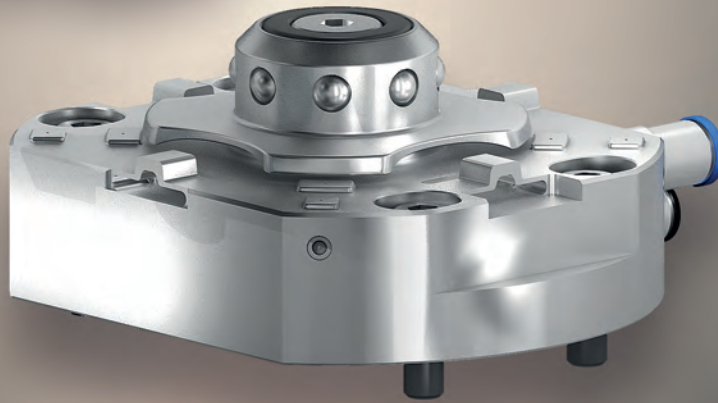


SMARTGRIP

WIRE ERODING - SYSTEMATICALLY



The Smart-Grip System

The modular zero-point palletizing system
for wire EDM-ing



The Inventor

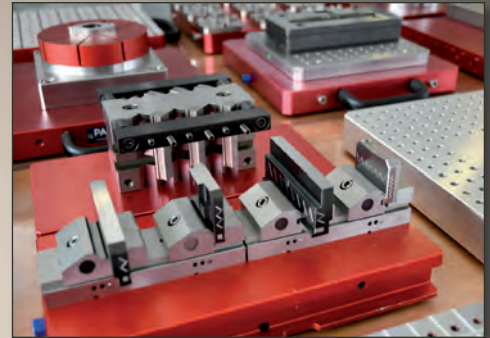
created by

PAROTEC
spanntechnik · robotik · engineering

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CH-9016 St. Gallen
Tel.: +41 (0)71 394 10 00
info@parotec.ch

PAROTEC has more than 35 years of experience in the field of high precision workpiece 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

PARTOOL
Palettieren · Automatisieren · Rationalisieren

PARTOOL GmbH & Co. KG
Edisonstraße 19
D-90431 Nürnberg
Tel.: +49 (0)911 65 65 89- 0
info@partool.de

The company PARTOOL is distributor of the manufacturer PAROTEC for Germany and Benelux for more than 25 years.

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



Precision clamping with Smart-Grip – the zero-point palletizing system for wire EDM-ing.

Smart-Grip. The clamping system for your production requirements.

Smart-Grip EASY offers you a simple, cost-effective entry into economical and process-reliable clamping technology. The fixtures, clamping devices and workpieces can be clamped and aligned in the machine. The system can be upgraded to the Smart-Grip AIR zero-point clamping system at any time.

Smart-Grip AIR is the zero-point clamping system. This allows the aligning and clamping of fixtures and workpieces outside the machine. With Smart-Grip AIR, the workpieces can be placed in the machine fully automatically with a robot. Productivity is significantly increased by Smart-Grip.

Smart-Grip BAR is the optimum solution for large workpieces to be clamped directly in the machine. The clamping bars also allow multiple clamping of different or identical workpieces with optimum utilisation of the machine's entire travel range.

Content

SMARTGRIP



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Smart-Grip EASY

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Smart-Grip AIR

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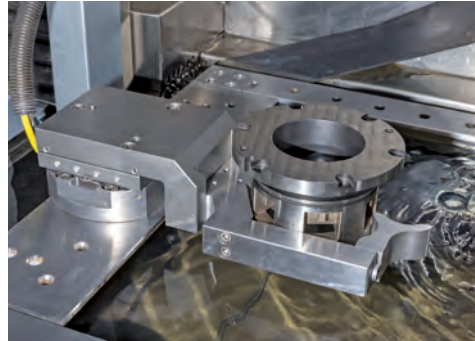
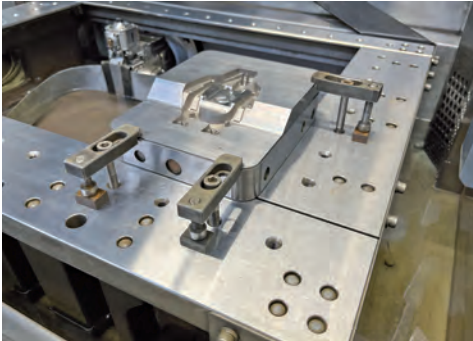
Smart-Grip BAR

For big sizes and more	Pages 50 / 51
Sample applications	Pages 52 / 53
Components	Pages 54 - 59

Machine Uptime



Up to 45% more efficiency of your wire EDM-ing machines due to Smart-Grip.



Actual state:
Time-consuming set-up
in the machines.

- 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
- High risk of collision

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

Target state:
Main time-parallel set-up
outside the machines.

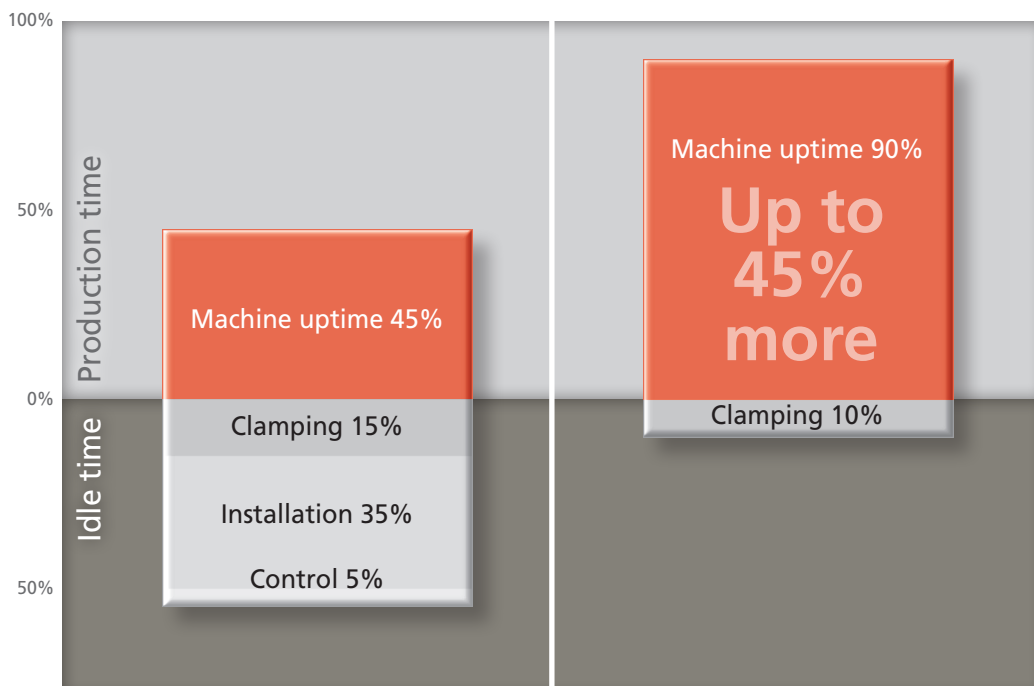
- Higher productivity and income
- Optimized manufacturing processes
- Standardized interfaces
- Low unit costs
- Reduced delivery times
- Adherence to delivery dates
- Low error rate
- Competitive capacity
- Collision-free clamping thanks to presetting

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

SMARTGRIP



*Optimized use of
production time.*



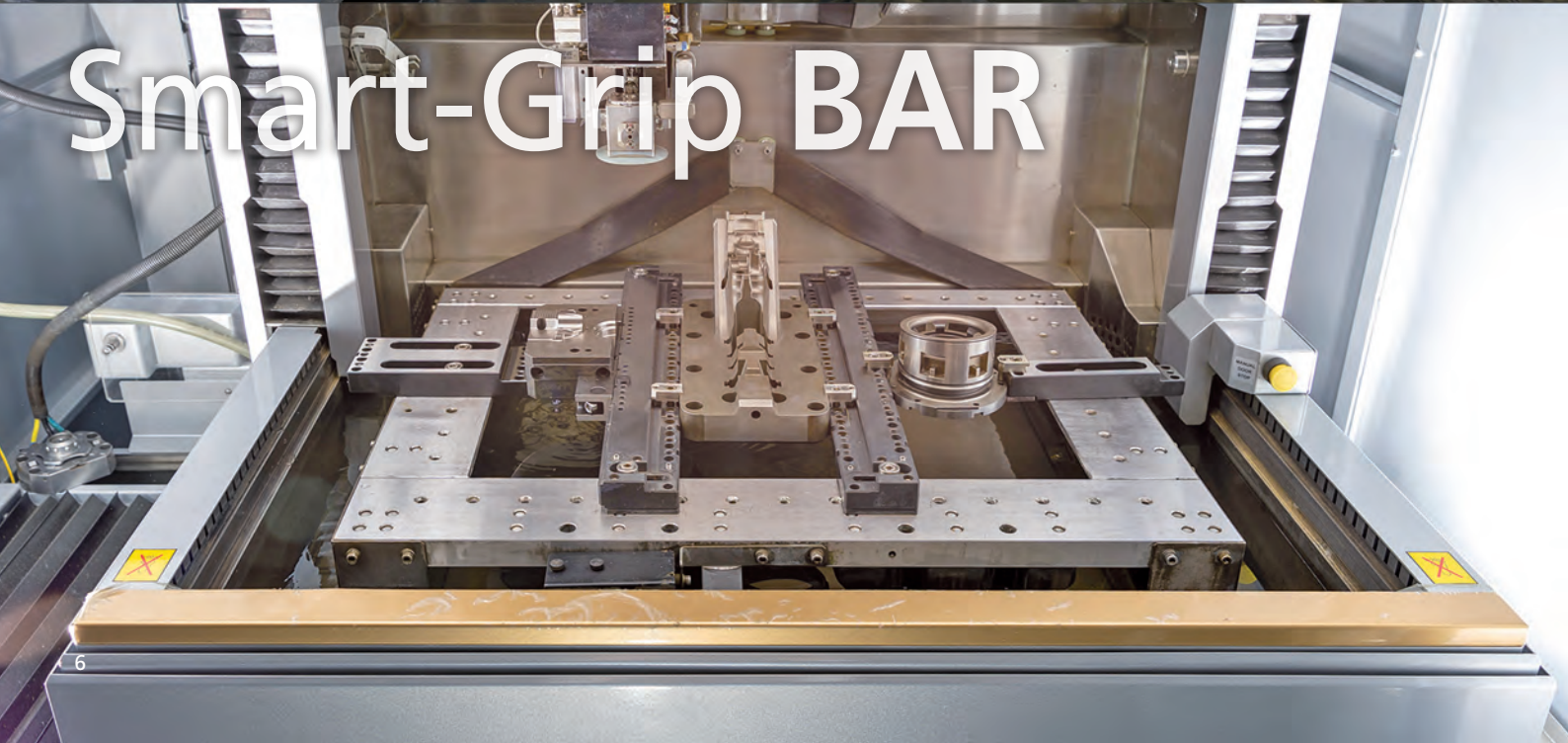
Smart-Grip EASY



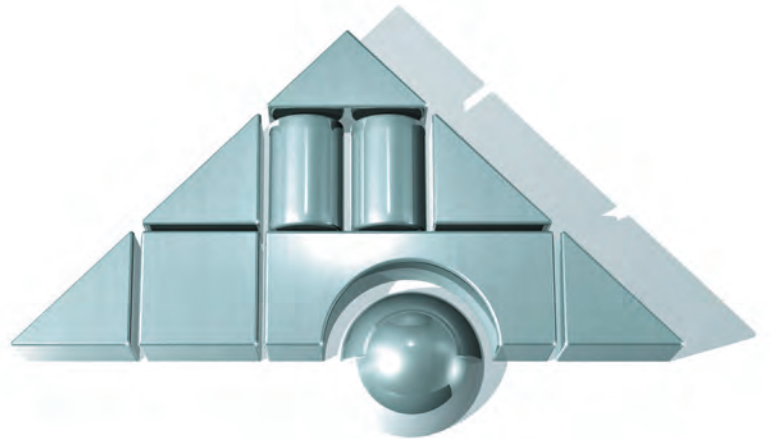
Smart-Grip AIR



Smart-Grip BAR



Flexibility from manual entry to automation.



1. Smart-Grip **EASY** – the manual adjustment unit

The simple low-cost way to get started.

- Quick change of different clamping elements, fixtures, etc.
- Easy alignment of workpieces in the machine

SMARTGRIP



*With system
to success*

2. Smart-Grip **AIR** – the zero-point clamping system

Workflow with zero point „to-go“ – fully automated on request.

1. Main time-parallel clamping and alignment of workpieces outside the machine
2. External acquisition of offset data with measuring machine
3. Machining in the eroding machine
4. Final measurement of the components for quality assurance
5. Post-processing if required
(Steps 2. to 5. can also be fully automated.)
6. Collision control thanks to presetting (presetplace)

Adaptions for common systems from other manufacturers are available for Smart-Grip EASY and Smart-Grip AIR.

3. Smart-Grip **BAR** – Clamping bars and accessoires

Stable. Flexible. Future-proof.

- Clamping of small and large workpieces directly in the machine
- Multiple clamping of the same or different workpieces
- Optimum utilisation of the complete working area of the machine

Smart-Grip EASY



The cost-effective way to get started.

Smart-Grip EASY.
Clamping workpieces economically.

Functionality, setting options and future-proofing.

- The dovetail guide with lateral clamping jaw enables a quick change of various clamping devices, such as vice, clamping prisms, flanges or fixtures. These clamping elements are clamped via the lateral clamping jaw in dovetail guide.
- Various adapters allow the use of existing clamping elements of clamping systems from other manufacturers.
- Many adapters and clamping devices can be indexed by 90°, 180° und 270° via dovetail guide.
- Smart-Grip EASY offers the following alignment options:
 - Alignment of the workpieces and clamping devices in the plane
 - Alignment of the C-twist
 - Adjustment of the Z-position of the clamping devices via the dovetail guide.This means that workpieces and clamping devices can also be positioned in relation to the lower flushing nozzles of the wire EDM machines.

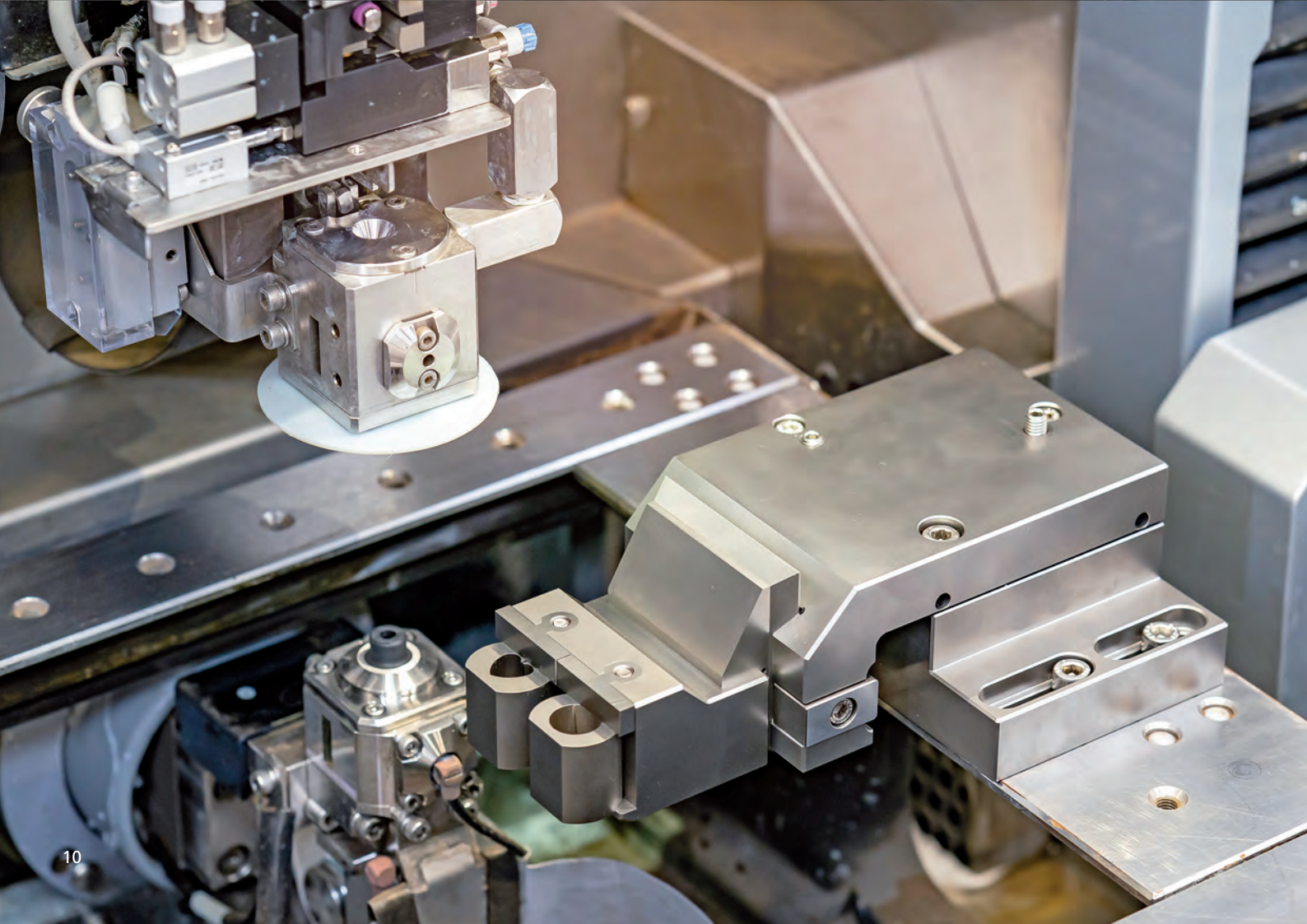
SMARTGRIP



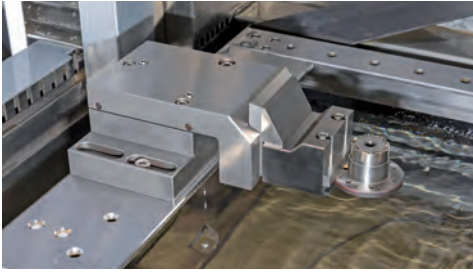
*Production time
perfectly optimized*

Smart-Grip EASY

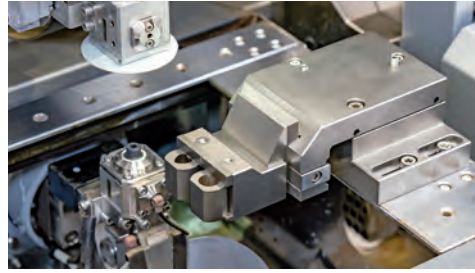
Application examples



Smart-Grip EASY in practice.



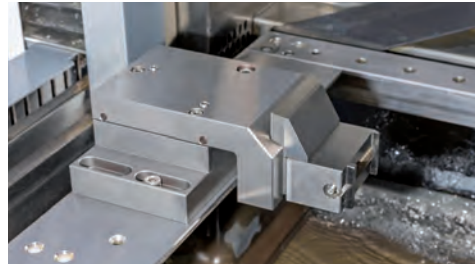
Smart-Grip EASY with
vice 0 – 40 mm



Smart-Grip EASY with
vice 0 – 40 mm



Smart-Grip EASY
with vice 0 – 60 mm, vertical



Smart-Grip EASY
with vice 0 – 60 mm, horizontal

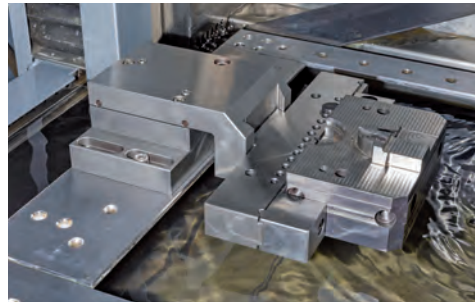
SMARTGRIP



*Perfect to meet
all practical requirements*



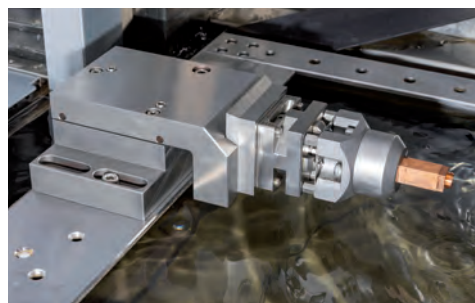
Smart-Grip EASY
with Smart-Vice 0 – 120 mm



Smart-Grip EASY
with Smart-Vice 0 – 175 mm



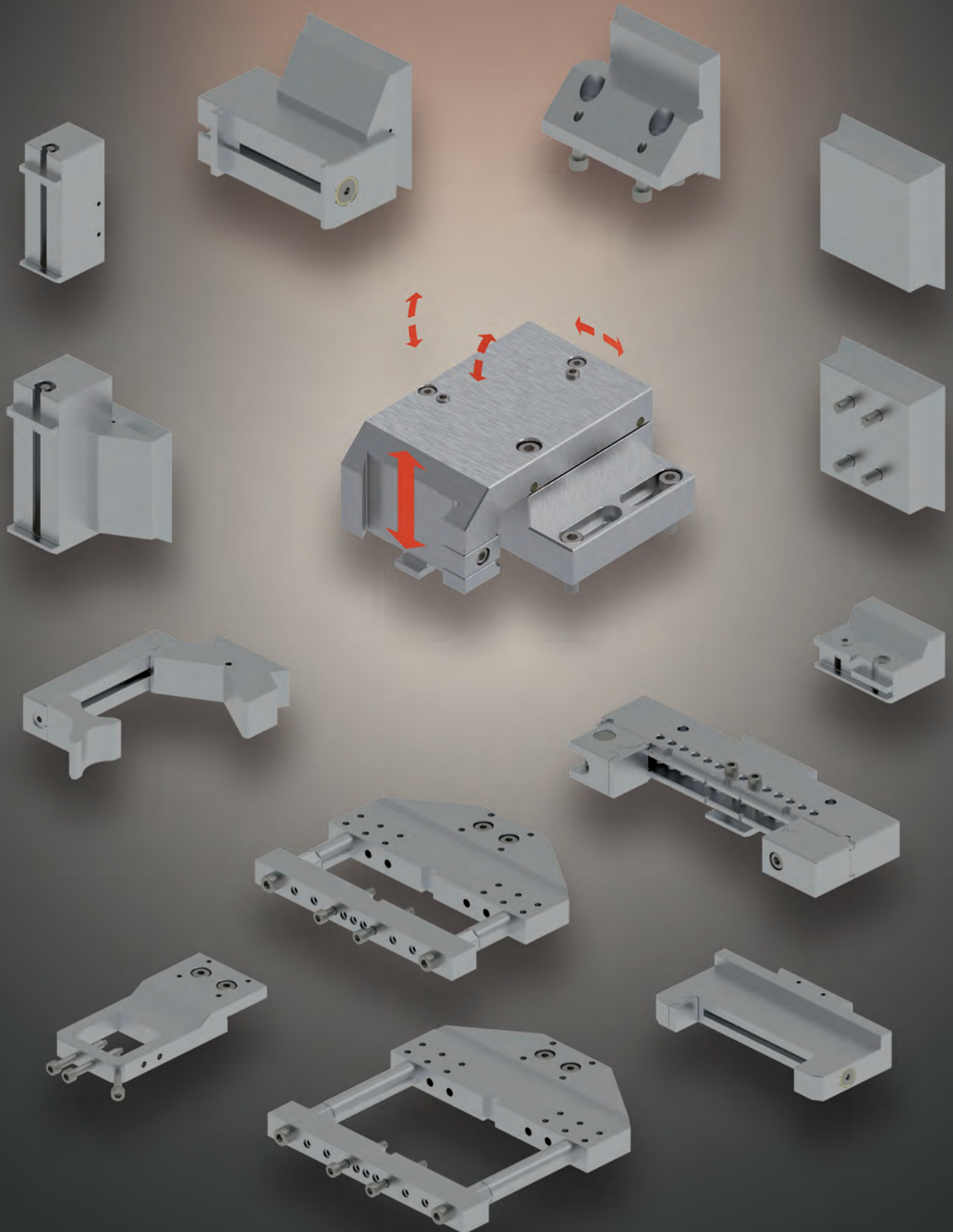
Smart-Grip EASY
with prism 10 – 100 mm



Smart-Grip EASY
with electrode clamping system EROWA ITS 50

Smart-Grip EASY

Components



Smart-Grip EASY

Smart-Grip EASY adjustment unit manual

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	Base for all clamping elements and adapters with dovetail
Function 1	Adjustment in the plane and torsion
Function 2	Adjustment of the clamping devices in the Z-axis (dovetail guide)
Max. workpiece weight	15 kg

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9105616000	155	172	71



Smart-Grip EASY Set 1

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application 1	Horizontal clamping in vice 0 – 120 mm
Application 2	All other clamping elements with dovetail can be used
Function 1	Adjustment in the plane and torsion
Function 2	Adjustment of the clamping devices in the Z-axis (dovetail guide)
Note	Consisting of Smart-Grip EASY pendulum head and vice 0 – 120
Max. workpiece weight	with Smart-Vice 0 – 120 mm 5 kg Note: When using other clamping elements, their maximum workpiece weights must be observed

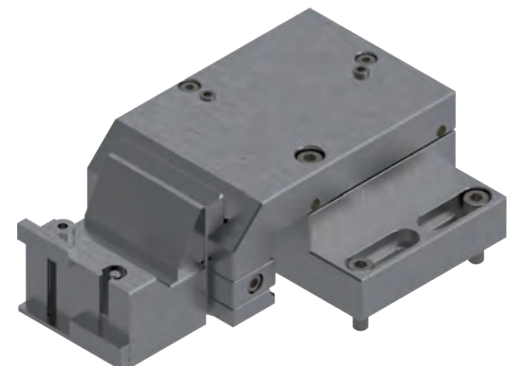
Item no.	Length L in mm	Width B in mm	Height H in mm
ST9105301200	230	172	71



Smart-Grip EASY Set 2

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application 1	Vertical clamping in vice 0 – 40 mm
Application 2	All other clamping elements with dovetail can be used
Function 1	Adjustment in the plane and torsion
Function 2	Adjustment of the clamping devices in the Z-axis (dovetail guide)
Note	Consisting of Smart-Grip EASY pendulum head and vice 0 – 40
Max. workpiece weight	with vice 0 – 40 mm 8 kg Note: When using other clamping elements, their maximum workpiece weights must be observed

Item no.	Length L in mm	Width B in mm	Height H in mm
ST9105400900	218	172	71



Clamping elements

Smart-Grip Flange

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Vertical clamping of workpieces
Note	with variable support lips and clamping claws
Max. workpiece weight	Up to 25 kg with 4 screws M8

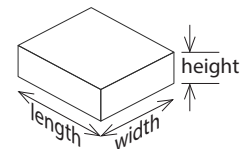
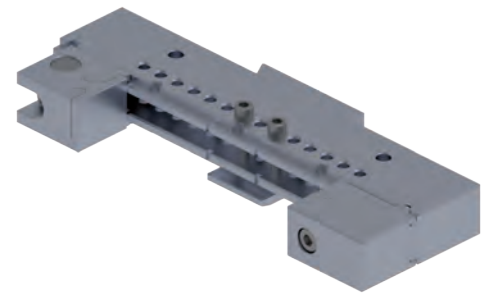
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9410302700	270	60	30



Smart-Grip SMART-Vice 0 – 175

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Horizontal clamping
Function 1	Pull-down effect on jaw fixed and movable
Function 2	Clamping jaws fixed, fixed double-sided, movable and prism jaw usable
Note	with variable support lips and clamping claws
Max. workpiece weight	10 kg for 120 mm (width B, see sketch)

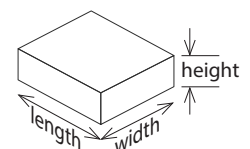
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9430301750	260	96	30,1	0 – 175



Smart-Grip SMART-Vice 0 – 120

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Horizontal clamping
Function	Pull-down effect on clamping and fixed jaws
Max. workpiece weight	5 kg for 80 mm (width B, see sketch)

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9430301200	170	83,3	30,5	0 – 120

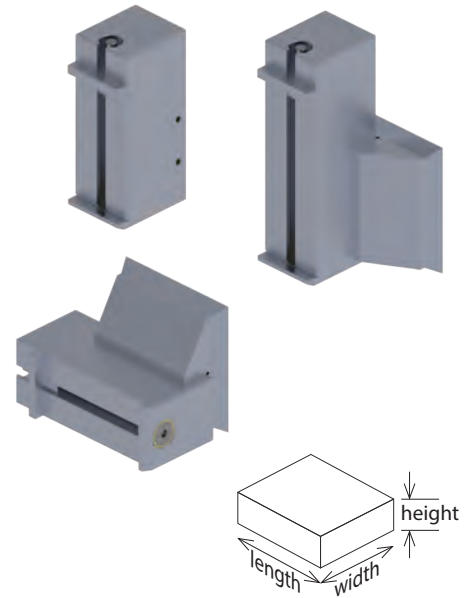


Clamping elements

Smart-Grip vices 0 – 60 / 0 – 90 / 0 – 120

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of workpieces
Note	The adapter flange „Flange 90°“ is additionally required (s.P. 17 top)
Max. workpiece weight	8 kg for 120 mm (width B, see sketch)
Scope of delivery without adapter PT9167502800	

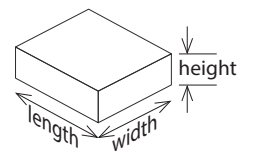
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9440400600	36	50	72	0 – 60
PT9440400900	36	50	102	0 – 90
PT9440401200	36	50	132	0 – 120



Smart-Grip vices 0 – 20 / 0 – 40

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of workpieces
Note	The adapter flange „Flange 90°“ is additionally required (s.P. 17 top)
Max. workpiece weight	3,5 kg for 120 mm (width B, see sketch)

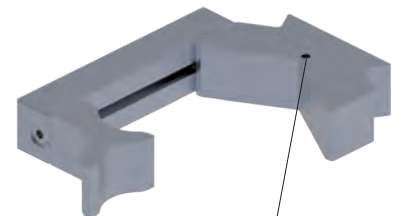
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9440700200	60	72	37,5	0 – 20
PT9440700400	60	72	46	0 – 40



Smart-Grip Prism 10 – 100

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of round workpieces
Note	Reversible clamping jaw
Max. workpiece weight	8 kg for 130 mm height

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9450271000	185,5	124	30	10 – 100



Reference hole for workpiece centre point

$$\text{Formula: } x = (R \times 1,1547) + 5$$

Clamping elements

Smart-Grip PRISM „ICS”

Material	Stainless steel, corrosion-resistant and hardened
Use	for pallet fix „ICS” und adapter 3R „ICS”
Application	Clamping of small workpieces up to 45 x 45 mm bzw. Ø 45 mm
Max. workpiece weight	1,5 kg

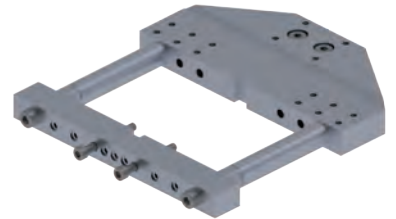
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
XT9450150450	152	69	15 / 22	45 x 45



Smart-Grip Flange „ICS”

Material	Stainless steel, corrosion-resistant and hardened
Use	for pallet fix „ICS” und adapter 3R „ICS”
Application	Clamping of bigger workpieces
Max. workpiece weight	Max. 20 kg with 4 screws M6

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
XT9410262000	>145	200	19 / 24	variabel



Smart-Grip support lip

Material	Stainless steel, corrosion-resistant and hardened
Application	Clamping jaw for vices 0 – 20, 0 – 40, 0 – 60, 0 – 90, 0 – 120

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9040130370	37	19,7	13



Adapter

Smart-Grip Adapter „Flange 90°“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Assembly of the vices 0 – 20, 0 – 40, 0 – 60, 0 – 90, 0 - 120
Function	Indexable 90°

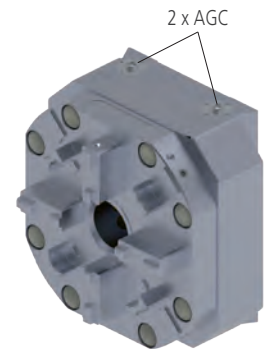
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9167502800	28	75	75



Smart-Grip Adapter POLY GRIP

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Clamping of electrode holders of the systems EROWA ITS und 3R Macro
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
XT9257505000	62,2	98	98



AGC = Air gun connection for loosening and retensioning

Adapter

Smart-Grip Adapter Universal

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of self-made fixtures and clamping elements
Function	Indexable 90°

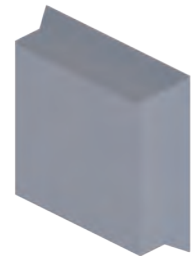
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9217652210	22	75	75



Smart-Grip Adapter without drilling pattern

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of self-made fixtures and clamping elements
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9217652200	22	75	75



Smart-Grip Adapter System 3R

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements System 3R „Super Vice“
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
XT9217505000	50	75	75

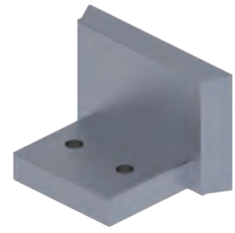


Adapter

Smart-Grip Adapter System 3R „ICS“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements System 3R „ICS“ only for Typ B und C

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9207505200	52	75	48



Smart-Grip Adapter EROWA „ITS“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements with EROWA centring plate „ITS 50“
Function	Indexable 90°
Note	The centring plate and the support feet of the EROWA ITS clamping elements must be dismantled

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9227502210	22	75	75



Smart-Grip Adapter EROWA Quick Chuck

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of a chuck EROWA Quick Chuck 50
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9227502200	22	75	75



Adapter

Smart-Grip Adapter HIRSCHMANN

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of HIRSCHMANN clamping elements
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9237503000	30	80	75



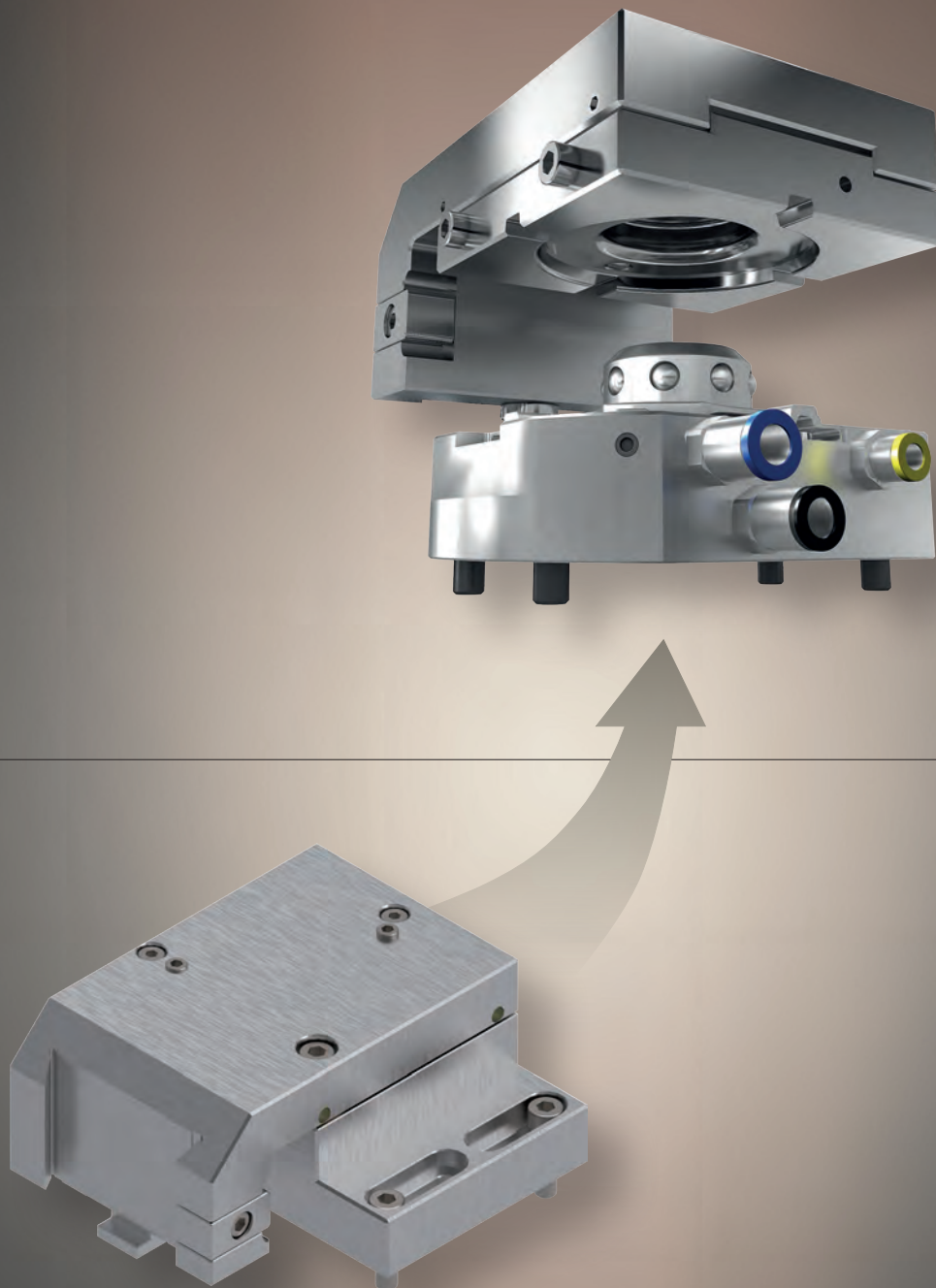
Smart-Grip Adapter HIRSCHMANN 4000

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of HIRSCHMANN clamping elements System 4000
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
XT9237505000	50	80	75



The next step: Upgrade to Smart-Grip AIR – the zero-point clamping system.



Simple upgrade towards full automation.

Smart-Grip **EASY** can easily be upgraded to Smart-Grip **AIR**, our pneumatic zero-point clamping system. To do this, the guide bracket of Smart-Grip **EASY** is dismantled from the basic holder and fitted with a Smart-Grip centring and clamping pallet (PT9100010220, see p. 38). This creates a Smart-Grip **AIR** pallet holder. The set-up and alignment of the workpieces and clamping devices can now be carried out externally and in parallel to production time.

Very important: The existing clamping devices can still be used.

Smart-Grip AIR.



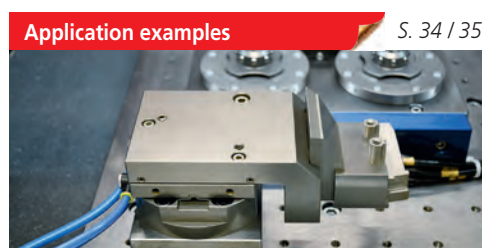
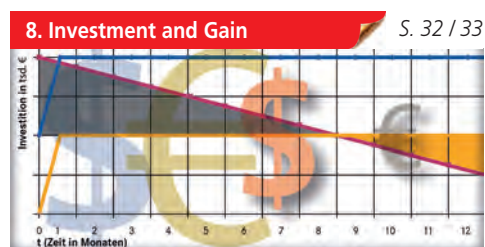
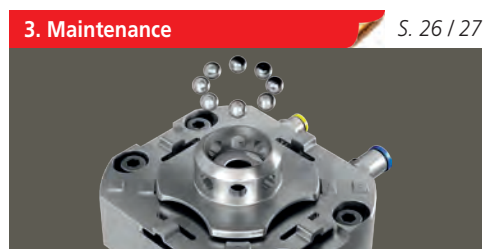
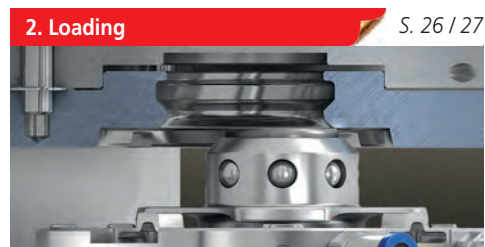
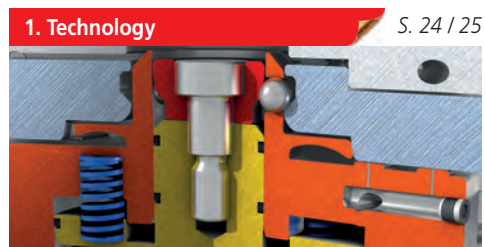
Smart-Grip AIR.

Workflow with zero point „to-go“.

Smart-Grip AIR – the big plus for the skill of your production

- Clamping and alignment take place outside the machine in parallel to machining time
- The offset data can be recorded with a measuring machine
- Workpieces and fixtures can be clamped and aligned on a set-up station in parallel with machining time
- Now flexible machining of the prepared workpieces depending on deadline/priority is possible
- After machining, QA measurement and, if required, subsequent reworking is possible without reclamping, aligning and presetting the workpieces
- With a presetting station collision-free clamping is possible

The Smart-Grip AIR advantages at a glance.

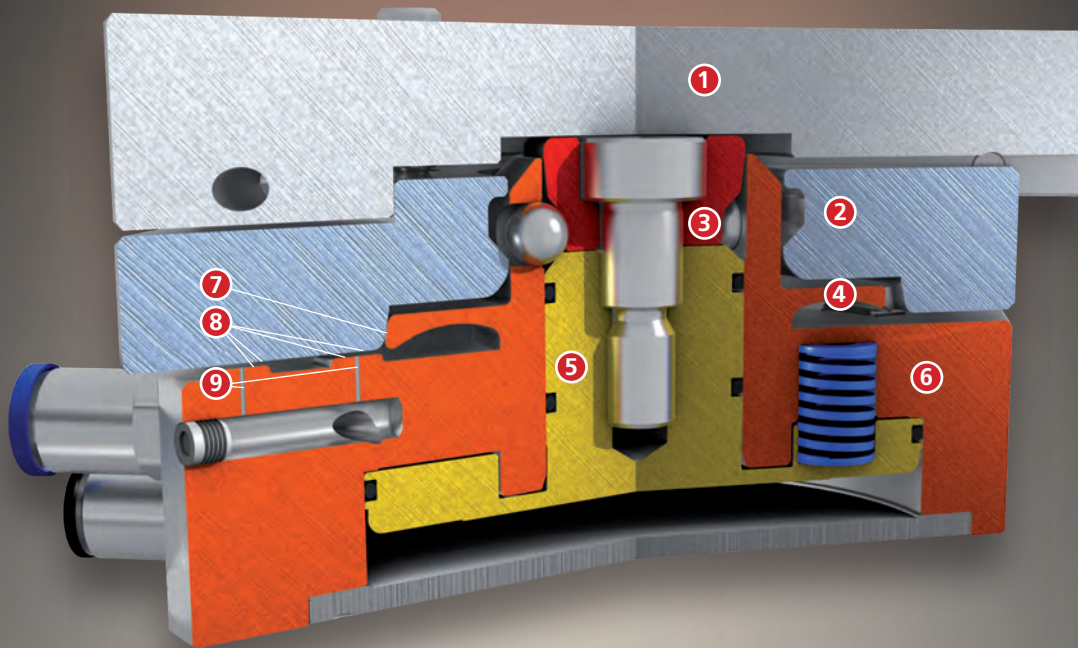


SMARTGRIP



*Plus points for
top quality*

1. Technology

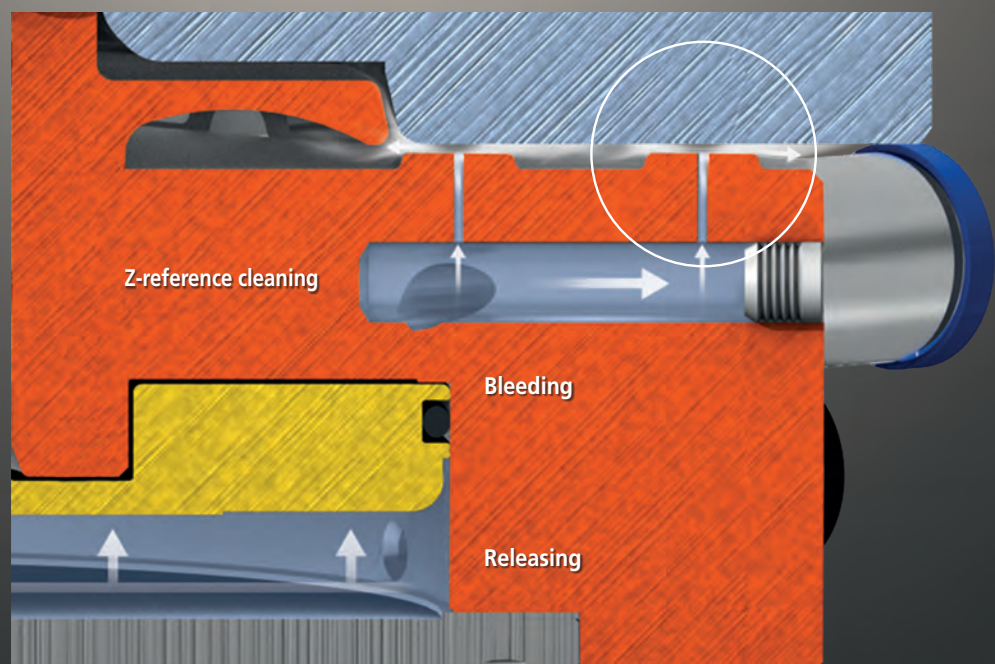


High quality through and through.

All Smart-Grip reference surfaces are hardened. The pallet carrier all chucks and adapters are rust-proof. All components are virtually non-wearing.

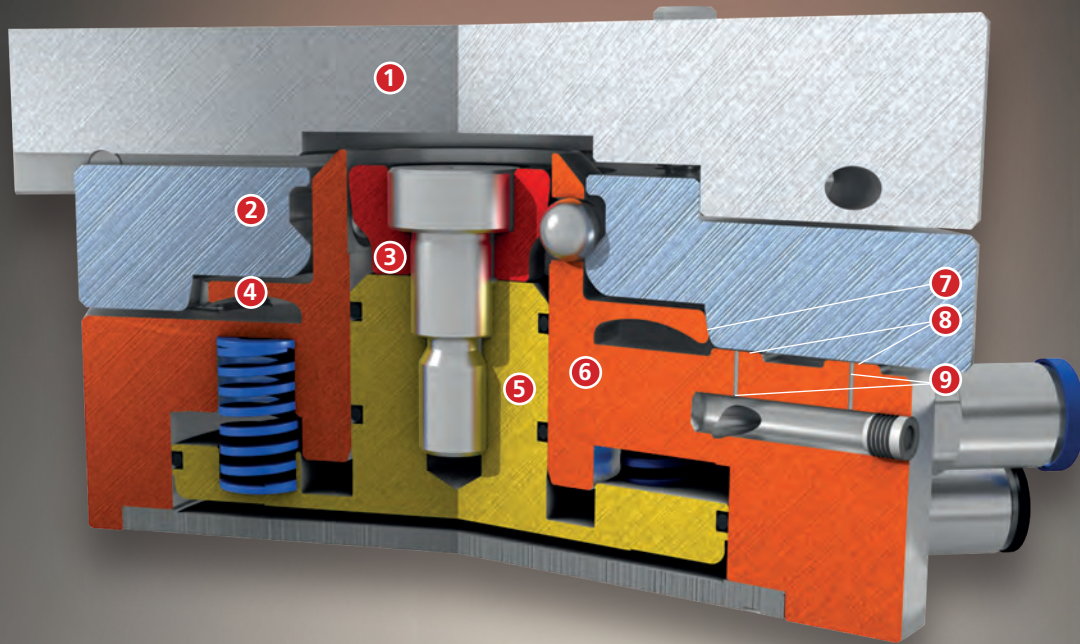
Unlocked Smart-Grip

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.

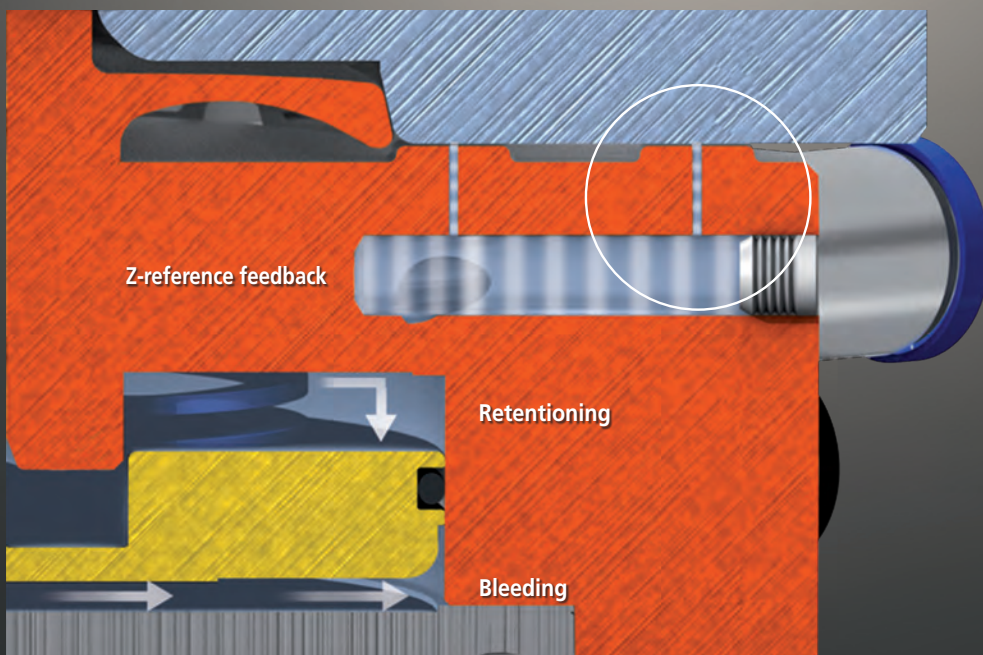
One-of-a-kind worldwide



- ① Adjustment pallet 3D with dovetail
- ② Centering clamping sleeve
- ③ Clamping cone
- ④ Centering spring lug
- ⑤ Piston
- ⑥ Pallet carrier
- ⑦ Play-free centring for more stiffness. The actual positioning is done via the index centring cams (not visible in the picture)
- ⑧ Z-reference surface
- ⑨ Nozzles for Z-reference cleaning

Granting process safety whilst clamping with power and precision.

Smart-Grip offers maximum process safety by means of attendance checks via the Z-references. It works in a material-friendly way und clamps with 15.000 N.



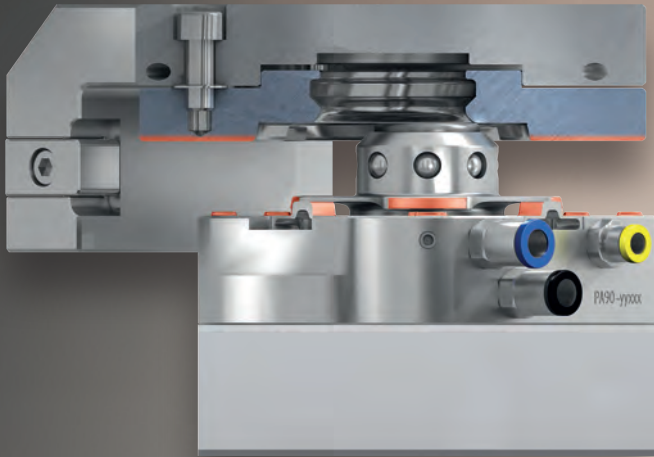
Locked Smart-Grip

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

2. Loading

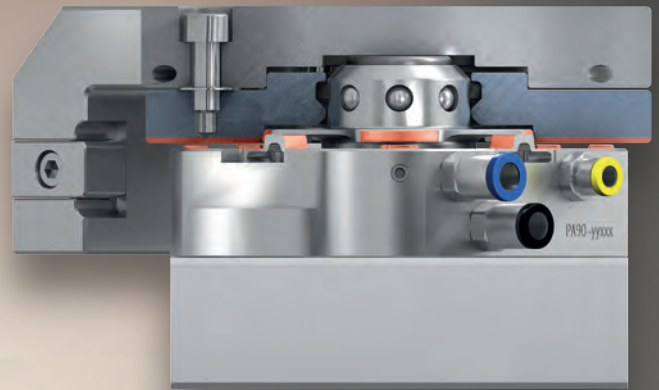
Near miss?

The pallet finds it's place!



Success!

The pallet engages!



3. Maintenance



The clamping system with interated self-protection mechanism.

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

With Smart-Grip AIR 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 0.5 mm. Thus Z-reference surfaces only come into contact with one another during the clamping process.

Wir vergleichen		Pre-centering and loading
Classic clamping systems	Smart-Grip-AIR	
<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 0.5 mm	

Maintenance without zero-point loss.

SMARTGRIP



*Safety from
the very beginning*

Maintenance with minimum effort.

In contrast to other palletizing systems, all important wear parts of the Smart-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 Smart-Grip, there is no risk of idle time due to dirt or abrasive wear.

The external clamping mechanism is freely accessible and can easily be cleaned by yourself at any time.

Benefit from:

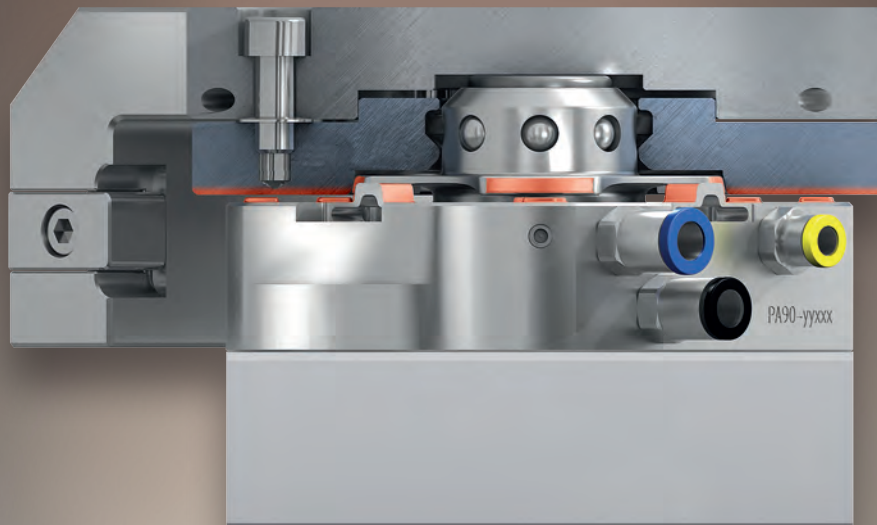
- Low time and costs for cleaning
- Maintenance „without zero-point loss“
- Highest process reliability
- Maintenance within very short time
- Maintenance „inhouse“ by your own machine user without expensive service technician



4. Accuracy



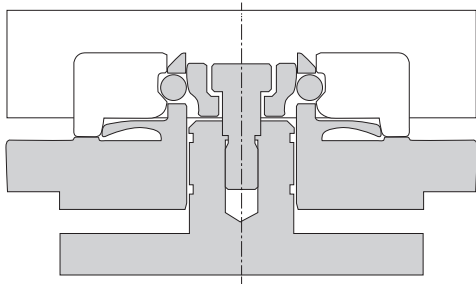
5. Z-References



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

Accurately repeatable.

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



System accuracy.

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

Your technical advantages:

- Cone-shaped, spring-loaded alignment with planar support (HSK principle, hollow pole cone)
- Four axial centering spring lugs guarantee tolerance-free centering
- Index cams (not visible in the picture) for exact positioning

SMARTGRIP



Focus on precision

Permanently process-safe production.

Permanent cleaning of Z-references.

Smart-Grip AIR 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 **Smart-Grip AIR** reference surfaces, both in the palletizing system and the pallets, make this system virtually non-wearing and readily automatable.

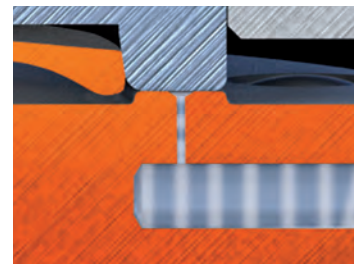
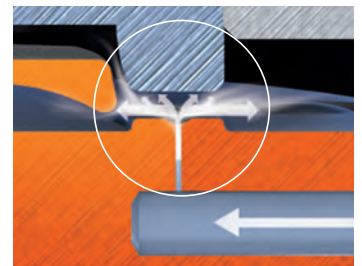
Process-reliable use in automation.

Look forward to a long lifespan and consistent precision of the system.

Your technical advantages:

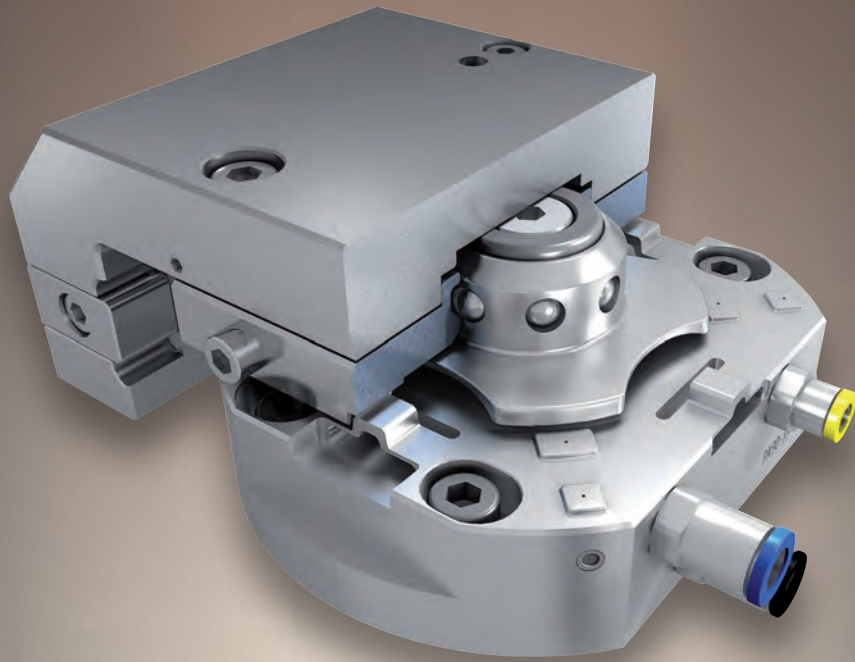
- Automatic Z-reference cleaning
- System control for automation possible at any time
- Overpressure against the penetration of erosion particles or dielectric fluid
- Consistently high process reliability

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

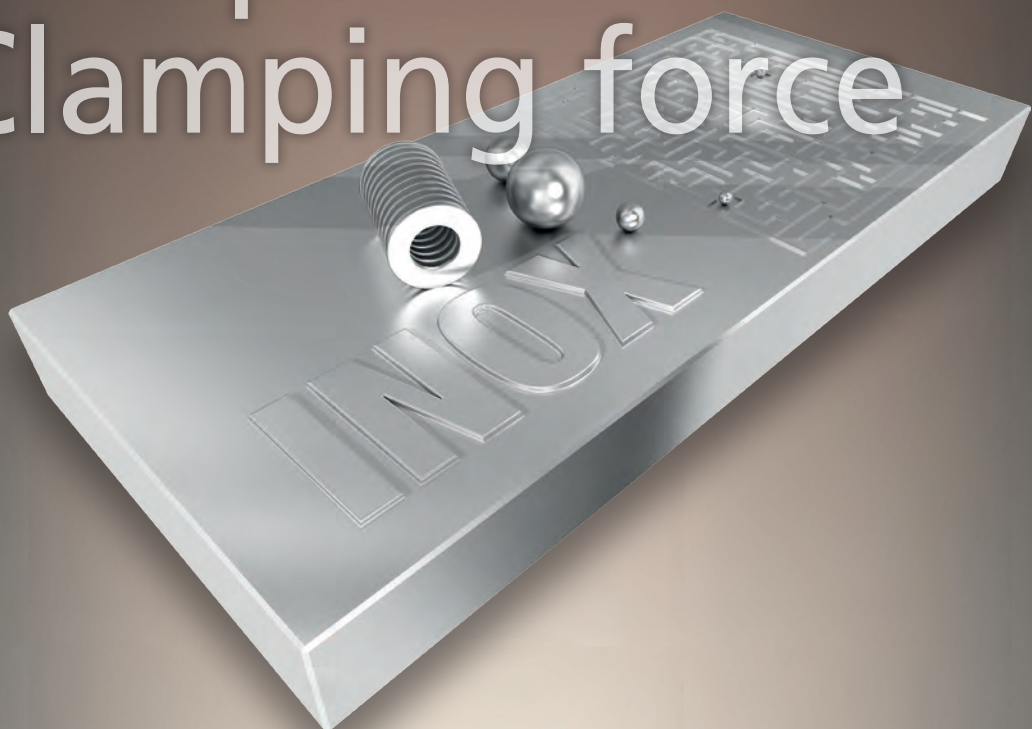


In a locked state the airflow is interrupted – the signal for the system that „the pallet is clamped”. The production can begin.

6. Process safety



7. Material Lifespan Clamping force



Automation as standard und included.

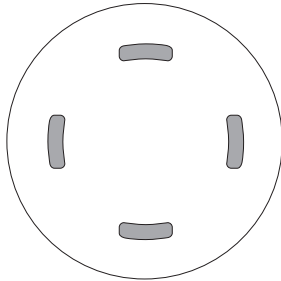
Process safety during automation.

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, Smart-Grip can be automated at any time.

Smart-Grip AIR pallet carriers always offer the possibility of system control via the Z-references.

Profit from:

- the possibility of automation
- at any time
- without additional costs
- with existing Smart-Grip pallet



SMARTGRIP



*Safety from
the very beginning*

You can rely on Smart-Grip AIR.

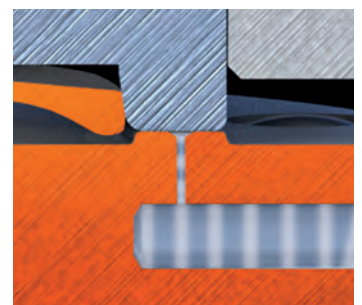
Self-locking chucking.

Smart-Grip AIR is made of high quality materials. The pallet carriers chuck self-locking with a clamping force of 15.000 N. Even under high pressure, e.g. under high machining forces or during a machine crash, pallets cannot be ripped from the palletizing system.

The **Smart-Grip AIR** pallet carriers as well as the pallets, clamping devices and adapters are corrosion-resistant.

Result:

- higher accuracy
- higher lifespan



In a locked state the airflow is interrupted – the signal for the system that „the pallet is clamped”. The production can begin.

Designation	Loosening	Clamping force
Smart-Grip AIR pallet carrier	6 bar	15.000 N

8. Investment and gain



Smart-Grip AIR.

Sow and harvest.

SMARTGRIP



*An investment
that pays off.*

	Example A	Example B	Example C
	without Smart-Grip AIR zero-palletizing system	with Smart-Grip AIR zero-palletizing system	with Smart-Grip AIR zero-palletizing system and automation
Total runtime (palletized >35% potential extra operating time) Spindle running hours of your wire eroding machine per year	1.500	2.000	4.000
Acquisition costs:			
Wire eroding machine acquisition costs of your machine tool	200.000,00 €	200.000,00 €	200.000,00 €
Smart-Grip AIR 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]	4.000,00 €	4.300,00 €	6.000,00 €
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	41.933,00 €	46.533,00 €	65.900,00 €
Fixed costs / hour Fixed costs/year divided by total runtime	27,96 €	23,27 €	16,48 €
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.	4,50 €	4,50 €	4,50 €
Energy estimated share of energy/hr.	4,00 €	4,00 €	6,00 €
Miscellaneous variable costs Estimated share of variable costs	1,00 €	1,00 €	2,00 €
Variable costs/hr. Sum of positions	36,17 €	25,75 €	18,75 €
Production costs/hr. Fixed costs/hr. + variable costs/hr.	64,13 €	49,02 €	35,23 €
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.	-4,13 €	10,98 €	24,77 €
Your profit / year difference derived from prod. costs and attainable hourly rate multiplied by total runtime	-6.195,00 €	21.960,00 €	99.080,00 €
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!	+28.155,00 €	+105.275,00 €

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!

9. Smart-Grip AIR

Application examples



Smart-Grip AIR application examples.



Smart-Grip AIR
with reference pallet



Smart-Grip AIR
presetplace



Smart-Grip AIR
with adjustment pallet 3D and
EROWA Quick Chuck 50



Smart-Grip AIR
with pallet fix and
Flange system 3R ICS



Smart-Grip AIR
with adjustment pallet 3D and
Smart vice 0 – 120 mm

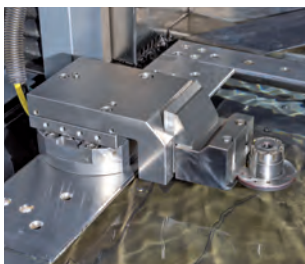


Smart-Grip AIR
with adjustment pallet 3D and
6-fold prism

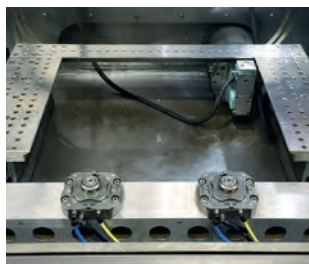
SMARTGRIP



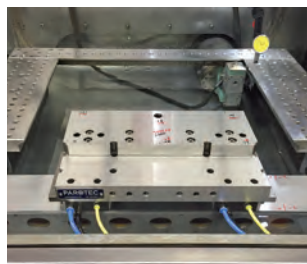
*Up to all
technical requirements*



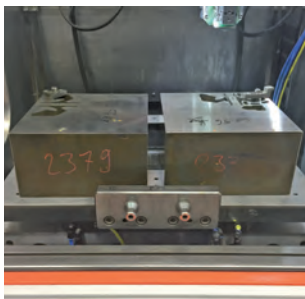
Smart-Grip AIR
with adjustment pallet 3D and
vice 0 – 40



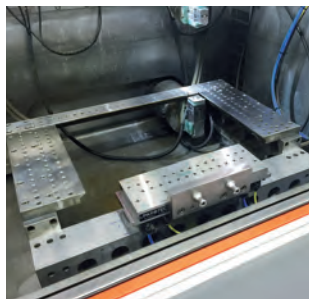
x2 Smart-Grip AIR
on GF CUT 3000 S



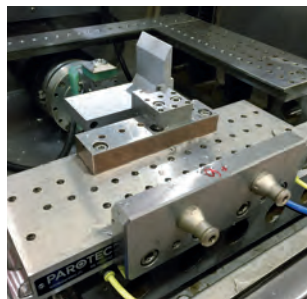
Smart-Grip AIR
reference pallet (x2) on
GF Cut 2000S



Smart-Grip AIR
double clamping frame with
approx. 130 kg weight



Smart-Grip AIR
pallet (x2)
on GF CUT 3000 S

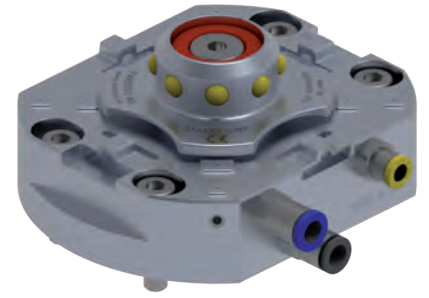


Smart-Grip AIR
pallet (x2)
on GF CUT 3000 S

Pallet carrier

Smart-Grip pallet carrier with connections straight

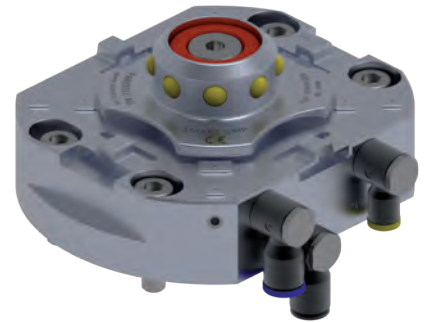
Material	Stainless steel, corrosion-resistant and hardened
Application	Clamping of adjustment pallets 3D and pallets fix + devices
Use	in wire eroding and measurement machines as well as on set-up stations
Can be automated	Yes (dynamic pressure measurement)
Repeatability	0,002 mm / 200 mm
System accuracy	0,005 mm
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
Lifting of pallet when loosening	approx. 0,5 mm
Max. workpiece weight clamp. dev. included	25 kg per unit with pallet fix



Item no.	Dimension L x B in mm	Height H in mm	Clamping force with retensioning	Release pressure
PT9013210200	130 x 101,8	32	15 kN	6 bar

Smart-Grip pallet carrier with connections angled

Material	Stainless steel, corrosion-resistant and hardened
Application	Clamping of adjustment pallets 3D and pallets fix
Use	in wire eroding and measurement machines as well as on set-up stations
Can be automated	Yes (dynamic pressure measurement)
Repeatability	0,002 mm / 200 mm
System accuracy	0,005 mm
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
Lifting of pallet when loosening	approx. 0,5 mm
Max. workpiece weight clamp. dev. included	25 kg per unit with pallet fix



Item no.	Dimension L x B in mm	Height H in mm	Clamping force with retensioning	Release pressure
PT9013210210	130 x 101,8	32	15 kN	6 bar

Smart-Grip pallet carrier with connections straight, temperatue-resistant up to 150°C

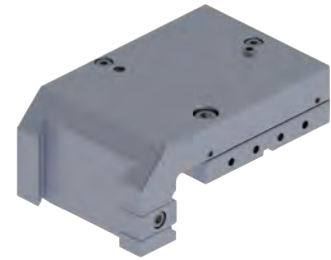
Material	Stainless steel, corrosion-resistant and hardened
Application	Clamping of adjustment pallets 3D and pallets fix
Use	in wire eroding and measurement machines as well as on set-up stations
Can be automated	Yes (dynamic pressure measurement)
Repeatability	0,002 mm / 200 mm
System accuracy	0,005 mm
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
Lifting of pallet when loosening	approx. 0,5 mm
Max. workpiece weight clamp. dev. included	25 kg per unit with pallet fix



Item no.	Dimension L x B in mm	Height H in mm	Clamping force with retensioning	Release pressure
PT9013210230	130 x 101,8	32	15 kN	6 bar

Smart-Grip adjustment pallets 3D

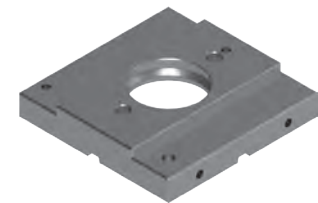
Material	Stainless steel, corrosion-resistant and hardened
Use	on Smart-Grip pallet carriers
Application	Base for all clamping elements and adapters with dovetail
Can be automatized	Yes, prepared for different grippers
Function 1	Adjustment in flatness and torsion
Function 2	Adjustment of clamping elements in the Z-axis (dovetail guide)
Max. workpiece weight	15 kg



Item no.	Length L in mm	Width B in mm	Height H in mm
XT9137015590	180	102	65,5

Smart-Grip centring and clamping pallet WEDM

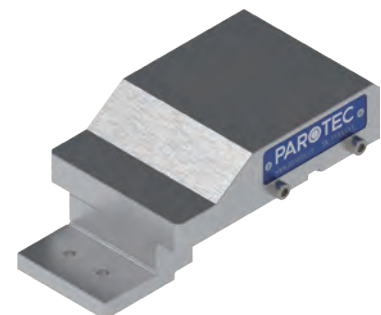
Material	Stainless steel, corrosion-resistant and hardened
Use	on Smart-Grip pallet carriers
Application	in adjustment pallets for self-made devices
Can be automatized	Yes, prepared for different grippers



Item no.	Length L in mm	Width B in mm	Height H in mm
PT9100010220	102	102	20

Smart-Grip pallet FIX „ICS“

Material	Stainless steel, corrosion-resistant and hardened
Use	on Smart-Grip pallet carriers
Application	Base for all clamping elements System 3R „ICS“ and self-made devices
Can be automatized	Yes, prepared for different grippers
Function	not adjustable
Max. workpiece weight	25 kg



Item no.	Length L in mm	Width B in mm	Height H in mm
XT9123215800	200	102	71,7

Pallets / accessoires

Smart-Grip pallet FIX for EROWA frame

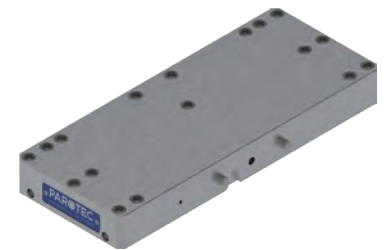
Material	Stainless steel, corrosion-resistant and hardened
Use	on Smart-Grip pallet carriers
Application	for mounting on clamping frames and devices
Can be automated	Yes, prepared for differnt grippers
Max. workpiece weight	25 kg



Item no.	Length L in mm	Width B in mm	Height H in mm
XT9122215000	149	102	50

Smart-Grip pallet x2 (customized and project-specific execution)

Material	Stainless steel, corrosion-resistant and hardened
Use	on 2 Smart-Grip pallet carriers
Application	Clamping of workpieces
Can be automated	Yes, prepared for differnt grippers
Max. workpiece weight	60 kg



Item no.	Length L in mm	Width B in mm	Height H in mm
variable	customized		

Smart-Grip attachment

Material	Stainless steel, corrosion-resistant and hardened
Use	together with Smart-Grip pallets
Application	Automized pallet handling with RCS-gripper
Note	chucking bolts not included



Item no.	Length L in mm	Width B in mm	Height H in mm
XT9180010040	100	25	24,6

Clamping elements

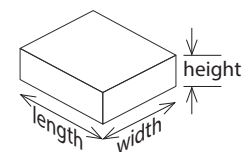
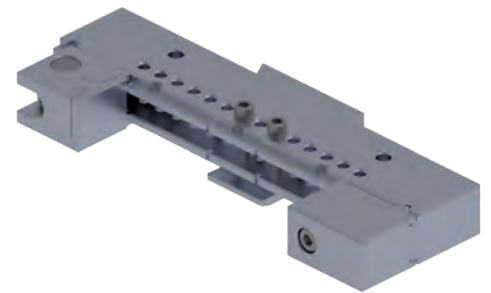
Smart-Grip Flange	
Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Vertical clamping of workpieces
Note	with variable support lips and clamping claws
Max. workpiece weight	Up to 25 kg with 4 screws M8

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9410302700	270	60	30



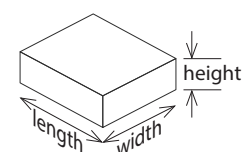
Smart-Grip SMART-Vice 0 – 175	
Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Horizontal clamping
Function 1	Pull-down effect on jaw fixed and movable
Function 2	Clamping jaws fixed, fixed double-sided, movable and prism jaw usable
Note	with variable support lips and clamping claws
Max. workpiece weight	10 kg for 120 mm (width B, see sketch)

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9430301750	260	96	30,1	0 – 175



Smart-Grip SMART-Vice 0 – 120	
Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Horizontal clamping
Function	Pull-down effect on clamping and fixed jaws
Max. workpiece weight	5 kg for 80 mm (width B, see sketch)

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9430301200	170	83,3	30,5	0 – 120

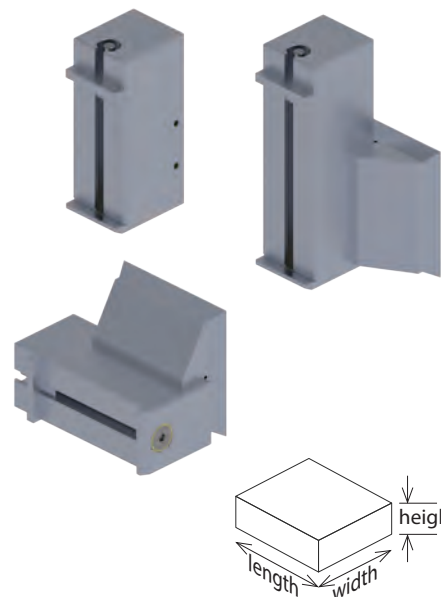


Clamping elements

Smart-Grip vices 0 – 60 / 0 – 90 / 0 – 120

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of workpieces
Note	The adapter flange „Flange 90°“ is additionally required (s.P. 17 top)
Max. workpiece weight	8 kg for 120 mm (width B, see sketch)
Scope of delivery without adapter PT9167502800	

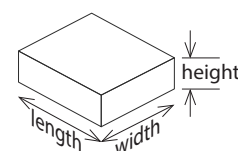
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9440400600	36	50	72	0 – 60
PT9440400900	36	50	102	0 – 90
PT9440401200	36	50	132	0 – 120



Smart-Grip vices 0 – 20 / 0 – 40

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of workpieces
Note	The adapter flange „Flange 90°“ is additionally required (s.P. 17 top)
Max. workpiece weight	3,5 kg for 120 mm (width B, see sketch)

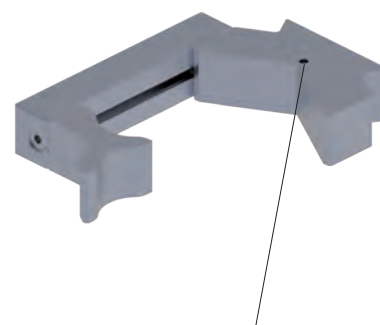
Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9440700200	60	72	37,5	0 – 20
PT9440700400	60	72	46	0 – 40



Smart-Grip Prism 10 – 100

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjusting pallets 3D and Smart-Grip EASY
Application	Clamping of round workpieces
Note	Reversible clamping jaw
Max. workpiece weight	8 kg for 130 mm height

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
PT9450271000	185,5	124	30	10 – 100



Reference hole for workpiece centre point

$$\text{Formula: } x = (R \times 1,1547) + 5$$

Clamping elements

Smart-Grip PRISM „ICS”

Material	Stainless steel, corrosion-resistant and hardened
Use	for pallet fix „ICS” und adapter 3R „ICS”
Application	Clamping of small workpieces up to 45 x 45 mm bzw. Ø 45 mm
Max. workpiece weight	1,5 kg

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
XT9450150450	152	69	15 / 22	45 x 45



Smart-Grip Flange „ICS”

Material	Stainless steel, corrosion-resistant and hardened
Use	for pallet fix „ICS” und adapter 3R „ICS”
Application	Clamping of bigger workpieces
Max. workpiece weight	Max. 20 kg with 4 screws M6

Item no.	Length L in mm	Width B in mm	Height H in mm	Clamping range
XT9410262000	>145	200	19 / 24	variabel



Smart-Grip support lip

Material	Stainless steel, corrosion-resistant and hardened
Application	Clamping jaw for vices 0 – 20, 0 – 40, 0 – 60, 0 – 90, 0 – 120

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9040130370	37	19,7	13



Adapter

Smart-Grip Adapter „Flange 90°“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Assembly of the vices 0 – 20, 0 – 40, 0 – 60, 0 – 90, 0 - 120
Function	Indexable 90°

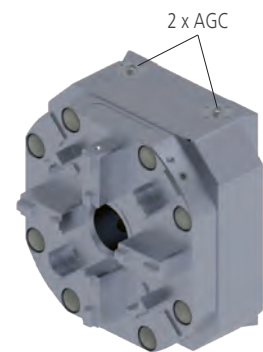
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9167502800	28	75	75



Smart-Grip Adapter POLY GRIP

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Clamping of electrode holders of the systems EROWA ITS und 3R Macro
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
XT9257505000	62,2	98	98



AGC = Air gun connection for loosening and retensioning

Smart-Grip Adapter Universal

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of self-made fixtures and clamping elements
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9217652210	22	75	75

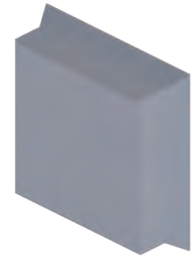


Adapter

Smart-Grip Adapter without drilling pattern

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of self-made fixtures and clamping elements
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9217652200	22	75	75



Smart-Grip Adapter System 3R

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements System 3R „Super Vice“
Function	Indexable 90°

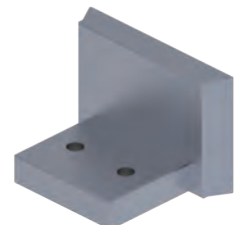
Item no.	Length L in mm	Width B in mm	Height H in mm
XT9217505000	50	75	75



Smart-Grip Adapter System 3R „ICS“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements System 3R „ICS“ only for Typ B und C

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9207505200	52	75	48



Adapter

Smart-Grip Adapter EROWA „ITS“

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of clamping elements with EROWA centring plate „ITS 50“
Function	Indexable 90°
Note	The centring plate and the support feet of the EROWA ITS clamping elements must be dismantled

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9227502210	22	75	75



Smart-Grip Adapter EROWA Quick Chuck

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of a chuck EROWA Quick Chuck 50
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9227502200	22	75	75



Smart-Grip Adapter HIRSCHMANN

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of HIRSCHMANN clamping elements
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9237503000	30	80	75



Smart-Grip Adapter HIRSCHMANN 4000

Material	Stainless steel, corrosion-resistant and hardened
Use	in adjustment pallets 3D and Smart-Grip EASY
Application	Mounting of HIRSCHMANN clamping elements System 4000
Function	Indexable 90°

Item no.	Length L in mm	Width B in mm	Height H in mm
XT9237505000	50	80	75

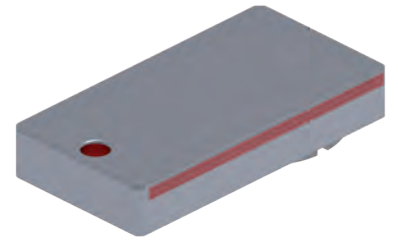


Reference pallets and protective cover

Smart-Grip reference pallet 1-fold

Material	Stainless steel, corrosion-resistant and hardened
Use	on Smart-Grip pallet carriers
Application	for aligning the pallet carriers as well as for zero-point recording

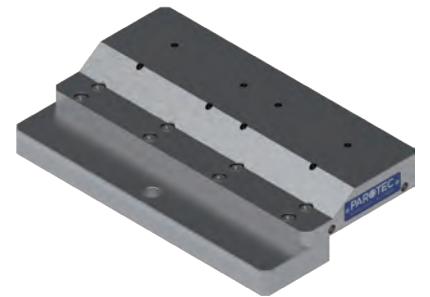
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9503219800	198	104	36



Smart-Grip reference pallet 2-fold (customized and project-specific execution)

Material	Stainless steel, corrosion-resistant and hardened
Use	on 2 Smart-Grip pallet carriers
Application	for aligning the pallet carriers as well as for zero-point recording

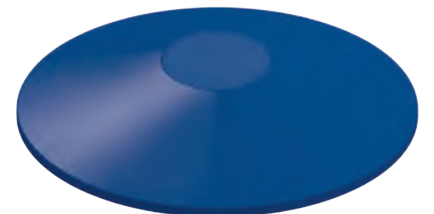
Item no.	Length L in mm	Width B in mm	Height H in mm
variable	customized		



Smart-Grip protective cover

Material	Aluminium anodised
Application	for covering of unused Smart-Grip AIR pallet carriers

Item no.	Diameter in mm	Height H in mm
PT0170000005	158	28



Accessoires

Smart-Grip electric control unit without overpressure with 3 connections for 1 pallet carrier

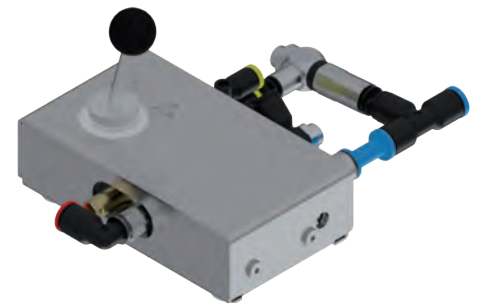
Use	for set-up areas
Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp Z: Z-reference cleaning U: excess pressure/overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity NS: pneumatic retightening
Application	for set-up areas



Item no.	Length L in mm	Width B in mm	Height H in mm
PT 3900431010	128	123	100

Smart-Grip electric control unit with overpressure with 3 connections for 1 pallet carrier

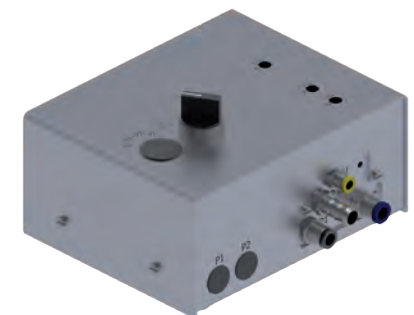
Use	for set-up areas
Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp Z: Z-reference cleaning U: excess pressure/overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: overpressure intensity NS: pneumatic retightening
Application	Die sinking, wire EDM-ing, grinding



Item no.	Length L in mm	Width B in mm	Height H in mm
PT 3900431030	128	181	100

Smart-Grip electric control unit with 3 connections for 1 pallet carrier

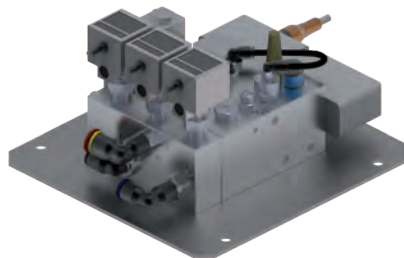
Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp Z: Z-reference cleaning/overpressure U: excess pressure/overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: overpressure intensity NS: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



Item no.	Length L in mm	Width B in mm	Height H in mm
PT 3900831000	188	173	112

Reference pallets und protective cover

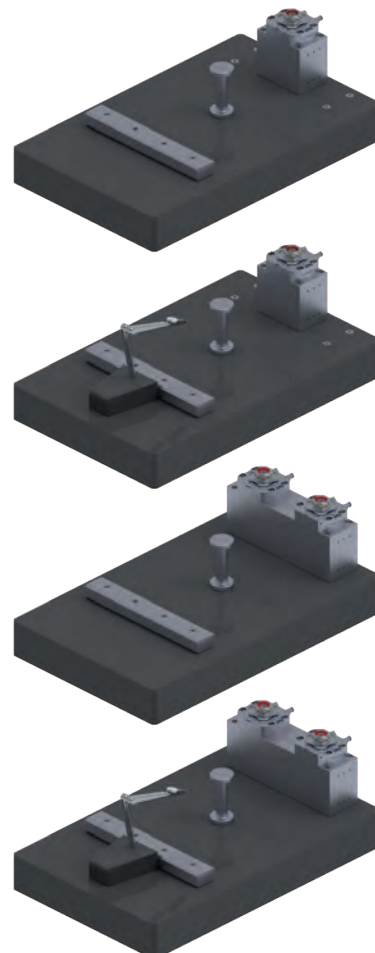
Smart-Grip electric control unit with 3 connections for 1 pallet carrier and 3 pressure sensors	
Number of air connections	3 air connections + main connection
Connections	Pin: main connection P1: unlock/clamp Z: Z-reference cleaning/overpressure U: excess pressure/overpressure/pneumatic retightening
Setting options	S: clamping speed Z: Z-reference cleaning intensity U: Overpressure intensity NS: pneumatic retightening
Monitoring possibilities	with 3 pressure sensors, see operating instructions
Application	Automation for die-sinking, wire EDM-ing, milling, grinding, etc.



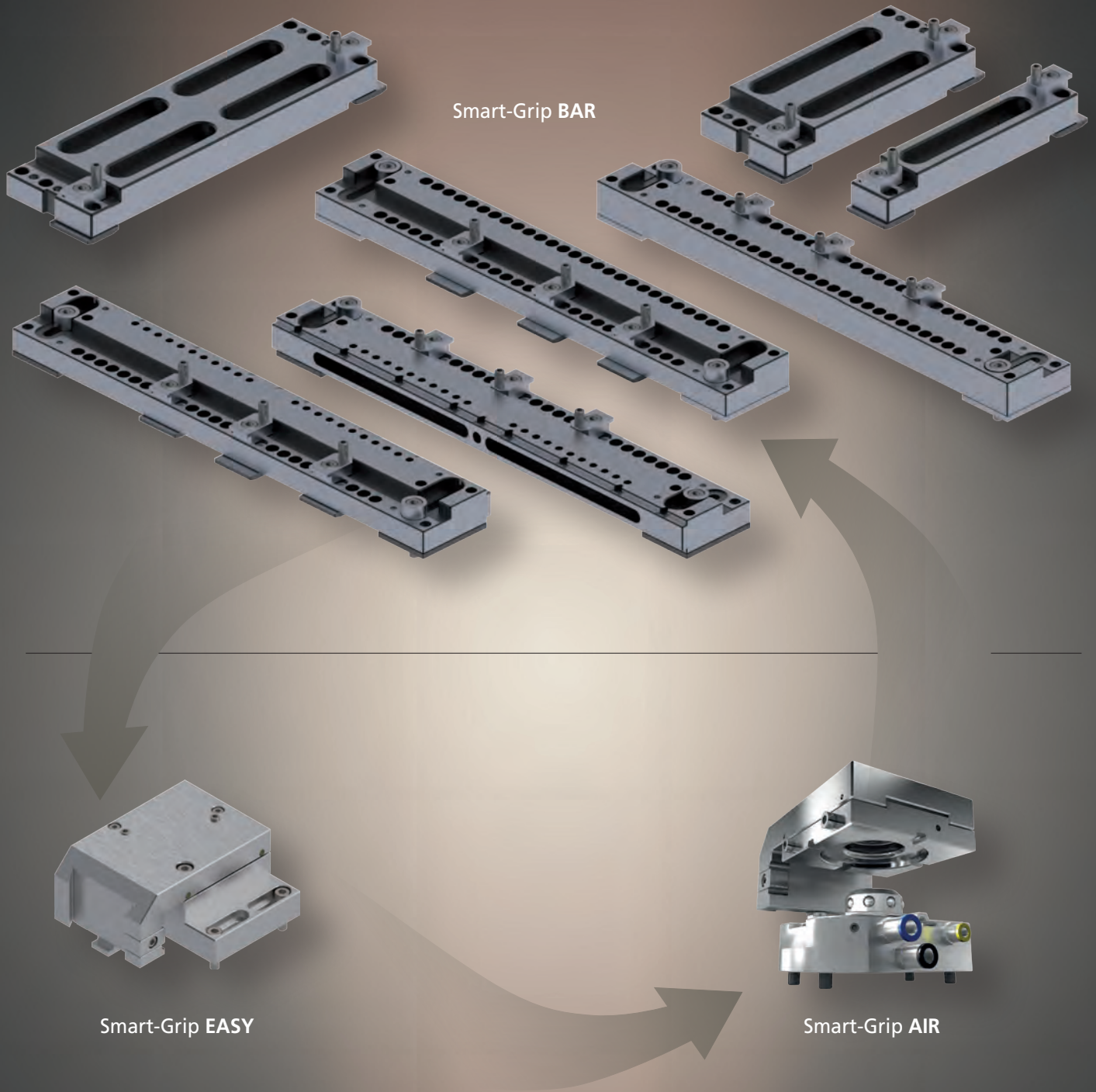
Item no.	Length L in mm	Width B in mm	Height H in mm
XT3901831505	235	190	105

Preset Place	
Material	Granite
Application	Main time-parallel adjusting outside the wire EDM machines.
Note	with pallet carrier, stop bar and support foot

Item no.		Length L in mm	Width B in mm	Height H in mm
ST9881800100	1-fold	800	500	226
ST9881800110	1-fold with dial gage	800	500	226
ST9882800100	2-fold	800	500	226
ST9882800110	2-fold with dial gage	800	500	226



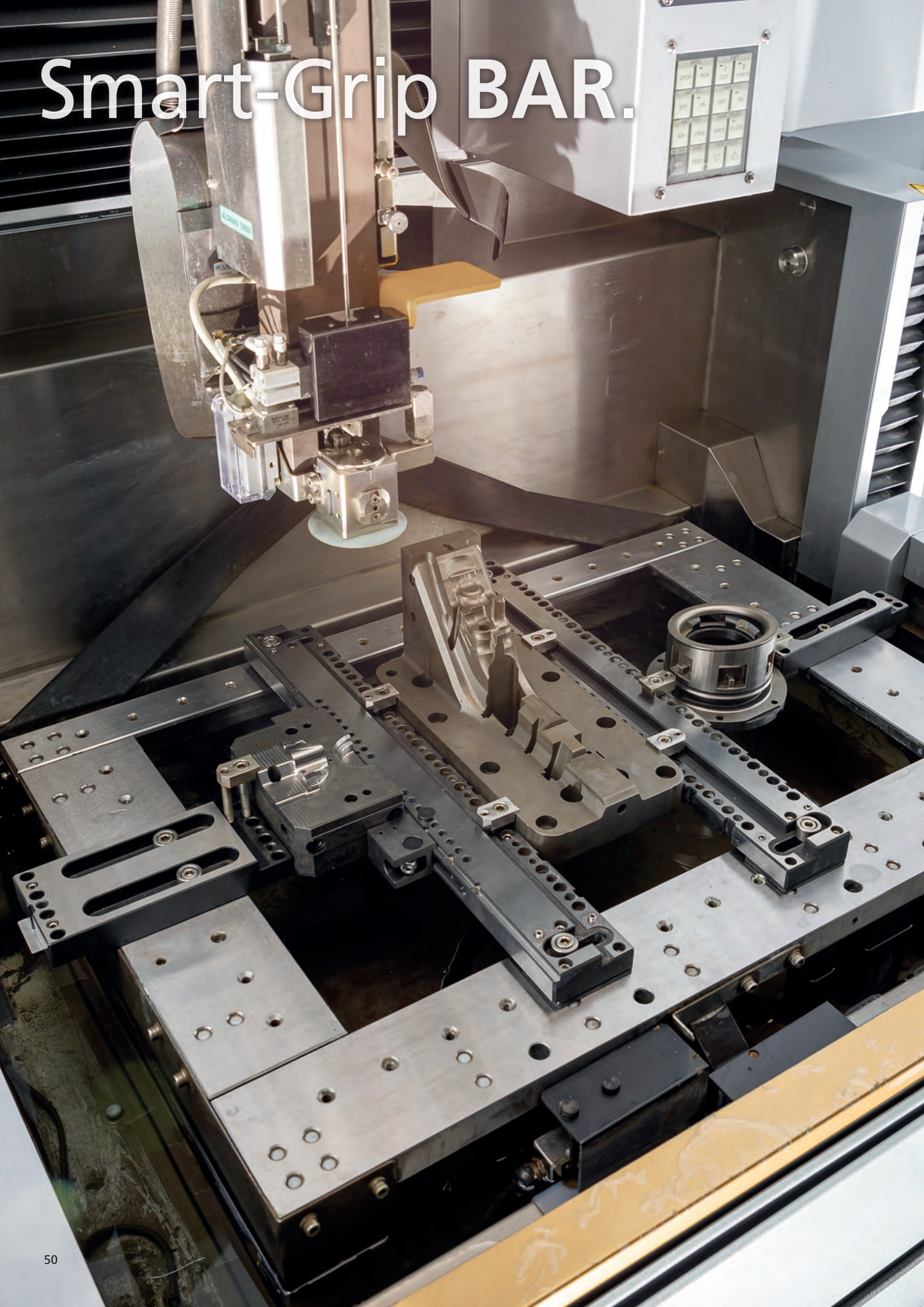
Smart-Grip BAR – The system solution for Heavyweights and multiple clamping.



Smart-Grip BAR.

Smart-Grip BAR is the system solution for the heavyweights. The travel range of the wire EDM machines can be optimally utilised. The clamping bars also make it possible to clamp several identical or different workpieces together. Thus Smart-Grip BAR increases flexibility and ultimately your productivity.

Smart-Grip BAR.



Smart-Grip BAR.

For big sizes and more.

Smart-Grip **BAR.**
clamping bars, tensioners and accessoires.

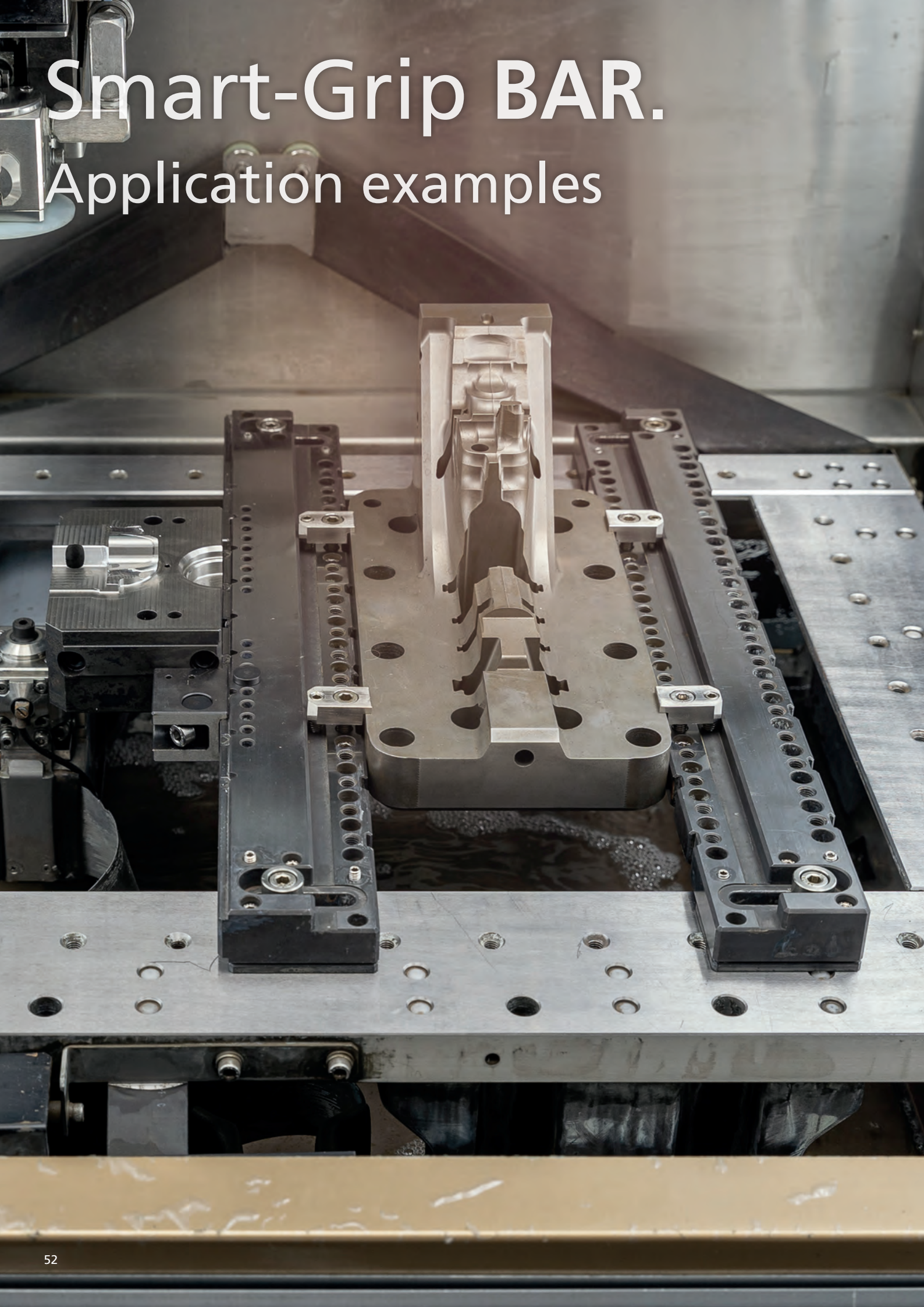
For clamping large workpieces and for multiple clamping.

- With our Smart-Grip „slide“ and „vice-slide“ clamping bars, larger workpieces can be clamped easily and always within the travel range of the wire EDM machines.
- The use of clamping bars enables multiple clamping of workpieces. Multiple clamping can significantly increase machine running times.
- Various clamping bars can be mounted laterally on the „vice slide“ clamping bars. This allows these clamping bars to be converted into a horizontal vice for clamping cubic as well as small round workpieces.
- Variable Z-support lips can be screwed onto the clamping bars to support the workpieces. Thus collision-free clamping is guaranteed.
- To avoid collisions, it is possible to screw supports to the clamping beams. This keeps the Z-support lips outside the area of the rinsing nozzles.
- With four screws each, the clamping beams can be easily adjusted in the plane.
- By using the „single“ and „double“ clamps, larger workpieces can be additionally supported and thus secured against tilting.

SMARTGRIP



*Precision
brought to the zero point*



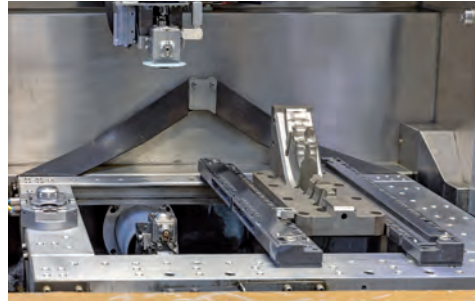
Smart-Grip BAR.

Application examples

Smart-Grip BAR in practice.



Smart-Grip BAR
Vice-Slide and Slide



Smart-Grip BAR
Vice-Slide and Slide as well as
pallet carrier Smart-Grip AIR



Smart-Grip BAR
Vice-Slide and Slide as well as
pallet carrier Smart-Grip AIR

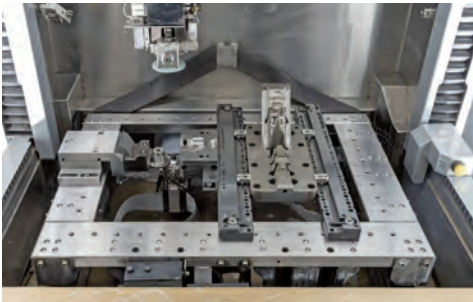


Smart-Grip BAR
Vice-Slide with clamping jaws
fixed and movable

SMARTGRIP



*Able to meet
all practical requirements*



Smart-Grip BAR
Vice-Slide and Slide as well as
Smart-Grip EASY



Smart-Grip BAR
Vice-Slide and Slide as well as
clamping jaw double and simple



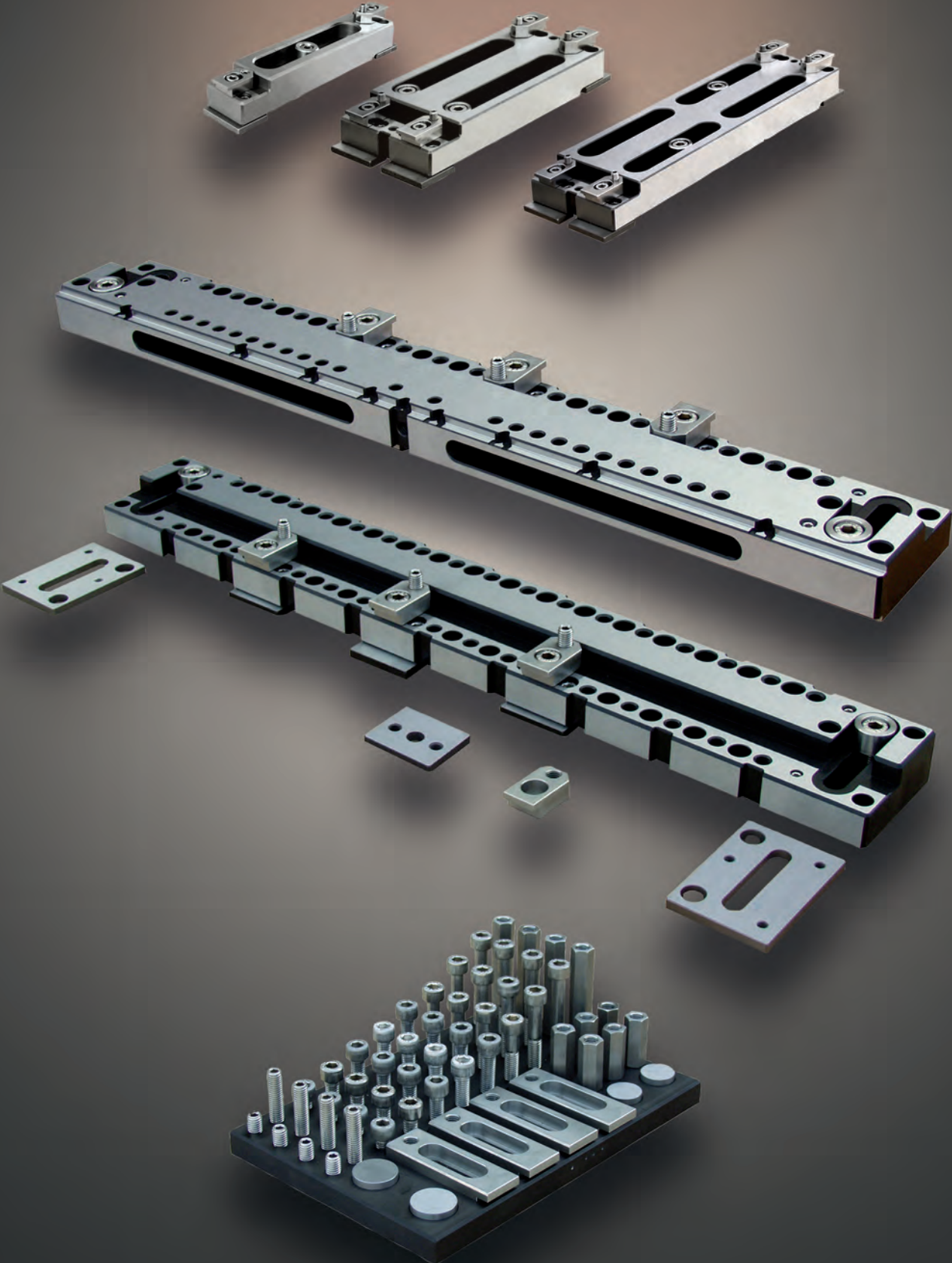
Smart-Grip BAR
Vice-Slide and Slide as well as
clamping jaw double and simple



Smart-Grip BAR
Vice-Slide and Slide as well as
clamping jaw double and simple

Smart-Grip BAR.

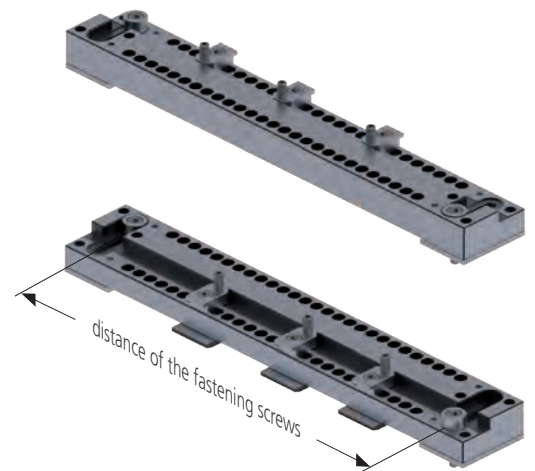
Components



Clampings bars and accessoires

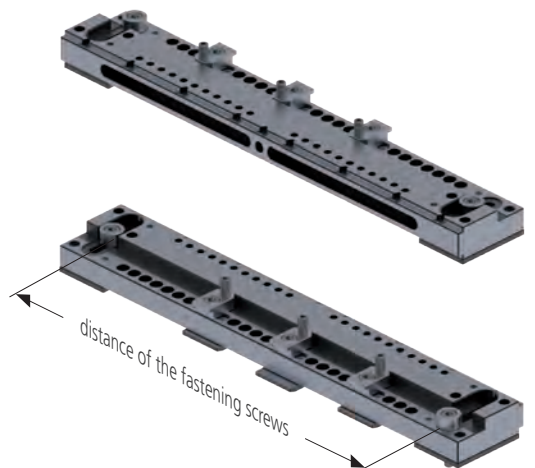
SMART SLIDE	
Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	vertical clamping of workpieces
Note	with variable support lips, clamping claws and support for collision-free clamping

Item no.	Distance of fastening screws in mm	Length L in mm	Width B in mm	Height H in mm
PT9000330345	345	395	70	30
PT9000330355	355	405	70	30
PT9000330370	370	420	70	30
PT9000330380	380	430	70	30
PT9000330400	400	450	70	30
PT9000330426	426	476	70	30
PT9000330450	450	500	70	30
PT9000330470	470	520	70	30
PT9000330475	475	525	70	30
PT9000330495	495	545	70	30
PT9000335620	620	670	70	35
PT9000335670	670	720	70	35
PT9000335695	695	745	70	35
PT9000335700	700	750	70	35
XT9000342456	456	506	70	42
XT9000342480	480	530	70	42
XT9000342680	680	730	70	42
Other sizes on request				



SMART VICE SLIDE	
Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	vertical and horizontal clamping of workpieces
Function	Clamping jaws fixed, fixed double sided, movable and prism jaw usable. (see example below - see also clamping jaw page 58/59)
Note	with variable support lips, clamping jaws and supports for collision-free clamping

Item no.	Distance of fastening screws in mm	Length L in mm	Width B in mm	Height H in mm
PT9000430345	345	395	75	30
PT9000430355	355	405	75	30
PT9000430370	370	420	75	30
PT9000430380	380	430	75	30
PT9000430400	400	450	75	30
PT9000430426	426	476	75	30
PT9000430450	450	500	75	30
PT9000430470	470	520	75	30
PT9000430475	475	525	75	30
PT9000430495	495	545	75	30
PT9000435620	620	670	75	35
PT9000435670	670	720	75	35
Other sizes on request				



Tensioner

Smart-Grip tensioner simple

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	Supporting and vertical clamping of workpieces
Note	with variable support lips and clamping jaws

Item no.	Distance of fastening in mm	Length L in mm	Width B in mm	Height H in mm
PT9000230180	180	200	40	30



Smart-Grip tensioner double

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	Supporting and vertical clamping of workpieces
Note	with variable support lips and clamping jaws

Item no.	Distance of fastening in mm	Length L in mm	Width B in mm	Height H in mm
PT9000230200	180	200	90	30



Smart-Grip tensioner double, long

Material	Stainless steel, corrosion-resistant and hardened
Use	Mounting on machine tables
Application	Supporting and vertical clamping of workpieces
Note	with variable support lips and clamping jaws

Item no.	Distance of fastening in mm	Length L in mm	Width B in mm	Height H in mm
PT9000230300	280	300	90	30

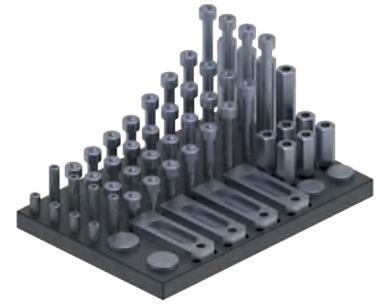


Accessoires

Smart-Grip Clamping accessoires M8

Material	Stainless steel, corrosion-resistant
Note	consisting of clamping jaws, magnets, spacers and M8 Allen screws

Item no.	Version
PT9000001080	Set



Smart-Grip clamping jaws

Material	Stainless steel, corrosion-resistant
Use	for clamping bars Smart Slide, Smart Vice Slide as well as tensioner simple and double

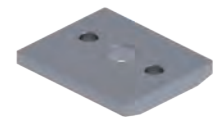
Item no.	Length L in mm	Width B in mm	Height H in mm
PT9000020035 (kurz)	33	20	11
PT9000020070 (lang)	70	23	12



Smart-Grip support lip

Material	Stainless steel, corrosion-resistant and hardened
Use	for clamping bars Smart Slide, Smart Vice Slide as well as tensioner simple and double

Item no.	Length L in mm	Width B in mm	Height H in mm
PT9000020040	40	33	5



Smart-Grip supports for collision-free clamping

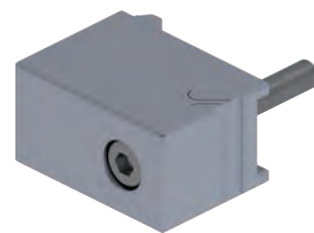
Material	Stainless steel, corrosion-resistant and hardened
Use	for clamping bar Smart Slide and Smart Vice Slide
Application	to be placed under the clamping bars for collision-free clamping



Item no.	Length L in mm	Width B in mm	Height H in mm
PT9000025070	70	50	5

Fixed jaw for vice 0 – 175 and clamping bar SMART VICE SLIDE

Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal clamping of workpieces
Function	Fixed jaw, with pull-down effect



Item no.	Jaw type	Length L in mm	Width B in mm	Height H in mm
PT9000103030	Jaw fixed	55	43	30

Fixed jaw double-sided for clamping bar SMART VICE SLIDE

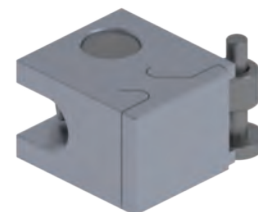
Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal clamping of workpieces
Function	Fixed jaw, with pull-down effect double-sided



Item no.	Jaw type	Length L in mm	Width B in mm	Height H in mm
PT9000103040	Jaw fixed double-sided	40	43	30

Clamping jaw moveable for vice 0 – 175 and clamping bar SMART VICE SLIDE

Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal clamping of workpieces
Function	Clamping jaw, with pull-down effect

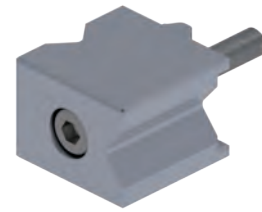


Item no.	Jaw type	Length L in mm	Width B in mm	Height H in mm
PT9000123045	Jaw movable	45	40	30

Accessoires

Prism jaw fixed for clamping bar SMART VICE SLIDE

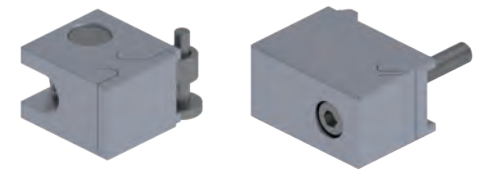
Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal and vertical clamping of round workpieces
Function	Jaw fixed



Item no.	Jaw type	Length L in mm	Width B in mm	Height H in mm
PT9000153030	Prism jaw	40	40	30

Jaw set 1 for vice 0 – 175 und clamping bar SMART VICE SLIDE

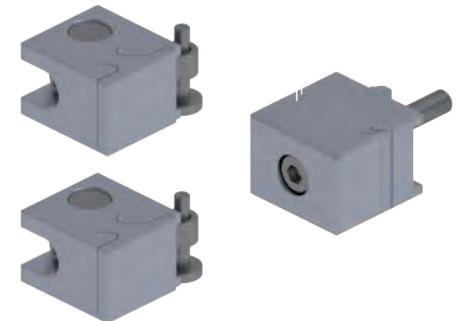
Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal clamping of workpieces
Function	Jaws, with pull-down effect



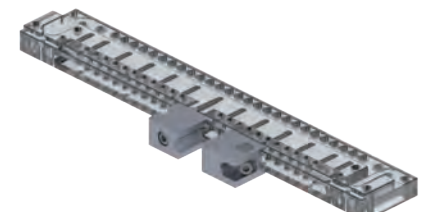
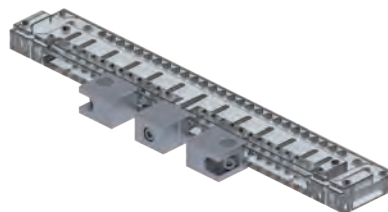
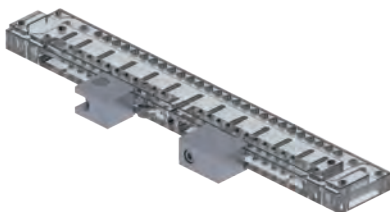
Item no.	Set
ST9000103040	Consisting of: 1 x clamping bar, PT9000123045 1 x jaw fixed, PT9000103030

Jaw set 2 for clamping bar SMART VICE SLIDE

Material	Stainless steel, corrosion-resistant and hardened
Use	Clamping jaw for Smart Vice 0 – 175 and clamping bar Smart Vice Slide
Application	horizontal clamping of workpieces
Function	Jaws, with pull-down effect



Item no.	Set
ST9000133040	Consisting of: 2 x clamping bar, PT9000123045 1 x jaw fixed, PT9000103040



SMARTGRIP

WIRE ERODING - SYSTEMATICALLY

Please also note the full range of our clamping systems:

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CLAMPING SYSTEMATICALLY

The zero-point clamping system for large-scale machining centres for milling and turning section

POWERGRIP
PALLETIZING SYSTEMATICALLY

The consistent zero-point palletizing system for all processing operations

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The modular mini zero-point palletizing system for workpieces and gripper technology

SMARTGRIP
WIRE ERODING - SYSTEMATICALLY

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