system 3R

TOOLING I AUTOMATION I SOFTWARE

Tooling for powder compacting technology

Design and quality by System 3R

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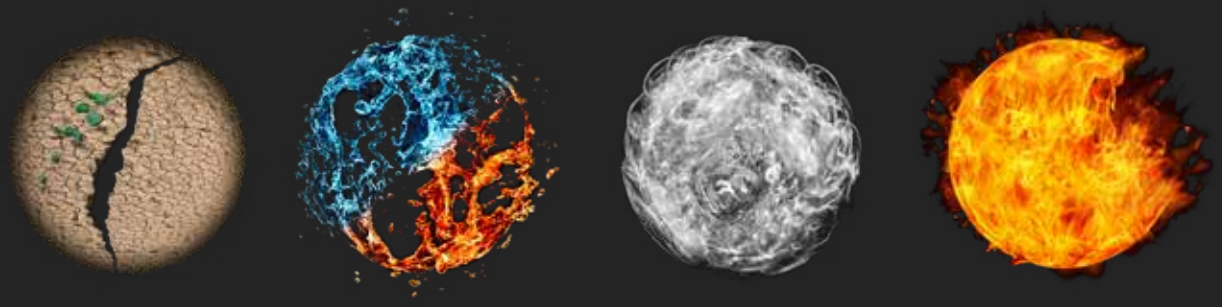
Chuck precision:

Std Standard

Adv Advanced

Hi-end High-end

Care for the environment and protection of natural resources are key elements in System 3R's operations



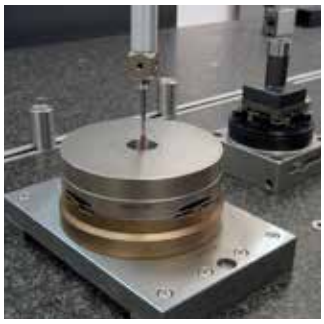
We take all necessary precautions to prevent contamination of soil, air and water.

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.

System 3R in your toolshop






MINIMISING SET-UP TIMES

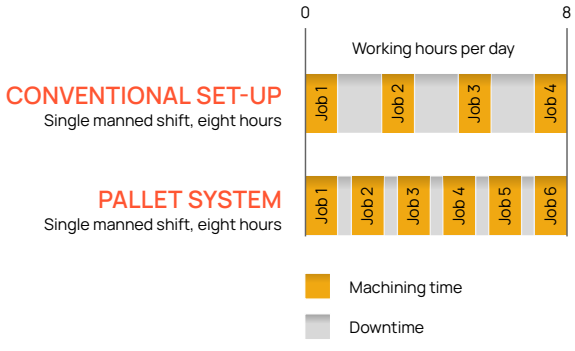
Experience has consistently shown that reducing a machine's downtime is significantly more worthwhile than chasing seconds in the actual machining process.

A stable and exact reference system is the way to achieve this. It lets you preset away from the machine and then get it running with minimum downtime. Quickly and precisely!

Every minute converted from internal to external set-up time increases a machine's spindle time and business productivity.

MAXIMISING MOBILITY

Fitting machines with the same reference system means that electrodes and workpieces can be moved between them without subsequent alignment and checking – **One Minute Set-up.**



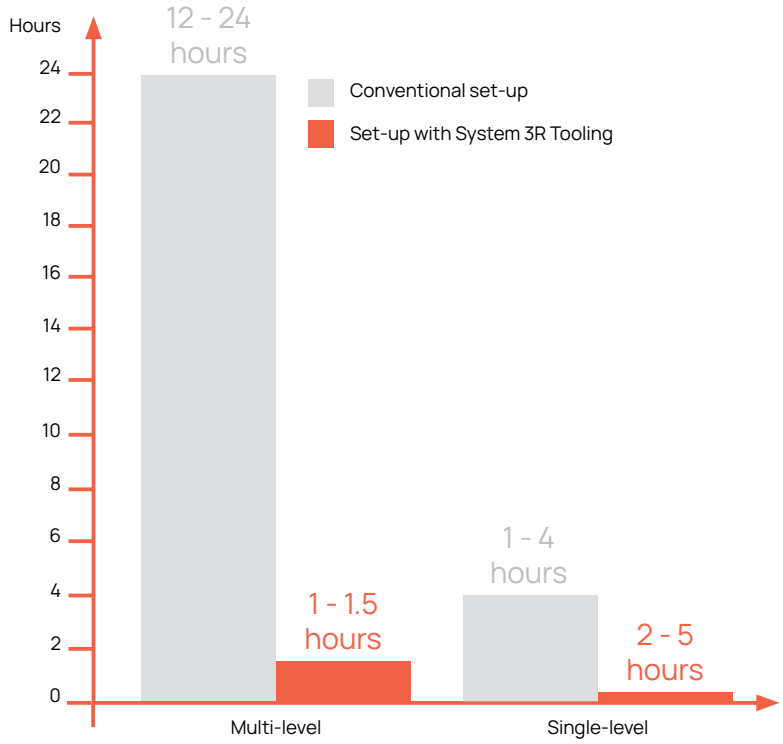
HIGHER PRODUCTIVITY (CALCULATION)

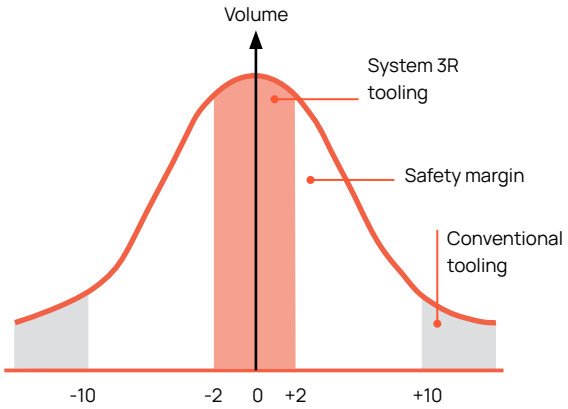
	Conventional set-up	Pallet system
Working hours per day	8	8
Set-up hours per day	- 4	- 0.5
Spindle hours per day	= 4	= 7.5
Working days per week	x 5	x 5
Spindle hours per week	= 20	= 37.5

FASTER PAYBACK (CALCULATION)

	Conventional set-up	Pallet system
Hourly invoicing (€)	50	50
Spindle hours per week	x 20	x 37.5
Revenue per week (€)	= 1,000	= 1,875
Capital cost, machine (€)	150,000	150,000
Capital cost, pallet system (€)	0	+ 10,000
Total capital outlay (€)	= 150,000	= 160,000
Payback time (weeks)	150	85

Set-up time reduced by 95%





Automation of tool-producing workshops (toolshops) is already a reality. The benefits of this can now also be enjoyed in press machines.

System 3R offers a complete solution – tooling, automation and software. Thus, mechanised production, improved productivity and Industry 4.0 compliant data are now also possible for powder compaction machines.

Your presses will feel the benefit. Quicker tool changes and more reliable positioning will reduce wear and tear to punches and dies.

Flexibility through precision

THE ON-DEMAND AFFORDABLE ALTERNATIVE

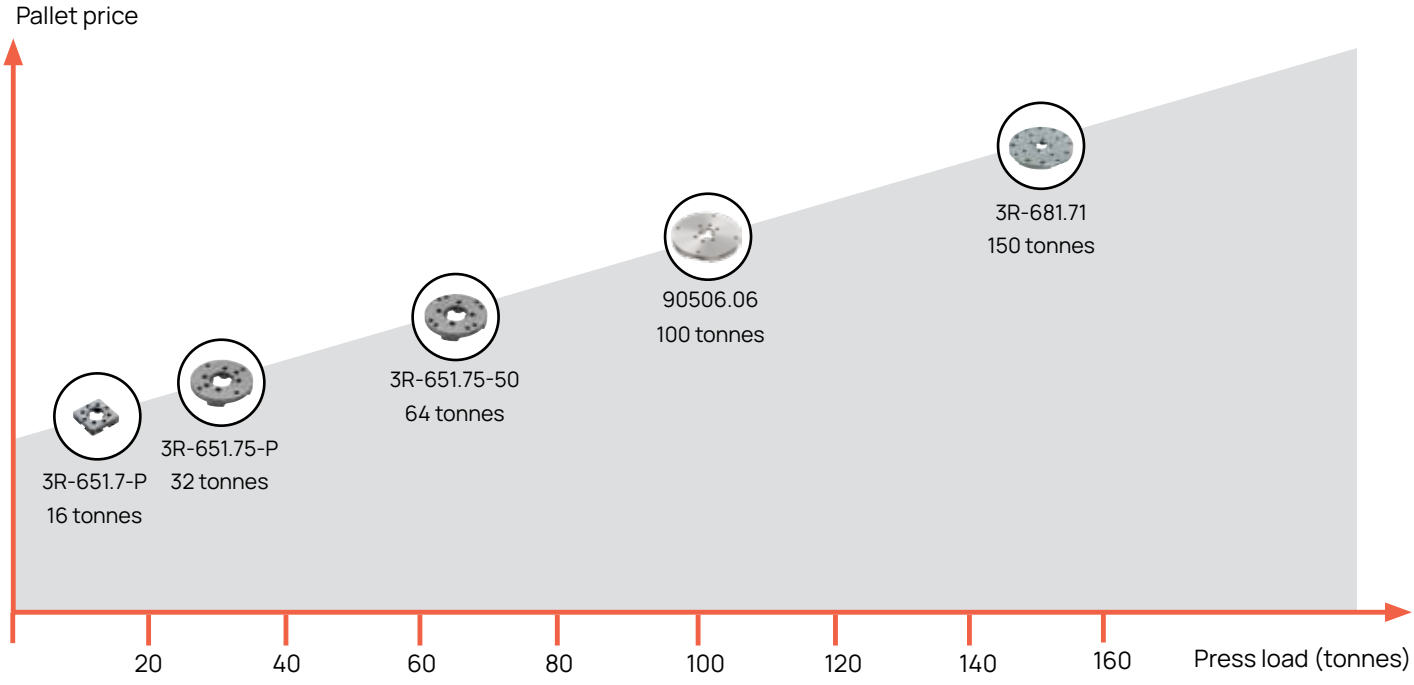
Gradation	Std Standard	Adv Advanced	Hi-end High-end
For tolerances of	2 - 4 µm	1 - 2 µm	≤ 1 µm
Cost	Low	Middle	High
System 3R Tooling	Macro and 3Refix	Macro and Matrix	MacroNano and MatrixNano
Application	Not presses	Full automation	Full automation

Chuck precision: Std Standard Adv Advanced Hi-end High-end

Example solution:
Pneumatic chuck
Where max. press load is 64 tonnes, you can alternate between 64-tonne pallets and smaller ones.

Flexibility through cost

CHUCK CHOICE SETS PERMISSIBLE MAX. PRESS LOAD FOR PUNCHES



Different tooling configurations to suit your needs

Press loadss from 16 to 300 tonnes

Powder press example

System 3R's tooling solutions can be tailored to: press forces/loads; and, your accuracy and handling requirements.

This gives you an incredibly diverse choice of tooling configurations that are based on the standardised interfaces used in tool making. For new customers, such choice may seem complex. However, it is perfectly possible to start at one level of complexity and then move to another without replacing your tools.

Our focus is always simple handling with high productivity, reliable accuracy and automation readiness.

The next few pages show possible designs of various tooling combinations. Pages 26 and 27 help you select the right chucks and couplings for your needs. So that you find a suitable combination, they take you through the options, step-by-step.

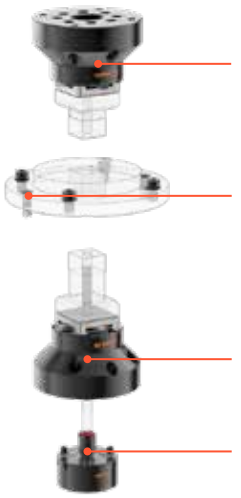
If you are looking for full powder press automation, you will need pneumatic chucks and core rod D-20175.30 or D-20175.40. A gripper interface (D-20212.03 or D-20212.13 depending on intended max. pressing force for the punch) is required when using tools in Macro systems.

Automation requires a pallet with gripper interface

Standard configurations

Manual handling – 16-tonne applications with Ø 10 core pin

16 tonnes



Upper punch
Chuck, Macro, 3R-600.27-30

Die
3Refix mandrels, 3R-901-10PM-TX

Lower punch
Chuck, Macro, 3R-600.27-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes

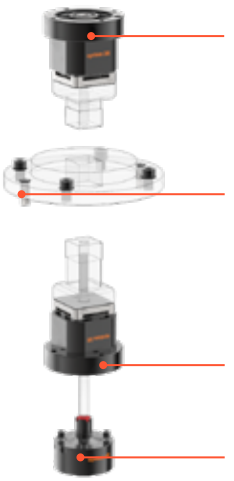
Upper punch
Chuck, Macro, 3R-600.27-30

Die
Chuck, Matrix 142, 3R-690.2-142

Lower punch
Chuck, Macro, 3R-600.27-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes



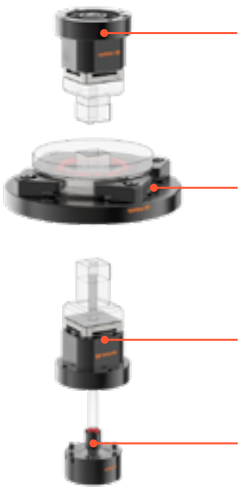
Upper punch
Chuck, Macro, 3R-600.17-16

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

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes



Upper punch
Chuck, Macro, 3R-600.17-16

Die
Chuck, Matrix 142, 3R-690.2-142

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175

Standard configurations

Manual handling – 16-tonne and 60-tonne applications with Ø 10 core pin

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
3Refix mandrels, 3R-901-10PM-TX

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-690.2-142

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

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

Lower punch
Chuck, Macro, 3R-600.17-60

Core pin
Chuck, core pin Ø 10 mm, D-20175

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

Die
Chuck, Matrix 142, 3R-690.2-142

Lower punch
Chuck, Macro, 3R-600.17-60

Core pin
Chuck, core pin Ø 10 mm, D-20175

Standard configurations

Manual handling – 25, 35, 60 and 100-tonne applications with Ø 55 and Ø 68 mm core pin

25 tonnes

Upper punch
Chuck, Matrix 110, 3R-690.1-110

Die
3Refix mandrels, 3R-901-10PM-TX

Lower punch
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

60 tonnes

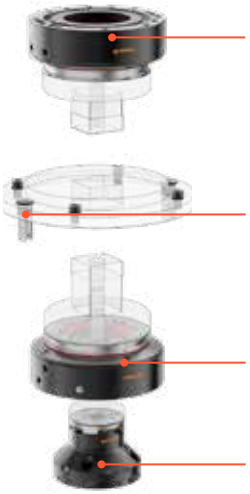
Upper punch
Chuck, Matrix 110, 3R-690.2-110

Die
3Refix mandrels, 3R-901-10PM-TX

Lower punch
Chuck, Matrix 110, 3R-690.2-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

35 tonnes



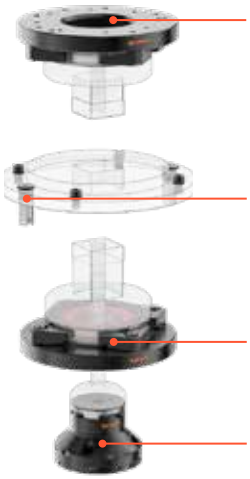
Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
3Refix mandrel, 3R-901-20PM-TX

Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin Ø 68 mm, 3R-600.17-30

100 tonnes



Upper punch
Chuck, Matrix 142, 3R-690.2-142

Die
3Refix mandrel, 3R-901-20PM-TX

Lower punch
Chuck, Matrix 142, 3R-690.2-142

Core pin
Chuck, core pin Ø 68 mm, 3R-600.17-30

Standard configurations

Semi-automatic handling – 16-tonne applications with Ø 10 core pin

16 tonnes

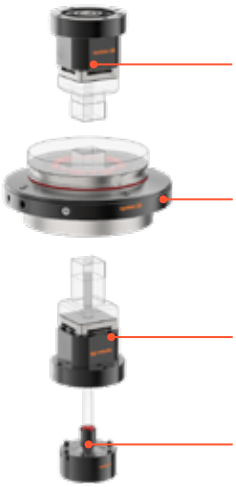
Upper punch
Chuck, Macro, 3R-600.17-16

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes



Upper punch
Chuck, Macro, 3R-600.17-16

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175

Standard configurations

Semi-automatic handling – 35 and 64-tonne applications with Ø 10 mm core pin

32 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

32 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-60

Core pin
Chuck, core pin, D-20175

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

Die
Chuck, Matrix 142, SP28219

Lower punch
Chuck, Macro, 3R-600.17-60

Core pin
Chuck, core pin, D-20175

Standard configurations

Semi-automatic handling – 35 and 64-tonne applications with Ø 16 or Ø 55 mm core pin

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 90803.50

Core pin
Chuck, core pin Ø 16 mm, D-20175

64 tonnes

Upper punch
Chuck, Macro, 3R-600.17-60

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 90803.50

Core pin
Chuck, core pin Ø 16 mm, D-20175

35 tonnes

Upper punch
Chuck, Matrix 110, 3R-690.1-110

Die
Chuck, Matrix 185, 3R-690.1-185

Lower punch
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

35 tonnes

Upper punch
Chuck, Matrix 110, 3R-690.1-110

Die
Chuck, Matrix 185, 3R-SP28268

Lower punch
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

Standard configurations

Semi-automatic handling – 50-tonne applications with Ø 68 mm core pin

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-690.1-220

Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-SP28340

Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-690.1-220

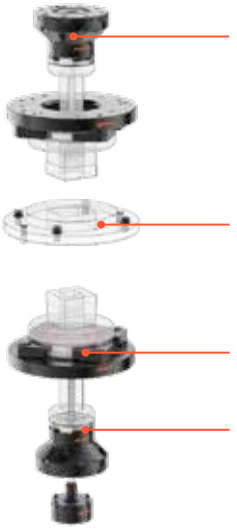
Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

Multi-level configurations

Manual or semi-automatic handling – 32-tonne applications with Ø 10 mm core pin

32 tonnes



Upper punch
Chuck, Macro, 3R-600.17-30

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 90803.50

Core pin
Chuck, core pin Ø 16 mm, D-20175

32 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 90803.50

Core pin
Chuck, core pin Ø 16 mm, D-20175

32 tonnes

Upper punch
Chuck, Matrix 110, 3R-690.1-110

Die
Chuck, Matrix 185, 3R-690.1-185

Lower punch
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

32 tonnes

Upper punch
Chuck, Matrix 110, 3R-690.1-110

Die
Chuck, Matrix 185, 3R-SP28268

Lower punch
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin Ø 55 mm, 3R-600.17-10

Multi-level configurations

Semi-automatic handling – 50-tonne applications with Ø 68 mm core pin

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-690.1-220

Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-SP28340

Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

50 tonnes

Upper punch
Chuck, Matrix 142, 3R-690.1-142

Die
Chuck, Matrix 220, 3R-690.1-220

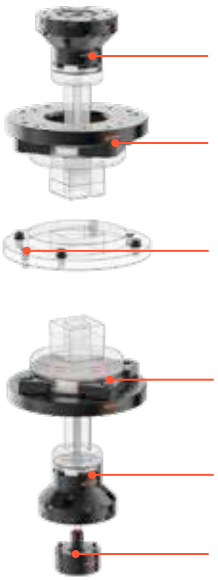
Lower punch
Chuck, Matrix 142, 3R-690.1-142

Core pin
Chuck, core pin, 3R-600.17-30

Multi-level configurations

Manual or semi-automatic handling – 32-tonne applications with Ø 10 mm core pin

32 tonnes



Upper punch 1
Chuck, Macro, 3R-600.17-30

Upper punch 2
Chuck, Matrix 142. 3R-690.2-142

Die
Mandrels, 3Refix, 3R-901-10PM-TX

Lower punch 2
Chuck, Matrix 142. 3R-690.2-142

Lower punch 1
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

32 tonnes

Upper punch 1
Chuck, Macro, 3R-600.17-30

Upper punch 2
Chuck, Matrix 142. 3R-690.2-142

Die
Chuck, Matrix 220, 3R-690.2-220

Lower punch 2
Chuck, Matrix 142. 3R-690.2-142

Lower punch 1
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

32 tonnes

Upper punch 1
Chuck, Macro, 3R-600.17-30

Upper punch 2
Chuck, Matrix 142. 3R-690.1-142

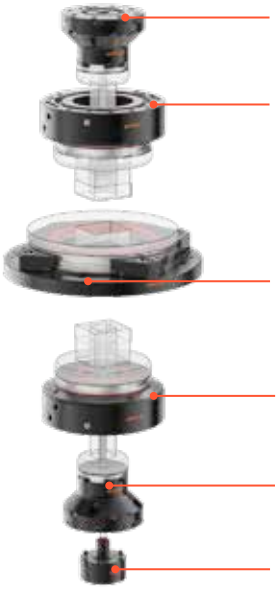
Die
Chuck, Matrix 220, 3R-SP28340

Lower punch 2
Chuck, Matrix 142. 3R-690.1-142

Lower punch 1
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

32 tonnes



Upper punch 1
Chuck, Macro, 3R-600.17-30

Upper punch 2
Chuck, Matrix 142. 3R-690.1-142

Die
Chuck, Matrix 220, 3R-690.2-220

Lower punch 2
Chuck, Matrix 142. 3R-690.1-142

Lower punch 1
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin, D-20175

Multi-level configurations

Manual or semi-automatic handling – 35 and 100-tonne applications with Ø 50 mm core pin

100 tonnes

Upper punch 1
Chuck, Matrix 110, 3R-690.2-110

Upper punch 2
Chuck, Matrix 185. 3R-690.2-185

Die
Mandrels, 3Refix, 3R-901-20PM-TX

Lower punch 2
Chuck, Matrix 185. 3R-690.2-185

Lower punch 1
Chuck, Matrix, 3R-690.2-110

Core pin
Chuck, core pin, 3R-600.17-10

35 tonnes

Upper punch 1
Chuck, Matrix 110, 3R-690.1-110

Upper punch 2
Chuck, Matrix 185. 3R-690.1-185

Die
Chuck, Matrix 260, 3R-SP28345

Lower punch 2
Chuck, Matrix 185, 3R-690.1-185

Lower punch 1
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin, 3R-600.17-10

35 tonnes

Upper punch 1
Chuck, Matrix 110, 3R-690.1-110

Upper punch 2
Chuck, Matrix 185. 3R-690.1-185

Die
Mandrels, 3Refix, 3R-901-20PM-TX

Lower punch 2
Chuck, Matrix 185, 3R-690.1-185

Lower punch 1
Chuck, Matrix 110, 3R-690.1-110

Core pin
Chuck, core pin, 3R-600.17-10

Automatic change configurations

Fully automated handling – 16 and 32-tonne applications with Ø 10 mm core pin

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-16

Die
Chuck Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175.30

16 tonnes

Upper punch
Chuck, Macro, 3R-600.17-16

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 3R-600.17-16

Core pin
Chuck, core pin Ø 10 mm, D-20175.30

32 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck Matrix 142, 3R-690.1-142

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175.30

32 tonnes

Upper punch
Chuck, Macro, 3R-600.17-30

Die
Chuck, Matrix 142, 3R-SP28219

Lower punch
Chuck, Macro, 3R-600.17-30

Core pin
Chuck, core pin Ø 10 mm, D-20175.30

Retrofits for your old equipment

Manual or automated handling

Tools for use with our Macro and 3Refix reference systems are the most common in the world.

If your equipment is old, we can offer you various retrofit devices that enable you to move to more high-end tooling or remain flexible. From automatic chuck adapters to spacers, there are many options.

To give an idea of what is possible, we give a few examples below.

Pallet adapter with hole pattern customised for 3Refix and fixing screws.

Where pneumatic chuck 3R-690.1-142 or 3R-SP28395 is used, distance adapter D-20201.01 may be needed to position the lower punch correctly.

Where punches need to be retrofitted with new pallets, see also D-20158-BASE.

Distance adapter, Macro, D-20201.01

Punch alignment system, D-20158-Base

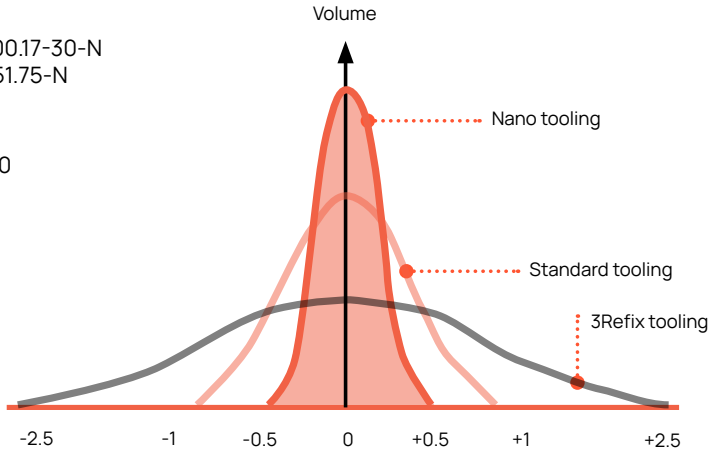
Nano precision configuration

Upper punch
Chuck, MacroNano, 3R-600.17-30-N
Reference element, 3R-651.75-N

Die
Chuck, MatrixNano, 3R-690.1-142-N
Pallet, MatrixNano, 3R-691.1-142-N

Lower punch
Chuck, MacroNano, 3R-600.17-30-N
Reference element, 3R-651.75-N

Core pin
Core rod chuck D-20175.30
Pallet D-20175.31



The tight tolerances achieved using Nano tooling improve the symmetry of pressed parts. Reduced gaps between punches and dies are also possible. For more information, see page 64, MacroNano in detail.

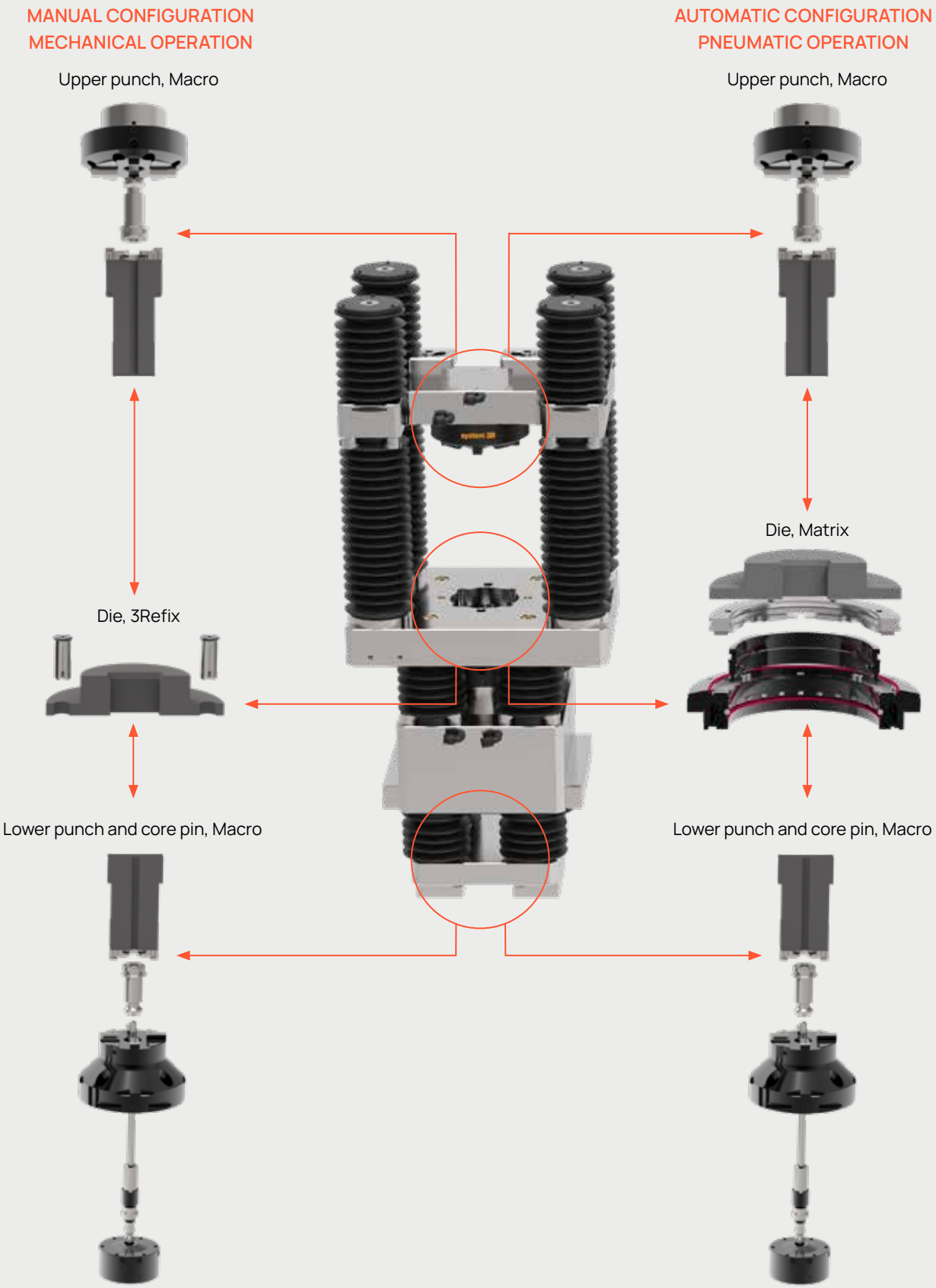
Different accessories

Nano chucks and pallets are available for Macro (up to 64 tonnes) and Matrix142. Using these latter interfaces enables single-level configuration. Thus, it is possible to use regular Macro and Matrix pallets with their regular tools. However, for full sub-micron precision, both chucks and pallets have to be Nano. This also applies to the workshop producing the tools.

For automatic changing in powder presses, ask for either special Nano pallets or, depending on choice of Macro reference elements, use spacer D-20211.03 or D-20211.13.

Single-level

Configuration examples

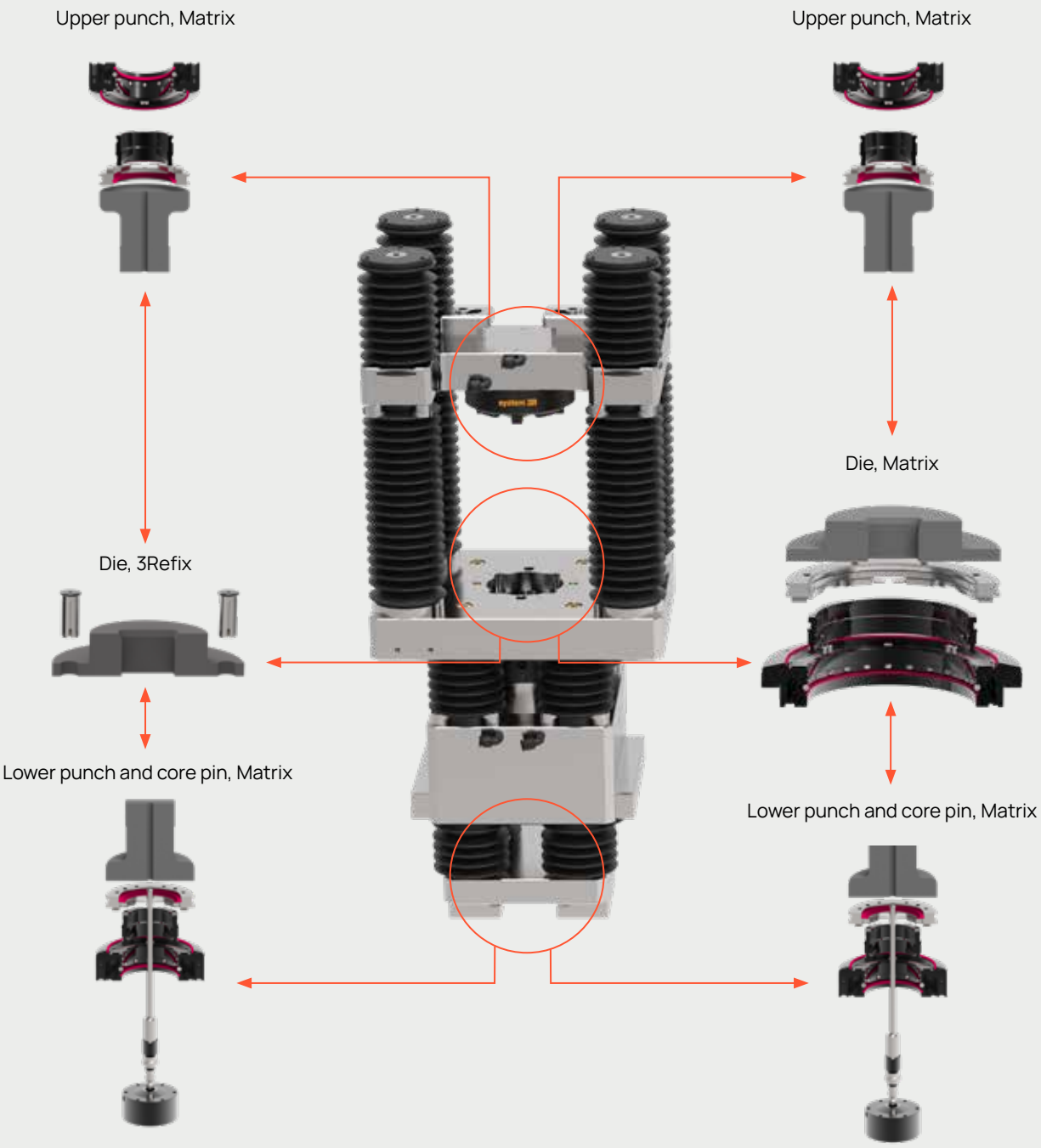


Single-level

Configuration examples

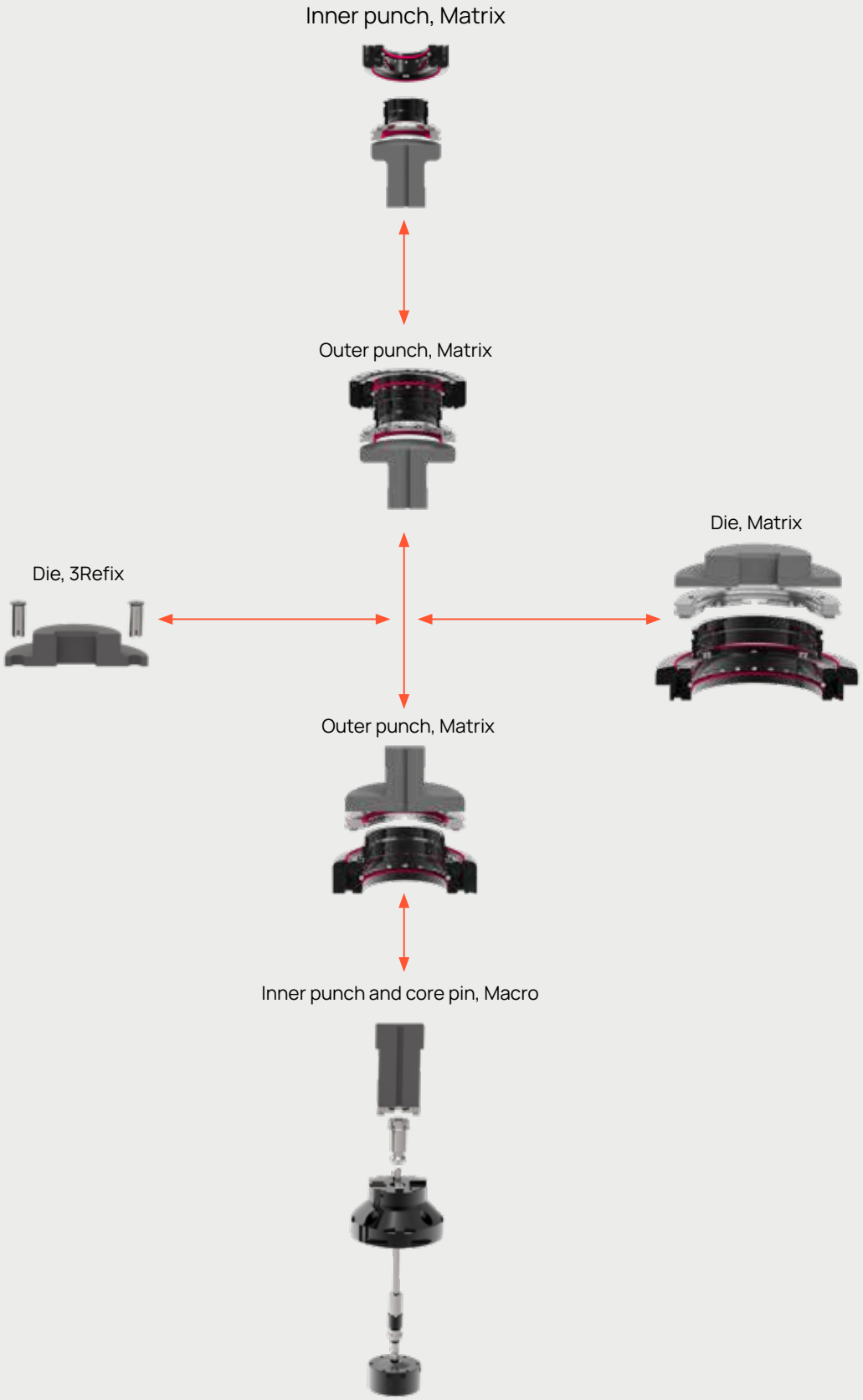
MANUAL CONFIGURATION
MECHANICAL OPERATION

AUTOMATIC CONFIGURATION
PNEUMATIC OPERATION



Multi-level

Configuration examples



Designing your configuration

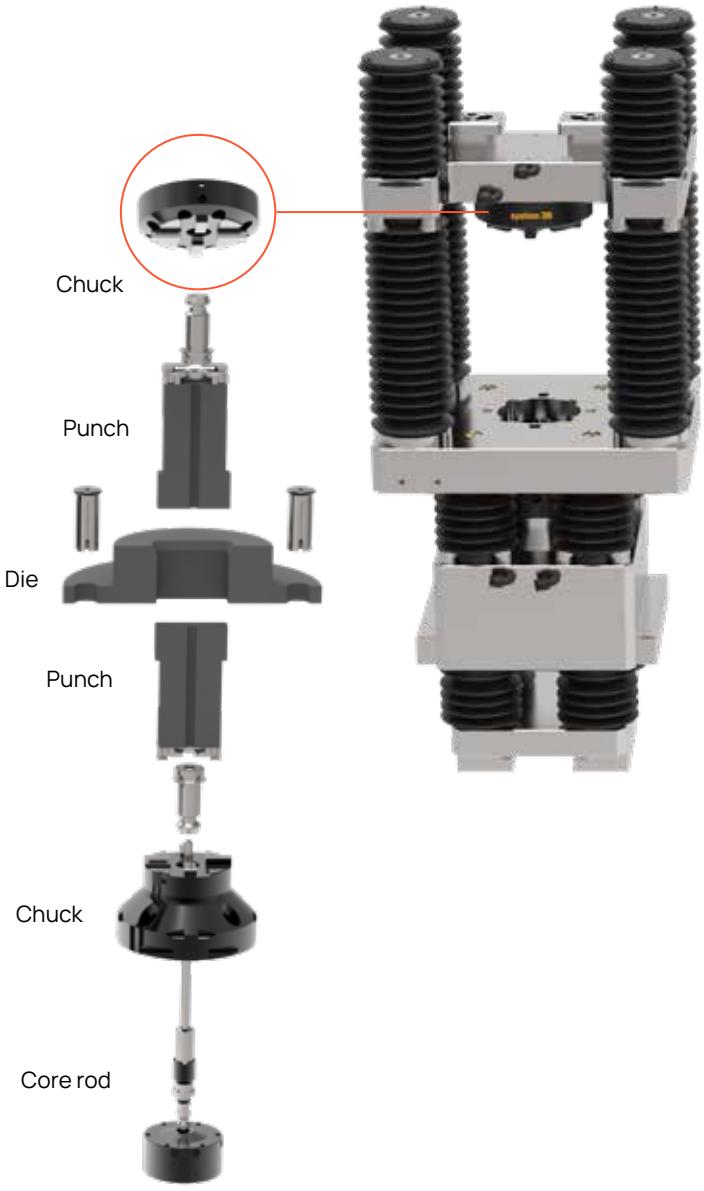
To design your configuration, first establish the max. press load and the intended size of the core rod. These set the choice of chuck for the lower punch and indicate suitable tooling systems for the die or outer punch.

The Macro range offers several different chuck features. This also applies to the core rod. Page 37 sets out core rod options.

For customers whose punches necessitate a high clamping force, the following chucks can operate at 10 bars: 3R-600.17-30, 3R-600.17-60, 3R-690.1-110HD and 3R-690.1-142HD.

Please pay special attention to the three levels of precision detailed on page 7 and indicated by the colour code.

1. To identify a suitable tooling system for your punch, establish:
   core rod size.
   max. press load.
2. Check which boxes are ticked as suitable tooling for the die or outer punch.
3. If you are designing a multi-press configuration, use the tooling system selected above for the outer punch. Re peat the steps to find suitable tooling for the die.



				Die	3R-901-10PM-TX	3R-901-20PM-TX	3R-690.1-142 *	3R-690.2-142	3R-690.1-142HD	3R-SP28219 *	3R-690.1-185	3R-690.2-185	3R-SP28268	3R-690.1-220	3R-690.2-220	3R-SP28340	3R-690.1-260
Manual or **P**neumatic:					M	M	P	M	P	P	M	P	P	P	M	P	P
Build **O**n or Build **I**n:					I	I	O	O	O	I	O	O	I	O	O	I	O
Punch																	
3R-600.17-10	10	7	P	P	P	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.17-16	16	10	P	O	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-690.1-110HD	25	55	P	O	√	-	-	-	-	-	√	√	√	√	√	√	√
D-20201	32	10	M	O	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-690.1-110HD	25	55	P	O	√	-	-	-	-	-	√	√	√	√	√	√	-
3R-600.17-30 *	32	10	P	O	√	-	√	√	√	√	-	-	-	-	-	-	-
D-20207	32	10	P	O	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.17-32	32	10	P	I	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.17-34	32	10	P	I	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.27-30	32	10	M	I	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-690.1-142 *	50	67	P	O	√	-	-	-	-	-	-	-	-	√	√	√	√
3R-690.1-142HD	50	67	P	O	√	-	-	-	-	-	-	-	-	√	√	√	√
3R-690.2-110	60	66	M	O	√	-	-	-	-	-	√	√	√	√	√	√	-
3R-600.17-60 *	64	10	P	O	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.17-62	64	10	M	I	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.17-64	64	10	P	I	√	-	√	√	√	√	-	-	-	-	-	-	-
3R-600.27-60	64	10	M	I	√	-	√	√	√	√	-	-	-	-	-	-	-
90803.50	64	16	P	O	√	-	√	√	√	√	-	-	-	-	-	-	-
90803.60	100	16	P	O	√	-	-	-	-	√	√	√	√	√	√	√	-
3R-690.1-185	100	110	P	O	-	√	-	-	-	-	-	-	-	-	-	√	√
3R-690.2-142	150	81	M	O	√	-	-	-	-	-	-	-	-	√	√	√	-
3R-690.1-220	150	145	P	O	-	√	-	-	-	-	-	-	-	-	-	-	√
3R-680.27-150	150	10	M	I	-	√	-	-	-	-	-	-	-	√	√	√	√
3R-690.2-185	250	124	M	O	√	-	-	-	-	-	-	-	-	-	-	-	-
3R-690.2-220	300	159	M	O	-	√	-	-	-	-	-	-	-	√	√	√	√
	Force (tonnes)	Core rod (Ø mm)	Manual or **P**neumatic	Build **O**n or Build **I**n													

*Also available as Nano version

Maintaining press flexibility

Convert multi to single

Using automatic chuck adapters, it is possible to switch from multi-level to single-level configurations. You can then use single-level tools in a multi-level configured machine.

Maintaining press flexibility

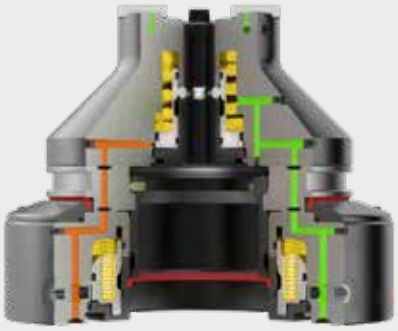
Adding a chuck adapter to a multi-level press will enable the machine to be used with regular, single-level tools.

With automatic chuck adapters, conversion is quick and reliable (adaptation is via air passing through machine-installed table chucks).

Workpiece chuck adapter for single punch

Core pin chuck adapter

Connectors for pneumatic chuck, Matrix



Chuck adapter connectors – unclamping and Turbo/air-blast cleaning

Press machine (PM) tooling

Chuck precision: Std Standard Adv Advanced Hi-end High-end

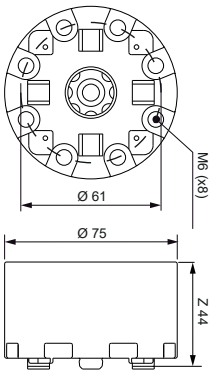
PM Tooling

Pneumatic chuck, Macro PM, 3R-600.17-10

Std

Can be used as core rod chuck and also for low-range press loads.

- Max. press load 10 t
- Max. core rod size Ø7 mm
- Required drawbar 3R-605.2
- Weight 1.1 kg

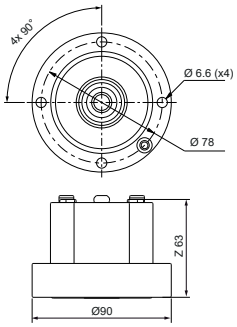


Pneumatic chuck, Macro PM, 3R-600.17-16

Std

Adv

- Built in height 63 mm
- Max. press load 16 t
- Required drawbar 3R-605.11
- Weight 1.6 kg

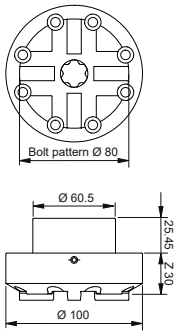


Build-in chuck, pneumatic, Macro PM, 3R-600.17-32

Std

Adv

- Build-in height 30 mm
- Max. press load 32 t
- Required drawbar 3R-605.11
- Weight 2 kg

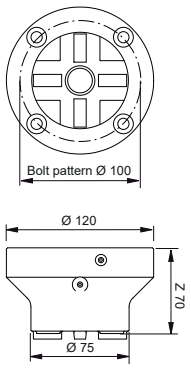


Pneumatic chuck, Macro PM, D-20207

Std

Adv

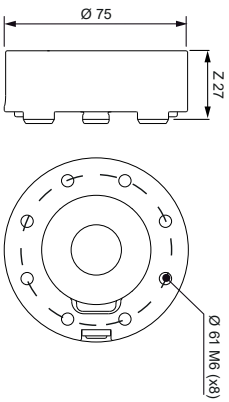
- Air sensor separated from Turbo
- Build-in height 70 mm
- Max. press load 32 t
- Carbide references
- Required drawbar 3R-605.11
- Weight 3.5 kg



Manual chuck, Macro PM, D-20201

Std

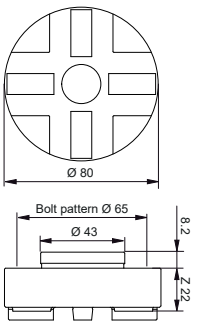
- Build-in height 22 mm.
- Max. press load 32 t
- Required drawbar 90958
- Torque 6 Nm
- Weight 1 kg



Manual chuck (built-in) Ø 80, Macro PM, 3R-600.27-30

Std

- Suitable housing 3R-A34249
- Build-in height 22 mm
- Max. press load 32 t
- Required drawbar 3R-605.11
- Torque 6 Nm
- Weight 1 kg



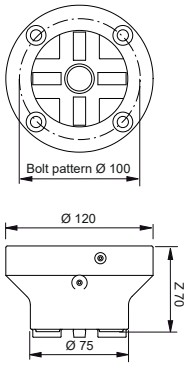
PM Tooling

Pneumatic chuck, Macro PM, 3R-600.17-30

Std

Adv

- Air sensor separated from Turbo.
- Build-in height 70 mm
- Max. press load 32 t
- Required drawbar 3R-605.11
- Weight 3.5 kg



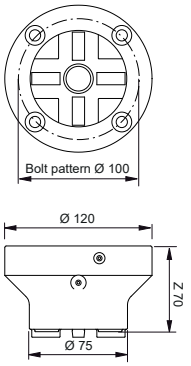
Pneumatic chuck, MacroNano PM, 3R-600.17-30-N

NANO

Hi-end

Requires either 3R-651.7-N or 3R-651.75-N.

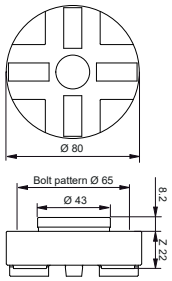
- Air sensor separated from Turbo
- Build-in height 70 mm
- Max. press load 32 t
- Required drawbar 3R-605.11
- Weight 3.5 kg



Manual chuck (built-in) Ø80, Macro PM, 3R-600.27-60

Std

- Suitable housing 3R-A34249
- Build-in height 22 mm
- Max. press load 64 t
- Required drawbar 3R-605.11
- Torque 6 Nm
- Weight 1 kg



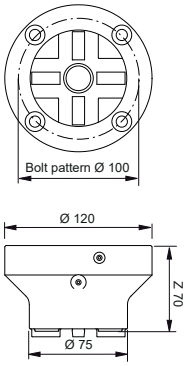
Pneumatic chuck, MacroNano PM, 3R-600.17-60-N

NANO

Hi-end

Requires either 3R-651.7-N, 3R-651.75-N or 3R-651.75-50-N.

- Air sensor separated from Turbo
- Build-in height 70 mm
- Max. press load 64 t
- Required drawbar 3R-605.11
- Weight 3.5 kg

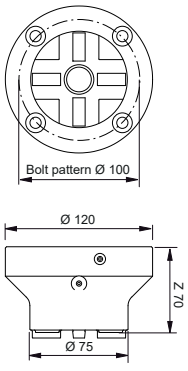


Pneumatic chuck, Macro PM, 3R-600.17-60

Std

Adv

- Air sensor separated from Turbo.
- Build-in height 70 mm
- Max. press load 64 t
- Required drawbar 3R-605.11
- Weight 3.5 kg



Wood tools

There is also tooling for multiple core rods.

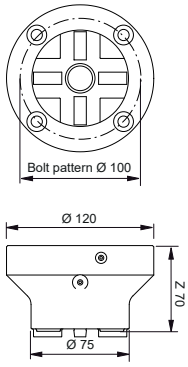
PM Tooling

Pneumatic chuck, Macro PM, 90803.50

Std

Adv

- Build-in height 70 mm
- Max. press load 64 t
- Required drawbar 90840.55
  (core rods up to Ø 16 mm can be used)

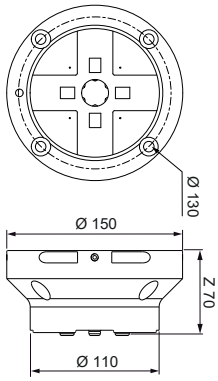


Pneumatic chuck, Macro PM, 90803.60

Std

Adv

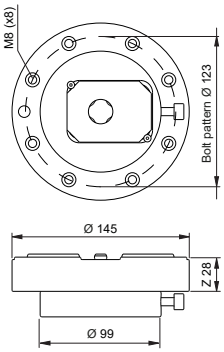
- Build-in height 70 mm
- Max. press load 100 t
- Required drawbar 90840.55
  (core rods up to Ø 16 mm can be used)
- Weight 7 kg



Manual chuck, MacroMagnum, 3R-680.27-150

Std

- Build-in height 28 mm
- Max. press load 150 t
- Required drawbar 3R-605.11
- Weight 4.7 kg

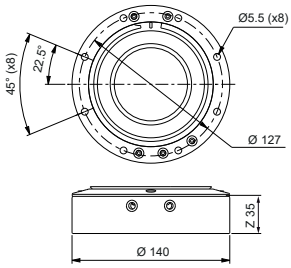


Pneumatic chuck, Matrix 110, 3R-690.1-110HD

Adv

Chuck for permanent mounting in a press.

- Air sensor separated from Turbo
- Build-in height 35 mm
- Max. press load 25 t
- Required drawbar 3R-695.2-110
- Weight 2.5 kg



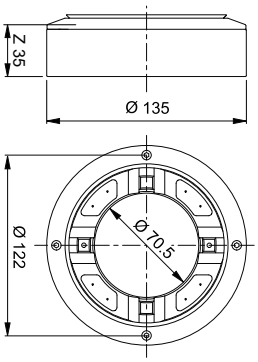
Pneumatic chuck, Matrix 110, 3R-690.1-110

Std

Adv

Chuck for permanent mounting in a press.

- Build-in height 35 mm
- Max. press load 25 t.
- Required drawbar 3R-695.2-110
- Weight 2.5 kg

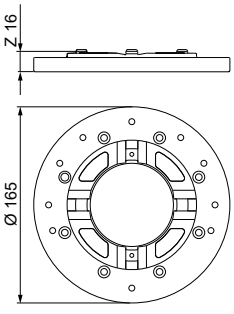


Manual chuck, Matrix 110, 3R-690.2-110

Std

Chuck for permanent mounting in a press.

- Build-in height 16 mm
- Max. press load 60 t
- Max core rod size Ø 66 mm
- Weight 2.5 kg



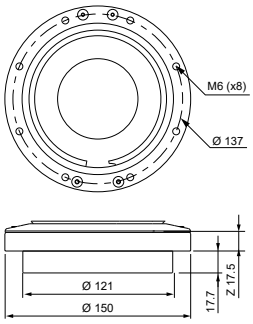
PM Tooling

Pneumatic chuck, Built in, Matrix 110, 3R-SP28395

Adv

Chuck for permanent mounting in a press.

- Built in height 25 mm
- Max. press load 25 t
- Required drawbar 3R-695.2-110
- Weight 2.5 kg

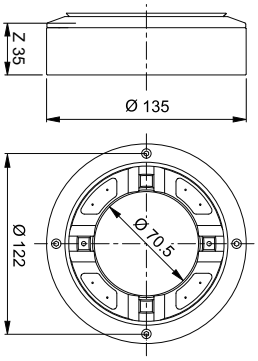


Pneumatic chuck, Matrix 110, 3R-690.1-110-N

NANO Hi-end

Chuck for permanent mounting in a press.

- Built in height 35 mm
- Max. pressure 25 t
- Required drawbar 3R-695.2-110
- Weight 2.5 kg

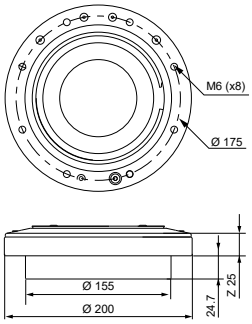


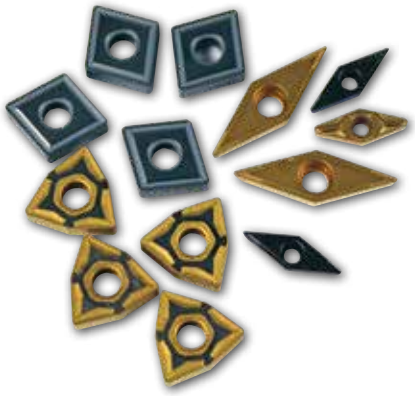
Pneumatic chuck, Built in, Matrix 142, 3R-SP28219

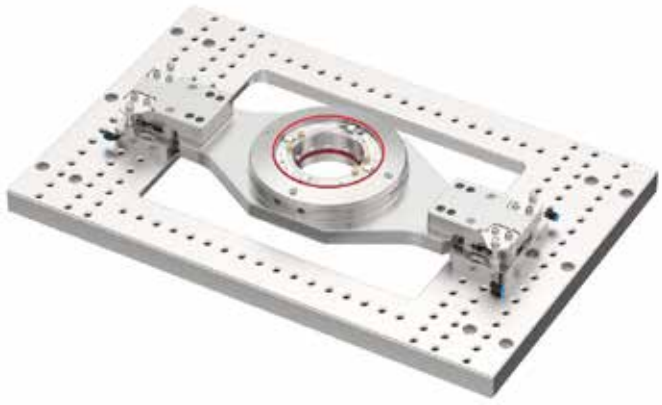
Adv

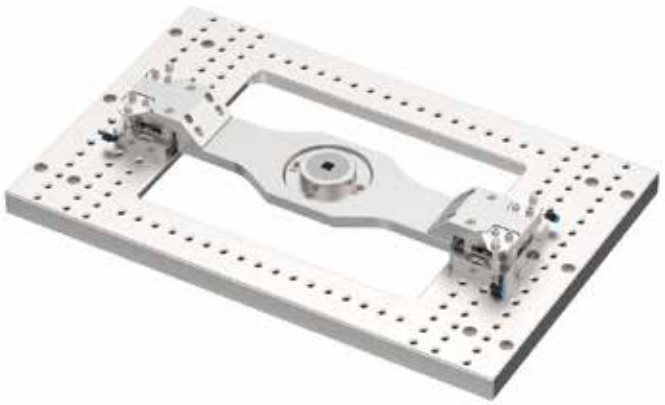
Chuck for permanent mounting in a PM press.

- Built in height 17.5 mm
- Max. press load 50 t
- Required drawbar 3R-695.2-142
- Weight 2.7 kg









Do-it-yourself solutions

For toolshop chucks, please refer to the catalogues for the machines in question.

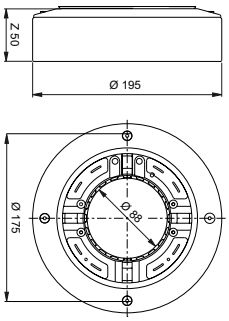
PM Tooling

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

Adv

Chuck for permanent mounting in a press.

- Air sensor separated from Turbo
- Build-in height 50 mm
- Max. press load 50 t
- Required drawbar 3R-695.2-142
- Weight 7 kg



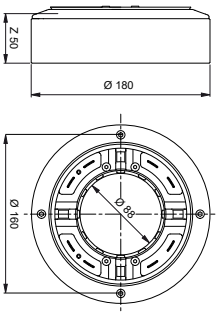
Pneumatic chuck, Matrix 142, 3R-690.1-142

Std

Adv

Chuck for permanent mounting in a press.

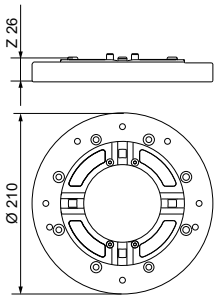
- Build-in height 50 mm
- Max. press load 50 t
- Required drawbar 3R-695.2-142
- Weight 7 kg



Manual chuck, Matrix 142, 3R-690.2-142

Std

- Build-in height 26 mm
- Max. press load 150 t
- Max. core rod size Ø 81 mm
- Weight 5.8 kg



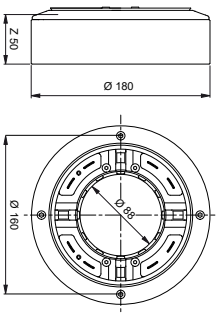
Pneumatic chuck, Matrix 142, 3R-690.1-142-N

NANO

Hi-end

Chuck for permanent mounting in a press.

- Build-in height 50 mm
- Max. pressure 50 t
- Required drawbar 3R-695.2-142
- Weight 7 kg



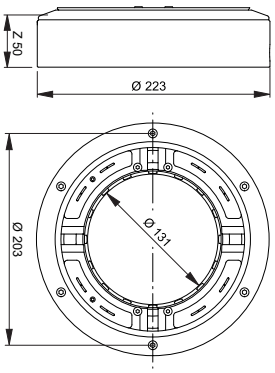
Pneumatic chuck, Matrix 185, 3R-690.1-185

Std

Adv

Chuck for permanent mounting in a press.

- Build-in height 50 mm
- Max. press load 100 t
- Required drawbar 3R-695.2-185
- Weight 9 kg

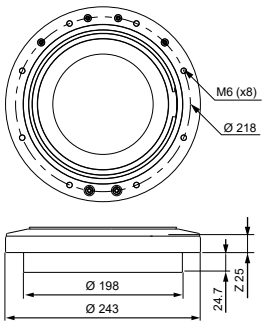


Pneumatic chuck, built in, Matrix 185, 3R-SP28268

Adv

Chuck for permanent mounting in a press.

- Build-in heigth 25 mm
- Max. press load 100 t
- Required drawbar 3R-695.2-185
- Weight 10.6 kg

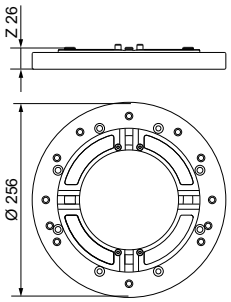


PM Tooling

Manual chuck, Matrix 185, 3R-690.2-185

Std

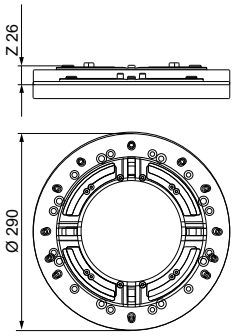
- Build-in height 26 mm
- Max. press load 250 t
- Max core rod size Ø 124 mm
- Weight 7.6 kg



Manual chuck, built in, Matrix 220, 3R-690.2-220

Std

- Build-in height 26 mm
- Max. press load 300 t
- Max core rod size Ø 159 mm
- Weight 9.4 kg

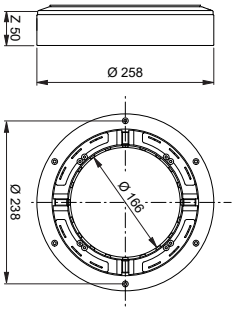


Pneumatic chuck, Matrix 220, 3R-690.1-220

Adv

Chuck for permanent mounting in a press.

- Build-in height 50 mm
- Max. press load 150 t
- Required drawbar 3R-695.2-220
- Weight 11 kg

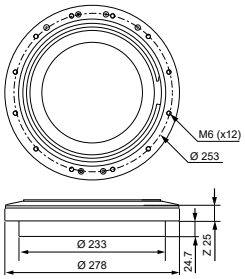


Pneumatic chuck, built in, Matrix 220, 3R-SP28340

Adv

Chuck for permanent mounting in a press.

- Build-in height 25 mm
- Max press load 150 ton.
- Required drawbar 3R-695.2-220
- Weight 10.6 kg

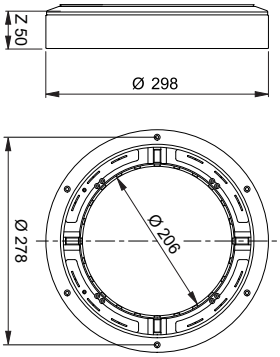


Pneumatic chuck, Matrix 260, 3R-690.1-260

Adv

Chuck for permanent mounting in a press.

- Build-in height 50 mm
- Max. press load 200 t
- Required drawbar 3R-695.2-260
- Hardened references
- Weight 13 kg



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

Std

Recommended tightening torque 4 Nm.

- Weight 0.02 kg

3R-901-20PM-TX, Ø20 mm

Recommended tightening torque 10 Nm.

- Weight 0.1 kg

We offer three lines of core rods

Line 1

- Core rods up to Ø 10 mm
- Chuck D-20175 with pallets D-20175.1X
- Pneumatically operated

Line 2

- Core rods up to Ø 64 mm
- Chuck 3R-600.17-10 with pallet D-20175.20
- Pneumatically operated

Line 3

- Ready for automatic change by robot
- Rods size up to Ø 10 mm
- Chuck D-20175.30 with pallet D-20175.31 and drawbar. Suitable for use with 3R-600.17-30 and similar
- Pneumatically operated

PM Tooling

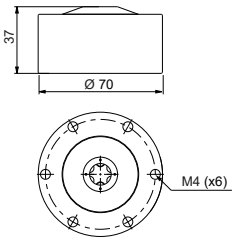
Pneumatic core rod chuck, D-20175

Std

Hi-end

For holder D-20175.1X.

- Build in height 37 mm
- Max. press load 5 t
- Weight 0.8 kg

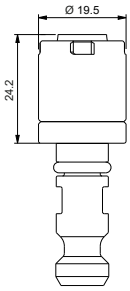


Core rod holder, floating, D-20175.10

Std

Hi-end

- Pallet for core rods (Ø 10 mm)
- Required chuck D-20175



Core rod holder M6, D-20175.12

Std

Hi-end

- Pallet for core rods up to Ø 10 mm
- Required chuck D-20175

Core rod holder, U ½“-20, D-20175.13

Std

Hi-end

Core rods up to Ø 10 mm

- Pallet for core rods up to Ø 8 mm
- Required chuck D-20175

Pneumatic chuck, Macro PM, 3R-600.17-10

Std

Hi-end

Can be used as core rod chuck and also for low-range press loads.

- Max. press load 10 t
- Max. core rod size Ø 7 mm
- Required drawbar 3R-605.2
- Weight 1.1 kg

Core rod holder, D-20175.20

Std

Hi-end

Pallet for core rods up to Ø 64 mm.

- Required chuck 3R-600.17-10 or 3R-600.17-16
- Choice of drawbar depends on choice of chuck

PM Tooling

Core rod chuck, D-20175.30

Std
Adv
Hi-end

Suitable for pneumatic or manual operation.
Ready for automatic change by robot.

- For holder D-20175.31
- Build-in height 44 mm
- Max. press load 5 t
- Required drawbar D-20175.32
- Weight 0.3 kg

Core rod holder M6, D-20175.31

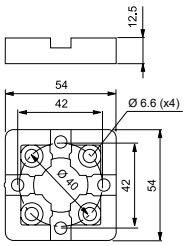
Std
Adv
Hi-end

- Pallet for core rods up to Ø 10 mm
- Required chuck D-20175.30
- Required drawbar D-20175.32

Pallet 54 x 54 mm, Macro, 3R-651.7E-P

Std
Adv

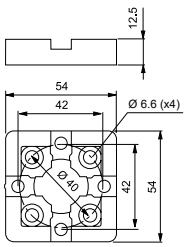
- Max. press load 16 t
- Supplied in sets of 8
- Rust resistant material
- Size 54 x 54 x 12.5 mm
- Weight 0.2 kg each



Pallet 54 x 54 mm, Macro, 3R-651.7E-N

NANO
Hi-end

- Max. press load 16 t
- Supplied in sets of 8
- Rust resistant material
- Size 54 x 54 x 12.5 mm
- Weight 0.2 kg each



Pallet 54 x 54 mm, Macro, D-20212.02

Std
Adv

- Max. press load 16 t
- M6 threads from top
- Rust resistant
- Size 54 x 54 x 22 mm
- Weight 0.4 kg

Pallet 54 x 54 mm, Macro, D-20212.03

Std
Adv

- Integrated gripper interface
- Max. press load 16 t
- M6 threads from top
- Rust resistant
- Size 54 x 54 x 27 mm
- Weight 0.5 kg

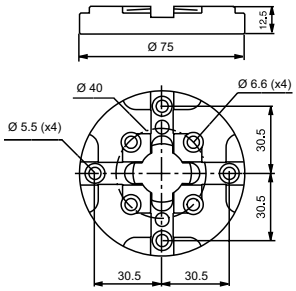
PM Tooling

Pallet Ø 75 mm, Macro, 3R-651.75E-P

Std

Adv

- Max. press load 32 t
- Supplied in sets of 10
- Rust-resistant material
- Size Ø 75 x 12.5 mm
- Weight 0.3 kg each

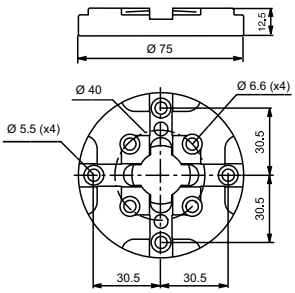


Pallet Ø 75 mm, Macro, 3R-651.75E-N

NANO

Hi-end

- Max. press load 32 t
- Supplied in sets of 10
- Rust-resistant material
- Size Ø 75 x 12.5 mm
- Weight 0.3 kg each

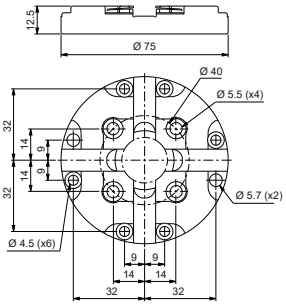


Pallet Ø 75 mm, Macro, 3R-651.75-50E

Std

Adv

- Max. press load 64 t
- Supplied in sets of 10
- Rust resistant material
- Size Ø 75 x 12.5 mm
- Weight 0.3 kg each

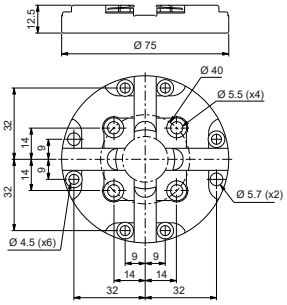


Pallet Ø 75 mm, Macro, 3R-651.75-50-N

NANO

Hi-end

- Max. press load 64 t
- Rust resistant material
- Size Ø 75 x 12.5 mm
- Weight 0.3 kg



Pallet Ø 75 mm, Macro, D-20212.12

Std

Adv

- Max. press load 32 t
- M6 threads from top
- Rust resistant
- Size Ø 75 x 22 mm
- Weight 0.6 kg

Pallet Ø 75 mm, Macro, D-20212.13

Std

Adv

- Integrated gripper interface
- Max. press load 32 t
- M6 threads from top
- Rust resistant
- Size Ø 75 x 27 mm
- Weight 0.7 kg

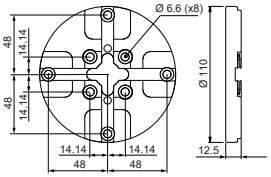
PM Tooling

Pallet Ø 110 mm, Macro, 90506.06

Std

Hardened pallet with clearance holes for fixing screws.

- Max. press load 100 t
- Rust-resistant material
- Size Ø 110 x 12.5 mm
- Weight 0.7 kg

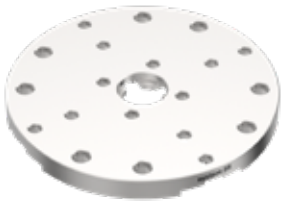


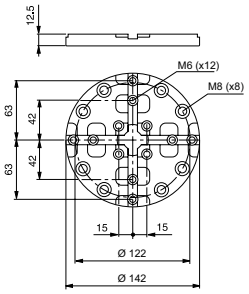
Pallet Ø 142 mm, MacroMagnum, 3R-681.71

Std

Hardened pallet with clearance holes for fixing screws.

- Max. press load 150 t
- Rust-resistant material
- Size Ø 142 x 12.5 mm
- Weight 1 kg





Spacerplate 54 x 54 mm, Macro, D-20211.01

Std
Adv
Hi-end

Requires either 3R-651.7-P or 3R-651.7-N.

- M6 threads from top
- Build-in height 14.5 mm
- Max. press load 16 t
- weight 0.3 kg

Spacerplate 54 x 54 mm, Macro, D-20211.02

Std
Adv
Hi-end

Requires either 3R-651.7-P or 3R-651.7-N.

- M6 threads from top
- Build-in height 27.5 mm
- Max. press load 16 t
- weight 0.6 kg

Spacerplate 54 x 54 mm, Macro, D-20211.03

Std
Adv
Hi-end

Requires either 3R-651.7-P or 3R-651.7-N.

- M6 threads from top
- Build-in height 14.5 mm
- Max. press load 16 t
- weight 0.3 kg

Spacerplate Ø 75 mm, Macro, D-20211.11

Std
Adv
Hi-end

Requires either 3R-651.75-P or 3R-651.75-N.

- M6 threads from top
- Build-in height 14.5 mm
- Max. press load 32 t
- weight 0.5 kg

PM Tooling

Spacer plate Ø 75 mm, Macro, D-20211.12

Std
Adv
Hi-end

Requires either 3R-651.75-P or 3R-651.75-N.

- M6 threads from top
- Build-in height 27.5 mm
- Max. press load 32
- weight 0.9 kg

Spacer plate Ø 75 mm, Macro, D-20211.13

Std
Adv
Hi-end

Requires either 3R-651.75-P or 3R-651.75-N.

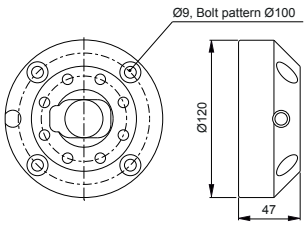
- M6 threads from top
- Build-in height 14.5 mm
- Max. press load 32 t
- weight 0.4 kg

Distance block, Macro PM, 3R-A34249

Std

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

- Built-in height 47 mm
- Weight 2.8 kg



Core pin chuck adapter, Macro PM, D-20175.40

Hi-end

Automatic chuck adapter (Macro to core pin). Pneumatic and manual operation. If pneumatic, requires special Macro chuck to transfer air to chuck adapter. For additional specifications, see also D-20175.30.

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

Drawbar, Macro, 90958

- Through hole Ø 10.2 mm
- Weight 0.1 kg

NOTE: In automated applications, ensure the gripper grips the pallet. Alternatively, change the drawbar for a gripper interface (i.e. 3R-605.1).

Index blocker-pin, 3R-SP29196

To disable indexing on Matrix 110 chucks.

- Delivered as set of 1

Index blocker-pin, 3R-SP29533E

To disable indexing on Matrix 142 and 185 chucks.

- Delivered as set of 2

Index blocker-pin, 3R-SP29559E

To disable indexing on Matrix 220 and 260 chucks.

- Delivered as set of 4

Handle, Matrix 110, 3R-692.7-110

Handle that overcomes pallet obstruction and makes chuck removal easier.

Handle Matrix 142, 3R-692.7-142

Handle that overcomes pallet obstruction and makes chuck removal easier.

Handle, Matrix 185, 3R-692.7-185

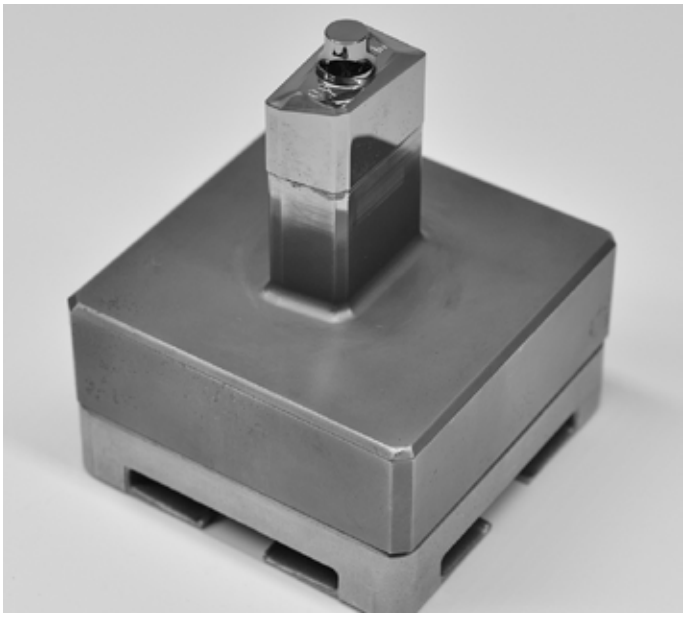
Handle that overcomes pallet obstruction and makes chuck removal easier.

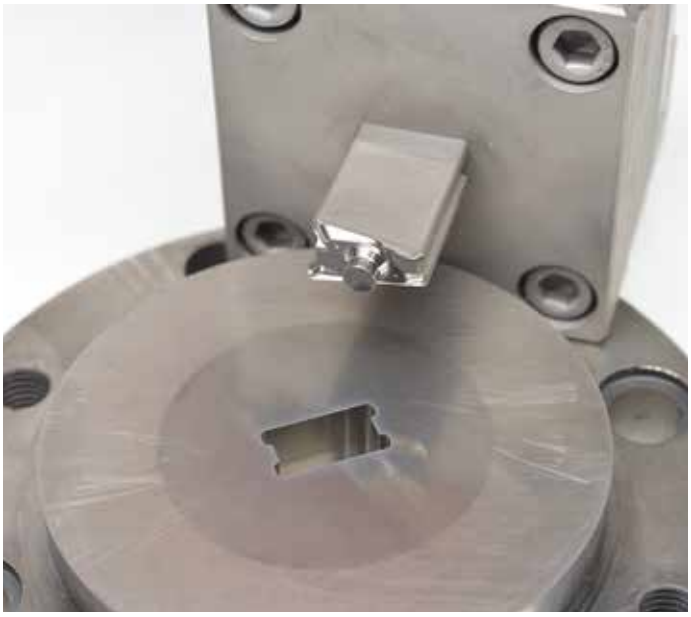
PM Tooling

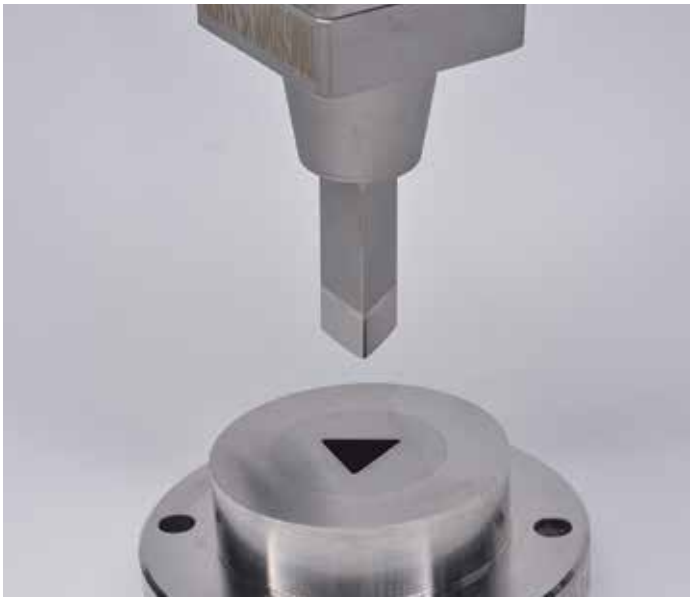
Handle Matrix 220, 3R-692.7-220
Handle that overcomes pallet obstruction and makes chuck removal easier.

Lifting device, 3R-692.8-142
Use with 3R-692.7-110 and 3R-692.7-142 to enable lift by crane.

Lifting device, 3R-692.8-220
Use with 3R-692.7-185 and 3R-692.7-220 to enable lifting by crane.





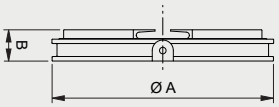


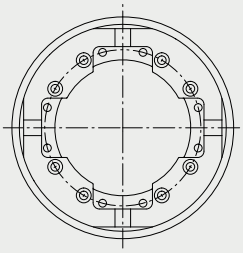
PM Tooling

Pallets, Matrix

Art. no	A	B	Press load	Drawbar	Weight
3R-691.1-110	110 mm	20 mm	25 t	3R-695.2-110	0.5 kg
3R-691.1-110-N	110 mm	20 mm	25 t	3R-695.2-110	0.5 kg
3R-691.1-142	142 mm	20 mm	50 t	3R-695.2-142	1.2 kg
3R-691.1-142-N	142 mm	20 mm	50 t	3R-695.2-142	1.2 kg
3R-691.1-185	185 mm	20 mm	110 t	3R-695.2-185	1.7 kg
3R-691.1-220	220 mm	25 mm	150 t	3R-695.2-220	2.6 kg
3R-691.1-260	260 mm	25 mm	200 t	3R-695.2-260	3.2 kg

NOTE: Rust-resistant material and adapted for automatic changing.
NOTE: self-carrying, requires extra support.

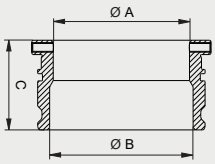




Drawbars, Matrix

Art. no	A	B	C	Weight
3R-695.2-110	57 mm	60 mm	38 mm	0.3 kg
3R-695.2-142	67 mm	79 mm	45.5 mm	0.5 kg
3R-695.2-185	112 mm	119 mm	45.5 mm	0.8 kg
3R-695.2-220	147 mm	149 mm	45.5 mm	1.3 kg
3R-695.2-260	187 mm	189 mm	45.5 mm	1.5 kg

NOTE: In automated applications, the gripper has to grip the pallet and not the drawbar.



Locking ring key, 3R-605-GE

To lift drawbar locking rings.

- Supplied in sets of 2

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

- Intended for Ø 10 mm 3Refix mandrels.
- 4 Nm

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

Intended for Macro manual chucks.

- 6 Nm

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

Intended for Ø 20 mm 3Refix mandrels.

- 10 Nm

PM Tooling

Air unit, 90125.25-05

Includes status indicators.

- Weight 1 kg

Macro punch fixture, 90238

Macro punch fixture for wire cutting through holes within Ø 20 mm.

Code carrier, 3R-863.01-10

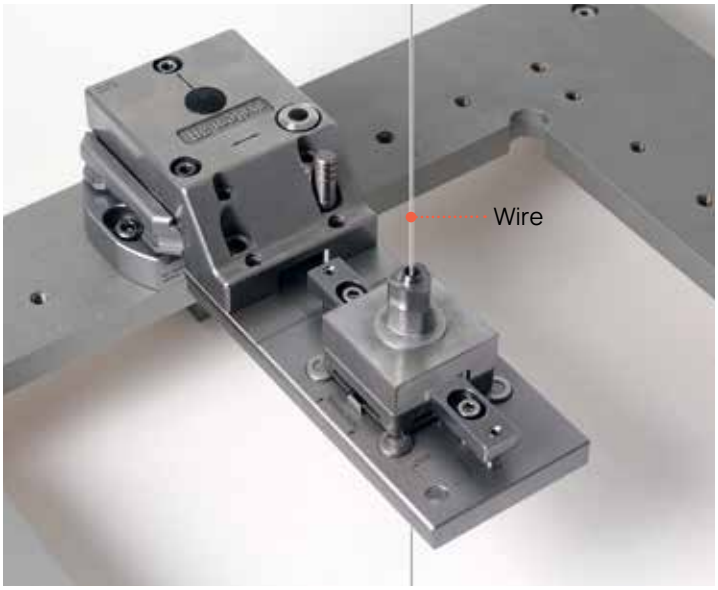
With pre-programmed unique identity, designed for use with Macro and Matrix pallets.

- Supplied in sets of 10

Code carrier, 3R-863.01-50

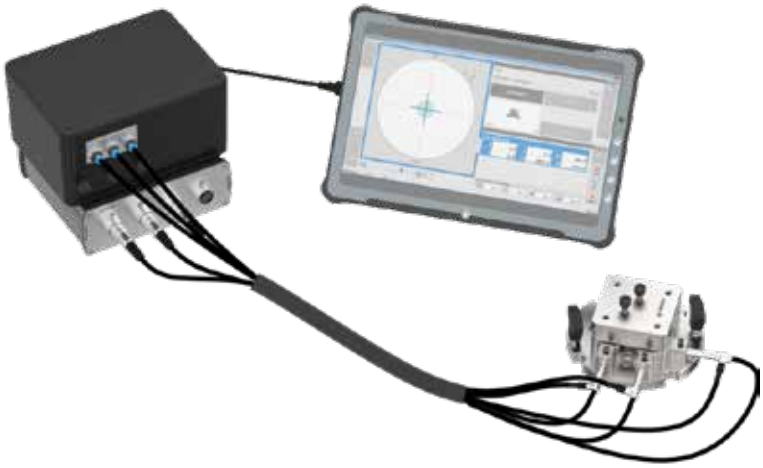
With pre-programmed unique identity, designed for use with Macro and Matrix pallets.

- Supplied in sets of 50



Alignment equipment

Alignment equipment for all press chucks – Verifying tool, HP



Easy alignment with software-assisted reading and following of the various steps. Formal documentation can be printed and/or stored after alignment.

High-performance verification kit

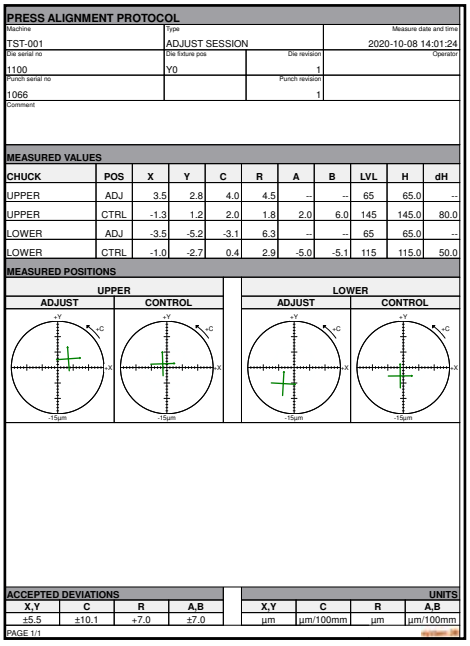
Deviation established to less than 0.1 µm within a second thanks to location measuring probes with pressure-limited tips. For better measuring of exact location while checking alignment, the hand-held computer can be positioned inside the machine. Values may be printed/stored after alignment of each punch chuck. Kits for use with punches and dies are sold separately. Use is via various tooling interfaces.

Contents

Computer kit for PM alignment, D-20189-BASE:

- Laptop
- Software
- Signal converter
- Pneumatic control unit
- Pneumatically operated probes (x3)

Tools specific to various dies and punches can be ordered separately. They include the required accessories.



PRESS ALIGNMENT PROTOCOL

Machine	Type	Measure date and time
TST-001	ADJUST SESSION	2020-10-08 14:01:24

Die serial no	Die fixture pos	Die revision	Operator
1100	Y0	1	

Punch serial no	Punch revision
1066	1

Comment

MEASURED VALUES

CHUCK	POS	X	Y	C	R	A	B	LVL	H	dH
UPPER	ADJ	3.5	2.8	4.0	4.5	--	--	65	65.0	--
UPPER	CTRL	-1.3	1.2	2.0	1.8	2.0	6.0	145	145.0	80.0
LOWER	ADJ	-3.5	-5.2	-3.1	6.3	--	--	65	65.0	--
LOWER	CTRL	-1.0	-2.7	0.4	2.9	-5.0	-5.1	115	115.0	50.0

MEASURED POSITIONS

UPPER: ADJUST, CONTROL — LOWER: ADJUST, CONTROL

ACCEPTED DEVIATIONS

X,Y	C	R	A,B
±5.5	±10.1	+7.0	±7.0

UNITS

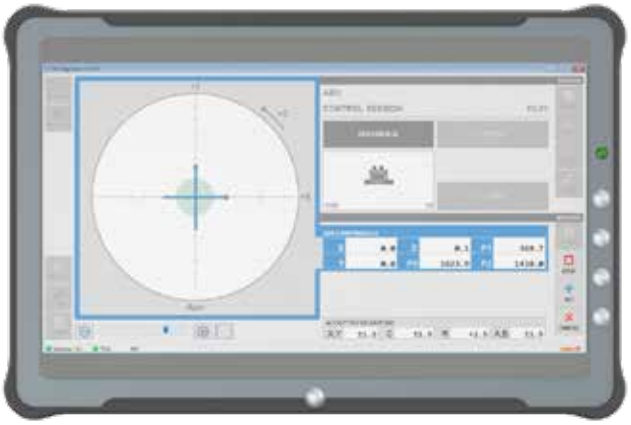
X,Y	C	R	A,B
µm	µm/100mm	µm	µm/100mm

PAGE 1/1

Intuitive real-time display

Alignment

Naturally enough, the main display is a real-time graph with verificatory values. Reading this overall picture is far easier than trying to follow several flickering numbers. Using the step-by-step approach shown below, the software is more or less self-instructive and, consequently, very intuitive and user friendly.



Re-set probes and values against the master

Load punch and die into machine. Initiate measuring.

Adjust location of chuck until displayed area turns green.

Check tilt of chuck as a verification.

Alignment

D-20189-BASE

Computer, software and pneumatic equipment to monitor location in real time.
Tool sets are available by different tooling systems and for punches by various lengths. Ask for more specific information. Accessories shown below are only a few.
Accessories

- Air tank, D-20189-TANK
- Alignment tool by xyc, punch, Macro, L=50 mm, D-20189-13
- Alignment tool by xyc, punch, Macro, L=150 mm, D-20189-14
- Alignment tool by xyc, die, 3Refix, D-20189-D11
- Alignment tool by xyc, die, Matrix 142, D-20189-D13
- Z-tool, punch, Macro, D-20198-Z01
- Z-tool, die, Matrix 142, D-20198-DZ01
- Z-tool, die, 3Refix, D-20198-DZ02.

Air container, D-20189-Tank

Container for mobile pressure supply.
Suitable for D-20158-BASE and D-20189-BASE (these have limited air access).

- Volume 2 litres

Alignment tool, die, 3Refix, D-20189-D11

Std Adv

Die for 3Refix tooling references. For holding measuring probes against a designated punch.

Alignment tool, die, Matrix 142, D-20189-D13

Adv Hi-end

Die for Matrix 142 tooling references. For holding measuring probes against a designated punch.

Alignment tool, punch, Macro, D-20189-13

Std Adv Hi-end

XYC location tool, punch, Macro, L = 50 mm.

Alignment

Alignment tool, punch, Macro, D-20189-14

Std
Adv
Hi-end

- XYZ location tool, punch, L = 150 mm.

Punches and dies
Available by multiple versions in order to optimize process by customer.

Z tool, die, Matrix 142, D-20198-DZ01

Std
Adv
Hi-end

Z tool to set chuck location in machine. Requires D-20189-BASE (for support) and appropriate software. To be used in combination with D-20198-Zxx punches. Further versions are available for different tooling systems and punches of various lengths.

Z tool, punch, Macro, D-20198-Z01

Z tool to set chuck location in machine. Requires D-20189-BASE (for support) and appropriate software. To be used in combination with D-20198-DZxx dies. Further versions are available for different tooling systems.

Z tool, die, 3Refix, D-20198-DZ02

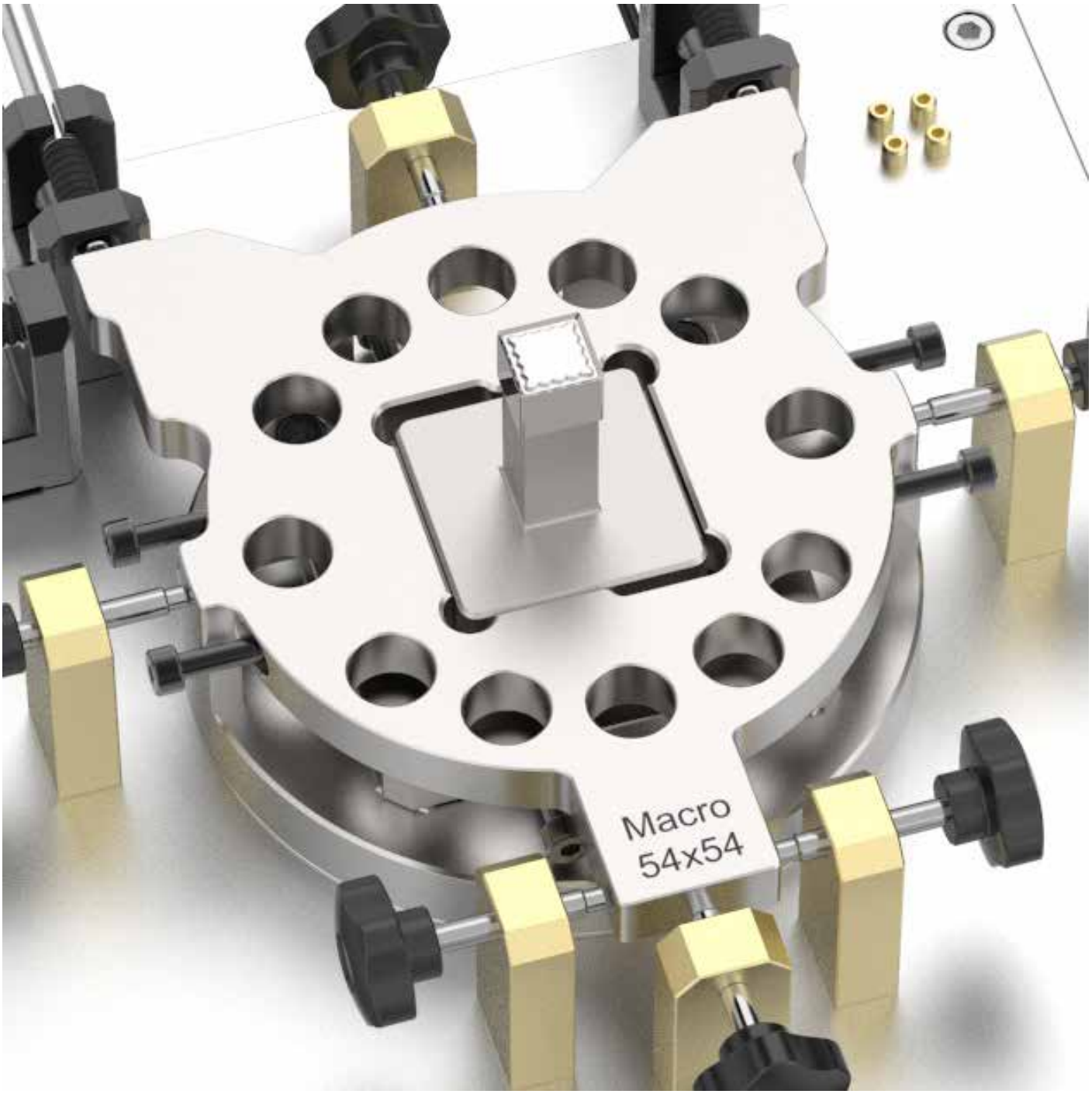
Z tool to set chuck location in machine. Works against corresponding Z tool for the punch.

Alignment & Z-distance control tool, Macro PM, 90909

Alignment and control tool for Macro + 3Refix systems in PMs. Alignment is rough, but helps reduce assembly time before final verification and alignment with verification tools. Can also be used to check that punch levels are parallel with die-plate-levels.

- Dimensions: Ø 115 x 75 mm
- 3Refix Ø 10 mm c-c. 46 + 44 mm
- Weight 2.1 kg

Alignment



Alignment

Alignment tool, die, D-20158-Macro 54

Std Adv Hi-end

Has two sections. One enables measuring in relation to the produced punch or electrode. The other fixes and holds the reference element firmly in place.

- Macro reference element by 54 x 54 mm

Alignment tool, die, D-20158-Macro 75

Std Adv Hi-end

Has two sections. One enables measuring in relation to the produced punch or electrode. The other fixes and holds the reference element firmly in place.

- Macro reference element by Ø 75 mm

Alignment tool, die, D-20158-Matrix 110

Std Adv Hi-end

Has two sections. One enables measuring in relation to the produced punch or electrode. The other fixes and holds the pallet firmly in place.

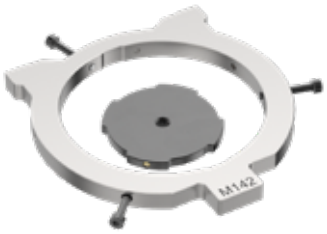
- Matrix 110 pallet by Ø 110 mm

Alignment tool, die, D-20158-Matrix 142

Std Adv Hi-end

Has two sections. One enables measuring in relation to the produced punch or electrode. The other fixes and holds the pallet firmly in place.

- Matrix 142 pallet by Ø 142 mm



Punch alignment system, D-20158-BASE

This enables punch adjustment in Macro-equipped metal powder presses. It is a stand-alone unit. Electrical sensors can replace the indicators. To get at the pallet's fixing screws, there is free access from beneath. The unit has 3 linear probes. The pneumatic pressure applied to the probes is 1.1 – 1.5 bars.

Probe measurement accuracy:

- Deviation 0.2 µm
- Repetition error 0.05 µm

Available accessory kits (supplied separately)

Macro 54
Macro 75
Matrix 110
Matrix 142

Tooling technology

If, instead of moving to computers and software, you want to keep using dial indicators, we offer several options with master tooling for alignment of press chucks.

For single-level press, 3Refix

1 Die pallet for hold dial indicators (Matrix 142)
2 3Refix mandrels Ø 10 mm
3 Lower punch (Macro)
4 Upper punch (Macro)
5 Pre-set tool
6 Drawbar (Macro)

NOTE: Dial indicators not included.

For single-level press, Matrix 142

1 Die pallet for holding 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 not included.

For multi-level press, 3Refix

1 Drawbar (Matrix 142)
2 Outer punch (Matrix 142)
3 Inner punch (Macro)
4 Die pallet for holding dial indicators
5 3Refix Ø 10 mm
6 Pre-set tool
7 Drawbar (Macro)

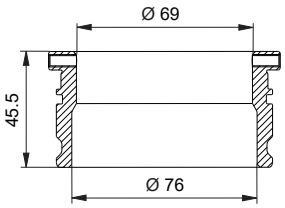
NOTE: Dial indicators not included.

PM adapters

PM adapters

Matrix 142-3Refix drawbar, 3R-SP29403

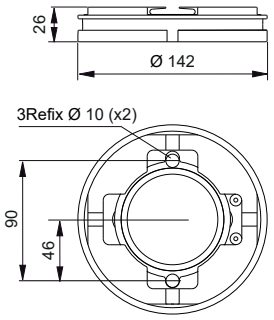
Special Matrix 142 drawbar for adapter pallet 3R-SP29388.



Adapter pallet Matrix 142-3Refix Ø 10, 3R-SP29388

Adapter pallet Matrix 142 to 3Refix (44/46) for dies.

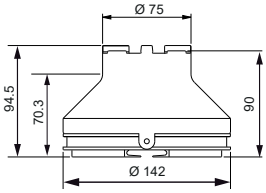
- Required drawbar 3R-SP29403
- Weight 1.6 kg



Chuck adapter, Matrix 142-Macro, 3R-SP33230

From Matrix 142 into Macro system. Chuck adapter with build-in Macro chuck.

- Build-in height 90 mm
- Hardened references
- Max. press load 50 t
- Required drawbar 3R-605.11
- Weight 7 kg



Distance adapter, D-20201.01

- Max. press load 32 t
- Required drawbar 90958
- Weight 1.8 kg

Core pin chuck adapter, Macro PM, D-20175.40

Hi-end

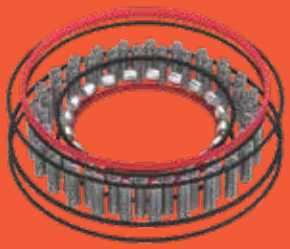
Automatic chuck adapter from Macro to core pin. Pneumatic and manual operation. If pneumatic, requires special Macro chuck to transfer air to chuck adapter.

For additional specifications, see also D-20175.30

Pneumatic chuck adapter, Matrix 185 to Matrix 142, 3R-SP35072

Main purpose is adapting x-press configuration so alternating with single-level tools is possible.

Servicing



Servicing

Alignment tools

Force gauge regular, 3R-SSP115-BASE

For checking clamping force of: all Matrix chucks; and, Macro chucks in non-compacting machines. Converter kits 3R-SSP115 Matrix xxx required for checking Matrix chucks.

Converter kit, 3R-SSP115, Matrix 110

Kit to enable checking of Matrix 110 chucks.

Converter kit, 3R-SSP115, Matrix 142

Kit to enable checking of Matrix 142 chucks.

Converter kit, 3R-SSP115, Matrix 185

Kit to enable checking of Matrix 185 chucks.

Force gauge, press Ø 72 mm, 3R-SSP122

For checking clamping force of: all Matrix chucks; and, Macro chucks in non-compacting machines (gauge overcomes cramped and limited space inside machine). Converter kits 3R-SSP115 Matrix xxx required for checking Matrix chucks.

Servicing – spare parts

Spare parts, 3R-SSP145
Replacement parts for servicing. Suitable for D-20175.

Spare parts, 3R-SSP149
Replacement parts for servicing. Suitable for 3R-600.17-10 (Version 01).

Spare parts, 3R-SSP07082E
Replacement parts for servicing. Suitable for 3R-605.11, 90958 and similar.

Spare parts, 3R-SSP086
Replacement parts for servicing. Suitable for 3R-600.17-20, 3R-600.17-50 and 3R-SP33230 (version 00).

Spare parts, 3R-SSP087
Replacement parts for servicing. Suitable for 3R-600.17-22, 3R-600.17-24, 3R-600.17-52 and 3R-600.17-54.

Spare parts, 3R-SSP119
Replacement parts for servicing. Suitable for 3R-600.27-xx.

Servicing – spare parts

Spare parts, 3R-SSP123

Replacement parts for servicing. Wear parts to be replaced at servicing . Suitable for 3R-600.17-30, 3R-600.17-60 and 3R-SP33230 (version 01).

Spare parts, 3R-SSP127

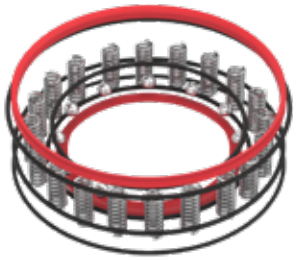
Replacement parts for servicing. Suitable for 3R-600.17-32, 3R-600.17-34, 3R-600.17-62 and 3R-600.17-64.

Spare parts, 3R-SSP146

Replacement parts for servicing. Suitable for 3R-600.17-16.

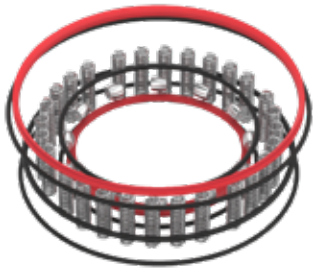
Spare parts, 3R-SSP074

Replacement parts for servicing. Suitable for 3R-690.1-110, 3R-690.1-110-N, 3R-SP28395 and 3R-SP28395-N. Service tool 3R-SSP079 recommended.



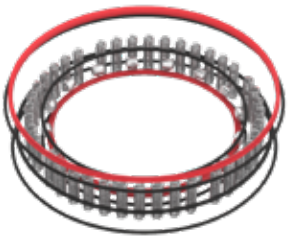
Spare parts, 3R-SSP075

Replacement parts for servicing. Suitable for 3R-690.1-142, 3R-690.1-142-N and 3R-SP28219. Service tool 3R-SSP080 recommended.



Spare parts, 3R-SSP076

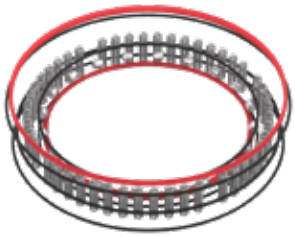
Replacement parts for servicing. Suitable for 3R-690.1-185 and 3R-SP28268. Service tool 3R-SSP081 recommended.



Servicing – spare parts

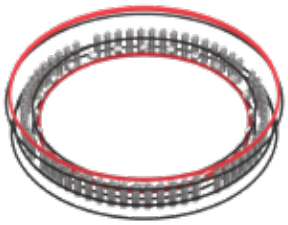
Spare parts, 3R-SSP077

Replacement parts for servicing. Suitable for 3R-690.1-220 and 3R-SP28340. Service tool 3R-SSP082 recommended.



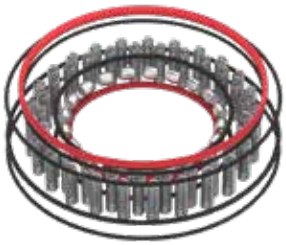
Spare parts, 3R-SSP078

Replacement parts for servicing. Suitable for 3R-690.1-260. Service tool 3R-SSP082 recommended.



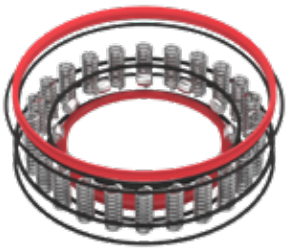
Spare parts, 3R-SSP136

Replacement parts for servicing. Suitable for 3R-690.1-142HD. Service tool 3R-SSP080 recommended.

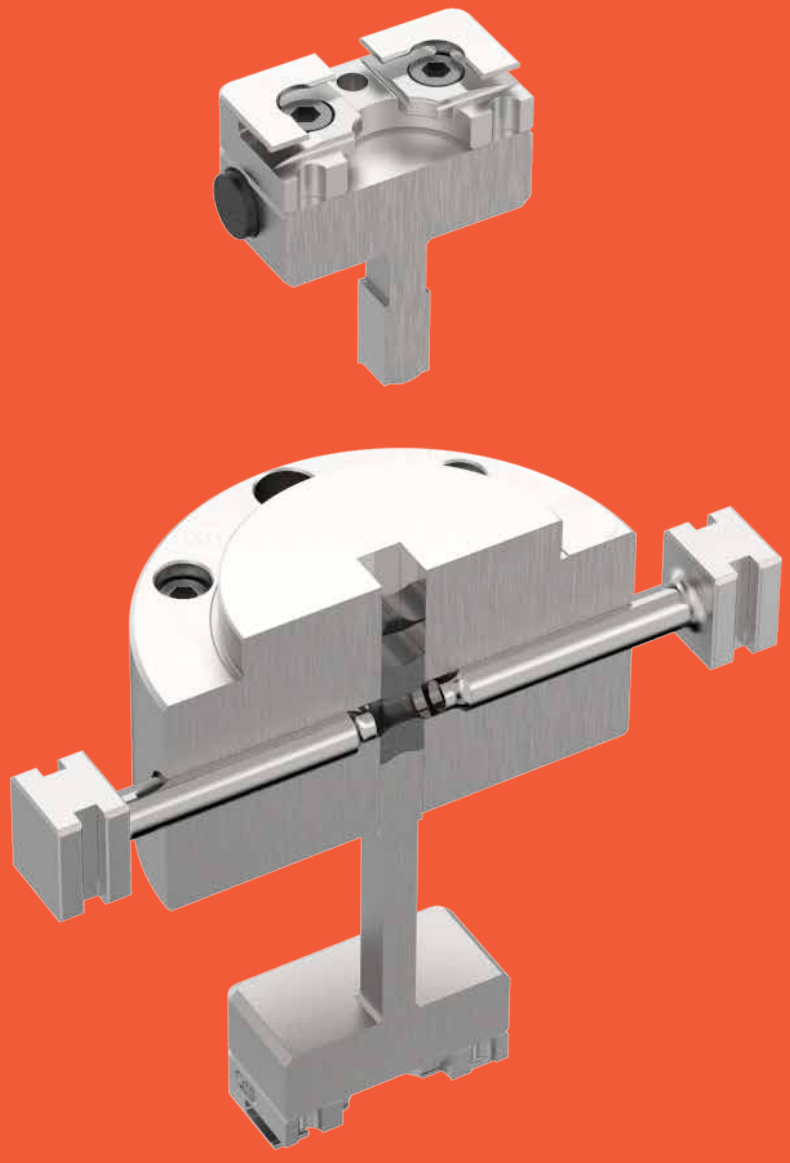


Spare parts, 3R-SSP147

Replacement parts for servicing. Suitable for 3R-690.1-110HD. Service tool 3R-SSP079 recommended.



X-pressing



X-pressing

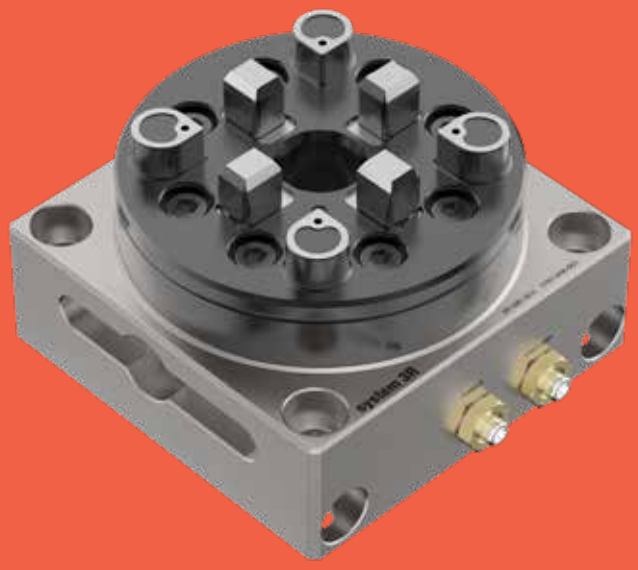
X-pressing comes in many different shapes and sizes. Some of these are determined by the machine and its prerequisites, others by customer preferences and the form of the final part. In some cases, alternating between X-pressing and the use of regular tools in single-level press operations requires special attention to be paid to the tooling interface in the powder press. This attention does not relate to the punches, but to remaining flexible with the interface for the die.

If it is felt that Matrix requires too much space, the 3Refix system is an option.

Automatic chuck adapters enable a machine that has just one configuration to switch between X-pressing and single-level tool operations. See also 3R-SP35072.

Dies can use Matrix tooling. Depending on chosen number of X-press units, 3 to 6 toe clamps are possible.

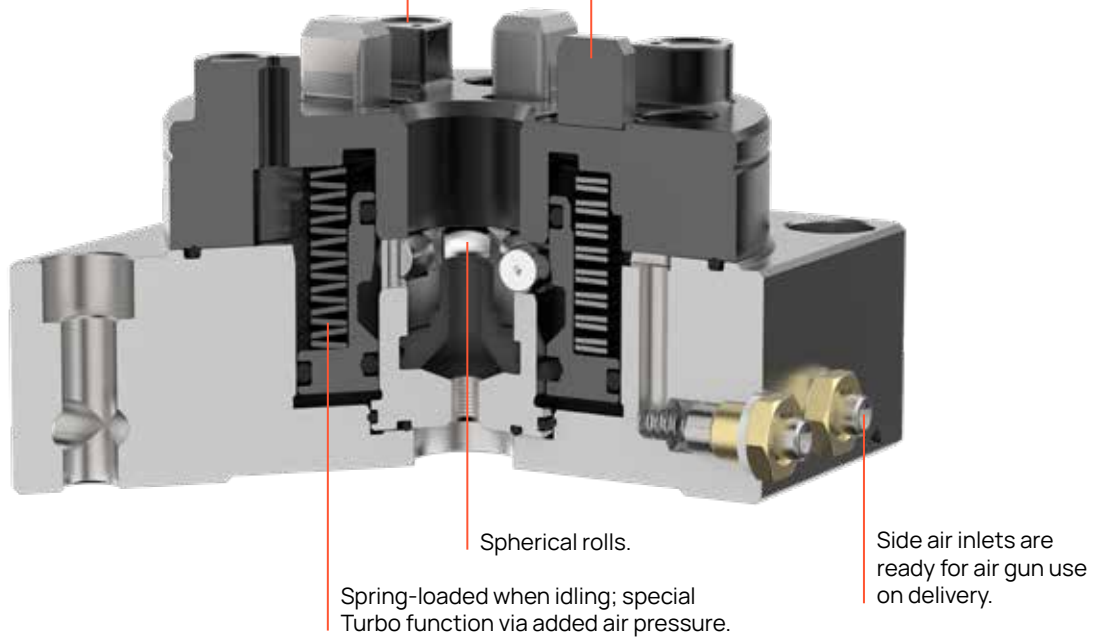
MacroNano in detail



Nano-precision machining requires nano-precision referencing of workpieces and tools. Even with state-of-the-art solutions, this is a real challenge. It becomes even more challenging when references have to be determined in the shortest possible time.
Our Nano system is best described in two words – precise and quick! Via ultra-precise coupling of both workpiece and tool clamping, the system ensures linking throughout the entire production chain.

The benefits of tooling precision are felt in toolshops and powder presses alike. Accurate positioning makes it more likely that pressed parts will end up more symmetrical. There is then less need for subsequent grinding.

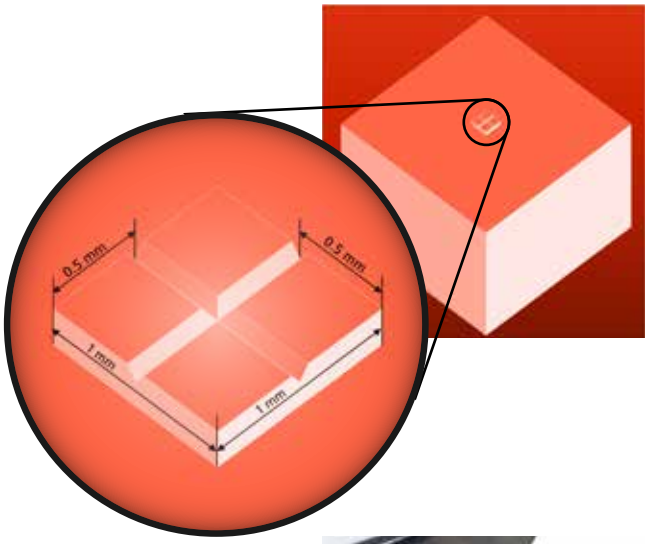
- Repetition accuracy within 0.001 mm
- Fixed index positions 4x90°
- Required air pressure, pneumatic chuck 6 bars (± 1)

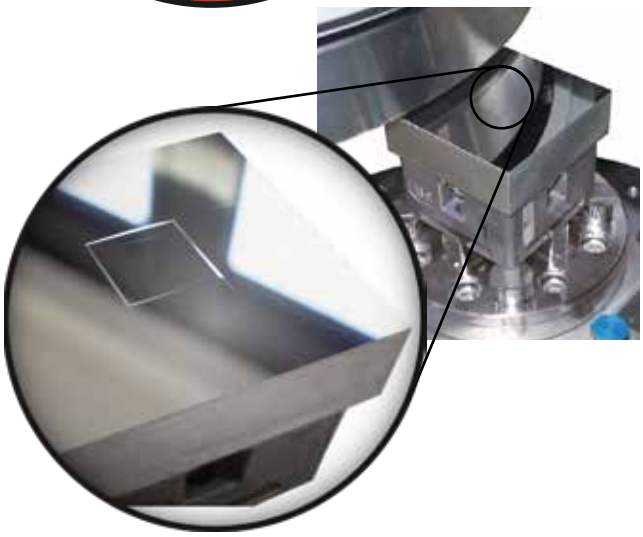


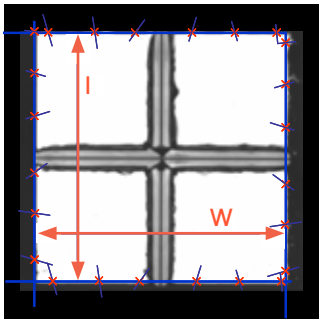
Application example: Microstructuring with diamond machining

Micro features produced to nano precision.

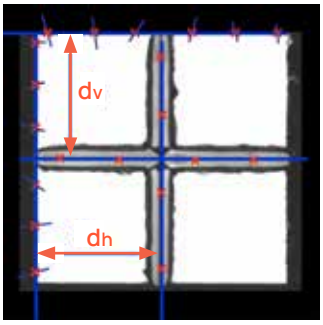
This microstructure was produced using two different diamond flycutting machines. Each was equipped with a MacroNano chuck and use was made of the MacroNano system's indexing feature. The square in the middle of the workpiece (picture on the right) was produced by plane milling on the 1st machine.To produce the microgrooves, the pallet carrying the workpiece was then transferred to the 2nd machine's chuck. The zero reference was determined only once on the 1st machine. Thanks to the MacroNano system's precision (indexing included therein), it was then carried throughout the entire process chain. Overall structure deviation was less than 0.5 microns.







Cube dimension measurement



Groove position measurement

Width (mm)		Length (mm)		Vertical dist. (mm)		Horizontal dist. (mm)	
W_1	0.9996	l_1	0.9999	dv_1	0.4988	dh_1	0.5013
W_2	0.9996	l_2	0.9999	dv_2	0.4993	dh_2	0.4995
W_3	0.9996	l_3	0.9999	dv_3	0.4996	dh_3	0.5001
W_4	0.9997	l_4	0.9999	dv_4	0.4991	dh_4	0.4995
W_5	0.9996	l_5	0.9998	dv_5	0.5010	dh_5	0.5001
W_6	0.9996	l_6	0.9998	dv_6	0.5007	dh_6	0.5002
W_7	0.9997	l_7	0.9999	dv_7	0.4996	dh_7	0.5012
W_8	0.9996	l_8	0.9999	dv_8	0.4992	dh_8	0.5009
W_9	0.9997	l_9	0.9999	dv_9	0.4996	dh_9	0.5009
W_{10}	0.9996	l_{10}	0.9998	dv_{10}	0.4998	dh_{10}	0.5008
W	**0.9996**	**l**	**0.9999**	**dv**	**0.4997**	**dh**	**0.5004**

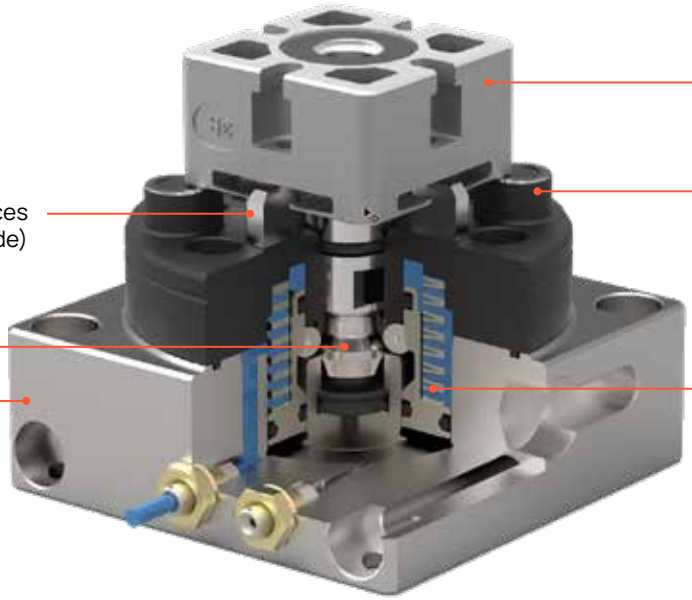
Mean values

Overall structure deviation < 0.5 µm

Tooling technology

The Macro system for punches

Choice of reference element is determined by required pressing force.

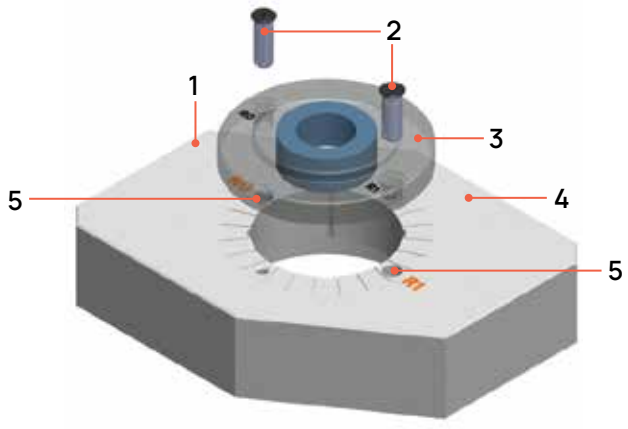


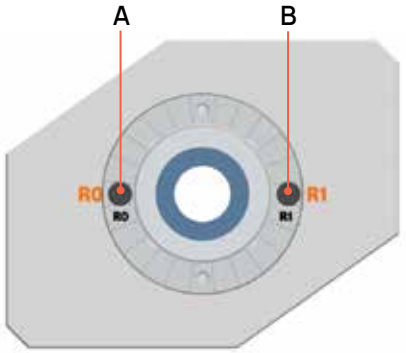
NOTE: Recommended air pressure, pneumatic chuck 6 bars (± 1).

The Matrix system for dies and punches

3Refix for dies

3Refix is a cost-effective solution. The two 3Refix expanding mandrels determine position. The first mandrel determines the X/Y position and the second determines the angle.

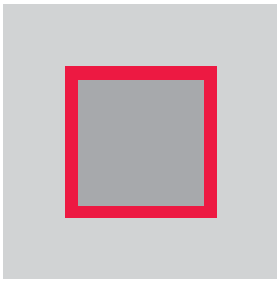




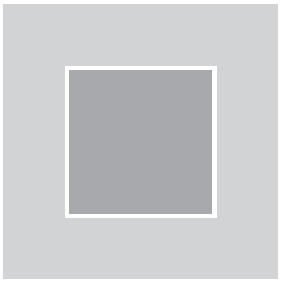
DESCRIPTION
1 Z-reference surface
2 3Refix mandrels
3 Customer-made die
4 Die plate (table)
5 Die plate only requires two holes for 3Refix mandrels

PROCEDURE (ALWAYS)
A Tighten R0 (primary)
B Tighten R1 (secondary)

POSITIONING ACCURACY
Improved positional accuracy.
Closer tolerances for finer grains.

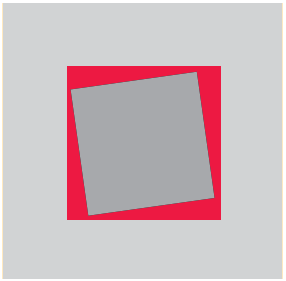


Conventional setting-up

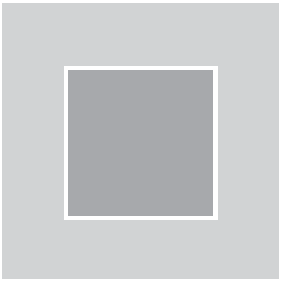


Setting-up with System 3R

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



Conventional setting-up



Setting-up with System 3R

Vibration-damped palletisation (VDP)

↓ 25%

Reduces cutting forces by up to 25%. Lower cutting forces mean reduced power consumption and less tool wear.

↑ 30%

- Lengthens tool life by up to 30%, thereby lowering tool costs.
- Lengthens the life of machine spindles. VDP also reduces machine spindle vibration, thereby extending spindle life by at least 30%.
- Reduces lead times. VDP enables machining with higher cutting data. This puts 30% better utilisation of existing machine capacity within your reach.

By reducing 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.

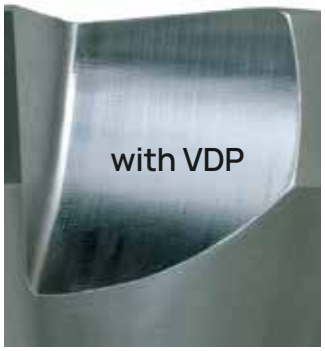
The essence of VDP is reduction of vibrations while material is removed by force. It is normally used in workshops when tools are being milled and/or ground. In powder compaction, the effects of vibration reduction are primarily noticed in superior finishes that make polishing unnecessary.

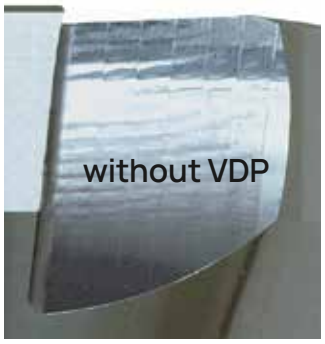
- Improved surface finish.
- Less tool wear extends cutting-tool life.
- Improved dimensional accuracy means fewer rejects.
- Higher removal rates shorten lead times.
- +30% capacity increase within reach.

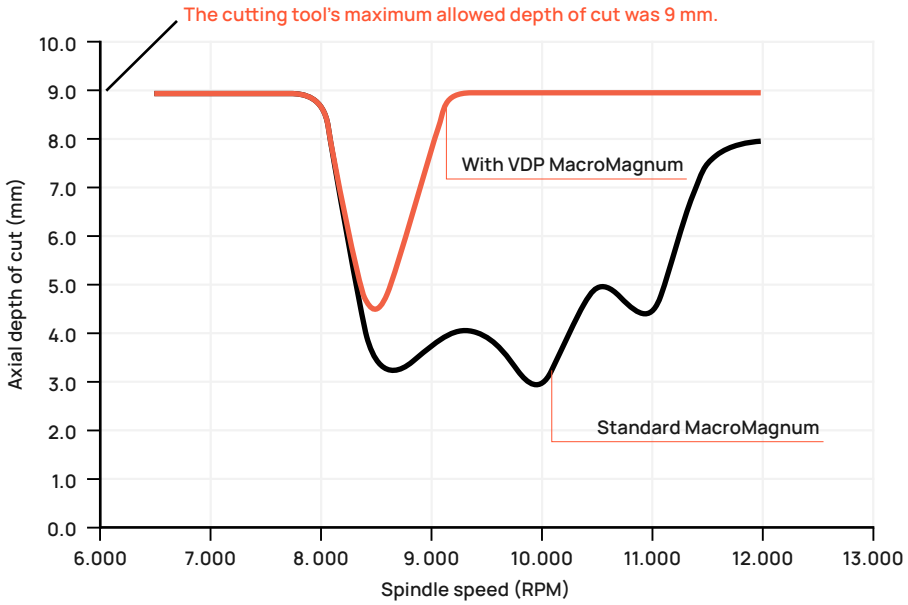
Vibration-damped palletisation (VDP)

INCREASE YOUR CAPACITY BY

↑ 30%



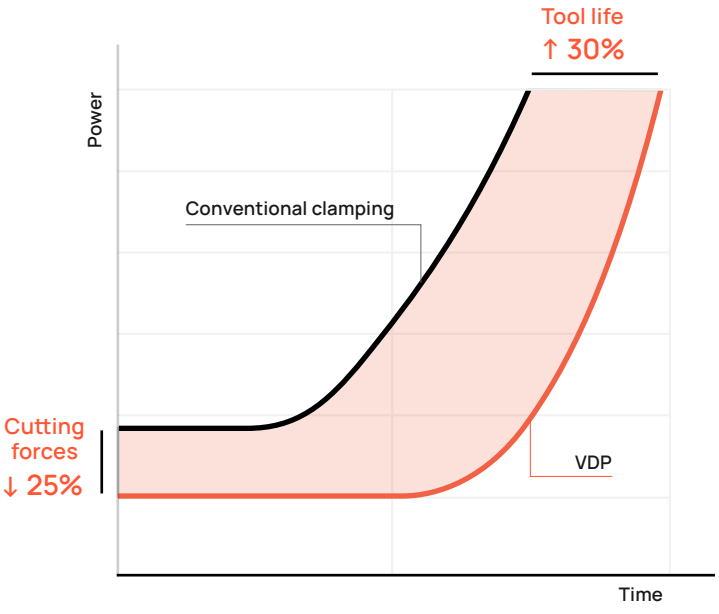




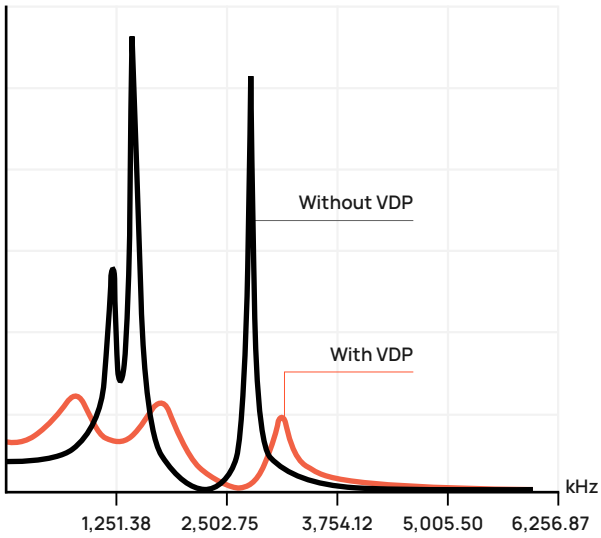
Process stability analysis (Swiss machine tool manufacturer)

Cutting speed (RPM)	Axial depth of cut (mm) Magnum Std	Magnum VDP	Increase in removal rate due to VDP (%)
8.500	3.5	4.5	28.6
9.000	4.0	9.0*	125
10.000	3.0	9.0*	200

* Cut depth limited by the cutting tool for the test and not by VDP.



Reduced tool wear extends tool life
= INCREASED REVENUE



Graph showing oscillation amplitudes when machining with the workpiece clamped conventionally (without VDP) and in a damped chuck (with VDP).

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!

Boost your productivity and sharpen your competitiveness with our four winners: WorkPal 1, WorkPartner 1+, Fanuc and AMR.

Last, but not least, they ensure faster payback on your investments.

For powder press automation solutions, please ask for more information.

WorkPal 1
Modest demands, major benefits.

WorkPartner 1+
Can serve two machines.

AMR
Supports lights-out manufacturing.

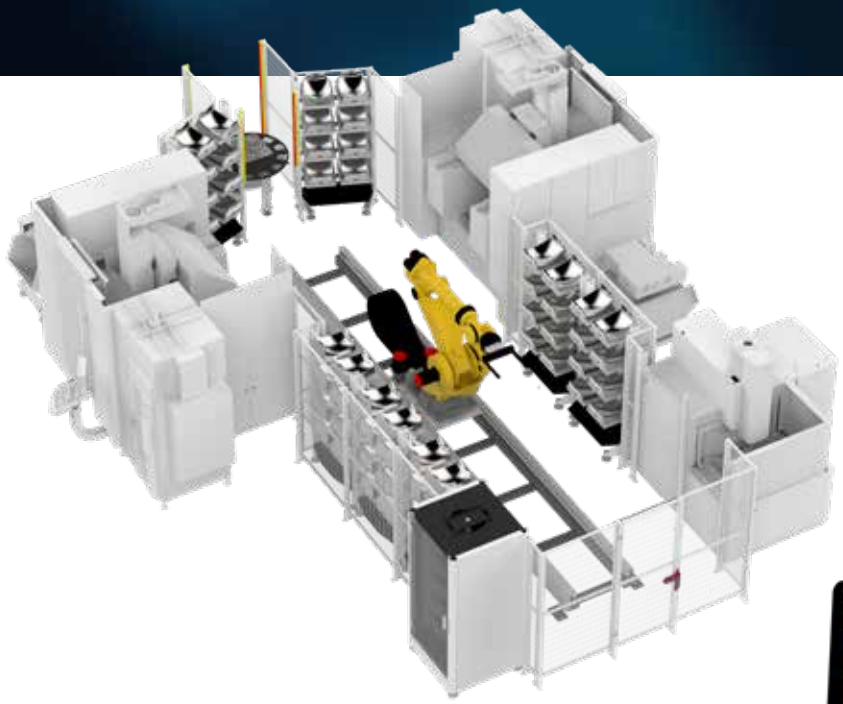
Transformer
Automation with six-axis Fanuc industrial robot.

WorkShopManager WSM

User-friendly cell-management software

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

- Simplify job preparation
- Execute jobs easily in manual or automated machines
- Monitor processes, change priorities and collect utilisation statistics
- Use ID chip management to ensure supreme process reliability.

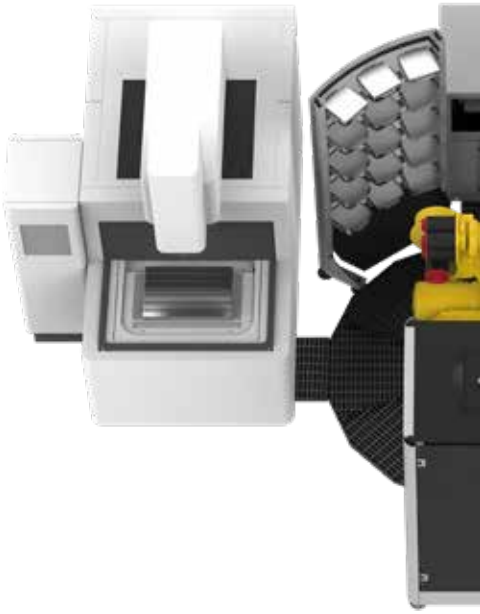


Sustainability declaration

IMPROVED PRODUCTIVITY

Improve your productivity by: using existing production equipment optimally; and, increasing resource use, e.g. run machines during unmanned hours (nights, weekends, etc.). Instead of outsourcing production and incurring shipping costs, produce in-house 24/7.
By seamlessly integrating advanced technology into your operations, you can execute repetitive tasks with precision and speed, thereby freeing up human resources for higher-value activities. Machines equipped with our automation systems work tirelessly, reducing errors, optimising production schedules and achieving consistent output.

In-house 24/7 production

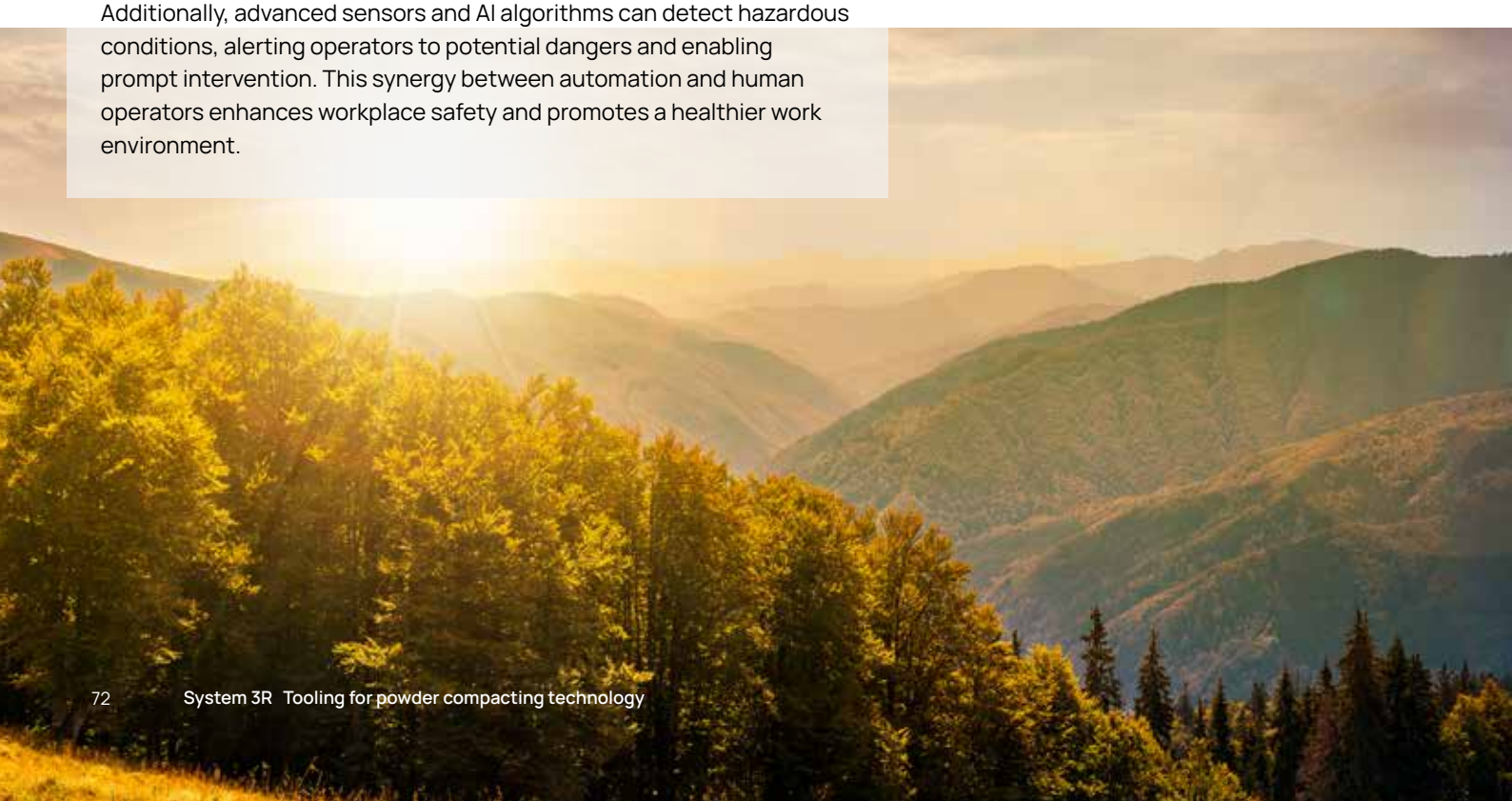


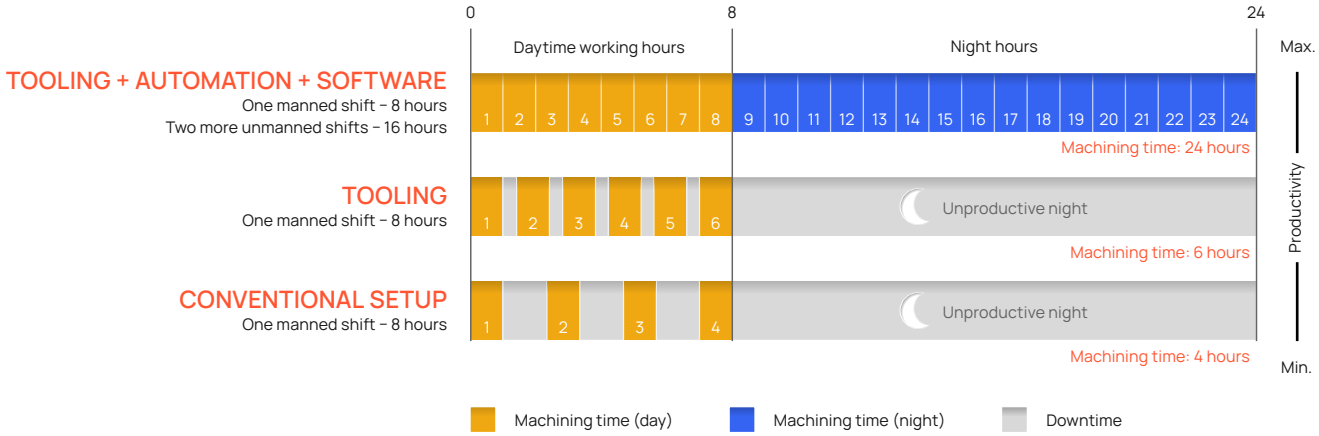
ADVANCED EASE OF OPERATION

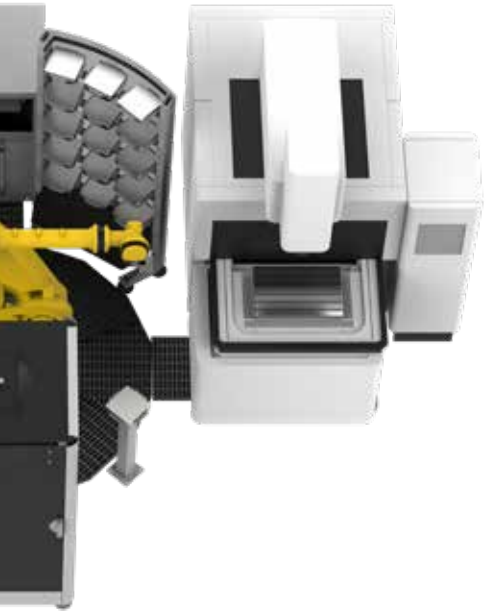
Machine automation has improved operation simplicity and revolutionised efficiency and productivity on an industrial scale. With intuitive interfaces and streamlined processes, workers can, with minimal training, quickly adapt and control complex tasks. Automated systems eliminate human error and promote precise execution. Consistent output and reduced downtime are two of the results.

SAFEGUARD OPERATOR HEALTH BY USING ROBOTS IN SELF-CONTAINED ENVIRONMENTS

Machine automation is a highly promising avenue for improving operator health. By taking over physically demanding tasks, our machines reduce the risk of musculoskeletal injuries and fatigue-related issues.
Additionally, advanced sensors and AI algorithms can detect hazardous conditions, alerting operators to potential dangers and enabling prompt intervention. This synergy between automation and human operators enhances workplace safety and promotes a healthier work environment.







CARBON-NEUTRAL FROM THE VERY START OF MANUFACTURING ALL THE WAY TO RECYCLING AFTER USE

- Our automation solutions are manufactured at our CO_2 neutral facility in Vällingby, Sweden.
- With the ability to self-diagnose and adapt, these solutions extend working lives, reduce maintenance costs and optimise production processes.
- They can also make optimum use of cheaper electricity supplied outside daily peak hours.
- At the end of their service lives, the items of equipment they use can be recycled as metals and standard electronics.

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System 3R's Customer Services department is uniquely positioned to help you maximise the availability, value, precision and productivity of your System 3R equipment. Our cost-effective, customer-centric and expert services put your success at the centre, ramp up your productivity and ensure predictable, uninterrupted uptime.
System 3R's service engineers are your expert partners for a wide range of success-triggering services.
For further details, contact your local System 3R dealer.

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