer is a versatile automation concept for a variety of applications in one or more milling machines and/or wire EDM machines, for instance. And changing can be done both in the machine spindle and on the machine table.

The changer unit is completely self-contained and can be adapted to “tailor-made” automation solutions with several types of magazine, as well as a number of options. One, two or three machines in the same production cell.

One clear advantage is the “open architecture” of the system. The customer chooses the machine (or machines) suited to the particular requirements of the business, and a Transformer is added.

Automation – with six-axis Fanuc industrial robot
System 3R offer automation solutions with industrial robots, both stationary and rail versions within the Die & Mold and Precision Production sector.
Fanuc solutions covers applications in terms of ...
... transfer weight from 70-700 kg
... radial reach, up to 3 400 mm
... complexed transfer movements
... parts handling
Order form

Company ________________________________________ Phone __________________________
Contact ________________________________________ Date _________________________

Specification of taper attachment

Taper

Type

Thread

Female thread
Male thread

Flange

Chuck 3R-
Other, please specify

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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