

System 3R

Tooling

for Powder Compacting Technology



System 3R

Simple, quick & precise!

- + Simple, quick set-up
- + High accuracy
- + Low scrap rate
- + Maximal machine utilization
- + Increased productivity



Contents

Introduction	2
Tooling systems for punches and dies	6
Singel level configuration	8
Multi level configuration	11
Flexibility in Press	14
Veryfying tools	17
System 3R – One Source Productivity Solutions	19



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!

Use System 3R tooling when producing punches and dies

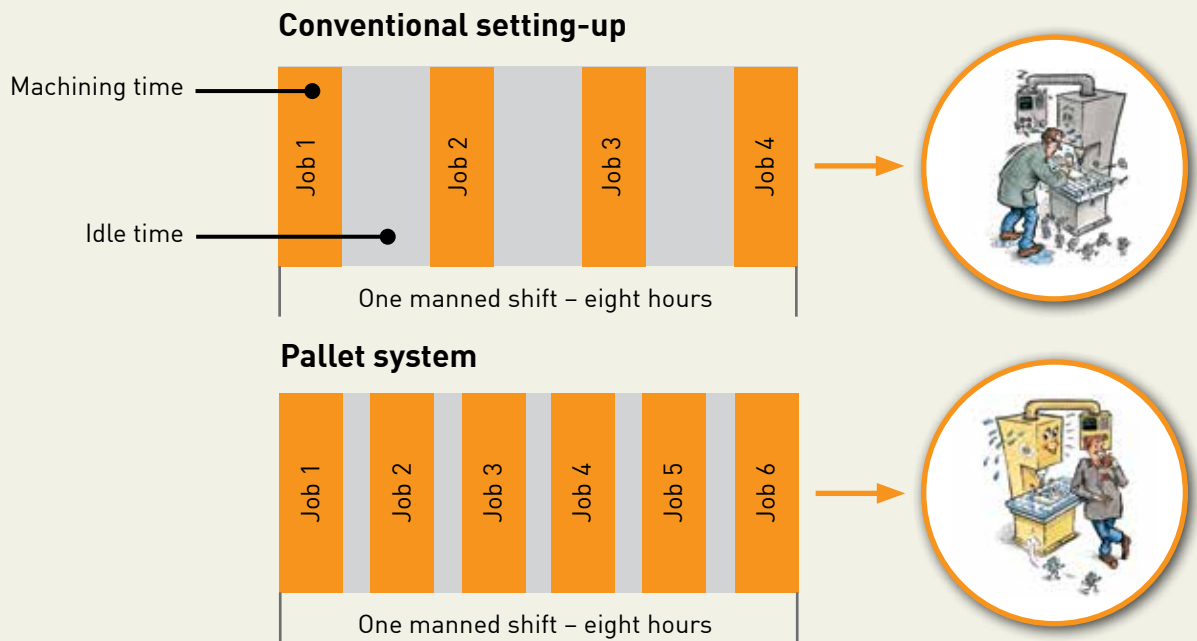
Gives an increased productivity in the Tool shop by a reduction of the set-up times, improved accuracy & quality and reduced number of rejections.

Use System 3R tooling also in the powder compaction process

Reduces the set-up times in the press and gives an improved accuracy & quality and less repairs.



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.**



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.

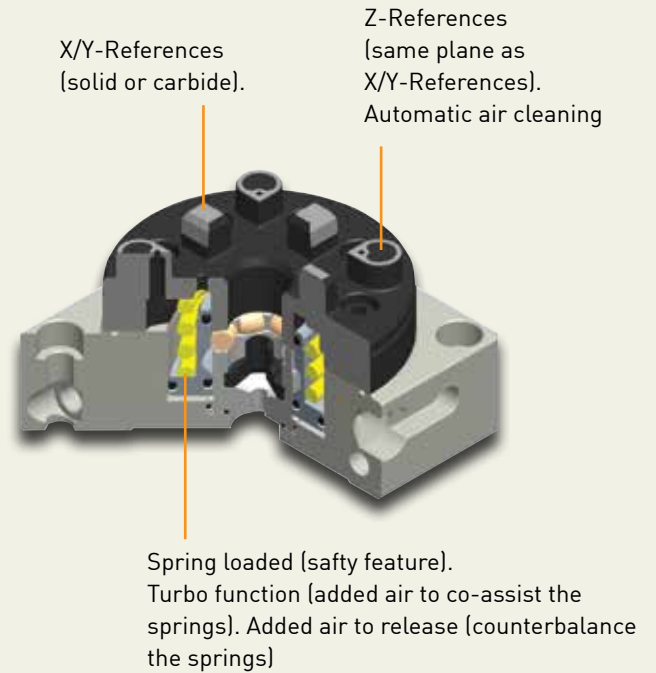
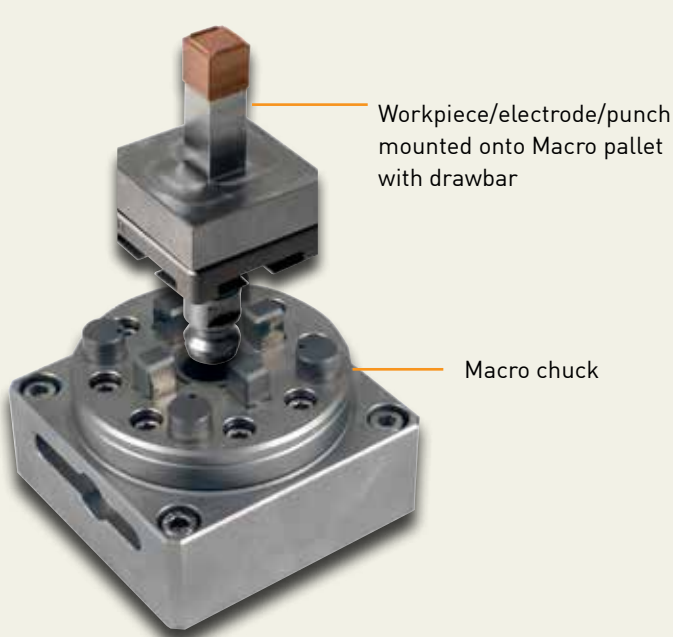
Big earnings are within your reach

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

Work smarter, not harder.

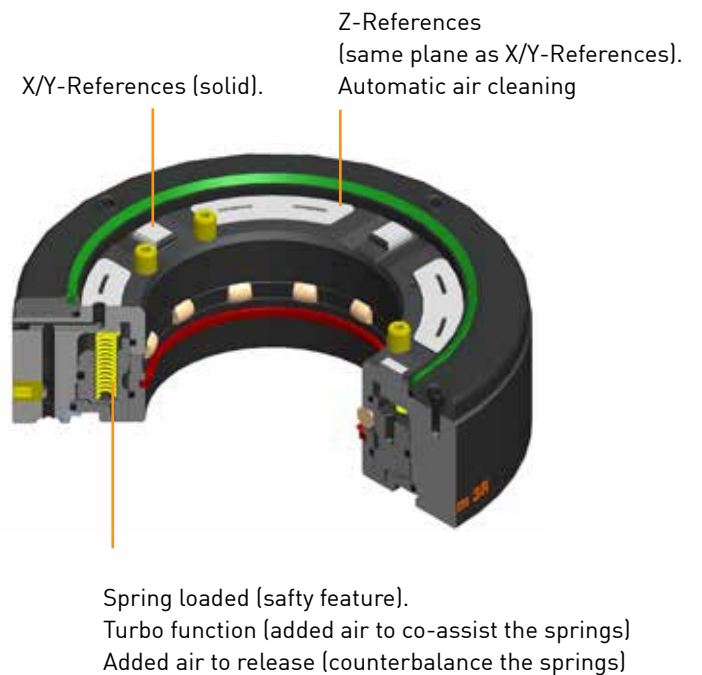
The Macro system for punches

Choice of reference element is determined by required pressing force.



Note: Recommended air pressure, pneumatic chuck 6 ± 1 bar.

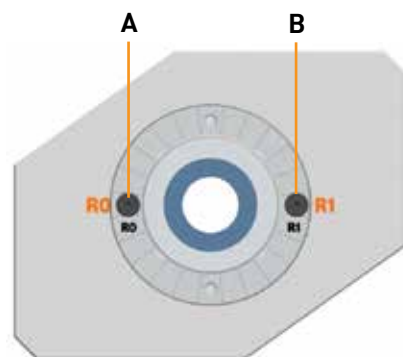
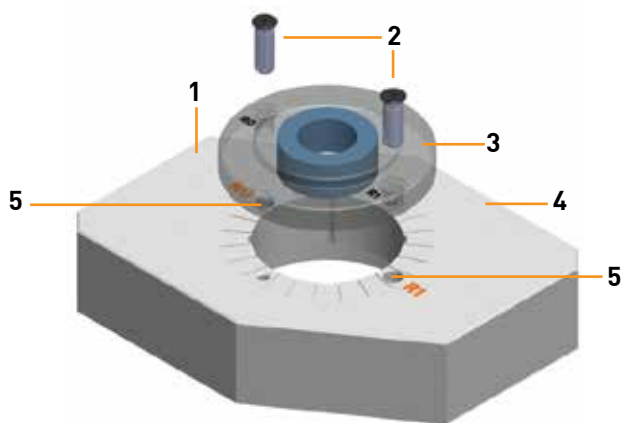
The Matrix system for dies and punches



Note: For the entire product range see www.system3r.com

3Refix for dies

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



Description

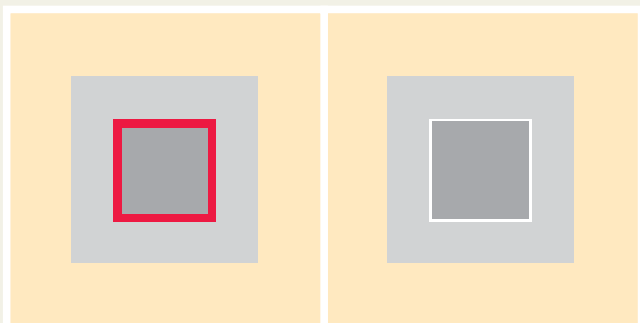
- 1 Z-reference surface
- 2 3Refix mandrels $\varnothing 10\text{mm}$, 3R-901-10PM-TX
- 3 Customer made die
- 4 Die plate (table)
- 5 Die plate only requires two holes for 3Refix mandrels

Procedure (always)

- A Tighten R0 (primary)
- B Tighten R1 (secondary)

Positioning accuracy

Improved positional accuracy.
Closer tolerances for finer grains.

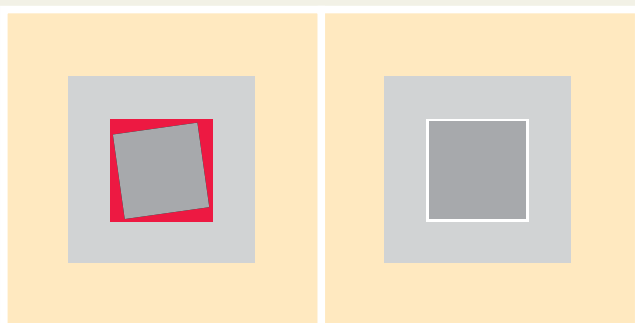


Conventional setting-up

Setting-up with System 3R

Angular accuracy

Smaller angular deviations
Less wear and damage to punch and die.



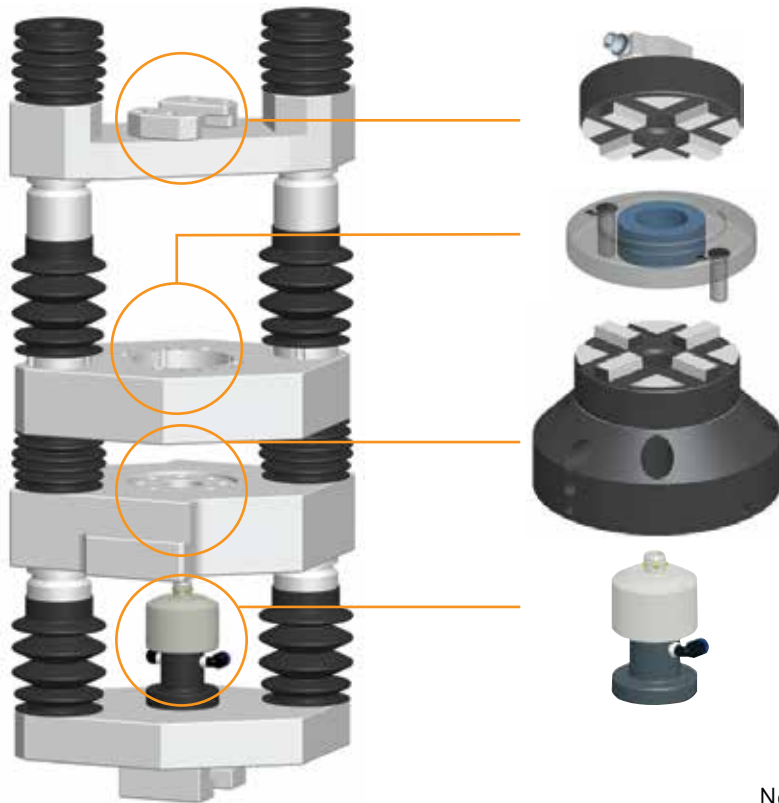
Conventional setting-up

Setting-up with System 3R

Single level configuration

Manual option

Press adaptor



Upper punch

Manual chuck Ø75, Macro PM, 3R-600.27-XX

Die with 3Refix mandrels

3Refix mandrel, 3R-901-10PM-TX

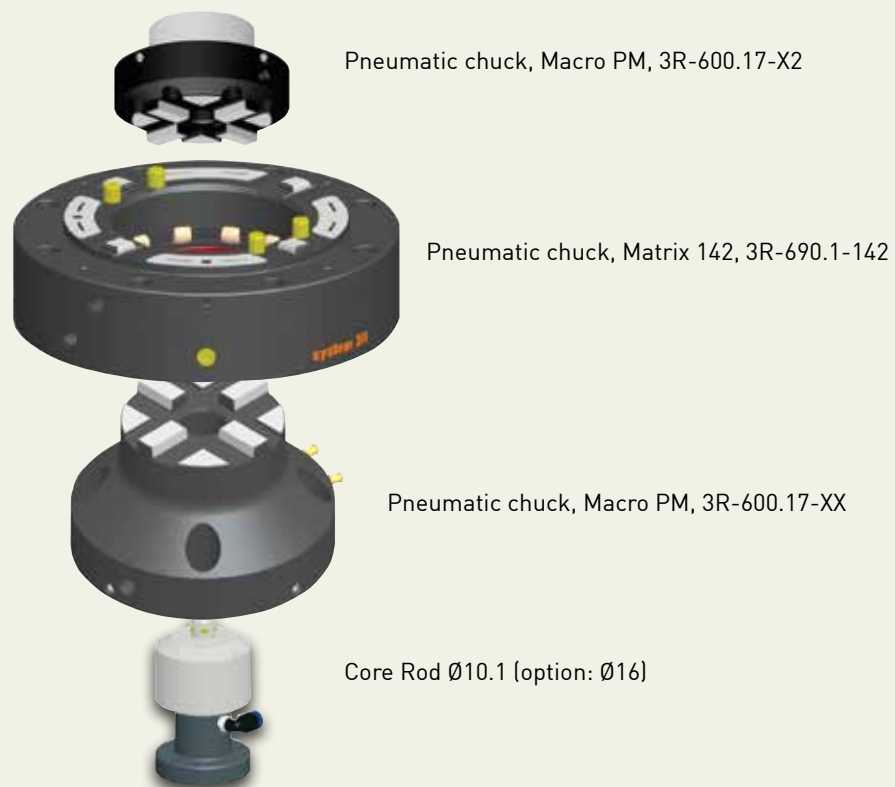
Lower punch

Manual chuck Ø75, Macro PM, 3R-600.27-XX
with Distance block, Macro PM, 90615-02

Core rod

Note: Press adaptor could also be produced upon request.

Automatic option



Pneumatic chuck, Macro PM, 3R-600.17-X2

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

Pneumatic chuck, Macro PM, 3R-600.17-XX

Core Rod Ø10.1 (option: Ø16)

Single level configuration

Die

3Refix mandrel, Ø10 mm, 3R-901-10PM-TX

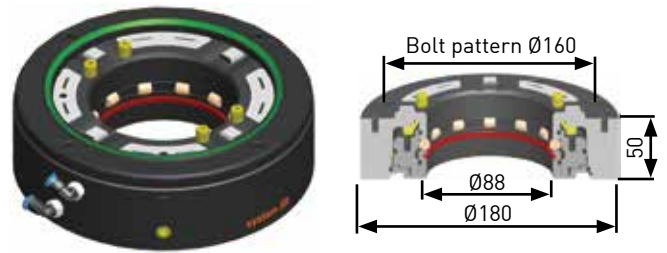
- Recommended tightening torque 4 Nm.
- Weight 0.02 kg.



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

Chuck for permanent mounting into a PM press.
Note: HD version available.

- Fixed index positions 4x90°
- Required drawbar 3R-695.2-142
- Weight 7 kg.



Punch

Distance block, Macro, 90615-02

For manual Macro chuck, i.e. 3R-600.27-XX.

- Height 47 mm.
- Weight 2.8 kg.



Manual chuck Ø75, Macro PM, 3R-600.27-20

- Built in height 22 mm
- Maximal pressure 20 ton.
- Required drawbar 3R-605.11
- Weight 1 kg.

Manual chuck Ø75, Macro PM, 3R-600.27-50

- Built in height 22 mm
- Maximal pressure 50 ton.
- Required drawbar 3R-605.11
- Torque 6 Nm.
- Weight 1 kg.

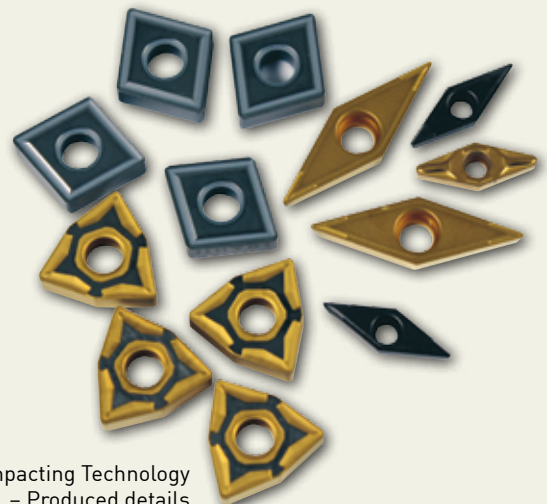


Pneumatic chuck, Macro PM, 3R-600.17-20

- Built in height 70 mm
- Max pressure 20 ton.
- Required drawbar 3R-605.11
- Weight 4 kg.

Pneumatic chuck, Macro PM, 3R-600.17-50

- Built in height 70 mm
- Max pressure 50 ton.
- Required drawbar 3R-605.11
- Weight 4 kg.



Powder Compacting Technology
– Produced details

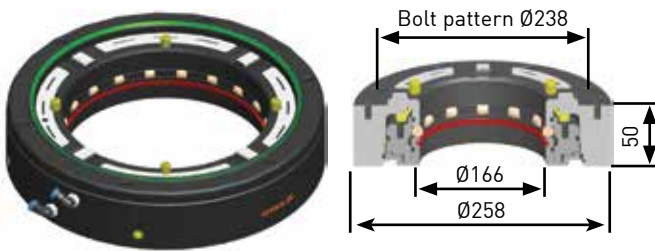
Single level configuration

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

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

Note: HD version available.

- Maximal pressure 160 ton.
- Required drawbar 3R-695.2-220
- Weight 11 kg.

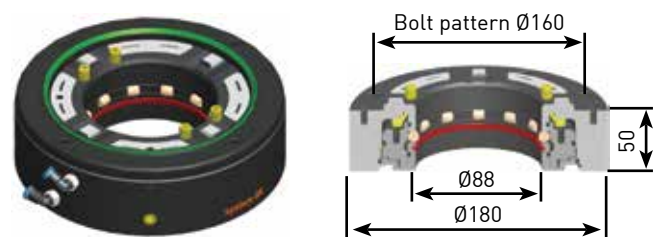


Pneumatic chuck, Matrix 142, 3R-690.1-142

Chuck for permanent mounting into a PM press.

Note: HD version available.

- Maximal pressure 80 ton.
- Required drawbar 3R-695.2-142
- Weight 7 kg.



Built in chucks

Pneumatic, Macro PM, 3R-600.17-22

- Built in height 30 mm
- Max pressure 20 ton.
- Required drawbar 3R-605.11
- Weight 2 kg.

Pneumatic, Macro PM, 3R-600.17-52

- Built in height 30 mm
- Max pressure 50 ton.
- Required drawbar 3R-605.11
- Weight 2 kg.

Pneumatic chuck, Macro PM, 3R-600.17-20

- Built in height 70 mm
- Required drawbar 3R-605.11
- Max pressure 20 ton.

Pneumatic chuck, Macro PM, 3R-600.17-50

- Built in height 70 mm
- Required drawbar 3R-605.11
- Max pressure 50 ton.

Pneumatic chuck, Macro PM, 90803.50

- Built in height 70 mm
- Required drawbar 90840.55 (core rods up to Ø16 mm can be used)
- Max pressure 40 ton.



Torque wrench, 4 Nm, 3R-614-04

Intended for 3Refix mandrels.

- 4 Nm.

Torque wrench, 6 Nm, 3R-614-06

Intended for Macro manual chucks.

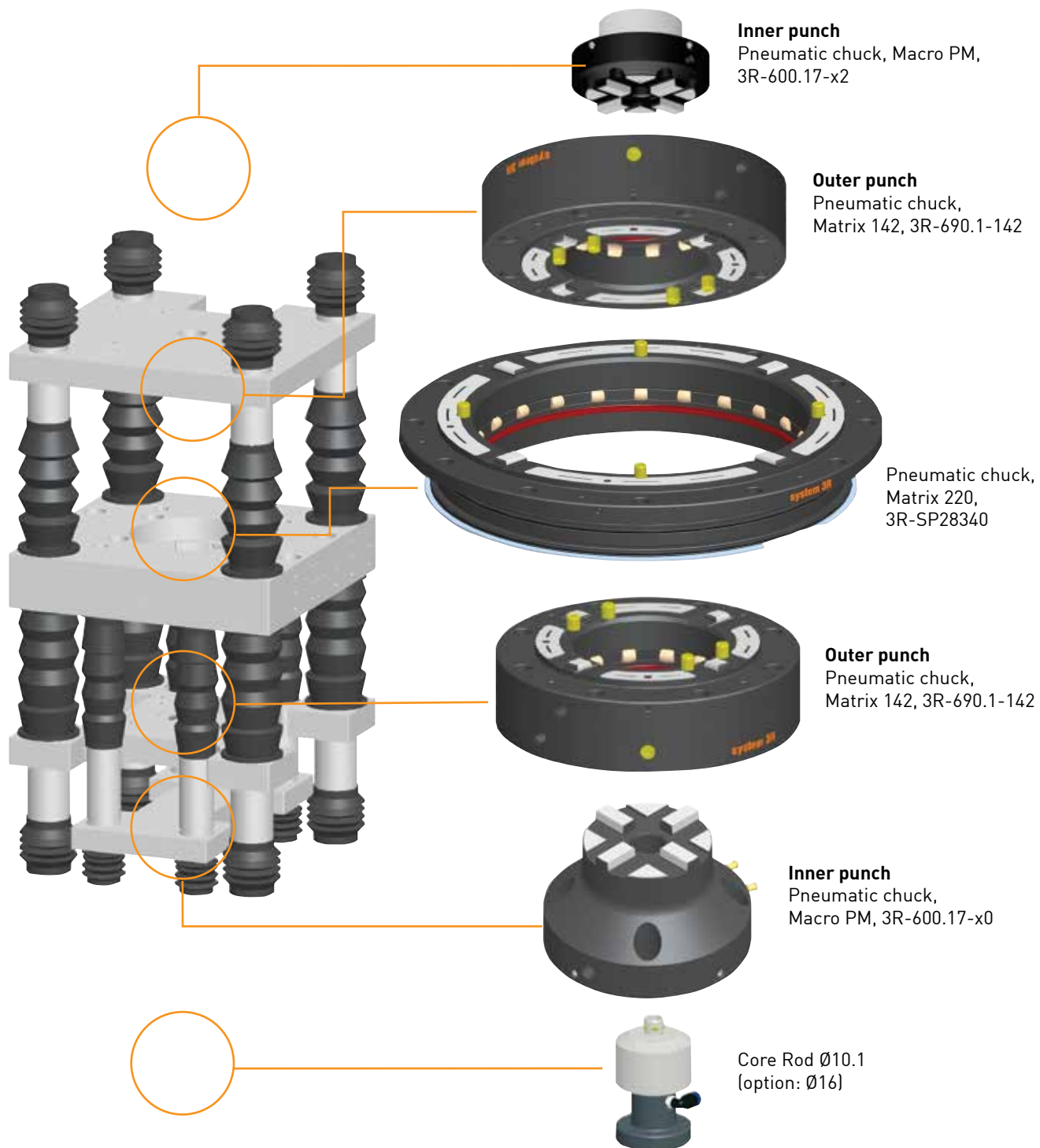
- 6 Nm.

Air unit, 90125.25-05

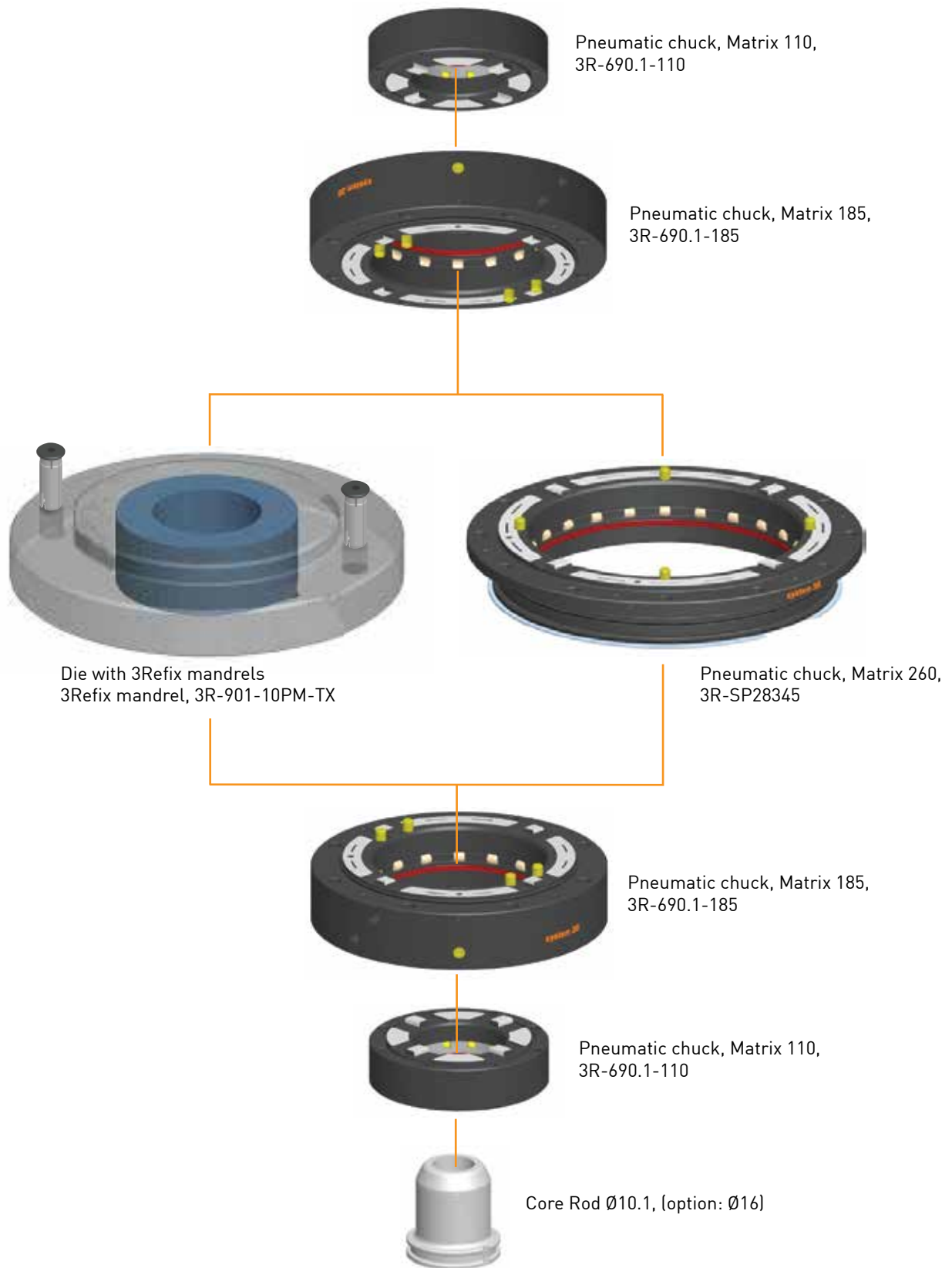
- Weight 1 kg.



Multi level configuration, #1



Multi level configurations, #2



Multi level configuration

Die

3Refix mandrel, Ø10 mm, 3R-901-10PM-TX

- Recommended tightening torque 4 Nm.
- Weight 0.02 kg.

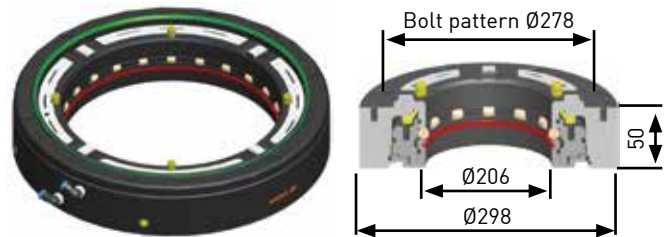


Pneumatic chuck, Matrix 260, 3R-690.1-260

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

Note: HD version available.

- Maximal pressure 210 ton.
- Hardened references
- Required drawbar 3R-695.2-260
- Weight 13 kg.



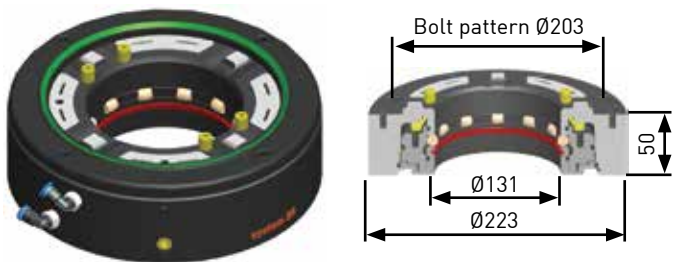
Outer punch

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

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

Note: HD version available.

- Maximal pressure 130 ton.
- Required drawbar 3R-695.2-185
- Weight 9 kg.



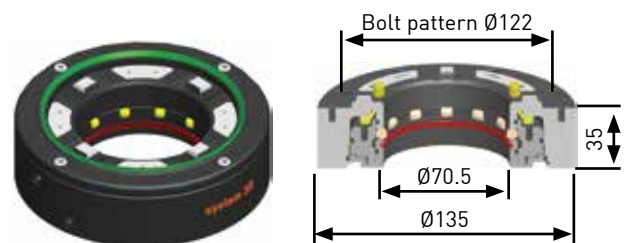
Inner punch

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

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

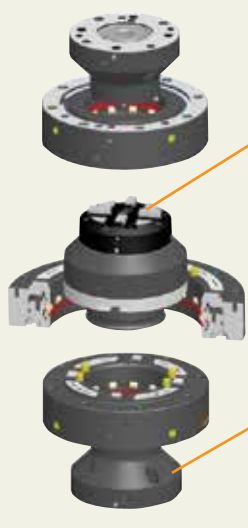
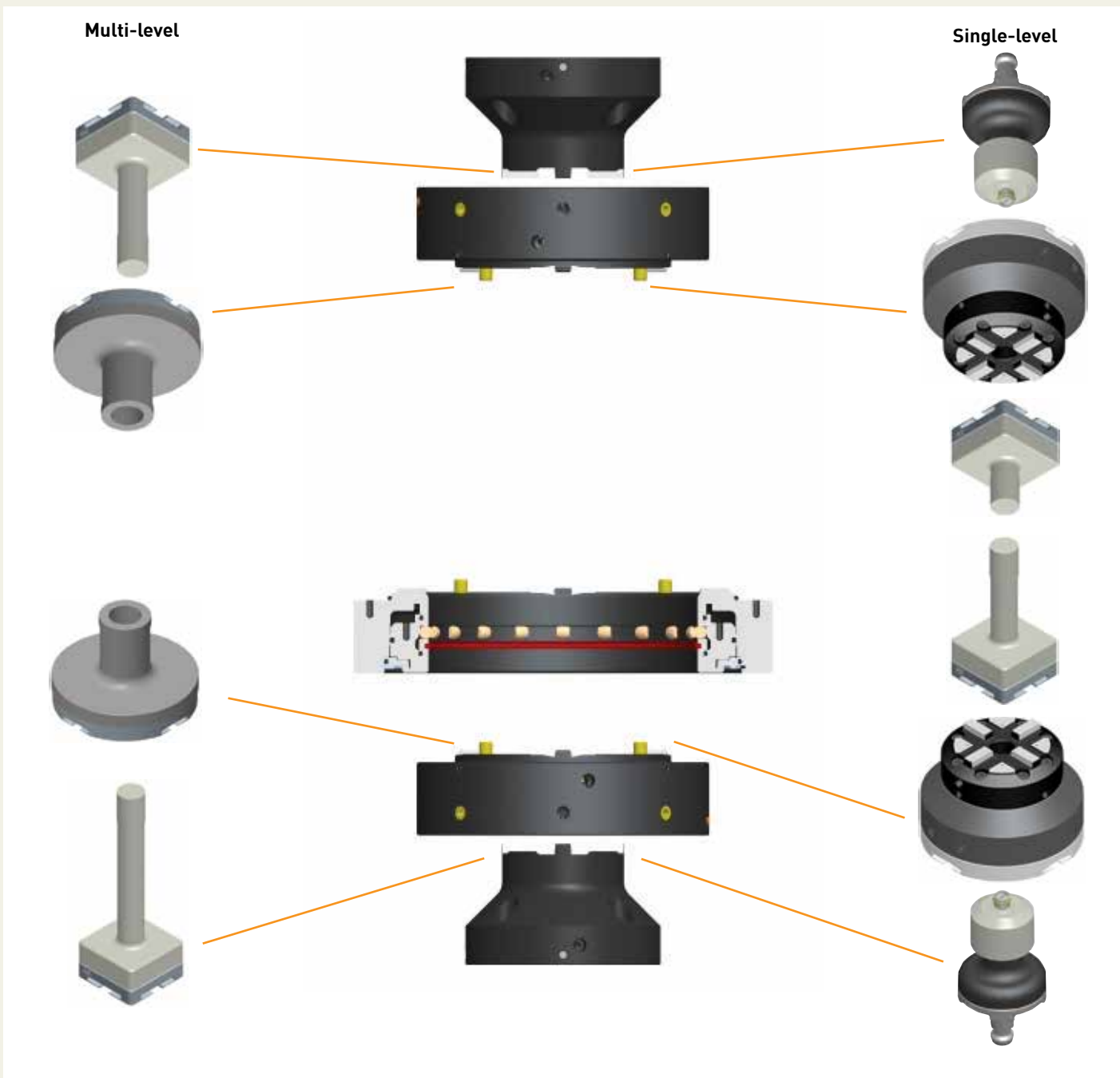
Note: HD version available.

- Maximal pressure 35 ton.
- Required drawbar 3R-695.2-110
- Weight 2.5 kg.



Powder Compacting Technology
– Produced details

Maintain flexibility in Press – Alternate Multi to single configuration

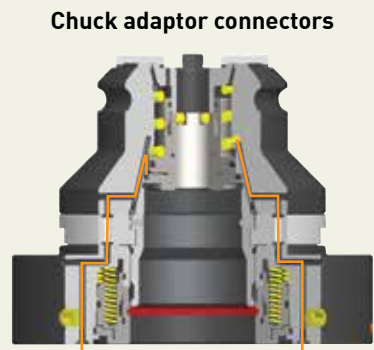


2. Load chuck adapter for single punch

1. Load chuck adapter for shorter core rod.



Connectors for Pneumatic chuck, Matrix142



Unclamp

Turbo/Airblast cleaning

Pallets & drawbars, Macro

Macro pallet 54 mm, 3R-651.7E-P

- Max press force: 12 ton.
- Supplied in set of 8 pcs
- Rust resistance material
- Size 54x54x12.5 mm
- Weight 0.2 kg.



Macro pallet Ø75 mm, 3R-651.75E-P

- Max press force: 20 ton.
- Supplied in set of 10 pcs
- Rust resistance material
- Size Ø75x12.5 mm
- Weight 0.3 kg.



Macro pallet Ø75 mm, 3R-651.75-50

- Max press force: 50 ton.
- Rust resistance material
- Size Ø75x12.5 mm
- Weight 0.3 kg.



Drawbar, Macro, 90840.55

- Requires chuck 90803.50
- Through hole Ø 16 mm
- Weight 0.2 kg.



Drawbar, Macro, 3R-605.11

- Through hole Ø 10.2 mm
- Weight 0.2 kg.



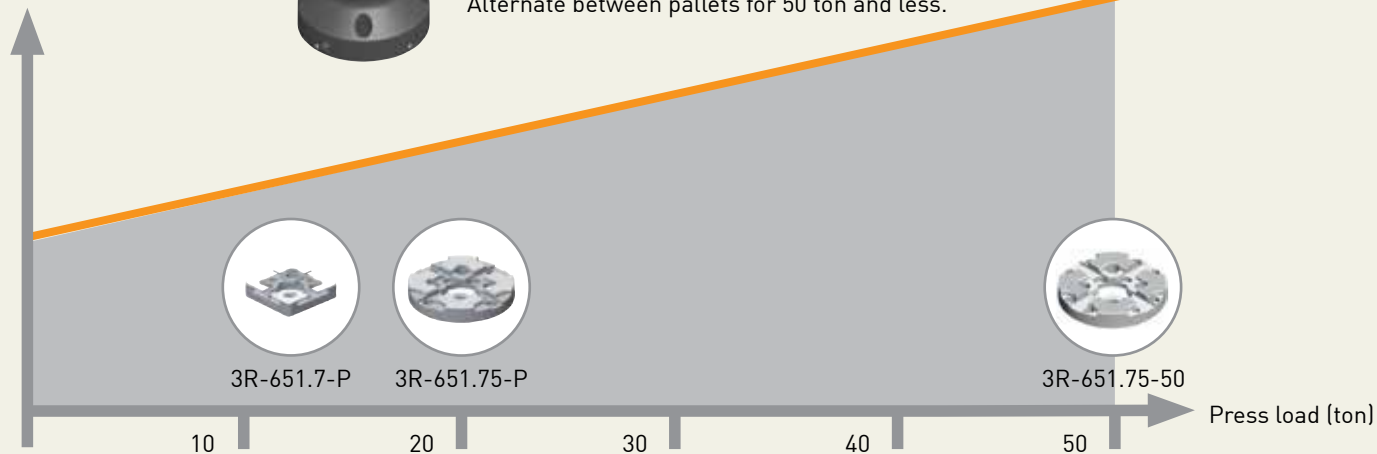
Note: With automation, the gripper has to grip on the pallet or change drawbar with gripper interface (i.e. 3R-605.1).

Choice of chuck, sets permissible max press load for punches

Price on consumables
pallets



Example: MacroPM chuck, 3R-600.17-50
Max. Press force: 50 ton.
Alternate between pallets for 50 ton and less.

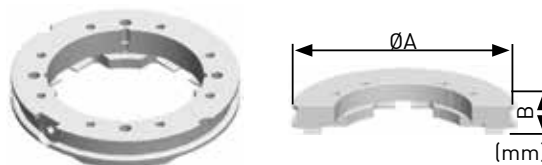


Pallets, drawbars & check rulers, Matrix

Pallets, Matrix

- Rust resistance material
- Adapted for automatic changing.

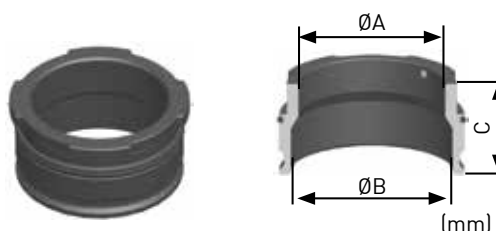
Note: Not self carrying, requires extra support.



Art. No	A	B	Press load (ton)	Drawbar	Weight (kg)
3R-691.1-110	110	20	35	3R-695.2-110	0.5
3R-691.1-142	142	20	80	3R-695.2-142	1.2
3R-691.1-185	185	20	130	3R-695.2-185	1.7
3R-691.1-220	220	25	160	3R-695.2-220	2.6
3R-691.1-260	260	25	210	3R-695.2-260	3.2

Drawbars, Matrix

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



Art. No	A	B	C	Weight (kg)
3R-695.2-110	57	60	38	0.3
3R-695.2-142	67	76	45.5	0.5
3R-695.2-185	112	119	45.5	0.8
3R-695.2-220	147	149	45.5	1.3
3R-695.2-220	187	189	45.5	1.5

Check rulers, Matrix

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

- Adapted for automatic changing
- Ready for code carrier.



Art. No	Measuring length	Weight (kg)
3R-696.1-110	80	1.6
3R-696.1-142	100	3.4
3R-696.1-185	125	5.7
3R-696.1-220	140	7.5
3R-696.1-260	160	10

Aligning equipment for all chucks in the press – Verifying tool, HP



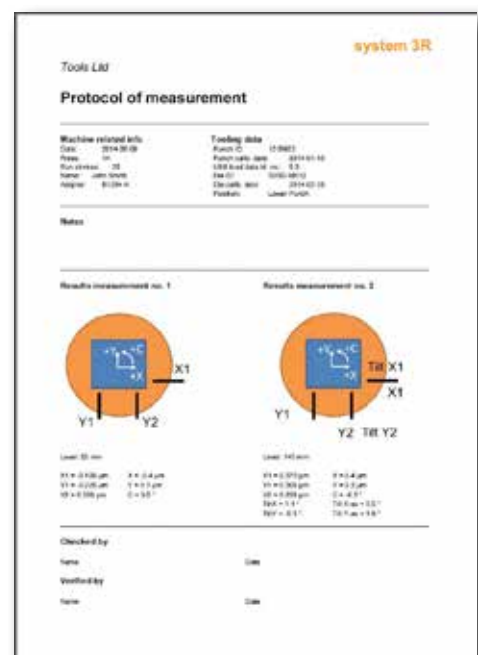
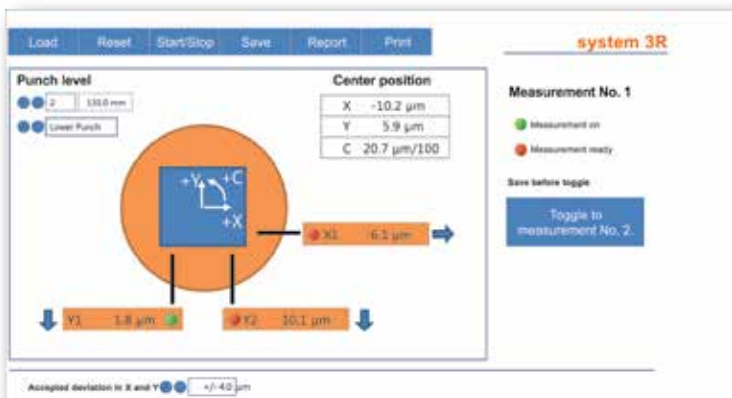
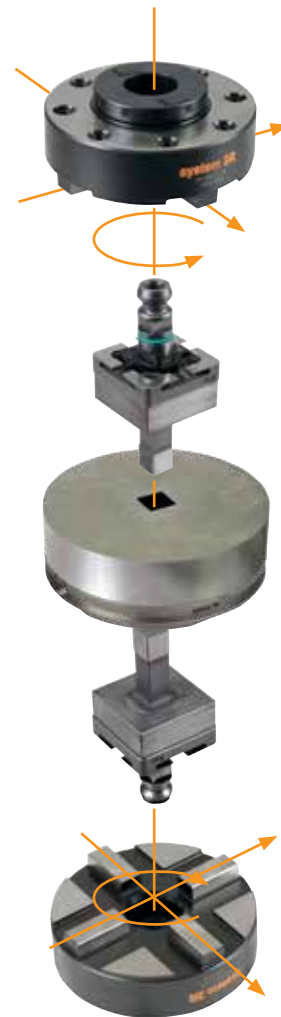
Software makes it easy to read and follow the steps.
Formal document is possible to print and/or store after alignment.

Verification set – High Performance

A set of non-contact device utilizing IR-LED light and electronics to measure distances more accurately down to $0.1 \mu\text{m}$ within a second. Handheld computer allows operator to bring it inside the machine for better monitoring of exact location while checking alignment. After each punch chuck has been aligned, values may be printed or stored. These sets are made available by various tooling interfaces though only made for single-level press.

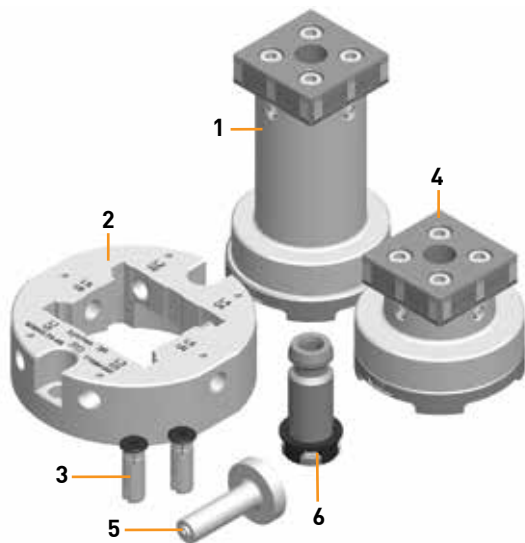
Contents:

- Lap-top
- Software
- Converter (light to signals)
- Die pallet to house fiber optical cables
- Punch for upper and lower chuck
- Check-tool
- Drawbar
- 3Refix mandrels
- Torque wrench.



Verifying tools, Standard

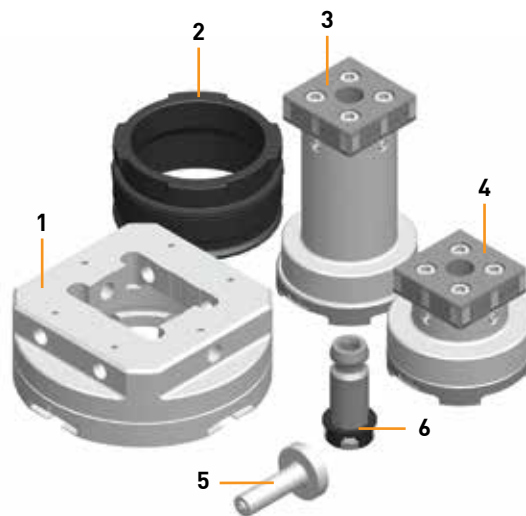
For Single-level press, 3Refix



- 1 Lower punch (Macro)
- 2 Die pallet to hold dial indicators
- 3 3Refix \varnothing 10 mm
- 4 Upper punch (Macro)
- 5 Pre-set tool
- 6 Drawbar (Macro)

Note: Dial indicators are optional.

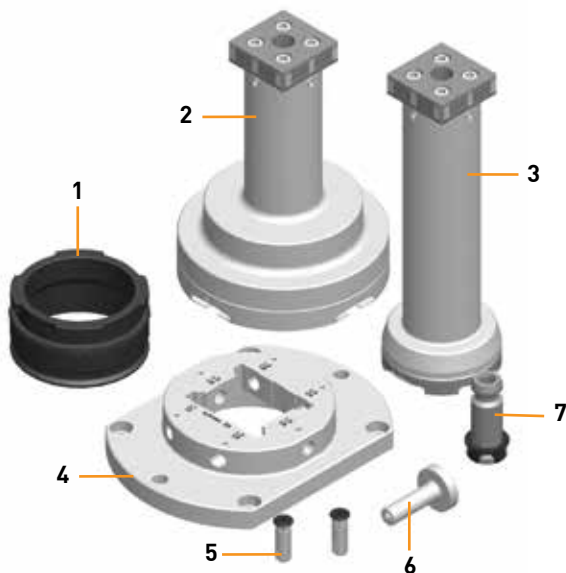
For Single-level press, Matrix 142



- 1 Die pallet to hold dial indicators (Matrix 142)
- 2 Drawbar (Matrix 142)
- 3 Lower punch (Macro)
- 4 Upper punch (Macro)
- 5 Pre-set tool
- 6 Drawbar (Macro)

Note: Dial indicators are optional.

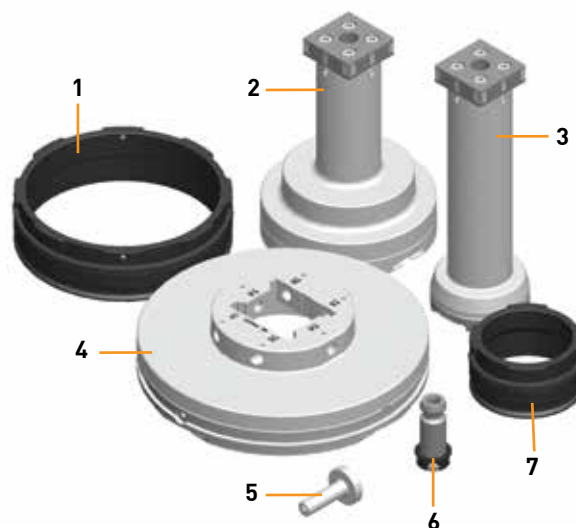
For Multi-level press, 3Refix



- 1 Drawbar (Matrix 142)
- 2 Outer punch (Matrix 142)
- 3 Inner punch (Macro)
- 4 Die pallet to hold dial indicators
- 5 3Refix \varnothing 10 mm
- 6 Pre-set tool
- 7 Drawbar (Macro)

Note: Dial indicators are optional.

For Multi-level press, Matrix 220



- 1 Drawbar (Matrix 220)
- 2 Outer punch (Matrix 142)
- 3 Inner punch (Macro)
- 4 Die pallet to hold dial indicators (Matrix 220)
- 5 Pre-set tool
- 6 Drawbar (Macro)
- 7 Drawbar (Matrix 142)

Note: Dial indicators are optional.

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



Tooling Catalogues

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



Automation Catalogues

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

For details, Please ask for a copy on your own.

GF Machining Solutions – A complete solution provider

GF Machining Solutions is a leading provider to the tool and mold making industry and to manufacturers of precision components.

- + Based in Switzerland, globally active with 50 sites worldwide
- + At your service with more than 3,000 employees
- + We are a premium brand in these core businesses: EDM, Milling and spindles, Laser, Tooling, Automation & Customer Services.



Die-sinking EDM



Spindle



Laser



Hole-drilling EDM



Milling



Wire-cutting EDM



Automation



Customer Services



Tooling

Our chucks can also be delivered with state-of-the-art-technologies for extra high performance

VDP - Vibration Damped Palletisation

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



Nano

- ... 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.

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.

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

- + Available in Macro and Matrix tooling systems.
- + Repetition accuracy – less than 0.001 mm.



Automation

Utilise every hour of the day and night!

An automatic production cell can generate revenue round the clock, seven days a week. Why be satisfied with 40 productive machine-hours a week when the same machine can achieve over 100 additional hours a week? Use every hour of the day and night for production!

WorkPal, WorkPartner and Transformer - three "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



WorkPartner 1+
– can serve two machines



Transformer
– a modular automation concept



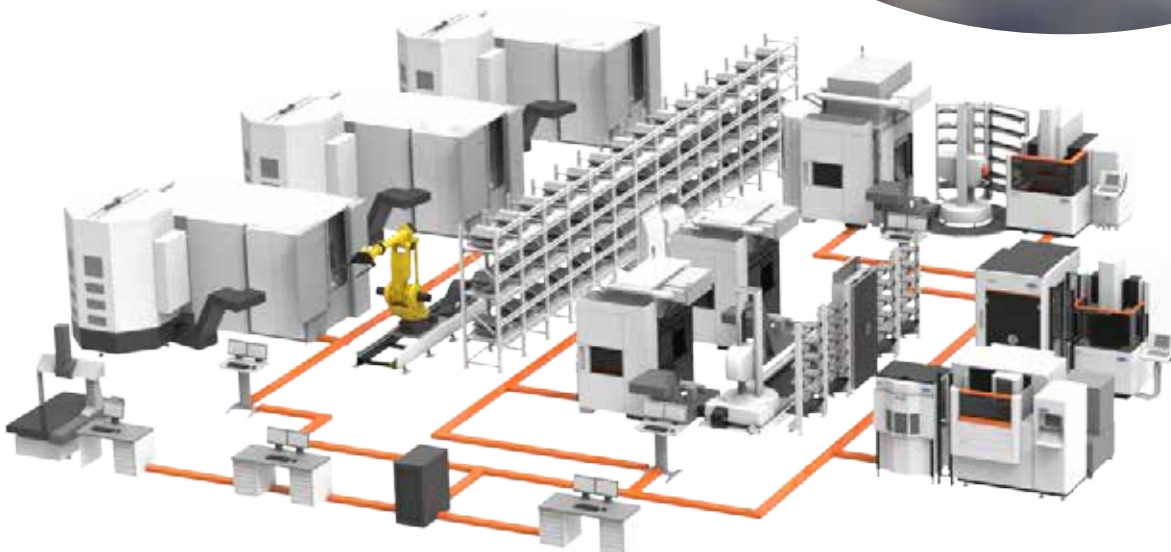
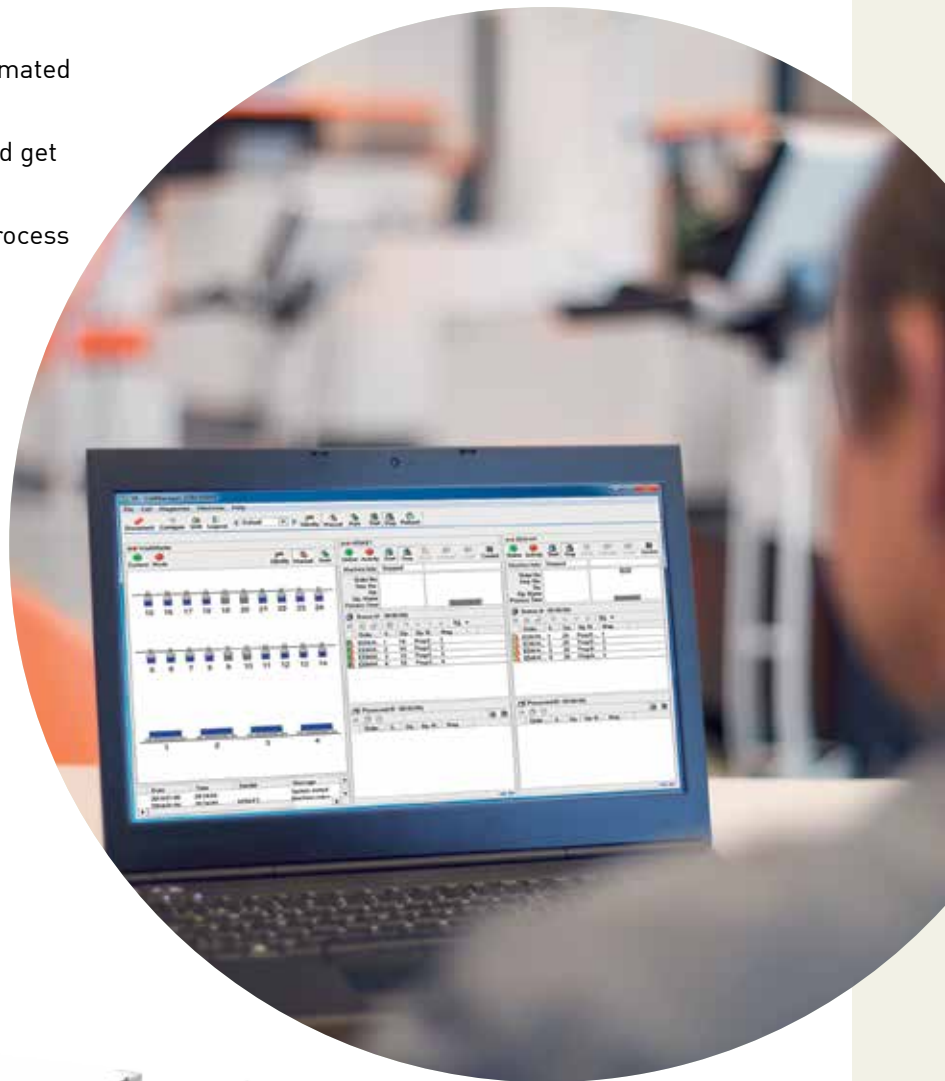
Automation – with six-axis Fanuc industrial robot

WSM – WorkShopManager

User-friendly Cell Management Software

Master workshop complexity and manage all control processes with our software. For manually controlled and automated processes.

- + Simplify the preparation of jobs
- + Easily execute the jobs in manual or automated machines
- + Monitor the process, change priorities and get utilization statistics
- + ID chip management to ensure highest process security.



At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser and Automation solutions. A comprehensive package of Customer Services completes our proposition.

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