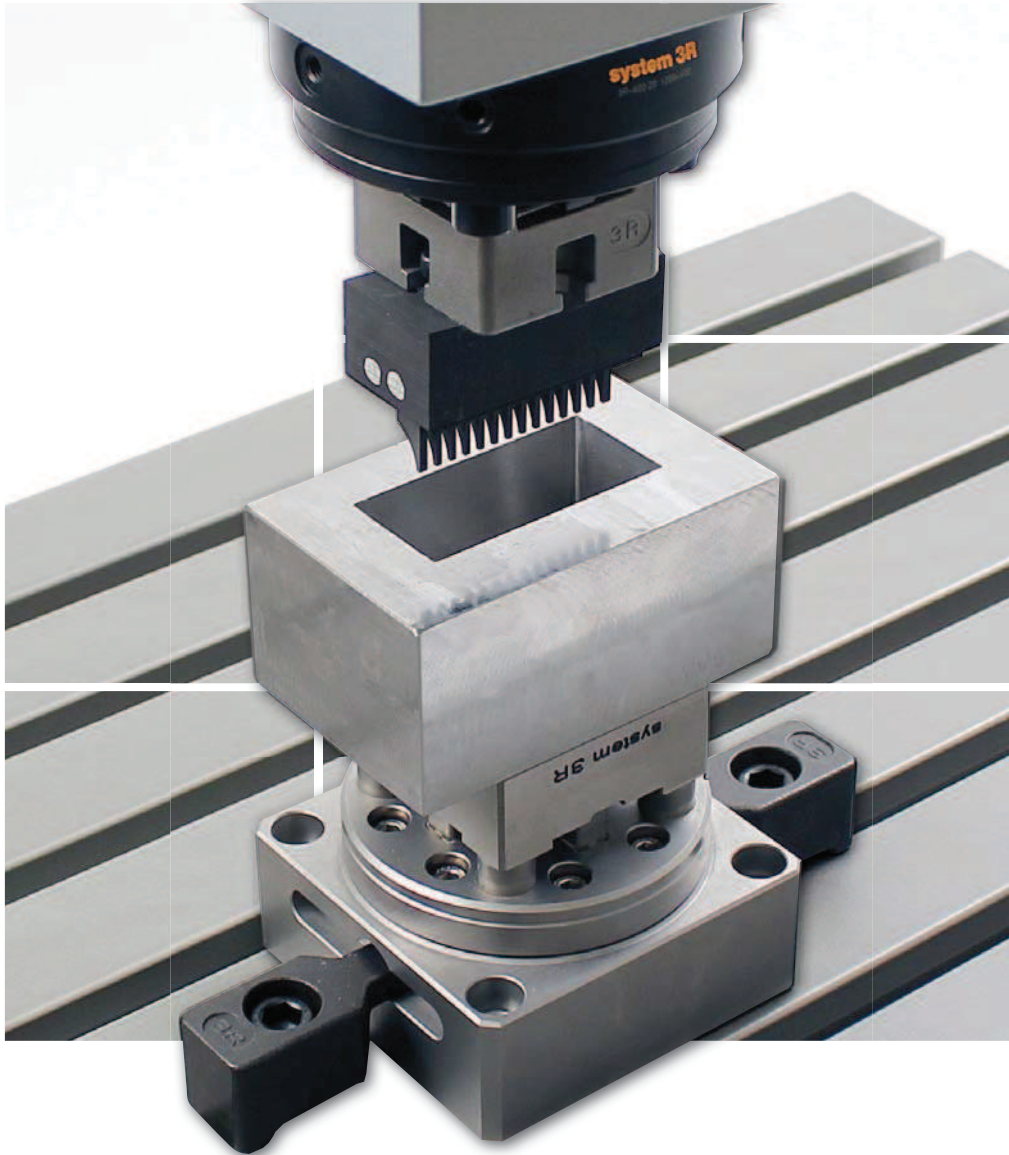
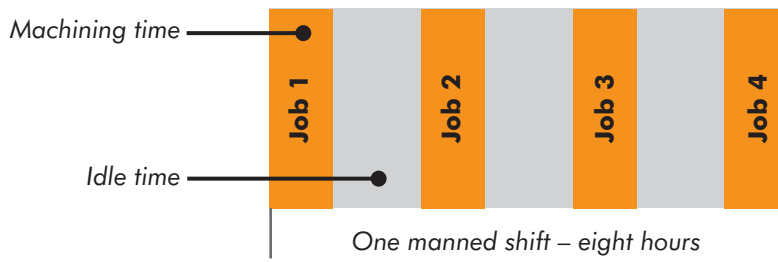


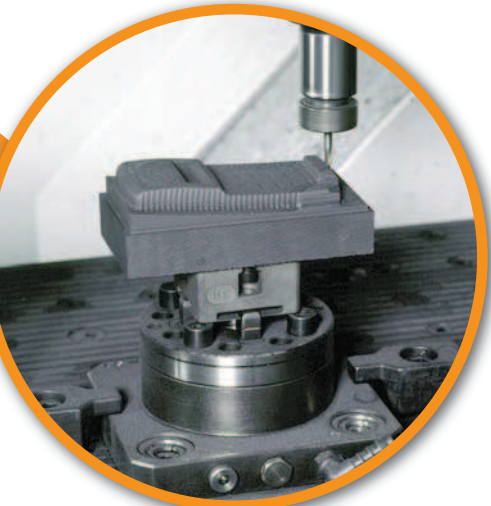
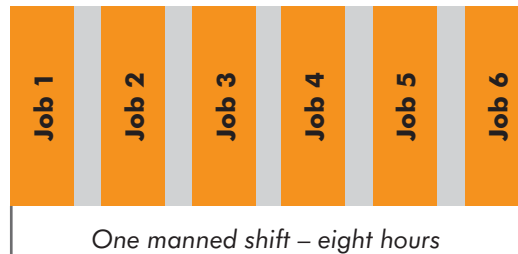
## Reference systems for electrode manufacturing & EDMing



## Conventional setting-up



## Pallet system



### Higher productivity, calculation example:

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

### Faster payback, calculation example:

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



### A reference system minimises setup times

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

### Big earnings are within your reach

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

**Work smarter, not harder.**

## From small to large

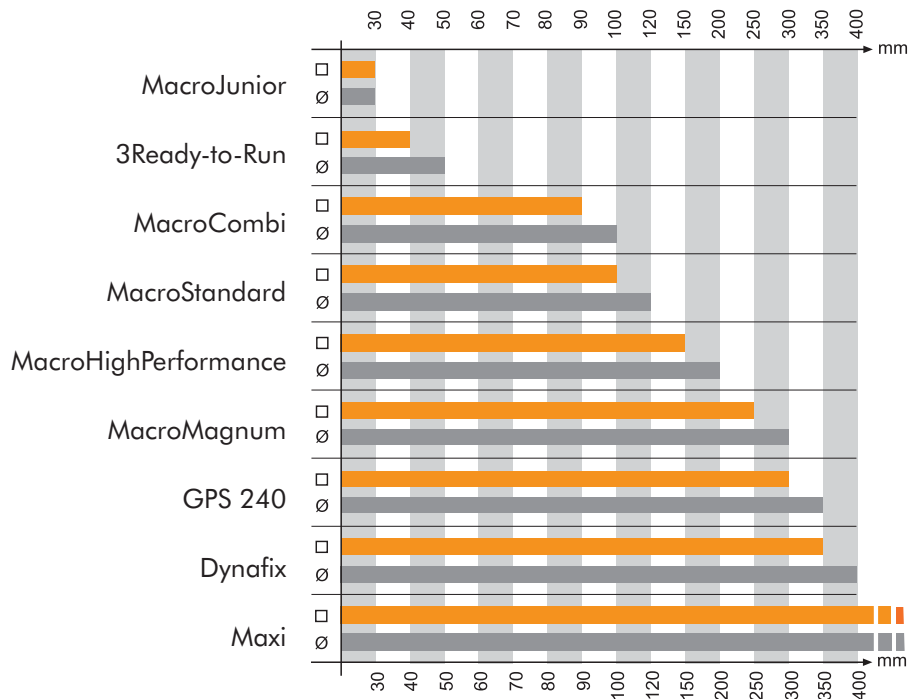
The engineering industry is complex. Every company is unique in terms of type of production, machinery, capacity etc.

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

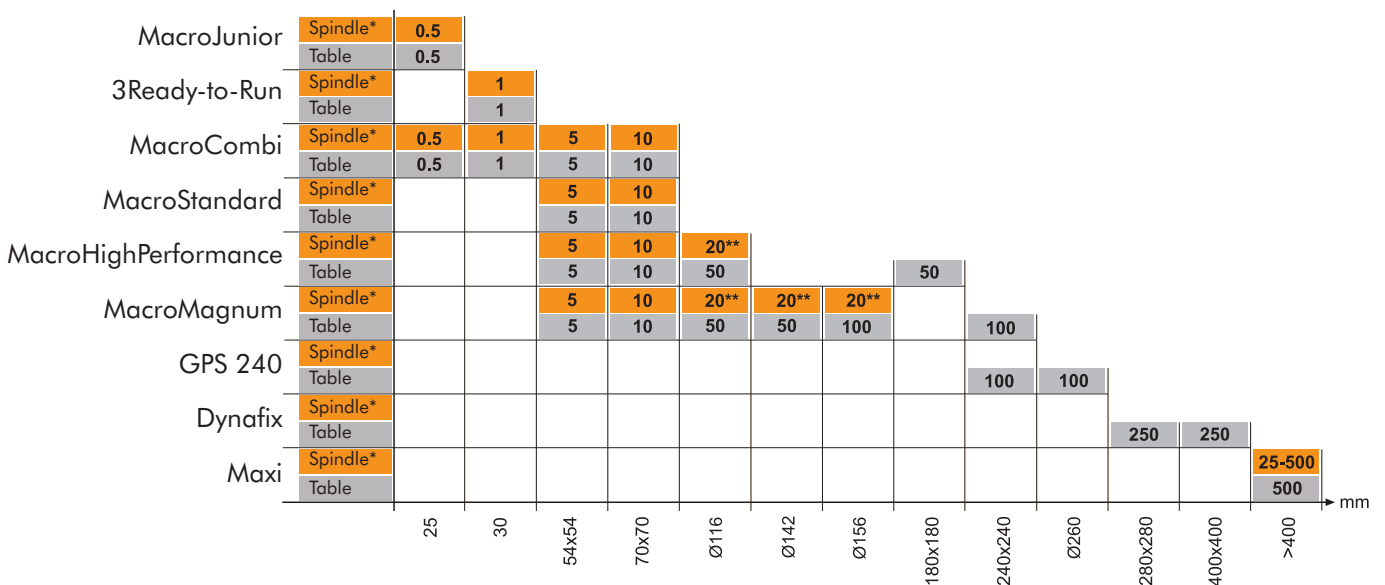
For every size of pallet there is a "recommended"

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



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



\* Die-sinking EDM spindle

\*\* With automatic changing

## 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.



Prepared for automatic chuck adapter.



Spherical rolls.



Inlets on side & underneath.



Low built-in height.



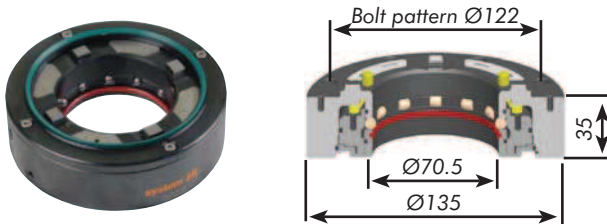
Pre-alignment studs.

## Matrix 110

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

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

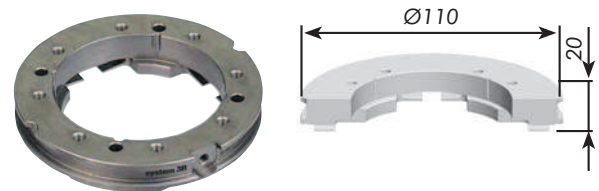
- Fixed index positions 4x90°
- Hardened references
- Clamping force 9000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-110
- Required air pressure,  $-6 \pm 1$  bar
- Weight 2.5 kg.



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

- Fixed index positions 4x90°
- Permissible press load 35 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-110 or similar
- Weight 0.5 kg.

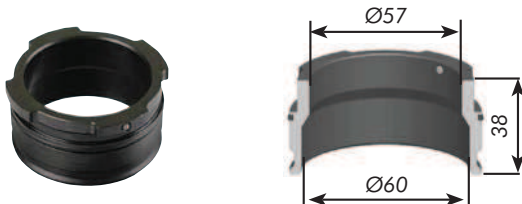
*Note: Not self carrying, requires extra support.*



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

- Adapted for automatic changing
- Weight 0.3 kg.

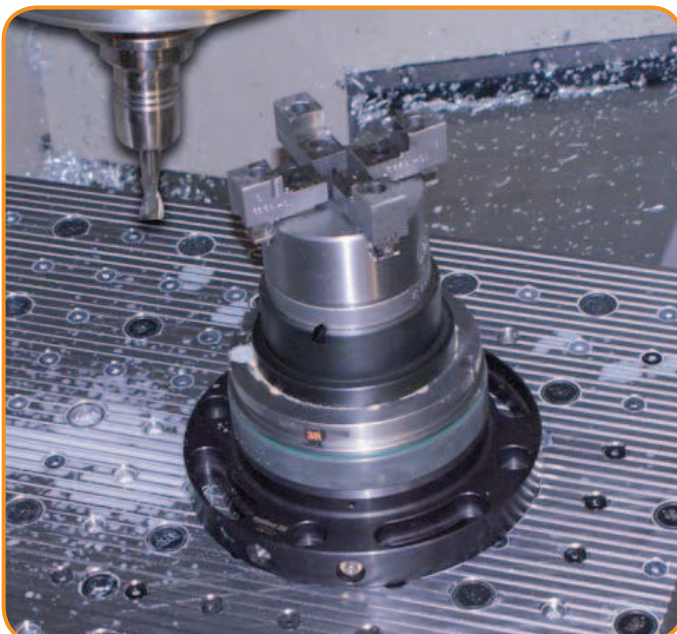
*Note: In automation the gripper has to grip on the pallet and not on the drawbar.*



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

For setting flatness and angular positions.

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



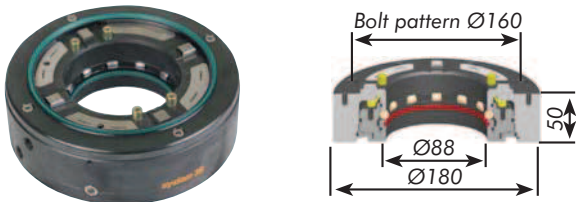
*Three-jaw chuck mounted on a pallet.*

## Matrix 142

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

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

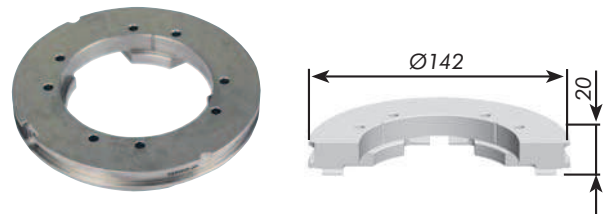
- Fixed index positions 4x90°
- Clamping force 12000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-142
- Required air pressure,  $-6 \pm 1$  bar
- Weight 7 kg.



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

- Fixed index positions 4x90°
- Permissible press load 80 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-142 or similar
- Weight 1.2 kg.

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



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

- Adapted for automatic changing
- Weight 0.5 kg.

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



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

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

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

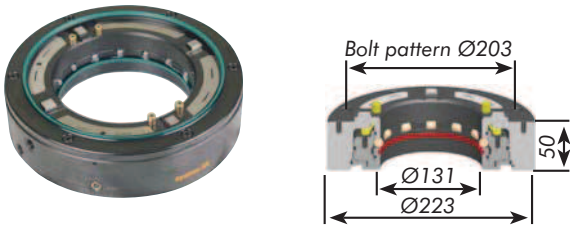


## Matrix 185

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

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

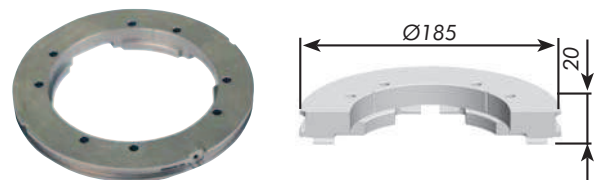
- Fixed index positions 4x90°
- Hardened references
- Clamping force 16 000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-185
- Required air pressure,  $-6 \pm 1$  bar
- Weight 9 kg.



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

- Fixed index positions 4x90°
- Permissible press load 130 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-185 or similar
- Weight 1.7 kg.

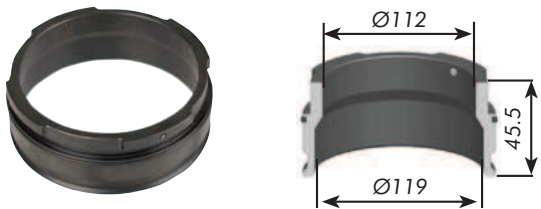
*Note: Not self carrying, requires extra support.*



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

- Adapted for automatic changing
- Weight 0.8 kg.

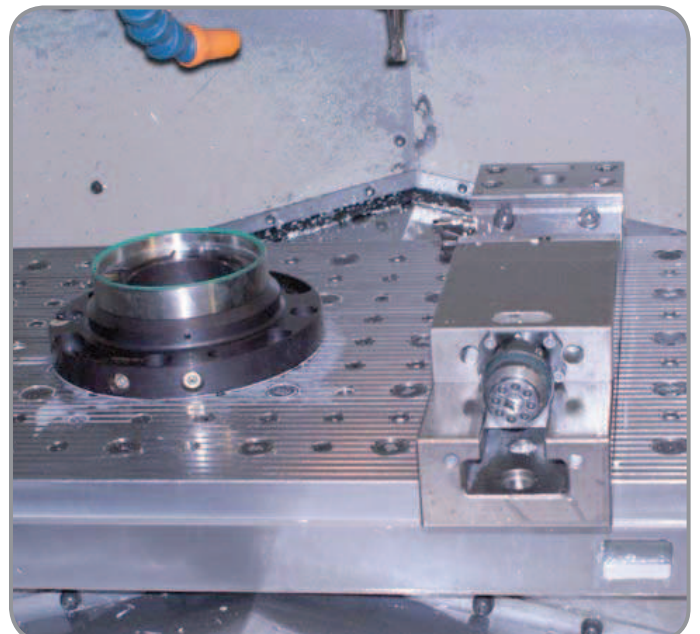
*Note: In automation the gripper has to grip on the pallet and not on the drawbar.*



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

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

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

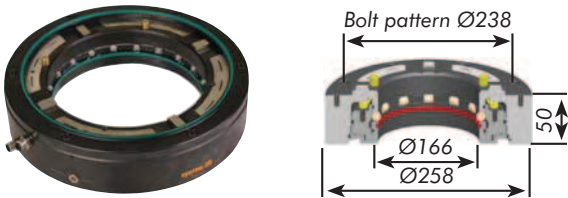


## Matrix 220

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

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

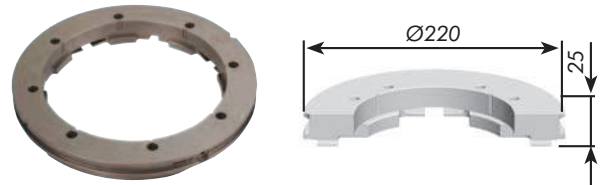
- Fixed index positions 4x90°
- Clamping force 18500 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-220
- Required air pressure,  $-6 \pm 1$  bar
- Weight 11 kg.



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

- Fixed index positions 4x90°
- Permissible press load 160 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-220 or similar
- Weight 2.6 kg.

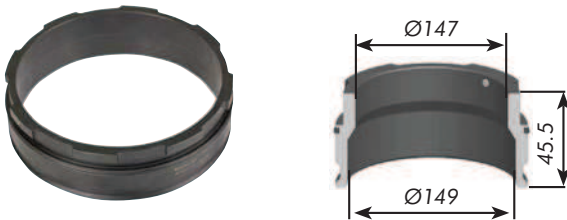
Note: Not self carrying, requires extra support.



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

- Adapted for automatic changing
- 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.

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



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

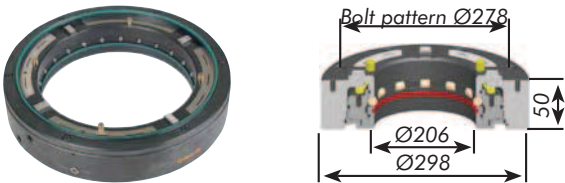


## Matrix 260

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

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

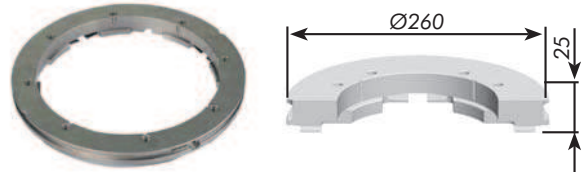
- Fixed index positions 4x90°
- Hardened references
- Clamping force 24000 N
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-260
- Required air pressure, - 6±1 bar
- Weight 13 kg.



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

- Fixed index positions 4x90°
- Permissible press load 210 ton
- Permissible torque 570 Nm
- Required drawbar 3R-695.2-260 or similar
- Weight 3.2 kg.

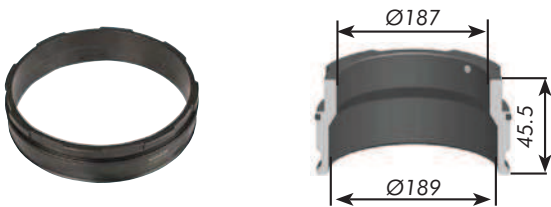
*Note: Not self carrying, requires extra support.*



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

- Adapted for automatic changing
- Weight 1.5 kg.

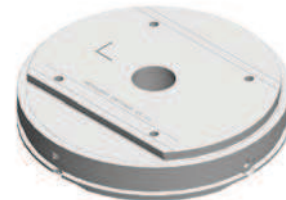
*Note: In automation the gripper has to grip on the pallet and not on the drawbar.*



### Check ruler, Matrix 260 3R-696.1-260

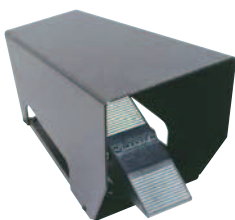
For setting flatness and angular positions. Ground hole for centering.

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

