

POWERGRIP

PALLETIZING SYSTEMATICALLY



The Power-Grip System

The consistent zero-point palletizing system
for all processing operations



The Inventor

created by

PAROTEC
spanntechnik · robotik · engineering

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PAROTEC has more than 35 years of experience in the field of high precision work piece clamping.

One of the technical top performers is the development of the zero-point palletizing system "Power-Grip". Many notable clients worldwide have trusted the process reliability of this technology for years.



Distribution Germany and Benelux

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The company PARTOOL is distributor of the manufacturer PAROTEC for Germany and Benelux.

At the technology and sales center in Nuremberg, you can personally convince yourself of the performance and the precision of Power-Grip at any time.



Precision clamping without chucking bolt. Power-Grip – the zero-point palletizing system.

What is a zero-point palletizing system?

A **zero-point palletizing system** allows you to clamp and position work pieces, clamping media and fixtures **quickly and precisely**.

The standardised interfaces **drastically reduce set-up time, particularly for single work pieces and small batch production, thereby increasing effective machine uptime and productivity.**

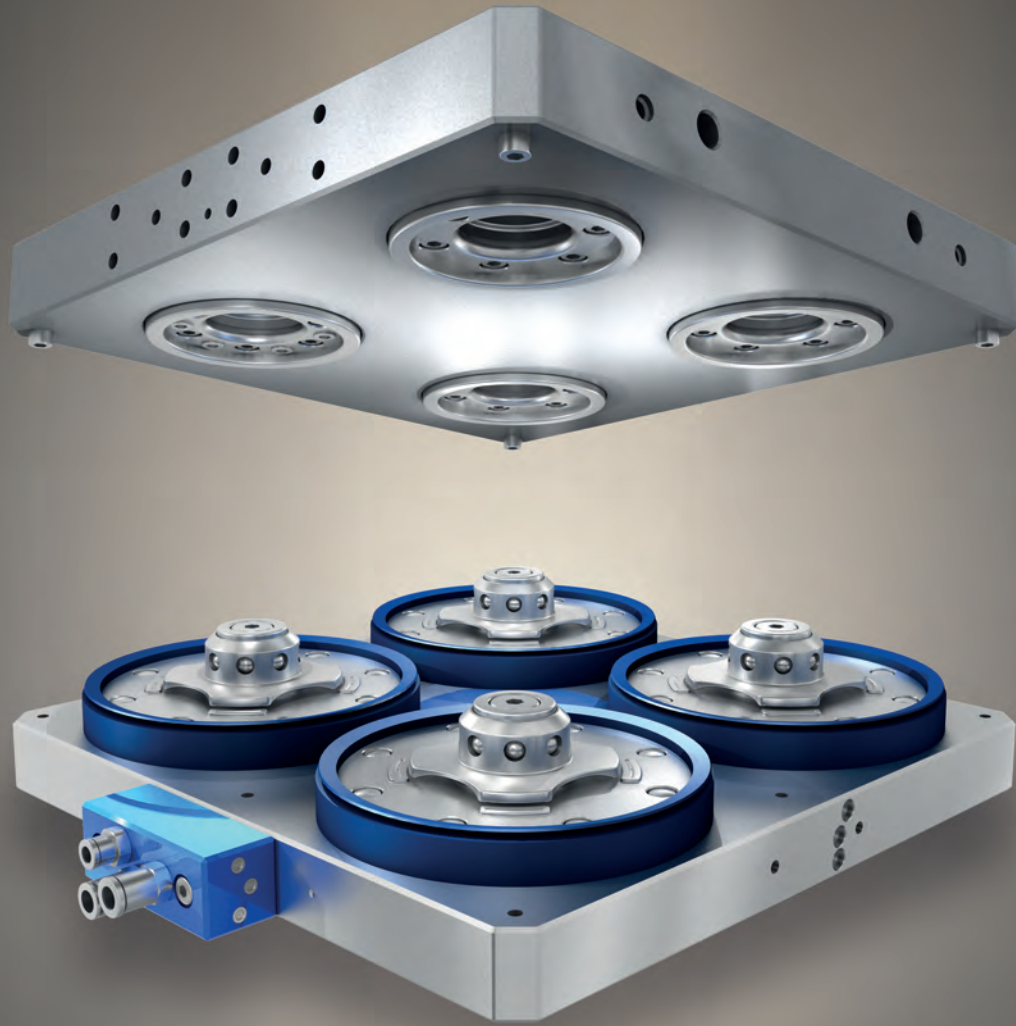
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POWERGRIP

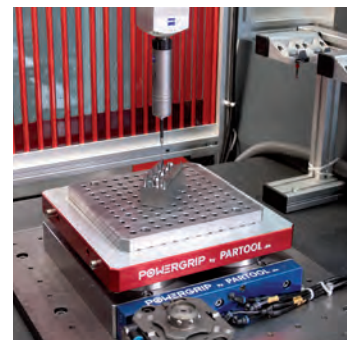
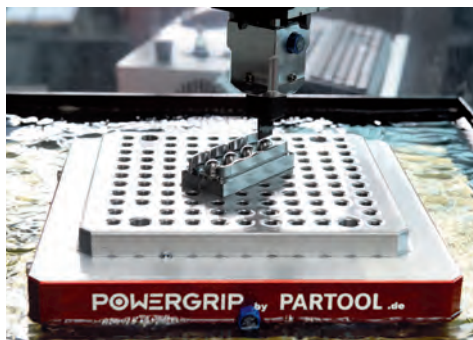


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The System



The zero-point palletizing system with one single interface for all machining processes.



Modular and compatible.

With various grid sizes of e.g. 160 mm, 200 mm and 320 mm, you can effortlessly implement all your technical requirements. With Power-Grip your devices are no longer confined to individual machines. Once components have been mounted, they can easily be swapped in and out. Power-Grip does not lose its zero-point even if you have to swiftly produce something else in the meantime.

Easy automation.

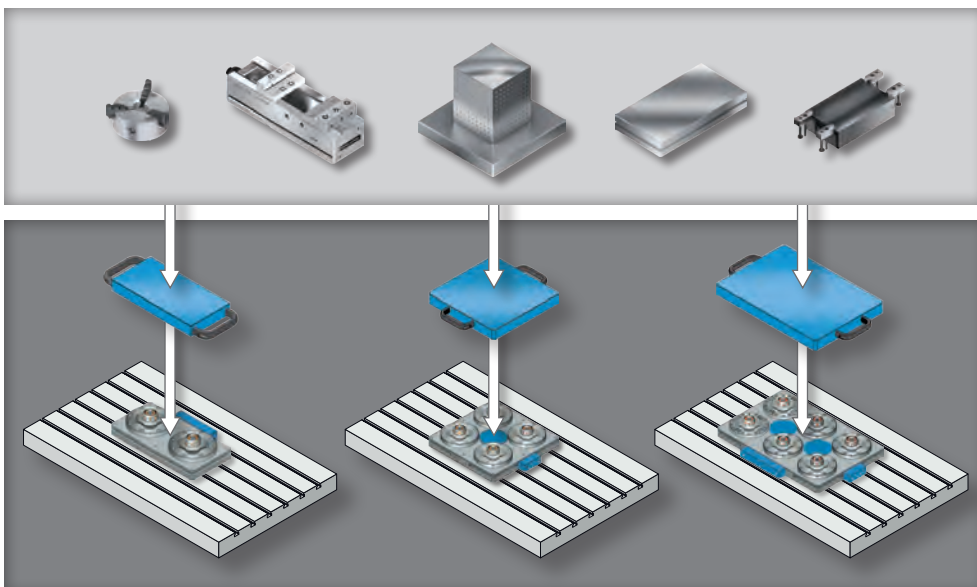
Power-Grip adapts effortlessly to any manufacturing processes, including automated ones, and renders your assembly as flexible as you wish.

POWERGRIP



Smart palletizing.

The right palletizing boosts your production.



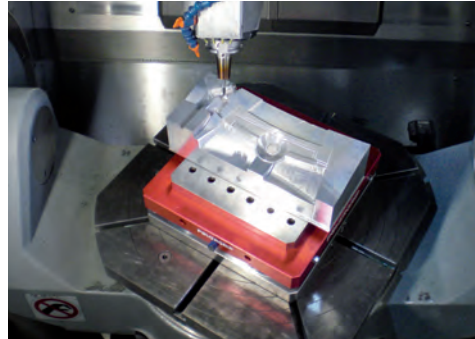
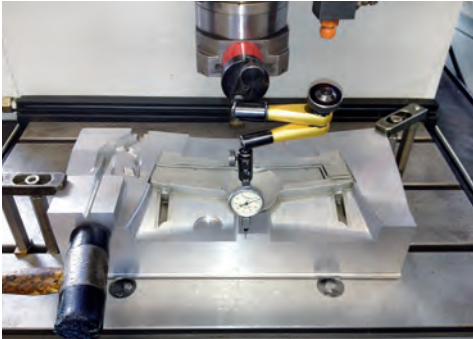
You fasten your fixture or work piece outside of the machine to the Power-Grip pallet.

You can clamp within seconds to an accuracy of 0.002 mm on the pallet carrier and machine of your choice.

Machine Uptime



Up to 45% more efficiency of your existing machine outfit – thanks to Power-Grip



Actual state.

- Uneconomic manufacturing
- Non-optimized manufacturing processes
- No standardization
- High costs per unit
- Excessive delivery times
- Unfulfilled delivery dates
- High error rate
- Pricing pressure and competitive pressure

*Many say: You can't change that.
This is what our routine looks like:*

Target state.

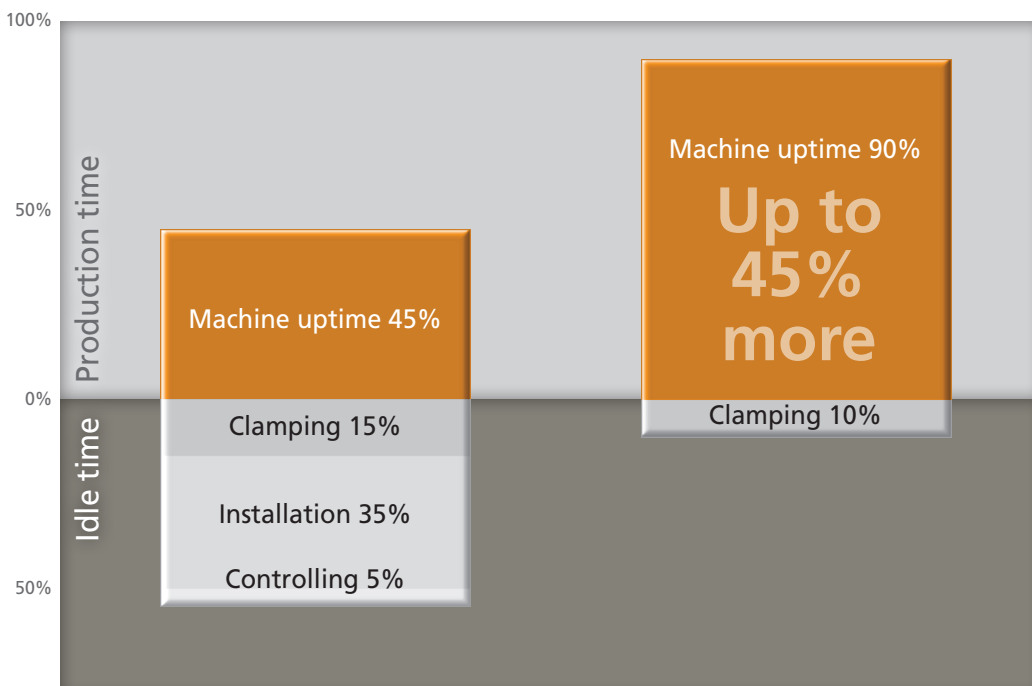
- Higher productivity and income
- Optimized manufacturing processes
- Standardized interfaces
- Low unit costs
- Reduced delivery times
- Adherence to delivery dates
- Low error rate
- Competitive capacity

*We say: Everything changes with Power-Grip.
And this is what your Power-Grip future looks like:*

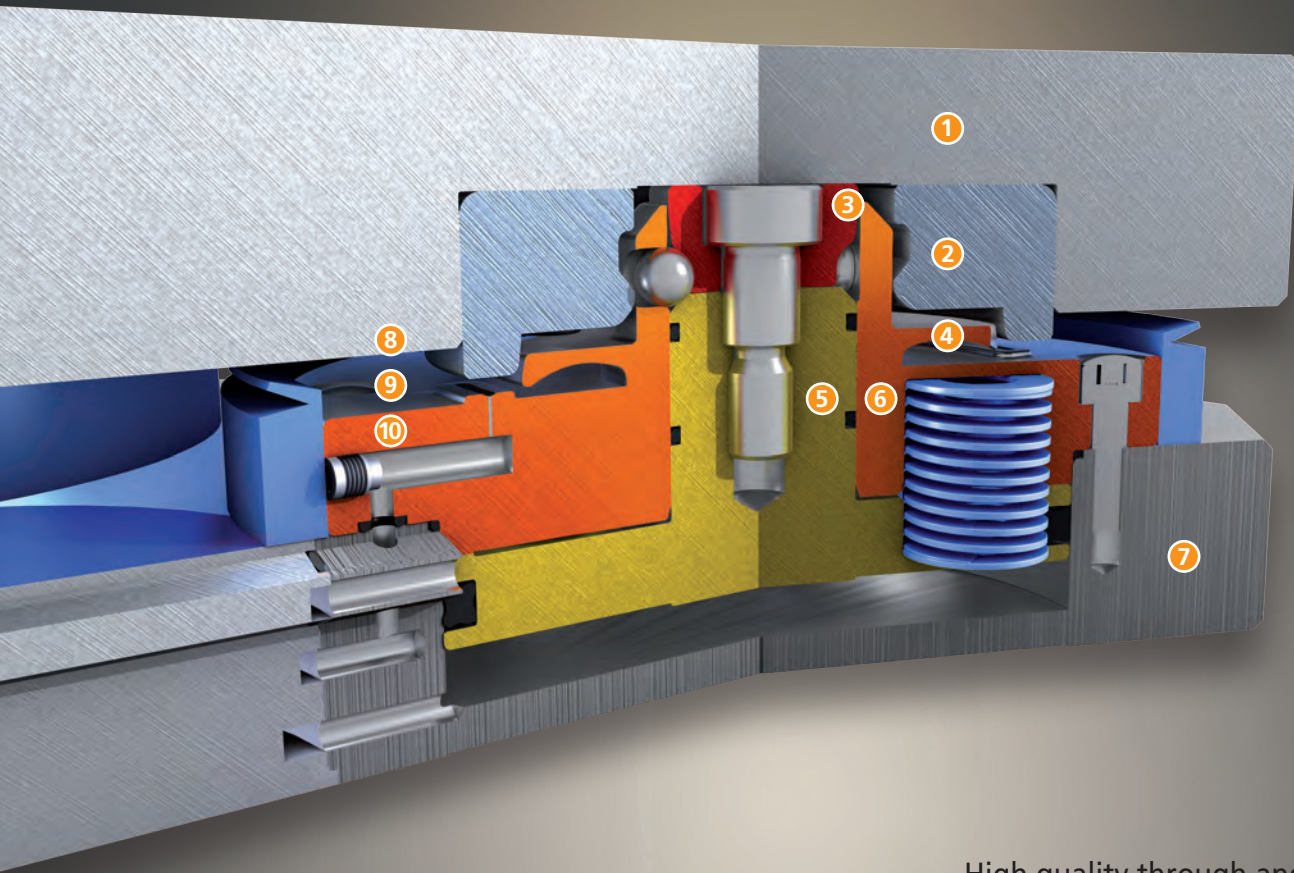
POWERGRIP



*Optimized use of
production time.*



The Technology

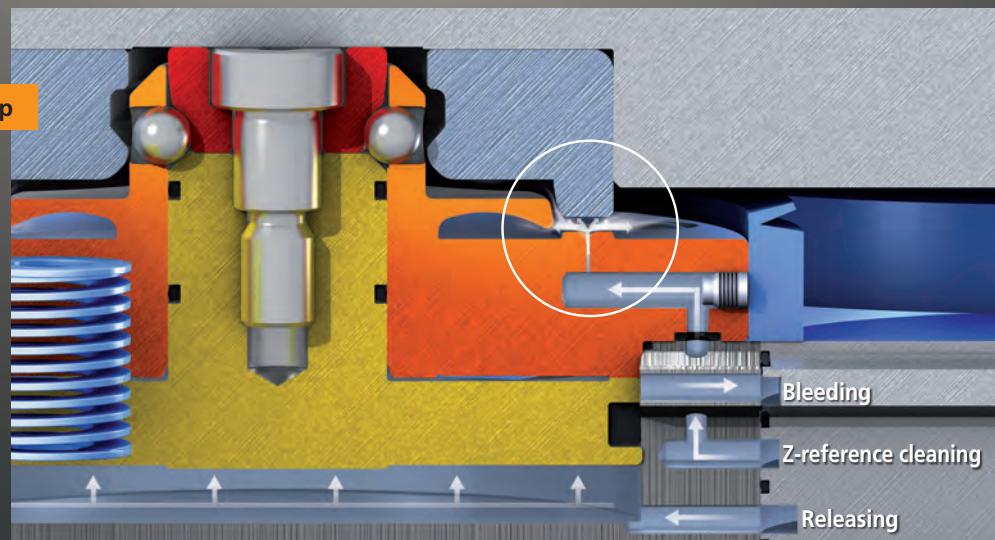


High quality through and through.

All Power-Grip reference surfaces are hardened. The pallet carrier consists of steel (1.2085), the set of springs and the centering sleeves are rust-proof and hardened. The entire system is rust-proof. All components are virtually non-wearing.

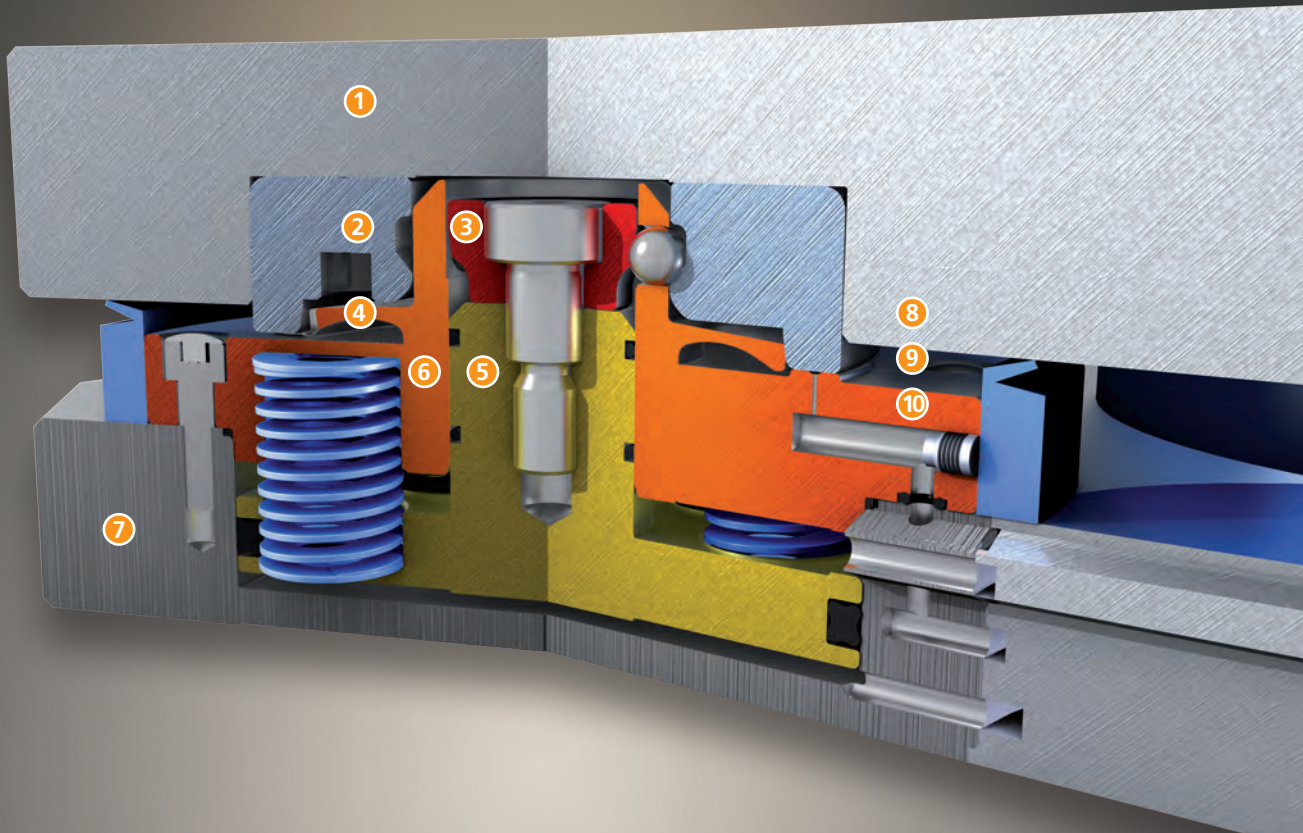
unlocked Power-Grip

In a released state, a permanent current of air cleans and protects the Z-references from dirt.



A show-piece for precision and process safety.

One-of-a-kind worldwide

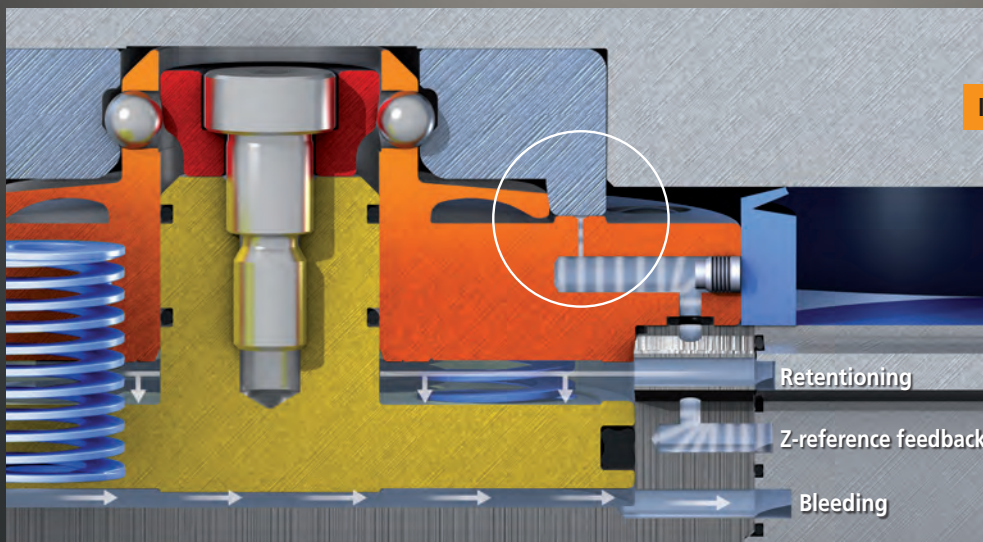


- ① Power-Grip pallet
- ② Centering clamping sleeve
- ③ Clamping cone
- ④ Four centering spring lugs
- ⑤ Pistons
- ⑥ Centering unit
- ⑦ Pallet carrier
- ⑧ XY reference surfaces
- ⑨ Z-reference surfaces
- ⑩ Nozzles for Z-reference cleaning

Granting process safety whilst clamping with power and precision.

Power-Grip offers maximum process safety by means of attendance checks via the Z-references. It works in a gentle, material-friendly way and clamps upwards of 17.000 N.

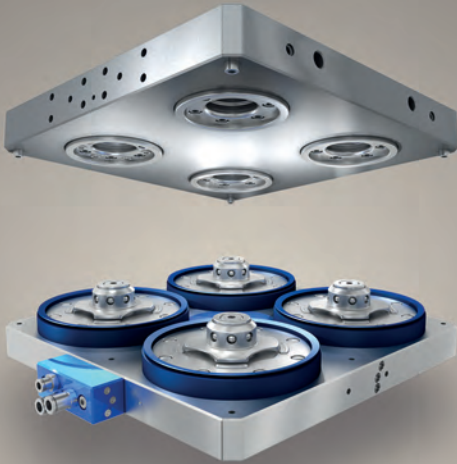
On request, clamping force per spring unit can be increased.



locked Power-Grip

In a locked state, the airflow is interrupted – this signals to the system that “the pallet is clamped”. The production can begin.

Go Compare



There are many clamping systems.
Power-Grip is unique.

One-of-a-kind
worldwide

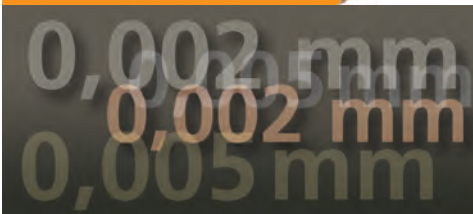
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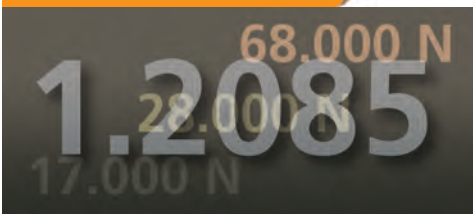
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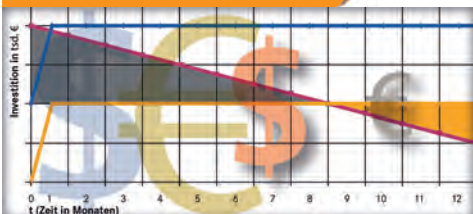
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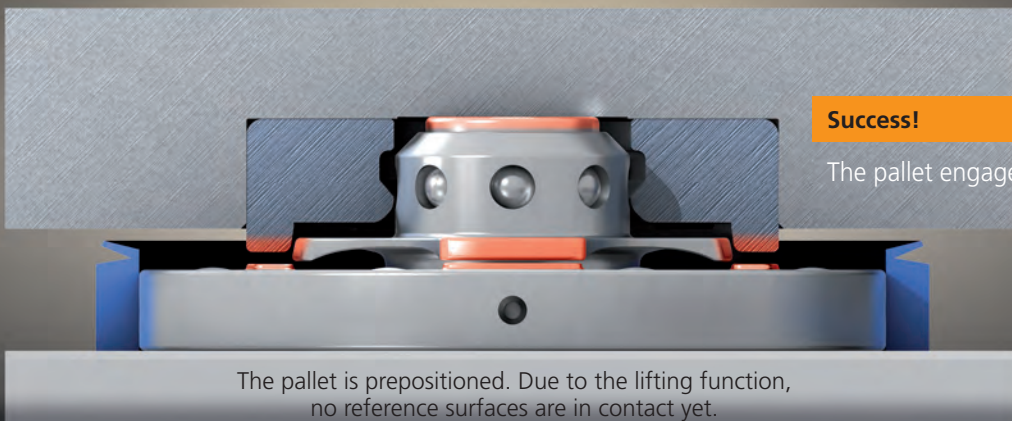
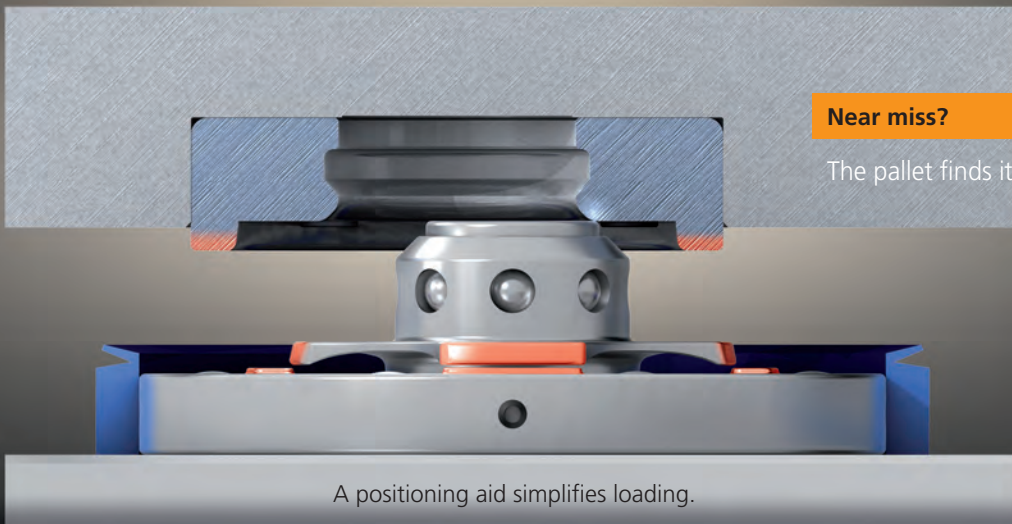
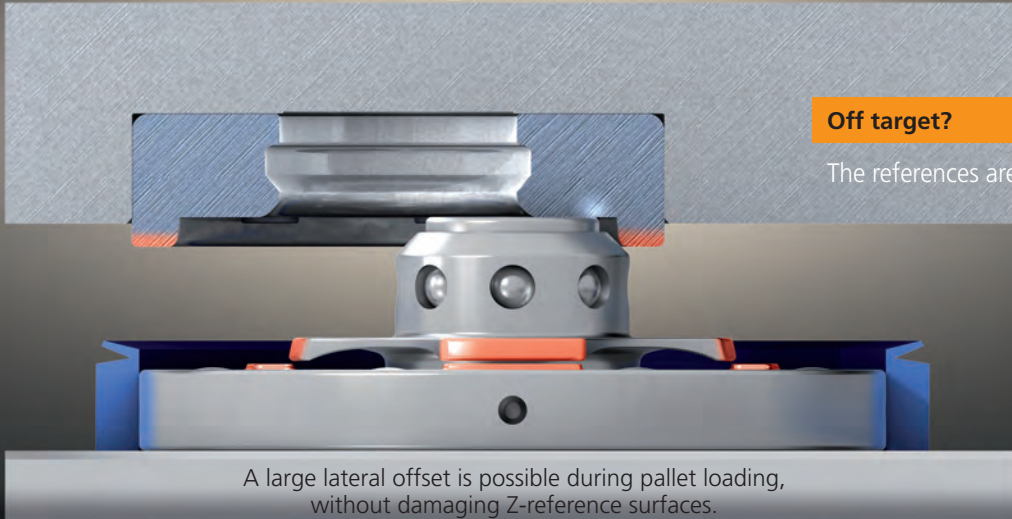
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10 Plus points
for top quality

1. Loading



The palletizing system with integrated self-protection mechanism.

**One-of-a-kind
worldwide**

With Power-Grip you choose double integrated safety.

1. With a large pre-centering unit above the outlying ball cage, you can eliminate any damage to Z-reference surfaces.

2. The lifting function raises the pallets by about 2 mm. Thus Z-reference surfaces only come into contact with one another during the clamping process.

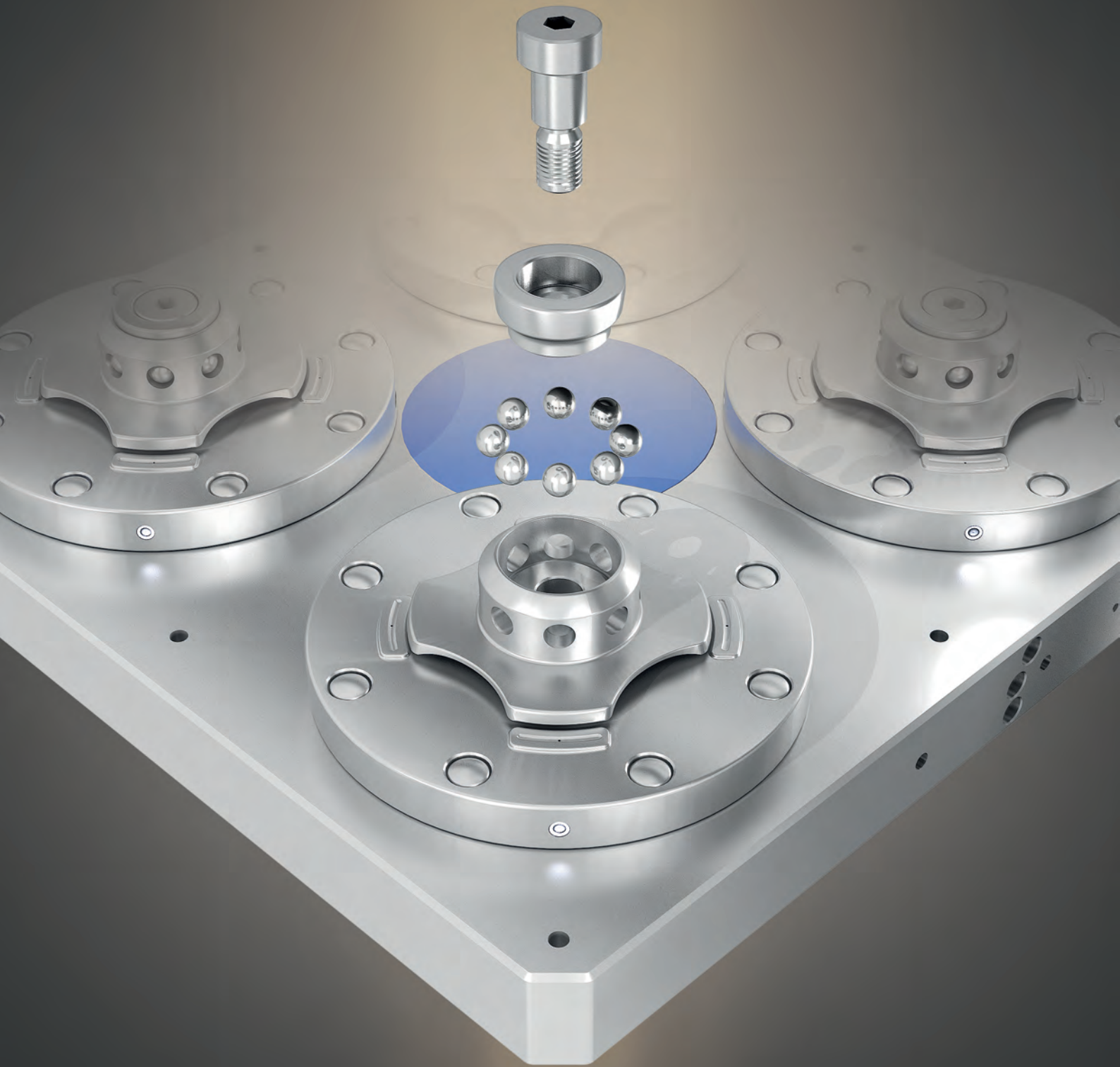
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*Safety
from the very beginning*

We compare		Pre-centering and loading
Classic chucking systems	Power-Grip technology	
<input checked="" type="checkbox"/> Protruding chucking bolts Result: Possibility of Z-reference surface damage during pallet loading and unloading	<input checked="" type="checkbox"/> No chucking bolts – large pre-centering Result: Z-reference surface damage avoidance during pallet loading and unloading	
<input checked="" type="checkbox"/> Usually no lifting function Result: During pallet loading, damage is pre-programmed, since the pallet collides with the Z-reference surfaces as soon as it is loaded	<input checked="" type="checkbox"/> Lifting function Result: Whilst the pallet is being loaded, the risk of damage is excluded since the pallet is lifted by 2 mm	
<input checked="" type="checkbox"/> Storage problem Pallets with chucking bolts can easily lose their references when being parked	<input checked="" type="checkbox"/> No storage problem Result: Since there are no chucking bolts, there is no reference loss	

2. Maintenance



Power-Grip. Maintenance without zero-point loss.

One-of-a-kind
worldwide



Maintenance with minimal effort.

In contrast to other palletizing systems, all important wear parts of the Power-Grip system are accessible from the outside. The system is easy to clean. Complete disassembly is unnecessary.

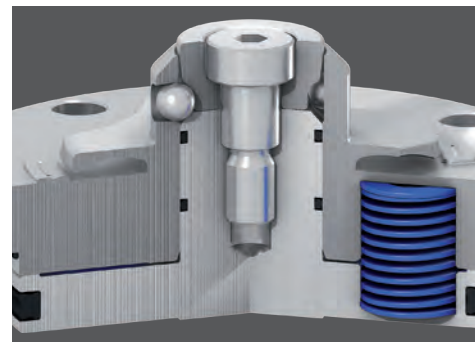
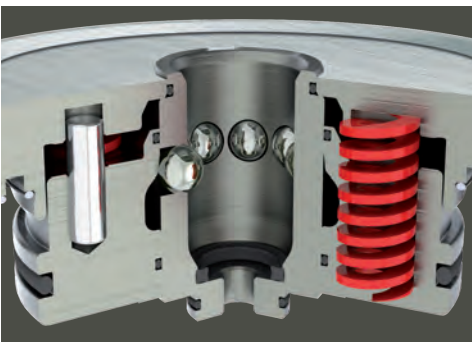
The zero-point is not lost. This process only requires little time. With Power-Grip, there is no risk of idle time due to dirt or abrasive wear.

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*Functionality
down to the smallest detail*

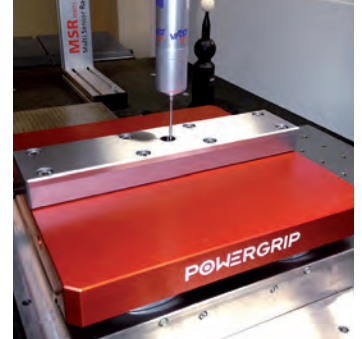
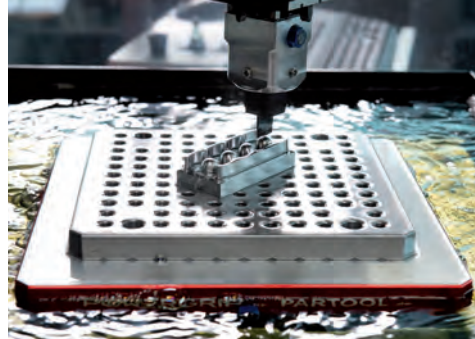
We compare		Maintenance and Cleaning
Classic palletizing systems	Power-Grip technology	
<p>☒ The internal chucking mechanism is inaccessible and therefore cannot be cleaned.</p> <p>Result: Higher investment of time and cost during servicing</p> <p>The dirt can lead to system blockages</p> <p>No process safety</p>	<p>☑ The external chucking mechanism is easily accessible and can be cleaned at any time by the machine operator himself.</p> <p>Result: Reduced cleaning time and expenditure</p> <p>Maintenance „without zero-point loss“ within very little time</p> <p>High process safety</p>	



3. Accuracy



Power-Grip. Back and forth without offset or hassle.



Accurately repeatable.

System accuracy.

POWERGRIP



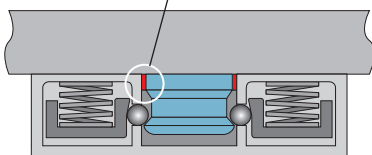
Focus on precision

With Power-Grip you clamp your pallet on the same palletizing system with a repeatable accuracy of 0.002 mm. 750,000 times. Guaranteed.

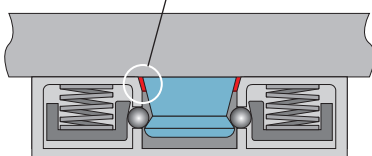
With Power-Grip you clamp your pallets for diverse machining operations, e.g. measuring, milling, EDM-ing to an accuracy of 0.005 mm

We compare		Accuracy
Classic palletizing systems	Power-Grip technology	
<p><input checked="" type="checkbox"/> Backlash For classic palletizing systems, there is a certain amount of backlash between chucking bolts and reference holes due to manufacturing tolerances. It measures between 0,005 and 0,01 mm.</p>	<p><input checked="" type="checkbox"/> Cone-shaped, spring-loaded alignment with planar support (HSK principle, hollow pole cone)</p> <ul style="list-style-type: none"> • Four axial centering spring lugs guarantee tolerance-free centering 	

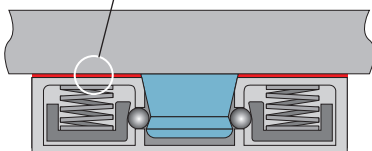
Backlash with cylindric chucking bolts



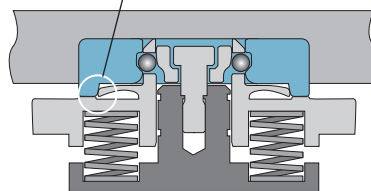
Possible backlash with conical chucking bolts



Possible backlash with conical chucking bolts

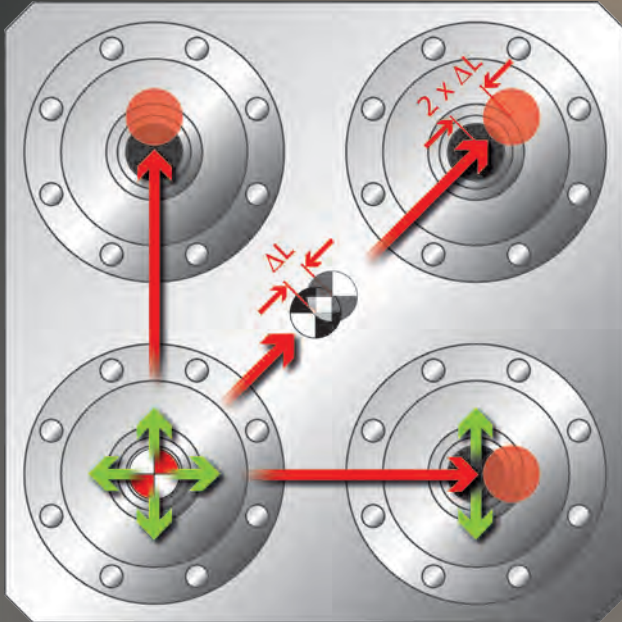


Tolerance-free centering with Power-Grip



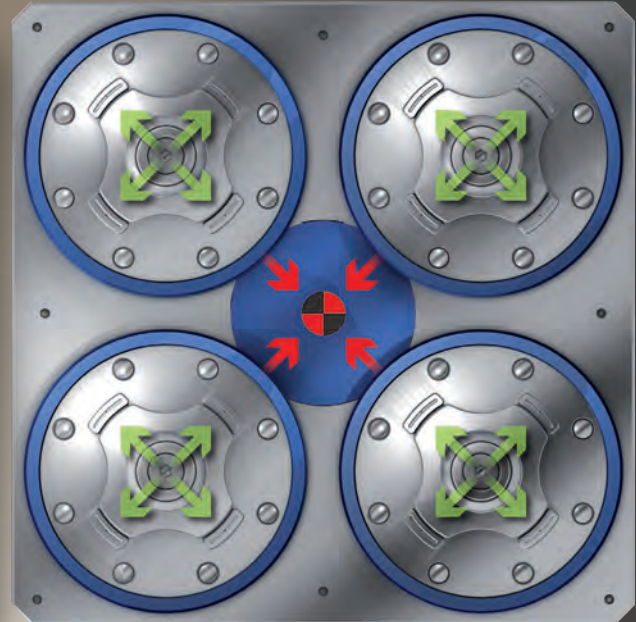
4. Thermal Expansion

Classic palletizing system

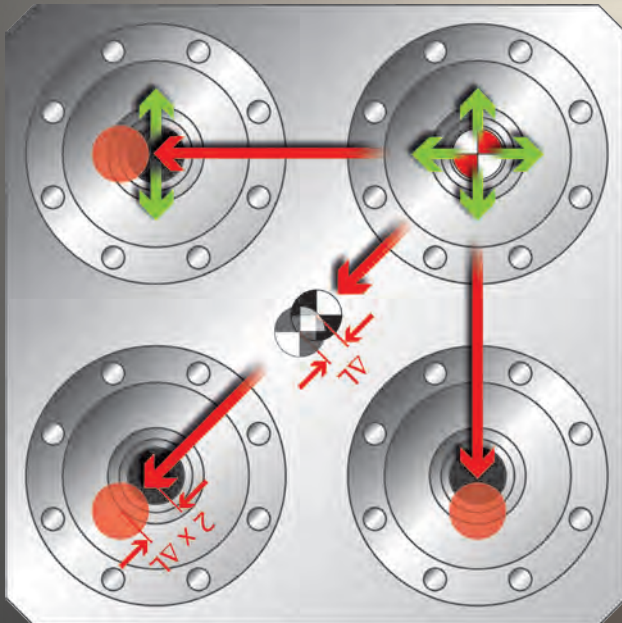


positioned at 0°

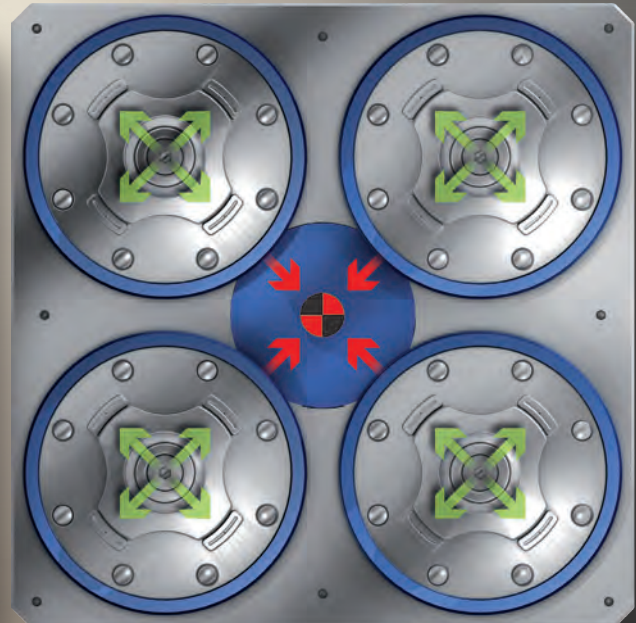
Power-Grip technology



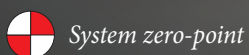
positioned at 0°



machine table rotated by 180°



machine table rotated by 180°



System zero-point



Work piece zero-point



System and work piece zero-point

Thermal variations cause the work piece zero-point to shift away from the system zero-point.

This offset doubles when the machine table is turned by 180° (during 4- and 5-axis machining).

Working precisely and repeatably becomes almost impossible.

Power-Grip: thermal variations relate to clamping only towards the system zero-point.

Even when the machine table is rotated, the system zero-point is maintained.

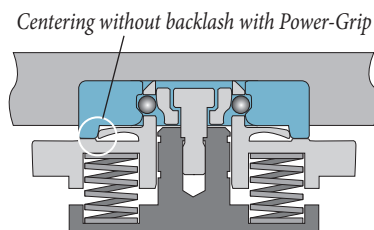
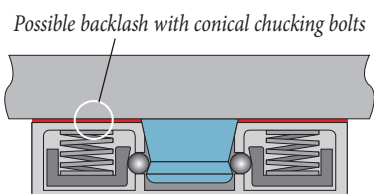
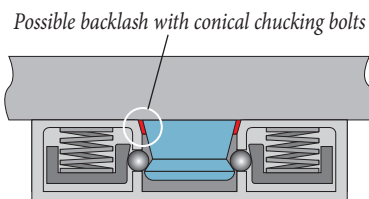
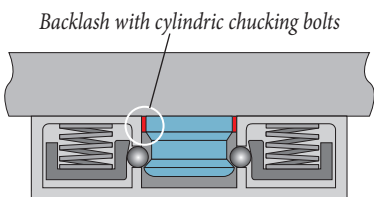
Precise and repeatable work becomes standard procedure.

Power-Grip. Highest level of accuracy due to secure compensation.

**One-of-a-kind
worldwide**

Four axial centering spring lugs for highest precision and rigidity.

We compare		
Classic palletizing systems	Power-Grip technology	
<p><input checked="" type="checkbox"/> No tolerance-free centering possible (always SK steep taper principle)</p> <ul style="list-style-type: none"> Positioning only by reference and compensation bolts At least 3 kinds of chucking bolts are necessary: reference, compensation and chucking bolts, bolts for automation etc. The abrasive wear of rigid clamping components can lead to increased abrasive wear and therefore backlash 	<p><input checked="" type="checkbox"/> Centering absolutely free from backlash (HSK principle, hollow pole cone)</p> <ul style="list-style-type: none"> Centering is achieved across all centering sleeves Only one kind of centering and clamping sleeve Four axial centering spring lugs do not allow abrasive wear and therefore no backlash 	Positioning
<p><input checked="" type="checkbox"/> Mechanically guided chucking mechanism</p> <p>Result: Possible warping of the pallet</p> <ul style="list-style-type: none"> Thermal variations cause irregular engagement of ball pivots/slide feeds 	<p><input checked="" type="checkbox"/> Floating clamping cone</p> <p>Result: Pallet warping is impossible</p> <ul style="list-style-type: none"> Ball pivots engage equally during thermal variations 	
<p><input checked="" type="checkbox"/> Compensation for thermal expansion by compensation bolts</p> <p>Result: Zero-point displacement, warping and stability problems</p> <ul style="list-style-type: none"> Centering offset during 5-axis processing 	<p><input checked="" type="checkbox"/> Thermal expansion compensation due to four axial centering spring lugs</p> <p>Result: No zero-point displacement or warping in the system</p> <ul style="list-style-type: none"> no centering offset during 5-axis processing 	Thermal expansion compensation



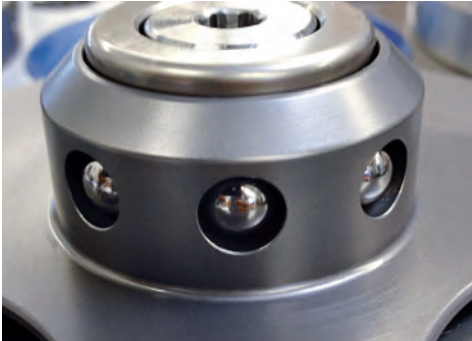
In contrast to all other chucking systems, Power-Grip halves the amount of physical mistakes of thermal expansion by positioning to the system zero-point.

5. Z-references

A close-up photograph of a metallic component, likely a mold or a precision part. The image shows a complex, curved surface with a prominent, polished, U-shaped feature that serves as a Z-reference. The lighting is dramatic, highlighting the metallic sheen and the sharp edges of the part. The background is dark and out of focus, emphasizing the intricate details of the component.

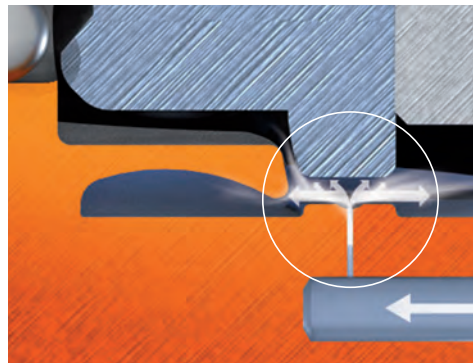
Power-Grip. Long-lasting safe production.

One-of-a-kind
worldwide



Permanent cleaning of Z-references.

Power-Grip is always equipped with a Z-reference cleaning system. Z-reference surfaces are cleaned at every chucking process. This is important for high levels of accuracy, process safety and lifespan. The hardened and rust-proof Power-Grip reference surfaces, both in the palletizing system and the PG pallets, make this system virtually non-wearing and readily automatable.



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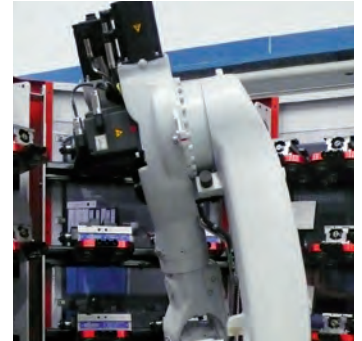
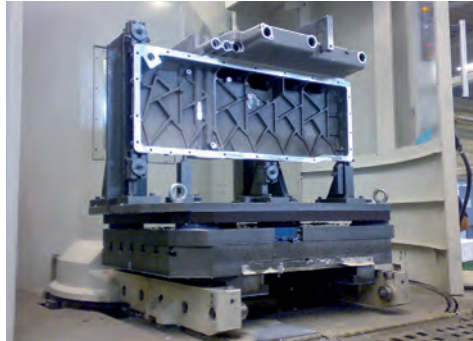
*In a released state, a permanent current of air cleans and protects the Z-references from dirt.
(See p. 08/09 Technology)*

We compare		
Classic palletizing systems	Power-Grip technology	
<input checked="" type="checkbox"/> Standard: Soft Z-references on the pallet Result: Wear and therefore inaccuracy	<input checked="" type="checkbox"/> Standard: Hardened, rust-proof Z-references on the pallet and pallet carrier Result: Long lifespan and consistent accuracy	Z-references
<input checked="" type="checkbox"/> No standard Z-reference cleaning Result: High levels of wear and therefore loss of precision <ul style="list-style-type: none"> • Overpressure not possible • Not automatable • Modification for automation is very costly/might be impossible 	<input checked="" type="checkbox"/> Permanent Z-reference cleaning Result: Reduction of dirt, high process safety and best possible accuracy <ul style="list-style-type: none"> • Overpressure available • Z-reference feedback always possible for automation • Modification for automation practicable within a few minutes and without specialists 	Z-reference cleaning Overpressure Z-reference feedback
<input checked="" type="checkbox"/> Large-dimensioned Z-references Result: Large-dimensioned Z-references are difficult to clean	<input checked="" type="checkbox"/> Minimized, but hardened Z-references Result: Minimized Z-references can easily be cleaned	Z-references

6. Process Safety Automation

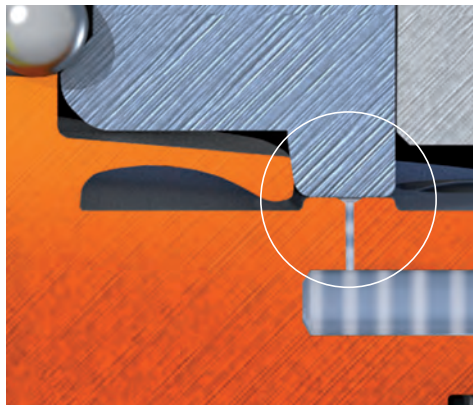


Power-Grip. Automatic process safety.



Process safety during automation.

By means of hardened, rust-proof reference surfaces, both on the pallet and the pallet carrier, as well as by the additional possibility of monitoring by Z-reference feedback, Power-Grip can be automated at any time.



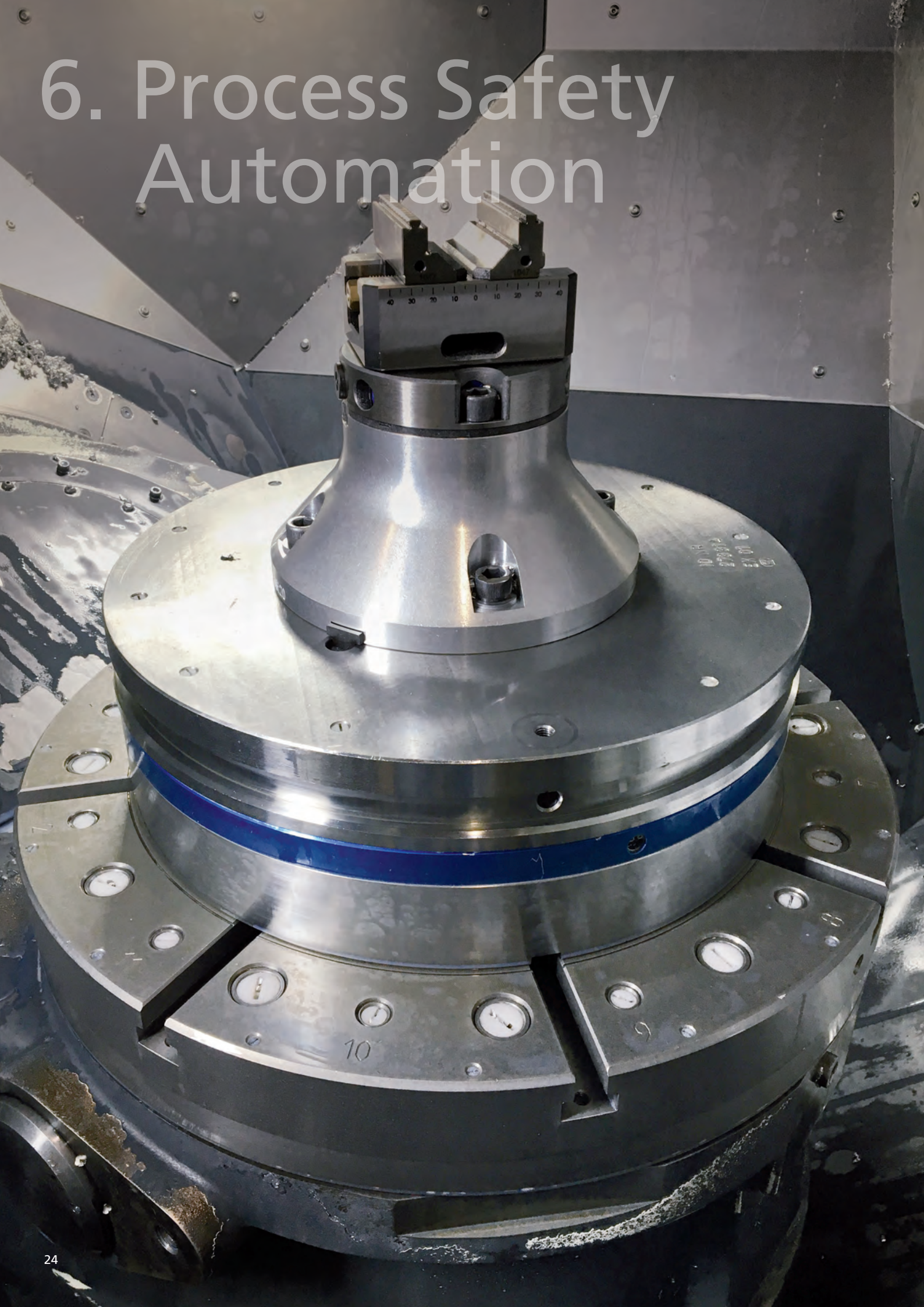
POWERGRIP



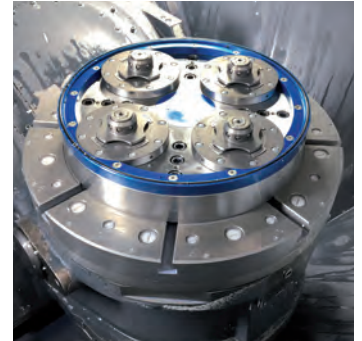
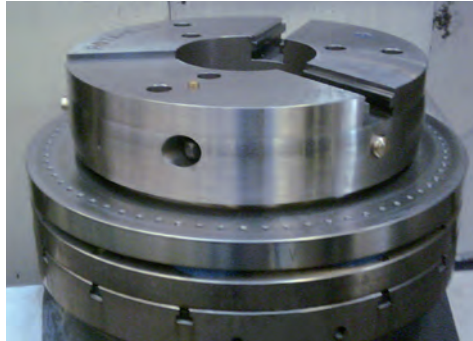
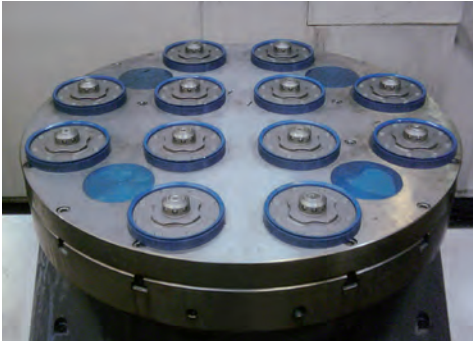
*In a locked state the airflow is interrupted – the signal for the system that “the pallet is clamped”. The production can begin.
(See p. 08/09 Technology)*

We compare		Automation
Classic palletizing systems	Power-Grip Technology	
<input checked="" type="checkbox"/> No standard Z-reference feedback Result: No process safety. Not suitable for automation. Available standard palletizing systems must be exchanged for automation.	<input checked="" type="checkbox"/> Standard Z-reference feedback Result: High level of process safety Ideally suited for automation.	

6. Process Safety Automation



Process safety during turning and milling.



The Power-Grip process safety.

The pallet of the classic clamping system normally rests on the Z-references of the clamping module by its own weight. Even if a chucking bolt is broken or does not exist any more the drill holes for the Z-reference feedback are still sealed. The pallet seems to be clamped mechanically but it isn't. The start signal for the beginning of processing can still be carried out. Tolerances during fabrication and variations in temperature cause additional problems.

The positioning by conical chucking bolts can not be carried out exactly. Process safety does not really exist in the end.

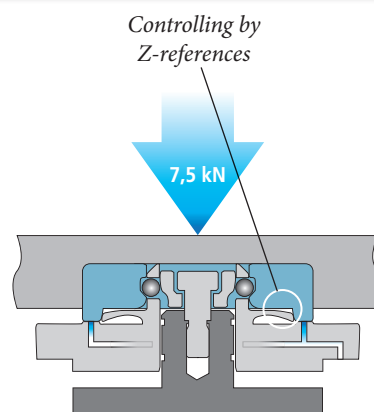
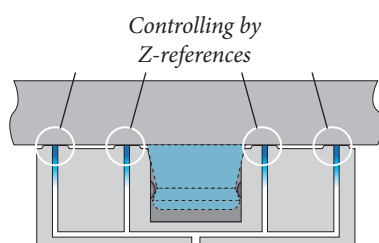
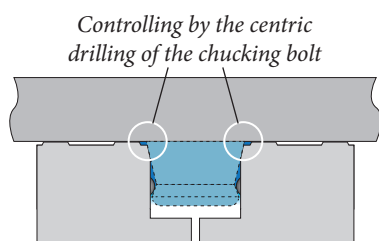
Power-Grip works different. The pallet does not contact the Z-references. Contact only takes place in the moment of clamping. The signal for „pallet clamped“ only occurs if the centering spring lugs (7,5 kN each) are loaded and the drilling holes of the Z-reference feedback are closed.

POWERGRIP

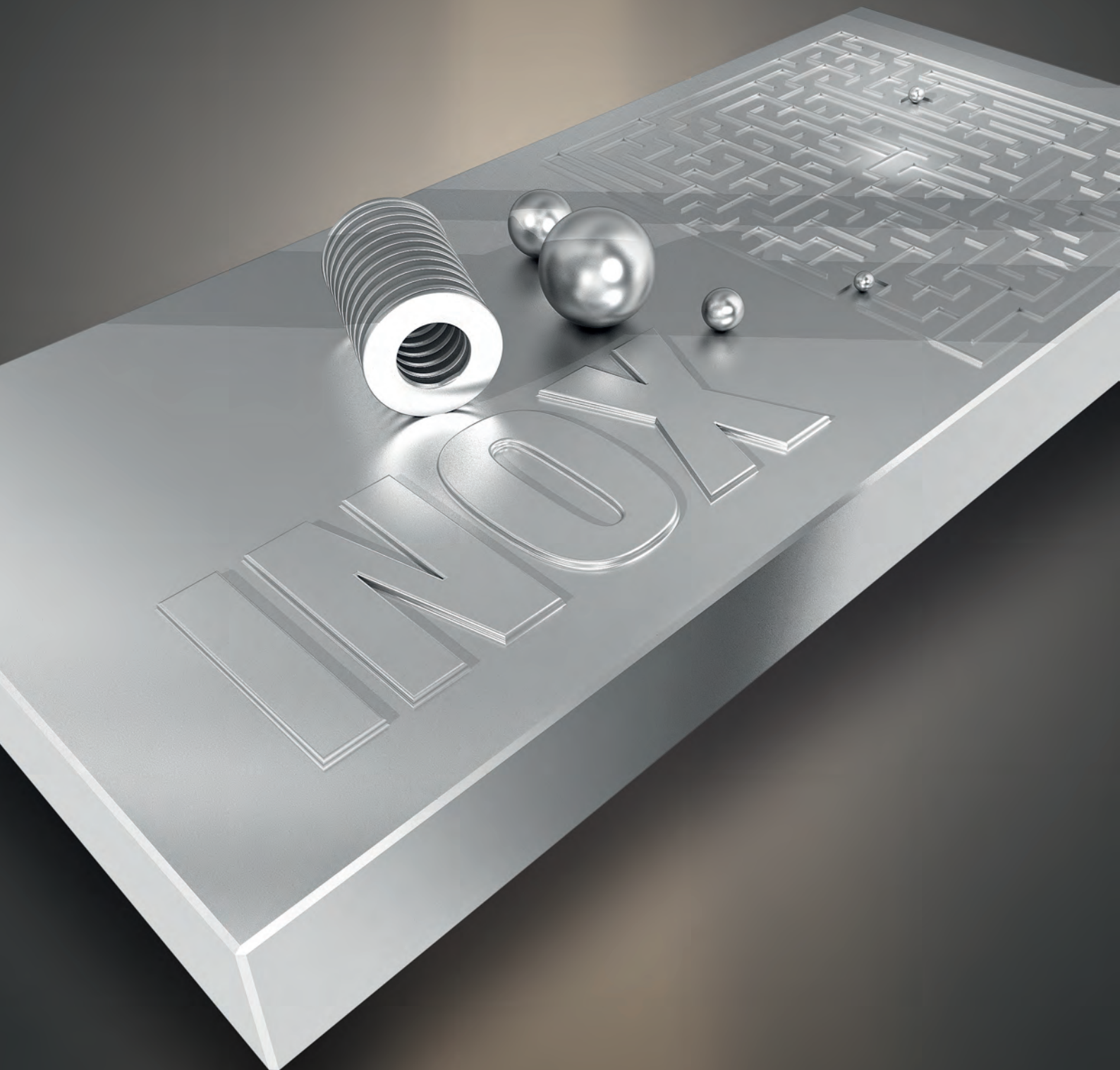


The release for processing by Power-Grip does not occur until the pallet is effectively clamped.

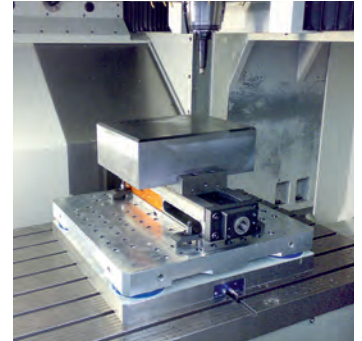
We compare		Z-reference feedback
Classic clamping system	Power-Grip	
<input checked="" type="checkbox"/> Security gap in supervision concerning pallet clamping is possible Result: risk of accident	<input checked="" type="checkbox"/> Safe supervision of the clamping of the pallet Result: High reliability during operation	



7. Material Endurance Clamping Force



Power-Grip can be relied upon.



Self-locking chucking.

Power-Grip is made of high quality materials. Each centering unit chucks automatically with a clamping force from 16,000 N up to 39,000 N.

Even under high pressure, e.g. under high machining forces or during a machine crash, pallets cannot be ripped from the palletizing system.

POWERGRIP



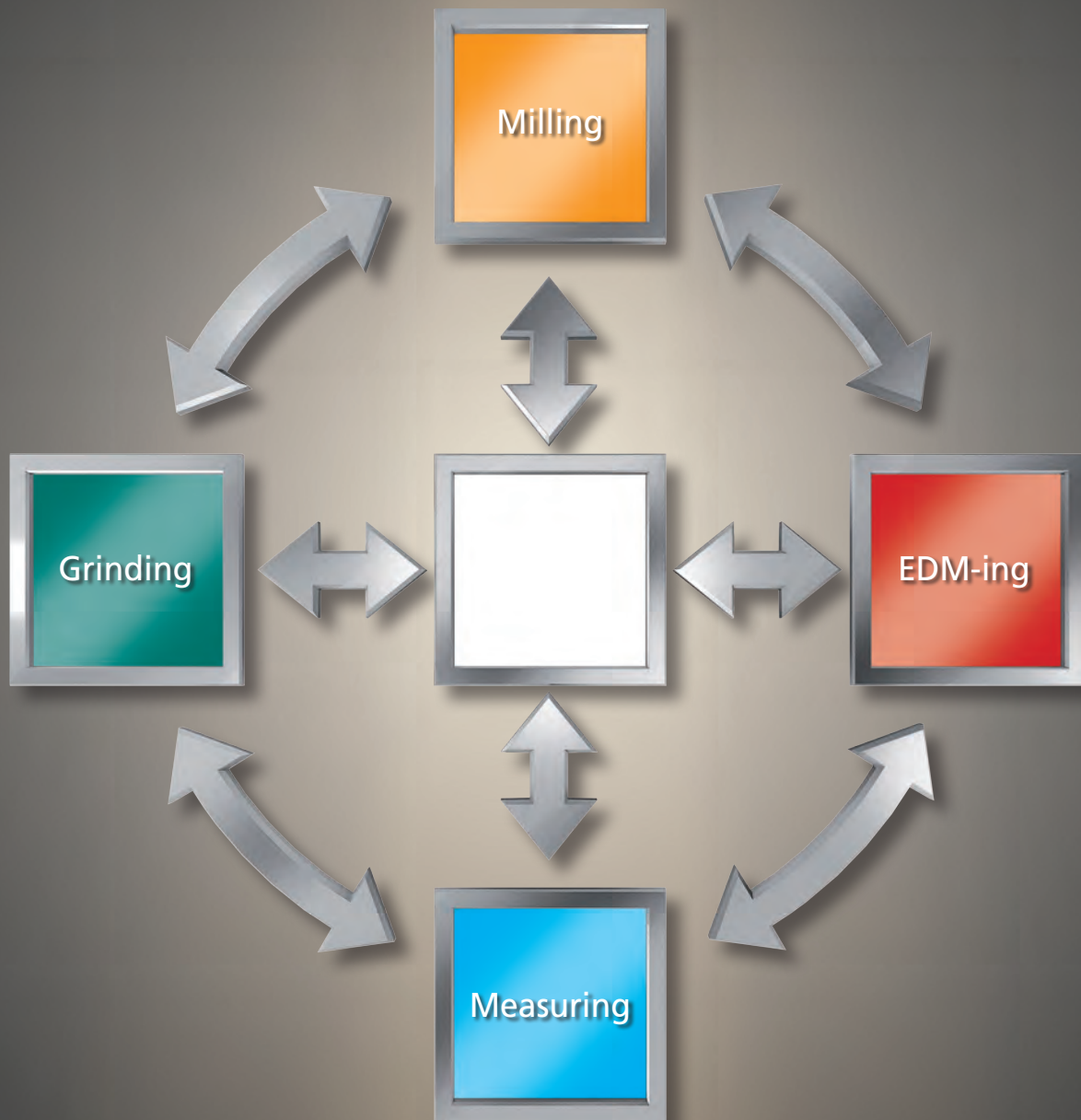
*Ideal for
everyday production*

We compare		
Classic palletizing systems	Power-Grip Technology	
<input checked="" type="checkbox"/> Systems are not completely rust-proof Result: High level of wear due to corrosion, shorter lifespan	<input checked="" type="checkbox"/> The system is completely rust-proof Result: Higher level of accuracy, longer lifespan The pallet carrier consists of 1.2085 steel, centering units as well as centering and clamping sleeves are made of rust-proof steel	Material
<input checked="" type="checkbox"/> Additional pneumatic or hydraulic generator may be necessary Result: Increased costs and space requirements	Only 6 bar compressed air required to release the system Result: Hardly any auxiliary devices necessary	

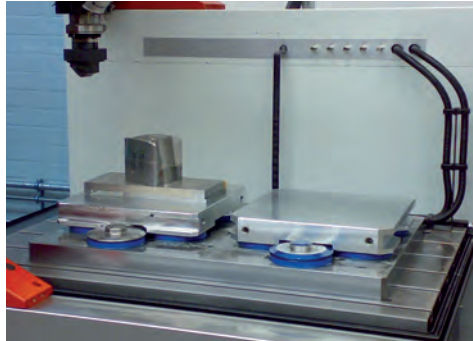
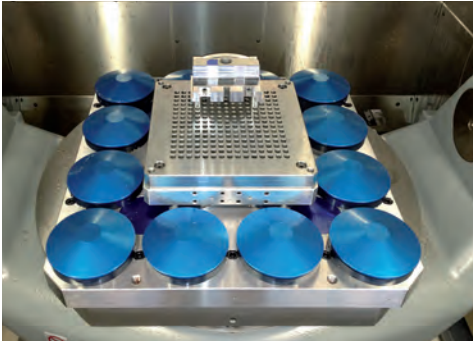
Designation	Releasing	Clamping Force*	Retention	Clamping Force*
Power-Grip centering units (pneumatic)	6 bar	16.000 N	5 bar	31.000 N
Power-Grip centering units (hydraulic)	30 bar	27.500 N	4 bar maximum	39.000 N

* Clamping force is the maximum force under which the pallet still safely lies on the Z-references of the palletizing system.

8. Modularity and Consistency



Power-Grip. Flexible response.



Maximum flexibility.
Absolutely consistent.

Due to Power-Grip's modularity, the palletizing system can be adapted to various work piece sizes as well as to existing and new machines.

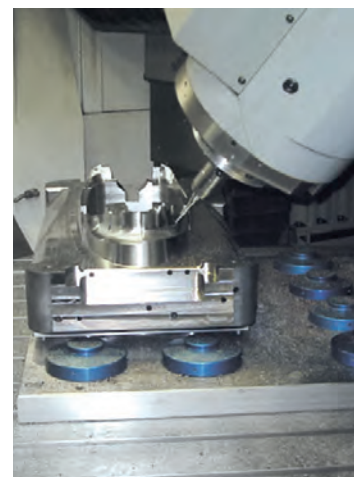
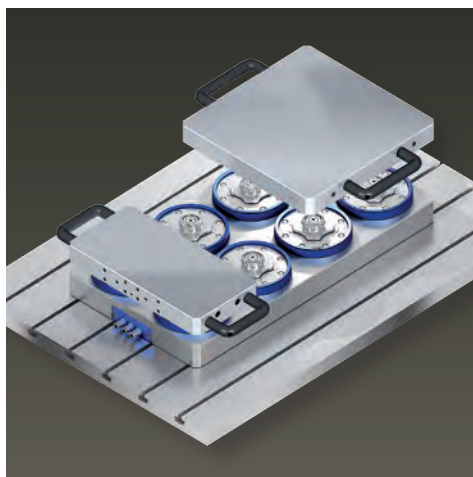
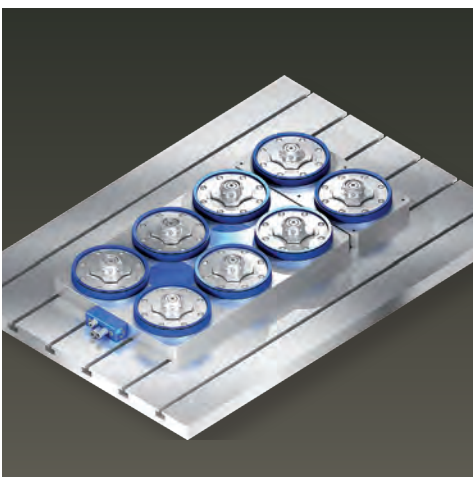
Power-Grip can be used for a variety of manufacturing processes. These include:

- 3- or 5-axis milling
- EDM-ing
- Measuring
- Grinding
- Lasering
- Turning

POWERGRIP



*Optimal control
over manufacture.*



The system can be extended step-by-step at any time: All Power-Grip pallet carriers are compatible with one another.

With Power-Grip, it doesn't matter which pallets you use for the existing centering units.

Unused centering units are safely covered by the chip protector.

We compare		
Classic palletizing systems	Power-Grip technology	Modularity
<input checked="" type="checkbox"/> Partly fixed system sizes (e.g. 280x280 / 320x320)	<input checked="" type="checkbox"/> Variable system sizes and grid sizes (Pallet sizes from 125x125 to 2000x2000)	
<input checked="" type="checkbox"/> Differing, often incompatible, systems for diverse machining operations	<input checked="" type="checkbox"/> A single, ever-compatible system for all machining operations	Consistency

9. Investment and Gain



Power-Grip. Sow and harvest.

POWERGRIP

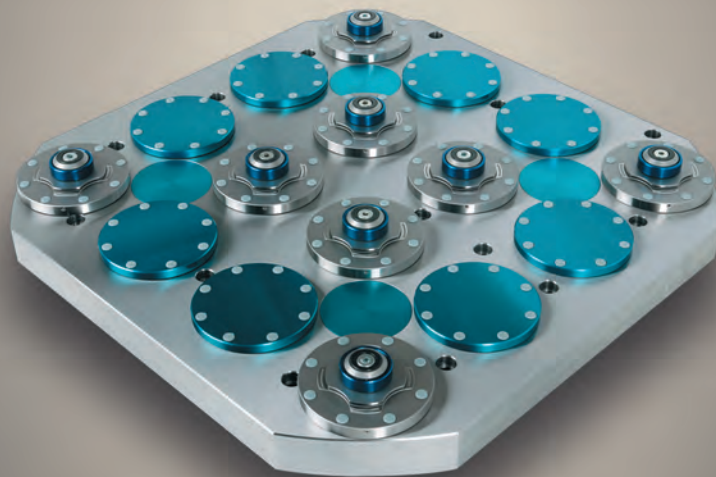
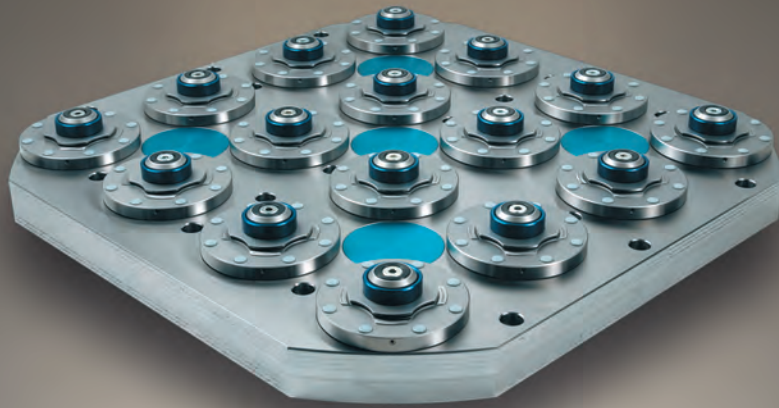


*An investment
that pays off.*

	Example A	Example B	Example C
	-	with zero-point palletizing system	with zero-point palletizing system + automation
Total runtime (palletized >35% potential extra operating time) Spindle running hours of your milling machine per year	1.500	2.000	4.000
Acquisition costs:			
Milling machine acquisition costs of your machine tool	200.000,00 €	200.000,00 €	200.000,00 €
Power-Grip palletizing system + automation Basic equipment ~ 15.000,- € and automation		15.000,00 €	100.000,00 €
Total investment Sum	200.000,00 €	215.000,00 €	300.000,00 €
Fixed costs / year: (refers to machine and palletizing system investment respectively automation)			
Depreciation / year (6 years) [= total investment divided by 6]	33.333,00 €	35.833,00 €	50.000,00 €
Interest/year (2% over 6 years) [= (total investment x 4,5 %)÷2]	2.000,00 €	2.150,00 €	3.000,00 €
Space costs regarding occupancy cost of machine space	800,00 €	800,00 €	1.200,00 €
Maintenance costs (50% more for example B due to longer runtimes) Maintenance costs	1.300,00 €	2.600,00 €	5.200,00 €
Share of overall wages (process planing, etc.) (Example B due to longer runtimes ca. 20% more) (Example C due to longer runtimes ca. 40% more) General share of wages	2.500,00 €	3.000,00 €	3.500,00 €
Fixed costs / year Sum of positions	39.933,00 €	44.383,00 €	62.900,00 €
Fixed costs / hour Fixed costs/year divided by total runtime	26,62 €	22,19 €	15,73 €
Variable costs / hr.: (refers to machine and palletizing system investment respectively automation)			
Wages (50.000 p.a.) wage costs + additional machine operator costs per year (Ex. A: 80% , Ex. B: 65%, Ex. C: 50% of the wages / total runtime)	26,67 €	16,25 €	6,25 €
Consumables estimated share of expendable goods/hr.	6,00 €	6,00 €	6,00 €
Energy estimated share of energy/hr.	1,50 €	1,50 €	2,50 €
Miscellaneous variable costs Estimated share of variable costs	1,00 €	1,00 €	2,00 €
Variable costs/hr. Sum of positions	35,17 €	24,75 €	16,75 €
Production costs/hr. Fixed costs/hr. + variable costs/hr.	61,79 €	46,94 €	32,48 €
Attainable hourly rate / hour (estimated) -> = 1,- € per minute Hourly rate attainable on the market	60,00 €	60,00 €	60,00 €
Profit /hr. attainable hourly rate/hr. minus production costs/hr.	-1,79 €	13,06 €	27,53 €
Your profit / year difference derived from prod. costs and attainable hourly rate multiplied by total runtime	-2.683,33 €	26.116,67 €	110.100,00 €
More profit compared to Ex. „A“ by application of a zero-point palletizing system respectively the investment in automation of your machine tool per year:	loss!	+28.800,00 €	+112.783,33 €

The acquisition of a clamping system amounting to 15.000,- € already amortizes by additional 500 hrs. of machine runtime in the first 6 months making an added profit of 28.800,- €! The investment in automation amounting to 100.000,- € completely amortizes in less than 1 year!

10. Sample Applications



More than 2,500 solutions speak for themselves.



1-fold T-slot pallet
with down pull chuck



1-fold pallet
with vice



1-fold pallet
with prismatic adapter

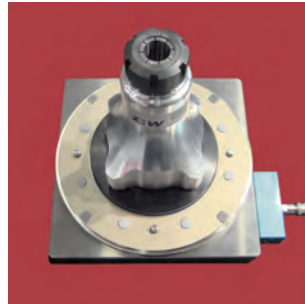
Power-Grip 1-fold



1-fold pallet
with magnet



1-fold pallet
125 x 125 with vice



1-fold pallet
for 5-axis machining

POWERGRIP



*Best performance
to the (zero) point*



2-fold pallet
with horizontal
electrode chuck



2-fold pallet
with magnet



2-fold pallet
with vice

Power-Grip 2-fold



2-fold pallet
with thread grid

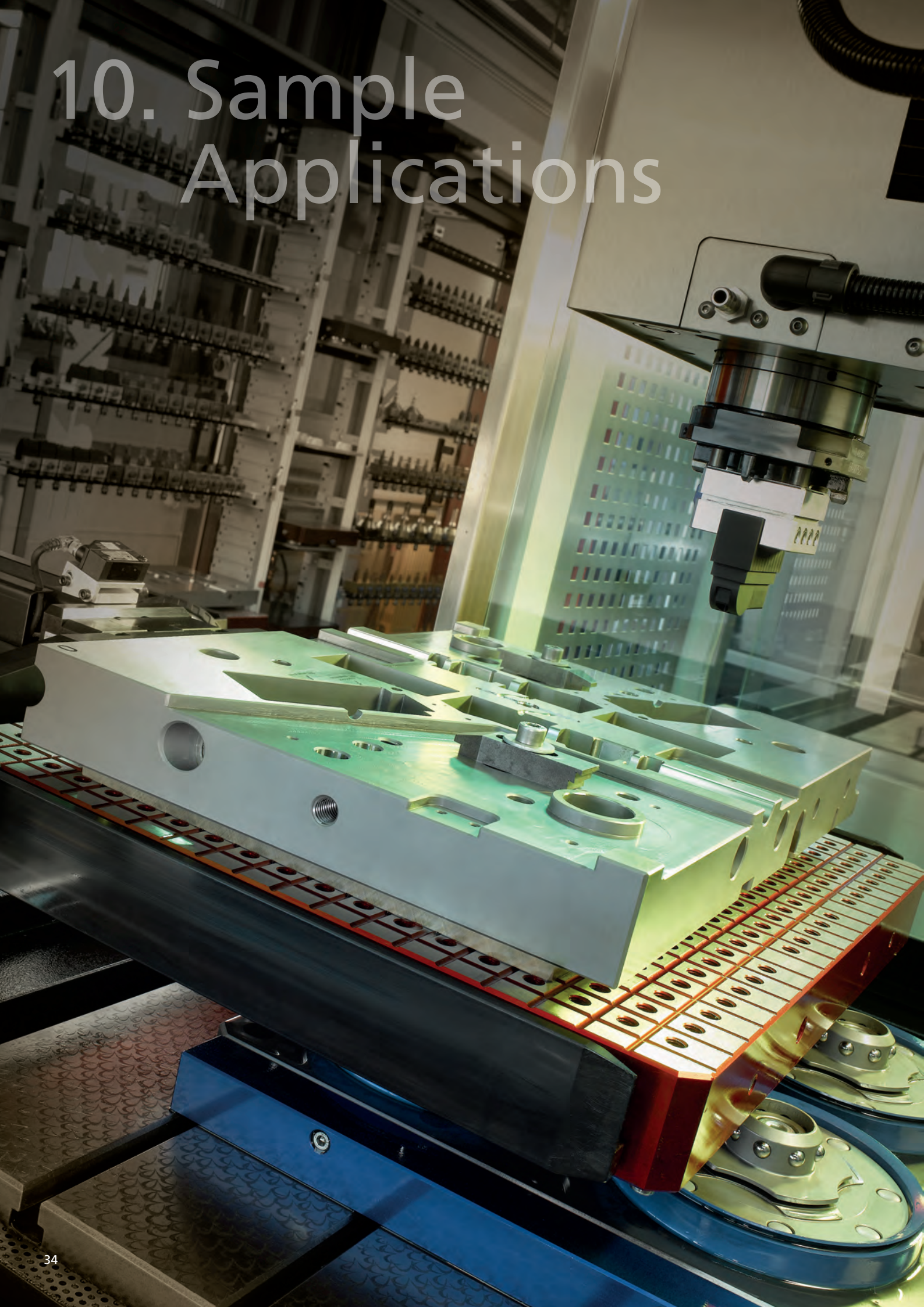


2x 2-fold pallet carrier
on spark erosion machine

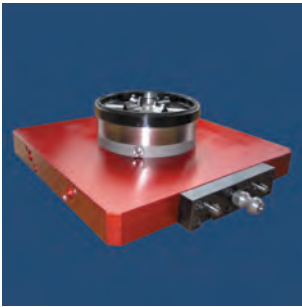


2-fold pallet
with 2x 2-fold vice

10. Sample Applications



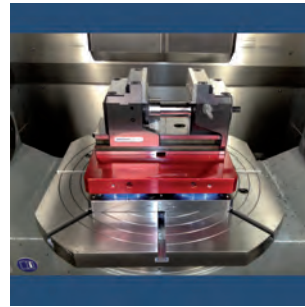
More than 2,500 solutions speak for themselves.



4-fold pallet
with Erowa Power-Chuck

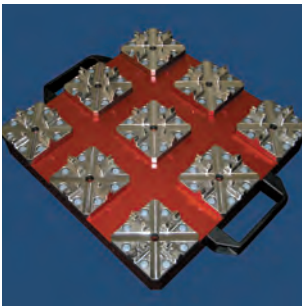


4-fold pallet
with chucking tower

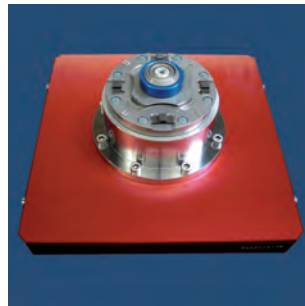


4-fold pallet
with 5-axis power chuck

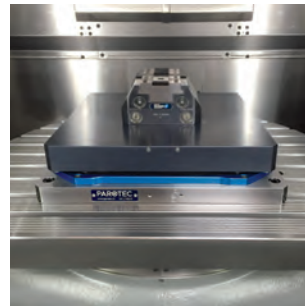
Power-Grip 4-fold



4-fold pallet
with 9x electrode chuck



4-fold pallet
with Power-Grip index



4-fold angular pallet
with work pieces

POWERGRIP

Best performance
to the (zero) point



6-fold pallet carrier
with 2-fold pallet



6-fold pallet carrier
with 2-fold and 4-fold pallet

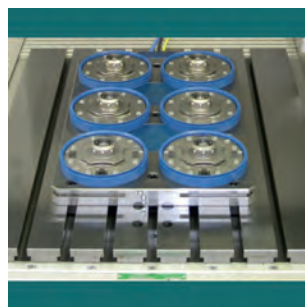


6-fold pallet carrier
on Fehlmann P 60

Power-Grip 6-fold



6-fold pallet
with CNC dividing head



6-fold pallet carrier
on Rödgers RFM 760

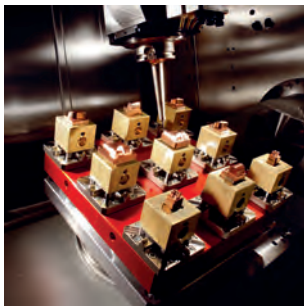


4-fold carrier PG 200
on Hermle C30 U
with SRT 630

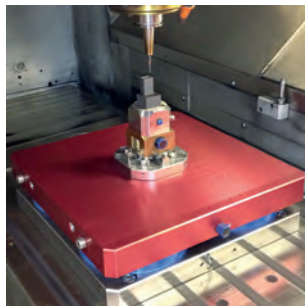
10. Sample Applications



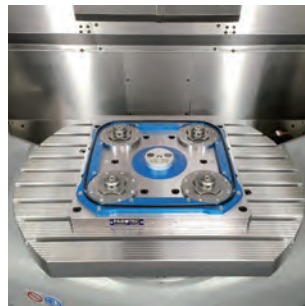
Production tailored to your needs. Power-Grip in practice.



4-fold pallet carrier
with 9x electrode mount

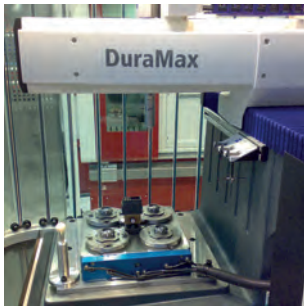


4-fold pre-pallet
carrier with POLY-GRIP

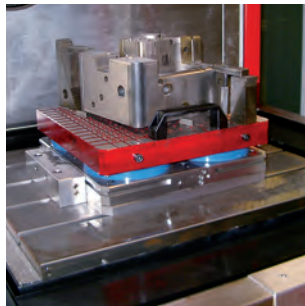


4-fold pallet carrier
on Ingersoll Gantry 500

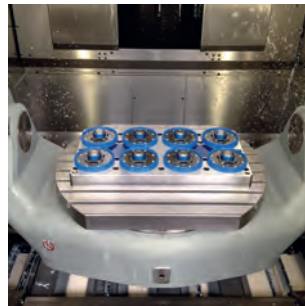
Power-Grip miscellaneous



4-fold pallet carrier
on Zeiss DuraMax



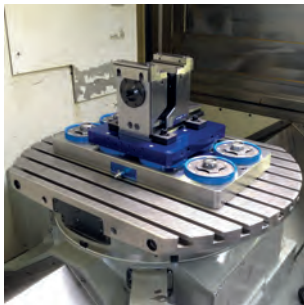
4-fold pallet carrier
on Zimmer+Kreim Genius 700



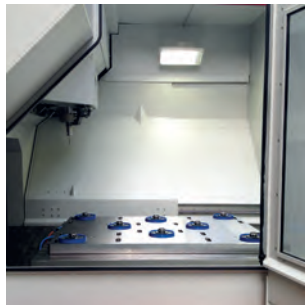
8-fold pallet carrier
on Hermle C42U

POWERGRIP

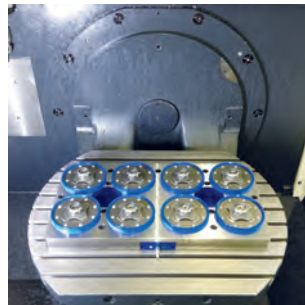
Best performance
brought to the (zero) point



8-fold pallet carrier
on DMU 80P



8-fold pallet carrier
on Röders RXU 1200



8-fold pallet carrier
on DMU 70

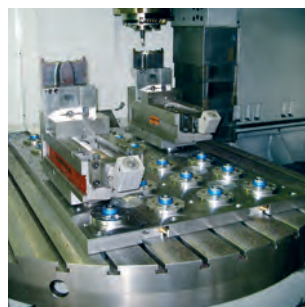
Power-Grip miscellaneous



12-fold pallet carrier
on Hermle C62U

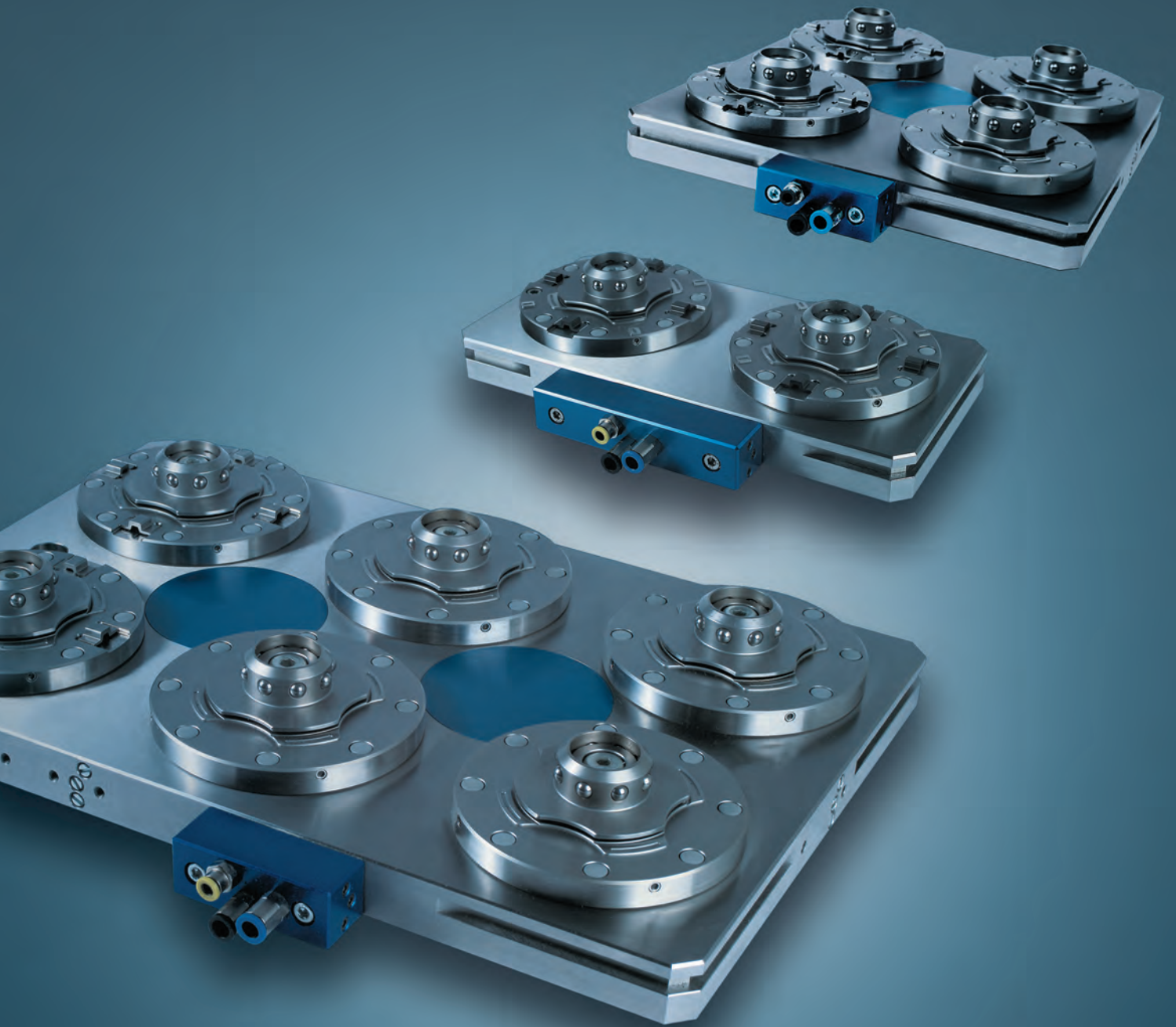


16-fold pallet carrier
on Mori Seiki



24-fold pallet carrier
on DMU 200P

Pallet Carriers



Power-Grip pallet carrier.

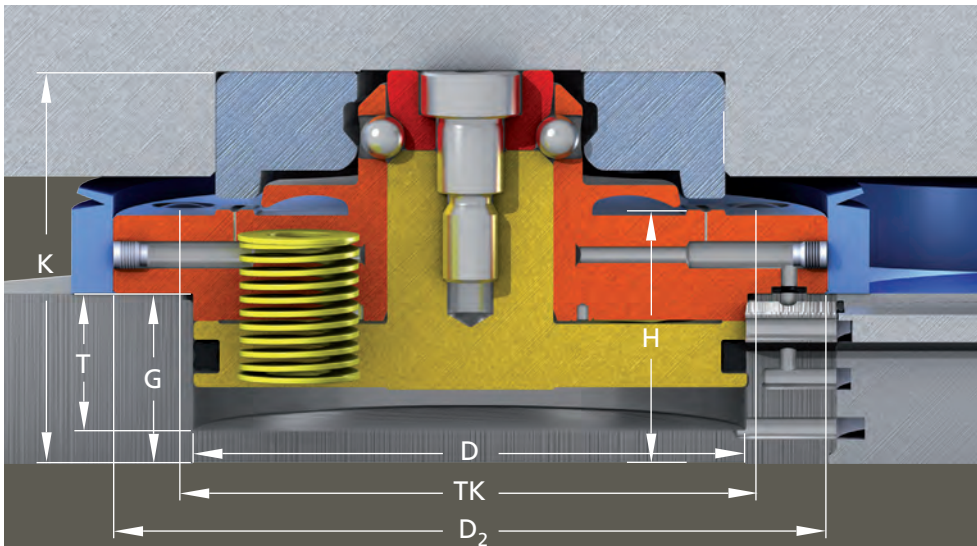
Time to change.

The Power-Grip pallet carrier

- is suitable for any kind of processing
- consists of rust- and acid-proof steel (1.2085)
- has a repeatability of 0.002 mm over a length of 300 mm
- works with a clamping force per centering unit of 17,000 to 50,000 N
- is pneumatically released (min. 6 bar)
- automatically cleans all z-reference surfaces with each chucking process

POWERGRIP

•
•
•
Fit for the competition.



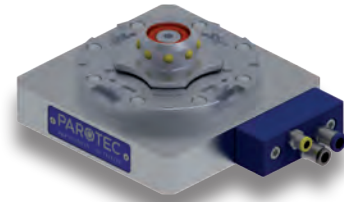
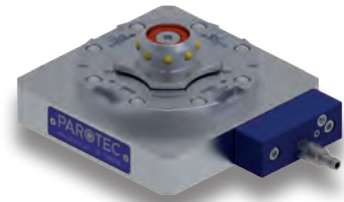
D	TK	T	G*	H*	D ₂	K*
100 ^{+ 0,018} _{+ 0,004}	112 ± 0,1	25 ± 0,1	31 ^{+ 0,005} _{- 0,00}	46 ^{+ 0,01} _{- 0,00}	129	68,75

* Height can vary depending on the execution.

Examples of our product range

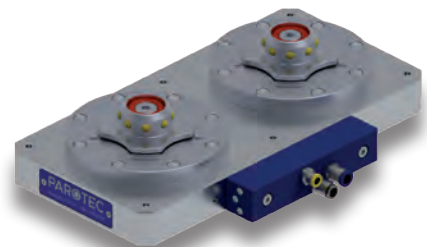
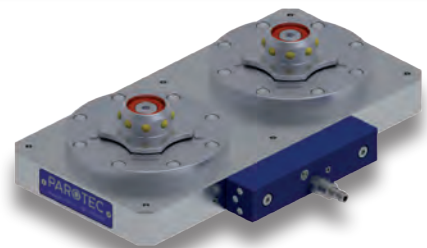
Power-Grip indexable 1-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 16.000 N Release pressure 30 bar: 27.500 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 31.000 N Release pressure 30 bar and retightening 4 bar: 39.000 N
Unlocking	Pneumatic with 6 bar, if needed also hydraulic with 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Mounting pattern	Insertion is possible individually depending on machine table

Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11601_-----	-	156	156	46	158 x 158 x 42	198 x 198

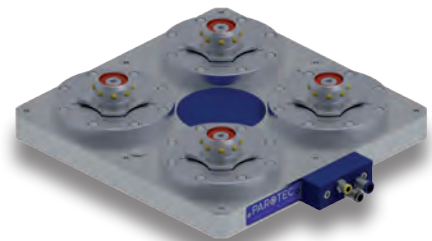
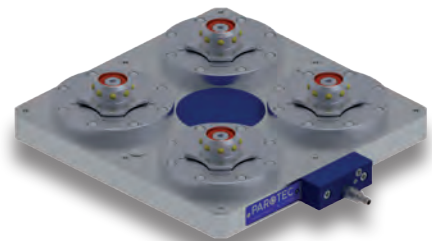


Power-Grip 2-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 32.000 N Release pressure 30 bar: 55.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 62.000 N Release pressure 30 bar and retightening 4 bar: 78.000 N
Unlocking	Pneumatic with 6 bar, if needed also hydraulic with 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 2-fold pallet
Mounting pattern	Insertion is possible individually depending on machine table

Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11602_-----	160	316	156	46	318 x 158 x 42	450 x 200
PT 12002_-----	200	356	156	46	398 x 198 x 42	500 x 200
PT 12402_-----	240	396	156	55	498 x 198 x 52	550 x 200

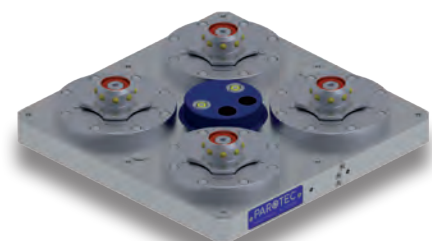
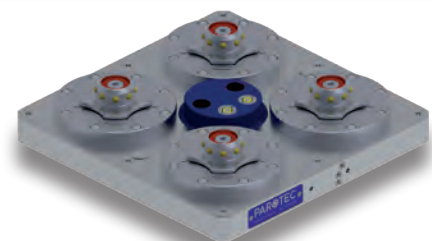


Power-Grip 4-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 64.000 N Release pressure 30 bar: 110.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 124.000 N Release pressure 30 bar and retightening 4 bar: 156.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 4-fold or 2 x 2-fold pallets
Mounting pattern	Insertion is possible individually depending on machine table



Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11604_ _ _ _ _	160	316	316	46	318 x 318 x 42	450 x 450
PT 12004_ _ _ _ _	200	356	356	46	398 x 398 x 42	500 x 500
PT 12404_ _ _ _ _	240	436	436	46	478 x 478 x 52	550 x 550

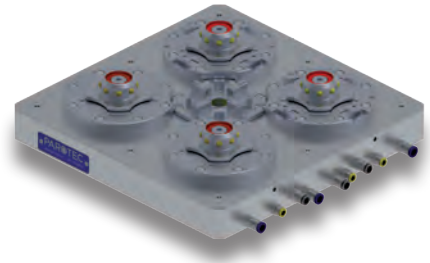
Power-Grip 4-fold pallet carrier with pneumatic retransmission for central palletizing system	
Pneumatic transmission	Up to 6 feeds pneumatic
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Yes
Clamping force without retightening	Release pressure 6 bar and retightening 5 bar: 64.000 N Release pressure 30 bar and retightening 4 bar: 110.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 124.000 N Release pressure 30 bar and retightening 4 bar: 156.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Pneumatic with approx. 4.5 bar
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 4-fold or 2 x 2-fold pallets
Mounting pattern	Insertion is possible individually depending on machine table



Item no. (here: pallet carrier with 1 central connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11604_ _ _ _ _	160	316	316	46	318 x 318 x 42	450 x 450
PT 12004_ _ _ _ _	200	356	356	46	398 x 398 x 42	500 x 500
PT 12404_ _ _ _ _	240	436	436	46	478 x 478 x 52	550 x 550

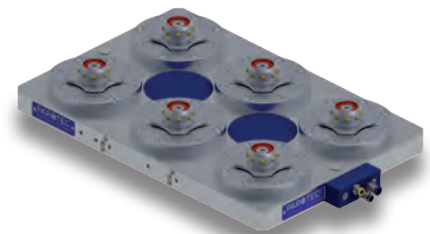
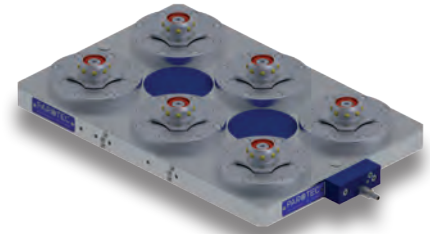
Examples of our product range

Power-Grip 4-fold pallet carrier with POLY-GRIP chuck	
Central chuck	POLY-GRIP (alternative EROWA ITS, 3R Macro, Hirschmann 8000)
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Yes
Clamping force without retightening	Release pressure 6 bar and retightening 5 bar: 64.000 N Release pressure 30 bar and retightening 4 bar: 110.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 124.000 N Release pressure 30 bar and retightening 4 bar: 156.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Pneumatic with approx. 4.5 bar
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering, drilling
Possible pallets	1 x 4-fold or 2 x 2-fold pallets
Mounting pattern	Insertion is possible individually depending on machine table



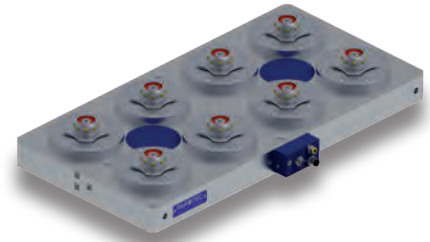
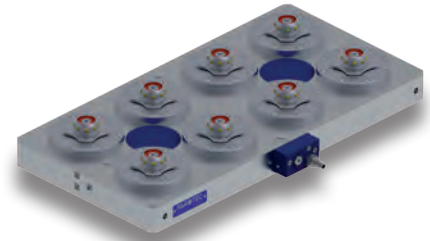
Item no. (here: pallet carrier with 1 central connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11604_ _ _ _ _	160	316	316	46	318 x 318 x 42	450 x 450
PT 12004_ _ _ _ _	200	356	356	46	398 x 398 x 42	500 x 500
PT 12404_ _ _ _ _	240	436	436	46	478 x 478 x 52	550 x 550

Power-Grip 6-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 96.000 N Release pressure 30 bar: 165.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 186.000 N Release pressure 30 bar and retightening 4 bar: 234.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 6-fold, 1 x 4-fold + 1 x 2-fold or 3 x 2-fold pallets
Mounting pattern	Insertion is possible individually depending on machine table



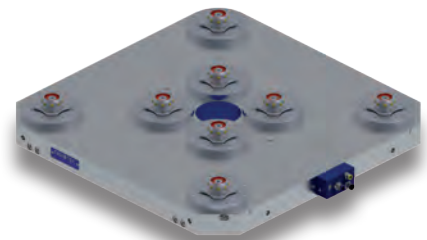
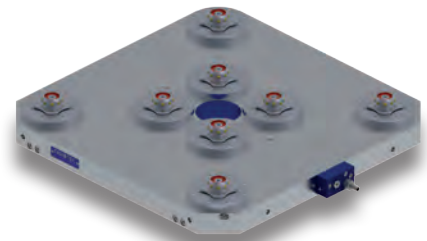
Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11606_ _ _ _ _	160	476	316	46	478 x 318 x 42	610 x 450
PT 12006_ _ _ _ _	200	576	356	55	598 x 398 x 42	700 x 500
PT 12406_ _ _ _ _	240	656	426	65	698 x 478 x 52	800 x 550

Power-Grip 8-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 128.000 N Release pressure 30 bar: 220.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 248.000 N Release pressure 30 bar and retightening 4 bar: 312.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 8-fold, 2 x 4-fold, 1 x 6-fold + 1 x 2-fold or 4 x 2-fold
Mounting pattern	Insertion is possible individually depending on machine table



Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
PT 11608_ _ _ _ _	160	656	336	65	638 x 318 x 42	800 x 450
PT 12008_ _ _ _ _	200	776	376	65	798 x 398 x 42	950 x 500
PT 12408_ _ _ _ _	240	896	436	65	958 x 478 x 52	1100 x 550

Power-Grip 8-fold pallet carrier	
Repeatability	0.002 mm (over a length of 300 mm)
System accuracy	0.005 mm (over a length of 300 mm)
Automatable	Carrier with 1 pin: no , carrier with 3 pins: yes (1-pin carriers can be converted to 3-pin carriers at any time)
Clamping force without retightening	Release pressure 6 bar: 128.000 N Release pressure 30 bar: 220.000 N
Clamping force with retightening 6 bar	Release pressure 6 bar and retightening 5 bar: 248.000 N Release pressure 30 bar and retightening 4 bar: 312.000 N
Unlocking	Pneumatic with 6 bar, on demand also hydraulically up to 30 bar
Clamping	Spring assembly with self-locking ball-bearing mechanism
Connections	Lateral, or fitted to rotary feedthroughs
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Carrier with 1 pin: not possible Carrier with 3 pins: possible
Material	Carrier and centering unit acid-proof stainless steel
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Possible pallets	1 x 8-fold, 1 x 4-fold, 2 x 2-fold
Mounting pattern	Insertion is possible individually depending on machine table



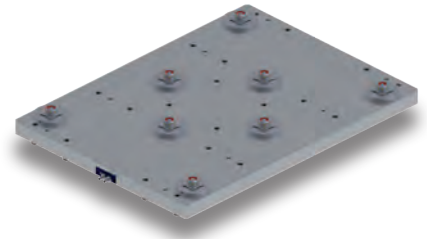
Item no. (here: pallet carrier with 1 connection)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm	Standard pallet sizes in mm	Maximum pallet sizes in mm
XT 11608_ _ _ _ _	160	646	646	65	638 x 638 x 52	800 x 800
XT 12008_ _ _ _ _	200	776	776	65	798 x 798 x 52	950 x 950
XT 12408_ _ _ _ _	240	896	896	65	898 x 898 x 52	1100 x 1100

Examples of our customized solutions

Power-Grip 8-fold pallet carriers

Machine 3-axis HSC milling machine Rödgers RXU 1200

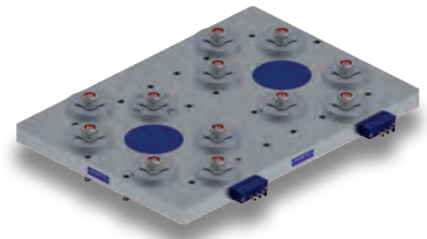
Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
480/960	1186	876	70



Power-Grip 12-fold pallet carrier

Machine EDM machine Zimmer + Kreim Genius 1200

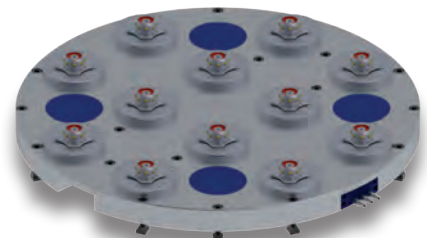
Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
240/480	896	636	65



Power-Grip 12-fold pallet carrier

Machine 5-axis machining center AXA VHC 50-8000 XTS D

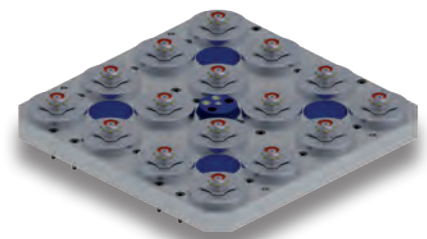
Grid size S in mm	Diameter D in mm	Height H (on Z-references) in mm
200	798	70



Power-Grip 16-fold pallet carrier

Machine 5-axis machining center Hermle C42U

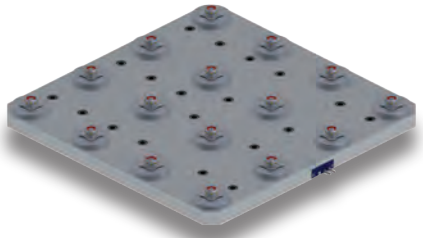
Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
160	636	636	70



Power-Grip 16-fold pallet carrier

Machine	5-axis machining center Soraluce TA-25D
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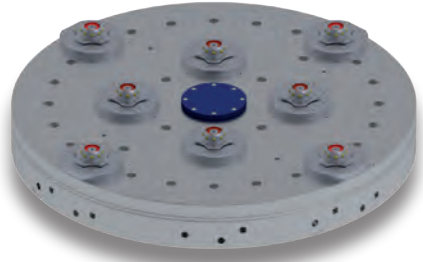
Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
280	996	996	70



Power-Grip 16-fold pallet carrier

Machine	5-axis machining center Deckel-Maho DMU 100P
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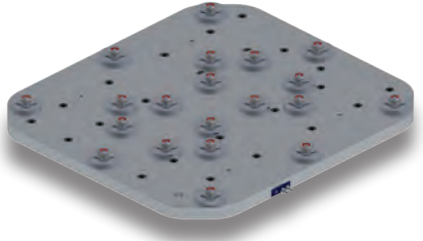
Grid size S in mm	Diameter D in mm	Height H (on Z-references) in mm
240/480	800	115



Power-Grip 20-fold pallet carrier

Machine	5-axis machining center Deckel-Maho DMU 200P
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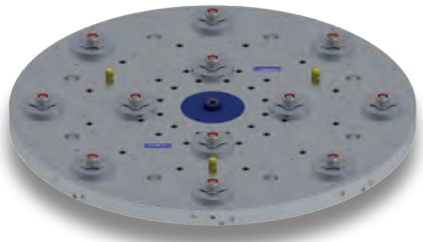
Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
240/480	1320	1200	70



Power-Grip 16-fold pallet carrier

Machine	5-axis machining center Deckel-Maho DMU 160P
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Grid size S in mm	Diameter D in mm	Height H (on Z-references) in mm
320/TK700	1.200	70



Pallets



Power-Grip Pallets

In. Out. Over. In. It fits.

The Power-Grip pallet

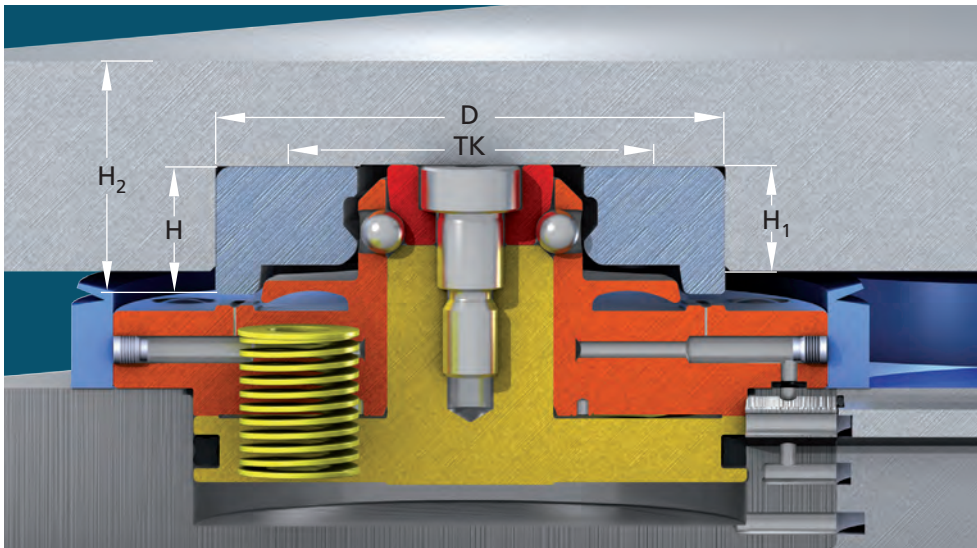
- is suitable for any kind of processing
- standard: made of high-strength aluminum, or steel on request
- has a repeatable accuracy of 0.002 mm over a length of 300 mm

Whether milled, ground with thread grid or with magnet, made of steel or aluminum, we manufacture all sizes and designs.

POWERGRIP



Fit for change.



				ground	milled
D	TK	H	H ₁	H ₂ *	H ₂
92 ^{+0.018} _{-0.00}	62 ± 0.1	23 ^{+0.005} _{-0.00}	19 ^{+0.01} _{-0.00}	42 ^{+0.02} _{-0.00}	42 ^{+0.1} _{-0.00}

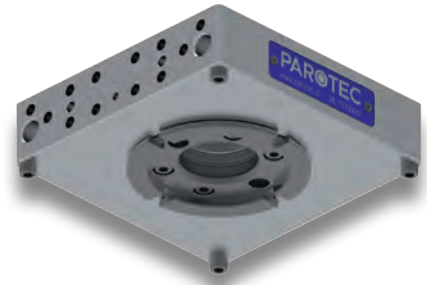
* Height can vary depending on the execution.

Examples of our product range

Power-Grip 1-fold pallets index

Material	Standard pallets: high-strength aluminum (other materials, e.g. steel on request)
Reference elements	1-piece Power-Grip centering clamping sleeve index
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Milled only, ground, with thread grid, with T-slots, with magnet; further models on request
Robot gripper system for automation	Adaptable to various robot gripper systems on request

Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 4160100000	-	158	158	42



Power-Grip 2-fold pallets

Material	Standard pallets: high-strength aluminum (other materials, e.g. steel, on request)
Reference elements	2-piece Power-Grip centering clamping sleeve standard
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Milled only, ground, with thread grid, with T-slots, with magnet; further models on request
Robot gripper system for automation	Adaptable to various robot gripper systems on request

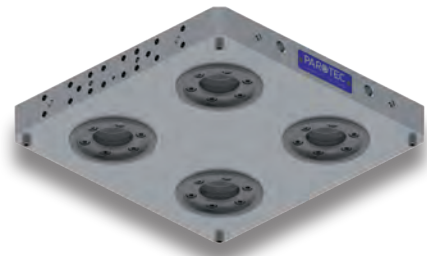
Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 4160200000	160	318	158	42
PT 4200200000	200	398	198	42
PT 4240200000	240	478	198	52



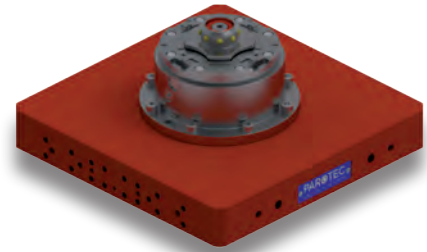
Power-Grip 4-fold pallets

Material	Standard pallets: high-strength aluminum (other materials, e.g. steel, on request)
Reference elements	4-piece Power-Grip centering clamping sleeve standard
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Milled only, ground, with thread grid, with T-slots, with magnet; further models on request
Robot gripper system for automation	Adaptable to various robot gripper systems on request

Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 4160400000	160	318	318	42
PT 4200400000	200	398	398	42
PT 4240400060	240	478	478	52

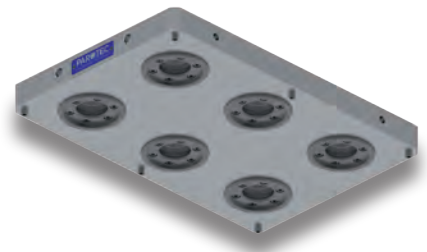


Power-Grip 4-fold pre-pallets	
Material	Standard pallets: high-strength aluminum (other materials, e.g. steel, on request)
Reference elements	4-piece Power-Grip centering clamping sleeve standard
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Ground and anodized, with adaption: Power-Grip, Defo-Grip, Poly-Grip, robot gripper system, etc.
Robot gripper system for automation	Adaptable to various robot gripper systems on request



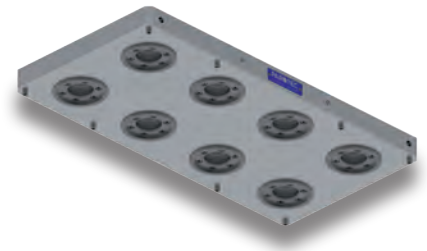
Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 41604_-----	160	318	318	120
PT 42004_-----	200	398	398	120
PT 42404_-----	240	478	478	120

Power-Grip 6-fold pallets	
Material	Standard pallets: high-strength aluminum (other materials, e.g. steel, on request)
Reference elements	6-piece Power-Grip centering clamping sleeve standard
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Milled only, ground, with thread grid, with T-slots, with magnet; further models on request
Robot gripper system for automation	Adaptable to various robot gripper systems on request



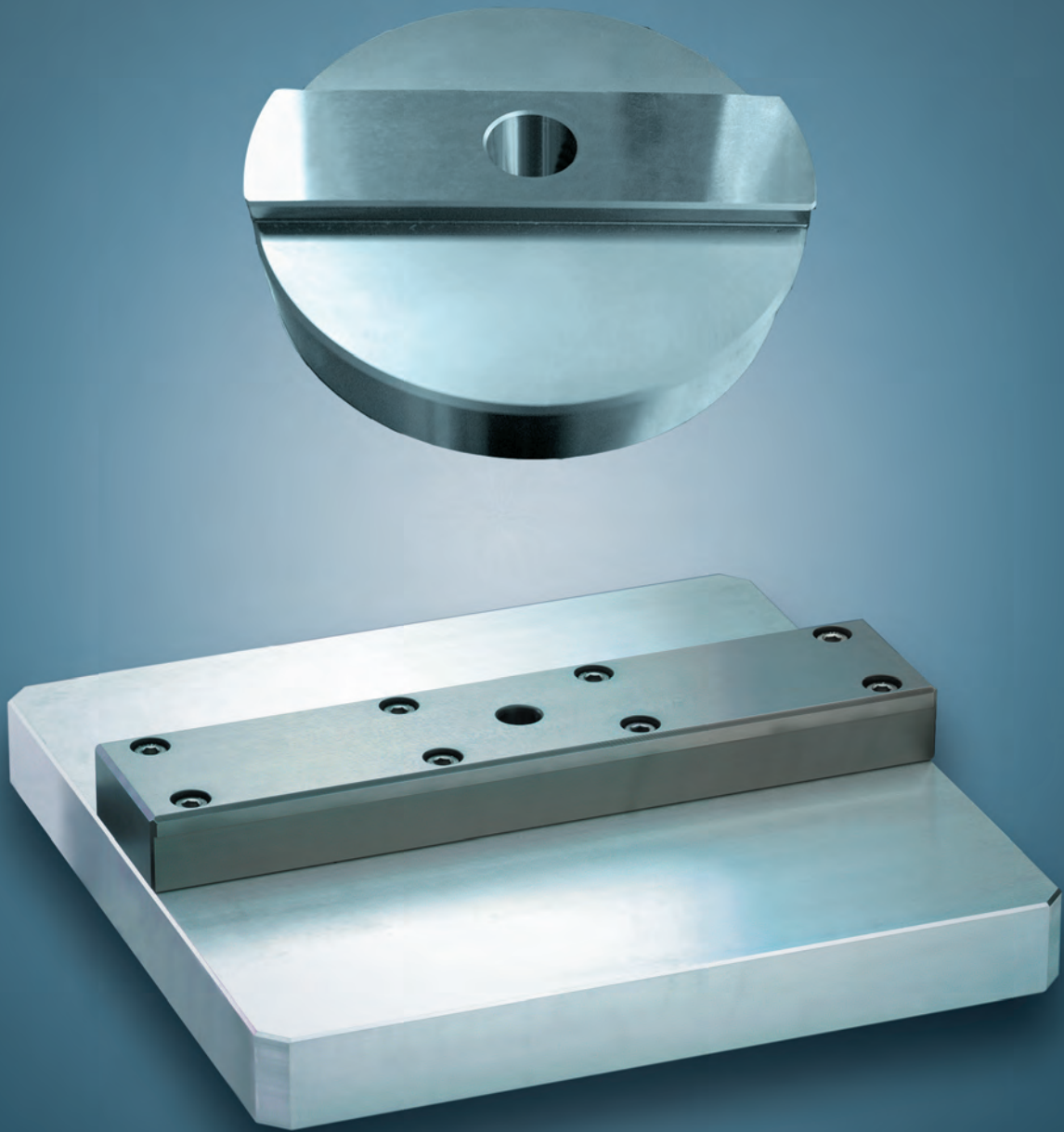
Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 4160600000	160	478	318	42
PT 4200600000	200	598	398	42
PT 4240600000	240	698	478	52

Power-Grip 8-fold pallets	
Material	Standard pallets: high-strength aluminum (other materials, e.g. steel, on request)
Reference elements	8-piece Power-Grip centering clamping sleeve standard
Reference surfaces	Hardened and rust-proof
Automatable	Yes , thanks to hardened and rust-proof reference surfaces
Application	Milling, EDM-ing, measuring, grinding, turning, lasering
Specification	Milled only, ground, with thread grid, with T-slots, with magnet; further models on request
Robot gripper system for automation	Adaptable to various robot gripper systems on request



Item no. (milled only model)	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 4160800000	160	638	318	42
PT 4200800000	200	798	398	42
PT 4240800000	240	958	478	52

Reference Elements



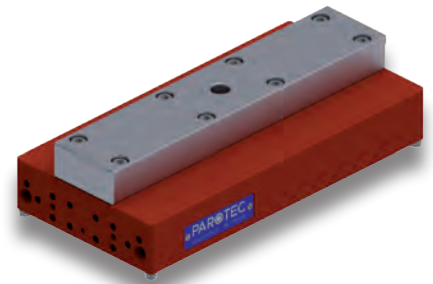
Power-Grip 1-fold reference pallets	
Material	Steel, rust-proof, hardened
Reference surfaces	Hardened and ground
Application	For pallet carrier alignment and zero-point calibration
Specification	With hardened, rust-proof reference surfaces and reference borehole

Item no.	Diameter in mm	Height H in mm
PT 5160120000	129	40



Power-Grip 2-fold reference pallets	
Material	High-strength aluminum
Reference elements	2-piece Power-Grip centering clamping sleeve index
Reference surfaces	Hardened and rust-proof
Application	For pallet carrier alignment and zero-point calibration
Specification	Ground and anodized, with hardened, rust-proof reference bar and reference borehole

Item no.	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 5160201200	160	318	158	84
PT 5200201200	200	398	158	84
PT 5240201200	240	398	158	84

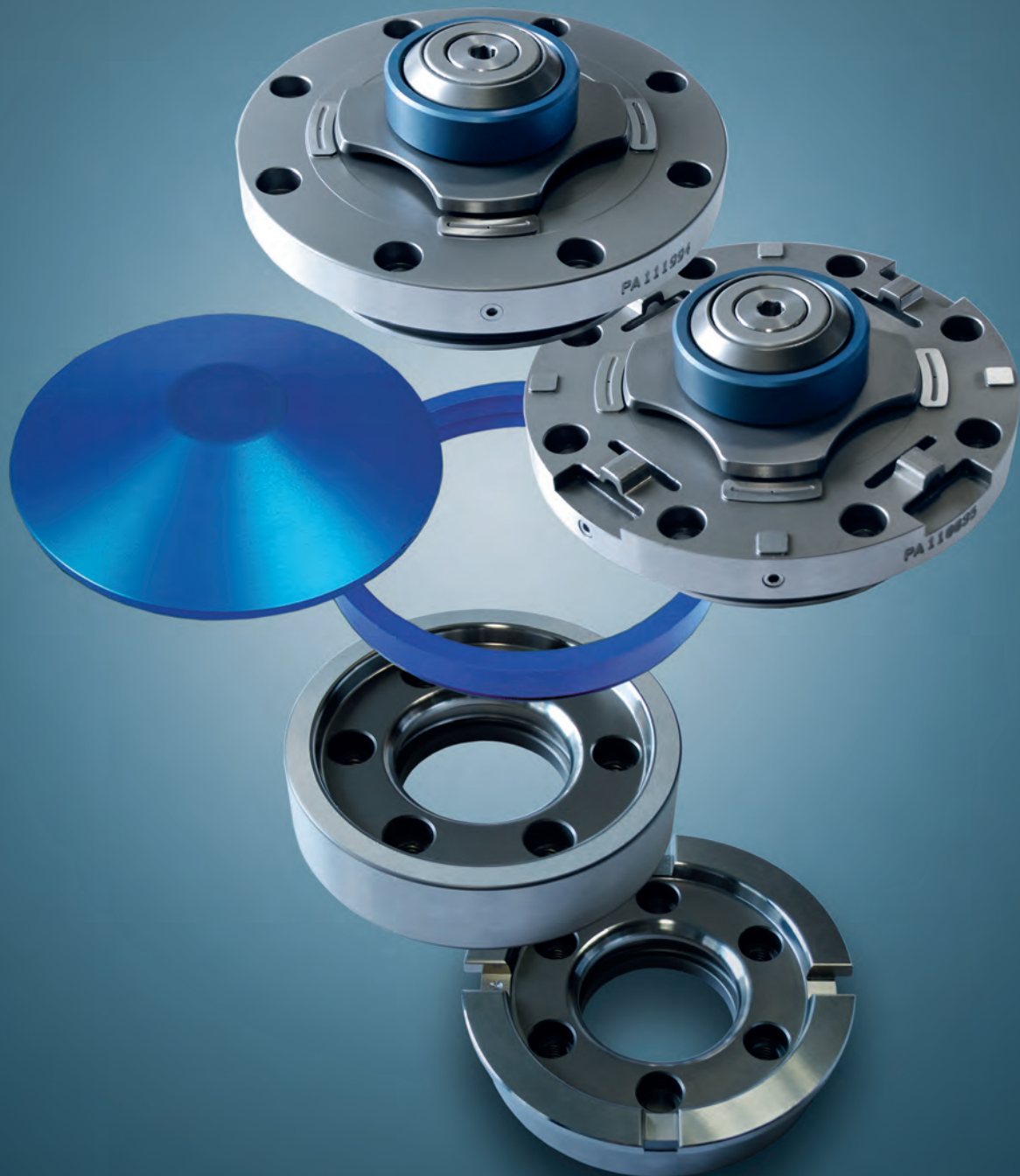


Power-Grip 4-fold reference pallets	
Material	High-strength aluminum/ steel, rust-proof, hardened
Reference elements	4-piece Power-Grip centering sleeve
Reference surfaces	Hardened and rust-proof
Application	For pallet carrier alignment and zero-point calibration
Specification	Ground and anodized, with hardened, rust-proof reference bar and reference borehole

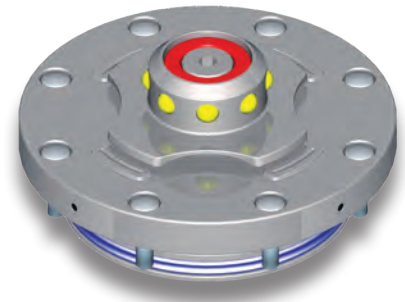
Item no.	Grid size S in mm	Length L in mm	Width B in mm	Height H (on Z-references) in mm
PT 5160460230	160	318	318	84
PT 5200460230	200	398	398	84
PT 5240460230	240	398	398	84



Centering Units, Clamping Sleeves & Co.

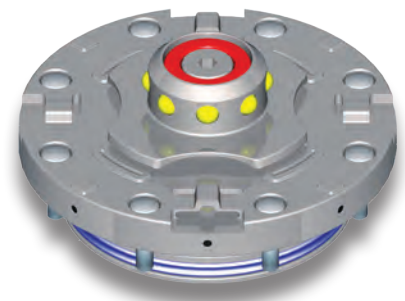


Power-Grip standard centering unit	
Repeatability	0,002 mm
System accuracy	0,005 mm
Automatable	Yes
Clamping force without retightening	see scale below
Clamping force with retightening 6 bar	see scale below
Unlocking	see scale below
Clamping	Spring assembly with self-locking ball-bearing mechanism
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Pneumatic with approx. 4.5 bar
Material	Rust-proof, hardened, ground
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering, etc.



Item no.	Diameter in mm	Height H (on Z-references) in mm	Clamping force	Clamping force (additional 6 bar retightening)	Release pressure
PT 0120010020	129	15	16.000 N	31.000 N retightening pressure 5 bar	6 bar (pneumatic)
PT 0120010220	129	15	27.500 N	39.000 N retightening pressure max. 4 bar	30 bar (hydraulic)

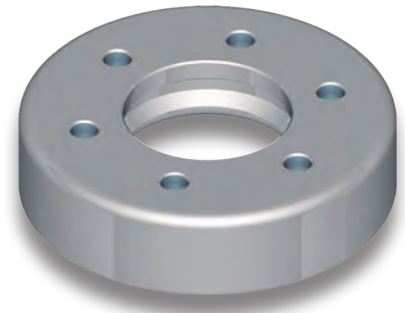
Power-Grip indexable centering unit	
Repeatability	0,002 mm
System accuracy	0,005 mm
Indexing accuracy	Indexing 0.004 mm over 120 mm, 4 x 90 degrees
Automatable	Yes
Clamping force without retightening	see scale below
Clamping force with 6 bar retightening	see scale below
Unlocking	see scale below
Clamping	Spring assembly with self-locking ball-bearing mechanism
Reference surface cleaning	Pneumatic with approx. 3.5 bar
Z-reference feedback	Pneumatic with approx. 4.5 bar
Material	Rust-proof, hardened, ground
Pallet lifting during unlocking	Approx. 2 mm
Application	Milling, EDM-ing, measuring, grinding, turning, lasering, etc.



Item no.	Diameter in mm	Height H (on Z-references) in mm	Clamping force	Clamping force (additional 6 bar retightening)	Release pressure
PT 0120020040	129	15	16.000 N	31.000 N retightening pressure 5 bar	6 bar (pneumatic)
PT 0120020240	129	15	27.500 N	39.000 N retightening pressure max. 4 bar	30 bar (hydraulic)

Power-Grip standard centering clamping sleeve	
Material	Rust-proof, hardened, ground
Application	For installation in pallets, fixtures and clamping media
Application areas	For Power-Grip pallet carriers with at least 2 standard centering units

Item no.	Diameter in mm	Height H (on Z-references) in mm
PT 4000100000	92	23



Power-Grip indexable centering clamping sleeve	
Material	Rust-proof, hardened, ground
Indexing accuracy	Indexing 0.004 mm on 120 mm, 4 x 90 degrees
Application	For installation in pallets, fixtures and clamping media
Application areas	For Power-Grip pallet carriers with indexable centering units

Item no.	Diameter in mm	Height H (on Z-references) in mm
PT 4000101000	92	23



1-fold Power-Grip seal ring	
Material	Synthetic NBR
Application	For sealing individual Power-Grip centering units

Item no.	Diameter in mm	Height H (built in) in mm
PT 0100100005	144	19



1-fold Power-Grip sealing pallet	
Material	Anodized aluminum
Application	For sealing individual Power-Grip centering units when using indexable 1-fold pallets 125 mm x 125 mm

Item no.	Diameter in mm	Height H in mm
PT 0100100040	158	19



Power-Grip 4-fold sealing plate	
Material	Anodized aluminum
Application	For sealing 4-fold Power-Grip pallet carriers with pneumatic or hydraulic couplings for pneumatic retransmission

Item no.	Grid size S in mm	Length L in mm	Width B in mm	Height H (built-in) in mm
PT 0100416000	160	316	316	19
PT 0100420000	200	356	356	19
PT 0100424000	240	416	416	19



Power-Grip chip protection for pallet carrier	
Material	Anodized aluminum
Application	For sealing unused Power-Grip centering units

Item no.	Diameter in mm	Height H (built in) in mm
PT 0170000000	158	28



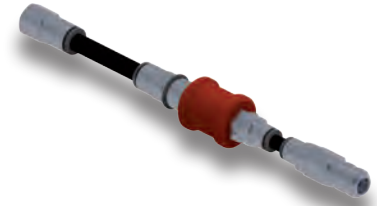
Control Units



Power-Grip pneumatic control unit with 1 connection for 2 pallet carriers

Material	Rust-proof sheet-steel enclosure
Number of air connections	1 air connection
Connections	Pin: main air connection P1: unlock/clamp and cleaning pallet carrier
Setting options	None
Application	Manual milling, measuring, grinding

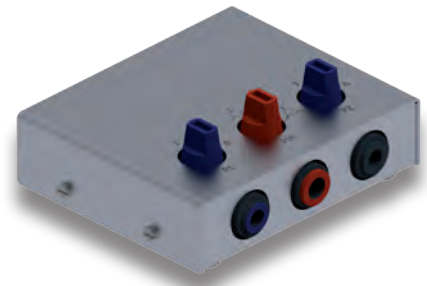
Item No.	Length L in mm	Width B in mm	Height H in mm
PT 3900411010	---	---	---



Power-Grip control unit with 3 connections for 1 pallet carrier

Material	Rust-proof sheet-steel enclosure
Number of air connections	3 air connections
Connections	Pin: main connection P1: unlock/clamp and Z-reference cleaning carrier 1 P2: unlock/clamp and Z-reference cleaning carrier 2
Setting options	None
Application	Manual milling, measuring, grinding

Item No.	Length L in mm	Width B in mm	Height H in mm
PT 3900812000 (up to 6 centring units)	132	112	53
PT 3902012000 (from 8 centring units)	132	112	53



Power-Grip electric control unit with 3 connections for 1 pallet carrier as well as 3 press switches

Material	Aluminum base plate
Number of air connections	3 air connections + 1 main air connection
Connections	Pin: main connection P1: unlock/clamp Z: Z-reference cleaning U: excess pressure / overpressure / pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: overpressure intensity NS: pneumatic retightening
Application	Spark erosion, wire EDM-ing, milling, grinding, etc.

Item No.	Length L in mm	Width B in mm	Height H in mm
PT 3900831000	185	150	85

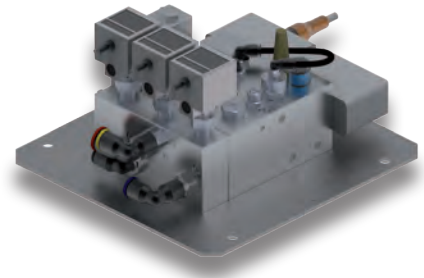




**Power-Grip electric control unit
with 3 connections for 1 pallet carrier as well as 3 press switches**

Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp PT1 Z: Z-reference cleaning U: excess pressure/overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: overpressure intensity NS: pneumatic retightening
Monitoring capacity	with 3 pressure sensors, see attachment
Application	die sinking, wire EDM-ing, milling, grinding, etc.

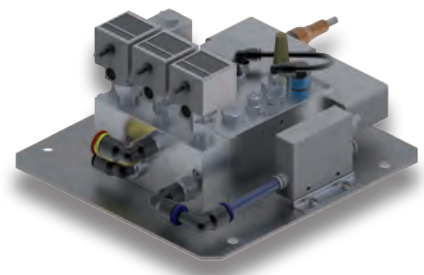
Item no.	Length L in mm	Width B in mm	Height H in mm
PT 3900831120	250	200	105



**Power-Grip electric control unit
with 3 connections for 1 pallet carrier as well as 3 press switches and sensor for flow rate**

Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp PT1 Z: Z-reference cleaning U: overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: overpressure intensity NS: pneumatic retightening
Monitoring capacity	with 3 pressure sensors, see attachment
Application	die sinking, wire EDM-ing, milling, grinding, etc.

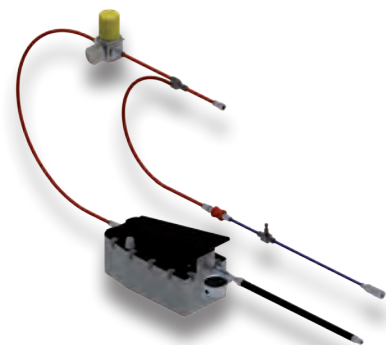
Item no.	Length L in mm	Width B in mm	Height H in mm
PT 3900831210	250	200	105



**Power-Grip hydraulic control unit
with 2 connections for 1 pallet carrier**

Number of air connections	2 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp hydraulic 30 bar Z: Z-reference cleaning
Setting options	Z: Z-reference cleaning intensity
Application	milling, grinding, etc.

Item no.	Length L in mm	Width B in mm	Height H in mm
XT 3901810000	500	160	210



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